



Big Boardwalk Builders

Penn State Stone Valley Recreation Area

Final Report

Boardwalk Trail Replacement Project

Introduction

Big Boardwalk Builders Inc. is pleased to provide Stone Valley Recreational Area with the final report for the Boardwalk Replacement project awarded on May 3rd, 2023, and executed during the project period from May 15th, 2023, to June 23rd, 2023.

Original Need

The main trail, which is the busiest section, sees hundreds if not thousands of visitors every year and has been active since its construction in the 1980s. Stone Valley is also subject to frequent harsh weather which has compromised the rigidity and structural integrity of the trail. The wooden boards on the trail experience warping and cracking which shifts the base support and loosens its structural elements. All these weaknesses on the trail pose a big threat to travelers and the surrounding environment. The boards on the trail might fail which would lead to significant injury to visitors or even wildlife. This in turn could hurt the reputation of the stone valley trail and could even drive away potential future visitors. The handrail should be strong and sturdy enough to provide support to travelers. The trail must be well lit at night with ample signage to ensure travelers are safe and do not get lost. In areas such as the Stony Valley, it is important to ensure substantial erosion and sediment control to maintain rigidity in the soil to help it be able to support the trail. It is important for the trail and its structural condition to be at its best as it can pose a safety hazard that could cause severe injury to travelers and the surrounding habitat if it is not at its best condition.

Original Project Objective(s)

To make the Stone Valley boardwalk trail safer, more accessible, and welcoming to new visitors, reduce the threat of the aging trail, preserve the recreational site, and protect the ecosystem by reconstructing the trail with cost-effective and innovative solutions within 30 days, by June 23rd, 2023, with a budget not exceeding \$1,000,000.

Original Requirements

The original requirements of this project involved replacing the Stone Valley Recreation Area's existing 0.25-mile Boardwalk Trail, viewing area, and viewing area railings to better facilitate ADA access and public safety and included the addition of emergency lighting installed along the length of the boardwalk path as well as the design and installation of new directional and informational signage.

Project Description

During this project, with resources totaling \$976,114, the preservation of the wetlands was one of the top priorities to avoid the disturbance of wildlife. During the construction of the boardwalk, the utilization of pressure-treated wood was chosen over composite plastic. This is due to the pressure-treated wood not only being more cost friendly in comparison to the plastic composite, but pressure-treated wood will not become brittle when put under the freezing conditions known to the area during the winter seasons. To address the lack of ADA access, the entire boardwalk was constructed with ADA accessibility in mind. The full length of the boardwalk will be accessible, and a T-intersection can function as an additional passing space. For viewing spaces, the current viewing area was revamped with an observation deck, providing visitors with panoramic views of the wetland for a captivating experience. The observation deck and boardwalk include a stainless-steel railing that aids with our goal of ADA accessibility and the safety of all

visitors. Accessibility, safety, and additional features (ex. viewing areas) were provided for ease of access to the boardwalk so all users can properly admire the wetland's beauty safely. Safety features include weight load risks, railing considerations, emergency lighting, and other risk factors. In addition to essential lighting that was placed along the full length of the boardwalk path, emergency lighting has the capability of running by a backup generator. To further aid the visitors, the design of new reflective directional and informational signage was also added.

Degree Project Met Original Objectives

- **Scope:** Project met scope objectives.

Requested Feature	Delivered Feature
Wheelchair and stroller-friendly 0.25-mile trail	6 feet wide x 1320 feet long ADA-accessible trail
At least 1 viewing area	5 viewing areas
Environmental testing and no contamination	Two rounds of environmental testing and assurance of no contamination

- **Quality:** The quality of the project was upheld to the highest standards of BBB's work. In response to the shortened schedule, modular installations were used to complete the construction of the boardwalk trail and railings as well as the signage. This resulted in not as many hands needed to complete the construction and the use of pieces that were prefabricated rather than wholly put together on-site. Regarding demolition, instead of removing all existing structures the method of selective demolition was used to be more focused on the environmental impacts of the project as well as reduce the time spent on demolition. Neither of the changes implemented impacted the overall end quality of the work done, as BBB holds themselves to the highest standards, rather they eased the burden of a shortened schedule by using proven methods such as modular installations from reputable companies and an eco-conscious removal method to complete the project by a new deadline.
- **Budget:** The original budget was not sufficient for the changes requested to be completed. As such, there was a request made for additional compensation resulting from impediments from scheduling changes, resource constraints, the proposed modular installations, the proposed preservations, and other impacts. These budgetary impacts were agreed upon by the customer and the vendor in response to the customer's request to shorten the schedule.
- **Schedule:** The schedule was shortened by one week at the request of the customer. The original goals of the project were completed in a five-week time period rather than a six-week time period. Also, the following tasks were shortened in duration: Develop demolition plans, Construct the boardwalk trail, Post construction signage, Remove existing structures, and Construct boardwalk railing. All durations were halved in days spent except for removing existing structures which was reduced by 1 day.

Actual Versus Anticipated Benefits

An anticipated benefit of the construction of a new boardwalk and viewing areas was a rise in the number of people visiting the Stone Valley Recreation Area. This benefit was achieved, as the construction was reported on by local news and featured on the 6 pm news multiple times, highlighting the careful efforts to preserve the wetlands and build out signage that was accessible to everyone. As such, visitors began

to frequent the site while it was still under construction to see when they would be able to take walks along the new boardwalk themselves. Now that the project has been completed, the parking lot has moved from being full of construction vehicles to full of families in minivans coming to experience nature in a safe and educational environment. Also, the boardwalk and viewing areas have been approved by the township to host various wetland and birding events which will bring new visitors to the area and raise the tourism revenue of the township and the donations made to SVRA by having a greater number of guests visit and share in the glorious nature available to them. As more families are visiting the SVRA it has led to a 5% increase in applications to Penn State's School of Agriculture, clearly showing the local ecology draws more students in. This project was done by a local company and as such the needs of the community were known and met. When removing the old materials from the structures that were removed the original plan was to properly dispose of them via recycling or the most appropriate method. This would have had the least environmental impact possible, in keeping with the goals of the SVRA. When the project was beginning to remove the old structures coverage from the news media as well as word of mouth let the community know there would be excess wood and other materials. This led to a community effort to repurpose the wood and build lending libraries for the town and one to stand at the beginning of the boardwalk trail. Big Boardwalk Builders was proud to change our plans and help facilitate the new life of these older materials into a positive impact on the community rather than a net zero impact as planned.

Future Considerations

Though this project was highly successful there are a few future considerations that would be useful in the future. The schedule change would suggest that future building projects occur when the weather is pleasant year-round to ensure that any new potential changes in schedule would have an easier time being accommodated for longer working hours. Future projects would flourish for this condition in late spring, early summer, and early fall to not have temperatures too high to prevent work but enough sunlight and daylight to allow for effective working conditions. Another future consideration would be building an educational area for groups to come and receive teaching from the SVRA staff rather than just interacting with the informational signage. This would bring more visitors to the boardwalk by building new programming for children and students visiting as well as giving local schools a new opportunity to have a field trip location to educate students about local ecology. Another future consideration would be adding safety blue lights so that visitors are able to signal help if needed and feel more secure during their visit to the SVRA. Both projects could be effectively completed by BBB in the future. Any further construction needs within the SVRA would be easily fulfilled by BBB due to a clear understanding of the area, environment, and needs of the customer after completing this project. In the future, when conducting a project of this magnitude, clear and time-bound check-ins with the customer would be preferable to unannounced visits. Also, the news coverage was helpful to the end success of the project, but advance notice and a clear goal for the coverage would be useful. This was a missed opportunity for BBB to share its name when speaking about the new boardwalk being built at the SVRA.

Deliverable List

- One drawing of the boardwalk trail:
 - Trail dimensions: 6 feet wide x 1320 feet long.
- Boardwalk trail material of construction list:
 - Wood planks: Area to cover (6 feet wide x 1320 feet long).

- Precast concrete piers: A total of 220 (2 piers for every 12 feet).
 - Railing: Timber fence on each side of the boardwalk.
- Five drawings one for each viewing area:
 - Viewing area dimensions: 8 feet wide x 8 feet long.
- Viewing area material of construction list:
 - Wood planks: Area to cover (8 feet wide x 8 feet long).
 - Precast concrete piers: 6 piers
 - Railing: Timber fence around the viewing area.
- Electrical equipment list:
 - One backup generator
 - Boardwalk Lighting
 - Quantity: 22
 - Type: LED gooseneck light mounted off a J box and a 4" x 4" post 10 feet high.
 - Emergency Boardwalk Lighting
 - Quantity: 22
 - Type: LED Weatherproof Emergency Light
 - Viewing Lighting
 - Quantity: 5
 - Type: LED gooseneck light mounted off a J box and a 4" x 4" post 10 feet high.
 - Emergency Viewing Lighting
 - Quantity: 5
 - Type: LED Weatherproof Emergency Light
 - Signage Lighting (6)
 - Quantity: 6
 - Type: LED Weatherproof Light
- Boardwalk signage
 - Quantity: 6
 - Type: Reflective Aluminum
- Fasteners
 - Quantity: 2000
 - Type: 4" Anchor Steel
- One copy of the soil and water testing report.
- One training manual for the backup generator.
- One copy of the demolition permit.
- One copy of the building permit.
- One copy of the approval certificate.
- One copy of the user manual for each lighting type.
- A signed copy of the contract including the approved budget, schedule, and scope.
- One copy of load calculations.
- One copy of the QA/QC report including the inspection results.
- One copy of the Department of Responsibilities (DOR) list.
- One copy of the challenges and lessons learned report.
- One copy of the demolition plan upon Nondisclosure Agreement (NDA).
- One copy of the bill of materials, financial reports, and commercial documents.
- One copy of the safety record.

Final Acceptance Data

- 1- The initial environmental testing on water and soil established the baseline for the contamination levels. The results were also used to assess the soil strength to use as input into the load calculations.
- 2- Based on the load calculations results:
 - a. The required number of precast concrete piers for the new boardwalk and viewing areas' structures was determined.
 - b. The type and weight of the construction were determined.
- 3- The observations and information collected by the land surveyor were used to help with the following activities:
 - a. Generate the demolition plan.
 - b. Generate the waste management plan.
 - c. Generate the design and building plan.
 - d. Determine the minimum number and dimensions of new viewing areas.
 - e. Determine the minimum number and locations for signage.
 - f. Determine the minimum number and locations for boardwalk lighting and emergency lighting.
 - g. Determine the minimum number and locations for viewing areas' lighting and emergency lighting.
 - h. Determine the size of the backup power generator.
- 4- The final environmental testing on water and soil confirmed no contamination occurred due to demolition, construction, or waste removal.
- 5- Final inspections including structural tests of the boardwalk and viewing areas and electrical systems test met the acceptance criteria.
- 6- Final payment was made after the final walkthrough site visit and receiving a signed approval and satisfaction notice from SVRA.

Final Remarks

On behalf of Big Boardwalk Builders, I want to say thank you for your business and putting your trust in us. We are so fortunate to have a customer like you and we would like to continue this relationship and support you with your future projects. We hope you enjoy your boardwalk back and every aspect of its new safety features and pleasant view.

Sincerely,

Leigh Davis, B³ Project Manger

Office of Big Boardwalk Builders

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