

2026 Gateway Arch National Park Engineering Contest (GANPEC)

Safely Decorating and Raising the Garrison Flag at the Old Courthouse Rotunda

Overview

For decades the Fourth of July decorations at the Old Courthouse brought a sense of national pride to park visitors. Bunting, banners, greenery, patriotic symbols and the eye-catching centerpiece of a 20x36ft garrison filling the Rotunda were a period appropriate way of celebrating the season. In all seasons, park maintenance staff accessed the higher levels of the Rotunda to clean and maintain the historic light fixtures.

In 2025 the Old Courthouse reopened to the public after a massive renovation of the historic structure. The renovation, while an overall great positive, highlighted some existing safety issues and created new barriers for staff. A park safety officer also reviewed the past work procedures and found them to be unsustainable. The question for this year's GANPEC is how the Park maintains this tradition of decoration and care while also incorporating the changes made to the Courthouse with a particular focus on staff safety.

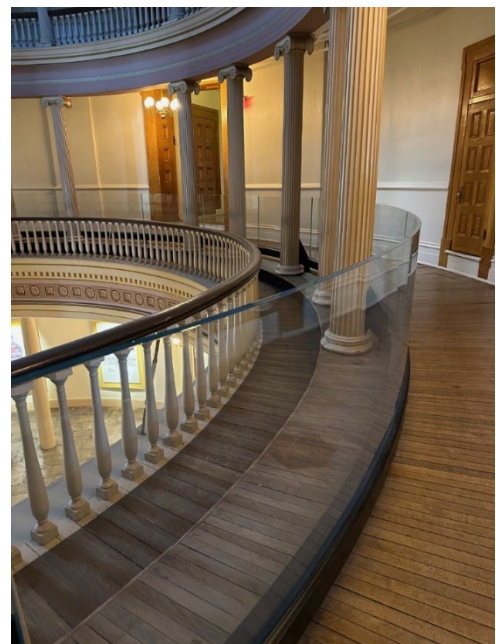


Engineering Problem

Teams are tasked with creating a process to allow staff to safely access the higher levels of the Rotunda to maintain the historic lighting fixtures and to annually decorate the Old Courthouse rotunda, while achieving these main objectives in the order of importance:

1. Ensure employee safety by adhering to the National Park Service's **Hierarchy of Controls**, which mitigates hazards from the most effective to the least effective
2. **Impacts the process will have on the building shall be examined and defined. The proposal shall outline how** [The Secretary of the Interior's Standards for the Treatment of Historic Properties](#) were applied in the project and how the proposal meets the standards and address Section 106 of the National Historic Preservation Act.
3. Devise a procedure for employees to safely access the third, fourth and fifth floors in order to access and maintain historic lighting fixtures. In addition, access to decorate the chandeliers and sconces with greenery on each level safely.
4. Hang the 20 ft x 36 ft garrison flag in the Rotunda at a height where it makes for a notable impression on visitors
5. Provide safe and efficient access beyond plexiglass barrier to first balcony to drape eight (8) red, white, and blue banners over the first- balcony
6. Thread the greenery in the Rotunda in a way that best complements the garrison flag and banners.
7. Develop a detailed yet appropriately concise procedure for the annual set-up, removal, and storage of all decorations. The instructions should be clear enough for new employees to follow. Teams need to come up with easy to store device(s) to gain access to the rotunda including light fixtures and barriers.

- No decorations covering the lunettes.
- Flags should be displayed in accordance with the [U.S. Flag Code](#).
- No decorations in the exhibit galleries.
- Maintain the historic appearance of the building consistent with its period of significance (mid-1800s).

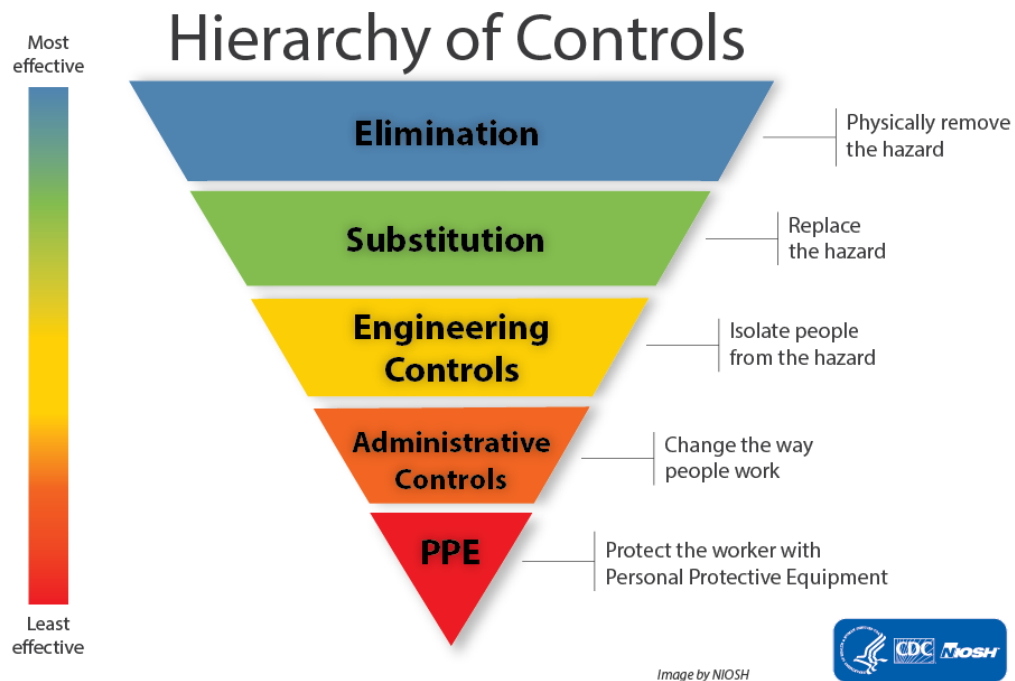


Resources

Previous Instructions for Raising the Garrison Flag are included at the end of this document for reference. These instructions describe the method previously used to raise the garrison flag before the Old Courthouse renovation.

Information on the NPS Hierarchy of Controls can be found here:

<https://www.cdc.gov/niosh/hierarchy-of-controls/about/index.html>



Criteria for Evaluation

Teams will be judged on the following:

1. Meeting the highest level of safety, as stipulated by the NPS Hierarchy of Controls
2. Assessment of how the process ensures the highest positive and patriotic impact on visitors to the Old Courthouse
3. Efficiency of process, which considers:
 - a. Time necessary to complete the task from beginning to end (this includes set-up and take-down time, in addition to storage of items)
 - b. Number of NPS employees needed to complete tasks
4. Cost of the proposed process, including any required equipment, devices (e.g., ropes, cables), and storage items.
5. Quality and format of the proposed implementation guide, including organization, clarity, completeness, appropriate level of detail, and ease of use by NPS employees.
6. How well the proposal meets the Secretary of the Interior's standards and consideration of the Section 106 process.

Timeline

Teams need to schedule site visits by emailing Jennifer King at Jennifer_King@nps.gov.

- *September 1 – Mid-October 2026:* Site visits at the Old Courthouse (OCH) will be available Monday through Friday from 9:00 a.m. to 4:00 p.m.
- *Friday, November 6, 2026 by noon:* Executive Summaries are due.
- *Saturday, November 14, 2026:* Team Presentations will be held at the Washington University McKelvey School of Engineering from 10:00 a.m. to 2:00 p.m.

Inquires

Jennifer King at Jennifer_King@nps.gov.

Previous Instructions for Raising the Garrison Flag

These instructions document the method previously used to raise the garrison flag before the Old Courthouse renovation. This process is no longer considered to meet current safety expectations and is provided as background information to illustrate the need for the engineering solution to be developed as part of this year's contest.

PHASE 1 – Raising the Garrison Flag in the OCH Rotunda

Before the flag is raised, the Buildings & Utilities (B&U) staff will need to silence the fire alarms in the building so the staff does not activate the alarms while raising the flag.

1. Set three 8-foot tables centered on the rotunda floor; place the 3 tables longways north to south.
2. Unpack the Garrison Flag from the flag container and place it on the table.
3. Unfold the width (20ft) of the flag onto the tables with the field of blue to the north. Leave the length (36ft) of the flag folded on the tables.
4. Clean the flagpole and cables and lay the flagpole and top of the flag.
5. Separate and position each of the 4 lift cables that are used to raise the flag towards each one of the four benches in the rotunda.
6. Wire the flag to the pole using Zerlon plastic-coated wire. Place the wire through each of the brass grommets and secure it to the flagpole.
7. Inspect the 4 ropes used to raise the flag, ensuring that the carabiners are securely fastened to the ropes and that the ropes are in good shape and not worn or frayed,
8. The 4 ropes are lowered from the fourth-level balcony. Each carabiner is attached to one of the lift cables using the loops at the end of each lift cable that are attached to the flagpole.
9. After each rope is attached to one of the four cables from the flagpole, raise the ropes from the fourth balcony to remove the slack from the rope. Tie each rope to one of the four posts of the black balcony railing, using the posts that are closest to the Juliet Balcony.
10. Set the 4 chains with the cloth socks placed on the chain to lessen the wear to the paint of each of the four posts. Open the Quick Link by unscrewing the locking mechanism. Place one chain around the base of each of the four posts that also have ropes tied. Lock each of the chains by screwing the locking mechanism closed.

11. To raise the flag, position one person at each of the black posts where the ropes and chains are attached. Untie the rope from the top of the post, and when ready, all four individuals pull the ropes to raise the flag.
12. When the flag reaches the pinnacle, the fifth person, while on their knees, reaches under the black balcony railing and pulls the cable towards the base of the post and then unscrews the quick link and attaches the chain through the cable loop to secure the flag cable to the base of the post. The 5th person repeats this process until each cable loop has been secured to the base of the post with the chain.
13. The flag is now secured.

PHASE 2 – Decorating the first balcony of the OCH

14. Tie the 8 red, white, and blue banners to the top of the brown railing of the first balcony. Each banner should be centered on the second and fourth column in each of the column groupings in each quadrant of the rotunda.
15. When the banners are secured to the railing, drop the banners into the lower level of the rotunda. Using a lift, tie the end of the banner to the top of the Doric column that is located directly beneath the banner.
16. Center the red, white, and blue bunting on the column that the bunting hangs in front. Tie the center of the bunting first and then tie either end to the brown railing of the first balcony.
17. Center one of the blue cloth-covered flag blocks over the east hallway and one over the west hallway. Secure each of these flag blocks to the base of the balcony spindles using Zerlon.
18. Place two of the 33-star flags with the longest poles first into the block, using the holes that are closest to the railing. Also secure these flags to the spindles of the railing with Zerlon. Two people will be needed to place the first 2 flags. Place the next two flags with the next longest poles into the second set of holes away from the railing. Place these flags securely and as deep as they will go into the block.
19. Next, using the shortest tow flag poles, set them into the remaining holes of the block. All six flags should be secure and safely set. Place the red, white, and blue shield into the center of the flag cluster using the brown cord attached to tie the shield to the railing spindles.
20. Repeat the above process for the opposite side.

21. Using the greenery for the first balcony and starting behind one of the flag clusters, thread the greenery through the spindle from behind and loop under the bunting to make a swag under the bunting.
22. Bring the greenery between the bunting and banner. Thread from the rotunda side and under the brown railing, placing the greenery over the top of the brown rail and loop under the top of the rail and swag under the next banner.
23. Continue this looping of the greenery under each piece of bunting has a swag of greenery below and a swag of greenery over the banner, just where the banner breaks at the edge of the cornice of the first balcony.
24. Continue around the rotunda until completed. The greenery will need to be tied between each piece of banner or bunting. Each sprig of greenery can act as a tie, and twist two sprigs of greenery to secure the greenery between each wrap of the brown railing.

PHASE 3 – Decorating the second balcony of the OCH

The second balcony level is decorated with two pieces of bunting being placed between each column in each of the column groupings. The space between the inner columns is larger than the space between the outer two columns.

25. Starting with the outer column of the group, use the smaller white piece of bunting and the smaller blue piece of bunting. Tie these two pieces together using a brown cord.
26. Find the center of the space between the first and second column by counting the number of spindles. Tie the two pieces of bunting (one white and one blue, with blue being on top) to the brown rail at the top of the spindles.
27. Attach the ends of the white bunting to the outer edge of the column, ensuring that the bunting lies in front of the column. Then secure the blue bunting by tying the left and right sides to the brown rail.
28. When placing the next set of bunting, make sure the second bunting passes in front of the column and over the previously set bunting. Continue this all the way around the rotunda.
29. Using one of the 4 pieces of greenery marked for the second balcony, place the greenery on the balcony below.
30. When the greenery is placed, set gold stars onto the field of blue. Examine the blue bunting closely to find where the stars were placed previously. Place a thumb tack

through the back of the blue fabric and place the center of a star onto the point of the tack. This will set the stars onto the field of blue.

31. Place three gold leaf sprays on the first third and fifth column in each grouping. Place the stem of the gold sprays down behind the greenery to secure.
32. Place the flag clusters over the north and south hallways and follow the same instructions for the first balcony.

PHASE 4 – Decorating the third balcony of the OCH

33. Place four pieces of red, white, and blue bunting on this balcony.
34. Place one piece over each of the four hallways on the first floor.
35. Tie the bunting to the top of the brown railing and place one piece of greenery under each bunting piece.

PHASE 5 – Decorating the fourth balcony of the OCH

36. Center and tie one red, white, and blue banner on each of the Juliet balconies.
37. Place a small greenery swag to the left and right of the banner.

PHASE 6 – Placing the curtain on the floor of the rotunda

The stage curtain is placed on the north side of the rotunda.

38. Place the cable around the base of the two Doric columns at the north corridor.
39. Use the two rubber pieces of hose to buffer the top, outside of the column when the cable is raised. Lay the cable out on the floor and around the back of the two columns, ensuring that the hose pieces are at the outside back of the column.
40. Place the connecting part of the cable near the inside of the east column nearest the rotunda wall. Have at least two people assist in raising the cable from the back of each column.
41. Using the lift, a third person will be positioned at the east column to help raise the cable. The cable should be raised at the same time.
42. When the cable is raised high enough the person on the lift will be able to attach the two ends of the cable and screw the eye bolt into place to the opposite end of the cable.

43. Continue to raise the cable to the top of the column. Make sure the hoses are placed at the back of the column to prevent the cable from damaging the column.
44. Once the cable is set, the fabric is placed over the cable. First place the side panels. The longest two side panels are placed next to each column. Then place the tiered or folded side panels. Each piece of fabric has Velcro to attach the fabric.
45. The three swags are placed; each swag is marked as to what side they should attach. Place the left and right swags first and then the center swag. Each swag has Velcro that will attach to the cable and well to the sides that it overlays.
46. The curtain will need to be steamed using the exhibit's steamer. Place the steamer in the basket of the lift and glide the steamer head over the material to remove the wrinkles.
47. Attach the thirteen white matt board stars. Arrange as shown in the Victorian 4th of July file in the exhibits office. Stars are placed using thumb tacks from the backside of the material.