

This presentation premiered at WaterSmart Innovations

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Demonstrating the Nexus Between Water Efficiency and Storm Water

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Overview

- Then and Now
 - Outdoor Water Efficiency
 - Storm Water Management
- From Challenge to Collaboration
- Demonstrating the Nexus – a Case Study
- Lessons Learned
- Q&A



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City of Santa Rosa

- Population = 169,000
- Provide service to 52,000 Water Customers
- Deliver approx 20,000 acre-feet of water per year
- Treat approx 6 billion gal/year
- Over 100 miles of creeks
- 10 agencies as CoPermittees in Storm Water Permit



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Then and Now

Outdoor Water Efficiency

- Moving beyond irrigation efficiency and controller programming

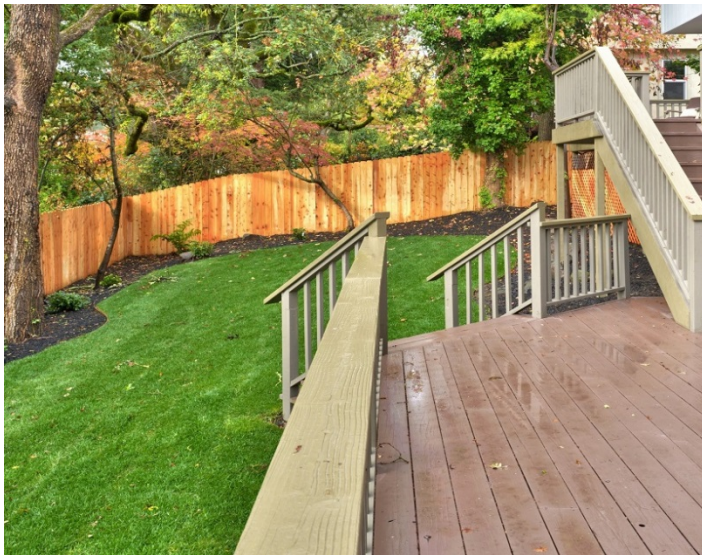


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Then and Now

Outdoor Water Efficiency

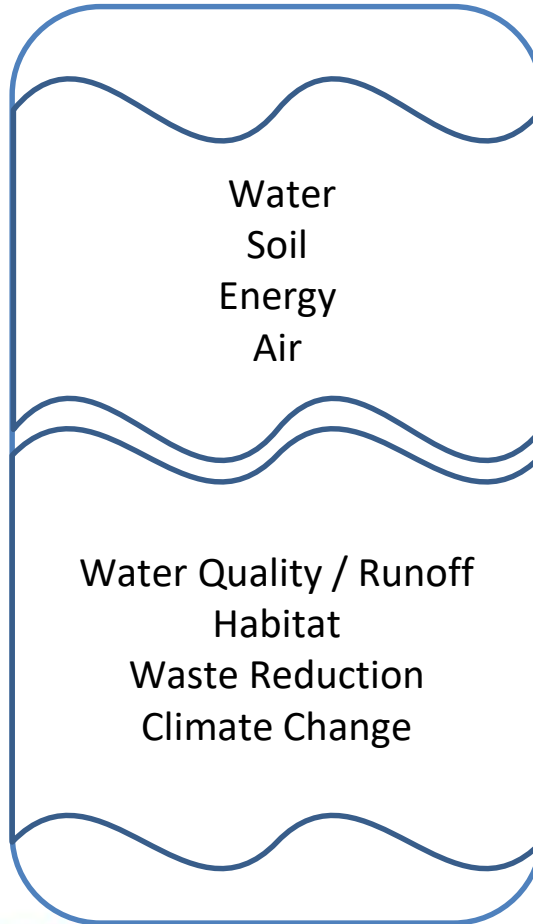
- Watershed approach – leveraging multiple benefits



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Then and Now

Outdoor Water Efficiency



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Then and Now

Storm Water Management

- Storm Water viewed as a problem, nuisance, and hazard
- Solution was pavement, pipes, and channelized waterways
- Large detention ponds and structures





Channelized creeks
led to erosion and
habitat degradation



Paved and
channelized
creeks to move
water quickly







Then and Now

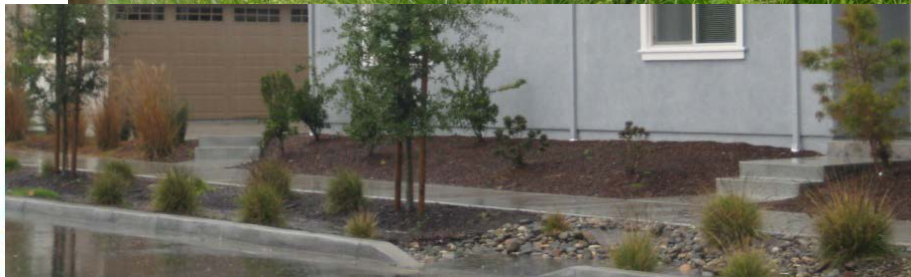
Storm Water Management

- Storm Water is a Valuable Resource
- Using the Landscape to Mimic Natural Function



What is Low Impact Development?

LID features are small scale, infiltration based, landscape features that aim to mimic the undeveloped site...



How it works:



Storm water is allowed to infiltrate and is filtered through the soil .

Storm water is directed into landscape from the street and lots.

High flows overflow to the bypass inlet and discharge to storm drain.



Bioretention treats storm water
with soil and plant-based filtration





Constructed wetlands slowly filter storm water and provide habitat

Rain gardens capture and infiltrate storm water and remove pollutants





Vegetated swales
slow storm water
and trap pollutants



This is the Nexus!

- Storm Water and Water Efficiency are converging
 - Same physical space
 - Multiple benefits
 - Water as a resource
 - Innovation
- All of this convergence poses challenges!



From Challenge... to Collaboration

- Space
- Regulations
- Design Requirements
- Utility Conflicts
- Plant Palette and Density
- Maintenance
- Public Expectation



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From Challenge...to Collaboration

- Create dual-use urban spaces – an opportunity for Collaboration
- Stack functions within the landscape
- Leverage technical expertise
- Innovate the design to achieve all objectives
- **Result = sum greater than individual parts!**



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Demonstrating the Nexus- a case study

- City Hall Sustainable Educational Garden and LID Retrofit



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City Hall Plaza Demonstration Garden and Low Impact Development (LID) Retrofit Project Map

North Demonstration Area Vegetated Swale

800 square feet of roof area, drains into 180 linear feet of vegetated swale.

West Demonstration Area Vegetated Swale

2,660 square feet of roof area, drains into 188 linear feet of vegetated swale.

Santa Rosa Creek drains into the **Laguna de Santa Rosa**
303(d) listed for: indicator bacteria, dissolved oxygen, nitrogen, phosphorus, sediment/siltation and temperature.

West Parking Lot Bioretention

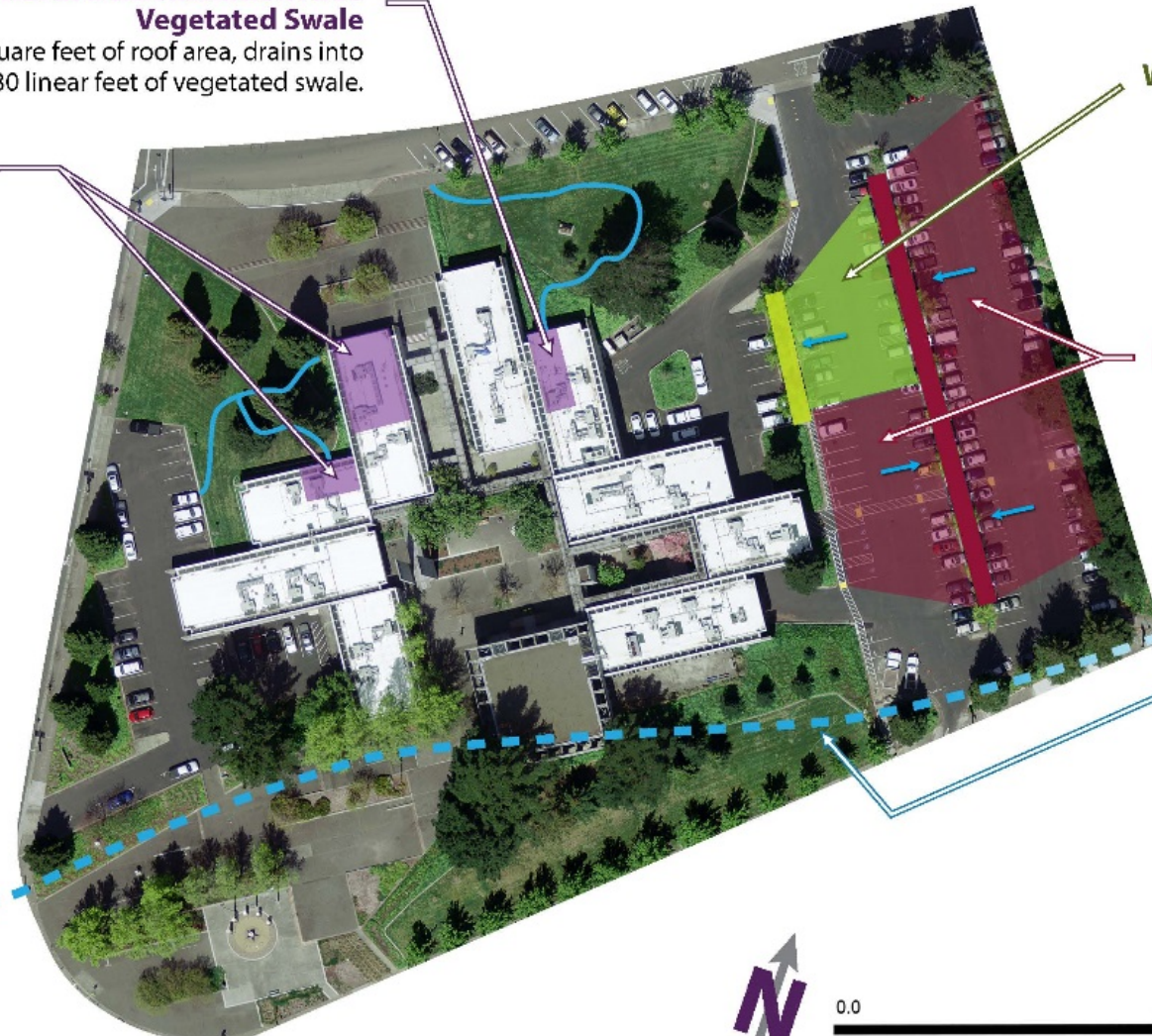
7,650 square feet of parking lot drains into 600 square feet of bioretention.

East Parking Lot Bioretention

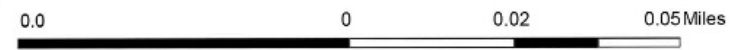
29,000 square feet of parking lot drains into 2,300 square feet of bioretention.

Santa Rosa Creek

which is diverted underground for a short stretch near City Hall is 303(d) listed for: indicator bacteria and sediment/siltation.



flows into the Laguna de Santa Rosa



Demonstrating the Nexus- a case study

- North Demo Area



Demonstrating the Nexus- a case study

- North Demo Area



Demonstrating the Nexus- a case study

- Integration of design: permeable concrete
 - Allows soil infiltration
 - Reduces runoff
 - ADA compliant path of travel
 - Durable
 - Reduces pollutant loading



Demonstrating the Nexus- a case study

- North Demo Area



Demonstrating the Nexus- a case study

- Integration of design: rainwater harvesting
 - Water supply
 - Flow attenuation
 - Ground water recharge



Demonstrating the Nexus- a case study

- West Demo Area



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Demonstrating the Nexus- a case study

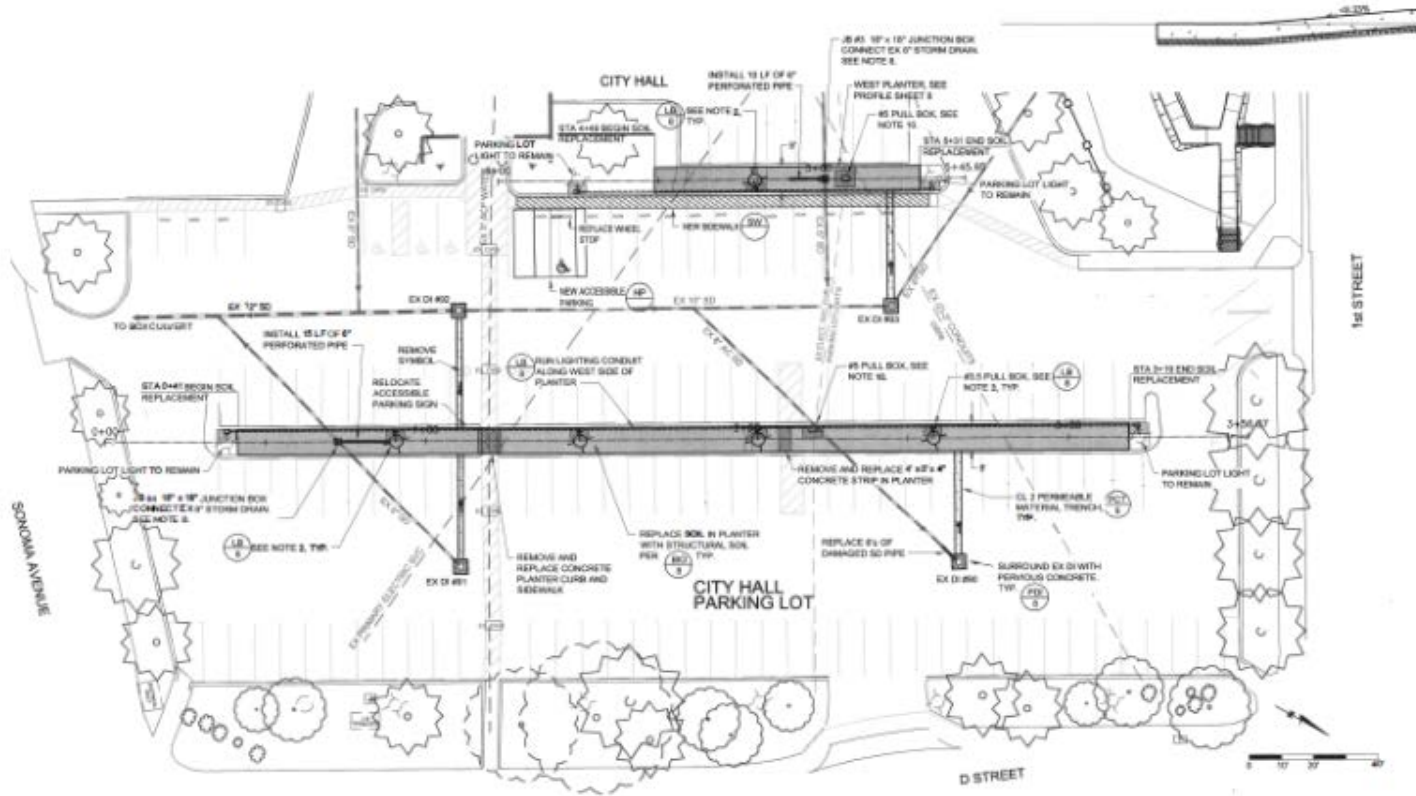
- Main Parking Lot



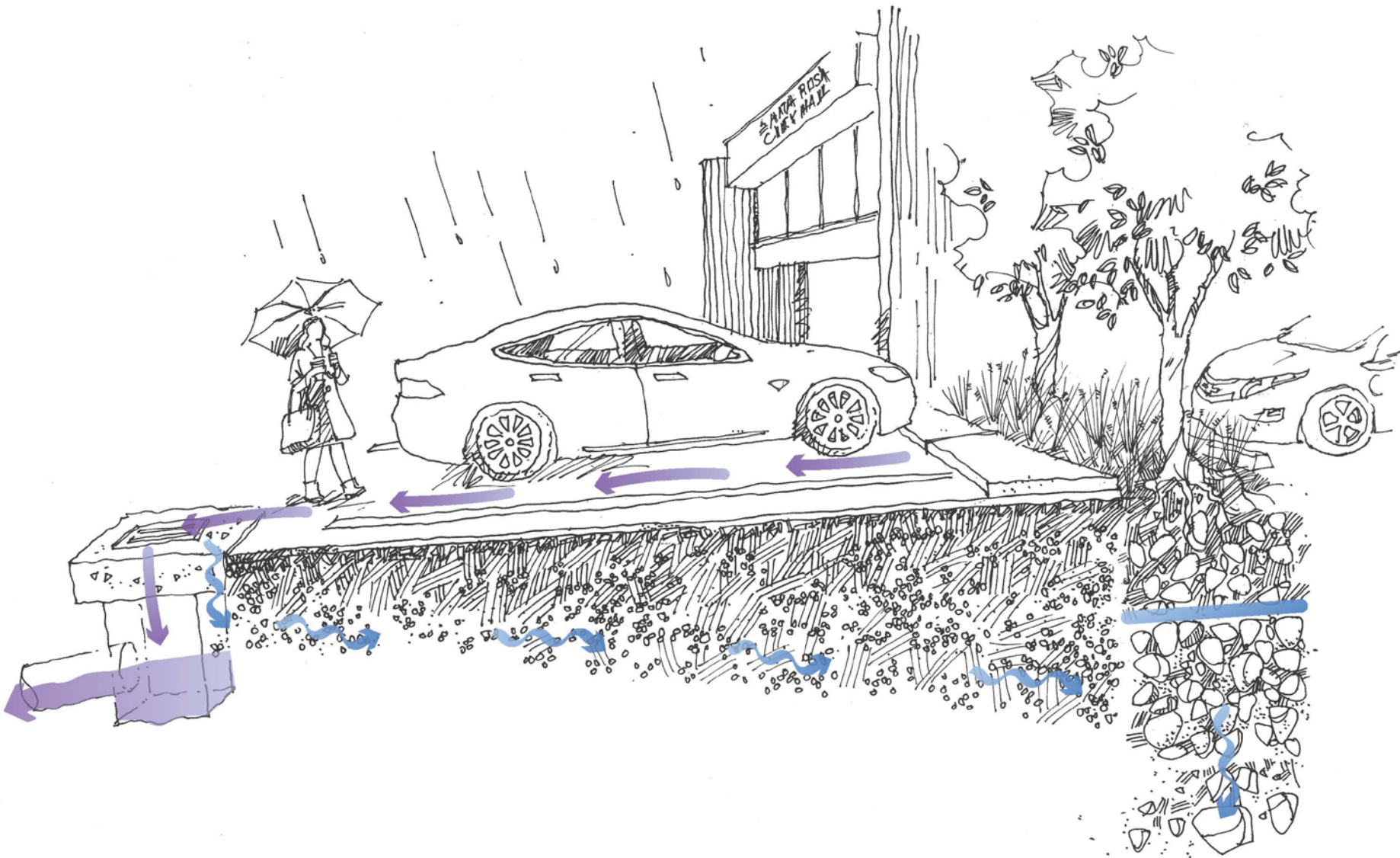
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Demonstrating the Nexus- a case study

- Main Parking Lot

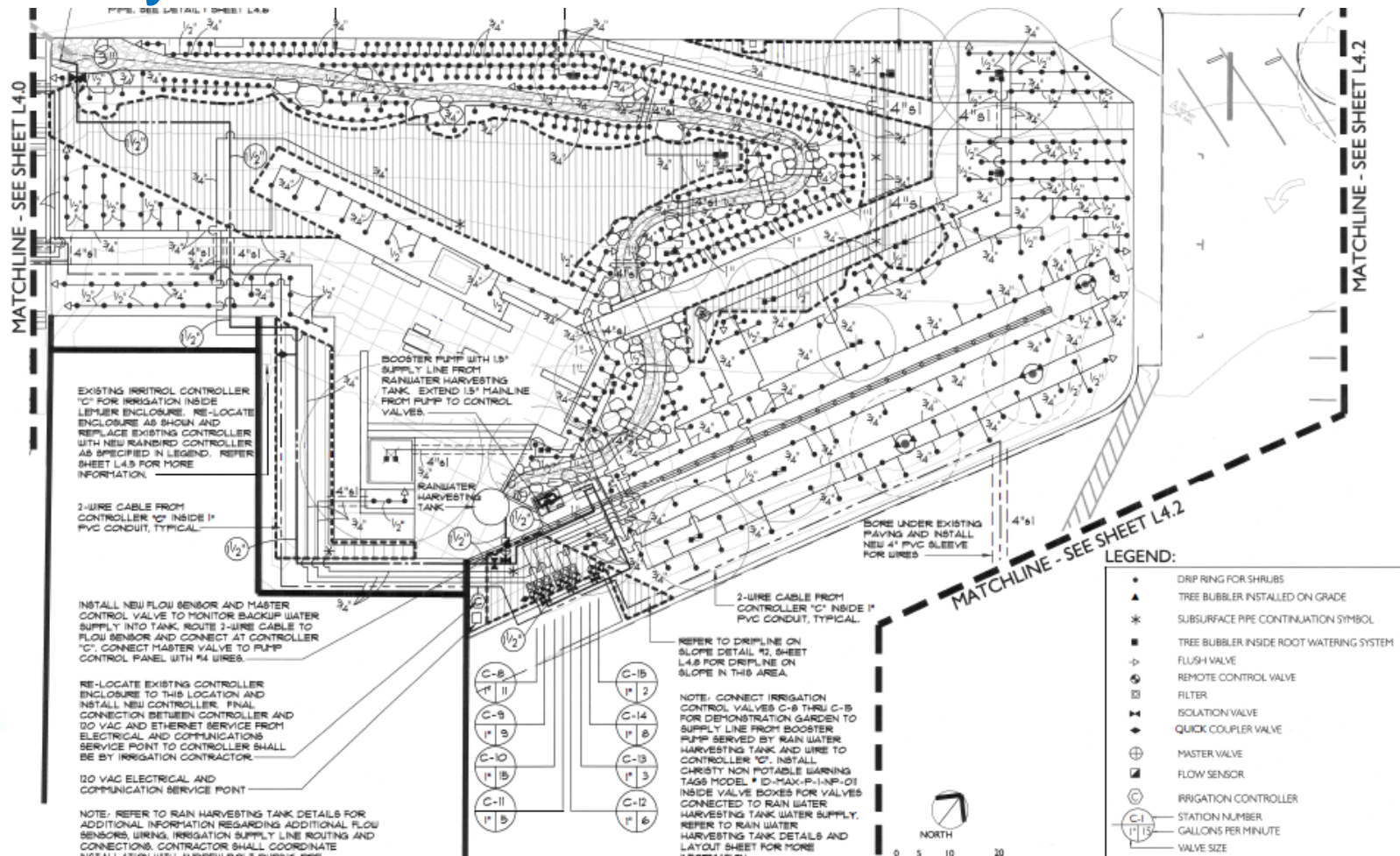


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Demonstrating the Nexus- a case study

- Irrigation system



Demonstrating the Nexus- a case study

- Education and collaborative stakeholder involvement
 - City Council
 - Design Review Board
 - Staff Info Meetings
 - Press Release
 - Design Charrette
 - Public Comment Period



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Demonstrating the Nexus- a case study

- Project web page: www.srcityhallgarden.org



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CITY HALL DEMONSTRATION GARDEN

Santa Rosa is transforming our City Hall lawn and landscape into a beautiful demonstration garden and community gathering area. The garden will be designed using holistic water-use efficiency and storm water best management practices. This garden will feature:

- Drought tolerant, low water-use plants including California Natives which will meet the City's **Water Efficient Landscape Ordinance**.
- Russian-River Friendly **Landscaping Best Practices** that work in harmony with the natural conditions of the Russian River Watershed.
- Bioswales and bioretention to capture and naturally clean storm water runoff onsite. As explained in the **Storm Water Low Impact Technical Design Manual**.

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Project Information

Project Map: Overview of the project's storm water quality components.

Regional Map: Regional context of the project within the City of Santa Rosa.

Project Renderings: Renderings of key project elements. Drafted for concept only.

Project Work Plan: Summary of the project including all work elements.

Grant Agreement: Executed agreement between the City of Santa Rosa and the State Water Resources Control Board who



Lessons Learned

- Nexus lead to grant funding
- Public participation improved project
- Get early buy in across departments
- Obtain political and managerial support
- Consider maintenance and durability
- ADA, ADA, ADA
- Budget
- Timeline

It Can Be Done!



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Demonstrating the Nexus- a case study

- Main Parking Lot



Demonstrating the Nexus- a case study

- North Demo Area



Questions?



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