

A PROPOSED LEAN PROJECT DELIVERY PROCESS FOR PRESERVATION PROJECTS IN JEDDAH CITY, SAUDI ARABIA

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ABSTRACT

Preserving sites with historical significance, especially those with international recognition, helps protect the world's heritage. The historic centre of Jeddah City in Saudi Arabia encompasses a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage site that contains about 400 historic buildings, many of which are in poor condition. Since the UNESCO recognition, attention towards the area increased significantly. Owners of historic properties in the World Heritage site area have shown interest in preservation, though the local market struggles to deliver preservation projects.

This paper presents a proposed lean project delivery process for maintaining and preserving historic buildings in Jeddah City, Saudi Arabia. This process allows the local market to deliver value to the owner and permitting agency, as it makes their expectations explicit. The paper presents a process map illustrating the proposed lean process for preserving historical buildings in Jeddah City. It leverages planning tools and the local legislature's statutes and standards. This paper presents an implementation of the statutes to help move the market toward routine implementation of the Supreme Commission for Tourism and Antiquities (SCTA) standards. Finally, the paper discusses challenges associated with implementing this process in Jeddah City.

KEYWORDS

Process mapping, historic preservation, Lean project delivery process

INTRODUCTION

Jeddah city is located on the west coast of Saudi Arabia and is considered the main gate for Muslims on pilgrimage to perform their rituals at the holy city of Makkah. The historic part of Jeddah, "Albalad," comprises the old centre of the city (Baker 2007). In 2014, a portion of historic Jeddah was nominated by UNESCO as one of the world heritage sites (World Heritage List 2013). The nominated area includes buildings built more than 350

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years ago; these older buildings incorporate inherited characteristics from the era when they were built (Baik, Yaagoubi, and Boehm 2015).

Since the nomination, government officials, property owners, and other stakeholders have focused more of their attention toward revitalizing historic Jeddah. The SCTA and the Historic Jeddah municipality prepared many administrative guidelines and technical standards for stakeholders seeking to begin a preservation project in historic Jeddah. The Historic Jeddah municipality classified properties located in the historic area into three categories based on their cultural significance and structural condition. Specifically, a building can be classified as: first class, meaning it requires restoration and rehabilitation; second class, or requiring rehabilitation; or third class, requiring reconstruction. In addition, the number of periodic social events, which attract a lot of visitors to the area, increased since the UNESCO nomination. Finally, the government honoured and supported the owners of the 400 buildings located in the nominated area that took the initiative to improve or work on their properties, whether at the owner's expense or using government funds (Saudi Press Agency 2014). This increased attention to the area, as well as the potential for government recognition, creates a welcoming environment for performing preservation projects in Historic Jeddah.

For many years, building owners and operators in Historic Jeddah did not perform repairs and maintenance, leading to poor conditions in many of these buildings (Nomination Document for the Inspection on the World Heritage List 2013). Given the general lack of maintenance of buildings in Historic Jeddah, the authors hypothesize that the local construction market in Jeddah is inexperienced with building restoration and rehabilitation projects in historic buildings. This inexperience extends to design services as well. In fact, some building owners have complained that they find the cost of preservation more expensive than new construction, which seems counterintuitive (Reuters 2013). For instance, the Ministry of Islamic affairs recently refused to pay for the restoration of Alshafey Mosque, a building they own, because they discovered the contractor did not follow the exact specifications for restoring the property (Almadina, 2015). Similarly, one of the authors worked for a firm hired to perform consulting services for a rehabilitation project in Historic Jeddah. The firm did not have experience with this type of project, so they struggled to prepare a proposal for such a project, and they lacked the human resources required to complete it successfully. For instance, the firm could not find a local historian to assist in the restoration process. Therefore, the firm hired a foreign historian who was knowledgeable about the building type, but was not familiar with local issues. In turn, the client rejected the proposal when he saw the costs required for personnel with the requisite skills and experience to successfully complete the rehabilitation. These general and local challenges can increase the chances of negatively impacting the performance of these potential projects. On the one hand, the new regulations represent a difficult new undertaking for the local market. On the other hand, owners do not understand the skills and services required to successfully deliver a preservation project. The process proposed herein aims to make values of each transparent, through value stream mapping, allowing local building professionals to understand and meet the expectations of building owners, while also illuminating for owners why it can be challenging to meet these new standards.

To assist owners and professionals in their delivery of preservation projects in Historic Jeddah within the required standards, the authors propose a new project delivery process, documented in this paper. This process focuses on making value transparent for all parties, ultimately allowing the local market to deliver value to owners. In turn, this will support efficient performance of preservation activities in Jeddah City. The process map presented herein adapts best practices from other historical preservation literature and aligns those practices with the municipal regulations in Jeddah City, thereby creating an environment for successful preservation project delivery in Jeddah.

METHODOLOGY

The authors first conducted a literature review to identify best practices for preservation projects. Based on this review, the authors developed a process map (e.g., Damelio 1996) that illustrates the general guidelines for maintaining the integrity of the historic properties located in Historic Jeddah (Figure 1). The authors developed this process leveraging lean values –they recognized that a failure in the current system is that the local contractors do not understand what constitutes value for their customers, in this case the building owners and permitting agencies. This map documents a process that provides value to the permitting agencies, and in turn, building owners. In making the process transparent and explicit in the map, the authors support achieving the lean ideal, giving your customer exactly what they want, exactly when they want it, with nothing in store. In particular, this map illustrates a process to give the customers what they want when they want it.



Figure 1: Historic Jeddah (from <http://ai.stanford.edu/~latombe/mountain/photo/ksa-08/ksa-08.htm>, visited 1 April 2016)

To mitigate the risks to building owners and other stakeholders, the authors propose a new process for preservation projects that adapts best practices from existing literature on historic preservation. For instance, the Whole Design Building Guide provides detailed descriptions of the objectives of each project phase for a preservation project (WBDG Historic Preservation Subcommittee 2015). This guide and others (e.g., AIA 2001) generally describe the same process for successful historic preservation projects; they support the notion that planning is critical to gain the best results when working with historical buildings, due to the special characteristics associated with these projects.

According to the Department of the Interior restoration model, “successful restoration implementation demands a high level of advance scheduling and foresight that constitutes planning by any measure” (US Department of The Interior 2011). Developing a project management plan (PMP) is essential to help control projects’ activities and achieve the expected results (Patrick 2010).

PROPOSED LEAN PRESERVATION PROJECT DELIVERY PROCESS

Figure 2 presents a map of the proposed preservation project delivery process, described in the balance of this section.

FINANCIAL PLANNING [PROCESS]

After the owner initiates the project, the owner and his/her consultants identify the expected needs and resources to complete the project (“Financial Analysis” sub-process) and determine how it will be funded (“Funding Allocation” sub-process); they document this in a financial plan. As part of the Funding Allocation sub-process, the owner’s team should identify SCTA incentives that the project qualifies for, e.g., financial or easement incentives. This process also involves determining a contingency to cover unforeseen issues that may impact the project.

INITIAL PLANNING

The initial planning process aims to ensure the owner is prepared, financially and technically, to move forward with the project. It comprises four sub-processes.

Conduct Preliminary Survey [Sub-process]

Historical properties tend to have unforeseen site conditions that might be hard to identify in the planning stage. Nonetheless, the project’s consultants evaluate the building’s structural integrity as well as the physical site conditions for this preliminary survey. The Construction Industry Institute recommends leveraging advanced technology like laser scanning for this process (CII FEP Research Team 2009). Moreover, this process involves developing a preservation work plan, including a discussion of professional services that will be needed, and preliminary cost estimates (AIA 2001). Project teams may also want to develop a mitigation plan during this process to minimize the impact of any unidentified site or structural issues, e.g., determine a lean buffer in the schedule, include contingency in the cost estimate.

Review building documents [Sub-process]

One of the main issues with historic properties is the lack of documentation. Any photographs, drawings, or other documents that depict the original status of the property supports effective initial planning and restoration efforts if required.

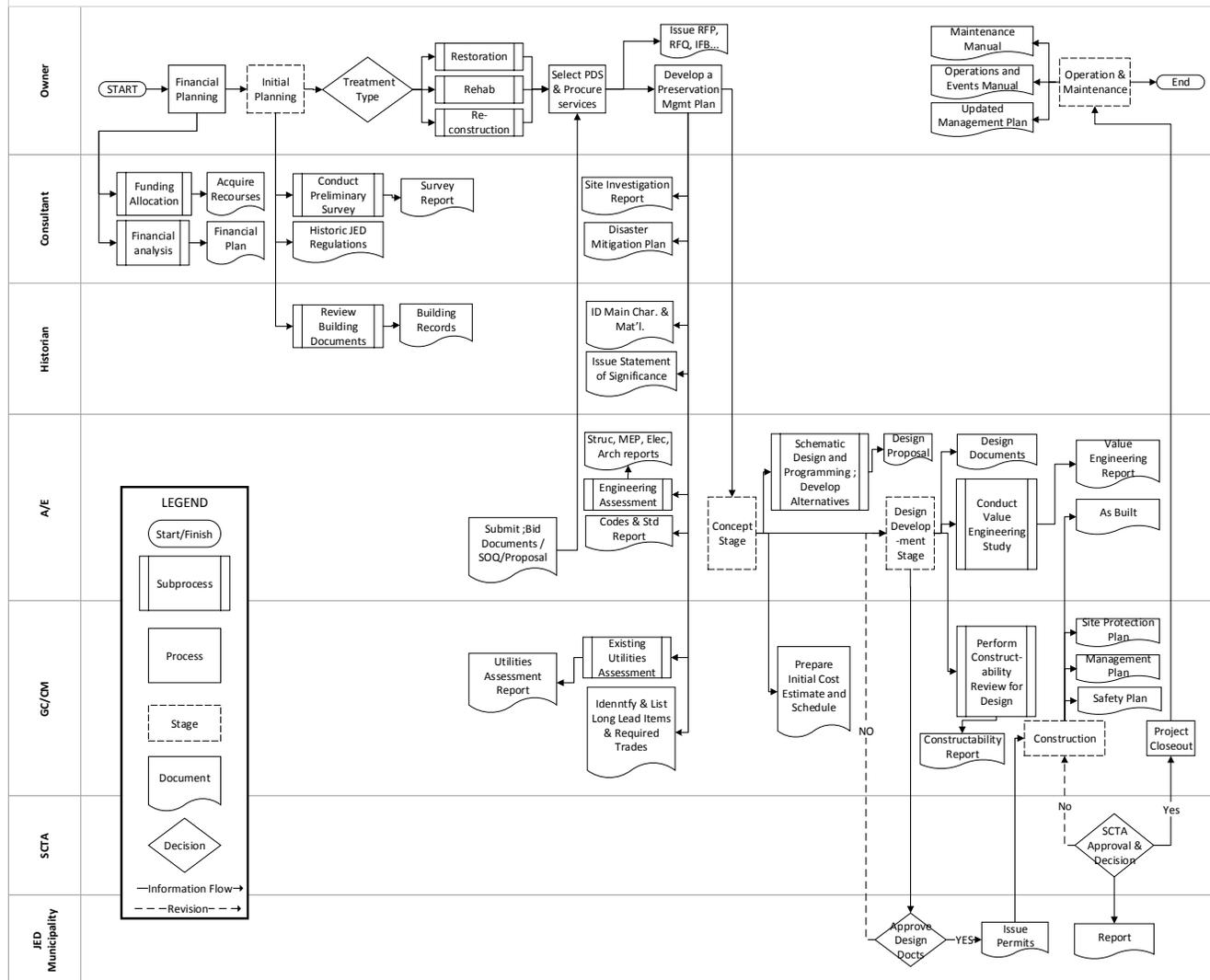


Figure 2: Proposed Lean Process Map for Historic Preservation Projects at Jeddah City

Review Historic JED Regulations [Sub-process]

The regulations and guidelines provided by the municipality and SCTA guide owners and professionals who engage in performing preservation projects in Historic Jeddah. The regulations address matters related to urban and architectural work. Additionally, these regulations and guidelines guarantee compliance with UNESCO standards and help the owner and consultants determine the type of treatment required for the property (Nominated Property Document 2013).

TREATMENT TYPE [DECISION]

At this stage, the owners or their representatives review the municipality regulations to determine the property's classification status that in turn determines the type of treatment required for the property. The municipality classified historic properties into three categories based on their historical importance and their conditions as previously described (World Heritage List 2013).

SELECT PROJECT DELIVERY SYSTEM (PDS) & PROCURE SERVICES [PROCESS]

The owner must select the best contracting strategy for the preservation project. The type of coordination, leadership, and ownership requirements affects this selection. For instance, the municipality requires design-bid-build for public projects, so if the preservation project is publically owned, and then the PDS selection process is straightforward. The process leader – be it an architect, a contractor or specialty consultants – also affects the PDS decision, as different PDSs support different levels of involvement for each party.

The owner must also procure a project team, comprised of individuals or organizations with the appropriate qualifications and experience to successfully complete the project. Professional services may be critical on preservation projects due to their public sensitivity and relative complexity (compared to a new construction project). Owners may opt to hire design and contractor teams with experience in preservation, which may rule out many organizations in the local construction market. The municipal guidelines suggest required qualifications for professional services on preservation projects in Historic Jeddah. If experienced professionals are not available, the owner may set requirements for training prior to hiring.

DEVELOP A PRESERVATION MANAGEMENT PLAN [PROCESS]

This process involves reviewing multiple documents to develop a comprehensive plan for the project. The authors describe documents reviewed in this development effort below.

Site investigation and survey report [Document]

The project team conducts a detailed site investigation, including geotechnical studies, environmental assessment, and other studies; they document their findings in this report.

Disaster mitigation plan [Document]

Severe floods in Historic Jeddah deteriorated the condition of many historic properties in the area. To protect these properties from future damage, the teams develop and document

a disaster mitigation plan to reduce the probability of damaged resulting from any unexpected natural or non-natural event. This disaster management plan is akin to the risk management and mitigation plan discussed in the WBDG (WBDG Secure/Safe Committee 2015).

Identification of main character and material [Document]

The historian and the design team can coordinate at this stage to list the materials and structural elements that frame the project, as well as the material and structural needs to return the property to its original status. When dealing with historic buildings, less is more, so every effort should be taken to use existing materials when it is safe to do so.

Engineering assessment of existing conditions [Sub-process]

The SCTA reports that many properties in Historic Jeddah were not well maintained, so many are now in poor structural and architectural condition (SCTA 2013). Figure 2 illustrates this disrepair. Therefore, project engineers must assess the existing engineering systems, including the structural, mechanical, and electrical systems and determine if the systems should be repaired or replaced. The engineers prepare reports with their findings (“Struct., MEP, electrical reports” in Figure 2).



Figure 3: Existing Conditions of some properties at Historic Jeddah (left: from from <http://ai.stanford.edu/~latombe/mountain/photo/ksa-08/ksa-08.htm>, right: from <http://gvshp.org/blog/2014/12/26/historic-preservation-in-context>; both visited 1 April 2016)

Existing utilities assessment [Sub-process]

The engineers must assess the availability and condition of the site utilities. Many of the historic properties in Jeddah have long been vacant; thus, most buildings either do not connect to utilities or the connections have issues.

Codes and standards review [Sub-process]

The design team reviews the codes and standards that apply to their preservation project. Coordinating with the municipality and SCTA offices can help the team comply with the new guidelines and requirements, reducing the risk of delays and rework that would result from not meeting the required standards.

Identify long lead items and required specialty trades [Sub-process]

In most preservation projects, minimal disruption to the existing building is preferred (WBDG Historic Preservation Subcommittee 2015). However, at the need of repairs, finding the original materials may be difficult; they may not be available in the local market. Therefore, identifying required materials, especially with long lead time, is a critical issue for successful project planning. Procurement may not be the only issue with uncommon materials: it may also be difficult to find workers familiar with these unique elements. Identifying and procuring required materials, equipment and labour early on in the project help ensure efficient project delivery.

Issue the statement of significance [Document]

The historian or an archaeological consultant should issue a statement that describes the property's importance and defines its essential integrity (AIA 2001).

CONCEPT STAGE

Following the development of the preservation management plan, the project is generally turned over to the design and construction teams, who design and build the project.

Schematic design & programming; Developing alternatives [Sub-processes]

The design team must develop spatial programs that match the needs of the building services as well as its potential users. Following space programming, the design team may develop initial design proposals or propose alternative conceptual designs appropriate for the treatment type.

Prepare initial cost estimates and schedule [Sub-process]

The design and construction team (i.e., GC/CM and A/E) should collaborate to develop preliminary project cost estimates and a schedule so these initial items will reflect both the design and construction realities of the project.

DESIGN DEVELOPMENT

Conduct value engineering study [Sub-process]

This process, led by the architect or engineer (A/E), supports review of design options to identify design options that offer similar functionality for less cost.

Perform constructability review for design [Sub-process]

The GC/CM (General Contractor/Construction Manager) assesses the A/E's designs to determine the feasibility and cost of building the design. This process often reduces the construction schedule, as the GC/CM can begin to plan their work activities. Moreover, in identifying issues early on, the GC/CM and A/E can develop buildable design options, reducing the need for change orders and rework during construction.

Prepare design documents and municipality review [Sub-process]

The A/E prepares final design documents and submits them to the municipality to request project permits and approval to proceed with construction. The municipality reviews these documents to ensure the design complies with their standards.

CONSTRUCTION

Site protection plan [Sub-process]

The GC/CM prepares this plan to ensure the building and site's structural integrity during construction and operations. Given the dense nature of buildings in Jeddah, this plan also documents construction practices that reduce the risk of damage to neighbouring sites.

Safety plan [Sub-process]

The safety plan documents the plan for informing construction workers and the public about ongoing construction activities and how to complete them without injury. The safety plan includes discussion of additional precautions necessary given the unknowns of historic sites (e.g., wearing masks during demolition in case mold is discovered).

SCTA supervision and approval [Decision]

The Jeddah municipality and SCTA review and monitor design documents and construction activities to ensure following the guidelines, in turn ensuring the property will qualify for UNESCO recognition. SCTA supervise on site activities and review final reports and documentation to issue permits as required. Early coordination from the design and construction team with SCTA the SCTA can result into non-compliance issues before construction and consequently smooth the process.

As built drawings [Document]

The design team prepares drawings that reflect the final design, specifications, and construction details of the building after construction ends.

OPERATION AND MAINTENANCE

Prepare maintenance, operations and events manual [Sub-process]

Many of these properties will be used for public and special events. During these events, there is an increased probability of damage to the building. Therefore, in addition to typical operating manuals, the building owner may also want to issue a manual that describes actions necessary for protecting the property during special events.

Update preservation management plan [Sub-process]

The owner should update the preservation management plan and building documents periodically to reflect the conditions of the property, particularly when changes occur.

DISCUSSION

The suggested process provides a guide that owners, designers, and builders can follow when working on preservation projects in Historic Jeddah. Additionally, following this suggested process facilitates preservation projects that comply with UNESCO management plans and standards. The suggested process requires collaboration and commitment from project stakeholders to achieve quality results and reduce the impact of, or altogether eliminate, the challenges associated with preservation projects. Consequently, this reduces projects' failures and wastes, furthering supporting a lean process that the

authors sought to deliver in making transparent the roles, responsibilities, and expectations of the various stakeholders involved in preservation projects.

CONCLUSION

Treating and preserving historical projects share some similarities with new construction projects. Yet, preservation projects tend to be more complex due to, e.g., unforeseen conditions, material availability and disrepair. All these factors require project planning strategies to mitigate risks and successfully deliver preservation projects. Following a defined process, particularly one rooted in best practices for preservation, supports successful project delivery. This paper presented such a process, and in making this process transparent, the authors hope to undertake more preservation projects while recognizing the complexities involved in such projects. Ultimately, undertaking preservation projects will help revive and protect the heritage of Historic Jeddah.

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