

**BENCHMARKING CURRENT PERCEPTIONS OF GENERAL
CONTRACTORS OF RETURN ON INVESTMENT ON AFFORDABLE
REHABILITATION HOUSING PROJECTS: A CASE STUDY IN THE STATE
OF TEXAS**

A Thesis

by

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MASTER OF SCIENCE

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ABSTRACT

This exploratory case study investigates the perception of general contractors of affordable rehabilitation housing projects in the state of Texas. This study was carried out in collaboration with a corporation that is working on affordable rehabilitation housing in the state of Texas. For the purpose of maintaining anonymity, this organization is referred to as “Corporation X”. To evaluate the perceptions of the general contractors involved in affordable rehabilitation housing with Corporation X, face-to-face or Skype interviews were carried out. The results showed positive aspects, as well as attributes to be improved, from the general contractors’ perspective. Although the contractors do not expect a sizable return on investment, their morale is high due to the satisfaction they feel knowing they are helping underprivileged communities. The cost constraint compounded by the poor existing condition of the houses challenge the ability of general contractors to attain quality standards. However, the general contractors claim they maintain work with high standards of safety and so have not experienced accidents on these sites.

DEDICATION

To my loving family, Pedro Pablo Díaz Díaz, Aura Maria Puentes de Díaz and Carolina Díaz, for their patience and consistent support during my research and my life.

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1. INTRODUCTION

1.1 Background

This case study benchmarks the current general contractors' perception of return on investment when working on affordable rehabilitation housing projects developed by a not-for profit organization for low income residents in the state of Texas. For the purpose of maintaining anonymity this organization has been referred to as "Corporation X" in this case study.

Corporation X involved in this study was created in the mid-nineties. Its conviction is that every Texan deserves the right to live in a safe, decent and affordable house. Its corporate mission is to help low-income families and other underserved populations in Texas who do not have adequate housing options through conventional financial channels. In addition, the corporation has six main programs involved on various divisions of affordable housing at a statewide level.

This exploratory case study research helped benchmark general contractors' perception of return on investment on affordable rehabilitation housing projects in the state of Texas. On one hand, rehabilitation for affordable housing is the least traditional method used in construction where the developers do more work with lower budgets in a faster way (Hecht 2006). Although there are many general contractors capable of fulfilling the demand for this particular type of construction, factors such as target populations, budget

and scope of work might influence their willingness to participate in these projects (Hecht 2006).

On the other hand, a 2000 study by the Urban Institute found that not-for-profit developers significantly increased their capacity to generate affordable housing from 1990-2000. These findings are important for this study because it shows general contractors can be motivated to participate in these types of projects. If there are more general contractors willing to participate in these projects, the affordable housing sector could be positively impacted in terms of increase in number of affordable housing projects and quality of these projects due to the competition that will result due to more players in the sector.

The goal of this study was to gather information from general contractors regarding their thoughts and opinions about affordable rehabilitation housing projects. The intent was to reverse the negative perception about this area of construction. If Corporation X perceives that contractor participation increases following this research and its application, they will be able to expand more effectively serve more low-income communities.

To my knowledge, there has been no prior research on return on investment of affordable rehabilitation housing projects. This case study research attempts to fill this gap. Due to the lack of research with respect to general contractors' desire to work on

affordable rehabilitation housing projects this case study is intended to serve as a model for other corporations currently dealing with similar concerns.

1.2 Problem Statement

There is insufficient participation of general contractors in affordable rehabilitation housing initiatives in the state of Texas (Will & Baker 2013). This research benchmarked the current state of return on investment to the construction sector and to explore ways to make the sector of rehabilitation affordable housing more attractive to general contractors.

1.3 Goal

The goal of this exploratory case study research is to increase the participation of general contractors in the rehabilitation initiative of a non-profit Texas corporation within the sector of affordable housing. The intent is that findings from this research may serve as a case study for comparable organizations dealing with comparable situations.

1.4 Research Objectives

The objectives of this case study are to:

- a. Develop an inventory of root causes of problems to be able to compare the current state of the problem scenario within Corporation X with a future strategy to improve logistics and performance. Figure 1.1 is the graphical representation of the Plan-Do-Check-Act (PDCA) cycle of continuous improvement from current to future state which

forms the basis of lean thinking. OAEC stands for Owners, Architects, Engineer, and Contractors and represents the collaborative, improvement engine of lean (Rybkowski et al. 2013).

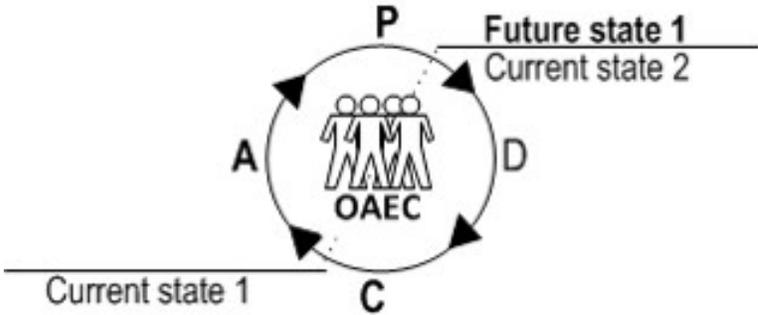


Figure 1.1 The Collaborative Improvement Engine of Lean (Rybkoswki et al. 2013).

- b. Utilize the metrics of lean construction such as safety, quality, cost, time, morale, and plus /delta analysis to benchmark the corporation current state and recommend opportunities to improve it to a better future state as show in Figure 1.2. (Liker 2004).
- c. Facilitate a communication channel between general contractors and Corporation X.

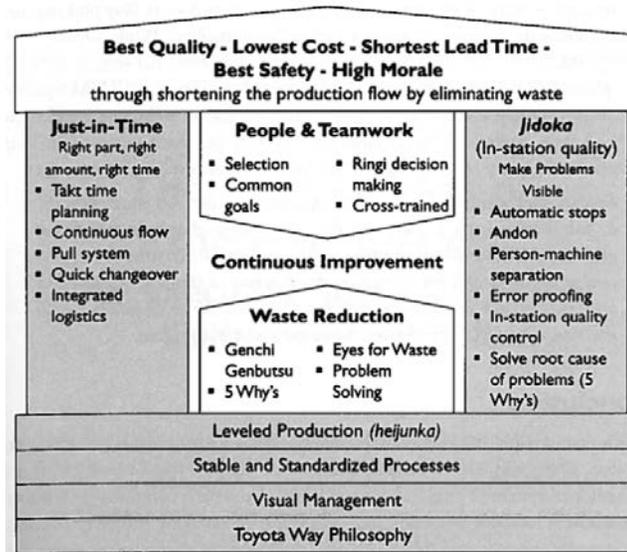


Figure 1.2 The Toyota Production System (Reprinted from Liker 2004, p.33 Fig 3-3).

2. LITERATURE REVIEW

2.1 Affordable Housing

According to *Out of Reach* (2013), an annual report by National Low Income Housing Coalition, affordability is defined as the situation where no more than 30% of a household's income is spent on gross housing costs. Having a place to call home has been a cornerstone of opportunity in America. Yet, too many Americans are severely restricted in their ability to obtain decent housing at an affordable cost. It seems that the breach between cost of housing and ability to pay is quite wide. For example, in Texas, the Fair Market Rent (FMR) for a two room apartment is \$826. To afford this level of rent and utilities without paying more than 30% of income on housing a resident has to earn \$2,753 monthly or \$33,039 annually. However, assuming that in Texas, a minimum wage is \$7.25, a resident intending to pay for a two-room apartment must work 88 hours per week, 52 weeks per year (National Low Income Housing Coalition 2012).

The concept of affordable housing is difficult to explain because it involves dynamic factors. A study by Field (1997) stated that affordable housing requires not only special arrangements between members of different parties involved in the project but also creative financial strategies to reduce cost such as waivers of land, arrangements to provide utilities for the households and guidelines to successfully meet clients' expectations.

The population of Texas has grown at a rate more than twice the national growth rate over ten years from 2000 – 2010. This increase is approximately 21 percent compared to 9.7 percent nationwide creating an increase of expected housing demands for urban and rural populations. The majority of the state programs used the poverty line as a tool to determine eligibility for affordable housing. For example, in 2012 the poverty line for a family of four was defined to be \$23,050 (TDHCA 2013). According to the 2013 report by the Texas Department of Housing & Community Affairs (TDHCA), affordable housing remains a significant concern nationwide.

2.2 Not-for-Profit Organization

Corporation X involved in this study is a not-for-profit housing developer in the state of Texas. Not-for-profit housing developers and their supporters have committed themselves to a daunting task due to the fact that they have to face daily challenges and confrontations in order to successfully create and sustain wholesome, safe living environments for underserved communities.

Not-for-profit organizations are dealing with problems that may have gone unnoticed for some time and that currently are creating barriers for developers and their clients. For example, not-for-profit organizations have a limited track record as developers and a limited ability to invest sufficient equity in projects. In fact, most of the support system for not-for-profit housing organizations – local and national intermediaries, and federal

programs and set asides¹ – were created to stimulate and support resourceful activities to benefit underserved communities (Hecht 2006).

2.3 Rehabilitation

The term “affordable rehabilitation housing development” includes numerous strategies that can negatively or positively affect the suggested budget and the outcome of the project. Depending on the condition of the construction to be improved, the contractor may decide to either replace units or restore parts of the construction. For rehabilitation to succeed, workers must have advanced skills, and work in a supportive environment (Hecht 2006).

For this research, Corporation X’s rehabilitation housing project was chosen which focuses on selective rehabilitation. Selective rehabilitation is defined by Hecht (2006) as the systematic repair and replacement of worn-out components of a residential structure, usually combined with limited modernization.

¹ “Set aside” is defined as a federal program needed for certain percentage of government funds and contracts that are reserved for businesses owned by women and members of different minority groups.

2.4 Local Partners (General Contractors)

Corporation X calls general contractors that work on its rehabilitation projects “Local Partners.” Asaf et al. (2010) states that multiple factors such as demographic changes, availability of supplies, availability of rental units, land for housing in communities, costs of building, and cost of labor can significantly impact the final cost of constructing homes. However, the fact that feedback from general contractors is not yet included in the list of requirements during the planning of building affordable housing for underserved communities might be a mistake due to their crucial role during the performance of a project (San Cristóbal 2012). Therefore, the history of construction projects have been well-known for their adversarial relationships between the client/owner of construction companies and general contractors (Ng et al. 2002) and compiling different points of view might be a positive initiative for the construction field in a near future.

2.5 Return on Investment (ROI)

Return on investment (ROI) is simply a measure of benefits versus cost. Expressed as a percentage, ROI is determined by total net present benefits divided by total net present costs. Benefits and costs are converted into present values since they usually accrue over extended periods of time (Glover et al. 1999). Although this definition of ROI differs from that used by engineering economics and some financiers, it is the definition used by general contractors and participants in the real estate industry.

2.6 Problematic Factors Identified

This study explores the type of problematic duties and barriers that general contractors and owners face daily. This section discusses potential issues faced by contractors and owners: (see APPENDIX B)

- *Advertising:* Preliminary discussion with Corporation X revealed that general contractors may elect to work on affordable rehabilitation housing to enhance their reputation with the general public. However, neglect of/or poor quality advertising by Corporation X can put off general contractors.

- *Miscommunication:* Some of the problems with advertising are derived from lack of communication between the parties. Both parties should understand and agree with the results of whatever is proposed. Good communication is the main tool to keep teams working efficiently in a healthy work environment (Ng et al. 2002).

- *Limited Budget:* Sometimes Corporation X does not have enough financial resources and has the tendency to save money by purchasing cheap or poor quality advertising. This decision could diminish the general contractor's interest in such projects.

- *Rewards:* The reward is a recognition that the corporation gives to the general contractors for their services, achievements, and efforts during the performance of their job. The rewards can be financial or verbal. Sometimes, when financial bonuses are not

established from the beginning or when there is a lack of commitment from one party, the whole project can be affected by it (Ng et al. 2002).

- *Efficiency*: Efficiency and accuracy, commitment, responsibility and honesty must be present in every member of the construction team. It is necessary to gather and sign all legal documents before construction commences. If changes occur, these changes must be reported and communicated to all members. This will decrease the rate of mistakes and negative legal consequences in case a client complains. Once paperwork is completed, resources management takes place. Factors such as schedule, budget, quality, security, technology to be used and risk assessments need to be taken into consideration among all parties involved (Dozzi et al. 1996).

- *Location*: Selecting the location and area for the construction project is vital. Many factors such as budget, security, availability of labor and accessibility for equipment will be greatly affected by this decision. In addition, the selected project site may not facilitate daily visits from the general contractors due to long distance. Lack of supervision is a major risk that the company must assume if the project is in a remote location.

- *Trust*: Trust is important in the construction industry (Smith 2013). Every single project involves different people with a variety of personalities. If team building is not approached from the beginning, and rules are not set, problems might arise during the

project. The respect and commitment to the project from all members of the team will improve the flow of the construction and the work environment for the workers (Ng et al. 2002). Also, the members of the team must be willing to take constructive criticism when a mistake is made. This itself can improve the relationship between the parties (Ng et al. 2002). However, criticism must be supplemented with empowerment of general contractors and recognition of team members at the right moment to increase a team's morale, making the project successful (Ng et al. 2002).

- *Quality and quantity:* Quality is extremely important in any type of project. General contractors and owners must have special care while planning and performing a construction project not only for budget purposes but also for the safety of the workers and future tenants.

Factors such as lack of training and experience from the workers involved in the team could cause disturbances on the goals of the construction (Ng et al. 2002). In addition, the amount of projects undertaken by a company can dramatically impact the quality of the construction. In some cases, general contractors due to their ambition to increase profit agree to oversee too many projects. This can lead to mistakes and poor construction.

3. METHODOLOGY

3.1 Introduction

According to Leedy and Ormrod (2013) in *Practical Research Planning and Design*, qualitative research methodologies support structured exploration of a problem, an approach that is suitable for this study.

Specifically, this case study investigated the five most important metrics of Lean Construction, namely, quality, cost, time, safety and morale. Lean Construction is a design and construction administration process based on lean manufacturing principles designed to reduce waste and add value using continuous improvements in a culture of respect (Castelo 2007; Rybkowski 2013). The purpose of this case study was to benchmark the current state of return on investment to the construction sector and to explore ways to make the sector of rehabilitation affordable housing more attractive to general contractors.

3.2 Study Population

The target population for this study was provided by Corporation X. Corporation X is a not-for-profit-corporation located in Central Texas which has already completed about 30 affordable rehabilitation houses and are looking to expand its work. Their identity has been kept confidential for the purpose of this study. The initial sample consisted of 13 general contractors who are/ or have worked with Corporation X on affordable

rehabilitation projects. This case study was introduced to the general contractors by Corporation X, who also encouraged them to take part in the study. When invited by the researcher to participate in the study, 10 of the 13 general contractors responded positively and agreed to engage in interviews with the researcher.

3.3 Delimitations

The scope of this study is limited to interviews with not-for-profit entities; not-for-profit entities must:

- a. Not-for-profit entities must be an active not-for-profit 501(c)(3) or (c)(4) corporation as recognized by the U.S. Internal Revenue Service, and registered as a domestic not-for-profit corporation within the State of Texas.
- b. Provide financial audits or statements for a two year period that reflect the entity's ability to manage funds appropriately, as determined solely by the Corporation.
- c. Have at least two years of experience in the planning, marketing, development or management of housing programs for moderate and low-income households.
- d. Demonstrate the ability to provide evidence of support from local government officials for their activities within the target community. In this case study, the

researcher focused on an affordable rehabilitation housing initiative program undertaken by a not-for-profit Corporation.

3.4 Research Design

A literature review was first conducted to identify the factors that are generally problematic in affordable rehabilitation housing projects. An interview protocol was prepared based on the factors identified in literature and also based on the researcher's assumptions about reasons for insufficient participation of general contractors in affordable rehabilitation housing initiatives in the state of Texas (See APPENDIX B).

Corporation X introduced the study to the general contractors who have worked on their affordable rehabilitation projects. Since, the data collection required interviews with general contractors working with Company X on affordable rehabilitation housing projects, Texas A&M Institutional Review Board approval (see APPENDIX E) was obtained before scheduling interviews with participants (general contractors). General contractors were contacted by the researcher to set up interviews to collect data. The general contractors were asked to indicate the place, time and mode of interviews (Skype, face-to-face or telephone) they preferred. Before beginning the interviews, an information sheet containing the required information of the research study was provided to the general contractors. Once they read and understood the information sheet, verbal consent was obtained from them. The permission to use audio recordings was also obtained from the general contractors prior to their interviews in order to ensure that

responses were recorded accurately. The respondents and the interviewer used the same explicit understanding of terms such as safety issues, morale issues, time issues, cost issues, quality issues and return on investment.

The audio recordings were transcribed after the interviews and the response summaries of each respondent were entered into a table (See Appendix D). These responses were then recorded using a “plus-delta” tabular format. Table 3.1 shows a plus -delta chart that was used during the interview. “Plus” (+) responses represent characteristics of the contracting process that general contractors perceived to be positive. “Delta” (Δ) responses represent characteristics of the contracting process that general contractors perceived to be in need of improvement.

+	Δ

Table 3.1 Plus -Delta Chart

4. DATA ANALYSIS

4.1 Analysis of the Data Obtained from the Interviews

The study sample data is small and does not lend itself to statistical analysis. The process used to analyze and evaluate responses drew inferences from the information provided and observe some trends and commonalities (see APPENDIX C). Observations about collected responses are included beneath each interview questions as follow:

Question 1

Do you work with any other not-for-profit companies?

To work with Corporation X, the local partners or general contractors must be not-for-profit companies themselves. However, due to lack of not-for-profit general contractors in a certain location, one for-profit general contractor was awarded work and was allowed to work with Corporation X. Unfortunately, this general contractor could not participate in the interview.

The majority of respondents (60%) said that they are neither working nor have other projects with other not-for-profit corporations. However, they have their own affordable housing projects. Forty percent of the respondents claimed that they have different kinds of projects with other not-for-profit organizations.

Question 2

How does this affordable rehabilitation housing project compare with other affordable housing projects that you have work on?

The affordable housing sector is divided into two branches. The first is to build new affordable houses. The other branch deals with rehabilitating houses that are donated by public or private institutions. All the respondents (100%) said that they have been working on both kinds of projects.

2.1 In what ways are these affordable rehabilitation housing projects similar?

Respondents pointed out that affordable rehabilitation housing is similar to other affordable housing projects in the sense that in both cases they are required to build affordable and safe houses to assist people and communities with their needs.

2.2 In what ways are these affordable rehabilitation housing projects different?

Affordable rehabilitation housing projects were perceived by general contractors to be different from other affordable housing projects in which they have engaged primarily because of the nature of funding where, in other cases, government funds are used, Corporation X has its own line of credit and finances the initiative of affordable rehabilitation housing.

Question 3

Using a Plus /Delta table, collect perceptions about current state of general contractors' perceptions of return in investment on affordable rehabilitation housing.

For this specific situation, the affordable rehabilitation housing, the respondents reported that rehabilitation is not really common or attractive in the sector at this point of time as compared to new affordable housing projects.

The majority (70%) of the respondents said that they do not receive significant return on investment in the monetary way. There is a small window between affordability and maximum investment for these kind of projects. This type of low return-on-investment situation tends to result in a lack of interest and commitment to work on these projects. However 30% of participants thought that there is a reasonable return on investment.

They argued that ROI depends on how they develop their rehabilitation work; by focusing on just the essential components during the rehabilitation planning stage, adequate return on investment can be obtained. Return on investment for affordable rehabilitation housing also depends on the location of the house, the market value of the house and the economy.

Question 4

*Using a Plus /Delta table, collect perceptions about **time** problems faced in implementing affordable rehabilitation housing projects.*

Generally, not-for-profit general contractors who are interested in developing affordable housing projects have to submit documentation to access funds or grants from the government and the entire process takes approximately 120 days. However, because Corporation X maintain its own line of credit, it is able to dispatch required funds in about 30 days. 70% of the general contractors felt that this is a major advantage and this makes Corporation X more attractive as compared to other similar corporations without their own funding source. Nevertheless 30% of the general contractors, who receive adequate funds from the government for affordable housing, do not use funding from Corporation X, as the funding they receive from the government helps build up their records and reputation and this helps in securing further funds from the government.

Some general contractors also stated that during the construction phase, projects are delayed by the subcontractors due to unforeseen weather conditions and ineffective scheduling on the part of general contractors.

Question 5

Using a Plus /Delta table, collect perceptions about cost problems faced in implementing affordable rehabilitation housing projects.

The pre-existing houses the general contractors have to deal with in this kind of project are generally in very poor condition. Before bidding for the project, contractors are provided with a preliminary inspection report. Nevertheless, hidden damages or problematic issues with various components of the house; can be revealed later during the rehabilitation process. Due to these unexpected complications, the contractors are sometimes forced to invest more money, exceeding their budgets. Because of this several general contractors, felt that more detailed inspections and selection of better quality houses chosen for rehabilitation are vital from the cost perspective of affordable rehabilitation housing.

Also, due to steep variations in market prices of materials or components, the actual money spent on the projects exceeds initial budgets and the houses are no longer affordable. For example, according to one of the general contractor interviewed, the price of concrete sometimes increases by more than 10% over one month. This variability in material prices can significantly affect a contractors' ability to deliver the project at the agreed upon cost of project.

Question 6

*Using Plus /Delta table, collect perceptions about **quality** problems faced in implementing affordable rehabilitation housing projects.*

All of the general contractors have quality certifications or work with subcontractors with such certifications. Apart from low cost, the contractors are also selected based on the quality of their previous projects, in terms of sustainability and superiority of materials or components used.

Although the general contractors try their best to rehabilitate houses to a high quality, due to cost constraints, they are not always able to achieve the quality they aim for. This puts off some general contractors as they are aware that such work might taint their reputation in the building sector.

Question 7

*Using Plus /Delta table, collect perceptions about **safety** problems faced in implementing affordable rehabilitation housing projects.*

All of the general contractors indicated that there have not been any major safety issues during the construction phase of the affordable rehabilitation housing projects and in most cases safety equipment such as hard hats and boots are used.

Question 8

*Using Plus /Delta table, collect perceptions about **morale** problems faced in implementing affordable rehabilitation housing projects.*

The general contractors feel they have a high morale as their very intention to partner with corporations like Corporation X is to better the quality of life of deserving underprivileged people. They are satisfied when they see how they have changed the state of the house and how this in turn, positively impacts the lives of people. However, most of the general contractors also reported that the stress caused by the need to achieve quality despite cost constraints often lowers their morale during the construction phase.

5. RECOMMENDATIONS AND CONCLUSION

5.1 Recommendations

The following recommendations are made, based on interviews with the general contractors. These recommendations should considerably improve the perceptions general contractors have of affordable housing initiatives.

a. There is a lack of communication between Corporation X and the general contractors which can lead to misunderstanding. For example, the return on investment on the houses is something which can be attractive to the general contractors. However, the general contractors do not have a clear idea of what percentage of profit they will obtain. Because of this, regular meetings between general contractors with Corporation X during which they discuss the terms and conditions of the construction contract are recommended to clarify these misunderstandings.

b. Allow for-profit companies or private general contractors to become involved with affordable rehabilitation housing projects, as they, with their own funds, may be more productive and effective and may act as role models for other companies. This was observed in the case of the one for-profit company that works with Corporation X.

c. While choosing houses for rehabilitation, more restrictions should be imposed on the quality of houses being selected and more detailed inspections should be carried out to accurately assess the quality or condition of the house.

d. Encourage general contractors that do not have sufficient funds to take advantage of the funds that Corporation X possess.

5.2 Conclusion

From 2007-2009, during recession, rehabilitation was an efficient way to develop affordable housing as it turned out to be less expensive than to new affordable housing. Rehabilitation projects also rescued the sector as they sustained job opportunities. However, the economy has since improved, and rehabilitation has lost ground in the field of affordable housing. According to some of the general contractors who work with Corporation X, the return on investment on new projects is greater than that of rehabilitation projects. However, results also showed that some contractors with high morale are willing to work on such projects despite cost constraint. However, other general contractors are not attracted to rehabilitation work mostly because of lack of knowledge of the how the sector works.

To my knowledge, this study is the first of its kind. If Corporation X makes use of the information gathered from interviews with general contractors and the suggestions, Corporation X, along with its general contractors, could serve as role models to similar corporations. Also, information could be used to effectively improve the current state of affordable rehabilitation housing sector to make it more attractive to general contractors.

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APPENDIX A

Questionnaire Protocol

Good morning (afternoon). My name is Pedro Diaz Puentes. Thank you for your willingness to take part in this interview. I am a graduate student at the Department of Construction Science in Texas A&M and I am conducting a study on benchmarking current state of return on investment to the construction sector. This study will also explore ways to make the sector of rehabilitation affordable housing more attractive to general contractors. My purpose in meeting with you today is to learn your thoughts and perceptions on these kinds of projects. There is no right or wrong or desirable or undesirable answers. I would like you to feel comfortable with saying what you really think and how you really feel. This interview with you will help me significantly in my research. Your participation is voluntary and you may choose to withdraw from the interview at any point.

Anything you tell us is confidential. Nothing you say will be personally attributed to you in any reports that result from this interview. All of our reports will be written in a manner that no individual comment can be attributed to a particular person.

Do you have any questions before we begin?

Also, the interview will take approximately 20 minutes. You can stop me anytime you need a break.

Tape recording instructions: (optional)

If it is okay with you, I will be tape-recording our conversation. The only purpose of this is so that I can get all the details but at the same time be able to carry on an attentive conversation with you.

Information sheet instructions:

Before we get started, please take a few minutes to read this information sheet (Hand R information sheet. After R returns information sheet, turn tape recorder on).

Questions

1. Do you work with any other non-profit companies?

2. How does this affordable rehabilitation housing project compare with other affordable housing projects that you have work on?
 - 2.1 In what ways are these affordable rehabilitation housing projects similar?

 - 2.2 In what ways are these affordable rehabilitation housing projects different?

3. Using a Plus /Delta table to collect the current state of general contractor's perceptions toward return on investment in affordable rehabilitation housing projects.

+	Δ

4. Using a Plus /Delta table to collect general contractor's perceptions toward *time* issues faced during the construction phase of the affordable rehabilitation housing projects

+	Δ

5. Using a Plus /Delta table to collect general contractor's perceptions toward *cost* issues faced during the construction phase of the affordable rehabilitation housing projects

+	Δ

6. Using a Plus /Delta table to collect general contractor's perceptions toward *quality* issues faced during the construction phase of the affordable rehabilitation housing projects

+	Δ

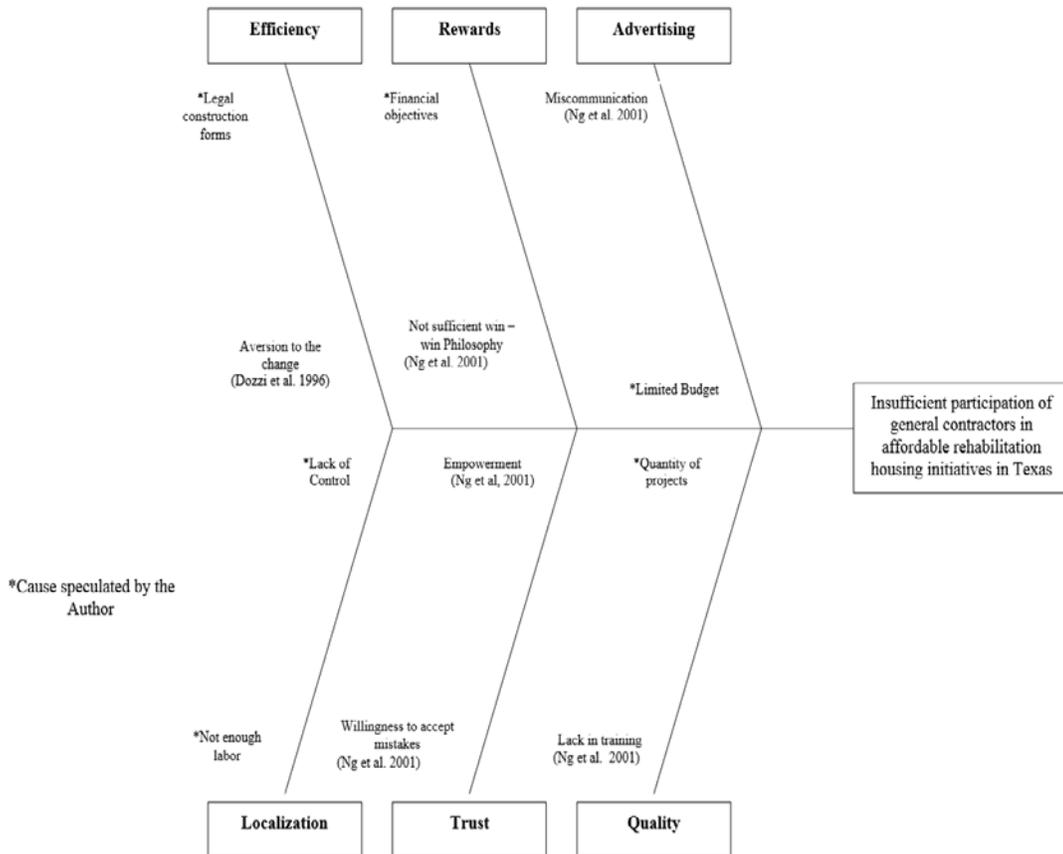
7. Using a Plus /Delta table to collect general contractor's perceptions toward *safety* issues faced during the construction phase of the affordable rehabilitation housing projects

+	Δ

8. Using a Plus /Delta table to collect general contractor's perceptions toward *morale* issues faced during the construction phase of the affordable rehabilitation housing projects

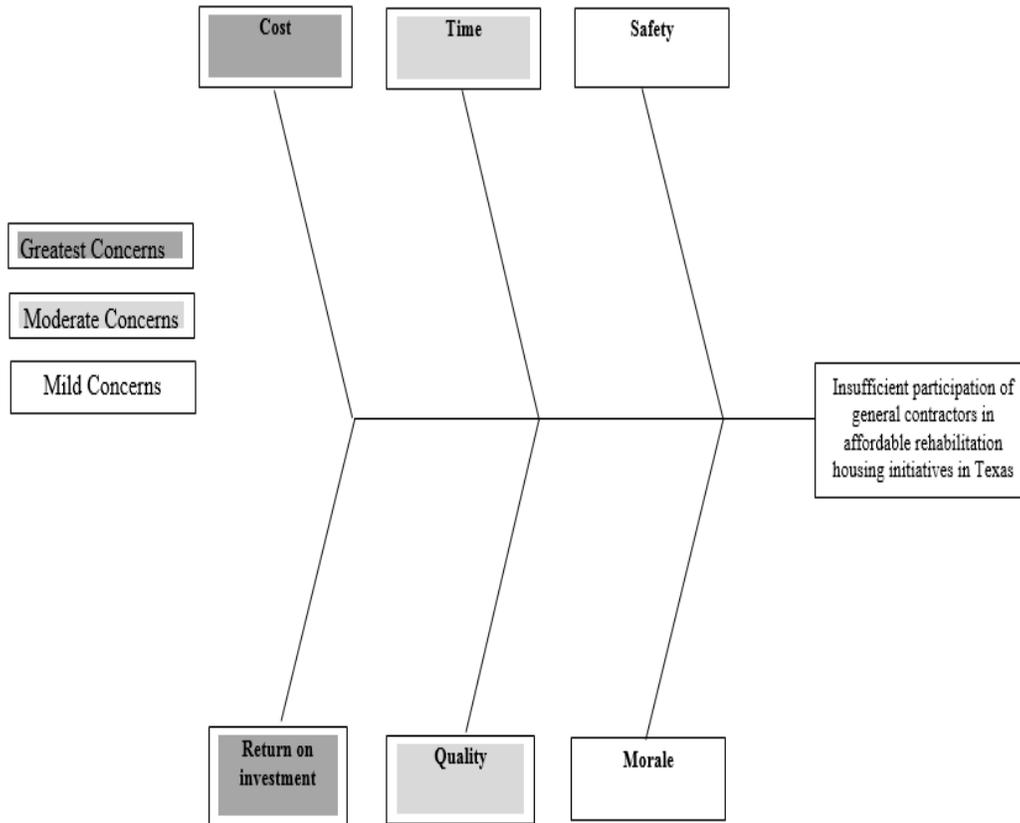
+	Δ

APPENDIX B



Ishikawa (cause and effect) Fishbone diagram documenting initial inventory of literature- informed and speculated reasons for Insufficient participation of general contractors in affordable rehabilitation housing initiatives in Texas

APPENDIX C



Ishikawa (cause and effect) Fishbone diagram documenting final inventory of informed reasons for Insufficient participation of general contractors in affordable rehabilitation housing initiatives in Texas.

Summary of findings from exploratory research shows that cost and return on investment represent the greatest concerns of general contractors in this type of project due the lack of inspections and lack of knowledge of the sector. Time and Quality represent moderate concerns due to the legal forms required to receive grants from the government and the concern about reputation of their work. Finally cost and safety are the mild concerns.

APPENDIX D

Questions	Respondent No.	Response Summary
<p><i>1. Do you work with any other not-for-profit companies?</i></p>	1	Yes, we are working with similar not- for – profit corporations.
	2	No, this is the first time working in projects with affordable rehabilitation housing
	3	No, we work just with corporation X.
	4	No, we are just working with corporation X. But we also have our own projects in affordable housing
	5	Yes, we do work with other not-for profit corporations.
	6	Yes, we do.
	7	Yes, we are working with several other corporations.
	8	No, we don't
	9	No, this is the only corporation we are working with.
	10	No, this is the only one. But we have our own affordable housing projects.
<p><i>2. How does this affordable rehabilitation housing project compare with other affordable housing projects that you have worked on?</i></p> <p><i>2.1. In what ways are these affordable rehabilitation housing projects similar?</i></p> <p><i>2.2. In what ways are these affordable rehabilitation housing projects different?</i></p>	1	We work on developing brand new affordable housing and also affordable rehabilitation housing. The work that we develop with Corporation X is similar in every way to other affordable rehabilitation housing. In general we just modified some critical parts of the house to make it habitable and affordable. This project is maybe different in terms of the funding provided by Corporation X
	2	This is the first time we are working on affordable rehabilitation housing. We do not know what are the similarities or differences in these kind of projects. We have heard that the funding given by

		Corporation X makes it stand out from similar projects.
	3	We have worked on all kinds of affordable housing. The work that we develop with Corporation X is rehabilitation and it is similar to rehabilitation projects that we have worked on before, i.e., these houses that we rehabilitate are donated by a third party. It is different in the way that the funding is given by corporation X.
	4	We have been developing new housing and also rehabilitation housing. Right now we are just working on rehabilitation housing. The similarity among all of our rehabilitation housing is the commitment to rehabilitate houses with good quality standards in a safe and affordable way.
	5	We develop both kinds of affordable housing, i.e. rehabilitation and new homes. This project which focuses on rehab affordable housing is similar to other rehab projects. Normally, we just fix certain elements in donated old houses or foreclosure houses. The difference of this project is in how Corporation X managed finances- Corporation X has its own line of credit in contrast to other rehabilitation housing projects which rely on government funding.
	6	We perform all kinds of affordable housing. The work that we develop with Corporation X is rehabilitation of donated houses. Just like all rehabilitation projects, we change some components in the house that are damaged or do not work properly. There is not a significant difference in this project in comparison with others. Maybe the only difference is the funding

		that Corporation X offers.
	7	Our company has worked on both kind of affordable housing projects. Nowadays we have several ongoing projects. The similarity is that we received these houses that need some changes in components and improvements. The difference is maybe in the funding that Corporation X give to us. But we also have our own funds, so we do not used the funding provided by Corporation X.
	8	It is our first time working on affordable rehabilitation housing. We think that this project is similar to any other rehabilitation project. However, we do not know as of now how it differs from other similar projects.
	9	We worked before on this kind of projects. This project is similar to other rehabilitation projects. We receive houses donated and are required to make them habitable for low income communities. The difference is the line of credit that Corporation X gives to us to work on this project.
	10	This is the first time we are working on such a project. So we can't comment on the similarities or differences.
<i>3. Perceptions about current state of general contractors' perceptions of return on investment on affordable rehabilitation housing.</i>	1	The return on investment is unique in this kind of projects. The only targeted return on investment is to have a great record with the government. The more projects of rehabilitation you have, more funds you are going to receive from the government. But, if you have good amount of funds, you can have some monetary return on investment in the long run. As we work with other

		<p>projects we have enough funding that let us work in a comfortable way that lets us have a return on investment in all our projects.</p>
	2	<p>Since, this is our first affordable rehabilitation housing, we are not at this point very confident about the return on investment. But, based on our previous experience with affordable new housing, we are expecting moderate return on investment.</p>
	3	<p>The return on investment is minimum in this kind of projects. In general the return on investment is small due to the limited budget that we have to work with. We tried to finance our projects with the government but sometimes it takes a lot of time. So the cash flow is insufficient to complete the projects with ease.</p>
	4	<p>The positive perception about return on investment is that you can receive some investment if you know how to efficiently rehabilitate the houses. You need to understand that in affordable rehabilitation housing, there is only a small window between affordability and maximum return on investment. Therefore you need to know how to run your business. The only problem we face is the difficulty in finding subcontractors qualified for this kind of projects and the market rate of the houses.</p>
	5	<p>The return on investment in this kind of projects is limited . When you are working with limited budgets, the return on investment is minimum. Some houses need a lot of changes and improvements so the price of the houses turn out</p>

		<p>to be very close to the market price of the house so we cannot have profit on it. The only return on investment is the satisfaction of helping our communities.</p>
	6	<p>Return on investment in projects on affordable rehabilitation housing is pretty narrow. The gap between the affordability and investment that you put in this kind of projects is trifling. If you check the majority of these houses, the investment to make it habitable is sometimes above 40 % of the market price of the house. So the return on investment for this sector is insignificant. The return on investment can improve if the quality of the houses received in donation and foreclosure came in a better shape and condition.</p>
	7	<p>The perception about return on investment in affordable rehabilitation housing is positive. You need to know how to handle the rehabilitation. You need to focus your effort and your budget to improve or change components that are critical to the rehabilitation of the houses. However, the return on investment depends on the location of the property and the market price of the house.</p>
	8	<p>We do not know what return on investment to expect in affordable rehabilitation housing. But we are expecting it to be normal. As a first time affordable rehabilitation housing developer our expectative are big. We are going to focus our labor in the critical parts of rehabilitation such us AC, plumbing and electrical problems instead of paint and cosmetic improvements. Right now we do not have any negative perception of return on investment.</p>

	9	The return on investment is minimal in affordable rehabilitation housing due to the budget constrained. We finance our last projects with the help of government funds but it was tedious and time consuming process.
	10	We do not know for sure at this point what return on investment to expect on affordable rehabilitation housing. We have worked on affordable new housing and the return on investment is reasonable in brand new houses.
<i>4. Perceptions about time problems faced in implementing affordable rehabilitation housing projects</i>	1	Time is important in the construction field. The documentation that you need to file for obtaining funding from the government sometimes take a lot of time and varies between 3 to 9 months. So, that is why we use our own funds. Also some problems such as weather can cause delay.
	2	The perception about time is something critical. Paper work to access federal funds from the government can take 3 or more months. This will delay the projects.
	3	Time is not a major concern during the construction phase. However, in this type of projects, documentation for funding from the government is time consuming. But working with Corporation X definitely has the advantage of not having to go through that process as they provide their own funds.
	4	Time is critical for our company not only for this project, but every project. The only problem we face in regard to time in this type of project is what is caused by the bureaucracy we deal with when we apply for grants. Normally, it takes 120 days, but it could take more time. Compared to this, it is such a relief to get the same funding from Corporation X in just about 30 days.

	5	Time is a big issue for every project. However, documentation for the government funds take time. So we take advantage of the funds that Corporation X provides. Moreover, we also experience schedule problems due to inefficiency of some of the subcontractors.
	6	We try to use the time effectively. Sometimes we use the government funds and at other times we sue our own funds. For this certain project, we are using our own funds. But we are in the process of applying for funds to the government for other projects which are lined up. The main time issue we deal with is weather related.
	7	Time is money in our sector. That is why we have our own funds. We work under time pressure. We try to do as many projects as we can. We improve our schedules and also we work with subcontractors that work efficiently. So we do not come across time issues that much.
	8	Obtaining funding from the government is a very long process. So we generally try to avoid that and so we use Corporation X's funds for this project.
	9	This is the first time we are working on rehabilitation housing. At first, we tried to obtain funding from the government. But once we realized it was taking forever, we decided to go with the funding that Corporation X can offer.
	10	Time is important for our company because in construction industry time is money. We try to work with the funds of Corporation X. That is an advantage for us because we receive the fund in less than a month and we can work more efficiently.

<p><i>5. Perceptions about cost problems faced in implementing affordable rehabilitation housing projects</i></p>	1	<p>The budget for these rehabilitation projects are narrow. If we do not have a good budget to carry out our rehabilitation activities, it becomes very difficult to adhere to quality standards especially in situations where the quality of the donated house is substandard. Therefore, it is very important to have a good inspection of the houses that are selected to this kind of projects.</p>
	2	<p>Cost in affordable housing is a variable. Everything depends on the quality of the existing house and also the funding that the corporation provides. We sometimes even work with rehabilitation housing that are 50 thousand dollars or less.</p>
	3	<p>The houses that we receive for rehabilitation are in very poor conditions. Around 50 to 60 percent of the houses are better to be demolished and rebuilt. However, Corporation X sometimes requires of us to rehabilitate these kind of houses. So, it gets very difficult to produce any profit at all when the quality of the house is so bad and the budget is so low. The inspections in general need to be more detailed and strict to avoid exceeding the budget.</p>
	4	<p>Cost in affordable housing is something that can vary. Sometimes the donated houses are coming in bad shape and the cost of rehab exceeds the budget that the government has given us. We should improve our inspection at the time to sign the contract with Corporation X because we found out that components such as electrical and plumbing are costly and sometimes they just pass those problems because they did some superficial inspections lead to problems during the rehabilitation process.</p>

	5	<p>In construction cost is a critical issue, especially when working on such projects on a limited budget. In these projects, the budgets tend to change drastically. The bad quality of some houses received for rehab make our budgets increase for unknown problems faced during the rehabilitation. Also sometimes the variability in the price of some components can affect the final cost of rehabilitation.</p>
	6	<p>First of all we have limited funds. Secondly the cost of affordable rehabilitation housing is based on inspection reports of the existing document. Sometimes inspections are not competent enough and does not determine the actual state of the house and required rehabilitation. When we base our budget on these inspections, we get into trouble during the rehabilitation process when some of the hidden damages surface. So the inspections should be improved so that general contractors can make a better assessment of the state of the building and the budget could be more accurate.</p>
	7	<p>Our company works with strict budgets. We are working in our inspections process to have an accurate budget for the projects. The quality of the houses is limited so we just need to be sure that all the improvements are included in the budget.</p>
	8	<p>Perception of cost in rehabilitation projects is important. It is important because we need to do accurate budgets that incorporate all the necessities of the house we are working on. This is the first time we are working on affordable rehabilitation housing, so we think inspection is something crucial at the time when we talk of the cost of rehab.</p>

	9	Cost is vital because the majority of houses for rehabilitation are in low quality condition. From our past experience, a great percentage of these houses are for demolition. Sometimes investing in this kind of houses is not worth it. Therefore, deeper inspections should be strictly enforced to determine if the houses are capable of rehabilitation.
	10	Cost is crucial for us. We work with slim budgets. The project budget may vary for reasons such as the initial inspection and price change in materials.
6. Perceptions about quality problems faced in implementing affordable rehabilitation housing projects	1	Quality- we monitor carefully all the steps in the construction site. Also, we have a routine inspection of all our works. Sometimes mistakes happen, but we fix it immediately
	2	The perception about quality needs to be more proactive with the term affordability because when we work in a rehab house we try to omit fixing of cosmetic problems and focus more on major components such as MEP. So, our standards of quality are applied to these components.
	3	The perception of quality is good. As a general contractor we have our own standards of quality. We check weekly all our works.
	4	We have high quality standards. We do not approve any change or work without supervision. We also work only with certified subcontractors.
	5	The perception about quality as a general contractor working on affordable rehabilitation housing is not bad. We maintain the basic standards for this kind of projects. The quality of these projects is basic. But, I must admit that sometimes we concerned about the warranty that we offer for houses because we just work on one

		part of the house and not the whole house.
	6	The perception about quality in rehabilitation houses is important for our company. We understand that the quality of our work is the image of our company. Therefore, we have strict standards of quality. Our craftsmen are well trained to work with the most high quality standards
	7	Quality is important in every project. We have quality standards to follow for all our projects. All the products, components and subcontractors as well as craftsmen that work on our projects need to be certified and have minimum standards of quality. We enforce quality work strictly.
	8	Our perception of quality is good as a general contractor working in the affordable rehabilitation sector. We work with the standards required for this type of construction.
	9	The perception of quality for this type of projects is similar to other projects related to rehabilitation. We have standards of quality that we strictly follow for all projects. Quality in components and labor are certified by our company
	10	Quality is important to our company. We work in rehab of housing trying to do our best job. We know that the quality sometimes can be difficult to obtain. But all the components and reforms that we do to the houses follow strict quality standards.
<i>7. Perceptions about safety problems faced in implementing affordable rehabilitation housing</i>	1	Safety is not a big concern in housing projects. I think there are more accidents in commercial construction.

<i>projects.</i>	2	Safety is generally not a problem in this kind of projects. In 12 years of working in this sector, we have never had any safety incidents.
	3	There has never been any major safety threats in such housing projects. It is generally safer when compared to other bigger projects.
	4	Safety issues in this kind of projects is limited. Since I started working here in this company, we have never had any issue with safety involving our employees or subcontractors.
	5	Working on rehabilitation projects are in most cases safe. We always follow the standards for safety in our work sites. We have never experienced any safety issues in our projects.
	6	Our company takes safety standards very seriously. So far in my work experience with this company, there has not been any major incidents. Talking specifically about this project, the chances of facing a safety issue is very rare.
	7	Safety is very important to our company. We want our employees and employees of our subcontractors to be safe on the site. So, we strictly follow the standards and also follow the OSHA terms.
	8	Perception of safety as a general contractor in this kind of projects is good. Every day we work to improve our safety schemes. It is mandatory for everyone on site to be wearing their security boots and hard hats.
	9	The perception on safety in general is fine. We have never had issues with safety in our projects. Safety in residential construction is not a big deal for our industry.

	10	Perception of safety is good in every projects we work on . We have never experienced any safety issues in our projects. We follow high safety standards in all our projects
<i>8. Perceptions about morale problems faced in implementing affordable rehabilitation housing projects.</i>	1	Though morale is generally high. But, quality and cost constraints of this type of projects are generally aspects that sometimes diminish the morale.
	2	Morale is high in general. The team feels pretty motivated when the projects are completed and see all the changes in the projects
	3	The morale as a general contractor is high because employees are proud of their work and happy to help the communities
	4	We feel so proud to work as a team and all the achievements are part of our pride. Issues with time delays can sometimes damage the morale though.
	5	Morale in general in our group is high. Affordable rehabilitation housing is a sector that can give you certain joys that make you feel proud - helping people and communities is the most important.
	6	Our team morale is pretty good. We work hard and we have good works.
	7	Although, the pressure to meet quality standards despite cost constraints sometimes can undermine the company's morale. But in general it is very satisfying to know we are doing our part in helping underprivileged communities.
	8	Working with limited budgets is not the easiest thing to do. But the idea is to improve the quality of life of some underprivileged communities and this gives us the high morale that we need to continue.

	9	Morale is high in our team. Sometimes issues with funding can decrease the morale but mostly our morale is high.
	10	Morale is general high. We believe we are doing a good job by lending a hand to help our communities. During the recession, the sector was in a bad state. Now, we have again started getting more of such opportunities.

APPENDIX E

DIVISION OF RESEARCH

Office of Research Compliance

APPROVAL DATE: January 22, 2014

MEMORANDUM

TO: Zofia K Rybkowski, PhD
TAMU - College Of Architecture - Construction Science

FROM: Human Subjects Protection Program
Institutional Review Board

SUBJECT: Initial Review Approval

Study Number: IRB2013-0861

Title: Benchmarking the current perceptions of attractiveness of affordable rehabilitation housing projects to general contractors in the state of Texas

Review Type Expedite
01/22/201

Approval Date: 4
Continuing 12/15/201

Review Due: 4
Expiration 01/15/201

Date: 5

Documents Reviewed and Approved:

Title	Version Number	Version Date	Outcome
questions interview final	Version 1.1	12/14/2013	Approved
TAMU Research - Letter of Support - 1.13.14	Version 1.0	01/13/2014	Approved
recruitment email edited	Version 1.0	01/13/2014	Approved
proposal pedro diaz 81	Version 2.0	12/14/2013	Approved
Consent - Information Sheet	Version 1.2	01/13/2014	Approved

Provisions:

Comments: 1. Investigator was responsive to the requests of the Reviewer.

This research project has been approved. As principal investigator, you assume the following responsibilities:

1. Continuing Review: The protocol must be renewed by the expiration date in order to continue with the research project. A Continuing Review application along with required documents must be submitted by the continuing review deadline. Failure to do so may result in processing delays, study termination, and/or loss of funding.
2. Completion Report: Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the IRB.
3. Unanticipated Problems and Adverse Events: Unanticipated problems and adverse events must be reported to the IRB immediately.
4. Reports of Potential Non-compliance: Potential non-compliance, including deviations from protocol and violations, must be reported to the IRB office immediately.
5. Amendments: Changes to the protocol must be requested by submitting an Amendment to the IRB for review. The Amendment must be approved by the IRB before being implemented.
6. Consent Forms: When using a consent form or information sheet, you must use the IRB stamped approved version. Please log into iRIS to download your stamped approved version of the consenting instruments. If you are unable to locate the stamped version in iRIS, please contact the office.
7. Audit: Your protocol may be subject to audit by the Human Subjects Post Approval Monitor. During the life of the study please review and document study progress using the PI self-assessment found on the RCB website as a method of preparation for the potential audit. Investigators are responsible for maintaining complete and accurate study records and making them available for inspection. Investigators are encouraged to request a pre-initiation site visit with the Post Approval Monitor. These visits are designed to help ensure that all necessary documents are approved and in order prior to initiating the study and to help investigators maintain compliance.
8. Recruitment: All approved recruitment materials will be stamped electronically by the HSPP staff and available for download from iRIS. These IRB-stamped approved documents from iRIS must be used for recruitment. For materials that are distributed to potential participants electronically and for which you can only feasibly use the approved text rather than the stamped document, the study's IRB Protocol number, approval date, and expiration dates must be included in the following format: TAMU IRB#20XX-XXXX Approved: XX/XX/XXXX Expiration Date: XX/XX/XXXX.
9. FERPA and PPRA: Investigators conducting research with students must have appropriate approvals from the FERPA administrator at the institution where the research will be conducted in accordance with the Family Education Rights and Privacy Act (FERPA). The Protection of Pupil Rights Amendment (PPRA) protects the rights of parents in students ensuring that written parental consent is required for participation in surveys, analysis, or evaluation that ask questions falling into categories of protected information.
10. Food: Any use of food in the conduct of human subjects research must follow Texas A&M University Standard Administrative Procedure 24.01.01.M4.02.
11. Payments: Any use of payments to human subjects must follow Texas A&M University Standard Administrative Procedure 21.01.99.M0.03.

This electronic document provides notification of the review results by the Institutional Review Board.