



# Final Bridge Design Charette 2

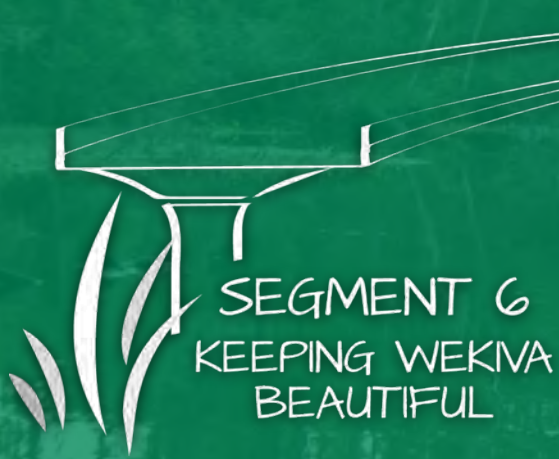
with the National Park Service and FDOT

## Wekiva River Bridges

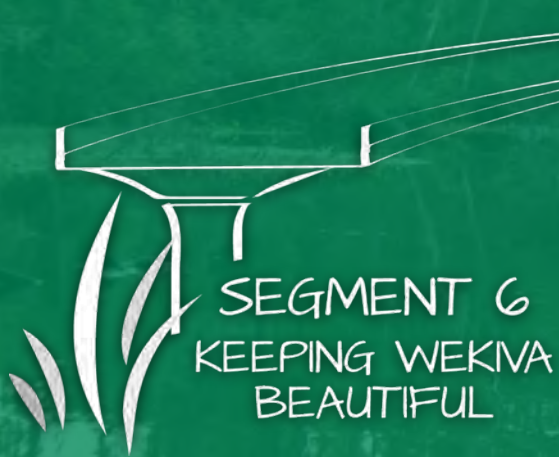
*in Harmony with the Scenic River*

January 28, 2014





**Coordination of Today's Activities**  
**Kevin Moss, P.E.**  
**Project Manager**  
**Florida Department of Transportation**



# Welcome and Introductions

Alan Hyman, P.E.  
District Five, Director of Operations  
Florida Department of Transportation

# Welcome & Introductions

## **Lead Agency**

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### Design Team



Project Management,  
Roadway Design, Stormwater Design



Wekiva River Bridge Design



Environmental

ETP

Noise Analysis



Roadway Design, Stormwater Design



Geotechnical

# Welcome & Introductions



## **FDOT - District 5**

Alan Hyman, P.E.  
Director of Transportation Operations

Kevin Moss, P.E.  
Project Manager

Hannah Hernandez  
Permit Coordinator



## **National Park Service**

Jeff Duncan, PhD  
Southeastern River's Program Manager  
River's, Trails and Conservation Assistance

Jaime Doubek-Racine  
Regional Program Manager  
River's, Trails and Conservation Assistance



## **US Army Corps of Engineers**

Andrew Phillips  
Project Manager

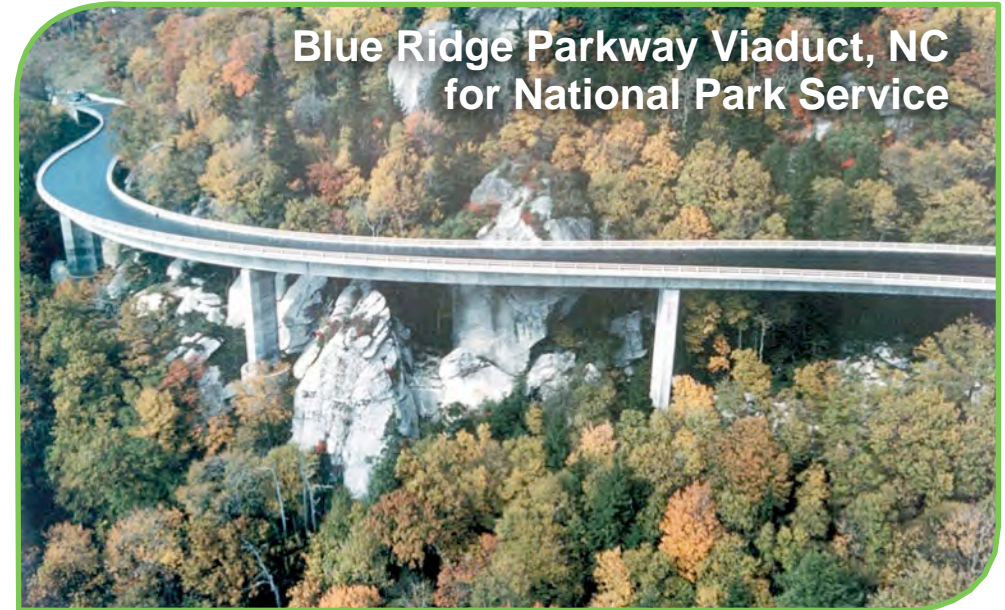
# Your Bridge Design Team

## **Linda Figg**

President / Director Of Bridge Art

## **Dwight Dempsey, P.E., S.E.**

Bridge Design Manager





SEGMENT 6  
KEEPING WEKIVA  
BEAUTIFUL

# Overview

# Design Charette 2 Agenda

**Process Goals and Objectives**

**Project Overview**

**Discussion of Bridge Aesthetics  
and Preferences from Final  
Bridge Design Charette 1**

**Bridge Pier Shape**

**Bridge Color**

**Bridge Railing for Multi-Use Trail**

**Discussion of Next Steps**

**Adjourn**



## Final Bridge Design Charette 2

SR 429/SR 46 Wekiva Parkway

### Wekiva River Bridges

January 28, 2014

Financial Project ID: 238275-7-32-02  
Lake and Seminole Counties



Prepared for: Florida Department of Transportation, District Five  
Prepared by: Figg Bridge Engineers, Inc.







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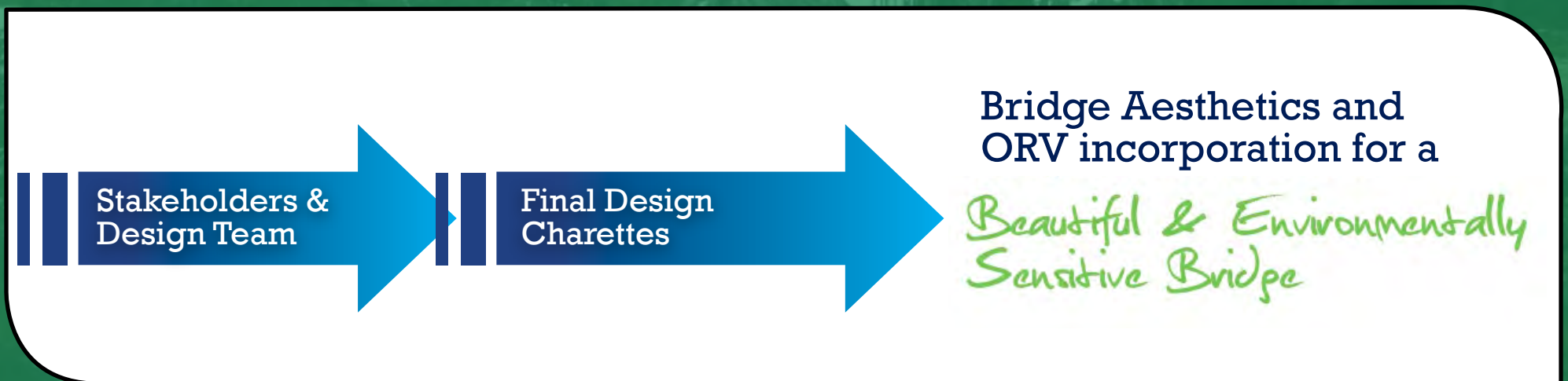
# Charette Process Goals and Objectives

# Public Involvement Process Goals & Objectives

## GOALS

**Gain input from the stakeholders through open communications throughout design.**

**Through the Design Charettes, participants come together to select key aesthetic features and incorporate Outstandingly Remarkable Values (ORV's) for the new bridge.**



# Final Bridge Design Charette Process Goals & Objectives

## OBJECTIVES

**Develop a solution that recognizes and protects the Outstandingly Remarkable Values (ORV's) of the Wekiva River**

**Achieve a design that allows for streamlined Section 7(a) approval**

**Create a bridge that is beautiful, functional and complements the landscape with context sensitive design while minimizing contrast**



# Final Bridge Design Charettes

## Bridge Design Charette 1 December 11, 2013

Select a Theme

Discuss overall bridge layout  
& configuration

### Select direction for:

Shapes

Textures and Colors

Other Features

ORV's

## Bridge Design Charette 2 January 28, 2014

Based on previous Design  
Charette preferences multiple  
design options are developed  
for selection

### Final Selection of:

Shapes/Textures

Colors

Railing

ORV's

Bridge Aesthetics and  
ORV incorporation for a

*Beautiful & Environmentally  
Sensitive Bridge*

Stakeholders &  
Design Team

Final Design  
Charettes

# Commitments as stated in FONSI, May 2012

**FDOT has made the following commitments to the National Park Service (NPS):**

**To clear span the waters of the Wekiva River with the proposed Wekiva River bridges**

**To coordinate with the Wekiva River System Advisory Management Committee on final design**

**To obtain the Wild and Scenic River's Act Section 7(a) determination from NPS prior to approving the final design**

Federal Highway Administration  
Florida Division

**ADMINISTRATIVE ACTION  
FINDING OF NO SIGNIFICANT IMPACT**

U.S. Department of Transportation Federal Highway Administration and  
Florida Department of Transportation, District Five  
In cooperation with the Orlando-Orange County Expressway Authority  
Financial Management Number(s): 238275 1 22 01 and 240200 1 22 01  
Federal Aid Project Number(s): TCSP 025 U and TCSP 024 U

Wekiva Parkway (SR 429)/SR 46 Realignment  
Orange, Lake, and Seminole Counties, Florida

Wekiva Parkway (SR 429)  
From US 441 (SR 500)/John Land Apopka Expressway (SR 429/SR 414) Interchange, Orange County  
to SR 417/1-4 (SR 400) Interchange, Seminole County

SR 46 Realignment  
From US 441 (SR 500)/SR 46 Interchange, Lake County  
to Wekiva Parkway (SR 429), Orange County

The proposed action is: construction of the Wekiva Parkway, a new four-lane/six-lane divided limited access tolled expressway to complete the Western Beltway (SR 429) around the metropolitan Orlando area from Apopka in Orange County to Sanford in Seminole County; realignment of CR 46A in Lake County as part of the Wekiva Parkway project; reconstruction of the existing SR 46 facility in Lake County and Mount Dora to provide six-lane divided controlled-access from US 441 to east of Round Lake Road; and the realignment of SR 46 as a limited access tolled expressway from east of Round Lake Road to a new systems interchange with Wekiva Parkway near the Orange/Lake County line.

Submitted pursuant to 42 U.S.C. 4332 (2)(c).

5/11/12  
Date

*for Freddy Currell*  
Division Administrator  
Federal Highway Administration

The Federal Highway Administration (FHWA) has determined that this project will not have any significant impact on the environment. This Finding of No Significant Impact is based on the attached Environmental Assessment which has been independently evaluated by the FHWA and determined to adequately and accurately discuss the environmental issues and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. The FHWA takes full responsibility for the accuracy, scope, and content of the attached Environmental Assessment.

# A Sustainable Bridge That Achieves NPS Goals For This Scenic River Crossing

- ✓ **Main span length of at least 300' to clear span the Wekiva River**
- ✓ **Design principles to blend the bridge with the environment repeating the landscape's visual element of form, line, color and texture**
- ✓ **Enhance area through greater natural lighting and reduced auditory levels**
- ✓ **Enhance recreational experience for river users**
- ✓ **Optimize connectivity of wildlife corridor under bridge**
- ✓ **Preserve water quality**



# Bridge Design Charette 1 - December 11, 2013

FDOT District 5 Office in Deland, FL from 9a.m to 4. p.m.  
19 Participants plus FDOT and Consultants



# Bridge Design Charette 1 - December 11, 2013

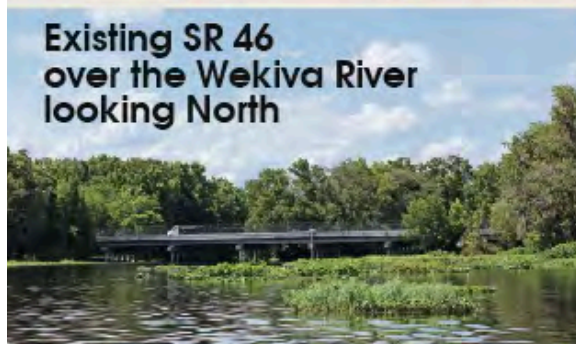
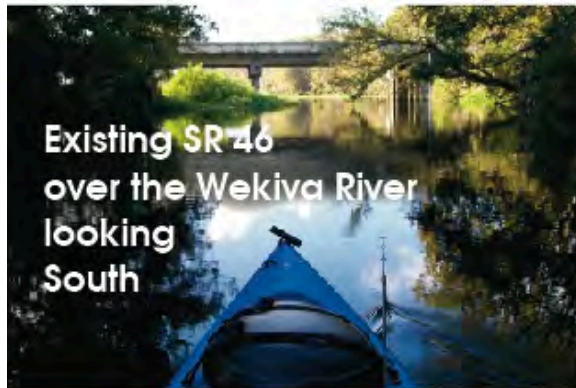
FDOT District 5 Office in Deland, FL at 9a.m - 4. p.m.  
19 Participants plus FDOT and Consultants





## Bridge Design Workshop with the National Park Service and FDOT Wekiva River Bridges

Environmental Park Bridge  
in Harmony with the Scenic River



# Bridge Design Charette 1 Dec. 11, 2013 - Key Discussion Items

New Bridge Viewsheds

How Aesthetically Pleasing Bridges are Created

Bridge Theme Preference Selection

Bridge Style Preferences Selection  
(Shape, Texture, Color)

Discussion on Outstandingly Remarkable Values (ORV)

# Items Identified for Further Study During Charette 1

**Lengthening bridge to remove MSE wall at east end**

**Feasibility of two bridge option versus three bridge option**

**Determine type, size, and location of trees on Wekiva River Island and investigate effects of proposed bridge on light shading**

# Meeting and Charette Schedules

<b>NPS/FDOT Workshop</b>	<b>Jun. 18, 2013</b>
<b>Bridge Design Charette 1</b>	<b>Dec. 11, 2013</b>
<b>Bridge Design Charette 2</b>	<b>Jan. 28, 2014</b>
<b>Public Information Meeting</b>	<b>April 29, 2014 (Tentative)</b>

# Bridge Design Charette 2

## Key Steps/Procedures same as Charette 1

**Follow a set agenda**

**Present Options**

**Encourage open discussion**

**Provide handouts on information presented**

**Record preferences**



# Recording Preferences

**Voting forms to record bridge design preferences are provided on each agenda topic**

## Example

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike			Neutral				Like		

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Like = 10

Neutral = 5


Dislike = 1

# Design Charette Voting Forms

Please completely fill-in only one red box as shown below, and use only the black pens provided on the tables.

**Correct**

Score will be recorded as an 8



A horizontal scale from 1 to 10. Above each number is a red rectangular box. Box 8 is completely filled with black ink. Below the scale is a bar with 'Dislike' on the left, 'Neutral' in the middle, and 'Like' on the right.

**Incorrect**



A horizontal scale from 1 to 10. Above each number is a red rectangular box. Box 3 is partially filled with black ink, and box 5 has a large black 'X' over it. Below the scale is a bar with 'Dislike' on the left, 'Neutral' in the middle, and 'Like' on the right.



# Project Overview- Bridge Site Review and Vistas

# Site Features





# Important Vistas Identified



Hwy 46 Wekiva River Bridge

Arrows placed by workshop participants showing views

Hwy 46 Wekiva River Bridge

46

Wekiva River

# Existing View 3

Looking South from North side of Bridge



# Existing View 4

Looking South from North side of Bridge



# Existing View 8

Looking North from South side of Bridge



# Existing View 10

Looking South from North side of Bridge



# Existing View 12

Looking West along North side of Bridge



# Existing View 14

Looking North from South side of Bridge



# Existing View 17

Looking East along  
North side of Bridge





# Existing View 18

Under Bridge Looking West



# Existing View 19

South Side of Bridge Looking Northwest



# Existing View 20

South Side of Bridge Looking Northeast



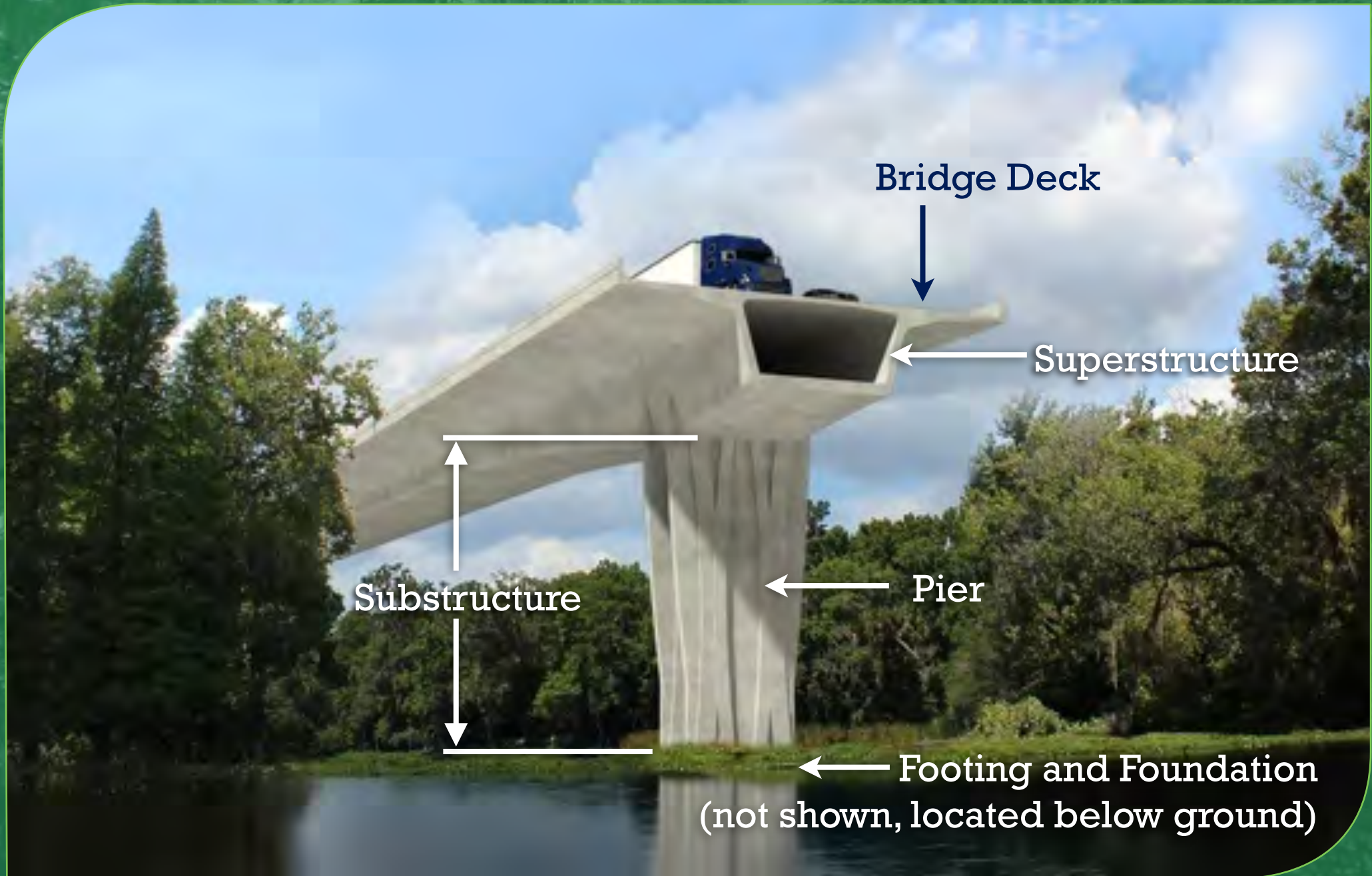


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# Bridge Project Development Criteria and Geometry

# Bridge Terminology

## Schematic Bridge For Illustration Of Terms



Bridge Deck

Superstructure

Pier

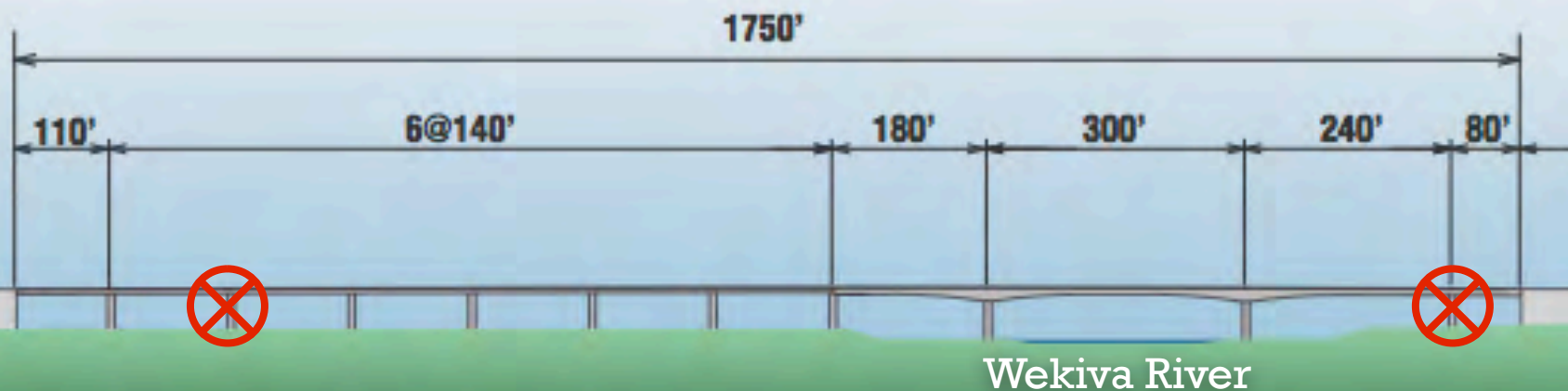
Substructure

Footing and Foundation  
(not shown, located below ground)



# Enhanced Design Preserves Environment

## Preliminary Bridge Layout from PD&E



1 Pier Removed

Main-Span increased from 300' to 360'  
Same minimized structure depth with longer spans

1 Pier Removed

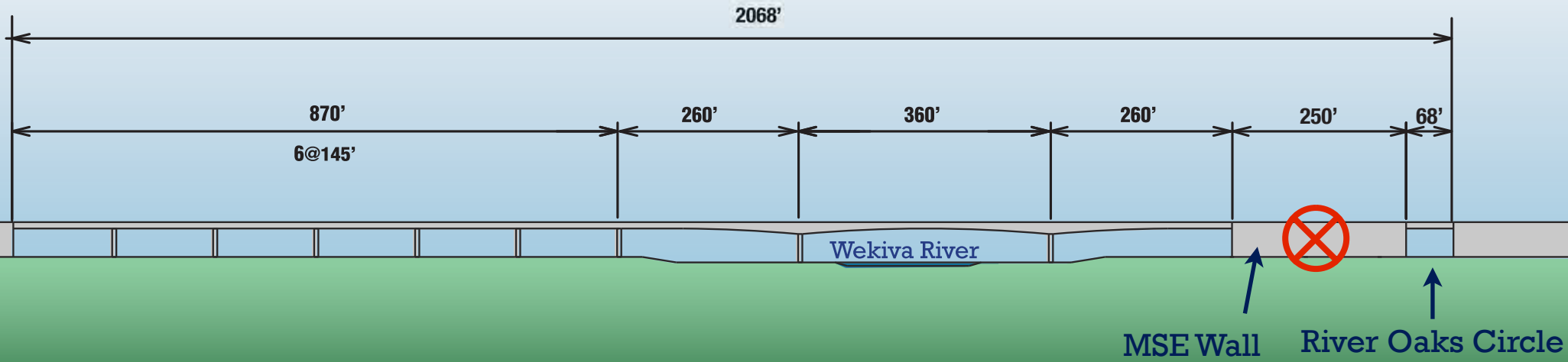


## Proposed Bridge Layout

**Longer span over river and 6 total piers removed**

# Removal of MSE Wall on East End

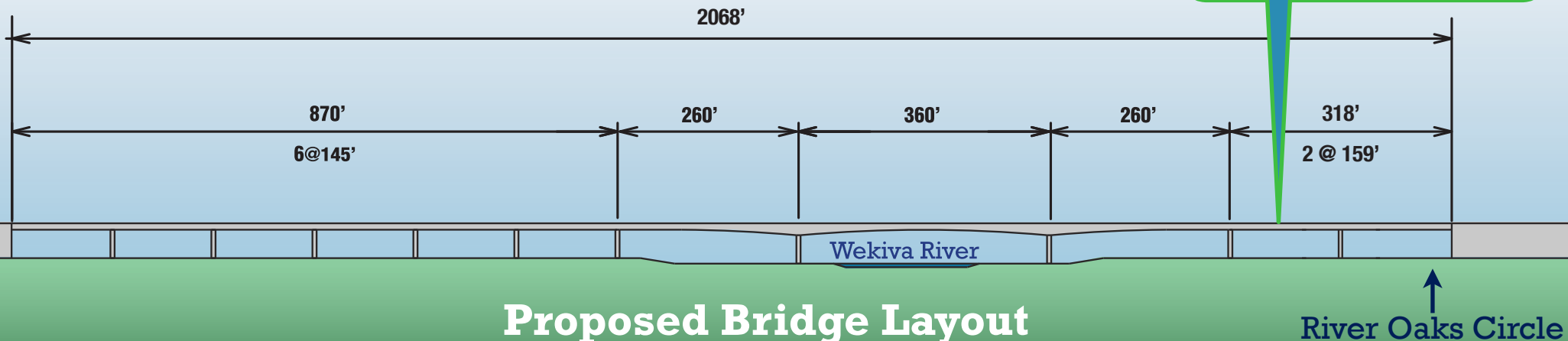
## Old span configuration with wall on east end



Wall Removed and Bridge Lengthened

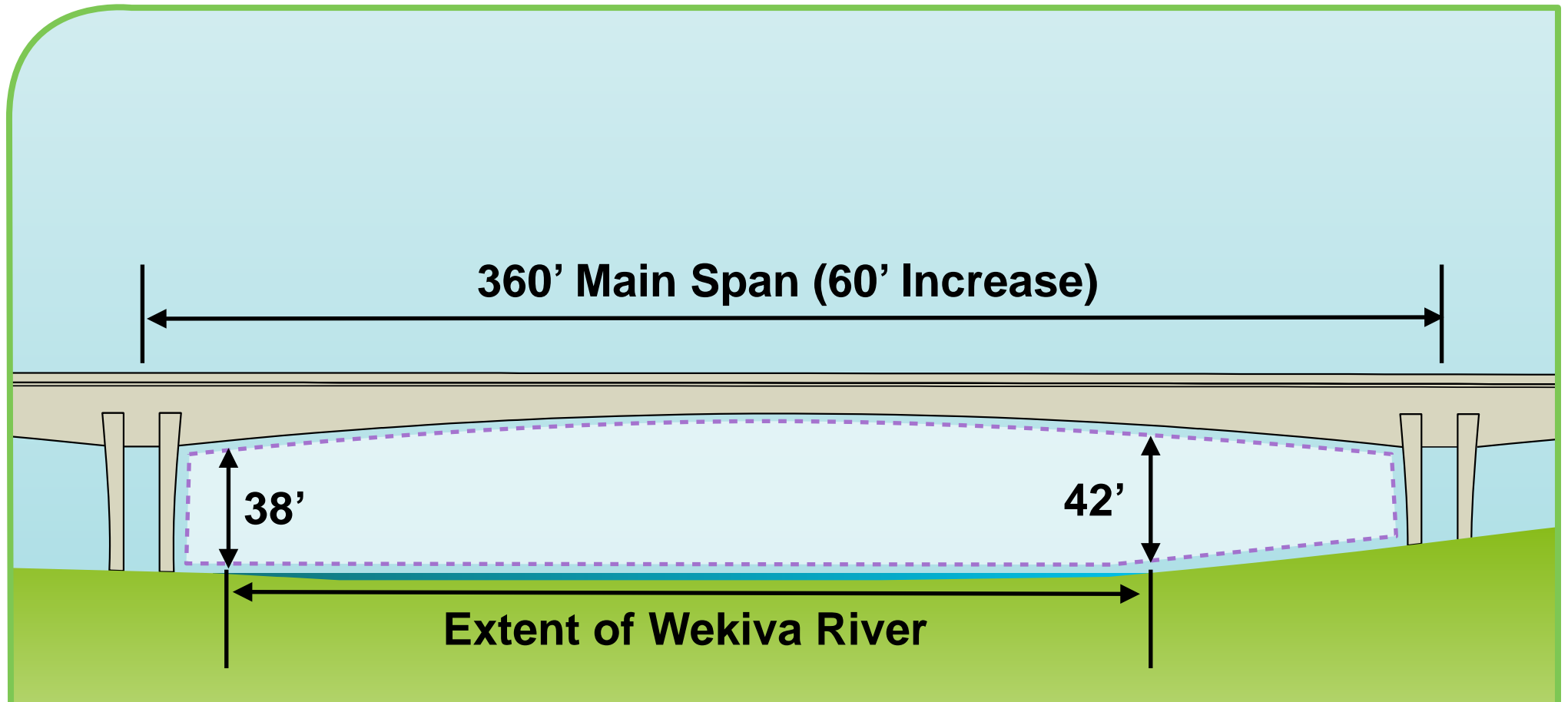
## Proposed Bridge Layout

New span configuration with additional bridge spans on east end





# Openness of Longer Span over River



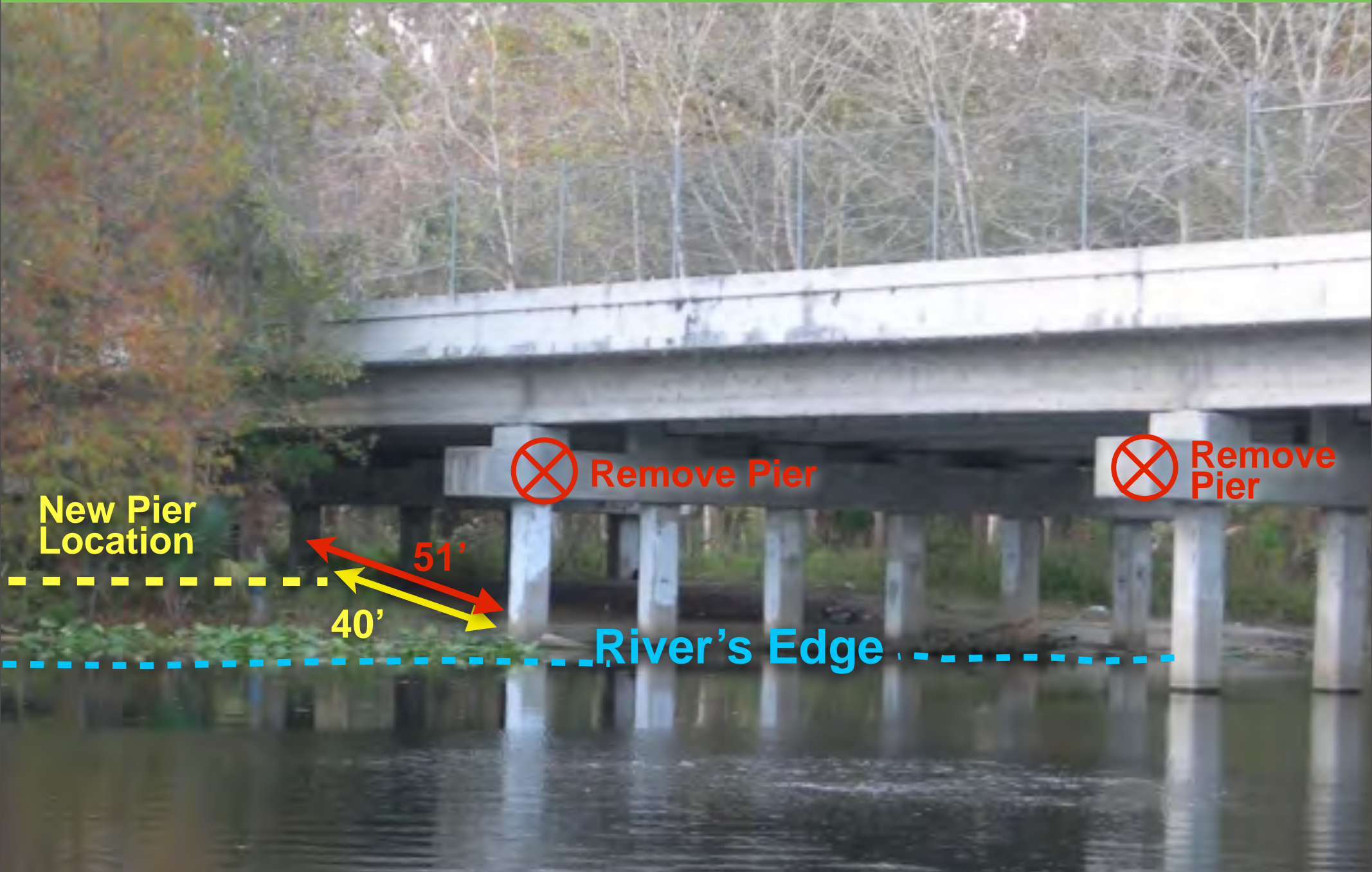
**Focus on Nature- Over 13,800 sq ft. clear window opening under the bridge which represents a 17% increase over the 300' span length**

# Location of Proposed Bridge Piers Distance from River's Edge



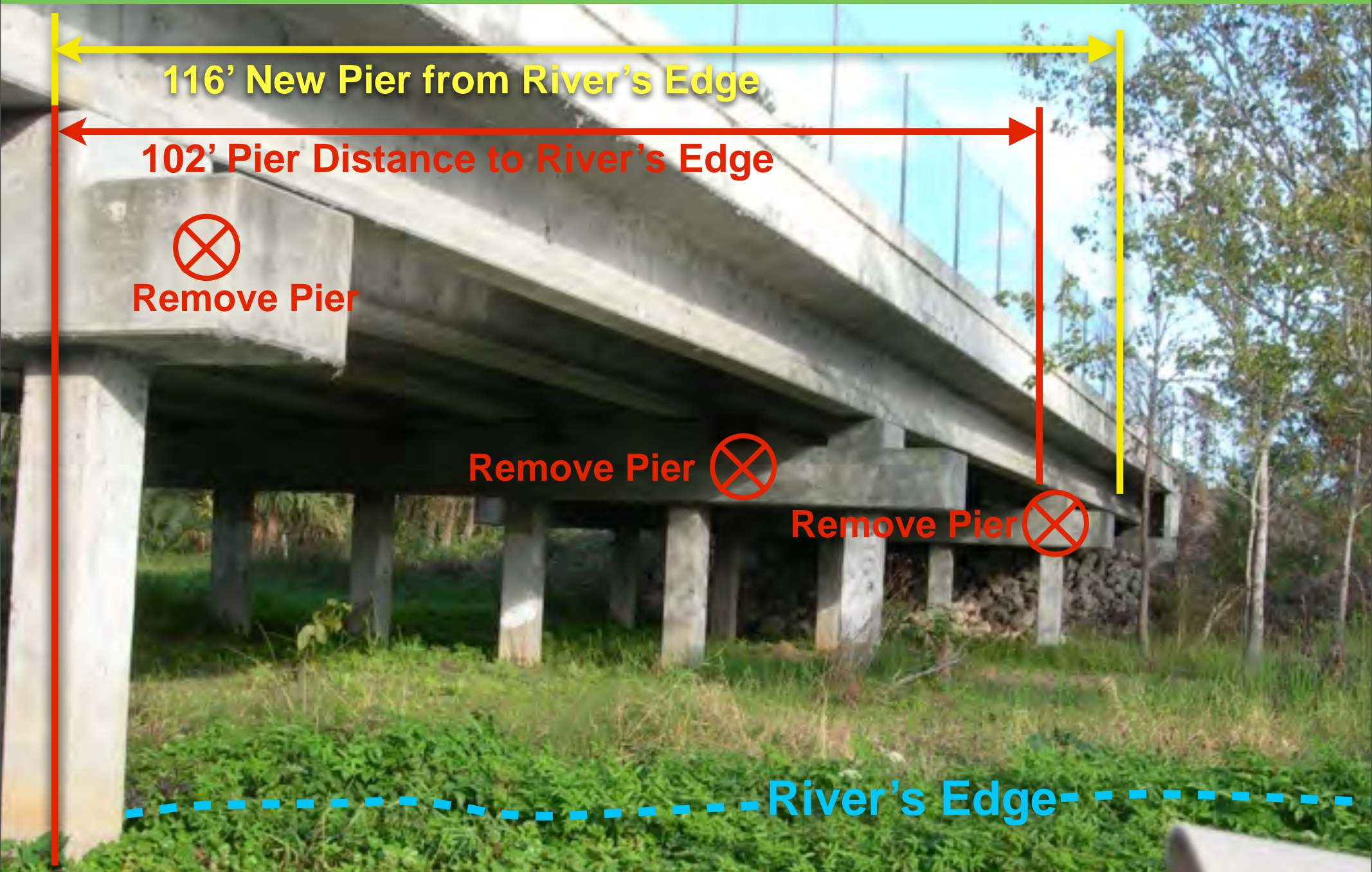
# Existing View 19

## South Side of Bridge Looking Northwest



# Existing View 20

## South Side of Bridge Looking Northeast




116' New Pier from River's Edge

102' Pier Distance to River's Edge

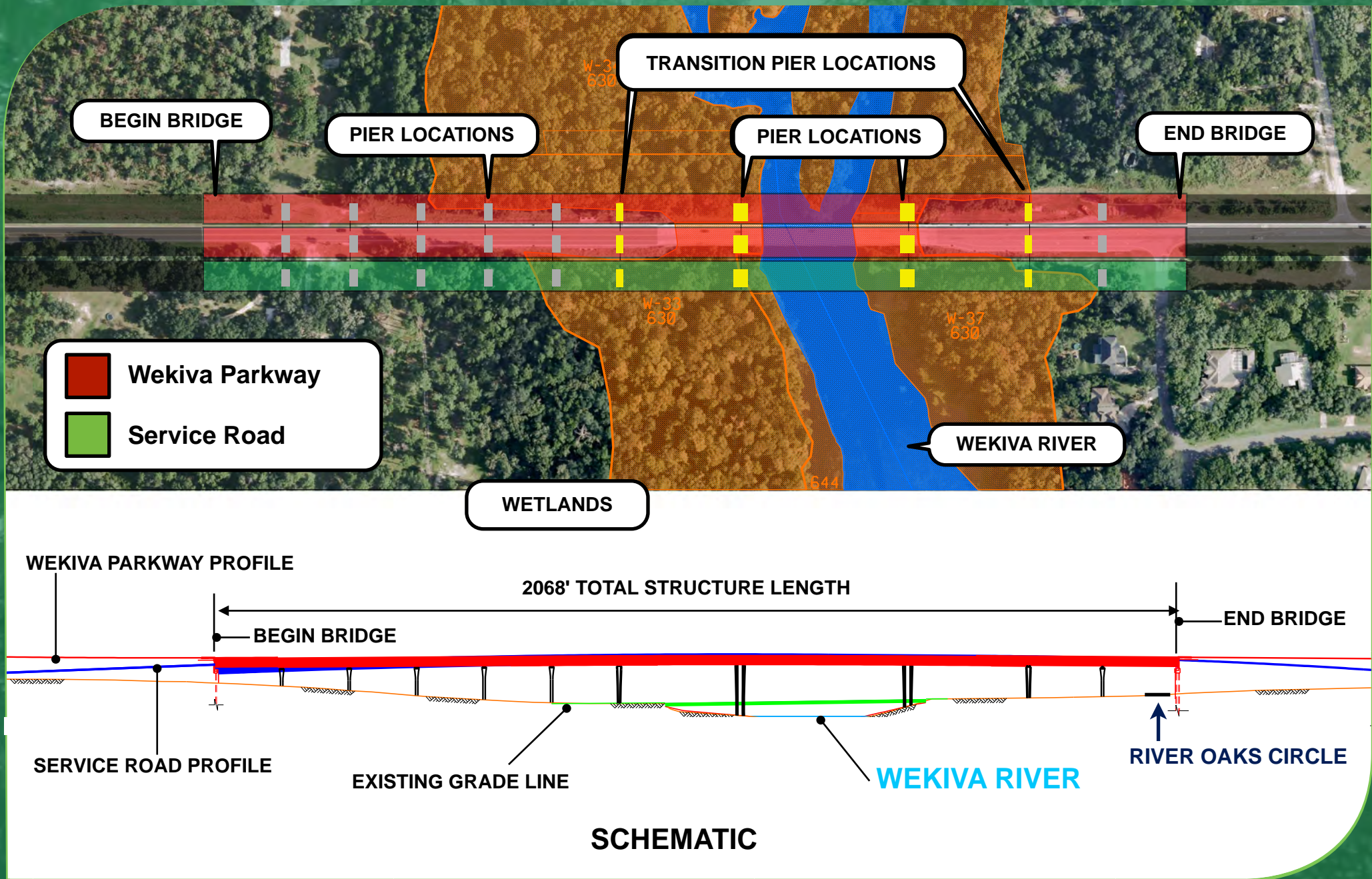
  
Remove Pier

Remove Pier 

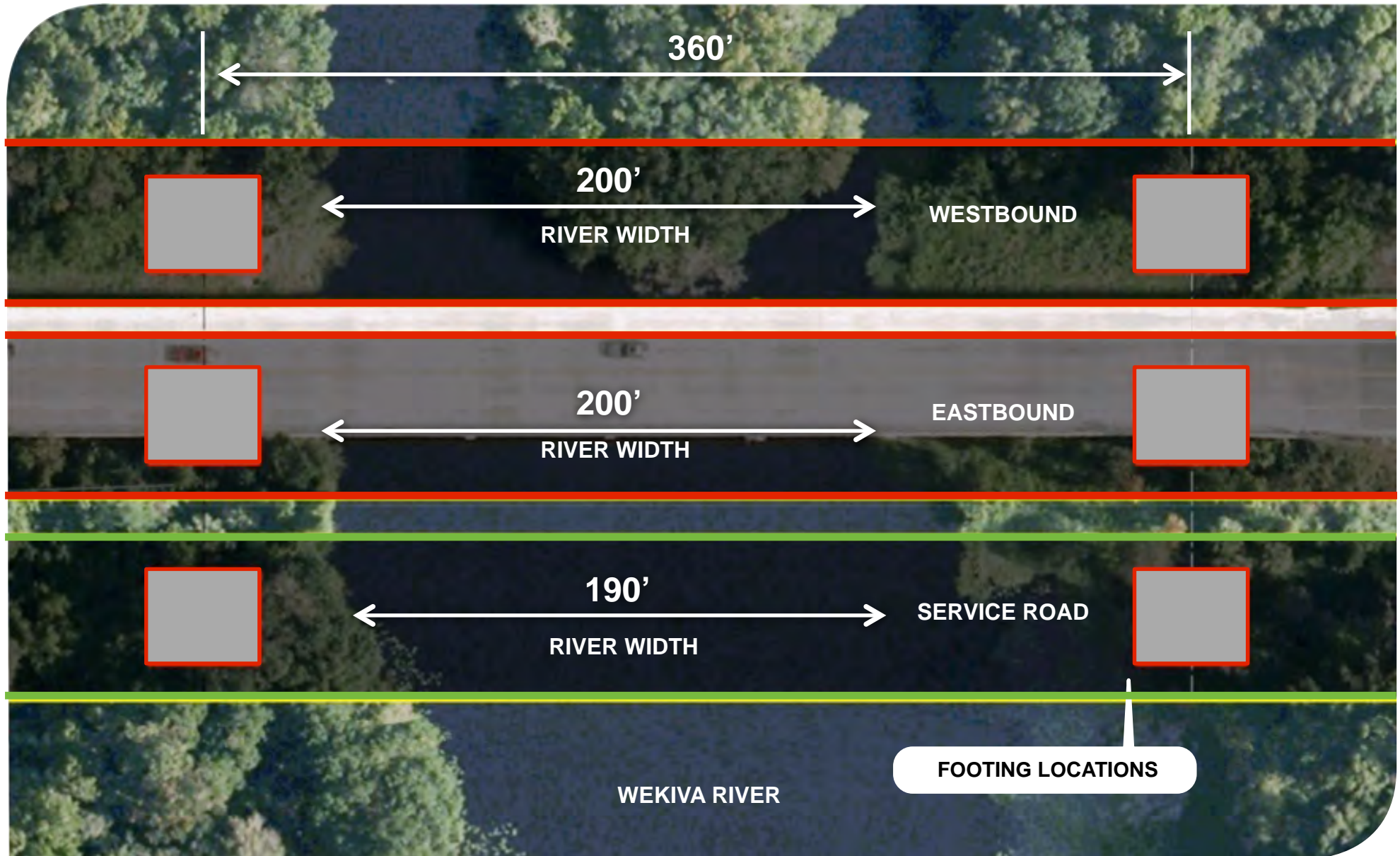
Remove Pier 

-----River's Edge-----

# New Bridge Plan and Profile

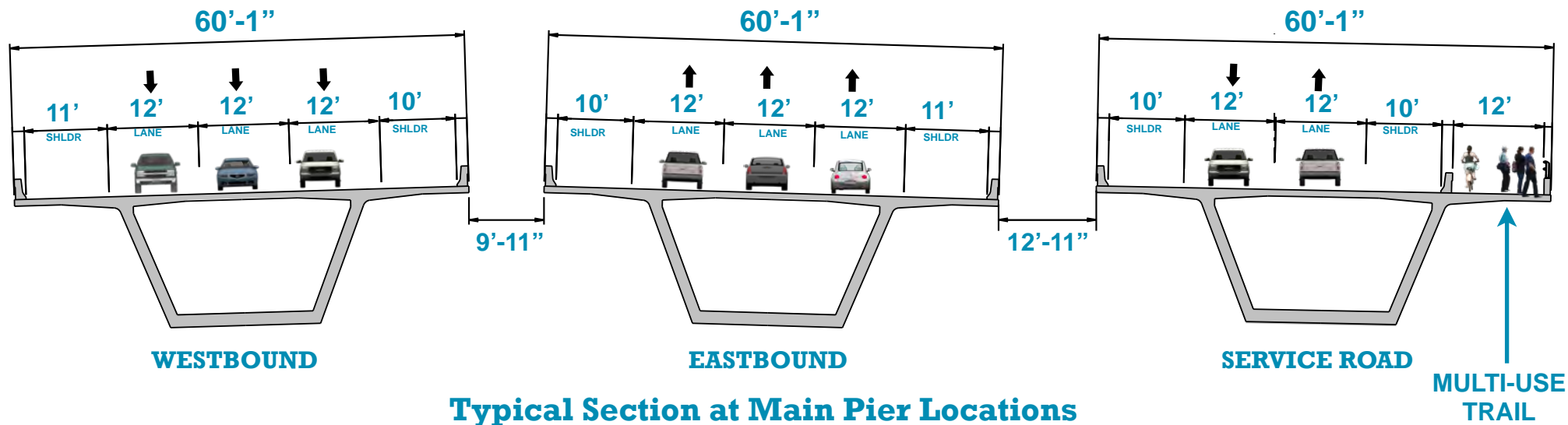
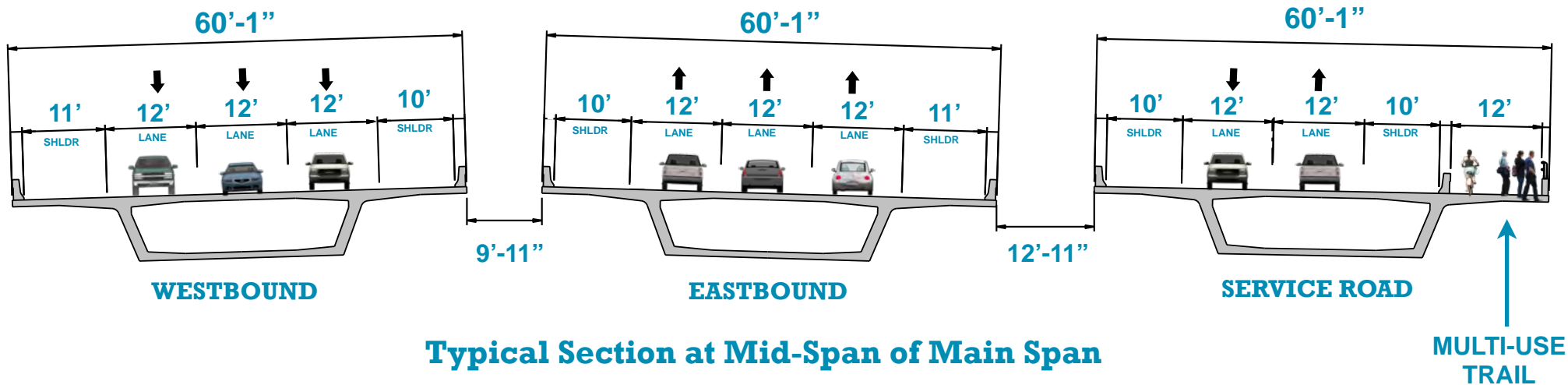


# Openness of Longer Span over River



FOOTINGS ARE LOCATED UNDERGROUND

# Typical Cross Sections



**Showing ultimate configuration.  
Parkway bridges will have 2 lanes in each direction for initial configuration.**

# Evaluation of Two vs Three Bridge Alternatives

## **Further evaluated combined bridge alternative**

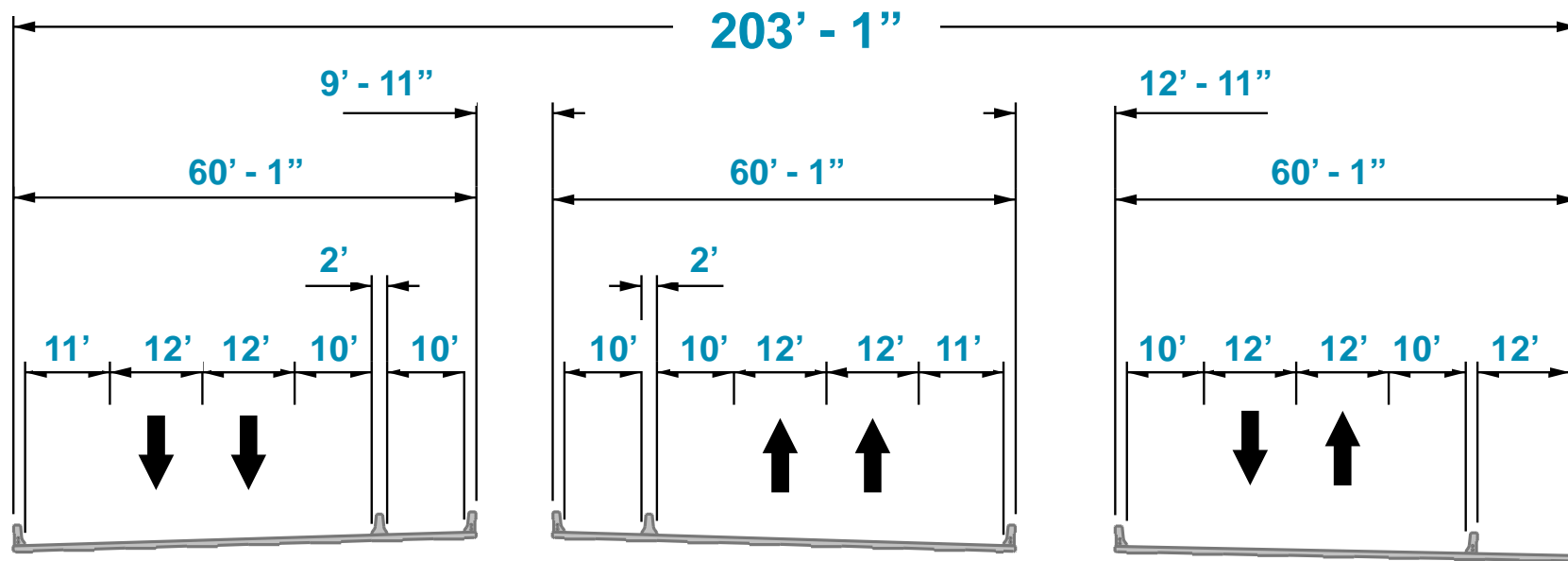
### **Barrier wall separated lanes required for two-bridge option**

- **Safety / Weave issues**
- **Complex geometry to accommodate necessary at-grade intersection**
- **Geometry Increases Right-of-Way needs and wetland impacts**
- **Tolling concerns**
- **Prior commitment to limit access points**

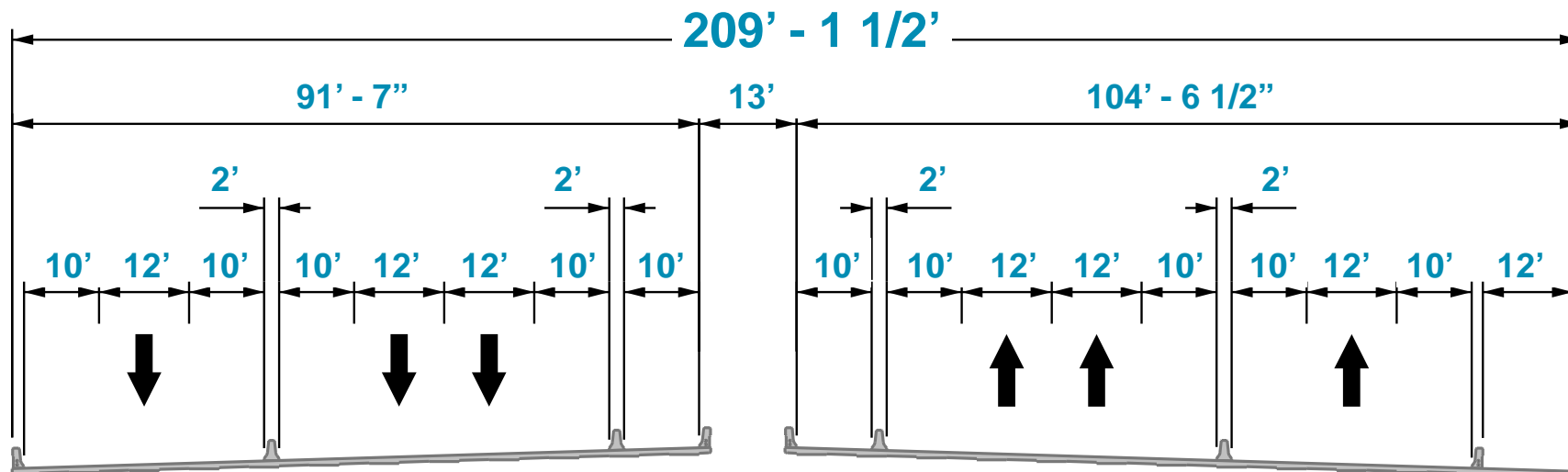


# Feasibility of Two Bridge Option

## Design per PD&E Line and Grade



## Two Bridge Alternative



# Island Tree Survey

**Island on North Side  
of Wekiva River Bridge**



# Island Tree Survey

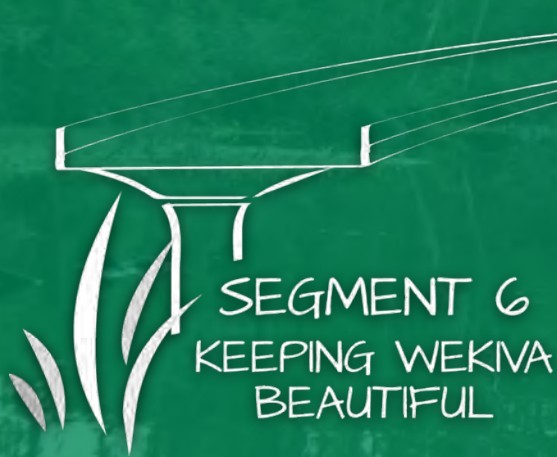


# Island Light Study Rendering



# Island Light Study





# Bridge Aesthetics and Selections from Final Bridge Design Charette 1

# Applying FIGG Archetypal Design Principles

**Establish a Theme**

**Blend Shapes**

**Create Shadows**

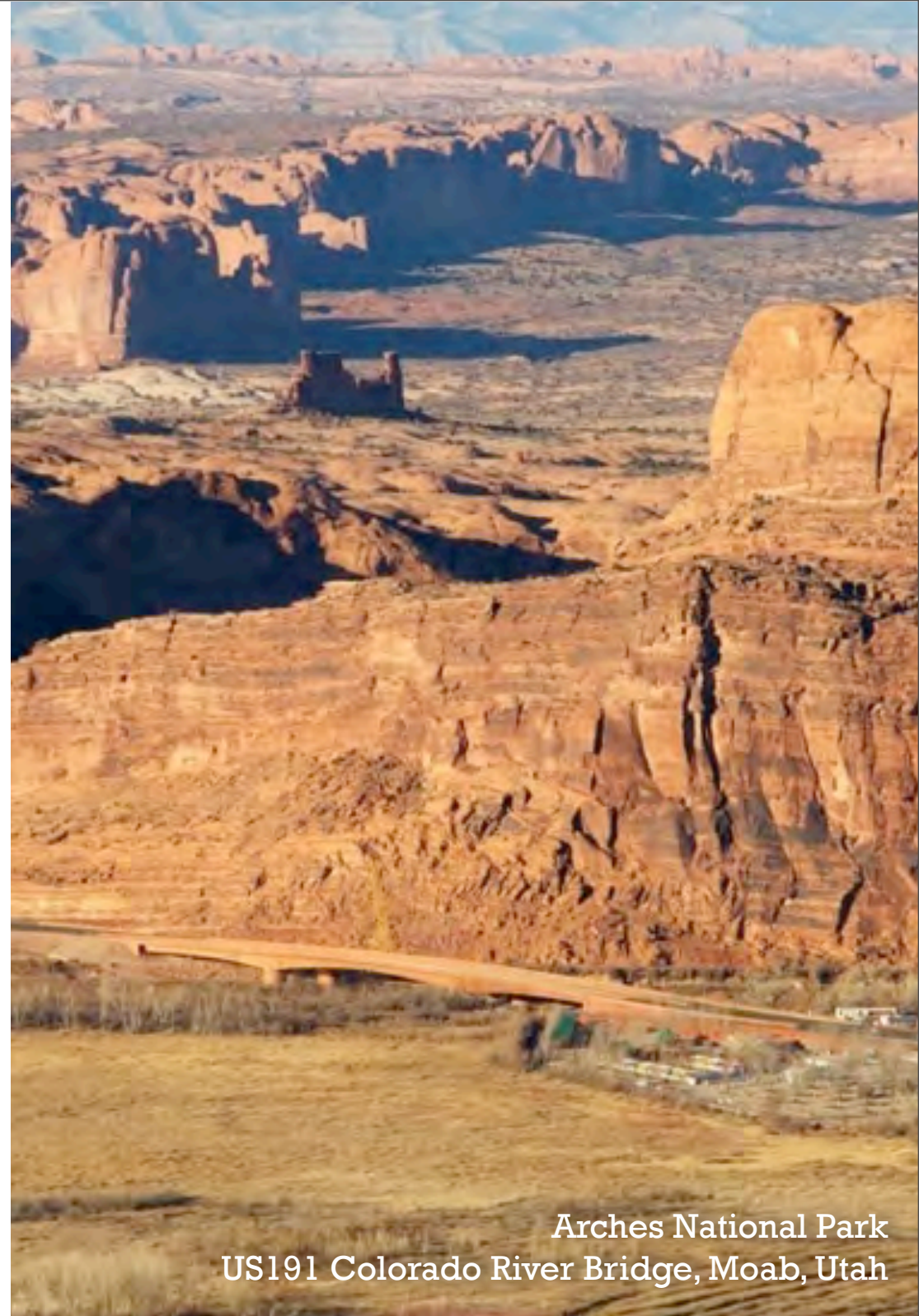
**Select Appropriate Textures**

**Choose Pleasing Colors**

**Open New Vistas**

**Use Native Materials**

**Incorporate Landscaping**



Arches National Park  
US191 Colorado River Bridge, Moab, Utah

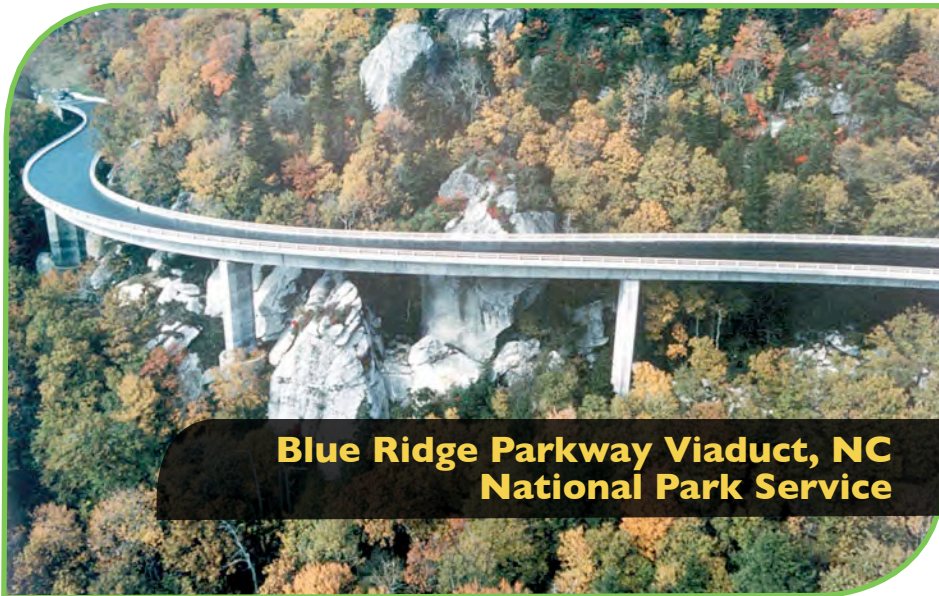
# NPS Goals for Wekiva River

## A National Wild and Scenic River

**“Project design fundamentals should include alternatives and analyses of proper site selection; reduction of unnecessary disturbance; and repeating elements of form, line, color and texture found in the immediate surrounding landscape scenery. Design strategies should include appropriate structural design and linear alignment, as well as sensitive and effective use of color, earthwork, vegetation manipulation and site restoration”**



# To Be Aesthetically Pleasing, A Bridge Must:



**Be Functional**

**Be Economical**

**Satisfy Cultural Needs**

**Be In Harmony with the Environment**

**Functional Bridge Sculpture™**

# Wekiva River Bridges

## In Harmony with the Scenic River

### Begins With A Theme

The “Theme” is the inspiration for creating bridge features using bridge archetypal design principles. Options of shapes, texture, and color were explored with the theme in mind.

# Wekiva River Themes



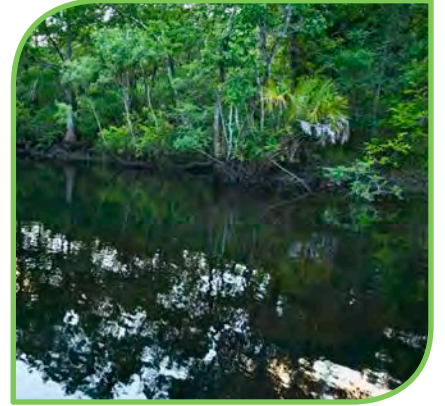
**Blooms Along  
the River**



**Celebration of Trees  
on the River's Edge**



**Tribute to Nature on  
Wekiva**



**Tribute to Water on  
Wekiva**

## Blooms Along the River



## Celebration of Trees on the River's Edge



**Fanning  
Palms**

## Tribute to Nature on Wekiva



**Wading Birds**



**Turtles**



## Tribute to Water on Wekiva



# Charette 1 Theme Preference Results



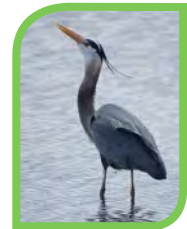
**Blooms Along the River**

**6.8**



**Celebration of Trees on the River's Edge**

**8.2**



**Tribute to Nature on Wekiva**

**6.0**



**Tribute to Water on Wekiva**

**4.8**

**Celebration of Trees on the River's Edge was identified as the preferred theme**

# Comments received for “Celebration of Trees on the River’s Edge”

**“I like the way this design mimics the appearance of the trees found along the river”**



**“When I think of cypress trees, I think of structure and support. I think a vague mimic of cypress on the bridge supports would be thematic and aesthetically pleasing”**



**“Vertical lines reflect shoreline”**

**“Like simplistic design that blends in with environment”**



# Comments received for

## “Celebration of Trees on the River’s Edge”

**“Color will also be an important component of this “tree” design”**

**“Columns/piers will eventually be at least partly covered by vegetation”**

**“Only if it’s not a lot more expensive. #62 or #63 without the hole so there is 3D on approach. For cleaning, they will not be in the river & could be pressure cleaned with water if structurally compromised. Otherwise, leave them alone. Normal aging/graying will look more like trees.”**

**“Like this but don’t want it to look too much like a tree. Subtle!”**

**“As long as it is not palm trees”**



# Comments Addressing Other Themes Which Relate To The Design

**“I am of the mindset to keep it simple, but still pleasing to the eye. Not just round or squares”**

**“Natural”**

**“Column design with relief or crevices may present maintenance problems”**

**“The piers will be too far from those who use the river to notice the themes”**

**“Designs on piers will only be seen close up. Color & bridge shape will dominate”**

**“Simple / subtle design”**

# SHAPES & SHADOWS

Examples of bridge pier shapes with rounded/organic styles and angular styles:

## Rounded/Organic



**Elliptical Pier with Glass Mosaic Tiles**  
Broadway Bridge,  
Florida



**Rounded Pier**  
Selmon Expressway, Florida



**Curved/Open pier**  
US 280 Elevated Roadway,  
Alabama



**Sculptural Slender Pier**  
New I-35W Bridge,  
Minnesota

## Angular



**Tapered Pier with Local Stone**  
Smart Road Bridge,  
Virginia



**Angular Pier**  
Victory Bridge,  
New Jersey



**Angular Slender Pier**  
17th Street Bridge,  
Florida



**Angular Pier**  
Wabasha Freedom Bridge,  
Minnesota

# Charette 1 Bridge Styles - Shape Preferences Results



**Rounded/Organic  
Shapes**

**Angular Shapes**

**5.1**

**5.1**

**Neutral**

# Comments received for Bridge Style Preferences (Shapes)

## **ROUNDED/ORGANIC SHAPES**

**“Do not like perfection in forms”**

**“Too Bland”**

**“Kind of Boring”**

**“No rounded piers, consider rounded box/cantilever”**

**“Preferred the rounded pier or sculptural pier structure. Curved/open pier would address to some extent light penetration under the bridge”**

**“I like the organic shape”**

**“I feel this would be too abrupt in the Wekiva setting”**

**“Too wide, not consistent with environment**

**“I lean more toward curvy, organic lines but not round”**

# Comments received for Bridge Style Preferences (Shapes)

## ANGULAR SHAPES

**“Like #62/63 not squared like this (Wabasha)”**

**“Combine”**

**“Vertical angular may be good to repeat linear tree trunks”**

**“More interesting”**

**“I do not think an angular shape reflects the flow of the river, stands out too much”**

**“Maybe example doesn’t show well, like angles in tree type design”**

**“I don’t like this example for Wekiva but other angular bridges are attractive”**

**“This looks manmade. Would not look good in natural setting”**

**“Too urban – too blocky – not consistent with environment. Prefer tree shape & motif. This seems in contrast to that option”**

**“Not for our application”**

**“Crisp lines will create contrast”**

# Abstract Texture or No Texture on Piers



# Charette 1 Bridge Style - Texture Preferences Results



**Abstract Texture**

**6.9**

**Consider Texture**



**No Texture**

**5.1**

# Comments received for Bridge Style Preferences (Textures)

## **ABSTRACT TEXTURE**

**“Like “trees” = 10; bumpy = algae = 2”**

**“Out of character for Wekiva area”**

**“Depends on resolution. Need some texture to avoid contrast”**

**“Consider variegated texture on entire pier. Orient texturing vertically”**

**“I like this better than no texture”**

**“Concerned that if the bridge has abstract texturing that it may increase the growth of mold & algae”**

**“Like texture, natural colors of environment”**

**“I feel this would better capture the façade of tree trunks”**

**“Subtle Texture and lines that complement the trees nearby –  
Texture in design but not surface texture”**

**“Less depth/layers”**

**“Yes, but more like slide 62 from previous presentation - Subtle”**



# Comments received for Bridge Style Preferences (Textures)

## **NO TEXTURE**

**“Smooth = no algae = 10; smooth like example = boring = 3”**

**“It’s OK”**

**“I do not see the need for texture”**

**“If tree is used, this could work”**

**“This will be more abrasive and unnatural”**

**“Less maintenance in the long run due to less algae/mold growth”**

# Natural Color of Material or Eco-Stain

Proper use of color can create a bridge that blends into the natural landscape



sand



water



cement



gravel



AirTrain JFK, New York



Victory Bridge, New Jersey



South Norfolk Jordan Bridge, Virginia

## Accent in Eco-Stains



US 191 Colorado River Bridge, UT

# Charette 1 Bridge Styles - Color Preferences Results



**Natural Color of  
Materials**

**3.6**

**Eco-Staining**

**8.4**

**Eco-Staining was identified as a preference**

# Comments received for Bridge Style Preferences (Colors)

## **NATURAL COLOR OF MATERIALS**

**“6 because we’re not using limestone or wood”**

**“Cypress bark might be a good source of color”**

**“Need some color”**

**“I like the staining better”**

**“I feel it needs to have some kind of blending color”**

**“Too stark, inconsistent with environment.**

**Subtle tree-like texture OK if not a maintenance nightmare”**

**“Sand or limestone would be too bright and contrasting”**

**“Too much contrast”**

# Comments received for Bridge Style Preferences (Colors)

## **ECO-STAINING**

**“If really eco-friendly”**

**“OK”**

**“Of natural color”**

**“Variegated staining is essential”**

**“Staining should be done in such a way that bridge blends into the landscape”**

**“Like natural color in environment”**

**“Undecided what may be the best color”**

# Comments received for Bridge Style Preferences (Colors)

## **ECO-STAINING**

**“Conduct the color swatch experiment as described with slide 23 (this presentation) to determine a suitable color – suggest tree bark – not green or brown”**

**“I like the idea of coloring the bridge in a way that will reduce its visual impact, however I am nervous that dark, earth tones will make the bridge look old and dingy”**

**“Colors to blend in with natural surroundings. Need color samples for blending. More greys & browns, not so much green, blue under bridge, sky & clouds”**

# Comments received for Bridge Style Preferences (Colors)

## General Comments

**“The eco stained color like used in the US191 Colorado Bridge, Moab, Utah blends well with the environment”**

**“A combination of (1) and (2) is the most conducive to blending with the natural environment”**

**“No blue underneath – unnatural”**

**“Steel truss still should be explored as a design option!”**

**“Also, using the accent in eco-stain texture like variegated stone shown in the Allegheny River Bridge, Pennsylvania really fits well within the natural environment”**



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BEAUTIFUL

# Break/Discussions





SEGMENT 6  
KEEPING WEKIVA  
BEAUTIFUL

# Bridge Pier Shape

# Celebration of Trees on the River's Edge



# Celebration of Trees on the River's Edge



# Celebration of Trees on the River's Edge



# Celebration of Trees on the River's Edge



# South Of The Bridge, Tree Overhanging River



# Celebration of Trees on the River's Edge



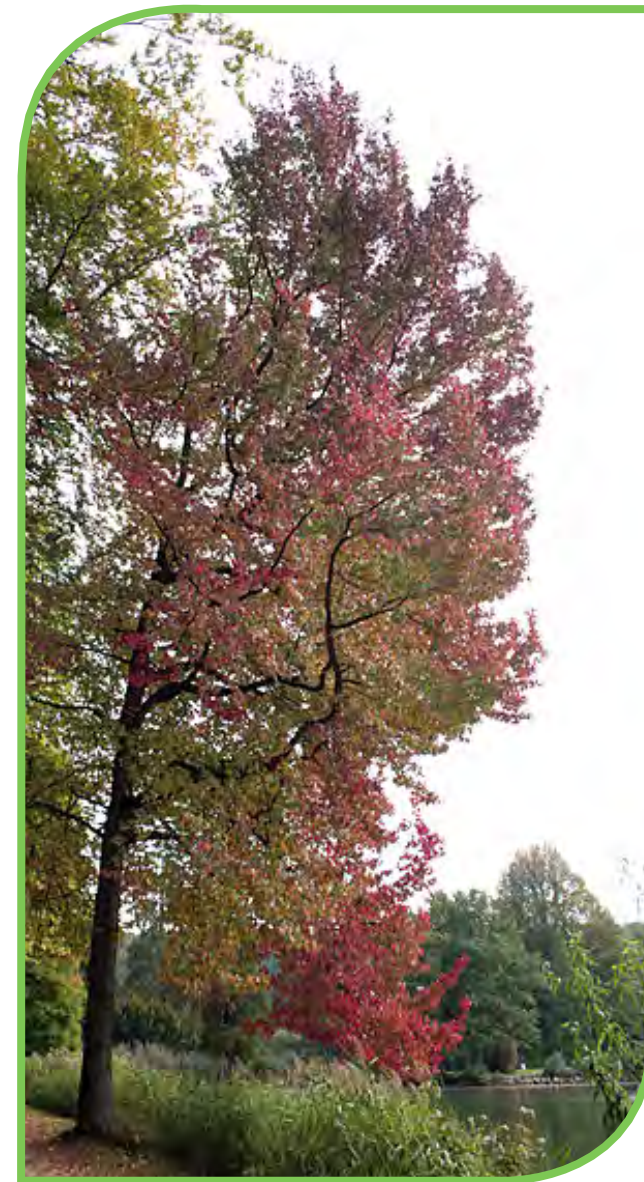
**Laurel Oak 65%**



**Red Maple 25%**



**Cabbage Palm 5%**



**Sweet Gum 5%**

# Dominant Trees on the River's Edge - Laurel Oak





# Dominant Trees on the River's Edge - Red Maple



# Dominant Trees on the River's Edge - Cabbage Palm



# Dominant Trees on the River's Edge - Sweet Gum



# Dominant Trees on the River's Edge - Occasional Cypress Tree



# Trees Near the Existing Bridge - Oak Trees



# Trees Near the Existing Bridge - Tupelo Trees



# Trees Next to Existing Bridge - Overall Views



# Trees Along 1 Mile Stretch of Existing Bridge





# Trees Along 1 Mile Stretch of Existing Bridge



# Trees Along 1 Mile Stretch of Existing Bridge



# Celebration of Trees on the River's Edge



**Branches Extending over Water**



**Contrast between Deciduous & Evergreens**



**Cabbage Palm**



**Floodplain Hardwoods**



**Cypress Tree Knees**

# Important Features Identified By The NPS:

## Line, Form, Color

Each of these elements were considered for the pier concepts while keeping the theme in mind



One Pier Concept

# “Line” Celebration of Trees on the River’s Edge

No straight lines  
Crossing tree trunks



# “Form”

## Celebration of Trees on the River’s Edge

### Overall Form

Wide tree bases

Irregular/Organic shapes



“Form”

# Celebration of Trees on the River's Edge

Overall Texture

Organic vertical  
lines with variations  
of surface



# “Color” Celebration of Trees on the River’s Edge

Variegated tree trunk coloring  
Blend of tans, ash, browns,  
grays, green



Red Maple 25%



Laurel Oak 65%



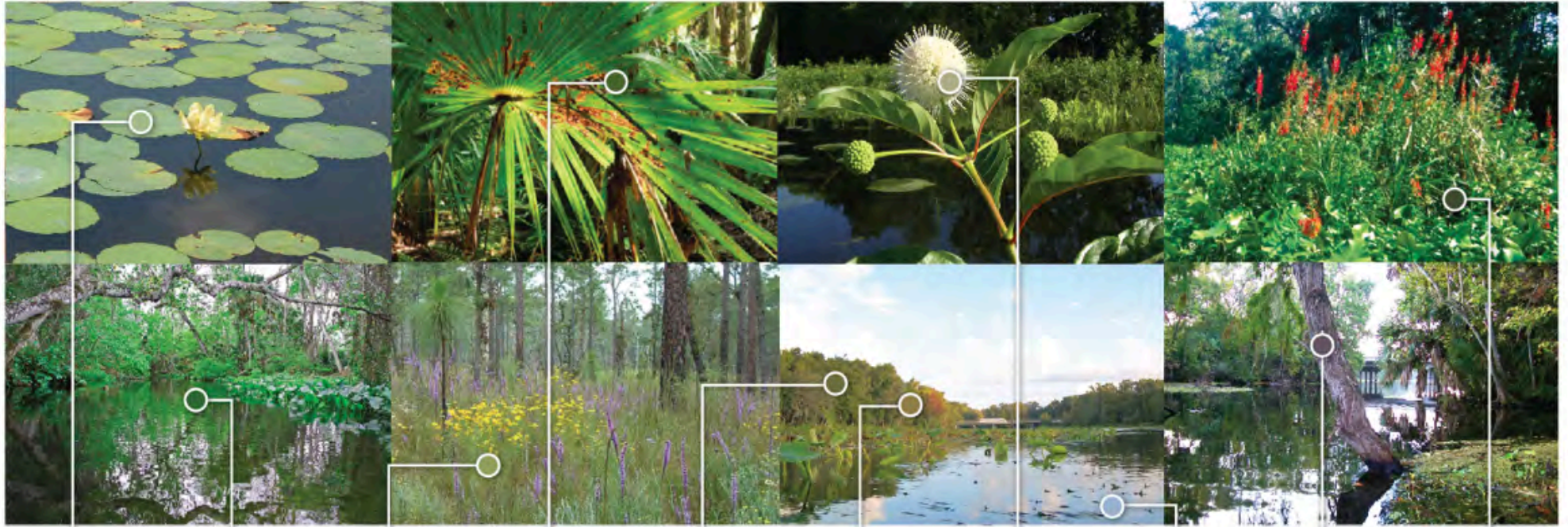
Cabbage Palm 5%



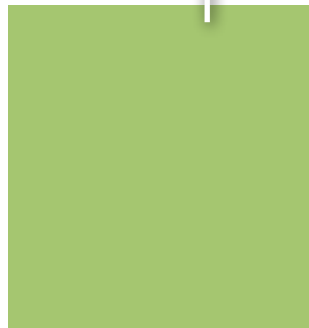
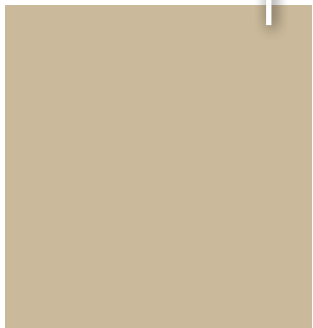
Sweet Gum 5%



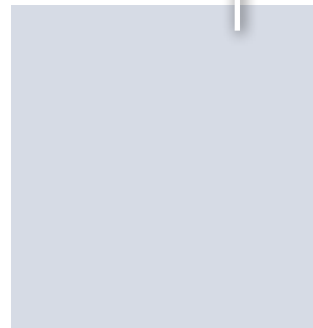
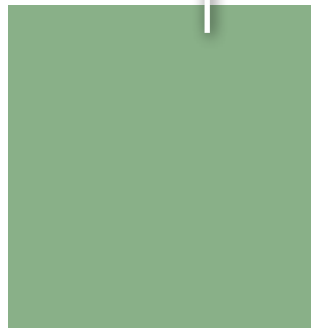
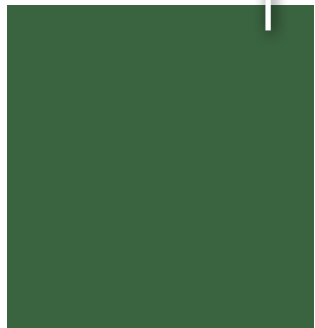
# Select Color Palette: Wekiva River Bridge Location



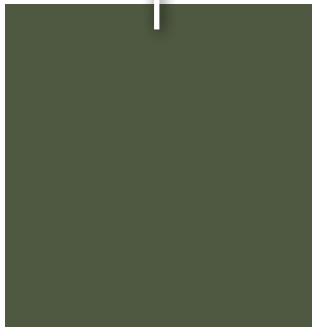
# Color Study - “Celebration of Trees on the River’s Edge”



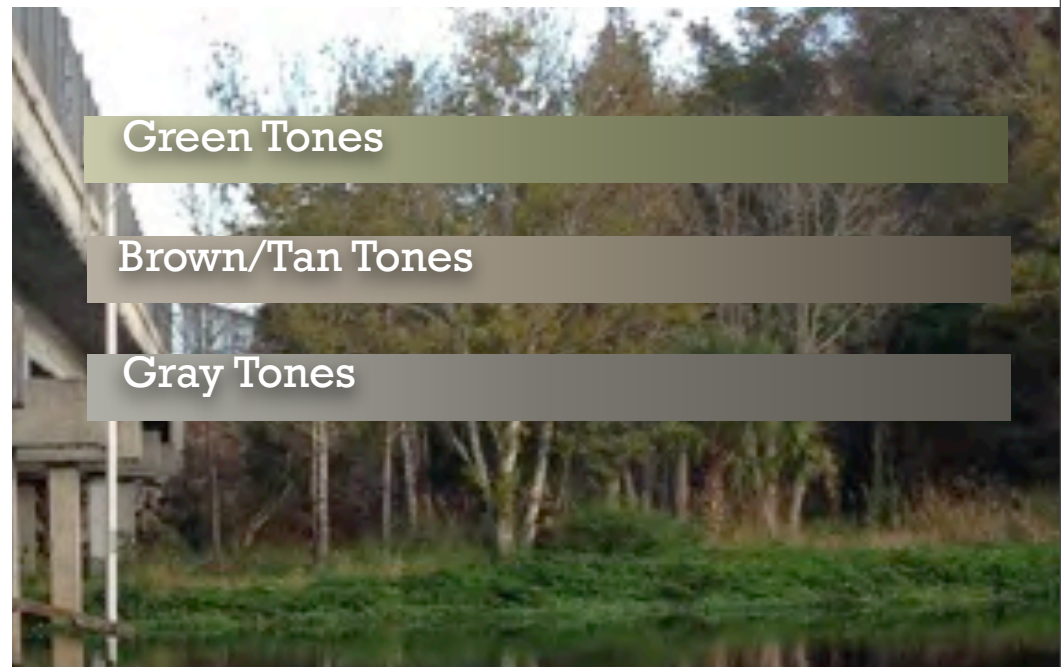
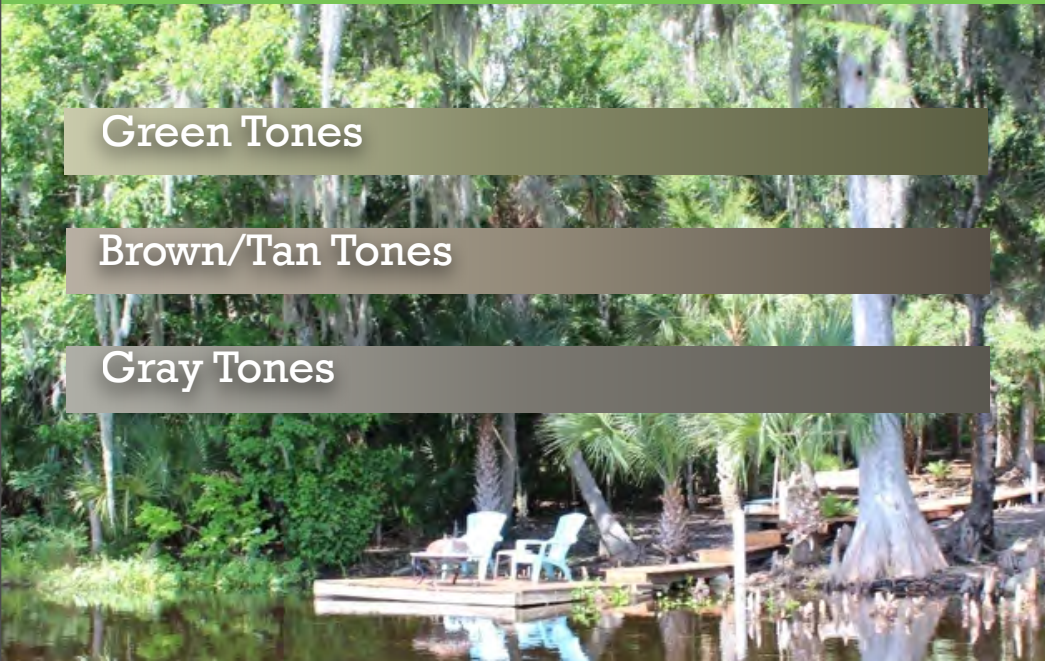
# Color Study - “Celebration of Trees on the River’s Edge”



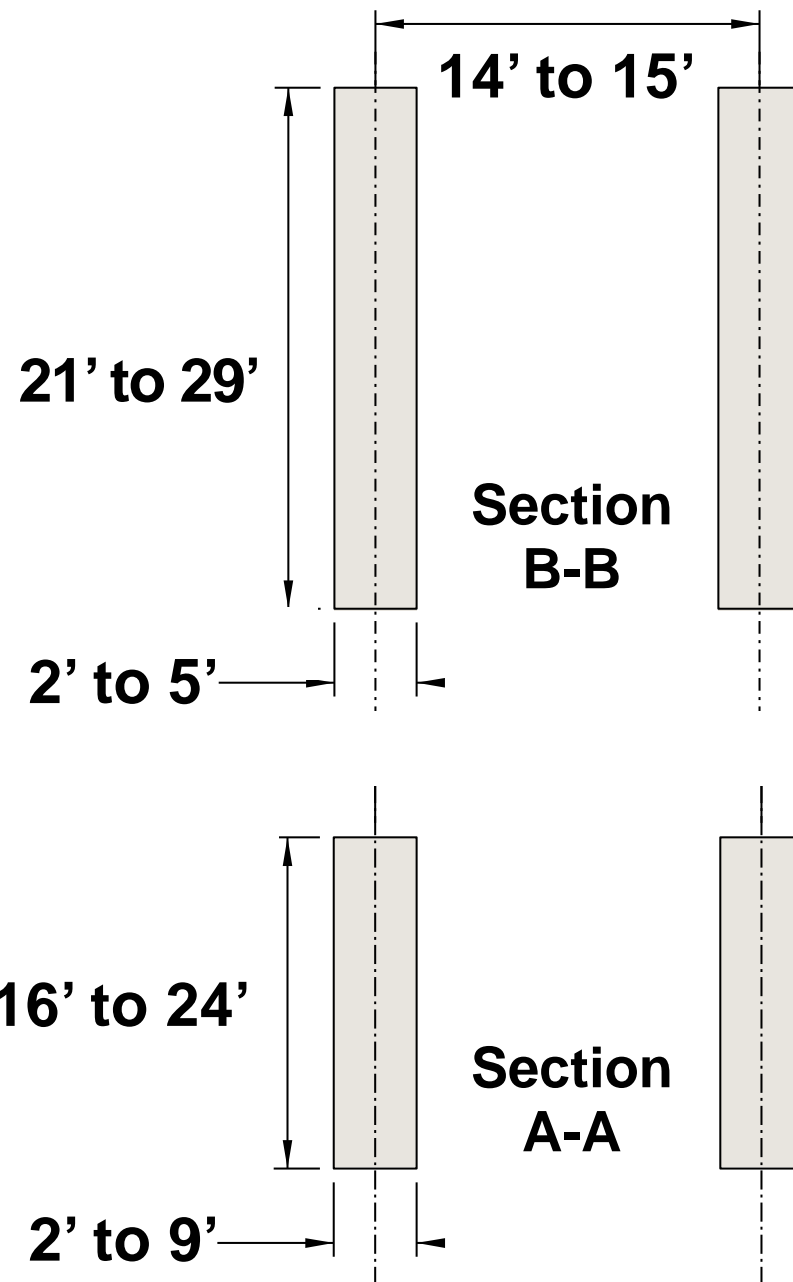
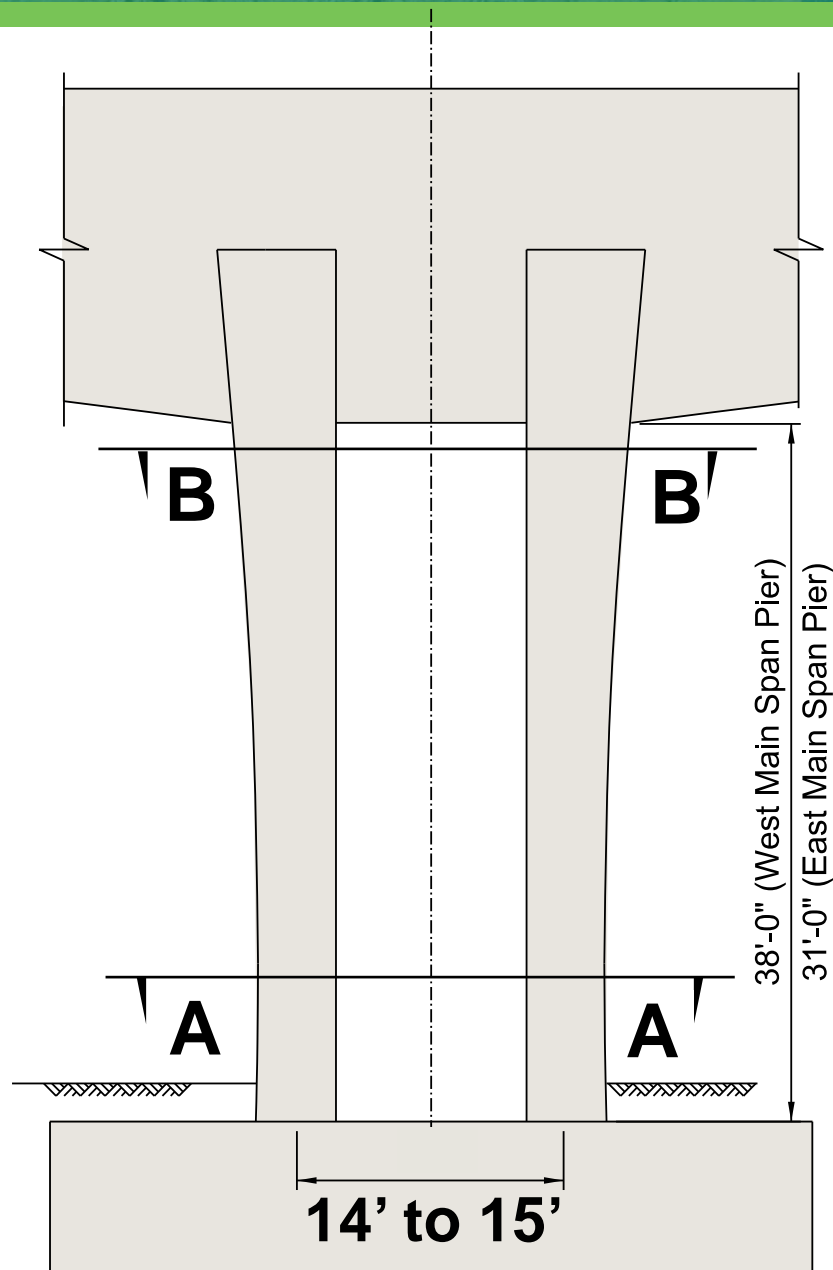
# Color Study - “Celebration of Trees on the River’s Edge”



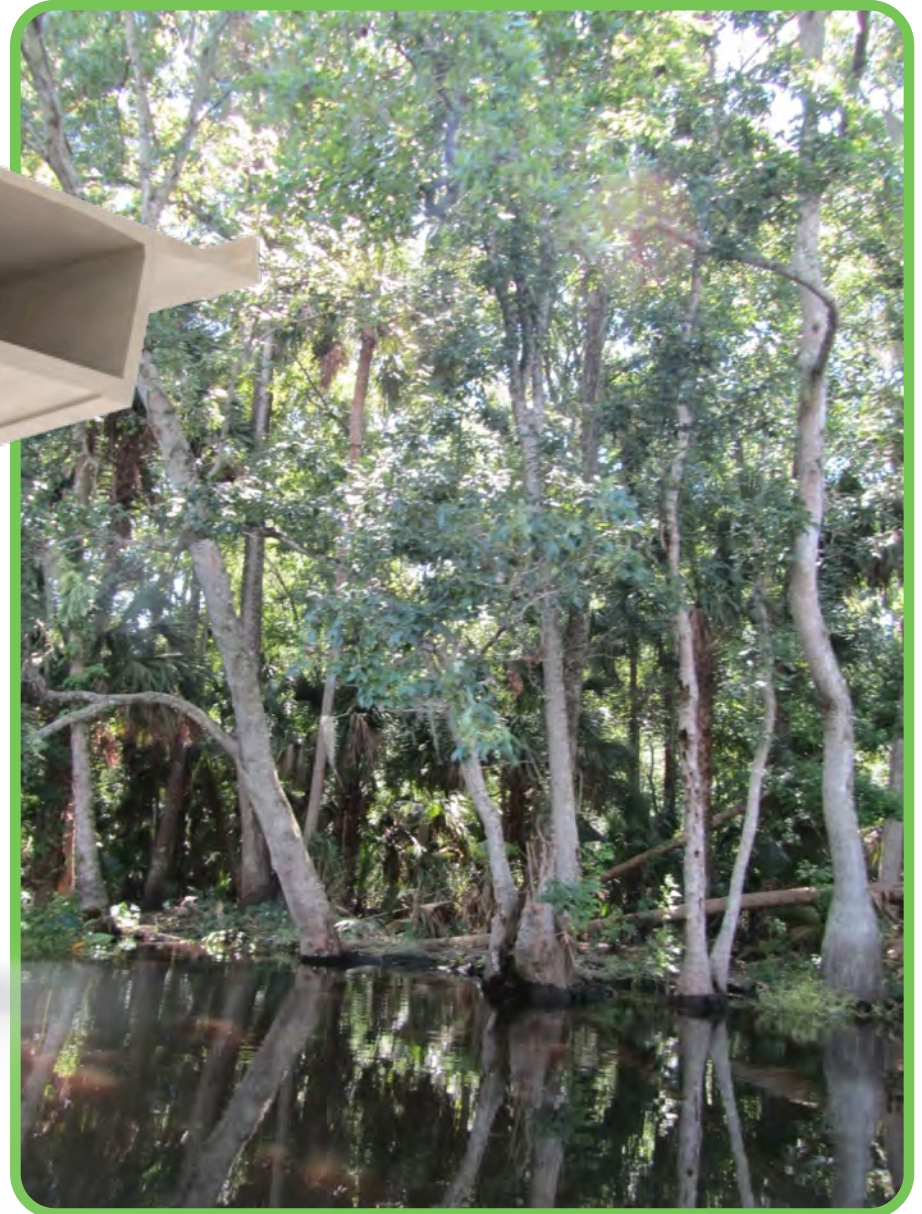
# Color Study - “Celebration of Trees on the River’s Edge”



# Basic Pier Dimensions (Dimension Ranges are Approx.)



# Pier Concept A



# Pier Concept A





# Pier Concept A



# Pier Concept B



# Pier Concept B



# Pier Concept B



# Pier Concept C



# Pier Concept C



# Pier Concept C



# Pier Concept D





# Pier Concept D

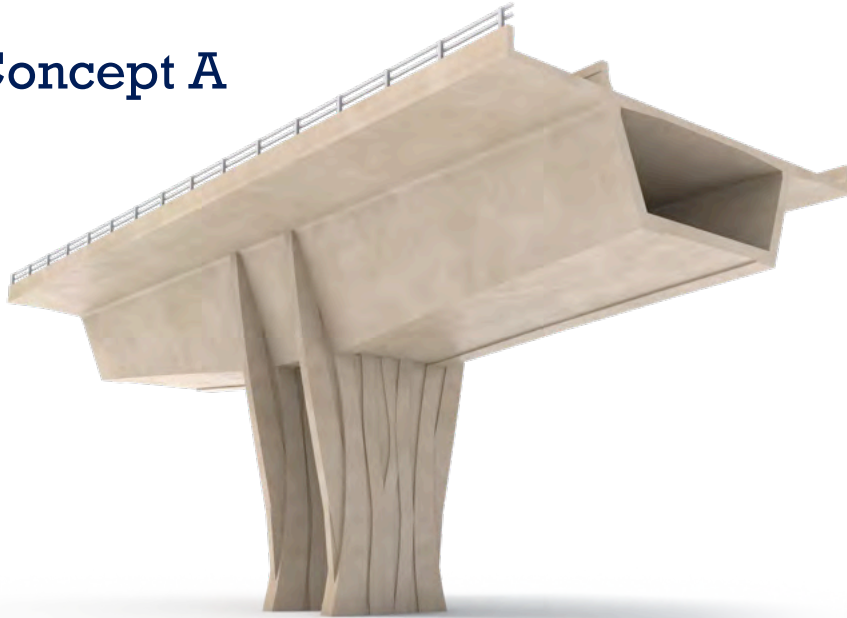


# Pier Concept D

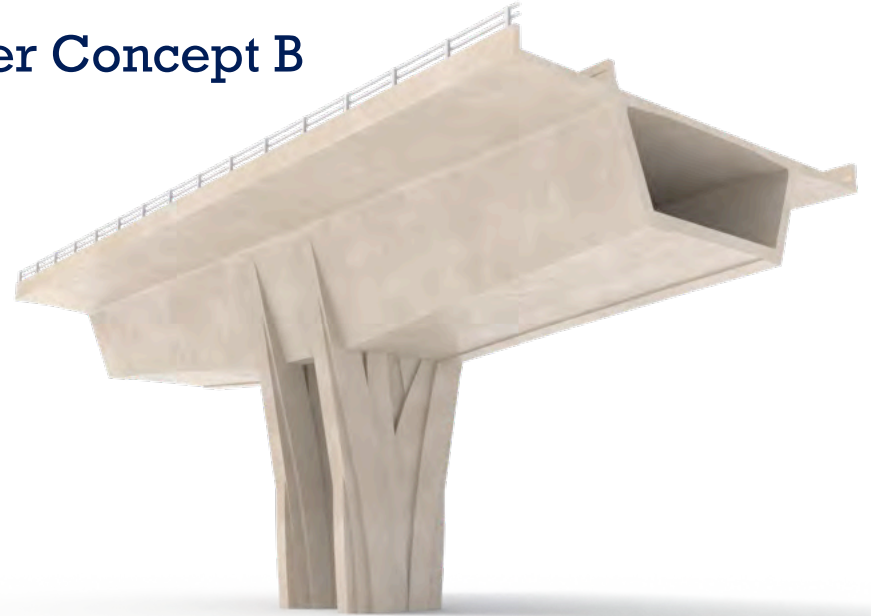


# Discussion on Bridge Pier Shape

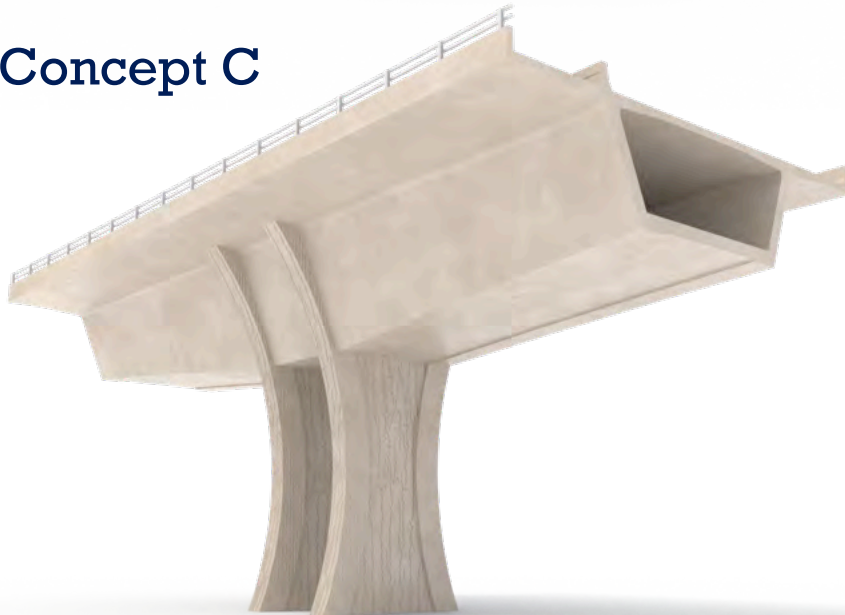
Pier Concept A



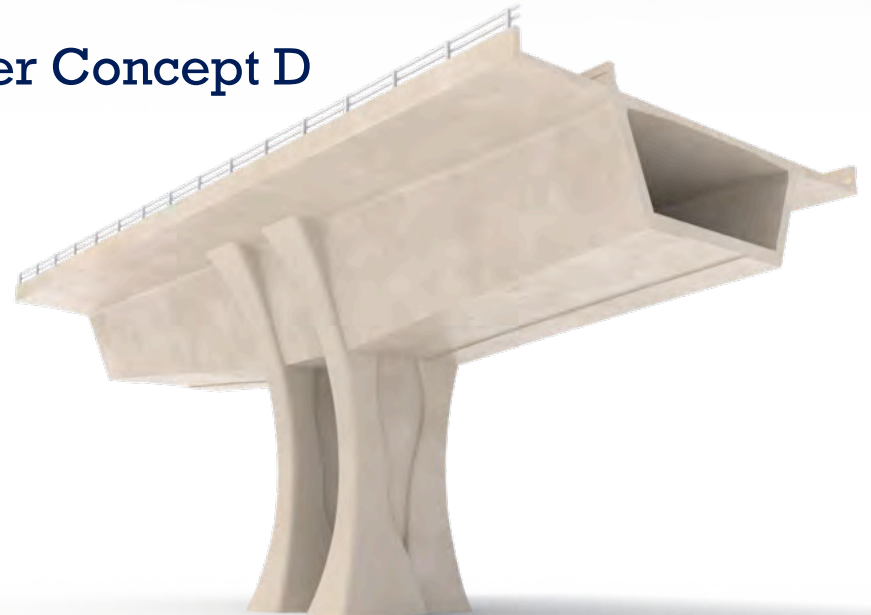
Pier Concept B



Pier Concept C



Pier Concept D



# Pier Shape Preference

## FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

### Wekiva River Bridges

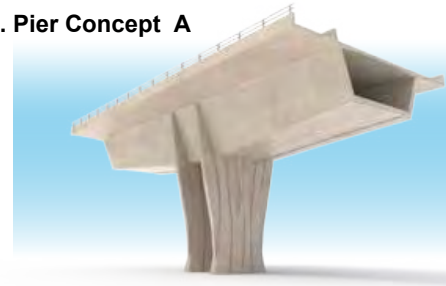
January 28, 2014



### Pier Concept Preferences

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral.  
NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

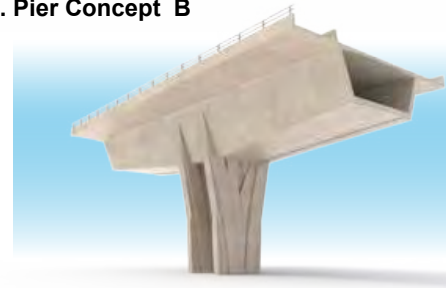
#### 1. Pier Concept A



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

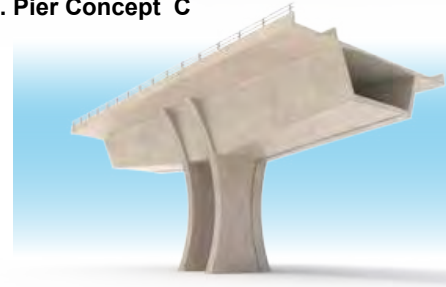
#### 2. Pier Concept B



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 3. Pier Concept C



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 4. Pier Concept D



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



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# Public Comments

# FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

## Wekiva River Bridges

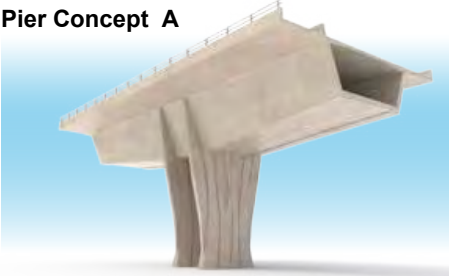
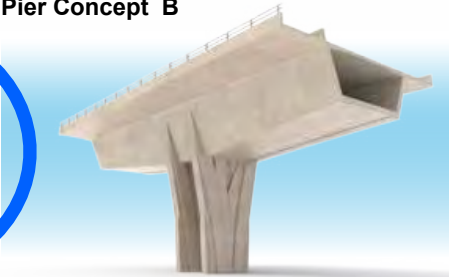
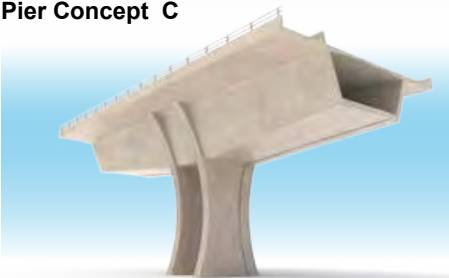
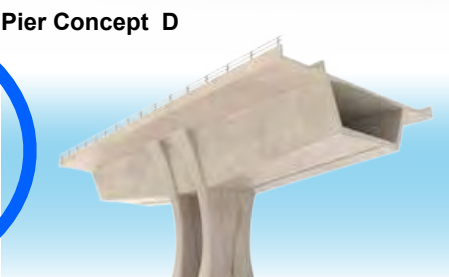
January 28, 2014



# Pier Shape Preference Results

### Pier Concept Preferences

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral.  
NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

RANK		Average Score	Total # of 1's	Total # of 2's
3	1. Pier Concept A 	2.67	4	2
2	2. Pier Concept B 	2.17	4	9
4	3. Pier Concept C 	3.17	3	2
1	4. Pier Concept D 	2.00	7	5

# Pier Concept B



# Pier Concept B





# Pier Concept B



# Pier Concept D



# Pier Concept D



# Pier Concept D





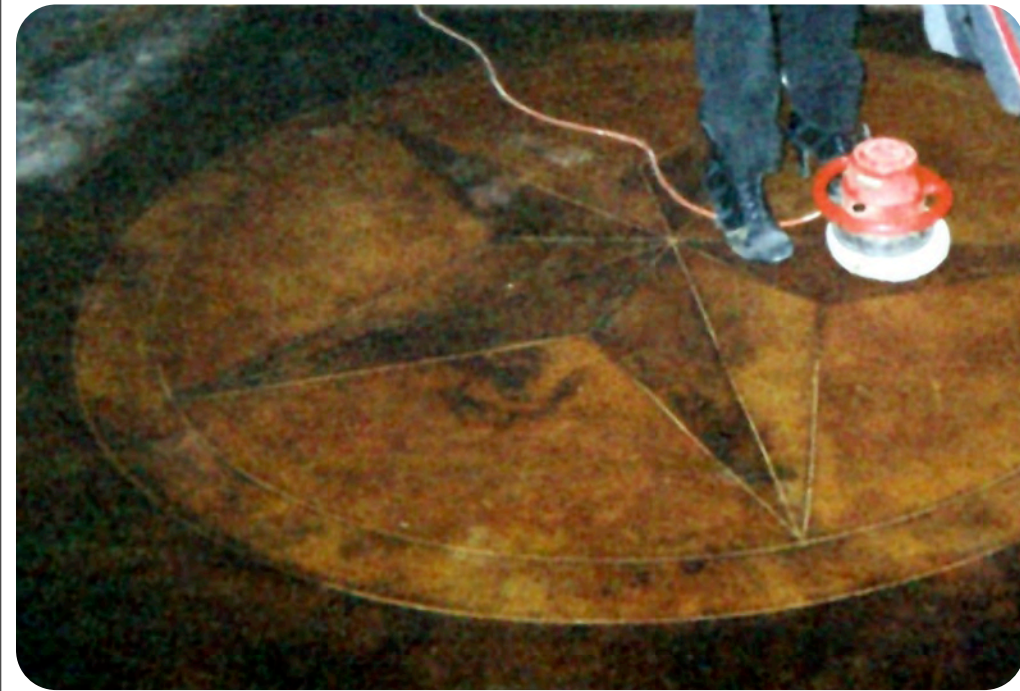
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# Bridge Color

# Eco-Friendly Stain



# Example of Stain Durability



**Original staining indoors**

NO FADE...  
NO COLOR SHIFT...  
NO DELAMINATION.



**Thirteen years later**  
**Eleven years after building**  
**tear down.**  
**Ten complete winters of**  
**freeze/thaw**

# Concrete Stain

**Oakmont Golf Course, PA**



**Allegheny River Bridge, PA**



**Variegated coloring can provide natural stone-like coloring**



# Permanent Chemical Coloration

Stained concrete wall on  
Allegheny River  
Bridge Project



**A variety of shades and color can be achieved**

# Eco-Friendly Stain



**The lack of acid and the quality of the salts makes for a much more predictable result and the most eco-friendly product.**

# Eco-Stain Application Works With Concrete And Has Naturally Variegated Shades



# “Color” Celebration of Trees on the River’s Edge

**Variegated tree trunk coloring  
Blend of tans, ash, browns,  
grays, green**



Red Maple 25%



Laurel Oak 65%

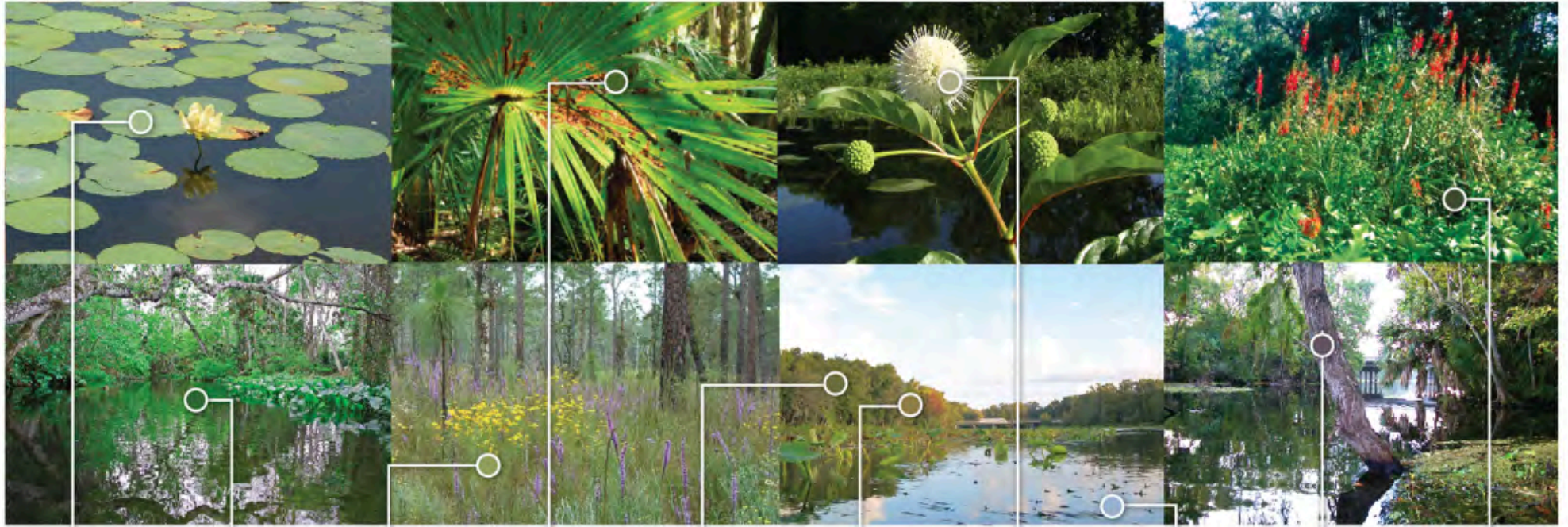


Cabbage Palm 5%

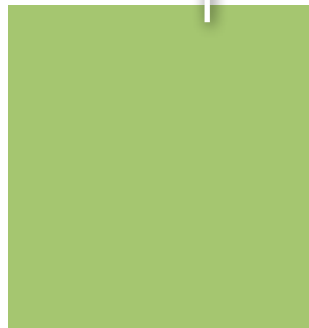
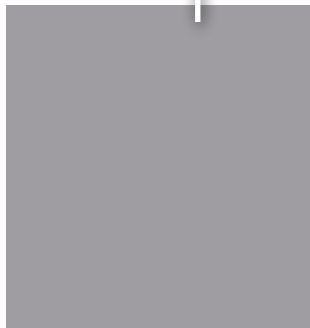
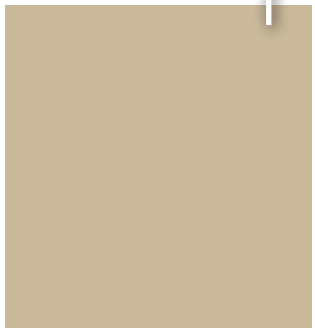


Sweet Gum 5%

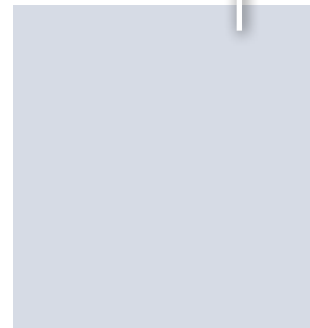
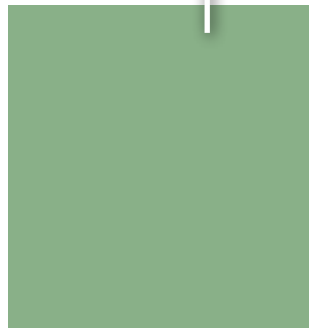
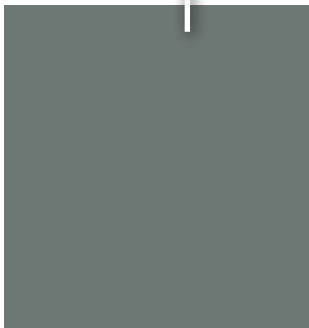
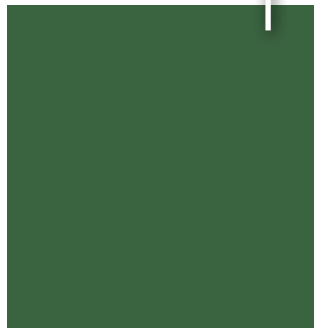
# Select Color Palette: Wekiva River Bridge Location



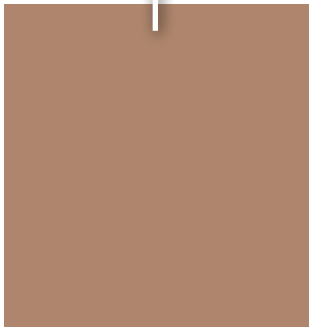
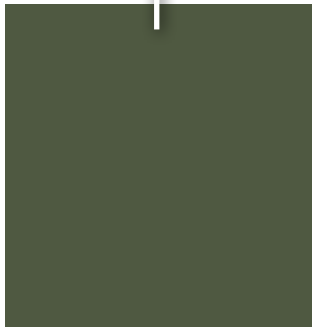
# Color Study - “Celebration of Trees on the River’s Edge”



# Color Study - “Celebration of Trees on the River’s Edge”



# Color Study - “Celebration of Trees on the River’s Edge”



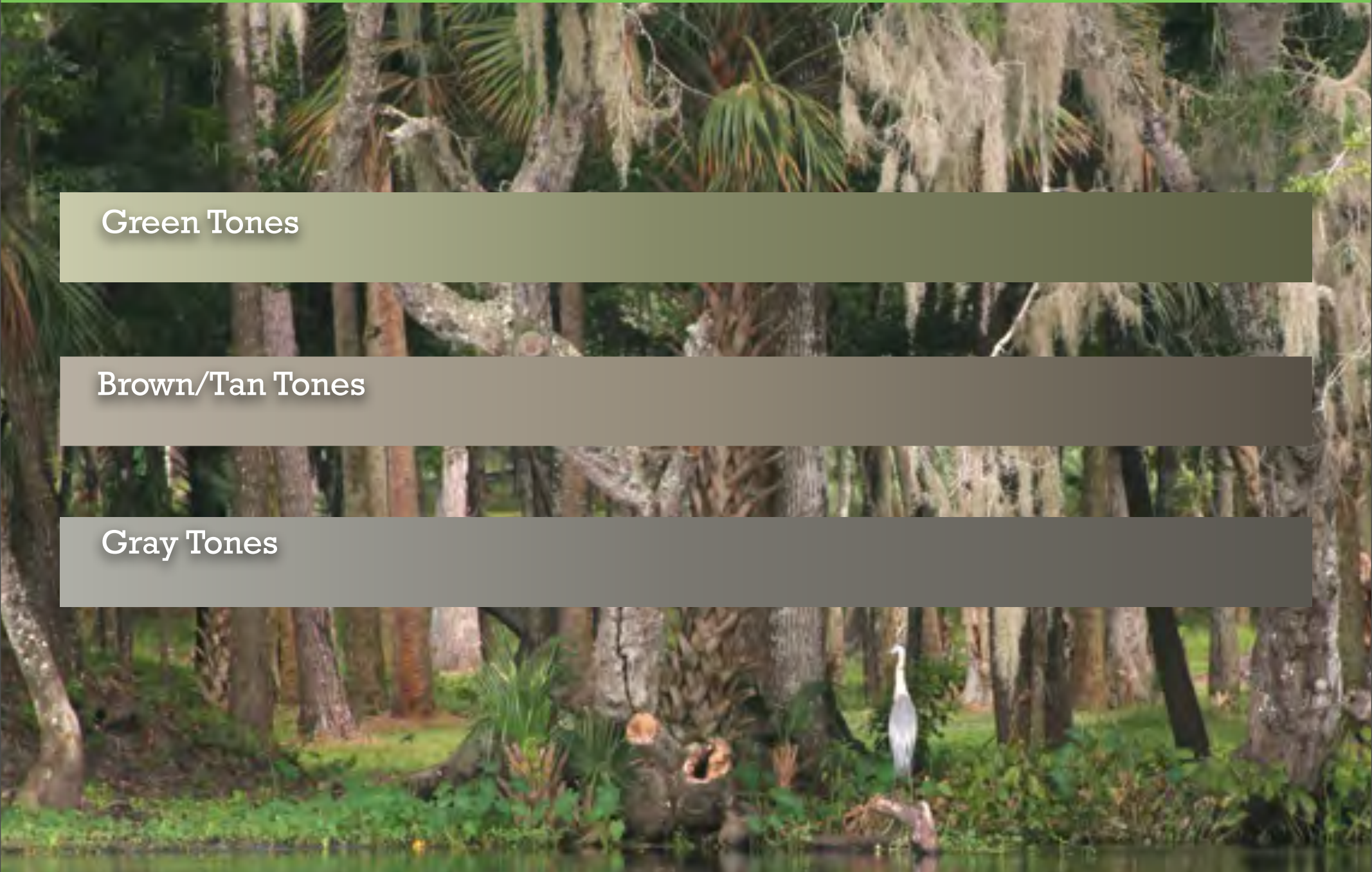


# Color Study - “Celebration of Trees on the River’s Edge”

Green Tones

Brown/Tan Tones

Gray Tones



# Color Study - “Celebration of Trees on the River’s Edge”



Green Tones

Brown/Tan Tones

Gray Tones

# Color Study - “Celebration of Trees on the River’s Edge”



Green Tones

Brown/Tan Tones

Gray Tones

# Color Study - “Celebration of Trees on the River’s Edge”



Green Tones

Brown/Tan Tones

Gray Tones

# Green Tones



# Green Tones



# Green Tones



# Green Tones





# Brown/Tan Tones



# Brown/Tan Tones



# Brown/Tan Tones



# Brown/Tan Tones



# Gray Tones



# Gray Tones



# Gray Tones



# Gray Tones





# Blue Stain Under Bridge to Maximize Openness

**A Great Thing about Nature is its Wonderful Visual Surprises**

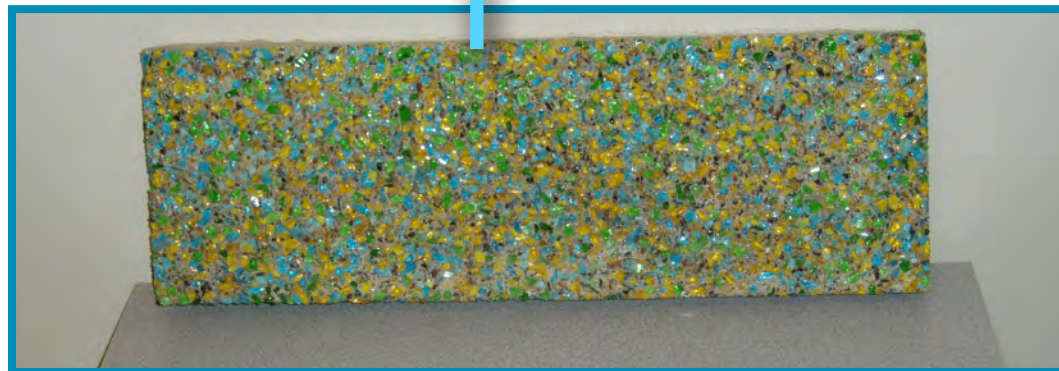
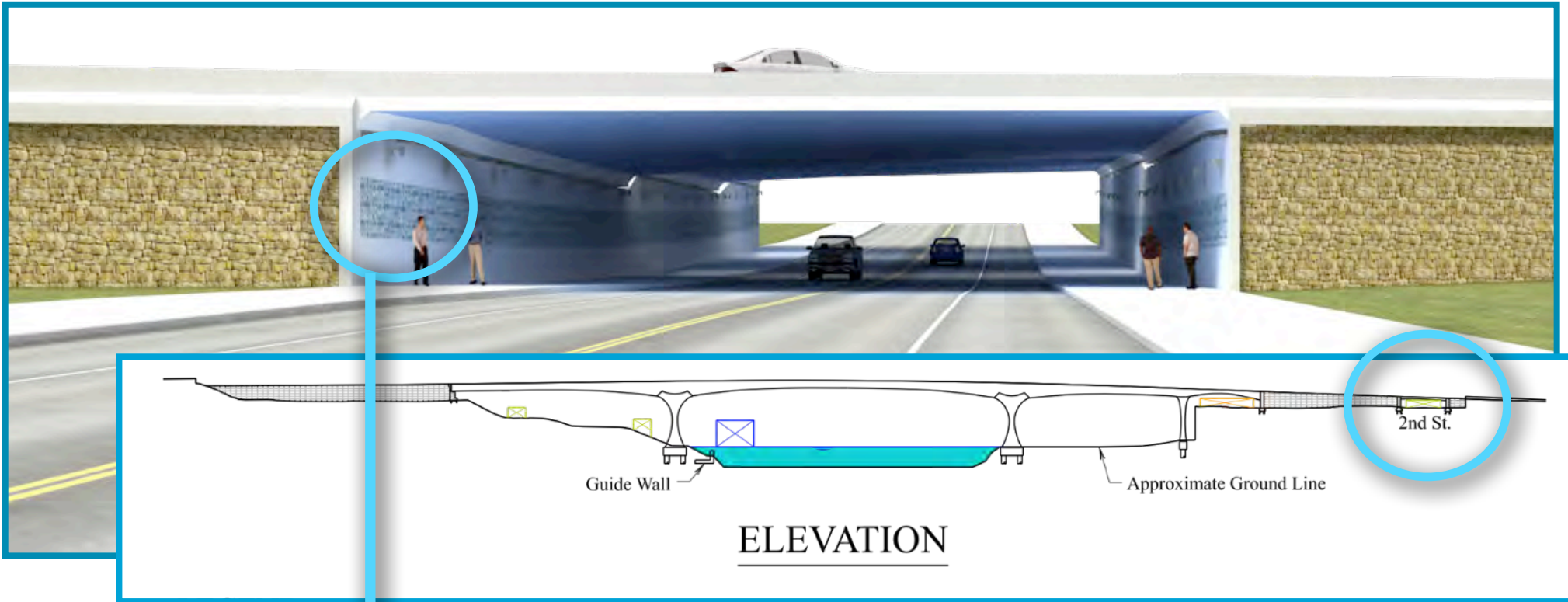


Reflective Blue color emphasizes the open blue sky background

# New I-35W Bridge, Minneapolis, MN



# New I-35W Bridge, Minneapolis, MN



# Subtle Blue Bridge Ceiling



Bridge Opened 2008 - Photo from 2011

# Subtle Blue Bridge Ceiling



Bridge Opened 2008 - Photo from 2014

# Subtle Blue Bridge Ceiling



Bridge Opened 2008 - Photo from 2014

# Discussion on Bridge Color Tone

**Green  
Tones**



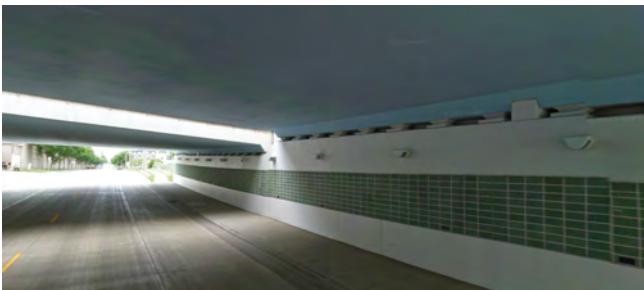
**Brown/  
Tan  
Tones**



**Gray  
Tones**



**Blue  
Tones  
(Underside)**



# Bridge Color Tone Preferences

## FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

### Wekiva River Bridges

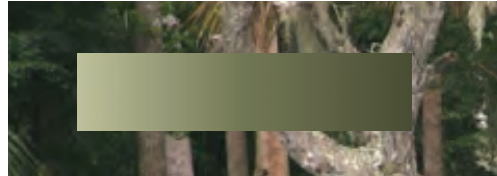
January 28, 2014



### Color Option Preferences

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral.  
NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

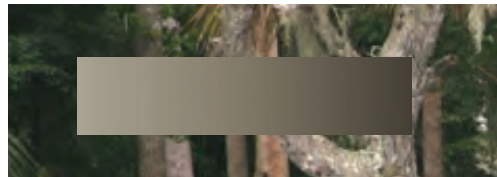
#### 1. Green Tones



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike		Neutral						Like	

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

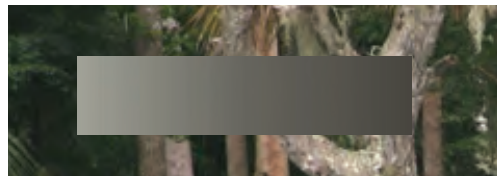
#### 2. Brown/Tan Tones



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike		Neutral						Like	

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 3. Gray Tones



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike		Neutral						Like	

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 4. Blue Tone (Underside)



<input type="checkbox"/>	<input type="checkbox"/>
Yes	No

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





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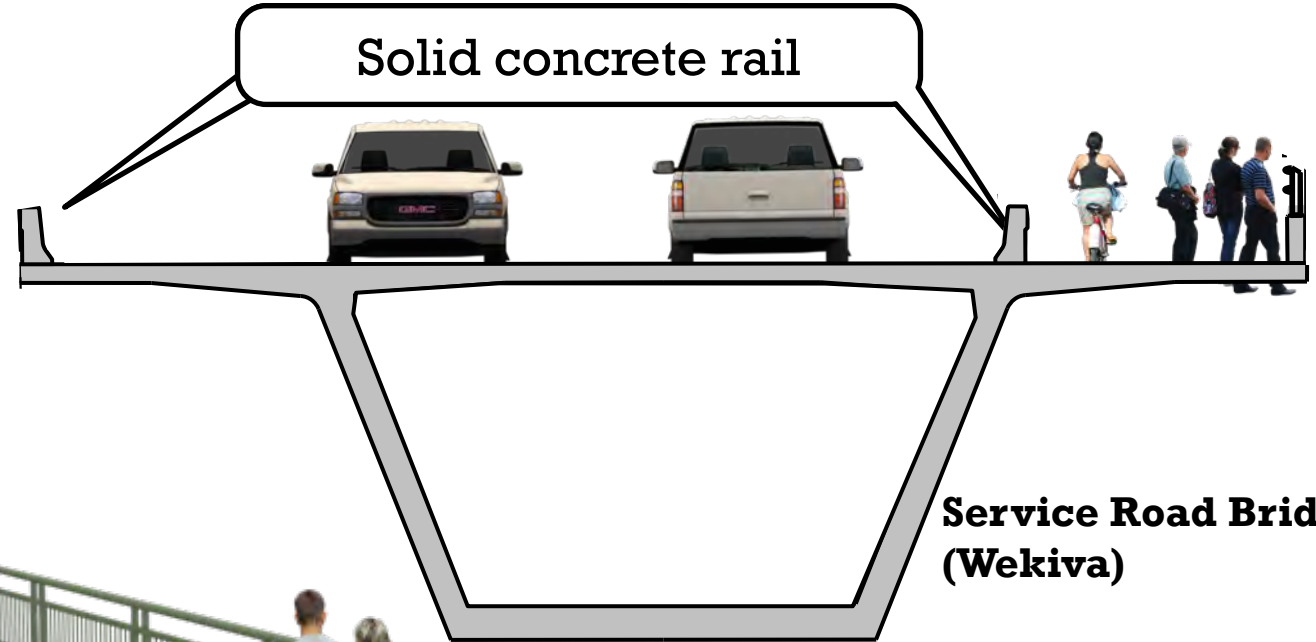
# Bridge Railing for Multi-Use Trail

Open pedestrian rail can have color if desired

Solid concrete rail

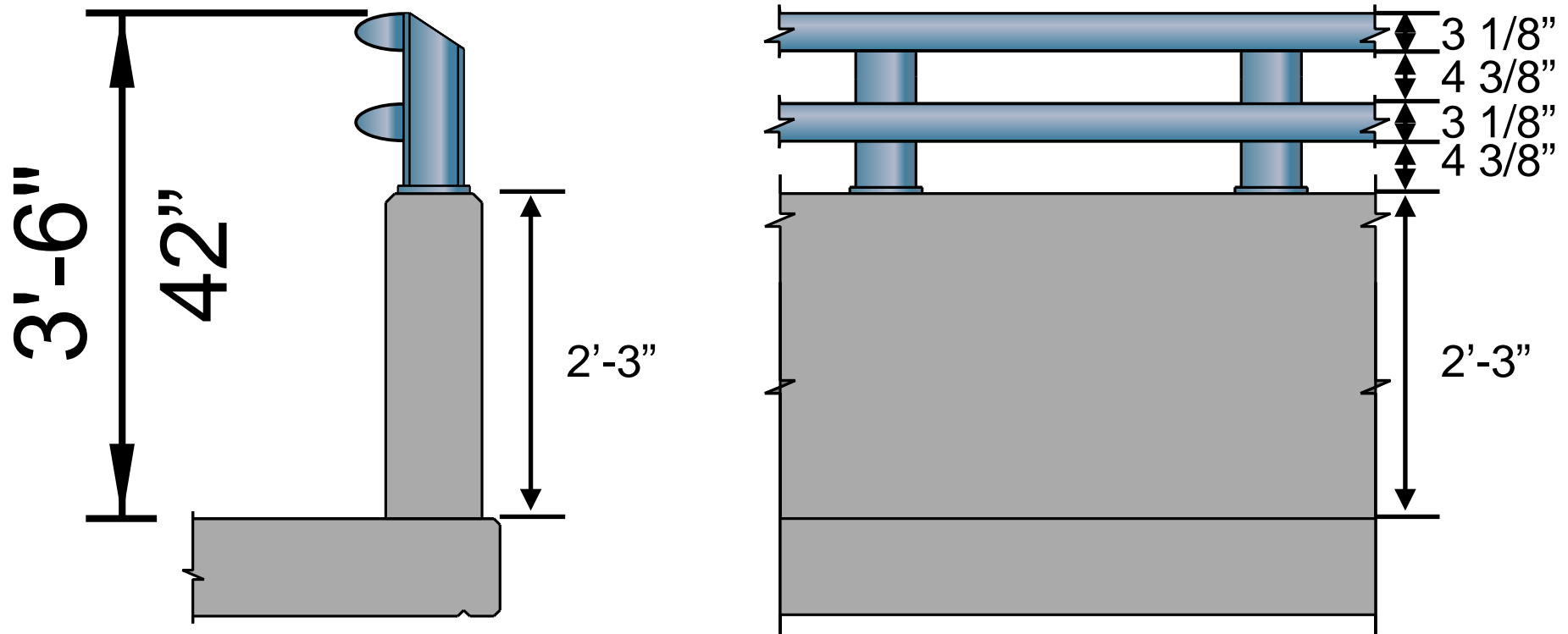
Service Road Bridge (Wekiva)

Multi-use trail



# Bridge Railing Options - Multi-Use Trail

## Option A - Partially Open



FDOT Index 820 Bridge  
Pedestrian/Bicycle Bullet Railing

# Option A - Partially Open



# Option A - Partially Open



# Option A - Partially Open

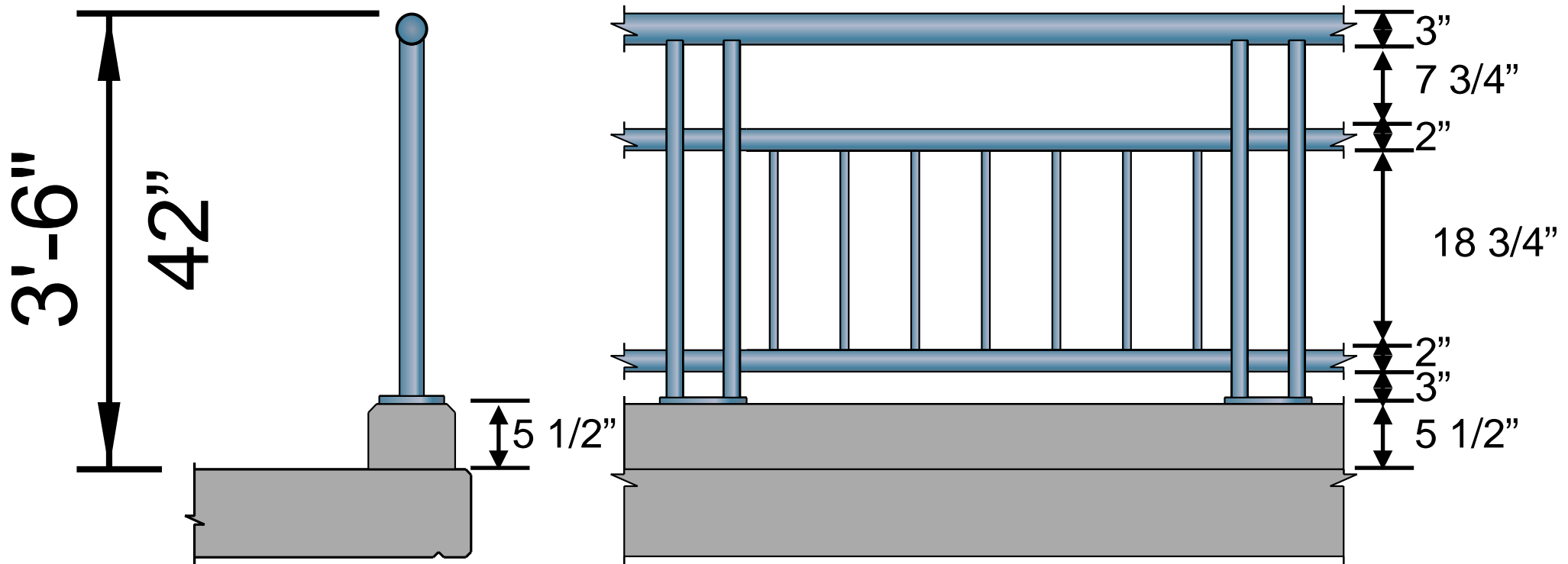


# Option A - Partially Open



# Bridge Railing Options - Multi-Use Trail

## Option B - Fully Open



FDOT Index 861 Bridge  
Pedestrian/Bicycle Railing



# Option B - Fully Open



# Option B - Fully Open



# Option B - Fully Open

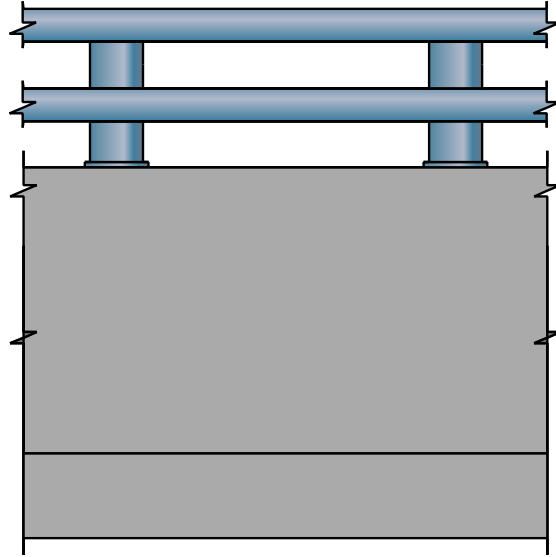


# Option B - Fully Open

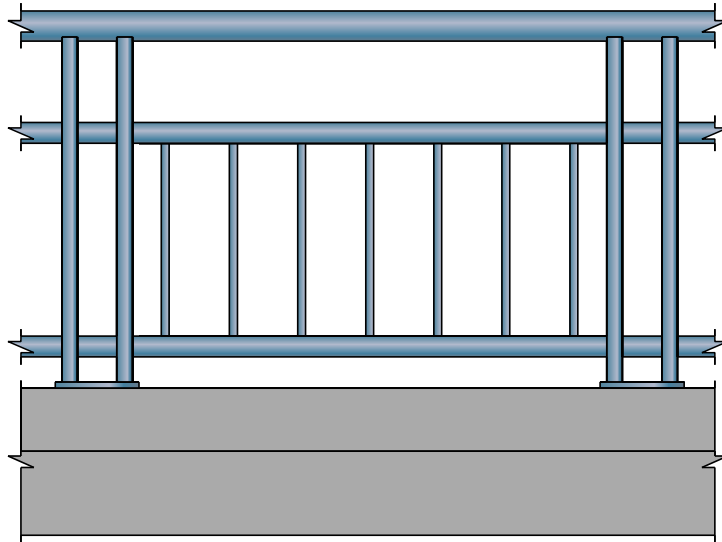


# Discussion on Railing for Multi-Use Trail

**Option A  
Partially Open**



**Option B  
Fully Open**



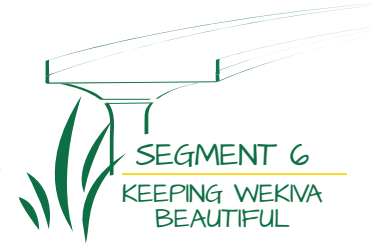
# Multi-Use Trail Rail Preference

## FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

## Wekiva River Bridges

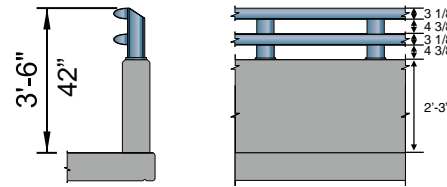
January 28, 2014



### Bridge Railing Preference

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral.  
NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

#### 1. Option A – Partially Open



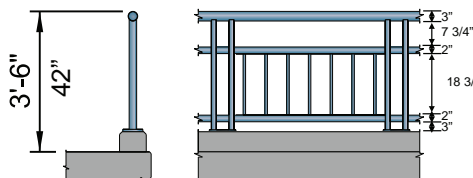
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike				Neutral		Like			

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### 2. Option B – Fully Open



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10
Dislike				Neutral		Like			

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



SEGMENT 6  
KEEPING WEKIVA  
BEAUTIFUL

Break/Discussion

# Pier Shape Preference Results

**Pier Concept B**



**1**



**Pier Concept D**



**2**

RANK

Average  
Score

Total #  
of 1's

1.47

8

1.53

7



# Bridge Color Tone Preferences Results

## FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

### Wekiva River Bridges

January 28, 2014

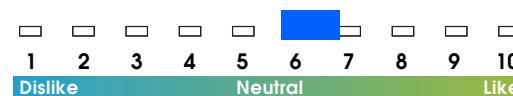
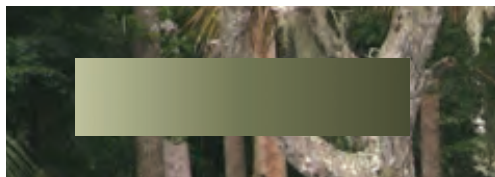


### Color Option Preferences

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral. NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

#### 1. Green Tones

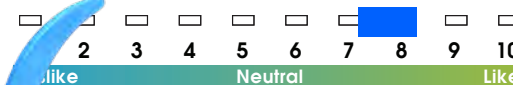
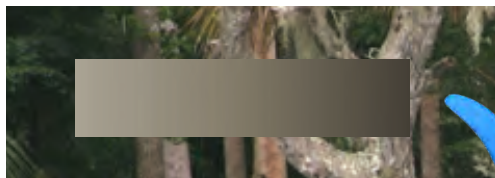
6.4



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 2. Brown/Tan Tones

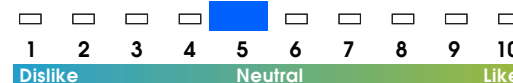
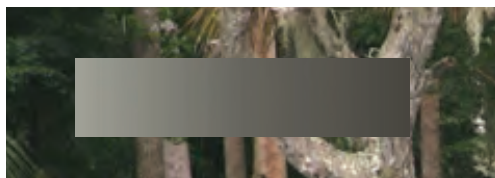
7.9



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 3. Gray Tones

5.3



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### 4. Blue Tone (Underside)



Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

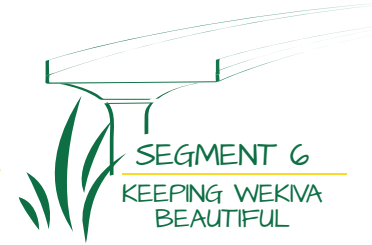
# Multi-Use Trail Rail Preference Results

## FINAL BRIDGE DESIGN CHARETTE 2

SR 429/SR 46 Wekiva Parkway

## Wekiva River Bridges

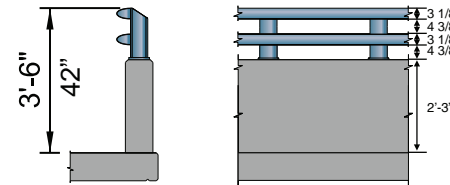
January 28, 2014



### Bridge Railing Preference

Using the black pens provided, please fill in completely one black box for each item that represents your preference. If no box is filled then a 5 will be recorded as Neutral. NOTE: 1 = Lowest Score (Dislike); 5 = Neutral; 10 = Highest Score (Like).

#### 1. Option A – Partially Open



<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

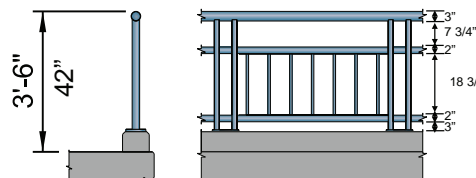
Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2.4

#### 2. Option B – Fully Open



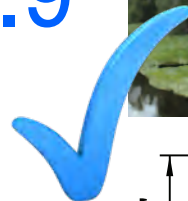
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1	2	3	4	5	6	7	8	9	10	
Dislike			Neutral				Like			

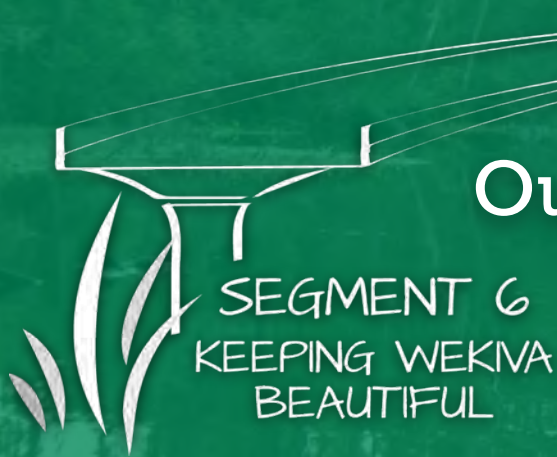
Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9.9





# Outstandingly Remarkable Value (ORV) Initiatives Discussion and Feedback

# Outstandingly Remarkable Values (ORV)

**Scenic**

**Recreation**

**Wildlife and Habitat**

**Historic and Cultural**

**Water Quality and Quantity**

# Scenic

**Bridge preserves and enhances scenery by repetition of surrounding landscape's fundamental visual elements of form, line, color and texture**

**Visual contrasts of the bridge against the surrounding landscape is minimized through optimized vertical profile and aesthetics**

**Sound and light:**

**Clear distances between bridges are 9'-11" and 12'-11" to add light**



# Comments Received on the Outstandingly Remarkable Values (ORV)

## Scenic

**“Very important – nature is beauty”**

**“ALL are equally important”**

**“Essential”**

**“Ultimate design needs to blend into the surrounding landscape to minimize the impact on this ORV”**

**“Blend into the character of the Wekiva area; make for a more pastoral, pleasant experience”**

**“I think it’s more important to be scenic from the river versus the bridge”**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Scenic

**“Already gave my color, etc. comments”**

**“The wider span of the bridge should greatly improve the vista”**

**“Maintain aesthetics”**

**“Scenic views are important BOTH from the ground and the bridge. A glimpse of the river, no matter how short, is worth it to some!”**

**“Very important to keep noise level reduced”**

**“This is a top tier ORV and is important specifically for people on the river and on the bank. I don’t believe the bridge will impact the scenic values when compared to existing bridge”**

# Recreation

**River recreation experience is enhanced by:**

**Pier locations being completely removed from the river and allowing unobstructed passage**

**Construction will allow use of the river during construction**





# Comments Received on the Outstandingly Remarkable Values (ORV)

## Recreation

**“Very important to have people enjoy our resources”**

**“Maintain or enhance aesthetic values as best as possible”**

**“Though important, water quality & quantity is necessary for this value”**

**“Ultimate design needs to blend into the surrounding landscape to minimize the negative impact & to ensure that the user experience is an enjoyable one”**

**“I grew up in Lake County & this area has always had a recreational use for my family”**

**“Provide a larger area of water body to traverse”**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Recreation

**“There will always be people enjoying the river”**

**“Removal of the bridge supports in the water will improve the experience from the water”**

**“Minimize contrast of structure with environment”**

**“Canoe/kayak, fishing, photography, bird watching”**

**“Very important that unobstructed passage allow use of river during construction”**

**“Also a top tier ORV, access to the river is important to our citizens”**

## **Upland and Wetland Habitats**

### **Impacts minimized by:**

**Using the existing road corridor**

**Extending the bridge ends to span the river & floodplain will improve the connection to adjacent habitats that are currently severed by fill.**

**Strict erosion control measures to minimize impacts to aquatic species**

**Raising the bridge to reduce shading impacts and reduce noise immediately beneath the bridge**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## **Wildlife and Habitat**

**“Increasing the span widths will have a positive impact on the movement of wildlife through the region”**

**“Continue to protect & improve wildlife habitat”**

**“The expansion of the corridor will be a great improvement for all wildlife”**

**“The proposed improvement will provide a tremendous benefit to wildlife/habitat and habitat connectivity when compared to the existing condition”**

**“1750’ span good – need additional span on Seminole County side”**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Wildlife and Habitat

**“Very important to preserve what habitat is left”**

**“As discussed, cannot lessen the wildlife corridor due to the lack of it now”**

**“I believe that considering greater height for the bridge structure will substantially benefit wildlife habitat, enable light to reach the island and reduce noise impacts”**

**“All are connected”**

**“Protect habitat and provide needed transportation facilities”**

**“Construction will be disturbing. End product will hopefully be lots better”**

**“Well considered, so far”**

# Island Tree Survey

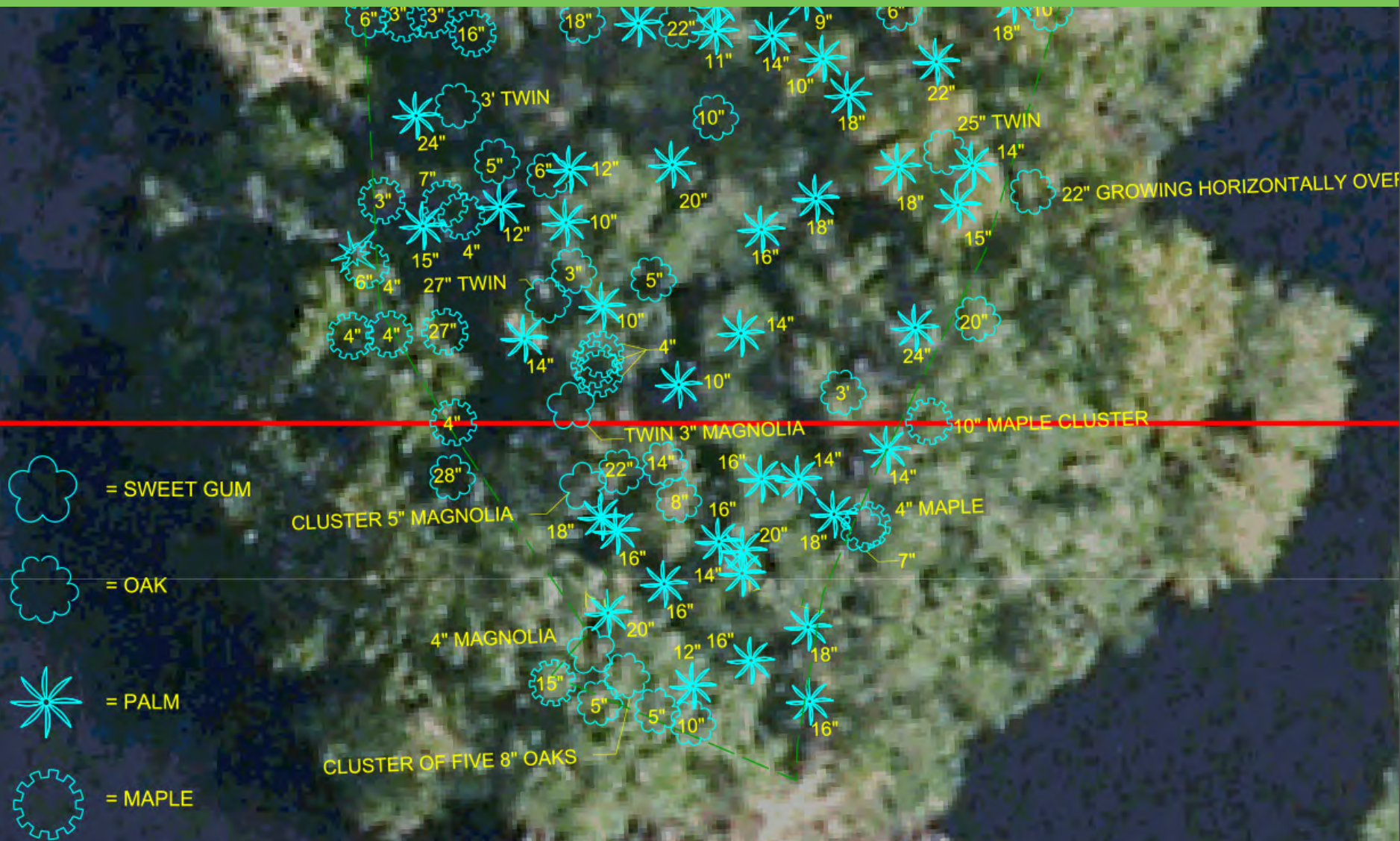
**Island on North Side  
of Wekiva River Bridge**



# Island Tree Survey



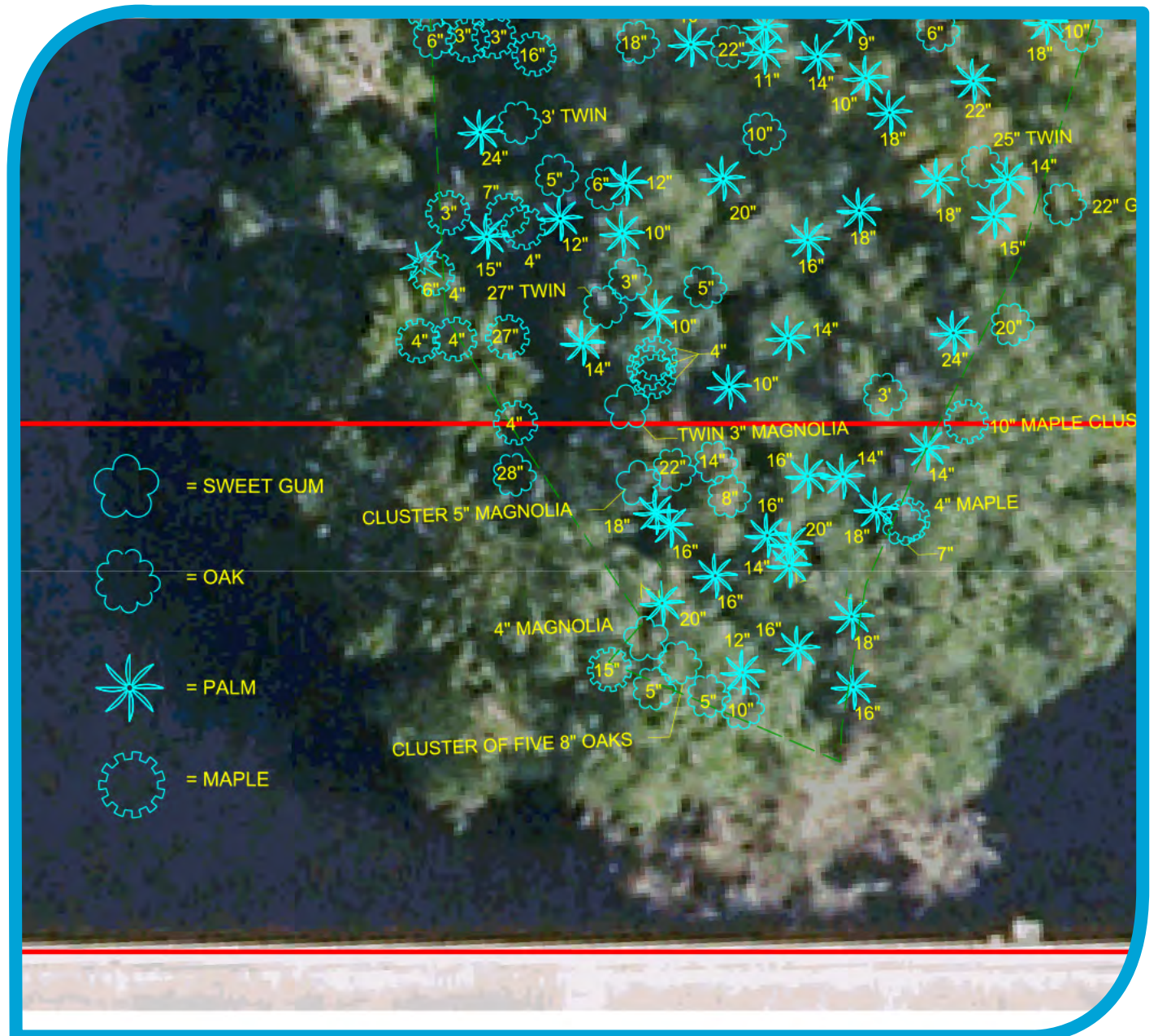
# Island Tree Survey





# Island Tree Survey

Species	#	%
Elm	1	3%
Red Maple	5	14%
Dahoon Holly	6	17%
Laurel Oak	7	19%
Sweetgum	1	3%
Cabbage Palm	16	44%
<b>Total</b>	<b>36</b>	<b>100%</b>



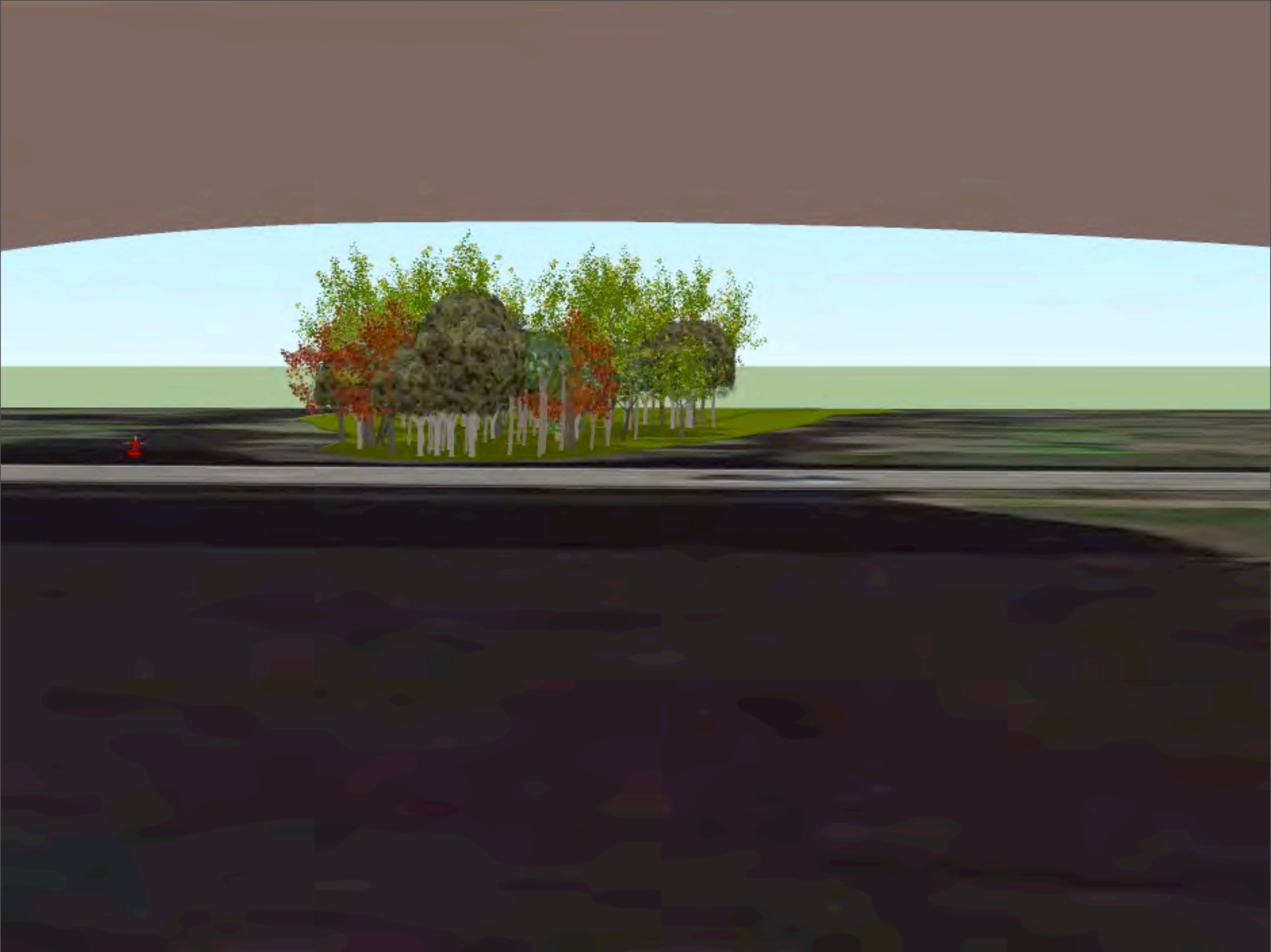
# Island Light Study Rendering



# Island Light Study







# Historic and Cultural

**Potential Impacts will be minimized by:**

**Using the existing road corridor**

**Spanning the river & floodplain**

**There are no documented archaeological or historic sites within the bridge footprint.**

**The proposed improvements are not expected to impact any archaeological or historic sites which are listed, determined eligible, or considered potentially eligible for listing in the NRHP.**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Historical and Cultural

**“Very important cultural resources!”**

**“Not applicable for this location”**

**“This is an education issue – traditional forms & colors are important”**

**“Do not destroy the wild & scenic character of the river”**

**“Maintain the rural character of the Wekiva area”**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Historical and Cultural

**“Not applicable at this location as far as we know. There may be mastodon bones or ancient canoes or more modern artifacts. Wouldn't hurt to have an ARM around & have construction workers keep an eye out for artifacts, etc.”**

**“N/A”**

**“Let's create history with a successful project that can / meet these goals”**

**“Very important”**

**“The ORV is a lower tier ORV in the bridge area”**



# Water Quality and Quantity

**The project will ensure attenuation requirements are met**

**Attenuation of peak flows to the river**

**Maintain pre-development discharge**

**No loss of Wekiva River floodplain volume**

**Improved flow through clear-spanning of the river  
and removal of the existing bridge piers**



# Comments Received on the Outstandingly Remarkable Values (ORV)

## Water Quality and Quantity

**“Don’t want to degrade an OFW and Wild and Scenic River”**

**“Most important value. River MF&L is set at 150 CFS –  
this week it was at 130 CFS”**

**“Storm water design needs to meet or exceed the criteria  
to ensure that the water quality is not impacted”**

**“It’s pristine, let’s keep it that way”**

**“Do not negatively reduce water quality or quantity;  
provide protection to this valuable asset”**

# Comments Received on the Outstandingly Remarkable Values (ORV)

## Water Quality and Quantity

**“Extremely important”**

**“Retention ponds, natural contour, natural vegetation,  
fence not necessary on state lands”**

**“Ensure no turbidity violations during construction”**

**“Minimize erosion, people getting out of their boats to  
access the land under the bridge”**

**“Very important”**

**“Also important to sustain the “Scenic”, “Recreation”  
and “Wildlife/Habitat” components”**

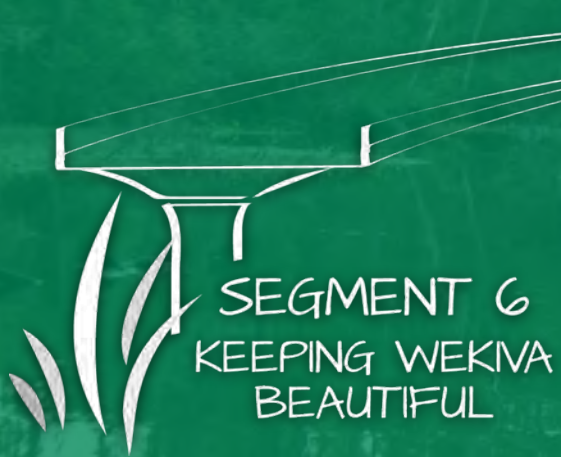


# Discussion of Outstandingly Remarkable Value Initiatives

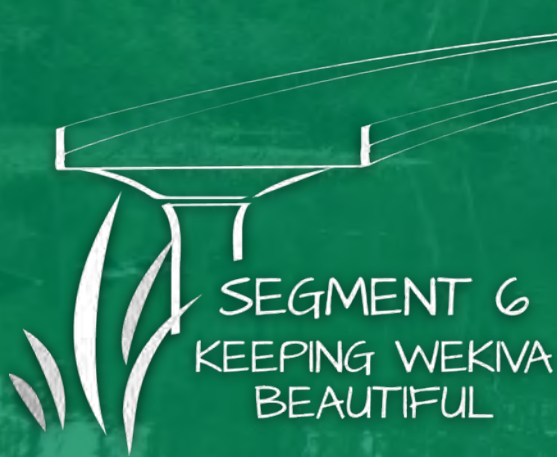


SEGMENT 6  
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## Summary of Final Bridge Design Charette 2



# Review of Preferences Selected



Hannah Hernandez  
District Five, Permit Coordinator  
Florida Department of Transportation

# Important Dates

**Results of Final Bridge Design Charette 2  
Preferences are used to create Bridge Layout  
and Renderings**

**Final renderings presented at February 12, 2014  
WRSAMC meeting**

**Permit Submittal on March 3, 2014 (Tentative)**

**Public Information Meeting on April 29, 2014**



# Federal Permitting Process



Is project federally assisted ?

Yes

Is project within a Wild and Scenic River (WSR) corridor?

Yes

Does project involve construction in WSR's bed or banks below ordinary high water mark?

Yes

Project evaluated under Section 7(a) "direct and adverse effect" standard; evaluation submitted to Federal permitting agency (USACE)

Federal permitting agency (USACE) issues CWA Section 404 Permit Public Notice and begins consultation with river-administering agency (NPS)

NPS –USACE – FDOT Coordination and Consultation w/ WRSAMC Stakeholder Input

NPS provides Section 7(a) Determination to USACE

USACE issues CWA Section 404 Permit for activity



# Thank You

for Participating in Creating  
Your Bridge Design!