

VALUE ANALYSIS STUDY

for

Upper Delaware Scenic and Recreational River

PMIS 223493: Zane Grey Porch Accessibility



March 24, 2022

National Park Service
Interior Region 1, North Atlantic - Appalachian
Historic Architecture, Conservation, and Engineering
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FOREWORD

This Value Analysis Report presents the analysis and recommendations of the Value Analysis Study for porch and landscape alterations to provide ABA compliant visitor access into the Zane Grey House from the walkway through the rear porch. These recommendations were developed in the Value Analysis study conducted on February 3, 2022 & February 22, 2022.

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This is to certify that the Value Analysis Study was reviewed by the undersigned National Park Service Value Analysis Technical Expert and was conducted in accordance with National Park Service value analysis principles and guidelines.

David Bittermann, Chief, Design and Preservation Planning (Ret.)
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EXECUTIVE SUMMARY

The National Park Service (NPS) performed a Value Analysis to determine a preferred final treatment for providing an accessible route into the Zane Grey House. The Value Analysis study was performed using the “Choosing by Advantages” process.

Summary Description of Project

Designated as a unit of the National Park System and the Wild and Scenic Rivers System, Upper Delaware Scenic and Recreational River (UPDE) manages over 55,000 acres and 73 miles of the upper Delaware River in partnership with 2 states, 15 municipalities, and the Delaware River Basin Commission. As described in both the 1978 enabling legislation and River Management Plan, UPDE has primary responsibility for the “interpretation of natural and cultural features, visitor education, and providing public information.”. Currently, the Park’s primary visitor contact station is the Zane Grey House, which focuses solely on the famous American author Zane Grey.

Physical Accessibility: The Zane Grey House, listed on the National Register of Historic Places, is not physically accessible (ABA compliant). This project proposes to construct an ABA compliant ramp or lift to access the building (including removal and reinstallation of bluestone pavers, installation of piers, and addition of ramp or lift infrastructure).

The existing back porch at the Zane Grey House is original to the structure (circa 1906). Today it serves as a secondary entrance and exit for both staff and visitors. It is proposed as the new primary entrance for the redesigned visitor center. The back porch had been in poor condition due to deterioration associated with age. It was first identified as a high priority safety need during a park Safety Committee audits in November 2013 when the assessment of risk was determined to be high. Since that time, many small corrective measures have been taken to address safety and resource protection issues as they arise including repair/replacement of the stairs and portions of decking, replacement of structural elements underneath and installation of supports to distribute weight, repair of rotted columns, etc.

In 2021, HACE staff performed a site visit to review existing conditions of the porch and site, and in conjunction with OCLP’s previously proposed Alternatives, facilitated the development of the Alternatives to be considered in this Value Analysis.

Value Study Objectives

The goal of this Value Analysis was to provide a structured process for the creation and evaluation of alternatives for the treatment of the porch accessibility. Specific objectives for the Value analysis included:

- Essential functional requirements are met
- All viable alternatives are considered
- Factors used to evaluate them are sound and fully considered
- All alternatives are tested equally against these factors
- Benefit to cost relationships were considered
- Independent second opinions and perspectives were considered

VALUE STUDY

STUDY SPECIFICS AND OBJECTIVES

The object of the value study was to analyze potential efficiencies in the prioritization and selection of a preferred alternative for the treatment of the porch accessibility.

The study team was composed of a combination of professional disciplines from the Upper Delaware Scenic and Recreational River (UPDE) and the Interior Region 1, North Atlantic – Appalachian office.

Applicable Codes:

- National Building Codes
- OSHA Guidelines
- Architectural Barriers Act (ABA) Standards

Planning Criteria and Constraints:

- The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.
- The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Treatment of Cultural Landscapes
- National Park Service Cultural Resources Management Director's Order # 28.
- Programmatic needs
- Consultation with SHPO

PHASE I - INFORMATION

A range of material was available to the value study team including:

- The Secretary of the Interior's Standards and Guidelines for Archeology, and Historic Preservation.
- The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Treatment of Cultural Landscapes
- NPS 28 – Cultural Resource Management Guidelines.
- “Historic Structure Report Zane Grey House” by Short and Ford Architects, 1989
- “Cultural Landscape Report for Roebling’s Delaware Aqueduct Site and the Zane Grey Property” Draft 1, January 11, 2021
- “Cultural Landscapes Inventory, Zane Grey House, Upper Delaware Scenic and Recreational River” 2014

PHASE II - CREATIVITY

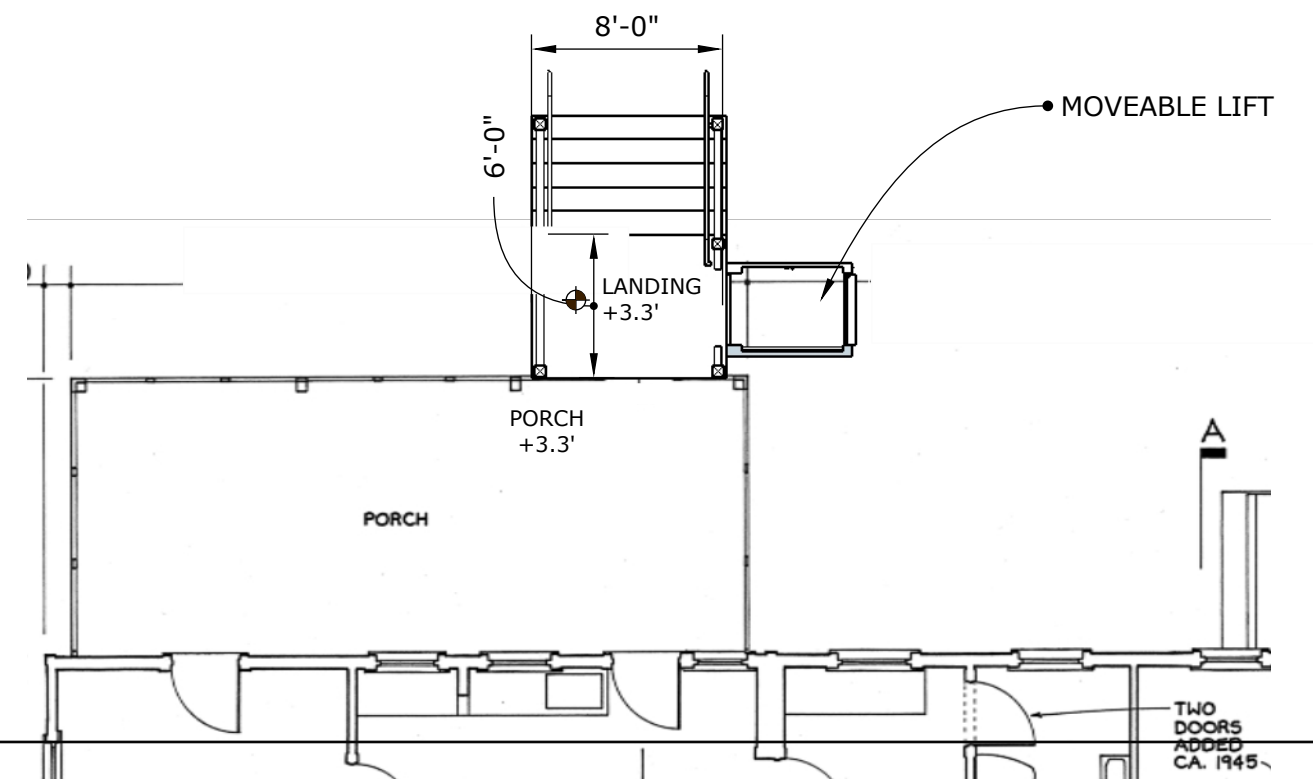
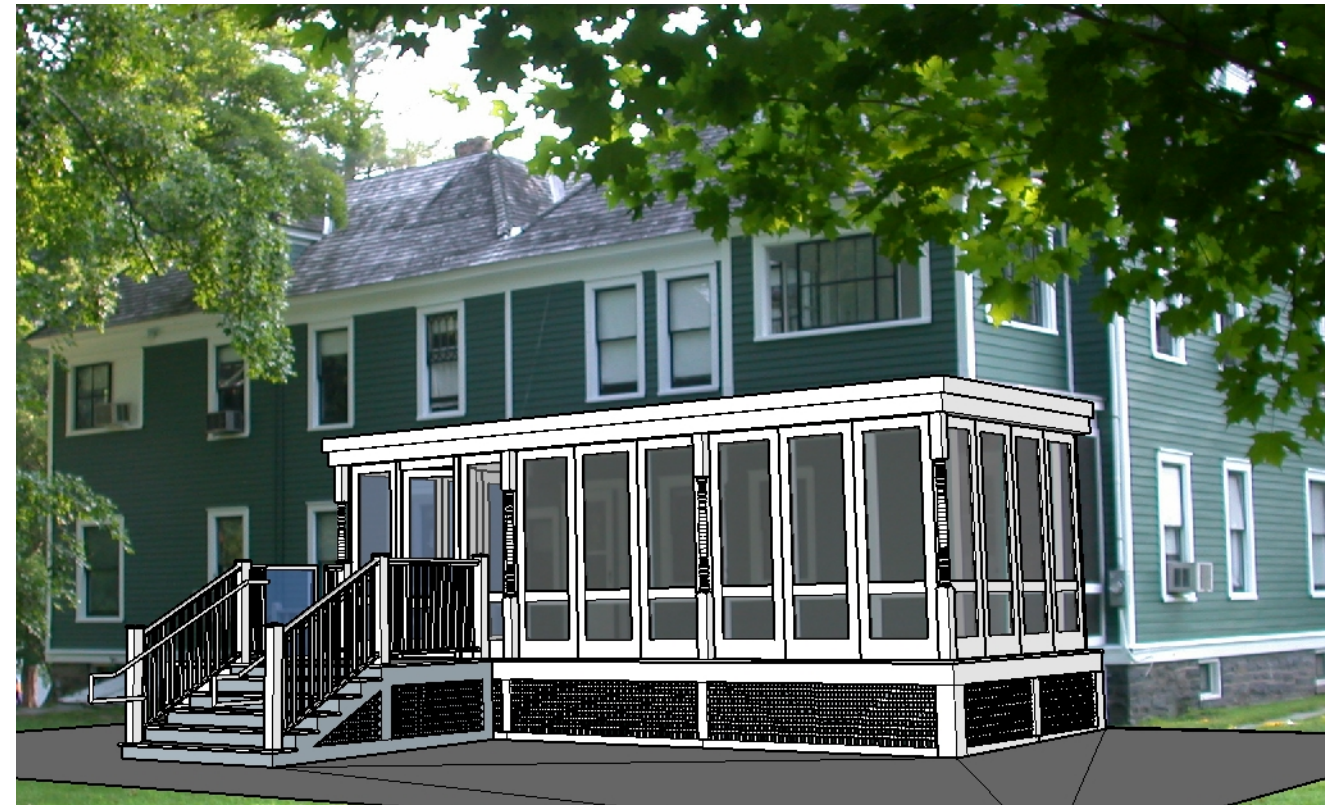
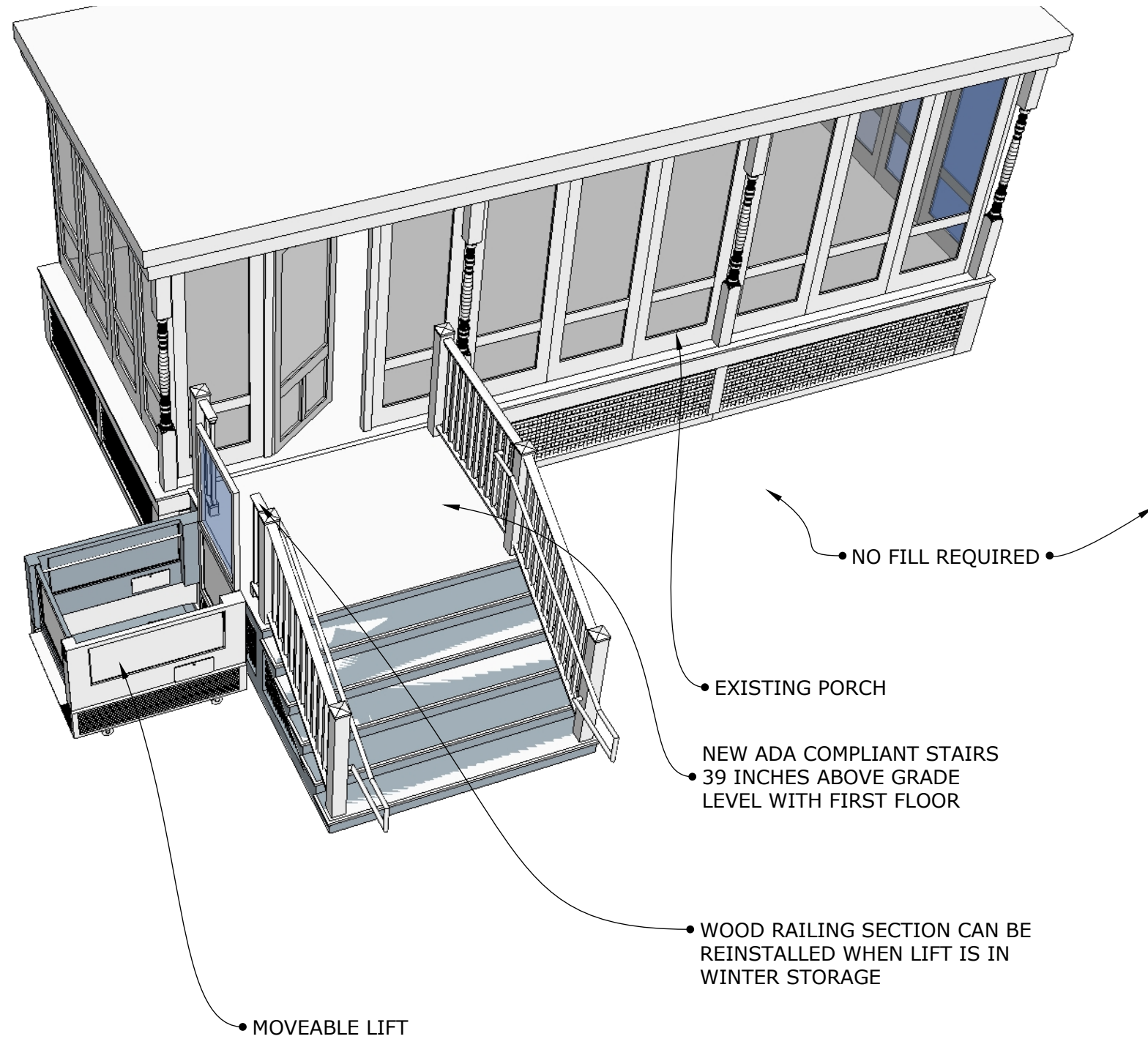
The value study team examined the following treatment alternatives for the treatment project and applied them to Choosing by Advantages (CBA) process.

#	Alternative (Brainstormed)	Disposition of Alternative
A	Provide mechanical platform lift, external to the porch construction. Lift will enter/exit from the new ABA compliant landing and stairs on Northwest corner of porch.	Refer To CBA Analysis
B	Ramp and Sloped Walk: The 1:20 walk will be constructed at an angle aligning with historic bluestone walk, leading to a 1:12 external ramp to the existing porch. The ramp will require one angled turn, two landings, and railings at the stair.	Refer To CBA Analysis
C	Ramp and Stair at North: The 1:12 ramp will be constructed external to the existing porch. The ramp will require two switchbacks with landings and handrails. Stairs will be on the North.	Refer To CBA Analysis
D	Ramp and Stair at South: The 1:12 ramp will be constructed external to the existing porch. The ramp will require two switchbacks with landings and handrails. Stairs will be on the South.	Refer to CBA Analysis
E	Interior Ramp and Exterior Sloped Walk: The 1:20 section of ramp will be constructed external to the existing porch, another 1:12 ramp will be constructed internal to the porch. The ramp will require two switchbacks with landings, and the internal ramp and external stair will require handrails.	Refer to CBA Analysis

SUMMARY OF VALUE ANALYSIS ALTERNATIVES

Alternative 1 – Lift:

- *Treatment Approach: Provide mechanical platform lift, external to the porch construction. Lift will enter/exit from new ABA compliant landing and stairs on Northwest corner of porch.*
- This option is predicated on retaining the existing porch structure and materials to the greatest extent possible.
- New stair with compliant landing will be constructed at Northwest corner of porch.
- Porch framing will need to be supplemented by adding sistered joists to reduce cross slope to less than 2%. Remove, reinstall, and selectively replace porch floor boards.
- West edge of porch elevation will be raised by approximately 1”.
- Trim porch columns and screens by approximately 1” to accommodate porch floor slope adjustment.
- No other structural alterations to porch framing required.
- Minimal changes to grade necessary to ensure slopes at grade landing and surrounding paved areas meet ABA requirements. Less than 2” anticipated.
- Lift will have the capability to be moved/stored in a sheltered location during the off-season, if desired.



Zane Grey House

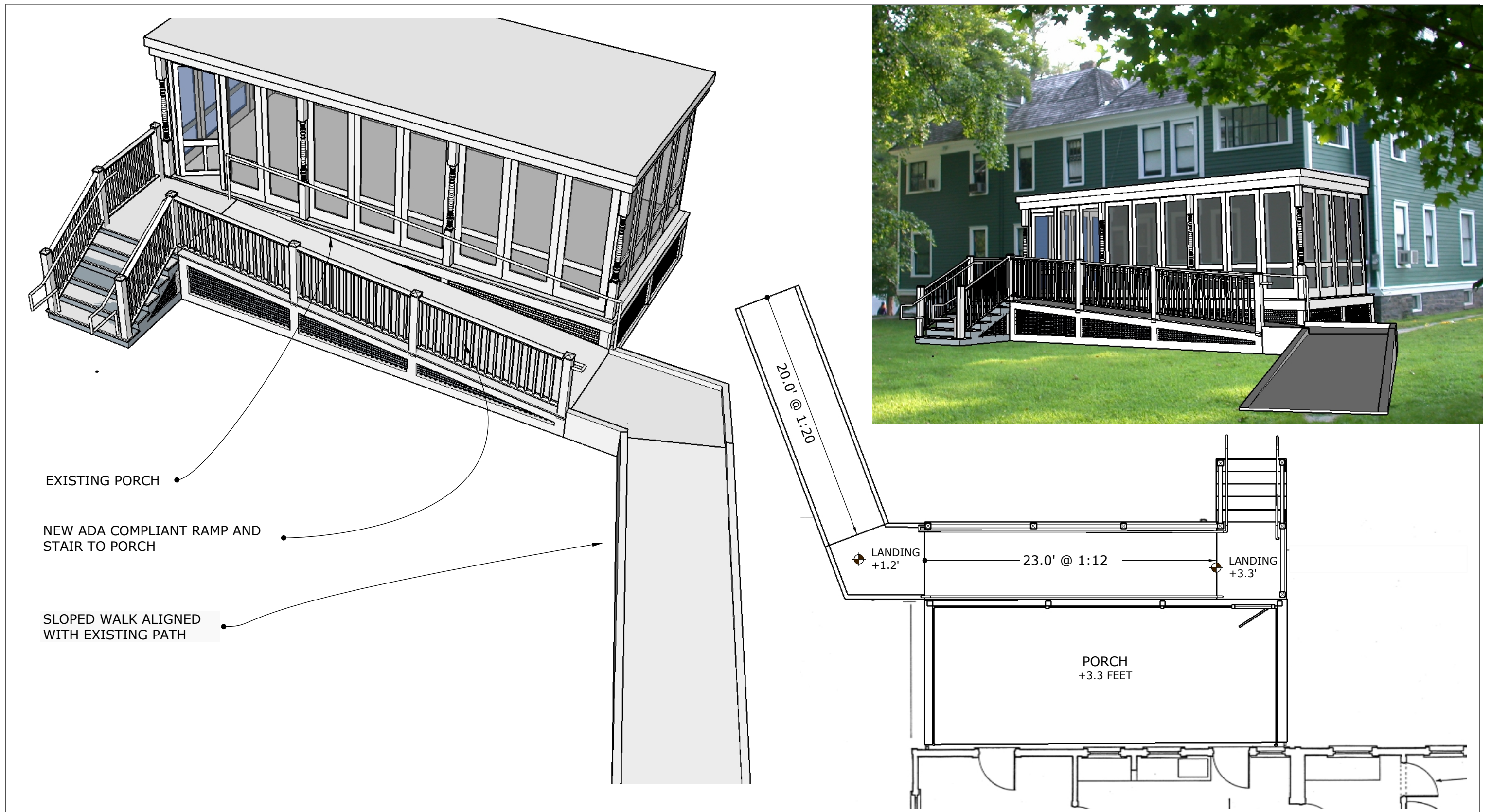
Upper Delaware Scenic and
Recreational River

Accessibility Study Alternative 1 - Lift

Value Analysis Exercise
January 21, 2022

Alternative 2 – Ramp and Sloped Walk:

- *Treatment Approach: The 1:20 walk will be constructed at an angle aligning with historic bluestone walk, leading to a 1:12 external ramp to the existing porch. The ramp will require one angled turn, two landings, and railings at the stair.*
- This option is predicated on retaining the existing porch structure and materials to the greatest extent possible.
- Stair and landing to enter the porch will be on Northwest corner of porch.
- Porch door location will remain on North side but will need to be widened to 36" min. Door leaf will be removed or be made removable based on Park needs.
- Minor grading change at end of sloped walk, tapering to existing grade near porch. Minimal grading near house required to ensure positive drainage away from the house.
- Porch framing will need to be supplemented by adding sistered joists to reduce cross slope to less than 2%. Remove, reinstall, and selectively replace porch floor boards.
- West edge of porch elevation will be raised by approximately 1".
- Trim porch columns and screens by approximately 1" to accommodate porch floor slope adjustment.
- New 4' deep footings for ramp will be required. Alternative for diamond pier system may be considered, although standard footings would be required for the lowermost ramp run and landing.
- 1:20 walk to be constructed of bluestone, no handrails required for this section.
- 24" of maneuvering clearance needed on latch side of screen door.



Zane Grey House

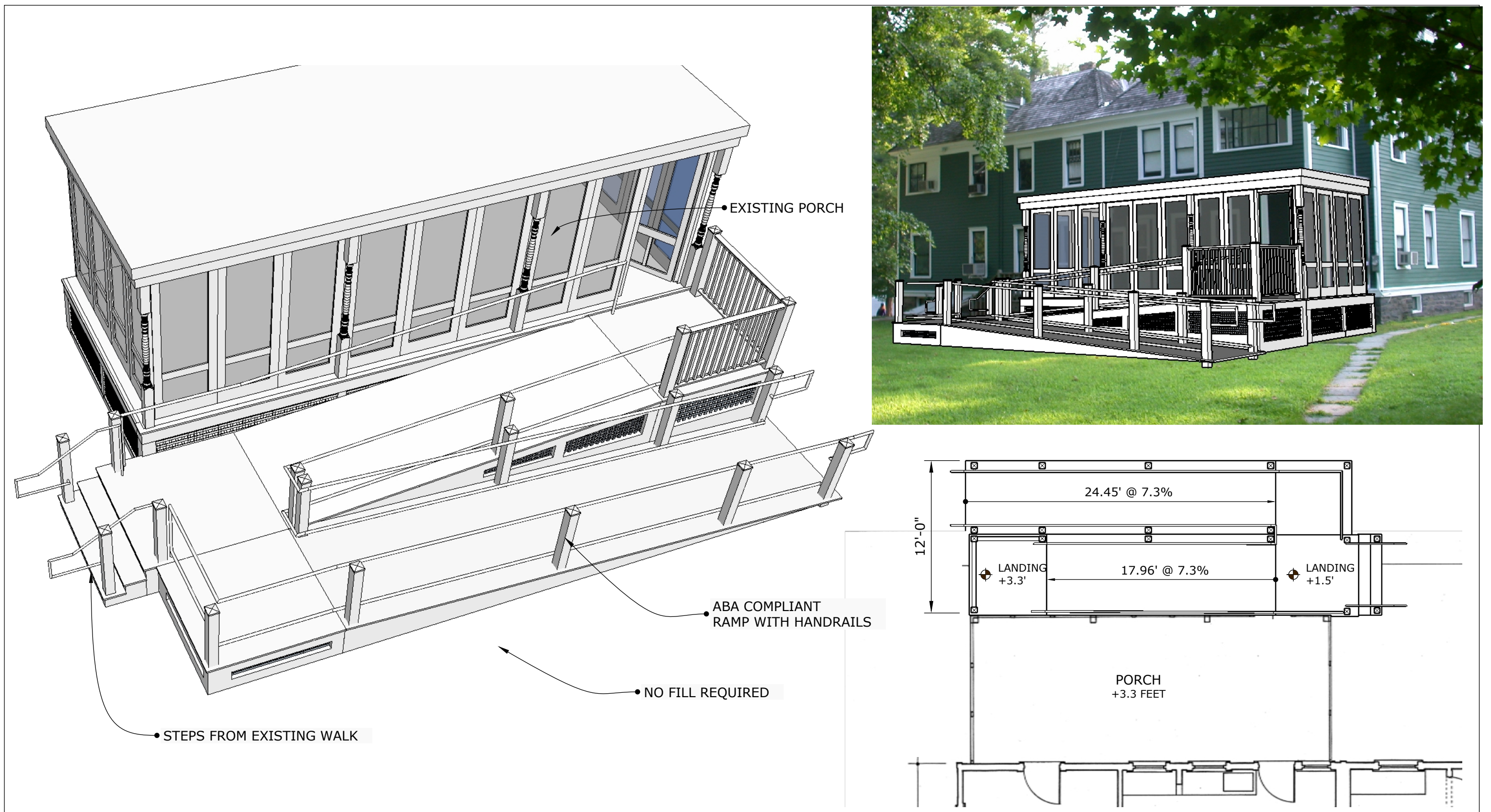
Upper Delaware Scenic and
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Accessibility Study Alternative 2 - Ramp and Sloped Walk

Value Analysis Exercise
January 21, 2022

Alternative 3 – Ramp and Stair at North:

- *Treatment Approach: The 1:12 ramp will be constructed external to the existing porch. The ramp will require two switchbacks with landings and handrails. Stairs will be on the North.*
- This option is predicated on retaining the existing porch structure and materials to the greatest extent possible.
- Stair and landing to enter the porch will be on the North of the ramp.
- Relocate existing porch door from North to South side with 36" min. width. Door leaf will be removed or be made removable based on Park needs.
- Minimal grading to ensure positive drainage away from house.
- Porch framing will need to be supplemented by adding sistered joists to reduce cross slope to less than 2%. Remove, reinstall, and selectively replace porch floor boards.
- West edge of porch elevation will be raised by approximately 1".
- Trim porch columns and screens by approximately 1" to accommodate porch floor slope adjustment.
- New 4' deep footings for ramp will be required. Alternative for diamond pier system may be considered.
- 24" of maneuvering clearance needed on latch side of screen door.



Zane Grey House

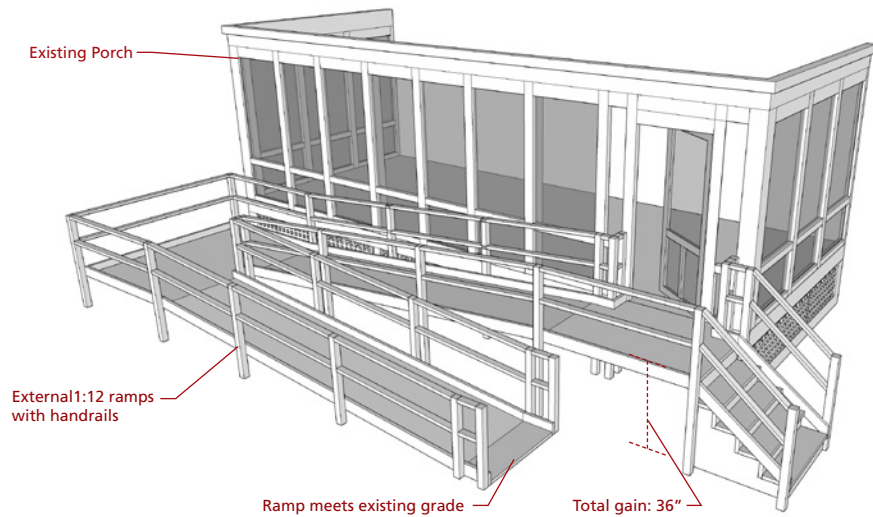
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Accessibility Study Alternative 3 - Ramp and Stairs at North

Value Analysis Exercise
January 21, 2022

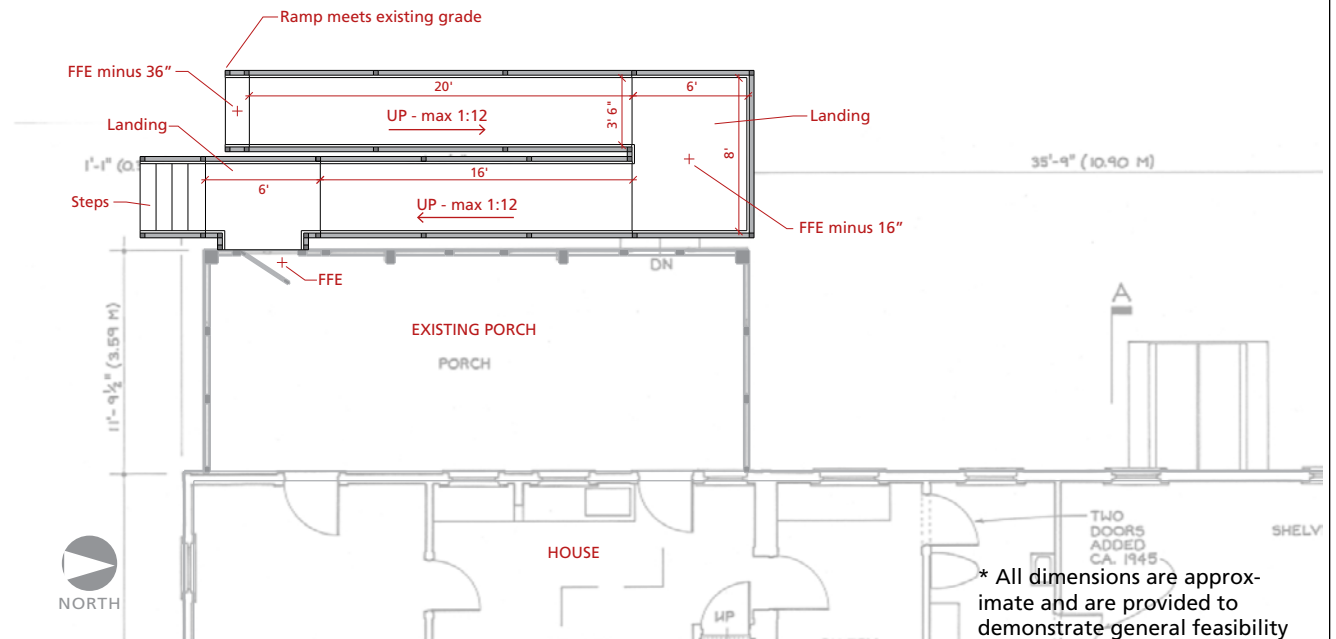
Alternative 4 – Ramp and Stair at South:

- *Treatment Approach: The 1:12 ramp will be constructed external to the existing porch. The ramp will require two switchbacks with landings and handrails. Stairs will be on the South.*
- This option is predicated on retaining the existing porch structure and materials to the greatest extent possible.
- Stair and landing to enter the porch will be on the South of the ramp.
- Relocate existing porch door from North to South side with 36" min. width. Door leaf will be removed or be made removable based on Park needs.
- Minimal grading to ensure positive drainage away from house.
- Porch framing will need to be supplemented by adding sistered joists to reduce cross slope to less than 2%. Remove, reinstall, and selectively replace porch floor boards.
- West edge of porch elevation will be raised by approximately 1".
- Trim porch columns and screens by approximately 1" to accommodate porch floor slope adjustment.
- New 4' deep footings for ramp will be required. Alternative for diamond pier system may be considered.
- Balusters and edge protection will be needed where height of ramp is greater than 30" above grade (not shown on rendering).
- 24" of maneuvering clearance needed on latch side of screen door.



Accessibility Ramp Option A

- Ramp constructed external to the existing porch
- 1:12 ramp requires two switchbacks with landings and handrails
- Alterations to porch include moving door to the south side
- No alterations to grade needed

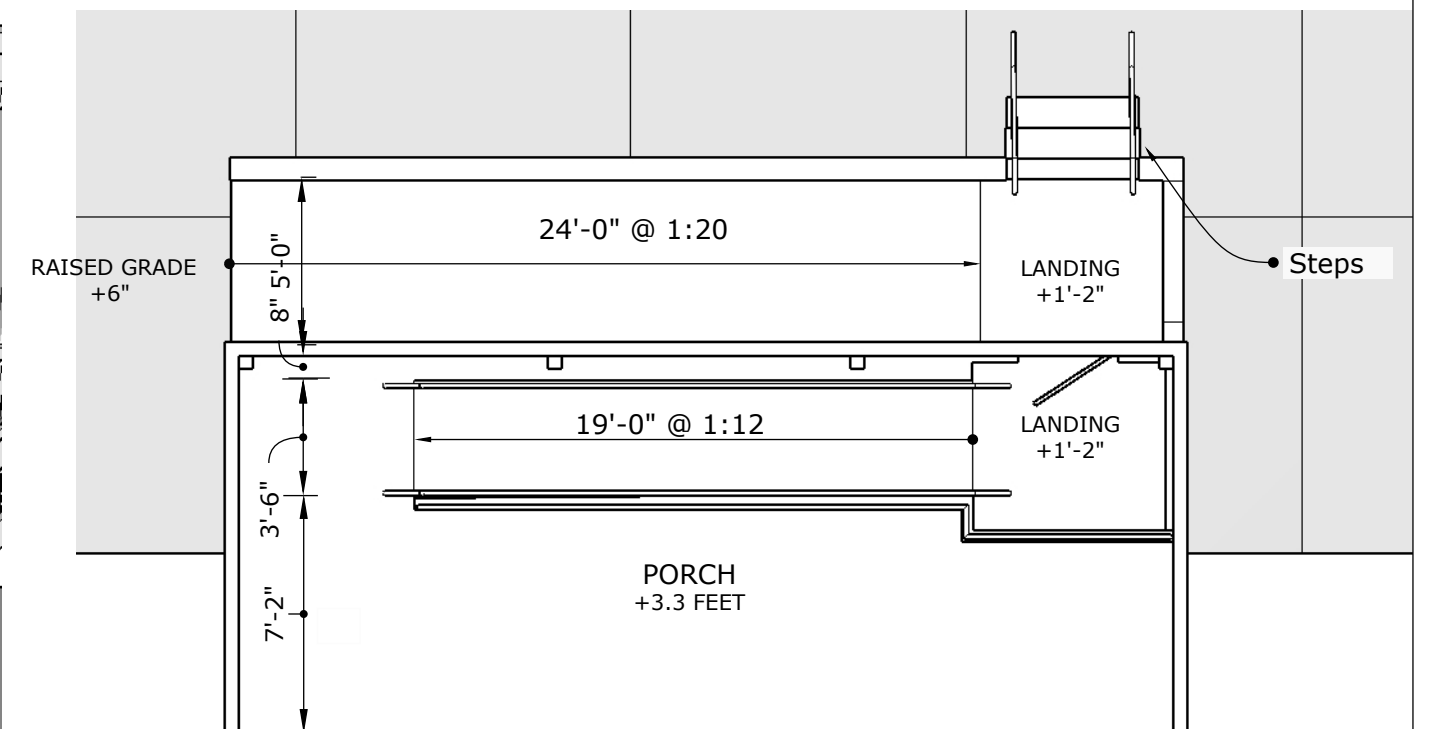
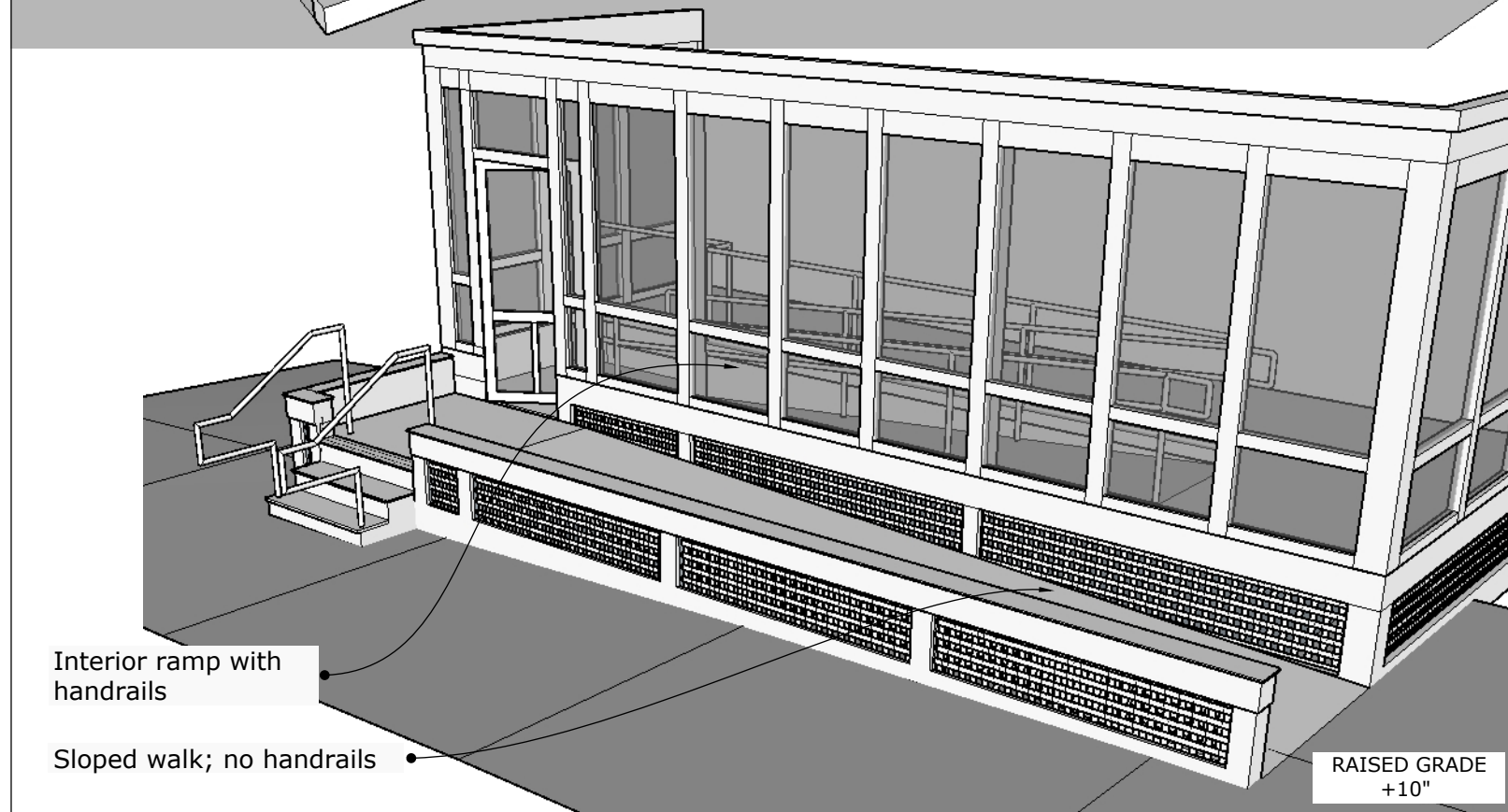
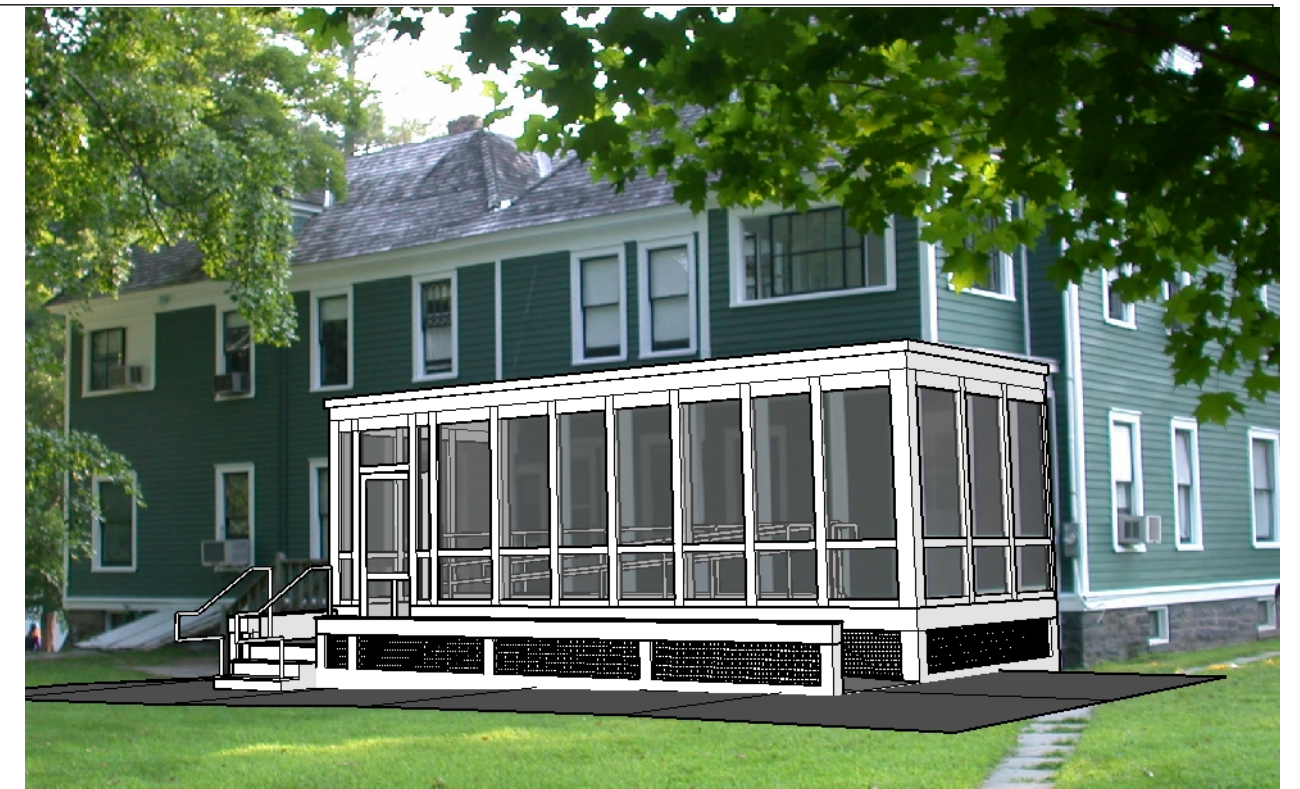
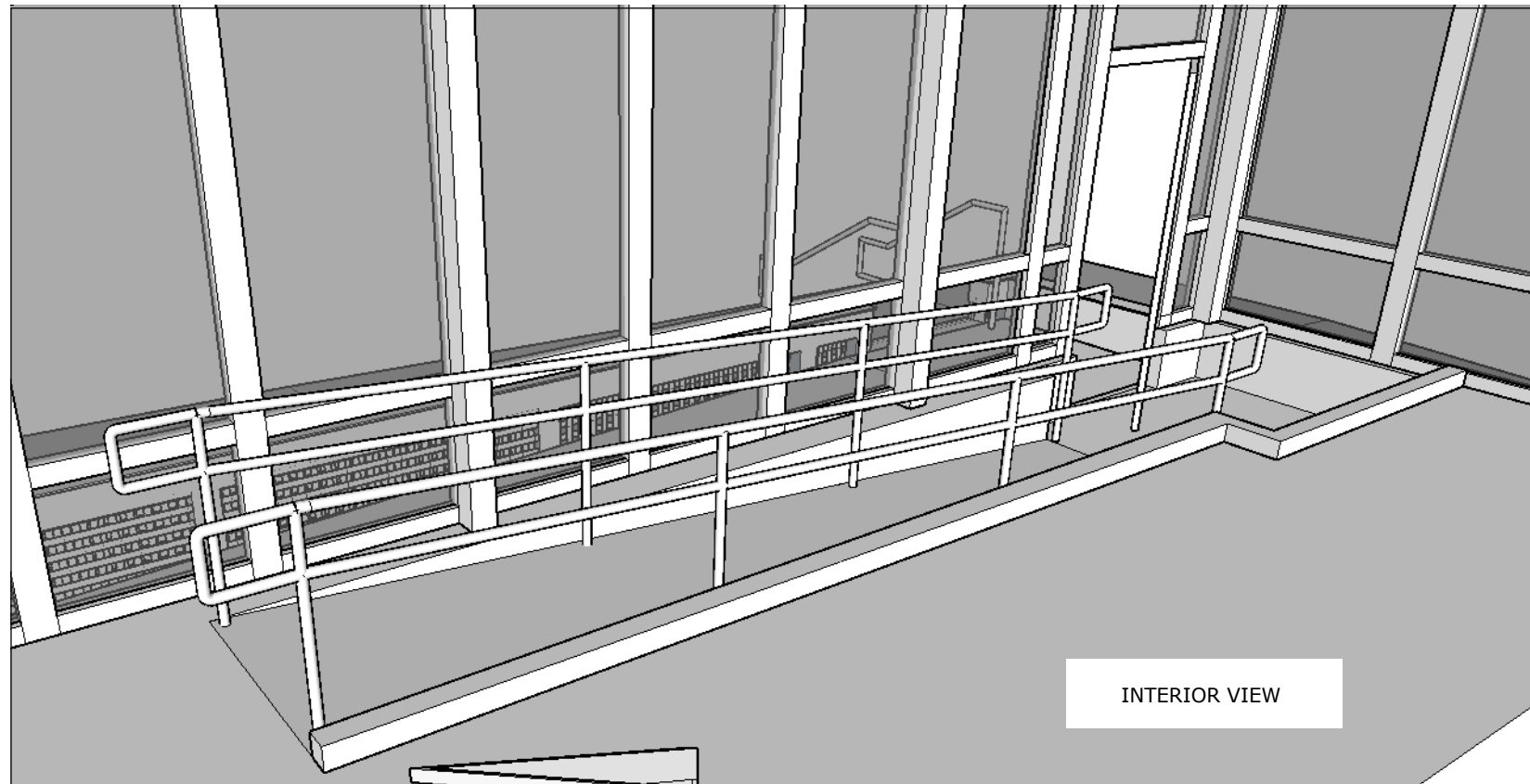


Zane Grey House
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Accessibility Ramp Concept
Alternative 4 - Ramp and Stairs at South

Alternative 5 – Interior Ramp and Exterior Sloped Walk

- *Treatment Approach: The 1:20 section of ramp will be constructed external to the existing porch, another 1:12 ramp will be constructed internal to the porch. The ramp will require two switchbacks with landings, and the internal ramp and external stair will require handrails.*
- Stair and landing to enter the porch will be on Northwest corner of porch.
- Porch door location will remain on North side but will need to be widened to 36" min. Door leaf will be removed or be made removable based on Park needs.
- Fill will be added to raise grade approximately 8 inches to meet foot of walk. Grade will extend to foundation to divert runoff, and grading will be controlled under the porch to ensure drainage away from structure and into yard. Basement window below porch will be welled. Alternative, lower walk could be extended by approximately 5', requiring approximately 4" of fill.
- Porch framing will need to be supplemented by adding sistered joists to reduce cross slope to less than 2%. Remove, reinstall, and selectively replace porch floor boards.
- West edge of porch elevation will be raised by approximately 1".
- Trim porch columns and screens by approximately 1" to accommodate porch floor slope adjustment.
- Structural alterations to existing porch will be required to accommodate internal ramp. Cutting of floor joists and beam, with the installation of new joists, beams, and footings anticipated.
- New 4' deep footings for ramps will be required. Alternative for diamond pier system may be considered.
- 24" of maneuvering clearance needed on latch side of screen door.
- Consider adding guardrail for open landing on interior of porch which is 14" elevation change. Per IBC 1015.2, guard rail not required at open landing less than 30" to floor below.



Zane Grey House

Upper Delaware Scenic and
Recreational River

Accessibility Study

Alternative 5 - Interior Ramp and Sloped Walk

Value Analysis Exercise
January 21, 2022

PHASE III - EVALUATION (Part 2 - Choosing by Advantages)

The alternatives were evaluated using a process called Choosing by Advantages, where decisions are based on the importance of advantages between alternatives. The evaluation involves the identification of the attributes or characteristics of each alternative relative to the evaluation criteria, a determination of the advantages for each alternative within each evaluation factor, and then the weighing of importance of each advantage.

The highest importance advantage is identified in each factor. The paramount advantage, across factors, was determined and assigned a weight of 100. Remaining advantages were rated on the same scale. Construction costs were developed for each alternative. Recommendations are based on a balance of cost and importance. The advantage with the highest importance within a factor is indicated by a highlight around the advantage cell. The advantages are all rated on a common scale.

COMPONENT:		FUNCTION:									
FACTOR	ALTERNATIVES										
	Alternative 1 Lift		Alternative 2 Ramp and Sloped Walk		Alternative 3 Ramp and Stair at North		Alternative 4 Ramp and Stair at South		Alternative 5 Interior Ramp and Exterior Sloped Walk		
PROTECT CULTURAL AND NATURAL RESOURCES											
FACTOR 1 - Prevent Loss of Resources											
F 1A – Minimize historic building fabric alterations											
Attributes	Add sistered joists to historic framing to reduce cross slope of porch. Trim porch columns and screens. Remove, reinstall, and replace porch floorboards. (Same for all Alternatives)		Add sistered joists to historic framing to reduce cross slope of porch. Trim porch columns and screens. Remove, reinstall, and replace porch floorboards. (Same for all Alternatives)		Add sistered joists to historic framing to reduce cross slope of porch. Trim porch columns and screens. Remove, reinstall, and replace porch floorboards. (Same for all Alternatives)		Add sistered joists to historic framing to reduce cross slope of porch. Trim porch columns and screens. Remove, reinstall, and replace porch floorboards. (Same for all Alternatives)		- Add sistered joists to historic framing to reduce cross slope of porch. Trim porch columns and screens. Remove, reinstall, and replace porch floorboards. (Same for all Alternatives) - Cutting and removal of historic porch framing to accommodate internal ramp required, impact will be roughly ½ porch footprint.		
Advantages	A	70	A	70	A	70	A	70	E	0	
F1B – Reversibility											
Attributes	- Sistering of joists to accommodate cross slope. - Cut porch columns by 1-2”. - Floor boards removed and reinstalled or replaced where deteriorated. - Addition of new landing and stair to exterior. - Increase of paved area surrounding porch to accommodate circulation – 350 SF (existing) to 790 SF including ramp area.		- Sistering of joists to accommodate cross slope. - Cut porch columns by 1-2”. - Floor boards removed and reinstalled or replaced where deteriorated. - Addition of new ramp and sloped walk to exterior. - Addition of fill soil to meet ABA grade requirements. - Increase of paved area surrounding porch to accommodate circulation – 350 SF (existing) to 1170 SF including ramp area.		- Sistering of joists to accommodate cross slope. - Cut and porch columns by 1-2”. - Floor boards removed and reinstalled or replaced where deteriorated. - Addition of two-part ramp to exterior. - Increase of paved area surrounding porch to accommodate circulation – 350 SF (existing) to 960 SF including ramp area.		- Sistering of joists to accommodate cross slope. - Cut and porch columns by 1-2”. - Floor boards removed and reinstalled or replaced where deteriorated. - Addition of two-part ramp to exterior. - Increase of paved area surrounding porch to accommodate circulation – 350 SF (existing) to 960 SF including ramp area.		- Sistering of joists to accommodate cross slope. - Cut and porch columns by 1-2”. - Floor boards removed and reinstalled or replaced where deteriorated. - Removal/cutting of historic porch beams and joists to accommodate interior ramp. - Addition sloped walk to exterior. - Addition of fill soil to meet ABA grade requirements. - Increase of paved area surrounding porch to accommodate circulation – 350 SF (existing) to 800 SF including ramp area.		
Advantages	A	60	D	0	C	15	C	15	E	10	

COMPONENT:			FUNCTION:							
FACTOR	ALTERNATIVES									
	Alternative 1 Lift		Alternative 2 Ramp and Sloped Walk		Alternative 3 Ramp and Stair at North		Alternative 4 Ramp and Stair at South		Alternative 5 Interior Ramp and Exterior Sloped Walk	
F1C – Minimize adverse impact on archeological resources										
Attributes	- Two (2) 48’’ deep concrete footings at stair landing. - Increase of paved area – 350 SF (existing) to 790 SF including ramp area. Additional hardscape or structure may prevent future archeological exploration. - Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill.		- Five (5) 48’’ deep concrete footings at stair landing and ramp. 48’’ deep strip footing (20’ long, both sides) at sloped walk. - Increase of paved area – 350 SF (existing) to 1170 SF including ramp area. Additional hardscape or structure may prevent future archeological exploration - Minimal grading near structure to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of 3’’-4’’ of fill soil at end of sloped walk.		- Eleven (11) 48’’ deep concrete footings at stair landing and ramp. - Increase of paved area – 350 SF (existing) to 960 SF including ramp area. Additional hardscape or structure may prevent future archeological exploration - Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill.		- Eleven (11) 48’’ deep concrete footings at stair landing and ramp. - Increase of paved area – 350 SF (existing) to 960 SF including ramp area. Additional hardscape or structure may prevent future archeological exploration - Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill.		- Eleven (11) 48’’ deep concrete footings at stair landing and ramp. - Increase of paved area – 350 SF (existing) to 800 SF including ramp area. Additional hardscape or structure may prevent future archeological exploration 8’’ of fill added south end of porch. Grading will extend to foundation to divert runoff.	
Advantages	A	50	E	0	C	20	C	20	B	35
F1D – Minimize adverse impact on cultural landscapes										
Attributes	- Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill. - Installation of concrete pad under lift. - Bluestone pavers surrounding porch will be removed and reused (or replaced in-kind). Bluestone may be damaged during construction.		- Minimal grading near structure to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of 3’’-4’’ of fill soil at end of sloped walk. - Bluestone pavers surrounding porch will be removed and reused (or replaced in-kind). Bluestone may be damaged during construction.		- Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill. - Bluestone pavers surrounding porch will be removed and reused (or replaced in-kind). Bluestone may be damaged during construction.		- Minimal grading to ensure positive drainage away from the house and accessibility at ramp and stair landings. Addition of minimal fill. - Bluestone pavers surrounding porch will be removed and reused (or replaced in-kind). Bluestone may be damaged during construction.		8’’ of fill added south end of porch. Grading will extend to foundation to divert runoff. - Addition of window well around basement window in area with new fill. - Bluestone pavers surrounding porch will be removed and reused (or replaced in-kind). Bluestone may be damaged during construction.	
Advantages	A	100	E	0	D	40	D	40	B	95
FACTOR 2 - Maintain and Improve Condition of Resources										
F2A – Ease of access to the accessible means										

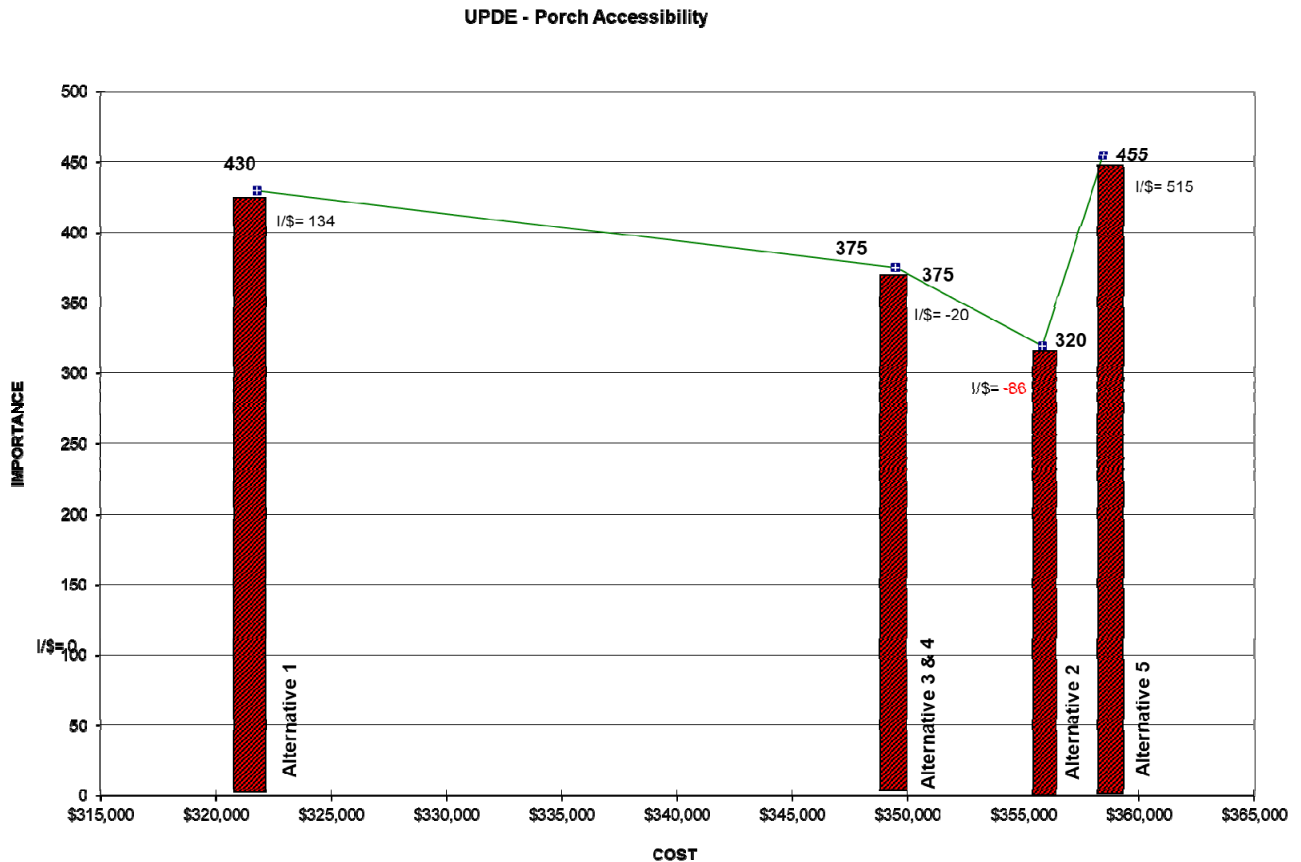
COMPONENT:			FUNCTION:							
FACTOR	ALTERNATIVES									
	Alternative 1 Lift		Alternative 2 Ramp and Sloped Walk		Alternative 3 Ramp and Stair at North		Alternative 4 Ramp and Stair at South		Alternative 5 Interior Ramp and Exterior Sloped Walk	
Attributes	May require assistance to operate lift.		1:20 slope and 1:12 slope		1:12 slope and 1:12 slope		1:12 slope and 1:12 slope		1:20 slope and 1:12 slope	
Advantages	E	0	A	80	B	60	B	60	A	80
F2B – Minimize impact on the ability to conduct building preservation tasks										
Attributes	No obstruction.		Ramp partially obstructs access to porch lattice.		Ramp partially obstructs access to porch lattice.		Ramp partially obstructs access to porch lattice.		- Sloped walk partially obstructs access to porch lattice. - Increase of fill below porch will reduce access for preservation tasks.	
Advantages	A	35	E	0	E	0	E	0	E	0
PROVIDE FOR VISITOR ENJOYMENT										
FACTOR 3 - Provide Visitor Services and Educational and Recreational Opportunities										
F3A – Minimize Visual Intrusion										
Attributes	- New compliant stairs and landing with railing. - Moveable lift.		- New sloped walk extends beyond edge of porch at angle. - Railing with balusters required.		- Open railings at ramp except at top landing with balusters. - Porch door location moved to South.		- Open railings at ramp except at top landing with balusters. - Porch door location moved to South.		- Interior of porch modified to include internal ramp with open railings. - Exterior walk wall mimics porch lattice. - Porch door lowered.	
Advantages	A	75	E	0	E	0	E	0	B	60
F3B – Enhance Interpretive Opportunity										
Attributes	Preserves entirety of porch footprint to accommodate visitors for interpretive orientation.		Preserves entirety of porch footprint to accommodate visitors for interpretive orientation.		Preserves entirety of porch footprint to accommodate visitors for interpretive orientation.		Preserves entirety of porch footprint to accommodate visitors for interpretive orientation.		Reduces porch footprint to accommodate visitors for interpretive orientation.	
Advantages	A	40	A	40	A	40	A	40	E	0
FACTOR 4 - Protect Public Health, Safety and Welfare										
Attributes	N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)	
Advantages										
IMPROVE EFFICIENCY OF PARK OPERATIONS										
FACTOR 5 - Improve Operational Efficiency and Sustainability										
F5A – Minimize Maintenance Demands										

COMPONENT:			FUNCTION:							
FACTOR	ALTERNATIVES									
	Alternative 1 Lift		Alternative 2 Ramp and Sloped Walk		Alternative 3 Ramp and Stair at North		Alternative 4 Ramp and Stair at South		Alternative 5 Interior Ramp and Exterior Sloped Walk	
Attributes	- Snow removal (150 SF) - New wood surfaces to paint and maintain (120 SF) - Routine maintenance on lift.		- Snow removal (275 SF) - New wood surfaces to paint and maintain (200 SF)		- Snow removal (320 SF) - New wood surfaces to paint and maintain (120 SF)		- Snow removal (320 SF) - New wood surfaces to paint and maintain (160 SF)		- Snow removal. (160 SF) - New wood surfaces to paint and maintain (60 SF)	
Advantages	E	0	C	45	C	45	C	45	A	90
F5B – Minimize Staff Operational Demands										
Attributes	- May require staff assistance to utilize lift. - Requires staff to enable lift (power on, remove cover).		No operational demands.		No operational demands.		No operational demands.		No operational demands.	
Advantages	E	0	A	85	A	85	A	85	A	85
FACTOR 6 – Protect Employee Health, Safety, and Welfare										
Attributes	N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)	
Advantages										
PROVIDE COST-EFFECTIVE, ENVIRONMENTALLY RESPONSIBLE, AND OTHERWISE BENEFICIAL DEVELOPMENT FOR THE NPS										
FACTOR 7 - Provide Other Advantages to the National Park System.										
Attributes	N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)		N/A (Equal Advantage)	
Advantages										
TOTAL IMPORTANCES OF ADVANTAGES	430		320		375		375		455	
Initial Cost (Net)	\$321,792		\$355,819		\$349,458		\$349,458		\$358,439	
Re-design Cost										
Compliance										
Life Cycle Cost (Net)										
TOTAL										
Version 12/11/98										

ANALYSIS

The study team evaluated the benefit or importance of advantage to be realized from the Alternatives 1, 2, 3, 4, & 5. Alternative 5 provides the greatest advantage to the NPS based on importance.

Initial construction cost estimates for the alternatives were developed. Results were graphed with importance or benefit on the vertical scale and construction cost on the horizontal scale. The respective importance:cost ratios are indicated by the bolded numbers near the top of each red bar. Although Alternative 5 carries the highest cost, the chart shows that the expenditure is justified due to the net positive slope (green line) when compared to any of the other calculated importance:cost ratios.



Findings and Recommendations

The existing back porch at the Zane Grey House is original to the structural (circa 1906) and will be made physically accessible (ABA compliant). Alternative 5 reflects the preferred treatment which would construct a ramp with two switchbacks. The 1:20 section of ramp will be constructed external to the existing porch, another 1:12 ramp will be constructed internal to the porch and result in removal of historic fabric from the porch to accommodate this portion of the ramp.

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