



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
Type	Concrete Culvert	Arch Bridge	Concrete Slab Bridge	Concrete Slab Bridge Modified
Size	8'x18' Box (1' bury)	7' rise x 20' span	28' span w H-pile foundations	40' span w H-pile foundations
Permitting	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
Utilities	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
Road work (grade)	Match existing	Match existing	Match existing	Raise road grade, temporary guard house relocation
Maintenance	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
Inspection requirements	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