White County Park at Tesnatee Creek

White County Board of Commissioners

February 23, 2015
• Background
• Project Setting
• Road and Bridge Design Assumptions
• Concept Costs – Baseline Assumptions
• Construction Cost Considerations
• Alternate 1 – Multi-Barrel Box Culvert
• Alternate 2 – Precast Modular Bridge
• Alternate 3 – Cast-In-Place Concrete Bridge
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• Questions
Site visit on August 8, 2014
Observed ball field, terrain, stream and surroundings
Investigated upstream and downstream crossings
Met with Mike Melton
Project Location – Tesnatee Creek

- Existing 35’ Timber Bridge
- Existing Double 10’x10’ Box Culvert

Project Site

Existing 35’ Timber Bridge

 Existing Double 10’x10’ Box Culvert
Asbestos Rd @ Freeman Creek (Upstream)
Yonah Valley @ Thurmond Creek (Upstream)
Proposed Roadway Assumptions

- No specifics on ball field at far bank
- Begins at far westerly point of Asbestoe Rd
- Cut through existing lower ball field
- Crossing Tesnatee Creek downstream of confluence (minimize bridge length)
- Straight alignment – 600 feet max (roadway and bridge)
- Designed for 20 mph
- Steep terrain limits options
Proposed Bridge Assumptions

- Evaluated four cost-effective structural alternates
- Minimize length and cost – cross perpendicular to stream
- Minimize length and cost – cross downstream of confluence
- Concept hydraulic opening based on County-supplied LiDAR
Concept Cost Considerations: Baseline Assumptions

- Discussed w/ Mike Melton – evaluate options for the most cost-effective stream crossing
- Identify opportunities to save $$$
- Roadway approaches -> 2 lanes @ 10’
- Light duty pavement (low truck traffic)
- Minimal roadside edge improvements - guardrail
- Bridge -> Narrow: 2 lanes – 24’ between inside face of barriers
- Bridge -> No approach slabs ($$$)
Concept Cost Considerations: Baseline Assumptions

- County owns all property -> No ROW or ROW plans ($$$)
- Property generally wooded/undeveloped = no existing utilities -> no utility coordination, relocation, delays/challenges
- Utilize onsite soil for roadway embankment (existing ballfield, slopes) -> No imported fill dirt ($$$)
- Some construction services provided by County forces:
  - Demolition of existing ballfield (dugouts, lighting)
  - Earthwork/grading
  - Construction inspection
Construction Cost Considerations: Concept to Construction

- Concept costs include design, permitting, and construction
- Concept costs based upon 600 feet of roadway/bridge
- Concept costs based on limited information (Ex: geotechnical conditions unknown)
- Concept estimates are based upon design and industry information available in August 2014
- With more work opportunities, bidding environment is less competitive than year ago
Construction Cost Considerations: Concept to Construction

- Small, non-typical project may incur contractor premiums – economy of scale
- CHA will strive to provide the most cost-effective design
  - Standard detailing - familiar to local road/bridge builders
  - Georgia DOT pay items
  - Well defined scope
  - Apply “contractor lessons learned”
- Communicate, cooperate, and collaborate with White County!
Alternate 1 – Multi-Barrel Box Culvert

- Triple 10’ (span) by 12’ (height) precast concrete box culvert
- Increases the upstream water surface by 1.63’
- Requires construction in the stream channel -> higher permitting costs
-Temporary diversion channel – $$$ and permits
- US Army Corps of Engineers requires fish baffles and “natural” bottom (fish, mussels, crayfish)...reduces efficiency
Alternate 1 – Multi-Barrel Box Culvert

- Prone to debris build-up = ongoing maintenance commitment
- Good durability
- Cost estimate: $515,000 to $535,000 (pricing from local precaster in August 2014)
Multi-Barrel Box Culvert
Alternate 2 – Precast Modular Bridge

- 80 foot long (two 40 foot spans) precast “channel” deck
- Precast concrete abutments
- Single pier in the middle of the stream
- Bent construction in stream channel:
  - Higher construction and permit costs
  - Scour and debris
- Good durability
- Cost estimate: $400,000 to $420,000 (pricing from local precaster in August 2014)
Precast Modular Bridge
Precast Modular Bridge
Alternate 3 – Conventional Concrete Bridge

- 70 foot long, single span
- Prestressed concrete beams with cast-in-place concrete deck
- Cast-in-place concrete abutments
- No construction in stream channel
- No constrictions in stream channel = best hydraulics, lowest maintenance (minimal debris)
- Excellent durability
- Cost estimate: $340,000 to $360,000 (past experience - August 2014)
Alternate 3 – Conventional Concrete Bridge
Alternate 3 – Conventional Concrete Bridge
Alternate 4 – Timber Bridge

- 65 foot long, single span
- Glulam beams with timber deck
- Timber barrier and abutments
- No construction in stream channel
- No constrictions in stream channel = best hydraulics, lowest maintenance (minimal debris)
- Good durability and aesthetics
- Cost estimate: $390,000 to $410,000 (timber bridge vendor quotes - August 2014)
Alternate 4 – Timber Bridge
Alternate 4 – Timber Bridge