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DATE: November 24, 2015
Revised December 31, 2015

SUBJECT: Underwood Creek Daylighting Project
Cost-Effective Design Phase Concepts

Project Scope

- Construct naturalized channel in Park 'n Shop parking lot from Watertown Plank Road to Wall Street.
- Abandon existing covered channel.
- Revise parking and traffic layout.
- Construct vehicular/pedestrian crossing bridges.

Project costs range from \$1,300,000 (Earth Tech 2003 Engineering Report) to \$3,250,000 (Village estimate 2014).

Design costs range from \$175,000 (Fund for Lake Michigan Grant Application) to \$350,000 (Village estimate 2014).

Narrative:

There is a wide range between design and construction cost estimates done in 2003 and 2004 and between the Fund for Lake Michigan Grant and the Village revised estimate of 2014.

This memo is not intended to critique those estimates. It is intended to offer constructive ideas on how to minimize upfront design and permitting costs to be able to utilize the grant monies by December of 2016 and proceed with construction in 2017.

The ideas and suggestions are grouped in the same “Contract Services” categories that were presented in the FLMG Grant application as follows:

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1. Village and Stakeholder Planning, Coordination and Meetings.

Typically a number of Village and Stakeholder meetings are held throughout the planning and design process. However, because the previous flood control project was successfully completed with numerous meetings, future meetings can be minimized.

Idea – Target three future meetings to coincide with 30%, 60%, and 90% design plan submittals. Have the Village coordinate and run the meetings using the design plans as exhibits.

Have Engineer attend only those meetings on an hourly basis.

Idea – Property acquisition can be a costly effort because of owner resistance. Have the Village coordinate and attend property owner meetings. Only involve the Engineer to create meeting exhibits.

2. Public Information Meetings (2)

Idea – Limit the meetings to coincide with 30% and 60% design plan submittals. Have an agenda and limit the meetings to 2 hours.

3. Topography, Bridges, Surface Features, Measure Downs

Idea – Utilize previous historic field work. Use aerial photos to create the design plan shells. Limit survey to specific corridor of selected alignment.

4. Easements (CPR, Village) Property Acquisition Assistance

Obtain “Title Letter Reports” on impacted properties to check out deed encumbrances.

Idea - Follow State statues in property acquisition process. Do not negotiate with Owners. Obtain independent appraisal as required by statute. Use Engineer to only prepare easement exhibits.

Idea – Offer additional \$2,000 to property owners who do not require an appraisal to save on negotiating time and expense.

5. Soil Sampling and Geotechnical Analysis.

This is an important part of the process to minimize construction risks.

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Idea – Utilize previous soil boring information and chemical analysis. (Boring B21 and B24 and WTP and Wall Street Bridge borings). Supplement with additional borings. Soil structural analysis for bearing capacity will be required. This information will be useful for structural design of retaining wall systems.

Idea - Use modular blocks or large stone blocks for retaining walls instead of concrete walls, which is acceptable to WDNR and aesthetically pleasing (See Pigeon Creek, Thiensville).

Idea – Delegate design of modular block retaining walls to block supplier, which will shift design costs into the construction phase.

Idea - Utilize previous ground water monitoring information. Do not install new ground water monitors.

Idea – Inspection of soil and groundwater for potential contamination will be required during the construction phase.

6. Environmental Analysis

Idea – Use previous environmental information in 2003 Engineering Report including wetland, archaeological and historical review. Also use existing environmental contamination reports. Discuss desire to use the 2003 information for the environmental analysis with WDNR to avoid redoing it.

The dry cleaner site should be remediated prior to Village acquisition.

7. Hydraulic Analysis

Idea – It is important to stress the need to be able to use the existing WDNR Hec-Ras model and flow split for this design phase. Get WDNR clearance to use this information before proceeding with design.

If new flows and a new model is required, it will increase design costs. Once agreement is reached, limit the model run to one selected alternative alignment and channel cross-section.

Add flood volume capacity for MMSD with additional flow detention. Provide wetland spawning area in retention/detention pond.

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8. Alternative Development

Idea – Choose one alignment from Alternative 4A concept and pick one channel cross-section after discussion with Village and stakeholders.

Idea - Do not review alternative alignments once selected alignment is chosen.

Refine the alternative to cost effectively avoid obstacles and match the preferred parking plan.

Idea - Have students develop alternative parking concepts to submit to Village and stakeholders. Once the final concept is selected, have them prepare a detailed parking plan layout with traffic patterns and hard features such as curb and gutter, islands, lighting and signage.

Idea - The channel cross-section includes a trail along top of the new open channel. The trail connections and pedestrian routing should be provided by the Village to save on design costs.

9. Channel Design

Idea – Use large stone block or modular block retaining wall on east side of channel where possible. Delegate structural design of wall to modular block wall supplier as part of construction phase. Minimize concrete wall design to transitions with existing channel at Watertown Plank Road and Wall Street.

Idea – Consider the use of soldier piles and steel lagging faced with decorative concrete panels or large stone blocks where channel abuts railroad right-of-way to conserve parking space.

Idea – Minimize channel cross-sections to model hydraulically. Multiple cross-sections will drive up design costs to review hydraulic and erosion impacts.

9a. Demolition of Existing Enclosure

Idea – Eliminate demolition and restoration of existing channel from channel relocation designs to save design costs. Leave the design of the demolition and the restoration of the impacted area up to the property owners. If that is not an option for all properties, then at least Sendik's restoration should not be a Village responsibility

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10. Bridges and/or Enclosure Design

Idea - Use a prefabricated pedestrian bridge in north end of parking area. Delegate design of the pedestrian bridge to construction phase depending upon the type of structure selected.

Idea – Consider three cell box structure for vehicular bridge between east and west parking areas. Bury bottom of box to provide fill for natural channel invert.

11. Design of Conflicting Sanitary Facilities/and Other Utilities

Idea – The existing 21-inch local trunk sewer will conflict with the new channel. A portion was already abandoned with the development of the former TAPCO site on Wall Street.

Idea - Electric and telephone facility conflicts should be identified early in the design process. There are overhead lines near the grocery store. The cost to relocate facilities on private property are usually not borne by the “utility”. Delays in relocating these utilities could result in delays in this project. The Village could handle coordination of this element.

12. Design of Temporary Traffic Facilities

Idea – Once the alignment and construction easements are identified, this is a task that could be performed as a student project. Traffic and detour plans need to be developed for the different construction phases to minimize business disruption.

Idea - Detailed construction traffic control and construction signage plan can be developed by students or delegated to the contractors.

13. WDNR Environmental Assessment Preparation

Idea – Much of the information for an EA was prepared as part of the 2003 report. Discuss the need for an EA with the WDNR because the “alternative” analysis was already performed with the selection and approval by WDNR of Alternative 4 in 2003. The environmental concerns of that concept should have already been addressed.

Permits will be required from both the WDNR and COE. A hydraulic analysis of the selected alternative will need to be submitted showing there are no flood level increases.

Once the project is constructed, the FEMA maps will need to be amended to show floodplain changes.

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14. Decorative Features

Idea – Railings, fences, and landscape features including trails, gardens, decorative lighting, and public space areas can be developed by students and or a Village committee.

Idea – Bid decorative features as a separate contract to simplify channel project and minimize design time.