

1. C.1. Existing Structures – Based on March 2017 aerial imaging, there does not appear to be any rip-rap or bank armoring along the Diversion Canal (above or below the ordinary high water mark) or any other existing in-water structures (e.g., docks) at the location of the proposed bridge crossing. Please confirm the absence of existing structures at the location of the proposed bridge crossing.

Palmetto Railways has observed the location of the proposed bridge crossing and confirms that it is not aware of any existing, or planned structures in the Diversion Canal at or near the crossing location.

2. D.3. Overwater Structures - Please describe the rail bridge decking for the bridge spans.
 - a. What are the components of the bridge from side to side (i.e., walkways, concrete ballast trough, rail, ties) and what are they made from (e.g., steel, concrete)?

The approach span superstructure consists of a 3' walkway, a 16' reinforced concrete ballast trough, and an additional 3' walkway. Walkways are made from steel. The main span will be a steel through girder, with reinforced concrete ballast trough.

- b. Are there any openings in the decking or are components impermeable (e.g., if there are walkways are they steel grated)?

The proposed walkways would consist of open grating.

- c. If there are openings in any component of the decking, what are the approximate distances between openings or opening dimensions?

Reinforced concrete ballast troughs have drain pipes at 48' center to center spacing on each gutterline.

3. D.5. General Construction Methods (not including pile installation – see next question) - Please provide detailed plans for step-by-step bridge construction methodology, and locations of work (barge, upland or both).

This project will use a design/build contracting process. Therefore, the exact construction methodology and sequence will be determined by the Contractor and the Engineer of Record. However, Palmetto Railways anticipates that a barge would be utilized for the drilled shaft/pile driving work in the channel. The barge would be moved to directly adjacent to each pier for work on that pier.

4. D.6. Pile Installation – It is understood that Palmetto Railways anticipates drilled shaft foundations for all bridge supports, but based on Palmetto Railways' Response to Information Request #3 (dated March 7, 2018), pile driving cannot be ruled out. Therefore, to adequately assess potential impacts should pile installation occur, please provide information on the construction methodology (similar to general construction

methods above) used to install any piles that may be driven in-water to support the bridge. For the following questions, provide reasonable estimates, as appropriate:

- a. What is the composition of the piles (e.g., wood, vinyl, concrete, metal)?

Pile type, if used, would be the choice of the Design/Build team. Prestressed concrete and structural steel are the reasonable choices.

- b. What is the estimated maximum number of piles that would be driven in a day?

Such a determination would be based on Contractor's chosen means and methods.

- c. What is the estimated average number of pile strikes per pile?

Such an estimate would be determined in the final design of the Design/Build process.

- d. Will piles be driven in a confined space (150 feet to nearest reflecting object)?

Piles, if used, would be driven near other piles in a footing possibly as close as 6' apart. Some footings would be within 150' of the bank.

- e. Based on Palmetto Railways' Section 404/401 Individual Permit Application, drilled shaft foundations will be used instead of piles, where feasible. Please describe drilled shaft foundations, how they differ from piles, and why Palmetto considers use of drilled shafts a mitigation/minimization measure that would benefit sturgeon (i.e., what impacts would be avoided/reduced by use of drilled shaft foundations).

Drilled shafts are essentially columns built in the ground. A steel casing would be driven into soft overburden soils to prevent collapse of the hole and would extend above the waterline. Once set, the soil inside the casing is removed with a hollow flight auger to the design depth. Once the hole is complete, a reinforcing steel cage is lowered into the hole and the hole is filled with concrete to produce a reinforced concrete element. Piles differ from drilled shafts, in part, in that piles driven, whereas drilled shafts are cast-in-place.

Drilled shafts are considered a mitigation measure because fewer drilled shafts are required per foundation, when compared to the number of driven piles. Typically, a

single shaft is used per column compared to multiple (estimated at more than 9) piles per column for a pile footing.

- f. Based on Palmetto Railways' Section 404/401 Individual Permit Application, piles will be installed with a vibratory driver to the maximum extent practicable, and impact hammer will be used if needed. Is there an estimate on how much one method may be used over the other, and are any other methods potentially necessary (i.e., jetting or auguring)?

The means and methods of the Contractor are unknown at this time and would likely be determined by site-specific conditions at the time of the work. Neither jetting nor auguring are anticipated to be required.

- g. Based on Palmetto Railways' Section 404/401 Individual Permit Application cushion blocks or other noise attenuation devices will be used if impact hammers are used. Please provide additional details on the cushion blocks and provide examples of the other attenuation devices that would be used. What would be the extent of underwater noise with and without attenuation devices for each method of pile driving used and what are the estimated underwater sound pressure levels?

Bubble curtains, pile cushions (cushion blocks), and a soft start (or slow start) method seem to be the most reasonable options available if impact hammers are required. Bubble curtains guard fish from the hammering sound waves by pumping air into aluminum rings around the piles during construction. Pile cushions (or cushion blocks) reduce the rise time in pile stress by delaying the onset of force into the pile, which results in reduced fluid particle velocities and noise. With a soft start method, pile-driving ramps up slowly in an effort to deter marine species from the work area. It is intended to be a warning mechanism for fauna so they can vacate the area before maximum energy is reached. As noted in the Section 404/401 Individual Permit Application (Attachment C – Avoidance and Mitigation Plan), other pile driving noise and vibration attenuation methods include the following:

- The contractor shall use drilled shaft foundations instead of piles, where feasible.
- The contractor shall use a vibratory hammer to the maximum extent practicable.
- Pile driving activities shall be limited to no more than 12 hours per day (February-March, sturgeon; May-September, manatee).

Palmetto Railways does not have information to gauge the extent of underwater noise or the estimated underwater sound pressure levels.

5. Construction Schedule – Please provide an estimated construction schedule with the duration of the bridge construction’s major phases of in-water work (e.g., number of days, weeks, or months, season restrictions, etc.). Please confirm that construction would only occur during daylight hours and no longer than 12 hours per day.

A construction schedule is dependent on the Contractor’s means and methods and the requirements of the RFP. Accordingly, Palmetto Railways cannot, at this time, confirm that construction would only occur 12 hours per day.

6. D.10. Conservation/Protective Measures – Please indicate how mitigation or other protective measures for sturgeon are being incorporated into the bridge design and construction, and if any measures in addition to those provided in Palmetto Railways’ Section 404/401 Individual Permit Application are planned to avoid or reduce potential impacts to sturgeon.

The following protective/conservation measures would be implemented to minimize or compensate for potential noise impacts on sturgeon:

- Contain stormwater runoff from bridges within a closed drainage system.
- Obtain the necessary NPDES permit and prepare a Stormwater Pollution Prevention Plan.
- Ensure equipment does not obstruct or impede passage through more than 50 percent of the channel.
- Use pile driving mitigation measures, including soft starts, bubble curtains, and pile cushions, to reduce the sound transmitted from pile driving.