SCVURPPP Green Infrastructure Handbook

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Outline of Presentation

- Overview
- Handbook Contents
- Schedule
Overview

- MRP requires GI Plans to include general guidelines, standards and details
- SCVURPPP C3PO AHTG requested guidance document
- Companion to C.3 Stormwater Handbook (June 2016)
  - Guidance for Regulated Projects
C.3 Stormwater Handbook

- Municipal Staff and Project Applicants
- Concepts
  - LID site design
  - Treatment Measures
  - Sizing Methodology
- Technical Guidance
  - Bioretention Area
  - Tree Well Filter
  - Pervious Pavement
  - Infiltration Trench
GI Handbook

- Part 1 – General Guidelines
- Part 2 – Details and Specifications
- References guidance documents from other jurisdictions
  - City of San Mateo (2015) – Sustainable Streets Plan and Design Guidelines
GI Handbook

- References cont.
  - City of San Diego (2014) – City Heights Urban Greening Plan
  - DC (2014) – Greening DC Streets
  - Philadelphia (2011) – Green Streets Design Manual and Appendices
GI Handbook Introduction

- Non-Regulated Projects
- Integration of LID into public rights-of-way
  - Streets and sidewalks
  - Parking lots
  - Public parks/landscape areas
- Focus on special considerations
  - Retrofits
  - Street vs parcel
GI Handbook Section 2

- Integration of GI with Public Streets, Parking Lots, Parks and other Public Outdoor Areas
- Identification and Prioritization of Potential GI Application and Sites
- Considerations unique to streets and public right-of-way
  - Street versus parcel
Integration of Treatment Measures

- Pervious Pavement
  - Cross walks
  - Sidewalks
  - Parking areas
  - Streets – **presentation today**
Integration of Treatment Measures

- Bioretention
  - Corner curb extension (bulb out)
  - Mid-block curb extension (bulb out)
  - Planter area along sidewalk
  - Application in parking lots

City Heights Handbook
Integration of Treatment Measures

- Tree Well Filter
  - Along sidewalk
  - Curb extension
  - Median

Images from SCVURPPP C.3 Handbook
Integration of Treatment Measures

- Infiltration Devices
  - Dry wells (deep)
    - Used with proprietary pretreatment device
    - Used with bioretention as pretreatment
    - Useful for small spaces and poor draining soils
  - Trenches (shallow)
    - Used with well draining soils
Identify Potential Sites

- Capital Improvement Projects
- Street/Road Types
  - Classify by road type
    - Arterials
    - Collectors
    - Local
Identify Potential Sites

- **Street/Road Types**
  - Classify by land use
    - Low density residential
    - High density residential
    - Commercial main street
    - Industrial
    - Alley
Identify Potential Sites

- Street/Road Types
  - Consider travel use
    - High volume pedestrian
    - Walkable commercial corridor
    - Auto oriented
    - Transit focus
    - Bike focus (bike route)
    - Truck/freight route
    - Shared
    - Emergency routes
Identify Potential Sites

- Identify Conditions (existing and future)
  - Gradient/drainage patterns
  - Subterranean conditions (soil & groundwater depth)
  - Storm drain system
  - Utilities
  - Roadway width (road diets)
  - Sidewalk width
  - Parking
  - Vegetated areas
  - Environmental (proximity to waterbody, pollutant management)
Identify Potential Sites

- **Parking Lots**
  - Shortening parking stalls for planters
  - Leftover space e.g., in front of and/or next to angled parking
  - Perimeter locations
  - Permeable pavement in parking stalls
GI Handbook Section 3

- Sample Applications
  - Public Streets
  - Parking Lots
  - Parks
  - Other Public Outdoor Areas

- Case Studies
  - Martha Gardens Alley, SJ
  - Hacienda Ave, Campbell
  - Southgate Green Streets, Palo Alto
  - Allston Way, Berkeley
  - San Pablo Ave, El Cerrito
GI Handbook Section 4

- **Sizing Methodology**
- **Standard**
  - C.3 Stormwater Handbook
  - C.3.d volume for Regulated Projects
- **Alternative – BASMAA Project**
  - Document project constraints
  - Use sizing chart to determine smallest facility size that will meet C.3.d
  - If this facility size is still infeasible, identify variations needed from standard design
  - Estimate percent of C.3.d volume that will be treated and evaluate cost-effectiveness

![Current Permit's Curve Matching Criteria](chart.png)

Dubin Environmental Proposal
GI Handbook Section 5

- Design Guidance
- Stormwater Treatment Systems
  - Additional design considerations for street projects
- Integration with Infrastructure for Pedestrian and Bicycle Features - *presentation today*
- Structural Support (i.e., Edge Treatments)
- Safety and Accessibility
Design Guidance

- Utility Conflicts
  - Avoidance – change project location
  - Acceptance – protect utility in place
  - Mitigation – change project design
  - Relocation – move/replace utility
Design Guidance

• Utility Types to Consider
  • Phone/Internet/Cable
  • Power (Underground and Overhead)
  • Gas
  • Water
  • Sewer
  • Streetlights, traffic signals
  • Fire Hydrants
Design Guidance

- Landscape Design – presentation today
  - Plant palette
  - Tree planting
  - Minimum soil volumes
  - Structural support (e.g., suspended pavement systems)
  - Mulch options
- Maintenance Considerations in Design – presentation today
- Trash/Litter Capture Guidance
Post-construction Maintenance Guidance
- Train staff
- May change over time
  - Establishing vegetation
  - Maintenance of vegetation
Surface level
- Pruning/weeding/invasive vegetation control
- Replacing treatment soil and mulch
- Watering
- Vacuum/street sweeper (permeable pavement)
Maintenance Guidance

- Cleaning actions
  - Trash removal
  - Sediment removal
- Erosion control
  - Mulch
  - Cobbles/splash blocks/flow dissipaters
- Inlet/outlet cleaning
- Subsurface maintenance
  - Pipe flushing
Maintenance Guidance

- Minor structural and functional repairs
  - Replacing broken or damaged pervious pavement
  - Regrade soil surface
- Suggested frequencies
Part 2 Details & Specs

- Compilation of available details from:
  - SCVURPPP agency projects
  - Central Coast Low Impact Development Initiative
  - Other jurisdictions (revised for local area as needed)
    - SFPUC (2016)
    - CalTrans (2016)
    - Philadelphia (2011)
    - District of Columbia (2014)
    - Denver (2016)
    - New York City (2014)
    - Portland OR (2016)
    - Seattle (2016)
    - Moreland Australia (2013)
Part 2 Details & Specs

- Pervious pavement
- Bioretention
- Tree Filter
- Infiltration Devices (trenches and dry wells)
- Utility Clearances
  - Communication/power (underground and overhead)
  - Gas
  - Water and Sewer
  - Streetlights
  - Fire Hydrants
NOTES:

1. BIORETENTION MATERIALS AND CONSTRUCTION SMALL MEET CURRENT APPROVED DODT SPECIFICATION FOR "BIORETENTION, PLANTING, AND STRUCTURAL SOILS".

2. LONGITUDINAL SLOPE OF PLANTER WATCHES ROAD, OR FLATTER AS REQUIRED PER DESIGN PLAN.

3. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE PONDING LEVEL REACHES SIDEWALK.

4. SEE DWG. NO. 621.40 FOR INLET / OUTLET AND FOREBAY DETAILS.

5. CHECK DAMS REQUIRED AS PER DESIGN PLANS, SEE DWG. NO. 621.60 TO 621.61.

6. DEPTH OF INFILTRATION SUMP AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER MANAGEMENT REQUIREMENTS.

7. SCARIFY SUBGRADE 3" MIN. BEFORE INSTALLATION.

SECTION A-A (SLOPE OPTION)

SECTION A-A (WALL OPTION)

LEGEND:

1. BIORETENTION SOIL
2. CHOKER LAYER, SAND & GRAVEL
3. AASHTO #57 STONE, DOUBLE WASHED
4. INFILTRATION SUMP, AASHTO #57 STONE, DOUBLE WASHED
5. GEOTEXTILE, CLASS 2
6. MULCH, PER PLANTING PLANS
7. WATERPROOF MEMBRANE

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DWG. NO. 621.24
Granite Curb with L-Wall Cradle

Notes:
1. At catch basins and other storm or utility structures, provide reduced base dimension to clear the structure.
2. Gutter material to match plans (concrete or brick).
3. Provide No. 57 stone beneath granite curb.
4. Provide mix 'E' concrete between bottom of gutter and wall base. Remove conflicting PCC dry mix prior to constructing concrete gutter.
5. Finish all exposed concrete surfaces.
6. Step out zone installation may be standard concrete sidewalk, sod, mulch or pavement based on surrounding conditions, as shown on plans.
7. Refer to design and engineering manual section for pedestrian safety design requirements.
8. Expansion joints shall be placed at maximum 90 foot interval. Contraction joints shall be formed or sawed at 30 foot maximum interval between expansion joints, where adjacent to curb, sidewalk or concrete pavement, joints shall line up.

Bioretention Facility Street Side Edge Treatment-2

District of Columbia
Department of Transportation

DwG. No. 621.31

Recommended by
Deputy Chief Engineer

Date: Approved by Issue

Reference: Chief Transportation Engineer
CONSTRUCTION NOTES:


2. EXISTING UTILITIES AND NATIVE SOIL AROUND EXISTING UTILITIES SHOULD REMAIN IN PLACE WHERE POSSIBLE. IF A PORTION OR ALL OF THE UTILITY IS UNCOVERED DURING EXCAVATION OR EXISTING SOIL WITHIN 1 FOOT OF THE KNOWN EXISTING UTILITY IS SCARRIFIED, NATIVE SOIL OR APPROVED ENGINEERED BACKFILL SHALL BE CAREFULLY PLACED AND COMPACTED AROUND THE UTILITY PER THE UTILITY PROVIDER'S REQUIREMENTS.

3. UTILITY PROVIDER MAY ALLOW UTILITY SERVICES TO BE LEFT IN PLACE AND WRAPPED WITH A WATERTIGHT WRAP OR TAPE IN LIEU OF A SLEEVE. THIS MUST BE APPROVED PRIOR TO THE START OF CONSTRUCTION.
Schedule

- Stormwater Resource Plan (SWRP) for Santa Clara Basin
  - GI guidance, design details and specification task for grant funding
  - June 2017 for Co-permittee review
  - Complete by September 2017

- Continue to modify design details and specifications
  - Complete by June 2018
Contact Information

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