Flood Control System

FCS Design & Construction Coordination with US Army Corps of Engineers

January 17, 2019
Current Design East Side

- J Avenue NE
- Shaver Road Bridge
- Cedar Lake
- Quaker Oats
- Downtown Cedar Rapids
- 9th Avenue
- NewBo
- 16th Avenue Gate
- Cargill Corn
- Additional Pumps
- 5th Avenue Pump Station

Legend:
- Yellow: City Lead Design
- Red: USACE Lead Design
2019 Construction Contracts - East Side

(projects currently over 50% designed)
January 2019 Grant Application

Downtown stormwater gatewells for $862,000
FEMA HMGP funding including:

1. A Ave NE gatewell
2. 2nd Ave SE gate (in CRST building)
3. 3rd Ave SE gate (in CRST building)
4. 4th Avenue SE gatewell
5. 5th Avenue SE gatewell

These projects are currently under design and scheduled for 2020 construction
Notes:

1. East side project on Schedule for majority of projects for construction bidding by 2022.
2. USACE and City teams comprise overall project management team.
3. City departments, including those who will maintain the system, are engaged in process.
4. West side construction projects continuing in Czech Village (started Phase 3 of levee project in December 2018)
Thank you
Questions?

Presented by:
Robert Davis, PE – Flood Control Program Manager
Flood Control System

Time and Motion Update

January 17, 2019
Time and Motion Study

- Operation and Deployment Risk Assessment Report by USACE
- Focuses on demountable and removable walls and gates
- Updates the 2012 east side study
- Adds west side FCS components
Assumptions

- Required personnel is trained and available
- Required equipment is available
- Current Master Plan
  - Size and Location of gates and removables
  - Several gate types
- Hydrology says installation within 48 hours
Installation risks affect erection time

- Inclement weather
- Training
- Damaged Panels
- Equipment Malfunctions

Range of study

- Nominal/minimal Risks
- Average risk
- 90% of risks occur (city request)
- Murphy's Law
Required operations into a schedule
Draft Study Results – Erection Time

• Current Master Plan
  • Minimum  26 hours
  • Mean    40 hours
  • Max     58 hours

• 90\textsuperscript{th} Percentile  =  47 Hours
Conclusions:

- Current Master Plan can work
- Opportunities exist to Improve Resiliency Percentile Above 90%
  - partial erection in advance (e.g. when river at minor flood stage)
  - reduce length of removable walls?
  - Further reduce number of roadway gates?
  - Use more efficient gates than stop log gates
Comments:

1. Example opportunities being evaluated to reduce removable walls & enhance experience:
   - Tree of Five Seasons (Tree on top of levee)
   - 1st & 1st Development (build protection into building like CRST)

2. Removables as percentage of total system
   - Original Master Plan 20%
   - Current Master Plan 15%
   - Master Plan Intent Preserved 12.5%
Council Committee Meeting April 2019:

- Update on design plan for east side removables in conjunction with USACE project
Thank you
Questions?

Presented by:
Robert Davis, PE – Flood Control Program Manager
Quaker Oats Wall

• 250 Linear Feet Complete
• Work continues with South Pump Station
• Camera is available:
Sinclair Monuments

- Boulder Contracting is under Contract
  - Early Start Date: 02/18/2019
  - Completion Date: 06/21/2019
Ellis Landings Flood Structure

- Floodwall being completed by Knutson with oversight from HR Green, City, and Terracon
- City has issued the permits
- Completion anticipated in late spring or summer 2019
Czech Village Levee

Bowling St SW to Landfill:
• Project began in Late Fall 2017
• Permits have been secured
• Estimated completion: Summer 2019

16th Ave. SW to Bowling St SW:
• Project began December 2018
• Permits have been secured
• Estimated Completion Summer 2020
Cedar Rapids Flood Control System – Voluntary Property Acquisition Adjoining Czech Village Detention Basin

City Council Flood Control Committee
January 17, 2019
Benefit of adding detention basins to FCS:

• Meters flows into pump station, thereby reducing pump sizes
• Improves pump station operation and efficiency
• Less reliance on pumps = more river flood resiliency
• Less neighborhood flooding in large rainfall events

FCS Master Plan:

• Originally pump stations without detention basins
• Currently 5 detention basins in FCS
• Additional basins being planned upstream of pump stations.
Project Includes:

- Voluntary acquisition of three homes immediately adjacent to the proposed detention pond.
- Parcels are 1.7 to 1.9 ft. above the detention pond high-water elevation.
- Potential ponding in yard or water in basement.
Key Facts about Project

• 100-year flood map shows structures staying dry:
  • Water will be on 22\textsuperscript{nd} Avenue SW and in yards

• Increased risk of flooding on parcels when river is in flood stage & storm gates are closed
Key Facts about Project

- Adjacent properties:
  - Homes low openings less than 2 feet above top of basin
  - All 3 properties sold after Jan 2016, before adjacent detention basin was added to FCS Master Plan
  - Flood insurance is nearly $\frac{1}{2}$ of mortgage payment
- Voluntary acquisition offers recommended
- Affected property owners are amenable to an offer
- Offers in 2019 if Council authorizes Master Plan change
Public Works Recommends

• Amend Chapter VI of the FCS Master Plan to accommodate voluntary acquisitions of 3 properties located on the protected side of the FCS.

• City Council action anticipated on January 22, 2019
Thank you
Questions?

Presented by:
Robert Davis, PE – Flood Control Program Manager
8th Avenue Bridge Replacement Timeline

2015: FCS Master Plan
2016: Request to add 8th Avenue Bridge Raising – Approved by State of Iowa
2017: 8th Avenue Added to Master Plan
2018: Consultant Selection for Design = T.Y. Lin International
2019: January Approval of T.Y. Lin Contract
# 8th Avenue Bridge Replacement Project Team

**Prime Consultant:** T.Y. Lin International  
- 8th Avenue Bridge Design  
- Architecture

**Sub-consultants:**

- **Auerbach Glasow**  - Aesthetic Lighting
- **Confluence**  - Landscape Architecture, Overall Aesthetics
- **Integrated Engineering Management**  - Cost Estimates
- **John Otter Engineering Services**  - Constructability Review
- **Rowan Williams Davies & Irwin**  - Wind Engineering
- **Shoemaker & Haaland**  - Surveying, Outreach, Coordination
- **Stanley Consultants**  - Misc. Structures, Roadway, Traffic
- **Terracon Consultants**  - Geotechnical

5/28/2019  
8th Avenue Bridge Design – Phase 1  
City of Cedar Rapids
T.Y. Lin – Preliminary Work

- Feasibility Studies
- Order of Magnitude Costs
- Public Bridge Preference
- Gathering Space Usage and Concepts
- Traffic Study
- Validation Study
  -> Specialty Structural Designer <-
T.Y. Lin – Bridge Design

- Inquisitive Outreach
- Field Investigations
- Bridge Alternatives Study
- Spans, Alignments, Geometry
- Aesthetics

Short Tower with Cables
Trail on Bridge
Greater Than 650’ Span
Clear of Potential Floods
T.Y. Lin – Auxiliary Design

- Gathering Space Development
- Intersection Geometry
- Flood Control Integration
- Trail Integration and Connectivity
- Adjacent Property Coordination

Downtown Views

Multi Use

Improved Intersection Geometry

Flood Control, Trail Integration
T.Y. Lin - 30% Design

- Geotechnical Investigation
- Scope of Construction
- Cost Estimates
- Permits
- Additional Funding Sources
- Demonstrative Outreach
- 30% Plan Set
## T.Y. Lin Contract

### Schedule

<table>
<thead>
<tr>
<th>Month</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2019</td>
<td>Contract Approval, Commence Design</td>
</tr>
<tr>
<td>June 2019</td>
<td>Complete Concept Design</td>
</tr>
<tr>
<td>July 2019</td>
<td>Commence 30% Design</td>
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<tr>
<td>December 2019</td>
<td>Complete 30% Design</td>
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### Fee

<table>
<thead>
<tr>
<th>Design Type</th>
<th>Fee</th>
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<tr>
<td>Concept Design</td>
<td>$1,658,340</td>
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<tr>
<td>30% Design</td>
<td>$1,532,829</td>
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<tr>
<td>ODC</td>
<td>$95,917</td>
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</tbody>
</table>

Total Fee = $3,287,086
Public Works Department recommends approval of the TY Lin International design contract. Thank you.

Questions?