

A photograph of a stream restoration project. The stream is a narrow, rocky channel with clear water, surrounded by lush green vegetation and tall grasses. A blue triangular graphic is on the left side of the image, and a green banner is at the bottom containing the title text.

Saving a Sanitary Sewer: A Stream Restoration Success Story

Introductions / Agenda



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Judge Webber Tributary – Problem Overview



Judge Webber Tributary – Design



Project Success? The Good, The Bad, and the Promising



- Full-service Architecture and Engineering firm
 - 475 employees across 24 offices
- Water Resources Group
- Champaign, Illinois



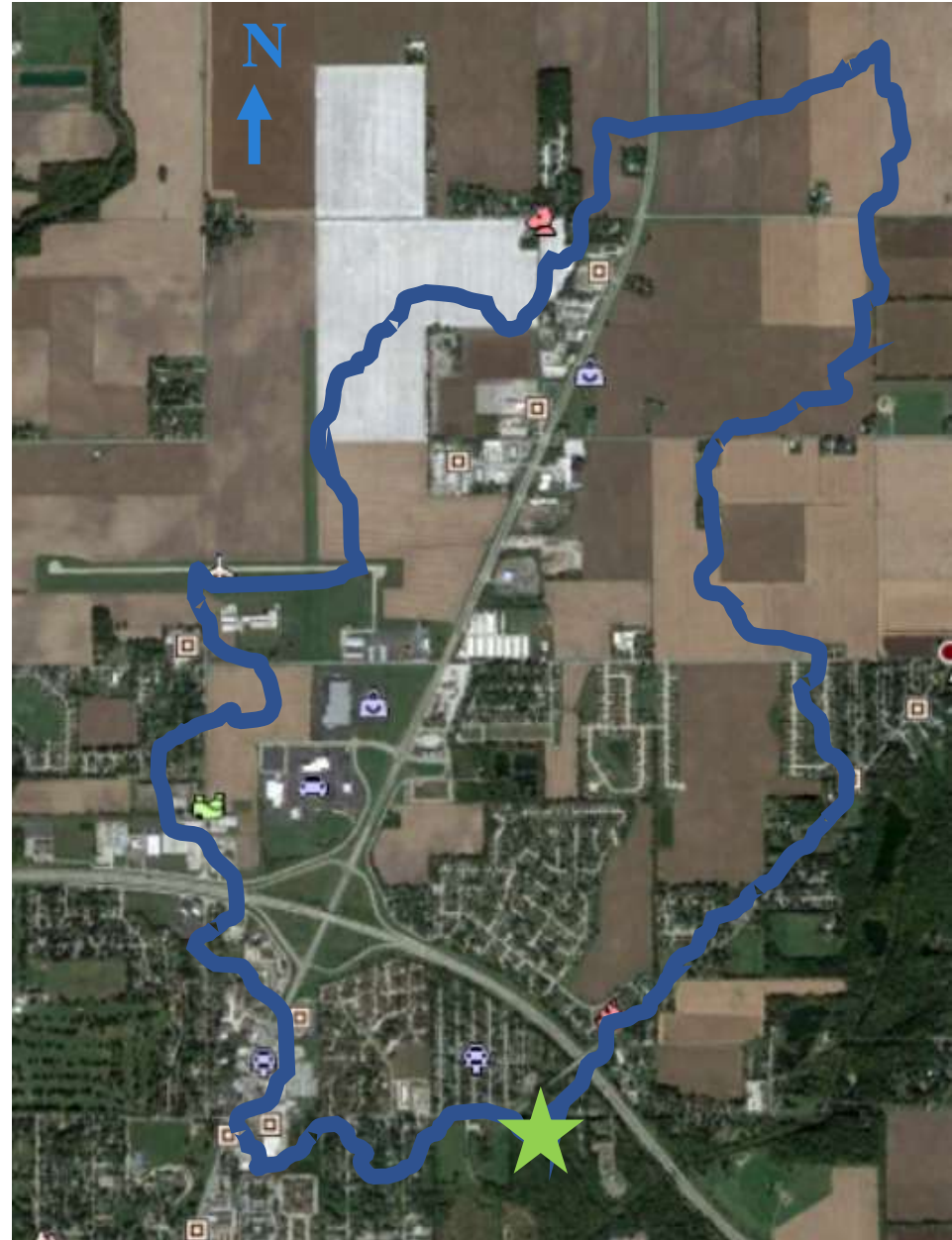
Judge Webber Tributary Problem Overview

Judge Webber Park | Exposed 33" Sanitary Interceptor



Judge Webber Tributary | Information

- Urbana, Illinois
- Tributary to the Saline Branch Drainage Ditch
- 1965: Sanitary interceptor constructed next to 1.5' deep ditch
- 2018: Tributary with 9' tall vertical banks
- Area = 2.9 mi²
- Flow 100yr = 1,440 cfs
- Bankfull
 - Q = 57 cfs
 - Depth = 2.65'





Judge Webber Tributary Design

Judge Webber Tributary | Challenges

PHYSICAL CONSTRAINTS

- + Large hill to west of stream
- + Elevations: Invert of pipe at channel thalweg
- + Crossing of pipe and stream inevitable

SOIL PROPERTIES

- + Rich, organic silty-loam
- + No structural properties in native soils
- + Steep 1:1 side slopes

ACCELERATED SCHEDULE

- + Need to protect pipe and provide permanent solution ASAP
- + Design to fit within parameters of permits that don't need review
 - + IL Statewide Permit #9
 - + USACE Permit #13

ACCESSIBILITY

- + Stream accessible only from east bank due to heavy woods and large hill

STAKEHOLDERS

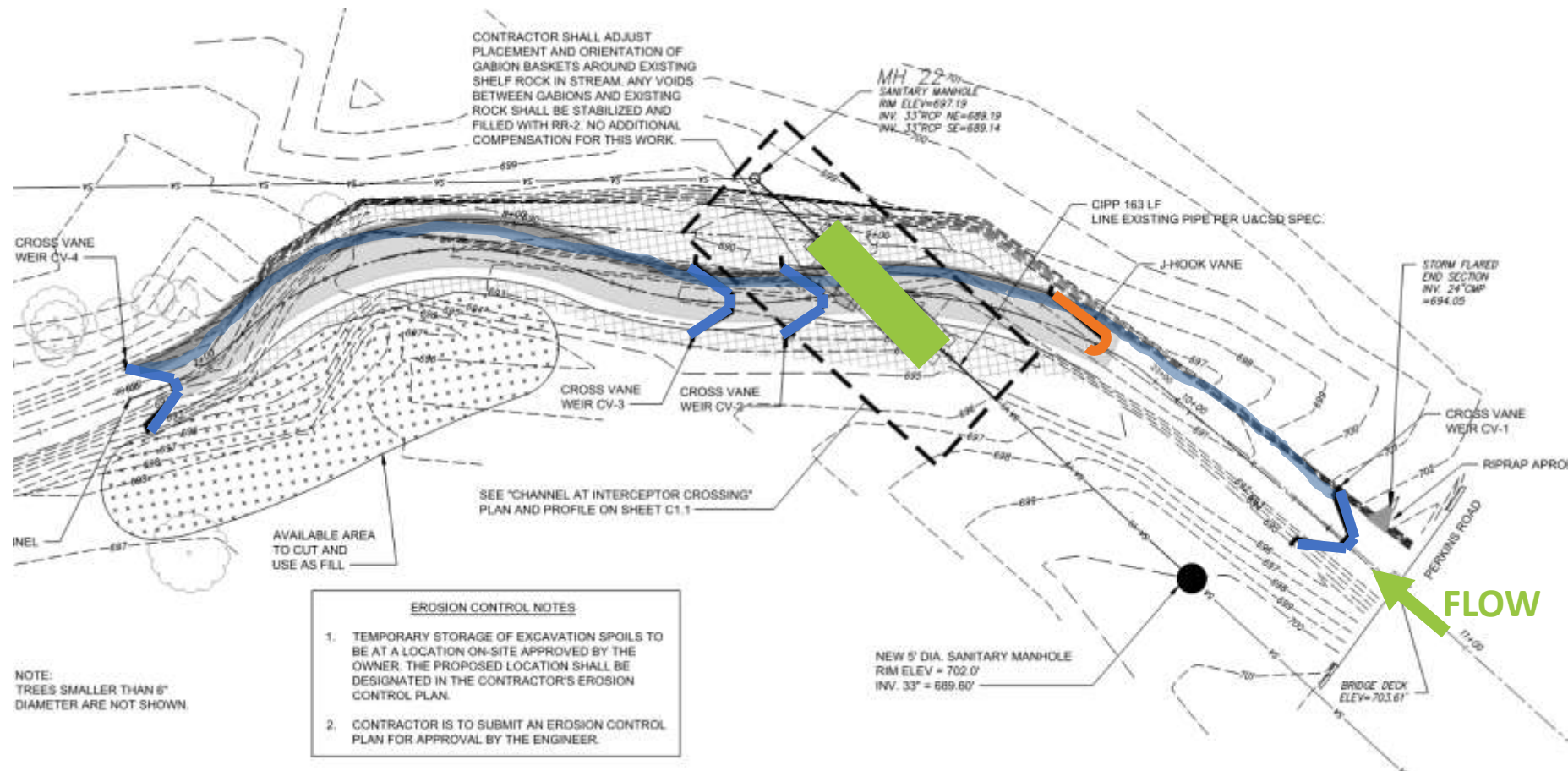
- + Urbana-Champaign Sanitary District
- + Urbana Park District
- + Drainage District

Judge Webber Tributary | Options



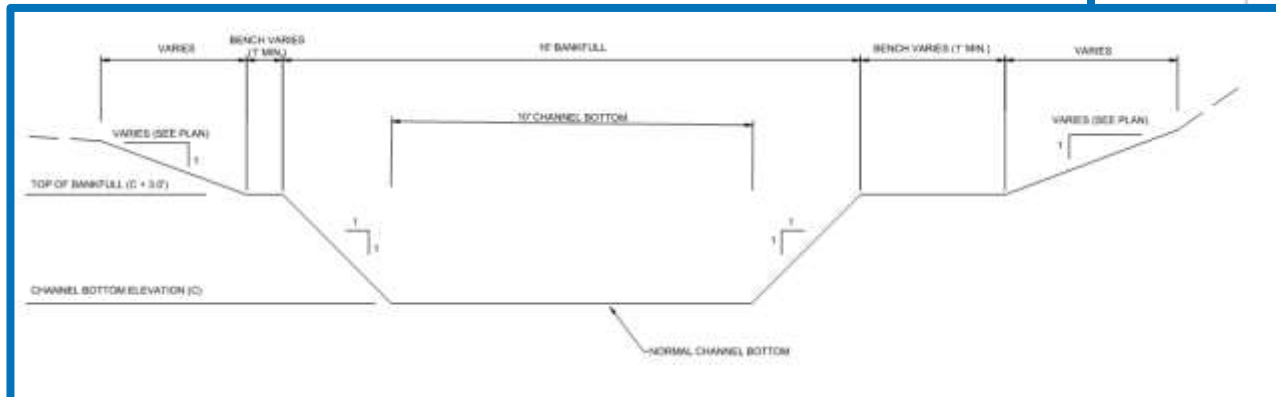
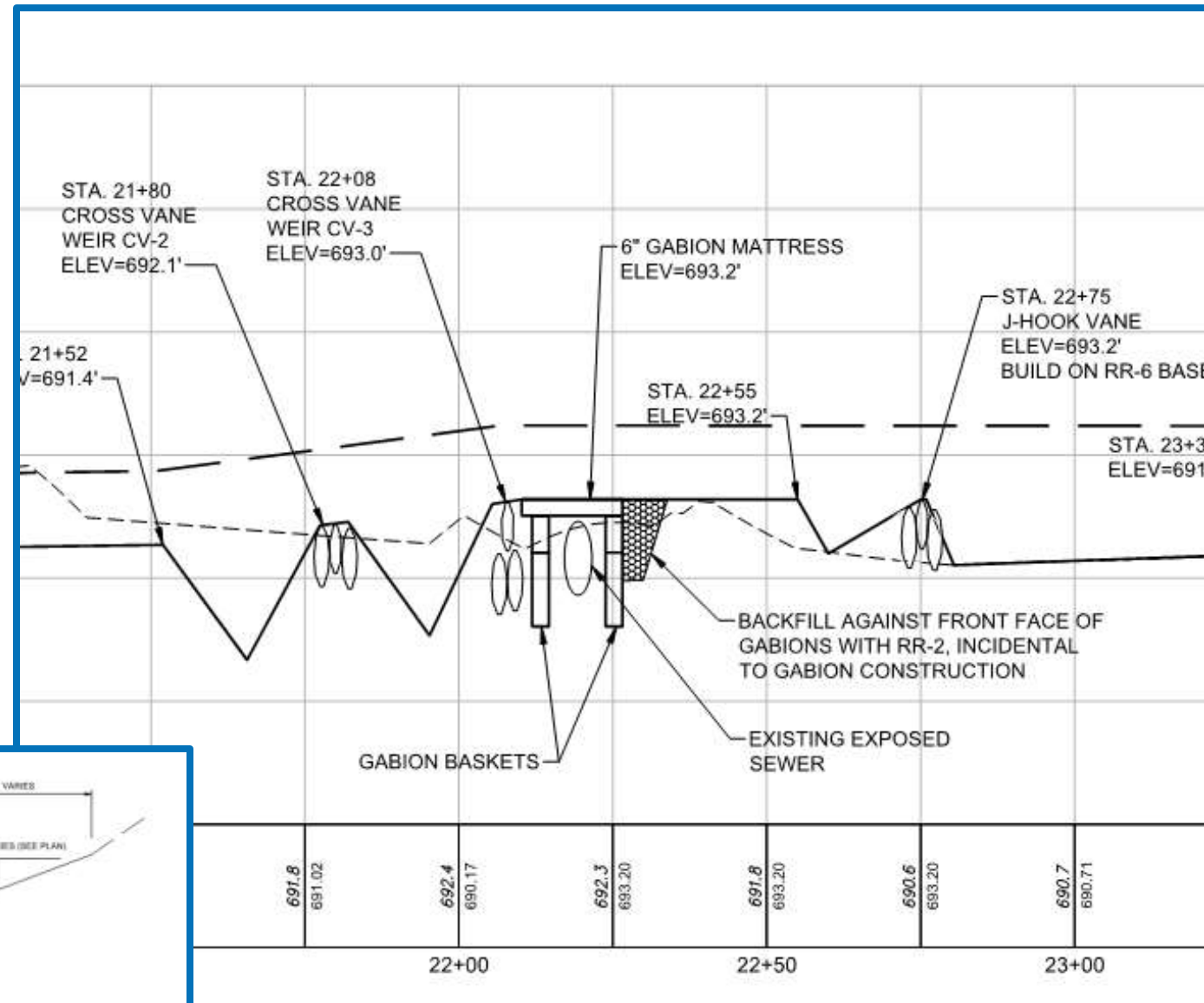
Tributary | Design

- 4 Cross Vane Weirs
- 1 J-hook
- Gabion basket armoring around pipe
- Reshape cross-section
- Adjust alignment at crossing
- Riprap toe



Tributary | Design

- Gabion mattress on top of pipe
- Cross Vane Weir directly downstream of pipe
- Settling pool upstream of pipe
- Plunge pools lined with gabion mattresses



Tributary | Construction

- Gabions around pipe



Tributary | Construction

- Soil instabilities



Tributary | Construction

- Gabion basket in plunge pool



Tributary | Finished Stream





Is the Project Successful?

The Good



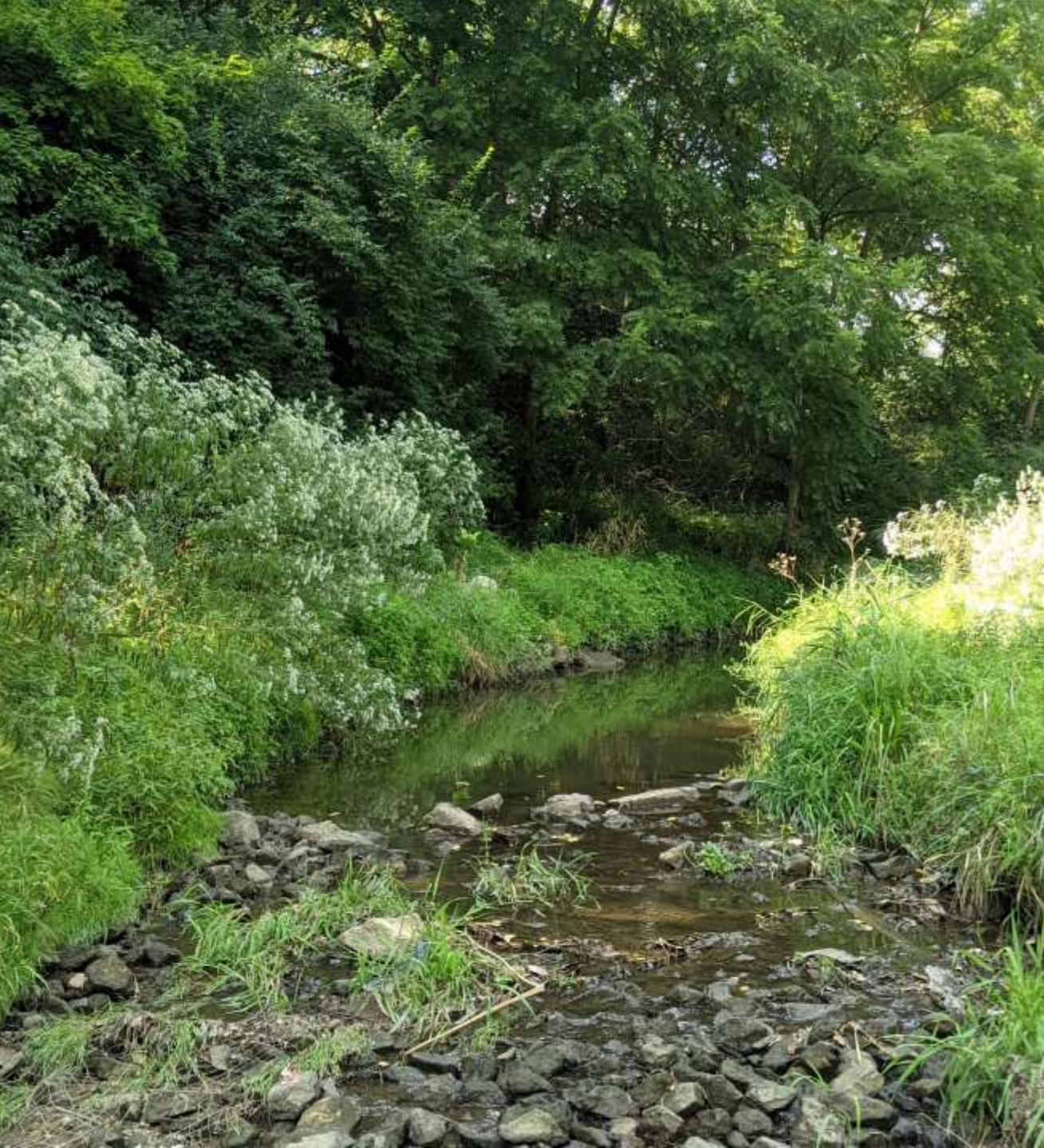
After

Success | Design

- Pipe is stabilized and buried



Before



Success | Design

- Stream is restored, providing ecological benefits



Is the Project Successful?

The Bad

Lessons Learned | Design Improvement

- Gabion baskets and mattresses



Lessons Learned | Design Improvement

- Water cut new path behind toe rock
- Sill rock omitted in Cross Vane Weirs during construction
- Need for clearer structure details
- Bank slope too steep for soils





Is the Project Successful? The Promising

Social Success | Educated Stakeholders

- Urbana-Champaign Sanitary District
 - Multiple stream restoration projects to protect their infrastructure
 - Inventory of pipe / stream crossings
 - Improving water quality is their business. Stream restoration is another tool to accomplish their goal.
- Urbana Park District | Using cross vane weirs and J-hooks in other areas
- Co-workers | Gained respect and credibility for sustainable stream restoration



Success | Definition

(noun)

1. Accomplishment of an aim or purpose.
 - *Fulfilled goal of long-term protection of sanitary interceptor*
2. Favorable or desired outcome.
 - *Shifting mindset of involved stakeholders*



thank you