EXISTING STRUCTURE
None.

INDEX OF SHEETS
SA1 General Plan and Elevation
SA2 General Data
SA3 Abutment Details
SA4 Pile Details
SA5-6 Boring Logs

DESIGN SPECIFICATIONS
2014 AASHTO LRFD Bridge Design Specifications,
7th Edition with 2015 & 2016 Interims
2009 AASHTO LRFD Guide Specifications for the
Design of Pedestrian Bridges with 2015 Interims

LOADING H20 & PEDESTRIAN
Design Vehicle: H20 (40,000 lbs.)
Pedestrian: 90 lbs

SEISMIC DATA
Soil Site Class = D

DESIGN STRESSES
C LIE N T  :  D V E N G IN EE R IN G
P E R A D O T T I  E N G IN EE R IN G

Licensed Structural Engineer
John S. Peradotti             Date: 8/31/2018
State of Illinois No. 081-005671
Expires 11/30/2018

I certify that to the best of my knowledge, information and belief, the structure and
design is structurally adequate for the design
loading shown on the plans. The design is an
ecological one for the style of structure and
complies with requirements of the "AASHTO
LRFD Bridge Design Specifications".

Note: See Sheet SA2 of 6 for Sections A-A and B-B.
1. Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts (in painted areas and ASTM A325 Type 3 in unpainted areas). Bolts size shall be determined by Pedestrian Truss Superstructure Manufacturer.

2. All structural steel shall be AASHTO M 270 Grade 50W.

3. No field welding is permitted except as specified in the contract documents.

4. Reinforcement bars designated (E) shall be epoxy coated.

5. The Inorganic Zinc Rich Primer / Acrylic / Acrylic Paint System shall be used for shop and field painting of new structural steel except where otherwise noted. The color of the final finish coat for all interior steel surfaces shall be Redish Brown, Munsell No. 2.5YR 3/4.

6. Only. Pedestrian truss superstructure manufacturer is responsible for design and loads to the substructure.

7. Bridge section details and unfactored reaction table loads are For Reference Only. Pedestrian truss superstructure manufacturer is responsible for design and loads to the substructure.

8. The substructure is designed per the current AASHTO LRFD Bridge Design Specifications and is based on the assumed truss loads shown in the Table. If the manufacturer's design exceeds these loads and/or the substructure needs to be adjusted to accommodate the truss superstructure chosen, then the Contractor shall submit the redesign to the Engineer for approval prior to ordering any material or starting construction. All design calculations, shop drawings and redesigned substructure drawings shall be sealed by a Structural Engineer licensed in the State of Illinois and shall be the responsibility of the Contractor.

9. Truss manufacturer shall provide the reinforced concrete deck design. Concrete deck to utilize stay-in-place galvanized forms. Reinforcement shall be epoxy coated. Contractor shall place the concrete deck after truss is set. Cost included with Pedestrian Truss Superstructure.

** Table References: **

- Vertical load at each base plate (4 per Bridge)
- Longitudinal load at each footing (2 per Bridge)
- Positive – Downward load; Negative – Upward load

Bridge Lifting Weight: 28,400 Lbs.
PILE DATA
Type: Metal Shells 12" x 0.250"
Nominal Required Bearing: 182 kips
Factored Resistance Available: 100 kips
Ext. Length: 26'E. Abut., 18'W. Abut.
No. Production Piles: 6
No. Test Piles: 2

FIELD CUTTING DIAGRAM
Order v(E) bars full length. Cut as shown and use remainder of bars in opposite face.

B E L L O F  M A T E R I A L
For Two Abutments

<table>
<thead>
<tr>
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<td>#4</td>
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<td>( s(E) )</td>
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<tr>
<td>v(E)</td>
<td>10</td>
<td>#8</td>
<td>20'</td>
<td>( v(E) )</td>
</tr>
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</table>

Notes:
- For details of piles and Concrete Encasement, see sheet 4 of 6.
- Cast backwall after superstructure and concrete deck have been erected.
- Anchor bolt size and spacing shall be as required by the Pedestrian Truss Superstructure fabricator. The cost of furnish and placing anchor bolts shall be considered included in the cost of Concrete Structures.
- All bearing assemblies shall conform to IDOT standards and shall meet material certification requirements. All bearing assemblies are to be supplied by the Pedestrian Truss Superstructure fabricator.
METAL SHELL PILE TABLE

<table>
<thead>
<tr>
<th>Designation</th>
<th>Wall thickness</th>
<th>Weight per foot</th>
<th>Inside volume (yd.³/ft.)</th>
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<tr>
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<td>31.37</td>
<td>0.0067</td>
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<td>0.0063</td>
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<td>PP18</td>
<td>0.375</td>
<td>62.64</td>
<td>0.0070</td>
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END PLATE ATTACHMENT

PILE SHOE ATTACHMENT

(When called for on the plans, the Contractor shall furnish metal shell pile shoes consisting of a single piece conical pile point as shown. The pile shoe shall be cast in one piece steel according to either ASTM A 148 Grade 90-60 or AASHTO M 103 Grade 65-35 and shall provide full bearing over the full circumference of the metal shell pile. The pile shoe shall have tapered leads to assure proper alignment and fitting and shall be secured to the pile with a circumferential weld.)

WELDED COMMERCIAL SPLICE

Notes:
The 1/2" x 3/4" min. fill bar may be constructed of 2 bars with a 1/16" max. gap between them. Pile segments shall be driven to solid contact with settler before welding.

INDIVIDUAL PILE CONCRETE

COMPLETE PENETRATION WELD SPLICE

* Field fabricated backing ring may be made from pile shell by removing segment to allow reducing circumference and vertically rejoin with partial joint penetration weld.

Note:
The metal shell piles shall be according to Article 1006.03 of the Standard Specifications.
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Type</th>
<th>N</th>
<th>W</th>
<th>Q</th>
<th>T</th>
<th>Depth</th>
<th>Elev.</th>
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</table>

**SOIL DESCRIPTIONS**

- Black clay; TOPSOIL (CL)
- Loose brown and gray SANDY LOAM, some gravel, moist to wet A-4
- Med. dense gray SAND and GRAVEL, saturated A-1-9
- Med. dense gray SAND, little gravel, saturated A-1-8
- Very stiff to stiff gray SILTY CLAY, little gravel, moist A-6
- Med. dense gray SANDY LLUAM, little gravel, wet A-4
- Med. dense gray SANDY LOAM, little gravel, wet A-4
- Med. dense gray CLAY LOAM, little to some gravel, moist A-6
- Med. dense clayey gravel OILY LOAM, traces gravel, A-4
- End of Boring at 50.0'

* Approximate unconfined compressive strength based on measurements with calibrated pocket penetrometer.
EXISTING STRUCTURE
A 30"x42" elliptical corrugated metal pipe culvert with no headwalls, approximately 35 feet in length.

SAVAGE
None.

INDEX OF SHEETS
S81. General Plan & Elevation
S82. General Data
S83. Superstructure
S84. 27"x48" PPC Deck Beam
S85. PPC Deck Beam Details
S86. Abutments
S87. Metal Shell Pipe Details
S88. Bicycle Railing
S89. Soil Boring Log

DESIGN SPECIFICATIONS

DESIGN STRESSES
PC = 3,500 psi
fy = 40,000 psi (Reinforcement)

PRECAST Prestressed Units
PC = 6,000 psi
fpu = 270,000 psi (I low lax. Strands)

LOADING HL-93
Allow 50°F/34°F for future wearing surface.

SEISMIC DATA
Seismic Performance Zone (SPZ) = 1 Design Spectral Acceleration at 0.2 sec. (SDS) = 0.160 Design Spectral Acceleration at 1.0 sec. (SD1) = 0.076

SCALE:
1'-0" = 20'-0"
1'-0" = 24'-0" Out-to-Out Deck
1'-0" = 22'-0" Face-to-Face Curb
3'-0" = 4'-0" Channel Width
4'-6" = 6'-0"

LEGEND
$ - Existing Overhead Lines
FD - Existing Underground Fiber Optic
$ - Soil Boring Location

GENERAL PLAN & ELEVATION
ARROW ROAD OVER SPRING BROOK CREEK
DUPAGE COUNTY
STA. 4+03.97
Sheet 1 of 9

DRAWING NO.
DATE:
PROJECT NO.
SHEET:

FOR REVISING DRAFT
DRAWN.
CHECKED.
DESIGN.
REVISION.

CREDENTIALS

I certify that to the best of my knowledge, information and belief, the bridge and design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the "AASHTO Bridge Design Specifications" as noted.

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GENERAL NOTES

1. Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.

2. Protective coating shall not be applied to surfaces to which Waterproofing Membrane System is applied.

3. Reinforcement bars designated (E) shall be epoxy coated.

4. Geotechnical Fabric for Drainage Aggregate must be installed as directed by the Engineer.

TOTAL BILL OF MATERIAL

<table>
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<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
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</thead>
<tbody>
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<td>Cobble for Bridges, 6'-18&quot;</td>
<td>Cu. Yd.</td>
<td>25.8</td>
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<td>Concrete Superintendent</td>
<td>Sq. Yd.</td>
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<td>Concrete Structures</td>
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<td>Steel Sheet Piles</td>
<td>Cu. Yd.</td>
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<td>Reinforcement Bars, Epoxy Coated</td>
<td>Roll</td>
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<td>Bicycle Path</td>
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<td>124</td>
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<td>Trenching</td>
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<td>Test Pile Metal Shells</td>
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<td>Warranted General Mortar for Filling Course</td>
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SECTION THRU ABUTMENT

(Horiz. dim. @ Rt. ±'s)

SECTION A-A

SECTION B-B

SPRING BROOK NO. 1
BUILT 2018 BY
FOREST PRESERVE DISTRICT
OF DUPAGE COUNTY
STA. 403.97
STR. NO. 022-9024 (LOADING NL-93)

NAME PLATE
Per Site 515001
**Bar List**

**One Beam Only**

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<thead>
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<th>Bar No.</th>
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<th>Length</th>
<th>Shape</th>
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<td>29</td>
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<td>8&quot;</td>
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</tbody>
</table>

**Notes:**

1. Bars indicated thus 5x3-#5 etc. indicates 5 lines of bars with 3 lengths per line.
2. See Sheets SB3 and SB5 for additional details and Bill of Material.

---

**Minimum Bar Lap**

- #4 bar = 1'-11"
- #5 bar = 7'-6"
Compressive strength of prestressed concrete at release, $f'_{ci}$, shall be 5000 psi.

Compressive strength of prestressed concrete, $f'_{c}$, shall be 6000 psi.

A minimum 2 $\frac{1}{4}$" Ø lifting pin shall be used to engage the lifting loops during handling.

Expansion bearing pad shall be bonded to the substructure.

Expansion bearing pad shall be filled with grout after transverse tie assembly.

The nominal diameter shall be 6" and the nominal cross-sectional area shall be 0.153 sq. in.

Lifting loops

Plan View

Typical Transverse Tie Assembly

Notes:
- All bearing pads shall be 3" thick.
- Only holes when using expansion bearings.
- Expansion bearing pad shall be bonded to the substructure.

Fabric Bearing Pad (Interior)

Fabric Bearing Pad (Exterior)

SECTION A-A

NOTES

Pre-stressing steel shall be unbonded high strength, low relaxation 7-wire strand, Grade 270.

The nominal diameter shall be 0.5" and the nominal cross-sectional area shall be 0.153 sq. in.

The 1/4" rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place.

Two 3/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.

A minimum 29/16" lifting pin shall be used to engage the lifting loops during handling.

Erosion inhibitor, per Article 100/356.6101 and 1023.07 of the Standard Specifications, shall be used in the concrete for prestressed concrete deck beams.

Compressive strength of prestressed concrete, $f_c$, shall be 6000 psi.

Compressive strength of prestressed concrete at release, $f'_{ci}$, shall be 5000 psi.

Bill of Material

Precast Prestressed Conc. Deck Bins (27" depth) 56 ft2 1.800
N. ABUT. PILE DATA
Type: Metal Shell - 14" dia. x 0.250" walls
Nominal Required Bearing: 273 kips
Factor of Safety Applied: 1.0
Factored Resistance Available: 273 kips
Est. Length: 13 ft
No. Production Piles: 1
No. Test Piles: 0

S. ABUT. PILE DATA
Type: Metal Shell - 14" dia. x 0.250" walls
Nominal Required Bearing: 273 kips
Factor of Safety Applied: 1.0
Factored Resistance Available: 273 kips
Est. Length: 13 ft
No. Production Piles: 1
No. Test Piles: 0

ENVELOPE EXCAVATION
Depth: 10' - 5'
Excavate to bedrock

REINFORCEMENT BARS
#4 Bars = 3'-2"

FIELD CUTTING DIAGRAM
Order (v1(E)) Full length. Cut as shown and use remainder of bars in opposite face.

BAR v2(E)

BAR s(E)

BAR u(E)

BILL OF MATERIAL
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<td>25</td>
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Type: Metal Shell - 14" dia. x 0.250" walls
Nominal Required Bearing: 273 kips
Factored Resistance Available: 273 kips

For details of Bearing Pads, see Sheet SB5.
For details of piles and Concrete Encasement, see Sheet SB7.
For details of piles and concrete encasement, see Sheet SB6.
먼주

DRAWING NO. SHEET 6 OF 9

FOR details of piles and concrete encasement, see Sheet SB6.
**ANCHOR BOLT DETAILS**

In lieu of the cast-in-place anchor bonding shown, the Contractor has the option of driving and setting 1/2"Ø anchor rods according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.

**NOTES**

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

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**BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle Railing</td>
<td>Post</td>
<td>1992</td>
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</tbody>
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**SECTION AT CURB & RAILING**

**RAIL SPLICE**

**BASE**

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**DETAIL A**

**DETAIL B**

**DETAIL C**
PROJECT: Pedestrian/Vehicular Bridge Over Spring Brook Creek Warenville, IL

CLIENT: Wills Burke Kelsey Associates, Ltd., 116 W. Main Street, St. Charles, IL

BORED: SB-2

DATE STARTED: 6-25-15
DATE COMPLETED: 6-25-15

ELEVATIONS
GROUND SURFACE: 705.5
END OF BORING: 665.5

Vehicular Bridge

SOIL DESCRIPTIONS

- Fill, black clayey TOPSOIL, little gravel, very moist (CL)
- Fill, gray and black clayey silty SAND and GRAVEL, occasional Cobbles, very moist (SC/GG)
- Firm, gray sandy SAND and GRAVEL, occasional Cobbles, saturated (SP/GP) [Possible Fill]
- Hard gray very silty CLAY, little sand and gravel, occasional Cobbles, moist (CL-ML)
- Loose gray fine to medium SAND, saturated (SP)
- Hard gray very silty LOAM, little sand, trace gravel, moist (CL-ML)

* Approximate undrained shear strength based on measurements with a calibrated large cone penetrometer.