PROJECT: LAKE METROPARKS, OH FRP PEDESTRIAN BRIDGE-2, 40FT X 6FT
CLIENT: LAKE METROPARKS, PAINESVILLE, OHIO

GENERAL NOTES
These specifications are for fully engineered clear span bridge of fiber-reinforced polymer (FRP) composite construction and shall be regarded as minimum standards for design and construction as manufactured by Areté Structures.

1.0 GENERAL FEATURES OF BRIDGE

1.1 Span
Bridge span will be 40ft (straight line dimension) and shall be measured from each end of the bridge structure.
1.2 Width
Bridge width shall be 6ft and shall be measured from the inside face of structural elements at deck level.
1.3 Bridge System Type
Bridge to be designed as a FRP Composite Truss. Bridge shall have Sloped Ends.
1.4 Member Components
All members shall be fabricated from pultruded FRP composite profiles and structural shapes as required.
1.5 Camber
Bridge shall be mechanically pre-cambered to eliminate initial dead load deflections.

2.0 DESIGN STANDARDS

Structural design of the bridge structure shall be performed by or under the direct supervision of a licensed professional engineer and done in accordance with recognized engineering practices and principles.
2.1 Uniform Live Load
Bridges shall be designed for 85 psf pedestrian live load rating.
2.2 Vehicle Load
N/A
2.3 Wind Load
All bridges shall be designed for a minimum wind load of 35 psf. The wind is calculated on the entire vertical surface of the bridge as if fully enclosed.
2.4 Allowbale Stress Design Approach
An Allowable Stress Design (ASD) approach is used for the design of all structural members. Factors of safety used by Areté Structures in the design of FRP bridges are as follows unless otherwise specified (based on the Ultimate Strength of the FRP material):
- Tension: 4.0
- Bending: 4.0
- Compression: 4.0
- End Bearing: 4.0
- Shear: 4.0
- Connections: 4.0

2.5 Serviceability Criteria
Service loads are used for the design of all structural members when addressing deflection and vibration issues. Criteria used in the design of FRP bridges are as follows:
Deflection:
- Live load (LL) deflection = L/500
- Vertical frequency (fn): = 5.0 Hz
- Horizontal frequency (fn): 3.0 Hz

The fundamental frequency of the pedestrian bridge (in the vertical direction) without live load should be greater than 5.0 Hz to avoid any issues with the first and second harmonics. The fundamental frequency of the pedestrian bridge (in the horizontal direction) without live load should be greater than 3.0 hertz (Hz) to avoid any issues due to side to side motion involving the first and second harmonics.
2.6 Snow Load
Bridge shall be designed for 80 psf snow load rating.

3.0 MATERIALS

3.1 FRP Composites
FRP bridge shall be fabricated from Strongwell 500 Series Fiber Reinforce Polymer.
Weathering and ultraviolet light protection shall be provided by addition of a veil to the laminate construction. Minimum material strengths and properties are as follows:
- Tension: 30 ksi
- Compression: 30 ksi
- Shear: 4 ksi
- Bending: 30 ksi
- Modulus: 2,800,000 psi
- Young's Modulus: 2,800,000 psi

The minimum thickness of FRP Composite shapes shall be as follows unless otherwise specified: Square-tube members (closed-type shape) shall be a minimum wall thickness of 0.25 in. Wide-flange beams, channel sections, and angles (open-type shapes) shall be a minimum thickness of 0.375 in, when used as a structural member. Standard plate shall be a minimum thickness of 0.25.
3.2 Decking
3X12 P.T. SYP timber decking.
3.3 Hardware
Truss Bolted connections shall be A307 hot-dipped galvanized steel unless otherwise specified.
Deck Fasteners shall be 5/16" x 4" GRK RSS structural wood screw.
Railing Hardware shall be 410ss #8 Self-Drilling Screws.
6061-T6 Aluminum abutment clips.
3/4in Fasteners to abutment (supplied & designed by others).

4.0 SUBMITTALS

4.1 Submittal Drawings
Schematic drawings and diagrams shall be submitted to the client for their review after receipt of order. As required, all drawings shall be signed and sealed by licensed professional engineer.
4.2 Assembly/Erection Plans
Assembly/Erection plans to be supplied before erection. Temporary Scaffolding will be required to support bridge during assembly.

5.0 FABRICATION

5.1 Tolerances
All cutting and drilling fabrication to be done by experienced fiberglass workers using carbide or diamond-tipped tooling to a tolerance of 1/16". No material deviations beyond industry standards are accepted. All cut edges to be cleaned and sealed.
5.2 Special Provisions
Top Caps to be coated for additional UV resistance.

6.0 RAILINGS

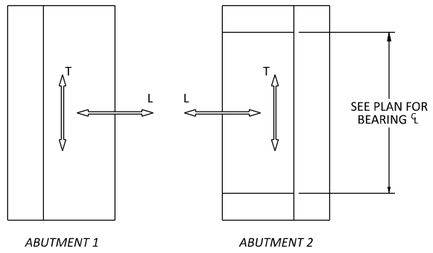
6.1 Height
Railing height shall be min. 54" above the floor deck.
6.2 Material
C3 X 1/4" FRP railing, Max. opening between rails is 4in.

7.0 FINISHING

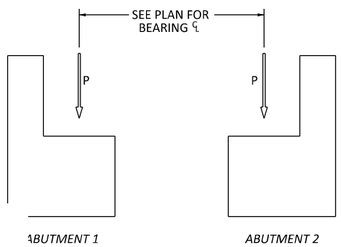
Bridge color shall be Olive Green. No painting is required as the color is added during the manufacturing process. Additional clear coat to be applied to top caps for additional UV protection. Note that all FRP members are manufactured with a Weathering & UV protection added to the laminated veil.

8.0 DELIVERY AND ERECTION

8.1 Delivery
Delivery is made by truck to a location nearest the site accessible by roads. The manufacturer shall notify the client in advance of the expected time of arrival at the site. Contractor is responsible for "off-loading" of the bridge and any equipment required.
8.2 Erection Direction
Areté Structures shall provide assembly drawings and a recommended assembly procedure for building the bridge. Temporary supports or rigging equipment is the responsibility of the client.
8.3 Site Issues and Foundation Design
The Contractor shall procure all necessary information about the site and soil conditions. Soil tests shall be procured by the client. The engineering design and construction of the bridge abutments, piers, and/or footing shall be by the contractor. Areté Structures will provide the necessary information pertaining to the bridge support reactions. The contractor shall install the anchor bolts in accordance with Areté Structures' anchor bolt spacing dimensions.



ABUTMENT REACTION PLAN



BUTMENT REACTION ELEVATION

UNFACTORED REACTIONS

	ABUTMENT 1			ABUTMENT 2		
	P (kips)	T (kips)	L (kips)	P (kips)	T (kips)	L (kips)
DEAD LOAD	2.97			2.97		
UNIFORM LIVE LOAD	10.20			10.20		
SNOW LOAD	9.60			9.60		
WIND	-	3.68		-	3.68	-
THERMAL			1.04			1.04

"P" - VERTICAL LOAD TO EACH ABUTMENT
"T" - TRANSVERSE LOAD TO EACH ABUTMENT
"L" - LONGITUDINAL LOAD TO EACH ABUTMENT

STATE OF OHIO
TERRY S. AUSEL
PE-72912
REGISTERED
PROFESSIONAL ENGINEER

Signed by:
Terry Shawn Ausel
8799B05BF2BC462...
8/17/2026

	NAME	DATE
DRAWN:	MO	7.29.2026
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

NO.	REVISION	DATE

Areté STRUCTURES
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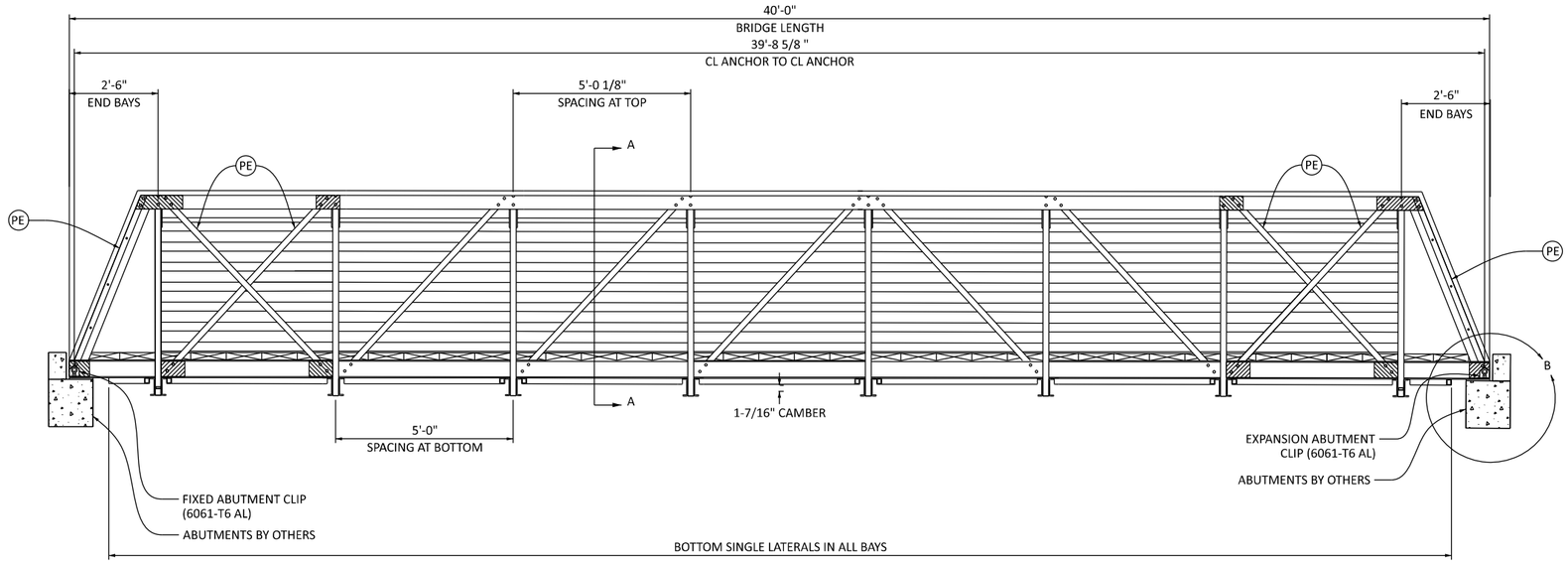
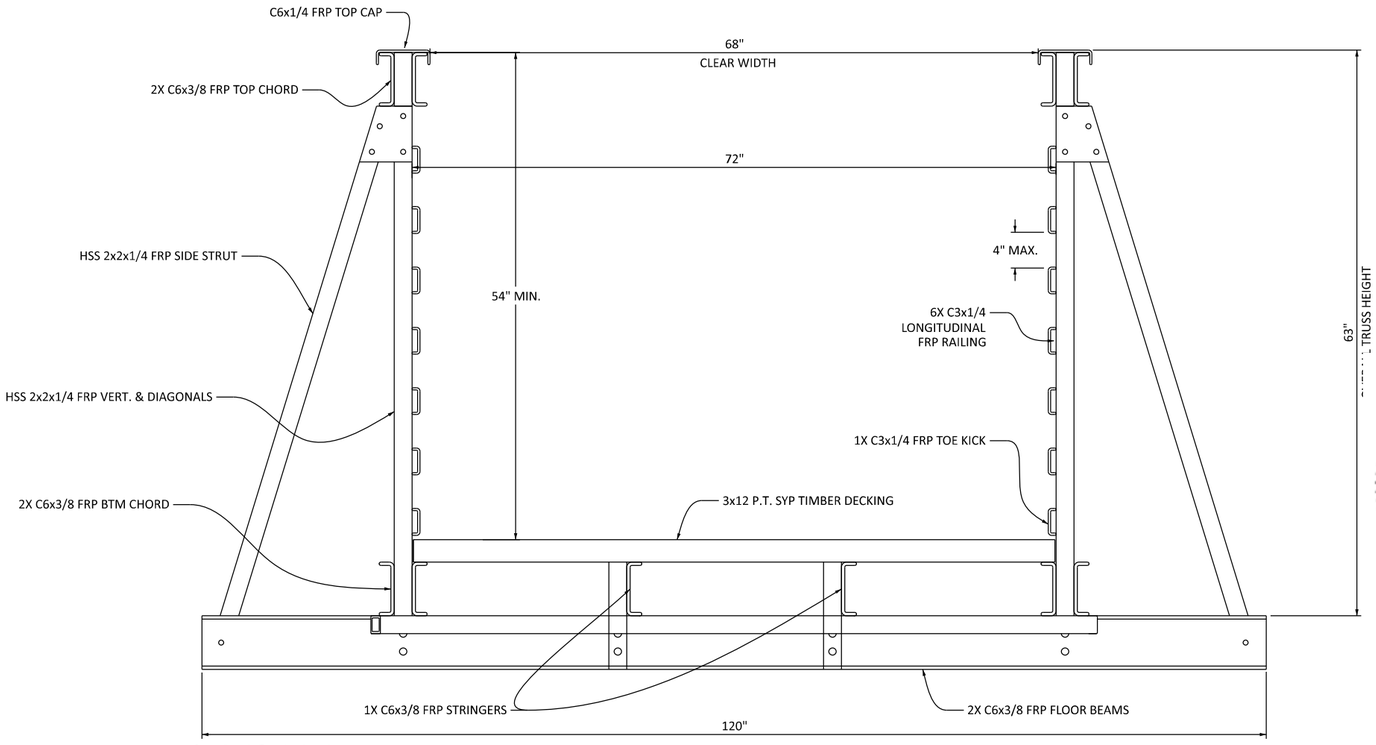
ARETE STRUCTURES, LLC
7668 Valley Blvd.,
P.O. Box 745
Blowing Rock, NC 28605

GENERAL ARRANGEMENT TITLE:
LAKE METROPARKS, OH FRP PEDESTRIAN BRIDGE-2,
40FT X 6FT

SIZE	DWG. NO.	REV
B	940-2271	

SCALE:	WEIGHT:	SHEET 1 OF 3





SECTION A-A
TYP. CROSS-SECTION

PE END OF TUBES TO BE PLUGGED

1/4" WEB REINFORCEMENT PLATE

STATE OF OHIO
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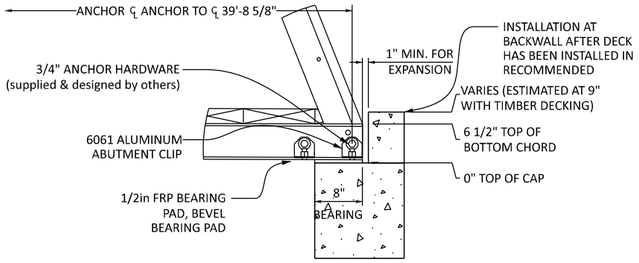
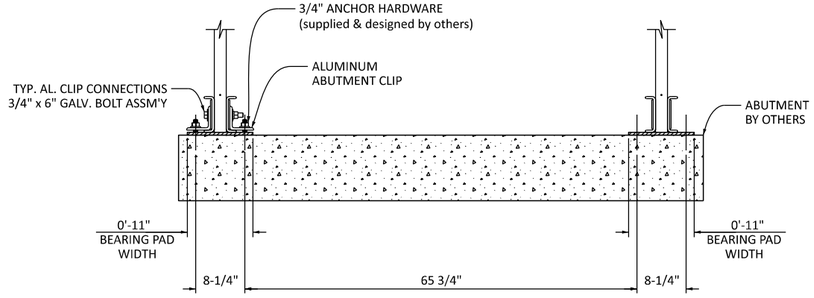
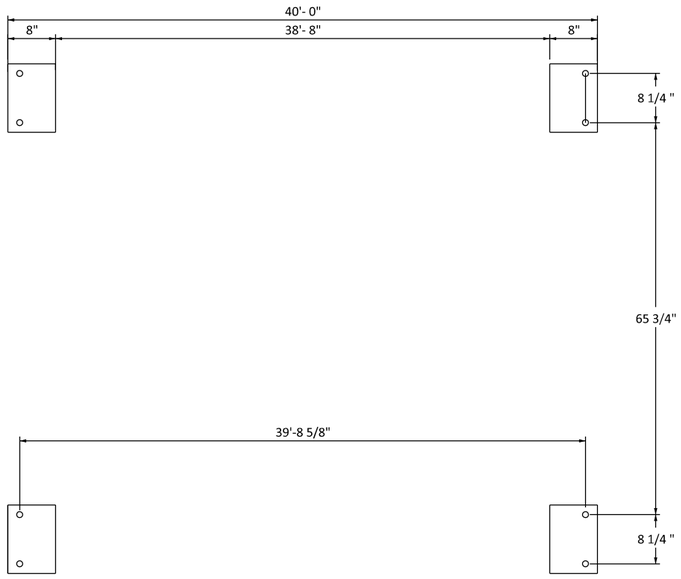
SCALE:	WEIGHT:	SHEET 2 OF 3

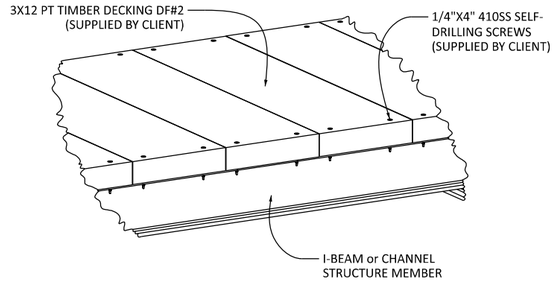




SECTION B-B
TYP. ABUTMENT DETAIL



SECTION C-C
BEARING ANCHOR PLAN VIEW



TYP. TIMBER DECKING: EST. WEIGHT = 10.5psf

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SCALE:	WEIGHT:	SHEET 3 OF 3