

Success and Lessons Learnt, 7th Avenue Creek

City of St. Charles, IL

MARKET



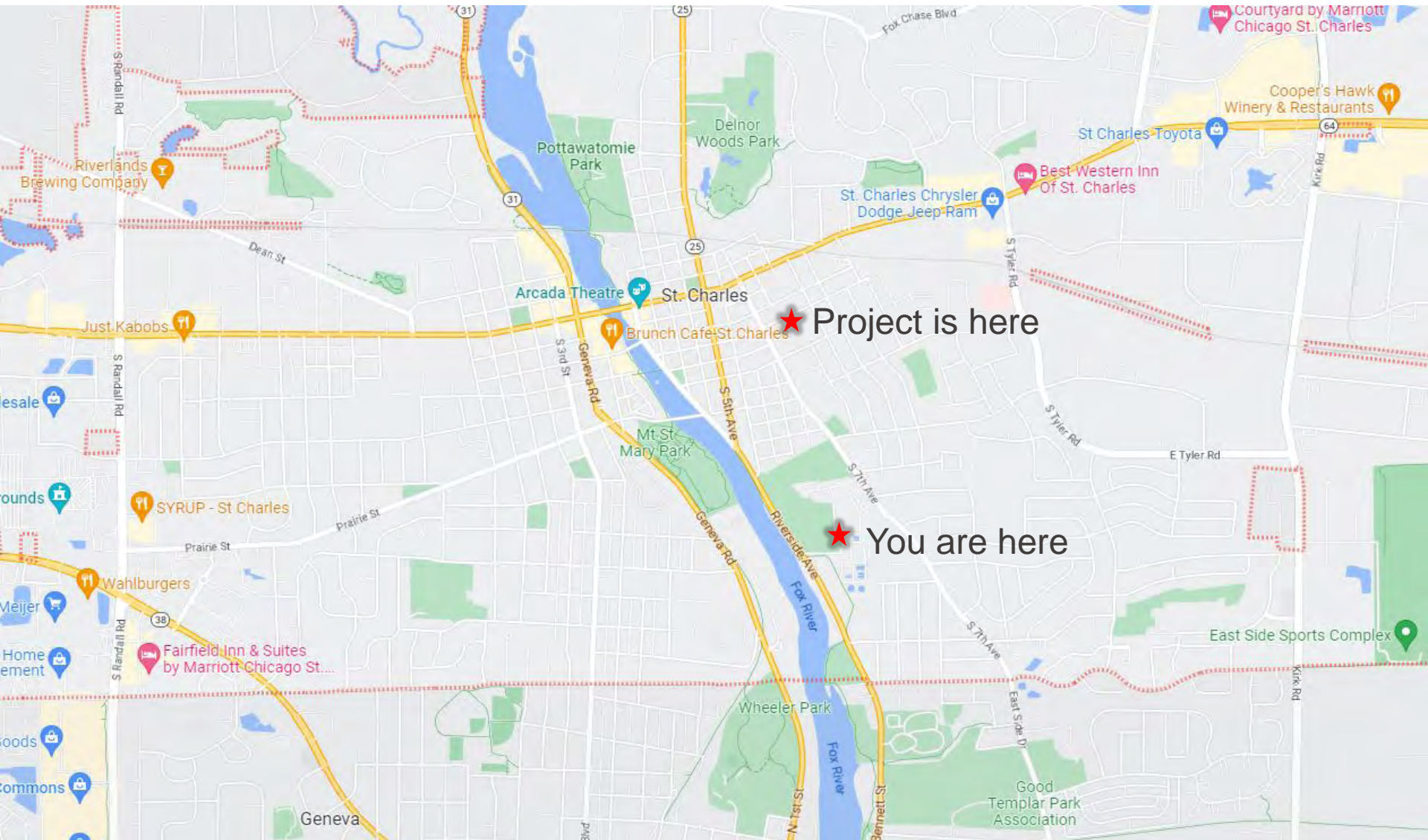
Fox River Ecosystem Partnership
FREP Noon Network
April 12th, 2023



AGENDA

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

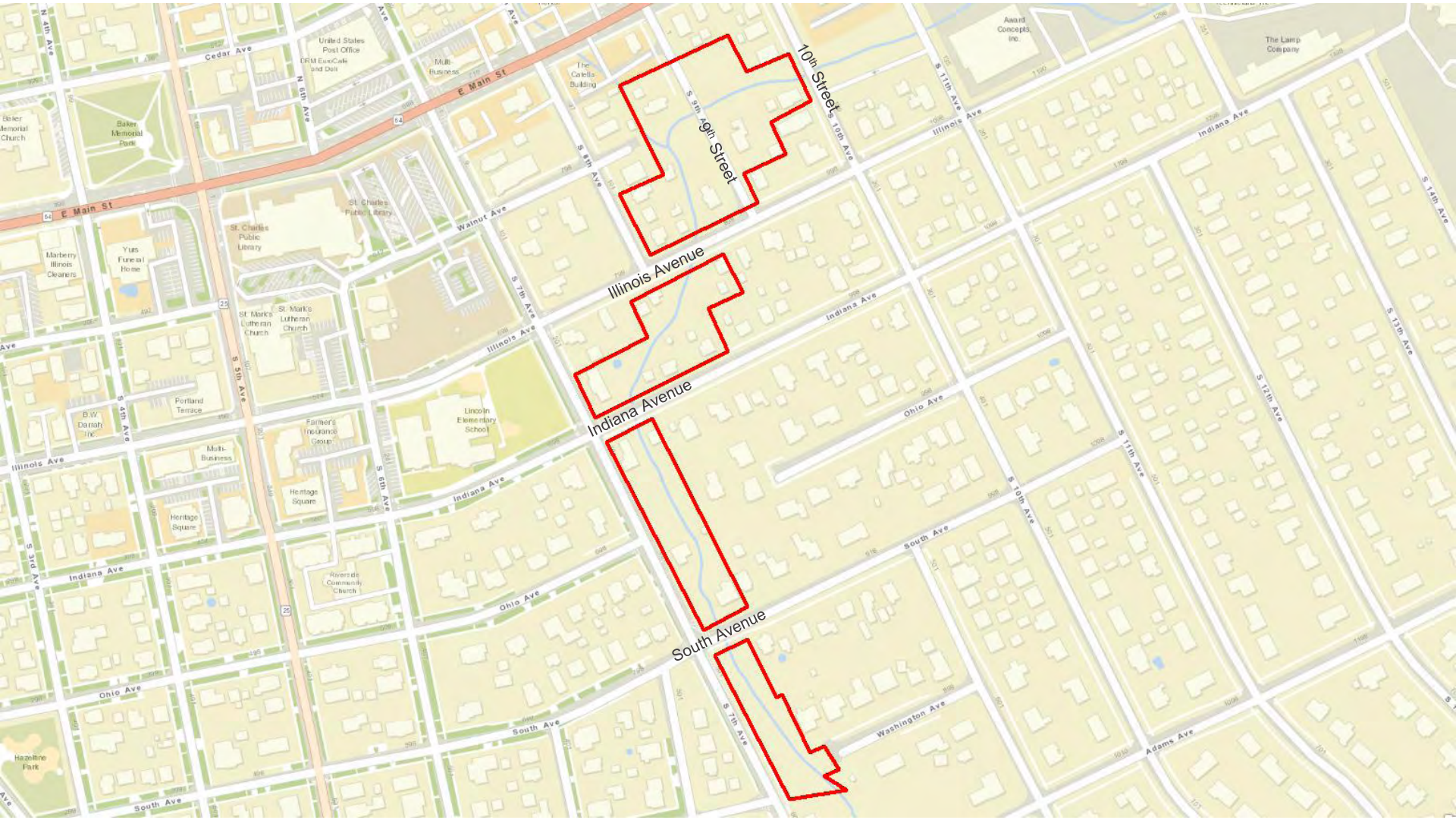
PROJECT LOCATION



7th Avenue Creek | St. Charles, IL



PROJECT LOCATION



7th Avenue Creek | St. Charles, IL



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 – 7th 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**
- 2022 – Ongoing vegetation maintenance

2008 RAIN EVENT



RESIDENTIAL STRUCTURE FLOODING



Tyler Road North of UPRR
Locking 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

EXISTING VS. PROPOSED FLOODPLAIN

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: IL State Plane East
Projection: UTM
Author: L. Gilbertsen - HRG



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



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

Many banks were highly eroded and threatening private property



EXISTING CONDITIONS



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EXISTING CONDITIONS

This structure was bought out and removed from the floodplain



EXISTING CONDITIONS

Many retaining walls were removed to restore a natural channel.



PHASE I CONCEPT PLAN



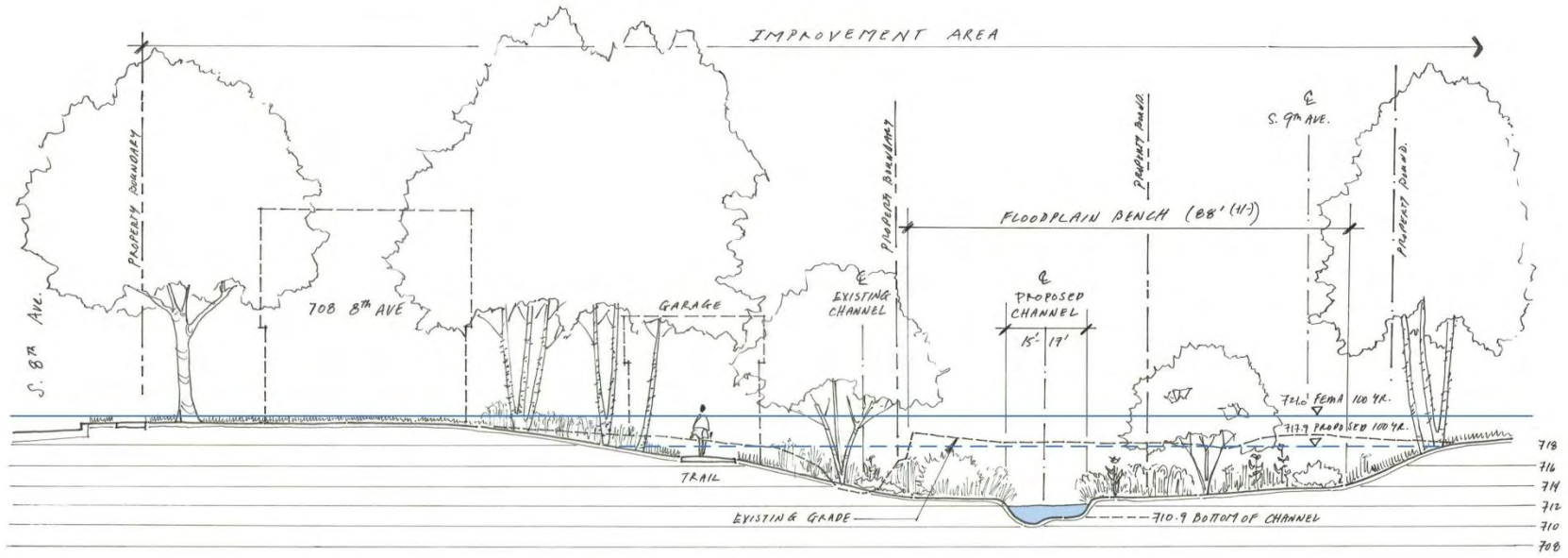
Reach 3 (7th6): Reach 3 is per City Master Plan. 7th6 is corresponding reach ID per approved Watershed Basic Plan (Typ.)

7th Avenue Creek Stream Restoration Project

Reach 3, 5 & 6 Proposed Improvements

EXHIBIT 7

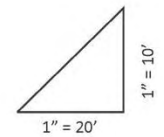
PHASE I CONCEPT PLAN



Key Plan: Reach 5



Existing Photo



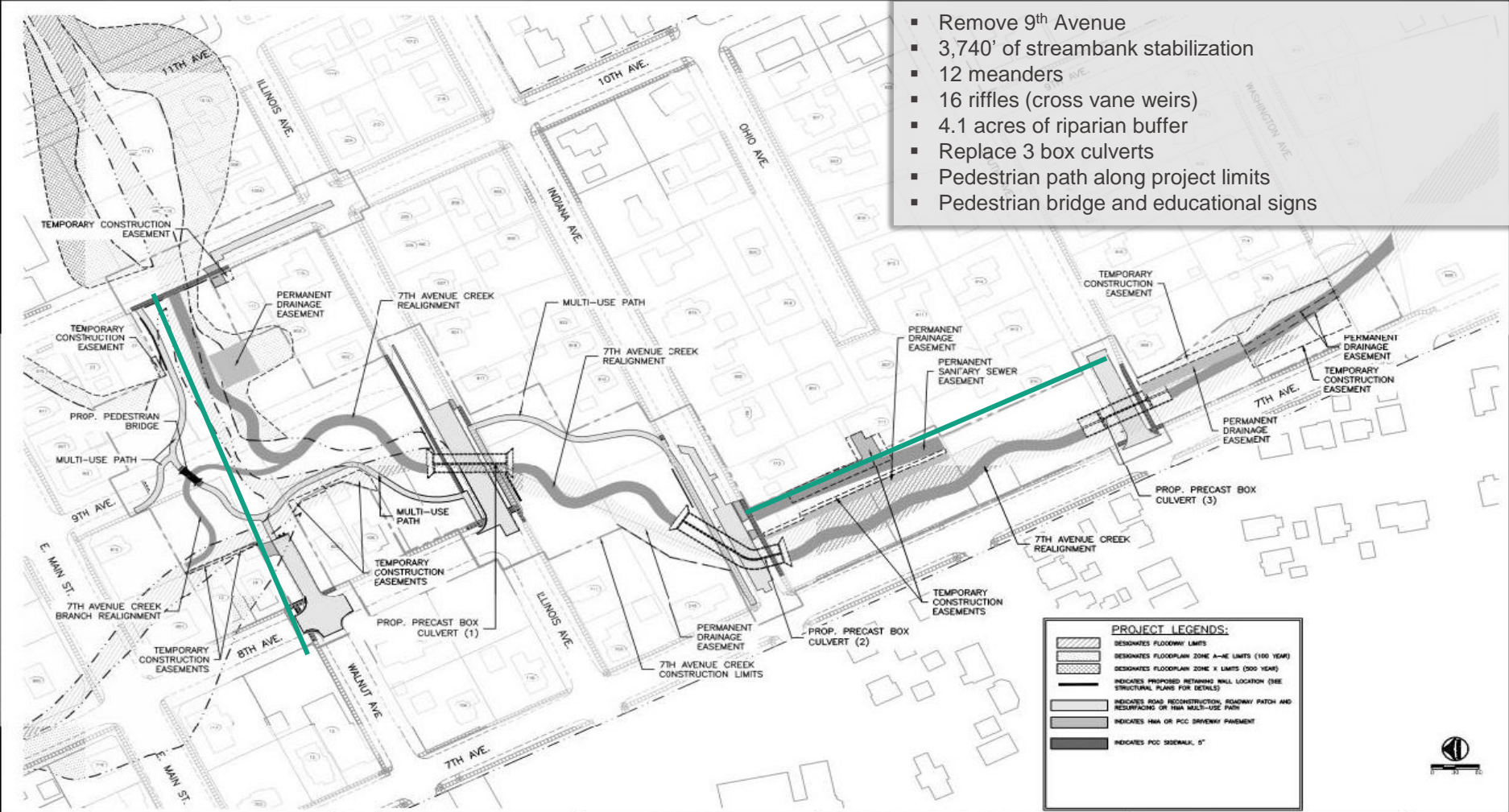
7th Avenue Creek

Reach 5 – Sta. 65+80, Proposed Section Looking Upstream

Draft: November 6, 2016

PHASE I FINAL PLAN

- Remove 9th Avenue
- 3,740' of streambank stabilization
- 12 meanders
- 16 riffles (cross vane weirs)
- 4.1 acres of riparian buffer
- Replace 3 box culverts
- Pedestrian path along project limits
- Pedestrian bridge and educational signs



PROJECT LEGENDS:

- DESIGNATES FLOODWAY LIMITS
- DESIGNATES FLOODPLAIN ZONE A-E LIMITS (100 YEAR)
- DESIGNATES FLOODPLAIN ZONE X LIMITS (500 YEAR)
- INDICATES PROPOSED RETAINING WALL LOCATION (SEE STRUCTURAL PLANS FOR DETAILS)
- INDICATES ROAD RECONSTRUCTION, ROADWAY PATCH AND RESURFACING OR HMA MULTI-USE PATH
- INDICATES HMA OR PCC DRIVEWAY PAVEMENT
- INDICATES PCC SIDEWALK, 6"

DRAWN BY: MFL	JOB DATE: NOVEMBER 04, 2020	DATE OF THIS SHEET ON SPECIAL ORDERS:
APPROVED: ZAM	JOB NUMBER: 170818	DATE OF THIS SHEET ON SPECIAL ORDERS:
ISSUE DATE: 10/25/20	ISSUE TIME: 3:43:10 PM	ISSUE BY: MFL
ISSUE REASON: 170818-01-0001		

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen

ILLINOIS DESIGN FIRM # 04-001333
 420 N. FRONT STREET, SUITE 100
 NORTON, ILLINOIS 62450
 PHONE: 618.385.1778 | FAX: 618.385.1768
 WWW.HRGREEN.COM

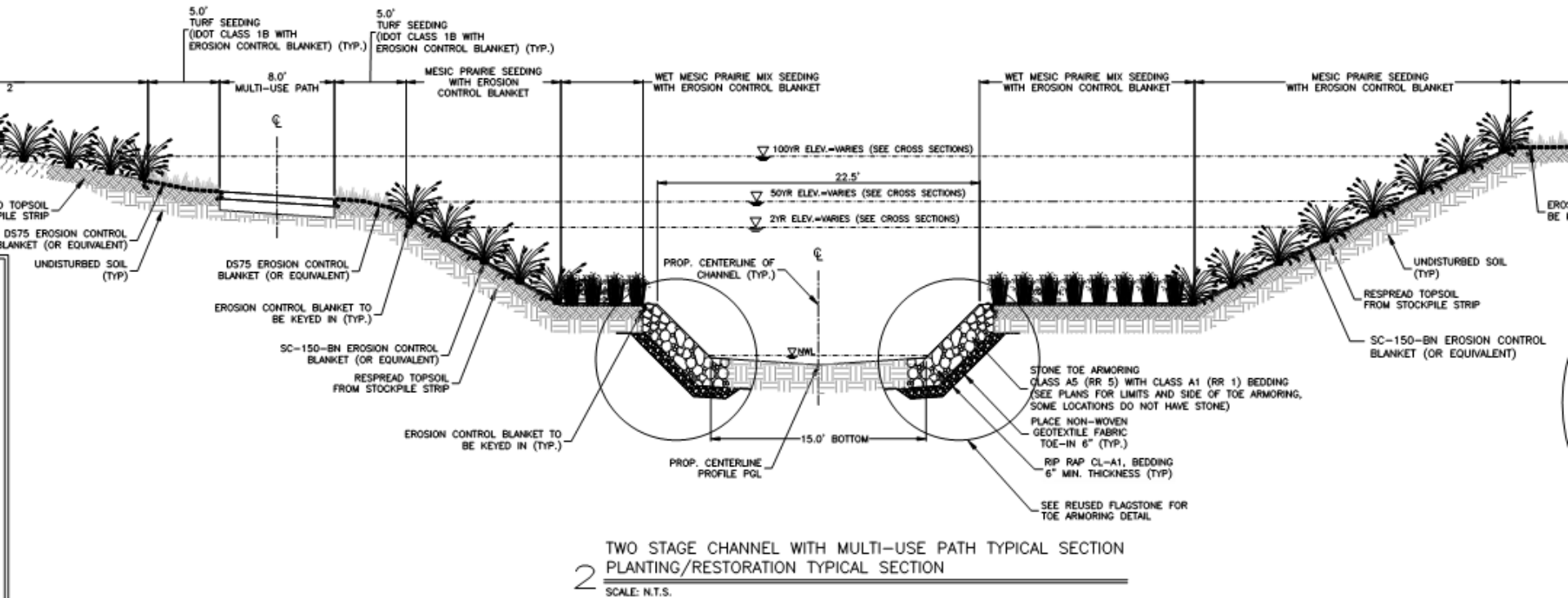
FLOOD REDUCTION & WATER QUALITY IMPROVEMENTS - PHASE I
 CITY OF ST. CHARLES, IL
 ST. CHARLES, IL

SHEETS	SHEET NO.
OVERALL VICINITY PLAN & EASEMENTS	6



PHASE I FINAL PLAN

- 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



POLLUTANT REDUCTION BENEFITS

- Pollutant reduction calculations performed using the EPA's STEPL
- Final calculated pollutant reductions exceeded what was included in grant applications due to the inclusion of additional bank stabilization south of South Avenue

Pollutant	Reduction (lbs/yr)
Sediment	628,000 (314 tons/yr)
Total Suspended Solids (TSS)	17,758
Phosphorus	287
Nitrogen	715

*In-field testing has not been completed

FUNDING SUMMARY

- 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 PROJECT!

EARTHWORK



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EARTHWORK



EROSION CONTROL

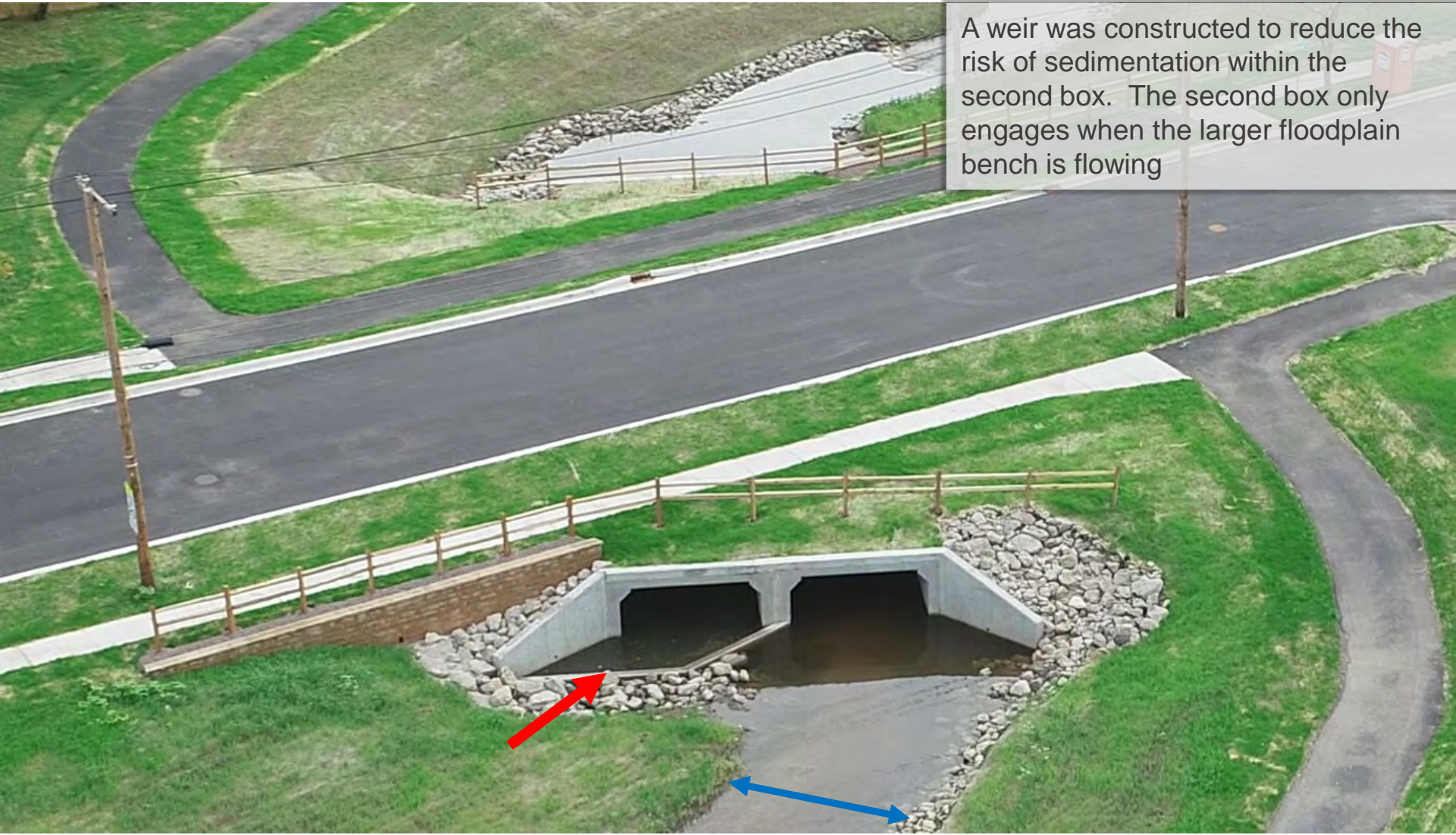


PREVENTING SEDIMENTATION W/ CULVERTS

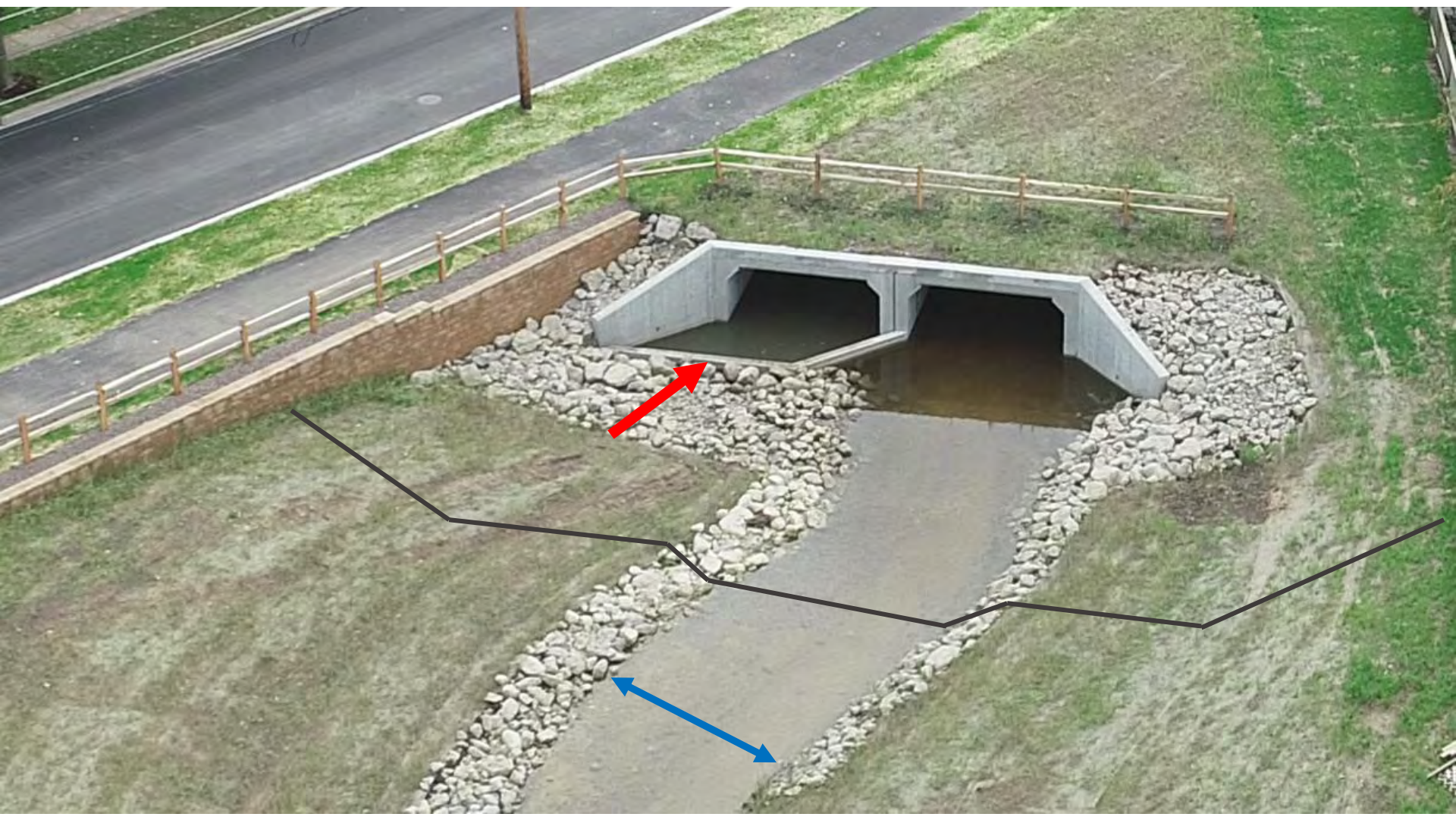


PREVENTING SEDIMENTATION W/ CULVERTS

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



PREVENTING SEDIMENTATION W/ CULVERTS



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NATIVE LANDSCAPE

Establishment and Maintenance



▶ 2022 – Sleep

- The site is primarily a temporary cover crop and weeds – This is normal!
- Mow the site to 8” twice during the growing season
- Spot treat the weeds with herbicide
- The native plants are focusing their energy into their root network

▶ 2023 – Creep

- The weeds are lessened and the native plants are spending more energy on growth
- Mow the site to 12” once or twice during the growing season
- Spot treat the weeds with herbicide

▶ 2024 – Leap

- The native plants are now starting to out-compete the weeds
- A controlled burn can now be implemented on a three year cycle
- Mowing in the late fall can be used in areas that are near trees that might be sensitive to burning

VEGETATION ESTABLISHMENT



NATIVE LANDSCAPE
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MEANDER DESIGN



- 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

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

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



RETURNING AMENITY BACK TO RESIDENTS



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RETURNING AMENITY BACK TO RESIDENTS



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RETURNING AMENITY BACK TO RESIDENTS

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



RETURNING AMENITY BACK TO RESIDENTS



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RETURNING AMENITY BACK TO RESIDENTS



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BEFORE AND AFTER STREAM CORRIDOR



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

FLAGSTONE AND BOULDERS REUSE



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PROJECT COMPLETION – 2021



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PROJECT COMPLETION – 2021



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STREAM & RIPARIAN RESTORATION

Creating A Diverse Riparian Community

WHAT IS A RITILE?

Wetlands that occur along streams and rivers are called riparian wetlands. They are the interface between the land and the water. They are the most productive and diverse of all ecosystems. They provide habitat for many species of plants and animals. They also filter pollutants and sediments from the water. They are important for the health of the stream and the surrounding land.

Over the past century, many riparian wetlands have been lost to agriculture, urban development, and other human activities. This restored portion of 7th Avenue Creek represents the diverse stream and riparian ecosystem that existed in Illinois before agricultural and urban development. Large areas of connected prairies, wetlands, and streams once improved water quality and reduced flooding while supporting a wide range of native plants and wildlife species.

RIPIARIAN ZONES AT A GLANCE

Riparian buffers are the transition zones between the aquatic habitat of the stream and the surrounding land. Although they do not make up a large portion of the landscape, these zones are densely overflowing with a wide diversity of both plants and animals. The plants they host are native prairie species which have deep root systems which help to stabilize the soils along 7th Avenue Creek and prevent erosion. The different heights of the plants allow for them to live closely together without competing for sunlight and water.

NOW TAKE A CLOSER LOOK

As you explore the prairie plants and waters edge, remember to look out for turtles sunning themselves and frogs hiding amongst the densest patches of grasses. In the riparian areas you'll find a densely packed environment teeming with insects, spiders and small animals. Look for insects that rely on the stream ecosystem including dragon flies, mayflies and stoneflies. You may even catch a glimpse of a muskrat or beaver living within the stream ecosystem.



New England Aster
Aster novae-angliae



Rattlesnake Master
Eryngium yuccifolium



Eastern Bluebird
Sialia sialis



Black-eyed Susan
Rudbeckia hirta



Purple Coneflower
Echinacea purpurea



Small Milkweed Bug
Ligustrum sibiricum



Tiger Balm
Thymus serpyllifolius



Wild Bergamot
Monarda mollis



Red Milkweed Beetle
Leptoglossus phyllis



Painted Turtle
Pseudemys peninsularis



Monarch
Danaus plexippus



Buckeye
Bananaeis autumnalis



Hairy Woodpecker
Picoides villosus



Orange-crowned Butterfly
Lycaonopsis tityus

PROJECT COMPLETION – 2021



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PROJECT COMPLETION – 2021



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PROJECT COMPLETION – 2021

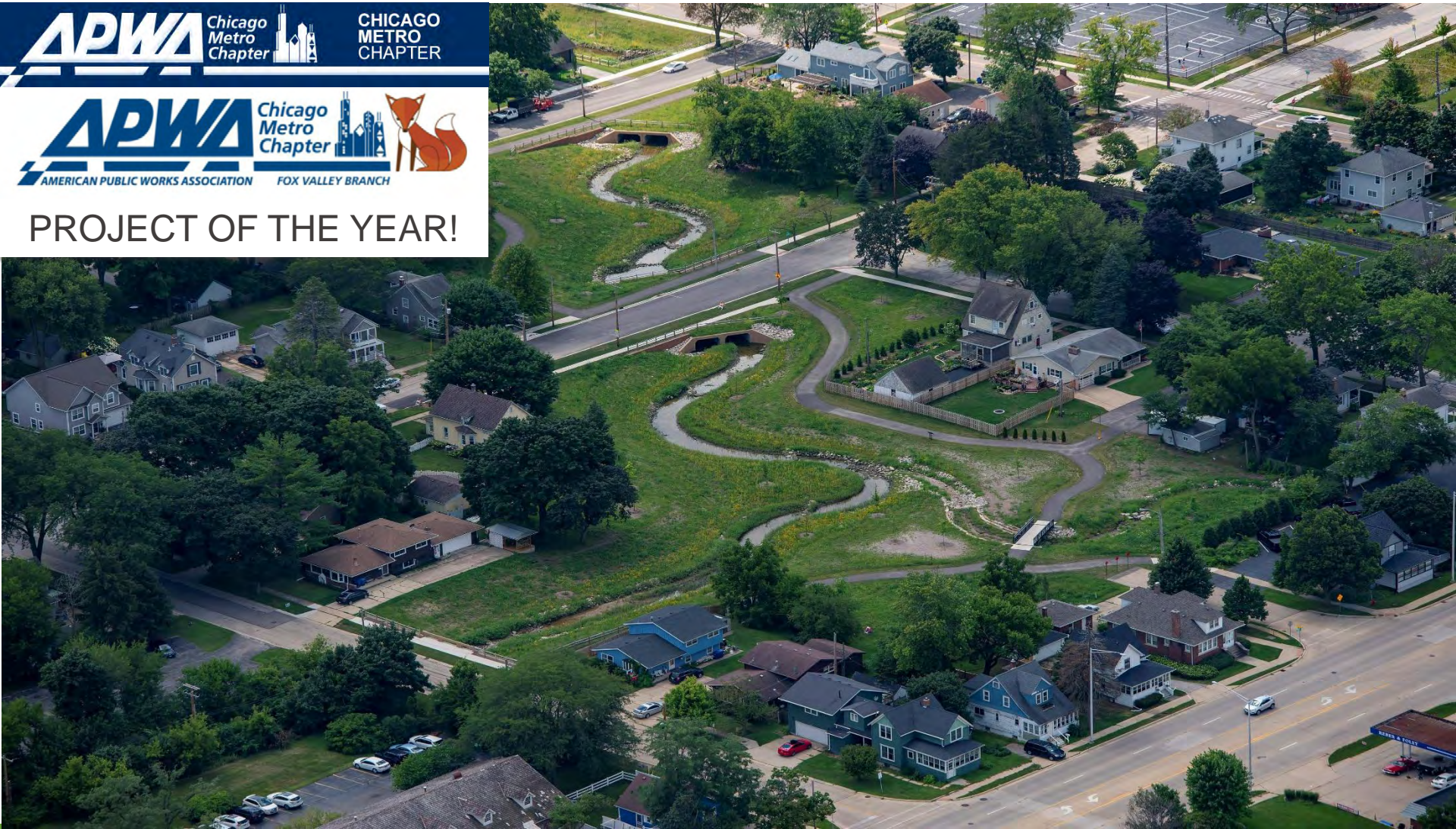


APWA Chicago Metro Chapter CHICAGO METRO CHAPTER



APWA Chicago Metro Chapter AMERICAN PUBLIC WORKS ASSOCIATION FOX VALLEY BRANCH

PROJECT OF THE YEAR!



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QUESTIONS FROM THE AUDIENCE



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