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Significant Trade Contractor Performance Characteristics as Evaluated by Big-D Construction

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SIGNIFICANT TRADE CONTRACTOR PERFORMANCE CHARACHTERISTICS AS EVALUATED BY BIG-D CONSTRUCTION

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GRADUATE COMMITTEE APPROVAL

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ABSTRACT

SIGNIFICANT TRADE CONTRACTOR PERFORMANCE

CHARACHTERISTICS AS EVALUATED

BY BIG-D CONSTRUCTION

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The purpose of this research is to determine which aspects, other than price, of trade contractor performance are the most important to the general contractor, Big-D Construction. The impression a trade contractor leaves on the project manager and superintendent provides an indication of their performance. To determine what tasks trade contractors perform that most greatly impact overall perception of the general contractor's project manager and superintendent, hundreds of trade contractors were evaluated in ten separate categories and were then given an overall rating. The correlation between each category and the overall rating was found. The categories were then sorted from highest correlation to lowest.

Of the ten categories, professionalism had the highest correlation. Next to professionalism, schedule adherence was found to be most important. All of the next

six categories: Coordination with other subs, quality of work, technical knowledge of drawings & specs, project close out (O&M's, punchlist, as-builts), monthly invoices - timely and accurate, and accuracy/timeliness of change orders, all had similar impact on overall performance. Daily clean-up and safety attitude, had the least impact on performance, with safety falling significantly lower than every other category.

Overall, being professional, keeping to the schedule and doing good work are most important to project management teams, while keeping the job clean is noticeably less and safety is much less important.

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CHAPTER 1

INTRODUCTION

Background of the Problem

Since before the industrial revolution, specialized labor has been the key to all forms of construction. As large construction tasks are broken down to smaller, more manageable tasks, specialists can perform them quickly, correctly, and safely. These specialists gain their skills by continually repeating their portion of the construction process, enabling them to complete quality work quickly and efficiently. However, without a professional to coordinate and combine the efforts of various specialists, a specialist's abilities would be of little benefit to the process. A positive relationship between specialists and those professionals coordinating the construction process is vital to efficient and profitable construction processes.

Today, we call these specialists trade contractors, or "trade contractors." The professionals who coordinate the construction process are called general contractors. Trade contractors help general contractors overcome problems such as resource shortages, financial limitations, and special expertise requirements (Elazouni, 2000). Trade contractors are also often highly regulated and licensed by the government to protect the public from the construction of unsafe buildings, highways, etc. and to standardize professions (Fenn, 2005). In the United States, regulation can come from federal, state, and city government levels.

The interactions between general contractors and trade contractors can greatly impact the overall quality, efficiency, safety, and cost of a construction project. General contractors have external demands placed on them from outside sources such as project owners, architects, government institutions like OSHA and the IRS, lending institutions, and building officials. The general contractor must juggle these demands and delegate most of them to the various trade contractors beneath him. For example, if poor quality work is performed, the general contractor must ensure that the trade contractor responsible for the problem returns to the jobsite to fix it. Also, if unsafe conditions exist, OSHA may issue a fine to the general and trade contractors and may even fine the owner as well. Additionally, if the project's schedule is not followed, the project owner may claim liquidated damages against the general contractor, who will then pass them on to whichever trade contractor is at fault.

There are also various internal demands the general contractor must manage such as controlling risk, assuring accurate accounting and documentation, staffing, and finishing projects on time to allow for following projects to begin on time. As with external demands, these demands are also often passed down from the general contractor to the trade contractors. These demands can potentially put pressure on the trade contractor-contractor relationship. Cox and Townsend believe that "prudent selection of trade contractors is an essential element to customer satisfaction and business success" (1998). This indicates that individual success of the trade contractors and general contractors is linked. It is in the best interest of both parties to understand the intricate workings of their relationship. This will help both parties understand how to strengthen

their relationship and avoid potential pitfalls. Particular to this study, the general contractors' view of trade contractors is especially important.

When working for Big-D, trade contractors are graded on their performance. Their performance is recorded as a grade on a trade contractor post job evaluation form. From the years 2000 to 2005 these trade contractor post job evaluation forms have been filed in a set of filing cabinets at the Big-D main office. The forms are reviewed during buyout to help determine which trade contractors will be awarded the contract. Though not intended for this purpose, the forms could also be used to provide information on how Big-D views trade contractors. Information would be collected from the forms and entered into a database to analyze it. The analysis would reveal the correlation of each category to the overall rating. This could provide information on how Big-D superintendents weighed the various aspects of trade contractor performance. Will adherence to schedule be worth 70% of the general contractor's opinion of them, or only 20%? And, how will safety, professionalism, cleanliness, etc. be weighed? There is no guideline as to how general contractors should evaluate their trade contractors' performance, but they will tend to value some areas to a greater degree than others. There is little research available to indicate what trade contractors should focus on to leave positive, lasting impressions.

General contractors could benefit from consciously knowing how they evaluate a trade contractors' performance. As stated earlier, there is no set rubric in place for general contractors to use to evaluate trade contractors, but the general contractor will subconsciously place varying degrees of value on the different activities trade contractors perform.

Statement of the Problem

The problem is that it is unclear how trade contractors should prioritize their daily, on-the-job activities. There is limited research available as to what factors of trade contractor performance are most important to general contractors.

Purpose of Research

The purpose of the research is to identify what areas of trade contractor performance are most important to Big-D's project management.

Contribution to Construction Management

There has been much research conducted to help owners and architects identify good general contractors, but limited research has been conducted on how general contractors should choose trade contractors. This study identifies which specific activities and services trade contractors routinely perform that are of most value to the Big-D superintendents and project managers. This study provides necessary data for trade contractors to better understand what factors most affect their standing with the Big-D superintendents and project managers. The study also helps Big-D identify areas of performance they should focus on during buy-out, see 'buy-out' in the *Definitions* section of this chapter.

Assumptions

- Responses given by managers of Big-D construction were relevant to the industry as a whole.
- All superintendents/project managers were rating trade contractors with neutral, unbiased opinions.

- Project management perceptions of trade contractors reflect accurate performance.
- All evaluations were considered complete and representative of actual circumstances.

Delimitations

- The research will only gather data from one commercial construction firm, Big-D Construction. Big-D construction was established in November of 1967 and is based out of Salt Lake City, Utah. It employs over 500 employees, has revenues of $320 million, and is ranked 155th on the ENR top 400 list (ENR, 2006).
- The research will only address commercial construction and will not consider highway, industrial, or residential construction.
- Only those who provide labor are evaluated, and suppliers are not included.
- Trade contractor reputation will not be considered. Reputation can influence perception of trade contractors before they ever step onsite. It can also help win or lose jobs when they are awarded on a "lowest and best bid" basis.
- The research will not include the financial stability and bonding capacity of the trade contractors.
- This study will not include bid or change order pricing. Monetary factors that influence the general contractor's perception, or even choice of trade contractor, are excluded from this study.

Definitions

Buyout: The process of finalizing trade contractor selection, price, scope, and signing the contract documents.

General Contractor: The person or entity holding the prime contract in a construction project. Or, as the current definition implicates, the party responsible for all facets of construction.

Professionalism: Various definitions are found on the term professionalism, indicating it covers a broad spectrum of meanings. The term professionalism can imply experience in one case and refer to moral character or standards in another. The survey form in this study used the term "Professionalism (phonecall response, work ethics…care for others)".

Project Management: The management team representing the general contractor. For the purpose of this study, the team will consist of the project manager and superintendent only.

Project Manager: The person who is responsible overall for the successful planning and execution of any project. The project manager (PM) is the general contractors' primary contact with the client and architect. The PM must possess a combination of skills including an ability to ask penetrating questions, an ability to detect unstated assumptions, and an ability to resolve interpersonal conflicts.

Partnering: Partnering is an imprecise term that covers a variety of arrangements with varying degrees of intensity. Cox and Townsend contend that partnering is simply a form of strategic planning or a variant of Total Quality Management (Cox, 1998). Partnering happens when entities work together to ensure that all involved benefit, rather than each entity looking out only for their own interests. Partnering is often used to develop long-term relationships.

Sub Contractor: Trade specialists such as electricians, plumbers, HVAC technicians, etc. who are retained by the general contractor to install a portion or portions of a commercial building.

Superintendent: On-site supervisor who is responsible for scheduling trade contractors and for managing the daily construction activities on behalf of the general contractor.

Trade Contractor: Another term for "trade contractor." The term trade contractor is becoming increasingly popular and somewhat politically correct, as the prefix 'sub' denotes "below" or "less- than."

CHAPTER 2

REVIEW OF THE LITERATURE

This section discusses the research related to trade contractor performance. Focus has been given primarily to the construction industry, yet some findings related to manufacturing and government procurement are also included. The chapter will begin with the review procedures and then proceed to the benefits of contracting out to trade contractors. Next, the cost factor and considerations of price followed by the relevance of past-time performance in indicating future performance will be reviewed. Research regarding the general contractor – trade contractor relationship and partnering will also be reviewed, after which, findings on employee training will be addressed. Thereafter, safety issues will be considered and the chapter will conclude with professionalism.

Review Procedures

Reviewed studies were selected through various methods. The Academic Search Premier (EBSCO) database, ABI/INFORM (ProQuest) database, and Compendex databases were searched for the years 1966–2006. Descriptors of "contractor," "subcontractor," and "trade contractor" were used. Other key words such as "rating," "selection," "evaluation," "choosing," "quality," and "price" were used to narrow the findings. Abstracts were reviewed for relevance and the most appropriate studies were saved in PDF format for future review.

Contracting Out

By contracting work out to trade contractors, general contractors can overcome problems such as resource shortages, financial limitations, and special expertise requirements (Elazouni, 2000). "One frequent economic decision for private industry is whether to produce an item or service within the firm or contract out its production…in recent years, it has become more common to do more contracting out" (Straight, 1999). This is true concerning the construction industry; it has become popular for general contractors to hire multiple trade contractors for building their projects. Straight continues, "Deciding to contract out requires methods selecting the best contractor and for monitoring performance during the course of the contract".

In regards to the selection of multiple trade contractors, Cox and Townsend indicate that "construction is not one supply chain, but a series of distinct chains, with unique properties" (1998). In consideration of the construction business in particular, prudent selection of trade contractors is an essential element of customer satisfaction and business success. The kind of work a trade contractor performs, whether it is fast or slow, good quality or poor quality, determines to a large extent the final outcome of the product. This being the case, several relevant features should be assessed in the hiring and working phases of a trade contractor. Notable factors to consider are not merely the cost, but the trade contractor's training and previous performance, the general contractor-trade contractor relationship, and the option of becoming trade-partners.

The Cost Factor

Cost is an essential factor to consider when operating any business. The question of the quality of services to be received compared to the price of those services must be

analyzed carefully in the construction industry. Waara and Brochner (2006) indicate that "although the public sector has a long tradition of using the lowest bid as the award criterion for contracts, reliance on non-price criteria is increasing." It wasn't until the 1980's that multiple criteria were considered over the single cost value in the construction industry (Waara, 2006). Further assessment and evaluation of trade contractors is now valued to assure quality work for a fair price. According to Singh (2005):

> Construction clients are becoming more aware of the fact that selection of a contractor based on tender price alone is quite risky and may lead to the failure of the project in terms of time delay and poor quality standards. Evaluation of contractors based on multiple criteria is, therefore, becoming more popular. Contractor selection in a multicriteria environment is, in essence, largely dependent on the uncertainty inherent in the nature of construction projects and subjective judgment of decision makers.

There are significant benefits of selecting trade contractors who can overcome unexpected complications and complete the project as desired by the general contractor. Efficient performance has the potential to add value to the project. By selecting trade contractors on a mulitcriteria basis, general contractors can save time and money.

One research study examined an alternative general contractor selection model called the "analytical hierarchy process" (AHP). The purpose was to:

> Help construction clients identify contractors with the best potential to deliver satisfactory outcomes in a final contractor selection process which is not based simply on the lowest bid. The AHP comprised three parts: hierarchic structure, prioritization procedure, and calculation of results. In the research, the model was tested by a hypothetical scenario where three contractor candidates were evaluated. The criteria used for contractor selection in the model have been identified, and the significance of each criterion has been arrived at by conducting a questionnaire survey in public organizations in Hong Kong. Comparisons are made by ranking the aggregate scores of each candidate with regard to their performance against each of the criteria, and the candidate associated with the highest scores is the best contractor on this occasion (Fong, 2000).

This research illustrates the recent movement of general construction management personnel in selecting trade contractors on a multi-factorial basis. As the construction industry evolves, there is a continual trend in implementing additional requirements in the hiring process than evaluating the cost factor alone.

A study done by the National Construction Institute (NCI) found that "contract awards based on price, contractor history with the owner, and compatibility of software used did not build 'value' into a project" (Brooks, 2003). The study found that:

> …of 12 categories of differentiators, seven had a positive relationship with net value added, but contrary to owner perception, contract price was not one of them. The lesson was that owners, who emphasize price too much, are not getting the most for their money (Brooks, 2003).

The NCI reviewed features of preconstruction processes, the working relationship between the trade contractors and the general contractor's project management personnel, as well as price factors among trade contractors. Cost, while a very important consideration, is not the most important factor when it comes to making a project profitable. The focus of NCI's research study was based on the relationship of the trade contractors with the project managers and superintendents. Securing good trade contractors will satisfy the superintendent's demands to finish work on time. There will also be fewer delays, accidents, better quality work, etc. All of these benefits lead to reduced costs. Advantages continue to emerge as desirable trade contractors are used for subsequent projects. Familiarity with the job reduces mistakes and frequent interactions improve the relationship between the trade contractor and superintendent. Trade contractors also develop loyalties and pride in their work, as they realize their work is valued beyond cost alone.

Conversely, should a tradesman whose services were purchased at a low cost perform poor quality labor or have indigent coordinating and communication skills, the project may be delayed and there may be an increase in cost to satisfy any repairs, damaged materials, or lost time incurred. Hatush and Skitmore suggest that "the selection of the contractor based on the lowest tender price is one of the major reasons for project delivery problems, as contractors desperately quote low prices by reducing their quality of work" (Singh, 2005).

How tasks are performed on site is equally as important as the bid price. Inadequate work performance by an unreliable trade contractor can end up costing the general contractor more due to delays and poorly built projects. This not only affects the bottom line of that particular project, but will also damage the reputation of that general contractor and negatively affect their ability to gain work in the future. The administration team of Washington state's Department of Transportation noted that, "Poor subcontractor attainment will reflect upon the prime contractor if the overall goal is not met" (2006). In such situations, it may be more profitable to spend extra on the services of a more costly trade contractor who performs better work.

Other research has validated that "there is a weakness where only tender price is used for selecting contractors, such as poor quality and prolonged construction duration" (Drew, 1997; Cheng, 2000). How one trade contractor performs can significantly affect the satisfaction of both the project management team and the buyers. This is why it is so essential for a general contractor to find skilled tradesmen who perform thorough, quality work.

After defining which additional factors, other than price, should be considered when selecting a trade contractor, a source of information is needed. A trade contractor's work performance history can provide such information at a multi-criteria level, offering data on various elements of efficiency and productivity.

Past-time Performance

Relevance. According to Tam and Harris, a "contractors' past performance is one of the most important determinants of predictive performance" (1996). A general contractor can make an educated decision in choosing the trade contractors that will do the best and most efficient job at the most reasonable price by evaluating their work histories.

Evaluating a trade contractor's previous work can be a useful tool in the decision-making process of employment consideration. According to Ronald Straight of Howard University, "Measurement of contractor performance is important not only for contract administration purposes but also for use as an evaluation factor in selecting contractors for future work" (1999). Performance histories can identify adequately trained tradesmen, providing information that can be substantial indicators of their future performance.

Length of Work History. The extent of a trade contractor's experience can be identified with an initial assessment of the company's history. The length of time a company has been in business and how much business they've received may correlate with how polished their work is. McDaniel, et al., expresses this concept in an article written in 1998: "Empirical study showed that relevant experience was correlated with job performance." Dulung, Pheng, and Low (2005) continue, "The 'relevant experience'

was especially needed when a difficult condition occurs, for example, when abnormal conditions were encountered or extremely rigid time limits were involved in a project, such as in a BR [building refurbishment] project environment." The more experience a trade contractor has, the greater probability that he has refined skills, timing, communication and coordination; and thus, a more efficient team.

Performance Criteria. In addition to the length of a trade contractor's work history, certain factors within that history should be evaluated. In regards to measuring a trade contractor's performance, Straight (1999) explains, "Subjective measures, such as user satisfaction, should be balanced with objective measures, such as strict adherence to contract requirements." More specifically, Brislawn and Dowd indicate that past performance should include a minimum of the following:

> …agency evaluations of completed contracts; other performance ratings made during the course of the contract; federal, state, and local and private contracts; contractor self-assessments prepared for the solicitation (the contractor should identify problems on previous contracts and explain root causes, corrective actions, and results; user and buyer evaluations; and performance qualifications or certifications (Straight, 1999).

General Contractor – Trade Contractor Relationship

The interactions between general contractors and trade contractors can greatly impact the overall quality, efficiency, safety, and cost of a construction project. According to current research, "[general] contractor performance is positively and strongly associated with their relationships with subcontractors" (Kale, 2001). Research supporting this claim is easy to find, though reasons given for the positive correlation of relationship and performance vary. One study suggests that "the sense of alienation and mistrust between contractors and trade contractors often prevents teamwork and can

cause various productivity barriers" (Hsieh, 1998). Another finding indicates that the "uncertainties in connection with a subcontractor's technical qualifications, timeliness, reliability and financial stability may bring risks to contractors in terms of cost, time and quality" (Akinci, 1998). The success of the general contractor is closely connected to the work performed by each of the trade contractors employed on the project. It only takes one very poor performance by a key trade contractor to ruin a project.

Social Embeddedness. Elements such as trust, reliability, morale, and aptitude affect the cohesiveness of the contractor-trade contractor relationship. As these qualities develop, Kale & Arditi note that there is an improvement in the general contractors' production output (2001). Granovetter (1985, 1992) incorporates these characteristics in his concept of "social embeddedness," which analyzes industrial social relationships. Social embeddedness also emphasizes the idea that the transactions between the contracted parties become more efficient as the work between the two becomes more frequent. This is due to the "inter-organizational learning that allows firms to acquire experience from previous transactions" (Kale, 2001). As the trade contractor returns to perform more work for the general contractor, familiarity with the expectations, routine, coordination, and opportunities for trust develop, thus eliminating lost time in labor, improved productivity, and increased social cohesion with the general contractor.

However, if an element within "social embeddedness" is lacking, such as when the trade contractor's labor continues to be slow or inefficient after repeated jobs, the relationship with the general contractor will suffer and may look to more reliable trade contractors for work. Should a sense of alienation and mistrust exist between general contractors and trade contractors, teamwork will suffer, leading to various productivity

barriers (Hsieh, 1998). In essence, if the project management and trade contractors harbor any kind of social conflict or do not work well together, the overall product output will decline. To develop a strong and lasting relationship with trade contractors, some general contractors adopted a fairly recent practice called "partnering."

Partnering

Partnering began in the late 1980's and typically involved an official agreement or charter signed by both the general contractor and trade contractor, describing mutually agreed-upon goals and expectations (Jones, 2002). The conventional mode of transacting business from multiple competitive trade contractors had been contributing to setbacks and financial losses. Coordinating and upholding several different working relationships was proving difficult to maintain. To ameliorate this dilemma, general contractors began to execute a system known as partnering. Cox and Townsend (1998) define partnering as:

> A long term long term commitment between two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participant's resources…The relationship is based on trust, dedication to common goals and an understanding of each other's individual expectations and values. Expected benefits include improved efficiency and cost effectiveness, increased opportunity for innovation, and the continuous improvement of quality products and service.

A partnered relationship increases dependability for the general contractor as well as a higher sense of job security for the trade contractors. Welling and Kamman illustrate this concept in their research as they found that, "when the interaction between individuals is likely to continue for a long time, and the players care enough about their future together, the conditions are ripe for the emergence and maintenance of cooperation

in construction" (2001). On a more measurable level, Kumaraswamy & Mathews, noted in their study that,

> Subcontractor pricing levels were reduced by about 10% to account for anticipated efficiencies arising from the proposed partnering. Markedly better time and cost control was achieved…[and] the relationships between all project participants were also found to have improved considerably (2000).

Another finding indicates that "without much extra input, the typical cost saving for partnered projects ranges from 2 percent to 10 percent, and can be up to 30 percent in the long term because of improved productivity" (Bennett, 1995). The effects of building long lasting relationships are lowered costs and reduced construction times. This is especially true in the housing market, where trade contractors can anticipate an even flow of work. Trade contractors benefit from building the same houses repeatedly, which allows them to learn each plan and know exactly what materials and labor are needed. Consequently, partnered inter-organizational relationships have an advantage over the traditional use of a trade contractor's economic performance (Kumaraswamy, 2000).

Restricting Relationships. A study conducted by Welling and Kamann denotes the significance of minimizing the network of working relationships: "when the same individuals have to deal with each other in a series of projects, cooperation is more likely to occur than when they deal with a different individual in each project" (2001). Implementing a partnering system between the general contractors and trade contractors have provided some of the solutions needed to improve progress in production output. "Projects where partnering has been implemented have been known to benefit from better performance, lower budget overruns and shorter delays" (Pocock, 1996).

Although the existing relationship may be positive between a trade contractor and general contractor, without partnering the general contractor may have setbacks in hiring new tradesmen if their favored tradesmen are constructing projects for other general contractors. According to Kale and Arditi (2001), "restricting access to transaction relationships increases the frequency of transactions between existing parties and enables them to learn from one another to overcome problems caused by newness (i.e. learning new roles, coordination problems, developing trust and communication routes, etc.)." When a trade contractor and general contractor are involved in partnering, a long-term relationship develops in which trust, flexibility, and reliability are established—an indication that a successful industrial relationship is emerging (Granovetter, 1985). As these parties develop a "socially embedded relationship," the general contractor's productivity and savings increase.

Employee Training

Aside from being used by management, collected data may also be used to train employees. A survey by Hong Xiao and David Proverbs (2003) revealed that, "all Japanese companies claimed to provide lifetime employment. In contrast, approximately half of US companies and about a third of UK companies claimed to do so." Xiao and Proverbs emphasize the importance of employee training by noting the following: "Multiple regression analysis reveals that overall contractor performance is dependent on: their past performance on previous similar projects; their commitment towards lifetime employment; their perceived importance of time performance; their relationship with subcontractors; and the number of design variations during construction". The

conclusion is that performance of both general and trade contractors in the United States are adversely effected by poor employee retention and training.

As indicated by Xiao and Proverbs (2003), there is a high turnover rate of employees in the construction industry in our nation. Arditi also recognizes this trend: "Compared to the manufacturing industry, the work force in construction is quite transient" (1998). Xiao and Proverbs note the existence of the benefits of "lifetime employment" in Japan as it provides "a certain degree of stability and continuity":

> This gives contractors an incentive to invest in training their workforce, leading to better quality, productivity and efficiency. With a commitment to lifetime employment, the workforce may be more committed as they realize their own interests lie in the survival and development of the company. A sense of loyalty and belonging can motivate operatives to play an active role in activities such as TQM, which requires the participation of everyone in an organization. The performance of Japanese workers, who often form groups to study, suggest and practice ways to improve the quality of their operations and the final products (Levy, 1990), demonstrates the benefits of such commitment on the behalf of employers."

Like Japan, the construction business in the United States continues to work on ways to improve and encourage quality work from the trade contractor teams. Trade contractor motivation and incentives have been occurring both from the subcontracting team and from the general project management. This is illustrated by the following:

Subcontractor Motivation. As has been addressed, hired trade contractors should be skilled and professional workers. "Poor subcontractor attainment will reflect upon the prime contractor if the overall goal is not met" (Cox, 1998). Some of the factors which can motivate trade contractors include contract price and the ability to make a profit, relationship with the general contractor, loyalty to employees and pressure to provide work for them, personal life, and fear of fines or liquidated damages. Not only are the

trade contractors interested in providing encouragement to the laborers within their teams, but the general contractor implements incentives to increase motivation as well.

General Contractor Motivation. The general management has a considerable influence over their trade contractors in regards to the quality of work they provide. First and foremost, it is important for the general contracting management to provide a safe and reasonable environment for trade contractors. J ust as the general management appreciates skilled, hard-working trade contractors, so do trade contractors value general management that is mindful of them. In his article "Working with Subcontractors," Leon Frechette suggests some ways that general project managers can provide for an attractive atmosphere for the trade contractors:

- Communicate with trade contractors at all times, asking for their opinions and/or input;
- Give adequate notice of scheduled work or delays and immediately advise them of any changes;
- If you are supplying the materials for the trade contractors, have the materials on hand when work is to begin;
- And, most importantly, pay promptly—money talks! (1994)

Once the working environment is suitable and the communication patterns are established, further methods can be employed to encourage trade contractors to provide timely and quality work.

Cox, Issa, and Frey performed a motivational study in which general contractors provided incentives and reward programs to their trade contractors to motivate them on the job site (2006). "Such programs at the management level have proven to be

beneficial to a project by increasing productivity and by reducing a project's overall budget and/or duration" (Cox, 2006). Encouragement such as "pat on the back" rewards, clothing, lunches, and monetary bonuses were used to foster motivated laborers. The research concluded that a worker must first receive praise before feeling like a member of the team, and thereby feel a sense of job security (Cox, 2006).

Incentive and disincentive methods have been effective in other firms as well. Perhaps the most commonly used method is that of monetary rewards for good performance.

> In this method, the contract time is determined by the owner and presented as part of the bid documents. If the contractor is able to complete the project ahead of schedule, this contractor would then be entitled to a bonus (incentive fee). If, on the other hand, the contractor finishes the project behind schedule, a penalty (disincentive fee) is then assessed by the owner (Herbsman, 1995).

The skills learned by the trade contracting management and encouraged through the general contractor can, consequently, foster the relationship with the general contracting team and can advance productivity.

Safety Attitude

The attitude of the general contractors management team has toward safety has great impact on the construction site. One study found: "In his on-site managerial role, the superintendent has complete control of what takes place on the site" (Schommer, 1984). Schommer also found that "results showed that the safest superintendents were those who were considered by their superiors to excel in meeting their job costs and their time schedules". In one study "it was shown that the superintendents with better safety records managed to keep excess pressures from their foremen and workers" (Hinze,

1978). Surprisingly, it was found that a contractor's recordable incident rate did not have a positive correlation. It was the presence of a definitive safety plan that made a difference.

Professionalism

People termed "professionals" are characterized by high standards of behavior and attitudes. In response to societal expectations, professionals have defined for themselves codes of ethics depending on their industry. Although these codes appear idealistic in comparison to the societal norm, professionals are obligated to conduct both their public and private lives in accordance with these standards (Oates, 1993). Various definitions are found on the term professionalism, indicating it covers a broad spectrum of meanings. The term professionalism can imply experience in one case and refer to moral character or standards in another.

CHAPTER 3

METHODOLOGY

The Method

This chapter will discuss the research process and data collection methods for this paper. The method of research was based upon quantitative principles. A correlation procedure was performed, to determine the extent to which differences in various areas of trade contractor performance are related to differences in overall performance.

The first section of this chapter discusses the survey population and setting of the study. In the second section, the history and validation of the survey form will be discussed. The next section will describe the database entry procedure. The last section will address the analysis of the collected data.

Survey Population

From the year 1996 to 2005, Big-D required its superintendents and project managers to fill out a Trade contractor Post Job Evaluation Form. This form was completed by either the superintendents or project managers, one for each trade contractor on every job, and was then filed away for future reference. Data was included in this study from all forms that met the following criteria:

1. The survey population was limited to those trade contractors who have completed work for Big-D Construction, from the years 2000-2005.

2. An overall rating was given.
3. At least two of the ten categories were rated.

The survey population represents all forms that have been completed in the years 2000 to 2005. There was not a completed form for every trade contractor who worked on Big-D jobsites during this time because some forms were lost or never completed. Forms with no variation in responses were included in the database. The effect of identical responses lead to higher correlations. However, the correlation of each category remained in the same position in relation to the other categories.

Survey Form

The survey instrument used in this study was a Subcontractor Post Job Evaluation Form that was created to track trade contractor performance. The person in charge of maintaining the form was Julianne Olson, a corporate trainer for Big-D. Julianne indicated that the purpose for the Subcontractor Post Job Evaluation Form, was help estimators stop using substandard trade contractors (personal communication, March 12, 2007). The form consisted of ten categories, and an overall rating. The overall rating was essential to this study as the second variable to which correlation could be determined. The survey form was intended for a purpose different from how it is used in this study. Because the superintendents and project managers were unaware that the information was used to determine which trade contractor performance characteristics are most important to them, the data gathered is unbiased.

The current Subcontractor Evaluation Form in use by Big-D has evolved from five previous forms to its current format. Initially, the form consisted of sixteen categories with empty spaces where the project manager or superintendent filling out the

form would rate a trade contractor on a scale between one and ten, one being the lowest (Appendix A.6). The second version of the form consisted of the same sixteen questions, but instead of providing empty spaces, each number between one and ten was printed out as in the figure below (Appendix A.5) for the person to circle the number scored instead of having to write it out.

1 2 3 4 5 6 7 8 9 10

Figure 3.1 Scale of One to Ten

The third (Appendix A.4), fourth (Appendix A.3), fifth (Appendix A.2), and the currently used sixth (Appendix A.1) forms changed dramatically from the first two forms. The last four forms were fairly similar except for some minor formatting changes. The third form dropped from sixteen categories to ten, and added an overall rating. The six categories that were eliminated were:

1. Response to Initial Call, Telephone call returns, Back Charges – Care for Others Work, and Professionalism were combined to "Professionalism (phone call response, work ethics, … care for others work)." This combined four categories into one eliminating three.
2. Man Power/Productivity was combined with Adherence to Schedules. The result was "Man Power/Productivity/Schedule Adherence."
3. Holds Safety Meetings and Safety Attitude were combined to become "Holds Safety Meeting/Safety Attitude".
4. The Follow-Up Warranty Items category was deleted.

According to Julianne, the reason for the changes was to "focus on the core competencies and make the form easier to fill out". She went on to say that with fewer categories "the guys would take the time to do it" (personal communication, March 12, 2007).

Another difference from the first two forms to the last four was instead of using a numeric scale of one to ten, each category was rated on a grading scale of A through F, skipping E.

A B C D F

Figure 3.2 Grading Scale

Because these final three forms include the same categories and rating systems, all three were used in the study. The first two forms were not used since they had different categories, rated the responses differently, and did not include and overall rating, which was a vital part of the study. All entries made on the four forms included are dated from the years 2000 to 2005.

Sample Size

Every available form in an eligible format with at least two responses circled was included in the sample.

Survey Questions

As stated in the *Survey Form* section, the forms used in this survey evolved out of two earlier versions of the form. Of the sixteen original categories, six were either

combined with others or deleted, leaving ten categories that were considered valuable. Because there was not any additional explanation or clarification available for the managers who filled out each form, the title of each category is to be self explanatory:

Category 1 – Man Power/Productivity/Schedule Adherence

Category 2 – Quality of Work

Category 3 – Coordination with Other Subs

Category 4 – Holds Safety Meeting/Safety Attitude

Category 5 – Technical Knowledge of Drawings & Specs

Category 6 – Daily Clean-Up

Category 7 – Accuracy/Timeliness of Change Order/Backup

Category 8 – Monthly Invoices – Timely and Accurate

Category 9 – Project Close Out (O&M's, Punchlist, As-Builts)

Category 10 – Professionalism (phone call response, work ethics, … care for others work).

Database Entry

Survey forms were entered into a database shown in table 3.1. To protect both the employees and individual trade contractors of Big-D Construction the names of both parties were replaced by numbers. Because SAS version 9.1, the analysis program used, did not support letters, the survey results were converted from alphabetic form to numeric form as shown in table 3.2.

Table 3.1 – Example Survey Database

Survey Form	Trade Contractor	PM	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy/Timliness of Change Prder/Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Proffesionalism	**Overall Rating**
1	TradeContractor 1	PM7	Superintendent 16	5	5	5	5	5	5	4				5	
2	TradeContractor 2	PM 5	Superintendent 12	10	3	3	3	3	3	3	3	3	3	3	
3	TradeContractor 3	PM 6	Superintendent 7	8	3	3	3	3	4	3	1		2	2	**3**
4	TradeContractor 3	PM 6	Superintendent 13	8	4	4	4		4					4	**4**
5	TradeContractor 3	PM 7	Superintendent 5	8	3	4	4	4	4	4	3	4	4	3	**4**
6	TradeContractor 3	PM 7	Superintendent 14	8	4	4	4	4	4	4	3	4	3	4	**4**

Table 3.2 Conversion Scale from Alpha to Numeric

A+	=	5.00
A	=	5.00
A-	=	4.66
A & B	=	4.50
B+	=	4.33
B	=	4.00
B-	=	3.66
B & C	=	3.50
C+	=	3.33
C	=	3.00
C-	=	2.66
C & D	=	2.50
D+	=	2.33
D	=	2.00
D-	=	1.66
D & F	=	1.50
F+	=	1.33
F	=	1.00
F-	=	1.00

Frequently, the surveys were found to have an extra "+" or "-" next to the letter circled, as in Figure 3.3, or some had two letters circled, as in Figure 3.4. To accurately represent

the +'s, an extra .33 was added. For the extra –'s .33 was deducted. When two were circled as in Figure 3.4, the two were averaged. See Table 3.2 above for a list of conversion values.

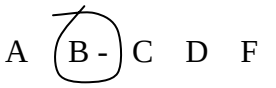

Figure 3.3 An added -

Figure 3.4 Two values circled

Data Analysis

The data analysis was generated using SAS software. Copyright, SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA. Statistical procedures in SAS are consistently being updated to reflect the latest advances in statistical methodology (SAS/STAT Software, 2007). The correlations and simple statistics generated by SAS Version 9.1 were converted from text form into excel tables. This allowed the data to be sorted, compiled and graphed for easier analysis.

CHAPTER 4

Findings

This chapter will first analyze the results with all ten categories compiled together, and will analyze the results by category second.

Correlation to Overall Rating

The Pearson Correlation Coefficient of each category to the overall rating was the primary tool used to evaluate the survey responses. Every correlation to the overall rating had a P value of <.0001, which is highly significant. The SAS program will state any P values less than 0.0001 as <.0001 and will go no further. All categories were found to have a positive correlation, some with a much stronger correlations than others. The N value was 767. The findings for each survey are listed in appendix B. Professionalism (phone call response, work ethic, care for others) had the highest correlation at 082026. Next Productivity/Man Power/Schedule Adherence came in at 0.79429. The next four were grouped closely together: Coordination with other Subs 0.76882, Quality of Work 0.75759, Technical Knowledge of Drawings & Specs 0.75261, Project Close Out (O&M's, Punchlist, As-Builts) 0.75183. In seventh was Monthly Invoices - Timely and Accurate 0.72701, and eighth was Accuracy/Timeliness of Change Orders 0.70991. From here there was a significant drop in correlation to Daily Clean-Up

0.64769. The last category, Holds Safety Meetings/Safety Attitude, fell very far behind all the others with a correlation of 0.54643. See the following table:

Table 4.1 Each of the Ten Categories in Order of Correlation to the Overall Rating

		Pearson Correlation Coefficients
1.	Professionalism (phone call response, work ethics…care for others)	0.82026
2.	Productivity / Man Power / Schedule Adherence	0.79429
3.	Coordination with other Subs	0.76882
4.	Quality of Work	0.75759
5.	Technical Knowledge of Drawings & Specs	0.75261
6.	Project Close Out (O&M's, Punchlist, As-Builts)	0.75183
7.	Monthly Invoices - Timely and Accurate	0.72701
8.	Accuracy / Timeliness of Change Orders	0.70991
9.	Daily Clean-Up	0.64769
10.	Holds Safety Meetings / Safety Attitude	0.54643

It was observed that many surveys were filled out with a tendency to give scores that did not vary more than one letter score from the overall value. This tendency is natural, but it means that smaller shifts in correlation have much more meaning. As stated by Dr. Eggett "on a five point scale, a standard deviation of less than one is to be excepted, especially when there is a human opinion factor involved" (Eggett, 2007). In some survey responses there was no variation in scoring whatsoever.

Simple Statistics

Through all ten categories the standard deviation was close to one, showing that most responses were within one point, which is typical on the five-point scale. Correlation position does seem to match up with the standard deviation position, except for Accuracy/Timeliness of Change Order/Backup and Coordination with other trade contractors. The mean responses averaged 3.6 and didn't deviate more than 0.27 from the average. See the table below.

Table 4.2 Simple Statistics – Organized by Standard Deviation

Variable	Standard Deviation	Corr Position (Table 4.1)	Responses (out of 767)	Mean Response	Response Rank (Highest toLowest)
Professionalism	1.04006	1	739	3.69	4
Man Power / Productivity / Schedule Adherence	1.02692	2	754	3.57	6
Accuracy / Timeliness of Change Order / Backup	1.00109	8	564	3.46	8
Technical knowledge of Drawings and Specs	0.92895	5	733	3.70	3
Project Close Out (O&M's, Punchlist, As-Builts)	0.92783	6	541	3.59	5
Overall Rating	0.91895		705	3.57	
Quality of Work	0.90852	4	748	3.73	2
Monthly Invoices - Timely and Accurate	0.89160	7	528	3.76	1
Coordination with other Subs	0.88551	3	728	3.55	7
Daily Clean-Up	0.87510	8	678	3.33	10
Holds Safety Meetings	0.84174	9	629	3.36	9
Average	0.9315		668	3.60	

Incomplete forms

As anticipated, not all forms were complete. Of the 767 forms recorded, 375 (49%) were not filled out completely, with an average of 2.91 questions skipped per uncompleted form. As the respondents proceed through the survey, the response rate began to drop off and more categories were left blank until the last two, professionalism and the overall rating, which had high response rates. Table 4.3 below is organized in the same order as the questions on the survey form.

Table 4.3 Categories Left Blank

Category	Blanks	% Blank
Man Power/ Productivity/ Schedule Adherence	13	2%
Quality of Work	19	2%
Coordination with other Subs	39	5%
Holds Safety Meetings	138	18%
Technical knowledge of Drawings and Specs	34	4%
Daily Clean-Up	89	12%
Accuracy/Timeliness of Change Order/Backup	203	26%
Monthly Invoices – Timely and Accurate	239	31%
Project Close Out (O&M's, Punchlist, As-Builts)	226	29%
Professionalism (phone call response, work ethics…care for others)	28	4%
Overall Rating	*62*	*8%*
	N = 767	

Response Distribution

Eight of the ten categories had similar response distributions, with the highest number of responses being "B." Theses eight were also similar to the response

distribution for the overall rating. The two categories which where not distributed along with this norm were Holds Safety Meetings/Safety Attitude, which both had more "C" responses. The response distributions are shown in figure 4.1 below.

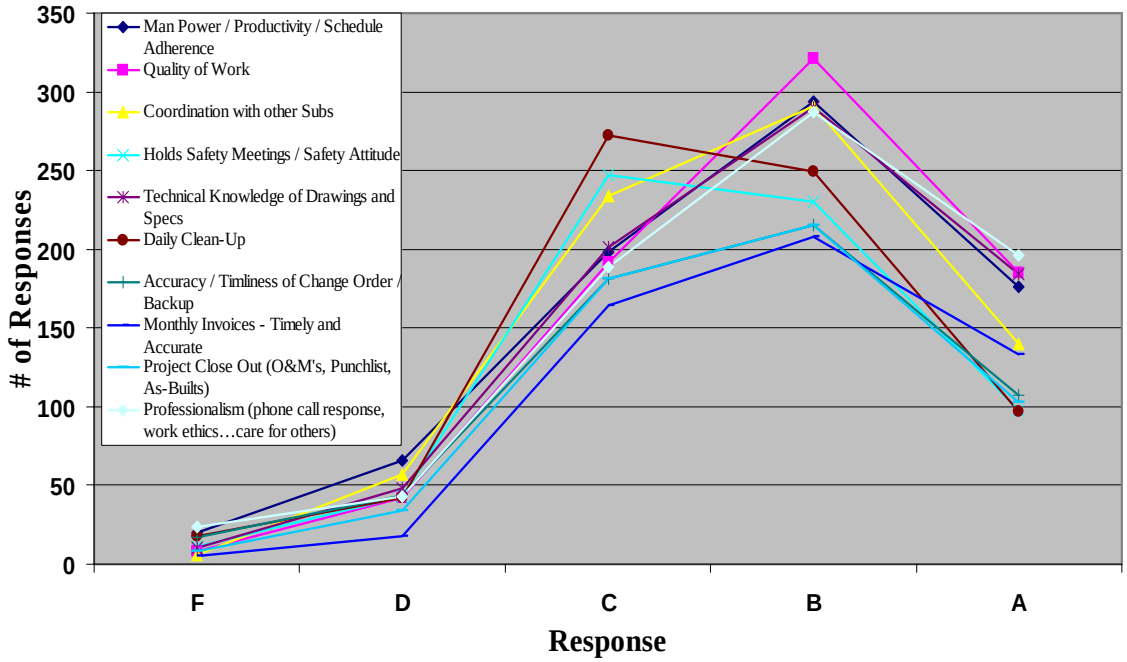

Figure 4.1 Line Graph of Total Responses for Each Category

Correlation of Each Category to the Other Categories

The correlation of each category to the other categories is seen in table 4.4 below. The total shown in the table excludes the correlation of each category to itself, which is always 1.00. Every correlation of one survey category to another had a P value of <.0001, which is highly significant. The SAS program will state any P values less than 0.0001 as <.0001 and will go no further.

Table 4.4 Pearson Correlation Coefficients of each Category to all other Categories in Order of Highest Total Correlation to Lowest.

	Productivity	Quality	Coordination	Safety	Technical	Cleanup	Change Orders	Invoices	Closeout - Punch list	Professionalism	**Total**
Professionalism	0.64	0.62	0.65	0.46	0.57	0.61	0.67	0.65	0.70	1.00	**5.57**
Invoices	0.56	0.53	0.55	0.52	0.59	0.64	0.81	1.00	0.68	0.65	**5.53**
Change Orders	0.61	0.50	0.55	0.46	0.57	0.60	1.00	0.81	0.69	0.67	**5.46**
Closeout - Punch list	0.59	0.57	0.57	0.52	0.57	0.52	0.69	0.68	1.00	0.70	**5.42**
Coordination	0.66	0.67	1.00	0.49	0.63	0.57	0.55	0.55	0.57	0.65	**5.35**
Productivity	1.00	0.69	0.66	0.42	0.64	0.51	0.61	0.56	0.59	0.64	**5.32**
Technical	0.64	0.67	0.63	0.54	1.00	0.53	0.57	0.59	0.57	0.57	**5.31**
Quality	0.69	1.00	0.67	0.42	0.67	0.50	0.50	0.53	0.57	0.62	**5.17**
Cleanup	0.51	0.50	0.57	0.52	0.53	1.00	0.60	0.64	0.52	0.61	**5.00**
Safety	0.42	0.42	0.49	1.00	0.54	0.52	0.46	0.52	0.52	0.46	**4.35**

Results by Category

Professionalism (phone call response, work ethics…care for others). This category had the highest correlation to the overall response, and was thus found to be the most important to project managers and superintendents. Professionalism also had the highest correlation to the other categories. The responses were distributed normally, compared to the other nine categories with "B" having the highest number of responses. Responses are shown in the table below:

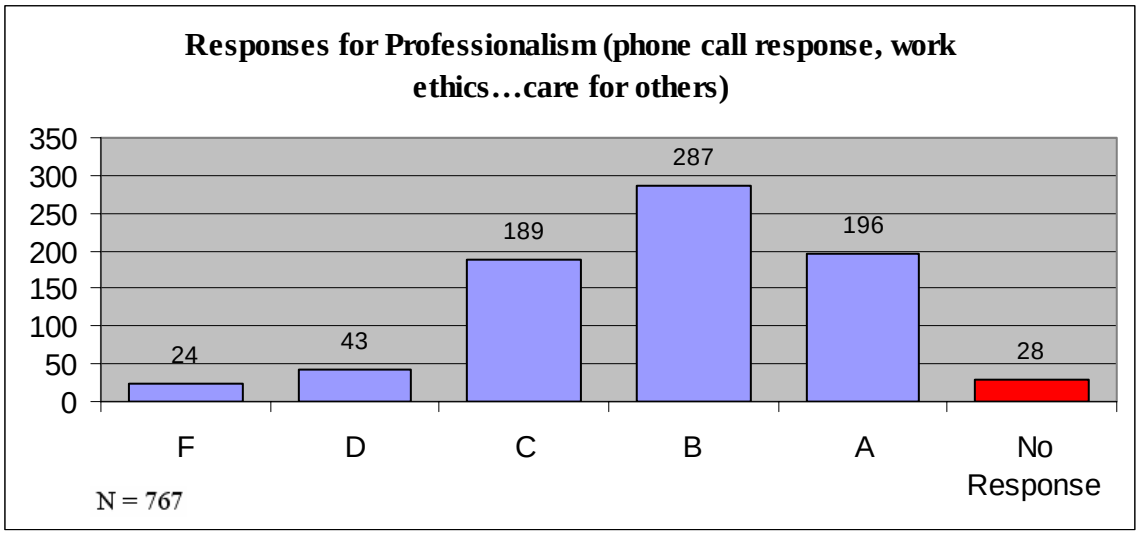

Figure 4.2—Total Responses for Professionalism (phone call response, work ethics…care for others).

Productivity/Man Power/Schedule Adherence This category had the second highest correlation to the overall response. Its high correlation to the overall rating shows that productivity and schedule adherence are very important to a general contractor's management team. Responses were distributed normally, compared to the other categories, and Productivity/Man Power/Schedule Adherence had the least number of blank spaces out of the ten categories, with only 13 out of 767—a 98.3% response rate. See the graph on the next page:

Coordination with other Subs This category had the third highest correlation to the overall response, but came in lower in other areas. In correlation to the other categories it was fifth, average response was seventh and standard deviation eighth. However, responses were still distributed normally, compared to the other categories, and a moderately low number of non-responses as seen in the graph on the next page.

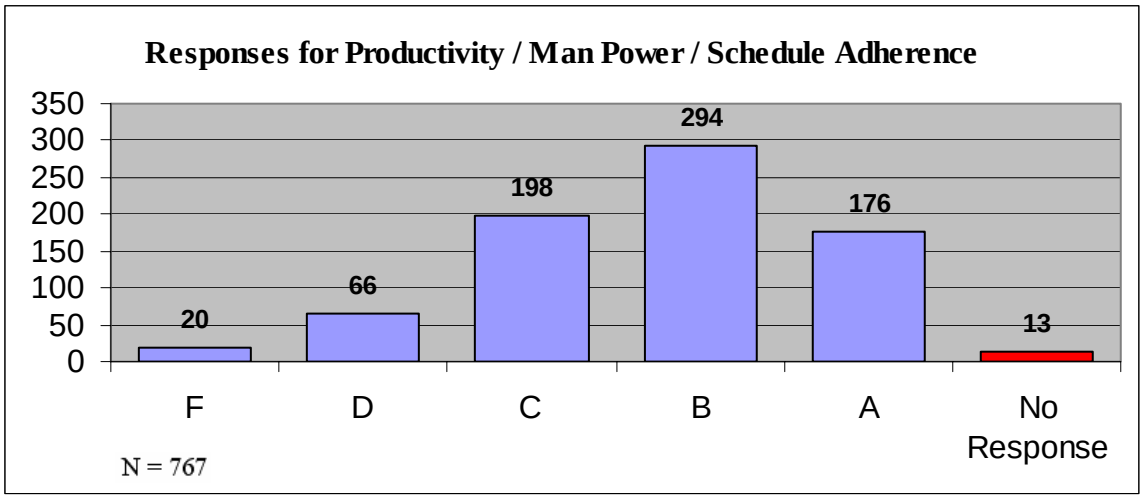

Figure 4.3—Total Responses for Productivity/Man Power/Schedule Adherence

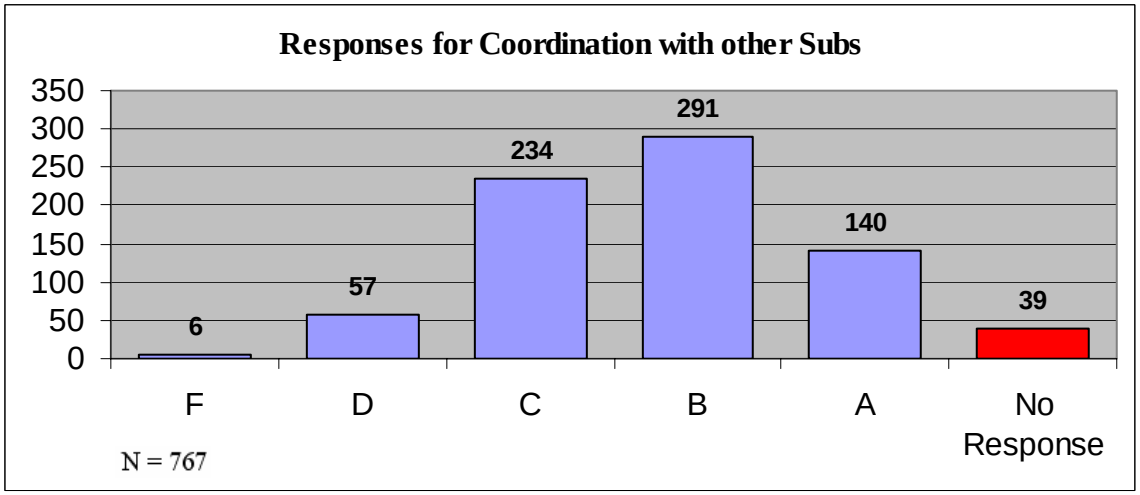

Figure 4.4—Total Responses for Coordination with other Subs

Quality of Work This category had the fourth highest correlation to the overall response, but had a low correlation to the other categories, coming in at eighth. Of the ten categories Quality of Work had the second highest average response (on the 1–5 scale). Responses were distributed normally, compared to the other categories, and Quality of Work had only 19 blanks out of 767—a 97.5% response rate.

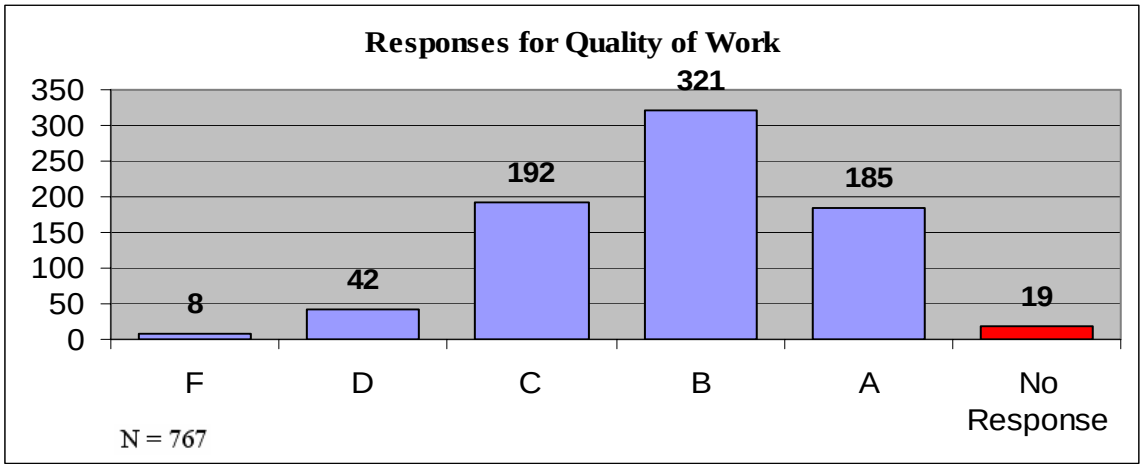

Figure 4.5—Total Responses for Quality of Work

Technical Knowledge of Drawings and Specs This category had the fifth highest correlation to the overall response, and was also average in the other ratings as well. Responses were distributed normally, compared to the other categories. Of interest, this category had a high response rate compared to the categories immediately before and after it on the survey form.

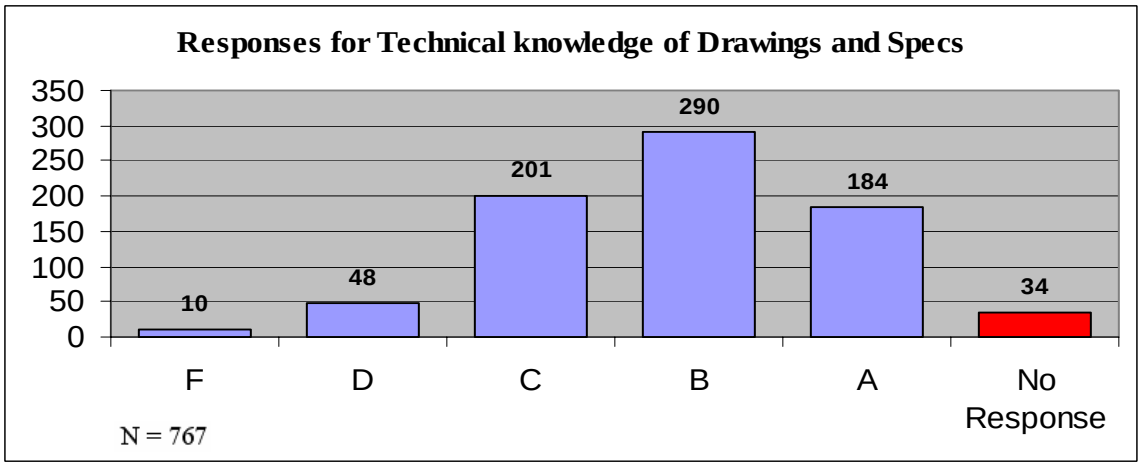

Figure 4.6—Total Responses for Technical knowledge of Drawings and Specs

Project Close Out (O&M's, Punchlist, As-Builts) This category had the sixth highest correlation to the overall response. Project Close-Out was average across the board with correlation to other trade contractors coming in at fourth, response position fourth, and standard deviation fifth. Responses were distributed normally, with "B" having the highest number of responses, compared to the other categories. This category had an extremely high non-response rate.

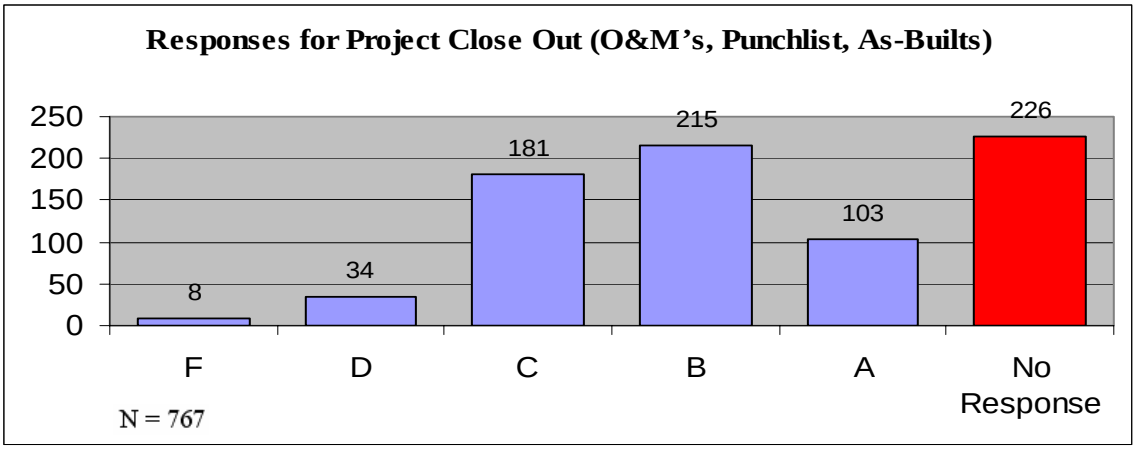

Figure 4.7—Total Responses for Project Close Out (O&M's, Punchlist, As-Builts)

Monthly Invoices - Timely and Accurate This category had the seventh highest correlation to the overall response, though this category had the highest overall average response, and the highest rate of non-response. Also, this category had the second highest correlation to the other categories. Responses were distributed normally, with "B" having the highest number of responses, compared to the other categories. This category had an extremely high non-response rate.

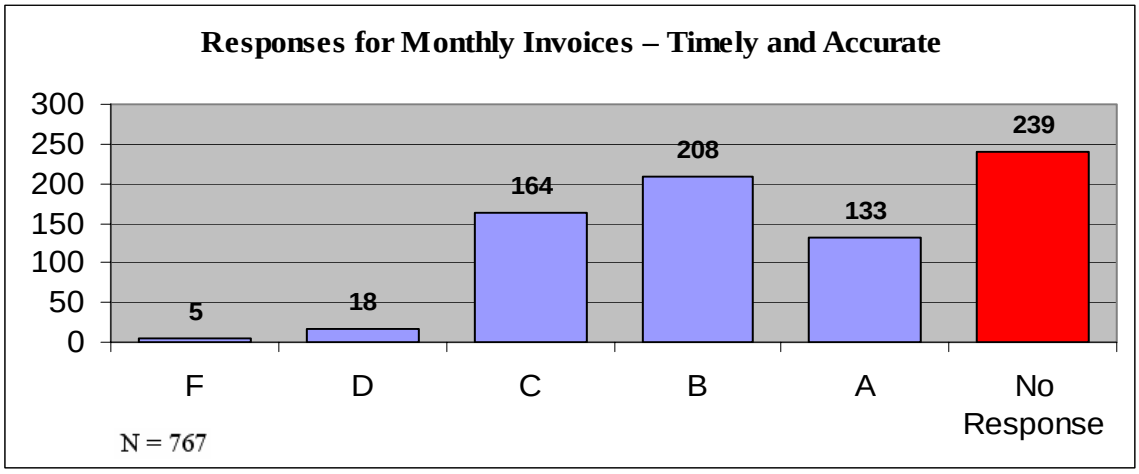

Figure 4.8—Total Responses for Project Close Out (O&M's, Punchlist, As-Builts)

Accuracy/ Timeliness of Change Order/Backup This category had the eighth highest correlation to the overall response and the eighth highest mean response. This category had the third highest correlation to the other categories. Responses were distributed normally, with "B" having the highest number of responses, compared to the other categories. This category had a high non-response rate.

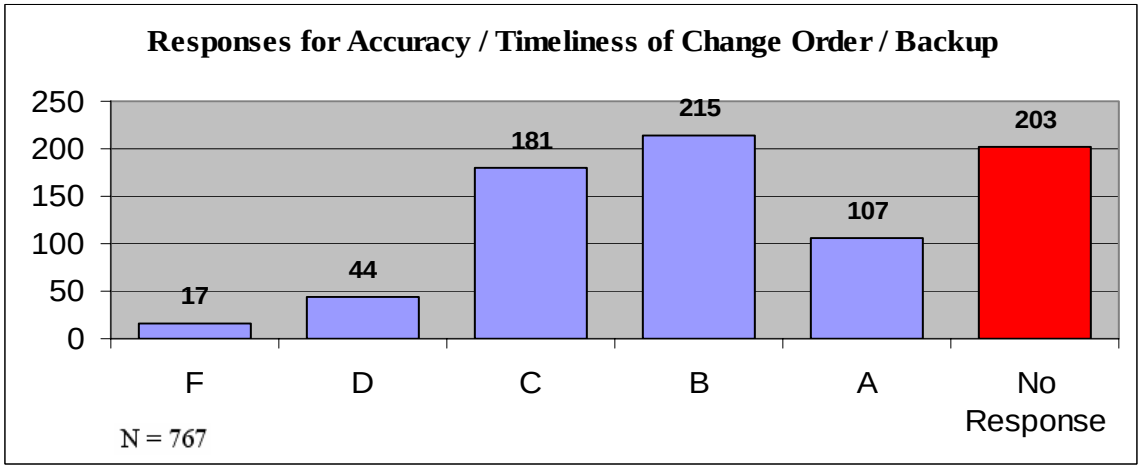

Figure 4.9—Total Responses for Accuracy / Timeliness of Change Order / Backup

Daily Clean-Up This category had the second lowest correlation to the overall response when compared to the other categories. It also had the lowest mean response. Responses were not distributed normally, as seen in figure 4.— below, daily clean-up received more C responses than the other categories. Daily clean-up had an average number of non-responses.

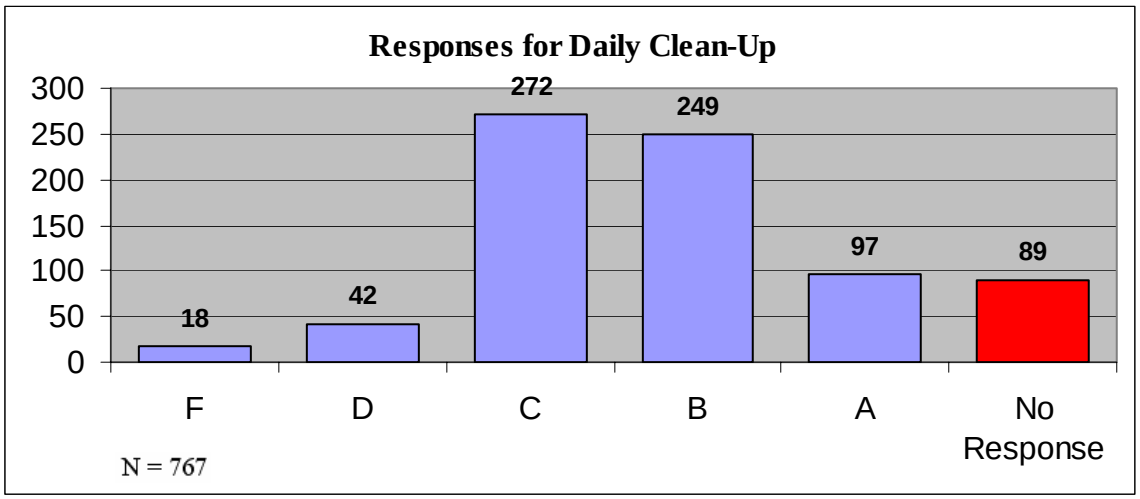

Figure 4.10—Total Responses for Daily Clean-Up

Holds Safety Meetings/Safety Attitude This category had the lowest correlation to the overall response, coming in at last place relative to the other categories. It also had the second lowest mean response. Responses were not distributed normally, as seen in figure 4.— below, safety received more "C" responses than the other categories. Despite the poor correlation to every other category, to the overall rating, and the low mean response, safety did not have a high number of "F" or "D" responses.

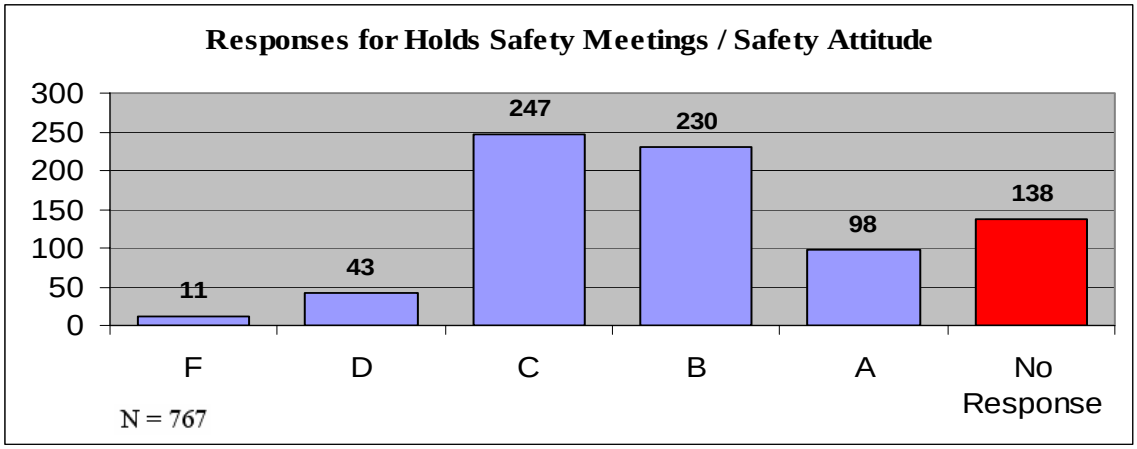

Figure 4.11—Total Responses for Holds Safety Meetings / Safety Attitude

Overall Rating Unlike the ten categories that were compared to the overall rating, the overall rating is the standard itself, and there are more increments for responses to fall into. The extra increments are result of respondent attempts to give more accurate overall ratings by adding +'s, -'s and by circling two responses. The added increments make the overall rating difficult to compare to the ten categories as done throughout this chapter. The non-response rate of 62 surveys effectively reduced the number of surveys from 767 to 705, since to correlation to the overall rating can be found without an overall rating.

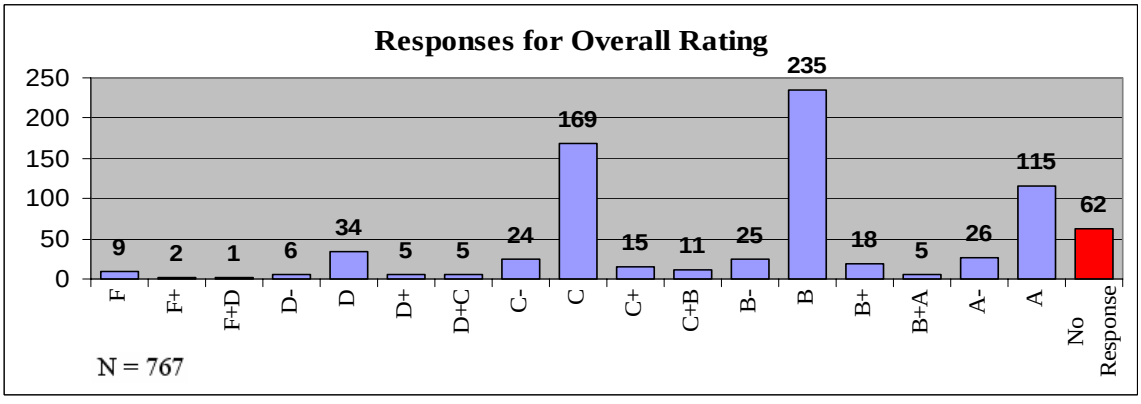

Figure 4.12—Total Responses for Project Overall Rating

It was found that the correlations and simple statistics for category were dependent to one another. The categories with higher correlation to the overall rating had higher mean responses, while the two categories with the lowest correlation also had the lowest mean responses. It was observed that the number of non responses for each category was positively correlated to that categories correlation to the overall rating.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

In the Mind of Big-D Superintendents and Project Managers

The question of the study was, "which part of a trade contractors' performance is most important to Big-D project managers and Superintendents?" One way this question could have been answered would have been by surveying general contractors and asking them the question directly. While simple and direct, the weakness to this approach would be that the general contractors may have given different answers on a survey than what their actual behaviors would have suggested. The survey form was designed to evaluate trade contractor performance to help determine whether to hire them in the future. The advantage of the survey form was that respondents were unaware that the information was also used to determine what trade contractor performance characteristics are most important to Big D's project management. This allowed us to subjectively measure the behaviors of Big-D superintendents and project managers.

Four Groups

The findings indicate that the behaviors fall into four groups. The first group consists of two categories that had higher correlations to the overall rating and higher response rates than the other categories. These first two categories are grouped together as the most important. The second group consists of four categories with moderately

high correlations, and these four were closely grouped coming within .017 points of each other. The third group, found to be less important, consists of two categories. Finally, the last and least important group consists of two categories that had considerably less correlation than the rest.

The meaning or strength of the correlations is relative. Since each category is measured against all others, the correlation strength of a category is determined by where the category falls in relation to the others. See table 5.1 on the next page.

Table 5.1 The Four Groups

Correlation to Overall Rating	Pearson Correlation Coefficients	Spread (Corr less .54643)	Percent of Spread	Group
Professionalism	0.82026	0.274	100%	Most Important
Productivity / Man Power / Schedule Adherence	0.79429	0.248	91%	
Coordination with other Subs	0.76882	0.222	81%	Moderately Important
Quality of Work	0.75759	0.211	77%	
Technical Knowledge of Drawings & Specs	0.75261	0.206	75%	
Project Close Out (O&M's, Punchlist, As-Builts)	0.75183	0.205	75%	
Monthly Invoices - Timely and Accurate	0.72701	0.181	66%	Less Important
Accuracy / Timeliness of Change Orders	0.70991	0.163	60%	
Daily Clean-Up	0.64769	0.101	37%	Least Important
Holds Safety Meetings / Safety Attitude	0.54643	0.000	0%	

Most Important Areas

Professionalism (phone call response, work ethics…care for others) is clearly most important to the general contractors, project managers, and superintendents. However, there is a drawback to measuring professionalism; according to Dr. Eggett "it encompasses too broad a scope" (Eggett, 2007). When rating professionalism, respondents are likely to be thinking about behaviors that would fall into other categories. It is like another overall rating, and the fact that professionalism had the highest correlation to the overall rating supports this theory. Another factor that may have contributed to the high correlation of professionalism to the overall rating is its position on the survey form. Professionalism is placed right before the overall rating as the last two categories on the form. According to Dr. Eggett of the BYU statistics department, "This position is a psychological factor that will cause higher correlation" (2007). However, the fact that professionalism had the highest correlation to the other categories, the most "A" responses, the highest standard deviation, and one of the higher response rates, strengthens its position as the most important trade contractor behavior to the general contractor. In almost every way the data was analyzed this category came out on top. However, this category still has the weakness of being very broad. The meaning of "Professionalism (phone call response, work ethics… care for others)" could include the trade contractor's people skills, integrity, honesty of the sub, how well the trade contractor has it together, responsiveness to phone calls, etc. The information gathered would have more meaning if this category was more defined.

Productivity/Man Power/Schedule Adherence was also found to be most important and, unlike professionalism, it is clear and well defined what is meant by

productivity/man power/schedule adherence. It is surprising that this category was not most important.

The Moderately Important Categories

Coordination with other Subs, Quality of Work, Technical Knowledge of Drawings & Specs, and Project Close Out (O&M's, Punchlist, As-Builts) were found to have a strong correlation to the overall rating. However, the low response rates for these categories indicate it is likely that some of the high correlations of these categories are due to lack of problems they may cause during the construction process. For example, technical knowledge of drawings and specs had a lower response rate, and is usually not a problem between the superintendent and the trade contractors. This may be true of this entire group except for Quality of Work, which had a significantly higher response rate than the rest. The lower response rates of the other three categories in this group may also indicate that respondents considered the category unimportant or not applicable.

The Less Important Areas

Monthly Invoices - Timely and Accurate, Accuracy/Timeliness of Change Orders both had lower correlation to the overall rating, and very high non-response rate. They are found to be much less important than the previous six categories. If all the categories were graded on a scale, these would be in the "D" range. It is likely that these two had fewer responses and low correlations because they don't really affect the general contractor if the trade contractor does a poor job. If the trade contractor does not submit invoices or change orders on time then the general contractor simply does not pay them.

Least Important Areas

Daily Clean-Up Gets a low 37% on the grading curve. Daily Clean-Up is clearly not a high impact item when it comes to making a good impression on the general contractor. Daily Clean-Up had the lowest mean response of all the categories, which indicates trade contractors often did not keep the job site clean. It makes sense that Daily clean-up scored so low, since low scores in this area will not cause the general contractor nearly as many problems as low scores in other areas.

Holds Safety Meetings/Safety Attitude was found to have the least impact on the general contractors' perceptions of the trade contractors. Trade contractors can fail poorly in this area and still receive praise and approval from the general contractor. This is not to say that the general contractor has no regard for safety. Poor safety attitudes or lack of safety meetings rarely cause problems for the general contractor.

Recommendations for Additional Study

The intent of this research was to determine the areas of trade contractors performance that most and least affect the opinion of the general contractor. The hope was to gain insight into the workings of the relationship between the general and trade contractors. While doing so, other issues came up that could warrant additional research. The following are suggestions for additional research topics.

Additional research is recommended to determine performance of subcontractors by division. The data found in Appendix B includes the CSI division for each subcontractor when it could be determined. The data is in the old CSI format and includes divisions 2-15.

It is recommended that the study be repeated with a much larger contractor base. Information gathered from multiple contractors can be added to the data gathered in this study to determine important subcontractor performance characteristics for the construction industry as a whole.

Additional research is recommended to determine why Daily Clean-Up and Holds Safety Meetings / Safety Attitude had such low correlation to the overall rating, low mean response, and low correlation to the other categories. This study could use data found in Appendix B and chapter four of this study along with another, more specific survey form.

Additional research is recommended to address the factors that are most important for general contractors performance measured from the trade contractor's position. This study could provide more information to help understand the workings of the relationships between trade contractors and general contractors. It would also be of interest to compare the information found in this study, and see how the agenda's of trade contractors and general contractors compare.

Additional study is recommended to determine what factors would cause a trade contractor to provide Big-D with lower bids on future work.

Additional research is recommended to determine what characteristics, behaviors, or attitudes "professionalism" includes. The category Professionalism (phone call response, work ethics…care for others) has been found in this study to have the most influence on the general contractor. However, professionalism is a broad term and could have a number of different meanings to general contractors.

Implications

The implications of this study suggest that the project management at Big-D most value working with "professional" trade contractors they can rely on to complete the job on time (productivity). They are also interested in a trade contractor who can perform the job correctly (quality, technical knowledge) and get along with others (coordination with other subs), though these are not as important as the first two. What is not important to the general contractor is whether or not the trade contractors do their paperwork, on time or correctly. And they almost don't care at all if the trade contractors keep the job site clean during the project, so long as they took care of the first few items. And in a distant last place is safety. From what was found in this study, it is apparent that having a good safety attitude does not affect the opinion of general contractor superintendents and project managers. It may not mean safety is unimportant to them, in fact they probably will issue fines when safety is not followed, but they will still give good ratings on the trade contractors' performance.

The trade contractor behaviors evaluated in the survey are usually considered only when there was a problem. Coordination with other trade contractors is a prime example of this. Often, no coordination is needed by the trade contractor and if coordination is needed, it is only likely to catch the attention of the general contractor if there is a problem. This tendency for general contractors not to worry a trade contractor's performance until a problem arises is important to consider. Some categories likely had higher correlations to the overall rating than they should have because there were no problems in that area, so the respondents gave the trade contractors a score that reflected

their perception of that trade contractor. This perception of the trade contractor is equivalent to the overall rating.

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APPENDICES

BIG-D CONSTRUCTION CORP.
389 WEST 2ND STREET
OGDEN, UTAH 84404

SUBCONTRACTOR POST JOB EVALUATION

SUBCONTRACTOR _____

JOB NO. Jm 197 JOB NAME _____

PROJECT MANAGER John A. Maki

SUPERINTENDENT Scott Jones

DIVISION 5 CONTRACT AMOUNT $_____ OVERALL RATING C
(A, B, C, D, F)

Circle One Rating Scale 1 - 10 1 = Poor 10 = Excellent

Response to Initial Call	7
Man Power/Productivity	
Adherence to Schedules	6
Coordination with Other Subs	
Telephone Call Returns	8
Holds Safety Meetings	
Safety Attitude	
Technical Knowledge of Drawings & Spec's	5
Quality of Work	5
Daily Clean-up	
Professionalism	5
Accuracy and Timeliness of Change Orders/Backup	
Back Charges -- Care for Other Work	
Monthly Invoices -- Timely and Accurate	
Project Close Out	
Follow Up Warranty Items	

Additional Comments: Had alot of Field & Fab due to inaccurate steel.

BIG-D CONSTRUCTION CORP.
389 WEST 2ND STREET
OGDEN, UTAH 84404

Mike McDonough / Bovis

SUBCONTRACTOR POST JOB EVALUATION

SUBCONTRACTOR _____

JOB NO. _____ JOB NAME _____

PROJECT MANAGER _____

SUPERINTENDENT Scott Boyce

DIVISION 2 CONTRACT AMOUNT $_____ OVERALL RATING 2

Circle One Rating Scale 1 - 10 1 = Poor 10 = Excellent

Response to Initial Call	1 2 3 4 5 6 7 8 9 10
Man Power/Productivity	1 2 3 4 5 6 7 8 9 10
Adherence to Schedules	1 2 3 4 5 6 7 8 9 10
Coordination with Other Subs	1 2 3 4 5 6 7 8 9 10
Telephone Call Returns	1 2 3 4 5 6 7 8 9 10
Holds Safety Meetings	1 2 3 4 5 6 7 8 9 10
Safety Attitude	1 2 3 4 5 6 7 8 9 10
Technical Knowledge of Drawings & Spec's	1 2 3 4 5 6 7 8 9 10
Quality of Work	1 2 3 4 5 6 7 8 9 10
Daily Clean-up	1 2 3 4 5 6 7 8 9 10
Professionalism	1 2 3 4 5 6 7 8 9 10
Accuracy and Timeliness of Change Orders/Backup	1 2 3 4 5 6 7 8 9 10
Back Charges -- Care for Other Work	1 2 3 4 5 6 7 8 9 10
Monthly Invoices -- Timely and Accurate	1 2 3 4 5 6 7 8 9 10
Project Close Out	1 2 3 4 5 6 7 8 9 10
Follow Up Warranty Items	1 2 3 4 5 6 7 8 9 10

Additional Comments: Major Pain Poor work No QC.
Very Slow. Site Cleanup is BAD.

APPENDIX A.3

BIG-D CONSTRUCTION CORP.
4774 South 1300 West
Ogden, Utah 84405-3621
801 392-3200

SUBCONTRACTOR POST JOB EVALUATION

SUBCONTRACTOR _____

JOB NO. KA111 **JOB NAME** _____

PROJECT MANAGER KERRY ARNOLD/BILL HENDRICKSON

SUPERINTENDENT JOHN DEBOER/DAVEY MCCUBBIN

TRADE/SCOPE OF WORK STEEL ERECTION

Man Power/Productivity/Schedule Adherance	(A)	B	C	D	F
Quality of Work	A	(B)	C	D	F
Coordination with Other Subs	A	(B)	C	D	F
Holds Safety Meetings/Safety Attitude	(A)	B	C	D	F
Technical Knowledge of Drawings & Spec's	(A)	B	C	D	F
Daily Clean-up	A	(B)	C	D	F
Accuracy/Timeliness of Change Order/Backup	A	B	(C)	D	F
Monthly Invoices -- Timely and Accurate	A	B	C	D	F
Project Close Out (O&M's, Punchlist, As-Builts)	A	(B)	C	D	F
Professionalism (phone call response, work ethics,... care for others work).	A	(B)	C	D	F

Additional Comments: KEVIN IS ONE OF THE BEST!

LPR's adherence to schedule milestones allowed TRW to complete on time.

OVERALL RATING (circle one)	(A)	B	C	D	F

BIG-D CONSTRUCTION
DESIGN BUILD

SUBCONTRACTOR POST JOB EVALUATION

SUBCONTRACTOR _____

JOB NO. KB103 **JOB NAME** _____

PROJECT MANAGER _____

EVALUATION DONE BY BRAD MORGAN

✳ **SUPERINTENDENT** _____

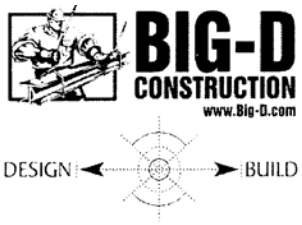
TRADE/SCOPE OF WORK PAINTING / WALLCOVERING

Man Power/Productivity/Schedule Adherence	A	B	**C**	D	F
Quality of Work	A	B	C	**D**	F
Coordination with Other Subs	A	B	C	**D**	F
Holds Safety Meetings/Safety Attitude	A	B	**C**	D	F
Technical Knowledge of Drawings & Spec's	**A**	B	C	D	F
Daily Clean-up	A	**B**	C	D	F
Accuracy/Timeliness of Change Order/Backup	A	**B**	C	D	F
Monthly Invoices -- Timely and Accurate	**A**	B	C	D	F
Project Close Out (O&M's, Punchlist, As-Builts)	A	B	C	**D**	F
Professionalism (phone call response, work ethics,... care for others work).	A	B	C	D	**F**

Additional Comments: _____

OVERALL RATING (circle one)	A	B	C	**D**	F

APPENDIX A.5



SUBCONTRACTOR POST JOB EVALUATION

SUBCONTRACTOR_____

JOB NO._____ **JOB NAME**_____

PROJECT MANAGER_____

SUPERINTENDENT_____

TRADE/SCOPE OF WORK_____

Man Power/Productivity/Schedule Adherence	A	B	C	D	F
Quality of Work	A	B	C	D	F
Coordination with Other Subs	A	B	C	D	F
Holds Safety Meeting/Safety Attitude	A	B	C	D	F
Technical Knowledge of Drawings & Spec's	A	B	C	D	F
Daily Clean-Up	A	B	C	D	F
Accuracy/Timeliness of Change Order/Backup	A	B	C	D	F
Monthly Invoices—Timely and Accurate	A	B	C	D	F
Project Close Out (O&M's, Punchlist, As-Builts)	A	B	C	D	F
Professionalism (phone call response, work ethics,…care for others work).	A	B	C	D	F

Additional Comments: _____

OVERALL RATING (circle one)	**A**	**B**	**C**	**D**	**F**

APPENDIX A.6

SUBCONTRACTOR POST JOB EVALUATION

Subcontractor: Project Name:

Project Manager: Project Number:
Superintendent:

Scope of Work:

	Circle One:				
Man Power / Productivity / Schedule Adherence	A	B	C	D	F
Quality of Work	A	B	C	D	F
Coordination with Other Subs	A	B	C	D	F
Hods Safety Meeting / Safety Attitude	A	B	C	D	F
Technical Knowledge of Drawings & Spec's	A	B	C	D	F
Daily Clean-Up	A	B	C	D	F
Accuracy / Timeliness of Change Order/Backup	A	B	C	D	F
Monthly Invoices - Timely and Accurate	A	B	C	D	F
Project Close Out (O&M's, Punchlist, As-Builts)	A	B	C	D	F
Professionalism (phone call response, work ethics,...care for others).	A	B	C	D	F

Additional Comments: _____

OVERALL RATING (circle one)	**A**	**B**	**C**	**D**	**F**

404 West 400 South | Salt Lake City, UT 84101 | ph: 801-415-6000 | fax: 801-415-6900

APPENDIX B

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
1	TC 1	PM 7	Supr 16	5	5	5	5	5	5	4				5	
2	TC 2	PM 5	Supr 12	10	3	3	3	3	3	3	3	3	3	3	
3	TC 3	PM 6	Supr 7	8	3	3	3	3	4	3	1		2	2	**3**
4	TC 3	PM 6	Supr 13	8	4	4	4		4					4	**4**
5	TC 3	PM 7	Supr 5	8	3	4	4	4	4	4	3	4	4	3	**4**
6	TC 3	PM 7	Supr 14	8	4	4	4	4	4	4	3	4	3	4	**4**
7	TC 3	PM 8	Supr 1	8	5	4			5		4	4	5	4	**4**
8	TC 4	PM 2	Supr 2	2	3	3	3	3	4	4	3	3	3	4	**4**
9	TC 5	PM 2	Supr 2	9	3	4	4	3	4	3	3	3	4	4	**4**
10	TC 5	PM 3	Supr 9	9	2	3	2	3	3	3	2	4	2	3	**2.5**
11	TC 5	PM 5	Supr 10	9	4	4	5	5	5	4	4	5	4	5	**5**
12	TC 5	PM 5	Supr 12	10	5	5	5		4	3				5	
13	TC 5	PM 6	Supr 13	9	4	4	4	3	4	4				4	**4**
14	TC 5	PM 7	Supr 5	9	4	4	3	4	3	3	4	4	4	4	**4**
15	TC 5	PM 7	Supr 5	9	4	5	4	1	3	1	4	4	3	3	**3**
16	TC 5	PM 7	Supr 5	9	5	4	4	2		2				4	**3**
17	TC 5	PM 7	Supr 5	9	4	4	3	4	4	3	5	5	4	5	**4**
18	TC 5	PM 9	Supr 11	9	4	4	4	4	2	3	4	4	4	4	**4**
19	TC 5	PM 9	Supr 11	9	4	4	4	4	4	4				4	**4**
20	TC 5	PM 9	Supr 15	9	3	4	2	2	3	3	3	3	3	4	**3**
21	TC 5	PM 9	Supr 15	9	3	3	3	3	3	3				3	**3**
22	TC 5		Supr 9	9	3	3	3	3	3	4	3	3	3	4	**3**
23	TC 6	PM 1	Supr 6	9	2	2	2		2	2	3	3	4	1	**1.66**
24	TC 6	PM 1	Supr 6	9	2	3	3		2	3	3	3	4	3	**2**
25	TC 7	PM 8	Supr 1	8	5	5	4		5	5	5	5	5	5	**5**
26	TC 8	PM 6	Supr 13	13	4	4	4			4				4	**4**
27	TC 9	PM 1	Supr 6	8	2	2	2		2	3	3	3	3	3	**2.33**
28	TC 9	PM 1	Supr 6	8	3	3	3		3	3	3	3	4	4	**3**
29	TC 10	PM 9	Supr 11	14	2	3	2	2	2	2	2	2	2	2	**2**
30	TC 10	PM 9	Supr 11	14	2	3	2	2	2	2	2	2	2	1	**1.66**
31	TC 11	PM 4	Supr 7	9	4	3	4	4	4	3			4	4	**4**
32	TC 11	PM 4	Supr 7	9	3	4	4	4	4	3	3	4	3	4	**3**
33	TC 11	PM 4	Supr 7	9	5	4	5	4	5			5		4	**4**
34	TC 11	PM 4	Supr 7	9	4	4	3		3	3			4	4	**3.66**
35	TC 11	PM 7	Supr 7	9	4	4	4	4	4	4	4	4	4	4	4
36	TC 12	PM 7	Supr 16	9	5	4	4	4	3	4				5	
37	TC 13	PM 1	Supr 6	8	2	2	2	3	3	2	3	3	4	2	**2.66**
38	TC 13	PM 1	Supr 6	8	3	3	3	3	4	3	3	3	5	3	**3**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
39	TC 13	PM 5	Supr 12	10	4	5	4		5	5	4			5	
40	TC 13	PM 6	Supr 7	8	3	3	3	3	3	2	3		3	2	**2.66**
41	TC 13	PM 6	Supr 13	8	4	4	4		4	3				4	**3.66**
42	TC 13	PM 7	Supr 6	11	3	3	3	3	3	3	3	3	3	3	3
43	TC 14	PM 6	Supr 7	5	2	4	3	3	3	3	1		1	3	**3**
44	TC 14	PM 7	Supr 6	5	3	3	3	3	3	3	3	3	3	3	3
45	TC 14	PM 9	Supr 15	5	3	4	4	3	4	3	3	3	3	3	**3.33**
46	TC 14	PM 9	Supr 15	5	3	4	4	2	4	3				4	**4**
47	TC 15		Supr 8	8	5	4	5	5	5	5	5	5	5	5	**5**
48	TC 16	PM 9	Supr 17	13	5	5	4	3	5	3	3	4	5	5	**4.66**
49	TC 17	PM 6	Supr 13	5	4	3	4	2	3	3				4	**3**
50	TC 18		Supr 8	8	3	2	2	3	5	2	3	3	1	1	**2**
51	TC 19	PM 9	Supr 17	2	5	4	4	3	4	5	4	4	3	5	**4**
52	TC 20	PM 3	Supr 9	8	3	3	4	4	4	3	2	5	4	4	**4**
53	TC 20		Supr 9	8	3	3	4	3	2	2	4	4	3	4	**2.5**
54	TC 21	PM 7	Supr 14	2	3	3	3	3	3	3	3	3	3	3	3
55	TC 22	PM 4	Supr 7	9	2	3	2	3	3	3	2		2	2	**2.33**
56	TC 22	PM 4	Supr 7	9	2	3	2	2	2	2	2	3	2	2	**2**
57	TC 22		Supr 8	9	4	4	5	3	5	5	5	5	3	3	**4**
58	TC 23	PM 7	Supr 6	6	3	3	4	3	4	3	3	3	3	3	**3**
59	TC 24	PM 6	Supr 7	1	4	3	4	4	3	3	3		3	4	**3**
60	TC 25	PM 6	Supr 7	11	3	4	4	3	4	3	2		2	4	**4**
61	TC 26	PM 4	Supr 7	11	3	3	3	3	3	2	3		3	3	**3**
62	TC 26	PM 4	Supr 7	11	4	4	2	4	4		3	4	4	3	**3**
63	TC 26	PM 4	Supr 7	11	4	4	4	4	4	4	4	4	4	2	**4**
64	TC 26	PM 4	Supr 7	11	4	4	3		3	3				4	**3.66**
65	TC 26	PM 5	Supr 10	11	3	3	3	3	4	3	4	4		3	**3**
66	TC 26	PM 6	Supr 13	11	4	4	4		4	4				4	**4**
67	TC 26	PM 7	Supr 7	11	4	4	4	4	4	4	4	4	4	4	4
68	TC 26	PM 9	Supr 17	11	3	4	3		4	2		3	4	4	**4**
69	TC 27	PM 5	Supr 12	10	2	3	4		5	3	4	4		3	
70	TC 28	PM 4	Supr 7	10	4	4	3		4		4	4		4	**4**
71	TC 28	PM 4	Supr 7	10	3	4	3	3	4	3				4	**3.33**
72	TC 29	PM 7	Supr 16	8	5	5	5	5	5	5				5	
73	TC 30		Supr 9	16	4	3	3	4	4	4	4	4	4	4	**3.5**
74	TC 30	PM 3	Supr 9	16	5	5	4	4	5	4	5	5	5	5	**5**
75	TC 31	PM 8	Supr 1	6	3	3	3	3	3	3	4	4	3	3	**3**
76	TC 32	PM 7	Supr 5	11	3	3	4	1	3	1					**3**
77	TC 32	PM 7	Supr 5	11	3	3	3	3	3	3	3	3	3	3	3
78	TC 33	PM 8	Supr 1	7	1	1	1	1	1	1	1	1	1	1	1
79	TC 34		Supr 8	6	5	5	5	5	5	5	5	5	5	5	5

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
80	TC 35	PM 5	Supr 12	1	5	5	5		5			5		5	
81	TC 36	PM 4	Supr 7	8	3	2			2		3	3		2	**2**
82	TC 36	PM 4	Supr 7	8	2	2	2		2					2	**2**
83	TC 37	PM 7	Supr 14	3	4	4	4	4	4	4	4	4	4	4	4
84	TC 38	PM 7	Supr 16	4	5	4	5	5	4	4				5	
85	TC 39	PM 2	Supr 2	10	3	3	4	3	4	3	3	3	3	3	**3**
86	TC 40	PM 2	Supr 2	8	2	1	3	3	2	2	3	3	2	3	**1.66**
87	TC 41	PM 8	Supr 1	2	5	5	5	5	5	5	5	5	5	5	5
88	TC 42	PM 8	Supr 1	4	2	5	4		4	3	3	3	3	3	**3**
89	TC 43	PM 9	Supr 17	3	4	5	4	3	4	4	2	3	2	3	**3**
90	TC 44	PM 1	Supr 6	7	1	2	2	3	3	2	3	3	3	3	**2**
91	TC 44	PM 1	Supr 6	7	2	3	3	3	4	3	3	3	3	3	**3**
92	TC 45	PM 9	Supr 17	8	4									5	
93	TC 46	PM 2	Supr 2	3	2	2	3	3	3	3	3	3	2	3	**2**
94	TC 47	PM 1	Supr 6	8	1	3	3		2		2	3	4	4	**2.33**
95	TC 47	PM 1	Supr 6	8	2	3	3		2		2	3	4	4	**2.66**
96	TC 47	PM 5	Supr 10	5	4	4	3				4	3		4	**3**
97	TC 47	PM 7	Supr 6	5	3	3	3	3	3	3	3	3	3	3	3
98	TC 47	PM 7	Supr 16	8	3	3	3	5	3	5				3	
99	TC 48	PM 7	Supr 5	3	4	4	5	4	4	4	4	3	4	4	**4**
100	TC 48	PM 7	Supr 5	3	5	4	5	5	5	5		3			**4.33**
101	TC 49	PM 1	Supr 6	11	3	2	2	3	3	3	4	3	3	4	**3**
102	TC 49	PM 1	Supr 6	11	3	3	3	3	4	3	4	3	3	4	**3**
103	TC 50	PM 7	Supr 14	10	4	4	4	4	4	4	4	4	4	4	4
104	TC 51	PM 5	Supr 12	1	5	5	5		5		4			5	
105	TC 52	PM 4	Supr 7	5	4	4			4		4		4	4	**4**
106	TC 52	PM 5	Supr 12	3	5	5	5	5	5	5	5	5	5	5	
107	TC 52	PM 7	Supr 14	3	4	4	4	4	4	4	4	4	4	4	4
108	TC 52	PM 7	Supr 16	5	4	5	5	5	5	5				5	
109	TC 52	PM 9	Supr 15	5	5	5	5							5	**5**
110	TC 52	PM 9	Supr 15	5		4			4		4	4	4	4	**4**
111	TC 53	PM 7	Supr 16	2	2	3	3	3	2	3				2	
112	TC 54	PM 5	Supr 10	5	1	2	2	3	3	3				3	**2**
113	TC 55	PM 6	Supr 13	7	4	4	4	3	3	4				4	**3.66**
114	TC 56		Supr 8	8	2	2	2	2	4	5	5	5	3	3	**3**
115	TC 57	PM 4	Supr 7	5	4	5	4	5	5	4	4	5	5	5	**4.66**
116	TC 57	PM 4	Supr 7	5	4	5	4	5	5	4	4	5	5	5	**4.66**
117	TC 57	PM 4	Supr 7	5	4	4	3	3	4	3	4		4	4	**4**
118	TC 57	PM 6	Supr 7	5	4	4	4	4	4		4		3	4	**4**
119	TC 57	PM 7	Supr 5	5	5	5	4	4	4	4	4	4	4	4	**4**
120	TC 58	PM 8	Supr 1	9	1	1	1	1	1	1	1	1	1	1	1

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
121	TC 59	PM 2	Supr 2	13	4	4	3	3	3	3	3	3	3	3	**3**
122	TC 60	PM 7	Supr 14	9	4	4	4	4	4	4	4	4	4	4	4
123	TC 61	PM 5	Supr 10	2	4	5	4	3	4	4	5	5	3	5	**5**
124	TC 61	PM 7	Supr 5	2	3	4	4	3	4	4	4	4	4	4	**4**
125	TC 61	PM 7	Supr 5	2	4	4	4	2		2					**3**
126	TC 61	PM 7	Supr 5	2	4	4	4	3	4	3	4	4	4	4	**4**
127	TC 61	PM 7	Supr 5	2	3	3	3	3	3	3	3	3	3	3	3
128	TC 61	PM 9	Supr 15	2	5	4	4	4	4	3	3	3	3	4	**4**
129	TC 61	PM 9	Supr 15	2	5	5	5	3	4	5				5	**5**
130	TC 62	PM 7	Supr 14	9	4	4	4	4	3	4	4	4	4	4	**4**
131	TC 63	PM 1	Supr 6	5	3	3	3	3	4	3	3				**3**
132	TC 63	PM 1	Supr 6	5	3	4	4	4	4	3	3				**3**
133	TC 64	PM 2	Supr 2	16	4	4	4	4	4	4	4	4	4	4	4
134	TC 64	PM 9	Supr 11	16	4	5	3	4	5	4	2	2	2	3	**3.66**
135	TC 64	PM 9	Supr 11	16	5	5	5	5	5	4				5	**5**
136	TC 65	PM 7	Supr 14	2	5	4	4	4	4	4	4	4	4	4	**4**
137	TC 66	PM 3	Supr 9	7	4	4	4	3	3	3	3	4	4	4	**3.5**
138	TC 66		Supr 9	7	4	4	3	3	3	4				4	**3.5**
139	TC 67	PM 9	Supr 17	9	4	5				4	4	4	4	5	**4**
140	TC 68	PM 1	Supr 6	10	2	2	2	2	2	1	4	3	4	3	**2**
141	TC 68	PM 1	Supr 6	10	2	3	3	3	4	3	4	3	4	4	**3**
142	TC 68	PM 5	Supr 12	10	4	4	4	4	4	4	4	4	4	4	4
143	TC 68	PM 6	Supr 7	10	3	3	3	3	3	3	3	3	3	3	3
144	TC 68	PM 6	Supr 13	10	4	4	4	3	4	3				4	**3.66**
145	TC 68	PM 8	Supr 1	10	4	4	4	4	4	4	4	4	4	4	4
146	TC 68	PM 9	Supr 15	10	4	3	4	4	4	4				4	**4**
147	TC 68	PM 9	Supr 15	10	4		4		4	4	4	4	4	4	4
148	TC 68		Supr 8	10	5	5	5	5	5	5	5	5	5	5	5
149	TC 69	PM 7	Supr 5	8	4	4	4	4	4	4	4	4	4	4	4
150	TC 69	PM 9	Supr 11	11	3	3	3	3	4	3	4	4	4	2	**3**
151	TC 69	PM 9	Supr 11	11	3	3	3	3	3	3				4	**3**
152	TC 70	PM 2	Supr 2	15	3	4	3	4	3	3	3	3	3	3	**3**
153	TC 70	PM 4	Supr 7	15	4	4	4	4	4	3	4	3	3	4	**3.66**
154	TC 70	PM 4	Supr 7	15	3	3	3	3	3	3			3		**3**
155	TC 70	PM 5	Supr 10	15	3	3	4		4	4	5	5	5	3	**4**
156	TC 70	PM 7	Supr 5	15	3	4	3	4	4	4	3	3	3	3	**3**
157	TC 70	PM 7	Supr 5	15	3	3	3	4	4	1				2	**1.66**
158	TC 70	PM 7	Supr 5	15	2	2	2	4	3	1	1	1	1	1	**1.5**
159	TC 70	PM 7	Supr 5	15	3	3	4	4	4	4	3	3	3	3	**3**
160	TC 70	PM 7	Supr 14	15	4	4	4	4	4	4	4	4	4	4	4
161	TC 71	PM 9	Supr 11	5	3	3	4	4	3	4	4	4	4	4	**3.66**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
162	TC 71	PM 9	Supr 11	5	3	4	4	3	3	3				4	**3.33**
163	TC 72	PM 4	Supr 7	3	4	4	3	3	4	4	5	5		4	**4**
164	TC 72	PM 4	Supr 7	3	3	3	3	3	3	3			3	3	**3**
165	TC 72	PM 5	Supr 10	3		5			5		5	5		5	**5**
166	TC 72	PM 8	Supr 1	3	4	4	4		4	4	4	4	4	4	**4**
167	TC 73	PM 6	Supr 13	2	3	4	4	3	3	3				3	**3**
168	TC 74	PM 6	Supr 7	10	4	4	3	3	3	3	4		4	4	**3**
169	TC 75	PM 5	Supr 12	7	4	5	4		3						
170	TC 75		Supr 8	7	4	4	5	5	5	4	4	5	4	2	**4**
171	TC 76	PM 3	Supr 9	1	4	5	5		5		3	4	4	4	**4**
172	TC 76		Supr 9	3	5	5	5	5	5						
173	TC 77	PM 9	Supr 17	3	5	5	5	5	5	5	5	5	5	5	**5**
174	TC 78	PM 2	Supr 2	10	4	4	4	3	4	3	3	3	3	3	**3.66**
175	TC 78	PM 6	Supr 13	10	4	4	4		3	4				4	**3.66**
176	TC 78	PM 7	Supr 14	10	2	3	3	4	3	3	3	3	3	3	**3**
177	TC 79	PM 4	Supr 7	11	4	5	4		5			5	4	5	**4.66**
178	TC 79	PM 4	Supr 7	11	4									4	**4**
179	TC 80	PM 2	Supr 2	10	3	3	3	3	3	3	3	3	3	3	**3**
180	TC 81	PM 2	Supr 2	1											**3**
181	TC 81	PM 4	Supr 7	1	4	4	4	4	4		3	2	2	2	**2.66**
182	TC 81	PM 4	Supr 7	1	4	4	4	4	4		2			3	**3.66**
183	TC 82	PM 6	Supr 13	2	4	4	3	3	4	4				4	**3.66**
184	TC 82	PM 9	Supr 10	2	3	3	4	4	4	4				3	**3.66**
185	TC 82	PM 9	Supr 10	2	2	3	3	2	3	3	3	3	3	2	**2.66**
186	TC 83	PM 7	Supr 5	13	4	4	4	4	4	4	4	4	4	4	**4**
187	TC 84	PM 2	Supr 2	3	3	3	3	3	3	3	3	3	3	3	**3**
188	TC 85	PM 7	Supr 16	1	5	5	5	5	5	5				5	
189	TC 86	PM 7	Supr 6	1	3	2	2	3	3	3	3	3	3	3	**3**
190	TC 87	PM 2	Supr 2	8											**3**
191	TC 87	PM 4	Supr 7	8	3	3	3	3	3	3			3	3	**3**
192	TC 87	PM 4	Supr 7	8	4	4	4		4		4	4	4	5	**4**
193	TC 87	PM 5	Supr 10	8	4	4	4		5	5	5	5		5	**4.5**
194	TC 87	PM 6	Supr 13	8	4	4	4	3	4	4				4	**4**
195	TC 87	PM 9	Supr 15	8	2	3	2	3	3	2	2	3	2	2	**2**
196	TC 87	PM 9	Supr 15	8	4	4	4	4						4	**4**
197	TC 88	PM 9	Supr 15	3	4	4	3	4	4	3	3	4	4	2	**2.66**
198	TC 88	PM 9	Supr 15	3	5	5	5	5	4	5				5	**5**
199	TC 89	PM 9	Supr 15	6	2	2	2	2	2	3	2	3	2	1	**2**
200	TC 89	PM 9	Supr 15	6	4	4	4	4	4	4					**4**
201	TC 90	PM 5	Supr 12	1	4	5	4		5					5	
202	TC 91	PM 9	Supr 11	7	4	4	4	4	4	4	4	4	4	4	**4**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
203	TC 91	PM 9	Supr 11	7	5	4	4	4	4	4				5	**4**
204	TC 91	PM 9	Supr 15	7	4	4	4	3	3	3					**3.5**
205	TC 91	PM 9	Supr 15	7	4	4	4	4	4	4	4	4	4	4	4
206	TC 92	PM 9	Supr 17	10	4	4			4		4	4	4	4	**4**
207	TC 93	PM 9	Supr 11	6	3	4	3	3	3	4				4	**3.33**
208	TC 93	PM 9	Supr 11	6	2	3	3	3	3	3	2	3	3	4	**3**
209	TC 94	PM 7	Supr 5	11	4	4	4	4	4	4	4	4	4	4	**4**
210	TC 95	PM 5	Supr 12	1	2	5	3					3			
211	TC 96	PM 7	Supr 16	8	3	4	3	4	2	3				3	
212	TC 97	PM 7	Supr 14	6	4	4	4	4	4	4	4	4	4	4	**4**
213	TC 98	PM 3	Supr 9	9	4	4	4	3	4	4	4	4	4	4	**4**
214	TC 98	PM 6	Supr 13	9	5	5	4	3	4	4				4	**4.33**
215	TC 98		Supr 9	9	4	3	3	3	4	4	4	4	4	4	**3.5**
216	TC 99	PM 4	Supr 7	4	3	3	3	3	3	3			3	4	**3**
217	TC 99	PM 4	Supr 7	4	5	5	5	5	5			5		5	**5**
218	TC 99	PM 4	Supr 7	4	5	5	5	5	5	5	5	5	5	5	5
219	TC 99	PM 4	Supr 7	4	4	4	3	3	3	3			3	4	**3.33**
220	TC 99	PM 5	Supr 12	4	5	5	5	5	5	5	5	5	5	5	**5**
221	TC 99	PM 6	Supr 13	4	4	4	4	4	5	4				4	**4**
222	TC 99	PM 7	Supr 5	4	4	4	4	4	4	4	4	4	4	4	**4**
223	TC 99	PM 7	Supr 5	4	4	4	4	3	4	2				4	**4**
224	TC 100	PM 9	Supr 11	9	3	3	3	3	3	3	2	3	3	2	**3**
225	TC 100	PM 9	Supr 11	9	5	5	5	4	5	5				5	**5**
226	TC 101	PM 7	Supr 6	7	3	3	3	3	3	3	3	3	3	3	3
227	TC 102	PM 4	Supr 7	7	3	3	3	3		3	3		3	3	**3**
228	TC 102	PM 4	Supr 7	7	4	4	5	4	4	5	5	5	4	5	**4.66**
229	TC 102	PM 5	Supr 12	7	5	4	3						4		
230	TC 102	PM 6	Supr 7	9	4	4	4	4	4	3	4		5	5	**4**
231	TC 102	PM 6	Supr 13	7	5	5	5	2	4	4				4	**4**
232	TC 102	PM 8	Supr 1	7	4	5	5		4	4	5	5	5	5	**4.33**
233	TC 103	PM 2	Supr 2	13	3	4	4	3	3	3	3	3	3	3	**3**
234	TC 104	PM 5	Supr 10	9	4	4	4		5	5	5	4		4	
235	TC 104	PM 7	Supr 5	9	4	4	4	3	4	4	4	4	4	4	**4**
236	TC 104	PM 7	Supr 5	9	3	3	3	2	3	2				3	**3**
237	TC 104	PM 7	Supr 14	9	4	4	4	4	4	4	4	4	4	4	**4**
238	TC 104	PM 9	Supr 15	9	4	4	4	4	4	3	3	4	4	4	**4**
239	TC 104	PM 9	Supr 15	9	5	5	5	5	5	5				5	**5**
240	TC 105	PM 5	Supr 10	2	4	4	3		4	4	5	5	4	5	
241	TC 105	PM 9	Supr 10	2	5	5	5	5	5	5	5	5	5	5	5
242	TC 105	PM 9	Supr 10	2	5	5			4	4		5	4	5	**4.66**
243	TC 106	PM 1	Supr 6	10	1	1	1		3	3	1	3	2	1	**1.66**

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244	TC 106	PM 1	Supr 6	10	1	2	2		3	3	1	3	2	1	**2**
245	TC 106	PM 3	Supr 9	10	2	4	3	3	2	4	1	3	2	1	**2**
246	TC 106		Supr 9	10	2	3	2	2	2	3	3	3	3	3	**2.5**
247	TC 107	PM 7	Supr 14	10	3	3	3	3	3	3	3	3	3	3	3
248	TC 108	PM 9	Supr 17	15	4	4	4	3	4	4	4	4	4	5	**4.33**
249	TC 109		Supr 8	9	3	2	2	3	3	2	3	5	2	1	**2**
250	TC 110	PM 9	Supr 11	8	4	4	4	3	4	3				4	**4**
251	TC 110	PM 9	Supr 11	8	4	4	4	4	4	4	4	4	4	4	4
252	TC 111	PM 7	Supr 16	3	2	5	4	5	4	2				2	
253	TC 112	PM 7	Supr 14	10	3	3	3	3	3	3	3	3	3	3	3
254	TC 113	PM 4	Supr 7	7	3	3	3	4	4	4	3		3	3	**3.33**
255	TC 113	PM 4	Supr 7	7	3	4	3		4	4		4		4	**4**
256	TC 114	PM 9	Supr 17	2	4	4	4		3		3	4	3	3	**3.66**
257	TC 115	PM 5	Supr 10	1	5	5	5		5					5	
258	TC 116	PM 5	Supr 12	7	3	4	4	4	4	4	4	4	4	4	
259	TC 117	PM 6	Supr 7	3	2	2	2	2	2	2	2		2	2	**2**
260	TC 118	PM 7	Supr 5	11	4	4	4	4	4	4	4	4	4	4	**4**
261	TC 119	PM 3	Supr 9	12	4	4	3	3	3	3	3	4		3	**3**
262	TC 120	PM 7	Supr 5	6	3	4	4	4	4	4	4	4	4	4	**4**
263	TC 121	PM 3	Supr 9	13	5	5	4	4	5	4	5	5	5	5	**5**
264	TC 121	PM 4	Supr 7	13	4	4	3	4		3				3	**3.66**
265	TC 121	PM 4	Supr 7	13	4	4	4	4	4	4	5	5	4	4	**4**
266	TC 121	PM 4	Supr 7	13	2	3	3	3	3	3	2		2	2	**2.66**
267	TC 121	PM 4	Supr 7	13	3	4	3	4	5	4	5	4	3	5	**4**
268	TC 121	PM 5	Supr 12	13	5	5	5		5	4	5	5	5	5	
269	TC 121	PM 7	Supr 14	13	4	4	4	4	4	4	4	4	4	4	**4**
270	TC 121	PM 9	Supr 11	13	4	5	5	4	5	4				5	**4.33**
271	TC 121	PM 9	Supr 11	13	4	4	4	4	4	4	4	4	5	5	**4.33**
272	TC 121		Supr 8	13	5	5	5	5	5	5	5	5	5	5	5
273	TC 121		Supr 9	13	4	4	4	4	4	4	4	4	4	4	4
274	TC 122	PM 9	Supr 15	13	4	4	4	4	4	3	3	4	3	4	**4**
275	TC 122	PM 9	Supr 15	13	5	5	5	5	5	5				5	**5**
276	TC 123	PM 6	Supr 7	13	4	4	4	4	4	4	4		4	4	**4**
277	TC 123	PM 7	Supr 7	13	4	4	4	4	4	4	4	4	4	4	**4**
278	TC 124	PM 8	Supr 1	11	3	4	4		4	4		5	4	4	**4**
279	TC 125	PM 7	Supr 5	9	4	4	4	4	4	4	4	4	4	4	4
280	TC 125	PM 8	Supr 1	9	3	4	4		4	4	5	5	4	3	**3.66**
281	TC 126	PM 3	Supr 9	6	3	5	4	3	4	3	3	3	4	3	**4**
282	TC 126		Supr 9	6	2	3	3	3	3	3	3	3	4	3	**3**
283	TC 127	PM 7	Supr 5	11	5	5	5		5				5	5	**5**
284	TC 128	PM 7	Supr 16	5	4	4	3	4	4	4				4	

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
285	TC 129	PM 2	Supr 2	9	4	4	4	4	4	4	4	4	4	4	4
286	TC 130	PM 7	Supr 7	2	4	4	4	4	4	4	4	4	4	4	4
287	TC 131	PM 8	Supr 1	8	2	3	3		2	3	3	4	3	3	**2.66**
288	TC 132	PM 7	Supr 7	5	3	4	3	4	4	4	4	4	4	4	**4**
289	TC 133	PM 6	Supr 13	16	3	3	3	3	4	3				4	**3.33**
290	TC 134	PM 4	Supr 7	11	4	5			5		4	4		4	**4**
291	TC 134	PM 4	Supr 7	11	4									4	**4**
292	TC 134	PM 9	Supr 17	7	3	3	2		2		2	4		4	**2.66**
293	TC 135	PM 5	Supr 12	2	4	5	4	4	4	4	4	4	4	4	**4**
294	TC 136	PM 6	Supr 7	10	3	4	3	3	3	3	3		3	3	**3**
295	TC 137	PM 6	Supr 7	5	3	3	3	3	3	3	3		3	3	**3**
296	TC 137	PM 9	Supr 10	5	4	3	3	3	3	3	3	3	3	4	**4**
297	TC 137	PM 9	Supr 10	5	4	3			2		3	4	4	4	**3.66**
298	TC 138		Supr 8	9	3	2	2	3	5	4	4	5	2	1	**1**
299	TC 139	PM 7	Supr 5	5	2	2	2	3	3	3	3	3	3	3	**2**
300	TC 139	PM 7	Supr 6	5	3	2	3	3	3	3	3	3	3	3	**3**
301	TC 140	PM 5	Supr 12	2	5	5	5	5	5	5	5	5		5	**5**
302	TC 140	PM 6	Supr 7	2	4	4	4	4	4	4	4		4	4	**4**
303	TC 140	PM 7	Supr 6	2	3	3	3	3	3	3	3	3	3	3	3
304	TC 140	PM 9	Supr 15	2	3	4	4	4	4	3	3	4	4	4	**4**
305	TC 140	PM 9	Supr 15	2	5	5	5	5	5	5				5	**5**
306	TC 141	PM 1	Supr 6	5	1	3	3	3	2	1	2	2	3	1	**1.66**
307	TC 141	PM 1	Supr 6	5	1	4	3	3	3	1	2	2	3	3	**2**
308	TC 141		Supr 3	5	5	5	5	5	5	5	5	5	5	5	5
309	TC 142	PM 3	Supr 9	2	4	4	4	4	3	3	4	4	4	3	**4**
310	TC 142		Supr 9	2	4	3	4	4	3	3	3	3	3	3	**3.5**
311	TC 143	PM 2	Supr 2	1	3	3	3	3	3	3	3	3	3	3	3
312	TC 144	PM 7	Supr 5	3	4	4	4	4	4	4	4	4	4	4	4
313	TC 145	PM 3	Supr 9	5	5	5					4	4		5	**5**
314	TC 145		Supr 9	4	4	5	5	3	4		4	4		5	**4.5**
315	TC 146	PM 5	Supr 10	13	4	3	2		5	4	4	4	3	2	
316	TC 146	PM 7	Supr 5	13	4	4	4	4	5	4	5	5	4	4	**4**
317	TC 146	PM 7	Supr 5	13	5	5	3	3	5	1				1	**4.66**
318	TC 146	PM 7	Supr 5	13	4	4	2	1	3	1				1	**2.5**
319	TC 146	PM 7	Supr 5	13	4	4	5	4	5	4	5	5	5	5	**5**
320	TC 147	PM 1	Supr 6	9	2	2	1	3	1	2	3	3	3	1	**1.33**
321	TC 147	PM 1	Supr 6	9	4	4	2	3	4	3	3	3	3	2	**2.66**
322	TC 148	PM 5	Supr 12	1	3	5	4		5					5	
323	TC 149	PM 7	Supr 14	3	4	4	4	4	4	4	4	4	4	4	**4**
324	TC 149	PM 9	Supr 17	3	5	5	5	3	4	4	5	5	5	4	**4.66**
325	TC 150	PM 2	Supr 2	2	3	3	3	3	3	3	3	3	3	3	**3**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
326	TC 151	PM 2	Supr 2	9	4	3	3	3	3	3	3	3	3	3	**3**
327	TC 151	PM 5	Supr 10	9	5	5	5	4	5	4	4	4		5	
328	TC 151	PM 5	Supr 12	9	5	5	5	5	5	5	5	5	5	5	**5**
329	TC 151	PM 6	Supr 7	9	4	4	4	4	4	4	4		5	5	**4**
330	TC 151	PM 7	Supr 5	9	4	4	4	4	4	4	4	4	4	4	**4**
331	TC 151	PM 7	Supr 5	9	4	4	5	4	4	4				4	**4.5**
332	TC 151	PM 7	Supr 5	9	4	4	4	4	3	3	4	4		3	**4**
333	TC 151	PM 7	Supr 5	9	4	4	5	5	5	4	5	5	5	5	**5**
334	TC 151	PM 9	Supr 10	9	5	5	4	3	4	4	4	4	4	5	**4.33**
335	TC 151	PM 9	Supr 10	9	5	5	5	4	5	5	5	5	5	5	**5**
336	TC 151	PM 9	Supr 15	9	5	5	5	5	5	4	5	5	5	5	**5**
337	TC 151	PM 9	Supr 15	9	5	5	5	5	5	5				5	**5**
338	TC 152	PM 8	Supr 1	10	5		5		5			5	5	3	**4**
339	TC 153	PM 6	Supr 7	9	3	3	2	2	2	3	1		3	2	
340	TC 154	PM 2	Supr 2	2	2	2	3	3	3	3	3	3	3	3	**2.66**
341	TC 155	PM 5	Supr 12	15	4	5	3	3	5	4				3	
342	TC 156	PM 1	Supr 6	2	3	4	4	4	5		4	4	4	5	**4**
343	TC 157	PM 9	Supr 11	15	4	5	4	5	5	4	5	5	5	5	**4.66**
344	TC 157	PM 9	Supr 11	15	4	5	5	4	5	4				5	**5**
345	TC 158	PM 4	Supr 7	11	4	4	3	3	3	3	4		4	4	**4**
346	TC 158	PM 4	Supr 7	11	5	5	5	5	5	5	5	5	5	5	**5**
347	TC 159	PM 7	Supr 6	11	3	3	3	3	3	3	3	3	3	3	**3**
348	TC 160	PM 4	Supr 7	7	4	4	4	4	4		3	3	4	3	**4**
349	TC 160	PM 4	Supr 7	7	3	4	3	3	3	3			3	4	**3.33**
350	TC 160	PM 4	Supr 7	7	2	3	3	3	3	3	2		2	2	**2.66**
351	TC 160	PM 4	Supr 7	7	3	4	3	3	3	3	3	3	3	3	**3**
352	TC 160	PM 7	Supr 7	7	2	3	2	3	3	3	2	2	2	2	**2**
353	TC 161	PM 2	Supr 2	8	2	3	3	3	3	3	3	3	3	3	**3**
354	TC 161		Supr 3	8	5	4	5	5	5	5	5	5	5	4	**5**
355	TC 162	PM 5	Supr 12	10	3	3	3	3	3	3	3	3	3	3	**3**
356	TC 163	PM 9	Supr 15	6	3	4	3	3	4	2	3	3	4	3	**3.33**
357	TC 163	PM 9	Supr 15	6	3	5	3	4	4	4				3	**3.5**
358	TC 164	PM 7	Supr 14	10	4	4	4	4	4	4	4	4	4	4	**4**
359	TC 165		Supr 3	4	5	4	5	3	5	5	5	5	5	5	**5**
360	TC 166	PM 7	Supr 6	16	3	3	3	3	3	3	3	3	3	3	**3**
361	TC 167	PM 7	Supr 14	3	5	5	5	5	5	4	4	4	5	5	**5**
362	TC 168	PM 7	Supr 14	4	4	4	4	4	4	4	4	4	4	4	**4**
363	TC 169	PM 2	Supr 2	15	3	3	2	3	3	3	3	3	3	3	**3**
364	TC 169	PM 7	Supr 14	15	3	4	3	4	4	3	4	4	4	3	**3.66**
365	TC 170	PM 4	Supr 7	13	5				5			4	4	5	**4.66**
366	TC 170	PM 4	Supr 7	13	4									4	**4**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
367	TC 171	PM 9	Supr 11	7	4	4	3	4	4	4	5	5	5	5	**4.33**
368	TC 171	PM 9	Supr 11	7	5	4	4	3		4				5	**4**
369	TC 172	PM 7	Supr 6	2	3	3	3	3	3	3	3	3	3	3	**3**
370	TC 173	PM 2	Supr 2	6											**3**
371	TC 173	PM 5	Supr 10	`6	5	5	5		5	5	5	5		5	**5**
372	TC 173	PM 5	Supr 12	6	5	5	5	5	5	5	5	5	5	5	**5**
373	TC 173	PM 7	Supr 5	6	5	5	4	4	4	4	5	5	4	4	**4**
374	TC 173	PM 7	Supr 6	6	4	4	4	4	4	4	4	4	4	4	**4**
375	TC 173	PM 9	Supr 10	6	5	5	4		5	5	5	5	5	5	**5**
376	TC 173	PM 9	Supr 10	6	5	5	5	5	5	5	5	5	5	5	**5**
377	TC 173		Supr 3	6	5	5	5	5	5	5	5	5	5	5	**5**
378	TC 174	PM 7	Supr 14	2	5	5	5	4	4	4	4	4	4	4	**5**
379	TC 175	PM 3	Supr 9	15	4	4	3	4	4	3	3	4	4	4	**4**
380	TC 175		Supr 9	15	4	4	4	4	4	4	4	4	4	4	**4**
381	TC 176	PM 4	Supr 7	2	3	3	3	3	3	3	3		3	4	**3**
382	TC 176	PM 4	Supr 7	2	4	4	4	4	4	4	4	3		4	**4**
383	TC 176	PM 4	Supr 7	2	4	4	4	4	4	4	4	4	4	4	4
384	TC 176	PM 4	Supr 7	2	3	4	3	3	3	3	4			4	**3.33**
385	TC 176	PM 5	Supr 10	2	5	5	3		5	4	4	4		5	
386	TC 176	PM 7	Supr 5	2	4	5	4	4	5	4	4	4	4	4	**4**
387	TC 176	PM 7	Supr 5	2	5	5	5	3	5	3				5	**5**
388	TC 177	PM 7	Supr 16	8	5	4	4	4	4	4				5	
389	TC 178	PM 7	Supr 14	1	4	4	4	4	4	4	4	4	4	4	**4**
390	TC 179	PM 7	Supr 7	15	2	3	2	3	3	3	3	3	3	3	**2**
391	TC 180	PM 7	Supr 14	2	4	4	4	4	4	4	4	4	4	4	**4**
392	TC 181	PM 4	Supr 7	7	3	3	3	3	3	3				3	**3**
393	TC 181	PM 4	Supr 7	7	4	4	4	4	4	3		4		4	**4**
394	TC 182	PM 7	Supr 16	9	4	4	4	5	5	4				5	
395	TC 183	PM 8	Supr 1	5	2	3	3		2		2	2	2	2	**2**
396	TC 184	PM 4	Supr 7	3	5	5	5	5	5	4	4	4	4	5	**4.66**
397	TC 184	PM 4	Supr 7	3	5	5	4	4	4	3			4	4	**4.33**
398	TC 184	PM 7	Supr 5	3	4	4	3	4	4	3	4	4	4	4	**4**
399	TC 184	PM 7	Supr 5	3	4	5	2	2	4	3				5	**4.5**
400	TC 184	PM 7	Supr 16	3	5	5	5	5	5	5				5	**5**
401	TC 185	PM 6	Supr 7	2	4	4	3	3	3	3	4		4	3	**3**
402	TC 186	PM 3	Supr 9	7	3	4	2	3	3	3	2	4	4	3	**3**
403	TC 186		Supr 9	7	3	4	4	4	4	3	4	4	3	4	**4**
404	TC 187	PM 9	Supr 15	11	4		3		3	2	3	3	3	3	**3**
405	TC 187	PM 9	Supr 15	11	5	5	5	5	5	5				5	**5**
406	TC 188		Supr 3	3	5	5	5	5	5	5	5	5	5	5	**5**
407	TC 189	PM 7	Supr 5	2	4	4	4	4	4	4	4	4	4	4	**4**

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408	TC 189	PM 7	Supr 5	2	4	4	4	2	5	4				5	**4**
409	TC 189	PM 7	Supr 5	2	5	4	4	3	4	4	3	3	3	4	**4**
410	TC 189	PM 7	Supr 5	2	4	4	4	4	4	4	3	3	4	4	**4**
411	TC 190	PM 9	Supr 11	9	3	3	3	3	3	2	2	2	3	3	**2.66**
412	TC 190	PM 9	Supr 11	9	3	3	3	3	3	3				3	**3**
413	TC 191	PM 7	Supr 5	15	4	4	4	4	5	4	5	5	4	4	**4**
414	TC 191	PM 7	Supr 5	15	5	5	2	2	5	2				3	**4**
415	TC 192	PM 2	Supr 2	10	3	3	3	3	3	3	3	3	3	3	**3**
416	TC 192	PM 7	Supr 14	10	3	4	3	4	3	4	4	4	4	4	**3.66**
417	TC 193	PM 4	Supr 7	15	2	4	4	4	5	3	4	4	4	4	**3**
418	TC 193	PM 4	Supr 7	15	3	4	3	4	4	3	3			3	**3.33**
419	TC 194		Supr 3	10	5	5	5	5	5	5	5	5	5	5	**5**
420	TC 195	PM 6	Supr 7	6	4	4	4	4	4	4	4		4	4	**4**
421	TC 196	PM 5	Supr 12	2	5	5	4		5	4	4	5		5	
422	TC 196	PM 8	Supr 1	2	4	5	5		5	4	4	5	5	5	**4.66**
423	TC 197	PM 5	Supr 12	11	3	3	3		5	3				3	
424	TC 198	PM 7	Supr 16	16	1	4	3	5		4					
425	TC 199	PM 4	Supr 7	6	3	3	3	3	3	3			3	3	**3**
426	TC 199	PM 4	Supr 7	6	4	4	4	4	4			4		4	**4**
427	TC 200	PM 7	Supr 7	2	4	4	4	4	4	4	4	4	4	4	**4**
428	TC 201	PM 7	Supr 7	2	4	4	4	4	4	4	4	4	4	4	**4**
429	TC 202	PM 1	Supr 6	8	2	3	4	3	4	3	2	3	3	2	**3**
430	TC 202	PM 1	Supr 6	8	4	4	5	4	5	3	2	3	3	4	**4**
431	TC 202	PM 7	Supr 5	8	3	4	3	4	4	4	4	4	4	4	**4**
432	TC 203	PM 2	Supr 2	7											**3**
433	TC 203	PM 4	Supr 7	7	4	5			5		5	5		5	**5**
434	TC 203	PM 4	Supr 7	7	4				3					4	**4**
435	TC 204	PM 6	Supr 7	5	5	4	4	5	5	4	3		4	4	**5**
436	TC 205	PM 7	Supr 7	16	4	5	5	5	5	5	5	5	5	5	**5**
437	TC 206	PM 4	Supr 7	16	4	4	4	4	4	3	4		4	4	**4**
438	TC 206	PM 4	Supr 7	16	5	5	5	5	5	5	5	5	5	5	**5**
439	TC 206	PM 4	Supr 7	16	4	4	4	4	4	3	4		4	4	**4**
440	TC 206	PM 4	Supr 7	16	5	5	5	5	5	5	5	5	5	5	**5**
441	TC 207	PM 8	Supr 1	15	5	5	5	5	5	5	5	5	5	5	**5**
442	TC 207	PM 9	Supr 15	15	4	3	4	4	4	3	3	3	4	4	**4**
443	TC 207	PM 9	Supr 15	15	4	4	4	4	4	4				5	**4**
444	TC 208	PM 7	Supr 6	13	3	3	3	3	3	3	3	3	3	3	**3**
445	TC 209	PM 7	Supr 16	3	5	5	5	5	5	4				5	
446	TC 210	PM 5	Supr 10	5	4	4	4		5		5	5	5	5	
447	TC 210	PM 5	Supr 12	5	5	5	4		4			4		5	
448	TC 211	PM 8	Supr 1	11					4		3	4	3	3	**3**

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449	TC 212	PM 3	Supr 9	9	1	1	1	2	2	1	1	2		1	**1**
450	TC 212	PM 6	Supr 13	9	2	3	2	1	2	2				3	**2**
451	TC 212		Supr 9	9	1	1	2	1	2	2	1	2	1	1	**1**
452	TC 213	PM 7	Supr 14	10	4	4	4	4	4	4	4	4	4	4	**4**
453	TC 214	PM 4	Supr 7	2	5	5	5	5	5	5	5	5	5	5	**5**
454	TC 214	PM 4	Supr 7	2	4	4	3	3	4	3	4		4	5	**4.33**
455	TC 214	PM 7	Supr 7	2	4	4	4	4	4	4	4	4	4	4	**4**
456	TC 215	PM 7	Supr 16	6	5	5	4	4	5	4				4	
457	TC 216	PM 2	Supr 2	2	4	3	3	3	3	3	3	3	3	3	**3**
458	TC 217	PM 8	Supr 1	1		3					2	4		3	**3**
459	TC 218	PM 6	Supr 13	15	3	3	3	3	3	1				3	**2.66**
460	TC 219	PM 7	Supr 5	13	4	4	4	4	4	4	4	4	4	4	**4**
461	TC 219	PM 9	Supr 11	9	4				4		2	3	4	4	**4**
462	TC 219	PM 9	Supr 11	9	4	4			4					4	**4**
463	TC 220	PM 2	Supr 2	5	4	4	3	3	4	4	3	3	4	4	**4**
464	TC 221		Supr 3	8	5	4	5	5	5	5	5	5	5	5	**5**
465	TC 222	PM 4	Supr 7	9	3	4	3	3	3	3	3		3	3	**3**
466	TC 222	PM 4	Supr 7	9	5	5	4		5			4		4	**4.66**
467	TC 223	PM 6	Supr 7	9	4	4	4	3	3	3	4		3	4	**4**
468	TC 223	PM 6	Supr 13	9	4	3	4	3	3	3				4	**3.66**
469	TC 224	PM 2	Supr 2	4	2	2	3	2	2	3	3	3	3	3	**2**
470	TC 225	PM 9	Supr 15	2	5	5	5	4	5	3	5	5	5	5	**5**
471	TC 225	PM 9	Supr 15	2	5	5	5	5	5	5				5	**5**
472	TC 226	PM 6	Supr 7	9	4	4	4	4	3		4		3	5	**4**
473	TC 227	PM 9	Supr 15	7	5	5	4	4	5	4	4	4	4	5	**5**
474	TC 227	PM 9	Supr 15	7	5	5	5	5	5	5				5	**5**
475	TC 228	PM 7	Supr 14	8	4	4	4	4	4	4	4	4	4	4	**4**
476	TC 229	PM 1	Supr 6	14	1	2	3	3	3	3	3	3		1	**2.33**
477	TC 229	PM 1	Supr 6	14	2	3	3	3	4	3	3	3	4	3	**3**
478	TC 230	PM 8	Supr 1	3	2	4	3		3	3	1	1	3	1	**1**
479	TC 231	PM 3	Supr 9	9	4	4	4	3	4	5	4	4	4	4	**4**
480	TC 231	PM 4	Supr 7	4	3	3	3	3	3	3			3	3	**3**
481	TC 231	PM 4	Supr 7	4	3	3	3	3	3	3	3	4		4	**3**
482	TC 231	PM 5	Supr 12	9	5	5	5	5	5	5	5	4	4	5	
483	TC 231	PM 6	Supr 13	9	5	5	5	3	4	4				5	**4.66**
484	TC 231		Supr 9	9	4	4	4	3	3	3	4	3	3	4	
485	TC 232	PM 2	Supr 2	2	3	3	3	3	3	3	3	3	3	3	**3**
486	TC 232	PM 3	Supr 9	2	4	4	4	3	4	4	4	4	4	4	**4**
487	TC 232	PM 5	Supr 12	2	3	3	3	3	3	3	3	3	3	3	
488	TC 232	PM 6	Supr 7	2	3	4	3	4	3	3	3		4	4	**4**
489	TC 232	PM 8	Supr 1	2	1	2	3		1	3	3	3	3	2	**2**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
490	TC 232		Supr 9	2	4	4									**4**
491	TC 233	PM 7	Supr 7	5	3	3	3	3	3	3	3	3	3	3	**3**
492	TC 234	PM 7	Supr 16	10	3	3	2	2	2	3				2	
493	TC 235	PM 7	Supr 6	9	2	2	2	2	1	2	2	3	3	3	**2**
494	TC 236	PM 3	Supr 9	7	5	5	4	4	5	4	5	5	5	5	**5**
495	TC 236		Supr 9	7	4	3	3	3	4	3	4	3	4	5	**4**
496	TC 237		Supr 3	9	5	5	5	5	5	5	5	5	5	5	**5**
497	TC 238	PM 7	Supr 6	8	3	4	4	3	3	3	3	3	3	3	**3**
498	TC 239		Supr 3	10	5	5	5	5	5	5	5	5	4	5	**5**
499	TC 240	PM 8	Supr 1	5	4	5	5		5	4	5	5	5	5	**4.66**
500	TC 241	PM 7	Supr 6	9	3	3	3	3	3	3	3	3	3	3	**3**
501	TC 242	PM 9	Supr 11	2	3	4	4	2	3	3	3	3	3	3	**3**
502	TC 242	PM 9	Supr 11	2	4	4	4	3	3	3				4	**4**
503	TC 243	PM 7	Supr 14	10	4	4	4	4	4	4	4	4	4	4	**4**
504	TC 244	PM 6	Supr 7	15	4	4	4	4	4	4	2		2	4	**4**
505	TC 244	PM 8	Supr 6	15	3	4	3	3	3	3	3	3	3	3	**3**
506	TC 245	PM 7	Supr 6	9	3	3	3	3	3	3	3	3	3	3	**3**
507	TC 245	PM 9	Supr 10	9	4	4	4	4	4	4	4	4	4	4	**4**
508	TC 245	PM 9	Supr 10	9	3	2	3	3	3	3	2	2	2	3	**2.66**
509	TC 246	PM 6	Supr 7	14	3	4	3	4	4	3	3		4	4	**4**
510	TC 246	PM 6	Supr 13	14	5	4	4	4	4	3				4	**3.66**
511	TC 247	PM 6	Supr 9	8	3	3	3	3	3	3	3	3	3	3	**3**
512	TC 248	PM 7	Supr 16	11	5	5	5	5	5					5	**5**
513	TC 249	PM 7	Supr 14	16	5	5	5	4	4	4	4	4	4	5	**5**
514	TC 250	PM 7	Supr 16	7	1	4	1	4	1	2				2	**1**
515	TC 251	PM 1	Supr 6	15	3	3	3	4	4	3	3	4	3	3	**3.33**
516	TC 251	PM 1	Supr 6	15	3	3	4	4	4	3	3	4	3	4	**4**
517	TC 252	PM 9	Supr 17	2	4	4	4		4	5	4	5		5	**4.66**
518	TC 253	PM 3	Supr 9	1	3	3	4	2	3	3	3	3	3	4	**3**
519	TC 253		Supr 9	1	4	3	3	3	2	3	3	4		4	**3.5**
520	TC 254	PM 7	Supr 6	9	3	3	3	3	3	3	3	3	3	3	**3**
521	TC 254	PM 9	Supr 11	9	4	4	3	3	3	3	4	4	4	4	**4**
522	TC 254	PM 9	Supr 11	9	4	4	4	3		4				4	**4**
523	TC 255	PM 4	Supr 7	2	4	3	3	3	3	3	3		3	3	**3**
524	TC 255	PM 4	Supr 7	2	5	4	4	4	4		4	4		4	**4**
525	TC 255	PM 9	Supr 17	2	5	5	5	3	5	5	4	5	5	5	**5**
526	TC 256	PM 7	Supr 5	9	4	4	4	4	4	4	4	4	4	4	**4**
527	TC 256	PM 7	Supr 5	9	4	4	4	4	4	4	4	4	4	4	**4**
528	TC 256	PM 8	Supr 1	9	4	4	4	4	4	4	4	4	4	4	**4**
529	TC 257	PM 7	Supr 6	1	4	3	4	3	3	3	3	3	3	3	**3**
530	TC 258	PM 1	Supr 4	2	1	4	4		3	4		5	2	3	**3**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
531	TC 259	PM 5	Supr 12	8	4	4	4		5	4					
532	TC 259	PM 7	Supr 7	8	5	5	5	5	4	4	4	4	4	5	**5**
533	TC 259	PM 9	Supr 10	8	4	4	4	4	4	4	4	4	4	4	**4.33**
534	TC 259	PM 9	Supr 10	8		4			3		2	3	3	4	**3.33**
535	TC 259	PM 9	Supr 15	8	3	3	4	2	3	3	3	3	3	3	**3**
536	TC 259	PM 9	Supr 15	8	4	4	4	4	4	4				4	**4**
537	TC 260	PM 1	Supr 6	10	2	2	2		3	2	4	4	4	3	**3**
538	TC 260	PM 1	Supr 6	10	3	3	3		4	3	4	4	4	4	**3.66**
539	TC 260	PM 4	Supr 7	10	5	5			5			5		5	**5**
540	TC 260	PM 4	Supr 7	10	4				3					4	**4**
541	TC 260	PM 5	Supr 12	10	4	4	4	4	4	4	4	4	4	4	**4**
542	TC 260	PM 7	Supr 6	10	3	3	3	3	3	3	3	3	3	3	**3**
543	TC 260	PM 9	Supr 11	10	4	4	4	4	4	4	4	4	4	4	**4**
544	TC 260	PM 9	Supr 11	10	5	5	5	3	5	4				5	**5**
545	TC 260	PM 9	Supr 17	10	3				3				3	4	**3**
546	TC 261	PM 5	Supr 10	2	5	5	4	3	5	4	4	4		5	**4.5**
547	TC 261	PM 9	Supr 15	2	4	4	3	3	3	3	2	2	3	2	**3**
548	TC 261	PM 9	Supr 15	2	5	5	5	5	5	5				5	**5**
549	TC 262	PM 1	Supr 6	11	2	3	3	3	3	3	3	3	3	3	**3**
550	TC 262	PM 1	Supr 6	11	2	3	3	3	4	3	3	3	3	3	**3**
551	TC 263	PM 7	Supr 14	1	4	4	4	4	4	4	4	4	4	4	**4**
552	TC 263	PM 9	Supr 17	13	3	5					5	5	5	3	**5**
553	TC 264	PM 7	Supr 16	15	3	4	4	4	1	3				2	
554	TC 265	PM 9	Supr 17	10	4	5	5		5	5	5	5	5	5	**5**
555	TC 266	PM 7	Supr 6	5	4	3	3	3	4	3	3	3	3	3	**3**
556	TC 267	PM 7	Supr 14	10	4	4	4	4	4	4	4	4	4	4	**4**
557	TC 268	PM 7	Supr 6	1	3	3	3	3	3	3	3	3	3	3	**3**
558	TC 269	PM 7	Supr 5	10	4	4	4	4	4	4	4	4	4	4	**4**
559	TC 269	PM 9	Supr 11	10	4	4	4	3		4				4	**4**
560	TC 269	PM 9	Supr 11	10	4	4	4	4	4	4	4	4	4	4	**4**
561	TC 270	PM 9	Supr 17	9	4	5	4		4	4		5	4	5	**4.33**
562	TC 271	PM 2	Supr 2	3	3	3	3	3	3	3	3	3	3	3	**3**
563	TC 272	PM 2	Supr 2	7	3	3	3	3	3	3	3	3	3	3	**3**
564	TC 272	PM 4	Supr 7	7	5	4	4	4	5	4	3	4	4	4	**4**
565	TC 272	PM 4	Supr 7	7	4	4	3	3	3	3	4			4	**3.33**
566	TC 272	PM 5	Supr 10	7	4	3	2		3		4	4		3	
567	TC 272	PM 6	Supr 13	7	4	4	4	4	4	4				4	**4**
568	TC 272	PM 7	Supr 5	7	4	4	4	4	4	4	4	4	4	4	**4**
569	TC 272	PM 7	Supr 5	7	4	4	4	3	4	1				3	**4**
570	TC 272	PM 7	Supr 7	7	4	5	5	4	5	4	4	4	3	5	**4.66**
571	TC 272	PM 7	Supr 14	7	4	4	4	4	4	4	4	4	4	4	**4**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
572	TC 272	PM 8	Supr 1	7	5	5	5	5	5	5	5	5	5	5	**5**
573	TC 272	PM 9	Supr 15	7	4	4	4	4	4	4	4	4	4	4	**4**
574	TC 272	PM 9	Supr 15	7	5	5	5	5	5	5				5	**5**
575	TC 273	PM 4	Supr 7	10	5	5	5	5	5			4		5	**5**
576	TC 273	PM 5	Supr 10	10	4	4			4		4	5		5	**4**
577	TC 273	PM 6	Supr 7	10	3	3	3	3	3	3	4		4	3	**3**
578	TC 273	PM 7	Supr 5	10	4	4	4	4	4	4	4	4	4	4	**4**
579	TC 273	PM 7	Supr 5	10	2	3	2	3	3	2			3	3	**2.66**
580	TC 273	PM 8	Supr 1	10	4	4	4	4	4	4	4	4	4	4	**4**
581	TC 273	PM 9	Supr 10	10	4	4	4	4	4	4	4	4	4	4	**4.33**
582	TC 274	PM 9	Supr 17	2	4	5	5		4	5	3	4	4	5	**4.33**
583	TC 275	PM 2	Supr 2	7	4	4	3	3	3	3	3	3	3	3	**3**
584	TC 275	PM 4	Supr 7	7	3	3	3	3	3	3			3	4	**3**
585	TC 275	PM 4	Supr 7	7	5	5	4		4		4	5		5	**4**
586	TC 275	PM 7	Supr 6	7	3	3	3	3	3	3	3	3	3	3	**3**
587	TC 276		Supr 3	8	4	3	3	5	2	5	4	5	3	3	**3**
588	TC 277	PM 5	Supr 10	16	4	4	4	4	4	4	4	5	4	5	
589	TC 277	PM 6	Supr 7	16	5	4	4	4	4	4	5		5	5	**4**
590	TC 277		Supr 3	16	5	5	5	3	5	3	5	5	5	5	**5**
591	TC 278	PM 7	Supr 6	8	2	2	2	2	2	2	3	3	2	3	**2**
592	TC 279	PM 7	Supr 6	4	4	4	4	4	4	4	4	4	4	4	**4**
593	TC 279	PM 9	Supr 15	4	5	5	4	4	5	4	4	4	4	4	**4.66**
594	TC 279	PM 9	Supr 15	4	5	5	5	5	5	5				5	**5**
595	TC 280	PM 9	Supr 11	15	3	4	2	2	4	3			4	3	**3**
596	TC 280	PM 9	Supr 11	15	4	4	4	3	4	3				4	**4**
597	TC 281	PM 8	Supr 1	13	5	5	5	5	5	5	5	5	5	5	**5**
598	TC 282	PM 9	Supr 10	15	3	3	4	3	3	3	3	3	3	3	**3**
599	TC 282	PM 9	Supr 10	15	4	4	4	4	4	3				4	**4**
600	TC 283	PM 4	Supr 7	9	3	3	3	3	3	3	3		3	4	**3**
601	TC 283	PM 4	Supr 7	9	4	4	5	5	4	4	4	4		4	**4**
602	TC 283	PM 4	Supr 7	9	4	4	4	4	4	4	5	5	3	4	**4**
603	TC 283	PM 4	Supr 7	9	4	4	3	4	4	3	3		3	4	**4**
604	TC 283	PM 7	Supr 7	9	4	3	4	4	4	3	4	4	4	4	**4**
605	TC 284	PM 7	Supr 14	10	3	3	4	4	3	4	4	4	4	4	**3.66**
606	TC 285	PM 6	Supr 13	16	4	4	4	2	4	3				4	**4**
607	TC 285	PM 7	Supr 5	16	3	4	4	4	4	4	4	4	4	4	**4**
608	TC 285	PM 7	Supr 5	16	4	4	4	2	5	1				3	**4**
609	TC 285	PM 7	Supr 5	16	3	3	3	1	3	1				1	**2**
610	TC 285	PM 7	Supr 5	16	4	4	3	4	4	4	4	4	3	4	**4**
611	TC 286		Supr 3	15	4	4	4	5	5	4	5	5	3	4	**4**
612	TC 287	PM 8	Supr 1	16	5	5	5		5	5	5	5	5	5	**5**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
613	TC 288	PM 8	Supr 1	15	5	5	5		5	5	5	5	5	5	**5**
614	TC 289	PM 7	Supr 6	14	3	3	3	3	3	3	3	3	3	3	**3**
615	TC 289	PM 7	Supr 14	14	4	4	3	4	4	4	3	4	4	4	**3.66**
616	TC 290	PM 9	Supr 17	7	4	4	4			4	3	4	4	5	**4**
617	TC 291	PM 6	Supr 13	2	4	4	4	3	4	4				4	**4**
618	TC 292	PM 1	Supr 6	9	1	2	2	2	1	1	1	3	1	1	**1.33**
619	TC 292	PM 1	Supr 6	9	1	2	3	3	2	2	1	3	3	2	**2**
620	TC 293	PM 9	Supr 10	5	3	2	2	2	2	3		3	3	3	**2.66**
621	TC 293	PM 9	Supr 10	5	3	3	4	4	2	4					**3**
622	TC 293	PM 9	Supr 11	5	3	3	3	2	2	3	3	3	3	3	**3**
623	TC 293	PM 9	Supr 11	5	3	3	3	3	3	3				4	**3**
624	TC 294	PM 7	Supr 6	3	3	3	3	3	3	3	3	3	3	3	**3**
625	TC 295	PM 9	Supr 17	10	3	5	4		5	4				3	**3**
626	TC 295	PM 9	Supr 17	10		3			2		2	3	4		**2.66**
627	TC 296	PM 7	Supr 6	11	2	2	2	2	2	2	2	2	2	2	**2**
628	TC 297	PM 5	Supr 12	2	1	2	3		2					2	
629	TC 297	PM 7	Supr 5	2	4	4	4	4	4	4	4	4	4	4	**4**
630	TC 297	PM 7	Supr 5	2	3	3	3	1		3					**3**
631	TC 297		Supr 3	13	5	5	5	5	5	5	5	5	5	5	**5**
632	TC 298	PM 2	Supr 2	5	3	3	3	3	4	3	3	3	3	3	**3**
633	TC 299	PM 9	Supr 17	16	3	4	3	5	4	3	2	3	4	4	**2.66**
634	TC 300	PM 7	Supr 14	8	4	5	5	4	5	4	5	5	5	5	**5**
635	TC 301	PM 2	Supr 2	10	4	3	4	3	4	3	3	3	3	4	**4**
636	TC 302	PM 8	Supr 1	2	4	4	3		4	4	4	4	4	4	**4**
637	TC 303	PM 1	Supr 6	9	4	5	4	4	5	3	2	4	5	5	**4.66**
638	TC 303	PM 1	Supr 6	9	4	5	4	4	5	3	2	4	5	5	**4.66**
639	TC 303	PM 3	Supr 9	9	5	4	5	4	4	4	5	5	5	5	**5**
640	TC 303	PM 5	Supr 12	9	5	5	5		5	4	4	4			
641	TC 303	PM 6	Supr 7	9	5	3	4	4	3	4	4		5	4	**4**
642	TC 303	PM 7	Supr 14	9	3	4	3	4	4	3	4	4	4	4	**4**
643	TC 303	PM 9	Supr 17	9	5	5	5		5	5	5	5	5	5	**5**
644	TC 303		Supr 3	9	5	4	3	3	5	5	5	5	5	4	**5**
645	TC 303		Supr 9	9	3	4	4	4	4	3	4	3	3	4	**4**
646	TC 304	PM 2	Supr 2	5											**3**
647	TC 304	PM 3	Supr 9	8	3	4	3	2	4	2	3	4	4	3	**3**
648	TC 304	PM 7	Supr 5	5	2	4	4	4	4	4	4	4	4	4	**2**
649	TC 304	PM 7	Supr 6	3	3	3	3	3	3	3	3	3	3	3	**3**
650	TC 304	PM 8	Supr 1	5	5	5	5	5	5	5	5	5	5	5	**5**
651	TC 304	PM 9	Supr 11	5	2	3	3		2					3	**3**
652	TC 304	PM 9	Supr 11	5	2	1	2		2		3	3	3	3	**2**
653	TC 304		Supr 9	8	2	4	2	4	3	2	4	4	4	4	

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654	TC 305	PM 2	Supr 2	5	3	3	3	3	3	3	3	3	3	3	**3**
655	TC 306	PM 7	Supr 6	9	3	2	3	3	2	2	3	3	3	3	**2.33**
656	TC 307	PM 5	Supr 10	4	5	3	3	2	3	4	5	5		4	
657	TC 307	PM 9	Supr 11	4	4	3	4	2	4	3				4	**4**
658	TC 307	PM 9	Supr 11	4	5	5	4	4	5	3	4	4	4	4	**4.33**
659	TC 308	PM 9	Supr 17	7	4	5	4	5	5	4	4	5	5	5	**4.66**
660	TC 309	PM 7	Supr 14	7	4	5	5	4	5	4	5	5	5	5	**5**
661	TC 310	PM 7	Supr 6	8	3	3	3	3	3	3	3	3	3	3	**3**
662	TC 311	PM 5	Supr 10	7	5	4	3	3	4	4	4	5		4	
663	TC 311	PM 7	Supr 6	7	3	3	4	3	4	3	3	3	3	3	**3**
664	TC 311	PM 8	Supr 1	7	5	5	5		5	5	4	5	5	5	**5**
665	TC 312	PM 5	Supr 12	7	5	5	4		5		4				
666	TC 312	PM 6	Supr 7	7	3	3	3	3	3	3	1		2	2	**3**
667	TC 313	PM 7	Supr 5	5	3	4	3	4	4	4	4	4	4	4	**3**
668	TC 313	PM 7	Supr 5	5	4	2	2	1	3	1				2	**2.5**
669	TC 313	PM 7	Supr 14	5	5	5	5	5	5	5	5	5	5	5	**5**
670	TC 314		Supr 3	9	5	3	3	5	5	5	5	5	5	5	**5**
671	TC 315	PM 7	Supr 14	11	3	2	2	3	1	3	3	3	2	2	**2**
672	TC 316	PM 2	Supr 2	7	3	3	3	3	3	3	3	3	3	3	**3**
673	TC 316	PM 7	Supr 5	7	4	4	4	4	4	4	4	4	4	4	**4**
674	TC 317	PM 1	Supr 6	16	5	3	4	5	4	3	4	4	3	4	**4.33**
675	TC 317	PM 1	Supr 6	16	5	4	5	5	5	4	4	4	5	5	**4.66**
676	TC 317	PM 5	Supr 12	16	5	5	5	5	5	5	5	5	5	5	**5**
677	TC 318	PM 9	Supr 10	15	2	2	3	3	3	3	2	2	3	3	**2.66**
678	TC 318	PM 9	Supr 10	15	3	3	3	4	4	2				4	**3**
679	TC 319	PM 1	Supr 6	5	3	3	3	4	4	3	5	5	5	5	**4**
680	TC 319	PM 1	Supr 6	5	4	4	4	4	5	4	5	5	5	5	**5**
681	TC 319	PM 9	Supr 17	5	4	5	4		4	4	4	4	4	4	**4**
682	TC 320	PM 4	Supr 7	16	3	3	3	3	3	3			3	3	**3**
683	TC 320	PM 4	Supr 7	16	3	4	3	3	4		3	2	2	3	**2.66**
684	TC 321	PM 6	Supr 13	2	4	4	4	4	4	4				4	**4**
685	TC 322	PM 7	Supr 5	13	5	5	4	4	4	4	4	4	4	4	**4**
686	TC 322	PM 7	Supr 5	13	5	5	5	5	5	5				5	**5**
687	TC 323		Supr 3	14	5	4	4	5	5	5	5	5	5	3	**5**
688	TC 324	PM 6	Supr 13	2	4	4	4	3	4	4				4	**4**
689	TC 325	PM 7	Supr 6	6	3	3	3	3	3	3	3	3	3	3	**3**
690	TC 326	PM 3	Supr 9	1	5	5	5	3	3	4	4	4	4	5	**4**
691	TC 326		Supr 9	1	5	5	5	4	5	5	5	5	5	5	**5**
692	TC 327	PM 4	Supr 7	8	3	3							2	2	**2.66**
693	TC 327	PM 4	Supr 7	8		5			5		4	4		5	**4.66**
694	TC 328	PM 2	Supr 2	14	2	3	3	3	3	3	3	3	3	3	**3**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
695	TC 329	PM 6	Supr 7	10	3	3	3	3	3	2	3		3	3	**3**
696	TC 330	PM 9	Supr 17	15	5	5	5		5	4	4	4	5	5	**4.66**
697	TC 331	PM 7	Supr 6	3	3	3	3	3	3	3	3	3	3	3	**3**
698	TC 331	PM 7	Supr 7	3	4	4	3	3	3	3	1	1	1	1	**1**
699	TC 332	PM 8	Supr 1	8	5	5	4		4	5	5	5	4	5	**4.33**
700	TC 333	PM 2	Supr 2	7	2	2	3	2	2	3	3	3	3	3	**2**
701	TC 334	PM 9	Supr 15	9	3	2	3	3	3	3	2	3	3	3	**3**
702	TC 334	PM 9	Supr 15	9	3	3	3	3	3	3				3	**3**
703	TC 335	PM 3	Supr 9	1	2	3	3	3	3	3	3	3	3	4	**3**
704	TC 335	PM 7	Supr 5	1	4	4	4	2		5					**4**
705	TC 335	PM 7	Supr 9	1	5	4	4	4	4	4	4	4	4	4	**4**
706	TC 335		Supr 9	1	1	1	2	1	1	2	2	2		1	**1**
707	TC 336		Supr 3	7	5	5	5	5	5	5	5	5	5	5	**5**
708	TC 337	PM 7	Supr 14	8	4	4	4	4	4	4	4	4	4	4	**4**
709	TC 338	PM 4	Supr 7	15	4	4	4	4	4	3	3		4	4	**4**
710	TC 338	PM 4	Supr 7	15	5	5	5	5	5	4	5	5	4	5	**5**
711	TC 338	PM 4	Supr 7	15	5	5	5	5	5	5	5	5	5	5	**5**
712	TC 338	PM 4	Supr 7	15	4	4	4	4	4	3	4		4	4	**4**
713	TC 338	PM 7	Supr 7	15	5	5	5	5	5	5	5	5	5	5	**5**
714	TC 339	PM 2	Supr 2	9											**3**
715	TC 339	PM 3	Supr 9	9	5	5	5	4	4	5	4	5	5	5	**5**
716	TC 339	PM 5	Supr 10	9	5	5	5		5		5	5		5	**5**
717	TC 339	PM 5	Supr 12	9	5	5	5	5	5	5	5	5	5	5	**5**
718	TC 339	PM 7	Supr 14	9	5	5	5	4	5	4	5	5	5	5	**5**
719	TC 339	PM 9	Supr 10	9	5	5	5	5	5	5	5	5	5	5	**5**
720	TC 339	PM 9	Supr 10	9	5	5	5	5	5	5	5	5	5	5	**5**
721	TC 339	PM 9	Supr 11	9	5	5	4	4	5	4	4	5	5	5	**4.66**
722	TC 339	PM 9	Supr 11	9	5	5	5	3	5	4				5	**5**
723	TC 339	PM 9	Supr 15	9	4	4	3	3	4	4	4	4	4	5	**4**
724	TC 339	PM 9	Supr 15	9	5	5	5	5	5	5				5	**5**
725	TC 339	PM 9	Supr 17	9	5	5	5			5	5	5	5	5	**5**
726	TC 339		Supr 9	9	5	5	5	5	5	5	5	5	5	5	**5**
727	TC 340	PM 7	Supr 5	8	3	4	4	4	4	4	4	4	4	4	**4**
728	TC 340	PM 7	Supr 5	8	3	3	3	3	3	3	3	3	3	3	**3**
729	TC 341	PM 2	Supr 2	7	3	3	3	3	3	3	3	3	3	3	**3**
730	TC 341	PM 6	Supr 7	7	4	4	3	3	3	4	3		4	4	**4**
731	TC 341	PM 6	Supr 13	7	4	4	4	3	2	3				4	**3.66**
732	TC 341	PM 7	Supr 5	7	4	4	4	4	4	4	4	4	4	4	**4**
733	TC 342	PM 4	Supr 7	9	4	3	3		3	3		4		4	**3**
734	TC 342	PM 4	Supr 7	9	4	3	3	3	3	3			3	4	**3.33**
735	TC 343		Supr 3	8	5	4	4	5	5	3	5	5	5	4	**4**

Form	Trade Contractor	Project Manager	Superintendent	Division	Man Power/ Productivity/ Schedule Adherence	Quality of Work	Coordination with other Subs	Holds Safety Meetings	Technical knowledge of Drawings and Specs	Daily Clean-Up	Accuracy /Timeliness of Change Order /Backup	Monthly Invoices - Timely and Accurate	Project Close Out (O&M's, Punchlist, As-Builts)	Professionalism	**Overall Rating**
736	TC 344	PM 7	Supr 16	15	2	3	3	4	3	3				3	
737	TC 345	PM 7	Supr 16	9	4	4	3	4	2	3				3	
738	TC 346	PM 2	Supr 2	9	3	3	3	3	3	3	3	3	3	3	**3**
739	TC 347	PM 3	Supr 9	13	3	3	3	2	3	3		4	3	3	**3**
740	TC 347		Supr 9	13	4	3		3	4	3				4	**3.5**
741	TC 348	PM 7	Supr 14	6	5	5	5	5	5	5	5	5	5	5	**5**
742	TC 349	PM 3	Supr 9	5	5	4	3	2	4	2	4	4	4	4	**4**
743	TC 349		Supr 9	5	4	2	4	3	4	3	3	4	3	4	**3.5**
744	TC 350	PM 3	Supr 9	8	3	3	3	3	3	4	3	4	3	4	**3**
745	TC 350	PM 4	Supr 7	8	3	3	3	3	3	3				3	**3**
746	TC 350	PM 4	Supr 7	8	5	5	5	5	5		5	5		5	**5**
747	TC 350	PM 5	Supr 10	8	4	5	4		5	4	4	4		5	**4**
748	TC 350	PM 5	Supr 12	8	4	4	4		2						
749	TC 350	PM 6	Supr 7	8	5	4	4	4	4	4	4		4	4	**4**
750	TC 350	PM 6	Supr 13	8	5	5	4	3	4	4				5	**4.66**
751	TC 350	PM 7	Supr 7	8	4	4	4	4	4	4	4	4	4	4	**4**
752	TC 350	PM 9	Supr 11	8	4	4	4	3	4	3				4	**4**
753	TC 350	PM 9	Supr 11	8	3	4	4	3	4	4	4	4	5	5	**4.33**
754	TC 350	PM 9	Supr 15	8	3	4	3	3	4	3	3	4	4	4	**4**
755	TC 350	PM 9	Supr 15	8	5	5	5	5	5	5				5	**5**
756	TC 350		Supr 9	8	4	4	3	3	4	4	3	3		3	**3.5**
757	TC 351	PM 9	Supr 11	15	4	4	4	4	4	4				4	**4**
758	TC 351	PM 9	Supr 11	15	4	4	4	4	5	3	4	4	5	4	**4**
759	TC 352	PM 6	Supr 13	6	3	3	3	2	3	3				3	**2.66**
760	TC 353	PM 9	Supr 17	2	5	5	5		4	5	5	5	5	5	**5**
761	TC 354	PM 3	Supr 9	15	4	4	4	4	4	3	1	2	4	2	**3**
762	TC 354		Supr 9	15	5	4	4	4	3	3	4	3	4	4	**4**
763	TC 355	PM 5	Supr 10	7	2	3	2		3		3			2	**2.66**
764	TC 355	PM 7	Supr 6	7	3	3	3	3	3	3	3	3	3	3	**3**
765	TC 355	PM 8	Supr 1	7	3	4	4		4	4	3	4	4	3	**3**
766	TC 356	PM 9	Supr 15	16	3	4	2	3	4	2	2	3	2	2	**2**
767	TC 356	PM 9	Supr 15	16	5	5	5	5	5	5				5	