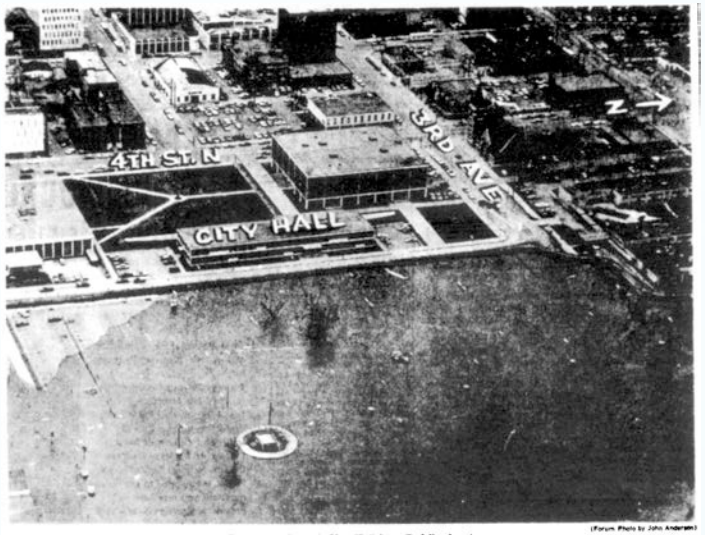
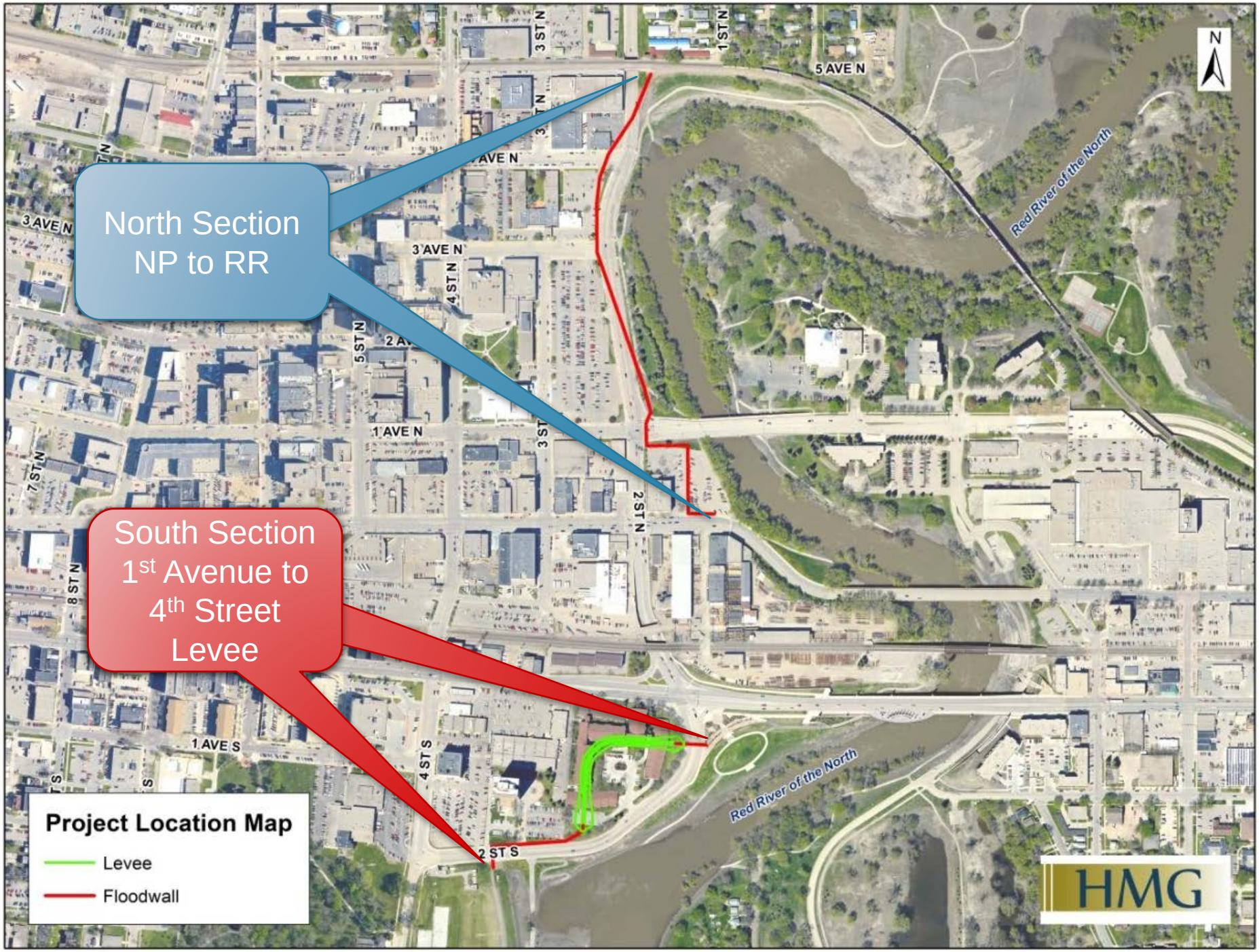
2nd Street/Downtown Flood Control Improvement Project

Commission Update
September 3, 2013



Dike protects Fargo's City Hall from Red flood waters.


North Section
NP to RR
South Section
1st Avenue to
4th Street
Levee
Project Location Map
Levee
Floodwall
Red River of the North
Red River of the North
5 AVE N
3 AVE N
1 AVE N
1 AVE S
2 ST N
2 ST S
3 ST N
4 ST N
4 ST S
5 ST N
7 ST N
8 ST N
N
HMG

Project Considerations

- **Flood protection capability**
- **Geotechnical stability/sustainability**
- Private property impacts
- Traffic/transportation impacts
- Parking impacts
- Utility impacts
- Environmental impacts
- River connectivity
- Public green space opportunities
- Economic development opportunities
- Operation/maintenance requirements
- Costs

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Early Concept Plan Development

- Numerous alignments
- Multiple methods
- Varied levels of protection
- Geotechnical evaluation
- Traffic analysis
- Environmental assessments
- Project costs estimates
- Preliminary design

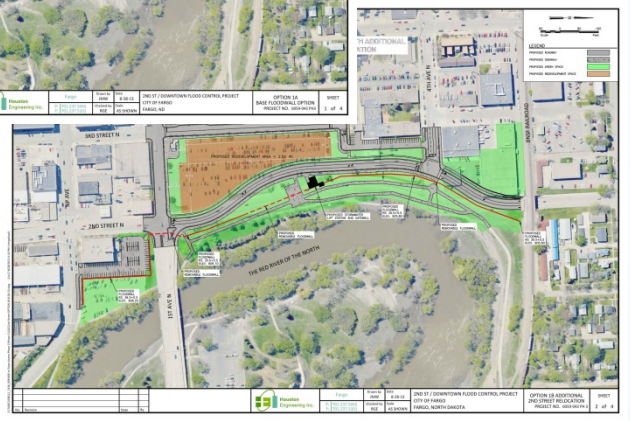


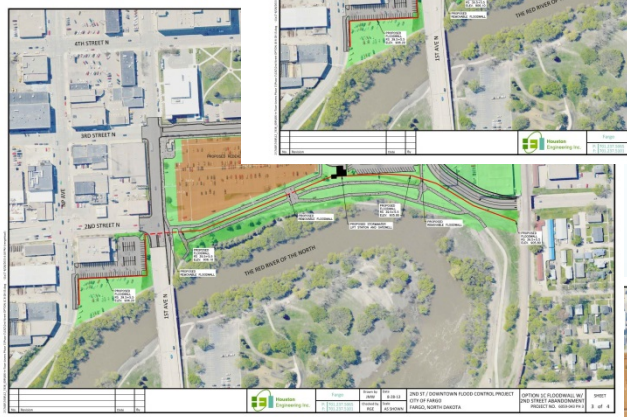


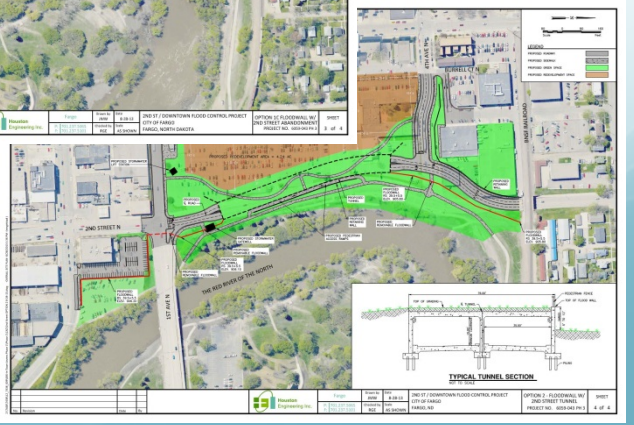


Options for Consideration

- Option 1A – Floodwall Base Option
- Option 1B – Floodwall with Additional 2nd Street Relocation
- Option 1C – Floodwall with 2nd Street Abandonment
- Option 2 – Floodwall with 2nd Street Tunnel / Grade Separation Structure







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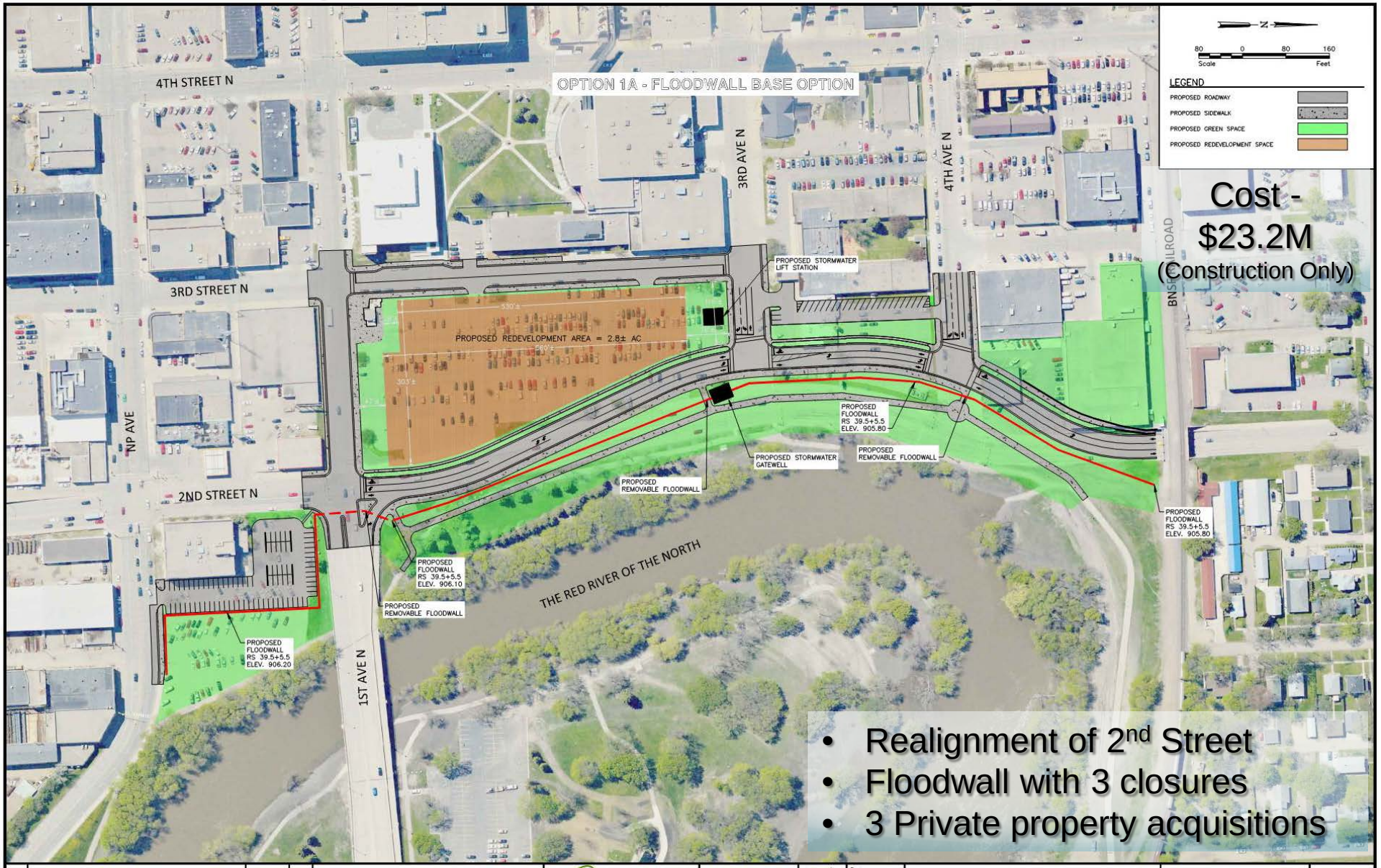
Option 1A – Floodwall Base Option



Cost - $23.2M
(Construction Only)

- Realignment of 2nd Street
- Floodwall with 3 closures
- 3 Private property acquisitions

No.	Revision	Date	By

Houston Engineering Inc.
Fargo
P: 701.237.5065
F: 701.237.5101

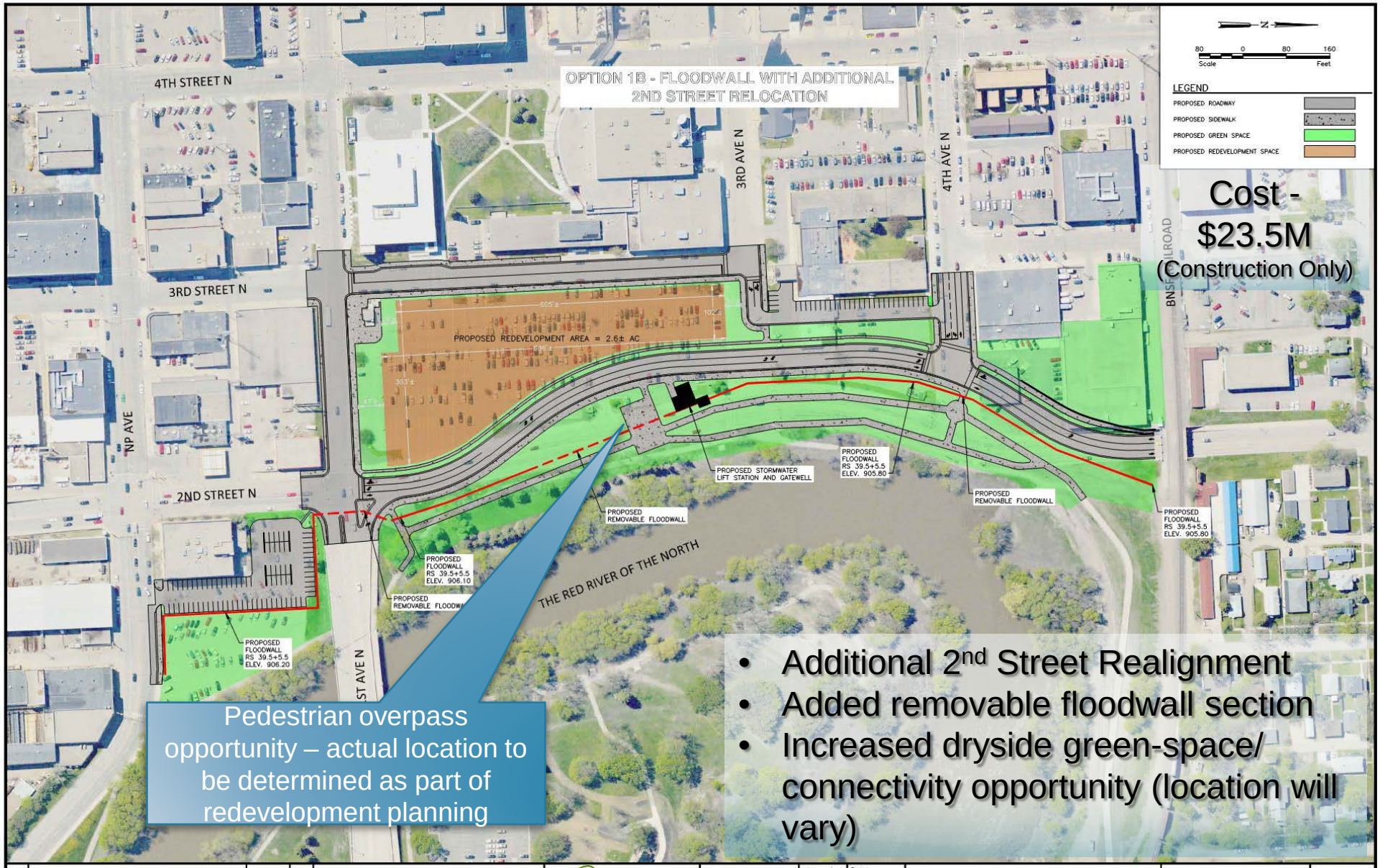
Drawn by	Date
JMW	8-28-13
Checked by	Scale
RGE	AS SHOWN

2ND ST / DOWNTOWN FLOOD CONTROL PROJECT
CITY OF FARGO
FARGO, ND

OPTION 1A
BASE FLOODWALL OPTION
PROJECT NO. 6059-043 PH3

SHEET 1 of 4

Option 1B – Floodwall – Added 2nd Street Relocation



Cost - $23.5M
(Construction Only)

Pedestrian overpass opportunity – actual location to be determined as part of redevelopment planning

- Additional 2nd Street Realignment
- Added removable floodwall section
- Increased dryside green-space/ connectivity opportunity (location will vary)

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F: 701.237.5101

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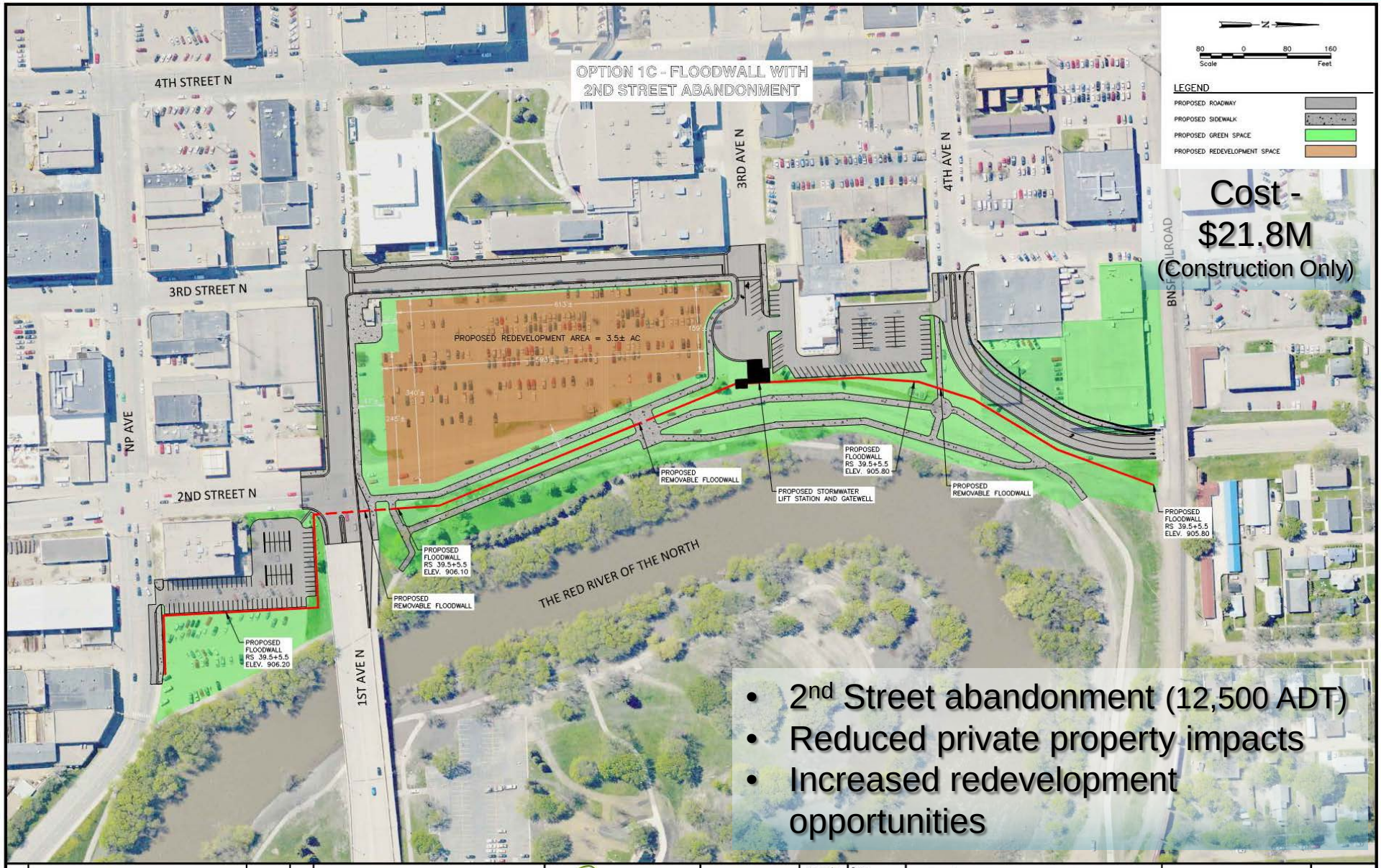
Checked by RGE | Scale AS SHOWN

2ND ST / DOWNTOWN FLOOD CONTROL PROJECT
CITY OF FARGO
FARGO, NORTH DAKOTA

OPTION 1B ADDITIONAL 2ND STREET RELOCATION
PROJECT NO. 6059-043 PH 3

SHEET 2 of 4

Option 1C – Floodwall – 2nd Street Abandonment



Cost - $21.8M
(Construction Only)

- 2nd Street abandonment (12,500 ADT)
- Reduced private property impacts
- Increased redevelopment opportunities

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2ND ST / DOWNTOWN FLOOD CONTROL PROJECT
CITY OF FARGO
FARGO, NORTH DAKOTA

OPTION 1C FLOODWALL W/ 2ND STREET ABANDONMENT
PROJECT NO. 6059-043 PH 3

SHEET 3 of 4

Option 2 – Floodwall – 2nd Street Tunnel/Grade Separation

OPTION 2 - FLOODWALL WITH 2ND STREET TUNNEL

3RD STREET N
2ND STREET N
3RD AVE N
4TH AVE N
BURRELL CT N
BNSF RAILROAD
THE RED RIVER OF THE NORTH

PROPOSED REDEVELOPMENT AREA = 4.2± AC

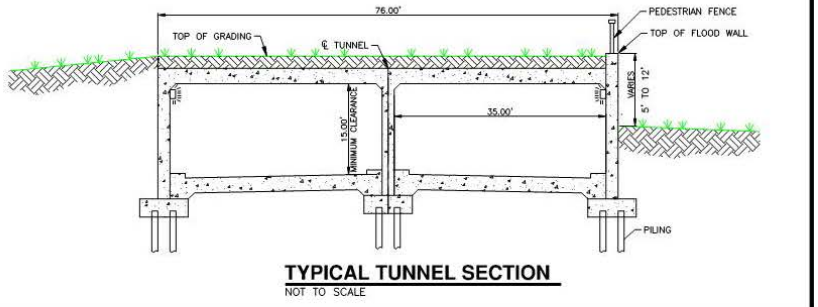
PROPOSED STORMWATER LIFT STATION
PROPOSED ℄ ROAD
PROPOSED TUNNEL
PROPOSED RETAINING WALL
PROPOSED FLOODWALL RS 39.5+5.5 ELEV. 905.80
PROPOSED REMOVABLE FLOODWALL
PROPOSED RETAINING WALL
PROPOSED FLOODWALL RS 39.5+5.5 ELEV. 905.80
PROPOSED PEDESTRIAN ACCESS RAMPS
PROPOSED STORMWATER GATEWELL
PROPOSED REMOVABLE FLOODWALL
PROPOSED FLOODWALL RS 39.5+5.5 ELEV. 906.10
PROPOSED REMOVABLE FLOODWALL
PROPOSED FLOODWALL RS 39.5+5.5 ELEV. 906.20

80 0 80 160
Scale Feet

LEGEND
PROPOSED ROADWAY
PROPOSED SIDEWALK
PROPOSED GREEN SPACE
PROPOSED REDEVELOPMENT SPACE

Cost - $44.1M
(Construction Only)

- Tunnel – Increased redevelopment opportunities
- Improved river visibility/connectivity
- Additional private property impacts



TYPICAL TUNNEL SECTION
NOT TO SCALE

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Drawn by	Date
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Checked by	Scale
RGE	AS SHOWN

2ND ST / DOWNTOWN FLOOD CONTROL PROJECT
CITY OF FARGO
FARGO, ND

OPTION 2 - FLOODWALL W/ 2ND STREET TUNNEL
PROJECT NO. 6059-043 PH 3

SHEET 4 of 4

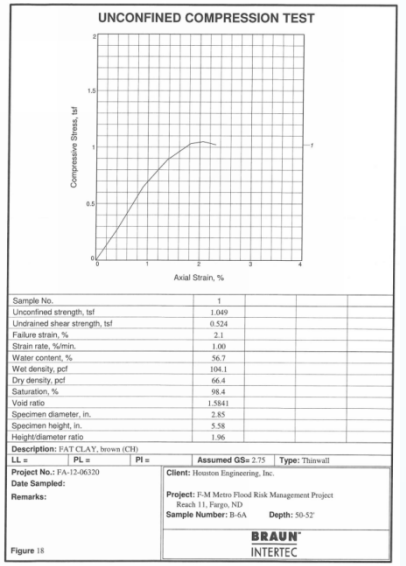
Option Consideration Comparison

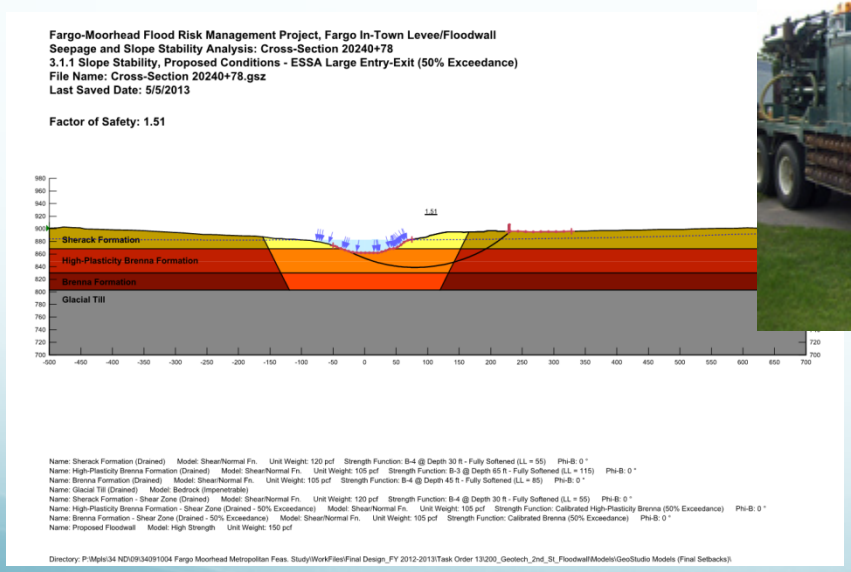
"all options meet flood protection needs and are technically feasible" Option	Flood protection capability	Private property impacts		Traffic/transportation impacts	Parking impacts	Utility impacts	Environmental impacts	River connectivity / visibility	Public green space opportunities (acres)	Redevelopment opportunities (acres)			Operation/maintenance requirements	Costs (millions - Construction Only)
		Number of structure acquisitions	Approx. Assessed Value							Outside LDZS/MDZS	within LDZS (450-ft)	within MDZS (350-ft)		
Option 1A Floodwall Base Option	Good	2.5	$2.8M	Low	Low	High	Low	Low	2.8	0.96	1.35	0.49	Low	$23.2M
Option 1B Floodwall with Additional 2nd Street Relocation	Good	2.5	$2.8M	Low	High	High	Low	Medium	2.6	1.00	1.40	0.20	Medium	$23.5M
Option 1C Floodwall with 2nd Street Abandonment	Good	2	$2.2M	High	Low	High	Low	High	3.5	0.94	1.47	1.09	Low	$21.8M
Option 2 Floodwall with 2nd Street Tunnel	Good	3	$4.8M	Low	High	High	Low	High	4.2*	2.34*	1.73	0.13	High	$44.1M

Redevelopment/Setback Requirements

Geotechnical Stability Requirements

- Soil Borings
- Slope Stability Evaluation
- Foundation Bearing Capacity
- Seepage Analysis
- Settlement Analysis
- Minimum Design Requirements (USACE and FEMA)





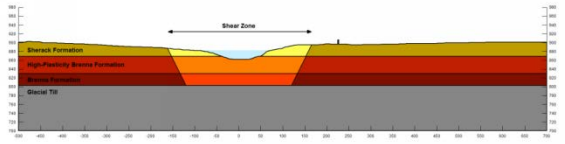


Figure 6 Model Geometry at Cross-Section 20240+78

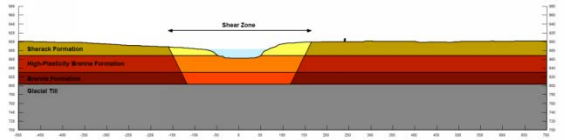


Figure 7 Model Geometry at Cross-Section 20243+60

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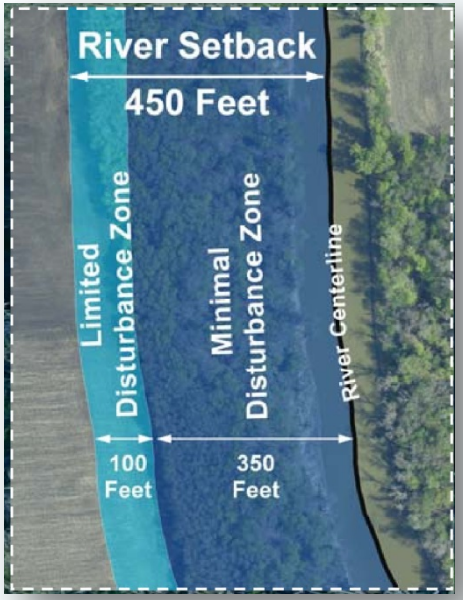
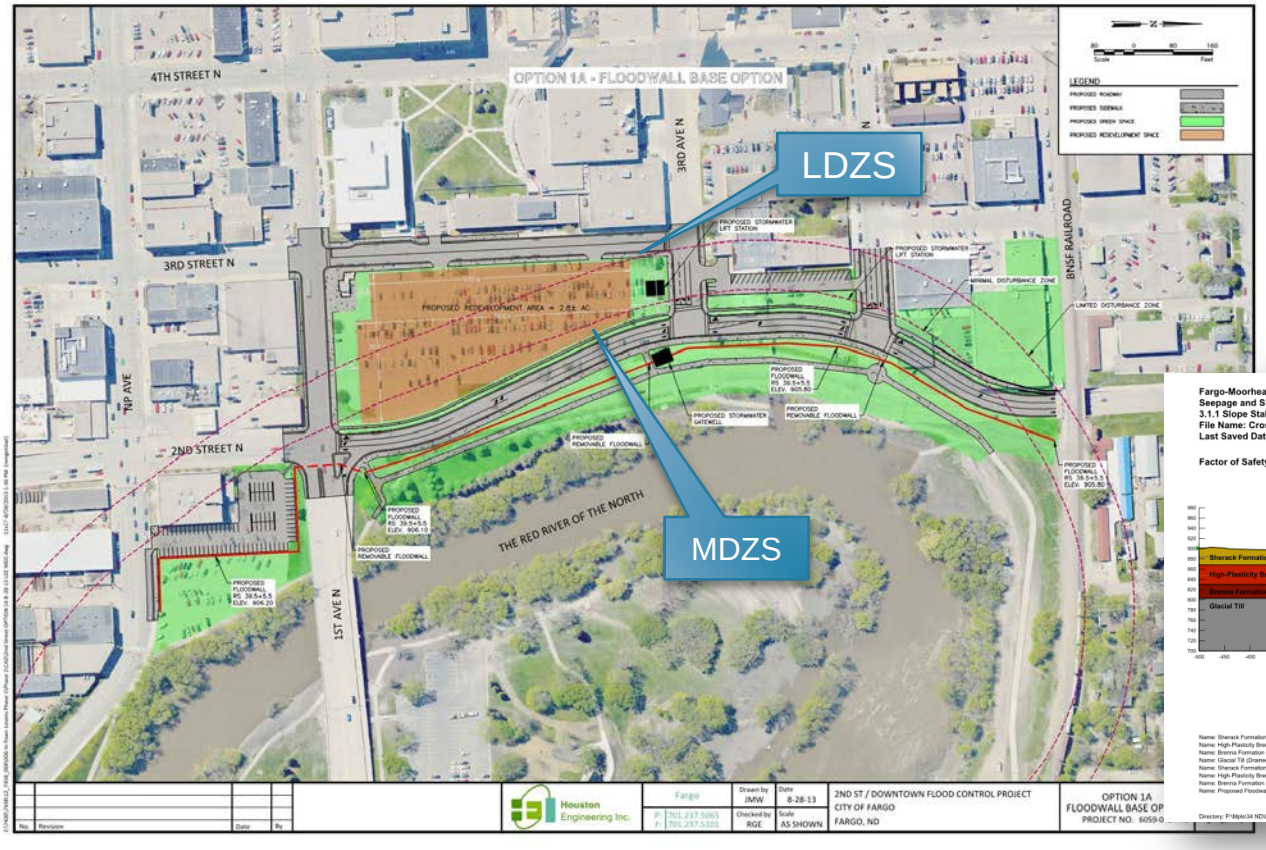
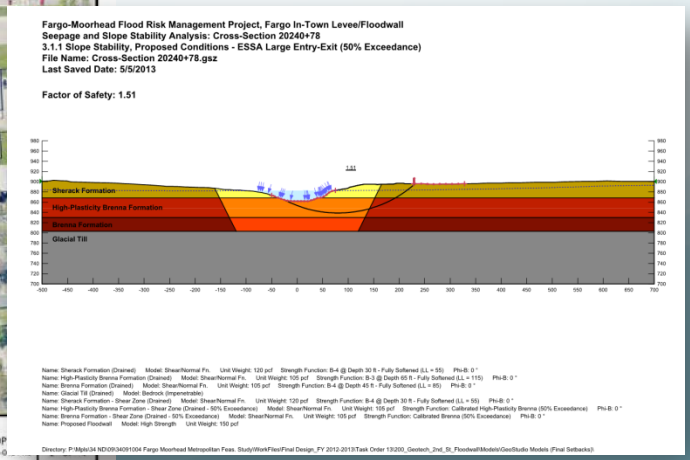
Redevelopment/Setback Requirements

River Setback Requirements – Stability Concerns

- Minimal Disturbance Zone Setback (MDZS) – 350ft
  - *ESSENTIALLY NO "DISRUPTIVE" ACTIVITY ALLOWED*
- Limited Disturbance Zone Setback (LDZS) – 450ft
  - *ONLY LIMITED "DISRUPTIVE" ACTIVITY ALLOWED*
  - *Development would require wavier*
- No Impact to Floodwall Stability would be required.







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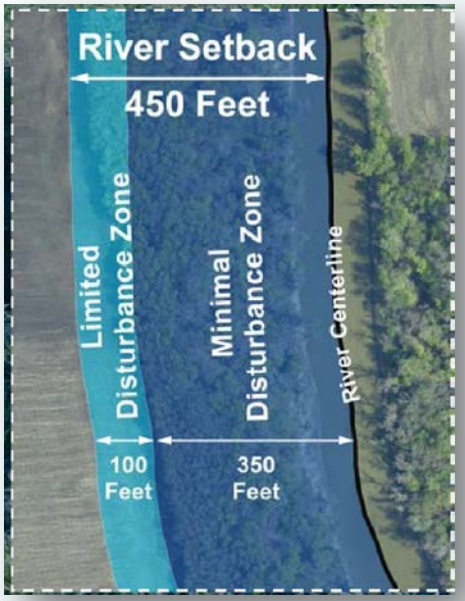

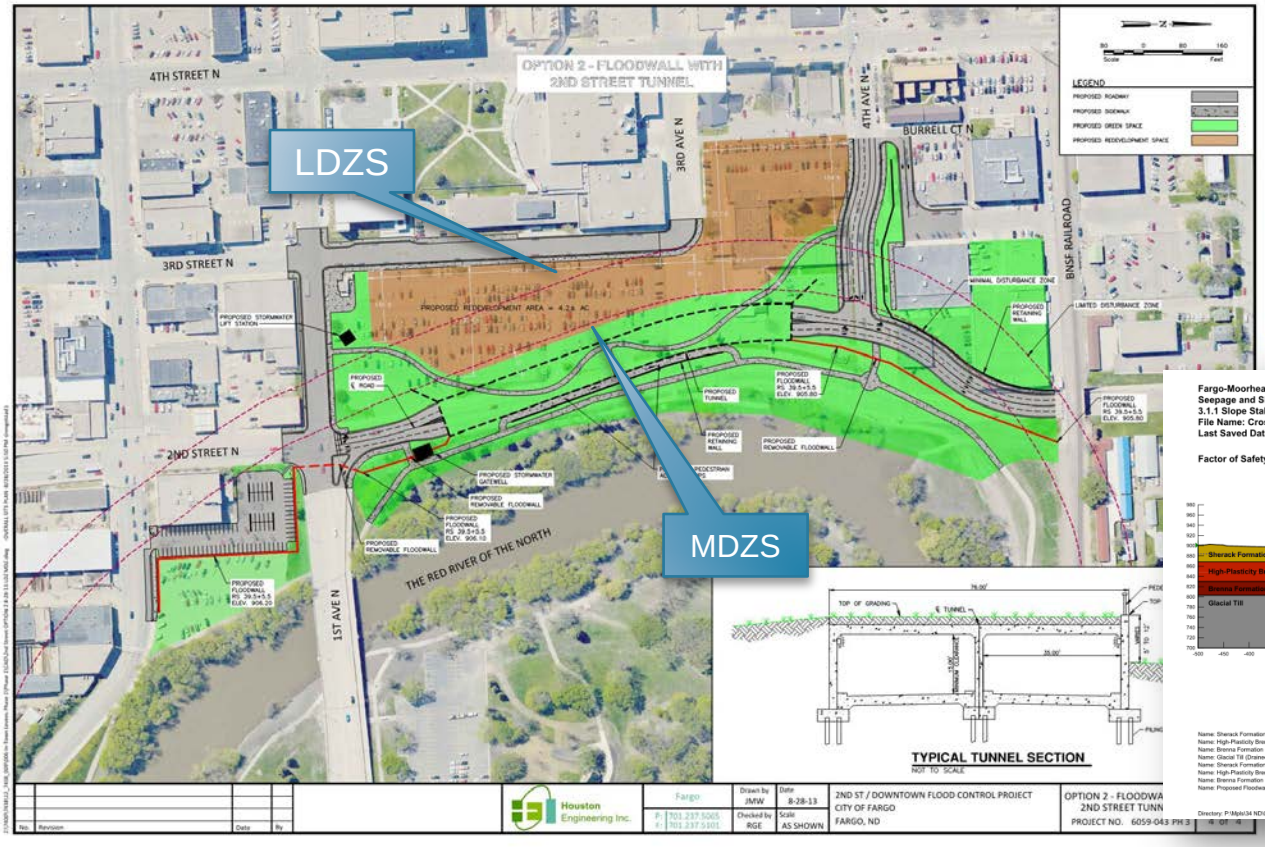

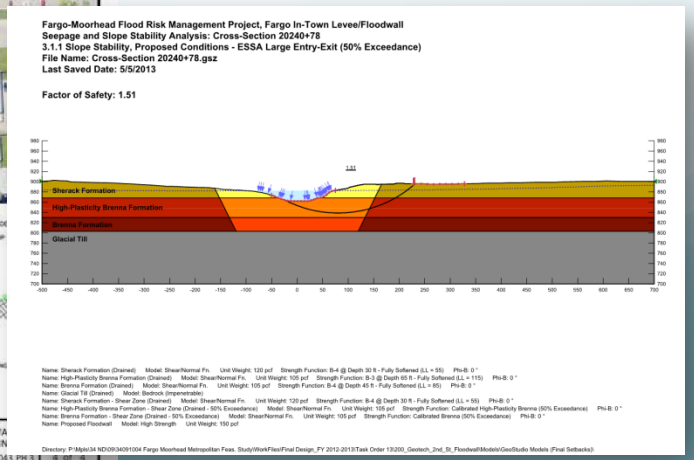

Option Consideration Comparison

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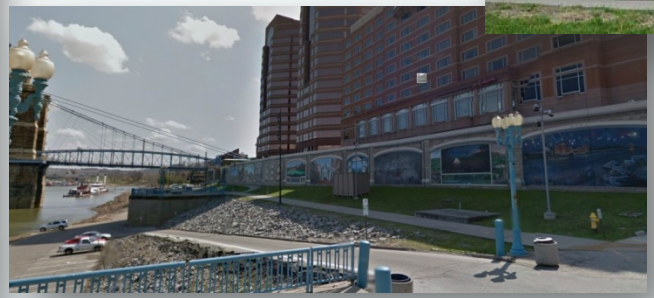
Additional Aesthetic Enhancement Opportunities

Covington KY – Adjacent Development Example

Grand Forks – Aesthetic Treatment Example



East Grand Forks – Removable Panel Example

Questions?

HoustonEngineering Inc.

Website & Public Comment

www.CityofFargo.com/2ndStFloodProtection

CITY OF Fargo

City Info | Residential

Search... Go

- 2nd Street North
- 4th Street South Levee
- Coulees Crossing
- Harwood Drive Levee
- Mickelson Field Area
- Oakcreek/Copperfield Court
- River Vili
- Rose Creek North Side

Home > City Info > Departments > Engineering > Flood Co
North

2nd Street North Flood Contro

The City of Fargo has developed four options to help reduce
downtown area along 2nd Street North from approximately N
North. These four options provide the same levels of protecti
opportunities for defining our river corridor through the inclus

- Enhanced public space options
- Area for future redevelopment that is protected from frequ
- Ways of maintaining various levels of connectivity to the r

Background

As anyone familiar with a Fargo flood fight knows, the portion
from NP Avenue to 6th Avenue North, requires the construct
levee whenever the river is projected to reach major flood sta
of 30-feet or higher. This temporary levee protects areas of
floodwaters and has been installed five times in the last five
actually required to be installed two times in 2013 alone due
summer floods.

While the City has been successful to date in holding back th
temporary measures, it is vital to establish permanent protec
reliable than the emergency efforts. To advance toward that goal the City has
developed four options, listed on the right column of this page, for potential flood risk
reduction projects.

Public Survey

2nd Street Flood Risk Reduction Public Comment

Name (optional):

What city do you live in? (required):

Fargo

Email Address (required):

Please rank which elements are most important (1-4): (required):

1
2
3
4

Which option do you prefer: (required)

(Please refer to the project homepage for more information on these options)

- 1A – Floodwall, maintain 2nd Street. $23.2 million.
- 1B – Floodwall, maintain 2nd Street, ability to accommodate grade separated pedestrian connection. $23.5 million.
- 1C – Floodwall, abandon 2nd Street. $21.8 million.
- 2 – Floodwall with grade separated traffic and pedestrian facilities (tunnel). $44.1 million.

Additional Comments (optional):

comment link below:

Comment now!

Your input will help guide Fargo City Commissioners as they make the final decision.