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**QUANTIFICATION OF TRANSACTIONAL
DISPUTE RESOLUTION COSTS FOR THE
U.S. CONSTRUCTION INDUSTRY**

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**Quantification of Transactional Dispute Resolution Costs for the
U.S. Construction Industry**

by

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Dissertation

Presented to the Faculty of the Graduate School of
The University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

**The University of Texas at Austin
May 2006**

UMI Number: 3225420

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Dedication

This dissertation is dedicated to my wife, my best friend, my inspiration, and my constant source of love, support, and encouragement.

April, thank you for everything.

This dissertation is also dedicated to my parents for whom I am eternally grateful.

Acknowledgements

I would like to acknowledge Dr. G. Edward Gibson, Jr. and express my gratitude for his support as both an advisor and an academic mentor over the past few years. His patience, guidance, and careful encouragement have been instrumental in the completion of this dissertation and invaluable component of my academic and professional development.

I would also like to thank the other members of my dissertation committee, Dr. Carlos Caldas, Dr. David Eaton, Mr. John Fleming, Dr. James O'Connor, and Dr. Jeffrey Siegel. Their participation, comments, and feedback have greatly improved the quality of this research. In addition, invaluable collaboration, assistance, and feedback were received from the following organizations: the National Academy of Construction (Dr. Richard Tucker, Mr. James Slaughter, and Mr. Ted Kennedy), the American Arbitrations Association's National Construction Dispute Resolution Committee (Mr. Robert Meade and Ms. Mary Jo Champion), the Center for the Prevention and Resolution of Disputes (Mr. Tom Stipanowich and Ms. Cathy Cronin Harris), and the American College of Construction Lawyers.

These acknowledgements would not be complete without expressing my gratitude and indebtedness to Mr. Jim Groton and Mr. Steve Nelson. These two progressive construction attorneys (at one time or another) have truly been both an integral part of this research and a guiding light for change in the industry. It was only with their support that this research was even possible.

This research was made possible with funding from the Alfred P. Sloan Foundation's Center for Construction Industry Studies (CCIS) at the University of Texas at Austin.

Quantification of Transactional Dispute Resolution Costs for the U.S. Construction industry

Publication No. _____

Richard John Gebken II, Ph.D.
The University of Texas at Austin, 2006

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The construction industry has been a paradoxical leader in both dispute occurrences and dispute resolution systems for many years. While this may or may not be an enviable position, the industry has managed to develop and adopt many unique ways to address the potential risks of disputes. However, the justification for implementing these procedures has been based primarily upon contractual requirements, governmental regulations, court orders, limited previous experience, or basic reactionary instinct, and not on measured cost savings.

This dissertation presents an exploratory effort to collect some of the first data on the true costs of resolving disputes in the construction industry. A methodology to capture these costs through transactional dispute resolution costs is proposed and a framework for dispute risk management is also explored.

Data from approximately 80 individuals, representing 57 organizations, were used in this multi-disciplinary research study focusing on the quantification of transactional costs (direct, indirect, and hidden sources) as a criterion for evaluating various dispute resolution and prevention methodologies. Quantitative questionnaires, qualitative case studies, and a comprehensive literature review are presented in an effort to identify efficient dispute resolution methodologies.

The results indicate that resolving a dispute in the construction industry is an expensive endeavor no matter which dispute resolution methodology is selected. While direct inferences to the industry as a whole is limited by the relatively small sample size, the identification and quantification of transactional dispute resolution costs may provide sufficient encouragement towards both the further adoption of cost efficient dispute resolution/prevention methodologies and the reduction of the antagonistic environment for which the construction industry is known.

Table of Contents

CHAPTER 1 INTRODUCTION.....	1
1.1 The Construction Industry and Project Disputes.....	2
1.2 Statement of the Problem	3
1.3 Importance of the Study	4
1.4 Research Objectives	6
1.5 Research Hypotheses.....	7
1.6 Research Scope	7
1.7 Research Partners	9
CHAPTER 2 INDUSTRY/ACADEMIA WORKSHOP	10
2.1 Overview	10
2.2 Workshop Background and Participants	11
2.3 Workshop Objectives	12
2.4 Research Workshop Methodology	13
2.5 Workshop Notes and Discussion.....	14
2.5.1 Pre-workshop Questionnaire Design	14
2.5.2 Condensed In-workshop Questionnaire Results	14
2.6 Final Topics from Breakout Group Sessions	20
2.7 Multi-Voting Analysis and Path Forward	21
2.7.1 Multi-voting Procedures	21
2.7.2 Multi-voting Results	22
2.7.3 Post-Workshop Survey	24
2.8 Workshop Summary.....	24
CHAPTER 3 LITERATURE REVIEW.....	26
3.1 What is a Dispute?.....	26
3.2 The Basics of Dispute Resolution	29
3.2.1 Negotiation.....	30
3.2.2 Mediation (Including Conciliation)	32
3.2.3 Neutral Evaluation	32
3.2.4 Adjudication / Expert Determination.....	33
3.2.5 Dispute Review Boards.....	34
3.2.6 Arbitration.....	36
3.2.7 Summary of ADR Options.....	39
3.3 Sources of Construction Disputes	41
3.4 Methods to Prevent Construction Disputes	45
3.5 Trends in Construction Industry Dispute Resolution	46
3.6 Previous Quantification Studies on ADR.....	50
3.6.1 Non-Industry Specific ADR Studies.....	51
3.6.2 Construction Industry Specific ADR Studies	53

3.6.2.1	Deloitte & Touche, LLP Construction Industry Reports	53
3.6.2.2	University of Kentucky Construction Dispute Study	54
3.6.2.3	Independent Project Analysis, Inc. Construction Dispute Study	56
3.7	Transactional Costs in this Study	57
3.8	Transactional Cost Economics	59
3.9	Literature Review Summary	61
CHAPTER 4 METHODOLOGY		62
4.1	Research Study Methodological Basis	62
4.2	Pre-Data Collection	64
4.2.1	Unit of Analysis	64
4.2.2	Measures of Analysis	65
4.3	Data Collection	65
4.3.1	Quantitative Data	66
4.3.1.1	Mail Survey	66
4.3.1.2	Web-Based Survey	67
4.3.2	Qualitative Data	68
4.4	Post-Data Collection	69
4.4.1	Analysis of Variance	69
4.4.2	Statistical Box Plots	70
4.4.3	Qualitative Data Analysis	71
4.5	Assumptions of the Study	72
4.6	Limitation of the Study	72
4.7	Summary	74
CHAPTER 5 QUANTITATIVE FINDINGS		75
5.1	Data Collection	75
5.2	General Project Information	76
5.2.1	Project Location	76
5.2.2	Owner Type	78
5.2.3	Facility Type	81
5.2.4	Construction Type	83
5.2.5	Fee Arrangement and Contract Type	84
5.2.6	Contract Amount	86
5.2.7	ADR Language in Contract	87
5.3	Project Schedule Information	89
5.3.1	Project Start Date	89
5.3.2	Project Substantial Completion Date	90
5.3.3	Project Final Acceptance Date	90
5.3.4	Project Duration	91

5.3.5	Number of Disputes on Project.....	92
5.3.6	Project Percent Complete when Dispute First Occurred	93
5.3.7	Project Percent Complete when Claim First Formally Notified	94
5.3.8	Dispute Settlement Date	96
5.4	Project Dispute Detailed Information	97
5.4.1	Dispute Type.....	97
5.4.2	Parties in Dispute	98
5.4.3	Perceived Dispute Complexity	99
5.4.4	ADR Methods Attempted Prior to Final Settlement.....	100
5.4.5	Final Settlement Method.....	101
5.4.6	Total Claim Amount	101
5.4.7	Total Counterclaim Amount	102
5.4.8	Transaction Costs.....	103
5.4.8.1	Transactional Costs Collected from Whom.....	103
5.4.8.2	CLAIMAINT VS NON-CLAIMAINT.....	104
5.4.8.3	Outside Counsel Costs	105
5.4.8.4	In-house Counsel Salary and Benefits	105
5.4.8.5	Outside Consultant and Expert Witness Costs.....	106
5.4.8.6	Management and Staff Salary Costs.....	107
5.4.8.7	Filing Fees, Arbitration/Mediation/Court Costs	107
5.4.8.8	Other Transactional Costs.....	108
5.4.8.9	Summary of Specific Transactional Cost Categories ...	109
5.4.9	Dispute Settlement Information.....	111
5.5	Other Data Analyses.....	112
5.5.1	Effects of ADR Method Selection on Cost.....	114
5.5.2	Effects of ADR Method Selection on Length of Dispute	117
5.5.3	Effects of Disputing Party.....	120
5.5.4	Effects of Perceived Dispute Complexity.....	121
5.6	Anecdotal Transactional Cost Information	123
5.6.1	The cost of Expert Reports	123
5.6.2	Use of Dispute Review Boards.....	124
5.6.3	Quantitative Data Anecdotes Collected in Case Study Analyses.....	125
5.7	Summary	126
CHAPTER 6 QUALITATIVE DATA FINDINGS		128
6.1	Selection of Interviewees	128
6.2	Questionnaire Structure.....	129
6.3	Findings.....	129
6.3.1	Other Costs of Disputes	130
6.3.2	Current Quantification Techniques for Disputes	133

6.3.3	Methods to Prevent/Minimize Disputes.....	135
6.3.4	Familiarity and Usage of ADR Techniques.....	137
6.3.5	Role of Lawyers in Construction	139
6.4	Conclusions	141
CHAPTER 7 COMBINED ANALYSIS		142
7.1	Universal Findings	142
7.1.1	Substantial Cost of Construction Disputes	143
7.1.2	Dispute Uniqueness	143
7.1.3	Dispute Resolution Design	144
7.2	Dispute Risk Management	145
7.3	Combined Analysis Conclusions	147
CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS		150
8.1	Review of Research Objectives.....	150
8.1.1	Objective One – Discussion.....	151
8.1.2	Objective Two – Discussion.....	152
8.1.3	Objective Three – Discussion.....	152
8.1.4	Objective Four – Discussion.....	153
8.2	Review of Research Hypotheses.....	154
8.3	Conclusions	156
8.4	Contributions.....	157
8.5	Recommendations for future research.....	158
APPENDICES		160
	Appendix A – Industry/Academia Workshop Participants	161
	Appendix B – Pre-Workshop Questionnaire.....	162
	Appendix C – Pre-workshop Questionnaire Response Summary.....	164
	Appendix D – Quantitative Area Mail Survey	170
	Appendix E –Web-Based Survey Screenshots.....	181
	Appendix F – Semi-Structured Interview Question Sheet	187
	Appendix G – Contractor 1 Interview Transcription	190
	Appendix H – Contractor 2 Interview Transcription	197
	Appendix I – Lawyer 1 Interview Transcription.....	208
	Appendix J – Lawyer 2 Interview Transcription	225
	Appendix K – Owner 1 Interview Transcription	239
	Appendix L – Owner 2 Interview Transcription.....	250
	Appendix M – Unabridged Quantitative Dataset.....	259
	Appendix N – Adopted Definitions of Dispute Causes/Types	280
	Appendix O –Full ANOVA Tables for Quantitative Analyses.....	282
	Appendix P – Participating Companies and Organization in Quantitative and Qualitative Data Collection	293

References	294
Vita	302

List of Tables

Table 3.1: Arbitration Length Comparisons between Fast and Non-Fast Track Cases for 2004	37
Table 3.2: Estimated Days Saved in Dispute Resolution.....	54
Table 3.3: Estimated Cost Savings in Dispute Resolution.....	55
Table 5.1: Summary Table of Project Locations by State (n=60).....	76
Table 5.2: ANOVA Results for Dispute Length after Substantial Completion by Owner Type.....	80
Table 5.3: ANOVA Results for Transactional Cost Ratio by Owner Type.....	81
Table 5.4: ANOVA Summary for Notification Timing versus Mean Days from Dispute Occurrence to Dispute Resolution Date.....	96
Table 5.5: ANOVA Summary for Notification Timing versus Mean Days from Project Substantial Completion to Dispute Resolution Date	96
Table 5.6: Descriptive Statistics of Transactional Cost Study Project Data	113
Table 5.7: Transactional Costs as a Percent of Contract Amount, Original Claim, and Settlement/Award	114
Table 5.8: ANOVA for Final Settlement Method vs. Total Transactional Costs	115
Table 5.9: ANOVA for Negotiation vs. Other ADR Methods by Total Transactional Costs	116
Table 5.10: ANOVA Summary for Final ADR Method vs. Days from Substantial Completion to Dispute Resolution (Measure 1).....	118
Table 5.11: ANOVA of Final ADR Method vs. Days from Dispute First Occurrence to Dispute Resolution (Measure 2)	119
Table 5.12: ANOVA of Final ADR Method vs. Days to Resolution (Measure 1)	120
Table 5.13: ANOVA of Final ADR Method vs. Days to Resolution (Measure 2)	120
Table 5.14: ANOVA Summary of Party Transactional Costs as a Percentage of Original Claim Value	120
Table 5.15: ANOVA Summary for Dispute Complexity vs. Total Transactional Costs Divided by Original Claim Amount.....	122
Table 5.16: Two-way ANOVA Summary - Transactional Costs Divided by Original Claim Amount VS. Complexity and Claim Value (n = 35).....	123
Table 6.1: Background Information of Qualitative Projects	129
Table 6.2: Interviewee Perception of Transactional Cost Category Magnitude .	134

List of Figures

Figure 2.1: Breakdown of Workshop Participants	12
Figure 2.2: Area 1 Results – Corporate/Company-Level Business Issues.....	17
Figure 2.3: Area 2 Results – Project-Level Issues	18
Figure 2.4: Area 3 Results – Construction Legal Environment Issues	19
Figure 2.5: Final Multi-Voting Results	23
Figure 3.1: Relationship between Conflict, Claims, and Disputes.....	28
Figure 3.2: Control of Outcome vs. Cost and Hostility of Dispute.....	31
Figure 3.3: Typical Dispute Process Diagram	40
Figure 3.4: NAVFAC Total Litigation 1982-2002	47
Figure 3.5: USACE Total Litigation 1980 – 2004	49
Figure 4.1: Research Methodology Diagram	63
Figure 4.2: Box Plot Definitions	70
Figure 5.1: States Represented with Data in the Quantitative Survey (n=60)	77
Figure 5.2: Owner Type (n=61)	79
Figure 5.3: Facility Type (n=61)	82
Figure 5.4: Construction Type (n=60).....	84
Figure 5.5: Project Fee Arrangement (n=60)	85
Figure 5.6: Contract Scope (n=61).....	86
Figure 5.7: Box Plot of Contract Values (n=58)	87
Figure 5.8: ADR Language in Contract (n=60)	88
Figure 5.9: Project Duration (n=51).....	91
Figure 5.10: Project Percent Complete when Dispute First Occurred (n=52)	93
Figure 5.11: Project Percent Complete when Claim First Formally Notified (n=52).....	95
Figure 5.12: Causes/Types of Dispute based upon Dispute Description (n=41) ..	98
Figure 5.13: Perceived Dispute Complexity (n=47)	99
Figure 5.14: Frequency of ADR Methods Attempted Prior to Settlement (n = 47)	100
Figure 5.15: Final Settlement Method (n=48).....	101
Figure 5.16: Transactional Costs Collected from Whom (n=47).....	103
Figure 5.17: Overall Aggregate Dispute Resolution Transactional Cost Breakdown (n=45).....	109
Figure 5.18: Negotiation Dispute Resolution Transactional Cost Breakdown (n=17).....	110
Figure 5.19: Mediation Dispute Resolution Transactional Cost Breakdown (n=15)	110
Figure 5.20: Arbitration Dispute Resolution Transactional Cost Breakdown (n=11).....	110
Figure 5.21: Settlement Paid to Whom (n=46)	112
Figure 5.22: Box Plot of Dispute Amount vs. Final Dispute Resolution Method	116

Figure 5.23: Box Plot of Final ADR Method vs. Days from Substantial Completion to Dispute Resolution (Measure 1).....	118
Figure 5.24: Box Plot of Final ADR Method vs. Days from Dispute First Occurrence to Dispute Resolution (Measure 2)	119
Figure 7.1: Dispute Resolution Management System	146
Figure 7.2: Revised Control of Outcome vs. Cost of Dispute Resolution	148

CHAPTER 1 INTRODUCTION

“Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them how the nominal winner is often a real loser – in fees, expenses, and waste of time (Abraham Lincoln 1850).” Abraham Lincoln’s famous 1850 quote on the pitfalls of litigation rings as true today as it did more than 150 years ago. This advice is especially pertinent for the construction industry – a well-known contestant in the civil court system. As U.S. courts find themselves buried under an increasing backlog of litigation and attorney fees and expert witness costs continue to climb to unexperienced new highs, today’s construction industry litigants find themselves stuck between the proverbial “rock and a hard place.” On one side, unresolved conflict poisons the work environment and protracts the adversarial nature of the industry. On the other, the costs for resolving conflict are escalating to astronomical proportions and the search for resolution alternatives is as fervent as ever.

Unfortunately, the comparative newness of the dispute resolution/prevention movement has been coupled with rapid and frequent expansion in options and alternatives. The combination of inexperience and rapid change has left many practitioners in a state of bewilderment. To heighten this problem, quantitative data are unavailable to help decision makers understand the positives and negatives of available alternatives.

This dissertation examines the transactional costs associated with dispute resolution efforts in the construction industry using both quantitative and qualitative techniques to help industry practitioners realize the extent to which disputes affect the industry and the overall economy, while at the same time offering them alternatives for improvement.

1.1 The Construction Industry and Project Disputes

The construction industry has been a paradoxical leader in both dispute occurrences and dispute resolution systems for many years (Groton 2005; Keil 1999; Michel 1998). While this may or may not be an enviable position, the industry has managed to develop and adopt many unique ways to address the potential risks of disputes (Harmon 2003; Mix 1997; Peña-Mora et al. 2003; Rubin et al. 1999; Zack 1997). Additionally, many of these concepts and systems, including partnering, realistic risk allocation, dispute review boards, and stepped negotiations, have been successfully applied in other industries (Stipanowich 1995; Treacy 1995). However, the justification for implementing these procedures has been based primarily upon contractual requirements, governmental regulations, court orders, limited previous experience, or basic reactionary instinct, and not on measured cost savings.

The hard truth is that disputes are not new to the construction industry. Critics, both internal and external, have deplored the existence and extent of construction disputes for decades. One industry publication, Engineering News-Record, has expressed numerous editorials over the past 20 years on the disappointing performance of dispute prevention and resolution on construction projects. Their comments include, “Corporate heads are seeing the cost of arbitration and litigation growing (Editorials 1985, p. 23).” “Litigation, says one CEO, is better than dueling, but it's more expensive (Editorials 1988, p. 64).” “The process [litigation] simply takes too long, costs too much and often doesn't deliver much justice (Editorials 1991, p. 86).” “Over the past decade, we have documented the rise of litigiousness in this industry, lamenting its cancerous effect on virtually all it touches (Editorials 1994, p. 58).” And finally, “When it comes to the construction industry, the main dispute resolution tool remains a lawyer, and every disagreement still looks like a lawsuit (Editorials 1999, p. 68).”

Numerous other authors agree; citing litigation as a money and time draining endeavor no company should pursue lightly (Pawson 2003; Rubin et al. 1991; Steen and MacPherson 2000; Stickel 1999). One industry expert calculates that \$5 billion is spent on construction-related litigation each year and that these numbers are increasing at a rate of ten percent per year (Michel 1998). It is no wonder why the construction industry has been stereotyped as an adversarial and combative industry.

For an industry keenly focused on quantitative results, it is an amazement that parties involved in the purchase or construction of capital projects frequently fail to analyze the actual costs associated with dispute occurrences through both their frequency and severity (Adrian 1988). Without this quantitative data, practitioners cannot make informed decisions concerning dispute resolution systems. Providing such data is the objective of this research.

1.2 Statement of the Problem

In a 1994 survey on uses of ADR in the construction industry, Stipanowich notes, “A particular concern of [managers who make decisions about implementing dispute resolution] is the relative costs of pursuing various alternatives. Though maddeningly elusive, such numbers may represent the essential lubricant for change in a [construction] bureaucracy demanding empirical justification for decision making (Stipanowich and O’Neal 1995, p. 7).” More than ten years later, an empirical description of the costs associated with dispute resolution has still not been produced.

At the same time, the lack of objective criteria to evaluate dispute resolution and prevention methodologies precludes industry practitioners from selecting the most appropriate procedures to limit the impact of disputes. Consequently, valuable money and resources are wasted on conflict and not construction. It is estimated that for each \$1 billion USD saved through the elimination of disputes (a mere 20 percent of the estimated

total spent on lawsuits in construction), a total annual gain of 40,000 jobs in construction could be achieved (Michel 1998). This dollar figure does not even take into account the hidden costs of disputes including lost productivity, rework, and damaged business relationships to name a few.

Theory and experience agree that disputes waste a lot of money and resources on non-value adding activities. However, no research has been conducted to quantify what these losses may total. Uncovering the true costs of disputes in the construction industry may help further encourage a shift from combative to collaborative project environments.

1.3 Importance of the Study

In 2005, the construction industry installed over \$1.1 trillion USD of capital projects in the United States alone (U. S. Census Bureau 2005). Employing more than 7.9 million workers and constituting nearly eight percent of the U.S. gross domestic product, the construction industry greatly influences the overall U.S. economy (Construction Specifications Institute 2001). Given the amount of capital expenditures funneled through the construction industry each year and the propensity of the industry towards conflict, it is surprising to note that no current system exists to evaluate and benchmark the performance of dispute prevention and resolution methodologies in the construction industry.

In September 2004, an industry forum focusing on reducing construction costs through better dispute resolution practices was held in Washington, D.C. Co-sponsored by the Federal Facilities Council and the National Academy of Construction, the forum emphasized both the current tools available to today's project teams for dispute prevention and resolution and the need to encourage further use of these tools to avoid and quickly resolve disputes (Federal Facilities Council and National Academy of Construction 2004). The unanimous message conveyed at this forum was, "The costs of

disputes are one of the greatest problems facing the industry today (Federal Facilities Council and National Academy of Construction 2004).”

While some have stated that the quantity and severity of disputes is invariably linked to the overall health of the economy (Brooker and Lavers 1997; Flanigan et al. 1997; Yates 2003), the consensus belief still appears to be that disputes are unwanted occurrences on construction projects no matter what the economic considerations. However, the importance placed upon construction dispute reduction is justified (Loosemore et al. 2000) and a perceived necessary step to improve the industry as a whole. This was an opinion that was reaffirmed at a Center for Construction Industry Studies (CCIS) research workshop meeting held in September 2003 (Gibson et al. 2003).

At this workshop, twenty-two attendees from industry and academia met to brainstorm, discuss, and prioritize research topics for the Economic, Financial, and Dispute Resolution Thrust Area for CCIS. While the full details of this workshop will be presented in Chapter 2, multi-voting analysis revealed that disputes were a top concern and priority of the industry, at least for those who were part of the workshop. The top three areas of research opportunities ranked by the attendees were as follows:

- Investigate and document the transactional costs of dispute resolution through the progression of the dispute.
- Identify up-front programming, planning, and design phase process improvements for minimizing/managing disputes.
- Quantify benefits of using techniques designed to reduce and eliminate the costs of disputes.

The unanimous call to action to address the problems and issues arising from dispute occurrences pointed the researcher towards the severity of the problem in the

industry. As such, the top vote receiving research category, transactional cost quantification for dispute resolution efforts, was to become the focus of this dissertation. Knowing that other researchers had referred to these numbers as “maddeningly elusive” (Stipanowich and O’Neal 1995, p. 7), the timeliness and potential impact of this research was too great to be dissuaded.

1.4 Research Objectives

This research study will attempt to quantify the costs associated with disputes in the construction industry using both quantitative and qualitative data sources in order to achieve four main objectives. These include:

- Provide objective criteria for use in universally evaluating the effectiveness of dispute resolution methodologies in the construction industry.
- Quantify the transactional costs associated with multiple dispute resolution methodologies in the construction industry.
- Evaluate the cost effects of construction disputes and construction dispute resolution methodologies on the parties in dispute.
- Recognize successful methods for reducing construction disputes and their costs.

Achieving these four objectives will help industry practitioners realize the extent to which disputes affect the industry and the overall economy while at the same time offering them alternatives for improvement. In addition, developing a dispute resolution evaluation methodology will allow industry professional to select and benchmark project performance to improve overall capital efficiency by potentially reducing construction costs through improved conflict management.

1.5 Research Hypotheses

This research will collect quantitative information on baseline dispute durations and costs. In addition, this research will collect qualitative information on additional costs incurred during dispute resolution efforts that cannot be directly captured in the quantitative study. Utilizing all of this information, the following hypotheses will be investigated:

- **Hypothesis 1** – The cost and time necessary to resolve a construction dispute are significantly and positively affected by the application and timing of varying alternative dispute resolution techniques.
- **Hypothesis 2** – The transactional costs of construction disputes are significantly affected by the role the parties play in the dispute.
- **Hypothesis 3** – The transactional costs of construction disputes are significantly and positively affected by the perceived complexity of the issue in dispute.

1.6 Research Scope

This research focuses on the transactional costs associated with dispute resolution in the construction industry. These are the costs that are incurred because of the presence of a dispute including direct costs (such as fees and expenses paid to lawyers, paralegals, accountants, claims consultants, and other experts), indirect costs (such as salaries and associated overhead of in-house lawyers, company managers, and other employees who have to assemble the facts, serve as witnesses and otherwise process the dispute), and (to the extent they can be measured) hidden costs (such as the inefficiencies, delays, loss of quality that disputes cause to the construction process itself, and the costs of strained

business relations between the contracting parties). Transactional costs do not include monies paid out in “settlement” of a dispute because these are, in general, amounts that have been recognized as being owed.

Another important attribute of this research is its exploratory nature. Little previous research has focused on quantifying the transactional costs of dispute resolution, and as such, the scope of this research is to provide a preliminary groundwork for methods of quantitatively analyzing varying dispute resolution and prevention techniques. The scope of this research also includes the recognition of successful techniques for reducing the costs of disputes, and it is anticipated that the information acquired in this research can be used as the basis for future studies.

The scope of this study will be limited to commercial, industrial, and civil/heavy highway projects built in the United States. Disputes within the residential construction sector will not be studied, nor will disputes on projects located outside of the United States. Lastly, the scope of this study is limited to examination of the costs that are incurred by only one party of the dispute. In general, this is either the owner or the general contractor. However, information from subcontractors, designers, and other parties will also be accepted to gain as complete a picture as possible on disputes within the construction industry. It is anticipated that by collecting enough data from both parties of the dispute, it will be possible to make inferences about the total monies spent on transactional costs for an entire dispute.

Data collected for this research will be part of a convenience sample and not randomly selected. However, the following section will outline the national organizations that played a critical role in helping ensure that a wide breadth and depth of data was collected.

1.7 Research Partners

A variety of national organizations played an integral part in generating a diverse set of questionnaire respondents. As stated previously, the respondents were not randomly selected but rather part of a convenience sample. The four organizations that were influential in contacting their membership to solicit voluntary responses include:

- The American Arbitration Association's National Construction Dispute Resolution Committee (AAA-NCDRC),
- The American College of Construction Lawyers (ACCL),
- The International Institute for Conflict Prevention and Resolution (CPR),
and
- The National Academy of Construction (NAC).

In addition, a variety of local/regional contractors and owner organizations were contracted from the central Texas area to participate in this study.

CHAPTER 2 INDUSTRY/ACADEMIA WORKSHOP

The idea to undertake research towards the goal of dispute resolution transactional costs quantification was not reached in a vacuum. This chapter presents the foundation upon which this dissertation was built by focusing on an industry/academia workshop held at the University of Texas at Austin in 2003. Under the auspices of the Center for Construction Industry Studies' Economic, Financial, and Dispute Resolution (EFDR) Thrust, industry experts, both practitioners and academics, offered their insights and opinions in order to help identify areas of high importance and high impact for the construction industry. The following sections will describe the process and results of that 2003 workshop.

2.1 Overview

Entering into its third phase of research, the Center for Construction Industry Studies (CCIS) had identified many potential research topics within the EFDR domain. (The thrust area was renamed from Economic, Financial, and Legal subsequent to input from the workshop.) Topics included industry economic drivers, innovative project financing, project accounting, sureties and bonding, project insurance, claims avoidance, and alternative dispute resolution. All of these potential subject matters were considered to have a significant impact on project and company financing, business sector health and viability, and overall company performance and were thus of importance to the center's research goals.

In 2003, developing a prioritized research agenda in this area was the next step to building a strong and relevant research focus for this and other future studies. As such, the EFDR research team members set out to hold a research workshop where select industry professionals and related academics could offer valuable insight into the unique

needs and concerns of the sector. On Friday, September 5, 2003, the workshop was held at the University of Texas at Austin campus. The goals of the workshop were to identify relevant research topics, develop a prioritized research agenda, and discuss potential partners and sources of data for the research.

2.2 Workshop Background and Participants

The Center for Construction Industry Studies is a research center studying the construction industry and was initiated in 1996 with grants from the Alfred P. Sloan Foundation and the Construction Industry Institute (CII). It was created to perform multi-disciplinary, long-range studies addressing construction industry challenges in order to complement the traditionally short-term research process employed by CII and others. It has subsequently been sustained by two additional grants from the Alfred P. Sloan Foundation.

CII is a research organization whose mission is to improve the competitiveness of the construction industry. CII is a consortium of approximately 90 leading owners and contractors who have joined together to find better ways of planning and executing capital construction programs.

Participants in the CCIS research workshop included participants from industry and academia; CII member companies and non-CII member companies; from owners, contractors, engineering firms, and law firms; and from commercial, industrial, and institutional sectors. Appendix A lists the workshop attendees. Figure 2.1 graphically illustrates how the participants break out according to their main business perspective; although, it should be noted that several of the participants worked in diverse organizations and gained perspectives from several directions.

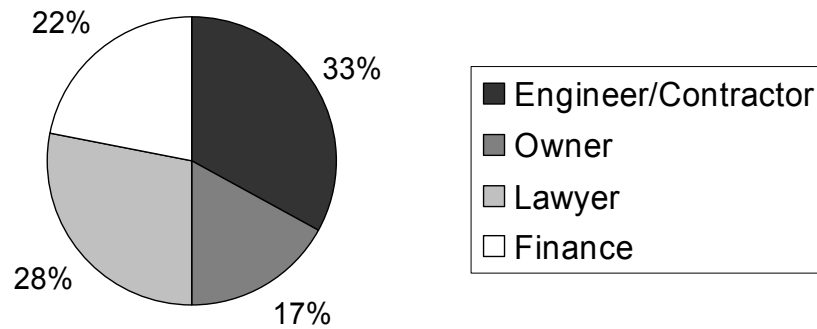


Figure 2.1: Breakdown of Workshop Participants (n=18)

2.3 Workshop Objectives

Many observations by the CCIS research team indicated a need for research in the EFDR Thrust area. Key signals included an industry downturn (particularly in project-based financing), the effects of 9/11 on insurance, surety, and international ventures, an “up-tick” in litigation (perception or reality?), interest from industry, and high potential for significant research with little substantive previous research. As such, the EFDR Research Workshop was held to accomplish five main objectives. These included:

- Defining the scope of the Economic, Financial, and Dispute Resolution Thrust Area
- Identifying relevant research topics
- Developing a prioritized research agenda
- Assessing potential impact and “doability” of chosen topics
- Discussing potential partners and sources of data for the research

2.4 Research Workshop Methodology

Planning for the workshop consisted of three main components. First, participants were asked to complete a pre-workshop questionnaire identifying their opinions on topics of importance. The questionnaire was broken into three broad areas of research – corporate/company-level business environment, project-level issues facing the construction industry, and legal environment of the engineering and construction industry. Answers were to be in the form of a rank-ordered, free-form list. These responses were then used to poll all attendees at the workshop and to help initiate the conversation of the breakout sessions. The pre-workshop questionnaire is listed in Appendix B.

The second component of the workshop consisted of small group breakout sessions. In these breakout groups, participants were asked to give feedback on the EFDR Thrust, brainstorm topics of interest in their designated area, and develop three to five topics of research for the group to vote on. The breakout groups were formed by taking a cross-sectional representation of the participants and placing them in the three topical areas identified in the pre-workshop questionnaire – corporate/company-level business environment, project-level issues facing the construction industry, and legal environment of the engineering and construction industry.

The last component of the workshop was a multi-voting analysis. In this exercise, group representatives from each of the three areas presented their three to five research topic suggestions. When completed, all participants were given five votes (designated by small orange “dots”) to identify which areas were of highest interest for the group. Each individual could place up to two votes for any one topic and all votes had to be used. The findings from this multi-voting session will be discussed in a subsequent section.

2.5 Workshop Notes and Discussion

This section will look at two distinctive aspects of the research workshop. First, the pre-workshop questionnaire will be discussed. Secondly, the notes taken during the workshop breakouts will be presented. These items are presented together because of their interrelated roles within the workshop. As will be discussed below, the pre-workshop questionnaire served as the starting point for discussion in the representative breakout sessions held at the workshop.

2.5.1 PRE-WORKSHOP QUESTIONNAIRE DESIGN

Prior to the September 5 workshop, a questionnaire was sent out to all invitees to elicit their ideas as to what topics of study in the EFDR research thrust were most important. Respondents were asked to rank-order their top three topics for research within three broad areas. These areas include:

- Area #1 – Corporate/Company-level Business Environment,
- Area #2 – Project-level Issues Facing the Construction Industry, and
- Area #3 – Legal Environment of the Engineering and Construction Industry

The sample questionnaire can be found in Appendix B. Nine responses were received from the industry participants, and using these responses, the authors were able to consolidate and group the research topics for a follow-up query in the workshop. The responses from the pre-workshop questionnaire can be found in Appendix C.

2.5.2 CONDENSED IN-WORKSHOP QUESTIONNAIRE RESULTS

Using the pre-workshop questionnaire responses, the research team then consolidated and reorganized the topics into distinct potential research investigations.

The condensed lists were then used as an early voting and discussion tool in the workshop. Participants were asked to rank order the top three topics within each area early in the workshop. Results were combined and tallied from all participants according to the following scoring scheme.

1 = Highest Importance; 5 points

2 = High Importance; 3 points

3 = Important; 1 point

In addition, the top three topics from each area are listed below. These results were then utilized in the breakout group sessions as a starting point of discussion for each area.

Area #1 – Corporate/Company-level Business Environment

- Economic and market factors affecting the profitability of engineering and construction companies and in general the industry
- Extent and economic impact of trade workforce shortages
- Overall engineering and construction sector health: comparisons between similar and dissimilar industries

Area #2 – Project-level Issues facing the Construction Industry

- Up-front programming, planning, and design phase process improvements for minimizing/managing disputes
- U.S. insurance industry and its effects on the overall engineering and construction industry and individual projects
- Better methods for surety and insurance companies to understand risks and risk portfolios

Area #3 – Legal Environment of the Engineering and Construction Industry

- Determine the real costs of dispute resolution (including litigation and various forms of alternative dispute resolution)
- Develop strategies for increasing awareness and utilization of techniques designed to reduce/eliminate the costs of disputes
- Identify the impacts of onerous, high-risk, owner-imposed contractual language on projects and organizations

Figure 2.2, Figure 2.3, and Figure 2.4 show the Pareto charts from the condensed in-workshop questionnaire.

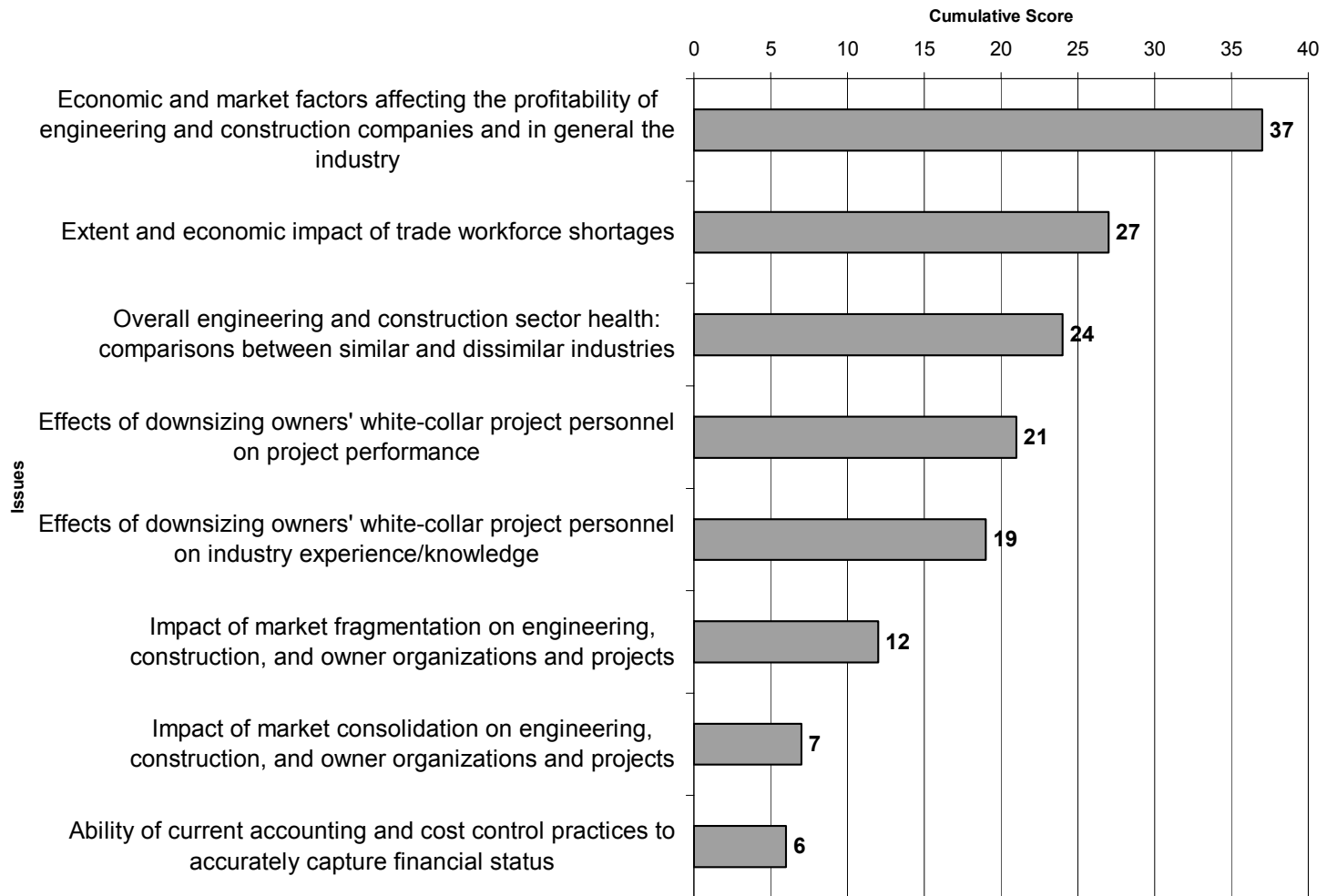


Figure 2.2: Area 1 Results – Corporate/Company-Level Business Issues

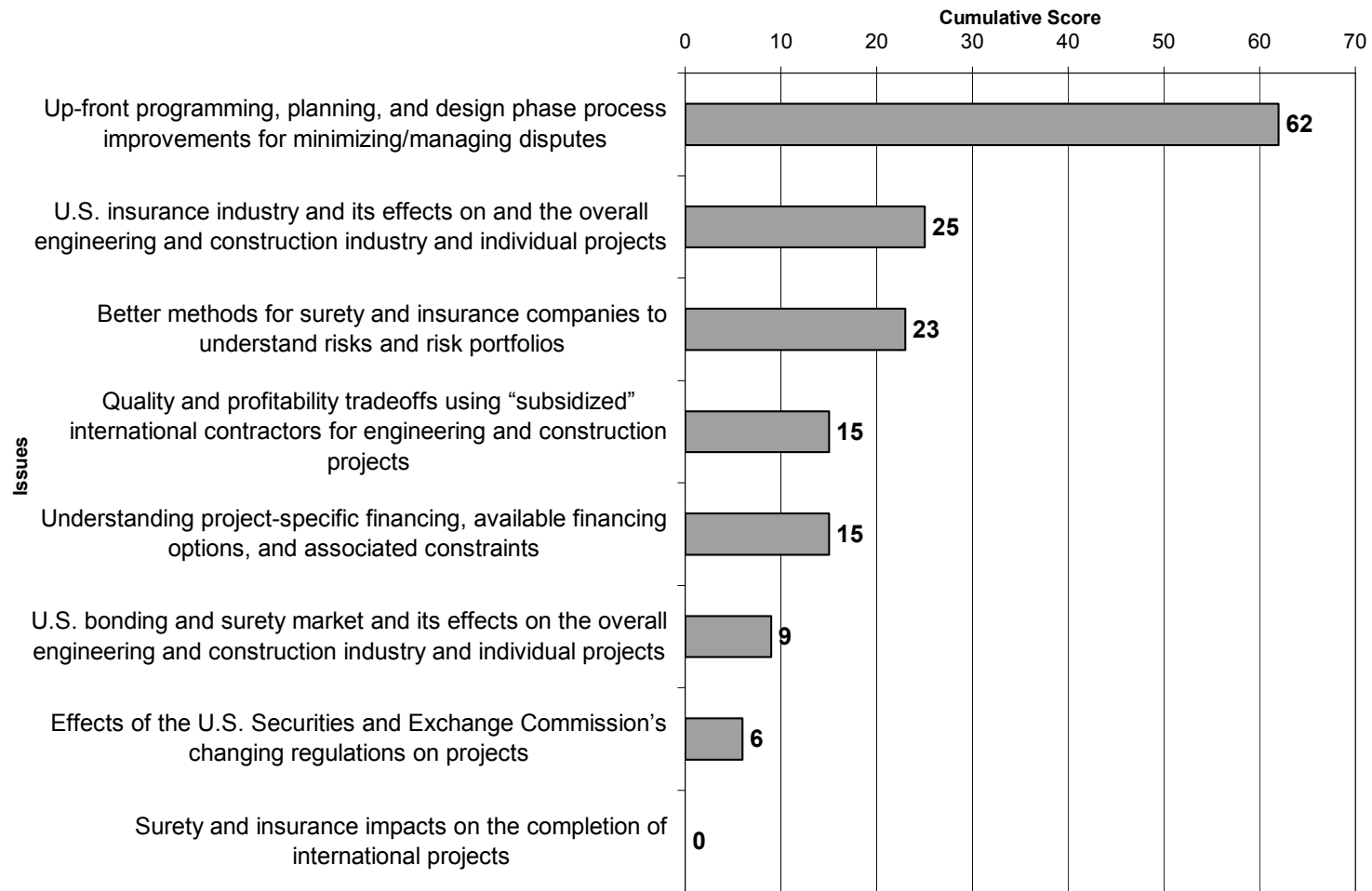


Figure 2.3: Area 2 Results – Project-Level Issues

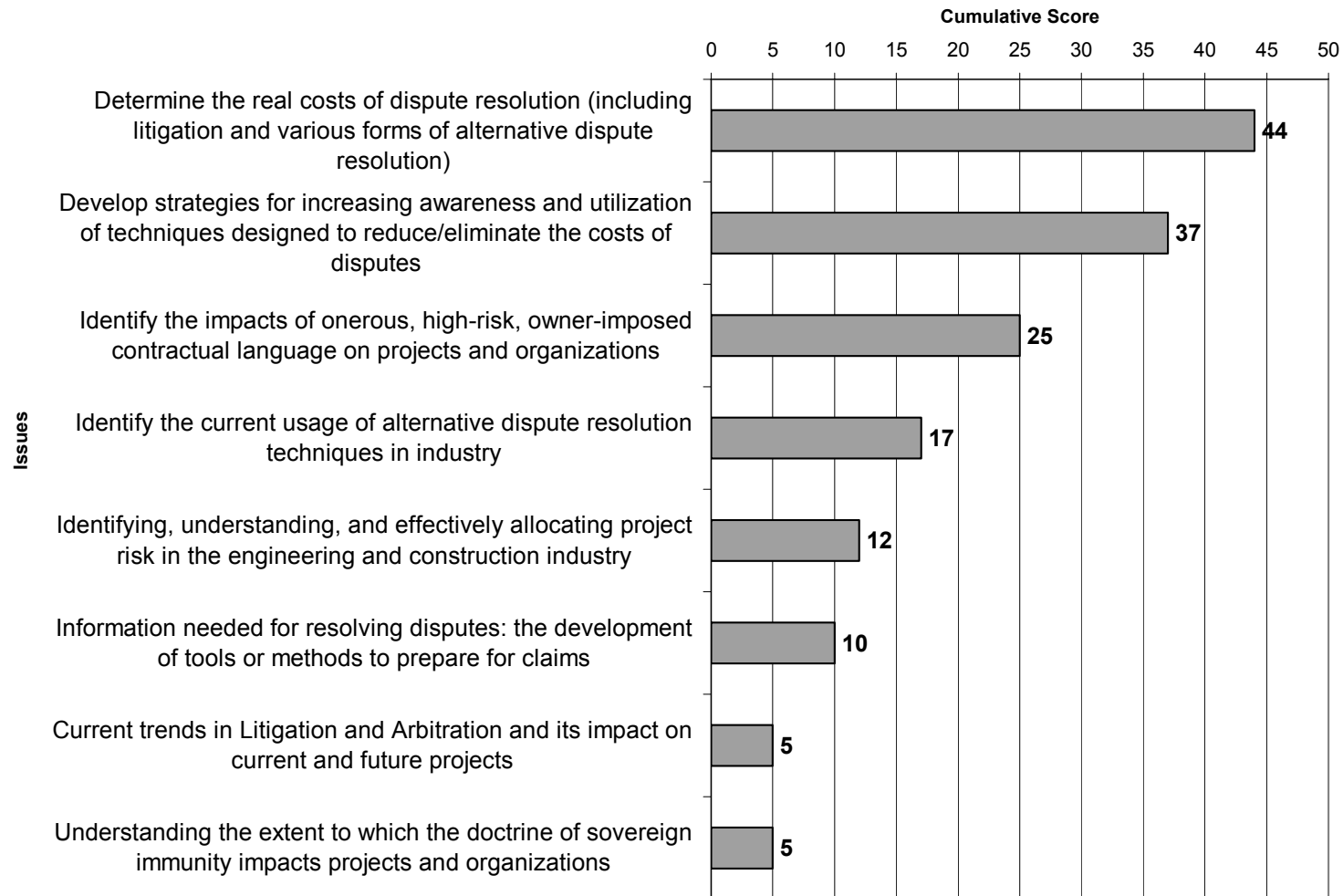


Figure 2.4: Area 3 Results – Construction Legal Environment Issues

2.6 Final Topics from Breakout Group Sessions

After brainstorming and discussing the topics listed above, each breakout group was asked to identify three to five topics to present back to the entire group. These final topics would be used for a multi-voting analysis. Below is the breakdown of each group's final topic list by area.

Area # 1 – Corporate/Company-level Business Environment

- Effects of downsizing owner's white-collar project workforce on project performance (in-house vs. contracted out)
- Economic impact to engineering and construction firms of work going overseas; industry health
- Gain an understanding of Wall Street perspective in regard to capital infrastructure development
- Evaluating projects based on business results; increase creativity, “friendly contracting,” product configuration, quality assurance

Area #2 – Project-level Issues Facing the Construction Industry

- Value contracting - not low bid, not corrupted, cost of sovereign immunity
- Up-front programming, planning, and design phase process improvements for minimizing/managing disputes
- Statutes that promote bad business practices
- Willingness to pay - risk assessment, realistic expectations, etc.

Area #3 – Legal Environment of the Engineering and Construction Industry

- Determine the transactional costs of dispute resolution through the progression of the dispute
- Quantify benefits of using techniques designed to reduce and eliminate the costs of disputes
- Develop methods for increasing awareness/utilization of techniques to reduce/eliminate disputes

2.7 Multi-Voting Analysis and Path Forward

After the workshop breakout sessions, a multi-voting analysis session was held to distinguish and prioritize the research topics discussed in the small groups. This section will focus on the multi-voting analysis of the workshop. In addition, it will discuss the conclusions from the workshop.

2.7.1 MULTI-VOTING PROCEDURES

A multi-voting analysis was chosen to help finalize the results of the workshop for three reasons. First, multi-voting is a technique by which consensus can be reached by a large group of individuals easily and visually. Second, multi-voting allows all group members to participate in the decision making process, thus facilitating ownership of the results by all participants. Lastly, multi-voting helps establish a prioritized ranking of results.

The multi-voting analysis used in this workshop consisted of several steps. First, each breakout group elected a spokesperson (or spokespeople) to present their findings to all of the workshop attendees. Based upon these presentations, workshop participants were given five orange “voting” dots. The rules for voting were simple. Each participant must place all of their votes on the topics in front of the group. Each individual may

place a vote on any topic of their choosing; however, no more than two votes may be placed on any one topic. When all votes were placed, a quick tally was made to identify which topic should be worked on first, second, and so on.

2.7.2 MULTI-VOTING RESULTS

Using the topics listed above, workshop attendees used the multi-voting analysis described above to prioritize the research topics. Figure 2.5 summarizes the multi-voting analysis in a Pareto chart. From these tallies, it can be seen that two of the top three vote receivers were from the legal environment of the construction industry area – determine the transactional costs of dispute resolution through the progression of the dispute, and quantify the benefits of using techniques designed to reduce and eliminate the costs of disputes. However, many of the issues involved with these topics are interrelated with the other areas as well. In fact, the second highest vote receiver was also related to construction disputes – up-front programming, planning, and design phase process improvements for minimizing/managing disputes.

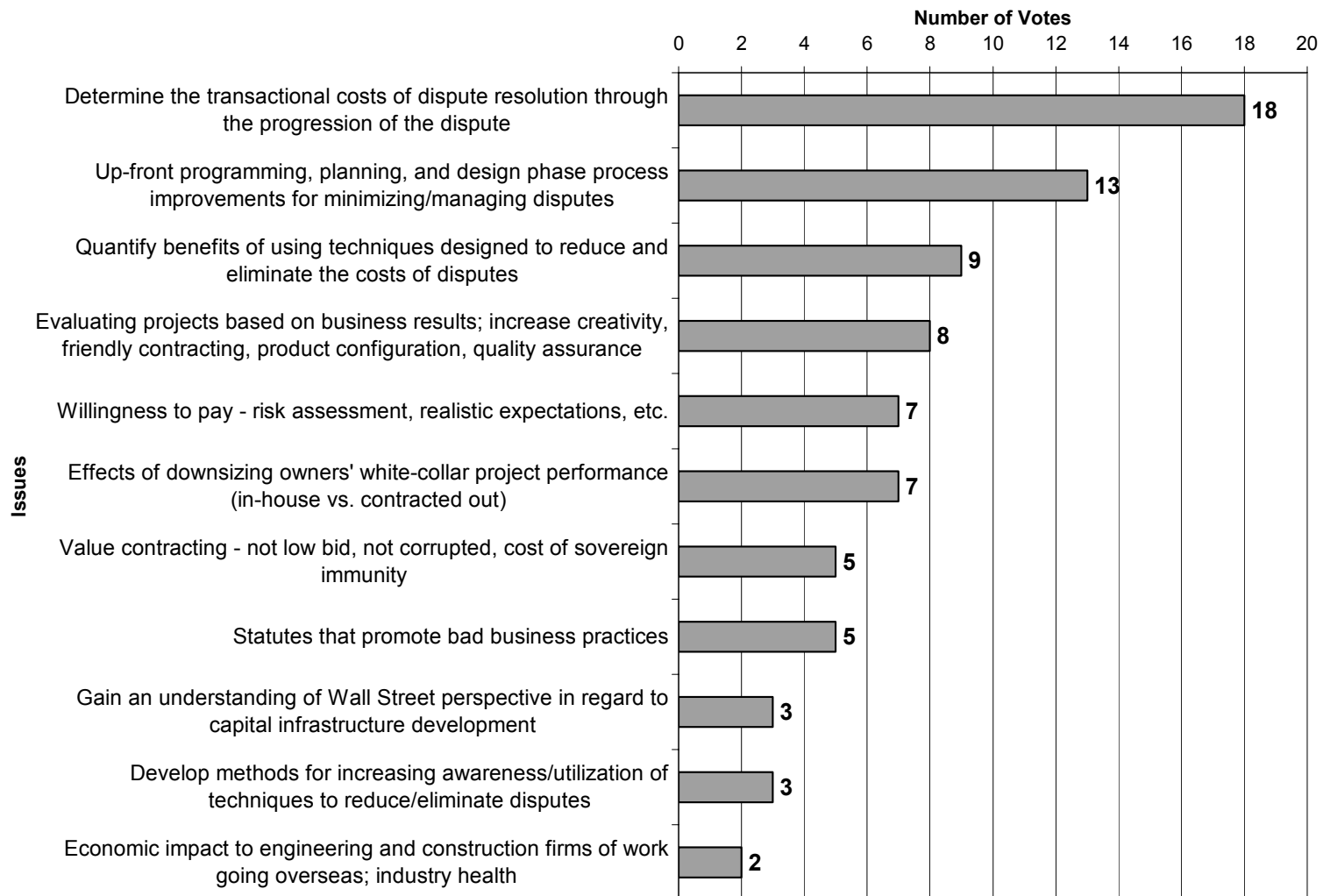


Figure 2.5: Final Multi-Voting Results

2.7.3 POST-WORKSHOP SURVEY

A brief post-workshop survey was administered to the participants to gather their input and feedback about both the relevance of the research investigations in the EFDR area and the usefulness of the workshop format. Out of the 15 respondents, the average score for the overall usefulness of the workshop was 4.3, where a 4.0 was very good and a 5.0 was excellent. With respect to the overall relevance of the EFDR research topic area, the average score was a 4.4, where a 4.0 was very good and a 5.0 was excellent. In addition, respondents were asked if they would be interested in participating in EFDR research in the future and an overwhelming majority (93 percent) responded in the affirmative. These evaluations, in addition to the enthusiasm for future studies, show the efficacy of research issues in the EFDR area.

2.8 Workshop Summary

The EFDR Research Workshop conducted on September 5, 2003 was the first step in developing and conducting new research investigations in the engineering and construction industry at CCIS. The CCIS research team felt that there were many reasons to conduct new research including industry concerns over insurance and surety issues, perceived increases in construction disputes and litigation, and a downturn in economic market indicators. However, it was felt that using industry feedback as a barometer of what topics would offer the highest impact and highest “doability” was needed.

From the multi-voting analysis, the top three areas of research opportunity, in rank order, for the workshop attendees were as follows:

- Investigate and document the transactional costs of dispute resolution through the progression of the dispute

- Identify up-front programming, planning, and design phase process improvements for minimizing/managing disputes
- Quantify benefits of using techniques designed to reduce and eliminate the costs of disputes

The research workshop not only helped identify which areas of concern were most important to practitioners and related academics but also began the process of establishing a multi-disciplinary research team for future work. Most of the workshop participants indicated they were willing to participate in future research studies in this EFDR area. In fact, approximately one-third of the workshop participants provided data for the quantitative survey. In addition, this dissertation is a direct output of the perceived need exposed by this research workshop.

CHAPTER 3 LITERATURE REVIEW

This chapter delves into the sizeable existing body of literature related to disputes and dispute resolution. The first section will review the many definitions of dispute in order to clarify what is meant by the title of this dissertation – Quantification of Transactional Dispute Resolution Costs for the Construction Industry. The second section of the literature review will look at the common types of dispute resolution methodologies used in the construction industry. Next, existing literature on the sources of construction disputes will be discussed; followed by an examination of methods to prevent disputes from occurring. In addition, literature on the trends of disputes in the construction industry will be surveyed followed by a review of previous research studies aimed at quantifying the costs and/or benefits of using alternative dispute resolution methodologies. Lastly, the definition of transactional costs, as used in this study, will be presented. This definition will be contrasted and compared to current usages of transactional cost economics in the construction industry. This existing body of knowledge will help form the basis for this research investigation.

3.1 What is a Dispute?

Early on in this research, it was necessary to define what was meant by the term dispute. While many authorities on the subject have laid down basic guidelines on how to distinguish between disputes, claims, and conflict, confusion still remains throughout the industry. In fact, some authors and industry practitioners use these terms interchangeably when their meanings are actually quite different. As this research deals with the quantification of dispute resolution costs, it is imperative to develop a clear definition of what a dispute encompasses.

For this study, the author followed Diekmann and Girard's (1995) definition for dispute. They characterize a dispute as, "any contract question or controversy that must be settled beyond the jobsite management staff (Diekmann and Girard 1995, p. 355)." This definition is also similar to that adopted by the Construction Industry Institute (1995). It defines a dispute as, "a problem or disagreement between the parties that cannot be resolved by on-site project managers (Construction Industry Institute 1995, p. 1)."

In contrast, some authors cite a broader definition for the term dispute. One source defines a dispute as, "a class or kind of conflict, which manifests itself in distinct, justiciable issues. It involves disagreement over issues capable of resolution by negotiation, mediation or third party adjudication (Brown and Marriott 1993, cited by Yates 2003, p. 1)." However, in the author's opinion, this definition includes characteristics that describe both dispute and claim. Conversely, the definition for dispute proposed by Institution of Civil Engineers Arbitration Procedure is too narrow. They choose to define dispute based upon the time when, "a claim or assertion made by one party is rejected by the other party and that rejection is not accepted (Kumaraswamy 1998, p. 3)." Again, neither the Brown and Marriott (1993) nor the Kumaraswamy (1998) definition adequately separate a claim from a dispute. To clarify this issue, it is necessary to look at some of the definitions for claim found in the literature.

Adrian defines a claim as, "A request by a construction contractor for compensation over and above the agreed-upon contract amount for additional work or damages supposedly resulting from events that were not included in the initial contract (Adrian 1988, p. 2)." Similarly, Richter and Mitchell define a claim as, "A written statement by one party requesting additional time and/or money for acts or omissions by another during the performance of the construction contract (Richter and Mitchell 1982,

p. 475).” Thus, a claim refers specifically to the case where a problem or issue has been documented and written up for review by another party and still has the potential to be resolved at the field level. A dispute, that may or may not be documented in writing, is impossible to be resolved at the job site.

To clarify this matter, Kumaraswamy (1997) develops a useful graphic to help define the relationship between conflict, claims, and disputes. Figure 3.1 shows how conflict can lead to both disputes and claims. In addition, it shows that claims can in turn lead to disputes when settlement cannot be reached. Thus we see that conflict, defined as a disagreement of objectives, priorities, or interest between parties (Yates 2003), is the root cause of both claims and disputes.

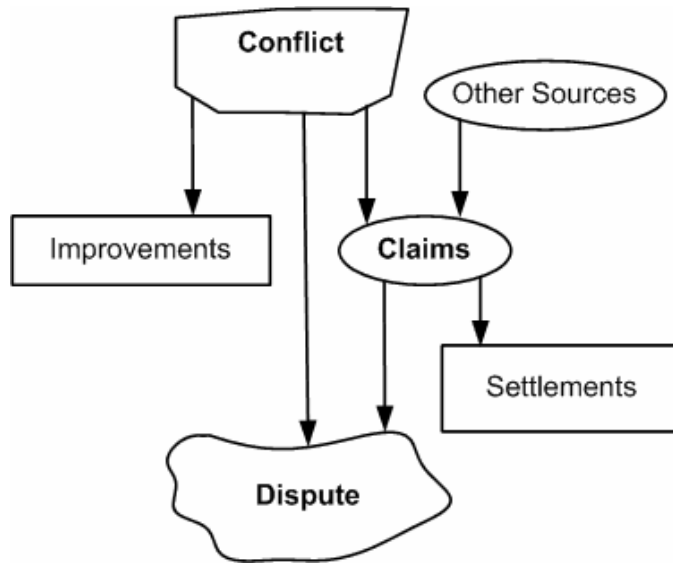


Figure 3.1: Relationship between Conflict, Claims, and Disputes
(Adapted from Kumaraswamy 1997)

While many have highlighted the inevitability of construction conflict (Cheung and Suen 2002; Ho and Liu 2004; Stipanowich 1996a), disputes, on the other hand, can be prevented or at least minimized through improvements (e.g., sufficient preproject planning, adequate scope definition, partnering, etc.) and proper claims management

procedures. However, when disputes do arise, there are a plethora of options and alternatives for resolution methods. The next section will highlight the basics of dispute resolution.

3.2 The Basics of Dispute Resolution

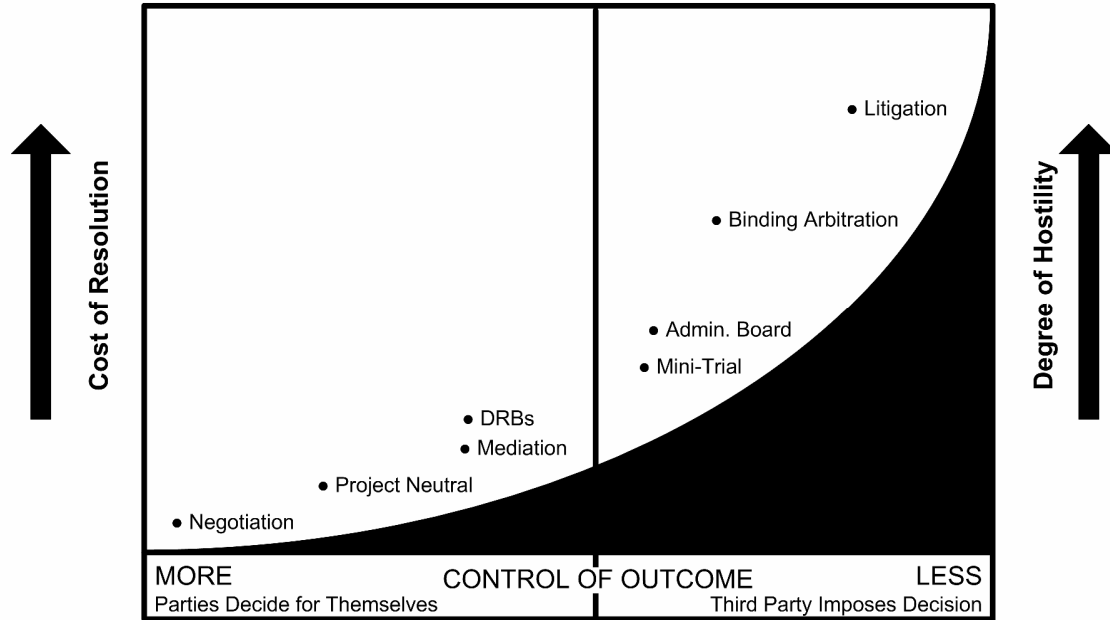
For the construction industry, contract theory has an important part of the legal process that has allowed contractual disputes to be resolved in the courtroom for more than two centuries. However, in the last few decades courtroom congestion and skyrocketing legal costs have opened up many other opportunities for dispute resolution, most of which are outside the courtroom. This change has been referred to as Alternative Dispute Resolution (ADR). ADR is broadly defined as any method by which conflicts and disputes are resolved privately and other than through litigation in the public courts (Kovach 2004). ADR techniques can include both binding and non-binding procedures. As such, the development of a virtual sliding scale of alternative dispute resolution techniques has evolved over the years. Some suggestions of the progression of ADR techniques ranges from negotiation, mediation, conciliation, neutral evaluation, expert determination, adjudication, to arbitration (Kellogg 1999; Office of Government Commerce 2002). While many of the construction industry standard contracts (American Institute of Architects [AIA], Associated General Contractors of America [AGC], and the Construction Management Association of America [CMAA]) have traditionally focused their alternative dispute resolution verbiage on arbitration, there is a growing movement to utilize less expensive and less combative system. This section will briefly define many of the ADR techniques currently being used in the construction industry.

3.2.1 NEGOTIATION

Negotiation has been defined as, “communication for the purpose of persuasion (Goldberg et al. 1999, p. 17).” In the context of the construction industry, negotiation is often the first and last step necessary to resolve disputes. It is generally only when negotiation fails, or fails repeatedly, that a problem becomes a full-blown dispute.

Aside from the prevention of disputes entirely, negotiation is often viewed as a low cost, cooperative endeavor, and favored over other more adversarial and expensive processes (Mays 2003). Figure 3.2 illustrates a continuum of dispute resolution procedures and their escalating costs and hostilities as compared to the control the parties retain in the process (Richter 2000). Dispute resolution techniques that keep control of the dispute in the hands of the parties in disagreement can clearly incur fewer costs during the resolution process and keep hostilities to a minimum. Conversely, disputes that rely entirely on the determination of other individuals (litigation and binding arbitration) are believed to have both higher costs and increased hostilities.

Despite the acknowledged benefits of negotiation, it is a process that is not universally successful. One recent study has found that negotiation can fail because of misunderstandings and tactical miscalculations (Loosemore 1999). Examining the process and communication that takes place during informal negotiations in the construction industry, Loosemore (1999) identifies a trend that hostilities from one party can be returned with hostilities by the other side; causing an never-ending spiral of increasing conflict and cost. This type of negotiation is often called distributional or competitive.



**Figure 3.2: Control of Outcome vs. Cost and Hostility of Dispute
(Adapted from Richter 2000)**

Another solution is integrative or cooperative negotiating. Oftentimes, the most successful negotiations occur when parties focus on interests and not positions (Fisher et al. 1991). Unfortunately, in the construction industry positional bargaining tends to be used more often than interest based bargaining (Peña-Mora et al. 2003).

Perhaps the most frequently utilized methodological adoption of negotiation into the construction industry has been the use of step negotiations. These procedures call for escalating levels of authority from both negotiation parties the longer a disagreement persists (Groton 1997). One example is when field level employees who oftentimes have first hand experience with the issue in dispute raise the negotiation responsibilities to their superiors (e.g., project managers, division heads, or company presidents). In general, contractual step negotiation procedures enumerate both the individuals and the time through which each step of negotiation must follow.

3.2.2 MEDIATION (INCLUDING CONCILIATION)

Mediation is a process that is becoming more and more popular in the U.S. construction industry. Mediation can be used to settle disputes on the job site, or ones that already involve litigation or other ADR techniques (Mays 2003). Mediation can be defined as, “a process where the third part neutral, whether one person or more, acts as a facilitator to assist in resolving a dispute between two or more parties (Kovach 2004, p. 14).” The mediator may or may not be an expert in a given industry, but rather they are presumed to be knowledgeable in the techniques of mediation (Rubin et al. 1991). Techniques for conducting mediations vary greatly depending on the mediator; however, the mediator does not render a decision but rather helps the parties reach a settlement on their own. In addition, mediation may be ordered by the court during and/or prior to trial. Court-ordered mediation is generally not mandatory; however, parties often follow through on the courts recommendation to help avoid an impending trial.

Conciliation is a process similar to mediation; yet, a conciliator can propose a solution to the dispute. While offering personal opinions from the mediator is normally frowned upon in other mediations contexts, mediators of construction cases often make evaluations of each party’s case during private caucuses. This is done without referring to the procedure as a conciliation meeting. Additionally, construction mediators are frequently expected to propose an offer (normally referred to as a mediator’s offer), after the mediation has run its full course and impasse is inevitable (Stipanowich 1996b).

3.2.3 NEUTRAL EVALUATION

A neutral evaluation is a private and non-binding technique whereby a third party, usually legally qualified, gives an opinion on the likely outcome at trial for the basis of settlement discussions (Office of Government Commerce 2002). An example of neutral evaluation is mini-trials. Groton (1997, p. 55) defines the mini-trial as, “A brief

presentation of each side's 'best case' arguments in the presence of principle executives of both parties, whose efforts to settle the dispute are usually facilitated by a neutral."

Mini-trials are conducted as if the case were being presented in front of a jury or arbitration panel. Parties make a presentation to a neutral third party and a panel of senior executives from each side. In order to make an effective summary presentation, each side must have a reasonable amount of time for limited discovery so that they gain an understanding of their own contentions, as well as, the opposing side's contentions (Hinchey and Schor 2002). The third party neutral is responsible for providing a thorough assessment to both parties of the dispute. The disputing parties can then decide to settle based on the neutral's evaluation or move to another form of resolution (Mays 2003).

3.2.4 ADJUDICATION / EXPERT DETERMINATION

Expert determination is defined as, "a private process involving an independent expert with inquisitorial powers who gives a binding decision (Office of Government Commerce 2002, p. 4)." This term is most frequently encountered in the construction industry in the U.K. Adjudication is a binding decision made by an appointed neutral, often a quantity surveyor, either by deciding on the basis of submitted documents, or as is increasingly the case, after a hearing. It is designed to provide a speedy, if not always elegant, resolution to enable work to continue on site without interruption. Either party may appeal the adjudicator's decision to court or arbitration, or indeed settle the dispute by mediation. The Housing, Grants, Regeneration Act 1996 in the United Kingdom has greatly increased the use of adjudication (Brooker and Lavers 1997; Office of Government Commerce 2002).

3.2.5 DISPUTE REVIEW BOARDS

Dispute Review Boards (DRBs) are a mixture of both expert opinions and neutral evaluations. Initially developed within the construction industry, DRBs are substantiated in industry experience and have been in use for more than 25 years. The first recognized project to utilize a DRB was the Eisenhower Tunnel in Colorado; and during the first ten years of its existence, DRBs was primarily used on tunnel and heavy civil projects (Matyas et al. 1996). However, today its application in other construction projects is becoming more accepted.

The basic structure of a DRB consists of a three member, expert panel appointed by both the owner and the contractor. The critical difference between a DRB and other forms of alternative dispute resolution is that the DRB team meets both before and during construction operations. This allows the DRB members to familiarize themselves with the people, process, and project specifics. Using project drawings, specifications and site visits, the DRB makes non-binding recommendations to the parties who cannot resolve issues at the project level. “Acceptance by the parties is facilitated by their confidence in the DRB – in its members’ technical expertise, firsthand understanding of the project conditions, and practical judgment – as well as by the parties’ opportunities to be heard (Matyas et al. 1996, p. 3).”

An important organization dedicated to the increasing use of DRBs is the Dispute Resolution Board Foundation (DRBF). DRBF is a non-profit organization that encourages the avoidance and resolution of disputes through the application of DRBs. “The Foundation provides assistance with the worldwide application of the DRB method by providing general advice and suggestions tailored for the conditions and practices existing in local areas (Dispute Resolution Board Foundation 2005).”

The DRBF has collected a comprehensive database of projects (over 1,200 projects since 1975) that have utilized DRBs. This database is freely available online for download at http://www.drb.org/manual_access.htm. The fields for the database include project name, project type, project location, start year, finish year, Owner name, Contractor name, contract value, percent complete, number of disputes (pending, heard, settled, and litigated), advisory opinions, and update status. The aggregate total for contract value for the 1,237 projects listed is an impressive \$89.7 billion USD. The mean construction contract value for projects in the DRBF database is \$72.5 million USD. Out of the 1,237 projects, there were: 54 disputes pending evaluation, 1501 disputes heard by a DRB panel, 1440 disputes settled by the DRB, 45 disputes (in 15 projects) that were settled through litigation, and 28 advisory opinions issued. Therefore, the percentage of projects that have disputes reaching the courthouse was approximately 1.2 percent.

Despite the absence of concrete numbers for the percentage of total projects that end up in litigation for the entire industry, few can argue that it is even close to the 12 in 1000 that the DRB methodology has shown. This does not even take into consideration the fact that the projects in the DRB database are often some of the most complex and riskiest projects of their kind.

The evaluation that is still left to be done is that of the cost effectiveness of DRBs. The DRBF indicates, “DRB costs range from 0.05 percent of final construction contract cost, for relatively dispute-free projects, to a maximum of 0.25 percent for difficult projects with disputes. [The average was] 0.15 percent of final construction contract cost, including an average of four dispute recommendations (Dispute Resolution Board Foundation 2005).” This dissertation included DRBs as a possible final dispute resolution methodology in the quantitative survey presented in Chapter 5; however, only one project was submitted that fell into this category. Despite this fact, the one data point

collected for DRBs reaffirms their relative efficiency in resolving disputes in terms of costs. In this data point, approximately 2% of a \$2 million USD claim was spent on transactional costs. This amount is far less than those costs spent pursuing other dispute resolution methodologies (see Chapter 5 for further analyses).

3.2.6 ARBITRATION

Arbitration is defined by the American Arbitration Association (AAA) as, “the submission of a dispute to one or more impartial persons for a final and binding decision. Through contractual provisions, the parties may control the range of issues to be resolved, the scope of relief to be awarded, and many procedural aspects of the process (American Arbitration Association 2004).” In the United States, arbitration has been the dispute resolution method of choice for many years in the construction industry and is included in many industry standard contract documents including the American Institute of Architects and the Associated General Contractors of America.

Typically, the proceedings are administered by an organization, such as the AAA, which will have specific rules for the process (Nelson 2003). The AAA Construction Industry Arbitration Rules and Mediation Procedures is a lengthy document covering every detail of the proposed arbitration procedures for the construction industry. However, parties may set up their own rules in the contract as long as both parties agree with those rules. Final decisions of the arbiter are final, binding, and generally not reviewable by the court system. A detailed coverage of arbitration usage in construction can be found in Stipanowich (1987).

Despite centuries of use in resolving disputes (Stipanowich 1996b), arbitration has recently received sharp criticism from academics and practitioners alike. Anecdotes about the process, the arbitrators, and the decisions have shown that arbitration proceedings are becoming more and more like litigation (Harmon 2003; Keil 1999;

Reuben 1996; Stipanowich and O'Neal 1995). Braun (1998, p. 9) writes, “Arbitration can be an expensive, unending kangaroo court in which the concepts of justice and fairness are trampled and neither the arbitrators nor the arbitration association seems to have any interest in anything other than maximizing the fees paid to them by the parties.” Despite these criticisms, arbitration remains a standard part of the AIA and AGC documents.

In addition to the condemnation of the high costs of arbitration procedures, many critics argue that arbitration is also an unnecessarily lengthy process. Some recent unpublished AAA figures, not specifically focusing on construction disputes, quantify various timelines for fast track and no-fast track arbitrations for 2004. Table 3.1 compares illustrates these cases (Lurie 2005).

Table 3.1: Arbitration Length Comparisons between Fast and Non-Fast Track Cases for 2004

Category	Fast Track Cases (\$75,000 USD or less)	Non-Fast Track Cases (\$75,000 - \$150,000 USD)
Number of Cases Filed	1452	571
Median Days from Filing to Award	155	286
% of Cases Decided on Documents Only	10.5%	--
% of Cases Decided in One Hearing or Less	73%	26%
% of Cases Decided in Three Hearing or Less	--	68%
Median Number of Hearings	1	2

Three organizations (the International Chamber of Commerce’s (ICC) International Court of Arbitration, the EJCDC, and the AIA) are all at different stages of implementing more cost effective measures of dispute resolution with a focus on limiting the usage of arbitration. The first organization, the ICC, has recently established a task force to evaluate the time and cost impacts of arbitration procedures. The first meeting of the task force was held in November 2005, with the goal of producing a report in May

2006. A member of the task force, His Honour Judge Humphrey Lloyd QC wrote, “In terms of the costs of an ICC arbitration on average 2 percent goes on administrative expenses; the fees and expenses of the arbitrators are about 18 percent; the balance of 80 percent is accounted for by the parties' legal and other costs (Lloyd 2005).” Depending on the findings of this task force, changes may be in the future for the ICC and the way in which it administers arbitration hearings.

Further, along in the adoption of change, the AIA and the EJCDC are both in the process of revising their default dispute resolution procedures because of the same cost/time criticisms heard by the ICC. The EJCDC revised their dispute resolution language during their transition from the 1996 to the 2002 edition (EJCDC C-700). According to the EJCDC commentary, the new document,

... provides for mediation of disputes remaining after an Engineer Decision. The American Arbitration Association Mediation Rules are referenced and the parties are obligated to participate in good faith (notwithstanding that mediation is a non-binding process). In the event that mediation is not successful, a claiming party has the options of invoking any dispute resolution clauses in the Supplementary Conditions, or agree with the other party to submit the claim to another process, or provide written notice of intent to pursue the claim through litigation (National Society of Professional Engineers 2002, p. 8).

This is contrast to the 1996 edition of the EJCDC documents that provide for mandatory negotiation, followed by optional mediation or arbitration (Engineers Joint Contract Documents Committee 2001). Similarly, the AIA updated its design/build documents from AIA 191-1996 to AIA 141-2004. The new AIA design build documents allow, “The parties to designate a ‘neutral’ at the beginning of the contract. The neutral would serve as the initial evaluator of disputes prior to submission of disputes to mediation, court, or arbitration. If no neutral is designated by the parties, the owner is

required to make the initial decision on claims (Ruesch 2005, p. 2).” Currently, the AIA is considering adoption of what is being termed “check-a-box” dispute resolution language, with the default dispute resolution mechanism being litigation rather than mediation, in its new A series documents due out in 2007 (Lurie 2005).

3.2.7 SUMMARY OF ADR OPTIONS

Whether using negotiation, mediation, arbitration, dispute review boards or any other means for resolving disputes, the main purpose is to reach equitable solutions quickly and with as little distraction as possible. Unfortunately, the plethora of options available to today’s industry practitioners for resolving disputes can be both confusing and time consuming. Figure 3.3 shows the typical procedures for a dispute to be resolved in the construction industry. This complex process diagram validates two key ideas. First, disputes are an inevitable facet of construction projects. Second, no one method of performing dispute resolution works in every instance. The key is to understand the proper application and associated benefits of each system. The next section will examine the sources of construction disputes.

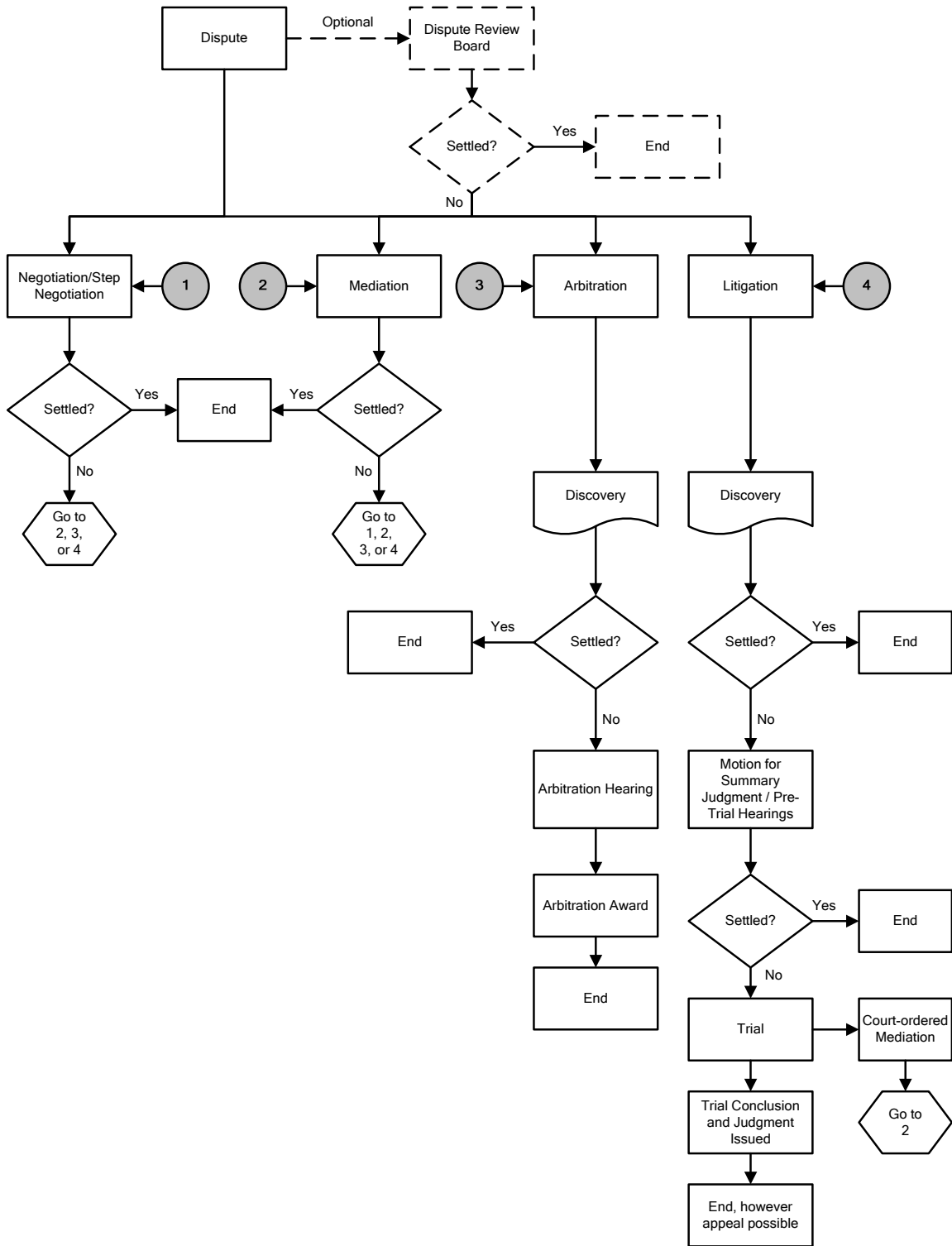


Figure 3.3: Typical Dispute Process Diagram

3.3 Sources of Construction Disputes

Identifying potential dispute items at the onset of a project provides not only a basis for monitoring challenging areas during a project but also an opportunity for preventing these issues from ever becoming a problem. This section will review the Disputes Potential Index (DPI) developed by CII and then discuss its system for identifying potential construction dispute causes. In addition, this section will also look at other causes of construction disputes identified in the literature and attempt to categorize them into the DPI framework.

In 1994, the Construction Industry Institute (CII), based at The University of Texas at Austin, published its findings on a methodology for identifying the potential for a construction project to incur disputes and claims. This document (Diekmann and Abdul-Hadi 1994) was later revised into a working tool by the Disputes Prevention and Resolution Task Force to assist practitioners in applying the research findings. Embedded in this report/tool is a system of predicting the relative possibility of a project to be dispute prone. The characteristics used to identify this possibility were based upon three logical causal categories – people, process and project (Construction Industry Institute 1995).

Using statistical analysis, the DPI was able to rank which characteristics were most likely to increase and/or decrease the potential for disputes on a project. The analysis revealed that people factors played the biggest role in project dispute potential, while the process and project attributes played important but less influential roles respectively. In addition, Diekmann and Girard (1995) argued that while people were not necessarily the cause of disputes, they exhibited the greatest influence on project disputes performance; more than any other type of project variable. The eleven factors identified

in the DPI research that directly correlate people and dispute potential are listed below (Diekmann and Girard 1995).

- Owner/Contractor Qualities or Characteristics
- Capable Management
- Effectiveness of Responsibility Structures
- Experience with Type of Project
- Success of Past Projects
- Experience/Competence
- Motivation (Reward Structure)
- Interpersonal Skills
- Business Relationship between Owner/Contractor pertaining to
- Team Building
- History Together
- Power Balance
- Expectation of Future Work

While there seems to be little analytical literature supporting the softer side of construction disputes (people related issues), their impacts are uniquely important in field operations. The ability of field personnel to resolve disputes at the lowest possible level allows the project operations to continue with minimal distractions. Perhaps the absence of disputes where quality people are on-site and in the project office is a reason why their effects are not easily quantifiable. Again, this would support why most literature refers to the effects of increased scope, differing site conditions, inadequate bid information, etc. as the main causes of construction disputes.

While the influence of people issues on the calculation of the DPI has been shown to be significant, the other two factors making up the DPI should also be examined. The next most influential criteria affecting project disputes is process related factors. The following list divides the nine process related factors used in the DPI research into two sub-categories (Diekmann and Girard 1995).

- Pre-Construction Planning
- Input from all Groups Involved
- Financial Planning
- Permits and Regulations
- Scope Definition
- Construction Contracting
- Realistic Obligations
- Risk Identification/Allocation
- Adequacy of Technical Plans/Specifications
- Formal Dispute Resolution Process
- Operating Procedures

The process related factors of construction dispute causes appear much more frequently in the literature. In fact, much attention has been given to construction contracts as both a cause and a possible solution for avoiding construction disputes. Construction contracts have been the major focus of academic journals (Jergeas and Hartman 1994; Semple et al. 1994), practitioner journals (Frano 1996), textbooks (Adrian 1988; Russell and Jaselskis 1992), and even foreign government initiatives to decrease the amount of disputes, claims, and litigation on projects (Office of Government

Commerce 2002). In addition, the role that risk plays in the construction industry, as determined in construction contracts, has become a fervent area of debate.

Surprisingly, the part of the DPI framework where the most quantitative data are available is within the project related factors area. While project related factors were found to be the least influential on construction disputes in the DPI research, their causes are detailed in the literature frequently. The following list divides the nine project related factors used in the DPI research into two sub-categories (Diekmann and Girard 1995)

- External Variables
- Environmental Issues
- Public Interferences
- Site Limitations
- Remoteness
- Availability of Capable Craftsmen/Subcontractors
- Internal Variables
- Pioneer Projects
- Design Complexity
- Construction Complexity
- Size

Of particular note are the factors of design complexity, construction complexity and site limitations. In research by both Diekmann and Nelson (1985) and Semple et al. (1994), the major source of construction disputes, and hence claims, was a combination of design errors and scope increases. Anywhere from 50 to 72 percent of the claims in the studies were shown to occur because of this reason, all of which are outside the

control of the contractor (Diekmann and Nelson 1985). The next section examines opportunities for avoiding construction disputes.

3.4 Methods to Prevent Construction Disputes

Once identified, the natural next step to dispute control is to prevent them from occurring. Many of the ideas explored in the current research are simple in concept but difficult to implement in practice. Items such as accurate record keeping, adequate knowledge of contracts, preservation of contract rights, careful planning and scheduling, and proactive actions are only a few of the ways in which construction disputes can be mitigated from a contractor's point of view (Jergeas and Hartman 1994).

Design and engineering firms can also help to avoid downstream disputes. In Allen's survey on professional practice (1998), the majority of respondents claimed that clear scope definition was the most effective dispute avoidance measure. This was followed by quality work, adequate budget, and adequate time by and for the design team. Additional measures in the design and engineering phases that may also lead to diminished dispute levels include value engineering and constructability studies (Semple et al. 1994).

To counter these effects, numerous techniques are suggested including pre-project risk assessments, a partnering-type project structure, cost allowance for areas of uncertainty, standard contracts to avoid misinterpretations of project risk, teambuilding exercises, and appointing managers and superintendents with good attitudes and strong cooperative skills (Mitropoulos and Howell 2001). All of these solutions, and the others presented in the literature, attempt to limit problems and resolve them at their lowest level in the organization.

Another technique for avoiding construction disputes is to include in the contract adequate means to resolve disputes once they occur. Ideas such as Alternative Dispute Resolution, which includes processes like mediation and dispute review boards, can not only serve as a deterrent to dispute escalation but also as a means to eliminate the growth of hostilities between the contract parties.

3.5 Trends in Construction Industry Dispute Resolution

Studies into the trends of construction dispute resolutions have been conflicting to say the least. An Engineering News Record editorial from March 10, 1997 states, "...we still don't know definitively whether we [the construction industry] have had any success combating law suits. All we have is 'possibly' and 'presumably' (Editorials 1997, p. 62)." A Stanford study (Sacks et al. 1995) stated that for the period from 1988-1993, construction litigation increased by 40 percent, while an Associated General Contractors/Deloitte Touche LLP survey reported that the cost of litigation had become less significant for general and specialty contractors since 1994 (Flanigan et al. 1997). The lack of awareness about the state of dispute resolution in industry is preventing a clear message about the true costs of disputes from being known.

Three recent studies at The University of Texas at Austin have been completed looking at the trends in construction industry dispute resolution. The first study was conducted on construction litigation cases involving the U.S. Naval Facilities Engineering Command (NAVFAC) by Kilian and Gibson (2005). This study investigated 666 litigation cases involving NAVFAC construction contracts during the period 1982-2002. Kilian and Gibson (2005) identified the largest drivers behind litigation as; interpretation of contracts (26 percent), delays (12 percent), and disputes (11 percent). Their study also identified poor field and contractual management on projects

to be the primary “root” causes of litigation. The study’s most interesting finding indicated a trend towards reduction of litigation over the past twenty years.

As part of the trend analysis on the data extracted from the total population, the overall period of study (1982–2002) was subdivided into two smaller periods (1982–1992 and 1993–2002) to differentiate where the emergence of design–build and partnering practices in NAVFAC construction contracts occurred. These data are represented in a year-by-year frequency chart as given in Figure 3.4, showing frequency of decisions rendered on an annual basis by the ASBCA from 1982 to 2002. This reduction was credited to the implementation of partnering and design-build initiatives (Kilian and Gibson 2005).

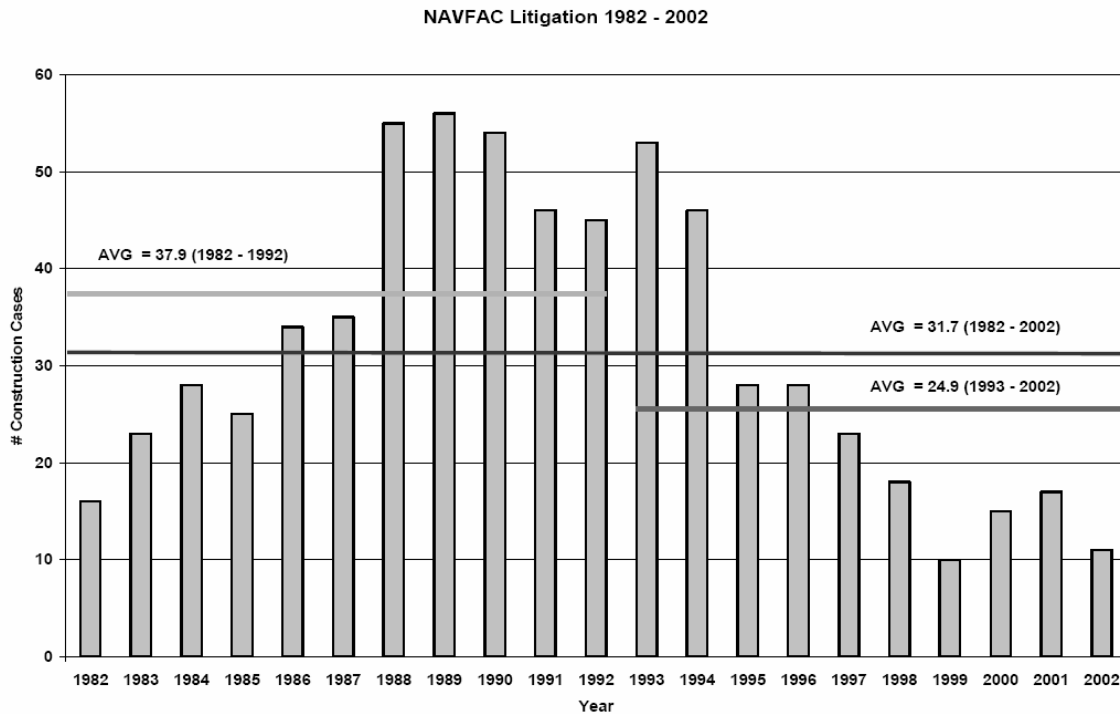
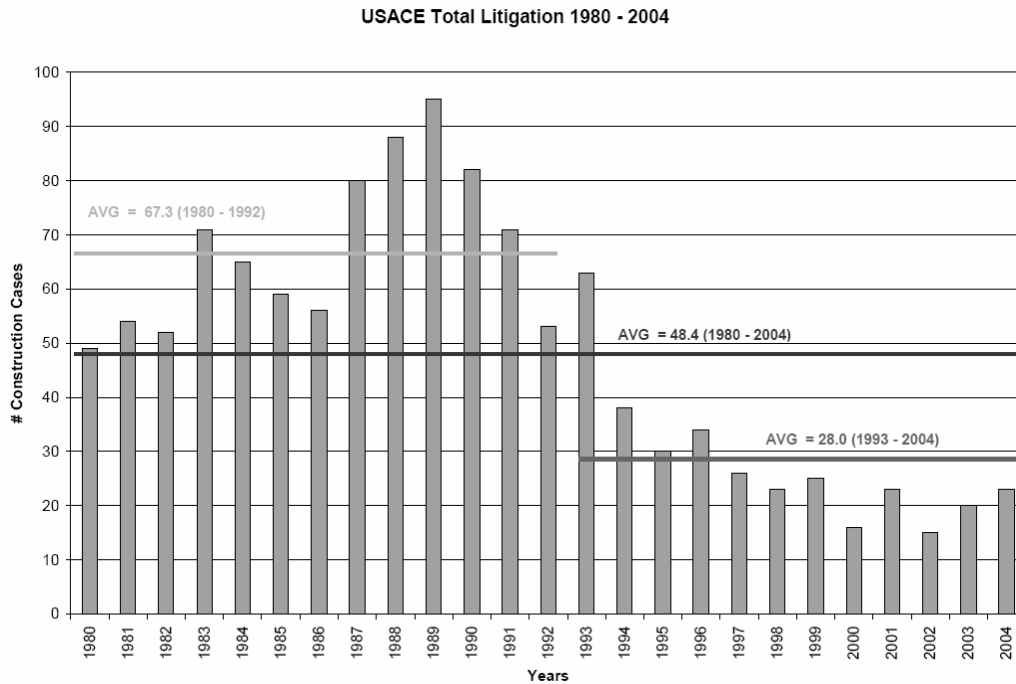


Figure 3.4: NAVFAC Total Litigation 1982-2002
(Adapted from Kilian 2003)

A second similar study was performed on the U.S. Army Corps of Engineers (USACE) by Kurgan (2005). Case decisions from the Engineer Board of Contract

Appeals (ENGBCA), the Armed Services Board of Contract Appeals (ASBCA), and the U.S. Court of Federal Claims (USCOFC) were collected. The number of USACE construction cases litigated to a decision between 1980 and 2004 totaled 1211 from these three venues. The breakdown for the 1211 cases includes 309 ENGBCA decisions, 770 ASBCA decisions, and 132 USCOFC decisions. The case decisions are depicted in a year-by-year frequency chart shown in Figure 3.5. The chart depicts the total number of decisions rendered per year from 1980 to 2004. The mean number of cases decided annually between 1980 and 2004 was 48.4/annum. The mean number of cases decided between 1980 and 1992 was 67.3/annum, and the mean number of cases decided between 1993 and 2004 was 28.0/annum. As in the NAVFAC study, the USACE study reveals a marked decrease in the number of construction claims litigated after 1993. Again, construction budgets during this period remained fairly constant.

Both the NAVFAC and the USACE studies reveal a reduction in the amount of construction related litigation (Kilian and Gibson 2005; Kurgan 2005). The out-year numbers (1993–2002) and the overall downward trend may be due to a number of factors including the successful implementation of partnering, the more frequent awarding of design–build and cost plus contracts, best value selection, and a possible paradigm shift in internal policy on the part of NAVFAC and USACE towards its claim settlement process. In the course of their research, Kilian (2003) and Kurgan (2005) found nothing to contradict these possibilities. However, no specific causal link between the trend and the above-cited practices was made. It stands to reason that the use of partnering and design–build would lower the instances of litigation as they both provide an opportunity for improved communication and problem solving based upon intuitive reasoning. Such matching findings were not the case in the third University of Texas research study.



**Figure 3.5: USACE Total Litigation 1980 – 2004
(Adapted from Kurgan 2005)**

The third study involved a 2003 survey of the Construction Users Roundtable (CURT). In this exploratory study, a snapshot of 12 owner organizations, two contractors, and one other organization revealed the following (Mays 2003):

- The majority of companies are using alternative dispute resolution techniques to manage claims and disputes. However, there is still a lot of room for improvement as many claims are requiring litigation in order to be resolved.
- Few respondents indicated the use of arbitration as a method to settle disputes. This is surprising considering the perception over the past few decades that arbitration is the dispute resolution method of choice on construction projects.

- Alternative dispute resolution processes where the parties have a high amount of control (such as negotiation and dispute review boards) lead to disputes being resolved faster. This saves companies time and money.
- The majority of the respondents agree that the impact of claims or disputes involving capital projects in their company is either negligible or minor.
- In addition to legal problems and cost, excessive management time impacted by claims or disputes has the biggest negative impact.
- The average dollar amount of pending claims has increased by almost 375 percent in the last five years for this sample and appears to have increased statistically.
- Most respondents feel that claims management impact will increase in the construction industry as a whole, while staying the same or decreasing in their own company.

While none of these studies appears to show one concise path for dispute resolution within the industry, they do help uncover the many subtleties involved in studying industry trends. This difficulty in identifying trends is confirmed in the next section which looks at previous research efforts conducted by the Rand Corporation, Cornell University and the Foundation for the Prevention and Early Resolution of Conflict (PERC), Deloitte & Touche LLP, and a multi-disciplined study lead by the College of Law at the University of Kentucky, and one study by the American Arbitration Association (AAA).

3.6 Previous Quantification Studies on ADR

A basic problem with trying to develop a quantitative study of the transactional costs involved with dispute resolution is the lack of a benchmark for making comparisons

against. While anecdotal information abounds about the various methods to resolve disputes, there is little empirical information to explain why some processes are better received than others are. Nor is there empirical information readily available for lawyers and project professional to make knowledgeable decisions about how to select an appropriate dispute resolution system. This is not to say that there are no studies on the hard numbers behind dispute resolution, rather there are a handful of studies in the literature that present limited empirical data, and even fewer specifically focusing on the construction industry. The following two subsections will look at five different studies. The first subsection will focus on dispute resolution in non-industry specific studies, while the second subsection will cover two studies that are specific to the construction industry.

3.6.1 NON-INDUSTRY SPECIFIC ADR STUDIES

An early study on the effectiveness of alternative dispute resolution methods was performed by the RAND Institute for Civil Justice in 1996 (Kakalik et al. 1996). The RAND study looked at the impacts from the federal government's adoption of the Civil Justice Reform Act (CJRA) of 1990. Initiated as a method to reduce the time and cost associated with resolving lawsuits in the federal court system, the CJRA (1990) is one of many federal government initiatives that not only acknowledges the problems existent within the current legal system but also offers methods for making changes. The CJRA (1990) initiated both measurement systems and reforms within the case management methodologies of ten pilot U.S. District Courts. From the RAND evaluation, the following three findings were made (Kakalik et al. 1996, p. 1):

- “The CJRA pilot program as implemented had little effect on time to disposition, litigation costs, satisfaction, or views of fairness.

- Some case management procedures--for example, certain types of alternative dispute resolution--have no major effects on cost and delay.
- However, a package of procedures containing early judicial management, early setting of a trial date, and shorter discovery cutoff could reduce time to disposition by 30 percent, with no change in direct litigation costs, satisfaction, or perceived fairness.”

These findings sparked much debate in the legal community (Hensler 1997; Higgins and O'Connell 1997; Kinnard 1997; Plapinger 1997; Van Duch 1997). Despite RAND's findings, other researchers have found differing empirical data for cost savings attributed to ADR usage. Shortly after the publishing of the RAND study, a joint study was performed by Cornell University, the Foundation for the Prevention and Early Resolution of Conflict (PERC) and Price Waterhouse LLP during the first quarter of 1997 (Lipsky and Seeber 1997). The PERC study revealed that 90 percent of respondents viewed mediation as a cost-saving measure for their corporation, and 66 percent of respondents said mediation provides more “satisfactory settlements.” In addition, 54 percent of the survey respondents said, “cost pressures affected their decision to use ADR (Dispute Resolution Journal 1997, p. 7).”

Similar results were found in a more recent American Arbitration Association study (American Arbitration Association 2003). Drawing on a pool of 101 Fortune 1000 companies, 103 mid-size public companies, and 50 privately held companies, the AAA study found that 91 percent of respondents used mediation because it saved money; 84 percent used mediation because it saved time, and 61 percent said mediation provides more satisfactory settlements (American Arbitration Association 2003, p. 24). Additionally, 77 percent of respondents believed mediation saved costs in comparison to

litigation while only 58 percent of respondents felt the same way when comparing arbitration and litigation (American Arbitration Association 2003, p. 19). While both the AAA study and the PERC study data reveal very similar findings on mediation and ADR in general, neither study tackles the issue of actually quantifying what the savings or the costs to pursue a settlement is in terms of transactional dollars. Additionally, none of the above-mentioned studies look specifically at the construction industry.

3.6.2 CONSTRUCTION INDUSTRY SPECIFIC ADR STUDIES

To date, three studies known to the author have examined specifically quantitative research on ADR in the construction industry – a series of reports by Deloitte & Touche LLP (Casey and Bechdol 1994; Flanigan 2000; Flanigan et al. 1997), a study lead by Thomas Stipanowich at the University of Kentucky (Stipanowich 1996a), and a privately funded study performed by Independent Project Analysis, Inc. (IPA). These three research studies provide an in-depth look at the construction industry and its implementation of dispute resolution systems.

3.6.2.1 Deloitte & Touche, LLP Construction Industry Reports

Supported by the Associated General Contractors of America (AGC), the Deloitte & Touche research series covers many issues concerning the construction industry including business environment, profitability, business strategies, business development, business outlook, and information technology, in addition to the alternative dispute resolution work. In the three years of the Insights in Construction Reports (Casey and Bechdol 1994; Flanigan 2000; Flanigan et al. 1997) examined for this manuscript, two findings stand-out as unique conclusions not found elsewhere in the literature. First, as the size of the firms' revenue increases, so does the significance of the cost of litigation. Secondly, in the period from 1994 to 2000, the perceived overall significance of litigation has decreased. "The familiarity with and use of ADR techniques has improved for both

General and Specialty Contractors, reflecting improved owner (customer) relationships and, possibly, the effectiveness of both partnering and quality programs (Flanigan 2000, p. 34).” Aside from these two observations, the Deloitte & Touche research series, as the other studies covered in this section, do not analyze the hard dollar costs involved in resolving construction industry disputes.

3.6.2.2 University of Kentucky Construction Dispute Study

Conversely, the 1994 Multidisciplinary Survey on Dispute Avoidance and Resolution in the Construction Industry (Stipanowich 1996a) is a landmark study that looks at a broad range of qualitative and quantitative data from lawyers, contractors, and design professionals. Unlike any other research, Stipanowich (1996a) captures both the perceptions about the effectiveness of various alternative dispute resolution / prevention techniques and the estimated savings, in both days and dollars. Table 3.2 and Table 3.3 summarize the estimated savings calculated by the respondents.

**Table 3.2: Estimated Days Saved in Dispute Resolution
(Adapted from Stipanowich 1996b)**

	Attorneys		Design Professionals		Contractors	
	# of Cases Where Days Saved	Median # of Days Saved	# of Cases Where Days Saved	Median # of Days Saved	# of Cases Where Days Saved	Median # of Days Saved
Partnering	8 (47%)	6	20 (22.5%)	60	33 (37.5%)	45
Nonbinding Arbitration	7 (53.8%)	9	1 (7.14%)	30	3 (42.9%)	365
Dispute Review Board	3 (23.1%)	9	2 (25.0%)	30	2 (30.8%)	70
Mediation	102 (61.4%)	8	45 (36.6%)	120	19 (41.3%)	120
Binding Arbitration	39 (43.3%)	6	16 (18.2%)	120	11 (17.2%)	365

Examining Table 3.2, it is clear that the interpretation of the question is different for each of the survey respondent groups. It appears as if the attorney group is looking at days saved at trial or some other form of dispute resolution, while the contractors and design professionals appear to be estimating the time savings over the life of the project (and perhaps beyond).

**Table 3.3: Estimated Cost Savings in Dispute Resolution
(Adapted from Stipanowich 1996b)**

	Attorneys		Design Professionals		Contractors	
	# of Cases Reporting Cost Saving	Median Saved	# of Cases Reporting Cost Saving	Median Saved	# of Cases Reporting Cost Saving	Median Saved
Partnering	7 (41.2%)	\$ 300,000	18 (20.2%)	\$ 250,000	31 (35.2%)	\$ 85,000
Nonbinding Arbitration	6 (46.2%)	\$ 50,000	3 (21.4%)	\$ 20,000	1 (14.3%)	\$1,000,000
Dispute Review Board	4 (30.7%)	\$ 150,000	2 (25.0%)	\$ 5,000	46 (66.7%)	\$ 10,000
Mediation	116 (69.9%)	\$ 200,000	62 (49.6%)	\$ 15,000	25 (54.3%)	\$ 100,000
Binding Arbitration	46 (51.1%)	\$ 50,000	27 (30.7%)	\$ 25,000	2 (66.7%)	\$ 50,000

In general, Table 3.3 is relatively consistent between the various respondents. However, one can note that the attorneys' evaluation of the costs saved in the above dispute resolution methods is usually higher than the two groups. Additionally, the design professionals evaluate their cost savings consistently lower than both the lawyers and the contractors.

On the qualitative side of the study, Stipanowich (1996b) examines the relative effectiveness of several dispute resolution methodologies. On a scale from one (very ineffective) to five (very effective), respondents ranked partnering, mediation, and early neutral evaluation consistently within the top three cost saving methods with scores ranging from to 3.25 to 4.05. As each respondent group was asked to evaluate slightly different scenarios in each of the respective surveys, it is difficult to see if one method would have been chosen unanimously by all three groups. Two of the top three methods attempt to resolve disputes at the earliest point possible. Stipanowich (1996a, p. 80) notes, "It is preferable to resolve construction contract disputes as early as possible, before positions harden, costs mount, and conflict poisons the job environment." Stipanowich's work remains the only publicly available empirical data on construction industry dispute resolution costs and benefits.

3.6.2.3 Independent Project Analysis, Inc. Construction Dispute Study

On January 12, 2004, the author visited with representatives from a private management consulting firm to discuss a recent study they had conducted on disputes and “claimsmanship” in the construction industry (Independent Project Analysis 2004). Independent Project Analysis, Inc. (IPA), a consulting firm specializing in quantitative analysis of capital project effectiveness, had just finished a privately sponsored research study looking at approximately 120 “chemical-type” projects from over 70 owners from around the world. While the exact details of that study remain proprietary to the project sponsor, IPA was able to share some of the more interesting findings that were uncovered during their investigation.

IPA based their study upon an article entitled “Claimsmanship: Current Perspective” by Zack (1993), which focuses on “claims games” that contractors and owners alike can play to minimize their own risks by shifting liabilities to other parties. The purpose of the study was to find out if any of these topics had an impact on the construction process and, more specifically, an impact on the overall effectiveness of capital construction projects in the industrial sector. The study was initiated in 2003; ten years following the publishing of the Zack article and focused specifically on findings from the owner’s perspective.

As the information for this study was not part of the standard IPA database of projects, the company established the definition of claim to be a disputed change order, and set out to collect as much information as possible from already completed projects. Their first finding was that projects with arbitration language in the contract were more likely to have claims filed on them. While IPA did not discuss the root causes of this finding with the author of this dissertation, one possible reason could be the reduced threat of having a claim heard in open court may incite additional claim filings.

The second finding revealed to the author from this study was that overall facility costs were lower (better) for those owners who did not solve every claim. This finding implies that the “nice guy” might finish last when it comes to resolving disputes from the owner’s perspective. Again, the details and the root causes of this finding were not discussed with the author of this dissertation; however, while counterintuitive, one can surmise that this finding can make sense from the owner’s perspective. While disputes inevitably cost both parties money, an owner who easily approves all change orders may stimulate an incentive for frivolous or trivial claims to be brought forward in an attempt to “sneak” it by the owner.

Aside from these two findings, IPA also collected limited data on litigation, mediation, and other ADR techniques; however not enough data were available to make conclusive findings. IPA also studied how the perceived relationship between owners and contractors affected claims; however, they did not share these findings with the author. IPA further stated that the lessons learned from their study included the fact that this area is a highly controversial area and that some quantitative data is very difficult to capture from a single individual. In addition, they cited concerns over data access and data availability as a hurdle to this research area; however, they did mention that future studies in this area should focus on “full and final” contract language and its effect on capital project effectiveness.

3.7 Transactional Costs in this Study

The title of this dissertation identifies the information to be collected and analyzed by this research as transactional costs. To some, this may invoke images of stock market trading, grocery store sales, or computer database additions; to others, it may call up reference to Transactional Cost Economics (TCE) or other business management

theories. However, none of these definitions fully characterizes the transactional costs studied in this dissertation. The above evocations are somewhat related to the transactional costs captured in this study, but they do not capture the link between dispute resolution methodologies and their associated costs to reach a final solution. As there has been no previous research in this area, a detailed definition of transactional costs for dispute resolution efforts must be developed.

For this research, dispute resolution transactional costs are sources of cost that are incurred because of the presence of a dispute including direct costs (such as fees and expenses paid to lawyers, paralegals, accountants, claims consultants, and other experts), indirect costs (such as salaries and associated overhead of in-house lawyers, company managers, and other employees who have to assemble the facts, serve as witnesses and otherwise process the dispute), and (to the extent they can be measured) hidden costs (such as the inefficiencies, delays, loss of quality that disputes cause to the construction process itself; and the costs of strained business relations between the contracting parties).

Transactional costs do not include monies paid out in “settlement” of a dispute because these are, in general, amounts that have been recognized as being owed. In addition, transactional costs, for this study, do not include prejudgment interest that may be awarded by a court or arbitration panel. While these interest costs are related to the length of time necessary to resolve a dispute (prejudgment interest is usually calculated both from the time a payment should have been made by the offending party until the time it is actually awarded by a verdict or a judgment and a set interest rate established by either the contract or the court/panel), they are more closely aligned with the amount “owed” and are infrequently awarded in most ADR settings.

Transactional costs, as defined in this research, are costs that do not add value to the construction process and, as a result, should be minimized whenever possible. This approach is based upon concepts developed within TCE theory, which will be discussed in the subsequent section.

3.8 Transactional Cost Economics

Not to be confused with the terminology of this research, several other studies have focused on applying transactional cost economics (TCE) theory to the construction industry. While parts of TCE theory have been used to design this quantification study of dispute resolution costs, TCE is a broader theory that looks to join together economics, organization theory, contract law, and the evolution of business organizations (Williamson 1981). TCE traditionally has focused on the ideology of minimizing the costs of transactions – both the costs of production and the costs of building and maintaining business arrangement (Yates 1998). Under TCE theory, organizational arrangements will be based upon transactional costs minimization when given multiple options. This is where the ideas behind TCE can be applied to this current research effort. Do organizational choices of dispute resolution systems reflect the same transactional cost minimization beliefs?

Disputes increase the costs incurred within the governance side of the project transaction. Project resources are expended on items not directly related to the production of the project itself, and as a result, the transaction costs of constructing a project are increased. These costs can be attributed to the time, money, and personal impacts spent in resolving the dispute, the satisfaction with process and outcome, the future business relationships, and the recurrence of disputes (Mitropoulos and Howell 2001).

Both Mitropoulos and Howell (2001) and Yates (2003) cite Williamson's work on TCE (1979; 1981) as the source for their consideration of the factors that cause disputes. Both identified the following three factors as causes to dispute occurrences predicted by TCE theory (Mitropoulos and Howell 2001; Yates 2003):

- Contractual incompleteness (based upon bounded rationality, risk and uncertainty, and complexity),
- Asset specificity (long-term investments in project-specific assets that can create "monopolistic bargaining power" on either side of the contract), and
- Opportunistic behavior by either party.

Mitropoulos and Howell (2001) further establish these factors by relating them to the research findings of the Dispute Prevention and Resolution Task Force of the Construction Industry Institute. They contend that the people, process, and project categories discussed earlier (Construction Industry Institute 1995) are identical to those concepts predicted by TCE theory – opportunism, contracting problems, and project uncertainty (Mitropoulos and Howell 2001).

Dispute causes and the costs associated with their resolution are not the only area where TCE theory has been applied. Another area of investigation by researchers studying TCE theory in the construction industry is the application of transactional costs to the development of governance structures for project-based processes (Walker and Wing 1999; Winch 2001). Analyzing the ways in which construction project teams organize, Winch (2001) developed a conceptual framework by which the cost of transactions influences the decision of whether to perform work in-house or to subcontract it to others. Included within these transaction costs are the project management costs consisting of: 1) the costs of negotiation between all parties, and 2) the

costs of enforcing the contract terms including dispute and settlement costs, among many others (Walker and Wing 1999). Unfortunately, the costs of conducting business are rarely known because firms do not accurately collect these data (Winch 2001), and managers base their corporate configuration decisions on perceived transaction costs rather than quantitatively known figures (Buckley and Chapman 1997). Collecting even a portion of the costs of doing business, such as the transactional costs of dispute resolution given in this research study, may help organizations select more efficient business structures in the future.

3.9 Literature Review Summary

This chapter has reviewed many of the concepts and systems that comprise dispute resolution procedures in the construction industry. Establishing definitions of terms like claims, conflict, and disputes, and combining that with the basics of alternative dispute resolution and prevention tools helps create the groundwork for this dissertation research. In addition, the above literature review helps layout where this research fits into the existing body of knowledge. Identifying transactional costs of dispute resolution procedures in the construction industry will establish an initial estimate on what the severity of disputes in the construction industry really totals. Combining dispute severity and frequency data, an overall tool for dispute assessment can be generated. This is the first of three parts of an overall framework for dispute risk management which also includes dispute identification and dispute control (Gebken and Gibson 2006). The next chapter will describe the methodology for collecting the necessary data for the study.

CHAPTER 4 METHODOLOGY

After an extensive review of the available literature on disputes within (and to some extent outside) the construction industry, a research methodology was developed to address the unique nature of this exploratory research. As depicted in Figure 4.1, a triangulated research approach was selected with data collection focusing on two areas – quantitative data and qualitative data. Adding in the previously mentioned literature review, this triangulated approach was selected because of its innate ability to help reduce or eliminate the disadvantages of a single research approach while gaining the benefits of several approaches, and of their combination (Fellows and Liu 2003). The following sections describe in detail the different focuses for each data collection element of this dissertation. In addition, the assumptions and limitation of the study will also be discussed along with the methods and units of analysis.

4.1 Research Study Methodological Basis

The initial phase of this research focused on the development of a high impact and high importance area of concern for the construction industry. A workshop, held in September 2003, focused on identifying potential research topics within the CCIS Economic, Financial, and Dispute Resolution Research Thrust. As discussed in Chapter 2, the findings and comments from the industry/academia workshop identified the need for research on quantifying the transactional dispute resolution costs in the construction industry. Following the development of the subject matter to be researched, a general methodology for completing the research was developed. This methodology is depicted in three phases in Figure 4.1 and will be described in further detail herein.

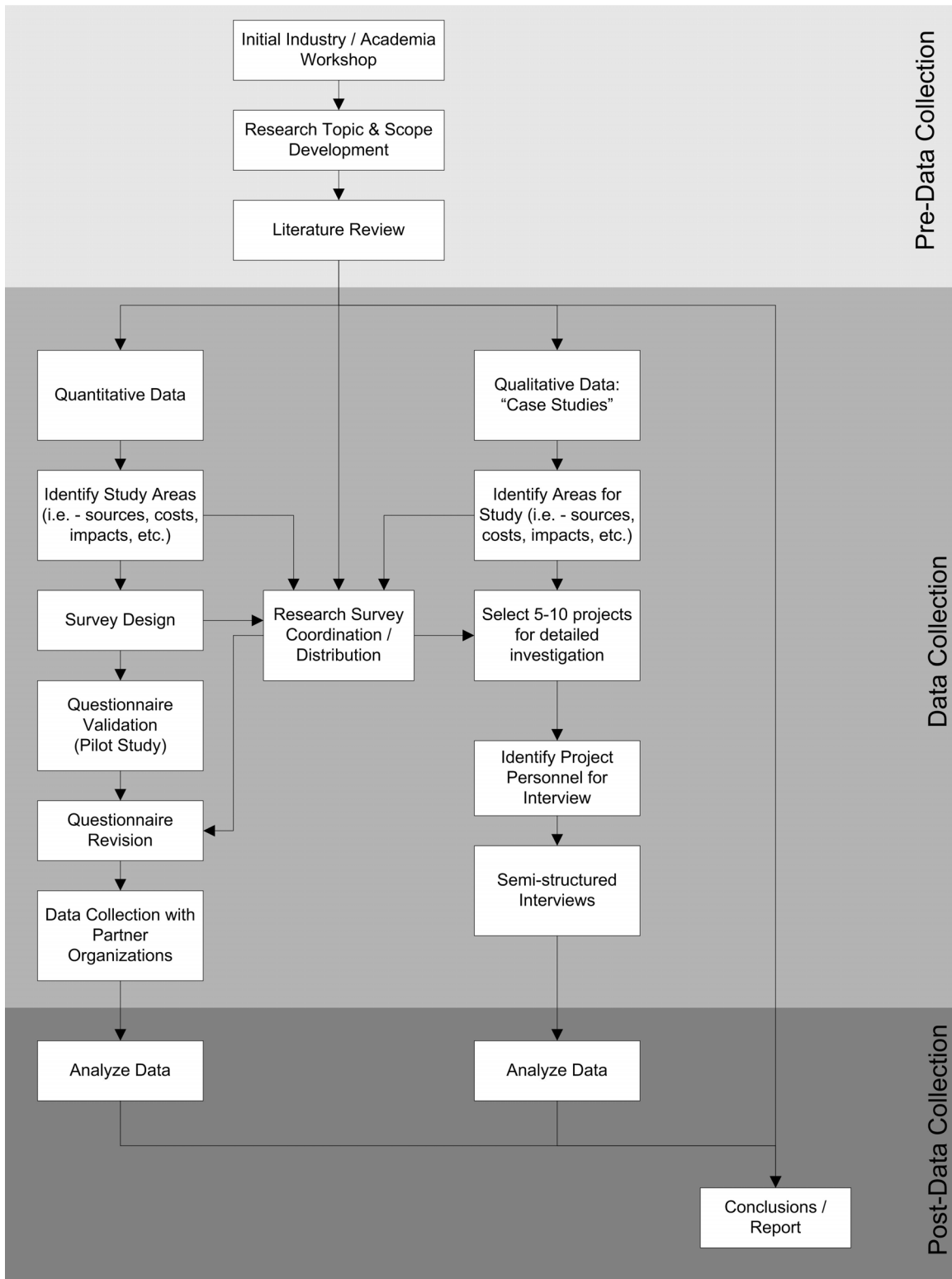


Figure 4.1: Research Methodology Diagram

4.2 Pre-Data Collection

The first phase of the research methodology is pre-data collection that consists of two major steps – the industry/academia workshop and the literature review. Both of these items were covered in detail in Chapter 2 and Chapter 3. These two elements help define the research topic for this dissertation and provide a theoretical groundwork for its execution. In addition to these two steps, the author also considered two other factors before attempting data collection from industry – the unit and measures of analysis. These two topics will be covered in the following subsections.

4.2.1 UNIT OF ANALYSIS

The unit of analysis selected for this study was based upon individual construction projects containing at least one dispute that had to be resolved outside of the project team. As such, participant responses were based upon post-project and post-resolution disputes. This selection was made because construction disputes are the result of the execution of a single construction project and analyzing disputes on a project level permits detailed analyses of specific project factors that may have affected the dispute characteristics.

In the quantitative data collection effort, respondents were asked to complete the survey based upon their most recently resolved construction dispute. Emphasis was also added that respondents should not describe atypical disputes. Respondents were only limited to two qualifications: domestic project disputes, and non-residential project disputes. In the qualitative data collection effort, interviewees were asked about the thoughts and experiences dealing with disputes in the industry. While responses were limited to a specific project, interviewees oftentimes based their comments upon experiences from a given project. The methods used to collect and analyze this data will be discussed later within this chapter.

4.2.2 MEASURES OF ANALYSIS

As this research is the first to attempt to collect the transactional costs of dispute resolution efforts, no existing literature exists that establishes a framework or system for comparing the varying costs between different projects, let alone different parties and different dispute types. As such, it was important to consider the possible measure of analysis prior to collecting data from industry.

As one would expect, the size of the project and the size of the dispute play a considerable role in determining the overall amount of time and money expended to resolve a dispute. The author examined numerous data measures (e.g., the transactional costs expended, the ratio of transactional divided by project costs, the ratio of transactional costs divided by original dispute amount, the ratio of transactional costs divided by the sum of the original dispute amount and the counterclaim amount, and the ratio of the transactional costs minus the settlement amount divided by the original claim amount). In the end, the author selected transactional costs divided by the original claim amount to be the appropriate measure for quantitative data analysis. This measure was not as susceptible to the deleterious effects associated with the other measures including: positional tactics of counterclaim values, dilution/magnification effects of construction project size, and relative bargaining power based upon settlement amount. However, other measures are also explored in Chapter 5 as additional insight may be added to the primary measure. The next section will detail how the data were collected.

4.3 Data Collection

One rationale for the selection of a triangulated research study approach was to address the diverse characteristics and attributes of construction dispute resolution data. The desired information gain was addressed by data collection means and methods

appropriate for each subject matter using a multifaceted approach. For example, the questionnaire survey (in both paper and on-line formats) was utilized to collect the cost and time data used in this research because of their quantitative and concrete nature. Conversely, the qualitative and abstract nature of dispute decision making and reasoning suggested the use of semi-structured interview. The following subsections will describe these two research processes and how they fit within the overall research framework.

4.3.1 QUANTITATIVE DATA

The quantitative data for this dissertation examines the hard dollar cost and time affects of disputes on the construction industry. Data collection was accomplished through the distribution, collection, and analysis of transactional costs quantification questionnaires. The questionnaire was developed and refined in an iterative process with the help of area contractors (local to Austin, TX), AAA-NCDRC administrators, CPR executives, and participants from the industry/academia workshop described in Chapter 2. Feedback on the questionnaire's completeness, accuracy, length, and other areas were used to make revisions and modifications to the questionnaire.

The format of the survey included three section and 26 questions. Section one focused on general project information. Section two focused on schedule information, and section three concentrated on dispute information for the largest dispute on the specific project. The final version of the questionnaire tool was distributed to target participants through either a mail or web-based format, each of which will be discussed below.

4.3.1.1 Mail Survey

Primary distribution of the mail-based survey was through partner organizations, including AAA, CPR, and ACCL. Physical distribution method selection was determined by each respective organization and included traditional postal delivery,

email delivery as an attachment, and hand delivered hard copy. The hard copy version of the questionnaire can be found in Appendix D with a cover letter asking for participation from the target audience. In the directions, respondents were asked to mail, email, or fax responses to the author at The University of Texas at Austin. No surveys were collected by any of the partner organizations who distributed them for confidentiality reasons.

The majority of questionnaires were self-completed by the respondents; however, some were completed with the assistance of the author. In either case, the paper-based survey served as the guiding document for the quantitative data collection effort. It should be noted that during visits with four of the six case studies reported in the qualitative data chapter, quantitative data questionnaire were also completed. In this case, the qualitative semi-structured interviews were provided to the respondent prior to administering the quantitative questionnaire. In addition, some questionnaires were generated with the cooperation of Mr. Steve Nelson's CE 395U.3 – Advanced Legal Concepts class during June 2004. Students in the class were trained how to administer the questionnaire during a two-hour lecture by the author. After training, students were assigned local contractor and owner representatives from contacts of Mr. Nelson to interview and collect data. These data were reported in Gebken et al. (2005) and formed the starting basis of the data for this dissertation.

4.3.1.2 Web-Based Survey

In addition to the mail surveys, a research study website was developed to facilitate additional distribution of survey questionnaires and other study related material. The website address was <http://web.austin.utexas.edu/disputes/> and was hosted by the University of Texas's Information Technology Services (ITS). It was constructed with the assistance of Mr. Lilin Liang using Macromedia Dreamweaver MX and Macromedia

Cold Fusion MX 7. The database behind the web interface was constructed using Microsoft Access 2003.

The format of the web-based survey was identical to that of the paper-based survey – three section and 26 questions; however, many of the on-line question response fields were restricted to allow only certain types of data input (i.e., numerical or date format information). This restriction helped keep database records consistent between different respondents. In addition, other ancillary benefits of the online questionnaire format included elimination of data entry repetition and transcription errors encountered with the mail surveys.

Another important consideration that was addressed through the online survey was that of confidentiality. Not only did individual respondents generate their own username and password, but the information associating each particular user was stored in a separate database table from the quantitative data records. The ease and convenience of the online survey instrument was further utilized by the researcher as a transcription tool to transfer mailed and faxed questionnaires into a unified database. Screenshots of the web-based survey can be found in Appendix E.

Irrespective of the distribution method, follow-up contact was made when needed via telephone or email to complete missing data or to clarify responses.

4.3.2 QUALITATIVE DATA

The qualitative data focuses on guided interviews of construction dispute experts including contractors, owners, and lawyer representatives. These studies were performed to help capture additional information, parallel to that of the quantitative survey results, but could not be captured in a quantifiable questionnaire. Using semi-structured personal interviews, individuals were interviewed on both their perceptions of transactional costs for dispute resolution efforts and their observations related to dispute decision-making in

the construction industry. The decision to utilize a semi-structured personal interview was made because of the exploratory nature of the work, the sensitive nature of the subject matter, and the wide-range of participant roles in the construction industry.

Prior to the scheduled meeting time, advanced copies of the interview questions were forwarded to interviewees along with detailed instructions as to the nature of the case study analysis. All case study interviews were conducted, recorded, and transcribed by the author. The semi-structured interview question sheet can be found in Appendix F. Copies of the transcriptions can be found in Appendix G, Appendix H, Appendix I, Appendix J, Appendix K, and Appendix L based upon the audio recordings from each interview. Methods of analyzing the data collected during the interviews will be discussed in Section 4.4.3. In addition, the findings from the interview analyses will be covered in Chapter 6.

4.4 Post-Data Collection

Statistical analyses were performed on the data collected from the quantitative questionnaires. In addition, qualitative data analyses based upon the principles of Grounded Theory (Glaser and Strauss 1987) and pattern matching (Crabtree and Miller 1999) were performed on the case-study interviews. The following subsections describe the methods of analysis.

4.4.1 ANALYSIS OF VARIANCE

The primary data analysis tool for this research will be analysis of variance. This analysis technique has been selected as a tool to understand what factors affect the transactional cost of a dispute. An analysis of variance test will determine how much the total variability among scores to attribute to various sources of variation (Borich 2004). The analysis of variance test will also indicate whether or not there is a significant

difference in population means given a particular alpha level (Albright et al. 2003). The use of non-parametric statistics was considered as some of the collected data were not normally distributed, but the robust nature of the ANOVA test and the importance of numerical analyses based upon actual quantitative data led the author to select analysis of variance as the primary analytical methodology. Lastly, the alpha level was set at 0.10 (confidence level equals 90 percent) because of the exploratory nature of the study. All analysis of variance tests were completed in the SPSS 12.0 for Windows. The results of the analysis of variance tests are presented in Chapter 5.

4.4.2 STATISTICAL BOX PLOTS

Box plots were selected as an analysis tool for this study because of their simultaneous graphical representation of multiple summary statistical measures. In addition, box plots can help compare two or more variable at the same time (Albright et al. 2003). All box and whisker plots were generated using SPSS 12.0 for Windows. Figure 4.2 identifies the components of the box plots used for this dissertation.

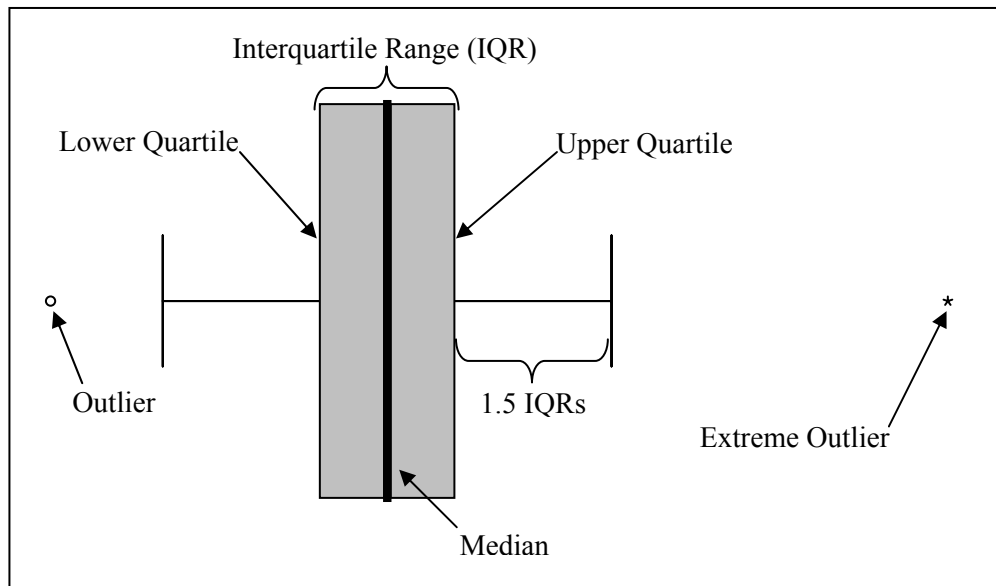


Figure 4.2: Box Plot Definitions

As shown above, the following information is identified (if applicable) in each of the box plots used for this dissertation: interquartile range (IQR), median value, outliers, and extreme outliers. The IQR is defined as the difference between the 25th percentile and the 75th percentile of the data. The median value is the data value that equally splits the lower and upper halves of the data set. As used in this dissertation, an outlier is defined as any point that falls 1.5 to 2 IQRs from the upper or lower edge of the box. These points are represented by an open dot. An extreme outlier is defined as a point that lays more than 3 IQRs from the upper or lower edge of the box. These points are represented by an asterisk.

4.4.3 QUALITATIVE DATA ANALYSIS

Data analysis for the interviews conducted as part of the qualitative data portion of this study were based upon the theories first elaborated by Glaser and Strauss (1987) and later by Crabtree and Miller (1999). Sometimes referred to as pattern matching, meaning categorization, template analysis, or ‘Editing’ because, “the interpreter enters the text much like an editor searching for meaningful segments, cutting, pasting, and rearranging until the reduced summary reveals the interpretive truth in the text (Crabtree and Miller 1999, p. 22-23).” The principal tasks include careful review of the audio tapes and transcripts, inductive development of key themes and/or terminology, coding of interview comments, and finally categorization/linking of similar concepts into overarching associations and relationships (Allan and Skinner 1991; Hakim 2000; Kvale 1996). This procedure is often an iterative process in which the researcher continues coding and linking interview sections until all possible instances of a given phenomenon have been captured and structured (Allan and Skinner 1991).

The software package ATLAS.ti 5.0 was used to analyze the interviews (Hakim 2000; Scientific Software Development GmbH 2006). After importing the transcripts

from Microsoft Word, the author marked lines and or sections of the interview with codes describing the basic concept relayed by the interviewee. The code list was continually updated as the researcher read through all the interviews until a final list was completed at the conclusion of the first pass through the coding process. The author then reread the earlier transcripts and added codes that were not part of the code library during the first reading. After the coding process was complete, the author grouped and categorized the codes, and their associated text, into related headings to create an overall framework of the qualitative findings. Detailed analysis of the qualitative data will be presented in Chapter 6.

4.5 Assumptions of the Study

The assumptions made within this study include the following:

- Transactional costs are an effective evaluation tool for dispute resolution methodologies in the construction industry.
- The disputes studied within this research are representative of disputes within the entire industry, although caveats will be made based upon the exact make-up of the sample.
- Respondents and interviewees will be able to quantify accurately, whether through documented records or approximations, the actual costs associated with resolving a completely resolved construction dispute.

4.6 Limitation of the Study

Studying the transactional costs associated with dispute resolution in the construction industry is a difficult proposition. From the beginning, disputes are one of the most contentious issues on a project. Parties to a dispute can feel anger and hostility

towards the other side and oftentimes transfer the project disagreements into personal attacks. Objective data can regularly be difficult to locate because of poor records, lack of accurate metrics, or inflated positional stances, to name a few. Project personnel often transfer disputes to lawyers, claims specialists, and consultants who far too many times do not have either the required technical expertise to understand the dispute or the first-hand experience of the specific matter in dispute. Additionally, many organizations believe that dispute data are some of the most confidential information within the company and many settlements include non-disclosure agreements.

That being said, this research is an exploratory study on the transactional costs of dispute resolution procedures in the construction industry. As the sample will not be randomly selected, data and information collected in this research may not be applicable to the industry as a whole. The ability to make inferences about the entire population (the U.S. construction industry) will need to have detailed caveats. However, every effort to reflect accurately the costs associated with resolving a dispute in the construction industry will be made and findings should point towards areas where additional research is needed.

Further limitations of this study can be related to the choice of target respondents for the questionnaire and case study analyses. The construction industry is a complex industry based upon complex contracting and business relationships. Many times projects include architects, engineers, specialty architectural and engineering consultants, owners, developers, sureties, general contractors, construction managers, subcontractors, governmental authorities, and many others. As disputes can occur between nearly any of these parties, failure to capture the transactional costs from all these parties may create additional bias within the research findings.

Other sources of bias for the research include the possibility that questionnaire respondents selected atypical disputes for the study, the aggregation of data from dissimilar project types (i.e., industrial, commercial, and heavy highway/civil), and the effects of looking at data from only one side of the dispute.

4.7 Summary

This chapter outlined the basic methods and procedures used from the initial industry/academia workshop where the topic of this dissertation was first formulated, through data collection, and to data analysis and review. The entire process took approximately four years from start to finish with the preponderance of data collection occurring from June 2004 through August 2005. The following two chapters analyze the data collected during the quantitative and qualitative components of the study, respectively.

CHAPTER 5 QUANTITATIVE FINDINGS

This chapter presents the data collected from the quantitative surveys detailed in Appendix D, Appendix E, and Appendix M. The primary focus of the analyses of this chapter is on the cost and time impacts of disputes in the construction industry as outlined in the hypotheses developed in Chapter 1. Overall summary statistics are presented first, followed by discussions of the effects of ADR method selection on cost, the effects of ADR selection on time, the effects of disputing party on cost, and the effects of the perceived complexity of the dispute on cost.

5.1 Data Collection

In collaboration with the American Arbitration Association's National Construction Dispute Resolution Committee (AAA-NCDRC), the American College of Construction Lawyers (ACCL), the International Institute for Conflict Prevention and Resolution (CPR), and the National Academy of Construction (NAC), this Center for Construction Industry Studies (CCIS) research collected data from 61 projects from 56 organizations through electronically mailed surveys, personal interviews, and web-based questionnaires. This was a convenience sample, not randomly selected. In addition, four of the projects collected as part of the quantitative survey were part of the qualitative case studies discussed in Chapter 6.

The surveys were collected between June 2004 and August 2005. The format of the survey included three sections and 26 questions. Section one focused on general project information. Section two focused on schedule information, and section three concentrated on dispute information for the largest dispute on the specific project. The

following three sections will address each question within its respective heading and a fourth section will examine the research hypotheses in more detail.

5.2 General Project Information

This section will examine the first part of the questionnaire, questions one through seven, which focuses on the basic descriptive information for each project submitted. The following subsections will breakdown each of the seven questions to better clarify the data collected for the quantitative portion of this dissertation.

5.2.1 PROJECT LOCATION

Question one of the quantitative survey asked respondents to identify the location, city, and state, of the project upon which they were reporting. Of the 61 sample projects collected, 21 states were represented. They include Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Illinois, Kansas, Louisiana, Michigan, Mississippi, New Mexico, New York, Oklahoma, Pennsylvania, Texas, Utah, Virginia, Washington, and Wisconsin. Figure 5.1 and Table 5.1 identify these locations across the United States.

Table 5.1: Summary Table of Project Locations by State (n=60)

State	Projects	State	Projects
Alabama	1	Mississippi	1
Arizona	2	New Mexico	2
California	2	New York	2
Colorado	1	Oklahoma	1
Delaware	1	Pennsylvania	2
Florida	2	Texas	33
Georgia	1	Utah	1
Illinois	2	Virginia	1
Kansas	1	Washington	1
Louisiana	1	Wisconsin	1
Michigan	1		

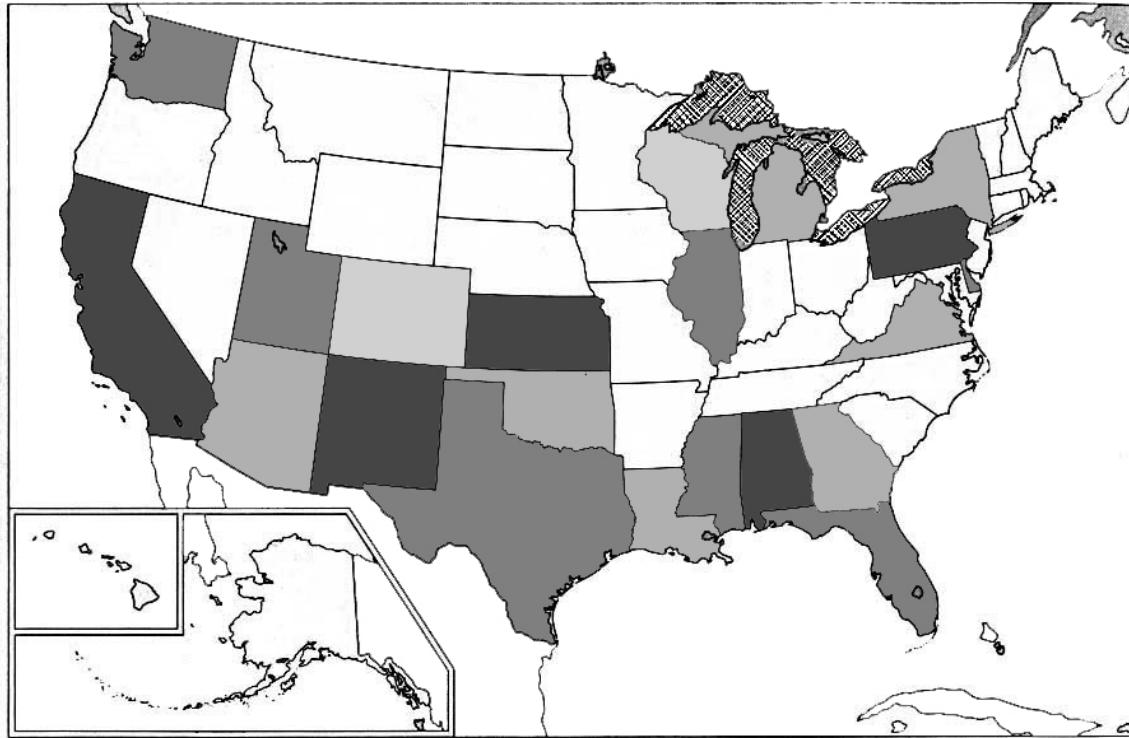


Figure 5.1: States Represented with Data in the Quantitative Survey (n=60)

Understanding the constituent project makeup of the dataset is an important factor when interpreting the collected sample. State laws and specific regional dispute environments may affect the transactional costs of dispute resolution efforts. Unfortunately, too few projects were collected from within each state to perform an analysis on either the dispute transactional costs or the dispute resolution lengths compared to the respective project location.

It should be noted that the majority of projects, 33 in all, were constructed within the state of Texas. This may have skewed the findings in relation to the entire population of domestic construction projects. As such, two statistical analyses were performed on the data in relation to the projects location. First, an ANOVA test was completed by dividing the projects into two groups – projects within the state of Texas and those outside of Texas. The dependent variable was selected as the ratio of the total

transactional costs divided by the original claim amount. This was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). The null hypothesis was established as the means of the two groups being equal. Using an alpha of 0.10, the difference in means of the transactional cost ratio between Texas and “non-Texas” states was found to be not significant (see Appendix O for full analyses).

A second ANOVA analysis was conducted by dividing Texas, California, and Florida-based projects from the other states. This was based upon the popular belief that these three states are at the forefront of ADR resolution methods (Fleming 2006). Again, the dependent variable was measured by dividing the total transactional costs by the original claim amount. The null hypothesis was established as the means of the two groups being equal. Using an alpha of 0.10, the difference in means of the transactional cost ratio between “ADR leader” and “non-ADR leader” states was also found to be not significant (see Appendix O for full analyses).

5.2.2 OWNER TYPE

Question two asked survey respondents to identify the owner type, public or private, of the project they were reporting upon. Of the 61 responses, 41 percent (25 projects) of the sample projects were owned by public entities while 59% (36 projects) were owned by private entities. Figure 5.2 shows a pie chart of the breakdown of the project owner types for the collected dataset.

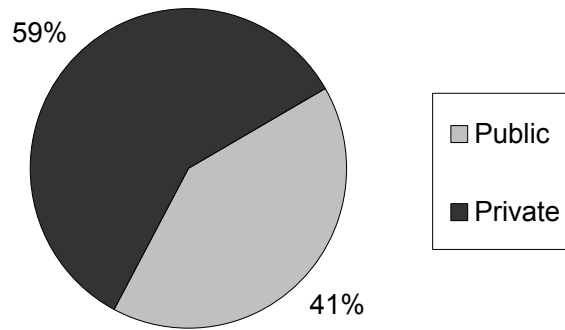


Figure 5.2: Owner Type (n=61)

To identify whether or not the owner type has an influence on the transactional costs or the time to resolution, three separate analyses were performed (see Appendix O for full analyses). First, projects were divided into two groups, public-based or private-based ownership, and then the amount of time to resolve the dispute was calculated for each project. The first measure was calculated by using the difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete when the event occurred (question #13), the project start date (question #8), and the substantial completion date (question #9), and the dispute resolution date (question #15). This calculation can be seen in Equation 5.1. Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution between for this measure was found not to be significant.

However, the second measure of subtracting the substantial completion date (question #9) from the dispute resolution date (question #15) revealed a different finding for the average length of a dispute beyond the project's construction phase. This calculation can be found in Equation 5.2. Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution between public and private owners for this measure was found to be significant. This would indicate that resolving a dispute with a

private owner would take almost twice as long (on average) than for those with a public owner. These findings are summarized below in Table 5.2.

Equation 5.1: Dispute Resolution Time from first occurrence of Dispute

$$RT_{Occurr} = DRD - \{(PWCO) \times [(SCD) - (PSD)] - (PSD)\}$$

Where:

RT_{Occurr} = Resolution Time from Date of Dispute First Occurrence
 DRD = Dispute Resolution Date
 PWCO = Percent Work Complete when Dispute First Occurred
 SCD = Substantial Completion Date
 PSD = Project Start Date

Equation 5.2: Dispute Resolution Time from Substantial Completion Date

$$RT_{SCD} = DRD - SCD$$

Where:

RT_{SCD} = Resolution Time from Substantial Completion Date
 DRD = Dispute Resolution Date
 SCD = Substantial Completion Date

Table 5.2: ANOVA Results for Dispute Length after Substantial Completion by Owner Type

Groups (n = 43)	Count	<u>Days</u>	Variance	P-value
Private	20	683	374976	0.074
Public	18	355	219196	

The third analysis took the same two groups, public-based or private-based ownership, and then the transactional dispute resolution costs were calculated as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test with an alpha of 0.10, the difference in means of the transactional cost ratio between public and private owners was also found to be significant. Table 5.3 shows the summary of the ANOVA results.

Table 5.3: ANOVA Results for Transactional Cost Ratio by Owner Type

Groups (n = 46)	Count	<u>Mean Transactional Cost Original Claim Value</u>	Variance	P-value
Private	26	43.2 %	0.257	0.011
Public	20	12.5%	0.012	

Examining the information in Table 5.3, the transactional costs for resolving disputes on projects with private owners costs over three times as much as those projects with public owners. One explanation for this large differential could be the presence of more owner data in the group. As will be shown in a later section (see subsection 0), owners typically spend far less than contractors do when resolving disputes (approximately half as much). Thus, the fact that the percentage of owners represented in the private project group is 20 percent and the percentage of owners in the public project group is 45 percent could be one explanation for the above difference in means.

5.2.3 FACILITY TYPE

Question three asked survey respondents to identify the facility type (industrial, civil/infrastructure, or commercial/building) of the sample project they were reporting upon. Of the 61 responses, the majority of projects, 56 percent, were commercial/building type projects. The remaining fraction of projects was almost equally divided between civil/infrastructure and industrial projects, 21 percent and 23 percent respectively. Figure 5.3 shows a pie chart of the breakdown of the project facility types for the collected dataset.

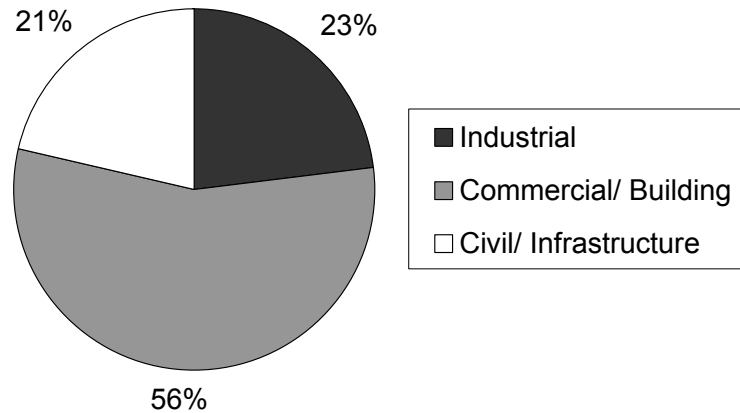


Figure 5.3: Facility Type (n=61)

Three ANOVA tests with alpha equal to 0.10 were conducted based upon the facility type categories (see Appendix O for full analyses). First, projects were divided into the three aforementioned facility types, and then the amount of time to resolve the dispute was calculated for each project. The first measure was calculated by using the difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete (question #13), the project start date (question #8), and the substantial completion date (question #9), and the dispute resolution date (question #15). The second measure was calculated by subtracting the substantial completion date (question #9) from the dispute resolution date (question #15). Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution times between facility types for both measures was not significant.

The third ANOVA test took the same facility type groups and examined their mean transactional dispute resolution costs as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test with an alpha of 0.10, the difference in means of the transactional cost ratio between facility types was also found to be not significant.

5.2.4 CONSTRUCTION TYPE

Question four asked survey respondents to identify the type of construction (greenfield, renovation, expansion, or mixed construction) of the project they were reporting upon. Of the 60 responses to this question, the majority of projects, 51 percent, were greenfield, otherwise known as new construction. The remaining fraction of projects were decreasing split between expansion, renovation, and mixed construction projects (22 percent, 17 percent, and 10 percent respectively). Figure 5.4 shows a pie chart of the breakdown of the construction type for the collected dataset.

Three ANOVA tests (alpha equal to 0.10) were conducted based upon the construction type categories (see Appendix O for full analyses). First, projects were divided into the four aforementioned construction types, and then the amount of time to resolve the dispute was calculated for each project. The first measure was calculated by using the difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete (question #13), the project start date (question #8), and the substantial completion date (question #9), and the dispute resolution date (question #15). The second measure was calculated by subtracting the substantial completion date (question #9) from the dispute resolution date (question #15). Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution times between construction types for both measures was not significant.

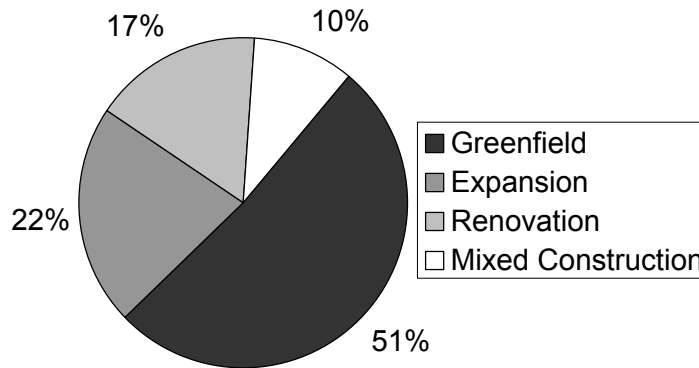


Figure 5.4: Construction Type (n=60)

The third ANOVA test took the same construction type groups and examined their mean transactional dispute resolution costs as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test with an alpha of 0.10, the difference in means of the transactional cost ratio between construction types was also found to be not significant.

5.2.5 FEE ARRANGEMENT AND CONTRACT TYPE

Question five part “A” and part “B” asks survey respondents to identify the fee arrangement (fixed price, guaranteed maximum price, cost plus, or other) and contract type (design-bid-build, design-build/EPC, subcontract, or other) for the project they are reporting upon. Of the 60 responses to part “A”, the majority of projects, 60 percent, were fixed price contracts. The remaining fraction of projects were decreasing split between guaranteed maximum price, cost-plus, and other types of contracts (20 percent, 17 percent, and 3 percent respectively). Figure 5.5 shows a pie chart of the breakdown of the fee arrangement for the collected dataset.

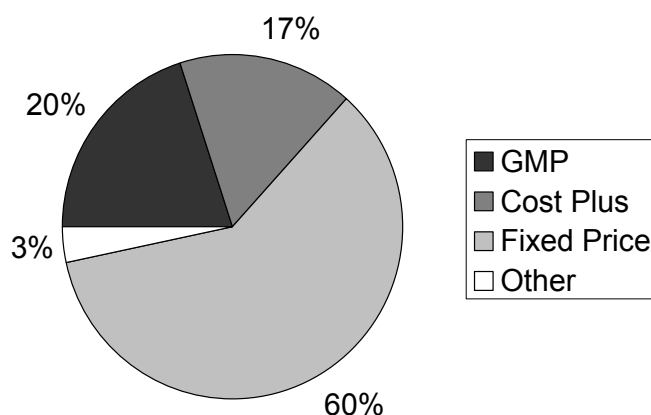


Figure 5.5: Project Fee Arrangement (n=60)

Three ANOVA tests (alpha equal to 0.10) were conducted based upon the fee arrangement type categories (see Appendix O for full analyses). First, projects were divided into three fee arrangement types (“others” was omitted as only two projects fell within this category), and then the amount of time to resolve the dispute was calculated for each project. The first measure was calculated by using the difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete (question #13), the project start date (question #8), and the substantial completion date (question #9), and the dispute resolution date (question #15). The second measure was calculated by subtracting the substantial completion date (question #9) from the dispute resolution date (question #15). Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution times between fee arrangements for both measures was not significant.

The third ANOVA test took the same fee arrangement groups and examined their mean transactional dispute resolution costs as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test

with an alpha of 0.10, the difference in means of the transactional cost ratio between fee arrangement types was also found to be not significant.

The second part of question five asked respondents about the contract type. Of the 61 responses to part “B”, the largest contract type was the traditional design-bid-build (31 percent). Subcontract work accounted for 15 percent of the projects and design-build or EPC contract types accounted for 16 percent. Eight percent of the projects fell into the other category, while 30 percent of respondents did not answer this question. Figure 5.6 shows a pie chart of the breakdown of the contract types for the collected dataset.

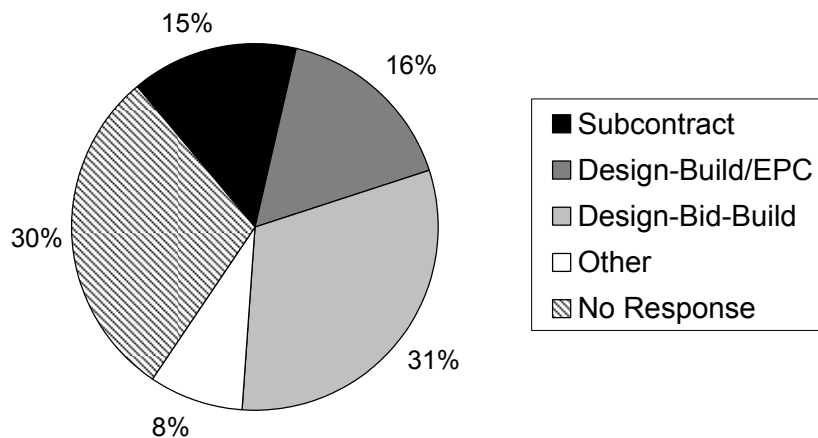


Figure 5.6: Contract Scope (n=61)

No statistical tests were performed to see if the contract scope had an effect on either the time to resolution or the ratio of transactional costs to initial claim amount. These tests were not performed because of the numerous contract scope methods, the large amount of no responses, and the subsequent small number of projects within each category to perform an adequate analysis.

5.2.6 CONTRACT AMOUNT

Question six asked survey respondents to identify the contract amount for the project for which they were reporting. Of the 58 responses to this question, the mean and

median values were \$143,412,472 USD and \$12,500,000 USD respectively. The total contract value of all projects was approximately \$8.3 billion USD and the minimum and maximum contract values were \$10,000 USD and \$5,500,000,000 USD respectively. Figure 5.7 depicts the statistical box plot of the contract values for the collected dataset on a logarithmic scale.

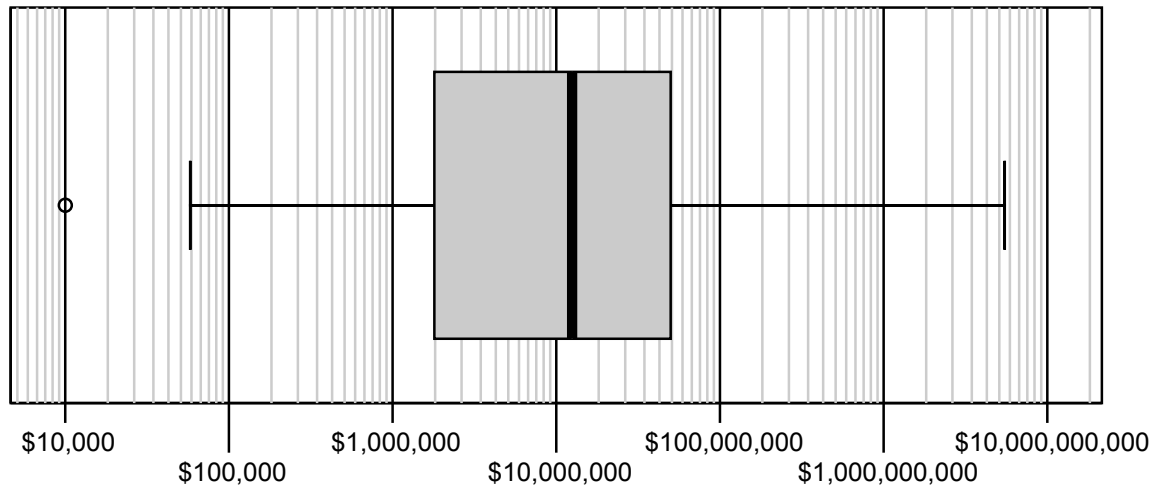


Figure 5.7: Box Plot of Contract Values (n=58)

The mean and median values are very distant indicating that the data collected in this research is skewed towards larger projects. In addition, the maximum contract value (Dispute #1126) accounts for over 66% of the total contract values for this dataset. Since the interquartile range (IQR) is from approximately \$2 million USD to \$60 million USD, the largest and smallest projects will be excluded in the additional analyses presented in Section 5.5.

5.2.7 ADR LANGUAGE IN CONTRACT

Question seven asks respondents to identify which ADR clauses, if any, are present within the capital facility contract they are reporting upon. The question's main set of choices listed partnering, negotiation, mediation, arbitration. None (no ADR

language present within the contract) was also a selection. In addition, a category for “Other” was also listed with respondents having the option to list additional specific ADR procedures as outlined in the contract. Respondents were directed to list as many ADR procedures in the contract as applicable. Figure 5.8 shows a histogram of the ADR language used in the contracts for this dataset.

Of the 60 responses to question seven, the majority of contracts, 55 percent, had a mediation clause within the contract. Arbitration was a close second at 48 percent. Negotiation was identified in approximately one-fourth of the projects, 28 percent, while partnering and “Other” procedures (step negotiation, med/arb, incentives, and governmental ADR procedures).were far less. It is interesting to note that in almost one-fifth of the contracts, 17 percent, no ADR clauses were enumerated in the contract at all.

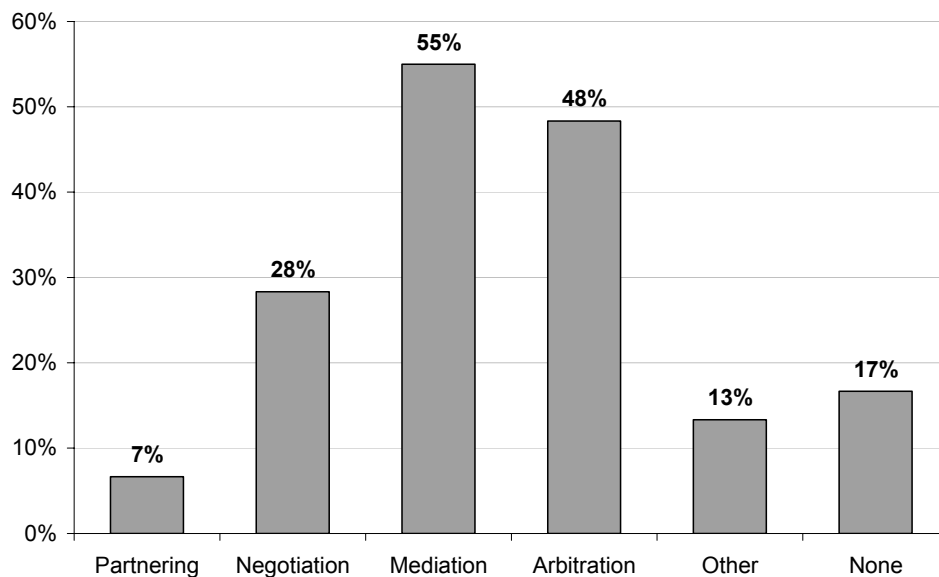


Figure 5.8: ADR Language in Contract (n=60)

No specific statistical analyses were performed between the ADR language in the contract and the cost and time to resolve construction disputes. As there are many options to how, when, and to what extent different ADR options can be pursued within

each contract, the researcher elected to examine the impact of the final method of resolution on cost and time to resolution (see section 5.5). Future studies with larger samples and specific questions on contractual language should examine if the availability of varying ADR procedures by contract may limit and/or reduce the cost and time necessary to seek dispute resolution. Likewise, future studies should closely examine what ADR options have and have not been pursued prior to the final resolution method. This will be discussed further in Chapter 7. It would also be beneficial for future studies to examine what other means of dispute resolution are being employed by the industry as well. Of particular note is the growing trend towards “waiver of jury” litigation (also known as trial by bench).

5.3 Project Schedule Information

Section two of the quantitative questionnaire examined project schedule information. Eight questions focused on topics ranging from project start date, project substantial completion date, project final acceptance date, project duration, number of disputes, and dispute settlement date. These questions and their respective responses will be discussed in the following subsections.

5.3.1 PROJECT START DATE

Question eight asked respondents to identify the month and year that construction operations first began on-site. Respondents were encouraged to provide the most recent dispute for which they had information; however, no specific time frame was specified. Of the 49 responses to this question, the earliest project commencement date was May 1991 and the latest project commencement date was June 2004. Dollar values for transactional costs and contract values were not adjusted for inflation, despite a 13-year

difference between the earliest and latest projects, as most of the metrics used are relative to target values such as project cost or schedule.

5.3.2 PROJECT SUBSTANTIAL COMPLETION DATE

Question nine asked respondents to identify the month and year that substantial completion for the facility was obtained. As defined in this research, substantial completion was that date at which the Work or designated portion thereof was sufficiently complete, in accordance with the Contract Documents, so the Owner could occupy or utilize the Work for its intended use (AIA 2001). Of the 49 responses to this question, the earliest project substantial completion date was October 1991 and the latest project substantial completion date is projected to be December 2012. Only one project was collected with a substantial completion after the last day of data collection; however, that dispute was resolved prior to the conclusion of construction operations. The substantial completion date was used as a measure for dispute duration in almost all instances as it signifies when the majority of construction work is complete. In addition, it was often the most responded to time related question. Other measures of time will be explicitly stated for those instances in which the date of resolution minus the date of substantial completion is not used.

5.3.3 PROJECT FINAL ACCEPTANCE DATE

Question ten asked respondents to identify the month and year that final acceptance of the facility was obtained. As defined in this research, final acceptance was that date after contract requirements have been fulfilled and formal acceptance by the Owner of a finished construction project takes place (Bockrath 1986). Of the 43 responses to this question, the earliest project final acceptance date was May 1998 and the latest project final acceptance date was December 2005.

5.3.4 PROJECT DURATION

Question eleven asked respondents to identify the ratio of the actual project duration divided by the planned duration plus any additional time granted through non-disputed change orders. The options for selection included less than 95 percent of the last agreed upon length, 95 percent to 105 percent of the last agreed upon length, and longer than 105 percent of the last agreed upon length. Of the 51 responses to question eleven, the majority of projects were almost equally split between 95 percent to 105 percent of the last agreed upon length and greater than 105 percent of the last agreed upon length, 45 percent, and 49 percent respectively. Only six percent of the projects were completed ahead of schedule at 95 percent or less than the last agreed upon length. Figure 5.9 shows a pie chart of the breakdown of the project lengths for the collected sample.

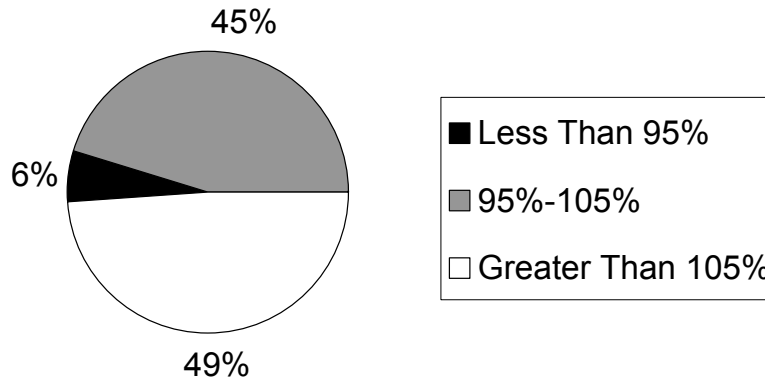


Figure 5.9: Project Duration (n=51)

Three ANOVA tests (alpha equal to 0.10) were conducted based upon the project duration (see Appendix O for full analyses). First, projects were divided into three project duration categories mentioned above, and then the amount of time to resolve the dispute was calculated for each project. The first measure was calculated by using the difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete (question #13), the project start date (question

#8), and the substantial completion date (question #9), and the dispute resolution date (question #15). The second measure was calculated by subtracting the substantial completion date (question #9) from the dispute resolution date (question #15). Based upon an ANOVA test with an alpha of 0.10, the difference in mean resolution times between different project durations for both measures was not significant.

The third ANOVA test took the same project duration groups and examined their mean transactional dispute resolution costs as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test with an alpha of 0.10, the difference in means of the transactional cost ratio between project duration types was also found to be not significant.

5.3.5 NUMBER OF DISPUTES ON PROJECT

Question twelve asked respondents to identify the number of disputes on the project for which they were reporting. Of the 48 responses collected for this question, the mean was nine disputes per project and the median was three disputes per project. On first examination, one can see that the data sample is skewed towards projects with more disputes as the mean value is almost three times more than the median value. In addition, the author believes that many of the responses given were more a reflection of the nature of the project environment (e.g., how combative or how protracted the disputes/conflict were) rather than the actual total number of disputes. As such, the number of disputes was not analyzed any further with respect to its impact of the time and cost to resolve the dispute described in section three of the questionnaire.

5.3.6 PROJECT PERCENT COMPLETE WHEN DISPUTE FIRST OCCURRED

Question thirteen asked respondents to identify the project percent complete when the dispute first occurred. This time was defined as an estimate of project work completed compared to the total amount of project work in the contract when disputed work and/or item first occurred. The options for selection included less than 20 percent, between 20 percent and 40 percent complete, between 40 percent and 60 percent complete, between 60 percent and 80 percent complete, and greater than 80 percent complete. Of the 52 responses to question thirteen, respondents identified each percent complete category almost evenly. Figure 5.10 shows a pie chart of the breakdown of the project of the different project completions when the dispute first occurred.

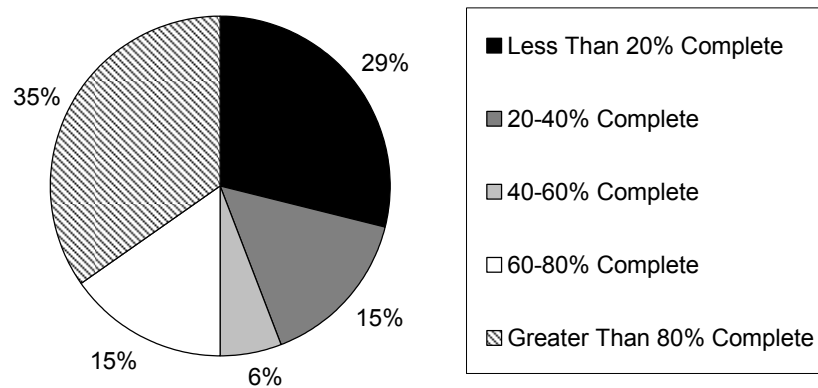


Figure 5.10: Project Percent Complete when Dispute First Occurred (n=52)

Examining the data in Figure 5.10, 64 percent of the disputes either occurred in the first or last 20 % of the project. In other words, only about one-third of the disputes of the project began during the middle two-thirds of the project. On the surface, this makes logical sense as some of the primary causes of conflict, and hence claims and disputes, are differing site conditions (usually near the beginning of a project), delays, and changes (especially those occurring near the end of a project). Another factor that can also increase the acrimony between parties is late filing of requests for changes. The

next subsection will examine what percent the project was complete when notice of the claim was first given to the proper authority.

5.3.7 PROJECT PERCENT COMPLETE WHEN CLAIM FIRST FORMALLY NOTIFIED

Question fourteen asked respondents to identify the project percent complete when the claim was first formally notified. This time was defined as an estimate of project work completed compared to the total amount of project work in the contract when notification of claim was first filed with the owner. The options for selection included less than 20 percent, between 20 percent and 40 percent complete, between 40 percent and 60 percent complete, between 60 percent and 80 percent complete, and greater than 80 percent complete. Of the 52 responses to question fourteen, the answers were evenly split between all categories. Figure 5.11 shows a pie chart of the breakdown of the project of the different project completions when the claim was first formally notified.

Figure 5.10 and Figure 5.11 indicate that there is a slight delay from when a dispute first occurs to when it is first notified to the proper authority. There are fewer projects in the less than 20 percent category and more projects in the 40 to 60 percent range. In addition, more projects were in the greater than 80 percent completion range as well.

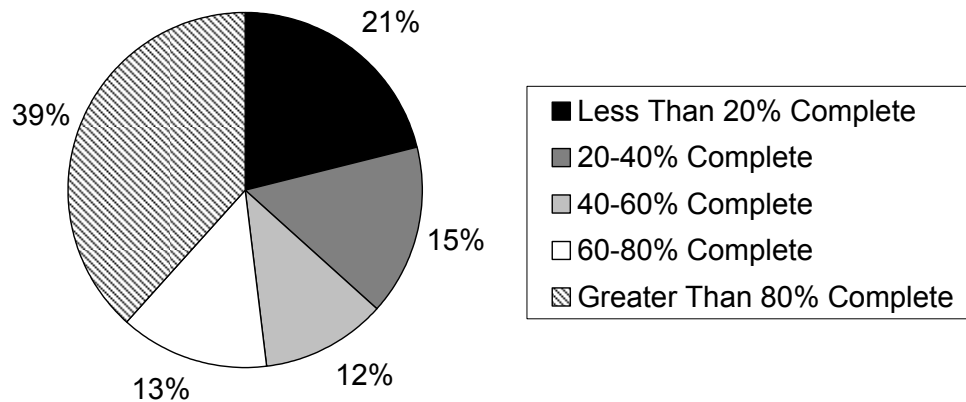


Figure 5.11: Project Percent Complete when Claim First Formally Notified (n=52)

Three ANOVA tests (alpha equal to 0.10) were conducted to see if late notification had an effect on the cost and time to resolve a dispute (see Appendix O for full analyses). First, projects were divided into two categories, one for when notification happened later than occurrence and one category for when occurrence and notification occurred approximately during the same period as reported in the sample. Then the amount of time to resolve the dispute was calculated for each project using two measures. The first was calculated by using the time difference between the substantial completion date (question #9) from the dispute resolution date (question #13) and the time difference between the date when the event that caused the dispute occurred, estimated from the percent the project was complete (question #13), and the project start date (question #8). The second was calculated from the difference between the substantial completion date (question #9), and the dispute resolution date (question #15). Based upon an ANOVA test with an alpha of 0.10 and the null hypotheses being the means were equal, the difference in mean resolution times between late and “on-time” notification was significant for both measures. Table 5.4 and Table 5.5 show the ANOVA summaries for these tests.

Table 5.4: ANOVA Summary for Notification Timing versus Mean Days from Dispute Occurrence to Dispute Resolution Date

Groups (n = 38)	Count	Days until Final Resolution	Variance	P-value
Late Notification	6	1186	426409	0.079
On-time Notification	32	745	279841	

Table 5.5: ANOVA Summary for Notification Timing versus Mean Days from Project Substantial Completion to Dispute Resolution Date

Groups (n = 38)	Count	Days until Final Resolution	Variance	P-value
Late Notification	6	893	436921	0.086
On-time Notification	32	460	281961	

The third ANOVA test took the same notification groups as described above and examined their mean transactional dispute resolution costs as a percentage of the initial claim values. This cost ratio was calculated by dividing the total transactional costs (sum of question #23-b through #23-g) by the original claim value (question #21). Using an ANOVA test with an alpha of 0.10, the difference in means of the transactional cost ratio between late and “on-time” notification was found to be not significant.

5.3.8 DISPUTE SETTLEMENT DATE

The last question of section two, question fifteen, asks respondents to identify the month and year the dispute was resolved. Of the 46 responses to this question, the earliest dispute resolution date was July 1994 and the latest dispute resolution date was December 2005. Question fifteen of the survey was used extensively in the analysis of the time to resolution for many sections of this report. The dispute settlement date was not used to adjust transactional costs, claim values, or contract amounts for inflation.

5.4 Project Dispute Detailed Information

Section three of the quantitative questionnaire examined dispute specific cost and resolution information. Eleven questions focused on the parties involved in the dispute, the complexity of the dispute, the dispute resolution processes attempted prior to resolution, the final dispute resolution procedure, the various transactional costs of the dispute resolution efforts, the settlement amount (if applicable), the total claim amount, the total counterclaim amount (if applicable), and any other comments the respondents felt may be applicable. These questions and their respective responses will be discussed in the following subsections.

5.4.1 DISPUTE TYPE

Question sixteen asked respondents to give a brief description of the subject matter in dispute. As these responses were free text and difficult to analyze through statistical methods, the author categorized the description of the disputes based upon the primary dispute cause framework developed by Kilian (2003) as best as possible. The definitions for these cause/type categorization can be found in Appendix N. The primary causes included interpretation of contracts, delays, disputes, performance, modifications, site conditions, quality, default, and liquidated damages. Figure 5.12 shows a Pareto chart for the dispute types for this study.

Of the 41 responses from this study's sample, the two most prevalent disputes types were based upon either quality or default issues. The third most prevalent subject matter was a tie between modifications and delays. However, it is interesting to note that of the 41 responses that could be categorized based upon the information given, there is no definitive answer as to what is the primary cause of disputes. This theme is repeated in the qualitative case study interviews presented in the next chapter.

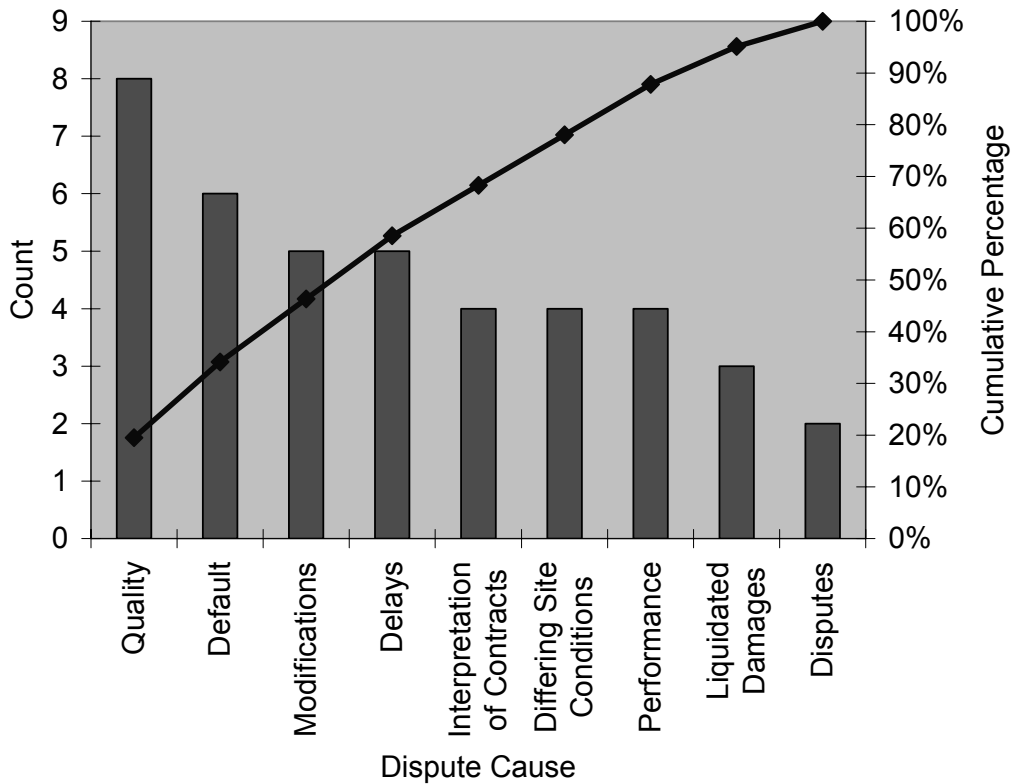


Figure 5.12: Causes/Types of Dispute based upon Dispute Description (n=41)

5.4.2 PARTIES IN DISPUTE

Question seventeen asked respondents to identify the parties involved in the dispute for the project being described. Of the 48 sample projects where responses were given, the total number of parties (from both sides) included 43 general contractors, 40 owners, 23 subcontractors, 16 architects, seven bonding companies, and two others (vendors). That totals 131 parties involved in dispute and a mean of 2.7 parties per dispute. Since the party's side of the dispute was not directly related to the party for which the transactional dispute resolution cost information was collected, it is difficult to make inferences about how all the parties involved affected the time and costs necessary to resolve the project disputes.

5.4.3 PERCEIVED DISPUTE COMPLEXITY

Question eighteen asked respondents to identify the perceived complexity of the dispute in question. The options for selection included simple, moderately simple, average/normal, moderately complex, and complex. Of the 47 responses to question eighteen, the majority of projects were identified as being average or normal. No projects were identified as having simple disputes and equal amounts (21 percent each) claimed to have complex or moderately complex disputes. Figure 5.13 shows a pie chart of the breakdown of the perceived dispute complexity for the collected sample.

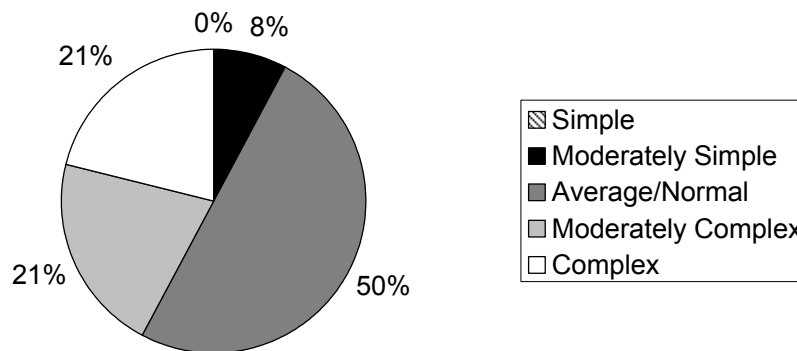


Figure 5.13: Perceived Dispute Complexity (n=47)

Examining the graph above, one can identify two trends. First, no disputes were perceived to be simple. This observation lends one to believe that if a dispute had been simple in nature then it would be resolved easily and quickly. Second, the overwhelming sentiment that the perceived complexity of the dispute was average or normal would lead one to believe that the subject matter in dispute is most likely a subject matter that has been dealt with previously. Despite the average complexity of these disputes, they still remain protracted and difficult to resolve. Statistical analysis of the impact of perceived complexity on the transactional costs of dispute resolution will be covered later within this chapter; however, the lesson learned from the data uncovered by this question is that disputes do not necessarily have to be complex to be difficult to resolve.

5.4.4 ADR METHODS ATTEMPTED PRIOR TO FINAL SETTLEMENT

Question nineteen asked respondents to identify which ADR methods had been attempted prior to reaching final settlement. Possible answers to this question include the following check-ins for all that apply: mediation, arbitration, mini-trial, litigation, dispute review board, negotiation, and an “others” category. Figure 5.14 shows a histogram of the ADR methods attempted prior to settlement.

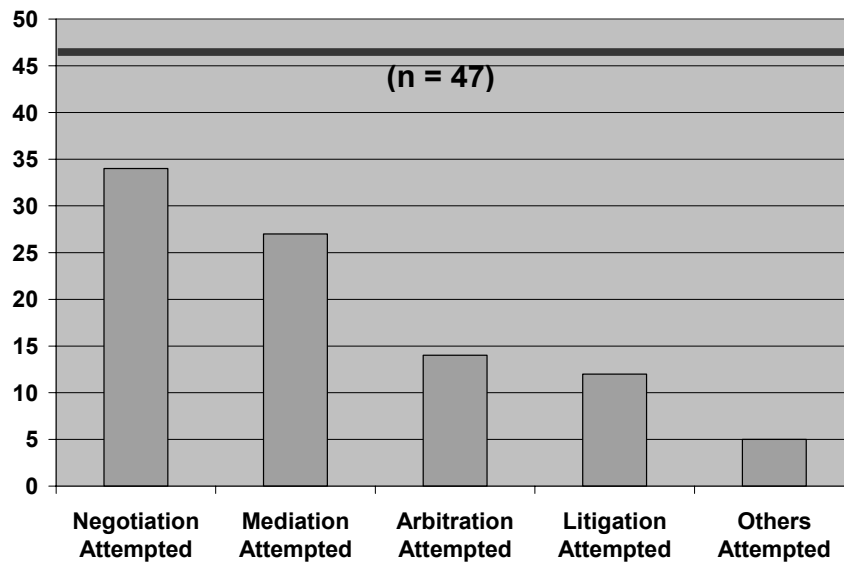


Figure 5.14: Frequency of ADR Methods Attempted Prior to Settlement (n = 47)

The most utilized ADR method was negotiation for which 72 percent of the respondents stated that they had attempted negotiation prior to reaching final settlement. Mediation was the second most utilized ADR method with 57 percent of the dispute attempting a mediation session prior to final settlement. Arbitration, litigation, and other ADR methods were utilized less of the time, 30 percent, 26 percent, and eleven percent of the time respectively. Although only one data point was collected where the final dispute resolution method was litigation, it is interesting to note that litigation was attempted in twelve of the 47 project disputes. Likewise, arbitration was at least attempted in fourteen

of the 47 project disputes. This is an important observation as the cost for some final ADR methods may be higher as more protracted and more costly measures may have been simultaneously pursued. Unfortunately, there is not enough data to test if prior attempted ADR methods are a covariate with the final ADR method when examining its effects on the cost and time necessary to resolve a construction dispute.

5.4.5 FINAL SETTLEMENT METHOD

Question twenty asked respondents to identify the ADR method that achieved final settlement. The possible answers for this question included mediation, arbitration, negotiation, litigation, dispute review boards, mini-trials, and other (to be input by the respondent). No data was collected for mini-trials and only one project was received for both DRB and litigation. Figure 5.15 shows a pie chart for the various ADR methods for final resolution; however, the statistical analyses of the impact of the final settlement method on both the cost and time to resolution will be covered later in this chapter

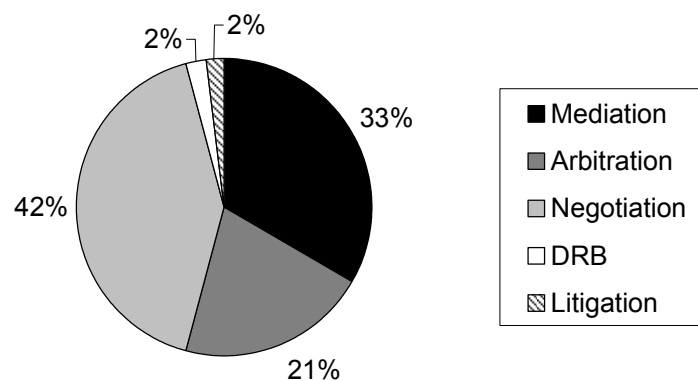


Figure 5.15: Final Settlement Method (n=48)

5.4.6 TOTAL CLAIM AMOUNT

Question 21 asked respondents to identify the total claim amount for the project dispute in question. For this study, total claim amount was defined as the total amount claimed by the party who initiated the claim (the plaintiff). A total of 48 responses were

collected for question 21. The total sum of all claim amounts was approximately \$553 million USD. The mean claim amount was \$11.5 million USD and the median claim amount was just over \$1 million USD. The large difference between the mean and the median amount indicate that the total claim amount in the sample was skewed towards larger disputes. However, this skew is in line with the skew of the overall contract values towards larger projects. The total claim amount was used in most measures of transactional cost impact, and as such, was not addressed by separate statistical analyses. The next subsection discusses the presence of a related topic, the total counterclaim amount.

5.4.7 TOTAL COUNTERCLAIM AMOUNT

Question 22 asked respondents to identify, if applicable, the total counterclaim amount for the project dispute in question. For this study, total counterclaim amount was defined as the total amount claimed by the party who did not initiate the claim (the defendant). A total of 45 responses were collected this question. Of the 45 responses, 15 were indicated that there was no counterclaim (zero dollars). While a counterclaim can be used as positional bargaining tool, it is important to examine the counterclaim amounts in relation to the original claim amounts to see how disparate the assessments of the subject matter in dispute truly may be.

The total sum of all counterclaim amounts was approximately \$659 million USD. The mean counterclaim size was \$14.7 million USD and the median counterclaim was \$68,000 USD. If the zero values were removed from the dataset, the new mean and median values would be approximately \$22 million USD and \$850,000 USD, respectively. It is interesting to note that the overall counterclaim value was approximately 20 percent higher than the overall claim value, but the total number of projects actually reporting a counterclaim was 38 percent fewer. This disparity indicates

that either the initiating party was not the real loss sufferer or the counterclaim amount was unduly inflated to create positional bargaining power.

5.4.8 TRANSACTION COSTS

Question 23 is the core effort to capture transactional costs of dispute resolution efforts within the construction industry. This subsection and its associated parts will examine each component of transactional costs as collected in this study. The six parts of question 23 include: identification of whom the transactional costs are for, the outside counsel fees, the allocation of in-house counsel salary and benefits, the outside consultant and expert witness costs, the management and staff salary and benefits allocated to support the dispute resolution efforts, the filing fees/arbitration fees/court fees, and other transactional costs not covered.

5.4.8.1 Transactional Costs Collected from Whom

Question 23-A asks respondents to identify for whom the transactional costs identified in this survey were accounted by. The general selections for response included: contractor, owner, subcontractor, or other. Figure 5.16 depicts the pie chart for the parties from whom the transactional costs were collected.

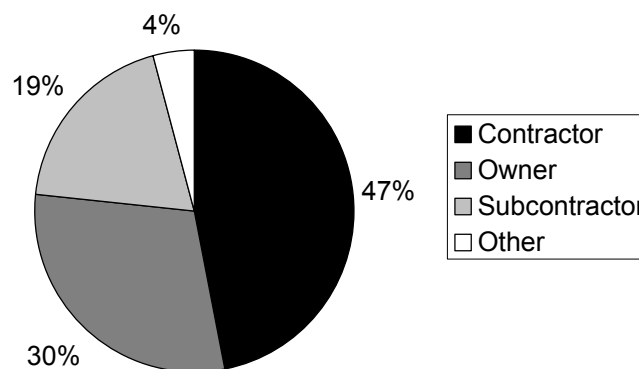


Figure 5.16: Transactional Costs Collected from Whom (n=47)

Of the 47 respondents to this question, 30 percent of the costs collected were from owner organizations while contractor and subcontractor organizations accounted for 47 percent and 19 percent respectively. The remaining four percent in the other category were from a designer and an equipment vendor company. It is important to understand that the figures presented within this research account for approximately one-half of the true overall transactional costs for a dispute as the data collected was from only one party. The true total figure for money spent on transactional costs of dispute resolution may be slightly higher or slightly lower depending on both the number and type of parties involved in the dispute.

5.4.8.2 CLAIMAINT VS NON-CLAIMAINT

One characteristic of the data that was not specifically collected, but can be extrapolated from the dataset is the difference in mean transactional costs expended for parties who bring a claim versus those parties who are respondents to a claim. Thus, based upon the data, the questionnaires' comments sections, and the author's knowledge of the projects, each dispute was divided into one of two groups – claimants or non-claimants. An ANOVA test, with an alpha of 0.10, was conducted on the mean transactional costs divided by the original claim amount versus the party's claimant/non-claimant status. The null hypothesis was established to be the means transactional cost ratios are equal. The results of the ANOVA test indicate that there is not a significant difference in transactional cost ratios between claimants and non-claimants (see Appendix O for full analyses).

One would logically think that claimants should have higher transactional costs than non-claimants, as parties who bring a claim for extra compensation must bare the burden of proof. However, these data counter that common held belief. Some explanations for this difference could include the types of claims being raised (document

intensive versus more conceptual/abstract claims), the owner-type of the project, and the relative bargaining power of each party involved. Future studies should attempt to collect more information on the differences in expended transactional resolution costs for both claimants and respondents.

5.4.8.3 Outside Counsel Costs

Question 23-B asked respondents to identify how much money was spent on outside counsel fees to resolve the dispute. Of the 43 responses to this question, the total sum spent was approximately \$23.5 million USD. The mean value was \$544,296 and the median value was \$70,000. The difference between the mean and median value would indicate that the data collected within this sample is skewed towards disputes with larger legal fees.

In addition to asking for the actual expenses for outside counsel, respondents were also asked to identify how confident they were in the numbers they reported. The possible responses to this question included: do not know (value = 1), wild guess (value = 2), rough estimate (value = 3), careful estimate (value = 4), definitively known (value = 5), and not applicable (value = N/A). Of the 44 responses to this confidence question, the mean value was 3.6. This value indicates that many of the respondents were estimating the outside counsel fees as opposed to utilizing the actual billings submitted.

5.4.8.4 In-house Counsel Salary and Benefits

Question 23-C asked respondents to identify how much money was spent on outside counsel fees to resolve the dispute. Of the 43 responses to this question, the total sum spent was approximately \$2.1 million USD. The mean value was \$49,116 and the median value was zero dollars. The median value of zero for this question indicates that most respondents either did not use an in-house counsel for this dispute or did not have in-house counsel within the organization.

In addition to asking for the costs associated with in-house counsel, respondents were also asked to identify how confident they were in the numbers they reported. The possible responses to this question included: don't know (value = 1), wild guess (value = 2), rough estimate (value = 3), careful estimate (value = 4), definitively known (value = 5), and not applicable (value = N/A). Of the 42 responses to this confidence question, the mean value was 4.0. This value indicates that many of the most respondents were fairly well informed about the costs associated with in-house counsel; however, this higher confidence level more likely reflects the extent to which the in-house counsel salary and benefits were actually zero (because there was no in-house counsel costs) and thus definitively known.

5.4.8.5 Outside Consultant and Expert Witness Costs

Question 23-D asked respondents to identify how much money was spent on outside consultants and expert witness costs. Of the 44 responses to this question, the total sum spent was approximately \$4.5 million USD. The mean value was \$101,087 and the median value was \$6,000. The difference between the mean and median value would again indicate that the data collected within this sample is skewed towards disputes with larger outside consultant and expert witness costs.

In addition to asking for the actual expenses for consultants and expert witnesses, respondents were also asked to identify how confident they were in the numbers they reported. The possible responses to this question included: don't know (value = 1), wild guess (value = 2), rough estimate (value = 3), careful estimate (value = 4), definitively known (value = 5), and not applicable (value = N/A). Of the 44 responses to this confidence question, the mean value was 3.8. This value indicates that many of the respondents were estimating the outside counsel and expert witness costs; however, it

appears as if these costs are better known than the outside counsel costs presented above and the management and staff salary costs presented in the next section.

5.4.8.6 Management and Staff Salary Costs

Question 23-E asked respondents to identify how much money was spent on management and staff salary costs to support the dispute resolution efforts. Of the 43 responses to this question, the total sum spent was approximately \$6.3 million USD. The mean value was \$147,352 and the median value was \$20,000. The difference between the mean and median value would indicate that the data collected within this sample is skewed towards disputes with larger management and staff salary costs incurred to resolve the dispute.

In addition to asking for the actual costs expended on management and staff salary to support the dispute resolution efforts, respondents were also asked to identify how confident they were in the numbers they reported. The possible responses to this question included: don't know (value = 1), wild guess (value = 2), rough estimate (value = 3), careful estimate (value = 4), definitively known (value = 5), and not applicable (value = N/A). Of the 45 responses to this confidence question, the mean value was 3.0. This value indicates that the majority of respondents were making rough estimates of the actual costs associated with management and staff time needed to resolve a dispute. This response level is echoed in the information presented within Chapter 6.

5.4.8.7 Filing Fees, Arbitration/Mediation/Court Costs

Question 23-F asked respondents to identify how much money was spent on filing fees and arbitration/mediation/court costs. Of the 42 responses to this question, the total sum spent was approximately \$1.3 million USD. The mean value was \$31,237 and the median value was \$2,250. While the mean and median values for this question would indicate a skewed sample, the relative small amount of costs for filing fees and

arbitration/mediation/court costs indicates that this category is not a significant amount in the overall value of transactional dispute resolution costs.

In addition to asking for the actual expenses for filing fees and arbitration/mediation/court costs, respondents were also asked to identify how confident they were in the numbers they reported. The possible responses to this question included: don't know (value = 1), wild guess (value = 2), rough estimate (value = 3), careful estimate (value = 4), definitively known (value = 5), and not applicable (value = N/A). Of the 44 responses to this confidence question, the mean value was 3.68. This value indicates that many of the respondents were estimating the outside counsel and expert witness costs; however, it appears as if these costs are better known than the management and staff salary costs presented above. This higher confidence level could also signify the large proportion of zero value responses where the dispute resolution efforts did not include any filing fees or equivalent and thus the amount was definitely known.

5.4.8.8 Other Transactional Costs

Question 23-G asks respondents to identify how much money was spent in other transactional cost areas that were not included in the categories already identified. Of the 30 responses to this question, the total sum spent was approximately \$1.7 million USD. The mean value was \$56,295 and the median value was zero dollars. Some of the other cost areas indicated by the respondents included deposition transcripts, insurance deductibles, copying costs, and travel expenses. While the mean and median values for this question would indicate a skewed sample, the relative small amount of costs for filing fees and arbitration/mediation/court costs indicates that this category is not a significant amount in the overall value of transactional dispute resolution costs. In addition, the median value of zero indicates that the majority of respondents did not incur any additional transactional costs other than those identified in parts B through F.

5.4.8.9 Summary of Specific Transactional Cost Categories

The total of transactional costs for the 45 sample projects was in excess of \$39.3 million USD. Figure 5.17 details the breakout of each of the transactional cost areas as a percentage of the total. One should note that outside counsel fees account for over 62 percent of the entire transactional cost total and is larger than the next most costly subcategory by almost four times. The complete list of transactional costs, in hard dollar figures, in descending order of magnitude include: outside counsel fees, management and staff costs, consultant and expert witness costs, in-house counsel costs, court/mediation/arbitration costs, and other costs. These figures will be reexamined in Chapter 6 along with the estimates given by the interviewees during the qualitative portion of the study.

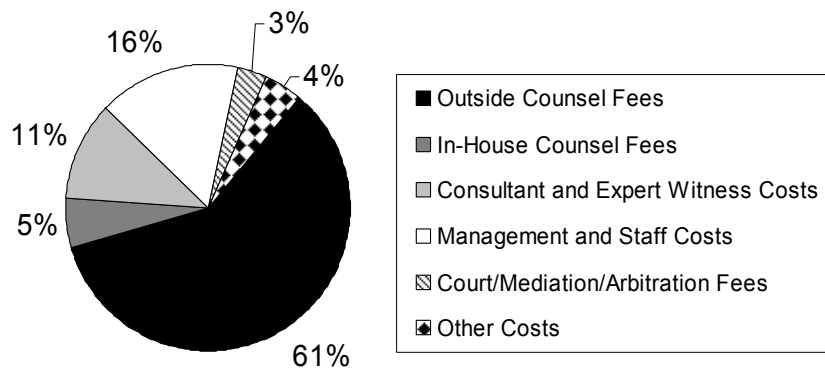


Figure 5.17: Overall Aggregate Dispute Resolution Transactional Cost Breakdown (n=45)

While Figure 5.17 depicts the overall aggregate transactional dispute resolution costs, it is also important to break out each dispute resolution method individually to see if there appears to be any noticeable differences in cost category expenditures. Figure 5.18, Figure 5.19, and Figure 5.20 illustrate the same transactional cost categories as above, but for negotiation, mediation, and arbitration, respectively.

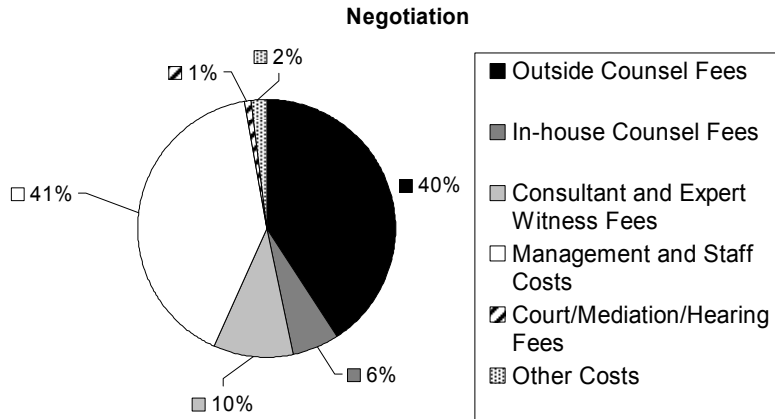


Figure 5.18: Negotiation Dispute Resolution Transactional Cost Breakdown (n=17)

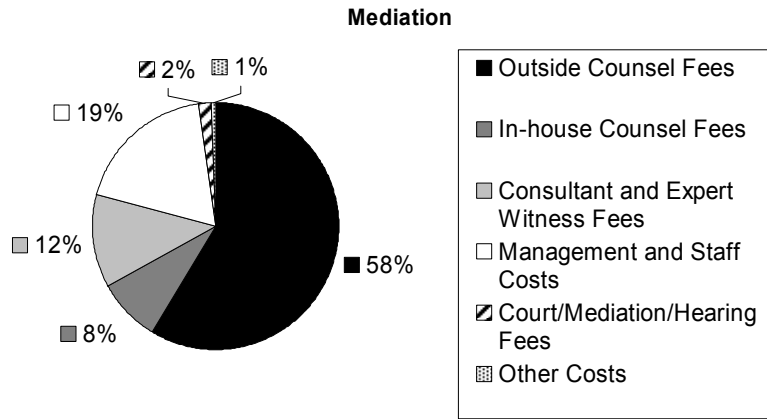


Figure 5.19: Mediation Dispute Resolution Transactional Cost Breakdown (n=15)

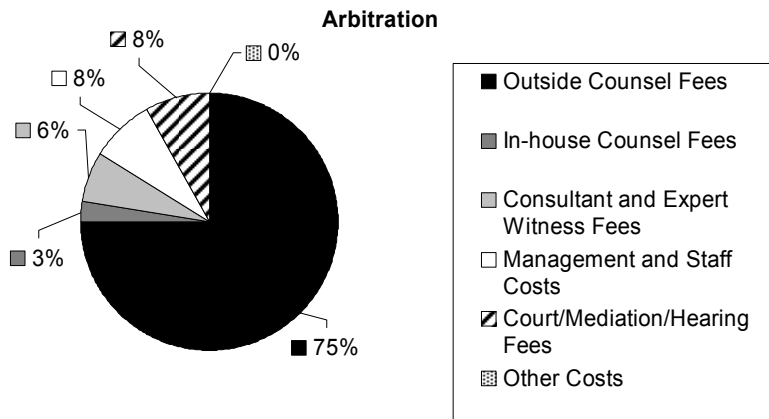


Figure 5.20: Arbitration Dispute Resolution Transactional Cost Breakdown (n=11)

It is easy to see how large the percentage of transactional costs outside counsel fees can become as ADR methods progress up the hostility hierarchy (see Figure 3.2). In fact, the industry critics who have deplored arbitration as a process that is becoming more and more like litigation may have some firm reasoning behind their arguments. According to this data set, 75 percent of all transactional costs are spent on outside counsel fees for arbitration, while only 58 percent and 40 percent were spent on mediation and negotiation, respectively.

Similarly, it is interesting to note the direct change in staff and management costs as a percentage of the overall transactional costs over the same ADR method hierarchy. While staff and management costs account for 41 percent of the costs in negotiation, only 19 percent and 8 percent were spent during mediation and arbitration, respectively. Both of these findings further the argument against protracted disputes as lawyer fees can rapidly grow as a dispute drags on and on, until those fees can dwarf all others costs.

5.4.9 DISPUTE SETTLEMENT INFORMATION

Question 24 asked respondents to identify the dispute settlement amount and to whom the amount was paid. The options for to whom the settlement was paid to included owner, contractor, subcontractor, and other (as identified by the respondent) organizations. Of the 46 responses to question 24, the majority of settlements were awarded to contractors (54 percent) while the remaining balance was fairly evenly split between owners, subcontractors, and others (15 percent, 20 percent, and 11 percent respectively). Figure 5.21 shows a pie chart of the breakdown of the party to whom the settlement was awarded or granted. While not directly related to whom the transactional cost data were collected from, it is interesting to note that breakdown between the different parties for both settlement recipients (Figure 5.21) and survey respondents

(Figure 5.16) was similar for all groups except for owners. In this data sample, owners provided 30 percent of study data, but only received a settlement 15 percent of the time.

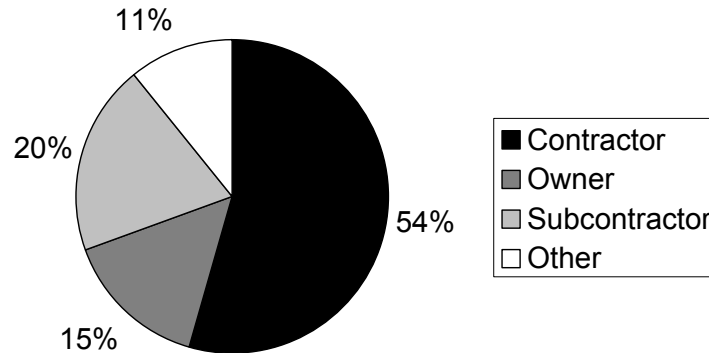


Figure 5.21: Settlement Paid to Whom (n=46)

Of the 46 responses to the settlement amount, the total value was approximately \$377 million USD. The mean and median values were \$8.1 million USD and \$300,000 USD respectively. The mean and median values are very distant indicating that the data collected in this research is skewed towards projects with very large settlements.

5.5 Other Data Analyses

This section extends the analyses presented in the previous sections by directly examining measures directly related to the hypotheses presented in Chapter 1. These hypotheses include: the cost and time necessary to resolve a construction dispute are significantly and positively affected by the application and timing of varying alternative dispute resolution techniques, the transactional costs of construction disputes are significantly affected by the role the parties play in the dispute, and the transactional costs of construction disputes are significantly and positively affected by the perceived complexity of the issue in dispute.

Prior to examining these hypotheses, the complete dataset was reevaluated based on missing, incomplete, and unusable data. In addition, outliers within the sample data

set (e.g., a project with a contract value of over \$5 billion USD, dispute resolved through litigation, or dispute resolved through dispute review board) were removed. In the end, 16 records were removed from the overall data collected. From the 46 usable records, Table 5.6 shows a listing of the basic summary measures for the sample. An important condition of the sample data set is that the transactional costs listed are only those collected in “hard dollar” figures. Monetary estimates of injured business relationships, tarnished reputations, and other more difficult or qualitative issues are not included. These items are addressed in separate case studies analyses presented in Chapter 6.

Table 5.6: Descriptive Statistics of Transactional Cost Study Project Data

n=46	Total	Mean	Median	Standard Deviation (σ)
Contract Values in Dispute	\$ 2,079,350,072	\$ 45,203,262	\$ 7,750,000	\$ 81,771,464
Claims and Counter Claims	\$ 605,999,426	\$ 13,173,901	\$ 1,050,000	\$ 35,235,842
Transactional Costs	\$ 35,070,399	\$ 762,400	\$ 95,500	\$ 1,343,409
Settlements/Awards	\$ 227,581,416	\$ 4,947,422	\$ 287,500	\$ 13,550,094

From this data set, over \$35 million USD were observed in transactional costs to resolve disputes once the resolution responsibility left the project team. Looking at the aggregate data (the sum total of all the costs), that equates to 15 percent of the settlements/award amounts, 6 percent of the original claims, and almost 2 percent of the entire contract amount expended on transactional costs. These figures take into account only “half” of the conflict resolution efforts as data were collected only from one party. Table 5.7 show a more detailed analysis of these figures by looking at the mean, median, and range numbers for these same measurements.

Table 5.7: Transactional Costs as a Percent of Contract Amount, Original Claim, and Settlement/Award

Measurement	Mean	Median	Range		Aggregate
			Minimum	Maximum	
Transactional Cost / Contract Amount (n=46)	15%	2%	< 0.1%	429%	2%
Transactional Cost / Original Claim (n=46)	29%	12%	1%	197%	6%
Transactional Cost / (Settlement or Award Amount) (n=41)	78%	22%	1%	1140%	15%

In all three measures examined in Table 5.7 the mean value is much larger than the median value. This tendency indicates that the sample is skewed towards projects with larger transactional costs and not normally distributed. The range information is also very informative as it indicates that there is a wide range of possible costs that can be spent to resolve a dispute. One explanation as to why the maximum values are several orders of magnitude larger than the mean and median values is the inclusion of small project data. In this instance, project ID “Dispute 1045” had an original contract value of \$10,000 USD, but a claim of \$25,000 USD was filed. Even excluding this project, the maximum values described in Table 5.7 still regularly exceed the mean and median values by factors of eight to ten.

The aggregate values, which lie between the mean and median values, may help reveal a more realistic picture of the impact of disputes on the overall industry. This concept will be addressed more in Chapter 7.

5.5.1 EFFECTS OF ADR METHOD SELECTION ON COST

One of the main goals of studying the transactional costs of dispute resolution is to see if selecting different dispute resolution methods has a significant impact on the costs of resolution. Referring back to the dispute resolution continuum (Figure 3.2), the related costs and hostilities of dispute resolution efforts are assumed to escalate from

negotiation to mediation, and up through 3rd party imposed methods (i.e., arbitration and litigation).

Using an ANOVA to test for difference in means, a significance level of 0.10 was selected because of the exploratory nature of the research. The data were narrowed down to 44 projects with final methods of dispute resolution of negotiation, mediation, or arbitration. Table 5.8 shows the ANOVA summary with the null hypothesis being the means were equal (see Appendix O for full analysis). While the results were not found to be significant at the 10 percent alpha level, there are several other items of interest.

Table 5.8: ANOVA for Final Settlement Method vs. Total Transactional Costs

Groups	Count	Mean Transactional Costs	Variance	P-value
Arbitration	11	\$ 1,167,182	3.23 E+12	0.16
Mediation	15	\$ 1,212,433	3.14 E+12	
Negotiation	18	\$ 330,199	4.51 E+11	

First, the mean amount spent on mediation is almost identical to that spent on arbitration. The author, based upon follow-up interviews and further examination of the data, believes that this is due in large part to the situation in which many of the disputes were settled in mediation. Some were part of court-ordered mediation while others had gone through a prolonged document discovery and deposition phase before resolving their dispute in mediation. These added significant costs to the mediation process.

Additionally, an ANOVA examination on the difference on transactional costs expended between negotiation and the combination of the other two alternatives, mediation and arbitration, does reveal a statistically significant finding. Using a significance level of 0.10, the mean transactional costs for negotiation were approximately one-fourth the amount spent on the other two methods combined (see Appendix O for the full analysis). Table 5.9 shows the ANOVA summary for this statistical analysis with the null hypothesis being the means were equal.

Table 5.9: ANOVA for Negotiation vs. Other ADR Methods by Total Transactional Costs

Groups	Count	Mean Transactional Costs	Variance	P-value
Other ADR Methods	11	\$ 1,193,288	3.05 E+12	0.05
Negotiation	18	\$ 330,199	4.51 E+11	

Lastly, the differential between what mean transactional costs were expended through negotiation compared with those spent through mediation and arbitration were quite large. While one would expect negotiation transactional costs to be less than those for mediation or arbitration, an analysis of the size of disputes resolved gives an additional perspective. The median claim sizes were \$1.8 million USD, \$1.05 million USD, and \$250,000 USD for arbitration, mediation, and negotiation respectively. Figure 5.22 shows a box plot of the dispute amount and the final method of resolution chosen for the same 44 projects analyzed above. As one might expect, larger claims were settled by arbitration while smaller claims were settled through negotiation. However, it is interesting to note the range of dispute amounts resolved through mediation.

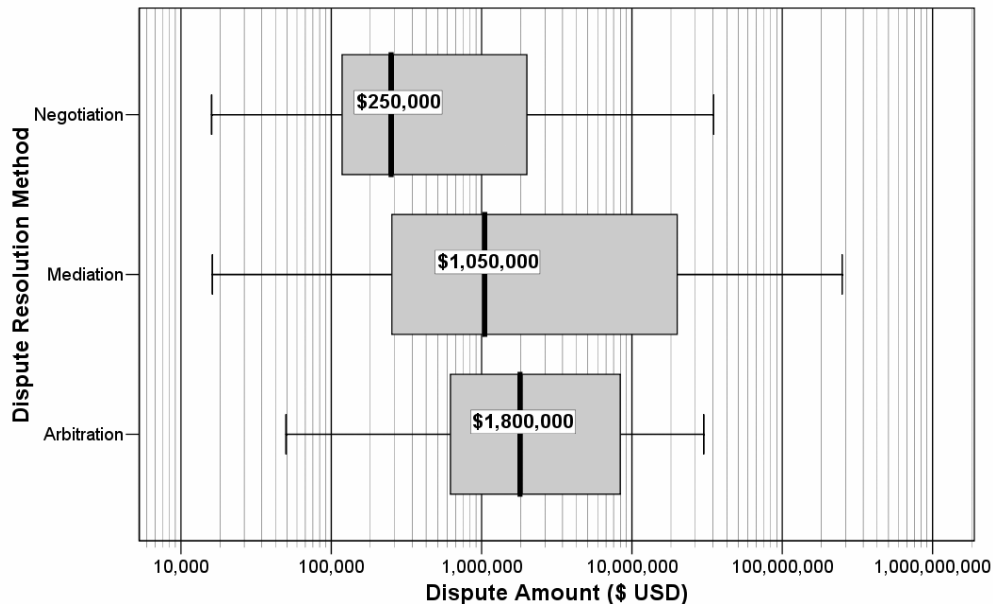


Figure 5.22: Box Plot of Dispute Amount vs. Final Dispute Resolution Method

5.5.2 EFFECTS OF ADR METHOD SELECTION ON LENGTH OF DISPUTE

The construction dispute literature often cites a reduction in the time it takes to resolve a dispute as a reason why practitioners should adopt various methods of ADR. While some processes, like mediation and arbitration, may be touted as a less complicated and less time consuming endeavor than litigation, little quantitative analysis has looked at the entire life-cycle of the dispute as a means for assessing the time to resolution. Rather, the actual physical time taken in a proceeding (i.e., mediation session, arbitration hearing, etc.) is used to identify time saving methods. As such, one of the hypotheses of this research was to examine the time impact various ADR methods may have on the length of a dispute.

Two methods for analyzing the length of a dispute were selected for this study. First, the time from project substantial completion date to final dispute resolution date was analyzed. These values were measured in days and could have positive or negative value, as some disputes were resolved prior to substantial completion. For this dataset, the median values were 151 days, 684 days, and 123 days for arbitration, mediation, and negotiation, respectively. Figure 5.23 shows the box plot for this first measure. In addition, an analysis of variance test with a 0.10 level of significance was conducted. The null hypothesis was set as the mean time of resolution being equal between the three ADR methods identified above, and the p-value was found to be 0.08, thus indicating a significant difference (see Appendix O for full analysis). Based upon post-hoc evaluations (using the Tamhane T2 post-hoc test, as the assumption of homogeneous variances was not met), a significant difference between the time to resolution for mediation and negotiation was found. The author, based upon comments from industry professionals, believes this to be a true as more and more mediation are following the track of litigation and thus creating longer delays until resolution can be reached.

Table 5.10: ANOVA Summary for Final ADR Method vs. Days from Substantial Completion to Dispute Resolution (Measure 1)

Groups	Count	Mean Days	Std. Dev.	P-Value
Negotiation	15	288	478	0.08
Mediation	14	727	515	
Arbitration	7	484	591	

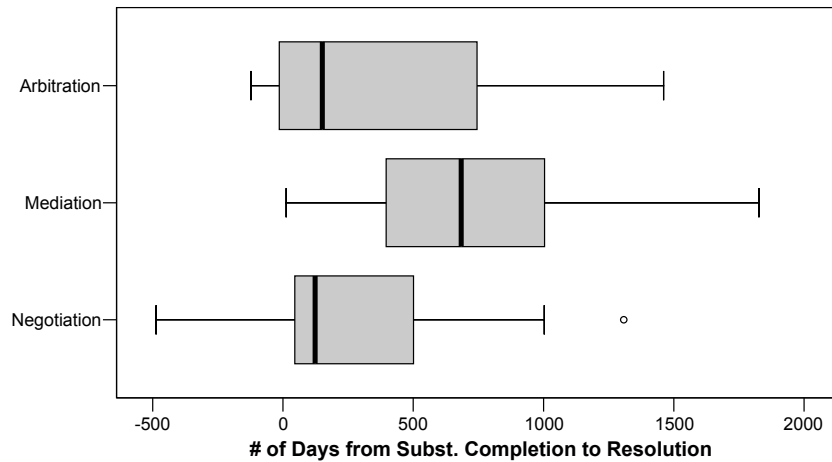


Figure 5.23: Box Plot of Final ADR Method vs. Days from Substantial Completion to Dispute Resolution (Measure 1)

The second measure used to analyze the effect of ADR method selection on dispute resolution time was that based upon the time from when the events that triggered the dispute first occurred to when the dispute was finally resolved. The date when the event that caused the dispute to occur was calculated by using the respondent's estimates of the percent the project was complete, the project start date, and the substantial completion date. Again, these measures were based upon days, however values could only be positive as a dispute could not be resolved prior to its inception. The range of time values for this measure was from 21 days to over 2119 days for the three ADR methods combined. The median values were 770 days, 970 days, and 329 days for arbitration, mediation, and negotiation, respectively. The box plots for these data are shown in Figure 5.24. In addition, an analysis of variance test with a 0.10 level of

significance was conducted. While the null hypothesis was set as the mean time of resolution being equal between the three ADR methods identified above, the data could not rule out the null hypothesis and thus no significant results could be found for this dataset. Table 5.11 summarizes the ANOVA results (see Appendix O for full analysis).

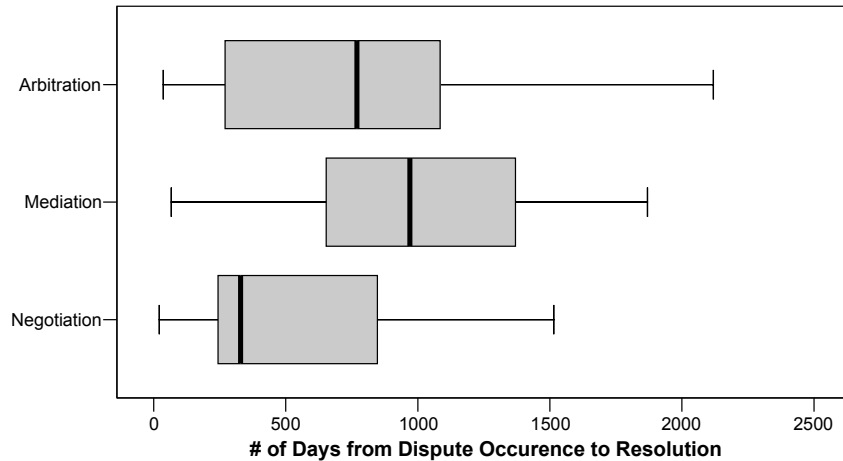


Figure 5.24: Box Plot of Final ADR Method vs. Days from Dispute First Occurrence to Dispute Resolution (Measure 2)

Table 5.11: ANOVA of Final ADR Method vs. Days from Dispute First Occurrence to Dispute Resolution (Measure 2)

Groups	Count	Mean Days	Std. Dev.	P-Value
Negotiation	15	582	481	0.14
Mediation	14	991	502	
Arbitration	7	805	713	

Based upon the analyses in both Table 5.10 and Table 5.11, it appears that negotiation is the most rapid dispute resolution method of the three alternatives. An ANOVA analysis on the difference in time to resolution for negotiation compared to the combination of the other two alternatives (arbitration and mediation) reveals that the difference is significant at the 0.10 level of significance for both measures (e.g., measure 1 or measure 2). Table 5.12 and Table 5.13 and summarize these analyses (see Appendix O for full analyses).

Table 5.12: ANOVA of Final ADR Method vs. Days to Resolution (Measure 1)

Groups	Count	Mean Days	Std. Dev.	P-Value
Negotiation	15	288	478	0.06
Other ADR Methods	21	625	546	

Table 5.13: ANOVA of Final ADR Method vs. Days to Resolution (Measure 2)

Groups	Count	Mean Days	Std. Dev.	P-Value
Negotiation	15	582	481	0.06
Other ADR Methods	21	929	570	

5.5.3 EFFECTS OF DISPUTING PARTY

When negotiating the resolution of a dispute, one of the factors that may play into a parties' decision whether to continue forward with increasing hostilities or deciding to settle is the cost to pursue the dispute further. In other words, will prolonging the dispute yield a better result than resolving the matter through the current settlement offer? While the answer to the question is sometimes irrelevant (e.g., when settling matters of law and not fact), most parties to a dispute will determine some sort of cost to benefit ratio. However, one thing that is rarely added into this calculation is the position of the other party at the table.

Utilizing contractor and owner responses, a statistical analysis was performed to see if there is a difference in the amount of money spent on transactional costs between these two parties. A significance level of 0.10 was selected and the null hypothesis was established, as the mean of the two parties' transactional costs divided by the original claim amount was equal. Table 5.14 shows the ANOVA summary for this statistical analysis (see Appendix O for full analysis).

Table 5.14: ANOVA Summary of Party Transactional Costs as a Percentage of Original Claim Value

Groups	Count	<u>Mean Transactional Costs</u> <u>Original Claim Value</u>	Variance	P-value
Owner	14	16 %	0.05	0.10
Contractor	20	39 %	0.22	

The difference between the means for the owner and contractor transactional costs divided by the original claim value was found to be statistically significant at an alpha of 10 percent. The mean value for the owner group was 16 percent while the contractor group was 39 percent; this is a difference of almost 2.5 times. That means for every dollar an owner spends in dispute a contractor will spend 2-1/2 times more, for this sample. To many practitioners this may not be a surprise; as contractors, frequently the claim initiators, have the burden of proof. It is also the contractor who must perform extensive research, analyses, and extra “legal” actions to prove they are owed compensation while owner organizations can wait to take action until the contractor has prepared adequate backup for the claim. Additionally, in the author’s opinion, it is the owner, especially public entities, who generally wield the “power of the purse string” and have the financial resources to stall dispute resolution efforts until it is in their advantage.

5.5.4 EFFECTS OF PERCEIVED DISPUTE COMPLEXITY

The last analysis presented within this chapter examines how a disputes perceived complexity affects the amount of money expended on transactional costs of resolution. One would think that the more complex a dispute is perceived to be, the more money would be expended in order to resolve it. Increased time, money, and resources would be expected for more complex disputes because of the very nature of gathering together more backup material, more project participants, and educating those people not familiar with the particulars of the dispute (company executives, lawyers, expert witnesses, etc.). While these data show that this is true (a mean of \$529,000 USD for average or less complex disputes and \$1,576,000 USD for disputes with greater than average complexity), this is misleading. Instead, Table 5.15 shows the ANOVA summary of the

total transactional costs divided by the original claim amount (see Appendix O for full analysis).

Table 5.15: ANOVA Summary for Dispute Complexity vs. Total Transactional Costs Divided by Original Claim Amount

Groups	Count	<u>Mean Transactional Costs</u> Original Claim Value	Variance	P-value
Average or Less Complexity	22	39 %	0.20	0.10
Greater than Average Complexity	13	17 %	0.05	

Constructing the null hypothesis to be the transactional cost difference between less complex and more complex disputes as zero, a single factor ANOVA test with a level of significance of 0.10 was conducted. What the author found was that the P-value was 0.10, indicating a significant difference between the means for more complex and less complex disputes when looking at the total transactional costs divided by the original claim amount. The mean percent of money expended on less complex disputes was 39 percent, while larger more complex disputes only spent 17 percent of the original claim on transactional costs.

Upon review of the data, it was also deemed necessary to evaluate the interaction between perceived dispute complexity and the original claim value. Using the median claim value as a cutoff (\$1.3 million USD), a two-way ANOVA of perceived complexity and original claim value was analyzed against the mean transactional cost divided by the original claim value. The alpha level was set at 0.1 and the null hypothesis was established as the mean being different. Table 5.16 reaffirms the findings above by showing that the only factor significant in this model is the complexity factor with a p-value of 0.10 while the claim value had a p-value of 0.32. Full statistical tabulations are in Appendix O.

Table 5.16: Two-way ANOVA Summary - Transactional Costs Divided by Original Claim Amount VS. Complexity and Claim Value (n = 35)

Groups	Sum of Squares	Degrees of Freedom	Means Square	F	P-value
Within Variation	4.69	31	0.15	--	--
Perceived Complexity	0.41	1	0.41	2.74	0.10
Claim Value	0.15	1	0.15	1.01	0.32
Interaction of Complexity and Claim Value	0.02	1	0.02	0.10	0.75

5.6 Anecdotal Transactional Cost Information

During the course of this study, the researcher encountered many instances of anecdotal stories or other commentaries. These other information sources range from partially complete quantitative questionnaires to email correspondence. This section will describe a few of these anecdotes.

5.6.1 THE COST OF EXPERT REPORTS

Two construction projects were submitted in the quantitative questionnaire that could not be included in the Chapter 5 analysis because the respondent was unable to complete all the transactional cost categories. However, the value of these anecdotes was too great to exclude from discussion. These two project disputes serve as an example for the potential costs that some expert reports may entail.

The first dispute was for a \$375 million USD contract that had a \$35 million USD claim. The expert report cost the client \$1.5 million USD, which equates to 4 percent of the claim and 0.4 percent of the total contract value. The final negotiated settlement for this dispute was \$30 million USD. The second dispute was for a \$150 million USD contract that had a \$10 million USD claim and a \$75 million USD counterclaim. The

expert report cost the client \$1.0 million USD, which equates to 10 percent of the claim and 0.7 percent of the entire contract value. The final arbitration award amount was \$10 million USD.

5.6.2 USE OF DISPUTE REVIEW BOARDS

At the outset of this study, it was anticipated that the full spectrum of dispute resolution options would be studied to identify which methods were most economical in time and money to resolve a construction dispute. Unfortunately, only three methods of ADR were collected in quantities large enough for statistical analysis. Section 3.2.5 discussed some of the statistics of the Dispute Review Board Foundation; the author did not want to omit entirely the one DRB-resolved dispute captured in this quantitative survey.

The first observation that was noteworthy from the DRB-resolved dispute was the fact that its settlement value exceeded its original claim amount by 25 percent. Only once did the settlement value exceed the original claim amount. In that particular case, attorney fees and consultant fees were also recovered. The fact that the DRB-resolved project dispute was able to settle for amount larger than the original claim value reinforces the evaluative strength and persuasive reasoning a DRB panel can have on the parties in dispute.

The second observation from the DRB-resolved dispute was that the transactional costs for resolution were only \$45,000 USD (\$5,000 USD for outside counsel, \$15,000 USD for in-house counsel, and \$25,000 USD for management and staff costs). The ratio of transactional costs divided by original claim amount works out to be approximately two percent (original claim amount equals \$2 million USD). This ratio is 1/10th the value of the mean and 1/6th the value of the median value of the entire sample. Thus, the savings in transactional costs is quite large when comparing to other dispute resolution

methods that may have forced resolution to be more protracted and to extend beyond the end of the project.

Lastly, it is interesting to note that the respondent for the DRB-resolved dispute wrote the following in the “other comments” section of the questionnaire, “Good client...finished on good terms.” In this instance, not only did the contractor recover an amount in excess of the original claim amount, but both the owner and the contractor finished the project on good terms. The anecdotes captured in this one data point provides some evidence that DRBs may be one of the most efficient and least antagonistic dispute resolution processes.

5.6.3 QUANTITATIVE DATA ANECDOTES COLLECTED IN CASE STUDY ANALYSES

One purpose of collecting data through both quantitative and qualitative methods is to gain an insight into the problem area in a way that would not be possible through only a single data collection process. In this study, four of the six case studies presented in Chapter 6 are from individuals who also contributed data to the quantitative survey database discussed in this chapter. This subsection will highlight two of the items found to be of interest from these project overlaps.

First, the four overlapping projects included interviews with two lawyers and two contractors who presented cases from both the owner’s (one case) and the contractor’s (three cases) point of view. In all cases, the respondents stressed the concept that lawyers should not play a leading role in dispute resolution efforts. While in each of the four cases, legal counsel was utilized, the emphasis of these respondents was that all possible efforts to resolve the dispute at the job site level should be exhausted before elevating the disputed matter to an attorney.

Secondly, the four overlapping projects were resolved through negotiation (three projects) and litigation (one project). In the three negotiated settlements, all parties

decided not to pursue further action because any potential future financial gains did not justify the additional cost and time necessary to protract the dispute. In the litigation case, the dispute involved a governmental agency who was required to pursue litigation as opposed to arbitration or another ADR method excluding negotiation. In the end, the governmental agency, for whom the data was reported, won the case filed against them.

Lastly, an unanticipated procedural uncertainty was uncovered when analyzing projects both through the quantitative and qualitative portions of this study. The author believes that individualized decision processes and thought patterns affect each dispute resolution process differently. In addition, the manner in which conflict is resolved and hostilities addressed is as much a function of the people involved as it is many other factors including contract language, economic cycles, possibilities of future work, and more. Thus, it is virtually impossible to understand why one dispute may incur more transactional costs than another given similar fact patterns. However, the more detailed that an analysis can be performed; the more understanding can be reached about the costs involved in resolving a specific dispute.

5.7 Summary

While these data are only exploratory in nature, it is an important first step to collecting quantitative data in the area of dispute resolution. Quantitative data is the key to true process improvement. As with continuous quality improvement efforts in other areas of business operations, a process must be measured before it can be improved.

This chapter has examined and analyzed the data collected through the quantitative questionnaire portion of this study. From these analyses, it can be shown, at least for this dataset, that the ADR method selected does not have a statistically significant impact on the cost and time necessary to resolve a dispute. However, what

this chapter does reveal, at least for this dataset, is that the both the perceived complexity of the dispute and the party involved in the dispute significantly affect the transactional cost necessary to resolve a dispute. The next chapter will further explore the non-quantifiable issues related to dispute resolution decision making.

While the sheer volume of transactional costs is staggering, it is important to note that this data set only consists of projects where disputes occurred. While the estimate of how frequently disputes (claims that rise beyond the project team level) occur has never been widely published, the author estimates, based upon experience and anecdotal information, this range to be between 10 percent and 30 percent of all construction projects. Thus when considering the construction industry accounts for almost \$1.1 trillion USD of the U.S. economy each year (U. S. Census Bureau 2005), the money spent on transactional costs for dispute resolution may total \$4 to \$12 billion USD or more each year. This is in the same range as that predicted by Michel (1998), whose estimate, adjusted for inflation, would total approximately \$11 billion USD.

Understanding the scope of the effects of transactional costs on the entire industry is just one level of assessing the data. Understanding how the relationship between the final method of resolution, the disputing party, and the perceived dispute complexity interacts with transactional costs, may help industry practitioners (especially those responsible for contract drafting and/or dispute resolution) make better decisions about preventing and resolving conflict.

CHAPTER 6 QUALITATIVE DATA FINDINGS

While the title of this dissertation asserts that transactional costs of dispute resolution efforts will be quantified, there are some costs that are virtually impossible to quantify in hard dollar costs. To address these issues, non-quantifiable issues were explored using personal interviews. The purpose of the semi-structured personal interviews was to isolate and capture transactional cost issues that could not be conveyed through the quantitative surveys that were presented in Chapter 5. In addition, the interviews permitted the researcher to look behind the numbers associated with dispute resolution efforts to see what thought processes individual decision makers go through when resolving a construction dispute. This chapter outlines the structure of the qualitative portion of this study and discusses common themes found throughout all of the interview sessions.

6.1 Selection of Interviewees

Six semi-structured interviews were conducted for the qualitative data portion of this study. Interviewees were selected because of their background and experience in the construction industry and were equally distributed between owner, contractor, and legal organizations. Interviewees were not randomly selected, but were a convenience sample of both local and national organizations who work with or in the construction industry on a continuous basis. As the small number of interviewees did not permit statistical analysis, interviews were reviewed and condensed to identify common themes, thought processes, and practices to understand how transactional costs fully affect dispute resolution efforts. Table 6.1 summarizes the project background of the six projects discussed as part of the qualitative portion of this study.

Table 6.1: Background Information of Qualitative Projects

Measure	Contract Amount	Original Claim Amount	Total Transactional Costs	Final Dispute Resolution Methods
Total	\$8,866,000	\$783,000	\$333,335	Litigation (1) Negotiation (5)
Mean	\$1,477,667	\$130,500	\$55,556	
Maximum	\$3,800,000	\$250,000	\$151,335	
Minimum	\$58,000	\$35,000	\$12,500	

6.2 Questionnaire Structure

A semi-structured interview format was selected because it follows a sequence of topics with suggested questions, but allows for rearrangement and additional questioning if necessary (Kvale 1996). Furthermore, the semi-structured interview structure allows the interviewees the freedom to relate personal experiences into their responses adding richness to the collected data.

The five areas selected for the semi-structured interviews included: general dispute questions, alternative dispute resolution, dispute impacts on projects, dispute preventions and minimization techniques, and transactional costs. The following section and associated subsections will discuss the common themes found throughout the interviews. A copy of the interview guide sheet can be found in Appendix F.

6.3 Findings

While completing the template interview analysis, a total of 25 codes were generated for the interview transcripts. These 25 codes were later combined and grouped into five logical categories. These five categories include: 1) other costs of disputes, 2)

current quantification techniques for dispute resolution costs, 3) methods to prevent/minimize disputes, 4) familiarity and usage of ADR options, and 5) the role of lawyers in the construction industry. The following subsections will describe each of these areas.

6.3.1 OTHER COSTS OF DISPUTES

One of the primary goals of the qualitative interviews was to inquire about hidden and/or unquantifiable costs related to dispute resolution efforts in the construction industry. Owners, contractors, and attorneys alike all stressed the importance of these types of issues when making decisions about resolving disputes. The most prevalent comments concerned how disputes can affect both the morale on the project and the personal lives of the people involved in the dispute; however, business relationships, loss of company focus/momentum, and loss of business volume were also mentioned frequently. This section will summarize and highlight the comments pertaining to these less quantifiable effects of dispute resolution.

As stated, the most frequent response to inquires about dispute resolution costs outside of the five areas addressed in the quantitative study (outside legal fees, in-house lawyer salary and benefits, expert witnesses/consultants, management/staff salary and benefits, and filing fees/court costs) was the emotional costs associated with the presence of a dispute. These costs were noted to affect not only the people at the job site but also throughout the company. One contractor stated, “These types of disputes affect people’s personal lives. They affect your sleep; they affect your family relationships. So, it is a pretty widespread problem when you have a significant dispute that reaches out to a lot more people than just the ones that are at the job.” These sentiments were closely echoed by one of the attorneys interviewed,

There is a lot of emotional energy that goes into it, especially when you get your pride wrapped up into it. You are going to get angry and upset about it and you are going to want to work on it all the time and you are going to lose sleep, and wake up in the middle of the night about it. So that is an impact that a lot of people don't recognize at the time. Even when it is pointed out to them, they kind of dismiss it. But, if you have a trial coming up in three months, you are going to be thinking about that and that is going to be an emotional drain on you.

In addition to the emotional costs, business relationships were also a recurring theme throughout the interviews. The concern about business relationships centered on business reputations and future work. From the owner's perspective, trust seemed to be the main factor for maintaining positive business relationships. On the other hand, contractors stressed the deleterious effects of garnering a reputation as a company who actively seeks out claims and disputes. A negative reputation in regards to dispute occurrences was identified as one major reason why future work may be jeopardized. Mention of debarment from government projects and the effects of matrix-style competitive bid evaluations were also identified as reasons why companies try to avoid being characterized as a dispute-prone organization. One contractor even ventured to say, "There are people that we will not do business with, even if they are friends, because of disputes."

Many interviewees discussed the interruptions and loss of focus disputes cause throughout all levels of the organization. Some pointed to the field level employees going out of their way to look for errors or mistakes by the other party to defend or offset allegations by other parties. One contractor stated, "... the relationships begin to deteriorate. The morale of not only the contractor's people but also the owner's people begins to deteriorate. So then, everybody starts looking for other reasons to be unhappy and pretty soon ... it is a cancer that spreads pretty quickly."

Others mentioned the significant amount of time required of company executives to resolve disputes. The importance of obtaining new work and moving onto the next project was frequently identified as something that could not be accomplished while a dispute was present. One attorney stated,

[Disputes] take away from the focus of the company. A company is set-up to go out and do work. Get work. Complete work and get paid. And, when you have the president of the company, the comptroller, whoever, or project manager screwing around with the dispute, that is going to take away time from when they could be doing something else.

Overburdening of staff is also a serious concern when it comes to protracted project disputes. Project managers are forced to manage dispute resolution efforts on top of their ongoing project duties. Estimators and engineers are asked to come back and review original designs and estimates when they could be working on new or upcoming projects. As a result of this back and forth push and pull from ongoing work and old disputes, many individuals become discouraged. One interviewee summed it up by saying, "... you are liable to lose good individuals out of their frustration with you and out of your frustration with them."

Finally, business volume of all companies seems to decline as conflict protracts and evolves into lengthy disputes. On the contractor's side, bonding capacity and cash flows are major issues that can affect how much new work can be started. On the owner's side, new business opportunities and marketplace entry are issues that are all affected as disputes consume valuable time and resources. "That is all lost business opportunity. They are hard to quantify, but you are putting all your money into fighting a fire and not out chasing new business," said one contractor.

6.3.2 CURRENT QUANTIFICATION TECHNIQUES FOR DISPUTES

One of the underlying assumptions of this study was that survey respondents would have quantitative data available to them to complete the quantitative questionnaire described in Chapter 5. In addition, it was assumed that careful estimates of actual costs could be made by project executives when data were not readily available. To verify whether these assumptions are accurate, the qualitative interviews asked representatives from owner, contractor, and law offices how they measured the cost impacts of dispute resolution efforts. While no clear-cut, universal system for capturing dispute resolution costs were conveyed, most organizations relied on after-the-fact cost accounting systems with designated cost codes for issues that may lead to or already part of a dispute.

Both lawyer and contractor representatives stated that it was a good idea to keep track of field office staff time when dealing with a dispute. Timesheets, whether used as a measure of compensation or not, appeared to serve multiple purposes including negotiation points, change order backup, and justification for increased project management and/or supervision. However, several of the interviewees remarked how difficult it was to ensure that these cost-coding systems were being used correctly and timely. One contractor declared, “It is an ongoing deal, I mean training people to recognize what is the scope of our work. It is that point, when we leave our scope of work that we try to train people to request a phase to isolate the costs that could go into that. It could end up being a cost that we should have born, and we may never collect. It is at least available that way.”

Owner organizations were less likely to collect, measure, or quantify the impacts of disputes on projects. While the respondents in this category seemed to agree that cost control measures were taken to document the hard dollar costs of changes, they did not monitor the other, more transactional costs. Nevertheless, the evaluations of relative

magnitude between the varying transactional cost categories were quite similar between all parties. Table 6.2 shows the responses from all six interviewees when asked to rank order the five categories of transactional costs collected in the quantitative survey. The top three most significant responses, based upon mean value, were outside counsel fees, management and staff salary, and outside consultant/expert witness costs. It is interesting to compare these values to those presented in Figure 5.17. While both the quantitative and qualitative portions equally identified the largest three areas of transactional costs, there appears to be a disparity between the perceived magnitudes of these differences.

It is interesting to note (through the examination of section 5.4.8.9 and Table 6.2) that while people instinctively feel that staff and management costs are a considerable portion of the total transactional dispute resolution costs, it is hard to rectify those thoughts with actual quantitative data. The only explanations for this disparity can be either industry professionals overestimate the importance of management and staff costs or there is a severe problem in accurately collecting these data.

Table 6.2: Interviewee Perception of Transactional Cost Category Magnitude

Cost Types	Contractor 1	Contractor 2	Lawyer 1	Lawyer 2	Owner 1	Owner 2	Avg.
Outside Counsel Fees	1	2	1	2	3	1	1.7
In-house Counsel Salary and Benefits	4	4	5	5	4	5	4.5
Outside Consultant Fees and Expert Witness Costs	2	3	2.5	3	2	3	2.6
Management and Staff Salary to Support Dispute Resolution Effort	3	1	4	1	1	2	1.8
Filing Fees, Arbitration / Mediation / Court Fees, etc.	5	5	2.5	4	5	4	4.3
1 = Most Significant Cost to 5 = Least Significant Cost							

6.3.3 METHODS TO PREVENT/MINIMIZE DISPUTES

One of the objectives outlined in Chapter 1 was to recognize successful methods to reduce construction disputes and their costs. While the quantitative survey in Chapter 5 identified the scope of costs associated with dispute resolution efforts, the process of recognizing effective methods of reducing disputes and their costs must also involve some non-quantitative aspects. During the qualitative interviews, owners, contractors, and attorneys were asked what their observations and experiences were with respect to successful methods of dispute minimization and prevention. Almost universally, the interviewees responded communication.

The importance of communication was stressed throughout the construction process. Whether it was for reviewing the contract, defining scope, managing changes, or resolving a dispute, all interviewees mentioned communication skills as one of the most important dispute prevention and minimization tools. In fact, three of the six interviewees stated that early, consistent, and respectful communication was a “key” dispute preventing strategy. One attorney stated, “... 95 percent of the projects that I see are a result of a failure of communication. I just think it is as simple as that. They are failures of communication.” The way in which communication is conducted is also important. More than one of the interviewees commented that when problems arise, project personnel must be able to take a step back and work on solutions rather than point fingers of blame.

Project managers were frequently identified as the key project participant where these communication skills should reside. One owner stated, “I think there is absolutely no substitution for good project management. And when I say good project management, I mean having a good, experienced project manager who is not afraid to say no. Or more importantly, who is not afraid to say no nicely.” The contractor interviewees also

concentrated on the importance of good project management. One contractor mentioned they spent a significant amount training time on documentation and procedures. Another contractor focused on double checking critical problems identified in past disputes (e.g., waterproofing, moisture protection details, etc.).

The second common factor that was repeated through many of the interviews was the necessity to review thoroughly the contract documents early in the project. Some mentioned a line-by-line reading of the contract between the two parties at a kick-off meeting, while others recommended a detailed scope review meeting to catch potential items of conflict. One attorney stressed, “If I was to label the most important issue, the scope issue is issue number one.” Concentrating on developing good project scopes and good subcontractor scopes, depending on perspective, helps alleviate many problems before they can even become construction issues. In addition to the scope review, another key procedure is to follow carefully through on is basic document management. One attorney stressed,

Well, the first thing goes back to the blocking and tackling of the contracts. Make sure that the contract identifies the parties, all the attachments are attached, and everything is executed. In theory, if you went to both parties contract file, the documents would look exactly the same and both parties would agree, “Yes, that is it.” That way we don't waste time fighting over that and the terms are clear.

Good documentation also topped the list of all three categories of interviewees. Disputes can be prevented and minimized by prompt notification of changed scope, by documenting the original anticipated scope at the onset of the project (e.g., escrowed bid documents), and by actively pursuing issues as they arise. One contractor answered, “...recognizing earlier and being prompt in notifying, and following up to receive the answers is kind of what we are trying to better at.”

Surprisingly absent from recommendations to prevent or minimize disputes was partnering. Several of the interviewees relayed bad experiences with partnering. While they admittedly saw value in working and collaborating with the party on the other side of the contract, the universal feeling was that partnering was becoming too much of a gimmick. One owner stated, “I have done [partnering] from both sides of the fence, from both the sellers and buyers stand point. I have to tell you, I think it is overblown.” Similar sentiments were heard from another contractor,

Well, we used to have partnering for a while and that was a buzzword. We would have partnering meetings and I guess unfortunately they had a whole bunch of gimmick things going on including facilitators. You know after you had been through a one or two-day session of partnering meetings, it got to where it became a waste of time. So it kind of threw partnering in the wrong direction....

While these experiences may be unique to the interviewees of this study, it is interesting to note that poorly planned and executed partnering sessions can quickly turn people away from a process that was developed to reduce project disputes. In the end, methods to prevent and minimize disputes must incorporate ways to integrate change efficiently into the contract. As one owner interviewee reminded, “We don't live in a perfect world, so I think change is inevitable.” Dealing with change, whether through effective communication, proper documentation, or change management plans, is important when trying to reduce and/or prevent disputes from becoming a major impact on projects.

6.3.4 FAMILIARITY AND USAGE OF ADR TECHNIQUES

With the wide variety of ADR options detailed in the literature, one objective of the qualitative interviews was to see what level of ADR familiarity and usage was prevalent in the industry. This was especially important to this study as the data collected

in the quantitative analysis reflected only negotiation, mediation, and arbitration. Only one data point was collected where the method of final resolution was something atypical – a dispute review board. As such, interviewees were asked to elaborate upon their familiarity and experience with ADR tools.

All interviewees responded that they were familiar with arbitration and mediation. The vast majority of respondents had taken part in at least one of both of these types of dispute resolution methodologies; however, mediation seemed to be the most frequently used among this group of individuals. Some responded that they were familiar with other options, but struggled naming those alternatives. One interviewee commented, “I am pretty familiar with all the options; the two main ones being arbitration and mediation. I know there are a lot of hybrids out there ... but mediation and arbitration are pretty common. Obviously, they are written on every AIA contract and are more common in most contracts now.”

When asked about specific methods of resolution, interviewees were quick to voice their opinions. Mediation and arbitration both received positive and negative commentaries. The majority of comments on mediation were about how its use is becoming more widespread. In addition, one of the lawyers interviewed had a very specific plan to make mediation a more effective tool.

If I had a perfect world, I would write something in along the lines of: 1) you can mediate, 2) prior to mediation you can send five interrogatories that have to be answered, 3) you can ask for documents that have to be responded to, and 4) and you get ten hours of deposition time however you want to use it that wouldn't count against deposition time in litigation. That way, you could go take two or three three-hour court depositions, so that you have an understanding of where the other side is coming from. You also have an opportunity to quiz them on documents and that sort of thing. You are not going through a full-blown

deal, but you know that you have a process that can help you understand what is going on in a down and dirty basis.

As far as arbitration is concerned, the comments were more mixed. While some identified the benefit of having an arbiter with construction experience, others cited the process as an excessively expensive undertaking. One interviewee called particular attention to the situation where a claimant may be waiting for payment and cannot afford to pay the arbitration fees upfront. Nevertheless, according to the interviewees, arbitration still appears to be well used within the construction industry.

6.3.5 ROLE OF LAWYERS IN CONSTRUCTION

The last issue to be included in the qualitative analysis is related to the role of lawyers on construction projects. This topic was a volatile subject for some, even from the attorneys themselves; however, most interviewees had constructive comments as to where they felt lawyers complement and where they felt lawyers hinder the construction process. As such, this section discusses recommendations based upon whether or not the interviewees felt it was an area where lawyers could be effectively utilized.

First, lawyers were almost universally accepted as preproject commencement resource. Having lawyers review contracts for proper risk allocation, dispute resolution mechanisms, and other common areas of conflict were all seen as acceptable, and even advisable, function for lawyers in the construction industry. One contractor admitted, "...we have some very good construction lawyers [who] kind of rap us sometimes for not having gone to them in that pre-stage. We have had our general subcontract run through them, but we don't specifically run each one. And there are some questions of indemnity that we do call and ask them."

Even lawyers themselves pointed out that their main responsibility is in an advisory role. "Obviously, in the teaching function of reminding people of how to go

through contracts, how to write them, and how to not press for a pound of flesh in every deal, these are more of a counselor function [that lawyers play],” commented one attorney. However, the same attorney also responded that there should not be lawyers in the construction industry, and that he would prefer that construction projects were run by construction personnel. These words were resoundingly echoed by one contractor who passionately explained, “You know, lawyers are just a bunch of scoundrels I have found. You know they are very unethical and they really don't compete for business, they create their own. They create chaos in order to promote their own business.”

While this disdain for lawyers in the construction industry may be one extreme, the majority of interviewees found that utilizing lawyers in the construction industry correctly was more about timing and appropriateness. The two comments that illustrate this best were interestingly from both an owner and a contractor. The contractor noted, “Well, you know when you start talking about lawyers, you unsheathed your sword. So, it is not something you should take lightly because they might have a bigger sword than you.” Similarly, the owner said, “The challenge that most companies have is ensuring they employ their legal counsel at the appropriate time. All too often, people will get legal counsel involved in minor issues. That wastes their time, energy, and effort when they should be saving that for larger issues.”

In the end, all the interviewees did identify some important roles for lawyers in the construction industry. While the transactional costs collected in Chapter 5 show that lawyers can be a large expense when it comes to resolving a dispute, their efforts to prevent disputes appear to offset some of these costs. One contractor put it best when he said, “You know it is unfortunate that we usually don't get them involved until we are ready to have conflicting issues with somebody, or already have them and are ready to step it up to a bigger level. So, personally I think if more lawyers were more intimately

educated about the process then there would be a lot less hassles through the construction process. It is just they are such an outside resource rather than an integral resource.”

6.4 Conclusions

In this chapter a series of six interviews were utilized to form the basis of a qualitative analysis. Interviews were conducted with two contractors, two owners, and two construction attorneys to identify concepts, thought processes, and other hidden costs of construction dispute resolution efforts that could not be captured in the quantitative surveys presented in Chapter 5. Using a qualitative template analysis methodology, five common themes appeared throughout the interviews including: 1) other costs of disputes, 2) current quantification techniques for dispute resolution costs, 3) methods to prevent/minimize disputes, 4) familiarity and usage of ADR options, and 5) the role of lawyers in the construction industry. The overriding conclusion found through the study’s interviews was that change, and equally conflict, is inevitable. As such, mechanisms that can be established a priori can help reduce the costs of resolving problems on the construction site. Additionally, these in-place systems can greatly reduce the hidden costs of injured business relationships, tarnished corporate images, and anguished personal lives by having a system that can be easily followed in times of uncertainty. The next chapter will combine the analyses from Chapter 2, Chapter 3, Chapter 5 and Chapter 6 to widen the overall examination of the data to find commonalities and fundamental concepts that encapsulates transactional dispute resolution costs in the construction industry.

CHAPTER 7 COMBINED ANALYSIS

To this point, this dissertation has examined four distinct sources of information to try to understand the scope and impact of transactional costs on dispute resolution efforts in the construction industry. In Chapter 2, the industry workshop laid the groundwork for the identification of the problem – lack of quantitative data about dispute resolution alternatives. In Chapter 3, the existing literature on disputes and dispute resolution procedures was examined to understand the basic development of ADR in research and in practice. In Chapter 5, data and analyses from the quantitative survey developed within this study was presented to layout the exploratory framework of transactional costs as a method for dispute prevention, management, and resolution. Lastly, Chapter 6 examined the qualitative issues related to disputes and dispute resolution processes through six case study evaluations. This chapter attempts to gather together each of these pieces of the construction dispute resolution “puzzle” to construct a combined analysis that more accurately reflects the actual environment of today’s industry. In addition, this chapter extends the individual analyses of each of the abovementioned chapters to develop an overall dispute prevention and management tool to address the inherent risks of construction industry conflict.

7.1 Universal Findings

This section will address three themes that were repeatedly encountered while undertaking the various steps of the triangulated research methodology. The findings presented herewith are based upon the input and data collected from the 22 individuals involved in the research workshop discussed in Chapter 2, the 62 questionnaires from 56 companies analyzed in Chapter 5, the six case study interviews presented within Chapter

6, and the more than 200 sources of construction dispute literature which formed the basis of the Chapter 3 background information.

7.1.1 SUBSTANTIAL COST OF CONSTRUCTION DISPUTES

Repeatedly throughout this dissertation, attention has been called to the impact that disputes have on construction projects and the industry in general. One of the most significant impacts is the cost of resolving disputes once they occur. These monetary, and to some extent non-monetary, costs can account for a large portion of the settlement amount, the original claim amount, and even the overall contract amount.

Data collected in Chapter 5, feedback from the Chapter 6 interviews, and anecdotes from the Chapter 3 literature review all point towards the large financial impact that disputes can have on a project and a company. One potential area for future improvement is to utilize a small portion of the money that is spent on resolving disputes after the project has been completed on preventative measures and management procedures that will help reduce the overall costs of dispute resolution. While it is the author's opinion that conflict is inevitable in the construction industry, it is possible both to limit the amount of conflict that evolves into a dispute and to manage/resolve problems in a cost efficient manner when problems do escalate.

7.1.2 DISPUTE UNIQUENESS

This dissertation has attempted to gather the first exploratory data concerning transactional dispute resolution costs in the construction industry. Through literature review, quantitative data analysis, and interview case studies, the composite dataset indicates that each dispute scenario is unique to the project and the environment from which it was founded. Finding statistically significant results for many of the analyses performed within this dissertation was difficult. While the sample size was small, the

amount of variation between each project was anything but little. Examining both the cost and time attributes of dispute resolution efforts is a prime example of how different two projects may be give a similar fact pattern. Based upon the uniqueness of each dispute, future studies within this area must seek out additional factors that may affect how and when disputes are resolved. It is the author's opinion that even given larger samples and more factors for analysis, developing a comprehensive model to explain the cost and time necessary to resolve a construction dispute will be difficult. Instead, developing a more accurate estimate of the costs associated with dispute resolution efforts may be the catalyst towards widespread adoption of additional dispute prevention and management tools.

7.1.3 DISPUTE RESOLUTION DESIGN

Based upon the above discussion of dispute resolution uniqueness, a follow-on conclusion must be made about dispute resolution design. As each dispute is unique to the environment from which it developed, it is necessary to build dispute resolution systems that are not only flexible but also adaptive to the particulars of the dispute. An example of such a system is the Flexible Framework for the Prevention and Resolution of Construction Disputes (Pappas 2004). This system creates a dispute resolution advocate who is responsible for assisting parties to adopt dispute resolution procedures that are not appropriate for the subject matter in dispute. It has been the observation of the author that many disputes are not resolved at the early stages because the parties feel as if they are merely stepping-stones along the path towards an "authoritative" conclusion of the matter. Some parties treat negotiations and even early mediation efforts as positional bargaining or tactical maneuvering tools for settlement later.

While step negotiations and dispute resolution systems based upon an escalating progression of ADR tools makes logical sense in a broad view, it is the forced nature of

pursuing one option before another, and another that builds hostilities and additional costs into the resolution efforts. Future dispute resolution designs should focus on directing disputes towards a resolution procedure that will assist parties in resolving differences as quickly and as inexpensively as possible. To do this, the risks must be known and accounted for. The next section will show where this research fits into this risk management philosophy and where future research must go.

7.2 Dispute Risk Management

Because of the potentially large financial impacts of disputes in the industry, savvy construction practitioner should attempt to limit possible consequences in the same manner they would address other construction risks. Construction disputes should, as outlined in the risk management literature, be identified, assessed, and controlled.

While there has been a lot of literature covering disputes, the focus has been on discussing dispute identification, dispute control, and to some extent dispute frequency within the industry; however, the linchpin of dispute management, dispute severity, has not been addressed. This research has provided a framework for quantifying the severity of disputes and is an important step towards completing a dispute resolution management system for the construction industry. Together with dispute identification and dispute control, the potential for project savings is enormous. Figure 7.1 details how these dispute management concepts can be implemented in the dispute resolution area.

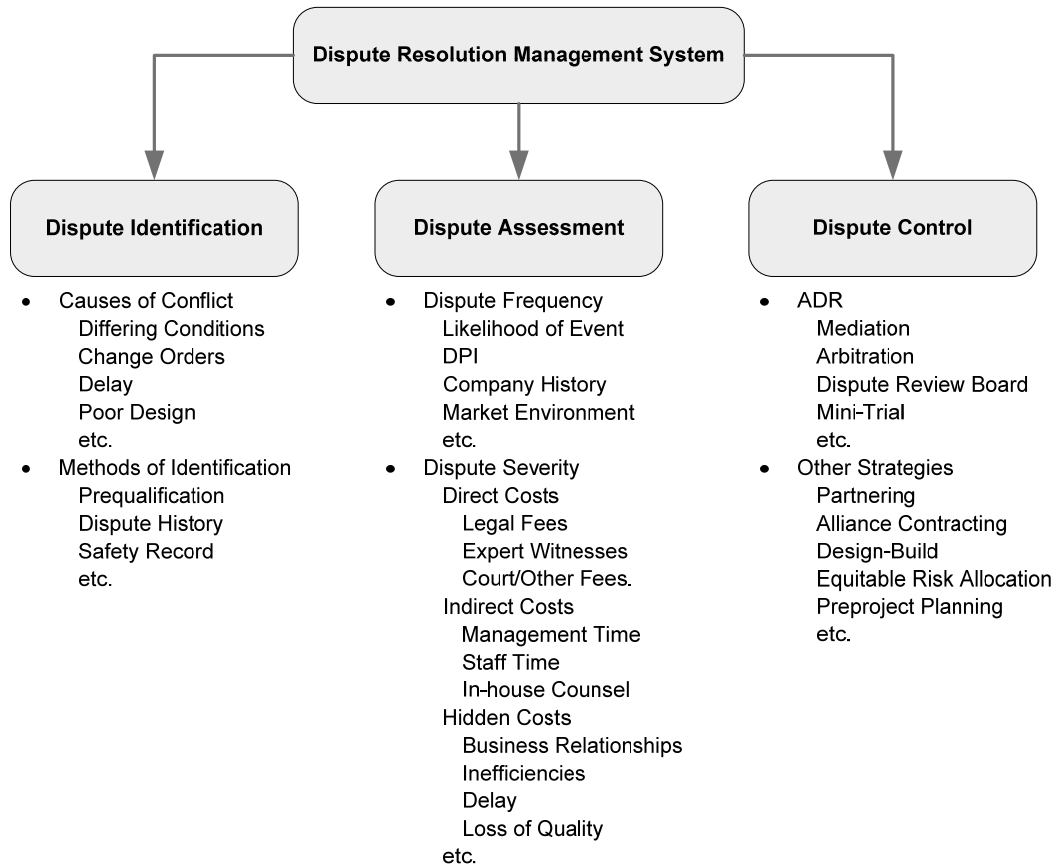


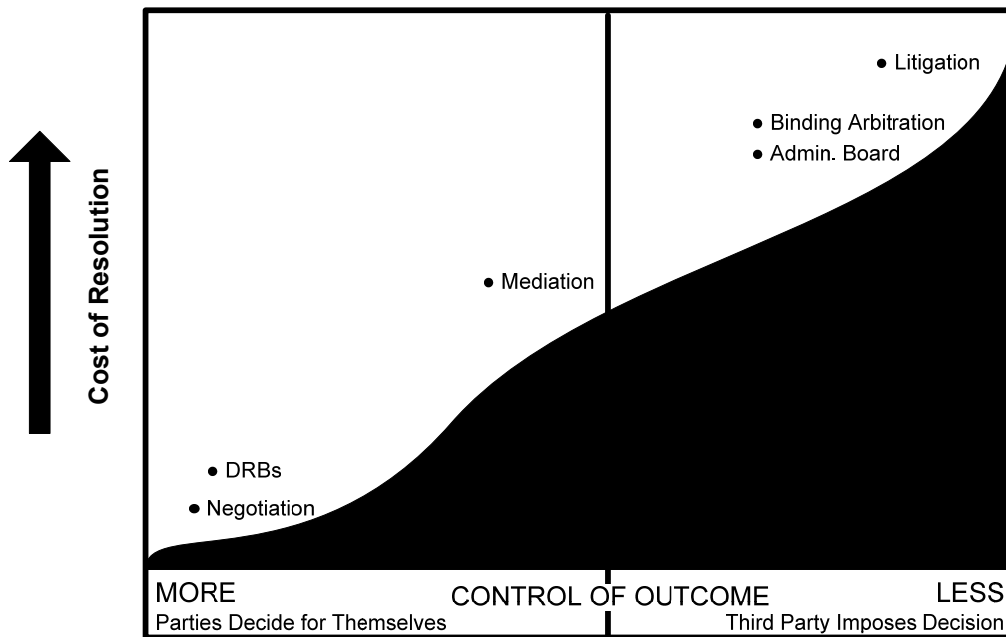
Figure 7.1: Dispute Resolution Management System

Industry participants must strive to collect as much data and information as possible concerning disputes in order to establish some benchmarks for future improvement. When the costs of resolving disputes are known, companies can evaluate their dispute history and see how money spent on transactional costs of resolution might be better spent on preventative measures. Owners, contractors, and subcontractors alike can review their contract documents and tailor the language to each individual project depending on the comprehensive dispute management system established by each organization. The data and method presented in this dissertation can serve as a starting point.

7.3 Combined Analysis Conclusions

This study has focused primarily on the relatively easily quantified transactional costs of dispute resolution efforts. While the less quantifiable areas (e.g., hidden costs) were cursorily discussed in the qualitative interview chapter, the full impact and true “costs” of these issues are still unknown. Future study must continue to capture additional data and additional attributes/characteristics of dispute decision making so that a comprehensive model of dispute risks in construction can be developed. An excellent example of the factors still needed for the development of a dispute decision-making model is how settlement values are affected by estimated transactional costs. In other words, how much will a party be willing to discount (or overpay) a claim for additional compensation knowing that potentially significant transactional costs may be on the horizon as dispute resolution methodologies venture from self-determining to third-party imposed decisions. In addition, what impact, if any, does the project’s percentage of overall workload play into the dispute decision-making scenario?

The reason as to why these answers are so important is that managers rely upon the likelihood and severity of disputes to make decisions about how best to manage the risks of disputes on construction projects. While these figures have been termed “maddeningly elusive,” even relative approximation can add value. Figure 7.2 reexamines Figure 3.2 and modifies some of the relative cost of dispute resolution efforts based upon the data and information collected in this study.



**Figure 7.2: Revised Control of Outcome vs. Cost of Dispute Resolution
(Adapted from Richter 2000)**

As earlier, this revised chart does not give exact figures as to the cost of different dispute resolution methodologies; however, it does modify the placement of the alternatives along the cost curve line. From this study, the author has seen the relative costs of both mediation and binding arbitration rise well above and potentially closer to the costs incurred during full trial litigation. While negotiation remains low on the cost curve, the observed costs of this ADR procedure may be closer to the costs of implementing a DRB than previously thought. Lastly, the overall slope of the curve has also been adjusted to account for the rapid escalation of resolution costs beyond a party-to-party negotiation.

In addition to the overall transactional costs for dispute resolution procedures, one must also consider the time necessary to resolve a dispute. As the old adage goes, “Time is money,” and dispute resolution procedures that reduce the overall time necessary to

reach a resolution (as mediation was shown to in this study) also reduce the overall transactional costs of resolution. Vorster (1993) called the difference between resolution methods on and off of the jobsite as “the continental divide” of dispute costs.

The various components of this dissertation have all focused on understanding how disputes affect construction projects and the industry in general. The large costs (direct, indirect, and hidden forms) associated with dispute resolution efforts in the industry coupled with the uniqueness of each project and dispute must be calculated in as an inherent risk in the overall project management philosophy. Developing tools, systems, and procedures that make economic and financial efficiency a core focus is essential. The final chapter of this dissertation will summarize each of the findings from this study and explain what contributions were made through the examination of transactional costs in the construction industry.

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

The final chapter of this dissertation brings together the knowledge gained through the quantitative, qualitative, and literature review portions of this study to generate findings and recommendations about the transactional costs of dispute resolution efforts in the construction industry. It begins by reviewing the research objectives and hypotheses. Findings are then drawn from the triangulated analysis and conclusions are made based upon the study data. Finally, contributions to the body of knowledge are discussed and areas for future research are presented.

8.1 Review of Research Objectives

As detailed in Chapter 1, the objectives of this study were to:

- Objective 1 – Provide objective criteria for use in universally evaluating the effectiveness of dispute resolution methodologies in the construction industry.
- Objective 2 – Quantify the transactional costs associated with multiple dispute resolution methodologies in the construction industry.
- Objective 3 – Evaluate the cost effects of construction disputes and construction dispute resolution methodologies on the parties in dispute.
- Objective 4 – Recognize successful methods for reducing construction disputes and their costs.

Each of these objectives is discussed in the following subsections.

8.1.1 OBJECTIVE ONE – DISCUSSION

The first objective of the study was to provide objective criteria for use in universally evaluating the effectiveness of dispute resolution methodologies in the construction industry. This objective was met through the identification and collection of transactional cost information incurred because of the presence of a dispute. The five major cost categories identified in this study include: 1) outside counsel fees, 2) in-house counsel salary and benefits, 3) outside consultant fees and expert witness costs, 4) management and staff salary to support the dispute resolution effort, and 5) filing fees, arbitration/mediation fees, and others. For this data set, outside counsel costs were found to be the single largest contributor (61 percent) of the overall transactional costs expended on dispute resolution efforts, although these values vary greatly depending on which dispute resolution methodology is selected. This was followed by management and staff costs (16 percent), and consultant and expert witness fees (11 percent) at the aggregate level, but again, these figures vary greatly depending on which ADR method was utilized during final resolution. The other areas of transactional costs, in-house counsel costs, “other” costs, and court/mediation/arbitration fees, were all found to be relatively small (five, four, and three percent respectively), at least for this data set.

These categories allow practitioners to make objective evaluations of dispute resolution options because they focus on the costs necessary to pursue individual options before, during, and after a dispute has occurred. In addition, less quantifiable issues such as business relationships, business reputations, emotional stress, and loss of future work were also identified as probable items that should be used to help select effective dispute resolution methodologies. Future research should attempt to quantify these hidden amounts and include them in the transactional costs of dispute resolution.

8.1.2 OBJECTIVE TWO – DISCUSSION

The second objective was to quantify the transactional costs associated with multiple dispute resolution methodologies in the construction industry. This objective was completed through the quantitative survey presented in Chapter 5. Although the data were a convenience sample not randomly selected, this study presents some interesting data in an exploratory area where little quantitative research has been completed before. In addition, this study presents data from a variety of projects and is an invaluable archive of actual dispute resolution costs.

The dispute resolution methodologies specifically addressed by this study include negotiation (20 project disputes), mediation (16 project disputes), and arbitration (10 project disputes). While other methods of dispute resolution methods were included on the survey instrument, it appears that both the quantitative and qualitative portions of the study point to the conclusion that these are the three primary methods of dispute resolution in the construction industry outside of litigation. Furthermore, an interesting finding was discovered when asking about the presence of alternative dispute resolution procedures in the contract. This data set shows that almost 20 percent of contracts still do not include dispute resolution procedures in their documents. Considering ADR procedures have been around for decades, it is hard to understand why some organizations still do not employ at least some dispute resolution/management/prevention procedures in their contracts. This is a clear indication that more education and outreach on the benefits of dispute “management” language in the contract is needed.

8.1.3 OBJECTIVE THREE – DISCUSSION

The third objective was to evaluate the cost effects of construction disputes and construction dispute resolution methodologies on the parties in dispute. This objective was also accomplished through the quantitative survey presented in Chapter 5. The study

revealed, at least for this sample, the significant expenditure differentials for owner and contractor organization when trying to resolve a dispute. This data set indicates that owners will spend approximately 16 percent of the original claim value on transactional costs while a contractor will spend approximately 39 percent. While there was not enough data to examine each dispute resolution methodology individually against the parties involved, the ratio between what contractors and owners spent, about two to one, suggests that the methodology does not affect the disparity significantly. Future research should attempt to revisit this objective by including architects, engineers, and subcontractors to the list of parties studied.

8.1.4 OBJECTIVE FOUR – DISCUSSION

The fourth objective was to recognize successful methods for reducing construction disputes and their costs. This objective was met through the combined findings of Chapter 5, Chapter 6, and Chapter 7. It appears that negotiation is the least expensive option when compared to other alternatives, \$330,200 in transactional costs, on average, as opposed to \$1.2 million USD, on average, for all other types. In addition, it appears that negotiation is also the least time-consuming dispute resolution option compared to the other processes study in this dissertation (see Figure 5.23 and Figure 5.24). However, with the small amount of available data, future researchers should revisit these findings to see how resolution methodologies employed prior to final resolution (along with other measure) affect the time and cost necessary to resolve construction disputes.

Nevertheless, it was apparent that the best approach to minimizing both costs and occurrences was to resolve conflict at the lowest levels possible. Key suggestions found in the qualitative interviews included reducing emotional attachment to disputes, empowering field employees to resolve disputes without direct management involvement,

and fostering long-term relationships with owners, contractors, and subcontractors. In addition, the supplementary data chapter identified dispute review boards as one method through which the frequency and severity of construction disputes may be reduced. Another suggestion to reduce and/or prevent protracted disputes includes continuing education as the qualitative interviews revealed that many individuals are still unaware or uneducated about both the available options and the large costs associated with dispute resolution.

8.2 Review of Research Hypotheses

This study set out to test three hypotheses related to the transactional costs of dispute resolution in the U.S. construction industry. The proposed hypotheses from Chapter 1 were:

- **Hypothesis 1** – The cost and time necessary to resolve a construction dispute are significantly and positively affected by the application and timing of varying alternative dispute resolution techniques.
- **Hypothesis 2** – The transactional costs of construction disputes are significantly affected by the role the parties play in the dispute.
- **Hypothesis 3** – The transactional costs of construction disputes are significantly and positively affected by the perceived complexity of the issue in dispute.

When looking at hypothesis one, the analysis becomes much more difficult. While hypothesis one could not be proved or disproved with full certainty given the collected information, the data did reveal that large sums of money are being spent on resolving disputes no matter what resolution method is chosen. According to the data in

this research, when a dispute (a conflict that could not be resolved at the project team level) was present, an aggregate mean of 6 percent of the original claim value, or equivalently 2 percent of the overall contract value, were expended on transactional costs for resolution efforts. In addition, these results are for only one side of the dispute. Given the fact that not every project will have a dispute, these figures still give some justification and incentive for both sides to look for other solutions. If the upfront costs of some dispute resolution systems, like DRBs, have been perceived to be high, perhaps the costs associated with resolving disputes as they are currently being done will motivate change. Then again, perhaps the potential savings and profits to be gained by resolving disputes early and quickly may also spur change in the industry.

Both hypothesis two and hypothesis three were shown to be true, at least for this sample of projects. Contractor organizations were shown to spend over two times as much as an owner organization to resolve a dispute. Realistically, this finding makes logical sense as contractor organizations often have the burden of proof to justify additional money and/or time for a claim. Additionally, contractor organizations often lack bargaining power, as “the golden rule” (he who has the gold, rules) is clearly apparent in the construction industry.

The perceived dispute complexity was also shown to significantly impact the amount of money spent on dispute resolution efforts. However, this finding is unique such that, when looking at just hard dollar cost figures, disputes that are more complex incur higher transactional costs. However, when examining the percentage of transactional costs in relation to the original claim amount, disputes that are actually perceived to be less complex incur more costs than their complicated counterparts do. To be more precise, less complex disputes cost nearly twice as much as disputes that are

more complex. This finding is also true when controlling for both perceived dispute complexity and claim amount.

8.3 Conclusions

Given the relatively small data sample, the information presented in this dissertation is by no means an encompassing representation of the overall industry; however, it does illustrate a pressing problem that needs to be explored further. Given the amount of capital expenditures funneled through the construction industry each year and the propensity of the industry towards conflict, it is imperative that the industry focus on eliminating processes that do not add value to the project.

One of the main criticisms in the area of dispute prevention and resolution has been the lack of quantitative data. In 1997, an ENR editorial wrote, “Here is construction, the nation's second largest industry, arguably the most important, accounting for about 8 percent of GDP, and we still don't know definitively whether we've had any success combating lawsuits (Editorials 1997, p. 62).” Almost a decade later, this is still true. In addition, despite data being “maddeningly elusive” as discussed earlier, they are needed nonetheless by industry professionals who make contract decisions everyday.

This research is the first study to attempt to quantify the transactional dispute resolution costs of the construction industry. To accomplish this, a methodology was developed that divides all costs into three components - direct, indirect, and hidden costs. This framework is also an important first step in helping reduce the enormous impacts of disputes on the construction industry. One industry expert has cited that nearly \$5 billion USD is spent on construction litigation alone each year and that this number will increase ten percent each year (Michel 1998). If this is the figure for merely construction

litigation, imagine how much is expended on resolving disputes as a whole, since 95 percent of disputes never make it to trial (Stipanowich 2004).

As conflicts are inevitable, their destructive component, project disputes, must be reduced. Parties must work to establish dispute management systems that resolve conflict at the lowest levels possible as resolving a dispute after a project has been completed with lawyers, judges/arbitrators, and jury members far removed from the actual project costs everyone money, time, and much aggravation. As many researchers have argued before, confronting issues at the jobsite and working towards the resolution of problems before the project is over is critical to controlling the effects of disputes on both projects and companies.

8.4 Contributions

This research was an exploratory investigation into the transactional costs of dispute resolution efforts in the construction industry. No published or comprehensive study has been undertaken to quantify the sizeable transactional costs associated with resolving a dispute in the construction industry throughout the spectrum of dispute resolution options. While there is a large body of knowledge concerning the appropriateness of where and how dispute resolution techniques should be undertaken, there has been little in the way of quantitative data that can assist industry practitioners in making cost effective dispute resolution decisions.

This study's main contribution has been in the development of a methodology to addresses the direct, indirect, and hidden costs associated with dispute resolution efforts. This study has also collected the first industry data relating to the actual costs of dispute resolution efforts on actual construction projects. The collection of these data has permitted the first analyses to be undertaken that quantitatively look at the economic

differences between dispute resolution options. In addition, the collection of qualitative interview data has furthered the understanding of the decision-making factors and thought processes that industry professionals use when resolving a dispute.

In addition, this research provides valid intelligence on the actual costs of dispute resolution efforts regardless of whether “statistical significance” can be found. The recognition of the importance in understanding transactional dispute resolution costs is a first step both to encouraging future research and to acknowledge the problems encountered by industry professionals day in and day out.

8.5 Recommendations for future research

Throughout the progression of this research study, areas where future research is needed have been identified and noted. As this is an exploratory study, there are many opportunities where others can add to this knowledge area. To begin, more data must be collected on the actual costs of dispute resolution transactional costs in the construction industry. Additional data will allow for both analyses that are more detailed and findings that are of equal or greater importance. In addition, future research studies should attempt to capture more information pertaining to the progression of the dispute. One possibility as to why transactional cost differences were not observed between the various methods could be because of the focus on final dispute resolution methodologies. While some limited statistical analyses were performed on perceived covariates of transactional costs, there was not enough data to perform a formal analysis. The author also suggests that future researchers collect additional data on litigation. As the overall theme of this and similar research initiatives have focused on reducing litigation costs, collecting actual transactional costs for litigation would strengthen future arguments for the increased adoption of ADR.

The author of this dissertation advises future researchers that systems to capture and quantify these costs in the industry must be more widely adopted before any future studies can attempt to collect sizeable data samples. Currently, many anecdotes were conveyed to the researcher that the information asked for in this study was not known by one single individual, but rather multiple individuals who each knew only a portion of the overall costs. To facilitate data collection for research and for corporate use, enterprise-wide systems/procedures must be initiated across the board to capture costs as they occur. Currently, dispute resolution transactional costs have only been monitored late in the progression of the dispute resolution process, oftentimes when lawyers and expert witnesses become involved for an upcoming trial or hearing.

Future researcher should also consider improved survey methods to ensure the data collected is representative of the actual costs and time experiences in the project dispute. As dispute can be an emotional endeavor, one suggestion for future researchers would be to collect data from multiple individuals involved in the same dispute from the same company or to survey the same respondent a two different times. This suggestion may help limit the potential for irrational inflations (or deflations as the case may be) about the attributes of the dispute resolution data. In addition, future researcher should attempt to address and differentiate between the fixed and variable costs associated with dispute resolution efforts.

As stated many times in this manuscript, transactional costs for dispute resolution efforts can be difficult to measure, but continued efforts to capture, model, and understand these data will slowly uncover the information for industry practitioners. With readily available data, future practitioners may be able to make more informed and more cost-effective decisions about how to deal with the risks of project disputes.

APPENDICES

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Appendix A – Industry/Academia Workshop Participants

<i>Industry Representatives</i>	
D. Keith Dodson Consultant; formerly V.P. Brown & Root Intl., President John Brown, Sr. V. P. of Engineering for Enron Engr. & Const. Co.	David Nicastro Chief Executive Officer Engineering Diagnostics, Inc.
John C. Fleming Attorney-Mediator, Adjunct Professor of Law Galton, Cunningham & Bourgeois, P.L.L.C	August C. Petersen Lecturer University of Texas at Austin
Patrick Flynn President Flynn Construction	Raymond Suire In-house Counsel Zachry Construction Corporation
Sherri R. Greenberg Lecturer in Public Administration; former member, Texas House of Representatives University of Texas at Austin	Jimmy Slaughter President S&B Engineers
Jim Groton Partner, retired Sutherland Asbill & Brennan LLP	Dan Stoppenhagen Director, Transportation Fluor Enterprises, Inc.
Emerson T. Johns Operations Leader and Chief Financial Officer of the DuPont Engineering, Facilities, and Safety, Health, and Environmental Operations E. I. duPont de Nemours & co., Inc.	Jan Summer Adjunct Professor of Law; Exec. Dir. of The Center for Public Policy Dispute Resolution University of Texas at Austin
Robert P. Kehoe Manager, Construction of Facilities Program NASA - Johnson Space Center	Hans Van Winkle (MG, Ret.) Director, Construction Industry Institute; formerly Deputy Chief, U.S. Army Corps of Engineers
Curt Martin President Construction Resolutions	Ben T. Wheatley Partner Allensworth and Porter, L.L.P
Douglas J. Morrice Professor in Mgmt. Science and Info. Systems University of Texas at Austin	John Wray Vice President Westney Project Services, Inc.
<i>UT Construction Engineering and Project Management Faculty</i>	
John D. Borchering Adjunct Professor in Civil Engineering University of Texas at Austin	G. Edward Gibson Professor in Civil Engineering University of Texas at Austin
Carlos Caldas Research Fellow in Civil Engineering University of Texas at Austin	James T. O'Connor Professor in Civil Engineering University of Texas at Austin
<i>UT Graduate Research Assistants</i>	
Jui-Sheng Chou Graduate Research Assistant University of Texas at Austin	Mike Pappas Graduate Research Assistant University of Texas at Austin
Richard Gebken Graduate Research Assistant University of Texas at Austin	
Will Lyons Graduate Research Assistant University of Texas at Austin	
Jeff Mays Graduate Research Assistant University of Texas at Austin	

Appendix B – Pre-Workshop Questionnaire

In order to facilitate the process of identifying and prioritizing the key research topics within the Economic, Financial, and Dispute Resolution (EFDR) thrust area, we ask that you take a few minutes to answer some questions. We will use these questions to both structure the workshop on September 5 and direct future research. Please feel free to provide comments or concerns about the research endeavor as well. We value your input and appreciate any comments.

Name: _____

Area 1 - Corporate/Company Level Business Environment

(i.e., industry economic drivers, industry fragmentation, industry consolidation, company financing, accounting/auditing, profitability, income recognition, etc.)

Please identify the top three (3) concerns facing companies within the construction industry with respect to corporate level business activities.

Area 2 - Project Level Issues Facing the Engineering and Construction Industry
(i.e., innovative project financing, sureties and bonding, project insurance, job cost accounting, etc.)

Please identify the top three (3) concerns facing the construction industry at the project-level.

Area 3 - Legal Environment of the Engineering and Construction Industry
(i.e., claims avoidance, construction litigation, alternative dispute resolution, contract language concerns, risk allocation, etc.)

Please identify the top three (3) concerns facing the construction industry with respect to its legal environment.

Appendix C – Pre-workshop Questionnaire Response Summary

Below are the pre-workshop questionnaire topics that are of greatest concern to the engineering and construction industry according to the respondents. These topics are the raw data responses from the questionnaire although they have been grouped into sub-topics within each area by the authors.

Questionnaire Results for Area 1 - Corporate/Company-Level Business Environment

Market Consolidation and Fragmentation

- Fragmentation of participants in the construction process separates the “people” from the “project”
- Industry consolidation forces change in market power/influence from traditional “power-holders”
- Unrealistic expectations of owners, and their general lack of knowledge about the construction process is becoming more prevalent
- Ability to build international mega-projects has deteriorated

U.S. Economy

- U.S. Economy; declining construction opportunities have lead to increased competition

- Many engineering and construction companies have been significantly weakened financially causing work to be shifted to engineering and construction companies and fabricators who are less qualified

Declining Profitability

- Declining profitability has forced many engineering and construction companies to consolidate or go out of business
- Thin profit margins due to international competition in products and services severely limits cash and profit for owners and contractors
- Failure of projects to meet cost, operability, and schedule objectives inhibits future investment
- Risk management processes are inadequate
- Cost control systems do not meet business needs
- Finding new business opportunities is difficult

Workforce Issues

- Availability and quality of trade workforce
- Downsizing in current engineering and construction industry will create a lack of capacity when demand increases, allowing engineering and construction companies to dictate contract terms and conditions
- Consolidations of owners and contractors and the attendant cost cutting and "purchase accounting" has destroyed much capital

facility capability, and maybe most importantly, the confidence in what capability that is left

Income Recognition

- Percent of completion profit recognition is inadequate for proper statement of contractor financial position, due to projects stretching over several accounting years

Questionnaire Results for Area 2 - Project-level Issues Facing the Construction Industry

Bonding, Surety and Insurance Issues

- Insurers and sureties are much less willing to participate in larger or more complicated projects because they represent too much risk
- Insurance: increasing costs, declining coverage, dealing with innovative delivery schemes will kill project economics and force projects overseas

Workforce Issues

- Fewer experienced people to staff owner, engineering and construction, and fabricator project teams
- (Lack of/Level of) Owner funding for worker training, including safety and health training
- Availability of skilled workers
- Cultural challenges associated with multi-national workforces

- Owners are using "subsidized" international contractors who are offering lower cost and taking higher risks

Project Management Control

- Inadequate attention to up-front programming, planning, design, and instituting processes for management and control of disputes
- Relating losses to problems recorded is difficult because project personnel do not document an impacted project well
- Cost Control Systems fail to capture costs of problems encountered

Other

- Engineering delays and shrinking design budgets are affecting overall project performance including the quality of project documents and quality of construction
- Financing is less available because of the lack of engineering and construction companies willing to bid Lump Sum Turnkey – often a requirement for lending institutions
- Increased regulation and its affects on project planning and execution

Questionnaire Results for Area 3 - Legal Environment of the Construction Industry

Cost of Dispute Resolution

- Cost of dispute resolution (both legal services and alternative dispute resolution costs) is severe
- Disputes take too long to resolve and often require significant cost even if mediation is successful
- Companies are not following bid scopes and then do not pay the attendant claims
- Determining damages after establishing cause and effect in legal disputes is very difficult because data is often questioned concerning applicability and reliability

Lack of Awareness of Alternative Dispute Resolution

- Lack of awareness and encouragement to utilize techniques for reducing and/or eliminating the costs of disputes before they become claims

Risk Allocation

- Need for realistic evaluation and allocation of risks among project participants
- Onerous, high-risk, owner imposed contract language
- Risk shifting affecting general contractors, subs, and bonding companies

Dispute Control

- Owners and contractors disregard contractual requirements when a project suffers delays, disruptions, and cost overruns

Other

- The extent to which the doctrine of sovereign immunity impacts project costs [i.e., what additional transaction costs (in this case enforcement costs) are included in Contractor's bids (if any) to compensate for the risk of having to collect contract damages from an entity subject to sovereign immunity]
- Construction litigation and arbitration is a growth industry for the next few years just from completed projects. It may not be an issue in the future, as few projects will go ahead.

Appendix D – Quantitative Area Mail Survey



COLLEGE OF ENGINEERING
THE UNIVERSITY OF TEXAS AT AUSTIN

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June 29, 2004

Transactional Cost Quantification of Dispute Resolution Procedures in the Construction Industry

The construction industry is generally acknowledged as the world's most litigious industry. One research study has reported that in the United States alone, nearly \$5 billion is spent each year by the construction industry on lawsuits and arbitrations, and that these legal expenditures have increased at an alarming rate of 10 percent per year over the past 10 years. Yet at the same time, the construction industry has been at the leading edge of creating and implementing innovative new techniques for preventing, controlling, managing and amicably resolving disputes promptly and economically for many years. As a result the construction industry has available to it a wide spectrum of dispute-management methods, ranging from prevention and "real time" dispute resolution techniques such as realistic risk allocation, partnering, step negotiations and dispute review boards, to supplement the more traditional dispute resolution methods such as mediation, arbitration and court litigation.

Dispute resolution costs money, not just the amounts paid to settle the dispute, but also the "transaction costs" of processing the dispute: lawyer fees, experts' fees, management time, etc. We know intuitively that court litigation and arbitration cost more in transaction fees than, for example, dispute review boards. However, there has never been a comprehensive quantitative or qualitative study into the actual transactional costs associated with the various different methods of dispute resolution. If empirical information could be made available as to the relative transaction costs of different methods of dispute resolution, this would assist industry participants in evaluating these different methods of dispute resolution so they could make rational decisions on which dispute resolution methods to employ. In a 1994 survey on uses of alternative methods for resolving disputes in the construction industry, Thomas J. Stipanowich, then Professor of Law at the University of Kentucky, noted, "A particular concern [of managers who make decisions about implementing dispute resolution] is the relative costs of pursuing various alternatives. Though maddeningly elusive, such numbers may represent the essential lubricant for change in a bureaucracy demanding empirical justification for decision making."

The Center for Construction Industry Studies (CCIS), of the University of Texas at Austin, with encouragement from CII and the National Academy of Construction, and funding from the Alfred P. Sloan Foundation, is now conducting a research study to quantify the transactional costs of dispute resolution procedures in the construction industry, and requests your help.

The objectives of this research are to:

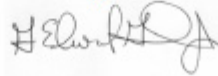
- 1) Identify the transactional costs associated with different methods of dispute resolution throughout the full spectrum of dispute resolution techniques, from prevention to litigation,
- 2) Evaluate the effect of the time spent in getting a dispute resolved on the transactional costs of dispute resolution,
- 3) Provide industry participants with reliable data on these transactional costs, so they can accurately evaluate the effect of these costs on their own construction projects and profits, and
- 4) Encourage industry participants to select and use the most cost effective techniques for resolving disputes on their future projects.
- 5) Of course, the overriding objective is to have data that will promote the avoidance of construction disputes.

We ask that you, as a service to the construction industry, (and we hope, to your future profitability), participate in this study. The enclosed survey should take 30-45 minutes of your time. Enclosed with this letter you will find three attachments. First are instructions for understanding and filling out the survey. Second, you will find an alphabetical listing of research terms for your use in completing the questionnaire. Finally, you will find a three-page, 21-question anonymous, confidential survey concerning your dispute experience a single project. (If you are willing to furnish us with a separate survey on more than one project, so much the better) The results of this survey will be kept absolutely confidential. When completed, please email, fax, or mail the completed survey according to the instruction sheet.

We thank you for your support and participation in this study. If you would like to find out more information about the Center for Construction Industry Studies, you can find the Center's website at (<http://www.ce.utexas.edu/org/ccis/>).

If you should have any further questions or concerns, please feel free to contact Richard Gebken (rgebken@mail.utexas.edu) or me at any time.

Sincerely,



G. Edward Gibson, Jr., Ph.D., P.E.
Professor of Civil Engineering
Austin Industries Endowed Faculty Fellow
Phone: 512-471-4522 FAX: 512-471-3191
egibson@mail.utexas.edu

TRANSACTIONAL COST QUANTIFICATION OF DISPUTE RESOLUTION PROCEDURES IN THE CONSTRUCTION INDUSTRY QUESTIONNAIRE

Purpose:

The purpose of this survey is to quantify the transactional costs associated with different methods of resolving disputes in the construction industry. This information will help industry participants realize the extent to which disputes have an impact on their business, the industry, and the overall economy, and at the same time will provide them with information that will assist them in reducing future costs of dispute resolution, and possibly lead to dispute avoidance.

Instructions:

- Please complete the survey as directed, bearing in mind that the survey should be answered in the context of a particular project.
- The selected project should represent a typical situation where disputes have arisen. The intent of this research is not to collect the “biggest” or the “meanest” disputes, but rather document a typical dispute and its resolution in the construction industry. Respondents are encouraged to complete the questionnaire based upon the most recently resolved dispute.
- **All data will be held in strict confidence.**
- If you wish to complete a survey for more than one project, please make copies of the blank survey form, or contact me for additional copies.
- Please contact Richard Gebken at (512)773-1445 with any comments or questions.
- Please send the completed survey to one of the following addresses:

By Mail:

Civil Engineering Department ARE/CEPM/ICAR
Attn: Richard J. Gebken
The University of Texas at Austin
University Station C1752
Austin, Texas 78712-0276

By Fax:

Civil Engineering Department
Attn: Richard J. Gebken
Fax: (512) 471-3191

By Email:

Email: rgebken@mail.utexas.edu

**You may also complete a survey online at
<http://web.austin.utexas.edu/disputes/>**

Part I – General Project Information

- 1) Project Location (City and State if possible): _____
- 2) Owner Type:
 - a) Public
 - b) Private
- 3) Facility Type:
 - a) Civil/Infrastructure
 - b) Commercial/Building
 - c) Industrial
 - d) Other (please specify) _____
- 4) Project Type:
 - a) Greenfield
 - b) Expansion
 - c) Renovation
 - d) Other (please specify) _____
- 5) Contract Type:
 - a) Fee Arrangement
 - i) Fixed Price
 - ii) Cost Plus
 - iii) Guaranteed Max. Price
 - iv) Other (please specify) _____
 - b) Scope of Contract
 - i) Design-Bid-Build
 - ii) Design-Build/EPC
 - iii) CM at Risk
 - iv) Subcontract
 - v) Other (please specify) _____
- 6) Contract Amount (approximate \$): _____
- 7) Alternative Dispute Resolution Language in Contract (check all that apply):
 - a) Partnering
 - b) Negotiations
 - c) Mediation
 - d) Arbitration
 - e) None
 - f) Other (please specify) _____

Part II –Project Schedule Information

8) Project Start Date: _____ (MM/YYYY)

9) Project Substantial Completion Date: _____ (MM/YYYY)

10) Project Final Acceptance Date: _____ (MM/YYYY)

11) Project duration was

- a) Less than 95% of the last agreed upon length
- b) Between 95% and 105% of that last agreed upon length
- c) Longer than 105% of the last agreed upon length

12) How many disputes did you have on the Project? _____

13) For the biggest dispute on the Project, what Percentage of Completion had been achieved by the Date the Dispute First Occurred:

- a) Project less than 20% complete
- b) Project between 20% and 40% complete
- c) Project between 40% and 60% complete
- d) Project between 60% and 80% complete
- e) Project more than 80% complete

14) For that dispute, what Percentage of Completion had been achieved at Date of first formal Claim Notification:

- a) Project less than 20% complete
- b) Project between 20% and 40% complete
- c) Project between 40% and 60% complete
- d) Project between 60% and 80% complete
- e) Project more than 80% complete

15) Dispute Settlement Date: _____ (MM/YYYY)

Part III –Project Dispute Information for the Largest Dispute

16) Please give a brief description of the subject matter in dispute. _____

17) Parties to the dispute included (check all that apply):

a) Disputing Party 1

- i) Owner
- ii) General Contractor
- iii) Designer/Architect
- iv) Subcontractor
- v) Surety/Bonding Agency
- vi) Other (please specify) _____

b) Disputing Party 2

- i) Owner
- ii) General Contractor
- iii) Designer/Architect
- iv) Subcontractor
- v) Surety/Bonding Agency
- vi) Other (please specify) _____

c) Additional information (if necessary): _____

18) Rate your perceived complexity of the dispute (check only one)

- a) Simple
- b) Moderately Simple
- c) Average/Normal
- d) Moderately Complex
- e) Complex

19) Dispute resolution process(es) attempted prior to settlement:

- a) Mediation
- b) Arbitration
- c) Mini-Trial
- d) Litigation
- e) Dispute Review Board
- f) Negotiation
- g) Other (please specify) _____

20) Dispute resolution process that achieved Final Settlement:

- a) Mediation
- b) Arbitration
- c) Mini-Trial
- d) Litigation
- e) Dispute Review Board
- f) Negotiation
- g) Other (please specify) _____

21) Total Claim Amount (\$): _____

22) Total Counterclaim Amount (if applicable) (\$): _____

23) Transactional Costs incurred in resolving all disputes on this Project (information for one party only):

a) The below costs are for (check one):

- i) Owner
- ii) Contractor
- iii) Subcontractor
- iv) Other (please specify) _____

b) Outside counsel fees (\$): _____
N/A Don't Know Wild Guess Rough Estimate Careful Estimate Definitively Known

c) Allocation of a portion of in-house counsel salary and benefits (\$): _____
N/A Don't Know Wild Guess Rough Estimate Careful Estimate Definitively Known

d) Outside consultant and expert witness costs (\$): _____
N/A Don't Know Wild Guess Rough Estimate Careful Estimate Definitively Known

e) Management and staff salary and benefits allocated to support the dispute resolution effort (\$): _____
N/A Don't Know Wild Guess Rough Estimate Careful Estimate Definitively Known

f) Filing fees, arbitration/mediation/court fees, etc. (\$): _____
N/A Don't Know Wild Guess Rough Estimate Careful Estimate Definitively Known

g) Other transaction costs of dispute resolution(\$): _____

24) Settlement amount paid to resolve the largest dispute (\$): _____

Settlement Paid to Whom

- a) Owner
- b) Contractor
- c) Subcontractor
- d) Other (please specify) _____

25) If the dispute was resolved short of trial by mediation, facilitation, mini-trial or any other ADR procedure, please estimate the transactional costs (same breakdown as above) that were SAVED or AVOIDED by not proceeding to trial or award;

a) Outside counsel fees (\$): _____

b) Allocation of a portion of in-house counsel salary and benefits (\$): _____

c) Outside consultant and expert witness costs (\$): _____

d) Management and staff salary and benefits allocated to support the dispute resolution effort (\$): _____

e) Filing fees, arbitration/mediation/court fees, etc. (\$): _____

f) How much different do you realistically believe the final award or judgment would have been, (the amount that you would have paid or received) had the matter not been settled and proceeded to trial or award?

26) Other Comments (continue on back if necessary):

Thank you for completing this survey. Please email, mail, or fax completed questionnaire to the address listed in the instructions.

TRANSACTIONAL COST QUANTIFICATION OF DISPUTE RESOLUTION PROCEDURES IN THE CONSTRUCTION INDUSTRY RESEARCH TERMS

The following terms are used in the enclosed survey and are defined here for your convenience in filling out the survey.

Alternative Dispute Resolution (ADR) - Processes where legal conflicts and disputes are resolved privately and by mutual agreement, as opposed to binding resolution through litigation in the public courts or by arbitration. The most popular forms of ADR are negotiation and mediation; however, many other types of alternative dispute resolution procedures are currently practiced.

Arbitration – A binding private dispute resolution method by which an independent, neutral third person ("arbitrator") is appointed to hear and consider the merits of the dispute and renders a final and binding decision called an award. The process is similar to the litigation process as it involves final and binding adjudication, except that the parties choose their arbitrator(s) and the manner in which the arbitration will proceed.

Civil/Infrastructure Project – Projects including but not limited to water/wastewater, electrical distribution, communications, tunneling, highway, airport, rail, flood control, navigation, marine facilities, mining, solid waster management, etc.

Commercial/Building Project – Project including but not limited to multi-unit residential, hotel/motel, low-rise office, mid-rise office, high-rise office, retail, parking garage, warehouse, educational, hospital/clinic, laboratory, correctional, entertainment, etc.

Cost Plus Contract - A form of contract for construction work in which the construction contractor is reimbursed for the costs it incurs in performing the work plus a lump sum or percentage fee.

Design-Build Contract – A construction delivery method where a single entity is contracted to provide both design and construction services.

Dispute – A claim, issue or other matter that has been brought to the attention of the opposing party and that party has had an opportunity of considering and admitting, modifying or rejecting the claim or assertion and a disagreement has arisen.

Dispute Review Board – A process in which the parties at the inception of the Project select three independent construction industry professionals to be available to provide non-binding decisions of any disputes presented to them.

Dispute Settlement Date – Date at which final agreement was made between disputing parties (i.e. – date of arbitration adjudication award, date of court award, date of mediation agreement).

Filing fees, arbitration/mediation/court fees, etc. (\$) – Monies paid towards court costs, mediator/arbitrator fees/expenses, or similar costs to resolve disputes.

Fixed Price Contract - A type of contract in which the amount to be paid is fixed for a specified amount of work or specified deliverables.

Guaranteed Maximum Price Contract - A form of contract in which compensation may vary according to the amount of work involved but in any case not more than an agreed total amount.

Industrial Project – Projects including but not limited to foods, pharmaceuticals manufacturing, consumer products manufacturing, automotive, microelectronics manufacturing, pulp and paper, power generation, petroleum refining, chemical manufacturing, oil and gas production, environmental remediation, metals refining/ processing, etc.

In-house Counsel Salary and Benefits – Monies and other fringes paid to staff lawyers. This amount should reflect the amount of time spent on the dispute in question with respect to their overall job duties.

Litigation – A method of dispute resolution whereby legal proceedings take place in a court; a judicial contest to determine and enforce legal rights through adjudication

Management and staff salary and benefits allocated to support the dispute resolution effort – Monies paid to company employees working on preparing dispute materials or other duties outside of their normal daily responsibilities because of the dispute's occurrence. These costs are often hidden and difficult to quantify.

Mediation - The most used alternative dispute resolution aside from negotiations; mediation involves the appointment of a mediator who acts as a facilitator assisting the parties in negotiating a settlement. The mediator does not adjudicate the issues in dispute or force a compromise; only the parties, of their own volition, can shift their positions in order to achieve a settlement. The result of a successful mediation is resolution of the dispute by mutual consent.

Negotiations – An alternative dispute resolution process where parties directly exchange ideas, views, promises, and problems surrounding a dispute without the assistance of a third party. This is the most common form of alternative dispute resolution.

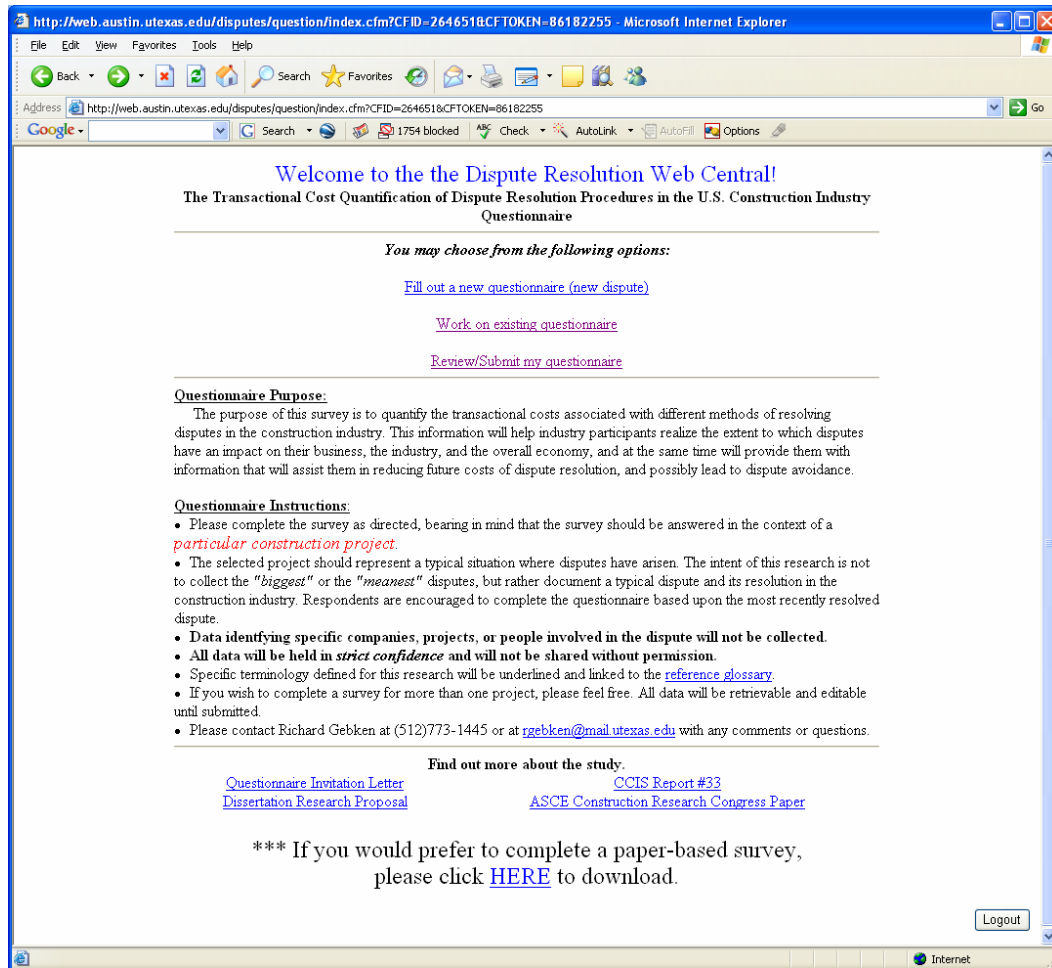
Outside consultant and expert witness costs – Monies and other expenses paid for third-party individuals (other than outside counsel) to prepare materials, testify, or otherwise support a party in its efforts to achieve resolution of a dispute.

Outside Counsel Costs – Monies and fees paid to “out-of-house” lawyers for expenses directly related to efforts to resolve disputes. These costs can include time spent preventing, preparing, and/or presenting a dispute.

Partnering – A process by which two or more organizations with shared interests act as a team to achieve mutually beneficial goals. In general, parties make an attitude adjustment and form a contract in the spirit of teamwork, cooperation, and good faith performance.

- Project Cost (\$)** - Total installed cost of the constructed project, including design and construction (but not land) costs.
- Project Final Acceptance Date** – The date when formal acceptance by the Owner of a finished construction project, after contract requirements have been fulfilled
- Project Percent Complete at Date of Claim Notification** – An estimate of project work completed compared to the total amount of project work in the contract when notification of claim was first filed with the owner.
- Project Percent Complete at Date of Dispute First Occurrence** - An estimate of project work completed compared to the total amount of project work in the contract when disputed work or item first occurred.
- Project Start Date** – Date of notice to proceed on Work.
- Project Substantial Completion Date** – Date at which the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use
- Settlement Amount (\$)** – The amount paid to satisfy judgments, awards, or otherwise settle a dispute.
- Total Claim Amount (\$)** – The amount claimed by the party who initiated the claim (plaintiff).
- Total Counterclaim Amount (\$)** – The amount claimed by the party who did not initiate the claim (defendant).
- Transactional Costs** – Sources of cost that are incurred because of the presence of a dispute including direct costs (such as fees and expenses paid to lawyers, paralegals, accountants, claims consultants, and other experts), indirect costs (such as salaries and associated overhead of in-house lawyers, company managers, and other employees who have to assemble the facts, serve as witnesses and otherwise process the dispute), and (to the extent they can be measured) hidden costs (such as the inefficiencies, delays, loss of quality that disputes cause to the construction process itself, and the costs of strained business relations between the contracting parties). Transactional costs do not include monies paid out in “settlement” of a dispute because these are, in general, amounts that have been recognized as being owed.

Appendix E – Web-Based Survey Screenshots



General Information Form

Your project ID is: DISPUTE1129

1) Project Location

a) City:

b) State: Choose a State

2) Owner Type:

- Public
 Private

3) Facility Type:

- [Civil/Infrastructure](#)
 [Commercial/Building](#)
 [Industrial](#)
Other

4) Project Type:

- Greenfield
 Expansion
 Renovation
Other

5) Contract Type:

A) Fee Arrangement:

- [Fixed Price](#)
 [Cost Plus](#)
 [Guaranteed Maximum](#)
Price
Other

B) Scope of Contract:

- [Design-Bid-Build](#)
 [Design-Build/EPC](#)
 [CM at Risk](#)
 [Subcontract](#)
Other _____

6) Contract Amount (approximate \$): *(Please enter numbers only, no ", "\$" or letters)*

7) [Alternative Dispute Resolution](#) Language in Contract (check all that apply):

- [Partnering](#)
 [Negotiation](#)
 [Mediation](#)
 [Arbitration](#)
 None
Other

Save Changes

Reset This Page

Project Schedule Information

Your project ID is: DISPUTE1129

8. [Project Start Date:](#) (MM/YYYY)

9. [Project Substantial Completion Date:](#)
(MM/YYYY)

10. [Project Final Acceptance Date:](#) (MM/YYYY)

11. Project duration was

- Less than 95% of the last agreed upon length
- Between 95% and 105% of that last agreed upon length
- Longer than 105% of the last agreed upon length

12. How many [disputes](#) did you have on the Project?

13. For the biggest dispute on the Project, what Percentage of Completion had been achieved by the [Date the Dispute First Occurred:](#)

- Project less than 20% complete
- Project between 20% and 40% complete
- Project between 40% and 60% complete
- Project between 60% and 80% complete
- Project more than 80% complete

14. For that dispute, what Percentage of Completion had been achieved at [Date of first formal Claim Notification:](#)

- Project less than 20% complete
- Project between 20% and 40% complete
- Project between 40% and 60% complete
- Project between 60% and 80% complete
- Project more than 80% complete

15. [Dispute Settlement Date:](#) (MM/YYYY)

Save Changes

Reset This Page

Project Dispute Information for the Largest Dispute

Your project ID is: DISPUTE1129

16. Please give a brief description of the subject matter in dispute:

17. Parties to the dispute included (check all that apply):

A. Disputing Party 1

- Owner
 General Contractor
 Designer/Architect
 Subcontractor
 Surety/Bonding Agency
Other (please specify)

B. Disputing Party 2

- Owner
 General Contractor
 Designer/Architect
 Subcontractor
 Surety/Bonding Agency
Other (please specify)

C. Additional information (if necessary):

18. Rate your perceived complexity of the dispute (check only one)

- Simple
 Moderately Simple
 Average/Normal
 Moderately Complex
 Complex

19. Dispute resolution process(es) attempted prior to settlement:

- [Mediation](#)
 [Arbitration](#)
 [Mini-Trial](#)
 [Litigation](#)
 [Dispute Review Board](#)
 [Negotiation](#)

Other (please specify):

20. Dispute resolution process that achieved Final Settlement:

- [Mediation](#)
 [Arbitration](#)
 [Mini-Trial](#)
 [Litigation](#)
 [Dispute Review Board](#)
 [Negotiation](#)

Other (please specify):

21. Total Claim Amount (\$):

(Please enter numbers only, no ", " "\$" or letters)

22. Total Counterclaim Amount (\$) (if applicable):
"\$" or letters

(Please enter numbers only, no ", "

23. Transactional Costs incurred in resolving all disputes on this Project (information for one party only):
 (Please enter numbers only, no "," "\$" or letters)

A. The below costs are for (check one):

- Owner
- Contractor
- Subcontractor
- Other (please specify):

B. Outside counsel fees (\$):

Don't Know	Wild Guess	Rough Estimate	Careful Estimate	Definitively Known
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

C. Allocation of a portion of in-house counsel salary and benefits (\$):

Don't Know	Wild Guess	Rough Estimate	Careful Estimate	Definitively Known
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D. Outside consultant and expert witness costs (\$):

Don't Know	Wild Guess	Rough Estimate	Careful Estimate	Definitively Known
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E. Management and staff salary and benefits allocated to support the dispute resolution effort (\$):

Don't Know	Wild Guess	Rough Estimate	Careful Estimate	Definitively Known
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

F. Filing fees, arbitration/mediation/court fees, etc. (\$):

Don't Know	Wild Guess	Rough Estimate	Careful Estimate	Definitively Known
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G. Other transaction costs of dispute resolution (\$):

H. Cost Comments:

24. Settlement amount paid to resolve the largest dispute (\$):
 no "," "\$" or letters)

(Please enter numbers only,

Settlement Paid to Whom

- Owner
- Contractor
- Subcontractor
- Other (please specify):

25. If the dispute was resolved short of trial by mediation, facilitation, mini-trial or any other ADR procedure, please estimate the transactional costs (same breakdown as above) that were SAVED or AVOIDED by not proceeding to trial or award;

- A. Outside counsel fees (\$): (Please enter numbers only, no ", " "\$" or letters)
- B. Allocation of a portion of in-house counsel salary and benefits (\$): (Please enter numbers only, no ", " "\$" or letters)
- C. Outside consultant and expert witness costs (\$): (Please enter numbers only, no ", " "\$" or letters)
- D. Management and staff salary and benefits allocated to support the dispute resolution effort (\$): (Please enter numbers only, no ", " "\$" or letters)
- E. Filing fees, arbitration/mediation/court fees, etc. (\$): (Please enter numbers only, no ", " "\$" or letters)
- F. How much different do you realistically believe the final award or judgment would have been, (the amount that you would have paid or received) had the matter not been settled and proceeded to trial or award? (Please enter numbers only, no ", " "\$" or letters)

26. Other Comments :

Save Changes

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Appendix F – Semi-Structured Interview Question Sheet

Quantification of Transactional Dispute Resolution Costs in the Construction Industry

Semi-Structured Personal Interview

Background:

The construction industry is generally acknowledged as the world's most litigious industry with one industry study citing nearly \$5 billion in annual expenses on litigation and arbitration in the United States alone. Yet no empirical data exists on the transactional costs for resolving disputes throughout the full spectrum of dispute resolution techniques. Inevitably, resolving a dispute costs all parties money, not just the amounts paid to settle the dispute, but also the "transaction costs" of processing the dispute: lawyer fees, experts' fees, management time, etc. This study is part of an ongoing research project at the University of Texas at Austin sponsored by the Center for Construction Industry Studies (CCIS) with encouragement from the National Academy of Construction, the American Arbitration Association's National Construction Dispute Resolution Committee, and the CPR Institute for Dispute Resolution.

Purpose:

This research will attempt to quantify the costs associated with disputes in the construction industry using both quantitative and qualitative data sources in order to achieve four main objectives.

1. Provide objective criteria for use in universally evaluating the effectiveness of dispute resolution methodologies in the construction industry.
2. Quantify the transactional costs associated with multiple dispute resolution methodologies in the construction industry.
3. Evaluate the cost effects of construction disputes and construction dispute resolution methodologies on the parties in dispute.
4. Recognize successful methods for reducing construction disputes and their costs.

Interview Overview:

The interview is expected to take approximately one hour to complete. Questions will be on several areas including alternative dispute resolution, dispute impacts on projects, dispute prevention and minimization, and general dispute questions. Following the semi-structured interview, interviewees will complete the 26-question research questionnaire.

Interviewee Anonymity

The following conditions will be maintained:

1. The recording of this interview will not be placed in any permanent record, and will be destroyed when no longer needed by the researchers.
2. The identity of the interviewee will remain anonymous, and any and all information obtained in the course of this interview will not be linked in any way to participants' names.

Permission to Audiotape Interview

We want to be sure that our report is as accurate as possible. With your permission, we'd like to audiotape this interview; this allows us more time for dialogue and minimizes the time required for written notes. You can choose to discontinue the tape-recording at any time during this interview, and/or to request that portions of it not be used in any way. The tape will be completely erased once it serves the interviewer's purposes. Your identity will remain anonymous.

Quantification of Transactional Dispute Resolution Costs in the Construction Industry

Participants: Interviewee: Interviewers:	Research Project:
Type: Interview appointment	Expected Duration: 1 Hour
Date:	Place:

Interview Questions

Section 1: General Dispute Questions

1.1 Quantity and magnitude of disputes in the industry (5 years ago vs. now vs. 5 years in future)

1.2 Role of lawyers on construction projects

1.3 Factors that affect dispute resolution decision making (e.g. – how to resolve a dispute)

1.4 Disputes are (are not):

1.4.1 A problem in the industry

1.4.2 A profit earning opportunity

1.4.3 Inevitable

Section 2: Alternative Dispute Resolution (ADR)

2.1 Familiarity with ADR options

2.2 Usage of ADR options

2.3 Importance of dispute resolution procedures in contract

Section 3: Dispute Impacts on Projects

3.1 Cost impacts

3.2 Schedule impacts

3.3 Other impacts

3.4 Methods in use to measure or quantify the impacts of disputes

Section 4: Dispute Prevention and Minimization

4.1 Things to prevent disputes from occurring

4.2 Things to minimize/manage disputes when they do occur

4.3 Things that almost always signify that a dispute is imminent

Section 5: Transactional Costs

5.1 Rank order the following categories into most significant (1) to least significant (5) in terms of overall cost for resolving a project dispute:

- a. Outside Counsel Fees
- b. In-house Counsel Salary and Benefits
- c. Outside Consultant Fees and Expert Witness Costs
- d. Management and Staff Salary Allocated to Support Dispute Resolution Effort
- e. Filing Fees, Arbitration/Mediation/Court Fees, etc.

5.2 Identify other items that are not easily quantifiable but are of equal or greater importance in deciding what the true cost of resolving a dispute totals

a. Business Relationships _____

b. _____

c. _____

More:

Appendix G – Contractor 1 Interview Transcription

Q: I just wanted to get an overview in general disputes of where you think the disputes are in the industry compared to the past and the present and where it is going. Is there more, less?

A: I think there are more disputes in the industry currently. I think that lawyers are getting more aggressive as far as pursuing suits and I think that there is a huge issue with lawyers approaching suits from trying to gain access to insurance proceeds. So they can make up a claim, they can make up a suit, and they can sue 4 or 5 different parties, and people will do anything instead of court. And the attorneys know it. And so they can generate some fees and in the end, bring a bunch of parties to mediation and the insurance company is going to write the checks - just because they don't want to take it any further.

Q: Do you think that trend is something that will go into the future?

A: Absolutely, and unless there is some preventative measure and I don't know what that is going to be. You know, lawyers are just a bunch of scoundrels I have found. You know they are very unethical and they really don't compete for business, they create their own. They create chaos in order to promote their own business. At \$350 an hour, what the hell is going to stop them?

Q: That kind of rolls into the next question. Do you see a role for lawyers? Is there an increasing role that lawyers are playing in a project? You say that they are trying to dig into these insurance monies, is there are role that they should play.

A: Sure there is a legitimate role for lawyers in contract negotiations and even in mediating a dispute. Or even getting involved - you know I've got a lawyer that I will run different issues by her and strategize on what we want to do and how we want to do it. But really it is the litigious lawyers that create cases. Like the whole mold problem, there is no way you can quantify mold and the effects it has on a building. We have one case right now where we are using a bunch of professors at UT as expert witnesses. And they ran the building negative with about 3000 cfm of outside air because they never ran the make-up unit for the hood for the kitchen vents. And now they are having some mold problems. What they did was pulled the building negative and the broke the seals of all the windows, from Pella windows. Because it is 3000 cfm and it is a lot of outside air that would have been made up. And we thought that there was a window problem when the windows starting leaking. It wasn't until 2 years later that we realized that they weren't running the make-up air unit. But that is an owner-operator issue. It has now parleyed into a pretty sizeable lawsuit that didn't need to happen. But they are going after everybody and it was there own problem, their operator error that caused all the problems.

Q: The next question, what are some factors that you as a company look at for what decides whether you are going to after or pursue a dispute or whether you are going to try to resolve it early? What are some of the business decisions that you include it that decision making process?

A: I think you need to get beyond the principle of the matter because principles... any decision you make to get an attorney involved is going to be a financial concern. Normally, my decision matrix will largely be due to what kind of financial impact will this have on the company and what type of liability do we have here? And how can I minimize and manage the risk. I was supposed to go to court a week ago on a case where I had about \$160,000 into a pool contractor that never finished the job and of course the attorneys spent about \$30,000. And the week before we went to court, she [the lawyers] said, "maybe we should do an asset check and I will get a private investigator and I will hire him and we will do an asset check." And the guy came back and said, "You know, they don't have any assets." And I said, "Damn, it would have been good if you had called him \$30,000 dollars before this, wouldn't it?" The case was there two years while she screwed along. To find out this information on the front end, I never would have pursued it. You know you can't take the guy to court on the principle of the matter and say you know, "You screwed up." That would have cost me additional money and so I just had to fold at that time.

Q: Do you think disputes are a problem in the industry?

A: Huge.

Q: Do you see disputes as a way to potentially make money, or do they always cost money?

A: They cost much more... they cost us a considerable amount of money.

Q: Do you think disputes are inevitable, that they will always happen? Or are there chances to avoid them?

A: I would like to know more about dispute resolution techniques and having spent hundreds of thousands of dollars of legal fees I; I would like to learn methods for dispute resolution up-front and try to avoid the legal cost. They are some attorneys that are going to try to drive up the cost, drive the case.

Q: Going to the next issue, which is on ADR, Alternative dispute resolution, how familiar are you with the different types, which is the second part, have you used those? Examples are mediation, arbitration. You said you were familiar with litigation.

A: I have used mediation before, several times,

Q: What about arbitration?

A: Never been to arbitration.

Q: And you have had to go to court you said for some cases?

A: Yes.

Q: Have you had any experience with mini-trials, or dispute review boards?

A: No.

Q: Do you think that the dispute resolution section in the contract something that you review upon bid? Is it a big factor, or is something that you don't worry about till the end or until you have a project.

A: Well we figure out if there is an arbitration clause in the contract and what are the terms there in terms of cost. And there are contracts that when they don't want to arbitrate, they want to use legal channels. So we will go to court. It

is a provision that you have to be aware of up front and understand what you are signing up for.

Q: Do you think that affects you bid?

A: No, it really doesn't affect going in. You know we try to avoid litigation and we try to the best we can to ensure that we wouldn't end up in court.

Q: Ok, this next section kind of gets into what we will talk about in the actual survey. For the cost impacts, stuff that you see actual monetary costs for when you have a dispute, what are the general areas that you either keep track of or know that there are costs? For instance, we talked earlier about lawyers being a big fee, what are some of the other things?

A: Lawyers are big fee. Forensic investigation. Project management time. Administration time. Documentation time. Meeting time. Lost business opportunities. Repair work by carpenters. Investigate if there are actual damages.

Q: Schedule impacts? Do you have disputes that generally cause things to be pushed out?

A: We have a problem with the subcontractor and the subcontractor doesn't finish the contract. That is a cost impact. Are you taking the work over for the subcontractor and what is it going to cost you to do that? How is that going to impact the schedule overall.

Q: And also once the project is closed out and there is a dispute does that affect other project. Possibly where you will have to pick people off of one job to go back and to do some kind of repair work or investigation work or some project management time.

A: Right, Yes.

Q: Do you currently use any particular things to the costs that you spend on resolving disputes.

A: We have a job cost reporting system. We track the costs that we spend on impact of disputes.

Q: Do you set up the cost codes before a dispute happens or as they happen?

A: After they happen we put all the costs into one cost code, so we can get a damage model established.

Q: Things you can do to prevent disputes from occurring we kind of covered earlier, about learning some of the other techniques, is there anything that your company does in particular that you do to prevent disputes from occurring or manage disputes once they do occur.

A: With the experience we have had, we will go out of our way to check waterproofing in projects, be more careful in looking at plan details in projects. We are probably better negotiators, trying to sit down at the table to see if we can come to some type of agreement early before it gets out of control.

Q: Is there anything that signifies to you that something on a project is going to turn sour, that a dispute is imminent, some tell-tale signs that you look at?

A: Well, subcontractor performance may be one. Whether a problem occurs when an attorney gets involved, you don't really know the true motives and

the true agenda of the attorney and either they may say that they are there to try to mitigate damages, they have all the incentive to crank the case and churn it.

Q: Section five is the main categories that are part of our survey for collecting data on transactional dispute costs. Can you rank order them one to five for what you think the most significant items are in terms of total cost.

A: Outside counsel fees would be one, maybe even zero. I say inside counsel fees would be four. I say outside consultant fees and expert witness costs would be two. Management and staff salary would be three. Filing fees, arbitration/mediation/court fees would be five.

Q: Those are the ones that we are looking at in order to quantify. Are they other things that are not quantifiable? That is of equal or greater importance in trying to resolve disputes. We talked about one I wrote down already, business relationships with maybe an owner or sub.

A: That is all lost business opportunity. They are hard to quantify, but you are putting all your money into fighting a fire and not out chasing new business. Repairs and repair work are others.

Appendix H – Contractor 2 Interview Transcription

Q: This is some dispute resolution stuff, so in the first section it is just about some general disputes. Question one addresses the quantity and magnitude of disputes, 5 years ago, where you think it is now, and where you think it is in the future?

A: I definitely think that it's getting worse. You know, I think a lot of the projects are becoming more complex and somehow time has become more the most precious commodity in the world and because of that on the contractors side of that we are being asked to do more than can humanly be done in the amount when giant penalties and so, the short comings on the design end that then effect our building progress, besides our own issues about finding good help and weather and all those are ripe for claims because when you are put into those scenarios of being penalized great sums of money, you are going to fight tooth and nail for time and then every issue has to be disputed because if time is not granted and/or cost as well, so I really think the trend is getting worse because somebody just really tightened the screws down on time a couple of few years ago and not let up.

Q: Ok, the next question is on the role of lawyers on a construction project - when you might see that they are needed or are useful or when they might not be.

A: Well, you know when you start talking about lawyers, you unsheathed your sword. So, it is not something you should take lightly because they might

have a bigger sword than you. I can't remember what direction you wanted to go with this question.

Q: What use do you see for lawyers, either at the end or at the beginning, for contract stuff? I mean, do you run your contracts by a lawyer to have them read through things or do you have them involved in the negotiation process.

A: Well, when you talk to our lawyers for instance, we have some very good construction lawyers; you know they kind of rap us sometimes for not having gone to them in that pre-stage. We have had our general-subcontract run through them, but we don't specifically run each one. And there are some questions of indemnity that we do call and ask them. You know it is unfortunate that we usually don't get them involved until we are ready to have conflicting issues with somebody or already have them and are ready to step it up to a bigger level. So, personally I think if more lawyers were more intimately educated about the process then there would be a lot less hassles through the construction process. It is just they are such an outside resource rather than an integral resource. Now, bigger companies have in-house counsel and they would have a better understanding of guiding the process. Most of us aren't big enough to have in-house counsel so you know, we look at the cost and we don't utilize them until we are in trouble.

Q: OK, the next one talks about factors that affect dispute resolution dispute resolution making. This questions kind of addresses what factors do

you look at, as far as, whether you are going to settle at a certain time or whether you want to pursue it further.

A: Well, first thing is, "is this a one time relationship, or is it going to be long-term." Certainly, if it is going to be long-term, you need to be more willing to compromise then if you are never going to have this relationship again. And then also, the severity of the difference is also a part. Are they setting us up for some grand loss? If it is a minor hiccup as far as cost or time goes then you know we are a lot more willing to compromise and/or avoid any type of dispute resolution outside the job site. But, if it is more significant dollar-wise then you know we still prefer to keep it in the realm of project management group depending on the tiers that the owner has. We try to avoid even the first step of what might be their formal process.

Q: Next question. Do you think disputes are a problem in the industry?

A: Yes

Q: Do you see disputes as a profit earning opportunity?

A: No, disputes take a lot of energy. They take a lot of focus away from your core business. Although, it is usually a response to a situation that you have already gone in the hole on. So, we look to it as a recovery not as a money making situation/scheme. It is just so counter-productive. Any type of change in a project, to me, is just counter-productive. Some of them present opportunity, you know not including brining claims, but that chance is so rare. It is usually any change is another obstacle.

Q: Last one in this section; do you see disputes as inevitable? Are they always going to happen?

A: Well, because of how people are, you are always going to run into certain individuals that don't understand our business and don't understand the circumstances we get put into, and/or believe in being confrontational. So, it is inevitable. You are going to have disputes. It is unfortunate that they can't be resolved at the first and second tier-level.

Q: The next question is on some ADR items. How familiar are you with different ADR options? What ADR options have you been party to?

A: I don't know what all the different options are, but what we have seen are mediation and arbitration. Those are what we put in the language of our subcontracts to avoid going to court. Some of the municipal entities have a board that you go to prior to any arbitration. I think that is a better set-up. We like to bring in the management people - more or less the top dogs listen to it and make a decision. As long as after that there is an option to go to court and/or the next level of mediation and/or arbitration then lastly law suits. There should be that run. You know that there are entities that say you need to meet with a panel of a couple of our people and that is final. Then, we will go to the courts. You know I believe most issues can be resolved, if there is not death and financial ruin involved, most issues can be resolved at the owner level.

Q: What ADR options have you been party to?

A: We have gone through mediation, and municipal boards. We are in arbitration right now, but it has been a very lengthy process. We are right now

choosing an arbiter. You know again, I will probably have a comment on the process afterwards, but it may force us to settle before it gets to this. It is better than going to court, but this is our first time in it.

Q: It is not as nice as some of the other methods?

A: Yeah, the other ones you just talk and make a deal and then go home.

Q: The importance of the dispute resolution procedures in the contract. How do you look at that and how important do you see that as a factor to negotiate with the owner.

A: We do so much public work and we have no opportunity to negotiate. You could in the private side. Certainly, we read through these provisions. If there is language that we have no recourse then we just have to make the decision not to bid. On the private side, we generally try to stick with AIA documents or some other kind of entity that we respect and the language is going to allow fair play in dispute. It could make a difference whether we do business with someone, but we do not necessarily have the opportunity to change the way they see the process.

Q: Section three is on the impacts of disputes on projects. What are some of the cost impacts of disputes on projects? What are some of the schedule and other impacts of disputes also?

A: Like I said, change period disrupts the continuity of work. It is continuity that gives us our success. Predictability comes from continuity. You know the whole process; if it can be continuous by predictability then everybody usually comes out alright. The problem is when there is change is that you have

to stop. And when you stop some element of your construction, something else gets stopped and the whole coordination effort is disrupted. And then the pricing of that change, if it is due additional cost, it is usually regulated. You can only mark it up so much, it is scrutinized. You are more apt to create animosity over \$2000 change because of what you can and can not mark-up. The job had received no benefit other than, yes as a contractor you might get compensated for a cost we shouldn't have incurred, but it is the process that does long-term damage. So it hurts the schedule, because it is very hard to keep putting off and putting back the following players. The players that are coming to bat because the resolution is unknown and/or you keep changing. They have other work and other business and where they had you slotted keeps changing. Their flexibility is not infinite. So, it is not good - any type of change that is unforeseen. Somebody sees something and what to change it to make it better, as long as it is done in advanced and/or if change occurs and you have a team that agrees that we are going to solve this problem quickly and cost is not going to be the battle zone. That is the attitude that owners, architect/engineers, and contractors need to have to make a job go at the pace we are faced with on most of the jobs we are faced with any more.

Q: Outside cost and schedule area, what are the things project disputes might impact?

A: Well, it impacts cash flow for a contractor. If you get a bunch of disputes going on, or a bunch of changes out, you have probably done the work or incurred the cost and then waiting to be paid. Again, the relationships begin to

deteriorate. The morale of not only the contractor's people but also the owner's people begins to deteriorate. So then, everybody starts looking for other reasons to be unhappy and pretty soon, it can happen pretty quickly. It is a cancer that spreads pretty quickly.

Q: The last question in this section - what methods are used to measure and/or quantify the impacts of disputes as far as a business perspective?

A: Well, in our phase codes for our financial reporting, our internal system, we set-up individual codes to charge time to individual elements that we think are going to be extra cost. Or that we think we should separate into different items that we might try to negotiate with. I don't know if that is answering your question or not.

Q: I think it is, but I have a follow-up question. When do you establish those codes?

A: It is an ongoing deal, I mean training people to recognize what is the scope of our work. It is that point, when we leave our scope of work that we try to train people to request a phase to isolate the costs that could go into that. It could end up being a cost that we should have born, and we may never collect. It is at least available that way. It is much harder to go back. Then you have your administrative people working backwards trying to find and agree on what happened. You get so many elements going backwards that it is very hard to get that direction when you are on a forward moving ship.

Q: The next question is on dispute prevention and minimization. What things, in your experience, permit disputes from occurring at the job site?

A: Well, we used to have partnering for awhile and that was a buzz word. We would have partnering meetings and I guess unfortunately they had a whole bunch of gimmick things going on including facilitators. You know after you had been through a one or two-day session of partnering meetings, it got to where it became a waste of time. So it kind of threw partnering in the wrong direction, but the whole thing starts with people believing that if we put our heads together as the owner, as the consultant group, and as the contractor; we can resolve the issues. Owners believe that we [contractors] make our money on change orders. So owners think they are a good owner if they prevented change orders. That puts the consultant group in a bad spot. Often change orders occur because of a lack of coordination on their effort. So unrealistic expectations are hard and a partnering atmosphere has to be there. You hope that the owners and the other entities have experience in that to believe in that because that is the first line. The second one is to really, thoroughly go through the requirements of the work and recognize in advance what is missing. Give architects an opportunity to correct those mistakes before it is a hot item and raises a red flag to the owner which puts them in the hot seat. Then you have allowed for a better resolution for that problem without it backfiring because if you embarrass the architects and engineers by throwing something up that makes them look bad, then the next thing you need, when you as a contractor make a mistake, is to expect them make

a quick resolution to an issue is not going to happen. It is a long answer to a short question, but that whole idea of cooperating and everybody intending to be quick to resolve things is so important. And I am seeing less of it again.

Q: What are things that you or your company uses to minimize the impacts of disputes when they do occur?

A: Well, we try. We just had a specialist in here for 10 days and we are trying to better documenting it without emotion, pressing the issue, and seeking resolution. We can do a lot of documentation that we know in a court case would look good, but if you don't get the answers from that, from RFI's and such, then what good does it do you? The best thing to do is to press and get the answers you need, move forward. So, recognizing earlier and being prompt in notifying, and following up to receive the answers is kind of what we are trying to better at.

Q: Are there any tell-tale signs, or anything you look for to know when a dispute is eminent on a project?

A: On one project of late, when things become delinquent and you start to see answers, return of submittals; and you begin to hear the animosities between the owner and the architect/engineer group. Then from a contractor's perspective, we know that is all going to go down hill and we can see that late returns of submittals can have an effect. But, who is going to take the brunt of that? So we then begin to look towards our schedules to show those impacts. Rather than, saying, "Yeah, you returned those submittals 21 days instead of 14, but you know we don't want to piss you off so we won't say anything." And later, the fact that it was late and had to be resubmitted and didn't come in on time, or was wrong.

Then we are the bad guy when those 7 days might have cost us 30 days. So, we are trying to being more practical and say, "look guys, it has been 14 days and unemotionally say, you are late." Because you can't predict which items are going to be the ones that put us in the hot seat. It is done with the intent of partnering, but it is no different than an inspector or someone notifying us of a deficiency.

Q: This next question is actually a ranking one. It has 5 different items, and these relate to the 5 different categories of the survey that we will look at in a few minutes. Please rank from 1 to 5, where one is the most significant and 5 is the least significant in terms of cost. They are: outside counsel fees, in-house counsel costs, outside consultant fees and expert witnesses, management and staff salary, and finally filling fees/arbitration fees.

A: Management and staff salary is number 1. That is the most significant. There is just no doubt. It requires so much backpedaling to gather information, to plan strategies, and to do all the pricing. I would say the number 2 is outside counsel fees. Three would be outside consultants. And then, I think finally filling fees and arbitration fees would be number 4. I can't comment on in-house counsel fees because that does not apply to our company.

Q: The last question is are there other items besides these that are not easily quantifiable but are of equal or greater importance when deciding what the true costs of resolving disputes are? A started answer to the question is business relationships. What are some of the other things that

you factor that aren't necessarily hard dollars that decide what the cost of the dispute resolution process will be on a project for your company?

A: Morale is certainly one. As a group of people, as a company, as a whole, as individuals, you are liable to lose good individuals out of their frustration and out of your frustration with them. So, morale definitely shakes up a group and how tight they are. The business relationships, I mean there are people that we will not do business with even if they are friends because of disputes. So, it gets into your personal life. These types of disputes affect people's personal lives. They affect your sleep; they affect your family relationships. So, it is a pretty widespread problem when you have a significant dispute that reaches out to a lot more people than just the ones that are at the job.

Appendix I – Lawyer 1 Interview Transcription

Q: Question 1, can you talk about the quantity and magnitude of disputes in the industry, 5 years ago versus now versus 5 years in the future?

A: It is hard for me to say anything about 5 years ago since I wasn't practicing law 5 years ago, but in five years, I don't know that I have necessarily seen all that much of a change in it. It is real easy for people to say that disputes are more common now. And maybe there are, I don't know. It is hard for me to say that. I will say this, as far as the number and type of things people are going to raise a fuss over and file suit over, I don't think that has really changed. Although, like I said, I can't speak to what was going on five years ago and I don't notice a change even within three years, but I will say this, there are a lot of cases that lawsuits are filed over a small amount of money, over very small issues - things that are maybe probably less than \$5,000. And I would say some less than \$2,000. And, I get those clients that will come in and think about file a suit or filing a lien for a couple hundred or a couple thousand dollars. So, as far as the type of case and the magnitude of case that will be pushed through to a dispute those seem to be getting smaller. As far as the number and the types, I couldn't tell you.

Q: Ok, as far as the future, do you see much change?

A: My prediction is that it is going to come to a climax and turn and go the other way. People are more litigious now. People are more likely to take after someone else for a problem than anywhere, since a long time ago, say 15 years

ago. I think that people have made a business decision to hire lawyers even though they hate it; and just go fight disputes. So, I think that disputes will continue to increase until some point where it will just unyielding and overwhelming and people will finally back away from it, or the legislature does something about it, like they have done with tort reform. In the foreseeable future, I don't see it subsiding just because people have begun to feel better about things. I think if it subsides, it subsides because of the amount of work subsides or the economy slows down. Which doesn't necessarily mean litigation slows down, sometimes it means it goes up, but when there are fewer projects out there that there are less overall disputes?

Q: How do you see the role of a lawyer on a construction project at any stage - either from very early on before a projects starts or wherever? Where do you see lawyers playing crucial roles?

A: I have a friend of mine who actually graduated from law school and I didn't know the guy was interested in construction law at the time. But, he went straight to work for Austin Commercial straight out of law school which I thought was pretty interesting. They have him working out in the field and I think he is basically kind of a glorified project manager. But, the thing about it is, that is a cost. And I have talked to other contractors about whether or not they thought it was a good idea. They disagree because it is expensive - putting someone expensive like that out in the field that is not making you money in the sense that you are not pushing the work forward. Although, I don't know what he is doing. At the same time, I think it is a benefit to Austin Commercial because here is

someone who has a law degree, who obviously is not afraid of writing a lot which I think in this industry when you get up with the big guys you are playing for big time stakes and big time projects. You need someone who is conversant, who can write well, who understands the issues and who can articulate that in a letter. It is all about what you can put in paper and prove at the time, and so, having a lawyer in the field writing letters on change orders or safety violations or disputes about scope of work or whatever, I think that is a huge benefit to them. So, I think as things get more litigious and people recognize and accept that disputes are going to become part of business, I think they will start putting lawyers, the bigger firms, will start putting lawyers in the field, or at least in the office to deal with things on a day to day basis. I don't think the majority of people are at that point yet, just because you have another mouth to feed and profits are pretty slim right now. But, I think eventually they will. So, that will change the role of lawyers in that deal. I think lawyers that practice law in this area will, as they have done in other areas like technology, IP stuff, and commercial transactions, I think some lawyers, while it is still a pretty small construction bar, I think some construction lawyers will leave practice to go into construction. Just because I think there is a natural trade-off. I mean if you work with an industry, you go to work for that industry. So, I think there are going to be some changes, and I know at least one lawyer who has done that.

Q: Just as a follow up to that, what are the primary areas that you, lawyers at this firm, get called in?

A: Ninety percent of our work is after the fact. Now, I have one client that I got an email from today who came to us ahead of time, which is very atypical. I mean he is young; he is 19 years old. He is a developer contractor, but his parents have money and he wanted to do this, so they helped him get started and they said you need to get a lawyer. They are pretty sharp. And so, he came to us to draft all of his contracts and help him set-up his business and get going and doing all that stuff and giving him advice on how this thing is going to work. So, every once in awhile contractors, architects, and engineers to some extent, come to us at the front of the project to get advice. Let me give you another example. I would say that 90 percent of it is after the fact, and five to six percent is for contract drafting. And then I would say the remainder is calls about disputes that are starting to take place or change orders, or some complex has occurred. And I would say that not many of those turn into full-fledged disputes and I don't know if it is because they called us, but I think it really is because there is somebody out there in the field that there is a problem. And they have the foresight to call a lawyer, and this type of person is someone who is likely to make something happen that will resolve the issue before it becomes a full-fledged lawsuit.

Q: What do you think are the major factors that affect dispute resolution decision making – both from your point of you and also from your client's perspective? What are some of the main things that play into the equation of whether to pursue something at all?

A: Personality, people who have the personality that they have too much pride involved in the project. Typically, if it is a person who was involved in the day-to-day process or has personal relevant experience in the project itself and they made decisions that may or may not have resulted in the dispute, those people are less likely to give any ground because they have made a decision that they feel is right. And they are less inclined to settle to resolve the dispute. If somebody comes in above that person that doesn't have a personal investment in that project, it seems like most of the times reasonable minds will prevail and there will be a settlement. So, I think personalities and ego. I think the climate of the market. If the market is hot and there is a lot of work, it is easier to convince a client that it is not worth spending money on lawyer when they can go out and just walk away from it and go make money on another project. The other side of that is that the other party in that dispute feels the same way and so it is easier to reach a compromise. You know, you can split the difference on whatever the dispute is because both sides knows that they can go out and make more money. So, the climate of the market is also important. If things are slow and this is the only job they've got - people are more likely to do it. Also, the size of the dispute is also obvious. I mean as the number gets higher and higher. It is not an absolute number; it is kind of a percentage of the revenue and profits of the company involved. And as the number gets higher, obviously, people have more at stake. And then the lawyers, if you have good competent experienced lawyers, you can get those disputes resolved pretty quickly. But, I think it kind of goes

back to personalities. I mean if the client doesn't want to settle, it is hard to force it on them.

Q: These next three questions are all grouped together, and I would like you to talk to each one. The first one is - Disputes are (not) a problem in the industry.

A: I think they are in some areas. It is hard to say because we see a lot of the disputes. But, I know there is a large percentage of disputes out there that don't have disputes; disputes that we don't see. So, I would have to say in general, that it is not necessarily a problem in the industry, although industry professional would probably tell you otherwise. I think everyone in construction knows that it is a litigious industry, but it is complicated. There is a lot of moving parts; there is a lot of money involved. So, that leads itself into being a dispute-prone industry. But, like I said that there are a lot of projects out there that work well. The big contractors who are sophisticated, it is either because they are sophisticated or because they continually get big projects and can control a lot of their subcontractors and can head off these disputes and they never end up in litigation. So, I would say in some areas where you are dealing with small subcontractors, who don't care about future repeat business with an owner or a contractor, it is a problem because they don't have anything in it and they don't have anything to lose. Those people will fight disputes over nothing until the bitter end because they have nothing better else to do. So that could be problem.

Q: The next statement is that disputes are or are not a profit earning opportunity.

A: They are a profit earning opportunity for the lawyers. Very rarely does, or have I seen, contractors actually get their profit from or as a result of prosecuting their dispute, although it does happen. We just finished up a case in here where that probably happened. Although, they lost money, they still got a lot more than they thought they would realistically get. So, that could have turned into a profit earning deal for them, but I would say that very rarely happens.

Q: Disputes are or are not inevitable.

A: That is absolutely true. They are inevitable.

Q: The second section is just on ADR in general. What is your familiarity with ADR options?

A: From my stand point or from the contractors?

Q: Let's talk about both, you and the contractors and link questions 2.1 and 2.2 together where we will talk about familiarity and use of the different methods.

A: I am pretty familiar with all the options. The two main ones are arbitration and mediation. I know there are a lot of hybrids out there. I am not familiar with these hybrids. Most people do not elect to take part in those things. I have heard of people doing high-lows and I understand that. Those cases just haven't ever come through my office. But mediation and arbitration are pretty common. Obviously, they are written on every AIA contract and are more common in most contracts now. I think lawyers are very familiar with them and the construction industry is becoming pretty familiar with them. I think most contractors, now, have been through one or two or more mediations. Probably

less arbitrations, but they all understand that they are there and I think most contractors are putting those in their contracts. Under usage of the ADR options, like I said, I think they are becoming much more widespread. I think they are in every AIA contract. Contractors are putting them in their own standard-form agreements. So, the usage may be at an all-time high, and it may be going to almost exclusive ADR, although I am seeing a little bit of a pull-back from that. I think now that people have used it and gone full bore towards ADR and getting out of the courts, they are realizing: 1) Arbitration is not necessarily a less-expensive route. You have to pay the arbitrators, the arbitrators' fees. You still have lawyers' fees. The benefit of arbitration is that you are probably going to get somebody who has knowledge of construction deciding the dispute. Which is a benefit, but you have to pay the administrative costs, especially if you are using the AAA, and the dispute gets more expensive and the claim gets bigger. The costs of administrating that claim go up. AAA makes a lot of money off of that. So, that is expensive. Also, if you have a three person panel of lawyers or people with construction experience, that is expensive. If you are going to trial, you have a judge who is paid by the State, and that makes it cheaper. Usage is at an all time high. There may be some pull-back and I think at the same time, I think it has kind of flat lined probably at this point because everybody that is going to do it at this point is probably already doing it, and some people who aren't are going to go to ADR and the people at ADR and who have done it a lot may be starting to pull back - so it may just even out.

Q: Can you talk about the importance of dispute resolution procedures in the contract?

A: I think it is important. Not just ADR, but also the dispute resolution procedures in the contract are important. This is because disputes are inevitable. And, when the parties are cranking along on a project and something comes up, I think they all need to step back and look at the contract and see what they need to do. It happens a lot, where this is just typical for the construction industry, you have change order procedures, you have final payment procedures, you have release of retainage procedures, you have dispute and claim procedures. The farther it gets going in the heat of the battle, those things get lost and people forget what they are supposed to do. You have termination procedures and a lot of times that party that gets really upset will fly off the handle and write a letter that terminates the contract without bothering to look at the contract to see what they are suppose to do. I think it is important to have it. It is in there for a reason. I think contractors need to look at that before they sign the contract to see if it makes sense to them and if they are going to be able to follow that. It is a very onerous thing, where it is going to take them 10 days to send a letter and wait another 15 days for an architects response then another 10 days for an owners response, those things may not be realistic and they may want to change those. I think having a procedure in place and everybody knows they are operating on the same playing field is important to know going into the project.

Q: What have you seen as far as the cost impact of disputes on projects?

A: I think it can go one of two ways. I think a dispute should send up red flags that you are fixing to lose money. Those who decide to work through it and try to move on are going to recognize the least cost impact on their project. Those who decide this is a major deal and they are going to fight tooth and nail, I think almost necessarily means they are going to have a huge cost impact to their project. There is also anything in between. As soon as the dispute become apparent, you should immediately begin to think that you are about to lose money because almost everybody on both sides are going to lose money as a result of the dispute.

Q: What about the same issue for schedule impacts from disputes?

A: I don't know if it impacts the schedule in the same way. I think with the size of the dispute as it gets bigger will obviously impact the schedule more. If it is a major dispute over major scope of work and major changes, contractors will have a lot of reluctance to proceed with the schedule not having a clear picture of what they or their subcontractor are supposed to do. And so, as the size and scope of the dispute gets bigger, the more impact it is going to have on the schedule. A small dispute over whether or not this change or that change was included in my scope and whether or not I am entitled to a change order: most of the time, I would say, contractors and subs will continue doing the work and keep working out their with minimum impact to the schedule itself.

Q: Just as a follow-up, what percent of disputes do you think get resolved before the project is over?

A: Well, it is probably a sliding scale again. The larger the dispute, in terms of a percentage of the overall contract - if your dispute is talking about 50 percent of your contract or more - I would say that the chances that the dispute gets resolved before the completion of the project are pretty slim. That is the type of dispute where if it is 50 percent of your contract, you are probably not going to go forward without having a clear picture. If they kick you off the job, you are probably not going to have that resolved until the end of it. It would be hard to say a percentage that is a very difficult question. Smaller disputes typically get resolved during the project. I mean if you are talking about one over five percent of the contract price, I would have to say that 75 percent of those get resolved before the project is completed. If you have a dispute where you are not getting paid and you think you are owed more money, either the contractor or the subcontractor, what is going to happen is most likely you are going to file a lien. You will go forward with the project, you will initiate the dispute process or claims process, but you will probably file a lien. Well, you can close out the project until those liens are cleared. So, the owner gets involved, the architect gets involved; the contractor gets involved at the end of the project because the contractor wants retainage. Retainage will not be released until liens are cleared and most of the issues get resolved at the end. I would say that the majority of these kinds of disputes get resolved before final payment.

Q: Are there other impacts that you have come across that are major for projects or companies?

A: Well, it takes away from the focus of the company. Most companies are set-up do work, get work, complete work, and get paid. And, when you have the president of the company, the comptroller, whoever, or project manager screwing around with the dispute, that is going to take away time from when they could be doing something else. So, that is an impact. Obviously, the time you spend completing a project or working on a project is going to be hindered. And the time you might spend if you are the one going out there and getting new work, especially presidents of companies, if you are spending your time in depositions, or trying to resolve disputes by writing letters back and forth trying to get the thing solved, you are not out there picking up new work. So that is an impact. And then there is a lot of emotional energy that goes into it, especially when you get your pride wrapped up into it. You are going to get angry and upset about it and you are going to want to work on it all the time and you are going to lose sleep, and wake up in the middle of the night about it, and so that is an impact that a lot of people don't recognize at the time. Even when it is pointed out to them, they kind of dismiss it, but if you have a trial coming up in three months, you are going to be thinking about that and that is going to be an emotional drain on you.

Q: What have you seen for effective or ineffective ways to measure or quantify the impacts of a dispute?

A: Money. I mean I don't know how they quantify it.

Q: Have you come across effective or ineffective ways that people quantify that?

A: I mean with things like impacts on schedules and acceleration and things like that, it is always very difficult to do. And I don't know of a good way to do that, other than to keep track of your man-hours, what you have in the job, compared to what you actually did. Non-impact claims, I think are always quantified in money and I am not sure this is exactly the question, but maybe in some round about way it is. Most contractors that get in these disputes, the decision of whether or not to settle it up and for how much and what they can take away, compromise the claim, and move on, is always a simple function of math. It is just money - How much do I think I am owed? How much is it going to cost me to fight it? What can I settle for and not lose my skin? And it is a simple arithmetic. If it is going to cost more to get a number, then at some point, you are just going to have to give up and say I will take this and move on. So, that is the most common thing that I see, is that people just quantify it by numbers.

Q: What are some things that you and others are doing that are preventing disputes from occurring?

A: I think the starting place is the contract. And even before that, I think even knowing who you are dealing with. I will give you an example. I don't have personal experience in this, but anecdotally, the Owner A has a really good relationship with Contractor A, and whoever their project team guy is here in Austin. The Owner's office has some good relationship with Contractor A. Those guys know what each other is about and how each other operated and I rarely, if ever, have seen a dispute between the Owner A and Contractor A. I think it is because they know each other, because they know how each other

operates. They trust each other. They have a contract. They know what the contract says. They know what the contract requires of them to do. And this is not to say that Contractor A has never got into a situation where they thought they were owed more money from the Owner A. It just means that when Contractor A thinks that they are owed more money, they know the procedure. The procedure is to explain it to the Owner - go through the contract procedures because they are a stickler for following procedure, talking it out and making sure the other side understands that and moving forward and almost always I think they get it resolved. The other side of that is that they know who they are dealing with and Contractor A is not out to screw Owner A because they get repeat business out of the deal. I think being upfront with everybody, and a lot of time people understand that and know that, but they fail to execute on it because what they do instead is a subcontractor will think they are owed more money and what they think they need to do is get it to the contractor as quickly as possible and get in their face and say look here is what I think. And it begins a letter writing campaign. And, there is a lack of personal involvement or at least face to face conversation about the issues. And when you start these letter writing campaigns, more often than not, I am seeing these letters being read as insults, "I am in your face, and you are a liar." And that is probably one of the worst ways to resolve the dispute. So, I think clearly understanding what the contract is going to require of you; understanding exactly what the scope of the work is; who you are dealing with; and how exactly this project is going to proceed are probably the key things in getting the thing set-up and situated to minimize disputes.

Q: What are some things you can do to minimize or manage disputes when they do occur?

A: Yeah, I think calling the other side up and getting the two decision makers involved early on is key. Now that doesn't have to mean the presidents of the companies, it can be the project managers. But as long as the project managers have a good working relationship and at least respect for the other side, and you don't do it in an insulting way, talking through the issues. See the problem is that you get a lot of subcontractors who feel so strongly that whatever the contractor is asking them to do is so far outside of their scope that they get their backup and they start writing these letters insulting the general contractor for not knowing what he is doing. Well, that may be true, but if you are so adamant about that not being in your scope, then explain that to the general contractor in a way he explains that without being condescending or insulting. But at the same time, I do think you need to write things down and I think it needs to be clear from the record that this was something that you had not contemplated you doing. I think a lot of disputes can be minimized at the buyout stage and contractors are real bad about buyout, trying to get people to pick up other work that they probably didn't originally expect to have in their contract. Well, that is all fine and good as long as everyone understands. Generally, the subcontractor thinks one thing and the general contractor thinks another when they are buying out something. Who's picking up caulking and control joints or something like that? Well, you have to make sure your understanding that the flatwork contractor is probably not going to pick up control joints in the wall. But, when you say

division whatever it is in the CSI, you have control joints, everybody needs to be on the same page. And so, I think that is a huge way to minimize disputes. When they do occur, you have to get it in writing, and I think the procedures probably in the contract for submitting claims or whatever is a big deal, but not insulting the other side.

Q: What are some things that almost always signify that a dispute is imminent?

A: That is a hard one. I think a lack of communication. When people stop talking and start writing letters. Once you get to that point, you are probably at Code Yellow. The longer that proceeds, you begin to move up to Code Orange because if you are writing letters and they are responding by writing other letters, then you have yourself entrenched in a letter writing campaign. And the longer that goes on, that means things are going down hill fast.

Q: The last section is on what the final section of the survey is on which is transactional costs. Question 5.1 asks to identify which is the most significant to least significant of the following dispute resolution transactional costs.

A: I would say that outside counsel fees are probably number one (1) [most expensive]. Filing fees, court costs, and stuff like that, that is hard to say. See, I am looking at that and comparing it to C - Outside consultant fees and witnesses. I am not sure which is more significant because it depends on the size of the dispute. See if you have a lot of consultants and expert witnesses "C" will obviously be number 2. If you don't have expert witnesses, than I would have to

say that arbitration costs are going to be higher because you have to pay the arbitrators, you have to pay the filing fee, you have to pay administrative costs. That can be higher. Management and staff salary to support... I think it is "A" is number 1, "C" or "E" is number 2 depending on the size, and then 4 is "D." I don't see "B" in-house counsel that often. I just don't have a lot of client who have in-house counsel.

Q: Aside from these particular categories, what are some things that are not easily quantifiable but of equal or greater value when determining the true cost of a dispute? An example is business relationships.

A: Obviously, that [business relationships] is a big one. Emotional energy and sort of some of the stuff up here about management and staff salary allocated to support ... not just at a monetary stand point, but from a time stand point. You have guys working on other projects and the more that your staff is wrapped up in one project or one dispute when most contractors have project manager running multiple jobs. Or getting you original estimator to come back with you original bid or original take-off on the project when they could be bidding other work. You know allocation of staff to dispute resolution impacts the work. It is kind of wrapped up in business relationships, but a lot of these owners will, especially government ones, will want to know what disputes you have been involved in the last five or ten years. And that will, if you have been a lot of disputes, not look good. Especially when you are doing these competitive bid proposals when they are using the evaluation matrix .That can have an impact on future work if you are involved in a lot of disputes.

Appendix J – Lawyer 2 Interview Transcription

Q: Section one is on general dispute questions. The first question asks what is the quantity and magnitude of disputes now versus five years ago, and five years in the future. What do you think the trends are?

A: Well, if you exclude tort reform, I think you have to factor that into the question. Essentially, in Texas they have taken away home owner litigation which was a mistake. In its place, they have put in this certificate of merit for suing architects and engineers, which I think was a smart thing because there is a weigh station. Otherwise, if you take into consideration economic fluctuations, I think it is about the same as it always has been. Again, I think if you take those things out of the equation, I think it is about as same as it always has been. I don't see anyone getting any smarter or any dumber about how to manage this stuff.

Q: So basically, you think it is staying about constant as far as the number of disputes people are having with buildings, construction, and things like that.

A: As a percentage number.

Q: What about in the future, do you think it will stay the same?

A: Sure, yes I do. I just think it is that way and it's a hard business. And it is hard to change things.

Q: The next question has seen some interest from CII and others, but it asks, what do you think the role of the lawyer should be in the construction industry?

A: There shouldn't be one.

Q: What about prior to the job?

A: Well, here is the deal. So much of that stuff is labels. It is not the lawyers that pick the fights, it's the clients. Especially in the construction industry, you have Republican Pro Tort Reform Parties on both sides saying that it is the other side acting like plaintiff lawyer democrats. And, we didn't start it. I have a strong feeling about this. Obviously, in the teaching function of reminding people of how to go through contracts, how to write them, and how to not press for a pound of flesh in every deal, these are more of a counselor function. They go towards striking a deal everyone can live with and is the way to go - to have fair terms not to have winning terms. Also, lawyers help to make sure the contract protocol is followed which is a huge problem. And what I mean by that is very specific, it is two things. One, it is what I call the blocking and tackling of contracts. In other words, are the parties named correctly? Are all the attachments to the contract actually attached and in both of the parties' files? Are they executed with authority? Is everything filled out? So, when there is a dispute and you go look at it, you know what document to go look at. And the second part – is the scope spelled out clearly? The biggest problem is that 95 percent of the project that I see is a result of a failure of communication. I just think it is as simple as that. They are failures of communication. Nobody wants to hear stuff like this. Let's say if you took a dispute where there are good lawyers on both sides that understand the construction industry, instead of having mediation or something you had a session where both parties educated about their

point of view factually. I think if you let the lawyers make the determination of what is in their client's best interest, you could get things done a lot faster. The other point I mean by that is that most good lawyers are not in this to try to run up bills. Because we have plenty of business and we realize the impact. But, we also realize the impact that nobody accounts for: 1) We didn't start the fight, and 2) the deleterious effect on ongoing operations. The price of taking people away from making new deals and screwing around with litigation is great. So, I think construction projects should be run by construction personnel.

Q: So you have advocated a lot of opportunities where a lawyer can help out to make the process go smoother.

A: Yeah, and a lot more of it is in the role of counselor than as attorney. The one thing we know more than anybody else is what these disputes look like and what their root cause is. If I die today, I would go to my grave convinced that the root cause is the result of one or two things. You have frankly evil people who are trying to screw people - they are out there. The other is people who do a bad job of communication and documenting things.

Q: What do you think are some of the factors that affect dispute resolution decision making, both in the minds of clients and lawyers?

A: One of the biggest factors goes back to this opportunistic deal where you have this person who is not the ultimate decision maker but has a lot of influence on day to day operations. This individual may not have the ethics that the organization wants and does things, or made mistakes, and tries to insulate information at their level which results in a protracted dispute. This is a result of

that individual being unwilling to fess up, and let us be charitable and say that this is a mistake instead of on purpose. Cultures are not forgiving for that kind of stuff. So, that person realizes that their job is on the line if they don't win this dispute, so it ends up in a protracted manner instead of coming to the table and admitting to the mistake. The other thing is just trying to figure out how to save face on both sides. If you get in a position where people have staked out these unilateral positions, and based on those positions you may never get a deal. So, you have to figure out how to wordsmith, or whatever you want to call it, a deal that all of a sudden allows them to switch their position without seeming like they are making a philosophical change about how they view the dispute - when it is really a philosophical change.

Q: What about money or business issues?

A: I mean everything that I just said presupposes that in reality that once you have had a chance to look at the dispute. It is based upon the idea that you have figured out the dollars within a striking distance of where it should be resolved. Then it is about how to get people off of their hard points. A deal where one party made a million dollar mistake and they are unwilling to own up to it, and the other party is in a position where they can't not recover that million dollars, then you are never going to get a resolution without the aid of a court. The other part is reminding people that the way these disputes used to get settled was with pistols. If you look at it from that perspective, this is not so bad.

Q: Do you think that disputes are or are not a problem in the industry?

A: I think they are a part of the industry. You have to remember that each one of these endeavors, no matter how similar it looks to another project, has never been done before. So, it is like saying are there going to be problems landing a man on the moon? Yeah, but rather than accepting that as part of the process and people stick to these protracted unilateral positions causing things to blow up. For all the criticism of lawyers, if people in the construction industry were able to resolve these disputes, they wouldn't need us lawyers.

Q: Do you think disputes are a profit earning opportunity?

A: I think they are for some companies. There is no question in my mind that they are for some companies. [Company A] is the perfect example. Are you familiar with them? Just to describe it again, [Company A] was a very well thought of corporation when they stuck to their market in North Texas. Then, when the son of the owner got in charge and came up with the idea that they needed offices in Houston and Austin, they way they broke into the market was by bidding public jobs. They underbid them on purpose and we caught them doing it red handed. [Company A], as soon as they started the job, would put in a claim. It worked for them for two public jobs because they had the horsepower to run rough shot over the clients they were working with. But the third time, they ran into someone who actually had a little more horsepower and knowledge about the industry than they did. So, yes, I absolutely believe that people use it as a profit earning opportunity.

Q: Do you think disputes are or are not inevitable?

A: I think they are absolutely inevitable. And that is my point; people should approach it as a bad thing. It is just what it is. If they had that philosophy where they are not so emotionally tied to being right or wrong, then dispute would resolve a lot easier.

Q: Section two is on ADR. What is your familiarity with ADR options? How familiar are you with different ones?

A: I am extremely familiar.

Q: As far as using the option, what options have you been a part of using?

A: Every option that there is - mediation and arbitration. And those are the two that I am aware of.

Q: Have you taken part, say for instance, in a dispute review board, a mini-trial.

A: No, I have not done those. Mediation and arbitration are the primary methods by which my disputes are resolved.

Q: The next question talks about the importance of dispute resolution procedures in the contract. Can you talk about the importance and what they are and how they should be reviewed?

A: Well, I think there should absolutely be a provision for mediation as a precursor to filing suit. The problem is that a lot of times mediation can be expensive in and of itself. And in order for it to be fruitful, parties need to have more knowledge than they have at the time when the dispute arises. If I had a perfect world, I would write something in along the lines of: 1) you can

mediation, 2) prior to mediation you can send five interrogatories that have to be answered, 3) you can ask for documents that have to be responded to, and 4) and you get ten hours of deposition time however you want to use it that wouldn't count against deposition time in litigation. That way, you could go take two or three three-hour court depositions, so that you have an understanding of where the other side is coming from. You also have an opportunity to quiz them on documents and that sort of thing. You are not going through a full blown deal, but you know that you have a process that can help you understand what is going on in a down and dirty basis. I think something like that would be extremely valuable. Arbitration - the older I get, the less value I put in it. I personally have reached the conclusion that I am against arbitration. I think it is too expensive for starters - outrageously too expensive. It really, particularly if you have a claimant that is short on cash because of something the opposing party did, it becomes a major decision factor. If they have to lay down \$30,000 with the AAA in order to get there, when they are already broke, that is a huge problem. It is something that gets used as a tool unfairly. I also think it takes advocacy out of the process. Personally, I think that I am better at doing this than most lawyers. The advantages of retaining me get muted substantially by the arbitration process. The bottom line is that when you have someone who is really dirty, it creates a real advantage for them. For instance there is a case that I am involved with right now, where the opposing party did some really rotten things where they would be crushed in front of a jury. Yet, in front of an arbitration panel it is not as bad.

Q: Section three talks about dispute impacts on projects and is broken down to different categories. What are the cost impacts that disputes have on projects?

A: It is hard for me to quantify it in terms of impact on the job itself. The only way I can quantify it is in terms of transactional costs of hiring lawyers and stuff like that. Obviously, that is a cost center.

Q: What are some of the things that you would look as far as cost categories and such that you would look at to quantify if someone brought a dispute to you?

A: Stuff like the inability to obtain consequential damages when they do actually exist. The magnification of being unable to resolve impacts the job in terms of time for the parties involved. An example would be the time where they spend on the dispute and not on finishing the project. But other than that, this part is hard for me to quantify, because I am not inside it and looking at it from the project perspective. A lot of times, the project is over when I am involved. And all we are looking at is a quantification of the costs flowing from the facts that give rise to the dispute. To the extent that the project is finished, those are costs that are liquidated if you will; we just don't know what they are. Then, you throw the transactional costs on top of those costs - whatever they are.

Q: The second question of this section was going to ask about schedule impacts. You have already said that you usually see disputes when the project is over, but one follow up to this point is how long, in general, do you think disputes carry on after the project is over?

A: Well, if you classify it as a Class "A" dispute, meaning big whatever that is, that is going to go for two years on average. So, to the extent that you have a cost code that you go back and bill against the job, you could quantify that impact. So the extent to which you are holding a job open on the schedule because it is not "finished" then obviously, that is an impact. But in terms of obtaining a certificate of occupancy or something along those lines, I don't really see it unless we are dealing with something that has to do with a structural bust that has to be dealt with right then and we get called in with it right then. I think whatever delay is being caused by the dispute is pretty much contemporaneous with the delay cause by the fact pattern itself. So, the actually impact in terms of the critical path of the end goal of the project is not really a big impact, in my mind.

Q: Are there other things, in addition to cost and schedule impacts, that happen on a jobsite that are affected by the presence of a dispute?

A: Well, I think the biggest thing there are the two things we already covered and then the paper wars. By that I mean, when both parties know something big is coming down the pipe then spend an inadvertent amount of time fooling around with project documentation that they otherwise wouldn't do. In addition, the drain on manpower and personnel is great in terms of dealing with that kind of thing instead of trying to complete the project.

Q: What are some methods that you can use to effectively measure or quantify these impacts? What are some of the things that people are doing or should do to quantify the impacts of disputes?

A: I think the first things would be to open up a job number that somebody could post their time to in terms of dealing with things. Whether it is a measure of compensation or not, they could at least to have something to go back when it is all complete and say, "Yeah we have spent 87 man-hours dealing with this change order that we otherwise wouldn't have to." That would be things like all the time sitting down and talking with the lawyers, finding paperwork, preparing materials for us to use, that sort of thing.

Q: Section four talks about dispute prevention and minimization. What are some of the things that people can do to prevent disputes from occurring?

A: Well, the first thing goes back to the blocking and tackling of the contracts. Make sure that the contract identifies the parties, all the attachments are attached, and everything is executed. That, in theory, if you went to both parties contract file the document would look exactly the same and both parties would agree, "Yes, that is it." That way we don't waste time fighting over that and the terms are clear. I think one of the biggest mistakes people think and make is they don't use the contract as a project management tool as they should, because that is what it is. If you are going to go back to the essence of what you are supposed to do, everyone should be able to sit around a table and say, "Here it is. We do this. You do that. We do this, and you do that." Also, to the extent that something gets left out (going back to are disputes inevitable), provisions should be made to enable parties to say, "Ok, here we are. Let's decide right here what we are going to do with this piece, and document it through change orders that

become an amendment to the contract." That way it is signed by both parties to the contract and it is in the file. The other part is that the scope is written and clearly understood so that everyone knows what it is that they are suppose to really do. If I was to label the most important issue, the scope issue is issue number one. And it is not to say that not even the best individual is not going to leave some scope out, but the more of that stuff you can write down clearly, the better off you are.

Q: What are some of things that people can do to manage and/or minimize disputes when they do occur?

A: Get decision makers in the same room with lawyers or without. Try to reach a consensus about what the genesis of the dispute, what its resolution is, and take action at that time.

Q: Related to that, what are some things that almost always signify that a dispute is imminent?

A: When someone tells you that there is a big change order coming is one. When lots of RFI's on stuff that is somewhat meaningless and someone is all of a sudden ginning up some RFI's to say that the plans and specifications are ambiguous is a sure sign of an imminent dispute. Another thing to go back to spending real and meaningful time with the plans and specifications during the pre-contract process. Whoever is making the bids should understand that if there is an ambiguity or a conflict or any of the things that are outlined in the AIA instructions to bidders that are their responsibility that those are followed through on. So later on when a contractor says, "Well, I didn't understand," you can say

that, "you were very clear that you were supposed to understand. And you were suppose to ask these questions and price these issues before you every signed the contract." And that is another thing that seems to fall down. Another area is when the contracts don't match. When you have a different set of forms being used for the design team then is being used for the construction contract and is being used for the subcontracts and so on. It is very important that all those things happen. An example would be that the design team has a contract based upon a traditional design-bid-build contract delivery system, whereas what is really going on is a design-build type scenario. And we have seen that. For example, when the numbers don't come back the way the owner wants, and he goes back to the architect and says you need to redesign within the price. But the architect is not obligated because none of the triggers that would require the architect to redesign, such as a negotiated proposal or a hard bid, have actually occurred.

Q: This last section is on transactional costs which is the focus of this study. I was wondering if you could rank the following items from most significant, 1, to least significant, 5, in your opinion.

A: Five would be In-house counsel salary and benefits. Filing fees, arbitration/mediation/court fees would be four although that depends. If it is arbitration that could be much higher, but if it is court it is maybe number five. Outside consultant fees and expert witness costs would be three. Outside counsel fees would be two. And management and staff salary allocated to support dispute resolution efforts would be number one. While the numbers may not show staff

costs to be higher than the outside counsel costs, the truth is that people don't realize and take into account the actual costs and impacts associated with staff and management time.

Q: The last questions talk about items that are not easily quantifiable, but are of equal or greater importance in deciding the true costs of resolving disputes. An example is business relationships, what are some other things?

A: Reputation in the community is one. I mean relationships with subcontractors, vendors, sub consultants where payments could be held up. The inability to get new work where you're bonding capacity is impacted or hindered. You can't go out and bid new work. You can be debarred from government projects. Again, to go back, it doesn't necessarily belong here but it ends up here because it is never quantified is item "D" from above - management and staff salary allocated to support dispute resolution efforts. It could be quantified but it is typically not. When people have to deal with disputes, it is an emotional drain. One of the things we always see, which is fascinating, is when someone sues an architect for malpractice and they state, "Why does the architect care, it isn't his money, it is the insurance company's' money?" Well, any time people have professional pride in what they do and they are being sued not they made mistakes, but they committed malpractice. That is a very visceral thing that people have happen to take very seriously whether it is for a dollar or a million dollars. This is especially true when at the beginning somebody has been very vocal about the job somebody else did, and so there is a lot of pride, emotion, and

a lot of hurt feelings, so when you get with a mediator sitting there and telling you that you need to put all that aside and we just need to make a business decision. But, it is not always as simple as that. In fact, a lot of times it is not as simple as that. And so, part of this is when you are getting into a dispute, people need to do a very good job of trying not to personalize it. You should try not to use a lot of adjectives, or inflammatory language about what it is that is going on. It should be, "Look, we understand we have a mistake and we need to deal with it on the basis of it being a mistake. We are not saying you are a bad person, we are just saying that we have a problem that needs to get resolved. And if it turns out that we are wrong about it, then we apologize for raising the issue." As opposed to saying, "You are incompetent. You are a buffoon. I am going to ruin you." The point of it is that a lot of the personalities that are involved in construction, going back to the thesis statement at the beginning of this document, "The construction industry is generally acknowledged as the world's most litigious." Why is that? I mean it is not because of the lawyers, it is because of the personalities involved. You have a lot of dogmatic, strong personalities that like to be able to tell people how things are going to go. And what happens when you have the same personalities on the other side?

Appendix K – Owner 1 Interview Transcription

Q: From your perspective, what do you think the quantity and magnitude of disputes are in the industry? And this is in terms of 5 years ago vs. now, vs. 5 years in the future.

A: I would say that really depends on how you define disputes. If you are talking about formal disputes - disputes that actually go to arbitration, mediation, or court - then there has probably been an increase in that. But, I can't say definitively what this size of the increases has been. What I can tell you is from my experience, there tends to be more of an adversarial relationship in projects. So, that had lead to an increase in claims, if you will, or more appropriately, requests for equitable adjustments.

Q: What do you think the trends are going forward? Do think it is going to worsen or get better or stay the same?

A: I think that is really a function of how well the industry can educate its clients. I think there are many clients that don't have an appreciation for the project management and project controls skills that the main three EPC contractors bring to the party.

Q: What role do you think lawyers should play on construction projects?

A: I think that really varies from company to company. I have been in three different companies now; one was an OEM manufacturer, one was an EPC contractor, and now with an owner. In each instance, what I have found is that

the role of the attorneys will differ. Some companies have contract management professionals. These are people who actually are responsible for negotiating the contracts with their customers. Similarly, all three of the companies I worked for had people who would negotiate contracts with their subcontractors. These people came out of the procurement department generally, but they are now being called associate departments in many companies. In each, the lawyers and legal counsel play a very important part. The challenge that most companies have is ensuring they employ their legal counsel at the appropriate time. All too often, people will get legal counsel involved in minor issues. That waste their time, energy, and effort when they should be saving that for larger issues.

Q: What are the things that affect your dispute resolution decision making? How are you going to resolve a dispute? When will you resolve a dispute? What are some of the things you look at?

A: I think a principle question is the project a one off deal or is it one of an ongoing series of projects with a long-term customer relationship.

Q: Do costs or schedule factor into that decision making?

A: Yes. Absolutely, I think particularly costs. There is a decided need to avoid formal dispute resolution - arbitration, mediation or for that matter going to court - because of the costs associated with it. That really serves as a brake or a check on that. There is less of a hesitancy to elevate an issue to management within a company because of perceptions that there are not a lot of costs. Or for that matter, any costs associated with elevating issues within your own management. Now, that can be a little deceptive. I think it depends on the

amount of money that is at stake, the size of the project, and the complexity of the project because when you do elevate it to management, there are costs, although hidden, that are associated with pulling together a presentation for top management.

Q: The next questions are group together and ask for your opinion as to whether you agree or disagree with the statement. The first statement is: disputes are or are not a problem in the industry?

A: They are a problem.

Q: Disputes are or are not a profit earning opportunity?

A: Some companies do view them as a profit making opportunity. I have had some companies who have deliberately bid low and sold up on a project. I would say that is not true for all companies, but I have seen that strategy employed.

Q: The last one is: disputes are or are not inevitable?

A: We don't live in a perfect world, so I think change is inevitable. Whether it becomes a dispute or not can be eliminated with proper project planning and proper project execution.

Q: We are on to section two already, and the heading is alternative dispute resolution. What is your familiarity with ADR options?

A: I am somewhat familiar with arbitration and mediation, but have not used it extensively enough in order to comment. I do know that companies seem to have a preference for mediation or arbitration. One company I worked for absolutely preferred mediation and wrote that into our contracts. Another

company I was with preferred arbitration and made sure we wrote that into our contracts. Whether that was a function of timing, I mean the preference, I am not sure. Mediation was around the mid 90's and arbitration is now, early 2000's.

Q: This is kind of related and may have already answered, but what has been your usage of ADR options?

A: I have taken part in one or two of each.

Q: The third question in this section asks about the importance of dispute resolution procedures in the contract.

A: They are absolutely essential. It has to be spelled out. If you don't spell it out it can lead to even more problems.

Q: As a follow up to that, are there things that you now put into your contracts that you see as a benefit to that?

A: One of the companies that I worked for had a very detailed process that clearly spelled out the fact that if it could not be resolved at the project level, then it would go to the management level. Oftentimes we called out specifically the people on both sides of the contract who would be called in at each step. It could be the vice president of operations or the president of the business unit.

Q: In section three, we talk about dispute impacts on projects. What are some of the costs impacts that disputes can have on a project?

A: There are direct and obvious costs, and that would be pulling the cost and schedule information that supports or rebuts a claim for delay or a claim for a change. There is the time, energy, and effort that are expended by the member of the project team - the project manager, the employees. There is also additional

information to give. You have to pull notes from the file and your email. There are all the evidentiary items that you need when you are going into a negotiation. That is a cost that occurs even at the project level when the project team is attempting to resolve it. When you move on to a management level, now you have people from your finance organization. You have people from legal, and you have people from other disciplines and you start to incur additional costs associated with that. If it is big enough, the dispute can become a project in and of itself. It can consume a tremendous amount of resources. Indirect costs associated with disputes are also encountered. Anytime you are in a dispute, there is the intangible impact, although sometimes tangible, on your relationships that you have with your customer or your supplier. That is difficult to quantify, but I know in many instances, wither I have or customers have ultimately said, "You have won this round, but we are not going to do business with you again." So, there are those kinds of intangible impacts.

Q: You have answered a lot of the questions in this section all in one response, so I will ask the next one a little bit more specifically. When do you see the most schedule impacts of a dispute; is it during or after a project?

A: It is almost always during the project. The schedule impacts are driven by changes in scope generated by the customer. Or, they can be driven by a few mistakes on the part of the engineering firm and/or construction firm if they are not doing it on a design/build basis.

Q: The third question is what are the other business impacts of disputes?

A: Well, talking about disputes, they can cause a large amount of uncertainty to hang around with a large sum of money. Whether that rises to the level of contingent liability and needs to be reported financially. I don't know and that is difficult to say. I think the biggest single intangible is impact on the relationship between the companies involved in the dispute. If it is bad enough, it could impact the company's reputation in the industry and more importantly within their client community.

Q: The last one in this section asks about methods that you or your company use to quantify the impacts of disputes.

A: We don't measure or quantify the impacts of disputes, per se. We do measure and quantify the dollars - the plus or minus associated with a dispute on a project.

Q: So you don't have any particular cost codes or anything that you set up along the way to track the costs?

A: We do not have anything in particular on a broad, enterprise-wide basis. The minute we have any potential change on a project that could have a cost or schedule impact, we would immediately set-up a separate account. We would start tracking the costs in that account number. And in some cases, it may be complex enough to have its own work breakdown structure.

Q: Section four asks about dispute prevention and minimization. The first question asks what some things that you can do are, or companies can do, to prevent disputes from occurring?

A: I think customers have to be very clear about what it is they want. Contractors need to be clear about what their customers want as well. I think communication is very important. I think there is absolutely no substitution for good project management. And when I say good project management, I mean having a good, experienced project manager who is not afraid to say no. Or more importantly, who is not afraid to say no nicely. They should be able to point out what the request of the change is from a cost a schedule stand point. I think that is absolutely important. I think construction companies or EPC companies get into trouble when they have a relatively weak project manager who trades on or puts an undue amount of value on the relationship that he has with his client and doesn't sit down with the client and state what the cost and schedule impact will be. Associated with that, I think the project team has to have good cost and scheduling tools. You have to have a good project control guy in there. If it is big enough, you need to have a full time contract manager on the job and then you have to have excellent subcontract management as well. You need a very good change control process. A good technique that I have seen to resolve that actually comes out of the government sector; it is a change control board. We would try to set that up on every project, where any change that was generated is documented and forwarded to the change control board. That board would meet on a weekly basis and say either, "Yes we want that," or, "No, we don't want that," based upon what the cost and schedule impact related to that were. Those numbers had to be there in front of the change control board, so the change control board could make the appropriate decisions. They could say, "Yea, we want that change and it

meets with our schedule and budget constraints," or, "No, that is going to have too much impact on our budget and schedule, so let's not go ahead with that."

Q: One follow up to that - Do you guys use partnering or have you seen any benefits if you do?

A: I have done that from both sides of the fence, from both the sellers and buyers stand point. I have to tell you, I think it is overblown. I think that there is absolutely no substitute for the project team sitting down on its own and going through the contract line by line. That is a technique that I have seen by very experienced contract managers. They will get the entire project team in a room together. They take a week and go down through the contract so everybody understands exactly what is called for in that contract. This is done so that when a change does occur, or the customer or contractor suggests something, they can review it and say, "That is in scope and that is already covered," or, "That is not in scope and we need to run that up to the change control board." I have seen some instances, a few, where both teams have come together to read the contract, not on line by line basis, but at least gone through the basics, at a kickoff meeting. And when I say the contract, I am talking about not just the scope of work; I am also talking about some of the provisions with the terms and conditions. Admittedly, the project team doesn't need to go through the indemnification provision, or consequential damages, or release from consequential damages. But what they do need to do, they need to understand what the notice provisions are with regards to the changes clause, and what do we do if the stock isn't warranted, or what do we

do under a force majeure situation. Those are the kinds of things that I think everybody on a project team needs to understand.

Q: I think you have answered a lot of the things that I was going to ask about managing and controlling disputes when they do occur, but the next question I do want to ask wants to know some things that almost always signifies a dispute is imminent.

A: Disputes invariable arise when there is a late notification of a significant cost and schedule impact late in the project. That is an absolute no win situation. What happens then, and there are curves where I have drawn this out and so have others, the longer you go into the project, the less flexibility you have to make a change in the project. Therefore, when you do make change, the more it costs you. So that is on the seller side. On the buyer side, the longer you go into the project you have less money available because you have used up your contingency for some of the changes that have been identified earlier on. So now, if you are the contractor coming in a proposing a change late in the project, first it is going to cost more. Secondly, there is going to be less money available from the owner. So, the best way to address a change is to make sure that change is identified early and that the cost and schedule impact associated with that is identified to the owner early. If you make a change in the early stages of a project it is not going to cost you as much; and, an owner will have contingency money available early on in a project. I think that the best way that I have seen to detect potential disputes is really through a change control process. If you are doing good controls, sometimes called in the project controls industry trend analysis,

and you are doing your s-curves and tracking the different tasks on the project, and a very good work breakdown structure, everybody understands what their budgets are. If the project controls team is not tracking those, they can not identify major variances; you know cost overruns or schedule delays. Those are usually the early warning signals of a potential change or that a change is occurring. If you are looking for those, you can really get on top of those things right away. It is classic constructive change - where an owner or an engineer will verbally request a change on site and a guy does it. Then it has a ripple effect. That is the early warning. The most obvious example or warning signal is the one that I already illustrated and then some other early warning signal are when you start to not hear as much from inside. The communications start to become a little less forthcoming or there are significant delays in providing information and back.

Q: Section five - this first question here list five different topics and asks you to rank order these from one through five, where one is most significant cost and five being the least significant cost) and asks you to rank order them. They are outside counsel, in-house counsel, outside consultants or expert witnesses, management and staff salary to support the dispute resolution effort, and court/mediation/arbitration fees.

A: I would say that there are two answers to that. From one perspective would be the actual costs incurred and the second being what factors are most important when deciding whether to go to arbitration or not. From the first perspective, I would say that management and staff salary would be one. Outside consultants would be two. Outside counsel fees would be three. In-house counsel

would be four, and filing fees and the like would be five. On the second perspective, I would say that outside counsel fees would be number one. Filing fees and arbitration costs would be number two, outside consultants would be number three. Management and staff salary would be number four, and in-house counsel would be five. I have seen this very often. There is a real disconnect associated with people trying to minimize the impact on their own organization. It is only when it is a real big complex litigation that people start to point out that it can become a project on its own. If that particular project has had one of your best project managers or project teams on it, that project team can then be tied up for anywhere from six months to a year to 18 months to two years just working that particular case. That takes them out of the loop as far as making good money with other projects.

Q: That is interesting. This is the last question of the interview here. It asks you to identify other items that are not easily quantifiable but are of equal or greater importance when deciding what the true costs of resolving a dispute is. As an example, one of the things I listed was business relationships.

A: As you said, I think business relationships. I think reputation in the industry is another important one. The last thing you want is to have a customer that you just had a dispute with talking with another potential customer at a trade show or convention. You don't want them to say, "Hey, I am going with 'X'" and they say back, "You don't want to go with 'X' and let me tell you why." So, business relationships, reputations, and loss business are all hidden factors.

Appendix L – Owner 2 Interview Transcription

Q: The first section asks just about general dispute questions. What are your impressions of the quantity and magnitude of disputes with reference to five years ago, versus now, versus five years in the future?

A: Well, where I sit now, we launched our company about 2-1/2 years ago. So, we haven't been around for a huge amount of time, but I think the reason [Person 1] recommended me was because we had a couple of small contractual disputes on this job. I would imagine in my company as time goes on, you know five years in the future, the level of disputes will become less because we will have become more accustomed to priming people up front. We will also have contractual documents in place that will lean any sort of dispute in my favor which is one of the major things I focused on. This round I try to use standard contracts, like the A401, that is modified to give me the upper hand in the dispute. Because what it comes down to is, the subcontractor is there at your benefit right? So, they should work under you and a dispute should not, in turn, cost me money, time, and headaches.

Q: Do you think that dispute as a trend in the industry will get less or worsen?

A: I think to an extent there are a lot of combative issues that come up when you are dealing with subcontractors that either have poor organization. It can also be that there are a lot of things that they can bid on a job, which they are not aware of, that can put a subcontractor in a position where they become

unconsciously combative. Either they are sunk on a job, or they are behind schedule, or whatever the reason may be, on their end of the table the deal no longer works. That is usually where disputes arise, at least in my history.

Q: What do you see as the role of lawyers on construction projects? Or do you see them in a role at all?

A: Well, my legal team is hugely important on this job. I mean I spent weeks and weeks before I even signed a single contract preparing documents. That is huge, because when you have a properly set-up arbitration, mediation, and dispute resolution clause in the agreement, then it makes it drastically easier for you to enforce what is basically a fair resolution to any dispute. For instance in this last case, it was very cut and dry. The guy wasn't performing the job. He had a certain set of impressions, but what it came down to was that I had an agreement with him that I could, given two three day notices, terminate the contract, which was great. I made a couple of notices to the subcontractor that he was not performing his contractual obligations. Terminated the contract and moved forward and it was a done deal. That would not have been possible without legal counsel.

Q: What are some of the things that affect your dispute resolution decision making? Whether you want to go after some one or whether you want to pursue legal or other dispute resolution options?

A: Well, in this game of commercial multi-family residential, which is our specialty, not only monetary delays are important but time delays become monetary delays; especially when you have a huge project up in the air. So what

is a relatively small contract, if the delay is large enough that you actually need to go after someone for forced compliance or monetary reasons in order to complete the work? Then I would be much more likely to go after them in a litigating sense than simply terminating the contract and walk away. And that is always decided dispute by dispute. I sit down with some of my attorneys or just members of the company and say, "Ok, what are the two sides of this table? What do we stand to lose? And what is the impact of terminating?" And then you have to make a decision, basically piece by piece.

Q: Do you think disputes are or are not a problem in the industry?

A: I think they are a big problem. Every time a dispute comes up it is going to cause hardship on both sides of the table in most cases. Specifically in my case, in my most recent dispute, I had a guy that, regardless of what the hard facts were, refused to stop calling me and taking up my time. The old saying time is money is very much true. I am overextended every day, I run this business. Even one hour out of my day to go to a dispute, is one hour less that I can be spending on a productive piece of my business.

Q: Do you think that disputes are a profit earning opportunity?

A: I wouldn't consider them to be that. I couldn't imagine any dispute, on my end, actually come out to benefit me, at least not if they are dealt with in a fair manor.

Q: Disputes are or are not inevitable?

A: I think they are likely inevitable. To the degree at which they reoccur is the only case that we have control. Because in this business, you can not fully

expect to understand the business machine behind everyone you work with. It is usually the break down of that machine that causes the dispute.

Q: The second option talks about ADR options. How familiar are you with different ADR options?

A: I am actually not particularly that familiar. I have never had to go through any sort of ADR resolution.

Q: Do you think that the dispute resolution procedures in the contract are important?

A: Definitely, they are so. I think having dispute resolution in the contract documents as a part of the agreement, at day one, is absolutely crucial. Because if a dispute does arise, there should be no question as to how it is suppose to be dealt with, especially as monetary numbers escalate. Of course, the goal is to always stay out of litigation. Keep these things on the table.

Q: Section three explores the impacts of disputes on projects. What are some of the cost impacts that disputes can cause?

A: Well, a lot of the direct cost impacts that I have are consulting and legal fees being, one of the most predominant. A secondary one being potentially lost business or distraction from the core line of your business. That almost becomes, not necessarily on the job because that is another impact, a distraction from the business machine. Even beyond that, having to remobilize other crews to finish work or fill-in where the dispute arose from, which can also lead to other expenses. If the work was done improperly, sometimes the costs of completing that work can be higher than what you have in your favor on the contract.

Q: You talked a little about schedule impacts, what are some of the other schedule impacts that disputes can cause?

A: Obviously, you can have a contract signed with time clauses in it where you build a schedule around the performance of a subcontractor. If the subcontractor does not perform then there is a period of "dead air" while you enforce mediation or arbitration, whatever the dispute resolution method is, and then seek to remobilize somebody to complete the work. There is generally several weeks, if not months, of lag time there that, depending on how crucial the subcontractor is, can have a domino impact effect on all the other trades on the job.

Q: What are some other things that are dispute impacts that aren't directly cost or schedule related?

A: As much as people like to think that there is no emotion in business, it comes up a lot. And one of the biggest things that happen, other than direct monetary or schedule delays/expenses, is just the discomfort of having to go through a dispute. You end up losing what was one of your business relationships in a kind of sour manor. To me, being relatively new in the business, I like every relationship that I have to be positive and ongoing. And for me, that can sometimes hurt, because you can sit down at the end of the day and you are heartbroken.

Q: What are some methods that you use to measure or quantify the impacts of disputes on projects? Or do you?

A: Generally, I use two main ways to quantify them. One is just hard line costs. What is my direct cost of the consulting and direct expenses to close the dispute? Then, the additional expense above the original contract sum to complete the work stipulated or disputed. Again, a lot of flexibility there it could be work that was completely improperly or so on. Beyond that, I also like to assign a schedule delay so I can understand how the dispute happened and what the total impact was. It is very important to understand that both time and money are important.

Q: Section four asks about dispute prevention and minimization. What are some things that you think can help prevent disputes from occurring?

A: I think that clarity in contract documents is one thing. I also think that awareness of all parties is extremely important, because as strong as one party's contract may be, the second party's ignorance could completely undo its usefulness. You may still have the upper hand legally and in negotiations, but if the second party does not understand their contractual obligations, how can they be expected to abide by it. So, I think that is one of the most important things. I feel that, especially having gone through a few disputes, requiring a second party to sit down with their legal counsel and be made aware of the language. I have had people return signed contracts to me that it was obvious that they did not read them. In one case, I gave a mason a framing contract by mistake and he signed it. That is where you get a lot of sloppiness. It is almost hilarious. They don't even

know what they are signing. For all I know, I could offer not to pay them and they would probably not do the work.

Q: What are some things that you can do to minimize or manage disputes when they do occur?

A: I think one of the biggest things that occur is a break down in communications. I think one of the biggest things that I will look for in the future is that if a dispute arises it needs to be brought to a round table discussion immediately. All parties involved need to come together physically in the same room and sit down and review the documents to make a plan of action before going into full dispute resolution. There are a lot of cases where it is mutually beneficial to complete the work but a break down in communications is a huge problem in the construction industry. You have so many types of individual working together.

Q: The last question in this section asks, what are some things that almost always signify that a dispute is imminent?

A: Some warning signs are if you get a feeling that a trade is overextended. That can cause problems. I have also found, more so than not, that labor problems, whether it be underpaid labor or disputes with the actual mechanics of the people on sight not necessarily the management, leads to a lot of dispute. This is especially true at least in the nature of construction I am in. Beyond that I can not think of anything else that definitely is a warning sign. There is, of course, the emotional language stuff that you pick up on.

Q: The next question might be easiest if you take a look at the sheet I gave you. Can you rank order these five categories of transactional costs for dispute resolution based upon the magnitude, where one is most significant and five is least significant?

A: I would say in my disputes, 'A' is the most significant - my outside counsel fees. That is because I rely very heavily upon outside counsel because we are a small company with no real inside counsel. I would say 'D'; management and staff salary which ties directly to mine and my agent's time is the second most significant. I would say that outside consultants and expert witnesses would be third. Fourth would be filing fees, arbitration/mediation/court fees. And for me, fifth would be in-house counsel because I don't have any.

R: The last question asks about other items that are not easily quantifiable but are of equal or greater importance when deciding what the true costs of resolving a dispute are? One of the examples that I listed was business relationships.

A: Sure, like I mentioned earlier when I was talking about the emotional weight of disputes. We all set up basically a network it is important in business and personal life. Every time you have a dispute, you are alienating a connection in your network and you are losing a potential contact. You are also trading this kind of negative press, so to speak. Granted it may be a small group and you may not be at fault. In terms of other items, it is not easy to put a quantity on reputation/integrity of your network. Especially, going back to the fact that we are a young company that is up and coming, the integrity of our name and the

quality of work we do with people, from day one, is crucial, because we are going to look back to these people for positive references. This is why when disputes arise that it can be very frustrating for a young company because it hurts basically your reputation.

Appendix M – Unabridged Quantitative Dataset

Project ID	City	State	Owner Type	Facility Type	Greenfield Project	Expansion Project	Renovation Project	Fee Arrangement	Contract Scope	Contract Amount	Partnering Language	Negotiation Language
DISPUTE1005		FL	Public	Industrial	TRUE			FixedPrice		\$ 72,000,000		TRUE
DISPUTE1030		TX	Private	Industrial	TRUE	TRUE		CostPlus		\$ 200,000,000		
DISPUTE1031		TX	Private	Industrial		TRUE		FixedPrice		\$ 20,000,000		TRUE
DISPUTE1032		OK	Private	Commercial/Building	TRUE			GMP	DB-EPC	\$ 80,000,000		
DISPUTE1033	Avondale	AZ	Private	Commercial/Building	TRUE			CostPlus	CM	\$ 6,000,000		
DISPUTE1034	Manor	TX	Private	Commercial/Building	TRUE			Mixed	Sub	\$ 203,000		
DISPUTE1035	Austin	TX	Public	Commercial/Building	TRUE			GMP		\$ 8,000,000		
DISPUTE1036		LA	Private	Industrial		TRUE	TRUE	CostPlus		\$ 145,000,000		
DISPUTE1037	Austin	TX	Public	Civil/Infrastructure			TRUE	FixedPrice	DBB	\$ 5,000,000	TRUE	TRUE
DISPUTE1038	Austin	TX	Private	Commercial/Building			TRUE	FixedPrice	DBB	\$ 353,053		
DISPUTE1039	Laredo	TX	Public	Commercial/Building	TRUE			FixedPrice	DBB	\$ 17,000,000		TRUE
DISPUTE1040	Austin	TX	Public	Commercial/Building	TRUE			FixedPrice	Sub	\$ 58,000		
DISPUTE1041	Austin	TX	Private	Commercial/Building		TRUE		FixedPrice	Sub	\$ 160,000		
DISPUTE1042	Sulphur Springs	TX	Private	Commercial/Building	TRUE			FixedPrice	DBB	\$ 6,700,000		
DISPUTE1043	Beaumont	TX	Public	Civil/Infrastructure			TRUE	FixedPrice	IBB Construction	\$ 900,000		TRUE
DISPUTE1044	Arlington	TX	Public	Civil/Infrastructure		TRUE		FixedPrice	DBB	\$ 865,000		TRUE
DISPUTE1045	Lakeway	TX	Private	Commercial/Building			TRUE	CostPlus	Sub	\$ 10,000		
DISPUTE1048	Covert	MI	Private	Industrial	TRUE			FixedPrice	DB-EPC	\$ 375,000,000		
DISPUTE1049	Chicago	IL	Private	Commercial/Building		TRUE		GMP	DBB	\$ 30,000,000		

Project ID	City	State	Owner Type	Facility Type	Greenfield Project	Expansion Project	Renovation Project	Fee Arrangement	Contract Scope	Contract Amount	Partnering Language	Negotiation Language
DISPUTE1050	Georgetown	TX	Private	Commercial/Building	TRUE			Fixed Price	DBB	\$ 2,700,000		
DISPUTE1051	Austin	TX	Private	Commercial/Building	TRUE			GMP		\$ 25,000,000		
DISPUTE1052	Dallas	TX	Public	Civil/Infrastructure	TRUE			Fixed Price	DBB	\$ 40,000,000		
DISPUTE1053	Salt Lake City	UT	Public	Commercial/Building			TRUE	Fixed Price	DBB	\$ 3,200,000		
DISPUTE1055	Espanola	NM	Public	Civil/Infrastructure		TRUE	TRUE	Unit Price		\$ 1,676,762		
DISPUTE1056	Bosque Farms	NM	Public	Civil/Infrastructure		TRUE		Fixed Price		\$ 3,819,257		
DISPUTE1057	Monument	CO	Public	Civil/Infrastructure		TRUE		Fixed Price		\$ 4,000,000		
DISPUTE1058	Leawood	KS	Private	Commercial/Building	TRUE			Fixed Price	DBB	\$ 1,100,000		
DISPUTE1061	San Antonio	TX	Private	Industrial	TRUE			Fixed Price	DB-EPC	\$ 300,000,000	TRUE	TRUE
DISPUTE1062	Miami	FL	Private	Industrial		TRUE		Fixed Price	DB-EPC		TRUE	TRUE
DISPUTE1065	Austin	TX	Private	Commercial/Building	TRUE			Fixed Price	Sub	\$ 305,000		
DISPUTE1066	Austin	TX	Private	Commercial/Building	TRUE			GMP	DBB	\$ 30,000,000		
DISPUTE1067	Austin	TX	Public	Commercial/Building	TRUE			GMP	OM	\$ 13,000,000		TRUE
DISPUTE1068	Austin	TX	Public	Civil/Infrastructure			TRUE	Fixed Price	DBB	\$ 1,800,000		
DISPUTE1069	Philadelphia	PA	Private	Commercial/Building			TRUE	Fixed Price	Sub	\$ 800,000		

Project ID	City	State	Owner Type	Facility Type	Greenfield Project	Expansion Project	Renovation Project	Fee Arrangement	Contract Scope	Contract Amount	Partnering Language	Negotiation Language
DISPUTE1070	Seattle	WA	Private	Commercial/Building	TRUE			FixedPrice	DB-EPC	\$ 150,000,000		
DISPUTE1071	Wichita Falls	TX	Public	CivilInfrastructure			TRUE	FixedPrice	DBB	\$ 3,800,000		
DISPUTE1072	New York	NY	Public	CivilInfrastructure	TRUE			CostPlus	Design	\$ 300,000,000		
DISPUTE1074	Austin	TX	Public	Commercial/Building	TRUE			FixedPrice	DBB	\$ 30,000,000		TRUE
DISPUTE1076	Austin	TX	Private	Commercial/Building	TRUE			GMP		\$ 10,000,000		
DISPUTE1077	Dallas	TX	Public	Commercial/Building		TRUE	TRUE	GMP	CM	\$ 120,000,000		
DISPUTE1079	Houston	TX	Private	Commercial/Building			TRUE	FixedPrice	DB-EPC	\$ 1,000,000		
DISPUTE1080	San Antonio	TX	Public	Commercial/Building		TRUE		FixedPrice	Sub	\$ 12,000,000		
DISPUTE1081	Houston	TX	Private	Commercial/Building	TRUE			FixedPrice		\$ 1,200,000		
DISPUTE1089		VA	Private	CivilInfrastructure		TRUE		CostPlus		\$ 50,000,000		
DISPUTE1090	Ashland	WI	Private	Commercial/Building	TRUE			GMP		\$ 7,500,000		TRUE
DISPUTE1093	Wilmington	DE	Private	Industrial		TRUE		CostPlus		\$ 20,000,000		
DISPUTE1094	Dallas	TX	Public	CivilInfrastructure		TRUE		FixedPrice	Sub	\$ 1,800,000		
DISPUTE1095	Atlanta	GA	Public	Commercial/Building	TRUE			FixedPrice		\$ 50,000,000		
DISPUTE1097	Austin	TX	Private	CivilInfrastructure	TRUE			FixedPrice	DBB	\$ 3,500,000		
DISPUTE1098	Mobile	AL	Public	Industrial	TRUE			GMP		\$ 180,000,000		TRUE
DISPUTE1099		TX	Private	Industrial		TRUE		FixedPrice	DB-EPC	\$ 46,000,000		
DISPUTE1100	Midlothian	TX	Private	Industrial		TRUE		GMP	DB-EPC	\$ 127,000,000		TRUE
DISPUTE1102	San Francisco	CA	Public	Commercial/Building	TRUE			FixedPrice	DBB	\$ 42,000,000		TRUE
DISPUTE1103	San Francisco	CA	Private	Commercial/Building	TRUE			FixedPrice	DBB	\$ 25,000,000		
DISPUTE1109	Jackson	MS	Private	Industrial	TRUE			FixedPrice	DB-EPC	\$ 200,000,000		TRUE
DISPUTE1114	Phoenix	AZ	Private	Commercial/Building	TRUE			GMP		\$ 25,000,000		TRUE
DISPUTE1116	Long Island	NY	Public	Commercial/Building		TRUE	TRUE	FixedPrice		\$ 13,000,000		
DISPUTE1121	Chicago	IL	Private	Commercial/Building				CostPlus	DBB			
DISPUTE1122	Philadelphia	PA	Private	Industrial			TRUE	CostPlus	Sub	\$ 4,473,276		
DISPUTE1123	Austin	TX	Public	Commercial/Building	TRUE			CostPlus	DBB			
DISPUTE1123	Austin	TX	Public	Commercial/Building	TRUE			CostPlus	DBB			
DISPUTE1126	Alberta	AR	Private	Industrial	TRUE	TRUE		FixedPrice	DB-EPC	#####	TRUE	TRUE
DISPUTE1126	Alberta		Private	Industrial	TRUE	TRUE		FixedPrice	DB-EPC	#####	TRUE	TRUE

Project ID	Mediation Language	Arbitration Language	No ADR Language	Other ADR Language	Project Start	Substantial Completion	Project Acceptance	Project Duration	Dispute Quantity	% Complete Occurred	% Complete when Dispute Notified	Dispute Settlement Date
DISPUTE1005	TRUE	TRUE			6/1/2000	3/1/2002		GT105%	2	GTR80%	GTR80%	7/6/2004
DISPUTE1030		TRUE			1/1/1997	12/1/1998	12/1/1999	GT105%	1	GTR80%	GTR80%	8/1/2001
DISPUTE1031	TRUE	TRUE	TRUE		10/1/2000	7/1/2001	7/1/2001	95-105%	50	GTR80%	GTR80%	
DISPUTE1032					2/2/2000	4/1/2002	7/1/2002	95-105%	15	GTR80%	60-80%	7/1/2002
DISPUTE1033		TRUE			5/1/2000	11/1/2002	2/1/2003	GT105%	70	GTR80%	GTR80%	
DISPUTE1034		TRUE			6/1/1998	8/1/1999	8/1/1999	GT105%	1	GTR80%	GTR80%	6/1/2004
DISPUTE1035		TRUE			4/1/2003	9/1/2004	9/1/2004	LT95%	1	20-40%	20-40%	5/1/2004
DISPUTE1036			TRUE		8/1/1996	8/1/1999		GT105%	50	60-80%	60-80%	8/1/2001
DISPUTE1037	TRUE				5/1/2002	2/1/2004	7/1/2004	95-105%	2	20-40%	60-80%	7/1/2004
DISPUTE1038			TRUE		6/1/2001	11/1/2001	8/1/2003	LT95%		GTR80%	60-80%	8/1/2003
DISPUTE1039	TRUE			In-house Process also	4/1/2003	7/1/2005		95-105%	1	LT20%	LT20%	3/1/2004
DISPUTE1040	TRUE				5/1/2002	11/1/2003	1/1/2004	95-105%	1	20-40%	GTR80%	
DISPUTE1041	TRUE							GTR80%		GTR80%	GTR80%	11/13/2003
DISPUTE1042			TRUE		1/1/1992	2/1/1993		GT105%	1	LT20%	LT20%	7/1/1994
DISPUTE1043	TRUE				5/1/2001	5/1/2002		GT105%	5	LT20%	GTR80%	10/1/2002
DISPUTE1044	TRUE			Chapter 2260	5/1/2003	12/1/2003	12/1/2003	GT105%	1	GTR80%	GTR80%	7/1/2004
DISPUTE1045			TRUE		5/1/1991	10/1/1991	1/1/2002	95-105%	2	GTR80%	GTR80%	1/1/1999
DISPUTE1048	TRUE	TRUE			1/1/2000	8/3/2005	3/1/2004	GT105%	1	GTR80%	GTR80%	2/1/2005
DISPUTE1049	TRUE				1/1/2002	5/1/2004	12/1/2004	95-105%	1	GTR80%	GTR80%	6/1/2005

Project ID	Mediation Language	Arbitration Language	No ADR Language	Other ADR Language	Project Start	Substantial Completion	Project Acceptance	Project Duration	Dispute Quantity	% Complete Occurred	% Complete when Dispute Notified	Dispute Settlement Date
DISPUTE1050		TRUE			5/1/2000	8/1/2001	9/1/2001	GT1:05%	1	60-80%	60-80%	3/1/2005
DISPUTE1051		TRUE			5/1/2001	5/1/2002	6/1/2002	95-1:05%	1	GT8:0%	GT8:0%	5/1/2002
DISPUTE1052			TRUE		6/1/2000	1/1/2005	4/1/2005	95-1:05%	10	40-60%	40-60%	3/1/2005
DISPUTE1053			TRUE		2/1/2000	10/1/2000	11/1/2000	95-1:05%	2	20-40%	20-40%	2/1/2001
DISPUTE1055	TRUE	TRUE			4/1/2001	11/1/2001	2/1/2002	95-1:05%	10	LT2:0%	LT2:0%	6/1/2003
DISPUTE1056	TRUE	TRUE			3/1/1998	3/1/1999	7/1/1999	LT9:5%	3	LT2:0%	LT2:0%	2/1/1999
DISPUTE1057	TRUE				10/1/1997	2/1/1998	6/1/1999	GT1:05%	1	60-80%	60-80%	7/1/1999
DISPUTE1058		TRUE										
DISPUTE1061	TRUE				9/1/2000	9/1/2004	12/1/2004	95-1:05%	10	40-60%	40-60%	12/1/2004
DISPUTE1062		TRUE		incentives, DRB								
DISPUTE1065		TRUE		Contract Never Signed by Sub	5/1/2002	11/1/2002	1/1/2002	95-1:05%	1	LT2:0%	40-60%	5/1/2005
DISPUTE1066		TRUE			1/1/1998	3/1/1999	5/1/1998	95-1:05%	1	GT8:0%	GT8:0%	3/1/2004
DISPUTE1067	TRUE				6/1/2001	8/1/2002	10/1/2002	95-1:05%	7	LT2:0%	LT2:0%	9/1/2003
DISPUTE1068	TRUE				1/1/2000	9/1/2001	9/1/2001	GT1:05%		LT2:0%	LT2:0%	6/1/2004
DISPUTE1069	TRUE	TRUE		AIA	6/1/2001	10/1/2001	2/1/2002	GT1:05%	7	LT2:0%	LT2:0%	5/1/2003

Project ID	Mediation Language	Arbitration Language	No ADR Language	Other ADR Language	Project Start	Substantial Completion	Project Acceptance	Project Duration	Dispute Quantity	% Complete Occurred	% Complete when Dispute Notified	Dispute Settlement Date
DISPUTE1070	TRUE	TRUE			1/1/1997	1/1/1999	1/1/2000	GTI 05%		20-40%	20-40%	
DISPUTE1071				In-house process	11/1/2003	10/1/2004	11/1/2004	95-105%	4	40-60%	40-60%	2/1/2005
DISPUTE1072	TRUE				1/1/2000	12/1/2012		95-105%	1	LT20%	LT20%	3/1/2003
DISPUTE1074	TRUE				8/1/1998	8/1/2000	10/1/2000	95-105%	5	20-40%	20-40%	5/1/2003
DISPUTE1076	TRUE											
DISPUTE1077	TRUE	TRUE			7/1/2000	9/1/2002	6/1/2005	GTI 05%	3	LT20%	40-60%	6/1/2005
DISPUTE1079	TRUE											
DISPUTE1080				mediarb				GTI 05%	10	20-40%	20-40%	6/1/2004
DISPUTE1081		TRUE			3/1/2001	2/1/2002	2/1/2002	95-105%	4	GT80%	GT80%	5/1/2005
DISPUTE1089		TRUE						GTI 05%	1	GT80%	GT80%	
DISPUTE1090	TRUE	TRUE			4/1/2002	11/30/2004	12/30/2004	95-105%	3	GT80%	GT80%	
DISPUTE1095			TRUE		6/1/2004	5/1/2005	6/1/2005	95-105%	1	60-80%	60-80%	4/1/2005
DISPUTE1094			TRUE		9/1/2000	7/1/2001	7/1/2001	GTI 05%	25	LT20%	LT20%	4/1/2005
DISPUTE1095	TRUE	TRUE			4/1/2002	8/1/2004	12/1/2004	GTI 05%	3	60-80%	20-40%	12/1/2005
DISPUTE1097	TRUE	TRUE			11/1/2001	12/1/2002	3/1/2003	GTI 05%	5	60-80%	GT80%	6/1/2005
DISPUTE1098					2/1/1999	12/1/2000	4/1/2001	GTI 05%	8	LT20%	LT20%	4/1/2000
DISPUTE1099		TRUE			1/1/2000	1/1/2003	1/1/2003	GTI 05%	10	LT20%	LT20%	6/1/2003
DISPUTE1100		TRUE		stopped-negotiation	3/1/1998	3/1/2000	9/1/2000	95-105%	55	LT20%	GT80%	3/1/2004
DISPUTE1102	TRUE											
DISPUTE1103	TRUE	TRUE										
DISPUTE1109	TRUE	TRUE			6/1/1998	12/1/2000	6/1/2002	GTI 05%	3	20-40%	20-40%	12/1/2002
DISPUTE1114	TRUE											
DISPUTE1116			TRUE		5/1/2001	5/1/2004	12/1/2005	GTI 05%	30	60-80%	20-40%	5/1/2004
DISPUTE1121	TRUE											
DISPUTE1122	TRUE				6/1/2002	11/1/2002	11/1/2002	95-105%	1	GT80%	GT80%	12/1/2003
DISPUTE1123												
DISPUTE1125												
DISPUTE1126	TRUE	TRUE			7/1/2001	9/1/2003	1/1/2004	GTI 05%	2	60-80%	40-60%	9/1/2004
DISPUTE1126	TRUE	TRUE			7/1/2001	9/1/2003	1/1/2004	GTI 05%	2	60-80%	40-60%	9/1/2004

Project ID	Dispute Description	Dispute Description					Owner - GC - Party 1		Architect - Subcontractor - Party 1		Bonding Company - Party 1		Other - Owner - Party 2		GC - Party 2	
		Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 1	Party 2	Party 2
DISPUTE1005						TRUE								TRUE		
DISPUTE1030						TRUE								TRUE		
DISPUTE1031						TRUE								TRUE		
DISPUTE1032	Complex commercial/warehouse space. Owner and Contractor has strong previous relationship. Contractor tried to insert ADR language in contract, but owner refused.					TRUE										TRUE
DISPUTE1033						TRUE								TRUE		
DISPUTE1034																TRUE
DISPUTE1035						TRUE										TRUE
DISPUTE1036						TRUE								TRUE		
DISPUTE1037	Wastewater treatment plant					TRUE										TRUE
DISPUTE1038						TRUE								TRUE		
DISPUTE1039						TRUE								TRUE		
DISPUTE1040																TRUE
DISPUTE1041	Contract for Boiler purchase, installation and startup.													TRUE		
DISPUTE1042						TRUE								TRUE		
DISPUTE1043	Replace sewer connections with waste water treatment system.					TRUE										TRUE
DISPUTE1044						TRUE										TRUE
DISPUTE1045														TRUE		
DISPUTE1048	Power island equipment vendor assessed liquidated damages for delay to contractually required Provisional Acceptance date					TRUE										
DISPUTE1049	One dispute was whether a portion of the Work was capped or not by a GMP. The other dispute concerned the repair of structural problems in the parking structure adjacent to this mixed use development					TRUE										TRUE

Project ID	Dispute Description	Owner - GC - Party 1		Architect - Party 1		Subcontractor - Party 1		Bonding Company - Party 1		Other - Owner - Party 1		GC - Party 2	
		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE	
DISPUTE1050			TRUE										TRUE
DISPUTE1051													
DISPUTE1052			TRUE			TRUE						TRUE	
DISPUTE1053	Public Bid Construction Contract for the renovation of an elementary school					TRUE						TRUE	
DISPUTE1055	Replacing and placing a water line and water system. Encountered numerous existing utilities not shown on bid or contract documents. Tried to get engineer to work with us to relocate as may conflict as possible. Soil conditions were as indicated in the documents, and allowed for use in backfill. When work began the engineer required all excavated material to be removed from site and replaced with engineered fill. Owner would not compensate for any of the additional work. Engineer took position, contractor should allow for these additional cost in its bid. Slow payment, without paying interest in accordance with state statute.		TRUE		TRUE								
DISPUTE1056	Bid and Contract documents indicated all existing utilities to be on the south side of the street and all new utilities were to be placed on the north side of the street. When locates were obtained it was determined that most of the existing utilities were above where the new utilities were to be placed. Re-location was done as much as possible, but some existing utilities still had to be dealt with to install the new utility.		TRUE		TRUE								
DISPUTE1057	Bid and Contract documents did not indicate rock excavation. The soils reports did not indicate rock would be encountered. Bid project at a production rate of 150 lf per day in normal soil. Obtained 33 lf per day in solid rock.		TRUE		TRUE								
DISPUTE1058													
DISPUTE1061	Subcontractor provided water treatment equipment did not perform properly		TRUE			TRUE			TRUE				TRUE
DISPUTE1062													
DISPUTE1065	Dispute over scope of work for subcontractor. Also, was there a subcontract because sub did not sign contract.				TRUE				TRUE				
DISPUTE1066	Leaking building 4-years after construction. Contractor had no relation to designer.		TRUE			TRUE							TRUE
DISPUTE1067	Numerous disputes combined into one settlement for school construction in Austin. Errors and omissions claim		TRUE										
DISPUTE1068													
DISPUTE1069	Plumbing subcontractor on major hotel renovation		TRUE		TRUE								TRUE

Project ID	Dispute Description	Owner - GC - Architect - Subcontractor - Bonding Other - Owner - GC - Party 1 Party 1 Party 1 Party 1 Party 2 Party 2					
		Party 1	Party 1	Party 1	Party 1	Party 1	Party 2
DISPUTE1070	Delay and cost overrun dispute.	TRUE					TRUE
DISPUTE1071	Liquidated damages assessed on project.		TRUE				TRUE
DISPUTE1072							
DISPUTE1074		TRUE					TRUE
DISPUTE1076							
DISPUTE1077							
DISPUTE1079							
DISPUTE1080	Delay and labor inefficiency	TRUE					
DISPUTE1081	Moisture intrusion/Stucco facade, roof flashing, A/C drains & roof penetration, plumbing code violations	TRUE	TRUE	TRUE			
DISPUTE1089	Contract interpretation and damages	TRUE					TRUE
DISPUTE1090	Standing seam metal roof system is leaking, water infiltration through exterior masonry walls	TRUE					TRUE
DISPUTE1093	Construction quality	TRUE					TRUE
DISPUTE1094	Underground obstructions encountered causing delay and additional costs.	TRUE		TRUE			TRUE
DISPUTE1095	General contractor and electrical subcontractor dispute. General contractor accused the sub of a significant project delay and defective work. Electrical subs crews were supplemented by the general contractor		TRUE		TRUE		
DISPUTE1097	Project delays and responsibility for repair of damage	TRUE					TRUE
DISPUTE1098							
DISPUTE1099	Cost overrun claim due to design and procurement issue	TRUE					TRUE
DISPUTE1100		TRUE					TRUE
DISPUTE1102							
DISPUTE1105							
DISPUTE1109	There were a variety, but the major disputes were from inadequacies of delivery of process equipment. Making plant start-up very difficult		TRUE				TRUE
DISPUTE1114	Default/termination of contract	TRUE		TRUE			TRUE
DISPUTE1116	Multi-purpose Residential Commercial						
DISPUTE1121							
DISPUTE1122							
DISPUTE1123							
DISPUTE1125							
DISPUTE1126	Productivity impacts from changes, extras. Also, delays and scope issues were in dispute.		TRUE	TRUE			TRUE
DISPUTE1126	Productivity impacts from changes, extras. Also, delays and scope issues were in dispute.		TRUE	TRUE	TRUE	TRUE	TRUE

Project ID	Architect - Party 2	Subcontractor - Party 2	Bonding Company - Party 2	Other - Party 2	Additional Party Info.	Dispute Complexity
DISPUTE005						Average/Normal
DISPUTE030					Owner company bought company we were doing business for.	Average/Normal
DISPUTE031						Average/Normal
DISPUTE032						Average/Normal
DISPUTE033					Disputes involved owner, GC, and subs. Due to the numerous number of disputes, the overall length spanned more than a year with many major issues.	Moderately Complex
DISPUTE034						Average/Normal
DISPUTE035	TRUE					Average/Normal
DISPUTE036						Average/Normal
DISPUTE037	TRUE			Manufacturer of Machinery	Resolution between owner and general contractor.	Average/Normal
DISPUTE038	TRUE					Average/Normal
DISPUTE039						Average/Normal
DISPUTE040						Average/Normal
DISPUTE041		TRUE			Mechanical subcontractor to boiler installer dispute.	Average/Normal
DISPUTE042						Average/Normal
DISPUTE043						
DISPUTE044			TRUE			
DISPUTE045						
DISPUTE048				Equipment Vendor		Moderately Complex
DISPUTE049						Complex

Project ID	Architect - Party 2	Subcontractor - Party 2	Bonding Company - Party 2	Other - Party 2	Additional Party Info.	Dispute Complexity
DISPUTE1050		TRUE				Average/Normal
DISPUTE1051	TRUE	TRUE				
DISPUTE1052						Moderately Complex
DISPUTE1053						
DISPUTE1055	TRUE					Average/Normal
DISPUTE1056	TRUE					Moderately Simple
DISPUTE1057						Average/Normal
DISPUTE1058						
DISPUTE1061		TRUE	TRUE		Settled with Owner, currently in arbitration with sub	Complex
DISPUTE1062						
DISPUTE1065		TRUE			Owner was involved because of lien, but matter settled between sub and GC.	Moderately Complex
DISPUTE1066		TRUE			50% Designer/Arch. and 50% subcontractor responsibility on both sides.	
DISPUTE1067	TRUE					
DISPUTE1068						
DISPUTE1069		TRUE				Average/Normal

Project ID	Architect - Party 2	Subcontractor - Party 2	Bonding Company - Party 2	Other - Party 2	Additional Party Info.	Dispute Complexity
DISPUTE1070						Complex
DISPUTE1071						Average/Normal
DISPUTE1072						
DISPUTE1074						
DISPUTE1076						
DISPUTE1077						
DISPUTE1079						
DISPUTE1080		TRUE				Moderately Complex
DISPUTE1081						Average/Normal
DISPUTE1089						Moderately Complex
DISPUTE1090					Architect and various subcontractors also involved	Moderately Complex
DISPUTE1093		TRUE				Moderately Simple
DISPUTE1094						Moderately Complex
DISPUTE1095		TRUE				Average/Normal
DISPUTE1097						Moderately Simple
DISPUTE1098						Complex
DISPUTE1099						Complex
DISPUTE1100	TRUE	TRUE			party 1 was design-build entity	Complex
DISPUTE1102						
DISPUTE1103						
DISPUTE1109		TRUE			Party 1 was in EPC role	Complex
DISPUTE1114						
DISPUTE1116			TRUE			
DISPUTE1121						Complex
DISPUTE1122						
DISPUTE1123						
DISPUTE1123					EPCM company and their casualty insurance company were involved	Complex
DISPUTE1126					EPCM company and their casualty insurance company were involved	Complex

Project ID	Mediation Attempted	Arbitration Attempted	Mini-trial Attempted	Litigation Attempted	DRB Attempted	Negotiation Attempted	Other Options Attempted	ADR Final	Original Claim	Counterclaim	Costs For	Outside Counsel
DISPUTE1005						TRUE		DRB	\$ 2,000,000	\$ 2,400,000	Contractor	\$ 5,000
DISPUTE1030		TRUE				TRUE		Mediation	\$ 23,500,000	\$ 24,000,000	Contractor	\$ 2,700,000
DISPUTE1031		TRUE		TRUE		TRUE		Negotiation	\$ 6,000,000	\$ 2,000,000	Contractor	\$ 1,500,000
DISPUTE1032	TRUE					TRUE		Negotiation	\$ 4,000,000	\$ 10,000,000	Contractor	\$ 900,000
DISPUTE1033						TRUE		Negotiation	\$ 1,500,000	\$ -	Contractor	\$ 20,000
DISPUTE1034						TRUE		Litigation	\$ 250,000	\$ -	Subcontractor	\$ 120,727
DISPUTE1035				TRUE		TRUE		Arbitration	\$ 135,000	\$ -	Contractor	\$ 10,000
DISPUTE1036						TRUE		Mediation	\$ 3,000,000	\$ 33,000,000	Contractor	\$ 900,000
DISPUTE1037						TRUE	Meetings w/ lawyers	Negotiation	\$ 235,000	\$ 172,000	Owner	\$ -
DISPUTE1038	TRUE			TRUE		TRUE		Mediation	\$ 60,000	\$ 68,000	Contractor	\$ 30,000
DISPUTE1039						TRUE		Negotiation	\$ 550,000	\$ -	Owner	
DISPUTE1040						TRUE		Negotiation	\$ 118,000	\$ -	Subcontractor	\$ 1,500
DISPUTE1041	TRUE					TRUE		Mediation	\$ 16,200	\$ 23,628	Subcontractor	\$ 2,512
DISPUTE1042	TRUE			TRUE				Negotiation	\$ 400,000		Contractor	\$ 389,000
DISPUTE1043	TRUE					TRUE		Mediation	\$ 253,000	\$ 63,000	Owner	\$ -
DISPUTE1044						TRUE		Negotiation	\$ 43,000	\$ 33,000	Owner	\$ -
DISPUTE1045				TRUE		TRUE		Negotiation	\$ 25,000	\$ 10,000	Designer	\$ 20,000
DISPUTE1048	TRUE	TRUE						Negotiation	\$ 35,000,000	\$ -	equipment vendor	
DISPUTE1049	TRUE							Mediation	\$ 6,000,000			

Project ID	Mediation Attempted	Arbitration Attempted	Mini-trial Attempted	Litigation Attempted	DRB Attempted	Negotiation Attempted	Other Options Attempted	ADR Final	Original Claim	Counterclaim	Costs For	Outside Counsel
DISPUTE1050	TRUE			TRUE		TRUE		Negotiation	\$ 60,000	\$ 160,000	Contractor	\$ 30,000
DISPUTE1051	TRUE					TRUE		Arbitration	\$ 1,500,000	\$ -	Contractor	\$ -
DISPUTE1052				TRUE		TRUE		Mediation	\$ 20,000,000	\$ -	Subcontractor	\$ 300,000
DISPUTE1053						TRUE		Negotiation	\$ 16,000	\$ 5,000	Owner	
DISPUTE1055	TRUE	TRUE						Arbitration	\$ 350,000	\$ 150,000	Contractor	\$ 50,000
DISPUTE1056	TRUE	TRUE						Arbitration	\$ 50,000	\$ 5,000	Contractor	\$ 1,000
DISPUTE1057	TRUE							Mediation	\$ 450,000	\$ 100,000	Contractor	\$ 30,000
DISPUTE1058												
DISPUTE1061	TRUE					TRUE	in arbitration	Negotiation	\$ 3,000,000	\$ 3,000,000	Contractor	\$ 450,000
DISPUTE1062												
DISPUTE1065				TRUE		TRUE		Negotiation	\$ 250,000	\$ 150,000	Contractor	\$ 70,000
DISPUTE1066	TRUE			TRUE			Court-annexed med.	Mediation	\$ 3,000,000	\$ 3,000,000	Contractor	\$ 500,000
DISPUTE1067	TRUE					TRUE		Mediation	\$ 188,000	\$ -	Owner	\$ 5,000
DISPUTE1068	TRUE					TRUE		Mediation	\$ 1,100,000	\$ 440,000	Owner	\$ -
DISPUTE1069	TRUE							Mediation	\$ 650,000	\$ 500,000	Subcontractor	\$ 125,000

Project ID	Mediation Attempted	Arbitration Attempted	Mini-trial Attempted	Litigation Attempted	DRB Attempted	Negotiation Attempted	Other Options Attempted	ADR Final	Original Claim	Counterclaim	Costs For	Outside Counsel
DISPUTE1070	TRUE	TRUE						Arbitration	\$ 10,000,000	\$ 75,000,000	Contractor	
DISPUTE1071						TRUE		Negotiation	\$ 35,000	\$ 10,000	Contractor	\$ -
DISPUTE1072						TRUE		Negotiation	\$ 200,584	\$ -	Owner	\$ 5,000
DISPUTE1074												
DISPUTE1076												
DISPUTE1077												
DISPUTE1079												
DISPUTE1080	TRUE	TRUE					mediarb	Arbitration	\$ 4,600,000	\$ -	Subcontractor	\$ 140,000
DISPUTE1081	TRUE	TRUE		TRUE		TRUE		Mediation	\$ 950,000	\$ -	Subcontractor	\$ 5,000
DISPUTE1089		TRUE						Arbitration	\$ 30,000,000	\$ 5,000,000	Owner	\$1,500,000
DISPUTE1090	TRUE	TRUE						Negotiation	\$ 1,100,000		Owner	\$ 200,000
DISPUTE1093						TRUE		Negotiation	\$ 125,000	\$ -	Owner	\$ -
DISPUTE1094	TRUE	TRUE		TRUE		TRUE		Mediation	\$ 1,000,000	\$ -	Subcontractor	\$ 80,000
DISPUTE1095	TRUE	TRUE				TRUE		Negotiation	\$ 5,000,000	\$ 3,000,000	Subcontractor	\$ 175,000
DISPUTE1097	TRUE	TRUE						Arbitration	\$ 1,800,000	\$ 1,200,000	Owner	\$ 240,000
DISPUTE1098												
DISPUTE1099						TRUE		Arbitration	\$ 22,000,000	\$ -	Contractor	\$2,500,000
DISPUTE1100	TRUE	TRUE				TRUE	verified process	Arbitration	\$ 7,000,000	\$ 21,000,000	Owner	\$4,200,000
DISPUTE1102												
DISPUTE1103												
DISPUTE1109	TRUE	TRUE				TRUE		Mediation	\$ 100,000,000	\$ 120,000,000	Contractor	\$3,500,000
DISPUTE1114												
DISPUTE1116						TRUE						
DISPUTE1121						TRUE		Negotiation	\$ 5,000,000	\$ 5,000,000	Owner	\$ 200,000
DISPUTE1122												
DISPUTE1123												
DISPUTE1123												
DISPUTE1125												
DISPUTE1126	TRUE	TRUE		TRUE		TRUE		Mediation	\$ 250,000,000	\$ 350,000,000	Contractor	\$2,500,000
DISPUTE1126	TRUE	TRUE		TRUE		TRUE		Mediation	\$ 250,000,000	\$ 350,000,000	Contractor	\$2,500,000

Project ID	Outside Counsel Confidence	In-house Counsel Confidence	In-house Counsel	Consultant Fee	Consultant Fee Confidence	Staff Costs Confidence	Staff Costs	Court Fees Confidence	Court Fees	Other Costs	Cost Comments
DISPUTE1005	3	3	\$ 15,000	\$ -	5	\$ 25,000	3	5	\$ -	\$ -	
DISPUTE1030	3	3	\$ 125,000	\$ 400,000	3	\$ 400,000	3	1	\$ -	\$ -	
DISPUTE1031	3	3	\$ 25,000	\$ -	1	\$ 120,000	3	1	\$ -	\$ -	
DISPUTE1032	3	3	\$ 200,000	\$ 350,000	3	\$ 1,000,000	3	3	\$ 35,000	\$ 64,000	\$64,000 in copying costs, etc. for other costs.
DISPUTE1033	3	5	\$ -	\$ -	5	\$ 50,000	3	5	\$ -	\$ 10,000	\$10,000 other costs for travel and misc.
DISPUTE1034	5	5	\$ -	\$ 12,387	5	\$ 9,702	5	5	\$ 8,320	\$ -	
DISPUTE1035	3	5	\$ -	\$ 3,000	3	\$ 15,000	3	3	\$ 4,000	\$ -	
DISPUTE1036	3	3	\$ 100,000	\$ 150,000	3	\$ 500,000	3	3	\$ 50,000	\$ -	Counterclaim by owner tried to eat our company out
DISPUTE1037	5	3	\$ 30,000	\$ 20,000	3	\$ 30,000	3	5	\$ -	\$ -	
DISPUTE1038	3	3	\$ 8,000	\$ 15,000	5	\$ 4,276	5	3	\$ 2,500	\$ -	
DISPUTE1039	1	5	\$ -	\$ -	5	\$ 8,000	3	5	\$ -	\$ 1,500	
DISPUTE1040	3	5	\$ -	\$ 7,000	3	\$ 5,000	3	5	\$ -	\$ -	
DISPUTE1041	3	5	\$ -	\$ -	5	\$ 3,600	3	5	\$ 475	\$ -	
DISPUTE1042	5	5	\$ -	\$ -	5	\$ 400,000	3	5	\$ -	\$ -	Filing fees, outside consultant fees all included
DISPUTE1043	5	3	\$ 6,000	\$ 3,000	3		1	3	\$ 2,000	\$ -	
DISPUTE1044	5	3	\$ 2,500	\$ 750	3	\$ 1,500	3	5	\$ -	\$ -	
DISPUTE1045	3	5	\$ -	\$ 2,000	3	\$ 10,800	3	3	\$ 75	\$ 10,000	There was a \$10,000 insurance deductible that had
DISPUTE1048										\$1,500,000	Only known costs for independent expert report and
DISPUTE1049											As the mediator, I was not privy to the above info

Project ID	Outside Counsel Confidence	In-house Counsel	In-house Counsel Confidence	Consistant Fee	Consistant Fee Confidence	Staff Costs	Staff Costs Confidence	Court Fees	Court Fees Confidence	Other Costs	Cost Comments
DISPUTE1050	4	\$ -	5	\$ -	5	\$ 25,000	5	\$ 2,000	5	\$ -	
DISPUTE1051	5	\$ 15,000	5	\$ 20,000	5	\$ 75,000	5	\$ 1,000	5	\$ -	
DISPUTE1052	3	\$ 50,000	3	\$ 300,000	3	\$ 1,000,000	2	\$ 35,000	4	\$ -	
DISPUTE1053	1	\$ 500	3	\$ -	5	\$ 750	3	\$ -	5		
DISPUTE1055	3	\$ -		\$ -		\$ 25,000	3	\$ 5,000	2	\$ 5,000	AAA fee fees are high, tried to get Owner to not u
DISPUTE1056	3	\$ -	3	\$ -	3	\$ 5,000	3	\$ 2,500	3	\$ 1,500	Owner and contractor represented themselves. Engi
DISPUTE1057	3	\$ -	3	\$ -	3	\$ 15,000	3	\$ 3,000		\$ 1,000	Avoided AAA and used Colorado JAG Mediator
DISPUTE1058											
DISPUTE1061	4	\$ 50,000	3	\$ 25,000	4	\$ 20,000	3	\$ 10,000	3		
DISPUTE1062											
DISPUTE1065	5	\$ -	5	\$ -	5	\$ 10,000	3	\$ 1,000	3	\$ 3,000	Other costs for deposition transcripts.
DISPUTE1066	3	\$ -	5	\$ 450,000	3	\$ 150,000	3	\$ 25,000	3	\$ 100,000	
DISPUTE1067	3	\$ -	5	\$ -	5	\$ 10,000	3	\$ -	5	\$ -	
DISPUTE1068	5	\$ 15,000	3	\$ 25,000	3	\$ 5,000	3	\$ -	1	\$ -	
DISPUTE1069	5	\$ -	5	\$ 2,500	5	\$ 10,000	3	\$ 375	5	\$ -	

Project ID	Outside Counsel Confidence	In-house Counsel	In-house Counsel Confidence	Consultant Fee	Consultant Fee Confidence	Staff Costs	Staff Costs Confidence	Court Fees	Court Fees Confidence	Other Costs	Cost Comments
DISPUTE1070	1		1	\$ 1,000,000	3		1		1		Counterclaim was owner-agent EPC
DISPUTE1071	5	\$ -	5	\$ -	5	\$ 15,000	3	\$ -	5		
DISPUTE1072											
DISPUTE1074	5	\$ -	5	\$ -	5	\$ 10,000	3	\$ -	5	\$ -	
DISPUTE1076											
DISPUTE1077											
DISPUTE1079											
DISPUTE1080	3	\$ -	5	\$ 15,000	3	\$ 50,000	3	\$ 5,000	3		
DISPUTE1081	4	\$ 5,000	4	\$ 3,000	5	\$ 1,500	4	\$ 5,000	3	\$ 1,750	
DISPUTE1089	3	\$ 250,000	3	\$ 250,000	3	\$ 250,000	3	\$ 100,000	3		
DISPUTE1090	4			\$ 35,000	4	\$ 25,000	3	\$ 11,000	4		
DISPUTE1093		\$ -		\$ -		\$ 1,000		\$ -		\$ -	
DISPUTE1094	4	\$ -	5	\$ 5,000	4	\$ 10,000	1	\$ 1,000	3	\$ 10,000	
DISPUTE1095		\$ 15,000	3	\$ 29,000	4	\$ 10,000	2	\$ 2,700	3		The AAA is too expensive for the services provided
DISPUTE1097	5			\$ 50,000	4	\$ 30,000	3	\$ 25,000	4		
DISPUTE1098											
DISPUTE1099	2	\$ -	5		1	\$ 125,000	1	\$ 125,000	3	\$ -	
DISPUTE1100	5	\$ -	5	\$ 400,000	3	\$ 500,000	4	\$ 700,000	4	\$ -	35 days of arbitration hearings
DISPUTE1102											
DISPUTE1103											
DISPUTE1109	5	\$ 200,000	3	\$ 700,000	4	\$ 800,000	2	\$ 50,000	3		arbit
DISPUTE1114											
DISPUTE1116	3	\$ -	5	\$ 25,000	3	\$ 200,000	2	\$ -	5	\$ -	
DISPUTE1121											
DISPUTE1122											
DISPUTE1123											
DISPUTE1123											
DISPUTE1126	4	\$ 1,000,000	3	\$ 150,000	4	\$ 500,000	4	\$ 100,000	4		
DISPUTE1126	4	\$ 1,000,000	3	\$ 150,000	4	\$ 500,000	4	\$ 100,000	4		

Project ID	Settlement Amount	Paid to Whom	Other Comments
DISPUTE1005	\$ 2,500,000	Contractor	Good client. Finished on good terms.
DISPUTE1030	\$ 21,664,000	Contractor	
DISPUTE1031	\$ -	Not finalized	Arbitrated at \$1,500,000 to contractor. Arbitration under appeal. Learned in discovery that owner set them up for failure. Project 3% over budget (5% contingency) Original PM terminated, new PM was claims consultant. Owner withheld \$600k for completed and accepted work. Owner "partnered", but contractor felt it was a ruse. Contractor pursued mediation, but owner wouldn't agree. Actual award was \$2.5 million plus \$500,000 assignment of other claim.
DISPUTE1032	\$ 3,000,000	Contractor	
DISPUTE1033	\$ 1,200,000	Contractor	Settlement involved owner paid \$1,200,000 to GC and GC fixed and redo or replaced many items and systems in the project. GC in term was able to pay subs for the remaining sub contract amounts (not discussed in this survey). Estimated cost savings by not going to trial estimated at approximately \$300,000.
DISPUTE1034	\$ -	No damages	Subcontractor did not have to pay claim because no damages were awarded by court
DISPUTE1035	\$ 45,000	Owner	
DISPUTE1036	\$ 461,000	Contractor	Saved \$46k by not going to trial
DISPUTE1037	\$ 25,000	Contractor	
DISPUTE1038	\$ -	None	Parties mutually agreed to dissolve claim. Parties agreed to individually absorb attorney fees, and court costs and walk away from claims and litigation. A total cost of \$119,776 including claim
DISPUTE1039	\$ 410,000	Contractor	
DISPUTE1040	\$ 45,000	Subcontractor	The foundation system was compromised by subsurface water closer to the surface than soil reports indicated. We later learned that the concrete subcontractor on project had missed some things on bid and this was his opportunity to capture those costs.
DISPUTE1041	\$ 4,848	Subcontractor	
DISPUTE1042	\$ 1,050,000	Contractor	In this case we were the subcontractor and received a settlement on a claim we filed. They do not often go to trial so he can not quantify the costs of the dispute had it gone to trial. However, with the claim being \$16,000, he was sure that he would have easily surpassed that level in legal and management fees. They feel that they would have netted between \$5,000 and \$10,000 had they gone to trial, but it was simply not worth the time, effort, and money to fight it. In the end, they paid the sub \$48-48 to go away. The cost of the process was about \$11,000 after legal fees, management fees, and settlement
DISPUTE1043	\$ 83,000	Contractor	Of the \$1MM settlement, \$450,000 went to subcontractor and the rest went to counsel fees, cost the contractor time, energy, and attitude. Contractor felt it was a personal attack on himself. Owner settled two other stewart disputes and has been more careful with contracts since then.
DISPUTE1044	\$ 17,000	Contractor	Contractor out of business, negotiating close out and final payment with surety. Estimated cost saved by not litigating \$50k. Estimated judgement if it had gone to trial - 1 to 2 times the actual settlement
DISPUTE1045	\$ -	Case Dropped	*** Costs for Designer *** Owner dropped O&E suit after grand jury hearing. \$10k is for insurance deductible for insurance company following through on suit for things like lawyers fees, etc settlement was business decision based on the total cost to pursue through arbitration. In addition, equipment vendor relieved of all further contractual obligations, including warranty. The structure of the settlement was that the Owner would pay the balance of the contract and the Contractor would repair the garage.
DISPUTE1048	\$ 30,000,000	equipment vendor	
DISPUTE1049	\$ 600,000	Contractor	

Project ID	Settlement Amount	Paid to Whom	Other Comments
DISPUTE1050	\$ 5,000	Contractor	Subcontractor filed original claim of 60,000 but ended up paying money to general contractor. The reason for the settlement was because the general contractor found out that the subcontractor had no assets to pursue in court litigation.
DISPUTE1051			The conflict consists in that the floor concrete slab began to drain water to the surface when it was already finished. They were making studies to know what really happened, if it was a design mistake, poor construction, drainage piping, etc. That is why everybody was involved in the process of resolution.
DISPUTE1052	\$ 9,000,000	Subcontractor	After a week of mediation dispute was settled. Airport authority was going to go to court according to their documents but the airport board wanted it to go to mediation. Very long and difficult process.
DISPUTE1053	\$ 9,000	Subcontractor	Subcontractor claim for change order on plumbing fixture. Suit was filed and negotiation resolved quickly.
DISPUTE1055	\$ 125,000	Contractor	Though the Arbitrator was and Engineer/ Attorney he did not have good grasp of issue. The other sides attorney made the mediation impossible which turned out to be a waste of time. Then in Arbitration was like a circus. Arbitrator just let it happen. Elected to settle for little just to keep employees from going through the humiliation of the arbitration. Also, the attorney for the other side was embarrassing and humiliating his own people. Once we were able to get the two parties to talk without attorneys, the dispute was resolved in less than 30 minutes without either attorney's knowledge.
DISPUTE1056	\$ 45,000	Contractor	
DISPUTE1057	\$ 275,000	Contractor	Found where Engineer had performed soil borings in the area of the dispute and did not disclose. Found where the Owner knew of the rock and did not disclose. Mediator was excellent, without his determination to get this resolved, do not think it would have been without a trial.
DISPUTE1058			
DISPUTE1061	\$ 968,984	Contractor	
DISPUTE1062			
DISPUTE1065	\$ 50,000	Subcontractor	If this case had not settled in negotiation, then the client would have had to play \$10,000 to sub, plus their attorney's costs (\$0k) plus the additional costs of the outside counsel (30k). That totals more than what the settlement that was reached.
DISPUTE1066	\$ 2,000,000	Owner	4 years after project completion mold/leakage was found. Insurance companies got involved. Contractor sued architect to bring him to Texas. Architects contract language specified NC rules. Biggest dispute was cost of lost profits (\$ million vs. 750k). Mediation saved everybody transactional costs but total claim would have been paid by insurance companies anyway. Mediation was a 2-day court-annexed mediation.
DISPUTE1067	\$ 188,000	Owner	Professional liability breakdown. Architect - \$30k; Civil Eng. - \$13.5k; Struct. Eng. - \$22k
DISPUTE1068	\$ 200,000	Contractor	
DISPUTE1069	\$ 300,000	Subcontractor	Several disputes combined into one settlement.

Project ID	Settlement Amount	Paid to Whom	Other Comments
DISPUTE1070	\$ 10,000,000	Contractor	
DISPUTE1071	\$ 35,000	Contractor	
DISPUTE1072			
DISPUTE1074	\$ 200,584	Owner	Professional liability claim breakdown. Architect - \$42,650; MEP Eng. - \$16,595; and Struct. Eng. - \$141,339.
DISPUTE1076			
DISPUTE1077			
DISPUTE1079			
DISPUTE1080	\$ 3,500,000	Subcontractor	
DISPUTE1081	\$ 125,000	Owner	
DISPUTE1089	\$ 20,000,000	Contractor	
DISPUTE1090			The matter is unresolved. Arbitration is scheduled.
DISPUTE1093	\$ 100,000	Owner	
DISPUTE1094	\$ 300,000	Subcontractor	
DISPUTE1095	\$ 1,250,000	Subcontractor	
DISPUTE1097	\$ 650,000	Contractor	
DISPUTE1098			
DISPUTE1099	\$ 18,500,000	Contractor	Question 2.5 not applicable because settled in arbitration
DISPUTE1100	\$ 12,750,000	Contractor	question 2.5 not applicable - resolved in arbitration
DISPUTE1102			
DISPUTE1103			
DISPUTE1109	\$ 83,000,000	Contractor	
DISPUTE1114			
DISPUTE1116	\$ 2,000,000	Contractor	
DISPUTE1121			
DISPUTE1122			
DISPUTE1123			
DISPUTE1123			
DISPUTE1126	\$150,000,000	Owner	Settlement amount was based primarily upon the possibility of large amounts of future business with owner.
DISPUTE1126	\$150,000,000	Owner	Settlement amount was based primarily upon the possibility of large amounts of future business with owner.

Appendix N – Adopted Definitions of Dispute Causes/Types

The following dispute causes and/or types were first catalogued, categorized, and defined by Kilian in his master's thesis at the University of Texas at Austin (2003). The definitions presented herewith are presented for reference as to how the author categorized dispute causes/types for this study. For further details, readers are encouraged to review the original work from which these definitions were first published.

Interpretation of Contracts – A wide ranging classification to characterize misinterpretation of the contract and/or contract requirements.

Delays – Delays are defined as any action taken by either party that causes an interruption of the construction schedule. These actions result in a negative impact on the other party and/or the project.

Disputes – Disputes are generally procedural disagreements between the contractor and the owner. The data surrounding “Disputes” are representations of general instances not covered by other categories when there is a disputed modification to the contract. The disputes category is also a “catch-all” classification.

Performance – Performance describes the failure of the contractor or the owner to properly execute their responsibilities under the terms and conditions of the contract.

Modifications – This cause addresses differences generated because of the introduction of contract modifications. A contract modification can be any type of change to the scope of the project and/or a change in contractual procedural language. A modification can be additive or deductive in nature.

Site Conditions – Site conditions represents situations where actual site conditions are not what they appeared to be prior to the submission of the bid. This is commonly found in projects where the contractor is not given or doesn't have the ability to survey the site prior to bid development.

Quality – Quality issues are commonly related to differences in material selection and construction method. This cause is generated when there are disconnects between the quality control and quality assurance personnel of the contractor and the owner.

Default – Default addresses issues of contract “Termination for Default” on the part of the contractor. The default cause can be characterized as the contractor disputing a “Termination for Default” on the part of the owner or a request by the owner for a summary judgment or dismissal of a claim by the contractor contesting termination.

Liquidated Damages – Claims involving liquidated damages are normally filed by a contractor who is typically seeking to reduce or eliminate monetary damages assessed by an owner.

Appendix O –Full ANOVA Tables for Quantitative Analyses

Project Location – Section 5.2.1

Descriptives

Transactional Costs Divided by Original Claim

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Texas	28	.3303	.42326	.07999	.1661	.4944	.02	1.97
Outside Texas	16	.1676	.18692	.04673	.0680	.2672	.01	.64
Total	44	.2711	.36186	.05455	.1611	.3811	.01	1.97

Test of Homogeneity of Variances

Transactional Costs Divided by Original Claim

Levene Statistic	df1	df2	Sig.
3.251	1	42	.079

ANOVA

Transactional Costs Divided by Original Claim

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.270	1	.270	2.111	.154
Within Groups	5.361	42	.128		
Total	5.631	43			

Descriptives

Transactional Costs Divided by Original Claim

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ADR Leader State	29	.3197	.41954	.07791	.1601	.4792	.02	1.97
Non-ADR Leader State	15	.1772	.18929	.04887	.0724	.2821	.01	.64
Total	44	.2711	.36186	.05455	.1611	.3811	.01	1.97

Test of Homogeneity of Variances

Transactional Costs Divided by Original Claim

Levene Statistic	df1	df2	Sig.
2.947	1	42	.093

ANOVA

Transactional Costs Divided by Original Claim

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.201	1	.201	1.551	.220
Within Groups	5.430	42	.129		
Total	5.631	43			

Owner Type – Section 5.2.2

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
Length of Dispute beyond Occurrence	Public	18	688.5111	467.49603	110.18987	456.0308	920.9914	234.40	1642.70
	Private	20	928.8450	630.58281	141.00260	633.7232	1223.9668	21.10	2118.90
	Total	38	815.0026	565.15140	91.67966	629.2420	1000.7633	21.10	2118.90
Length of Dispute beyond Subst. Completion	Public	18	355.2222	468.18405	110.35204	122.3998	588.0447	-487.00	1370.00
	Private	20	683.4500	612.35357	136.92642	396.8597	970.0403	-183.00	1827.00
	Total	38	527.9737	566.43816	91.88840	341.7901	714.1573	-487.00	1827.00
Trans. Costs divided by Original Claim Amount	Public	20	.125337	.1100022	.0245972	.073855	-.176820	.0173	.4286
	Private	26	.432185	.5065663	.0993458	.227579	.636792	.0080	1.9725
	Total	46	.298773	.4139112	.0610279	.175857	.421690	.0080	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	1.438	1	36	.238
Length of Dispute beyond Subst. Completion	1.525	1	36	.225
Trans. Costs divided by Original Claim Amount	14.021	1	44	.001

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	547203.6	1	547203.582	1.748	.194
	Within Groups	11270452	36	313068.114		
	Total	11817656	37			
Length of Dispute beyond Subst. Completion	Between Groups	1020633	1	1020632.913	3.386	.074
	Within Groups	10850898	36	301413.835		
	Total	11871531	37			
Trans. Costs divided by Original Claim Amount	Between Groups	1.064	1	1.064	7.048	.011
	Within Groups	6.645	44	.151		
	Total	7.710	45			

Facility Type – Section 5.2.3

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
Length of Dispute beyond Occurrence	Industrial	9	951.57	637.640	212.547	461.43	1441.70	21	2119
	Commercial/Building	18	780.84	593.516	139.893	485.69	1075.99	37	1869
	Civil/Infrastructure	11	459.09	459.261	138.472	150.56	767.63	-28	1370
	Total	38	728.14	584.619	94.838	535.98	920.30	-28	2119
Length of Dispute beyond Subst. Completion	Industrial	9	531.44	548.885	182.962	109.53	953.35	-183	1461
	Commercial/Building	18	568.33	653.970	154.142	243.12	893.55	-487	1827
	Civil/Infrastructure	11	759.17	485.119	146.269	433.27	1085.08	234	1643
	Total	38	614.84	578.086	93.778	424.83	804.85	-487	1827
Trans. Costs divided by Original Claim Amount	Industrial	11	.206440	.2630071	.0792996	.029749	.383130	.0080	.8286
	Commercial/Building	24	.396412	.5273685	.1076486	.173724	.619100	.0173	1.9725
	Civil/Infrastructure	12	.164654	.1213716	.0350370	.087538	.241770	.0409	.4286
	Total	47	.292778	.4114454	.0600155	.171973	.413583	.0080	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	.332	2	35	.720
Length of Dispute beyond Subst. Completion	.622	2	35	.543
Trans. Costs divided by Original Claim Amount	4.615	2	44	.015

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	1295526	2	647762.968	1.997	.151
	Within Groups	11350315	35	324294.705		
	Total	12645841	37			
Length of Dispute beyond Subst. Completion	Between Groups	330676.3	2	165338.163	.481	.622
	Within Groups	12034107	35	343831.625		
	Total	12364783	37			
Trans. Costs divided by Original Claim Amount	Between Groups	.537	2	.268	1.629	.208
	Within Groups	7.250	44	.165		
	Total	7.787	46			

Construction Type – Section 5.2.4

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Length of Dispute beyond Occurrence	Greenfield	19	899.3895	565.98835	129.84663	626.5918	1172.1871	21.10	1869.40
	Expansion	8	765.3625	779.64113	275.64477	113.5662	1417.1588	66.90	2118.90
	Renovation	7	651.0000	428.69623	162.03194	254.5221	1047.4779	290.50	1552.10
	Mixed Construction	4	800.4500	341.45778	170.72889	257.1145	1343.7855	328.80	1059.50
	Total	38	815.0026	565.15140	91.67966	629.2420	1000.7633	21.10	2118.90
Length of Dispute beyond Subst. Completion	Greenfield	19	597.2632	654.02420	150.04344	282.0336	912.4927	-487.00	1827.00
	Expansion	8	458.0000	617.42923	218.29420	-58.1838	974.1838	-30.00	1461.00
	Renovation	7	395.5714	348.59712	131.75733	73.1729	717.9700	123.00	1004.00
	Mixed Construction	4	570.5000	413.95853	206.97927	-88.2004	1229.2004	.00	974.00
	Total	38	527.9737	566.43816	91.88840	341.7901	714.1573	-487.00	1827.00
Trans. Costs divided by Original Claim Amount	Greenfield	24	.276334	.4306326	.0879025	.094494	.458174	.0173	1.9725
	Expansion	12	.190500	.2314694	.0668194	.043431	.337569	.0000	.8286
	Renovation	7	.539538	.6115803	.2311556	-.026079	1.105156	.0409	1.7150
	Mixed Construction	4	.262195	.2130149	.1065074	-.076759	.601149	.0850	.5667
	Total	47	.292416	.4117005	.0600527	.171536	.413296	.0000	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	2.160	3	34	.111
Length of Dispute beyond Subst. Completion	1.566	3	34	.216
Trans. Costs divided by Original Claim Amount	1.903	3	43	.143

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	344139.9	3	114713.314	.340	.797
	Within Groups	11473516	34	337456.345		
	Total	11817656	37			
Length of Dispute beyond Subst. Completion	Between Groups	260336.6	3	86778.858	.254	.858
	Within Groups	11611194	34	341505.718		
	Total	11871531	37			
Trans. Costs divided by Original Claim Amount	Between Groups	.562	3	.187	1.113	.354
	Within Groups	7.235	43	.168		
	Total	7.797	46			

Fee Arrangement – Section 5.2.5

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Length of Dispute beyond Occurrence	GMP	7	1003.0000	904.44234	341.84707	166.5304	1839.4696	36.50	2118.90
	Cost Plus	3	724.5333	566.72297	327.19766	-683.2846	2132.3512	70.20	1059.50
	Fixed Price	27	777.9963	478.62857	92.11211	588.6571	967.3355	21.10	1642.70
	Total	37	816.2297	572.89563	94.18346	625.2168	1007.2426	21.10	2118.90
Length of Dispute beyond Subst. Completion	GMP	7	774.0000	873.48917	330.14787	-33.8427	1581.8427	-123.00	1827.00
	Cost Plus	3	558.3333	523.79799	302.41491	-742.8530	1859.5197	-30.00	974.00
	Fixed Price	27	459.0000	487.83596	93.88407	266.0185	651.9815	-487.00	1370.00
	Total	37	526.6486	574.19176	94.39654	335.2036	718.0937	-487.00	1827.00
Trans. Costs divided by Original Claim Amount	GMP	7	.358763	.2849270	.1076923	-.095250	.622277	.0740	.8286
	Cost Plus	6	.429265	.6617501	.2701583	-.265199	1.123729	.0080	1.7150
	Fixed Price	31	.251885	.3975013	.0713933	.106080	.397690	.0173	1.9725
	Total	44	.293076	.4207129	.0634249	-.165168	.420985	.0080	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	6.847	2	34	.003
Length of Dispute beyond Subst. Completion	6.705	2	34	.004
Trans. Costs divided by Original Claim Amount	1.530	2	41	.229

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	308875.1	2	154437.551	.456	.637
	Within Groups	11506663	34	338431.279		
	Total	11815539	36			
Length of Dispute beyond Subst. Completion	Between Groups	554851.8	2	277425.883	.834	.443
	Within Groups	11314211	34	332770.902		
	Total	11869062	36			
Trans. Costs divided by Original Claim Amount	Between Groups	.194	2	.097	.536	.589
	Within Groups	7.417	41	.181		
	Total	7.611	43			

Project Duration – Section 5.3.4

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Length of Dispute beyond Occurrence	Less Than 95%	3	398.03	223.107	128.811	-156.20	952.26	240	653
	95% - 105%	17	755.52	638.963	154.971	427.00	1084.05	37	2119
	More than 105%	18	940.67	504.084	118.814	690.00	1191.35	21	1809
	Total	38	815.00	565.151	91.680	629.24	1000.76	21	2119
Length of Dispute beyond Subst. Completion	Less Than 95%	3	162.33	414.669	239.409	-867.76	1192.43	-123	638
	95% - 105%	17	440.82	623.095	151.123	120.46	761.19	-487	1827
	More than 105%	18	671.22	509.678	120.132	417.77	924.68	-183	1766
	Total	38	527.97	566.438	91.888	341.79	714.16	-487	1827
Trans. Costs divided by Original Claim Amount	Less Than 95%	3	.477768	.4494148	.2594698	-.638640	1.594176	.2000	.9963
	95% - 105%	20	.324386	.3929912	.0878755	.140461	.508312	.0080	1.7150
	More than 105%	23	.248918	.4395330	.0916490	.058850	.438987	.0170	1.9725
	Total	46	.296656	.4151227	.0612065	.173379	.419932	.0080	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	1.452	2	35	.248
Length of Dispute beyond Subst. Completion	.782	2	35	.465
Trans. Costs divided by Original Claim Amount	.120	2	43	.887

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	866003.4	2	433001.698	1.384	.264
	Within Groups	10951652	35	312904.351		
	Total	11817656	37			
Length of Dispute beyond Subst. Completion	Between Groups	899558.7	2	449779.363	1.435	.252
	Within Groups	10971972	35	313484.921		
	Total	11871531	37			
Trans. Costs divided by Original Claim Amount	Between Groups	.166	2	.083	.471	.628
	Within Groups	7.589	43	.176		
	Total	7.755	45			

Project Percent Complete when Claim First Notified – Section 5.3.7

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Length of Dispute beyond Occurrence	Late Notification	6	1186.30	653.241	266.685	500.77	1871.83	482	2119
	"On-time" Notification	32	745.38	529.813	93.659	554.37	936.40	21	1869
	Total	38	815.00	565.151	91.680	629.24	1000.76	21	2119
Length of Dispute beyond Subst. Completion	Late Notification	6	892.67	660.860	269.795	199.14	1586.20	151	1766
	"On-time" Notification	32	459.59	530.983	93.865	268.15	651.03	-487	1827
	Total	38	527.97	566.438	91.888	341.79	714.16	-487	1827
Trans. Costs divided by Original Claim Amount	Late Notification	7	.298798	.2576356	.0973771	.060525	.537071	.0435	.8286
	"On-time" Notification	37	.311369	.4470882	.0735008	.162302	.460435	.0080	1.9725
	Total	44	.309369	.4202754	.0633589	.181593	.437144	.0080	1.9725

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Length of Dispute beyond Occurrence	.388	1	36	.537
Length of Dispute beyond Subst. Completion	.189	1	36	.666
Trans. Costs divided by Original Claim Amount	.996	1	42	.324

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Length of Dispute beyond Occurrence	Between Groups	982264.9	1	982264.868	3.264	.079
	Within Groups	10835391	36	300983.078		
	Total	11817656	37			
Length of Dispute beyond Subst. Completion	Between Groups	947631.9	1	947631.922	3.123	.086
	Within Groups	10923899	36	303441.640		
	Total	11871531	37			
Trans. Costs divided by Original Claim Amount	Between Groups	.001	1	.001	.005	.943
	Within Groups	7.594	42	.181		
	Total	7.595	43			

Effects of Claimant Status on Transactional Cost Ratios – Section 5.4.8.2

Descriptives

Transactional Costs Divided by Original Claim Amount

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Claimant	30	.324810	.4702489	.0858553	.149216	.500404	.0080	1.9725
Non-Claimant	16	.239453	.2928521	.0732130	.083403	.395503	.0170	.9963
Total	46	.295121	.4156748	.0612879	.171681	.418561	.0080	1.9725

Test of Homogeneity of Variances

Transactional Costs Divided by Original Claim Amount

Levene Statistic	df1	df2	Sig.
1.095	1	44	.301

ANOVA

Transactional Costs Divided by Original Claim Amount

		Sum of Squares	df	Mean Square	F	Sig.
Between Groups		.076	1	.076	.434	.513
Within Groups		7.699	44	.175		
Total		7.775	45			

Effects of ADR Method Selection on Cost – Section 5.5.1

Descriptives

Total Transactional Costs

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Mediation	15	\$1,212,433	1772501.68	457658.0	230853.8201	2194011.247	\$6,587	\$5250000
Arbitration	11	\$1,167,182	1797913.06	542091.2	-40672.6091	2375036.245	\$10,000	\$5800000
Negotiation	18	\$330,199	671669.89	158314.1	-3814.9687	664212.1909	\$1,000	\$2549000
Total	44	\$840,206	1462040.96	220411.0	395704.8986	1284707.056	\$1,000	\$5800000

Test of Homogeneity of Variances

Total Transactional Costs

Levene Statistic	df1	df2	Sig.
5.846	2	41	.006

ANOVA

Total Transactional Costs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.94E+12	2	3.968E+12	1.937	.157
Within Groups	8.40E+13	41	2.048E+12		
Total	9.19E+13	43			

Effects of ADR Method Selection on Cost – Section 5.5.1 (alternative method)

Descriptives

Total Transactional Costs

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
All Other ADR Methods	26	\$1,193,288	1747256	342665.1	487556.0708	1899019.929	\$6,587	\$5800000
Negotiation	18	\$330,199	671669.9	158314.1	-3814.9687	664212.1909	\$1,000	\$2549000
Total	44	\$840,206	1462041	220411.0	395704.8986	1284707.056	\$1,000	\$5800000

Test of Homogeneity of Variances

Total Transactional Costs

Levene Statistic	df1	df2	Sig.
12.063	1	42	.001

ANOVA

Total Transactional Costs

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.92E+12	1	7.923E+12	3.962	.053
Within Groups	8.40E+13	42	2.000E+12		
Total	9.19E+13	43			

Effects of ADR Method Selection on Dispute Length – Section 5.5.2 (Measure 1)

Descriptives

of Days from Subst. Completion to Resolution

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Negotiation	15	287.8000	477.72724	123.34864	23.2435	552.3565	-487.00	1308.00
Mediation	14	726.5000	514.61887	137.53768	429.3679	1023.6321	12.00	1827.00
Arbitration	7	421.5714	590.99855	223.37646	-125.0111	968.1539	-123.00	1461.00
Total	36	484.4167	538.82424	89.80404	302.1048	666.7286	-487.00	1827.00

Test of Homogeneity of Variances

of Days from Subst. Completion to Resolution

Levene Statistic	df1	df2	Sig.
.343	2	33	.712

ANOVA

of Days from Subst. Completion to Resolution

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1427979	2	713989.568	2.698	.082
Within Groups	8733626	33	264655.322		
Total	10161605	35			

Multiple Comparisons

Dependent Variable: # of Days from Subst. Completion to Resolution

(I) ADR Option Selection	(J) ADR Option Selection	Mean Difference (I-J)	Std. Error	Sig.	90% Confidence Interval		
					Lower Bound	Upper Bound	
Tukey HSD	Negotiation	Mediation	-438.70000*	191.17437	.071	-845.1189	-32.2811
		Arbitration	-133.77143	235.48162	.838	-634.3834	366.8405
	Mediation	Negotiation	438.70000*	191.17437	.071	32.2811	845.1189
		Arbitration	304.92857	238.14251	.416	-201.3402	811.1974
	Arbitration	Negotiation	133.77143	235.48162	.838	-366.8405	634.3834
		Mediation	-304.92857	238.14251	.416	-811.1974	201.3402
Tamhane	Negotiation	Mediation	-438.70000*	184.74713	.073	-850.5183	-26.8817
		Arbitration	-133.77143	255.17039	.941	-759.5633	492.0205
	Mediation	Negotiation	438.70000*	184.74713	.073	26.8817	850.5183
		Arbitration	304.92857	262.32357	.612	-330.1797	940.0368
	Arbitration	Negotiation	133.77143	255.17039	.941	-492.0205	759.5633
		Mediation	-304.92857	262.32357	.612	-940.0368	330.1797

*. The mean difference is significant at the .1 level.

Effects of ADR Method Selection on Dispute Length – Section 5.5.2 (Measure 2)

Descriptives

of Days from Dispute Occurrence to Resolution

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Negotiation	15	582.1733	480.92895	124.17532	315.8438	848.5029	21.10	1514.70
Mediation	14	990.8857	502.34860	134.25831	700.8383	1280.9332	66.90	1869.40
Arbitration	7	804.9571	713.36958	269.62836	145.2003	1464.7140	36.50	2118.90
Total	36	784.4361	555.11592	92.51932	596.6119	972.2603	21.10	2118.90

Test of Homogeneity of Variances

of Days from Dispute Occurrence to Resolution

Levene Statistic	df1	df2	Sig.
.576	2	33	.568

ANOVA

of Days from Dispute Occurrence to Resolution

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1213301	2	606650.700	2.091	.140
Within Groups	9572078	33	290062.959		
Total	10785379	35			

Effects of ADR Method Selection on Dispute Length – Section 5.5.2 (Alternate)

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
# of Days from Dispute Occurrence to Resolution	Negotiation	15	582.1733	480.92895	124.17532	315.8438	848.5029	21.10	1514.70
	Other ADR Methods	21	928.9095	569.88176	124.35840	669.5025	1188.3166	36.50	2118.90
	Total	36	784.4361	555.11592	92.51932	596.6119	972.2603	21.10	2118.90
# of Days from Subst. Completion to Resolution	Negotiation	15	287.8000	477.72724	123.34864	23.2435	552.3565	-487.00	1308.00
	Other ADR Methods	21	624.8571	546.46192	119.24777	376.1107	873.6036	-123.00	1827.00
	Total	36	484.4167	538.82424	89.80404	302.1048	666.7286	-487.00	1827.00

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
# of Days from Dispute Occurrence to Resolution	.276	1	34	.603
# of Days from Subst. Completion to Resolution	.408	1	34	.527

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
# of Days from Dispute Occurrence to Resolution	Between Groups	1051977	1	1051977.376	3.675	.064
	Within Groups	9733402	34	286276.520		
	Total	10785379	35			
# of Days from Subst. Completion to Resolution	Between Groups	994065.8	1	994065.779	3.687	.063
	Within Groups	9167539	34	269633.499		
	Total	10161605	35			

Effects of Disputing Party – Section 5.5.3

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-
Cell Means and Standard Deviations
Variable .. y
FACTOR          CODE          Mean  Std. Dev.    N
a                1                .665   .627         12
b                2                .183   .189          9
b                3                .162   .193          9
a                2                .105   .109          7
b                1                .124   .112          4
b                2                .331   .431          3
b                3                .302   .422         44
For entire sample
                .302   .422         44

* * * * * A n a l y s i s   o f   V a r i a n c e  -- design 1 * * *
* * *

Tests of Significance for y using SEQUENTIAL Sums of Squares
Source of Variation    SS      DF      MS      F      Sig of F

WITHIN CELLS          5.38     38      .14
Party Involved(A)     .42      1       .42     2.99   .092
Orig. Claim Amount(B) .94      2       .47     3.32   .047
A BY B                .92      2       .46     3.24   .050

(Model)              2.28     5       .46     3.22   .016
(Total)              7.67    43      .18

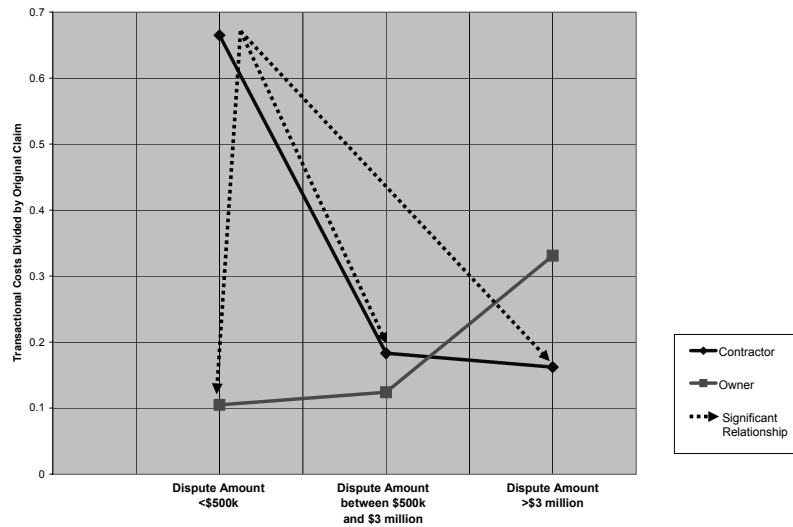
R-Squared = .298
Adjusted R-Squared = .205
    
```

Multiple Comparisons

Dependent Variable: y
Tukey HSD

(I) ab	(J) ab	Mean Difference (I-J)	Std. Error	Sig.	90% Confidence Interval	
					Lower Bound	Upper Bound
11	12	.4814250*	.1659889	.063	.034225	.928625
	13	.5029250*	.1659889	.047	.055725	.950125
	21	.5597774*	.1790270	.037	.077450	1.042104
	22	.5407167	.2173305	.153	-.044806	1.126239
12	11	-.4814250*	.1659889	.063	-.928625	-.034225
	13	.0215000	.1774496	1.000	-.456577	.499577
	21	.0783524	.1897016	.998	-.432734	.589439
	22	.0592917	.2262048	1.000	-.550140	.668723
13	11	-.5029250*	.1659889	.047	-.950125	-.055725
	12	-.0215000	.1774496	1.000	-.499577	.456577
	21	.0568524	.1897016	1.000	-.454234	.567939
	22	.0377917	.2262048	1.000	-.571640	.647223
21	11	-.5597774*	.1790270	.037	-1.042104	-.077450
	12	-.0783524	.1897016	.998	-.589439	.432734
	13	-.0568524	.1897016	1.000	-.567939	.454234
	22	-.0190607	.2359384	1.000	-.654716	.616595
22	11	.5407167	.2173305	.153	-.044806	1.126239
	12	.0592917	.2262048	1.000	-.668723	.550140
	13	-.0377917	.2262048	1.000	-.647223	.571640
	21	.0190607	.2359384	1.000	-.616595	.654716
23	11	-.3341583	.2429829	.741	-.988793	.320476
	12	.1472667	.2509517	.991	-.528837	.823370
	13	.1687667	.2509517	.984	-.507337	.844870
	21	.2256190	.2597596	.952	-.474215	.925453
22	11	.2065583	.2875012	.978	-.568015	.981132
	12	-.5407167	.2173305	.153	-1.126239	.044806
	13	-.0592917	.2262048	1.000	-.668723	.550140
	21	-.0377917	.2262048	1.000	-.647223	.571640

*. The mean difference is significant at the .1 level.



Effects of Perceived Dispute Complexity – Section 5.5.4

```

Cell Means and Standard Deviations
Variable .. TC_Complex Transactional Costs divided by Original
          FACTOR          CODE          Mean Std. Dev.          N

Complex          Average or Less
Disputes          Less than $1.3MM          .450          .521          15
Disputes          Over $1.3MM          .270          .243          7
Complex          Greater than Average
Disputes          Less than $1.3MM          .229          .116          3
Disputes          Over $1.3MM          .149          .240          10
For entire sample          .309          .394          35

* * * * * A n a l y s i s   o f   V a r i a n c e  -- design 1 * * *
* * *

Tests of Significance for TC_Complex using SEQUENTIAL Sums of Squares
Source of Variation          SS          DF          MS          F          Sig of F

WITHIN CELLS          4.69          31          .15
COMPLEX          .41          1          .41          2.74          .108
DISPUTESIZES          .15          1          .15          1.01          .322
COMPLEX BY DISPUTESI          .02          1          .02          .10          .753
ZES (ERROR 1)

(Model)          .58          3          .19          1.28          .297
(Total)          5.28          34          .16

R-Squared =          .111
Adjusted R-Squared =          .024

-----
Abbreviated   Extended
Name          Name

Disputes     Disputesizes

```

Appendix P – Participating Companies and Organization in Quantitative and Qualitative Data Collection

3M
Allen & Overy LLP
Allen Dell, PA
Allensworth and Porter, LLP
American Construction Investigations
Andrews Myers Coulter & Cohen, PC
Armbrust and Brown
Austin Commercial, LP
Baker & Daniels
Bingham McCutchen, LLP
Blitman Building Corporation
C.D. Henderson
City of Austin
Del Valle ISD
Desert Star Construction, Inc.
DLA Piper Rudnick Gray Cary US LLP
Dorsey & Whitney LLP
Dufresne Henry
DuPont
Dynamic Systems
Faegre & Benson
Farella Braun + Martel
FCI Construction, Inc.
Fisk & Fielder, PC
Flynn Construction
Ford Nassen & Baldwin
Fraser Milner Casgrain, LLP
Holland & Knight, LLP
Intel Corporation
Jacoby Donner, PC
Jay Reese Construction
Kelley Drye & Warren, LLP
Kirkland & Ellis, LLP
Law Offices of Ronald Max Raydon
LCRA
Lemley & Associates, Inc.
Leonard, Street and Deinard
Mayer, Brown, Rowe & Maw
Mills Shirley, LLP
Milton Architects
National Association of Surety Bond Producers
Nielson-Wurster
Parsons Brinckerhoff
Paulsen Construction
PBC Dispute Resolution Services, LLP
Pillsbury Winthrop Shaw Pittman, LLP
Postner & Rubin
Pratt & Sanderford, PC
Price & Associates, PC
Prism Development Corp.
RMCI, Inc.
S&B Engineering and Constructors, Ltd.
Sarabi Investment, LLC
Schiff Hardin LLP
Shell Oil Products US
Snell & Wilmer
Strasburger & Price, LLP
TAMU Facilities Planning
The Nielsen-Wurster Group
Thelen Reid & Priest, LLP
Troutman Sanders, LLP
UT System
Wickwire Gavin
Workman Corporation
Zachry Construction Corporation

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Vita

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