LINCOLN STREET

SPOKANE URBAN GREENWAY ECOSYSTEMS (SURGE)
CONTACT INFORMATION

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OVERVIEW

• Project location and background
• SURGE goals
• Design challenges
• Stormwater design and compliance
• Design features
• Construction
• Evaluation
• Summary
• Lincoln Street 10-year Street Bond Project
• Originally scheduled for 2008 - delayed
• Length 0.84 miles
• Bio-infiltration cells from N. of 29th to S. of 19th
• Construction of storm conveyance from 29th to Cannon Hill Park Pond
BACKGROUND - LINCOLN STREET

• Original construction 1909 as 29’ wide brick street with large planting strips
• Prior to 1960 street paved and widened 45’
• Planting strips narrowed to add street parking
• Zoning Residential Single Family
• Light traffic ± 5000 VPD - no commercial traffic
• Arterial but functions as a parkway
• Sanitary and storm flows in Combined Sewer System (CSS)
STORMWATER ISSUES

- Compliance with EPA Clean Water Act and WAC 173-245
- CSO discharges limited to 1 per year per outfall
- Phosphates limited to <50 parts per billion to Spokane River
- Regulations are tiered and will become more restrictive (and costly) with time

Riverside Park Water Reclamation Facility (RPWRF)
COST OF TREATMENT

- $1,000 for 1 million gallons - current treatment cost only
- $100 million for RPWRF upgrades
- $250 – 300 million for CSO detention and upgrades
SURGE GOAL

Inflow Reduction Technology: detention, vortex separators, treatment plant upgrades, stormwater separation and treatment

Goal: Reduce flow to Riverside Park Water Reclamation Facility
LINCOLN STREET DESIGN CHALLENGES

- Shallow Bedrock
- Old growth tree roots in excavation zone
- Steep Slopes >7%
DESIGN CHALLENGES CONTINUED

• Existing utilities - due to bedrock not where expected

• +100 year old drainage structures and CSS

• Historic Cannon Hill Park
DESIGN CHALLENGES CONTINUED

• Extreme climate: freezing winters, wet spring, dry and hot summers

• Active Neighborhood (Manito-Cannon Hill Neighborhood)

• Pedestrian-Driver concerns: sight and crossing distances, maintaining lanes
• Eastern Washington Stormwater Manual Compliance
• Bio-infiltration design for 6 mo. NRCS Type II 24 hr. storm
• System and outlet 10-year design storm
• Treatment facilities sized and processes designed to meet EWSM Presumptive Approach
• All stormwater to Cannon Hill Park is treated
• Untreated flows bypass curb extensions to CSS
• Treats and removes up to 86,000 gallons per rainfall event
DESIGN – EXTENSION LOCATIONS
• Lincoln Street returned to 1909 width in extension areas
• Curb extensions shaped to accommodate street sweepers
• Planter strip increased to accommodate large street trees
• 1.5’ minimum soil treatment layer
• Top 1’ select bio-infiltration soil: silty loam, 20% by volume WSDOT fine compost, C:N ratio between 20:1 and 25:1
• Tree root issues addressed: clay liner and existing curb removed
• French drain filter/ collection system
• Sand filter layer to protect french drain system
Curb inlets and driveway inlets re-designed to improve collection and prevent blockage.
DESIGN – TIMBER STYLE CHECK DAM

- Vertical design maximizes treatment areas
- Addresses problems from steep slopes
- Reduces flow velocity
- Uses min. 50% post consumer single resin or co-mingled plastic material (No PVC, polystyrene, fiberglass)
• 3 pallets based on available sunlight
• Drought resistant - low water demand
• Able to survive periods with “wet feet”
• Meets driver sight visibility needs
• 18 Month plant establishment period specified
Bricks that weren't removed by pick up trucks at night.

A few rocks were encountered.
CONSTRUCTION PHOTOS

100 years to cultivate

How big was that pipe again?
CONSTRUCTION PHOTOS

Work in the Park
Just how good is your equipment operator - really?
CONSTRUCTION PHOTOS

New COS pool site

Sidewalk Supervisors - always a problem
CONSTRUCTION PHOTOS

Curb and driveway inlets

A 5 Star Crew?
But it looked so easy on the Plans
We had the grand opening - so it must be done
Evaluation

- Post construction inspection and evaluation
- Revisit specifications based on performance
- Potential for times when the system won’t collect the first flush
- Expense of treatment - can reduce the burden if disposal can be accomplished in the treatment bay
- Plant survival and maintenance required to keep the system operating efficiently are contingent upon care from homeowners.
- Public involvement is the most critical item
COMMENTS/QUESTIONS ?