

SUSTAINABILITY VERSUS LUXURY:
AN EXPLORATORY INVESTIGATION OF THE
RELATIONSHIP BETWEEN SUSTAINABILITY AND LUXURY
IN HOTEL GUESTROOM ENVIRONMENTS

A Thesis

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ABSTRACT

The hospitality industry is beginning to adopt sustainable construction and operational practices, in an effort to preserve the environment. However, many hotels are struggling with the issue of sustainability versus luxury because there is a potential conflict between sustainable practices and luxury experiences. The purpose of the study is to investigate the relationship between sustainability and luxuriousness in the hotel guestroom environments. The first phase of the study compares the Guestroom Luxury Rating Guidelines developed from AAA Diamond Rating Guidelines with the applicable credits from LEED v4 for Interior Design and Construction, to examine whether there is any conflict between the LEED rating system and luxury rating guidelines. In the second phase of this study, the guestrooms of two luxury hotels were compared for their level of luxury: a luxury non-LEED hotel, and a luxury LEED hotel. This phase of the study investigates if LEED certification has negative impacts on the level of luxury.

The comparative analysis of the first phase of the study show that there is no conflict between the luxury attributes and sustainable practices in guestroom environments as outlined by the Guestroom Luxury Rating Guidelines and credits from LEED rating guidelines. The second phase of the research showed that in the cases of the two chosen hotels, the luxury level of the LEED certified hotel rated lower than the non-LEED hotel, but for reasons not related to a conflict between luxury and sustainability.

BIOGRAPHICAL SKETCH

Pingting Hong was born and raised in Fujian Province, China. She attended the Iowa State University and earned a Bachelor's degree in Interior design. Through the years of study in Iowa State, she developed her passion for hospitality design and became interested in Sustainable Design after graduating from there. Pingting aspires to bring both knowledge and training to the field, and hopes to apply this research study to hospitality design industry helping to reduce the negative impact of hotel buildings on the environment and promote healthy and stylish guestroom environments.

Dedicated to my parents and grandpa,
thank you for your endless love and support.

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CHAPTER ONE

INTRODUCTION

1.1 Background

The hospitality industry is a competitive enterprise that heavily relies on its interior design and services to attract and retain its customers (Choka, 2012). However, beyond aesthetics and functions, another important factor for hotels that cannot be neglected is sustainability. Hotel buildings have a much larger ecological impact than other commercial buildings of similar size due to their specific and unique function and operational patterns (Bohdanowicz, Simanic & Martinac, 2004). For instance, hotels operate 24 hours a day throughout the year with various services and amenities. One or more buildings of a hotel would include the guestrooms, lobbies, banquet facilities, restaurants, retails, swimming pools, gyms, and offices. Besides, hotels usually have laundries and kitchens on-site, and scatter equipment such as ice machines and vending machines throughout (EnergyStar, 2007). Although hotels typically represent less than 5% of a nation's building stock (Bohdanowicz et al., 2004), the global hotel industry comprising over 300, 000 facilities, constitutes one of the most important sectors of tourism industry (Olsen, Zhao, Sharma & Choi, 2000). Moreover, travel and tourism generates billions of dollars in economic activity in the United States (World Travel & Tourism Council (WTTC), 2014) and the industry's GDP growth rate is predicted to reach over 4% annually that continue to be higher than growth rates in other sectors. "The potential impacts of such growth on the environment, along with factors such as global climate change, have become particularly hot topics within the travel and tourism arena today" (Millar & Baloglu, 2011). With awareness of the negative

impacts that hotels may have on the environment, the hospitality industry has received much attention in the travel and tourism field (Kasim, 2004). It is likely that developers will increasingly consider adopting green building practices in the future to improve the environmental, social, and life cycle economic performance of their hotels (Ahn & Pearce, 2013).

However, many hotels are struggling to reconcile sustainability with luxury, because there is often the perception of conflict between guest satisfaction and green building practices in hotels that aspire to sustainability (Ahn & Pearce, 2013). For example, the conflict may result in the conservation of resources including water and energy, which could detract from a guest's experience and comfort (Kirk, 1995). Since sustainable hotels only recently become a trend in the hospitality industry, the idea of how sustainability and luxury might fit together is still unclear for many hotel professionals.

In all the literature on making hotels sustainable, few studies have been done with the focus on both concepts of luxury and sustainability in interior environments. Such a study that explores ways to make luxury and sustainability coexist in hotel environment is significant because hotel guests' experience, their satisfaction and their likelihood to revisit or recommend a hotel are influenced by the design, style, and comfort of the hotel's built-environment (Heide & Grønhaug, 2009; Kasim, 2004; Ramsaran-Fowdar, 2007; Skogland & Siguaw, 2004). In addition, given the size of the hospitality industry, the collective environment impact is enormous (Diener, Parekh & Pitera, 2007) There is an opportunity for luxury hotel brands to be more environmentally and socially responsible. New opportunities could be opened for business endeavors if a great guest experience and a hotel's sustainable goals could coexist (Kasim, 2004).

The AAA Diamond Rating Guidelines and LEED rating system are selected for this comparative analysis, because the AAA Diamond Rating Guidelines evaluate the level of luxury in hotels neglecting their sustainable aspects, while the LEED rating system focuses on the sustainability of buildings including hotel, but ignores luxury in the requirements. Both of the rating systems are established in the United States and have been widely applied to hotels buildings. However, no research study has compared these two rating systems previously. By comparing and analyzing these two existing building guidelines, some insights may be gained on how sustainability practices and luxury design could coexist in hotel interior environments.

The study focuses on the hotel guestrooms because guests spend most of their time in the guestrooms while staying at a hotel, and guestrooms and suites generally represent between 65 and 85 percent of the total floor area in a hotel (Penner, Adams & Robson, 2012).

Given this context, this study aims to discover how sustainability and luxury could fit together in a hotel guestroom environment. The results will assist hotel professionals and interior designers to understand the relationship between sustainable attributes and luxury design in hotel guestrooms, so that they can make more informed decisions related to hotel development, and contribute to environmental conservation.

1.2 Objectives:

Because of the potential conflict between the values and attributes of luxury and sustainable design, an important question to answer is: How to make sustainable development and luxury interior design genuinely co-exist? This study has two phases in order to try to answer this important question:

1. Compare the “AAA Diamond Rating Guidelines” with “LEED v4 for Interior Design and Construction” to figure out whether there is any conflict between these two guidelines in terms of interior design and how the luxury attributes could coexist with sustainability in hospitality environments.
2. Apply the “AAA Diamond Rating Guidelines – Guestrooms”, to two chosen hotels and assess the level of luxury in the hotel guestrooms. Interview hotel professionals of the selected hotels to understand how hotels view the issue of sustainability versus luxury and what the common and different design attributes are between the two luxury hotels.

CHAPTER TWO

LITERATURE REVIEW

2.1 Sustainability

2.1.1 Introduction of Sustainability

The meaning of the word “sustain” was originally developed from Latin and French words. In 13th century, an old French word “sostenir” and a Latin word “sustinere” meant “hold up, bear; suffer, endure,” and in 14th century, the Latin word “sub” and “tenere” meant “to hold.” Sustain then meant “continue and keep up” from early 14th century (Etymology Dictionary). The concept of sustainability has gained increasing attention and has been adopted by many different industries in the last decades. The term sustainability was developed by the World Commission view on Environment and Development (WCED) in 1987. Sustainability was defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report, 1987). Three interconnected principles of sustainability were introduced in the World Summit in 2002, which are economic, social, and environmental (WSSD, 2002). These three principles are also known as triple bottom line and they are equally important. The economic category is important because it links with employment, financial growth, and technological advancements (Becker, 2009). Businesses must consider the profit to develop and survive the economy without having a negative impact on the natural environments (McDonough & Braugart, 2010). The social aspect considers the fairness and treatment of the people (McDonough & Braugart, 2010), and the environment category focuses on conserving

natural materials and resources. The way to achieve sustainability is to balance these three principles.

Today, regeneration and resilience are the terms added to the concept of sustainability. Regeneration describes processes to create sustainable systems by restoring, renewing, or revitalizing the sources of energy and materials. Regenerative development is the use of resources that improves social wellbeing and builds the capacity of support systems for future growth (Dutta, 2013). It interlinks various components including “energy, buildings, transport, ecosystems, people, physical and psychological healthy conditions, water, waste etc.” (Dutta, 2013). The great interlinkages of regenerative development and its continuous process makes it a more robust and effective sustainable approach to environmental problems (Dutta, 2013). Resilience describes the capacity of a system to experience shocks while retaining function, structure, feedback and, therefore, identity (Walker and Salt, 2006, cited in Redman, 2014). The concept of resilience is not only about recovery but also about the ability to adapt (McPhearson, 2014). The goal is to have minimal losses to the system and to its essential functioning when the system experiences changing conditions (Redman, 2014). Both the concepts of regeneration and resilience are important contributing to sustainability. Buildings should be designed for durability and robustness to maximize their future resilience, and to prevent them from extreme whether events that increasing climate change will produce. Many old constructions have been reused for new purposes and such durable buildings could be redesigned and used for hotels to help achieve sustainability.

2.1.2 Sustainable Design

Van der Ryn and Cowan (2007) interpreted that sustainability “offers a holistic response to the environmental crisis that makes much-needed connections between nature, culture, values, power relationships, and technology.” In order to build a sustainable world, the only long-term approach is to redesign the details of the products, buildings, and landscape around us. This means one must pay carefully attention to scale, community self-reliance, traditional knowledge, and the wisdom of nature’s own designs. It is a process that requires patience and humility (Van der Ryn & Cowan, 2007). Van der Ryn and Cowan (2007) also indicated that sustainable design can reflect the different roles of designers, “...the intentional shaping of matter, energy, and process to meet a perceived need or desire. Design is a hinge that inevitably connects culture and nature through exchange of materials, flows of energy, and choices of land use. By this definition, architects, landscape architects, and city planners are clearly designers, but so are farmers, chemical engineers industrial designers, interior decorators, and many others. All are involved in shaping the physical details of our daily experience.”

Sustainable design is also known as ecological design, green design, eco-effective, and environmentally friendly design (Edwards, 2005). McLennan (2004) defined sustainable design as the philosophy of designing physical objects, built environment, and services to comply with the triple bottom line, and it is “a design philosophy that seeks to maximize the quality of the built environment, while minimizing or eliminating negative impact to the natural environment.”

When sustainable design was first introduced into the architectural field in the 1960s, people believed that green buildings are unattractive and uncomfortable because at that time it held many references to primitive living with little or no modern comforts (McLennan, 2004, Becker 2009). However the green design movement has been maturing and growing rapidly during the

first decade of the 21th century (McLennan, 2004). The growing international acceptance of the United States Green Building Council's (USGBC) green building guidelines, "Leadership in Energy and Environmental Design" (LEED) demonstrates this growth (Becker, 2009).

2.1.3 Two Approaches to Sustainability

There are two different approaches to sustainability; one is technological sustainability while the other one is ecological sustainability (Orr, 1992; Van der Ryn & Cowan, 2007). Although both of these concepts are coherent responses to the environmental crisis, they differ in approach and implementation. Technological sustainability consists of expert interventions that seek to resolves problems through high-profile international agreements and sophisticated management techniques (Orr, 1992; Van der Ryn & Cowan, 2007). The LEED rating system is an example of technological sustainability.

In contrast, ecological sustainability is "the task of finding alternatives to the practices that got us into trouble in the first place; it is necessary to rethink agriculture, shelter, energy use, urban design, transportation, economics, community patterns, resource use, forestry, the importance of wilderness, and our central values" (Orr, 1992). Sustainable practices such as using local, natural materials from sustainable sources and designing buildings to integrate into the natural surroundings are examples of ecological sustainability (Watson, 2005).

In this research, one of the chosen hotel implemented both technological and ecological sustainable practices, which is a hotel with LEED certification and also pays attention to the sources of materials, and uses many untouched natural textures and materials throughout the hotel.

2.1.4 LEED Green Building Rating System

LEED is an independent, third-party verification building certification program that provides a framework for meeting sustainable goals and assessing building performance. The U.S. Green Building Council (USGBC) launched the first LEED pilot Project Program Version 1.0 in August 1998. After extensive modifications, the LEED Green Building Rating System Version 2.0 was released in March 2000. Since its unveiling in 2000, the LEED green building certification system has focused on the environmental performance of commercial, institutional and residential projects both in the United States and many abroad. LEED has great brand recognition as its standards have been adopted by and applied to over 7,000 projects in the United States and 30 countries making it the most popular green building rating system in the world (USGBC, 2007).

The rating systems and reference guides help teams make the right green building decisions for their projects through an integrated process, ensuring that building systems work together effectively. LEED has five rating systems to address multiple project types, including Building Design and Construction (BD+C), Interior Design and Construction (ID+C), Building Operations and Maintenance (O+M), Neighborhood Development (ND), and Homes. Within the five rating systems of LEED, the hospitality industry is addressed only in the first three, which are BD+C, ID+C and O+M.

Each rating system follows a similar structure, with green building strategies divided into six main categories: Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Material and Resources (MR), Indoor Environmental Quality (EQ), and Innovation and Design (ID). Within each of the credit categories, projects have to satisfy specific prerequisites and

pursue variety of credits to earn points. The number of points the project earns determines its level of LEED certification. Thresholds for a project to earn LEED certification are as follows (USGBC, 2007):

- 40-49 points: LEED Certified
- 50-59 points: LEED Silver
- 60-79 points: LEED Gold
- 80 points and above: LEED Platinum

LEED certified buildings allow building owners to manage the buildings through their entire lifecycle. The rating system focuses on the performance and sustainability of buildings and it is continuously updated, maintained, operated and improved; however, it ignores aesthetics and luxury aspects in the requirements.

2.2 Luxury

2.2.1 Origins of Luxury

Luxury is an appealing subject for human beings. In human history, some people condemned it while some other defended for it (Cheung, 2012). During this process, the meaning of luxury has been changing all the time and it is still ambiguous today.

In late 14th century, luxury meant “sensual pleasure” and in 1630s it was defined as a “habit of indulgence in what is choice or costly”; from 1704, it has the meaning of "sumptuous surroundings" and then it was identified as "something enjoyable or comfortable beyond life's necessities" from 1780 (Etymology Dictionary).

Bernstein (1999) indicated that the most fundamental concept of luxury is that it is a form of waste. In the 19th century, a German philosopher Werner Sombart (1988, cited in Csaba, 2008) defined luxury from both quantitative and qualitative aspects, as either having excessive goods or refined goods and services. Appadurai (1986) indicated five characteristics of luxury: difficult to acquire because of legal restrictions or exorbitant price, complexity of acquisition, semiotic virtuosity, specialized knowledge that is needed to guide the appropriate consumption, and extremely high degree of linkage of their consumption to human body, person, and personality. Vigneron & Johnson (1999) stated five effects on luxury consumption as: interpersonal effect, snob effect, bandwagon effect, personal hedonism and pursuing perfection effect. Tsai (2005) also linked luxury with hedonism, pleasure and utilitarianism that reflects the taste for quality. Heine (2010) conducted a survey that identified six different aspects of luxury, which are price, quality, aesthetics, rarity, extraordinariness and symbol meaning. Bernstein (1999) pointed out the luxury has different meaning for different people: “one person’s functionality may be another person’s luxury.”

2.2.2 Luxury Today

Luxury is commonly defined as an unnecessary dimension that goes beyond human needs or functionality (Bernstein, 1999). Luxury is related to a condition of mind that is stated by Low (2010): “be able to draw the consumer into a world beyond reality – satisfaction gained through escapism from everyday routine.” Many brands now promote their luxury products or services with an emphasis on the holistic customer experience (Cheung, 2012). Cheung (2012) explained luxury products and services are more accessible in the form of luxury brands. As Berthon, Pitt, Parent & Berthon. (2009) indicated: “Luxury increasingly became the brand - carefully crafted symbols, which go beyond the material, beyond the craftsmen to invoke a world of dreams,

images, signs, and motifs.” In order to add to the brand experience, many luxury brands use complex layers, substrates and finishes in product packaging, because that is what consumers have come to expect (Hildebrandt, 2009). As luxury products and services become more and more accessible, the concept of luxury has been blended into people’s daily lives, and it is impossible to avoid or prohibit luxury nowadays.

2.3 Hotels

2.3.1 Luxury Hotels

Luxury hotels are defined by the Smith Travel Research (STR) as a market price segment and it has the top 15% average room rates. The vice president of STR, Vail Brown, reported that the ADR (Average Daily Rate) of luxury hotels in the United States in 2013 was \$286, which is much higher than upper upscale hotels (\$160). Luxury hotels aim to provide excellent service to guests who are looking for hotel experiences with style, service, comfort, and luxury that are personal and authentic (Becker 2009). These hotels often explore high fashion architecture, hotel design, and distinct interiors that influence hotel guest satisfaction, intent to return, and their likelihood to recommend a hotel (Heide & Gronhaug 2009). Ahn and Pearce (2013) collected the key design features that can promote a hotel to luxury status by reviewing a number of studies. The key design features are summarized in Table 2.1 (Becker, 2009; Heung, Fei & Hu, 2006; Curtis, 2001; Bernstein, 1999; Cohen & Bodker, 2008; Heide & Gronhuang, 2009).

Table 2.1 Design Features for Luxury Hotels (Becker, 2009)

Hotel Spaces	Design Features for Luxury Hotels
Lobby	<ul style="list-style-type: none"> • Social interaction spaces not only for guests but also for the local community (Curtis, 2001) • Staged to provide a theatrical introduction to the environment and hotel spaces (Becker, 2009)
Guestroom (Becker,2009)	<ul style="list-style-type: none"> • Safety, comfort, privacy, quiet and spacious guestrooms • Unique design details, technology, and controllable lighting • Comfortable indoor environment • Comfortable office spaces within the room • Stylish furniture, plush materials and high tech entertainment devices
Bathroom	<ul style="list-style-type: none"> • Spacious bathroom (Curtis, 2001) • Deep tubs, his and her lavatories, walk-in showers, marble and chrome finishes (Becker, 2009) • Quality and appearance of amenities (Curtis, 2001) • Technology such as a small plasma television, flexible lighting (Becker, 2009)
Artwork	<ul style="list-style-type: none"> • High quality artwork in guestrooms, hallways, lobbies, staircases, and elevators (Curtis, 2001) • Gallery areas in the hotel (Heung et al., 2006)
Spa	<ul style="list-style-type: none"> • Attention to interior design, increasing guest relaxation (Cohen & Bodker, 2008) • Transition areas and generous public spaces (Cohen & Bodker, 2008) • Multiple relaxation areas: outdoor and indoor (Bernstein, 1999) • Environmental controls for guest comfort (Heide & Gronhuang, 2009) • Spa cuisine-health, organic options (Cohen & Bodker, 2008)
Food & Beverage	<ul style="list-style-type: none"> • Organic food and unusual food items (Heung et al., 2006) • Top quality food and beverage (Heung et al., 2006)

Landscaping & Exterior Environment	<ul style="list-style-type: none"> • Parks/gardens with trees and plants (Bernstein, 1999) • Open space with trees and plants (Bernstein, 1999) • Diverse colors and textures (Heide & Gronhuang, 2009)
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2.3.2 Boutique Hotels

Some luxury hotels can be defined as boutique hotel properties because of their size and/or their design attributes. Boutique hotels are also called lifestyle hotels or design hotels (Penner et al., 2012). The emergence of the boutique hotel concept was started with Ian Schrager's Morgans Hotel in New York in 1984. The architect was Andrew J. Thomas, and Andree Putman served as the interior designer to renovate its 1927 structure. The concept has developed dramatically since the 1990s (Blank, 1999). Among 2.5 million hotel rooms occupied in the United States on an average day, about 15,000 rooms were in boutique hotels (Blank, 1999). Smith Travel Research reports that about 55,000 hotel rooms out of the nearly 5 million rooms in the US were in boutique hotels. Boutique hotels show distinct features that are different from traditional hotels (McIntosh and Sigg, 2005). The Boutique and Lifestyle lodging Association (BLLA) indicated that the boutique industry is made up from 22 different types of lodging properties. They defined a boutique hotel as a hotel property that has characteristics of "intimate, usually luxurious or quirky, and upscale hotels environment for a very particular clientele" (BLLA, 2012). Smith Travel Research defined boutique hotels as properties that have ADR (Average Daily Rate) of \$175 or higher, typically have 200 or less rooms, and public spaces that provide unique, contemporary and distinctive design and transmit an avant-garde feeling through style and luxuriousness (STR, 2013). PricewaterhouseCoopers (2005) identified boutique hotel features according to the scale of the enterprise, diverse customized services, reflecting the personality

and style of owner, designer or entrepreneur, rooms with quality technological utilities, and unique design. Boutique hotels have become increasingly popular around the world in recent years and more and more large international hotel chains have started to focus on the boutique hotel market (Horner & Swarbrook, 2004).

Many scholars have investigated the definition of boutique hotels. Teo, Chia & Khoo (1998) identified the features of boutique hotels as their small size, low staff-to-guest ratio that enables them to provide customized service and attention. Boutique hotels were also defined as the theme, design should reflect the local context and the history of the region (Rowe, 2003). Albazzaz et al. (2003) defined boutique hotels as properties with a thematic, notable design offering warmth and intimacy, have relatively less number of rooms and aim to target customers from 20 to 55 years old. McIntosh and Siggs (2005) summarized five significant characteristics of boutique hotels, including uniqueness, personalized services, making guests feel at home, high quality standards and value creation. Boutique hotels have established a unique identity of their own in the hospitality industry (Wang, 2013) by emphasizing stylistic uniqueness, high standards, and individual interaction with guests (McIntosh & Siggs, 2005; Van Hartesvelt, 2006).

McIntosh and Siggs (2005) indicated that the emotive aspects of guest experience have a positive impact on customer satisfaction with boutique hotels. They identified five experiential dimensions for the success of boutique hotels, which are unique, personalized, homey, quality, and value added. Three primary characteristics of boutique accommodations were summarized by Olga (2009, cited in Wang, 2013), the boutique hotels have unique style, distinction, warmth, and intimacy; they often have personalized and outstanding services that connects the guests and hotel staffs; and their target market is customers from around 20 to 55 years old with mid to upper incomes.

2.3.3 Impacts of Hotel Buildings on the Environment

The hospitality industry constitutes one of the most energy and resource intensive sectors of the tourism industry and has been shown to have the greatest negative impact on the environment (Sloan, Legrand & Chen, 2013). Hotel buildings have a much larger ecological impact than other commercial buildings of similar size due to their specific and unique function and operational patterns (Bohdanowicz et al., 2004). A hotel's operations involve water, energy, other resources, chemicals, food, sewage, and waste (Diener et al., 2007). Hotel buildings release between 160 to 200 kilograms of carbon dioxide per square meter of guestroom floor area every year, and according to the US Environmental Protection Agency, an average hotel produces 29.53 kilograms of carbon dioxide per guestroom per night, equal to an average US home (Sloan et al., 2013), while an upscale hotel generates 33.38 kilograms of carbon dioxide per room per night (Sloan et al., 2013). Hotel buildings consume 170 to 440 liters of water per guest per night in an average five-star hotel (Sloan et al., 2013), the whole US hospitality industry consumes around 174.88 million cubic meters of water every year (Bohdanowicz et al., 2004), and produce 1 kilogram of waste per guest per night (Sloan et al., 2013). Moreover, the entire American lodging industry, which includes hotels, dormitories, and other accommodation facilities, was estimated to consume the total of 55.6 TWh energy in 2000, while Europe consumed 39 TWh (UNEP, 2003).

According to a study that was done by InterContinental Hotels in 2007, the company surveyed 26 of their hotels to estimate the carbon footprint of the hotels (Sloan et al., 2013). The result showed that the company's total estimated carbon footprint is approximately 9 million metric tonnes, which is equal to 4,777 Empire State Buildings. 4.6 out of the 9 million tonnes come

from use of energy while the rest 4.4 are indirect emissions from consumption of other resources, including material and waste.

Because of the huge impact that the hospitality industry makes on the environment, it is necessary to adopt sustainable practices in the hotels to protect the environment effectively.

2.3.4 Sustainable Hotels and Green Practices

Sustainable hotels, also called eco-friendly hotels, ecologically friendly hotels, or environmentally friendly hotels, are defined in a variety of ways (Millar & Baloglue, 2008). Since the beginning of this century, the sustainable real estate development movement in North America has gained significant national attention, originally with institutional and commercial development, and now with hospitality.

Green Hotel Association (GHA) defined green hotels as “environmentally-friendly properties whose managers aim to institute programs that save water, save energy and reduce solid waste – while saving money – to help protect our one and only earth” (GHA, 2007). Kasim (2004) defined sustainable hotels that incorporated socio-economic factors: “the hotel operates in a responsible manner towards its employees, the local community, the local culture, and the surrounding ecology”. According to International Tourism Partnership (ITP) (2007), sustainable hotels have “evolved to embrace all areas of sustainability and corporate social responsibility.” All of these diverse definitions encompass the spirit of sustainable hotels.

There are many steps that hotels can take to reduce their negative impact on the environment. Green practices in a hotel include: increasing efficiency to save energy, water, and other resource; furnishing satisfying, productive, healthy, and high quality indoor spaces; using environmentally

preferable materials; and educating building occupants about efficiency and conservation (Ahn & Pearce 2007; Kibert 2008).

Adopting sustainable practices in hotels can help decrease the negative impact on the environment, provide healthier indoor environments for hotel guests, and gain long-term financial benefits. In order to achieve these benefits, green building protocols have been established. Green buildings certifications save cost on utilities, properties that have properly implemented a green certification saw a decrease of \$40,000 to \$50,000 in electricity alone (Mayock, 2010). As presented above, LEED is one of the most popular programs that have been adopted all over the world. The number of LEED certified hotels is increasing dramatically since 2009. There were 21 LEED certified hotels in 2009, and in 2011, the number has been increased to 122. There are 273 hotel buildings that have achieved LEED certification as of June, 2014, and 167 of them are in the United States (Hasek, 2014). Other certification programs such as Green Globe and Ecotel have also developed levels of “greenness.” A hotel that only participates in recycling would be at the very basic level, while those hotels taking more extensive steps would be at higher levels, for instance, installing more efficient thermostats in every hotel guest room (Millar & Baloglue, 2008).

2.3.5 Guests’ Perception of Sustainable Hotels

While hotel design features have a significant impact on the environment, guests' hotel selection is more important (Millar & Baloglue 2008). In 2002, a survey study conducted by International Hotel Environmental Initiative revealed that 54% of American, 60% of Australian, and 87% of British travelers would prefer to stay at environmentally friendly hotels during their travels. However, the percentages of consumers who would like to stay in green hotels are relatively high

is because that the consumers were given the location of the facility was acceptable, the level of service was high, and the price was reasonable (IHEI). A study of hotel environmental management in Macao, China (Penny, 2007) surveyed hotel managers on their opinions of green hotels. The results showed 43.2% hotel managers disagreed that environmental attributes would increase guest satisfaction and the rest 56.8% of the managers agreed that those attributes increase guest satisfaction in hotels. In the study, concern for the environment was considered by managers to be the least important reason for guests to choose a hotel (Penny, 2007). Although hotel managers were aware of hotel facilities' influence on the environment, most of the managers perceived that gaining guests' supports is difficult. Susskind and Verma (2011) conducted a study at the Statler Hotel in Cornell University, they randomly selected guests in the hotel to complete the survey they developed. There were 192 guests that participated in the study had an average age of 40.77. Susskind and Verma discovered that only 30% of the participants in their study indicated they would choose a particular hotel or hotel brand based on the hotel's commitment to sustainability initiatives, and 45% indicated that they would be willing to pay a higher room rate to stay in a sustainable hotel, and the rest of participants did not think it is necessary to stay in a sustainable hotel. Susskind and Verma (2011) concluded that hotel guests are still not fully ready or committed to seeking out hotels that focus on sustainability.

However, Walsman and Verma conducted another study in 2014, indicated that LEED hotels tend to have a higher ADR (Average Daily Rate) than non-LEED hotels, and customers are willing to pay more for a greener stay. In addition, LEED hotels offer a higher value to customers, and customers feel LEED hotels are healthier buildings than others in the markets. The hotel industry is embracing LEED because hotel customers want to know what hotels are doing to limit their carbon footprints. Millar and Baloglu's study (2011) identified guests'

preferences for green attributes in guestrooms. They found that among the 571 business and leisure travelers, the majority of the participants would like to stay in a hotel room that incorporates a green certification and several other sustainable design features, such as refillable shampoo dispensers, energy-efficient light bulbs, and towel and linen reuse policies, as well as key card electricity control.

2.3.6 Hotel Rating Systems

AAA Diamond Rating Guidelines

AAA Diamond Rating Guidelines is a rating system that evaluates the level of luxury for lodging that is widely used in the United States. It represents “a combination of the overall quality, the range of facilities, and the level of hospitality offered by a property” (AAA, 2008). AAA was established in 1902 as a federation of independent motor clubs. In 1937, the first AAA field representatives were hired to review lodgings and restaurants, and in 1963, AAA began to assign lodging ratings to different levels from “good” to “outstanding.” The AAA Diamond Rating System was introduced for lodgings in 1977 and in 1989, it was applied to restaurants. The AAA Lodging Diamond Rating Guidelines was introduced for industry review in 1987 (AAA, 2008).

The guidelines are divided into five levels from one diamond to five diamonds, one diamond being the lowest level. The program is voluntary and hotels that wish to participate must meet the AAA Approval Requirements, that is, the minimum requirements in the categories of cleanliness and condition, management style of operation, exterior and public areas, guest rooms, and guest bathrooms. After the hotel meets the minimum requirements, it can apply to be reviewed by the guidelines (AAA, 2008).

The AAA Diamond Rating Guidelines provides requirements for four different areas in a hotel, which are exterior, public areas, guestrooms, and bathroom. Hotels would be reviewed in each area and assigned diamonds from one to five. Table 2.2 shows a general description of each diamond level (AAA, 2008).

Table 2.2 AAA Diamond Rating Levels (AAA, 2008)

Diamond (s)	Description
One	<ul style="list-style-type: none"> • Properties appeal to the budget-minded traveler • Provide essential, no-frills accommodations • Meet the basic requirements of comfort, cleanliness, and hospitality
Two	<ul style="list-style-type: none"> • Properties appeal to the traveler seeking more than the basic accommodations • Modest enhancements to the overall physical attributes, and amenities of the facility typically at a moderate price
Three	<ul style="list-style-type: none"> • Properties appeal to traveler with comprehensive needs • Properties are multifaceted with a distinguished style, including marked upgrades in the quality of physical attributes, amenities, and level of comfort
Four	<ul style="list-style-type: none"> • Properties are upscale in all areas • Refined and stylish accommodation (physical attributes and amenities) • High degree with hospitality, service, and attention to detail
Five	<ul style="list-style-type: none"> • Properties are luxurious and sophisticated • First class accommodation (physical attributes and amenities) • Meticulous Service exceeds guest expectations, and maintains an impeccable standard of excellence • Many personalized services and amenities

Forbes Travel Guide Star Ratings

Forbes Travel Guide, which was originally called Mobil Guide or Mobil Travel Guide, established the Five Star Ratings for hotels, restaurants and spas in 1958. It has a team of inspectors and editors who travel globally to the hotels, restaurants, and spas and evaluate the properties anonymously. The Five Star rating categories include Five-Star, Four-Star, and Recommended. A Four- or Five-Star rating is considered superior (Forbes Travel Guide, 2011).

The Five Star Hotels should provide an impressive experience through flawless service and the finest amenities, with intuitive and passionate staff. The hotel should be designed with the customers' comfort in mind with an emphasis on craftsmanship and quality of product. The Four Star Hotels should provide a unique setting with inviting and interesting elements for customers to enjoy. The hotel design should pay attention to details and quality of products. Staff should be accommodating throughout the guests' stay. And the Recommended Hotels should have enhanced amenities and design that shows a strong relationship with the local context. The hotels have distinguishing design and ambience, or focus more on functionality (Forbes Travel Guide, 2011).

The AAA Diamond Rating Guidelines provide detailed criteria for different areas and facilities in hotels with the scale from one diamond to five diamonds, while the Forbes Travel Guide Star Ratings only provides general criteria for hotels without focusing on specific areas.

2.4 Sustainable Luxury

2.4.1 Introduction to Sustainable Luxury

The earliest usage of the term sustainable luxury can be traced as far back as 2005 in the fashion, design and luxury brands industry (Baker, 2005; Dorfman, 2006). People did not accept and agree with the term and it was seen as an oxymoron in the early stage (Cvijanovich, 2011; Pedersen, 2006). Trade professionals and consumers were not convinced by the term and did not believe sustainability and luxury could go hand in hand (Cheung, 2012). Since then, opinions and attitudes started to change, and industry took some actions (Cheung, 2012). For instance, the luxury brands industry professionals gathered for the annual International Herald Tribune's luxury conference in 2009, 'Sustainable Luxury' was the title of the conference (International Herald Tribune, 2009). There was a major shift in both consumer behavior and expectations because of the downturn of the global economy at that time, and it also affected the bottom line of many luxury brands (Roy, 2009). In 2009, an art exhibition was held by an organization called 1.618 in Paris, which is an international network of luxury professionals and consumers that aims to celebrate luxury in the 21st century and the power of creative innovations; the exhibition was named '1.618 First Sustainable Luxury Fair' (Lock, 2009). In the same year, the Time Magazine had published a report called 'Sustainable Luxury: Green Design 100' presenting 100 sustainable luxury designs (Time Magazine, 2009). Organizations and academic programs about sustainable luxury were established in the year of 2011 and 2012 (Cheung, 2012). For example, an organization called Center for Studies on Sustainable Luxury, studies the concept of sustainable luxury was established in South America in 2011. In 2012, a new Master of Science program of Luxury Management in Business School Lausanne, offered sustainable luxury as core syllabus (Cheung, 2012).

2.4.2 Application of Sustainable Luxury across Different Industries

As many industries started to adopt sustainable practices, many luxury brands implemented sustainability as well. For instance, the fashion designer Stella McCartney has successfully applied the concept of sustainable luxury in her brand. She abandoned leather and fur, designed an eco-capsule collection, and produced an organic skincare line (Cheung, 2012). The jewelry industry is showing radical change toward sustainability in material sourcing and production (Henery & Borrellm, 2011; Cheung, 2012). Implementing sustainability in architecture reduces building costs in the long term, saves energy and resources consumption, and promotes healthier indoor environment for building occupants. For the tourism industry, luxury eco hotels are reportedly raising awareness of environmental issues (Diener et al., 2007); the demand for green initiatives and luxury travel is increasing (Brickwood, 2013). Many influential groups in hospitality development established their sustainable programs that contribute to conserve the environment, such as Marriott International, Hilton, Hyatt, Starwood, and InterContinental.

2.4.3 The Conflict between Sustainability and Luxury in the Hospitality Industry

Many upscale hotels are struggling with the issue of sustainability verses luxury, because there is often the perception of some conflicts between guest satisfaction and green practices in hotels that wish to be sustainable (Ahn & Pearce, 2013). The conflict may result where the conservation of resources including water and energy could detract from a guest's experience and comfort (Kirk, 1995). Luxury hotels place a large focus on the guest experience that includes satisfaction and expectation. Generally speaking, the qualities of luxury hotels may include spaciousness, having plush or exotic materials, sophisticated lighting that makes a space warm and inviting, and large bathtubs and multiple showerheads (Schor, 2008). Luxury hotels aim to provide

excellent service to guests who are looking for a hotel experience with style, service, comfort, and luxury, which is personal, authentic and creatively intriguing. These hotels influence guest satisfaction by exploring high fashion hotel design with distinct interiors (Heide & Gronhaug, 2009). In contrast, according to McLennan and Becker (2004, 2009), sustainable hotels might be less spacious, use more recycled or renewable materials instead of plush materials, and have more fluorescent lighting rather than sophisticated lighting to reduce energy use and place an emphasis on the conservation of water. Sustainable design is often seen to be less attractive in appearance and uncomfortable (McLennan, 2004). These perceptions were found in the 1960s when the sustainable architecture was first becoming a trend (McLennan, 2004).

The hospitality industry is making an effort to successfully combine luxury and sustainability together without having negative impacts on guest experience (Sheehan, 2007). In a hotel, the two most important features that affect guest luxury experience are style and comfort (Talbot, 2004). The LEED rating system may provide guidelines for the hotel industry to achieve a balance between sustainability and meeting guests' expectation (Becker, 2009). This is because LEED verifies the sustainable practices in hotel buildings, while at the same time providing more comfortable environments for guests (Sheehan, 2007).

On the other hand, some researchers indicate that much of the discussion in tourism has been focusing on sustainable luxury in the suppliers rather than changing the values and behaviors of tourists themselves (Ryan & Stewart, 2009). Robins (1999) believes that changing customer behavior and improving their sense of responsibility and knowledge about sustainability is important in implementing sustainability in the industry. Because of the "lack of information" on ethical issues and the "lack of availability" on the market, customers often put low priority on the ethical luxury (Davies, Lee & Ahonkhai, 2011). Lee, Hsu, Han, and Kim (2010) distributed an

online survey with a description of a green hotel to hotel customers who claimed that they have stayed at one or more green hotels, the questions included what a green hotel is and its eco-friendly practices. The response rate of 13.87% indicated that few guests had experienced with green practices. Lee, Hsu, Han, and Kim (2010) interpreted the low response rate was because there is small number of green hotels available and the tendency that many hotels do not market their green practices. In addition, people from different nations may have different level of awareness of sustainability. Simkus (2010) revealed that people from France care less about sustainability compared to people from Canada. Besides, a study showed guests' eco-friendly attitudes would have positive effect on their intentions to stay at a green hotel (Han, Hsu, Lee & Sheu, 2011). Simkus (2010) suggested that luxury brands should influence their consumers on the concept of sustainability. The main motivation for guests to choose a green hotel is to achieve that their consumption decision contributes to conserving the environment for future generations (Lee et al., 2010) Penner et al. (2012) claimed that in the future, all new hotel projects will be expected to implement sustainable practices as a matter of course. Hotel designers will need to make the sustainable attributes relatively transparent to hotel guests, especially in the North American market, where guests have been slow to accept green practices such as key-controlled guestroom power that are common in many other areas in the world (Penner et al., 2012).

CHAPTER THREE

METHODOLOGY

The AAA Diamond Rating Guidelines and LEED v4 for Interior Design and Construction were used for this study. AAA Diamond Rating Guidelines was chosen for this study because it provides detailed rating criteria for various design elements in different areas in a hotel, while Forbes Travel Guide's Star Rating only provides general requirements for different Star levels. The study focused on interior design of hotel guestrooms; therefore, fifteen design elements from the Diamond Rating Guidelines (guestrooms) that are related to interior design were selected and analyzed for the study, to assess the level of luxury in hotels' guestrooms. Table 3.2 shows the modified Diamond Rating Guidelines for guestrooms. In the first phase, the developed Diamond Rating Guidelines for guestrooms were compared with applicable credits from LEED v4 for Interior Design and Construction to find out whether there is any conflict between these two guidelines in terms of luxury and sustainability in hotel guestrooms. In the second phase, a luxury non-LEED hotel and a luxury LEED certified hotel were chosen for this study to compare the guestrooms' level of luxury. Hotel professionals from the selected hotels were interviewed to understand how hotels view the issue of sustainability versus luxury and what the common and different design attributes are between the chosen luxury hotels.

3.1 AAA Diamond Rating Guidelines – Guestroom

In this section, the selection of fifteen design elements from Diamond Rating Guidelines, and each criterion’s requirements of the guidelines are described.

3.1.1 Selecting the Criteria from Diamond Rating Guidelines

AAA Diamond Rating Guidelines is a hospitality rating system that is widely used in the United States. It represents “a combination of the overall quality, the range of facilities, and the level of hospitality offered by a property” (AAA, 2008). The rating system provides guidelines for four different areas in a hotel; the exterior, public areas, guestrooms, and bathroom. This study focuses on the interior design of guestrooms. Therefore, the criteria for guestrooms were selected from the AAA rating guidelines to compare the interior design of guestrooms in the two chosen hotels. Elements that are related to amenity and/or electronic equipment are excluded because they are not directly related to interior design of guestrooms. The bathroom rating guideline in the Diamond Rating system is separated from guestroom rating guideline and it is not included in the study. The modified rating guidelines will be called “GLRG” (Guestroom Luxury Rating Guidelines). The selected criteria for GLRG and all the design elements associated with each criterion are shown in Table 3.1, and the developed GLRG is shown in Table 3.2.

Table 3.1 Design Elements and Related Criteria in Guestroom Luxury Rating Guidelines (GLRG)

Design Elements	Related Criteria
General Décor Style	Degree of comfort, room size, decoration, function, appointments
Free Floor Space	Restriction, circulation, room size, placement of appointments
Floor Coverings	Materials, degree of comfort
Wall Coverings	Materials, wall treatments
Wall Hanging/ Decorative	Artworks, accent pieces, plants

Enhancements	
Ceilings	Materials, architectural design features
Window Coverings	Blackout effect, design enhancement, visual effect
Bed	Materials of headboard and mattress, level of comfort
Clothes Storage Hang Space	Level of enclosure, number of hangers, closet depth
Additional Storage Space	Spaces of additional storage, number of guests that the storage could accommodate
Illumination	Number of lighting fixtures, level of illumination, custom lighting
Furniture	Material, quality, design, function, custom
Seating	Seating type, material, level of comfort and number of guests the chairs could accommodate
Work Space/ Writing Surface	Size and function
Ventilation	Control, and location of the heat and air conditioning

3.1.2 Description of Guestroom Luxury Rating Guidelines and Each Criterion

The rating scale of GLRG is from One Diamond (economy) to Five Diamond (ultra-luxury), when applying the rating guidelines to luxury hotels, guestroom design elements meet the criteria of one diamond would get one point, and would get five points if it meets the five diamond criteria. The scores of each hotel would range from 15 to 75 points; higher score indicates higher level of luxury. All the design elements chosen in the GLRG are significant elements that constitute the interior design of a hotel guestroom. The focuses of the GLRG in each design element are described below.

General Décor Style

The general décor style is the overall first impression of the guestroom. The degree of comfort is its main focus, all the elements in the guestroom including room size, decoration, and function should contribute to the level of comfort. The guestroom with residential style, attractive appointments, and elegant style would get higher points.

Free Floor Space

This criterion focuses on the size and the circulation of the guestroom. Limited restriction for guest circulation is the basic requirement. A guestroom that is spacious, allowing ease of movement for multiple guests, contributing to higher level of comfort would get more points than smaller guestroom with some level of restrictions.

Floor Coverings

Materials of the floor coverings and the degree of comfort that the floor coverings provide is the main focuses of this criterion. Guestrooms that has carpet with enhanced design, such as patterns and textures; high grade wood, stone, or other hard surface floors have decorative rugs that provide a high level of comfort for guests would get higher points.

Wall Coverings

Materials of wall coverings and wall treatments are the main focuses of the criterion. The walls in a guestroom that have at least one significant upscale design enhancement, and/or use high grade materials would get higher points in this criterion.

Wall Hangings/ Decorative Enhancements

This criterion focuses on the artworks or other accent pieces in the guestroom. A guestroom that has plants or special artworks such as limited edition prints, canvas art, or sculptures would get higher points.

Ceilings

The design and materials/finishes of ceilings reflects the level of luxury. A ceiling that has basic material and design, such as drop tile, concrete, or standard grade wood would get the lowest point, and a ceiling with more architectural design features would get higher points.

Window Coverings

The window covering that has blackout effect in a guestroom meets the lowest requirement in the criterion. Coverings that have more design enhancements and create luxurious and visual effect would get higher points.

Bed

The materials of headboard and mattress are the main focuses of this criterion. A bed that has a decorative headboard and a comfortable mattress that provides guests with adjustable level of comfort and creates visual appeal would get higher points.

Clothes Storage Hang Space

The level of enclosure, number of hangers, and depth of closets are the main focuses of this criterion. A fully-enclosed closet with more hangers and hanging attachments for different types of apparel would get higher points.

Additional Storage Space

The number of additional storage spaces, and the increased number of guests that the storage space could accommodate are the focuses of this criterion. A larger space for more guests to store luggage and personal items would get higher points.

Illumination

The illumination criterion mainly focuses on the number of lighting fixtures and level of overall illumination. A guestroom that has more custom lighting fixtures providing excellent level of overall illumination and unique illumination effect would get higher points.

Furniture

This criterion is mainly looking at the material, quality, design, and function of the furniture. Custom design pieces that are modern or antique or upscale style providing a high level of comfort would get higher points.

Seating

The seating type, material, level of comfort and number of guests the chairs could accommodate are the main foci of this criterion. A guestroom that has both a desk chair and lounge chair for more than two guests, and has additional furniture pieces such as end tables, coffee or occasional tables would get higher points.

Work Space/Writing Surface

The size and function of the desk are the main considerations of this criterion. A large work space providing enough room for guests to use, and has multiple electrical outlets and office supplies would get higher points.

Ventilation

Control, style, and noise of the heat and air conditioning are the main foci of this criterion. Modern, conveniently located ventilation exhausts with easy-to-use controls would get higher points.

Table 3.2 Guestroom Luxury Rating Guidelines (GLRG)

Note: The table contains terms such as “2P, plus” or “3P, plus” or “4P, plus” in the criteria column means that the rating includes the bolded elements of the previous row in addition to elements of the current row.

Design Elements	Points	Criteria
General Décor Style	1	Basic or dated style with limited coordination appointments that provide an adequate level of comfort
	2	Increased coordination of appointments combined with modest enhancements to function, design elements, room size, and /or amenities that provide an enhanced level of comfort
	3	Residential style with decorative appointments that are attractive, well-coordinated for form and function that provide an obvious degree of comfort
	4	3P, plus: Upscale style that provides an exceptional degree of comfort
	5	4P, plus: Elegant style with luxurious, unique, and artistic appointments

Free Floor Space	1	Restricted by Size and/or placement of appointments. However, provides an adequate level of comfort
	2	Modest restrictions due to size and/or placement of appointments
	3	No restrictions, as placement of appointments is well-proportioned to room size
	4	Room size and placement of appointments provide an obvious degree of spaciousness, allowing increased ease of movement for multiple guests
	5	Room size and placement of appoints provide a free flowing abundance of space that contributes to the ultimate level of comfort and relaxation for multiple guests
Floor Coverings	1	Basic material (linoleum, low density pile carpet with padding) that provides little or no comfort
	2	Enhanced material (wood, laminates and vinyl, or medium density pile carpet with padding) that provide average comfort
	3	2P, plus: Wood laminates or carpet with enhanced design such as patterns, textures, or inlays , decorative tile (ceramic stone, concrete, terra cotta, etc.); Hard surfaced floors have decorative area rugs as appropriate
	4	3P, plus: High grade wood, marble, granite, or other upscale stone floors, or high density pile carpet with padding that provides exceptional comfort
	5	4P, plus: Custom inlays or textured enhancements that provide an overall design that is obviously elegant and unique; Area rugs are luxurious and unique
Wall Coverings	1	Basic material and design (cinder block with a plain paint finish, standard grade wood, prefab modular laminate paneling, or wallpaper

Wall Coverings	2	Wall treatments are modestly enhanced, such as: drywall with basic paint finish or plain finish or plain vinyl coverings; Rubber or vinyl baseboards
	3	Decorative wall treatments (drywall with textured and painted finish, decorative vinyl coverings, or select grade wood/stone; carpeted baseboards)
	4	3P, plus: At least one significant upscale design enhancement (accent wall(s), furniture-finish wood paneling, soft wall coverings, ceiling trim, architectural feature, wainscot, chair rails, etc.; Wood baseboards)
	5	4P, plus: Wall finishes are of the highest grade materials; Accented with multiple luxurious design enhancements
Wall Hangings /Decorative Enhancements	1	No wall hangings or decorative enhancements
	2	Poster(s) or commercial artwork with thin, un-enhanced wood, metal, or plastic frame(s)
	3	Matted and framed artwork and enhanced frame(s) or other decorative appointments
	4	Variety of matted and framed artwork (various sizes and scenes) or other appointments that provide a distinctive or thematic upscale appeal
	5	4P, plus: Variety of styles and accent pieces (limited edition prints, canvas art, tapestries, or lithographs with enhanced matting and preservation frames, assorted artisan pieces or sculptures, floral displays or plants)
Ceiling	1	Basic material and design (drop tile, concrete, or standard grade wood)
	2	Modest enhancements to material and design (enhanced drop tile, painted drywall, popcorn finish, sand textured concrete, etc.
	3	Predominant use of decorative enhancements to painted drywall, such as: an advanced textured finish (knockdown,

Ceiling	3	orange peel, comb, slap brush, etc.) or selected grade wood/stone
	4	3P, plus: One architectural or design feature (treys, beams, medallions, vaulted/volume, murals/stencils, tin tiles or skylights, ceiling fans, special effect lighting, etc.))
	5	4P, plus: Multiple architectural or design features
Window Coverings	1	Basic drapes, blinds, or shades offering limited blackout effect from the sun or outside light sources
	2	1P, plus: Full blackout effect
	3	2P, plus: Two design enhancements (blinds, shutters, sheers, fabric side panels, valance, glass treatment, cornice, etc.,) provides a professional design effect
	4	3P, plus: Three or more design enhancements
	5	4P, plus: Elaborate, luxurious, and unique visual effect
Bed	1	No headboard or head board and mattress of basic materials and plain design (vinyl flat top); Box spring or bed base
	2	Headboard and mattress are of modestly enhanced materials and design (quilted, soft top); Box spring or bed base
	3	2P, plus: Decorative headboard
	4	Upscale headboard, bed base and mattress which includes a comfort enhancement (pillow top, memory foam padding, adjustable comfort level, etc.)
	5	4P, plus: Elaborate, luxurious, and unique visual appeal
Clothes Storage Hang Space	1	Open wall-mounted clothes rack with simple wire or non-detachable hangers
	2	Semi-enclosed area with detachable wood, plastic, or heavy metal hangers
	3	Fully enclosed with at least six open-hook wood or heavy gauge, sculptured plastic matching hangers some with skirt or pant hanging attachments; Closet depth is 22 inches

Clothes Storage Hang Space	3	minimum and can enclose full length apparel
	4	3P, plus: At least eight hangers
	5	4P, plus: At least ten hangers, one or more designer features (drawers, shelves, shoe rack, walk in capability, etc.; Closet is illuminated
Additional Storage Space	1	Open clothes storage space
	2	Multiple enclosed drawers; Total storage space can accommodate the needs of two or more guests
	3	2P, plus: Sufficient space for one piece of luggage (folding metal rack, bench, or credenza top)
	4	3P, plus: Sufficient space for two pieces of luggage (upgraded wooden racks or designer-style benches); Total storage space can accommodate the need of three or more guests
	5	Total storage space can accommodate the needs of four or more guests
Illumination	1	Two or more well-positioned basic lighting fixtures; Provide an adequate level of overall illumination
	2	Three or more lighting fixtures; Modestly enhanced in style, positioning, and function; Provide a good level of overall illumination
	3	Four or more well-positioned lighting fixtures; Decorative and well-coordinated for form and function; Provide a good level of overall illumination at each location
	4	3P, plus: Predominantly freestanding fixtures of upscale design; Provide an excellent level of overall illumination
	5	4P, plus: Custom lighting fixtures of outstanding quality; Custom functions(s), (dimmers, point lighting, multiple switches, and/or natural light sources); Provide a unique illumination effect

Furniture	1	Predominately basic materials (particle board, pressboard, laminate, or vinyl finishes); Dated styles with limited coordination; Provides an adequate level of comfort
	2	1P. plus: An increased level of coordination; Modest enhancements in materials, design and function; Provides an enhanced level of comfort
	3	Predominantly freestanding; Decorative and well-coordinated for form and function; Overall design reflects current industry trends (Melamine resins, solid wood trim, or upgraded laminated finishes; Provides an obvious degree of comfort
	4	3P, plus: Modern or antique upscale style and materials, such as: solid wood, polished metals, leather, designer fabric, veneer finishes with solid wood accents, laminated insets, etc.; Provides an exceptional degree of comfort
	5	4P, plus: Luxurious, unique, and elegant custom design and workmanship
Seating	1	One chair (typically placed as part of a duplex, triplex, or task table)
	2	1P. plus: Additional seating for one guest; Vinyl or fabric upholstery
	3	Comfortable seating for two guests –to include desk chair with arms and partial upholstery (vinyl, leather, or fabric); Plus one additional fully upholstered lounge chair for TV viewing
	4	3P, plus: Comfortable seating for three guests; Upscale materials and design in an expanded setting, such as: a loveseat, sofa, or oversized chair with ottoman
	5	4P, plus: Luxurious materials and design; Additional furniture pieces (end tables, coffee or occasional tables)
Work Space/Writing Surface	1	Duplex, triplex, or small task table that provides adequate work space (e.g., enough space for a laptop and an 8x10 inch reference material item)

Work Space/Writing Surface	2	Desk or medium task table that provides good work space (e.g., enough space for a laptop and two 8x10 inch reference material items)
	3	Desk or large task that that provides very good work space (e.g., enough space for a laptop and three 8x10 inch reference material items); One electrical outlet (not in use) conveniently placed at the desk
	4	Large desk that provide ample work space (e.g., enough space for a laptop, three 8x 10 inch reference material items, and a portable printer); Multiple electrical outlets (not in use) conveniently placed at the desk
	5	4P, plus: Desktop enhancements (desk blotter, pull-out writing surface, stationery, and other office supplies)
Ventilation	1	Heat and/or air conditioning available on a seasonal basis as needed; Window style air-conditioning units
	2	1P, plus: Conveniently located through-wall units
	3	2P, plus: Heat and air conditioning available on demand; Modern, quiet, with easily accessible controls in each guestroom
	4	Heat and air conditioning available on demand; Central system with thermostat control
	5	4P, plus: Digital thermostat control

Table 3.2 provides detailed luxury rating criteria for different design elements in guestroom environments; however, it does not mention the sustainability aspect of the elements. Since comfort and health play an important part in guest satisfaction during a stay in hotels, it is necessary to use a rating system that focuses on sustainability of building and occupants' comfort to compare with the luxury rating system.

3.2 LEED v4 for Interior Design and Construction

LEED v4 for Interior Design and Construction is selected for this study because it is the latest LEED rating system that can be applied to commercial interiors, retail, and hospitality projects. This rating system focuses on eight categories of green building strategies: Location and Transportation (LT), Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Material and Resources (MR), Indoor Environmental Quality (EQ), Innovation and Design (ID), and Regional Priority (RP). Credits that are applicable for guestroom interior design were selected to compare with the developed Guestroom Luxury Rating Guidelines. Table 3.3 shows overall credits of LEED v4 for Interior Design and Construction and applicable credits that were selected for comparison in hotel guestrooms.

Table 3.3 Overall LEED credits and credits selected for the study

Categories	Credits	Related Credits
1. Location and Transportation	Credit 1. LEED for Neighborhood Development Location	N/A
	Credit 2. Surrounding Density and Diverse Uses	N/A
	Credit 3. Access to Quality Transit	N/A
	Credit 4. Bicycle Facilities	N/A
	Credit 5. Reduced Parking Footprint	N/A
2. Sustainable Sites		N/A
3. Water Efficiency	Prerequisite: Indoor Water Use Reduction	N/A
	Credit: Indoor Water Use Reduction	N/A
4. Energy and Atmosphere	Prerequisite 1. Fundamental Commissioning and Verification	N/A
	Prerequisite 2. Minimum Energy Performance	N/A
	Prerequisite 3. Fundamental Refrigerant Management	✓

4. Energy and Atmosphere	Credit 1. Enhanced Commissioning	N/A
	Credit 2. Optimize Energy Performance	✓
	Credit 3. Advanced Energy Metering	N/A
	Credit 4. Renewable Energy Production	N/A
	Credit 5. Enhanced Refrigerant Management	✓
	Credit 6. Green Power and Carbon Offsets	N/A
5. Materials and Resources	Prerequisite 1. Storage and Collection of Recyclables	N/A
	Prerequisite 2. Construction and Demolition Waste Management Planning	N/A
	Credit 1. Long-Term Commitment	N/A
	Credit 2. Interiors Life-Cycle Impact Reduction	✓
	Credit 3. Building Product Disclosure and Optimization – Environmental Product Declaration	✓
	Credit 4. Building Product Disclosure and Optimization – Sourcing of Raw Materials	✓
	Credit 5. Building Product Disclosure and Optimization – Material Ingredients	✓
	Credit 6. Construction and Demolition Waste Management	N/A
6. Indoor Environmental Quality	Prerequisite 1. Minimum Indoor Air Quality Performance	N/A
	Prerequisite 2. Environmental Tobacco Smoke Control	N/A
	Credit 1. Enhanced Indoor Air Strategies	N/A
	Credit 2. Low-Emitting Materials	✓
	Credit 3. Construction Indoor Air Quality Management Plan	N/A
	Credit 4. Indoor Air Quality Assessment	N/A
	Credit 5. Thermal Comfort	N/A
	Credit 6. Interior Lighting	✓
	Credit 7. Daylight	✓
	Credit 8. Acoustic Performance	✓
7. Innovation	Credit 1. Innovation	N/A
	Credit 2. LEED Accredited Professional	N/A

8. Regional Priority		N/A
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*N/A: A credit did not apply and was not analyzed in this study

*N/A for 6. Environmental Quality-Credit 5. Thermal Comfort: Since hotel guestrooms are assumed to provide adequate thermal comfort controls in LEED guidelines, therefore, this credit is not applicable in the study.

Table 3.4 shows selected credits from LEED and the guestroom design elements associated with each credit. The requirements of each credit were compared with criteria of each guestroom design elements.

Table 3.4 Selected LEED Credits and Related Design Elements for Comparison

Categories	Credits	Design Elements
Energy and Atmosphere	Prerequisite 3. Fundamental Refrigerant Management	Ventilation
	Credit 2. Optimize Energy Performance	
	Credit 5. Enhanced Refrigerant Management	
Material and Resources	Credit 2. Interiors Life-Cycle Impact Reduction	Floor Coverings, Wall Coverings, Wall Hangings, Ceilings, Window Coverings, Illumination, Bed, Clothes Storage Hang Space, Additional Storage Space, Furniture, Seating, Work Space/Writing Surface
	Credit 3. Building Product Disclosure and Optimization –Environmental Product Declaration	
	Credit 4. Building Product Disclosure and Optimization – Sourcing of Raw Materials	
	Credit 5. Building Product Disclosure and Optimization –Material Ingredients	
Indoor Environmental Quality	Credit 2. Low-Emitting Materials	Floor Coverings, Wall Coverings, Ceilings, Window Coverings, Bed, Clothes Storage Hang Space,

Indoor Environmen tal Quality	Credit 2. Low-Emitting Materials	Additional Storage Space, Furniture, Seating, Work Space/Writing Surface
	Credit 6. Interior Lighting	Illumination
	Credit 7. Daylight	Window Coverings, Illumination
	Credit 8. Acoustic Performance	Ventilation

3.3 Comparing Guestroom Luxury Rating Guidelines with Credits in LEED v4 for Interior Design and Construction

Both of the two rating guidelines are for hospitality projects. Guestroom Luxury Rating Guidelines developed from AAA Diamond Rating Guidelines is the guidelines for hotel guestrooms to achieve the level of luxury and LEED v4 for Interior Design and Construction is for hotels to achieve sustainability. Figuring out the relationship between these two guidelines is the key to understanding the issue of luxury versus sustainability in hospitality environment. The commonalities and conflicts between these two guidelines were obtained after review and comparison.

3.4 Description of the Chosen Hotels

Two boutique hotels in New York City are selected for this study. Hotel A is a luxury conventional hotel, where environmental consideration is not the priority in this project and it is not a LEED certified hotel. Hotel B is a luxury LEED certified hotel. For comparability, these two hotels were selected based upon four requirements. The first is that both hotels are located in the same bio-climatic region, which is in downtown Manhattan, New York City. The second is

that both hotels are full-service hotels of similar scale. The third requirement is that both hotels are luxury boutique hotel, and the last requirement is that both hotels are adaptive reuse projects that are using old buildings for their hotels.

3.4.1 An Existing Luxury non-LEED Hotel - Hotel A

The Hotel A is a full-service lifestyle hotel with 270 guestrooms, including suites. The sizes of guestroom range from 275 square feet to 345 square feet and the suites provide 440 square feet to 1000 square feet of space. Guestrooms with double-, or king-size beds are available with amenities. The hotel renovated and redesigned its 270 guestrooms in 2012, which merged the traditional and contemporary styles to create a playful visual environment for its guests.

3.4.2 An Existing Luxury LEED Hotel - Hotel B

The Hotel B is a full-service nature-inspired boutique hotel with 230 guestrooms, including suites. The sizes of guestroom range from 235 square feet to 275 square feet. The hotel aims to create beautiful spaces that are natural and unique. This hotel uses natural and reclaimed materials throughout the projects to create an “undesigned” guest experience.

3.5 Research Procedures

The first and most important step was to compare GLRG with applicable credits from LEED v4 for Interior Design and Construction to discover whether there is any conflict between these two guidelines and how the luxury attributes could coexist with sustainability in hotel guestroom environments. After the comparison between the two rating systems, hotel data were collected to add on the findings.

Hotel data were collected for this study by three methodologies: 1) visiting hotel sites and observing hotel typical guestrooms; 2) interviewing hotel general managers and designers; and 3) photographic documentation. While visiting the hotel sites, the fifteen design elements in luxury rating guidelines were observed and photos of the guestrooms were taken for documentation. The GLRG (Guestroom Luxury Rating Guidelines), which was developed previously from the AAA Diamond Rating Guidelines, was applied to both of the hotel guestrooms to get the guestroom luxury scores. Semi-structured interviews were used to collect qualitative data. The hotels' general managers, design directors, and designers were interviewed to understand how hotel professionals view the issue of sustainability versus luxury and what the common and different design attributes are between the two luxury hotels. The concept of luxury and sustainability, and the relative practices and challenges were the focus of the data collection.

CHAPTER FOUR

RESULTS & DISCUSSION

This chapter consists of four main sections: the comparative analysis of GLRG (Guestroom Luxury Rating Guidelines) and LEED credits; results of analysis of luxury level of Hotel A (luxury non-LEED hotel); results of analysis of luxury level of Hotel B (luxury LEED Hotel); and discussion of the findings in comparing Hotel A and Hotel B. In first section, the GLRG was compared with applicable credits in LEED v4 for Interior Design and Construction to verify whether there is any conflict between these two guidelines. In the second and third sections, fifteen design elements, which are general décor style, free floor space, floor coverings, wall coverings, wall hangings/decorative enhancements, ceilings, window coverings, bed, clothes storage hanging space, additional storage space, illumination, furniture, seating, work space/writing surface, and ventilation in the two hotels' typical guestrooms were analyzed and rated. In the last section, the luxury level of the two hotels – luxury non-LEED hotel, and luxury LEED hotel, were compared.

4.1 Comparison between Guestroom Luxury Rating Guidelines and LEED Credits

Under this section, the Guestroom Luxury Rating Guidelines (GLRG) was compared with credits from LEED v4 for Interior Design and Construction to exam whether the LEED rating system would have negative impact on the level of luxury in a hotel guestroom.

In the guidelines of LEED v4 for Interior Design and Construction, the intent and requirements of each credit are given. In Chapter Three, eleven selected LEED credits were matched with fourteen related design elements in GLRG for comparison (Table 3.3), the credits were selected from categories of Energy and Atmosphere (EA), Material and Resources (MR), and Indoor Environmental Quality (EQ). The categories of green building strategies and credits that do not focus on interior design of hotel guestrooms are not in conflict with the criteria in GLRG, and those credits were not analyzed in this study. In this section, each selected LEED credit was compared with the related guestroom design elements.

4.1.1 Energy and Atmosphere

Three credits in Energy and Atmosphere category were selected for this study, which are Fundamental Refrigerant Management, Optimize Energy Performance, and Enhanced Refrigerant Management. The design element in GLRG related to these credits is Ventilation.

EA Prerequisite 3. Fundamental Refrigerant Management

The intent of this LEED prerequisite is to reduce the ozone depletion, which requires using no chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R). In GLRG, the refrigerant of HVAC system is not mentioned in the criteria of Ventilation, and the type of refrigerant in HVAC would not affect its control, style and

noise that the GLRG evaluates. Therefore, there is no conflict between the prerequisite of Fundamental Refrigerant Management in LEED rating system and criteria of Ventilation in GLRG.

EA Credit 2. Optimize Energy Performance

The intent of this LEED credit is to achieve energy performance beyond prerequisite standard that requires the hotels establishing an energy performance target prior to the schematic design phase. To achieve this credit, two options are available for project team to implement. Option one is to have an analysis of energy measures during the design process and apply the results to the design decision-making. One of the analysis' focuses is the efficiency of HVAC-related strategies. Option two suggests providing control of HVAC system in response to space demand for each interior space. In addition, using ENERGY STAR HVAC system and other equipment allow the project to achieve points in this credit. The ventilation criteria in GLRG focus on control, style, and noise of the HVAC system. Having an analysis of HVAC-related strategies and using an ENERGY STAR HVAC system that increases energy performance does not affect the control, style, and noise of HVAC in guestroom. Moreover, having easily accessible controls in the hotel guestrooms meets the requirements of both LEED credit and ventilation criteria in GLRG, in this regard, LEED credit - Optimize Energy Performance and Ventilation criteria in GLRG supports each other.

EA Credit 5. Enhanced Refrigerant Management

The intent of this credit is to reduce ozone depletion by using no refrigerants or low-impact refrigerants. Same as the prerequisite - Fundamental Refrigerant Management, the type of refrigerant used in HVAC does not impact the level of luxury.

4.1.2 Material and Resources

Four credits in Material and Resources category were selected for this study, which are Interiors Life-Cycle Impact Reduction, Building Product Disclosure and Optimization –Environmental Product Declaration, Building Product Disclosure and Optimization – Sourcing of Raw Material, and Building Product Disclosure Optimization – Material Ingredients. Twelve design elements in GLRG related to these credits are: Floor Coverings, Wall Coverings, Wall Hangings, Ceilings, Window Coverings, Illumination, Bed, Clothes Storage Hang Space, Additional Storage Space, Furniture, Seating, and Work Space/Writing Surface.

MR Credit 2. Interiors Life-Cycle Impact Reduction

The intent of this LEED credit is to encourage adaptive reuse and maximize the environmental performance of products and materials. This credit could be achieved by reusing or salvaging interior nonstructural and nonhazardous elements for at least 50% of the surface area. The design elements in GLRG that are applicable to interior nonstructural elements are floor coverings, wall coverings, and ceilings. All of these elements in GLRG emphasize on the quality of materials, higher grade of materials indicates higher level of luxury, and GLRG does not mention whether the material should be used or new. Many building materials have the potential for recycling and reusing, for instance, glass, plastic, metals, concrete or brick, and wood. Glass, plastic and metals can be reformed by heating; concrete and brick can be transformed to new masonry by grinding them up; and wood can be resawn for reuse, or chipped for use in composite materials (Jong-Jin & Rigdon, 1998). For example, wood from old barns has become popular to be reused in new construction. Existing old structures were constructed from some of the oldest and most durable trees in the forests, and in many cases, the quality and craftsmanship of these reused materials

could not be reproduced again. Therefore, reusing interior nonstructural elements in hotel guestrooms does not necessarily conflict with the luxury criteria of floor coverings, wall coverings, and ceilings in GLRG, as long as the materials are in good conditions.

The project team could also achieve the credit by the other option, which is reusing, salvaging, or refurbishing furniture and furnishings for at least 30% of the total furniture and furnishings cost. The design elements in GLRG that are applicable to furniture and furnishings are work space/writing surface (criteria focus on the size and function of the desk), seating (seating type, material, level of comfort, and number of guests the chairs could accommodate), furniture (material, quality, design, function, and whether the furniture is custom), illumination (number of lighting fixture, level of illumination, and whether the lighting is custom), bed (material of headboard and mattress, and level of comfort), window coverings (blackout effect, design enhancement, and visual effect), and wall hangings (whether the room has artworks, accent pieces, or plants). All of these elements have the potential for restoration; quality, condition, and design are the main considerations for used furniture and furnishings. Reusing, salvaging, or refurbishing furniture and furnishings that have high quality would meet the requirements of both LEED credit and criteria in GLRG.

In addition, using strategies to increase space flexibility and ease of adaptive reuse could earn points in this credit. Strategies include: installing accessible floor or ceiling system; having a minimum of 50% of the interior nonstructural walls, ceilings, and floors to be movable or demountable. These two strategies could be used for hotel public areas but are not suitable to be applied to guestroom floors.

To increase building materials recycling, project teams should ensure that at least 50% of nonstructural materials have integral labels that indicate the information of material origin, properties, and date of manufacture; and ensure a minimum of 50% of the nonstructural materials are reusable or recyclable. As presented above, nonstructural elements in hotel guestrooms such as floor coverings, wall coverings, and ceilings emphasize on the quality of materials in GLRG, higher grade of materials indicates higher level of luxury, having materials that have detailed information and are reusable or recyclable do not conflict with the criteria in GLRG.

Lastly, in order to easily reconfigure and repurpose lighting and other systems, this LEED credit requires implementing a flexible lighting control system such as wall controls and sensors for at least of 50% of the lighting load. In GLRG, having multiple switches for lighting fixtures in guestrooms meets the luxury criteria. Therefore, flexible lighting control system could be applied to both LEED credit and GLRG.

MR Credit 3. Building Product Disclosure and Optimization –Environmental Product Declaration

The intent of this credit is to promote the use of the products that have environmentally, economically, and socially preferable life-cycle impacts by encouraging project teams to select products from manufacturers that have qualified life-cycle impacts. The hotel project team should use a minimum of 20 permanently installed products sourced from a minimum of 5 different manufacturers that have a publicly available Environmental Product Declaration (EPD) or alternatively, half of the permanently installed products should be certified by third party program that have impact reduction below industry average. The permanently installed products

in a hotel guestroom are floor coverings, wall coverings, ceilings, and clothes storage. The GLRG requires higher grade of materials, therefore, having permanently installed products that have public environmental product declarations available do not conflict with criteria in GLRG.

MR Credit 4. Building Product Disclosure and Optimization – Sourcing of Raw Materials

The intent of this credit is to encourage the use of products and materials that have life cycle information and have preferable life cycle impacts. The hotel project team should use a minimum of 20 permanently installed products sourced from a minimum of 5 different manufactures that have released a public report from the raw material suppliers, which contain raw material supplier extraction locations, a commitment to using land ecologically in a long-term, a commitment to reducing environmental impacts from extraction and/or manufacturing processes, and a commitment to meeting applicable standards or programs voluntarily that have responsible sourcing criteria. The design elements in GLRG focus on the quality of materials instead of material extraction. For instance, luxury floor coverings in GLRG suggest having high grade wood, marble, granite, or other upscale stone floors, or high density pile carpet. Therefore, as long as the hotel project team choose the permanently installed products that have high quality and material sustainability reports available, the products are both sustainable and luxury according to LEED guidelines and GLRG.

In addition, project team could also choose to use products that meet the responsible extraction criteria, such as purchasing products from a manufacturer that participates in an extended producer responsibility program; specifying bio-based products, that conform to the Sustainable Agriculture Network’s Sustainable Agriculture Standard; wood products certified by the Forest Stewardship Council or USGBC-approved equivalent; or products that contain post-consumer

and pre-consumer recycled content. These standards and recycling techniques do not affect producing products with high quality. As presented above, GLRG does not focus on material extraction. Therefore, the LEED credit Building Product Disclosure and Optimization – Sourcing of Raw Materials does not conflict with GLRG criteria. The materials and products that meet the requirements of this LEED credit could be applied to a luxury hotel guestroom.

MR Credit 5. Building Product Disclosure and Optimization – Material Ingredients

The intent of this credit is to encourage the use of products that have chemical ingredients inventoried using an accepted methodology, have minimum use of harmful substances, and promote use of products that have improved life cycle impacts. The hotel project team could achieve the requirements by using a minimum of 20 permanently installed products from at least 5 different manufacturers that use a qualified program to ensure that the chemical inventories of the products are publicly available, or by ensuring 25% of the total permanently installed products have the material ingredient optimization documented by USGBC approved program, or by having 25% of the permanently installed products sourced from manufacturers that engage in qualified and robust safety, health, and risk program for at least 99% of the ingredients used to make the products, and the manufacturers have third party verification that verifies the information of chemical ingredients. The permanently installed products in a hotel guestroom are floor coverings, wall coverings, ceilings, and clothes storage. Using products and materials with minimum harmful ingredients does not conflict with the criteria in GLRG.

4.1.3 Indoor Environmental Quality

Four credits in Indoor Environmental Quality were selected for comparison, which are Low-Emitting Materials, Interior Lighting, Daylight, and Acoustic Performance. Twelve design

elements in GLRG related to these credits are: Floor Coverings, Wall Coverings, Ceilings, Window Coverings, Bed, Clothes Storage Hang Space, Additional Storage Space, Furniture, Seating, Work Space/Writing Surface, Illumination, and Ventilation.

EQ Credit 2. Low-Emitting Materials

The intent of this credit is to reduce the emissions of chemical contaminants into the indoor environment that can lower air quality and damage human health, productivity, and the environment. This credit focuses on volatile organic compound (VOC) emissions of products. The requirement is to meet or exceed VOC limits for interior paints, coatings, sealants, flooring, composite wood, ceilings, walls, thermal, acoustic insulation and furniture. Inherently non-emitting sources of VOC include stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring are fully compliant without VOC emissions testing. The materials suggested in GLRG that are not included in the non-emitting sources of VOC should comply with VOC emissions testing to achieve this LEED credit. The materials used for floor coverings, wall coverings, wall hangings, ceilings, window coverings, bed, clothes storage, additional storage, furniture, seating, and work space/writing surface that satisfy the VOC limits and meet the LEED credit could also be used in a luxury hotel guestroom.

EQ Credit 6. Interior Lighting

The intent of this credit is to provide high-quality lighting that promotes the occupants' productivity, comfort, and well-being. The design element of illumination in GLRG related to this credit focuses on the overall illumination quality instead of the detailed standard of lighting fixtures. This credit requires the light sources' luminance, CRI, and rated life, which do not

conflict with the illumination criteria in GLRG. The requirements of meeting or exceeding the surface reflectance limits for ceilings, walls, floors, work surfaces, and movable partitions in guestrooms do not conflict with the luxury criteria in GLRG. Besides, the requirements of this LEED credit increase the guests' comfort while staying in the hotel guestroom.

EQ Credit 7. Daylight

The intent of this credit is to provide a connection between indoor and outdoor space by introducing daylight into the space and reducing the use of electrical lighting. The credit requires the project providing manual or automatic glare control devices for the occupied spaces. Spatial daylight autonomy and annual sunlight exposure are the metrics used in the credit. Spatial daylight autonomy describes the percentage of floor area that receives 300 to 3,000 lux for at least 50% of the annual occupied hours. And annual sunlight exposure is the percentage of floor area in regularly occupied spaces that receives direct sunlight that is at least 1,000 lux for at least 250 occupied hour during the year (Sterner, 2014). In a hotel guestroom, the spatial daylight autonomy should be 55%, 75% or 90%, and the annual sunlight exposure should not exceed 10%. Or the hotel guestrooms' illuminance levels should be between 300 lux and 3,000 lux from 9 a.m. to 3 p.m. The design elements of Window Coverings and Illumination are related to this LEED credit. As presented above, the criteria of illumination only focuses on the number of lighting fixtures, whether the lightings are custom made, and the overall illumination, the window coverings in GLRG should have full blackout effect with design enhancements such as blinds, shutters, or glass treatment that provide visual effect. The criteria of spatial daylight autonomy and annual sunlight exposure are not included in the GLRG, and both guidelines emphasize on providing glare-control for the spaces. Therefore, the credit of Daylight does not conflict with the

criteria of Illumination and Window Coverings in GLRG, and the requirement of providing glare-control for the spaces is the same in both guidelines.

EQ Credit 8. Acoustic Performance

The intent of this credit is to provide interior environments with effective acoustic design that promotes occupants' well-being, productivity, and communications. It is important to have effective acoustic design in a hotel guestroom to provide guests with a quiet space for rest. This LEED credit requires the HVAC systems to have limit background noise, which is the same as the criteria of Ventilation in GLRG, GLRG requires a luxury hotel guestroom to have quiet HVAC. Therefore, the LEED credit of Acoustic Performance and criteria of Ventilation in GLRG supports each other.

Table 4.1 Comparison between Guestroom Luxury Rating Guidelines and LEED credits

Design Elements	Luxury Criteria (GLRG)	Sustainable Criteria (LEED)	Relation
Floor Coverings,	<ul style="list-style-type: none"> • Use high grade materials, such as: High grade wood, marble, granite, or other upscale stone floors, or high density pile carpet with padding • Custom inlays or textured enhancements 	<ul style="list-style-type: none"> • 50% of interior nonstructural materials that: Are reused or salvaged ; Have information of origin, properties, and date of manufacture available; Are reusable and recyclable. 	No Conflict
Wall Coverings	<ul style="list-style-type: none"> • Have significant upscale design enhancement, such as: accent wall(s), furniture-finish wood paneling, soft wall coverings, ceiling trim, architecture feature, wainscot, chair rails, etc. • Use wood baseboards • Use high grade materials for wall finishes 	<ul style="list-style-type: none"> • 20 permanently installed products sourced from 5 different manufactures that have: EPD (Environmental Product Declarations) available; Released a report from the raw material suppliers; Publicly available chemical inventories. 	No Conflict
Ceilings	<ul style="list-style-type: none"> • Use decorative enhancements to painted drywall, such as: An advanced textured finish Select grade wood/stone • Use architectural or design features, such as: Treys, beams, medallions, vaulted/volume, 	<ul style="list-style-type: none"> • Half of the permanently installed products are certified by third party program • 25% of the permanently installed products that: Have documented material ingredient optimization; Engage in qualified risk program to verify the information of chemical ingredients. 	No Conflict

	murals/stencils, tin tiles or skylights, ceiling fans, special effect lighting, etc.	<ul style="list-style-type: none"> • Meet or exceed VOC limits for the required materials • Wood products certified by Forest Stewardship Council 	
Wall Hanging/ Decorative Enhancements	Use artwork or other appointments, such as floral displays or plants in the guestroom	Reuse, salvage, or refurbish the wall hanging or decorative enhancements.	No Conflict
Window Coverings	<ul style="list-style-type: none"> • Provide full blackout effect • Have design enhancements, such as: blinds, shutters, sheers, fabric side panels, valance, glass treatment, cornice, etc. • Provide luxurious and unique visual effect 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish the window coverings • Meet or exceed VOC limits • Provide glare-control 	Support
Bed	<ul style="list-style-type: none"> • Have decorative upscale headboard • Mattress includes a comfort enhancement, such as: pillow top, memory foam padding, adjustable comfort level, etc. 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish the bed materials. • Meet or exceed VOC limits • Wood products certified by Forest Stewardship Council 	No Conflict
Clothes Storage Hang Space	<ul style="list-style-type: none"> • Fully-enclosed with at least six to ten hangers for different clothes • Closet depth is 22 inches at minimum • Can enclose full length apparel • Provide drawers, or shelves, shoe racks, 	<ul style="list-style-type: none"> • 20 permanently installed products sourced from 5 different manufactures that have: EPD available; Released a report from the raw material suppliers; 	No Conflict

	walk-in capacity, etc.	Publicly available chemical inventories.	
Additional Storage Space	<ul style="list-style-type: none"> • Provide sufficient space for two pieces of luggage with available wooden racks or benches • Total storage space can accommodate the needs of three or more guests 	<ul style="list-style-type: none"> • Half of the permanently installed products are certified by third party program • 25% of the permanently installed products that: <ul style="list-style-type: none"> Have documented material ingredient optimization; Engage in qualified risk program to verify the information of chemical ingredients. • Meet or exceed VOC limits • Wood products certified by Forest Stewardship Council 	No Conflict
Illumination	<ul style="list-style-type: none"> • Provide four or more well-positioned lighting fixtures • Have custom lighting fixtures • Provide multiple switches • Provide excellent level of overall illumination and unique illumination effect 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish the lighting fixture • Provide flexible lighting control • Meet the required illuminance, CRI, rated life, and reflectance limits 	Support
Furniture	<ul style="list-style-type: none"> • Provide furniture with modern or antique upscale style and materials, such as Solid wood, polished metals, leather, fabric, veneer finishes with solid wood accents, laminate insets, etc. 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish the furniture pieces • Meet or exceed VOC limits 	No Conflict

	<ul style="list-style-type: none"> • Have custom furniture 		
Seating	<ul style="list-style-type: none"> • Provide seating with upscale materials and design for three guests, such as: Loveseat, sofa, oversized chair • Provide additional furniture pieces such as: End tables, coffee or occasional tables 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish seating • Meet or exceed VOC limits 	No Conflict
Work Space/ Writing Surface	<ul style="list-style-type: none"> • Provide large work space that is enough for a laptop, three 8x10 inch reference material items, and a portable printer • Provide multiple electrical outlets • Provide desk enhancements, such as: desk blotter, pull-out writing surface, stationery, and other office supplies 	<ul style="list-style-type: none"> • Reuse, salvage, or refurbish the work space/writing surface • Meet or exceed VOC limits • Wood products certified by Forest Stewardship Council 	No Conflict
Ventilation	<ul style="list-style-type: none"> • Have heat and air conditioning available on demand • Provide digital thermostat control • Modern, quiet with easily accessible controls in guestroom 	<ul style="list-style-type: none"> • Use no CFC based refrigerants in new HVAC system • Analyze the efficiency of HVAC-related strategies • Provide control of HVAC system in response to space demand • Use ENERGY STAR HVAC system • Have limited background noise 	Support

4.2 Criticizing AAA Diamond Rating Guidelines - Guestrooms

The comparison between Guestroom Luxury Rating Guidelines and LEED credits indicated how LEED could coexist with luxury attributes to design a luxury green guestroom. However, other than LEED requirements, some suggestions should be made for designers and hotel professionals to avoid making negative impact on the environment while applying the AAA Diamond Rating Guidelines to hotel guestrooms.

Free Floor Space

This criterion emphasizes on the room size and circulation. The five diamonds criterion requires the room size and placement of appointments providing a free flowing abundance of space that contributes to the ultimate level of comfort and relaxation for multiple guests. A luxury guestroom is typically larger than 400 square feet (Penner et al., 2012). However, larger spaces need more energy to heat and cool, and larger square footage does not equal to a higher level of luxury. For instance, a typical guestroom often has two double/queen size beds, or one queen/king size bed that could accommodate two to four guests. The size of guestrooms should depend on the capacity and customers' needs; extra undesired spaces are wastes of resources and energy.

Floor Coverings

This criterion requires guestrooms using high grade wood, or other upscale hard surface flooring, or high density pile carpet with padding that provides exceptional comfort. However, the rating guideline does not provide its standard of "high grade" materials. Sometimes, high grade materials are not sustainable. For instance, African Blackwood, which is also called Mpingo, has high quality, fine texture, and it is rated as very durable material, however, this specie continues

to diminish (Grant, 2010). Therefore, while selecting materials, both the quality and sustainability should be considered.

Wall Coverings

The materials suggested using in guestroom in the two-, and three- diamond criteria include vinyl coverings. Vinyl is an unsustainable material and has been classified as a human carcinogen by EPA. It is a type of plastic that is made from ethylene (found in crude oil), and chlorine (found in regular salt), when processed, both the substances are combined to form Polyvinyl Chloride (PVC) resin, or as is commonly known as vinyl (Vinyl Info). Exposure to vinyl products may cause liver damage, joint and muscle pain, dizziness, headache, memory loss, etc. (Todd, 2004). Therefore, vinyl products should not be used in guestrooms especially for luxury hotels.

4.3 Applying GLRG to Hotel A and Hotel B

Under this section, the fifteen design elements in the hotels' typical guestrooms were analyzed and rated according to the GLRG (Guestroom Luxury Rating Guidelines). Typical guestrooms with one king size bed were selected from the two hotels.

4.3.1 Luxury Score of Hotel A - A Luxury Non-LEED Hotel

General Décor Style

The room is spacious with good amount of natural light and interior lighting. The grey carpet, blue accent walls, and pop-up red color create a luxurious color palette. The room has a residential style with some decorative pieces that are attractive, such as custom headboard and

luxurious mirror, and provide guests with an exceptional degree of comfort. Four points are obtained.



Figure 4.1 Overview of a Standard Guestroom

Free Floor Space

The size of the guestroom is 275 square feet, which is relatively small since a guestroom in a luxury hotel is typically larger than 400 square feet (Penner et al., 2012). However, since the room does not have restrictions, as the placement of furniture is well-proportioned to room size; according to GLRG, three points are obtained.

Floor Coverings

The floor covering of the guestroom is solution dyed nylon carpet. It is a high density pile carpet with padding that provides exceptional comfort. Four points are obtained.

Wall Coverings

The material of wall coverings in the guestroom is Type II vinyl. There is one accent wall as a part of headboard that garners special attention, and the room uses wood baseboards. Four points are obtained.

Wall Hangings/ Decorative Enhancements

The room has one decorative mirror against the wall next to the bed that provides a distinctive upscale appeal. There is no artwork, or floral displays. Three points are obtained.

Ceilings

The ceiling is painted drywall without any decorative enhancement. Two points are obtained.

Window Coverings

The room has two layers of drapes and cornice that provide a full blackout effect and a professional design effect. Three points are obtained.

Bed

The mattress is custom and it has a pillow top, the bed is accented by a decorative headboard that provide luxurious and unique visual appeal. Five points are obtained.

Clothes Storage Hang Space

The closet is fully enclosed with ten open-hook wood hangers. Five hangers have the hanging attachments for skirt or pant. The closet depth is 22 inches and can enclose full length apparel. Drawers and shelves are also provided. Five points are obtained.

Additional Storage Space

The total storage space can accommodate the needs of three or more guests. The room provides wooden benches and one folding metal rack for luggage. Four points are obtained.

Illumination

All of the lighting fixtures in the guestroom are custom. The bed lamps are customized to match the headboard and have outlet bases. All the lighting fixtures and the natural light in the room provide a unique illumination effect. Five points are obtained.

Furniture

All furniture in the room is custom with the materials of solid wood, polished metals, and leather, which is luxurious, unique, and elegant. Five points are obtained.

Seating

The room provides comfortable seating for two guests. One desk chair has a leather-upholstered seat and polished metal legs, the other one is a lounge chair with an upholstered-leather seat and a wood structure, positioned for television viewing. Three points are obtained.

Work Space/Writing Surface

The desk surface is 33 inches long and 19.5 inches wide, which provides enough space for a laptop and three 8x10 inch reference material items. The desk lamp has a outlet base with two available electrical outlets. Three points are obtained.

Ventilation

The room has digital thermostat control with heat and air conditioning available on demand. Five points are obtained.

4.3.2 Luxury Score of Hotel B - A Luxury LEED Hotel

General Décor Style

The room has a neutral color palette and uses many wood materials that provide a cozy and comfort atmosphere. The window niche is a key design feature in the room that provides a comfortable space for guests to rest or read. Overall the room has a residential style. Three points are obtained.



Figure 4.2 Overview of a Standard Guestroom

Free Floor Space

The size of the guestroom is 230 square feet, which is the typical size for an economy hotel (Penner et al., 2012). There is a rustic wood column on the entry and the closet is around 21

inches extended from the wall. Therefore, the room has some restrictions due to the size and the placement of furniture. Two points are obtained.

Floor Coverings

The floor covering of the guestroom is reclaimed wood, and has a decorative area rug under the bed. Three points are obtained.

Wall Coverings

The guestroom uses low-VOC textured paint finish for most of the walls and it has wood baseboards. One accent wall uses reclaimed spruce wood with different thickness to create shadow effect, and the TV wall uses soft wall coverings, which is a linen fabric. Four points are obtained.

Wall Hangings/ Decorative Enhancements

The room does not have artworks or artisan pieces. But it provides several natural plants that echo with the natural materials in the room that create a thematic appeal. Four points are obtained.

Ceilings

The ceiling material is concrete with plaster finish and it has three beams. Therefore, it has one decorative enhancement and one architectural feature, four points are obtained.

Window Coverings

The room has two layers of drapes and cornice that provide a full blackout effect and a professional design effect. Three points are obtained.

Bed

The mattress is custom and has a pillow top, the bed has a leather headboard that provides obvious degree of comfort. Five points are obtained.

Clothes Storage Hang Space

The closet is fully enclosed with four open-hook recycled paper hangers. None of the hangers have hanging attachments for skirt or pant. The closet depth is 20 inches, which is below the minimum requirement. Two drawers are provided. 2.5 points are obtained.

Additional Storage Space

The total storage space can accommodate the needs of two guests, and the room has a folding metal rack which provides sufficient space for one piece of luggage. Three points are obtained.

Illumination

All of the lighting fixtures in the guestroom are custom. The room uses the Crestron system to control the lighting in the room with different moods. All the lighting fixtures and the natural light in the room provide a unique illumination effect. Five points are obtained.

Furniture

All furniture in the room is custom with the materials of high quality reclaimed wood, polished metals, and leather, which is luxurious, unique, and elegant. Five points are obtained.

Seating

The room provides comfortable seating for two guests. One desk chair with reclaimed wood, fabric cushion, and polished metal legs, the other one is a window niche daybed. Three points are obtained.

Work Space/Writing Surface

The desk surface is 55 inches long and 18 inches wide, which provides enough space for a laptop, three 8x10 inch reference material items, and a portable printer. The desk provides multiple available electrical outlets. Four points are obtained.

Ventilation

The room provides a tablet for guests to control the whole guest experience including the control of thermostat and heat and air conditioning. Five points are obtained.

4.4 Comparison between Hotel A and Hotel B

Under this section, luxury level of the two hotels was compared according to their luxury scores got from the GLRG. In addition, the sustainability of the two hotels was compared based on the interview data. Table 4.2 shows the two hotels' luxury scores of each design element.

Table 4.2 Luxury Scores of Hotel A and Hotel B

Design Elements	Hotel A (Points)	Hotel B (points)
General Décor Style	4	3
Free Floor Space	3	2
Floor Coverings	4	3
Wall Coverings	4	4

Wall Hanging/ Decorative Enhancements	3	4
Ceilings	2	4
Window Coverings	3	3
Bed	5	5
Clothes Storage Hang Space	5	2.5
Additional Storage Space	4	3
Illumination	5	5
Furniture	5	5
Seating	3	3
Work Space/ Writing Surface	3	4
Ventilation	5	5
Total	58	55.5

Overall, the luxury score of Hotel A, which is the luxury non-LEED hotel (58), is slightly higher than the luxury score of Hotel B (55.5), the luxury LEED hotel. For the two chosen hotels with the same star rating, the guestroom of the LEED certified hotel is less luxurious than the guestroom in a non-LEED hotel. However, analyzing the interview data revealed the fact that the score difference was not because of LEED rating system, it was about the hotels' design concepts and their definitions of luxury. The interview data of the two chosen hotels are analyzed below.

Hotel A

Hotel A targets the guests who are trendsetters and seek luxurious environments with fun elements. They consider luxury as being a unique lifestyle brand and able to afford the details that make the guest experience most optimal. Hotel A pays attention to the local context and combines the themes of business and fun together to reflect the playful luxury in the interior

space, and aims to create bold moments and great attention to detail to attract their customers. For instance, in the guestrooms the abstract city maps headboard and nightstand lamp were designed to reflect the concept.

Both the general manager and the design group thought sustainability in the hotel guestroom depends on the sustainable products they use. The interior designer claimed that sustainability is still a word not utilized enough in interior design. The hotel team did not implement sustainable building practices when the original building was converted to the hotel. Consequently, the energy cost of Hotel A is higher than many newly built or sustainable hotels. The interior designer admitted that the design team did not have any sustainable attributes in their guestrooms except using low emitting materials. Although Hotel A is not a LEED certified hotel, they had implemented some basic sustainable practices such as recycling, having high-efficiency lighting, low flow fixtures, low-emitting materials, and using eco sheets that are made of recycled plastic bottles. However, Hotel A did not promote that they use eco sheets in the guestrooms, because they considered the customers may think using the sustainable sheets are not luxurious, and the customers still need to get more used to the idea of sustainability in guestrooms.

Hotel B

Hotel B considers luxury as creating the idea of beautiful space that is natural and unique. They aim to create a hotel that is a home away from home. They target customers who enjoy luxurious surroundings, while having access to the best technology in hotels. Their customers are on the go but also looking for an opportunity to switch off, breathe deep and take in everything that is natural. Hotel B believes that the concept of luxury is evolving and what was luxury yesterday is not luxury today. Sustainability to the hotel means to have as low impact as possible.

The interior designer of Hotel B admitted that many LEED points this project received did not have anything to do with their interior work. The LEED points that they did get for interior design were for low emitting materials, reclaimed materials and finishes, and local sources of the materials. Just as Hotel A pointed out, the sustainability of guestroom interiors deals with the sustainable products. In addition, the interior designer considered that in some peoples' minds, this hotel's definition of luxury may not equal the customer's sense of luxury, but the designer believed the exploration of natural materials is something that they cherished and was remarkable in the project. Hotel B promotes their sustainable attributes and hopes to encourage their guests to stop, recalibrate and gain some inspiration from the steps that they took to protect nature.

The hotel building is an old building. The team implemented many sustainable practices to convert an old building into a new hotel with LEED certification. They also have many other sustainable attributes to provide a unique guest experience throughout the hotel. For instance, they saved 4,000 wine bottles from the trash and reclaimed the bottles into drinking glasses and carafes; the hotel installed a triple filtered water system to eliminate the consumption of 116,000 plastic bottles; 6,288 square feet of reclaimed water tank wood were reused in the hotel's guestroom; and 2,459 square feet of reclaimed "mushroom wood" were used throughout the guestrooms; this wood is reclaimed from the bedding bins of mushroom growing facilities and is naturally sculpted by enzymes released during the mushroom growth cycle. These examples of sustainable attributes that Hotel B has taken demonstrate that Hotel B is both a technologically and ecologically sustainable hotel, which also aims to provide a luxury experience to their guests.

Comparing Hotel A & Hotel B

Hotel B is obviously more sustainable than Hotel A, not only because Hotel B is a LEED certified Hotel, but also because of the large amount of natural materials that the project used in this hotel. However none of the interior design directors of the projects were LEED accredited, they were not familiar with LEED credits and did not have LEED project experience before.

For the level of luxury in the two hotel guestrooms, there are several reasons why Hotel A got higher points in the GLRG than Hotel B. First, Hotel A's typical guestroom has larger room size (275 square feet) than the typical guestroom of Hotel B (235 square feet). Both of the hotels are located in central Manhattan; the guestroom with larger size appeals more luxurious than the other one. Second, Hotel A uses carpet in the guestroom that provides an exceptional degree of comfort while Hotel B has wood flooring with an area rug under the bed, which does not appear as comfortable as the carpet flooring in a guestroom. Third, Hotel B aims to use materials that look natural and rough while Hotel A uses materials that are fine and appear more luxurious than materials with rough surfaces. However, these design features of the two hotels depended on the hotels' different design concepts and intentions, and the room rate for a standard king guestroom of Hotel A (\$285) is similar as Hotel B (\$272) in the same time of the year; therefore, it cannot be validly concluded that guestrooms in a LEED certified hotel are less luxurious than guestrooms in a non-LEED certified hotel, and customers do not necessary to pay a higher rate for a greener stay.

CHAPTER FIVE

CONCLUSION

5.1 Limitation of the Study and Implications for Future Research

There are some limitations in this study that should be mentioned. First of all, the sample size of hotels in this study was small. Only two luxury hotels were selected for the study. This is not enough to generalize the findings to other cases and does not permit any kind of valid statistical inferences to be made. However, this project was more of an exploratory study to determine what needs further study, and as such, has met its objectives. Consequent related studies are recommended to have larger sample sizes in order to strengthen the conclusions.

Second, the level of luxury of the two hotels were rated by the researcher. Using subjective indices to measure variables may lack objectivity and could threaten the validity of the study. This threat would be reduced if the study used official results of the AAA Diamond Rating from the hotels. However, since one of the hotels was still under construction while the researcher was conducting this study, the hotel has not applied for AAA Diamond Rating and there was no official result. In order to keep the rating process consistent between the two hotels, the researcher needed to rate the level of luxury for both hotels. In the future research, if similar studies are well supported by hotels, it is recommended to use official result of AAA Diamond Rating to compare the level of luxury between different hotels.

Third, this study did not collect any consumer data about their perceptions of the level of luxury of the chosen hotels. Future studies could develop a survey to understand how the customers view the issue of luxury and sustainability in the chosen hotels.

Lastly, this study only compared the selected criteria and credits from AAA Diamond Rating Guidelines and LEED v4 for Interior Design and Construction that are applicable in hotel guestrooms, the complete versions of these two guidelines were not compared. Future studies should include other indoor areas other than guestrooms to compare the level of luxury in all interior spaces of hotels, such as bathrooms, hotel lobby, and restaurants, and compare the entire AAA Diamond Rating Guidelines with the LEED v4 for Interior Design and Construction to add on the findings in this study.

5.2 Conclusion

This study compared the Guestroom Luxury Rating Guidelines (GLRG) developed from AAA Diamond Rating Guidelines and credits from LEED v4 for Interior Design and Construction to discover whether LEED rating system would lower the level of luxury in a hotel guestroom, and rated and compared the level of luxury in two hotels.

The comparison between GLRG and LEED credits indicated that there is no conflict between LEED credits and luxury criteria of GLRG. GLRG mainly focuses on the overall degree of comfort, the guest experience, and the quality of materials in the guestroom, while LEED credits mainly focus on the sustainability of materials and products used in the interior space. Purchasing high quality materials that are also environmentally friendly is one essential factor to design hotel guestrooms with the coexistence between sustainability and luxury. In addition,

some LEED credits support the criteria of luxury in GLRG. Both LEED credits and GLRG criteria require having glare-control, flexible lighting control, easily accessible control for HVAC system, and HVAC system with limited background noise in guestrooms. Moreover, the green materials and products promoted by LEED have positive impacts on human health and well-being. Having LEED certified products in hotel guestrooms increases the level of comfort of guests that makes the guestroom luxurious as well. The study has approved that the GLRG and LEED credits could be applied to guestroom design together to build a luxury sustainable guestroom. However, some standards in GLRG/AAA Diamond Rating Guidelines were criticized because they are unclear or suggest using vinyl products. The luxury LEED hotel is less luxurious compared to the luxury non-LEED hotel according to the hotels' luxury scores. However, it cannot be validly concluded that LEED rating system has a negative impact on hotel guestrooms' level of luxury because the two hotels selected for this study have distinctive design concepts and intentions. Moreover, according to the room rates of the chosen hotels, customers do not necessary to pay more for a greener stay.

As the hotel professionals pointed out during the interviews, products and materials play important roles in sustainability in interior spaces. Having good quality materials that are also environmentally conscious could achieve both sustainability and luxury in a hotel guestroom. Sustainability should be another variable for designers to work with in luxury brands. Hotel interior designers have the responsibility to use environmentally friendly materials and products in the interior environments to reduce the negative impact of hotel buildings on the natural environment and promote hotel guests' comfort and health. If they are not part of the solution, they are part of the problem.

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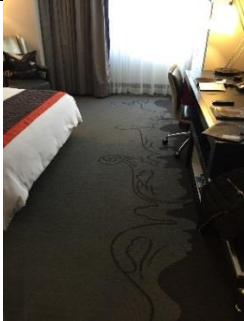





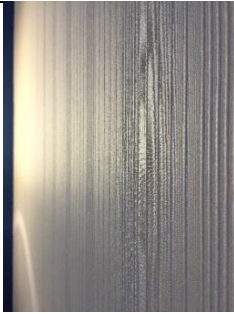




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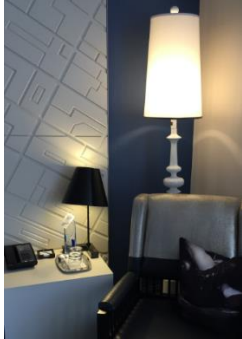


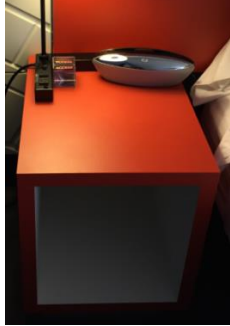

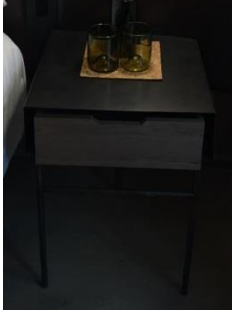





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APPENDIX A

Photo Documentation of Two Hotels

	Hotel A	Hotel B
General D écor Style		
Free Floor Space	 	
Floor Coverings		 
Wall Coverings	  Plus an accent wall (see overview photo)	  

<p>Wall Hanging/ Decorative Enhancements</p>		
<p>Ceilings</p>		
<p>Window Coverings</p>		
<p>Bed</p>		
<p>Clothes Storage Hang Space</p>		

<p>Additional Storage Space</p>	 <p>Plus a metal rack (see Clothes Storage Hang Space photo)</p>	
<p>Illumination</p>	 	 
<p>Furniture</p>	  <p>Plus photos of seating, work space, and storage space.</p>	  <p>Plus photos of seating, work space, and storage space.</p>
<p>Seating</p>	 	 

Work Space/
Writing
Surface



Ventilation



The control tablet was not presented in the showroom while the researcher visited the hotel; therefore, no photos are presented here.