



Shawcroft Road Hurricane Matthew Repair – Culvert or Bridge

August 6, 2018

Background

- Hurricane Matthew destroyed culvert and washed away a portion of the road in October 2016.
- Temporary Culvert installed in 2017.
- One access to King's Grant – 600 residents
- FEMA approved funding for permanent culvert with an estimated cost of \$830,000.
- Citizens requested that a bridge be considered
 - Interest in influencing the classification of the private dam owned by the Kings Grant Golf Course (upstream)

Alternatives

	Option 1	Option 2	Option 3
Type	Concrete Culvert	Arch Bridge	Concrete Slab Bridge
Cost	\$830,000	\$880,000	\$1,080,000

Engineer's Opinion (Golf Course)

- All three of the design alternatives considered by the City will not prevent the dam from being classified as High Hazard by NC Dam Safety
- Ramsey St overtops whether or not there is a failure of the dam.
- Modify bridge design:
 - Raise the roadway sag by 1.2 feet
 - Raise the bridge deck by 1.0 foot
 - Increasing the bridge span by 12 feet,
- *“Modifications provide a reasonable possibility that Wooded Lake Dam could be classified as exempt by NC Dam Safety”* (conditioned to additional survey and Dam Safety review)

+\$600K

NC DEQ Dam Safety

- Staff met with DEQ Dam Safety staff and they have declined to comment on the issue until a final determination is made.
- Exempting Wooded Lake Dam from the Dam Safety regulations removes a level of oversight and robustness from the system, which exists to preserve the safety of the community.

FEMA

- A Culvert is currently approved for reimbursement.
- The City will need to pay any additional cost associated with the construction of a bridge.
 - Reimbursement for this option will be capped.
 - Specifically, FEMA will only pay \$727,659 if a bridge option is selected by the City. This amount is based on the original estimate for the culvert minus the funds already spent on the design effort for the repair.
 - Estimated \$600,000 in additional funds needed for the bridge.
- **FEMA requested decision from the City ASAP**

	Option 1	Option 2	Option 3	Option 4
<i>Type</i>	Concrete Culvert	Arch Bridge	Concrete Slab Bridge	Concrete Slab Bridge Modified
<i>Size</i>	8'x18' Box (1' bury)	7' rise x 20' span	28' span w H-pile foundations	40' span w H-pile foundations
<i>Permitting</i>	Typical (State, Army Corps & Local)	Typical (State, Army Corps & Local)	Typical (State, Army Corps & Local)	State, Army Corps, Local, FEMA compliance (CLOMR/LOMR), temporary guard house relocation
<i>Utilities</i>	Shallow cover requires re-routing of existing utilities; aerial waterline	Shallow cover requires re-routing of existing utilities; aerial waterline	Requires re-routing of existing utilities; aerial waterline	Requires re-routing of existing utilities; aerial waterline
<i>Road work (grade)</i>	Match existing	Match existing	Match existing	Raise road grade, temporary guard house relocation
<i>Maintenance</i>	Debris removal, periodic structural inspection, reduced scour risk	Debris removal, periodic structural inspection	Maintenance of asphalt on bridge surface, scour /abutment stability, seal deck joints and concrete, debris removal	Maintenance of asphalt on bridge surface, scour /abutment stability, seal deck joints and concrete, debris removal
<i>Inspection requirements</i>	City Standard	City Standard & maybe National (by NCDOT)	National Bridge Inspection standards (by NCDOT)	National Bridge Inspection standards (by NCDOT)

Alternatives

	Option 1	Option 2	Option 3	Option 4
Type	Concrete Culvert	Arch Bridge	Concrete Slab Bridge	Concrete Slab Bridge Modified
Cost	\$830,000	\$880,000	\$1,080,000	\$1,340,000

*FEMA reimbursement capped at \$727,659 for bridge option

Budget Impact

- If the City moves forward with the culvert option, FEMA will reimburse the City for the final cost of the project, even if it is in excess of the estimate.
- If the City chooses the bridge alternative, FEMA reimbursement will be capped at \$727,659, leaving the City to pay any additional costs.
- It should be noted that the estimated bridge cost of \$1,340,000 is a preliminary figure and is likely to increase based on the trends experienced with bid prices, economic growth, construction industry availability, etc.

City's Engineering Recommendation

- The culvert is the recommended option due to:
 - Reimbursable option
 - Characteristics of the site
 - Environmental protection
 - Permitting
 - Shorter timeline
 - Reduced maintenance and inspection cost
 - Reduced impact to existing property

Culvert or Bridge?

Discussion