



Executive Director's Recommendation

Commission Meeting: April 3, 2014

PROJECT**Dwight D. Eisenhower Memorial**

National Mall and Memorial Parks
Bound by Independence Avenue, 4th Street,
and 6th Streets, SW, and by the
Lyndon B. Johnson - Department of Education
Headquarters Building
Washington, DC

NCPC FILE NUMBER

6694

NCPC MAP FILE NUMBER

1.71(73.10)43508

APPLICANT'S REQUEST

Preliminary approval of site and
building plans

SUBMITTED BY

United States Department of the Interior
National Park Service on behalf of the Dwight
D. Eisenhower Memorial Commission

PROPOSED ACTION

Disapprove and provide comments
on preliminary site and building
plans

REVIEW AUTHORITY

Approval
per 40 U.S.C. 8903, 40 U.S.C. § 8905, 40 U.S.C. 8711(a),
and 40 U.S.C. 8722(b)(1) and (d)

ACTION ITEM TYPE

Staff Presentation

PROJECT SUMMARY

The National Park Service, on behalf of the Dwight D. Eisenhower Memorial Commission, has submitted preliminary site and building plans for the Dwight D. Eisenhower Memorial. The project is located on a four-acre site in Southwest Washington, DC, that the National Capital Planning Commission approved in September 2006. The project includes sections of Maryland Avenue, SW and is adjacent to Independence Avenue, SW, both prominent L'Enfant streets, and is in close proximity to the U.S. Capitol, National Mall, federal headquarters, national museums, and other commemorative works. A central Memorial core containing limestone bas-relief blocks, free-standing bronze sculpture, and quotations will commemorate Dwight D. Eisenhower and his role in American history as a military General and as President of the United States.

The Memorial core and the site are framed by a colonnade supporting three large-scale stainless steel tapestries that depict landscape scenery of Abilene, Kansas, Eisenhower's birthplace, and are intended to signify Eisenhower's Midwestern core values of strength, modesty, and integrity. The tapestries are also used to enclose the site to create a distinct precinct for the Memorial within the area framed by the buildings that border the site. The three tapestries are each approximately 80 feet high. The tapestry along the south side of the site is approximately 447 feet long and the two on the east and west are approximately 89 feet long. The columns supporting the tapestries are approximately 80 feet high and ten feet in diameter. The landscape design of the Memorial reinforces the tapestry imagery through plant materials that are characteristic of the Kansas plains. The Memorial ground plane is treated with groomed lawn, intended to define the historic Maryland Avenue cartway, and slightly taller grasses throughout the rest of site. Several types of canopy and understory trees are arranged in clusters throughout the site to frame the Maryland Avenue viewshed and views of the Memorial core and tapestries. Visitor services will be located in a one-

story information center placed in the southeast corner of the site. The building has a footprint of approximately 2,400 square feet and will contain restrooms, a bookstore, and an NPS ranger contact station. Finally, the Memorial will be separated from the Lyndon B. Johnson Department of Education Building by a pedestrian promenade, to be known as LBJ Promenade. The Promenade will serve as a new entry forecourt to the Department of Education Building and will provide outdoor seating, exhibit areas, and a Memorial overlook that can accommodate gatherings of various sizes.

KEY INFORMATION

Commemorative works in Washington have been an important planning consideration since the very beginning, when in 1791, George Washington hired Pierre L'Enfant to create a plan for the new permanent seat of the nation's capital. One of the core principles of L'Enfant's Plan, and perhaps the most important, was the physical and symbolic connecting of important public buildings and public reservations along wide, tree-lined avenues. L'Enfant envisioned these public reservations as serving two roles. First, these spaces were seen as open spaces or public parks where residents could gather. Second, they were seen as locations to place commemorative works. L'Enfant specified that each of these reservations would feature statues and memorials to honor worthy citizens, and that the open spaces were as integral to the nation's capital as the buildings to be erected around them.

The importance, and challenges, associated with placing commemorative works in the nation's capital continued with the McMillan Commission's work. Their report to Congress, known as the McMillan Plan, acknowledges the challenge of devising a plan that "restore[s] that unity of design which was the fundamental conception of those who first laid out the city as a national capital, and of formulating definite principles for the placing of those future structures which; in order to become effective, demand both a landscape setting and a visible orderly relation one to another for their mutual support and enhancement." While noting the ease with which they could accomplish their work if Washington was not the nation's capital, where the placement of public buildings is of the utmost importance, and if the city was not by its very plan tied to a historic past, the Commission recognized that "the greatest service they could perform" would be to carry out the comprehensive, intelligent, and yet simple and straightforward scheme devised by L'Enfant.

The Commission's review is guided by its authorities and responsibilities under the National Capital Planning Act, directing the Commission "to preserve the important historical and natural features of the National Capital;" and the Commemorative Works Act, whose purposes are "(1) to preserve the integrity of the comprehensive design of the L'Enfant and McMillan plans for the Nation's Capital; [and] (2) to ensure the continued public use and enjoyment of open space in the District of Columbia and its environs, and to encourage the location of commemorative works within the urban fabric of the District of Columbia." All of the Commission's plans and policies are directed at achieving these larger goals.

The recommendation is based upon an analysis of the Memorial project's consistency with the purposes, and specific criteria, of the National Capital Planning Act and the Commemorative Works Act, NCPC's site selection design principles, and other relevant NCPC plans and policies,

with the goal of ensuring a commemorative work that prominently features the accomplishments and legacy of President Eisenhower within an activated public space that is integrated into the urban fabric, relates to its surrounding context; and preserves the integrity of historic resources. By virtue of its prominent, urban location within the L'Enfant City, the design must respond to its historic, urban and symbolic context. The design of this four-acre project must serve the commemorative experience while also providing public space that contributes to the city's vitality, and the day-to-day activities of surrounding uses and the needs of workers, visitors and residents.

The National Environmental Policy Act (NEPA) requires that federal agency actions, including the Commission's approval of projects, be informed by materials developed in accordance with government-wide regulations and agency specific policies and procedures implementing NEPA. In this case, the Commission's actions shall be guided by seven design principles that were incorporated as required mitigation in NCPC's Finding of No Significant Impact issued for its action approving the Memorial site. These principles were developed in consultation with cooperating agencies during the environmental and historic preservation review processes for site selection. NCPC's site approval action was also conditioned upon conformance with these principles which are listed below:

1. Preserve reciprocal views to and from the U.S. Capitol along Maryland Avenue, SW.
2. Enhance the nature of the site as one in a sequence of public spaces embellishing the Maryland Avenue vista.
3. Create a unified memorial site that integrates the disparate parcels into a meaningful and functional public gathering place that also unifies the surrounding precinct.
4. Reflect L'Enfant Plan principles by shaping the Memorial site as a separate and distinct public space that complements the Department of Education Headquarters and other surrounding buildings.
5. Respect and complement the architecture of the surrounding precinct.
6. Respect the building lines of the surrounding rights-of-way and the alignment of trees along Maryland Avenue.
7. Incorporate significant green space into the design of the memorial.

The materials and fabrication of the Memorial tapestries are complex and untested, and given their scale and extensive use, close attention was given to durability testing to better understand their conformity to the requirements of the Commemorative Works Act. The applicant has completed several rounds of corrosion testing on the chosen tapestry stainless steel alloy and mechanical strength and fatigue testing on tapestry weld samples. NCPC staff engaged experts from the National Institute of Standards and Technology, United States Department of Defense, and the Smithsonian Institution to assist in evaluating the test results regarding the long-term durability of the tapestries.

RECOMMENDATION

The Commission:

Disapproves the preliminary site and building plans for the Dwight D. Eisenhower Memorial on account of the proposed scale and configuration of the tapestries.

Finds the project inconsistent with the purposes of the National Capital Planning Act and the Commemorative Works Act, and with the design principles adopted by the Commission as part of its 2006 site approval, specifically the following three principles:

- Preserve reciprocal views to and from the U.S. Capitol along Maryland Avenue, SW.
- Respect the building lines of the surrounding rights-of-way and the alignment of trees along Maryland Avenue.
- Reflect L'Enfant Plan principles by shaping the Memorial site as a separate and distinct public space that complements the Department of Education Headquarters and other surrounding buildings.

Notes the Commission's continued support for a modern and innovative approach to commemorate President Dwight D. Eisenhower, including the possible use of the stainless steel tapestries, although not as currently proposed. The Commission therefore **requests** that the applicant modify the design, however necessary, to fulfill the purposes of the National Capital Planning Act and Commemorative Works Act, and to meet the design principles.

Notes that the adopted site selection design principles are included as required mitigation in NCPC's Finding of No Significant Impact, issued in accordance with the National Environmental Policy Act, for approval of the site, and are appended to the Memorandum of Agreement established pursuant to Section 106 of the National Historic Preservation Act for the Memorial design.

Comments on general planning-related issues:

Requests the applicant to modify the Memorial design to address:

- Pedestrian circulation: The proposed circulation is too narrowly focused on providing access from the site corners to the Memorial core and needs to take into consideration likely circulation patterns along Maryland Avenue and midblock from Independence Avenue.
- Perimeter security: The proposed bollards along LBJ Promenade should be eliminated, particularly those located at the base of the Memorial overlook, or modified in design and spacing to maintain the openness of the Promenade and avoid unnecessary obstructions to pedestrian circulation.
- Lighting: As a commemorative work located within the urban fabric of the city, the design of the Memorial lighting should be informed by lighting at other similarly situated public spaces and must not diminish the nighttime prominence of the U.S. Capitol Building along the Maryland Avenue viewshed.

- Public Space: The program and landscape plan should delineate areas primarily intended to serve the commemorative experience, and areas that contribute to broader public open space use.

Commemorative Works Act durability criteria:

Notes that the Commemorative Works Act requires the National Capital Planning Commission, the U.S. Commission of Fine Arts, and the Secretary of the Interior to be guided by a specific set of decision criteria when considering design proposals, including whether a commemorative work will be built of durable materials.

Notes that due to the untested complexity of the Memorial tapestries, and to ensure that its actions are consistent with its responsibilities under the Commemorative Works Act, NCPC has engaged experts from the National Institute of Standards and Technology, the United States Department of Defense, and the Smithsonian Institution to assist in evaluating the results of the applicant's numerous durability tests.

Finds that the results of the durability tests show that the stainless steel alloy proposed for the tapestry panels has exhibited resistance to corrosion and the proposed tapestry panel welds are likely to be mechanically sound, and therefore, the proposed tapestry materials and fabrication methods meet the Commemorative Works Act durability criteria.

Requests that by the final review stage the applicant demonstrate the following:

- The tapestry material and welds continue to reach the same durability standards as fabrication methods are further refined.
- The recommended maintenance regimen, including cleaning, will not cause weld failure if carried out properly.
- The operational protocols that will be employed to avoid danger to the public during instances where snow and ice has accumulated on the tapestries.

PROJECT REVIEW TIMELINE

Previous actions	<p><i>** No formal Commission actions on Memorial design to date **</i></p> <ul style="list-style-type: none">• September 2006 – Approval of Memorial site with adopted set of design principles• February 2011 – Review and comment on three concept design alternatives• October 2011 – Information presentation on proposed design
Remaining actions (anticipated)	<ul style="list-style-type: none">• Approval of preliminary site and building plans (<i>upon meeting site selection design guidelines, the National Capital Planning Act, and Commemorative Works Act criteria</i>)• Approval of final site and building plans• Approval of any related transfers of jurisdiction (<i>to be processed before or together with final approval</i>)• Review of any related street closings (<i>to be processed before or together with final approval</i>)

Prepared by Shane L. Dettman
March 28, 2013

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I. PROJECT DESCRIPTION

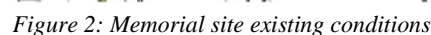
Site



Figure 1: Aerial image of Memorial site and surrounding context

The Memorial site encompasses approximately four acres of land within the Southwest quadrant of Washington, DC. The site is located one block south of the National Mall and is bound by Independence Avenue on the north, 4th Street on the east, and 6th Street on west, and the Lyndon B. Johnson, Department of Education Building (LBJ Building) on the south. In addition to the LBJ Building, the site is surrounded by several other federal office buildings and cultural facilities. These include the Smithsonian National Air and Space Museum to the north, the historic Wilbur J. Cohen Building that is home to the Voice of America (VOA) to the east, and the Wilbur Wright Building, headquarters of the Federal Aviation Administration (FAA), to the west. The site also in close proximity to the U.S. Capitol. (Figure 1)

Currently, the site is composed of three parts controlled by three separate entities. The historic [160'] Maryland Avenue right-of-way bisects the site and encompasses approximately two acres



To the north of the Maryland Avenue right-of-way is an approximately one half-acre area controlled by the National Park Service (NPS). This area currently contains a community garden and small exercise facility. The remaining 1.5 acres of the site located south of Maryland Avenue is controlled by the United States General Services Administration (GSA) and features a hardscape plaza that was constructed with the LBJ Building as the building's entry forecourt. The plaza is sparsely vegetated (70% paved and 30% green space) and contains a sunken courtyard that exists primarily to provide natural light to the Department of Education's basement-level. Prior to construction of the Memorial, all portions of the site will be transferred to NPS with the exception of a 50-foot buffer area along the north façade of the LBJ Building which will remain in GSA control. Following construction, NPS will be responsible for the long-term operation and maintenance of the Memorial.

The Dwight D. Eisenhower Memorial was authorized by Congress on October 25, 1999 (Public Law 106-79). In its authorization, Congress stated that “the people of the United States feel a deep

debt of gratitude to Dwight D. Eisenhower, who served as Supreme Commander of the Allied Forces in Europe in World War II and subsequently as 34th President of the United States; and therefore, an appropriate permanent memorial to Dwight D. Eisenhower should be created to perpetuate his memory and his contributions to the United States.” The authorizing legislation also created the Dwight D. Eisenhower Memorial Commission (EMC), whose responsibility it is to develop plans for the Memorial including its nature, design, construction, and location. Subsequent to its initial authorization of the Memorial, Congress enacted two additional laws pertaining to the Eisenhower Memorial. In January 2002, Congress passed Public Law 107-117, which amended the Memorial’s authorizing legislation to allow it to be established on land under the jurisdiction of the Secretary of the Interior in the District of Columbia, or its environs, in accordance with the Commemorative Works Act of 1986 (CWA), as amended (40 U.S.C. 8901, et seq.). In May 2006, Congress passed Public Law 109-220 which authorized the Memorial to be located on a site within Area 1, an area defined within the CWA and reserved for commemorative works considered to be of preminent historical and lasting significance to the United States.

At its September 7, 2006 meeting, the Commission approved the site for the Memorial provided that the applicant design the Memorial to meet seven design principles that are discussed in detail later in this report. The design principles were developed in consultation with cooperating agencies during the environmental and historic preservation review process for site selection. The design principles were also incorporated as mitigation in NCPC’s Finding of No Significant Impact (FONSI).

At its February 2011 meeting, the Commission provided comments on three concept design alternatives. In general, the Commission supported the applicant’s modern and innovative approach to commemorate President Dwight D. Eisenhower, including the possible use of the woven stainless steel tapestries, but found each of the alternatives to be not yet consistent with the 2006 design principles. Specifically regarding the alternative that has since evolved into the current Memorial design (Figure 3), the Commission found that only two of the design principles had been satisfied. In its action, the Commission noted that the design principles must be met to: 1) mitigate



Figure 3: Memorial site plan (February 2011)



Figure 4: Memorial site plan (October 2011)

otherwise potentially significant environmental impacts caused by the use of the site for a commemorative work, and 2) better relate the Memorial to its surroundings.

In October 2011, the applicant provided the Commission with an information presentation on modifications made to the Memorial design since NCPC's concept review. (Figure 4) Commissioners were supportive of the changes that had been made to the design since their concept review, and were impressed by the progress that had been made in the design of the proposed stainless steel tapestries. Commissioners commented on the very large scale of the design, and on impacts this could have on the view along Maryland Avenue and on the visitor / pedestrian experience. In order to resolve some of the issues of scale and visual impact, the Commission suggested that the applicant consider reducing the diameter and/or height of the columns and relaxing the rigid geometry of the tapestry configuration to help the Memorial better relate to its surrounding context.

Proposal

The National Park Service (NPS), on behalf of the Dwight D. Eisenhower Memorial Commission (EMC), has submitted preliminary site and building plans for the Dwight D. Eisenhower Memorial. According to the applicant, the Memorial design seeks to achieve three fundamental goals:

- To honor Dwight D. Eisenhower and his role in American history as a General and as President of the United States,
- To recognize the larger urban context in which the Memorial is placed,
- To respect the immediate community, particularly the Department of Education.

The Memorial design is composed of several large-scale commemorative elements in the form of bas-relief sculpture blocks, freestanding sculpture, speech excerpts and quotations, and stainless steel tapestries; a robust landscape design; and a one-story information center. In addition, the design also includes a new pedestrian promenade, LBJ Promenade, which will distinguish the Memorial from the LBJ Building and serve as a new entry forecourt to the Department of Education. (Figure 5)

The overarching concept of the Memorial is to commemorate Dwight D. Eisenhower's monumental achievements as a military general and 34th President of the United States within a setting that recognizes the humble way in which he approached these roles based on the set of Midwestern values he acquired during his upbringing in Abilene, Kansas. As stated by the applicant, "His humility, his values and accomplishments are what set him apart...and so these are what will set the monument apart. This is a monument to his ideas, to the words that he left with us, and to the principles that guided his decisions and fueled his remarkable achievements."

In its execution of the overarching concept, the applicant has drawn inspiration from the "temple-like organization" of the Lincoln Memorial. (Figure 6) In the case of the Lincoln Memorial, the temple structure creates a unique setting that is separated from the surrounding, open expanse of the National Mall. Its monumental colonnade marks the transition from the surroundings to the commemorative core. Within the core, a statue of President Lincoln sits flanked by quotations

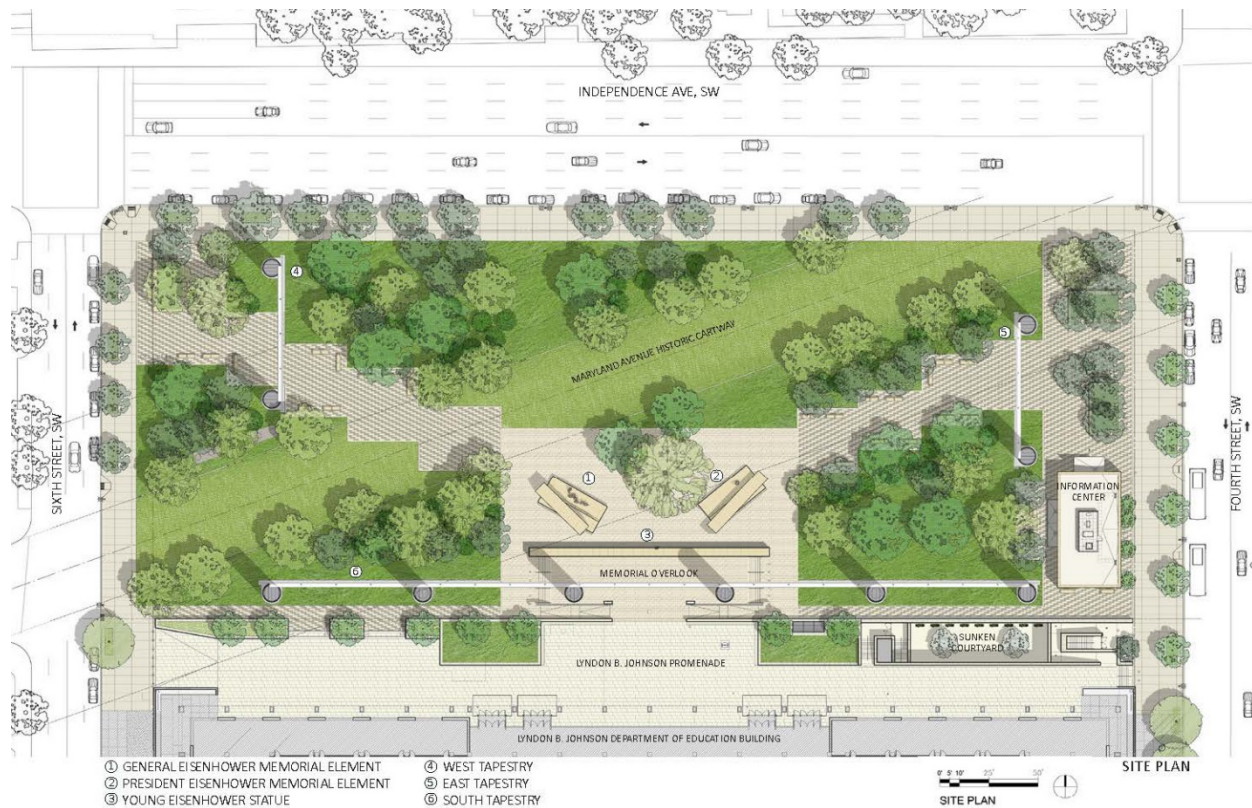


Figure 5: Current Memorial site plan (April 2014)

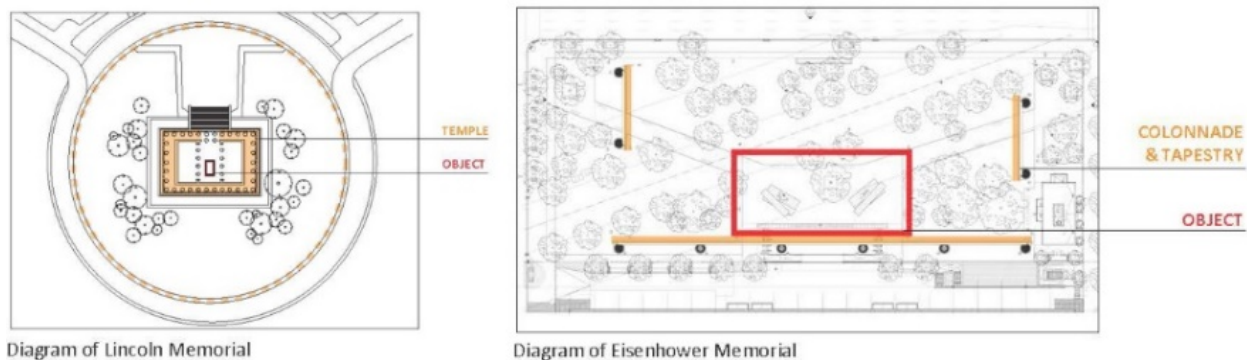


Figure 6: Comparison of Lincoln Memorial and Eisenhower Memorial organization

from his Gettysburg Address and second inaugural address. Similar to the Lincoln Memorial, the Eisenhower Memorial is organized as an “object within a temple” within a surrounding precinct. The applicant is proposing three stainless steel tapestries supported by a large-scale colonnade to define the perimeter of the site and serve as a transition from the surrounding urban environment. The tapestries also serve as integral commemorative elements. According to the applicant, the colonnade is “similar in proportion to those in the Lincoln Memorial creating a sense of scale in keeping with other presidential monuments.” Upon passing through this transition area, visitors are drawn into a Memorial core where additional commemorative elements are located. Each of

the commemorative elements of the Memorial design as well as other components such as the landscape, information center, lighting, and signage are further described below.

Memorial core

Located near the center of the site, on axis with the LBJ Building entrances, the Memorial core will contain a combination of freestanding sculpture, bas relief blocks, and engraved quotations and speech excerpts to commemorate Eisenhower's military and Presidential careers. (Figure 7) This area will be set apart from the rest of the site, and in particular from approaching walkways, through the use of special paving that will define the limits of the commemorative core. Large trees set in pavement will also help define the core from the rest of the surrounding landscape. The freestanding sculpture will be bronze and measure approximately 8 – 10 feet in height, while the sculptural relief blocks will consist of limestone and measure approximately 15 feet high. In addition, a 9 ½ foot high limestone lintel block containing an Eisenhower quotation is proposed atop each relief block. (Figures 8 & 9)

To commemorate his military achievements, a sculpture of General Eisenhower speaking to members of the 101st Airborne Division before D-Day is proposed in front of a bas relief depicting the landing on the beach of Normandy, France on June 6, 1944. (Figure 8) The quotation proposed for the lintel block is taken from a radio address that General Eisenhower gave to the troops on D-Day in which he stated "The tide has turned! The free men of the world are marching together in victory!" The back of the relief block will include an excerpt from General Eisenhower's Guildhall Address, which he delivered in London, England upon receiving the "Freedom of the City of London" award, and the "Order of Merit" from King George VI, following his leading of the Allied victory in World War II. According to the applicant, this particular speech was selected because it demonstrates Eisenhower's humility and leadership qualities in the way he accepted these honors.



Figure 7: Site plan and rendering of Memorial core



Figure 8: Memorial core bronze sculpture and limestone bas relief blocks
(Left) President Eisenhower, (Right) General Eisenhower

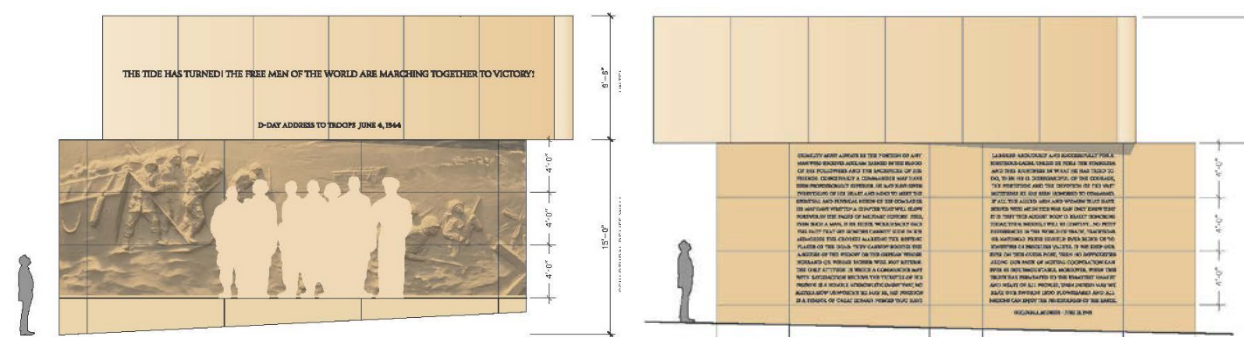


Figure 9: Dimensions and scale of sculpture, bas relief blocks, and inscription walls

To commemorate Eisenhower's legacy as the 34th President of the United States, a solitary freestanding sculpture of President Eisenhower is proposed in front of a bas relief scene of the signing of the Civil Rights Act of 1957, the first civil rights legislation enacted by Congress in the United States since Reconstruction following the Civil War. (Figure 8) The quotation proposed for the lintel block is taken from President Eisenhower's "Chance for Peace" address, given to members of the American Society for Newspaper Editors in April 1963, in which he warned against the fiscal costs and dangers of Cold War-level military spending and stated "Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and not clothed." The back of the relief block will include two excerpts from President Eisenhower's inaugural speeches which highlight his focus on the importance of foreign policy.

The final element of the Memorial core is a sculpture of Eisenhower as a young man placed on top of a wall looking out towards the Memorial core. (Figure 10) The statue is intended to create a connection between the Kansas imagery depicted on the proposed large-scale tapestries and the elements within the Memorial core commemorating Eisenhower's monumental future accomplishments as a general and President. According to the applicant, inspiration for this sculpture comes from a quote taken from Eisenhower's homecoming speech in which he reflected upon his achievements in life and the lifelong pride he held in his Kansas upbringing. In reference to the heroic aspirations typical of young men growing up, Eisenhower stated:



Figure 10: Statue of Dwight Eisenhower as young man

“Always in his dreams is the day when he finally comes home to a welcome from his hometown. Today that dream of mine of 45 years or more ago has been realized beyond the wildest stretches of my own imagination, I came here, first, to thank you, to say the proudest thing I can claim is that I am from Abilene.”

According to the applicant, the proposed composition of the Memorial core, with the statue of young Eisenhower, set against the backdrop of the Kansas landscape will

invite visitors to share in Eisenhower’s personal journey and convey the story of “a simple man from the American heartland...who went on to accomplish the greatest of things that shaped the course of human history.”

Tapestries

The Memorial core and the site are framed by a colonnade supporting three large-scale stainless steel tapestries that depict landscape scenery of Abilene, Kansas, Eisenhower’s birthplace, and are intended to signify Eisenhower’s Midwestern core values of strength, modesty, and integrity. The tapestries are also used to enclose the site to create a distinct precinct for the Memorial within the area framed by the buildings that border the site. The three tapestries are each approximately 80 feet high. The tapestry along the south side of the site is approximately 447 feet long and the two on the east and west are approximately 89 feet long. The columns supporting the tapestries are approximately 80 feet high and ten feet in diameter. (Figures 5 & 13) Symbolically, the applicant considers the tapestries as representative of the set of personal values of strength, modesty, and integrity that are often associated with the Midwestern American landscape, and the role that landscape has in shaping a person’s character. The monumental size of the tapestries is meant to symbolize the significant influence that this landscape had on Eisenhower’s personal character, on the decisions that he made, and on the way he viewed the rest of the world. Eisenhower often expressed pride in where he was raised and in the set of values that came from it through statements such as “I come from the very heart of America,” and “Whatever America hopes to bring to pass in the world must first come to pass in the heart of America.”

Since NCPC’s review of the Memorial concept in February 2011, the applicant has made modifications to the size and alignment of the proposed tapestries. (Figure 11) The applicant has also made significant progress in the tapestry’s artistic development and fabrication method. At



Figure 11: Comparison of concept and preliminary tapestry alignments
(Left) February 2011 concept design, (Right) April 2014 preliminary design

the concept stage, the three tapestries were all aligned in an east-west orientation parallel to Independence Avenue. One large tapestry, approximately 550 feet in length and spanning the entire length of the LBJ façade, was proposed at the southern edge of the Memorial. In addition, two, 100-foot long tapestries were proposed at each end of the site's northern edge, parallel with Independence Avenue and behind a 50-foot setback that aligned with the buildings immediately to the east and west. When viewed from Independence Avenue, this tapestry configuration was intended to create a proscenium stage type setting, with the south tapestry as the backdrop, upon which the story of Eisenhower unfolded within the Memorial core. Along Maryland Avenue the view toward the Capitol was asymmetrically framed by the tapestries. In the concept design the columns that support the tapestries were approximately 80-feet high and approximately 12-feet in diameter.

The current Memorial design continues to include three tapestries; however, the two smaller tapestries, previously aligned with Independence Avenue, have been reoriented to align with 4th and 6th Streets. Therefore, the site is now framed by the tapestries along three sides (south, east, and west) with generally open views into the site from Independence Avenue. (Figure 11) This has also resulted in the view along Maryland Avenue being re-centered on the Capitol framed by columns that are approximately 95-feet apart measured perpendicular to the centerline. (Figure 12) The tapestries will be supported by a stainless steel box beam and cable net system that spans between limestone clad columns that are approximately 80-feet high and 10-feet in diameter. (Figure 13) The width of the south tapestry has been reduced to approximately 447 feet and has been centered on the LBJ Building to allow views of the east and west ends of the building from Independence Avenue. The distance from the north façade of the LBJ Building to the face of the south tapestry is approximately 71 feet. (Figure 13) The widths of the east and west tapestries have also been reduced from 100 feet to approximately 89 feet. The bottoms of the tapestries remain raised above the ground plane to allow pedestrian passage underneath. The distance between the



Figure 12: View along Maryland Avenue toward U.S. Capitol



Figure 13: Tapestry and column dimensions

ground plane and the bottom of the tapestries varies slightly with an average of approximately 18 feet. The tops of all three tapestries are aligned with the first cornice line of the LBJ Building approximately 80-feet above grade. (Figure 13)

In tandem with the design process, the applicant has continued extensive research and development efforts to fabricate a tapestry that accomplishes its desired commemorative, design, and planning goals. Initially, the applicant had explored three different tapestry fabrication methods using various types and combinations of stainless steel wire and Teflon thread.



Figure 14: Images of preferred tapestry (artistic) mockup at Memorial site



Figure 15: Picture of 3' x 3' mechanically fabricated tapestry sample

Two of the methods utilized a jacquard loom to create a traditional woven tapestry. The third fabrication method consists of four types of stainless steel cable and braided wire assembled together to form the tapestry imagery. This third method effectively produces different image densities based on the location within the Kansas landscape imagery through the use of different gauges and types of stainless steel material.

Unlike the first two methods which achieved a low level of transparency through the use of lighter color materials or looser weave patterns, the third method achieves greater transparency by allowing upper portions of the tapestries, generally the areas of the imagery that correspond to sky above the Kansas horizon, to remain open. Each of the fabrication methods were thoroughly analyzed by the applicant including placement of full-scale mock ups on the Memorial site. These mock-ups were prepared by hand to see if this method should even be considered viable.

At the conclusion of its analysis the applicant selected the third fabrication method to advance. (Figure 14) Since selecting a fabrication method, the applicant has directed considerable effort toward testing the durability of the tapestry materials and welds, and developing a mechanical fabrication method. While still in development, the applicant recently fabricated a three foot by three foot tapestry sample using automated welding equipment that relies upon a computer-aided design drawing of the tapestries. (Figure 15)

Landscape design



Figure 16: Views along northeast pathway towards Memorial core

The proposed landscape design introduces a substantial amount of new green space and is intended to reinforce the commemorative message of the Memorial by complementing the Kansas landscape scenery depicted on the proposed tapestries. In describing the relationship between the tapestries and the landscape design, the applicant states:

“The tapestry commemorative art provides a visually arresting Kansas landscape image that establishes a connection between images and living things, reinforcing the message of landscape’s power to shape man’s character. The entire landscape design is developed as a natural and physical extension of the tapestry elements.”

Overall, the landscape design is intended to establish a micro-climate that is both sunny and shaded with shade provided by large canopy and smaller

understory trees, and sunny open areas focused on the Memorial core and along Maryland Avenue. The layout of the Memorial planting design is reminiscent of the landscape found around Abilene, Kansas. The primary access points to the Memorial are located at the northeast and northwest corners where paved entry plazas with planters and integrated seating and signage will receive visitors and direct them along walkways that lead underneath the east and west tapestries and toward the Memorial core.

The east and west tapestries are intended to serve as an organizing perimeter to the site and a threshold into the Memorial precinct. The approach walkways maintain site lines to Memorial elements and have staggered, orthogonal edges to form social gathering areas that contain seating. (Figure 16) The entry plazas and approach walkways will share the same paving material and patterns which will be different than the paving within the Memorial core. The ground plane is treated simply with a groomed lawn along the 50-foot Maryland Avenue cartway and a more

casual, un-groomed lawn throughout the remainder of the site.¹ Treating the ground plane in this unified manner is intended to allow accessibility from any point around the perimeter and within the site.

The proposed tree canopy is characterized as an arrangement of informal groves within the center of the site with some trees placed in paving at the Memorial core and entry plazas where both shade and hard surfaces are necessary to accommodate visitors. The informal groves are intended to act as a counterpoint to the strict geometry of the tapestry elements while reinforcing the primary open spaces of the site along Maryland Avenue and the Memorial core. The layered tree canopy also creates a dialog with the landscape imagery depicted on the tapestries. (Figure 17)



Figure 17: View from Independence Avenue towards Memorial core

Tree locations and species have been chosen to provide edge definition, especially along Maryland Avenue, and seasonal interest throughout the year. Along Maryland Avenue, an allee of trees is proposed to frame the view towards the U.S. Capitol. Voids along the allee have been purposefully introduced to balance the informal setting of the groves and the desire to frame views toward the Memorial core.

The groves will consist of a palette of larger canopy trees and smaller understory trees initially planted at varying stages of maturity. The tree species selected complement each other and will consist of a number of different sized specimens with a particular affiliation to Kansas, or

¹ The Maryland Avenue cartway is defined by the 50-foot curb-to-curb distance that currently exists along this segment of the Avenue. The cartway makes up the middle portion of the historic 160-foot Maryland Avenue right-of-way.

appropriateness to Eisenhower and his legacy. In addition, the species are all suitable to the Washington, D.C. microclimate. Generally, the larger canopy trees will consist of species such as Hackberry, Oak, London Plane, and Serviceberry. Understory trees will augment the larger canopy and help frame views of Memorial elements. These smaller, flowering trees will consist of Dogwood, Ironwood, Redbud, and Hornbeam. Finally, a collection of raised planters are proposed at the two entry plazas and along LBJ Promenade. The planters will generally be used for perennial plantings. Along LBJ Promenade, the planters will also contain Serviceberry trees to help modulate the individual spaces along the length of the promenade, and further define the promenade as a separate space from the Memorial. (Figures 18 & 19)

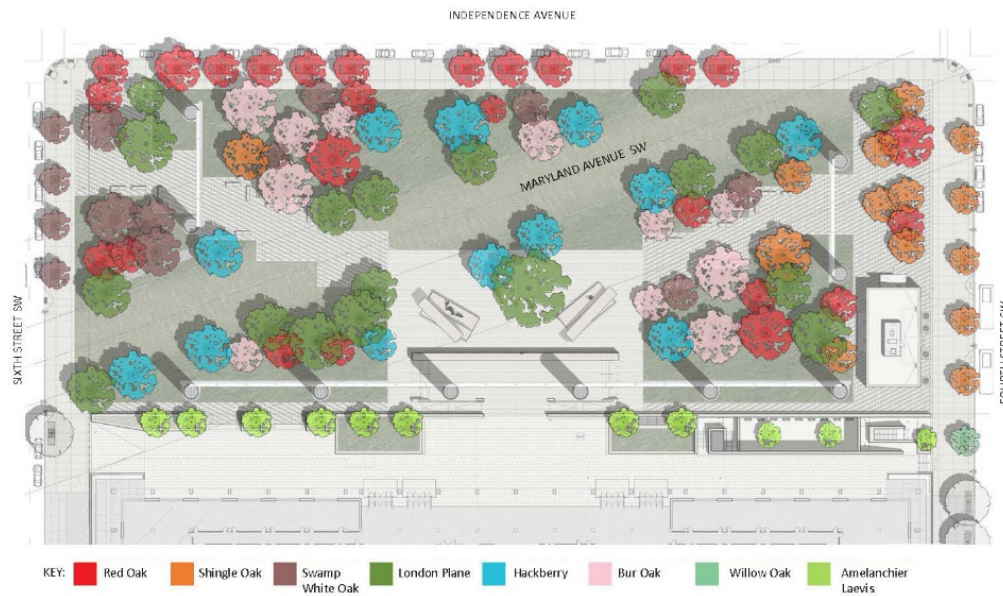


Figure 18: Proposed Memorial landscape plan (canopy trees)



Figure 19: Proposed Memorial landscape plan (ground plane and understory trees)

Information center



Figure 20: Information center east and west elevations



Figure 21: Information center looking from 4th Street

A small, one-story information center is proposed in the southeast corner of the site along 4th Street, SW near the main tour bus drop off area. According to the applicant, function is the primary influence for the design of the building which will serve the maintenance and interpretive, and needs of the NPS, and serve educational needs through book sales.

The architecture of the building has been kept simple to blend with the surrounding neighborhood and not compete with the Memorial elements. (Figure 20) As currently proposed, the building has a footprint of approximately 2,400 square feet and houses a bookstore, ranger contact station, and public restrooms. It also has a basement level containing mechanical and electrical equipment to serve the

building and provide general storage for NPS maintenance supplies. Mechanical equipment is also shown on the rooftop. The building will be clad in precast concrete with stainless steel and aluminum finishes on rooftop mechanical screening, canopy edges, and other frame details.

The public entrance to the bookstore is located on the north side of the building through a small, glass entrance vestibule. (Figure 21) The entrances to the restrooms are located on the south side of building close to the east entrance of LBJ Promenade. The east façade of the building, facing 4th Street, contains bookstore windows, service / maintenance doors, and clerestory restroom windows. The west façade of the building, facing the Memorial, includes bookstore windows, ranger contact station windows and door, a family restroom door, and clerestory restroom windows.

LBJ Promenade

A new pedestrian promenade is proposed between the Memorial and the LBJ Building. The promenade, referred to as LBJ Promenade, is intended to create a distinct zone separate from the Memorial that recognizes the formal entrance to the Department of Education and serves as a “fourth frame” around the Memorial site. It is also intended to serve as a security buffer for the Department of Education Headquarters.

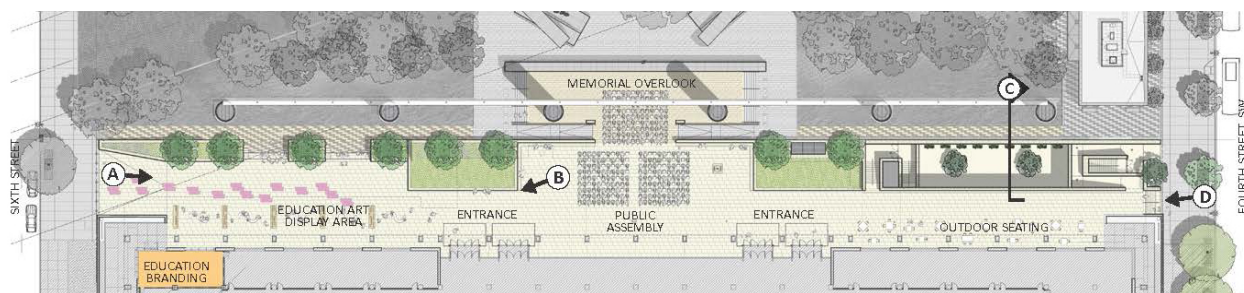


Figure 22: LBJ Promenade site plan

The design of LBJ Promenade has been broken into three areas that have specific purposes. (Figure 22) On the west end of the Promenade is an area that is designed to provide permanent exterior exhibit space for the Department of Education to display information about its mission or curate children's artwork as part of the programming of this area. A series of steps that lead down into the Memorial can also be used as seating to accommodate small gatherings. This end of the Promenade was specifically chosen for these activities as it relates to a possible future public outreach and retail function within the ground floor of the LBJ Building. The east end of LBJ Promenade, adjacent to the existing Department of Education cafeteria, will provide opportunities for outdoor seating. Finally, the center portion of the Promenade, which is set apart from the east and west areas by two large planters, provides access to existing building entrances and is designed as an open area that can also be used for small and large gatherings. This area extends further north than the rest of the Promenade to create a Memorial overlook. A set of stairways and ramps on either side of the overlook provide access down into the Memorial core.

As noted above, LBJ Promenade will also serve a security function, providing a 50-foot security buffer between the north façade of the LBJ Building and the Memorial. As a result of the Memorial having a slightly lower elevation, much of the security barrier has been integrated into the north retaining wall of the Promenade. Bollards are proposed at the east and west ends of the Promenade, across the stairways adjacent to the exhibit area, and at the base of the stairways and ramps leading from the overlook to the Memorial core. As proposed, the bollards are 36-inches tall, 12-inches in diameter, and will be constructed of concrete with stainless steel cladding. The bollards are spaced five feet center-to-center with a pedestrian clearance of approximately four feet.

Lighting

The proposed lighting concept is intended to create a volume of light through illuminating the various Memorial elements using a horizontal layering scheme. In describing the lighting plan the applicant states: "Just as the other avenues of the city are bound spatially by the roadway surfaces and the surrounding buildings, the Eisenhower Memorial uses the tapestry elements, Memorial blocks, and horizontal landscape plane as its binding lighting elements."

The lighting plan is composed of several horizontal layers of light that are intended to work together to reinforce the transition from human scale at the ground level to the larger scale Memorial elements. (Figure 23) At the ground level, subtle lighting integrated into the benches



Figure 23: Memorial lighting plan rendering



Figure 24: View of Memorial core at night



Figure 25: Image of illuminated tapestry mock-up

along the Memorial pathways is proposed. At an intermediate height, certain Memorial elements or landscape will be illuminated. (Figure 24) This appears to be accomplished through freestanding light fixtures and other fixtures that are integrated into the Memorial elements themselves. The lighting of the proposed tapestries is the most significant element of the lighting scheme. It will be accomplished through a continuous line of light fixtures at the bottom of each tapestry. (Figure 25) According to the applicant, the tapestries will be illuminated in a subtle way and will create the urban volume of light that will define the Eisenhower Memorial at night. The placement of lights at the bottom of the tapestries will result in a gradual decrease of light intensity as it reaches the middle and upper portions of the tapestry.

Signage

To help visitors navigate and identify the Memorial, a system of wayfinding and site identification signage is proposed for the Memorial and the LBJ Building. The proposed signage is consistent with the recently developed NPS signage standards for the National Mall. In addition, the signage proposed for the LBJ Building is consistent with the General Services Administration's (GSA) recently developed standard building identification signage design. NPS wayfinding and site identification signage is proposed at the northwest and northeast corners of the site near the primary pedestrian entryways. Similar signage is proposed at the west end of LBJ Promenade, the Memorial overlook, and at the information center. Signage for the LBJ Building is proposed at either end of LBJ Promenade.

Other than the standard NPS and GSA signage, the Memorial design also includes signage that is unique to the project at the Memorial information center. Just north of the support building, a tactile site map is proposed to provide visually-impaired visitors with an overview of the Memorial. The sign will be a raised, bronze plaque containing a plan of the site and key quotes from the Memorial elements. It will be placed on a limestone base.

II. PROJECT ANALYSIS/CONFORMANCE

Executive Summary

Based upon an analysis of the Memorial design's consistency with the purposes and specific criteria of the National Capital Planning Act and the Commemorative Works Act, NCPC's site selection design principles, and other relevant NCPC plans and policies, staff recommends disapproval of the preliminary site and building plans for the Dwight D. Eisenhower Memorial.

The current Memorial design continues to employ a modern and innovative approach to commemorating President Eisenhower. This overall approach is not in itself inconsistent with the design principles and one that was previously supported by staff and the Commission. However, while the proposed stainless steel tapestries are modern and innovative in their own right, as currently proposed they render the design inconsistent with specific design principles. This analysis finds that the tapestries, at their current scale and configuration, present issues for the Commission regarding its responsibilities under the National Capital Planning Act "to preserve the important historical and natural features of the National Capital;" and under the Commemorative Works Act to preserve the integrity of the comprehensive design of the L'Enfant and McMillan Plans. Therefore, staff recommends that the Commission request the applicant to modify the design, however necessary, to reach the intent of the Planning Act and Commemorative Works Act, and meet the design principles to the Commission's satisfaction.

In addition to being adopted as a condition to the Commission site approval action, the adopted site selection design principles (listed below) are included as required mitigation in NCPC's Finding of No Significant Impact, issued in accordance with the National Environmental Policy Act (NEPA), for approval of the site, and are appended to the Memorandum of Agreement established pursuant to Section 106 of the National Historic Preservation Act for the Memorial design. Furthermore, analysis of the preliminary Memorial design identified additional planning-related issues that should be addressed before the next review stage. These issues pertain to overall pedestrian circulation, perimeter security, lighting, and public space.

Finally, staff has determined that the project meets specific decision criteria required under the Commemorative Works Act generally pertaining to the Memorial's surroundings, location, landscape features, and donor recognition. Regarding the criterion pertaining to durability, while the applicant has completed a full spectrum of durability tests, staff's analysis focused only on those areas of durability that fall squarely within the realm of planning and design. Specifically, staff's focus was on the environmental durability, or corrosion resistance, of the stainless steel base material chosen for the tapestries, and the mechanical durability, or mechanical strength, of the welds that will hold the tapestry panels together. Therefore regarding those specific areas, staff

recommends that the Commission find that the project meets the Commemorative Works Act durability criteria. Staff's analysis did not assess the Memorial's artistic durability (i.e. what effect would corrosion and weld failure have on the artistic qualities of the tapestries) or required maintenance protocols and costs to sustain durability. These are areas that more appropriately fall within the purview and expertise of other agencies that also have jurisdiction over the project.

National Capital Planning Act

The National Capital Planning Act established NCPC as the central planning agency for the federal government in the National Capital Region for purposes of preserving the important historical and natural features of the nation's capital. NCPC carries out this important mission partly through its mandate to development, jointly with the Mayor of the District of Columbia, a Comprehensive Plan for the National Capital. In addition to various policies intended to protect and enhance parks and open space as well as the natural environment, the Comprehensive Plan contains several policies intended to preserve historic and potentially historic resources. Several of these policies exist to protect the historic L'Enfant and McMillan Plans. Maryland Avenue, being the mirror reflection of Pennsylvania Avenue and on axis with the U.S. Capitol, is one of the most important avenues in both of these plans. Therefore, development of any kind along this corridor must be carried out carefully and in a manner that adheres to the principles that are inherent to the L'Enfant Plan which give Washington its iconic image. As for the current Memorial design, the proposed scale and configuration of the tapestries have a considerable impact on Maryland Avenue and its viewshed to the U.S. Capitol, both contributing resources to the historic Plan of Washington. Therefore, staff considers the proposal inconsistent with the purpose of the National Capital Planning Act.

Commemorative Works Act

The stated purpose of the Commemorative Works Act (CWA) is: 1) to preserve the integrity of the comprehensive design of the L'Enfant and McMillan Plans for the Nation's Capital; and 2) to ensure the continued public use and enjoyment of open space in the District of Columbia, and to encourage the location of commemorative works within the urban fabric of the District of Columbia. To that end, the CWA establishes a process by which commemorative works located in the District of Columbia and its environs are established. The CWA process is intended to help ensure that future commemorative works are appropriately designed, constructed and located, and reflect a consensus of the lasting national significance of the subjects involved.

The CWA contains a set of decision criteria that must be used by the agencies involved in making decisions on commemorative works. Specifically, the Act states: "in considering site and design proposals, the Commission of Fine Arts, National Capital Planning Commission, and the Secretary or Administrator (as appropriate) shall be guided by, but not limited by, the following criteria:"

- **Surroundings** - To the maximum extent possible, a commemorative work shall be located in surroundings that are relevant to the subject of the work.

- **Location** - A commemorative work shall be located so that:
 - It does not interfere with, or encroach on, an existing commemorative work; and
 - To the maximum extent practicable, it protects open space, existing public use, and cultural and natural resources.
- **Material** - A commemorative work shall be constructed of durable material suitable to the outdoor environment.
- **Landscape features** - Landscape features of commemorative works shall be compatible with the climate.
- **Museums** - No commemorative work primarily designed as a museum may be located on lands under the jurisdiction of the Secretary in Area I or in East Potomac Park.
- **Site-specific guidelines**² - The National Capital Planning Commission and the Commission of Fine Arts may develop such criteria or guidelines specific to each site that are mutually agreed upon to ensure that the design of the commemorative work carries out the purposes of this chapter.
- **Donor contributions** - Donor contributions to commemorative works shall not be acknowledged in any manner as part of the commemorative work or its site.

While the proposed Memorial is appropriately located within the urban fabric of the city and will contribute to the District of Columbia's system of public open space, the Memorial as currently designed has a considerable adverse effect on the integrity of the L'Enfant and McMillan Plans. This is primarily as a result of the scale and configuration of the proposed tapestries in relation to the historic Maryland Avenue right-of-way, a contributing element of the historic Plan for the City of Washington.

The project is consistent with the CWA's specific decision criteria regarding surroundings, location, landscape features, museums, and donor contributions. The Memorial location is surrounded by buildings and uses that are relevant to President Eisenhower's achievements and the time period in which he served in the White House. The Memorial will not interfere or encroach upon any existing commemorative works, has not been designed primarily as a museum, and will be landscaped in a manner that is compatible with Washington's microclimate. Finally, the CWA currently prohibits donor recognition in any manner as part of a commemorative work or its site. According to the preliminary site and building plans submitted by the applicant the Memorial does not contain any elements intended to recognize donor contributions, including within or on the exterior of the Memorial support building.

With regard to the requirement to protect open space, existing public use, and cultural and natural resources, compared to existing conditions the project will add to the city's system of parks and

² The criterion pertaining to site-specific guidelines is not applicable to this project as NCPC and the Commission of Fine Arts opted not to develop mutually agreed upon guidelines. Rather, NCPC's adopted design principles were developed during site selection through the Section 106 process and included as required mitigation in the Commission's Finding of No Significant Impact, issued under the National Environmental Policy Act, for approval of the site. The Commission of Fine Arts supported the intent of NCPC's guidelines, particularly the importance of maintaining the historic view corridor of Maryland Avenue, but decided against using guidelines in favor of leaving it to the design team to fully consider the appropriate treatment of the site in developing a concept for review.

open space and provide additional opportunities for public use. However, as currently proposed the allocation of public gathering space versus space for commemorative reflection does not create a commemorative work that prominently features the accomplishments and legacy of President Eisenhower within an activated public space that is integrated into the urban fabric, relates to its surrounding context; and preserves the integrity of historic resources.

Regarding durability, while the applicant has completed a full spectrum of durability tests, this analysis focused only on those areas of durability that fall squarely within the realm of planning and design, a detailed discussion of which follows. Specifically, the analysis focused on the environmental durability, or corrosion resistance, of the stainless steel base material chosen for the tapestries, and the mechanical durability, or mechanical strength, of the welds that will hold the tapestry panels together. While the responsibility to meet the CWA criteria apply to NCPC, U.S. Commission of Fine Arts (CFA), and the Secretary of the Interior, the expertise and responsibilities to evaluate artistic durability (i.e. what effect would corrosion and weld failure have on the artistic qualities of the tapestries?) and required maintenance protocols and costs to sustain durability reside more appropriately with these other agencies.

Based on NCPC staff's review of the applicant's testing and the evaluations of NIST, the DoD, and the Smithsonian Institution, the results of the durability tests show that the 317L stainless steel alloy proposed for the tapestry panels has exhibited resistance to corrosion and the proposed tapestry panel welds are likely to be mechanically sound and therefore, the proposed tapestry materials and fabrication methods meet the Commemorative Works Act durability criteria.

In order to ensure that the corrosion and mechanical strength performance is sustained while the tapestry fabrication method continues to be refined, the applicant should submit the following documentation at subsequent reviews:

- The tapestry material and welds continue to reach the same durability standards as fabrication methods are further refined.
- The recommended maintenance regimen, including cleaning, will not cause weld failure if carried out properly.
- The operational protocols that will be employed to avoid danger to the public during instances where snow and ice has accumulated on the tapestries.

2006 Site Selection Design Principles

An important component of NCPC's review of the preliminary Memorial design is the project's consistency with the 2006 site selection design principles that were adopted by the Commission as part of its 2006 site approval and included as required mitigation in NCPC's Finding of No Significant Impact (FONSI) for site selection. The design principles are as follows:

1. Preserve reciprocal views to and from the U.S. Capitol along Maryland Avenue, SW.
2. Enhance the nature of the site as one in a sequence of public spaces embellishing the Maryland Avenue vista.
3. Create a unified memorial site that integrates the disparate parcels into a meaningful and functional public gathering place that also unifies the surrounding precinct.

4. Reflect L'Enfant Plan principles by shaping the Memorial site as a separate and distinct public space that complements the Department of Education Headquarters and other surrounding buildings.
5. Respect and complement the architecture of the surrounding precinct.
6. Respect the building lines of the surrounding rights-of-way and the alignment of trees along Maryland Avenue.
7. Incorporate significant green space into the design of the memorial.

Consistent with how the principles were applied at the concept review stage, staff's approach to applying the design principles to the current Memorial design relies on the overarching intent of the principles, which is to have the Memorial reflect and respect key characteristics of the L'Enfant Plan as they pertain to the shaping of view corridors and public spaces. In other words, to have the Memorial take the form of an active public park that is defined by surrounding buildings and preserves important view corridors.

Staff's analysis finds that the current proposal meets the following four design principles:

Incorporate significant green space into the design of the memorial

Compared to existing conditions, significant green space will replace existing impervious surface through a diverse landscape plan that proposes a formal and informal arrangement of vegetation. (Figure 5, 18 and 19) In acknowledgement of Maryland Avenue, the design creates a meadow-like promenade that will consist of a groomed lawn. Throughout the rest of the site, a more informal landscape of taller, un-groomed lawn is proposed to evoke the Kansas landscape. The informal landscape will establish a non-uniform arrangement of large canopy trees and smaller, flowering understory trees across the site that will relate to the landscape imagery of the tapestries. The proposed design is approximately 70 percent pervious and will add approximately 1.5 acres of additional landscaped area compared to existing conditions. This significant amount of green space will be a welcomed amenity in an area of the city that is characterized by significant amounts of impervious surface and lacking in useable open space.

Respect and complement the architecture of the surrounding precinct

The intention of this principle is to have a Memorial that utilizes modern and innovative approaches in its design as well as in the way it commemorates Dwight D. Eisenhower. As proposed, the Memorial meets this principle through the widespread use of a modern material like stainless steel, and the highly-innovative development and use of the stainless steel tapestries as a commemorative element. The project also complements the surrounding precinct through the use of similar materials including limestone, granite, and concrete.

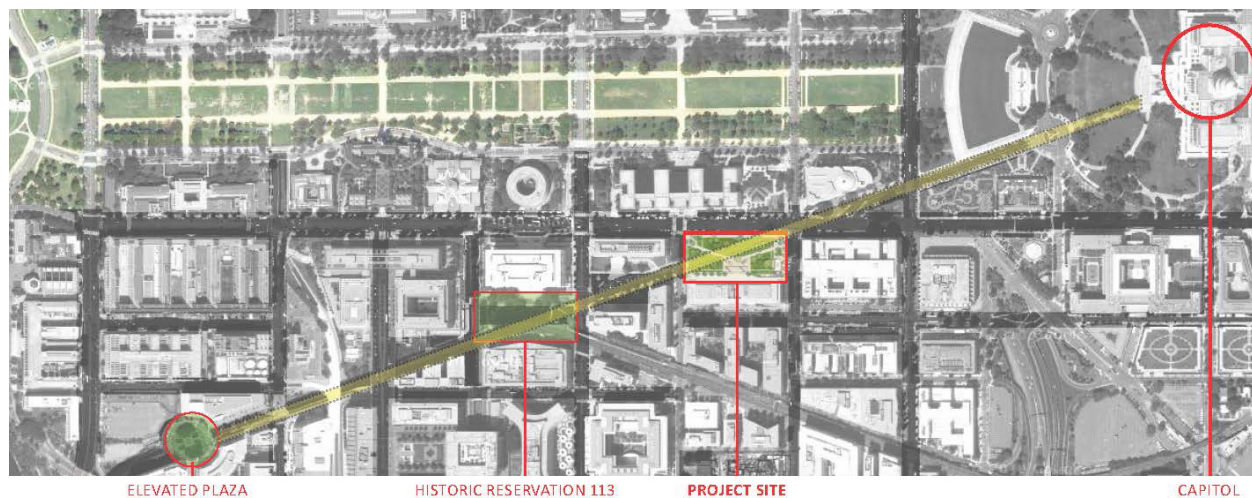


Figure 26: Relationship of Memorial site to other public spaces along Maryland Avenue

Enhance the nature of the site as one in a sequence of public spaces embellishing the Maryland Avenue vista and Create a unified memorial site that integrates the disparate parcels into a meaningful and functional public gathering place that also unifies the surrounding precinct

The proposed Memorial will integrate the site's collection of disparate parcels into a unified Memorial site and unique public gathering space that establishes the site as one in a sequence of public spaces along Maryland Avenue. (Figure 26) In addition, the elimination of multiple unrelated uses in favor of a unified commemorative park unifies the surrounding precinct.

While staff considers these two principles to be met due to the replacement of the existing collection of disparate parcels with a unified site that will have substantially more green space and tree canopy, the scale and configuration of the tapestries reserve the vast majority of the site for commemorative purposes leaving only narrow areas behind the east and west tapestries for public gathering. Furthermore, the tapestries also reduce the site's potential to unify the surrounding precinct by creating the sense of a "precinct within a precinct" and weakening the ability of the surrounding streets and buildings to define the site.

Staff's analysis finds that the current proposal does not meet the following three design principles:

Preserve reciprocal views to and from the U.S. Capitol along Maryland Avenue, SW

With regard to the need to preserve reciprocal views along Maryland Avenue, the changes made to the configuration of the east and west tapestries, and to the length of the south tapestry, are an improvement from what was previously proposed at the concept stage. However, the scale and configuration of the columns and tapestries within the 160-foot right-of-way continue to obscure the view towards the U.S. Capitol. (Figure 27) While it was determined during site selection that the Maryland Avenue cartway, defined by the existing alignment of trees, would be recognized as being a development restriction zone that is off limits to any physical memorial elements, the actual historic viewshed to be preserved remains to be the entire 160' right-of-way. The

environmental assessment prepared during site selection and adopted by NCPC as the basis for its Finding of No Significant Impact notes as a development constraint “protect Maryland Avenue’s 160-foot [right-of-way] and 60-foot historic cartway/view corridor by limiting development in the corridor to public spaces, landscaping, sculptures and artworks.” While the tapestries clearly fall



Figure 27: Comparison of view along Maryland Avenue towards the U.S. Capitol (Top) February 2011 concept design, (Bottom) April 2014 preliminary design

within the category of artwork, their scale and configuration, which narrows the viewshed from 160’ to 95’ with columns that are 78’ high and 10’ in diameter results in a substantial diminution of what is intended to be one of the L’Enfant Plan’s most symbolic and monumental views. The placement of any memorial elements within the right-of-way must be done sensitively, and in a manner that minimizes the loss of integrity to the historic view toward the U.S. Capitol.

Placement of elements within the viewshed should also be done in a manner that preserves the prevailing civic – *more horizontal* – character that is typical of the city’s broader, more significant avenues which allows public buildings and commemorative works to be the dominant elements within these important view corridors. As

currently proposed, the framed view of the Capitol established by the height of the tapestries and their distance from the centerline of Maryland Avenue compromises this character. The significance of this horizontal versus vertical character of the city’s monumental corridors was an underlying principle within the “The Height Master Plan for Washington, DC: Federal Interest Report and Final Recommendations” prepared and adopted by the Commission in November 2013.

Reflect L’Enfant Plan principles by shaping the Memorial site as a separate and distinct public space that complements the Department of Education Headquarters and other surrounding buildings

This principle, and the one that follows regarding the need to respect the building lines of the surrounding rights-of-way, go hand-in-hand toward achieving the overarching intent of the principles discussed above. With regard to what it means to “reflect L’Enfant Plan principles,” the District of Columbia State Historic Preservation Officer succinctly described it in comments

provided to NCPD during the 2006 site selection process by stating “it is the shaping of view corridors and public spaces framed by building sites that is the essence of the plan.”

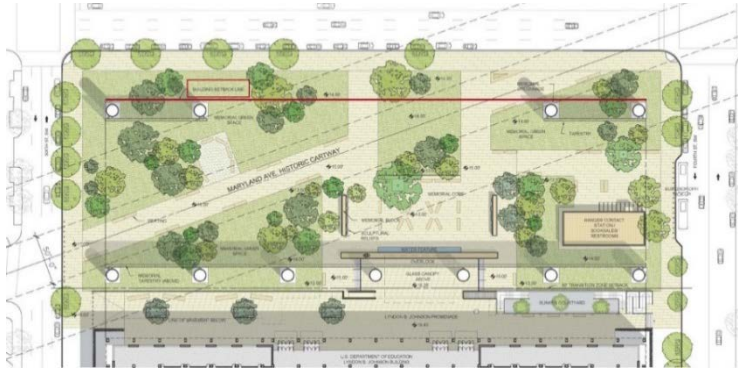


Figure 28: February 2011 concept design showing building setback line

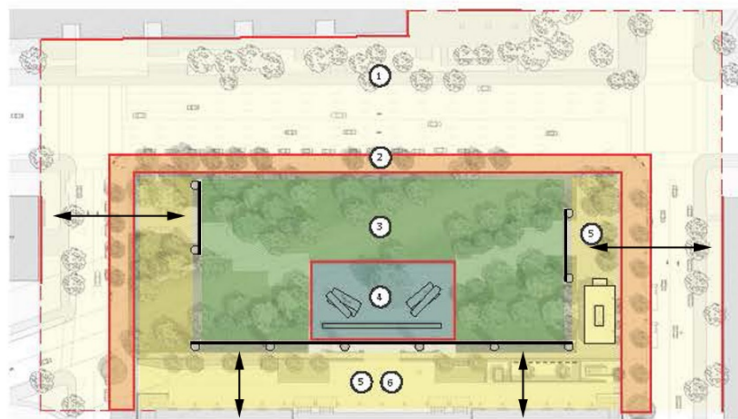


Figure 29: Diagram showing redefined relationship to buildings and 4th and 6th Streets



Figure 30: Relationship of tapestries to surrounding buildings

550 feet to approximately 447 feet and centered on the LBJ Building. These changes, while having the effect of allowing Independence Avenue and the National Air and Space Museum to define the northern edge of the site, have resulted in a diminution of the role of the buildings and streets on

At the concept review stage, the project was inconsistent with these two principles as a result of the two smaller tapestries, which were located parallel to Independence Avenue along a 50-foot setback line that coincided with the adjacent buildings, thereby establishing an extension of the street wall similar to what would occur if a building was constructed on the site. (Figure 28) Staff noted at the time that “rather than striving to reinforce or extend existing street walls, the design principles intend the site to be an opening in the street wall similar to the function of other public squares throughout the city.” In addition, the applicant’s proposed configuration of the tapestries to reflect a proscenium stage setting did not reflect L’Enfant Plan principles and complement the Department of Education building. (Figure 11) Generally, the concept precluded the surrounding buildings’ ability to define the Memorial site, all of which have thematic ties to President Eisenhower, and instead created a precinct within a precinct.

Since the concept stage the applicant has made changes to the width and configuration of the tapestries. Specifically, the two smaller tapestries have been rotated 90 degrees to be parallel to 4th and 6th Streets and pulled in slightly from the site perimeter. In addition, the south tapestry length has been reduced from



Figure 31: Relationship of height and length of south tapestry to the LBJ Building



Figure 32: Diagram of south tapestry showing estimated image densities (in percent solid)

the east and west sides to define the site. (Figures 29) The placement of the east and west tapestries also takes away from the success of the urban park as a unifying element within the precinct. Rather, the spatial relationship is established more between the adjacent buildings and the tapestries as opposed to the Memorial core and the surrounding park. (Figure 30) Furthermore, while the reduction in length of the south tapestry has opened up oblique views of the east and west ends of the LBJ Building, the length of the south tapestry still overshadows the building with regard to views and its ability to help define the Memorial and surrounding park, both physically and thematically, especially when considered in combination with the range of image densities currently planned for the tapestries. (Figure 31)

The degree of transparency achieved for the tapestries contributes to the Memorial's overall scale and whether it successfully reflects L'Enfant Plan principles and complements surrounding buildings. Taken together, the height, length, configuration, and transparency of the tapestries will dictate the degree to which the surrounding buildings are perceived to define the Memorial and surrounding park in a manner that is consistent in character with other L'Enfant public spaces found throughout the District of Columbia. Specifically considering the length of the south tapestry, which has a length that is 80% of the LBJ Building, and the image densities described below, the proposal would have a considerable effect on the perception of that building actively contributing to the definition of the Memorial space.

The applicant continues to work on, and refine, the tapestry fabrication process to achieve its desired commemorative and design goals for this significant element. The chosen fabrication method will result in the tapestries having a range of transparencies with the upper portions being

primarily open and the lower portions being largely opaque. According to information provided by the applicant, the “solidity” of the tapestries will range from 20 – 95% under normal conditions.³ Based on the current plan to use imagery of the Kansas landscape, the lower portion of the tapestry will be approximately 95% solid with the middle and the upper portions being 50% and 20% solid, respectively. (Figure 32) This results in the lower two-thirds, or 40 feet, of the tapestry height having an average image density of 73% (average of lower and middle solidity values).

Respect the building lines of the surrounding rights-of-way and the alignment of trees along Maryland Avenue

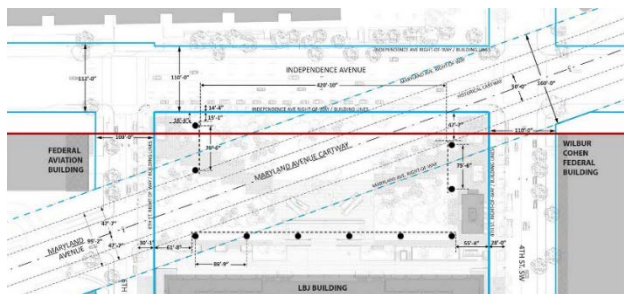


Figure 33: Diagram showing placement of tapestries in relation to building setback line

This purpose of this particular principle is to provide guidance with regard to the appropriate placement of Memorial elements on the site while taking into account certain constraints established by existing conditions the surround the site. Similar to other principles that address how the Memorial relates architecturally to the surrounding context, this principle focuses on contextual relationships from the perspective of site planning. With regard to the placement of Memorial elements in relation to the alignment of trees along Maryland Avenue, the current design is successful in that no elements are located within the proposed allee of trees that define the 50-foot cartway. However, regarding Independence Avenue, while the changes to the tapestry configuration address comments from the concept stage, the current design has created a new issue that causes inconsistency with this principle. Specifically, the realignment of the smaller tapestries has resulted in the column at the northwest corner extending beyond the building line established by the adjacent buildings to the east and west (Wilbur Cohen Building and Wilbur Wright Building) creating a visual intrusion into the existing view along Independence Avenue, a primary approach to the Memorial. (Figures 33 & 34)



Figure 34: Views of Memorial looking east along Independence Avenue

³ See *Eisenhower Memorial Tapestry Engineering and Technical Data Summary, Volume 1 Tapestry Overview and Engineering Summary*, Section 3.3.5 - Wind Loads

The interpretation of the term “building line” has been well established since the 2006 site selection process. During site selection, the National Park Service, in association with the EMC, prepared the *Proposed Dwight D. Eisenhower Memorial Site Selection Environmental Assessment*. NCPC relied upon the content of the environmental assessment, as well as input received during the Section 106 consultation process, to develop the design principles and issue its mitigated Finding of No Significant Impact for approval of the site. The environmental assessment contains a section entitled “Site Development Framework” that describes and illustrates several factors that influence how the site could be developed. Included in the list of *development constraints*, the assessment recognized the need to “conform to the established setbacks of surrounding buildings to maintain the integrity of adjacent L’Enfant streets, including Independence Avenue, 4th Street, and 6th Street.” The illustration included in the assessment clearly shows the established setback along Independence Avenue as being the line formed by the north facades of the Wilbur Cohen and Wilbur Wright Buildings. (Figure 35) Another section of the assessment discusses the need to “respect and maintain the setback line of the corridor established by adjacent buildings.”

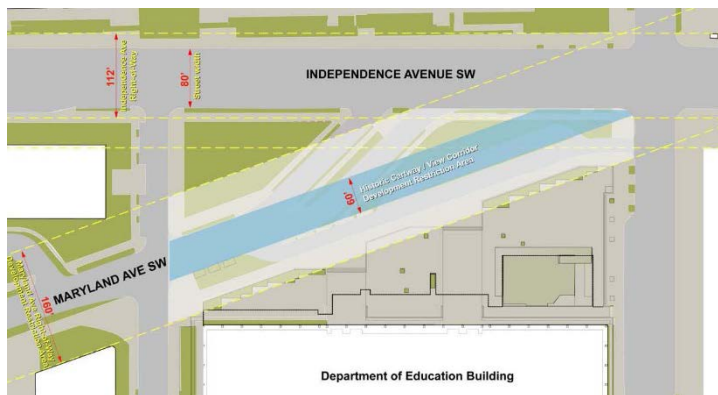


Figure 35: Development framework diagram (2006 Site Selection EA)



Figure 36: Memorial site geometry and constraints diagram (February 2011)

Following site selection, previous presentations and design concepts presented to the Commission reflected the established setback line formed by adjacent buildings as the line of demarcation for placement of Memorial elements. The information submitted for NCPC’s February 2011 concept review includes a diagram showing a 50-foot setback from Independence Avenue and a notation stating “the project site is defined visually by the adjacent neighboring building street walls.” (Figure 36) All three concepts reviewed by the Commission at that time adhered to this setback. The current proposal’s inconsistency with this design principle caused by the west tapestry column projecting beyond the established building line arose after NCPC’s concept review when the two tapestries previously aligned with Independence Avenue were reconfigured to be parallel with 4th and 6th Streets.

Notwithstanding the clear record that exists regarding what has been commonly understood as the regulating development constraint along the north side of the Memorial site, adherence to the setback of the adjacent buildings would also be beneficial to the arrival experience of pedestrians

approaching the Memorial along Independence Avenue, how the Memorial relates to the surrounding context, and how the design reflects L'Enfant Plan principles.

Tapestry durability

The materials and fabrication of other commemorative works in the Nation's Capital have tended to be more traditional and have demonstrated their durability over time. As noted at previous Commission meetings, the Eisenhower Memorial's proposed stainless steel tapestries are truly innovative as commemorative elements. Therefore, the need for a thorough analysis of the tapestries' long-term durability is critical to establishing conformance with the CWA and ensuring the long-term integrity of the Memorial. To assist in reviewing and verifying the durability tests being conducted by the applicant and its design team, NCPC staff has been working with technical experts in metallurgy, corrosion prevention, structural engineering, and fine art conservation from the National Institute of Standards and Technology (NIST), the United States Department of Defense (DOD), and the Smithsonian Institution. Representatives from these agencies are assisting NCPC in reviewing the applicant's proposed testing protocols; interpreting the results of performance, structural, and longevity tests; and providing recommendations on outdoor art conservation, maintenance, and corrosion prevention best practices.

Due to the untested complexity of the tapestries and the scale and extent at which they are proposed, the applicant and its design team have completed an extensive sequence of tests on the tapestry engineering, fabrication methods and materials, and maintenance protocols. According to information provided by the applicant, the testing protocols are based on general engineering practices required for a structure of this nature. The material and environmental testing procedures utilize accepted standards when available, and in certain circumstances have been modified to more closely reflect the atmospheric conditions of the Memorial site. In these instances, the applicant, NCPC staff, and the technical agencies worked together to establish mutually agreed upon testing parameters.

Since 2012, the applicant has diligently completed a wide range of analyses to test the durability of the proposed stainless steel tapestries. In general terms, these tests have looked closely at the tapestry's structural durability with regard to their ability to withstand low to high intensity wind, seismic, ice, and thermal loads. This structural testing has included mechanical strength testing of several sample tapestry welds under different load scenarios as well as weld fatigue testing on a three foot by three foot tapestry sample that was fabricated to specification. In addition, several rounds of testing have been completed to assess the environmental durability of the tapestries, specifically the corrosion potential of the tapestry base material stainless steel. The corrosion tests, which utilized an industry standard salt fog method that was modified to reflect the atmospheric conditions of Washington, DC, were conducted on several samples of different stainless steel alloys in welded and un-welded states. In fact, the environment that was modeled in these tests was much more corrosive than what is expected to occur in place.

Corrosion resistance

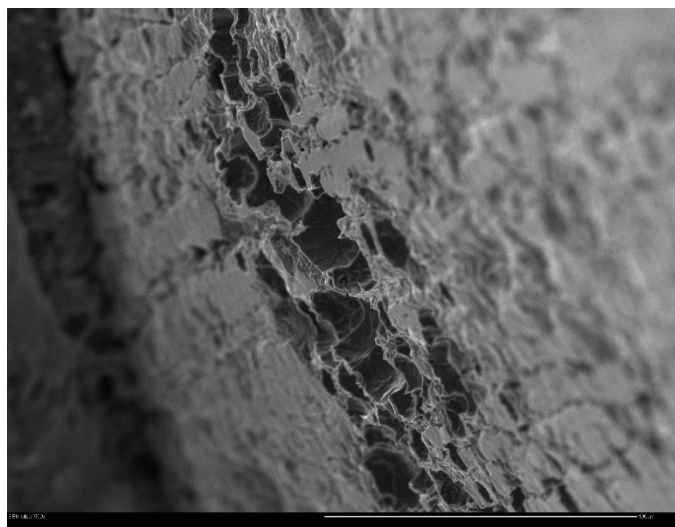


Figure 37: Example of “pitting” under high magnification
Image produced with Scanning Electron Microscope (500X)

The salt fog tests that were carried out by the applicant were conducted using the Standard Practice for Operating Salt Spray (Fog) Apparatus (ASTM B117 – 11), and ASTM G85 Annex A4, with protocol modifications to more closely recreate a severe version of the environment that the tapestries may be exposed to while in service. The tests followed the standard runtime of 1,000 hours. According to the applicant’s report, prior to placement in the salt fog chamber, the materials were rack mounted with a two pound weight applied to each sample to model the tensile loads of the actual tapestry. In addition, the samples were coated with lamp black to simulate carbon soot pollution, typical of urban

environments. During the tests, the samples were subjected to a constant spray of Sodium Chloride (salt) and a periodic spray of sulfur dioxide (SO₂) gas to maintain a highly acidic pH of 2.5 – 3.2. In its report, the applicant notes that “the sulfur dioxide salt spray test is much more aggressive than the standard salt spray test due to the periodic introduction of [sulfur dioxide] which results in a highly acidified environment.” The severity of the modeled salt fog environment is also confirmed in reports received by NIST and the DOD. At the conclusion of the test, the samples were evaluated for the presence of sensitization / corrosion to the tapestry base materials both inside and outside of the heat affected zone (HAZ)⁴ of the weld joint. In technical terms, sensitization occurs in the form of “pitting” (Figure 37) which is described by NIST, as follows:

“Pitting occurs in welded stainless steel when the heating near the weld causes the chromium in the metal to react with carbon and form chromium carbides on the boundaries between grains. With the Cr tied up in carbides, it is no longer available to form chromium oxide, which is the naturally occurring protective coating that makes stainless steel “stainless.” The protection is lost where these boundaries intersect the surface, and the environment selectively attacks these chemically weak areas, causing the formation of corrosion pits. These pits are undesirable because they weaken the wire by reducing its load-bearing cross sectional area and provide locations where fatigue cracks can nucleate.”

(Second Preliminary Report on Metallurgical Analysis of Corrosion Studies of Select Proposed Wire Materials for the Eisenhower Memorial Tapestries, National Institute of Standards and Technology, August 26, 2013)

⁴ The heat affected zone (HAZ) is the zone within a base metal that undergoes structural changes but does not melt during welding, cutting, or brazing.

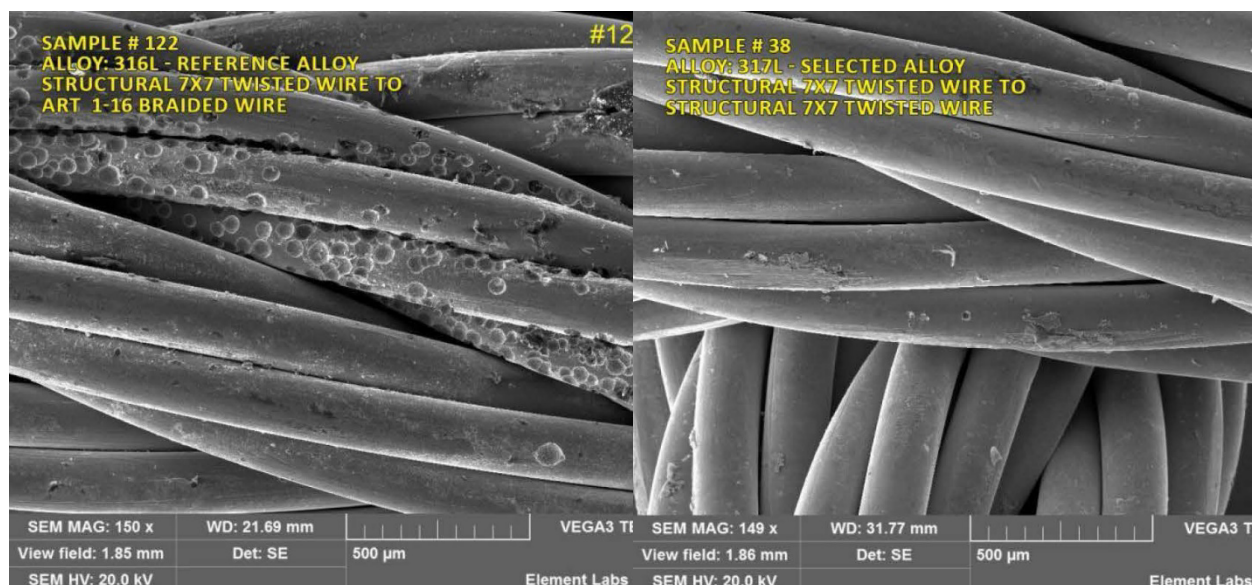


Figure 38: Images of pitting in 316L (left) and no pitting in 317L (right) structural cable

Following multiple rounds of salt fog testing on welded and un-welded solid, twisted, and braided wire samples of various stainless steel alloys, including: Types 304, 316L, 317L, and 321, the applicant has committed to fabricating the tapestries using 317L stainless steel as it exhibited superior corrosion resistance compared to the other alloys tested. The applicant's most recent round of corrosion testing, completed in December 2013, was conducted on 120 stainless steel braided and twisted wire weld joint samples. These samples were composed of different combinations of 317L structural twisted cable and 316L artistic braided cable.⁵ At the completion of a 1,000 hour modified salt fog test, visual examinations were performed on the structural weld joints using an optical stereo microscope as well as a Scanning Electron Microscope, or SEM. As discussed in the applicant's report, dated February 3, 2014, the results of the corrosion testing show no evidence of pitting attack on the structural weld joints made of 317L twisted stainless steel wire both inside and outside the HAZ. However, pitting was observed in the structural joints made of 316L twisted stainless steel. (Figure 38) Pitting was also observed in the 316L braided art wire used in the test. These results are consistent with prior rounds of salt fog tests that were conducted by the applicant using welded solid wire samples, and specifically that welded 317L alloy material exhibits better corrosion resistance than welded 316L material in a highly acidic marine test environment. Based on these tests, and several corrosion tests previously completed, the applicant states that the results directly reflect the durable nature of the 317L alloy relative to atmospheric corrosion and provide a firm basis for the decision to use this particular alloy for construction of the tapestries.

⁵ A combination of 317L structural and 316L artistic material was used during this round of testing due to the limited availability of "off-the-shelf" 317L wire types. However, 316L stainless steel, which was previously a candidate alloy, was available in all forms and was included in the study for comparison purposes. Corrosion tests of braided art wires made from 317L are planned and will be completed prior to NCPC final review.

Mechanical strength

To assess the mechanical durability of the tapestry welds a series of strength tests were conducted on several welded wire samples to quantify the loads at which these joints failed. Several samples were prepared using 317L and 316L stainless steel in order to draw comparisons across the two alloys. In addition, half of the samples were subjected to a 1,000 hour salt spray test to see if corrosion testing had any effect on weld strength.

Four different weld joint types were prepared for purposes of the mechanical strength test. The four joint types correspond to the different combinations of structural and artistic wire welds that will be present in the tapestries. The horizontal and vertical structural component of the tapestry panels will consist of 1/16" (7 x 7) 317L twisted cable. The artistic component of the tapestry panels will be composed of three different types of braided cable. (Figure 39)

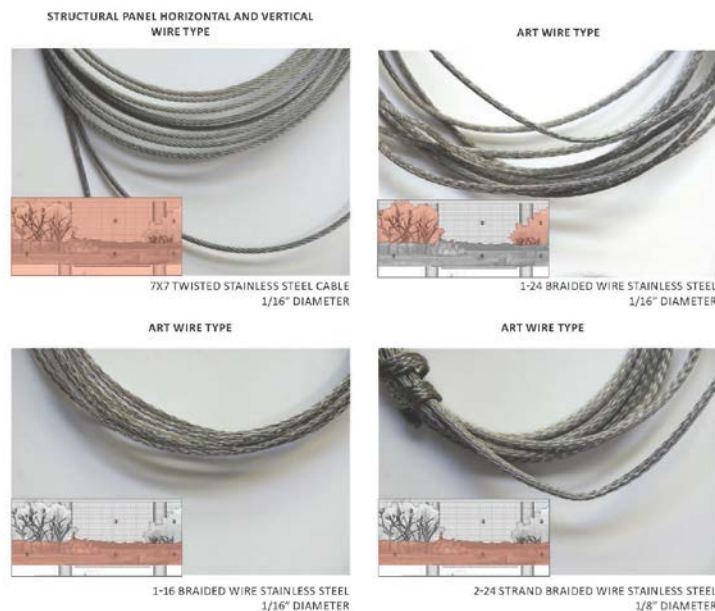


Figure 39: Tapestry twisted and braided wire types

Different weld settings were used to create each of these joints based on the types of wire that were involved in the weld. This was required as a result of the differing geometries of the materials. For example, samples prepared with 2 structural cables required different power, pressure, and time settings than samples consisting of two types of artistic braided cables.

Three types of tensile strength tests – shear, peel, and torque - were performed on 150 welded joints; the difference between these tests being the direction in which the sample wires are pulled to failure. Baseline failure measurement were collected on a set of as-welded weld joints. The same tests were then performed on duplicate welded joints which had been exposed to a 1,000 hour salt spray test. In general, the measured weld strengths across all three tensile tests and across the as-welded and salt fog tested samples showed a degree of variability. According to the applicant:

“The measured weld joint strength results reflect the variability in weld strength which was anticipated due to the unique nature of welding braided and twisted wires. The number of individual wires that are in contact with one another when the weld is made can vary. This has a direct effect on the number of wires welded and accounts for the weld strength variations observed.”

More specifically, the applicant reported that the testing performed on the 317L and 316L structural weld joints showed no degradation in mechanical strength between the as-welded and salt-fog tested samples. The measured strength values clearly showed that the structural wire welds

were the strongest with an average breaking strength of approximately 50 pounds (lbs) for the samples made of 317L material. The artistic braided wire welds showed lower breaking strengths than the structural wire welds which, according to the applicant, was not unexpected in that the weld settings were chosen to optimize the weld quality while minimizing heat tint, or discoloration caused by heat during the welding process, and taking into account the lower load carrying requirements of the art wires compared to the structural wires.

The average measured strength values acquired from the tensile tests describe above were used to calculate the overall expected capacity of each *structural* weld in the tapestry panels. These calculations took into account a safety factor of four (4), meaning only a fourth of the average measured weld strength was used to calculate expected weld capacity. These calculated values were then compared to the expected maximum load on each tapestry structural weld. According to the applicant, the results of these calculations show that even with a safety factor of four (4), the weld capacity is almost five (5) times greater than the maximum expected load on each structural weld. Specifically, the calculated capacity of the structural welds is approximately nine (9) pounds and the maximum expected load on each structural weld is approximately two (2) pounds.

Finally, the applicant also conducted fatigue testing on a three foot by three foot tapestry sample that was mechanically fabricated to specification. The purpose of the fatigue test was to simulate wind-induced load cycles expected to act on the tapestry panels during moderate to extreme wind events. Pressure levels ranging from the approximately one-month to 100-year wind event were considered. Common, frequently-occurring low wind events and other types of environmental loading, such as rain, snow, ice, and thermal, were not considered in this test.

Weld fatigue can be simply described as the application of loads that may individually fall below the breaking strength of the welded material, however, when applied variably and over a prolonged period of time can lead to permanent deformation or failure of a weld, similar to what occurs when one continuously bends a paper clip back and forth. As this pertains to the proposed stainless steel tapestries, the fatigue test was conducted to discern whether the tapestry welds were subject to failure as a result of continuous, and cyclical, wind loading.

Prior to the fatigue test, the applicant conducted a visual inspection of the tapestry sample to identify any pre-test missing or broken welds and to document other structural or artistic issues. According to the applicant, approximately 18 - 19 welds were identified as either missing or broken prior to fatigue testing. Of these, approximately eight were structural welds. The applicant decided not to repair these welds prior to the fatigue test in order to see whether these welds would impact the tapestry during the test.

Following completion of the fatigue test the applicant determined that the tapestry sample had satisfied both of the pass/fail criteria established. The first addressed permanent deformation of the tapestry sample, or the permanent increase in length of the horizontal structural wires. In order to be considered a success it was determined that the increase in length of the horizontal structural wires shall not exceed one percent (1%). The results of the test show that the maximum non-permanent elongation measured during the test was 0.09%, much less than the 1% criterion. These measurements were taken while the wind loads were actively being applied to the tapestry sample.

According to the applicant's report, "even though the 1% elongation was intended to be measured when no load is applied to the tapestry sample...if the criterion is achieved when 100-year wind pressure is applied, it will also be satisfied under a no-load condition." Measurements of permanent deformation were also gathered after the full spectrum of wind loads had been applied to the tapestry sample. The applicant states that these measurements show a permanent elongation of approximately 0.004%, well below the 1% pass/fail threshold.

The second pass/fail criteria addressed structural and artistic weld failure measured based on a visual inspection of the tapestry welds before and after the test for structural and aesthetic purposes. For the structural welds, it was determined that 20percent of the total number of welds must remain intact in order to be considered a success. The visual inspection of the structural welds was limited to those that were easily visible and not obscured under layers of art wire. For the artistic wire welds, an aesthetic only review would be conducted. According to information provided by the applicant, since these cables are not structural the review of the artistic welds focused on identification of any formidable damage in appearance to the image displayed on the tapestry caused by the fatigue testing regime. A post-test visual inspection conducted by the applicant revealed that three structural welds had failed, attributed to testing. It was also observed that the location of the welds that failed during testing were adjacent to the missing or broken welds identified prior to the test. The three broken welds would account for approximately 0.3% of the total number of structural welds in the tapestry sample. Factoring in the 18 - 19 missing or broken welds that were identified prior to the test would increase this percentage to approximately 2.1% of the structural welds, still well below the pass/fail criteria. Finally, the visual inspection of the tapestry sample artistic welds did not show any appreciable damage or aesthetic degradation.

Agency reports

On February 5, 2014, the results of the most recent salt fog tests and completed mechanical strength testing were submitted to NCPC and NIST. In addition, the actual welded and un-welded samples that were corrosion and strength tested, and the three foot by three foot tapestry fatigue sample, were provided to NIST for further visual and microscopic observation. What follows is a summary of the most recent report provided by NIST containing its observations and findings based on a review of the applicant's technical materials. In addition, a summary of the comments and recommendations received by the DoD and the Smithsonian Institution is also provided below.

National Institute of Standards and Technology (NIST)

On March 10, 2014, NIST submitted its latest report, the fourth overall, which focuses primarily on the methodology and results of the mechanical weld strength and fatigue testing. (Appendix A)⁶ Regarding the results of the most recent corrosion testing, NIST found that "the corrosion behavior is consistent with previous tests, and does not change the recommendation that 317L is the best choice of the candidate materials. Regarding the mechanical strength tests conducted on structural and artistic weld samples, and the fatigue test that was performed on the 3' x 3' tapestry

⁶ On March 27, 2014, the applicant submitted a response to NIST's report which is also included in Appendix A.

sample, NIST did not find anything that would lead to a finding that the proposed tapestry materials are inadequate for the application. A more detailed discussion concerning the weld strength and fatigue testing follows.

As stated, NIST's review of the technical documentation and actual weld test samples provided by the applicant did not reveal anything that suggested the tapestry panels were prone to mechanical failure. However, NIST did make some observations regarding the range of measured weld strengths. Regarding the tensile test measured weld strengths, just as the applicant observed, NIST also observed significant variation in the strength of the welds and states that this can be directly traced to "the degree of penetration and, in the case of twisted and woven braids, the number of sub-wire participating in the weld." More specifically, NIST states:

"When welding cables, the number of wires participating in the weld is not going to be a constant, despite the application of consistent weld settings, and it affects the character or geometry of the joint. If there are too many wires, the power from the spot weld is distributed with too little power per wire, causing incomplete heating of the weld zone. If too few wires are participating in the weld, the power is distributed with too much power per wire, and the wires may completely melt rather than weld together."

To demonstrate the relationship between weld penetration and the variation in measured weld strength, NIST's report included specific examples from the samples provided by the applicant. For instance, one structural weld sample failed at 68 lbs and it appears 13 wires participated in the weld. Another structural sample failed at 36 lbs and only five wires participated in the weld. The applicant's current fabrication protocol and weld strength calculations assume a contact area of 20 percent, which in the case of the structural welds would be approximately 20 wires participating (ten in each cable). To further demonstrate the potential for variability, a third example of a welded joint involving a structural wire and artistic wire shows two or three wire strands participating and that the two different types of wire may behave differently in the weld.

In addition to its review of the mechanical strength data, NIST also performed its own visual inspection of the three foot by three foot tapestry sample that was used to carry out the fatigue testing. Overall, NIST found that little damage attributable to the fatigue test could be seen. NIST estimated that of the approximately 1,000 structural welds contained in the tapestry sample, approximately 400 were unobscured by artwork and approximately eight (2%) were missing or broken prior to the fatigue test. The report goes on to state that, with regard to the structural welds, these were presumably the most consistent in terms of weld equipment power settings, access, and geometry, and therefore, perhaps the two percent could be assumed as a lower bound for an estimate of the non-completion rate of welds during fabrication of the panels.

Regarding post-test observation, NIST again confirmed the applicant's observation that the few structural welds that failed during the test were located adjacent to welds that were not formed during fabrication. While noting the improbability of being able to make an explicit determination of cause and effect, NIST does state the possibility that this is a result of welds having to bear the loads from adjacent un-welded or missing joints. NIST also states that this could be a result of

variability in the welding process such as insufficient power settings creating weak welds that ultimately failed during fatigue testing.

United States Department of Defense (DoD)

NCPC provided the DoD with the latest set of technical documents, and discussed decisions the applicant has made regarding the selection of the tapestry base material, fatigue testing, and weather simulation analysis. The DoD responded favorably to the decision to construct the tapestry panels of 317L stainless steel and indicated that this reduced concerns previously expressed that led to prior recommendations to construct a duplicate set of tapestry panels.

In a previous memorandum, dated August 2, 2013, the DoD provided comments and recommendations based on a prior round of corrosion analysis. (Appendix B) With regard to the testing methodology that was used, the DoD supported the applicant's decision to run the material samples under weighted load and coated with lamp black, and to utilize the SO₂ salt fog test describing it as "one of the harshest accelerated corrosion methods in use and is often the only manner possible to determine any corrosion susceptibilities of inherently corrosion resistant alloys such as stainless steel." The DoD representative was encouraged by the results of the most recent corrosion test and expressed confidence in the durability of the 316L and 317L stainless steel alloy. The DoD made a final recommendation that the SO₂ salt fog exposure be continued on the 316L and 317L samples and run to failure or at least to 3,000 hours "to distinguish differences between the two alloys" if any exist. Staff discussed this recommendation with the applicant and NIST at a follow up meeting in September 2013. The applicant stated that consideration of this recommendation was no longer necessary since a commitment has been made to use 317L stainless steel. NIST concurred with this noting that additional exposure of the samples would likely only amplify the current findings that 317L performs better than 316L.

The DoD also offered comments on the ice load bearing capacity of the proposed tapestries and the potential for ice to fall off of the tapestries causing potential public safety issues. Upon review of the ice loading calculations, the DoD was confident that the tapestry could bear the static weight of the calculated ice loads. However, a question was raised regarding the ability of the tapestry welds to withstand bending / twisting moments caused by partial ice releases. Therefore, the DoD indicated there was a need for additional testing "to determine the strength of single, twisted, and braided wire spot welds" and to establish process controls for fabrication to ensure consistency of weld integrity. The ice loading capacity of the tapestry welds, in addition to thermal, wind, and seismic loading capacity is addressed in the latest set of testing documentation.

Regarding the DoD's questions related to snow and ice, the applicant completed a weather simulation test to assess the potential for snow and ice to accumulate on the tapestries. After several rounds of this test it was found that there is potential for snow and ice to attach and accumulate on the tapestries to varying degrees depending upon the density of artwork in a particular location. According to the results of the test, it was found that the artistic areas of the tapestry panels performed better than the unadorned structural areas but that both promoted a "melt in place strategy, releasing (if at all) as small and individual formation at the end of the melting period when their [snow and ice] mass is diminished." Based on the results of the test, several

recommendations were made to further reduce the potential for harmful releases of snow and ice on the tapestries which the applicant has indicated will be incorporated into the design. These recommendations are intended to increase the duration for snow and ice to remain attached to the tapestry so that it may melt in place. In addition, a recommendation was made to incorporate heated walkways in areas near the base of the tapestries to address any accumulations or potential for refreezing of melt water.

Smithsonian Institution

Since the applicant's latest round of durability testing focused more on mechanical strength testing, something more in line with NIST's and DOD's area of expertise, NCPC did not solicit additional comments from the Smithsonian Institution. Therefore, the last memorandum provided by the Smithsonian, dated August 1, 2013, is based upon the durability testing completed at that time. (Appendix C) The memorandum provides several comments related to tapestry maintenance and cleaning which were also raised in previous memorandums. With regard to the recommended tapestry maintenance schedule, the Smithsonian noted the likelihood for the tapestry to become soiled by guano from birds and expected that more would be required than the recommended simple wash down on a yearly basis. The Smithsonian also noted the large extent to which the south tapestry will be in shade and the potential this might have on formation of algal growths on the limestone sculptures, similar to those found on the adjacent Wilbur J. Cohen Building. The need for caution was raised if a high pressure sprayer is used for cleaning and debris removal.

Finally, a specific question was raised regarding the apparent placement of lift equipment on unpaved areas and within a vegetated swale. The applicant has since removed the vegetated swales entirely from the landscape design and included paved areas near the base of all three tapestries. In those areas where maintenance equipment will need to be placed on unpaved areas, such as along the front of the south tapestry, the applicant has stated that those areas will be designed using reinforced turf.

NCPC Plans and Policies

Comprehensive Plan for the National Capital

With respect to the location of the Memorial, and the potential of the proposed design to provide environmentally sustainable benefits, the project is not inconsistent with the policies of the Parks and Open Spaces, Federal Environment, and Visitors Elements of the Comprehensive Plan for the National Capital.

The design as currently proposed does reflect inconsistencies with policies of the Preservation and Historic Features Element, notably those pertaining to the protection of the historic L'Enfant Plan. While this element encourages the placement of memorials along L'Enfant avenues such that they provide views and points of reference, it stresses doing so in a manner that protects historic views and vistas, the settings of historic properties, and the *openness of L'Enfant rights-of-way*. The policies place a heavy emphasis on protecting the integrity, form, and design of the L'Enfant Plan's system of streets and reservations from inappropriate new buildings and physical incursions.

In addition to addressing the importance of maintaining the symbolic hierarchy of public buildings and spaces that is an integral piece of the L'Enfant Plan through its system of monumental avenues, the Comprehensive Plan also addresses the importance of protecting the expression of this hierarchy at night through carefully designed exterior lighting. The Comprehensive Plan encourages agencies to design exterior lighting in a manner that contributes to the capital's nighttime image and respects the established hierarchy among the symbols and features of the nation's capital. Although the Memorial carries with it the stature of a national Presidential memorial, the lighting plan must take into consideration the visual prominence of the museums, memorials, and monuments on the National Mall, and not obstruct or obscure the nighttime predominance of the U.S. Capitol Building along the Maryland Avenue viewshed. As the lighting plan is further developed, consideration must be given to eliminating the lighting of any large-scale Memorial elements within the Maryland Avenue right of way.

Memorials and Museums Master Plan

To advance NCPC's Extending the Legacy Plan (the Legacy Plan) vision for distributing new memorials and museums to all quadrants of Washington, the 2001 Memorials and Museums Master Plan (2M) identifies 100 potential sites and provides guidelines for their development. The 2M Plan identifies the location of the Eisenhower Memorial as Prime Candidate Site #3. Some of the characteristics that qualify this site as a "Prime Candidate" include its location along two special streets, Maryland Avenue and Independence Avenue, proximity to the National Mall and U.S. Capitol, and its proximity to public transportation. The site's potential to accommodate a major memorial that relates to its surroundings is also a recognized asset. In particular, the plan states that "a primary memorial on this site could relate thematically to the Department of Education."

The 2M Plan includes a set of specific design considerations that are intended to inform the development of a memorial on this site. Some of these consideration address the use of existing infrastructures around the site and potential for a memorial to advance other plans such as the revitalization and realignment of Maryland Avenue, others address specific planning issues such as the effect of mass and scale on views along Maryland Avenue and on the Department of Education Building and the allocation of space for public gatherings versus commemorative reflection. There is also a specific design consideration regarding the provision of visitor services.

Overall, staff finds the project to be inconsistent with the 2M Plan. Regarding scale, the design considerations state that "any future memorial should incorporate existing reciprocal views along Maryland Avenue. The mass and scale should not obstruct or obscure the primary axial relationships along the Avenue, and should not overshadow the Department of Education Building." As discussed in the site selection design principle section, the proposed scale and configuration of the tapestries dominate and obscure the existing viewshed established by the historic Maryland Avenue right-of-way. In addition, while the length of the south tapestry has been reduced since the Commission's concept review it continues to overshadow the Department of Education Building which diminishes the association the building has with the site as well as its ability to define the southern edge of the Memorial and surrounding park landscape, an important characteristic of a typical L'Enfant square. Additionally, 2M promotes a memorial plan that

functions as a public gathering space as well as a commemorative work. As currently configured, the tapestries claim the vast majority of the site as a commemorative precinct leaving only a small portion of the site behind the east and west tapestries, and the area along LBJ Promenade, for public gatherings. As previously discussed, both the Commemorative Works Act and NCPC's site selection design principles endeavor to balance the importance of establishing a memorial to President Dwight D. Eisenhower and the need to protect public open space in the District of Columbia by having this site also function as an active public park. Therefore, the Memorial's program and landscape plan should delineate areas primarily intended to serve the commemorative experience, and areas that contribute to broader public open space use.

Finally, staff notes that the proposed Memorial information center is inconsistent with the 2M Plan design consideration addressing visitor services. The Plan states that amenities such as parking and visitor services, i.e. restrooms, gift shops, and parking, should not be located at this site and that the site is not appropriate for a building. This inconsistency is not unintentional and evolved out of the 2006 site selection process. The environmental assessment that was prepared by the applicant during site selection included the analysis of a 2,500 square foot visitor services building. This was included in the assessment as a potential programmatic need of the National Park Service. NCPC's Finding of No Significant Impact issued for approval of the site is based on the analysis contained in the environmental assessment and notes that the Memorial would include a building not exceeding this size. In addition, it is staff understanding that at the time of site selection the use of the ground floor level of one of the surrounding buildings to provide visitor services was not supported for security reasons.

National Capital Urban Design and Security Plan Objectives and Policies

Overall, the project is consistent with the National Capital Urban Design and Security Plan Objectives and Policies. According to the preliminary site and building plans, a relatively minor amount of physical perimeter security is proposed along LBJ Promenade for providing security to the Department of Education. As for the Memorial itself, NPS has informed NCPC staff that a determination was made that no physical perimeter security elements are necessary.

As a result of being slightly higher than the Memorial, much of the security barrier for LBJ Promenade has been integrated into retaining walls along the north side. (Figure 40) Pedestrian access to the Promenade is provided from 4th and 6th Streets and directly from the Memorial via stairways along the west side of the Promenade and at the base of the Memorial overlook. These areas are secured by rows of bollards. According to information provided by the applicant in late-2013, the bollards will be 36-inches high, 12-inch in diameter, and will be clad in stainless steel. As proposed, the bollards will be spaced 5-feet on center resulting in a pedestrian clearance of approximately four feet.

The degree to which the perimeter security is overtly visible has been minimized due to the barrier being mostly integrated into the north retaining wall of the Promenade and Memorial overlook. In addition, given the location and width of the pedestrian access points, the use of bollards seems to be the most appropriate if a security element is absolutely necessary. Staff does, however, have an overarching question as to whether there is an absolute need for the proposed bollards, especially

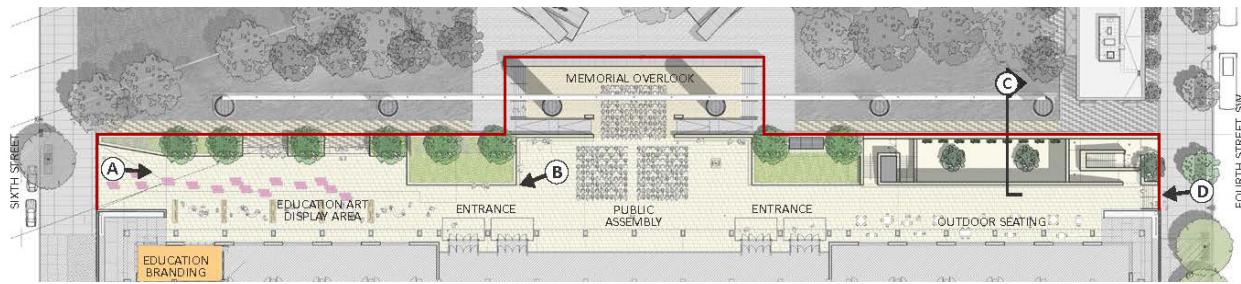


Figure 40: LBJ Promenade perimeter security barrier line

along the north side of the Promenade, given the elevation of LBJ Promenade, the distance from Independence Avenue, the placement of Memorial elements, and the number trees that will be planted on the site. The combination of these elements seems likely to be effective in protecting the LBJ Building through several layers of security. Specific to the current proposal, and compared to several recent perimeter security projects approved by the Commission, the pedestrian clearance between the bollards seems too narrow and should be evaluated in order to increase this distance to the maximum extent possible. Therefore, staff recommends that the applicant work with the General Services Administration and Department of Education to evaluate the potential for eliminating some or all of the proposed bollards along LBJ Promenade, or address the issue of pedestrian clearance through modifications to the bollard design.

III. U.S. COMMISSION OF FINE ARTS REVIEW

The U.S. Commission of Fine Arts (CFA) is also reviewing this project pursuant to the Commemorative Works Act, and thus far has reviewed the project on five separate occasions: January 2011, September 2011, July 2013, November 2013, and February 2014. CFA's final letters to the applicant are include as Appendix D to this report.

IV. COMPLIANCE

National Environmental Policy Act (NEPA)

To fulfill its obligation under the National Environmental Policy Act (NEPA), NPS, in association with EMC, completed the Dwight D. Eisenhower Memorial Design Environmental Assessment (EA) which analyzes three design alternatives and a no action alternative. The EA prepared for the Memorial design tiers off of the project's 2006 Site Selection EA. NCPC also has an independent NEPA obligation resulting from its approval authority over the project, and thus was a cooperating agency in the preparation of the EA. GSA was also a cooperating agency. The EA analyzed each of the alternatives for impacts to the following environmental topic areas: cultural resources; including aesthetics, viewshed, archeological, and historic; hazardous materials and waste; park operations and management; soils; transportation systems; vegetation; visitor use and experience; and water resources.

The National Park Service solicited public input on the scope and content of the EA byway of public meetings and its Planning, Environment, and Public Comment website. The final EA was also made available for a 30-day public comment period from September 19, 2011 to October 19,

2011. On March 6, 2012, following review and consideration of the comments received, NPS issued a Finding of No Significant Impact (FONSI) for implementation of EA Alternative #3, Maryland Park/Tapestry alternative.

NCPC relied upon the Site Selection EA to issue its August 31, 2006 Finding of No Significant Impact which found approval of the Memorial site would not significantly affect the human environment on the condition that the applicant design the Memorial using the design principles developed by NCPC staff in consultation with NPS, DC SHPO, and other consulting parties. The FONSI incorporated these design principles as required mitigation. Therefore, staff notes that in order for NCPC to take a formal action on the Memorial design it must first reach another FONSI based on the content of the two EAs prepared for the project, and only after finding that the Memorial design successfully meets the required mitigation contained in the 2006 Site Selection FONSI. As discussed above, staff is unable to make a recommendation to the Commission that the proposed Memorial design meets the design principles, and therefore, cannot independently reach a FONSI at this time, nor can it adopt the FONSI issued by NPS.

National Historic Preservation Act (NHPA)

Both NCPC and NPS have an independent responsibility under Section 106 of the National Historic Preservation Act. The National Park Service's undertaking is the issuance of the construction permit once the EMC has received final approvals from NCPC and the U.S. Commission of Fine Arts. NCPC's undertaking is the approval of the Memorial site and design.

Through the Section 106 process, NPS and NCPC consulted with the District of Columbia State Historic Preservation Officer (DC SHPO) and several other consulting parties and determined that the undertakings would have an adverse effect on the L'Enfant and McMillan Plans, the National Mall, the LBJ Building and its northern plaza, the Wilbur Wright Federal Building, the National Air and Space Museum, and the Wilbur J. Cohen Building, which are listed or eligible for listing in the National Register of Historic Places. As a result of this determination, a Memorandum of Agreement (MOA) was entered into by NPS, NCPC, DC SHPO, and the Advisory Council on Historic Preservation. The MOA contains several mitigation measures that must be addressed in the Memorial's final design. In addition, the MOA defines a process for additional consultation on certain aspects of the Memorial design following NCPC's preliminary review. These aspects include:

- Further development of the central core elements, including relief blocks, images, and text;
- Further development of the landscape treatment of the site, including green space, plazas, walkways, and elements included to recognize the historic alignment of Maryland Avenue;
- Night lighting;
- The design of the Memorial support building;
- Further development of LBJ Promenade; and
- Changes made to the design in response to, or required by, NCPC's preliminary design review.

V. CONSULTATION

National Capital Memorials Advisory Committee

As required by the Commemorative Works Act, memorial sponsors must consult with the National Capital Memorials Advisory Committee (NCMAC) on the selection of alternative sites and design concepts prior to submitting the project to NCPC and CFA for formal design review. In fulfillment of this requirement, EMC made an initial presentation to NCMAC at its April 21, 2010 meeting. In general, the Commission members saw the use of this site for a memorial as bringing great potential benefit to the city, and both CFA and NCPC representatives expressed that the Memorial has the potential to introduce a new typology of commemoration into the city's public spaces. The NCMAC members noted that there were site specific design guidelines in the 2M Plan which should be considered as the Memorial design evolves, in addition to the site selection design principles adopted by NCPC.

A second NCMAC consultation was held on February 16, 2011. Commission members were supportive of the design progress made since the previous consultation. Strong support was also expressed for the artistic potential of the tapestries and for the applicant's desire to explore a different approach to commemoration compared to what has traditionally been done.

NCMAC conducted its third and final consultation on September 14, 2011 at which several supportive comments were made regarding the artistry and composition of the tapestries. Commissioners were especially supportive of using the Kansas landscape as the scene depicted on the tapestries due in part to the direct influence Eisenhower's Midwestern upbringing had on his personality and the decisions he made.

Coordinating Committee

The Coordinating Committee reviewed the proposal at its March 12, 2014 meeting and forwarded the project to the Commission with the statement that the proposal has been coordinated with all participating agencies. The participating agencies were: NCPC, the District of Columbia Office of Planning; the District Department of Transportation; the State Historic Preservation Office; the National Park Service, the General Services Administration and the Washington Metropolitan Area Transit Authority.

VI. APPENDIX

- **Appendix A:**
 - Analysis of the mechanical test specimens, fatigue tested tapestry, and information in the document entitled "Eisenhower Memorial Tapestry Engineering and Technical Data Summary Volume 2: Tapestry Technical Data Summary," National Institute of Standards and Technology, March 10, 2014
 - Applicant response to National Institute of Standards and Technology (NIST) letter dated March 10, 2014, submitted March 26, 2014
- **Appendix B:** Durability Memorandum: *Eisenhower Memorial Corrosion Resistant Materials Findings Follow-up*, Department of Defense, August 2, 2013
- **Appendix C:** Durability Memorandum, Smithsonian Institution, August 1, 2013
- **Appendix D:** U.S. Commission of Fine Arts letters

Appendix A



March 10th, 2014

Shane L. Dettman, AICP
Senior Urban Planner, Urban Design and Plan Review
National Capital Planning Commission
401 9th Street, NW - Suite 500
Washington, DC 20004

Dear Shane,

This letter and accompanying report constitute my and Adam's analysis of the mechanical test specimens, fatigue tested tapestry and information in the document entitled "Eisenhower Memorial Tapestry Engineering and Technical Data Summary Volume 2: Tapestry Technical Data Summary, all provided to NIST by the NCPC.

A summary of the significant points:

1. Nothing in the corrosion tests nor in the fatigue specimen would lead us to believe that the materials are inadequate for the application.
2. The corrosion behavior is consistent with previous tests, and does not change the recommendation that 317L is the best choice of the candidate materials.
3. Significant variation in the strength of the welds was reported, and can be directly traced to variability in the degree of penetration and, in the case of twisted and woven braids, the number of sub-wires participating in the weld.
4. A close examination of the analysis by Najjarine Structures of the thermal loads on the panels found considerable errors, and leads one to suspect possible errors in other analyses. There was insufficient time to check over all of their work but, to whatever extent these results bear on assumptions such as the maximum expected weld load of 1.7 pounds on the tapestry structural welds, the errors found should be kept in mind.
5. The 3' x 3' tapestry sample panel prepared by the design team, a picture of which is attached to this report, appears largely unaffected by the fatigue test, however it is noted that nearly 2% of the structural welds were unsuccessfully formed during fabrication, and aesthetically the resulting panel does not look very much like the CAD drawing presented or the tapestry mockups previously prepared by hand.
6. The proscribed cleaning regimen of a worker scrubbing with a brush while perched 60 feet in the air, or using a power washer, will very likely cause

loads on the structural welds of the tapestry well in excess of the expected 1.7 pounds.

Please feel free to contact me with questions or comments, and also please let us know the schedule and procedure for returning the panel and samples to whomever.

Regards,

A handwritten signature in dark ink, appearing to read "T. Foecke". The signature is fluid and cursive, with a horizontal line extending from the end.

Tim Foecke, PhD
Leader, Mechanical Performance Group, Materials Science and Engineering Division

More detailed analysis of issues in the report, and things to consider going forward:

1. Fabrication conditions of the test specimens

Pages 6 through 11 of the Element report in Section 4.4 describe the measured strength of the welded cables under different combinations of wire (structural and artistic) and loading (shear, peel, torque). Note that for each combination of wire, the weld settings reported were slightly different, which is assumed to have been necessary to form welds from the different wire types (twisted and braided), but complicates inter-comparisons. The various weld settings that were used are reported in the matrix included in Section 4.2.

2. Analysis of the strength of welds by other parties

The structural weld analysis on Pages 10 and 11 of the Najjarine structural report in Section 4.4 states that the expected load on the structural wires is 1.66 lbs, and the load on the artistic wires is 0.37 lbs. Intuitively, this seems low even for the self loading of the weight of the multi-layered sections of the tapestry. We've done our best to digest the analysis by Najjarine of the wind, ice, self and thermal loadings on the vertical structural and horizontal non-structural wires within the time we have available, and it appears that some of the analyses are incorrect. We shall describe a singular example of the thermal loads (Section 4.4: Mechanical Strength Analysis, Page 6 of 11).

- In the analysis, the lengths of the spans are given as 36 inches in the horizontal and 24 in the vertical, with areas and moments of inertia calculated for the twisted cables that assume a structure of a solid wire of the same diameter. Coefficients of thermal expansion are specified, as well as temperature changes that are somewhat low but not totally unreasonable of 60 degrees for "mean" and 120 degrees for "total". The change in length and stress are calculated for the "mean" temperature range (cooling from the average temp to the low for the year), and it is found that the increase in stress for the horizontal is 16.6 ksi due to thermal contraction. This stress, with the area of the braid, is used to calculate the change in load to be 51 pounds.
- The next equation attempts to calculate the shear load on the weld using the relation for the bending in a beam fixed at two ends under a point load

$$V_{\Delta,v} = \frac{48\Delta_{ex} E_{ss} I_w}{L^3}$$

where Δ_{ex} is the change in length of the horizontal wire (0.5mm), E is the elastic tensile modulus of stainless steel, L is assumed to be L_v (the

vertical wire length) but the subscript is cut off in the text, and I_w is the moment of inertia of the braid. It comes up with a horizontal force of less than 1/40th of an ounce.

This analysis is incorrect. The calculation essentially finds the force applied to a vertical wire by a horizontal wire IF the horizontal wire is, for some reason, disconnected from the frame on one end, and is able to apply the full contraction of 0.5 mm of the horizontal wire to the vertical one. If the horizontal wire were disconnected, that would constitute a much greater structural problem than worrying about the loads on the weld. The correct answer is that if the frame and wires were heated or cooled, as it is made of essentially all the same material, it would shrink and expand uniformly, and the lateral pull of the welded joints would be zero, and thus the stresses on the welds due to thermal effects would be zero. An important caveat is that this analysis is for a single pair of wires, and applies to any uniform distribution of wires on the frame. This would be imbalanced if the art wire were non-uniformly distributed on the panel, but the effect is small. The analysis also assumes that the frame is not absolutely secured such that it cannot freely expand and contract, which appears consistent with the design.

It is possible that this was intended to be some sort of worst-case analysis of the maximum pull of a horizontal wire on a welded connection to a vertical one. However, no narrative of this was provided and it is purely speculation on our part. If so, the conditions for this scenario (horizontal wire with 1 functional weld at the extreme end to one vertical wire with the end of the horizontal wire detached) are extremely unlikely.

Other assumptions that are in error in this analysis are:

- That the bending moment of inertia for a wire and a braid of the same diameter are equal. Braids are MUCH less resistant to bending than wires - by design.
- That the welded joint is the full diameter of the wire. However, based on the samples prepared a maximum of 20% was observed.
- That failure will be in tension when in reality it will be in shear, which is weaker in metals than tension.

This is the only part of the Najjarine Structures report that we were able to analyze in detail, and the errors in this part would cause us to be concerned about errors in other analyses. This is an important point, as other tapestry design and performance parameters such as the minimum weld strength may come from these other analyses.

3. An analysis of the failure load data

Based on the measured strengths in the Element Report of Section 4.4, the Najjarine structural report in Section 4.4 uses the following values to compare the expected load on the cables:

- For the structural cables, values were taken from 2B Joint Type 1 (316L Structural 7x7 Twisted Wire to 316L Structural 7x7 Twisted Wire), showing an average breaking load of 36.4 lbs under torque loading, and 42.2 lbs under peel loading.
- For the artistic wire, combination values were taken from 3B Joint Type 2 (316L Art 1-16 Braided Wire to 317L Structural 7x7 Twisted Wire) showing an average breaking load of 12.4 lbs under torque loading and 11.8 lbs under peel loading.

Based on these mean values and the expected loads on the wires re-stated above, the structure seems very robust. However, these are the average values and there is significant variation in the weld strengths from sample to sample. Inspecting the data for 2B Joint Type 1, the minimum tested values are 26 lbs torque and 36 lbs peel for the structural wire, a decrease of 10 lbs and 8 lbs respectively. For the artistic wire 3B Joint Type 2, the minimum tested values were 0 lbs under torque loading and 6 lbs under peel loading, a decrease of 12 lbs and 6 lbs respectively.

It is worth noting that two of the welds failed before testing (#117 and #173) with a stated strength of 0 lbs. A microscopic examination of these welds revealed that the welding procedure created no joint and only heat tinting (Sample #117) and a joint that consisted of a single wire from each braid that was half burned through (Sample #173).

The mechanical property data for Samples #1 to #5 gave a mean shear strength value of 50.4 lbs. Page 4 of the Element report in Section 4.4 refers to the variation in the weld regions but performs no calculations to account for or quantify the variability, however it is possible to make an attempt. Assuming the welds to vary as a bell curve, the standard deviation is 9.8 lbs. Despite a limited sample set size (5) to work with, we can estimate a confidence interval of 95% (that is, 95% of all welds would have strengths within this range plus and minus from the mean) of ± 27.1 lbs. For a confidence interval of 99%, the range is ± 44.95 lbs. In this case, 1% of the welds would be outside of this distribution, or 0.5% of all welds would have a strength less than 5.45 lbs and 0.5% of the welds would have a strength greater than 95.35 lbs.

The initial guess that five samples would adequately quantify the variability of the welds strengths seems to have been underestimated, and given our experience with mechanical testing of many different materials systems and geometries, was contrary to our expectations. The observed degree of variability, which is likely due to variability in the bond area and degree of

penetration of the welds (see below), is unexpectedly large. As with all investigations of mechanical strengths of structures, an initial estimate is made based on experience, and adjustments are made as the data begins to be generated. In this case, the initial estimate was low due to the unforeseeably large variation in weld geometries.

Summing all of the tests together for both as-welded samples and corrosion tested samples (235 tests), two (2) samples failed at "0" (0 structural, 2 artistic), which is a failure rate of 0.8%. This value is fairly close to the assumed confidence interval predicting 0.5% of welds to fail at loads less than 5.45 lbs, shown previously. Ten (10) samples failed at loads less than 10 lbs (0 structural, 10 artistic) which is 4.2% of the population of samples. Combining both sets, there are 12 total tests below 10 lbs, which is 5.1% of the population of the tests.

The variation in weld strengths is attributable to the differing number of wires participating in the welds of the different samples. When welding cables, the number of wires participating in the weld is not going to be a constant, despite the application of consistent weld settings, and it affects the character or geometry of the joint. If there are too many wires, the power from the spot weld is distributed with too little power per wire, causing incomplete heating of the weld zone. If too few wires are participating in the weld, the power is distributed with too much power per wire, and the wires may completely melt rather than weld together.

An example providing evidence of this is shown on pages 25 to 28 of Section 4.3. Sample #19 failed at 68 lbs, and it appears that 13 wires participated in the weld. Sample #23 failed at 36 lbs, and only 5 wires participated in the weld. Page 10 of the structural engineering section of Section 4.4 assumes a total contact area of 20%, which in the structural cable would be approximately 10 wires in each cable. An example on Page 23 of the Element report in Section 4.4 shows a weld with a single strand participating in the weld failing at a load of 5 lbf. The example shown on Page 14 of Section 4.3 indicates that only two to three wire strands participated in the weld, and that the artistic wire and structural wire may participate differently in the weld. Further confirmation of this conjecture would be gained through examination of all the wires, however, this is made difficult by the weld interaction zones being masked by lighting, or the wires themselves, in the Scanning Electron Microscope and optical images shown in Section 4.3.

4. Observations from the fatigue specimen:

Little damage attributable to the fatigue test could be seen.

It was noted that the tension in the horizontal structural cables was many times that of the vertical structural cables, which were nearly slack. Reason unknown.

It was noted on the plastic overlay that came attached to the fatigue specimen that 18-19 welds had failed before fatigue testing. Of these, we determined that 8 were welds of the horizontal-to-vertical structural cables. We further estimate that the art obscured approximately 60% of these structural connections from observation. Thus, of the 1,000 main structural welds, 400 were visible (unobscured by art), and eight (or 2%) were unsuccessfully formed during fabrication. As these were the welds that presumably were the most consistent in terms of weld equipment power settings, tip access, geometry, etc, perhaps it could be assumed that this is a lower bound for an estimate of the non-completion rate of welds during fabrication of the panels.

It is noted that the few structural welds that failed during the fatigue test were located adjacent to welds that were not formed during fabrication of the panel. It is possible that the loads on these welds were increased during the fatigue test by having to bear the loads from the un-welded joints. It is also possible that the insufficient power settings applied to the incomplete welds corrected itself after making a few bad welds, but in the transition made a weak weld that eventually failed in fatigue. It is not possible to make an unambiguous determination of cause and effect.

The imagery of the fatigue sample appears quite different than what is depicted in the CAD file, and particularly when compared to the artistic tapestry mockup previously prepared by hand. This potentially could have an effect on the results of the weld strength testing, and actual performance of the tapestry, if the designer's ultimate intention is to bring the imagery of the mechanically fabricated tapestries closer to what the artistic mockup looks like.

5. Cleaning regimen

It was stated in the document that the tapestry could be cleaned once a year by a worker in a lift using a soft brush with soap and water. In other documents, funding for and mentions of a power washer are made. The forces on the welds due to either cleaning procedure are not explored, but it is our contention that either technique would produce loads well in excess of the expected 1.7 pounds of load per weld. For example, for a 900 psi pressure washer hitting a 1/16th inch diameter braid, (assuming an impact pressure of the full 900 psi and a very conservative estimated square impact area of the diameter of the braid), the load on the wire is approximately 4 pounds. If the water fan hits the braid in the long direction of the fan, the load can be several times this.

6. Combined loading scenarios

The report details the maximum expected loadings due to wind, ice, seismic, etc loadings individually, but does not consider them in combination, nor as mentioned above does the report detail the loadings expected under the proposed cleaning regimen.

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Tensile Bond & Tensile Wire Weld Strength Testing			
TESTING SUMMARY TABLES			
Tensile Wire to 1/16" Structures 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
53.8 lbs	53.8 lbs	42.3 lbs	47.2 lbs
Wire to 1/16" Structures 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
42.2 lbs	42.2 lbs	38.4 lbs	42.0 lbs
Structure 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
12.5 lbs	12.5 lbs	12.5 lbs	12.5 lbs
1/8" Structure Wire			
Average	Peak Average	Peak Average	Peak Average
48.7 lbs	48.7 lbs	48.7 lbs	48.7 lbs
1/4" Structure Wire			
Average	Peak Average	Peak Average	Peak Average
10.7 lbs	10.7 lbs	10.7 lbs	10.7 lbs
Tensile Wire to 1/16" Structures 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
53.8 lbs	53.8 lbs	42.3 lbs	47.2 lbs
Wire to 1/16" Structures 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
42.2 lbs	42.2 lbs	38.4 lbs	42.0 lbs
Structure 1x7 Tensile Wire			
Average	Peak Average	Peak Average	Peak Average
12.5 lbs	12.5 lbs	12.5 lbs	12.5 lbs
1/8" Structure Wire			
Average	Peak Average	Peak Average	Peak Average
48.7 lbs	48.7 lbs	48.7 lbs	48.7 lbs
1/4" Structure Wire			
Average	Peak Average	Peak Average	Peak Average
10.7 lbs	10.7 lbs	10.7 lbs	10.7 lbs

March 26, 2014

Mr. Marcel Acosta
Executive Director
National Capital Planning Commission
401 9th Street, NW - North Lobby, Suite 500
Washington, DC 20004

Re: Response to National Institute of Standards and Technology (NIST) letter dated March 10, 2014

Dear Mr. Acosta,

The Gehry Partners – AECOM Joint Venture has received and reviewed the March 10, 2014 peer review letter from NIST regarding their review of the Tapestry Engineering and Technical Data Summary, Volume 2: Tapestry Technical Data Summary. This letter is intended to formally respond to the NIST comments.

Based on the design team's review of the NIST peer review letter, we have found very few definitive comments that would alter our current approach to the material selection or fabrication technology and fully stand behind our submission that we have fulfilled the requirements of the Commemorative Works Act (40 U.S.C. 8905(b) (3)) "a commemorative work shall be constructed of durable material suitable to the outdoor environment" for this memorial element.

Our responses and clarifications to the summary of significant points identified in the NIST letter are formally submitted to you below.

1. Corrosion Testing: We agree with NIST that there have been positive results in both the corrosion testing regimen and the fatigue testing regimen. The design team has concluded the correct material selection through the testing regimen.
2. Alloy: The design team is committed to using 317L for the tapestry stainless steel wire material as it has performed the best of all alloys that have been tested to date.
3. Weld Strength Variation: The NIST report states "*Significant variation in the strength of the welds was reported, and can be directly traced to variability in the degree of penetration and, in the case of twisted and woven braids, the number of sub-wires participating in the weld.*" The NIST report also noted the structure is "*very robust.*" The design team would like to bring to the attention of NCPC that 30 samples of each joint wire type were mechanically tested and evaluated for a total of 150 mechanical strength tests. Our results of the test specimens establish that the tested allowable weld capacity exceeds the minimum calculated load for a single structural weld joint by 5 times including a safety factor of 4. The results do vary however the weld strength far exceeds what is required structurally. For example, no structural weld tested had a breaking load less than 26 lbs. and the actual load is less than 2 lbs. The results of the fatigue testing also confirm that the welds have passed for fatigue stress and meet our durability requirements.
4. Thermal Analysis: The NIST report concludes "*A close examination of the analysis by Najjarine Structures of the thermal loads on the panels found considerable errors, and leads one to suspect possible errors in other analyses.*" Overall with regards to thermal effects, the design team

agrees with NIST that the *“stresses on the welds due to thermal effects would be zero”*, therefore thermal loading is not an issue as it relates to the loading on the welds. The thermal loading calculations provided in Section 4.4 in the Weld Capacity Report are confirmed as a *“worst case scenario”* in order to establish a conservative approach for the engineering. In this conservative scenario, beam deflection calculations were used for vertical wires in order to obtain the highest shear value on the weld, knowing that braided wires will not behave like a rigid beam. We agree a narrative clarifying the conservative approach and assumptions for the thermal analysis would have been helpful for the reviewer. Never the less, the fact that Najjarine and NIST used different assumptions to arrive at the same conclusion with respect to thermal effects does not necessarily mean that the Najjarine Structure’s report has *“considerable errors”* or that it contains errors in other analyses.

Contrary to Section 2 of the detailed analysis comments, the other Najjarine Structures assumptions are not in error:

- a) The NIST letter states *“that the bending moment of inertia for a wire and a braid of the same diameter are equal. Braids are MUCH less resistant to bending than wires –by design.”* As we stated above, considering the vertical wire behavior as a rigid beam will theoretically cause more pull on the vertical and is more therefore a more conservative approach;
- b) The NIST letter states *“That the welded joint is the full diameter of the wire. However based on the samples prepared a maximum of 20% was observed.”* The full diameter of the wire was only considered when calculating additional force on the horizontal wire due to temperature change as shown on page 6 of 11 in the Weld Capacity Report of Section 4.4. Page 10 of 11 shows that the allowable weld at 20% contact was considered in the loading calculations.
- c) The NIST report states *“That the failure will be in tension when in reality it will be in shear, which is weaker in metals than tension.”* The Weld Capacity Report thermal expansion calculations show the tension forces along the horizontal wire (not the weld) and vertical shear force on the weld connection. We agree with NIST that a weld failure will be in shear. However, the shear force on the weld due to thermal loading is practically zero. On page 10 of 11, the resultant combined force on the weld is compared to both the shear and tension average tested weld strength results.

We defend our results which clearly establish that the tested weld strength capacity far exceeds the loading on the welds and take issue with the NIST assertion to *“suspect possible errors in other analyses”* simply due to *“insufficient time to check over all their work.”*

5. Fatigue Specimen: NIST has pointed out in their report that; *“Little damage attributable to the fatigue test can be seen”*. The design team is very satisfied with the physical performance of the sample. It has proven to be durable when subjected to wind pressure ranges and those frequencies predicted for the project over a hundred year period. The permanent deformation/elongation of the sample were measured at .004% post testing. This product is durable. The NIST letter makes note that nearly 2% of the structural welds were unsuccessfully formed during fabrication. As we clarified to NIST on two occasions, the insufficient welds on the sample prior to testing were noted on the fatigue sample documentation, and intentionally left to inform the design team of the effects of this condition on the fatigue results. The fabrication process for

the Memorial panels will include a rigorous QA/QC inspection post fabrication and repairs if needed will be made prior to installation.

NIST also noted that the resulting panel does not aesthetically look like the CAD drawing presented or the tapestry mockups previously prepared by hand. The fatigue sample is a prototype and not intended to represent the final art on the tapestry. The sample does reflect the fabrication methodology being used, the art represents the 8 layers intended for the tapestry, and the resistance welding method for the art was created from the automated equipment. We disagree with the NIST report that the aesthetic appearance of art on the fatigue sample would change the weld strength testing since the weld strength tests were performed on individual sample welds, and not a panel assembly. Given the successful fatigue test results with 99.7% of the structural welds remaining intact, and the permanent deformation equating to .004%, it is unlikely that a different pattern of art wires would yield a significantly different test result.

6. Cleaning Regimen: The NIST letter indicates *“the prescribed cleaning regimen of a worker scrubbing with a brush while perched 60 feet in the air or using a power washer will very likely cause loads on the structural welds of the tapestry well in excess of the expected 1.7 pounds.”* NIST included a calculated load of 4 lbs. on the weld for a 900 psi pressure washer in their report and sources *“other documents.”* We are not sure that one could assume these loads given the proximity of the hose to the surface of the tapestry as they will vary in distance. A final water pressure for cleaning has not yet been established. Even if the weld load were 4 lbs., it is still two times below the tested allowable load capacity of 9 lbs., and therefore not a structural issue with respect to the tapestry panel. The design team is committed to providing a tested recommendation for a process to clean and maintain the tapestry that will not cause harm to the structural integrity of the system.
7. In Section 6 of the NIST detailed analysis it was stated; *“The report details the maximum expected loadings due to wind, ice, seismic etc. But does not consider them in combination.”* For the record, the loads are combined in the calculations per code ASCE 7-05: Minimum Design Loads for Buildings and Other Structures. In Section 4.4 in the Weld Capacity Report, the load combinations for dead loads and ice are documented per ASCE/SEI 7-05 on page 7 of 11 for the value P_{DL-V} , and P_{TDL-V} and on page 8 of 11 for the combined wind value of $P_{V,W}$. These two values are used to determine the load on each weld on page 10 of 11 resulting in the calculated weld load of 1.66 lbs. Seismic loading is not included in the load combinations, as the wind load exceeds the seismic loading and therefore wind loading governs in the calculations.

As you are fully aware, our team has collaborated with NCPC staff and NIST staff throughout this submission review process to satisfy the concerns initially raised in September 2012. Our team met with NCPC staff and NIST in October 2012 and again September 2013 along with multiple conference calls to gain a consensus on the appropriate testing protocols in advance of performing the tests. As a result, our Tapestry Engineering and Testing Data Summary includes all testing required for preliminary review with definitive results that clearly indicate the materials are adequate for the intended purpose.

The design team appreciates the efforts of the NCPC staff and the NIST team to date. Their valuable input has helped to shape the direction and design results reached to date. We hope these clarifications will assist NCPC staff in affirming our positive conclusions.

We respectfully request that this document be included as part of our submission to address and clarify the specific points in the NIST report.

Sincerely,

A handwritten signature in black ink, appearing to read 'John Bowers', is centered below the word 'Sincerely,'.

John Bowers
Partner
Gehry Partners LLP

cc:

Mr. Peter May, Associate Regional Director Land, Resource and Planning NCR, National Park Service
Mr. Carl Reddel, Executive Director, Dwight D. Eisenhower Memorial
Mr. Tyrone Anderson, Project Executive, General Services Administration

Appendix B



DEPARTMENT OF THE ARMY
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
ARMY RESEARCH LABORATORY
ABERDEEN PROVING GROUND MD 21005-5069

REPLY TO
ATTENTION OF RDRL-WMM-C

2 AUG 2013

MEMORANDUM FOR NATIONAL CAPITAL PLANNING COMMISSION (NCPC)

SUBJECT: Eisenhower Memorial Corrosion Resistant Materials Findings Follow-up

1. Accelerated corrosion in accordance with ASTM G85 A4 SO₂ salt fog: The decision to run welded specimens under load and contaminated with lamp black carbon was wise. The ASTM G85 A4 SO₂ salt fog is one of the harshest accelerated corrosion methods in use and is often the only manner possible to determine any corrosion susceptibilities of inherently corrosion resistant alloys such as stainless steels. After exposing the welded stainless steel alloys 316L, 317L, and 321 in the SO₂ salt fog environment and demonstrating excellent corrosion resistance of both the 316L and 317L wires, even with the carbon black added to simulate city soot, I confidently recommend either alloy. The 316L may be more favorable due to its wider usage, greater variety of wrought products, and lower cost. If possible, it is recommended that the SO₂ salt fog exposure for the 316L and 317L samples be continued and run to failure or at least to 3000 hours to distinguish differences between the 316L and 317L alloys. If no further degradations occur under the longer exposures the confidence level for the tapestry base material to endure will increase.

2. Alloy selection admonition: Whether 316L or 317L is ultimately selected, **under no circumstances should undesignated 316 (no "L") or undesignated 317 (no "L") EVER be used** for construction of the tapestry. The "L" stands for low carbon and it is critical that the carbon content is minimized for the maximum lifespan and durability of the welds. The greatest of care and diligence must be maintained at all times to ensure that the undesignated versions of either of these alloys are never procured. Furthermore, if two or more different sources for 316L or 317L products are presented for purchase contract consideration, the individual statements of compositions should each be referenced and the vendor having the lowest carbon content within their wires preferentially selected.

3. Post-assembly pickling and passivation: My prior recommendation for this procedure remains unchanged. In order maximize the lifespan of the stainless steel tapestry panels, it is recommended that the individual tapestry panel assemblies are each pickled and passivated prior to placement at the memorial site. The pickling will remove the discolored areas from high heating on and adjacent to the welds where chromium levels are sometimes reduced. Pickling is done through immersion in hydrofluoric and nitric acid mixtures per the ASTM A380 specification that is already included in Section 6.1 of the Eisenhower Memorial Tapestry Engineering and Technical Data Summary Notebook. After pickling, a final passivation step through immersion in nitric acid once again in accordance with ASTM A380 will build and optimize the passive layer thus maximizing the corrosion resistance.

RDRL-WMM-C

SUBJECT: Eisenhower Memorial Corrosion Resistant Materials Findings Follow-up

4. Design and operational strategies for long-term memorial durability:

In my prior memorandum dated 17 SEP 2012, it was suggested that a set of duplicate tapestries be considered as part of an interchangeable modular system. This suggestion is definitely a major consideration, however my strong recommendation for this remains. The use of an interchangeable system of tapestry panels would minimize unsightly disruptions at the memorial site by having “new” panels immediately available for fast onsite exchanges in the event of unforeseen damage from an accident or the elements. The ability to then refurbish and repair the degraded or damaged tapestry panels under ideal controlled conditions at an offsite location would ensure the highest quality and would enhance overall memorial safety versus the alternative of onsite in-situ repairs of single copy tapestry panels. When exchanged, the weathered panels could easily be refurbished to near new conditions via spot re-welding to reattach missing or damaged wires followed by pickling, and passivation at minimal cost levels and could be stored in reserve until the twin panel is ready for its cycle of maintenance. The extra panels are a wise investment in the event of any unforeseen catastrophic events such as vehicle collisions, crane accidents, tree falls, or accidents during maintenance. President Eisenhower, greatly admired for his mastery of planning and preparing for complex operations once quoted: *“You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics”*. Using the tapestry panel rotation method would extend the lifespan of individual panels and would reflect well upon President Eisenhower’s legacy.

5. Falling ice issues: Through the due diligence of the Ice Loading calculations in section 3.3.2 of the 8 July 2013 Technical Data Summary I am confident in the tapestry’s ability to bear the loading of all but the most extreme of ice storms. Unanswered questions however remain. One issue is partial releases of melting ice could lead to large bending moments leading to much greater localized stresses than anticipated in section 3.3.2 that could possibly twist and tear the wire spot welds apart. Further engineering studies are needed to determine the strength of single, twisted, and braided wire spot welds and to establish process controls for the construction and assembly phase to ensure consistent integrity of the welds. I also remain concerned over what is to be done as ice melts and inevitably falls from the structure. In the event of a full ice release, care must be taken to ensure the safety of memorial visitors and the regular passing pedestrians. Engineering workarounds for inherently safer designs for bulk ice falls or an established safety procedure from the National Park Service for ice buildup are recommended.

6. Summary: The additional measures taken during the last year by Gehry Partners, LLP have increased my confidence that a tapestry base alloy such as 316L or 317L stainless steel can satisfy the durability criteria of the Commemorative Works Act. In particular, the ASTM G85 A4 SO₂ salt fog results were helpful. If my remaining

RDRL-WMM-C

SUBJECT: Eisenhower Memorial Corrosion Resistant Materials Findings Follow-up

recommendations including post assembly pickling, the duplicate tapestry panel set, and strong admonishment to **NEVER** use undesignated 316 or 317 stainless steel wire products minus the "L" are followed, my increased confidence will be further boosted. It has been a distinct honor for me to participate in this important project honoring Dwight D. Eisenhower's legacy as our President, our General, and his greatness as a fellow American citizen. I look forward to providing additional assistance as additional durability analyses are conducted on the tapestry welds as well as additional samples of the base material alloy.

7. The point of contact for this action is Mr. Brian Placzankis, brian.e.placzankis.civ@mail.mil, 410-306-0841.

A handwritten signature in black ink, appearing to read "B. E. Placzankis". The signature is fluid and cursive, with the first name "B." and last name "Placzankis" clearly distinguishable.

Brian E. Placzankis
Team Leader
Corrosion and Surface Science
U.S. Army Research Laboratory

Appendix C



Smithsonian
Museum Conservation Institute

Carol A. Grissom
Senior Objects Conservator

August 1, 2013

Mr. Shane L. Dettman, AICP
Senior Urban Planner, Urban Design and Plan Review
National Capital Planning Commission
401 9th Street, NW – Suite 500
Washington, DC 20004

Dear Shane:

I have looked over the materials in the latest more-than-700-page Eisenhower Memorial Tapestry Engineering and Technical Data Summary submitted July 8, 2013. Results for new laboratory testing of welds are included, and articles have been added on the stainless-steel United States Air Force Memorial (2006), the Korean War Veterans Memorial (1995), and passenger rail cars at Bombardier. Automated gas shielded flux core arc welding of the US Air Force Memorial and automated resistance welding at Bombardier may have application to the Eisenhower Memorial tapestry, but the cast stainless-steel of figures in the Korean War Veterans Memorial would seem to be less relevant. Sections on subjects more within my area of expertise (metal and sculpture conservation), however, are essentially unchanged from the previous submission.

Several items (now found in Section 5.0 Maintenance and Cleaning) that I noted in my letter of February 13, 2013, have still not been addressed in the current report. They include the following:

- 1) The likelihood is noted of “an addition of a protective plastic film after initial manufacturing of the tapestry [that] should protect the stainless steel from damage and soiling after fabrication and during installation.” Is it plastic sheeting, or is it a sprayed-on coating? If it is a sprayed-on coating, how would it be removed? I ask this, because if a sprayed-on coating is used, any residues left on the tapestry might result in corrosion.
- 2) The amount and frequency of cleaning that will be required for the tapestry remains a concern, in so far as it is difficult to estimate in the absence of comparable items. Nevertheless, I would expect the tapestry to be regularly disfigured by guano from birds perched on the box beams at the tops of each tapestry or even on the tapestry itself, and I would expect that more than the proposed “simple wash-down on a yearly basis” would be required. I would also like to see details about the ease of removal of panels, should an area become damaged.
- 3) In the section on *General Cleaning*, “use of a high pressure spray is not recommended as it could potentially compromise the passivation of the Stainless Steel.” This would

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Museum Support Center
4210 Silver Hill Road
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www.si.edu/mci Web address

seem to contradict testing done for removal of wind-blown debris by Gale Associates. Although the amount of pressure was not specified, a pressure washer was required to remove both plastic bags and wet toilet paper during the testing. Moreover, the temptation to use a pressure washer to remove guano from the tapestry will be great.

- 4) Two lifts are shown for cleaning the tapestry, and there is no explanation as to why two lifts are required, since both reach heights of around 80 feet. Lift 1, an MLE T7535-45-Atrium Lift with outriggers, is inappropriate for use at the Eisenhower Memorial. MLE (Man & Material Lift Engineering, 414-486-1760) maintains that the lift should only be used indoors on flat hard surfaces. Lift 2, an 860 SJ (the Genie lift in the key?), is illustrated in use on the south tapestry in a swale, a depression in the terrain near trees. I would like to know if it is safe to use the lift on soft ground in a swale.

Since I understand that the National Park Service (NPS) is to provide maintenance for the tapestry, does it own a lift that will reach to the top of the tapestry or will it have to rent one? Does the NPS bear costs associated with renting or purchasing a lift or lifts?

I cede authority to NIST's Tim Foecke and other corrosion scientists in the matter of weld corrosion, but, like him, I look forward to seeing a sample of robotically welded tapestry. Only then can the feasibility and durability of the proposed tapestry be evaluated with confidence.

Sincerely,

A handwritten signature in blue ink, appearing to read "C. Allen", is written below the word "Sincerely,".

Appendix D

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-3720 202-504-2200 FAX 202-504-1195 WWW.CFA.GOV

27 January 2011

Dear Ms. O'Dell:

In its meeting of 20 January, the Commission of Fine Arts reviewed the concept submission from the National Park Service for the Dwight D. Eisenhower National Memorial at Independence and Maryland Avenues between 4th and 6th Streets, SW. The Commission expressed overall support for the proposal and, following extensive discussion of the design features, approved the preferred alternative (option 3) with suggestions for further study.

The Commission members endorsed the proposed combination of large-scale gestures to capture the overall site and, toward the center of the site, a memorial precinct that focuses on the commemoration of Eisenhower. They expressed strong support for the proposed rows of colossal columns, agreeing that the great scale and abstract form of the columns—reminiscent of the grain silos near Eisenhower's boyhood home—would be effective in framing the site, and would also create a beautifully defined space along the Department of Education headquarters building on the south; overall, they commented that the memorial design would enhance rather than detract from the Education building.

However, the Commission members questioned the presence and character of the proposed metal tapestries to be supported by the columns, including the primary tapestry spanning roughly 540 feet across the south edge of the site depicting a landscape photograph of Eisenhower's boyhood home. They observed that the immense display of a photographic image is more typically associated with commercial advertising as seen on billboards, rather than with a dignified memorial; they recommended engaging an artist to create an original image as an iconic element of the presidential memorial. Despite their reservations, they commented that the choice of a landscape image is the most successful at the scale and proportion of the primary tapestry, suggesting an evocative quality for the entire site while subtly referring to Eisenhower as the subject of the memorial. Acknowledging that the details of this novel construction concept are still being developed, they recommended that the appearance of the structural support system for the tapestries be as simple as possible to avoid detracting from the formal purity of the columns and from the tapestry image itself.

To address these concerns, the Commission members emphasized the need for careful study of the technical details of the tapestries such as the size of the weave, the support system, and the long-term maintenance issues. They strongly suggested consideration of eliminating the tapestries altogether—relying instead on the unexpectedly successful strategy of using the colossal columns to both define the urban space and establish the character of the memorial itself. Even if the large tapestry remains, they recommended eliminating the two smaller tapestries along Independence Avenue to avoid distraction from the design's major gestures; they also recommended adding more columns along Independence Avenue to reinforce the definition of the site.

In support of the overall concept for treating the site as an urban space containing a focused memorial precinct, the Commission members expressed a clear preference for the approach of filling the surrounding space with trees; they suggested a refinement of the pattern of trees, such as a grid across the site as illustrated in options 1 and 2. They noted the importance of providing shade within the large site and urged consideration of the landscape's appearance before the trees have reached their mature size. The Commission members supported the framing of the memorial's central precinct with flanking walls representing Eisenhower's military and civilian achievements; they recommended further study of the elements in this area, including the possible development of a freestanding sculpture of Eisenhower instead of the proposed bas-relief panels. They also suggested that the design more strongly acknowledge the diagonal alignment of the Maryland Avenue corridor, which they said could be more deliberately related to the central commemorative precinct. They supported the consolidation of all ancillary functions in a single structure located in the southeast portion of the site.

In summary, the Commission members complimented the design team for its progress on the memorial proposal since the information presentation in May 2010, noting the improvements to make this national memorial more dignified, subtle, and focused. Citing Eisenhower's extraordinary leadership and strengths, they encouraged that these qualities be expressed in the memorial design as a lasting inspiration to future generations. As always, the staff is available to assist you with the next submission as the concept is developed.

Sincerely,



Thomas E. Luebke, AIA
Secretary

Margaret O'Dell, Regional Director
National Park Service, National Capital Region
1100 Ohio Drive, SW
Washington, DC 20242

cc: Peter May, National Park Service
Brig. Gen. Carl W. Reddel, Dwight D. Eisenhower Memorial Commission
Frank Gehry, Gehry Partners
Joe Brown, AECOM

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

101 P STREET NW SUITE 112 WASHINGTON DC 20001-2720 TEL 202-279-0100 FAX 202-294-2196 WWW.CFA.GOV

22 September 2011

Dear Mr. Whitesell:

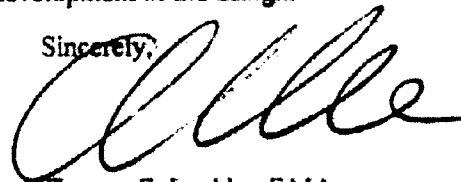
In its meeting of 15 September, the Commission of Fine Arts reviewed a revised concept submission from the National Park Service for the Dwight D. Eisenhower National Memorial at Independence and Maryland Avenues between 4th and 6th Streets, SW. The Commission approved the revised concept, expressing great enthusiasm for the development of the design and for the artistic quality of the tapestry mockups as displayed on the memorial site.

In their discussion, the Commission members expressed strong support for the revised configuration of the proposed memorial, including the 90-degree rotation of the two smaller tapestries and the reduction in the number of colossal columns. They again supported the overall height and scale of the columns and tapestries, observing that these elements of the proposed memorial enable a welcome transformation of its site, currently a poorly defined urban space. They also commented positively on the more unified treatment of the area within the columns; however, they noted that both the landscape and the series of raised elements at the center of the composition require further development to provide a focus for the memorial.

Regarding the development of the monumental tapestries, the Commission members expressed a strong preference for the technique using welded stainless-steel cable instead of the Jacquard-style woven alternative presented. They commented that the preferred method—derived from the hatched technique of engravers such as Albrecht Dürer—was highly sculptural when seen up close but appeared more photographic from a distance. While extremely supportive of this artistic approach, they raised concern about the literal translation of photography into art at this scale and encouraged further development of the conception of the image as a drawing. Reiterating their support for a landscape image for the memorial, they commented that the most powerful element of the image is the horizon line which, by extending across all three tapestries, would unify the sequence of panels.

In general, the Commission members commended the project team for the sophistication of the design, noting that the proposed artistic treatment will transform the site and the context of adjacent federal buildings. They look forward to the review of further development of the memorial's design, particularly regarding the character of the central memorial space. As always, the staff is available to assist with development of the design.

Sincerely,



Thomas E. Luebke, FAIA
Secretary

Steve Whitesell, Regional Director
National Park Service, National Capital Region
1100 Ohio Drive, SW
Washington, DC 20242

cc: Peter May, National Park Service
Carl W. Reddel, Dwight D. Eisenhower Memorial Commission
Frank Gehry, Gehry Partners
Joe Brown, AECOM

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

26 July 2013

Dear Mr. Whitesell:

In its meeting of 18 July, the Commission of Fine Arts reviewed the submission of the design of several elements to complete the concept design for the Dwight D. Eisenhower National Memorial at Independence and Maryland Avenues between 4th and 6th Streets, SW. The Commission approved the presented designs—for the central memorial elements, the planning of the site, and the ancillary structures—and made several recommendations for the development of the design.

The Commission complimented the design team for the extensive and thorough studies of the memorial's core elements, as presented in the many physical models and sculptural maquettes. In general, the Commission members continued to express support for the overall design and high artistry of the proposed memorial, including the monumental columns and woven metal tapestries that define the four-acre site, characterizing the layering of trees, tapestries, and sculpture as a beautiful composition. They endorsed the organization of the site with the consolidation of the memorial elements at the center, but they recommended further development of the concept of the landscape as a memorial within a park. They suggested reconsidering the necessity of the columns along the east and west ends of the site, which they said may contribute to an impression of massive scale that is incongruent with Eisenhower's characteristic humility. In particular, they noted the visual effect of the column at the northwest corner, which emphasizes the colossal scale as visitors approach the memorial along Independence Avenue.

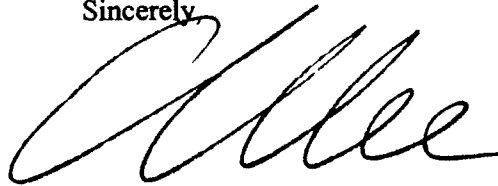
For the tripartite composition of walls, statuary, and inscriptions at the memorial's core, the Commission members supported the proposed concept of stone walls with quotations as framing devices for bas-relief scenes and bronze figures representing the role of Dwight D. Eisenhower as a general and as president. For the sculptures, they noted the disparity of presenting General Eisenhower as part of a group and President Eisenhower alone; they suggested refining the design—perhaps in the degree of relief—to create a balance between the two panels and the multiple depictions of the subject. They supported the portrayal of Eisenhower as a youth placed on the central wall, but questioned the diminutive scale of the figure in relation to the heroic size of the nearby sculptures. They suggested refinement of the design of the stone elements, particularly the offset lintels above the bas-relief panels below; they noted that the detailing of the stone joints would inevitably reveal these blocks to be composed of many smaller pieces instead of the monoliths implied by the presentation materials.

Noting the lack of conceptual development of the landscape in comparison to the central commemorative elements, the Commission requested development of the site design to support the idea of a memorial within a public landscape. Specifically, they recommended a more robust architecture and canopy of trees within the landscape to relate more deliberately to the larger elements of the memorial, to define the central allée of Maryland Avenue more

tightly, and to create a more hospitable microclimate. They requested further development of the site's ground plane, noting that the treatment of swales and paved walks should be reconsidered in their role to enhance the visitor experience within this public space.

The Commission looks forward to reviewing further development of the memorial's design, particularly in the conception of the memorial's landscape as a unifying element, as well as the details of the columns, tapestries, statuary, inscriptions, signage, lighting, and other details. As always, the staff is available to assist you with the next submission.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Luebke', written in a cursive style.

Thomas E. Luebke, FAIA
Secretary

Steve Whitesell, Regional Director
National Park Service, National Capital Region
1100 Ohio Drive, SW
Washington, DC 20242

cc: Peter May, National Park Service
Carl W. Reddel, Dwight D. Eisenhower Memorial Commission
Frank Gehry, Gehry Partners
Joe Brown, AECOM

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

2 December 2013

Dear Mr. Whitesell:

In its meeting of 21 November, the Commission of Fine Arts reviewed proposed revisions to the approved concept design for the landscape and site elements of the national memorial to President Dwight D. Eisenhower at Independence and Maryland Avenues between 4th and 6th Streets, SW, providing the following comments concerning the refinement of the site design as the project is further developed.

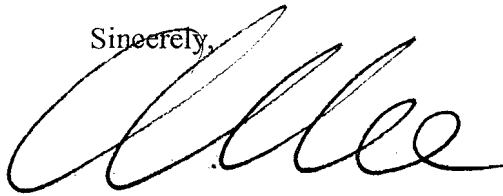
The Commission reaffirmed its support for many aspects of this important national project and emphasized its continuing support for the creation of a memorial that is modern in character as an appropriate means of honoring Eisenhower's many achievements as general and president in the mid-20th century. The Commission members also continued to express admiration for the artistic vision of the memorial, particularly for the monumental stainless steel tapestries, which they characterized as beautiful. However, they raised strong concerns about the lack of conceptual clarity in the site design, identifying an apparent disengagement between the design of the colossal columns and tapestries—featuring images of an abstracted prairie landscape—and the landscape of the memorial itself. Noting that the iconic Great Plains landscape of Eisenhower's childhood is used as a central metaphor for the memorial as a whole, they found the actual landscape design to be underdeveloped and cryptic, with isolated tall grass swales intended to evoke the prairie relegated to the margins of the site. Instead, they recommended pursuing a bolder and more unified conception of the landscape, perhaps making deliberate use of understory and canopy trees to frame more emphatically the primary experience of a grassland within the site. They strongly recommended a closer collaboration between architect and landscape architect in order to achieve the necessary conceptual clarity for the memorial overall.

The Commission members observed what they characterized as a partially developed quality of frontality and theatricality in the design, which is composed of a series of flat diaphanous planes and sculptural tableaux oriented to a favored view experienced from the north. Noting that most visitors will reach the site from many directions, they continued to question the columns and panels on the east and west, which may also contribute to the impression of approaching the memorial from behind and compromise the concept of the tapestries as a backdrop. Whether developing further the experience of frontality or not, they recommended that the concept for the overall design be clarified in its public place-making within this extensive site through elements of enclosure such as trees. If the concept of defining the memorial precinct principally with monumental columns and screens is pursued further, the burden is upon a compelling landscape design to reinforce more clearly the conceptual intent. They advised treating the perimeter roadways as urban streets lined by regularly spaced rows of trees, commenting that the proposed intermittent placement of trees along Independence Avenue may undermine the experience of the memorial as a defined precinct. They reiterated their concerns about how the composition of columns is seen along Independence Avenue, but clarified that this is a conceptual issue of the design rather than a concern about transgressing what is actually an irregular line of

building fronts along the avenue. While they acknowledged the importance of celebrating the Maryland Avenue axis and view to the U.S. Capitol, they also found that the proposed treatment of this diagonal swath lacks a strong conceptual connection with the landscape design for the memorial. Finally, the Commission members commented that the area of service structures at the southeast corner of the site was needlessly complex, with a small storage shed now added to the composition; they recommended a more careful arrangement of these elements.

In conclusion, the Commission looks forward to the development of this memorial as it progresses toward a final design that is unified in its conception of architecture, landscape, and sculpture as contributing to Washington's larger commemorative landscape. As always, the staff is available to assist you with the next submission.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Luebke', written in a cursive style.

Thomas E. Luebke, FAIA
Secretary

Steve Whitesell, Regional Director
National Park Service, National Capital Region
1100 Ohio Drive, SW
Washington, DC 20242

cc: Peter May, National Park Service
Carl W. Reddel, Dwight D. Eisenhower Memorial Commission
Frank Gehry, Gehry Partners
Joe Brown, AECOM

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

27 February 2014

Dear Mr. Whitesell:

In its meeting of 20 February, the Commission of Fine Arts reviewed revisions to the landscape design for the national memorial to President Dwight D. Eisenhower at Independence and Avenues between 4th and 6th Streets, SW, and provided the following comments for the development of the final design of the project.

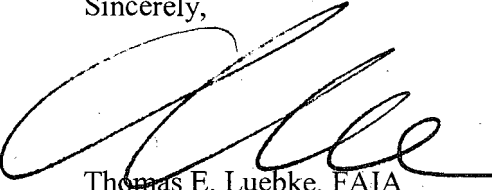
The Commission members acknowledged the fundamental challenge of the memorial's site design, characterizing it as a tension between two ideas: a memorial within a park versus a park framed by memorial elements. They observed that the design must be developed to balance successfully the memorial's natural and artificial elements that define the unfolding experience of the visitor moving through this large space. They acknowledged the improvements to the design—increasing substantially the number of trees, removing the shaded swales, revising the spatial sequence of the approaches—and commented that the new landscape design, while less ambitious conceptually, would create a more coherent urban space.

While expressing appreciation for the testimony of several representatives of civic groups, the Commission members reaffirmed their support for a landscape definition of the Maryland Avenue axis at a width considerably narrower than the historic right-of-way; they emphasized that the historic development of the avenue requires that it must be considered as typologically different from its graphic analogue in the L'Enfant Plan, Pennsylvania Avenue. They also clarified that the conceptual qualities of frontality and theatricality in the proposed design are not inherently problematic, but that these must be executed in a way that reinforces the symbolic meaning of the memorial as well as the dynamic experience of the visitor.

In their discussion, the Commission members made several recommendations to refine the landscape design as the project moves forward. Noting that ample views will exist below the tree canopy, they discouraged the deliberate framing of views created by the irregular placement of trees along Independence Avenue, and they commented that an even stronger development of the landscape with trees will reinforce the perception of the memorial within a grove-like park. For the paved areas within the memorial site, they questioned the extensive use of limestone, which may not be as durable as the granite used elsewhere; they also questioned the staggered rectangular configuration of the diagonal approaches to the memorial's core, which they found formally assertive in relation to the great Maryland Avenue axis. For the treatment of Maryland Avenue itself, they supported the proposed idea of an open, occupiable greensward framed by substantial trees; they suggested that the reality of heavy pedestrian movement across this long expanse of grass may require the provision of walkways to avoid unintended paths being worn into the turf.

In conclusion, the Commission members found that the landscape design has progressed positively; they also acknowledged the improvements in the design of the small service building near the southeast corner of the site. The Commission looks forward to the review of the next submission, comprising a comprehensive design of the memorial's commemorative features—including sculpture, tapestries, columns, and landscape elements—as they contribute to the overall symbolic program for the memorial. As always, the staff is available to assist you with the next submission.

Sincerely,



Thomas E. Luebke, FAIA
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