Stormwater BMP and Stream Restoration in a City Park

Brown AND Caldwell

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Project Location

- Camp Creek in Metro Atlanta
- 7 sq. mile drainage area at project site
- Within 100 yr FEMA floodplain
- City owned property
- Greenway/city park

Site Information – Pre-restoration

- 900 linear feet on City-owned parcels
- 30 feet wide channel with 8 to 12 feet vertical banks
- Railroad overpass just upstream
- Upstream sand source

Camp Creek Existing Condition

- Incised channel, no connection to floodplain (Rosgen F-5)
- Poor habitat
- Stream eroding into left bank and encroaching on park facilities
- Steep, vertical banks - safety hazard to park patrons
- Debris jams throughout

Pre-construction conditions

- Municipal complex (courts, police, etc.)
- On downtown square, high visibility
- Park has large greenspace, amphitheater, walking trails, playground, etc.
- Camp Creek fenced off from park
- Five pipe outfalls; direct stormwater discharges to creek from 30 developed acres, no treatment
- Flooding problems in park

Pre-construction Monitoring

- Water Quality Sampling
  - High bacteria, high TSS during storms, high nitrogen, low DO
- Habitat Assessment
  - Suboptimal
- Benthic macro-invertebrate assessment
  - Poor
- Geomorphic measurements
  - F-5, Incised, aggraded in places
  - Debris jams

Developed 2 Alternative Conceptual Designs

- Priority 3 Stream Restoration
- Stabilize banks in place
- Create floodplain benches and reconnect to floodplain where feasible
- Remove concrete debris
- Revegetate

Selected Alternative 2 – Priority 1 Stream Restoration

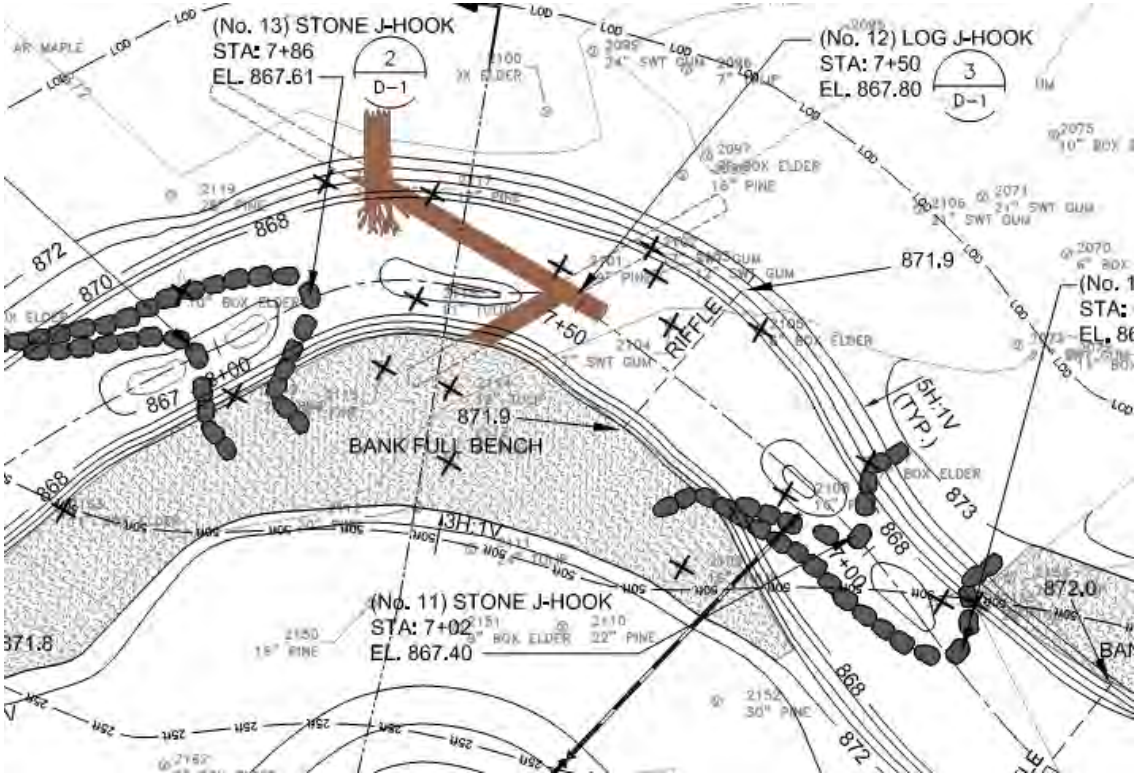
- Relocate stream into right floodplain
- Utilize old channel for bioretention treatment of 30 acres
- Remove invasives and revegetate

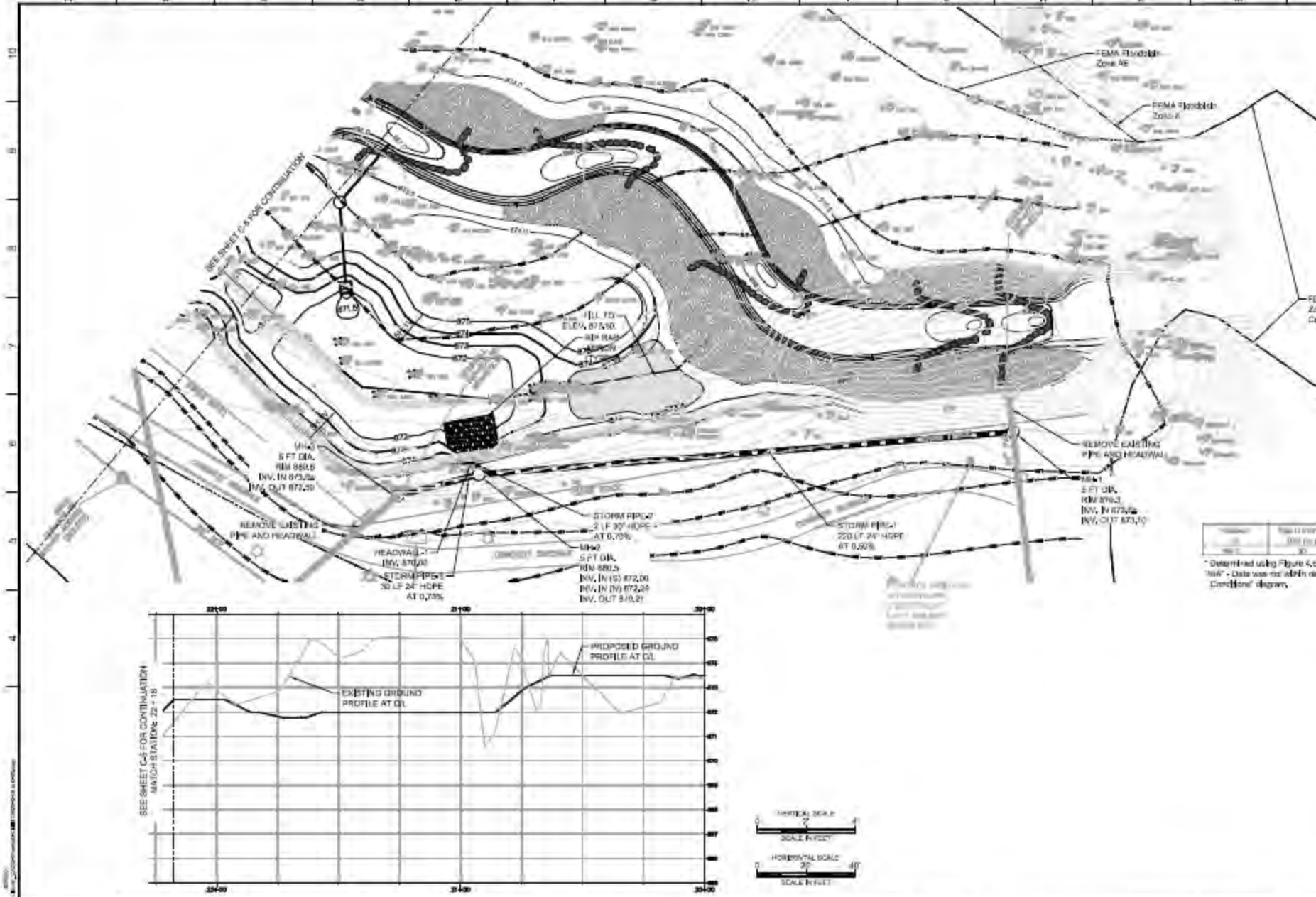
Project Benefits

- Improved access to floodplain
- Moved stream away from park facilities
- Enlarged park area and provides new amenity for patrons
- Combined several storm sewer outfalls
- Bioretention stormwater treatment (3 cascading cells, fieldstone outfall) for 30 acres
- Nature trail

Design & Construction - Stream

- C-5 Type Channel
- 975 linear feet
- 0.2% slope
- 2 stone cross vanes
- 5 stone J-hooks
- 2 log J- hooks
- 3 double stone J-hooks
- Toe wood/brush mattresses
- Bankfull width 22-26 ft.; Dmax 4 ft.
- Bankfull benches





* Determined using Figure 4.5 "NAA" - Data was not within the "Combined" diagram.

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DESIGNED	JH				
DRAWN	AP				
REVIEWED	JLH				
APPROVED	GDR				

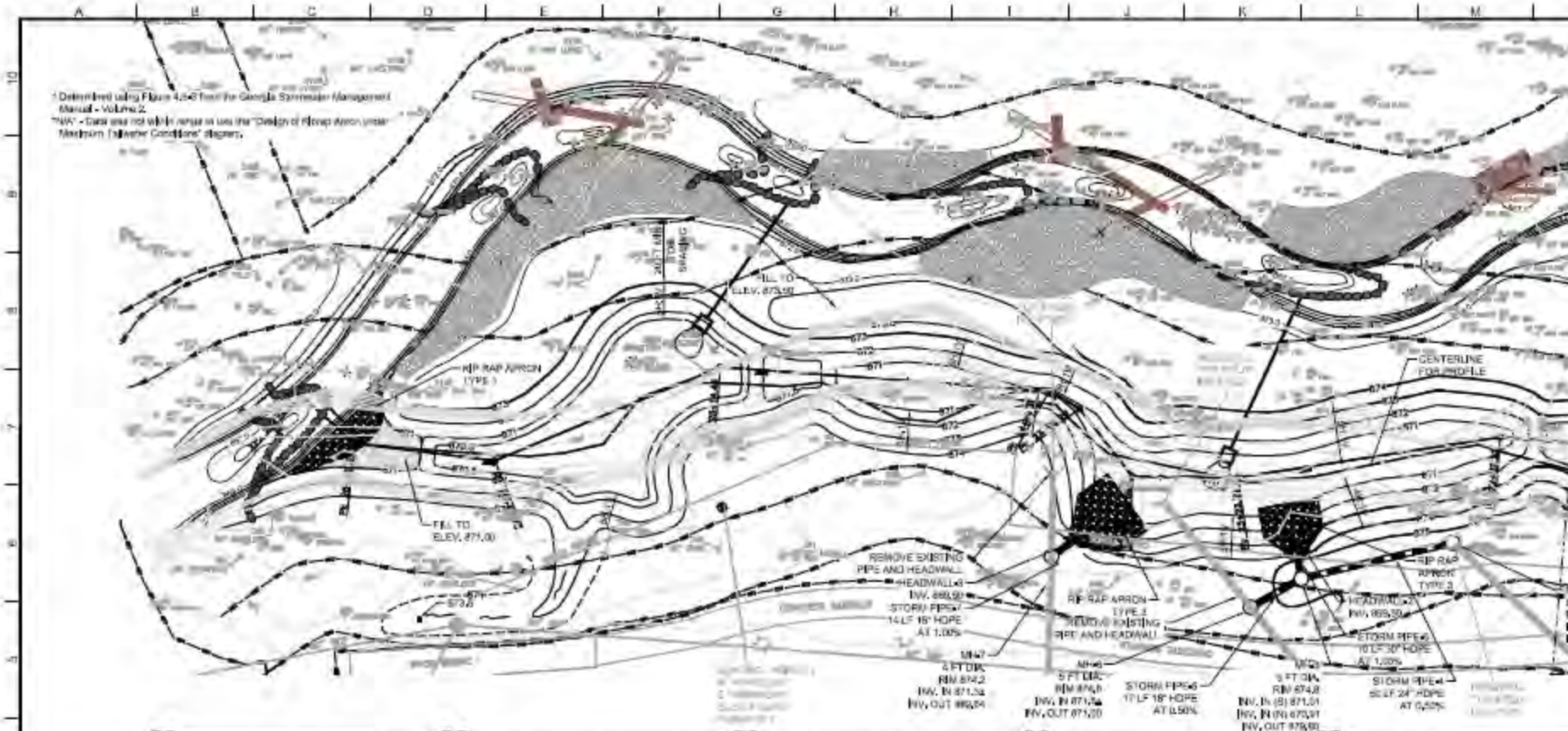
REVISIONS

DATE	NO.	DESCRIPTION	BY	DATE	APP.
	A	90% DESIGN / NOT FOR CONSTRUCTION	JDS	4/4/17	JLH

GWINNETT COUNTY
DEPARTMENT OF WATER RESOURCES
GWINNETT COUNTY, GEORGIA

LILBUR
WATER
AND CAMP C

STORMWA
PARTIAL PL



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Construction

- 150 days – Substantial Completion (March – July 2012); $725,000
- First built new channel, Camp Creek isolated from construction
- Removed plug and activated new channel
- Combined outfalls and built 3 cascading bioretention cells
- Plantings – three phases

Stream Construction

Cleared and flagged for new channel

Roughed in new channel

Stream Construction

Stream Construction

Log vane

Scour log and toe wood/brush mattress

During Construction – Installing Fieldstone Cross Vanes, Structures 1 and 2

Stream Construction

Stone J-hook

Completed Stone J-hook

Completed Project

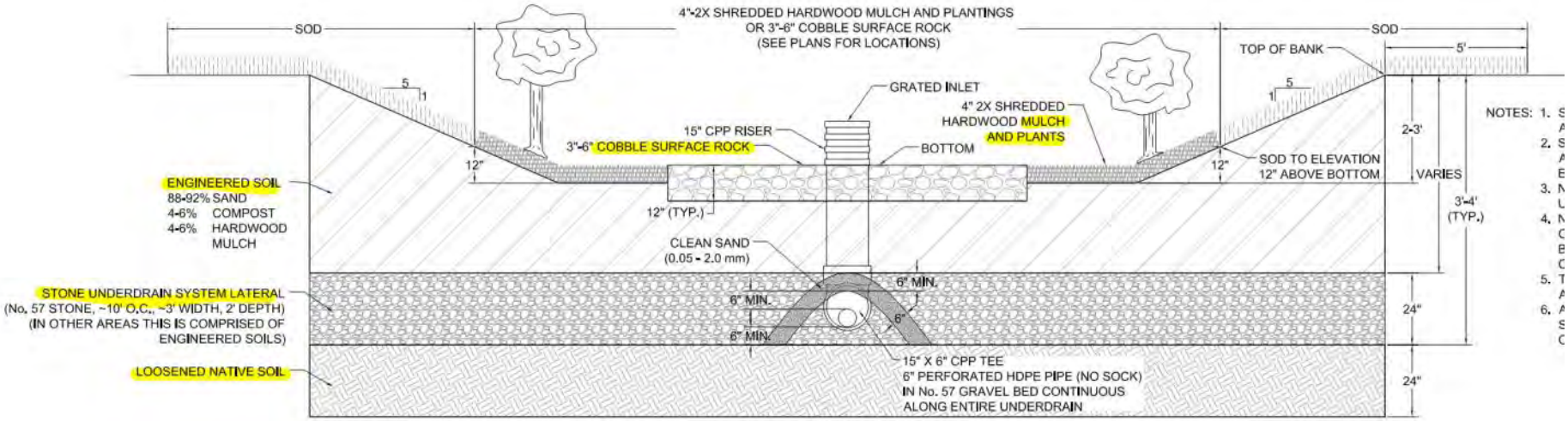
Completed Project

Completed Project

Completed Project

Design & Construction – Bioretention BMP

- 5 outfalls – total drainage area – 30 acres
- Designed system of 3 cascading bioretention cells in old channel
- Underdrain system with valve (only to be used if needed)
- Engineered soil
- Outfall connection to stream
- Plantings



Bioretention BMP

Underdrain Installation

Installing Engineered Soil

Bioretention BMP

Engineered soil Installed in 1-ft lifts, water in, no compaction

Type 3 Rip-rap at outfalls

Bioretention BMP

Cobble and mulch installed

Sod and Irrigation System

Completed Bioretention BMP

Thank you!

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