# *Nailed it*: How Work Passion Relates to Safety Behavior Amongst Construction Foremen

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**Abstract**

*Nailed it*: How Work Passion Relates to Safety Behavior Amongst Construction Foremen

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The construction industry is one of the most physically dangerous fields in the world. Traditionally, safety research has focused on environmental hazards, organizational capacity, etc. More recently, psychological factors are recognized as critical in shaping safety behaviour. Among which, workplace passion is a powerful and entirely unexplored factor within construction safety research. This study investigated the relationship between work passion and safety behaviour. The research employed a questionnaire based on two existing validated scales- the Work Passion Scale (WPS) measuring four dimensions: Work Enjoyment, Self Motivation, Self Identity, and Sense of Learning, and the Safety Behaviour Scale (SBS). The respondents were experienced (M = 19.9 years), foremen (M = 43.2 years) spanning 51 different trades and approximately 50 different companies. Pearson correlation analysis revealed a positive correlation between overall Work Passion and Safety Behaviour ($r = 0.322$, $p = .001$). However, a dimensional specific

analysis showed that Self Identity had the strongest relationship with safety behaviour ($r = 0.451$, $p < .001$), followed by Sense of Learning ($r = 0.339$, $p < .001$). Whereas Work Enjoyment ($r = 0.096$, $p = .340$) and Self Motivation ($r = 0.091$, $p = .364$) showed no significant relationship. These findings suggest that work passion can impact safety behaviour specifically in identity-based and learning-oriented dimensions. The study provides practical implications for the construction industry in recommending a shift from a compliance-oriented safety environment to a commitment oriented one.

**Acknowledgements**

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My utmost appreciation of my radiant mother Suchana Pandey Pokharel, my visionary father Dr. Arjun Raj Pandey, my incredible sisters Priya & Anshu Pandey. As well as the westbound platform of the Sherbourne Subway Station.

I am grateful for passion, of delicious devouring bites, and unlike Jean Paul Sarte, the refusal of a toothless life.

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**Prose: On Passion and the Foreman**

**By Prabidhi Pandey**

**Sept 16, 2024**

Does passion feel hot on the outer layer of the skin? Does it burn? When god spoke to moses from the burning bush, was there passion in his speech? Or was it just a command?

When the foreman asks his journeyman for the electric drill on the right side of the steel stud, does the cacophony of sounds in the jobsite clatter the eardrums?

Is his job all encompassing? All consuming? Is there a carnal devotion to his work? Does he make a religion out of it?

When you step up to him and you hand him a paper to sign, does it show on his calloused hand? Can you identify it radiating? Does he care? Is there a stubborn heart, an even temper, a violent desire?

And if there is an absence of it. If he does not sear the metal he touches, then what does it look like?

Can you tell if his soul has rotten inside of him? Is the smell poignant?

1. **Introduction:**

*"Hire for passion and intensity; there is training for everything else."* —Nolan Bushnell

Today's world heavily focuses on Passion. From movies, to art, to the working and corporate world, there is a message of the ideation of passion as a charismatic, noble and virtuous trait. Yet is passion necessarily something to seek out? Is there such a thing as too much passion? Is there an extent to which passion can become futile, or worse, dangerous? And perhaps even passion can be trained and managed, just like everything else.

The etymological roots of the word 'Passion' begins with a vastly different story from the outlook of today. The start of the use of the word from Classic Latin in approximately 4th Century AD finds that it comes from the word 'Pati', which means to suffer or endure. During the Middle Ages, the term was used primarily in a Christian theological sense to describe the suffering of Christ during his crucifixion. This usage emphasized the idea of intense emotional or physical suffering. It denoted strong associations with sacrifice and devotion (Cadieux, 2011). The different perspectives of philosophers like Aristotle and Stoic thinkers influenced the evolution of this term overall. For example, In Aristotle's philosophy, passions were seen as emotions or feelings that can influence moral and ethical behavior. He distinguished between rational and irrational passions, suggesting that while passions can motivate individuals, they need to be guided by reason to ensure virtuous behavior (Leighton, 1995).

This was different than Stoic philosophers like Seneca and Epictetus who viewed passion as a potential source of disturbance and irrationality. For Stoics, passions were seen as disruptive forces that could lead one away from rational thought and tranquility. They advocated for control over passions through rationality and self-discipline (Armstrong, 2013). In contrast, Romantic-era movement in later centuries celebrated passion as a vital, creative force. Romantic thinkers and writers such as Friedrich Schiller, viewed passion as a source of artistic inspiration and personal fulfillment (Weber, 2011). Over time, passion's meaning evolved to represent a profound emotional commitment to an activity, cause, or person (Jachimowicz, Wihler, & Galinsky, 2022). Yet, given its roots, this very trait, when it becomes intense and unchecked can also lead to unanticipated risks and manifest as categorically unsafe behaviours in humans.

Passion for work is often regarded as a highly desirable trait, associated with increased motivation, resilience, and job satisfaction. Yet, its impact on safety behaviors remains complex and sometimes contradictory. In 2003, RJ Vallerand began a more nuanced and comprehensive study of passion overall and especially passion at work (Vallerand Houlfort, & Bourdeau, 2019). Though not specifically related to the construction field, Vallerand was able to specialize in a more psychological as opposed to previous generally philosophical view of passion. He was able to explore the distinguished behavioural harmonious and obsessive passion. Harmonious passion, where individuals engage in work because it aligns with their values and provides intrinsic satisfaction, often leads to balanced and sustainable engagement. Conversely, obsessive passion reflects a compulsion to work, driven by external pressures or self-imposed obligations.

This research aims to explore the nuances of this passion-safety behavior relationship, specifically in the construction industry, focusing on foremen as key influencers of site safety. By examining how foremen's passion affects their safety practices and those of their team, this study seeks to bridge an essential knowledge gap in construction management research. A better understanding of this relationship can lead to targeted efforts to foster a culture of safe, engaged, and productive work environment in the construction industry.

### 1.1 Research Objectives

The research objectives are as follows:

*Objective 1 (Obj 1).*

To explore existing research, literature and theoretical frameworks on the understanding of passion for work and safety behaviors in construction, then in its correlation with the two.

*Objective 2 (Obj 2).*

To conduct a comprehensive survey study with a specific emphasis on construction foremen to ascertain the level of passion in their roles and its impact/correlation on their safety behaviors, promotion, endorsement and practices.

*Objective 3 (Obj 3).*

To propose guidelines of best practices that leverage and harness passion to strengthen safety behaviors, enhance appropriate delegation and allocation of tasks within the personnel to improve safety culture among construction foremen.

### 1.2 Dissertation Outline

Firstly, as noted for Obj 1, this dissertation explores the current theoretical understandings of Passions and Safety Behavior in the construction site among foremen. This concludes with discernment of the knowledge gap and the planned contribution to this area of study from the research being undertaken. After, null and alternative hypothesis is established. Subsequently, the methodology and its usage in the field for this study are presented. Following Obj 2, data is collected, analysed and discussed.

Then, as per Obj 3, recommendations are presented for proposed guidelines of best practices that leverage and harness passion to strengthen safety behaviors. Finally, possible extensions for future research in this field of study is provided.

## 2. Literature Review

This literature review aims to synthesize the existing research to establish a theoretical foundation with regards to construction safety behaviour and its relational significance to work passion among construction foremen. This review is structured in three main parts. Firstly, the conceptualization and parameters around the measurement of work passion is discussed. Secondly, the predicating factors following safety behaviour is explored. Upon which, thirdly, existing publications with adjacent high-risk industries are examined that have aimed to link passion related constructions to associated parameters around job performance with potential concerns of job safety.

To decipher the relevance of certain studies or papers over others, the criteria of selection was that publications had to be related to keywords of the ensuing nature or combination as follows: Construction Safety, Construction Foremen, Passion, Work Passion, Jobsite Safety, Safety Behaviour, Occupational Passion, Safety Compliance, Work engagement, Safety Participation, Safety Performance, Motivation, Proactive Behaviour, Leadership, Construction Leadership, Leadership Passion, Supervisory Influence, High Risk Industries, Occupational Safety, Work Performance, Models of Passion etc.
Upon this engagement with the search, Table 1 was created with the summary of key information from specifically selected research papers relevant to the factors, variables, objectives and frameworks being discussed.

**Table 1: Literature Review Study Comparative Table**

| Study | Purpose of Study | Methodology | Main Findings | Relevance to Passion/Safety research |
|---|---|---|---|---|
| Mo et al. (2023) | Examining proactive personality & safety behaviour | Multi-stage survey | Proactive personality positively and significantly influenced construction workers' safety behaviors | Demonstrates internal dispositions influence safety behaviour |
| Wu et al. (2018) | Developing job stress scale and a link between stress & safety | Semi Structured interview, Survey | There is a negative correlation between job stress and safety behavior | Demonstrates psychological factors affect safety |
| Philippe et al. (2009) | Examining passion and well-being | Cross-sectional study Two studies | Passion improves well-being if harmonious | Demonstrates behavioural outcomes of passion |
| Johri et al. (2016) | Developing Work Passion Scale | EFA and CFA analysis | Validated a four-factor passion scale | Provides a framework for measurement |
| Cadieux (2010) | Assessing harmonious vs. obsessive passion & job performance in consultant civil engineers | Survey | Obsessive passion has significant positive relationship with several performance indicators | Demonstrates that passion is related to professional performance in construction adjacent professions |
| Birkeland & Buch (2014) | Examining passion and work outcomes | Two Studies Cross sectional, Cross-lagged | Passion predicts performance and engagement | Passion is related to job performance and behaviour |
| Wu et al. (2022) | Examining sense of calling and safety behaviour in pilots | Survey | safety-specific transformational leadership has a positive effect on safety behavior | Demonstrates constructs related to passion influence safety |
| Guo & Gonzalez (2020) | Examining personality and safety behaviour | Survey | Conscientiousness predicts safety behaviour | Demonstrates internal traits is linked to safety |
| Hayes et al. (1998) | Developing the Safety Behaviour Scale | Development of scale | Establishes a two-factor safety measure | Provides a framework for measurement |
| Landay et al. (2022) | Examining passion and burnout in nurses | Survey | Passion improves commitment but risks burnout | Demonstrates complex effects of passion for high-risk work |
| Zigarmi et al. (2009) | Defining employee work passion | Theoretical analysis | Directs intentional study in employee engagement & passion | Demonstrates there is behavioural relevance with passion in Work |

### 2.1 Work Passion

Passion as a whole and work passion has evolved drastically through its etymological, historical and philosophical roots (Cadieux, 2011) before developing into the concept that it is in modern psychology today. A lot of work for the nuanced and comprehensive examination of passion and passion in work can be credited to RJ Vallerand and his extensive catalogue of research in the past three decades (Vallerand Houlfort, & Bourdeau, 2019). Contemporary works now define passion as “a strong inclination toward an activity that people like, find important, and in which they invest time and energy” (Zigarmi et al., 2009). The emphasis lies in the multidimensional capacity of what work passion connects to in the individual- such as emotional enjoyment (Johri et al., 2016), intrinsic drive (Zigarmi et al., 2009) or personal identity (Philipe et al., 2009). Philipe et al. (2009) especially emphasize that work passion is a major contributor in vitality and well being with personal fulfillment being a source of deep meaning for an individual. All of which aligns closely with a long-held view of construction foremen with their great sense of responsibility to their role (Borcherding 1977).

The role of a construction foremen requires both the necessary competence in the technological side, and interpersonal engagement in the behavioural side for their work (Thoengsal and Tumpu, 2023). Therefore, an empirical scale such as the ‘Work Passion Scale (WPS)’ developed by Johri et al. (2016) meets the requirement both in structure and nuance as a very appropriate measurement parameter to be applied to the construction industry. Johri et al. (2016) delineate work passion in four dimensions: Work Enjoyment (WE) as an emotional factor, Self Motivation (SM) and Self Identity (SI)

as cognitive factors and Sense of learning (SoL) as a behavioural factor in their literature. WPS's multidimensional framework fosters the in-depth consideration of work passion which can bring very valuable insights in the construction industry.

## 2.2 Safety Behaviour in Construction

Safety behaviour has been widely studied in the overall literary landscape across several industries. Hayes et al. (1998) captured the two main components of safety behaviour which has been extensively validated in specifically construction research. The two components consist of safety compliance and safety participation. Safety compliance refers to the following of protective measures, rules and procedures on the jobsite, whereas safety participation is more of a proactive and voluntary action that is actively supporting and creating a safe environment. Reflective of such concepts, Wu et al. (2018) found that construction job stress in workload, interpersonal and organizational conflicts as well as pressures reduces the participation and compliance in safety. In this, stress was shown to undermine attention and risk perception. In another research, Gao et al. (2020) found that personality traits of the construction workers can be associated with their safety behaviour. They found that the more conscientious the worker, the safer their behaviour was. Similarly, Mo et al. (2023) also found that in relation to safety self efficacy and team member exchange, that workers who felt supported by their teams and believed in their ability to perform safely had enhanced safety behaviours. They also showed the significance of a safety- specific leadership to strengthen such behaviours in the jobsite. All of these findings were able to demonstrate collectively that the safety behaviour is very much studied in construction, and even more so, with psychological and psychosocial concepts in the humanity of construction.

### 2.3 Work Passion and Safety Behaviour: Adjacent fields

Although in construction, there does not exist any literature in the examination of passion and its predicators with regards to safety behaviour, there is some research that exists in a similar capacity in other fields. In high-risk fields adjacent to construction, compelling research can be found that examine passion or passion-like constructs. In aviation, Xu et al. (2023) found that those airline pilots who had an inherent 'sense of calling' predominantly engaged in enhanced safety behaviours, which were mediated by motivational factors within. As well, within another high-stress field like nursing, Landay et al. (2022) were able to demonstrate that for nurses, passion in their work heightened commitment to overall safety critical tasks. However, the same passion also contributed to burnout when there were extreme demands from the workers to be met. This duality of enhanced passion could potentially be an outcome within construction workers as they also face long hours, high stress and pressure as well as continuous imminent possibility of accidents (Langdon et al., 2018).

There also exist studies and literature related to passion and work performance a whole. Cadieux (2011) studied how passion related to performance within consultant civil engineers. The findings showed that obsessive passion had a relationship with several performance indicators where participants achieved higher performance levels across the criteria that was measured. In general, organizational behaviour, Birkeland and Buch (2014) were also able to corroborate that passion does predict positive correlation with job performance and engagement with work. Similarly, Zigarmi et al. (2009) argued that passion brought forth particularly intentional behaviour and long-term commitment. All

of which, suggest that passion and safety behaviour could be related with determining factors of mechanisms such as motivation, persistence, commitment and personal identity.

### 2.4 Knowledge Gap

This literature review demonstrated that there exists a robust foundation for work passion and safety behaviour as independent entities and in specific fields. Yet, despite all of the conceptual relevance and potential pragmatic utility of such knowledge, there are no empirical studies exploring the relationship between passion in the workplace and safety behaviour among construction foremen. Foremen play a critical role in enforcing and encouraging jobsite cultures as well as modeling behaviour within the crew (Peng and Zhang 2022). With the specific dimensional dispositions of motivation, learning and identity within passion, the behavioural consistency with performance of safety could offer valuable insight.

## 3. Research Hypothesis and Scope Limitations

### 3.1 Proposed Research Hypothesis

In examining the relationship between passion for work and safety behavior among construction foremen, the following can be stated:

Null Hypothesis ($H_o$): No relationship exists between a construction foremen's work passion and safety behavior

Alternative Hypothesis ($H_1$): A significant relationship exists between a construction foremen's work passion and safety behavior

Understanding this relationship can provide valuable insights into enhancing safety performance and reducing incidents or injuries. If passion promotes effective safety behavior, then it would be an underutilized lever for improving safety strategies in training and management practices to inform safety outcomes in construction. The findings can be used create a pragmatic tool that can be harnessed in the work environment, and potentially even create a basis for other fields.

### 3.2 Scope Limitations

The extent of the scope is to research levels of passions and the corresponding safety behavior of foremen on construction sites. Any research can be subject to limitations within its scope. The following can potentially be considerations for this research:

- The motivation to complete the survey: with electronic, QR codes and the distribution of the survey with a request to complete it, it is likely that many foremen are not interested or simply do not have the time or motivation to complete the survey. As well, it can also signal that those completing this survey are potentially those that may already have a certain degree of passion for the job, ultimately skewing the data to a certain conclusion. To mitigate this, in-person survey administration has been scheduled by the researcher.
- Inaccurate self reporting: since this is a self reported survey, there is a possibility of inaccurate data- especially with the connotation of todays world regarding 'passion' as a sought-out trait, foreman can potentially be uncomfortable reporting their lack of passion or neglect in safety. Furthermore, it is possible that they do not want this information to be known by their peers, employers etc in the company. To combat this, it is emphasised that the survey is 100% confidential in terms of the responses. No data regarding their name or identifiable information will be published. Each responder will be separated with a serial number.

- Selected established measurement parameters: In this study, two specific parameters of measurement for work passion and safety behaviour is selected. It is possible that other parameters yield a separate kind of data.
- Researcher educational background: The researcher and author of this paper has an educational background that is primarily in Construction Management. There are potential psychological or philosophical aspects that can be considered within this study. Therefore, an extension on this research with a multidisciplinary review can be done to allow for such perspectives.

## 4. Field Research Method

This research will employ a quantitative research method as a survey questionnaire combining demographic items, as well as the Work Passion Scale (WPS) and the Safety Behaviour Scale (SBS). This method aligns with the goal to measure behavioural framework of work passion as well as safety behaviour using existing validated scales. The survey format allows for a quick and practical completion on the jobsite; wherein broad data collection can be done and analysed.

See Image 1 below for the flowchart of research steps to be completed throughout this study.

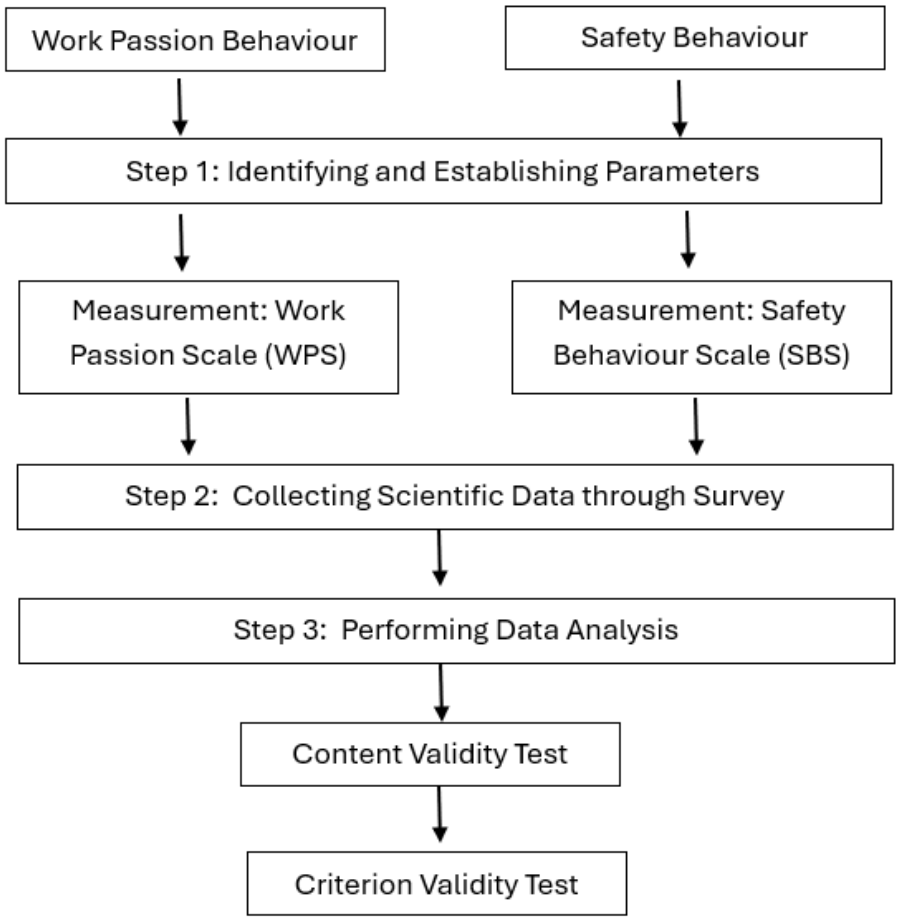


**Figure 1: Research Steps Flowchart**

### 4.1 Identifying Participants and Data Gathering

In the sample and population selection, a significant and diverse trades group was planned to be surveyed so as to reflect a balanced and unbiased dataset. With this, the foremen were chosen from among a multidisciplinary facet of the building trades including Mechanical, Electrical, Roofing, Civil, Environmental etc. (See Question Set A). The projects ranged all parts of Toronto, Canada. Questions were be created in an online platform- namely Microsoft forms. It must be noted that ethical considerations such as informed consent, right to withdraw and debriefing of the research were fully done with the interviewees before and after the questions being asked. As well, all data gathered was to be anonymous. No name (first, last or company) was to be published. All participants were assigned serial numbers to separate responses from one another.

#### 4.1.1 Physical Site Visits

At least twenty (20) physical sites were to be visited with projects of a variety of scopes for this purpose. Even though the questions were made in the online platform of Microsoft Forms, the questionnaire administrator/researcher took paper copies of the forms for on-site responses. See Appendix F of portable question set specifically formatted for site efficiency. In administering the questionnaire on site, the following steps were followed (Beatty et al., 2019)

The individual on site was:

- Greeted and asked for a short time to assist in a simple questionnaire
- Explained the purpose of the Questionnaire

- Explained the ethical considerations (Anonymity, confidentiality, right to revoke consent before, during or after etc.)
- Asked to complete the survey
- Debriefed and thanked for their time

Once the in-person paper questionnaires were completed and collected, the data was entered into the Microsoft forms according to the responses given for the purposes of analysis.

Note: Phone Call referrals were treated similar to physical In-person questions.

### 4.1.2 Electronic Alternatives

*QR Codes*

Microsoft forms was able to create a QR code link that, upon scanned is able to lead directly to the Survey questionnaire. These QR codes were printed in poster paper and, with permission, posted all across visited sites to encourage more participation. See Appendix B for QR Code.

*Electronic Emails*

For direct electronic access, the survey questionnaire were also sent to project foremen online through email.

All collected raw data were available to be analysed in spreadsheets from the forms.

### 4.2 Establishing Participants- Question Set A

Question Set A of the questionnaire focuses on the demographic and expertise. See Appendix C- Question Set A. Questions from this set are only going to be asked at the very end of the survey. As well, only relevant questions to the content and objective of the research are taken into consideration when inquiring on the demographic of the responder (Ziegenfuss et al., 2021). It is by intention that specific questions such as race and background- either heritage or education are not asked.

With the question on perceived expertise and years of experience, it is important to note that the number of years in a field might or might not correlate to expertise.

The last question in this set allows us an insight on how the questionnaire was approached and completed.

### 4.3 Establishing Measure of Passion- Question Set B

The Work Passion Scale (WPS) is designed to measure the intensity of passion an individual feels towards their work. Rooted in the understanding that work passion can influence personal satisfaction and organizational outcomes, the scale assesses how engaged, motivated, and enthusiastic individuals are about their professional roles. The WPS is typically self-reported with 17 items in a question set which allow workers to reflect on their feelings of passion toward their job using the scale developed by Johri et al. (2016). See Appendix D- Question Set B.

The WPS acknowledges that work passion has different dimensions that each question item addresses: work enjoyment (WE 5 items- Questions 1-5), self-motivation (SM 4 items- Questions 6-9), self-identity (SI 4 items- Questions 10-13) and sense of learning (SoL 4 items- Questions 14- 17).

The WE items reflect the emotional dimension of work passion characterized by feeling of positive emotions (e.g., 'I do not feel exhausted and bored while doing my work') and of vitality at work (e.g., 'I feel good and lively at my work').

The items for SM and SI reflects the cognitive dimension characterized by a sense of being internally motivated to do one's work (e.g., 'I get my motivation from the work itself and not from the rewards for it') and seeing one's identity in terms of one's work (e.g., 'I identify myself with the work I do').

The items on SoL reflect the behavioural dimension of 'work passion' definition characterized by a sense of continuous learning (e.g., 'I am ever willing to learn more and more about my work') and improvement (e.g., 'I make every effort to improve

the work I do').

In this present study, to maintain cohesiveness through the question sets, two minor modifications are made to the original scale. Firstly, in the original scale, the responses were measured using a seven-point scale (1 = strongly disagree to 7 = strongly agree). However, to maintain consistency with the Question Set C- Safety Behaviour Scale, the responses will be calculated in a Likert scale of 5 points. Secondly, the phrasing of the questions in this study all begins with "I see myself as someone who…." This addition does not change the meaning of the declaration, but attaches this behaviour to the foreman's personal identity, yielding a more accurate reflection of behaviour through ownership of action and feeling (Feser, 2005).

Due to the perceptive nature of the questions in this question set, this will be administered first. This approach is intended to prevent respondents from feeling as though their safety behaviours are being evaluated or inspected in the subsequent question set.

### 4.4 Establishing Measure of Safety- - Question Set C

The Safety Behavior Scale (SBS) is designed by Hayes et al. (1998) measures the safety behaviors exhibited by workers in a jobsite environment. It is grounded in the understanding that safety behavior is influenced by various personal and organizational factors in two components: task performance and contextual performance (Griffin & Neal, 2000). Task performance is the compliant behavior that individuals carry out to keep themselves safe, such as not taking shortcuts, using safety equipment, and following safety procedures and rules. Contextual performance refers to voluntary safety activities such as reporting safety problems, keeping workplaces clean, and caring for colleagues' safety, which may not directly contribute to one's own safety but help maintain an environment that supports safety.

The SBS is also self-reported with 11 items in a question set. See Appendix E-Question Set C. Questions 1 through 9 and 11 measure task performance. Questions 5,6 and 10 address contextual performance. It is measured in a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree) The overall score will be calculated by summing the scores on all items after recoding reversed items and then averaging altogether. A higher overall score on this scale will mean to indicate a greater performance in terms of behaving safely at work.

With the modifications for this question set, Q8 and 9 had a minor change in phrasing so that higher score *does* indicate greater performance.

**Table 2: SBS Question Rephrasing**

| Question # | Original Phrasing | Modified Rephrasing |
|---|---|---|
| Question 8 | Takes shortcuts to safe working behaviors in order to get the job done faster | Does not take shortcuts to safe working behaviors in order to get the job done faster |
| Question 9 | Does not follow safety rules that I think are unnecessary | Follows all safety rules and protocols even ones I think are unnecessary |

### 4.5 Establishing Expert Validity

Prior to administering the questionnaire to construction foremen on the jobsite, the questions were validated by a panel of one to ten experts in the industry. Experts ranged from construction managers, estimators, consultants or university faculty.

The panel were briefed on the background information of the study and requested to rate each of the questions with regards to their relevance, clarity, and simplicity (Bakas et al. 2009) in the scale as follows: relevance (1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = very relevant); clarity (1 = not clear, somewhat clear, 3 = clear, and 4 = very clear); and simplicity (1 = not simple, 2 = somewhat simple, 3 = simple, and 4 = very simple). Appendix A shows the Expert Validation Questionnaire QR code for experts to access.

Any items receiving the mean score of below a 3 on any of the criteria were removed or revised accordingly.

## 5. Results

As per Obj 2, this section will discuss results calculated in Microsoft Excel- first of the expert content validity, and then of the comprehensive survey study on construction foremen's level of passion in their roles with it's impact on safety behaviors, promotion, endorsement and practices. Note: visualizations for the charts in this section were created using a combination of Microsoft Excel and the generative AI: *Quadratic: The AI Spreadsheet* (Quadratic, 2026).

### 5.1 Content Validity Test: Expert Validation

The panel of experts in this study consisted of six industry professionals. This included an architect, a certified specification writer, a site supervisor, a construction site supervisor, a construction project manager, a construction safety director and a construction professor specializing in safety research. Names and identifying details are left confidential.

All questions in the Work Passion Scale and Safety Behaviour Scale were evaluated with the Likert scale of 1-4 on relevance, clarity and simplicity. Question 8 on the Work Passion Scale was the only one that scored below 3 on all criteria of relevance, clarity and simplicity with 2.33, 2.50 and 2.67 respectively. With the decision to eliminate any questions with the mean score of less than 3, Question 8 was removed. With the removal, mean scores of the scales were calculated. See Appendix G, Appendix H and Appendix I.

Mean scores of both scales were as follows:

**Table 3: Content Validity- Mean Scores on Relevance, Clarity and Simplicity**

| | **Work Passion Scale (WPS)** | **Safety Behaviour Scale (SBS)** |
|---|---|---|
| Relevance | 3.61 | 3.65 |
| Simplicity | 3.50 | 3.62 |
| Clarity | 3.45 | 3.50 |

The mean scores for both scales indicate that the items demonstrate satisfactory validity with regards to their content for their intended purpose for the field study.

### 5.2 Demographics of Foremen

The results of the demographics presented in this section were derived from the responses to Question Set A. A total of a 101 foremen were surveyed from 72+ sites. This data set comprised of 100 male participants and 1 female foreman. Data was collected almost entirely from in-person surveys, with 1 through telephone.

With regards to the self-reported expertise in the construction field, 100 participants self-identified as 'highly proficient' with only one as 'moderately proficient'. This suggests a high level of confidence with participants. The possibility of self-reporting bias is to be noted here, in the interpretation of the results.

The charts 1, 2 and 3 below illustrate the age group, years of work experience and trade of the construction foremen. The corresponding percentage of each category is indicated in the individual bars of the chart itself.

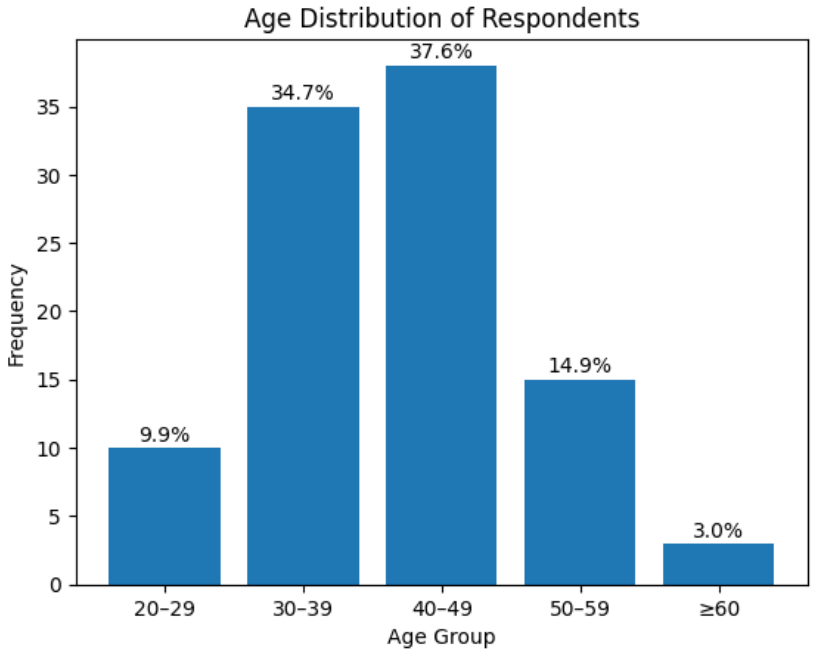


**Chart 1 : Age Distribution of Respondents**

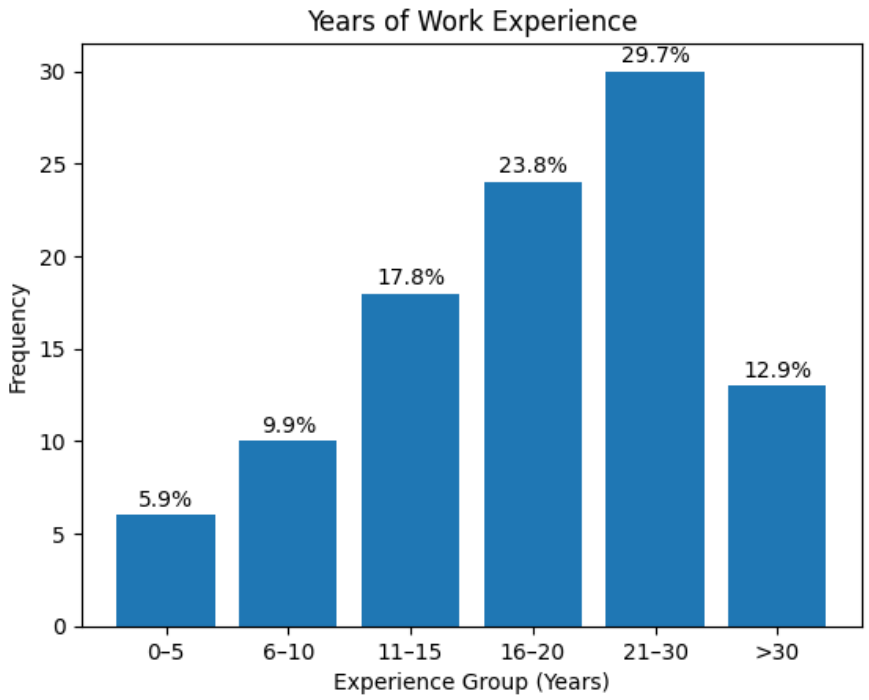


**Chart 2: Years of Work Experience of Respondents**

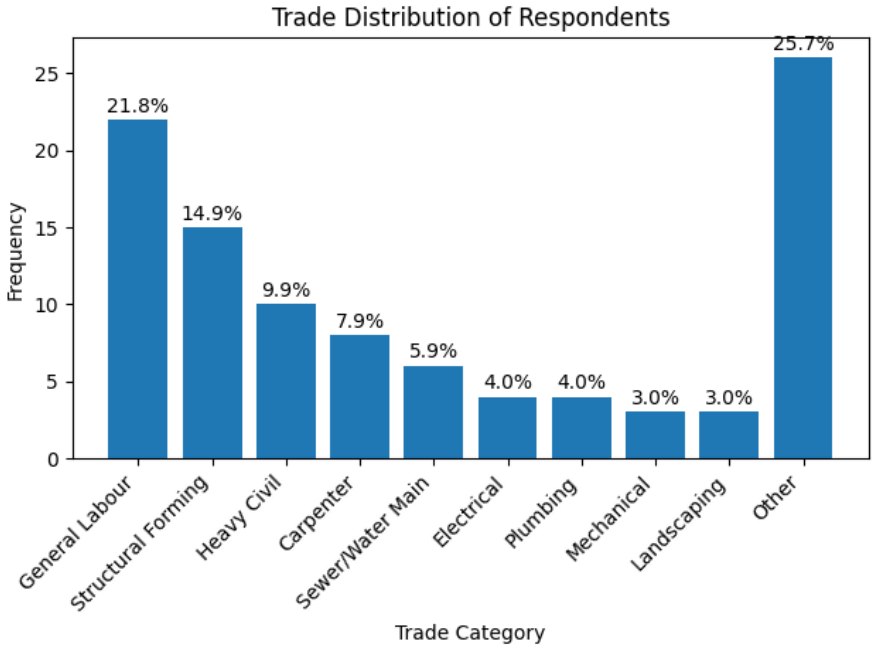


**Chart 3: Trades of the Respondents**

The mean age in years was 43.2 and the mean experience in years was 19.9 years. The age distribution shows that 72.3% of respondents are within the 30-49 years age group. This shows a strong representation of generally mid-career professionals. With regards to the experience, over 66% of the respondents have more than 15 years of experience, which indicates that the sample consists of seasoned professionals with extensive knowledge in this field.

There were 51 unique trades listed in the classification of the trades. As seen in Chart 3, the ‘Other’ category and ‘General Labour’ category are shown to have the highest number of respondents. This response must be interpreted with consideration of potential overlap with other categories. For example, ‘general labour’ can be a broad class encompassing of several roles. As well, the ‘other’ category can consist of more niche and specialised roles such as ‘tunneling’ which can be a subset of ‘structural forming’, but just described in greater detail by the respondent.

### 5.3 Criterion Validity Test: Correlation Analysis

In order to understand the statistical significance and correlation of the data set collected, first, the distribution of the composite scores were calculated with regards to Work Passion and Safety behavior. Then, the Pearson correlation and probability value is calculated. This is done first for the overall total scores of Work Passion and Safety behaviour. Then, the data is broken down into dimensional level analysis for work passion in Work Enjoyment (WE), Self Motivation (SM), Self Identity (SI) and Sense of Learning (SoL).

Raw data set collected of the survey results can be found in Appendix J. Identifying data is removed from publication for confidentiality.

### 5.3.1 Distribution of Composite Scores

Work Passion Scale scores averaged at a mean of 3.98/5, which is on the moderate to high end. The Work Passion Scale had more variability.

The Safety Behaviour Scale scores averaged 4.09/5, which is on the high end. The Safety Behaviour score had a tighter range, with most foremen reporting strong safety practices.

See Chart 4 below for the distribution of the composite scores. The Safety Behaviour is more uniform in the distribution across the respondents whereas passion varies more.

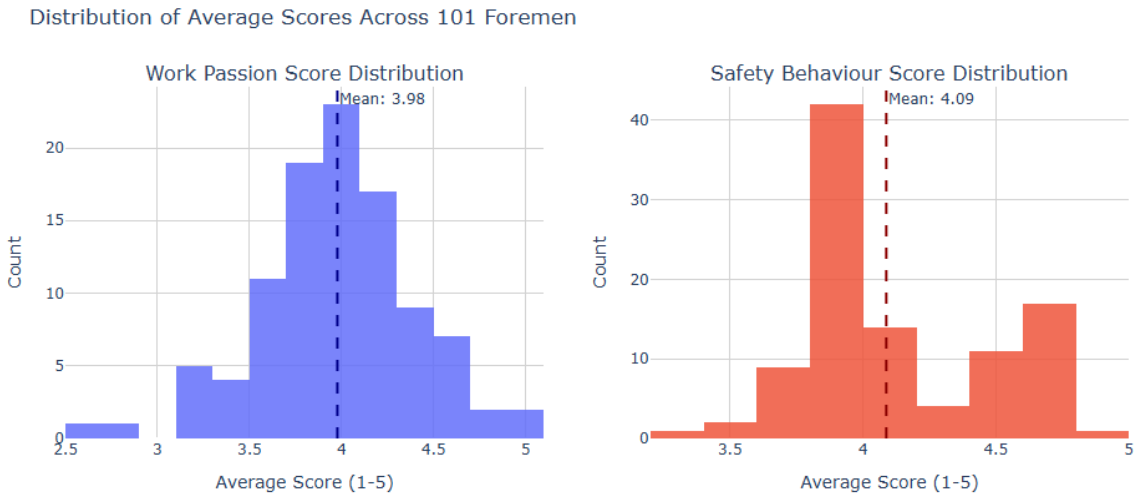


**Chart 4: Distribution of Composite Scores**

### 5.3.2 Relationship between Overall Work Passion and Safety Behaviour

In the Relationship between overall Work Passion of all its 16 items and Safety Behaviour of all its 11 items, the scale showed a moderate positive trend. For overall work passion, the data supports the hypothesis that work passion is positively associated with safety behaviour. Foremen with higher work passion are shown to exhibit stronger safety behaviours with the Pearsons correlation r value of 0.322 and the probability value of 0.0010 ($p < 0.05$). See Chart 5.

While the correlation in r value is moderate in nature Cohen (1977), it must be noted that the probability analysis in p value is highly significant. This suggests that this relationship has value in its exploration to be extracted for real and meaningful insights.

The Pearsons correlation was chosen for this data analysis as it is clear, conceptually interpretable and aligns with the theoretical framework. This is chosen over alternative models as the research question is specifically *relational* in nature. To understand, even with any correlation, that a certain relationship does exist and that it is meaningful and potentially actionable for expanding future understanding.

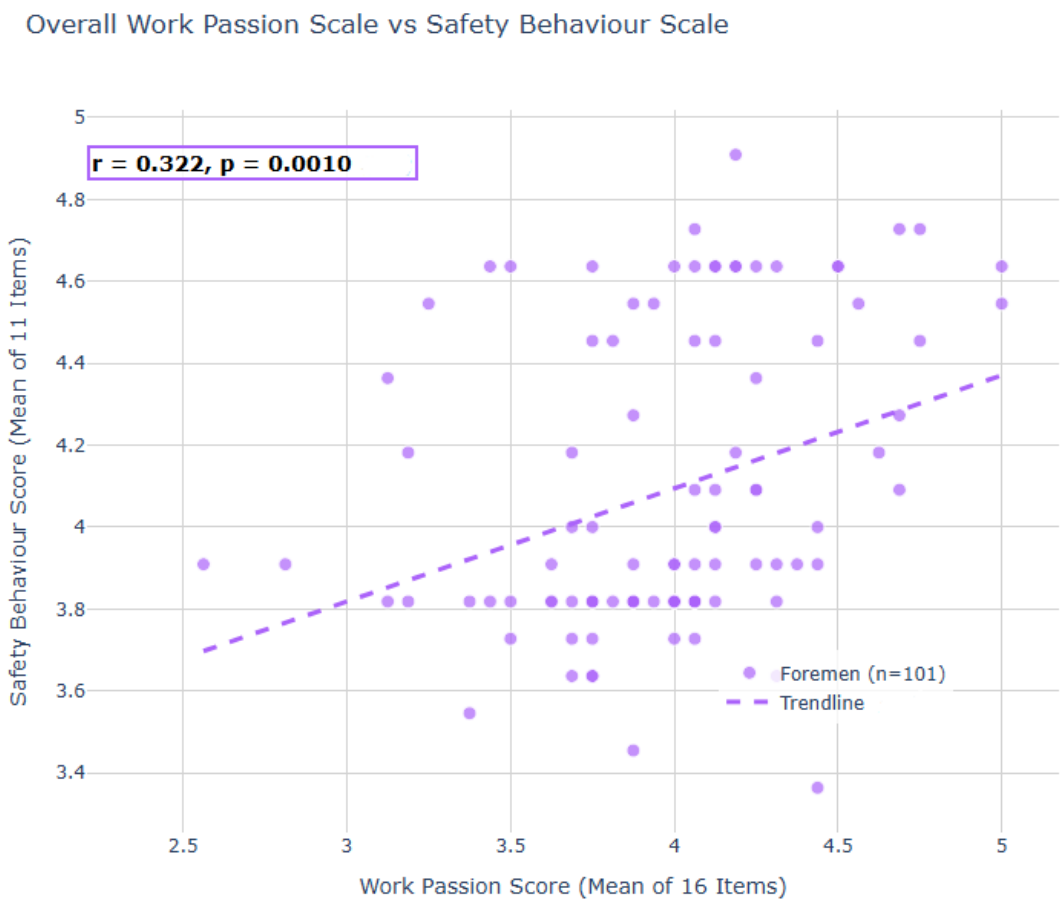


**Chart 5: Relationship Between Overall Work Passion and Safety Behaviour**

Furthermore, with the Generative Quadratic AI Spreadsheet Software, the foreman years of experience with regards to their work passion and safety behaviour responses were also included (Quadratic, 2026). See Chart 6.

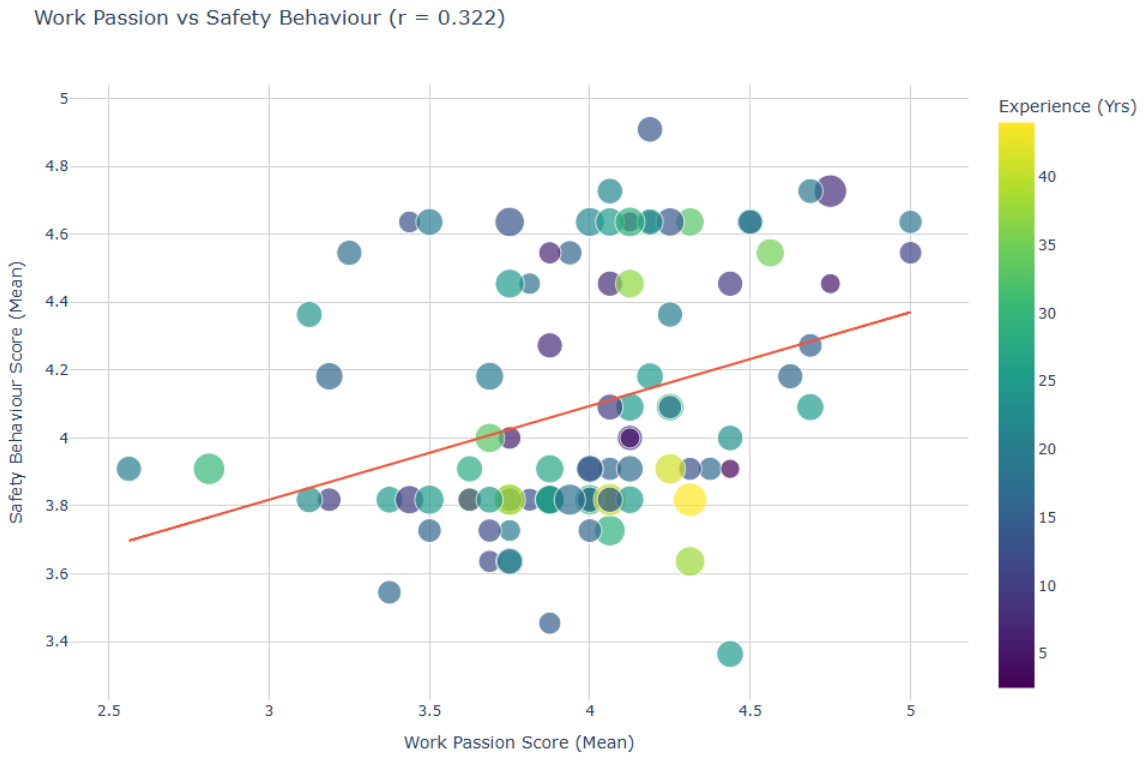


**Chart 6: Foremen Years of Experience with Work Passion and Safety Behaviour**

### 5.3.3 Dimension Specific Relationship between Work Passion and Safety Behaviour

In breaking the Work Passion Scale into specific dimensional level analysis, the following in Table 4 was obtained for each of the four dimensions. Visual representation is shown in Chart 7.

**Table 4: Correlation per Work Passion Scale Dimension with Safety behaviour**

| Dimension | Dimension Mean | Pearson r | p-value | Significance |
|---|---|---|---|---|
| Overall Work Passion | 3.978 | 0.3219 | 0.00103 | Yes |
| Work Enjoyment (Q1-Q5) | 3.966 | 0.0959 | 0.339975 | No Significance (ns) |
| Self Motivation (Q6-Q9) | 3.284 | 0.0913 | 0.363702 | No Significance (ns) |
| Self Identity (Q10-Q13) | 4.119 | 0.4513 | 0.000002 | Yes |
| Sense of Learning (Q14-Q17) | 4.371 | 0.3388 | 0.00053 | Yes |


**Chart 7: Visual Representation Correlation per Work Passion Scale Dimension and Safety behaviour**

Charts 8,9, 10 and 11 show the scatter plots with trendlines for specific dimensions of work passion and its relation to safety behaviour.

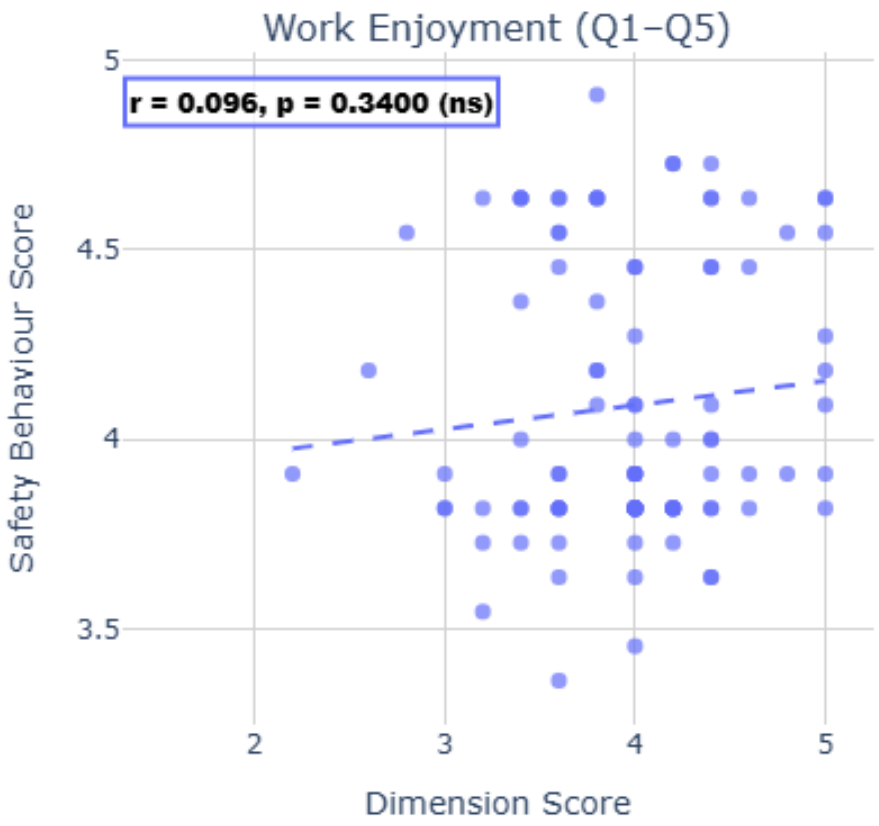


**Chart 8: Relationship Between Work Enjoyment and Safety Behaviour**

This demonstrates that simply enjoying the work is not a significant predictor of safety behaviour.

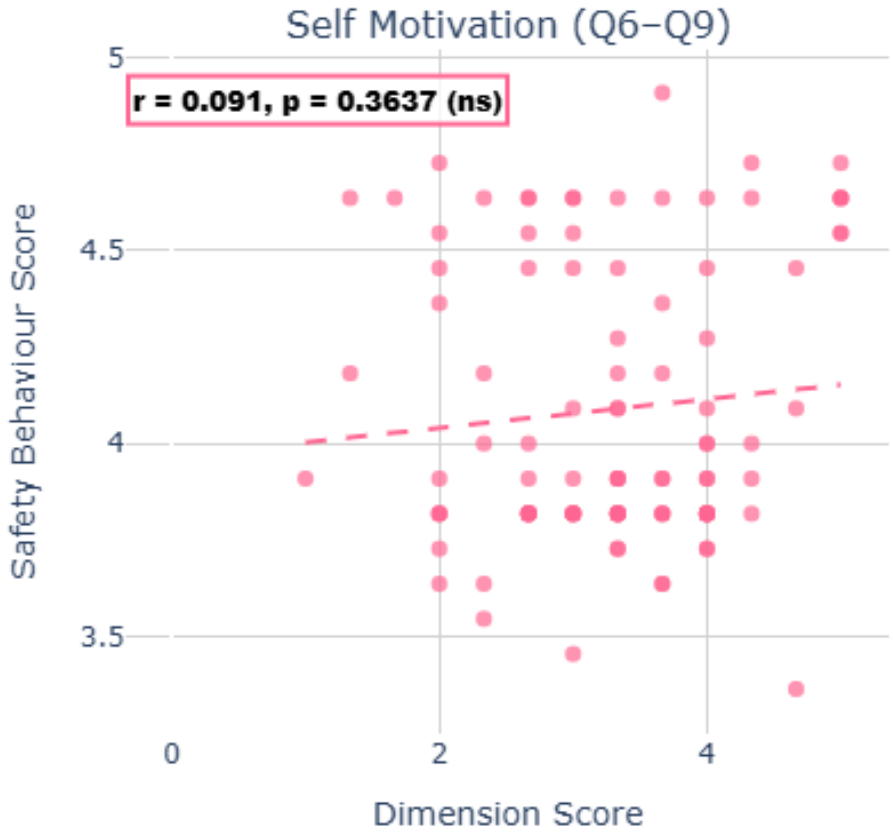


**Chart 9: Relationship Between Self Motivation and Safety Behaviour**

This demonstrates just being self motivated in the work is not a significant predictor of safety behaviour. External motivation is likely high in their relationship with their work.

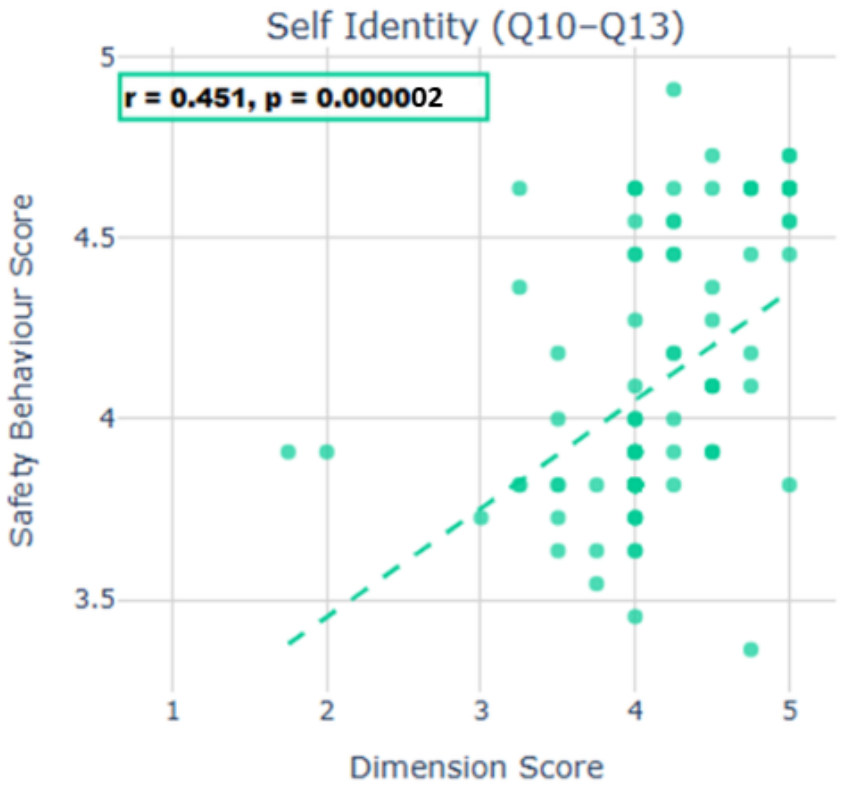


**Chart 10: Relationship Between Self Identity and Safety Behaviour**

Self Identity was found to be the strongest predictor of safe behaviour. Foremen that identified strongly with their work were significantly more conscious with regards to their safety. If work was central to their identity, it can be seen that the foremen protect that identity by working safely.

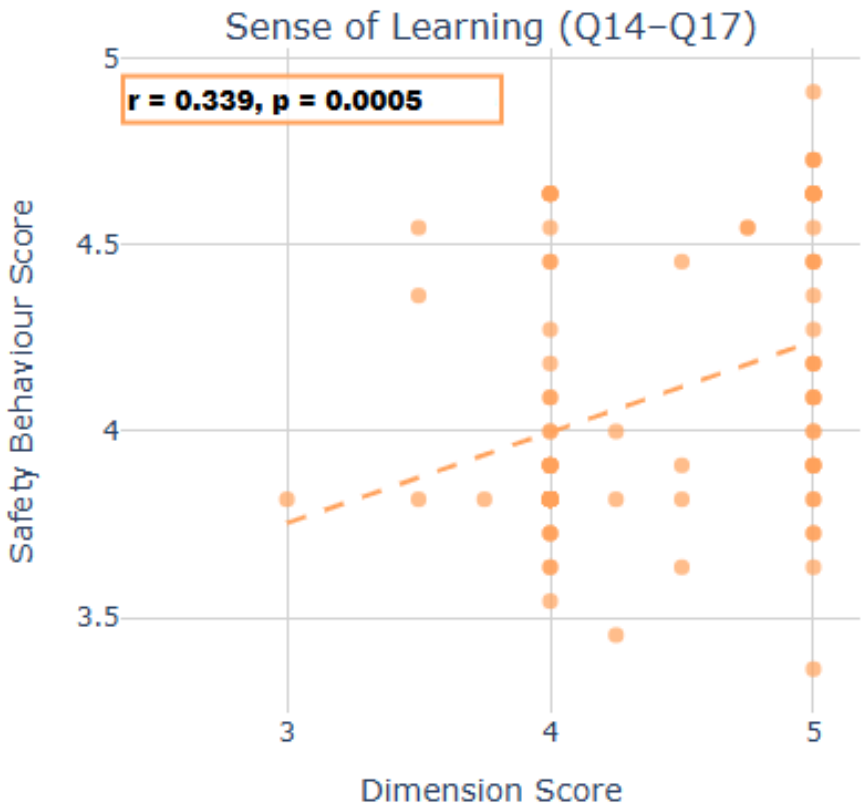


**Chart 11: Relationship Between Sense of Learning and Safety Behaviour**

Sense of learning was found to be the second strongest predictor of safe behaviour. Foremen that expressed the desire to keep learning were significantly more safe in their behaviour. Potentially the learning-oriented foremen would be more open to safety trainings and protocols. This will be discussed in the subsequent section.

## 6. Discussion

From the results, it was found that not all dimensions equally impacted safety behaviour among construction foremen. The relationship was primarily led by *self identity* (SI) and *sense of learning* (SOL). Foremen that identified with construction being the core of who they are in their personal values, as well as those that prioritized continuous learning in their work were found to behave most safely.

In this section, the discussion of results both in the quantitative extraction and qualitative observations will be done with regards to demographic profile, correlational results and contributions to the knowledge gap. This discussion of the interpreted results are a combination of existing theory and literature, anecdotal testimonies from gathered in-person surveys, and the researcher experience working in the construction industry.

Then, as per Obj 3, practical implications for fostering professional identity and encouraging a learning focused culture in its effectiveness will be discussed. Then, limitations of the study will be noted.

## 6.1 Discussion of Demographic Profile

### 6.1.1 Age Distribution and Years of Experience

The respondents were of the mean age of 43.2 years, ranging from 23 to 71 years old and averaged 19.9 years in experience. This would accurately reflect the aging Canadian construction workforce (BuildForce Canada, 2022). Ng & Feldman (2010) found that older workers often exhibited stronger safety compliance and more caution from behaviours developed overtime in their exposure of their workplace field hazards.

Developmental research shows that professional identity strengthens with age and experience as "[at] more advanced levels of professional identity formation, the exemplary professional's personal and moral values are fully integrated and consistent across context and situation. They are able to articulate the public duties of the profession, integrate them with personal value frameworks, and regularly and consistently engage in socially responsible actions. The identity of such exemplary professionals is contrasted with the identities of entering students [and] entering professionals" (Bebeau & Monson, 2011). This lends to understanding the strong correlation between Self Identity and Safety Behaviour ($r = 0.451$). As younger foremen may still be internalizing and forming their professional identity, and exhibit different safety behaviour patters to their older, more seasoned colleagues.

Burke et al. (2002) also found that experienced workers with more depth in practice and knowledge performed more effectively with consistent safety tasks as they recognized hazards with developed mental models of risk established over time.

### 6.1.2 Diversity in Trades

The data collected included respondents from 51 unique trades in the GTA from structural forming, heavy civil to electrical, plumbing, and other specialty trades. This diversity strengthened this research study as it reflects the real complexity of construction work and the continuous interaction and interrelated operation within several trades (Hinze et al., 2013). Despite the different types and levels of hazard faced in the trades, the relationship between work passion and safety behaviour remained consistent regardless of the exposed risk profile. This supported the idea that safety culture in construction is multi-trade in nature and not confined to a single trade discipline (Choudhry & Fang, 2008).

The trade diversity also allowed for a glimpse in the composition of Toronto's current construction focus. The most frequently represented trades being structural forming and heavy civil highlights the fulfilment of the municipal planning to have sustained growth in vertical construction with high rise residential buildings and infrastructure renewal in the city (City of Toronto, 2023).

It must also be noted that all participants were based out of Toronto. While this could limit generalizability, it also allowed for controlling the differences in regulatory practices and standards across a variety of geographic locations.

### 6.1.3 Organizational Differences- Company Representation

Participants noted being a part of more than 50 different companies, including major national contractors such as PCL, Aecon, EllisDon, Kiewit and Bird Construction as well as smaller subcontractors such as Soncin, Recon, Mondiale etc.

Safety culture can potentially vary widely across organizations (Clarke, 2006), yet the correlations in this study remained consistent. Here, Self Identity and Sense of Learning influenced safety behaviour regardless of company differences in management. This could demonstrate that such dimensions can be targeted in an individual-level nature as a psychological construct and ultimately complement it in an organizational- level through its permeation across the larger company culture and policy.

### 6.1.4 Level of Expertise

In this study, almost all participants (100 out of 101) rated themselves as “Highly Proficient” in their respective roles and trades. While this could be attributed to the social desirability bias (Piedmont, 2024), it could also be that with a mean experience of nearly 20 years, the foremen consider themselves high in proficiency. So, since all respondents selected the same category, this variable would have little statistical value, and actually demonstrate how the findings of WPS and SBS relation would apply specifically to a highly skilled group of foremen.

### 6.1.5 Survey Administration

In this study, 100 out of 101 surveys were completed in person and 1 via phone call. This ultimately strengthened research as face-to-face interviews allowed for clarification in questions to limit misinterpretation from varying literacy levels (Bryman, 2016) as well as language competencies of the foremen (Lingard & Rowlinson, 2005). In-person administration also allowed the researcher to observe specific site conditions in varying safety requirements per project, as well as add useful qualitative context from environmental conditions and personal anecdotes from the jobsite foremen. All of which ultimately enriched the collected data (Creswell & Plano Clark, 2018).

## 6.2 Discussion of Correlation Results

The results show that there is a relationship between work passion and safety behaviour, but that not all of Work Passion's subsequent dimensions have equal predictive power for safety behaviour analysis. The theoretical and practical insights for the dimensions are as follows:

### 6.2.1 Work Enjoyment and Safety Behaviour

The Work Enjoyment dimension, measured with Questions 1-5 yielded a mean score of 3.97. It showed no statistical correlation with Safety Behaviour ($r = 0.096$, $p = .340$). Although it would seem intuitive that enjoying one's work would lead to safer behaviours, theories point to a different direction. Research in 'Flow States' by Csikszentmihalyi (1990) suggests that deep enjoyment of an activity lends to such absorption and immersion in the task for the worker that sometimes, peripheral awareness and safety hazards can be compromised. Similarly, the Risk Homeostasis Theory (Wilde, 1982) also suggests that when there is an increased enjoyment in work, there is potentially an increased comfort and therefore greater risk tolerance. While the relatively high mean score for Work Enjoyment (3.97/5) indicates that the respondents enjoy their work, its presence alone is insufficient to promote safe behaviour. In the context of the construction industry, even though work enjoyment can have benefits for worker morale and job satisfaction (Judge et al., 2001) these findings caution against relying solely on creating an enjoyable workplace environment for safe work practice.

### 6.2.2 Self Motivation and Safety Behaviour

The Self Motivation dimension, measured with Questions 6-9 yielded a mean score of 3.28. It showed no statistical correlation with Safety Behaviour as the lowest scoring dimension ($r = 0.091$, $p = .364$). While intrinsic motivation has shown to improve performance (Gagné & Deci, 2005), safety behaviour in its compliance often requires a motivational orientation that is grounded more in duty, obligation and professional responsibility than just enthusiastic drive.

Also, as mentioned previously, Neal and Griffin (2006) distinguish the concept of safety behaviour into 'safety compliance' and 'safety participation'. In this study, this differentiation is not made when calculating the correlational results. It could be possible that self motivation may relate more with *participation* than *compliance*, where motivated individuals demonstrate more proactive participatory behaviours. The lower mean score of 3.28/5 in Self Motivation can be attributed simply to the nature of the work in construction compared to other professional settings (Dainty, Green, & Bagilhole, 2007). It is difficult to express autonomous self motivating behaviours when the work has external constraints, tight schedules, weather dependence and rigid hierarchies with structural chains of command.

### 6.2.3 Self Identity and Safety Behaviour

The Self Identity dimension, measured with Questions 10-13 yielded a mean score of 4.12. It showed the strongest statistical correlation with Safety Behaviour ($r = 0.451$, $p < .001$). This means that foremen who held strong professional identities and alignment with their craft exhibited safer behaviours.

This finding is the most theoretically important contribution of this research. According to Social Identity Theory by Tajfel & Turner (1979), individuals derive a large portion of their self concept from their social roles in group membership. This would mean that foremen who internalize their professional roles as a core part of their identity would more consistently adhere to the values, expectations and actions in accordance to that specific role. So, Foremen who see themselves as professionals, rather than simply an employee performing a job, would view safety as integral to their role and professional duty.

Ultimately, this lends itself to the Theory of Communities of Practice by Wenger (1998), which posits that identity formation happens through participation in professional communities and development of shared repertoires of practice. With that, in construction, this can be contextualized with programs which cultivate and nurture professional identity as mechanisms in improving safety behaviours. This way, building self-efficacy would allow self-identity to manifest in proactive safety behaviours like risk management & control, corrective actions and hazard identifications.

### 6.2.4 Sense of Learning and Safety Behaviour

The Sense of Learning Identity dimension, measured with Questions 14-17 yielded a mean score of 4.37. It showed the second strongest statistical correlation with Safety Behaviour ($r = 0.339$, $p < .001$). Here, foremen that value learning and professional growth within their field showed increased tendency to practice safer behaviours. At an individual level, foremen that embody the sense of learning would more likely stay updated in the new safety standards, hazard controls and best practices in this rapidly advancing industry.

The two main supporting mental models of foremen practicing the Sense of Learning in work passion would be the Safety-II thinking (Hollnagel, 2018), and the Double Loop Learning (Argyris and Schön, 1978). The Foremen engaging in Safety-II thinking often emphasise their understanding of why things go *right* in the jobsite instead of just fixing problems after failure of when they go wrong. In conjunction, the Double Loop Learning means that the foremen question and challenge existing safety practices to understand the underlying assumptions and advocate for improvements (as opposed to Single Loop, which would be merely complying with established protocols and correcting errors within existing violations).

With this, a learning oriented foreman would be looking to proactively understand the conditions that allow for better hazard anticipation as well as risk management, which allows for consistent safe behaviour.

### 6.2.5 Junction of Self Identity- Sense of Learning

In the overlapping intersection of Self Identity and Sense of Learning, the foreman can be described as one that sees their work as being meaningful and is committed, within their work, to growth. This particular junction resembles the definition of a "Calling" or vocation (Wrzesniewski et al., 1997), which is linked to a heightened sense of responsibility in one's work. Here, a proposed conjecture can be made that foremen who experience their work as a calling are likely to associate with safer work practices by scoring high in Self Identity and Sense of Learning dimensions. This conjecture is especially notable as a fantastically similar study has been conducted in an adjacent high-risk field as discussed in the Literature Review above. Wu et al., (2022) investigated and found that a significant relationship exists between sense of calling and safety behavior among airline pilots.

## 6.3 Contribution to Knowledge Gap

### 6.3.1 Work Passion and Safety Behaviour in the Construction Industry

Firstly, this study addressed a significant and critical gap in the existing literature of construction research. By empirically examining the relationship between work passion and safety behaviour, this research pioneered a level of understanding in a previously unexplored and unexamined area of study. By establishing that Work Passion, and particularly Self Identity and Sense of Learning significantly corelate to safety behaviour, this study opens an entirely new avenue for examination and study. Similarly, the application of an existing scale of the 'Work Passion Scale' by Jhori et al. (2016) in the construction occupational context also represents a novel contribution with regards to its validity.

### 6.3.2 Dimensional Specificity

The results of this study also contribute to the nuanced theoretical understanding of work passion. In demonstrating that there are specific dimensional differences with safety outcomes, it emphasizes the dimensional specificity of passion.

The finding that Self Identity ($r = 0.451$, $p < .001$) and Sense of Learning ($r = 0.339$, $p < .001$) is correlated with safety behaviour while Work Enjoyment ($r = 0.096$, $p = .340$) and Self Motivation ($r = 0.091$, $p = .364$) are not challenges the simplistic conceptualizations of 'passion' as just one umbrella unit. While this brings further nuance to the idea of passion being multidimensional (Vallerand et al., 2003), it also adds a new predictor to safety behaviour models (Christian et al., 2009; Neal & Griffin,

2006), suggesting that identity and learning orientation can potentially be explored further as a stable psychological foundation for safe behaviour.

## 6.4 Implications in the Industry

### 6.4.1 Re-imagining Construction Safety Training

Traditionally, existing safety trainings predominantly focus on rules, enforcement, regulations and procedural compliances (Burke et al., 2006). While still necessary, the findings from this research propose re-imaging safety training to also address psychological factors- especially Self Identity and Sense of Learning. With this, workers can be empowered as knowledgeable strongly identifying professionals with a learning mindset as opposed to potential violators needing control.

The proposition is the shift from a *compliance* oriented to a *commitment* oriented culture so that safety is not pursued as a checklist requirement, but because it is integral to the identity of the foremen.

A few practical training strategies can be as follows:

**Table 5: Practical Training Strategies**

| Training Strategies | Supporting Purpose |
|---|---|
| Mentorship Programs | Connecting younger/newer foremen early in their career with an experienced foremen specifically to share not just technical skills but also their experience with professional values and identity. |
| Story-telling and Case study approaches | Developing a story telling and case study approach that connects identity and pride for ones craft. |
| Intentional continuous Learning | Creating pathways for continuous learning with new technologies and best practices- while framing them as aligning with foremen professional identity. |
| Intentional Reflective practices | Encouraging foremen to reflect on decisions, both positively and also critically for future improvement, connecting professional identity with safe practices. |
| Incorporating into existing practices | Instead of a complete thorough introduction of a new mental model, it can be helpful to incorporate the proposed practices in items like toolbox talks, safety stand down and morning huddles to begin. |

These findings also have an implication for hiring foremen for future projects. If self identity and sense of learning can predict safety outcomes, the selection process can be specific in nature. In addition to their technical and general leadership competencies, hiring practices can assess the candidate's pride in their trade and willingness to learn in the interview questions and evaluations.

### 6.4.2 Fostering Professional Identity

Oftentimes, the perception of construction work and trades can be undervalued as being a fall-back as opposed to a prestigious career option (Dainty, Green, & Bagilhole, 2007). As per this study's primary finding, Self Identity has the strongest correlation with safety behaviour. As such, the industry can benefit from investing in strategies that foster and strengthen the professional identity for construction foremen.

See table below for proposed strategies that encourage workforce pride and ultimately improve safety behaviour:

**Table 6: Strategies for Fostering Professional Identity**

| Practicing Strategies | Supporting Purpose |
|---|---|
| Identity focused onboarding | Identity focused hiring practices as discussed before can communicate identity-based responsibility and values early in the process. |
| Clear career pathways | Clear and strategic career pathways reinforces long-term identification with the industry. |
| Recognition of Professional excellence | As other fields, award shows, recognition ceremonies and safety as a parameter for professional excellence improves social status of construction work and elevates the perception of the trades. |
| Professional Foremen Associations | Encouragement to actively participate in professional associations for foremen creates community recognition. |

As discussed, per Wenger's model of Communities of Practice (1998), these strategies allow for a space where foremen can share their experiences, discuss challenges and deepen identity-based solutions for better safety performance.

## 6.5 Limitations of the Study

While this study makes several meaningful contributions to the construction industry, some of the limitations must be acknowledged so as to contextualize the current research and guide future pathways.

### 6.5.1 Geographic Location

All participants were located in the Greater Toronto Area. While Toronto is one of the most diverse construction marker in North America, (City of Toronto, 2023), it must be noted that these findings have to be regarded with nuance in generalizing in other geographic regions and countries. As construction practices regulatory environments and cultural safety attitudes differ across varying locations (Mearns & Yule, 2009), future research should replicate this in several different cultural contexts to further understand this relationship.

### 6.5.2 Self Reporting Bias

As previously mentioned, the self-reporting nature of the questionnaire allowed foremen to self evaluate their behaviours. The social desirability bias, in attempting to present oneself favourably (Piedmont, 2024), could have encouraged foremen to over-report their behavioural competencies and passion for work. Future research can include more objective measures such as incident reports, audit scores and near miss data. This way, a more direct measurement of safety behaviour can be obtained.

### 6.5.3 Selection Bias

In employing convenience sampling, this study could have introduced selection bias as those foremen that agreed to participate could already posses certain traits different than those that declined. For example, they could be more passionate, extroverted, comfortable with self reflection and more safety conscious. This would limit complete generalizability, especially with regards to the self identity dimension as foremen with a strong professional identity would potentially be more likely to participate in a study affirming this identity. For future studies, random sampling can be done to enhance representation of the different kinds of foreman participants.

# 7. Conclusion and Recommendations

## 7.1 Summary of Key Findings

This study examined the relationship between work passion and safety behaviour among construction foremen across 51 different trades and 50+ companies in the Greater Toronto Area (GTA). Although work passion has been studied in other fields, it had not been empirically associated with safety in construction.

This study found a positive correlation between overall Work Passion and Safety Behaviour ($r = 0.322$, $p = .001$). This demonstrated that work passion is indeed a meaningful psychological factor in understanding and predicting construction safety. Yet, more importantly, the research also major contributions in its discovery that not all dimensions of passion matter equally:

- Work Enjoyment ($r = 0.096$, $p = .340$) and Self Motivation ($r = 0.091$, $p = .364$) did *not* predict safety behaviour. While these factors supported job satisfaction in general (Judge et al., 2001), they did not influence the level of jobsite safety of construction foremen work.
- Self Identity ($r = 0.451$, $p < .001$) was the strongest predictor of safety behaviour. Foremen who see their trade as part of who they are follow safety norms more diligently.
- Sense of Learning ($r = 0.339$, $p < .001$) was the second strongest predictor. Foremen who valued active and continuous learning demonstrated better safety behaviour.

## 7.2 **Recommendations for Future Research**

There can be several future directions taken to expand and strengthen this research:

- Future research for this study can control for other variables such as project types (residential, commercial, industrial), union status, shift patterns-nighttime, daytime, individual personality types, etc. in isolating their unique contributions to the relationship between work passion and safety behaviour.
- Longitudinal studies can be done to track foremen over time to see how passion develops and whether changes in identity or learning orientation-especially those foremen in the early stages of their career.
- There can be cross-cultural studies to understand whether the passion and safety relationship holds in different countries and regulatory environments.
- Research can also be done across job levels to explore whether similar patterns appear within labourers, project managers, or executives in the construction industry.
- Intervention can be done with focused programs that are specifically designed to strengthen identity and learning. As well, conducting experimental trails with these interventional programs comparing them to traditional safety training would provide strong pragmatic evidence for industry use.

## 7.4 **Concluding Statement**

This study began with a previously untested and relatively simple question- does a construction foreman's passion for their work relate to their safety behavior on the jobsite? The answer, based on the 101 foremen respondents across 51 trades was a qualified 'Yes', but unsurprisingly, with all of its necessary nuance.

It is passion, and more importantly, the professional identity and learning attitudes associated with passion that relates to increased safety behavior on the jobsite.

In its contribution to the literary and industrial construction landscape as a whole, that the study ends where it began: with Bushnell's suggestion to *"Hire for passion and intensity; there is training for everything else."* This research showed that perhaps he undersold it- turns out there can be training for passion too!

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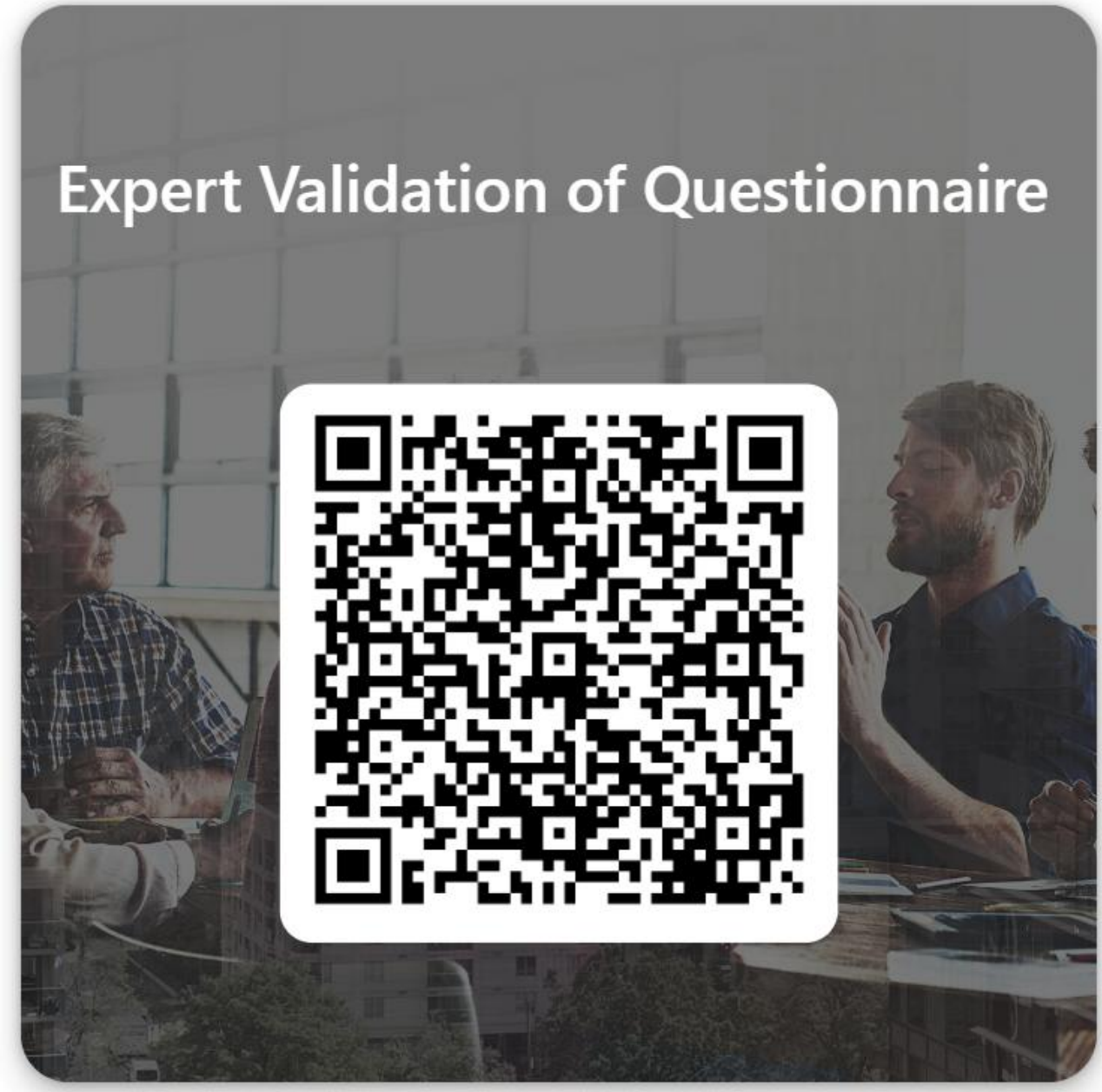
## 9. Appendices

### Appendix A- Expert Validation Questionnaire QR Code



**Appendix B- Survey Questionnaire Work Passion and Safety Behaviour QR Code**

**Appendix C- Question Set A- Demographic Questions**

**Q1: What trade are you a foreman of?**

a) Carpenter

b) Electrician

c) Plumber

d) Mason

e) Roofer

f) Other (please specify)

**Q2: Where are you located?**

**Q3: Name of Company: (Optional)**

**Q4: How many years of Experience do you have in the Construction field?**

**Q5: What is your expertise in the construction field:**

a) Highly Proficient

b) Moderately Proficient

c) Not Proficient

**Q6: By which method are you using to complete this Interview-Survey Questionnaire?**

a) In Person

b) online

b.1 QR code to online questions forms

b.2 Direct Link to online question forms from Interviewer

c) Phone call or video call

**Appendix D- Question Set B- The Work Passion Scale**

**I see myself as someone who…**

**Q1:** Enjoys my work

**Q2:** Really loves my work

**Q3:** Does not feel exhausted and bored while doing my work

**Q4:** Generally feels excited to go to my work

**Q5:** Feels good and lively at my work

**Q6:** Thinks I would still do this work, even I received less pay

**Q7:** Gets my motivation from the work itself and not from the rewards for it

**Q8:** Something inside me forces me to do my work

**Q9:** Often works extra hours even though nobody ask me to do so

**Q10:** Identifies myself with the work I do

**Q11:** Thinks that my work reflects qualities that I like about myself

**Q12:** Feels a sense of belongingness with my work

**Q13:** Thinks that the work I do is a cause of pride for me

**Q14:** Makes every effort to improve the work I do

**Q15:** Always attempts to find new and better ways of doing my work

**Q16:** Is ever willing to learn more and more about my work

**Q17:** often attempts to perform my work in the best possible way

**Appendix E- Question Set C- Safety Behaviour Scale**

**I see myself as someone who…**

**Q1:** overlooks safety procedures in order to get my job done more quickly.

**Q2:** follows all safety procedures regardless of the situation I am in

**Q3:** handles all situations as if there is a possibility of having an accident

**Q4:** wears safety equipment required by practice

**Q5:** keeps workplace clean

**Q6:** encourages co-workers to be safe

**Q7:** keeps my work equipment in safe working condition

**Q8:** does not take shortcuts to safe working behaviors in order to get the job done faster

**Q9:** follows all safety rules and protocols even ones I think are unnecessary

**Q10:** reports safety problems to my supervisor when I see safety problems

**Q11:** corrects safety problems to ensure accidents will not occur

## Appendix F- Portable Question Set- For Site Collection

| Question Set A: General Questions | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Q1: What trade are you a foreman of? (Carpenter, Electrician, Plumber, Mason, Roofer, Other) | | | | | | | | | | |
| Q2: Where are you located? | | | | | | | | | | |
| Q3: Name of Company: (Optional) | | | | | | | | | | |
| Q4: How many years of Experience do you have in the Construction field? | | | | | | | | | | |
| Q5: What is your expertise in the construction field: (Highly Proficient, Moderately Proficient, Not Proficient) | | | | | | | | | | |
| Q6: By which method are you using to complete this Interview-Survey Questionnaire? (In Person, Online - QR/Link, Phone/Video Call) | | | | | | | | | | |
| | | | | | | | | | | |
| Question Set B: Work Passion Scale | | | | | | | | | | |
| Q1: Enjoys my work | | | | | | | | | | |
| Q2: Really loves my work | | | | | | | | | | |
| Q3: Does not feel exhausted and bored while doing my work | | | | | | | | | | |
| Q4: Generally feels excited to go to my work | | | | | | | | | | |
| Q5: Feels good and lively at my work | | | | | | | | | | |
| Q6: Thinks I would still do this work, even I received less pay | | | | | | | | | | |
| Q7: Gets my motivation from the work itself and not from the rewards for it | | | | | | | | | | |
| Q8: Something inside me forces me to do my work | | | | | | | | | | |
| Q9: Often works extra hours even though nobody ask me to do so | | | | | | | | | | |
| Q10: Identifies myself with the work I do | | | | | | | | | | |
| Q11: Thinks that my work reflects qualities that I like about myself | | | | | | | | | | |
| Q12: Feels a sense of belongingness with my work | | | | | | | | | | |
| Q13: Thinks that the work I do is a cause of pride for me | | | | | | | | | | |
| Q14: Makes every effort to improve the work I do | | | | | | | | | | |
| Q15: Always attempts to find new and better ways of doing my work | | | | | | | | | | |
| Q16: Is ever willing to learn more and more about my work | | | | | | | | | | |
| Q17: Often attempts to perform my work in the best possible way | | | | | | | | | | |
| | | | | | | | | | | |
| Question Set C: Safety Behaviour Scale | | | | | | | | | | |
| Q1: overlooks safety procedures in order to get my job done more quickly. | | | | | | | | | | |
| Q2: follows all safety procedures regardless of the situation I am in | | | | | | | | | | |
| Q3: handles all situations as if there is a possibility of having an accident | | | | | | | | | | |
| Q4: wears safety equipment required by practice | | | | | | | | | | |
| Q5: keeps workplace clean | | | | | | | | | | |
| Q6: encourages co-workers to be safe | | | | | | | | | | |
| Q7: keeps my work equipment in safe working condition | | | | | | | | | | |
| Q8: does not take shortcuts to safe working behaviors in order to get the job done faster | | | | | | | | | | |
| Q9: follows all safety rules and protocols even ones I think are unnecessary | | | | | | | | | | |
| Q10: reports safety problems to my supervisor when I see safety problems | | | | | | | | | | |
| Q11: corrects safety problems to ensure accidents will not occur | | | | | | | | | | |

## Appendix G- Content Validity- Mean Score on Simplicity

**SIMPLICITY**

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** Enjoys my work | 3 | 2 | 3 | 4 | 3 | 4 | 3.17 |
| **Q2:** Really loves my work | 3 | 3 | 4 | 4 | 3 | 4 | 3.50 |
| **Q3:** Does not feel exhausted and bored while doing my work | 3 | 3 | 3 | 4 | 4 | 3 | 3.33 |
| **Q4:** Generally feels excited to go to my work | 3 | 4 | 3 | 3 | 4 | 4 | 3.50 |
| **Q5:** Feels good and lively at my work | 3 | 4 | 3 | 3 | 4 | 4 | 3.50 |
| **Q6:** Thinks I would still do this work, even I received less pay | 2 | 1 | 4 | 3 | 4 | 4 | 3.00 |
| **Q7:** Gets my motivation from the work itself and not from the rewards for it | 3 | 3 | 3 | 2 | 3 | 4 | 3.00 |
| **Q8:** Something inside me forces me to do my work | 3 | 2 | 3 | 3 | 3 | 2 | 2.67 |
| **Q9:** Often works extra hours even though nobody ask me to do so | 2 | 4 | 4 | 4 | 3 | 4 | 3.50 |
| **Q10:** Identifies myself with the work I do | 3 | 4 | 4 | 4 | 3 | 4 | 3.67 |
| **Q11:** Thinks that my work reflects qualities that I like about myself | 2 | 3 | 4 | 3 | 3 | 4 | 3.17 |
| **Q12:** Feels a sense of belongingness with my work | 3 | 4 | 4 | 4 | 3 | 4 | 3.67 |
| **Q13:** Thinks that the work I do is a cause of pride for me | 2 | 3 | 3 | 4 | 3 | 4 | 3.17 |
| **Q14:** Makes every effort to improve the work I do | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q15:** Always attempts to find new and better ways of doing my work | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q16:** Is ever willing to learn more and more about my work | 2 | 3 | 4 | 4 | 4 | 4 | 3.50 |
| **Q17:** often attempts to perform my work in the best possible way | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| | | | | | | sum (without 8) | 3.45 |

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** overlooks safety procedures in order to get my job done more quickly. | 3 | 3 | 4 | 4 | 4 | 4 | 3.67 |
| **Q2:** follows all safety procedures regardless of the situation I am in | 3 | 4 | 3 | 2 | 4 | 4 | 3.33 |
| **Q3:** handles all situations as if there is a possibility of having an accident | 2 | 3 | 3 | 3 | 3 | 4 | 3.00 |
| **Q4:** wears safety equipment required by practice | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| **Q5:** keeps workplace clean | 4 | 4 | 4 | 3 | 3 | 4 | 3.67 |
| **Q6:** encourages co-workers to be safe | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| **Q7:** keeps my work equipment in safe working condition | 3 | 4 | 3 | 3 | 3 | 4 | 3.33 |
| **Q8:** does not take shortcuts to safe working behaviors in order to get the job done | 2 | 4 | 4 | 4 | 4 | 4 | 3.67 |
| **Q9:** follows all safety rules and protocols even ones I think are unnecessary | 3 | 4 | 3 | 3 | 3 | 4 | 3.33 |
| **Q10:** reports safety problems to my supervisor when I see safety problems | 2 | 4 | 4 | 3 | 3 | 2 | 3.00 |
| **Q11:** corrects safety problems to ensure accidents will not occur | 3 | 3 | 4 | 4 | 3 | 4 | 3.50 |
| | | | | | | sum | 3.50 |

## Appendix H- Content Validity- Mean Score on Clarity

**CLARITY**

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** Enjoys my work | 3 | 3 | 3 | 4 | 3 | 4 | 3.33 |
| **Q2:** Really loves my work | 3 | 3 | 4 | 4 | 3 | 4 | 3.50 |
| **Q3:** Does not feel exhausted and bored while doing my work | 3 | 2 | 4 | 4 | 3 | 3 | 3.17 |
| **Q4:** Generally feels excited to go to my work | 3 | 4 | 3 | 3 | 3 | 4 | 3.33 |
| **Q5:** Feels good and lively at my work | 3 | 4 | 3 | 3 | 4 | 4 | 3.50 |
| **Q6:** Thinks I would still do this work, even I received less pay | 2 | 3 | 4 | 3 | 4 | 4 | 3.33 |
| **Q7:** Gets my motivation from the work itself and not from the rewards for it | 3 | 4 | 3 | 3 | 4 | 4 | 3.50 |
| **Q8:** Something inside me forces me to do my work | 3 | 2 | 3 | 2 | 3 | 2 | 2.50 |
| **Q9:** Often works extra hours even though nobody ask me to do so | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q10:** Identifies myself with the work I do | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q11:** Thinks that my work reflects qualities that I like about myself | 3 | 3 | 4 | 3 | 4 | 2 | 3.17 |
| **Q12:** Feels a sense of belongingness with my work | 3 | 4 | 4 | 4 | 3 | 4 | 3.67 |
| **Q13:** Thinks that the work I do is a cause of pride for me | 3 | 3 | 3 | 4 | 4 | 4 | 3.50 |
| **Q14:** Makes every effort to improve the work I do | 2 | 4 | 4 | 4 | 3 | 4 | 3.50 |
| **Q15:** Always attempts to find new and better ways of doing my work | 3 | 4 | 4 | 4 | 4 | 3 | 3.67 |
| **Q16:** Is ever willing to learn more and more about my work | 2 | 4 | 4 | 4 | 3 | 4 | 3.50 |
| **Q17:** often attempts to perform my work in the best possible way | 2 | 4 | 4 | 4 | 4 | 4 | 3.67 |
| | | | | | | sum (without 8) | 3.50 |

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** overlooks safety procedures in order to get my job done more quickly. | 4 | 4 | 4 | 4 | 3 | 4 | 3.83 |
| **Q2:** follows all safety procedures regardless of the situation I am in | 4 | 4 | 3 | 3 | 3 | 4 | 3.50 |
| **Q3:** handles all situations as if there is a possibility of having an accident | 2 | 3 | 3 | 3 | 4 | 4 | 3.17 |
| **Q4:** wears safety equipment required by practice | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| **Q5:** keeps workplace clean | 3 | 4 | 4 | 3 | 4 | 4 | 3.67 |
| **Q6:** encourages co-workers to be safe | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q7:** keeps my work equipment in safe working condition | 3 | 4 | 3 | 3 | 3 | 4 | 3.33 |
| **Q8:** does not take shortcuts to safe working behaviors in order to get the job done | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q9:** follows all safety rules and protocols even ones I think are unnecessary | 4 | 4 | 3 | 3 | 3 | 4 | 3.50 |
| **Q10:** reports safety problems to my supervisor when I see safety problems | 3 | 4 | 4 | 3 | 4 | 2 | 3.33 |
| **Q11:** corrects safety problems to ensure accidents will not occur | 4 | 4 | 4 | 4 | 3 | 4 | 3.83 |
| | | | | | | sum | 3.62 |

## Appendix I- Content Validity- Mean Score on Relevance

**RELEVANCE**

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** Enjoys my work | 3 | 3 | 3 | 4 | 3 | 4 | 3.33 |
| **Q2:** Really loves my work | 3 | 3 | 4 | 4 | 4 | 4 | 3.67 |
| **Q3:** Does not feel exhausted and bored while doing my work | 3 | 4 | 3 | 4 | 4 | 3 | 3.50 |
| **Q4:** Generally feels excited to go to my work | 3 | 4 | 4 | 3 | 4 | 4 | 3.67 |
| **Q5:** Feels good and lively at my work | 3 | 4 | 3 | 3 | 4 | 4 | 3.50 |
| **Q6:** Thinks I would still do this work, even I received less pay | 3 | 2 | 4 | 4 | 4 | 4 | 3.50 |
| **Q7:** Gets my motivation from the work itself and not from the rewards for it | 4 | 3 | 3 | 4 | 4 | 4 | 3.67 |
| **Q8:** Something inside me forces me to do my work | 2 | 2 | 3 | 3 | 1 | 3 | 2.33 |
| **Q9:** Often works extra hours even though nobody ask me to do so | 4 | 4 | 4 | 4 | 3 | 2 | 3.50 |
| **Q10:** Identifies myself with the work I do | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q11:** Thinks that my work reflects qualities that I like about myself | 4 | 2 | 3 | 4 | 3 | 4 | 3.33 |
| **Q12:** Feels a sense of belongingness with my work | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q13:** Thinks that the work I do is a cause of pride for me | 3 | 4 | 3 | 4 | 4 | 4 | 3.67 |
| **Q14:** Makes every effort to improve the work I do | 3 | 4 | 4 | 4 | 4 | 4 | 3.83 |
| **Q15:** Always attempts to find new and better ways of doing my work | 4 | 4 | 4 | 4 | 4 | 3 | 3.83 |
| **Q16:** Is ever willing to learn more and more about my work | 3 | 3 | 4 | 4 | 4 | 4 | 3.67 |
| **Q17:** often attempts to perform my work in the best possible way | 2 | 4 | 4 | 4 | 3 | 4 | 3.50 |
| | | | | | | sum (without 8) | 3.61 |

| | Architect | Spec writer | Site Super | Project Manager | Proffessor | Safety Director | Mean Scores |
|---|---|---|---|---|---|---|---|
| **Q1:** overlooks safety procedures in order to get my job done more quickly. | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| **Q2:** follows all safety procedures regardless of the situation I am in | 4 | 4 | 3 | 4 | 3 | 4 | 3.67 |
| **Q3:** handles all situations as if there is a possibility of having an accident | 3 | 3 | 3 | 3 | 3 | 4 | 3.17 |
| **Q4:** wears safety equipment required by practice | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| **Q5:** keeps workplace clean | 3 | 4 | 4 | 3 | 4 | 4 | 3.67 |
| **Q6:** encourages co-workers to be safe | 3 | 4 | 4 | 4 | 3 | 4 | 3.67 |
| **Q7:** keeps my work equipment in safe working condition | 3 | 4 | 3 | 3 | 3 | 4 | 3.33 |
| **Q8:** does not take shortcuts to safe working behaviors in order to get the job done | 3 | 4 | 4 | 4 | 3 | 4 | 3.67 |
| **Q9:** follows all safety rules and protocols even ones I think are unnecessary | 4 | 4 | 3 | 3 | 3 | 4 | 3.50 |
| **Q10:** reports safety problems to my supervisor when I see safety problems | 3 | 4 | 4 | 3 | 3 | 4 | 3.50 |
| **Q11:** corrects safety problems to ensure accidents will not occur | 4 | 4 | 4 | 4 | 4 | 4 | 4.00 |
| | | | | | | sum | 3.65 |

## Appendix J- Survey Results Collected Data Set

| Question Set A: General Questions | | | | | | |
|---|---|---|---|---|---|---|
| Q1: What trade are you a foreman of? (Carpenter, Electrician, Plumber, Mason, Roof | Structural | Heavy Civi | Heavy Civi | Shoring | Sewer/Wa | Heavy Civi |
| Q2: Where are you located? | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| Q4: How many years of Experience do you have in the Construction field? | 10 | 24 | 23 | 3 | 22 | 10 |
| Q5: What is your expertise in the construction field: (Highly Proficient, Moderately Proficient, Not Proficient) | Highly | Highly | Highly | Highly | Highly | Highly |
| Q6: By which method are you using to complete this Interview-Survey Questionnaire | In person | In person | In person | In person | In person | In person |
| Question Set B: Work Passion Scale | | | | | | |
| Q1: Enjoys my work | 3 | 4 | 4 | 5 | 4 | 5 |
| Q2: Really loves my work | 3 | 4 | 4 | 5 | 4 | 5 |
| Q3: Does not feel exhausted and bored while doing my work | 3 | 2 | 2 | 5 | 2 | 5 |
| Q4: Generally feels excited to go to my work | 3 | 3 | 3 | 5 | 3 | 3 |
| Q5: Feels good and lively at my work | 3 | 4 | 4 | 5 | 4 | 3 |
| Q6: Thinks I would still do this work, even I received less pay | 1 | 1 | 1 | 5 | 2 | 3 |
| Q7: Gets my motivation from the work itself and not from the rewards for it | 3 | 1 | 1 | 1 | 5 | 4 |
| Q9: Often works extra hours even though nobody ask me to do so | 4 | 4 | 4 | 3 | 5 | 4 |
| Q10: Identifies myself with the work I do | 4 | 4 | 4 | 4 | 5 | 4 |
| Q11: Thinks that my work reflects qualities that I like about myself | 4 | 2 | 2 | 4 | 5 | 4 |
| Q12: Feels a sense of belongingness with my work | 4 | 4 | 4 | 4 | 5 | 4 |
| Q13: Thinks that the work I do is a cause of pride for me | 4 | 3 | 3 | 4 | 4 | 4 |
| Q14: Makes every effort to improve the work I do | 3 | 4 | 4 | 4 | 4 | 4 |
| Q15: Always attempts to find new and better ways of doing my work | 3 | 4 | 4 | 4 | 4 | 4 |
| Q16: Is ever willing to learn more and more about my work | 3 | 3 | 3 | 4 | 4 | 4 |
| Q17: Often attempts to perform my work in the best possible way | 3 | 3 | 3 | 4 | 4 | 4 |
| Question Set C: Safety Behaviour Scale | | | | | | |
| Q1: overlooks safety procedures in order to get my job done more quickly. | 3 | 1 | 2 | 1 | 1 | 2 |
| Q2: follows all safety procedures regardless of the situation I am in | 4 | 4 | 4 | 5 | 5 | 4 |
| Q3: handles all situations as if there is a possibility of having an accident | 4 | 4 | 4 | 5 | 5 | 4 |
| Q4: wears safety equipment required by practice | 4 | 4 | 2 | 5 | 5 | 4 |
| Q5: keeps workplace clean | 4 | 5 | 5 | 5 | 5 | 4 |
| Q6: encourages co-workers to be safe | 4 | 5 | 4 | 5 | 5 | 4 |
| Q7: keeps my work equipment in safe working condition | 4 | 5 | 5 | 5 | 5 | 4 |
| Q8: does not take shortcuts to safe working behaviors in order to get the job done fa | 3 | 5 | 5 | 5 | 5 | 4 |
| Q9: follows all safety rules and protocols even ones I think are unnecessary | 4 | 5 | 2 | 5 | 5 | 4 |
| Q10: reports safety problems to my supervisor when I see safety problems | 4 | 5 | 4 | 5 | 5 | 4 |
| Q11: corrects safety problems to ensure accidents will not occur | 4 | 5 | 5 | 5 | 5 | 4 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sewer/Wa | General La | General La | Heavy Civi | Utility | Utility | Sewer/Wa | Sewer/Wa | Heavy Civi | Heavy Civi | Utility | General La | Heavy Civi |
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 16 | 16 | 25 | 25 | 18 | 13 | 25 | 25 | 15 | 20 | 7 | 33 | 8 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 3 | 5 | 5 | 4 |
| 5 | 5 | 5 | 5 | 2 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4 |
| 4 | 5 | 2 | 5 | 2 | 4 | 5 | 5 | 4 | 1 | 4 | 5 | 4 |
| 4 | 5 | 4 | 4 | 2 | 3 | 5 | 5 | 4 | 1 | 4 | 5 | 4 |
| 4 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 2 | 4 | 2 | 4 |
| 4 | 1 | 4 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 4 | 4 | 1 |
| 3 | 5 | 3 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 5 | 5 | 4 | 4 | 3 | 3 | 4 | 1 | 4 | 2 | 5 |
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| 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 |
| | | | | | | | | | | | | |
| 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 4 | 1 | 1 |
| 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 2 | 5 | 4 | 5 | 4 |
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| 4 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 |
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| 5 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 4 |
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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Structural | Structural | General La | General La | Structural | Mechanica | General La | Utility | General La | Tiling | Roofing | Mason | Structural |
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 25 | 20 | 27 | 16 | 28 | 38.7 | 17 | 14 | 27 | 13 | 14 | 6 | 25 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | Phone call | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 3 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 3 | 4 | 4 | 4 |
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| | | | | | | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 1 | 1 | 1 | 1 |
| 2 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 2 | 5 | 5 | 4 | 5 |
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| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 4 | 5 |
| 4 | 4 | 5 | 4 | 5 | 4 | 2 | 5 | 4 | 5 | 5 | 4 | 5 |
| 1 | 4 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 4 | 5 |
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| 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Civi | Structural | Carpenter | Structural | Structural | Structural | Structural | Sewer/Wa | Structural | Sewer | Landscapi | Excavation | Carpenter |
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 17 | 25 | 29 | 13 | 20 | 8 | 44 | 29 | 16 | 7 | 10 | 12 | 13 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 |
| 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 |
| 2 | 2 | 2 | 2 | 2 | 1 | 4 | 4 | 2 | 2 | 4 | 2 | 1 |
| 4 | 4 | 4 | 4 | 2 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 2 | 1 | 4 | 4 | 5 | 5 | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
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| 5 | 5 | 2 | 2 | 1 | 5 | 2 | 4 | 4 | 2 | 4 | 2 | 4 |
| 5 | 5 | 5 | 2 | 2 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 |
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| 5 | 5 | 5 | 4 | 2 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 |
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| 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 |
| 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 |
| 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 |
| 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 4 | 5 |
| | | | | | | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 4 | 5 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 |
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| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 5 |
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| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 2 | 2 |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 2 | 2 |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |

| Tunnel | Plumbing | Concrete | Electrical | Steam fitte | Sprinkler | Drywall/ s | Fibre Splic | General la | coring | Iron worke | Concrete c | carpenter |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 24 | 22 | 25 | 17 | 19 | 10 | 35 | 11 | 8 | 17 | 12 | 16 | 13 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 5 | 5 | 4 | 5 | 5 | 3 | 5 | 5 | 4 | 5 | 4 | 4 | 5 |
| 4 | 5 | 2 | 4 | 5 | 3 | 5 | 5 | 4 | 5 | 3 | 4 | 5 |
| 4 | 3 | 4 | 3 | 4 | 3 | 4 | 5 | 4 | 3 | 3 | 4 | 5 |
| 4 | 3 | 2 | 3 | 3 | 2 | 4 | 5 | 4 | 4 | 3 | 4 | 2 |
| 4 | 5 | 4 | 1 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 2 | 2 | 1 | 3 | 3 | 2 | 1 | 5 | 2 | 1 | 2 | 4 | 2 |
| 3 | 3 | 4 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 2 |
| 4 | 1 | 1 | 1 | 5 | 2 | 1 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| | | | | | | | | | | | | |
| 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 3 | 5 | 4 | 4 | 3 | 4 | 5 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |

| carpenter | concrete | general lat | shoring | General fo | heavy con | carpenter | general fo | carpenter | general lat | general lat | general lat | excavation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 27 | 20 | 16 | 5 | 17 | 16 | 5 | 10 | 30 | 18 | 20 | 15 | 18 |
| Highly | Highly | Highly | Moderatel | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 4 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| 4 | 5 | 1 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 1 |
| 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 2 | 2 | 2 | 5 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 2 | 1 |
| 4 | 4 | 2 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 2 |
| 4 | 5 | 2 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 |
| 4 | 4 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 3 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| | | | | | | | | | | | | |
| 4 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 5 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
| 4 | 4 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| 4 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

| shoring | shoring op | General La | Rigging | Rigging | Rebar | Landscapir | Landscapir | General La | General La | Carpenter | Landscapir | Sewer and |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 2.5 | 15 | 30 | 18 | 10 | 39 | 25 | 33 | 26 | 12 | 25 | 25 | 18 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| 5 | 5 | 3 | 3 | 4 | 5 | 4 | 4 | 4 | 1 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 2 | 4 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 4 | 2 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 4 | 4 |
| 4 | 4 | 5 | 5 | 4 | 4 | 2 | 2 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 5 | 4 | 2 | 2 | 4 | 2 | 4 | 4 | 4 |
| 4 | 4 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 2 | 4 | 4 | 4 |
| 5 | 5 | 4 | 4 | 5 | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 |
| | | | | | | | | | | | | |
| 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 |
| 4 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 |
| 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 |
| 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 |
| 4 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 |
| 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 |
| 5 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 |
| 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 |

| Precast | General La | Mechanica | Electrical | Plumbing | Carpentry | Drywalls | Carpentry | Forming | Roadwork | General La | General La | General La |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto | Toronto |
| 42 | 23.5 | 5 | 30 | 22 | 17 | 20 | 19 | 35 | 38 | 25 | 25 | 25 |
| Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly | Highly |
| In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person | In person |
| | | | | | | | | | | | | |
| 4 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 |
| 4 | 4 | 5 | 2 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 5 |
| 4 | 4 | 4 | 4 | 5 | 4 | 2 | 5 | 4 | 4 | 3 | 4 | 4 |
| 4 | 4 | 4 | 2 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 3 | 3 |
| 4 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 4 |
| 4 | 4 | 4 | 1 | 1 | 4 | 1 | 5 | 5 | 2 | 4 | 2 | 2 |
| 4 | 4 | 4 | 1 | 3 | 4 | 1 | 5 | 5 | 4 | 5 | 4 | 4 |
| 4 | 5 | 4 | 1 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 4 |
| 4 | 4 | 4 | 1 | 2 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 3 |
| 4 | 4 | 4 | 2 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 |
| 5 | 4 | 4 | 1 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 4 |
| 4 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 |
| 4 | 5 | 4 | 5 | 4 | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 |
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| 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 5 | 5 |
| | | | | | | | | | | | | |
| 2 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| 4 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 3 | 4 | 5 | 4 |
| 4 | 4 | 4 | 4 | 2 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 |
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| 4 | 4 | 4 | 4 | 2 | 4 | 5 | 5 | 5 | 3 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 4 |
| 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 |

| Finishing | Heavy Equ | Concrete f | General La |
|---|---|---|---|
| Toronto | Toronto | Toronto | Toronto |
| 15 | 16 | 41 | 37 |
| Highly | Highly | Highly | Highly |
| In person | In person | In person | In person |
| | | | |
| 4 | 3 | 5 | 5 |
| 4 | 2 | 5 | 5 |
| 4 | 4 | 5 | 5 |
| 4 | 1 | 5 | 5 |
| 4 | 3 | 4 | 2 |
| 5 | 1 | 2 | 4 |
| 4 | 2 | 5 | 4 |
| 4 | 1 | 2 | 4 |
| 4 | 4 | 5 | 4 |
| 4 | 4 | 4 | 4 |
| 4 | 3 | 4 | 4 |
| 4 | 3 | 4 | 4 |
| 4 | 5 | 4 | 4 |
| 4 | 5 | 4 | 4 |
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| 4 | 5 | 5 | 4 |
| | | | |
| 2 | 2 | 1 | 1 |
| 4 | 4 | 5 | 5 |
| 4 | 5 | 5 | 5 |
| 4 | 4 | 4 | 5 |
| 4 | 5 | 4 | 5 |
| 4 | 5 | 4 | 5 |
| 4 | 5 | 4 | 5 |
| 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 5 |
| 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 |