

The Severity of the Flooding

Nebraska City Gage


Historic Crests (ft)

1. March 2019 – 30.1
2. 2011 – 28.3
3. 1993 – 27.2
4. 1952 – 26.6
- ...
10. June 2019 – 23.1
12. Sep 2019 – 22.9

Flood Categories (in feet)	
Major Flood Stage:	27
Moderate Flood Stage:	23
Flood Stage:	18
Action Stage:	17

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You Want What By When?

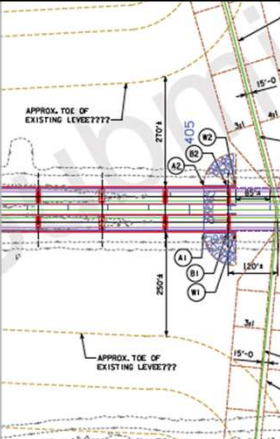


The Proposition

“Provide a functional overflow by March 1, 2020”

Rethinking Plan Preparation

What will it take to prepare plans and get the bridge built?



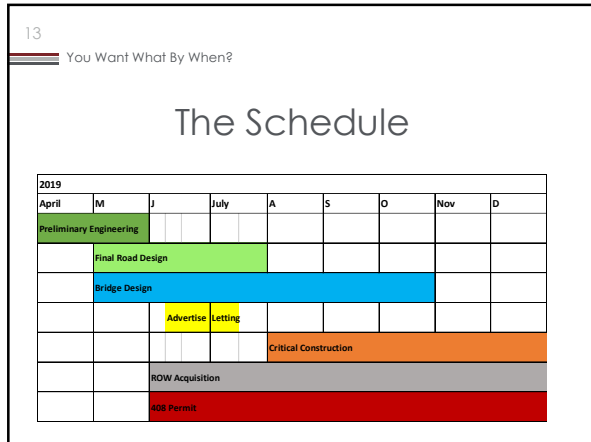
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You Want What By When?

Getting Organized & then Started

- Deciding who?
- Road Design
- Bridge Design
- Levee Design





Concepting Something Easy to Design & Build

- Rebuild a higher roadway, maintain median width and other criteria
- How do we keep it open to traffic during construction?
- What can expedite construction of a bridge?

Roadway Design

Setting alignment and grade & settling on the maintenance of traffic

..the gateway to others success



17 You Want What By When?

Execution

- USACE Levee Relocation / Section 408 Issues

18 You Want What By When?

USACE 408 Submittal Package

- Define project
- Analyze impact
- Certify no adverse impact
- Define timeline
- Create EAP template
- Summarize O&M impacts
- Sponsor's statement

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You Want What By When?

USACE 408 Schedule

- Developed Critical Path Schedule
- Responsible Parties on Critical Path
 - Thiele Geotech (Boring/Lab Testing)
 - Stanley Team - Levee Stability / Settlement, River Hydraulics
 - Iowa DOT - Roadway Design
 - USACE - (5 Interim Submittals, 408)
 - HDR - Levee Design, Construction Management, O&M Addendum, Levee Certification
 - Levee Sponsor - Concurrent review and approval of 408

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You Want What By When?

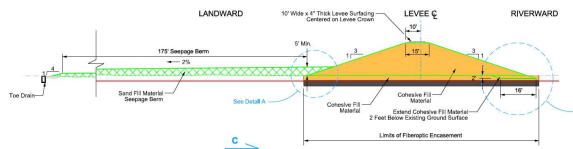
USACE 408 Schedule

- Results
 - Start Geotechnical Borings / Design - 5/1/2019
 - Preliminary Design Plans - 5/14/2019
 - Letting Plans to DOT Contracts - 6/15/2019
 - 408 Authorization from USACE - 7/12/2019

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You Want What By When?

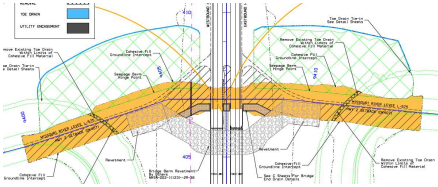
Levee Design Details



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You Want What By When?

Levee Design Details



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You Want What By When?

USACE Project Quote

To facilitate USACE review and approval, IDOT quickly set up meetings with USACE to coordinate the project. They identified critical design elements and milestones, contacts within the USACE team, and the IDOT team so questions could be answered quickly. The IDOT team and USACE team continued this coordination throughout the permission process. There were also "over the shoulder review points" completed to allow real time feedback from the USACE team to the IDOT team. This all ensured that the appropriate reviews occurred and USACE levee design criteria was met.

Ensuring flood risk reduction during construction required considerable planning and sequencing by IDOT. This would have been challenging during ordinary years, but in 2019 the Missouri River at the project site was above flood stage for 270 days. The sequencing, coordination and communication during construction allowed for confidence from the USACE team, the Levee Sponsors, and the community that flood risk reduction was continuous.

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You Want What By When?

Key Levee Takeaways

- USACE Trust and Pre-Submittal Review
- Strict Adherence to CPM Schedule
- Dewatering Issues
- Early Coordination – Levee Staged Construction
- Conservative Design to Start
- Fiber Optic Utility Issue
- Intensive Design Coordination
- Levee Construction Management / Certification



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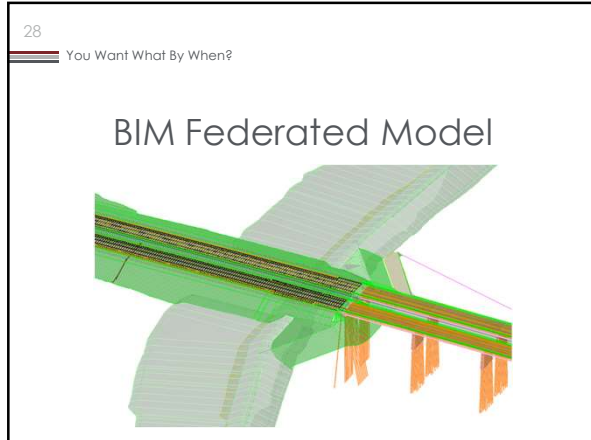
Execution

- Accelerated Bridge Design
- Bridge Concept Layout to Project Letting in 9 weeks!

Execution

Started all bridge design phases at Notice to Proceed

- Hydraulics using Conceptual Bridge Layout
- Superstructure Design utilizing IowaDOT standard details
- Substructure Design assuming poor soil conditions



Bridge Options

Targeting Contractor Flexibility

- Substructure included two pier types
- Temporary superstructure option

STAGE 2A - CONSTRUCT E.B. SUBSTRUCTURE

STAGE 2B - INSTALL TEMPORARY BRIDGE SUPERSTRUCTURE

Bridge Options

Keep it Simple!

- Repetitive, Conservative Designs
- IowaDOT Standard BTE155 prestressed beams
- Stub abutments
- Steel H-piles for all substructure foundations

43'-2" DECK WIDTH
40'-0" ROADWAY

E.B. 1A 2

SH. 6'-0" LANE 12'-0" LANE 12'-0" SHOULDER 10'-0"

2.0% 2.0%

TL-4 BARRIER (TYP.)

5 SPACES @ 7'-2 1/2" (-) = 36'-2"

3'-6" (TYP.)

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Key Bridge Takeaways

- Concurrent Preliminary and Final Design
- Continuous Coordination with Other Disciplines
- Provide Contractor Flexibility
- Plan for Challenging Site Conditions
- Keep it Simple - Repetitive & Conservative Design
- Utilize BIM model for visualization and over the shoulder QC
- Keep moving forward



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You Want What By When?

Checking In with Contractors

- Two meetings with AGC
 - May 8, 2019
 - June 3, 2019
- Two purposes
 - Get feedback on the design goals: *timeline, ease of construction*
 - Inform about contracting peculiarities: *unsigned plans, pending permits, short advertising period*

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Addressing Risk

- Bonus for opening the floodway ***
- Deferred completion date when waters exceeded a given elevation
- Advertising unsigned plans/addressing quantity changes
- Delays in permitting



The Letting

The Bid Letting was July 2, 2019

- 3 months after the green light was given

There were bidders!

Low bid was near estimated cost

Permits were in hand before letting

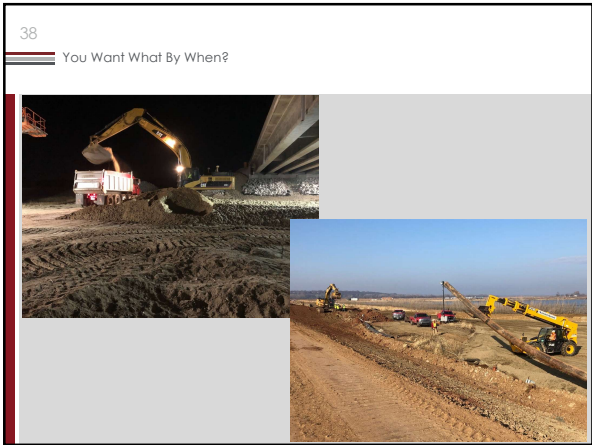
Signed plans were available ~14 days after letting

And then... Construction

The contractor continues the acceleration.









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You Want What By When?



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You Want What By When?




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You Want What By When?




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The Schedule



2019											
April	M	T	W	Th	Friday	S	S	O	Nov	D	
Preliminary Engineering											
Final Road Design											
Bridge Design											
			Advertise	Letting							
Critical Construction											
ROW Acquisition											
408 Permit											





THANK YOU FOR YOUR TIME AND ATTENTION

Tony Bower, P.E. Stanley Consultants
 Jeremy Vortherms, P.E. Iowa Department of Transportation
 Will Sharp, P.E. HDR
