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December 19, 2024

Wayne Hosking
Construction Systems Group, Inc.
whosking@csgengineer.com

**RE: Rehabilitation of the Bridges with an Alternate Wood Deck
Tanyard Springs HOA**

Dear Wayne:

I am very pleased to inform you that the Board of Directors at the above-referenced community has agreed to accept your proposal to begin gathering bids from contractors for **Option 3** based on the estimated cost you provided, as outlined.

Please see the attached documents and execute the bidding process.

Enclosed is the signed copy of the proposal for your records. Please also let me know if you have any questions. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Shireen Ambush'.

Shireen Ambush, PCAM
Property Manager



October 31, 2024

Ms. Shireen Ambush
Abaris Realty, Inc.
7811 Montrose Road, Suite 110
Potomac, MD 20854

**Re: Tanyard Springs HOA, 6920 Heritage Crossing, Glen Burnie, Maryland
Pedestrian Bridge Present Condition Survey
CSG Project # 24-098**

Dear Ms. Ambush,

Pursuant to our agreement dated September 3, 2024, we have completed the study of the two pedestrian bridges at the above captioned property (Photos 1-2), located on walking trails in the land bounded by Ingrahm Drive, Stalings Drive, and Mockingbird Drive. The field work was performed on October 22, 2024, and included a visual survey of the two (2) bridges and investigative demolition of the bridge deck. All work was coordinated with the onsite management.

Background

This office was contacted in the Fall of 2024 when the wood bridge decks were discovered to be deteriorated, with a section of the wooden deck on the bridge closest to Ingraham Drive (Photo 1) rotting through (Photos 3-4).

The two pedestrian bridges are steel-framed structures with wood decks. The wood decks are constructed of 2x4 dimensional lumber laid on its short axis, bearing upon, and clipped to, underlying steel framing (Photo 5). There are no available drawings for the bridges. Plaques mounted to each bridge indicate that the bridges were manufactured by Echo Bridge, Inc. of Elmira, New York (Photos 6-7). Attempts to contact Echo Bridge by phone and email have been unsuccessful, and the website is no longer active. Accordingly, it appears that the fabricator is no longer in business and cannot be consulted.

The precise date of construction is unknown. It is assumed that the bridges were a part of the development of the property, and accordingly are estimated to be 15-20 years old.

Observations

1. At the Bridge closest to Ingrahm Drive (Photo 1), we observed the following:
 - This bridge is approximately 80 feet in length and 8 feet wide.
 - The structure consists of steel trusses constructed of steel box members (5x5 perimeters, 4x4 verticals, and 3x3 diagonals), with ¼ inch thick steel W-sections as joists spanning

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between the trusses at 8-foot intervals, and 3x3 steel box members providing diagonal bracing. Accordingly, the clear span between each joist is nominally 8 feet.

- Investigative demolition was undertaken to ascertain the as-built configuration of the deck. We focused our effort on the area of deterioration near mid-span (Photo 8), and we should note that the 2x4 decking was easily removed using only a hammer, underscoring its poor condition. The 2x4 members are nailed to one another with an inconsistent nailing pattern ranging from a minimum of 8 inches to a maximum of 12 inches, but always in the same direction (Photo 9). The 2x4s are installed in a staggered pattern, such that where one 2x4 ends at a joist, there is a continuous member along either side (Photo 10). In this configuration, the typical 2x4 is 16-feet in length, and spans two (2) 8-foot clear spans. A label found on one of the members indicates the wood is pressure-treated southern yellow pine (Photo 11).
 - It appears that the deck was field-fabricated, with the installation of the 2x4s starting on the south side, laid tightly to the 2x2 steel angle along the edge, and installed working northward. The members along the south side show signs of nail tips, and nail heads are visible on the north side (Photo 12) along with wood wedges/spacers securing the final piece of the assembly.
 - There are typically five (5) 6-inch bolts securing the wood deck to each joist (Photos 13-14). These bolts straddle each W-section, and secure metal clips that grasp the flange of the W-member (Photo 15).
 - Under the deck, the W-section joists and the box tube members that brace the joists are heavily corroded, with the steel scaling and a significant section, as thick as 1/16 inch, falling away when struck with a hammer (Photos 16-18). With the steel originally ¼ thick, this constitutes a significant loss of section.
 - By contrast, the box trusses that constitute the sides of the bridge are in comparatively better condition, with only a light coating of surface corrosion that was easily removed with a grinder (Photo 19).
 - The bridge is bolted to concrete abutments at each end. This connection consists of four (4) bolts on each side of the span (2 to either side). These bolts and the associated anchoring plate appear to be in satisfactory condition, as do the concrete abutments themselves (Photos 20-21).
2. At the Bridge closest to Mockingbird Drive (Photo 2), we observed the following:
- This bridge is approximately 110 feet in length and 8 feet wide.
 - The structure consists of steel trusses constructed of steel box members (6x6 perimeters, 5x5 verticals, and 3x3 diagonals). These are larger sections relative to the other bridge, and

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the height of the trusses is also comparatively increased. The wood deck is again supported with ¼ inch thick steel W-sections as joists spanning between the trusses at 8-foot intervals, and 3x3 steel box members providing diagonal bracing. Accordingly, the clear span between each joist is again nominally 8 feet. This bridge appears to have been fabricated in two sections, with a bolted connection at mid-span. On the underside, the bridge sections are bolted through two (2) 2 ½ x 10-inch box members (Photos 22-25).

- We did not demolish any of the wood deck on this bridge. There were no areas that were rotted through at the time of our study. By inspection, we located the nail heads along one side of the bridge and evidence of nail tips on the other side. This deck appears to have been field-installed as well. The only difference of note occurs at mid-span, where the bolt pattern does not straddle the joist; instead, bolts are installed on both sides of the framing (Photos 26-27). These bolts are not secured to clips, but rather connected to 3x3, ¼-inch thick angles, welded to the box members. One bolt on one side appears to be missing, and the absence of an associated hole in the lumber indicates it was never installed. Again, the lack of design information precludes our determining whether this was intentional or a construction oversight.
- While the bridge deck is in comparatively better condition, the framing on the underside is in remarkably worse condition. The steel is corroding and flaking, and significant pieces fall away when struck with a hammer or when cleaned with a grinder. At the mid-span box member, a 3/16-inch-thick section fell away (Photos 28-31).
- The bridge abutments appear to be in stable condition. We note that one of the plates was buried below organic matter. It may be that some re-grading is required to protect the plates and bolts.

3. Both bridges were closed to pedestrian traffic at the conclusion of the study.

Discussion

The survey sought to ascertain the present condition of these bridges and advise the Owner on the remedial work required to address the failing wood decks. These bridges are steel-framed structures with wood decks serving as the pedestrian walking surface. This type of steel truss structure typically has an expected useful life exceeding 50 years, with the wood deck life span typically limited to 10-15 years.

The findings of the survey work indicate that bridge decks have reached the end of their useful life, and by the nature of their as-built configuration, require complete removal and replacement. When this deck was installed, the nails that that secure one 2x4 to the previous member are immediately covered and concealed by the subsequent member. This configuration means that the replacement of a rotted framing member or members necessitates the disassembly of a significant area of the deck.

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This type of bridge deck seems problematic. While the aesthetic of the deck may be desirable, its functionality is poor. There is no space between boards for water to fall through; drainage appears to occur at the bridge ends and at the butted end joints of each piece of dimensional lumber, which is over the steel joists. In this manner, water is channeled to the bridge's framing members. Additionally, wood members may remain in a wet or moist condition for extended periods of time.

The frame is constructed of steel, and the unfinished appearance of the steel suggests it is weathering steel, which is steel that is formulated to develop a protective patina layer, in lieu of more traditional paints, or coatings. Weathering steel, much like traditional steel, is vulnerable to corrosion, resulting in loss of section, when exposed to chlorides. A common source of chloride contamination is deicing salts, whether applied directly to the bridge or tracked onto the bridge by pedestrian traffic. Additionally, some research indicates that some types of weathering steel are susceptible to higher rates of corrosion when consistently exposed to moisture, and the presence of moist dimensional lumber against the weathering steel, and its joints allowing rainwater to drain to the top of the steel flanges, may create this condition and account for the deterioration we see on the underside of the bridge decks.

The loss of section in the supporting steel is problematic. It is clear that the framing on the underside of the deck is in need of replacement. The trusses appear to be stable, however, by virtue of the fact that these are hollow box sections, we cannot measure the current thickness of the steel. We recommend performing ultrasonic testing to ascertain the current thickness, and we recommend that this scanning be done prior to finalizing a remedial design. If testing confirms that the trusses are stable, we recommend the replacement-in-kind of the framing members (joists and diagonal braces) on the undersides of the bridges. On the larger bridge, this will necessitate the replacement of the bolted box members.

Consideration must then be given to preserving and prolonging the useful life of the bridge structure once restored. Replacement-in-kind of the bridge deck would initiate another cycle of significant remediation in 10-15 years, as the deck deteriorates, and we are concerned that the that deterioration of the underlying framing may also recur. An alternative deck cross section that would better drain is also an option. We understand that the Association has inquired about a Trex type deck. Trex decks have minimal clear spans (24 inch maximum), and adding Trex deck would necessitate the installation of a significant network of supplemental joists. However, a different style of wood deck, with planks spanning the short direction would require less supplemental framing and may be feasible and ultimately more maintainable.

The present condition of the weathering steel structure on the underside of the deck is concerning. It is possible that weathering steel was an unsuitable choice for these bridges, as a result of their environment or usage. In addition to an alternative bridge deck, we recommend preparing and coating the steel with a protective, corrosion inhibiting paint. This would prolong useful life but would require periodic future maintenance (re-coating).

Accordingly, we have budgeted three scenarios for consideration. The first is the replacement-in-kind of these bridges. Consideration should be given to improvements to the original design, such as galvanized coated steel in lieu of weathering steel and alternative deck types, such as pavement

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or concrete. Consultation with a manufacturer would provide an opportunity to assess a variety of design options. A second option is to rehab the existing bridge, coat the steel to prolong useful life, and replace the deck in kind. Finally, a third option is the rehabilitation of the structure and an alternative wood deck.

Option 1: Replacement in Kind of the Bridges

- Replacement in Kind of Weathering Steel Bridges: \$850,000-\$900,000
- Option – Upcharge for galvanized and painted steel \$150,000-\$200,000
- Subtotal: \$1,000,000-\$1,100,000**

Option 2: Rehabilitation of the Bridges and Replacement in Kind of the Deck*

- Framing Repair, Coating, and Deck Replacement in Kind: \$200,000-\$250,000**

Option 3: Rehabilitation of the Bridges with an Alternate Wood Deck*

- Framing Repair, Coating, and Alternative Deck: \$250,000-\$300,000**

* *Feasibility of salvaging the trusses to be confirmed by Ultrasonic Testing. We recommend a budget of \$10,000.00, including engineering costs.*

** *Excludes engineering design, bidding, and supervision.*

We trust that this information has been helpful. If you have any questions or comments, please do not hesitate to contact the writer.

RESPECTFULLY SUBMITTED;
CONSTRUCTION SYSTEMS GROUP, INC.

Patrick Murphy
Patrick Murphy, PE
Partner | Senior Engineer

Wayne F. Hosking
Wayne F. Hosking
Vice President

Cc: File 24-098

Fw: CSG Report on Pedestrian Bridges!

From Tanyard Springs <tanyardsprings@abarisrealty.com>

Date Thu 12/5/2024 9:54 AM

To Andrew Moorman <amoorman@abarisrealty.com>; Shireen Ambush1 <sambush1@abarisrealty.com>

Cc Shireen Ambush <sambush@abarisrealty.com>

 1 attachment (200 KB)

Pedestrian Bridge Evaluation of Steel Condition.pdf;

Include this also in December Report.

Mark

Mark Moorman, CMCA

On-site Manager

Tanyard Springs HOA

Tanyardsprings@abarisrealty.com

Site Office:

6920 Heritage Crossing

Glen Burnie, MD 21060

Phone: 410-360-4018

Main Office:

Abaris Realty, Inc.

7811 Montrose Road

Suite 110

Potomac, MD 20854

Phone: 301-468-8919

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From: Wayne Hosking <Whosking@csgengineer.com>

Sent: Thursday, December 5, 2024 9:52 AM

To: Shireen Ambush1 <sambush1@abarisrealty.com>

Cc: Tanyard Springs <tanyardsprings@abarisrealty.com>; Patrick Murphy <pmurphy@csgengineer.com>

Subject: RE: CSG Report on Pedestrian Bridges!

Good morning Shireen—Below is the Conceptual Cost Estimate that we put together for the Pedestrian Bridge Rehabilitation project at Tanyard Springs. This cost estimate makes a number of important assumptions that are not susceptible to immediate verification. Among those assumptions are the following:

- The condition of the bridge trusses*
- The schedules proposed bidding contractors

- Permit requirements imposed by the County

Design	\$28,000
Bidding	\$5,000
Permitting	\$5,000 (hourly w/ estimate)
Construction Contractor	\$250,000-\$300,000
3 rd -Party Testing	\$10,000
Engineering Oversight of Construction	\$42,000
TOTAL	\$340,000-390,000

*The table above excludes the cost of ultrasonic testing that is necessary for determining the condition of the bridge trusses. This is the next step in moving forward with the project. A proposal for this task is attached to this email.

If you or the Board have questions about any aspect of this estimate or attached proposal, please do not hesitate to contact me.

Wayne

Wayne Hosking

Construction Systems Group, Inc.
 (703) 943-9984 (mobile)
whosking@csgengineer.com

From: Shireen Ambush1 <sambush1@abarisrealty.com>
Sent: Tuesday, December 3, 2024 1:37 PM
To: Wayne Hosking <Whosking@csgengineer.com>
Cc: Tanyard Springs <tanyardsprings@abarisrealty.com>
Subject: Re: CSG Report on Pedestrian Bridges!

[External E-mail]

Hi Wayne

Please provide the proposal for the additional testing and also provide a ballpark itemization of option 3 with engineering fees assuming no trusses have to be replaced. If the testing proves otherwise, that would be an additional fee. Is that doable? Can you get it to me this week so we can get it to the Board?

Shireen Ambush, MPA, PCAM, CPM
 President

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All homeowner questions, comments or service requests should be submitted through our Homeowner Portal at <https://portal.abarisrealty.com> or by sending an email to our new company email address: customercare@abarisrealty.com

From: Wayne Hosking <Whosking@csgengineer.com>
Sent: Monday, December 2, 2024 12:00 PM
To: Shireen Ambush1 <sambush1@abarisrealty.com>
Cc: Tanyard Springs <tanyardsprings@abarisrealty.com>
Subject: RE: CSG Report on Pedestrian Bridges!

Shireen—I am re-sending the attached because it pre-dates the email I am replying to.

I owe you a proposal for the ultrasonic testing.

Wayne Hosking

Construction Systems Group, Inc.
(703) 943-9984 (mobile)
whosking@csgengineer.com

From: Shireen Ambush1 <sambush1@abarisrealty.com>
Sent: Wednesday, November 27, 2024 4:07 PM
To: Wayne Hosking <Whosking@csgengineer.com>
Cc: Tanyard Springs <tanyardsprings@abarisrealty.com>
Subject: Fw: CSG Report on Pedestrian Bridges!

[External E-mail]

Hi Wayne

See below from the Tanyard Springs Board. Can you provide the breakdown for the estimates in your report as requested by the Board? The Board liked option #3 the best. What is the next step to get bids on that option?

Shireen

Shireen Ambush, MPA, PCAM, CPM
President

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December 3, 2024

Ms. Shireen Ambush, CMCA,
Abaris Realty, Inc.
7811 Montrose Road
Suite 110
Potomac, MD 20854

**Re: Tanyard Springs HOA, 6920 Heritage Crossing, Glen Burnie, Maryland
Proposal: Pedestrian Bridge Evaluation of Steel Condition**

Dear Ms. Ambush,

Pursuant to our recent discussions, we propose to furnish all labor, material, and equipment, unless otherwise specified, necessary for the completion of the referenced project. All work shall be performed under the direction of a Professional Engineer licensed in the State of Maryland.

I. BACKGROUND

Based upon the client's acceptance of our recommendations to rehabilitate the existing bridges, we propose undertaking ultrasonic testing to evaluate the present condition of the steel trusses and confirm their suitability for re-use. This is a necessary pre-design verification.

II. SCOPE OF WORK

- Perform testing on a sampling of locations on the box sections that constitute the two (2) pedestrian bridge trusses, as follows:
 - Engage and coordinate a subcontractor to prepare the test locations by grinding away existing surface corrosion.
 - Engage and coordinate a certified testing agency to perform the ultrasonic scans.
- Analyze the survey data and consult with the client on our findings.
- Prepare a brief letter report documenting the findings and their implications.

III. FEE SCHEDULE

All work in accordance with the above scope to be in accordance with the schedule provided below.

- Survey, analysis, consultation, and report for the sum of Five Thousand and 00/100 Dollars (\$5,000.00), plus the reimbursable expenses noted below.

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- The cost for a subcontractor to prepare the steel surfaces is Two Thousand Five Hundred and 00/100 Dollars per day (\$2,500.00). We estimate that one day will be required.
- The cost of a certified testing agency to provide a technician and ultrasonic scanning equipment is Two Thousand Five Hundred and 00/100 Dollars per day (\$2,500.00). We estimate that one day will be required.
- Work determined to be beyond the scope of this agreement shall be billed at the currently prevailing billing rates of Three Hundred and 00/100 Dollars (\$300.00) per hour for Principal/Partner; Two Hundred Seventy-Five and 00/100 Dollars (\$275.00) per hour for Senior Engineer; Two Hundred Fifty and 00/100 Dollars (\$250.00) per hour for Project Engineer/Senior Project Manager; Two Hundred Twenty and 00/100 Dollars (\$220.00) per hour for Project Manager; and One Hundred Fifty and 00/100 Dollars (\$150.00) per hour for Technician.
- The costs of plan reproductions, couriers, mileage, and other direct costs shall be considered reimbursable expenses and passed through to the Owner with a fifteen percent (15%) administrative fee.

IV. TERMS OF AGREEMENT

In accordance with the terms and conditions of the Agreement, the Owner will be invoiced on a monthly basis for services provided during the previous month. Payment of the invoice is due within thirty (30) days of date of invoice. If payment is not received within thirty (30) days, a finance charge of 1% per month (12% APR) will be added to the outstanding balance.

It is further agreed that in the event suit is filed to enforce overdue payments under this agreement, we shall be reimbursed for all court costs and reasonable attorneys' fees.

Acceptance of this Agreement will be valid anytime within thirty (30) days from the date of this letter. If the above proposal meets with your approval, please sign and return to this office. We look forward to working with you on this Project.

ACCEPTED:

RESPECTFULLY SUBMITTED BY:
CONSTRUCTION SYSTEMS GROUP, INC.

BY: _____

BY: Patrick Murphy

Patrick Murphy, P.E.

TITLE: _____

Senior Engineer / Partner

DATE: _____

Wayne Hosking

Wayne Hosking
Vice President

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