FDOT FIU

PEDESTRIAN BRIDGE OVER SR 90/SW 8 ST & C-4 CANAL

FPID NO. 447046-1-32-01

ORAL PRESENTATION

bcc engineering

TODAY'S PRESENTERS

ARIEL MILLAN, PE

Principal
In Charge

FIU CLASS OF 1995

KATHY LAJO, PE

Project
Manager

FIU CLASS OF 1996

AGUSTIN BARRERA, AIA

Architect
QA/QC

FIU CLASS OF 2005

JAMES BOWERS, AIA, NCARB, LEED AP

Architect

LEO SPAANS, PE, SE

Lead Structural
Engineer/Complex
Bridge Design

OSCAR OLIVA, PE

Lead Roadway
Engineer/TCP

FIU CLASS OF 2009

INTRODUCTION

PROUD FIU HERITAGE:

- Our Team is composed of over 100 FIU Graduates!

LOCAL RELEVANT PROJECT EXPERIENCE

- SR 836, 17th Avenue Toll Plaza
  BA - Architect, BCC - Structural Engineers
- I-395 Signature Bridge
  (Janssen & Spaans, Structural Engineering & Constructability Analysis)
- City of Miami Beach Baywalk Connector Pedestrian Bridge
  (Kathy Lajo, PE - Project Manager)
- US-1 Douglas Station Pedestrian Bridge
  (Kathy Lajo, PE - Deputy Project Manager)
- US-1 University Station Pedestrian Bridge
  (Kathy Lajo, PE - Engineer of Record)

PEDESTRIAN BRIDGE EXPERIENCE

- 40+ Pedestrian Bridges
- 20+ Cable Stay Bridges

RELEVANT SKILLS SET

- A Team with unparalleled constructability experience = Strong Design-Build resume
- Unmatched understanding of D6's policies and procedures
- A team with proven ability to deliver to District 6
- One of the most respected CEI groups in South Florida = safety and constructability reviews

RELEVANT PROJECTS

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APPROACH TO THE PROJECT

ARCHITECTURAL EXPERIENCE

- Iconic Design
- Unique User Experience
- Verticality
- Gathering Place
- Events
- Plazas
- Shared-Use Multimodal Facility
- Provide Streetscape Elements
- Specialty Lighting

DESIGN & CONSTRUCTABILITY

- Safety/Redundancy
- Construction Sequence/ Constructability
- MOT/Minimizing Impacts to Traveling Public
- Durability
- Low Maintenance
- Life Cycle
- Budget Conscientious
- Form Follows Function

AESTHETICS

USER EXPERIENCE

- Iconic Bridge Design
- Unique Experience
- Pleasant and Inviting Design
- Very Active Area Throughout the Bridge
- Lounging Areas

AESTHETICS

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BRIDGE MATERIALS

- Aluminum Cladding on Bridge Roof and Fascia
- Standing Seam Roof Material
- Exposed Concrete Finishes
- Stainless Steel Mesh
- Wood Bench / Lounge

AESTHETICS

BRIDGE FEATURES

- LED Programmable Specialty Lighting Controls
- All Furniture removable if needed
- Open and inviting Plaza Electrical Outlets @ 40’ O.C. and WIFI
- CPTED (Crime Prevention Through Environmental Design)
- LEED Certification
- ADA Compliance / Elevator “Book-ends”
- Bicycle Accommodations and Accessibility
- Front/Back Elevators / Transparent Cab and Hoistway

CPTED CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

CPTED

- Territoriality / Citizen Ownership
- Surveillance/CCTV/Natural Light/ Mechanical Light
- Access Control
- Activity Support/Constant Use/ Discourage of Crime
- Image/Maintenance/Appearance
- Target Hardening

LEED CERTIFICATION

LEED CREDIT CATEGORIES

- Sustainable Practices
- Bridge Life Cycle Strategies
  - Accessibility
  - Durability of Materials
- Local Strategies for Building Material Procurement
- Green Strategies implemented within bridge
- Planters, Irrigation

BASE DESIGN

REFINED DESIGN

BASE DESIGN

REFINED DESIGN

RECONFIGURATION OF PYLON DESIGN (SHIFT IN ANGLE AND SHAPE)

BASE DESIGN

REFINED DESIGN

RECONFIGURATION OF ROOF SHAPE AND DESIGN RESULTS IN 4% MORE ROOF COVERAGE

BASE DESIGN

REFINED DESIGN

COLUMN RECONFIGURATION

RECONFIGURED CROSS SECTION

STANDING SEAM ALUMINUM PANELS

BASE DESIGN

REFINED DESIGN

RECONFIGURATION OF COLUMN SHAPE AND SIZE

INTEGRAL CONCRETE POUR

ALUMINUM PANELING SOFFIT & FASCIAS

ARCHITECTURAL CONCRETE FINISH

GFRC OPTION

STAINLESS STEEL MESH
WOOD BENCHES
NATIVE PLANTING

GFRC EXTERIOR LOUNGE FURNITURE

BASE DESIGN

REFINED DESIGN

RECONFIGURATION OF ELEVATOR “BOOKENDS”

CLEAR GLAZING
SMOOTH STUCCO FINISH
ARCHITECTURAL LOUVERS
CANOPIES OVER BOOKENDS

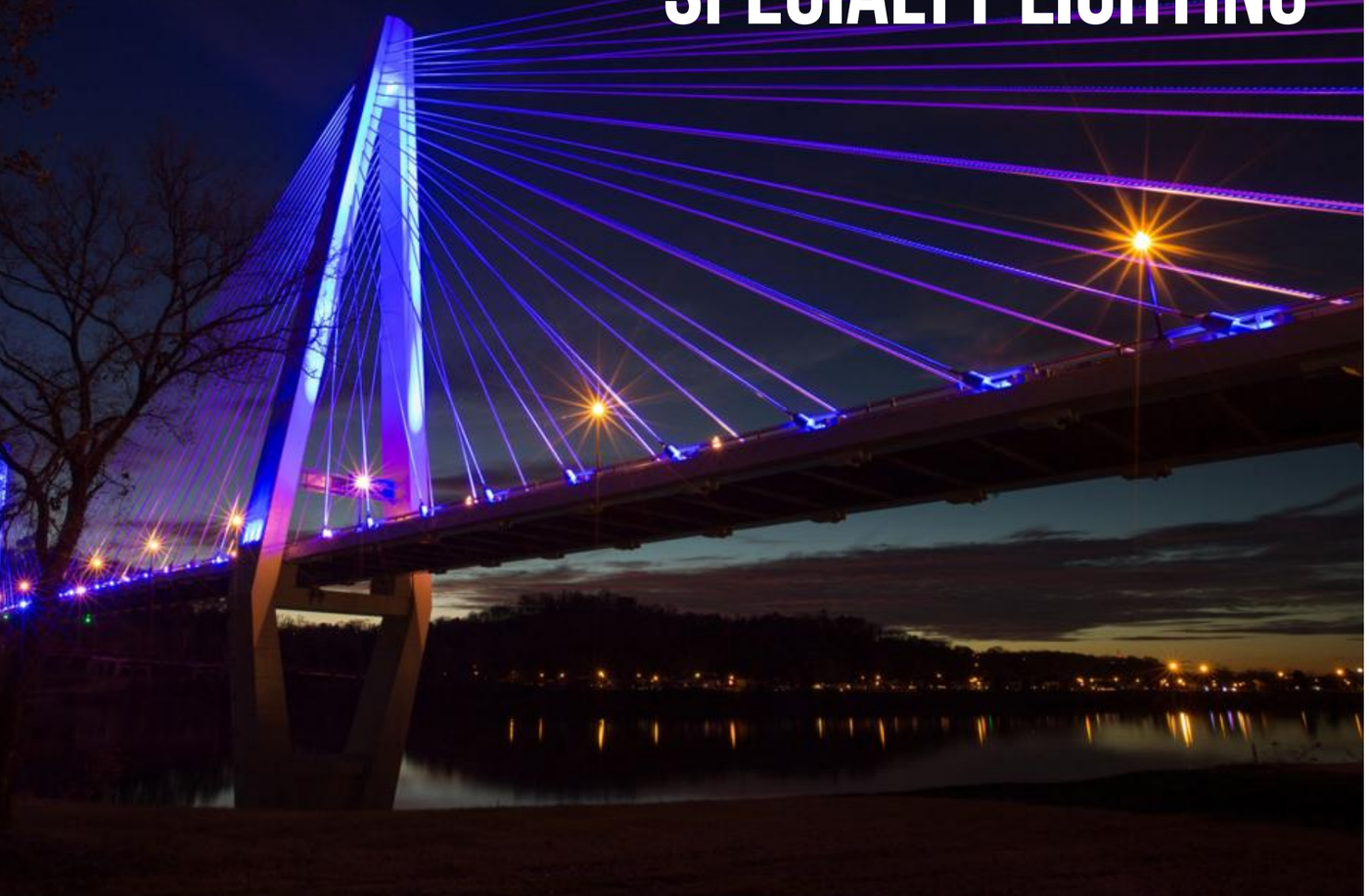
PLAZAS

BLUE TONED PAVING MATERIAL
STAMPED CONCRETE

FLORIDA NATIVE PLANT PALETTE
PROVIDE COLOR, TEXTURE & SOFTEN HARDSCAPE
LOW MAINTENANCE
ACCENT PLAZAS BOLD SHAPES

OPEN & INSPIRING ATMOSPHERE

SPECIALTY LIGHTING



BRIDGE FUTURE CONNECTION

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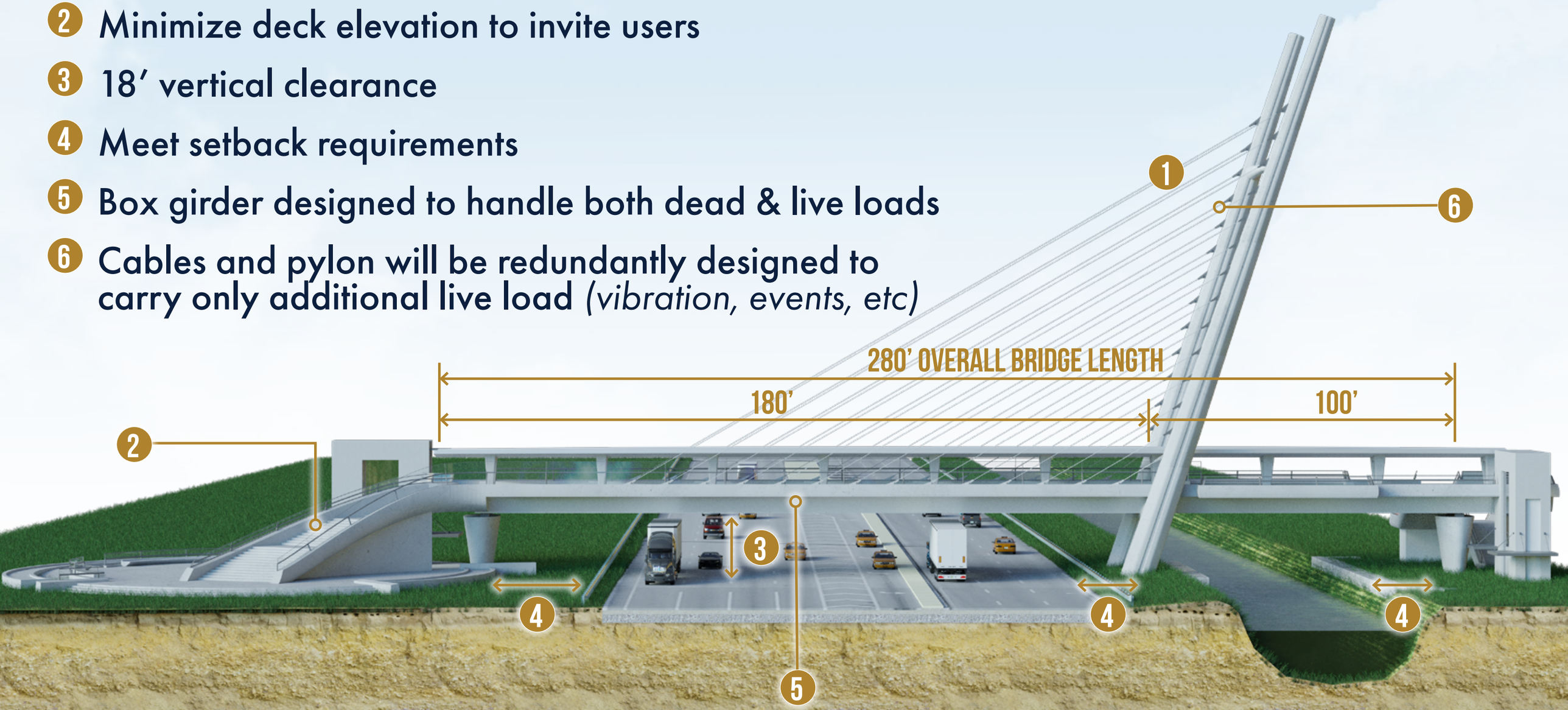
CONTINUOUS BRIDGE CONNECTION TO THE EXISTING FIU PARKING GARAGE

STRUCTURAL DESIGN APPROACH

BRIDGE

1. Complex, cable-stayed bridge structure
2. Minimize deck elevation to invite users
3. 18′ vertical clearance
4. Meet setback requirements
5. Box girder designed to handle both dead & live loads
6. Cables and pylon will be redundantly designed to carry only additional live load *(vibration, events, etc)*

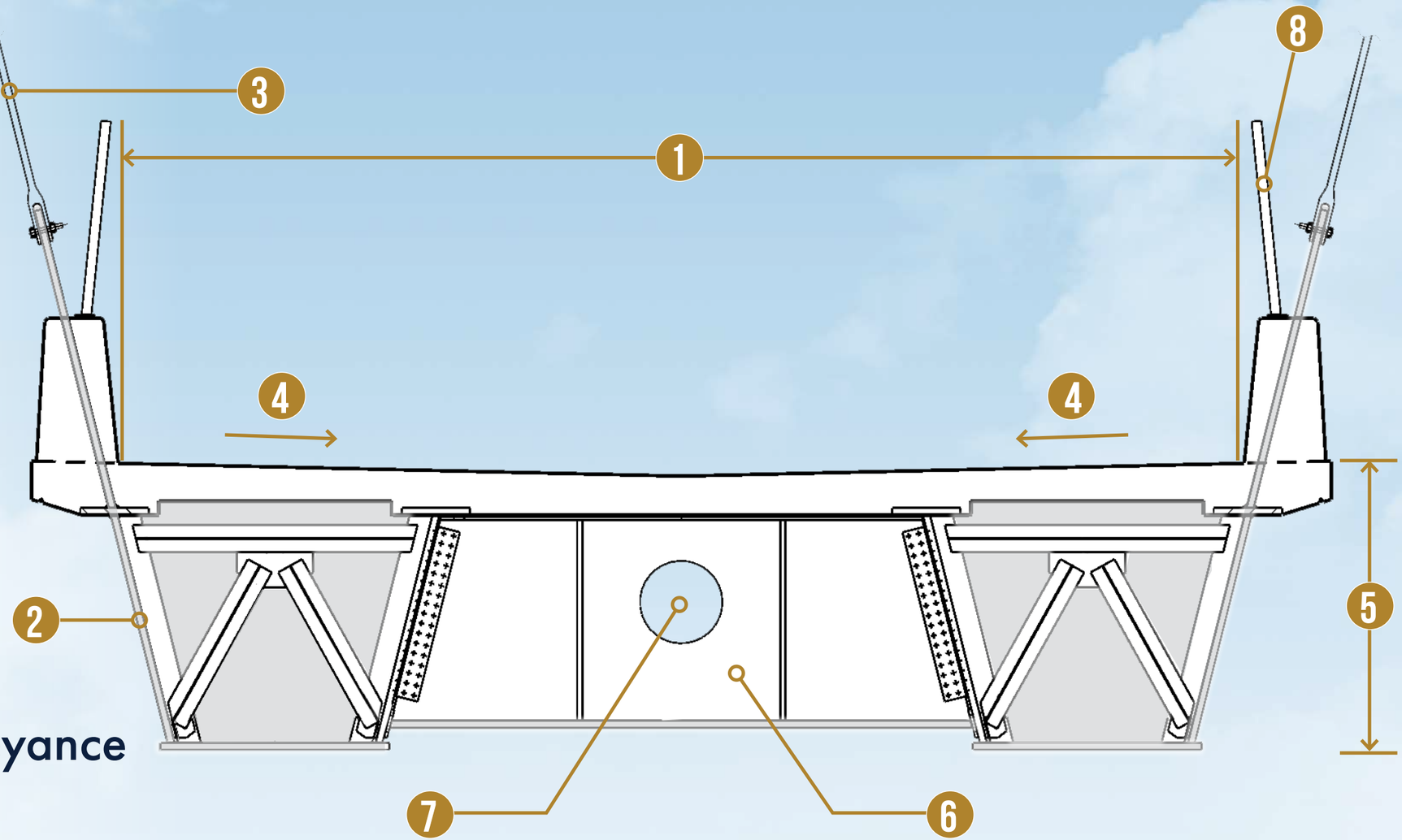


STRUCTURAL DESIGN APPROACH

TYPICAL SECTION

Steel Box Girders

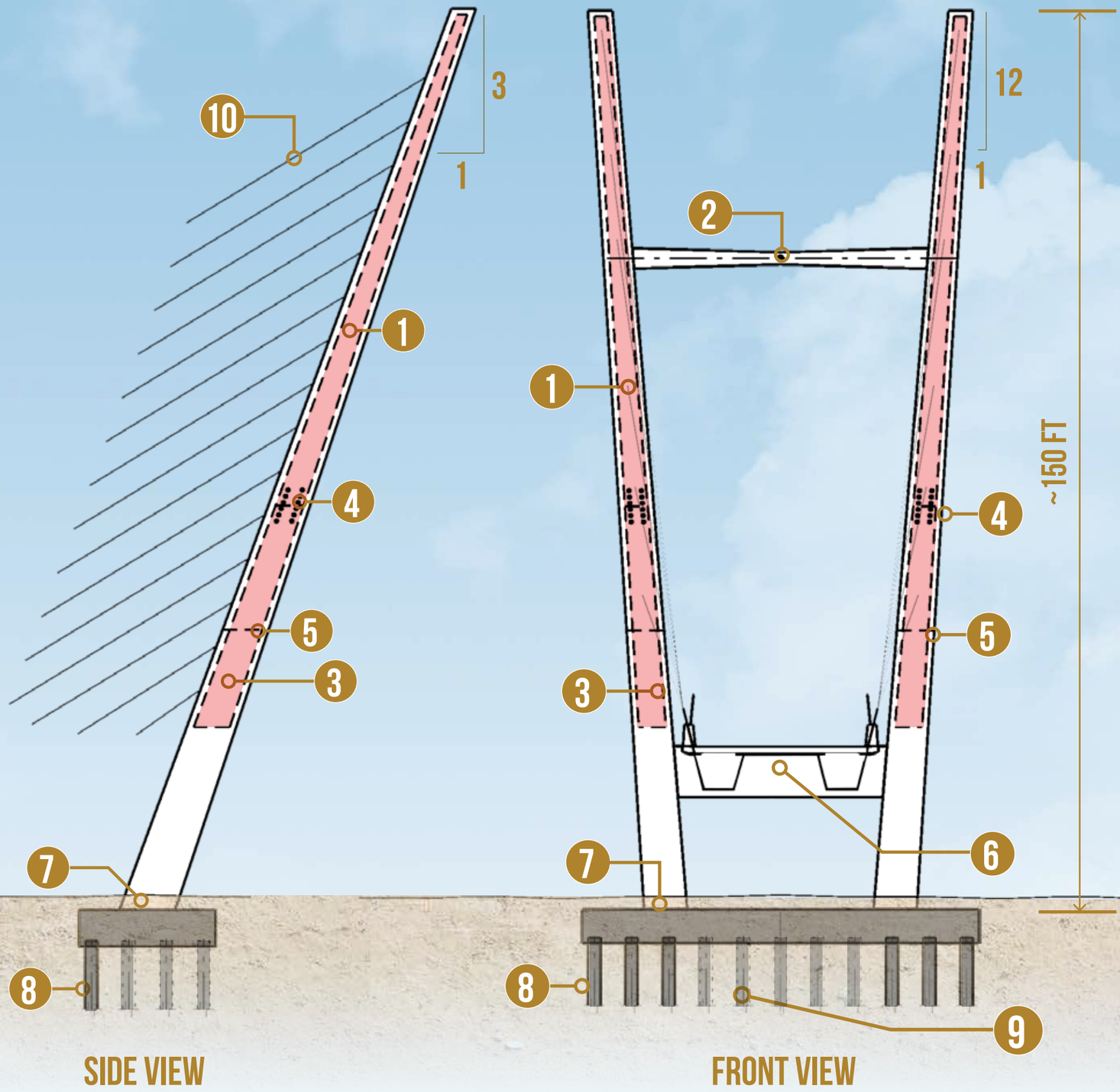
1. 20′ (min.) to 30′ (max.) walkable width
2. Steel box girder (typ.)
3. Galvanized clevis and wire rope cable
4. Deck sloped towards center for drainage
5. 6′-8″ max depth
6. External cross beam
7. Hole for drainage conveyance
8. Decorative stainless steel fence/mesh guard



STRUCTURAL DESIGN APPROACH

PYLON

1. Structural Steel Core Encased in Reinforced Concrete
2. Horizontal Strut
3. Steel Core Embedded in Reinforced Concrete Base
4. Bolted Field Splice Embedded in Concrete
5. Concrete Construction Joint
6. Post-Tensioned Integral Cap
7. Conventionally-Reinforced Concrete Pylon to Footing Connection
8. Proposed Augercast Pile (Typ.)
9. Existing Prestressed Concrete Pile
10. Galvanized clevis and wire rope cable (typ.)

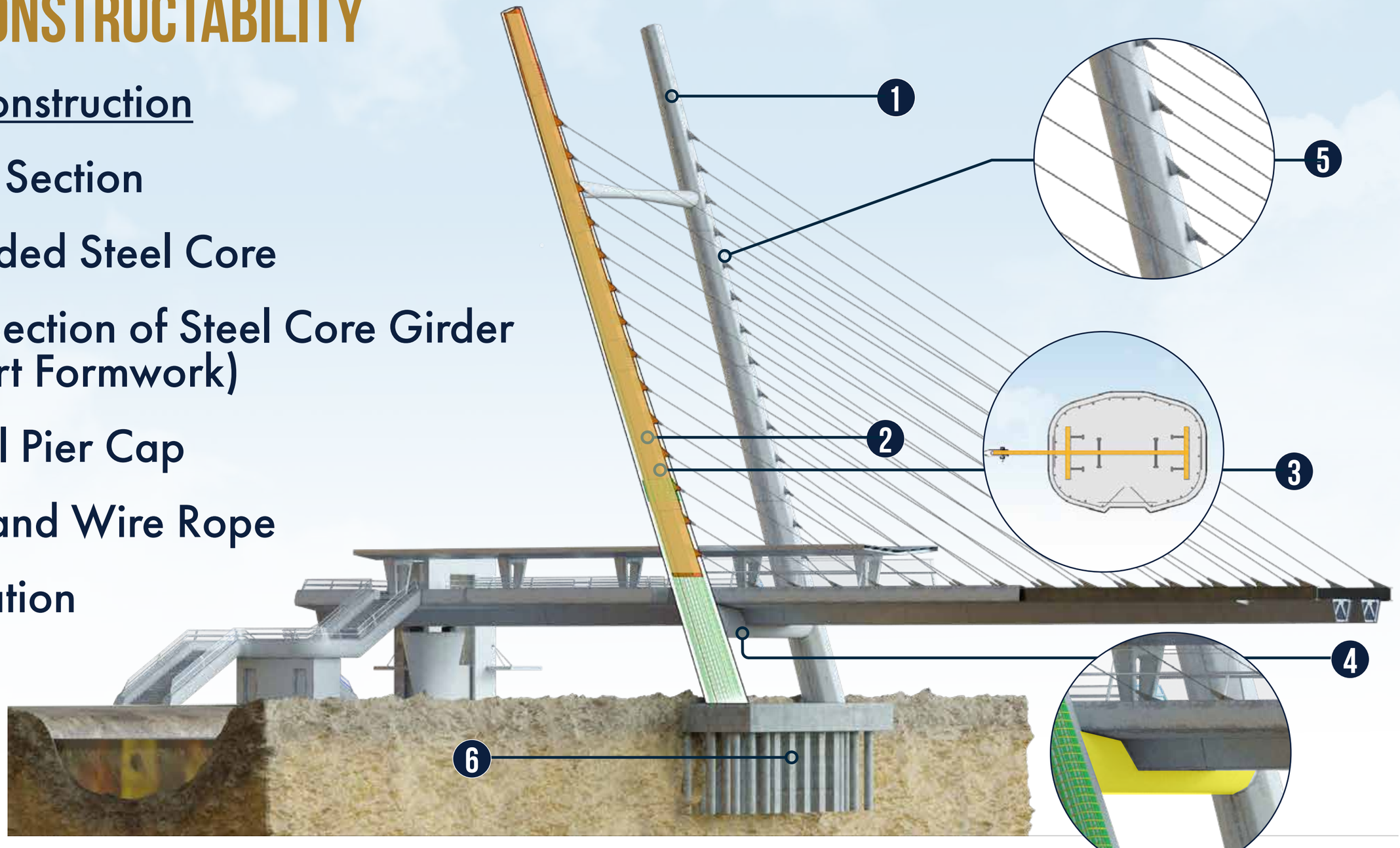


STRUCTURAL DESIGN APPROACH

PYLON CONSTRUCTABILITY

Ease of Construction

1. Hybrid Section
2. Embedded Steel Core
3. Cross Section of Steel Core Girder (Support Formwork)
4. Integral Pier Cap
5. Clevis and Wire Rope
6. Foundation



STRUCTURAL DESIGN APPROACH

CONSTRUCTION STEP 1

Construction Activities

1. Remove existing footing cap at Pylon 2
2. Test existing piles for integrity and capacity
3. Install new augercast piles at night
4. Cast Pylon 2 Footing

Maintenance of Traffic

- Shift WB SW 8th St. traffic towards the inside to place temporary barrier walls to facilitate installation of temporary sheet pile
- Nightly lane closures along WB SW 8th St. will be used to construct Pylon 2 foundation
- EB SW 8th St. Traffic to remain in existing configuration

STRUCTURAL DESIGN APPROACH

CONSTRUCTION STEP 2

Construction Activities

1. Construct concrete base of Pylon 2
2. Construct Abutments 1 and 3
3. Place temporary shoring at Pylon 2
4. Erect Span 2 box girders at night

Maintenance of Traffic

- **Detour WB SW 8th St. during girder erection** *(detour will use major roadways such as SW 107th Ave, SW 24thSt. and SW 117th Ave.)*
- **EB SW 8th St. Traffic to remain in existing configuration**

STRUCTURAL DESIGN APPROACH

CONSTRUCTION STEP 3

Construction Activities

1. Construct Integral Cap at Pylon 2
2. Erect Span 1 box girders at night

Maintenance of Traffic

- **Full closure Detour of SW 8th St. Traffic** *(detour will use major roadways such as SW 107th Ave, SW 24th St. and SW 117th Ave.)*

STRUCTURAL DESIGN APPROACH


CONSTRUCTION STEP 4

Construction Activities

1. Erect steel core/hanger plate assemblies and pylon strut at night
2. Support formwork from steel core and place pylon concrete in lifts

Maintenance of Traffic

- **Full closure Detour of SW 8th St. Traffic** *(detour will use major roadways such as SW 107th Ave, SW 24th St. and SW 117th Ave.)*

STRUCTURAL DESIGN APPROACH

CONSTRUCTION STEP 5

Construction Activities

1. Pour deck concrete at night

Maintenance of Traffic

- Detour WB or EB SW 8th St. during deck pours *(closure dependent on area of work)*

STRUCTURAL DESIGN APPROACH

CONSTRUCTION STEP 6

Construction Activities

1. Construct Canopy and railings at night
2. Install and Stress Pylon wire rope at night

Maintenance of Traffic

- **Full closure Detour of SW 8th St. Traffic** *(detour will use major roadways such as SW 107th Ave, SW 24th St. and SW 117th Ave.)*

INNOVATIVE IDEAS

COST & TIME SAVINGS

INNOVATIONS	SAFETY	COST	TIME SAVINGS
Steel Box Girder Superstructure	✓	✓	✓
Pre-attached Hanger Plates	✓	✓	✓
Hybrid Pylon Design	✓	✓	✓
Integral Post-Tensioned Cap	✓	✓	✓
Increased Pylon Transverse Inclination	✓		
Pylon Strut	✓	✓	✓
Augercast Piles at Pylon 2	✓	✓	✓
Construction Sequencing	✓	✓	✓
Suspender System - Prefabricated Galvanized Wire Rope Cable and Clevises	✓	✓	✓
Structural Redundancy - Design steel box superstructure for full dead and live loading, and design cables for additional loading	✓	✓	✓
Low material life cycle cost		✓	
Application of LEED Strategies in Landscape Design		✓	

THE BCC TEAM IS MADE UP OF OVER 100 PROUD FIU GRADUATES!

BA AT FIU ARCHITECTURAL DESIGN CLASS

THANK YOU!

THE BCC TEAM

IS READY FOR THIS PROJECT