

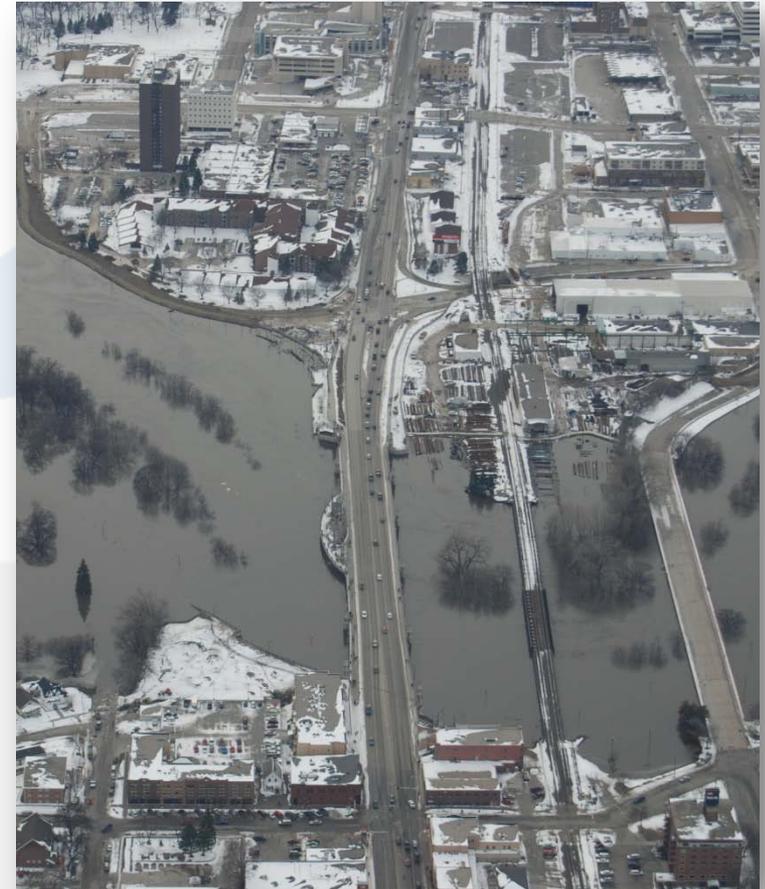
Infrastructure Contingency Planning for the 2011 Fargo Flood

North Dakota Water and Pollution Control Conference
Bismarck, North Dakota

October 13, 2011

Presentation Overview

- **Scope of the Project**
- **Contingency Planning Challenges**
- **Contingency Plans for Vulnerable Areas**
- **Closing Thoughts and Recommendations**



Scope of the Project

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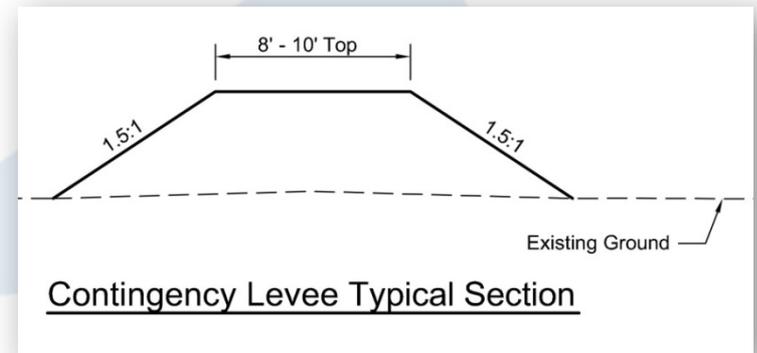
- **Contingency Plans Developed for Vulnerable Areas of the City**
 - Earthen Levees
 - Subsurface Infrastructure Plans
 - Private Plumbing Impacts
- **Contingency Plan Areas are Prioritized**
 - Prioritized based on Historical Events



Scope of the Project

- **Determination of Project Quantities**

- Clay Levees
- Infrastructure Plugs
- Temporary Pumping
- Private Plumbing Work



- **Implementation of Contingency Plans**

- Red River Level of 40.0' and Rising
- Dependent on Crest Predictions
- Staged Process for Some Neighborhoods

Scope of the Project

- **Valuable for Short Term/Long Term Planning**
 - Future Infrastructure Projects
 - Compartmentalizing the City



Contingency Planning Challenges

Contingency Planning Challenges

- **Contingency Plans are not Full Proof**
 - Earthen Levees are the Easy Part
 - Infrastructure Plugs are Vulnerable
 - Private Plumbing is Vulnerable

Contingency Planning Challenges

- **Contingency Plans Become More Complicated the Farther West of the Red River Levees are Built**
 - Subsurface Infrastructure Plans become Difficult to Implement
 - Private Plumbing Impacts Multiply
 - Time Required to Implement Plan Increase

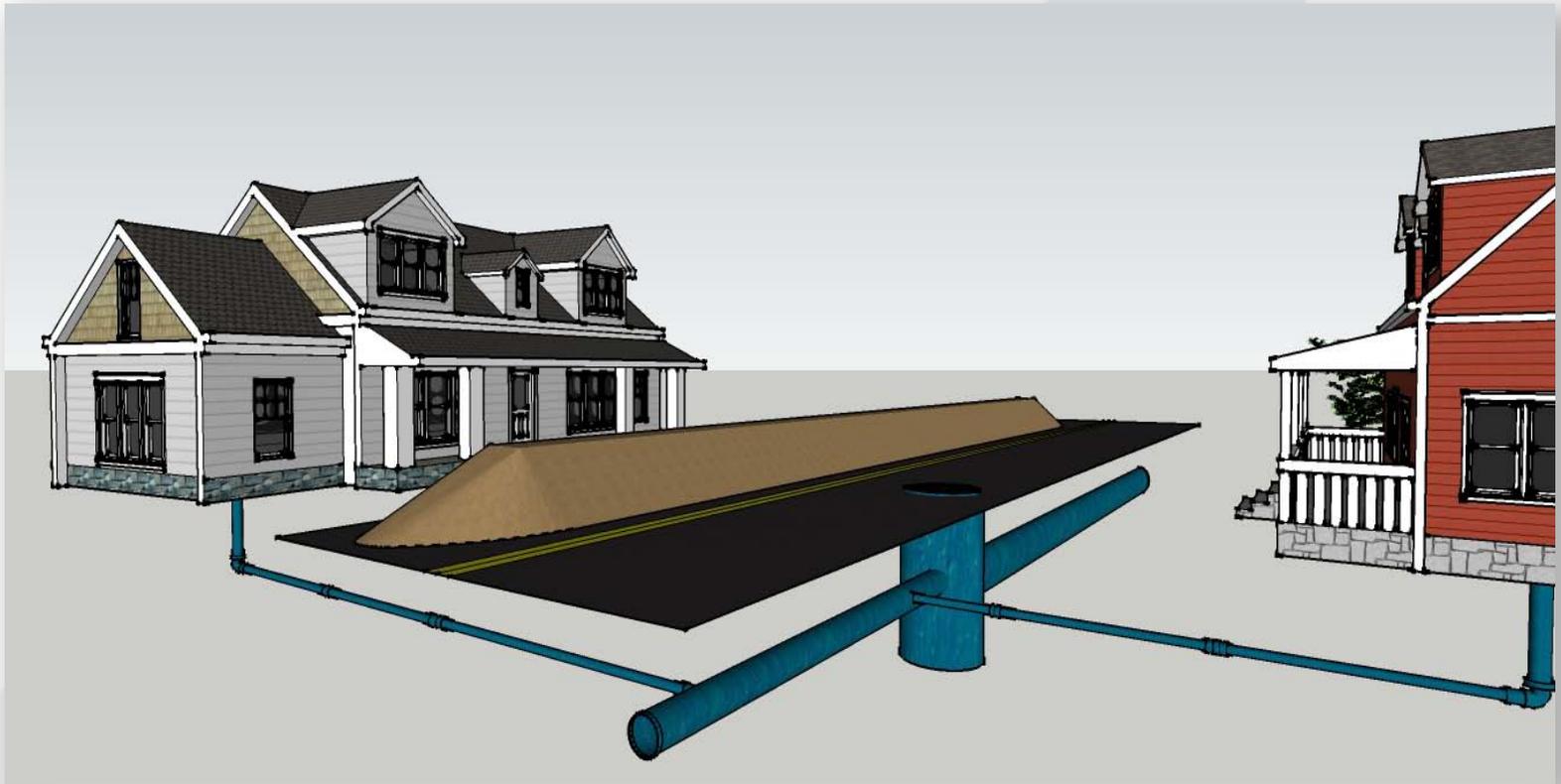
Contingency Planning Challenges

- **Contingency Plan – What about the Pipes?**



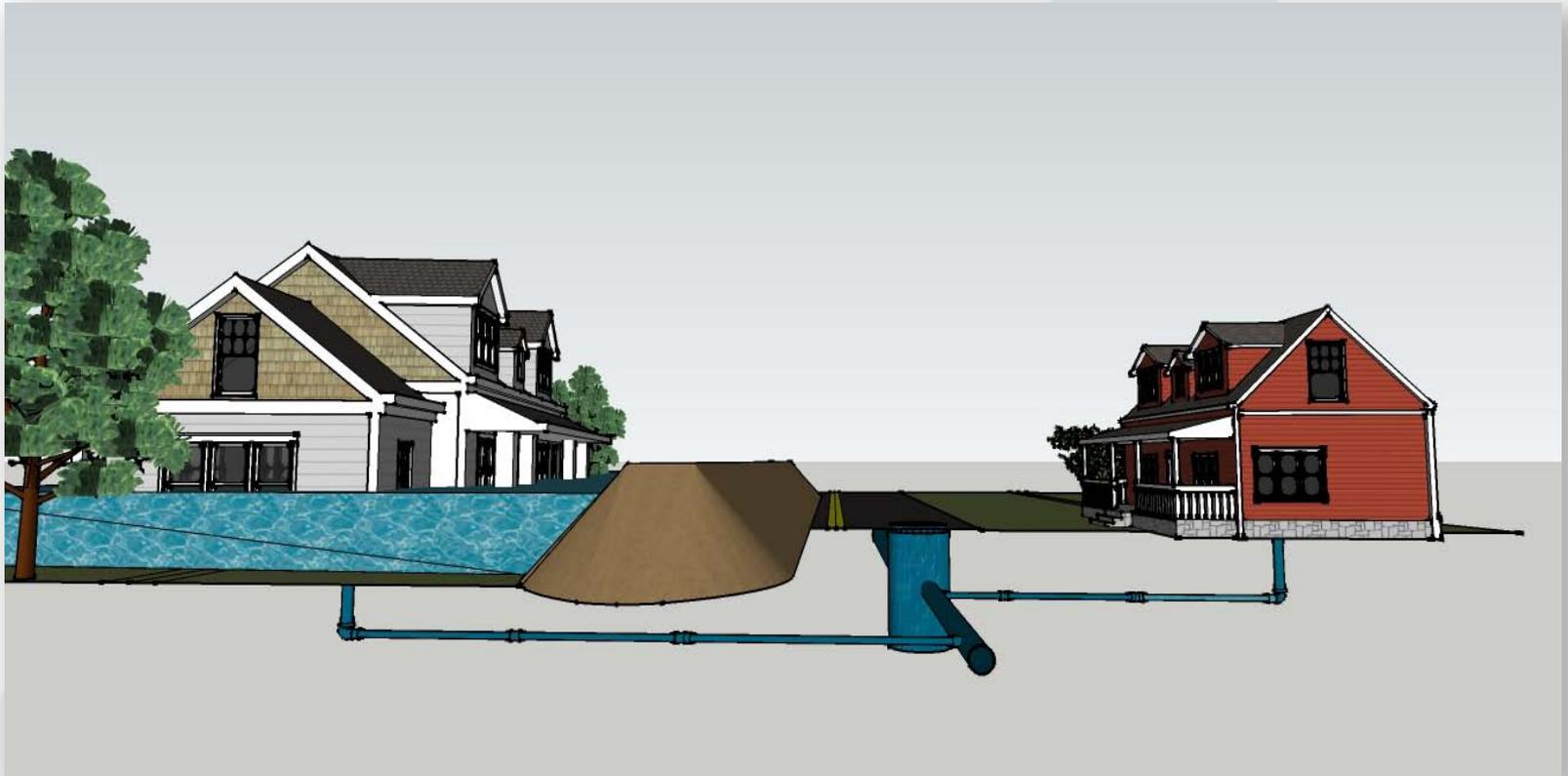
Contingency Planning Challenges

- **Private Plumbing Issues**

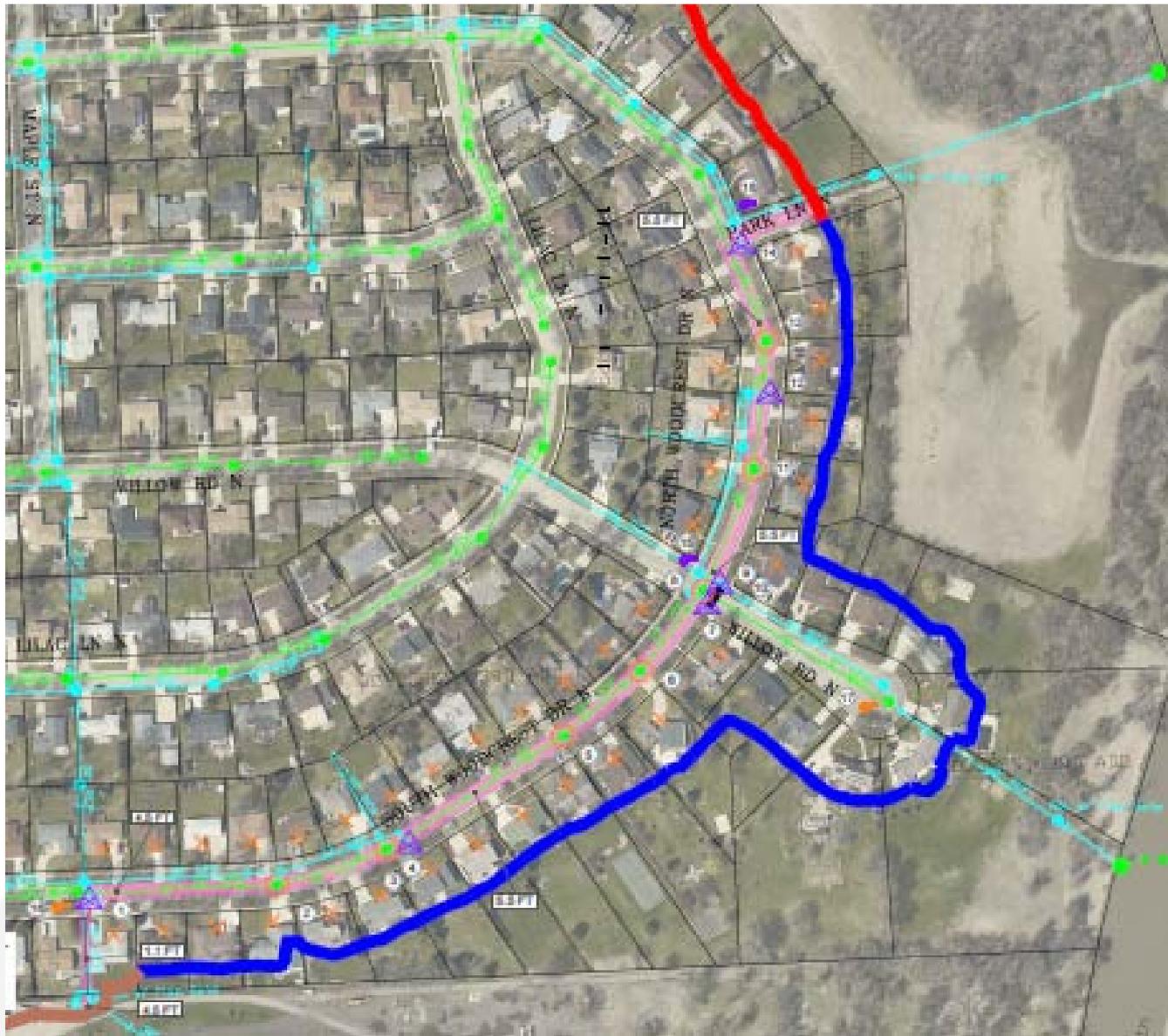


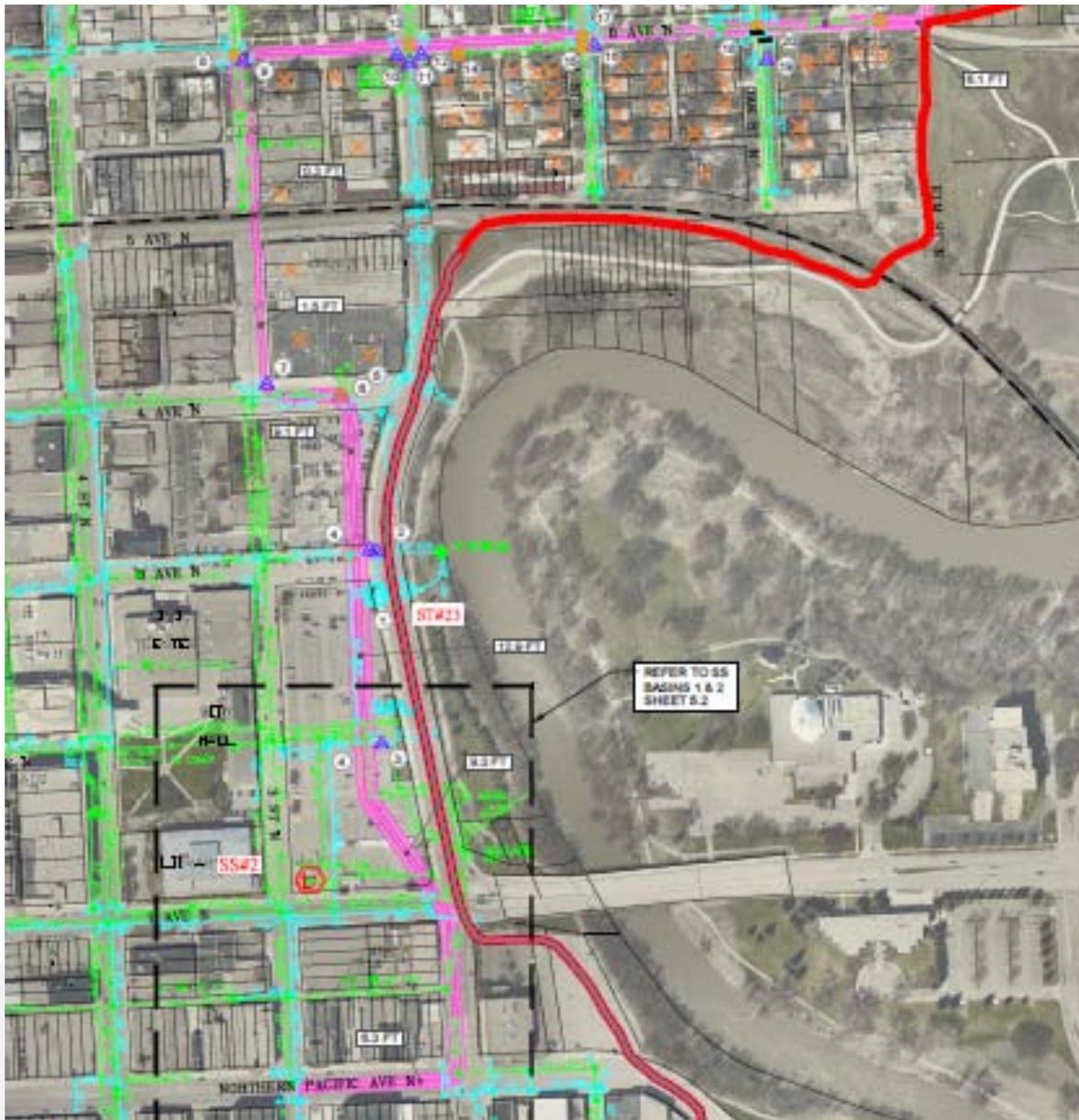
Contingency Planning Challenges

- **Private Plumbing Issues**



Contingency Plans for Vulnerable Areas





Closing Thoughts and Recommendations

Closing Thoughts

- **2011 Contingency Plans**

- Provides a Fall-Back Line of Protection
- Plans In-Hand Provide Another Flood Fighting Tool
 - helps identify utilities to plug
- Plans will be Implemented at 40' and Rising to Crest Prediction of 42'+
- Plans will Take Time to Implement

Closing Thoughts

▪ 2011 Contingency Plans

Quantity Summary

- Clay Levees = **284,000 CY** (for all locations)
 - 84,000 CY in 5 most critical areas
- Plug and/or Seal MHs and Inlets = **325**
- Plug Sewer Lines (test plugs) = **62**
- Back-up Storm and Sanitary Pumps = **60**
- Private Homes (plug sewers) = **493**

Recommendations

- **Short Term Improvements**

- Sanitary and Storm Sewer Control Structures to Protect Vulnerable Infrastructure Areas
- Private Plumbing Improvements
- Pursue FEMA Grant Programs for Hazard Mitigation

Recommendations

▪ Long Term Improvements

- Earthen Levees to Reduce Sand Bagging
- Home Buyouts to Accommodate Earthen Levees
- Study to Compartmentalize the City
 - Protect Key Storm Trunk Lines and Sanitary Sewer Interceptors, Collectors and Pump Stations
 - Identify High Ground – Last Line of Protection

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