Public Works Project of the Year Award
Nomination Form

Deadline: January 17, 2018
(electronic submissions only)

Project Name
Beaver Creek Road Bridge

Project Completion Date
Must be substantially completed (90%) and available for public use as of December 31, 2017.
September 1, 2017

Public Agency
Thurston County Public Works

Project Category
☐ Structures
☐ Transportation
☒ Environment
☐ Historical Restoration/Preservation
☐ Disaster or Emergency Construction/Repair

Project Division
☐ Less than $5 Million
☐ $5 Million, but less than $25 Million
☐ $25 Million–$75 Million
☐ More than $75 Million

Managing Agency
Scott Lindblom
Name
County Engineer
Title
Thurston County Public Works
Agency/Organization
9501 Tilley Rd. S
Address (if post office box, include street address)
Olympia, WA 98512
City
State/Province
Zip/Postal Code
360-867-2329
Phone
Fax
LindblS@co.thurston.wa.us
E-mail

Primary Contractor
Lane McAllister
Name
Road Operations Supervisor
Title
Thurston County Public Works, Road Operations Division
Agency/Organization
9501 Tilley Rd. S
Address (if post office box, include street address)
Olympia, WA 98512
City
State/Province
Zip/Postal Code
360-867-2386
Phone
Fax
McAlliL@co.thurston.wa.us
E-mail

Primary Consultant
Matt Unzelman
Name
Senior Civil Engineer
Title
Thurston County Public Works, Design Engineering
Agency/Organization
9501 Tilley Rd. S
Address (if post office box, include street address)
Olympia, WA 98512
City
State/Province
Zip/Postal Code
360-867-2335
Phone
Fax
unzelmm@co.thurston.wa.us
E-mail

Continued...
Public Works Project of the Year Award
Supporting Data Form

Please address each of the following areas in your nomination, adhering to the sequence below when possible.

- Completion date contained in contract. Any time extensions granted should be addressed in the submittal.
- Construction schedule, management, and control techniques used. Use of alternative materials, practices of funding that demonstrates a commitment to sustainability.
- Safety performance including number of lost-time injuries per 1,000 man-hours worked and overall safety program employed during the construction phase.
- Environmental considerations including special steps taken to preserve and protect the environment, endangered species, etc., during the construction phase.
- Community relations—a summary of the efforts by the agency, consultant and contractor to protect public lives and property, minimize public inconvenience and improve relations.
- Unusual accomplishments under adverse conditions, including but not limited to, adverse weather, soil or site conditions, or other occurrences over which there was no control.
- Additional considerations you would like to bring to the attention of the project review panel, such as innovations in technology and/or management applications during the project.

NOTE: Supporting documentation is limited to 20 pages, exclusive of photographs and nomination form. Photographs will be used for promotional purposes by the association. Submittal should include nomination form and supporting documentation form, and photographs. No letters of recommendation please. Simultaneous nomination of the same project in two categories is not permitted.

Nominated by: (Can only be nominated by managing public agency or APWA chapters.) Projects that involve or reside within two or more chapters locations can be co-nominated. Each chapter will receive credit to submit a PACE nomination. All chapters must be identified on the nomination form and before the nominations are judged.

Scott Lindblom
Name
County Engineer
Title
Thurston County Public Works
Agency/Organization
9501 Tilley Rd. S
Address (if post office box, include street address)
Olympia, WA 98512
City  State/Province  Zip/Postal Code
360-867-2329
Phone
LindbLS@co.thurston.wa.us
E-mail
BEAVER CREEK ROAD BRIDGE

APWA 2018 PROJECT OF THE YEAR SUBMISSION
Thurston County Public Works
Division: <$5 million
Category: Environment
Beaver Creek runs through the southeastern portion of Thurston County, Washington. A tributary to the Black River, the riparian area surrounding Beaver Creek supports a variety of protected wildlife, including the federally-listed Oregon Spotted Frog, Cutthroat Trout, and multiple species of salmon. Beaver Creek Road, which crosses over the creek, is the only access for 15 adjacent homes. During the 1960s, a 48-inch culvert was installed to provide stream crossing. Over time, the culvert bottom eroded away. In 2015, a sinkhole began to form and the culvert lost function.

Due to the environmental sensitivity of the area, culvert maintenance proved to be difficult and costly. Installing another culvert was not the county’s preferred option. In coordination with multiple federal and state agencies, Thurston County Public Works replaced the culvert with a 40-foot prefabricated bridge. Construction started August 7, 2017 and was completed on-schedule September 1, 2017.

Removing the culvert helped to restore the natural flow of Beaver Creek, maintain the integrity of the riparian habitat for wildlife, remove a barrier to fish passage, and provide safer stream crossing for vehicular traffic. This project has become a model for construction in environmentally-sensitive areas with federally-protected species.

Not only was the project an environmental success, but saved the county approximately half the costs in design, materials, and labor, if the bridge had been constructed on-site. This bridge installation project cost just under $250,000.

<table>
<thead>
<tr>
<th>Scheduled start date</th>
<th>Aug. 7</th>
<th>Actual start date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled bridge part 1 installation</td>
<td>Aug. 11</td>
<td>Actual bridge part 1 installation</td>
</tr>
<tr>
<td>Scheduled bridge part 2 installation</td>
<td>Aug. 16</td>
<td>Actual bridge part 2 installation</td>
</tr>
<tr>
<td>Scheduled end date</td>
<td>Sept. 1</td>
<td>Actual end date</td>
</tr>
</tbody>
</table>

**Estimated project cost:**
$300,000

**Actual project cost:**
$250,000
Thurston County Public Works - Beaver Creek Bridge Project

BEFORE

DURING

AFTER
The Beaver Creek Road bridge installation project faced two key challenges that required significant logistical planning and creative field solutions:

(1) Beaver Creek supports habitat for the federally-protected Oregon Spotted Frog. Because this species is newly-listed, no federal or state construction protocols existed.

(2) Beaver Creek Road, a narrow county road with above-ground power lines, is the only access for a small neighborhood of five single-family homes.

Months before construction began, county staff consulted with the Washington Department of Fish and Wildlife to determine construction protocols within Oregon Spotted Frog habitat. This collaboration resulted in field guidelines for bridge construction that will now be required throughout Washington, and possibly adopted in other states with federally-listed species residing in aquatic habitats. Limiting the construction area was the greatest environmental logistical hurdle. All construction activities and equipment staging had to occur within the bridge footprint - a 20-foot by 40-foot area. A gravity bypass was installed parallel to the failed culvert and all bridge installation activities were conducted around this bypass.

Construction activities were limited to three summer months as a result of Washington's fish-window requirements that prohibit construction in salmon and trout streams during spawning season. Within this short time frame, the project was managed based on a series of tightly-coordinated scheduling milestones. Because both parts of the bridge had to be installed separately, communication and power utilities had to be turned off twice for bridge delivery and crane operations. Due to safety reasons, and to minimize impact on residents, these service interruptions had to be scheduled months in advance and could only last a few hours. It was imperative that all construction activities leading up to both bridge delivery milestones be completed on-time to accommodate this rigid time frame. Furthermore, the narrow roadway meant weekday road closures for extended periods requiring proactive communication with residents.

This 40-foot prefabricated bridge is comprised of weathered steel with a lifespan of 75 years. Because of its durability, the bridge will require minimal long-term maintenance and is less environmentally disruptive than a culvert. Total construction cost, including delivery, was just under $250,000. This is less than half the typical cost of a bridge constructed of equal size.

Project construction began August 7, 2017 and was completed September 1, 2017, as scheduled, and came in $50,000 under budget.
Thurston County Public Works - Beaver Creek Bridge Project

Project timeline

- Environmental permits submitted

Dec 2016

- Bridge ordered and delivered

Jan 2017

- Oregon Spotted Frog construction protocol development

Spring 2017

- Coordination with utility and crane companies

- Stream bypass construction complete

Aug 1-3

- Traffic lane detour construction

Aug 4-7

- Set bridge foundations

Aug 8-10

- Removed first half of culvert, constructed channel

1st temporary power outage, set first half of the bridge

Aug 11

- Set Oregon Spotted Frog traps

Aug 14-15

- Removed second half of culvert, finished channel construction

2nd temporary power outage, set second half of the bridge

Aug 16

- Removed stream bypass

Aug 17

- Built road approaches

Aug 22-23

- Paved road

Sept 1

- Final inspection - project completed

- Traffic lane detour construction

- Stream bypass construction complete

- Set bridge foundations

- Removed first half of culvert, constructed channel

- Set Oregon Spotted Frog traps

- Removed second half of culvert, finished channel construction

- Built road approaches

- Paved road

- Final inspection - project completed
Due to many project complexities, such as overhead hazards in a small area and potential contact with high-power lines, extra precaution was spent on evaluating safety. Public safety was crucial as the project area had high-cut banks, 12-foot drops, a narrow roadway, and overhead equipment.

A safety plan was developed specifically for the county crew operations and two for public safety management. The county crew engaged in daily, early-morning tailgate meetings where personal protective gear, overhead obstructions, overhead lifting, confined space, heat stress, and hazards-of-the-day were discussed. The first public safety plan included actions for traffic flaggers and traffic control. The second was an emergency services plan that detailed what to do if a fire or public medical need were to occur during bridge installation.

The county spent 1,760 staff-hours for all construction activities on this project and no time-loss injuries occurred.
ENVIRONMENTAL CONSIDERATIONS

As a tributary to the Black River, Beaver Creek supports habitat for the Oregon Spotted Frog (*Rana pretiosa*), a species that lives on the banks of slow moving stream systems and is newly-listed under the federal Endangered Species Act. These frogs can be found in open areas with little to no riparian cover - making pastureland with streams and low banks ideal habitat. Installation of the Beaver Creek Road bridge is the first known construction project within Oregon Spotted Frog habitat.

The county obtained the following environmental permits and special protections:

- Endangered Species Act’s formal consultation “Likely to Adverse Effect” through the U.S. Fish & Wildlife
- Joint Aquatic Resources Permit through the U.S. Army Corp of Engineers.
- State Environmental Protection Act checklist through the Washington Department of Ecology.
- Shoreline Permit through the Washington Department of Ecology.
- Hydraulic Permit Application through the Washington Department of Fish & Wildlife.

In collaboration with U.S. Fish & Wildlife Service, Thurston County developed environmental conservation measures specific for this site and future projects for Oregon Spotted Frog management. These measures include:

- Set frog traps 24 hours before construction.
- No equipment staging on the stream banks, this includes pumps and associated equipment.
- Require all bypass and pumping equipment to have screens that prevent frogs from passing through.
- Require all work to be completed during the summer.
- Stop construction work and relocate any frog found to a suitable upstream location well outside the project area.

In addition, all common salmon and trout species required protection. As Beaver Creek is a healthy and productive stream, numerous rearing salmon, Cutthroat Trout and other fish species were relocated from the project area. The stream also contains a wide variety of invertebrate species - a strong indication of clean water quality and productive riparian habitat. The county coordinated the timing of construction activities with state-mandated fish windows in order to meet both Oregon Spotted Frog and native fish protection requirements.
Beaver Creek Road serves as the only vehicular access road for a small community of 15 isolated single-family residences. Bridge construction required a full road closure for extended periods of time, thus it was imperative local residents were aware of imminent power outages and road closures.

Community outreach by county staff was proactive, frequent, and began well in-advance of construction activities to ensure all residents had time to schedule for disruptions.

In July, the county sent multiple letters advising residents of the upcoming culvert removal and bridge installation activities. Following the letters, three postcards were sent to residents providing specific dates and times for the scheduled power outages and road closures. Because of the relatively small population affected by the construction activities, county staff were able to go door-to-door and speak with many of the residents.

At the conclusion of the project, another letter was sent with a self-addressed postcard requesting resident feedback. The county has received 10 completed surveys of the 15 mailed out. All responses were positive.
Installation of the Beaver Creek bridge begins Wednesday, August 9, at 8 a.m. You can expect significant travel delays between 8 a.m. - 5 p.m. and the interruption of power and communication services from early-morning to mid-afternoon. To avoid lengthy travel delays, it is best to park your vehicle on the west side of the bridge if leaving your neighborhood after 8 a.m.

Questions? Contact Matt Unzelman at unzelmm@co.thurston.wa.us or 360-867-2335.
The Oregon Spotted Frog conservation measures prohibited construction activities on the stream’s bank. This required diverting the water into a stream bypass as opposed to the commonly used gas-powered water pump and hose diversion technique.

A large steel plate was embedded parallel to the deteriorating culvert to divert creek water into the adjacent bypass. A frog-friendly screen was added to the bypass to ensure capture and release upstream of any frog that might have wandered into the construction area. All water diversion was required to stay within the 20x40-foot area of disturbance, so the bypass operated for the duration of construction activities and county crews simply worked around it.

The bypass allowed the construction crew to work in the dry area and thus eliminate concerns regarding eroding wet banks, excess sediment in the water column, and disturbing aquatic wildlife. This technique surpassed staff’s expectations on the ability of the bypass to minimize impact to the habitat. In addition, its efficiency reduced the need for substantial best management practice maintenance during construction activities.

In addition, using the bridge’s pre-cast components minimized traffic and construction delays, improved efficiencies in construction, and expedited project delivery.
Thoroughly planning the logistics and spending extra time to synchronize activities was key to the project’s success. Although this can be categorized as a small project, it required large project logistics. Residents required time to plan for utility disruptions and road closures. Construction milestones had to be met before the choreographed activities of utility companies and cranes worked to shut off power so the bridge could be safely installed.

It was imperative project steps where synchronized and internal communication was at its best. To ensure project success, county staff performed a couple of dry runs to work out any logistical issues with materials and staff communication. As a result of the meticulous planning, the project was completed on-time, under budget, and in-compliance with all special permits and requirements.