

SEE EVALUATION, A COMPREHENSIVE SUSTAINABILITY CERTIFICATION FOR
THE CONSTRUCTION INDUSTRY

By

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To my Mother and Father, your love has molded me into the man I am today. Without your care,
none of this would be possible.

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LIST OF ABBREVIATIONS

CSR	Corporate social responsibility
EMAS	Eco-management and audit scheme
EMR	Emergency modification rating
EPA	Environmental protection agency
GEMI	Global environmental management initiative
GRI	Global reporting initiative
IISD	International institute for sustainable development
ISO	International organization for standardization
LEED	Leadership in environment efficiency design
SAI	Social accountability international
USGBC	United states green building council
WBCSD	World business for sustainable development
WCED	World commission on environment and development
WSSD	World summit on sustainable development

LIST OF TERMS

Corruption	The misuse of entrusted power for private gain.
Discrimination	Unfair treatment of a person or group on the basis of prejudice
Honesty	The quality of being honest, is a value which can be defined in multiple ways. In the context of human communication, people are generally said to be honest when they tell the truth to the best of their knowledge and do not hide what they know or think.
Illegal labor	Labor that is not authorized by law
Integrity	firm adherence to a code of especially moral or artistic values
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs
Transparency	The principle that allows those affected by administrative decisions, business transactions or charitable work to know not only the basic facts and figures but also the mechanisms and processes
Triple Bottom Line	The whole set of values, issues and processes that companies must address in order to minimize any harm resulting from their activities and to create economic, social and environmental value. This involves being clear about the company's purpose and taking into consideration the needs of all the company's stakeholders

Abstract of Thesis Presented to the Graduate School
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The majority of sustainable practices in the construction industry are based on the construction product, caused by the popularity of the Leadership in Environmentally Efficient Design (LEED) program, the primary division of the United States Green Building Council. The LEED program certifies the construction product, which has a profound effect on the built environment but, overlooks many aspects of the construction industry that could improve from sustainable practices. Currently, there is not a construction certification that addresses the social, economic, and environmental aspects of sustainability through the company's policies.

The purpose of the research was to develop a sustainable certification system that evaluates construction companies based on their social, economic, and environmental performance. Laws, standards, certifications, and various documents helped to develop a set of policies that equally evaluate small, medium, and large construction companies. The Social, Economic, and Environmental (SEE) Evaluation is tailored to the construction industry, identifying specific areas of improvement towards sustainability. Construction companies are evaluated on topics developed beneath the three pronged, social, economic, and environmental framework. Each policy focuses on a topic, with the goal to create a sustainable construction industry that meets

the needs of the present without compromising the ability of future generations to meet their own needs. The SEE Evaluation is one step on the path towards sustainable development for an industry that is in desperate need for change.

CHAPTER 1 INTRODUCTION

The world's population is growing at an alarming rate. According to the U.S. Census Bureau there are currently over six billion people on the earth, with a projection of over nine billion people by the year 2050 (United States Census Bureau 2007). If it is possible to meet the growing needs of the human race, our resources must be better managed and energy used more efficiently. America is one of the world's largest consumers of energy per capita, exceeding both China and India. This consumer based society's policies have enabled Americans to lose sight of operating efficiently and the harm it is doing to the environment. The world's resources are rapidly being depleted to meet the high demands of growing populations. Continuing on the unchanged consumptive path, the same capitalistic concept that has made America a world leader, will eventually lead to its downfall. It is clear there is a need for change. A drastic reduction in resource and energy consumption needs to occur. The change will not occur overnight. It will require a change in the way individuals and companies currently operate.

The development of third party certifications has aided in the fight for sustainable living. There have been many documents created by the United Nations, organizations, and governments to increase sustainable practices. These documents contain information that is pertinent to the construction industry. Currently, there are no sustainable certification systems that directly focus on the construction industry's standards. The research will help to design a third party certification pertaining to sustainable development, specifically relating to the construction industry. The rating system is based on the three primary areas of sustainability. The Social, Economic, and Environmental (SEE) Evaluation is a third party sustainable certification tailored to evaluate construction companies. The framework will identify policies and rate construction companies based on their performance. The SEE Evaluation is not a cure

for the world's dilemmas, but a progressive step in the right direction for an industry that is in desperate need for change. The evaluation will help construction companies identify deficiencies and operate more efficiently. The sustainable movement will take form in minor advances and understanding. Experience has shown that a pathway to sustainable development cannot be charted in advance. Rather, the pathway must be navigated through processes of learning and adaptation (Clark and Kates 1999). The SEE Evaluation is a progressive step in a new direction for the construction industry.

1.1 Building Measurement System

Construction companies, suppliers, and subcontractors are important participants in making a shift towards a sustainable built environment. The United States Green Building Council states that in the United States, buildings use one third of our total energy, two thirds of our electricity, one eighth of our water (USGBC 2005). Companies constantly claim that they are sustainable, but there is no third party organization that has developed set of policies to certify them. The proposed certification will identify credible construction companies. The rating will evaluate and inform the company, employees, clients, and shareholders of a company's performance in the social, economic, and environmental aspects of sustainability, identifying specific areas of needed improvement. The impartial third party verification process is specifically tailored to certify construction companies based on their level of performance in the social, economic, and environmental categories. The policies of the framework exceed the current requirements set by law. The SEE Evaluation shows a company's commitment to sustainable development and the future of society.

Many construction companies have become involved with the Leadership in Energy Environmental Design (LEED) certification. The LEED certification certifies and awards the construction product, but has very little effect on the policies and practices of a construction

company. The LEED certification only attempts to improve the building product. It does not examine or address the construction company's social or economic agenda. The framework will enforce certified construction companies to operate more efficiently and ethically. The proposed SEE Evaluation will attempt to change the current harmful practices of construction companies.

1.1.1 Purpose

Sustainable development and green technologies are frequently used terms in the construction industry. These terms are commonly misunderstood and often used inaccurately. The scholarly definition of sustainable development is still vague. The standard definition of sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987). Many companies consider themselves to be sustainable without having a true understanding of the actual meaning. With the growing popularity of being environmentally friendly and the unregulated use of the term, any company can say that they are sustainable and often do.

The purpose of creating the independent certification system is to make construction companies operate in an ethical manner, save energy, reduce waste, and use appropriate materials. The drive for businesses to become certified would be derived through governmental incentives, ethics, and awareness. Each policy must be quantifiable to ensure that proper decisions are being made. The certification identifies construction companies that are dedicated to sustainable practices. Through certification, the company will be rewarded and favored in job selection. The United States government will recognize the need for sustainable practices and reward companies operating in the required manner. The increased cost to operate in a sustainable manner will be compensated through increased jobs awarded to the company. The

evaluation identifies areas of improvement that have previously been unidentified or unacknowledged.

The advantage of the third party certification is that it ensures all certified companies are upholding the SEE policies and operating in a proper manner. The third party certification takes the responsibility of reporting out of the construction companies' hands and creates a level playing field for all certified companies. The independent certification's overall goal is to ensure construction companies' policies and performances are in line with sustainable practices.

1.1.2 Objective

The objective of the study is to design a third party sustainable certification system developed specifically for construction companies. The SEE Evaluation will assess construction companies on the social, economic, and environmental aspects of sustainability: Policies directly pertaining to construction will be designed beneath the three pronged framework. The defined policies are limited to the control and capabilities of the contractor's role. The company must meet the policy's requirements to receive the associated points. Subcategories will identify areas of the construction industry that could be improved to advance sustainable development. The policies will be derived from previous and existing third party verification systems, standards, and laws and then tailored to the construction industry. The primary objectives of the research are to

- design a framework that enables construction companies to be properly evaluated on their social, economic, and environmental performance;
- based on the framework, develop a third party evaluation system, the (SEE) Evaluation.

1.1.3 Scope Limitations

The research investigates the primary aspects of sustainability when applied to the construction industry. The research is limited to the capabilities and decision making power of

the contractor. Design-build and construction management firms were not considered for the formation of the SEE Evaluation. The research examines previous documents created by organizations, governments, and the United Nations to gain knowledge about the goals of sustainable development. Construction companies were not considered a primary source of information. The research was guided by organizations that publish sustainable development documents and specialize in the advancement of sustainable development. Development of each SEE Evaluation topic and the implementation of the third party certification for the construction industry are explored.

1.2 Outline

The formation of the framework is a detailed process that begins with the exploration of all documents dealing with any of the three aspects of sustainable development. Laws, documents, standards, and certifications that deal with any division of sustainable development will be researched. Research will be gathered and dissected for information that directly pertains to the construction industry. The literature review describes the creation of organizations and formation of documents pertaining to sustainable development. The documents will be studied to assist in the development of the SEE Evaluation's policies. The research will help to explain how each policy will help to create a sustainable development. The framework's policies will be guided by the research, but are not limited to the research information. The research will act as a cornerstone source to substantiate the evaluation.

The certification will be divided into three primary divisions: social, economic and environmental, creating the acronym SEE. The three divisions of the framework are divided into further detail by separating the major divisions into sections. Sections are defined areas of interest that pertain to construction. Each section is composed of Policies. Policies can either be prerequisites or points that pertain to a specific topic. Each topic is composed of two paragraphs,

the purpose and policy terms. Each topic of the framework specifies policies the company must maintain to receive certification. Prerequisites establish policies that must be met by the company to become certified. The points are credits that are able to be selected by the company to enhance their certification Points specify areas of improvement that may be attempted by a company. In order to become certified, a specified number of points must be obtained. This process standardizes requirements to prove a company is acting socially, economically and environmentally prudent. The goal is to create and develop a third party certification that advances the current condition of sustainable development in the construction industry.

Major, unintended changes are occurring in the atmosphere, in soils, in waters, among plants and animals. Nature is bountiful but it is also fragile and finely balanced. There are thresholds that cannot be crossed without endangering the basic integrity of the system. Today we are close to many of those thresholds. (World Commission on Environment and Development 1987)

CHAPTER 2 LITERATURE REVIEW

Since its inception in the early 1980s, sustainable development has been an important topic for the United Nations and various organizations. In the past few years, sustainable development has become increasingly popular with the general population because of environmental awareness and climate change. The rising consciousness has placed sustainable development in the forefront of many world leaders' agenda. Sustainable development is divided into three primary areas of focus. The research will look into these three areas of focus and examine the history, goals, and concepts of sustainable development. The attempts of previous and current organizations' to positively influence sustainable development are identified and explored.

The research has been divided into four primary categories that include documents that pertain to social, economic, environmental aspects of the construction industry. The subject that binds the first three categories, sustainable development is also explored. The four categories are divided into subcategories that examine the history, evolution, and current status of the topic. The history and evolution of the social, economical, and environmental categories are explored to form a relation to the construction industry's standards and conditions. Sustainable development documents created by companies and governments are studied to gain insight into advancing its position. The research addresses the importance of each topic and the progression of the four categories. Previously designed certification systems, standards, and laws are examined to define specific areas of focus that can increase sustainable practices in the construction industry.

2.1 Social Dimension

The social realm of the research relates human society and its modes of organization to the construction industry. The research examines laws, standards, and certifications in the context of

American history. The social rights in construction begin with American laws. American labor laws were developed through the twentieth century to continually advance the rights of the American workforce. Laws were developed to advocate the fair treatment of all employees.

Throughout the history of the United States, government regulations and company policies have been primary controls for social justice. Third party certifications are a recent development that has advanced employee rights. Over the past thirty years, there have been advances in corporate social responsibility through the development of third party certifications. Third party certification organizations have the ability to set the current social standards in America. The social dimension of the research is defined by American laws, third party verification systems, and corporate policies.

2.1.1 Social Certifications, Standards, and Applicable Laws

In the United States there have been many laws, standards, and certifications created to protect the rights of individuals. Safety, minimum wage, child labor, gender and race discrimination are all issues addressed in American labor laws. The government has an integral role in the protection of employees in the United States. Laws have been created to ensure that employees earn fair wages and have equal opportunity. In the past, social justice was reliant upon laws to regulate the quality of working conditions. There has recently been a transition to corporate social responsibility. Recently companies have considered it a moral obligation to provide employees with a defined basic quality of life. The current status of the social equality is based on a company's willingness to be evaluated by third party certifications and form corporate social responsibility standards and policies. The seal of a third party evaluation enables an employer to differentiate themselves from other companies. A brief history of laws, standards, and certifications based on social justice in the United States is explored in order to understand

the evolution of social responsibility in the construction industry. The research begins with American laws and progresses to the most recent standards and certifications.

2.1.1.1 Davis-Bacon Act of 1931

The Davis-Bacon Act of 1931 was the first bill to be passed which advanced employee rights in the United States. The Davis-Bacon Act requires all contractors and subcontractors working on government construction projects pay their employees the prevailing wage which is determined by the Secretary of Labor. The Act guarantees that all employees who work on a public project will be paid the local prevailing wage including educational, pension, and health benefits. Contractors and subcontractors that are found guilty of not paying the prevailing wages on government jobs will be replaced. The contractor or subcontractor is held responsible for all costs incurred during the replacement process. If a contractor or subcontractor does not abide by the act, then they will be placed on a list that will prohibit them from bidding on a public project. If the contractor is unable to pay back charges owed to the workers, the comptroller is allowed to pay the workers, and the government has the power to sue the contractor and sureties whether or not the workers agreed to the pay given to them by the contractor. The President of the United States has the power to suspend the act at a time of emergency.

2.1.1.2 Walsh-Healy Act of 1936

The Walsh-Healy Act of 1936 was designed to require contractors performing government work to pay a minimum wage. The Walsh- Healy Act set basic standards for employees working on government contracts exceeding \$10,000. The Secretary of Labor determines the minimum wage. Child labor and convict labor was outlawed on government contracts. The act set the standard of an eight-hour day and forty-hour work week. The Walsh-Healy Act established that an employee was entitled to be paid time and a half for overtime. The Walsh-Healey Public Contracts Act (PCA) applies to contractors with contracts in excess of \$10,000 for the

manufacturing or furnishing of materials, supplies, articles, or equipment to the U.S. government or the District of Columbia. The Act covers employees who produce, assemble, handle, or ship goods under these contracts (United States Department of Labor 1976).

2.1.1.3 Fair Labor Standard Act of 1938

The Fair Labor Standard Act of 1938 was formed to create a federal minimum wage standard. The Fair Labor Standard Act established minimum wage and overtime standards for all employees. The Fair Labor Standard Act addresses and regulates minimum wage, work exceeding the standard workweek, child labor and discrimination. There are many issues that the Fair Labor Standard Act of 1938 does address however it does not require or address

- vacation, holiday, severance, or sick pay;
- meal or rest periods, holidays, or vacations;
- premium pay for weekend or holiday work;
- pay raises or fringe benefits;
- discharge notice, reason for discharge, or immediate payment of final wages to terminated employees.

2.1.1.4 Equal Pay Act of 1963

The Equal Pay Act of 1963 is the first legislation to address the issue of female employees being underpaid due to their sex. The law stipulates No employer having employees subject to any provisions of this section shall discriminate, within any establishment in which such employees are employed, between employees on the basis of sex by paying wages to employees in such establishment at a rate less than the rate at which he pays wages to employees of the opposite sex in such establishment for equal work on jobs the performance of which requires equal skill, effort, and responsibility (U.S. Equal Employment Opportunity Commission 1997).

The Equal Pay Act of 1963 corrects the unethical practice of paying females less for performing the same job as their male counterparts.

2.1.1.5 Civil Rights Act of 1964

President Lyndon Johnson signed the Civil Rights Act of 1964 into law on July 2, 1964. Title VI, and Title VII of the Civil Rights Act have a profound affect on the construction industry. Title VI of the Act protects persons from discrimination on the basis of race, color, and national origin in programs and activities. Title VII focuses on outlawing discrimination in employment in any business on the basis of race, religion, sex, or national origin. The law also outlaws retaliation against employees who oppose unlawful discrimination.

2.1.1.6 Occupational Safety and Health Act of 1970

The government's concern for workplace safety resulted in the creation of the Occupational Safety and Health Act of 1970. The Occupational Safety and Health Administration (OSHA) was created by this act. OSHA focuses on creating a safe work environment in eight major industry categories. The construction industry is one of the eight major categories. The federal law applies to private and public employers. The intent of OSHA is to prevent work-related injuries, illnesses, and deaths. OSHA will fine or shut down jobs because of incompliant practices. OSHA ensures that all workers have the opportunity to work in a safe, hazard-free environment. The Occupational Safety and Health Act of 1970 was created to provide a safe work environment for all employees.

2.1.1.7 Public Works Employment Act of 1977

Public Works Employment Act of 1977 supports the development of small disadvantaged businesses. The act addresses goals for minority and women owned businesses. A specific percentage goal for procurement from these businesses is addressed in the Public Works Employment Act. The Disadvantaged Business Enterprises Program attempts to ensure that

minority owned companies have the opportunity to grow and become independent. This enables disadvantaged businesses to develop and compete with non-disadvantaged businesses.

2.1.1.8 Social Accountability International, SA 8000

The Social Accountability 8000 is a standard for working conditions developed by Social Accountability International (SAI). The SAI is an organization that promotes human rights for workers. Found in 1996, the SA 8000 is the principal work of the SAI. The SA 8000 was composed and published in 1997 and updated in 2001. The SA 8000 specifies standards for social accountability. It is comprised of nine sections, addressing child labor, forced labor, health and safety, collective bargaining, disciplinary practices, working hours, remuneration, and management systems.

The child labor section of the SA 8000 is composed of four requirements. The first portion of the section stipulates that companies cannot engage in or support the use of child labor. The definition of child labor according to SAI is any work by a child less than 15 years of age, unless local minimum age law stipulates a higher age for work or mandatory schooling in which case the higher age would apply the age specified in the above definition of a child, except as provided for by ILO Recommendation 146. If, however, local minimum age law is set at 14 years of age in accordance with developing-country exceptions under ILO Convention 138, the lower age will apply (SAI 2001). Paragraph 1.2 informs a company that it must document, maintain, and communicate company policy for child labor remediation. Paragraph 1.3 explicitly states that the company shall establish, document, maintain, and effectively communicate to personnel and other interested parties policies and procedures for promotion of education for children covered under ILO Recommendation 146 and young workers who are subject to local compulsory education laws or are attending school, including means to ensure that no such child or young worker is employed during school hours and that combined hours of daily

transportation to and from work and school, school, and work time does not exceed 10 hours a day (SAI 2001). The last paragraph of section 1 addresses child and young worker safety. The paragraph informs companies that they shall not place children in unsafe, unhealthy, or hazardous environments. The SA 8000 defines the limitation of labor for certification by the SAI

Forced labor is not a major concern in the American construction industry but is addressed by paragraph 2.1 of the SA 8000. In order to be certified, the company cannot use, endorse, or support the use of forced labor. According to paragraph 2.1, a company may not withhold an employee's identification upon employment.

The health and safety of employees is addressed in the third section of the SA 8000. The health and safety section is divided into six paragraphs. Each paragraph establishes a standard, which must be met to be certified by the SAI. Paragraph 3.1 demands that a safe working environment must be provided for all employees. The standard hazards of the industry are recognized but note that sufficient steps must be taken to ensure worker safety. Accident prevention is essential for any company and will occur through exercising extreme caution for employee well being. Paragraph 3.2 mandates that a senior management representative is responsible for the implementation of the health and safety portion of the SA 8000. The specified senior manager is also responsible for the health and safety of all personnel. Employees must receive health and safety training for the tasks which they are performing specified in paragraph 3.3. Established by section 3.4, detection systems must be set in place to ensure the health and safety of all employees. The certification system identifies and demands access to clean bathrooms, potable water, and sanitary facilities for food storage for all personnel in paragraph 3.5. Paragraph 3.6 requires that employers provide a clean, safe facility for employees. It is imperative for the employer to provide a healthy and safe work environment.

The fourth major topic identified by the SA 8000 is freedom of association and the right to collective bargaining. The employee must maintain the right to form and join unions. The employee must be allowed to bargain for wages and benefits only limited by law. The third paragraph ensures that the personnel's representatives are not discriminated against and have access to the represented employee at work.

The SA 8000's fifth section identifies standards based on discrimination. The criteria for certification are based on three paragraphs covering discrimination. The primary concept of the fifth section is that a company cannot discriminate on a person during any part of the hiring and employment process. A person may not be discriminated against because of race, gender, sexual orientation, national origin, religion, or age. Paragraph 5.2 eliminates the ability for a company to limit personal beliefs and paragraph 5.3 demands that no sexual, threatening, or abusive terms, gestures, or contact are directed toward any personnel.

The disciplinary practices of the SA 8000 establish a policy that companies must follow to be certified by the SAI. The SA 8000 requires that the company may not use, support, or condone corporal punishment, mental or physical coercion, and verbal abuse (SAI 2001).

The criteria to meet the SA 8000's standards for work hours require that the company will comply with all laws and industry standards. The SAI recognizes that a standard workweek should not exceed 48 hours and that all employees must have at least one day off every consecutive seven-day period. The policy also defines limits on overtime. Overtime must be reimbursed at a premium rate and cannot exceed 12 hours over the standard time limit of a workweek for each employee. Paragraph 7.2 mandates that overtime shall be completely voluntary other than stated in section 7.3. Paragraph 7.3 explicitly states, where the company is party to a collective bargaining agreement freely negotiated with worker organizations (as

defined by the ILO) representing a significant portion of its workforce, it may require overtime work in accordance with such agreement to meet short-term business demand (SAI 2001). Any such agreement must comply with the requirements prescribed by paragraph 7.1

Remuneration is covered in the eighth section of SA 8000. The requirements of the eighth section are all wages for personnel must meet the legal minimum wage and industry standard. The funds must be sufficient to meet basic human needs and additional discretionary income. Paragraph 8.2 eliminates the ability of a company to withhold wages for disciplinary reasons. Wages and benefits must be in compliance with all laws. The SA 8000 does not allow companies to form agreements with personnel to reduce its social obligation to the employee.

The ninth and last criterion described by the SA 8000 is a management system. The management system is defined by 14 paragraphs that address the developmental roles and policies developed by the SA 8000. The company must form a social accountability policy based on the requirements set in the ninth chapter. Upper level managements must create the policy of the management system. The management policy must include a commitment to conform to all proposed guidelines in the previous sections of the SA 8000, comply with all applicable laws, and commit to constantly improve. The document and all procedures must be carried out to its specifications, available to the public, and understood by all personnel. The management must review and update the policies to the company's potential.

2.1.2 Corporate Social Responsibility

Though the government still plays a large role in social equality of employees, many corporations have taken the role into their own hands. The term corporate social responsibility (CSR) has become a key phrase in the business world since the early 1970s. CSR is the concept that organizations have an obligation to employees, clients, shareholders and communities in every aspect of their operation. Many businesses have realized the implementation of CSR into

the company helps to meet the employees' needs and better the performance of the company. CSR is a process of continual improvement that is closely related to social aspect of sustainable development. Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large (WBCSD 1999).

2.1.2.1 Socially responsible corporations

The increasing popularity of being socially responsible has taken large corporations by storm. Starbucks and Toshiba are just a few of the corporations that are committed to social responsibility. With the abundance of negative attention of corporations in the early nineties caused by corruption, companies have attempted to find a way to separate and define themselves as a socially responsible company. Starbucks and Toshiba are defining their company's reputation through third party evaluations and Corporate Social Responsibility reports. Companies have begun to evaluate their social performance through employee satisfaction surveys and other quantifiable methods.

2.1.2.2 International Organization for Standardization, ISO 26000

The International Organization for Standardization, the world leader in developing international standards, will be coming out with a document on social responsibility in the near future. The document will be named the ISO 26000 or ISO SR. The ISO 26000 is expected to be released in 2008 and will focus on defining standards for corporate social responsibility.

2.2 Economic Dimension

The economic and social dimensions are closely related. The economic dimension contains much of the information gathered for the social section of the literature review. Employees are directly related to the economic performance and requirements of a company. Current economic

patterns are controlled by the managing party of the corporation. The company maintains the obligation to the stakeholder to perform and generate profit. This is the basis for all economic prosperity. The economic performance of a company currently controls the decisions and operations of a company. There are not many issues that need to be addressed under the economic research. The research addresses the need for companies to operate transparently. This practice is becoming more popular due to the corporate social obligations of a company.

2.2.1 History of Economic Responsibility in the Construction Industry

Economic responsibility is the concern of the impact of the company's on the economic interests of its stakeholders. The history of economic responsibility is based on the expectations of a construction company to generate a profit for its stockholders. Currently there are safe guards like transparent reporting that help to protect the interest of the company's stakeholders.

2.2.2 Transparency

The transparency of companies has grown with the popularity of corporate social responsibility. The term transparency in relation to a corporation implies free communication and accountability. The concept of a transparent business is a business that holds people accountable through openly published reports. The primary purpose of being transparent is to fight corruption. There are many companies that are currently exercise transparent policies and have disclosure of their financial statements. Reporting transparency is a critical request for reports to be shown on paper and open to the public. Transparency shows the performance of the company and indicates that the company is not acting illegally.

2.3 Environmental Dimension

The environment has become a popular topic and concern in the construction industry. Environmental performance has become a way to differentiate construction companies. In the United States, buildings use one-third of our total energy, two-thirds of our electricity, one-

eighth of our water, and transform land that provides valuable ecological resources (USGBC 2). The primary existing environmental certifications focus on the product of construction and neglect the construction company. The environmental research explores documents created by independent organizations, the United States government, and the United Nations.

2.3.1 History of Environmental Responsibility in Construction

Environmental responsibility is a fairly new concept in the United States but people are becoming aware that there are limited resources available for consumption. The United States government has identified and acknowledged the importance of protecting the environment. The Environmental Protection Agency (EPA) was established by the United States government in 1970 to help protect and preserve the environment. The EPA has been the primary control of environmental policies and practices throughout American history, until recent times. The environment has become a popular topic in America and has influenced the construction industry. The construction industry is a large consumer of natural resources and energy. With the rise sustainable construction, the construction industry has become inundated with environmental certifications. One of the most recognized construction certifications is the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program. The program attempts to advance and improve the quality of the environment through improving the building product. This sustainable certification influences construction products and avoids the process and policies of construction companies.

2.3.2 Environmental Certifications, Programs, Standards, and Laws

In recent times, environmentally friendly and responsible certification systems have become increasingly popular because of global warming and environmental awareness. There are also many laws enforcing environmental protection. Current laws do not eliminate or control pollution to the extent needed to create a sustainable society. The construction industry has an

enormous effect on the natural and built environment and through sustainable practice can have a positive effect on the environment. The environmental research examines current and previous programs, laws, standards, and certifications to gain insight into the protection of the environment.

2.3.2.1 Environmental Protection Agency

Laws and regulations are two major tools in protecting the environment. Congress passed a 1970s law that created the Environmental Protection Agency (EPA). The EPA was created to govern the United States in its environmental practices. The EPA was a response to the public demand for cleaner water, air, and land. The primary goal of the EPA is to protect human health and the environment. The EPA is involved in many aspects of the environment; it develops and enforces environmental regulations, performs environmental research, and offers financial assistance for specialized environmental programs. The EnviroSense Program created by the EPA provides information on pollution prevention and the Waste Minimization Program focuses on waste reduction. There are EPA programs that focus on air, pesticides, pollution prevention, toxics and chemicals, water, waste, and recycling. Many of the EPA topics affect the manner in which construction companies operate. Since 1970, the EPA has been working for a cleaner, healthier environment for America.

Characterization of Building related Construction and Demolition Debris in the United States is a major report completed for the EPA (Franklin Associates 1998). The EPA commissioned a report by Franklin Associates to examine construction and demolition debris in the United States. The report is broken into generation and management sections. The generation and management sections are divided by residential and nonresidential construction. The report was commissioned by the EPA to have an understanding of how much waste was being generated by construction, demolition, and renovation and what types of waste were being

generated. The report estimated 136 million tons of building related construction and demolition debris was generated in 1996. Forty three percent of the waste was generated from residential sources and 57 % is from non-residential sources (Franklin Associates 1998).

Wood is the largest component of waste material generated at construction sites and concrete is the largest component of building demolition debris. Thirty five to forty five percent of construction and demolition debris was land filled and 20% to 30% was recycled. The most common materials recycled were concrete, asphalt, metals, and wood. Metals have the highest recycling rate among recovered construction materials. Currently over 85% of steel is recycled. The EPA's report on construction and demolition debris helps to identify areas of needed improvement for the construction industry.

2.3.2.2 Energy Star

Energy Star is a voluntary market based partnership designed to offer businesses and consumers with effective energy efficient solutions. It saves energy, money, and the environment. The labeling program is designed to identify and promote energy efficient products to reduce greenhouse gas emissions. Energy Star is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy. It helps to save money and protect the environment by using energy efficient products and practices. Energy Star works with more than 8,000 private and public sector organizations and has been a leader in the United States for energy conservation. It has had an influence on the use of technological innovations like LED traffic lights, efficient fluorescent lighting, power management systems for office equipment, and low standby energy use. Energy Star labels over fifty different product categories. Programs like Energy Star are playing a vital role in efforts to reduce greenhouse gas. Energy Star has saved Americans over \$12 billion on their energy bills and has reduced a comparable amount of greenhouse gas emissions.

2.3.2.3 International Organization for Standardization, ISO 14000

The International Organization for Standardization is an international body that contains representatives from 158 different countries. The International Organization for Standardization helps to define international standards required by business, governments, and society as a whole. The primary works of the international organization are the International Standards. The organization addresses many different topics in these standards.

The ISO 14000, the Environmental Management Standards in Production Environments is a series of standards that are designed to reduce the negative impacts organizations have on the environment. The document pertains to the life cycle of a product, not the product. The goal of the ISO 14000 is to reduce the environmental impact of the production process. The ISO 14000 is composed of six standards ranging from ISO 14001 to 14063. The ISO 14001 is the primary standard of the ISO 14000. The 14001 gives an outlined structured approach to develop environmental goals for production process. The ISO 14000 developed performance indicators to identify the efficiency of the product output.

2.3.2.4 Leadership in Environment Efficiency Design, LEED New Construction 2.2

The Leadership in Environmental Efficiency Design (LEED) certification system has grown to become a construction industry standards practice. The focus of United States Green Building Council's (USGBC) LEED certification is to improve the building product. The LEED New Construction (NC) 2.2 is a point based certification system that is composed of prerequisites, credits, and points. The LEED certification was formed in the nineties and has gained tremendous popularity in the construction industry. There are many deficiencies with this certification system, but it is an attempt to create a better environment for the future. The LEED certification is composed of six sections focusing on specific areas of the construction product. The six sections are Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and

Resources, Indoor Environmental Air Quality, and Innovation and Design. The majority of viable information from LEED was found in the Materials and Resources (MR) division and the Indoor Environmental Quality division (EQ). These two sections are the primary applicable areas of research. The construction company is able to make decisions in these two sections. The other sectors are heavily dependent upon the architect and owner's decisions.

MR Credit 2.1 & 2.2 Construction Waste Management demand a certain percentage of waste is diverted from disposal. The Construction Waste Management Plan diverts 50% or 75% of waste depending on the attempted credit. The intent of these credits is to divert construction, demolition, and land clearing debris from disposal in landfills and incinerators. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites (USGBC 2005). Credit 2.1 requires 50% waste diversion whereas Credit 2.2 increases the amount of waste diversion to 75%. The goals of MR Credit 2.1 and 2.2 are to recycle and/or salvage at non-hazardous construction and demolition debris. The company must develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted onsite or commingled. Excavated soil and land-clearing debris do not contribute to this credit. Calculations can be done by weight or volume, but must be consistent throughout (USGBC 2005).

MR Credit 4.1 Recycled Content: 10% and MR Credit 4.2 Recycled Content: 20% are credits that specify a particular amount of construction materials must be made of recycled materials. The intent of the Recycled Content Credit is to reduce the demand for extraction and processing of virgin materials by using materials that are made of recycled content. This credit reduces the amount of energy used to extract raw materials and the impact made on the natural

environment. The LEED credits must meet the recycled content requirements set by the International Standards Organization Document, ISO 14021. The contractor has the ability to select specified materials that have a high recycled content unless specified otherwise by the architect. The requirements of credit MR Credit 4.1 are to use materials with recycled content such that the sum of post-consumer recycled content plus one half of the preconsumer content constitutes at least 10% based on cost of the total value of the materials in the project (USGBC 2005). The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. Mechanical, electrical, and plumbing components and specialty items such as elevators shall not be included in this calculation. Only include materials permanently installed (USGBC 2005).

MR Credit 5.1 Regional Materials: 10% and MR Credit 5.2 Regional Materials: 20% are LEED points that specify an amount of materials that must be extracted, processed, and manufactured regionally. The LEED credits limit the distance materials are extracted, processed, and manufactured from the construction site. The purpose of the credits is to reduce the amount of carbon dioxide produced by transportation. The requirements set by the credit are building materials or products must be extracted, processed, and manufactured within five hundred miles of the job site for a minimum of 10% to 20% of the total material cost. The calculation does not include mechanical, electrical, or plumbing components.

MR Credit 7: Certified Wood offers one point to encourage sustainable wood harvesting practices. Fifty percent of all wood based materials used on the project must be certified in accordance with the Forest Stewardship Council Principles for Certified Wood. All wood that is permanently placed on site must be included in the calculation.

EQ Credit 3.1. Construction Indoor Air Quality Management Plan is a credit that establishes an Indoor Air Quality (IAQ) management plan for the construction phase of the building. This credit's purpose is to reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well being of construction workers and building occupants (USGBC 2005). The credit requires that an IAQ plan must be established for the construction phase of the building that includes

- during construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3 (USGBC 2005);
- protect stored on-site or installed absorptive materials from moisture damage (USGBC 2005);
- if permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-1999. Replace all filtration media immediately prior to occupancy (USGBC 2005).

EQ Credit 3.2. Construction IAQ Management Plan improves the indoor air quality for building occupants by developing an IAQ management plan for preoccupancy of the building. Credit 3.2 offers two different options. Option 1 is to flush out the entire building and option 2 is to perform IAQ testing on the building. Both of the requirements ensure the required indoor air quality credits are met through LEED.

2.3.2.5 Green Globes

The Green Globes Organization also certifies buildings built by construction companies. The difference between the LEED Certification and the Green Globes Certification is the latter focuses on an integrated design process including the owner, architect, and contractor into a functioning unit. Though similar to the LEED Certification, the construction company has limited decision making capabilities. The Green Globes Certification is heavily dependent upon the architect.

2.3.2.6 Eco-Management and Audit Scheme

Eco-Management and Audit Scheme (EMAS) is a European organization that has developed documents that address the construction industry, under the topic of “organizations controlling temporary sites.” The applicant organization must provide evidence that it has adopted procedures and technologies, suitable to the specific sites in which it has to temporarily operate to be a member of EMAS. Where applicable, these procedures should include at least the following items (EMAS 2001):

- appropriate technology and training (EMAS 2001)
- proper environmental analysis of the sites prior to the start of the activity (EMAS 2001)
- analysis of the environmental consequences out coming from future planned activities (EMAS 2001)
- communication to the public living in the area and to the local authorities concerning the relevant environmental aspects associated to the working plan, and the related identified solutions (EMAS 2001)
- formulation of recovering plans or solutions for improving the involved area’s environmental conditions at the end of the operations (EMAS 2001)

Temporary sites will be observed by spot checking the organization’s site and obtaining the information needed to ensure the site is in the proper condition. EMAS will ensure the company is operating properly through the spot check technique. Random checks are part of the verification process. EMAS registers the activities of the company, not just the selected site location. EMAS created rules for the applicant company that addresses the procedures the company must perform to be certified by EMAS. The list of the procedures is a set of the primary stages of EMAS. Registration of an organization must comply with the following steps:

- Conduct an environmental review considering all environmental aspects of the organization’s activities, products and services, methods to assess these, its legal and regulatory framework and existing environmental management practices and procedures (EMAS 1995).

- In the light of the results of the review, establish an effective environmental management system aimed at achieving the organization's environmental policy defined by the top management. The management system needs to set responsibilities, objectives, means, operational procedures, training needs, monitoring and communication systems (EMAS 1995).
- Carry out an environmental audit assessing in particular the management system in place and conformity with the organization's policy and programme as well as compliance with relevant environmental regulatory requirements (EMAS 1995).
- Provide a statement of its environmental performance which lays down the results achieved against the environmental objectives and the future steps to be undertaken in order to continuously improve the organization's environmental performance (EMAS 1995).

2.4 Sustainable Development

Sustainable development is a fairly new topic that has grown to be very popular in the turn of this century. The recent concern of greenhouse gases and increased attention to the environment has helped to make the term sustainable development a household term. Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987). The social, economic, and environmental aspects of sustainable development help to identify current and future goals of improvement for our world.

2.4.1 Laws, Standards, Documents, Conferences, and Certifications on Sustainable Development

There have been many documents produced to help advance sustainable development. The United Nations has created many documents on sustainable development to set goals for future government policies since the 1970s. Sustainable development documents encompass all three topics previously addressed in the literature review. Sustainable development documents have been created throughout the past 35 years by different organizations, companies, and governments to increase awareness and advance sustainable development.

2.4.1.1 Stockholm Conference

The Stockholm Conference was established by the United Nations in 1972. The Stockholm Conference was the first conference to address the impacts made by humans on the environment. The conference established a long term strategy to achieve the goal of sustainable development. The Stockholm Conference goals were to inform and positively affect the future of the world. The conference recognized the link between the environment and humans and the important role humans play in the protection of the environment.

2.4.1.2 World Commission on Environment and Development, International Conference on Environment and Economics, and the Brundtland Report

The term sustainable development was defined in the Brundtland Report published in 1987. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987). The term spurred from the World Commission on Environment and Development, also known as the Brundtland Commission. The 1983 conference helped to develop strategies to achieve sustainable development. The International Conference on Environment and Economics helped to develop the Brundtland Report. The Brundtland Report addresses the importance of nations to be independent and environmentally responsible. The Brundtland Report received its name in dedication to the former Norwegian Prime Minister, Harlem Brundtland. Mrs. Brundtland acted as the chair of the World Commission on Environment and Development and was a major contributor the Brundtland report. The World Commission on Environment and Development, International Conference on Environment and Economics, and the Brundtland Report paved the way for the Earth Summit and the adoption of Agenda 21.

2.4.1.3 Agenda 21 and World Summit on Sustainable Development

Agenda 21 is the United Nation's global blueprint for sustainable development. The creation of Agenda 21 took place in Rio de Janeiro, Brazil in 1992 and was updated by the World Summit of Sustainable Development in Johannesburg, South Africa in 2002. The United Nations Department of Economic and Social Affairs, Division of Sustainable Development, created both documents. Agenda 21 was developed for governmental advances in sustainable development. The agenda is not a prescriptive document for companies; it sets the goals for sustainable development of the entire world. The Agenda 21 gave insight into sustainable development and the procedures that need to be taken to become sustainable.

Agenda 21 is divided into four major sections. The first section of Agenda 21 addresses social and economic dimensions. Section two covers conservation and management of resource development. The Strengthening the Role of Major Groups section is explored in the third segment. The Implementation of the Agenda 21 is composed in section four. From the four categories each section is broken down into chapters. Each chapter is made up of multiple four paragraph programs. The programs are composed of the basis for action, the objective, activities, and cost of implementation. Much of the information included in the Agenda 21 is not applicable to the construction industry. The Agenda 21 is studied to gain insight into applicable guidelines for the development of a sustainable construction certification.

The social and economic section includes applicable information for the development of the certification system. The section is divided into eight chapters, each covering a specific topic, addressed by the United Nations. Not all of the chapters are essential for the research. The information that pertains to an applicable topic is explored. Paragraph 2.5 expands on the need to create a nondiscriminatory and predictable trading system. Through developing a fair, nondiscriminatory trade, developing countries will have the ability to grow and positively affect

the environment. The fourth chapter of Agenda 21 contains information on current consumption patterns and identifies areas of improvement for nonsustainable habits. Special attention should be paid to the demand for natural resources generated by unsustainable consumption and to the efficient use of those resources consistent with the goal of minimizing depletion and reducing pollution. Changing consumption patterns will require a multipronged strategy focusing on demand, meeting the basic needs of the poor, and reducing wastage and the use of finite resources in the production process (United Nations 2005). Efficient production processes must be developed and waste production must be decreased to be sustainable. Paragraph 4.18 addresses the need for increased operating efficiency. The paragraph encourages the reduction of energy and materials per unit of production. If current practices become more efficient, material amounts reduce and energy costs subside, saving the applicator money. Paragraph 5.11 states awareness should be increased at all levels concerning the need to optimize the sustainable use of resources through efficient resource management, taking into account the development needs of the populations of developing countries. Agenda 21 addresses the primary needs of the world's population in Chapter 6, protecting human health. Special attention is paid to the health needs of the elderly and disabled population. Sub-Chapter E, Reducing Health Risk from Environmental Pollution and Hazards, is an important topic that affects the construction industry. Indoor air pollution, water pollution, pesticides, and solid waste are topics that reduce health risk. The Agenda 21 focuses on governmental tasks that include the development of programs and control technologies.

The second section of the Agenda 21 is conservation and management of resources for development. The second major section is dissected into fourteen chapters. The first chapter is Protection of the Atmosphere. This chapter includes four program areas. The program areas

address uncertainties, promoting sustainable development, preventing ozone depletion, and atmospheric pollution. Paragraph 9.11 states, the basic and ultimate objective of promoting sustainable development in the second program area is to reduce adverse effects on the atmosphere from the energy sector by promoting policies or programs, as appropriate, to increase the contribution of environmentally sound and cost effective energy systems, particularly new and renewable ones, through less polluting and more efficient energy production, transmission, distribution and use (United Nations 2005). The sustainable development program includes objectives to identify and promote the use of economically viable and environmentally sound energy sources.

The second chapter beneath the promoting sustainable development topic is transportation. The basic objective of sustainable transportation is to develop and promote cost effective policies or programs to reduce the amount of harmful emissions. The third focal point of promoting sustainable development is industrial development. The purpose of the topic is to reduce materials and resource consumption by using environmentally friendly technologies in the industrial sector. Program C, Preventing stratospheric ozone depletion focus on the elimination of man made CFC, halons, and similar substances through the ratification of the 1990 Montreal Protocol. The fourth program is transboundary atmospheric pollution. The goal for the fourth section is to develop and apply pollution control and measurement technologies for stationary and mobile sources of air pollution and to develop alternative environmentally sound technologies (United Nations 2005). The goal of the ninth chapter is to reduce air pollution and give insight to applicable steps to create a sustainable environment. Chapter 19 of Agenda 21 addresses environmentally responsible management of toxic chemicals. The topic is divided into six program areas. The fourth program area establishes a risk reduction program for the

management of toxic chemicals. The concept is to eliminate unacceptable or unreasonable risks and, to the extent economically feasible, to reduce risks posed by toxic chemicals, by employing a broad based approach involving a wide range of risk reduction options and by taking precautionary measures derived from a broad based life cycle analysis (United Nations 2005). Paragraph 19.50 establishes guidance for industry use of toxic chemicals. The agenda identifies the importance of establishing a code of principles for the use of toxic chemicals that involve a responsible use approach based on alternative materials replacing toxic chemicals.

In section three, strengthening the role of major groups, the implementation of sustainable development practices into real world applications is explored. Section three acknowledges the imperative involvement of women, children, nongovernmental organizations, and workers in sustainable development. Promoting cleaner production is an objective set out by Agenda 21. All companies should increase efficiency of resources, increase reuse and recycling, and reduce the amount of waste discharge per unit output. The agenda holds companies accountable for their energy use, companies should practice annual reports on their environmental impact, including material and resource use. Agenda 21 is not a prescriptive document for companies, but a body of work that identifies areas of importance that must be addressed to create a sustainable environment.

Agenda 21 is the United Nation's global blueprint for sustainable development. Agenda 21 was updated by the World Summit for Sustainable Development to further progress the implementation of sustainable development. The WSSD formed two documents created by the United Nations Department of Economic and Social Affairs, Division of Sustainable Development. The two documents are the Johannesburg Declaration on Sustainable

Development and the Johannesburg Plan of Implementation. The other primary goal of the international conference was to develop a plan to further implement the Agenda 21 document.

2.4.1.4 Global Environmental Management Initiative

The Global Environmental Management Initiative (GEMI) is a not for profit organization designed to aid in the advance of sustainable development. The organization was created in 1990 and has developed many different documents exploring and advancing areas of sustainable development. The GEMI motto is “businesses helping business”. Many documents have been produced by the GEMI to enable businesses to evaluate themselves. The GEMI has designed and developed tools to advance the current status of sustainable development. The GEMI is not a third party certification and does not require that any particular standard must be met. The GEMI acknowledges the three primary facets of sustainable development and has created many different document addressing different topics in each of these three categories. The vision of the GEMI is to be globally recognized as a leader in providing strategies for businesses to achieve environmental, health and safety (EHS) excellence, economic success and corporate citizenship (GEMI 2005). The GEMI has developed tools to enable the easy application of sustainable practices in an industry. The GEMI is not a certification based organization, but a company that produces documents and advice to advance sustainable development.

2.4.1.5 International Institute for Sustainable Development

The IISD is a not for profit policy research institute formed in 1990. The Canadian based organization works with governments, business, and non governmental organizations to form environmental and social policies. Many valuable documents are made public through the IISD website. National Strategies for Sustainable Development: Challenges, Approaches and Innovations in Strategic and Coordinated Action is a document developed and published by the IISD. The document’s goal is to progress sustainable development through implementing

sustainable practices into industries and governments. Each document created by the IISD addresses a particular topic to advance sustainable development.

2.4.1.6 World Business Council for Sustainable Development

The World Business Council for Sustainable Development (WBCSD) is a world wide organization made up of large corporations dedicated to sustainable development. After the Rio de Janeiro Earth Summit in 1992, the Business Council for Sustainable Development was formed. The WBCSD was created in 1995 in a merger of the Business Council for Sustainable Development and the World Industry Council for the Environment. The focus of the WBCSD is to gain and share knowledge about eco-efficiency and sustainable development. The executive committee decides the members of the organization by evaluating their dedication to sustainable development. The election for membership is vague and undefined. Companies share information about their environmental performance and advice on their improvements. The WBCSD works with governments and non governmental organizations to encourage sustainable development. The WBCSD divides their information into four areas of focus. The areas of focus are energy and climate, development, business role, and ecosystems. The WBCSD has many published papers, each identifying an area of sustainable development.

2.4.2 Sustainable Reporting

The concept of sustainable reporting is new concept that addresses the three primary aspects of sustainability. The concept of sustainable reporting addresses the social, economic, and environmental performance of a company. Shareholders, employees, customers, and the public use these sustainable reports to evaluate the performance of corporations. Proper reporting practices for sustainable development have been identified and described by different organizations to help promote sustainable practices. Current standard reporting practices only address the economic aspect. Sustainable reporting identifies a company's performance in all

three sectors through the use of performance indicators. Performance indicators enable companies to directly compare a performance to another company's performance or their prior performance. The reports establish these methods of measuring performance in all three areas of sustainability. The sustainable reports help to identify the company's deficiencies and areas of improvement. Topics formed underneath the three pronged framework are addressed to properly complete a triple bottom line report. The term "triple bottom line" describes an accounting principle that accounts for the impact of the social, economic and environmental performance of a company. Triple bottom line report measures the sustainability of a company. Sustainable reporting identifies a company's performance and impact in the three areas of sustainability instead of the current practice which only focuses on economic performance.

2.4.2.1 Global Reporting Initiative, G3

The Global Reporting Initiative (GRI) is a recent addition to the sustainable reporting organization realm. The GRI came into development to enable accurate and proper sustainable reporting. The GRI was originated from a not for profit sustainable reporting project. In 2000 the GRI released its first set of sustainability reporting guidelines. The guidelines for sustainable reporting form a reporting framework for all companies, large and small, to follow. The reporting framework of the GRI is composed of the reporting guidelines, sector supplements and indicator protocols. Since 2000, companies have been using the GRI format to release reports based on the prescribed reporting guidelines. In 2006 the GRI released the G3, the primary reporting document of the GRI. The G3 guidelines outline topics that are important to sustainable reporting. The guidelines address many different topics all contained within the sustainable framework and rate the companies by established performance indicators. The goal of the GRI is to have reports on social, economic, and environmental performance by all companies in all sectors. The reporting is similar to the currently practiced standard accounting

principles, except the report informs and notifies the company on their performance in all three of the sustainable categories.

2.4.2.2 AccountAbility, AA1000 Assurance Standard

The Institute for Social and Ethical AccountAbility (ISEA) was created in 1996. The purpose of the Institute was to develop and measure reporting methods that will accurately and properly define a company's performance. The AA1000 framework was developed in 1999. The goal of the AA1000 was to help progress sustainable development through the learning process of ethical accounting. The AA1000 Assurance Standard (AS) was the next document produced by AccountAbility. The Assurance Standard was released in 2003. The AA1000 AS ensures consistent sustainable reporting to hold companies accountable. AccountAbility released the AA1000 AS to ensure proper reporting of sustainable performance. The AA1000 is not a certifiable standard rather a generally applicable standard for assessing, attesting to, and strengthening the credibility and quality of organizations' sustainability reporting (ISEA 2003). The AA1000 is a web based interactive standard. The AA1000 AS is intended to encourage innovation around key quality principles, which at this stage; it considers a more effective approach in moving forward individual adopting organizations and the field as a whole (ISEA 1999). The AA1000 gives a set of guidelines for proper sustainability reporting. AA1000 is an AccountAbility standard focused on securing the quality of social and ethical accounting, auditing, and reporting. It is comprised of principles and process standards (ISEA 1999). The sustainable reporting standard evaluates the credibility of published reports.

The AccountAbility defines the process of reporting for the AA1000 AS as a process standard, not a substantive performance standard. It specifies processes that an organization should follow to account for its performance and not the levels of performance the organization should achieve (ISEA 1999). The process of social and ethical accounting begins with a planning

process that defines a company's obligations, objectives, and targets. The second step is to account for the defined information. Data must be gathered to properly identify targets and improvement plans. The third step for proper accounting is to have the completed report audited to confirm the reports legitimacy. The report must be made accessible to shareholders to gain applicable feedback. The process will then be refined to produce a tailored document that is integrated into the company's standards.

2.5 Summary

The literature review explored the social, economic, and environmental dimensions of sustainable development. The research identified specific areas of sustainable development that need improvement. These specific areas of improvement were explored through the three primary aspects of sustainability. The research examined the history, goals, and concepts of sustainable development in an attempt to design a framework to evaluate construction companies.

CHAPTER 3 METHODOLOGY

The objective of the research is to create a comprehensive sustainable construction specific certification. The collection of documents pertaining to the three primary aspects of sustainable development provided ample information for the development to the Social, Economic, and Environmental (SEE) Evaluation. Documents, certifications, standards, and laws pertaining to the three aspects of sustainable development were observed through current American history. The gathered information determined specific areas of focus and developed the policies to which the areas of focus must be upheld. The information has been sorted by it's relation to sustainable development and organized by date and significance. Previous and current documents give informative insight into the development of the SEE Evaluation.

3.1 SEE Evaluation Design

The framework of the SEE Evaluation began by researching previous sustainable standards applicable to the construction industry. The evaluation acknowledges the goals and intent of each document, then applies the documents goals to the construction industry standards and practices. The current inefficiencies of the construction industry are addressed by the researched documents. The framework of the evaluation examined current construction industry practices and explored possible areas of improvement in the social, economic, and environmental realms. The areas of improvement are addressed in the policies of the SEE Evaluation.

3.1.1 Social Development

The social research began with American labor laws. Labor laws are the initial documents that address social rights of American employees. These American laws are the basis of American social standards and helped develop corporate social responsibility. Construction companies must currently operate and perform by the seven laws studied in the literature review.

Leading companies' social documents are explored to gain insight into the forefront of current corporate social policies in America. Starbucks and Toshiba's current policies are observed to help define the baseline social performance of the SEE Evaluation. These current laws and documents identify the expected performance of the construction industry. The evaluation's goal is to advance and improve the current condition of social performance through creating policies that the applicant company must operate by.

3.1.2 Economic Development

Economic development has naturally occurred through American history. Economic development is typically based on the monetary performance of a company. Economic development has been the primary performance concern to American companies. The social and environmental aspects of sustainability have been neglected caused by the concern of economic performance. Stockholders control the current economic operation practices of their company. The SEE Evaluation framework's primary focus in the economic section is to maintain corporate practices that are expected from the leading American companies. The requirement for the company to perform transparently is the primary concern of the SEE Evaluation process.

3.1.3 Environmental Development

Environmental performance in the construction industry will be improved by the SEE Evaluation process. The research began with American laws that were created to protect the environment. The history of environmental protection is followed through the Environmental Protection Agency (EPA). The defined environmental protection laws are identified and carried over in to the framework of the evaluation. Certifications for the construction product inform the SEE Evaluation by approaching sustainable development from a different aspect. Current construction certifications focus on the construction product and neglect construction processes and policies. These certifications are drastically different than the SEE Evaluation but are

beneficial to the development of the evaluation's framework. The Leadership in Environment Efficient Design (LEED) New Construction 2.2 identifies specific areas of improvement that make construction companies operate more efficient. The designed framework has areas of improvement that directly overlap with construction product certifications. The environmental section of the framework is designed by the exploration of previous developed standards, laws, and documents to improve the performance of the construction industry.

3.2 Method of Investigation

A formal investigation was performed on current and previous laws pertaining to social, economic, and environmental standards, laws, and certifications. The three aspects of sustainability were divided and explored independently. The research examined the history of each different aspect of sustainability from its inception into American history. The gathered information provided the groundwork for the construction certification policies. Studying the different documents gave an understanding of the different realms of sustainable development and the changes that must occur to reach the goal of sustainable development. The framework was created by observing previously published documents and identified their relationship to the construction industry.

CHAPTER 4 THE SEE EVALUATION

The SEE Evaluation is an impartial sustainable third party certification system designed to evaluate construction companies. Previous laws, standards, and certifications were examined to obtain insight into the development of the SEE Evaluation. The SEE Evaluation measures various aspects of a company, not the buildings that they might construct. The evaluation has been specifically tailored to address specific deficiencies in the construction industry. The defined policies equally evaluate small, medium, and large construction companies. It is imperative to the success of the SEE Evaluation that the developed policies be clear, concise, and understandable. The policies must establish exactly what is required from the company. Figure 4-1 is an outlined preview of the SEE Evaluation policy framework.

The certification is divided into three divisions: social, economic, and environmental. Each division is composed of specific sections that include prerequisites and topic points. Each section describes a general area of the construction industry that needs to be addressed. Every policy is divided into two paragraphs identifying the purpose and policy terms. The company must adhere to the prerequisites to be certified by the SEE Evaluation. The policy points are optional points that companies may or may not choose to obtain. The applicant company must attain a sufficient amount of points to obtain a specified level of certification. The more point attained the higher the level of certification. The evaluation gives prescriptive measures and sets requirements that must be met instead of setting goals that do not require conformance. The applicant company must comply with the selected SEE Evaluation policies but is not limited by them. Additional information can be created by the applicant company and is encouraged as long as it does not conflict with any central goals of the evaluation's prerequisites, selected policies, and laws. The applicant companies may or may not currently practice the defined policies. The evaluation only

requires that the applicant comply with all prerequisites and selected points if they are to be certified by the SEE Evaluation.

4.1 Company Statement

The goal of the SEE Evaluation is to make the construction industry as sustainable as possible. The path to sustainability is a path of trial and error, attempting to effectively alter the way business is currently conducted. It is important to share knowledge with one another about innovative ideas and concepts that further the movement towards sustainable development.

4.1.1 Company Reporting

It is important for a company to report its performance in all three aspects of sustainability. The applicant company must adopt the Global Reporting Initiative's (GRI) G3 reporting policy to indicate its performance and ensure it is performing to the best of its capabilities. The G3 will enable companies to identify deficiencies and areas of improvement through the use of the G3's established performance indicators. The SEE Evaluation uses the G3 report to monitor certified companies performance to ensure conformance to the applicable polices.

4.1.2 Company Communication

Construction companies need to share and publicize their successes and failures to help other companies make proper and informed decisions. An online forum will allow companies to post their failures and successes. It is important that information be shared. Innovative concepts that help companies obtain points or help to further their social, economic, and environmental responsibility should be posted. Companies should not retain information that could be utilized by other companies to support unethical motives. The postings should be accessible to all construction companies for examination. Postings could include information on sustainable ideas or information on an environmentally friendly supplier. Any information considered beneficial to sustainable development should be shared in postings. The shared information forms an

interconnected network of socially, economically, and environmentally responsible construction companies attempting to improve sustainable development.

4.1.3 Company Advances

Leaders of the construction industry adopt new technologies that help them to operate more efficiently. It is important these technologies be adopted by certified companies. The use of building information modeling is an example of rewarding company advancement. The use of technology is continually increasing and advancing the construction industry. Companies that adopt and evolve new technologies enable them to operate more efficiently. This subsequently is beneficial to the environment. A company that adopts and embraces new technologies is given an advantage over those companies that are resistant to change. The SEE Evaluation encourages technological advances and use of technology to enhance efficiency.

4.2 SEE Evaluation, Social Division

The Social Division of the framework explores the relationship of the construction company with its employees. The framework defines the company's manner of operations, observing equality and fairness in every aspect. The roles and responsibilities of the employee, employer, subcontractor, client, and community are the relationships identified and investigated in the Social Division of the SEE Evaluation. The evaluation observes the company's operations and sets policies by which employees must operate. The social segment of the certification evaluates factors of human equality and rights of individuals. The Social Division of the SEE Evaluation's goal is to create a proper and fair construction industry where employees, companies, clients, and communities will obtain a mutually beneficial relationship.

To ensure the satisfaction of all individuals, satisfaction surveys will be distributed biannually. The biannual satisfaction survey will help to quantify the social performance of the company. Performance indicators for the social aspect of the evaluation are very difficult to

define and quantify. Each human defines satisfaction and happiness differently. The evaluation will attempt to effectively create policies that foster a healthy productive social environment.

4.2.1 Employees Obligations to the Company

The Employees' Obligation to the Company section explores employees' responsibilities and obligations to the employer construction company. It is an essential condition of employment that each employee represents their employer to the best of their ability at all times. There must be a mutually beneficial relationship formed between the employee and employer during employment. The framework of the certification sets social polices by which employees of the certified company must abide. Key requirements set by the SEE Evaluation are defined by policies.

4.2.1.1 Ethical Business Conduct Guidelines 1.1.1 (prerequisite)

Ethical decisions are constantly made during the daily operation of a company and each employee is held responsible for his or her decisions. Each employee is held to the highest standards of integrity. A set of fundamental values are set that will help guide employees through the ethical decision making process. The company benefits from the Ethical Business Conduct Guidelines by establishing what is expected of all employees. In this way, expectations of the individual will be standardized. Every individual will be operating with the same understanding of what is expected of them. This effect creates a positive, unified construction company with direction and common goals.

Purpose. The Ethical Business Conduct Guidelines establish standards by which all employees should operate. Employees are held to the highest of standards and expected to operate by the established code of ethics in the SEE Evaluation. If employees choose not to follow the rules established by the guidelines, it is grounds for termination of employment. Harassment is an example issue that is addressed in the Ethical Business Conduct Guidelines.

Harassment is a current and ongoing problem in the construction industry and can create a negative effect on the company's atmosphere. Harassment can directly effect production and can be the source of many negative business issues in the construction industry. The Ethical Business Conduct Guidelines address these issues and set a tone for what is expected from the employees. The purpose of the ethical business conduct guidelines is to ensure that employees act in the proper ethical manner which is prescribed in the policy terms.

Policy terms. The applicant company must adopt the Ethical Business Conduct Guidelines defined by the SEE Evaluation. Employees must acknowledge their obligation to the company through reading and signing the Ethical Business Conduct Guidelines. The company's ethical business conduct guidelines may include additional information, tailored to the company. The supplementary information added to the ethical business conduct guidelines must not interfere or conflict with the core policies set by the SEE Evaluation. The Ethical Business Conduct Guidelines must be carefully read, acknowledged, signed, and abided by all employees of the company. The core ethical business conduct guidelines are as follows:

- All employees must be honest in all dealings with their company of employment and its operations.
- All employees must operate with integrity while interacting with their company of employment.
- All employees must not place themselves or others in harm's way.
- All employees must respect and care for the environment.
- All employees must keep personal life and work separate.
- All employees must respect the identities of all individuals.

4.2.1.2 Substance Abuse Policy 1.1.2 (prerequisite)

A safe and healthy working environment is one of the most important aspects that are controlled by the construction company. There are no excuses for any type of substance abuse by

any employee. Without impaired judgment, the construction industry is a dangerous industry. The use of a controlled substance or alcohol places others at risk and cannot be tolerated.

Purpose. The Substance Abuse Policy helps to maintain a safe, efficient, and healthy working environment. Employees who abuse any substance put others in harm's way. Participating in any jobsite activities while under the influence of drugs or alcohol poses a serious risk to jobsite safety and will not be tolerated.

Policy terms. There is no tolerance for substance abuse and precautions must be taken to avoid this mistake. The Substance Abuse Policy explicitly lists the rules that the certified company must abide by.

- All employees must not be impaired through use of drug, alcohol, or any illegal substances at any time during employment.
- All employees will be drug tested pre-employment with the company.
- All employees are subjugated to random drug testing on a regular basis.
- All associated employees will be post accident drug tested.

4.2.2 Company Obligations to Employees

It is essential that the applicant companies create a healthy and safe working environment for all employees and comply with all federal and state employment laws. Social obligations go beyond abiding by current laws. The SEE Evaluation establishes a set of social policies that identify the obligations of the employer to the employee.

4.2.2.1 Safety Policy 1.2.1 (prerequisite)

The SEE Evaluation framework is committed to creating a safe working environment for all employees. The safety of employees is essential for the success of a construction company. A list of safety requirements that must be met to be considered for certification has been developed. The Safety Policy is a prerequisite of the SEE Evaluation that must be met to be certified.

Purpose. Construction is the most dangerous industry outside of fishing in the United States. Employees, as company's most important asset, should be provided a safe work place and be given the opportunity to become knowledgeable about safety issues. Falls, electrocutions, vehicle rollovers, personnel run over by vehicles, and excavation cave-ins are the five leading causes of death in construction. It is important for employees to be knowledgeable about these unsafe situations and the need to protect themselves from these dangers. It is imperative that a safe working environment be provided for all employees in the construction industry.

Safety in the construction industry is already an important concern of many construction companies. Good safety practices produce low experience modification ratings. Safe construction companies have lower safety experience modification ratings due to their dedication to creating safe environments for their employees. The less recordable injuries, lost time, and deaths, the lower the construction company's Experience Modification Rating (EMR) is. The lower the EMR, the more money the construction company saves.

Jobsite specific safety analysis is another subcategory addressed in the SEE Evaluation framework. The jobsite specific safety analysis is a process that analyzes and develops site specific safety plans that address specific issues of concern on particular sites. The analysis enables all on-site workers to be aware of specific safety concerns and conduct safe working practices. The analysis directly deals with situations and tasks that will be performed on a specific construction site. All employees and subcontractors should be aware of the jobsite specific safety plan and should receive adequate instruction on the implementation of the plan.

The subcontractor plays a significant role in creating a safe jobsite. If a construction company exercises extreme safety practices but neglects to address the issue of safety with the subcontractors, the jobsite is not necessarily safe. Therefore, subcontractor safety is as much a

part of the SEE Evaluation as contractor safety. The policy terms explicitly state the specifications for subcontractors.

The SEE Evaluation is committed to providing a safe workplace in every aspect of the construction industry. Criminal background checks are required for all employees before employment with a SEE certified company. Infractions of the law may eliminate the opportunity for future employment with the company depending on the severity of the infraction.

Policy terms. The safety of all workers should be of the utmost importance to any company. The safety policies must be abided by construction companies to ensure certification. Applicant companies that do not abide by this policy are not eligible for certification. The construction company's safety policy must contain and abide by the prescribed SEE Evaluation Safety Policy. The construction company's safety policy must be compliant with the following information but is not limited to this information:

- All construction sites must be OSHA compliant.
- OSHA compliance officers must always be granted access to all construction sites.
- All employees must be ten hour OSHA certified.
- A jobsite specific safety plan must be developed for every project that the company builds.
- Subcontractors with a safety experience modification rate greater than 0.95 cannot be hired by the contractor.
- Pre-employment criminal background checks are required for all employees.

4.2.2.2 Employment Policy 1.2.2 (prerequisite)

The Employment Policy is a prerequisite that directly deals with the relationship between employer and employee. The Employment Policy contains many different areas of focus pertaining to the employees' quality of life. The Employment Policy addresses affirmative action, illegal labor, wages, harassment, and overtime.

Purpose. The proper treatment of employees is essential for sustainable development to occur; therefore employment conditions and employee rights are an important social aspect of the framework. The construction industry is known for its harsh working conditions and unfair treatment of employees. The Employment Policy addresses concerns of employees and develops suitable standards for employees. Fair employment practices in the construction industry are emphasized in the SEE Evaluation. The evaluation examines and acknowledges particular negative social aspects of the construction industry and their need for improvement.

The construction industry is one of the largest employers of short-term illegal workers. An estimated 1.4 million unauthorized workers are employed in the construction industry. This accounts for about 12% of the construction work force. Many construction companies employ undocumented workers. Many undocumented employees are paid below minimum wages and face harsh and unfair labor conditions. The use of illegal labor is prohibited in the SEE Evaluation.

The Affirmative Action subpolicy addresses issues that arise out of discrimination on the basis of race, color, sex, age, religion, national origin, disability, or veteran status. Construction companies must be equal opportunity employers in all phases of employment. Companies have an ethical and legal obligation to provide a work environment in which employment opportunities are open to all qualified individuals without discrimination. These standards must be maintained throughout all stages of employment.

All employees must be paid fair labor rates that match or exceed industry standards. Fair labor wages ensure employees will be able to provide for themselves and their dependents to create a sustainable development. The living wage policy requires employers to pay wages that equal or are higher than the state and federal minimum wage. The living wage policy establishes

a specified percent of workers that must be paid at a rate that places them over the poverty line. Living wages help to distribute wealth among the less fortunate and develop the surrounding community.

Policy terms. The Employment Policy is a prerequisite of the framework. The policy defines guidelines for the company of employment. The policy sets the living wage rates equal to 130% of the poverty line. The poverty line must be updated and established each year of certification. The policy terms the employer must abide by are

- will abide by all state and federal requirements;
- may not use illegal labor of any kind;
- will not discriminate on the basis of race, color, sex, age, religion, national origin, disability, or veteran status;
- will establish living wage rates for all employees equal to 130% above the poverty line updated and established each year.

4.2.2.3 Health Insurance Policy, Healthy Living Program 1.2.3 (20 points)

The SEE Evaluation Health Insurance Policy promotes a healthy lifestyle for sustainable development. The program rewards employees for their health performance. The 20 point policy establishes guidelines for a health insurance program to promote healthy living habits. The Healthy Living Program enables the employee to have the ability to decide on the amount of insurance coverage received through lifestyle practices.

Purpose. The purpose of the Health Insurance Policy is to promote healthy behavior for all employees in the company. Many current construction companies' insurance policies do not influence employees to be healthy. The SEE Evaluation Health Insurance Policy is designed to promote a healthy lifestyle for employees. The healthier the employees are, the more the employees are rewarded. Figure 4-2 explains the Healthy Living Program in extensive detail.

Policy terms. The insurance program promotes the health of its employee by increasing the amount of insurance covered by the construction company. A set of subpolicies are established by the Healthy Living Program. An employee's insurance can range from complete coverage to no coverage through the Healthy Living Program. Healthy lifestyle subpolicies are defined by the Healthy Living Program. The decision to not smoke will cover 25% of an employee's health insurance. If an employee exercises at least three times a week, over thirty minute intervals, another 25% of the employee's health insurance will be covered. The remaining 50% of an employee's health insurance coverage is dedicated to a healthy diet and decisions. The employee must have healthy lifestyle habits and must be checked by a doctor every year to ensure the individual is actively well.

4.2.2.4 Benefits Policy 1.2.4 (10/20 points)

The Benefit Policy defines requirements for the employers benefit policy. The 401K is a retirement plan sponsored by the employer. The 401K is a standard practice for employers to use but the Benefit Policy sets exact parameters the construction company must operate by to obtain the points.

Purpose. The Benefit Policy encourages employees to save for their financial future. The purpose of the Benefit Policy is to define a benefit standard that companies need to uphold and to define the specific parameters set by benefit programs. Figure 4-3 helps to define and explain the parameters of the Benefit Policy.

Policy terms. To receive 10 points, the employer must offer a voluntary 401K retirement plan to all employees after one year of employment. The company must contribute at least 50% of the employee's contribution of up to 10% of the employee's salary. The construction company must exceed the industry standards to receive 20 points. A voluntary 401K retirement plan must be offered to all employees after one year of employment. To receive 20 points for the Benefit

Policy the employer must match or exceed a 100% of the employee's contributions of up to 10% of the employee's salary. The individual employee is able to retain all of their contributions and will obtain 50% of the employer's contributions with over 2 years of employment and 100% of the employer's contributions with five years of employment.

4.2.2.5 Educational Assistance Policy 1.2.5 (15 points)

The Educational Assistance Policy is a 15 point policy that is proposed to advance the education of employees. The employee's courses should enhance competencies for current tasks, enhance the performance of the employees current position, or provide the employee new skills to advance to another position within the construction company. The policy requires the defined guidelines must be met to obtain the policy's points.

Purpose. The Educational Assistance Policy enables regular full-time employees to attend continuing education courses to advance themselves. The continual improvement of an individual is a sustainable practice that helps to develop the individual and the company. The policy advances knowledge and increases performance.

Policy terms. The Educational Assistance Policy establishes a voluntary program that provides further education aid for full time employees. The construction company will reimburse employees for 50% of schooling up to \$1,000 per semester for successfully completed courses.

The following subpolicies must be met to obtain furthering education approval:

- Employee must attend an accredited school.
- Employee must not take more than two classes a semester.
- Employee must be a full time employee.
- Employee must not take classes during work hours.
- Employee must provide proof of successful schooling and associated expenditures for reimbursement.

4.2.2.6 Daycare Policy 1.2.6 (10 points)

The Daycare Policy is defines a daycare policy for employees' children. The Daycare Policy is worth 10 points. The policy sets guidelines that enable employees who would typically be unable to afford daycare to obtain daycare for their children. Daycare has been proven to offer a positive environment for children and fosters an improved quality of living for the development of children.

Purpose. Daycare fosters a safe environment for children while parents work. Childcare is a difficult task, especially for a single working parent. Employees who cannot provide satisfactory daycare for their children are eligible for additional daycare aid prescribed by the Daycare Policy.

Policy terms. The applicant company must provide daycare aid for employees who are unable to afford satisfactory daycare. Employees must apply for supplemental daycare aid. The company must provide supplemental funds for applicant employees who are proven unable to provide their children with daycare caused by insufficient funds. Supplemental daycare funds will be established on a case by case basis. In addition to providing additional funds for daycare the employer must also select one of the options listed below to receive the Daycare Policy points.

Option one is to provide a list of the five closest daycare centers in relation to the jobsite or main office, depending on the location where the individual works. Option two is to form a company daycare center for employees' children. The daycare center can actually serve as a profit center for the company. The daycare facility must be able to safely house all of the employees' children and charge fair daycare rates.

4.2.2.7 Indoor Air Quality during Construction Policy 1.2.7 (5/10 points)

Indoor Air Quality Policy helps to protect the health and safety of its employees and subcontractors. The policy prescribes specific requirements that must be met by the construction company to obtain 5 or 10 points. The policy establishes two different levels of indoor air quality performance during construction. Employee health and safety are a major concern of the Social Division of the framework.

Purpose. The purpose of achieving a high indoor air quality during construction is to ensure the proper protection of all individuals temporarily occupying the space during the construction of a project. There are many toxic chemicals released by building materials that can harm individuals without proper filtration.

Policy terms. The SEE certification requires that the construction company adhere to the policies set by LEED Credit 3.1: Construction Indoor Air Quality Management Plan. The LEED specifications state that selected projects must meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) Indoor Air Quality Guidelines for Occupied Buildings under Construction, 1995, Chapter 3 (USGBC 2005). If permanently installed air handlers are used during construction to receive the points, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-1999. All filtration media must also immediately be replaced prior to occupancy. Five points will be awarded if 50% of all project points meet the guidelines prescribed above. Ten points will be awarded if 90% of the project points meet the policy requirements. The Indoor Air Quality During Construction Policy will use a weighted value scale to obtain a fair value of project percentage. The scale associates the total cost of the project including current change orders and profit to a point value. Figure 4-4 and Figure 4-5 identify the specific features of the Indoor Air Quality Policy.

Each project that follows the guidelines will be awarded the allowed points established by the project costs. The project points will then be divided by the total points established by the entire amount of work in progress. The calculation will give a fair representation of current projects in progress. The calculation establishes a weighted importance of the project so that an applicant company has a fair chance to obtain the topic point. If the project does not have air conditioning in the design, the project will receive the certifiable points in relation to value identified by the project value indicator.

4.2.2.8 Smoking Policy 1.2.8 (5 points)

The Smoking Policy is an easily attainable 5 point policy that increases healthy behavior habits and discourages smoking. The policy defines parameters for smoking areas to protect the health of nonparticipating individuals. Smoking is detrimental to the health of participants and nonparticipants.

Purpose. Smoking is known to be a major cause of cancer and directly affects physical health. Smoking habits consume valuable operation time and can have a direct or indirect negative effect on personnel. To protect the health of individuals, the company will abide by the requirements set in the Smoking Policy to receive the points.

Policy terms. The Smoking Policy is established to protect the health and safety. The policy defines areas and limitations of smoking. Designated smoking areas will be established at the office and at every construction site. A defined area must be a well ventilated space that includes a receptacle to dispose of cigarette remains. The policy prohibits smoking in areas shared by the public and areas defined but not limited to

- shared employee work spaces;
- entrances into main office buildings, site offices, and trailers;

- areas that present fire risks, including material storage areas, lay down areas, and areas with combustible materials.

4.2.3 Obligations to the Subcontracted

The Obligations to the Subcontracted Section explores the relationship of the contractor to vendors, suppliers, and subcontractors. The Obligation to the Subcontracted Section establishes policies of conduct that the construction company must follow in relation to subcontracted. The ethical policies help to develop a sustainable society.

4.2.3.1 Supplier Selection Policy 1.3.1 (prerequisite)

The Supplier Selection Policy is an easily attainable prerequisite. The Policy only requires the company abide by an ethical set of policies in its dealings with subcontractors, suppliers, and vendors. The company must adopt and abide by an ethical set of policies to be eligible for certification.

Purpose. It is imperative that the applicant construction companies operate to the highest ethical values. All subcontractors must be given a fair chance to perform work in the open competitive market. The selection of subcontractors due to unethical motives is unacceptable. The Supplier Selection Policy creates fair market competition, helping to advance the economy.

Policy terms. Procurement decisions must be made based on factors such as quality, service, price, delivery, and best value. Care must be taken to avoid conflicts and the appearance of partiality. Kickbacks are strictly prohibited and favoritism to subcontractors for unethical motives is strictly forbidden.

4.2.3.1 Supplier Diversity Policy 1.3.2 (15 points)

The Supplier Diversity Policy stipulates a required amount of suppliers and subcontractor must be minorities. The 15 point policy requires that the company uses minority suppliers for 2%

of total subcontracted construction value. The policy aids in the development of the community the helps to raise the current economic median.

Purpose. The Supplier Diversity Policy gives minority owners the opportunity to obtain subcontracts in fair market competition. The Supplier Diversity Policy enables minority subcontractors to grow through increases in their selection. It is important to understand the benefits that come from working with locally owned businesses in the community. The Supplier Diversity Policy requires that the company to use a certain percentage of minority owned subcontractors in relation to the current amount of work being performed

Policy terms. Minority subcontractors must be awarded at least 2% of all subcontracts calculated out of the company's total project amount. The company's total project amount will use the current value of all subcontracts and divide it by the current total value of all minority subcontracts.

4.2.4 Obligations to Community and Customers Section

The community and customers of the company are essential to a company's success and performance. Construction companies must acknowledge their obligations to the community and customers. The framework defines policies for companies in relation to the client and community.

4.2.4.1 Client Inform Policy 1.4.1 (prerequisite)

The Client Inform Policy is an easily attainable prerequisite that helps the community and client to understand the construction company's policies and goals. The Client Inform Policy is composed of 2 different sections. The first section defines the creation of a brochure and the second segment defines required topics the company must cover during the first meeting with the client.

Purpose. The Client Inform Policy establishes the company's track record and informs the client of the construction company's ethical stance on the social, economic, and environmental aspects of construction. The policy helps in identifying the company's dedication to deliver a quality product and to adhere to sustainable principles. The increased awareness can prove to be beneficial to the company. The goal of the policy is to increase awareness about sustainable practices through the policy terms.

Policy terms. The company must create a brochure that informs stakeholders about sustainable practices and display the construction services offered by the company. The brochure must identify the company's objectives and define their performance. The goal is to promote sustainable development to the clients and community. The company is also required to supply the client with the company's goals, practices, and capabilities during the first meeting.

4.2.4.2 Proper Storage of Materials Policy 1.4.2 (prerequisite)

The proper storage of materials is a standard practice of the construction industry. Material must be able to uphold their integrity to produce a quality product for the client. The Proper Storage of Materials Policy prescribes specific requirements the company must perform to obtain the prerequisite.

Purpose. The proper storage of all materials is important to offer a finished product without defects. If certain materials are not protected, moisture damage can occur. This can affect the quality of the final product, the indoor air quality of the building, and can even cause illnesses.

Policy terms. The applicant company must properly store materials in the manner described in the Indoor Environmental Quality section of the LEED, credit 3.1 to receive the proper storage of materials point. LEED credit 3.1 states Protect stored onsite or installed absorptive materials from moisture damage (USGBC 2005). The policy offers prescriptive

measures to ensure that materials are properly stored. All materials that will be installed within two days must be covered with weather resistant plastic to protect the materials integrity. Any absorptive materials that will not be installed within two days and can be damaged by weather must be stored in a dry storage container on or off site.

4.2.4.3 Constructive Construction Criticism Policy 1.4.3 (10 points)

The contractor shall put forth an effort to work with the architect in the development of the project. The contractor has expertise in construction methods and should share knowledge gained through experience to make the building's construction, building systems and building operate more efficiently in cost and time.

Purpose. The Constructive Construction Criticism Policy will attempt to work and aid in the design process, giving advice pertaining to the construction of the building and the building's operating systems. The contractor has expertise and knowledge of construction that the architect does not have. Applying this knowledge to the design can save money, reduce waste, and save energy.

Policy terms. The contractors should have an open dialogue with the architect and be willing to set forth advice to the architect about energy conserving methods or tactics. The contractor will aid the architect in selecting properly sized energy efficient systems. Value engineering is a valuable additional quality to the construction process and must be considered by the contractor.

4.2.4.4 Volunteerism Policy 1.4.4 (5 points)

The Volunteerism Policy is a 5 point policy that is dedicated to giving back to the community. The policy can be obtained through volunteering a specified amount of time. The applicant construction company can attain the 5 point policy through adopting the requirements set by the policy.

Purpose. Volunteering time establishes an ethical responsibility to give back to the community. It is important increase the conditions of the surrounding environment to promote sustainable development. The company will give back to the community and be recognized for the positive efforts it has made. Volunteering helps the community and helps to identify the company as a reputable and ethical organization.

Policy terms. The Volunteerism Policy requires the company to form an employee volunteer program. The volunteer program must form relationships with volunteer companies and identify the not for profit companies with which it is involved. It is required that the heads of each department in the construction company must volunteer at least 50 hours a year. It is important for these leaders of the company to serve as an example for the employees. It is recommended that each employee volunteer at least sixteen hours a year, but this is not mandatory. The volunteer program will allow employees two days off of work to complete the recommended minimum volunteer hours. If an employee chooses to volunteer over the recommended sixteen hours, the construction company does not have any obligation to give more time off to the volunteer.

4.3 SEE Evaluation, Economic Division

The Economic Division of the SEE Evaluation as one sections composed of two policies. The first policy addresses the obligation of the company to be transparent. The second policy addresses the obligation of the company to its shareholders. These two topics are closely related to each other but define different advances toward sustainable development. The economic performance and values of the company are identified in Economic Division.

4.3.1 Obligation to Stakeholders

The Obligation to Stakeholders Section addresses a company's responsibility to any party that is affected by the company's actions; this includes the stockholder, employee, subcontractor,

and community. The applicant company must acknowledge its power to effectively influence the surrounding stakeholders. The company has the ability to positively affect the current social, economic, and environmental performance of other companies through the promotion of sustainable development.

4.3.1.2 Transparency Policy 2.1.1 (prerequisite)

The Transparency Policy is a prerequisite of the SEE Evaluation's framework. The policy requires the company disclose its financial performance to all stakeholders. The policy defines the economic requirements the company must operate by, disclosing all performance information to the company's shareholders.

Purpose. The purpose of the Transparency Policy is to hold construction companies accountable through openly published reports. Openly published reports help to fight corruption and misappropriated funds. All shareholders must be able to access published reports that identifies and reveals information about the company's social, economic, and environmental performance.

Policy terms. All of the company performance must be transparent. The organization must make the company's performance available to all employees, clients, and the public through openly published performance reports. The company must produce a biannual report disclosing the required information to be certified by the SEE Evaluation.

4.3.1.2 Shareholders Statement Policy 2.1.2 (prerequisite)

The Shareholders Statement Policy identifies the company's dedication to adhere to sustainable principles and abide by the policies defined in SEE Evaluation's framework. Shareholders may feel obligated to invest in a social, economic, and environmental responsible company, the obligation to shareholder statement helps to identify the company's stance towards sustainable development.

Purpose. Construction companies have an obligation to their shareholders. Typically the primary concern of the shareholder is the economic performance of their investment, but some investors do not only consider the economic output of their investment. Some investors believe it is their moral obligation to invest in companies that also behave in a socially and environmentally responsible manner. This practice enables the shareholder to make a profit and acts as an advocate of sustainable development.

Policy terms. The company must be responsive to the shareholders' concerns and provide a company statement to identify the company's ethical stance and define its dedication to sustainable development. The company must define the company's track record and inform the shareholder of the construction company's ethical stance on the social, economic, and environmental aspects of construction. Companies must work with their shareholders to identify specific issues of concern. It is important to form an open dialogue with all of the shareholders to communicate the performance of the company to gain input and advice

4.4 SEE Evaluation, Environmental Division

The Environmental Division of the SEE Evaluation is divided into two sections, dealing with two different segments of a construction company. The Environmental Section of the framework is divided into Office Obligation and Site Obligation. The obligations approach construction inefficiencies from different aspects, helping to encompass every area of the construction industry.

4.4.1 Office Obligation

The Office Section addresses environmental issues and policies that effect the office and the general policies of the company. The company's beliefs must be effectively represented through its dedication to the environment. Many companies need to alter their current practices. The alteration of company policies begin with a change in attitude towards the environment. The

company leaders need to act as examples. The leaders of the company will play a pivotal role in the success of the SEE Evaluation. They must uphold the policies and insist that their subordinates abide by them. Each policy that is instituted by the company must include an explanation for the decision. The decision must define the purpose, reasoning, and positive effect that the new policy has on the environment.

An example of this would be for a company to send out a demanding letter that banned the use of Styrofoam cups. If an individual is forbidden to use Styrofoam cups without an explanation, it is likely that they the demand will be resented. If the policy is approached in a manner of respect, then it would more likely be embraced. The internal decision to reduce or eliminate the use of Styrofoam needs to be explained. The policy should explain the reasoning behind the decision. The explanation should include data about the negative impact of Styrofoam and disposable waste. The information should include reasoning such as, Styrofoam is composed of harmful chemicals, takes over 500 years for one cup to disintegrate, and takes up to 25 to 30% of the current land fill volume in the United States. In addition the company should provide all the employees with a reusable container, cup, or ceramic mug to properly instill the sense of environmental responsibility. With this explanation and alternative, the company policy would most likely be embraced by employees.

4.4.1.1 New Company Offices and Renovations Policy 3.1.1 (prerequisite)

Any new facilities built for use of the company must be LEED or Green Globe certified. The theory behind this prerequisite is that firms need to practice what they preach. The company must act as a leader in environmental performance. Any product produced for the use of the construction company must promote sustainability and should exercise environmentally friendly practices and products.

Purpose. Construction companies should promote sustainability in every aspect possible, including their building product. Company renovations, additions, and buildings need to be environmentally friendly to improve the quality and performance of the built environment to the extent the construction can control.

Policy terms. Any new renovations, interior renovations, or buildings completed for the use of the construction company must be either certified by Green Globes or LEED to ensure the company is being environmentally responsible in their decisions. All renovations must be as environmentally friendly as possible, including environmentally friendly materials and efficient operating performance of building systems.

4.4.1.2 Compact Florescent Light Bulbs and Energy Star Policy 3.1.2 (prerequisite)

The policy is an environmental prerequisite that must be met for certification. Any new appliance purchased for the company use must be environmentally friendly. Dedicated construction companies are responsible to environment. The use of energy efficient products help to decrease the negative impact a company creates on the environment.

Purpose. The Energy Star program certifies over fifty different product categories. The Energy Star label identifies energy efficient products. Energy Star certified products help a business to operate more efficiently than with standard products. This means the product will save the company money and energy. Energy Star products are an intelligent and ethical investment. Energy Star certified products and energy efficient lights are both simple steps a company can take to become more sustainable. These efficient products consume less electricity and reduce the amount of greenhouse gases produced.

Policy terms. The certified company must abide by the guidelines defined by the CFL and Energy Star Policy:

- All new appliances purchased by the company must be Energy Star certified.

- All new light bulbs used by the company must be compact florescent light bulbs CFLs or as energy efficient as CFLs.

4.4.1.3 Recycle Program Policy 3.1.3 (prerequisite)

The Recycle Program Policy promotes sustainable practices by reducing the amount of raw materials that need to be extracted from the earth. The prerequisite strictly encourages a simple habit that can be adopted by employees. By providing ample recycling stations there is no deterrent to recycling.

Purpose. The Recycle Program Policy must be established for the office to be certified by the evaluation. As a minimum, 95% of all recyclable material disposed of at the office must be recycled. This point will demand the involvement of all employees of the company. Recycling is the responsibility of all individuals. It is every employee's responsibility to carry out environmentally friendly practices. Recycling is a simple procedure that involves all individuals, which consumes very little effort and time.

Policy terms. Recycle stations will be established throughout the offices of the company and at all jobsite trailers. There must be at least one recycle retainer, including receptacles for paper, plastic, glass, and metals for every 2,500 square feet of space. If the space exceeds two thousand square feet then two recycle retainers must be placed in the office. Each additional 2500 square feet must include an additional recycle receptacle. Every floor of the office must have a recycle receptacle. The receptacles cannot be placed within 50 feet of each other. All of the company's expired documentation and non active plans must be recycled. Paper use in the construction industry is abundant and needs to be addressed. The receptacles must be strategically located for the convenience of the employees and to encourage recycling.

4.4.1.4 Water Efficiency Policy 3.1.4 (15 points)

Water reduction is a simple goal for the construction company to attain. The cost of becoming water efficient has a relatively short pay back period. The office must exercise water conservation through the use of waterless urinals, ultra low flow fixtures, and toilet. The company must also have efficiently designed landscaping.

Purpose. The Water Efficiency Policy's purpose is to improve construction companies' use of water. The water use can be drastically reduced through simple steps. Landscaping is an outlet that can reduce water usage. The office landscape must be designed to reduce irrigation demands. This task can be completed through specifying trees and plants that do not require large amounts of irrigation. Water reduction technologies will prove to be a beneficial investment to the company and environment because of the increasing cost of water.

Policy terms. The construction company's office should use water efficient fixtures, urinals and toilets and no water may be used to irrigate the office's landscaping. There can not be permanent irrigation on the construction company's property. The terms reduce the industry standard water consumption. Water reduction is easily obtained through conscientious habits and the uses of water efficient technologies.

4.4.1.5 Reusable Cup Policy 3.1.5 (5 points)

The Reusable Cup Policy is an easily attainable 5 point policy. The policy help to bring awareness to the simple steps that can be taken to produce a more sustainable environment. The Reusable Cup Policy is a policy that can be easily instated by the company.

Purpose. The purpose of the Reusable Cup Policy is to reduce the amount of waste generated by the company. This simple policy can save the company money through the decreased costs of purchasing disposable cups. The Reusable Cup Policy helps to raise awareness about sustainable practices and helps to promote a positive outlook.

Policy terms. The Reusable Cup Policy states the applicant company will provide every employee with a permanent cup. The cup should be labeled and uniquely identified for each employee. The container should be composed of an environmentally friendly material, include a lid and have insulative properties. If the policy, is implemented all employees must be informed of the reasons they should use reusable cups instead of Styrofoam and disposable cups. The information should include the amount of waste that disposable cups generate and the amount of waste that is being reduced because of using a reusable cups.

4.4.2 Site Obligation

The Site Obligation Section addresses environmental issues that directly pertain to the construction site. The Site Obligation Section develops policies that will be maintained on the jobsite. The Site Obligations addressed in the framework are all issues over which the construction company controls and has the ability to change.

4.4.2.1 Waste Diversion Policy 3.2.1 (25 points)

Waste diversion is an important topic in the construction industry has a profound effect sustainable development. The highly valued policy influences companies to increase waste diversion practices. There is a limited amount of resources available on planet earth. These resources must be used, reused, and recycled to increase the life of a material. Materials should not serve one purpose and then be disposed of if we are to be a sustainable society.

Purpose. The construction industry generates over a hundred million tons of waste each year. Waste reduction is essential in sustainable development. Construction, demolition, and renovation generate about 35% of all generated waste. It is essential for the construction industry to reduce the amount of waste it generates.

Policy terms. The Waste Diversion Policy requires that 90% of all recyclable material must be recycled. The policy requires the construction company to provide recyclable containers

on every jobsite. There must be an established container for woods, plastics, and metals. The waste generation of recyclable materials will be calculated each month to ensure the Waste Diversion Policy is being followed.

4.4.2.2 Regional Materials Policy 3.2.2 (15 points)

The Regional Materials Policy is a 15 point policy that requires companies to obtain supplies that have less than a 1,000 mile life cycle process from extraction to the jobsite. The policy requires materials selected by the contactors are as local to the jobsite as possible through establishing a maximum distance for a specified amount of materials to be extracted from.

Purpose. The closer materials are extracted and manufactured in relation to the site, the less energy will be consumed for transportation. The closer the materials are to the site the less energy used. The less energy used the less greenhouse gases are produced.

Policy terms. Fifteen percent of all project materials cannot exceed a total 1,000 mile life cycle distance from extraction to jobsite. It is understood that the architect can specify materials that do not meet these requirements. If this occurs, these specified noncompliant materials can be subtracted out of the total project cost. To earn the Regional Material points, the total distance that 15 % of all materials can travel from extraction to jobsite is 1000 miles. The percentage calculation is derived by obtaining the total project cost and subtracting noncompliant architect specified materials. The total from the previous calculation is then divided by the cost of all regional materials that meet the specifications. If the calculation is greater than 15% for the total average of all current projects, the point is awarded.

4.4.2.3 Site Condition Policy 3.2.3 (10 points)

The Site Condition Policy requires that every construction site the company builds must be upheld to the highest quality standards and must meet every aspect prescribed in the policy

terms. The site must be maintained and cleaned daily to provide a conducive work environment for employees and subcontractors.

Purpose. The condition of the site is a direct statement of the construction company's responsibility to the environment. It is important to keep the site in good working condition so the employees and non participants are not hindered while on the construction site.

Policy terms. The Site Condition Policy point is associated to the Sustainable Sites prerequisite 1 of LEED 2.2., Construction Activity Pollution Prevention. The Site Condition Policy requires construction companies to maintain control of airborne particles, water waste, and earth sedimentation. Trash receptacles must be provided every 5,000 square feet of the site and on every floor construction takes place. The site must be maintained and cleaned daily to provide a conducive work environment. To obtain the Site Condition Policy point, the construction company must meet the define policy terms:

- All construction sites must be compliant with all laws and ordinances of the project location.
- All construction sites must be compliant with the erosion and sedimentation requirements of the EPA.
- All construction sites must be cleaned and maintained daily by construction personnel.

4.4.2.4 Leadership in Environmental Efficient Design (LEED) Accredited Professional Employee Policy 3.2.4 (10 points)

LEED Accredited professionals help to promote the use of the LEED certification. Accredited professionals (AP) are knowledgeable about environmental performance and help to promote sustainable development. The improvement of the built environment is a step towards sustainable development. The LEED AP facilitates the to LEED certification process.

Purpose. A company certified by the SEE Evaluation must be knowledgeable in all areas of sustainability, including the building product. The SEE Evaluation promotes sustainable

development in any applicable manner. A company that builds LEED certified projects needs to be knowledgeable about sustainable construction certification systems

Policy terms. Ten percent of the company's employees must be LEED accredited professionals.

4.4.2.5 Electric Documentation Policy 3.2.5 (10 points)

The Electric Documentation Policy promotes advances in technology that help to improve the performance and efficiency of the applicant company. Electric documentation helps to reduce the massive amount of paper consumed by construction companies. Documents and files can be stored electronically which is more preferable than paper documentation that takes up space and produces waste.

Purpose. The construction industry's foundation is traditionally based on paper documentation. The ability of a company to divert from this practice will greatly benefit the environment. Advances in technology have eliminated the need for an excess of paper documentation. Electronic documentation has enabled companies to reduce their paper use by electronically storing information.

Policy terms. To receive the Electronic Construction Documentation Policy points the company must use a paperless documentation system. The company must also eliminate the use of paper documentation to the extent possible. If the company does not eliminate the use of paper documentation, they are double documenting. The double documenting practice is inefficient and does not provide a benefit to the environment therefore will not receive the points.

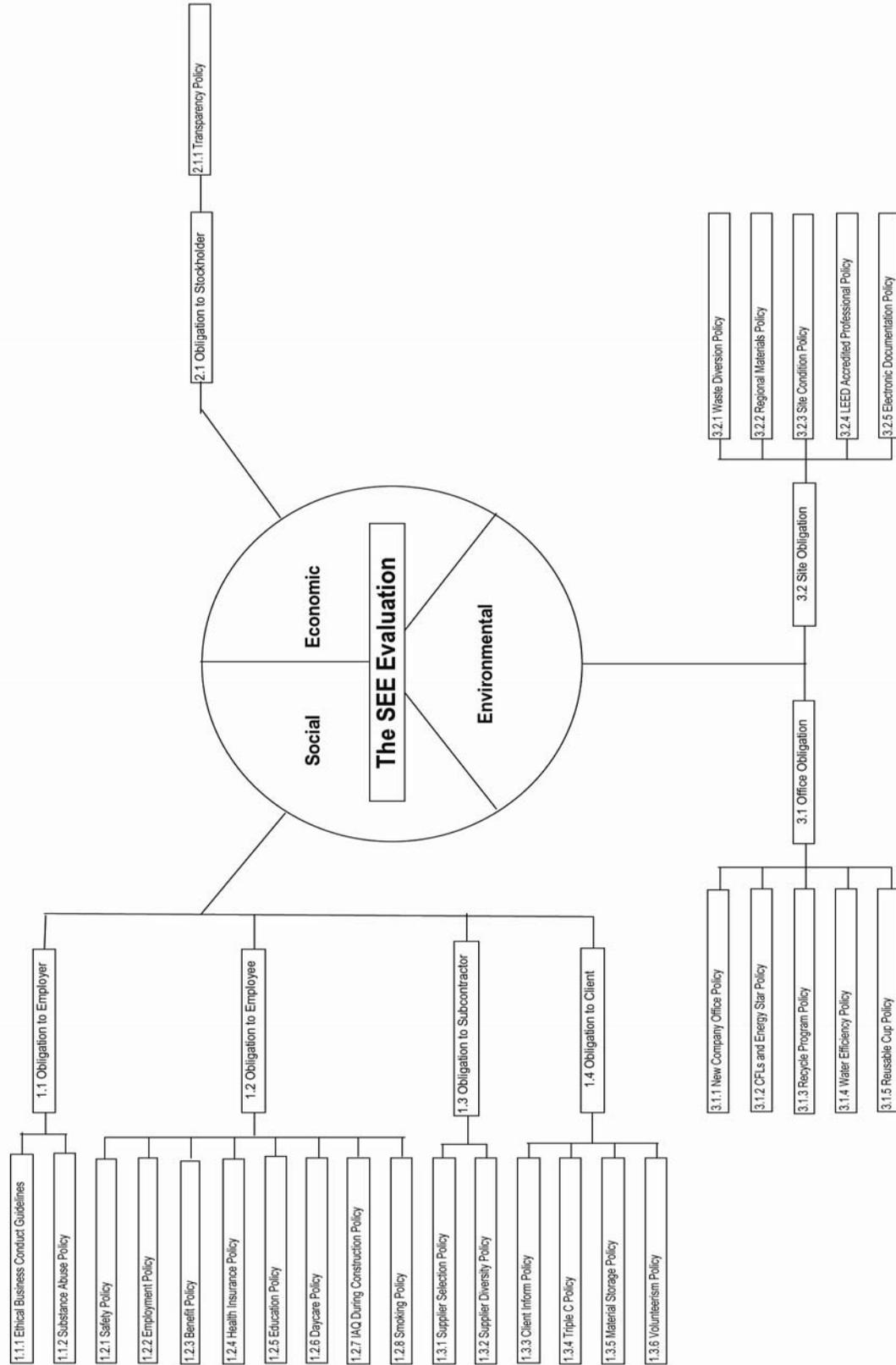


Figure 4-1. SEE Evaluation points and prerequisites layout.

SEE Evaluation Healthy Living Program			
All Subpolicy the employee qualifies for Select:		Yes	Employees Name:
All Subpolicy the employee does not qualifies for Select:		No	Birth Date:
Title of Standard	Percent Covered		Insurance Coverage Subpolicies
Non Smoke Subpolicy	25%	Yes	Can not perform any type of smoking at any time
Exercise Subpolicy	25%	Yes	Exercise at least (3) 30 min. Intervals a week
Health Subpolicy	50%	Yes	Healthy lifestyle habits
100%		Percent of Insurance Covered By Company	

Figure 4-2. Healthy Living Program, SEE Evaluation Health Insurance Policy.

Option 1:	Match 50% of the contribution up to 10% of the salary			Note: Employer does has no obligation to match contributions over 15% of Salary		
1 Point:	Salary	Employee Contribution %	Employee Contribution Amount	Employer Contribution %	Employer Contribution Amount	Contribution Totals
Employee 1	50,000	10	\$5,000	5	\$2,500	\$7,500
Employee 2	75,000	10	\$7,500	5	\$3,750	\$11,250
Employee 3	100,000	10	\$10,000	5	\$5,000	\$15,000

Option 2:	Match 100% of the contribution up to 10% of the salary			Note: Employer has no obligation to match contributions over 10% of Sale		
2 Points	Salary	Employee Contribution %	Employee Contribution Amount	Employer Contribution %	Employer Contribution Amount	Contribution Totals
Employee 1	50,000	10	\$5,000	10	\$5,000	\$10,000
Employee 2	75,000	10	\$7,500	10	\$7,500	\$15,000
Employee 3	100,000	10	\$10,000	10	\$10,000	\$20,000

Figure 4-3. Benefit Policy

Value of Project			Point Value	
0	to	4,999,999	1	point
5,000,000	to	9,999,999	2	points
10,000,000	to	19,999,999	4	points
20,000,000	to	49,999,999	8	points
50,000,000	to	above	10	points

Figure 4-4. Project value indicator for SEE Evaluation.

Projects in Progress	Project Value	Certi fiable Points	Total Point Value
Office Complex 1	\$7,000,000	0	2
Residential Apartment	\$15,000,000	4	4
Eco-plex	\$4,000,000	1	1
High Rise	\$65,000,000	0	10
Office Complex 2	\$20,000,000	8	8
Eco-plex 2	\$5,000,000	2	2
Totals		15	27
Application Percentage	0.56	Certi fiable Points divided by Point Value	
Over .5 receive	1 point	<input checked="" type="checkbox"/>	Please: Only input information into the available white spaces according to respective values
Over .9 receive	2 points	<input type="checkbox"/>	

Figure 4-5. Example Project Calculation for SEE Evaluation, Indoor Air Quality During Construction.

Social Division: 1			Division Total:	Value
Obligation to Employer: Section 1				
	Prerequisite 1.1.1	Ethical Business Conduct Guidelines	<input type="checkbox"/>	15
	Prerequisite 1.1.2	Substance Abuse Policy	<input type="checkbox"/>	15
			<input type="checkbox"/>	Subtotal
Obligation to Employee: Section 2				
	Prerequisite 1.2.1	Safety Policy	<input type="checkbox"/>	15
	Prerequisite 1.2.2	Employment Policy	<input type="checkbox"/>	15
	Point 1.2.3	Health Insurance Policy	<input type="checkbox"/>	20
	Point 1.2.4	Benefit Policy	<input type="checkbox"/>	10 to 20
	Point 1.2.5	Educational Assistance Policy	<input type="checkbox"/>	15
	Point 1.2.6	Daycare Policy	<input type="checkbox"/>	10
	Point 1.2.7	Indoor Air Quality During Construction Policy	<input type="checkbox"/>	5 to 10
	Point 1.2.8	Smoking Policy	<input type="checkbox"/>	5
			<input type="checkbox"/>	Subtotal
Obligation to Subcontractor: Section 3				
	Prerequisite 1.3.1	Supplier Selection Policy	<input type="checkbox"/>	15
	Point 1.3.2	Supplier Diversity Policy	<input type="checkbox"/>	15
			<input type="checkbox"/>	Subtotal
Obligation to Client and Community: Section 4				
	Prerequisite 1.4.1	Client Inform Policy	<input type="checkbox"/>	15
	Prerequisite 1.4.2	Proper Storage of Materials	<input type="checkbox"/>	15
	Point 1.4.3	Constructive Construction Criticism	<input type="checkbox"/>	10
	Point 1.4.4	Volunteerism Policy	<input type="checkbox"/>	5
			<input type="checkbox"/>	Subtotal
Economic Division: 2			Division Total:	Value
Obligation to Stakeholder: Section 1				
	Prerequisite 2.1.1	Transparency Policy	<input type="checkbox"/>	15
	Prerequisite 2.1.2	Shareholders Statement Policy	<input type="checkbox"/>	15
			<input type="checkbox"/>	Subtotal
Environmental Division: 3			Division Total:	Value
Office Obligation: Section 1				
	Prerequisite 3.1.1	Company Offices and Renovations Policy	<input type="checkbox"/>	15
	Prerequisite 3.1.2	CFL and Energy Star Policy	<input type="checkbox"/>	15
	Prerequisite 3.1.3	Recycle Program Policy	<input type="checkbox"/>	15
	Point 3.1.4	Water Efficiency Policy	<input type="checkbox"/>	15
	Point 3.1.5	Reusable Cup Policy	<input type="checkbox"/>	5
			<input type="checkbox"/>	Subtotal
Site Obligation: Section 2				
	Point 3.2.1	Waste Diversion Policy	<input type="checkbox"/>	25
	Point 3.2.2	Regional Materials Policy	<input type="checkbox"/>	15
	Point 3.2.3	Site Condition Policy	<input type="checkbox"/>	10
	Point 3.2.4	LEED A.P. Employee Policy	<input type="checkbox"/>	10
	Point 3.2.5	Electronic Documentation Policy	<input type="checkbox"/>	10
			<input type="checkbox"/>	Subtotal
	180 prerequisite points	Must attain all prerequisite points	<input type="checkbox"/>	Total
	200 additional points	Select desired additional point	<input type="checkbox"/>	Out of 380

Figure 4-6. The SEE Evaluation point and prerequisite calculation sheet.

CHAPTER 5 IMPLEMENTATION OF THE SEE EVALUATION AND ASSOCIATED IMPLICATIONS

There are many possibilities for the future of the SEE Evaluation. The demand for ethically and efficient construction companies will come in the form of governmental policies and the demands of conscientious clients. The seal of the certification will identify reputable companies that promote sustainable development.

5.1 Implementation into the Construction Industry

Many construction companies will have to alter the way that they conduct business if they intend to be certified by the SEE Evaluation, while other construction companies may not have to change any of their operational procedures and policies. The SEE Evaluation's framework is based on a set of defined policies. If the company complies with the standards, they are eligible for certification. The framework only sets policies of operation that the certified companies must abide. Through the certification process, construction companies are able to compare themselves with other certified construction companies. The framework hypothetically allows companies to operate on a fair playing field. Implementing the certification policies into the construction industry would result in a positive change from the current industry standards.

5.1.1 Barriers to Implementation into the Construction Industry

There are barriers to the implementation of the framework. It is evident that the construction industry is an industry that is adverse to change; therefore the implementation of the framework would be very difficult. The standard operating practices of many construction companies are likely to not change because of their current economic condition. Change will occur if laws and incentives are created by governmental policies to promote sustainable development.

5.1.2 Implementation of Performance Indicators

Performance indicators are essential for the success of the SEE Evaluation. Performance indicators are qualitative or quantitative measures that provide an indication a company's performance of a specific policy. Performance indicators identify if change has occurred since the implementation of the framework and if the change has had a positive or negative impact. Performance indicators established in the SEE Evaluation will identify the performance of the certified company and notify the stakeholder of their success.

5.1.3 Social Implication

The effects of applying the social policies in a construction company will significantly impact the company. The company will have clearly defined ethical parameters. The social policies help employees to understand the proper way to conduct themselves in a sustainable manner. Applying the social prerequisites and points will drastically alter the current social conditions of construction industry, but may increase construction costs. The proper treatment of all employees, clients, and subcontractors is imperative to the certification's success, but will mostly likely increase the cost of the company's operation. Employee satisfaction evaluations should be performed to ensure quality social performance.

5.1.4 Economic Implication

Current stockholder reporting is fairly well established in America. There is no direct cost associated with a company to be transparent. There might be an indirect association of cost to implement transparent practices into the company's accounting policy. There are no legitimate reasons for a company to not be transparent. The primary reasons a company may not want to be transparent are to prevent the disclosure of the company's profitability, expose possible internal misleadings, or hide large salaries of key personnel.

5.1.5 Environmental Implication

Applying the SEE Evaluation framework into the practices of the construction industry will have a positive effect on the environment. Benchmarking will be used to establish quantitative and qualitative values. The benchmarking process examines the performance of the company pre and post implementation of the framework to identify the improvement. The amount of energy consumed, materials utilized, water consumed, and carbon dioxide generated will be measured by the certification. The G3 performance indicators inform the construction company how efficiently it is operating. The SEE Evaluation will have a positive effect on the environment by encouraging companies to reduce waste and become energy efficient. The implications will vary for each construction company based on their current policy and practices.

5.2 Implementation of SEE Evaluation in a Construction Company

The implementation of the framework in a construction company should be approached in a collective manner. The certification process begins by evaluating the construction company current policies. Areas of improvement towards sustainable development are identified by the defined policies. Once the deficiencies of the company are defined, the next procedure is to institute the corrective measures. The prerequisites identify mandatory areas of improvement and the points improve the company's performance. Every employee should be involved in the process of point selection to help create a democratic atmosphere. It is important for employees to convey the points they believe to be important. The point selection process should be approached as a democratic procedure where each employee retains the right to vote on the topics that they value and desire to obtain. It is important to use this democratic process in order to ensure that each voice is heard. The topic selection will help to define the quantity of points attainable by the construction company. It will also help to identify the certification level attainable by the construction company. The higher the certification level, the better the ethical

and efficient performance of the company. The democratic process identifies the topics that are valued by the company and directs the areas in which they will attempt to receive certification points. The evaluation does not require that all of the selected points are obtained, it is only mandatory that they are attempted. Once the attemptable points are identified the company must update their policies to ensure they are congruent with the framework's policies. The company must adopt the selected practices and instate the new policies.

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

The SEE Evaluation was created to advance sustainable development in the construction industry. The evaluation encourages construction companies to alter their current operating practices and policies and to evolve into a socially, economically, and environmentally responsible organization. The framework of the evaluation must also adapt to advance sustainable practices. The current framework provides a set of guidelines by which the construction industry should operate in order to advance sustainable development but will evolve with the advances of sustainability.

6.1 Future of the SEE Evaluation

The SEE Evaluation has tremendous potential to grow into a large third party certification system for construction companies. The framework will grow and adapt as the wealth of knowledge about sustainable practices increases. The SEE Evaluation's framework has the capacity to be altered and fine tuned in order to operate to its optimum ability. The certification is designed to be adaptable to new demands and suggestions of the construction industry, other sustainable organizations, and newly created laws. The evaluation is part of growing process. Without adoptability the nature the certification is quickly outdated due to the expanding knowledge of sustainability. The evaluation must adopt to properly grow with time. It must alter and mutate to new prescribed policies for continual improvement of the construction industry but is important the evaluation continue to have defined policies to ensure quality performance of construction companies. The framework will change in the future to meet and define new policies that properly identify the demands of a sustainable culture.

6.1.1 Further Development

The next step in bringing the SEE Evaluation to life would be to gain feedback about each policy for insight of its feasibility and practicality. The most informative solution would be to monitor a construction company for a year before instituting the certification, then monitoring its actions while it operates in accordance with the framework's policies. This would be beneficial in understanding what effects would occur, which topics apply directly to creating a sustainable future for the construction industry, and pinpointing new directions for growth. The SEE Evaluation policies will go out for review among construction professionals, professors, and key organizations to gain different perspectives on the same topics.

Future advances of the SEE Evaluation could use surveys of employees from certified companies to help identify and establish the proper value of each specified policy. The survey would help define potential areas of improvement in the construction industry. An in depth cost evaluation for each point and prerequisite will need to occur to have an understanding of the actual cost associated with the policies. In many sections the cost difference will vary due to the construction companies' current policies. If the company already exercises a sustainability policy, that particular policy would not increase its current operating costs of the company. The SEE Evaluation could grow to include new policies for different types of construction organizations. The framework could be formatted to include design build and construction management companies. The SEE Evaluation has great potential to be a step in the right direction for the entire construction industry. By trail and error in the workplace, it is expected that the certification would adapt to what is needed to improve sustainable practices.

6.1.2 Future Collaboration

The SEE Evaluation could eventually partner with existing programs to form mutually beneficial relationships that further advance sustainable development. The SEE Evaluation could

team up with the United States Green Building Council's LEED program. The LEED program could offer innovation credits for being SEE certified. This relationship would reward the company for being certified by the SEE Evaluation. The framework has existing points that are similar to LEED 2.2 but takes a different approach towards the construction. The different aspects of construction enable companies to combine and cover more areas of sustainability. The evaluation requires company to operate in particular manner all the time rather than when building a LEED certified project.

6.2 Conclusion

The SEE Evaluation is a sustainable certification system that evaluates construction companies based on their social, economic, and environmental performance. A set of evolving policies were developed through previous laws, standards, certifications, and documents to equally evaluate small, medium, and large construction companies. The developed policies of the SEE Evaluation were tailored to address specific inefficiencies of the construction industry. The three pronged framework is limited to the control and capabilities of the contractor to positively influence sustainable development. The SEE Evaluation improves the construction industry by rating construction companies on the adoption of policies in a point based format.

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BIOGRAPHICAL SKETCH

John Robert Banting was accepted to the University of Florida beginning with the fall of 2001. With four years of undergraduate schooling under his belt, he received a Bachelor of Design from the University of Florida School of Architecture. Continuing his education at the University of Florida, he proceeded to obtain his Master of Science in Building Construction with a focus in sustainability in 2007.

During the six years he spent at the University of Florida, he has made many new and profound relationships through the School of Architecture and the School of Building Construction. John interned with both large and small construction companies during the summers of his graduate schooling. John will pursue a job in the construction industry. He will also attain a LEED accredited professional certification in hopes to work on primarily LEED-certified projects. John accepted the position of Project Engineer from his future employer, Hedrick Brothers Construction, with the goal of obtaining a position in the company to advance sustainable development in the construction industry.