Concept Plan & Community Engagement Report

Natural Park at Ramona Gardens Housing Development

Recycle Stormwater • Create Green Open Space • Improve Air Quality • Restore Native Habitat

LEGACY LA

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August 2018

About the Natural Park at Ramona Gardens Housing Development

Combining community priorities, ecosystem science and engineering, the Natural Park will plant native trees, shrubs and plants to transform land between Ramona Gardens and the 15-lane freeway corridor into a beautiful 'Nature in the City' park. This innovative 'Big Nature' approach will reduce air and noise pollution, recycle stormwater, build resiliency to climate change and provide a wonderful green open space for families and children to gather, walk and play.

Community Conservation Solutions (CCS)

CCS is a 501(c)(3) non-profit organization that tackles the complex problems created where people and nature intersect. CCS pioneers innovative projects that benefit both human and natural communities. CCS develops integrated, nature-based solutions that improve water quality and water supplies, build resiliency to climate change, restore native habitat and create green open space in communities with the greatest needs.

CCS conceived of the vision for the Natural Park at Ramona Gardens, and directed the concept planning, coordination with public agencies and community outreach and engagement.

Special Thanks

Special thanks to Joe Laskin, Lillian Ikuta, the office of L.A. City Councilmember José Huizar, the Housing Authority of the City of Los Angeles, L.A. Police Department's Community Safety Partnership for Ramona Gardens, and the Ramona Gardens Residents Advisory Council.

The Project Team

Legacy LA — **Community Engagement**

Legacy LA is a local community-based organization focused on youth development and environmental justice in Ramona Gardens and Boyle Heights. Legacy LA employs local youth to conduct community engagement activities through the Legacy LA Youth Council.

SWA — **Landscape Architecture**

SWA is a landscape architecture, urban design and planning firm, with seven studios worldwide. SWA's public park portfolio focuses on improving quality of life in cities by addressing issues of density, pollution, sustainability, community programming, arts, and culture.

VS2 Consulting Inc. — **Engineering and Stormwater Green Infrastructure**

VS2 provides planning, civil and environmental engineering, and project management services to institutional, public, private, and non-governmental organizations. VS2's expertise includes urban public parks, sustainable green infrastructure, stormwater, and institutional and public facilities.

Land IQ — **Habitat Restoration and Soil Science**

Land IQ specializes in providing solutions to challenging agricultural and environmental problems throughout the world. Native habitat restoration services include revegetating and reclaiming disturbed landscapes, and natural resources planning, analysis, and management.

For more information, contact us at www.conservationsolutions.org

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To download this report, go to
www.conservationsolutions.org/NaturalPark-RamonaGardens

August 2018

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Legacy LA and the Ramona Gardens Residents Advisory Council (RAC) led the effort to identify community priorities for the Natural Park.

EXECUTIVE SUMMARY

by Community Conservation Solutions

EXECUTIVE SUMMARY

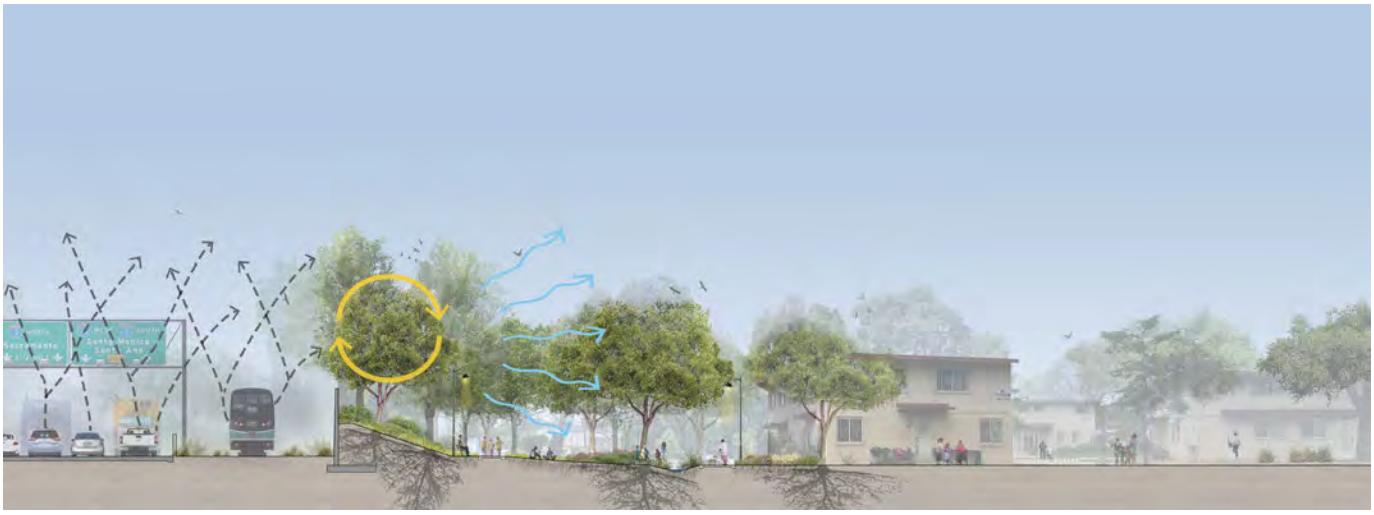
By Esther Feldman, President
Community Conservation Solutions

Community Conservation Solutions is very pleased to present this 'Big Nature' conceptual plan for the Natural Park at the Ramona Gardens Housing Development in Northern Boyle Heights, in the City of Los Angeles.

Reflecting community priorities, the Natural Park will transform four acres of underused land between the residences at Ramona Gardens and a 15-lane freeway and transit corridor into a beautiful, green 'Nature in the City' open space park that features an innovative Anti-Pollution Green Buffer designed to reduce air and noise pollution, provide shade and natural cooling and help increase local resiliency to climate change. The Natural Park at Ramona Gardens is within the L.A. River watershed, so the park's capture and re-use of urban runoff and stormwater will help improve water quality in the L.A. River.

The Natural Park integrates ecosystem science and engineering to address multiple public health, environmental and community needs, and includes these features:

- Native trees, shrubs and plants that restore natural habitats and improve air quality
- Recycled urban runoff for irrigation
- Walking fitness trail
- Plaza for weekly swap meet and community use
- Seating and shade structures
- Recreation courts and exercise steps
- Interpretive sculpture and murals
- Natural places for children and families to play



Air Pollutants from 15 Lane Freeway

ANTI-POLLUTION GREEN BUFFER

Ramona Gardens Housing Development

'BIG NATURE' TO HELP REDUCE POLLUTION

Located next to one of the busiest freeways in the United States, Ramona Gardens is in one of the most polluted communities in California and is designated as severely disadvantaged by the California Environmental Protection Agency (CalEPA). Residents of Ramona Gardens and Northern Boyle Heights suffer disproportionately from serious health problems and diseases that natural outdoor play and regular walking have been shown to significantly reduce, including obesity, asthma, high blood pressure, cholesterol and diabetes.

The Natural Park will help make Ramona Gardens a healthier place for the families and children who live here, and will improve air quality for the surrounding neighborhood.

Combining Ecosystem Science, Engineering and Community Needs

IN PARTNERSHIP WITH LEGACY LA

This 'Big Nature' conceptual plan for the Natural Park at Ramona Gardens is the result of extensive community engagement, door-to-door outreach and workshops conducted in partnership with Legacy LA, Legacy LA's Youth Leaders and the Ramona Gardens Residents Advisory Council.

The Natural Park conceptual plan includes input from community stakeholders, the office of Los Angeles City Councilmember Jose Huizar, the Housing Authority of the City of Los Angeles, the Los Angeles Police Department's Community Safety Partnership, health leaders and numerous community stakeholder organizations.

The Project Team consists of Community Conservation Solutions, SWA, VS2 Consulting Inc., Land IQ and Legacy LA. Work included community outreach and engagement, technical site analyses, analysis of stormdrain channel dry weather flow, planning, research, coordination with public agencies and landscape design. See Appendix A for more information on the project team.

NATURE-BASED APPROACH BENEFITS PEOPLE AND THE ENVIRONMENT

The Natural Park uses an ecosystem-focused design based on the native plant communities that flourished in this area over 100 years ago. The complex of native trees, tree-sized shrubs, grasses and plants are long-lived, adapted to this part of Southern California and resilient to heat and drought. These trees and plants work together as a natural system, with extensive year-round leaf canopies that support birds, butterflies and other invertebrates, as well as robust root systems that contribute to a healthy soil environment rich in micro-organisms.

In combination with the sound wall and earth berms in the Anti-Pollution Green Buffer to elevate the tree and vegetation barrier, the Natural Park maximizes the ability of the native habitat – both above and below ground – to absorb air pollutants from the adjacent freeway, store carbon and reduce greenhouse gases.

The benefits to this integrated, nature-based approach are many:

Improves Air Quality

Native trees, shrubs and plants create a healthy ecosystem that absorbs air pollutants, reducing air and noise pollution from the adjacent freeway.

Creates Natural Places for Children of All Ages

Beautiful natural places encourage children, families and adults of all ages to play, rest and take a break from the city.

Promotes Climate Change Resiliency

A healthy Natural Park maximizes long-term carbon storage in leaves and soil and reduces greenhouse gases. Year-round natural cooling and shade reduce urban heat island effects.

Improves Water Quality and Water Sustainability

Diverts urban runoff from storm drains under the project site for cleaning and re-use, provides a year-round water source for irrigation and helps to improve water quality in the L.A. River.

Improves Health and Quality of Life

A walking trail, exercise steps, shade and natural areas to play provide attractive places to walk and exercise. The Plaza Verde provides a gathering area for the swap meet and other community uses.

A 'NATURE IN THE CITY' PARK MODEL FOR PUBLIC HOUSING DEVELOPMENTS

The Natural Park at Ramona Gardens provides a model that can be replicated at public housing developments and in disadvantaged communities throughout California. This 'Nature in the City' model demonstrates how integrating restored native habitat with stormwater recycling, air pollution reduction strategies, recreation and walking trails can address serious pollution and public health problems that plague disadvantaged communities, while also meeting community needs for flexible open space, increasing local water supplies and developing resilience to the effects of climate change.

The next steps in advancing the Natural Park at Ramona Gardens to implementation are dependent on commitments from state, regional and local public agencies and others to fund technical design, construction documents, permitting, construction and on-going maintenance, and continued community engagement.

Thank you to the State Coastal Conservancy, Santa Monica Mountains Conservancy, The Rosalinde and Arthur Gilbert Foundation, the Southern California Gas Company, and the Union Bank Foundation for providing funding for development of the conceptual plan for the Natural Park at Ramona Gardens.

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SITE EVALUATION AND CONCEPT PLAN REPORT

Site Evaluation and Research

Community Workshop Results

Concept Plans: Big Nature

Native Habitat Types

Project Phasing and Cost Estimates

By SWA, with
VS2 Consulting Inc., Land IQ,
and Community Conservation Solutions

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COMMUNITY CONSERVATION SOLUTIONS

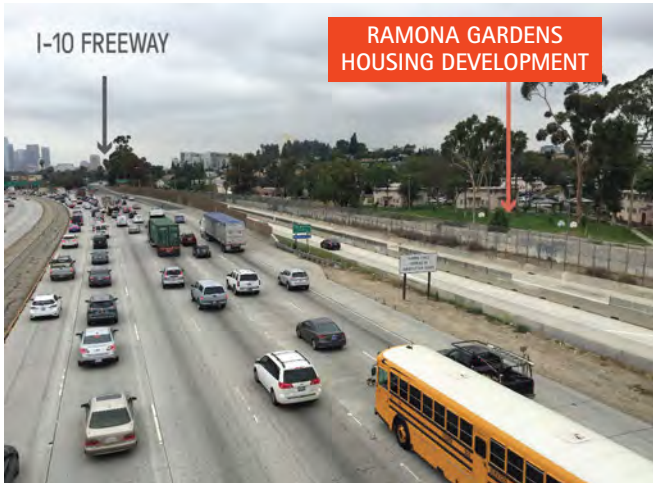
INTRODUCTION

By SWA, with VS2 Consulting Inc. and Land IQ

A BIG NATURE VISION FOR RAMONA GARDENS

There was a time when natural systems of the Los Angeles region included rivers, streams, forests and wildlife, and provided a wonderful place for humans to live in a beautiful and big natural place. The area was topographically complex, biologically diverse, and sustainable. The Natural Park at Ramona Gardens project is inspired by what this area of Los Angeles used to be, and aspires to harness "big nature" once again, interpreted as a unique, ecologically-robust linear park for a very important community.

Figure 1.1



The Ramona Gardens Natural Park site sits next to 15 lanes of freeway, carpool lane, and Metro line Figure 1.2

NATURAL PARK PROJECT GOALS

Water
Improve urban run-off water quality and conserve potable water supplies.

Habitat
Restore native habitat to support wildlife and enhance human well-being.

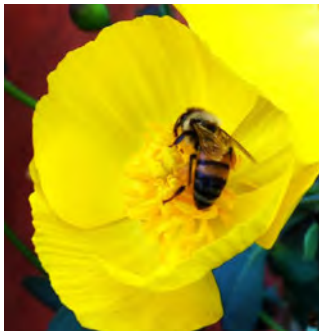
Air
Improve air quality and mitigate negative impacts to Ramona Gardens residents from the adjacent 15-lane freeway and transit corridor.

Community
Reconnect humans to nature, strengthen community, and improve the physical and mental health of Ramona Gardens residents.

The Northern Boyle Heights neighborhood of Los Angeles, which includes the Ramona Gardens Housing Development, a public housing project operated since 1940 by the Housing Authority of the City of Los Angeles (HACLA), is one of the most disadvantaged communities in Los Angeles County. Boyle Heights is one of the most densely populated urban areas in the United States, with over 14,000 people per square mile. It is designated as "severely disadvantaged" by the CA Department of Water Resources' Disadvantaged Communities mapping tool and falls within the top percentile bracket (96-100%) of disadvantaged communities according to the CA Environmental Protection Agency (CalEPA).

Furthermore, Northern Boyle Heights is in the top 1% of polluted communities in California. This community is heavily impacted by air pollutants and noise from the adjacent I-10 and I-5 freeways, a busway and High Occupancy Vehicle (HOV) lane and a Metrolink train line, and from multiple industrial land uses. See Appendix B.

Vehicles traveling on this 15-lane transit corridor emit air pollutants that cause serious, chronic health problems that disproportionately affect the Ramona Gardens community. Air pollutants include ozone, particulate matter, nitrogen dioxides, sulfur dioxide, and carbon monoxide. Breathing fine particulate matter from freeways is among the leading causes of asthma and impaired lung development in children and of cardiovascular disease, early death and severe disability in adults[1]. Poor health



Examples of other urban natural parks

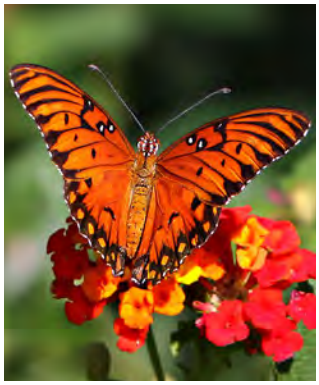
Figure 1.3

1. USC Keck School of Medicine, Epidemiology.
Vol. 16, No. 6, November 2005

due to air pollution has also been shown to affect school attendance, academic and work performance, and is associated with lower earnings potential. In addition, community members throughout Northern Boyle Heights are continually exposed to noise pollution produced by the vehicles on the freeway and the Metrolink train. The closest residences are 100 feet away from the freeway and the five to six foot concrete block wall with little to no vegetation and tree cover does not reduce the noise that residents of Ramona Gardens endure on a daily basis.

A team of community and environmental planning and design professionals has developed this vision and concept plan for a Natural Park at Ramona Gardens. Team members include: Community Conservation Solutions, Legacy LA, SWA Group, VS2 Consulting Inc., and Land IQ.

Recognizing the needs of the community and the potential to improve water quality within the Los Angeles River watershed, this team, led by Community Conservation Solutions, has proposed a 'Big Nature' Natural Park at Ramona Gardens that will harness stormwater and urban runoff, support robust native habitat, improve air quality, and create beautiful, green places for people of all ages to gather, walk, rest, and play.



Examples of other urban natural parks Figure 1.4

SITE EVALUATION AND RESEARCH

1. COMMUNITY DEMOGRAPHICS

Ramona Gardens' population consists of 1,800 residents living in 500 units, including 700 children.[1] The population is 94.7% Latino or Hispanic, with a portion of the population being Black (2.9%), Caucasian (1.3%), and Asian (1.1%). The gender composition is 58% female and 42% male. Over one third of the 1,800 residents are under the age of 18 years old, and 59% of household units include children. Within Ramona Gardens, 64% of households live in poverty, with an average income of less than $20,000.

Ramona Gardens residents suffer disproportionately from health problems that regular walking has been shown to prevent, including obesity and asthma, with an obesity rate of 45%, well beyond the nation's average of 35.9%.[2] In addition, the UCLA Center for Health Policy Research found that 27% of Boyle Height's youth (ages 2–17) are diagnosed with asthma, nearly twice California's statewide average of 15%. Refer to Figure 2.1.

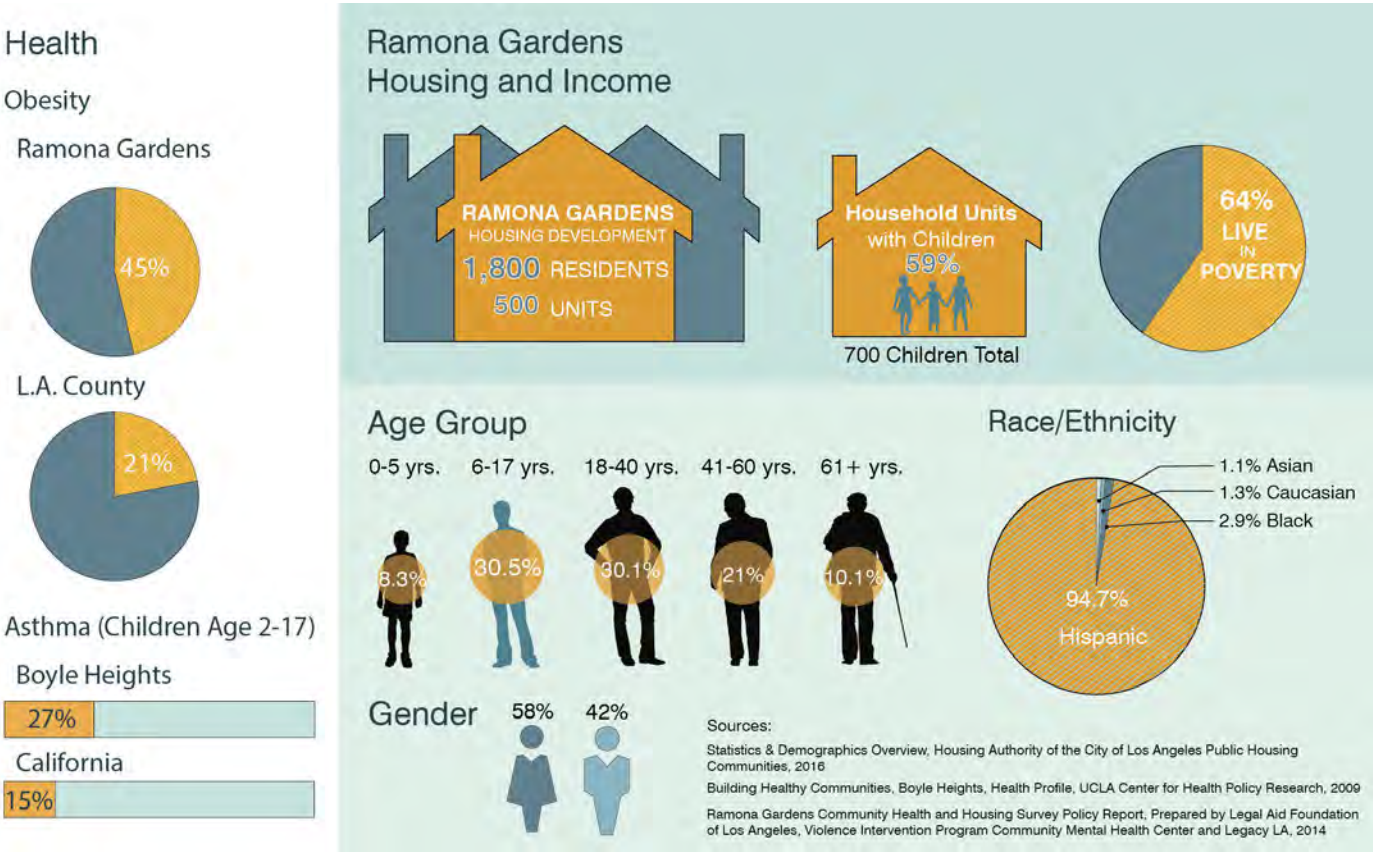


Figure 2.1

1. Statistics & Demographics Overview, published by the Housing Authority of the City of Los Angeles in 2016

2. Ramona Gardens Community Health and Housing Survey Policy Report, prepared by Legal Aid Foundation of Los Angeles, Violence Intervention Program Community Mental Health Center, and Legacy LA

2. REGIONAL CONTEXT

Ramona Gardens is located in the northern area of the historic Boyle Heights neighborhood of the City of Los Angeles, approximately four miles to the northeast of downtown Los Angeles. The Regional Context graphic on page 14 illustrates the location of Ramona Gardens in relation to the surrounding Los Angeles area, and an existing network of natural open space areas that the Natural Park project can link to, improving habitat corridor connectivity. Ramona Gardens is less than two miles from the Los Angeles River. There are two city parks and one natural open space area within approximately two miles. The L.A. State Historic Park near the L.A. River across the I-5 freeway is three miles away.

Ramona Gardens residents suffer from inadequate access to park space. There are only 2.15 acres of parks per 1,000 residents within a half-mile radius centered on Ramona Gardens.[1] This is below the Los Angeles County median of 3.3 acres per 1,000 people, and far below the 6.8 acres per 1,000 people in other high-density cities in the U.S.[2] Creating accessible park, recreation, and natural open space in Ramona Gardens through the Natural Park project will help alleviate the shortage of easily-accessible park amenities in this community. Refer to Figure 2.2.

Existing Parks within One-Half to Three Miles

- L.A. State Historic Park
- Ascot Hills Park
- Lincoln Park
- Hazard Park and Recreation Center

Proximity to the Los Angeles River

- Opportunity to connect to planned and in-progress recreational amenities, such as the L.A. River Greenway and Piggyback Yard Park
- Opportunity to divert, naturally clean, and re-use urban runoff and stormwater before it reaches the river

1. California State Parks Community Fact Finder Report, Coordinates 34.0575, -118.1939, May 16, 2018.
2. "Los Angeles is Short on Parks, Ranking 74th Out of 100 Cities", KCET.org, April 9, 2018.

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NATURAL PARK AT RAMONA GARDENS
Site Evaluation and Research
Regional Context

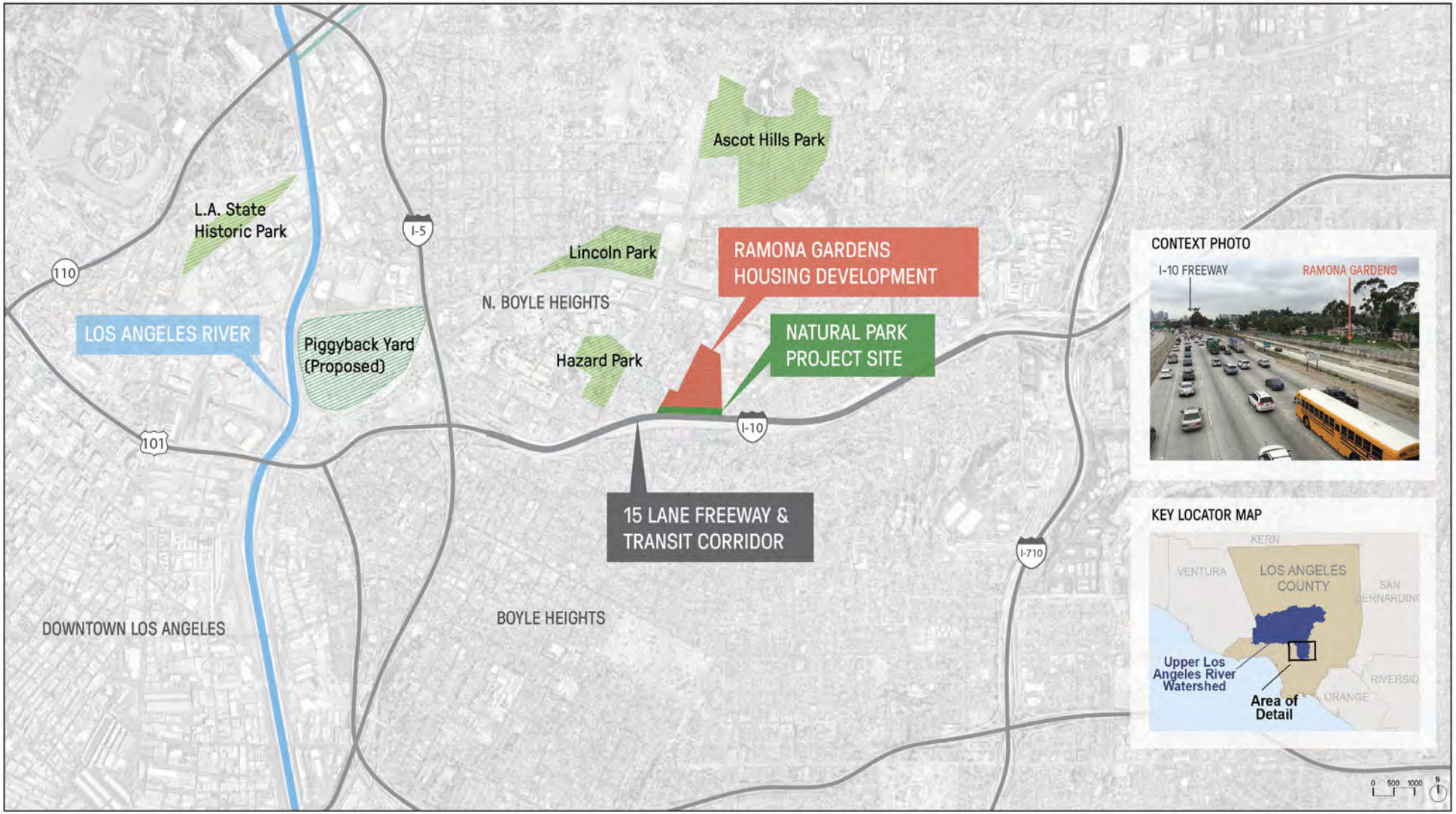

Figure 2.2

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NATURAL PARK AT RAMONA GARDENS
Site Evaluation and Research
Proposed Green Street Walking Connections

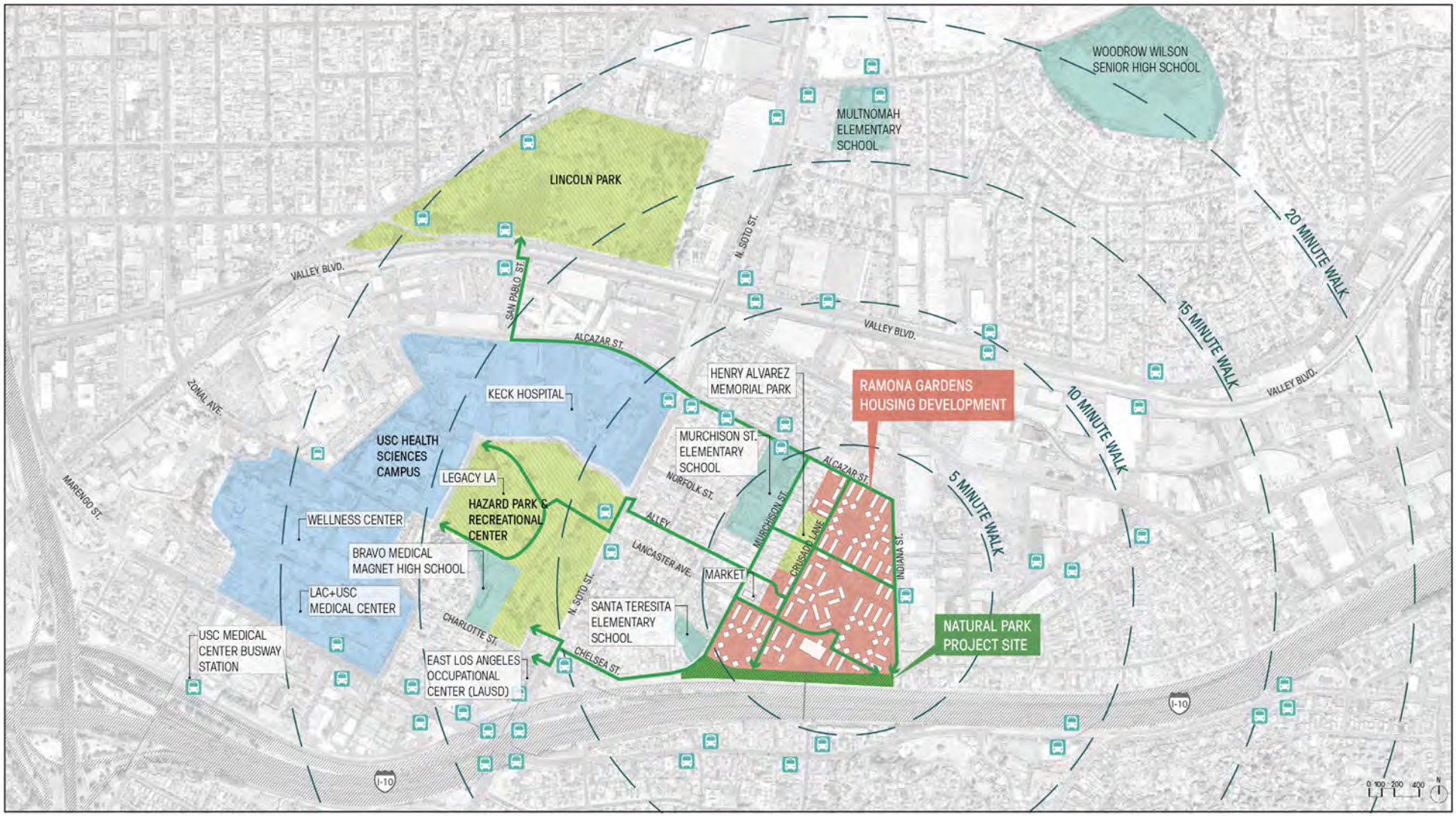


Figure 2.3

www.conservationsolutions.org/NaturalPark-RamonaGardens

3. GREEN STREET WALKING CONNECTIONS

Strategic planning for a network of green streetscapes can provide pedestrian-friendly thoroughfares and safe school routes from Ramona Gardens to nearby schools, Legacy LA's headquarters, Hazard Park, the USC medical center complex, and other public resources. The primary approach is to enhance streetscapes of streets, alleys, and lanes that directly connect Ramona Gardens to these resources, making it easier and safer for people to walk from their homes to key destinations.

Greening the streets with street trees will create a physical barrier between the street and sidewalk, increasing the safety of pedestrians and encouraging community members to walk. Street trees will also help clean the air, absorb greenhouse gases, and create a cooler environment through evapotranspiration and the natural shade of their canopies. These "green connections" will not only beautify the community, but would also improve access to surrounding parks and amenities, with the additional benefit of encouraging a healthier lifestyle through walking.

The proposed routes for Green Street Walking Connections are shown in green in the graphic on the opposite page (see Figure 2.3). Green Street Walking Connections would provide the following:

- Appropriately located shade trees
- Safe and accessible pedestrian pavements
- Safe and accessible street crossings
- Adequate lighting for visibility and safety
- Appropriately located site furnishings (such as seating and waste receptacles)
- Appropriately located low impact development Best Management Practices (BMPs) for stormwater management

These green connections would connect Ramona Gardens' residents to the proposed Natural Park, Hazard Park and Recreation Center, Lincoln Park, neighboring schools, and resources that benefit the community, all within a one mile radius, which is equivalent to a 20 minute walk. Crusado Lane and the alley located between Lancaster Avenue and Norfolk Street (see Figure 2.4) are already being used by Ramona Gardens residents and other community members as their key connecting route, because it is relatively flat compared to the steep hills on

The alley provides an accessible walking connection through the neighborhood

Figure 2.4

Lancaster Avenue and Zonal Avenue. Crusado Lane is the main pedestrian connection between the north and south ends of the housing development, and would also serve as a connection to the Natural Park at Ramona Gardens.

LA City Planning's *Complete Streets Manual* and LA Stormwater's *Green Streets and Alleys Guidelines and Standards* should serve as guiding documents for the continued planning and design of the Green Street Walking Connections.

The following is a list of amenities within a 5, 10, 15, and 20 minute walk[1] from the center of the Ramona Gardens Housing Development:

5 Minute Walk

- Natural Park at Ramona Gardens
- Murchison Street Elementary School
- Nico's Market at the corner of Murchison Street and Lancaster Avenue (the only market currently available to Ramona Garden residents within a one-mile radius)
- Santa Teresita Elementary School

10 Minute Walk

- Santa Teresita Elementary School
- Hazard Park and Recreation Center

15 Minute Walk

- Bravo Medical Magnet High School
- East Los Angeles Occupational Center (LAUSD)
- Legacy LA: Non-profit organization whose purpose is to provide at-risk youth with the tools necessary to build better lives for their communities and themselves.
    - Provides numerous learning and leadership opportunities to the youth living in Ramona Gardens.
    - Partners and works actively with community leaders and youth from Ramona Gardens.
- Keck Hospital of University of Southern California

20 Minute Walk

- USC Health Sciences Campus
- LAC+USC Medical Center
- Wellness Center: Provides wellness and prevention services and resources for residents to prevent health complications and to improve the overall health of the community.
- Lincoln Park
- Multnomah Elementary School
- Woodrow Wilson Senior High School

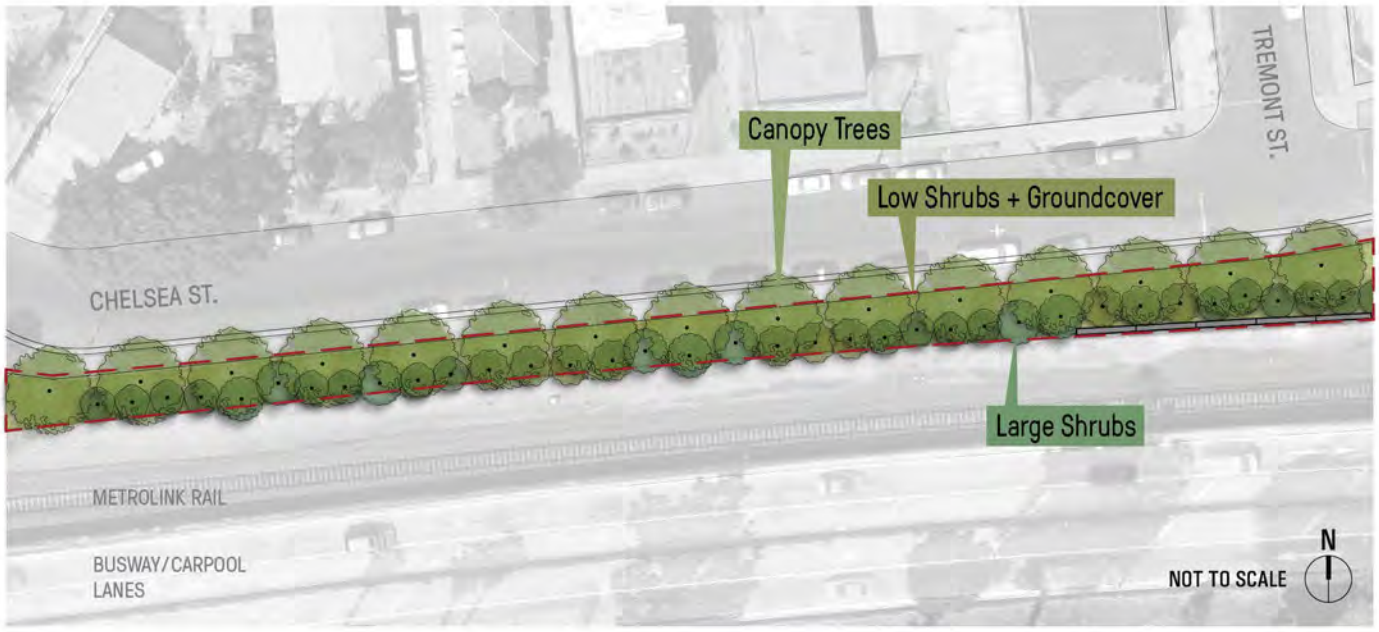
3.1 CHELSEA STREET GREEN WALKING CONNECTION PLANTING

The barren right-of-way between the south side of Chelsea Street and the rail corridor is a prime opportunity for planting shade trees along the sidewalk and large shrubs to help buffer the community from the train and freeway.

The strip of land should serve as a continuation of the Anti-Pollution Green Buffer planting in the Natural Park (see the "Concept Plan: Big Nature" chapter starting on page 34). Shade canopy tree species should have evergreen canopies and provide air pollution mitigation. *Fraxinus uhdei* (Evergreen Ash), *Quercus agrifolia* (Coast Live Oak), or *Tipuana Tipu* (Tipu Tree) are the preferred species. Plant a single species of canopy tree, with consistent spacing, and according to the City of Los Angeles Bureau of Street Services Street Tree Division street tree planting guidelines. Appropriate shrub and groundcover species are listed in Figure 2.5.

1. Walking times are estimated based on direct "crow's flight" distances. Actual walking times may differ based on the available route taken.

CHELSEA STREET GREEN WALKING CONNECTION PLANTING



Canopy Trees

Species	Common Name
Fraxinus uhdei	Evergreen Ash
Quercus agrifolia	Coast Live Oak
Tipuana Tipu	Tipu Tree

Large Shrubs

Species	Common Name
Heteromeles arbutifolia	Toyon
Rhus Ovata	Sugarbush
Sambucus nigra spp. Cerulean	Elderberry

Low Shrubs and Groundcover

Species	Common Name
Achillea millefolium	Yarrow
Corethrogyne filaginifolia	California Aster
Eriogonum fasciculatum	California Buckwheat
Penstemon centranthifolius	Scarlet Bugler
Stipa pulchra	Purple Needlegrass

Figure 2.5

4. LAND USE

The Ramona Gardens Housing Development is surrounded by an industrial zone to the north and east and a 15-lane freeway transit corridor to the south, both of which contribute to the poor air quality that residents must endure. Other land uses adjacent to or near Ramona Gardens include residential areas to the west and south of the I-10 Freeway, and a small number of commercial properties to the west.

The housing development is also near other amenities and resources, such as: Hazard Park, Lincoln Park, schools, the USC Health Sciences Campus, LAC+USC Medical Center, Keck Hospital, and other Los Angeles City public facilities. Refer to Figure 2.6.

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NATURAL PARK AT RAMONA GARDENS
Site Evaluation and Research
Land Use

Figure 2.6

www.conservationsolutions.org/NaturalPark-RamonaGardens

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5. URBAN RUNOFF AND STORMWATER RE-USE

By VS2 Consulting Inc.

5.1 DATA COLLECTION, MAPPING, AND TECHNICAL DATA COLLECTION

Record Data Research

Existing on-site and adjacent off-site utility information was compiled from maps and record drawings obtained through responses to written inquiries from utility companies, information from the City of Los Angeles database (Navigate LA), and from record information provided by the Housing Authority of the City of Los Angeles (HACLA).

Topographic Site Survey

Existing topographical and surface indication information was gathered by aerial photogrammetry, engineering inspection and field survey methods. The aerial topographic map created by photogrammetric methods shows an overall surface flow direction from east to west and shows contours in intervals of one foot.

Property Line/Easements

Property line and easements were plotted based on assessor data. A Preliminary Title Report (PTR) was not ordered or reviewed as a part of this work. A PTR shall be ordered and reviewed to confirm lot lines and easement in a future phase.

Utility Base Mapping

Existing utilities shown on record drawings, maps, and information supplied by various utility companies and the City of Los Angeles were plotted/reconciled relative to surface indications of these utilities as surveyed by field methods. The utility base map represents approximate utility locations based on the best available information. Exact utility locations, depths, and sizes have not been field verified. See Appendix C.

Soils Investigation

A limited soils investigation was conducted to include:

- Percolation testing to determine suitability of surficial soils for infiltration.
- Auger borings to a depth of 15 feet below the ground surface to obtain soil samples for hydro collapse verification and laboratory analysis.
- Laboratory tests on selected soil samples to evaluate, in-situ moisture and densities, compaction, Water-Soluble Sulfate, Chloride, PH, and Resistivity of the soils and expansion characteristics of the prevailing soil conditions.
- Standard agricultural suitability of the soil. Testing for Electrical conductivity (Ec), sodium absorption (SAR), nutrients, and micronutrients.

The soils investigation indicated that infiltration of runoff would be infeasible on this site due to low soil infiltration rates. See Appendix D.

Urban Runoff Monitoring

Dry weather runoff rates were measured in January of 2018 prior to the first significant precipitation event of the season. Downstream Service Inc. entered the existing 9' wide x 10'-6" high box culvert at the intersection of Tremont Street and Chelsea Street to measure the flow width, depth, shape and surface velocity in order to estimate the urban runoff rate. Dry weather runoff was estimated at approximately 545 gallons-per-day (GPD) based on the measurements made in the field. Because urban runoff rates vary and conservation measures will improve over time, a rate of 400 GPD was selected for design purposes. See Appendix E.

6. EXISTING SITE CONDITIONS

The Natural Park at Ramona Gardens site is owned and maintained by the Housing Authority of the City of Los Angeles. The site is primarily comprised of turf grass lawn, bare dirt, concrete and asphalt paving in poor condition, old concrete foundations, basketball and other courts in poor condition, and trees of various species and ages. A concrete walkway extends along the length of the site between the site and the adjacent residences, and connects to a pedestrian bridge that spans the freeway. A concrete block wall runs along the southern site boundary, between the park and adjacent rail line and freeway corridor. The height varies between five to six feet, and over the years residents have decorated it with colorful murals. While the wall serves as a physical barrier, it provides no buffer between the residents and the air pollution and noise generated by the freeway and transportation corridor.

A portion of the site at the west end serves as the location for a weekly community swap meet, and includes an area of uneven asphalt paving with concrete block wall segments. Another area of broken paving and wall foundations provides no functional benefit. An oversized area of asphalt paving in the middle area of the site accommodates two basketball courts and old concrete footings for light poles that have been removed.

There is an existing storm drain catch basin at the end of Vanegas Lane that drains a 60 inch storm drain into a ten-foot box storm drain that runs beneath the site. The storm drain transports urban run-off (both dry weather and storm event flows) collected from 657 acres of surrounding paved streets and industrial, commercial, and residential land, to the Los Angeles River.

Areas of the site that are most-utilized in the present condition are a children's playground and two modular buildings that house a small library and offices. There is also a small community garden with access restricted to a select group of residents. At the east end of the site, there is another old paved area formerly used as a tennis court. Interspersed between these paved or structured areas are open lawns with some trees. Refer to Figure 2.7.

Existing Elements On-Site

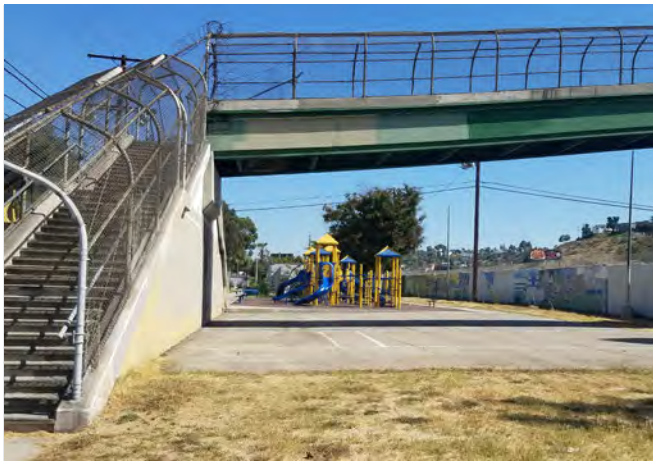
- Two basketball courts and former tennis court
- Concrete and asphalt paving with areas of turf grass and trees
- Old concrete foundations
- Existing 5 to 6 foot high cinder block wall between freeway and site
- Playground
- Library in mobile unit
- Offices for Ramona Gardens Residents Advisory Council (RAC), Soledad Enrichment Action (SEA) and GRYD (Gang Reduction Youth Development) program in mobile units
- Two benches and picnic tables between the library and RAC/SEA offices
- Community garden
- Pedestrian bridge crossing freeway
- Concrete path

West end of Ramona Gardens serves as the location for weekly swap meet

Old and unused concrete foundations, surrounded by dirt and dead grass

Old, underutilized, poorly maintained basketball courts

Large storm drain located at the end of Vanegas Lane



Pedestrian bridge allows residents to cross over the freeway

Old, unutilized tennis court

Figure 2.7

7. OPPORTUNITIES AND CONSTRAINTS

An evaluation of existing conditions helped identify the opportunities and constraints of the Natural Park site. Opportunities are deemed as conditions that are favorable to the goals of the proposed Natural Park. Constraints are conditions that can possibly limit the design and goals and call for ways to best address the limitations. Refer to Figure 2.8.

7.1 OPPORTUNITIES

- Most of the existing Natural Park project site is undeveloped open space that is currently underutilized due to its design and poor condition
- Existing mature trees that can provide immediate shade to the proposed walking trails and plaza spaces
- Existing storm drain under the site that will provide a consistent water source from dry weather runoff (water that is carried in the storm drain daily as a result of human activities, such as irrigation, car-washing or other outdoor water use, and broken pipes) and stormwater
- Multiple entries to the Natural Park site from the Ramona Gardens Housing Development
- Connection to the Boys and Girls Club, used daily for after-school care and activities
- Connection across the freeway via the existing pedestrian bridge
- Streets that provide pedestrian connections to community resources
- Potential connection to Los Angeles River Greenway

7.2 CONSTRAINTS

- Existing 10' x 8' box storm drain under site
- Restrictions on site improvements above the existing storm drain infrastructure
- Catch basin/drain inlet at Vanegas Lane impacts entry to Natural Park site
- High volumes of semi-truck traffic on Indiana Street cause noise and safety issues at the east end of the Natural Park site
- Existing amenities, which will remain in their existing location and condition:
    - Pedestrian Bridge
    - Playground
    - Library
    - RAC/SEA and GRYD Offices
    - Community Garden

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NATURAL PARK AT RAMONA GARDENS
Site Evaluation and Research
Opportunities and Constraints

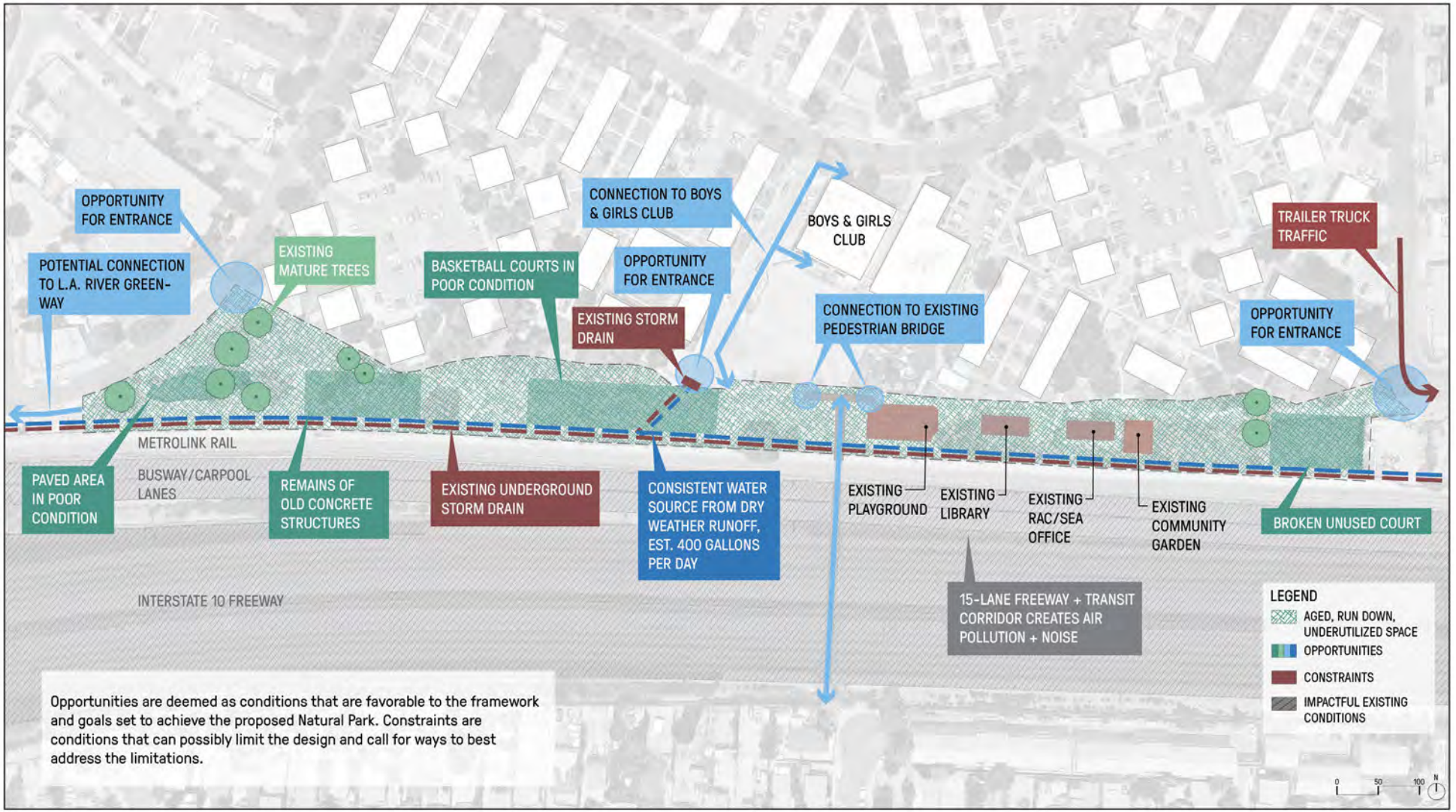

Figure 2.8

www.conservationsolutions.org/NaturalPark-RamonaGardens

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NATURAL PARK AT RAMONA GARDENS
Anti-Pollution Green Buffer & Arroyo Perspective
Walking Fitness Trail, Shaded Seating

Figure 3.1

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CONCEPT PLAN: BIG NATURE

Inspired by the ecology of the natural landscape that dominated the Northern Boyle Heights area in the past, 'Big Nature' is a concept that will reconnect the Ramona Gardens community to a robust ecosystem-focused natural landscape. An arroyo feature will recall the time when rainwater flowed across the land in a natural stream corridor, supporting a range of native habitats, and hills of rolling terrain will provide restored topography and an ecological backdrop for community members who gather in the park to walk, learn, play, visit, take a break from the city and be inspired.

1. COMMUNITY WORKSHOP SUMMARY

By SWA and Legacy LA

Outreach efforts were led by Legacy LA, Legacy LA Youth Leaders, and the Ramona Gardens Residents Advisory Council. These local leaders played an active role in raising awareness within the Ramona Gardens and Northern Boyle Heights community regarding the Natural Park project and in encouraging community members and stakeholders to voice their concerns about and aspirations for the Natural Park concept.

A brief summary of the two concept planning community workshops is included here. For more information on the full community engagement process, see the Community Engagement Report on page 59.

1.1 COMMUNITY WORKSHOP #1

The first community workshop for the Natural Park at Ramona Gardens provided an opportunity for residents, community members and other stakeholders to learn about the proposed project, and for the project team to collect input from the community that would help inform the park's conceptual design. The design objectives were for the project team to better understand how community members currently use the site, learn what they would like to see and do in the proposed natural park, and hear first-hand the community's priorities and concerns.

In order to determine the current use of the project site, the design team presented a board with images of the existing site and asked community members to write down how they use the specific areas shown, and post their comments on the board. The design team evaluated the comments to identify how the site was being used, how often, and for what activities. Many residents do not use the site because they find it unappealing; there are no seating areas and limited shade; and it is poorly maintained. One area that the community uses and wishes to see improved is located at the west end of the park, where the well-attended swap meet is held on Saturdays. The playground is used, and a few residents use the community garden and basketball courts. See Appendix F.

For the objective of learning what community members would like in the future Natural Park, the design team presented an image board that community members responded to by indicating the natural elements and amenities that they preferred. The project team compiled the selections and developed a list of the community's highest priorities. Refer to Figure 3.2.

COMMUNITY INPUT RANKED BY PRIORITY

- Quiet place to escape the city, where people can interact with beautiful native plants, trees, and wildlife
- A natural place where children can run and play
- Protection from the air pollution and noise emitted from the 15 lane freeway
- A walking trail and other exercise opportunities
- Shaded seating and picnic areas to relax and interact with family and friends
- Security lighting throughout the site
- Improved area for swap meet

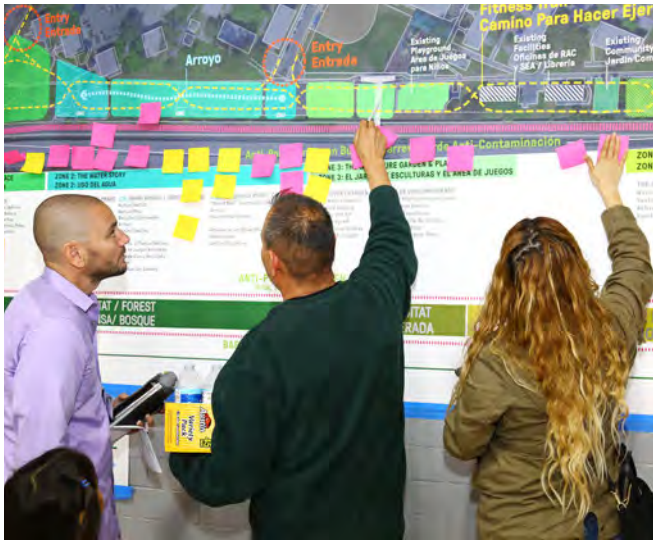
Other items considered of lesser importance were basketball courts, active play areas, murals and art, and a dog park.

These community priorities and existing site uses served as a guiding framework for the conceptual design process, to ensure that the community's needs would be addressed in the proposed conceptual design for the Natural Park.

The elements for a Natural Park were selected as high priorities by Ramona Gardens residents through a door-to-door survey and a community workshop, and supported by over 90% of respondents.

Estos elementos para un Parque Natural fueron identificados de alta prioridad por los residentes de Ramona Gardens a través de una encuesta y un taller communitario, con el apoyo de más del 90% de los participantes de la encuesta.

Figure 3.2



Community members vote on the amenities and natural elements they would like to see at the Natural Park.

Project team presents community with findings from the first workshop and introduces the 'Big Nature' concept. Residents provide additional input. Figure 3.3

Photos above by David Ng

1.2 COMMUNITY WORKSHOP #2

The design team held the second community workshop to share the preliminary Natural Park design concept for the site with Ramona Gardens' residents, community members, and stakeholders, including how the community-identified priorities from the first workshop had been incorporated into the conceptual design. After a full group presentation of the 'Big Nature' concept plan and how it was developed, the participants split into two smaller groups to discuss the proposed concept plan and provide feedback.

Feedback was generally positive and affirmed the framework for the proposed program zones. Comments provided by community members at the second workshop built upon those shared with the design team at the first workshop. In particular, residents emphasized a desire to have improved walking and exercise opportunities, enhanced natural beauty and shade, a sport court that functions for futsal and basketball, and an improved swap meet area that would work better for the weekly swap meet—but could also be used for other purposes in a park setting.

Working with Community Conservation Solutions, the design team incorporated input from additional project stakeholders. Swap meet leaders expressed the need for an improved space for tents, food stands, and a shaded seating area for people to sit and eat, as well as an improved entrance to the park where

'Big Nature' concept community presentation

they could drive their trucks in to unload equipment and food for the food stands. The Los Angeles Police Department (LAPD) requested that security lighting and cameras be included in the improvements, in addition to keeping clear lines of sight and LAPD patrol vehicle access through the park. HACLA's requests included: ensuring that the swap meet be incorporated into the Natural Park design and swap meet vendors' needs addressed; residents' needs and concerns are addressed; the Ramona Gardens Residents Advisory Council and community members are supportive of the concept plan; LAPD's public safety needs are integrated, and sufficient funding is secured for long-term operations and maintenance of the site. Refer to Figure 3.2.

Photos by David Ng

Figure 3.4

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NATURAL PARK AT RAMONA GARDENS
Big Nature Concept Plan
Illustrative Plan

Figure 3.5

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2. 'BIG NATURE' CONCEPT PLAN OVERVIEW

Based on community priorities, the 'Big Nature' concept design is organized into four zones and the Anti-Pollution Green Buffer, which runs through all four zones. Each zone is strategically designed to serve an ecological function and create spaces where Ramona Gardens residents may immerse themselves in nature and engage in recreational activity. The opportunity to capture, treat, and re-use urban runoff and stormwater from the storm drain is paramount to the site's design and 'Big Nature' concept. Where there is water, there is also life, and therefore native habitat is integrated with the water system to provide a cohesive ecological setting. See Figure 3.5.

Zone 1, La Plaza Verde, at the west end of the Natural Park, is intended to serve as the community's primary gathering place, the beginning of the fitness walking trail, and the swap meet. Zone 2, The Water Story, is the area of the Natural Park focused on the urban runoff and stormwater capture, cleaning, and re-use system. Zone 3, The Sculpture Garden and Play Area, is an interactive art and sculpture play space and the Natural Park's secondary communal gathering area, providing an area for interpretive murals and sculpture for children and residents of all ages. Zone 4, The Summit, creates a visual destination at the east end of the Natural Park, and is designed to motivate the community to live a healthier lifestyle through active recreation.

An ecosystem of native habitats, the Fitness Walking Trail and Anti-Pollution Green Buffer unify the four zones. The Fitness Walking Trail provides numerous walking loops throughout the site. The Anti-Pollution Green Buffer is the highly vegetated zone with rolling hills and an improved 15-foot retaining and sound wall that will mitigate the noise and air pollution from the 15-lane freeway and transit corridor.

The four zones and the Anti-Pollution Green Buffer work together to provide: urban runoff and stormwater re-use; natural habitat; and public use, art, and recreation. These three functional components of the concept are described and illustrated further in this section of the report.

3. CONCEPT ZONE DESCRIPTIONS

By SWA, with VS2 Consulting Inc. and Land IQ

This section includes descriptions of each of the 'Big Nature' zones, indicating the primary features of each, and the intended social and natural system functions. Refer to the Illustrative Concept Plan on page 32, the Urban Runoff and Stormwater Re-use Concept Plan on page 44, the Native Habitat Concept Plan on page 45, and the Public Use, Art, and Recreation Concept Plan on page 59. Additional details on the urban runoff and stormwater re-use and native habitat approaches are provided in separate narrative sections (see pages 42-51).

3.1 ANTI-POLLUTION GREEN BUFFER

The Anti-Pollution Green Buffer includes the following features:

- Hills/earth berms
- Native trees and plants
- Native habitat: Woodland Anti-Pollution Green Buffer and Air Renewal Understory
- Retaining sound wall

The second highest priority based on community input is for the Natural Park to buffer Ramona Gardens from freeway noise and to help improve air quality. The Anti-Pollution Green Buffer, which runs along the length of the park, addresses this need by replacing or augmenting the existing low block wall with a nature-based, designed element that incorporates natural habitat, earth berms and rolling terrain, and air pollution reduction features and technologies. See Figures 3.5 and 3.7.

The Anti-Pollution Green Buffer integrates a robust native tree, shrub, and vegetation barrier with woodland and air renewal understory plant species; earth berms to increase the height and health of the tree and vegetation barrier, and soil ecosystem to enhance uptake of air pollutants and carbon; a 15-foot retaining sound wall, and other associated technologies. Integrating this Anti-Pollution Green Buffer into the planned Natural Park at Ramona Gardens will help to improve air quality, reduce community exposure to air pollutants and improve public health issues that disproportionately affect this disadvantaged and pollution-ridden community.

The Anti-Pollution Green Buffer will help optimize air quality improvement by integrating numerous air pollution reduction strategies. The height of the tree and vegetation barrier will be elevated by the earth berm, and features native trees and plants, which are long-lived, adapted to Southern California's climate, and have both extensive year-round leaf canopy and root systems. This will optimize the removal of airborne pollutants and reduction of greenhouse gases produced by vehicles traveling on the adjacent 15 lane freeway and transit corridor, including ozone (O3), particulate matter (PM), nitrogen dioxides (NO2), sulfur dioxide (SO2), and carbon monoxide (CO).

According to the U.S. Forest Service, a single large tree can remove 2.8 lb. of O3, 2.4 lb. of PM 10, and 1.6 lb. of NO2 every year. Planting species for the Anti-Pollution Green Buffer comprise woodland and air renewal understory habitats, which are described in the Native Habitat section of the report (see page 46). The berms will be densely planted with evergreen canopy trees to trap airborne pollutants, and large shrubs (pruned to maintain clear visibility) and low-growing plants will complete the native habitat. Subsequent phases of this Natural Park project will investigate innovative technologies, such as coatings or mechanical systems, which can be integrated with the physical structure of the wall to augment its pollution mitigation performance. See Figure 3.6 for typical examples of freeway buffers.

Vegetative barriers help capture air pollutants and greenhouse gas emission, and store carbon

Sound walls help reduce movement of air pollutants and noise emanating from freeway

A combination of earth berms, trees, native habitat, and sound wall creates a healthier and more beautiful environment for residents

Figure 3.6

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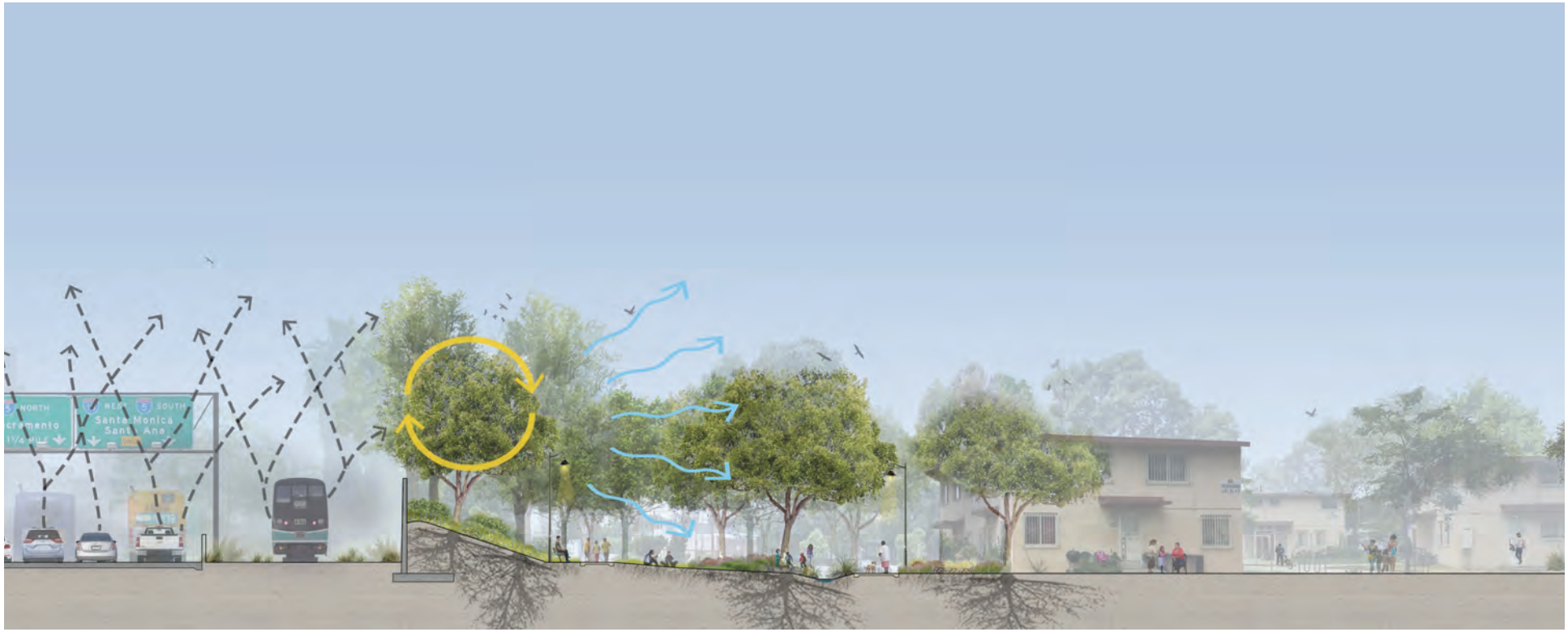
NATURAL PARK AT RAMONA GARDENS

Anti-Pollution Green Buffer



Air Pollutants from 15 lane Freeway Corridor

Ground-level Ozone (O_3)	Lead (Pb)
Particulate Matter (PM)	Sulfur Dioxide (SO_2)
Carbon Monoxide (CO)	Nitrogen Dioxide (NO_2)

Anti-Pollution Green Buffer

Earth Berm, Hills, Trees, Habitat, Sound Wall

Uptakes air pollutants
Reduces greenhouse gases
Provides shade and cooling
Recycles urban runoff and stormwater

Ramona Gardens Housing Development

Top 1% of polluted communities in CA
Designated severely disadvantaged

1,800 residents
700 children

0 10 20

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NATURAL PARK AT RAMONA GARDENS
La Plaza Verde Perspective
Entrance at Murchison Street, Swapmeet, Gathering, Natural Play

Figure 3.8

www.conservationsolutions.org/NaturalPark-RamonaGardens

3.2 ZONE 1: THE GATHERING PLACE – LA PLAZA VERDE

Zone 1 includes the following features:

- Entrance at Murchison
- Native Habitats:
    - Oak/Walnut Woodland with Understory Plants
    - Riparian Grassland Species
- Beginning of Walking Fitness Trail
- Natural Play Area
- Shaded Seating
- Picnic/Plaza/Swap Meet Area
- Overlook at End of Arroyo
- Recycled Urban Runoff and Stormwater

La Plaza Verde, at the west end of the park, is intended to serve as the community's primary gathering place and the beginning of the walking fitness trail. This area addresses the community's need for a shaded picnic and seating area, as well as an improved space for the weekly Saturday swap meet to take place. An open plaza with ample shade trees and picnic tables will be functional every day of the week, whether for the swap meet, other event, or informal daily use. Stepped seating at the edge of the plaza overlooks the end of the arroyo and dry creek bed, with its planted, rocky bottom offering a natural place for kids to play. The stepped seating is designed to serve as spaces where people can rest and feel immersed in the natural environment. Artistic, vertical elements mark the entry to the Natural Park from Murchison Street, signifying that visitors have arrived at a special piece of nature within the city. See Figures 3.5, 3.8, 3.9, 3.14, 3.15, and 3.23.

Examples from other parks: shaded seating, swap meet and natural play area

Figure 3.9

3.3 ZONE 2: THE WATER STORY

Zone 2 includes the following features:

- Native Meadow/Freshwater Marsh
- Recycled Urban Runoff and Stormwater
- Arroyo
- Walking Fitness Trail
- Shaded Seating
- Overlooks and Bridges
- Native Habitats:
    - Freshwater Marsh/Meadow
    - Arroyo Flowering Shrub and Grassland Habitat Plant Species
    - Coastal Sage Butterfly Habitat Plant Species
- Natural Play Area

Zone 2 is the area of the park focused on the urban runoff and stormwater capture, cleaning, and re-use system. This stormwater infrastructure functions beneath the surface to use the recycled urban runoff to irrigate a Freshwater Marsh/Meadow, which will feature perennial riparian plants (described in the Native Habitat section, page 46 and Appendix G). The walking fitness trail will loop between this meadow and along an arroyo planted with flowering shrubs and native grasses, and will include ample shade and seating. The arroyo originates at the transition between Zones 2 and 3, and gently curves through the site and passes beneath small pedestrian bridges of the walking trail. While the arroyo will be dry for most of the year in Southern California's climate, during significant rainfall the stormwater from the site will flow through the arroyo, providing a temporary stream for all to enjoy. The origin of the arroyo, therefore, is primarily a symbolic wellspring, and will be represented as an interpretive feature that showcases natural systems and/or the cultural heritage of Ramona Gardens and Boyle Heights. This interpretive feature is located at the transition between Zones 2 and 3. See Figures 3.5, 3.10, 3.14, 3.15, and 3.23.

Photo by SWA

Photo by SWA

Examples from other natural parks: stormwater treatment, pedestrian bridge with swale, and arroyo to capture runoff

Figure 3.10

3.4 ZONE 3: THE SCULPTURE GARDEN AND PLAY AREA

Zone 3 includes the following features:

- Dry Native Habitat: Palo Verde Woodland
- Walking Fitness Trail
- Shaded Seating
- Murals and Art
- Area for Food Drop-Off
- Interpretive Educational Display
- Interpretive Play Sculptures
- Existing Playground
- Connection to Pedestrian Bridge
- Connection to Boys and Girls Club

Zone 3 is the Natural Park's secondary communal gathering area, providing a natural play area for children and adults of all ages. The existing playground is supplemented in Zone 3 by sculptural elements that will help tell the story of the natural history of this area, be visually stimulating and physically engaging. Children and adults alike will be able to climb on these interactive sculptures. Planting in this area will highlight a dry garden demonstration of flowering plants and shade trees that can survive with low amounts of water. Plaza space will frame the sculpture play area on both sides. To the east, murals will transform the pedestrian bridge infrastructure into a lively amenity; to the west, interpretive and artistic elements will mark the entry to the Natural Park from Vanegas Lane. The plaza space will be shaded by trees, and support flexible use to meet community needs, including regular food drop-offs. Based on community input at the second workshop, the theme for the Zone 3 artwork should reflect both natural history and Ramona Gardens' cultural history. See Figures 3.5, 3.11, 3.14, and 3.23.

Photo by SWA

Examples of interactive sculpture, murals under a freeway
Palos Verde tree

Figure 3.11

3.5 ZONE 4: THE ACTIVE PLACE – THE SUMMIT

Zone 4 includes the following features:

- Walking Fitness Trail
- Exercise/Seating Steps
- Active Recreation
- Sports Court
- Fitness Stations
- Lawn
- California-Friendly Planting

The Summit is designed to motivate the community to live a healthier lifestyle through active recreation. Located at the natural park's highest elevation, "The Summit" represents reaching new heights – whether metaphorically through physical fitness and healthy lifestyle choices, or literally by climbing the exercise steps built into the end of the park. Combination futsal-basketball courts and fitness stations located just off the walking fitness trail provide active fitness opportunities. Zone 4 also includes picnic tables beneath shade trees, and a lawn that could be used by fitness classes. See Figures 3.5 and 3.23.

Examples of futball and basketball courts; exercise steps/seating

Figure 3.12

4. URBAN RUNOFF AND STORMWATER RE-USE CONCEPT PLAN

By VS2 Consulting Inc.

4.1 URBAN RUNOFF REUSE

The Natural Park will reduce its use of potable water for irrigation purposes, relative to a normally irrigated public park, via the reuse of urban runoff to supplement the park's irrigation demand. At the same time, the Natural Park will reduce the introduction of pollutants normally found in urban runoff to receiving waters by implementing a series of pre-treatment measures. Based on a design rate of 400 GPD of available dry weather runoff, we estimate up to 0.45 acre-feet/year of potable water use may be avoided.

Urban runoff (dry weather flow) will be diverted from the existing 9'W x 10-6"H box culvert that runs through (beneath) the project site via a low-head-loss-diversion structure and a wet-well pump station.Structural pre-treatment shall then include a trash rack/bar screen and a hydrodynamic separator or filtration unit. The project will structurally pretreat the diverted urban runoff prior to use as subsurface irrigation. See Figures 3.13 and 3.14. Diversion, pre-treatment, and pumping are described below.

Diversion Structure

A drop-type diversion structure with the opening at the floor of the existing box culvert shall be constructed to minimize negative effects to the hydraulics of the box culvert.

Structural Pre-treatment

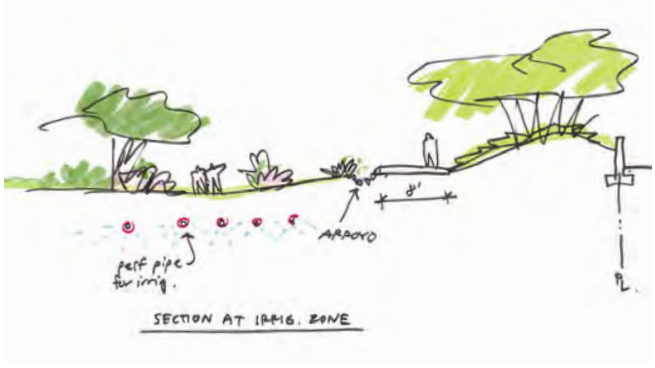
Trash, debris, sediments, oil, and grease will undergo pre-treatment prior to entering the pump system. This may be achieved via a combination of trash rack/bar screen and a continuous deflection separator/hydrodynamic separator or a filtration unit prior to entering the pump station.

Pump Station

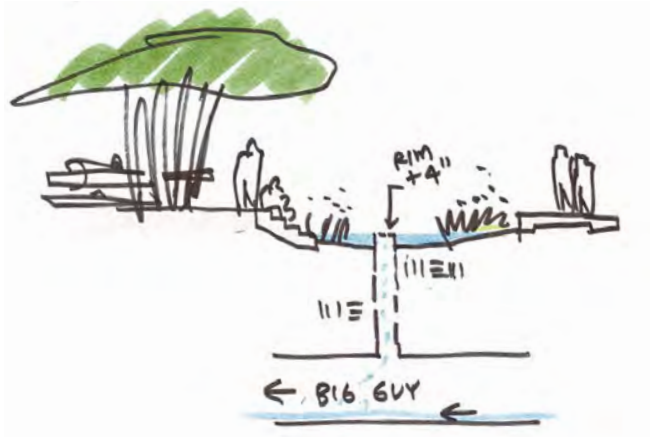
The pump system shall be installed immediately downstream of the pretreatment system. The pump station shall consist of a wet well, submersible pumps, control panel, and visual alarm. After structural pre-treatment, urban runoff will collect in the wet-well until the water level in the wet well activates the low flow pumps. The pump system shall be sized/designed to dose the subsurface irrigation system in the dry weather condition and to provide a steady day-lighted runoff condition within the creek bed during precipitation events.

Site Runoff and Creek Bed Overflow Capture

A surface inlet structure will be constructed at the western end of the site to capture and convey surface runoff and any excess creek bed flows to the box culvert.



Perforated pipes deliver subsurface irrigation to the freshwater marsh/meadow



Excess flows at the western end of the arroyo return to the large storm drain

Figure 3.13

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swa VS2 Consulting Inc.

NATURAL PARK AT RAMONA GARDENS
Big Nature Concept Plan
Urban Runoff and Stormwater Re-Use

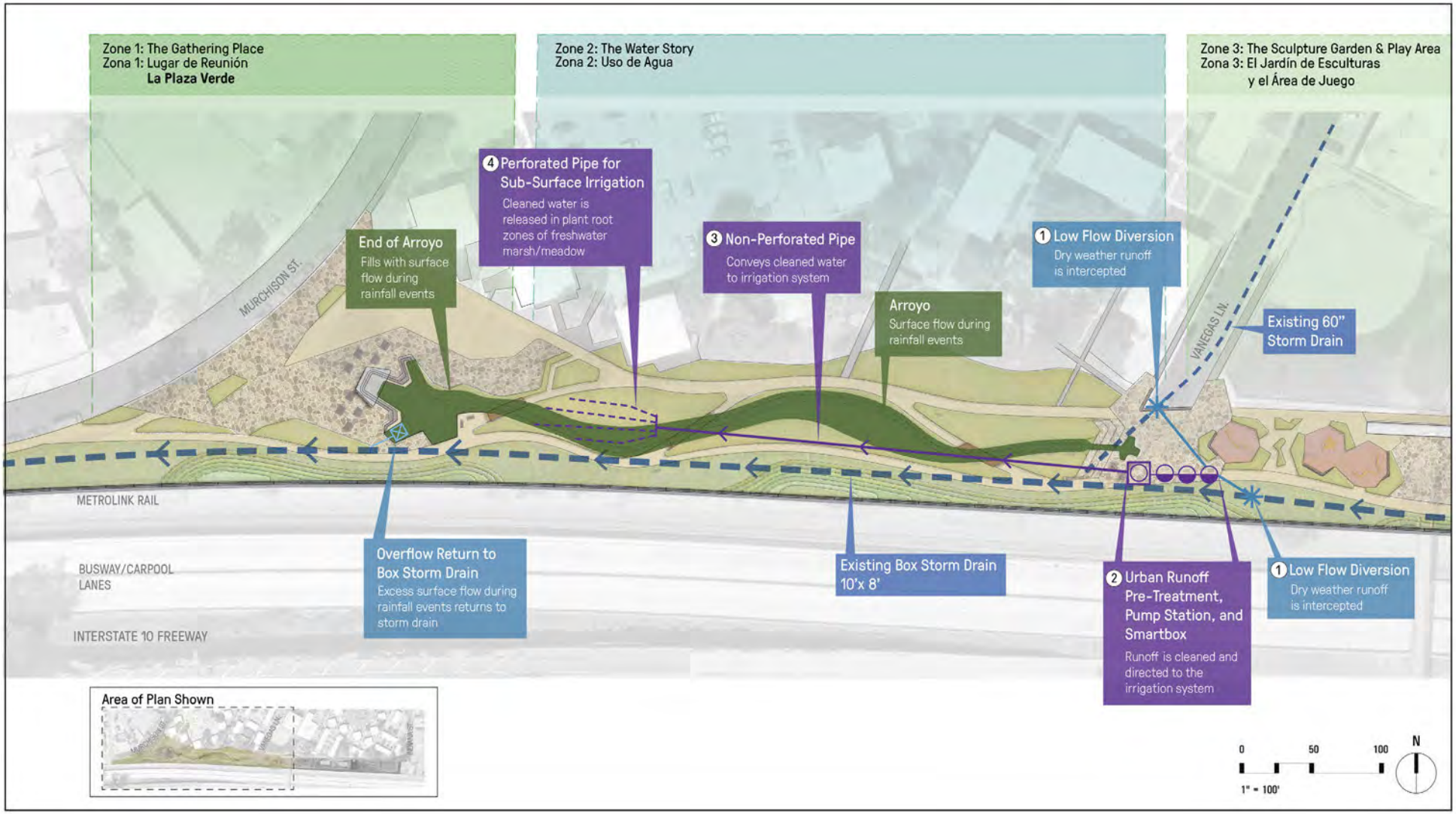

Figure 3.14

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swa LAND IQ

NATURAL PARK AT RAMONA GARDENS
Big Nature Concept Plan
Native Habitat

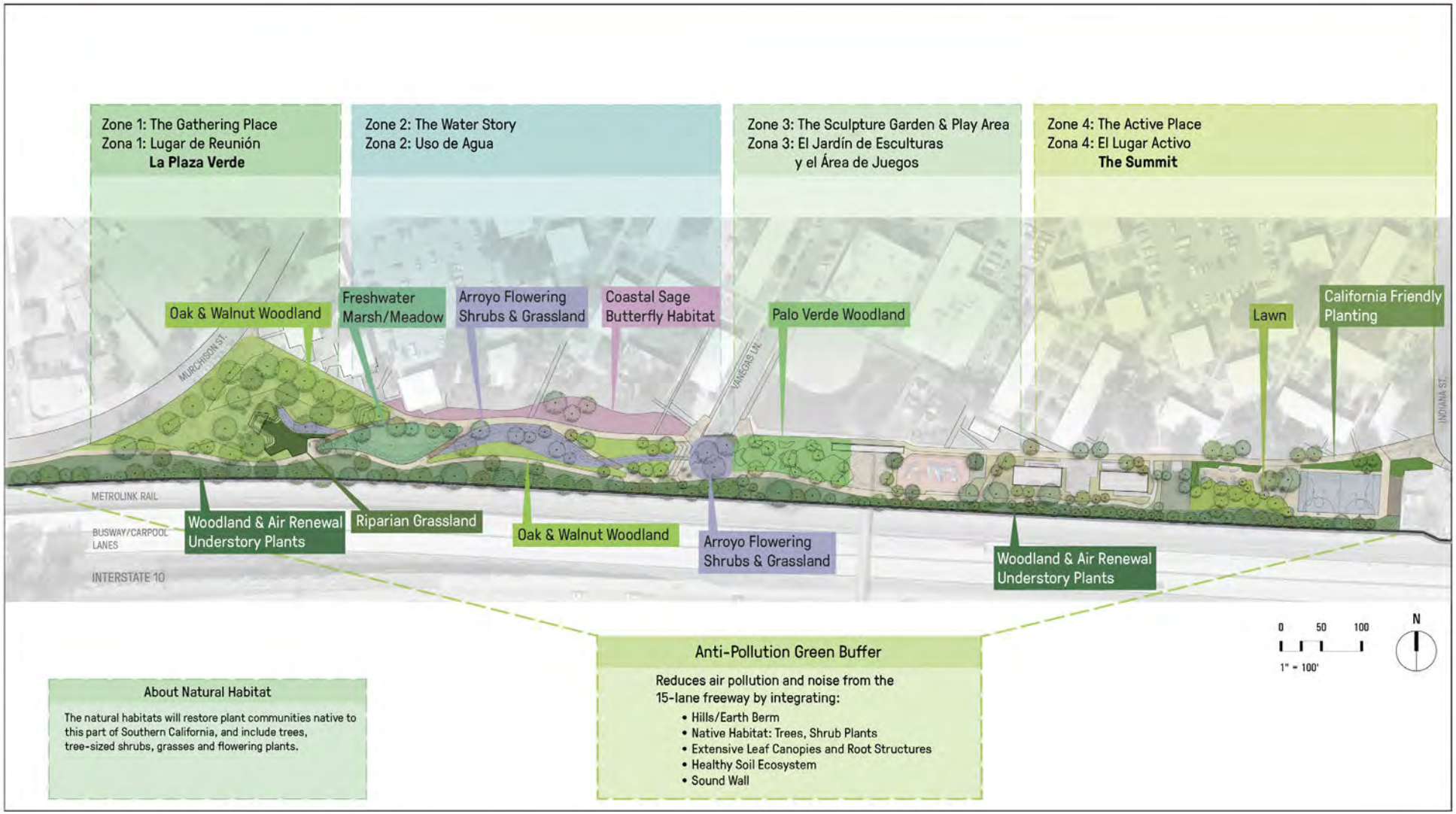


Figure 3.15

www.conservationsolutions.org/NaturalPark-RamonaGardens

5. NATIVE HABITAT CONCEPT PLAN

By Land IQ

'Big Nature' native habitats will be planted using an ecosystem-based model that incorporates plant communities native to this part of Southern California, with year-round leaf canopies above ground and extensive root systems with an associated soil biome below ground. These native habitats include trees, tree-sized shrubs, grasses, and flowering plants. See Figure 3.15.

5.1 BENEFITS

This specific native habitat approach will help optimize the removal of airborne pollutants from the adjacent freeway and carbon sequestration to reduce greenhouse gases that contribute to climate change. The structure of each plant community is designed to maximize plant and soil carbon sequestration both in above ground plant canopy and below ground for the specific climate and soils at Ramona Gardens. The plants have been chosen in part for their ability to form mutualistic relationships with soil symbionts that increase plant productivity and improve the carbon sequestration in both plant canopy production above-ground as well as below ground in the root biosphere. Soil symbionts can reduce soil carbon loss by extending root lifespan and by improving soil aggregate formation.[1]

The native habitats will help reduce urban heat island effects by strategically planting shade trees and tree-sized shrubs, creating year-round shade to help offset longer-term climate change impacts. The project's use of recycled urban runoff from the storm drains under the project site ensures that there will be a sustainable local water source to sustain the freshwater marsh/meadow. This treatment train, which includes natural filtration and cleaning, will help improve water quality in the L.A. River. In addition to these environmental benefits, native vegetation has been associated with lower levels of asthma and obesity, and there is strong evidence that urban vegetation provides respiratory health benefits.

The native habitat approach will create permanent, functioning habitats that create sustainable green, open space in the heart of this urbanized part of Los Angeles; support native birds, butterflies, invertebrates and reptiles; and be a functional habitat link to other regional natural areas. This approach restores native habitat lost to over a century of urban development. The native habitat is a primary feature in the Natural Park's Anti-Pollution Green Buffer, which will strategically use multi-layered vegetation, an earth berm, a sound wall and other technologies to help reduce the community's exposure to air pollutants from the adjacent 15-lane freeway and transit corridor.

1. Gerlinde B. Deyn, Johannes H.C. Cornelissen, and Richard D. Bardgett. Plant Functional traits and soil carbon sequestration in contrasting biomes. Ecology Letters (2008) 11: 1-16.

2. McPherson EG, Simpson JR, Peper PJ, Xiao Q. Tree Guidelines for San Joaquin Valley Communities. Western Center for Urban Forest Research and Education, US Forest Service, Davis, CA. 1999. Online at: www.itreetools.org/streets/resources/Streets_CTG/CUFR_38_Inland_Valleys_CTG.pdf

Anti-Pollution Green Buffer: Native Habitat is the Key to Improving Air Quality

The Anti-Pollution Green Buffer and Air Renewal Understory in the planned Natural Park at Ramona Gardens integrates a robust native tree, shrub, and vegetation barrier; earth berms to increase the height and health of the tree and vegetation barrier and enhance uptake of air pollutants and carbon; a retaining sound wall and other associated technologies. Integrating this Anti-Pollution Green Buffer into the planned Natural Park at Ramona Gardens will help to improve air quality, reduce community exposure to air pollutants, and improve public health issues that disproportionately affect this disadvantaged and pollution-ridden community.

The Anti-Pollution Green Buffer and Air Renewal Understory will help optimize air quality improvement by integrating numerous air pollution reduction strategies. The height of the tree and vegetation barrier will be elevated by the earth berm, and features native trees and plants, which are long-lived, adapted to Southern California's climate, and have both extensive year-round leaf canopy and root systems. This will optimize the removal of airborne pollutants and reduction of greenhouse gases produced by vehicles travelling on the adjacent 15-lane freeway and transit corridor, including ozone (O3), particulate matter (PM), nitrogen dioxides (NO2), sulfur dioxide (SO2), and carbon monoxide (CO). According to the U.S. Forest Service, a single large tree can remove 2.8 lb. of O3, 2.4 lb. of PM 10, and 1.6 lb. of NO2 every year.[2]

Native trees and plants, when planted in an ecosystem-focused design, develop robust root systems, which contribute to a healthy soil environment rich in micro-organisms, and increase the ability of the soil system to sequester carbon and reduce greenhouse gases. The ability for vegetation to clean these pollutants is of particular importance in the Los Angeles area, where disadvantaged communities routinely experience substandard air quality, even as the air quality of the region overall continues to improve. Importantly, the ecosystem design of the green buffer considers not only the plant canopies but also the associated soil biosphere that can increase soil carbon sequestration and promote healthy sustainable habitats for both humans and wildlife.

5.2 NATIVE HABITAT TYPES

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

The Woodland Anti-Pollution Green Buffer, which includes Air Renewal Understory habitat, will run the length of the project area and has important overall environmental benefits based on the selected plant material, including:

- Maximizing leaf cover through a functional structure of tree canopy and understory grasses and plants to optimize carbon uptake and sequestration, both in leaf canopy/plant growth above ground, and in the roots/soil biosphere below ground
- Providing nesting and foraging sites for resident and migratory birds
- Natural cooling and reduction of urban heat island effects through the use of shade trees with extensive leaf canopy
- Restoring wildlife habitat for native insects, birds, and butterflies
- Creating accessible green natural open space for Ramona Gardens residents to enjoy

The Anti-Pollution Green Buffer and Air Renewal Understory planting is designed as large trees and understory planting that will enhance both the above ground and below ground habitats. The soil biosphere will develop so that the deeply-rooted habitat, including trees, shrubs, and grasses, will sequester carbon in the soil while delivering oxygen into the urban atmosphere. The specific environmental benefits of the plant species selected include species that form mutualisms with mycorrhizal fungi to improve root development and soil carbon holding capacity. It has been found that native plants with deep root structures and soil that is rich with microorganisms can store carbon (up to 5.5 billion tons of carbon globally[1]), helping to maximize carbon sequestration on site.

Additionally, the species selected will provide habitat for wildlife. For example, Coast Live Oak attracts more than 30 species of native birds, provides nesting sites, and is a food plant and larval host for the California Sister butterfly. The understory perennial species are generally lower growing species that will allow for law enforcement preferences in the buffer area while still allowing the insects that feed on trees to have a habitat below to complete their life cycles, and thus attracting avian wildlife both in the trees and on the ground. California Buckwheat attracts bees and numerous butterflies and birds. Toyon provides berries for birds. Giant Wild Rye seeds are eaten by mammals and birds. The specific composition of each plant community described in the zones below were determined based on their compatibility and contributions to the soil biome.

Anti-Pollution Green Buffer Plant Species
(see Appendix G)

Yarrow, *Achillea millefolium*
Strawberry Tree, *Arbutus unedo*
Purple Three-Awned Grass, *Artistida purpurea*
Narrow Leaf Milkweed, *Asclepias fascicularis*
Field Sedge, *Carex praegracilis*
California Aster, *Corethrogyne filaginifolia*
Giant Wild Rye, *Elymus/Leymus condensatus 'Canyon Prince'*
California Fuchsia, *Epilobium canum ssp. canum*
California Buckwheat, *Eriogonum fasciculatum*
Toyon, *Heteromeles arbutifolia*
Catalina Ironwood, *Lyonothamnus floribundus*
Scarlet Bugler, *Penstemon centranthifolius*
Coast Live Oak, *Quercus agrifolia*
Sugar Bush, *Rhus ovata*
White Sage, *Salvia apiana*
Elderberry, *Sambucus nigra ssp. Cerulean*
Purple Needlegrass, *Stipa pulchra*
Tipu Tree, *Tipuana tipu*

Figure 3.16

1. Kerlin, Kat. "A Climate Change Solution Beneath Our Feet." UC Davis College of Agricultural and Environmental Sciences, UC Davis, 2 June 2017, www.caes.ucdavis.edu/news/articles/2017/06/a-climate-change-solution-beneath-our-feet.

Figure 3.17

Oak/Walnut Woodland with Understory Plant Species
Zone 1: The Gathering Place – La Plaza Verde

The Oak/Walnut Woodland will provide shade for the Gathering Place. The understory plants will increase the health of the trees and attract birds. The Oak/Walnut Woodland habitat features two dominant native tree species that once thrived in the area, with an understory that can take some foot traffic. The understory plants are composed of deep-rooted bunch grasses and perennial flowering species to insure a healthy soil biome for maximum root development below ground, and include the following species (see Appendix G):

- Yarrow, *Achillea millefolium*
- Purple Three-Awned Grass, *Artistida purpurea*
- Narrow Leaf Milkweed, *Asclepias fascicularis*
- Field Sedge, *Carex praegracilis*
- California Aster, *Corethrogyne filaginifolia*
- California Fuchsia, *Epilobium canum ssp. canum*
- California Black Walnut, *Juglans californica*
- Coast Live Oak, *Quercus agrifolia*

Figure 3.18

The Riparian Grassland
Zone 1: The Gathering Place – La Plaza Verde

The Riparian Grassland will provide an area that can receive water during the rainy season and also survive the dry season. The Riparian Grassland is composed of mainly bunch grasses and rhizome-producing plants that are deep-rooted, including the following plants (see Appendix G):

- Yarrow, *Achillea millefolium*
- Ambrosia, *Ambrosia psilostachys*
- Mugwort, *Artemisia douglasiana*
- Field Sedge, *Carex praegracilis*
- Juncus, *Juncus arcticus var. mexicanus*
- Deer Grass, *Muhlenbergia rigens*

Figure 3.19

Freshwater Marsh/Meadow
Zone 2: The Water Story

Zone 2 contains the perennial Freshwater Marsh/Meadow area, the seasonal Arroyo Flowering Shrub and Grassland habitat and Coastal Sage Butterfly habitat. These habitat areas demonstrate natural regional features while providing beautiful habitat for both humans and wildlife. These native plant communities help tell the 'Big Nature' water story.

Plants in the Freshwater Marsh require moisture throughout the year and will help to clean the urban dry season runoff. The Meadow species exist along the outer edges of the marsh, and these plants can tolerate drier conditions while providing erosion control through their deep root systems (see Appendix G):

- Yarrow, *Achillea millefolium*
- Yerba Mansa, *Anemopsis californica*
- Mugwort, *Artemisia douglasiana*
- Field Sage, *Carex praegracilis*
- Juncus, *Juncus arcticus var. mexicanus*
- Deer Grass, *Muhlenbergia rigens*

Figure 3.20

Arroyo Flowering Shrub and Grassland
Zone 2: The Water Story

Plant species for the Arroyo Flowering Shrubs and Grassland habitat will be able to tolerate flowing water during the rainy season and dry conditions the rest of the year. The recommended perennial species are generally lower-growing species that will allow insects that feed on adjacent trees in Zone 2 to have a habitat to complete their life cycles, and thus attracting avian wildlife both in the trees and on the ground. The Arroyo Flowering Shrubs and Grassland include the flowing plants (see Appendix G):

- Ambrosia, *Ambrosia psilostachys*
- California Sage Brush, *Artemisia californica*
- Purple Three-Awned Grass, *Artistida purpurea*
- Field Sedge, *Carex praegracilis*
- California Aster, *Corethrogyne filaginifolia*
- Giant Wild Rye, *Elymus/Leymus condensatus 'Canyon Prince'*
- California Fuchsia, *Epilobium canum ssp. canum*
- California Buckwheat, *Eriogonum fasciculatum*
- Goldenbush, *Isocoma menziesii var. vernonioides*
- Spiny Juncus, *Juncus acutus*
- Deer Grass, *Muhlenbergia rigens*
- Western Sycamore, *Plantanus racemosa*

Figure 3.21

Coastal Sage Butterfly Habitat
Zone 2: The Water Story

The plant species in the Coastal Sage Butterfly habitat will attract not only butterflies but also other insect pollinators and birds. These plant species are adapted to the wet winter/dry summer climate and have deep, extensive roots. The plants are general low-growing species, and the mix of species will provide flowering throughout the year (see Appendix G):

- California Sage Brush, *Artemisia californica*
- Purple Three-Awned Grass, *Artistida purpurea*
- Narrow Leaf Milkweed, *Asclepias fascicularis*
- California Aster, *Corethrogyne filaginifolia*
- California Bush Sunflower, *Encelia californica*
- California Fuchsia, *Epilobium canum ssp. canum*
- California Buckwheat, *Eriogonum fasciculatum*
- Goldenbush, *Isocoma menziesii var. vernonioides*
- Scarlet Bugler, *Penstemon centranthifolius*
- Bladderpod, *Peritoma arborea*
- White Sage, *Salvia apiana*
- Wooly Blue Curls, *Trichostema lanatum*

Figure 3.22

Palo Verde Woodland
Zone 3: The Sculpture Garden and Play Area

Palo Verde Woodland is planned within the Zone 3 Sculpture Garden and Play Area. The species described can be spaced in a natural-looking mosaic that provide shade and foliage for the zone. The species are either general low growing species or in the case of Palo Verde trees, light, open foliage. The Palo Verde Woodland includes the following plants (see Appendix G):

- California Copperleaf, *Acalypha californica*
- Purple Three-Awned Grass, *Artistida purpurea*
- Palo Verde, *Cercidium microphyllum*

6. PUBLIC USE, ART, AND RECREATION

'Big Nature' is as much about sustainably supporting human communities as it is about water, air, plants, and wildlife. The Natural Park at Ramona Gardens will help foster healthy lifestyles through its design for public use, art, and recreation.

The Public Use, Art, and Recreation Plan, shown in Figure 3.23, highlights recreational features of the park that directly relate to priorities expressed by the community. See Figure 3.2.

6.1 PARK ENTRIES

Park visitors will be able to easily access the Natural Park from three main entry points. At the west end, artistic, vertical elements mark the entry to the Natural Park from Murchison Street (see Figure 3.8). The entry leads into La Plaza Verde and connects with the walking fitness trail.

The second main entry is in the middle of the Natural Park at Vanegas Lane, and connects to the Boys and Girls Club. Here, a decorative wall replaces the existing chain link fence as a safety barrier for the storm drain inlet. This entry marks the beginning of the arroyo, with a plaza linking Zones 2 and 3, and connects to the walking fitness trail, sculpture garden and play area.

The third main entry is at the east end of the Natural Park, at Indiana Street. The open entry is paved with the same material as the other two entries, contributes to a consistent park identity and provides clear views into the park. This entry connects to the walking fitness trail, the active recreation courts, and the exercise steps at The Summit.

6.2 WALKING FITNESS TRAIL

A walking fitness trail runs through the length of the Natural Park, with loops and cross-overs for a variety of routes and distances, totaling three-quarters of a mile. Shaded seating, distance markers, and interpretive displays will be located at points along the way for rest and motivation. See Figure 3.5.

6.3 LA PLAZA VERDE

La Plaza Verde, at the west end of the park, is intended to serve as the community's primary gathering place and the beginning of the walking fitness trail. This area addresses the community's need for a shaded picnic and seating area, as well as an improved space for the weekly Saturday swap meet. An open plaza with ample shade trees and picnic tables will be functional every day of the week, whether for the swap meet, other event, or informal daily use. Stepped seating at the edge of the plaza overlooks the end of the arroyo, with its planted, rocky bottom offering a natural place for children to play. The stepped seating is designed to serve as spaces where people can rest and feel immersed in the natural environment. See figures 3.5 and 3.8.

6.4 PASSIVE RECREATION

Community members expressed a desire to have a quiet place where they can escape from the city, and relax among native trees, flowers, wildlife, and water. They also wanted natural places where their children can play. La Plaza Verde will provide a peaceful place for these types of activities when scheduled events are not taking place. Zone 2's rocky dry arroyo, shaded by leafy canopy trees provides a perfect setting for sitting on a trail-side bench and for curious young minds to explore. See Figures 3.5 and 3.8.

6.5 THE SCULPTURE GARDEN AND PLAY AREA

Zone 3 is the Natural Park's secondary communal gathering area, providing a natural play area for children and adults of all ages. The existing playground is supplemented by sculptural elements that will help tell the story of the area's natural history, be visually stimulating, and physically engaging. Children and adults alike will be able to climb on these interactive sculptures. Planting in this area will highlight a dry garden demonstration of flowering plants and shade trees that can survive with low amounts of water. A plaza is on the West side of zone, at the Vanegas Lane park entry. Within the plaza, an interpretive feature at the arroyo's beginning showcases natural systems and the cultural heritage of the communities of Ramona Gardens and Northern Boyle Heights. The plaza space will be shaded by trees, and support flexible use to meet community needs, including

regular food drop-offs. To the east of the sculpture garden, murals will transform the pedestrian bridge infrastructure into a lively amenity. Based on community input at the second workshop, the theme for the Zone 3 artwork should reflect both natural history and Ramona Gardens' cultural history.

6.6 THE SUMMIT

The Summit includes exercise steps and is designed to motivate the community to live a healthier lifestyle through active recreation. Located at the Natural Park's highest elevation, "The Summit" represents reaching new heights – whether metaphorically through physical fitness and healthy lifestyle choices, or literally by climbing the steps at this end of the park. The steps extend from the eastern end of the Anti-Pollution Green Buffer earthen berm, and help screen the Natural Park from adjacent industrial land uses. Marking one end of the walking fitness trail, the steps provide a way for walkers and runners to further challenge themselves. Combination futsal-basketball courts as well as exercise fitness stations located in this area provide additional active fitness opportunities. Zone 4 also includes picnic tables beneath shade trees, and a lawn that could be used by fitness classes.

6.7 PUBLIC SAFETY

Creating an environment that feels safe and secure for the community is of utmost importance. Security lighting and cameras will be strategically placed throughout the Natural Park to provide public safety with minimal negative impact to adjacent residences and to the birds, butterflies and insects in the natural habitat. Los Angeles Police Department patrol vehicles will have a continuous 8-foot-wide access route along the walking fitness trail between Murchison Street and Indiana Street, and trees, shrubs and other vegetation will be planted and maintained to allow for clear sight lines through the Natural Park.

7. PROJECT PHASING

By SWA and VS2 Consulting Inc.

This document is the culmination of the concept planning effort to determine the feasibility of and the guiding concept design framework for the Natural Park at Ramona Gardens. Subsequent phases, as funding becomes available, will further test the design ideas set forth for the Natural Park project, evaluate alternative design solutions for carrying out the concept plans, develop detailed design drawings, and ultimately lead to the construction of the Natural Park.

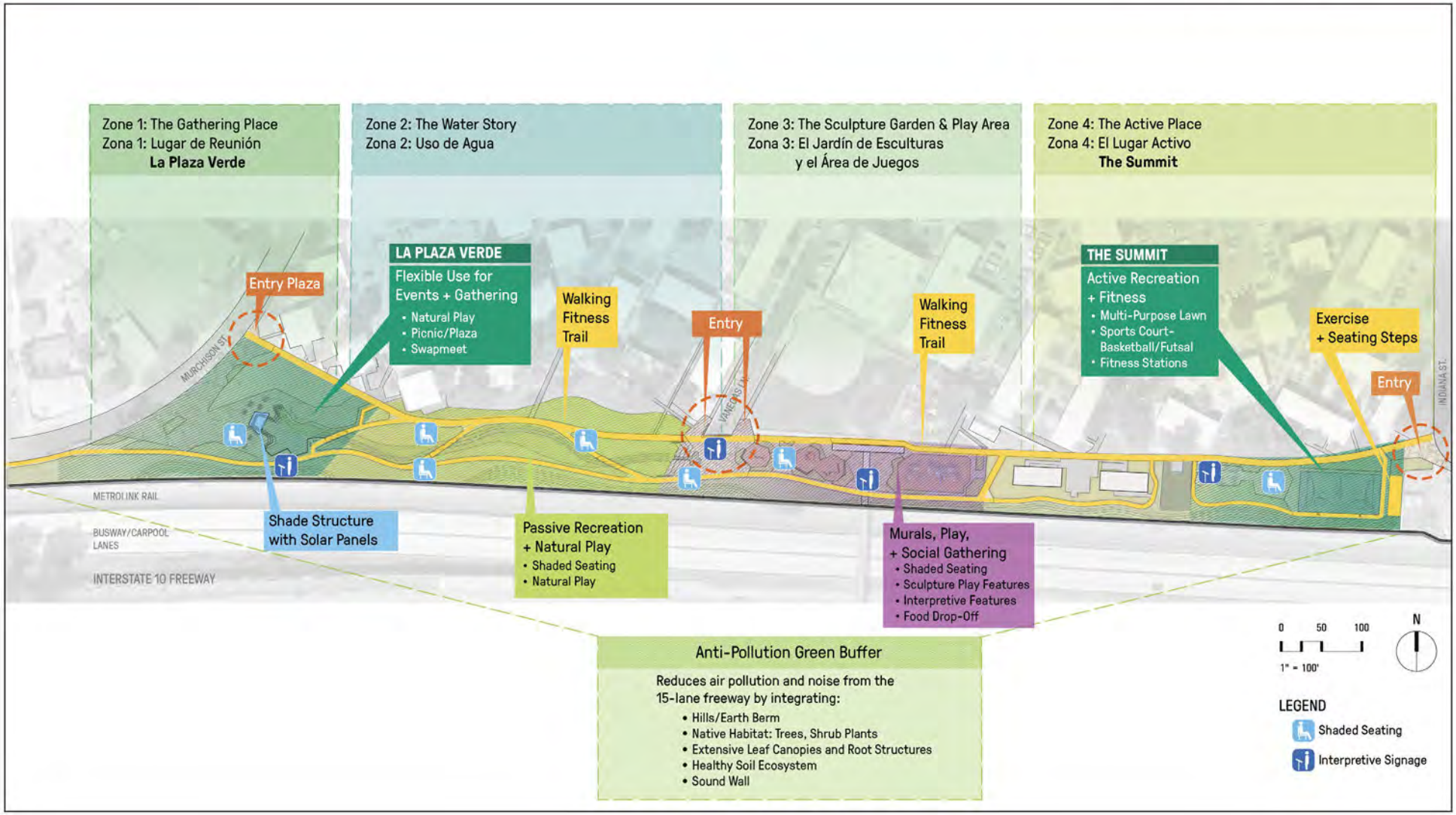
Implementation of the Natural Park at Ramona Gardens is recommended to occur cohesively. Linear elements such as the Anti-Pollution Green Buffer, arroyo, and walking trails extend along the park's length, and are integrated with the other park features. Therefore the full park site should be designed and constructed as a unit, versus separate pieces at different times.

The next phases of work for the Natural Park at Ramona Gardens are as follows:

- **Schematic Design**
  Determine permitting and California Environmental Quality Act (CEQA) compliance requirements, analyze all components of project elements, and develop schematic drawings and technical specifications.
- **Design Development**
  Complete the design of all park elements and resolve all technical and design issues.
- **Construction Documentation and Permitting**
  Select final materials and products, and prepare construction drawings and specifications to describe the final design in order that it can be built as intended. Complete CEQA compliance documents. Consult with permitting agencies and secure all permits.
- **Bidding and Award**
  Selection of contractor for project construction.
- **Construction and Project Closeout**
  Construction of Natural Park and review of work completed.

swa

NATURAL PARK AT RAMONA GARDENS
Big Nature Concept Plan
Public Use, Art, and Recreation



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8. PRELIMINARY ESTIMATE OF PROBABLE CONSTRUCTION COSTS

By SWA and VS2 Consulting Inc.

8.1 COST CATEGORIES

The following construction cost categories were developed and include the project elements described below:

Sitework and Infrastructure

- Site demolition, preparation, earthwork, and soil amendment
- Anti-pollution green buffer and earthen berm
- Urban runoff, diversion, treatment, and reuse system
- Site utilities including site/safety/security, lighting, and photovoltaic solar
- Security/public safety access
- Park entrances
- Walking fitness trail

Hardscape

- Site paving
- Plaza
- Swap meet area
- Food drop off
- Active recreation surfaces

Landscape and Irrigation

- Native habitat planting
- Trees
- Irrigation

Site Furnishings and Amenities

- Sculpture play features, murals
- Interpretive signage

Site Structures

- New sound/retaining wall
- Arroyo overlook/footbridge
- Stairs
- Shade structure

8.2 ESTIMATED CONSTRUCTION COST

The project construction cost is estimated at $12,998,595 including escalation through June 2020 as described in the table below:

Description	Cost
Sitework and Infrastructure	$ 5,650,000
Hardscape	$ 1,000,000
Landscape and irrigation	$ 900,000
Site furnishings and amenities	$ 375,000
Site structures	$ 2,300,000
Subtotal (1)	$ 10,225,000
Estimating Contingency 10%	$ 1,022,500
Subtotal (2)	$ 11,247,500
Construction Contingency 10%	$ 1,124,750
Subtotal (3)	$ 12,372,250
Escalation 2.5%/annum (through June 2020)	$ 626,345
Total Estimated Construction Cost	**$ 12,998,595**

8.3 SOFT COSTS

Soft costs, including A/E services, environmental clearance, project management, bid and award, and construction phase professional services are estimated at $3,600,000.

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COMMUNITY OUTREACH AND ENGAGEMENT REPORT

by Legacy LA and
Community Conservation Solutions

LEGACY LA

COMMUNITY OUTREACH AND ENGAGEMENT

Natural Park at Ramona Gardens

Lou Calanche and Project Team looking at natural park examples at a community workshop

SUMMARY

In partnership with Legacy LA, Community Conservation Solutions conducted detailed community and stakeholder outreach and engagement to identify community and stakeholder needs, concerns and priorities for the proposed Natural Park at Ramona Gardens. Results of community input were the driving force for and informed the development of the concept design for the Natural Park at the Ramona Gardens Housing Development.

The following report summarizes the outreach conducted and the methods used, and the input received from meetings, community workshops, and door-to-door surveys of Ramona Gardens residents. Community and stakeholder engagement included:

- Two community workshops at the Boys and Girls Club at Ramona Gardens, each attended by nearly 100 people
- Legacy LA's door-to-door survey of 500 residences at Ramona Gardens
- Legacy LA Youth Leaders training
- Field Trip with Legacy LA to example Natural Parks
- Distribution of informational materials in English and Spanish
- Posting of fliers throughout the community
- Legacy LA weekly presence at Ramona Gardens Swap Meet

Lou Calanche, Executive Director-Legacy LA; Esther Feldman, President-Community Conservation Solutions; Ana Bryan, Chair-Ramona Gardens Residents Advisory Council; Sergeant Monica Valenzuela-L.A. Police Dept. Community Safety Partnership

Looking at examples of natural parks at a Community Workshop

Meetings with key stakeholders included:

- L.A. City Councilmember José Huizar and staff
- State Assemblymember Wendy Carrillo
- Housing Authority of the City of Los Angeles
- L.A. Police Department Community Safety Partnership
- Ramona Gardens Residents Advisory Council (RAC)
- Ramona Gardens Swap Meet Vendors, L.A. Voice and Hunger Action L.A.
- Health leaders
    - The California Endowment
    - USC Preventive Medicine
    - USC Environmental Health
    - Alta Med Health Care Services
    - Boyle Heights Building Healthy Communities
- Hazard Park – Park Advisory Board

Legacy LA Youth Leaders survey Ramona Gardens' residents

Photos by David Ng

COMMUNITY PRIORITY ELEMENTS FOR THE NATURAL PARK

The elements below were selected as top priorities by residents and community members through a community workshop and a door-to-door survey of Ramona Gardens residents. These elements were supported by over 90% of respondents from the community survey.

PRIORITY
PRIORIDAD

VERY IMPORTANT
MUY IMPORTANTE

 Quiet place to escape city, beauty Native trees, flowers and wildlife Water Natural places for children to play	Lugar tranquilo para descansar, belleza Arboles, flores y pájaros nativos Agua Lugares naturales para que juegen los niños
 Buffer from freeway noise Remove air pollutants	Barrera para desminuir el sonido de la auropista Remueve la contaminación del aire
 Walking trail Exercise	Camino natural Ejercicio
 Shade, seating areas Picnic area	Sombra, áreas para sentarse Area de Picnic
 Security lighting	Luces de seguridad
 Improved area for swap meet	Area del agachón mejorado

IMPORTANT
IMPORTANTE

• Basketball courts/Active play area • Murals and art • Dog park	• Canchas de baloncesto / Área activa de juego • Murales y arte • Parque para perros

Gathering input from all ages at a community workshop

Sean Vargas, VS2 Consulting Inc. receives community input on concept plan.
Photos by David Ng

LEGACY LA

COMMUNITY OUTREACH AND ENGAGEMENT

Conducted by Legacy LA and Legacy LA Youth and Resident Leaders

ABOUT LEGACY LA

Legacy LA's mission is to make positive interventions in the lives of young people by offering alternatives to gangs and violence. Legacy LA builds the capacity of youth to reach their full potential and equips them with tools to transform their lives and community. Founded in 2007 by former Ramona Gardens neighborhood resident Maria "Lou" Calanche, Legacy LA addresses the impact of multi-generational gang violence and low educational attainment in the Ramona Gardens community in Northern Boyle Heights, a neighborhood of the City of Los Angeles. Legacy LA provides the following programs that promote higher education and empower youth to transform their community, serving more than 300 low-income youth ages 10–24 annually:

Legacy LA Youth and Resident leaders

Legacy LA surveys Ramona Gardens residents

Leadership Development

Legacy LA's flagship leadership development program engages youth in three years of training using a social justice model to increase knowledge of community issues, civics, and community organizing, and to increase capacity to respond to community needs. Legacy LA youth are actively engaged in activities to increase public investment in youth development locally and citywide, environmental justice and improving relations between teens and law enforcement

Student Success Program

Legacy LA provides after-school mentoring and academic supports to 145 youth from middle school through college as a drop-out prevention strategy with the long-term goals of college access and completion

Family Source Center

As a subcontractor and satellite location for the local City-funded Family Source Center, Legacy LA provides family services to increase academic achievement for youth, and increase income for their parents/guardians.

PROJECT STAFF

Lou Calanche, Executive Director

Founder and Executive Director of Legacy LA she is committed to providing at-risk youth living in the Ramona Gardens community of Boyle Heights with the tools and resources needed to help them reach their full potential. Raised in the Ramona Gardens Community, Lou's dream was to return to make a difference in her community to help address the systemic issues that create obstacles for youth success and as well as to improve overall community health. Lou's long-term vision for engaging youth and residents has contributed to Legacy LA's rapid trajectory as a model of comprehensive service provision in Boyle Heights and facilitates the successful development and implementation of programs and projects for youth. Lou has a Master of Public Administration Degree and is a Doctoral Candidate in Public Administration at USC, focusing her research on land-use policy and citizen participation.

Ruby Rivera, Director of Policy and Programs

Born and raised in Lynwood, CA, Ruby earned a B.A. in Chicana/o Studies and Labor and Workplace Studies at UCLA in 2010. She recently earned her MSW in Community, Organization, and Business Innovation from the University of Southern California. There she interned at the Center for the Study of Social Policy in New York City. Ruby has served the community of Boyle Heights for over 7 years as a youth organizer and policy advocate. Ruby is passionately committed to positive youth development and fighting youth criminalization through policy advocacy, community organizing, and systemic change.

Ruth Rodriguez, Community Outreach Coordinator

Originally from Durango, Mexico, Ruth is Legacy LA's Community Outreach Coordinator. She grew up in Mexico and studied psychology, specializing in social psychology. Her work in Mexico focused on community development and research. For over eight years, she worked closely with very under-resourced communities in Mexico to successfully develop and implement community research and drug prevention projects. Ruth moved to Los Angeles three years ago and began her work in Ramona Gardens in September 2017.

Adult Resident Outreach Team

Ana Bryan, Ramona Gardens Resident
Emilia Rodriguez, Ramona Gardens Resident
Liliana Martinez, Ramona Gardens Resident
Julio Perez, Ramona Gardens Resident

Amanda Gutierrez, Youth Organizer

A senior at Mount St. Mary's University majoring in Psychology, Amanda C. Gutierrez has lived in Ramona Gardens for twenty-one years, all of her life. She has been a Legacy LA leader for eight years starting when she a freshman in high school. Amanda is currently a youth organizer at Legacy LA working on two major projects, Environmental Justice and the implementation of the Through Our Eyes Project, a program she co-founded while a high school student that is focused on improving relationships between youth and law enforcement through a youth-led workshop. Amanda led the outreach and survey implementation for the Natural Park Project leading twelve community youth to conduct door to door survey implementation on weekends and attending special community events to ensure that youth participated in the survey.

Amanda will graduate in May 2018 with a Bachelor's Degree in Psychology and will use her academic skills and community experience to continue to develop programs and activities that help youth living in Ramona Gardens.

Youth Outreach Team

Martha Aguilera
Jocelyn Benavides
Destiny Cabral
Norma Galeas
Alejandra Perez
Desteny Perez

COMMUNITY OUTREACH METHODS

Legacy LA employed the following tools and techniques to engage the Ramona Gardens community in the planning process with the goal of building awareness about the benefits of a natural park in their community, the need to address air pollution, and to solicit their opinions and feedback about how a natural park could best improve their quality of life. All informational materials were provided in both English and Spanish.

Community Survey

A community survey was developed and conducted of all 500 residences in the Ramona Gardens Housing Development to understand the current uses of the proposed Natural Park Project location, the desire and need for the Natural Park Project, and to gauge what types of activities the community would like to see developed in the space. Four adult residents and 12 youth leaders were trained to implement the survey in both English and Spanish. The survey was implemented through door-to-door outreach, at youth meetings, as well as reaching out to residents attending the weekly swap meet, also known as "Agachon" and the food pantry. A total of 500 surveys were collected during the months of September through November.

Legacy LA collecting information at the weekly swap meet at Ramona Gardens

Ruby Rivera, Legacy LA and Gerdo Aquino, SWA lead a lively discussion at a Community Workshop in December 2017

Outreach for Community Meetings and Workshops

Outreach to invite residents and community members to the two interactive community workshops was conducted with the help of residents of Ramona Gardens, youth and adult leaders. Meeting fliers were delivered to all 500 units in Ramona Gardens to invite residents to the workshops. Our team also provided project information to residents who did not know about the Natural Park Project. Outreach for the first planning meeting began two weeks in advance of and on the day of the workshop. Follow up phone calls were also made to remind residents to attend the December 7th workshops. Over 500 fliers were also distributed at the community swap meet and at the food pantry; The second workshop took place on March 14th and involved similar outreach. Outreach for the second workshop included contacting residents that had participated in the first planning meeting, so they could see how their comments had been incorporated.

RAMONA GARDENS RESIDENTS REACHED

GROUPS REACHED	NO. OF RESIDENTS
Swap Meet "Agachon" Resident Leaders	4
Swap Meet "Agachon" Vendors	50
Senior Citizen Group	15
Food Pantry	17
Resident Advisory Council Leaders	5
House Meetings	20
Monthly Resident Advisory Council Community Meeting	50
Community Survey	500

Those engaged through outreach efforts included people from ages 14–85 who identified as men or women and included both Ramona Gardens residents and non-residents. Outreach and participation included 85% of residents living in the Ramona Gardens Public Housing Development and 15% of those residing on the periphery in the market-rate residential area just outside the development.

Ying-yu Hung-SWA and Lou Calanche-Legacy LA lead discussion on the concept plan at a Community Workshop in December 2017

PRESENTATIONS TO STAKEHOLDER GROUPS

Boyle Heights Building Healthy Communities

Building Healthy Communities (BHC) is a ten-year, $1 billion comprehensive, place-based, community initiative focused on engaging residents and local organizations in making health happen in their neighborhoods, schools and with prevention. Building Healthy Communities has a simple strategy: work on a local scale to create broad, statewide impact. The Boyle Heights BHC is led by a steering committee composed of non-profit leaders and residents that meet monthly to make decisions on the trajectory of the BHC campaigns.

Participating Organizations:

- Clinica Romero
- The Wall Las Memorias
- Maternal and Child Health Access
- The Wellness Center
- Alliance for California Traditional Arts
- Casa 0101
- OneLA
- Neighborhood Legal Services of Los Angeles (NLS)
- LA Voice
- Volunteers of America Los Angeles
- Partnership for Los Angeles Schools
- Public Counsel
- Gay-Straight Alliance Network
- InnerCity Struggle
- Latino Equality Alliance
- California Center for Public Health Advocacy
- East LA YMCA
- Labor Community Strategy Center
- Jovenes, Inc.
- Self-Help Graphics and Arts, Inc.
- East LA Community Corporation
- East Los Angeles Women's Center
- Violence Prevention Coalition

Los Angeles Police Department Ramona Gardens Safety Partnership

The Ramona Gardens Safety Partnership meets monthly and is led by the Los Angeles Police Department (LAPD). Sergeant Monique Valenzuela leads the team and works to bring together community organizations serving Ramona Gardens. Monthly meetings focus on community safety and partnership opportunities.

Participating Organizations:

- LAPD Hollenbeck Division
- Ramona Gardens Resident Advisory Council
- Murchison Street School
- Santa Teresita Parochial School
- Soledad Enrichment Action
- East LA Women Center
- Peace Over Violence
- Project SOAR – HACLA Sponsored College Access Program
- Hazard Park Recreation Center

Hazard Park – Park Advisory Board (PAB)

Appointed by the Park Director, the PAB works closely with the Director to support activities and maintenance of Hazard Park.

Members:

- Ray Rios, Chair
- Nancy Guerrero
- Tommy Varela
- Cookie Rios
- Elizabeth Narvaez, Park Director

Health Leaders Meeting

An outreach meeting was conducted to engage health leaders and partners that are connected to Ramona Gardens and or have an interest in improving public health outcomes in this community. The meeting helped to provide an overview of the Natural Park Project and assessed interest in leveraging research and health resources to support the project.

Attendees Included:

- The California Endowment
- USC Preventive Medicine
- USC Environmental Health
- Alta Med Health Care Services
- Boyle Heights Building Healthy Communities

State Assemblymember Wendy Carrillo

Legacy LA youth leaders traveled to Sacramento during April 2018 to meet with Assembly member Wendy Carrillo, State representative for the Ramona Gardens community. Youth leaders presented the outreach work and community survey and the need for the natural park in Ramona Gardens.

LEGACY LA'S FINDINGS AND RECOMMENDATIONS

The Ramona Gardens Natural Park planning process demonstrates that the community is open and excited to participate in the planning and future development of a safe, beautiful natural space that will bring many health and environmental benefits to the community. The number of youth and adults involved in the process will create ownership and use of the park and serves as a model for how future community development should be implemented. The concerns shared by residents include safety, maintenance, and ensuring that the elements included are aligned with what they've shared as necessary such as exercise areas, recreation areas, and ensuring that the "Agachon" area is enhanced in ways that support the community's use of that space. The community wants to continue to be a part of the conversation as the planning and design for construction continue to develop.

YOUTH AND ADULT RAMONA GARDENS RESIDENT PERSPECTIVES

The residents of Ramona Gardens were very engaged in this process. They felt like their input was valued because of the opportunities to take part in the research, planning and design process. The residents are excited to begin the construction phase of the Natural Park and are looking forward to continuous engagement in this process.

Community Quotes

"We are very happy and excited for the new Natural Park Project for our community that will bring us a better quality of life in the environment!"
–Ana Bryan, Ramona Gardens Resident and President of the Resident Advisory Council

"I have enjoyed being part of outreaching to my community about the nature park in Ramona Gardens because I like seeing their excitement when I inform them about all the benefits that come with a nature park. I like attending the community meetings because along with my community I get to decide what we all want included in the nature park. I can't wait to have the nature park in Ramona Gardens because it will be a place like no other in my community."
–Lesly Valenzuela, Ramona Gardens Resident and youth leader, age 18

"I am excited and waiting for this small park to be completed because it will help us improve our way of living by improving the air pollution that impacts the health of our entire community."
–Emilia P. Rodriguez, Ramona Gardens Resident and member of the Resident Advisory Council.

"Working as a youth leader conducting outreach and surveys for the Ramona Gardens Natural Park, I learned that as I was growing up in this great community where people fight for what they love and need. I'm slowly getting closer to getting sick or a disease because of this bad pollution from freeways and factories that really hurt my community. I will really love a nature park to help out the pollution and get people to get healthier."
–Jaime Valenzuela, Ramona Gardens Resident and youth leader, age 18

MEETINGS AND PRESENTATIONS

Conducted by Community Conservation Solutions

City of Los Angeles

Throughout the project period, CCS coordinated with the office of Los Angeles City Councilmember José Huizar and the Housing Authority of the City of Los Angeles (HACLA).

Ramona Gardens Residents Advisory Council (RAC)

CCS met and kept in close communication with the Ramona Gardens RAC throughout the research and conceptual design . We met with the RAC before launching the outreach effort, and CCS and the project team presented at the Ramona Gardens RAC's monthly meeting prior to beginning Legacy LA's door-to-door survey and other community outreach activities. The Ramona RAC assisted in the presentations at both community workshops in December 2017 and March 2018.

Los Angeles Police Department, Community Safety Partnership (LAPD)

In February 2018, we met with the Los Angeles Police Department Community Safety Partnership, an initiative between HACLA and the LAPD, led by Sargent Monique Valenzuela. The CSP provided input regarding the LAPD's need for improved site access for patrol cars, security lighting and cameras, and maintaining line-of-sight visibility. This information helped to inform the conceptual design for the Natural Park.

Health Leaders

In February 2018, CCS and Legacy LA met with key health leaders to discuss public health issues in Northern Boyle Heights, current efforts underway by the California Endowment and USC, and how the proposed Natural Park could help address identified concerns. Attendees included:

- The California Endowment's Building Healthy Communities: Boyle Heights Initiative
- University of Southern California Keck School of Medicine
- USC School of Environmental Science
- USC School of Preventative Medicine
- AltaMed

Ramona Gardens Swap Meet Vendors

In March 2018, we met with leaders of vendors from the weekly Ramona Gardens Swap Meet and members of LA Voice and Hunger Action LA, who were instrumental in helping to establish the Ramona Gardens Swap Meet. We received input on space requirements for vendors, numbers of vendors, L.A. County Health Department requirements, HACLA requirements,

water and power needs, and access and parking. Requests were made for improved and increased shaded seating, access and circulation. This information helped to inform the conceptual design for the Natural Park.

COMMUNITY SURVEY RESULTS

1. Reducing Air Pollution

Reducing air pollution from the adjacent 15 lane freeway corridor was identified as a top priority in both the community workshop and survey. Results below are from the survey of 500 residents.

2. Walking Regularly for Exercise

More than 75% of the residents at Ramona Gardens walk regularly for exercise. 86% said they would use an unpaved walking trail in the proposed Natural Park two or more times per week.

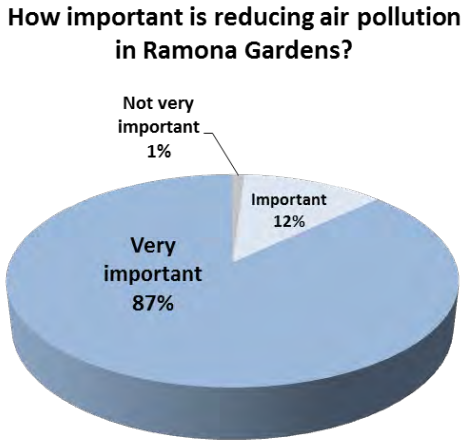
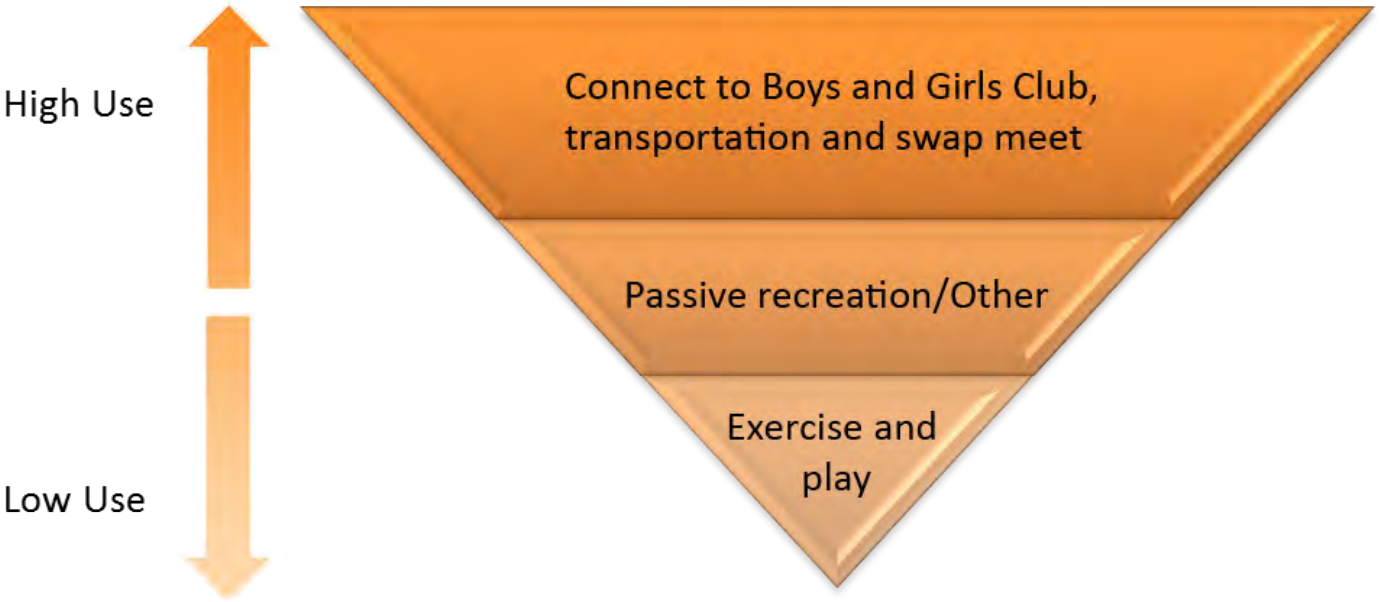


Figure 4.1

3. Current Use of Natural Park Project Site

The majority of residents living at Ramona Gardens use the site primarily for connecting to nearby transportation and as a way to get to the Boys and Girls Club and Saturday swap meet.

85% of residents currently pass through the Natural Park project site at least once a week.



4. Use of Basketball Courts

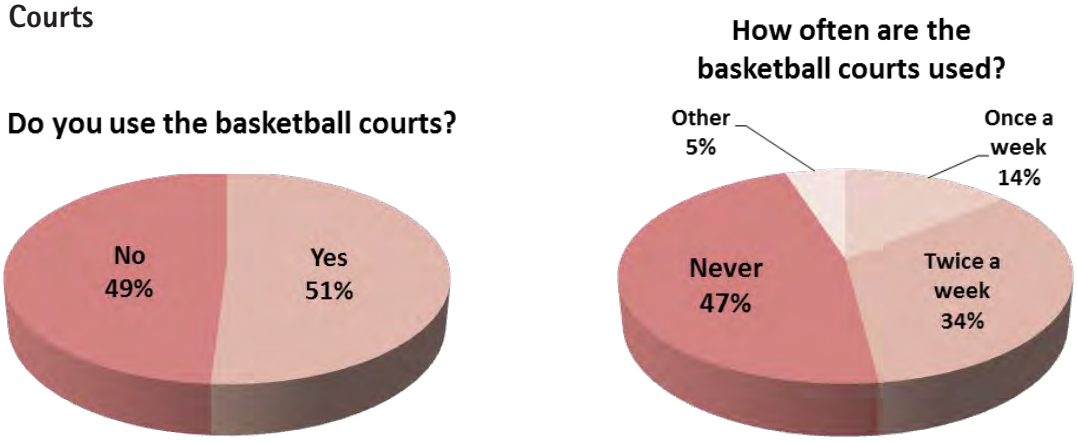


Figure 4.2

SUMMARY OF COMMENTS FROM COMMUNITY WORKSHOPS, DECEMBER 2017 AND MARCH 2018

WORKSHOP #1: December 7, 2017

The project team was officially introduced to the Ramona Gardens community and presented possible Natural Park elements to workshop participants. The team emphasized the importance of certain project elements that are tied to State Funding and educated participants on air quality, water quality and defined the term "Natural Park", showing visual examples. The participants were split into two groups to provide critical feedback and ask questions about the elements that they would like to see in the Natural Park. Participants posted remarks, suggestions and questions on the potential elements listed on each board.

General Comments

- Don't like poor air quality and pollution from the adjacent freeway corridor
- Need more flowers and trees
- Need more lighting
- Fix broken/cracked pavement
- Need more safety measures
- Need benches and tables to rest
- Need regular maintenance
- Need an area for kids to play

Entrance at Murchison, West End and Swap Meet

- Like trees and grass
- Currently use for swap meet and activities like stake boarding
- Don't like broken/cracked pavement, unpleasant smell
- Need lighting, protection from pollution from freeway, trash clean up, more flowers and plants, benches and tables to rest, maintenance on sound wall and more monitoring for safety from street
- Like ideas of gathering/play space for kids, gazebo

Walking Path

- Like walking here – good connection to basketball courts, residences
- Need lighting, exercise equipment, flowers and plants, tables and benches and regular maintenance
- Too much pollution, no barrier from freeway, gets hot (no shade)

Basketball Courts

- Likes area to play basketball, good area for kids to play
- Not used by residents, needs regular maintenance
- Move courts to the knoll (La loma), replace with more plants and gazebo
- Replace with soccer field

Under the Bridge

- Need lighting, dangerous area, safety concern, trash is thrown here
- Used to catch bus on other side of freeway,
- Food bank occurs near here
- Possibility of adding camera, increase lighting, more flowers, play area for kids

Existing Mobile Units

- Dislike that is only used for meetings, bad use of big space
- Noise from train and freeway
- Possibility for kids play area, basketball area, improve for seniors, improve safety

Community Garden

- Like the idea of a garden, space to plant things
- Dislikes how it's not open to public (need key)
- Needs lighting
- Unaware of how to get access to vegetables and fruits to eat

Playground

- Like how it is a dedicated place for kids to play
- Needs regular maintenance, lighting, shade (structures can get hot), equipment for all ages, fence and new games and equipment

Old Tennis Court

- Dislike how space is closed off, useless space
- Like that kids play in this space, good space but underutilized
- Need lighting
- Would like to have a natural space to exercise
- Possible pool or soccer field could go here

WORKSHOP #2: March 14, 2017

The proposed concept plan was presented, and participants were split into two groups to respond to the specific elements. Participants posted remarks with their feedback on the elements proposed for each zone of the draft concept plan. This list summarizes participant remarks by zone.

ZONE 1: The Gathering Place

- Yes, more picnic areas and more shade
- I want to see the park [more] and the swap meet less.
- Informational Kiosk. The displays panels can be switched out as needed. Community info can be posted here or about the swap meet.
- Shades and benches and lights, shade structure/arbors
- No smoking
- Exercise machines
- That whatever is planned becomes a reality and you follow through
- Pavement should be permeable, not asphalt

ZONE 2: The Water Story

- Exercise station, exercise machines and no smoking signs
- Educational areas and artwork
- Decomposed granite walking path throughout
- Drinking fountains with jug filler
- Thank you, it is an excellent plan I am very excited. Good luck with funding. And everything was explained very well.
- Young people to compare their art drawings with the elderly so they can both see the difference.
- More art for adults to participate in something cultural and where they can reminisce on their childhood memories. And for youth this could be something new.
- A list of rules at the entrances and parts of park.
- I would like the park to have a theme of peace and love. This could be through murals or signs, so that when we go to the park we can return home reflecting on what we have lived through.
- How to use trail: Obstacle course (run); Explore nature's beauty. Follow a butterfly's flight or squirrel paws on the ground; Walks with family who are less mobile—even pavement; Sit/Stop Areas
- Interpretive displays throughout the walking path would be nice to explain: water capture system underground, plant, trees, etc.
- Dog poop stations and water fountain stations through the trail
- Everything is okay for me.
- We need more lights along the walking path. Place trash cans so that people who have animals can pick up dog poop.
- I want lush plants and not dry plants that can attract lizards and insects.

ZONE 3: The Sculpture Garden

- Trees and shade
- People to clean their animals poop
- Exercise station/exercise machines
- Area of gardens and flowers
- Better playing area for the kids to play. Educational area for the kids.
- Area to do exercise and to rest
- Area for exhibit/fair/event

ZONE 4: The Active Place

- Add community garden, decomposed granite for the walking path, farmers market.
- Kiosk; gathering areas.
- Signs to pick up dog droppings
- Build soccer fields for youth
- Futsal. We have many basketball courts. There is no soccer/ futsal area.
- Build a soccer field for youth in the community

General Comments

- Make the walking paths dirt
- Stairs to walk up and down
- Everything looks beautiful!
- Tables and trash cans
- Bathrooms and fixed seating
- Chairs and tables for the park
- Plants and trees
- Lots of seating
- The idea of recycling water is very important and a great idea.
- Are you making the wall taller?
- Are you going to fix the pedestrian bridge?
- Please include exercise trail to motivate us to work out.
- Will there be a designated smoking area?
- Will there be police patrol of the kids park?
- Will the park close early or be open all the time?
- Will there be a skate park?

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APPENDICES

APPENDIX A

About the Project Team

Community Conservation Solutions

Community Conservation Solutions (CCS) tackles the complex and challenging problems created where people and nature intersect. CCS pioneers innovative, strategic changes that are essential to solving the environmental problems affecting our human and natural communities with a focus on improving water quality and water supplies, restoring habitat and creating green open space in communities with the greatest needs.

CCS implements practical solutions that unite diverse communities and leverage investments of public and private funds. CCS integrates science, technology, engineering, planning and geospatial data analysis to create permanent public benefits. CCS' successful projects include: the L.A. River Greenway Trail and Habitat Restoration in the San Fernando Valley; the two-square mile Baldwin Hills Park in the heart of urban Los Angeles; and acquisition of the North East L.A. Center for the L.A. Conservation Corps. CCS' projects range from parks and beaches to wilderness and watersheds, and from recreational sites to mixed-use developments. CCS is a non-profit 501(c)(3) organization. www.conservationsolutions.org

LEGACY LA

Legacy LA is a local community-based organization focused on youth development in Ramona Gardens and Boyle Heights. They direct community engagement activities through their Legacy LA Youth Council, which employs youth from the surrounding community. They have a track record of soliciting community input on various issues of community concern, including public and environmental health.

Legacy LA's flagship leadership development program engages youth in three years of training using a social justice model to increase knowledge of community issues, civics, and community organizing. Legacy LA provides after-school mentoring and academic supports to 145 youth from middle school through college as a drop-out prevention strategy with the long-term goals of college access and completion. As a subcontractor and satellite location for the local City-funded Family Source Center, Legacy LA provides family services to increase academic achievement for youth, and increase income for their parents/guardians.

swa International landscape architecture and urban design firm SWA celebrates 60 years of creating robust, sustainable landscapes throughout the world. They partner with clients to create vibrant places that are at once ecologically resilient, aesthetically compelling and socially beneficial.

From the smallest details at a neighborhood park to the large-scale interventions of a multi-layered, eco-corridor along urban waterways, SWA's design reflects a sensibility both pragmatic and imaginative, uniting beauty with purpose in the natural and built environments. The public realm portfolio of the Los Angeles studio focuses on improving quality of life in our cities by addressing issues of density, pollution, mobility, community programming, arts, and culture.

Two small SWA-designed urban parks on the fringes of infrastructure—the freeway and the channelized river—are packing more punch than their size. Bicyclists and birdwatchers share common recreational space at the 1.2 acre Milton Street Park, along the concrete-lined Ballona Creek in Del Rey. Native plantings promote habitat for wildlife there while pass-through planters filter stormwater. Lynwood's Ricardo Lara Park transforms a formerly vacant 5-acre stretch along the I-105 freeway into a neighborhood amenity that draws children for play, adults for exercise, and whole families for community planting days. The park contains a robust stormwater management system. Both parks exemplify how SWA utilizes creative thinking and great design to advance social equity and environmental health.

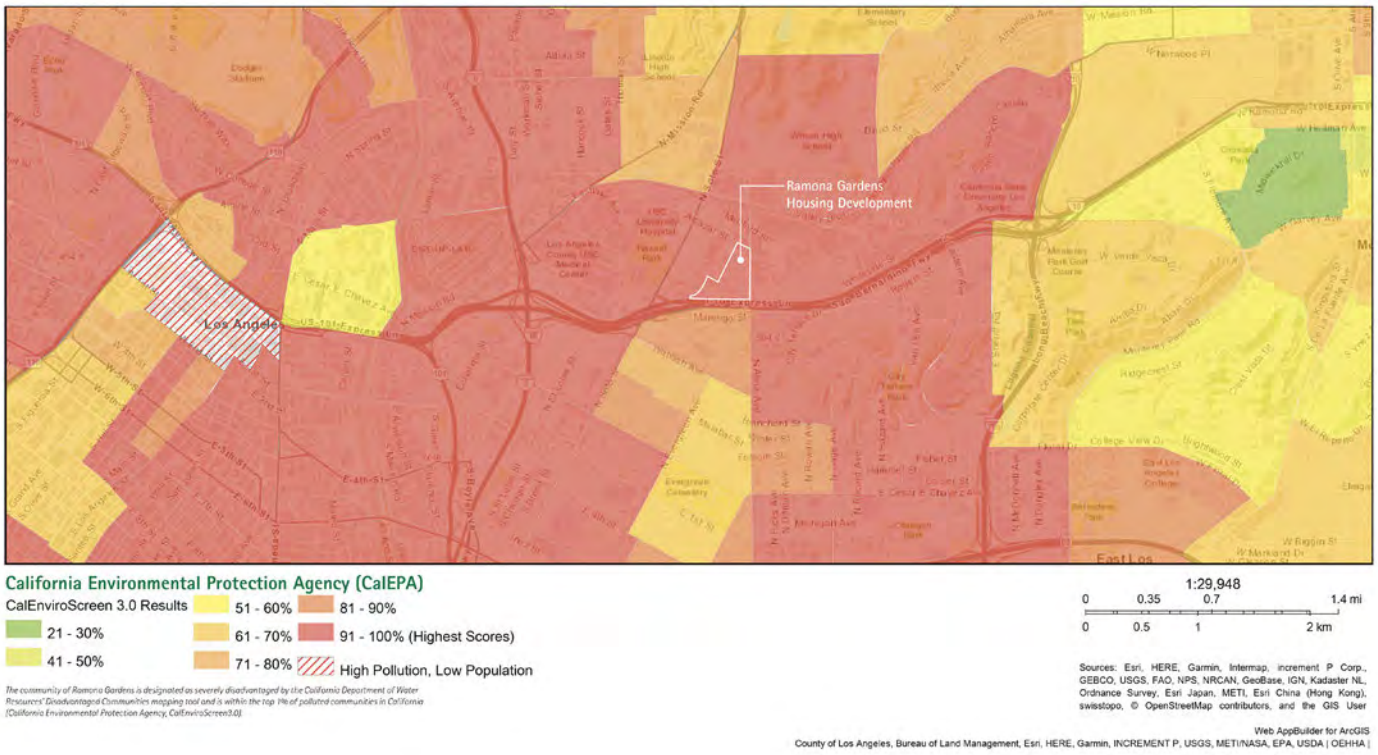
VS2 Consulting Inc. create • restore • thrive Headquartered in Los Angeles, California, VS2 Consulting Inc. (VS2) provides planning, civil and environmental engineering, and project/program management services to institutional, public, private, and non-governmental organizations. VS2 leverages engineering expertise, local knowledge, and an innovative approach to deliver sustainably-conceived and engineered solutions to our client partners. VS2 has extensive experience in the master planning and design of urban public parks, innovative sustainable infrastructure, and institutional and public facilities.

LAND IQ Land IQ specializes in providing solutions to challenging agricultural and environmental problems throughout the world. Our areas of expertise include soil science, water quality, agricultural systems, salinity and nutrient management, ecosystem restoration, remote sensing, geospatial analysis, land stabilization and regulatory policy. Native habitat restoration services include revegetating and reclaiming disturbed landscapes and specialized services in natural resources planning, analysis, restoration and management.

APPENDIX B

California Environmental Protection Agency
CalEnviroScreen 3.0 Results and Map

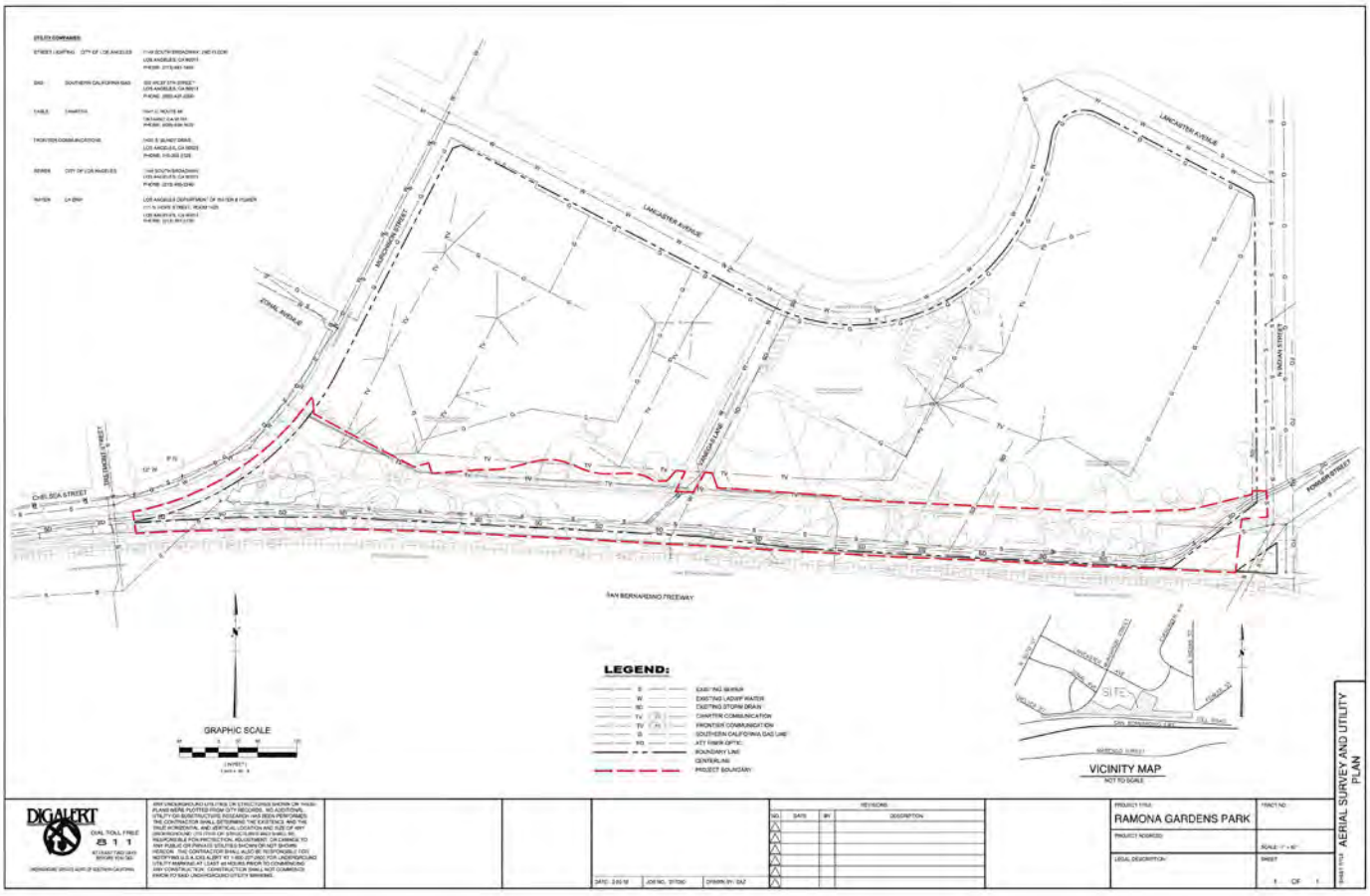
Ramona Gardens Housing Development, Northern Boyle Heights: Severely Disadvantaged and Top 1% of Polluted Communities in California



APPENDIX C

Project Boundary and Utilities Map

Project Boundary and Utilities Map



APPENDIX D

Limited Geotechnical Investigation Report

LIMITED GEOTECHNICAL INVESTIGATION

PROPOSED NATURAL PARK
RAMONA GARDENS HOUSING
BETWEEN INTERSECTION OF CHELSEA ST. AND TREMONT ST. AND INTERSECTION OF INDIANA ST. AND FOWLER ST.
LOS ANGELES, CALIFORNIA

APN: 5202-024-903
TRACT: TR 12022
LOTS: 1, 2

GEOCON
WEST, INC.

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

SWA GROUP
LOS ANGELES, CA

PROJECT NO. A9685-06-01

JANUARY 8, 2018

GEOCON
WEST, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. A9685-06-01
January 8, 2018

SWA Group
811 W. 7th Street, 8th Floor
Los Angeles, California 90017

Attention: Ms. Jana Wehby

Subject: LIMITED GEOTECHNICAL INVESTIGATION
PROPOSED NATURAL PARK
RAMONA GARDENS HOUSING
BETWEEN INTERSECTION OF CHELSEA ST. AND TREMONT ST. AND
INTERSECTION OF INDIANA ST. AND FOWLER ST.
LOS ANGELES, CALIFORNIA
APN: 5202-024-903
TRACT: TR 12022
LOTS: 1, 2

Dear Ms. Wehby:

In accordance with our revised proposal dated October 18, 2017, we have prepared this limited geotechnical investigation report providing recommendations for the proposed improvements to the natural park consisting of a shallow stormwater infiltration system and new walkway slab-on-grade at the subject property located south of the Ramona Gardens Housing, between intersection of Chelsea Street and Tremont Street and intersection of Indiana Street and Fowler Street in the City of Los Angeles, California. The accompanying report presents the findings of our study and our conclusions and recommendations pertaining to the geotechnical aspects of proposed design and construction. Based on the results of our investigation, it is our opinion that the proposed improvements can be constructed as proposed, provided the recommendations of this report are followed and implemented during design and construction.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

Very truly yours,

GEOCON WEST, INC.

Rex Panoy
Staff Engineer

Harry Derkalousdian
PE 79694

Susan F. Kirkgard
CEG 1754

(EMAIL) Addressee

TABLE OF CONTENTS

LIMITED GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of a limited geotechnical investigation for the proposed improvements at the subject property located along the southern border of the Ramona Gardens Housing Development in the City of Los Angeles, California. (see Vicinity Map and Site Plan, Figures 1 and 2). The purpose of the investigation was to evaluate subsurface soil and geologic conditions underlying the area of proposed construction and, based on conditions encountered, to provide conclusions and recommendations pertaining to the geotechnical aspects of proposed design and construction.

The scope of our investigation included a site reconnaissance, field exploration, laboratory testing, engineering analysis, and the preparation of this report. The site was explored on December 4 and 5, 2017 by excavating eight 4-inch diameter borings utilizing hand auger equipment and hand tools. The borings were advanced to a maximum depth of 15½ feet below the existing ground surface using manual auger equipment and digging tools. The approximate locations of the exploratory borings are depicted on the Site Plan (see Figure 2). A detailed discussion of the field exploration, including boring logs, is presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to determine pertinent physical and chemical soil properties. Appendix B presents a summary of the laboratory test results.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions.

If project details vary significantly from those described above, Geocon should be contacted to determine the necessity for review and possible revision of this report.

2. SITE AND PROJECT DESCRIPTION

The subject site is located along the southern border of the Ramona Gardens Housing Development in the City of Los Angeles, California. The area of the proposed natural park development is an approximate 4-acre, irregular-shaped parcel currently occupied by Ramona Gardens Recreation which includes a paved walkway path, several recreational courts and playground areas, a library, an Enrichment Center, and associated parking areas. The area of the proposed natural park improvement is bounded by the Ramona Gardens Housing Development to the north, by single-story residential structures to the east and west, and by the Metrolink right-of-way to the south. The site gently slopes from west to east. Surface water drainage at the site appears to be by sheet flow along the existing ground contours to the city streets. Vegetation consists of trees, shrubs, and grass located throughout.

Based on the information provided by the Client, it is our understanding that the proposed improvements at the site will consist of the creation of a natural park and walkway trail. The improvements include the installation of a shallow stormwater infiltration system and new hardscape/walkway slab-on-grade. The proposed improvements will be constructed at or near existing site grade (see Site Plan, Figure 2).

Once the design phase proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Any changes in the design, location or elevation of any structure, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

3. SOIL AND GEOLOGIC CONDITIONS

Based on our field investigation and published geologic maps of the area, the site is underlain by artificial fill and Holocene age alluvium consisting of predominantly clay, sand, silt, and gravel (California Geological Survey, 2012). Detailed stratigraphic profiles are provided on the boring logs in Appendix A.

3.1 Artificial Fill

Artificial fill was encountered in our field explorations to a maximum depth of approximately 7 feet below existing ground surface. The artificial fill generally consists of brown to dark brown or yellowish brown silty sand and sandy silt with various amounts of fine to coarse gravel. The artificial fill is characterized as slightly moist to wet and soft or medium dense. The fill is likely the result of past grading or construction activities at the site. Deeper fill may exist between excavations and in other portions of the site that were not directly explored.

3.2 Alluvium

Holocene age alluvium was encountered beneath the fill to the maximum depth explored (15½ feet below the ground surface). The alluvium consists primarily of light to dark brown or olive brown sandy silt, silty sand, and sand with silt with various amounts of fine gravel. The alluvial soils are characterized as slightly moist to moist and firm or medium dense to dense.

4. GROUNDWATER

Review of the Seismic Hazard Zone Report for the Los Angeles Quadrangle (California Division of Mines and Geology [CDMG], 1998) indicates the historically highest groundwater level in the area is approximately 20 feet beneath the ground surface. Groundwater information presented in this document is generated from data collected in the early 1900's to the late 1990s. Based on current groundwater basin management practices, it is unlikely that groundwater levels will ever exceed the historic high levels.

Groundwater was not encountered in our field explorations excavated to a maximum depth of 15½ feet below the existing ground surface. Based on the reported historic high groundwater level in the site vicinity (CDMG, 1998), the lack of groundwater in our borings, and the anticipated depth of proposed construction, groundwater is neither expected to be encountered during construction, nor have a detrimental effect on the project. However, it is not uncommon for groundwater levels to vary seasonally or for groundwater seepage conditions to develop where none previously existed, especially in impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall. In addition, recent requirements for stormwater infiltration could result in shallower seepage conditions in the immediate site vicinity. Proper surface drainage of irrigation and precipitation will be critical for future performance of the project. Recommendations for drainage are provided in the Surface Drainage section of this report (see Section 6.12).

5. SEISMIC DESIGN CRITERIA

The following table summarizes site-specific design criteria obtained from the 2016 California Building Code (CBC; Based on the 2015 International Building Code [IBC] and ASCE 7-10), Chapter 16 Structural Design, Section 1613 Earthquake Loads. The data was calculated using the computer program U.S. Seismic Design Maps, provided by the USGS. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.3.2 of the 2016 CBC and Table 20.3-1 of ASCE 7-10. The values presented below are for the risk-targeted maximum considered earthquake (MCE_R).

2016 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2016 CBC Reference
Site Class	D	Table 1613.3.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	2.531g	Figure 1613.3.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.880g	Figure 1613.3.1(2)
Site Coefficient, F_A	1.0	Table 1613.3.3(1)
Site Coefficient, F_V	1.5	Table 1613.3.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	2.531g	Section 1613.3.3 (Eqn 16-37)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	1.319g	Section 1613.3.3 (Eqn 16-38)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	1.688g	Section 1613.3.4 (Eqn 16-39)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.880g	Section 1613.3.4 (Eqn 16-40)

The table below presents the mapped maximum considered geometric mean (MCE_G) seismic design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-10.

ASCE 7-10 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-10 Reference
Mapped MCE_G Peak Ground Acceleration, PGA	0.962g	Figure 22-7
Site Coefficient, F_{PGA}	1.0	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.962g	Section 11.8.3 (Eqn 11.8-1)

The Maximum Considered Earthquake Ground Motion (MCE) is the level of ground motion that has a 2 percent chance of exceedance in 50 years, with a statistical return period of 2,475 years. According to the 2016 California Building Code and ASCE 7-10, the MCE is to be utilized for the evaluation of liquefaction, lateral spreading, seismic settlements, and it is our understanding that the intent of the Building code is to maintain "Life Safety" during a MCE event. The Design Earthquake Ground Motion (DE) is the level of ground motion that has a 10 percent chance of exceedance in 50 years, with a statistical return period of 475 years.

Deaggregation of the MCE peak ground acceleration was performed using the USGS online Unified Hazard Tool, 2008 Conterminous U.S. Dynamic edition. The result of the deaggregation analysis indicates that the predominant earthquake contributing to the MCE peak ground acceleration is characterized as a 6.63 magnitude event occurring at a hypocentral distance of 6.1 kilometers from the site.

Deaggregation was also performed for the Design Earthquake (DE) peak ground acceleration, and the result of the analysis indicates that the predominant earthquake contributing to the DE peak ground acceleration is characterized as a 6.64 magnitude occurring at a hypocentral distance of 9.93 kilometers from the site.

Conformance to the criteria in the above tables for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 General

6.1.1 It is our opinion that neither soil nor geologic conditions were encountered during the investigation that would preclude the construction of the proposed improvements provided the recommendations presented herein are followed and implemented during design and construction.

6.1.2 Based on site explorations, the area of proposed improvement appears to be mantled by 2 to 7 feet of existing artificial fill. The deepest accumulations of artificial fill on the order of 5 and 7 to feet in depth was encountered at borings B3 and B4, respectively. The existing fill encountered is believed to be the result of past grading and construction activities at the site. Deeper fill may exist in other areas of the site that were not directly explored. It is our opinion that the existing fill, in its present condition, is not suitable for direct support of proposed foundations or slabs; however, the existing fill and site soils are suitable for re-use as engineered fill provided the recommendations in the *Grading* section of this report are followed (see Section 6.4).

6.1.3 All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). Prior to placing any fill, the excavation bottom must be proof-rolled in the presence of the Geotechnical Engineer (a representative of Geocon). Recommendations for earthwork are provided in the *Grading* section of this report (see Section 6.4).

6.1.4 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures, which will not be tied to structures, may be supported on conventional foundations bearing on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and proper compaction cannot be performed or is undesirable, foundations may be deepened as necessary to maintain a minimum 12-inch embedment into undisturbed alluvial soils. It is essential that proper drainage be maintained in order to minimize settlements in the soils and any foundations supported therein. If the soils exposed in the excavation bottom are soft or loose, compaction of the soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved in writing by a Geocon representative.

6.1.5 Subsequent to the recommended grading, concrete slabs-on-grade may derive support on newly placed engineered fill. Any soils that are disturbed should be properly compacted for slab support. Where necessary, the existing artificial fill and alluvial soils are suitable for re-use as an engineered fill provided the procedures outlined in the *Grading* section of this report are followed (see Section 6.4).

6.1.6 It is anticipated that stable excavations for the recommended grading associated with the proposed site improvements can be achieved with sloping measures. However, if excavations in close proximity to an adjacent property line and/or structure are required, special excavation measures may be necessary in order to maintain lateral support for offsite improvements. Excavation recommendations are provided in the *Temporary Excavations* section of this report (Section 6.10).

6.1.7 Based on the results of the percolation testing performed at the site, a stormwater infiltration system is not considered feasible for this project. Additional discussion is provided in *Stormwater Infiltration* section of this report (see Section 6.11).

6.1.8 Once the design configuration for the proposed improvements proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary.

6.1.9 Any changes in the design, location or elevation, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

6.2 Soil and Excavation Characteristics

6.2.1 The in-situ soils can be excavated with moderate effort using conventional excavation equipment. Some caving should be anticipated in unshored excavations, especially where granular soils are encountered.

6.2.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable OSHA rules and regulations to maintain safety and maintain the stability of adjacent existing improvements.

6.2.3 All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and existing foundation supports are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of existing structures or the existing foundation support. Penetrations below this 1:1 projection will require special excavation measures. Excavation recommendations are provided in the *Temporary Excavations* section of this report (see Section 6.10).

6.2.4 The upper five feet of site soils encountered during the investigation are considered to have a "moderate" expansive potential (EI = 58) and are classified as "expansive" (EI greater than 20) as defined by 2016 California Building Code (CBC) Section 1803.5.3. Recommendations presented herein assume that foundations and slabs will derive support in these materials.

6.3 Minimum Resistivity and pH

6.3.1 Potential of Hydrogen (pH) and resistivity testing were performed on representative samples of soil to generally evaluate the corrosion potential to surface utilities. The tests were performed in accordance with California Test Method Nos. 643 and 422 and indicate that the soils are considered "severely corrosive" with respect to corrosion of buried ferrous metals on site. The results are presented in Appendix B (Figure B5) and should be considered for design of underground structures. Due to the corrosive potential of the soils, it is recommended that ABS pipes are utilized in lieu of cast-iron for subdrains and retaining wall drains.

6.3.2 Laboratory tests were performed on representative samples of the on-site soil to measure the percentage of water-soluble sulfate content. Results from the laboratory water-soluble sulfate tests are presented in Appendix B (Figure B5) and indicate that the on-site soil possess a "negligible" sulfate exposure to concrete structures as defined by 2016 CBC Section 1904 and ACI 318-11 Sections 4.2 and 4.3.

6.3.3 Geocon West, Inc. does not practice in the field of corrosion engineering and mitigation. If corrosion sensitive improvements are planned, it is recommended that a corrosion engineer be retained to evaluate corrosion test results and incorporate the necessary precautions to avoid premature corrosion of buried metal pipes and concrete structures in direct contact with the soils.

6.4 Grading

6.4.1 Grading is anticipated to include excavation and compaction of site soils for proposed walkway slab-on-grade, installation of the shallow stormwater infiltration system, and excavation and backfill of utility trenches.

6.4.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer, geotechnical engineer, and, if applicable, building official in attendance. Special soil handling requirements can be discussed at that time.

6.4.3 Earthwork should be observed, and compacted fill tested by representatives of Geocon West, Inc. The existing fill encountered during exploration is suitable for re-use as an engineered fill, provided any encountered oversize material (greater than 6 inches) and any encountered deleterious debris are removed.

6.4.4 Grading should commence with the removal of all existing vegetation and existing improvements from the area to be graded. Deleterious debris such as wood and root structures should be exported from the site and should not be mixed with the fill soils. Asphalt and concrete should not be mixed with the fill soils unless approved by the Geotechnical Engineer. All existing underground improvements planned for removal should be completely excavated and the resulting depressions properly backfilled in accordance with the procedures described herein. Once a clean excavation bottom has been established it must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.).

6.4.5 All excavations must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon). Prior to placing any fill, the excavation bottom must be proof-rolled with heavy equipment in the presence of the Geotechnical Engineer (a representative of Geocon West, Inc.).

6.4.6 The City of Los Angeles Department of Building and Safety requires a minimum compactive effort of 95 percent of the laboratory maximum dry density in accordance with ASTM D 1557 (latest edition) where the soils to be utilized in the fill have less than 15 percent finer than 0.005 millimeters. Soils with more than 15 percent finer than 0.005 millimeters may be compacted to 90 percent of the laboratory maximum dry density in accordance with ASTM D 1557 (latest edition). It is anticipated that the soils encountered by this firm would require the minimum 95 percent compaction requirement. All fill and backfill soils should be placed in horizontal loose layers approximately 6 to 8 inches thick, moisture conditioned to optimum moisture content, and properly compacted to the required degree of compaction in accordance with ASTM D 1557 (latest edition).

6.4.7 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and compaction cannot be performed or is undesirable, such as adjacent to property lines, foundations may be deepened as necessary to maintain a minimum 12-inch embedment into the undisturbed alluvial soils. It is essential that proper drainage be maintained in order to minimize settlements in the soils and any foundations supported therein. If the soils exposed in the excavation bottom are soft, compaction of the soft soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative.

6.4.8 Where new concrete slab-on-grade is to be constructed, it is recommended that any soils disturbed during construction activities be properly compacted for slab support. The concrete slab-on-grade should derive support on newly placed engineered fill.

6.4.9 Utility trenches should be properly backfilled in accordance with the requirements of the Green Book (latest edition). The pipe should be bedded with clean sands (Sand Equivalent greater than 30) to a depth of at least one foot over the pipe, and the bedding material must be inspected and approved in writing by the Geotechnical Engineer (a representative of Geocon). The use of gravel is not acceptable unless used in conjunction with filter fabric to prevent the gravel from having direct contact with soil. The remainder of the trench backfill may be derived from onsite soil or approved import soil, compacted as necessary, until the required compaction is obtained. The use of minimum 2-sack slurry is also acceptable as backfill (see Section 6.5). Prior to placing any bedding materials or pipes, the excavation bottom must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon).

6.4.10 Although not anticipated for this project, all imported fill shall be observed, tested, and approved by Geocon West, Inc. prior to bringing soil to the site. Rocks larger than 6 inches in diameter shall not be used in the fill. If necessary, import soils used as structural fill should have an expansion index less than 50 and corrosivity properties that are equally or less detrimental to that of the existing onsite soils (see Figure B5).

6.4.11 All trench and foundation excavation bottoms must be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon), prior to placing bedding materials, fill, steel, gravel, or concrete.

6.5 Controlled Low Strength Material (CLSM)

6.5.1 Controlled Low Strength Material (CLSM) may be utilized in lieu of compacted soil as engineered fill where approved in writing by the Geotechnical Engineer. Where utilized within the City of Los Angeles use of CLSM is subject to the following requirements:

Standard Requirements

1. CLSM shall be ready-mixed by a City of Los Angeles approved batch plant;
2. CLSM shall not be placed on uncertified fill, on incompetent natural soil, nor below water;
3. CLSM shall not be placed on a sloping surface with a gradient steeper than 5:1 (horizontal to vertical);
4. Placement of the CLSM shall be under the continuous inspection of a concrete deputy inspector;
5. The excavation bottom shall be accepted by the soil engineer and the City Inspector prior to placing CLSM.

Requirements for CLSM that will be used for support of footings

1. The cement content of the CLSM shall not be less than 188 pounds per cubic yard (min. 2 sacks);
2. The excavation bottom must be level, cleaned of loose soils and approved in writing by Geocon prior to placement of the CLSM;
3. The ultimate compressive strength of the CLSM shall be no less than 100 pounds per square inch (psi) when tested on the 28th-day per ASTM D4832 (latest edition), Standard Test Method for Preparation and Testing of Controlled Low Strength Material Test Cylinders. Compression testing will be performed in accordance with ASTM C39 and City of Los Angeles requirements;
4. Samples of the CLSM will be collected during placement, a minimum of one test (two cylinders) for each 50 cubic yards or fraction thereof;
5. Overexcavation for CLSM placement shall extend laterally beyond the footprint of any proposed footings as required for placement of compacted fill, unless justified otherwise by the soil engineer that footings will have adequate vertical and horizontal bearing capacity.

6.6 Shrinkage

6.6.1 Shrinkage results when a volume of material removed at one density is compacted to a higher density. A shrinkage factor between 9 to 26 percent should be anticipated when excavating and compacting the upper 5 feet of existing earth materials on the site to an average relative compaction of 95 percent.

6.7 Miscellaneous Foundations

6.7.1 Foundations for small outlying structures, such as block walls up to 6 feet in height, planter walls or trash enclosures may be supported on conventional foundations bearing on a minimum of 12 inches of newly placed engineered fill. Where excavation and compaction cannot be performed or is undesirable, such as adjacent to property lines, foundations may be deepened as necessary to maintain a minimum 12-inch embedment into the undisturbed alluvial soils. It is essential that proper drainage be maintained in order to minimize settlements in the soils and any foundations supported therein.

6.7.2 If the soils exposed in the excavation bottom are soft, compaction of the soft soils will be required prior to placing steel or concrete. Compaction of the foundation excavation bottom is typically accomplished with a compaction wheel or mechanical whacker and must be observed and approved by a Geocon representative. Miscellaneous foundations may be designed for a bearing value of 1,500 psf, and should be a minimum of 12 inches in width, 24 inches in depth below the lowest adjacent grade and 12 inches into the recommended bearing material. The allowable bearing pressure may be increased by up to one-third for transient loads due to wind or seismic forces.

6.7.3 Foundation excavations should be observed and approved in writing by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to the placement of reinforcing steel and concrete to verify that the excavations and exposed soil conditions are consistent with those anticipated.

6.8 Lateral Design

6.8.1 Resistance to lateral loading may be provided by friction acting at the base of foundations, slabs and by passive earth pressure. An allowable coefficient of friction of 0.35 may be used with the dead load forces in the newly placed engineered fill.

6.8.2 Passive earth pressure for the sides of foundations and slabs poured against the newly placed engineered fill may be computed as an equivalent fluid having a density of 200 pcf with a maximum earth pressure of 2,000 pcf. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

6.9 Concrete Slabs-on-Grade

6.9.1 Subsequent to the recommended grading, exterior concrete slabs-on-grade for walkways or flatwork, not subject to vehicle loading, should be a minimum of 4 inches thick and minimum slab reinforcement should consist of No. 3 steel reinforcing bars placed 18 inches on center in both horizontal directions. Steel reinforcing should be positioned vertically near the slab midpoint. Crack control joints should be spaced at intervals not greater than 10 feet and should be constructed using saw-cuts or other methods as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by the project structural engineer.

6.9.2 Slabs-on-grade at the ground surface that may receive moisture-sensitive floor coverings or may be used to store moisture-sensitive materials should be underlain by a vapor retarder placed directly beneath the slab. The vapor retarder and acceptable permeance should be specified by the project architect or developer based on the type of floor covering that will be installed. The vapor retarder design should be consistent with the guidelines presented in Section 9.3 of the American Concrete Institute's (ACI) *Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials* (ACI 302.2R-06) and should be installed in general conformance with ASTM E 1643 (latest edition) and the manufacturer's recommendations. A minimum thickness of 15 mils extruded polyolefin plastic is recommended; vapor retarders which contain recycled content or woven materials are not recommended. The vapor retarder should have a permeance of less than 0.01 perms demonstrated by testing before and after mandatory conditioning. The vapor retarder should be installed in direct contact with the concrete slab with proper perimeter seal. If the Los Angeles Green Building Code requirements apply to this project, the vapor retarder should be underlain by 4 inches of clean aggregate. It is important that the vapor retarder be puncture

resistant since it will be in direct contact with angular gravel. As an alternative to the clean aggregate suggested in the Los Angeles Green Building Code, it is our opinion that the concrete slab-on-grade may be underlain by a vapor retarder over 4 inches of clean sand (sand equivalent greater than 30), since the sand will serve a capillary break and will minimize the potential for punctures and damage to the vapor barrier.

6.9.3 For seismic design purposes, a coefficient of friction of 0.35 may be utilized between concrete slabs and subgrade soils without a moisture barrier, and 0.15 for slabs underlain by a moisture barrier.

6.9.4 The recommendations of this report are intended to reduce the potential for cracking of slabs due to settlement. However, even with the incorporation of the recommendations presented herein, foundations and slabs-on-grade may exhibit some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

6.10 Temporary Excavations

6.10.1 Excavations of less than 7 feet in vertical height are anticipated during grading. The excavations are expected to expose artificial fill and alluvial soils, which may be suitable for vertical excavations up to 5 feet where loose soils or caving sands are not present, and where not surcharged by adjacent foundations or other surcharge loads.

6.10.2 Vertical excavations greater than 5 feet will require sloping or shoring measures in order to provide a stable excavation. It is anticipated that stable excavations for the recommended grading can be achieved and maintained with sloping measures. Where sufficient space is available, temporary unsurcharged embankments could be sloped back at a uniform 1:1 slope gradient or flatter. A uniform slope does not have a vertical portion.

6.10.3 Where sloped embankments are utilized, the top of the slope should be barricaded to prevent vehicles and storage loads at the top of the slope within a horizontal distance equal to the height of the slope. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. Geocon personnel should inspect the soils exposed in the cut slopes during excavation so that modifications of the slopes can be made if variations in the soil conditions occur. All excavations should be stabilized within 30 days of initial excavation.

6.11 Stormwater Infiltration

6.11.1 During the December 4 and 5, 2017, site exploration, borings B1, B3, B5, and B7 were utilized to perform percolation testing. The borings were advanced to the depth listed in the table below. Slotted casings were placed in the borings, and the annular space between the casings and excavations were filled with gravel. The borings were then filled with water to pre-saturate the soils. During the site exploration, the casings were refilled with water and percolation test readings were performed after repeated flooding of the cased excavations. Based on the test results, the measured percolation rate and design infiltration rate, for the earth materials encountered, are provided in the following table. These values have been calculated in accordance with the Boring Percolation Test Procedure in the County of Los Angeles Department of Public Works GMED *Guidelines for Geotechnical Investigation and Reporting, Low Impact Development Stormwater Infiltration* (June 2017). Percolation test field data and calculations of the measured percolation rates and design infiltration rates are provided on Figures 3 through 6.

Boring	Soil Type	Infiltration Depth (ft)	Measured Percolation Rate (in / hour)	Design Infiltration Rate (in / hour)
B1	Silty Sand (SM)	½ - 5	0.11	0.03
B3	Silty Sand (SM)	½ - 5	1.11	0.28
B5	Sandy Silt (ML)	½ - 5	0.07	0.02
B7	Sandy Silt (ML)	½ - 5	0.73	0.18

6.11.2 The results of the percolation testing indicate that soils at the locations and depths listed in the table above are very low to minimally conductive to infiltration. These infiltration rates are considered to be slow and are likely the result of the finer-grained soils that are present at the testing depths. Fine-grained soils are typically not conducive to rapid infiltration. Based on these considerations, a stormwater infiltration system is likely not feasible for this project; however, the project civil engineer should evaluate these results.

6.12 Surface Drainage

6.12.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the original designed engineering properties. Proper drainage should be maintained at all times.

6.12.2 All site drainage should be collected and controlled in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable standards. In addition, drainage should not be allowed to flow uncontrolled over any descending slope. Discharge from downspouts, roof drains and scuppers are not recommended onto unprotected soils within 5 feet of the building perimeter. Planters which are located adjacent to foundations should be sealed to prevent moisture intrusion into the soils providing foundation support. Landscape irrigation is not recommended within 5 feet of the building perimeter footings except when enclosed in protected planters.

6.12.3 Positive site drainage should be provided away from structures, pavement, and the tops of slopes to swales or other controlled drainage structures. The building pad and pavement areas should be fine graded such that water is not allowed to pond.

6.12.4 Landscaping planters immediately adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Either a subdrain, which collects excess irrigation water and transmits it to drainage structures, or an impervious above-grade planter boxes should be used. In addition, where landscaping is planned adjacent to the pavement, it is recommended that consideration be given to providing a cutoff wall along the edge of the pavement that extends at least 12 inches below the base material.

6.13 Plan Review

6.13.1 Grading, and, if applicable, shoring and foundation plans should be reviewed by the Geotechnical Engineer (a representative of Geocon West, Inc.), prior to finalization to verify that the plans have been prepared in substantial conformance with the recommendations of this report and to provide additional analyses or recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon West, Inc. should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon West, Inc.

2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The findings of this report are valid as of the date of this report. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

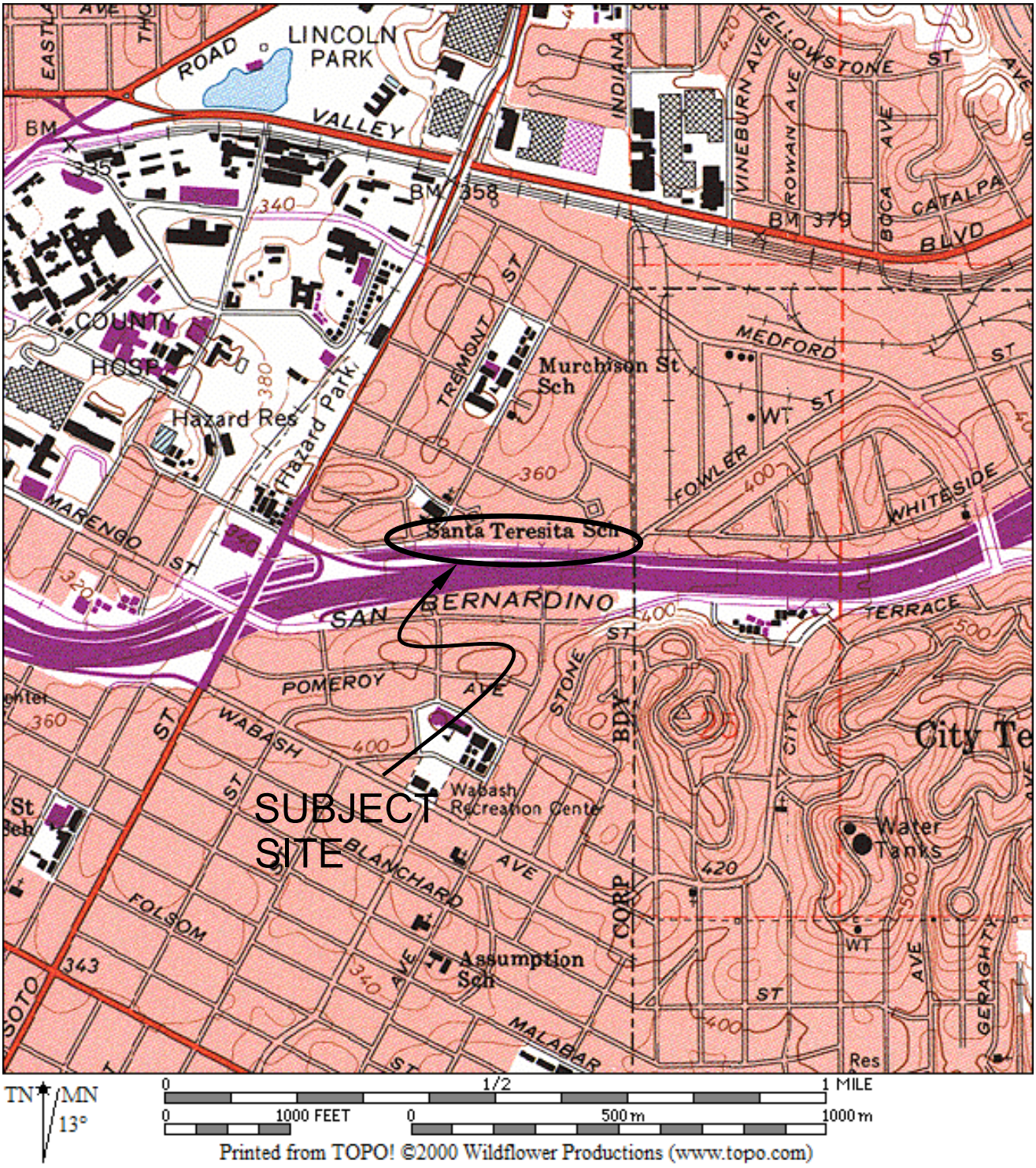
4. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

REFERENCES

California Division of Mines and Geology, 1999; *State of California Seismic Hazard Zones, Los Angeles Quadrangle,* Official Map Released March 25, 1999.

California Division of Mines and Geology, 1998, *Seismic Hazard Evaluation of the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California,* Open-File Report 98-20.

California Geological Survey, 2012, *Geologic Compilation of Quaternary Surficial Deposits in Southern California, Los Angeles 30' X 60' Quadrangle*, A Project for the Department of Water Resources by the California Geological Survey, Compiled from existing sources by Trinda L. Bedrossian, CEG and Peter D. Roffers, CGS Special Report 217, Plate 9, Scale 1:100,000.



REFERENCE:U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES, LOS ANGELES, CA QUADRANGLE

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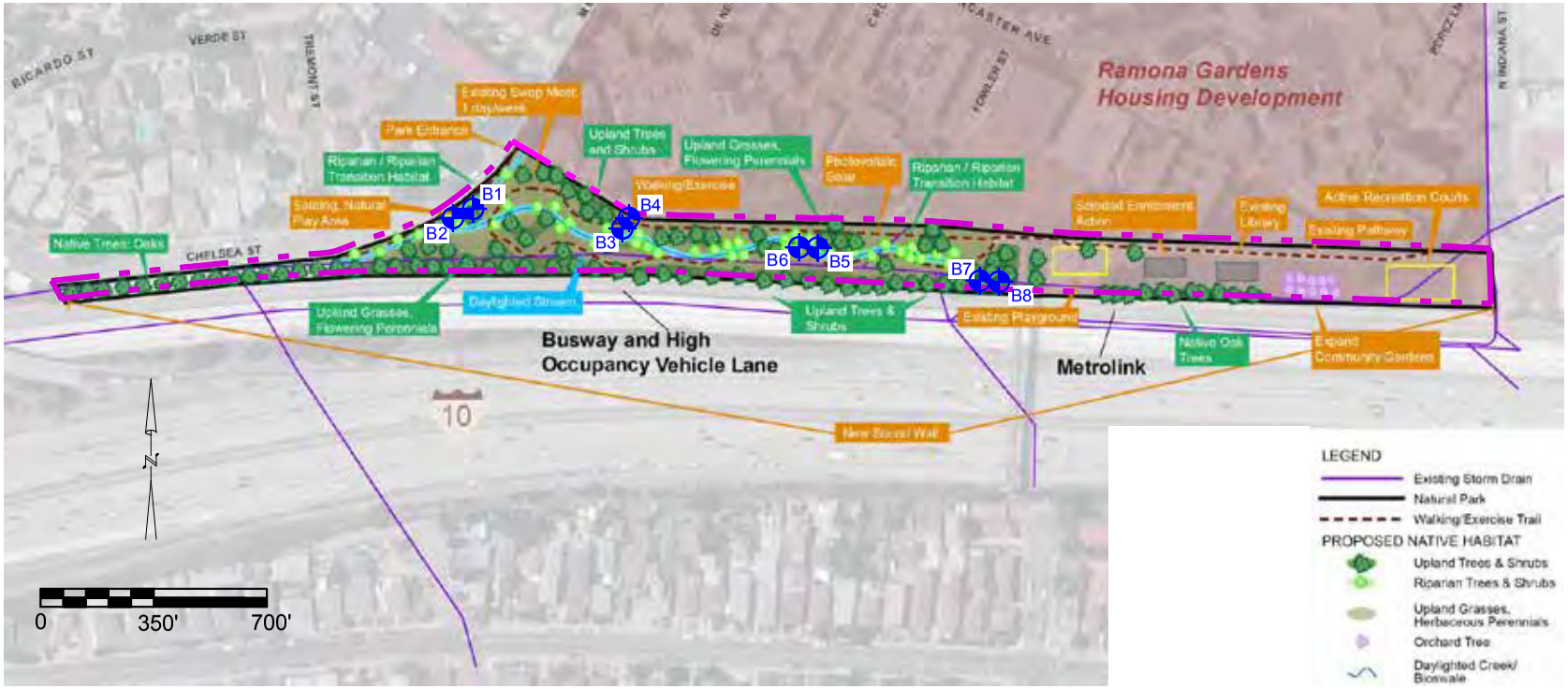
VICINITY MAP

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018	PROJECT NO. A9685-06-01	FIG. 1

REFERENCE: COMMUNITY CONSERVATION SOLUTIONS, RAMONA GARDENS HOUSING PROJECT AND BOYLE HEIGHTS: PROPOSED RAMONA GARDENS NATURAL PARK



LEGEND

B8 — Boring Location and Number

Limits of Proposed Improvements

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SITE PLAN

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018	PROJECT NO. A9685-06-01	FIG. 2

BORING PERCOLATION TEST FIELD LOG

Date:	12/4/2017	**Boring/Test Number:**	Boring 1	
Project Number:	A9685-06-01	**Diameter of Boring:**	4	inches
Project Location:	Ramona Gardens Park	**Diameter of Casing:**	2	inches
Earth Description:	SM	**Depth of Boring:**	5	feet
Tested By:	SRH	**Depth to Invert of BMP:**	n/a	feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	n/a	feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	6	inches
Start Time for Pre-Soak:	8:30 AM	**Water Remaining in Boring (Y/N):**	Yes	
Start Time for Standard:	9:40 AM	**Standard Time Interval Between Readings:**	30 min	

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	9:40 AM	10:10 AM	30	4.1	
2	10:13 AM	10:43 AM	30	3.2	
3	10:50 AM	11:20 AM	30	2.9	
4	11:22 AM	11:52 AM	30	3.1	
5	11:54 AM	12:24 PM	30	3.1	
6	12:26 PM	12:56 PM	30	3.0	Stabilized Readings
7	12:58 PM	1:28 PM	30	2.9	Achieved with Readings
8	1:30 PM	2:00 PM	30	2.9	3 through 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 2 inches

Test Section Height, h: 54.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **691** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V =	**38**	in^3	Percolation Rate =	**0.11**	inches/hour
Reading 7	V =	**36**	in^3	Percolation Rate =	**0.11**	inches/hour
Reading 8	V =	**36**	in^3	Percolation Rate =	**0.11**	inches/hour

Measured Percolation Rate = **0.11** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t + RF_v + RF_s$$

Total Reduction Factor = 4

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate\ /RF$$

Design Infiltration Rate = **0.03** inches/hour

FIGURE 3

BORING PERCOLATION TEST FIELD LOG

Date:	12/6/2017	**Boring/Test Number:**	Boring 3	
Project Number:	A9685-06-01	**Diameter of Boring:**	4	inches
Project Location:	Ramona Gardens Park	**Diameter of Casing:**	2	inches
Earth Description:	SM	**Depth of Boring:**	5	feet
Tested By:	SRH	**Depth to Invert of BMP:**	n/a	feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	n/a	feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	6	inches
Start Time for Pre-Soak:	7:35 AM	**Water Remaining in Boring (Y/N):**	Yes	
Start Time for Standard:	8:38 AM	**Standard Time Interval Between Readings:**	30 min	

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	8:38 AM	9:08 AM	30	32.5	
2	9:11 AM	9:41 AM	30	31.0	
3	9:43 AM	10:13 AM	30	32.1	
4	10:15 AM	10:45 AM	30	31.5	
5	10:48 AM	11:18 AM	30	31.1	
6	11:21 AM	11:51 AM	30	30.7	Stabilized Readings
7	11:53 AM	12:23 PM	30	30.4	Achieved with Readings
8	12:26 PM	12:56 PM	30	30.1	2 through 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 2 inches

Test Section Height, h: 54.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **691** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V =	**386**	in^3	Percolation Rate =	**1.12** inches/hour
Reading 7	V =	**382**	in^3	Percolation Rate =	**1.11** inches/hour
Reading 8	V =	**378**	in^3	Percolation Rate =	**1.09** inches/hour

Measured Percolation Rate = **1.11** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t + RF_v + RF_s$$

Total Reduction Factor = 4

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate\ /RF$$

Design Infiltration Rate = **0.28** inches/hour

FIGURE 4

BORING PERCOLATION TEST FIELD LOG

Date:	12/5/2017	**Boring/Test Number:**	Boring 5	
Project Number:	A9685-06-01	**Diameter of Boring:**	4	inches
Project Location:	Ramona Gardens Park	**Diameter of Casing:**	2	inches
Earth Description:	ML	**Depth of Boring:**	5	feet
Tested By:	SRH	**Depth to Invert of BMP:**	n/a	feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	n/a	feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	6	inches
Start Time for Pre-Soak:	7:53 AM	**Water Remaining in Boring (Y/N):**	Yes	
Start Time for Standard:	8:55 AM	**Standard Time Interval Between Readings:**	30 min	

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	8:55 AM	9:25 AM	30	2.2	
2	9:27 AM	9:57 AM	30	1.9	
3	9:54 AM	10:24 AM	30	1.8	
4	10:30 AM	11:00 AM	30	1.9	
5	11:01 AM	11:31 AM	30	1.9	
6	11:32 AM	12:02 PM	30	1.9	Stabilized Readings
7	12:04 PM	12:34 PM	30	1.8	Achieved with Readings
8	12:36 PM	1:06 PM	30	1.9	2 through 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 2 inches

Test Section Height, h: 54.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **691** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V =	**24**	in^3	Percolation Rate =	**0.07**	inches/hour
Reading 7	V =	**23**	in^3	Percolation Rate =	**0.07**	inches/hour
Reading 8	V =	**24**	in^3	Percolation Rate =	**0.07**	inches/hour

Measured Percolation Rate = **0.07** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t + RF_v + RF_s$$

Total Reduction Factor = 4

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate\ /RF$$

Design Infiltration Rate = **0.02** inches/hour

FIGURE 5

BORING PERCOLATION TEST FIELD LOG

Date:	12/4/2017	**Boring/Test Number:**	Boring 7	
Project Number:	A9685-06-01	**Diameter of Boring:**	4	inches
Project Location:	Ramona Gardens Park	**Diameter of Casing:**	2	inches
Earth Description:	ML	**Depth of Boring:**	5	feet
Tested By:	SRH	**Depth to Invert of BMP:**	n/a	feet
Liquid Description:	Clear Clean Tap Water	**Depth to Water Table:**	n/a	feet
Measurement Method:	Sounder	**Depth to Initial Water Depth (d_1):**	6	inches
Start Time for Pre-Soak:	9:56 AM	**Water Remaining in Boring (Y/N):**	Yes	
Start Time for Standard:	11:12 AM	**Standard Time Interval Between Readings:**	30 min	

Reading Number	Time Start (hh:mm)	Time End (hh:mm)	Elapsed Time Δtime (min)	Water Drop During Standard Time Interval, Δd (in)	Soil Description Notes Comments
1	11:12 AM	11:42 AM	30	17.6	
2	11:46 AM	12:16 PM	30	15.9	
3	12:18 PM	12:48 PM	30	17.1	
4	12:50 PM	1:20 PM	30	19.2	
5	1:23 PM	1:53 PM	30	20.1	
6	1:56 PM	2:26 PM	30	19.9	Stabilized Readings
7	2:29 PM	2:59 PM	30	20.2	Achieved with Readings
8	3:02 PM	3:32 PM	30	20.0	5 through 8

MEASURED PERCOLATION RATE & DESIGN INFILTRATION RATE CALCULATIONS*

* Calculations Below Based on Stabilized Readings Only

Boring Radius, r: 2 inches

Test Section Height, h: 54.0 inches

$$Test\ Section\ Surface\ Area, A = 2\pi rh + \pi r^2$$

A = **691** in^2

$$Discharged\ Water\ Volume, V = \pi r^2 \Delta d$$

$$Percolation\ Rate = \left(\frac{V/A}{\Delta T}\right)$$

Reading 6	V =	**250**	in^3	Percolation Rate = **0.72**	inches/hour
Reading 7	V =	**254**	in^3	Percolation Rate = **0.73**	inches/hour
Reading 8	V =	**251**	in^3	Percolation Rate = **0.73**	inches/hour

Measured Percolation Rate = **0.73** inches/hour

Reduction Factors

Boring Percolation Test, RF_t = 2

Site Variability, RF_v = 1

Long Term Siltation, RF_s = 1

$$Total\ Reduction\ Factor, RF = RF_t + RF_v + RF_s$$

Total Reduction Factor = 4

Design Infiltration Rate

$$Design\ Infiltration\ Rate = Measured\ Percolation\ Rate\ /RF$$

Design Infiltration Rate = **0.18** inches/hour

FIGURE 6

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

The site was explored on December 4 and 5, 2017, by excavating eight 4-inch diameter borings utilizing hand auger equipment and hand tools. The borings were advanced to a maximum depth of 15½ feet below the existing ground surface using manual auger equipment and digging tools. Representative and relatively undisturbed samples were obtained by driving a 3-inch, O. D., sampler into the "undisturbed" soil mass with blows from a slide hammer. The sampler was equipped with 1-inch by 2⅜-inch brass sampler rings to facilitate removal and testing. Bulk samples were also obtained.

The soil conditions encountered in the borings were visually examined, classified and logged in general accordance with the Unified Soil Classification System (USCS). Logs of the borings are presented on Figures A1 through A8. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained. The locations of the borings are shown on Figure 2.

BORING B1

ELEV. (MSL.) -- DATE COMPLETED **12/4/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, brown, fine-grained, some rootlets.			
2				SP-SM	**ALLUVIUM** Sand with Silt, poorly graded, medium dense, slightly moist, light brown, fine- to medium-grained.			
4					Total depth of boring: 5 feet Fill to 2 feet. No groundwater encountered. Percolation testing performed on 12/4/17. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A1,
Log of Boring B1, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B2

ELEV. (MSL.) -- DATE COMPLETED **12/4/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	BULK 0-5'				**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, brown, fine-grained, trace rootlets.			
2					**ALLUVIUM** Sand with Silt, poorly graded, medium dense, slightly moist, light brown, fine- to medium-grained.			
4								
6	B2@5'			SP-SM	- decrease in silt, some coarse-grained		86.9	18.6
8					- some fine gravel (to ½")			
10	B2@10'			ML	Sandy Silt, firm, moist, olive brown, fine- to medium-grained.		108.5	16.3
12								
14	B2@15'						89.0	33.5
					Total depth of boring: 15.5 feet Fill to 2 feet. No groundwater encountered. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A2,
Log of Boring B2, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B3

ELEV. (MSL.) -- DATE COMPLETED **12/4/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, light yellowish brown, fine- to medium-grained, some gravel (to 1").			
2								
4								
					Total depth of boring: 5 feet Fill to 5 feet. No groundwater encountered. Percolation testing performed on 12/6/17. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A3,
Log of Boring B3, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B4

ELEV. (MSL.) -- DATE COMPLETED **12/4/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	BULK 0-5'				**ARTIFICIAL FILL** Silty Sand, poorly graded, medium dense, slightly moist, light yellowish brown, fine- to medium-grained, some gravel (to 1").			
2								
4								
6	B4@5'						87.8	16.6
8				ML	**ALLUVIUM** Sandy Silt, firm, moist, dark brown, fine-grained.			
10	B4@10'			SM	Silty Sand, poorly graded, medium dense, slightly moist, dark brown, fine-grained.		109.7	15.2
12								
14				ML	Sandy Silt, firm, slightly moist, dark brown, fine-grained.			
	B4@15'						102.9	22.5
					Total depth of boring: 15.5 feet Fill to 7 feet. No groundwater encountered. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A4,
Log of Boring B4, Page 1 of 1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B5

ELEV. (MSL.) -- DATE COMPLETED **12/5/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ARTIFICIAL FILL** Sandy Silt, soft, wet, dark brown, fine- to medium-grained, some fine to coarse gravel (to 1"), some rootlets.			
2				ML	**ALLUVIUM** Sandy Silt, firm, moist, light brown, fine- to medium-grained, some fine gravel (to ½").			
4					Total depth of boring: 5 feet Fill to 2 feet. No groundwater encountered. Percolation testing performed on 12/5/17. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A5,
Log of Boring B5, Page 1 of 1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B6

ELEV. (MSL.) -- DATE COMPLETED **12/5/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	BULK 0-5'				**ARTIFICIAL FILL** Sandy Silt, soft, wet, dark brown, fine- to medium-grained, some rootlets.			
2					**ALLUVIUM** Sandy Silt, firm, moist, light brown, fine- to medium-grained, some fine gravel (to ½").			
4								
6	B6@5'						95.7	20.8
8				ML	- decrease in sand, dark brown			
10	B6@10'				- brown		109.8	17.1
12								
14								
	B6@15'				- increase in sand		106.9	10.3
					Total depth of boring: 15.5 feet Fill to 2 feet. No groundwater encountered. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A6,
Log of Boring B6, Page 1 of 1

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	BORING B7	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) -- DATE COMPLETED **12/5/17** EQUIPMENT **HAND AUGER** BY: **SRH**			
					MATERIAL DESCRIPTION			
0					**ARTIFICIAL FILL** Sandy Silt, soft, wet, dark brown, fine- to medium-grained.			
2				ML	**ALLUVIUM** Sandy Silt, firm, moist, brown, fine- to coarse-grained.			
4								
					Total depth of boring: 5 feet Fill to 2 feet. No groundwater encountered. Percolation testing performed on 12/4/17. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A7,
Log of Boring B7, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B8

ELEV. (MSL.) -- DATE COMPLETED **12/5/17**

EQUIPMENT **HAND AUGER** BY: **SRH**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT*)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	BULK 0-5'				**ARTIFICIAL FILL** Sandy Silt, soft, wet, dark brown, fine- to medium-grained.			
2					**ALLUVIUM** Sandy Silt, firm, moist, brown, fine- to coarse-grained, trace fine gravel (to ½").			
4								
6	B8@5'						106.6	16.0
8				ML	- some oxidation staining			
10	B8@10'				- decrease in sand, dark olive brown		104.5	19.1
12								
14					Silty Sand, poorly graded, dense, slightly moist, brown, fine- to medium-grained.			
	B8@15'			SM			82.3	6.6
					Total depth of boring: 15.5 feet Fill to 2 feet. No groundwater encountered. Backfilled with soil cuttings and tamped.			

A9685-06-01 BORING LOGS.GPJ

Figure A8,
Log of Boring B8, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

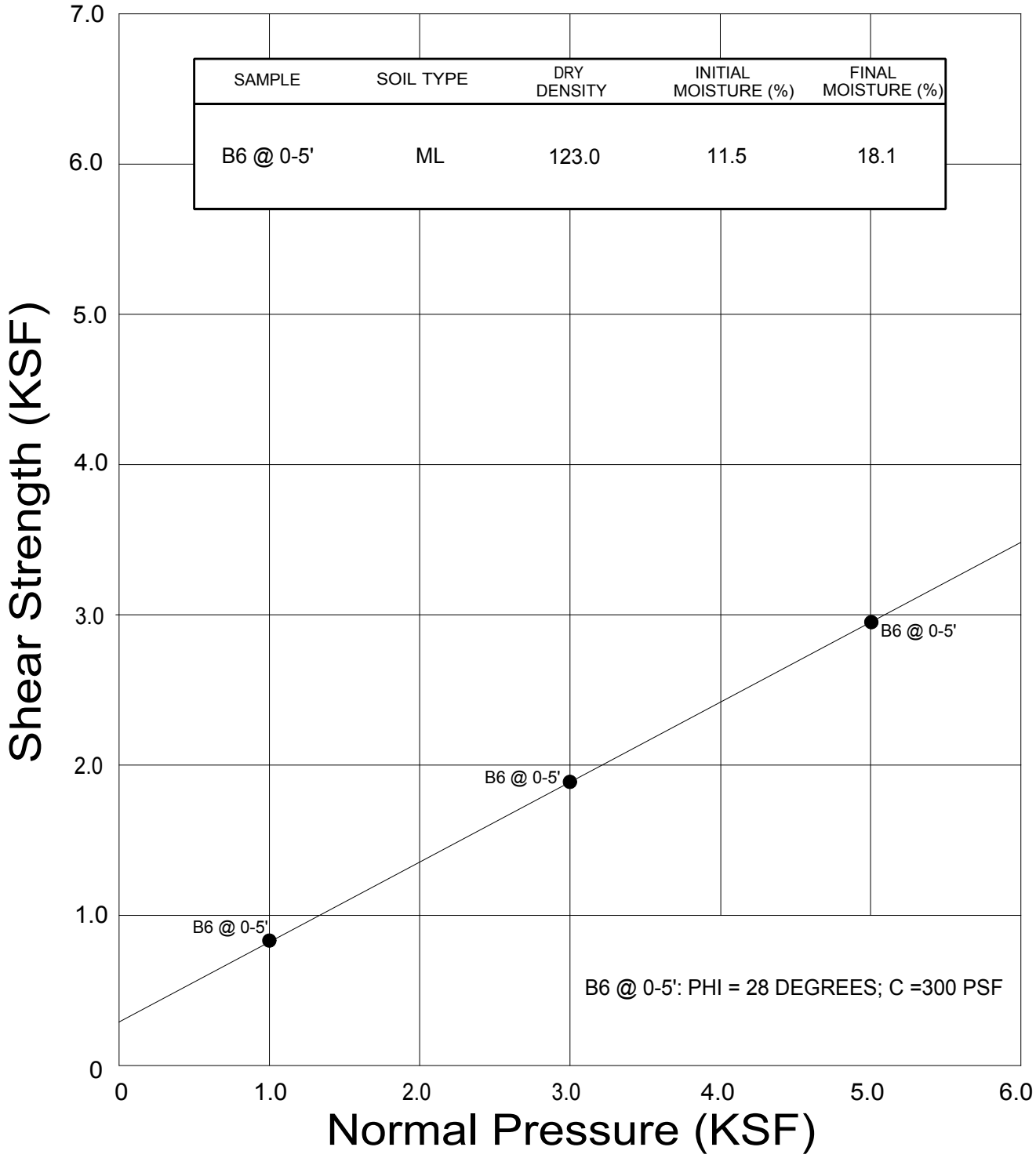
APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the ASTM International, or other suggested procedures. Selected samples were tested for direct shear strength, consolidation, compaction, corrosivity, and in-place dry density and moisture content. The results of the laboratory tests are summarized in Figures B1 through B5. The in-place dry density and moisture content of the samples tested are presented on the boring logs, Appendix A.

SAMPLE	SOIL TYPE	DRY DENSITY	INITIAL MOISTURE (%)	FINAL MOISTURE (%)
B6 @ 0-5'	ML	123.0	11.5	18.1



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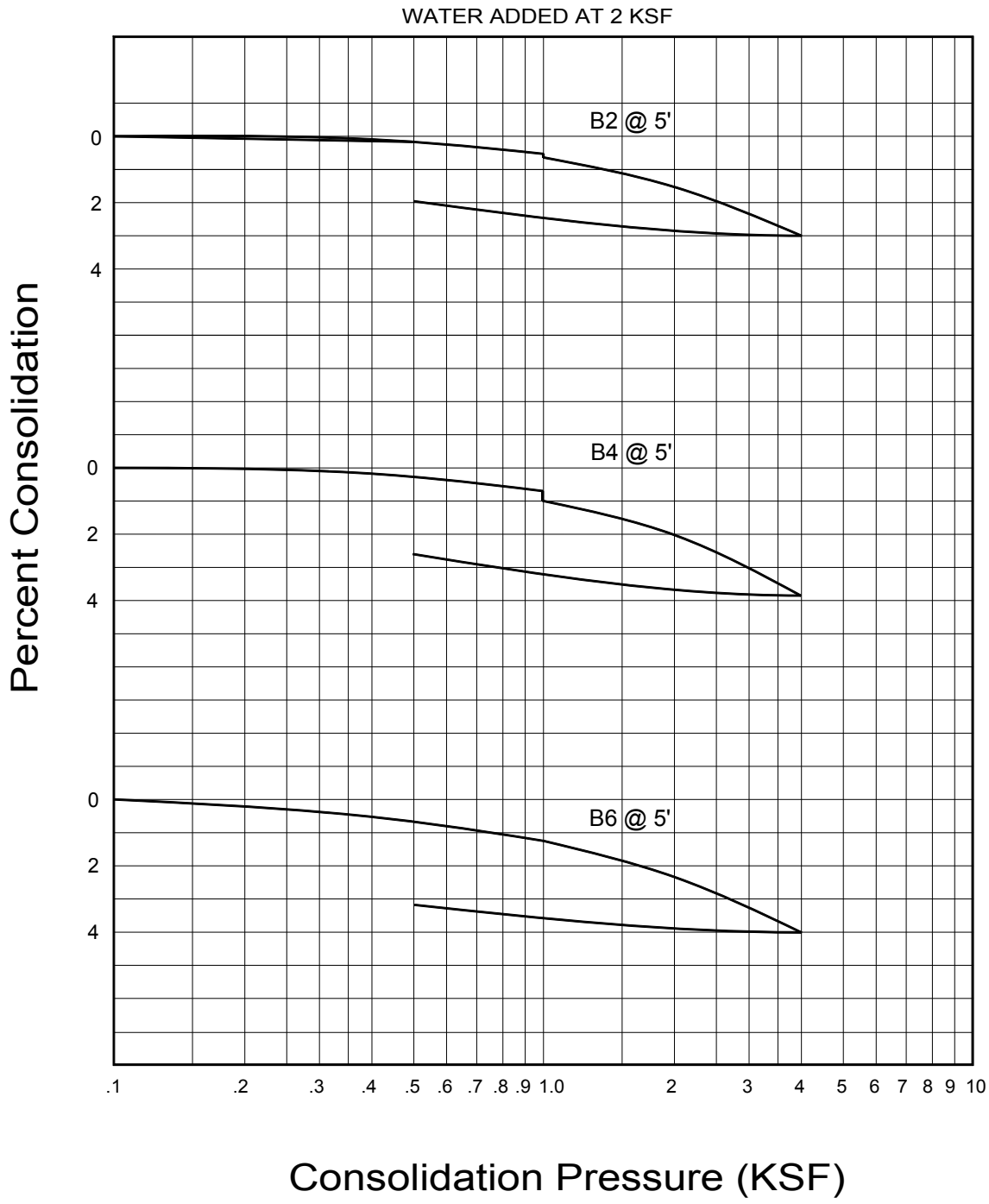
PHONE (818) 841-8388 - FAX (818) 841-1704

DIRECT SHEAR TEST RESULTS

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

DRAFTED BY: JMH	CHECKED BY: HHD

JAN. 2018	PROJECT NO. A9685-06-01	FIG. B1



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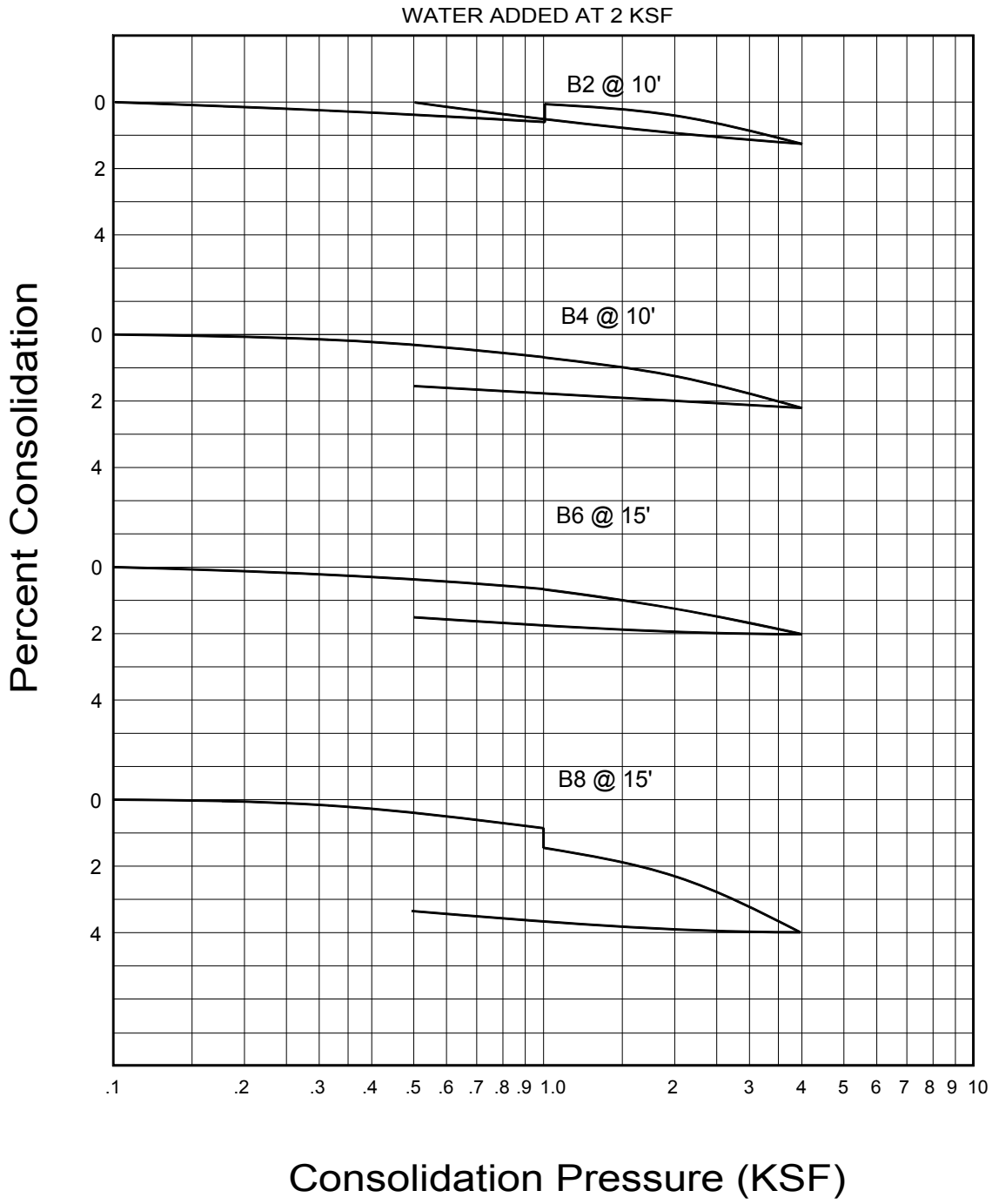
DRAFTED BY: JMH	CHECKED BY: HHD

CONSOLIDATION TEST RESULTS

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018	PROJECT NO. A9685-06-01	FIG. B2



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DRAFTED BY: JMH	CHECKED BY: HHD

CONSOLIDATION TEST RESULTS

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018	PROJECT NO. A9685-06-01	FIG. B3

SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS
ASTM D 4829-11

Sample No.	Moisture Content (%)		Dry Density (pcf)	Expansion Index	*UBC Classification	**CBC Classification
	Before	After				
B6 @ 0-5'	10.7	24.0	107.8	58	Moderate	Expansive

* Reference: 1997 Uniform Building Code, Table 18-I-B.

** Reference: 2016 California Building Code, Section 1803.5.3

SUMMARY OF LABORATORY MAXIMUM DENSITY AND AND OPTIMUM MOISTURE CONTENT TEST RESULTS
ASTM D 1557-12

Sample No.	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
B6 @ 0-5'	Brown Sandy Silt	123.0	12.0

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DRAFTED BY: JMH | CHECKED BY: HHD

LABORATORY TEST RESULTS

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018 | PROJECT NO. A9685-06-01 | FIG. B4

SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS CALIFORNIA TEST NO. 643

Sample No.	pH	Resistivity (Ohm Centimeters)
B6 @ 0-5'	6.72	830 (Severly Corrosive)

SUMMARY OF LABORATORY CHLORIDE CONTENT TEST RESULTS EPA NO. 325.3

Sample No.	Chloride Ion Content (%)
B6 @ 0-5'	0.007

SUMMARY OF LABORATORY WATER SOLUBLE SULFATE TEST RESULTS CALIFORNIA TEST NO. 417

Sample No.	Water Soluble Sulfate (% SO_4)	Sulfate Exposure*
B6 @ 0-5'	0.002	Negligible

* Reference: 2016 California Building Code, Section 1904.3 and ACI 318-11 Section 4.3.

GEOCON WEST, INC.

ENVIRONMENTAL GEOTECHNICAL MATERIALS
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA 91504
PHONE (818) 841-8388 - FAX (818) 841-1704

DRAFTED BY: JMH | CHECKED BY: HHD

CORROSIVITY TEST RESULTS

SWA GROUP
RAMONA GARDENS NATURAL PARK
RAMONA GARDENS HOUSING DEVELOPMENT
LOS ANGELES, CALIFORNIA

JAN. 2018 | PROJECT NO. A9685-06-01 | FIG. B5

APPENDIX C

FGL ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

December 21, 2017

Geocon West, Inc.
Attn: Neal Berliner
3303 North San Fernando Blvd.
Burbank, CA 91504-2531

Lab ID : SP 1715250-001
Customer ID : 2-23559

Sampled On : December 4, 2017
Sampled By : Sean Hemmer
Received On : December 13, 2017
Depth : 0-60"

Description : B1 Project No. A9685-06-01
Project : Proposed Constrruction Area

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation
				Very Low / Moderately Low / Optimum / Moderately High / Very High
Primary Nutrients				
Nitrate-Nitrogen	0.634	Lbs/1000ft	2.2 - 4.0	
Phosphorus-P_2O_5	1.90	Lbs/1000ft	5.6 - 7.8	
Potassium-K_2O (Exch)	16.9	Lbs/1000ft	14 - 83	
Potassium-K_2O (Sol)	0.52	Lbs/1000ft	4.1 - 13	0%
Secondary Nutrients				
Calcium (Exch)	440	Lbs/1000ft	350 - 470	
Calcium (Sol)	49.3	Lbs/1000ft	5.3 - 16	39%
Magnesium (Exch)	67.0	Lbs/1000ft	36 - 72	
Magnesium (Sol)	16.2	Lbs/1000ft	1.1 - 4.4	21%
Sodium (Exch)	37.8	Lbs/1000ft	0.0 - 34	
Sodium (Sol)	56.2	Lbs/1000ft	0.0 - 57	39%
Sulfate	224	Lbs/1000ft	36 - 120	
Micro Nutrients				
Zinc	0.193	Lbs/1000ft	0.14 - 4.0	
Manganese	0.294	Lbs/1000ft	0.28 - 6.0	
Iron	1.08	Lbs/1000ft	1.2 - 7.1	
Copper	0.147	Lbs/1000ft	0.033 - 3.9	
Boron	0.0518	Lbs/1000ft	0.034 - 0.14	
Chloride	39.1	Lbs/1000ft	0.56 - 15	
CEC	32.1	meq/100g	14 - 35	
% Base Saturation				
CEC - Calcium	74.5	%	60 - 80	
CEC - Magnesium	18.7	%	10 - 20	
CEC - Potassium	1.21	%	1.0 - 6.0	
CEC - Sodium	5.58	%	0.0 - 5.0	
CEC - Hydrogen	< 1.00	%	0.0 - 3.0	
				Strongly Acidic / Moderately Acidic / Near Neutral / Moderately Alkaline / Strongly Alkaline
pH	7.67	---	6.5 - 7.5	

Good — Problem — Indicates physical conditions and/or phenological and amendment requirements.

December 21, 2017

Geocon West, Inc.

Lab ID : SP 1715250-001
Customer ID : 2-23559
Description : B1 Project No. A9685-06-01

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation
Others				Satisfactory / Possible Problem / Moderate Problem / Increasing Problem
Soil Salinity	5.38	dS/m	0.0 - 2.0	
SAR	5.9		0.0 - 6.0	
Limestone	0.7	%	0.0 - 0.50	
				0 / 1 / 2 / 3 / 4 / 5 / 6
Lime Requirement	0	Tons/AF	---	
Gypsum Requirement	< 0.50	Tons/AF	---	
				Very Low / Moderately Low / Optimum / Moderately High / Very High
Moisture	16.7	%	4.4 - 31	
				Loamy Sand / Sandy Loam / Loam / Silt Loam / Clay Loam / Clay / Organic
Saturation	44.4	%	40 - 50	

Good — Problem — Indicates physical conditions and/or phenological and amendment requirements.

Note: Soils with gypsum requirements over 10 tons should be applied incrementally at a maximum of 10 tons per acre per year and reanalyzed yearly after each application.

Soil pH & Limestone levels are important to consider when making plant selections. Soil pH levels above 7.0 are not suitable for acid loving plants. Soils containing limestone are not suitable for plants sensitive to Limestone.

FRUIT GROWERS LABORATORY, INC.

Scott Bucy

Scott Bucy, Director of Ag. Services

SB1:EHB

APPENDIX E

Dry Weather Runoff Volume Evaluation and Report

VS2 Consulting
create • restore • thrive

Ramona Gardens Natural Park - Pre-design
2-Apr-18

Task 1.3 - Dry Weather Runoff Monitoring

The proposed Ramona Garden's Natural Park intends to use all dry-weather runoff available from the existing 9'w x 10'-6"h concrete box parallel to Chelsea Street.
The diverted runoff shall be used to offset a portion of the irrigation demand from the proposed natural park.

Downstream Services Inc. (DSI), from Escondido, CA was contracted to measure dry weather runoff in January 2018 prior to any significant rainfall event. *See DSI Report 2017.5.272 attached.*

DSI used manual field measurements (flow width, depth, shape, roughness, and surface velocity) to estimate flow rate.

DSI estimated the dry weather runoff to be between the **observed rate of 0.379 GPM** and a potential rate of 0.758 GPM.

These correspond to 0.000834 CFS and 0.001668 CFS using a conversion rate of 1 GPM = 0.0022 CFS

and 545.76 GPD and 1091.52 GPD using a conversion rate of 1 GPM = 1440 GPD

We expect that as water conservation measures continually improve over time, that the 2018 observed dry-weather runoff will diminish in availability. For the purpose of pre-design we will use a value for available dry-weather runoff of 75% of the observed (545.76 GPD) = 409.32 GPD.

SAY 400 GPD available for irrigation reuse

STORMDRAIN CHANNEL DRY WEATHER FLOW MONITORING

Prepared for: VS2 Consulting

ATTN: Sean Vargas

Date: January 5, 2018

Prepared by: WWW.DOWNSTREAMSERVICES.COM DownStream Services, Inc.

Project No. 2017.5.272

DownStream Services, Inc.
SANITARY SEWER & STORM WATER SPECIALISTS

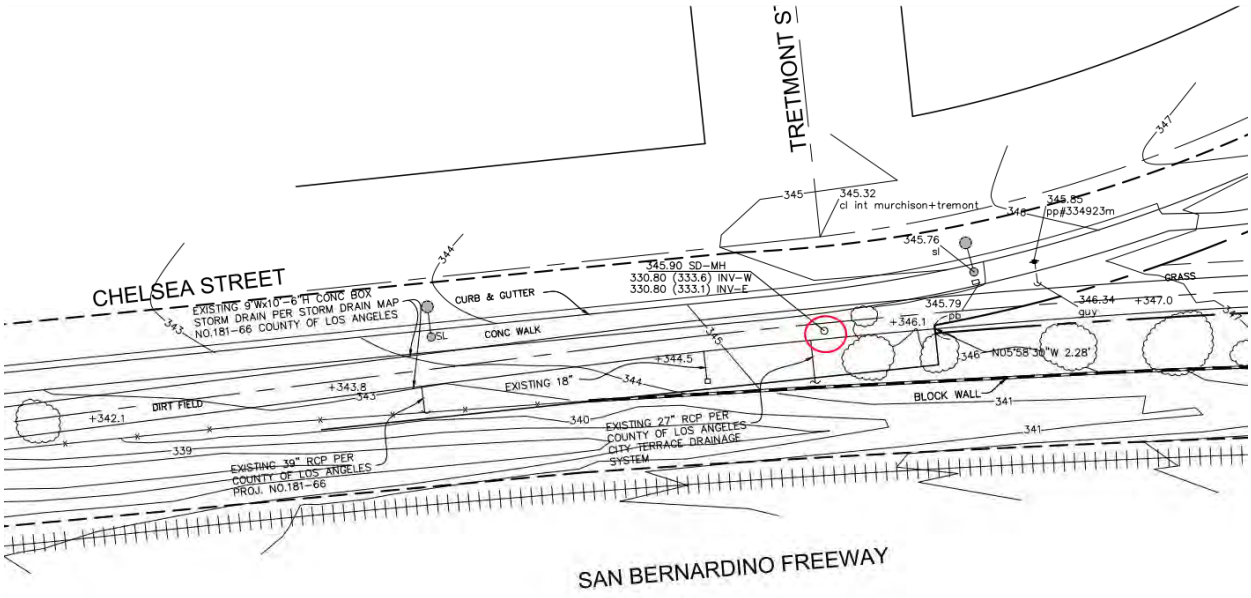
Flow Monitoring Study

Downstream Services, Inc. (DSI) is a San Diego based firm centrally located to provide service to Southern California. We are the largest pipeline inspection and cleaning company in San Diego County. Our personnel are experienced and qualified for pipeline inspections, cleaning, flow monitoring, storm water management, underground repair, and other services. We use state of the art equipment and continually upgrade our systems to maintain the highest standard of excellence. Please visit our website at www.downstreamservices.com.

Goal of the Scope:

To obtain the dry weather flow rate in the box culvert located at the Cross Street of Chelsea Street & Tremont Street, Los Angeles, CA 90033 for the below referenced project:

Ramona Gardens Storm Drain Dry Weather Flow Monitoring - Los Angeles - 1CCS010200



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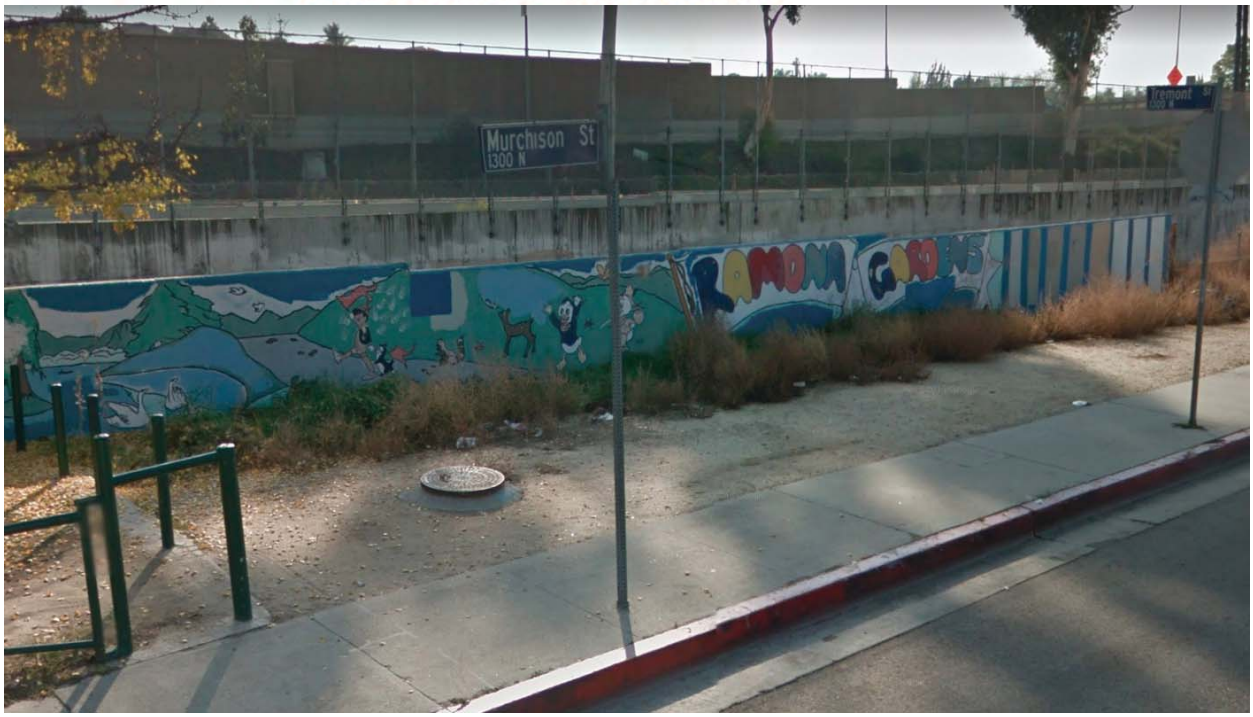
SANITARY SEWER & STORM WATER SPECIALISTS



Site and Technology Identification:

Downstream Services Inc. is an independent service provider for flow monitoring services that has access to many different technologies that are deployed based upon application. Each flow monitoring location has a unique hydraulic "fingerprint" resulting in each site presenting a unique set of criteria. Hydraulics is the primary criteria for selection of the appropriate flow monitoring site. Analysis of turbulence, velocities, depths, pipe diameters, upstream pipe diameters, diurnal flow patterns, and several other dynamics all contribute to selecting the correct technology for each flow monitoring application. DSI maintains quality partnerships with many different manufacturers of flow monitoring equipment to ensure our clients can benefit from our ability to accurately identify site application requirements and provide the best technology to meet the client's needs. It is not uncommon that projects performed by Downstream Services utilize two or more technologies to meet the ultimate goal of the project, accurate data.

For this particular site even with concentrating flow to a smaller path we would not have enough flow depth to use electronic flow meters over a period of time. Downstream chose instead to use manual measurements and visual inspection of flow lines to come up with accurate flow measurements. This consists of

DownStream Services, Inc.
SANITARY SEWER & STORM WATER SPECIALISTS

measuring the flow width, depth, shape, and surface velocity along with a few modifiers for roughness of the flow path to calculate flow rates.

Flow Monitoring Plan

Scope of Work:

Calculate the dry weather flow for a box culver using manual flow monitoring methods by means of confined space entry.

Cleaning concerns:

If a particular sewer line must be cleaned in order to obtain accurate flow measurements, a sediment trap should be installed upstream for the duration of the monitoring period. This particular line showed neither signs of sediment nor the possibility of upstream sediment affecting the flow rates.

Data Analysis:

DSI relies on quality trained personnel, state of the art equipment, high quality installations, and accurately performed calibrations to ensure we deliver the most accurate data to the client. Once a data set is retrieved from the field it is verified for accuracy by reviewing field documentation including pipe measurements and field calibrations. First the data is reviewed for completeness and to determine if any anomalies are present.

Data Collected:

Measurements of the wetted area and flow area are included below. Please also find video of flow rates and observations to be included with this report.

Wetted Area Width: 24 Inches, 2.0 Feet
Flowing Area Width: 12 Inches, 1.0 Feet
Surface Velocity: 15 Feet per Minute
Depth of Flow: .125 Inches, .0104 Feet
Triangular flow Shape

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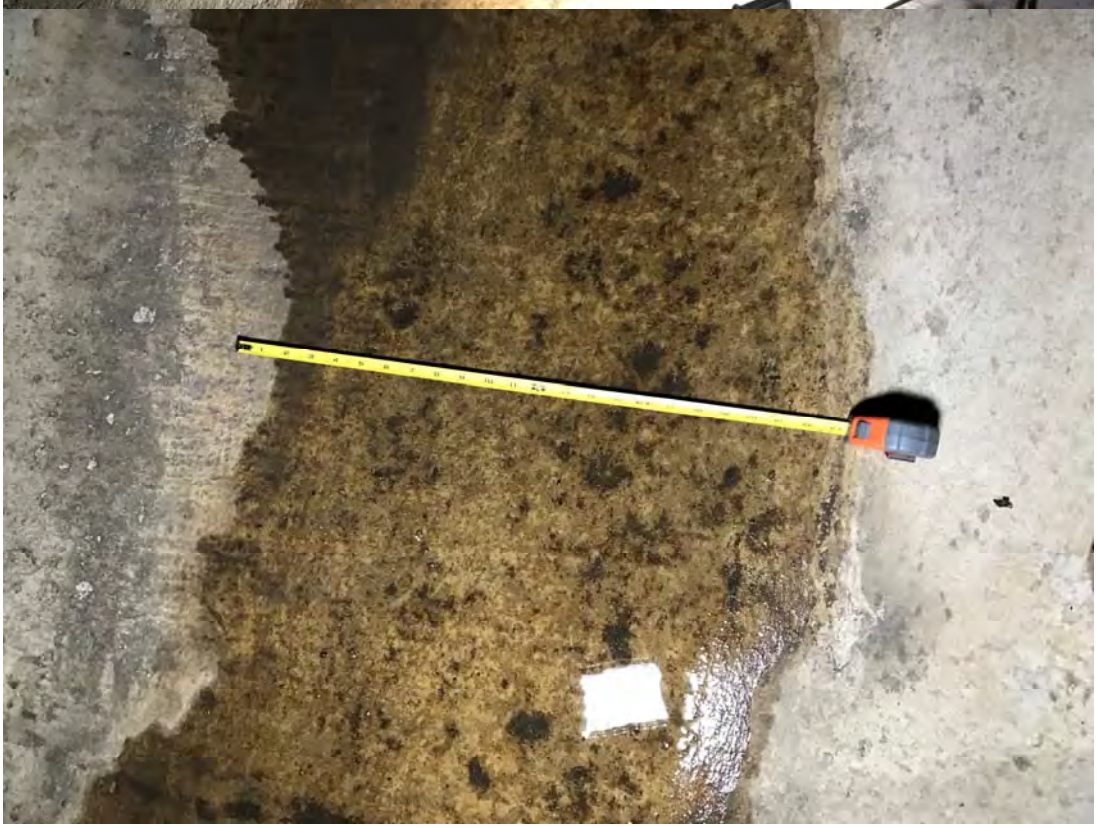


Corporate Office • 2855 Progress Place • Escondido, CA 92029
Ph **760 746 2544** Ph **800 262 0999** Fax **760 746 2667**
www.downstreamservices.com

DownStream Services, Inc.
SANITARY SEWER & STORM WATER SPECIALISTS

Flow Calculations:

The Following Equation is used to measure flow in small streams of water:
Q = K x A x V Where:
Q (quantity) = Flow rate in cubic feet per minute
A (area) = Cross section of stream in square feet perpendicular to flow
V (velocity) = measured surface velocity in feet per minute
K (constant) = a corrected conversion factor to adjust for surface flow being faster than average flow.

Normal non storm flows should use K factor of: .850, however due to the extremely small profile of flow, assume a slightly lower factor of .650.

A (Wetted Area) = .5 x 2.0ft x.0104ft
A (Wetted Area) =.0104 sqft
Q (Wetted Area) =.650 x .0104 sqft x 15ft/min
Q (Wetted Area) =.1014 cuft/min
Q (Wetted Area) =.7585 Gallons per minute

A (Flowing Area) = .5 x 1.0ft x.0104ft
A (Flowing Area) =.0052 sqft
Q (Flowing Area) =.650 x .0052 sqft x 15ft/min
Q (Flowing Area) =.0507 cuft/min
Q (Flowing Area) =.3792 Gallons per minute

Source:
http://www.hydromatch.com/
(Page used attached)

Based on the staining within the box it is fairly safe to say within reason that the average dry weather flows stays within the wetted area and flowing area flow rates due to the lack of staining outside of the wetted area you would expect to see if sustained flows reached a width larger than the two feet witnessed. We did see staining on the walls between one and eight inches indicating varied storm flows as would be expected. Due to the gentle slope of the culvert it would be safe to assume the velocity of water remained constant for the small variation in flow rate.

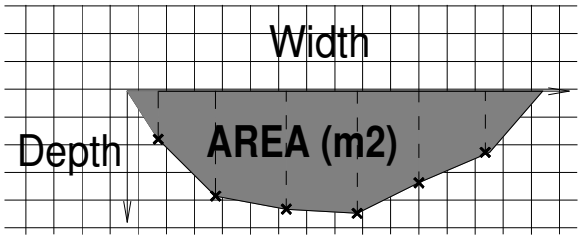
The Float Method

This works well in canals or channels. It can also be used in rivers and streams although with less accuracy. Two pieces of information are needed to calculate the flow by this method. The first is the **cross-sectional area** of the water flowing in the stream or channel. The second is the **speed** that the water is flowing. This is measured using a float and timing its travel between two points a known distance apart. A plastic bottle with the cap replaced makes an ideal float.

STEP 1: Find the cross-sectional area (CSA)

The difficulty of measuring the cross-sectional area depends on the type of flow under consideration. Estimating the CSA in a smooth-sided channel is much easier than in a shallow, rocky stream.

To estimate the area at a particular point, measure the width and then take depth measurements at regular intervals across the flow. Plot the depth measurements on squared paper. Join them up with straight lines to the width that is marked along one axis to create an enclosed area. The area can be estimated by counting the number of squares that are enclosed. Multiply the number of squares by the area which one square represents in m^2. Repeat these measurements in the middle and at the other end of the length over which the float is being timed (approximately 10 metres). Three values of the CSA will allow an average to be calculated.



STEP 2: Measure the speed of the flow (surface velocity)

A length (L) of 10 metres between the marking points should be sufficient. Put the float in the water several meters upstream of the first marking point. Begin to time the float when it passes the first marker and stop as soon as it passes the second. Repeat at least three times for consistent results. For the test, choose the straightest section of stream with the most even cross-sectional area.

STEP 3: Calculate the flow in litres per second

The flow is the product of the average stream area and the average velocity of the flow: Since the water moves more quickly on the surface than in other parts of the stream, an additional factor must be introduced which takes this difference into account. The difference between the surface velocity and the average stream velocity depends on the type of stream. Guideline "velocity correction factors" are given below. The table also gives an indication of the accuracy that can be expected. Divide the answer by 1000 for a flow rate in litres per second. Clearly, the accuracy of the float method is limited because of the requirement for correction factors and the difficulty of measuring the cross-sectional area of many streams.

Type of stream	Velocity correction factor	Accuracy
A rectangular channel with smooth sides and bed	0.85	Good
A deep, slow moving stream	0.75	Reasonable
A small stream with a smooth bed	0.65	Poor
A quick, turbulent stream	0.45	Very poor
A very shallow, rocky stream	0.25	Very poor

The equation to calculate the flow is:

$$\mathbf{Q = A_{ave} \times V_{surface} \times Correction\ Factor}$$

where

Q= Flow rate (m^3/s)

A_{ave}= Average cross-sectional area (m^2)

$V_{surface}$= *Surface velocity (m/s)*

APPENDIX F

Community Workshop Exhibits

Proposed Natural Park at Ramona Gardens:
Propuesta de un Parque Natural en Ramona Gardens:

The Site Today
Lugar Actual


Proximity to Freeway
Proximidad a la Autopista (Freeway)


West End
Termina Oeste


Walking Path
Camino


Basketball Courts
Canchas de Bolancesto


RAC and SEA Office / Library
Oficinas de RAC y SEA / Librería


Playground
Área de Juegos para Niños


Entrance at Murchison Street
Entrada por la Calle Murichson


West End: Asphalt Area
Termine Oeste: Área Pavimentada


Walking Path
Camino


Under the Bridge
Bajo el Puente


Community Garden
Jardin Comunitario


Old Tennis Court
Antiguas Pistas de Tenis

Proposed Natural Park at Ramona Gardens
Propuesta de un Parque Natural en Ramona Gardens

swa LEGACY LA VS2 Consulting Inc. LAND IQ


Proposed Natural Park at Ramona Gardens:
Propuesta de un Parque Natural en Ramona Gardens:
Possibilities
Posibilidades
Natural Elements
Aspectos Naturales
Beauty
Belleza
Native Wildlife
Fauna Nativa
Native Trees and Flowers
Arboles y Flores Nativos
Remove Air Pollutants
Remueve la Contaminación del Aire
Clean and Recycle Stormwater
Limpia y Recicla las Aguas Pluviales
Quiet Place to Escape City
Lugar Tranquilo para Descansar
Natural Places for Children to Play
Shade
Sombra
Walking Trail
Camino Natural
Buffer from Freeway Noise
What Else Do You Want To See Here?
¿Qué Más Quiere Ver Aquí?
Natural Water Feature
Cascada de Agua
Shade Structures
Estructuras para dar Sombra
Picnic Area / Plaza
Área de Picnic / Plaza
Murals / Art
Murales / Arte
More Community Gardens
Mas Jardines comunitarios
Improved Swap Meet Area
Seating
Bancas
Dog Park
Parque para Perros
Birdwatching
Observación de Aves
Security Lighting
Luces de Seguridad
Basketball Courts
Canchas de Baloncesto
Improved Sound Wall
Pared para Desminuir el Sonido
Exercise
Ejercicio
Meditation
Meditación
Games
Juegos
Proposed Natural Park at Ramona Gardens
Propuesta de un Parque Natural en Ramona Gardens
swa
LEGACY LA
VS2 Consulting Inc.
LAND IQ

APPENDIX G

Native Tree and Plant Species by Habitat Types

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Oak/Walnut Woodland with Understory Plant Species

Riparian Grassland Species

Freshwater Marsh/Meadow Plant Species

Arroyo Flowering Shrub and Grassland Habitat Plant Species

Coastal Sage Butterfly Habitat Plant Species

Palo Verde Woodland Plant Species

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Plant Species	Planting Notes
Achillea millefolium	Semi evergreen herbaceous perennial, low growing and spreads by rhizomes. White flowers with grey-green foliage. Plantings can take some foot traffic when established.
Common Name	
Yarrow	

Plant Species	Planting Notes
Arbutus unedo	Evergreen small tree with small white flowers and colorful round red fruits.
Common Name	
Strawberry Tree	

Plant Species	Planting Notes
Artistida purpurea	Use as all-purpose grass to fill areas between shrubs and rocks. Will re-seed itself and very drought tolerant.
Common Name	
Purple Three-Awned Grass	

Plant Species	Planting Notes
Asclepias fascicularis	Herbaceous perennial; use occasionally on edge of trails. Late spring flowering. Attracts Monarch butterflies, larval host plant.
Common Name	
Narrow Leaf Milkweed	

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Plant Species
Carex praegracilis

Common Name
Field Sedge

Planting Notes
Clumping evergreen perennial sedge with chestnut-colored seeds. Plant under trees and large shrubs.

Plant Species
Corethrogyne filaginifolia

Common Name
California Aster

Planting Notes
Low growing perennial, lavender flower w/yellow center; larval food plant to butterflies.

Plant Species
Elymus condensatus 'Canyon Prince'

Common Name
Giant Wild Rye

Planting Notes
Grey-green morph, spreads easily from rhizomes with some irrigation, does well in part shade.

Plant Species
Epilobium canum ssp. *canum*

Common Name
California Fuchsia

Planting Notes
Low growing perennial, fall flowering red. Use for edges between trees/large shrubs and along trails. Excellent for hummingbirds.

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Plant Species
Eriogonum fasciculatum

Common Name
California Buckwheat

Planting Notes
Shrub, color all year from buds, flowers and dry bronze flowers. Excellent for small butterflies and other pollinators.

Plant Species
Heteromeles arbutifolia

Common Name
Toyon

Planting Notes
Large, evergreen shrub. Flowers in summer with red berries in fall. Feeds birds. Can be pruned to tree form.

Plant Species
Lyonothamnus floribundus

Common Name
Catalina Ironwood

Planting Notes
Evergreen, slow growing tree with white flowers.

Plant Species
Penstemon centranthifolius

Common Name
Scarlet Bugler

Planting Notes
Low growing perennial herbaceous species, spring/summer flowering. Good for edges along trails. Excellent for hummingbirds.

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Plant Species	Planting Notes
Quercus agrifolia	Large evergreen riparian/canyon tree. Supports insects and avian wildlife.
Common Name	
Coast Live Oak	

Plant Species	Planting Notes
Rhus ovata	Large evergreen shrub, easily pruned. Pinkish while clusters of flowers and reddish fruits support insect and hummingbird pollinators, and other avian wildlife.
Common Name	
Sugarbush	

Plant Species	Planting Notes
Salvia apiana	Shrub, grey green foliage, spring flowering, evergreen. Good for bumble bees and other native bees.
Common Name	
White sage	

Woodland Anti-Pollution Green Buffer and Air Renewal Understory Plant Species

Plant Species	Planting Notes
Sambucus nigra ssp. *Cerulean*	Large summer deciduous shrub, cream-colored umbel flowers with late spring purple berries that feed birds. Can be pruned to tree form.
Common Name	
Elderberry	

Plant Species	Planting Notes
Stipa pulchra	Perennial bunch grass; plant between trees/large shrubs.
Common Name	
Purple Needlegrass	

Plant Species	Planting Notes
Tipuana tipu	Evergreen tree with yellow flowers spring and fall.
Common Name	
Tipu Tree	

Oak/Walnut Woodland with Understory Plant Species

Plant Species	Planting Notes
Achillea millefolium	Semi evergreen herbaceous perennial, low growing and spreads by rhizomes. White flowers with grey-green foliage. Plantings can take some foot traffic when established.
Common Name	
Yarrow	

Plant Species	Planting Notes
Artistida purpurea	Use as all-purpose grass to edge trail and to fill areas between shrubs - limits future weeding. Will re-seed itself and very drought tolerant.
Common Name	
Purple Three-Awned Grass	

Plant Species	Planting Notes
Asclepias fascicularis	Herbaceous perennial; use occasionally on edge of trails. Late spring flowering. Attracts Monarch butterflies, larval host plant.
Common Name	
Narrow Leaf Milkweed	

Plant Species	Planting Notes
Carex praegracilis	Clumping evergreen perennial sedge with chestnut-colored seeds. Plant under trees and large shrubs.
Common Name	
Field Sedge	

Oak/Walnut Woodland with Understory Plant Species

Plant Species	Planting Notes
Corethrogyne filaginifolia	Low growing perennial, lavender flower w/yellow center; larval food plant to butterflies.
Common Name	
California Aster	

Plant Species	Planting Notes
Epilobium canum ssp. *canum*	Low growing perennial, fall flowering red. Use for edges between trees/large shrubs and along trails. Excellent for hummingbirds.
Common Name	
California Fuchsia	

Plant Species	Planting Notes
Juglans californica	Medium height, winter deciduous canyon tree. Supports wildlife with nuts produced in summer.
Common Name	
California Black Walnut	

Plant Species	Planting Notes
Quercus agrifolia	Large evergreen riparian/canyon tree. Supports insects and avian wildlife.
Common Name	
Coast Live Oak	

Riparian Grassland Species

Plant Species	Planting Notes
Achillea millefolium	Semi evergreen herbaceous perennial, low growing and spreads by rhizomes. White flowers with grey-green foliage. Plantings can take some foot traffic when established.
Common Name	
Yarrow	

Plant Species	Planting Notes
Ambrosia psilostachys	Evergreen herbaceous perennial, low growing and spreads by rhizomes.
Common Name	
Ambrosia	

Plant Species	Planting Notes
Artemisia douglasiana	Perennial riparian plant, grey-green foliage, flowers not showy, spreads through rhizomes. Medicinal plant for local Indian tribes.
Common Name	
Mugwort	

Plant Species	Planting Notes
Carex praegracilis	Evergreen perennial grass-like sedge, low growing with rusty red flowers, and spreads through rhizomes. Plantings can take some foot traffic when established.
Common Name	
Field Sedge	

Riparian Grassland Species

Plant Species	Planting Notes
Juncus arcticus var. mexicanus	Perennial marsh/riparian plant, green with brown seeds that are attractive to birds.
Common Name	
Juncus	

Plant Species	Planting Notes
Muhlenbergia rigens	Large perennial bunch grass. Used by Indian tribes for coiled baskets.
Common Name	
Deer Grass	

Freshwater Marsh/Meadow Species

Plant Species	Planting Notes
Achillea millefolium	Semi evergreen herbaceous perennial, low growing and spreads by rhizomes. White flowers with grey-green foliage. Plantings can take some foot traffic when established.
Common Name	
Yarrow	

Plant Species	Planting Notes
Anemopsis californica	Perennial marsh plant, low growing and spreads through rhizomes to cover areas as a mass. White cone-like flowers in spring/summer with bronze colored seed heads. Medicinal plant for local Indian tribes.
Common Name	
Yerba Mansa	

Plant Species	Planting Notes
Artemisia douglasiana	Perennial riparian plant, grey-green foliage, flowers not showy, spreads through rhizomes. Medicinal plant for local Indian tribes.
Common Name	
Mugwort	

Plant Species	Planting Notes
Carex praegracilis	Evergreen perennial grass-like sedge, low growing with rusty red flowers, and spreads through rhizomes. Plantings can take some foot traffic when established.
Common Name	
Field Sedge	

Freshwater Marsh/Meadow Species

Plant Species

Juncus arcticus var. mexicanus

Common Name

Juncus

Planting Notes

Perennial marsh/riparian plant, green with brown seeds that are attractive to birds.

Plant Species

Muhlenbergia rigens

Common Name

Deer Grass

Planting Notes

Large perennial bunch grass. Used by Indian tribes for coiled baskets.

Arroyo Flowering Shrub and Grassland Habitat Plant Species

Plant Species	Planting Notes
Ambrosia psilostchys	Herbaceous evergreen perennial, spreads by rhizomes.
Common Name	
Ambrosia	

Plant Species	Planting Notes
Artemisia californica	Shrub, evergreen. Small inconspicuous flowers in spring.
Common Name	
California Sage Brush	

Plant Species	Planting Notes
Artistida purpurea	Use as all-purpose grass to fill areas between shrubs and rocks. Will re-seed itself and very drought tolerant.
Common Name	
Purple Three-Awned Grass	

Plant Species	Planting Notes
Carex praegracilis	Clumping evergreen perennial sedge with chestnut-colored seeds.
Common Name	
Field Sedge	

Arroyo Flowering Shrub and Grassland Habitat Plant Species

Plant Species	Planting Notes
Corethrogyne filaginifolia	Low growing perennial, lavender flower w/yellow center; larval food plant to butterflies.
Common Name	
California Aster	

Plant Species	Planting Notes
Elymus condensatus 'Canyon Prince'	Grey-green morph, spreads easily from rhizomes with some irrigation, does well in part shade.
Common Name	
Giant Wild Rye	

Plant Species	Planting Notes
Epilobium canum ssp. *canum*	Low growing perennial, fall flowering red. Use for edges between shrubs and along trails. Excellent for hummingbirds.
Common Name	
California Fuchsia	

Plant Species	Planting Notes
Eriogonum fasciculatum	Shrub, color all year from buds, flowers and dry bronze flowers. Excellent for small butterflies and other pollinators.
Common Name	
California Buckwheat	

Arroyo Flowering Shrub and Grassland Habitat Plant Species

Plant Species	Planting Notes
Isocoma menziesii var. *vernonioides*	Evergreen shrub, fast growing and re-seeds itself, fall flowering. Excellent for many insect pollinators.
Common Name	
Goldenbush	

Plant Species	Planting Notes
Juncus acutus	Rounded plant with spiny tips, chestnut brown seeds that attract birds.
Common Name	
Spiny Juncus	

Plant Species	Planting Notes
Muhlenbergia rigens	Large perennial bunch grass.
Common Name	
Deer Grass	

Plant Species	Planting Notes
Plantanus racemosa	Large deciduous riparian tree.
Common Name	
Western Sycamore	

Coastal Sage Butterfly Habitat Plant Species

Plant Species	Planting Notes
Artemisia californica	Occasional shrub, grey-green foliage, flowers not showy. Can be summer dormant w/out irrigation. Smells wonderfully of sage, but is in the sunflower family.
Common Name	
California Sage Brush	

Plant Species	Planting Notes
Artistida purpurea	Use as an all purpose perennial grass to edge trails and/or to fill areas between shrubs - limits future weeding. Will re-seed itself, very drought tolerant.
Common Name	
Purple Three-Awned Grass	

Plant Species	Planting Notes
Asclepias fascicularis	Herbaceous perennial; use occasionally between shrubs and on edge of trails. Late spring flowering. Attracts Monarch butterflies, and is Monarch larval host plant.
Common Name	
Narrow Leaf Milkweed	

Plant Species	Planting Notes
Corethrogyne filaginifolia	Low growing perennial, lavender flower w/ yellow center; larval food plant to butterflies.
Common Name	
California Aster	

Coastal Sage Butterfly Habitat Plant Species

Plant Species	Common Name	Planting Notes
Encelia californica	California Bush Sunflower	Occasional shrub, spring flowering, summer dormant w/out irrigation. Good for many pollinators.

Plant Species	Common Name	Planting Notes
Epilobium canum ssp. *canum*	California Fuchsia	Low growing perennial, fall flowering red. Use for edges along trails. Excellent for hummingbirds.

Plant Species	Common Name	Planting Notes
Eriogonum fasciculatum	California Buckwheat	Co-dominant shrub, color all year from buds, flowers and dry bronze flowers. Excellent for small Lycenid butterflies and other pollinators.

Plant Species	Common Name	Planting Notes
Isocoma menziesii var. *vernonioides*	Goldenbush	Co-dominant shrub, fast growing, evergreen, and re-seeds itself, fall flowering golden yellow. Excellent for many insect pollinators.

Coastal Sage Butterfly Habitat Plant Species

Plant Species	Planting Notes
Penstemon centranthifolius	Low growing perennial herbaceous species, spring/summer flowering. Good for edges along trails. Excellent for hummingbirds.
Common Name	
Scarlet Bugler	

Plant Species	Planting Notes
Peritoma arborea	Co-dominant shrub, evergreen, spring/summer flowering yellow. Good for insect pollinators.
Common Name	
Bladderpod	

Plant Species	Planting Notes
Salvia apiana	Occasional shrub, grey green foliage, spring flowering white, evergreen. Good for bumble bees and other native bees.
Common Name	
White Sage	

Plant Species	Planting Notes
Trichostema lanatum	Sub-dominant, evergreen, spring/summer flowering, purple. Hummingbird pollinated.
Common Name	
Wooly Blue Curls	

Palo Verde Woodland Plant Species

Plant Species	Planting Notes
Acalypha californica	Red-twigged evergreen shrub, low growing in rocky, dry areas.
Common Name	
California Copperleaf	

Plant Species	Planting Notes
Artistida purpurea	Use as all-purpose grass to fill areas between other plants. Will re-seed itself and very drought tolerant.
Common Name	
Purple Three-Awned Grass	

Plant Species	Planting Notes
Cercidium microphyllum	Medium height, winter deciduous canyon tree. Supports wildlife with nuts produced in summer.
Common Name	
Palo Verde	

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