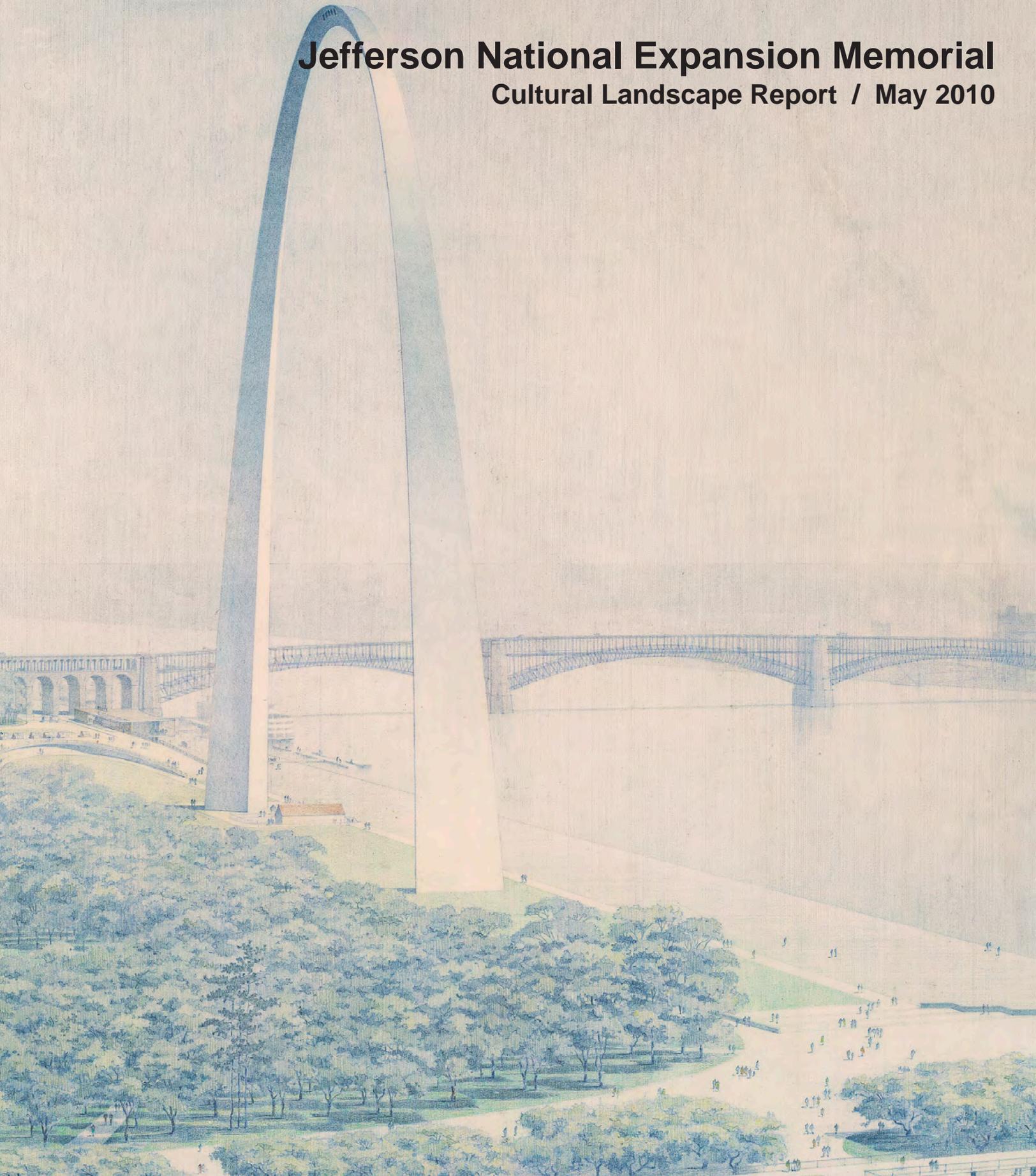




# Jefferson National Expansion Memorial

## Cultural Landscape Report / May 2010





# CULTURAL LANDSCAPE REPORT

JEFFERSON NATIONAL EXPANSION MEMORIAL

ST. LOUIS, MISSOURI

MAY 2010

PREPARED FOR NATIONAL PARK SERVICE

MIDWEST REGIONAL OFFICE

OMAHA, NEBRASKA

## ACKNOWLEDGMENTS

The 2010 update of this Cultural Landscape Report was prepared by AECOM, Charlottesville, Virginia. The initial 1996 edition of this Cultural Landscape Report was prepared by Historical Landscape Architect Regina M. Bellavia, Midwest Field Area, National Park Service. The Saarinen/Kiley design collaboration history was prepared in 1996 by Landscape Architect Consultant Gregg Bleam, Charlottesville, Virginia.

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## PREFACE TO 2010 UPDATE

This Cultural Landscape Report for Jefferson National Expansion Memorial represents an effort undertaken in 2010 to update a Cultural Landscape Report that was originally produced in 1996. The update was completed by AECOM under contract with the National Park Service. The project team worked in close coordination with National Park Service Midwest Region and Memorial personnel to prepare this update.

In 2010, the original Cultural Landscape Report was nearly 15 years old and had provided years of valuable guidance for the Memorial landscape. However, it was determined to be in need of an update to address changes in the current conditions and management issues at the Memorial and thus continue to provide effective guidance. This update builds on the 1996 report's research, documentation, evaluations, findings, and recommendations, and provides additional material such as an expanded discussion of significance and descriptions of features.

A major milestone for the Memorial occurred with the completion of a General Management Plan (GMP) in 2009. The updated Cultural Landscape Report provides a framework for evaluating future design proposals that may occur as part of the implementation of the GMP's Preferred Alternative, as well as specific recommendations for implementing the Preferred Alternative with minimal impact on the cultural landscape of the Memorial grounds.

The Cultural Landscape Report update:

- Clarifies, enhances, and refines the 1996 edition, including its finding that design intent is a critical factor in evaluating the historical significance of the Memorial's landscape;
- Clarifies the rationale for significance based on design intent, and identifies contributing features;
- Expands the discussion of significance, design intent, and character utilizing information and frameworks based on post-1996 advances in cultural landscape research, documentation, analysis, and treatment approaches relating to mid-twentieth-century Modern design;
- Provides a benchmark for compatibility for any future rehabilitation actions or additions/changes to the landscape;
- Includes treatment recommendations using rehabilitation standards to provide a framework for how the landscape should be managed in the future; and
- Provides background information to assist in the appropriate implementation of the 2009 General Management Plan Preferred Alternative in a manner that is consistent with the standards for rehabilitation and clearly defines compatibility, character, and other cultural landscape concepts for the Memorial landscape for the use of site managers and designers.



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# Introduction

## Study Area Boundaries

Jefferson National Expansion Memorial is a 91-acre park surrounding the iconic Gateway Arch, located in St. Louis, Missouri on the west bank of the Mississippi River (see Figure 1.1). The Memorial occupies 40 city blocks between Washington Avenue and Poplar Street and is bound by Leonor K. Sullivan Boulevard on the east and Memorial Drive and the depressed Interstate Highway 70 on the west. Also included in the Memorial's boundary are two blocks to the west of Memorial Drive: Luther Ely Smith Square and the site of the Old Courthouse (see Figure 1.2).<sup>1</sup>

## Management Summary

The Memorial is a unit of the U.S. National Park system, managed and maintained by the National Park Service. This Cultural Landscape Report is intended to provide the site managers with a comprehensive, detailed history of the designed landscape and its character-defining features, and recommendations for future planning decisions. A CLR for the Memorial was initially produced in 1996 as a collaborative effort between the Cultural Resources Division, Midwest Field Area, National Park Service, and Jefferson National Expansion Memorial. Landscape architect Gregg Bleam was hired to consult on the project and prepare a report documenting the early history and the design evolution under a separate contract.<sup>2</sup> In 2009-2010, AECOM was retained by the National Park Service to update the Cultural Landscape Report to reflect current conditions and address new management issues, including those related to the 2009 General Management Plan/Environmental Impact Statement

(GMP/EIS) for the Memorial, and develop landscape treatment recommendations into implementation plans.

The GMP/EIS is an operational blueprint for the Memorial, and is the lead document setting priorities and long-term goals for management, resource stewardship, visitor experience, partnerships, and facility operations for 15 to 20 years. In the Preferred Alternative, the Memorial would be revitalized through expanded programming, facilities, and partnerships planned in part as the result of an international design competition. See pages 1-7 and 1-8 for a more detailed description of the GMP/EIS and the design competition goals.

## Historical Overview

The Gateway Arch and surrounding landscape were designed by architect Eero Saarinen in collaboration with landscape architect Dan Kiley. The period of significance for the landscape is 1947-2003. This period includes the original design competition, evolution of the award-winning design development plan, and implementation of the approved development plan. Although modifications were made to the approved Saarinen/Kiley design development plan during its long implementation period, the approved design was essentially executed with few changes.

A two-stage national design competition was held in 1947-1948. The first stage, in 1947, narrowed the competition from 172 entries to five finalists. Of the five, Eero Saarinen's

design was chosen unanimously in 1948. Following the competition, a 10-year period of negotiations between the City of St. Louis, the National Park Service, and the Terminal Railroad Association (TRRA) regarding the relocation of the elevated railroad tracks on the levee took place. In 1957, when an agreement was finally reached, Saarinen and Associates was hired to design the Memorial (the railroad relocation plan required major alterations to the design). Saarinen subsequently subcontracted Dan Kiley as landscape architect for the project. Throughout the evolution of the design development plan between 1947 and 1966 (the year the final planting plan was approved), the concept remained the same: a symbolic memorial in the form of an inverted catenary curve located in a landscaped setting on the riverfront.

Construction of major structural elements (the railroad tunnels and overlooks) began in 1959 and concluded with the completion of the Gateway Arch in 1965. There were two major phases of landscape development. The first, 1969-1973, focused on the north-south axis and area immediately west of the railroad cuts. The second, 1979-1981, focused on the completion of the plan (the entire west half of the site). The grand staircase, another major structural element, was partially constructed between these two periods in 1976, and the three-story parking garage was completed in 1986. The central section of the grand staircase was completed in 2003. Thorough documentation of the landscape's development is recorded in Chapter 2: Site Physical History.



Figure 1.1 Location map showing the regional context of the Memorial.

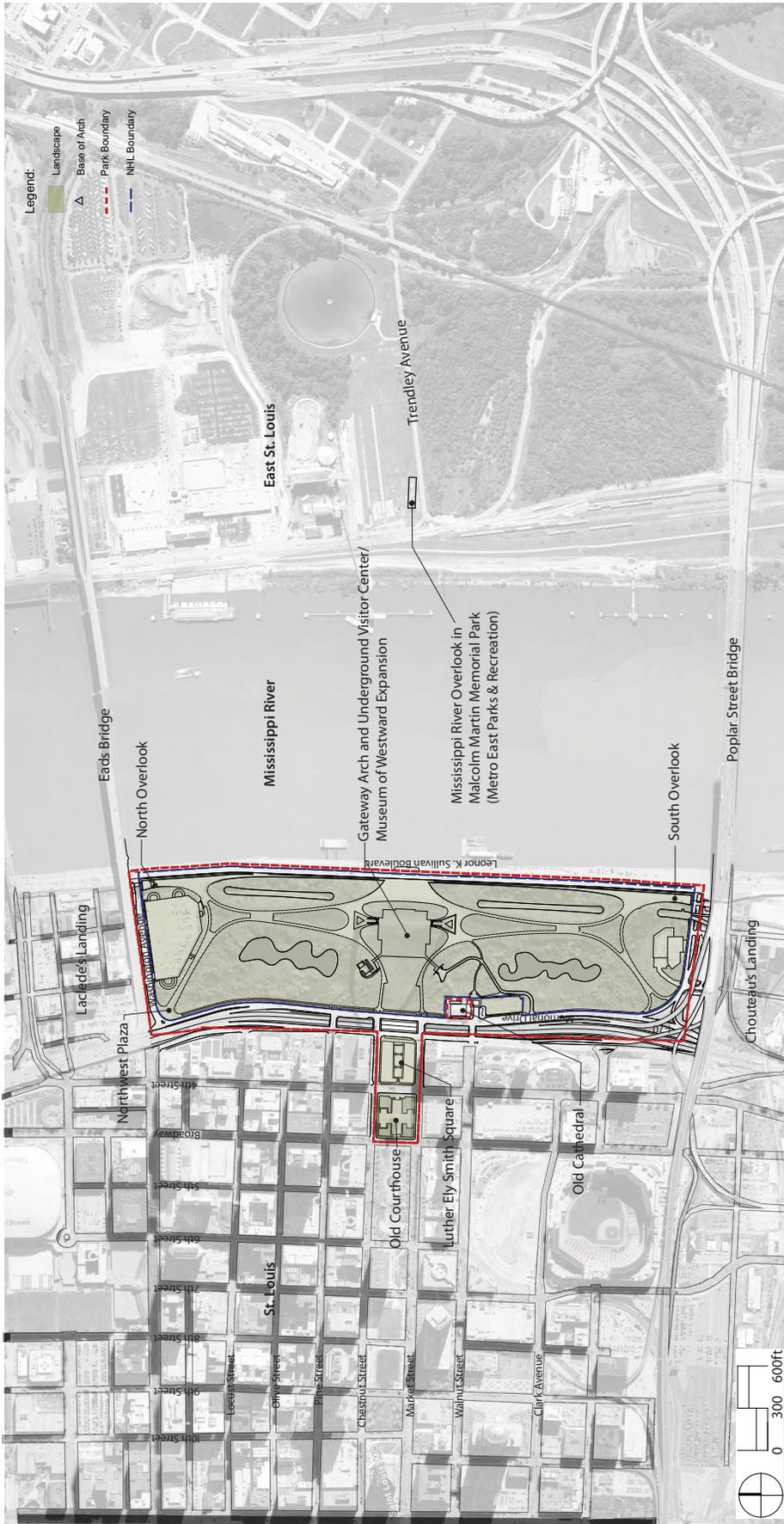


Figure 1.2 Map showing the vicinity and urban context of the Memorial.

## SUMMARY OF FINDINGS

The 91-acre Memorial grounds surrounding the Gateway Arch are a nationally distinguished cultural landscape. Reflecting the design philosophies of a master architect and master landscape architect, the Memorial continues to convey its significance as a major designed landscape of the Modern period.

The site design developed by Eero Saarinen and Dan Kiley is evident today. The layout and siting of major structures, walkways, plantings, and other features were implemented in a manner that is in keeping with their design. The catenary curve forms reflected in the railroad tunnel entrances, walkways, undulating topography, and overlook walls and stairs were designed by Saarinen, and are a primary example of his design philosophy—keeping within the same “form-world” as the Gateway Arch. Other features, such as the curvilinear pond edges and the grand staircase, were not constructed precisely as designed, but were implemented using forms with the same general character in keeping with Saarinen’s design intent.

The planting plan designed by Dan Kiley was intended to define and structure spaces with the use of a consistent palette of plant species. A limited number of tree species, each used in great profusion, were meant to strengthen the site layout, creating a sense of enclosure along the pedestrian walks contrasted with open spaces around the ponds. This “forest and meadow” concept was integral to the landscape architect’s intent; although its implementation deviated from the original design concept, major elements including the allées along the walks and the circles and groves of baldcypress near the ponds are character-defining features in keeping with the design intent.

The major character-defining landscape features that contribute to the Memorial’s significance include the Gateway Arch; the overall landform and spatial organization; designed views; the system of walks; the single-species allées; the two ponds; the overlooks; the railroad open cuts and tunnels; the grand staircase; the baldcypress circles; the screen

plantings and depressed service areas; the entrance ramps into the Gateway Arch; and the concrete benches.

### Significance

According to National Register Criteria for Evaluation, properties which are less than 50 years old may be listed on the National Register of Historic Places if they are of “exceptional importance.”<sup>3</sup> The Gateway Arch is recognized as significant because it has architectural and engineering design value which will endure the “test of time.” The merits of the design to the architecture and landscape architecture design professions are eternal and could be recognized before the customary 50-year “test of time.”

The Jefferson National Expansion Memorial is listed on the National Register of Historic Places, and is also designated a National Historic Landmark due to its exceptional significance. The Memorial derives national significance under National Register Criterion A for its commemoration of Thomas Jefferson and others responsible for the nation’s territorial expansion to the West. The Memorial marks the symbolic economic hub and embarkation point of westward expansion. In addition, and perhaps most importantly, the Memorial is significant under National Register Criterion C for its architectural and engineering merit.<sup>4</sup>

Although the 91-acre landscape surrounding the Gateway Arch is included in the National Register nomination, the specific features that characterize the landscape are not clearly addressed in the nomination, nor is Dan Kiley, a master landscape architect, credited for his work.<sup>5</sup> Despite this oversight, the Memorial is also significant under Criterion C as the collaboration of a master architect and landscape architect.

An exploration into Saarinen and Kiley’s design philosophies, their design intent for the Memorial, and their working relationship is undertaken in this report. The two men did not only create a unique monument to a historic American event, itself a worthy accomplishment, but also collaborated on

many important building projects as architect and landscape architect. Moreover, they were close friends with common ideas about the possibilities for architecture and design. Perhaps what makes the Memorial even more noteworthy is that their winning design for the Memorial's architectural competition of 1947-1948 launched their respective careers.

From this exploration of Saarinen and Kiley, one theme becomes quite dominant: the firm belief in an architecture that addresses the total environment. Consequently, the Memorial's impressive Gateway Arch was never intended to be an isolated object separate from the site planning and landscape design for the Memorial grounds. Early on, the designers generated the idea of the Memorial as a forested, park-like setting, a simple complement to the majesty of the Gateway Arch, yet with a function and purpose of its own. Saarinen and Kiley's compelling vision for the Memorial had the strength to sustain their intentions through the subsequent decades of incremental changes, including alterations due to budget constraints and other designers' development of their concepts.

### Treatment Recommendations

The landscape surrounding the Gateway Arch closely reflects the design concept originally conceived by Eero Saarinen and Dan Kiley. It is clear that both the architectural features designed by Saarinen and the landscape features designed by Kiley were meant to function as a single seamless monumental design, together creating the unique character of Jefferson National Expansion Memorial. The integration of architecture and landscape was of paramount importance to both masters of design.

The recommendations presented in this Cultural Landscape Report are intended to guide the rehabilitation of the landscape surrounding the Gateway Arch. This report thoroughly documents the original design intent as proposed by Saarinen and Kiley. Park managers, working with planners and designers, can effectively accommodate contemporary management needs while retaining the character of the original

design concept by conforming to the recommendations presented here.

### Scope of Work and Methodology

The original Jefferson National Expansion Memorial Cultural Landscape Report provided much-needed guidance for the landscape over more than a decade, but was determined to be in need of an update to address changes in current conditions and issues at the Memorial and thus continue to provide effective guidance. This updated edition of the report builds on the 1996 edition's research, documentation, evaluations, findings, recommendations, and provides additional material such as expanded discussion of significance and descriptions of features.

A major milestone for the Memorial occurred with the completion of a GMP/EIS in 2009. The updated report provides a framework for evaluating future design proposals that may occur as part of the implementation of the Preferred Alternative.

Goals for the Cultural Landscape Report update are as follows:

- Clarify, enhance, and refine the 1996 edition, including its finding that design intent is a critical factor in evaluating the historical significance of the Memorial's landscape;
- Clarify rationale for significance based on design intent, and identify contributing features;
- Expand discussion of significance, design intent, and character utilizing information and frameworks based on advances in cultural landscape research, documentation, analysis, and treatment approaches relating to mid-twentieth-century Modern design;
- Provide a benchmark for compatibility for any future rehabilitation actions, additions, or changes to the landscape; and

- Develop treatment recommendations using the Secretary of the Interior’s standards for rehabilitation to provide a framework of how the landscape should be managed in the future; outline concepts for management, maintenance, and repair of significant landscape features; and provide clear and specific cultural landscape treatment guidance related to the actions identified in the Preferred Alternative.

The update was undertaken by AECOM under contract with the National Park Service. The project team closely reviewed the 1996 edition and engaged in discussions with Midwest Region and Memorial personnel regarding needs for the document update. The project team developed a technical memorandum regarding refinement of the discussion of the landscape’s significance and contributing/non-contributing criteria; particular issues affecting treatment approach, such as the importance of design intent vs. as-built implementation; and its status as a unique Modern designed work with a long and complex construction period. The project team visited the site in September-October 2009 to update existing conditions documentation. This was incorporated into the updated report. An updated AutoCAD base map file provided by the National Park Service was utilized to provide a revised existing conditions map base for the 2010 update.

## ADMINISTRATIVE CONTEXT

Other National Park Service (NPS) planning documents or previous studies that identify and/or recommend treatment of the cultural landscape include the following, all of which were consulted in the course of developing the Cultural Landscape Report:

### Conceptual Plans (various dates from 1935-present)<sup>6</sup>

The idea for a riverfront memorial in St. Louis dates to well before the inception of Jefferson National Expansion Memorial by President Franklin D. Roosevelt in 1935. Many conceptual plans and references to plans can be found in the JNEM Archives. For example, among the early proposals for redevelopment of the St. Louis riverfront was a c. 1928 plan

by noted landscape architect Harland Bartholomew.

After the 1948 competition, Saarinen and Associates developed many variations of their memorial concept during the 16-year period between the competition and NPS approval of the plan. These transitional plans clearly document the evolution in the concept from a forested “wilderness” to the more open landscape with continued use of a catenary line. At least one plan was approved and then superseded by a very similar plan which became the final design development plan for the Memorial. Many sets of construction documents were prepared by the NPS Denver Service Center (DSC) and by the local St. Louis firm Harland Bartholomew & Associates (HB&A). The drawings for the landscape development are confusing because they were packaged and re-packaged several times in light of budgetary opportunities and constraints at different periods in the implementation process. The drawings that were used by contractors to construct the landscape and its character-defining features are identified in Chapter 2: Site Physical History.

A “Land Use Plan” was developed by the DSC in 1981 upon completion of landscape construction. The basic data for the maps was taken from the construction documents and specifications developed by the DSC and HB&A, and from the Laclede Gas Company, the Metropolitan St. Louis Sewer District, and Deeds and Court Actions in the St. Louis Civil Courts.<sup>7</sup>

Survey maps of the Memorial were created by Kuhlmann Design Group, Inc. in 1995. The firm used aerial photography and photogrammetric mapping to produce plans of the site in AutoCAD, Release 13.

### Administrative History, Jefferson National Expansion Memorial National Historic Site

*Prepared by Sharon A. Brown, June 1984.*

Sharon Brown’s 1984 *Administrative History* details the history of the Memorial from 1933 to 1980. It gives an in-depth account of the

establishment of the Memorial from inception of the idea, through the design competition, through construction of the Gateway Arch and landscape. Ms. Brown's publication is a good source of information regarding legal issues, financial difficulties, and the political history of the park. Much of the background information for this report and other Memorial planning documents and reports comes from this source.

### **Urban Innovation and Practical Partnerships: An Administrative History of Jefferson National Expansion Memorial, 1980-1991**

*Prepared by Historian Bob Moore, 1994.*

The 1994 *Administrative History* detailed the inner workings of the Memorial from 1980 to 1991. It described in depth the day-to-day jobs of maintaining, protecting, administering, and interpreting the resource. The document discussed grounds maintenance practices and the changes that took place over the 11-year period. It provided a detailed history of the Veiled Prophet Fair (Fair St. Louis) and the effects the celebration had on the landscape. *Urban Innovations and Practical Partnerships* also provided information regarding the operations of the park, the history and association with cooperating agencies and how the cooperative agreements were established and maintained.

### **List of Classified Structures**

*Prepared by Architectural Historian Dena Sanford, 1995.*

The List of Classified Structures (LCS) identified all historic and prehistoric structures that have archeological, historical, architectural, and/or engineering significance. The original LCS for the Memorial was completed in 1975 and was updated in 1994-1995. The update emphasized the identification of structures which were previously overlooked. The major architectural and engineering structures, including the Gateway Arch and the Old Courthouse, were listed, but the updated list also included landscape features which were considered contributing to the overall significance of the

property. These included: the grand staircase, the circulation system, railroad tunnels, north and south overlooks, and ponds. The LCS coincided with the 1996 cultural landscape report, which elaborated on these features.

### **Resources Management Plan**

Prepared by Curator of Cultural Resources Kathryn Thomas, 1995.

The plan addressed the existing conditions of the cultural resources of the Memorial and identified needs for better protection of these resources. In particular the plan identified several studies and preservation efforts pertaining to some of the landscape features. It clearly identified the need for a Cultural Landscape Report.

### **Statement for Interpretation**

*Prepared by Park Ranger Dave Uhler, 1995.*

The *Statement for Interpretation* identified the themes and objectives of the interpretive program at Jefferson National Expansion Memorial. The objectives coincided with those of this Cultural Landscape Report. A new Long Range Interpretive Plan is scheduled for completion in 2010.

### **Jefferson National Expansion Memorial General Management Plan/ Environmental Impact Statement**

*Prepared by NPS Midwest Region and AECOM, 2009.*

General Management Plans (GMPs) are required of all national park units by law and serve as long-term plans to guide the management and use of park lands. The prior master plan for the Memorial was released in 1962, more than a decade before the completion of key elements of the Memorial grounds, and was completed prior to the enactment of the National Environmental Policy Act, National Historic Preservation Act, and other relevant laws. As such, it was out of date. The 2009 *General Management Plan/Environmental Impact Statement* (GMP/EIS) for Jefferson National Expansion Memorial is critical for guiding the operations

and management of the Memorial over the subsequent 15 to 20 years. It is the lead document currently guiding all decisions at the Memorial.

The GMP/EIS examined four alternatives for managing the Memorial, each with a series of management zones that are intended to articulate long-term goals for resource condition, visitor experience, and appropriate development. Management zones are discussed in more detail in Chapter 5: Treatment Recommendations. The document also analyzed the impacts of implementing each of the alternatives. Alternatives consisted of a “no action” alternative that would have continued the existing Memorial management and that served as a baseline for comparison in evaluating three action alternatives that differed from the existing management of the Memorial. The action alternatives proposed different ways to manage resources and new facilities that would have allowed new types of visitor uses and amenities. Alternative 3 was selected as the National Park Service’s Preferred Alternative.

The major action of the GMP/EIS Preferred Alternative is a design competition. The purpose of the design competition is to gather a wide range of ideas for the revitalization of the Memorial, emphasizing improvement of the north and south portals, creation of new east and west portals, providing physical and/or thematic connections to downtown St. Louis, the riverfront, adjacent commercial development areas and the expanded Memorial in East St. Louis. While partners are involved throughout the process, the National Park Service has sole authority over Memorial lands and is the ultimate decision maker on proposed new designs within the Memorial boundaries.

The following are the design competition goals:

- Protection of historic and cultural resources of the Memorial;
- Increased connectivity between the Old Courthouse and the Gateway Arch (including any combination of a single elevated deck, multiple bridges, and

improved at-grade pedestrian crossings across Memorial Drive);

- Increased and improved connectivity between the Memorial, downtown St. Louis, the riverfront, the adjacent commercial districts of Laclede’s and Chouteau’s Landings and the expanded Memorial in East St. Louis;
- Increased opportunities, through programs and facilities, for the public to be more engaged with the primary themes and stories of the Memorial;
- Increased opportunities for the public to feel more welcomed to the Memorial with the provision of amenities and services that support a safe and enjoyable experience; and
- Operational efficiency and effectiveness for the Memorial’s operation in a sustainable manner.

## ORGANIZATION OF REPORT

This Cultural Landscape Report consists of six chapters:

- Chapter 1 provides a general introduction and summary, including an overview of the Memorial and its boundaries; summary of findings, including significance and treatment; a brief discussion of the scope of work and methodologies; and a discussion of other plans which directly relate to or affect this report.
- Chapter 2 provides a site history, including the background and design context as well as physical implementation of the site design. It discusses the development of plans for the Memorial from the time of inception until the final construction documents and specifications were completed. This chapter takes us through Eero Saarinen and Dan Kiley’s involvement, the NPS design and construction offices’ (these included the former Eastern Office of Design and Construction and the San Francisco Planning and Design Office

— later known as the Western Service Center – which were consolidated in 1972 to form the NPS Denver Service Center) approval and development of construction documents and specifications based on Saarinen and Kiley’s plan, and the involvement of the local firm HB&A. Chapter 2 also documents the implementation of the site development and landscape plan. This chapter is divided into four construction periods when the major development occurred. Period plans complement each of the four periods, depicting the features which were added or removed during the time period.

- Chapter 3 provides a detailed description of the site, including an assessment of conditions and an existing condition site plan.
- Chapter 4 includes a comparative analysis of historic and existing conditions, and describes the significance and integrity of the Memorial grounds. Threats to the integrity of particular features are identified as a high priority for treatment.
- Treatment Recommendations are proposed in Chapter 5. The chapter begins with a brief discussion of the recognized preservation treatments and clearly identifies why rehabilitation is chosen as the recommended overall treatment for the Memorial landscape. A treatment concept is described, addressing the management goals laid out in the 2009 GMP/EIS. General and specific recommendations were made to guide future landscape management and planning decisions.
- Chapter 6 includes implementation projects for preservation actions based on the recommendations in Chapter 5. These implementation projects include general cost estimates.

Several appendices and a bibliography follow Chapter 6. For a complete list of appendices, consult the Table of Contents.

## Endnotes

1. A 100-acre extension of the park on the east side of the Mississippi River was authorized in 1984 and finalized in 1992. The east bank will not be addressed in detail in this report.
2. Midwest Region (formerly Midwest Field Area) of the National Park Service, contract with Gregg Bleam, Landscape Architect. Contract #:1443PX600094635. Portions of this report are taken directly from Gregg Bleam's "Evolution of a Landscape: Eero Saarinen and Dan Kiley's Collaborative Design for Jefferson National Expansion Memorial."
3. U.S. Department of Interior. *National Register Bulletin 22: Guidelines For Evaluating and Nominating Properties That Have Achieved Significance Within the Last 50 Years*. The bulletin was completed by the Interagency Resources Division of the National Park Service, U.S. Department of Interior, n.d., 3.
4. Laura Souillière Harrison, *National Register of Historic Places Inventory, Nomination Form for Jefferson National Expansion Memorial, 1985* and *Jefferson National Expansion Memorial Gateway Arch, National Historic Landmark Nomination Form, 1987*.
5. A detailed comparative analysis and assessment of contributing status of landscape features, and the statement of significance, can be found later in this report in Chapter 4: Analysis and Evaluation.
6. Most of the plans discussed throughout this report can be found in the JNEM Archives, Record Units 104, 120, and 128.
7. Basic Data information is noted on page 1 of the Land Use Plan, October 2, 1981. Copy on file in JNEM Archives, Record Unit 120, Drawer 13, Folder 10.



into the western territories. As western lands opened and trade began, St. Louis became a hub of commercial activity. It was in recognition of this movement westward, and St. Louis' central role as the "Gateway to the West," that the Gateway Arch was destined to rise over St. Louis' waterfront at the point of Laclede's original settlement.

### The Riverfront

St. Louis quickly became a hub of the young nation's river transport, being well located near the confluence of the Missouri and Mississippi Rivers, with the Missouri River becoming the main artery for frontier commerce. Regular steamboat runs began soon after the first crude launch arrived in 1817, and the sloping site of the old village quickly came to be crowded with warehouses and steamboats moored along its levee (see Figure 2.2). Following such rapid growth and Missouri statehood, St. Louis incorporated as a city in 1822. A massive fire in 1849 required the rebuilding of several blocks of commercial structures in the riverfront district.

St. Louis grew to over 300,000 residents by 1870, developing and thriving as a result of steamboat and river commerce. This commerce eventually declined, and was largely replaced by rail transport following the Civil War. St. Louis ultimately became the nation's



Figure 2.2. St. Louis Riverfront, 1852. (JNEM Archives, uncatalogued collection)

second largest rail terminal, but with this shift in transportation came a corresponding deterioration of the city's riverfront area, a cause for concern among civic leaders. The Louisiana Purchase Exposition of 1904 was built in St. Louis' Forest Park, eight miles west of the riverfront. It was the largest world's fair ever staged, and prompted action on the riverfront issue. Its classically arranged Beaux Arts buildings set amidst broad lagoons and statuary brought the "City Beautiful" movement to St. Louis and sparked interest in civic improvements. Subsequently, comprehensive city planning began in 1907, including recommendations for improvements for the decaying riverfront.

Many different plans were suggested for the development of the decayed riverfront between 1907 and 1937. Two plans produced by the City Plan Commission in 1926 and 1927 focused on large-scale automobile parking. Other later proposals included a sea wall on the river with a large aquarium on the site, and another proposed a major housing project.<sup>2</sup>

Of particular interest was "Plan 8009" developed by the National Park Service (NPS) (see Figure 2.3).<sup>3</sup> The plan maintained several historic buildings in their original locations, as well as retaining the original street pattern of the old French village. Major north-south and east-west axes were proposed, and at their intersection stood a central tower surrounded by a colonnade which would shelter a narrative about the "winning of America by and for the Americans."<sup>4</sup> The Memorial plaza concept, studied for many subsequent years, formed an important urban axis, upon which the Gateway Arch was later aligned.

### 1933-1944 — Movement to Establish a Memorial

Plans for the revitalization of the St. Louis riverfront most firmly coalesced in 1933 through the efforts of Luther Ely Smith, a prominent St. Louis attorney. Smith conceived the idea for a riverfront memorial after touring the monument to George Rogers Clark in Vincennes, Indiana. In addition to memorializing an event of national significance, the project was a means to revitalize the riverfront, promote economic

development, and provide jobs in the midst of the Great Depression.

St. Louis Mayor Bernard Dickmann reacted favorably to Smith’s proposal for a riverfront memorial, in turn presenting the plan to a group of community and business leaders in December 1933. Again, the idea was well received, and the group formed a temporary committee to further explore the matter. Shortly thereafter, the committee formed the Jefferson National Expansion Memorial Association (JNEMA), chartered as a nonprofit organization with the intent to develop and adopt plans, generate public interest, build financial support, and ultimately improve a site for the Memorial. More specifically, this was to be:

“... a suitable and permanent public memorial to the men who made possible the western territorial expansion of the United States, particularly President Jefferson, his aides Livingston and Monroe, the great explorers, Lewis and Clark, and the hardy hunters, trappers, frontiersman and pioneers who contributed to the territorial expansion and development of these United States; and thereby to bring before the public of this and

future generations the history of our development and induce familiarity with the patriotic accomplishments of these great builders of our country.”<sup>5</sup>

From the outset, these words established the guiding ideal for the Memorial, an ideal which proved critical in overcoming ongoing political, legal, and financial obstacles to the Memorial’s development.

### Federal Support – The United States Territorial Expansion Memorial Commission

Because the proposal was to memorialize events of national significance rather than to commemorate local persons or events, within months of its founding, the JNEMA pursued congressional support and funding. This support was initiated upon authorization in 1934 of the United States Territorial Expansion Memorial Commission to design and construct a permanent memorial upon approximately 85 acres adjoining the St. Louis levee south of the Eads Bridge. In accordance with the resolution providing for the Commission’s establishment, the group’s fifteen members were composed of federal lawmakers and persons from

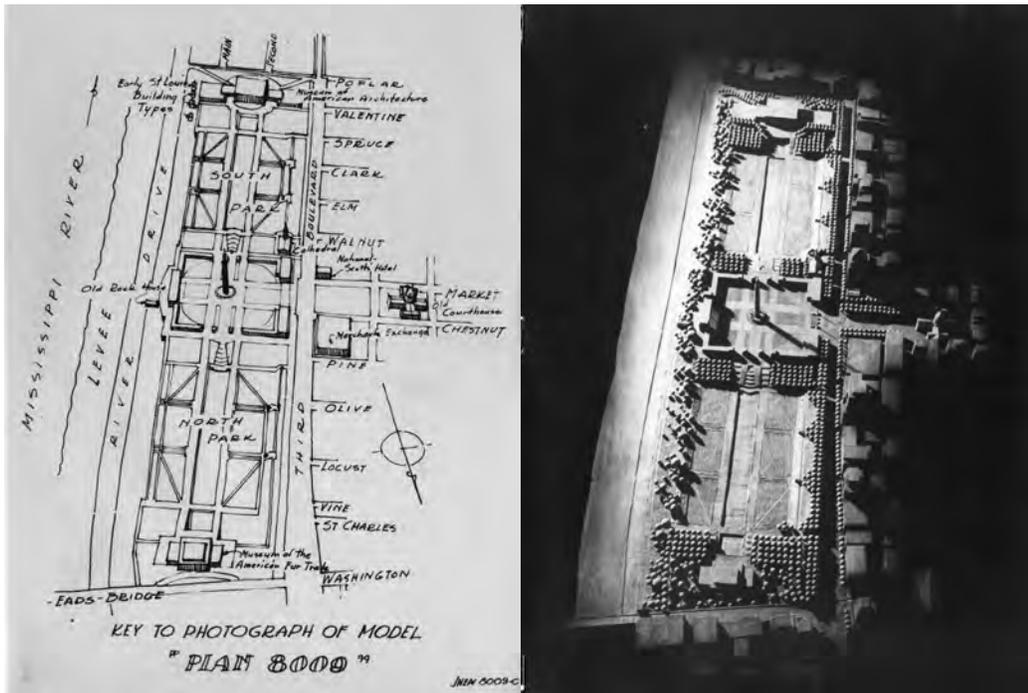


Figure 2.3. National Park Service “Plan 8009,” 1937. (JNEM Archives, Record Unit 104, Box 31, Folder 7)

throughout the country, including Luther Ely Smith.

Despite creation of the national commission, the more local JNEMA continued to develop detailed plans for the riverfront, and considered the idea of holding an architectural competition for the Memorial. A St. Louis architect hired by the JNEMA, Louis La Beaume, provided a written concept for the competition in early 1935, important because it contained the principal components of the competition actually held twelve years later. Meanwhile, the commission initiated meetings and by May 1935, based on input from the JNEMA, agreed upon the Memorial's historical significance, and approved site boundaries and the concept of a national architectural competition, as well as a cost estimate of \$30 million for planning, acquisition, and development.

#### Financial Matters and Historic Site Designation

Financial support from state and local lawmakers arrived rapidly, with the St. Louis Board of Aldermen approving an ordinance permitting a special bond issue election to contribute \$7.5 million toward the Memorial

project. Although the election was scheduled for September 1935, the approval came with the understanding that federal authorities would approve the project and make a substantial financial contribution prior to the date of the election. Therefore, commission and JNEMA members continued to pressure federal authorities for promises of financial support.

Attempts to secure funding focused on the Federal Public Works Administration (PWA), chaired by Harold Ickes, and the Works Progress Administration (WPA), headed by Harry Hopkins, project backers arguing that the Memorial was a suitable candidate for New Deal work relief funds. By August 1935, the commission gained verbal promises of support in their application for federal relief funds from both Ickes and Hopkins, as well as a promise that the National Park Service would assume responsibility for maintenance of the Memorial. The National Park Service began preliminary investigations into the project, relying on NPS engineer John Nagle to inspect the proposed plans and location. Nagle reported favorably on the project and its significance, also recommending federal aid, but for the first time he addressed the difficulties existing railroad tracks presented for development of the site (see Figure 2.4).



Figure 2.4. Elevated railroad tracks along the levee in St. Louis, c. 1935. (JNEM Archives, reference slide collection)

With the verbal assurances of Ickes and Hopkins, the city proceeded with the bond issue election on September 10, 1935. The bond issue passed and survived immediate legal challenges. Federal funding followed in unusual fashion when on December 21, 1935, President Franklin D. Roosevelt signed Executive Order 7253 permitting the Secretary of the Interior to acquire and develop Jefferson National Expansion Memorial.<sup>6</sup> In order to overcome various political and legal roadblocks, the Executive Order declared Old St. Louis as the location of the Memorial, and designated it the country's first National Historic Site under the Historic Sites Act. This recent (1935) law provided for the preservation of historic sites, buildings, objects, and antiquities of national significance, and gave the Secretary of the Interior broad powers to carry out this policy through the National Park Service. The President's action included the allocation of \$3.3 million in WPA funds and \$3.45 million in PWA funds for site acquisition.<sup>7</sup>

Between 1936 and 1939, progress was slow while the JNEMA found themselves dealing with numerous political, financial, and legal delays. John Nagle continued to oversee efforts for the National Park Service, in June 1936 opening an office in St. Louis as Superintendent of the Memorial, and commencing with various historical and planning studies that continued for the next four years. Much activity revolved around complicated matters of land acquisition.

### **The NPS — Planning Studies**

NPS studies were initiated with an early proposal for a Museum of American Architecture, and thereafter gained momentum. Most importantly, the National Park Service brought aboard Thomas E. Tallmadge, FAIA to study the site and comment on the value of certain buildings in the Memorial area. Tallmadge's report proved vital, as the National Park Service generally relied on its findings in determining which buildings should be spared demolition. While Tallmadge believed many of the buildings possessed architectural and historic value, he did not find any to be of outstanding quality. Consequently, he recommended the preservation of only

two buildings in the Memorial area, the Old Cathedral and the Old Rock House.<sup>8</sup> The report also stated that the Old Courthouse (constructed between 1839 and 1862) should be included in the Memorial's "great architectural scheme," an idea that received favorable reaction from NPS personnel (see Figures 2.5, 2.6, and 2.7). Beyond the report's assessment, however, saving and restoring decayed warehouses seemed to lack economic justification during the Great Depression.

Following the Tallmadge report, the NPS Branch of Historic Sites and Buildings prepared recommendations for the Memorial, consisting of additional requirements for historical research, including a detailed analysis of the historic value of buildings in the area, development of an educational program relating the area to the history of westward expansion, and development of a temporary historic museum as a step toward the Memorial's permanent development. This report became the basis for NPS work beginning in 1937, which eventually led to further support for demolishing buildings in the Memorial area, as well as the establishment in 1943 of a temporary museum in the Old Courthouse.

### **Land Acquisition and the Railroad Problem**

The process of land acquisition essentially began with filing the first condemnation suits in June 1937, but proceeded slowly. Much of the delay was due to federal caution and legal challenges to such action. A major hurdle was cleared in January 1939 when the United States Circuit Court of Appeals upheld the validity of the federal government's program of land acquisition, allowing the National Park Service to proceed with condemnation plans. Even so, the start of demolition on site was delayed until October 10, 1939. Moreover, questions remained as to the Memorial's status, with project backers uncertain as to whether funding for the project beyond land acquisition and demolition would become available. It seemed that Congress would have to be approached for additional funds.



Figure 2.5. Restored Old Rock House, c. 1943. (JNEM Archives, Visual Image 106-943, Record Unit 106, Box 10, Folder 7)



Figure 2.6. Old Cathedral, c. 1939. (JNEM Archives, Visual Image 106-1436, Record Unit 106, Box 9, Folder 14)



Figure 2.7. Old Courthouse, c. 1939. (JNEM Archives, Visual Image 106-175, Record Unit 106, Box 20, Folder 42)

Of equal concern, the railroad tracks crossing the site along the levee posed their first threat to the project when Secretary of the Interior Ickes ruled that no moneys would be allocated toward building the Memorial without their removal. Therefore, Superintendent Nagle began immediate negotiations for the removal of the tracks, simultaneously with the process of land acquisition. From the beginning the National Park Service favored a solution whereby the tracks would be relocated off site. Yet, with three surface and two elevated tracks along the riverfront on the east side of the Memorial site, it would take 20 years to overcome the obstacles posed by their existence.

### General Development Principles

With land acquisition progressing slowly through 1938 and questions arising as to the Memorial’s justification, planning became more sharply focused on general development principles and defining the underlying idea for the artistic and historical development of the Memorial. Superintendent Nagle’s leadership was significant in this regard, defining the major purpose of the Memorial as “to commemorate the westward expansion of the United States with emphasis on the Louisiana Purchase.”<sup>9</sup> For Nagle, this meant that the importance of the site and its buildings depended on their relation to national events. Thus, only the Old Courthouse and the Old Cathedral were regarded as worthy of preservation, reflecting the findings of the Tallmadge report and the NPS studies.

Nagle’s vision also meant that development of the site was to place emphasis on the relationship between the city and the Mississippi River, recognizing the important tie between river and landing in the city’s and the nation’s development. The Memorial’s architectural elements were to be symbolic of St. Louis’ role as the “Gateway to the West,” with the architectural elements centering on the east-west axis set by the Old Courthouse, and following the original mall proposal. As for the Memorial grounds, Nagle required a scheme with a maximum of open green space, and any structures built on the site were to interpret events connected with the Louisiana Purchase and westward expansion. Finally, these goals were to be realized through a nationwide

professional competition seeking the nation's best talent to give architectural expression to the Memorial. The above ideas were reinforced by a series of landscape studies prepared by NPS staff, examining principal site features and compositional ideas.<sup>10</sup> While Nagle's proposals were just that in 1938, they were to become among the strongest influences upon the Memorial project.

#### 1940-1944

Property acquisition and demolition of the riverfront buildings continued until 1942, as did problems and delays (see Figure 2.8). There was a general lack of progress toward completion of the Memorial with no specific plans or funding for the Memorial itself. Of course, World War II effectively determined such an outcome, with the entire country focused on the war effort; no domestic memorial project could feasibly be constructed at such a time. Most crucial, however, the public saw evidence of progress through the process of demolition and grading of the site, and the rehabilitation of a few select buildings. By early 1942, all but three buildings were razed from the Memorial area, the Old Rock House, the Denchar

Warehouse, and the Old Cathedral (see Figure 2.9).<sup>11</sup> John Nagle resigned as Superintendent of the Memorial to accept a position with the War Department, and was replaced by Julian Spotts, who had served as an advisor on the project.

#### The Old Courthouse and Other Issues

In addition to demolition, the most important work focused on the preservation and inclusion of the Old Courthouse as integral to the Memorial scheme, and continued negotiations to solve the railroad problem. While little progress was made on the railroad problem, the former issue found favor among project backers as evidence revealed that the Old Courthouse played a crucial role in the movement west. Moreover, it was reasserted that President Roosevelt's Executive Order declaring the Memorial a historic site specifically referred to the Old Courthouse. While some federal officials were reluctant to take possession of the building in its dilapidated state, President Roosevelt approved action to take title. Restoration work allowed the Old Courthouse to open in 1943 as a temporary museum and to house the National Park Service's St. Louis offices. The museum and the associated exhibit



Figure 2.8. St. Louis riverfront after demolition of warehouses, c. 1942. (JNEM Archives reference slide collection)

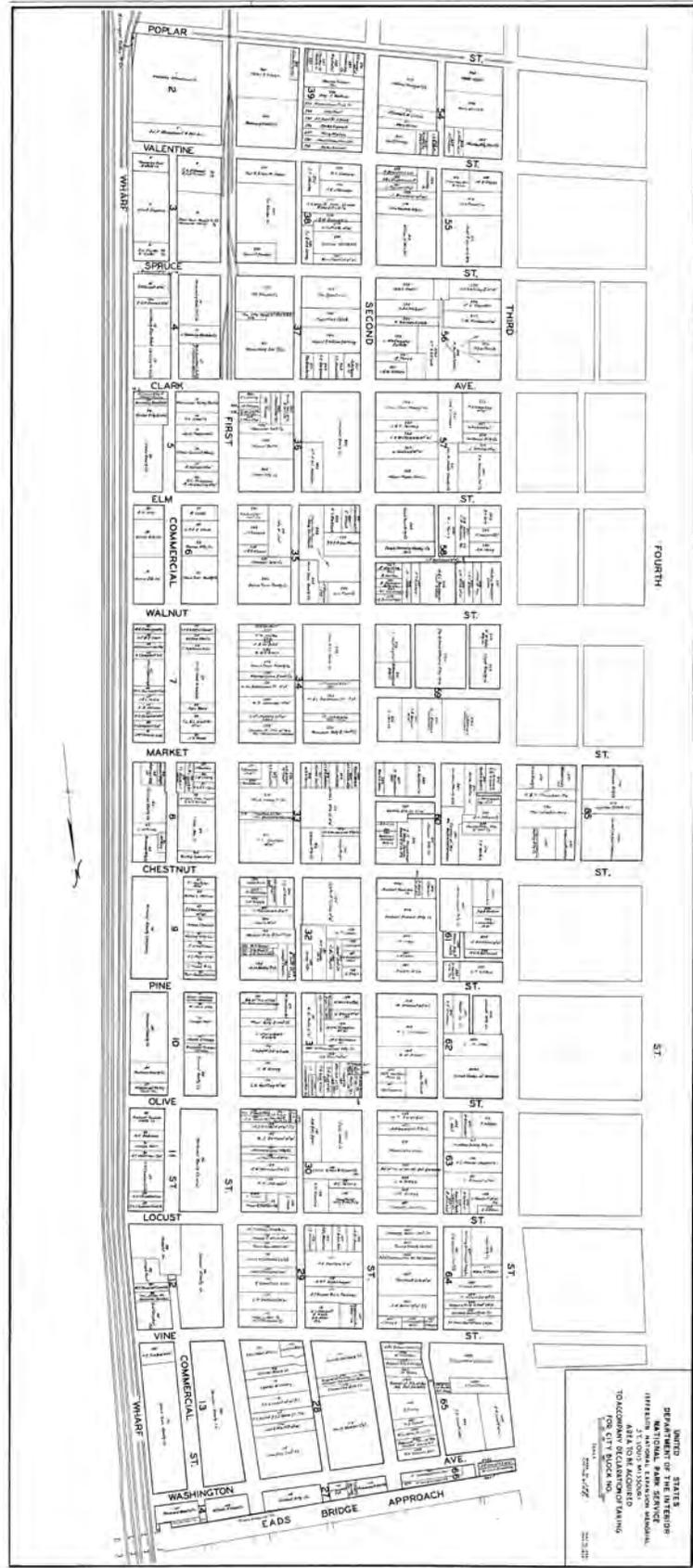


Figure 2.9. Map of a portion of the St. Louis waterfront, c. 1936. (JNEM Archives, uncatalogued collection)

and lecture programs sponsored by the National Park Service generated additional public interest in the Memorial.

### Competition Prelude

After February 1, 1941 the Works Progress Administration (WPA) ceased to operate any federally sponsored projects. This was crucial to Memorial development as its available funds were spent, work relief funds were no longer an option, and further development beyond the completed land acquisition and demolition would clearly rely on future approvals from Congress. Therefore, NPS staff turned their attention toward postwar planning, believing that additional funds would eventually become available. Once again, this meant a reexamination of the Memorial's purpose and theme, with special consideration given to how the Memorial would conform to NPS ideals, particularly its function in interpreting relevant United States history. In fact, questions arose as to the necessity of a new memorial structure given the historic site designation. Superintendent Spotts, however, saw value in a memorial, potentially bringing more people into contact with NPS interpretive work. Likewise, he felt that because the National Park Service did not have a specific design for the Memorial, it should cooperate with the JNEMA's proposed architectural competition.

### 1945-1948 — The Design Competition

The end of World War II allowed efforts to focus on the development of a design for the Memorial project; this meant undertaking an architectural competition as proposed by the JNEMA. The original intent, that the Memorial be a \$30 million enterprise, meant that following land acquisition and clearance, \$20 million were to be expected for improvements to the site. Therefore, JNEMA members desired the best talent available to transform their vision into clear form as demonstrated through drawings and models.<sup>12</sup>

### NPS Conditions

This vision was most clear in the mind of civic leader Luther Ely Smith, the man who set the process in motion beginning in 1933. He remained firm in his convictions, expressing

his desire for a memorial “transcending in spiritual and aesthetic values.”<sup>13</sup> His personal view was that these values could best be expressed through one central feature, such as a shaft, a building, an arch or some other construction symbolic of American culture and civilization. Nonetheless, he and the other JNEMA members recognized that their desires would have to be balanced against the needs and ideas set by the federal government.

The JNEMA formally announced a national architectural competition in January 1945, despite the fact that approximately \$225,000 had yet to be raised to stage the competition, and that the National Park Service, although favoring the idea, had not officially endorsed it. The latter issue was crucial, as any design chosen through the competition would have to be approved by the Department of the Interior and the U. S. Territorial Expansion Memorial Commission. Encouraged by Superintendent Julian Spotts, NPS Director Newton Drury indicated that his agency would cooperate in the competition provided that the Memorial carry out the theme of westward expansion with emphasis on the historic significance of the site, and that the proposal include space for a museum. In addition, any design proposal would have to abide by the condition imposed by former Secretary of the Interior Ickes that the railroad tracks along the Memorial's east boundary had to be removed to reestablish the critical connection between the river and the site. Finally, the National Park Service balked at the inclusion of extensive parking as part of the Memorial scheme, an element desired by many downtown St. Louis businessmen who were primary financial contributors to the architectural competition. Otherwise, Drury felt that the designer should be allowed complete liberty to express the Memorial's theme.

### A Competition Advisor

Fundraising spearheaded by Smith progressed slowly, taking two years to raise the money from local sources. However, in August 1946, as fundraising neared completion, Philadelphian George Howe, a fellow of the American Institute of Architects (AIA), was asked by Smith to serve as professional advisor to the competition. Both the National Park Service and the JNEMA felt that the

competition would benefit from a well-known advisor based outside St. Louis; the advisor was intended to give the competition national stature. Howe agreed to serve on the condition that the competition reflect his architectural philosophy.

As a proponent of a modern architectural philosophy, Howe believed that architecture was meant to reflect modern life spiritually and materially rather than merely mimic historic forms. As regards the Memorial site, Howe emphasized inspirational, educational, and recreational facilities that celebrate life in the present above the act of remembrance. He felt that this approach could prove troublesome and warned Smith accordingly.

Regardless of his own concerns, George Howe was confirmed by the JNEMA as a professional advisor to the competition, and spent several months writing the competition guidelines. Luther Ely Smith remained influential, guiding the JNEMA throughout the competition proceedings as the organization's president.

### **The Competition Program**

The competition guidelines prepared by Howe closely followed earlier plans for a competition established by the JNEMA, reflecting the contribution of local architect Louis La Beume. Principally, there were to be two stages to the competition, both anonymous: the first stage to eliminate all but a few competitors and the second stage to select a single architect and design. In addition, the competition was open to all architects and practitioners of the allied arts including sculptors, landscape architects, and painters who were citizens of the United States.

Smith and Howe met with NPS representatives in March 1947 to discuss final plans for the competition, at which point differences between local and national intent for the Memorial emerged. In particular, Smith and Howe wished to accommodate an underground parking lot as an element of the competition, while the National Park Service strongly opposed such a conception as incompatible with the function of a national memorial. Potentially more problematic, the federal government expressed concern that local

commercial interests were becoming overly influential in the development of a memorial intended to commemorate significant events in the nation's history. Smith reached a compromise by suggesting that the first stage of the competition remain open to a range of solutions, whereas the second stage could remedy specific problems and disagreements.

The Competition Program drafted by the JNEMA established the rules for submission of a design, and set forth programmatic requirements for a design proposal. These programmatic requirements attempted to satisfy diverse functions while presenting a unified intent for the Memorial:

“(a) an architectural memorial or memorials to Jefferson; dealing (b) with preservation of the site of Old St. Louis — landscaping, provision of an open-air campfire theater, reerection or reproduction of a few typical old buildings, provision of a Museum interpreting the Westward movement; (c) a living memorial to Jefferson's ‘vision of greater opportunities for men of all races and creeds;’ (d) recreational facilities, both sides of the river; and (e) parking facilities, access, relocation of railroads, placement of an interstate highway.”<sup>14</sup>

In this, the program attempted to meet the requirements of the congressionally sanctioned and appointed U.S. Territorial Expansion Memorial Commission, the City of St. Louis, the National Park Service, and the private non-profit JNEMA. (For instance, the open-air campfire theater was a standard requirement for every national park in 1947.) Thus, its scope was unique in its comprehensiveness and extent, including a consideration of the entire memorial area and its relation to the adjacent cities of St. Louis and East St. Louis.

The JNEMA also set forth the rules by which a jury composed of seven persons was to select the competition winner and the size of the prize. The identity of competitors was to remain anonymous until the jury completed its work, with decisions reached by secret ballot requiring a majority vote to carry the decision. Just before the competition's scheduled opening on May 30, 1947, it received an important endorsement when the U.S. Territorial

Expansion Memorial Commission approved the competition plans.

The JNEMA's competition attracted immediate attention among practitioners as the major architectural competition following the war. More than 200 architects signified their intent to enter and received the Competition Program. Three months were allotted within which to submit an entry, with the deadline set for September 1, 1947. Ultimately, 172 entries were received from throughout the country, and on September 23, Howe met in St. Louis with the seven jury members for three and one-half days of deliberations. The jury members were Chairman William W. Wurster, A.I.A.; S. Herbert Hare, F.A.S.L.A.; Fiske Kimball, F.A.I.A.; Louis La Beume, F.A.I.A.; Charles Nagel, Jr., A.I.A.; Richard J. Neutra, A.I.A.; and Roland Wank, A.I.A. Although Howe was not permitted to vote, he took part in the deliberations.

### **The Saarinen Gateway Arch — Competition Stage One**

Among the five finalists chosen from the numbered entries was Design Number 144, an immense arch (see Figures 2.10 and 2.11). Written comments provided by the jury described a range of reactions.<sup>15</sup> Hare was skeptical as to the practicality of the scheme, while both Wank and Nagel thought the design to be one of considerable merit. In fact, Wank referred to the scheme as “inspired,” and Nagel thought the entry “an abstract form peculiarly happy in its symbolism.”<sup>16</sup>

The monumental Gateway Arch and grounds of Design Number 144 were the work of a collaborative team headed by Eero Saarinen of the firm Saarinen, Saarinen and Associates of Bloomfield Hills, Michigan, a firm well established through the work of Eero's father, Eliel Saarinen. However, the competition provided the younger Saarinen with an opportunity to produce a major work apart from his father. Assisting in this task were J. Henderson Barr, associate architect, Dan Kiley, landscape architect, Alexander H. Girard, painter, and Lily Swann Saarinen, sculptor.

Despite the collaborative nature of the effort, the Gateway Arch itself was strictly Saarinen's

conception. Underscoring his attachment to the symbolic expression of an arch as the “Gateway to the West,” he pursued a simple expression of form, ultimately settling upon the two-legged Gateway Arch following a visit to the Memorial site. Saarinen's major concern was to create a monument which would have lasting significance and be a landmark for modern times. He recognized that “an absolutely simple shape — such as the Egyptian pyramids or obelisks — seemed to be the basis of the great memorials that have kept their significance and dignity across time.”<sup>17</sup>

In developing this scheme, Saarinen chose the purest expression of the forces acting upon an arch, a mathematically precise catenary curve in which the thrust forces are directed toward the center of the arch legs. Built of stainless steel with a concrete core, its materials were to emphasize both a timeless and a modern quality. These fundamental components generated the sweeping, upward thrusting character of the Gateway Arch, no longer earth-bound and wholly in line with Saarinen's visualization that this should be the tallest of monuments.

Saarinen stated that “Neither an obelisk nor a rectangular box nor a dome seemed right on this site or for this purpose. But here, at the edge of the Mississippi River, a great arch *did seem right*.”<sup>18</sup>

Landscape architect Dan Kiley was an especially important member of the design team. Saarinen invited Kiley to work on the first competition entry, the idea for a Gateway Arch as symbolically important already well established in his mind. Consequently, from the outset of their collaboration, Saarinen and Kiley together wrestled with the Gateway Arch's symbolic value and its special relation to the site, seeking a unified conception. Most importantly, the Gateway Arch was the lofty visual center within a park setting meant to “symbolize the spirit of the whole Memorial.”<sup>19</sup> Sited parallel to the river with the centerline initially placed slightly off-axis to the Old Courthouse, the Gateway Arch nonetheless framed views of the courthouse from the river, creating an immediate connection.

As for the character of the site, Saarinen later commented: “We believed that what



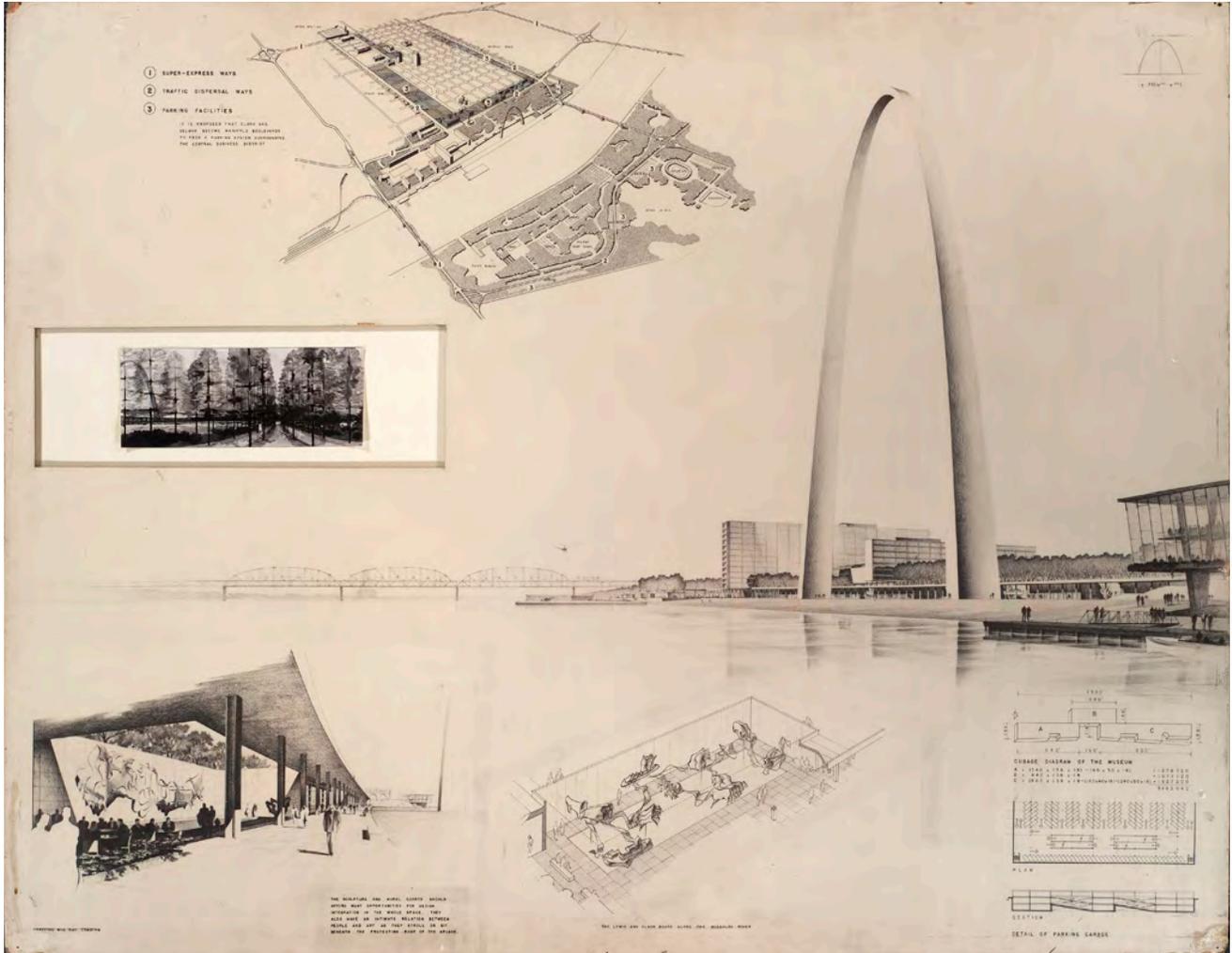


Figure 2.11. Eero Saarinen's Stage One submission, perspective, axonometric and other views, 1947. Note inset perspective view of allée was added to submission at a later date. (JNEM Archives, Visual Image 104-252)

downtown needed was a tree-covered park. We wanted to have the most nature possible toward the City.”<sup>20</sup> Kiley emphasized that the site should take on the character of a forest zone that one might pass through while traveling across the prairie landscape, a forest dominated by one or two tree species, much as he viewed the composition of a totally “natural” landscape. The simplicity of Kiley’s conceptual forest was to give majesty to Saarinen’s Gateway Arch.<sup>21</sup>

### Saarinen and Kiley

Saarinen and Kiley were first introduced in 1942 by the architect Louis Kahn, and continued to correspond throughout the war years, beginning their professional relationship in 1945 with a competition for a government center in Quito, Ecuador. Their relationship developed in such a way that Kiley collaborated as the landscape architect on much of Saarinen’s most important work, including Jefferson National Expansion Memorial, the Detroit Civic Center, Dulles International Airport, and master planning projects for a number of colleges and major universities. Kiley recalled that “... Eero asked me to do all his work, for twenty years, and the only time I didn’t do it is because the client already had somebody they wanted ... So, Eero and I had a very close relationship.”<sup>22</sup>

The nature of Saarinen and Kiley’s relationship is evident in Kiley’s remembrance of Saarinen’s initial correspondence concerning the Gateway Arch, inviting Kiley to join him in preparing a submission for a major competition. The letter was sent to Kiley’s New Hampshire residence in what Kiley refers to as “mirror writing”; to be read, the letter had to be held up to a mirror. In fact, Saarinen frequently communicated with Kiley in this manner, revealing a close friendship.<sup>23</sup>

With an affirmative answer, Saarinen and his wife Lily traveled to Kiley’s residence in Franconia, New Hampshire to begin conceptualizing and preparing the competition entry. Saarinen arrived with a small sketch of an arch in hand. For the next week, the two discussed the symbolic value of the arch, and its relation to the remainder of the site, all the while preparing more sketches.<sup>24</sup>

Following the week in New Hampshire, there was another month of intense work at Saarinen’s office in Michigan, the other team members becoming more involved. This intensity and rush to generate the competition entry even caused Saarinen and Kiley to work on a single drawing at the same time, an episode which seems to have become a competition unto itself. Beginning at opposite ends and meeting in the middle, Saarinen’s proved to be the faster hand. “I’m left-handed,” remembered Kiley, “and Eero started here and I started on this side, and he beat me to the middle, but my claim to fame was I could draw cobblestones like Eero ...”<sup>25</sup> Regardless, Kiley’s humor provided relief in the Saarinen office, and balanced Saarinen’s especially competitive drive.<sup>26</sup>

Preparing for the second stage of the Memorial competition, the atmosphere was equally high-pitched. Kiley again spent considerable time at the Saarinen office in Bloomfield Hills, Michigan, the two working nearly around the clock for a period of four months. “We were delighted to learn that we were one of the five selected for a final competition in 1948. I lived with Eero and Lily Saarinen for four months working all night every night or as Eero put it, ‘till we achieved a definite advance.”<sup>27</sup> A close collaboration such as that between architect and landscape architect was therefore critical to Saarinen’s design approach, but clearly the relationship between Saarinen and Kiley was unusually strong, based on friendship as well as professional circumstance.

That Saarinen found value in the relationship between architect and landscape architect might best be distilled from a lecture he gave a number of years later, at Dickinson College in 1959:

“The conviction that a building cannot be placed on a site, but that a building grows from its site, is another principle in which I believe. I see architecture not as the building alone, but the building in relation to its surroundings, whether nature or man-made surroundings. I believe very strongly that the single building must be carefully related to the whole in the outdoor space it creates. In its mass and scale and material it must become an enhancing element in the total environment.

Now this does not mean that the building has to succumb to the total. Any architecture must hold its head high. But a way must be found for uniting the whole, because the total environment is more important than a single building.”<sup>28</sup>

Here was direct evidence that Saarinen carried forth his father’s philosophy in the Scandinavian tradition of creating an architecture that benefited from a reciprocal relationship with the landscape. Saarinen continued by saying that “Unlike painting and sculpture, where the individual works entirely alone, architecture involves many people. It is true that it all has to be siphoned through one mind, but there is always teamwork.”<sup>29</sup>

The design of the Jefferson National Expansion Memorial proves Saarinen’s to be the “one mind” through which “it all has to be siphoned,” but without a doubt Kiley was a key member of the team.<sup>30</sup> As Kiley’s role developed, he focused on the preparation of the planting plan, which both he and Saarinen considered essential to the Memorial’s total development, and a fitting setting and complement to the Gateway Arch. Certainly, the original conception was for the Gateway Arch to rise from a forested, park-like setting, and the architect and landscape architect never deviated from this ideal.

### **Program Changes**

With the completion of the first stage of the competition, and the selection and announcement of five designers, Howe drafted a second stage addenda somewhat redefining the nature of the problem. Addressing NPS concerns while not proposing solutions, the five semi-finalists were to view the railroad tracks along the riverfront as though they were already removed or placed underground, and consider any underground components of the design such as a parking garage in such a way as not to affect the surface design. The addenda also called for a transformation of the site into a shaded park with an open view between the levee and the Old Courthouse, although the designers were no longer required to consider a specific redesign of the levee, and were now fundamentally confined to the area between the levee and the city. Finally, the architectural

memorial was to be considered as “essentially non-functional,” an appealing and notable structure visible from a distance. Both the Director of the National Park Service and the Assistant Secretary of the Interior gave their approval to these requirements. As a result, most of the competitors were required to rethink their schemes.<sup>31</sup>

Kiley recalled: “The second stage of the competition was grueling. For four months I lived in Bloomfield Hills with the Saarinens, immersed in Eero’s determination and competitive drive. At the time it seemed to be a string of endless days and nights — every day and every night — of poring over models and sketches. The majority of our effort went into the final presentation boards, masterminded by Eero. He had a habit of standing back to view the work, cigar gripped tightly in teeth, hands gently rubbing together in appraisal of the drawings. I had a great time mimicking his stance — pencil dangling from my mouth, forehead crinkled in concentration. After the competition was over, others on the team said that my antics kept everyone’s spirits up. I do know that levity was a necessary counterpoint to the intensity of the competition drive. And that experience taught me an important life lesson: never work nights again!”<sup>32</sup>

A deadline of February 10, 1948 was established for submittal of the final competition entries, with an awards dinner scheduled for February 18 to announce the competition winner. All five semi-finalists submitted their entries by the deadline, and a week later the jury met for final deliberations. Upon meeting, Chairman William Wurster read important sections of the Competition Program to remind the jury of their charge, and George Howe affirmed that the Memorial should have a striking design and character.

### **The Competition Winner — Competition Stage Two**

After reviewing the entries the jury took a test ballot, and Design Number 144 won every vote (see Figure 2.12). No further balloting was necessary; the proposal submitted by Saarinen’s design team had been chosen the winner of the competition. Significantly, the addenda to the Competition Program did not

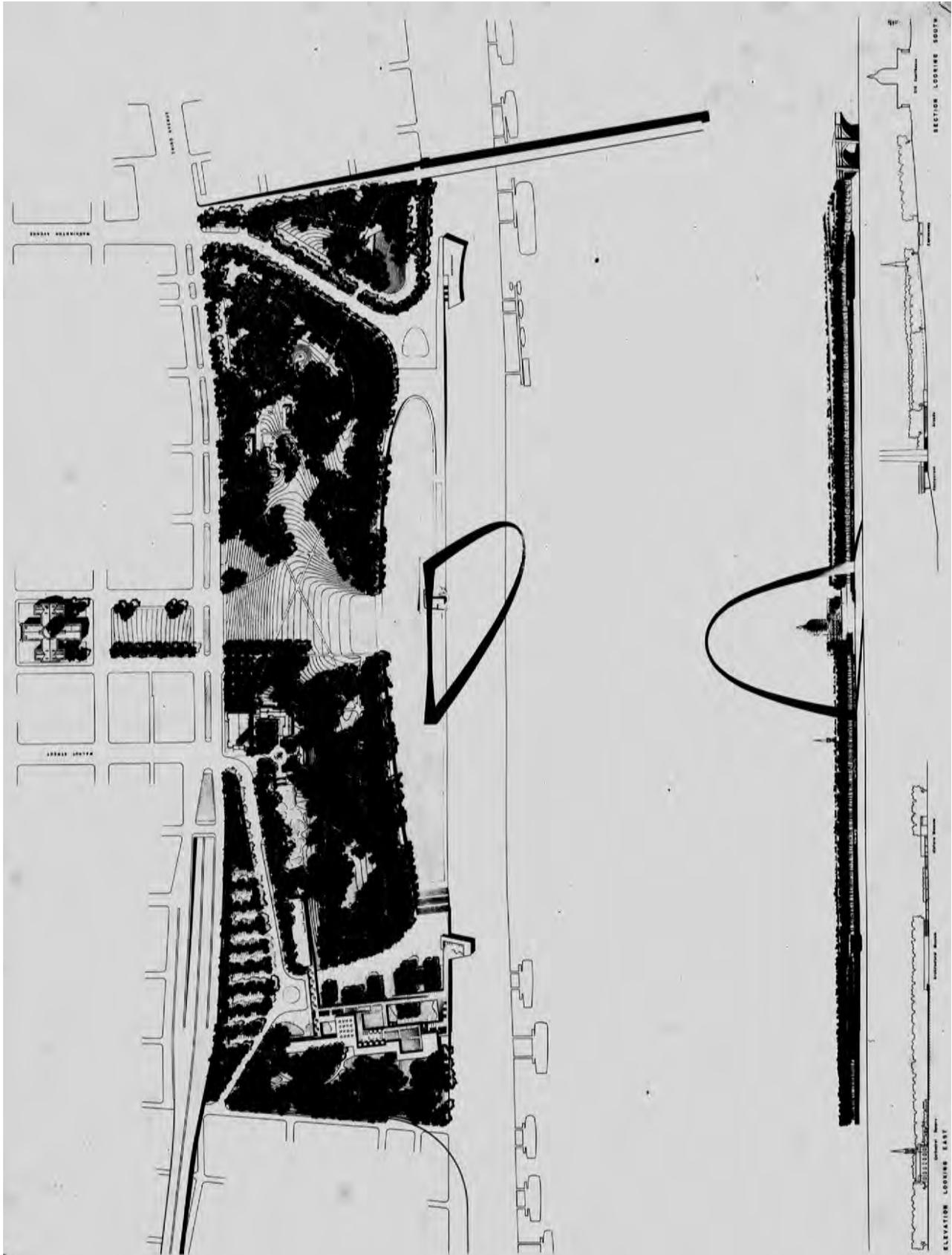


Figure 2.12. Eero Saarinen's winning competition entry, plan view, 1948. (JNEM Archives, Record Unit 104, unnumbered)

change Saarinen's conception of a monumental Gateway Arch in a wooded setting, a conviction which won favor with the jury.

The final report of the jury of award described the competition winner and the jury's assessment. It described some of the main features of the design included with the Gateway Arch, such as an "arcade" to feature sculpture and paintings to tell the story of westward expansion, a theater and a pioneer village re-creation to augment NPS interpretive goals, and two museums, one architectural and the other historical. But also clear in this discussion was the intentional relationship between the grand Gateway Arch, the Memorial site, its subsidiary elements, and the connections to the adjacent community and surroundings (see Figure 2.13).

"This entry placed in the First Stage, for it contains intrinsically the very features aspired to by the Program ... a memorial, a park, balanced harmony and fine grouping of buildings. The success of the plan does not depend upon the carrying out of a suggested collaboration of communities on the eastern bank of the Mississippi though it suggests to the full the advantages of such a possibility.

"The Second Stage resulted in an enriched and improved plan with no diminution of any of its initial excellencies. It tends to have the inevitable quality of a right solution. The monument suggests the historic past of St. Louis as the Gateway to the West. It is large in scale, yet does not dwarf other structures, and by its very form is sympathetic with the Old Courthouse dome. The use of the Manuel Lisa Warehouse as an entrance to the Memorial is a peculiarly happy instance of the brilliant effect to be gained by the occasional close juxtaposition of old and new.

"The park gives promise of shade in the warm season. The treatment of the roadways is an effective guard against traffic intrusion. The approach to the Old Cathedral and its adjacent dependencies ensures a proper setting for that dignified structure. The treatment of sculpture commemorating historical episodes is particularly engaging as it gradually unfolds along the levee edge. A frontier village in the wooded area recalls the flavor of the time of

the Western Expansion. Restaurants on either end afford vistas of the Memorial area and the Mississippi. Feature by feature a masterful plan reaches desired fulfillment.

"The entire concept, full of exciting possibilities for actual achievement, is a work of genius, and the Memorial structure is of that high order which will rank it among the nation's greatest monuments."<sup>33</sup>

Perhaps such a viewpoint, cognizant of the entire concept, could not be avoided. J. Henderson Barr, an associate architect and the major draftsman on the project, produced a series of about 100 color sketches for the Final Stage study, illustrating the design impact of the monumental Gateway Arch from viewpoints around the compass and over the course of a day. The rendering chosen for the stage two competition entry dramatized the Gateway Arch, but also showed old and new structures, including St. Louis' historic Eads Bridge (see Figure 2.13).<sup>34</sup>

### Reaction

When renderings of the Saarinen proposal first appeared in the press, they provoked a range of commentary on the project. The *New York Times* called the Gateway Arch "a modern monument, fitting, beautiful and impressive."<sup>35</sup> The architectural press also reacted positively. By contrast, many locals referred to the Gateway Arch as a "stupendous hairpin and a stainless steel hitching post."<sup>36</sup> The most volatile criticism came from Gilmore D. Clarke, a landscape architect and Chairman of the National Commission of Fine Arts. In a letter to jury Chairman Wurster, Clarke charged that Saarinen's design for the Gateway Arch too closely resembled one approved by Mussolini for a Fascist exhibition in Rome in 1942. For this reason, he felt that the Gateway Arch could not symbolize Jeffersonian Democracy.<sup>37</sup>

The Gilmore controversy attracted national attention. While Saarinen thought the objections ridiculous, Wurster took the charges quite seriously and with other members of the jury drafted a rebuttal which finally ended the controversy.<sup>38</sup> Their reply stressed the historic and modern usage of the arch as an architec-



Figure 2.13. Eero Saarinen's winning competition entry, perspective rendering, 1948. (JNEM Archives, Visual Image 104-321)

tural form, and that it was clearly not a fascist invention. In reference to Saarinen's Gateway Arch, they reiterated the suitability of its symbolism as the Gateway to the West. For his part, Saarinen claimed that his Gateway Arch was based on mathematical principles. "It's just preposterous to think that a basic form, based on a completely natural figure, should have any ideological connection."<sup>39</sup>

With the passing of the initial praise and criticism, the United States Territorial Expansion Memorial Commission unanimously adopted a resolution in May 1948 approving the selection of the Saarinen team's design and recommending to the National Park Service and the Secretary of the Interior that Saarinen be selected as architect for the Memorial's development and construction. Meanwhile, Saarinen forged ahead on the project, working without a contract. Concerned that the proposal would become reality, Saarinen began engineering studies on the Gateway Arch itself, and proceeded to deal with the unresolved problems of parking and the relocation of the railroad lines crossing the site. Working with

William Wurster he also developed objectives for special zoning in the area adjacent the Memorial site, wishing to ensure that future development not interfere with his vision of the Memorial as a unified whole.

In October 1948, Secretary of the Interior and NPS Director Newton B. Drury gave general approval to the competition's winning design and awarded a contract to Saarinen for preliminary work. With a definite design proposal the Memorial appeared ready for the next step in its development. Yet, appropriations for construction of the Memorial required congressional approval, and funding remained in danger until the railroad problem could be solved. Optimism over the project still ran high. To Luther Ely Smith, who resigned as president of the JNEMA within months of the competition's completion, Saarinen's design was the fulfillment of his dream for a memorial. At the awards dinner honoring the competition winner, Smith displayed his gratitude: "We are still breathless at the vision you have opened up for us by your marvelously fine design. The more we gaze upon it the more wonderful and

gripping it grows.”<sup>40</sup> Unfortunately, Smith died on April 2, 1951, well before the Memorial’s realization.

### 1949-1956 — Railroad Problem

Despite progress achieved through the competition and the legitimacy bestowed on the project through President Truman’s dedication of the Memorial site on June 10, 1950, problems continued to surface that delayed further advancement for several years. A major obstacle was once again armed conflict. With the outbreak of the Korean War in June 1950, international matters would hold the attention of Congress and the President until late 1953, and as a result postpone congressional authorization and appropriations for the Memorial. Therefore, although Saarinen and Kiley made progress in their production of working plans for the Memorial, no improvements were completed on the physical site itself. In fact, much of Saarinen’s work revolved around finding a workable solution to the relocation of the railroad tracks crossing the site, a problem that continued to haunt the project.<sup>41</sup>

### The “Saarinen Vista”

In 1949 the railroads indicated that they would object to placing the railroad tracks underground because the potential costs seemed unlikely to be borne by the federal government. On the other hand, the National Park Service was adamantly opposed to any location which visibly placed the rail lines between the Memorial site and the river. Additionally, the National Park Service remained opposed to any on-site parking other than that essential to the operation of the Memorial. Meanwhile, Saarinen stated that he did not wish to be the architect for the project if the tracks separated the Memorial from the river (see Figure 2.14).<sup>42</sup>

Saarinen initially held to his position for the reason that the visual line from the river through the Memorial to the Old Courthouse was critical to his conception. This line both tied the Old Courthouse to the Memorial site and brought the river into the composition. The idea of connecting the river with the Memorial was especially important and caused the Gateway Arch to be placed along the levee in close proximity to the river, thereby

recognizing the influence of the river in the history of westward expansion. Saarinen remarked that “The arch was placed near the Mississippi River, where it would have the most significance. Here it could make a strong axial relation with the handsome, historic Old Courthouse which it frames. Here, from its summit, the public could confront the magnificent river. The arch would draw people to the superb view and picturesque activity at the river’s edge. The museum, the restaurant, the historic riverboats were all projected on the levee. The river would be drawn into the total composition.”<sup>43</sup>

Thus, the visual line was intended to draw people from the summit of the Old Courthouse down to the activity planned for the riverfront. In fact, the “Second Stage Addenda” to the Competition Program required a vista from the Old Courthouse to the river, although the Saarinen concept featured this sight line already in the first stage competition proposal, further suggesting its importance to the scheme. Maintaining the “Saarinen vista” would therefore guide the initial agreement for siting the railroad tracks, although not without compromise on the part of Saarinen.

### A Railroad Tunnel

A new concept for the rail lines was presented in June 1949, in which the lines were to be lowered and placed in a cut immediately in front of the Gateway Arch, and the cut was to be shielded from view by retaining walls and landscaping. Labeled the Levee-Tunnel Plan, the proposal was backed by the city and the railroads. Saarinen initially objected in favor of his own idea for placing the tracks in a tunnel farther removed from the riverfront, but recognizing the strength of support for the Levee-Tunnel Plan, he reluctantly worked with the idea, while at the same time suggesting changes to make the plan more aesthetically acceptable. This was the first step toward resolution, and emerged as a strong influence upon the final treatment of the track relocation problem.

Frustrated by the lack of definitive progress, the various groups vitally interested in the Memorial’s completion met in early December to resolve the uncertainties associated with

the project, especially the railroad and parking controversies. The urgency attached to the meeting was based on knowledge that the necessary Congressional authorization and appropriations required the resolution of these matters.

In response, the parties consented to a “Memorandum of Understanding,” requiring the relocation of the existing surface and elevated railroad tracks based on a revised plan by Saarinen, and also including provisions for underground parking and above ground parking for the city. The Saarinen plan for the railroad lines reflected the compromise position of the groups involved, placing the tracks in a tunnel near the Gateway Arch and close to the alignment of the existing elevated railroad tracks. They were initially placed on the west side of the Gateway Arch opposite the river, but shortly thereafter Saarinen shifted the tunnel to a location between the river and the Gateway Arch in order to allow the existing elevated tracks to operate during the Memorial’s construction. This approximated the eventual location of the relocated tracks, and was further evidence of Saarinen’s willingness to compromise on the railroad issue.

The Secretary of the Interior approved the “Memorandum of Understanding,” but the tunnel proposal required special approval from the Missouri Public Service Commission for deviations in design standards. A lower than otherwise acceptable tunnel height proved necessary as there were physical limitations

as to how far the tunnel could be depressed, and to raise the tunnel would unacceptably negate the “Saarinen vista.” The Public Service Commission eventually gave their approval in August 1952. Even so, by early 1950 Memorial backers presented a united front to key members of Congress, pressing for immediate congressional authorization, all the while fearing the project’s demise. Unfortunately, the advice from congressional insiders was to abandon such efforts as inappropriate during a time of war.

### Preliminary Design Work

Without congressional approval and federal moneys for construction, efforts focused on project planning and office work. By January 1951, Saarinen had completed much of the preliminary work under his contract, an extensive set of drawings, including profile and structural drawings for the Gateway Arch, scale drawings of the museum and restaurants to be located on-site, and various layout and engineering studies for the proposed railroad tunnel. The engineering firm of Fred N. Severud provided structural calculations for the Gateway Arch, based on wind tunnel tests of an arch model. It was the railroad issue, however, that occupied much of Saarinen’s time, as completion of preliminary work on the railroads was seen as necessary for eventual congressional authorization.

Because work focused intensely on resolution of the railroad problem, as well as the

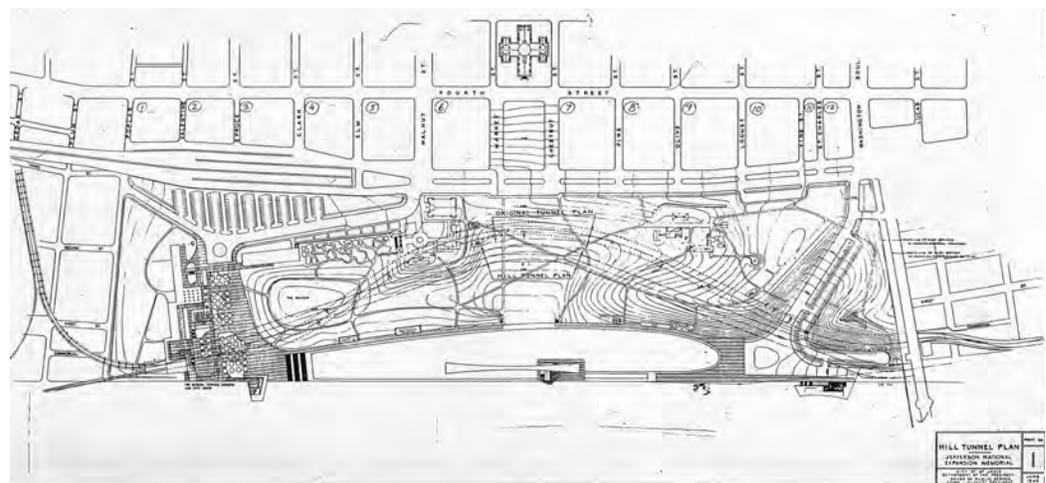


Figure 2.14. Eero Saarinen & Associates, early railroad study, 1949. (JNEM Archives, uncatalogued collection)

structural integrity of the Gateway Arch, Kiley's role was rather limited from the waning days of the competition until 1957. Then, he would reemerge as a significant collaborator on the project, the railroad problem forcing a more comprehensive consideration of the entire site plan. In the meantime, he began research for the planting plan, already looking to the Missouri Botanical Garden in St. Louis for information on plants appropriate to the region.<sup>44</sup>

Beyond its role in working to resolve the railroad and parking dilemmas, the National Park Service also continued its involvement in the planning of the Memorial. Specifically, they found it necessary at this stage to coordinate the NPS prewar planning with the Saarinen proposal. While accepting Saarinen's space allotments for a proposed western museum and a museum of architecture, they objected to that part of the winning concept that featured the frontier and cathedral villages to include reproductions of early St. Louis buildings. Eventually, cost and other design constraints altered the Saarinen plan for use of the grounds to more closely follow NPS goals.

### 1953-1956 — Congressional Authorization

The Louisiana Purchase sesquicentennial in 1953 brought renewed public attention to the Memorial project, as did other events. Some of this attention grew out of downtown St. Louis's parking problems; approximately 3,500 motorists routinely used the cleared Memorial site for a parking lot. More positively, extensive restoration of the Old Courthouse beginning in 1954 kept the Memorial in the public's mind. Amid all this public recognition of an unfinished project, and the end of the Korean War, new efforts were made to win federal authorization and appropriations.

Unfortunately, funding for the project was delayed: this time the Department of the Interior and other project backers were informed that appropriations would have to wait until the national budget could be balanced in the aftermath of the war. Nonetheless, a 1954 bill provided authorization for spending not more than \$5 million in federal funds on the Memorial project. Although no funds were immediately appro-

priated through this authorization, and while it restricted the expenditure of federal funds to the Gateway Arch itself, the authorization provided an indicator that Congress would follow through with plans to construct the Memorial.

### Defining Kiley's Role

Optimism and expectancies again surged when in January 1956, President Eisenhower announced the prospect of a balanced budget for 1957; a promise had been made that with a balanced budget, federal money would be released to begin the Memorial project. A partial appropriation of \$2.64 million dollars was made toward the relocation of the railroad tracks.

Anticipating renewed progress on the Memorial project, Saarinen wrote to Kiley on August 6, 1956, "... you and I should get together to reevaluate the design, placing of the Gateway Arch, the whole plan." Clearly, Saarinen considered Kiley's work essential to the project. In an accompanying memo also intended for his design associates, Saarinen outlined the anticipated scope of work under a series of contracts with the National Park Service, citing Kiley's role in the need for "finished site plan work and landscaping." Saarinen closed out the letter to Kiley with the following message: "I may be optimistic but it really looks as if sometime within the not too distant future you will be sitting on the steps of the Manuel Lisa Warehouse with your cigar supervising trees coming down the river in barges."<sup>45</sup>

### 1957 — Saarinen and Kiley's New Vision

On May 16, 1957, Delegates of the AIA Centennial Convention in St. Louis unanimously adopted a resolution urging Congress to take necessary action to complete the Memorial in accordance with the plan adopted by the United States Territorial Expansion Memorial Commission on May 25, 1948.<sup>46</sup>

In 1956 the National Park Service and the railroad interests, headed by the Terminal Railroad Association of St. Louis (TRRA), jointly hired a Chicago-based engineering firm, Alfred Benesch and Associates, to study the cost of

relocating the tracks. Controversy erupted when their final report was issued on May 3, 1957, and went beyond the requested scope of work, offering an opinion against removing the tracks because of the high cost associated with tunneling or otherwise lowering the tracks. Saarinen and the American Institute of Architects immediately denounced the idea, and it was made known by project supporters that the engineer was heavily biased toward the rail interests. NPS Director Conrad Wirth addressed the need for additional negotiations, and subsequently asked Saarinen to study design changes. The NPS response to the Benesch Report depended on what adjustments Saarinen could make to his design while at the same time minimizing the relocation of the rail lines.

### Revised Plans

The summer of 1957 was spent by Saarinen and his designers reworking the plans and by October the revisions were complete (see Figures 2.15, 2.16, and 2.17). Saarinen concluded that the competition plan was unworkable in the face of the railroad controversy, and he was eager to see his majestic Gateway Arch constructed.<sup>47</sup> Moreover, the impending construction of a bridge with interstate highway connections at the Memorial site's southern edge was expected to reduce the site to about 70 acres.<sup>48</sup>

The new Saarinen scheme provided for the railroad tracks to run through an open cut and partial tunnel configuration still proximate to the existing elevated lines, but reduced the depth by which the tracks were to be lowered. So as not to separate the Gateway Arch from

the river, a grand staircase was to rise over and bridge the tracks from the levee to the monument. As a result of grade changes related to this, the "Saarinen vista" was partially obscured. While the Gateway Arch was positioned in stronger axial relation to the Old Courthouse (the Gateway Arch was no longer slightly off-axis), the plan reduced the unobstructed sight line from the Old Courthouse to the river, or for that matter, from the Gateway Arch to the river (see Figure 2.18). Other components of the design were also altered, for instance, abandoning the Museum of American Architecture and the village-like reproductions of early St. Louis buildings. For the first time, lagoons or ponds appeared on the site plan as features embedded in the forest setting.

On October 2, 1957 Saarinen presented his revised plan in model form in the west courtroom of the Old Courthouse. Before city, railroad, and National Park Service representatives, as well as a congressional delegation, he offered a statement regarding the changes to the original plan. It was an appropriate description of the plan and its intent: "... The spirit of this new design is the same as that of the design which won the national competition 10 years ago. The Arch — the major element of the plan — is in fact unchanged from that of the original design and only in the plan of the park, the setting for and approaches to the Arch and the placement of other buildings on the site have changes been made.

"We feel that we have now related all the major elements of the Park to each other in a more unified way. The stainless steel Arch — as the symbolic Gateway to the West — is the center

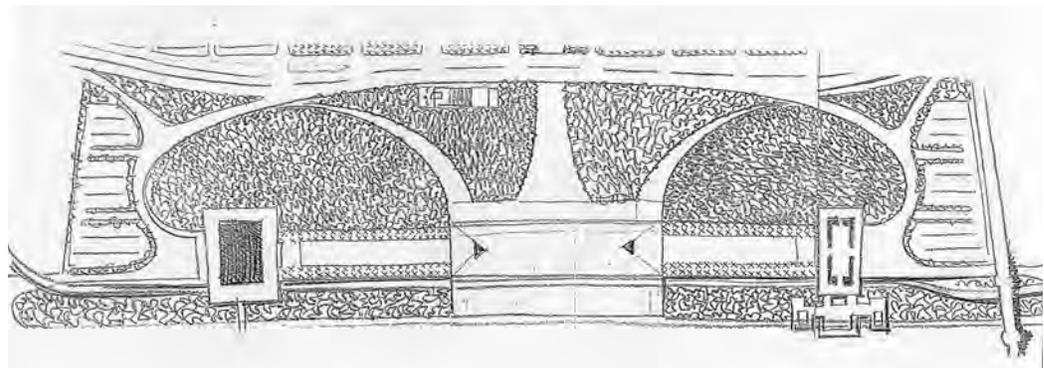


Figure 2.15. Eero Saarinen & Associates, site plan study, 1957. (JNEM Archives, uncatalogued collection)

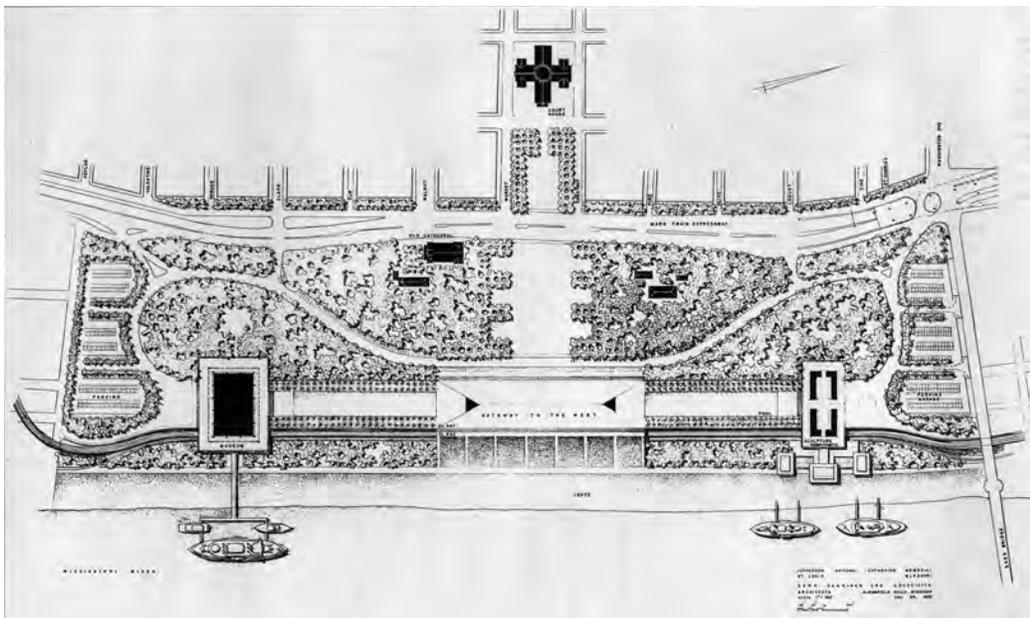
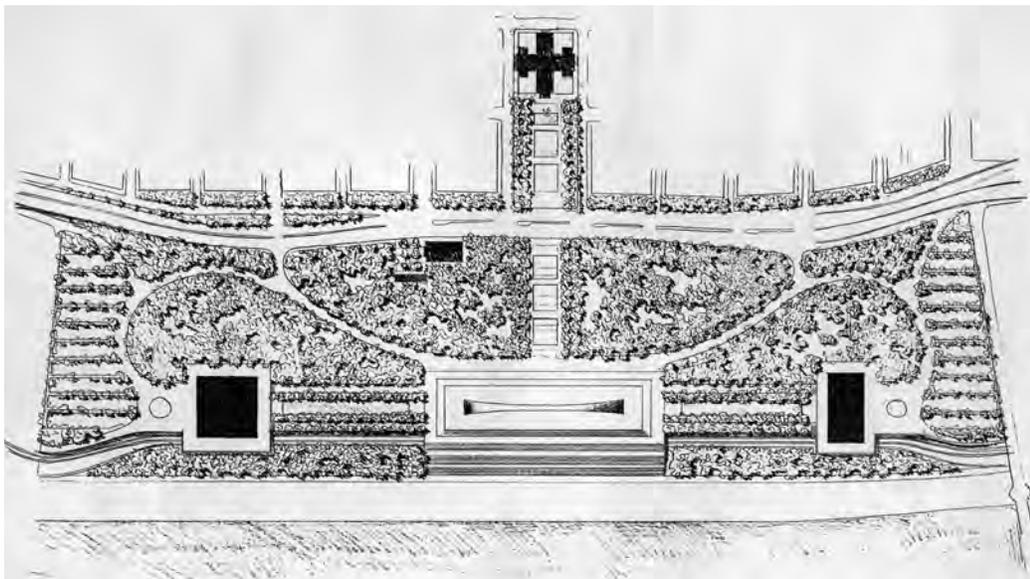
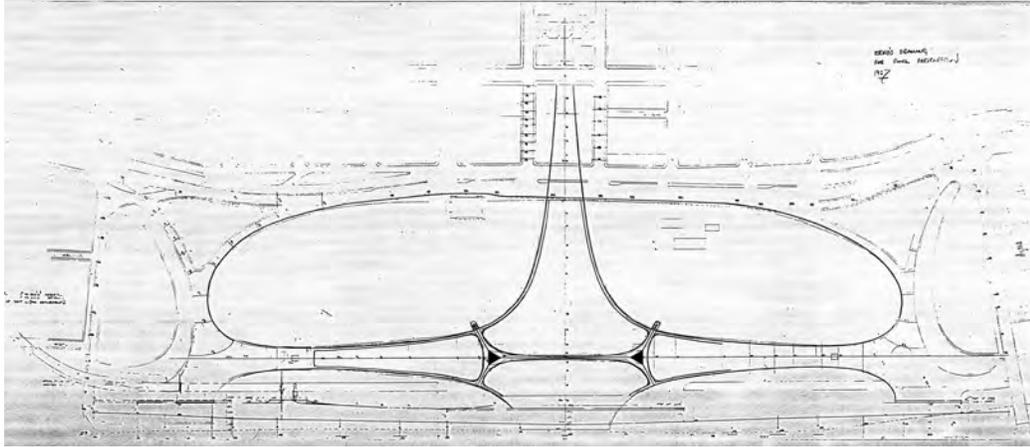


Figure 2.16. Eero Saarinen & Associates, site plan studies, 1957. (JNEM Archives, uncatalogued collection)

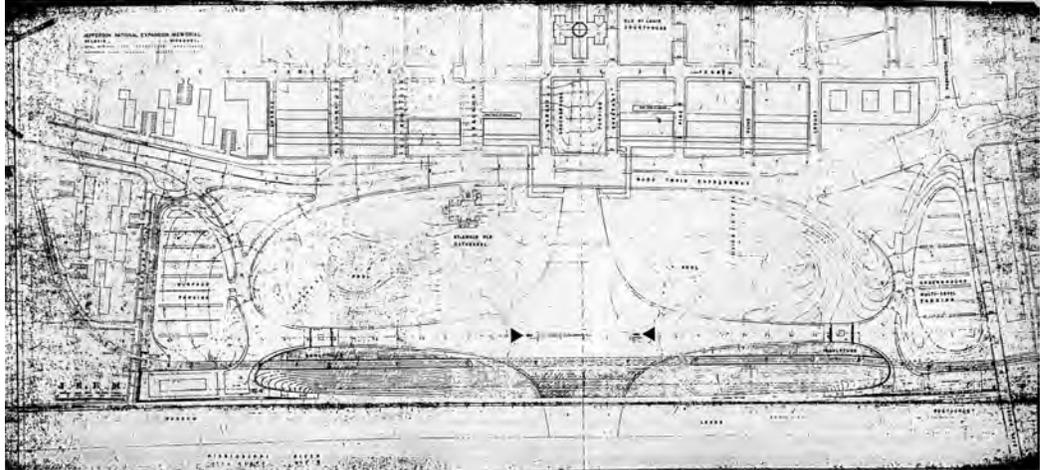


Figure 2.17. Eero Saarinen & Associates, site plan with 2-foot contour interval, Drawing 1 of 4, October, 1957. (JNEM Archives, uncatalogued collection)

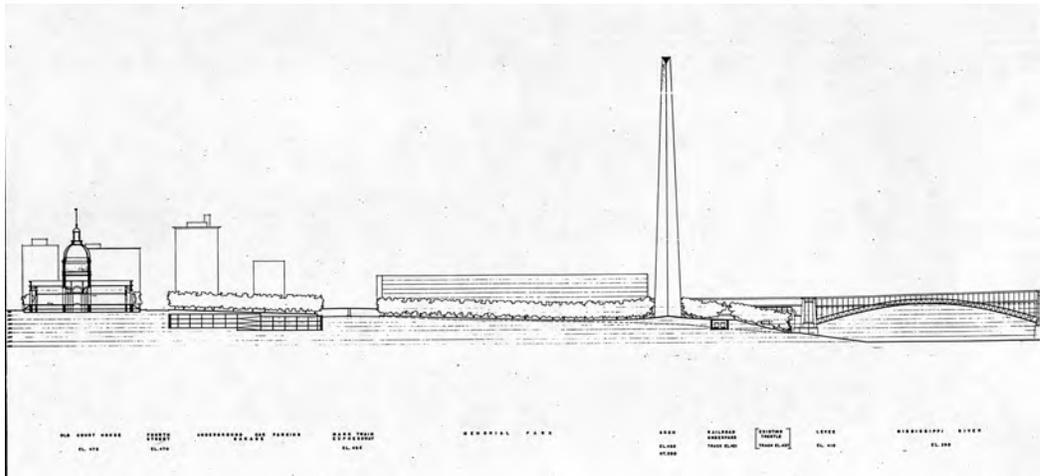


Figure 2.18. Eero Saarinen & Associates, section through axis from Old Courthouse to river, Drawing 2 of 4, October, 1957. (JNEM Archives, uncatalogued collection)

and focus. It now stands on a raised base as have all the great vertical monuments of the past ... On the levee side, a broad stairway, a broad monumental stairway leads up to the Arch. It is a symbolic stairway, as well as an actual one, for it symbolizes the movement of the peoples through St. Louis, the gateway.

“The axial relation between the Arch and the handsome, historic courthouse, which it frames, is now much stronger and clearer. The new curvilinear form of the plaza on which the Arch stands and of the roads which wind through the Park all belong to the same ‘parabolic’ family as does the Arch itself. Thus the whole design becomes a more mature and classic design.

“The formal elements of the Plaza and the axial, tree lined mall leading to the Court House are contrasted with the romantic forest areas on each side of the axis — areas in which we envision pools and rock outcroppings and pleasant, winding paths.

“... We have found a compromise with the problem of the railroads, which we think will be a practical as well as an aesthetically satisfactory solution. The tracks of the Terminal railroad now on the trestle have been relocated 100 feet westward and lowered a maximum of 16 feet. The railroad runs in an open cut among the trees. There is a 960-foot long bridge over the railroad where the broad, monumental stairway rises from the levee to the Arch. The

railroad is also bridged, at the north and south ends of the Park. Here the bridges lead to the (Historical) Museum and the restaurant and to the stairways down to the levee at these locations.

“One cannot think of the Park alone. The Park, the City, the west side of the Mississippi and the east side — these are all parts of one composition. On the model, we have taken the liberty of showing a diagrammatic redevelopment on all three sides of the Park. Not only do we believe that this frame of the Park — these edges — ought to be redeveloped, but we see here one of the great opportunities in an American city for redevelopment.”<sup>49</sup>

It is evident from Saarinen’s statement that while the railroad problem forced a reconsideration of the site plan, and the years of negotiations constrained Saarinen to substantial compromise that was at least “satisfactory,” the plan was in the end not driven by the railroads (see Figure 2.19). As with the competition scheme, Saarinen and his design team had a conception of the unified whole.

### The Same Form-World

During 1957 Eero Saarinen, perhaps in consultation with Dan Kiley, spent a great deal of time wrestling with the aesthetics of the site, taking into consideration the major changes caused by the introduction of a series of tunnels and open cuts for the railroad between the Gateway Arch and the Mississippi River, the Interstate highway along the western edge of the site, and the stated needs of the National Park Service. This intensive design period resulted in both men taking a fresh look at the problem of the St. Louis riverfront and completely re-imagining the landscape to complement the magnificent Gateway Arch. Among the many alterations to the site plan, perhaps the most lasting was the creation of a holistic scheme emphasizing the axial relationship with the Old Courthouse, and extending the curvilinear geometries of the Gateway Arch to other site features, especially the paths, stairways, railroad tunnel entrances, flood walls, ponds and roads. Commenting on the plan in January 1959, Saarinen allowed further insight to the Memorial’s development:

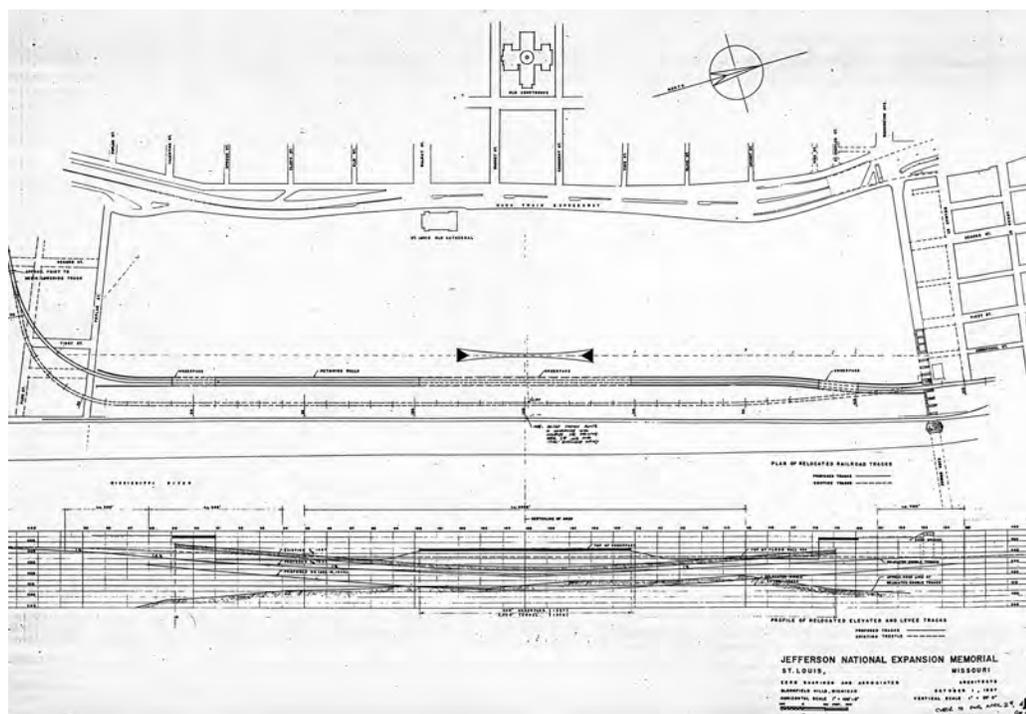


Figure 2.19. Eero Saarinen & Associates, plan and profile of proposed design for relocated railroad tracks, Drawing 4 of 4, October, 1957. (JNEM Archives, uncatalogued collection)

“The formal elements of the plaza and the axial, tree lined mall leading to the Old Courthouse are contrasted with the romantic areas on each side of the axis — areas with pools, rock outcroppings, and winding paths. All the lines of the site plan, including the paths and roads, and even the railroad tunnels, have been brought into the same family of curves to which the great arch itself belongs. More and more I believe that all parts of an architectural composition must be parts of the same form-world.”<sup>50</sup>

From the approved competition plan, only the concept of the Gateway Arch in a forested, park-like setting remained the same. Regardless of what had been lost, to Saarinen’s mind the new site design was better, much simpler and reflected the lines of the Gateway Arch itself: “You see, before it was put together with many different well-related things, but of many different form-worlds. Now it’s going to be all one.”<sup>51</sup>

The curvilinear form permeated the new design, expressed both in plan and section. Consequently, the broad, monumental stairway leading from the levee to the Gateway Arch, was designed to “have treads of

decreasing depth toward the top to dramatize the upward sweep of the approach to the arch.”<sup>52</sup> Considerations of this kind were not taken lightly. In response to concerns that the stairway design might not be safe, Saarinen’s office constructed a full-scale mock-up of the steps in plywood, and ran employees in the office up and down the steps to see if they would trip (see Figure 2.20).<sup>53</sup> Such consistent attention to detail and form continued throughout the process of design and construction.

Even while the form of the Gateway Arch had not changed, its location and relation to the site were distinctly different, forced to move due to the relocation of the railroad tracks. But Saarinen was still satisfied that an improvement had been made.

“The arch in the earlier plans was right on the levee. From the city you went down to it. It was almost at the bottom of the bowl. Now, because of practical things, we had to raise it up. It’s not only the practical things that made me want to raise it up. I also started thinking what vertical monuments are there that you approach going downhill and the only one I could think of was the sunken ship

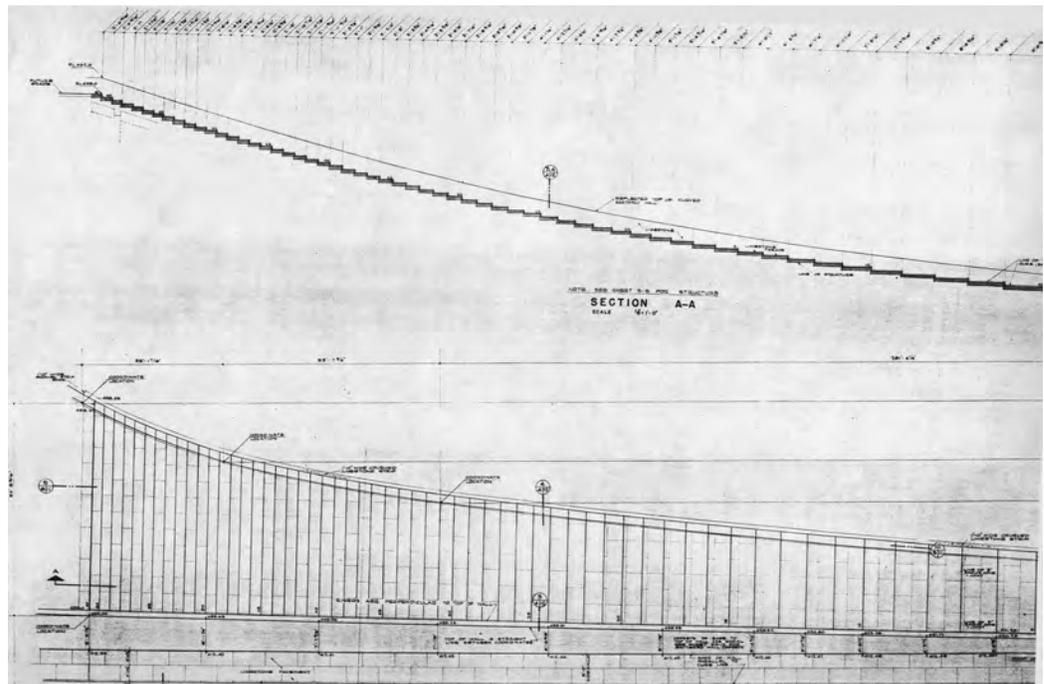


Figure 2.20. Section detail through proposed design for grand staircase, November 1960. (JNEM Archives, Record Unit 120, Drawer 22, Folder 12)

at the bottom of the Spanish Steps in Rome. You cannot place a vertical monument at the bottom of some steps.”<sup>54</sup>

Saarinen had become ever more conscious of the Gateway Arch’s relation to other buildings in the city and desired to raise the base; the base was to give the Gateway Arch “more dominance over the tall buildings of the city” and “it seemed essential as an approach to a vertical monument.”<sup>55</sup>

The strong placement of the Gateway Arch on axis with the Old Courthouse and the generally symmetrical layout suggests Saarinen’s influence as well. Writes one critic, “If you look at Eero’s site plans, you see modern buildings laid out according to Beaux-Arts compositional principles.”<sup>56</sup> The new focus drew naturally from Saarinen’s early Beaux Arts training at Yale University, the more general movement in the 1950’s toward a symmetrical, classical ordering of Modernist building design, and Saarinen’s commitment to the integration of building and landscape. The landscape also took on a highly ordered geometry, this union of geometries in both landscape and building emerging in the work of Saarinen in the 1950s.

Revisions to the conceptual order of the Memorial site therefore did not appear without precedent. Through the summer of 1957, prior to his revealing the revised proposal in October, the plan evolved through a series of site plan sketches prepared by Saarinen in which he experimented with axial layouts and curvilinear forms (see Figures 2.15 and 2.16).<sup>57</sup> Thus, Saarinen’s description of the revised Memorial plan and the preparatory site plan sketches are revealing in another respect. The conceptual basis for the site planning, the idea behind a single form-world, was inherent in his thought; his was the “one mind” through which “it all has to be siphoned.”

### **Kiley’s Role — Planting Plan as Integral to the Whole**

Dan Kiley remained an important team member, and his later descriptions of the Memorial project suggest a prominent role, especially in creating a planting scheme integral to the total conception.

“My basic interest in the landscape was to develop a sense of movement of spatial continuity,” he recalled. “This was done by arranging undulating lines of high tulip poplar trees spaced very close together so they started from either entrance wide and narrowed down to a neck, and then as one turned to the side elevation of the Gateway Arch, the trees would widen up to the base. This development would happen on both sides of the Gateway Arch. This was really the important aspect of the landscape design treatment; the rest of the planting was to provide color and interest with forest groves for sitting and picnicking and on the river side to clothe the banks with masses of flowering shrubs and trees; and finally at the levee included a boulevard of willow trees.”<sup>58</sup>

Favorably, Kiley’s ever-present interest in the spatial qualities of the landscape and this focus on the movement across the landscape in relation to the structure worked hand in hand with Saarinen’s unified conception of a site.<sup>59</sup> Moreover, it lent magnitude to Kiley’s role in the process of designing the Memorial project, and his activities focused on this ideal, refining and developing the planting plan in support of the whole.<sup>60</sup> However, it would not be until late 1959, when Kiley began working on the planting plan in earnest, that he would again become an obvious contributor to the project.<sup>61</sup> Of the planting plan, he would later recall, “... it took a lot of studies, many, many, many.”<sup>62</sup>

### **Revised Plan Approvals**

The new proposal, of course, required the support and approval of numerous groups, not the least being the railroad interests. The U.S. Territorial Expansion Commission rapidly approved the plans, and by the end of November interested parties, including the city, the railroads and the Department of the Interior, agreed to another “Memorandum of Understanding” accepting the revised plans for relocating the tracks. Saarinen even went so far as to accept the continued operation of the three surface tracks along the levee, and therefore, the estimated cost of \$5 million was to provide only for the relocation of the elevated lines. It seemed that the railroad problem was again near resolution, but difficulties briefly presented themselves once

more due to a disagreement over the allocation of costs. Fortunately, the new plan conception accommodated a final solution.

### 1958-1959 — The Site Plan Evolves

The years 1958-1959 were exceptional for the development of the Memorial in comparison to the stops and starts of the previous decade. The revised Saarinen plan presented at the end of 1957 provided the basis for progress and resolution on a number of levels. The railroad problem was resolved in a manner compatible with the plan, and this in turn helped provide the justification for additional funding requests. The revised Saarinen plan also provided the framework for development of the NPS 1959 Master Plan for Jefferson National Expansion Memorial, refining programmatic elements of the Memorial. By the middle of 1959, the site was ready for groundbreaking ceremonies.<sup>63</sup>

### Positive Signs: Railroad Resolution and Increased Federal Authorization

Following the revised agreement for relocation of the elevated railroad tracks, the railroad interests balked, anticipating that their share of the cost of relocation would be excessive. Instead, they favored an open cut without tunnels for the entire length of the Memorial site. The solution had to balance cost with aesthetic considerations, and emerged simply as an alternative whereby Saarinen's proposed 960-foot tunnel would be developed as a less costly open cut roofed with concrete slabs. Saarinen could foresee no changes in the aesthetics of his plan and approved of the concept, as did city and railroad officials. On June 2, 1958, a final agreement was signed by NPS Director Conrad Wirth and Secretary of Interior Marion B. Folsom, opening the way for the use of authorized federal funds for track relocation. The cost was approximately \$3 million, with the railroads and the city together matching the federal contribution. Following a modified ruling by the Missouri Public Service Commission to allow for the new rail line configuration, and payment of the railroad's financial obligation, NPS Director Wirth finally announced that relocation of the tracks would begin in June or July of 1959.

While the railroad problem was being concluded, Memorial supporters pushed for the authorization and appropriation of additional funds. Buoyed by the St. Louis area congressional delegation, a bill for the increased authorization of funds made its way through the House and Senate, and on September 7, 1958, President Eisenhower signed the bill authorizing an increase of \$12.25 million in funds for the Memorial (for a total authorization of \$17.25 million). Additionally, the bill eliminated restrictions on the use of funds for construction of the Gateway Arch itself. While the bill did not provide for immediate appropriation of the money, Congress provided clear evidence that the Memorial would be funded and built. With construction near at hand, the National Park Service named George B. Hartzog, Jr. to the Memorial Superintendent position, following the resignation of Julian Spotts.

### The 1959 NPS Master Plan Document

With a solution to the track relocation, limited appropriations, and authorization for more extensive funding, the site was ready for physical improvement. This meant following the general plan set by Saarinen's revised proposal and preparing the ground for construction of the Gateway Arch. While the dominant feature of the plan remained an arch located in a park setting, programming for the site continued to shift and cause alterations to the plan.<sup>64</sup>

George Hartzog took office on February 1, 1959, and immediately set about the tasks of planning and scheduling necessary to move the project ahead. A key part of all this was the completion of a document detailing the Memorial's development program and associated policies. Titled *Guidelines for the Master Plan, Jefferson National Expansion Memorial*, the document was revealed to the press and city officials at a meeting in the Old Courthouse on March 10, 1959; it was well received and approved by NPS Director Conrad Wirth in October of the same year.

While clarifying the primacy of the Saarinen arch and scheme, the NPS Master Plan furnished new ideas for a museum and other

interpretive features on-site. In conjunction with Saarinen, it was decided that a historical museum was to be included, and that this “Museum of Westward Expansion” was to be housed in a visitor center located beneath the promenade at the foot of the Gateway Arch (see Figure 2.21).<sup>65</sup> In addition, two river overlooks at the north and south ends of the Memorial were to contain exhibits concerning the importance of the river and the railroad in relation to westward expansion.

The plan also required the removal of any remaining buildings and parking lots on the grounds, except the Old Courthouse, the Old Cathedral, and the Old Rock House which was to be reconstructed near the south overlook. A later determination was made not to reassemble the Old Rock House; after it was dismantled, many felt that its integrity rested with its original site, which could no longer accommodate the structure. It was decided instead that the Old Rock House was to be dismantled. The Old Courthouse continued to serve as the NPS administrative and operational headquarters for the area, and to include interpretive elements on the structure’s history and St. Louis’ role in westward expansion. Other interpretive devices called for trail systems within the planted areas, relating to

the Oregon and Santa Fe Trails.<sup>66</sup> As for the Memorial’s role in the city, the plan restricted the location of city-constructed and operated parking facilities to the north or south end of the Memorial, although the plan made it clear that the Memorial was not to be developed and function as another city park.<sup>67</sup>

This matter of the Memorial’s relation to the city, however, was extremely important to Saarinen, and therefore, he continued to work with city officials on the zoning of property near the Memorial, a consideration which began shortly after the competition victory. Saarinen believed that much of the Memorial’s success depended upon the harmonious development of adjacent areas, including the design of a new bridge to handle a proposed interstate highway. The initial result of these efforts was a “gentleman’s agreement” to place a fifteen block area west of the Memorial under redevelopment, coupled with a decision by the city to restrict structures facing the Memorial to a height of 275 feet. A 1967 city ordinance raised the height limit to 306 feet and defined the peripheral area as a new zoning district known as the Jefferson Memorial District. In response, Saarinen chose to increase the height of the Gateway Arch from 590 feet to 630 feet in order to maintain its architectural presence.

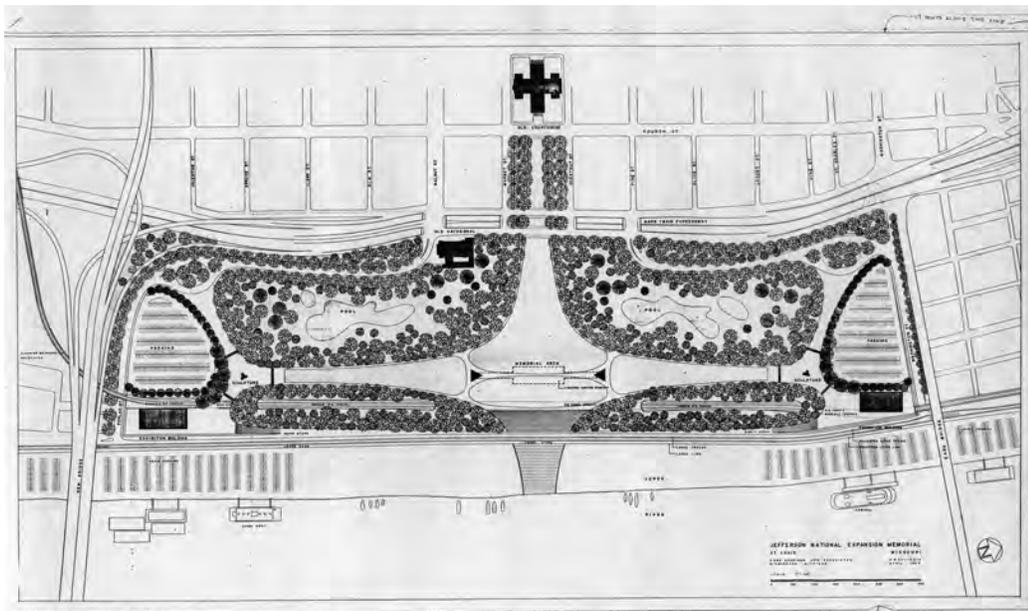


Figure 2.21. Eero Saarinen & Associates, design development site plan, April 1959. (JNEM Archives, uncatalogued collection)

## Groundbreaking

By the end of April, the National Park Service approved plans and specifications for the railroad's relocation as the first phase in the Memorial's development program, and accepted both the railroad's and the city's financial contributions to the track relocation. Following the Missouri Public Service Commission's formal hearing on the plans and specifications, the National Park Service accepted bids and awarded a contract for the work. The first phase of construction had at last cleared all hurdles, and at 10:30 A.M. on Tuesday, June 23, 1959, special ceremonies marked the opening of Memorial construction. On hand were St. Louis Mayor Raymond Tucker, who played a significant role in the railroad negotiations, NPS Director Conrad Wirth, and former Mayor Bernard Dickmann.

## Serious Planning

Construction on the first phase of development was well under way by the end of 1959, beginning with the excavation of the railroad tunnels, and a completion date of 1964 was anticipated for the Memorial (in time for the 200th anniversary of the founding of St. Louis). Therefore, Saarinen needed to move rapidly ahead on detailed plans for various features of the Memorial, consisting of the Gateway Arch, the visitor center, and the overlooks. This required a reinvestigation of the site plan. To proceed, however, he needed detailed data from the National Park Service on administrative, interpretive, and maintenance requirements for the Memorial. This prompted the National Park Service to begin a new round of planning studies in 1960, continuing through 1962.

With the project moving ahead at a quickening pace, Saarinen again looked to Kiley. In a letter dated October 17, 1959, he addressed Kiley's expected role:

"We are sending you ... the site plan of the St. Louis project in its present state. This site plan has finally been approved and it looks as if the project is getting serious now. The railroad tunnel, that is, the relocation of the railroad tracks, is already under contract. Some time after the first of the year we want to get serious

about the overall planning and would like to consult with you on landscaping."<sup>68</sup>

## 1960 — Construction Begins — Initial Planting Plan Proposals

Beginning in 1960, the National Park Service began its most intensive research and planning work on the historical aspects of the Memorial. This included the ongoing restoration of historic buildings; planning for exhibits and the installation of the museum's proposed interpretive units; and even an archaeological investigation of the Old St. Louis site. Rapid yet comprehensive planning was essential, as construction on the first phase of the Memorial was well under way and the 1964 completion date had been publicly announced. The museum planning, however, soon came to represent only one aspect of the complexity of the project. Construction, on-going funding battles, intense planning and programming, and a strict time limit required supreme coordination. Budgetary concerns were also being hinted at by the year's end.<sup>69</sup>

With the National Park Service pursuing its studies, in January contracts were issued to Saarinen for design, working drawings, supervision, and preliminary drawings for the visitor center and Gateway Arch. Kiley was once again heavily involved in the project, officially as the Site and Landscape Consultant, and as such became involved in meetings with NPS representatives and proceeded with development of the landscape plan.<sup>70</sup>

## Construction Schedules, Budget Constraints, and Funding Battles

Under the seemingly tight 1964 completion deadline for the Gateway Arch, a debate emerged as to whether the Museum of Western Expansion should be constructed in conjunction with the Gateway Arch, or instead be constructed and opened sometime later. The latter option was frowned upon by many involved in the Memorial's development, but especially Superintendent Hartzog. He understood the Gateway Arch and the Museum of Western Expansion to be wholly dependent upon one other, and it appeared that the Museum of Western Expansion was on the verge of being relegated to secondary status.

Yet, others felt that the complex engineering of the Gateway Arch (requiring “the best technical minds in structural design and erection, both here and in Europe ... to produce this marvel of modern technology”) and the on-going Museum of Western Expansion research and planning suggested a later construction date.<sup>71</sup> Hartzog battled strongly for simultaneous development and won the support and decision of Director Wirth.

In the midst of this debate, however, rising costs came to the forefront, and Director Wirth decided that the overall program for the Memorial was to be confined to that which was essential to completing the principal elements of Saarinen’s plan. As a result, certain features were pared down, including plans for the complete restoration of the Old Courthouse and construction of the grand staircase. Scheduling and budgetary concerns were compounded by the fact that federal money was appropriated only for the first phase of development, consisting primarily of the track relocation. Although the bill signed by President Eisenhower in 1958 authorized the expenditure of \$17.25 million on the Memorial, little of this money had yet been appropriated. In 1960, despite the best efforts of St. Louis Mayor Raymond Tucker, the U.S. Territorial Expansion Memorial Commission and others, only \$4.6 million could be gained, just enough to continue Memorial development at a minimum for the fiscal years 1960 and 1961.

### **The Planting Design — The Oregon and Santa Fe Trails and Detailed Planting Studies**

Saarinen and Kiley did not anticipate the impact that growing budget constraints and the priority given to the Museum of Western Expansion would soon have on the landscape program. Therefore, they continued in their understanding that the landscape treatment of the site, both conceptually and in detail, was integral to the Memorial’s development. With the design of the Gateway Arch and the main features of the site plan essentially set through the 1957-1959 redesign and with modifications derived from the 1959 Master Plan, the time had arrived to consider more comprehensively and with greater specificity the finished quality of the site. This was Kiley’s job, and he rightly

considered how the overall landscape plan could best be articulated so as to not only provide the proper setting for the Gateway Arch, but also build upon the symbolic, interpretive, and experiential qualities of the site.

A much-discussed aspect of the landscape plan at this stage was the concept of site trails, identified in the 1959 Master Plan document as interpretive elements relating to the Oregon and Santa Fe Trails, and which seemed to play into Saarinen’s 1947-1948 concept of village recreations as specified in the original competition criteria. With the elimination of the village reproductions in the 1957 redesign, however, the trail idea was retained and greatly emphasized.<sup>72</sup>

In response, Kiley’s office prepared a schematic plan and section drawings with elaborate mounding, featuring up to 40-foot grade changes and scaled interpretation of the historic trails (see Figures 2.22 and 2.23).<sup>73</sup> Yet, in response to this effort to create a literal reproduction of the trails as a miniature cross section of the United States and its dramatic mountain ranges, the National Park Service expressed unease. At a presentation of these drawings in late March 1960, it was suggested that the Oregon and Santa Fe Trails be treated in a less literal sense and instead be thought of as a guide to exhibits located in the trail area. Other suggestions were made as well: the planting of cottonwood trees, buffalo grasses, and other western botanical references to highlight the trails and the interpretive experience; and the more strategic use of earthen mounds to screen the two main planted areas incorporating the trails from the proposed Third Street Expressway.<sup>74</sup>

Regardless of this brief focus on an elaborate interpretive trail system, Kiley continued working with the main idea of providing a forested setting for the Gateway Arch. This allowed Kiley the flexibility to quickly abandon the overly literal quality of the Oregon and Santa Fe Trail scheme and focus on the essence of the idea. In effect, visitors were to make their way through the forest, encountering clearings for special features such as the ponds, which first found their way into the site plan beginning in 1957. This idea of clearings in a forest as places for special happenings had

been present in Kiley's and Saarinen's concept for the Memorial since the earliest days of the competition, and a revised planting plan soon emerged which reconfirmed the commitment to this ideal and eliminated the fanciful quality of the trails (see Figure 2.24).<sup>75</sup>

At the same time, Kiley's office prepared more detailed plans for the areas immediately surrounding the railroad cuts, specifying particular plant species to visually screen these rather intrusive features (see Figure 2.25).<sup>76</sup> By September 1960, the detailed plans addressing the railroad cuts, and a revised conceptual landscape plan for the site were prepared and again presented to the National Park Service at a meeting in which Director Wirth was in attendance.<sup>77</sup> Apparently, Wirth was not pleased with the result, largely due to looming budget problems, but the full consequences of his displeasure would not be made known to Saarinen and Kiley until the following year. Thus, much as the railroad problem caused a reassessment of the competition site plan, outside constraints would soon cause a reassessment of the landscape plan.

### Highway and Railroad Considerations

While Kiley was engaged in the development of the landscape plan, Saarinen remained vigilant in affecting development peripheral to the Memorial site. In particular, the proposed interstate highway bridge to be located south

of the Memorial area attracted Saarinen's attention. He felt that this bridge could be a positive addition, working with the Eads Bridge north of the Memorial area to tie the complex together. Of course, he was concerned with the aesthetics of the bridge and that the design be sympathetic to the Memorial. As a result tentative discussions were held which suggested depressing the expressway approaches on the Missouri side of the river.

The NPS also remained concerned with the remaining surface railroad lines running east of the Memorial, and in 1960 made a decision to pursue the relocation of these tracks. A primary consideration was to provide ample street width along the levee in order to accommodate automobile traffic. It was agreed by the affected parties that this could be accomplished through the consolidation of the three existing tracks into one track, a relatively easy determination by comparison to the railroad controversies of previous years. Saarinen and Kiley imagined this area as becoming a tree-lined boulevard with the rail line running down the middle. The boulevard would act as a transitional element between riverfront activities and the Memorial.<sup>78</sup>

The year 1960 ended with success on many fronts. Museum planning was on track, budget concerns were resolved, a landscape plan to complement prior site planning was developed, and potentially divisive issues

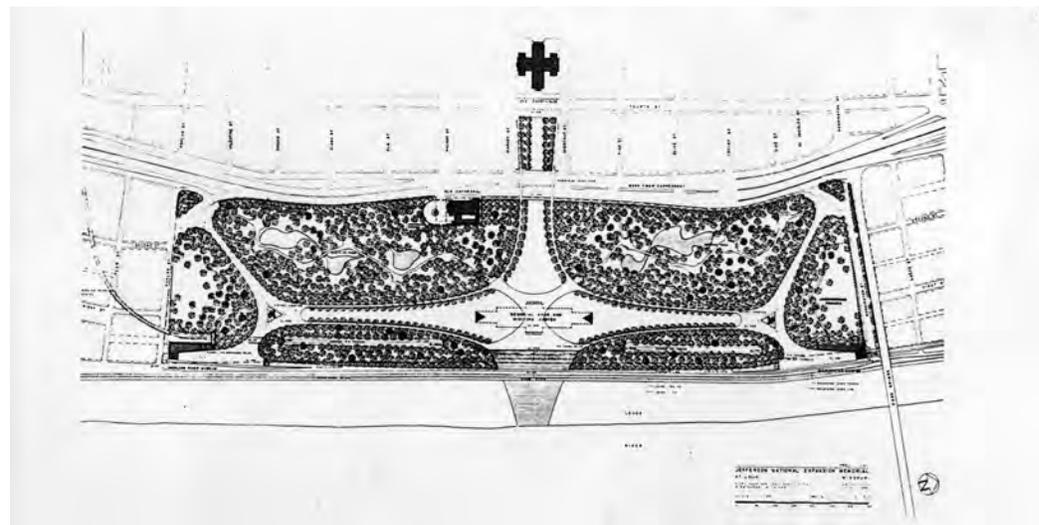


Figure 2.22. Office of Dan Kiley, schematic planting plan, February 1960. (JNEM Archives, uncatalogued collection)

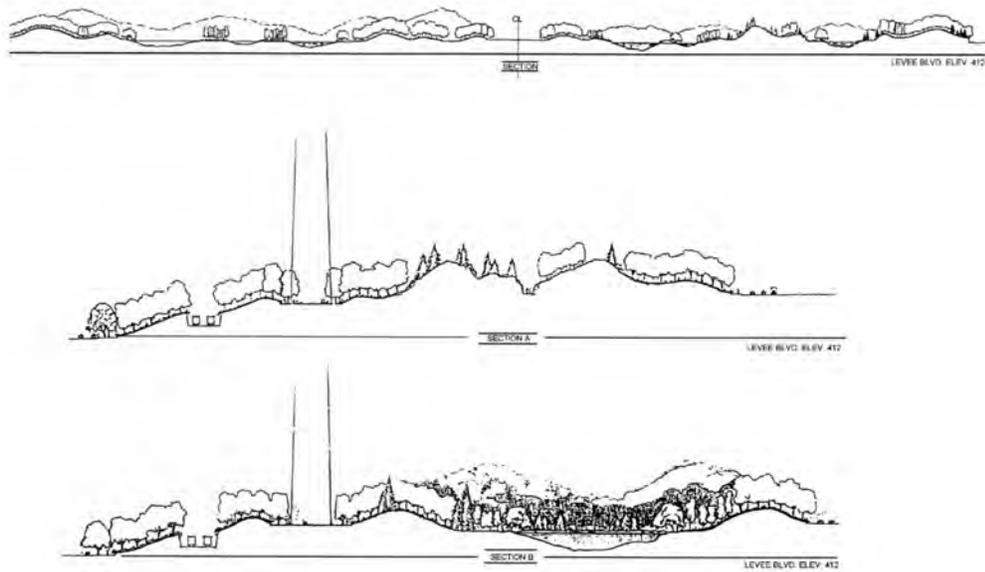


Figure 2.23. Office of Dan Kiley, sectional studies, February 1960. (JNEM Archives, uncatalogued collection)

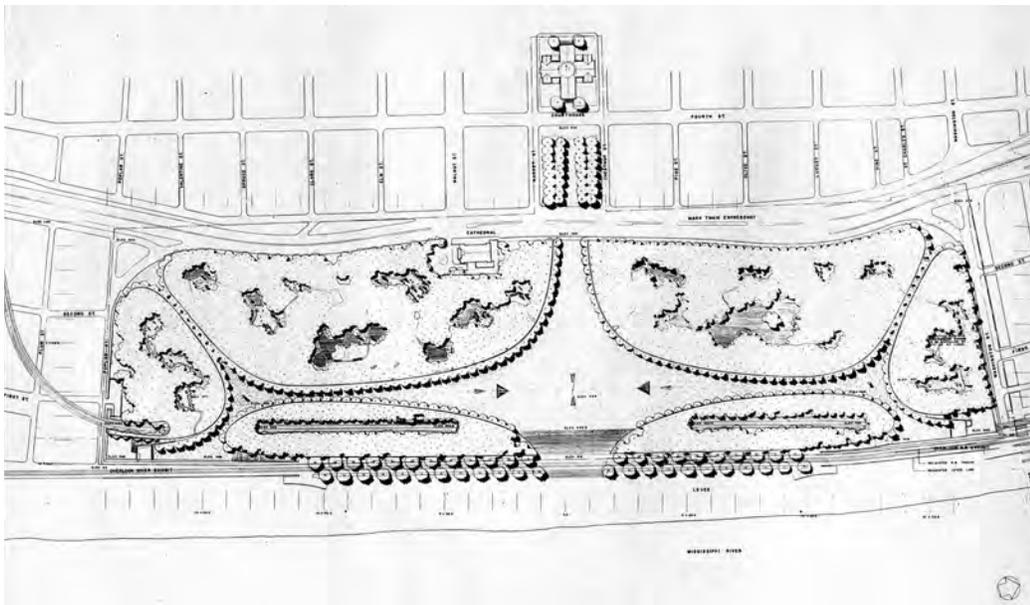


Figure 2.24. Eero Saarinen & Associates, revised site plan, August 1960. (JNEM Archives, uncatalogued collection)

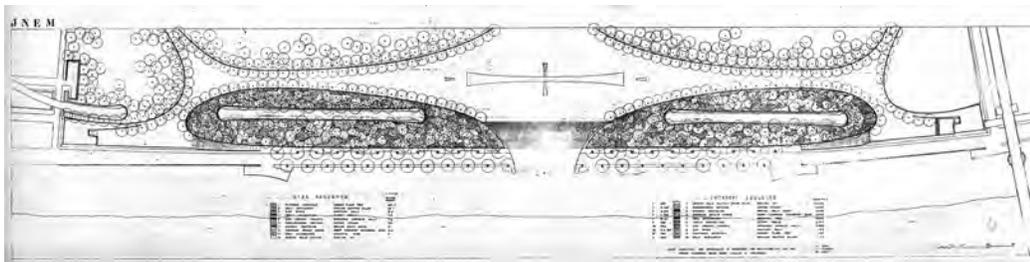


Figure 2.25. Office of Dan Kiley, planting plan of areas adjacent to railroad cuts, August 1960. (JNEM Archives, uncatalogued collection)

of peripheral development were settled in favor of the Memorial. Moreover, construction was proceeding well; the railroad relocation contract was approximately 50 percent complete by the end of the year, and the National Park Service was ready to award a contract for the levee construction. Appropriating funds from Congress appeared to be the only obstacle to timely completion of the Memorial project.

### 1961-1964 — Refining the Planting Plan

Although 1960 ended on a positive note for the Memorial's development, budget constraints continually delayed the project and forced ongoing cutbacks. By 1964, it was apparent that the landscape program would be the big loser. Ironically, after the funding struggles of the previous year, significant money was finally appropriated in 1961.<sup>79</sup>

### Substantial Federal Funds

On August 3, 1961, President Kennedy signed the 1962 fiscal year Interior Department Appropriation Bill which included approximately \$9.5 million for construction of the Memorial, an amount which covered almost the entirety of the remaining authorized federal moneys. Congressional approval was eased by project backers such as St. Louis Mayor Raymond Tucker, who guaranteed that the Memorial would be finished within the amount of the \$17.5 million federal authorization. As of December 1961, the total authorization of funds from a combination of federal and local sources stood at \$23 million, with about \$3.3 million remaining to be appropriated. This was in addition to the approximately \$9 million spent between 1935 and 1959.

### Preserving the Basic Design

In order to keep within the promised budget limit, Saarinen pursued further alterations to the plan while attempting to preserve its basic concept and retain a workable program in regard to the Memorial's function and operation. As a result, Saarinen deleted certain details and finishes, and cut back the square footage of finished exhibit space. This was not enough; NPS Director Wirth's cutbacks were more decisive.

Wirth agreed that certain desirable but nonessential elements would have to be eliminated to keep under budget and directed additional cost reductions while expanding the role of the National Park Service in the Memorial's design and development. Among the changes, it was decided to separate the contract for the interior construction of the Museum of Western Expansion from the contract to cover construction of the Gateway Arch and the shell of the visitor center and Museum of Western Expansion. This was to accommodate complete design of the exhibit spaces and exhibits by the National Park Service. A reduction in the scale of the north and south overlooks was also ordered.

Especially difficult for Saarinen, Director Wirth required that the landscape and utility programs be greatly reduced, anticipating that Jefferson National Expansion Memorial could solicit donations for the landscape program. Yet, Wirth's directive went even further; the landscape program was to be undertaken by the National Park Service, and Wirth stated that no dunes, mounds, or lagoons should be included in the landscaping despite their presence in Saarinen's design.<sup>80</sup> In effect, it seems that Kiley was to be removed from the project despite the need for a major reconsideration of the planting program.<sup>81</sup> By the end of 1961, planning, bidding, and work schedules were effectively complete, consistent with Wirth's cost reductions. Construction work was divided into four phases. Phase I primarily involved relocation of the tracks and was nearly complete, with operation of the trains on the relocated tracks beginning at year's end. Phase II began early in 1961 and consisted of museum planning, levee redevelopment with construction of the north and south overlooks, construction of the Gateway Arch foundations, and the visitor center/Museum of Western Expansion excavations. Phase III was to cover construction of the Gateway Arch and the visitor center/Museum of Western Expansion, and a portion of the final landscaping. Phase IV would involve the final landscaping. A completion date of 1964 was still envisioned.

While project proponents, especially Saarinen, battled to retain the essence of the Memorial design, a greater tragedy struck. Eero Saarinen died suddenly and unexpectedly of a brain

tumor on September 1, 1961, at Ann Arbor, Michigan. Many of those who knew Saarinen believed he was entering his most productive years, and mourned the loss of a great architect. His partners, Joseph Lacy, John Dinkeloo, and Kevin Roche supervised the completion of Saarinen's projects, including the Gateway Arch. Because the site planning and Gateway Arch design were by this time essentially set, his death did not result in radical changes to the concept and design. Nonetheless, prior to Saarinen's death he found the need to argue for the necessity of retaining Dan Kiley to prepare the landscape plan, a collaboration and a plan he always viewed as imperative to the Memorial's success. In many respects, Saarinen was successful in this regard, but as the final phase of development, the landscape design of the site was the most compromised and most delayed.

### The Planting Program

Director Wirth's decisions to scale back the Memorial's development program directly affected Kiley, especially the decision to have NPS staff oversee the landscaping program. This revealed an important area of disagreement between the National Park Service and Saarinen in dealing with the budget constraints. To Saarinen, the Gateway Arch was the most important aspect of the Memorial design, followed by the landscaping of the grounds, a reflection of the original conception of the Gateway Arch within a wooded setting. The National Park Service, on the other hand, felt that the Gateway Arch and the Museum of Western Expansion were the most crucial aspects of the Memorial, evident in Hartzog's desire to see museum development keep pace with the Gateway Arch construction.<sup>82</sup>

While Wirth wished to make better use of the NPS staff for planning and architecture, Saarinen remained loyal to Kiley and his contribution to the project, and sought to modify Wirth's decision as it would clearly minimize Kiley's role. He instead desired that Kiley at least be retained for the design work, and from this work the NPS staff could prepare working drawings and specifications, and supervise landscape installation. Saarinen wrote to Kiley: "I will also appeal to him on the basis that you were part of the competition, on

the basis that it is such an essential part of the architecture, that it is impossible to work with a new person, etc."<sup>83</sup> Meanwhile, the Kiley office continued its research into appropriate plant species for the area, apparently anticipating a continued role in the design process.<sup>84</sup>

Saarinen, however, was well aware of the budgetary constraints, and addressed the matter by asking Kiley to alter his preliminary landscape plan according to Wirth's requested changes. As Saarinen viewed it, Wirth presented three criticisms of the plan: 1) he disapproved of the extensively sculptured ground because the expressway was to be depressed and therefore not create a noise problem; 2) he did not favor the extensive use of underbrush because of policing problems, nor did he care for the use of tall trees for reasons of cost; and 3) "He did not at all like the budget." Saarinen continued in his letter to Kiley: "I will take full responsibility for the amounts and promise to eliminate them and I think it would be well for you to think of eliminating the underbrush and agreeing to work within a practical budget."<sup>85</sup>

In response, Kiley agreed to abide by these constraints, but clearly unhappy, indicated that the Memorial's design intent was compromised. He wondered "Is there not some way based on the rules of the competition that we can insist on doing the work based on our own design philosophy ... I do feel the tall tree forest covering the whole site is the most important landscape design element and regardless of what happens, I hope that you can retain that."<sup>86</sup>

Although Saarinen was successful in retaining Kiley for conceptual landscape design services on the Memorial, it was clear that the planting plan would have to be reconsidered in light of the increasing budget constraints.<sup>87</sup>

Late 1961 and early 1962 was a time of regrouping for the design team, following Saarinen's death, with Kevin Roche of the Saarinen office meeting with Kiley's office to reassess the landscape design.<sup>88</sup> From this point until the final planting plan was completed in late 1964, there was consistent activity from Kiley's office in preparing planting plan variations (see Figure 2.26). Yet, by the end of 1962,

the conceptual plan for the planting of the Memorial shifted considerably, and the variations revolved around a common conception, a planting of forest and meadow.

Budget constraints forced Kiley to reassess the relationship of forest to clearing, as the opportunities to create special site features and an extensive, tall tree forest were lost. As a result, the curvilinear scheme for the walks remained the same, set by the Memorial's earlier site planning, but much else changed. The remainder of the site, which had always been presented as heavily forested, was changed to depict areas both as heavily forested areas and two extensive open meadows. Kiley intended to present a contrast between the open meadow and forested area, a simple presentation of nature.

But the most important aspect of the planting plan remained the idea of forest as setting for the Memorial, and rather than relying on the entire site to emphasize this relationship, it was to be most strongly emphasized through the trees lining the curvilinear walkways. To create this effect, Kiley proposed lines of closely spaced tulip poplar (*Liriodendron tulipifera*) trees three rows deep for most of the length of the walks. Thus, the character of the walkways themselves changed in the sense that the walks

became more heavily lined with trees than prior plans had shown.

The new conception first emerged in a series of drawings prepared by Peter Ker Walker of the Kiley office in late 1962, watercolor renderings completed as part of a promotional package requested by the National Park Service. Included were a plan and perspective drawings featuring views of the Gateway Arch in different seasons of the year (see Figures 2.27 through 2.31).<sup>89</sup> The National Park Service, however, was dissatisfied with the plans, their quality, and that the main walks were too heavily planted with trees, and wished to see their numbers reduced so as to better afford views of the Gateway Arch along the walks.<sup>90</sup> In this matter the National Park Service failed to understand Kiley's thinking about movement and "spatial continuity."<sup>91</sup> Future variations of the plan continued to feature curvilinear walks heavily lined with multiple rows of tulip poplars.

#### Planting Plan Variations and Plant Research

A new set of drawings was prepared by Kiley's office for a March 18, 1963 meeting with the National Park Service. At this time it was agreed that the tree massing should reinforce the plan of the walks, and that the plan should

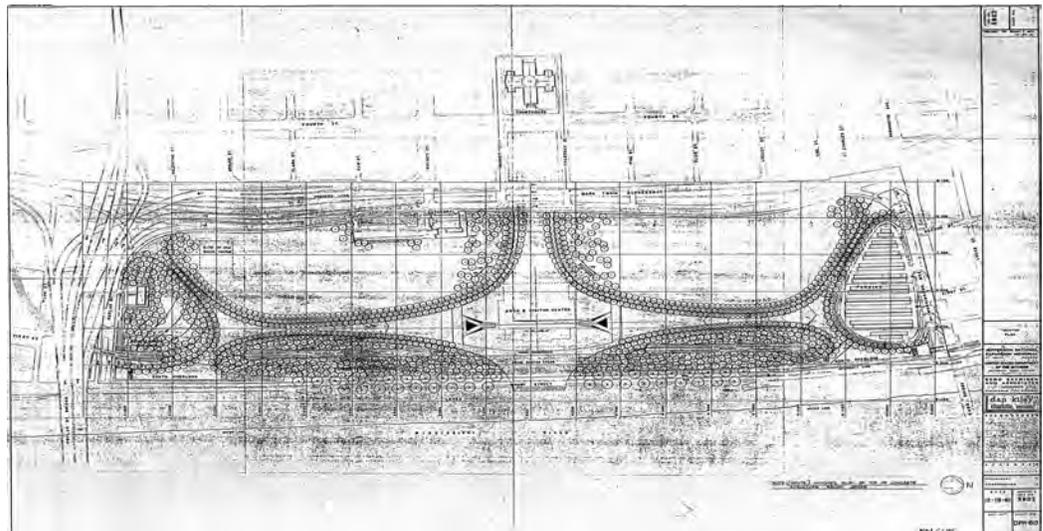


Figure 2.26. Office of Dan Kiley, schematic planting plan, December 1961. (JNEM Archives, uncatalogued collection)

hold to the concept of contrasting closed spaces and open areas; thus Kiley's basic conception was accepted. Therefore, while the National Park Service was concerned that the Kiley office review their proposed plant species with a materials list provided by the City of St. Louis, Department of Parks, Forestry and Recreation, Kiley and the National Park Service were approaching a planting plan suitable to both parties.<sup>92</sup> Over the course of the next few months, the plan changed through the incorporation of new alignments to the expressway and the paths leading to the Old Courthouse. Earlier in the year, Saarinen's office had already explored a variety of schemes for bringing pedestrians across the expressway from the Memorial to the Old Courthouse.

Although certain species such as the tulip poplar were favored in earlier schemes, plant species were finally decided upon only after much further investigation, accounting for earlier research efforts and responding to NPS requests. In 1963, while the planting plan was evolving in accordance with the new conception, Kiley's office again contacted numerous sources for input on proposed species, including the Missouri Botanical Garden, and the City of St. Louis, Department of Parks, Recreation and Forestry.<sup>93</sup> The responses were

favorable to the species chosen, with a few exceptions, and Kiley relied on the information provided, with one exception. One of the sources contacted was Harland Bartholomew and Associates (HB&A), a planning and landscape architecture office located in St. Louis. Their office recommended against the use of the tulip poplar on aesthetic grounds, the only source contacted which answered negatively. "The Tulip Tree loses its leaves very early here," they noted. "Because so many other trees put on a very fine leaf show for us, it seems a shame to devote any space to this one. I would omit it completely."<sup>94</sup> In the final planting plan from Kiley's office, approved by the National Park Service, the tulip poplar remained. The tulip poplar had too many other qualities that recommended its retention, such as its scale, stature, and fast growth, which Kiley found essential to the design (see Figure 2.32).

By September 1963, a new set of presentation drawings was complete, including a sequence of study sketches depicting views throughout the Memorial (Figure 2.33). These sketch views included studies of ponds (which had disappeared following Wirth's landscape cutbacks in 1961) within the Memorial site, which had returned as reconsidered elements on some of the drawings (Figure 2.34).<sup>95</sup> Robert G. Hall, chief of the NPS Eastern Office of Design and

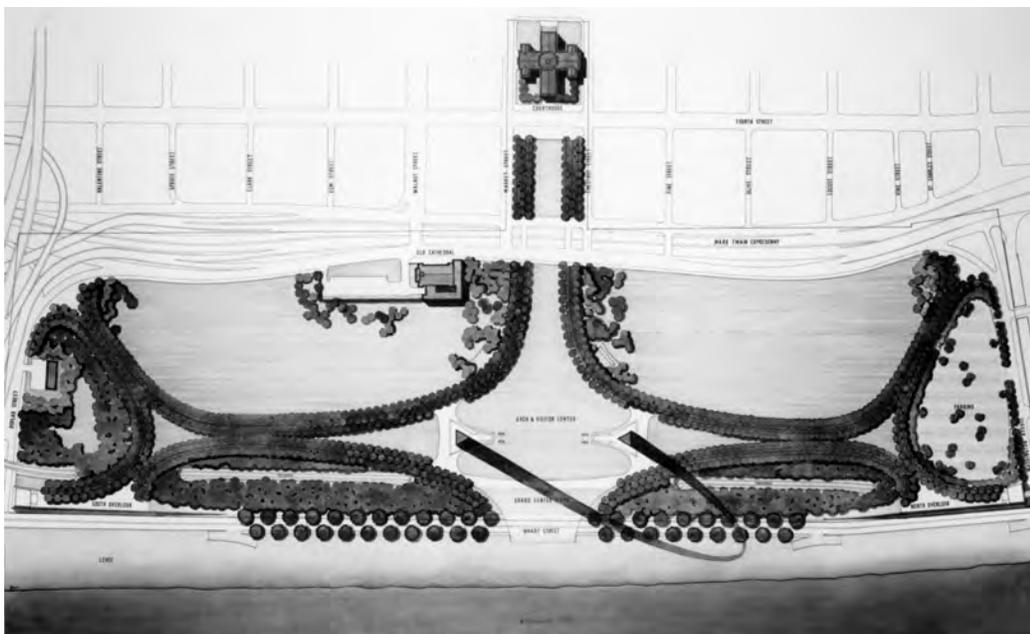


Figure 2.27. Office of Dan Kiley, design development plan (watercolor), December 1962. (JNEM Archives, reference photograph collection)



Figure 2.28. Office of Dan Kiley, "Approach to Gateway Arch from Southwest, Summer," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)



Figure 2.29. Office of Dan Kiley, "Wharf Street Looking North, Autumn," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)

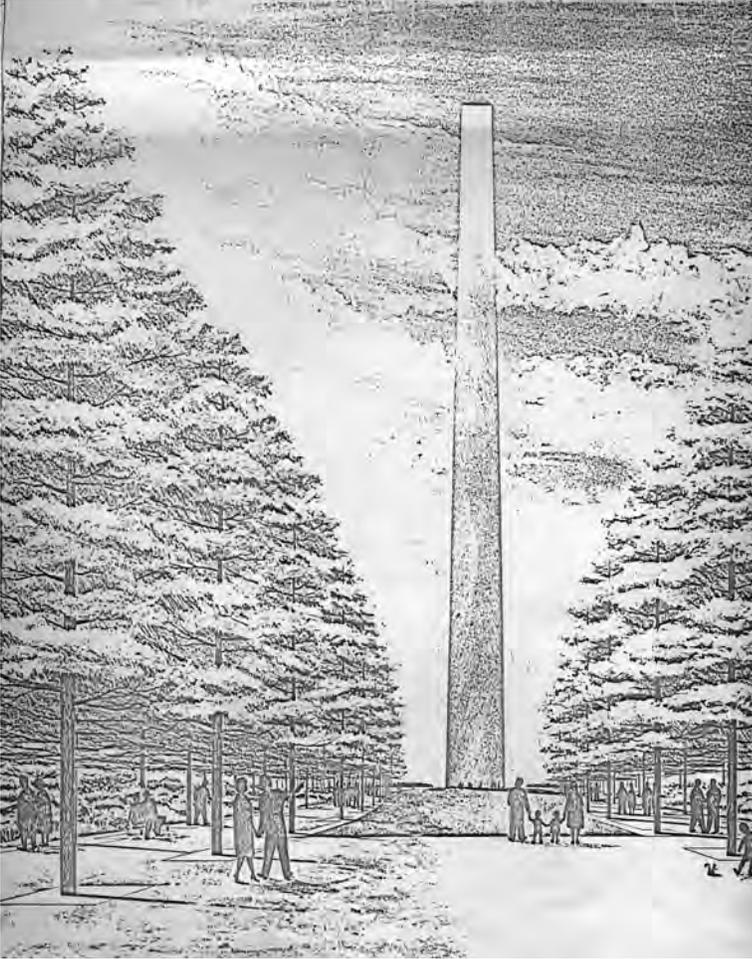


Figure 2.30. Office of Dan Kiley, "View Towards Arch from C-C," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)

Construction (EODC), responded favorably to the plans, although he expressed some reservations about the ponds: “Mr. Kiley did a very fine job presenting the revised plans, and we are most happy with the results.” Some minor modifications were requested as the design of the pedestrian bridges over the expressway was still in flux.<sup>96</sup> Nevertheless, a major hurdle had been crossed. On November 4, 1964, the Office of Dan Kiley shipped the final conceptual landscape drawings to the National Park Service for approval.<sup>97</sup>

Construction on the Memorial proceeded apart from a finished planting plan, as it had already been decided that the landscape program would be a subordinate phase of development. On March 14, 1962, Director Wirth signed the contract for construction of the Gateway Arch, and the first concrete for the foundations was poured on June 27 of the same year. Yet, by the end of 1962, financial troubles emerged more seriously than before.

Although extensive cutbacks in the project had been decided upon during the previous year, it was becoming evident that the cost of the Memorial project would exceed original estimates. As a result, the National Park Service decided that it would have to change its stand and request congressional funds

above the limit that had been promised. Wirth recognized that this would be an inevitable outcome if the project was to be completed in accordance with the basic plan. Even so, funding from other sources was pursued. For instance, through a bond issue, the Bi-State Development Agency (established by the states of Missouri and Illinois to promote planning in and around St. Louis) provided for the construction of the transportation system to take visitors to the top of the Gateway Arch. This was critical, as the transportation system was regarded as a key public attraction and there were no federal or local funds to build it.

The new construction stirred up interest from the press and surrounding community, and the first stainless steel section of the Gateway Arch was set in place on February 12, 1963. By the end of that year the north leg of the Gateway Arch stood at 168 feet, and the south leg measured 120 feet. In addition, Phase I and Phase II of the Memorial’s construction were essentially complete by the end of 1963, and NPS staff had made considerable progress toward completion of the research, planning, design, and specifications for exhibition units. Work on the Third Street Expressway also began in 1963, following plans to depress the expressway in front of the Memorial.

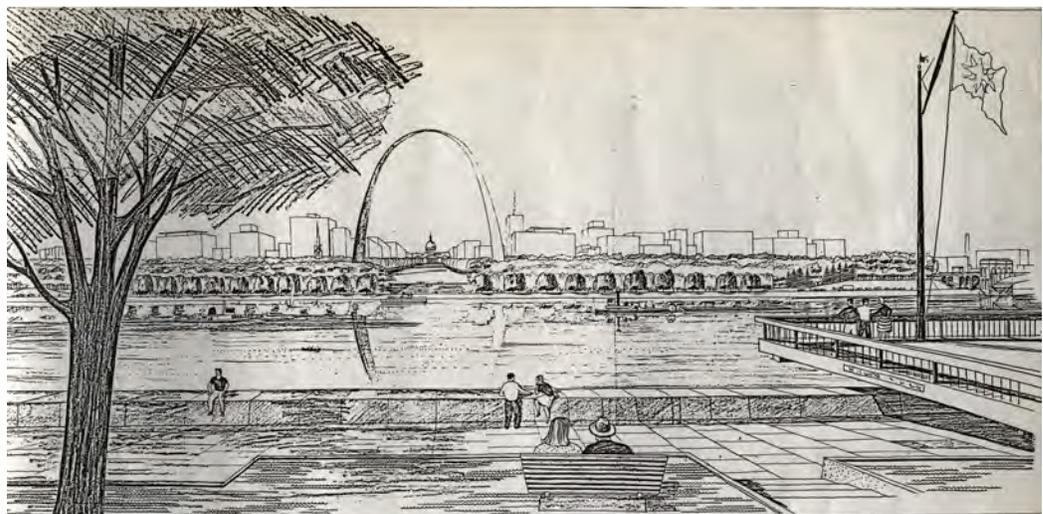


Figure 2.31. Office of Dan Kiley, “View from East St. Louis,” design development drawing, December 1962. (JNEM Archives, uncatalogued collection)

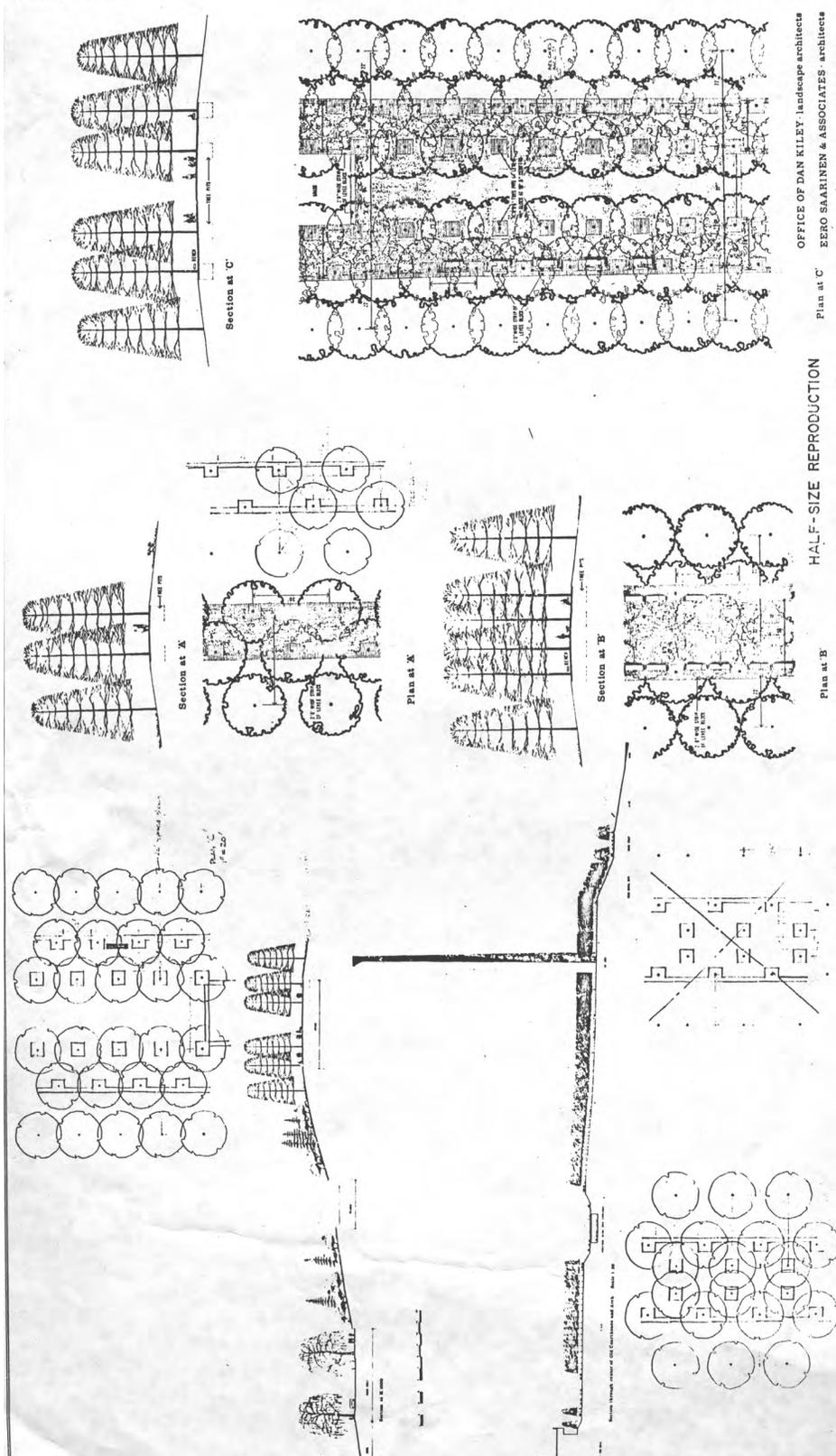


Figure 2.32. Office of Dan Kiley, section and plan details of walks and tulip poplar plantings, design development drawing, March 1963. (JNEM Archives, uncatalogued collection)

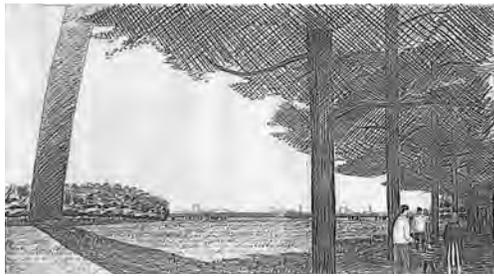
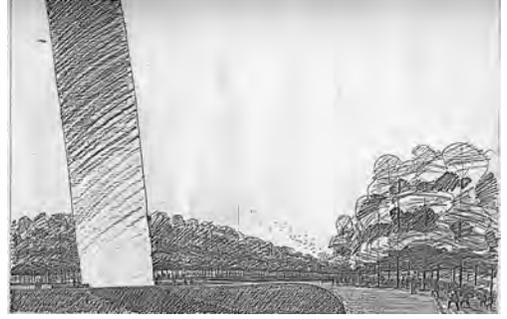
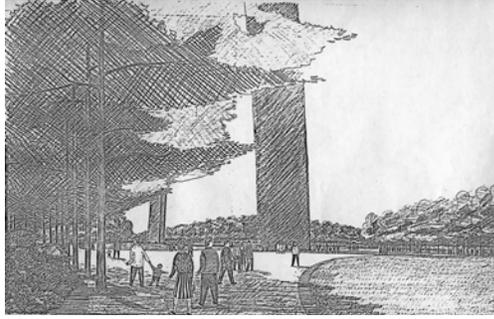


Figure 2.33. Office of Dan Kiley, study sketches of proposed views within the Jefferson National Expansion Memorial, September 1963. (JNEM Archives, uncatalogued collection)

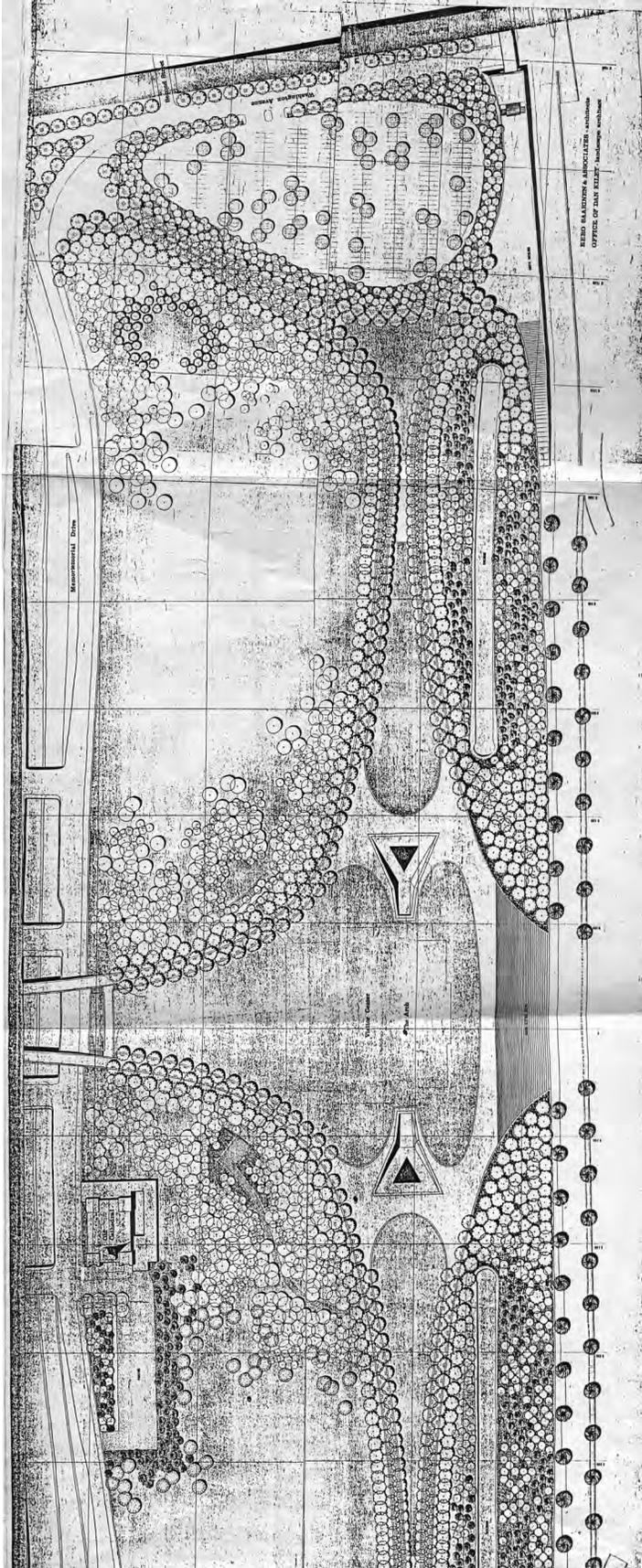


Figure 2.34. Office of Dan Kiley, final conceptual planting plan, 1964. Note absence of ponds. (JNEM Archives, uncatalogued collection)

Despite work stoppages along the way, including a delay to check the structure's stability, the north leg of the Gateway Arch reached almost 326 feet high and the south leg just over 347 feet by the end of 1964.<sup>98</sup> Nonetheless, with the passing of the city's 200th anniversary, and public interest at its height because of the ongoing construction, pressures to complete the Memorial and to do so rapidly were extreme. By this time, however, the National Park Service would give no assurances regarding the completion date, and was preparing to seek additional funds from Congress.

### 1965-1966— Kiley's Final Plan Approved

In 1965 the pursuit of federal funds was renewed, this time in excess of the ceiling established with the \$17.25 million authorization. With George Hartzog, Jr. as the new Director of the National Park Service, an increase to \$23.25 million in authorized funds was sought. He felt that the additional \$6 million would place the National Park Service in excellent financial shape to finish the project in accordance with the basic elements desired; he especially wished to see the Museum of Westward Expansion completed in a timely fashion. Meanwhile Mayor Raymond Tucker hoped that the additional funds would permit the construction of the grand staircase leading from the river to the Gateway Arch, which had previously been cut from the development program. With the backing of senators from a number of states, President Lyndon Johnson signed a bill on October 19, 1965, authorizing the additional funds.<sup>99</sup>

### The Gateway Arch's Last Section

The last section of the Gateway Arch was put in place at a public ceremony marking the occasion on October 28, 1965; with this section added, the Gateway Arch structure stood complete at 630 feet above the city. Much work remained to be done until the Memorial's dedication, including interior work on the Gateway Arch itself, such as completion of the all-important transportation system. In fact, due to the various struggles in acquiring funds and completing the work, the Memorial was not dedicated until May 25, 1968, twenty years to the day after the U.S. Territorial

Expansion Memorial Commission accepted Eero Saarinen's design for the Gateway Arch. Even with the dedication, two crucial elements remained incomplete that were certainly vital to Saarinen's complete conception: 1) the landscaping of the grounds and 2) the Museum of Westward Expansion.

### Kiley's Final Planting Plan

The conceptual planting plan, which Saarinen fought to have Kiley prepare, was eventually completed and approved in accordance with the ideas explored and settled upon during the previous few years. Approval came in the form of the printed signature of NPS Director George Hartzog on the final plan drawing on February 2, 1966 (see Figure 2.35).<sup>100</sup> This then was to be the plan to guide the future landscaping of the Memorial grounds, a plan which in certain respects would be deviated from over the years.

The plan as approved reveals and reinforces the site planning strategy largely devised by Saarinen. The roughly bilateral form is clear, as are the sweeping curves of the walkways which reflect the form of the Gateway Arch. Emphasizing this structure were Kiley's proposed tulip poplars, typically planted in three parallel rows, which line the major walks and bring the Old Courthouse into the whole composition. The remainder of the site takes the quality of the tall forest and low meadow, areas densely planted with tall trees and flowering trees at the edges that are distinct from two large and open grass areas. The ascending quality of the tulip poplar, tightly planted in a regular fashion, dominates the remaining wooded areas mixing white oak (*Quercus alba*), red oak (*Quercus rubra*), hackberry (*Celtis occidentalis*), and maidenhair or ginkgo tree (*Ginkgo biloba*); the tulip poplar is the one tree that dominates Kiley's abstracted forest. Only the tulip poplar has the stature to bring the pedestrian into direct relation with the immense Gateway Arch.

Along the wooded edge and leading into the meadows are flowering trees, primarily eastern redbud (*Cercis canadensis*) and flowering dogwood (*Cornus florida*) for color and texture. The lagoons, which Conrad Wirth initially ordered removed, reemerge in the



midst of either meadow as large ponds with a complex form and extensive outline. The form of the lagoons might be described as idiosyncratic; the water's edge interacts with the edges of Kiley's forest to create intimate spaces. In the completed Kiley plan the composition becomes the unified and serene park setting initially envisioned for Saarinen's majestic Gateway Arch.

### 1966-1978 — Construction Document Preparation

Upon Director Hartzog's approval of Dan Kiley's design development plan, it was forwarded to the NPS EODC in Philadelphia. Careful analysis of both the 1966 approved Kiley plan and the NPS first phase development plan revealed that revisions to the plant composition and open space, as well as other seemingly minor alterations to the plan during the preparation of construction documents, ultimately clouded the original design intent. Documentation of the preparation of construction documents and specifications, the contractors involved, and the modifications which were made to the plan are provided below.

#### NPS Modifications

Construction documents and specifications based on the 1966 approved plans were completed over a 12-year period by the NPS design and construction offices and by a local St. Louis firm, HB&A. Financial opportunities and constraints at different times during the long implementation process of the project required reformatting of the drawings into different bidding packages. Because the implementation of the landscape development spanned 12 years and the hands of many different professionals, the history can be quite confusing. The following section documents the National Park Service and HB&A's role in the design development of the Gateway Arch landscape.

Financial and programmatic delays held the project up until 1969. It was in April, in the NPS's San Francisco Planning and Design Office, that Landscape Architect John Ronscavage led the development of construction drawings and specifications for the

landscape surrounding the Gateway Arch.<sup>101</sup> According to Mr. Ronscavage, the National Park Service had every intention of following Kiley's approved design development plan as closely as possible.<sup>102</sup>

It was no secret that St. Louisans were unhappy about the dismal landscape surrounding their newly constructed \$14.5 million Gateway Arch.<sup>103</sup> In response to their concerns, John Ronscavage and the design team focused on preparing construction documents for as much of the landscaping as the budget would allow. The initial package prepared for bidding purposes included both grading and planting of the north-south axis of the Gateway Arch, as well as repairs to the visitor center roof (waterproofing), and drainage (see Figure 2.36). The design team hoped that completion of this work would change the appearance of the Gateway Arch grounds considerably and temporarily satisfy the local community.

The construction documents were completed in August 1969.<sup>104</sup> Several differences between these and the approved design development plan were noticeable. First, the design team removed the lagoons from the plan because at that time money was not available for their construction. They also removed fountains on either end of the park for the same reason.<sup>105</sup> The plant list remained the same except for the substitution of white pine (*Pinus strobus*) and Austrian pine (*Pinus nigra*) for Canada hemlock (*Tsuga canadensis*).<sup>106</sup> The substitution resulted from discussions between the National Park Service and the City Forestry Department in which they noted Canada hemlock was not suited to the conditions at the Memorial site (acid soils are necessary and they are intolerant of wind and pollution).<sup>107</sup>

A second notable revision came in January 1970 with another change to the plant list. The design team removed the ginkgo tree from the list. The reason for this is unknown and seems unusual because correspondence dated after January 1970 suggested that the ginkgo was a suitable tree for the on-site conditions and was previously approved by the National Park Service.<sup>108</sup> Nonetheless, the bidding package was put together using these drawings and

“Site Development Phase I” was scheduled to open for bids on March 19, 1970.

### Plant Substitutions

Before the official opening of bids for the first phase of landscaping took place, NPS plans and specifications met with criticism. In a March 12, 1970 article in the *St. Louis Globe-Democrat*, members of the Greater St. Louis Nurserymen’s Association publicly criticized the heavy use of tulip poplars.<sup>109</sup> Several other nurserymen confirmed that St. Louis was the “northernmost boundary” for the tulip poplar and that it would “leaf scorch and drop leaves all summer long ...”<sup>110</sup> Other concerns included the risk of planting a monoculture, combining earthwork, walk construction and planting in the same contract, the large size of trees specified, and restricting the source of plant material to a 50-mile radius around St. Louis.

The article prompted public debate and local citizens even wrote letters to their Missouri congressmen.<sup>111</sup> Senator Thomas F. Eagleton and Congressperson Leonor K. Sullivan responded by contacting Director George B. Hartzog and others to inquire about the situation.<sup>112</sup> These inquiries were sent through the appropriate channels for consideration. All bids received for the work exceeded the government estimate and therefore were discarded. The design team repackaged the proposal and eliminated the planting portion,

thereby buying time to deal with the controversy over the plant list.

The repackaging resulted in three new sets of construction documents, two new phases of site development and one phase of planting. The new “Site Development Phase I” consisted of grading the north-south axis of the Memorial, installing temporary crushed stone walks, waterproofing the visitor center roof, drainage, and seeding.<sup>113</sup> The final revision on this drawing was made in April 1970 and the work was contracted in June of the same year.

The second set of drawings, titled “Site Development Phase II,” consisted of water mains, storm drainage, electrical distribution, paving roads and walkways, addition of topsoil, lawn seeding, and planting wells for the trees (all along the north-south axis of the Gateway Arch).<sup>114</sup> This work was contracted shortly after Phase I. Kiley’s approved plan did not specify paving materials for the walks, and the National Park Service specified exposed aggregate in these drawings. Exposed aggregate was being used at nearby Kiener Plaza and the team thought it would be appropriate to use the same material on the Gateway Arch grounds.<sup>115</sup>

“Planting Phase I,” dated August 1971, consisted of planting trees on the east slope of the railroad tunnels and along the walks (see Figure 2.37).<sup>116</sup> By the time these draw-

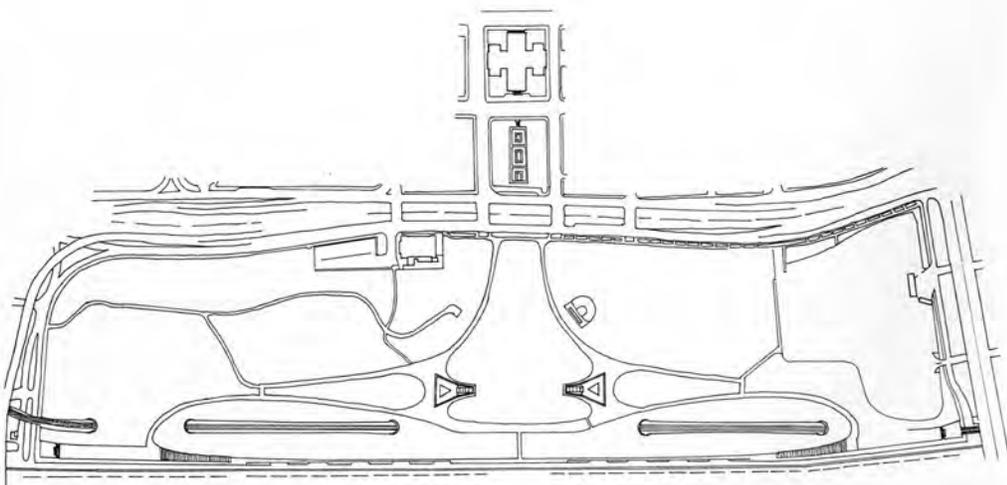


Figure 2.36. Limits of construction, Phase I. (Bellavia, 1996)

ings were completed, two of the three plants specified for Phase I had been substituted. The dominant plant species was changed from the tulip poplar to the 'Rosehill' white ash (*Fraxinus americana* 'Rosehill'), and the Canada hemlock was replaced with Japanese black pine (*Pinus thunbergiana*). These were the final construction drawings developed by the NPS design offices for the initial stages of development.

The opposition to the selection of plant materials came as a surprise to the design team in 1970. Records indicate that Dan Kiley contacted local experts regarding his proposed plant list and only one response raised any concern over the use of the tulip poplar, all others approved of its use.<sup>117</sup> In fact, in 1961, the St. Louis City Department of Parks, Recreation, and Forestry shared their plant materials list which listed the tulip poplar with Superintendent George Hartzog. Moreover, the NPS design team also contacted local experts and again met with general approval. For unknown reasons, objections to the tulip poplar were not raised on these earlier occasions but were clearly voiced when the contract went out to bid.

The second issue was the restriction on the source of plant material to within a 50-mile radius of St. Louis. These limits were later extended to a distance of 250 miles to the north, east, and west. The 50-mile restriction to the south remained. This specification was developed based on a recommendation by the

City Forestry Department. In their experience, plant materials from the south had a higher risk of disease and were generally less hardy.<sup>118</sup>

Raymond Freeman, Deputy Associate of Professional Services, defended the NPS design team from these criticisms.<sup>119</sup> He contended the restriction of sources was not discriminatory but followed a recommendation of the St. Louis Department of Parks, Recreation, and Forestry. Freeman defended the selection of plant species and combining the site development and planting plan. He claimed that the NPS landscape architect informally discussed the proposed list with Mr. Biemann of Shaw's Garden (Missouri Botanical Garden) and he considered the selections satisfactory.<sup>120</sup> The City Forestry Department also concurred. As for the scope of the contract, the National Park Service felt that small, separate contracts would be too costly. By combining development phases into one contract, administration and supervision costs would be kept to a minimum.

In a letter to the Midwest Regional Director, Superintendent Harry Pfanzer, who supported the NPS design team, showed concern over the plant controversy:

"It is my opinion that the Service should review the present plan and give due consideration to the criticism it has received. In the course of this review it should secure further advice from Mr. Biemann [of the Missouri Botanical Garden] and other persons recognized as

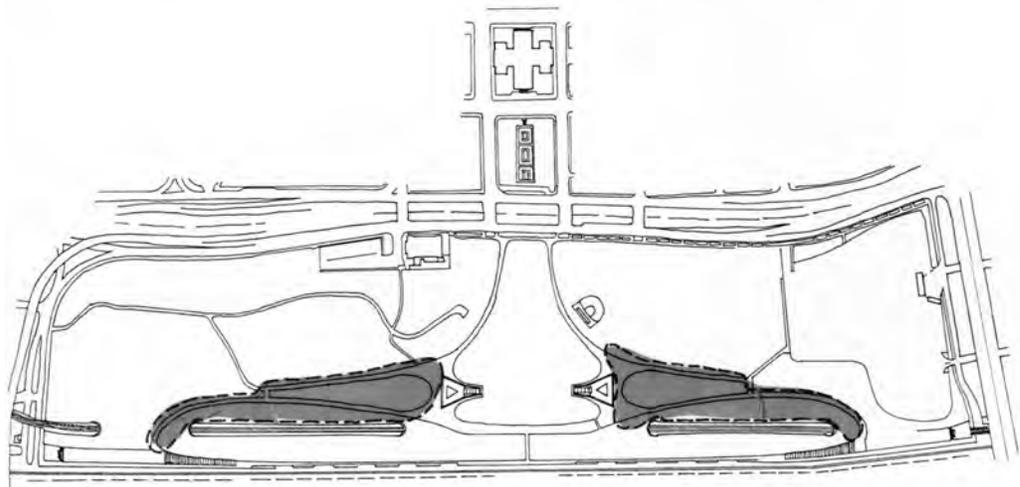


Figure 2.37. Limits of phase I planting plan. (Bellavia, 1996)

local experts. If at all possible whatever plan is utilized should have the open support of these men. If this is not done before the project goes out for bids we shall encounter as much if not more opposition than we received before and in doing so will jeopardize the public's confidence in us. Because we are using local funds it is essential that this confidence be maintained."<sup>121</sup>

On Pfanz's recommendation, the NPS design team contacted several local groups in St. Louis including the Missouri Botanical Garden, Missouri Department of Conservation, University of Missouri Extension, St. Louis Department of Parks, Recreation and Forestry, City of St. Louis, and several prominent nurserymen.<sup>122</sup> The planting plan was again analyzed and revisions were recommended to substitute the pin oak (*Quercus palustris*) for the tulip poplar. Local nurserymen also suggested that other species be interplanted with the pin oak to avoid the use of a monoculture and minimize the risks involved. The design team and Glenn O. Hendrix, the Chief of Planning and Design in San Francisco, were clearly opposed to this:

"It was suggested by many of the experts to include another species with the dominant tree, rather than risk 1200 trees of a single species to future insect or disease damage. However, in view of the effect that is to be achieved by the proposed plan, it would be difficult to substitute another species, even in the outer rows of trees surrounding the walkway ... We request that particular attention be given to the dominant tree (Tuliptree) controversy and our proposal to go all the way with one species, the Pin Oak. We believe that the plan would be weakened if the three rows of trees at each walkway were mixed with two or three species."<sup>123</sup>

The Associate Director, in response to this information, concurred with the recommendations but added his concerns regarding the approved concept for the planting:

"While the proposed plant substitutions are agreeable with this Office, we do wish to retain the site development concept which the Director approved in 1966 [referring to the Kiley plan, Figure 2.35]."<sup>124</sup>

At the time the design team recommended substituting the tulip poplar for the pin oak, other plant substitutions were recommended as well: the littleleaf linden (*Tilia cordata*) and the basswood (*Tilia americana*) were recommended to replace the oaks, which have transplanting difficulties; and the goldenrain-tree (*Koelreuteria paniculata*) or the Bradford pear (*Pyrus calleryana*) were recommended to replace the oriental cherry (*Prunus serrulata*), which has borer problems. Approval was granted by the NPS Associate Director in July and he suggested that the Midwest Regional Director issue a press release "to relieve the present controversy."<sup>125</sup>

Apparently the use of the pin oak as the dominant tree on the levee also met with criticism.<sup>126</sup> Ivan Parker, the newly appointed Superintendent, met with Leonard Hall, a St. Louis Globe-Democrat reporter and conservationist who had written about the plant controversy, to try to resolve the issue. Hall disapproved of the new choice because the alkalinity of the riverfront soil is high and the pin oak thrives in acidic soil.<sup>127</sup> These comments prompted further study of the new proposal and the existing riverfront soil.

Original soil tests conducted by EODC revealed that the riverfront soil was neutral, with a pH of 7.0. In researching the revised plant list, more soil studies were conducted. Royce Lambert, Soils Conservationist for the NPS Western Service Center, and the Soil and Plant Laboratory at Palo Alto, California conducted soil tests in the summer of 1971. The results indicated that the soil was more alkaline than previously reported with a pH of 7.5.<sup>128</sup> This initiated yet another review of the proposed plant list, and more revisions.

The most significant change was once again that of the dominant tree species. The pin oak, proposed to flank the pedestrian walks, tolerates a maximum pH of 6.5.<sup>129</sup> Clearly the trees would not survive well. Again a meeting was arranged with local plant authorities to recommend a tree that would perform well under the adverse urban conditions on the riverfront. Ultimately, the 'Rosehill' white ash was recommended to replace the pin oak. Its dense green foliage and fall coloring, upright, sturdy habit, fibrous root system, and tolerance

of alkaline soils were noted qualities.<sup>130</sup> Borers were recognized to be a common problem of the ash but not considered a threat because of the fast growth and natural resistance of the Rosehill ash cultivar.

Other recommendations were also made based on this study and the meeting of local authorities. The Austrian pine was eliminated because of a recent infestation of tip moth. The flowering dogwood was still recommended for moderate use, even though it preferred an acid soil, because it was the state tree. Bradford pear was recommended as a replacement for the Cornelian cherry dogwood (*Cornus mas*), and radiant crabapple (*Malus x purpurea* 'Radiant') was included to possibly replace the large quantity of flowering dogwood. Juniper, yew, or barberry were recommended to replace the mugo pine (*Pinus mugo*) if it was not available. All other plants from the previous list met with approval at this time. Ultimately, as a result of these changes, the plant list in September 1971 consisted of the following:

#### Canopy Trees:

Rosehill ash, hackberry, littleleaf linden, basswood, Japanese pagoda tree (*Sophora japonica*), baldcypress (*Taxodium distichum*), Japanese black pine, river birch (*Betula nigra*), saucer magnolia (*Magnolia x soulangiana*), and star magnolia (*Magnolia stellata*).

#### Flowering Trees:

Redbud, flowering dogwood, Washington hawthorn (*Crataegus phaenopyrum*), gold-enraintedree, Bradford pear, Arnold crabapple (*Malus arnoldiana*), Sargent crabapple (*Malus sargentii*), and radiant crabapple (*Malus hybrida*).

#### Shrubs and Groundcover:

Dwarf flowering quince (*Chaenomeles sp.*), mugo pine, Bulgarian ivy (*Hedera Helix* 'Bulgaria'), and fragrant sumac (*Rhus aromatica*).<sup>131</sup>

In August 1971, construction drawings for "Planting Phase I" were completed.<sup>132</sup> The limits of construction for this phase (see Figures 2.36 and 2.37) were the slopes on the west side of the railroad tunnel cuts and a portion of the north-south axis. The only plants listed on this drawing therefore were the

Japanese black pine and redbud proposed for the railroad cut slopes, and the Rosehill ash to line the sidewalks.

By the time construction drawings for subsequent planting phases were completed (by HB&A, drawing No. 366/41027), several new tree species were introduced to the list. Red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), thornless honeylocust (*Gleditsia triacanthos variety inermis* 'Shademaster'), and Kentucky coffeetree (*Gymnocladus dioicus*) were added to the plant list as major trees. River birch and hackberry were removed. Although evidence on the final list is clear, documentation regarding the reason for additions and deletions of plant material from the previously revised NPS list (1971) during this period was not found.<sup>133</sup>

In December 1978, the NPS DSC produced "as constructed drawings" for the planting at the Memorial, which depicted yet more changes to the plant list. Prepared in compliance with the previous two approved planting plans (No. 366/41019 and No. 366/41027), the drawings depicted four new species and eliminated four more. Added to the list of canopy trees were red oak (*Quercus rubra*) and bur oak (*Quercus macrocarpa*), which were previously determined to be difficult to transplant. Lalandi firethorn (*Pyracantha coccinea* 'Lalandi'), and wintercreeper (*Euonymus fortunei* 'Coloratus') were added to the list of shrubs and groundcovers.<sup>134</sup> Documentation of the rationale behind the changes was not found.

A comparison of the original approved plant list (Kiley's list) and the plant list "as constructed" indicates that approximately half of the original 21 plant species were retained and 10 new species were introduced (see Figure 2.38). The composition of the plantings in relation to the walks, ponds, Gateway Arch, and overlooks was reasonably retained.

#### Harland Bartholomew & Associates

The firm of HB&A was hired on January 12, 1973 to prepare construction documents and specifications necessary to complete the landscape development at the Memorial according to the 1966 approved plan.<sup>135</sup> The construction drawings developed by the

Final Kiley Plant List for JNEM (dwg.no-3071C) - February 1966

Final NPS Plant List (dwg.no.41047) - December 1978

Canopy Trees:	(Hackberry)	(Red Maple)
<i>Celtis occidentalis</i>	(Maidenhair Tree)	(Sugar Maple)
<i>Ginkgo biloba</i>	(White Oak)	(Common Thornless Honeylocust)
<i>Quercus alba</i>	(Red Oak)	(Kentucky Coffeetree)
<i>Quercus borealis maxima</i>	(Tuliptree)	(Rosehill White Ash)
<i>Liriodendron tulipifera</i>	(Japanese Pagoda Tree)	(Japanese Black Pine)
<i>Sophora japonica</i>	(Bald Cypress)	(Bur Oak)
<i>Taxodium distichum</i>	(Canada Hemlock)	(Japanese Pagoda Tree)
<i>Tsuga canadensis</i>	(Saucer Magnolia)	(Bald Cypress)
<i>Magnolia soulangiana</i>	(Star Magnolia)	(Greenspire Littleleaf Linden)
<i>Magnolia stellata</i>		
Flowering Trees:		
<i>Cercis canadensis</i>	(Eastern Redbud)	(Eastern Redbud)
<i>Comus florida</i>	(Flowering Dogwood)	(Flowering Dogwood)
<i>Crataegus phaenopyrum</i>	(Washington Hawthorn)	(Washington Hawthorn)
<i>Prunus serrulata</i>	(Oriental Cherry)	(Saucer Magnolia)
<i>Comus mas</i>	(Cornelian Cherry)	(Radiant Crabapple)
<i>Malus arnoldiana</i>	(Arnold Crabapple)	(Bradford Pear)
<i>Malus sargentii</i>	(Sargent Crabapple)	
Shrubs and Groundcover:		
<i>Chaenomeles</i> sp.	(Dwf. Flowering Quince)	(Mugo Pine)
<i>Pinus mugo mughus</i>	(Mugo Pine)	(Laland Firethorn)
<i>Hedera helix 'Bulgaria'</i>	(Bulgarian Ivy)	(Fragrant Sumac)
<i>Rhus aromatica</i>	(Fragrant Sumac)	
		<i>Euonymus fortunei 'Coloratus'</i>
		<i>Hedera helix 'Bulgaria'</i>
		(Wintercreeper)
		(Bulgarian Ivy)
Canopy Trees:		
<i>Acer rubrum</i>		
<i>Acer saccharum</i>		
<i>Gleditsia triacan. 'Shademaster'</i>		
<i>Gymnocladus dioica</i>		
<i>Fraxinus americana 'Rosehill'</i>		
<i>Pinus thunbergii</i>		
<i>Quercus borealis</i>		
<i>Quercus macrocarpa</i>		
<i>Sophora japonica</i>		
<i>Taxodium distichum</i>		
<i>Tilia cordata 'Greenspire'</i>		
Understory Trees:		
<i>Cercis canadensis</i>		
<i>Comus florida</i>		
<i>Crataegus phaenopyrum</i>		
<i>Magnolia soulangiana</i>		
<i>Malus x purpurea 'Radiant'</i>		
<i>Pyrus calleryana</i>		
Shrubs and Groundcover:		
<i>Pinus mugo mughus</i>		
<i>Pyracantha coccinea 'Lalandi'</i>		
<i>Rhus aromatica</i>		
<i>Euonymus fortunei 'Coloratus'</i>		
<i>Hedera helix 'Bulgaria'</i>		

Figure 2.38. Comparison of plant lists from 1964 and 1978. (Lists compiled from drawings located in JNEM Archives, Record Unit 120)

National Park Service, as well as the approved design development plan and grading plan, were forwarded to the firm. The NPS design and construction offices remained involved to review and supervise until 1978, when the NPS design team again took over and developed a planting plan for the remainder of the site.

The firm was involved in the project for three contracts over a period of six years. The first of the three contracts required a number of different types of services, divided into three categories:

“Title I services are performed as part of the initial planning and data gathering and will include such management information aids as the Government may direct. Title II services involve preparation of working specifications, drawings, construction contract documents, and estimates of the cost of construction. Title III services relate to supervision and inspection of the actual construction work (which will be performed by others) and to such other post construction activities as the Government may direct.”<sup>136</sup>

The services were to be in accordance with the NPS designs including the 1966 approved design development plan, and the construction drawings and specifications developed by the design and construction office in San Francisco.<sup>137</sup> Immediate projects included design concepts, construction drawings, specifications, and cost estimates for two pedestrian overpasses. Also outlined was the comprehensive design, construction drawings, specifications, cost estimates and construction supervision for completing the following: site grading and sealing of ponds, irrigation system, utility extensions, walk and area lighting, pedestrian walkways, Monumental Entrance (Grand Staircase), planting plan, rehabilitation of electrical components in the Old Courthouse, and modification of the existing storm drainage system.<sup>138</sup>

Although by the time HB&A’s contracts were completed many drawings had been produced, not all were approved and used for implementation. Rather than discuss all of the drawings HB&A developed, this discussion will focus on

the most important drawings that were used for construction purposes.

Three important sets of drawings were developed under this contract.<sup>139</sup> The first, in general, consisted of all site work including grading, utility extensions, irrigation system, and construction of ponds and retaining walls. The second was the specification of lighting standards, their location, and electrical requirements. The third was the planting plan that complemented the site work. (Note that Phase I was already constructed at this point and that these drawings focused on the completion of the 1966 approved plan — all but the north-south axis.) These drawings were approved by the Manager of the DSC in April 1973 and by the Acting Regional Director in November of the same year. Although implementation was not based on these drawings, all other construction drawings developed by both HB&A and the NPS Design and Construction Office were in compliance with these approved sets of drawings.

Although never approved or constructed, the pedestrian overpasses and Luther Ely Smith Square construction drawings were important because they were a major portion of the first contract with HB&A.<sup>140</sup> At the time they were developed, the engineering of segmented post-tension, pre-cast concrete structures was uncommon in this country (see Figure 2.39).

The second contract between the National Park Service and HB&A required the reformatting of the existing drawings (No. 366/41019-site development, No. 366/41027-planting plan) into six bidding packages.<sup>141</sup> In other words, the National Park Service wanted to break the remaining work into phases and complete only sections of the property and work at a time. As with the previous development at the Memorial, phases of implementation were required due to the financial opportunities and constraints of the time. The following drawings, construction specifications, and six engineer’s estimates were completed and mailed to the National Park Service in October 1977:

- Site Development Plan - Phase II (North Section), DWG. No. 366/41037, 36 sheets

Planting Plan - Phase II (North Section), DWG. No. 366/41038, 10 sheets;  
 • Site Development Plan - Phase III (South Section), DWG. No. 366/41039, 38 sheets  
 Planting Plan - Phase III (South Section), DWG. No. 366/41040, 10 sheets;  
 • Site Development - Phase IV (Levee Section), DWG. No. 366/41041, 11 sheets  
 Planting Plan - Phase IV (Levee Section), DWG. No. 366/41042, 10 sheets; and  
 • Construction Specifications - Site Development - Phases II, III, IV  
 Construction Specifications - Planting - Phases II, III, IV.<sup>142</sup>

The landscape was completed according to these drawings, but not in the phase order suggested by HB&A.<sup>143</sup> One major change and several minor changes to the original plan were suggested by HB&A and approved by the National Park Service. The most important was the change to the Monumental Entrance, or grand staircase.

As originally designed by Eero Saarinen, the Monumental Entrance or grand staircase was designed to be a bold connection of the Gateway Arch and the Old Courthouse to the historic riverfront. The steps were originally designed with an unusual tread/riser relation-

ship (see Figure 2.20). Each tread was to increase in size from the top of the staircase to the bottom (closest to the river) with a constant six-inch riser (the same design was constructed at each of the overlooks). The designers at HB&A were opposed to this design. They used the overlook steps as examples when arguing that this unusual tread/riser relationship, although unique and creative from a design standpoint, was uncomfortable and potentially dangerous for the large numbers of visitors that would use the steps daily.<sup>144</sup>

Although the overall form of the grand staircase (500 feet wide at the top and 291 feet wide at the bottom, with curved sides) and its location was retained as Saarinen designed it, the recommendations made by HB&A were considered and the details were changed, resulting in the specification of a typical tread/riser relationship. The construction documents were developed so that the Monumental Entrance would be constructed in two phases. The first phase consisted of construction of the north and south sections, leaving the middle section out for later development. The second phase of construction would connect the two previously constructed sections, thus completing the Monumental Entrance (see Figure 2.40).

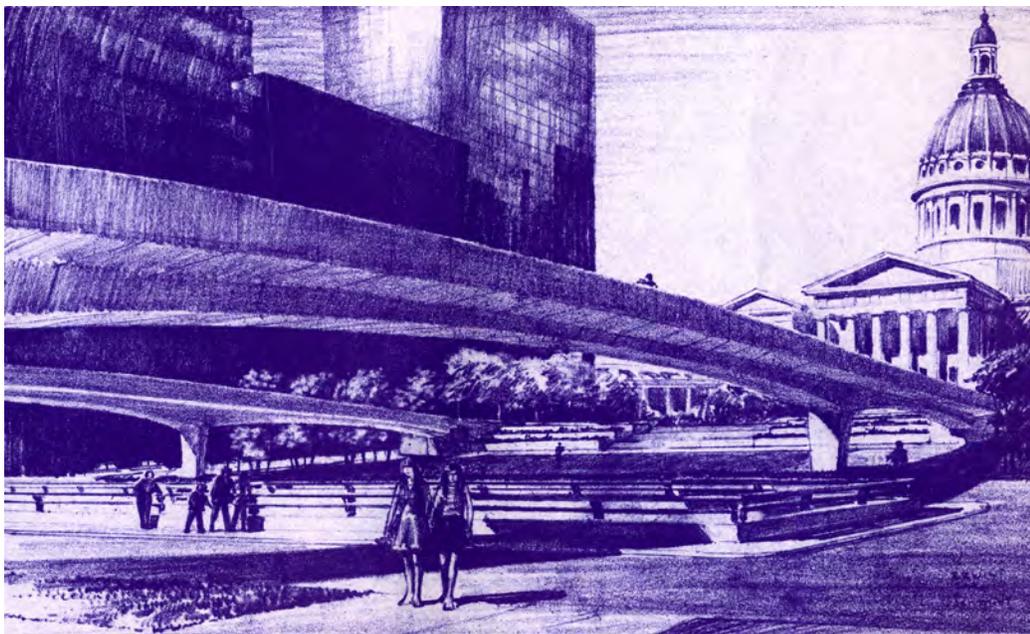


Figure 2.39. Harland Bartholomew & Associates, sketch of proposed pedestrian overpasses, 1975. (JNEM Archives, Record Unit 120, Drawing 366/41025)

## Summary of Design Development

The development of Jefferson National Expansion Memorial was a long and difficult task. The original winning design concept evolved from a forested site from which the Gateway Arch would soar to magnificent heights to an urban park with tree-lined pedestrian walkways and an overall curvilinear vocabulary reflecting the simple curves of the Gateway Arch. After the design concept was finalized and accepted, the National Park Service and other designers developed construction documents and specifications geared toward implementing the concept as envisioned by the original designers. Although some compromises and changes were made in the planning stages, the goal remained unchanged. All design efforts were directed toward realizing the Saarinen/Kiley concept development plan.

## Physical History of the Landscape

### Introduction

The history of the construction of the Memorial landscape is long and complicated. Many contracts and contractors were employed to complete different phases of the work. A summary chart of the contractors and their responsibilities can be found in Appendix A. The physical construction of the Memorial landscape began in 1951 with the temporary beautification of the block immediately east of the Old Courthouse (later to be called Luther Ely Smith Square) and ended with the last major construction effort in 2003, the completion of the grand staircase.<sup>143</sup> The following

narrative documents the physical construction of the site from 1951 through 1986. Period plans corresponding with each major development period graphically document the physical change over time and can be found at the end of this chapter.

### 1951: Luther Ely Smith Square

The block bounded by Fourth, Chestnut, Third, and Market Streets, just east of the Old Courthouse, was developed in 1951 as a result of an agreement between the United States of America and the City of St. Louis.<sup>146</sup> The “Riverfront Garden” as it was called, was designed by landscape architects who worked for the city’s parks department.<sup>147</sup> The plans called for a sunken garden with flower beds in the middle and two rows of trees on each side: one row of shade trees along Chestnut and Market Streets, and one row of flowering trees on either side of the sunken garden (see Figure 2.41). Concrete steps were to lead down to the garden from Fourth Street and it was to meet the grade at Third Street.

Portions of the Memorial grounds south of the Old Cathedral were also planned to be temporarily developed as ball fields (softball, baseball, and football) and a small playground. This work was never completed due to a lack of funding.<sup>148</sup>

### 1959-1968 — Railroad Relocation, Scenic Overlooks, and Gateway Arch

Construction of the Memorial began in 1959 with the dismantling of the Old Rock House which stood in the way of the proposed

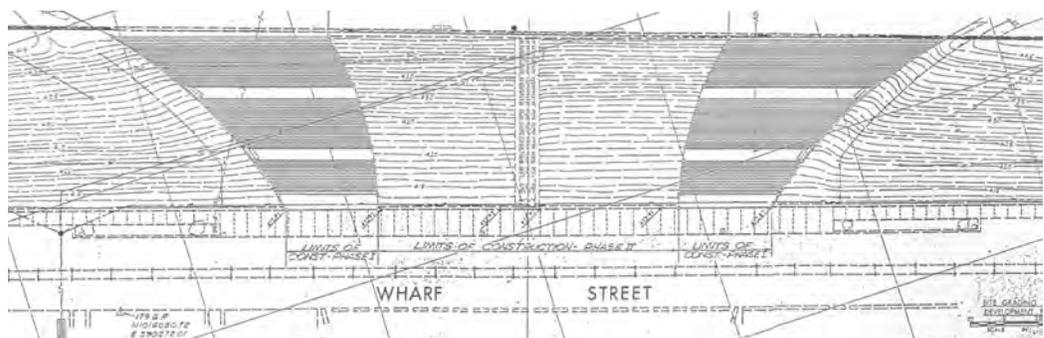


Figure 2.40. Phased development of grand staircase as proposed by HB&A. (Detail from Drawing No. 366/41025, JNEM Archives, Record Unit 120)

railroad relocation and grand staircase. Local citizens were dismayed to hear of its destruction since it had been restored just eighteen years earlier. In response to the protests, the National Park Service carefully numbered and stored some of the stones from the building with the intent to reconstruct it at a yet to be determined location on the site.<sup>149</sup> A location for the building was considered for a short time but eventually the idea to reconstruct it was eliminated from the development concept.<sup>150</sup>

At this time the Denchar Warehouse was also razed. This building had been used to store the ironwork and architectural fragments that had been salvaged from the demolition of other riverfront buildings. These were planned to be a principal resource for the site's proposed Museum of American Architecture, but in 1957, due to financial realities, this museum was dropped from Saarinen's development plan.<sup>151</sup>

The National Park Service, in an effort to coordinate construction, divided the work into four proposed phases. Phase I included the track relocation, retaining walls, and cross-over bridges. Phase II included research and planning for the museum, redevelopment of the levee, and excavations for the Gateway Arch foundations and visitor center/museum. The third phase would include the Gateway Arch construction, structural portions of the visitor center and Museum of Western Expansion, construction and installation of Museum of Western Expansion exhibits, and a portion of the final landscaping. Phase IV would be the final landscaping. Although the

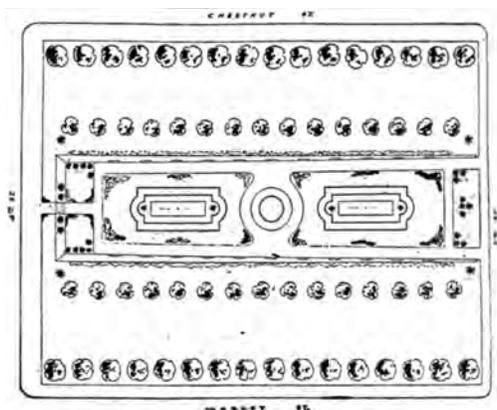


Figure 2.41. Architect's drawing of Riverfront Garden (*St. Louis Post Dispatch*, March 30, 1951. (Copy on file in the JNEM Archives, Record Unit 119, Box 15)

proposed completion date of 1964 was not met, this schedule for development was basically followed as planned, with a few changes along the way.

### Railroad Relocation

Once the Old Rock House was removed, efforts to relocate the two elevated railroad tracks approximately 105 feet to the west in a series of open cut walls and tunnels could begin. The project was completed under three separate contracts, each awarded to MacDonald Construction Company. The first was the construction of the 960-foot tunnel on the east side of the site. The contract was awarded in June 1959, and by August the tunnel excavation had started and concrete walls were being poured.

By January, 1960, contracting for the retaining walls (open cut walls) began (Figure 2.42). Three open cuts were constructed: a 731-foot cut on the north, and two more measuring 840 feet and 210 feet on the south. The retaining walls gradually increased in height from the middle toward the ends of each cut and were gently curved to reflect the curvature of the Gateway Arch. The cuts ranged from approximately 35 feet to 48 feet wide.

### North and South Overlooks

The third construction contract was awarded on February 9, 1961. MacDonald Construction Company again submitted the low bid of \$3,796,015 for the excavation of the Gateway Arch foundations and visitor center/Museum of Western Expansion, and the levee redevelopment. This contract also included construction of the north and south overlooks (see Figure 2.43).

The overlooks served two important functions; they bridged the railroad tracks from the open cuts to the perimeter of the Memorial, and they provided a viewing platform for watching the river traffic, an important aspect of the Saarinen concept. The overlooks were located 4,000 feet apart at the north and

south ends of the Memorial. A 56-foot by 60-foot building was part of each; these were intended as museums to interpret railroad and river transportation. The building roofs were designed as viewing platforms with concrete parapet walls and metal railings. The east walls of the overlooks ranged from just a few feet to 54 feet high and were an extension of the floodwall system. The walls were curved vertically as well as horizontally to reflect the curve of the Gateway Arch. The steps leading from the overlooks down to Wharf Street were not a typical design. Rather than have a standard, unchanging tread/riser relationship, Saarinen designed steps with an unchanging riser of eight inches and treads which increased in length from the top of the staircase to the bottom. This design created a sweeping effect and echoed the catenary line of the Gateway Arch. Construction of the overlooks completed the railroad relocation project and marked the beginning of the construction of the Gateway Arch.

### The Gateway Arch

On January 22, 1962, bid opening took place in the Old Courthouse for construction of the Gateway Arch and visitor center. Of the four bids received, MacDonald Construction Company was the low bidder and was subsequently awarded the contract on March 14, 1962.<sup>152</sup> Pouring the first concrete for the Gateway Arch foundations took place on June 27, 1962. The first section was placed on the south foundation on February 12, 1963 and filled with concrete on April 9.

When the Gateway Arch reached the 300-foot level, consultants to PDM questioned the integrity of the arch design. Construction ceased while the National Park Service brought in the Bureau of Public Roads and the Bureau of Reclamation to do seismographic measurements of the Gateway Arch and study its sway, complete a structure design study, and conduct wind tunnel tests. Ultimately



Figure 2.42. Construction of railroad open cut walls and tunnel, 1960. (Photo by Arteaga; JNEM Archives, Visual Image No. 106-3732)

the studies indicated that the Gateway Arch would be structurally sound and construction continued.<sup>153</sup> As a result of the wind tunnel tests, specific heights were proposed along the north-south axis of the Gateway Arch to deflect wind and protect the structure.<sup>154</sup> The final section was put in place on October 28, 1965 (see Figure 2.44).

### Old Cathedral Parking Lot

Several other minor additions to the site took place during this initial nine-year construction period. In 1960, NPS Director Conrad Wirth approved the construction of a small parking lot south of the Old Cathedral. The lot, paved with asphalt, measured 310 feet by 105 feet and held approximately 87 vehicles. A small plaza was also constructed between the Old Cathedral and the parking lot. A 57-foot-long free-standing stone wall, three trees, and two concrete benches were all part of the plaza.

In 1969, the Pastor of the Old Cathedral requested permission, at the expense of the Archdiocese of St. Louis, to enlarge the parking lot because the lot could not accommodate the number of parishioners during special masses.<sup>155</sup> The request proposed that the lot be almost doubled from 87 cars to 167 cars. The request was denied by the National Park Service for several reasons. First, the National Park Service felt that ample parking could be found in nearby garages or at the surface lot on the north end of the Memorial grounds. Second, the National Park Service felt that the extension would “adversely affect the architectural integrity of the whole memorial.”<sup>156</sup>

### Summary

By 1968 some of the major structural features of the site were constructed and the plan began to take shape. The entire north end of the site was used for parking. The south end



Figure 2.43. Construction of north overlook, 1961. (Photo by Arteaga; JNEM Archives, Visual Image No. 106-3792)

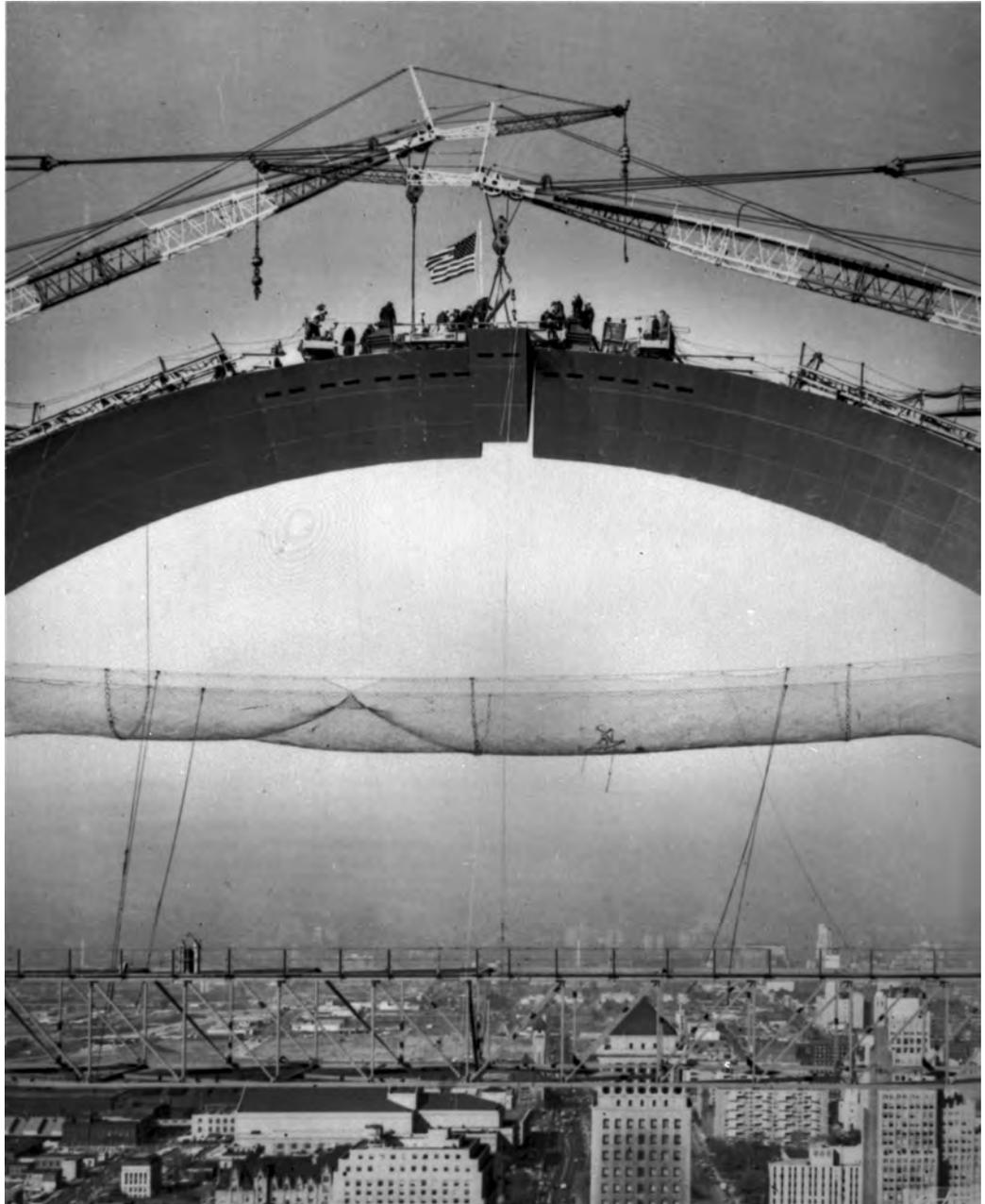


Figure 2.44. The final section of Gateway Arch is put in place, October 28, 1965. (Photo by Arteaga; JNEM Archives, reference photograph collection)

of the park was basically a construction lot. Construction roads scarred the landscape from Poplar Street to the Gateway Arch. Temporary pedestrian walks were constructed from Memorial Drive to the Gateway Arch legs (see Figure 2.48). The local community was anxious to see the landscape completed.

### 1969-1973 — Site Development Phase I and Planting Phase I

Construction projects completed before 1969 (the railroad relocation and the Gateway Arch) consumed more funds than had been anticipated, and so future projects were prioritized. It was the viewpoint of the National Park Service that the Museum of Westward Expansion was the next priority. After all, the story of westward expansion which the Gateway Arch symbolized was yet to be told. St. Louisans, however, felt differently. This wonderful contemporary icon that gave the city a new identity, and cost millions of dollars, stood amidst a wasteland of weeds and construction roads. The people of St. Louis felt that landscaping should be given priority before the visitor center and therefore the construction of one of the theaters in the visitor center was deferred to allow for the planting of trees.<sup>157</sup>

Landscape development based on the construction documents prepared by the NPS design team began in 1970. As previously stated, work originally planned to be completed as one contract was divided into three separate contracts and spread over a three year period. Phase I of the site development was completed by two separate contracts (and contractors) in 1970-1972 and Planting Phase I was completed in 1972-1973.<sup>158</sup>

The first phase of landscaping work was site development which included grading, drainage, temporary walks, and planting along the north-south axis of the Gateway Arch (see Figures 2.36 and 2.37). Bids were opened March 19, 1970 and all estimates were developed based on NPS construction drawings.<sup>159</sup> All bids received exceeded the government estimate and were therefore discarded.

The plans and specifications were revised, limiting the scope of work and eliminating the

planting of trees.<sup>160</sup> Bids were opened a second time three months later, on June 11, 1970. Four bids were received for the grading, drainage, waterproofing, and seeding of the visitor center roof. Kozeny-Wagner, Inc. submitted the low bid and was awarded the construction contract for site development Phase I on June 19, 1970.<sup>161</sup> Gene Mott and Jim Holland of the NPS DSC were assigned as project inspectors.<sup>162</sup>

The project supervisor for Kozeny-Wagner brought his workmen to the Old Courthouse to look at the model of the Gateway Arch "... so they'd know what Eero Saarinen had in mind for the landscaping."<sup>163</sup> Their work began on the south end of the site on July 27 and progressed to the north end by late August. The firm was responsible for installing a portion of the underground drainage system, scraping the soil off the visitor center roof to waterproof it, grading the visitor center roof and reseeding it, and basic grading to establish the sub-grade of the approved plan.

The initial earthwork produced a dramatic change in the appearance of the landscape. Before Kozeny-Wagner began, the site was predominantly flat. By September 1970, according to one observer, there appeared to be a ski jump at either end of the site.<sup>164</sup> The onlooker was referring to high points on the north and south axis of the Gateway Arch where the sidewalks would ultimately converge. These high points were designed as a result of wind tunnel studies that were conducted using a model of the Gateway Arch.<sup>165</sup> In combination with the trees lining the walks, the high points would help deflect potentially detrimental north-south winds, thereby protecting the Gateway Arch.

Many other tasks were being completed at the same time. Under the terms of the contract, Kozeny-Wagner was responsible for digging 147,000 cubic yards of unclassified excavation. They began by scraping the rubble off the top, contaminated with brick bats, concrete, and other unwanted material from the 1930s building demolition and the construction of the Third Street Expressway. This was stockpiled, cleaner soil was excavated, and the rubble was graded out. Clean soil was added to build up the high points of the landscape.

The ponds and surrounding ground were also sculpted out at this time.<sup>166</sup>

By September 1971, the first portion of Phase I of the site development was completed. In the meantime, in March of the same year, Kozeny-Wagner was awarded another contract for an addition to the visitor center lobby, construction of a theater, and the installation of air-conditioning and other mechanical work.<sup>167</sup>

The second portion of Phase I of the site development began in August 1971. It was divided into two contracts and four schedules. Schedules I and II were construction of portions of the sidewalk system, paving of service roads, construction of 280 tree wells, addition of topsoil, and installation of 14 concrete benches; Schedules III and IV included the installation portions of the sprinkler system. Millstone Associates, Inc. was awarded both contracts.<sup>168</sup>

Installation of the sidewalks began on the south side of the Gateway Arch. The exposed aggregate walkways were poured from the overlooks on the east side to the Gateway Arch legs, and from the rest areas on the west side to the Gateway Arch legs (on both the north and south ends of the site). The rest areas were not constructed at this time. These newly constructed walks met the older temporary bituminous walks which led to the Old Courthouse. A concrete base for the visitor information kiosk and a pedestrian walk along the south side of the visitor parking were also constructed (see Figure 2.49). The contractor was responsible for importing topsoil and grading it accordingly.

Implementation of Schedules III and IV, the installation of part of the irrigation system, as well as installation of the storm drainage system, repair of the sump pumps, and electrical distribution was completed by June 1972.

### **Planting Phase I**

Bids for Phase I of the planting plan were opened October 27, 1971. There were two options listed on the bid form. The second option called for trees of smaller size than the first one, another indication of the project's financial constraints. On November 9, 1971,

Suburban Tree Service, Inc. was awarded the contract for the ground preparation, seeding, and planting of 573 trees under option two (the smaller trees were planted).<sup>169</sup>

The plans and specifications, preliminary surveys, and construction layout of Phase I Planting were all completed by John Ronscavage of the Design Office of the San Francisco Service Center.<sup>170</sup> The first work, grading the north and south railroad cut slopes, began on December 1, 1971. The first trees planted along the slopes were redbuds on December 17.<sup>171</sup> By May 22, 1972, the grading, soil preparation, and planting of 120 redbuds and 80 black pines along the railroad cuts was completed.

Beginning in January 1972, topsoil was hauled in from a borrow pit at Lambert Field.<sup>170</sup> The spreading of topsoil and the planting of Rosehill ash trees began at the north end of the site and was completed at the south in July 1972. Two hundred and eighty Rosehill ash, two-inch to two and one-half-inch caliper, were planted along the newly constructed walks. Ninety-three of the same species and size were planted outside the walks. Suburban Tree Service completed Phase I with the paving of the tree wells. The borrow pit at Lambert Field was reshaped and seeded to the airport engineer's satisfaction, resulting in completion of the contract on September 21, 1972 (see Figure 2.45).

There were several problems encountered during the completion of Phase I planting. First, there was some difficulty finding enough Rosehill ash and black pine. Ronscavage and Holland made several trips to various nurseries to tag adequate trees.<sup>173</sup> Princeton Nurseries in New Jersey and Rosehill Nursery in Kansas City were the suppliers. Of the 280 Rosehill ash trees planted, 82 died and were replaced by the contractor. A study of the dead material indicated that there was insufficient drainage (most of the dead trees were on the north end of the site). This prompted the use of underdrains in the tree pits in the next phase of landscaping. Some of the plant material also had to be held during very hot, dry days until the sidewalk construction was completed, adding undue stress to the young trees.<sup>174</sup>

The first planting of grass only had a 40 percent success rate. This was determined to be a result of poor timing due to delays in other construction contracts. Time extensions to the contract were granted to allow for reseeding. There was one change order that resulted in a time extension also. The added work included restoring the north and west slopes adjacent to the parking area. All replacement materials and construction of this contract were completed and a final inspection was made on January 22, 1974.

### **1974-1977 — Museum of Westward Expansion, Grand Staircase, and other Miscellaneous Features**

This period in the construction history is predominantly devoted to the construction and development of the Museum of Westward Expansion. Funding for museum construction was provided in 1974, coming from several sources, including federal appropriations from Congress. Construction began in 1974 and the museum was opened on August 10, 1976.

### **Walk and Area Lighting**

The contract for the installation of utilities for the walk and area lighting was begun on February 18, 1974 and was completed on August 3, 1974. The plans and specifications, preliminary surveys, and construction layout were all completed by R. Johanningsmeier of the Design Office of the DSC.<sup>175</sup> Harding Electric Company was the contractor and Ted Rennison was the Project Supervisor. The work included the installation of transformers, control panels, and circuits in the Museum of Western Expansion area and supplying underground conduit for telephone and electric circuits for the area lighting and power receptacles on the grounds. The lights were 12-foot-high brown posts with a 21-inch globe at the top (see Figure 2.46). The lighting was typical for pedestrian spaces.

### **Temporary Maintenance Building**

In June 1974, a contract was let to construct a temporary maintenance building on the south



Figure 2.45. Aerial view of Memorial grounds after Phase I of landscape construction, 1975. (Photo by Arteaga; JNEM Archives, reference photograph collection)

end of the site. Until this time, maintenance vehicles and equipment were stored in the visitor center shell. Hankins Construction Company was awarded the contract which included site grading, installation of utilities, construction of foundations, and erection of a 32-foot by 72-foot prefabricated steel panel building.<sup>176</sup> A fenced yard measuring 50 feet by 72 feet was also completed at this time and was expected to meet the needs of the maintenance division for the next five years. Plans and specifications for the building and yard were developed by the Assistant Chief of Park Maintenance, Roy Scown, who was also responsible for the preliminary surveys and construction layout. Soon after construction, compacted construction roads leading from the building to the north end of the park emerged (see Figure 2.50).

### Overlook Paving

Around the time of the completion of the walk and area lighting, Sahrman Construction Company was commissioned to complete the paving of the north and south overlooks. Up until this time, 18-foot-wide pedestrian walks extended to the overlook steps, but the overlooks themselves were covered in grass. The contract began on August 12, 1974 and was completed on November 26, 1974. The work included demolition, excavation, and construction of underdrains, installation of base course and exposed aggregate paving, concrete light bases and manholes, and miscellaneous seeding.<sup>177</sup>

### Monumental Entrance (Grand Staircase)

Construction of the Monumental Entrance began on August 5, 1975 by contractor Kozeny-Wagner and was substantially completed by June 10, 1976 (see Figures 2.45 and 2.50).<sup>178</sup> Two phases of plans and specifications and preliminary surveys were completed by HB&A. The construction layout was made by Kozeny-Wagner. The work included the construction of two unconnected sections of steps and 1,500 square yards of new walks, installation of electrical service for light fixtures and a snow-melting mat for the north stairs, installation of a drainage system, and grading and seeding.

Several change orders were requested and approved for various reasons. The most noteworthy was the extension of the snow-melting mat to the sidewalk at the base of the north stairs, replacement of a section of exposed aggregate concrete at the south overlook, and sodding the section between the stairs rather than seeding. Although these were changes to the original contract, the plans and specifications for the first phase of the Monumental Entrance were closely followed. Phase II of the development of the Monumental Entrance (the center section) was not constructed until 2003 due to financial constraints.

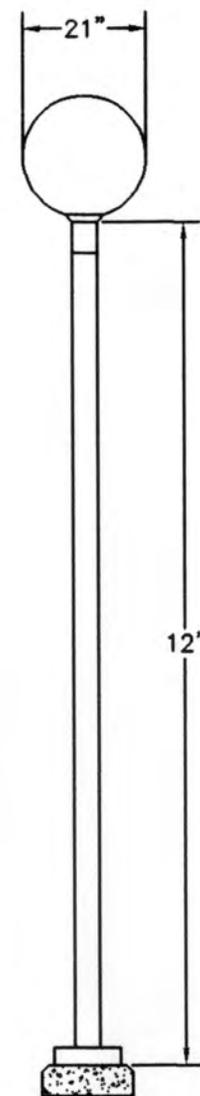


Figure 2.46. Construction detail of walk lighting, redrawn by Gargar Chan, 1996. (JNEM Archives, Record Unit 120, Drawer 15, Folder 4)

As already noted, the plans and specifications developed by HB&A incorporated a significant change from the original Saarinen/Kiley plan. The stairs were to be constructed with a tread/riser relationship similar to those of the overlook stairs. HB&A argued the point with the National Park Service based on the issues of visitor safety. The National Park Service agreed and the change was made. HB&A also studied the design in terms of the number of landings. Saarinen had designed the stairs with no landings. The final design included two landings (see Figure 2.40).

Only two years after construction, the grand staircase began crumbling despite the fact that Kozeny-Wagner followed strict specifications. After a year of debate as to why the concrete failed, Schuster Engineering, Inc. was contracted to make repairs. The repairs were completed during the summer of 1980.<sup>179</sup>

#### 1978-1986 — Site Development Phases II-IV

The completion of a major portion of the landscape development occurred between 1978 and 1981 (see Figure 2.51). HB&A produced construction documents and specifications for the development of the west half of the site.<sup>178</sup> Schuster Engineering was awarded the contract to complete the site development including the construction of two ponds, extension of the walks, extension of the irrigation system, extension of the electrical systems, extension of the walk lighting, and installation of cast-iron tree grates. The temporary maintenance building was also relocated at this time. Due to lack of funds, construction of the permanent facility was delayed until a later date and the temporary facility was relocated to the area where the permanent facility would eventually be built.

Construction began again in 1978 with the grading of the west side of the Memorial site. A large portion of the temporary parking lot had to be demolished to make way for the extension of the northwest sidewalk leading to Washington Avenue and Memorial Drive. More grading took place to establish appropriate heights so that construction of

the ponds and walkways could begin. The work progressed beginning with the center section, then the north, and finally the south. Along with the grading work, construction of retaining walls at both the north and south service entrances was required.

Several changes occurred during this portion of site development. Grade changes were made along Memorial Drive as a result of an error in the cut/fill calculations. Excess fill material was deposited along Memorial Drive south of the Old Cathedral.<sup>181</sup> This mounded area became five feet higher than originally planned.

Site furnishings such as benches and drinking fountains were detailed by HB&A based on drawings prepared earlier by the National Park Service.<sup>182</sup> The cobblestone paving around the Rosehill ash trees was removed and replaced with cast iron tree grates. The cobblestones were settling and caused an uneven, hazardous surface. Superintendent Robert Chandler realized that the full width of the sidewalks was not being utilized and decided to replace the cobblestones with cast-iron tree grates.<sup>183</sup>

While Schuster Engineering began the site development on the west side of the site, Shelton and Sons Landscaping was awarded a planting contract to begin working on the east side of the railroad tunnels. The plant material installed on the east side of the railroad tunnels included beds along the tunnels of low growing shrubs such as fragrant sumac, mugo pine, and pyracantha. Eastern redbud, flowering dogwood, and black pine were planted in groups along the tunnels. Baldcypress were planted in groups closer to the sidewalk along Wharf Street where existing baldcypress lined the west side of the street spaced 75 to 80 feet apart. Large beds of wintercreeper were planted along the west sides of the north and south overlook steps.

After Schuster Engineering completed the site development work, Shelton and Sons Landscaping began planting on the west half of the Memorial grounds. They planted the remaining Rosehill ash in and along the newly paved pedestrian walks. Shelton and Sons

Landscaping was required to remove the tree grates installed by Schuster Engineering only months before in order to plant the trees. Seeding of the lawns took place before the planting of the trees around the ponds, in order to stay on or close to the planting schedule. Schuster Engineering was delayed in completing their contract and this in turn held up the planting. Once the grass was planted, Shelton didn't want to drive across it and so they brought the trees to their planting holes by helicopter.<sup>184</sup>

To complete the planting plan, groundcover was planted around the service areas, maintenance building, and west of the railroad tunnels. Large beds of Bulgarian ivy were planted on the steep slopes west of the railroad tunnels. Wintercreeper was planted along the slopes surrounding the service entrances and around the maintenance facility. All of these areas had excessive slopes that would be difficult to maintain if they were seeded.

### Gateway Arch Parking Garage

As early as 1958, architect Eero Saarinen conducted feasibility studies for a parking garage on the north end of the Memorial grounds. Similar studies and several agreements between the National Park Service and the city of St. Louis were conducted between 1958 and 1978. The obstacle was a lack of construction funds. In 1983, as a result of a three-way partnership between the National Park Service, the City of St. Louis, and the Bi-State Development Agency, an agreement was forged to expedite the construction of the parking garage.<sup>185</sup>

Fred Weber, Inc. of St. Louis was awarded the contract for his low bid of \$6,262,000 to build the garage based on a design and specifications developed by WVP Corporation.<sup>186</sup> The agreement between the city and Bi-State Development Agency authorized the relocation of Washington Avenue approximately 20 feet to the north.

Excavation began in 1984 while archeological monitoring was conducted by Southern Illinois University at Edwardsville (SIUE). By 1986

construction of the three-story, 1,208-car parking garage was complete (see Figure 2.47). Two levels were constructed below grade and the top deck was at or close to grade with the north and northwest walkway.

A planting plan was also developed by WVP Corp. and implemented by Fred Weber, Inc. The plant list included low-growing shrubs in raised planters along Washington Avenue and the foundation walls on the south side, flowering trees, a few canopy trees, groundcover, and lawn areas. After recommendations made by the National Park Service were considered, the planting plan included the following trees, shrubs, and groundcovers: Rosehill ash, saucer magnolia, Sargent crabapple, radiant crabapple, amur maple (*Acer ginnala*), hetz blue juniper (*Juniperus chinensis* 'Hetzii Glauca'), mentor barberry (*Berberis x mentorensis*), anglojap yew (*Taxus x media*), and wintercreeper. The plant palette basically included species already existing in the park with the exception of the shrubs.

The flowering trees were generally planted in groups of two or more on the west, south, and east sides of the garage in lawn areas. Low-growing shrubs were located in raised planters along Washington Avenue and along either side of the garage entrance located off the northwest pedestrian walk. Wintercreeper was planted in the raised planters and other planting beds along the foundation walls as well. Amur maples were planted in concrete planters on the top deck of the garage.



Figure 2.47. The Gateway Arch parking garage. (Chan, NPS, 1996)

## Summary

By 1986, most of the major structures and plantings based on the Saarinen/Kiley plan were complete (see Figure 2.52). Exceptions included the permanent maintenance facility, the pedestrian overpasses, Luther Ely Smith Square, and the center section of the grand staircase. At this point in time, most efforts were focused on maintaining the plan as implemented thus far and not on completing any major construction, particularly related to the landscape.

## Endnotes

1. An abbreviated history is given here, but for a comprehensive history see *Administrative History Jefferson National Expansion Memorial* by Sharon A. Brown, 1984; and *Urban Innovation and Practical Partnerships: An Administrative History of Jefferson National Expansion Memorial, 1980-1991* by Bob Moore, 1994.
2. "St. Louis Riverfront Proposals of the Last 45 Years," *St. Louis Globe-Democrat*, November 17, 1946 (copy on file in JNEM Archives, Record Unit 119, Box 7).
3. "A Description and Explanation of Plan 8009 For The Jefferson National Expansion Memorial, St. Louis," October 1937. JNEM Archives, Record Unit 104, Box 7, Folder 31.
4. Ibid.
5. Brown, *Administrative History*, 1. Ms. Brown prints, in part, the Pro Forma Decree of Incorporation of the Jefferson National Expansion Memorial Association, June 11, 1934. A copy of the decree can also be found in the JNEM Archives, Record Unit 104, Box 24, Folder 9.
6. A copy of Executive Order 7253 is on file in the JNEM Archives, Record Unit 104, Box 4, Folder 21.
7. This had the effect of reducing moneys contributed from the municipal bond issue, which required three dollars of federal funds for each dollar of local funds. See Brown, *Administrative History*, 1-12.
8. Ultimately the National Park Service razed all buildings in the Memorial area, except the Old Cathedral, built in 1834, and originally known as the Cathedral of St. Louis of France. The Old Rock House was "restored" in 1942 to resemble its original 1818 appearance. It was dismantled in 1959 for reassembly elsewhere on the Memorial grounds in order to accommodate construction of the railroad tunnels to the east of the Gateway Arch, but it was later determined that the building's integrity rested in the original site and it was not reassembled. The Old Courthouse was saved and incorporated into the Memorial scheme.
9. John Nagle in correspondence to Dr. Herman Bumpus, March 3, 1938, as quoted in Brown, *Administrative History*, 36. Dr. Bumpus served as Chairman of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments, established as part of the Historic Sites Act of 1935.
10. A clay model prepared by the architectural staff of the Memorial reflected early NPS efforts toward directing site planning for the Memorial. Referred to as "Plan 8009," the formally arranged design included extensive open park land, and a centrally placed obelisk on axis with the Old Courthouse. The plan also retained the Old Cathedral and the Old Rock House, and provided for a museum of American architecture and a museum of the American fur trade.
11. The Denchar Warehouse, located at the corner of Second and Clark streets, was spared demolition for a time and used as a storage space for the architectural remnants saved during demolition for future display in the proposed Museum of American Architecture. When the museum was eliminated from the development plans the architectural remnants were given to the Smithsonian and others and the Denchar Warehouse was razed.
12. Brown, *Administrative History*, 79-88.
13. Correspondence from Luther Ely Smith to the Jefferson National Expansion Memorial Association, November 4, 1944, as quoted in Brown, *Administrative History*, 81.
14. This is an accurate summary of the programmatic requirements of the first stage of the competition, from "Jefferson Memorial Competition Winners," *Architectural Record*, v. 103 (April 1948).

- See the Jefferson National Expansion Memorial Association, “Architectural Competition for the National Expansion Memorial, Program” (St. Louis: 1947), pages 13-24, for the programmatic requirements of the competition. JNEM Archives, Record Unit 104, Box 26, Folder 2.
15. Typed comments of the judges in reference to the five finalists were recorded by the Jefferson National Expansion Memorial Association, JNEM Archives, Record Unit 104, Box 29, Folder 17.
  16. Ibid., and also, Brown, “Jefferson National Expansion Memorial: The 1947-1948 Competition,” in *Gateway Heritage, Magazine of the Missouri Historical Society*, Winter, 1980, pp. 40-48.
  17. Aline B. Saarinen, ed., *Eero Saarinen on His Work* (New Haven: Yale University Press, 1968), 18.
  18. Ibid, 18. On this basis, Allan Temko argues that the symbolism of the Arch as “Gateway to the West” was a later realization, and that it was derived from the simple notion of a high and permanent form rising from the river’s levee. See Allan Temko, *Eero Saarinen* (New York: George Braziller, 1962), 18-19. Temko’s argument seems the correct one based on a brief commentary written by Saarinen for the *St. Louis Post-Dispatch* (March 7, 1948), JNEM Archives, Record Unit 119, Box 10, Folder 61: “More and more, it began to dawn on us that the arch was really a gateway, and various friends who stopped to look at what we were doing immediately interpreted it as such. Gradually, we named it the ‘Gateway to the West.’”
  19. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 18.
  20. Ibid. The forest of trees was conceived as the setting for the Arch, but a practical purpose was assigned to the forest as well, the forest as a park. From the Saarinen commentary in the *St. Louis Post-Dispatch* (March 7, 1948; JNEM Archives, Record Unit 119, Box 10): “We got quite enthusiastic about covering as much of the site with a dense forest, because we had heard many people complain about the heat in St. Louis in the summer. In fact, we were so enthusiastic about this that we wondered whether our chances in the competition would not be greater if we forgot about the arch and just emphasized a great forest.”
  21. Mary Hughes, oral history interview with Dan Kiley, June 8, 1991 (transcript on file in JNEM Archives); Bob Moore, oral history interview with Dan Kiley, July 22, 1993 (transcript on file in JNEM Archives).
  22. Hughes, oral history interview with Dan Kiley, June 8, 1991. Kiley reaffirms this in his interview with Historian Bob Moore, July 22, 1993: “I did all his work, unless the client had a different idea.”
  23. Ibid.
  24. Ibid. Kiley also discussed this episode in the Moore interview, July 22, 1993, and in an interview with Gregg Bleam and Gina Bellavia, July 28, 1995 (transcripts on file in JNEM Archives). The Moore interview confirmed that Saarinen already had the idea for the Arch when he arrived in New Hampshire.
  25. Hughes interview with Kiley, June 18, 1991. A similar comment is made in Gregg Bleam’s interview with Kiley, July 28, 1995.
  26. In the Hughes interview, Kiley discussed the atmosphere in the Saarinen office while preparing for the first stage of the competition. “And through it there was lots of joking ... and I kept Eero’s office, you know, always having fun.” Also: “... everybody was so intense, and I kept making funny cracks all the time all through.” Kiley discusses Saarinen’s competitive nature, especially in preparation for the competition, in the Moore interview of July 22, 1993.
  27. Dan Kiley, “Jefferson National Expansion Memorial,” in *Landscape Design: Works of Dan Kiley, Process Architecture*, No. 33 (October 1982), 109.

28. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 6. Kevin Roche, a partner in Saarinen's firm, offers the following insight: "So in Eero's work right from the start—the St. Louis Competition, where Dan was a part of the winning team, and Dan's landscape—Eero himself was very interested in site planning and in site design and in landscaping as an idea for siting a building. It wasn't that he was an avid landscaper in the sense of knowing how or what tree should be used where, but in a compositional sense ..." Kevin Roche, oral history interview with Gregg Bleam, June 30, 1992 (transcript on file in JNEM Archives).
29. Ibid, 10.
30. Along this line of thought, Kevin Roche states in his oral history interview with Gregg Bleam, May 1, 1995 (transcript on file in JNEM Archives): "He [Eero] had very tight control over the whole thing, but ... he would certainly listen to what Dan had to say and so it was a collaboration."
31. Jefferson National Expansion Memorial Association, "Jefferson National Expansion Memorial Competition, Second Stage Addenda to the Program," 2. JNEM Archives, Record Unit 104, Box 29, Folder 19. The "Second Stage Addenda" certainly seemed to favor the Saarinen team proposal. From the Addenda: "In general, the Site is to be treated as a tree-shaded park, sloping down to the river, with an open vista from the Old Courthouse to the Levee. The architectural Memorial may be placed near its boundaries rather than towards the center."
32. Letter from Dan Kiley to Bob Moore, Historian, Jefferson National Expansion Memorial, faxed June 26, 1998, Historian's records, JNEM.
33. "Final Report of The Jury Of Award to the Professional Adviser on the First and Second Stages of the Jefferson National Expansion Memorial Competition," JNEM Archives, Record Unit 104, Box 29, Folder 16.
34. "Competition: Jefferson National Expansion Memorial," in *Progressive Architecture* (May 1948). The article also describes how the team studied the proposed contours of the site in a clay model to create a free flow among the various design elements.
35. Aline B. Louchheim, "For A Modern Monument: An Audacious Design", *New York Times*, February 29, 1948 (copy on file in JNEM Archives, Record Unit 119, Box 10).
36. "Big 'Hairpin' Memorial Leaves St. Louis Cold," Akron, Ohio *Beacon Journal*, February 27, 1948 (copy on file in JNEM Archives, Record Unit 119, Box 10).
37. Brown, "Jefferson National Expansion Memorial: The 1947-1948 Competition" in *Gateway Heritage*, discusses the reaction to the competition winner, including the Clarke controversy. See the following sources for the response of the architectural press: "Jefferson National Expansion Memorial Competition Winners," in *The Architectural FORUM*, v. 88 (March 1948); "Jefferson Memorial Competition Winners," in *Architectural Record* (April 1948); and "Competition: Jefferson National Expansion Memorial," in *Progressive Architecture* (May 1948). Also, a brief discussion of the Clarke controversy may be found in "St. Louis Selects Modern Design," in *Art News*, v.47 (March 1948). This article points out that the "Fascist" arch was never executed, and was designed with a semi-circular form.
38. "Winning Arch Not Fascist Invention, Says Award Jury," *St. Louis Post-Dispatch*, March 14, 1948 (copy on file in JNEM Archives, Record Unit 119, Box 10).
39. "Arch That Triumphed Attacked As Like One Mussolini Approved," *St. Louis Post-Dispatch*, February 26, 1948 (copy on file in JNEM Archives, Record Unit 119, Box 10).

40. Brown, “Jefferson National Expansion Memorial: The 1947-1948 Competition,” in *Gateway Heritage*. A letter written from Smith to Saarinen, dated June 3, 1948 (on file in JNEM Archives). “It was your design, your marvelous conception, your brilliant forecast into the future, that has made the realization of the dream possible—a dream that you and the wonderful genius at your command and the able assistance of your associates are going to achieve far beyond the remotest possibility that we had dared visualize in the beginning. Please accept again our profound gratitude.”
41. Brown, *Administrative History*, 94-114.
42. *Ibid*, 94.
43. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 18. Although this quote is taken from a January 1959 statement by Saarinen on the memorial project, following the extensive redesign in 1957, the quote discusses the intent and design of the original concept for the memorial’s relation to the Old Courthouse and the river.
44. Dan Kiley to the Missouri Botanical Garden, January 26, 1949 (copy on file in JNEM Archives).
45. Eero Saarinen to Dan Kiley, August 6, 1956 (copy on file in JNEM Archives. The accompanying memo is also dated August 6, 1956).
46. Brown, *Administrative History*, 113-116.
47. John Peter, *The Oral History of Modern Architecture: Interviews with the Greatest Architects of the Twentieth Century* (New York: Harry N. Abrams, Inc., 1994), 199. From a 1958 interview with Saarinen: “I’m terribly interested in Jefferson. That one I would like to build more than anything else. As you know, we have now come to an agreement with the railroad, so that if Congress says yes to the whole thing we may go ahead. I would very much like to build this stainless-steel arch and the whole park.” Saarinen’s partner Kevin Roche also stated in an interview with Gregg Bleam, May 2, 1995 (transcript on file in JNEM Archives): “He was anxious to get it going—it was his most identifiable [project] and the highlight of his career.”
48. This is the Bernard Dickmann Memorial Bridge, better known to residents of St. Louis as the Poplar Street Bridge.
49. Saarinen’s statement in its entirety may be found in the following source: “Revised Scheme, Revised Hope, For Saarinen’s St. Louis Arch,” in *Architectural Record*, v. 122 (November 1957).
50. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 18.
51. Peter, *The Oral History of Modern Architecture*, 201. From the same source: “The second thing was in the reworking of the lines of the park, the roads, the approaches to the thing to introduce the same lines inherent in the arch itself, the parabolic line. You see, all these things relate.”
52. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 18.
53. *Ibid*, 21. The story about the office employees testing the mock-up is taken from Gregg Bleam’s interview with Bob Burley, an associate in the Saarinen office, dated July 27, 1995 (transcript on file in JNEM Archives): “Well, it goes back to Eero’s curvilinear feeling, both in plan and section ... And, of course, there was the misgivings about whether that was going to be safe, which is why we did that full scale mock-up. And ran everyone in the office up and down the steps to see if they would trip.”
54. Peter, *The Oral History of Modern Architecture*, 201.
55. Aline B. Saarinen, ed., *Eero Saarinen on His Work*, 18.
56. Peter Papademetriou, as quoted in Andrea O. Dean, “Eero Saarinen in Perspective,” in *AIA Journal* (November 1981). Another critic writes: “... he tried to overtake the

fast moving train of technology ... and impose upon it a system of checks and balances similar in effect to the discipline of classical and Renaissance architecture.” See Rupert Spade, “Introduction” to *Library of Contemporary Architects: Eero Saarinen* (New York: Simon and Schuster, 1971), 9.

57. Site plan sketches and drawings from Saarinen’s office, dating from throughout 1957, are quite telling in a number of respects. First, they reveal Saarinen’s new emphasis on axial arrangement, showing rectangular pools aligned on a strong north-south axis with the Gateway Arch, as well as an approximately bilateral symmetry along the equally strong east-west axis connecting the Gateway Arch with the Old Courthouse. Second, the drawings also indicate that Saarinen’s major reconfiguration of the plan in late 1957 cannot be solely attributed to the railroad impasse, (although the railroad problems did in fact require a new scheme), but that the revised plan must also be seen in light of a changing design philosophy. Finally, these drawings seem to show an intermediate step toward the more strict reliance on curvilinear forms of the later plans. In the earlier schemes from 1957, rectangular forms interact with circular paths, albeit the curving lines appear considerably less graceful than with later schemes. Also, from Peters, *The Oral History of Modern Architecture*, 20: “Now, in the middle of the changes I saw for the first time that really in relation to the Arch, the park, the roads, the approaches to the park should all be done within the same curved-form world, which it wasn’t before (emphasis added).”
58. This statement can also be read as an effective description of the final planting plan concept prepared by Kiley’s office and approved in 1966 by the National Park Service. The intent here is to elicit the underlying source of his design response. Dan Kiley, “Jefferson National Expansion Memorial” in *Landscape Design: Works of Dan Kiley, Process Architecture*, No. 33, (October 1982), 109.
59. Dan Kiley recalled: “Well, one of the big things I was trying to tell Eero during the designing phases, both in the first and second phases, I was trying to interject a more spatial mystery to the whole site ... And that the landscape should relate more spatially, visually/spatially, like a walk in nature. It should be like a walk in the woods, and you don’t know what’s next. And it’s leading you, always leading you. And sort of—I call it spatial continuity. And, Eero would say, well, draw it.” From Bob Moore, oral history interview with Dan Kiley, July 22, 1993 (transcript on file in JNEM Archives). Much in line with the shift found in Saarinen’s work from the 1950s, Kiley’s work beginning with the Miller Garden (Columbus, Indiana) collaboration with Saarinen in 1955, revealed a new focus on the geometric ordering of outdoor space. Inherent in Kiley’s approach was the idea of spatial integration between building and landscape, and an understanding of the quality of movement through these spaces. Kiley’s approach found favor with many architects, and certainly contributed to the success of the on-going and collaborative nature of Saarinen and Kiley’s relationship. For a more in-depth discussion on this development in both Saarinen’s and Kiley’s work, see Gregg Bleam, “Modern and Classical Themes in the Work of Dan Kiley,” in *Modern Landscape Architecture: A Critical Review*, Marc Treib, ed. (Cambridge, The MIT Press, 1993), 220-239.
60. Therefore, it may not be surprising that Kiley’s later reflections on the design of the memorial project occasionally give precedence to circulatory dynamics in generating the curving form of the walks, rather than any desire to mimic the form of the Gateway Arch. In reference to the curved walks he stated that “It wasn’t trying to make a symbol, a mirror of the Arch at all. It was to do the circulation in a lyrical, three dimensional quality.” From Bob Moore, oral history interview with Dan Kiley, July 22, 1993. While one can

only speculate at this point, the argument here is for a fortuitous coupling of form and function, with Saarinen's single-form world conception taking precedence. In an interview with Gregg Bleam on May 1, 1995 (transcript on file in JNEM Archives), Saarinen's partner Kevin Roche confirmed Saarinen's lead in giving curvilinear form to the path system, and in Bleam's July 28, 1995, interview with Kiley (transcript on file in JNEM Archives), he succinctly states: "Eero had done the shape of the walks. I just put the trees along them." Of course, this statement downplays the importance of the trees in creating the "spatial continuity" that Kiley was after.

61. It is difficult to determine what the exact nature of Kiley's influence on the memorial project was between the period covering the end of the competition in 1948 and his work on the planting plan beginning in 1959, a period in which Kiley's role is less clearly documented. The close friendship between Saarinen and Kiley, and the fact that they collaborated on many projects together, leads one to suspect that many ideas were discussed outside the confines of documented correspondence. Kiley and Saarinen worked together on some 20 projects, at least ten of which were initiated in the years 1955-1958, including Dulles Airport. In his interview with Gregg Bleam, May 1, 1995, Kevin Roche confirmed that there was a close friendship: "As to Eero's and Dan's relationship it was always very, very good."
62. Mary Hughes, oral history interview with Dan Kiley, June 8, 1991 (transcript on file in JNEM Archives).
63. Brown, *Administrative History*, 123.
64. NPS, *Guidelines for the Master Plan, Jefferson National Expansion Memorial* (St. Louis: March 10, 1959), 2. JNEM Archives, Record Unit 104, Box 32, Folder 3. Guideline No.2 in this document containing a total of 22 numbered guidelines for the physical development of the Memorial states, "development will follow the general pattern of the revised Saarinen Plan of 1958, with certain modifications in detail reflected in the 1959 Master Plan." Guideline No. 3 reads as follows: "The dominant physical and inspirational feature of the Memorial will be a parabolic stainless steel arch of colossal dimensions, with elevator facilities, which will symbolize: (a) St. Louis as 'The Gateway to the West', (b) The great frontier traditions of the 'westward course of the empire', and (c) The new technological frontiers which challenge us today."
65. Ibid, 2. Guideline No. 4 states, "The principal facility for enlightenment of the visitor as to the historic theme of the Memorial will be a structure, to be designated a Visitor Center, containing exhibits telling the story of westward territorial expansion. The structure shall be incorporated in the arch below the promenade level."
66. Ibid, 3. Guideline No. 10 states, "In the two planted areas, readily accessible to the visitor center, there will be trail systems with interpretive devices relating to the Oregon and Santa Fe Trail."
67. Ibid, 4. Guideline No. 14 states, "It is believed that the City of St. Louis has ample facilities in civic parks and auditoriums for such events, and it is not intended that the Memorial be regarded as another City park."
68. Eero Saarinen to Dan Kiley, October 17, 1959 (copy on file in JNEM Archives).
69. Brown, *Administrative History*, 127.
70. This is shown in the Office of Eero Saarinen and Associates "Conference Notes" for meetings related to Jefferson National Expansion Memorial. On file in the JNEM Archives, is a copy of the "Conference Notes" for meetings held on the dates of March 21, 22, and 23, 1960; present were representatives from the National Park Service, Saarinen's Office, consulting engineers, and Kiley. The Oregon and Santa Fe Trails plan was discussed at these meetings. Also on file

at the JNEM Archives, is a copy of the Agenda for a meeting on September 2, 1960, involving Kiley and a discussion of the landscaping. NPS Director Conrad Wirth was also in attendance, and it is suspected that this is the meeting in which Wirth first raised his objections to Kiley's planting plan. Wirth was not in attendance at the March meetings.

71. Quotation from Edward Zimmer, Chief of the NPS Eastern Office of Design and Construction in correspondence with Jefferson National Expansion Memorial Superintendent George Hartzog, dated August 1, 1960, taken from Brown, *Administrative History*, 126. Zimmer favored delaying museum construction.
72. In later interviews, Kiley discussed the trails and considered them to have had a "Disney" like quality which he did not favor. He attributes the idea to Saarinen as part of his proposed village reproductions found in the winning competition plan. Mary Hughes, oral history interview with Dan Kiley, June 8, 1991 (transcript on file in JNEM Archives); Bob Moore, oral history interview with Dan Kiley, July 22, 1993 (transcript on file in JNEM Archives).
73. Whether or not Kiley favored a literal trail scheme, his office obviously moved ahead on the idea as evidenced in the early 1960 plan and section drawings for the site. Terry Boyle, an associate in the Kiley office, recalled: "I remember simulating climbing up mountains and they were supposed to represent ranges of mountains all the way up. I mean it was a miniature cross section of the U.S. from ... St. Louis to where the Lewis and Clark expedition ended. I thought that's what the profile was supposed to represent. That was my recollection." Gregg Bleam and Gina Bellavia, interview with Terry Boyle, July 27, 1995 (transcript on file in JNEM Archives). The 40-foot grade change may be determined from an examination of contours depicted on the early 1960 plan, and the sections confirm dramatic grade changes.
74. From the "Conference Notes" for the March 21, 22, and 23, 1960 meetings at the Office of Eero Saarinen.
75. For instance, the proposed village reproductions proposed in the competition drawings and later eliminated were imagined as unique places that would open up in the midst of the tall tree forest. Mary Hughes, interview with Dan Kiley, June 8, 1991. Transcript on file in JNEM Archives.
76. The chosen species included a number of shrubs as extensive underplanting adjacent to the railroad cuts. It seems that Wirth objected to the underplanting as causing a policing problem. The plans show the London planetree as the monoculture species lining the walks.
77. This is shown in the Agenda for the September 2, 1960 meeting with the National Park Service.
78. "Saarinen Calls for Boulevard on Riverfront," *St. Louis Post-Dispatch*, April 19, 1960. JNEM Archives, Record Unit 119, Box 24.
79. Brown, *Administrative History*, 128.
80. This overview of the cutbacks on the memorial project is taken from Brown, *Administrative History*, 129-130.
81. Although it is not entirely clear what Kiley's intended role was to be following Wirth's decision-making on cutbacks to the memorial project, there is an assumption that he was to be removed as collaborator on the project and its design, even when faced with a major reevaluation of the planting plan. This becomes more evident in a letter from Eero Saarinen to Dan Kiley, dated January 30, 1961 (copy on file in JNEM Archives). Not only did Saarinen outline the NPS objections to the planting plan presented to the National Park Service which had been presented by Kiley in late 1960, but he also wrote the following: "After the meeting, he ruled that the landscaping is to be done by the N.P.S. staff ... I understand that part of the

reason for him so ruling is that he felt that the large staffs the N.P.S. has for planning and architecture should be put to better use. This makes me very unhappy and I am planning at an appropriate time to try to get this situation modified. I think that it would be impossible to have him reverse his position completely so that all design, working drawings, specifications and supervision would be done outside of the Service. I think the only thing I can ask for is the design—in other words, consultation with an outside consultant (that is, you) and then the further detailed work be actually carried out by the Department.”

82. Bruce Detmers, interview with Gregg Bleam, May 1, 1995 (transcript on file in JNEM Archives). “I remember in a meeting with Conrad Wirth discussing the sequence of the project, Eero said the Arch is the most important part of the project, then the landscaping and then the museum. Wirth responded, ‘No, the priorities are the Arch first, the museum second, and the landscape third.’ For him the planting was not a high priority.”
83. Correspondence from Eero Saarinen to Dan Kiley, dated January 30, 1961, (copy on file in JNEM Archives).
84. Correspondence from Terrance J. Boyle to Dr. Philip C. Stowe, Entomology Department, University of Missouri, dated February 7, 1961 (copy on file in JNEM Archives). Boyle, an associate in Kiley’s office, was interested in information about plant pests).
85. Correspondence from Eero Saarinen to Dan Kiley, dated January 30, 1961 (copy on file in JNEM Archives). Wirth’s criticisms of the sculpted landforms is interesting in that it seems his opposition was to the inclusion of large berms to protect the site from noise from the nearby expressway, elements that were probably added at the suggestion of NPS representatives at the March 1960 presentation of the Oregon and Santa Fe Trail plan. However, it was also at about this time that Saarinen successfully pushed for a depressed expressway, his success and growing budget constraints probably affecting the NPS attitude toward the berm. The criticism of the underbrush was most likely Wirth’s response to the detailed planting plans for the areas adjacent to the railroad cuts.
86. Correspondence from Dan Kiley to Eero Saarinen, dated February 3, 1961 (copy on file in JNEM Archives). Kiley was referring to the original competition program which stated: “Every associate whose name appears as joint Author of a submission will be given full credit by name, in all publicity, for his contribution and, if associated with the Architect winning the First Prize, will be recommended, along with him, for ultimate employment by the Department of Interior in executing the design.” However, the Department of the Interior was never obligated to hire the design team recommended through the competition. Jefferson National Expansion Memorial Association, “Architectural Competition for the National Expansion Memorial, Program” (St. Louis: 1947). This document is on file in JNEM Archives, Record Unit 104, Box 26, Folder 2.
87. The particulars of Saarinen’s maneuverings to retain Kiley for design development of the landscape plan are unknown. It appears that Saarinen successfully pleaded Kiley’s case without Kiley’s participation in the lobbying effort. Later interviews with Kiley suggest that the relationship between he and Wirth was strained, and he attributes this to various causes: 1) his failure to join the American Society of Landscape Architects, an organization of which Wirth had been president; 2) a belief on Wirth’s part that the landscape architects employed by the National Park Service were the best in the country, and therefore, an outside consultant such as Kiley was seen as unnecessary; and 3) a disagreement over design philosophy, Kiley referring to Wirth as being from the Olmstedian tradition. This is drawn from the Mary Hughes oral history interview with Dan Kiley, June 8, 1991 (transcript on file in JNEM Archives) and the Bob Moore oral history interview

- with Dan Kiley, July 22, 1993 (transcript on file in JNEM Archives).
88. Bruce Detmers to Dan Kiley, January 9, 1962 (copy on file in JNEM Archives). Bruce Detmers, an associate in the Saarinen office, was writing to confirm an upcoming meeting “to resolve the landscaping and site problems.”
  89. Phillip Shipman to Bruce Detmers, October 2, 1963 (copy on file in JNEM Archives). Shipman, an associate in the Kiley office, discussed the promotional package and listed the drawings initially prepared for that package.
  90. Robert Hall, Chief EODC, to the Office of Eero Saarinen and Associates, February 7, 1963 (copy on file in JNEM Archives). The letter points out the NPS concerns with the landscape plans and drawings prepared to date.
  91. The tulip poplar was important, if not essential, to Kiley’s plan: “... I wanted tulip poplar, and I checked with horticulturists all over the country and everybody said it was a great tree ... with so many rows of trees together, it’s just like a forest. In Virginia the tulip poplar is beautiful, growing all over the forests there in Virginia, and it’s just a fantastic tree.” And, “I wanted something that soared up, cathedral-like with big, high trunks ...” Kiley also favored the tulip poplar because it grew fast. Mary Hughes interview with Dan Kiley, June 8, 1991. Kiley later noted that the elimination of the tulip poplar in favor of a smaller tree “weakened the proportional link between arch and landscape which the scale of the tulip poplars would have established.” Letter, Dan Kiley to Bob Moore, faxed June 26, 1998 (on file in Historian’s files, JNEM).
  92. Bruce Detmers to Robert Hall, Chief EODC, March 25, 1963 (copy on file in JNEM Archives). The letter summarizes points addressed at the March 18, 1963 meeting with the National Park Service to discuss the landscape plan.
  93. In a letter from an associate in the Kiley office, “We intend using a considerable quantity of some of these plants and, therefore, must be very certain of their validity and how they react to city conditions, local diseases, and pests, etc.” Records show that the letter, dated May 17, 1963 from Joseph P. Karr was sent to at least the following: the Missouri Botanical Garden; the City of St. Louis Department of Parks, Recreation and Forestry; Mr. Eldridge Lovelace, HB&A; and the Morton Arboretum, Lisle, Illinois (copies on file in JNEM Archives).
  94. Eldridge Lovelace, HB&A, to Joseph P. Karr, May 23, 1963 (copy on file in JNEM Archives).
  95. Shipman to Detmers, October 2, 1963. This letter lists the sequence of drawings prepared. In this same letter Shipman describes the preparation of drawings for a September 7, 1963 meeting illustrating the lagoons: “The original 1/30 scale plan by this time was in poor physical condition due to erasing, and in anticipation of a final meeting with Conrad Wirth a new plan seemed both a practical necessity and a desirable presentation item. During the following weeks a discussion on the ‘pros and cons’ of lakes emerged, which resulted in the then obsolete 1/30 scale plan being revised to show a ‘lake scheme.’ A sequence of study sketches was also submitted for your consideration and were subsequently drawn in more presentation detail for the most recent meeting.” Mr. Robert G. Hall, Messrs. Smith, Desilets, Associate Director Hartzog, and Assistant Solicitor Meyer were all present at this meeting as noted in a September 17, 1963 letter from Hall to the Office of Eero Saarinen.
  96. Robert Hall, Chief EODC, to the Office of Eero Saarinen and Associates, September 17, 1963 (copy on file in JNEM Archives). The letter also includes the following comment: “We were interested to review the suggested additional features for the Memorial, as illustrated in some of the sketches and in the extra plan which was included in the presentation. However,

- similar proposals have been suggested before but were not acceptable.” This comment presumably refers to the reemergence of the ponds as a plan element.
97. Transmittal for final landscape drawings, dated November 4, 1964.
  98. For more information regarding the questions of the Arch’s stability see Brown, *Administrative History*, 138; JNEM Archives Record Unit 106, Box 35 and 36; and “Gateway Arch Design Tested in Wind Tunnel,” *The Globe-Democrat* Washington Bureau, January 7, 1965 (copy on file in JNEM Archives, Record Unit 119, Box 27).
  99. Brown, *Administrative History*, 139.
  100. This date is taken directly off the final approved plan, No. 3071C (copy on file in JNEM Archives, Record Unit 120, Drawer 12, Folder 10).
  101. Glenn O. Hendrix, Chief, Design and Construction, SSC to Acting Assistant Director, Design and Construction, 26 May, 1969. JNEM Archives, Record Unit 106, Box 36, Folder 12. A reorganization of the design and construction offices of the National Park Service occurred early in 1969. All of the areas in the Midwest Regional Office (which included Jefferson National Expansion Memorial) were transferred from the Eastern Office of Planning and Design to the San Francisco Planning and Design Office (later called the Western Service Center). A second reorganization of the design and construction offices of the National Park Service occurred in 1972, when the Western Service Center and the Eastern Office of Design and Construction merged to form the Denver Service Center (DSC) in Denver, Colorado.
  102. John Ronscavage, interview with Gina Bellavia, Denver, CO, November 15, 1994. John Ronscavage, Team Captain, Jefferson National Expansion Memorial Design Team, to Chief, Design and Construction, SSC Glenn O. Hendrix, 23 July 1969. JNEM Archives, Record Unit 106, Box 36, Folder 12.
  103. “Beauty, Not Bickering,” *St. Louis Post-Dispatch*. 26 February, 1968.
  104. NPS, San Francisco Planning and Service Center, Drawing No. 366/41001, “Site Development, Arch, Jefferson National Expansion Memorial,” August 1969 (copy on file in JNEM Archives, unprocessed Rennison Collection).
  105. Ibid.
  106. Comparison of approved design development plan (No. 3071C) and DSC construction drawing No. 366/41001.
  107. Rich Huber to Ray Freeman, 20 March 1970. JNEM Archives, Record Unit 106, Box 36, Folder 23. Mr. Huber indicated that landscape architect John Ronscavage had discussions with the City Forestry Department which revealed that the hemlock was not suited to the existing conditions of the site.
  108. Glenn O. Hendrix, Chief, Environmental Planning and Design, WSC to Director, NPS, 25 June, 1970. JNEM Archives, Record Unit 106, Box 36, Folder 27. This change is reflected on Jefferson National Expansion Memorial drawing No. 366/41001B (copy on file in JNEM Archives, unprocessed Rennison Collection).
  109. “Nurserymen Fear Arch Landscape May Stay Bleak.” *The Globe-Democrat*, 5 February 1970.
  110. Ibid.
  111. Mrs. Kay Houlihan Behan to Senator Thomas Eagleton, 11 March 1970; Mrs. Paul Shatz to Representative Leonor Sullivan, 13 March, 1970; Clarence Owens to Senator Thomas Eagleton, 12 March 1970. JNEM Archives, Record Unit 106, Box 36, Folder 23.
  112. Thomas F. Eagleton to Charles Hamilton, 16 March, 1970; Leonor K. Sullivan to

- George B. Hartzog, 18 March, 1970. JNEM Archives, Record Unit 106, Box 36, Folders 23 and 25 respectively.
113. JNEM Drawing No. 366/41001C (copy on file in JNEM Archives, unprocessed Rennison Collection).
114. JNEM Drawing No. 366/41009 (copy on file in JNEM Archives, unprocessed Rennison Collection).
115. John Ronscavage, personal interview with Gina Bellavia, 15 November 1994, page 21, copy on file in JNEM Archives.
116. JNEM Drawing No. 366/41006 (copy on file in JNEM Archives, unprocessed Rennison Collection).
117. Joseph P. Karr, Office of Dan Kiley, to Missouri Botanical Gardens, 17 May, 1963 (copy on file in JNEM Archives).
118. Raymond L. Freeman, Deputy Associate Director, Professional Services to Charles Hamilton, Assistant to the Secretary for Congressional Liaison, 20 March, 1970. JNEM Archives, Record Unit 106, Box 36, Folder 23.
119. Ibid.
120. Ibid.
121. Harry W. Pfanz, Superintendent, Jefferson National Expansion Memorial to Director, Midwest Region. 27, April, 1970. JNEM Archives, Record Unit 106, Box 36, Folder 26.
122. Glenn O. Hendrix, Chief, Environmental Planning and Design, WSC to J.E.N. Jensen, Associate Director, Professional Services. 25 June, 1970. JNEM Archives, Record Unit 106, Box 36, Folder 27.
123. Ibid.
124. J.E.N. Jensen, Associate Director to Director, Midwest Region. 23 July, 1970. JNEM Archives, Record Unit 106, Box 36, Folder 27.
125. Ibid.
126. "The Greening of The Riverfront," The St. Louis *Globe-Democrat*, 29 May, 1971, by Sue Ann Wood. JNEM Archives Record Unit 119.
127. Ibid.
128. John Ronscavage, Captain JNEM Design Team, to Director, Western Service Center, 9 September 1971. JNEM Archives, unprocessed Rennison Collection.
129. Ibid.
130. It is important to understand that although the good qualities of the Rosehill Ash were noted, no attempt was made to maintain the visual and structural qualities of the originally proposed tulip poplar. The form, height, leaf color, and habit of the Rosehill Ash is markedly different from that of the tulip poplar proposed by Dan Kiley.
131. Memorandum to Director, Western Service Center from Team Captain, Jefferson National Expansion Memorial John Ronscavage, September 9, 1971. The subject of the memorandum was the soils report and revised plant list for Jefferson National Expansion Memorial. The plant list became the final used by the National Park Service.
132. JNEM Drawing No. 366/41006 (copy on file in JNEM Archives, unprocessed Rennison Collection).
133. The changes are reflected on JNEM Drawing No. 366/41027, produced by Harland Bartholomew and Associates (copy on file in JNEM Archives, Record Unit 120, Drawer 15, Folder 3).
134. JNEM Drawing No. 366/41047 (copy on file in JNEM Archives, Record Unit 120, Drawer 14, Folder 1).
135. Basic Agreement between National Park Service and Harland Bartholomew and Associates, Contract No. CX-2000-3-0033, January 12, 1973. Denver Service Center

- Storage, Accession No: 079-86-0008, Box 2 of 7, RCL No. 902831 (copy on file in JNEM Archives). Based on personal conversations with John Ronscavage, the NPS hired HB&A to complete construction document preparation because the Jefferson National Expansion Memorial project was taking too much of the DSC designers' time. It is unclear at this point why the NPS did not seek Kiley's services for this purpose.
136. Special Provisions (Architect-Engineer Basic Agreement) Contract No. CX-2000-3-0033 Professional Services Various Projects Jefferson National Expansion Memorial, St. Louis, Missouri, 1973 Fiscal Year Program. Denver Service Center Storage Accession No. 079-86-0008, Box 2 of 7, RCL No. 90283 (copy on file in JNEM Archives).
  137. Work Directive No. 0033-73-1, Basic Agreement No. CX-2000-3-0033, Jefferson National Expansion Memorial, Page 7. The drawings provided by the Government included 3071-C, 3030, 41001A, 41001C, 41009, 41006, and 3077, and electrical system study of the Old Courthouse by J. Kozel.
  138. Ibid.
  139. JNEM Drawings Nos. 366/41019, 41024A, and 41027. Copies on file in JNEM Archives, Record Unit 120.
  140. JNEM Drawing No. 366/41025 (copy on file in JNEM Archives, Record Unit 120).
  141. Architect-engineer Contract No. CX-2000-7-0013. The drawings produced as a result of this contract are Nos. 366/41037, 41038, 41039, 41040, 41041, and 41042.
  142. Stanley Dolecki, P. E., Harland Bartholomew & Associates, to Bob Shelly, NPS. October 4, 1977 (copy on file in JNEM Archives).
  143. The construction history is detailed later in this chapter.
  144. Eldridge Lovelace, former Partner, HB & A, interview with Gina Bellavia, December 6, 1994.
  145. It is important to realize that although this chapter of the cultural landscape report documents the construction projects up to 1996, the Saarinen/Kiley vision was not yet fully realized. Several major projects including a permanent maintenance facility were done later, and others such as pedestrian bridges over Memorial Drive were in the original concept but not realized.
  146. See agreement between the United States of America and the City of St. Louis, March 1, 1951 (copy on file in JNEM Archives, Record Unit 103, Box 7, Folder 3). The agreement allows the City to finance the temporary beautification of the Memorial grounds with money collected from the parking lot that was on the riverfront (in the north end of the Memorial). It is made clear in the agreement that the work will be temporary pending implementation of the Saarinen plan.
  147. See "Riverfront Garden Started," *St. Louis Post-Dispatch*, March 30, 1951 (copy on file in JNEM Archives, Record Unit 119, Box 15). Landscape Architect G.J. Griesenauer is mentioned. See also "Sunken Garden To Be Laid Out Soon On River Front Memorial," *Star Times*, February 20, 1951; "Riverfront Garden Will Be Built To Improve Memorial," *St. Louis Post-Dispatch*, February 20, 1951. Copies on file in JNEM Archives, Record Unit 119.
  148. See "Tidy Up River Front," *St. Louis Globe-Democrat*, January 18, 1951; and "\$20,000 River Front Landscape Fund Okayed," *St. Louis Star Times*, February 9, 1951. Copies on file in JNEM Archives, Record Unit 119, Box 15.
  149. A plan produced by Eero Saarinen and Associates dated December 18, 1961 shows a possible location for the reconstructed building in the southwest corner of the site (copy on file in JNEM Archives, Record Unit 120, Drawing No. D120-0053).

- The building does not appear on later Saarinen drawings and, according to George Hartzog, this was due to the fact that Saarinen didn't want to retain it. See George B. Hartzog, oral history interview with Bob Moore, October 25, 1994 (copy on file in JNEM Archives).
150. Since the Manual Lisa Warehouse was built into the limestone bluff, the west wall could not be reconstructed with original material. Therefore, an accurate reconstruction according to NPS standards was not possible. This played a large part in the decision not to attempt a reconstruction of the building.
  151. The architectural fragments and ironwork were donated to the Smithsonian and others and the Denchar Warehouse was subsequently demolished.
  152. Brown, *Administrative History*, 131-132. The low bid was \$11,923,163 which was \$3,856,163 above the government estimate. MacDonald Construction Company agreed to lower their bid by \$500,000 and NPS Director Conrad Wirth accepted the bid for \$11,442, 418. Ms. Brown gives a detailed narrative of the bidding process and some of the problems encountered.
  153. See Brown, *Administrative History* for a more detailed narrative of the construction of the Gateway Arch.
  154. Ibid. See also John Ronscavage interview with Gina Bellavia (copy on file in JNEM Archives); and wind tunnel study, JNEM Archives, Record Unit 106, Box 35, Folder 27.
  155. See JNEM Archives, Record Unit 106, Box 38, Folder 1 for correspondence between the pastor of the Old Cathedral, Jefferson National Expansion Memorial Superintendent, and NPS Regional Director regarding the request.
  156. Correspondence from Superintendent Ivan D. Parker to Colonel James E. Sanders, President, Board of Police Commissioners, March 22, 1971 (copy on file in JNEM Archives, Record Unit 106, Box 38, Folder 1).
  157. "Beauty, Not Bickering," *St. Louis Post-Dispatch*. February 26, 1968.
  158. Drawing No. 366/41001-C "Site Development Phase I (por) corresponding to the work completed by Kozeny-Wagner, Inc." and Drawing No. 366/41009A "Site Development Phase II corresponding to the work completed by Millstone Associates, Inc." were originally both considered Phase I. For the purposes of this report, their combined work during the early 1970s will be referred to as Phase I despite the fact that Drawing No. 366/41009A is clearly labeled Phase II. This helps to clarify the actual phases of development.
  159. See Drawing No. 41001-B (copy on file in JNEM Archives, unprocessed Rennison Collection).
  160. See Drawing No. 41001-C(por) (copy on file in JNEM Archives, unprocessed Rennison Collection).
  161. "Arch Landscaping Contract Let," *St. Louis Post-Dispatch*. June 20, 1970. Kozeny Wagner was awarded Contract No. 14-10-7-971-267 for their low bid of \$419,955.00.
  162. Acting Director, Midwest Region to Superintendent, Jefferson National Expansion Memorial. June 23, 1970 (copy on file in JNEM Archives, Record Unit 106, Box 36, Folder 27).
  163. "Landscaping At Last For The Arch," *St. Louis Post-Dispatch*. September 20, 1970.
  164. Ibid.
  165. "Aerodynamic Stability of Jefferson National Expansion Memorial Gateway Arch," written by Lloyd R. Cayes and Charles F. Scheffey, U.S. Department of Commerce, Bureau of Public Roads, July 1965 (copy on file in JNEM Archives, Record Unit 106, Box 35, Folder 27). See also, "Gateway Arch Design Tested in Wind Tunnel," *The St. Louis Globe*

- Democrat*. January 7, 1965 (copy on file in JNEM Archives, Record Unit 119, Box 27).
166. The ponds were not constructed at this time. The landscape was graded so that there were low points where the ponds would eventually be constructed.
167. "Bids opened on new Arch project." *St. Louis Post-Dispatch*, March 26, 1971. The contract number for this work was 4970B10045.
168. Contract No. 4970B101077 included the sidewalks and tree wells, and contract No. 4970B20053 included portions of the sprinkler system.
169. See Completion Report, Planting Phase I, Contract No. 4970B20053 (copy on file in JNEM Archives, unprocessed Rennison Collection). The work corresponded to Drawing No. 366/41006 and was completed for \$135,562.50.
170. Completion Report, Planting Phase I, Work Order No. 6525-8025-404, Contract No. 4970B20053, Suburban Tree Service, April 1974 (copy on file in JNEM Archives, unprocessed Rennison Collection).
171. *Ibid*; "Arch Landscaping," *The St. Louis Post-Dispatch*, December 19, 1971 (copy on file in JNEM Archives, Record Unit 119).
172. Lambert Field is northwest of St. Louis and is the site of the city's main airport, Lambert — St. Louis International Airport.
173. Ted Rennison replaced Jim Holland as Project Inspector in late July 1972. Rennison continued to work at Jefferson National Expansion Memorial for many more years.
174. Robert B. Schall, President of Suburban Tree Service, Inc. to Mr. Leon R. Thygesen, Contracting Officer, National Park Service, April 16, 1973 (copy on file in JNEM Archives, unprocessed Rennison Collection).
175. Completion Report, Work Order No. 6525-7600-503, Contract No. CX6000-4-9009, Harding Electric Company, Walk and Area Lighting, March 22, 1976 (copy on file in JNEM Archives, unprocessed Rennison Collection). The contract was completed at a cost of \$148,580.98).
176. Completion Report, Work Order No. 6525-7103-404, Contract No. CX6000-4-9017, Hankins Construction Company, Temporary Maintenance Building, May 22, 1975 (copy on file in JNEM Archives, unprocessed Rennison Collection). The contract was completed at a cost of \$57,723.00).
177. Completion Report, Work Order No. 6525-7601-503, Contract No. CX6000-4-9018, Sahrman Construction Company, Overlook Paving, February 9, 1976 (copy on file in JNEM Archives, unprocessed Rennison Collection). The contract was completed at a cost of \$115,296.44.
178. Completion Report, Work Order No. 6520-7602-503, Contract No. CX6000-5-9005, Kozeny-Wagner, Inc., Monumental Entrance, 5 January, 1977 (copy on file in JNEM Archives, unprocessed Rennison Collection).
179. Brown, *Administrative History*, 179; and *Statement for Management, Jefferson National Expansion Memorial*, 26. In 1980, the poured-in-place concrete was overlaid with pre-cast exposed aggregate concrete.
180. It is important to understand that HB&A did not do very much design. The construction documents and specifications produced by the firm were based on the approved Saarinen/Kiley design development plan.
181. Memorandum from John Ronscavage, Landscape Architect, to Chief, Branch of Construction, Midwest/Rocky Mountain Team, Denver Service Center, December 19, 1978 (copy on file in JNEM Archives, unprocessed Rennison Collection).
182. DSC Storage, Accession No. 079-86-0008, Box 2 of 7, Records Center Location

No. 902831, Basic Agreement No. CX-2000-3-0033; Special Provisions, Work Directive No. 0033-73-1.

183. Robert Chandler, personal telephone conversation with Gina Bellavia, March 1996.
184. Moore, *Urban Innovations and Practical Partnerships*, 110-114, 126. Although Jerry Schober takes credit for proposing to bring the trees in by helicopter, it should be noted that Mike Mayberry (Foreman, Shelton and Sons Landscaping) has disagreed. In a personal conversation with Gina Bellavia, Mayberry said it was his decision, and idea, as the contractor to import the trees by helicopter. According to Mayberry, 800 trees were lifted and planted in 10 hours. The seed mix used at the time was developed by former Superintendent Robert Chandler. The mix consisted of 49% arboretum bluegrass, 15% regal ryegrass, 15% creeping red fescue, 10% glade bluegrass, and 10% Kentucky bluegrass. This mix became known as the “Arch Grounds Seed Mix” and was available on the market.
185. Moore, *Urban Innovations and Practical Partnerships*, 13-22. Moore details the cooperative agreement between the National Park Service, City of St. Louis, and Bi-State Development Agency.
186. Ibid. Copies of the designs and specifications produced by WVP Corporation are on file in the Jefferson National Expansion Memorial Facility Manager’s Office.

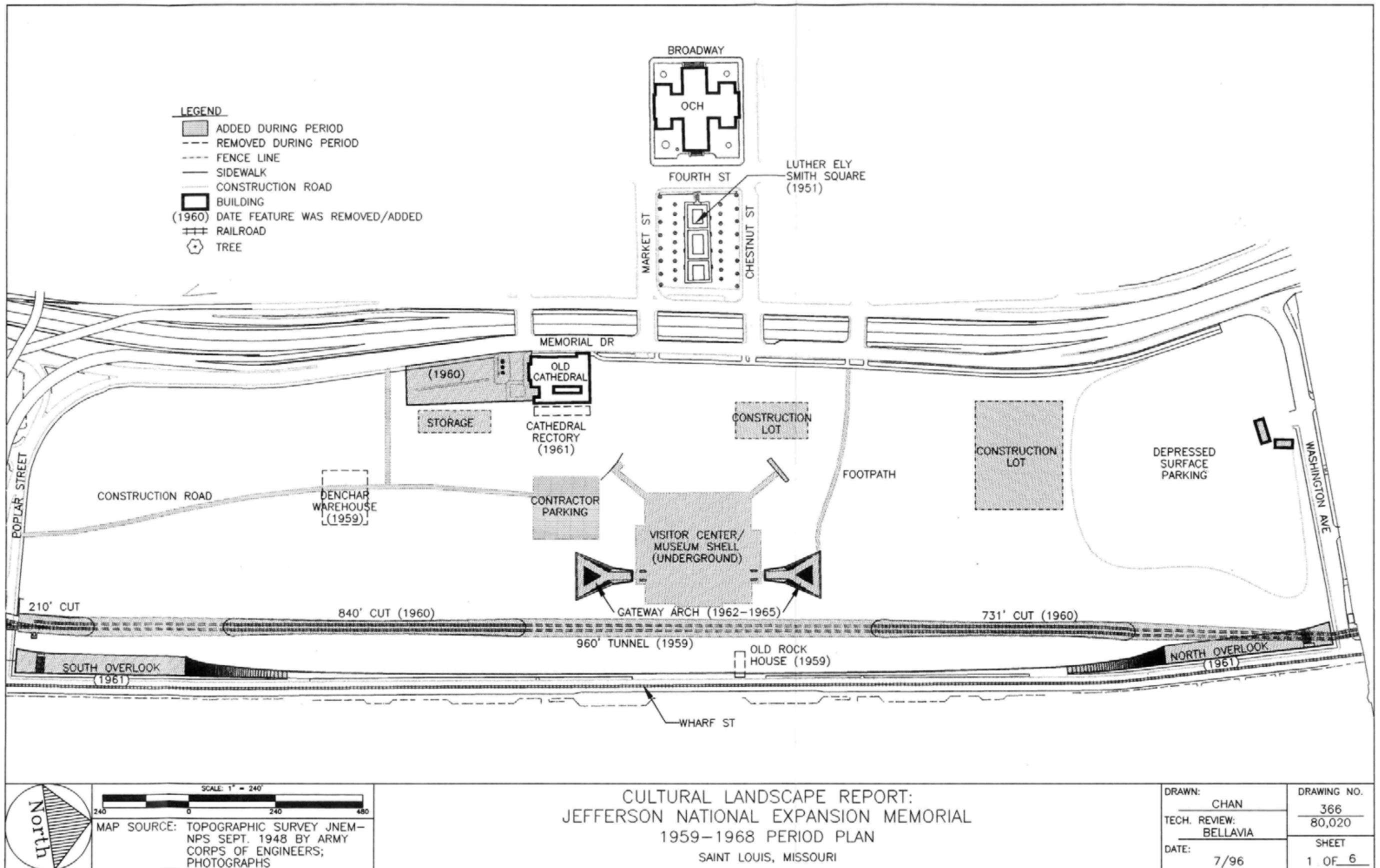


Figure 2.48. Period Plan, 1959 - 1968. (Chan, NPS, 1996)



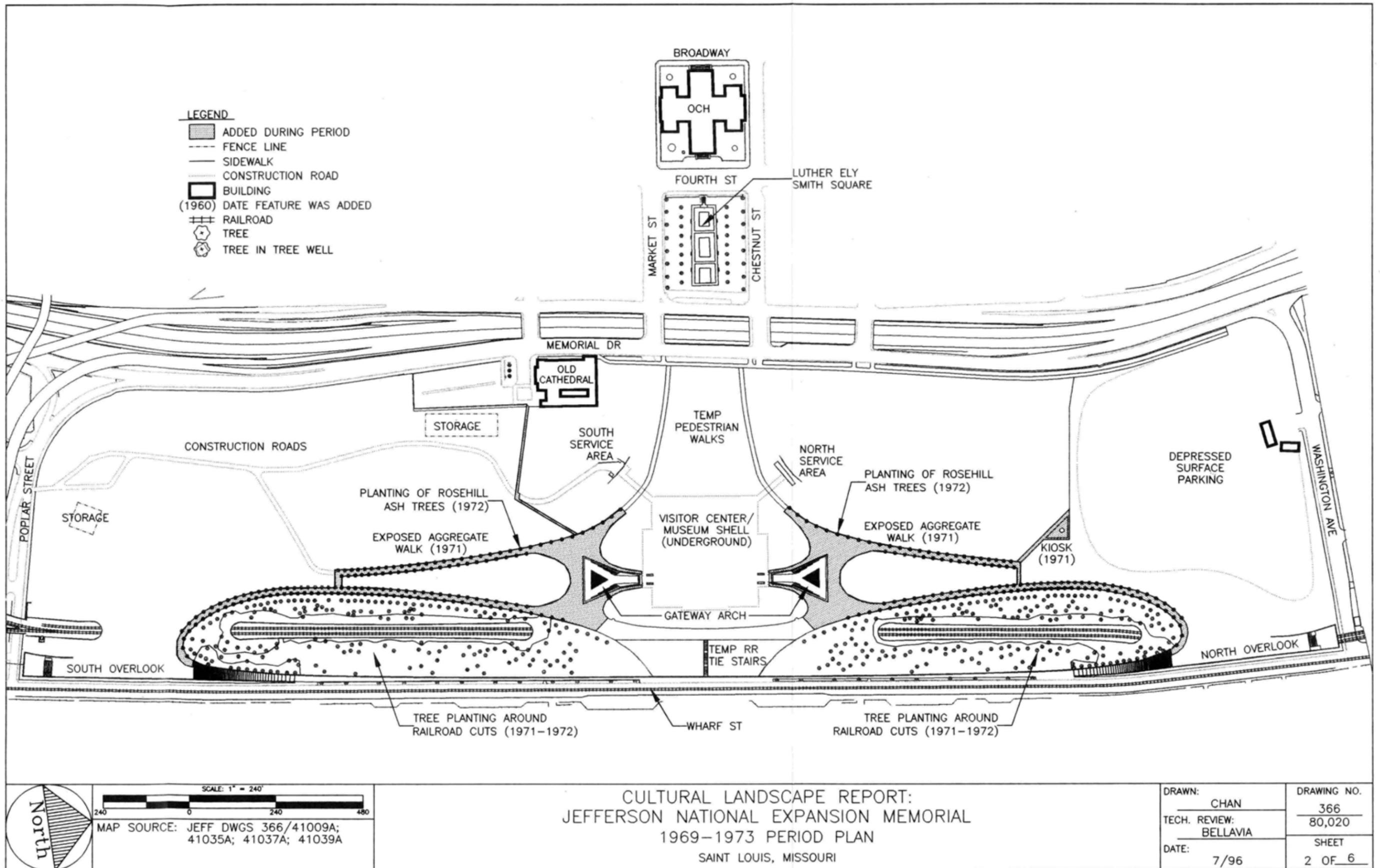


Figure 2.49. Period Plan, 1969 - 1973. (Chan, NPS, 1996)



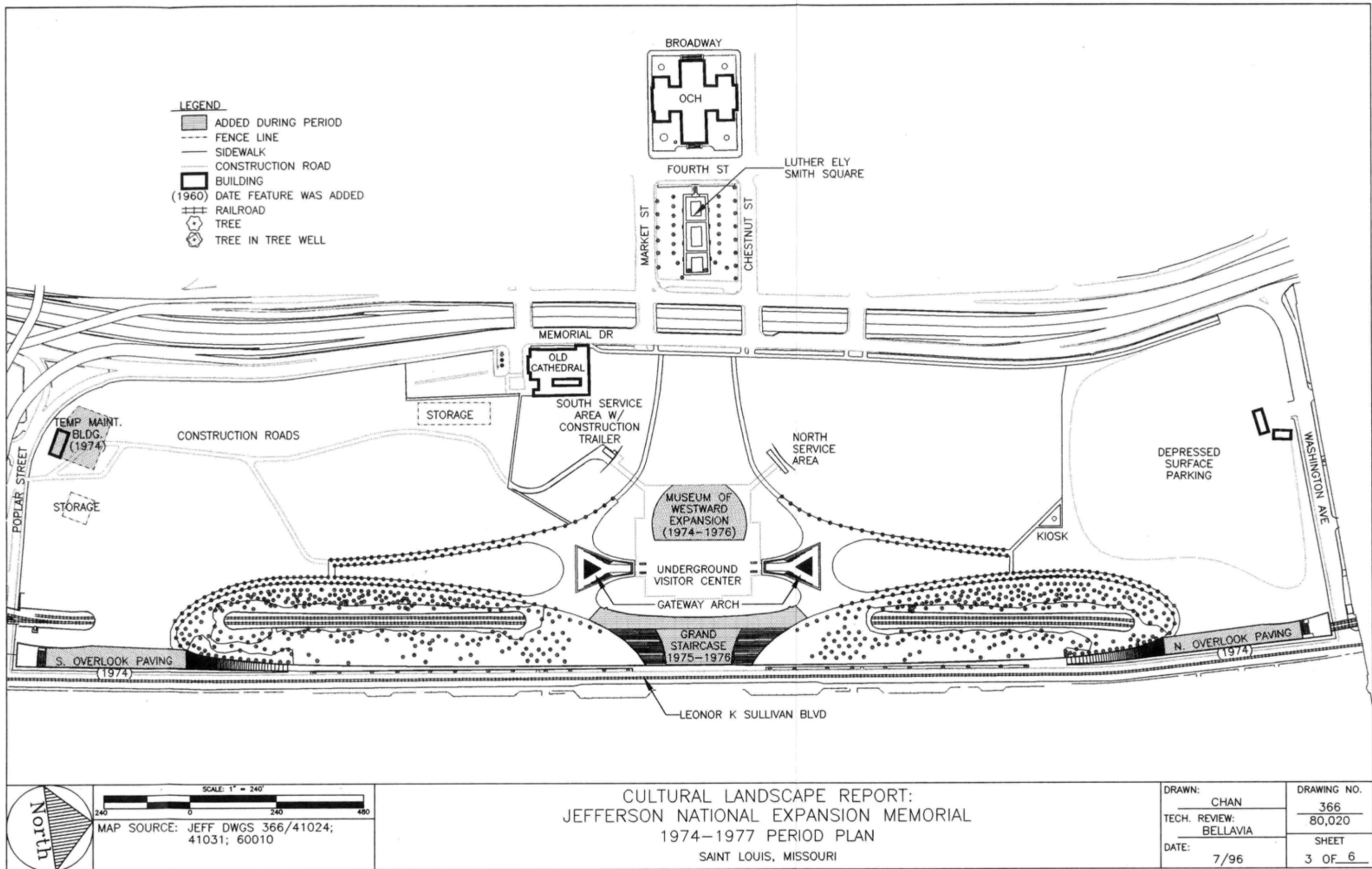


Figure 2.50. Period Plan, 1974 - 1977. (Chan, NPS, 1996)



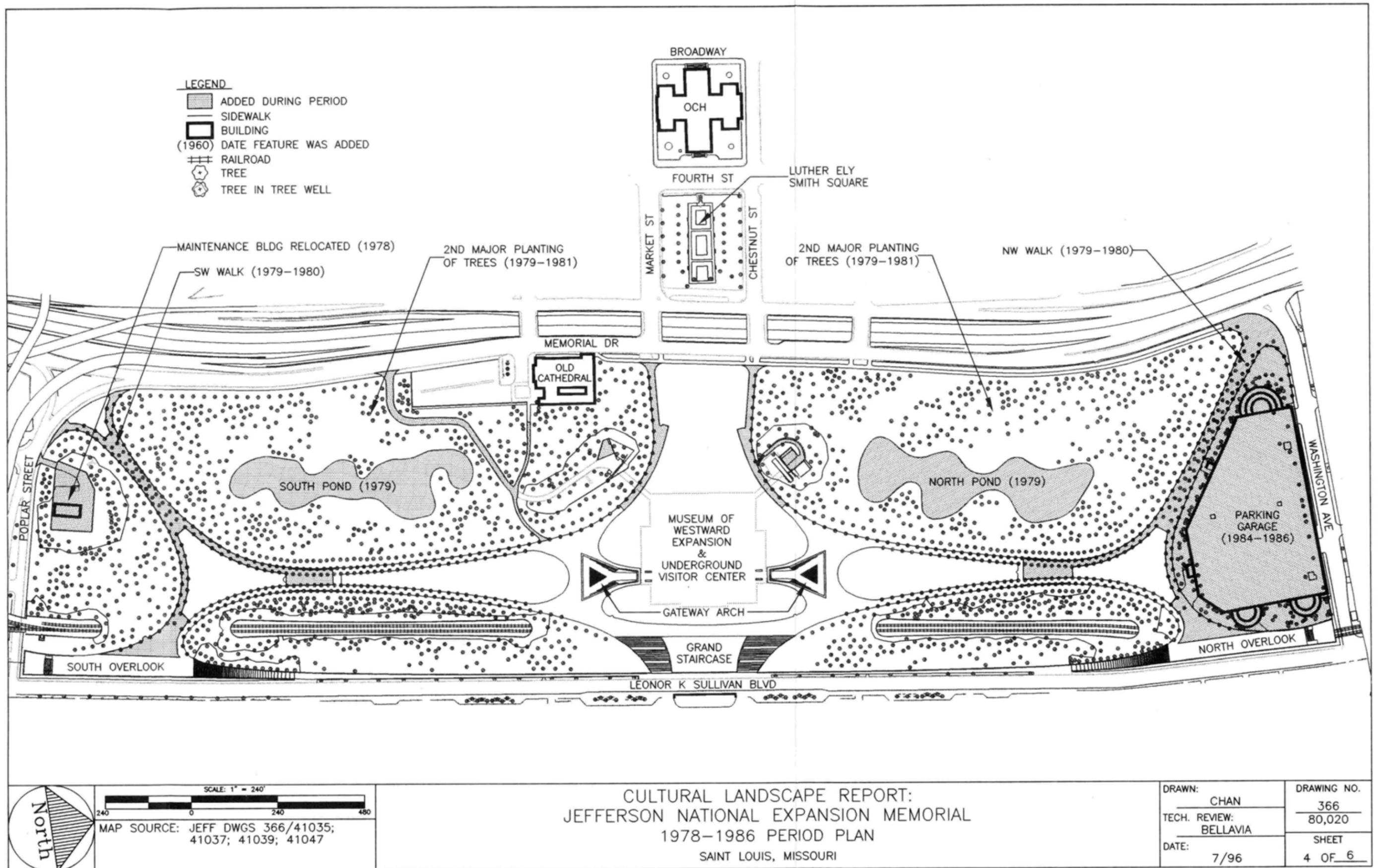


Figure 2.51. Period Plan, 1978 - 1985. (Chan, NPS, 1996)



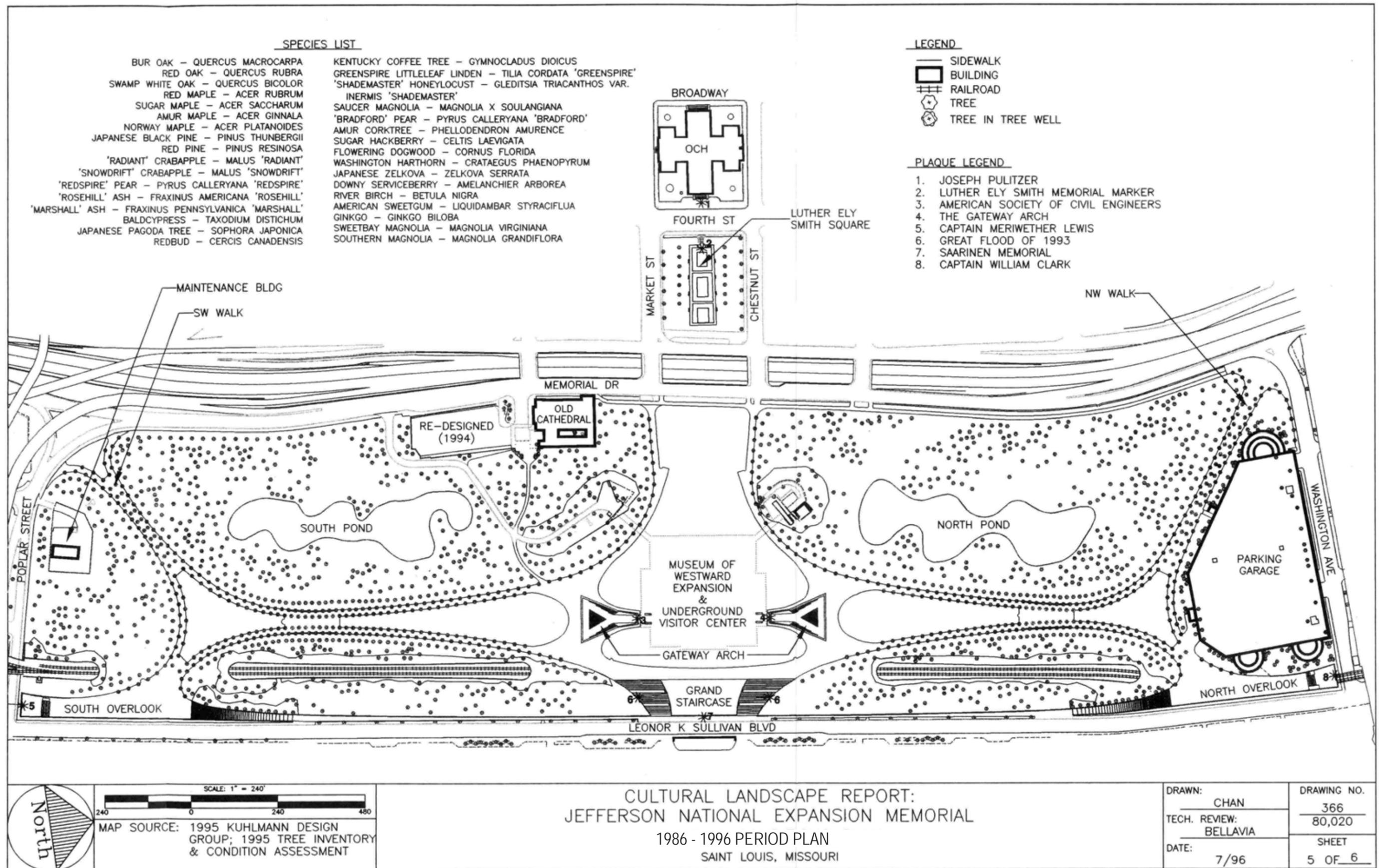
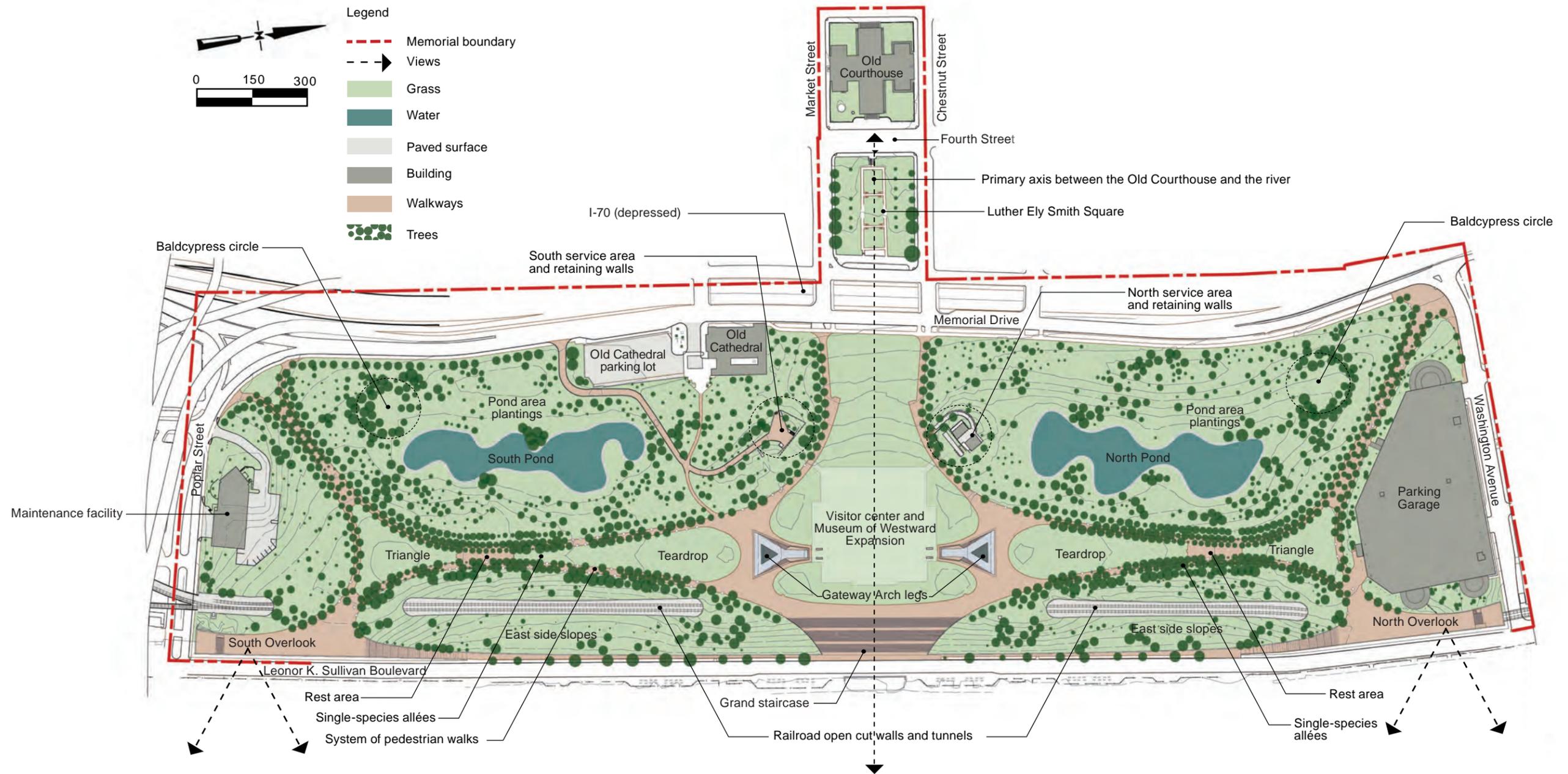


Figure 2.52. Period Plan, 1986 - 1996. (Chan, NPS, 1996)





**JEFFERSON NATIONAL EXPANSION MEMORIAL**

Figure 2.53. Period Plan, 1997 - 2009. (AECOM, 2010)



## Existing Conditions

Existing conditions documentation in this chapter provides an overview of features and systems for the Jefferson National Expansion Memorial landscape. The chapter begins with a description of the environmental context and landscape setting of the Memorial. The context provides an understanding of the relationship between the cultural landscape and its broader environment. Following this, the landscape is inventoried as a collection of features, organized into sections by landscape characteristics.

In 2009, field work included a site survey of existing landscape conditions for the purpose of updating the 1995 condition assessments, and documentation through photography and notation.<sup>1</sup> Black-and-white photographs were taken in 1995 and digital color photos in 2009 to document landscape features and conditions. The condition of each landscape feature was evaluated based on the criteria developed for the Cultural Landscape Inventory (CLI) and the NPS *Guide to Cultural Landscape Reports*:<sup>2</sup>

**Good:** The features of the landscape need no intervention; only minor or routine maintenance is needed.

**Fair:** Some deterioration, decline, or damage is noticeable; the feature may require immediate intervention; if intervention is deferred, the feature will require extensive attention in three to five years.

**Poor:** Deterioration, decline, or damage is serious; the feature is seriously deteriorated or damaged, or presents a hazardous condition; due to the level of deterioration, damage, or danger the feature requires extensive and immediate attention.

**Unknown:** Not enough information is available to make an evaluation.

The following narrative summarizes the existing conditions of the site. A 2010 Existing Conditions Plan is located at the end of this chapter (see Figure 2.52).

### ENVIRONMENTAL CONTEXT

The Mississippi River is the most significant natural feature which directly affects the Memorial and adjacent lands. Just north of St. Louis, the Missouri River converges with the Mississippi River. The Memorial grounds have been affected as a result of periodic flooding by the Mississippi River. The average depth of the river in St. Louis is 11.20 feet. The flood stage is 30 feet. In 1993, flood waters reached their highest recorded mark of 49.58 feet, 19.58 feet above flood stage.

The St. Louis Metropolitan Area encompasses approximately 5,300 square miles. It is made up of portions of both Missouri and Illinois, divided by the Mississippi River, and nine counties. The population of the metropolitan area in 1990 was 2,444,099, ranked 17<sup>th</sup> in the country.<sup>3</sup> In 2007, U.S. Census data placed the St. Louis Metropolitan Area population at 2,803,707, an increase of nearly 15 percent since 1990. In spite of this, its ranking has decreased slightly, making St. Louis the 18<sup>th</sup> largest metropolitan area in the United States.<sup>4</sup>

### LANDSCAPE SETTING

The perimeter of the Memorial is defined by roads, and the Memorial itself is intersected by two major streets. The main portion of the Memorial, adjacent to the river, is bounded to the north by Washington Avenue, to the

east by Leonor K. Sullivan Boulevard, to the south by Poplar Street; and separated from Luther Ely Smith Square on its western edge by Memorial Drive and the depressed I-70 expressway. Luther Ely Smith Square and the Old Courthouse are separated by Fourth Street, and bounded by Chestnut Street to the north and Market Street to the south.

Washington Avenue is a city street located along the north edge of the Memorial. North of Washington Avenue is Eads Bridge, the northern boundary line of the Memorial. Eads Bridge was listed on the National Register of Historic Places in 1966 and is a National Historic Landmark. The entrances to the Memorial grounds from Washington Avenue occur at the parking garage and at the plaza at the northwest corner of the Memorial grounds.

Adjacent to the northern boundary of the Memorial on the north side of Eads Bridge is Laclede's Landing. A rehabilitated historic district, Laclede's Landing has restaurants, bars, and small shops. This area resembles the landscape setting of historic warehouses that once occupied the entire riverfront in the Memorial area. Connections between this area and the Memorial include two pedestrian openings and three vehicular street openings in the Eads Bridge.

Leonor K. Sullivan Boulevard runs along the Mississippi riverfront, and is closed when flooding occurs. The grand staircase, along with the curving, battered walls of the overlooks, together with the adjacent landform, function as a floodwall system along the street edge.

The southern boundary of the Memorial, Poplar Street, is located below the interchange of four interstate highways: I-70, I-55, I-44, and I-64. Chouteau's Landing, a 19<sup>th</sup>- and 20<sup>th</sup>-century warehouse district, is situated south of the Memorial grounds.

Memorial Drive is composed of a pair of one-way streets classified as a minor arterial, with two sets of on/off ramps to the interstate occurring along its length adjacent to the Memorial. The I-70 expressway runs at a lower grade than Memorial Drive in a "depressed

section" between Pine and Walnut Streets. Two entries to the Memorial grounds are sited along the western edge where Memorial Drive intersects Market Street and Chestnut Street. These intersections underwent repair and resurfacing in 2009.<sup>5</sup>

A cooperative agreement between the United States and the Archdiocese of St. Louis dated February 23, 1961 provided for the preservation and interpretation of the Old Cathedral. This agreement is still in effect. The Old Cathedral is a fully functioning Catholic Church located within the boundary of the Memorial. The Cathedral and the land it occupies are owned by the Catholic Church. Adjacent land north of the Cathedral is used by the Church to accommodate air-conditioning units, and a surface parking lot to the south serves the congregation. Both of these areas are administered under special use permits.<sup>6</sup>

The Terminal Railroad Association (TRRA) has a perpetual easement on a rail alignment that runs through tunnels and open cuts within the Memorial grounds.<sup>7</sup> In 1981 the agreement was modified to accommodate railyard traffic so that the tracks on Leonor K. Sullivan Boulevard could be removed. The TRRA removed and replaced the entire track bed and installed one set of tracks in the center of the alignment in 1997.

The Gateway Arch's designation as a National Icon by the Department of the Interior resulted in security requirements that were instituted after September 11, 2001. This included the addition of bollards along the north, west, and south perimeter of the grounds. In 2010, the park was planning to add large planters along Leonor K. Sullivan Boulevard on the eastern perimeter of the park. Additional security features include a security checkpoint within the visitor center entrances, and the addition of security cameras on the grounds.

## SPATIAL ORGANIZATION

The Memorial is designed as a unified landscape, and its monumental character is achieved by a sequence of spaces which orchestrate movement, create or screen views, and contrast a sense of spatial compression and expansion through the use of proportion

and scale (see Figure 3.52). These spaces are shaped and defined by the combination of landform, vegetation, circulation, structures, views, and other landscape features discussed in detail in sections that follow.

The Memorial grounds are roughly bilaterally symmetrical to the north and south of a central axis running from the Mississippi River to the Old Courthouse, through the center of the Gateway Arch. This alignment is a primary organizing feature of the landscape. The contrast between the monumental expanse of space around the commanding vertical presence of the Gateway Arch and the ordered, enclosed space created by the tree-lined walks along the north-south axis has a strong visual and sensory impact. The grand staircase forms a monumental threshold along the primary axis, connecting to the river levee.

The tree-enclosed walkways terminate at the northeast and southeast corners of the Memorial grounds at overlooks where an expansive space emphasizes the horizontal plane and the view to the Mississippi River. The overlooks are monumental plinths and serve as viewing platforms for the river,

East St. Louis, as well as the Gateway Arch. The overlook walls and staircases, together with the slopes and grand staircase, form topographic variations of up to 55 feet between the Memorial grounds and the riverfront along Leonor K. Sullivan Boulevard. From the boulevard, the ground slopes gently down to the river.

The system of walks and allées forms a unified space which spans the length and breadth of the Memorial, the graceful curving walks echoing the catenary curve of the Gateway Arch. Along the north-south axis, the dense, evenly-spaced triple allées create



Figure 3.1 View along walk between north triangle and northeast plaza. Note lights and single-species tree planting.



Figure 3.2. View along walk in southern part of Memorial grounds; note single-species tree planting, tree grates, and lights.

an enclosed, rhythmically ordered forest space which contrasts with the open space surrounding the Gateway Arch. The uniform height of the trees creates a dense ceiling canopy for the walks. The lawn areas located within the north-south walkways (referred to as the “triangles” and “teardrops”) function to compress the pedestrian corridor alongside them, contrasting with the monumental space of the primary axis (see Figures 3.1 and 3.2).

Enclosed spaces created by vegetation and sculpted landforms surround the ponds. The north and south ponds each sit within a gentle depression, creating a sense of physical separation from the surrounding city. This contrasts with the sheltered, wooded walks. The two baldcypress (*Taxodium distichum*) circles are located northwest and southwest of the north and south ponds, respectively. They are densely planted, textured enclosures, with openings that frame views of the Gateway Arch (see Figure 3.3).

Luther Ely Smith Square is a one-block area bounded by Market Street, Fourth Street, Chestnut Street, and Memorial Drive. The entire area slopes gently down toward the east at a three percent grade. A central sunken area, measuring approximately 65 by 220 feet, is three to five feet lower than the adjacent streets. Concrete walks define three central squares of lawn which range in area from 800 to 1,500 square feet and have central squares of ornamental grasses and perennials. The roughly 70-foot-wide lawns along the north and south sides of the central area slope toward Memorial Drive. These lawn areas are planted with two parallel rows of trees spaced approximately 50 feet on center (see Figure 3.4).

The Old Courthouse block is the western terminus of the central east-west axis of Jefferson National Expansion Memorial. The large, domed, cruciform Old Courthouse



Figure 3.3. View of the Gateway Arch across the south pond from the southwest baldcypress circle.



Figure 3.4. View across Luther Ely Smith Square to the Gateway Arch.



Figure 3.5. The Old Courthouse.



Figure 3.6. View of the side of the Gateway Arch from the north triangle.

occupies the entire block, providing a strong vertical element. Adjacent to each of the four wings are roughly equal-sized courtyards bounded by a wrought-iron fence. Each of the four courtyards has a centrally located planting or architectural feature (see Figure 3.5).

The maintenance facility is inset into a bowl-shaped depression edging Poplar Street on the south, with slopes along the north, east, and west intended to hide this functional area from the rest of the Memorial grounds.

## TOPOGRAPHY

The designed landform of Jefferson National Expansion Memorial is defined by graceful, undulating curves which create a complex ground plane. The Memorial grounds were constructed with imported fill material which reaches approximately 55 feet above the Mississippi River, and accentuates the site's significant vertical features, including the Gateway Arch, the Old Courthouse, the overlooks, and the allées of trees along the walks. The Memorial's landform works together with vegetation to hide, reveal, and frame views of the Gateway Arch at key locations in the landscape, such as the high points of the triangles along the north-south axis of the Arch, which create a base for designed views of the sides of the Arch (see Figure 3.6). The sculpted topography also hides the railroad tracks, service functions, the Old Cathedral parking lot, and Memorial Drive, and creates a sense of remove from the surrounding city. The irregularly bowl-shaped gentle depressions around the ponds create an expanse of enclosed space and frame views of the Gateway Arch (see Figure 3.7).

The ground plane is generally level underneath the Gateway Arch at an elevation of approximately 446 feet above mean sea level. The elevation gently increases to the north and south and culminates at two high points at the triangles, which sit at elevations of about 470 feet, a 25-foot vertical change. Toward the west, a gentle slope rises 19 feet from the base of the Gateway Arch to a berm which parallels Memorial Drive, providing a visual base to the Old Courthouse while effectively concealing Memorial Drive (see Figure 3.8).



Figure 3.7. The south pond sits in an open, gently depressed landform.



Figure 3.8. A berm creates a visual base for the Old Courthouse when viewed from below the Gateway Arch.



Figure 3.9. Landform and vegetation create frames for views of Gateway Arch from the south pond.

The most extreme grade changes occur at the overlooks, around the ponds, at the service areas, and at the maintenance facility. The overlooks are plinths perched more than 50 feet above the river. From the top of the large retaining walls is a 55-foot drop to Leonor K. Sullivan Boulevard. In contrast, undulating topography around the ponds (where slopes range from 14 to 47 percent) works together with vegetation to frame iconic views of the Gateway Arch (see Figures 3.3, 3.7, and 3.9). In some places, there is a vertical change of almost 30 feet descending from the walks at the top of slope down to the pond edge. The service areas are in depressions and provide access to the service areas for the underground visitor center and Museum of Westward Expansion. Retaining walls around the service areas contain the steep slopes, ranging from 38 to 66 percent. The grade drops 16 feet at the north service area (containing a generator building and heating, ventilation, and air conditioning equipment) and 25 feet at the south service area (containing the shipping and receiving entrance). The maintenance facility sits in a hollow at an elevation of 423 feet, about 23 feet below the surrounding area, an intentional gesture to hide the building from sightlines on the north-south axis. The grass slopes average between 25 and 35 percent.

There are some very steep (50 to 70 percent) slopes on the site, particularly around the railroad open cuts and tunnels, the parking garage, and east of the maintenance building. These slopes are predominantly planted in lawn, and appear to have been affected by

erosion and gradual subsidence in some places. There are some drainage and erosion problems at the northeast end of the north pond and at the southeast end of the south pond. Erosion has incrementally altered the landform in some areas.

The soil composition at the Memorial is largely undetermined, being composed primarily of a 10- to 30-foot-deep section of undocumented fill (which includes building rubble) atop limestone bedrock.

## IEWS AND VISTAS

### View between the Old Courthouse and the Gateway Arch

The primary view at the Memorial is along the axis between the Old Courthouse and the Gateway Arch. This unobstructed view forms a relationship between the Old Courthouse, the Gateway Arch, the river, and East St. Louis (see Figure 3.10).



Figure 3.10. View from the Old Courthouse to the Gateway Arch.



Figure 3.11. View along the north-south axis, from the south triangle to the Gateway Arch.

### Vistas along the North-South Axis

The vistas along the north-south axis hide and reveal the Gateway Arch along the system of walks (see Figure 3.11). They are partially blocked by the trees along the walks.

### Views between the Memorial and East St. Louis

The view of the Gateway Arch and St. Louis from the east side of the Mississippi River was a major consideration of the Saarinen/Kiley plan throughout its development. Currently, none of the East St. Louis riverfront is part of the Memorial or NPS lands. A viewing platform was constructed on the east side of the river in Malcolm Martin Memorial Park in 2009. This view illustrates the Gateway Arch in relation to the city which it symbolizes. The industrial land uses on the east side of the river at this time limit opportunities for the enjoyment of this view. An important view from the Memorial is across the river to East St. Louis. A large wooded area is visible to the



Figure 3.12. View of the Memorial from East St. Louis.



Figure 3.13. View to East St. Louis from the Memorial's north overlook. Note the fountain and grain elevator.

south, and The Casino Queen and parking lot are visible to the north. Directly across from the Memorial are the Cargill grain elevator, multiple railroad tracks, and a fountain built in the early 1990s (see Figures 3.12 and 3.13).

#### Views Around the Ponds

Iconic views of the Gateway Arch are available from the open lawn areas around both ponds. From the north and south ponds, there are also views to downtown St. Louis, although Memorial Drive is screened by bermed landforms (see Figure 3.7). From the south pond, there are views to the Old Cathedral spire.

#### Views From the Overlooks

The overlooks were designed as viewing platforms. There are views from both overlooks towards the Gateway Arch, to East St. Louis, and to the river (see Figure 3.14). From the north overlook there are views to the historic



Figure 3.14. View towards the Gateway Arch from the south overlook.



Figure 3.15. Partially screened view to maintenance facility.

Eads Bridge and from the south overlook there are views to the Poplar Street Bridge.

#### Screened Views of Service Areas

Views to the service areas (shipping and receiving and generator buildings) are well screened from view within the Memorial grounds. The view to the maintenance facility from the south walkways, however, is not sufficiently screened from view (see Figure 3.15).

## BUILDINGS AND STRUCTURES

The majority of the buildings and structures on the Memorial grounds were constructed between 1959 and 1976. The oldest are the Old Courthouse, constructed from 1839 to 1862, and the Old Cathedral, completed in 1834. Structures added between 1984 and 2003 include the parking garage, the maintenance facility, and the central section of the grand staircase. A visual inspection of the buildings and structures indicates that there is some deterioration, but structural analysis has not been completed as part of this report. Some structures are being assessed through Historic Structure Reports (HSRs). In 2000, a seismic study was completed by FEMA for all memorial buildings and structures except the Gateway Arch. The following summarizes the existing conditions based on visual assessment in 1996 and 2009 and review of the Project Management Information System for the Memorial.<sup>8</sup>

### Buildings

#### Old Cathedral

The Old Cathedral was begun in 1831 from plans prepared by Joseph Laveille and George Morton and completed in 1834. The limestone



Figure 3.16. The Old Cathedral.

Old Cathedral is in the Greek Revival style. Although within the Memorial boundary, the building is owned and cared for by the Roman Catholic Archdiocese of St. Louis. The stonework appears to have worn somewhat over time, but the building appears to be in good condition (see Figure 3.16).

### Old Courthouse

The Old Courthouse was built between 1839 and 1862. It is a three-story Greek Revival brick and stone building designed by several architects. The building is a Greek cross in plan; the junction of the four wings forms a central domed rotunda (see Figure 3.17). The Old Courthouse forms one terminus of the primary axis to the river.

### Gateway Arch

The condition of the Gateway Arch was not assessed. It has not been structurally analyzed since its completion in 1965, but this work was ongoing in 2009 as part of a Historic Structure Report. A cursory inspection of the Gateway Arch legs and foundation construction joints in 1984 revealed defects, and possible water intrusion between the outer and inner skins.<sup>9</sup> Marks on the exterior stainless steel skin are visible at about 350 feet above the ground. A staining investigation was performed in 2007. Problems continue to occur with visitors scratching initials on the exterior of the north and south legs. An analysis is needed to determine if any damage has occurred to the structure and what measures may be needed to repair or stabilize it. A Historic Structure Report was being written in 2009 and will be released in 2010.

### Visitor Center and Museum of Westward Expansion

The underground visitor center and Museum of Westward Expansion, completed in 1976, was designed by Aram Mardirosian. A structural analysis of the underground visitor center was completed in 1989-1990. The analysis began as a simple investigation to locate the source of water intrusion but ultimately led to the discovery of cracks in the ceiling support beams. Structural reinforcements were erected and the roof was waterproofed.<sup>10</sup> As a result of this work, portions of the interior of the visitor center were altered. The American Indian Peace Medal Exhibit, two museum stores, and a ticket purchasing area have since

been added. The condition of the visitor center and Museum of Westward Expansion was not assessed for this report.

### Maintenance Facility

The existing maintenance facility was built in 2003. It is a two-story building constructed of concrete masonry units. The facility sits in a hollow in the landform, intended to screen the building from view of visitor areas at the Memorial (see Figure 3.18).

### Parking Garage

The parking garage is inset into the landform on its south and west sides, with a significant difference in grade between the garage and the adjacent overlook. Completed in 1986, the



Figure 3.17. The Old Courthouse.



Figure 3.18. The maintenance facility.



Figure 3.19. Parking garage from Washington Avenue.

garage is a three-level building punctuated by horizontal openings along the beige-brown exposed-aggregate concrete façade, as well as two larger openings at the entry and exit points. The condition of the parking garage was not assessed in this report. The garage is maintained by the Bi-State Development Agency, now called Metro (see Figure 3.19).

## Structures

### North and South Overlooks

The north and south overlooks are located 4,000 feet apart along the eastern edge of the Memorial. The overlooks consist of expansive plazas at the north and south ends of the Memorial over the rail tunnels, with a small elevated viewing platform at the end of each. The edge of the steps to the platform is cantilevered. A storage area is located beneath the north viewing platform.

The plazas and platforms sit atop monumental, vertically and horizontally curving walls, beginning at street level and rising along the staircases to a height of 55 feet, and also functioning as floodwalls. The beige concrete walls of the overlooks have a board-formed pattern. An unusual, vertically curving staircase

descends from each overlook to Leonor K. Sullivan Boulevard. The treads of the staircases have eight-inch risers; the steps decrease in depth from 11 feet at the base to three feet at the top to create a curved vertical line in the same family as that of the Gateway Arch (see Figures 3.20, 3.21, and 3.22).

The north and south overlooks were constructed in the early 1960s and have not been structurally analyzed since their completion. They were visually assessed in 1996 and 2009 and appear to be in fair to poor condition. Spalling concrete, cracking, and pieces of concrete falling from the floodwalls have been recurrent problems. Temporary measures have been taken to stabilize the overlook structures and eliminate hazards to visitors, but the underlying problem has not yet been identified or treated.

The north overlook plaza paving exhibits conditions that are likely related to insufficient underlying drainage. The concrete along the walls is efflorescing and crumbling in places. Nearly all the caulk in the expansion joints at the base of the wall and the mortar joints under the cap are failing. The joints where past repairs meet the original concrete are not all



Figure 3.20. South overlook floodwall seen from Poplar Street.



Figure 3.21. North overlook plaza.



Figure 3.22. North overlook wall - concrete spalling.



Figure 3.23. North overlook plaza repaved area with cracking indicates a continuing underlying problem.

flush (see Figure 3.22).

A Sika Top coating has been applied to the surface of the viewing platforms and their stairs. This material is now cracking and peeling off the platform at the north overlook. There are two small drains in the corners of the north viewing platform that appear to be non-functioning. The concrete masonry unit wall beneath the viewing platform contrasts with the concrete used in the surrounding features.

The north overlook staircase, leading from the Memorial down to Leonor K. Sullivan Boulevard, is in poor condition. The nearly one-inch-thick Sika Top coating used to repair the stairs is spalling and cracking, and has fallen off in places (see Figure 3.24). Poor drainage has led to deterioration; puddling and water seepage were observed, and exposed metal pins are visible along the edges of some steps (see Figure 3.25).

Similar conditions were observed along the south overlook staircase, although the damage appeared to be less advanced than that of the north overlook (see Figure 3.26). On the south overlook, the paving appears to be separating from its foundation where the wall begins on

the west side of the plaza.

Additionally, vertical cracking was observed on the surface of the monolithic, curving concrete floodwalls. Approximately mid-way along the length of each wall, water seeping through vertical cracks was observed, some with unidentified residue and biological growth, indicating ongoing moisture problems (see Figure 3.27). Deterioration appears to occur at the same level on both of the adjacent staircases.

### Railroad Open Cut Walls and Tunnels

The railroad open cut walls and tunnels were constructed in 1959-1960. The railroad open cuts are linear depressions flanked by retaining walls with a curved top profile, flush with the ground level and reflecting Saarinen's catenary curve. The tunnels are covered with mounded earth, planted with a groundcover of Bulgarian ivy (*Hedera helix* 'Bulgaria') and wintercreeper (*Euonymus fortunei* 'Coloratus'). The concrete tunnel opening recalls the form of the Gateway Arch, and has a board-formed pattern similar to the overlooks (see Figure 3.28). Structural analysis of the concrete tunnel structure was not undertaken for this report. A cursory visual inspection indicates that there has been some spalling and cracking of both the walls and the



Figure 3.24. Damage along north overlook staircase.



Figure 3.26. South overlook staircase.



Figure 3.25. Drainage problem at north overlook staircase.

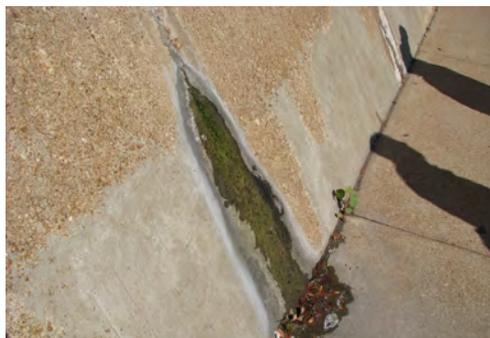


Figure 3.27. Weeping at base of south overlook floodwall.

tunnels. In 2009 some staining and cracking were observed on the concrete at the north entrance to the north tunnel. The metal drain pipes along the foot of the walls along the north railroad open cut appeared damaged, rusty, and degraded in many places.

### Grand Staircase

The central portion of the grand staircase was completed in 2003. The grand staircase steps are in fair condition. The snow-melting mats installed in the 1980s function intermittently; typically every third step is active. The heat mat covers about six feet of stair adjacent to the north and south handrails. Some joints have failed on the stairs, and in some places there is evidence of shifting and cracking. The covered trench drains appear to be functioning. During flood events, in order to deter visitors from attempting to access the river, the grand staircase is cordoned off. During special riverfront events, particularly for summer concerts, the steps are used as seating to watch performances given across Leonor K. Sullivan Boulevard to the east on the city-owned Riverfront Stage (see Figures 3.29 and 3.30).

### North and South Service Areas

The ventilation system tower, while sunken below the grade of the pathways, is highly reflective and compromises views of the landscape from the top of the Gateway Arch. It contrasts with the brown-aggregate roof of the adjacent generator building.

The shipping and receiving facility, inset in a depression, is well hidden by mature plantings and is largely unobtrusive in the landscape.

### Retaining Walls

There are a number of poured-in-place concrete retaining walls at the service areas,



Figure 3.28. Railroad tunnel entrance from above. Note catenary curve segment.

all of which appear visually to be in good condition, although a structural analysis was not undertaken for this report. Railroad ties along the western side of the north service area appear to have moved from original placement and there is some erosion. Along the southwestern perimeter of the Memorial a portion of the berm has been cut away and inset with a small concrete masonry unit retaining wall.

## VEGETATION

Vegetation at the Memorial is comprised entirely of designed ornamental and functional plantings. The plants define a variety of spaces, and frame or screen views. The vegetation forms much of the spatial experience of the site, from the dense plantings that enclose walkways to the broad expanse of lawn under the Gateway Arch. The single-species allées of trees along the walks are character-defining features distinguished by the close, rhythmic spacing of trees. The uniform height of the allées also creates an undulating line in the landscape that is apparent from the entrances to the Memorial. The form and color of the vegetation creates and defines spaces with varied degrees of transparency and texture. Trees are generally encircled with mulch rings

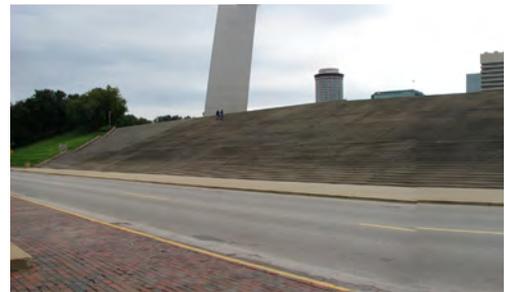


Figure 3.29. The grand staircase from Leonor K. Sullivan Boulevard.



Figure 3.30. View of the river from the top of the grand staircase.

in the lawn areas and tree grates along the walks. The Memorial grounds plantings are discussed by form below.

### Single-species Allées

The triple allée plantings of Rosehill ash trees (*Fraxinus americana* 'Rosehill') are in fair condition. These trees are all of approximately uniform height, forming an enclosure over the walks. They are planted partially within the edges of the walks, 30 feet apart, and along the outside of the walks in a third row, as well as an additional row within the rest areas. The rows are alternating, with the trees 16 to 20 feet on center within each line (see Figures 3.1 and 3.2). In 1996, 71 trees out of 985 were in poor condition and required replacement, and 11 were missing. For the most part, the trees that were in poor condition in 1996 were some of the oldest trees on the site (planted in Phase I, 1969-1973). These trees had reached their maturity and even outlasted the average lifespan of a typical urban tree. By 2009, 150 missing ash trees had not been replaced due to concerns about their susceptibility to the emerald ash borer. For more information regarding the emerald ash borer, see the Pests and Diseases section under Management Concerns later in this chapter. The trees' conditions are also affected by the grates which surround them; see the discussion of tree grates in the Small-scale Features section later in this chapter for more information.

### Baldcypress Circles

The baldcypress circles are located to the northwest of the north pond and the southwest of the south pond. Each circle is an enclosed space punctured by an opening that frames iconic views of the Gateway Arch and screens Memorial Drive and the city. The baldcypress circles were planted in 1980 and are in good condition (see Figure 3.31). Additionally, there are two small groves of baldcypresses inset into spots along the curvilinear edge at the western edge of both ponds, also in good condition. The baldcypress trees located adjacent to the grand staircase along Leonor K. Sullivan Boulevard are also in good condition.

### Pond Area Plantings

The trees on the slopes around the ponds are planted in irregularly spaced groupings

of three to seven trees. They include several species: bur oak (*Quercus macrocarpa*), swamp white oak (*Quercus bicolor*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), linden (*Tilia americana*), hawthorn (*Crataegus sp.*), Kentucky coffeetree (*Gymnocladus dioica*), river birch (*Betula nigra*), honeylocust (*Gleditsia triacanthos*), Bradford pear (*Pyrus calleryana*), Japanese pagodatree (*Sophora japonica*), saucer magnolia (*Magnolia x soulangeana*), eastern redbud (*Cercis canadensis*), and several varieties of crabapple (*Malus sp.*). The trees are in fair to good condition.

### Railroad Open Cut and Tunnel Plantings

Groundcovers over the railroad tunnels include pyracantha (*Pyracantha sp.*), Bulgarian ivy, and a few daylilies (*Hemerocallis sp.*) (see Figure 3.32). The ivy is growing down over some of the tunnel entrances, as well as beginning to climb the trees. The slopes along the west of the northern railroad open cuts are planted in lawn, as are the eastern slopes of the southern railroad open cut. The western slopes of the southern railroad open cut are planted with lindens and Japanese pagoda trees. These plantings appeared to be in good condition.



Figure 3.31. Baldcypress circle.



Figure 3.32. Railroad tunnel plantings.

### Plantings Along the East Side Slopes

The tree plantings on the slopes along the eastern side of the Memorial grounds, above Leonor K. Sullivan Boulevard, are in good condition. In 2009, some dead or dying Rosehill ash trees were noted alongside both staircases leading to the overlooks, along with immature trees. The wintercreeper groundcover is in fair condition. Wintercreeper is an invasive species, and has been identified by the Missouri Botanical Garden as one of the top twenty species spreading into and crowding out native plant areas (see Figure 3.33).

### Service Area Plantings

A wide variety of trees is planted in these areas including: hawthorn, maple, honeylocust, linden, crabapple, oak, and redbud. The slopes surrounding the north service area are planted with wintercreeper, and in 2009 mugo pine (*Pinus mugo*) shrubs were added along the east side of the service road. The trees and wintercreeper groundcover on the slopes surrounding the south service area appeared to be in good condition. A dense growth of euonymus covers the chain link fence. Overall, the service area plantings are in fair condition.

### Street Edge Plantings

The trees along the Memorial's northwestern edge consist of clumps of hawthorn, river birch, magnolia (*Magnolia sp.*), and eastern redbud. To the southwest, Rosehill ash trees line the Memorial's perimeter. The plantings around the Old Cathedral parking lot were modified in 1994, and did not retain the same number of trees or replace any of the Japanese black pine (*Pinus thunbergiana*) from the original planting. Several trees were removed from this area in 1997 and again circa 2003



Figure 3.33. Wintercreeper groundcover.

with the installation of security cameras and bollards.

The tree and shrub plantings along Washington Avenue were installed in 2009 by Metro and Laclede's Landing. These plantings include London planetree (*Platanus x acerfolia*), English oak (*Quercus robur*), European hornbeam (*Carpinus betulus*), arrowwood viburnum (*Viburnum dentatum*), ornamental grasses, and daylilies, and are dissimilar to those present in the Memorial landscape. In 2009, several species of trees that were new to the Memorial were planted along Poplar Street in order to test their hardiness. These include varieties of Norway Maple (*Acer platanoides* 'Emerald Queen') and hackberry (*Celtis occidentalis* 'Prairie Pride') along with two new species, Homestead elm (*Ulmus* 'Homestead') and Arnold tulip poplar (*Liriodendron tulipifera* 'Arnold'). Leonor K. Sullivan Boulevard is planted on the west side with baldcypress between the staircases.

To the north of the Old Cathedral, adjacent to the entry to the Memorial, is a grove of red maples. There are courtyards at each corner of the Old Courthouse which have central beds with small ornamental perennial plantings.

### Parking Garage Plantings

The Washington Avenue edge of the parking garage is planted with a narrow row of ornamental grasses and daylilies, along with English oak and arrowwood viburnum. On the south and east sides of the garage are some plantings of Bradford pears (*Pyrus calleryana*) and crabapples.

### Lawn areas

There are expanses of well-maintained turf lawn at the Memorial in several areas, the largest of which is along the primary axis. In addition, the triangles and teardrops along the walkway are planted with highly maintained turf. The slopes of the railroad open cuts and tunnels and the pond areas are planted with less intensively maintained turf. The lawn areas are resodded periodically and are in good condition throughout the Memorial. In some shaded, steep areas, erosion is occurring, and grass does not establish well.

### Luther Ely Smith Square Plantings

Luther Ely Smith Square's slopes are planted in lawn. Its concrete walks define three central square planting beds with ornamental grasses and perennials, bordered in lawn. The north and south sides of the block are planted with parallel rows of sweetgum (*Liquidambar styraciflua*) and crabapple trees.

## CIRCULATION

### System of Walks within Memorial Grounds

There are approximately five miles of exposed aggregate sidewalks on the interior of the Memorial grounds. The interior walks, paved in beige-brown exposed aggregate concrete and lined by trees, are designed as a sequence of spaces along the north-south axis of the Memorial. The gradually varying width of the walk is an important visual element. The alignment of the allées follows the curving form of the walks. At the topographic high points along this axis are triangles of lawn. When viewed from the northwest plaza, for example, the walk appears longer than it is. The 18-foot-wide walks curve from the northwest and southeast entrances and from the north and south overlooks, and merge at the triangles and expand to form the broad expanse of paving at the rest areas, which range from 65 to 80 feet in width. These are planted with another double row of trees along the interior. The rest areas give way to teardrop-shaped expanses of level, tree-lined lawns. The walks expand as they reach the Gateway Arch legs, where the paving is approximately 250 feet wide.

The beige-brown exposed aggregate concrete is laid with perpendicular expansion joints occurring at alternating widths along the walkways, with redwood spacers. The majority of the aggregate paving and the redwood in the expansion joints are in good condition. Some are in fair condition: areas of damage or deterioration are typically where larger trees are present in or adjacent to the walks, or at locations where drainage is poor, as well as at irregular expansion joints and junctures of paving. The existing circulation system is in fair condition. In some places the redwood spacers in the expansion joints have loosened or deteriorated, and in others the wood spacers have been replaced with thick bands of white caulk, which is also beginning to deteriorate.

Portions of the sidewalk have shifted and settled, requiring mud-jacking in the past to level them. There are drainage problems which appear to be causing paving failure, particularly in areas of large paving expanses, such as the northwest plaza and the north overlook plaza. There are drainage problems along the edges of walks, particularly in the southwest. Locations where sidewalk slabs have been replaced are sometimes evident, as it is challenging to match aggregate. Uplifted tree grates in the walks pose a tripping hazard to pedestrians (see discussion of tree grates in Small-scale Features section later in this chapter).

### Memorial Grounds Perimeter Walks

There are approximately 2.1 miles of concrete sidewalks around the perimeter of the Memorial grounds. Some of the perimeter sidewalks along the west and north street edges of the Memorial have the same color and aggregate mixture used inside the grounds. The perimeter sidewalk materials along Memorial Drive change to running bond brick paving alongside the Old Cathedral, and return to the beige-brown aggregate with redwood joints when the sidewalk meets the parking lot. All of the perimeter sidewalks have been replaced and repaired in patches, in some places with a light grey concrete with a broom finish, others with an unfinished taupe color, and still others which have a lighter aggregate mixture than most of the interior Memorial walks (see Figure 3.34). Some cracking was visible on the concrete perimeter walks. The beige-brown aggregate sidewalk along Leonor K. Sullivan Boulevard on the Memorial's eastern edge does not have redwood spacers in the expansion joints. An approximately 800-foot-long



Figure 3.34. Mismatched concrete paving materials along the Memorial perimeter.

strip of cobbles lies between the curb and the sidewalk to the north and south of the grand staircase. The cobbles are interspersed with baldcypress plantings. In one area, the cobbles have been replaced with pressed concrete. There has been some vehicular damage to the curbing along this edge.

#### Southwest Entrance

The southwest entrance located adjacent to several highway overpasses, is isolated from the city by roadways. There is a triangular lawn area set into beige-brown aggregate sidewalks. Drainage problems exist along the northern entry walk, with sediment covering some of the paving (see Figure 3.35). Multiple paving patterns and finishes occur where the perimeter sidewalk, interior sidewalk and bollards meet (see Figure 3.34).

#### Northwest Plaza

The northwest plaza is an approximately 75-foot-wide expanse of beige-brown concrete aggregate paving; though it is a main pedestrian entrance to the Memorial, it is difficult to access from the city, as it is surrounded by a 170-foot-wide band of busy roadways at an intersection with multiple turning lanes and highway entrance ramps. The plaza appears to be in good condition.

#### Gateway Arch Entrance Ramps and Steps

The ramps at the Gateway Arch entrances provide access into the underground visitor center/Museum of Westward Expansion. The concrete steps along both sides of the entrance ramps were constructed in the early 1960s as sculptural architectural features that could be used as seatwalls. The steps emerge from



Figure 3.35. Poor drainage on walk near southwest entrance.

a slanted concrete wall and grow progressively longer as they fade into the top of the ramps.<sup>11</sup> The entrances are beneath each leg of the Gateway Arch, and the ramps surround the base of each leg, affording visitors the chance to touch the base of the structure. The ramps are in good condition. However, they do not meet the Architectural Barriers Act Accessibility Standards (ABAAS) (see Other Management Concerns section later in this chapter for additional information regarding accessibility). Additionally, safety problems associated with drainage and slipping have occurred at the ramps. To address this problem, the granite pavers were replaced at the north entrance ramp in 2005 and the south entrance ramp in 2007. In winter storm events, ice forms at the edge of the sections of the ramp with warming mats. Drainage problems were observed at the north leg of the Gateway Arch, at the top of the ramp into the visitor center, where the aggregate paving meets the granite pavers. Additionally, some of the regouted joints between the granite pavers are leaching (see Figures 3.36 and 3.37). They are in fair condition, with visible layers of patching, and repairs made with bright white caulk.



Figure 3.36. Gateway Arch ramp expansion joint at granite pavers and aggregate paving.



Figure 3.37. Gateway Arch ramp, with leaching from grout between granite pavers visible.

### Old Cathedral Parking Lot

The Old Cathedral parking lot is level and unobtrusive, with walls and berms around its edges that partially screen it from view from within the Memorial grounds. It is in good condition. Adjacent to the Old Cathedral parking lot is a bus drop-off located along Memorial Drive.

### Old Cathedral Sidewalk

The Old Cathedral sidewalk which leads into the Memorial grounds from the parking lot is in fair condition. It is an eight-foot-wide exposed aggregate walk.

### Old Courthouse Sidewalk

The sidewalk around the Old Courthouse block is composed of standard red clay brick pavers arranged in a herringbone pattern, and is in good condition, although it differs greatly from other paving types elsewhere at the Memorial.

### Interior Roads

The service roads leading from Memorial Drive to the south service area, and from the interior walk system to the north service area, are in good condition. The concrete paving on both is approximately 15 feet wide with six-inch concrete curbing. In 2009, this service road was paved with a segment of white broom finish concrete, which is highly visible from the top of the Gateway Arch. The park interior roads are in good condition (see Figure 3.38).

### Perimeter Roads

There are approximately 2.1 miles of paved roads around the perimeter of the Memorial, all of which are included within the Memorial boundary. The portion of Washington Avenue between Memorial Drive and Leonor K. Sullivan Boulevard defines the Memorial's northern edge. Washington Avenue is a linear corridor defined to the north by the Eads Bridge, to the south by the parking garage, and to the east by views of the Mississippi River. The constructed edge of Leonor K. Sullivan Boulevard is defined by linear bands of concrete aggregate sidewalk, asphalt roadway, and cobblestone pavers (see Figures 3.39, 3.40, and 3.41). The Memorial grounds are divided by Memorial Drive and the below-grade I-70, which run between Luther Ely Smith Square



Figure 3.38. Interior road to south service area.



Figure 3.39. Washington Avenue.

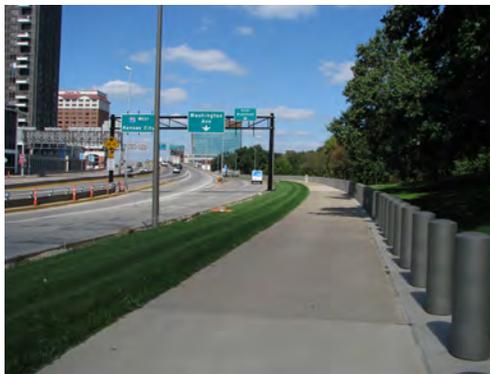


Figure 3.40. Memorial Drive.



Figure 3.41. Leonor K. Sullivan Boulevard.

and the main portion of the Memorial, and form the Memorial's boundary between Washington Avenue and Poplar Street. Fourth Street bisects Luther Ely Smith Square and the Old Courthouse, which are bounded by Chestnut Street to the north and Market Street to the south.

The curbs along the perimeter roads (Memorial Drive, Washington Avenue, Leonor K. Sullivan Boulevard, and Poplar Street) appear to be in good condition, with the exception of Poplar Street and Leonor K. Sullivan Boulevard, which are in fair condition. Memorial Drive underwent resurfacing and repair in 2009. Concrete curb cuts and diagonal herringbone pattern stamped asphalt crosswalks were installed to improve access between Luther Ely Smith Square and the eastern portion of the Memorial (see Figure 3.42).

## CONSTRUCTED WATER FEATURES

### North and South Ponds

The curving line of the concrete edges of the ponds complements the form of the Gateway Arch reflected in the water. The sinuous form of each pond's perimeter is such that its entirety is not visible from any single point along its outline, making each pond appear larger than it is.

The concrete lining of both ponds is undergoing repair in 2010. Additionally, expansion joints are being re-caulked, and the drain valves replaced. The visible concrete edges of both ponds appear to be in good condition. The ponds do not have aeration or filtration systems to recirculate the water and prevent the growth of algae. There are



Figure 3.42. Curb cuts along Memorial Drive.

significant algae blooms in the south pond that create a potential bacteria source. Little algae was observed in the north pond in 2009, although the water appeared stagnant.

## SMALL-SCALE FEATURES

### Benches

The concrete benches at the Memorial are a minimalist design composed of a thick slab of concrete 10 feet long and two to three feet wide, set on two concrete base blocks at a height of one foot four inches (see Figure 3.43). The existing concrete benches are in good condition. The older benches were installed in 1971 and 1979. There are now more than 70 concrete benches of this type; many have been added since 1996. Benches have been relocated to function as security barriers around the base of the Gateway Arch, as well as along the north triangle near the parking garage. Around the Gateway Arch they are placed at regular four-foot intervals, while the benches along the triangle are irregularly spaced. There are benches along both sides of the north and south rest areas.

The benches in the Old Cathedral parking lot are chamfered-edge concrete, while those in Luther Ely Smith Square are of dark-colored recycled-plastic, with backs.

### Walls

The cut limestone and concrete block walls surrounding the Old Cathedral and its parking lot were installed in 1994.

### Lighting

The lighting along the walkways is in fair condition, in the form of 12-foot-tall brown metal posts topped by 21-inch-diameter glass



Figure 3.43. Typical concrete bench.

globe lanterns. The lights are centrally located within the sidewalks along the approaches from the northwest plaza and the southwest entrance, then are staggered on either side of each walk where it curves. Most of the lighting around the perimeter roads consists of beige-brown concrete posts with standard “cobrahead” type streetlight luminaires.

### Gateway Arch Lighting

Although one of the earliest sketches of the Gateway Arch by Saarinen’s office in 1948 showed the structure lit by floodlights, the gleaming, reflective surface of the stainless steel made this difficult to implement. Intensive tests performed between 1965 and 1969 by several major companies all failed to adequately illuminate the Gateway Arch. Eventually, a successful solution to the lighting problem was found using the improved lights available in 2001. Floodlights are in four 8-foot-deep concrete vaults covered with grills that are set flush with the ground. They shine directly upward to illuminate the bottom of the Gateway Arch. The light vaults, although large, are not obtrusive as they are set belowground within the large lawn area.

### Handrails and Guardrails

Handrails and guardrails at the Gateway Arch entrance ramps, the overlooks, and the grand staircase are generally not in keeping with the design aesthetic found throughout the rest of the Memorial. At the entrance ramps, rust spots were observed where the brown metal railings meet the steps on either side of the entrance (see Figure 3.44). The low, black-painted metal handrails along the steps to the overlook viewing platforms, and the guardrails along their edge, have approximately 10-inch-wide openings between uprights. These railings do not appear to meet contemporary safety codes; there is some rust staining where the railings anchor to the steps. The metal guardrails along the north and south ends of the grand staircase, inset into beige-brown concrete aggregate cheek walls, are unobtrusive.

### Trash Receptacles

There are currently about 85 exposed aggregate concrete containers with brown plastic lids located throughout the Memorial grounds. The lids are replaced every 3-4 years. The trash receptacles are, in general, in fair condition.

### Drinking Fountains

Drinking fountains of exposed aggregate concrete are located east of the north and south legs of the Gateway Arch, at each rest area, and at the north and south overlooks. All of these appear to have been replaced with barrier-free accessible concrete aggregate drinking fountains, with the exception of one fountain at the south overlook. They appear to be in good condition. One drinking fountain is missing at the south rest area.

### Kiosk

The information kiosk is in good condition. It was constructed in 1986 just southeast of the parking garage. The kiosk is a three-sided precast beige-brown aggregate concrete structure, with a bronze plaque (see Figure 3.45). It has a four-foot-square information board for posting events, operating times and procedures.

### Entrance Signs

There are 12 seven-foot by three-foot rectangular entrance signs, one at each entrance to the Memorial. The signs are wood, painted grey with the NPS arrowhead, and identify the Memorial as a National Park site. The entrance signs are in fair condition (see Figure 3.46).

### Wayfinding

The wayfinding signage at the northwest plaza is of varying materials, types, sizes, colors, and lettering. There are multiple, competing parking signs placed here. There is a large amount of signage in the parking garage directing visitors to the Gateway Arch. Much of the rest of the grounds do not have wayfinding signage, in part due to the Modern landscape design which leads visitors to the Gateway Arch. A signage plan is currently



Figure 3.44. Handrails and concrete damage at the steps alongside the Gateway Arch entrance ramps.

being created and new signs may soon be implemented throughout the Memorial grounds.

### Security Cameras

Closed-circuit television cameras were installed in 1997 as part of a federal counter-terrorism program. These are located throughout the Memorial landscape, some in relatively unobtrusive spots, while others conflict with existing trees or stand within the views to the Gateway Arch along the walks.

### Chain-Link Fences

The galvanized chain-link fences surrounding the railroad open cuts and along the tops of the tunnel entrances are in good condition, and their dark green plastic coating makes them relatively unobtrusive. There is also chain-link fencing at the maintenance facility, north and south service areas, and parking garage, ranging from good to poor condition.

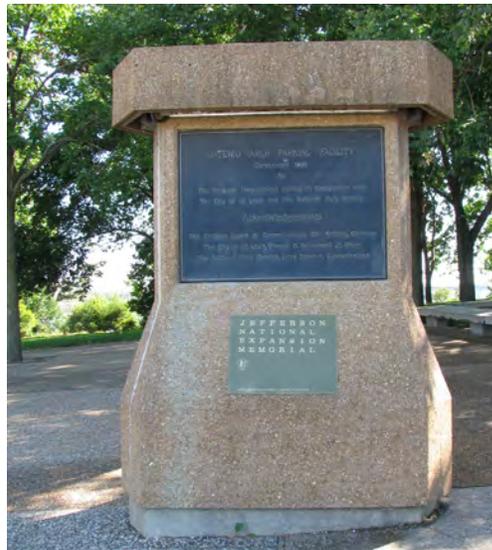


Figure 3.45. Information kiosk.



Figure 3.46. Entrance sign.

### Bollards

Grey metal bollards installed circa 2003 line Memorial Drive's eastern perimeter, curving to enter the Memorial at the northwest plaza, the southeast entrance, and extending to the Old Cathedral's northern wall. The one-foot-diameter bollards, spaced five feet on center, create a strong visual line in the landscape. Their installation was highly controversial due to their intrusive appearance along the visually prominent street edges of the Memorial.

The bollards are set into a 2-foot-wide strip of light-colored concrete, which contrasts with the lawn areas and exposed aggregate walks where it enters the Memorial (see Figure 3.47). The bollards are retractable at the Memorial entrances.

### Tree Grates

The cast-iron tree grates surrounding the Rosehill ash trees within and along the walks are in fair to poor condition (see Figure 3.48). The grates are difficult to maintain level due to improper installation (each rests on multiple slabs of concrete and/or on soil). The centers of the grates are routinely cut to accommodate tree growth. The grates not only require intensive maintenance, but their condition also presents a tripping hazard to pedestrians (see Figure 3.48). The tree grates are cut to different degrees, rusted, and roughly one-quarter are uplifted. More than half of the tree grates on the path between the northwest plaza and the north triangle are damaged or missing. In some places the grates have become filled in with sediment, which has then spread across adjacent paving. Some trees have been girdled by the grates. The grates in many cases rest directly on top of the soil and root flares, causing compaction and poor drainage around the root system. Siltation and erosion exist in places where the tree grates meet the grass. The grates are of a custom dimension, and therefore costly to replace.

### Irrigation System

The irrigation at the Memorial is organized in zones that are quite large by industry standards. The majority of the approximately 1,250 irrigation heads are Toro Model 640, a heavy-duty commercial head. The watering arc is not adjustable. Some of the sprinklers

are currently overwatering on the sidewalks; in other areas, coverage is lacking. Some of the sprinkler heads are placed high above ground level and are visually prominent.

### Joseph Pulitzer Plaque

The Joseph Pulitzer plaque is in good condition. It is a bronze plaque located in the sidewalk at the east entrance of the Old Courthouse. The plaque measures 28 by 21 inches and commemorates the location where Joseph Pulitzer bought the St. Louis *Dispatch* on December 9, 1878.

### Saarinen Memorial Plaque

The Saarinen memorial plaque has been removed and is currently in storage. The bronze, 22-by-28-inch plaque was mounted on a 24 by 29 ¾ inch stone base, pitched 45 degrees. The plaque was aligned on the Memorial's central axis, along the west sidewalk curb of Leonor K. Sullivan Boulevard, an area susceptible to flooding.

### Luther Ely Smith Memorial Marker

The Luther Ely Smith memorial marker is in good condition. It is a granite polished marker with an angled face and pitch-face base. It measures two feet 16 inches by three feet and is located on the west side of Luther Ely Smith Square. The marker, dedicated in 1985, commemorates the St. Louis lawyer who first proposed a monument on the riverfront in 1933.

### Lewis and Clark Plaques

The plaques commemorate the efforts of Lewis and Clark and their expedition. They are bronze plaques measuring 18 ¼ by 16 ¾ inches. The Meriwether Lewis plaque is mounted on the south overlook wall and the William

Clark plaque is mounted on the west side of the north overlook wall. The Lewis and Clark plaques are in good condition, but the patina from both plaques is staining the concrete walls below them.

### Flood of 1993 Plaques

The plaques marking the height of the 1993 floodwaters are in good condition. The plaques are mounted on the north and south walls of the grand staircase at the elevation where the floodwaters of the 1993 flood began to recede. The Mississippi River reached 49.58 feet, the highest level ever recorded in the City of St. Louis. The markers are bronze and measure 16 by 10¼ inches.

### American Society of Civil Engineers Plaque

Located on the wall above the south entrance to the underground visitor center, this plaque was awarded by the American Society of Civil Engineers for "outstanding civil engineering achievement" in 1967. The plaque is bronze and measures approximately two feet by 11 inches.

### The Gateway Arch Plaque

Located above the north entrance to the underground visitor center, the plaque was mounted to commemorate President Lyndon B. Johnson's 1968 dedication of the Gateway Arch to the people of the United States.<sup>12</sup> The bronze plaque measures approximately two feet by one foot eight inches.

### The Old Courthouse Plaque

This plaque commemorates the landmark 1846 lawsuit brought by Dred and Harriet Scott, enslaved people who sued for their freedom. While they won their case in St. Louis, this suit ultimately went before the U.S. Supreme Court



Figure 3.47. Bollards.



Figure 3.48. Tree grate.

which reversed the lower court's decision, and denied citizenship to people of African ancestry. This decision was a contributing factor to the Civil War. Located on the west side of the Old Courthouse fence, the plaque is in good condition.

## OTHER MANAGEMENT CONCERNS

### Plant Failures and Substitutions

Since the completion of the second phase of planting in 1981, there have been incremental diversions from the intended planting concept. Shrub and tree replacement at the Memorial has been based upon the 1981 as-built planting plan by the National Park Service. The original installation of the plants, as noted in Chapter 2, involved a smaller number of plants and various plant substitutions that were not entirely in keeping with Kiley's approved 1964 planting plan. Tree species substitutions and other alterations have occurred as the original plantings failed to establish in some areas, or particular species in the original planting were determined to not perform well in the landscape conditions at the Memorial. Some of the plantings have been tree-for-tree substitutions of one species with another; other new species have been introduced in small numbers to test their hardiness for potential future use. In many cases the trees were selected not specifically with design form or intent in mind, but rather due to being a similar variety or species to an existing tree in the Memorial, or for their hardiness.

Over time, there have been several contracts for replacements of trees and shrubs. The first such contract occurred around 1983 when Regency Landscaping was contracted to replace the failing Bulgarian ivy on the west side of the railroad tunnels with sod.<sup>13</sup> According to Mike Mayberry of Regency Landscaping, the ivy was not properly maintained and weeds overtook it, eventually requiring its removal. In 2009, there was sod on the slopes adjacent to the railroad cuts and ivy growing over the north tunnel.

In September 1985, Treeland Nurseries was awarded a contract to replace shrubs around the railroad tunnels and at the service entrances. Species replaced included fragrant sumac (*Rhus aromatica*), pyracantha 'Lalandei'

(*Pyracantha coccinea* 'Lalandei'), and mugo pine. These were in-kind replacements of shrubs planted in the early 1980s.

Another contract was awarded to Treeland Nurseries in May 1986, for the replacement of 178 dead trees. At this time it was evident that certain species did not perform well on the Memorial grounds under existing conditions. For example, in 1984, the grounds crew began a large-scale substitution of poorly performing flowering dogwood (*Cornus florida*) with snowdrift crabapple (*Malus x* 'Snowdrift'). This substitution continued under the 1986 Treeland Nurseries contract.

Between 1986 and 1995, the NPS grounds maintenance division continued to have difficulties with certain tree species. In particular, the following tree species were not performing well on the Memorial grounds: flowering dogwood, sugar maple, Bradford pear, and littleleaf linden (*Tilia cordata*). As these species began to decline, they were replaced by snowdrift crabapple, sugar hackberry (*Celtis laevigata*), redspire pear (*Pyrus calleryana* 'Redspire'), and river birch respectively. Japanese black pine also has not performed well at the Memorial, however a suitable replacement species was not identified.

The flood of 1993 decimated the plantings around the railroad tunnels and required the replacement of many trees and shrubs. An attempt was made to replant these areas with species native to wetland areas so that they would have a better chance of survival in future floods. Species introduced on the riverfront included: river birch, swamp white oak, black gum (*Nyssa sylvatica*), and sweetbay magnolia (*Magnolia virginiana*). Some of these species were introduced on an experimental basis and were monitored for adaptability to the site conditions. Shrubs were replaced with pyracantha 'Gnome' (a smaller variety than 'Lelandii'), daylilies, and foothergilla (*Fothergilla gardenii*). At this time, fragrant sumac (*Rhus aromatica*), which was included in the implemented planting plan, was replaced by 'Brilliantissima' chokeberry (*Aronia arbutifolia* 'Brilliantissima'), 'Sparkleberry' and 'Apollo' (male) winterberry (*Ilex*

*verticillata* ‘Sparkleberry’ and ‘Apollo’), and summersweet clethra (*Clethra alnifolia*).

By 1995, there were 11 more canopy tree species on the site than were originally planted in 1981, including five new flowering tree species; and two new shrubs and groundcovers. In 2009, there were 33 species of trees in the main portion of the Memorial, in contrast to the 13 proposed by Kiley. It should be noted, however, that some of these new species are very few in number. Past management practices at the Memorial promoted experimentation with new species to address pest susceptibility and disease problems. Some of these species were similar in form and habit to those selected by Kiley. For example, Kiley proposed the use of hackberry (*Celtis occidentalis*) and white oak (*Quercus alba*), which were substituted with sugar hackberry and swamp white oak.

Trees planted within the concrete walkways appear to have problems related to insufficient tree pits. When repairs have been made to the sidewalks, urban fill (i.e. bricks) have been discovered in the soil surrounding trees. New construction projects (such as the installation of bollards) have had a detrimental effect on vegetation at the Memorial; tree roots have been severed by trenching, and construction equipment has been driven over root flares.

By October 2009, the Rosehill ash allées were missing 150 trees. The last time trees were replaced was in 2004.

### **Pests and Diseases**

Many experts have been consulted since 1977 regarding plant health on the Memorial grounds. Much attention was given to the Rosehill ash single-species planting, but the health of other species was a concern as well. Experts contacted included plant pathologists, tree pathologists, and most recently a research agronomist specializing in soil science.<sup>14</sup> Their findings between 1977 and 1996 are summarized below.

From the late 1970s until the mid-1980s the decline and general poor health of the Rosehill ash trees was a concern. This was attributed to several possible causes including the ash borer, cytospora canker, and the

poor growing conditions of an urban site. Influences such as being planted in fill material, and urban pollution have added stress to the trees and therefore made them weaker and more susceptible to pests and disease. Sometimes the ash planting is referred to as a “monoculture” (not an ecologically accurate term, as it is planted among other species), which are considered ecologically unstable. The general consensus of horticulturists has been to replace the dead or diseased trees with alternate species to increase plant diversity, thereby eliminating some inherent problems. However, in light of the importance that the uniform character of the allées plays in the design concept of the Memorial, replacing the Rosehill ash trees with a variety of species has not been considered a viable option.

Once the causes of decline were identified and recommendations for pest control were implemented, the condition of the trees began to improve. By 1992, entomologist Dr. David Nielsen visited the park and was generally impressed with the condition of the Rosehill ash planting.<sup>15</sup> He suggested general plant management techniques such as aeration to combat soil compaction, mulching beneath trees, and continuing ash borer monitoring and the Dursban spray program. Today, it is recognized that most Rosehill ash decline at the Memorial is attributed to the age of the plants.<sup>16</sup> In 2009, the National Park Service was in the process of developing a replacement strategy for the Rosehill ash.

In 1995, soil scientist James Patterson visited the park and assessed some of the plant health problems from a soils standpoint.<sup>17</sup> In his opinion, the soil conditions adjacent to the sidewalks and in the tree pits were less than adequate for optimum plant growth. In general, the Rosehill ash suffered because they did not have ample room for root growth and many planting pits had poor drainage. Other areas of the Memorial grounds that were investigated also were found to have drainage problems.

Mr. Patterson outlined several important considerations in his report: first, there is a drainage problem. The park was built on fill material and therefore the soil conditions for plant growth are challenging. There is

a need for a rigorous soil amendment and aeration program. He also recommended creating mounds of improved soil where there are particularly wet conditions. And finally, he recommended replacing certain species with other species more tolerant of the wet conditions.<sup>18</sup>

By 2009, 150 missing ash trees in the allées had not been replaced due to the threat of the emerald ash borer. The emerald ash borer is an invasive beetle which feeds exclusively on ash trees and has no predators in North America. Infestations of the emerald ash borer typically wipe out stands of ash within a few years.

The Memorial participated in a Bacterial Leaf Scorch (BLS) study in 2008 and 2009. Bacterial leaf scorch was been confirmed on rosehill ash trees, and monitoring is ongoing.

#### **Vandalism and Visitor Impact**

Due to its urban location and heavy use, the Memorial grounds suffer from recurring vandalism. Proximity to downtown sporting events, riverboat gambling, and use of the Memorial grounds for major events contribute to this problem. The most frequent damage occurs to trees and trash receptacles. On occasion, branches are broken and initials are carved in tree bark. The trash receptacles, concrete walls, and concrete benches are occasionally spray-painted with graffiti. The NPS Protection Division combats this vandalism on a case-by-case basis.

Visitor impact is highest on the Memorial grounds during major events, in particular the Fair St. Louis, and results in damaged or destroyed trees, compacted soil, damaged turf, and weakened sidewalks. In addition, vehicles occasionally damage trees by traversing their root systems.

#### **Impacts From Construction Projects**

Construction projects occurring at the Memorial, such as the recent installation of bollards, sometimes have a deleterious impact on the landscape. During construction and repair projects, tree roots are damaged during excavation, root flares are damaged by construction equipment, and turf is compacted.

#### **Accessibility**

Jefferson National Expansion Memorial has implemented many measures to ensure that the Memorial and its programs meet accessibility standards. Although many of the improvements are related to providing barrier-free accessible experiences through self-activated video programs, large-print brochures, TDD equipment for the deaf, and wheelchairs on request, some physical changes have been made as well.

The most extensive construction project to accommodate barrier-free access was completed in 1994, when the Old Cathedral parking lot was redesigned and reconstructed to provide a bus pull-off along Memorial Drive. This enables drivers to drop off or pick up their parties close to the Gateway Arch's south leg near the Old Cathedral. Accessible parking for visitors is also provided at the parking garage, which is 1,100 feet north of the nearest visitor center entrance. The most common visitor complaint about accessibility at the Memorial is the distance between the parking garage and the Gateway Arch.

A wheelchair lift was installed in the southwest courtyard of the Old Courthouse in 2007. This is the only courtyard that may be accessed by the public.

The visitor center is accessed via ramps with an eight percent grade at both the south and north legs. Although the ramps meet the Architectural Barriers Act Accessibility Standard (ABAAS) requirements for steepness of grade, they exceed the acceptable length.<sup>19</sup> In addition, physically challenged visitors who do not have a problem conquering the ramps may have difficulty opening the heavy glass doors once they reach the visitor center entrances.

#### **Erosion and Drainage**

The irrigation design has numerous conflicts with the planting plan and did not account for the walkways. The maintenance staff has had to accommodate these conflicts retroactively.

Drainage is poor in many parts of the Memorial, in particular along the southwest walkway. Drains were added to this area but



Figure 3.49. Representative drainage problem along walks.

have failed. There are drainage problems which appear to be causing chronic paving failure, particularly at large paving expanses, such as the northwest plaza and the plaza on the north overlook (see Figures 3.49 and 3.50.).

There are erosion problems on many of the steepest slopes at the Memorial, including the slopes southeast of the south pond, northeast of the north pond, southwest of the HVAC/ generator area, and those alongside the railroad open cuts (see Figure 3.51). In some eroded areas, repeated filling with new soil has failed to solve the problem.



Figure 3.50. Representative drainage problem along walks.



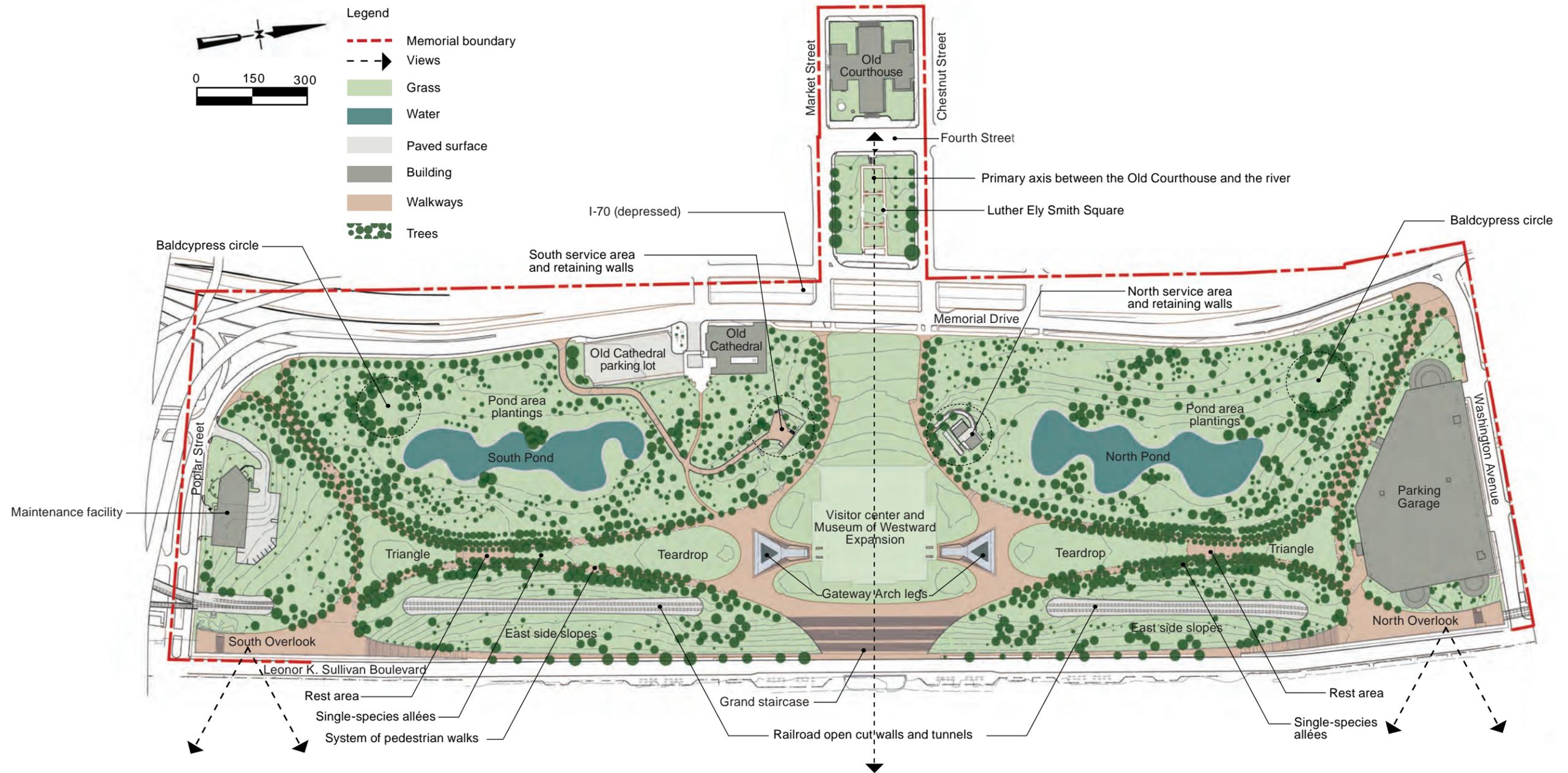
Figure 3.51. Erosion along slopes above the south pond.

## Endnotes

1. See Appendix B for samples of inspection sheets used for the 1995 assessment.
2. Robert R. Page et al, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington, DC: National Park Service, 1998).
3. James E. O'Donnell, ed., *St. Louis Currents: The community and its resources*. (St. Louis: Leadership Center of Greater St. Louis, 1992).
4. "What's in St. Louis: The Region at a Glance." *St. Louis Commerce Magazine*, March 2009. Accessed via internet: <http://www.stlcommercemagazine.com/archives/march2009/region.pdf>.
5. See the *Memorial Drive Traffic Study* (National Park Service, 2008) for a more detailed description of the roadway context surrounding the Memorial.
6. An agreement with the Pastor of the Old Cathedral provides for the use of 15 parking spaces in the lot by Memorial employees. These spaces are not available for their use during ceremonies and services at the church.
7. Track Relocation Agreement, June 2, 1958 (Copy on file in JNEM Archives, Record Unit 104, Box 19, Folder 1).
8. The Project Management Implementation System (PMIS) is a service-wide database used to track and implement projects.
9. Outlines of Park Requirements, package 802, October 25, 1984. A copy of the OPR can be found in the Facility Manager's Office, JNEM.
10. Moore, *Urban Innovations and Practical Partnerships*, 89-97, provides a detailed description of the water intrusion problem and the structural problems identified at the visitor center.
11. Bob Burley, Architect, oral history interview by Gina Bellavia and Gregg Bleam, July 27, 1995 (Copy on file in the JNEM Archives). Burley worked for Eero Saarinen and Associates from 1956 to 1963. He was personally responsible for the design of the entrances to the Gateway Arch and told Gina Bellavia that these were meant to be architectural features. The tread-riser relationship is not standard, indicating that the "steps" were meant for sitting or viewing rather than walking.
12. President Johnson did not visit the Gateway Arch in 1968, but his Vice President, Hubert Humphrey, attended the ceremony and spoke. President Johnson visited the site in 1964.
13. Gina Bellavia, oral history interview with Mike Mayberry of Regency Landscaping (formerly with Shelton and Sons Landscaping), February 21, 1995. Copy of notes on file in JNEM Archives.
14. The following experts have consulted on the health of the plants on the Memorial grounds: James B. Hanson, U.S. Department of Agriculture, National Forest Service; Dr. David G. Nielsen, Ohio Agricultural Research and Development Center, Department of Entomology; James L. Sherald, U.S. Department of the Interior, National Park Service.
15. Dr. David G. Nielsen to Jim Jacobs, November 3, 1992. Copy on file in JNEM Grounds Maintenance files.
16. For a more comprehensive discussion of some of the problems the grounds maintenance division was faced with between 1981 and 1991, see Moore, *Urban Innovations and Practical Partnerships*, 119-125.
17. James Patterson to Gary Easton, September 25, 1995. Copy on file in JNEM Archives.
18. Ibid.

19. The ADA requires a maximum of eight percent slope with at least five-foot landings at 30-foot intervals. The problem with the existing ramps at the Gateway Arch is that there are no landings and the distance from the top of the ramp to the entrance doors is 32 feet. Also of note, the Uniform Federal Accessibility Standards suggest that eight percent ramps are only acceptable if they are enclosed and protected. The ramps are only enclosed and protected for less than half their length. The Memorial generally does not receive complaints about the slope of the ramps but rather, the length of the walks from the parking garage and the entrance doors themselves, which are not automated.





**JEFFERSON NATIONAL EXPANSION MEMORIAL: EXISTING CONDITIONS PLAN SHOWING CONTRIBUTING LANDSCAPE FEATURES**

Figure 3.52. Existing conditions. (AECOM, 2010)



# Analysis and Evaluation

This chapter contains three parts: (1) the statement of significance and explanation of the period of significance for Jefferson National Expansion Memorial; (2) an analysis of character-defining features, including their contribution to the significance of the landscape; and (3) an assessment of the integrity of the property.

## SIGNIFICANCE EVALUATION

### STATEMENT OF SIGNIFICANCE

According to the Secretary of the Interior, a property is significant if it represents part of “the history, architecture, archeology, engineering, or culture of a community, state, or nation.”<sup>1</sup> A property can achieve significance if it meets one or more of the following four criteria:

- A – it has association with historic events, activities, or patterns;
- B – it has association with important persons;
- C – it has a distinctive physical characteristics of design, construction, or form; or
- D – it has the potential to yield important information.<sup>2</sup>

That the Memorial is a highly significant work of American design and engineering under Criterion C is not disputed. However, evaluation of the Memorial landscape’s significance remains challenging for several reasons. First, it was listed in the National Register of Historic Places and designated a National Historic Landmark prior to its complete construction. Additionally, sites are not usually considered for inclusion in the National Register of

Historic Places if they are less than 50 years of age. The Memorial was listed less than 30 years after the concept was initiated through the 1947 design competition; construction did not begin until 1958, and elements of the landscape design were still being implemented as recently as 2003.

According to the National Register Criteria for Evaluation, a property may have achieved significance within the last 50 years only if it is of exceptional importance.<sup>3</sup> The National Register recognizes that properties representing unusual contributions to the development of American history, architecture, archeology, engineering, and culture may become significant before the customary “passage of time” necessary to apply the adjective “historic.” Jefferson National Expansion Memorial is considered to have exceptional importance based on the transcendent nature of its architecture and engineering.

The Memorial also derives national significance under National Register Criterion A because of its memorialization of the role of Thomas Jefferson and others responsible for the nation’s territorial expansion to the West.<sup>4</sup> The Memorial was appropriately established in St. Louis, Missouri, the embarkation point and economic hub of the westward movement in the nineteenth century. The original primary significance of this site was its identification with the people, commerce, and buildings associated with the expansion of the United States. This aspect of significance, while not developed in the scope of this report, is also subject to National Register Criteria Consideration F which addresses significance of properties that are primarily commemorative in their intent.

Jefferson National Expansion Memorial is significant under National Register Criterion C as the work of a master architect, Eero Saarinen, and master landscape architect, Dan Kiley; and as an example of architectural and landscape architectural design embodying the principles of Modernism. Because the Gateway Arch is a unique and extraordinary structure, its significance under Criterion C has perhaps overshadowed its significance for commemoration.

Modernism is a design movement that has recently become a focus of preservation efforts as its architectural and landscape architectural landmarks—particularly those of the post-World War II era—begin to face demolition and deterioration. Modernism is characterized by an embrace of abstraction, a questioning of tried-and-true forms and formalities, and a willingness to experiment with altogether new forms and materials. New technologies had, in the eyes of Modernist designers, rendered old styles and ways of building obsolete. Pure geometries and monolithic materials characterizing this style lacked the traditional details and decorative motifs of earlier styles. Jefferson National Expansion Memorial is considered one of the best and most significant built examples of Modern design in the United States.

The Gateway Arch is well known as an extraordinary structure, a soaring emblem, part sculpture and part memorial, embodying the principles of Modernism as executed by one of its most recognized masters, architect Eero Saarinen. The landscape — though not initially afforded the same recognition — is the inextricable connection between the Gateway Arch and its setting.

The design for the landscape surrounding the Gateway Arch is the result of a close collaboration between Saarinen and landscape architect Dan Kiley. The contributions of architects such as Saarinen have been extensively studied, yet the profession of landscape architecture has not been so widely acknowledged. In May 1995, this trend changed when Dan Kiley was awarded the American Academy of Arts and Letters Arnold W. Brunner architecture prize.<sup>5</sup> Kiley was the first landscape architect ever so honored. This demonstrates the growing

recognition of the profession of landscape architecture as well as the importance of Kiley in the profession, specifically the Modern movement.

Jefferson National Expansion Memorial is a particularly important project in Kiley's career for two reasons. First, his participation and success in the Memorial project, the first major architectural competition in the United States after World War II, established his reputation. Second, it continued Kiley's long-term personal and professional relationship with Eero Saarinen. The two continued to work together on various projects for 14 years until Saarinen's untimely death.

Together, the architecture and landscape architecture of the Memorial embody the design philosophy of both Eero Saarinen and Dan Kiley. Eero Saarinen considered the entire site and carefully designed the landform to afford specific views of the Gateway Arch and Old Courthouse and to subtly disguise views of the service entrance, maintenance facility, and railroad tracks. Kiley enhanced his design by adding plants that would define vistas of the Gateway Arch and accentuate its simple magnificence. His use of a single tree species spaced closely together in allées is a Kiley signature. The simplicity of his design complements the simplicity of the Gateway Arch.

#### **Design Intent**

Design intent in the context of a Modern designed landscape or structure has been defined and elaborated upon by Theodore H. M. Prudon, a preservation architect, in his 2008 text, *Preservation of Modern Architecture*:

“Continuity and the ability to recognize original design intent is critical to the preservation of modern architecture. Original design intent is the visual and conceptual expression of the designer's creativity and therefore informs every aspect of both the building and its construction. This acceptance of and greater reliance on the intangible (and therefore the lesser reliance on material expression) diverges from conventional preservation practices in the U.S. It requires both a broader definition of authenticity and a less literal approach to material preservation. Whereas in traditional preservation practice the original material and

its presence is considered the most authentic and thus what needs to be preserved, in the preservation of modern architecture there is likely to be a combination of both design intent and material authenticity with, probably, a somewhat greater priority placed on the design itself.”<sup>6</sup>

Identifying a framework for how design intent relates to the landscape is complex in the case of a project such as the Memorial. The significance of the landscape is dependent upon its ability to convey the character intended by the master designers. This question of design intent is further complicated by the landscape design having been realized over decades of construction outside the direct control of the original designers, and including numerous incremental design iterations and changes in its execution.

The intent of the designers is encapsulated in part by Saarinen’s words about the Memorial in 1959:

“All the lines of the site plan, including the paths and roads, and even the railroad tunnels, have been brought into the same family of curves to which the great arch itself belongs. More and more I believe that all parts of an architectural composition must be parts of the same form-world.”<sup>7</sup>

Original design intent is a key aspect of significance for the Memorial, and thus a factor in the determining which landscape features do or do not contribute to its significance. Design intent at the Jefferson National Expansion Memorial is expressed through the built form as it exists today, and also through the designers’ surviving drawings, written and verbal communications.

Some considerations used in evaluating the closeness of existing built features on the Memorial grounds to the Saarinen/Kiley design intent are as follows.

1. Features that exist today as they were fully developed within the Saarinen/Kiley design, documented in their final master plan as approved by the National Park Service in 1964, are the most significant features at the Memorial and convey most strongly the

original design intent. Landscape features such as the Gateway Arch, north and south overlooks, and system of pedestrian walks are examples. They are part of the highly designed “form-world” of the Memorial. These are contributing features.

2. Features developed in the Saarinen/Kiley designs only to a schematic level—but subsequently developed, and construction documents prepared, by National Park Service and other designers—are also contributing features and convey the significance of the landscape. An example is the single-species allées of Rosehill ash (*Fraxinus americana* ‘Rosehill’), which were substituted for the tulip poplars (*Liriodendron tulipifera*) preferred by Kiley.
3. Features based on Saarinen/Kiley concepts (expressed in graphic and/or narrative form), and completely designed by others are for the most part considered non-contributing, though they may be compatible with the original design intent of the Memorial. For example, the service areas and other service features (located on a plan by Saarinen/Kiley in a manner that screened them from view, and never intended to be a part of the “form-world” of the Memorial) were designed over time by others and are generally non-contributing but compatible by virtue of their adherence to the requirement that they be visually unobtrusive in the landscape.
4. Features that were neither imagined by Saarinen/Kiley nor drawn by them, but were wholly designed and implemented by others in ways that detract from the “form-world” of the Memorial and/or are visually intrusive, are considered non-contributing incompatible features.

The intent of the National Park Service has always been to communicate the architectural and landscape architectural values of the Saarinen/Kiley plan. The landscape surrounding the Gateway Arch derives significance from that design concept. The ideas of the Saarinen/Kiley plan are important; however, not all of the built features at the Memorial reflect the intent of Saarinen/Kiley. This is due, in part, to financial constraints

over a long implementation period. In this respect, the more the features reflect the designers' intent, the more significant they are as integral parts of the cultural landscape.

### EXISTING RECOGNITION AND SIGNIFICANCE STATUS

In light of the importance of the landscape to the significance of the site, both the 1976 National Register nomination and the 1987 National Historic Landmark nomination statements of significance were reviewed as part of the preparation of the statement of significance for the cultural landscape. These nominations set a baseline of previously-recognized significance and provide precedents for how the significance of the landscape is evaluated in this report.<sup>8</sup>

The following are summaries of the periods of significance in these two nominations and how the significance statements characterize the landscape. The Memorial's landscape was listed prior to completion of its construction, an unusual situation which led to the end dates of the periods of significance in the 1976 and 1987 nominations being stated as "present." While these statements of significance mention various landscape features extant at the time, little detail is provided to explain the significance, character, and associations of the Memorial as a whole, or how the grounds and Gateway Arch were interrelated from a design perspective. The 1996 version of the Cultural Landscape Report endeavored to do so, providing a detailed history of the site concept, design process, and the Saarinen/Kiley collaboration. It may be advisable in the future to revisit these nominations in order to add new details relating to the significance of the Memorial, including the post-1987 designed landscape.

#### National Register District nomination (1976)

1. Period of Significance: "1935 to present."
  - a. 1935: establishment of Memorial (enabling legislation).
  - b. "present" = 1976.
2. District covers the "T-shaped park," and identifies specific buildings/structures

contributing to the district: the Gateway Arch, Old Courthouse, and Old Cathedral. The Memorial grounds construction was well under way at this time, but incomplete, with the overlooks, steps, and grand staircase listed in the nomination as part of the district, but described as "now under construction."

#### National Historic Landmark District nomination (1987)

1. Period of significance: "1947 to present."
  - a. 1947: Saarinen's initial design is submitted to the competition.
  - b. "present" = 1987.
2. The National Historic Landmark is called "Jefferson National Expansion Memorial Gateway Arch," and the discussion within the nomination focuses mostly on the Gateway Arch, but the boundary of the district covers the entire Memorial area east of Memorial Drive.
3. The nomination discusses existing features of the landscape as part of the significance statement. "Curvilinear, graceful staircases of toned concrete at the north and south ends provide access to the Arch grounds from the riverfront. The grounds themselves are carefully landscaped with ponds, trees, and walkways that again reflect the gentle curve of the Arch. Similar curves are repeated in the tunnel entrances for the railroad tracks that cut through the property. The design of the concrete tunnel entrances is so finely incorporated into the landscape through the curvilinear lines and placement below grade that the entrances hardly seem to exist."

### CULTURAL LANDSCAPE PERIOD OF SIGNIFICANCE

The period of significance for the Jefferson National Expansion Memorial landscape is 1947-2003. This period encompasses the key design and ongoing construction activities pertaining to the Memorial and its character-defining features, beginning with the 1947 design competition and ending with

the last major element of the design that was constructed: the central portion of the grand staircase. Note that the beginning and end dates of the overall period of significance encompass the following key dates/periods:

- a. **1947-1948:** Design competition – Saarinen/Kiley team entry wins in initial and second rounds of competition.
- b. **1957-1964:** Saarinen and Kiley collaborate on the conceptual and schematic designs for the Memorial. Saarinen dies in 1961 during the design process, and the National Park Service acceptance of the design-development drawings in 1964 marks the end of Kiley’s direct involvement. The 1964 drawings serve as the benchmark for later implementation and evaluation.
- c. **1966-1986:** National Park Service landscape architects and consultants develop the 1964 Saarinen/Kiley design drawings into construction drawings, and the design is largely implemented in two phases of major work (1971-1976, 1978-1981) with several other features built in intervening years. Some features are modified due to factors outside the control of the NPS landscape architects, such as budget constraints. Many aspects of the design’s implementation in this period faithfully retain the design concept, but are not executed exactly as conceptualized.
- d. **2003:** Completion of the grand staircase central section, based largely on the 1964 design. This represents the implementation of the final design concept that was developed in the Saarinen/Kiley drawings, but only partially executed in the early construction of the Memorial. Note that the grand staircase as built was modified from the Saarinen design.

The period of significance begins in 1947, the year the United States Territorial Expansion Commission sponsored a national design competition, marking the inception of the Memorial idea. Eero Saarinen started with a four-person design team including an architect, landscape architect, painter, and sculptor. The team’s design was chosen for its monumental, inspired, symbolic arch.

Between 1948 and 1957, the National Park Service, City of St. Louis, and the United States Territorial Expansion Commission negotiated with the Terminal Railroad Association (TRRA) on the relocation of the railroad tracks. During this nine-year period, Saarinen and Kiley moved on to other projects; and, for various reasons, some of the original team members—including the painter and sculptor—were no longer involved.<sup>9</sup> By 1957, Saarinen had become established as an architect at the forefront of the Modern movement. His burgeoning practice employed many talented young architects such as Robert Venturi, Cesar Pelli, and Kevin Roche. The collaborative work of many designers in Saarinen’s studio strengthened the design for the Memorial as it was developed.

In 1957 the negotiating parties reached an agreement on the relocation of the tracks. The solution, to place the tracks below grade in a series of tunnels and open cuts along the eastern side of the site, forced Saarinen to make changes to his winning plan. Nevertheless, even as some program elements changed, the underlying concept remained the same: a symbolic memorial, in the form of an inverted catenary curve, placed in a designed landscape setting on the riverfront.

From 1957 to 1964, Saarinen and Kiley—then Kiley on his own—took the overall concept for the Memorial and expanded it until the patterns of spatial organization and circulation met their ideals as well as the needs of the National Park Service. In 1964, a drawing set by Saarinen/Kiley was approved by the National Park Service, although the planting plan was revised through 1966. Once the concept and organizing features were solidified by Saarinen/Kiley and approved by the National Park Service, NPS landscape architects were charged with preparing construction documents and executing the plan.<sup>10</sup> Between 1960 and 1986, most of the major design features in the Saarinen/Kiley plan were constructed; the grand staircase’s central section was completed in 2003.

Saarinen and Kiley were associated with the site through the design development phase; therefore the landscape significance under National Register Criterion C derives from

the concepts of Saarinen and Kiley, not from the physical details of each landscape feature, many of which were determined after the master designers' involvement ended. During the design development stage of a project, materials, colors, and construction specifications are not always considered. Saarinen and Kiley did not create construction details for many features at the Memorial, instead concentrating on the overall form of the landscape. The structure of the landscape is created by the shape of the landform, the patterns of spatial organization, the patterns of circulation, and siting of the Gateway Arch. This framework was conceptualized by Saarinen and Kiley; afterwards others were charged with selecting materials and instructing contractors in the physical execution of their design.

Some features constructed during the period of significance do not contribute to the significance of the Memorial landscape, due to major departures from the 1964 design and the stated Saarinen/Kiley vision. Others do not contribute because they were not developed in the 1964 drawings, and were implemented based on National Park Service and other designers' concepts. These include the parking garage, lighting, maintenance facility, tree grates, and paving materials of the walks. Both the garage and maintenance facility were built in locations specified by Kiley, but they are not based on the design concepts (which were never developed past a master plan concept level). The maintenance building is not the earth-sheltered building originally planned. Instead of the surface parking lot Kiley had depicted, a parking garage was built to accommodate more vehicles.

The end date of the landscape period of significance may be considered for revision in the future under certain circumstances. It is possible that the appropriate end date could shift forward in time, if and when unrealized elements of the design are constructed in the future, depending on the closeness of the realized design to the 1964 Saarinen-Kiley design. Some elements of the design that were not developed completely include the pedestrian overpasses across Memorial Drive and the fountains planned to the north and south of the Gateway Arch. If Saarinen and Kiley

did not develop the designs past a conceptual level, then a newly designed feature utilizing their general intent could be constructed as a compatible, but non-contributing, feature post-dating the period of significance. Such features could include the overpasses over Memorial Drive and the two fountains in the north and south triangles. This kind of revision to the period of significance would have to be carefully evaluated and justified based on accepted National Register criteria, which could potentially occur in future updates to this report or to the Memorial's National Register or NHL nominations, if warranted.

### COMPARATIVE ANALYSIS OF HISTORIC AND EXISTING LANDSCAPE CONDITIONS BY CHARACTERISTIC

After the period of significance was established, a comparison of landscape features conceptualized and built in the period of significance (1947-2003) to the current landscape was undertaken. There are three parts to this comparison for each characteristic and major feature:

- An assessment of the feature during the period of significance (the "historic condition");
- An assessment of the feature in 1995, updated to 2009 where conditions have changed (the "existing condition"); and
- An analysis of the feature, together with a determination regarding the feature's contribution to the significance of the property.

Because significance is based on an association with the Saarinen/Kiley plan, the historic condition section for each feature discusses the Saarinen/Kiley design intention, if known, and how closely the actual implementation of the feature appears to resemble this concept.

Since the significance of this landscape is directly related to the Saarinen/Kiley design concept rather than its physical implementation, those features which have a character reflecting the designers' intent are more significant than those constructed features

which diverge from the intent. Therefore, each landscape feature was assessed as either being contributing or non-contributing based upon its relationship to design intent. This chapter concludes with an assessment of the integrity of the Memorial landscape.

Terms frequently encountered in descriptions of the significance of the cultural landscape are *contributing*, *character-defining*, and *non-contributing*. These are related, but distinct, terms.

The terms *contributing* and *non-contributing* are specific, quantifiable items intended for field identification of features for the purpose of the Cultural Landscape Inventory (CLI) and National Register of Historic Places evaluations.<sup>9</sup> Further, *non-contributing* features can be classified as either *compatible non-contributing* or *incompatible non-contributing*. Definitions are as follows:

#### **Contributing**

- A contributing feature is “a biotic or abiotic feature associated with a landscape characteristic that contributes to the significance of the cultural landscape.”<sup>12</sup>
- Similarly, a contributing resource, according to the National Register, is “a building, site, structure, or object that adds to the historic significance of a property. A contributing building, site, structure, or object adds to the historic associations, historical architectural qualities, or archaeological values for which a property is significant because of the following: it was present during the period of significance; it relates to the documented significance of the property; it possesses historic integrity or is capable of revealing information about the period; or it independently meets the National Register criteria.”<sup>13</sup>
- At the Memorial, contributing features reflect the Saarinen/Kiley design intent in their built character.

**Character-defining** features are within the set of contributing landscape features; they are those features that represent the essential historic qualities that lend the landscape its significance. Character-defining features

represent the most “prominent or distinctive aspect(s), quality(ies), or characteristic(s) of a historic property that contributes significantly to its physical character. Structures, objects, vegetation, spatial relationships, views... may be such features.” According to the CLR Guide, “The term ‘character-defining feature’ was conceived to guide the appropriate treatment and management of historic structures (and later of cultural landscapes), so that features conveying historic character would be retained by treatment activities.”<sup>14</sup>

#### **Non-Contributing**

- A non-contributing feature is “a biotic or abiotic feature associated with a landscape characteristic that does not contribute to the significance of the cultural landscape.”<sup>15</sup>
- A non-contributing feature is “a building, site, structure, or object that does not add to the historic architectural qualities, historic associations, or archaeological values for which a property is significant, because: it was not present during the period of significance or does not relate to the documented period of significance of the property; due to alterations, disturbances, additions or other changes, it no longer possesses historic integrity or is capable of yielding important information about the period; or it does not independently meet the National Register criteria.”<sup>16</sup>
- In the case of the Memorial, a non-contributing feature is one that was designed and implemented by a subsequent designer, or a design that was altered during implementation to the point that it no longer reflects the Saarinen/Kiley design intent.
- Non-contributing features or resources, however, are not all the same: they can have different impacts on the integrity of a cultural landscape or a historic district. Compatible and incompatible are distinctions that can be used to capture the different qualities of these features.<sup>17</sup>

**Non-contributing compatible** is a term used most often in describing buildings or other features in urban historic districts that are not historic in their own right, but are constructed or sited in a way that does not detract from the surrounding historic fabric.

The term “compatible” is used in preservation discussions of how new uses may be incorporated in historic settings. For example, a definition of the rehabilitation treatment approach is “the act or process of making possible an efficient compatible use for a cultural landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural and architectural values.” In rehabilitation, “alterations and additions [must] be compatible with the historic character of the landscape,” and “rehabilitation maintains the existing integrity and character of a historic structure, but allows major additions or alterations to accommodate a compatible contemporary use.”<sup>18</sup>

**Non-contributing incompatible** features are the non-historic features of the landscape that are intrusive and may detract from its integrity.

While the conceived-but-not-built design elements cannot be considered contributing and have no bearing on the integrity of what exists now, they have implications for how compatible additions may be considered and designed in the future.

## TOPOGRAPHY

*Historic Condition:* Saarinen was responsible for the design of the landform, and intended the catenary-curve geometry which characterizes the Gateway Arch and other site structures to also be expressed by curving lines on the ground plane.<sup>19</sup> The landform is composed of fill and carefully sculpted to achieve specific spatial and visual effects.<sup>20</sup> Saarinen’s insistence that the railroad cease to be a visual and physical obstruction between the city and the riverfront had a decisive effect on the landform. This decision resulted in a combination of open cuts and tunnels for the railroad through the eastern part of the Memorial. The topography was masterfully sculpted to hide the tracks and, as a result, the train causes minimal distraction in the Memorial setting.

Two high points, located within the centers of the north and the south triangles, are on axis with the Gateway Arch. The ground plane gradually rises to these points from the Gateway Arch legs at an approximately 2.8 percent slope; the topography drops gradually to street level at a minimal slope in the northwest, and at a steeper, 6.3 percent slope in the southwest. Depressed areas were designed around the service areas and maintenance facility to hide the operational activities of the Memorial from view of visitors. The landform was intended not only to screen these activities, but also to prevent visitors from accessing them.

Other significant designed landforms include the bowls creating the north and south ponds, the plinths forming the north and south overlooks, and the berms along Memorial Drive. The ponds not only serve as aesthetic features but were also designed as part of the drainage system, as they were sited at some of the lowest elevations in the landscape. The two overlooks, in contrast, were constructed high above the river levee to provide vantage points for views. Berms located along Memorial Drive, while part of the original plan, were constructed higher than originally designed, when during the second phase of construction (1978 to 1981), excess fill material was added to them (possibly also to reduce the impacts of wind on the Gateway Arch). The southwest berm was built up six feet higher, and the northwest 14 feet higher, than specified in the original design.

*Existing Condition:* All of these topographic features were implemented essentially as designed, although the berms are slightly taller than intended. Since design implementation, a few modifications to topography have occurred. Small berms were added along the north and south walks on the east side of the Memorial grounds to eliminate a drainage problem and to deter pedestrians from walking on the lawn. Other minimal, incremental changes to the topography occur during seasonal turf renovation.

Memorial management has identified several drainage problems which affect the sculpted landform. The most serious problem occurs along the west side of the walls of the open railroad cut, where the existing drainage

system is not working properly, resulting in continued erosion of the slopes along these structures. As a result, water and soil flows over the walls and onto the tracks during hard rains.

Drainage problems are evident on slopes throughout the Memorial grounds. For instance, along the edges of some of the pedestrian sidewalks, particularly in the southwest part of the Memorial, water runs off the walk and into the lawn area on the adjacent slope, causing soil erosion. Poor drainage appears to be causing chronic damage to the edges of some large paving expanses, such as the northwest plaza and the north overlook. There are areas of poor drainage in the lawn near the southwest baldcypress circle. Minor erosion is also evident along the slopes of the eastern sides of both ponds; north of the grand staircase; southwest of the North Service area; and on the top of the slope by the South Service area.

*Analysis:* Contributing.

The topography of the Memorial grounds is a character-defining element of the Saarinen/Kiley concept. The landform was implemented as originally intended, and remains intact today. The few changes made over time have resulted in minimal divergence from the design concept. The taller berms as built eliminate views of the roadway and reduce noise and pollution within the Memorial, and are therefore functionally important to the visual quality of the Memorial landscape.

## **SPATIAL ORGANIZATION**

This section begins with an overall description of the Memorial's spatial organization, and then by distinct areas within the Memorial grounds.

*Historic Condition:* The landscape surrounding the Gateway Arch was designed using the Modern interpretation of Beaux-Arts compositional principles, a signature style that Saarinen employed in many of his designs. At the Memorial, the overall space was organized and unified, combining a nearly symmetrical plan with an east-west primary axis, a north-south secondary axis, and a repetition of

curving forms echoing the catenary curve geometry of the Gateway Arch in various other features. The monumental character of the landscape is achieved through the varying scales and relationships of the spaces, and the spatial experience of compression and expansion created along the length of the pedestrian walks.

The planting plan was altered during the second major phase of implementation. The changes diverged somewhat from Kiley's design, affecting the pattern of spatial organization, particularly around the ponds. The number of plants was diminished, resulting in fewer enclosed spaces, thresholds, and edges than originally intended. Reduction in the numbers of plants used for screening functions slightly weakened the intended separation of service areas and visitor use areas.

*Existing Condition:* The current landscape as constructed reflects the design intention for spatial organization. The topography, ponds, and walks support the volumes and spaces that were part of the original design. While the planting plan of the allées along the walks achieves the intended effect of enclosure, the Rosehill ash trees do not have the size and form Kiley intended. In other areas, the spatial effect resulting from the reduction in planting density from the original design is evident, such as around the ponds and the Old Cathedral parking lot, maintenance area, service areas, railroad tunnels, and along Memorial Drive. Planted form in Luther Ely Smith Square is similar in plant locations lining the north and south edges of the square, but the wider spacing and plant forms differ from the rest of the grounds. The reduction of plants in some areas resulted in a divergence from the designers' intended spatial quality of the landscape.

*Analysis:* Contributing.

The overall spatial organization of the property remains the same as the Saarinen/Kiley plan, and therefore is contributing. A few minor departures from their plan occur in the planted forms and density used along the east-west axis, Memorial Drive, around the operations areas, in Luther Ely Smith Square, and around the ponds. However, the strength of the

designed spatial organization of the Memorial grounds continues to be character-defining. Landscape features that support the overall spatial organization of the Memorial landscape are identified as contributing features are described below in more detail.

### **System Of Walks And Allées**

(See Circulation for more information on walks; Vegetation for more information on single-species allée plantings.)

*Historic Condition:* The circulation system was a key element in organizing the Memorial landscape. The system, as planned by Saarinen, organized space in two ways. It provided access from multiple points (from every corner and side of the Memorial), leading visitors to the Gateway Arch. It differs in this way from many traditional memorials which are approached along a single route such as a formal processional way. The trees line the walks in allées with the same curving alignments and a strong north-south axial relationship to the Gateway Arch, providing different views of the Gateway Arch, ponds, and riverfront. The triangles, in particular, were intended to frame a designed view of the Gateway Arch along the north-south axis. The changing widths of the pedestrian walks evoke a streamlined, uniform, flowing character that reflects segments of the Gateway Arch's catenary curve.

Kiley recognized that in the landscape, horizontal dimensions are typically much greater than vertical dimensions. Plants are often used as vertical elements to organize and delineate space. The use of trees closely spaced along the walks in an allée created a deliberate edge and sense of enclosure. The trees, spaced 30 feet on center, formed a dense overhead canopy providing enclosure for the visitor while affording carefully controlled glimpses towards the soaring Gateway Arch.<sup>21</sup> Kiley said in a 1993 interview that he intended the trees to be cathedral-like, to create an "elevated, spiritual feeling." The use of the same tree throughout the pedestrian path system strengthened the edge and provided visual continuity and fluidity. Kiley stated that the main goal in the landscape design was "to develop a sense of movement of spatial continuity. This was done by arranging undu-

lating lines of high tulip poplar trees spaced very close together so they started from either entrance wide and narrowed down to a neck, and then as one turned to the side elevation of the Arch, the trees would widen up to the base. This development would happen on both sides of the Arch."<sup>22</sup> These allées were constructed along the north-south walkways, but remain unrealized in one area — on the lawn side of the walkways leading along the main axis from the west.

*Existing Condition:* The spatial organization of the Memorial is essentially the same as designed. The walks are in place today as designed. The form of the Rosehill ash trees that were substituted for tulip poplars specified by Kiley is not as upright, and some of the trees are missing, but the overall effect remains as intended.

*Analysis:* Contributing.

The uniformity of the closely spaced allée planting and the curving edges and alignments of the walks are part of the original Saarinen/Kiley design and evoke the intended spatial quality, despite substitution of a different tree species (see Figures 4.1 and 4.2).

### **Primary Axis Between The Old Courthouse And The River**

*Historic Condition:* The relationship between the Old Courthouse, the Gateway Arch, and the river is a strong axis that was a primary organizing element of the Saarinen/Kiley concept from the beginning. Saarinen intended for the Memorial to connect to the city and the river. The axis was left as an open space, the Gateway Arch centrally located within it, thus creating a strong visual and physical connection between the city and the river. Saarinen intended the grand staircase to be monumental in scale, to symbolize movement west through St. Louis, and to extend the primary axis from the Gateway Arch to the river. The topography along this axis was revised in design development in order to accommodate the rail line, which eliminated the possibility of the earlier concept of long views extending from the Old Courthouse to the river.



Figure 4.1. Office of Dan Kiley, "Approach to Gateway Arch from Southwest, Summer," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)



Figure 4.2. Approach to the Gateway Arch from the southwest, 2009. Note that the perspective in this photograph differs from that in the drawing produced by the office of Dan Kiley.

*Existing Condition:* The linear connection between the Old Courthouse and the Mississippi River through the Gateway Arch is a primary organizing element of the Memorial.

*Analysis:* Contributing.

The spatial connection between the Old Courthouse (a civic symbol of St. Louis) and the Mississippi River survives as a character-defining feature that is a key component of the Saarinen Kiley plan.

### **Pond Areas**

*Historic Condition:* Kiley's intended spatial composition at the ponds was to contrast dense, tall forest tree masses in some areas with open meadows in others. The edge between these spaces was to be articulated with flowering trees. The sinuous edge of the ponds was intended to create smaller spaces within a larger whole.

*Existing Condition:* Enclosed spaces created by vegetation and topographic forms surround the ponds. The north and south ponds each sit within a gentle depression, creating a sense of separation from the city.

*Analysis:* Contributing.

In general, the spatial relationship of the ponds to the rest of the Memorial grounds is the same as in the Saarinen/Kiley design. The planting around the ponds varies somewhat from the original concept. Particularly to the north and south of both ponds, the elimination of a large number of plants before implementation resulted in what the designer described as haphazard plant spacing and composition.<sup>23</sup> However, the enclosure by trees around the edges defines the space in a way that remains similar to the concept (see Figures 4.3 and 4.4).

### **Overlooks**

The overlooks were intended as formal viewing platforms for the river, a key component of the symmetrical site plan, as well as "finals" bracketing the ends of the Memorial grounds as viewed from the east side of the river. They continue to fulfill these functions today. For more analysis of the overlooks as structures, see the Buildings and Structures section below.

### **Luther Ely Smith Square**

*Historic Condition:* In the Saarinen/Kiley plan, Luther Ely Smith Square was a raised plaza framed by two triple allées of trees (of the same single-species planting as seen on the rest of the Memorial grounds) on the north and south sides of the block. Two pedestrian overpasses connected these allées across Memorial Drive to the Memorial grounds. The pedestrian overpasses and rows of trees were intended to physically and visually connect the square to the rest of the Memorial grounds. The overpasses and tulip poplar allées were never implemented, nor was the raised plaza.

*Existing Condition:* Currently, Luther Ely Smith Square is a depressed plaza with three areas of lawn with central planting beds of perennials. It is spatially defined by two rows of trees on the north and south sides, but the scale and form of the species differ from the design intent. The sunken garden, defined by sloped lawn areas and narrow sidewalks, does not resemble the raised plaza proposed in the Saarinen/Kiley design.

*Analysis:* Non-contributing compatible.

Luther Ely Smith Square today lacks elements that were identified in the Saarinen/Kiley concept for the space. Although its details and furnishings are not in keeping with the Modern aesthetic of the rest of the Memorial grounds, the space upholds the major axis from the Old Courthouse to the river by leaving this vista unobstructed (see Figures 4.5 through 4.8).

### **Old Courthouse Block**

The Old Courthouse was integrated into the design composition of the Memorial as a symbol of the city of St. Louis. It was intended to function as the eastern axial terminus of the Saarinen/Kiley site plan's primary axis. It continues to fulfill this function today.

*Analysis:* Contributing (For more about the Old Courthouse, see the Buildings and Structures section below.)



Figure 4.3. Office of Dan Kiley, design development perspective sketch of the view of the Gateway Arch across a pond, September 1963. Note height, habit, and texture of the vegetation in the foreground, and the curving form of the pond edge. (JNEM Archives, uncatalogued collection)



Figure 4.4. Pond edge: note character of lawn and tree vegetation, 2009.

### Service Areas

*Historic Condition:* Service areas including the generator building (north service area), shipping and receiving area (south service area), maintenance facility, and parking garage were sited as zones on the Saarinen/Kiley plan. These areas were not designed in detail by Saarinen/Kiley but their plans clearly showed that operational facilities were to be sited within low points in the topography and

screened by vegetation, concealing them from the view of visitors. The design character of these functional areas, as they are not visible to the public, was not addressed by Saarinen/Kiley, who did not appear concerned with the formal characteristics of the service facilities as long as they remained concealed.

*Existing Condition:* Today, the service areas fulfill the Saarinen/Kiley concept, as they are

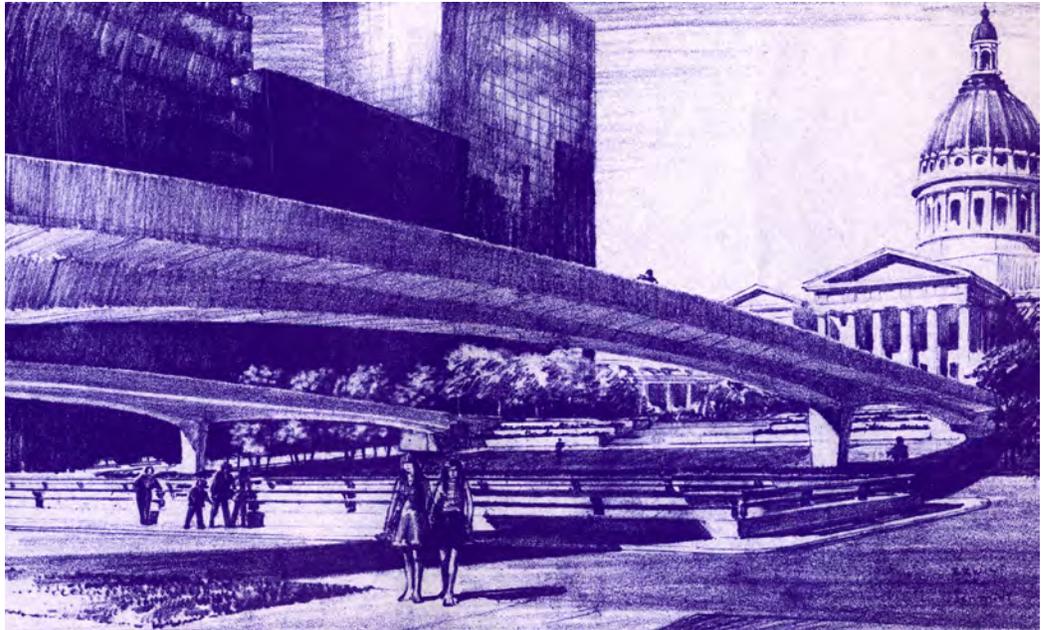


Figure 4.5. Harland Bartholomew & Associates' design development sketch of proposed pedestrian overpasses over Memorial Drive and Luther Ely Smith Square, 1975. (JNEM Archives, Record Unit 120, Drawing 366/41025)



Figure 4.6. View across Luther Ely Smith Square, 2009.

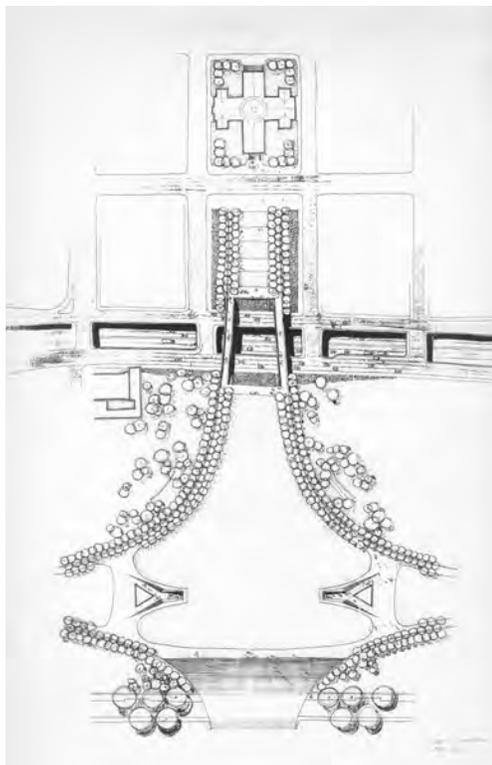
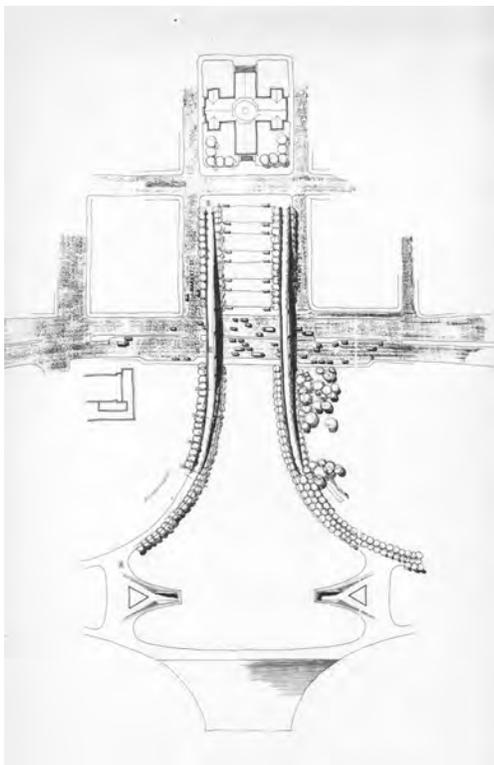
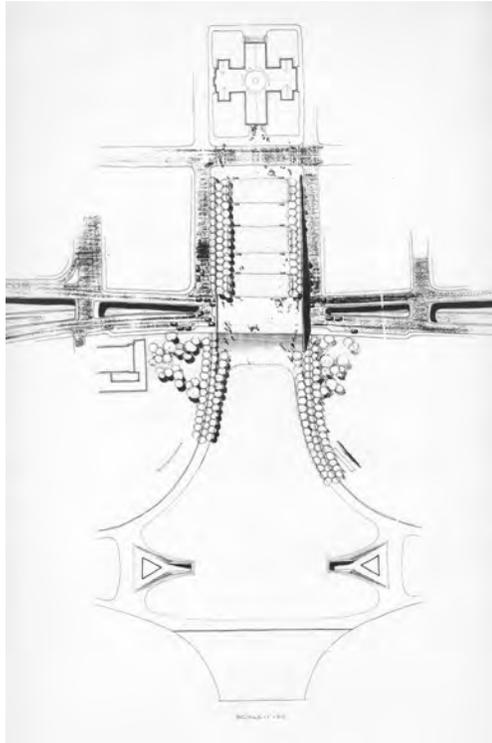
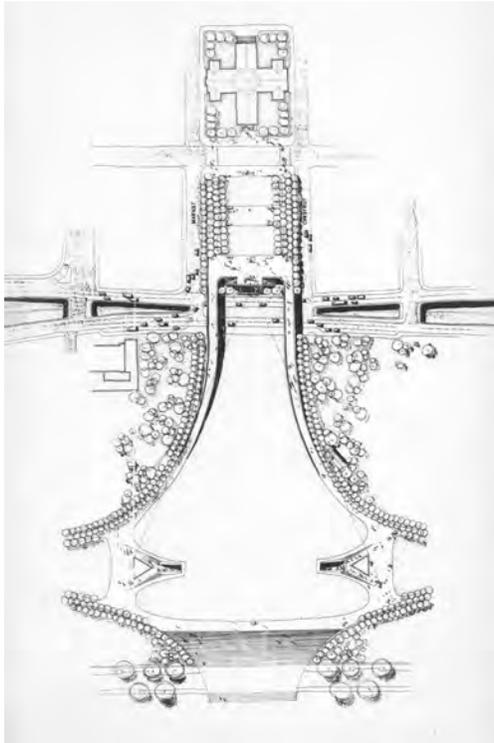


Figure 4.7. Studies of the proposed pedestrian overpasses. (Eero Saarinen & Associates, c. 1960. JNEM Archives, uncatalogued collection)

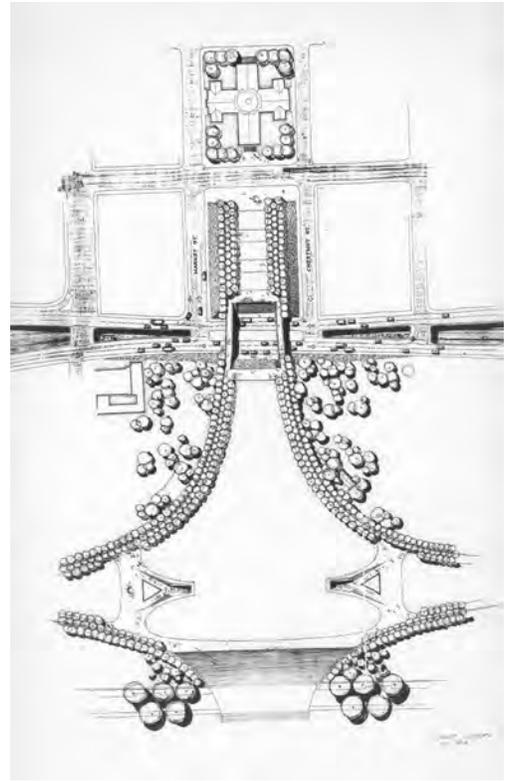
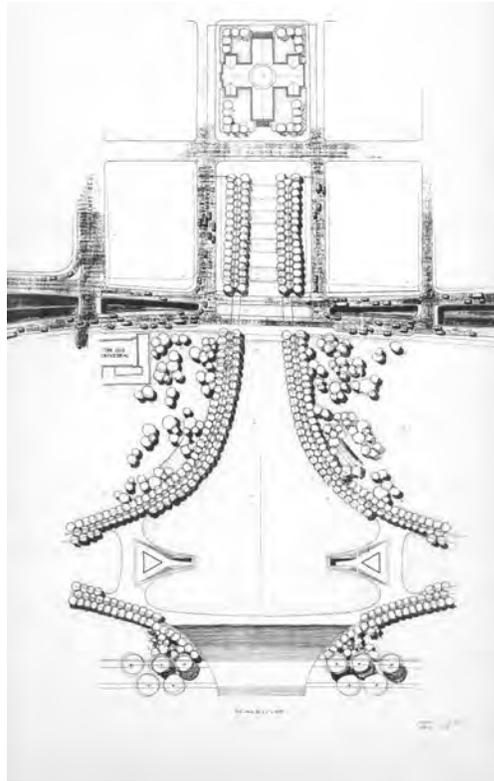


Figure 4.8. Studies of the proposed pedestrian overpasses. (Eero Saarinen & Associates, c. 1960. JNEM Archives, uncatalogued collection)

sited in low areas in locations where they were placed in the concept design. They are unobtrusive within the landscape. The maintenance facility is not as well screened by plantings as was intended, however, and it is visible from some of the walks in the south end of the Memorial grounds.

*Analysis:* Contributing.

The spatial arrangement of the service areas reflects the Saarinen/Kiley design intent, including their siting at low points surrounded by screening vegetation to camouflage their presence.

### IEWS AND VISTAS

The centrality of the Gateway Arch within the axial composition of the Memorial landscape had a direct influence on the designed views and vistas. According to Saarinen, “the Arch is in a sense a vertical monument on one axis and a wide monument in another.”<sup>24</sup> Views and vistas relate to both of these aspects of the Gateway Arch, the city, and the river.

#### View from the Old Courthouse to the Gateway Arch

*Historic Condition:* The strong east-west alignment between the Old Courthouse and the Gateway Arch was intended to create a primary vista, referred to at one time as the “Saarinen vista.” From the east, the Gateway Arch was to frame the Old Courthouse. From the west, the Gateway Arch was originally intended to frame a view of the Mississippi River. Saarinen wanted to create a strong visual relationship between the river and the city. Pedestrian overpasses and allées were designed, but never realized, in Luther Ely Smith Square with the intention of strengthening this vista. The vista was created when the Gateway Arch was constructed between 1963 and 1965. The view to the Mississippi River that Saarinen had intended, however, was compromised by the grading of the site necessitated by the retention of the railroad.

*Existing Condition:* The vista between the Old Courthouse and the Gateway Arch exists as implemented. Luther Ely Smith Square and the pedestrian overpasses were never constructed,

but the axial relationship is still very strong and the design intent is evident.

*Analysis:* Contributing.

The vista between the Old Courthouse and the Gateway Arch is a fundamental concept from the Saarinen/Kiley design that was realized and is a major feature of the landscape today.

#### View Along the North-South Axis

*Historic Condition:* Views of the Gateway Arch were intentionally planned from specific vantage points in the Memorial grounds. These views resulted from the designers' manipulation of landscape features such as topography, circulation, and vegetation. The vistas from the north and south triangles, on axis with the Gateway Arch, framed the sides of the Gateway Arch as a "vertical monument," tall and narrow, as opposed to the view from the Old Courthouse which portrays the Gateway Arch as a "wide monument."<sup>25</sup>

A series of glimpses of the Gateway Arch were intended along the pedestrian approaches, framed by the layout of the walks and the dense plantings of trees. The close, regular spacing of the trees and the gentle curve of the walks creates a sheltered condition, with occasional moments of openness that reveal views of the Gateway Arch. As the trees have grown, they have more closely fulfilled the original design intent by blocking views of the Gateway Arch from some areas of the Memorial grounds. The limited remaining views (for example, the views along the walks from the north and south rest areas) have become more dramatic as a result (see Figures 4.9 and 4.10).

*Existing Condition:* The views of the Gateway Arch from the north-south axis survive today as intended by Saarinen/Kiley. However, as the trees along the walks grow larger, they are beginning to block the lower portion of some of these views.

*Analysis:* Contributing.

The designed views to the Gateway Arch along the north-south axis of the memorial are a character-defining feature of the Memorial landscape. Dramatic glimpses of the Gateway

Arch from vantage points along the walks exist as intended.

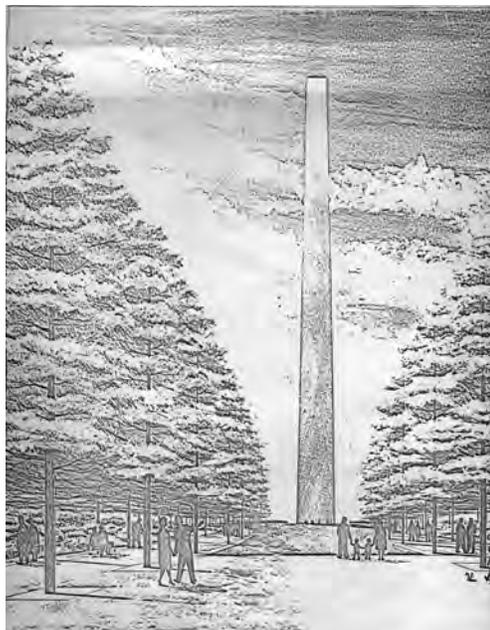


Figure 4.9 Office of Dan Kiley, "View Towards Arch from C-C," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)



Figure 4.10. View to Gateway Arch along north-south axis, 2009.

### Views Around the Ponds

*Historic Condition:* Views from the pond areas are shaped by the surrounding undulating landforms and plantings. Clumps of trees contrasting with open meadow areas were intended to obscure views in some areas and afford dramatic views in other areas, such as the views from within the circular plantings of baldcypress near each pond, framed through an intentional gap in the arc of the trees. The reflection of the Gateway Arch in the ponds was intended to enhance views from this area.

*Existing Condition:* Views of the Gateway Arch from the ponds exist generally as intended.

*Analysis:* Contributing.

Views to the Gateway Arch from the ponds reflect the design concept and therefore are contributing (see Figures 4.11 and 4.12).

### Views Between the Memorial and East St. Louis

*Historic Condition:* The view from the Gateway Arch to East St. Louis was intended to feature a wooded park on the east side of the Mississippi River. Saarinen's vision was to extend the Memorial to the east side of the river because of the magnificent views afforded from the east side toward downtown St. Louis. The Gateway Arch would frame the city. As with views from the Old Courthouse to the Gateway Arch, this view is influenced by the axial arrangement of the design and therefore the Gateway Arch appears as a wide monument.

*Existing Condition:* The Memorial has yet to be expanded but the views from the east side and the Poplar Street and Eads Bridges are magnificent. The National Park Service has been authorized by Congress to begin purchasing land on the east side for future Memorial development.

*Analysis:* Contributing.

Open views to and from East St. Louis reflect the design intent and therefore are contributing. However, Saarinen/Kiley's concept of what was to be viewed in East St. Louis was never fully defined or realized (see Figures 4.13 and 4.14).

### Views From the Overlooks

*Historic Condition:* The overlooks were designed to function as viewing platforms for the Mississippi River.

*Existing Condition:* The overlooks provide views to the Mississippi River and East St. Louis, as well as views toward the Gateway Arch.



Figure 4.11. Office of Dan Kiley, design development perspective sketch of the view of the Gateway Arch across one of the ponds, September 1963. (JNEM Archives, uncatalogued collection)



Figure 4.12. View to the Gateway Arch across the south pond, 2009.

*Analysis:* Contributing.

### Screened Views of Service Areas

*Historic Condition:* The service areas were intentionally screened through their placement within topographic hollows and planting design.

*Existing Condition:* The service areas are largely screened from view, particularly at ground level. The Maintenance Facility is not sufficiently screened.

*Analysis:* Contributing.

(See Spatial Organization for more analysis of these areas.)

### BUILDINGS AND STRUCTURES

#### Gateway Arch

*Historic Condition:* The Gateway Arch, a 630-foot-tall monumental structure in the form of a single weighted, inverted catenary curve, was constructed between 1963 and

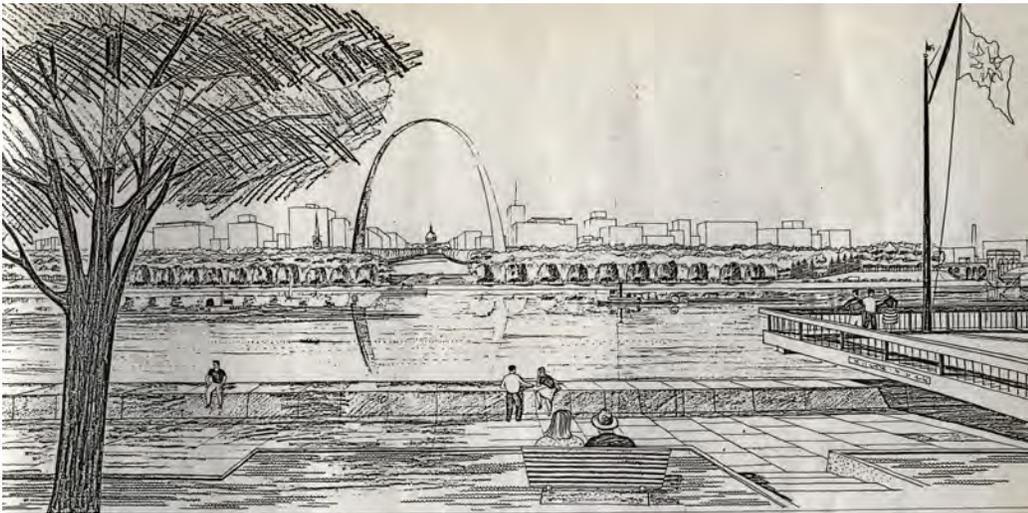


Figure 4.13. Office of Dan Kiley, "View from East St. Louis," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)



Figure 4.14. View to Gateway Arch from East St. Louis, 2009.

1965. It is composed of 172 triangular, stainless steel, double-walled sections.<sup>26</sup> The Gateway Arch was intended to be the centerpiece of the landscape, with its geometry echoed in other designed features in the surrounding landscape. On the larger scale, the landscape was intended to serve as a base to the Gateway Arch, grounding it in an abstracted “forest.” From the river and East St. Louis, the flood-walls and overlooks were designed to appear as “finials” at either end of a “pedestal” supporting the Memorial.

*Existing Condition:* The Gateway Arch currently exists as designed and implemented during the period of significance. No exterior structural changes have been made since its construction. The relationship of the Gateway Arch to the landscape remains essentially as designed by Saarinen: details of other features in the landscape reflect its catenary curve geometry, and the undulating topography, curving walks, and lush vegetation of the Memorial grounds provide a foundation and contrast to the soaring steel structure.

*Analysis:* Contributing.

The Gateway Arch, the main character-defining feature of the Memorial, was constructed as the original architect and engineers intended, and has been maintained in its original condition; its role as primary focal point of the surrounding landscape also remains as intended. A Historic Structure Report is currently underway for the Gateway Arch.

#### **Old Courthouse**

*Historic Condition:* The three-story Greek Revival Old Courthouse was constructed between 1839 and 1862.<sup>27</sup> The Old Courthouse underwent major rehabilitations in 1941-1942, 1954-1955, and 1985. Throughout the cultural landscape period of significance, the first floor of the building served as a museum, interpreting the famous Dred Scott case that took place in one of its courtrooms.<sup>28</sup> The second floor featured two restored courtrooms and served as administrative offices.

*Existing Condition:* The building retains its use as a museum and administrative offices for the Memorial and its appearance from the period

of significance (see Figures 4.15 and 4.16). Repairs, such as chimney stabilization, have occurred in recent years. The building was not assessed structurally nor the interior considered in this report. The landscape surrounding the Old Courthouse reflects its appearance after a “restoration” completed by the National Park Service in 1954 based on a c. 1870 photograph.<sup>29</sup> Thorough historical documentation of the Old Courthouse environs has not been undertaken.

*Analysis:* Contributing.

The Old Courthouse is a major element of the axial arrangement of the Memorial. More information is needed regarding its historic appearance over time.

#### **Visitor Center And Museum Of Westward Expansion**

*Historic Condition:* The underground Museum of Westward Expansion and visitor center located beneath the legs of the Gateway Arch was conceptualized as early as 1959.<sup>30</sup> The visitor center was completed in 1966. The lobby, including the center fountain and the loading zones for the transportation system was designed by Saarinen & Associates after Eero Saarinen’s death. Kevin Roche was the primary designer for these areas. Two theaters were conceptualized as part of the interpretation of the Gateway Arch. The 325-seat North Theater, later renamed the Tucker Theater, was completed in 1972 and the hollowed out space for the South Theater remained vacant until funds became available for construction. Aram Mardirosian developed the plan for the Museum of Westward Expansion which was completed in 1976.<sup>31</sup>

*Existing Condition:* The visitor center and Museum of Western Expansion have undergone improvements since the early 1990s. The Odyssey Theater, the second of the two theaters planned, was constructed in 1990-1993. The “image-wall,” a slide/film program, was removed in 1989 to create space on the north wall for the American Indian Peace Medal Exhibit, which was completed in 1994.<sup>32</sup> Overall, the Museum of Westward Expansion retains Mardirosian’s design. In 1995, the Museum Store and Bi-State ticketing area were remodeled to accommodate increasing

numbers of visitors. The Museum Store was again redesigned and remodeled in 2006.

*Analysis:* Contributing.

The belowground location of the visitor center and Museum of Western Expansion reflect Saarinen's design intent, though the exhibit design itself is not historic. The underground portions of the Memorial are conceptually important. The two concealed service areas (the generator building and shipping and receiving) for this complex are also contributing, characterized by their carefully concealed siting and ongoing function.

### Maintenance Facility

*Historic Condition:* According to the approved concept development plan, a maintenance building was to be located at the south end of the site. Other than its location, no details about the maintenance facility were specified on the Saarinen/Kiley plan. However, it is evident from the proposed landform surrounding the building that it was intended to be an earth-sheltered structure, hidden from view.

Until 1974, maintenance equipment was stored in the hollowed out shell of the future Museum of Westward Expansion and visitor center. When funds were appropriated for the construction of the Museum of Western Expansion, the need for a maintenance facility became apparent. In 1974 a temporary prefabricated steel building measuring 32 by 72 feet

was erected on the southwest portion of the site (approximately 240 feet northwest of the designed location).<sup>33</sup> Although the building was expected to be temporary, a lack of funds delayed the construction of a permanent facility. The temporary building was relocated and continued in use during the second phase of landscape construction (1978-1981). The temporary building was replaced in 2003 with a newly constructed two-story maintenance facility sited in the location designated on the Saarinen/Kiley plan.

*Existing Condition:* The maintenance facility is a recently constructed facility in good condition that serves the current needs of Memorial management. Its siting, massing, and low profile make it relatively unobtrusive and sympathetic to the rest of the Memorial.

*Analysis:* Non-contributing compatible.

While the maintenance facility is in the location specified in the Saarinen/Kiley concept, it was not developed in the original plans. The maintenance facility has no relationship to the design aesthetic or "form-world" of the Saarinen/Kiley plan. However, it is sited in the manner shown on the Saarinen/Kiley plan, which specified service areas to be placed low in the topography and screened by plantings. While the maintenance facility is non-contributing and is not the product of Saarinen/Kiley, it is compatible with the Memorial. The screening of the Maintenance Facility, however, is insufficient.



Figure 4.15. Old Courthouse, 1939. (JNEM Archives, visual image 106-175, Record Unit 106, Box 20, Folder 42)



Figure 4.16. Old Courthouse, 2009.

### **Parking Garage**

*Historic Condition:* Parking was always a part of the Saarinen/Kiley concept plan and was envisioned to occur on the north end of the Memorial.<sup>34</sup> Eero Saarinen was awarded a contract in 1959 to study the feasibility of a parking garage on the site.<sup>35</sup> He concluded that it was feasible, but a lack of funds prevented its design and construction at that time.

Surface parking existed at one time on almost the entire site, from the time the site was originally cleared (c. 1939). The area dedicated to parking was reduced as landscape development progressed. At one time, the north end of the site served as a temporary surface lot. By 1981, an asphalt-paved surface lot in this location accommodated approximately 320 cars.<sup>36</sup>

The existing parking garage was designed by HB&A and constructed between 1984 and 1986. It is a three-story (two underground) structure accommodating 1,208 cars and occupying 4.7 acres.<sup>37</sup> The garage construction was made possible by an agreement between the City of St. Louis, the Bi-State Development Agency, and the National Park Service.<sup>38</sup>

*Existing Condition:* The parking garage is in good condition. The garage is maintained and run by Metro (formerly known as the Bi-State Development Agency).

*Analysis:* Non-contributing compatible.

The parking garage is in keeping with the use identified for this area in the Saarinen/Kiley design concept, but was not physically developed in the design, and is therefore not contributing. The garage is generally unobtrusive from the Memorial grounds; it was designed to fit into the area designated for parking on the original plan, so its form and use are compatible. It is not, however, the work of Saarinen or Kiley. It does not share the distinctive Modern design vocabulary of the Memorial landscape (evident in the overlooks, for example).

### **Grand Staircase**

*Historic Condition:* Eero Saarinen designed the grand staircase to symbolize “the movement of peoples through St. Louis, the gateway.”<sup>39</sup> The stairs were a monumental physical connection

between the Gateway Arch and the riverfront. They were to be 500 feet wide at the top and 291 feet wide at the bottom, with curved sides to reflect the curvature of the Gateway Arch. The depth of the treads would decrease from approximately four feet deep at the bottom of the stairs to one foot six inches deep at the top, to “dramatize the upward sweep of the approach to the Arch.”<sup>40</sup> The risers were designed to be nine inches tall, not the standard six inches, for aesthetic reasons.<sup>41</sup> The support beams and pilings for the staircase were constructed in the early 1960s when the railroad tunnels running beneath them were completed.

In 1974, HB&A re-designed the tread-riser relationship of the steps to a more comfortable, consistent relationship of six-inch risers and one-foot-three-inch treads. Two landings were also incorporated as well as snow-melting mats on the north end. The steps were implemented in two phases. Phase I of the “Monumental Entrance,” consisting of the north and south side sections, was constructed in 1975 to 1976 to the specifications developed by HB&A. Some of the original support beams and pilings from the 1960s were utilized for construction. Phase II, the center section, was completed in 2003.

*Existing Condition:* The grand staircase as built fulfills the location, function, and general appearance/alignment of the Saarinen/Kiley plan, but the tread-riser relationship was substantially altered. The snow-melting mats work intermittently. There are some areas where the seams between the new and old sections of the stairs are separating or shifting. A structural analysis of the staircase was not undertaken as part of this report.

*Analysis:* Contributing.

The grand staircase is part of the Saarinen/Kiley concept. Although the tread/riser relationship was altered by a subsequent design firm when the staircase was implemented, the location, function, and general form were retained from the original plan. Saarinen/Kiley plan. As identified in their vision, it serves as the grand formal connection from the Gateway Arch to the riverfront on the primary axis. However, the steps’ variable tread lengths and heights as designed by Saarinen, which would

have resulted in a curved profile, were altered in implementation to a standard six-inch riser and landings (see Figure 4.17).

### North And South Overlooks

*Historic Condition:* The overlooks were designed to provide a place to view the Mississippi River from the Memorial grounds. They were constructed as designed by Saarinen & Associates in 1960-1962, at an elevation of approximately 457 feet above sea level. The interior spaces of the overlooks, accessed beneath the viewing platforms, were envisioned as museum locations but this use was never realized.

*Existing Condition:* The overlooks are formal high points situated above the river, creating “finials” for the Memorial grounds as viewed from East St. Louis. The monumental walls of the overlooks function as part of the floodwall system, while the plazas serve to bridge the rail lines. Both the walls and the staircases leading from the river to the overlooks were designed with Saarinen’s trademark catenary curve. The interior of the North Overlook is currently used for storage, and has never been used as museum space. The South Overlook interior space was not constructed.

There are a number of condition problems at the overlooks, including spalling, efflorescing, and crumbling concrete, failing expansion joints, and water infiltration within the floodwalls. A coating that was applied at some point in the past to repair the surface of the overlook staircases, viewing platform, and steps is deteriorating.

*Analysis:* Contributing.

The north and south overlook structures, implemented in the initial construction of the Memorial, are an integral part of the Saarinen/Kiley design concept and are character-defining structures. Their key features are their locations at the ends of the Memorial; their open quality that permits sweeping views from atop the overlooks; the presence of catenary curve segments in the concrete formworks of the floodwalls and staircases; and the monolithic appearance of the structures owing to their unified form and material.

### Railroad Open Cut Walls And Tunnels

*Historic Condition:* The depressed railroad alignment that runs through a series of below-grade open cuts and tunnels was conceptualized and designed by Saarinen & Associates.

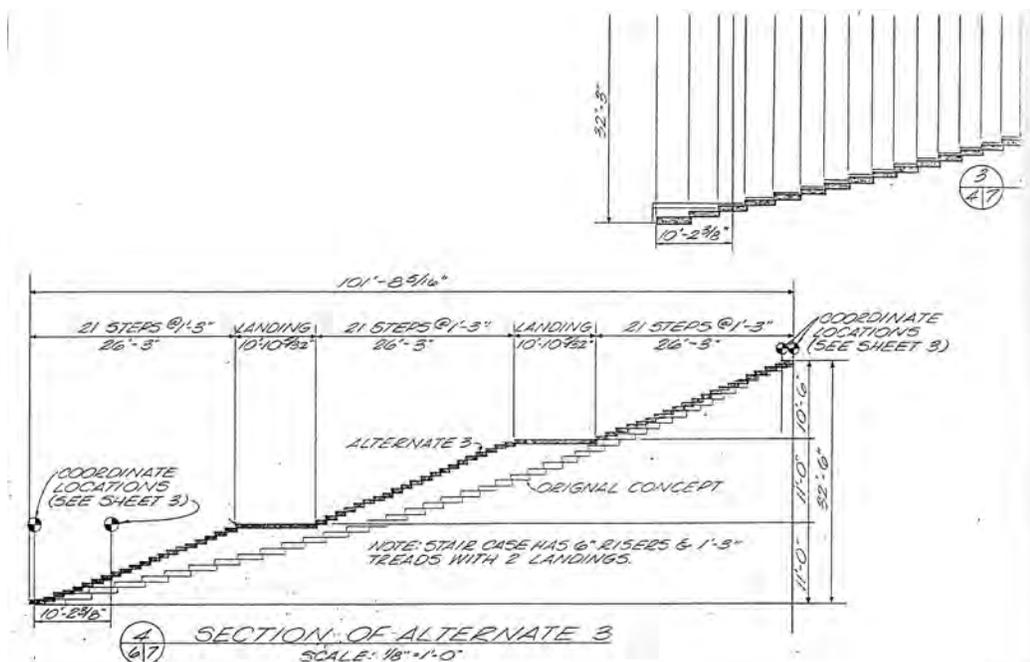


Figure 4.17. Section detail through grand staircase, November 1960. (JNEM Archives, Record Unit 120, Drawer 22, Folder 12)

Constructed in 1959-1960, the cuts and tunnels concealed the rail line from view, fulfilling a major design priority of Saarinen's. A 960-foot-long tunnel segment with an 18-foot vertical clearance was constructed beneath the proposed grand staircase, connecting the two open cuts. The entrances to the tunnels are curved, using catenary segments reflecting the geometry of the Gateway Arch. The tops of the railroad cut retaining walls are also curved.

*Existing Condition:* The railroad alignment and its open cuts and tunnels exist in their original locations and forms. A structural analysis of the walls and tunnel structures has not been undertaken. The tracks are currently in use by TRRA.

*Analysis:* Contributing.

The curvilinear entryways to the tunnels were intended to reflect the "single form-world" present throughout the site. The tunnels and open cuts were intended to screen the railway from the Memorial grounds. They were constructed to closely reflect the Saarinen/Kiley design, and were built during the earliest phase of construction.

#### **Retaining Walls**

*Historic Condition:* Retaining walls at the depressed service areas were not clearly detailed by Saarinen and Kiley.<sup>42</sup> Details and construction specifications were completed by HB&A and implemented in the second phase of construction.

*Existing Condition:* These retaining walls do not have any visible characteristics (catenary curve segments, monolithic concrete work) that connect them to Saarinen/Kiley design's "form-world." They function to support the depressed service areas, which are part of the original design. The structural integrity of the retaining walls has not been assessed and their condition is undetermined.

*Analysis:* Non-contributing compatible.

The walls do not directly relate to the Saarinen/Kiley design and therefore they are non-contributing. However, they are functionally important to maintain the existing landform.

## **VEGETATION**

### **General Plant Composition**

*Historic Condition:* Dan Kiley proposed a plant palette of 16 tree species to structure and define spaces. His intent was to rely on a purposely limited number of species, creating a consistent and dense planting to give the spaces character and definition. The design concept depended upon the scale and form of the tulip poplar to define the triple allées; tall canopy trees such as oak (*Quercus sp.*), ginkgo (*Ginkgo biloba*), and hackberry (*Celtis occidentalis*) to create forested areas to the north and south of the ponds; and a limited number of understory flowering trees like eastern redbud (*Cercis canadensis*), flowering dogwood (*Cornus florida*), star magnolia (*Magnolia stellata*), and saucer magnolia (*Magnolia x soulangiana*) to edge the tall tree canopy, and to provide color and texture. These flowering trees were intended to work together with the pond's curvilinear edge to define small-scale spaces. Evergreen trees, including Canadian hemlock (*Tsuga canadensis*), were intended to screen views of service and parking areas. By 1974, changes were made to the Kiley plan as planting was implemented; National Park Service plans showed an increase in the number of species, and a reduction in the overall number of trees to be planted. This differed from the Kiley scheme, which had proposed few species and dense plantings. The forms of the tree species proposed by the National Park Service were also less distinctive and varied in their character than Kiley's proposed species. The greater variety of species, spread more evenly over the landscape, as planted in the second phase of construction, obscured the original intent of the planting.

*Existing Condition:* There are currently 32 tree species planted at the Memorial, twice the number proposed by Kiley. There are approximately 2,179 trees in total, only 56 percent of the number originally proposed. With the exception of the highly organized allees, the tree plantings are widely spread across the site, dotted in uniformly mown turf lawn and encircled with mulch rings.

*Analysis:* Contributing.

The overall plant composition in some respects reflects Kiley’s design intent, particularly the distinctive planted form of the dense allées of uniform trees, the open lawn on the vista from the Old Courthouse to the Gateway Arch, and the baldcypress circles. However, in the pond areas, the concept of forest and meadow has been somewhat obscured by the development of a manicured, park-like character composed of small groups and single tree plantings set in a closely clipped lawn. The original intent in tree structure, form, and texture have not always been taken into consideration when tree replacements were made. Areas along the railroad open cuts were not planted as densely as intended in the Kiley planting plan.

### Single-Species Allées

*Historic Condition:* According to the Saarinen/Kiley plan, a triple allée (three parallel rows) composed entirely of tulip poplar trees was to be planted along either side of the walks, for a total of six rows. The dense, uniform mass of upright, straight-trunked trees planted along the walks was the strongest single feature of the Kiley planting plan. The uniform, tall trees would define the pedestrian space and conceptually strengthen the simplicity of the Gateway Arch and the surrounding site design (see Figures 4.18 and 4.19).

At the outset of the first major phase of construction the single-species tree planting of tulip poplar was changed to the Rosehill ash by the National Park Service Western Service Center of Design and Construction.<sup>43</sup> The alignment and spacing of the trees was maintained as specified on the approved plan. However, the differences in form were not carefully considered, as the Rosehill ash has a rounded canopy and wider branching form than the proposed tulip poplar which has a more columnar trunk and upright-oval canopy (see Figures 4.20 through 4.22).

*Existing Condition:* The condition of the allées is fair. The original alignment and spacing has been retained. The oldest trees (those planted during Phase I of construction, 1971-72) have lived well beyond the life expectancy of an urban tree.<sup>44</sup> Some trees have reached maturity or been removed and require replacement. Other trees have been replaced in-kind since 1981, although due to concerns about the

emerald ash borer, missing ash trees have not been replaced in recent years.

*Analysis:* Contributing.

The allée planting along the walks reflects the Saarinen/Kiley design concept and therefore is contributing. Although the tree species originally specified by Kiley was not used, the concept of a uniform planting of the same tree with a precise alignment and close spacing was implemented and is a character-defining feature of the Memorial grounds.

### Baldcypress Circles

*Historic Condition:* Two circles of baldcypress trees (*Taxodium distichum*), one in the northwest portion (51 trees proposed) and one in the southwest portion (70 trees proposed) of the site, were depicted on the Saarinen/Kiley concept plan. These areas had been depicted since the earliest plans in 1947 and were originally meant to serve as “campfire” interpretive areas. During the second major planting phase in the late 1970s and early 1980s, 34 baldcypress trees were planted in the northwest circle, and 30 in the southwest.

*Existing Condition:* The two circles of baldcypress remain on the site. The northwest circle consists of 35 trees and the southwest circle consists of 31 trees. Several of the trees are replacements of the original planting.

*Analysis:* Contributing.

The baldcypress trees reflect the Saarinen/Kiley design concept and therefore are contributing. Although the number of trees was reduced during implementation, the general form and materials were maintained (see Figures 4.23 and 4.25).

### Pond Area Plantings

*Historic Condition:* Kiley’s design concept for the pond areas relied on a limited number of species and a large number of trees, providing massing that was to be reminiscent of a forest with a few open meadow areas. The concept for planting included a few tall canopy tree species (oak, ginkgo, and hackberry) planted in groves; and several species of flowering trees, such as Eastern redbud, dogwood,



Figure 4.18. Office of Dan Kiley, "Approach to Gateway Arch from South, Winter," design development drawing, December 1962. (JNEM Archives, uncatalogued collection)



Figure 4.19. Approach to Gateway Arch from north, 2009.

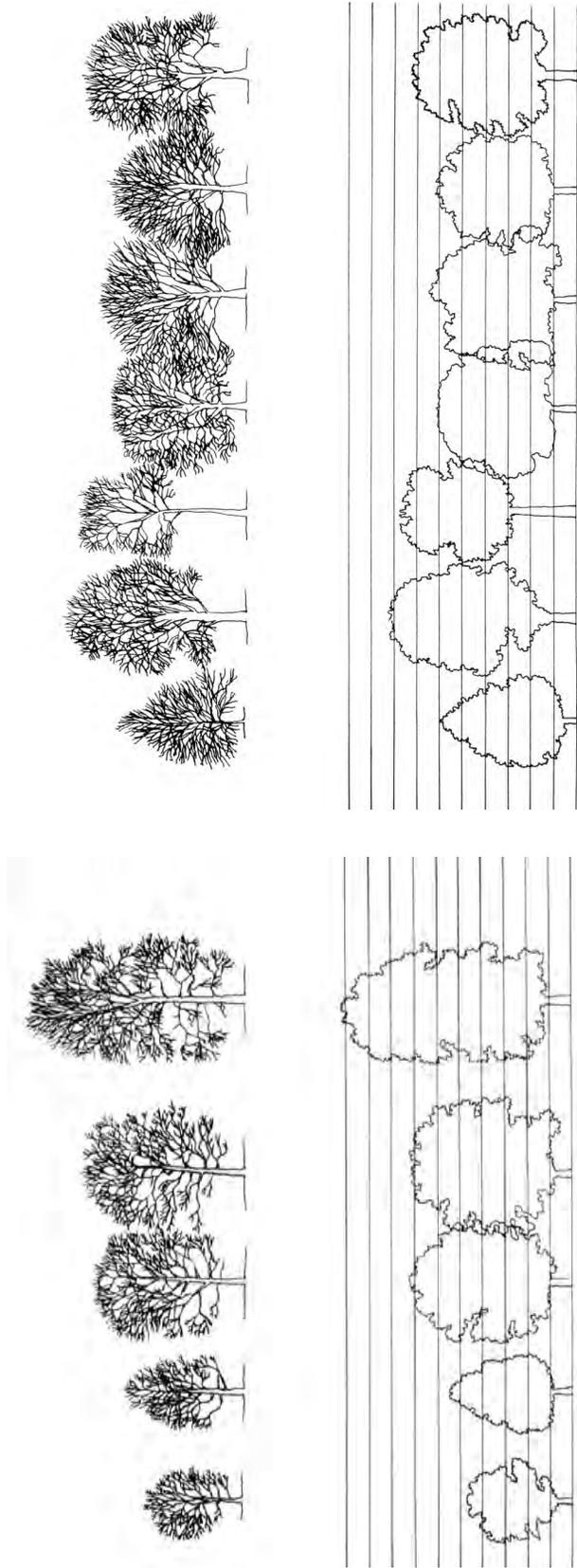


Figure 4.20. Comparison of canopy tree profiles, Kiley plan (left) and NPS plan (right). (Courtesy Gregg Bleam, 1996)

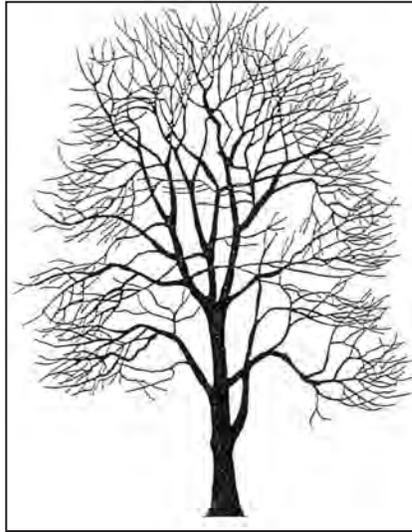


Figure 4.21. Rosehill ash profile. (Gregg Bleam, 1996)

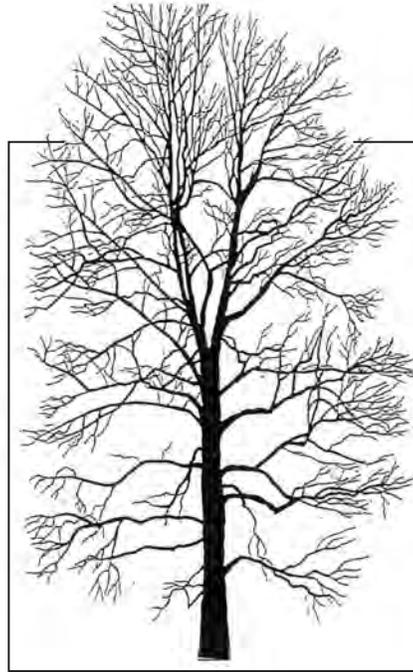


Figure 4.22. Tulip poplar profile. (Gregg Bleam, 1996)

magnolia, Washington hawthorn (*Crataegus phaenopyrum*), cherry (*Prunus sp.*), and crabapple (*Malus sp.*) planted as an understory fringe around the canopy tree groves to provide color and texture. The specific location of trees varied in the conceptual planting plans as they were altered and developed, making it difficult to discern whether Kiley had specific locations in mind for these plantings within the pond areas; the general intent for the character of the plantings, however, is clear.

The planting plans developed by the National Park Service departed from the Kiley concept by adding more tree species and greatly decreasing the numbers of trees.

*Existing Condition:* The tree plantings do not appear to be organized or structured based on a larger design, but are scattered as individuals and small groupings across the landscape. The groundcover is closely mown lawn with circular mulch rings surrounding the trees. The effect is a manicured, “park-like” appearance; the distinction between forest and meadow conceived of in the original Kiley planting plan is not evident.

*Analysis:* Non-contributing compatible.

The overall plant composition and spatial arrangement around the ponds does not reflect Kiley’s design intent, and therefore is non-contributing. The concept of forest and meadow is obscured by random tree plantings and manicured lawns. The attributes of tree structure, form, and texture in Kiley’s design have not been taken into consideration when tree replacements were made. The result is a non-distinctive, disorganized character in the plantings (see Figures 2.25 and 2.26).

#### Railroad Open Cut And Tunnel Plantings

*Historic Condition:* Kiley proposed dense plantings screening the railroad cuts and tunnel entrances. Kiley specified predominantly Canadian hemlock to screen the area and eastern redbud and flowering dogwood to add texture and color. Shrubs, such as fragrant sumac (*Rhus aromatica*), flowering quince (*Chaenomeles speciosa*), and mugo pine (*Pinus mugo*) were also intended to screen visually incompatible uses as well as add interest with color, form, and texture. The groundcover Bulgarian ivy (*Hedera helix* ‘Bulgaria’) was proposed along the steep slopes on the west side of the railroad cuts.

The first of these plantings was installed in 1971 along the west side of the railroad alignment. The planting consisted of black pine (*Pinus thunbergii*), replacing the originally intended Canadian hemlock and redbud.

*Existing Condition:* The railroad tunnels are planted with groundcover, including Bulgarian ivy and scarlet firethorn (*Pyracantha coccinea*), interspersed with daylilies (*Hemerocallis sp.*). The slopes to the west of the open cuts are planted primarily in lawn, with a few pine trees on the northwest. The slopes along the southern open railroad cut are planted with linden (*Tilia americana*) and Japanese pagodatree (*Sophora japonica*) on the western side, and lawn on the eastern side.



Figure 4.23. Sketch of proposed view to the Gateway Arch from baldcypress circle, Office of Dan Kiley, Sept. 1963. (JNEM Archives, uncatalogued collection)



Figure 4.24. View to Gateway Arch from baldcypress circle, 2009.

*Analysis:* Non-contributing compatible.

A few of the original trees have been retained, but for the most part these areas have been substantially altered. Existing vegetation, which is primarily open lawn with scattered individual trees and groups of small trees, does not reflect the character of the Saarinen/Kiley concept planting plan, which called for dense evergreen screening with a few flowering trees for contrast.

#### Plantings Along The East Side Slopes

*Historic Condition:* Kiley proposed massed tree plantings along the eastern slopes of the railroad open cuts, which line Leonor K. Sullivan between the overlooks. These slopes were planted between 1978 and 1979. These plantings included flowering dogwood, star magnolia, Arnold crabapple (*Malus arnoldiana*), black pine, and Bulgarian ivy. The planting followed the Kiley proposal closely. The Bulgarian ivy was removed several years later because it was being choked out by weeds.

*Existing Condition:* Wintercreeper (*Euonymus fortunei*) groundcover is planted on these slopes, as well as lawn grass in the areas adjacent to the grand staircase. The overlook staircases are lined with trees on the east side, some of which are dead or dying.

*Analysis:* Non-contributing compatible.

#### Service Area Plantings

*Historic Condition:* The plants proposed around the service areas (generator building, shipping and receiving, and maintenance facility) were intended to visually screen these operational functions and discourage visitors from approaching. Low-growing plants, including mugo pine, fragrant sumac, and flowering quince, were proposed as understory vegetation. Canopy and flowering trees including red oak (*Quercus rubra*), white oak (*Quercus alba*), hackberry, magnolia (saucer and star), crabapple, eastern redbud, and flowering dogwood were proposed along the slopes. Heavy plantings of Canadian hemlock were proposed around the maintenance building. These areas were generally planted as proposed on the Kiley planting plan. Changes

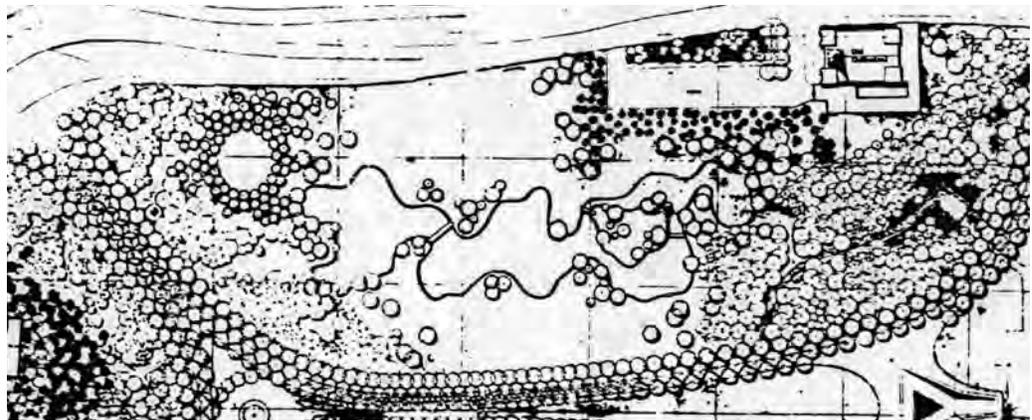


Figure 4.25. Detail of south pond plantings, Kiley final conceptual planting plan, 1964 (JNEM Archives, Record Unit 120, Drawer 12, Folder 10).



Figure 4.26. Diagrammatic map of south pond plantings, existing conditions, 2009.

included the substitution of black pine for Canadian hemlock, the elimination of flowering quince, and the introduction of wintercreeper as the groundcover planted on the slopes surrounding the service areas. Bulgarian ivy was planted on the slopes surrounding the maintenance facility, but it was later removed and replaced with sod.

*Existing Condition:* The plantings around the service entrances are in fair condition. The original black and mugo pines have since been largely replaced in these areas, due in part to their declining health, particularly around the maintenance facility. The maintenance facility is edged by scattered small trees in turf along the slope, which does not currently provide adequate screening. The planting around the south service area is denser and more mature than those around the north service area, and both have been replanted recently with mugo pines. The wintercreeper groundcover is growing vigorously in these locations.

*Analysis:* Non-contributing compatible.

The plantings around the service areas generally reflect the Saarinen/Kiley concept of screening the facilities from view. However, many of the plants have been replaced with different species, and in the case of the maintenance facility, existing plantings are too sparse to screen the area effectively.

#### Street Edge Plantings

*Historic Condition:* Kiley intended tulip poplars to be planted along both sides of Washington Avenue, as well as along the edges of a large triangle within the roadway. These were never realized. Along the eastern side of Memorial Drive, groves of canopy and flowering trees were intended to extend approximately 350 feet along the sidewalk from each entrance. Interspersed between these groves, unrealized meadows extended roughly 600 feet on the north and 350 feet on the south. Dense plantings along Poplar Street were intended

to screen the maintenance area from view. In addition to the plantings along the eastern slopes of the Memorial (discussed above), Kiley intended Canadian hemlock to line both sides of Leonor K. Sullivan Boulevard. Baldcypresses were substituted for the hemlock, and planted only along the eastern side of the street. At the Old Courthouse block, tulip poplars were to define the north and southeast lawns.

*Existing Condition:* The tree and shrub plantings along Washington Avenue, installed in 2009 by Metro, include London planetrees (*Platanus x acerfolia*), shrub viburnums (*Viburnum sp.*), and ornamental grasses. The trees along the Memorial’s northwestern edge, along Memorial Drive, consist of clumps of hawthorn, river birch (*Betula nigra*), magnolia, and eastern redbud; these are less dense than those in Kiley’s final planting plan, and extend into the areas Kiley intended for meadows. To the north of the Old Cathedral, adjacent to the entry to the Memorial, is a grove of red maple (*Acer rubrum*) trees. To the southwest, Rosehill ashes line the Memorial’s perimeter. Several lindens are found along Poplar Street, and Leonor K. Sullivan Boulevard is planted on the west side with baldcypress between the staircases.

*Analysis:* Non-contributing compatible.

### **Parking Garage Plantings**

*Historic Condition:* The Saarinen/Kiley plan proposed Japanese pagodatrees for the main parking area at the north end of the Memorial. The intent of this planting was presumably to shade the parking lot and to better integrate the lot into its surroundings. The proposed planting was dense, and would have screened views of the proposed parking area from the Memorial. This was never realized, but plantings were added around the garage after its construction in 1986 based on a planting plan developed by WVP Corporation. Planting along the northeastern edge of the parking garage was modified in 1997, with a number of trees removed to accommodate a new pedestrian sidewalk. The screen planting added with the sidewalk was later reduced due to the installation of a security camera.

*Existing Condition:* The parking garage planting is high-maintenance due to the inclusion of many crabapple trees which require frequent pruning.<sup>45</sup> Circular concrete planters that once contained Amur maple (*Acer ginnala*) stand atop the garage; the trees did not survive in the planters in this exposed location without irrigation. East of the parking garage is a group of Bradford pears (*Pyrus calleryana* ‘Bradford’). Problems with plantings in this area have resulted from sandy soil with a high pH and steep slopes.

*Analysis:* Non-contributing incompatible.

The existing planting in this area does not reflect any aspect of the originally proposed Saarinen/Kiley plan and therefore it is non-contributing. While it is not very intrusive due to its peripheral location, the planting is not in keeping with the design concept for the Memorial, is in poor condition, and presents maintenance problems.

### **Lawn Areas**

*Historic Condition:* Little emphasis was placed on lawn in the Saarinen/Kiley plan. The most prominent turf areas identified on their plan were large, open lawn underneath and stretching to the west of the Gateway Arch, and the small lawns (sometimes referred to by their form in plan as the “teardrops” and “triangles”) along the north-south axis of the Memorial. The open areas around the ponds were meant to represent meadow, and therefore presumably were not envisioned to be mown turf, but rather taller grasses. However, Kiley’s specific intention (if any) for the groundcover planting in these areas has not been determined.

The Memorial’s turf areas were later planted with a seed mix developed in the late 1970s known as the “Arch Grounds Seed Mix.”<sup>46</sup> The mix consisted of 49 percent arboretum bluegrass, 15 percent regal ryegrass, 15 percent creeping red fescue, 10 percent glade bluegrass, and 10 percent Kentucky bluegrass.

*Existing Condition:* Over a 91-acre site, the soil, sun and shade conditions, watering practices, natural factors, drainage, and level of use varies greatly. The use of a single seed mix to meet

these varied conditions with the expectation of producing quality results was determined to be unrealistic, and the Arch Grounds mix is no longer used. Three seed types are currently in use: “Thermal Blue” in sunny areas, a generic shade mix made up predominantly of glade bluegrass, red fescue, and rye for shady areas, and a blend of turf-type fescues for the sandy area over the museum roof. All the turf is regularly mown and aerated, and sod is replaced, resulting in a well-manicured lawn cover over most of the Memorial grounds.

*Analysis:* Non-contributing compatible.

The open lawn areas under the Gateway Arch and on the north-south axis of the Memorial are important aspects of the Saarinen/Kiley plan primarily in terms of the spatial quality of openness rather than the quality of the groundcover itself; therefore the turf does not itself contribute to the significance of the landscape. Although lawn areas are important to the current appearance of the Memorial grounds and should be maintained at a high level to meet the expectations and uses of an urban park, the seed mix used is not significant and may be modified to better manage varying site conditions.

#### **Luther Ely Smith Square Plantings**

*Historic Condition:* In the Saarinen/Kiley plan, Luther Ely Smith Square was shown with two triple allées of tulip poplars on the north and south sides of the block. Two pedestrian overpasses emerged from these allées and connected to the allées along the east-west axial walkways. The vegetation was intended to connect this area to the main portion of the Memorial grounds. The overpasses and tulip poplar allées were never implemented.

*Existing Condition:* Currently, Luther Ely Smith Square is a depressed plaza with three lawn-edged central planting beds of perennials and ornamental grasses. The north and south edges of the block are defined by two alternating rows of sweetgum (*Liquidambar styraciflua*) and crabapple trees.

*Analysis:* Non-contributing incompatible.

## **CIRCULATION**

### **Pedestrian Walks**

*Historic Condition:* The curvature of the walks was meant to reflect the catenary curve of the Gateway Arch. The symmetrical alignment of the walks strengthened the axial arrangement of the site design. The layout of the walks and the spacing of the trees in and alongside them was intended to be the dominant landscape feature, reflecting the simplicity of the Gateway Arch.

The paving material for the walks was not specified by the designers. NPS landscape architects specified exposed aggregate concrete as the material for the sidewalks. The walks were constructed in two different phases during the period of significance. The alignment of the walks, however, was implemented as the original designers intended.

*Existing Condition:* The walk paving and alignment exists as implemented. Some sections of the walks have been replaced or repaired.

*Analysis:* Contributing.

The existing walk layout reflects the Saarinen/Kiley design concept and therefore is contributing. Walk alignment is an important organizing element of the design and a character-defining feature. The layout of the walks, their unified material appearance, their earthy color and texture, and their relationship to the tree plantings are all distinctive characteristics that come from the Saarinen/Kiley design. The specific aggregate material of the walks is not as important, since no material was specified by Saarinen/Kiley, although it is compatible with the design of the walks at the Memorial. The walks have been prone to maintenance problems over time due to freeze/thaw and tree root heaving. These issues are discussed in more detail in Chapters 3 and 5.

### **Gateway Arch Entrance Ramps And Steps**

*Historic Condition:* The entrance ramps leading to the visitor center were designed by Eero Saarinen & Associates and constructed in the 1960s. The concept of entering the Gateway Arch at the base was important because it dramatically affected the visitor experience.

Approaching the Gateway Arch across the Memorial grounds and being able to touch the base before descending below, then ascending to the top, provided a breathtaking experience of contrast in scale and an unfolding visual experience of the Memorial.

Concrete “steps” were constructed along portions of the ramps to be used as sitting walls.<sup>47</sup> The ramps were made of terrazzo tiles, which were replaced by granite pavers in 1983. The steps, or architectural sitting walls, were made of poured concrete.

*Existing Condition:* The ramps remain essentially the same in form and structure as their original designed and implemented appearance. The ramps were resurfaced with granite pavers (c. 2005-2007) to ameliorate slippery conditions when wet or icy. However, the slippery ramps continue to present safety and maintenance problems. The ramps do not meet the Uniform Federal Accessibility Standards (41 CFR 101-19.6) or the Architectural Barriers Act Accessibility Standards (ABAAS) required for federal facilities. The concrete steps are in fair condition.

*Analysis:* Contributing.

The Gateway Arch entrance ramps and steps are part of the Saarinen design concept and therefore are contributing. The ramps are dangerous when they become wet and they do not meet current accessibility standards.

#### **Old Cathedral Parking Lot**

*Historic Condition:* The Old Cathedral parking lot was conceptually located south of that historic structure. Details of the lot were not developed by Saarinen/Kiley; however, the approved plan shows a planting bed on the lot’s west side along Memorial Drive. The parking lot was constructed in 1961 as a result of an agreement between the National Park Service and the Archdiocese.<sup>48</sup> The lot was asphalt-paved and accommodated approximately 85 cars.

*Existing Condition:* The existing parking lot is in good condition. It was redesigned by Cox/Croslin and Associates in 1993 and reconstructed in 1994. The parking lot differs from the original in that it was moved approximately

12 feet to the east to accommodate a bus drop-off along Memorial Drive. The lot accommodates 81 cars, with accessible spaces. It is paved in asphalt, and measures approximately 225 by 105 feet.

*Analysis:* Non-contributing compatible.

Conceptually the parking lot contributes to the Saarinen/Kiley design because it is located on the site they selected for this function, directly south of the Old Cathedral. However, the materials and construction details, while not conflicting with their surroundings, do not reflect a Saarinen/Kiley design concept.

#### **Old Cathedral Sidewalk**

*Historic Condition:* This sidewalk leading from the Old Cathedral to the Gateway Arch was not a part of the Saarinen/Kiley plan. It was designed by HB&A and constructed during the second major phase of implementation. The eight-foot-wide walk was constructed of exposed aggregate to match the Memorial’s existing sidewalk system.

*Existing Condition:* The Old Cathedral sidewalk is in fair condition.

*Analysis:* Non-contributing compatible.

The Old Cathedral sidewalk was not part of the Saarinen/Kiley design and therefore it is non-contributing. However, the walk is unobtrusive, matches the existing walks in terms of its materials, and is functionally important to circulation in the Memorial grounds.

#### **Interior Roads**

*Historic Condition:* Interior roads to the service entrances were not clearly detailed on the Saarinen/Kiley site plan. A road to the south service area was illustrated on the plan to be about 12 feet wide, with unspecified paving. The road was to lead from the sidewalk southwest of the south leg of the Gateway Arch to the south service area (shipping and receiving). A service road, while necessary, was not clearly indicated on the Saarinen/Kiley plan at the north service area (generator building).

HB&A altered the Saarinen/Kiley plan to include a service road from Memorial Drive to the south service entrance, and a road from the

exposed aggregate sidewalk north of the north leg of the Gateway Arch to the north service area. A delivery truck turnaround was also designed and constructed at the south service area. The south road is asphalt, approximately 13 feet wide. The north road was constructed of two strips of precast porous pavers, replaced c. 2003 with a standard mix, light-colored, broom-finish concrete drive.

*Existing Condition:* The roughly 15-foot-wide, white broom-finish concrete service roads to the north and south service areas are in good condition. These roads contrast with the other paving materials found in the eastern portion of the Memorial.

*Analysis:* Non-contributing incompatible.

The interior service roads as constructed do not reflect the Saarinen/Kiley plan and therefore are non-contributing. They are generally not visually intrusive at ground level, due to surrounding grading, but the use of light-colored concrete is quite visible from above (in views from the top of the Gateway Arch).

#### **Perimeter Roads**

*Historic Condition:* The exterior roads surrounding the Memorial grounds created definite edges to the site design. It was originally bounded by Washington Avenue on the north, Poplar Street on the south, Wharf Street on the east, and the Third Street Expressway on the west. A pair of pedestrian overpasses were conceptualized early in the planning stages to bridge over the Third Street Expressway between the Gateway Arch and the Old Courthouse, and were studied more extensively by Saarinen & Associates after Saarinen's death. Few changes were made to the exterior roads. Washington Avenue was relocated approximately 20 feet north when the Arch Parking Garage was constructed in 1986. Wharf Street was renamed Leonor K. Sullivan Boulevard, and the Third Street Expressway became known as Memorial Drive.

*Existing Condition:* Memorial Drive is a busy street, and there have been many accidents at the various intersections along the Memorial's edge in the past. The pedestrian overpasses intended to bridge over Memorial Drive

were never constructed, and pedestrians must cross at street level. Memorial Drive and the depressed I-70 expressway beneath it divide the Memorial grounds so strongly that some visitors do not realize that the Old Courthouse is within the Memorial. Accessible curb cuts were installed in 2009 at Memorial Drive pedestrian crossings to improve visitor access between the two sides of the Memorial grounds.

*Analysis:* Contributing.

The exterior roads on the perimeter of the Memorial are generally the same as during the period of significance and therefore they are contributing. Although this aspect of the design is partly unrealized without the pedestrian overpasses, the potential to make visual and physical connections remains.

### **CONSTRUCTED WATER FEATURES**

#### **North And South Ponds**

*Historic Condition:* The Saarinen/Kiley concept plan depicted lagoons, or ponds, on the northwest and southwest portions of the site. The south pond was proposed to occupy approximately 1.88 acres; the north, 2.5 acres.<sup>49</sup> An island was proposed on the north end of each pond with narrow footbridges accessing it, but this feature was never realized and disappeared as the form of the ponds changed through design development. The pond edges were depicted as complex and sinuous. Their complex shapes, combined with Kiley's planting plan, were meant to create a variety of intimate spaces along the ponds' edges (see Figure 4.27).

By 1969 the plans for the ponds took on a more simplified form, still curving, but with less intricate and irregular geometry, and the islands and footbridges were no longer considered (see Figure 4.28). It appears that the NPS design teams were responsible for simplifying the shapes to make construction possible. The ponds were constructed in the second phase of development (1978-1981). The south pond occupies approximately 1.59 acres, the north pond approximately 1.82 acres.<sup>50</sup> Although the sizes and shapes are comparable to those proposed by Saarinen and Kiley, the simplification of the edge represents a difference from

the original design.<sup>51</sup> However, it fulfills the design intent to a great degree.

*Existing Condition:* The concrete pond edges are in good condition today. Substantial algae blooms were observed on the south pond, and mosquitoes were noted at the north pond. Structural assessment of the ponds was not undertaken as part of this report. The ponds are periodically drained and cleaned.

*Analysis:* Contributing.

The north and south ponds reflect the Saarinen/Kiley design concept and therefore are contributing. Although the shapes have been simplified and the islands and footbridges were not constructed, the location and design

as implemented of the two curving-edged reflecting ponds meets the designers' intent.

### SMALL-SCALE FEATURES

#### Benches

*Historic Condition:* Benches were designed by Saarinen & Associates for the levee development.<sup>52</sup> The proposed benches were 10 feet long, two to three feet wide, and one foot four inches high. They were composed of limestone bench tops set on a limestone block and a concrete base. A steel dowel was to be threaded through the base, block, and bench top to anchor it together (see Figure 4.29). It has not been determined whether these benches were ever constructed on the levee.

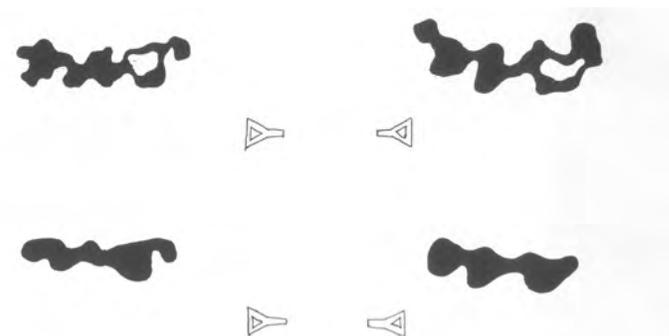


Figure 4.27. Kiley-designed pond configuration (top) National Park Service as-built pond configuration, c. 1996. (Gregg Bleam, 1996)

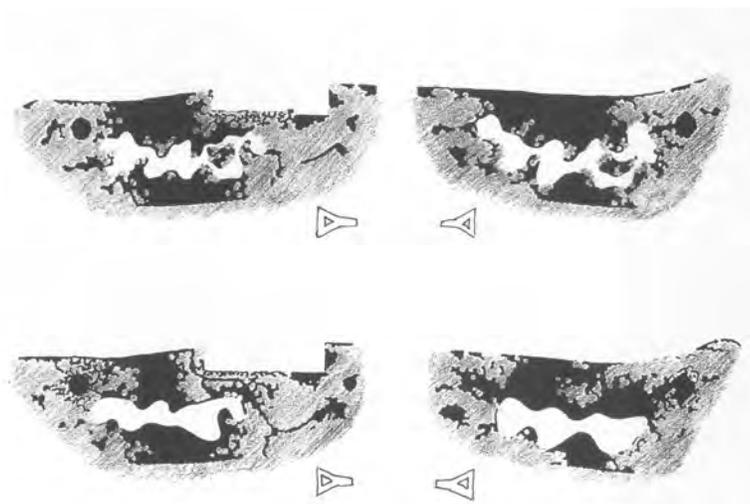


Figure 4.28. Kiley-designed planting plan at ponds (top) National Park Service as-built planting plans at ponds (bottom), c. 1996. (Gregg Bleam, 1996)

Concrete benches were later designed for the Memorial by NPS Western Service Center landscape architect John Ronscavage (see see Figure 4.30).<sup>53</sup> The size and construction specifications for the benches matched the design specifications proposed by Saarinen & Associates; however, the material was changed from limestone to concrete. These were constructed during the two major phases of landscape development. Seven benches were constructed on the east side of each rest area during the first phase of development and seven more at each rest area on the west side during phase two.

Four more benches, similar in design to the ones described above, were installed on the landings of the grand staircase. Another type of bench, black metal pipe frame with cast iron slats, was installed at an unknown date in Luther Ely Smith Square, but was subsequently replaced with recycled-plastic park benches.

*Existing Condition:* There are now more than 70 concrete benches of the Saarinen design in the Memorial; many have been added since 1996. There are no longer benches on the grand staircase landings. Numerous concrete benches are grouped around the perimeter of the entrance ramps at the Gateway Arch legs as a security measure and to meet a need for seating near the entrances.

*Analysis:* Contributing.

The existing benches are the same design as the benches proposed by Saarinen for the levee and therefore they are contributing. Although the material was changed, the size and construction specifications were retained and therefore the benches reflect Saarinen's design intent. The number of benches and their locations have also been altered, but these can be considered reversible conditions.

### Lighting

*Historic Condition:* A large lighting standard detail, consisting of a 27-foot single pole and shaded six-foot-wide luminaire, was recommended by Saarinen & Associates, although proposed locations were not identified.<sup>54</sup> However, plans and specifications for different lighting standards were prepared by NPS designers at the Denver Service Center

(see Figure 4.31).<sup>55</sup> The implemented lighting standards were modern in style, 12-foot-tall single poles of brown-painted aluminum with a single 21-inch-diameter globe. The standards were placed 12 inches from the edge of the sidewalks, between the trees, approximately 90 feet apart. The lighting was installed in two phases: in 1974 on the north-south axis, and between 1980 and 1981 on the northwest and southwest walks.

*Existing Condition:* The light standards and luminaires bear no similarity to the Saarinen design for lighting. They exist as implemented by National Park Service, and are in fair condition. Memorial staff has identified the need for replacement parts, bases, and replacement globes.<sup>56</sup>

In 2001, large spotlights were added to illuminate the Gateway Arch at night. They are located within four in-ground light vaults located beneath the Gateway Arch, two just to the east and two to the west of the legs. The underground vaults measure about 50 feet long and eight feet wide. While the surface area of the spotlight vaults is large, they are minimally noticeable at a distance due to their low profile.

*Analysis:* Non-contributing compatible.

Although the design for the light standards was altered in implementation, these are modern-looking and sympathetic in style to the rest of the Memorial. The new floodlighting beneath the Gateway Arch is low in profile and relatively unobtrusive.

### Trash Receptacles

*Historic Condition:* Trash receptacles were not addressed on the Saarinen/Kiley concept plan. Moveable, exposed-aggregate receptacles were installed during the construction phases. The exposed-aggregate receptacles have brown, hard plastic tops. It is unclear whether the receptacles were specified by the NPS DSC or HB&A. In the mid-1990s it was noted that there were more than 150 trash receptacles on the Memorial grounds.

*Existing Condition:* There are approximately 85 trash receptacles in the Memorial grounds today. The exposed-aggregate concrete

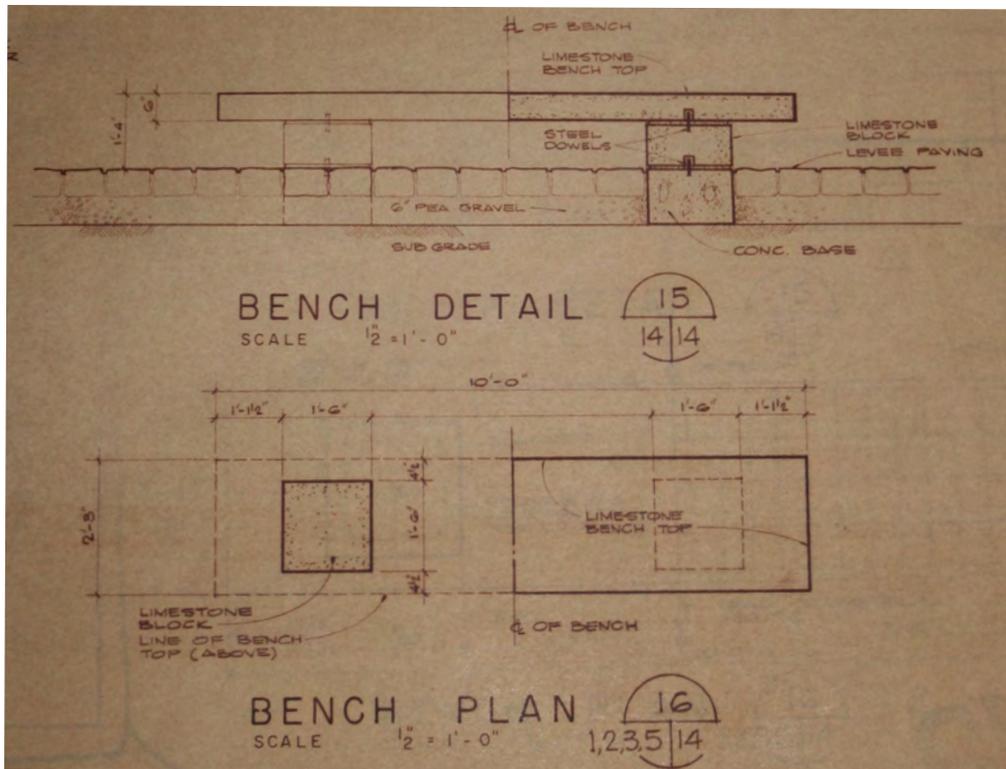


Figure 4.29. Eero Saarinen & Associates, Drawing SD-13, Bench Detail, 1960. (JNEM Archives, D-120-906)

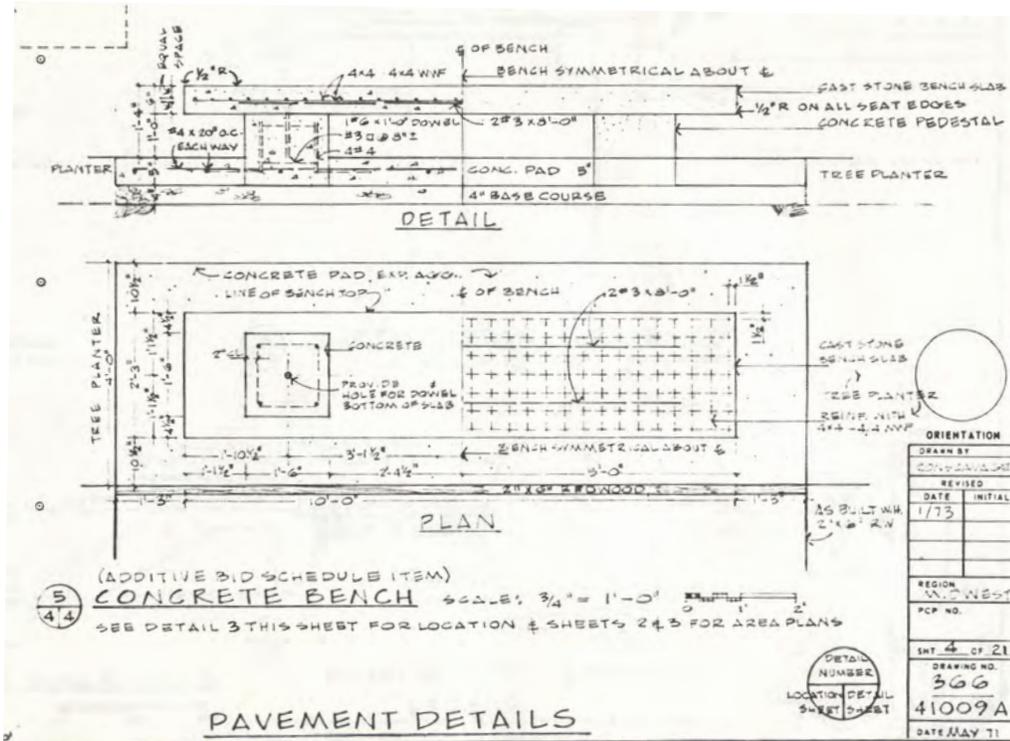


Figure 4.30. NPS Drawing 366/41009A, Bench Detail, May 1971. (JNEM Archives, D-120-1207)

receptacles are mostly in fair to good condition; about 25 percent of the total number of receptacles are in poor condition and need to be replaced.

*Analysis:* Non-contributing incompatible.

These trash receptacles are unrelated to the Saarinen/Kiley design. Although the existing trash receptacles are functional, they are somewhat intrusive due to their size and number; in addition, they are not designed to manage cigarette butts, resulting in a maintenance problem.

### **Drinking Fountains**

*Historic Condition:* Drinking fountains were not addressed by Saarinen/Kiley. The drinking fountains were designed by HB&A and installed during the two landscape construction phases. They are located on the east side of the Gateway Arch at the north and south, and at both of the rest areas, as well as near the north and south overlooks. The fountains are of exposed aggregate and match the material of the sidewalks.

*Existing Condition:* The drinking fountains are in fair condition. At some point new accessible fountains were installed, also of exposed aggregate.

*Analysis:* Non-contributing compatible.

The drinking fountains do not relate to the Saarinen/Kiley plan, and so are non-contributing. However, the fountain designs, materials, scale, and locations are relatively unobtrusive within the landscape.

### **Kiosk**

*Historic Condition:* The kiosk was constructed in 1986 upon completion of the parking garage. It was constructed of sandblasted, pre-cast concrete. The kiosk is a three-sided structure, measuring eight feet eight inches on each side with a four-foot-square bulletin board and changeable letter board.<sup>57</sup>

*Existing Condition:* The kiosk is in good condition, although the letter board is not optimally used.

*Analysis:* Non-contributing compatible.

The kiosk does not relate to the Saarinen/Kiley concept and therefore it is non-contributing. However, it is a relatively small feature with materials and form that are sympathetic to the design of the landscape. In addition, the structure is not visually intrusive.

### **Entrance Signs**

*Historic Condition:* Signs were not addressed on the Saarinen/Kiley concept plan. Temporary signs were located along Memorial Drive during construction of the Gateway Arch. A National Park Service entrance sign was placed at the corner of Chestnut Street and Memorial Drive after the completion of the Gateway Arch (date unknown). The sign measured four by 10 feet and was painted grey with brown lettering. Similar signs were attached to the wrought iron fence surrounding the Old Courthouse at the northwest and southeast corners.

*Existing Condition:* Twelve entrance signs are now located in the Memorial, with one at each entrance to the grounds. Mounted on four-inch-square posts set in concrete footings, the signs are similar to past signs, measuring four by 10 feet, painted grey with brown lettering and a NPS emblem.

*Analysis:* Non-contributing incompatible.

The signs do not relate to the Saarinen/Kiley concept plan and therefore they are non-contributing. Although the signs are functionally important, the existing ones are not in keeping with the site's character, and are somewhat intrusive. New signs are in the process of being designed and approved. Care is being taken that these signs are more compatible with the Saarinen/Kiley landscape.

### **Chain-Link Fences**

*Historic Condition:* Fences were not addressed in the Saarinen/Kiley concept plan. Chain-link fences were installed around the railroad tunnels and around the north and south service areas during the construction phases. The fences were 48-inch-tall chain-link.

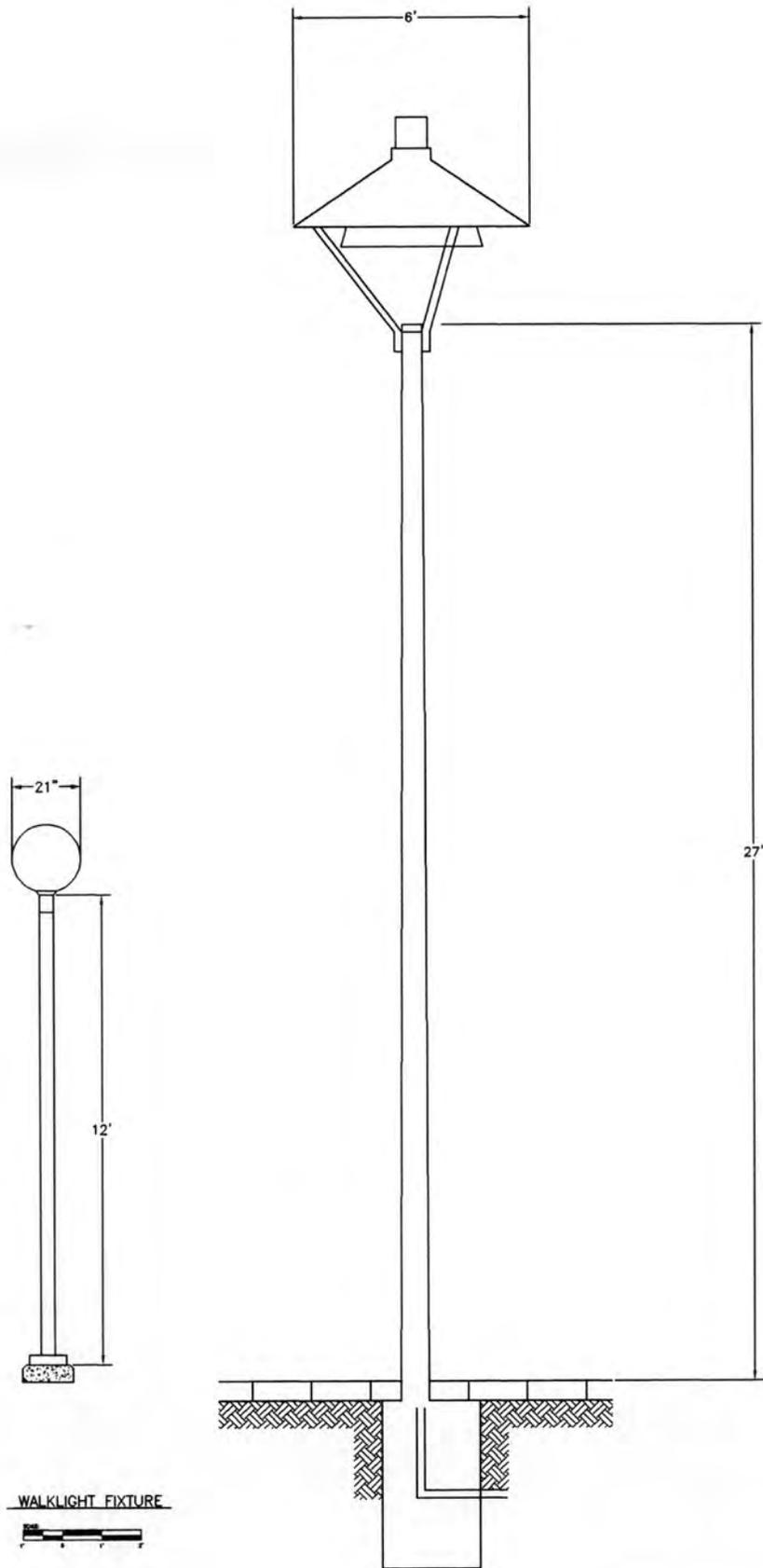


Figure 4.31. Comparison of Saارين lighting detail (right) and NPS lighting detail (left). (Redrawn by Gargar Chan from JNEM Archive Drawing Numbers D-120-909 and D-120-807)

*Existing Condition:* An eight-foot-high green vinyl coated chain-link fence surrounds the maintenance facility. Some other fences, particularly around the railroad tunnels, have also been replaced with dark-green plastic-coated chain link, which is less visually intrusive.<sup>58</sup> The fencing around the north and south service areas is the original green vinyl coated fencing, which is in fair to poor condition.

*Analysis:* Non-contributing incompatible.

The fences do not relate to the Saarinen/Kiley concept. Therefore, they are non-contributing. However, they are relatively unobtrusive and are functionally important for the safety and welfare of the public.

### **Irrigation System**

*Historic Condition:* Saarinen/ Kiley did not provide details of an irrigation system at the concept or design development stage. The Memorial's underground sprinkler system was initially designed by NPS DSC landscape architects and modified by HB&A. The system was installed in phases which resulted in problems with uneven coverage (some areas were overwatered, others under-watered). Improvements to the irrigation system aimed at correcting the deficiencies were made in 1986, and the system was automated in 1991.<sup>59</sup> Additional incremental changes have occurred as part of the Old Cathedral parking lot project in 1994, the construction of the new maintenance facility in 2002, the Luther Ely Smith Square sidewalk and plant bed realignment, the addition of bollards around the perimeter of the Memorial grounds, changes to the water supply conduit in 2006-2007, and the renovation of plantings along Washington Avenue in 2009.<sup>60</sup>

*Existing Condition:* The existing system was assessed as in fair operating condition in 1995; it was not reassessed in 2012. Adjusting and repairing irrigation heads is an ongoing maintenance task, and the individual irrigation zones are quite large by industry standards.

Some of the sprinklers need to be adjusted to eliminate watering the sidewalks and/or to provide coverage where it is lacking. Some of the sprinkler heads are placed too high above ground level and are visible to visitors.<sup>61</sup>

*Analysis:* Non-contributing compatible.

The underground sprinkler system does not relate to the Saarinen/Kiley design concept. However, it is unobtrusive and the system is functionally important to the maintenance of the plantings that are an essential part of the designed landscape.

### **Tree Grates**

*Historic Condition:* The Saarinen/Kiley concept plan specified cobblestone ("levee block") pavers surrounding the tree pits within the sidewalks and in a two-foot strip along the edge of the walks. This was one of the few details developed in the Saarinen/Kiley plan, and was intended to reflect the materials and vernacular of the adjacent Mississippi River levee.

The paving around the trees was implemented in 1972 during the first phase of construction. Because the cobblestone paving settled and became uneven, the pavers were deemed a safety hazard and were subsequently replaced with cast-iron tree grates in 1979. However, the tree grates also experienced settling and unevenness, resulting in numerous tripping hazards as well as causing damage to the root flares of some trees. In the 1980s, a small portion of the two-foot cobblestone border was reportedly implemented on an experimental basis, but the stones were removed some time later.

*Existing Condition:* The tree grates exist as implemented in the late 1970s. The six-foot-square cast iron grates are very heavy and difficult to maintain. Enlarging the holes in the center of grates to accommodate tree growth has resulted in some jagged edges; as the tree trunks become wider, the grates are causing damage due to conflict with larger root flares. The uneven walking surface resulting from the grates shifting creates a hazardous condition.

*Analysis:* Non-contributing incompatible.

The tree grates do not reflect the Saarinen/ Kiley concept plan (see Figure 4.32). Visually, they are intrusive to the walks and contrast with the intended design appearance indicated by the specification of levee block.

### Joseph Pulitzer Plaque

*Historic Condition:* A memorial plaque commemorating the location where Joseph Pulitzer bought the St. Louis Dispatch on December 9, 1878 was placed on April 10, 1947 in the sidewalk east of the Old Courthouse. The plaque was placed by Sigma Delta Chi, the National Professional Journalistic Fraternity.<sup>62</sup>

*Existing Condition:* The plaque, which is bronze and measures two feet four inches by one foot nine inches, is in good condition.

*Analysis:* Non-contributing compatible.

Although the plaque was put in place during the period of significance, it does not contribute to the landscape significance of the Memorial. The plaque has other historic values, and therefore it is listed on the List of Classified Structures.<sup>63</sup>

### American Society Of Civil Engineers Plaque

*Historic Condition:* The plaque, measuring approximately two feet by 11 inches, was located on the south entrance to the underground visitor center. The plaque was awarded to the Gateway Arch by the American Society of Civil Engineers in 1967 for "Outstanding Civil Engineering Achievement."

*Existing Condition:* The plaque appears to be in good condition with some minor weathering and patina.

*Analysis:* Non-contributing compatible.

Although this plaque may have other historic value, it is not part of the Saarinen/Kiley landscape design and therefore it is non-contributing to the significance of the landscape.

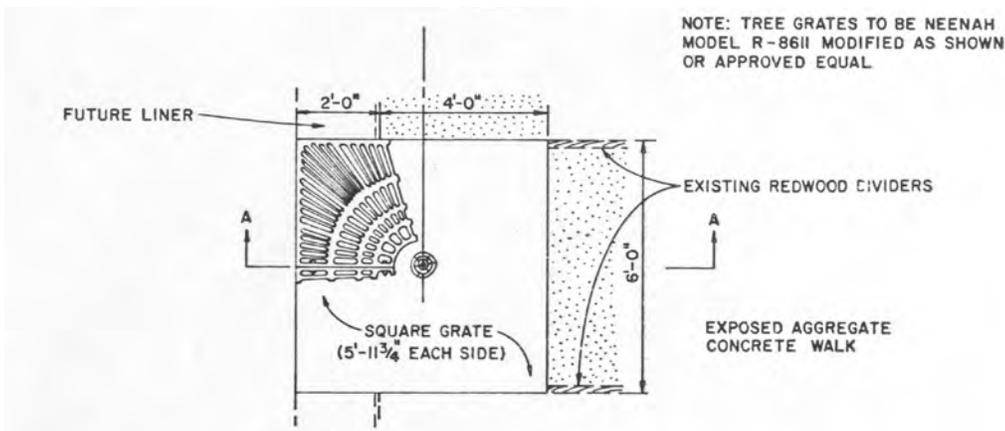
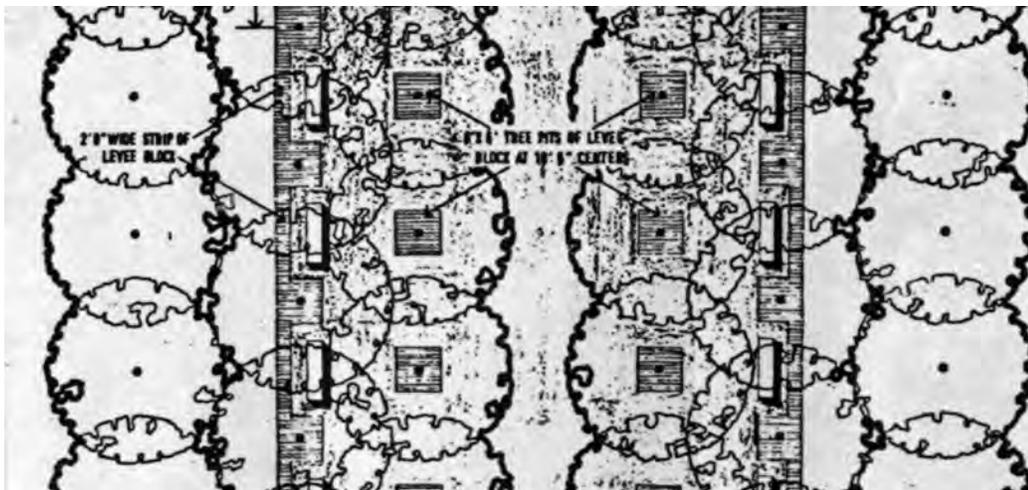


Figure 4.32. Comparison of Kiley development of cobblestone pavers (top) and NPS as-built tree grates (bottom). (JEFF Drawing Number 3027 and JEFF Drawing Number 366/41037)

### **Gateway Arch Plaque**

*Historic Condition:* The Gateway Arch plaque was dedicated to the people of the United States for President Lyndon B. Johnson by Vice President Hubert H. Humphrey on May 25, 1968. This plaque commemorates the dedication and is located at the north entrance to the underground visitor center.

*Existing Condition:* The plaque appears to be in good condition with some minor weathering and patina.

*Analysis:* Non-contributing compatible.

Although this plaque may have other historic value, it is not related to the Saarinen/Kiley landscape design and therefore it is non-contributing to the significance of the landscape.

### **Lewis & Clark Plaques**

*Historic Condition:* The overlook plaques were dedicated in memory of Lewis and Clark on August 24, 1973 by the JNEMA. The plaques measure one foot six and 1/4 inches by one foot four and 3/4 inches, and are made of bronze. The plaque dedicated to Meriwether Lewis was set into the south overlook bulkhead and the plaque dedicated to William Clark was set into the north overlook bulkhead.

*Existing Condition:* The plaques are in good condition.

*Analysis:* Non-contributing compatible.

Although the plaques may have other historic value, they are not a component of the Saarinen/Kiley landscape design and therefore are not contributing to the significance of the landscape.

### **Luther Ely Smith Memorial Marker**

*Historic Condition:* The Luther Ely Smith Memorial Marker was dedicated on April 12, 1985 to commemorate Luther Ely Smith, a local constituent who was instrumental in the development of Jefferson National Expansion Memorial.

*Existing Condition:* This memorial marker is in good condition.

*Analysis:* Non-contributing compatible.

Although this marker may have commemorative value, it is not related to the Saarinen/Kiley landscape design and therefore it is non-contributing to the significance of the landscape.

### **Saarinen Memorial Plaque**

*Historic Condition:* The Saarinen Memorial Plaque did not exist during the period of significance.

*Existing Condition:* The Saarinen Memorial Plaque was placed in the sidewalk along Leonor K. Sullivan Boulevard in 1989 by the FAIA. The plaque is in good condition and is in storage.

*Analysis:* Non-contributing compatible.

Although this plaque may have other historic or commemorative value, it is not related to the Saarinen/Kiley landscape design and therefore it is non-contributing to the significance of the landscape.

### **Flood Of 1993 Plaques**

*Historic Condition:* The flood plaques were added in the 1990s to mark the high water point and commemorate the flood of 1993. They are not related to the site's significance.

*Existing Condition:* The 1993 flood plaques are set into the walls on the north and south sides of the grand staircase. The bottom of the plaques marks the height of the Mississippi River during the flood of 1993. The plaques are in good condition.

*Analysis:* Non-contributing compatible.

Although these plaques may have interpretive value, they are not related to the Saarinen/Kiley landscape design and therefore are non-contributing to the significance of the landscape.

### **The Old Courthouse Plaque**

*Historic Condition:* The Dred Scott plaque at the Old Courthouse was installed in 1999, with a dedication ceremony on November 30 of that

year. It was affixed to the reproduction cast-iron fence on the west side of the building.

*Existing Condition:* This plaque commemorates the 1846 lawsuit of Dred and Harriet Scott, enslaved people who sued for their freedom at the Old Courthouse. This ultimate outcome of this lawsuit was a contributing factor to the Civil War.

*Analysis:* Non-contributing compatible.

## ASSESSMENT OF INTEGRITY

Integrity is the ability of a property to convey its significance. A property must not only be significant, but it must also have integrity. It is the combined effect of all of the landscape features that determines the overall integrity of the site. The National Register recognizes seven aspects or qualities of integrity: location, design, setting, materials, workmanship, feeling, and association.<sup>64</sup> To have integrity, a feature need not possess all of these qualities. The evaluation of integrity is somewhat subjective, but it must always be based on the physical form of the property in relation to its significance. At the Memorial, this means that the existing physical form must relate to the conceptual design intent of the approved Saarinen/Kiley plan in one or more of these seven aspects.

According to the CLR Guide, “Historic integrity is determined by the extent to which the general character of the historic period is evident, and the degree to which incompatible elements obscuring that character can be reversed.”<sup>65</sup> In the case of the Memorial, the historicity of existing materials is less important to its integrity than the survival of the overall design concept as implemented in a form that still conveys the more abstract intentions that are the most essential aspect of its character.

Preservation is based in large part upon the idea of authenticity. Traditionally, authenticity is defined by the historicity of existing materials, and also by how the built landscape manifests design intent. Particularly in Modernism, tangible materials and craftsmanship (which can be broken down into individual, replaceable, or repairable elements and features) are

secondary to intent and vision of the totality (manifest in a broad, holistic way that does not easily lend itself to being subdivided into features, elements, or parts).

In *Preservation of Modern Architecture*, Theodore Prudon states that “Challenging philosophical gaps occur when the physical materiality of modern buildings is emphasized rather than the visual character of the materials and of the period of time in which they were constructed.”<sup>66</sup> For Modern buildings and landscapes, Prudon notes, “In general it is not just how much remains of the original material that is important, but also how much of the original design is recognizable and visually cohesive.”<sup>67</sup>

Conversely, it is possible that additions and accretions to a significant designed feature or landscape such as the Memorial could become significant or be considered contributing in their own right; and that such alterations, if compatible, would have little to no negative impact on the integrity of the landscape.<sup>68</sup>

As documented in the statement of significance, Jefferson National Expansion Memorial is significant for its commemoration of westward expansion as well as its architectural, engineering, and landscape architectural design and construction. Although all aspects of integrity are important, location, design, setting, feeling, and association are the most important aspects to consider in order to evaluate the integrity of the Memorial.

The definition of all seven aspects of integrity, and whether and/or why they relate to the integrity of the Memorial follows. The Gateway Arch, a resource in itself and significant under National Register Criteria C: Design/Construction, retains high integrity in all seven aspects.

### LOCATION

“Location is the place where the historic property was constructed or the place where the historic event occurred.”<sup>69</sup> The Memorial retains high integrity of location. The aspect of location is very important to the integrity of the Memorial landscape. The Memorial was established in St. Louis at the original location

of the first settlement of the town of St. Louis, which was both the symbolic and physical embarkation point of westward expansion, the very reason for the Memorial's existence.

## DESIGN

“Design is the combination of elements that create the form, plan, space, structure, and style of a property.”<sup>70</sup> Design, with the exception of location, is the most important aspect to consider when evaluating the integrity of the Memorial. The Memorial landscape retains high integrity of design. It is the result of a major design competition and the work of two masters in their professions. Although some elements of the landscape were constructed in ways that deviate from the original design, their design concept was realized and is evident in the character of the landscape as a whole.

The site design developed by Eero Saarinen is evident today. The layout and siting of the major structures, walkways, and other features were implemented in a manner that is in keeping with his design. The catenary curve forms reflected in the railroad tunnel entrances, walkways, undulating topography, and overlook walls and stairs were designed by Saarinen, and are a primary example of his design philosophy—keeping within the same “form-world” as the Gateway Arch. Other features, such as the curvilinear pond edges and the grand staircase, were not constructed precisely as designed, but were implemented using forms with the same general character, in keeping with Saarinen's design intent.

Dan Kiley's planting plan, which complements Saarinen's site design, was intended to define and structure spaces with the use of a consistent number of plant species. A limited number of tree species each used in great profusion, was meant to strengthen the site layout, create a sense of enclosure along the pedestrian walks, and create intimate spaces contrasted with vast spaces around the ponds. This “forest and meadow” concept was integral to the landscape architect's intent.

Although it was implemented in a manner that deviated from the original design concept, the planting plan is possible to recapture. Major elements including the allées along the walks

and the circles and groves of baldcypress near the ponds are character-defining features in close keeping with the design intent. In general, despite some deviations from the concept, the landscape today shows the underlying form of Kiley's intent. Replanting and adjustment of maintenance regimes can increase the integrity of the plantings overtime.

## SETTING

“Setting is the physical environment of a historic property.”<sup>71</sup> The Memorial retains high integrity of setting. The urban character of the surrounding environment has been retained and reflects the environment as it existed when the Memorial was designed and built. Although materials and building styles have changed, the concept of an open green space in the urban center and on the Mississippi River reflects the intent of the original designers.

## MATERIALS

“Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.”<sup>72</sup> The Memorial landscape retains moderate integrity of materials. Major constructed site features such as the huge concrete overlook retaining walls, the Gateway Arch entrance area steps, and the railroad open cut walls and tunnels retain integrity of materials. These features, while varying in condition today, are generally of board-finish concrete using a large, golden aggregate, as they were originally constructed. Concrete and stainless steel, key materials at the Memorial, are the trademark materials of the Modern design movement. For some features, the existing materials do not reflect a specific selection by the original designers. However, the later NPS and other designers who implemented the design concepts strove to retain Saarinen/Kiley's intent. For example, though the aggregate in the walks was not specified by Saarinen/Kiley, the walk layout and spatial quality achieved with the use of these materials reflects the designers' concept, and thus the later selection of materials does not diminish the integrity of this feature.

## WORKMANSHIP

“Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.”<sup>73</sup> Workmanship is not the most important aspect for the evaluation of integrity of the Memorial landscape. However, the successful implementation of complex geometric forms echoing the Gateway Arch’s catenary curve indicate a high level of workmanship for many features, such as the overlook retaining walls, Gateway Arch entrance ramps and steps, railroad open cut walls and tunnels, and system of pedestrian walks.

## FEELING

“Feeling is a property’s expression of the aesthetic or historic sense of a particular period of time.”<sup>74</sup> Feeling is achieved when physical features are present and together they convey the original designers’ intent. The Memorial retains high integrity of feeling. The concept of a forested park in an urban setting is evident. The spatial quality resulting from the interaction of the walk layout and the densely planted single-species trees evokes a feeling of enclosure and creates a human scale contrasted with the immense scale of the Gateway Arch.

## ASSOCIATION

“Association is the direct link between an important historic event or person and a historic property.”<sup>75</sup> Integrity of association is high and is a major part of the significance of the Memorial. The Jefferson National Expansion Memorial commemorates the place where U.S. expansion to the west began. The Memorial is also directly associated with two master designers who played a major role in the modern movement of architecture and design. The Memorial clearly is a result of their vision, and therefore retains high integrity of association.

## SUMMARY

The Memorial landscape retains a high level of integrity, and continues to convey its significance as a nationally distinguished designed landscape of the Modern period. Landscape

features that contribute to this significance include the Gateway Arch; the Memorial’s overall landform and spatial organization; views; the system of walks; the single-species allées; ponds; overlooks; railroad open cuts and tunnels; grand staircase; baldcypress circles; screen plantings and depressed service areas; the entrance ramps into the Gateway Arch; and the concrete benches.

Some of the non-contributing landscape features, while not of value in providing a connection to the significant design of the Memorial, are compatible with the landscape and may be left in place or replaced. These include the service and maintenance areas and their retaining walls and plantings; plantings along the street edges, east side slopes, and pond areas; areas of lawn; Luther Ely Smith Square features; the parking garage; the Old Cathedral parking lot and sidewalk; interior service roads; and small-scale features including the lighting system, drinking fountains, kiosk, irrigation system, and memorial plaques.

Other features are non-contributing incompatible. These features may have a negative effect on the integrity of the landscape, as they are visually intrusive or not in keeping with the site’s significant character. They should be considered for removal or replacement with compatible features. These include plantings at Luther Ely Smith Square and the parking garage; and small-scale features including trash receptacles, chain-link fences, entrance signs, and tree grates.

The site analysis and integrity provides a basis for the treatment recommendations that follow in Chapter 5 of this report.

The key action recommended in the General Management Plan is the initiation of a Design Competition to gather a wide range of ideas for the revitalization of the Memorial. The treatment of the Memorial landscape in any of the proposed design solutions that emerge from the Design Competition must retain and enhance the character-defining contributing features of the landscape that reflect the design intent of Eero Saarinen and Dan Kiley, and thereby preserve and enhance the integrity of the Memorial.

**Table 4.1: Inventory Of Landscape Features**

Characteristic Type and Feature Name	Contributing Status	Notes/Key Characteristics
Topography and Landform	Contributing	Sculpted landform as a whole is character-defining.
<b>Spatial Organization</b>		
System of walks and allées	Contributing	Curving formal walks enclosed by uniform, regularly spaced massing of trees are character-defining.
Primary axis between Old Courthouse and river	Contributing	Principal organizing element of the Memorial grounds.
Pond areas	Contributing	Low areas defined by sinuous curved edge of ponds, undulating topography, reflected image of Gateway Arch in water, and enclosure by trees.
Overlooks	Contributing	Formal plazas and plinths intended to serve as open viewpoints situated above river and create finials of “pedestal” for Memorial as seen from the east; monolithic concrete structure designed with catenary curve segments.
Luther Ely Smith Square	Contributing	Forms an open foreground within the formal axis connecting the Old Courthouse to the Gateway Arch.
Old Courthouse block	Contributing	Anchors the city end of the Memorial and provides a contrast of scale and historic texture to the Gateway Arch.
North and south service areas	Contributing	Artfully concealed with limited visitor access through a combination of depressed topography and screen planting.
<b>Views and Vistas</b>		
View between the Old Courthouse and the Gateway Arch	Contributing	Major axial view of the “wide monument” essential to conveying the Memorial’s character.
Vista along the north-south axis	Contributing	Views of the “vertical monument” framed by trees lining walks.
Views between Memorial and East St. Louis	Contributing	Views to and from East St. Louis, including view from East St. Louis of Gateway Arch set atop the pedestal of the grounds, bookended by overlooks, and framing the Old Courthouse and city.
Views around ponds	Contributing	Views of Gateway Arch with reflection in pond waters.
Views from overlooks	Contributing	Views of Mississippi River, Eads and Poplar Street Bridges, and views to Gateway Arch.
Screened views of service areas	Contributing	Concealed by placement in topographic depressions and surrounded by plantings.

<b>Buildings and Structures</b>		
Gateway Arch	Contributing	Central focal point and source of catenary curve segment or “parabolic line” geometry found in many features in the Memorial grounds.
Old Courthouse	Contributing	Visual counterpoint to Arch; Old Courthouse is a major element of the axial arrangement of the Memorial.
Visitor Center/Museum of Westward Expansion	Contributing	Underground location permits large museum to function at Gateway Arch without competing with Memorial architecturally.
North and south overlooks	Contributing	Character-defining structures reflect “parabolic line” in their curved floodwall and staircase, monolithic appearance, and open views of river.
Railroad open cut walls and tunnels	Contributing	Walls and tunnel entrances conceal railroad line in the topography; geometry of concrete features reflects Saarinen’s signature catenary curve geometric form.
Grand staircase	Contributing	Part of Saarinen/Kiley concept, though details such as tread-riser relationship were altered; still supports the main axis and provides a monumental-scale access to riverfront.
Maintenance facility	Non-contributing	Compatible. Siting, massing, and low profile are relatively unobtrusive and sympathetic to the rest of the Memorial.
Parking garage	Non-contributing	Compatible. In keeping with use identified by Saarinen/Kiley for area, unobtrusive, but not of same design vocabulary as Memorial grounds.
Retaining walls	Non-contributing	Compatible. Functional and unobtrusive but not related to Saarinen/Kiley design.
<b>Vegetation</b>		
General plant composition	Contributing	General planting plan is similar to Kiley design, but includes wider variety of genera and fewer plants. The habit, texture, and massing of plants define its contributing character (not the species themselves).
Single-species allées	Contributing	The allées reflect Saarinen/Kiley design concept of uniform planting with precise alignment and close spacing along the walks.

Baldcypress circles	Contributing	The form of the densely planted evergreen circle with view of Gateway Arch across pond exists as in original Kiley planting plan.
Pond area plantings	Non-contributing	Compatible. While plant composition around te ponds does not reflect Kiley's design concept of a limited plant palette, forming distinct areas of abstracted forest and meadow, existing trees and lawn are not intrusive.
Railroad open cut and tunnel plantings	Non-contributing	Compatible. Plantings have been altered from dense screening to open lawn with scattered trees.
Plantings along east side slopes	Non-contributing	Compatible. Not densely screened by trees as in Saarinen/Kiley plan, and some condition problems
Service area plantings	Non-contributing	Compatible. Plantings generally reflect Saarinen/Kiley concept of screening the facilities from view, except where too sparse at Maintenance facility; many of the plants have also been replaced with different species.
Street edge plantings	Non-contributing	Compatible. Not the same as Kiley's intended planting.
Lawn areas	Non-contributing	Compatible. There is more lawn today than was called for in Saarinen/Kiley plan.
Luther Ely Smith Square plantings	Non-contributing	Incompatible. Intended to extend the form of the plantings across Memorial Drive, but are completely different tree forms.
Parking garage plantings	Non-contributing	Incompatible. Unrelated to plantings in the rest of Memorial and present maintenance problems.
<b>Circulation</b>		
Pedestrian walks	Contributing	Walk layout reflects Saarinen/Kiley design concept; their alignment is an important organizing principle and character-defining feature; the aggregate surface material of the walks was not specified by Saarinen/Kiley, but its continuous surface is compatible with the design of the walks at the Memorial.
Gateway Arch entrance ramps and steps	Contributing	Form of the ramps and steps are part of Saarinen design; problems with steep and slippery surface, however.
Perimeter roads	Contributing	General idea of roads surrounding edges, but not extending into or through the main part of Memorial grounds in keeping with original design.

Old Cathedral parking lot	Non-contributing	Compatible. Located on site selected by Saarinen/Kiley, but no details relate to their design.
Old Cathedral sidewalk	Non-contributing	Compatible. Not part of Saarinen/Kiley design, added later but in same materials as existing.
Interior roads (to service areas)	Non-contributing	Incompatible. Not too intrusive except for segments constructed of light-colored concrete.
<b>Constructed Water Features</b>		
North and south ponds	Contributing	Reflect the Saarinen/Kiley design concept; shapes have been simplified but location and design concept of the two curving-edged reflecting ponds meets the designers' intent.
<b>Small-Scale Features (furnishings and objects)</b>		
Concrete benches	Contributing	Concrete benches were designed by Saarinen.
Other benches	Non-contributing	Incompatible.
Lighting	Non-contributing	Compatible. Modern-looking, not too intrusive.
Trash receptacles	Non-contributing	Incompatible. Large, numerous, and unrelated to Saarinen/Kiley design.
Drinking fountains	Non-contributing	Compatible. Relatively unobtrusive in scale, materials, and location.
Kiosk	Non-contributing	Compatible. Relatively unobtrusive in scale, materials, and location.
Signs, entrance and wayfinding	Non-contributing	Incompatible. No unifying design for these features nor are they related to Saarinen/Kiley or Modern design concepts.
Chain-link fences	Non-contributing	Incompatible. Not related to Saarinen/Kiley or Modern design concepts.
Tree grates	Non-contributing	Incompatible. Not in keeping with Saarinen/Kiley concept of levee block. Maintenance problems, intrusive appearance.
Irrigation system	Non-contributing	Compatible. Unobtrusive and functional underground system.
Joseph Pulitzer plaque	Non-contributing	Compatible. Has commemorative value.
Saarinen memorial plaque	Non-contributing	Compatible. Has commemorative value.

Luther Ely Smith memorial marker	Non-contributing	Compatible. Has commemorative value.
Lewis and Clark plaques	Non-contributing	Compatible. Has commemorative value.
Flood of 1993 plaques	Non-contributing	Compatible. Has commemorative value.
American Society of Civil Engineers plaque	Non-contributing	Compatible. Has commemorative value.
The Gateway Arch plaque	Non-contributing	Compatible. Has commemorative value.
The Old Courthouse plaque	Non-contributing	Compatible. Has commemorative value.



## Endnotes

1. National Park Service, U.S. Department of Interior, *National Register Bulletin 16A: How to Complete the National Register Registration Form* (1991), 3.
2. National Park Service, *National Register Bulletin 16A*, 3.
3. National Park Service, U.S. Department of the Interior, *National Register Bulletin 22: Guidelines for Nominating Properties That Have Achieved Significance in the Last Fifty Years* (n.d.), 3.
4. Laura Soullière Harrison, *National Register of Historic Places Inventory—Nomination Form for Jefferson National Expansion Memorial* (1985).
5. M.W. Newman, “Landscape designer wins Brunner prize,” *The Chicago Tribune*, May 18, 1995. This honor has been awarded since 1898.
6. Theodore H.M. Prudon, *Preservation of Modern Architecture* (2008), 35.
7. Aline B. Saarinen, ed., *Eero Saarinen on His Work* (New Haven and London: Yale University Press, 1962), 18.
8. Laura Soullière Harrison, *National Register of Historic Places Inventory, Nomination Form for Jefferson National Expansion Memorial* (1985) and *Jefferson National Expansion Memorial Gateway Arch, National Historic Landmark Nomination Form*, (1987).
9. The winners of the competition were not given assurance that they would be employed by the federal government or even that the Memorial would be built. During the nine years of negotiations with TRRA, Saarinen and Kiley were not under contract with the government and therefore moved on to other projects. It was not until 1957 when an agreement was reached that the federal government hired Saarinen as architect for the Memorial and he subsequently hired Dan Kiley to work with him on the landscape plan.
10. The other designers included the National Park Service Denver Service Center (NPS DSC) and the firm of Harland Bartholomew & Associates (HB&A).
11. National Park Service, U.S. Department of the Interior, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (1996).
12. National Park Service, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.
13. National Park Service, *National Register Bulletin 16A*, 3.
14. Robert R. Page, Cathy Gilbert, and Susan Dolan, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington, D.C.: National Park Service, 1998), Landscape Lines 3:4.
15. National Park Service, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.
16. National Park Service, *National Register Bulletin 16A*, 3.
17. These distinctions have been employed by the National Park Service in documents including Quincy Unit CLR/EA in Keweenaw National Historic Park, and Hot Springs National Park CLR/EA.
18. National Park Service, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*; National Park Service, U.S. Department of Interior, *Director’s Order 28: Cultural Resources Management Guideline (DO-28), Release No. 5* (1997).

19. Mary Hughes, “Dan Kiley’s Site Design for the Gateway Arch,” in *Preserving Modern Landscape Architecture: Papers from the Wave Hill-National Park Service Conference* (Cambridge, Massachusetts: Spacemaker Press, 1995), 30.
20. See drawing number JNEM 3019, produced by Saarinen & Associates in 1962, copy on file in JNEM Archives, Record Unit 120, Drawer 12, Folder 10.
21. Dan Kiley oral history interview with Mary Hughes. Mr. Kiley took design inspiration from the Tuileries in France where the trees are spaced 12 feet six inches on center. Some of his original concept drawings for the Memorial reflected this spacing, which the National Park Service would not approve. The spacing that was implemented—30 feet on center, and closer in the rest areas—follows the National Park Service approved plan. Mr. Kiley was pleased that the National Park Service followed his ultimate design in terms of the spacing but remained disappointed with the substitution of ash trees for the tulip poplar he recommended.
22. Dan Kiley, “Jefferson National Expansion Memorial,” *Landscape Design: Works of Dan Kiley, Process Architecture*, No. 33 (October 1982), 109.
23. Dan Kiley interview with Gregg Bleam and Gina Bellavia. One source of disappointment to Kiley was the elimination of plantings around the ponds. He felt that the planting was haphazard and did not reflect the massing effect that he intended.
24. John Peter, *The Oral History of Modern Architecture* (New York, Harry N. Abrams, Incorporated, 1994), 201.
25. Peter, *Oral History of Modern Architecture*, 201.
26. For more detailed information regarding the Arch construction and engineering, see JNEM Archives, Record Units 103, 104, 106, and 120.
27. Midwest Regional Office, National Park Service, U.S. Department of Interior, *National Register of Historic Places Inventory - Jefferson National Expansion Memorial*, prepared by Architectural Historian Richard I. Ortega (Omaha, Nebraska: March 3, 1976), 1.
28. During the early years of the Memorial, prior to the completion of the Museum of Westward Expansion, the Old Courthouse served as a museum interpreting the overall themes of the Memorial.
29. John H. Lindenbusch, *Historic Structure Report and Historic Grounds Study* (Denver, Colorado: Denver Service Center, National Park Service, January 1982).
30. Sharon A. Brown, *Administrative History of Jefferson National Expansion Memorial National Historic Site, Part I* (National Park Service, 1984), 122; and Bob Burley, oral history interview with Gregg Bleam and Gina Bellavia, July 27, 1995. Mr. Burley was an employee of Saarinen & Associates from 1956 to 1963. The 1948 Competition Drawing and other interim plans for the Memorial showed as many as three proposed museums, all above ground. Plans were made to place the museum under the Gateway Arch after the concept of aboveground museums was abandoned, in part because of cost. Saarinen welcomed the idea of eliminating surface structures because they tended to clutter the site and detract from the focus on the Gateway Arch.
31. For more detailed information regarding the Museum of Western Expansion, visitor center, and theaters see Bob Moore, *Urban Innovation and Practical Partnerships: An Administrative History of Jefferson National Expansion Memorial, 1980-1991* (National Park Service, 1994).

32. Moore, *Urban Innovation*.
33. “Temporary Maintenance Building Completion Report,” copy on file in JNEM Archives, unprocessed Rennison Collection.
34. See early plans, Eero Saarinen & Associates, copies on file at JNEM Archives, uncatalogued collection. Parking areas were planned for both the north and south ends of the site at one time.
35. Brown, *Administrative History*, 121.
36. Moore, *Urban Innovation*, 13.
37. Moore, *Urban Innovation*, 16.
38. Moore, *Urban Innovation*, 13-22. Historian Bob Moore details the history of the construction of the parking garage as well as the operating agreement among the three agencies.
39. Saarinen, *Eero Saarinen on His Work*, 18.
40. Saarinen, *Eero Saarinen on His Work*, 18.
41. Bob Moore, telephone conversation with Bruce Detmers, October 31, 1995. Mr. Detmers recalled his own work on the mathematics of the grand staircase design. According to him, Eero Saarinen’s design of the staircase was to reflect a catenary curve on its side.
42. Although details of the retaining walls were not developed by Saarinen & Associates, the proposed landform around these areas clearly required retaining walls.
43. See the Site Physical History chapter of this report for explanation and history of this change.
44. Jim Patterson, Research Agronomist, Center for Urban Ecology, correspondence with the Memorial Superintendent, September 25, 1995. Patterson visited the Memorial to evaluate the soil condition and plant health/growth. He was impressed with the condition of the Rosehill ash. Other experts have evaluated the single-species planting in the past and have been equally impressed with their condition and survival rate. David G. Nielson, Professor Emeritus and Consultant, Ohio Agricultural Research and Development Center, Department of Entomology correspondence to Jim Jacobs, JNEM Gardener Supervisor, November 3, 1992. James B. Hanson, Field Representative, Forest Health Protection correspondence to Steven Cinnamon, IPM Coordinator, Midwest Regional Office of the National Park Service, July 7, 1992.
45. JNEM Gardener Supervisor Jim Jacobs, personal communications with Gina Bellavia, 1994-1996. Jacobs felt that the planting around the garage was an inappropriate and high-maintenance planting, and that the planting should reflect the other plantings on the site, and should be more easily managed.
46. Moore, *Urban Innovation*, 126.
47. Architect Bob Burley, interview with Gina Bellavia and Gregg Bleam, June 27, 1995, transcript on file in the JNEM Archives.
48. Cooperative Agreement between United States of America and the Archbishop of St. Louis, February 23, 1961. Copy on file at JNEM, Office of the Superintendent.
49. Gargar Chan, Civil Engineer, Jefferson National Expansion Memorial, personal communication with Gina Bellavia. Ms. Chan determined the areas of the ponds by using mathematical calculations and the 1966 approved Kiley development plan.
50. Dave Caselli, Park Engineer, Jefferson National Expansion Memorial, personal communication with Gina Bellavia, December 14, 1995. Mr. Caselli determined the area of the ponds using mathematical calculations and the 1995 Existing Conditions plan.
51. An examination of the existing topography and the proposed landform suggests that implementation of the Kiley design of

- the ponds would have required excessively steep grades.
52. NHS-JNEM Drawing Number 3077 (dated 11-23-60), copy on file in JNEM Archives, Record Unit 120, Drawer 23, Folder 7. The drawing includes construction details for planting, pavement, and benches on the levee.
  53. Drawing Number 366/41009A (May 1971), JNEM Archives, Record Unit 120, Drawer 17, Folder 2.
  54. Saarinen & Associates Drawing Number NHS-JNEM 3077 E-4 (December 9, 1960), JNEM Archives, Record Unit 120, Drawer 22, Folder 2. See also a line drawing depicting proposed luminaires along Wharf Street, found at Arteaga Studios Ltd., dated September 11, 1963, no. 639-11-3. It is unclear from this artist's rendering whether the luminaires were also proposed for the Memorial's walkways.
  55. JNEM Archives, Record Unit 120, Drawer 15, Folder 4. It is not known why the Saarinen & Associates standard and luminaire detail was not implemented.
  56. JNEM OPR 10-238s, no. CO16/515, copy on file in JNEM Facility Manager's Office.
  57. WVP Corporation, Construction Plan for Arch Parking Garage and Washington Avenue Relocation (February 18, 1986), Construction Details, Sheet A-16, copy in JNEM Facility Manager's Office.
  58. JNEM Gardener Supervisor Jim Jacobs, personal communication with Gina Bellavia, December 14, 1995.
  59. Moore, *Urban Innovation*, 128.
  60. Jacobs, personal communication, January 2010.
  61. Jacobs, personal communication, January 2010.
  62. U.S. Department of Interior, National Park Service, List of Classified Structures, prepared by Architectural Historian Dena Sanford (1994).
  63. The List of Classified Structures (LCS) is an evaluated inventory of all historic and prehistoric structures that have archeological, historical, architectural, and/or engineering significance. The Joseph Pulitzer plaque and a few other features at the Memorial are listed on the LCS as contributing features. It is important to note that some features may have inherent historic value that is not related to the overall cultural landscape of the Memorial, and therefore are considered "contributing" on the LCS and "non-contributing" in this Cultural Landscape Report.
  64. National Park Service, U.S. Department of the Interior, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (1991), 44.
  65. *Guide to Cultural Landscape Reports*, 72.
  66. Theodore H.M. Prudon, *Preservation of Modern Architecture* (Hoboken, New Jersey: John Wiley and Sons, 2008), 48.
  67. Prudon, *Preservation of Modern Architecture*, 158.
  68. Linda McClelland, "Evaluating the Significance of Additions and Accretions," A National Register White Paper (May 20, 2008).
  69. National Park Service, National Register Bulletin 15, 44.
  70. Ibid.
  71. Ibid.
  72. Ibid.
  73. Ibid.
  74. Ibid.
  75. Ibid.



# Treatment Recommendations

## INTRODUCTION

The preceding chapters of this Cultural Landscape Report discussed the history, significance, and integrity of the landscape of Jefferson National Expansion Memorial. The recommendations presented in this chapter are intended to

- 1) Provide viable approaches for future management of the property;
- 2) Preserve the character-defining features of the property which convey its significance as a designed landscape, and
- 3) Incorporate necessary safety and operational demands without compromising the integrity of the design.

These recommendations are intended to be part of the long-term planning for the Memorial landscape, as described in the 2009 General Management Plan/Environmental Impact Statement (GMP), and their implementation may depend on budgetary opportunities and other constraints.<sup>1</sup>

According to the National Park Service Guide to Cultural Landscape Reports (1998), a GMP “is the primary planning document for determining the general treatment of all cultural resources in a park based on cultural and natural resource inventories. However, many GMPs do not specifically address the treatment of cultural landscapes.”<sup>2</sup> The guide states that the Cultural Landscape Report, among other documents, can be developed to provide this treatment information in concert with the GMP.

The GMP envisions the Memorial

“... revitalized by expanded programming, facilities, and partnerships. The National Park Service would capitalize on multiple opportunities to expand visitor experience throughout the Memorial. In order to gain the widest breadth of ideas for expanding interpretation, education opportunities, and visitor amenities at the Memorial, a design competition, akin to the 1947 competition, would be initiated by the National Park Service in close coordination with partners. . . . In addition to considering the “winning” ideas from the competition, the National Park Service would continue the educational and interpretive programs currently offered at the Memorial and expand opportunities for visitors to participate in more interactive experiences across the Memorial grounds. The grounds surrounding the Gateway Arch would be managed in such a way as to accommodate and promote more visitor activities and special events than are currently provided. The National Park Service would actively coordinate with the City and State to enhance the pedestrian environment around the Memorial by developing a unifying streetscape along the Gateway Mall and the other streets adjacent to the Memorial, including Leonor K. Sullivan Boulevard and the riverfront levee.

“The National Park Service would use the design competition to seek opportunities to enhance existing entrances to the Memorial on the north and south, as well as to capitalize on the primary axis between the Old Courthouse and the Gateway Arch with new entrances on the west and east and by establishing a new east portal linking East St. Louis to the Gateway Arch grounds by water taxi. The competition would offer designs for a new

external and internal visitor transportation system. The ultimate configuration and use of the south end of the Memorial would be determined by the results of the design competition. It is the agency's intention that the maintenance facility remain in the current location; however, the Memorial would vacate the area if a design should emerge from the competition that offered a compelling program for the entire south end and could assure the Memorial the same high quality maintenance facility nearby. While the design solutions might include the development of above ground structures within a portion of the designated Design Competition Overlay, the National Park Service would not allow the implementation of a project that would cause impairment to the Memorial, and all of the enhancements would be required to be located in such a manner as to preserve the integrity of the National Historic Landmark and National Register Historic District."

The GMP Preferred Alternative is expressed physically as a series of management zones, which are descriptions of desired conditions for the resources and visitor experience of the Memorial. The zones are applied to different geographic areas of the Memorial landscape, identifying appropriate resource conditions, visitor experiences, and types of facilities that could occur in those locations. Five management zones were developed for use at the Memorial, including:

- Heritage Education and Visitor Amenities
- Original Landscape
- Orientation
- Streetscape/Riverscape
- Service

In addition, two Design Competition Areas overlay the management zones. Design Competition Areas identify thresholds for alterations that may occur as part of a major design competition under way in 2010. New features and elements may be added in these areas, provided they meet the intent of the underlying management zones:

- Design Competition Area A
- Design Competition Area B

These are described in more detail later in this chapter. Generally, the GMP proposes an increase in programmed activities on the Memorial grounds, and improvements in the physical connections to the surrounding communities and within the Memorial grounds. Both of these changes have the potential to affect the cultural landscape and the National Historic Landmark. Potential design and planning issues include the addition of temporary interventions such as tents and event structures; increased need for maintenance due to additional pedestrian and vehicular traffic on paths and lawn areas; addition of circulation features intended to improve accessibility; additional signage and interpretive materials; and new facilities and structures potentially requiring additions or alterations to the landscape.

There are four preservation treatment approaches recognized by the Secretary of the Interior: preservation, rehabilitation, reconstruction, and restoration. These four approaches are defined, and guidelines for their application are presented, in the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Historic Landscapes* (1995). Further guidance is provided in the *Guide to Cultural Landscape Reports* (1998). Based on the definitions of the four alternative treatment approaches and the documentation and analysis of the Memorial's landscape and its character-defining features, the recommended overall treatment for the Memorial grounds is rehabilitation.

The goal of rehabilitation is to preserve the portions or features of the landscape that are significant, yet still allow for alterations and additions necessary for efficient and safe operation of the Memorial. Within the framework of the overall landscape treatment, recommendations for individual features are made.

An explanation of the alternative treatment approaches follows this introduction, including a discussion of why rehabilitation is the most appropriate approach for the Memorial grounds. A treatment concept for the cultural landscape is followed by general and specific treatment recommendations.

The specific recommendations for landscape features are organized into three sub-sections. The first, “Recommended Approach,” outlines the general approach for the specific feature regarding goals for preserving character-defining qualities of the feature. The second, “Recommended Preservation Actions” identifies specific preservation projects or actions related to the feature, and guidance for practices to employ in the process of ongoing maintenance and repair activities to ensure character-defining features are preserved, and/or to enhance the historic character of the landscape. The third section, “Recommendations for Future Design,” includes guidance and parameters for potential future interventions that may occur in the landscape.

At the end of the chapter is a section regarding the unrealized elements of the design concept: those features that were conceived by Saarinen/Kiley, but never developed or constructed in any form. These include the fountains at the triangles; the pedestrian overpasses connecting the Old Courthouse to the portion of the Memorial on the east side of Memorial Drive; and the extension of the Memorial across the Mississippi River into East St. Louis.

## TREATMENT APPROACHES FOR THE CULTURAL LANDSCAPE

### Recommended Primary Treatment Approach: Rehabilitation

The primary treatment approach recommended for the Memorial landscape is a rehabilitation approach. As defined by the Department of the Interior:

“Rehabilitation encourages improvements to a historic property that make possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historical or cultural values. Archeological investigations may be required prior to replacement of missing historic features or projects involving new construction. In rehabilitation, the entire

history of the landscape is retained for interpretation.”<sup>3</sup>

After consultation with park managers and staff and NPS landscape preservation professionals, rehabilitation was selected as the most appropriate treatment approach for the Memorial landscape. This treatment approach allows for future alterations necessary to meet management needs and contemporary legal requirements while preserving the existing character-defining features. For example, universally accessible design can be provided in a manner which is sensitive to the original design concept, yet conforms with the Architectural Barriers Act (ABA).

Rehabilitation will help meet the goal of preserving the design as conceived by Eero Saarinen and Dan Kiley. It allows for the retention of non-contributing compatible features, such as the parking garage, maintenance facility, memorial plaques, and lighting fixtures; and also allows the addition of compatible new features or the addition of unrealized features found in the Saarinen/Kiley design concept, such as the fountains and pedestrian overpasses. Detailed recommendations for the rehabilitation of the landscape follow.

A key concept in the idea of rehabilitation is compatibility. In the rehabilitated landscape, one goal is to allow for necessary changes while ensuring that those changes do not detract from the character of the landscape or diminish its significance by changing the site’s appearance in a negative way. In the future, proposed additions (for example, designs developed through a future competition to resolve access and other issues) would be carefully reviewed for their compatibility with the character of the Memorial landscape. Existing non-contributing compatible features would either be retained as they are, or replaced with new, compatible features to support new uses with minimal detriment to the integrity of the landscape. “Rehabilitation improves the utility or function of a cultural landscape, through repair or alteration, to make possible an efficient compatible use while preserving those portions or features that are important in defining its significance.”<sup>4</sup>

## Other Alternatives for Treatment Approach

The following alternative approaches were determined to be inappropriate for the overall treatment approach for the Memorial grounds. However, they are included here because, in the case of specific features, an approach focusing more on preservation, restoration, or reconstruction may be preferable. These approaches are not in opposition to the overall approach of rehabilitation, as rehabilitation is flexible and necessarily includes more fine-tuned treatments needed to maintain and repair character-defining features, which in turn supports the adaptive reuse of the overall landscape.

### Preservation

Preservation is not recommended as the overall landscape treatment approach for several reasons. The definition of “preservation” is as follows:

“The objective of this treatment is the retention and protection of the historic property’s existing form, features, materials, and spaces. In addition to ongoing maintenance projects, preservation may include the repair and limited replacement of existing historic materials and features but does not allow for substantial replacement of missing features or new additions and alterations. Preservation as a treatment, allows for the interpretation of the evolution of the landscape, not just one historic period.”<sup>5</sup>

Although on first consideration preservation seems to be an appropriate treatment alternative for the Memorial landscape, it does not accommodate changes to meet contemporary needs or new legal codes, nor does it recognize the presence of intrusive features that detract from the significance of the landscape. However, as an approach to specific character-defining features, preservation, with its focus on ongoing maintenance, repair, and limited replacement may be the most appropriate course of action.

### Restoration

Restoration is not recommended as the primary treatment approach. The definition of “restoration” is as follows:

“The goal of restoration is to depict the landscape as it appeared at an earlier time during its period of greatest significance. This is usually accomplished through the removal of later historic features constructed after the restoration period, or the addition of missing historic features in order to recreate the appearance of the landscape at a particular period of time. In this treatment, only the restoration period is interpreted.”<sup>6</sup>

Restoration of the landscape is not an appropriate treatment alternative because the landscape retains much of its integrity. This alternative was considered inappropriate for overall treatment, since the goal of restoration is to depict the landscape as it appeared at an earlier time. The Memorial landscape does not have missing historic features in need of restoration, nor is there a specific date that best represents the significance of the landscape. Further, as noted in the significance statement and assessment of integrity in Chapter 4, material is of secondary importance in Modern design, with the conceptual aspects of design expression (geometry, overall form, and abstract association) conveying more significance than material and detail, which are a focus of traditional restoration activities.

### Reconstruction

Since the Memorial landscape retains much of its integrity, and reflects the Saarinen/Kiley vision, reconstruction cannot be considered a viable overall approach. As with restoration, there are no “missing historic features” per se. However, in the case of certain existing constructed character-defining features, particularly structures such as the overlooks, ponds, or walks, it is desirable to maintain them in a state that reflects their designed intent as part of this unified modern landscape. It is possible that, in the future, reconstruction of one or more of these features based on original designs may be necessary and preferable to maintenance through patching and superficial repairs. In specific future preservation activities at the Memorial, reconstruction may prove to be preferable to restoration in this regard.

## TREATMENT CONCEPT FOR THE MEMORIAL

The treatment concept for the cultural landscape of Jefferson National Expansion Memorial responds directly to current plans for management identified in the GMP Preferred Alternative and the Record of Decision. The GMP Preferred Alternative concept statement is:

“The Memorial would be revitalized by expanded programming, facilities, and partnerships. The National Park Service would capitalize on multiple opportunities to expand visitor experience throughout the Memorial. A design competition akin to the 1947 competition would be held in order to generate the widest breadth of ideas possible to revitalize the Memorial grounds and expand interpretation, education opportunities, and visitor amenities.”

Potential actions associated with the Preferred Alternative are addressed below by the corresponding GMP management zone.

### Treatment Concept

In order to protect the integrity of the Memorial grounds, the defined concept for treatment of the cultural landscape emphasizes the preservation and maintenance of character-defining features related to the Saarinen/Kiley plan. Other aspects of the site may be adapted to meet contemporary management, operational, and safety needs. The Memorial’s existing character-defining landscape features are maintained through active preservation maintenance, while necessary alterations of existing features are made and new features are added in a manner that is compatible with the existing Saarinen/Kiley designed landscape.

- **Site planning and design:** Future design interventions at the Memorial are envisioned to retain the overall site design and landscape setting as developed by Saarinen/Kiley. The arrangement of the existing site circulation system, siting of buildings and structures within the grounds, and the subtle use of catenary curve segments reflecting the form of the

Gateway Arch are retained and maintained as character-defining features of the landscape.

- **Topography and landform:** The sculpted, curving topography of the Memorial is retained and maintained. This landform was conceived by Saarinen as a designed feature used to control views and movement, emphasizing the Gateway Arch while subtly concealing maintenance and service areas, Memorial Drive, and the railroad. The landform continues to serve this purpose, retaining its sculpted form in the portion of the Memorial grounds east of Memorial Drive. West of Memorial Drive, the topography of Luther Ely Smith Square may be altered to meet management goals, as long as changes do not block the visual axis between the Gateway Arch and Old Courthouse.

- **Views and vistas:** Important character-defining views to and from the Gateway Arch are retained, maintained, and potentially enhanced. These include views between the Old Courthouse, the Gateway Arch, the river, and East St. Louis; and along the north-south axis of the Memorial. Any development occurring on the East St. Louis extension is undertaken with the understanding that the view to the Gateway Arch from East St. Louis along the primary axis is important to the Saarinen design concept. Secondary views to the Gateway Arch from the overlooks, across the ponds, and from along the walks in the Memorial grounds are retained and maintained as contributing features of the Saarinen/Kiley designed landscape.

- **Single-species allées:** The use of a uniform, single tree species to line and enclose the walks is retained and maintained, reflecting the Saarinen/Kiley design intent and the simple “form-world” of the Gateway Arch. This planting also strengthens the formal qualities of the pedestrian circulation system. The trees remain closely spaced, retaining the character-defining sense of enclosure along the walks that contrasts with the vertical monumentality of the Gateway Arch.

- **Use of limited palette of tree species:** The continuing use of a limited number of tree species to define spaces somewhat reflects the “forest and meadow” concept envisioned by Saarinen/Kiley from the beginning of the design competition, and partially realized in the planting that was implemented.

An inventory of individual landscape features with notes concerning their relationship to the Memorial’s significance can be found at the end of Chapter 4.

### Landscape Treatment Concept by General Management Plan Zones

This section details the treatment concept for each zone described in the GMP Preferred Alternative. These zones are intended to guide long-term management to achieve appropriate, desired conditions of the resources and visitor experiences in each portion of the Memorial. The concepts for landscape treatment provide a broad vision for applying the preservation approach described above in each of the different areas of the Memorial landscape. Recommendations relevant to the features in each of these zones, and addressing related GMP actions, are included in the detailed recommendations later in this chapter.

#### Heritage Education and Visitor Amenities Zone

The Heritage Education and Visitor Amenities zone encompasses areas in the north end of the Memorial including the north overlook and the parking garage (shared with Orientation); the area just north of the maintenance facility on the south end of the Memorial; the underground Museum of Westward Expansion and visitor center, and an underground area between the museum and Memorial Drive; the Old Courthouse; and part of the East St. Louis extension.

According to the GMP, this area’s primary purpose is to “provide visitor education, interpretation, orientation facilities and amenities.” Activities in this area will educate and convey interpretive themes to visitors, and provide opportunities for interpretive and educational programs. Facilities may be altered or added if considered necessary

and appropriate to the Memorial and its visitors. Typical facilities may include indoor and outdoor exhibits, museums/library/archives, classrooms, theaters, restrooms, benches, visitor centers, transit facilities, food service, and staff offices. Any new features must be compatible, following guidelines for rehabilitation. Changes in this area to support management goals are expected to have little impact on the NHL, and will preserve character-defining features of the landscape.

#### Cultural landscape treatment concept for the Heritage Education and Visitor Amenities zone:

- Existing character-defining features are retained and maintained.
- Existing buildings and structures are considered a primary location for planned new facilities.
- Additions or changes to existing non-contributing buildings and structures are appropriate, as long as proposed alterations or additions meet the Secretary of the Interior’s Standards for Rehabilitation.
- Alterations to the Old Courthouse and its environs are limited to what is necessary to support access, safety, continued use, and educational and interpretive goals.
- Substantial alterations to the north and south overlooks are limited so that the essential form of the overlooks is retained. There may be opportunities to utilize the interior space of the overlooks.
- The parking garage site and structure are considered as a location to accommodate uses and functions identified in the GMP that require conditioned building space.
- The GMP states that a new west access to the Museum of Westward Expansion will be designed in coordination with a rehabilitated streetscape at Memorial Drive and enhanced connectivity to

Luther Ely Smith Square and the Old Courthouse, as well as the rest of downtown St. Louis. Above-ground alterations and additions to the Museum of Westward Expansion and visitor center are limited to providing barrier-free access, meeting building and life safety codes, and wayfinding. Any new access to the existing or expanded Museum of Westward Expansion complex is designed in such a way as to be subordinate to the primary visitor approach and access at the legs of the Gateway Arch. To accommodate the historic design intent, it is preferable to continue to orient and direct visitors to approach and access the Gateway Arch at the original entrances.

- If new site furnishings are required for which a contributing, site-wide standard exists, such as benches, that standard is used to guide design and product selection for compatibility with the existing contributing landscape features. If features are added for which there is not an existing, contributing standard, such as lighting, new features are designed as part of a uniform site-wide standard that is either very unobtrusive, or compatible with the Modern aesthetic of the Memorial grounds.

- Any new features are designed and sited to fit into and not disrupt existing character-defining features. New features, such as concession- and transit-related facilities, are sited and located in such a way as to not intrude upon the Memorial's central purpose of evoking contemplation and inspiration.

### **Original Landscape Zone**

The Original Landscape zone encompasses the majority of the grounds east of Memorial Drive within the National Historic Landmark, with the exception of the overlooks, parking garage area, and maintenance facility area. A Heritage Education and Visitor Amenities Zone has been placed beneath the ground surface to accommodate the existing and proposed enlargement of the Museum of Westward Expansion.

According to the GMP, the Original Landscape zone's purpose is to "preserve National Historic Landmark status." This goal involves minimizing the changes to this area to those needed to provide safe visitor access and security, which are required to be of "compatible materials, design, and features." The entire zone will be preserved and "maintained to evoke contemplation and inspiration."

### **Cultural landscape treatment concept for the Original Landscape zone:**

- Change in this area is minimized, with the landscape retained, maintained, and repaired as required to reflect Saarinen/Kiley's monumental vision and to ensure that the Memorial grounds are "maintained to evoke contemplation and inspiration." All interventions for visitor access, security, and program support are carefully planned and designed to incur minimal visual and physical disturbance to the landscape. Creative alternatives requiring little or no physical landscape alteration to meet project goals are considered before new physical interventions are undertaken.

### **Orientation Zone**

The Orientation zone encompasses the parking garage (shared with the Heritage Education and Visitor Amenities zone), small areas where the water taxi landings could occur at the riverfront on both the east and west banks of the Mississippi River, and Luther Ely Smith Square.

According to the GMP, the priority for these areas is to "provide visitor orientation, enhance visual and physical connectivity, and support Memorial operations (parking)." It is envisioned as a transitional zone including wayfinding, parking, and practical visitor needs such as restrooms, benches, signage, orientation exhibits/kiosks, transit facilities including shuttle services and waterborne transit, parking, and convenience concessions. New additions to these areas are designed to be compatible with the historic landscape.

**Cultural landscape treatment concept for the Orientation zone:**

- Existing character-defining features are retained and maintained.
- New facilities and alteration of existing facilities for the purposes of increasing or enhancing connectivity and visitor orientation are undertaken in ways that are compatible with the character-defining features and Modern design aesthetic of the Gateway Arch and Memorial grounds.
- Smaller-scale orientation-related interventions, such as sign systems and kiosks, communicate the significance of the Saarinen/Kiley design to arriving visitors in ways that are compatible with the character-defining features and Modern design aesthetic of the Gateway Arch and Memorial grounds. This is accomplished through feature design as well as the information they provide.
- Features within the primary east-west axis of the Memorial grounds, such as the riverfront landings and any new features in Luther Ely Smith Square, are low-profile and visually unobtrusive and do not obstruct or otherwise impact the major designed views along this axis.
- Existing buildings and structures are considered for adaptive reuse and are the primary location for planned new facilities. Additions or alterations to existing non-contributing buildings and structures are appropriate, as long as proposed alterations or additions meet the Secretary of the Interior’s *Standards for Rehabilitation*.
  - The parking garage site is an appropriate facility to consider for uses and functions identified in the Preferred Alternative that require conditioned building space.
  - Above- or below-ground alterations and additions to Luther Ely Smith Square do not obstruct views from the east or west along the major axis of the Memorial. Retaining this designed view

is critical to maintaining the integrity of the Memorial and the visitor experience. The entire area of the square may be redesigned. Below-grade or below-structure facilities may be created to meet the goals established for this zone in the GMP. Increased pedestrian connectivity via a pedestrian overpass system that links Luther Ely Smith Square with the east side of Memorial Drive is encouraged as an appropriate option. Consideration is given to utilizing Saarinen’s concepts for flyover bridges as a guide to the design of a structure or structures that are compatible with the Memorial.

- If new site furnishings are required for which a contributing, site-wide standard exists, such as benches, that standard is used to guide design and product selection for compatibility with the existing contributing landscape features. If features are added for which there is not an existing, contributing standard, such as lighting, new features are designed as part of a uniform site-wide standard that is either unobtrusive, or compatible with the Modern aesthetic of the Memorial grounds. New features, such as concession, orientation, and transit facilities, are sited and located in ways that do not diminish the Memorial’s central purpose of evoking contemplation and inspiration.

**Streetscape/Riverscape Zone**

The Streetscape/Riverscape zone includes the street corridors surrounding all sides of the Memorial, the Old Courthouse, and Luther Ely Smith Square as well as the riverfront areas on both east and west banks of the Mississippi River.

The GMP states the purpose of this zone is to “create visual and physical connectivity between the city streets, riverfront, and the Memorial.” Goals include enhancing the “urban interface of the Memorial and to create a visual and physical thematic identity compatible with the National Historic Landmark.” Rehabilitation is the approach in this area, permitting addition of site enhancements aimed at revitalizing the street edge and riverfront and reconnecting

to the surrounding city, including “formal, pedestrian-oriented avenues and/or riverfronts the visitor passes through when approaching, entering, leaving, or walking by the Memorial.” The visual character of the Memorial is enhanced, and pedestrian safety and enjoyment are priorities. Compatible additions to this area may include lighting, signage, wayside exhibits, planting, accessible walks, site furnishings, and limited or temporary food service, tour, and convenience services. Options identified in the GMP for increasing connectivity include closing one or three blocks of Memorial Drive at Luther Ely Smith Square, a pedestrian crossing or “lid” over I-70 on Memorial Drive, and pedestrian flyover bridge or bridges over Memorial Drive at Luther Ely Smith Square.

#### **Cultural landscape treatment concept for the Streetscape/Riverscape zone:**

- This management zone is rehabilitated to provide improved pedestrian connections to areas surrounding the Memorial. The new connections are designed to communicate the Memorial’s design significance, utilizing compatible materials and patterns, and providing views into the Memorial grounds. New elements are not highly visible and do not disrupt views within the Memorial grounds. Non-contributing, non-compatible vertical elements along the streets (such as utility poles and lines) are placed underground or replaced with compatible features. Existing entrances to the Memorial grounds are revitalized, and their use is increased due to improved access across perimeter roads. No new perimeter entrances or major walks are added within the Memorial grounds.

#### **Service Zone**

The GMP’s Service zone encompasses the Old Cathedral parking lot and the maintenance facility. The GMP describes this zone’s priority use as support for Memorial operations, and states that it is subservient to the overall Memorial significance and purpose. Actions in this zone to support management goals are intended to have little impact on the National Historic Landmark, and preserve the contributing features of the landscape. The existing non-contributing features are expected to

remain in place in this zone, and necessary compatible additions to these areas support operations, administration, maintenance, parking, or security checkpoints.

#### **Cultural landscape treatment concept for the Service zone:**

- The maintenance facility is retained, and screened from the surrounding landscape in the spirit of Saarinen/Kiley’s approach to service functions. Any new additions in these areas are screened from the rest of the Memorial grounds.
- The parking lot at the Old Cathedral is managed in such a way as to not make a visual impact on the rest of the Memorial landscape. New interventions may have a character that is similar to or different from the character of the abutting new rehabilitated streetscape design.

#### **Design Competition Areas**

In the GMP, two design competition areas, A and B, overlay the management zones. Design Competition Area A includes the streets surrounding the Memorial, Luther Ely Smith Square, an area on the east side of Memorial Drive across from the square, the parking garage and maintenance facility surroundings, and the East St. Louis expansion area. These areas are envisioned as appropriate places to accommodate more intensive design elements while minimizing the impacts to the National Historic Landmark and cultural landscape. New design elements will support necessary goals such as enhancing physical and visual connectivity between the cities, riverfronts, and the Memorial by introducing new features to serve the educational, functional, and orientation needs of visitors. Facilities may include features such as interpretive exhibits, museums, theaters, classrooms, visitor orientation, transit, food service, restrooms, site furnishings, offices, streetscape improvements, and parking.

Design Competition Area B in the GMP includes areas within the National Historic Landmark that are more sensitive to change and are therefore more restricted in terms of potential design alterations. The GMP envisions sensitive design solutions that

support connectivity and accessibility, and serve the experiential needs of the visitor. All new interventions would be required to be compatible with the landscape and minimize impacts to the National Historic Landmark; they may include wayside exhibits, accessible walkways, plantings, fountains, site furnishings, and exterior lighting, among others.

It is important to note that various places and facilities associated with the Memorial are *not* included in the Design Competition Areas. These include the Gateway Arch itself and the broad expanse of ground beneath the Gateway Arch in the central portion of the Memorial; the Museum of Westward Expansion; the grand staircase; the primary pedestrian approach routes through the Memorial grounds from the east, west, north, and south to the Gateway Arch, and the landscape areas located between these routes along the north-south axis; the north and south ponds; the railroad and associated cuts and tunnels; the Old Cathedral and its immediate environs; and the Old Courthouse and its immediate environs. Most of these areas and features are excluded from the design competition because they include character-defining features designed by Saarinen/Kiley, and their alteration could cause the Memorial to be de-listed from the National Register of Historic Places. Other features that are not included in the Design Competition Areas do not contribute to the significance of the Memorial landscape. The maintenance facility is not included due to its recent (2003) construction. Also not addressed is the I-70 expressway, including its lanes, flyovers, and retaining walls. The National Park Service supports removing or redesigning some of the expressway features, but doing so is not considered feasible within the time frame of the GMP.

## GUIDELINES FOR REHABILITATION

Rehabilitation is considered the best approach for treatment when repair or replacement of deteriorated features is necessary; when alterations or additions are planned to support new or continued use; and when the recreation of the landscape to represent a particular time is not appropriate. According to the Secretary of the Interior's Standards:

“In Rehabilitation, a cultural landscape’s character-defining features and materials are protected and maintained as they are in the treatment Preservation; however, a determination is made prior to work that a greater amount of existing historic fabric has become damaged or deteriorated over time and, as a result, more repair and replacement will be required. The Standards for Rehabilitation and Guidelines for Rehabilitation allow the replacement of extensively deteriorated, damaged, or missing features using either traditional or substitute materials. For example, Rehabilitation may include replacing a crushed bluestone carriage drive with a rolled aggregate finish or replacing shaded-out understory shrubs with more shade-tolerant species. Of the four treatments, only Rehabilitation includes an opportunity to make possible an efficient contemporary use through alterations and additions; for example, replacing tillage with permanent grasslands to support a new system of livestock grazing or introducing new turf management to a park’s open meadows to support sports field use.<sup>7</sup>

“When alterations to a cultural landscape are needed to assure its continued use, it is most important that such alterations do not radically change, obscure, or destroy character-defining spatial organization and land patterns or features and materials. Alterations may include enclosing a septic system, increasing lighting foot-candles, extending acceleration and deceleration lanes on parkways, or, adding new planting to screen a contemporary use or facility. Such work may also include the selective removal of features that detract from the overall historic character.

“The installation of additions to a cultural landscape may seem to be essential for the new use, but it is emphasized in the Rehabilitation guidelines that such new additions should be avoided, if possible, and considered only after it is determined that those needs cannot be met by altering secondary, i.e., non character-defining, spatial organization and land patterns or features. If, after a thorough evaluation of alternative solutions, a new addition is still judged to be the only viable alternative, it should be planned, designed, and installed to be clearly differentiated from the character-

defining features, so that these features are not radically changed, obscured, damaged, or destroyed. For example, constructing a parking lot in a secondary meadow that is enclosed by existing vegetation or installing contemporary trail signage that is compatible with the historic character of a landscape.”<sup>8</sup>

According to National Park Service Director’s Order 28 (DO-28), in the rehabilitation approach:

- A cultural landscape is used as it was historically or is given a new or adaptive use that maximizes the retention of historic materials, features, spaces, and spatial relationships.
- The historic character of a cultural landscape is retained and preserved. The replacement or removal of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a landscape is avoided.
- Each cultural landscape is recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features from other landscapes, are not undertaken. Work needed to stabilize, consolidate, and conserve historic materials and features is physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
- Changes to a cultural landscape that have acquired historical significance in their own right are retained and preserved.
- Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a cultural landscape are preserved.
- Deteriorated historic features are repaired rather than replaced. Where the severity of deterioration requires repair or replacement of a historic feature, the new feature matches the old in design, color, texture, and, where possible, materials. Repair or replacement of missing

features is substantiated by archeological, documentary, or physical evidence.

- Chemical or physical treatments that cause damage to historic materials are not used.
- Archeological and structural resources are protected and preserved in place. If such resources must be disturbed, mitigation measures are undertaken including recovery, curation, and documentation.
- Additions, alterations, or related new construction do not destroy historic materials, features, and spatial relationships that characterize the cultural landscape. New work is differentiated from the old and is compatible with the historic materials, features, size, scale and proportion, and massing of the landscape.
- Additions and adjacent or related new construction are undertaken in such a manner that if removed in the future, the essential form and integrity of the cultural landscape would be unimpaired.

The recommendations presented below are organized by landscape characteristics (topography, spatial organization, views and vistas, etc.). General recommendations regarding the overall management of the Memorial landscape are followed by specific recommendations related to each of the existing landscape features described in the preceding chapters.

## GENERAL RECOMMENDATIONS

### Accessibility

- If a new pedestrian access on Memorial Drive into an expanded Museum of Westward Expansion is considered, ensure that it meets accessibility standards in a way that is as unobtrusive in the landscape as possible.
- Conduct further study of the need and feasibility of providing transportation to visitors from parking areas to the Gateway Arch.

- When planning barrier-free routes from the Memorial grounds to the riverfront:
  - Consider alternative methods of providing access between the grounds and the levee that require little or no permanent alteration to the landscape, such as accessible shuttle routes on perimeter roads, or addition of elevators or other conveyances within the overlook structures.
  - If ramps are determined to be the preferable barrier-free routes, minimize their impact on views of the Memorial from East St. Louis.
  - Design ramps in such a way as to minimize impacts on topography and landform.

### Special Events

- A goal set in the GMP Preferred Alternative is for the Memorial grounds to accommodate special events and promote increased visitor activities.
- Continue to protect the landscape by working closely with organizations holding major events at the Memorial. Prepare and distribute written guidelines which outline specific procedures and requirements to be followed by the organizations, vendors, and construction subcontractors associated with special events.

### Security

- When improving visitor screening at the visitor center under the Gateway Arch, keep security features within the structure and avoid adding security features outside around the entrances if possible. If not possible, use the most unobtrusive siting and design for the security features.
- If a new access is added to the Museum of Westward Expansion near Memorial Drive, consider locating security features at this access to minimize their presence in the area directly surrounding the Gateway Arch.

- Avoid placing security features in locations that conflict with contributing features such as trees or sidewalks, or within contributing views.

- The GMP Preferred Alternative states that Memorial perimeter security and public safety issues will continue to be addressed to the level required for an icon park. In the design process, explore alternatives to balance security requirements with preservation of the visual character of the Memorial and its physical fabric.

### Partnerships

- Continue to consult with, and maintain good communications with, the Terminal Railroad Association (TRRA) regarding any physical alterations involving the area of the railroad tracks and their perpetual easement along them, as well as long-term plans for TRRA's holdings in East St. Louis.

- Utilize partnerships with local and state agencies, adjacent landowners, and stakeholders, such as the City of St. Louis and State of Missouri, to educate and inform partners and the public about preservation values and the cultural landscape of the Memorial.

- Form partnerships to ensure a continuing discussion about the potential impacts of any interventions or alterations on rights-of-way or properties adjacent to the Memorial grounds.

### Documentation, Research, and Planning

- Consider amending the 1977 National Register of Historic Places Nomination Form for Jefferson National Expansion Memorial to reflect the significance of the cultural landscape and its features as identified in this report. The nomination could be modified through the submission of additional documentation to include more detail about the significance of the landscape.

- Pursue the acquisition of copies of original drawings from the former offices of Eero Saarinen & Associates relating to the Gateway Arch, now in the holdings of Yale University Archives, for inclusion in the Jefferson National Expansion Memorial Archives.

- Maintain a “Record of Treatment” for all landscape management activities. This record should include photographs, accounting information, narratives of the work, conditions, contractors, and construction materials. The information should ultimately be incorporated into an inventory condition assessment program which links visual information with a database for scheduling and documenting cyclic and emergency maintenance procedures.

## RECOMMENDATIONS FOR LANDSCAPE TREATMENT BY CHARACTERISTIC

### Topography

#### Landform of Grounds Surrounding Gateway Arch

The designed landform of the Memorial grounds east of Memorial Drive is a contributing feature. However, the grades are steep in some areas, leading to increased erosion and making it difficult to undertake regular maintenance such as lawn mowing using riding mowers.

*Recommended Approach:* Retain and maintain the contours of the landform. When controlling drainage and erosion problems, explore alternatives that minimize alterations to the landform. Any necessary alterations should be compatible with the original design concept of the sculpted landform serving to conceal functional site features from the view of visitors.

#### *Recommended Preservation Actions:*

- Minimize the visual impacts of erosion control measures in highly visible locations such as along the margins of walks and in major viewsheds. For example, consider using shade-tolerant, low-maintenance

groundcover plantings to stabilize slopes too shaded or steep for grass.

- Consider drainage improvements along walks and in areas where erosion is a problem. However, avoid visually prominent surface drainage interventions that will alter the landform’s simple curves and unified ground plane; for example, concrete-lined swales or major re-grading.

- Consult original designs, located in the JNEM Archives, before undertaking projects that could result in alterations to topography, drainage, or landform.

- Consider ways to repair the drainage problem along the west side of the railroad cuts in order to preserve the retaining walls, which are character-defining features (see Buildings and Structures).

- Consider planting low shrubs and groundcover on the less visually prominent slopes to mitigate erosion and eliminate the need for mowing.

- As part of other preservation actions along the sidewalks, minimize soil erosion to preserve the edges and footing of the walk. Explore alternatives that retain the essential character of the unobtrusive, dark brown aggregate surface beneath the tree canopy. Consider the option of installing cobblestones or a similar material around the trees and as a two-foot-wide border along the walks, as originally proposed by Kiley. While this design was never installed, it may prove to be an effective erosion control treatment.

- Consider adding structural soil in limited locations where trees are completely surrounded by concrete paving. These areas have higher tree replacement rates than other areas.

#### *Recommendations for Future Design:*

- When considering future design, avoid alterations to the character of the landform as much as possible.

- When planning projects to repair and manage drainage problems on steep slopes such as along the railroad cuts, around the ponds, on the west sides of the overlooks, and around the parking garage, investigate the impacts of any solutions on the overall grading of the site before implementation of repairs.

- Any interventions requiring grading should be designed to be compatible with the existing topographic character of the Memorial landscape: its undulating form echoing the Gateway Arch's curvature; depressed areas shielding views of service and operations areas; and its high points providing orienting views of the Gateway Arch, city, and river.

### Spatial Organization

The spatial organization of the park is based on a roughly bilateral symmetry of features arranged around the east-west axis of the Old Courthouse and the Gateway Arch, perpendicular to the Mississippi River shoreline. Features such as structures, plantings, roads and walks, and topography work together to define landscape spaces which evoke a contemplative feeling and contribute to the visual relationships on the site. The spatial organization of the Memorial grounds should be retained and, in some areas, may be enhanced.

*Recommended Approach:* Maintain the spatial organization of the Memorial landscape.

*Recommended Preservation Actions:*

- Maintain the visual connection between the Old Courthouse and the Gateway Arch, and the open expanse of lawn without obstructions to preserve the feeling of monumental space intended by the designers.
- Maintain the north-south axis, defined by the system of walks, as a series of enclosed spaces. The allée planting along the walks contributes greatly to the character of the space. Management of the planting will be discussed in more detail later in this chapter under Vegetation.

- Consider the addition of denser plantings, as well as a less diverse plant palette, around the ponds. This new planting design would help to achieve the spatial organization that was originally intended for these areas but never fully implemented. Specific recommendations regarding plantings will be addressed later in this chapter under Vegetation.

*Recommendations for Future Design:*

- If new interventions occur at the Memorial, locate them away from the character-defining spatial features of the landscape. Situate new features in the area of the parking garage or maintenance facility, on the East St. Louis addition, or off-site, where they will not be visually prominent or compete with views of the Gateway Arch.
- Any new entrance or addition to the Museum of Westward Expansion should be primarily below ground, and not disrupt the spatial connection between the Old Courthouse and Gateway Arch.
- Place any substantial new facility development in the Memorial in Design Area A identified in the GMP, which includes the East St. Louis extension of the Memorial within its authorized boundary.
- Consider the addition of the plantings that were eliminated during the initial implementation of the planting plan in order to strengthen the spatial qualities around the ponds.
- According to the GMP, the Memorial's maintenance facility will most likely remain at the south end of the Memorial, which matches the Saarinen/Kiley master plan location for this function.
- If the south end of the Memorial is proposed for a new use as part of the design competition, ensure any new facilities have a low profile or massing and are screened from view within the Memorial, in keeping with the Saarinen/Kiley intent for this area.

- Visitor parking should remain at the north end of the Memorial, in keeping with the function for this area identified in the Saarinen/Kiley master plan.

### **Luther Ely Smith Square**

Luther Ely Smith Square is part of the main east-west axis between the Old Courthouse and the Gateway Arch. The square was intended to be an integral connector between the Old Courthouse and the Memorial grounds, with single-species allée plantings matching those across Memorial Drive. The square was envisioned to serve as the west end of a pedestrian overpass linking the Memorial grounds to the Old Courthouse, although this overpass was never implemented.

*Recommended Approach:* Retain the open view corridor across the square connecting the Old Courthouse and Gateway Arch.

#### *Recommended Preservation Actions:*

- Avoid changes and additions to Luther Ely Smith Square that would visually interfere with the character-defining views along the axis between the Old Courthouse and Gateway Arch.

#### *Recommendations for Future Design:*

- Luther Ely Smith Square presents many opportunities for enhanced connectivity within the Memorial, as noted in the GMP. It also presents opportunities for extending the vocabulary of the Memorial grounds to the west, in keeping with the Saarinen/Kiley concept.
- When adding features to support visitor orientation and services at Luther Ely Smith Square, consider enhancements to the design of the square that better visually and physically connect the two sections of the Memorial grounds. Luther Ely Smith Square is part of the overall spatial organization and forms an important connection between the Gateway Arch and the Old Courthouse.

- Avoid vertical features in Luther Ely Smith Square that would interfere in any way with the open view along the Memorial’s primary east-west axis.

- Consider planting the north and south street edges of Luther Ely Smith Square with rows of trees matching the forms used for the allée plantings on the Memorial grounds, as the intention for the square was shown on the Saarinen/Kiley plan. Consider using a different species which is similar in form (see Vegetation section for more recommendations regarding plantings).

- See “Perimeter Roads” section below under Circulation for recommendations regarding the pedestrian overpass concept.

### **Views and Vistas**

The design of the Memorial grounds is centered on the axial arrangement of the Gateway Arch and Old Courthouse. This strong physical connection creates an important vista between the nineteenth- and twentieth-century structures and extends across the Mississippi River to East St. Louis. The great expanse of lawn beneath the Gateway Arch accentuates this connection. Specific views and vistas were designed to enhance the visitor experience. For instance, the north-south axis of the Gateway Arch and the use of closely spaced trees on this axis create significant contributing views of the Gateway Arch from the north and south teardrops, rest areas, and triangles.

*Recommended Approach:* Preserve and maintain the important views and vistas of the Gateway Arch including those along the north-south and east-west axis of the landscape, and those from around the ponds. Also consider ways to enhance and retain open views to the Gateway Arch and city from East St. Louis.

#### *Recommended Preservation Actions:*

- Retain and maintain the open view from the Old Courthouse to the Gateway Arch by avoiding the addition of any major vertical features within this area.

- Retain and maintain the teardrops and triangles as lawn areas open and free of tree plantings and furnishings to provide a vista of the Gateway Arch framed by the allée of trees.

- Retain and maintain views toward the Gateway Arch from around the north and south ponds, particularly the areas where its reflection is visible in the ponds, and where the Gateway Arch is framed by baldcypresses (*Taxodium distichum*) from within the tree circles.

- Retain and maintain periodic glimpses of the Gateway Arch from around the ponds by maintaining the existing topography and by following the specific recommendations regarding vegetation outlined later in this chapter.

*Recommendations for Future Design:*

- Consider relocating street lights, utility poles, highway signs, and other non-contributing vertical elements out of the view corridor at Memorial Drive within the vista between the Old Courthouse and the Gateway Arch.

- Avoid placing visually prominent or intrusive vertical elements within the Memorial’s significant view corridors in any new design.

- Enhance views toward the Gateway Arch and the city from East St. Louis by relocating or removing vertical elements such as power lines along the waterfront and providing vantage points for visitors.

**Buildings and Structures**

The Gateway Arch, Old Courthouse, Old Cathedral, Museum of Westward Expansion, visitor center, north and south overlooks and associated plazas/floodwalls/stairs, the grand staircase, and the railroad cut walls and tunnel entrances are significant contributing buildings and structures. The character of the landscape is defined in part by these structures, most of which have clearly designed features in keeping with Saarinen’s “form-world” for the Memorial. Buildings and structures that

are non-contributing but compatible include the maintenance facility, parking garage, and the north and south service areas (generator building and shipping and receiving). These are typically the features that are sited in low, screened areas as indicated in the Saarinen/Kiley plan and, while they share few characteristics with the contributing buildings and structures, they are unobtrusive and thus in keeping the intent of the designers.

Detailed recommendations for the Old Cathedral and visitor center/Museum of Westward Expansion are not addressed here. Recommendations below are landscape-oriented and do not include interior or structural recommendations for buildings and structures.

*Recommended Approach:* Retain and maintain these buildings and structures. If character-defining buildings and structures are imperiled by structural problems, consider reconstructing them based on the original Saarinen designs, or rebuilding them as implemented.

**Museum of Westward Expansion**

*Recommended Approach:* The GMP calls for the expansion of the Museum of Westward Expansion. Expansion is required to be below ground, and must preserve the character of the ground surface within the lawn areas.

*Recommended Preservation Actions:*

- When designing new pedestrian access to the expanded Museum along Memorial Drive, site the access and related features outside of the character-defining view within the axis between the Old Courthouse and Gateway Arch.

- Consider Saarinen’s original intentions for visitor arrival at the Gateway Arch. Any new access to the existing or expanded Museum of Westward Expansion complex should be subordinate to the primary visitor approach and access at the legs of the Gateway Arch. The historic design intent determines that it is preferable to continue to orient and direct visitors to approach the Gateway Arch at the original entrances.

### *Recommendations for Future Design:*

- When renovating the Museum of Westward Expansion to expand its size and better accommodate its associated functions, ensure that any addition remains belowground in keeping with the existing museum’s design and Saarinen/Kiley’s intent.
- Minimize the addition of features required to support underground facility systems (cooling and heating units, ventilation, etc.) and locate them in unobtrusive locations, such as the current service areas.
- Retain and maintain the entrance areas and ramps at the Gateway Arch legs and allow pedestrian access to them: this access permits visitors to experience the exterior of the Gateway Arch structure and understand the historic entrance route.
- Consider obscuring views of new access features along the historic view corridor while making them visible along Memorial Drive. This could be accomplished by depressing entrances, locating them to the sides, or on an oblique angle off the axis. The current grading along Memorial Drive at this location represents an incomplete Saarinen/Kiley design because it lacks the pedestrian overpasses.
- If a new access on Memorial Drive is constructed, place any new visitor screening and security facilities within it to limit the presence of intrusive features within the view corridor along the axis between the Old Courthouse and Gateway Arch.
- Coordinate any new museum access with other connectivity enhancements along Memorial Drive.

### **Gateway Arch**

Please refer to the Gateway Arch Historic Structure Report for recommendations.

### **Old Courthouse**

*Recommended Approach:* Retain and maintain the Old Courthouse.

### *Recommended Preservation Actions:*

- Complete a Historic Structure Report and Cultural Landscape Report for the Old Courthouse and its environs.

### **North and South Overlooks**

*Recommended Approach:* Retain, maintain, and repair these major character-defining landscape structures, including their associated plazas, floodwalls, viewing platforms, and staircases. Rehabilitate the overlooks to support appropriate new uses. The horizontal line of the top of the overlook walls—and their symmetrical appearance framing the Gateway Arch at its base—are important visual elements of character-defining views of the Memorial from East St. Louis.

### *Recommended Preservation Actions:*

- Retain and maintain the overlooks, including the symmetry and horizontal line the structures provide in views from East St. Louis; the existing geometry of the structures, including segments of catenary curves; their monolithic form; and their function as vantage points for important designed vistas to the river and Gateway Arch.
- Undertake a structural analysis of the overlooks to determine the root causes and potential long-term solutions to the drainage and structural problems evident on the surface. Employ a certified structural engineer, preferably with experience assessing significant twentieth-century Modern buildings and structures.
- Utilize the findings of the structural analysis to develop a detailed implementation plan for stabilization, repair and long-term maintenance of these features. This action should take priority over plans to continue patching small areas, an approach which has been undertaken with little success over the long term.
- If a structural analysis determines that retrofitting to repair drainage problems is not a feasible option, consider reconstruction of the overlooks, plazas,

stairs, and/or floodwalls closely following the original Saarinen/Kiley design drawings.

- In the process of repairing or reconstructing the structures, phase work (or resurface these features) in large sections to avoid a patched appearance and maintain the unified monolithic appearance that defines their character.
- Consider strategies for moving storage functions from inside the overlooks to the Grounds Maintenance Complex or another appropriate service area.

*Recommendations for Future Design:*

- Avoid alterations to the design of these significant structures, specifically their physical form, curved elements, monolithic appearance, and designed broad vistas of the river and Gateway Arch.
- When considering introduction of new or expanded educational/cultural facilities at the overlooks, explore options for compatible additions. New features should not block views from the overlooks to the river or Gateway Arch, and should be visually transparent, like glass, or as unobtrusive as possible.
- Consider adapting the overlooks for new uses by employing temporary or seasonal facilities, such as tensile structures. Tent anchor systems could be set into the paving in an unobtrusive manner.
- Consider rehabilitating the interior spaces beneath the overlooks that were originally intended to be used as small museums, but were later enclosed in concrete masonry unit walls for maintenance storage. These spaces may have limitations on their potential functions. Consider using these spaces to house appropriate educational/cultural facilities identified for the overlooks in the GMP. Remove the storage function and concrete masonry unit walls, ramps, and gates. Consult the Saarinen/Kiley design drawings for information on the intended appearance of these spaces.

**Railroad Open Cut Walls and Tunnels**

*Recommended Approach:* Retain and maintain the railroad cuts and tunnels and their character-defining structural walls.

*Recommended Preservation Actions:*

Retain and maintain the north and south railroad tunnels and open cuts. The form of the railroad cut walls with their signature vertical/horizontal catenary curve segments and top of wall flush with the ground level should not be altered.

- Monitor and manage the impacts of surface drainage at the top of this wall.
- Retain and maintain the railroad tunnel entrances with their curved portals. The entrances have a decorative catenary curve segment around their sides, a character-defining detail.
- Consider (in cooperation with TRRA) undertaking a structural evaluation of the railroad tunnels and walls by a certified structural engineer to ensure the features are sound and to better plan for long-term maintenance and repair regimes.
- Study design alternatives to eliminate the drainage and erosion problem to the west side of the walls, which will ultimately adversely affect these important features.

*Recommendations for Future Design:*

- In future planning efforts, consider alternatives—within the broader picture of the overall Memorial landscape—for improvements such as addition of minimal, appropriate screening plantings and less intrusive security fencing to conceal and secure the railroad cuts in keeping with the Saarinen/Kiley concept. Consider cooperation with TRRA/Metro to undertake any such plans.
- Avoid alterations to the topography around the tunnels and cuts, or the form of the walls/tunnels if new interventions are considered in this area.

## Grand Staircase

*Recommended Approach:* The grand staircase is a contributing feature and should be maintained according to National Park Service policies and standards. The general layout, alignment, location, and monolithic appearance of materials are based on the Saarinen/Kiley concept. The tread-riser relationship and landings are not the same as the original Saarinen/Kiley design.

### *Recommended Preservation Action:*

- Retain and maintain the grand staircase.
- If the steps require repair, replace with compatible materials that match the color, finish, aggregate, and form of the existing stairs.

### *Recommendations for Future Design:*

- Retain and maintain the grand staircase's general layout, alignment, location, and monolithic appearance. These attributes demonstrate its connection to the Gateway Arch and fulfill Saarinen's goal of creating a monumental connection between the Gateway Arch and riverfront.

## Parking Garage

*Recommended Approach:* Consider rehabilitation or replacement of this structure as needed. Retain and maintain the qualities—such as location at the north end of Memorial grounds, the muted colors, and the low profile massing of the existing parking garage—that are compatible with the historic character of the landscape.

### *Recommended Preservation Actions:*

- Maintain amicable relations with the Bi-State Development Agency and encourage appropriate and prompt maintenance of the parking garage.
- Retain the location, general massing, and height of the structure.

### *Recommendations for Future Design:*

- While the parking garage itself is not necessary to retain, avoid changes to it that

would intrude on the adjacent landscape within the Memorial grounds, such as additions that increase its height.

- In the future, consider locating some maintenance operations within the building envelope of the parking garage; or consider moving some functions off-site. Avoid additions to the parking garage that increase its footprint or vertical presence within the Memorial grounds.

- Consider moving additional parking out of the Memorial grounds and/or directing visitors to park in nearby off-site facilities.

- When redesigning the garage, provide a more pleasant visitor arrival experience at the Memorial with enhanced interpretive opportunities between the garage and the Gateway Arch.

- Consider redesigning the garage to provide a better visual and physical pedestrian connection between the Memorial and Eads Bridge/Laclede's Landing.

- Retain visitor parking in the area identified for parking in the Saarinen/Kiley concept, at the north end of the Memorial where the parking garage is located today.

## Retaining Walls

*Recommended Approach:* Maintain the non-contributing but compatible retaining walls located in the depressed areas concealing the north and south service areas. The walls are important in maintaining the existing landform as set out in the Saarinen/Kiley design concept.

### *Recommended Preservation Actions:*

- Retain, maintain, repair, and/or replace the retaining walls as needed to stabilize the steep landform concealing the service areas, and meet the Saarinen/Kiley design goal for these areas, which is to make them as unobtrusive as possible.

- Undertake periodic structural analysis of the retaining walls to determine if they require repair or replacement to fulfill their function.

## Vegetation

### Single-Species Allées

*Recommended Approach:* The allées are a contributing landscape feature that defines the character of the Memorial landscape. They should be retained and maintained, including the location and spacing of trees, and the use of a uniform, single-species planting of tall, relatively straight-trunked, deciduous trees, creating a continuous canopy and sense of enclosure over the walks. Maintaining the Rosehill ash cultivar (*Fraxinus americana* 'Rosehill') in particular is not as important as maintaining these formal characteristics.

### *Recommended Preservation Actions:*

- The spacing and locations of the trees should be faithfully maintained.
- Maintain the Rosehill ash trees in a healthy state for as long as possible by using accepted fertilizing, watering, and pruning practices. Because a single-species (and in this case, single cultivar) planting is a risky approach from a horticultural standpoint, the planting should be closely monitored for ash yellows, ash borer, and all other insects and diseases.
- If there is not a serious and immediate threat to the health of the majority of the Rosehill ash trees, continue to replace trees in-kind as needed.
- As trees are replaced, consider renovation of tree pits to ensure proper drainage and function.
- Emerald ash borer has become a concern in the Midwest. Measures are being undertaken to prevent, mitigate, and/or treat ash borer at the Memorial. See the Memorial's Ash Management Workgroup Recommendations and Draft Emerald Ash Borer Management Plan for more detailed information on ash borer control strategies.
- When the trees deteriorate to the point that they are hazardous or losing their natural form, they should be replaced in-kind.
- If there is a serious problem (such as an infestation of ash borer) that threatens the entire ash planting, replace the trees with an appropriate substitute tree, which could be another variety or cultivar of ash; or an appropriate new species, depending on the type of threat.
- The new tree should be tolerant of urban conditions, relatively pest and disease free, and should be aesthetically comparable in form, texture, and height to the originally proposed tulip poplar (*Liriodendron tulipifera*) tree.<sup>9</sup> If site-wide replacement of Rosehill ash trees is determined to be necessary, prioritize replacement trees with a form as close as possible to Kiley's intended design form (tall, straight, upright, deciduous, and fast-growing). Consider the originally specified tulip poplar and others.
- After selecting new trees by form, weigh the different trees' hardiness and pest susceptibility, as well as maintenance requirements. Be aware that as a single-species planting on an urban site with soils of undocumented fill, no tree is likely to perform ideally; plan maintenance practices accordingly. Over its lifetime the Rosehill ash planting has done extremely well (aside from potential borer susceptibility). Accommodations should be made for the selected trees to be maintained at a higher level of effort if that is required to keep them healthy.
- When replacing the ash trees, phase the replacement in a manner that is least intrusive to the appearance of the landscape.
- Retain the characteristic singularity of form of this planting by utilizing another single species for the allées.
- An appropriate replacement program should be developed by a qualified landscape architect, horticulturist, and/or arborist.

The following alternatives should be considered:

1. Replace trees in the sidewalks (only the trees that are surrounded by a tree grate, cobblestones, or exposed aggregate sidewalk) in-kind as they deteriorate beyond repair. Do not replace trees in the outside rows as they deteriorate; wait until at least five adjacent trees need to be replaced, and replace them in groups of five or more.
2. Replace all allée trees in-kind as the planting deteriorates beyond repair (whether inside or outside the sidewalk).
3. If a new single-species planting is to supercede the existing planting, develop a replacement pattern that has a specific rhythm. For example, starting at the Gateway Arch legs, replace the first 20 trees with the new species, leave 20 of the original species, replace the next 20 with the new, leave the next 20, and so on. Two to five years later, replace the remaining original species with the new species, always maintaining a rhythmic pattern.<sup>10</sup>

- Allée tree replacement, if undertaken for trees lining the walks in large segments or throughout the entire Memorial, should be coordinated with replacement of deteriorated sidewalks and renovation of tree pits. Renovation plans should be developed by a qualified landscape architect, horticulturist, and/or arborist, and may include enlarging the root space (using the entire space beneath the sidewalk); removing accumulated sediment and silt; and incorporating appropriate soil amendments and drainage systems.

#### *Recommendations for Future Design:*

- Any alteration to the allée plantings' essential characteristics (locations of trees, and uniform qualities of single-species planting) is not recommended as it will result in diminished integrity of the designed landscape.

### **Baldcypress Circles**

*Recommended Approach:* The baldcypress circles are character-defining vegetation features and should be maintained as densely planted, open-centered circles of evergreens, with a gap at one point in the circle framing a vista of the nearby pond and the Gateway Arch.

#### *Recommended Preservation Actions:*

- Maintain the baldcypress trees in a healthy state through use of accepted fertilizing, watering, and pruning practices. Consider the use of mulch and/or groundcover to lessen potential damage to baldcypress "knees" by lawn maintenance equipment.
- When the baldcypress trees deteriorate to the point where they lose their natural form or become hazardous, they should be replaced in-kind in the same location or very near to their original planting pit.
- If in the future, baldcypress need to be replaced with another species (if, for instance, an ash borer-type disease occurs), the replacement tree should be a tall evergreen with a soft-textured, dense form.

#### *Recommendations for Future Design:*

- Avoid alteration to the essential characteristics of the baldcypress circles as it will result in diminished integrity of the designed landscape.
- Consider increasing the number of baldcypress in the circles to adhere more closely to the original planting plan for these areas.

### **Pond Area Plantings**

*Recommended Action:* The plant composition and open space as it currently exists is non-contributing and should be rehabilitated in a manner that reflects more closely the original design concept. Consider alternative planting patterns that are more in keeping with the Kiley planting concept of forest/meadow.

*Recommendations for Future Design:*

- Limit the plant palette to approximately 16 tree species.
- Group trees in a manner similar to the Kiley design concept shown on the 1964 plan, contrasting dense plantings of “forest” with open areas of “meadow.”<sup>11</sup>
- Maintain the basic concept of planting canopy trees closely together with flowering trees on the edges. A large, deciduous canopy tree should dominate the “forest” with flowering trees and other smaller canopy trees inter-planted, particularly at the edges.<sup>12</sup>
- Maintaining a limited number of large tree species to dominate the forest canopy with a limited number of flowering species to add interest of color and texture is critical.
- Native species of trees, shrubs, and groundcover are preferred.
- Consider adding dense clumps of baldcypress near the lagoons, to strengthen the similarity of the character of this area to Kiley’s intention as shown in his planting plans.

**Railroad Open Cut and Tunnel Plantings**

*Recommended Approach:* The railroad tunnel plantings are non-contributing and present an opportunity to be enhanced to reflect the original design concept. Maintain existing non-contributing plantings but consider options for making alterations in this area to reflect the original design intent of concealing the railroad tracks from view.

*Recommended Preservation Actions:*

- Maintain existing plantings in a healthy state through accepted fertilizing, watering, and pruning practices.

*Recommendations for Future Design:*

- In the future, consider replanting in this area to fulfill its designed purpose: to conceal the railroad tracks. New planting designs should be mindful of

any maintenance difficulties that were presented by the original design (a result of inappropriate species selection), which may have led to its decline.

- Plantings should reflect Kiley’s original planting concept as much as possible, but should consider substituting hardier varieties of plants that have the same intended form.

- Use an evergreen tree suitable for screening.<sup>13</sup>

- Flowering trees (species taken from the limited plant palette suggested above) should be interplanted between evergreen trees to provide interest.

- Plant beds should be formed along the steep slopes and planted with groundcover.

- Original designs, located in the JNEM Archives, should be consulted and future design should be compatible with the original concept.

**Service Area Plantings**

*Recommended Approach:* Rehabilitation of the plantings may be undertaken to preserve their buffering qualities. Maintain the original concept of using plants to screen the service areas from visitors.

*Recommended Preservation Action:*

- Maintain the plantings around the service areas as needed to fulfill their screening function.
- Consider modifications to the plantings to decrease the amount of required maintenance and to improve their screening and soil retention function.

*Recommendations for Future Design:*

- Continue to maintain the black pine (*Pinus thunbergiana*) around the maintenance area; replacement with a similar species capable of performing a screening function is acceptable (the same species should be used

for the screening function throughout the service areas). Groundcover plants, such as Bulgarian ivy (*Hedera helix*) as originally proposed, should be replanted on the slopes around the maintenance building. Other plants, specifically the shrubs around the north and south service areas, should be replaced in-kind as needed.

### Street Edge Plantings

*Recommended Approach:* Rehabilitation, replacement, or alteration of the street edge plantings may be undertaken to support improvements to the pedestrian experience, while allowing necessary street access and maintenance (flood debris removal and snow cleanup, for example).

#### *Recommendations for Future Design:*

- When changing plantings along the street edge, maintain the permeable qualities of pedestrian access and views into the Memorial grounds.
- Plantings should be in keeping with the plant species and patterns used throughout the Memorial grounds.

### Parking Garage Plantings

*Recommended Approach:* These plantings are non-contributing and should be re-designed and replaced in a manner compatible with the character of the Memorial.

#### *Recommendations for Future Design:*

- In the future, replace plantings around the garage with species that are locally available and perform well in the existing urban site conditions.
- Develop a new planting concept in keeping with the Saarinen/Kiley design concept by screening views to the garage from within the Memorial landscape.
- Consider planting shrubs and groundcover on the steep slopes around the garage which are difficult to maintain in lawn.<sup>14</sup>

- Consider replacing garage area plantings with a new design using the same tree and shrub species found elsewhere on the site.

### Lawn Areas

*Recommended Approach:* Maintain a manicured lawn underneath the Gateway Arch and in the north and south teardrops and triangles. The quality of the turf under the trees and around the ponds may be maintained to a lower standard. Since lawn areas are most important for their spatial quality of openness rather than for the specific qualities of the grasses (type, height, or appearance), and were meant to represent the “meadow” in the original design concept, consider alternative ways to maintain and present areas currently in lawn.

#### *Recommended Preservation Actions:*

- Although the lawn areas are important to the current appearance of the Memorial landscape and should retain a high quality level to meet the expectations and uses of an urban park, the seed mix and grass varieties used are not significant, and may be modified or replaced with other seed mixes to better accommodate varying site conditions. When renovating the turf, select grass seed appropriate for the conditions of the turf area in question.
- Maintain lawn under the Gateway Arch and in the teardrops and triangle areas in a rigorous manner, including routine aerating and soil amendments to counter the damage done by compaction, particularly as a result of events.
- Although these areas are important, consider that all lawn areas do not need to be maintained as highly manicured turf. Identify areas that could be maintained in different ways.
- Comply with National Park Service policies for use of native plants and water use policies. Consider using native turf-forming grass species that can be maintained without irrigation in this environment yet still accommodate higher levels of foot traffic. Because the turf

grass mix is not considered a contributing element, the use of other grass species would be appropriate.

*Recommendations for Future Design:*

- Consider growing taller grasses around the ponds and on steep slopes, and therefore mowing less frequently.
- If more directed pedestrian access to the ponds is desired, consider mowing pathways in taller grass areas to create temporary, movable paths to and around the ponds. Routes can be altered as needed with little to no impact on the character-defining features of the Memorial grounds. This approach will reduce soil compaction around the ponds.

**Luther Ely Smith Square Plantings**

*Recommended Approach:* In the future, consider replacing the non-contributing plantings in Luther Ely Smith Square to reflect the unrealized design concept of strong visual unity with the plantings in the rest of the Memorial.

*Recommended Preservation Actions:*

- Plantings in Luther Ely Smith Square need not be preserved in their current form or composition. Maintain them as needed until the area is redesigned.

*Recommendations for Future Design:*

- Plan any future changes to the planting to strengthen and reinforce the square's function as an open visual connection between the Gateway Arch and the Old Courthouse along the park's primary axis.
- Consider replanting the double row of trees lining Luther Ely Smith Square, which was meant to form a strong visual and physical connection between the Old Courthouse and the Memorial grounds surrounding the Gateway Arch. Refer to the original plan approved by the National Park Service for specifics such as plant spacing.<sup>15</sup>

- As the existing sweetgum (*Liquidambar styraciflua*) trees deteriorate, replace them with the same tree utilized or planned for replacements along walks on the other areas of the Memorial (the uniform single-species planting).

- As part of any tree replacement, remove and replace the crabapple (*Malus* sp.) trees with a second row of the same tree that is used along the walks throughout the Memorial landscape.

**Circulation**

**Pedestrian Walks**

*Recommended Approach:* Retain and maintain the pedestrian walks, particularly their form and alignments, varying width, relationship to tree pits, and curving edges. Because they were intended to be a unified system, the walks should be visually unified and not composed of multiple kinds of paving and materials. However, the exposed aggregate concrete material itself is not significant.

*Recommended Preservation Actions:*

- Consider replacing the sidewalks, preferably in large sections that are carefully phased to maintain visual unity. Paving materials should adhere closely to the original design intention, presenting a unified surface and unobtrusive joints.
- Replace deteriorated or broken sections of walk in-kind as needed (currently, this would mean all replacement would match exposed aggregate concrete). The size and color of the aggregate and concrete should be consistent and match the existing sidewalk material.
- Dividers at construction joints (two-by-six-inch treated redwood strips) should be replaced at the same time as the sidewalk sections.

*Recommendations for Future Design:*

- Consider adding the cobblestone band along the edge of the walks, as specified by Saarinen/Kiley. Design this addition

to improve drainage and lessen turf maintenance along the walk edges.

- Coordinate sidewalk replacement in the Memorial grounds with replacement of the trees in and along the walks. Consult an arborist and historical landscape architect to monitor plans and implementation of this process. For trees planted in pits completely within the walks, consider ways to expand the planting pits underneath the paving to provide more root space and improved drainage. Appropriate soil amendments and drainage materials or systems should be installed prior to sidewalk replacement.

### Perimeter Roads

*Recommended Approach:* The exterior roads define the edges of the designed landscape of the Memorial grounds. The lack of vehicular access within the grounds—with roads only at the perimeter—is part of the Saarinen/Kiley design concept. Increased connection between the Old Courthouse and the rest of the Memorial grounds is an unrealized Saarinen/Kiley concept. The addition of pedestrian-friendly improvements and other street enhancements along the perimeter of the grounds is recommended in the GMP, in particular an improved crossing at Memorial Drive. However, while the National Park Service’s jurisdiction extends across Memorial Drive and Washington Street, these roads are maintained by the City of St. Louis and the Missouri Department of Transportation (MoDOT).

### *Recommended Preservation Actions:*

- Maintain partnerships with the City of St. Louis highway department and MoDOT to ensure that alterations and improvements along the road corridors surrounding the Memorial grounds are in keeping with the character of the landscape.
- Explore strategies for placing power lines and utilities currently on aerial poles underground as street improvements are undertaken to remove intrusions to views along the Memorial edge.

### *Recommendations for Future Design:*

- The GMP calls for improvement of pedestrian access across Memorial Drive. A one- or three-block wide portion of Memorial Drive could be closed to vehicular traffic, and proposals might include one or two elevated bridges, improved at-grade pedestrian crossings across Memorial Drive, or a civic plaza and “lid” above the depressed interstate.
- If designing elevated bridges, consider the idea of constructing the pedestrian overpasses illustrated in a set of alternative concept plans conceived by Saarinen/Kiley (see Unrealized Features of the Memorial Landscape below).
- Design ground-level pedestrian traffic improvements to direct visitors along the street edges to enter the Memorial at existing entrances at the corners of the Memorial and along the main east-west axis on Memorial Drive.
- When planning streetscape improvements, consider minimizing and grouping related features along the perimeter roads, such as signs, benches, and lighting.
- Avoid introduction of vertically prominent, brightly colored, or otherwise visually intrusive new elements along the street edge. Consider using neutral or earth tones, matte finishes, and features lower than eye level.
- If adding a civic plaza and “lid” above the depressed interstate, design it to be compatible with the existing vocabulary of walks, site furnishings, and plantings within the Memorial grounds.
- When adding features supporting orientation, wayfinding, and pedestrian safety and comfort along the street edges, design these features to be in keeping with the Modern design aesthetic of the Memorial.

### Old Cathedral parking lot

*Recommended Approach:* Maintain the Old Cathedral parking lot according to NPS policies and standards. The size and location of the parking lot is part of the Saarinen/Kiley plan.

*Recommendations for Future Design:*

- When redesigning the lot to improve its appearance and visual compatibility with the Memorial grounds, retain its existing location and size.
- Materials used in the parking lot should be visually unobtrusive, particularly when viewed from the top of the Gateway Arch.

### Old Cathedral Sidewalk

*Recommended Approach:* Retain and maintain the Old Cathedral sidewalk. While it is a non-contributing feature, this walk is compatible in appearance and is functionally important for visitor access to the Memorial from the Memorial Drive bus drop-off and Old Cathedral parking lot.

*Recommendations for Future Design:*

- If replacement or repair of this walk occurs in the future, use a material that matches the rest of the pedestrian circulation system in the Memorial grounds.

### Interior Roads

*Recommended Approach:* Maintain the interior roads to the service areas. These are non-contributing features but are functionally important for park operations; their alignments are unobtrusive and fulfill the Saarinen/Kiley concept of concealed service features.

*Recommendations for Future Design:*

- Avoid realigning the roads.
- If repaving is necessary, avoid use of bright, light-colored, or otherwise visually prominent paving materials.
- Consider using pervious paving or other environmentally sustainable materials when these roads are repaved in the future.

### Other Circulation

- When planning a visitor transportation system (such as a trolley or jitney) that links visitor facilities within the Memorial as well as visitor facilities outside of the Memorial, design any facilities associated with the system (such as bus stops, shelters, and signage) in a way that is compatible with the overall design vocabulary for the Memorial, and in keeping with the site's Modern design aesthetic. Related environmental graphics and signage should be designed as part of a unified site-wide system.

- When planning the seasonal water taxi linking the east and west units of the Memorial, design any landings or other features within the view along the main axis of the Gateway Arch to be as unobtrusive and low-profile as possible. Consider siting these features outside of the main axis.

### Water Features

#### Ponds

*Recommended Approach:* Retain and maintain the north and south ponds, which are contributing features that help define the character of the Memorial.

*Recommended Preservation Actions:*

- Maintain the existing ponds through regular maintenance.

*Recommendations for Future Design:*

- Consider alternatives for the installation of an aeration system for the ponds to mitigate the algae problem.

### Small-scale Features

#### Tree Grates

*Recommended Approach:* Rehabilitate the tree pits, including removal of the tree grates. The grates are a non-contributing feature and they create hazardous conditions for pedestrians.

*Recommended preservation Actions:*

- Remove the tree grates.

- Rehabilitate and reinvigorate the tree pits (also see Vegetation section).

*Recommendations for Future Design:*

- Consider replacing the tree grates with levee block (cobblestone pavers) or a similar material, based on the design drawings for the walks by Saarinen/Kiley.<sup>16</sup> The replacement material should contrast with the pavement in color and texture but also allow air exchange in the soil.

- Pavers are the preferable replacement material. They should be of a natural-looking material, such as cobblestones, not a refined material like brick or interlocking pavers, and should be installed in a manner similar to the original design detail.<sup>17</sup> Acceptable materials also include solid pavers that have the same color and texture as cobblestones, but are three inches square by seven inches tall. These should be set vertically, in the sailor position, and wide joints should be left between them to optimize air exchange.

- If desired, a two-foot-wide strip of the same pavers described above could be installed on the outside border of the sidewalks to reflect the original design intention. Implementation of this paving strip could help solve the drainage problem along the walks, as discussed above. The strip could be raised to form a curb which would direct the stormwater runoff to a drain, or a drainage system could be incorporated along the walks in and underneath the pavers.

**Benches**

*Recommended Approach:* Retain and maintain the concrete benches, which are contributing features.

*Recommended Preservation Actions:*

- Retain and maintain the benches.
- If additional benches are necessary, they should be compatible with the originals in design, form, color, texture, and material.

- Retain or relocate benches to the locations along the walks identified in the Saarinen/Kiley plan (at rest areas, triangles, and other locations).

- Consider removing the large number of benches currently clustered around the base of the Gateway Arch.

*Recommendations for Future Design:*

- If the benches deteriorate beyond repair or if funding becomes available to replace all, refer to the original Saarinen design specifications and consider replacing the concrete bench tops (the seat) with local limestone, stone, or slate.<sup>18</sup>

- Consider replacing the non-compatible plastic park benches at Luther Ely Smith Square and the chamfered-edged bench at the Old Cathedral parking lot with the Saarinen-designed concrete bench model.

**Lighting**

*Recommended Approach:* The lights are non-contributing features but are functionally necessary for the safety of employees and visitors. They are generally compatible with the existing landscape.

*Recommended Preservation Actions:*

- Maintain the existing lights and fixtures as necessary.
- Replace the lights in-place and avoid adding new lighting in other locations if possible.
- If additional lighting is determined to be necessary, review the Saarinen/Kiley plans to determine placement that is in keeping with the design intent.
- Avoid addition of vertical features such as light standards within any important views or vistas.
- Avoid placements for lighting that would require the removal of allée trees along the walks.

*Recommendations for Future Design:*

- If replacement of all the existing light standards becomes necessary in the future, they should be replaced with a Modern design style that is sympathetic to the Memorial’s design aesthetic.<sup>19</sup>
- When selecting new light standards in the future, consider an unobtrusive style and scale.
- Utilize new lighting that is environmentally sustainable. Consider selecting luminaires that meet dark-sky lighting standards to limit light pollution, unlike the current globes that lack cutoffs.

**Trash Receptacles**

*Recommended Approach:* The trash receptacles are non-contributing, but are functionally necessary features. Consider new trash receptacle standards that are compatible with the character of the Memorial landscape.

*Recommended Preservation Action:*

- Retain, maintain, and limit the number of trash receptacles on the Memorial grounds to the minimum needed.

*Recommendations for Future Design:*

- In the future, consider replacing the existing trash receptacles with uniform, modern substitutes. The receptacles should be carefully placed so as not to be visually intrusive.
- Consider adding recycling bins.

**Drinking Fountains**

*Recommended Approach:* The drinking fountains are non-contributing, but are necessary features for the comfort of the visitors. When they need replacement, use new drinking fountain standards that are compatible with the character of the Memorial landscape.

*Recommended Action:*

- Retain and maintain the existing drinking fountains.

*Recommendations for Future Design:*

- In the future, consider replacing the drinking fountains with improved, unobtrusive modern substitutes.

**Kiosk**

*Recommended Approach:* The information kiosk is non-contributing but it is an important directional tool to guide visitors to the site. If replacing the kiosk in the future, use a design that is compatible with the character of the Memorial landscape.

*Recommended Preservation Actions:*

- Retain and maintain the kiosk until new orientation features are designed to replace it.

*Recommendations for Future Design:*

- Consider replacing the kiosk with an improved, unobtrusive, modern feature fulfilling the same function.
- Consider options for a compatible orientation feature replacing the kiosk. This could be of similar materials to existing features in the landscape (aggregate concrete); or of an unobtrusive material (with transparent qualities such as glass); similar in scale to the existing kiosk, and could be moved to a different location or integrated into the adjacent garage instead of free-standing.

**Entrance Signs**

*Recommended Approach:* The National Park Service entrance signs are non-contributing, and their design is not in keeping with the Saarinen/Kiley “form-world.” However, their function is important in identifying the park. When replacing signs in the future, use a design that is compatible with the character of the Memorial landscape.

*Recommended Preservation Action:*

- If replacement of the entrance signs becomes necessary in the future, replace with uniform, modern substitutes that are not visually intrusive.

### *Recommendations for Future Design:*

- In keeping with the GMP, improve and enhance the signage system to better convey and reflect the identity of the Gateway Arch and Memorial grounds.
- Prepare a comprehensive signage plan which identifies appropriate size, font, color, style, and locations for all types of signage needed on site.
- Any new signs should be designed as part of a unified site-wide system of environmental graphics and signage.
- Consider a twentieth-century Modern design for all signage that, while clearly stating the site is NPS property, better fits the Memorial's character than the "park rustic" standard NPS signage found at many national parks.
- Consider installing wayside exhibits identifying the importance of the landscape and some of the significant character-defining features of the Saarinen/Kiley design.

### **Fencing**

*Recommended Approach:* Maintain and replace as needed the chain-link safety fencing on the Memorial grounds, being as minimal and unobtrusive as possible in siting and design. The chain-link fences are non-contributing features but are necessary for safety and security.

### *Recommended Preservation Actions:*

- Maintain unobtrusive fencing as necessary for safety along the rail cuts.
- Avoid adding additional fencing where safety concerns can be addressed using less visually intrusive means.
- Maintain and repair the fences as needed.
- Perform bi-annual condition assessments of the chain-link fences and replace with uniform, heavy-gauge wire mesh, posts and rails in-kind as necessary.

- Utilize replacement fencing that is as unobtrusive as possible; the current dark green plastic-coated galvanized chain link fencing fulfills this goal relatively well.

### *Recommendations for Future Design:*

- Consider as part of a new design replacing the chain-link fence with another type of barrier that is more reflective of the Modern aesthetic.

### **Irrigation System**

*Recommended Approach:* The underground sprinkler system is not a contributing feature, but it is important for keeping the lawn and plantings healthy.

### *Recommended Preservation Actions:*

- Conduct an irrigation audit to investigate current water usage and record deficiencies. Based on the results of the audit, modernize the system to optimize water usage and efficiency.
- Consider strategies for plant replacement that include plant species that do not require irrigation. Review and comply with National Park Service policies on the use of water for irrigation as well as sustainability standards involving water usage.

### *Recommendations for Future Design:*

- Re-design the system separating zones according to usage (e.g. lawn, shrubs, trees in walks). Establish a cyclic replacement schedule for the replacement of valves, heads, water lines, and automation clocks to maintain optimum quality and efficiency of the system.

### **Memorial Plaques**

The memorial plaques (Saarinen, Luther Ely Smith, Joseph Pulitzer, Lewis and Clark, and 1993 Flood) are non-contributing landscape features, but are compatible with the landscape and may have other historic and interpretive value.

*Recommended Approach:* Retain and maintain the memorial plaques.

*Recommended Preservation Actions:*

- Maintain the memorial plaques in-place. Maintain the plaques to prevent damage to surfaces of any contributing features on which they are mounted, and regularly clean the surfaces of patina staining where it is evident (such as the Lewis and Clark plaques on the overlooks).
- If relocation or removal of a plaque is required in the course of other projects, consider reinstalling it elsewhere within the Memorial.

### **Unrealized Features of the Memorial Landscape**

#### **Fountains**

*Recommended Approach:* While never developed or implemented, the Saarinen/Kiley concept of fountains on the north and south axis (in the north and south triangles) could be considered as a compatible future addition to the Memorial grounds.

*Recommendations for Future Design:*

- As part of future design, consider adding fountains and pedestrian plazas at the north and south triangles to reflect the original design concept.
- Consider basing designs on Kiley’s later verbal description: a low, bubbling type fountain at each of the two triangles, which would be paved with cobblestones or a compatible material. Benches, compatible in design and materials with the existing benches, could be grouped at these plazas.<sup>20</sup>

#### **Pedestrian Overpasses**

*Recommended Approach:* While never developed and implemented, Saarinen/Kiley’s concept of pedestrian overpasses bridging Memorial Drive and connecting the Gateway Arch to Luther Ely Smith Square could be considered as a compatible future addition to the Memorial grounds. The concept for the overpasses was conceived by Eero Saarinen and studied by his associates and by the local firm of HB&A.<sup>21</sup>

*Recommendations for Future Design:*

- Consider constructing the unrealized pedestrian overpasses (one on the north side and one on the south side) as originally proposed by Saarinen.
- Pedestrian overpasses or a “lid” above the recessed interstate, as proposed in the GMP, may alter the existing appearance of Luther Ely Smith Square. If adding a civic plaza on a lid, design it to extend or be compatible with the existing vocabulary of walks, site furnishings, and plantings within the Memorial grounds. If designing elevated bridges, consider using the Saarinen/Kiley alternative concepts for pedestrian overpasses in one of the alternative plans as inspiration.

#### **Extension of Memorial into East St. Louis**

*Recommended Approach:* Because this area lies outside the NHL, and there are no contributing cultural landscape features on the east side of the river, the East St. Louis extension area presents many opportunities for new design. Broad views to the Memorial grounds from the east side of the river are important to the Saarinen/Kiley concept and should be retained and maintained in any new design in this area.

*Recommendations for Future Design:*

- While planning for the East St. Louis extension, retain, maintain, and enhance unobstructed views from the east riverfront toward the Memorial grounds, including the Gateway Arch, Courthouse, and the span of the Memorial landscape between the overlooks.
- Research Saarinen’s early concepts for the east side extension during the planning process, and consider using them to the extent possible.<sup>22</sup>
- If substantial new facility development is desired in connection with the Memorial, consider placing it in East St. Louis as part of an extension of the Memorial within its authorized boundary.

- Explore ways to enhance views to and from East St. Louis; for example, by relocating or removing vertical elements along the riverfront, and by providing vantage points for visitors.

- When designing future interventions meeting the GMP Preferred Alternative goal of increased opportunities for natural resource protection and enhancement in East St. Louis addition, avoid obscuring the views of the Gateway Arch along its axis.

## Endnotes

1. “GMP” as used throughout this document refers to the GMP/EIS Preferred Alternative for the Memorial, as identified in the 2009 Record of Decision.
2. Robert R. Page, Cathy Gilbert, and Susan Dolan, *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* (Washington, D.C.: National Park Service, 1998).
3. U.S. Department of the Interior, *Guidelines for the Treatment of Historic Landscapes* (DRAFT, undated), prepared by the Preservation Assistance Division, National Park Service, 45.
4. Department of the Interior, National Park Service, *Director’s Order 28: Cultural Resource Management Guideline* (Washington, DC: NPS Office of Policy, 1998), 100.
5. *Director’s Order 28*, 27.
6. *Director’s Order 28*, 67.
7. The Secretary of the Interior’s *Standards for the Treatment of Historic Properties & Guidelines for the Treatment of Cultural Landscapes*, NPS Historic Landscape Initiative, [http://www.nps.gov/history/hps/hli/landscape\\_guidelines/rehab/approach.htm](http://www.nps.gov/history/hps/hli/landscape_guidelines/rehab/approach.htm).
8. The Secretary of the Interior’s *Standards for the Treatment of Historic Properties & Guidelines for the Treatment of Cultural Landscapes*.
9. Dan Kiley interview with Gina Bellavia, Mary Hughes, and Gregg Bleam, June 13, 1996 (transcript on file at JNEM). Kiley suggested the tulip poplar, London planetree (*Platanus hybrida*), ginkgo (*Ginkgo biloba*), honeylocust (*Gleditsia triacanthos*), or Eastern cottonwood (*Populus deltoides*) as possible replacements for the Rosehill ash. The single-species planting tree species should be fast-growing, tall, and deciduous. These characteristics should be balanced with maintenance concerns such as availability, resistance to insect and disease, and soil adaptability.
10. A rhythmic replacement program was suggested by Dan Kiley in an interview with Gina Bellavia, Mary Hughes, and Gregg Bleam, June 13, 1996. Transcript of the interview on file in JNEM Archives.
11. Refer to the original landscape design approved by the NPS in 1966. Copy on file in JNEM Archives, Record Unit 120, Drawer 12, Folder 10, Drawing number 3071C.
12. Dan Kiley interview with Gina Bellavia, Mary Hughes, and Gregg Bleam, June 13, 1996. Transcript on file in JNEM Archives. Kiley suggested the red oak (*Quercus rubra*) as the dominant canopy tree because it is found in the native Missouri forest. This decision should also be balanced with aspects such as availability, culture, sun and soil preference, and resistance to insects and disease.
13. Ibid. Kiley suggested using the loblolly pine (*Pinus taeda*) or pitch pine (*Pinus rigida*) to replace the black pine which generally does not perform well on the site. Aspects such as local availability, culture, sun and soil preference, and resistance to insects and disease should be considered.
14. The plantings chosen for this purpose should reflect those used for the same purpose throughout the site.
15. Ibid.
16. Dan Kiley interview with Gina Bellavia, Mary Hughes, and Gregg Bleam, June 13, 1996 (transcript on file in JNEM Archives). Kiley suggested removing the tree grates and planting groundcover in their place. This is not considered a feasible solution because of the maintenance involved in keeping the groundcover from spreading into the lawn area. Also, the groundcover would not only need to tolerate the

difficult growing conditions but would also have to withstand heavy foot traffic.

17. JNEM Archives, Record Unit 120, Drawing No. 3027. The installation of pavers would have to be coordinated with the tree replacement program since existing trees and roots will not allow their proper installation now. A landscape architect should design construction details for tree planting and paver installation.
18. Dan Kiley interview with Gina Bellavia, Mary Hughes, and Gregg Bleam. Kiley suggested the change to the benches which conforms with Saarinen and Kiley's original design for benches on the levee. See Drawing No. SD14 Details, JNEM Archives, Record Unit 120, Drawer 23, Folder 7.
19. Consider *Bega, Catalog Number Six*, page 167 for an appropriate style light fixture. This catalog and style was recommended by Dan Kiley in an interview with Gina Bellavia, June 13, 1996. A copy of the Bega catalog is on file in the JNEM Archives.
20. Transcript on file in JNEM Archives. Kiley suggested a low-bubbling fountain in the center of a paved pedestrian plaza.
21. The studies produced by Saarinen and Associates and the design produced by HB&A are on file in the JNEM Archives.
22. The east side expansion plans (past and present) were not researched in detail for this report. Material regarding the expansion can be found in various collections located in the JNEM Archives.



# Implementation Projects

## IDENTIFICATION AND DESCRIPTION OF TREATMENT PROJECTS

This chapter describes the means for implementing the “Recommended Preservation Actions” described in Chapter 5: Treatment Recommendations. The recommendations for preserving and rehabilitating the Jefferson National Expansion Memorial landscape have been developed into a series of potential implementation projects described below. The projects are intended to take the recommendations a step further, providing discrete rehabilitation and repair projects and processes that can be physically realized at the Memorial. They focus on preserving and enhancing the landscape’s significant character-defining features within the National Historic Landmark (NHL) boundary. Projects generally involve rehabilitating the designed landscape based on documentation, analysis, and recommendations provided in Chapters 1-5 of this report.

The project descriptions are organized to be compatible with the format of the NPS’s project tracking and management systems: the Facilities Management Software System (FMSS) and Project Management Information System (PMIS). The implementation projects respond to current landscape deficiencies identified by Memorial personnel in the development of this report; the documentation and findings of this report; life safety, visitor accessibility, and interpretation considerations; and goals outlined in the Memorial’s General Management Plan (GMP) completed in 2009. All potential projects are subject to review under federal Section 106 regulations.

Each overarching implementation project is presented below under a heading identifying the “deficiency” (as it is termed in FMSS) that the listed project or projects are intended to address. A brief description of each project is followed by a summary of justifications for undertaking it. Each project area is identified on a location map.

Next, the implementation process is organized in a table for each project. In each project’s table, five subheadings reference steps in the NPS Denver Service Center workflow process (predesign, schematic design, design development, construction documents, construction) with the addition of a sixth subheading, “documentation,” which is a necessary final step for projects undertaking alterations to the landscape within the NHL.

Tasks are listed in the first column, including studies and other anticipated components of the project. The second column, Expertise Needed, identifies what professional expertise or skilled technical labor is required to carry out each task. The third column, Cost Implications, summarizes the special factors or considerations that can be identified ahead of time as potentially influencing the cost of the tasks. These are based on typical mark-ups used in cost estimating (as identified in the NPS DSC Cost-Estimating Requirements Handbook, November 2007) as well as other predictable conditions that could cause fluctuations in costs.

The breakdown of tasks for each project does not include all project management, compliance and related reviews, and other management elements typically undertaken by NPS personnel as part of the planning, design, and construction phases of a project. It

is important to note that many of the potential implementation projects at the Memorial are complex, and may require additional studies to determine the full extent of each construction project and its costs.

### **Relationship to Landscape Preservation Maintenance Plan**

A related document to this Cultural Landscape Report is the Landscape Preservation Maintenance Plan for Jefferson National Expansion Memorial (scheduled for completion in 2010). The maintenance plan is based on this Cultural Landscape Report's findings and likewise focuses on the landscape within the NHL. The goal is to provide specific maintenance information to support retaining and renewing the Memorial's Modern aesthetic. The plan is expected to include specific guidance to support long-term day-to-day maintenance (such as correct pruning practices) to maintain the appropriate appearance of the landscape through cyclic practices. It will identify thresholds for maintenance, with an emphasis on vegetation. Structural elements and circulation will be addressed at a concept level, focusing on exterior aesthetic characteristics such as surface materials and retention of forms and details that are character-defining. The plan will also recommend general replacement and repair strategies and thresholds. It will not address potential new designs or planned alterations to the landscape, but may be updated periodically in the future to respond to such alterations when they occur.

### **DEFICIENCIES AND PROJECT DESCRIPTIONS**

#### **Deficiency: Poor Surface Water Drainage and Erosion**

Drainage is poor in many parts of the Memorial, in particular along the southwest portion of the system of walks. There are drainage problems which appear to be causing paving failure in some areas of large paving expanses, such as the northwest plaza and north overlook. Poor drainage contributes to erosion in steep slope areas such as those southeast of the south pond, northeast of the north pond, southwest of the north service

area, and along the railroad open cuts. In some places, overwatering by the irrigation system may be exacerbating erosion and drainage problems. Although drainage issues have been identified and treated in numerous locations within the park over time, they have not been analyzed and clearly identified at the overall landscape scale.

### **Project 1. Stormwater Management Plan**

#### **Project Description**

This project would include a watershed-level investigation and analysis of the stormwater and drainage patterns for the Memorial landscape. It would identify general and specific problems related to surface drainage and erosion and their causes, as well as noting areas with chronic drainage problems. The plan would propose a series of unobtrusive drainage improvements that could be implemented consistently throughout the landscape.

The plan would integrate existing information from previous studies, as well as conditions identified during maintenance and repair projects in recent years. This information would then be used to develop a Memorial-wide plan for stormwater management that is in keeping with goals for preservation of character-defining features of the landscape. The plan would serve as a basis for future repair, rehabilitation, and construction projects.

#### **Justification**

By approaching stormwater management in a holistic manner rather than focusing only on trouble spots and discrete project sites, this project can address larger-scale stormwater problems causing maintenance issues throughout the Memorial landscape. The big-picture analysis and provision of Memorial-wide solutions would support retention and maintenance of the character-defining features of the landscape in the NHL when managing drainage and erosion. The plan provides efficiency by eliminating redundant predesign studies for future construction and repair projects.

**Project 1 Implementation Process**

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Memorial-wide stormwater management plan	Landscape architect or engineer specializing in stormwater, supported by (as needed): civil engineer, historical landscape architect, cultural resource specialist, Memorial staff, NPS Region and/or DSC staff	Up-front planning and engineering costs to coordinate Memorial-wide plan; potential future efficiencies for pre-design and design phases of individual projects; better design solutions could reduce long-term design, construction, and maintenance costs
<b>2.0 Schematic Design</b>		
<i>Not applicable</i>	-	-
<b>3.0 Design Development</b>		
<i>Not applicable</i>	-	-
<b>4.0 Construction Documents</b>		
<i>Not applicable</i>	-	-
<b>5.0 Construction</b>		
<i>Not applicable</i>	-	-
<b>6.0 Documentation</b>		
<i>Not applicable</i>	-	-

**Deficiency: Diminished Integrity of Significant Views And Vistas**

Some significant designed views and vistas at the Memorial have been interrupted by non-historic vertical features. The maintenance facility and service areas are insufficiently screened from view. These integrity-diminishing conditions are complex due to varying responsibilities, such as utility and traffic features along Memorial Drive in the middle of the Memorial’s main vista. These conditions are potentially reversible with mitigation measures (such as undergrounding overhead utilities, or adding appropriate screening) that could improve the integrity of the Memorial landscape.

**Project 2. Visual Quality Assessment and Concept Plan**

**Project Description**

This project would focus on determining ways to enhance—and mitigate existing intrusions of—the character-defining views

within the Memorial landscape, including the major north-south and east-west vistas and the views to the Gateway Arch from the pond areas, overlooks, along the walks. The study would also consider views into the grounds from along the street perimeter and from the observation deck at the top of the Gateway Arch. The visual quality assessment would determine where views and vistas are obstructed or infringed upon by non-contributing features (such as street lights, utility poles, highway signs, bright or light-colored features in service areas of park, and security cameras); the concept plan would provide options and strategies to mitigate these problems, including identifying the parties and agencies with jurisdiction over identified intrusive features (such as overhead traffic signals, signs, and utilities on aerial poles), partnership opportunities and necessary coordination, and potential for phasing of enhancements as part of other projects.

Taking security and sustainability considerations into account, the plan would also identify areas for potential adjustment

of locations of security cameras and lighting within the grounds; and targeted pruning of tree branches where they are blocking views, such as along the north-south axis of the Memorial.

**Justification**

Views are essential to visitor experience and to conveying the design intent of Saarinen/Kiley for the Memorial. The presence

of non-contributing vertical elements interrupting these views diminishes the integrity of the Memorial landscape. This project would support the reversal of these conditions, which would enhance both visitor experience and the integrity of the Memorial landscape. Developing a coordinated plan supports efficiencies and opportunities to include view enhancements as part of other projects or in coordination with other responsible agencies.

**Project 2 Implementation Process**

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Memorial-wide visual quality assessment and concept plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs to coordinate Memorial-wide plan; potential future efficiencies for predesign and design phases of individual projects; better design solutions could reduce long-term design, construction, and maintenance costs of rehabilitating views, and support cooperative process with partners such as utility company, MODOT, etc.
<b>2.0 Schematic Design</b>		
<i>Not applicable</i>	-	-
<b>3.0 Design Development</b>		
<i>Not applicable</i>	-	-
<b>4.0 Construction Documents</b>		
<i>Not applicable</i>	-	-
<b>5.0 Construction</b>		
<i>Not applicable</i>	-	-
<b>6.0 Documentation</b>		
<i>Not applicable</i>	-	-

### Project 3. Enhance Screening of Service Areas And Maintenance Facility

#### Justification

#### Project Description

In coordination with the visual quality assessment described above in Project 2, this project would involve enhancement of screening plantings around the north and south service areas and the maintenance facility (see Figure 6.1 for general areas). A planting plan would be developed and implemented, based on an understanding of the original Saarinen/Kiley intention for plantings, with the goal of enhancing screening of the maintenance facility and north and south service areas.

These service and functional areas were intended to be screened from view of visitors to the Memorial by a combination of topography and vegetation. While the topographic changes remain effective, the vegetation is missing or otherwise ineffective in screening views in some areas, especially around the maintenance facility. Views of these service areas diminish the integrity of the cultural landscape. This condition is reversible through addition of appropriate vegetation to increase the visual buffer.



Figure 6.1 Project 3: Enhance Screening of Service Areas And Maintenance Facility.

## Project 3 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Memorial-wide visual quality assessment and concept plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs to coordinate Memorial-wide plan (see Project 2 above); cost of compliance review (verify compliance requirements); potential efficiency due to having a coordinated sub-area plan in place to streamline implementation (having estimated phasing, budget, scope, compliance completed); phasing allows a coordinated process for budgeting
<b>2.0 Schematic Design</b>		
Develop alternatives for planting (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed planting plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for planting	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Install plants	Landscape contractor; Memorial staff, NPS Region and/or DSC staff	Historic preservation factor will apply; complexity of construction logistics; maintenance of ongoing operations (visitor experience); variable costs including: number and size of plants to be added or replaced and number of plants to be retained, extent of protection needed for plants to remain, possible alterations to irrigation system configuration, extent of lawn areas requiring repair, availability, size, and age of new plants, date (season) of planting
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

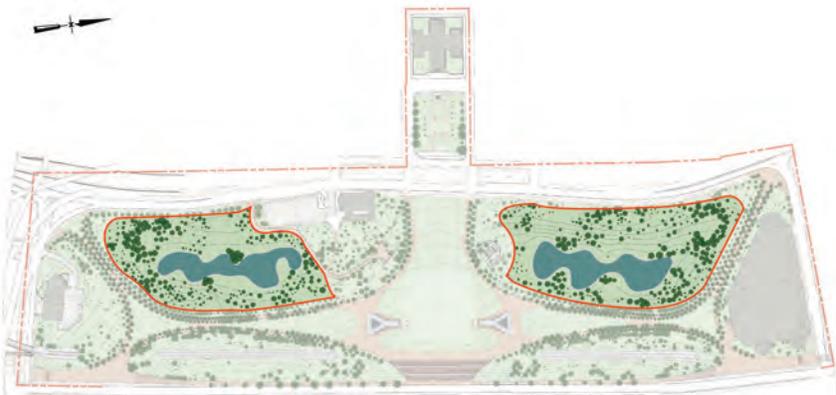


Figure 6.2 Project 4: Rehabilitate Pond Area Plantings to More Closely Represent Design Intention.

### Deficiency: Plantings Around Ponds do Not Reflect Design Intention

The existing plantings do not reflect Saarinen/Kiley’s design intention for the planting of the pond areas. The plantings around the ponds were installed more than a decade after the final planting plan designed by Dan Kiley and approved by the National Park Service. These plantings generally reflect the as-built 1980 NPS installation, which varied somewhat from the approved Kiley plan due to funding constraints, substitutions, and lower numbers of plants than originally specified. Incrementally, design development leading up to the 1980 installation altered the plantings from Kiley’s stated intention of a limited number of species composing an abstracted forest and meadows. After the plantings were initially installed, replacements and alterations made over time were made in reference to the 1980 plan. These ultimately changed the appearance of the pond areas even further due to past management decisions, such as experimenting with adding individual or small groups of new tree species or varieties to identify better-performing species for replacement tree plantings. Unintentionally, this and other practices resulted in a park-like landscape appearance that did not convey the character of Kiley’s design intention, and resulted in an increased number of tree species, low turf lawn and mulch rings, and additions of small groupings of trees in lawn. As a result, these areas of the landscape have diminished integrity.

### Project 4. Rehabilitate Pond Area Plantings to More Closely Represent Design Intention

#### Project Description

This project would rehabilitate the plantings surrounding the ponds to more closely realize Kiley’s “forest/meadow” concept for these areas evident in his 1966 NPS-approved planting plan. This project involves the area of the Memorial surrounding the ponds, bounded by the single-species allée plantings lining the walks (see Figure 6.2 for approximate area).

The project would consider the feasibility of using lower-maintenance, taller, and/or native grasses, as well as the potential reconfiguration of trees to more closely reflect the spatial arrangement and plant composition in the 1966 approved Kiley plan. A pre-design study would consider the feasibility of using Kiley-specified plants, and would determine appropriate substitutions where necessary. Because some of the original plants in the Kiley plan did not survive well, potential substitutions would be identified that convey similar form and character to the intended planting but are more hardy and suitable to site conditions. The project would refer to the original design drawings from the JNEM Archive, as well as this CLR and other existing studies, and would take into consideration stormwater management, security concerns, and sustainability goals.

**Justification**

The rehabilitation of this important planting would mitigate incremental changes that have occurred over time, and bring existing landscape character closer to the intended

design. It has the potential to increase the integrity of the landscape within these highly visible areas of the Memorial. Furthermore, resulting changes to mowing and irrigation regimes may assist the Memorial in meeting landscape sustainability goals for water, fuel, and energy use.

**Project 4 Implementation Process**

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Pond area concept plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs; cost of compliance review (verify compliance requirements); later potential efficiency due to having a coordinated sub-area plan in place to streamline implementation (by having estimated phasing, budget, scope, compliance completed); phasing allows a coordinated process for budgeting
<b>2.0 Schematic Design</b>		
Develop alternatives for planting (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed planting plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for planting	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Install plants	Landscape contractor; Memorial staff, NPS Region and/or DSC staff	Historic preservation factor will apply; complexity of construction logistics; maintenance of ongoing operations (visitor experience); variable costs including: extent of protection needed for plants to remain, possible alterations to irrigation system configuration, extent of lawn areas requiring repair, availability, size, and age of new plants, date (season) of planting
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

## **Deficiency: Rosehill Ash Trees Threatened by Borer**

The Rosehill ash trees in the single-species allées along the walks throughout the Memorial are expected to require replacement with a different tree species due to threat of emerald ash borer infestation. The NPS Emerald Ash Borer Working Group has been studying the issue and produced a draft report in 2009 documenting potential short-term replacement strategies; concurrently, the development of alternatives for tree replacement implementation and an Environmental Assessment were under way at the time of the writing of this CLR.

The replanting of the trees in-place is connected to a series of other issues, since the trees are planted in and along the edges of the concrete aggregate walks (addressed in Project 6). The tree pits will likely require soil amendment and rehabilitation, if not complete reconstruction, to ensure future tree health; stormwater management and drainage are also major considerations. The tree pits are covered with non-contributing tree grates that, in addition to maintenance and aesthetic concerns, present a tripping hazard and in some cases adversely impact the health of the trees. These deficiencies are inextricably connected due to the close physical proximity of the trees, tree pits, walks, and grates; remedying these issues will need to be closely coordinated as parts of an overall landscape rehabilitation process.

## **Project 5. Rehabilitate Single-Species Allée Plantings**

### **Project Description**

This project affects all the Rosehill ash trees in the single-species plantings lining the walks throughout the main part of the Memorial grounds (see Figure 6.3 for general area). All the trees would be replaced in their existing locations, but possibly with a substitute tree species (to be selected). A phasing plan for replacement of the trees would be developed based on identification of how to implement the project with the least impact to the Memorial landscape and the visitor experience.

A soil testing report is essential to support design development. This report would be undertaken to provide recommendations for soil rehabilitation and protection from compaction in the allée root zones, focusing particularly on the tree pits. This could involve a more comprehensive study to determine the need for and feasibility of a sub-surface structural soil system to support tree health (which would also necessarily overlap with rehabilitation of the system of walks, described in Project 6).

The Emerald Ash Borer Strategy (currently in progress) and Environmental Assessment (currently in progress) would serve as bases for development of this project, which would also reference this CLR and other existing studies. The project would also take into consideration stormwater management, security concerns, and sustainability goals.

### **Justification**

The single-species allée plantings are an essential character-defining feature of the Memorial landscape and the NHL. These plantings are threatened by the emerald ash borer (as described in Chapter 3 of this report) and much study has already gone into determining how to best maintain the planting without damaging its significant character. This project undertakes the replacement of the trees in a manner that would have a minimal impact to the landscape.

## Project 5 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Predesign studies in progress: Emerald Ash Borer Strategy, tree selection workshop, Environmental Assessment	NPS EAB Working Group; Historical landscape architect, arborist or urban forester, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs; cost of compliance review (verify compliance requirements); later potential efficiency due to having a coordinated sub-area plan in place to streamline implementation (by having estimated phasing, budget, scope, compliance completed); phasing allows a coordinated process for budgeting
Predesign study: Soil Testing Report	Soil scientist or agronomist	Number of test locations; up-front cost of study; possible implementation of tree pit and soil changes; ensuring in advance of tree planting that soil and tree pits can support tree health may reduce long-term maintenance and replacement costs
<b>2.0 Schematic Design</b>		
Develop alternatives for planting (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed planting plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for planting	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Install plants	Landscape contractor; Memorial staff, NPS Region and/or DSC staff	Historic preservation factor will apply; complexity of construction logistics; maintenance of ongoing operations (visitor experience); variable costs including: extent of protection needed for plants to remain, rehabilitation of tree pits and soil, possible alterations to irrigation system configuration, extent of lawn areas requiring repair, availability, size, and age of new plants, date (season) of planting
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

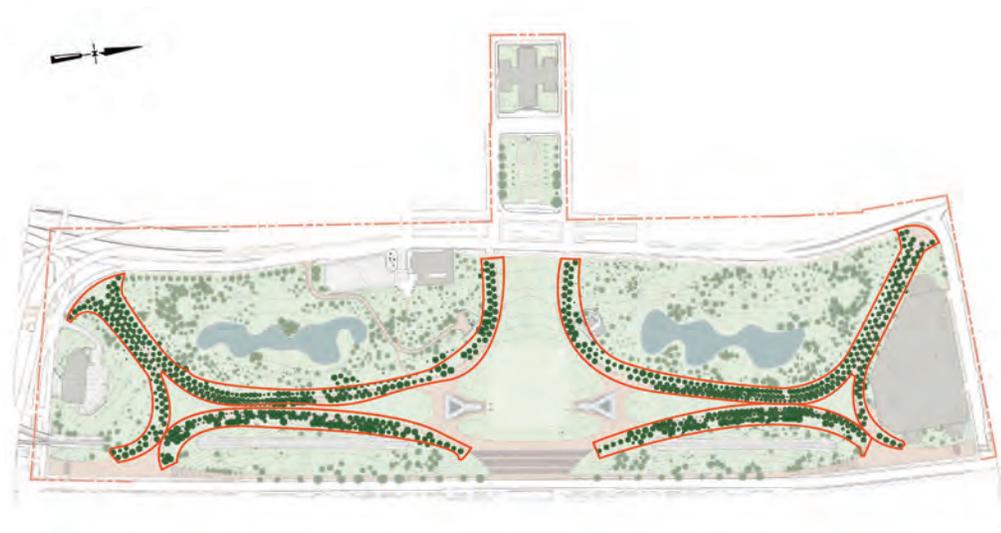


Figure 6.3 Project 5: Rehabilitate Single-Species Allée Plantings.

### Deficiency: Inadequate Drainage and Related Issues at Walks

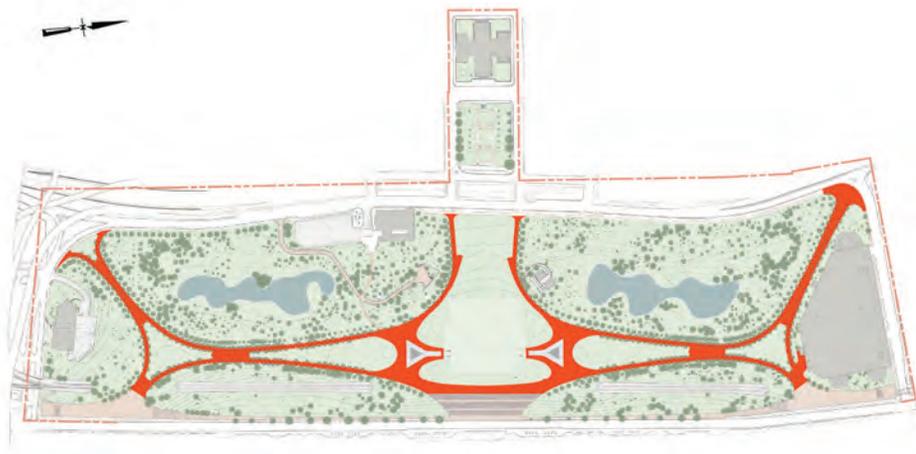
The concrete aggregate walks throughout the Memorial present difficulties for maintenance. Grass-covered, tree-shaded slopes along the walks, and tree roots pushing up paving, have led to chronic drainage and erosion issues, requiring replacement, mud-jacking to re-level areas, and other maintenance interventions. While the specific aggregate and redwood strips used are not necessarily essential to the character of the walks, the continuous appearance of the surface is critical, so any repairs must match the existing materials as closely as possible. However, matching the original aggregate has become difficult over time. The expansion joints are of redwood, which is expensive and difficult to replace as it degrades, and in some areas it has been supplemented with caulk, which is more easily available but not in keeping with the character of the Memorial landscape. The walks also include non-historic grates covering tree pits that, in addition to maintenance and aesthetic problems, present a tripping hazard and adversely impact the health of the trees. These deficiencies are inextricably connected to tree replacement (Project 3) due to the close physical proximity of the trees, tree pits, walks,

and grates; likely they will be best addressed as parts of the same overall landscape rehabilitation process.

### Project 6. Rehabilitate System of Walks

#### Project Description

This project affects the entire system of concrete-aggregate walks within the Memorial, with the exception of the plazas on the overlooks. These walks are an essential character-defining feature of the Memorial; their curving form, uniform surface appearance, and the manner in which the aggregate paving visually recedes into the ground plane beneath the trees are all important characteristics. This project would replace the concrete sidewalks in-place and in-kind. It would give consideration to whether changes to the aggregate type that would permit easier replacement and maintenance in the future could be undertaken without diminishing the integrity of the walks. It would explore the possibility of phasing large sections of the work to minimize impact to visitor experience, and coordinating with the tree replacement and rehabilitation of the planting system (see Project 5). Another consideration is the removal of tree grates, and determination



**Figure 6.4 Project 6: Rehabilitate System of Walks.**

of replacement options; the use of levee block, as originally detailed by Saarinen/Kiley, would be investigated, as this option would more closely represent the original design intention, and could support sustainability and stormwater management goals as well.

In coordination with the stormwater management plan for the overall Memorial grounds (see Project 1), this project may include design and installation of an enhanced stormwater management system along the edges of the walks. This project would refer to this CLR, as well as undertaking pre-design review of relevant historic construction documents, as-built, and record drawings for the walks, and other relevant studies. The project would also take into consideration security and sustainability goals.

### Justification

The system of walks is an essential character-defining feature of the Memorial. The uniform appearance of the paving reflects the Modern design of the feature, so any major repair or replacement must blend into the existing materials; or, if new materials are desired, they must be replaced throughout the entire system. Changes to the curving walk edges or the uniform character of the materials may diminish the integrity of the landscape. In addition, there are related issues concerning tree pits, tree replacement, drainage, and tree

grates that must be considered. This project would address these complex considerations, retaining the character of the walk system and ameliorating the condition problems while also coordinating with other related projects.

### Deficiency: North and South Overlooks are in Poor Condition

It is evident that while many surface repairs have been undertaken at the overlooks over time, recurring problems continue, likely caused by underlying issues that may be identified through a detailed internal and external structural assessment of the overlooks. This CLR looks only at the surface conditions, and does not include a structural assessment; surface conditions indicate the likely existence of underlying issues that cannot be diagnosed on the surface.

Surface conditions observed include the following. The north and south overlooks have visible condition problems, including spalling concrete, cracking, and pieces of concrete falling from the floodwalls. The top of the north overlook plaza walls is efflorescing and crumbling in places; expansion joints along the base of the wall and mortar joints under the cap are failing. The Sika Top coating applied to the surface of the viewing platforms, steps, and overlook staircases is in poor condition (cracking, spalling, and falling off in pieces). The nearly one-inch-thick Sika Top coating

## Project 6 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Pre-design studies: coordinate with studies described above for projects 1, 2 and 5: stormwater management plan, visual quality assessment, and rehabilitation of single-species allée planting	Not applicable	Not applicable
<b>2.0 Schematic Design</b>		
Develop alternatives for rehabilitation (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed design development drawing set (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for rehabilitation of walks (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Construct/repair rehabilitated walks	Landscape contractor	Historic preservation factor will apply; complexity of construction logistics for access to project site; maintenance of ongoing operations (visitor experience); variable costs including: extent of protection needed for adjacent plantings and features, possible grading for drainage repair, extent of lawn areas requiring repair, others
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

used to repair the north and south staircases to the overlooks is failing, and poor surface drainage is also evident. At the south overlook, the paving appears to be separating from its foundation where the wall begins on the west side of the plaza. On the floodwalls, vertical cracking and water seepage are visible.

### **Project 7. Overlooks Historic Structure Condition Assessment and Treatment Plan**

#### **Project Description**

This project affects the entire north and south overlooks, including the floodwalls, plazas, viewing platforms, stairs to viewing platforms, and large staircases between the plazas at the top of the overlooks and Leonor K. Sullivan Boulevard. The overlooks are clearly in need of attention, but any future action rests upon determining the underlying causes of visible damage and the structural condition of the overlooks. Prior to undertaking any major repair, reuse, or rehabilitation work at the overlooks, a detailed structural assessment of both north and south overlooks would be undertaken. The study would be akin to a Historic Structure Report, with appropriate research and testing, documentation of conditions on both interior and exterior of the overlooks, and detailed recommendations for treatment. Because the overlooks include walls that are part of the city's floodwall system, a hydraulic engineer would also be included in the process to ensure any planned treatment is coordinated with flood control requirements. Once discovered and identified, condition problems can be addressed through

a comprehensive rehabilitation project for the structures followed by appropriate long-term maintenance.

The elements to be addressed would include the interior and exterior of the overlooks, the plaza paving and substrate, viewing platforms, and the floodwalls. Existing PMIS projects could be coordinated with this overall project to avoid duplication and promote efficient use of resources. Existing projects in the PMIS system address repairs of the north and south staircases, rebuilding the stairs to viewing platforms.

Other considerations could include a feasibility study and potential rehabilitation of the interior overlook spaces; study of potential for adaptation to visitor uses to support goals of the GMP; and design and replacement of the non-contributing guardrails and handrails on the viewing platforms with code-compliant, compatible new railings.

The project would refer to the stormwater management plan, this CLR, and other existing studies, and would also take into consideration security and sustainability goals.

#### **Justification**

The overlooks are major character-defining features of the Memorial landscape. They are in poor condition despite evidence of numerous surface repairs and patches over time. Maintaining these essential elements of the Saarinen/Kiley landscape requires a better understanding of the underlying issues that may be responsible for ongoing condition



**Figure 6.5 Project 7: Overlooks Historic Structure Condition Assessment.**

## Project 7 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Predesign study: Historic Structures Report and recommendations, other feasibility studies	Structural engineer with historic concrete structures experience; historical architect, materials conservator, historical landscape architect	Structural assessment will require specialists who are experienced in mid-20th-century concrete structures and understand the historic preservation issues involved.
<b>2.0 Schematic Design</b>		
Develop alternatives for rehabilitation (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs; doing both overlooks at same time could provide cost efficiencies
<b>3.0 Design Development</b>		
Develop selected alternative into detailed design development drawing set	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction documents	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Construction work	Contractor with experience rehabilitating historic concrete structures	Could vary widely depending on the findings of the HSR; floodwall requirements may result in cost increase; historic preservation factor will apply; there will be a heightened level of complexity of construction logistics for access to project site; will need to plan for mitigation of potential disruptions to visitor experience during construction.
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical architect and historical landscape architect	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

problems on the surfaces of the overlooks. A holistic approach to the overlooks is the most efficient, effective method of preserving them over the long term, thereby enhancing the visitor experience and the integrity of the Memorial landscape.

### Deficiency: Existing Plantings do not Reflect Design Intention

The existing plantings do not reflect Saarinen/Kiley's design intention for planting at the Memorial in a few areas, specifically at the parking garage, and also along the slopes along the railroad open cuts and tunnels.

The plantings at the parking garage are non-contributing and unrelated to the Kiley plan. The plant selection is unlike other areas of the Memorial grounds and there are ongoing maintenance problems with the plants around the garage. As a result, the plants are in poor condition, there are erosion and drainage problems, and this area has diminished integrity.

The plantings on the slopes by the railroad open cuts were not implemented entirely in keeping with the Kiley 1966 approved planting plan. Substitutions and alterations occurred for various reasons, including funding limitations, during the NPS design development, reflected in the 1980 implementation. Subsequent management decisions and maintenance practices have incrementally changed the

plantings but they remain different from the intended appearance. This area was intended by Kiley to have a densely planted character, but today much of it is in low turf lawn with scattered trees, some of which are declining. In addition, many of the sloped areas that are currently lawn cover are suffering from erosion.

### Project 8. Redesign Parking Garage Plantings to Align with Planting Design of Larger Memorial Landscape

#### Project Description

This project would redesign and replace the non-contributing plantings around the parking garage to make them more compatible with the character of contributing plantings in the rest of the Memorial (see Figure 6.6). The project would also include repair and stabilization of eroding slopes around the garage area, and would refer to the stormwater management plan, this CLR, and other existing studies. The project would also accommodate security and sustainability goals.

#### Justification

This is the first area of the Memorial landscape viewed by visitors as they exit the parking garage on their way to the Gateway Arch. The redesign of plantings in this area would bring it closer in appearance to the other compatible

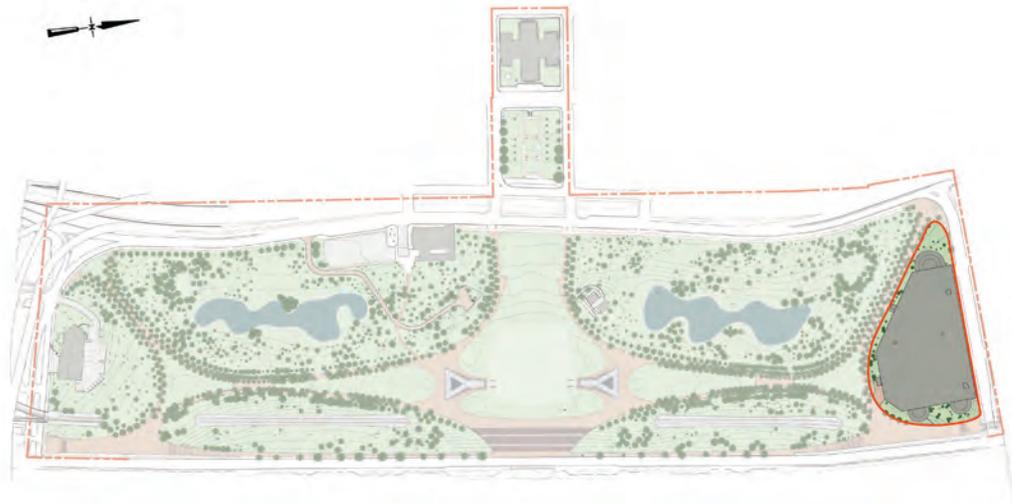


Figure 6.6 Project 8: Redesign Parking Garage Plantings to Align with Planting Design of Larger Memorial Landscape.

## Project 8 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Parking garage area concept plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs; cost of compliance review (verify compliance requirements); potential efficiency due to having a coordinated sub-area plan in place to streamline implementation (by having estimated phasing, budget, scope, compliance completed); phasing allows a coordinated process for budgeting
<b>2.0 Schematic Design</b>		
Develop alternatives for planting (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed planting plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for planting	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Install plants	Landscape contractor; Memorial staff, NPS Region and/or DSC staff	Historic preservation factor may apply; complexity of construction logistics; maintenance of ongoing operations (visitor experience); variable costs including: extent of protection needed for plants to remain, possible alterations to irrigation system configuration, extent of lawn areas requiring repair, availability, size, and age of new plants, date (season) of planting
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

and contributing plantings throughout the Memorial, and has the potential to enhance the integrity of the landscape.

### **Project 9. Rehabilitate Plantings Along Railroad Open Cuts to More Closely Represent Design Intent**

#### **Project Description**

This project would affect the non-contributing plantings on the slopes on the east and west sides of the north and south railroad open cuts (see Figure 6.7). This project would repair erosion and rehabilitate the appearance of the slopes around the open cuts to be more in keeping with Kiley's intention for the plantings. This project would include a predesign review of the 1966 design drawings including grading plans and Kiley planting plan for this area. Because some of the original plants in the Kiley plan did not survive well in this location, the design process would also

consider potential substitutions that convey similar form and character to the intended planting but are more hardy and suitable to site conditions. The project could also include assessment, repair and stabilization of the south tunnel slope (an existing PMIS project that could be coordinated with this project). The project would also include repair and stabilization of other eroding slopes around the tunnels and cuts, and would refer to the stormwater management plan, this CLR, and other existing studies. The project would also accommodate security and sustainability goals.

#### **Justification**

The redesign of plantings in this area would bring them closer in appearance to the contributing plantings throughout other areas of the Memorial, as well as ameliorate erosion and drainage problems, has the potential to increase the integrity of the landscape.



**Figure 6.7 Project 9: Rehabilitate Plantings Along Railroad Open Cuts to More Closely Represent Design Intent.**

## Project 9 Implementation Process

TASK	EXPERTISE NEEDED	COST IMPLICATIONS
<b>1.0 Predesign</b>		
Parking garage area concept plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Up-front planning costs; cost of compliance review (verify compliance requirements); potential efficiency due to having a coordinated sub-area plan in place to streamline implementation (by having estimated phasing, budget, scope, compliance completed); phasing allows a coordinated process for budgeting
<b>2.0 Schematic Design</b>		
Develop alternatives for planting (by phase)	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	If pre-design tasks are not completed, some of the steps would have to occur in schematic design phase, potentially increasing costs
<b>3.0 Design Development</b>		
Develop selected alternative into detailed planting plan	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>4.0 Construction Documents</b>		
Develop construction contract documents for planting	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Not applicable
<b>5.0 Construction</b>		
Install plants	Landscape contractor; Memorial staff, NPS Region and/or DSC staff	Historic preservation factor may apply; complexity of construction logistics; maintenance of ongoing operations (visitor experience); variable costs including: extent of protection needed for plants to remain, possible alterations to irrigation system configuration, extent of lawn areas requiring repair, availability, size, and age of new plants, date (season) of planting
<b>6.0 Documentation</b>		
Post-construction documentation of changes to landscape	Historical landscape architect, Memorial staff, NPS Region and/or DSC staff	Would likely involve professional fees above and beyond a typical scope of services for design; could be integrated into maintenance planning process or undertaken as part of a CLR Part III treatment documentation

This table identifies the phasing of implementation projects in terms of how far into the future they are recommended to occur.

**Phasing Chart of Projects**

PROJECT	WITHIN 5 YEARS	5-10 YEARS	10-15 YEARS
1. Stormwater Management Plan	●		
2. Visual Quality Assessment and Concept Plan		●	
3. Enhance Screening of Service Areas and Maintenance Facility	●		
4. Rehabilitate Pond Area Plantings			●
5. Rehabilitate Single-Species Allée Plantings	●		
6. Rehabilitate System of Walks		●	
7. Overlooks Historic Structure Condition Assessment and Treatment Plan	●		
8. Redesign Parking Garage Plantings			●
9. Rehabilitate Plantings Along Railroad Open Cuts			●

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# Appendix A: List of Landscape Contracts & Contractors



The following is a list of major landscape contracts and contractors who completed work on the Arch grounds. A second list of contracts, which were not researched in detail for the purposes of this report, is also included.

Kozeny-Wagner Construction Company  
(Construction Contract)

Contract #: 14-10-7-971-267

Project No.: JEF S363

Duration: June 1970-July 1972

Description: Site Development-Phase I; Schedule I-Grading and Drainage, Schedule II-Waterproofing and Drainage of Visitor Center, Schedule III-Seeding. The project consists of grading along the north-south axis of Arch, Visitor Center roof water proofing, drainage, and seeding.

Plans and Specs.: Drawing No.: 366/41001-C dated August 1969, revisions 1/70 and 4/70; drawn by Patten and checked by Ronscavage, EODC and Western Service Center Office of Environmental Planning and Design.

Cost: \$419,955.00

Documentation: Original specifications; plans; Globe-Democrat 6/20/70.

Millstone Associates, Inc. (Construction Contract)

Contract #: 4970B10107

Duration: August 13, 1971-August 1972

Description: Site Development, Phase II, Schedules I & II; sidewalks, roads to HVAC and SHIPREC. 280 tree wells, 14 concrete benches, topsoil.

Plans and Specs.: developed by NPS - 366/41009 (18 sheets).

Cost: Unknown

Documentation: Specifications for Site Development Phase II; Weekly Field Reports (JEFF Archives, unprocessed Rennison Collection)

Suburban Tree Service (Construction Contract)

Contract #: 4970B20053

Work Order #: 6525-8025-404 (366-03X20025)

Project No.: JEF-S371

Duration: 11/30/71-5/15/73

Description: Planting Plan-Phase I. Grounds construction, grounds preparation, and seedling tree planting. 573 trees including Rosehill ash, black pine, and Eastern redbud. Planting along the north-south axis up to rest

areas on west side and up to overlooks on east side. Levee block surrounding trees. Pines and Redbud planted on west side of RR tunnels.

Plans and Specs.: Drawing No.: 366/41006 dated August 1971 by John Ronscavage, Western Service Center Office of Environmental Planning and Design.

Cost: \$135,562.50

Documentation: Completion Report dated April 16, 1974. Photograph captions on last three pages but photos not included. (JEFF Archives, unprocessed Rennison Collection). Comments: October 1972 there was failure of ash tree predominantly on the north end of the site. Experts judged the cause to be excess moisture and/or planting too deep.

Millstone Associates, Inc. (Construction Contract)

Contract #: 4970B2009

Duration: June 1972

Description: Site Development, Phase II, Schedules III & IV; sprinkler system.

Plans and Specs.: Unknown.

Cost: Unknown

Documentation: Weekly Field Reports (JEFF Archives, unprocessed Rennison Collection).

Harland Bartholomew (A/E Contract)

Contract #: CX 2000-3-0033

Work Directive #: 0033-73-1

Duration: 1/73- contract completion date unknown

Description: Title I: preparation of topographical or field surveys, test borings, other subsurface data; Title II: adaptation of Government designs, drawings, and specs., preparation of preliminary and final working drawings, advice and interpretation of plans and specs. during construction; Title III: supervision and inspection of construction, review and approval of shop drawings, preparation of operation manuals, preparation of as-constructed drawings.

Plans and Specs.: Drawing No. 366/41019 resulted from this contract.

Cost: \$78,430.00 before change orders

Documentation: Copy of contract, correspondence

Hankins Construction Company  
(Construction Contract)

Contract #: CX6000-4-9017

Duration: 6/21/74-11/20/74

Description: Temporary Maintenance Building.  
Project #: 6520-5591  
Plans and Specs.: Produced by Roy J. Scown, Assistant Chief of Maintenance, JEFF. (NPS 366/60010, JEFF Archives, Record Unit 120, D-120-519).  
Cost: \$57,723.00  
Documentation: Completion Report - Temporary Maintenance Building, (JEFF Archives, unprocessed Rennison Collection).  
Sahrman Construction Company (Construction Contract-concrete)  
Contract #: CX-6000-4-9018  
Work Order #: 6525-7601-503  
Duration: 8/12/74-11/26/74  
Description: Overlook Paving.  
Plans and Specs.: HBA; drawing # 366/41018A (9 sheets)  
Cost: \$116,330.10  
Documentation: Completion Report.  
Notes: Other contracts as subcontractor under Schuster Engineering included ponds in 1979, and walks in 1980.

Harding Electric Company (Construction Contract)  
Contract #: 6000-4-9009  
Duration: 2/18/74-8/3/74  
Description: Walk and Area Lighting. 45 light fixtures, standards, etc.  
Plans and Specs.: DSC, J. Johanningsmeier  
Cost: \$148,580.98  
Documentation: Completion Report-contains photographs and they show levee block around the trees.

Kozeny-Wagner Construction Company (Construction Contract)  
Contract #: CX6000-5-9005  
Work Order #: 6520-7602-503  
Duration: 7/1/75-6/10/76  
Description: Monumental Entrance.  
Subcontractors: Allied Plumbing Contractors (drainage); Louis Payne Electric Company (electric); Valley Sod Inc.  
Plans & Specs.: HBA; preliminary surveys by HBA; drawing # 366/41031  
Cost: \$612,137.69  
Documentation: Contract, completion report, receipts, daily and weekly work reports. (JEFF Archives, unprocessed Rennison Collection).

Harland Bartholomew and Associates (A/E Contract)  
Contract #: CX 2000-7-0013  
Duration: 4/77- contract completion date unknown  
Description: Reformat Existing Site Development, Drawings, Specifications and Update Cost Estimates.  
Plans and Specs.: HB&A; Resulted in drawings 366-41037, 41039, 41035.  
Cost: \$94,757.18  
Documentation: Copy of contract, correspondence (Denver Service Center Storage Accession No: 079-86-0008, copy on file in JEFF Archives).

Schuster Engineering (Construction Contract)  
Contract #: CX 6000-8-9003  
Project #: S427  
Duration: 3/78 - contract completion date unknown  
Description: Site Development Phase I, II, III; Walk and Area Lighting. This project consists of the installation of: water mains, storm drainage system, electrical distribution, and paving of concrete road and walkways, and landscaping including top soiling, seeding, and tree wells.  
Subcontractors: Sahrman Contracting Company (concrete)  
Gartland Company Incorporated (plumbing)  
Samuel Kraus Company (engineering)  
Shelton & Sons Landscaping (planting)  
Plans and Specs.: HB&A; drawing #'s 366/41035; 366/41037; 366/41039  
Cost: \$2,890,179.89 initial bid price  
Documentation: Specifications for Site Development, Phases I, II, III, Walk and Area Lighting (JEFF Archives, unprocessed Rennison Collection).

Shelton & Sons Landscaping (Construction Contract)  
Contract #: CX 6000-9-9003, package 206  
Project #: (I.F.B.) 6520-79A  
Duration: 1978-1981; 605 days  
Description: Planting Plan-Phase II. This project consists of site landscaping including (1) planting trees, shrubs, and ground cover, (2) seeding lawn areas, (3) spreading imported topsoil, and (4) extension of irrigation system.  
Plans and Specs.: Drawing No. 366/41047 (as constructed drawings) dated 12/78,

Ronscavage, Stewart, Wenk Denver Service Center, 23 sheets.  
Cost: \$1,031,030.20  
Documentation: Work reports, correspondence, receipts, misc. (JEFF Archives, unprocessed Rennison Collection).

Schuster Engineering, Inc. (Construction Contract)  
Contract #: CX 6000-9-9005, package 225  
Duration: 1981  
Description: Entrance repairs  
Plans and Specs.: Unknown.  
Cost: \$598,951.00  
Documentation: Firearms Fund Insurance Companies, correspondence, general form, status inquiry (in box labeled 'Site Development, Phases I, II, and III, Walk and Area Lighting').

Treeland Nurseries (Construction Contract)  
Contract #: CX6000-5-0049; File S7212  
Federal Records Center  
Duration: 9/26/85-5/27/86  
Description: Replace mugo pine, pyracantha, and fragrant sumac on top of levee slope, south of Monumental Entrance, along fenceline and railroad open cut walls, north and south of the stairway, on slope around south service center entrance to visitors center, around fenced area of generator building.  
Plans and Specs.: Unknown  
Cost: Unknown  
Documentation: Administrative History by Bob Moore, p.115, Superintendent's Annual Report for 1986, p.7.

Treeland Nurseries (Construction Contract)  
Contract #: CX6000-6-0032; File S7217  
Federal Records Center  
Duration: 9/23/86-12/19/86  
Description: Replace dead trees. Grounds crew planted 68 of these new trees, while Treeland Nurseries planted a total of 110 trees and 1,330 shrubs.  
Plans and Specs.: Unknown.  
Cost: Unknown.  
Documentation: Administrative History by Bob Moore, p.115, Superintendent's Annual Report for 1986, p.7.

Other Contract (less information known):

Saarinen & Associates (A/E Contract)

Contract #: 14-10-529-2039  
Duration: 1959-1969 (contract completed by successor firm of Kevin Roche John Dinkeloo and Associates)  
Description: Design and construction documents for Gateway Arch.  
Plans and Specs.: Saarinen and Associates  
Documentation: Miscellaneous correspondence and contract-related material (JEFF Archives, Record Unit 106, box 38, folder 17).  
Comments: at least six amendments to contract (sixth made in 1963). The contract was not researched extensively for the purposes of this report. Most information could potentially be found in the JEFF Archives.

Davey Tree Service (Construction Contract)  
Duration: 1986  
Description: Transplant 28 Rosehill ash trees.

Fred Weber, Inc. (Construction Contract)  
Duration: 1987  
Description: Parking garage and landscaping.

Hillside Gardens (Construction Contract)  
Duration: November 1988  
Description: Replaced 186 trees, 18 species.  
Documentation: Administrative History by Bob Moore, p.115, Superintendent's Annual Report for 1986, p.7.

Hoel-Steffen (Construction Contract)  
Contract #: 14-10-0232-774  
Duration: 10/19/65-10/17/66  
Description: Gateway Arch and Interim Visitor Center

Rock Hill Mechanical Corporation  
(Construction Contract)  
Contract #: CX 6000-6-9011  
Duration: 8/13/76-3/28/78  
Description: Visitor Center, Mechanical Systems Improvements  
Project #: 6520-6907

Schuster Engineering, Inc. (Construction Contract)  
Contract #: CX 6000-8-9004  
Description: Generator Relocation.

Kozeny-Wagner (Construction Contract)  
Contract #: 4970B10045  
Duration: c. 1971-72  
Description: Visitor Center Addition.



# Appendix B: Sample Inventory and Condition Assessment Forms





*Jefferson National Expansion Memorial*  
**INVENTORY OF TREES**

*Tree Inventory & Condition Assessment*

inspected by \_\_\_\_\_ zone # \_\_\_\_\_ date \_\_\_\_\_

Species	Origin	Contributing(C) Non-Contrib.(N)	Age (yrs)	Status	Treatment Priority? (Y/N)	Recommended Action	Comments

*Origin Codes:*  
 1 = inst. Phase I  
 2 = inst. Phase II  
 3 = replacement in-kind  
 4 = introduced after Phase II

*Recommended Action Codes:*  
 1 = replace in-kind  
 2 = replace w/ alternate species  
 3 = do not replace

*Status Codes:*  
 Good = Good Condition  
 Fair = Fair Condition  
 Poor = Poor Condition  
 Gone = Gone, removed  
 Threat = Threatened





# Appendix C: List of Repositories and People Consulted



This list consists of all contacts made by Gina Bellavia or Gregg Bleam for the purposes of completing this Cultural Landscape Report and the design analysis Evolution of a Landscape: Eero Saarinen and Dan Kiley's Collaborative Design for Jefferson National Expansion Memorial completed by Gregg Bleam in 1996.

Office of Dan Kiley, East Farm, Charlotte, Vermont 05445

Several interviews were conducted regarding Dan Kiley's collaboration with Eero Saarinen on the 1948 Competition plan and subsequent design evolution. Mr. Kiley also shared sketches, drawings, and correspondence from his files.

Kevin Roche and John Dinkeloo & Associates, 20 Davis St., Hamden, Connecticut 06517  
Kevin Roche and John Dinkeloo worked at the former office of Eero Saarinen & Associates and were involved with the Arch project. Gregg Bleam interviewed the two architects regarding their part in the design process and their knowledge of Saarinen's design philosophy and his relationship with Dan Kiley. Mr. Bleam also spent a significant amount of time looking through the "Saarinen Archives" and was given permission to copy most of the drawings for this project.

Bob Burley, The Burley Partnership, Waitsfield, Vermont 05673

Mr. Burley is an architect who worked for Eero Saarinen from 1956-1963. He was directly related to the Arch project and was specifically responsible for the design of the entrances into the Arch visitor center and transportation system.

Terry Boyle, Burlington, Vermont

Mr. Boyle worked at the Office of Dan Kiley from 1959-1961 and again from 1965-1967. He was directly related to the Arch project, particularly with the evolution of the landscape design.

John Ronscavage, 4195 Dover Street, Wheat Ridge, Colorado 80033

Mr. Ronscavage was a landscape architect with the National Park Service and specifically with the Western Service Center and Denver Service Center Offices of Design and

Construction. He was the Team Captain for the JNEM Design Team when the National Park Service took over the project from Dan Kiley.

Jim Holland, 3815 N. Perry Park Road, Sedalia, Colorado 80135

Mr. Holland was a project manager with the NPS Denver Service Center and was a construction inspector during the landscape construction of the Arch grounds.

Eldridge Lovelace, 5 Brookside Lane, St. Louis, Missouri 63124

Mr. Lovelace was the project manager for Harland Bartholomew & Associates in the early 1970s when the firm was hired to complete construction documents for the Arch landscape.

Joseph Jensen, 211 Judy Street, Petersburg, West Virginia 26847

Mr. Jensen worked for both Eero Saarinen & Associates and the National Park Service and was directly involved with the Arch project.

Bob Kelly, 413 Williams Drive, Eureka, Missouri 63025

Mr. Kelly was the Facility Manager at JEFF for approximately 24 years. He was involved in site development through all major phases of landscape construction.

Mike Mayberry, 808 Marshall Road, Valley Park, Missouri 63088

Mr. Mayberry worked for Shelton & Sons Landscaping and was involved in the second major phase of landscape planting on the Arch grounds in the late 1970s.

Bob Chandler, Golden Gate NRA, Building 201, Fort Mason, San Francisco, California 94123

Mr. Chandler is a former JEFF Superintendent and was responsible for the Arch Grounds Seed Mix and the implementation of tree grates around the Rosehill Ash trees.

Nancy Baker, NPS-DSC, 12795 W. Alameda Pkwy., P.O. Box 25287, Denver, Colorado 80225

Ms. Baker was a project inspector working for the Denver Service Center in the 1980s. She was the project inspector for the final planting on the Arch grounds in 1980-81.

Bob Steenhagen, 2473 S. Carr Ct., Lakewood,  
Colorado 80227

Mr. Steenhagen worked at the NPS Eastern Service Center while the Arch project was being completed. According to Mr. Steenhagen, he was associated with Dan Kiley on a personal level and was not directly associated with JNEM.

Marlin Steward, NPS-DSC, 12795 W. Alameda Pkwy., P.O. Box 25287, Denver, Colorado 80225

Mr. Steward was a landscape architect with the National Capital Region when the Arch project was being completed. He helped pull together the final planting plans and irrigation plan.

Mike Hunter, NPS-DSC New River Gorge Support Office, P.O. Box 242, Glen Jean, West Virginia 25846

Mr. Hunter worked with the Denver Service Center from 1978-1980. He worked at JEFF as project manager supervising and directing work for much of the second major phase of development.

#### Repositories Consulted:

Denver Service Center Technical Information Center

12795 W. Alameda Pkwy.  
P.O. Box 25287  
Denver, Colorado 80225-0287  
303.969.2134

Jefferson National Expansion Memorial - Archives

11 North Fourth Street  
St. Louis, Missouri 63102  
314.425.4468

Mercantile Library  
510 Locust Street, Sixth Floor  
St. Louis, Missouri 63101  
314.621.0670

Office of Dan Kiley  
East Farm  
Charlotte, Vermont 05445  
802.425.2141

Kevin Roche and John Dinkeloo & Associates  
20 Davis Street  
Hamden, Connecticut 06517  
203.777.7251

# Appendix D: Copy of National Register Nomination Form



Form NPS 10-306 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE  
**NATIONAL REGISTER OF HISTORIC PLACES  
 INVENTORY -- NOMINATION FORM**  
 FOR FEDERAL PROPERTIES

432  
 VF JNE-072

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SEE INSTRUCTIONS IN HOW TO COMPLETE NATIONAL REGISTER FORMS  
 TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

**1. NAME** *Doc. accepted 3-4-77*

HISTORIC  
 Jefferson National Expansion Memorial  
 AND/OR COMMON  
 The Gateway Arch, The Old Courthouse, and The Old Cathedral

**2. LOCATION**

STREET & NUMBER  
 11 North 4th Street  
 CITY, TOWN  
 St. Louis  
 STATE  
 Missouri  
 VICINITY OF  
 St. Louis  
 COUNTY  
 St. Louis  
 CODE  
 29  
 NOT FOR PUBLICATION  
 CONGRESSIONAL DISTRICT  
 5th  
 COUNTY  
 St. Louis  
 CODE  
 510

**3. CLASSIFICATION** *(indep. city)*

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
<input checked="" type="checkbox"/> DISTRICT	<input checked="" type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE <input checked="" type="checkbox"/> MUSEUM
<input type="checkbox"/> BUILDINGS	<input type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL <input checked="" type="checkbox"/> PARK
<input type="checkbox"/> STRUCTURE	<input type="checkbox"/> CO-OP	<input checked="" type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL <input type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	<input type="checkbox"/> PUBLIC ACQUISITION	<input type="checkbox"/> ACCESSIBLE	<input type="checkbox"/> ENTERTAINMENT <input checked="" type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input type="checkbox"/> YES RESTRICTED	<input type="checkbox"/> GOVERNMENT <input type="checkbox"/> SCIENTIFIC
	<input type="checkbox"/> BEING CONSIDERED	<input checked="" type="checkbox"/> YES UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> TRANSPORTATION
		<input type="checkbox"/> NO	<input type="checkbox"/> MILITARY <input type="checkbox"/> OTHER

**4. AGENCY**

REGIONAL HEADQUARTERS, if applicable  
 U.S. National Park Service, Midwest Regional Office  
 STREET & NUMBER  
 1709 Jackson Street  
 CITY, TOWN  
 Omaha  
 STATE  
 Nebraska  
 VICINITY OF

**5. LOCATION OF LEGAL DESCRIPTION**

COURTHOUSE, REGISTRY OF DEEDS, ETC.  
 U.S. National Park Service, MWRO  
 STREET & NUMBER  
 1709 Jackson Street  
 CITY, TOWN  
 Omaha  
 STATE  
 Nebraska

**6. REPRESENTATION IN EXISTING SURVEYS**

TITLE  
 Historic American Buildings Survey  
 DATE  
 1936  
 DEPOSITORY FOR SURVEY RECORDS  
 Library of Congress  
 CITY, TOWN  
 Washington  
 STATE  
 D.C.  
 FEDERAL  STATE  COUNTY  LOCAL

(See Continuation Sheet, page 1)

Form 10-300a  
Rev. 10-74

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INVENTORY -- NOMINATION FORM

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CONTINUATION SHEET

ITEM NUMBER 6

PAGE 1

TITLE: List of Classified Structures

DATE: 1975

FEDERAL

DEPOSITORY FOR SURVEY RECORDS: U.S. National Park Service, Midwest  
Regional Office, Omaha, Nebraska

TITLE: National Survey of Historic Sites and Buildings

DATES: 1957-1962

FEDERAL

DEPOSITORY FOR SURVEY RECORDS: Office of Archeology and Historic  
Preservation, National Park Service, Washington, D.C.

 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input type="checkbox"/> UNALTERED	<input checked="" type="checkbox"/> ORIGINAL SITE
<input checked="" type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input checked="" type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

## DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The business center of old St. Louis grew up along the levee, where the riverfront was the jumping-off place for journeys westward. This area declined with the growth of the railroads, and most of the historic structures disappeared. The Jefferson National Expansion Memorial, including the Gateway Arch and the two remaining historic buildings, the Old Courthouse and the Old Cathedral, now occupies the area.

The large, T-shaped district in downtown St. Louis runs along the Mississippi River between the I-40/I-70 bridge, to the south, and Eads bridge, to the north. The great majority of the district is in the rectangular, park-like portion between the two bridges, Wharf Street, and I-55/I-70. This area includes the Gateway Arch and Visitor Center, the Old Cathedral, two scenic overlooks, parking facilities, several pedestrian paths, and two not-yet-completed ponds.

The Memorial was designed by Eero Saarinen in 1947. The original design envisioned a long, T-shaped park with the New Courthouse, (eight blocks west of the present memorial) Old Courthouse, and the Gateway Arch on a grand east-west axis linked by parks and terminating at the Mississippi River. The land between the two courthouses has never been cleared and the green belt axis has never been achieved, but the visual link can be clearly seen. Only the land between the Gateway Arch and the Old Courthouse has been cleared and incorporated into the Memorial. The final link to the river's edge, a grand stairway from the Arch to Wharf Street and the levee, is now under construction.

The easternmost structure is the Gateway Arch (No. NS 4), begun in 1962 and finished in 1965. The soaring, stainless steel, stressed-skin arch is 630 feet high. An inverted catenary curve, each leg is made up of double-walled, equilateral triangle sections. Throughout, the walls of each section are connected by high-strength steel rods, making a self-supporting, stressed-skin structure.

At ground level, each section is 12 feet high, and 5½ feet long on each side; at the top, the sections are 8 feet high, and 17 feet on each side. The Arch's 630-foot span straddles the underground Visitor Center and Museum of Westward Expansion. Housed at the top is an observation deck from which visitors are afforded a thirty-mile view to the east and west.

Within the Memorial boundaries, but still owned by the Roman Catholic Archdiocese of St. Louis, is the Old Cathedral. It was begun in 1831 from plans prepared by Joseph Laveille and George Horton (who also designed the 1826, brick courthouse replaced by the courthouse cited below) and it was finished in 1834. This (Joliet) limestone church in modified Greek Revival is rectangular in plan with a nave, two aisles, an apse, no transepts, and a steeple above the entrance. A later, one-story, addition runs along the north and east sides of the church.

The third major, and westernmost, structure in the Memorial is the Old St. Louis County Courthouse (No. NS 1). Built between 1839 and 1864, this Greek Revival, three-story, brick and stone structure was designed by several architects over the period of its construction (Henry Singleton, William Twombly, George I. Barnett, Robert S. Mitchell, Thomas D. F. Lanham, and William Rumbold), and has been altered several times, including

(See Continuation Sheet, page 2)

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a major restoration and remodeling completed in 1942. Basically a Greek Cross in plan, the junction of the four wings forms a central rotunda surmounted by a Renaissance style cast-iron dome and lantern. In the interior of the rotunda, the first three-stories are Greek Revival, but the later, upper levels, including the dome and lantern are Late Renaissance, almost Baroque, in style. This upper dome is elaborately decorated with murals, especially four lunette murals originally done by Carl Wilmar, and several later murals by Ettore Miragoli.

In the northeast and southeast corners of the Park are the two scenic overlooks. Designed to afford views of the river and the surrounding scenery, they are approached by a series of steps with variable slopes that reflect the catenary slope of the Gateway Arch.

 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input checked="" type="checkbox"/> RELIGION	
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input checked="" type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE	
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE	
<input type="checkbox"/> 1600-1699	<input checked="" type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN	
<input type="checkbox"/> 1700-1799	<input checked="" type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER	
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION	
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)	
		<input type="checkbox"/> INVENTION			

SPECIFIC DATES 1935 to present BUILDER/ARCHITECT Eero Saarinen

## STATEMENT OF SIGNIFICANCE

The Park was established in 1935 to memorialize the role of Thomas Jefferson and others responsible for the Nation's territorial expansion to the Pacific and of the countless pioneers who explored and settled the great American West.

To dramatize the growth and the great social, political, and economic changes that followed in the wake of the Louisiana Purchase, the National Park Service and the city of St. Louis undertook an extensive development program. In 1947, the Jefferson Nation Expansion Memorial Association held a national competition to select a design for the Memorial. The late Eero Saarinen's design was selected from more than 200 entries.

The central feature of the Saarinen Plan is the 630-foot, stainless steel Gateway Arch, symbolizing St. Louis' historic gateway role. The Arch, one of the most challenging engineering and construction projects ever attempted, is in the form of an inverted catenary curve. The catenary is the soundest of all arches, because all forces pass through the legs into the foundation. A variety of structural methods, some not normal used for buildings, unique to this structure, were employed by Saarinen. The stressed-skin design is similar to airplane structural design and allows the skin to carry all structural loads without massive interior framing. Furthermore, the design demanded new construction techniques; the arch was erected by unique, 100-ton, steel creeper cranes mounted on steel tracks affixed to each arch leg. These cranes lifted and placed the triangular sections. After the final section was placed in the arch, the derricks crept down, taking up their tracks and polishing the surface as they went.

The Old Courthouse derives its significance from several areas - architecture, art, engineering, and law. The dome atop the Courthouse was a major feat of engineering and architectural design when it was built. In 1851, the Courthouse's fifth architect, Thomas D. P. Lanham, proposed and designed a new Renaissance style dome to replace the original, smaller dome. However, it was Lanham's successor, William Rumbold, who, between 1859 and 1862, accomplished the detailed structural design and engineering, which he patented. The lightweight iron skeletal designs of the St. Louis dome and its contemporary on the National Capitol were unique in the United States at that time, and were among the first in the world. The designers of many statehouses took their inspiration from the National Capitol, but the St. Louis dome was completed one-and-a-half years before, and in this sense was the forerunner of those that followed.

The interior of Rumbold's dome, because of its lightweight structural design, allowed for a very high rotunda, so the architect and the muralists August Becker, Charles Wimar and Leon Pomeroy collaborated to redesign the old rotunda, which had been designed by George I. Barnett, the building's third architect.

(See Continuation Sheet, page 3)

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Wimar designed the original program and, by 1862, executed the four lunettes depicting the history of St. Louis. Subsequent work by Ettore Miragoli in 1880, repairs by August Becker in 1888 and 1905, restoration work by James Lyons in 1921, and a fire in 1936 have obliterated all of Wimar's program except two of his lunettes. The majority of the work visible today is a National Park Service restoration of Miragoli's nevertheless, both men were accomplished artists and the rotunda presents an impressive appearance.

An event of major political and legal importance occurred at the Courthouse in 1847, when Dred Scott sued the widow of Dr. John Emerson for his freedom. The trial verdict was rendered in favor of Mrs. Emerson. Upon appeal, this verdict was set aside and a second trial was held in 1850. These first two trials were known to have been held in the Courthouse. The State Supreme Court trial, in 1852, was probably not held in the Courthouse. The case saw its conclusion in the decision of the U.S. Supreme Court in Dred Scott vs. Sanford in 1857.

Also of note is the fact that Justice Louis Brandeis was admitted to the bar in this courthouse in 1878.

The old Cathedral, the second remaining historic building of old St. Louis, was built in 1831 to 1834, on land set aside for religious purposes by Pierre Laclède in the spring of 1764 when he founded the village of St. Louis. The building narrowly escaped destruction in the disastrous fire that swept the riverfront in 1849. The importance of the church declined sharply after the Civil War when the archdiocese moved its headquarters uptown to a new cathedral. But in 1961, Pope John XXIII designated the building "Basilica of St. Louis, King of France." This is the highest honor ever given an American Catholic church.

**10 MAJOR BIBLIOGRAPHICAL REFERENCES**

- Bryan, John A., An Architectural and Historical Sketch of the Old Cathedral.  
 St. Louis: Jefferson National Expansion Memorial, 1937.  
 -----, An Architectural and Historical Sketch of the Old Courthouse.  
 St. Louis: Jefferson National Expansion Memorial, 1937.  
 -----, A Physical History of the Old Courthouse, St. Louis, Missouri. 1826-1938.  
 St. Louis: Jefferson National Expansion Memorial, 1938.

**11 GEOGRAPHICAL DATA**

(See Continuation Sheet, page

ACREAGE OF NOMINATED PROPERTY 90.96

UTM REFERENCES

A	15	745000	4272210	0	15	745280	4272170
ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING	
c	15	745020	4278080	0	15	744780	4278090

VERBAL BOUNDARY DESCRIPTION

E 15 744850 4278670 F 15 744640 4278760  
 G 15 744660 4278840 H 15 744880 4278780

(See Continuation Sheet, page 5)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

**12 FORM PREPARED BY**

NAME / TITLE  
 Richard I. Ortega, Architectural Historian (Engineer)

ORGANIZATION  
 U.S. National Park Service, MWRO

DATE  
 3/3/76

STREET & NUMBER  
 1709 Jackson Street

TELEPHONE  
 402-221-3423

CITY OR TOWN  
 Omaha

STATE  
 Nebraska

**13 CERTIFICATION OF NOMINATION**

STATE HISTORIC PRESERVATION OFFICER RECOMMENDATION

YES \_\_\_ NO \_\_\_ NONE \_\_\_

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Historic Preservation Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The evaluated level of significance is X National \_\_\_ State \_\_\_ Local.

FEDERAL REPRESENTATIVE SIGNATURE

TITLE DATE

**FOR NPS USE ONLY**

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

Form No. 10-300a  
(Rev. 10-74)

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-----, The Riverfront at St. Louis: Gateway to the West. St. Louis: Jefferson  
National Expansion Memorial, 1942.

Dosch, Donald, History of the Old Courthouse. St. Louis: Jefferson National  
Expansion Memorial, 1969.

Form 10-741  
10-741UNITED STATES DEPARTMENT OF THE INTERIOR  
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The T-shaped park, starting at the intersection of Eads Bridge and Wharf Street, St. Louis, Missouri, runs south along the west side of Wharf Street for approximately 3600 feet; thence west along the north side of Poplar Street for approximately 800 feet; thence north along the east side of the Third Street Expressway for approximately 1600 feet; thence west along Market Street approximately 600 feet; thence north along Broadway approximately 300 feet; then east along Chestnut approximately 800 feet; thence north along the Expressway approximately 1400 feet; thence east along the south wall of Eads Bridge approximately 900 feet to the beginning.

