

# Success and Lessons Learnt, 7<sup>th</sup> Avenue Creek City of St. Charles, IL



IAFSM - 2022



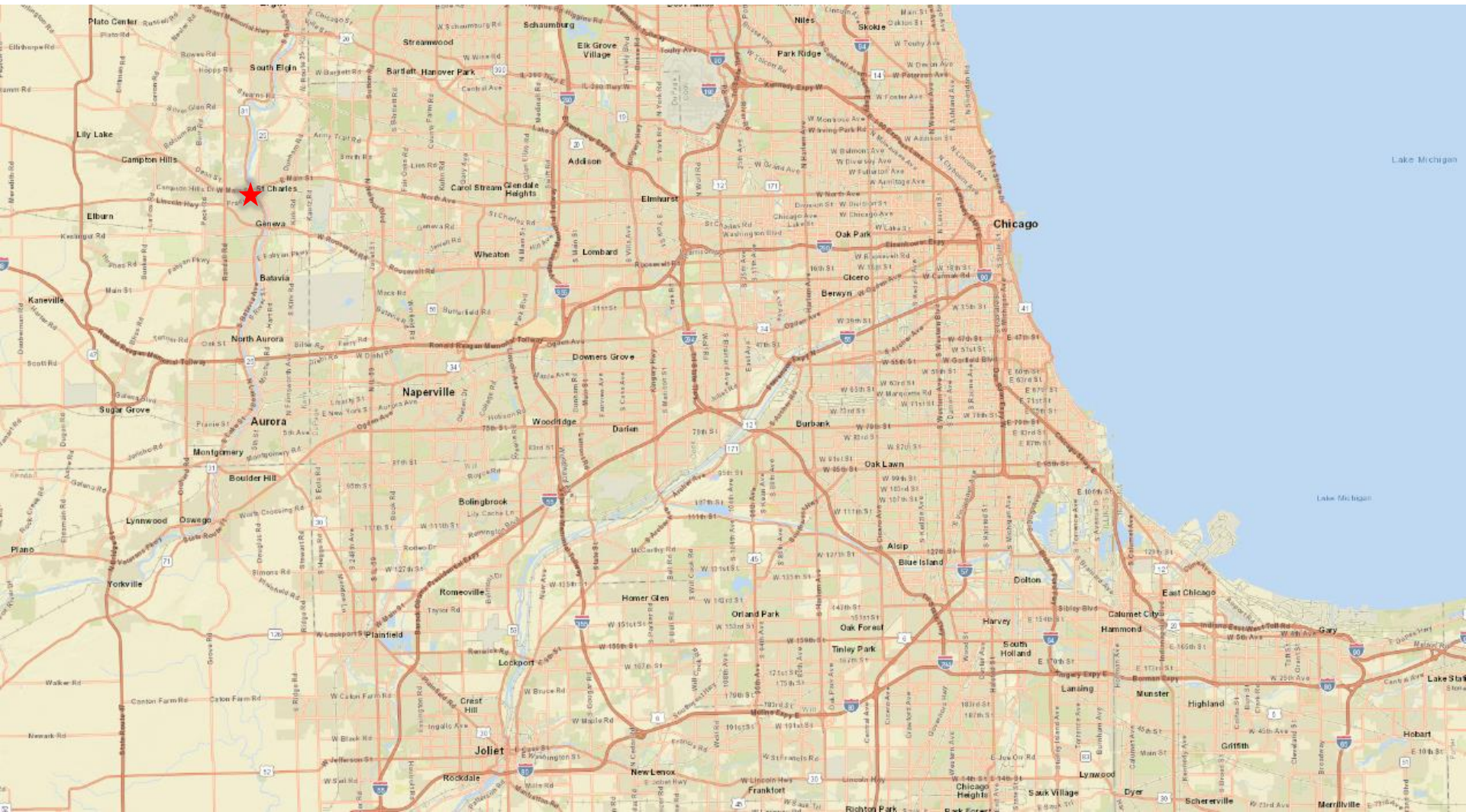
# AGENDA

- PROJECT HISTORY
- EXISTING CONDITIONS
- PROPOSED DESIGN
- LESSONS LEARNT
- PROJECT PHOTOS



# PROJECT LOCATION

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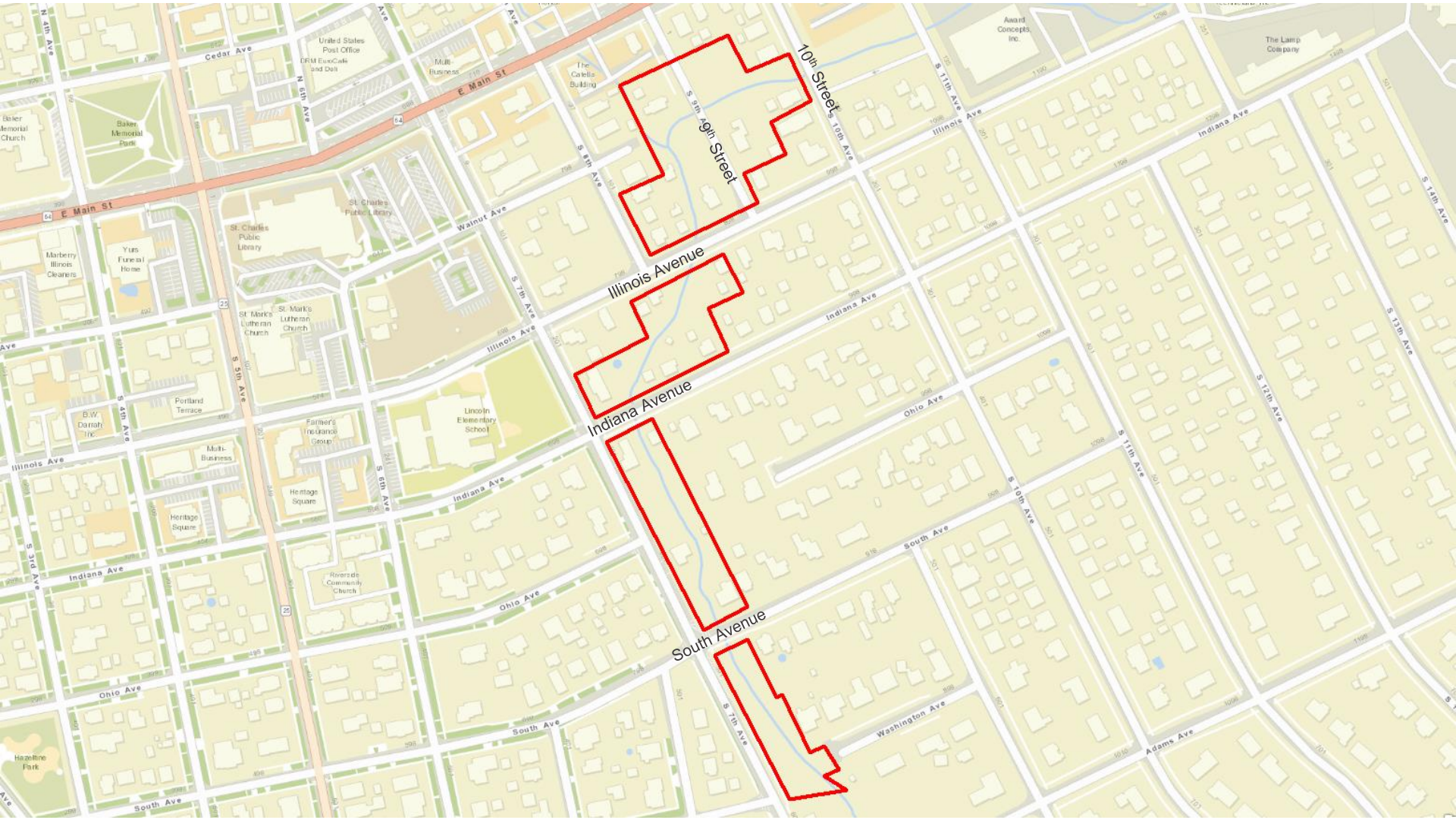
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# PROJECT LOCATION

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# PROJECT HISTORY

- 2008 – Flooding!
- 2009 – FEMA study results in increased BFE
- 2009 to 2014 – FEMA remapping process underway
- 2014 – HR Green was hired to prepare flood mitigation plan
- **2015 – FEMA Preliminary Maps Issued**
- **2016 – Master Plan is completed**
- 2018 – 7<sup>th</sup> Avenue Creek / State Street Creek Watershed-Based Plan
- 2018 – CLOMR applied for based on proposed improvements
- 2018/19 – Section 319 and GIGO grants obtained
- **2020 – FEMA Maps becomes effective**
- **2021 – Construction of Phase 1 completed**

# 2008 RAIN EVENT

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RESIDENTIAL STRUCTURE FLOODING



Tyler Road North of UPRR  
Looking South  
3:25 p.m. 9-13-2008  
ROADWAY OVERTOPPING/STRUCTURAL DAMAGE



Seventh Avenue Creek looking South  
Southwest behind Honda on IL64  
2:45 p.m. 9-13-2008

COMMERCIAL STRUCTURE FLOODING



II 68 COMMERCIAL CORRIDOR FLOODING

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# EXISTING VS. PROPOSED FLOODPLAIN

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## 7th Avenue Creek Improvements

### Existing vs Proposed Floodplain

City of St. Charles, IL

#### Legend

- Proposed 100Yr Floodplain
- Parcels
- Stream Centerline
- Current Regulatory 100Yr Floodplain
- Current Regulatory Floodway
- Proposed Conveyance Floodway



0 100 200 400 600 800 Feet

1 inch = 300 feet

Data Source: Kane County, St. Charles, ESRI  
Projected Coordinate System: U, State Plane East  
Projection: UTM  
Author: L. Gilbertson - HRG



- Approx. 118 properties impacted
  - 55 residential structures
  - 15 commercial structures
  - 49 structures newly mapped
  - Others with floodplain on property



# TWO CONCURRENT & PARALLEL PATHS

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**FEMA**



**City of St. Charles**





# PROJECT OBJECTIVES

## FEMA

- Flood Risk Mapping (FEMA)

## CITY

- Flood Mitigation (reduce below regulatory floodplain)
- Improve Aesthetics/Return Amenity to Residents
- Improve Water Quality
- Explore Funding
- Consider City's Comprehensive Plan
- Consider Economic Development Opportunities

# EXISTING CONDITIONS

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Many banks were highly eroded and threatening private property





# EXISTING CONDITIONS

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Around this location we learned that Ajay's phone was waterproof.

**First Lesson Learnt**



# EXISTING CONDITIONS

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This structure was bought out  
and removed from the  
floodplain





# EXISTING CONDITIONS

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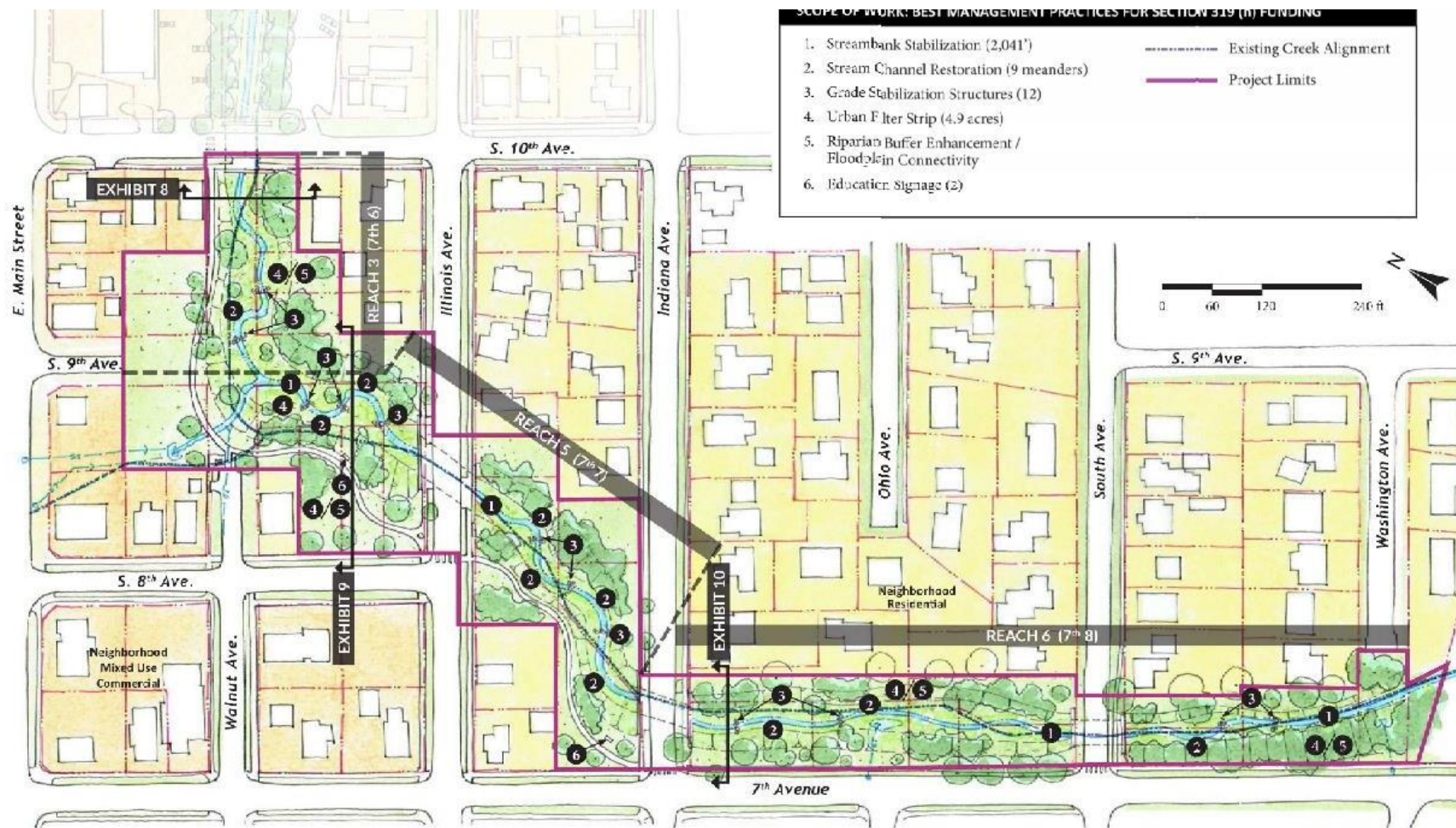
Many retaining walls were removed to restore a natural channel. Quantification and pay items for these items need to be clearly defined.





# PHASE I CONCEPT PLAN

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Reach 3 (7<sup>th</sup>6): Reach 3 is per City Master Plan. 7<sup>th</sup>6 is corresponding reach ID per approved Watershed Based Plan (Typ.)

7<sup>th</sup> Avenue Creek Stream Restoration Project

Reach 3, 5 & 6 Proposed Improvements

EXHIBIT 7

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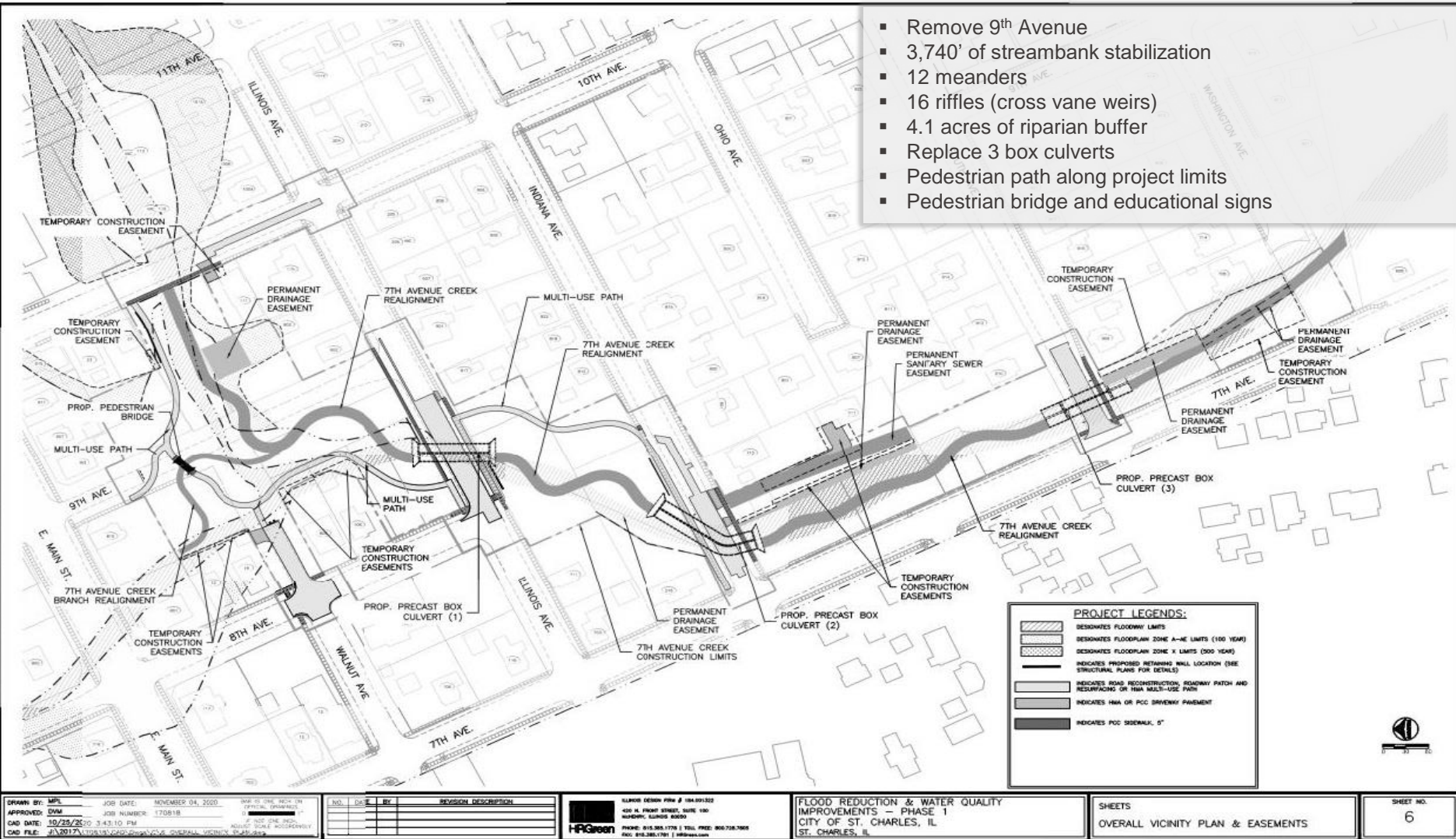






# PHASE I FINAL PLAN

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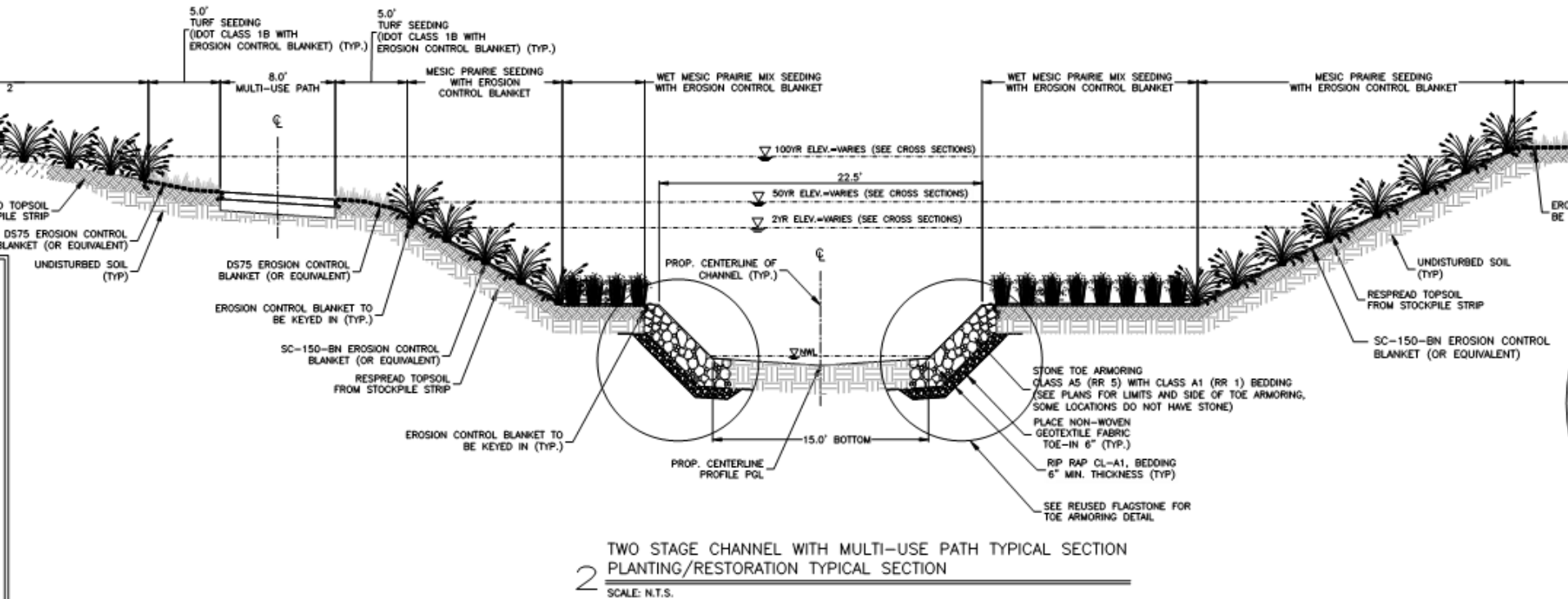




# PHASE I FINAL PLAN

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- The low flow channel was sized based on upstream and downstream stable sections
- The high flow channel and floodplain bench were sized for the 100-year event
- The low flow channel meanders within the high flow channel.
- Wherever possible, the multi-use trail was located above the 50-year WSE



# FUNDING SUMMARY

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- FEMA funded mapping revisions
- Obtained Riverboat Casino Grant
- Obtained 319 Grant for Phase I for eligible activities
- Obtained GIGO Grant for Phase I for eligible activities
- Phase I Completed (2021 construction)
- Total Construction Costs - \$3.6M
- City's Share of Construction Cost (\$1.7M or 47.4%)
  
- NOW ON TO THE LESSONS LEARNED!

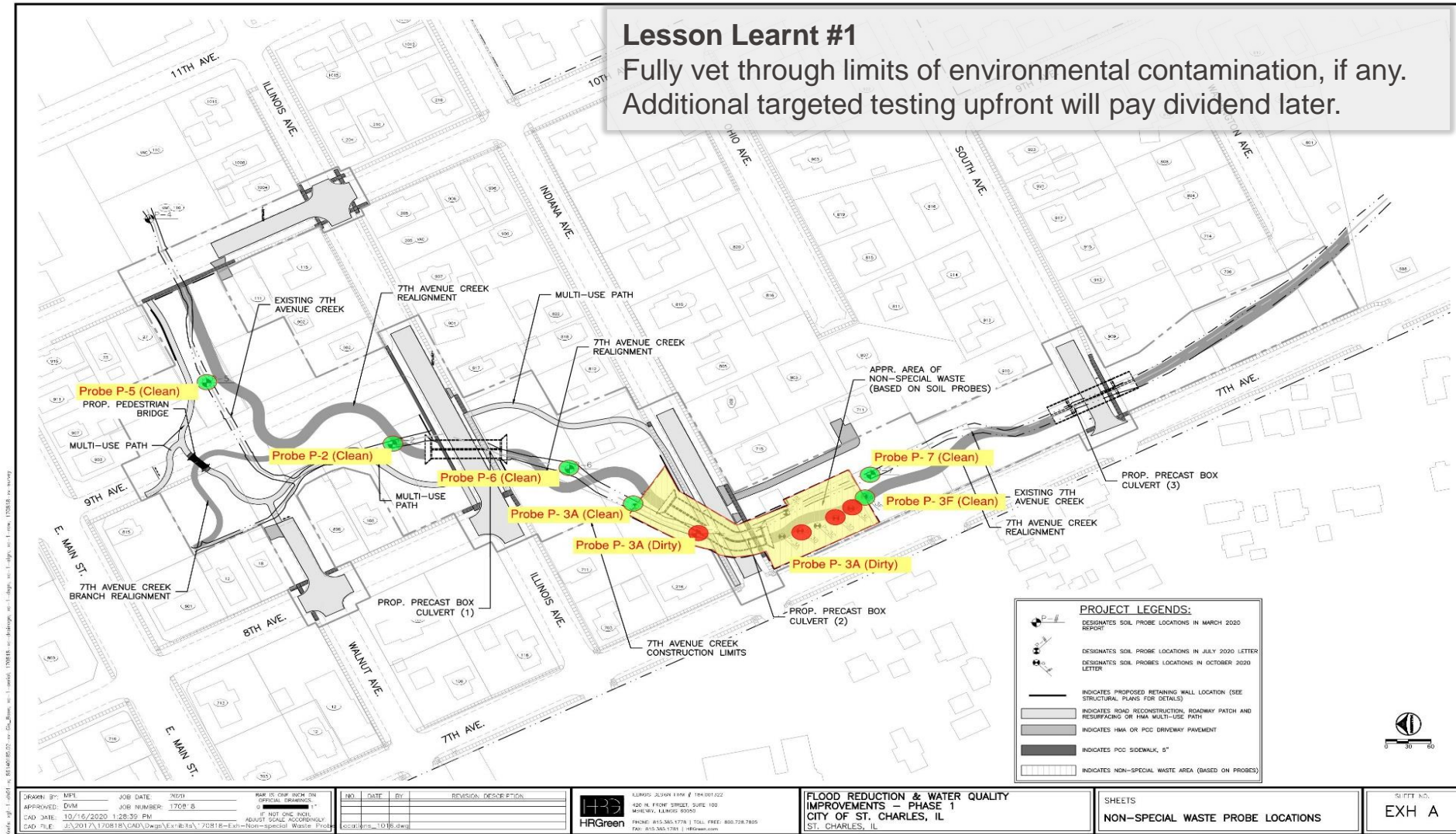


# ENVIRONMENTAL CONTAMINATION

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## Lesson Learnt #1

Fully vet through limits of environmental contamination, if any. Additional targeted testing upfront will pay dividend later.



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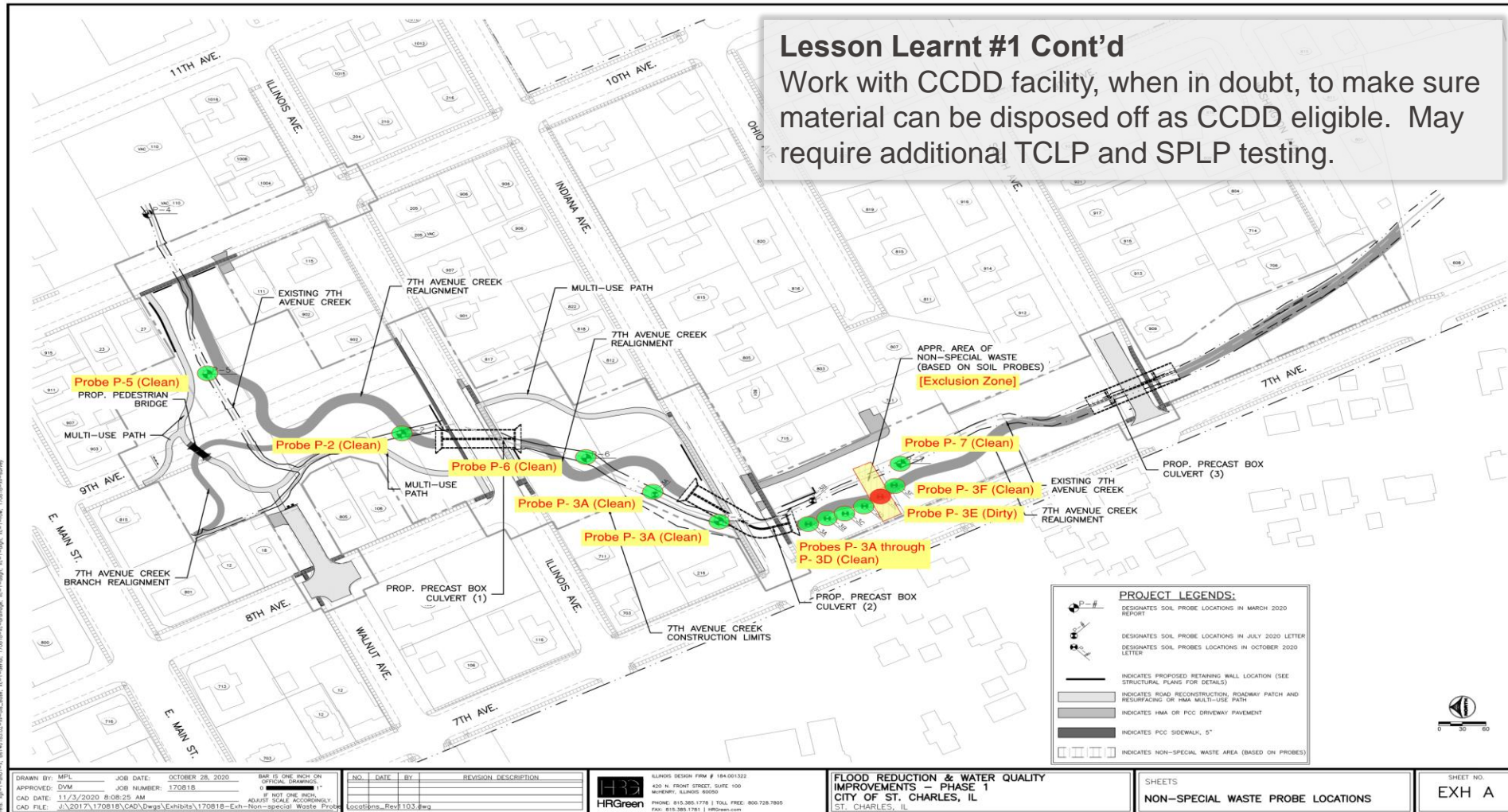


# ENVIRONMENTAL CONTAMINATION

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## Lesson Learnt #1 Cont'd

Work with CCDD facility, when in doubt, to make sure material can be disposed off as CCDD eligible. May require additional TCLP and SPLP testing.



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# EARTHWORK CALCULATIONS

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## Lesson Learnt #2

Earth excavation quantities can be tricky: Surface to surface to surface calculations – Ensure topsoil thickness is accounted for!



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# EARTHWORK CALCULATIONS

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## Lesson Learnt #3

Track how much quantity is rock excavation, channel excavation, earth excavation, topsoil excavation and respread.



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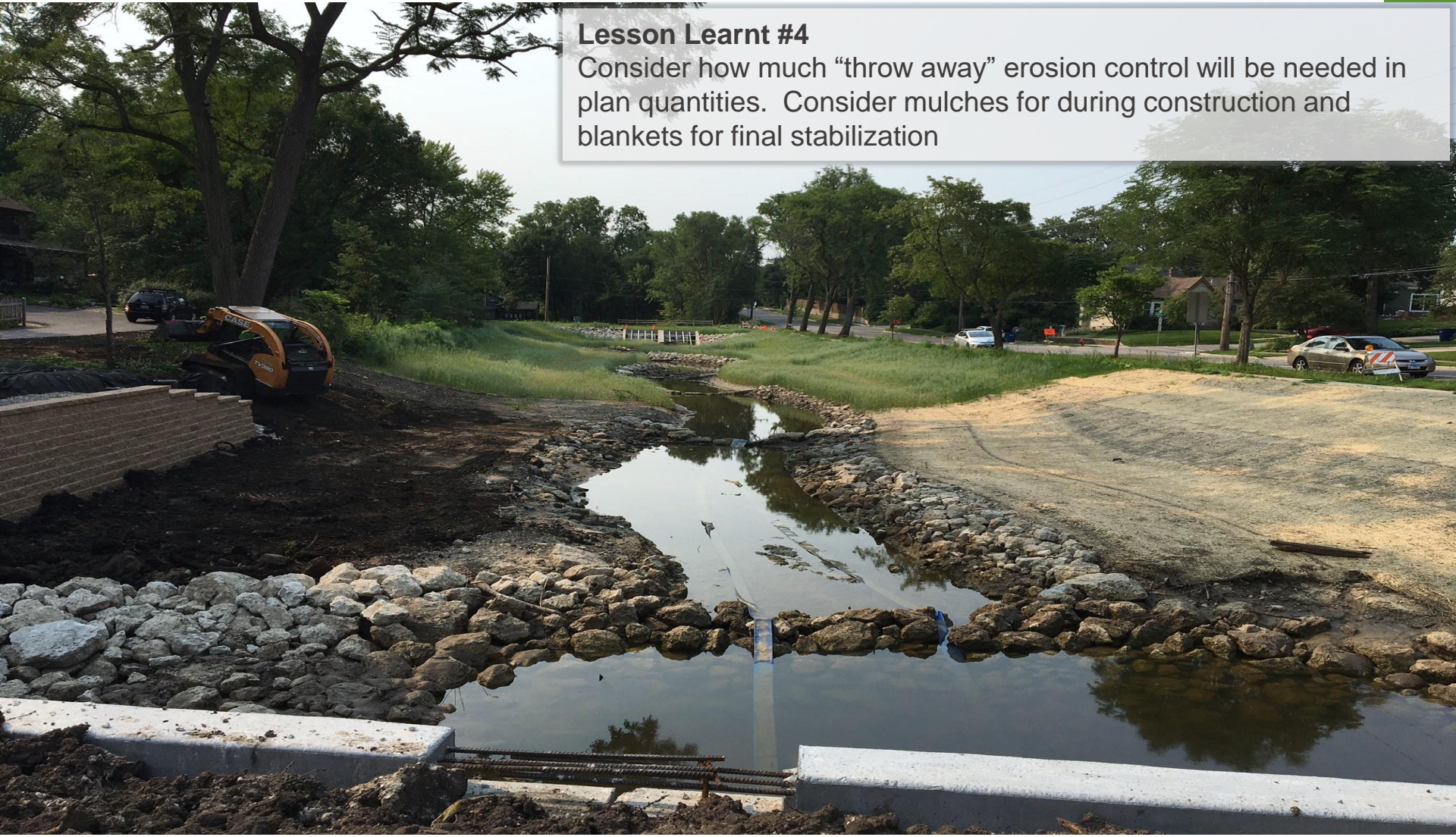


# EROSION CONTROL

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## Lesson Learnt #4

Consider how much “throw away” erosion control will be needed in plan quantities. Consider mulches for during construction and blankets for final stabilization



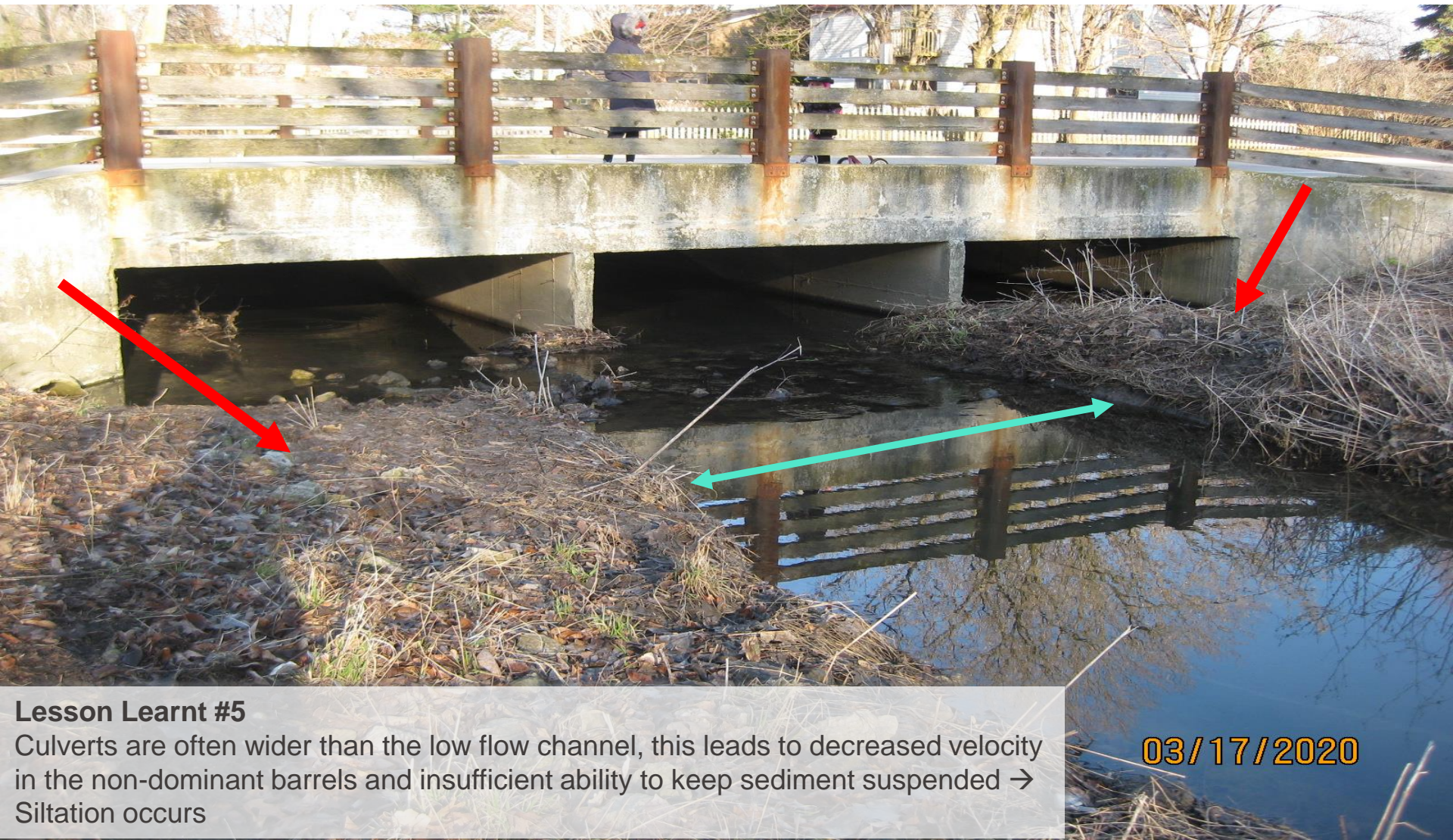
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# PREVENTING SEDIMENTATION W/ CULVERTS

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## Lesson Learnt #5

Culverts are often wider than the low flow channel, this leads to decreased velocity in the non-dominant barrels and insufficient ability to keep sediment suspended → Siltation occurs

03/17/2020

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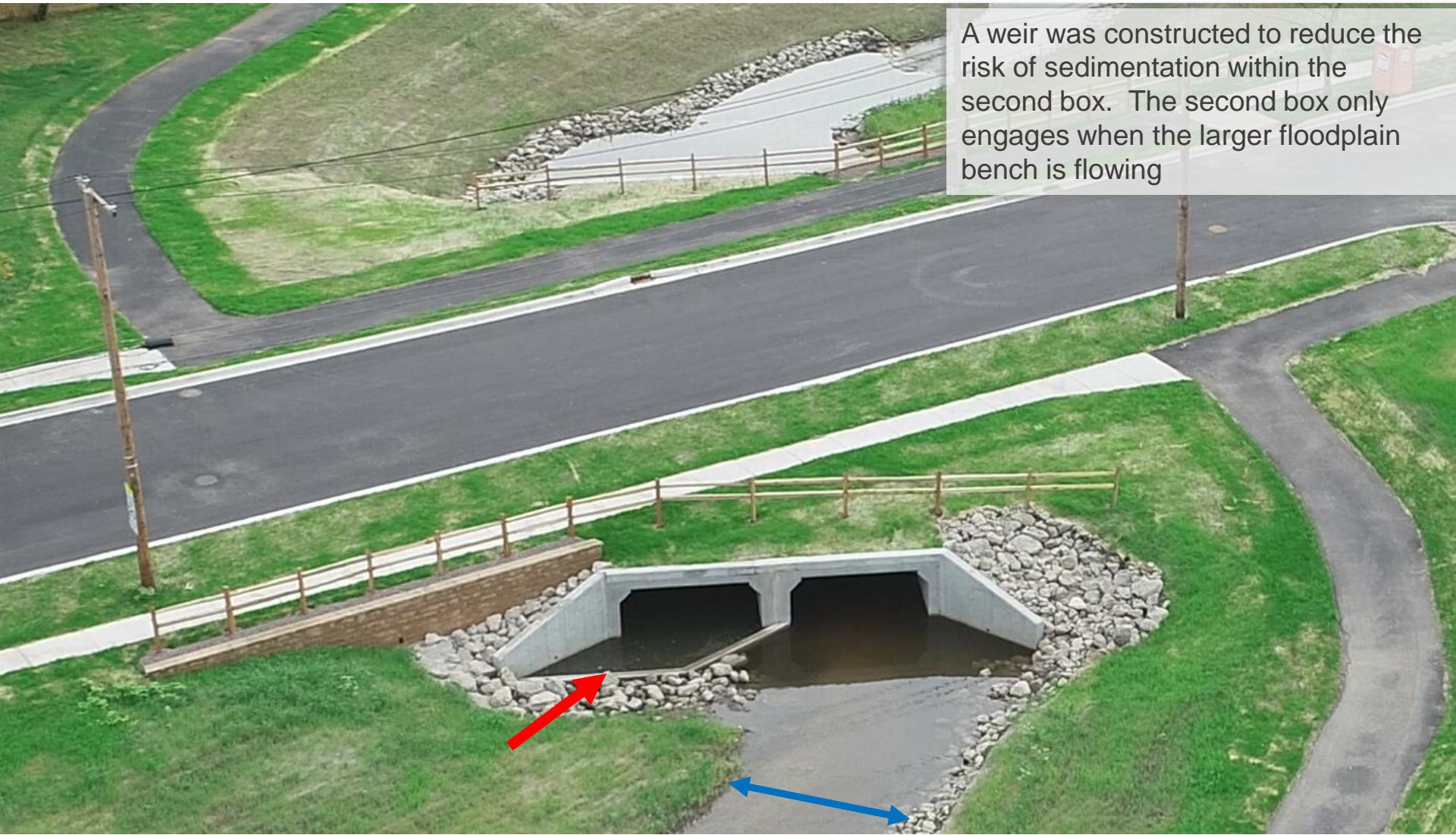




# PREVENTING SEDIMENTATION W/ CULVERTS

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A weir was constructed to reduce the risk of sedimentation within the second box. The second box only engages when the larger floodplain bench is flowing



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# PREVENTING SEDIMENTATION W/ CULVERTS

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# MEANDER DESIGN

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## Meander Design Methodology:

- Spreadsheet tools;
- Radius of Curvature;
- Meander Length;
- Belt Width;
- Sinuosity;
- Wetted Width;
- Channel Slope;
- Stone used on the outer bends
- Vegetation used on inside bend

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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Landscaping outcropping recycled from a bought-out property was used around the pedestrian bridge.

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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A last minute design change allowed us to keep this 30" DBH White Oak



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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# RETURNING AMENITY BACK TO RESIDENTS

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# BEFORE AND AFTER STREAM CORRIDOR

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From Indiana Ave, looking south, pre-construction



From Indiana Ave, looking south, post-construction



From Indiana Ave, looking north, pre-construction



From Indiana Ave, looking north, post-construction

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# FLAGSTONE AND BOULDERS REUSE

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# PROJECT COMPLETION – 2021

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# PROJECT COMPLETION – 2021

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# SUCCESS!

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# QUESTIONS FROM THE AUDIENCE



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