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The Cost of Interpersonal Conflict in Construction

Julie L. Brockman, Ph.D.
Michigan State University

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8484 Georgia Avenue
Suite 1000
Silver Spring, MD 20910

PHONE: 301.578.8500
FAX: 301.578.8572

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Table of Contents

| | |
|---|-----------|
| Acknowledgements..... | 3 |
| Abstract..... | 4 |
| Key Findings..... | 4 |
| Introduction..... | 5 |
| Research Design and Methods..... | 8 |
| Results..... | 10 |
| Discussion, Conclusions and Recommendations..... | 30 |
| Appendices | |
| Appendix A: Informed Consent..... | 34 |
| Appendix B: Interview Protocol..... | 36 |
| References..... | 37 |

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Abstract

Interpersonal conflict is identified as one of the top occupational stressors, strongly linked to a reduction in psychological and physical health. In addition, it has been identified as a determinant of work disability, occupational incidents, and other costs related to reduced quality, restructuring, decreased productivity, absenteeism, and employee turnover. Studies suggest that owners and contractors ranked conflict among project participants as the highest factor affecting project cost. No research studies previously existed which expose the financial cost of conflict in this industry. The purpose of this qualitative study is to explore the nature of interpersonal conflict on construction projects and its financial burden. Seventy-four construction industry personnel were interviewed using a protocol designed to elicit recalled conflict incidents. Forty-one of the 86 reported incidents underwent analysis using the reported time and associated labor costs. It is recommended that educational opportunities and innovative changes to the construction process could reduce the incidence of interpersonal conflict on the jobsite.

Key Findings

1. The average amount of time reported across all 41 analyzed conflict incidents was 161.25 hours (approximately 20 days) “lost” in managing conflict, with .5 hours as the minimum number of hours spent embroiled in a conflict and 6000 hours as the maximum number of hours “lost” as the result of a conflict.
2. The average cost reported across all 41 conflict incidents was \$10,948, with \$25 as the minimum cost for an incident and \$367,000 as the maximum cost for an incident.
3. The monetary cost of an ‘observed’ interpersonal conflict may underestimate the true monetary cost because the consequences of such behaviors can carry costs well beyond the observed incident.
4. Primary trigger events attributed to interpersonal conflict that occurs on a construction jobsite are most often tied to the process of construction versus construction personnel. “I think it’s the process rather than the people” is a quote by one of the superintendents interviewed. This thought was confirmed by the analysis of the 86 recorded incidents and their associated triggers for interpersonal conflict.
5. Resolution techniques most reported include verbal communication between the conflicting individuals by themselves or through the aid of a third party (supervision) as well as physically separating individuals from each other for the duration of a project.
6. Construction personnel have choices to make when reacting to a primary trigger event which can then have an impact on the strength of the consequences and hence, the monetary cost of interpersonal conflict in construction.

Introduction

The United States ranks number one in construction activity, spending an annual average of over \$889 billion (Ng, Pena-Mora, & Tamaki, 2007), with low profit margins ranging from 2% - 5%. Fierce competition has driven contractors to seek ways to reduce waste in the course of completing a project. A common dilemma which continues to eat away at construction companies' profit margins has yet to be fully realized: unresolved interpersonal conflict on the jobsite. Research suggests that unresolved interpersonal conflict in the workplace is one of the largest reducible productivity costs, yet it is the least identified (Dana, 1999; Slaikev & Hasson, 1998). Addressing interpersonal conflicts early and effectively will significantly reduce actual costs for contractors intent on cutting waste from their business operations.

Litigation and arbitration fees are the tangible costs associated with interpersonal conflict. What contractors often miss, however, is that the cost of workplace conflicts begin to be incurred very early in a dispute, way before it reaches the formal mechanisms used to resolve conflicts (Fullerton, 2005; Cram & MacWilliams, n.d.; Charkoudian, 2001; Brunette, 2005; Brett, Goldberg, & Ury, 1990). Identifying interpersonal conflicts early, and understanding how unresolved conflict places a burden on the financial health of a contracting company are the keys to cultivating an efficient and amicable workplace.

For this study, interpersonal conflict arises when two or more interdependent individuals perceive an interference with the means to a goal or an interest (Applebaum, Abdellah & Shapiro, 1999), proceeded by some form of interaction. This definition includes three elements that most definitions of interpersonal conflict include: interdependence among individuals, a perception that an incompatibility among goals exists for at least one of the individuals and some form of interaction between the individuals (Raver & Barling, 2008).

Interpersonal conflict on the job is identified as one of the top occupational job stressors (Keenan and Newton, 1985; Liu, 2002; Narayanan, Menon & Spector, 1999; NIOSH, 2010; Rainy, 1995; Spector and Bruk-Lee, 2008; Stewart & Ellerly, 1998), strongly linked to a reduction in worker psychological and physical health (Appelberg, Romanov, Heikkila, Honkasalo & Koskenvuo, 1996; Hershcovis & Barling, 2009; Hyde, Paavo, Theorell, Oxenstierna, 2006;

Kohler & Kemp, 1992; Narayanan, Menon & Spector, 1999; Northam, 2009; Sui, 2003; Tuckey, Dollar, Saebel & Berry, 2010). In addition, interpersonal conflict on the job has been identified as a determinant of work disability (Appelberg et al, 1996) and a predictor of workplace accidents (Sui, 2003). The frequency with which interpersonal conflict is reported to occur at work gives added importance to these findings. Studies describing the frequency of incidents of interpersonal conflict at work range from 25% to 50% of an employee's work day (Hahn, 2000). In addition, managers, on average, spend 30-42% of their time dealing with conflict between employees (Barnes-Slater & Ford, n.d.; Brahm, 2004; Bobinski, 2006; Denny, 2005). It follows that if interpersonal conflict is associated with unhealthy and unsafe work outcomes then steps taken to prevent and/or reduce interpersonal conflict on the jobsite will positively affect the overall revenue generated by a contractor, thereby increasing their profit margin.

Costs other than those directly and indirectly related to health and safety issues include wasted time, reduced quality, loss of skilled employees, restructuring inefficiencies, decreased motivation and productivity, absenteeism, and employee turnover. Numerous studies have documented the cost of unresolved conflict in a variety of workplaces. All translate to the loss of revenue for a company:

- Employees embroiled in conflict miss an average of 6% more work, and pay out an average of 50% more in healthcare costs than employees reporting no conflict (Kittusamy & Buchholz, 2004; Raak & Raak, 2003;).
- Absenteeism has increased 316% since 1995, a direct result of the stress caused by workplace conflict (Barnes-Slater & Ford, n.d.).
- Lower morale is a characteristic of employees dealing with disputes, and they are less productive while at work as compared to unhindered workers (Cram, n.d.; Levine, n.d.).
- Conflict at work accounts for 90% of involuntary departures and 50% of voluntary departures. The cost of replacing these employees can cost an organization between 75% and 150% of the employee's annual salary. (Bobinski, 2006).
- Those workers categorized as the target of a conflict lose 28% of work time because they are avoiding the instigator, and 53% lose time worrying about the incident or future incidents (Johnson & Indvik, 2001).

These examples provide a sharp picture of the consequences associated with unresolved conflict: it can be costly to the employer as well as the employee.

For the construction industry, the financial burden of interpersonal conflict may be even higher than it is for generic industry. By its very nature, the construction industry exists within an adversarial environment where conflict is unavoidable (Iyer & Jha, 2004; Ng, Pena-Mora, & Tamaki, 2007; Phillips, 1985; Spittler, 1992) and is often characterized by the high cost of conflict resolution (Ng, et al, 2007). While quantifying costs of litigation and arbitration is straightforward--researchers estimate the annual cost to be about \$5 billion (Michel, 1998)--it is the day to day conflicts, often the source of later litigation and arbitration, that are difficult to measure. According to a recent study of 50 Indian construction firms, Iyer and Jha (2004) found that owners and contractors ranked conflict among project participants as the highest factor affecting project cost. It is astonishing, in light of this fact, that no research studies exist which attempt to expose the unmistakable financial cost of day-to-day conflict in the construction industry.

The key to keeping the cost of conflict at a minimum is proximity: the resolution of conflict must take place closest to the source of the conflict, as much as circumstances will allow (Spittler & Jenteen, 1992; Thomas, 2002; Fullerton, 2005). Though the construction industry relies on formal conflict resolution processes like mediation, arbitration and litigation, these formal mechanisms are utilized well after disputes have already escalated out of control (Thomas, 2002). Crucial to running an efficient business is realizing the true value of prevention and early intervention of conflict. The cost of preventing and resolving conflict in its earliest stages is minimal compared to the cost of leaving conflict unresolved, or resolving troublesome circumstances late in the game through formal mechanisms (Thomas, 2002).

Contractors and leaders within the skilled construction trades would be eager to gain more insight about the nature of interpersonal conflict on the job site, as well as the approximate cost of such conflicts. As stated earlier, conflict represents one of the largest reducible costs in the workplace. A variety of initiatives can be instituted at various levels in the industry, from apprentices to owners, which aid in the prevention and resolution of interpersonal conflict in its earliest stages. However, these initiatives will only be instituted if the owner, contractors and/or skilled trade leaders are convinced that they will see a return on their investment. In order to calculate a return, they will need a measure of the cost of conflict. This research study will

initiate discussions among construction trade stakeholders by calculating the monetary cost of conflict on reported incidents of interpersonal conflict on construction jobsites.

Research Question

What is the nature of interpersonal conflict on a construction project and its associated financial burden?

Expected Significance

Previous research in general workplace conflict shows that incompatibility is common, so it is sensible to predict that a study of interpersonal conflict on construction jobsites will produce similar, if not more significant findings. If this forecast is borne out, the implications are far reaching. Though interpersonal conflict may be common, what is not always grasped by those involved is how to objectively identify and address a conflict early enough so that it does not have a negative impact on productivity and the health and safety of workers. The results of this study likely will raise the awareness of the problems created by conflict, which in turn can raise the awareness of solutions to problems. Raised awareness is often the first step in launching a positive domino effect toward solutions. Provided the findings of this pioneer study are recognized by construction industry stakeholders as significant--maybe even remarkable--it will warrant further exploration and expansion of its scope.

Research Design and Methods

The primary purpose of this study is to calculate the financial cost of conflict which occurs within the domain of commercial construction projects (multi-trade). In addition, the data collected will provide valuable information about the types of conflict that arise during a construction project, the origin of conflict in the workplace, and the various ways in which individuals resolve and prevent conflict.

Research Design

The qualitative technique best suited for this research study was the Critical Incident Technique, a technique used as an “investigative tool in organizational analysis from within an interpretive or phenomenological paradigm.” (Chell, 1998, p. 51) and most often used in multi-site studies (Chell, 1998).

The critical incident technique is a qualitative interview procedure which facilitates the investigation of significant occurrences (events, incidents, processes or issues) identified by the respondent, the way they are managed, and the outcomes in terms of perceived effects. The objective is to gain an understanding of the incident from the perspective of the individual, taking into account cognitive, affective and behavioral elements. (Chell, 1998, p.56).

Data Source and Procedures

Selection of Participants. A snowball sampling technique was used to access interview participants. Snowball sampling uses a small pool of initial informants to access interview participants who meet the interview eligibility criteria. In the case of this study, four general contracting/construction manager firms located near the researcher's location of study were initially contacted by the researcher who requested access to construction job sites, contractors and subcontractors. In all cases, these firms gave the researcher access to their jobsite superintendents who then started the "ball" rolling.

Source. The primary data source for this study was seventy-four construction personnel who routinely performed their work directly on a construction jobsite. Interview eligibility also included the following criteria: 1) voluntarily willing to be interviewed, 2) currently working on a construction jobsite, and 3) currently working as a superintendent, project manager, supervisor, foreman, journeyman or 5th year apprentice. The 74 construction personnel interviewed consisted of 17 fifth year apprentices, 18 journeymen, 13 foremen/supervisors, 13 superintendents and 13 project managers. Of the 74 participants, 14% had less than 5 years of construction industry experience, 21% had 6-10 years of construction industry experience, 20% had 11-15 years of construction industry experience, 17% had 16-20 years of construction industry experience, and 28% had more than 21 years of construction industry experience. At the time of the interview, all participants were engaged in large commercial sector projects (school, hospital, restaurant, bank, etc.).

Procedures. Following Human Subjects approval (Appendix A), data collection began using the semi-structured interview model of the Critical Incidents Technique, using a protocol designed to elicit one or more conflict incidents recalled by the interviewee (Appendix B). This format was ideal for eliciting detailed incidents of conflict. All semi-structured interviews were held in a closed office, a conference room or a construction site trailer. All participants were interviewed during working hours and offered a \$20 incentive at the beginning of the interview.

Each critical incident interview lasted approximately 45 minutes. All interviews were digitally audio-taped, transcribed and uploaded to Nvivo 9 qualitative analysis software.

Data Analysis

Each of the 86 reported critical conflict incidents were thematically analyzed using Hycner's phenomenological analysis of interview data as a guide (Hycner, 1985). Forty-one of the 86 reported incidents were analyzed using the time reported and associated labor costs. Each critical incident recorded and transcribed in the interview was entered into a database developed to represent each element of the incident, and the time and actual dollars associated with its components. As an example, if a supervisor spent one hour mediating an argument between two electrical journeymen on the jobsite concerning workmanship, three hours would be calculated for "time spent" dealing with a conflict. This "time spent" would then be converted to a dollar amount based upon labor cost, then added to time/dollars associated with other cost elements of the incident. The cost of all elements added together represents the total dollar expense for the "conflict incident".

In addition, each critical incident, once transcribed, was uploaded to Nvivo 9 qualitative analysis software for thematic analysis which identified conflict triggers, attempted ways to manage interpersonal conflict and the effects of interpersonal conflict to the individuals involved and the construction project as a whole.

Results

Conflict Incidents

Of the 86 conflict incidents reported, 41 were able to be analyzed using the time reported and associated labor costs. The hourly labor cost assigned with each construction personnel was estimated according to the following positions: 5th Year Apprentice, \$45; Journeyman, \$50; Foreman, \$55; Supervisor, \$60; Superintendent, \$65; Project Manager, \$70. The base hourly wage estimates were calculated using the median base wage rate (BLS, 2012), times 40 % for fringe benefits and another 40% for the fixed cost load factor.

The **average amount of time** reported across all 41 conflict incidents was 161.25 hours “lost” in managing conflict, with .5 hours as the minimum number of hours spent embroiled in a conflict and 6000 hours as the maximum number of hours “lost” as the result of a conflict.

The **average cost** reported across all 41 conflict incidents was \$10,948, with \$25 as the minimum cost for an incident and \$367,000 hours as the maximum cost for an incident.

Following is an example of how the analysis was conducted for each of the 41 conflict incidents. First, the researcher read the interview transcript, highlighting the conflict incident reported by the interviewee. For example, transcript #26 stated the following (I=interviewer; P=interviewee):

I: So this individual got all this stuff around and they needed to punch some holes in it. We have a piece of machinery called an iron worker, makes a beautiful hole. And you don't have to sit there with a drill. So this person, I think they got something in their eye. Went to the eye doctor. Well, they got back, the new person had loaded everything in the truck that was supposed to be taken care of in the shop and he's like, what are we doing cuz we need to punch holes. Well, I don't know how to work that thing. I don't know. Well, I'll show you. No, I don't know. We'll just, we'll just torch them. And so they went, okay, they didn't wanta make a big deal. Well, they got out there, well, they torched them and you torch a hole and you know what that looks like.

I: Yes

P: Kinda nasty. It'll work but he's going, well, that's why...

I: But it's not __ work

P: And then when they went to put it together, that made it sloppy and this person just blew up. You know, throwing the F bomb. This is, you know, and they're like... and then the next day, comes back in and goes, well, yeah, I was wrong. I'm sorry. Well, this happened two or three times. And this is someone that's new. Same individual went down with my second person and they're doing some piping and he said, well, that person was off the day before. I measured everything up, I got fittings, here's all the stuff, we're gonna put... Well, I ain't doing it that way. And I'm just going, you know, you haven't been here six months. You walk into a new place. I mean, I'm sorry. If I work for you and you say you want me to go stand on my head in that corner, okay. I don't know why but I'm a new... Well, I mean, you're gonna do what people ask you to do. And this individual wanted to argue about it. So then I went out and I said, well, we need to go look at these heaters we're gonna put in and I thought, and I wasn't trying to prompt something but I thought, well, I'm gonna give direction and then see how that goes. And actually, it didn't go too bad but I'm the boss.

I: Now, now one of the things that I'm looking at as kind of trying to estimate the cost of conflict. That's a really hard thing to do. But in, if you were to go back and look at that situation with that guy, how many hours did you put into counseling him?

P: over six months

I: Uh huh, or dealing with the people that were having problems so they called you. How much time did you put into that conflict?

P: Well, probably 40 to 60 hours over... for one individual. And that was a rather mild one, I would say.

I: right

P: Yeah, I think it was with

I: set people up for failure or...

P: You know, I really don't know. He was a different individual because he would do that with many different people. He just happened to be working with this individual. You know, and that one there, I tried being his friend. I tried counseling him. I brought him in and I peeled paint off the walls with every swear word I could think of to try and shock him and every one of them, he just kinda looked at me like screw you cuz I really don't care. And so at that point, you're kind of at a loss

I: Right

From this transcript, the researcher records the conflict incident in an attempt to identify the cost of the conflict incident:

| P# | Incident | Time (in hours) | Labor Rate (per hour) | Subtotal |
|----|---|-----------------|-----------------------|-----------------|
| 26 | 'J1' refuses to pipe the way 'J2' had planned | .25 | \$50 | \$12.5 |
| | 'J2' listens to 'J1' | .25 | \$50 | \$12.5 |
| | 'J2' calls 'Sv' | .25 | \$50 | \$12.5 |
| | 'Sv' listens to 'J2' | .25 | \$60 | \$15.0 |
| | 'Sv' travels to job and confronts 'J1' | 1.50 | \$60 | \$90.0 |
| | 'J3' replaces 'J1' | 1.50 | \$50 | \$75.0 |
| | 'Sv' counsels 'J1' for 6 months | 50.00 | \$60 | \$3000.0 |
| | 'J1' listens to 'Sv' as he is counseled | 50.00 | \$50 | \$2500.0 |
| | | 104.00 | | \$5702.0 |

Each of the 41 incidents the researcher was able to “cost out” was analyzed with regard to the trigger event and the participants involved in the conflict situation. In the above example, the trigger event was the refusal by one journeyman to lay pipe. Those involved in the incident are identified as follows: ‘J’ represents a journeyman (3 journeymen were involved in this incident) and ‘Sv’ represents a supervisor.

Primary and Secondary Triggers

A Primary Trigger is the perceived incident identified by the interview participant which ‘triggers’ the conflict situation. A Secondary Trigger is the first personal reaction immediately following the Primary Trigger. In every case, the Primary Trigger was followed by an interpersonal response/altercation-the Secondary Trigger. An illustration of this was expressed by one interview participant.

I mean, if you’ve got a guy, you’ve got a guy comes in, in a good mood and slips on the stairs climbing up, that’s gonna make him mad all day long. He’s not gonna perform as good as you want him to perform because he’s mad and he’s complaining about it all day long.

In this illustration, the primary trigger event is the slip on the stairs, whereas the secondary trigger event is the person’s reaction to the slip.

Primary Triggers. Of the 41 critical conflict incidents, several primary trigger events were described by interview participants, whether experienced or observed on a construction jobsite. Each primary trigger event is described, followed by an example quote(s) from interview participants. They include: perceived safety issues, rework, missing equipment/tools, construction scheduling, owner specifications, working conditions, workmanship, trade jurisdiction, lack of communication, coordination of trades, different ways of performing work, lack of information, and banter/horseplay.

Perceived Safety Issue. A construction jobsite is a hazardous environment, hence, it was not surprising to find that several primary trigger events involved perceived safety concerns. One superintendent “...saw that 2 guys on a scissor lift were not wearing their safety harnesses and told them that they need to wear them.” This led to an altercation between the superintendent and one of the journeymen working on the scissor lift. In another incident, a journeyman recounted an act that triggered an argument.

I was down doing something one day and the guys that were do the ceiling, they got those powder actuated guns and he shot one into the steel right above my head and it scared the crap out of me and I wasn't even paying attention cuz I was doing my thing and he's right above my head and he shoots it in.

Several other participants shared primary trigger events related to safety issues that led to an interpersonal conflict incident.

they're lifting the lift and just a one man bucket lift in the back of the truck at the end of the night. Doing it together, one yells at the other one, hey, watch my hand.

And we were trying to put the safeties on underneath the car and they're real, real heavy and so I was asking how we were gonna do it. How we were gonna go about doing this. I wanta be sure I don't get my finger smashed. His knee get smashed. You know, what's the process? Well, he thought I was trying to argue with him. I was asking too many questions. So he got mad

the plumber on the ground felt as though he's not comfortable with asbestos bags landing ten feet away from him

And one operator in particular was really just flying around the job site. And he bumped, bumped, hit the lift I was in. Me and another guy and, I mean, it was pretty scary.

He stood on the second from top step just to grab his tool and come back down. I understand that's unsafe but, I mean, for five seconds? You know, and this guy came and fired him. Fired him right there.

Rework. Suggesting or telling a journeyman or an apprentice to re-do a portion or majority of their work can trigger an interpersonal conflict. One supervisor recalled a situation with one of his painting subcontractors.

...the painter...I needed him to re-do something and he felt like...our expectations were too high and you know, he made some comments about, you know, the company as a whole and we shouldn't be that concerned about some of these little things because we ourselves aren't concerned about them.

Cost and pride in workmanship were two of the most frequent reasons given for rework as a primary trigger of interpersonal conflict.

Missing Equipment/Lack of Tools. Missing equipment and lack of tools were reported as primary triggers, though participants widely reported, as in the example below, that borrowed equipment, when requested, is both common and welcomed.

...the mason just took it upon himself to take that pallet jack from one floor to another and then not returning it. You know, and the contractor that they took it from didn't care if they used it but it's really frustrating when, when they needed it and it wasn't even on the same floor that they left it.

When we first got here, they had so many other jobs going out here that they couldn't get enough tools for everybody... you have to have your own hand tools but you borrow the power tools, so I have to go borrow one, then use it and then take it back. So you're just wasting, you're wasting a lot of time going back and forth. You know, that's most of my conflicts is just with the tool issue.

Construction Scheduling. One of the most frequent primary triggers reported was construction scheduling. Participants across all construction personnel positions mentioned aggressive scheduling as the root cause of the stress and anxiety that often accompanies construction projects. As one participant explained, "Deadlines really, really, really create a lot of conflict. People trying to get in, get out, get their monies."

The schedule is the one that...pushes toward everything...and that causes pressure. You get the trickledown theory, then I start pushing on everybody else, you know. That's where the spiral starts, right off the schedule.

...sometimes, like this job here, they want done the end of May. I mean, we've got a long ways to go yet and it's just been little delays throughout the project that compound and now at the end, and we don't have time enough.

Owner Specifications. Ambiguity of specifications, unmet specifications and lack of knowledge of specifications were identified by some participants as primary triggers for interpersonal conflict. Quotes from participants illustrate the beginning of an interpersonal conflict that took place in each incident, coupled with associated costs of changes necessary to meet the specifications.

I got a call from the owner's rep that the sinks that we're providing in the bathrooms were the wrong style. They didn't meet the specifications.

A school job and the concrete floors were poured. And they weren't up to standards to be able to accept a VCT (vinyl floor tile).

the contractor that bid the elevators bid it quite a bit lower than everybody else and they didn't read the specs.

Job specifications, we're not gonna pour that wall until everybody agrees that this is what we're gonna pour so now, we're holding up the job because we can't agree with what those specifications say.

So what we thought they wanted when we bid the job and what they actually wanted, it was, like I said, open to interpretation. Everybody was reading the specification wrong, or differently.

Working Conditions. Primary triggers regarding working conditions fell within four areas: long hours, the weather, workspace and job insecurity. Among all of the interview participants, 5th year apprentices and journeymen reported working conditions as triggers most frequently, stating, "It was just the long hours, we were a long way from home, everybody driving a long ways." Another participant, also mentioned long hours, with weather as an additional stressor, "...when they're getting tired and, you know, every day's the same day, you know and working a lot of hours and it's cold. I mean, the cold takes a lot out of the guys." Another working condition most frequently mentioned by participants across all construction personnel positions was the interpersonal conflict triggered by the close proximity of working tradesmen.

you see how big a bathroom is, we might go in there to go to work, do our thing and we're in there, the plumbers are already in there trying to set toilets and we're in there trying to do our countertops so they can finish up. And then electrician might come, wanna put light fixtures in, too. It can get ugly, for space.

you don't really see problem with other trades until you have to work in close proximity.

You know, you'll be in a room. You've got guys taping, guys painting, guys hanging lights, guys putting in ceilings. There's like we've all gotta work in this little bitty area together. You know, and it gets, gets a little heated at times.

Job insecurity was also mentioned by several participants as a trigger for interpersonal conflict as reflected in the following statement made by one participant, "...the nature of the work is we work ourselves out of work. And that being said, it's an unstable job. The famous saying that goes around our trade is the best--Being an electrician in the union is the best part time job you'll ever have. Because it is, it's a part time job."

Workmanship. Just as there are numerous ways to perform a task, there are also numerous perspectives on what it means to perform "quality work" and how long a task should take to perform as illustrated in the following quotes by participants.

He required three to four hours of my babysitting time, more than any other trade, for at least the first two to three weeks, from flashing to details, just because he was... I don't wanna say incompetent but he was less knowledgeable

Well, they got out there, well, they torched them and you torch a hole and you know what that looks like. Kinda nasty.

He's driving the painter nuts by constantly being in here, asking questions like we don't know our job. We don't need him in here, telling us how to do our job.

And the foreman starts yelling at me about how I have to shut the valve or else it's gonna squirt oil out.

So it took me approximately 3 ½ hours to clean the gang box which is excessive but the reason why it was excessive is because he didn't tell me the whole job up front. So I get done, he sends me off to something else. He's like, oh, you gotta go out to the trailer to get the supplies to do this. Okay. I go out to the trailer and the general foreman's in there. He was like, you don't take that fucking long to clean out gang boxes

We were carrying light fixtures from one area to another and apparently, the foreman didn't think I was doing it fast enough

Trade Jurisdiction. Trade jurisdiction issues are often attributed to the unionized trades as portrayed by the following quote by one participant.

I show up the next day, all the backing the carpenters put in is ripped out and thrown into the weeds. So I come in, I'm like... The carpenters are all mad, everything they've done is torn up and gone...so then I get into it and I hear the rumor that the plumbers tore it out because in their union, that's their work

However, it is also an issue between non-unionized trades as reported by a non-union tradesman, "...guys will claim that this is their work...and it turns into a dispute."

Lack of communication. Interpersonal conflict can be triggered by the "simple" lack of communication.

The plasterer said he'd be done Friday night...his floors are ready to paint. Well, the painter, unbeknownst to the plasterer, came in on Saturday and painted. Well, a day later, the plasterer went through and touched up a few spots on the wall that was already

painted. He says, well, I didn't think he'd come in and I was gonna tell him Monday morning, I needed an hour or so

Coordination of Trades. The above quote used to portray lack of communication as a primary trigger for interpersonal conflict also illustrates the problem associated with not coordinating the work of the trades as one participant stated, "Getting the trades to coordinate can cause conflict. We have to have electrical in and everything has to happen at a different time and in certain steps. So it's just coordinating the different pieces of it, with the different trades."

We have a lot of conflict because air handling systems are big and they take up a lot of space. So we have a lot of conflict with other trades because of the size of our ductwork. And it ranges from a small conflict, like a couple inches, to a major conflict, like you need an engineer to redesign this because you've got too many things going in one space.

They had a sheet metal guy down there and there were some carpenters and stuff. And they were discussing about when we're gonna get pipe in and when we're gonna get ductwork. Well, the pipefitter wanted, we need to get pipe ordered. I need to start installing them and Harry said, no. We need to wait for Joe to install his duct. Wait til he gets his duct mains in, then we worry about where we're putting our pipe

in order for us to get our work done, electricians and plumbers needed to come in, have their work done first...he needed to have that ready by a certain time for other crews to come in. He didn't have a place to put these guys so he was under a lot of stress...he was responsible for coordinating these other crews to get in there and he, he just ripped into this guy.

Different Ways of Performing Work. For those working in the construction industry, there are a "million ways to skin a cat." Like the quotes illustrate below, there are multiple ways to perform ones work, from coordination of trades (who goes first) to how a single task should be performed; from organizational practices to individual preferences.

So we got a plumber, electrician and a sheet metal guy and they're trying to decide who's gonna run down the hallway with the pipe. And the biggest issue was the gravity guys go first, meaning you can't fight gravity so if a pipe's gotta go downhill, it's gotta go downhill. You can't go up and over and then back down. Doesn't work. So common sense would tell you the gravity guy goes first. The next thing is the guy that's running the biggest line which is the ductwork goes next. And then the guys that are running the smaller lines that are pressure powered, where you can go up and down and over and around or electrical that can go up and down and over and around, go afterwards. Well, in

this particular case, the plumber, pipefitter thought that he should go first because he's always gone first on other jobs.

there was a question about how to run this wire that we were running from one end of the pool to the other.

And he goes, nope, that's not how we do things around here.

...issue on one of the elevators. And at one point, one of them's telling, you need to think of it in this way. And the other one says, no, it's not. You've gotta think of it this way. And it just finally got to a point where I don't know if either of them were listening, somebody said, just shut up a second and listen.

One guy wants to build it, you know, build a wall one way and the other guy, you know, wants to build it on the floor and stand it up

Lack of Information. Information, not shared, is frustrating for the tradesman. As stated by one participant, "Where there was a tradesman downstairs doing the pipefitting and he got irritated because he didn't have enough information to do the job." When information is not given, it leaves space for interpretation.

...conflicts that I've seen are, you know, a lot of times are really job related where maybe the job wasn't properly designed or there wasn't enough information. So the two tradespeople are confused and there's left, there's room left for interpretation. One interprets it that it should be put in this way, and the other one interprets it that it should be put in a different way.

Banter/Horseplay. Though the vast majority of primary triggers fall outside the scope of the individual, there were some reports of banter/horseplay that clearly caused interpersonal conflict as in the following accounts.

he felt that he was very funny and that his jokes, everyone would appreciate such as why are you so crabby today, Lisa? Oh, you must be on your period. Or you know, things like that. But he took it steps further and, you know, you can't take a purse on the job. So generally we have our woman products maybe in our lunchbox or in a jacket. I had mine in my jacket and he went in my jacket and pulled out a tampon and was like, see, that's why she's such a bitch as he waves it around at lunch.

I've seen employees or, yeah, employees basically berate other... not berate but talk down to other employees and really make fun of them

he was in a bad mood that day and I was messing with him, picking on him cuz I knew he was in a bad mood. And next thing I know, he's screaming, I'm gonna come down and knock your teeth out of your mouth

Secondary Triggers. The secondary trigger is the observed behavior arising out of the primary trigger event. In most situations, it is the secondary trigger (the other party's reaction) that signals to the individuals involved or those who are witness to the scene that a conflict has started. Therefore, the secondary trigger is often identified as the initial trigger whereby the cause of the conflict is attributed to an individual. For example, most interview participants, when asked to recall what caused a particular conflict would say "...people's personalities", but when pressed to trace the origin of the incident, recalled that the cause of the conflict incident was something else (what this report describes as primary triggers). It is important to distinguish between the two types of triggers for purposes of accurately placing the origin of an interpersonal conflict. Distinguishing between the primary and secondary triggers highlights the observation that people are rarely the cause of a conflict on a construction jobsite, though the way they manage it can determine its outcome and thereby the associated cost.

Triggers, Consequences and Resolution

Of the 86 critical conflict incidents transcribed, 41 contained enough detail to capture the partial cost of each incident. This left 45 additional conflict incidents which could not be costed in such a way. However, these additional 45 incidents helped to increase our understanding of the nature of conflict in construction- its triggers, consequences and resolution methods.

Is there conflict in construction? Following introductions, the first question to each interview participant was, "Is there conflict in construction?" In all 74 interview cases, the responses were affirmative, but with varied reactions which ranged from "(laughter)" to "Of course there is conflict." to "All organizations have conflict." In a few cases, participants requested a definition of conflict, to which the researcher intentionally stated the broadest, most ambiguous definition "...between people on a construction site." In other cases, participants offered their own definition and associated triggers.

A conflict can be a strong word but it's just part of what we do. We want somebody to do something and if they don't necessarily wanna do it, then you have to come to a conflict resolution. So it's all different types of conflict. I mean, it could be conflict in terms of us not agreeing with what the contractor wants or how they wanna be

compensated. It could be the type of workmanship that they're doing. It could be based on a schedule. It's maybe a contractor was in the space that another contractor was wanting to do work in. Maybe it is another contractor is waiting for another contractor to finish up some type of installation or system before they can get to it and it's their man hours for contractor A, contractor A who's waiting for contractor B to finish, so now they're spending labor hours that they don't need to or they have to remobilize to a different area on the project. It could be that what that other contractor installed isn't working the way it needs to for that second contractor to come in and do a portion of the work. It comes in all different types of packages.

Another example offered by a project manager who worked in the trades for many years offered a different definition.

...our upper management that's never worked in a skilled trades environment would look at conflict on a skilled trades job much differently than I would. I would look at many of the conflicts as good communication because they are communicating. We always want this perfect world where everybody communicates and, you know, and it's all fluffy and warm and fuzzy and complimentary. But that's as irritating to some as what the four letter words are to others. So we really have to look at how, whose eyes are we measuring this from? Because I don't want to come in and work, if I was on a skilled trades, I don't wanna go work with a bunch of skilled tradespeople that are a bunch of fake people, telling me, oh, yeah, that looks fine, that looks fine when you know it's crap.

Primary and Secondary Triggers. The primary and secondary triggers of 41 conflict incidents were previously described. However, of the remaining 45 conflict incidents, a number of new primary triggers were revealed. They include: poor documentation, perceived levels of competence/effort, home/life issues, and union/non-union workforce.

Poor documentation. A couple participants described conflicts arising from poor documentation and misalignment between the specifications and the drawings such that, "...the specs will read one way and the drawings will show something different." Another participant provided more detail, "...so it met the specifications but didn't meet the plans. The specs called for a smaller unit. The plans called for a bigger unit. So my carpentry contractor and gypsum contractor had already boarded and framed the wall per the architectural details because we didn't have shop drawings at the time to review for that. Poor documentation is then coupled with the gulf that usually exists between a plan on paper and the process of making it 'real'.

You know, they can draw it on paper but they have no idea what it's like to do it, you know, in the field. You know, that was the most that I heard probably out of the trades

guys. The guys get in the field and they try to, one guy's gotta run something through here and the other guy's got something coming through the same area and they're going, how come they can't see that? You know, it doesn't work. So then I'm busy writing the RFIs and you know, getting cost changes and everything else to reroute and everything else. So then it starts causing that conflict with, you know, between the trades guys and the owner and the architect and everything else.

To another participant, poor documentation and communication on the jobsite can equal conflict. This points directly to poor documentation as a primary trigger for interpersonal conflict. Below is a strong statement from a superintendent with 21+ years in the industry.

I've never had a set of documents that were done to where everybody could be highly efficient...it's never been done. It's a rude and crude way of putting together documents, schedules are put together in a vacuum a lot of times and there's overlap and underlap and one person drops the ball and causes three other people not to get their work done. So when you get out on the jobsite, in a perfect world, you have a good set of documents and the people are communicating all along the way. Now, when you have poor documents and the people are communicating, it can escalate to what we would call a conflict.

Perceived levels of competence/effort. This primary trigger for interpersonal conflict is similar to the category of workmanship discussed in the previous section, but it focuses more on differing levels of effort as perceived by one party or another.

Well, the biggest conflict that I often see is when you have two or more people working on a job site and there always seems to be a person who thinks that he's doing more and is more capable of doing than what he actually is. And then there's the employee that, that works harder than everybody else and feels almost taken advantage of, you know, and oftentimes, conflict arises between those two people because the one person is busting their butt to get stuff done and he doesn't seem to get the same credit from management or owners, or I shouldn't say the same. He doesn't get more or an additional amount of credit than the guy who's, you know, slouching around and not really pulling his weight. So that's often where the conflicts on job sites come from and it's usually not seen until management goes away and then there's usually a verbal conflict.

Home/Life issues. Not unlike any work situation, home/life issues can affect a person's worklife and this was discussed as a primary trigger by many interview participants as "You don't know what people are bringing from home."; "I've seen guys come to work ornery. I've worked with guys before that are splitting up with their wives and they'll come to work one day fine and the next day ornerier than ornery.

home life will affect how you come to work, your attitude when you come to work and how you interact with other people. If you're not, if you're going through something at home, you know, it carries over. You don't get a good night's rest. You wake up and you're thinking about that and you go to work and that's what you're thinking about and you might not really want to be at work so you're not doing a good job. You know, home life affects work.

Union/Non-Union. Surprisingly, there was only one instance where an interview participant mentioned a primary trigger as infighting between union and non-union trades.

a rat plumbing company comes in and that's gonna piss the union electricians off because, they know, they're sticking up for our rights. So they're, you might see some conflict going on there

Consequences. Each of the 86 conflict incidents reported by interview participants described the "observed" behaviors of those involved in the conflict. Many interview participants went beyond this description and shared the potential and/or actual consequences of the "observed" behavior. For example, one superintendent described a contentious meeting he attended with the construction manager and an elevator contractor. The construction manager refused to allow the contractor to install the elevators because they were not within the stated specifications.

Elevators not installed because the contractor did not read the specs: as simple as everybody had to use the stairs during the construction process. Well, you're talking more labor, more time consuming to get the job done where, you know, usually, they get one elevator done in a building when they're doing a big building so it can be used kinda as a construction elevator. And I mean, it's... labor intensive because you're taking wheels of wire to do electrical work, hauling them up and down steps instead of in the elevator. So yeah, cuz I think they went like \$80,000 in the hole on that job.

Observed, this conflict may have only lasted as long as the meeting, most likely described as the 'cost of doing business' or merely as one of many meetings which occur during a construction project. In reality, the meeting, triggered by the contractor intentionally or unintentionally veering from owner specifications was only the 'tip of the iceberg' in terms of the cost of the conflict. Another example of the consequences of an "observed" conflict incident was described by a 5th year apprentice who was working with a journeyman, running wire from one end of a pool to another.

he (the journeyman) was pretty strong headed so we actually got into an argument about it and he went to the foreman. The foreman just said, well, just do it the way you wanna

do it, don't listen to this apprentice because he doesn't know anything. So it turns out that, you know, we ran it and they had the work inspected and it failed... so we had to remove the cable and repull it the way I was gonna suggest to pull it and then they had it reinspected and it passed.

Observed, this may have only been a 15 minute argument, costing $\frac{1}{4}$ of each worker's hourly rate. In reality, the "conflict" cost possibly thousands of dollars in rework and reduced productivity. The consequence of reduced productivity was highlighted mainly by apprentices and journeyman interview participants.

I was going through the doorway, he pushed the studs into me. I don't know whether he saw... he may not have seen me. But then I lost my shit. So I started screaming at him. Fuck you this and fuck you that. It didn't escalate beyond a few words between us. Well, then I wasn't happy coming to work on a day to day basis. I was irritated on the inside.

Other consequences to a conflict incident are invisible to the person one might be in conflict with as described by one tradesman.

...unfortunately, he was, he was taking care of his circle of influence and what he needed to get done but he had no clue that those, every one of those guys were sticking it to him throughout the whole project. And the end result is the building owner lost out because the building was substandard, the quality of the work was substandard and they fought him every way. So just by his attitude and his arrogance, it set up a conflict between the guy that's gonna do the work and the guy that's just trying to manage it.

Other negative consequences may surface during the construction project with no direct understanding as to its connection with a particular conflict incident.

Pretty soon they're walking by safety items. Maybe a handrail is missing but they didn't notice it because of the fact they were concentrating on what this guy said that may have pissed them off. Now, they've passed by that. They may not have looked at a set of drawings that was just submitted to them because they were too busy complaining about what he did a month earlier, whatever it may be. So there's a lot of things that can get missed with that negativity.

Resolution. Of the 86 critical conflict incidents, each included an explanation of how the conflict was resolved. Below is a summary of these resolution categories with participant quote(s) to illustrate the category. Categories include: separation, talking, listening, reestablishing expectations, allowing time to vent emotions, reframing the situation, scolding,

humor, chameleon, seeking help, group meetings, role recognition, quid pro quo, avoidance, staying calm, violence, sabotage, and prevention.

Separation. Physically separating those embroiled in an interpersonal conflict is one way that several interview participants resolved an interpersonal conflict as in, “I would say you try to... you would break them up.” Another stated,

then you gotta start separating your guys and, you know, give them a little bit more time to themselves rather than, you know, cuz obviously when you get out here, some of these jobs, working ten hours a day, six days a week, it doesn't take long to take its toll on the guys.

In the same breath, interview participants who reported incidents of interpersonal conflict between workers talked about the importance of pulling together a crew for a construction project who worked well together.

Talking. Participants across the spectrum of positions felt that verbal communication was the key to resolving interpersonal conflict, as one participant stated, “... communication is the key. You can resolve a lot of your interpersonal problems if you just communicate..” and “So I think if you just went over and talked to the person and didn't get mad about it, tried to stay calm, I think that would solve probably 90% of it.” In fact, several stated that they had received formal training from their employers in how to resolve conflict through conversation. Though key to resolving conflict, participants also felt it was the most difficult, stating, “Obviously, communication's the biggest thing but it is tough.”

Listening. Listening was identified by both journeymen and supervisors as an important tool to resolving conflict. In fact, in the following incident, a journeyman explains how he listened to the supervisor on the job after an altercation had occurred, “I listened to the problems that he had. He unloaded everything. Everything that was on his mind. It wasn't just the concrete. It was, well, the electrical contractor isn't doing this. The window supplier isn't doing this. And pretty soon, he's telling me all of his woes.” Supervisors and foremen had various ways of resolving conflict with those who work for them as in the next quotes, which describes a supervisor sharing his preferred way of resolving conflict.

What I would normally do is grab a piece of paper and have first guy do his story without the other guy interrupt. Say, you know, I'm gonna give each of you guys your chance. I want him to tell his full story without you interrupting and then I want to go to the next and give him his full story, without interrupting. And then I would ask, go back to the first guy and say you got anything on what he said that might be different than what you said, and tell me what you see different.

Reestablish Expectations. In one conflict incident, the supervisor repeated the work performance expectation to a painter, "...the painter came into my office the next day and I reiterated to him what I wanted done on the job site." This was following a day of "cooling off" from an interpersonal altercation over work expectations involving rework. So, in reality, two types of resolution occurred: avoidance and reestablished expectations.

Time to Vent. Similar to avoidance, though much more intentional was the journeyman who "allowed" another journeyman to vent his frustrations.

I let him do his normal spout off and he had a little temper tantrum and when he got all done, then of course, he come back and apologized because now he understands. Well, I think it was more of an ego thing than really believing he was right at the time...so if you let people spin their wheels and get out their energy and, you know, give him an opportunity to, you know, regain trust, it takes a while but, you know, they come back and as long as they apologize and are willing to learn from it. But it's a delicate thing where you gotta let people have some emotion at times.

Reframing. One incident included a supervisor being replaced by another and the new supervisor walked into an already hostile work environment, "When I got on site, knowing it was a hostile environment, I just went and faced up to it first thing. Walked into their trailer and said what can I do to help? What can I do to help? Tell me what all your problems are." This approach was so foreign to the personnel on that particular job that it immediately caught the attention of the hostile individuals and changed or reframed the entire situation. It created a space for constructive conversation to occur, thereby reducing the hostility.

Scolding. Other participants found that scolding an individual resolved an interpersonal conflict. In this example, the case of the "missing scissorlift" was resolved by a foreman of one trade calling a journeyman of another trade, stating, "I just, all I did is just called the guy and just

scolded him. You know, just don't do that. Ask. You know, return the stuff. Just use common courtesy.

Humor. Light banter and humor was regarded as a quick, popular way to reduce small personal frustrations and stress on the jobsite. As one participant stated, "Humor, a little bit can go a long ways with it."

Chameleon. As stated earlier in this report, most interview participants, when asked to recall what caused a particular conflict would say "...people's personalities", but when pressed to trace the origin of the incident, recalled that the cause of the conflict incident was something else (what this report describes as primary triggers). With that in mind, it is no wonder that several participants mentioned the importance of getting along well with different types of personalities as a prevention/resolution of conflict, as one stated, "I think you have to be a personable person to be able to get along with multiple personalities."

Seek help. Some participants felt that help from a foreman or supervisor was essential to resolving conflict. One supervisor stated, "We need to get involved to the point that maybe we can't suggest the right answer but we can at least get the two parties or three parties talking in a constructive way." A journeyman had observed an instance where two forms of resolution were enacted: 3rd party assistance and separation.

typically, the foreman will step in. And then he works it out. Either they'll ship a guy over to another part of the project or to another project or they'll, you know, they'll work it out one way or another, talk about it, try to figure out what's going on

Group meeting. In one incident, the foreman brought his crew together, saying, "I want everybody involved, I get everybody together and we're gonna discuss it as a team, as a group. We are a team."

Role recognition. In another incident, a participant recognized his role in the interpersonal conflict he was experiencing with a co-worker who was of the same position. In this incident, the co-worker never returned his call.

He never checked his office phone. He emails me back and says, I'm sorry. He's a cool guy. I never told him that the best way to get a hold of me is my email or here's my cell phone number. So I emailed him back and said, you know, partly my fault, too. Sorry, I should've done a better job... Sometimes I think you gotta be like that. I should've done a better job to try to communicate with you more efficiently so I take responsibility, too. Now we're gonna move on. And we'll get our job done. Everything's fine. You know, the world is back in balance, know what I mean? She's not mad, I'm not upset at her. We've resolved our differences by talking to each other

Quid Pro Quo. Many interview participants discussed the importance and necessity of inter-trade sharing equipment, tools and ideas to the success of a project. It makes sense, then that one way of resolving a conflict between trades involves give and take as stated by one participant. Again, this incident used several types of resolution: communication and quid pro quo.

if there is a conflict, I have to get the parties involved and then usually we talk out the best option. You know, it's always nice if one person doesn't take the total brunt of fixing a problem or resolving a conflict. And that's usually the way I try to do it. I mean, if it makes total sense that one guy has to, then you just try to convince them that, yeah, you're catching it this time but, you know, you'll be benefiting, you'll benefit the next time and the problem probably was because you got a little aggressive or whatever. But we'll try to help you out in another way down the line, when we can.

Walk Away. It is no surprise that pure avoidance of an interpersonal altercation was described as a way to resolve conflict, though it was seen as a temporary fix, as one participant stated, "...some days it's best just to bite your tongue and walk away." Other participants recounted times when a 3rd party took them aside and helped them "walk it off".

Stay calm. A calm demeanor was reported several times as being essential to resolving conflict, though it was always paired with another method of resolution. As one participant stated, "...he's gotta stay calm. He can't have a loose temper."

Violence. The rarest type of resolution amongst the interview participants was physical violence, though one incident was shared.

We were pulling wire and we were pulling baloney cable which is very big wire. It's probably that big in diameter. As I was bent over pulling it through the tray, he put the other end like between my legs. So I hit him with it.

Sabotage. One recorded incident described what happened on a jobsite when certain conflicts weren't resolved.

So a lot of problems don't necessarily get resolved. A lot of problems get resolved by doing a lot of underhanded stuff. You come in the next day, your radio will be broke. It's a problem with you driving a foreign car, guess what? You left and there was nails all under your tires. Flat tires, all four of them. Cuz you got a foreign car. You come outside, there's buy American stickers on every single inch of your window, on every single window

Prevention. When asked how interview participants resolve conflict, many shared their experience preventing conflict. Prevention is an intentional activity that individuals, project coordinators and the industry can affect. For example, pre-planning meetings were reported as being extremely helpful for purposes of trade and material coordination. Recall that scheduling and coordination were discussed as a primary trigger for interpersonal conflict on a jobsite.

...we have meetings every Thursday, once a week with all the foremen are required to be here and part of the meeting is a two-week look ahead to determine exactly what, what's going on in the next two weeks. And it gives everybody an opportunity, I go through and, in rough scenario what's gonna happen in the next two weeks

Interview participants, especially those in the position of journeyman, talked about the importance of seeing the "big picture" and not just focusing on one's own work. As one journeyman stated, "You just start thinking about other trades before you slap your pipe in there." Another frequent prevention mechanism mentioned amongst participants in all positions was the importance of pulling together a compatible team in both technical and social skills, as one participant stated, "Not only are you trying to get the technical kind of skill and expertise matched to the job, but you're also trying to get guys matched together...trying to get the personalities." And once on a job, it is important to attend to other team members.

certain people have different ways of working and like, you know, different attitudes, personalities and things so you kinda figure out how to work with them and where you can be, kind of come to a mutual agreement on how to get things done and how they like to receive information.

The industry itself has prevented conflict by introducing new technical and social innovations.

Another thing out here that has reduced conflict in this job is 3D modeling which means the job--electrically, mechanically, plumbing, ductwork, heating lines and all that kinda stuff, sprinkler lines, architectural walls...the job was built ahead of time on computer. So most, a lot of conflicts are already wiped out. There's still conflicts but the big ones are gone.

But you know, if you could put more training into your workforce, trying to get them to understand everybody is different, everybody's not gonna think like you. You know, and that when you're in that work environment, you need to treat it like a work environment, not your personal environment.

Some participants felt that it was important to resolve conflict as quickly and closely to those involved in the conflict. In that way, they stated, the cost stays fairly low.

If they can have that conflict, resolve it and move on, that's fairly low cost. When it, when they quit communicating and quit having conflicts and they just put it in the way they think they should, and it falls up to the superintendent, and then there's a huge conflict, that's probably what they're seeing. So they're seeing the bigger ones that didn't get handled at the front line level and it has been escalated up so they have to deal with it. And those can be, you know, in the tens of thousands of dollars to hundreds of thousands of dollars. And in some case, you know, millions and millions of dollars...

Conflict is Good. A couple of interview participants shared the virtues of conflict on a construction site.

...the biggest cost comes when there's no conflict at all and people just do whatever they think they can do. Because then the conflict shifts from the onsite people to the managers that have to come in and then the whole disciplinary thing starts.

it (conflict) actually helped me out. It made me aware, to look into more of the union trades, what's expected of each union trade and what the crossovers are and stuff.

Discussion, Conclusions and Recommendations

By its very nature, the construction industry exists within an adversarial environment where conflict is unavoidable (Iyer & Jha, 2004; Ng, Pena-Mora, & Tamaki, 2007; Phillips, 1985; Spittler, 1992) and is often characterized by the high cost of conflict resolution (Ng, et al, 2007). While quantifying costs of litigation and arbitration is straightforward--researchers estimate the annual cost to be about \$5 billion (Michel, 1998)--it is the day to day conflicts, often the source of later litigation and arbitration, that are difficult to measure. According to a recent study of 50

Indian construction firms, Iyer and Jha (2004) found that owners and contractors ranked conflict among project participants as the highest factor affecting project cost. Until now, no research studies exist which attempt to expose the unmistakable financial cost of day-to-day conflict in the construction industry.

Based on the results of this research study, the following conclusions can be made: 1) Construction jobsite personnel have witnessed or experienced interpersonal conflict while working on a construction jobsite, 2) the average amount of time reported across all 41 conflict incidents was 161.25 hours “lost” in managing conflict, with .5 hours as the minimum number of hours spent embroiled in a conflict and 6000 hours as the maximum number of hours “lost” as the result of a conflict, 3) the average cost reported across all 41 conflict incidents was \$10,948, with \$25 as the minimum cost for an incident and \$367,000 hours as the maximum cost for an incident, 4) the monetary cost of an ‘observed’ interpersonal conflict may underestimate the true monetary cost because the consequences of such behaviors are not directly related to the incident itself, 5) primary trigger events attributed to interpersonal conflict that occurs on a construction jobsite are most often tied to the process of construction vs. construction personnel, 6) resolution techniques most reported include verbal communication between the conflicting individuals by themselves or through the aid of a 3rd party (supervision) as well as physically separating individuals from each other for the duration of a project, and 7) construction personnel have choices to make when reacting to the primary trigger event which can have an impact on the strength of the consequences and hence, the monetary cost of interpersonal conflict in construction.

As reported earlier, the key to keeping the cost of conflict at a minimum is to resolve conflict closest to the trigger event in both space and time. Though the construction industry relies on formal conflict resolution processes like mediation, arbitration and litigation, these formal mechanisms are utilized well after disputes have already escalated out of control (Thomas, 2002). Crucial to running an efficient business is realizing the true value of prevention and early intervention of conflict. The cost of preventing and resolving conflict in its earliest stages is minimal compared to the cost of leaving conflict unresolved, or resolving troublesome circumstances late in the game (Thomas, 2002).

Educational opportunities offered at all levels of construction personnel, beginning in apprenticeship programs, both union and non-union, would build awareness and skill in managing conflict once it has been triggered. The awareness that conflict is primarily triggered by organizational decisions and/or industry practices would direct people's attention away from the person as the "root cause" of interpersonal conflict. By providing contractors and skilled trades leaders with information on the nature of interpersonal conflict on the jobsite, they can act to address conflict in its beginning stages, and use effective tools to resolve problems early or prevent them altogether. The culmination of success could mean that the construction industry itself may find value in formulating strategies and policies for conflict prevention and related issues at the state and national levels.

Another recommendation is to create a conflict assessment tool which measures the potential for the incidence of interpersonal conflict on the jobsite. This assessment measure could then be used to mitigate interpersonal conflict through 1) the customization of a training and education plan for specific individuals and/or work crews prior to working on a project and/or 2) innovative changes at the "systems/process" level for the purpose of reducing or preventing the incidence of primary triggers, thereby reducing the incidence of interpersonal conflict.

The analysis and findings from this pilot research study lead to several interesting questions for further study: How would a conflict assessment tool be developed to aid in preventing/reducing interpersonal conflict? What is the nature of/cost of conflict on one large construction project? What are the conflict issues on large scale PLAs? What similar/different conflict issues occur across the various position levels of construction personnel, from owners to apprentices? What are the specific conflict issues which arise during particular phases of a construction project? Do training programs in conflict prevention translate to practice? These and other questions raised through the process of dissemination would be quite interesting (and beneficial) to the construction industry.

In addition, the process and experience of gaining access and interviewing project participants for this pilot study shows the willingness (and eagerness) of construction personnel to provide access and share information in detail which makes possible further exploration.

Dissemination through presentation of these findings and results from further research would be welcome at associations devoted to expanding conflict resolution research. In addition, construction industry associations and related publications would be interested in exploring innovations in the construction process and organizational decisionmaking to reduce/prevent interpersonal conflict on the construction site.

Appendix A

Informed Consent Form

Informed Consent Form Individual Interview

The Cost of Interpersonal Conflict in Construction

Summary: The general purpose of this research study is to determine the cost of interpersonal conflict on a construction site.

Explanation: You are being asked to participate in a research study of the interpersonal conflict which may occur on a construction jobsite. You must be at least 18 years old to participate in this research. If you agree to participate in this research study (as signified by your signature on this consent form), I will introduce the research purpose in more detail, request that you provide some demographic information, which is voluntary. I will then start the audiotape (assuming the interviewee gives permission per the consent form) and, using the interview protocol, proceed for approximately one hour to ask you several questions related to interpersonal conflict you have experienced on the construction jobsite.

Participation: Participation in this research project is completely voluntary. You have the right to say no. You may change your mind at any time and withdraw. You may choose not to answer specific questions or to stop participating at any time, without penalty.

Costs: There is minimal risk of participating in this study as all names identifying individuals or organizations and/or any other identifiable information will be deleted from the manuscript, both in audiotape or written form, in strict accordance with our confidentiality clause. You can withdraw participation from this interview at any time, without penalty. You can also refuse to answer a question. If you withdraw your participation during the interview, the audiotape will be immediately destroyed.

Benefits: You will not directly benefit from your participation in this study. However, your participation in this study may contribute to the understanding of the cost of interpersonal conflict in construction and hence, the reduction of such costs when more is known about the nature of interpersonal conflict.

Compensation: You will be compensated \$20 upon arrival for participating in the individual interview.

Confidentiality: All responses to the interview questions will be kept strictly confidential. Your identity will be confidential. Pseudonyms will be used in all written papers; both published and unpublished, in order to protect individual identification. Only the research study investigator and the Institutional Review Board (IRB) will have access to the data

collected in this research study, which will be kept in a locked file cabinet and a secured computer environment for 3 years following closure of the study after which all data will be destroyed. **Your confidentiality will be protected to the maximum extent allowable by law.**

*Transcription**:* If you agree to have this interview audiotaped, the researcher will retain the transcript of the audiotape and will delete any reference which may identify you as an individual or your employer. The audiotape will be destroyed after it is transcribed. If you would prefer not to be audiotaped, the interviewer will take extensive notes during the interview.

Contact Information: If you have any concerns or questions about this research study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher, Dr. Julie Brockman, 416 SKH, School of Human Resources and Labor Relations, Michigan State University, E. Lansing, Michigan 48823, (517) 452-4772, brockma4@msu.edu.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-452-4503, or e-mail irb@msu.edu or regular mail at 207 Olds Hall, MSU, East Lansing, MI 48824.

Your signature below means that you voluntarily agree to participate in this research study.

Signature of Participant _____ Date _____

Signature of Interviewer _____
Date _____

**Your initial here _____ indicates that you are voluntarily agreeing to have this interview audiotaped.

Appendix B

Critical Incident Interview Protocol

Instructions:

Investigator reviews the “Informed Consent Form”. If the participant signs the consent form, then continue with the interview.

Before we begin, do you have any questions?

Describe your current job

- How long have you held this job?
- What type of work are you required to perform?
- Can you describe a “typical day” in your job? What would a day in your work-life look like?

Interpersonal conflict:

- What conflicts have you experienced or observed on the jobsite? Small disagreement to physical fighting
- Briefly describe for me any recent conflicts you were involved in while at work.

Now I would like to focus on one of those incidents:

- What happened? Describe for me as specifically as you can the context or the situation and what went on in the situation.
- Can you identify the events which lead up to a recent conflict?
- What is the relationship you had with those who were involved in the recent conflict: was the person or persons a co-worker, supervisor, or employee?
- Did you attempt to resolve the conflict? If so, what did you do?
- What was the outcome or the resolution of the conflict?
- Did anything change as a result of the conflict, such as co-worker behaviors, or a change in tasks, practices, or procedures?
- Please estimate the actual time associated with the conflict situation and its resolution.
- Is there anything you would like to add that I haven’t asked you about this situation?

Is there anything else you would like to add that I haven’t asked you about regarding interpersonal conflict on the jobsite?

Thank you for talking with me today.

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