



# SACRAMENTO DOCKS AREA

## *DRAFT* SPECIFIC PLAN

AUGUST 2008



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Prepared for

**City of Sacramento**  
**Economic Development Department**

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# INTRODUCTION

The Docks Area Specific Plan creates planning and design standards for the redevelopment of approximately 29-acres of land along the Sacramento riverfront, just south of Tower Bridge, in an area known as the Docks Area. This Specific Plan represents the final stage in a planning process that includes the Sacramento Riverfront Master Plan (2003) and the Docks Area Concept Plan (2005). Building upon the principles and concepts set forth in these previous efforts, this Specific Plan, along with its companion document - the Docks Area Urban Design Guidelines - provides a comprehensive vision for the Docks Area, along with goals, policies and development standards to guide future public and private actions necessary to achieve that vision. The Specific Plan serves as the mechanism for insuring that future development and infrastructure will be feasible, coordinated and efficient.



The Docks Area: A new mixed-use riverfront neighborhood



Regional Context



Sacramento Context

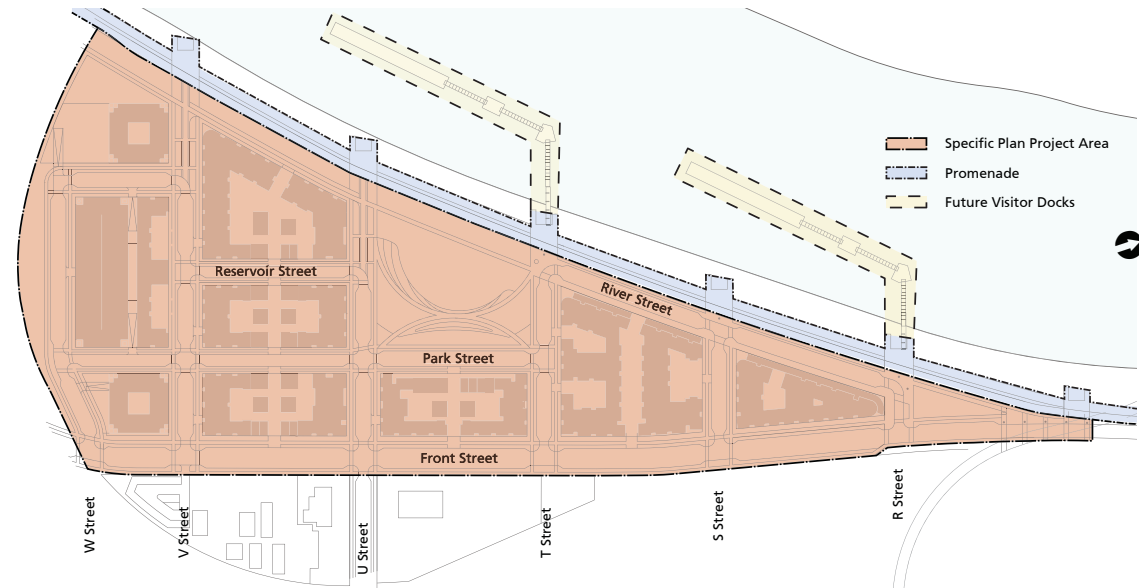


Project Area Context

## Specific Plan Area Context and Existing Conditions

The project area is located within the City of Sacramento, California, along the Sacramento River. The triangularly-shaped 29.3-acre property is bounded by the Sacramento River to the west, elevated Interstate 5 (I-5) to the east, and Highway 50 to the south. The project area is parallel to the Sacramento River, south of Old Sacramento, and separated from Downtown Sacramento by I-5. These natural and man-made features form a physical barrier between a majority of the Docks Area and adjacent land uses. Vehicular access is constrained and limited to Front Street from the north and south, Broadway from the south, and O Street from the east. The R Street over-crossing, once improved, will provide additional pedestrian and bicycle access from Downtown and the east.

The ownership of all industrially-zoned parcels north of Pioneer Bridge is currently held by the State of California, City of Sacramento, the Sacramento Housing and Redevelopment Agency (SHRA), and Pacific Gas and Electric Company (PG&E). The project area has been extensively disturbed and modified over the years—many of the parcels are vacant and were previously used for heavy commercial and industrial activity. Some of this land is either sealed or capped due to soil contamination and remediation.



Project Boundary (overlaid over Option A)

The levee condition and site topography of the project area pose some challenges as well as opportunities with regard to the development of public space and mixed use. In the northern portion of the site, the land is essentially flush with the top of the levee representing an “enlarged levee.” Moving south along the levee, the site grade drops. At the mid point, the difference between the top of levee and the site grade is approximately 15 feet. At the southern end of the site near Pioneer Bridge, the difference is approximately 25 feet. In this area, the

Pioneer Reservoir sits down at the site grade level and its roof is approximately level with the top of the levee (See Sections on page 5-3).

The Sacramento River is the dominant natural feature on the site. Although the existing levee blocks views of the Sacramento throughout much of the project area, the trees along the riverbank are visible above the levee and provide a strong visual connection to the Sacramento River.

## Site Opportunities and Constraints

The existing site possesses a number of features that are conducive to redevelopment. Specifically, the site:

- Is relatively flat;
- Has existing utilities at its periphery;
- Has a public street, Front Street, that runs along its entire length, and provides north and south access;
- Is close to Old Sacramento and Downtown, the proposed R Street pedestrian and bicycle bridge across Interstate 5, and the new CalPERS office building and its 4,000 employees;
- Is one of the few opportunities to redevelop along the riverfront; and
- Is adjacent to the Promenade, which will connect to the neighborhood to the south and to the Two Rivers Trail to the Railyards and River Districts to the north.

However, there are also a number of significant challenges to developing the site, including:

- The impact of the two freeways: high traffic volumes on north-south Interstate 5 and east-west Highway 50/Business 80 create both noise and airborne pollution, while the freeway structures sever connections with the existing street grid;
- The need to raise new streets and blocks to the height of the existing levee to afford views of the river;
- Areas of contaminated soil, the legacy of past industrial activities, that must be either removed or capped;
- The existing Pioneer Reservoir (not the highest and best use) that must be either relocated in its entirety or rebuilt and integrated into new development; and
- The State of California Excursion Train railway that runs immediately west of the site.



Existing Pioneer Reservoir (on right)

## Two Alternative Site Plans: The Pioneer Reservoir

The Pioneer Reservoir, located within the project area, represents an important component of the City's combined stormwater and sanitary sewer infrastructure. In major storm events, the Reservoir serves as an overflow receptacle for the City's combined sewer system. Relocation of this facility would allow for a centrally-located park that is flanked by the new neighborhood. A study currently underway is examining the feasibility of relocating this facility versus the technical challenge and expense of reconstructing it in place and capping it to accommodate a park on top of the structure.

Although a central park scheme involving relocation of the Reservoir is preferred, plans for both possibilities have been developed to an equal level of detail within this Specific Plan. This will provide development options until

studies have been evaluated and a determination is made by City Council regarding the outcome of the Pioneer Reservoir.

Option A assumes that the Reservoir will be relocated off-site. Option B accommodates the Reservoir on-site and incorporates it into the design of the Docks Park. The differences between the two options are discussed in detail in Chapter 3: Land Use.

A phasing plan for the development of the site is included in Chapter 8: Implementation. The site is designed to be developed in phases from the north to the south. However, a phase of development that includes office use has been identified as a flexible phase, or F Phase, that may be implemented first. A decision on whether the Reservoir will be moved must be made prior to the development of the F Phase. More information on phasing is included in Chapter 8: Implementation.

## Regulatory and Planning Context

The Docks Area Specific Plan fulfills the state requirements for specific plans established within Section 65450 et seq. of the California Government Code and conforms to the associated guidelines published by the California Office of Planning and Research. This Specific Plan provides policy direction and a regulatory framework for land use and development within the 29-acre Docks Area that will implement the goals, policies, and standards of the City of Sacramento General Plan and the Sacramento Riverfront Master Plan (2003).

This Specific Plan is consistent with adopted General Plan goals, policies and land use designations. Residential, retail/commercial, park, and parking uses are allowed under the Heavy Commercial/Warehouse land use designation in the Central City with a special permit, and thus the proposed uses are consistent with the General Plan designation. Additionally, at the time of this writing, the land uses proposed in the Specific Plan are consistent with the concepts being explored in the General Plan update process for the Docks Area site.

This document, once adopted as a Planned Unit Development, will be regulatory and apply to development applications, use permits, and subdivisions. Each phase of development

will be evaluated for consistency with both the General Plan and the Specific Plan, as well as for conformance with the City's existing development standards and design guidelines. Adopted by ordinance, the Specific Plan's policies and standards will take precedence over more general zoning and subdivision standards, guidelines, and administrative policies that would otherwise be applicable to the area. In situations where policies or standards relating to a particular subject have not been provided in the Specific Plan, the existing requirements of the City's Zoning Ordinance, Subdivision Ordinance, and other applicable regulations will continue to apply.

The following actions should occur concurrently with the adoption of the Specific Plan:

1. EIR Certification
2. DDA approved by the Redevelopment Agency
3. General Plan Amendment from Heavy Commercial/Warehouse to Residential Mixed-Use, Public/Quasi-Public, Parks and Office.
4. Community Plan Amendment: Change in Land-Use Map.
5. Rezoning to RMX-PUD (Residential Mixed Use) and Parks
6. Establishment of Planned Unit Development (PUD) Guidelines and a PUD Schematic Plan.

7. Review of Guidelines by City Council
8. Planning Commission
9. City Council

The tentative map will be filed at a later date when parcels have been assembled.

Numerous federal and state agencies will also be involved in permitting and funding various elements of the project, including:

- The Sacramento Metropolitan Air Quality Management District (SMAQMD)
- California Department of Toxic Substances Control (DTSC)
- The California Department of Transportation (Caltrans)
- The California State Reclamation Board
- The California Department of Fish and Game (DFG)
- The California Department of Parks and Recreation
- The United States Army Corps of Engineers
- Agencies with Review Authority
- The State of California Native American Heritage Commission
- The California State Clearinghouse, within the Office of Permit Assistance
- The California Department of Water Resources (DWR)



## Plan Preparation Process

A convergence of city and regional policy directives led to the initiation of the Docks Area planning process. These included:

- The completion and adoption of the Sacramento Riverfront Master Plan (SRMP, 2003) that identified and prioritized the development of the Docks Area;
- Policy direction from the City Council to City Agencies to pursue “Smart Growth” programs;
- Guidelines set forth by Sacramento Area Council of Governments’ (SACOG’s) “Blueprint” Transportation – Land Use Study identifying the Docks Area’s potential to accommodate regional growth.

These influences suggest not only the wisdom of focusing new housing and jobs in the Docks Area and other underutilized portions of Sacramento’s urban center, but also providing the public networks—parks, and other infrastructure—to support development while expanding access to the riverfront for the broader community.

In 2005, Wallace Roberts & Todd (WRT) was selected to create a “Concept Plan” for the Docks Area. The purpose of the Docks Area planning process was to further define the concepts developed for the Docks Area in the SRMP into



Sacramento Riverfront Master Plan (2003)



Docks Area Concept Plan (2005): alternate design scheme

a realistic and developable project consistent with its guiding principles.

This plan used a community-based process beginning in February 2005 that extended over a ten-month period and included three community workshops and two council workshops/presentations. The result was a conceptual plan that translated the desires of the community and City Council for the Docks Area into sound planning and design principles.

Upon completion of the Concept Plan, two separate implementing processes were begun: the extension of the City’s riverfront Promenade through the Docks Area and the solicitation of a development team. The City of Sacramento hired Walker-Macy to design the extension of the Docks Riverfront Promenade from O Street to Miller Park.

To prepare the Docks Area for development, the City released a Request for Proposals (RFP) to solicit and select a developer-led team. KSWM Docks Partners, LLC, a partnership between Wilson Meany Sullivan, Kenwood Investments, and Stockbridge Capital Partners were selected, and began plan refinements. WRT was brought on to the project by the City to prepare the Specific Plan in cooperation with the developer, who retains an exclusive right to negotiation, as well as the Sacramento Riverfront Promenade design team, stakeholders and a technical advisory committee. The technical advisory committee met multiple times, and a community workshop was held to explore alternatives for both redevelopment and the Promenade with the public. This resulting Specific Plan is intended to be the embodiment of the public’s, City’s and developer’s goals.

## Organization of the Specific Plan

This Specific Plan is organized to provide a step-by-step understanding of the Plan's components and the rationale behind its policy recommendations, design concepts, and implementation measures. The first two chapters are primarily descriptive, characterizing the existing setting, the planning context, and the vision behind the plan. Subsequent chapters present the standards, guidelines and implementation measures that will regulate future development in the planning area. These planning tools are organized into a series of chapters that correspond to topics identified by the City and established in the State's specific plan guidelines.

### Chapters in the Specific Plan include:

**1 Introduction** — articulates the broad purpose of the Specific Plan, describes the legislative authority under which specific plans exist, summarizes the general conditions and sequence of events leading up to the Plan's preparation, and outlines the organization of the Plan.

**2 Vision** — Sets forth the vision, guiding principles and key characteristics of the plan.

**3 Land Use** — Identifies land use goals and policies, describes the general land use program, summarizes development intensities, and describes the land use patterns and associated development concepts.

**4 Circulation** — Describes regional transportation context and access into the site; establishes vehicular, bicycle, and pedestrian circulation networks, and identifies land use goals and policies to support a “complete” circulation system that conveniently serves transit riders, pedestrians, bicyclists, and drivers.

**5 Urban Design Intent** — Outlines the broad intent of the Urban Design Guidelines as they apply to “public and private realms.” Urban Design Guidelines are the subject of a separate companion document.

**6 Infrastructure** — Describes the infrastructure systems necessary to provide water, sewer, stormwater management and other public utilities to the proposed development.

**7 Community and Public Services** — Describes important public services, such as police, fire protection, and schools, as well as trash collection required by the proposed development.

**8 Implementation** — Describes actions necessary to implement the Plan by identifying phasing, approval and amendment processes as well as potential financing mechanisms for proposed public improvements.

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# VISION



Front Street and R Street Park - A gateway to a new riverfront neighborhood: The Docks Area

The Docks Area Specific Plan will create an active new riverfront neighborhood that balances mixed-use development with inviting public open space. The Plan achieves this balance by taking advantage of the natural splendor of the Sacramento River and orienting new development and distinctive riverfront parks to the waterfront. The mix of residential, commercial and office uses will provide a compact, pedestrian oriented neighborhood where people live, work, dine, shop and play with a strong sense of connection to their neighbors and to the Sacramento River.



The Docks Area is an active new riverfront neighborhood that balances inviting public open space with mixed-use development.

In order to facilitate a more sustainable form of urban life, the Docks Area Specific Plan and Urban Design Guidelines advances the vision set forth in the Sacramento Riverfront Master Plan of creating a high-quality riverfront public space and surrounding it with a vibrant, urban neighborhood. The compact, mixed-use Docks Area neighborhood will begin to reverse trends of suburbanization and resource waste while providing a richer social experience for those who live, work, shop and recreate within it. In addition to reducing transportation impacts on the environment, the plan addresses development impacts by promoting green building practices, as well as best practices for reducing urban runoff pollution to the maximum extent practicable.

The vision for the site is to create a new high-density residential neighborhood with as many as 1,155 dwelling units comprised of a variety of dwelling types, riverfront-facing retail spaces, new commercial office space and new parks. The proposed pattern of streets and blocks, together with mid-block alleys, recalls the traditional pattern of Sacramento's street grid, thereby symbolically reconnecting the neighborhood

with those on the other side of the freeway. All letter-named, or "Alphabet" streets, and alleys lead to the river, creating a permeable block pattern and multiple pedestrian routes. Streets have been designed to encourage walking and biking, and to manage and treat stormwater flows.

Through a deliberate urban design approach, ample open space integrated into the neighborhood will provide both an amenity that supports the new neighborhood and an expansion of the regional riverfront recreation system that supports Downtown, Old Sacramento and the tourist industry.

In addition to carefully designed streets and open spaces, the plan proposes a strong definition of the public realm through the urban design of its buildings. By lining the edge of blocks with a typically continuous building line of properties, walls and frontage details, it establishes an active frontage and strong street enclosure. These active building frontages will further animate the public realm through design elements such as stoops, porches and other articulated building entrances.



This neighborhood street, River Street, functions as a linear plaza and active retail destination along the riverfront.



## Guiding Principles

The Sacramento Riverfront Master Plan (SRMP), completed in July 2003, identified the Docks Area as a critical opportunity site for redevelopment. The subsequent Docks Area Concept Plan (2005) set forth four objectives for the Docks Area:

1. Create a New Riverfront Neighborhood;
2. Create Parks and Open Space for a New Neighborhood;
3. Strengthen Riverfront Promenade Connections; and
4. Provide Access to the Water's Edge.

In addition, the following concepts were identified as key elements during the Sacramento Riverfront Master Plan process, refined by the Docks Area community outreach process, and now underlie this Plan:

- A new riverfront mixed-use neighborhood;
- Public access to an animated riverfront;
- New public open space including greenways and a Riverfront Promenade;
- A pedestrian orientation;
- Medium- to high-density development with building heights designed to maximize views to the river;
- Pedestrian and bicycle access integrated throughout the project area; and
- Linkages to adjacent neighborhoods.

The Docks Area is also a designated redevelopment area, and the plan responds to additional objectives of the Sacramento Housing and Redevelopment Agency for the planning area:

- Redevelopment of a brownfield site;
- New housing that embodies smart growth principles and takes advantage of the Project Area's proximity to downtown;
- Development that maximizes alternative modes of transportation;
- Development that uses sustainable and green building concepts;
- Development that takes advantage of limited opportunities for riverfront development;
- Development that bolsters the economic viability of Old Sacramento and Downtown; and
- Development that enhances property values.

The Docks Area Specific Plan and Urban Design Guidelines have built upon the design concepts developed for the Concept Plan to create a realistic development project that remains true to these guiding principles and objectives for the Docks Area.

## A New Riverfront Neighborhood

### Addressing the Levee and Site Grading

The Docks Plan establishes building grades at or near the levee level to enhance visual and functional connections to the river. This is accomplished by elevating the building levels with structured podium parking. The streets will be built up on fill material so that structured parking is buried in relation to the streets. The “Alphabet” streets (R, S, T, U, V, etc.) can then slope from River Street – at the levee level – back down to Front Street. More information on grading can be found in Chapter 6: Infrastructure.



Typical block with high-rise residential tower



Sidewalk, stoops and planters help to create an intimate neighborhood street. *North Park, San Jose, CA*

### Creating a Neighborhood through Building Types

The proposed development will contain a mix of predominately residential uses with a critical amount of corresponding ground-floor retail space. Residential development in the Docks Area will be strongly oriented to the river and open space within the development, and buffered from Highway 50 with office development on the southern side. Office uses are proposed for the southern blocks closest to Pioneer Bridge (I-50), where overshadowing, noise and the potential for airborne pollution are most significant. A buffer of office towers and

their structured garages can help separate the residential blocks from the freeway.

Sufficient housing density will provide the critical residential mass to create a vibrant waterfront neighborhood. A variety of building types, including low-, medium- and high-rise, are integrated within the neighborhood. The mix of building types along with varied architectural designs are intended to create a complete neighborhood that appears to have grown incrementally and organically over time.

Further discussion of building design is included in the “Private Realm” section of the companion document, Urban Design Guidelines.

### Differentiating Public, Semi-public and Private Space

The development schemes carefully differentiate between public space, semi-public space and private space to allow extensive public and private uses to simultaneously thrive within the Docks Area. The public space is designed to promote as much public access and use of the riverfront as possible, and includes parks, plazas, streets and the Promenade. The semi-public space is intended to provide clear but unobtrusive transitions between public and private spaces, and includes mid-block alleys, residential stoops and entries, and selected

interior courts and garden spaces. The private spaces are intended to provide residents and businesses a full range of amenities, and include rooftop gardens, private structured parking areas and other selected interior courts or gardens.

### **Making Livable Streets and Blocks**

A fine-grained street and block pattern is established to provide a walkable neighborhood. Proposed streets have been designed for pedestrian comfort. To promote a more human scale, interior neighborhood streets are narrow, and have one traffic lane in each direction, on-street parking and ample sidewalks lined with street trees. Mid-block alleys are also provided to create alternate pedestrian routes and access to semi-private interior courts and gardens.

Building façades are to be built at the back edge of the sidewalks with minimal to no setbacks, strengthening the relationship between pedestrians and ground-floor uses. As demonstrated by nearly all successful urban areas, this type of frontage is a prerequisite for neighborhood street life. Further discussion of streets and other public spaces is included in Chapter 3: Circulation and the “Public Realm” section of the Urban Design Guidelines Companion Document.



Livable Streets: A typical “Alphabet Street” adjacent to Docks Park and terminating on the river.

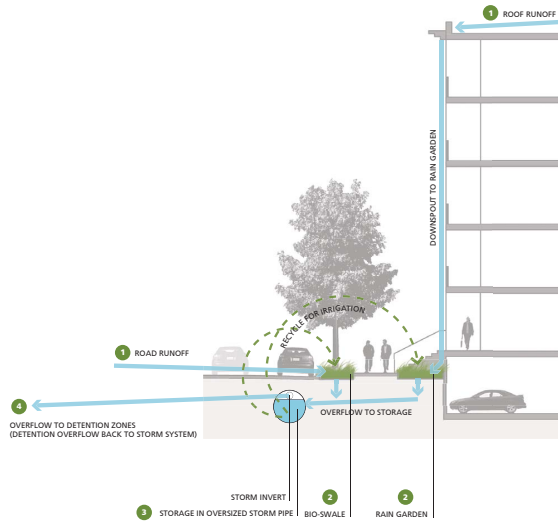
### **River Street: A Vibrant Pedestrian Street**

River Street is envisioned as a new riverfront retail and entertainment destination for Sacramento. To take advantage of the unique riverfront location and its proximity to Old Sacramento, approximately 40,000 square feet of ground-floor retail space is strategically placed along River Street just south of R Street Park. Desired uses include cafés, restaurants, shops, music venues, etc. A second floor of retail use is

permitted to maximize the amount of outdoor café and restaurant seating with river views. This retail corridor will offer a destination for local residents as well as entice visitors from Capitol Mall and Old Sacramento.

## Sustainability

The Docks Area Specific Plan provides a framework for implementing sustainable development. When sustainability is set as a goal at the outset, site-related planning, design, construction, operations and maintenance practices can link natural and built systems to achieve balanced environmental, social and economic outcomes. This improves the health and quality of life of both the community and the environment. This implementation of this plan should address the goals of Sacramento’s Sustainability Master Plan to the maximum practicable extent.



A network of bioswales and raingardens within the project area collect stormwater for treatment and potential re-use (See Chapter 6: Infrastructure).

## Land-Use and Site Design

In an effort to minimize air pollution, impacts on valuable habitat and agricultural land and loss of open space in the city, the Redevelopment Agency of the City of Sacramento identified vacant industrial land and waterfront properties as opportunities for significant infill development. Developing the properties in the Docks Area represents a key effort to advance these objectives. Inherent environmental benefits of this location include:

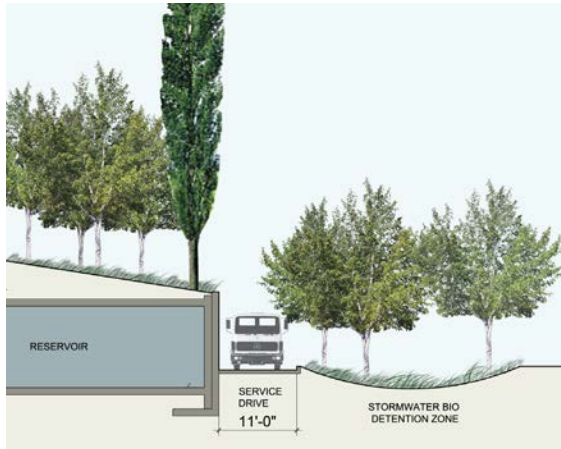
- Infill /previously developed site
- Access to Public Transportation

- Brownfield Redevelopment
- Contribution to Downtown Jobs-Housing Balance

The circulation system in the Docks Area will expand the community’s transportation options by extending and upgrading the road system, and creating a comprehensive pedestrian and bicycle network. By providing residential uses within close proximity to Downtown and regional transit, potential traffic generation will be reduced.

A mix of land-uses on-site will reduce the need for travel outside of the project area, and thus reduce the use of and dependence on automobiles. Mixed-use development also emphasizes local and regional-serving uses that will provide economic and social benefit to the city through the generation of tax revenues, employment opportunities, and enhanced local access to services.

Public parks and pedestrian friendly streets will provide health and environmental benefits by providing an environment that encourages social interaction, expands the community’s options for recreation and entertainment and minimizes the social and environmental strain associated with traffic congestion and pollution.



Stormwater detention zone on southern edge of property.



Raingarden - Portland, OR



Green roofs aid in stormwater management and energy efficiency.

### Natural Resources and Habitat

By integrating natural stormwater management techniques into the design of parks and public streets, the plan will yield multiple benefits, including reducing the volume and flow of stormwater runoff, improving water quality through natural filtration of runoff, securing land for open space, and educating the public through the revelation of ecological systems.

The Docks Area landscape concept integrates native planting areas in order to enhance ecological function and specifically, habitat value. The two main opportunities for these habitat zones are within forested zones in Docks Park and within wetland zones in the water detention zones.

### The Built Environment

In addition to overall site design, the buildings in the Docks Area themselves have tremendous potential for contributing to improved environmental performance. Areas where environmental improvements can be made include energy efficiency (including on-site renewable energy), water efficiency (reuse and conservation), selection of materials and resources, and indoor air quality.

With the imminent dangers of global warming, new buildings should be designed to be sustainable, especially with respect to energy performance. This is important for a city like Sacramento, located in a predominantly warm and dry climate.

A reduction of environmental impacts should be established as a goal from the outset of architectural design. Building design, construction and operation should attempt to reduce CO2 emissions and achieve high energy performance. Development should be built and designed according to current building standards and best practices. All retail, commercial and hotel buildings should achieve LEED Silver certification. Residential development shall meet Enterprise Green Communities criteria, or follow the Green Multi-family Design Guidelines by the California Integrated Waste Management Board. (An alternate rating system may be proposed by the project team, subject to approval by the planning reviewer.)



Docks Park



R Street Park

## Distinctive New Riverfront Parks

The objectives of open space and development are seen as interrelated in achieving a more sustainable and higher quality of life, both in the social and natural realms. In creating this new neighborhood, the Plan prioritizes defining and strengthening the public networks that will support development, facilitate recreation, increase access and improve city services. The Specific Plan is predicated on the conviction that numerous benefits will accrue from both public and private investment in providing open space resources. The riverfront's value as a regional recreational amenity will be enhanced through improvements to the public realm, but so will the Area's economic vitality and the quality of life for those who will work and reside here. The public spaces within the Docks Area strive to achieve the following benefits:

- Improved public health and safety as a result of flood control improvements;
- Enhanced community character and sense of place;
- An attractive and distinctive image for the Docks Area that will help retain and attract desirable businesses;
- A high-quality environment for Docks Area residents and employees;

- Increased opportunities for passive and active outdoor recreation associated with urban parks and improved access to the Sacramento River;
- Expansion of the urban forest through the planting of street and park trees.

Implementing these concepts is critical to establishing a successful neighborhood that contains the active, pedestrian-oriented, and mixed-use character envisioned for the Docks Area.

**Docks Park**

The anchor use of the Docks Area is a new riverfront park located strategically between Tower Bridge and Miller Park. The Docks Park will be one in a series of signature public spaces along the riverfront envisioned by the Sacramento Riverfront Master Plan. The park will combine formal and informal activity spaces to serve both as an amenity to new development as well as an important part of Sacramento’s regional park system. Of the two possible park locations, a centrally located park would become the centerpiece of the new neighborhood. Flanking the park with development on three sides would create more eyes on the street—a contrast with current conditions at Miller Park.

**R Street Park**

At the northern terminus of the Docks Area, R Street Park will serve as a gateway for people entering from the north and the east. It will connect directly to the planned R Street bicycle/ pedestrian bridge and the Riverfront Promenade. R Street Park will serve as an inviting space for relaxation and reflection, with lawn, benches, and small water features.

**Sacramento Riverfront Promenade**

An extension of the Riverfront Promenade, from the current terminus at O Street connecting south to Miller Park, is a separate project from this Specific Plan, and will be implemented by the city through a separate planning process. The Promenade accommodates pedestrian and bicycle circulation as well as riverfront seating, access to scenic lookouts and ultimately, connections to visitor docking. From the perspective of the Docks Area, the Promenade project is most important in providing critical, direct and attractive pedestrian connection to Old Sacramento and Downtown, including:

- Old Sacramento to Miller Park
- Downtown to the Promenade via R

Street Bridge

- Eventual pedestrian bridge to West Sacramento at R Street
- Broadway Avenue to the River District and the Railyards
- Central Loop in Sacramento River Master Plan

The design of the Docks Area streets and parks has been coordinated in detail with the Promenade design team. Their joint function is critical to the success of the Docks Area.

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# LAND USE

3

The Land Use chapter establishes the framework for development within the Docks Area. This chapter introduces the plans and describes the land uses for each scheme. The types, intensities, and distribution of uses are described for each block of development. The design of the public and private realms is addressed in Chapter 5: Urban Design Intent. Detailed development standards are established in the Urban Design Guidelines companion document, as well as in other elements of the Specific Plan. More specific information on the circulation system is contained in Chapter 4. Stormwater management and infrastructure information is included in Chapter 6.



A strong integration of a public open space system with residential mixed-use development.



The existing reservoir (seen at right of photo) may be relocated or capped at the level of the adjacent levee.

### Flexible Options

Two distinct plans and one additional variation have been developed to an equal level of detail to allow for flexibility to respond to unknown future fiscal- and market-related variables. Although the options share many features, there are some key differences in open space location and development density. The most significant differences between both options are the placement and the size of Docks Park due to the uncertainty of the future of the Reservoir. A study currently underway is examining the feasibility and costs accommodating the capacity in this facility off-site versus the technical challenge and expense of reconstructing it in place and capping it to accommodate a larger, but less central park on top.

Relocation of the Reservoir elsewhere in the stormwater infrastructure network would allow for a centrally-located park flanked by the new neighborhood (Option A). If the Reservoir cannot be moved, a structural reconstruction will be required to support capping it with fill and locating the park on top (Option B).

Option A, the preferred option, has a more central riverfront park (2.53 acres) in the center of the site and greater developable land opportunity (13.30 acres). Option A could also accommodate a visitor center.

Option B assumes that the Reservoir will stay in its current location in the southern end of the site, and that it be co-located with and integrated

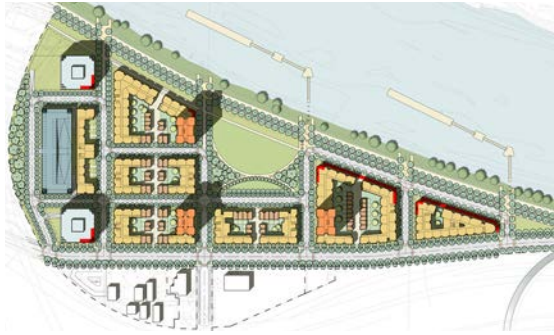


Option A1

into the design of the Docks Park. The roof structure will be rebuilt as a podium to support the park and will include the planting of trees, and a potential visitor's center. Option B's park is larger (8.18 acres) because it covers the entire Reservoir, and consequently, Option B contains less developable land (9.5 acres).

Flanked by the neighborhood on three sides, the centrally located park in Option A builds a better community space. By locating the park at the center of the site, it gains more exposure to the neighborhood than the park in Option B, which abuts Highway 50. This location creates more "eyes on the park," and brings more residents within close proximity of the park.

In both concepts, the street hierarchy is the same,



Option A2

although the circulation patterns differ somewhat to accommodate different park configurations due to the Reservoir. For both options, east-west streets are aligned with corresponding "Alphabet"-named streets across the I-5 freeway in the downtown (R Street, S Street, T Street, etc.). North-south circulation occurs on River, Park and Front Streets. Park Street functions as an interior street connecting the park with the neighborhood River Street functions as a neighborhood retail main street, and Front Street functions as a vehicular and bicycle access road. Design standards for street types apply uniformly across all options refer to Urban Design Guidelines companion document.

In addition, Option A has two schemes with phasing "options" for density distribution.



Option B

The two schemes are referred to as A1 and A2 throughout this document. Option A1 includes two residential high-rise towers, while A2 includes an additional third tower positioned near the river (on Block 6) to accommodate a greater number of dwelling units. These options are intended to provide flexibility to the developer to respond to potential variations in future market conditions. Option A2 contains the maximum overall development, while Option B contains the least.

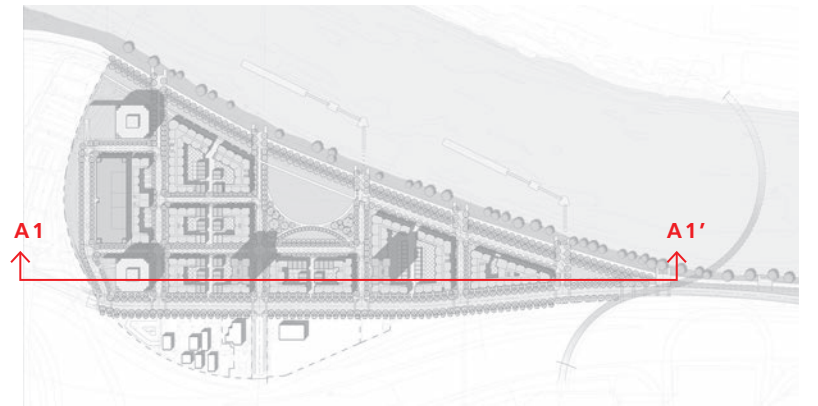
# OPTION A1

Reservoir	Relocated Off-Site
Residential Towers	2
Office Towers	2
Dwelling Units	1,020
Retail (sf)	41,400
Office (sf)	500,000
Off-Street Parking	2,770
On-Street Parking	420

Total Acreage (acres)	29.27
Public ROW	12.60
Open Space	3.37
Development	13.30
Average Net Density	79 DU/Acre

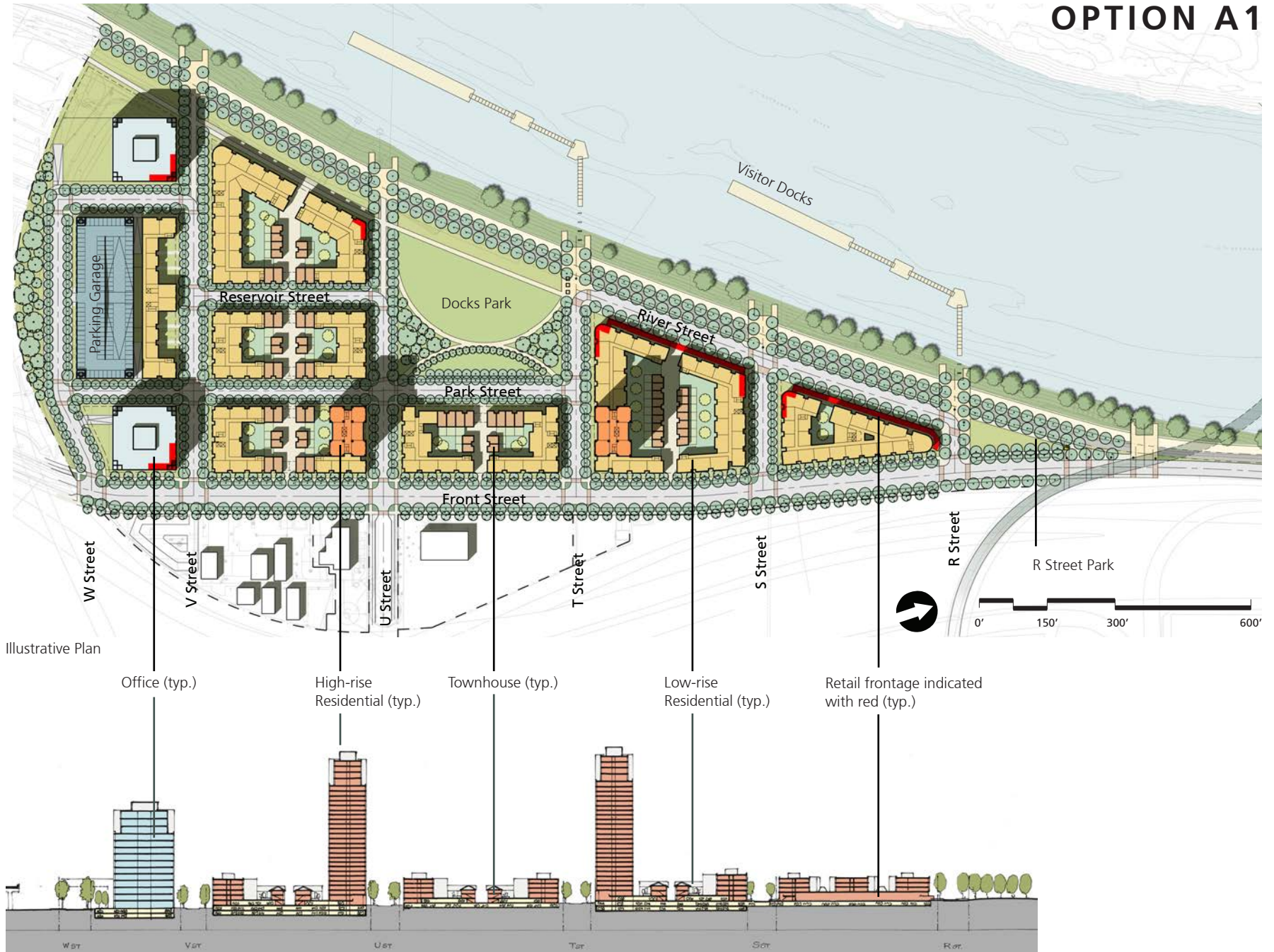


View from the northwest



Key Plan for Site Section (facing page)

# OPTION A1



Illustrative Plan

Office (typ.)      High-rise Residential (typ.)      Townhouse (typ.)      Low-rise Residential (typ.)      Retail frontage indicated with red (typ.)

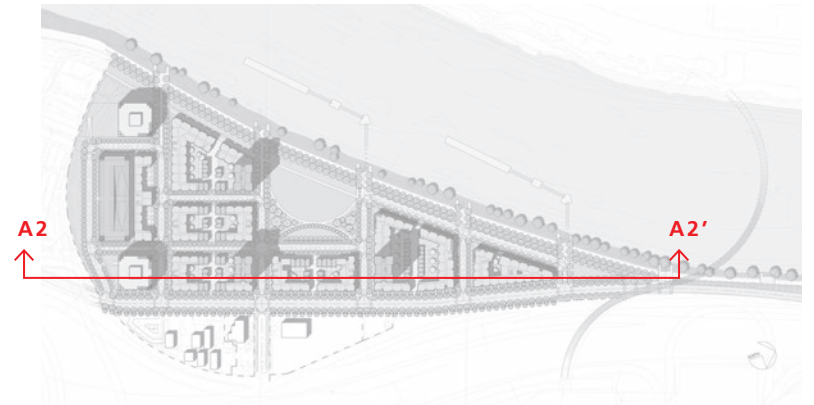
Site Section A-A'

# OPTION A2

Reservoir	Relocated Off-Site
Residential Towers	3
Office Towers	2
Dwelling Units	1,155
Retail (sf)	40,500
Office (sf)	500,000
Off-Street Parking	2,920
On-Street Parking	420
<hr/>	
Total Site Area (acres)	29.27
Public ROW	12.60
Open Space	3.37
Development	13.30
Average Net Density	87 DU/Acre

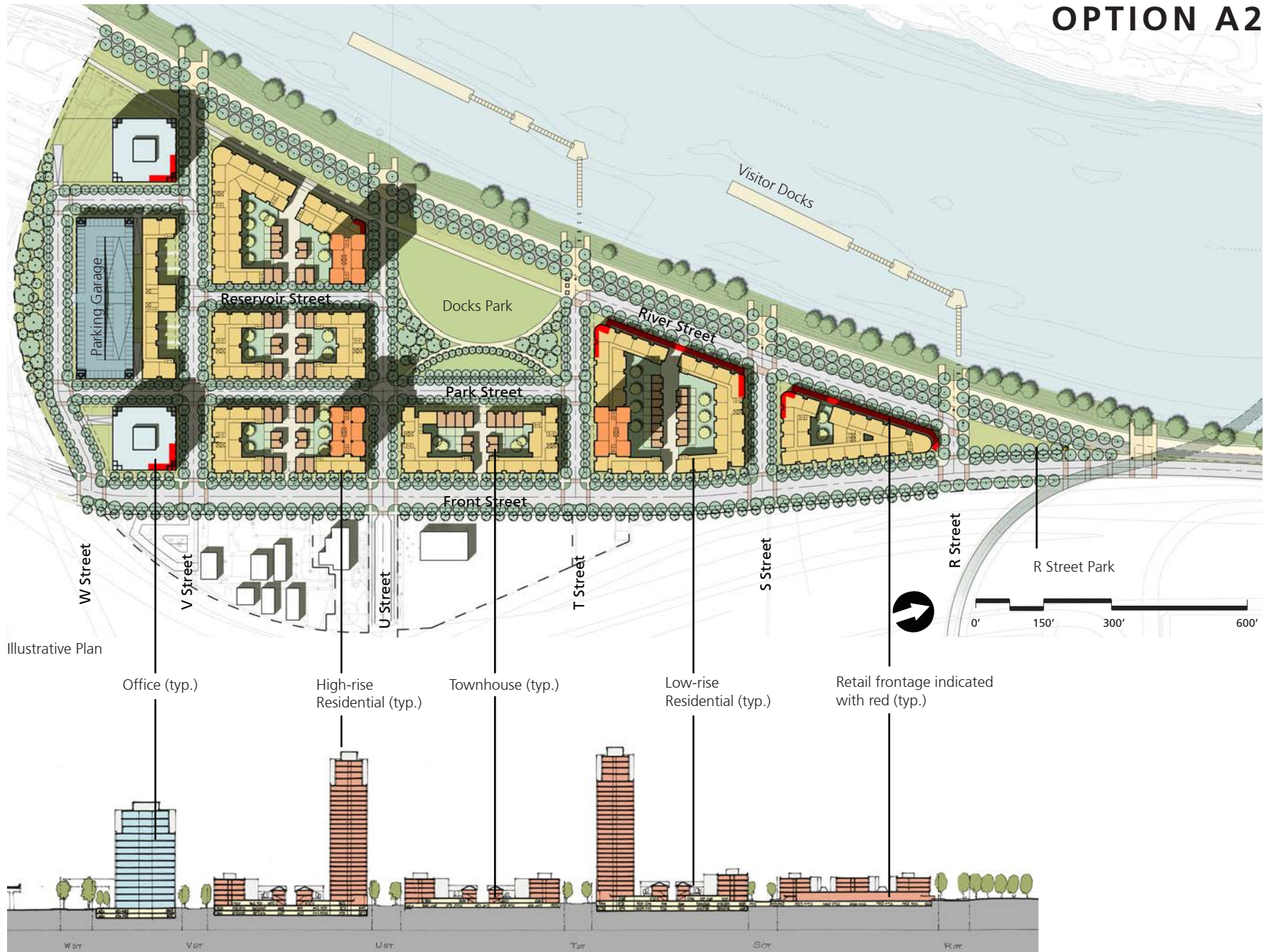


View from the northwest



Key Plan for Site Section (facing page)

# OPTION A2



Site Section A-A'

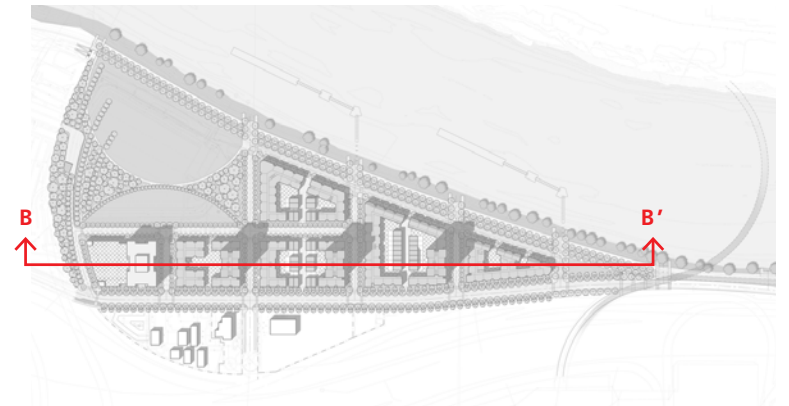
# OPTION B

Reservoir	On-Site
Residential Towers	3
Office Towers	1
Dwelling Units	1,000
Retail (sf)	43,300
Office (sf)	200,000
Off-Street Parking	1,870
On-Street Parking	420

Total Site Area (acres)	29.27
Public ROW	10.12
Open Space	9.74
Development	9.41
Average Net Density	106 DU/Acre



View from the northwest



Key Plan for Site Section (facing page)



# OPTION B



Illustrative Plan

Site Section B-B'

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## Land Use Program and Development Intensity

The land-use mix emphasizes local and regional-serving uses that will provide economic and social benefits to the city through the generation of tax revenues, employment opportunities, and enhanced local access to services. Development consists of predominantly medium- to high-density residential units mixed with some retail space, eating establishments and office space. Hotel or a signature entertainment use is permitted on Block 2, and includes the possibility of not only traditional room rental, but also extended-stay room rental or condos with hotel service and interval ownership. The majority of the retail space fronts onto River Street; the remainder is located on select corners throughout the project area to animate key areas. Retail on River Street features partial 2<sup>nd</sup>-level retail and dining terraces. Open space consists of public parks, greenways and a stormwater detention zone. Refer to the Urban Design Guidelines companion document for both the private and public realms.

The overall project development intensity includes between 1,000 – 1,155 dwelling units, 40,500 – 43,300 square feet of retail space, 156,000 – 500,000 square feet of office space, and 3.37 – 9.74 acres of open space.

The total projected development potential for the Docks Area is based on input from both the developer and the City of Sacramento, and is limited by the amount of vehicular traffic that can be accommodated on the local access streets. Detailed phasing schemes are included in Chapter 8: Implementation.

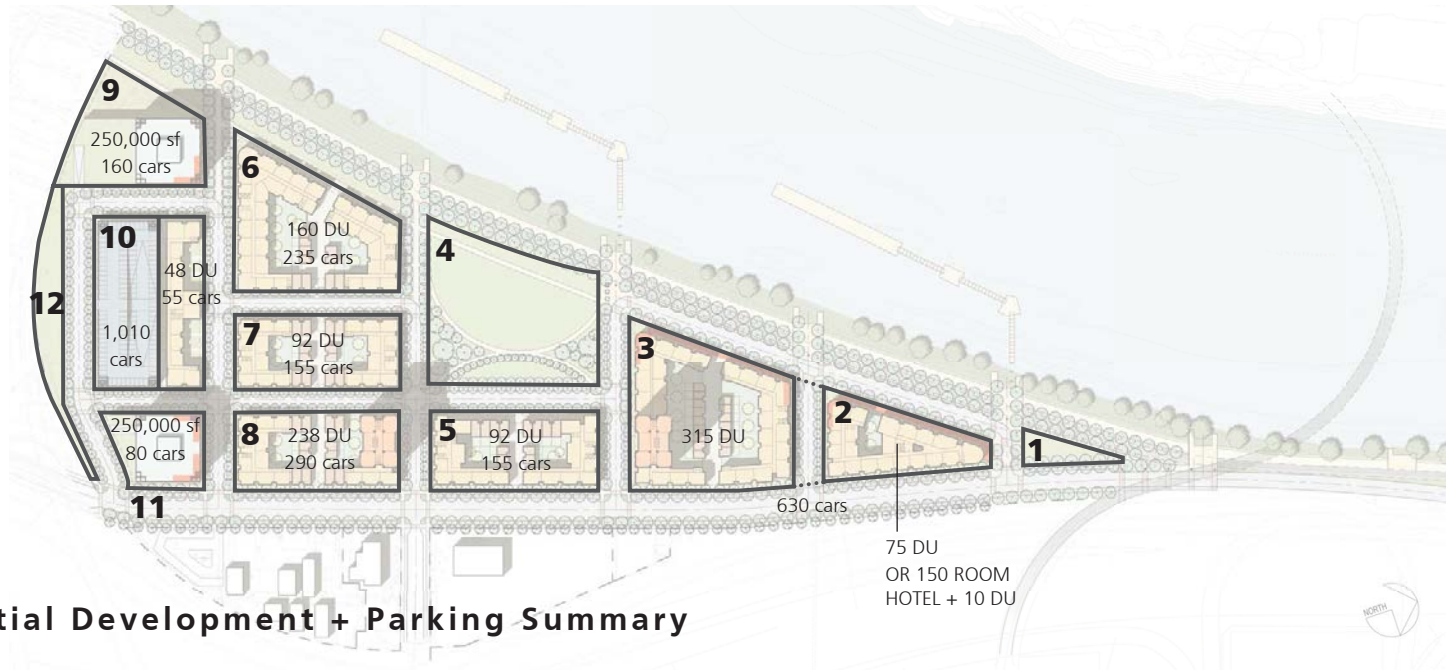
All options contain similar building types and are arranged using a palette of unit types. Residential unit types include high-rise stacked units, low-rise stacked units and walk-up townhouses. Low-rise building types are 5-story Type 5 construction over a Type 1 concrete podium for parking. The towers are constructed of either concrete slab or structural steel; high-rise office towers are constructed of structural steel.

Parking would be provided for residential uses in ground-floor and underground podiums, at an average ratio of 1.4-1.5 spaces per dwelling units for all options. Parking for office use is provided in a parking structure, at 2.5 spaces per 1,000 square feet. The total number of off-street parking spaces ranges from 1,870 spaces in Option B to 2,920 spaces in A2. In addition, 420 parallel parking spaces will be provided on-street for visitors and shoppers. Standards for off-street parking design and entrance locations are located in the Urban Design Guidelines companion document.

# OPTION A1



Land Use Plan



Office/Residential Development + Parking Summary

### Land Use - A1

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)					Subtotal
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft	Hotel	
1	0.21	0.21									
2	1.05		21,000		21,000		65			10	75
2' (hotel option)*	1.05		21,000		21,000					10	150
3	2.42		18,400		18,400	16	125	174			315
4	2.53	2.53									
5	1.37					12	80				92
6	2.00		500		500	10	150				160
7	1.29					12	80				92
8	1.34					12	52	174			238
9	1.14		500	250,000	250,500						
10	1.99						48				48
11	0.70		1,000	250,000	251,000						
12	0.63	0.63									
<b>TOTAL</b>	<b>16.67</b>	<b>3.37</b>	<b>41,400</b>	<b>500,000</b>	<b>541,400</b>	<b>62</b>	<b>600</b>	<b>348</b>	<b>10</b>	<b>N.A.</b>	<b>1,020</b>

\*Hotel option does not count towards totals

### Parking - A1

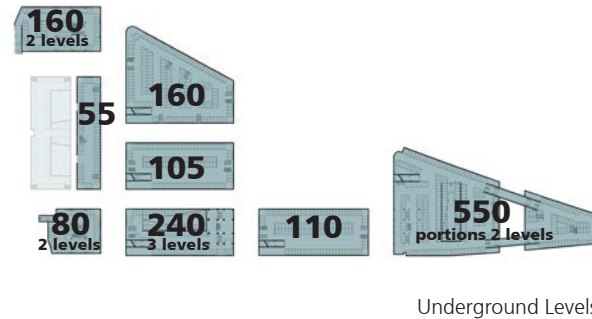
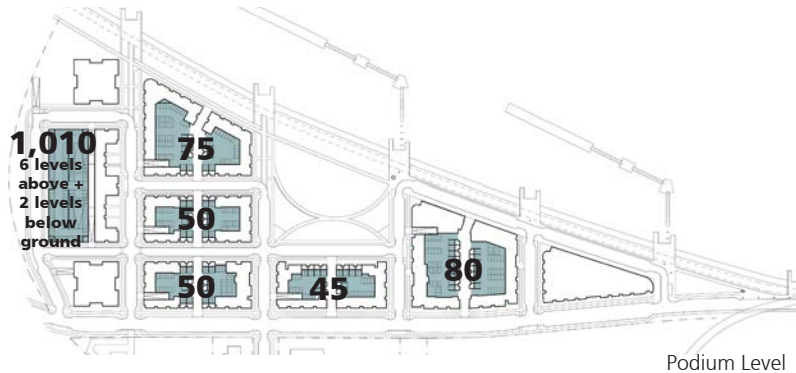
Block Number	Residential Parking Spaces				Parking Ratio (space/unit)	Office Parking Spaces		
	Underground	Podium Level	Subtotal	Dwelling Units		Underground	Podium Level	Subtotal
1								
2	550		630	75	1.6			
3		80		315				
4								
5	110	45	155	92	1.7			
6	160	75	235	160	1.5			
7	105	50	155	92	1.7			
8	240	50	290	238	1.2			
9						160		160
10	55		55	48	1.1	200	810	1010
11						80		80
12								
<b>TOTAL</b>	<b>1220</b>	<b>300</b>	<b>1,520</b>	<b>1,020</b>	<b>1.5</b>	<b>440</b>	<b>810</b>	<b>1250</b>

Additional On-Street Parking Total

420

Office Parking Ratio (space / 1k sf)

2.5

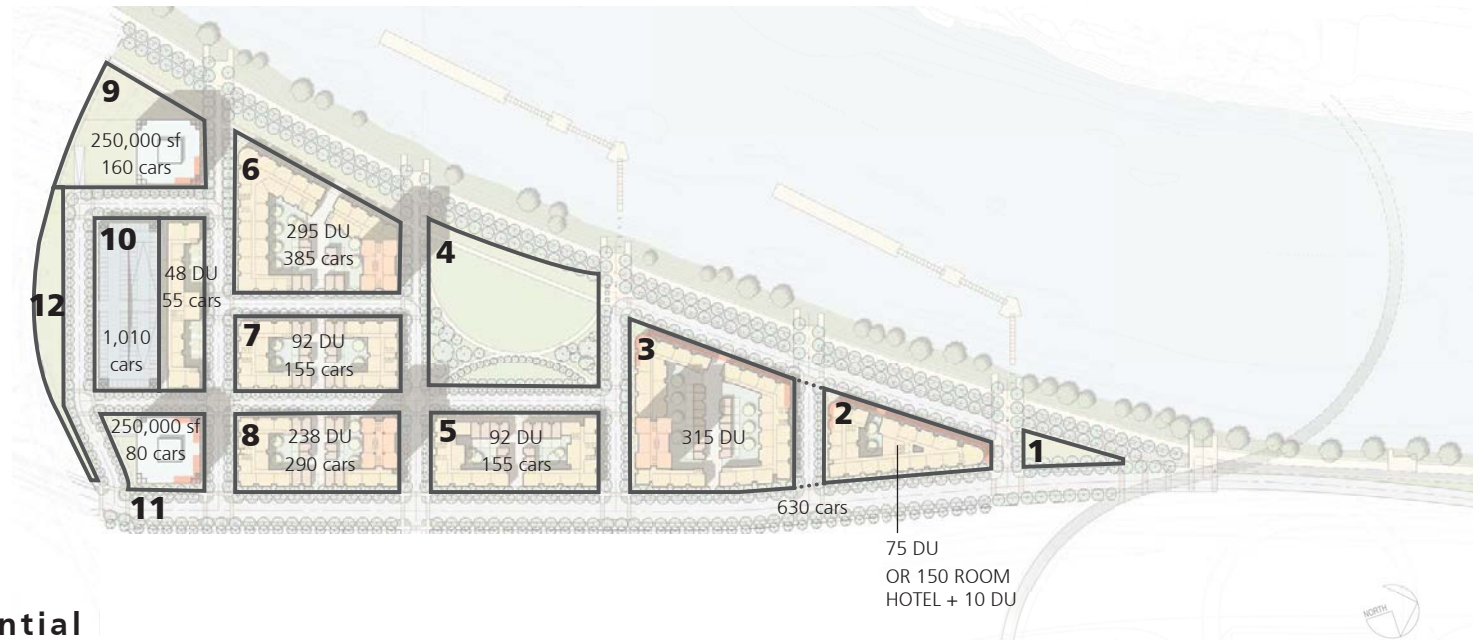


### Off-Street Parking

# OPTION A2



Land Use Pl.



Office/Residential

## Land Use - A2

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)					Subtotal
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft	Hotel	
1	0.21	0.21									
2	1.05		21,000		21,000		65			10	75
2' (hotel option)*	1.05		21,000		21,000					10	150
3	2.42		17,500		17,500	16	125	174			315
4	2.53	2.53									
5	1.37					12	80				92
6	2.00					10	111	174			295
7	1.29					12	80				92
8	1.34					12	52	174			238
9	1.14		1,000	250,000	251,000						
10	1.99						48				48
11	0.70		1,000	250,000	251,000						
12	0.63	0.63									
<b>TOTAL</b>	<b>16.67</b>	<b>3.37</b>	<b>40,500</b>	<b>500,000</b>	<b>540,500</b>	<b>62</b>	<b>561</b>	<b>522</b>	<b>10</b>	<b>N.A.</b>	<b>1,155</b>

\*Hotel option does not count towards totals

## Parking - A2

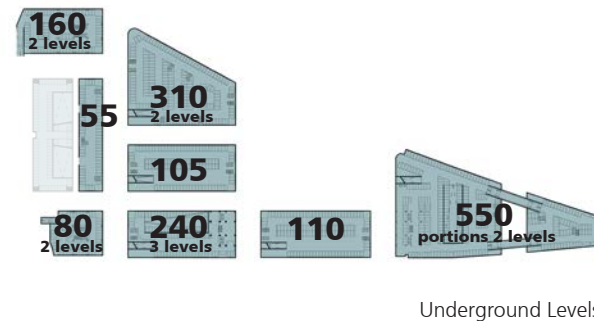
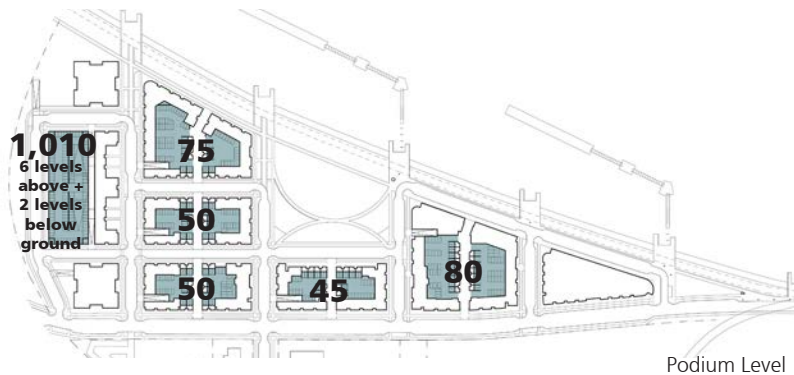
Block Number	Residential Parking Spaces				Office Parking Spaces			
	Underground	Podium Level	Subtotal	Dwelling Units	Parking Ratio (space/unit)	Underground	Podium Level	Subtotal
1								
2	550	80	630	75	1.6			
3				315				
4								
5	110	45	155	92	1.7			
6	310	75	385	295	1.3			
7	105	50	155	92	1.7			
8	240	50	290	238	1.2			
9						160		160
10	55		55	48	1.1	200	810	1010
11						80		80
12								
<b>TOTAL</b>	<b>1,370</b>	<b>300</b>	<b>1,670</b>	<b>1,155</b>	<b>1.4</b>	<b>440</b>	<b>810</b>	<b>1250</b>

Additional On-Street Parking Total

420

Office Parking Ratio (space / 1k sf)

2.5

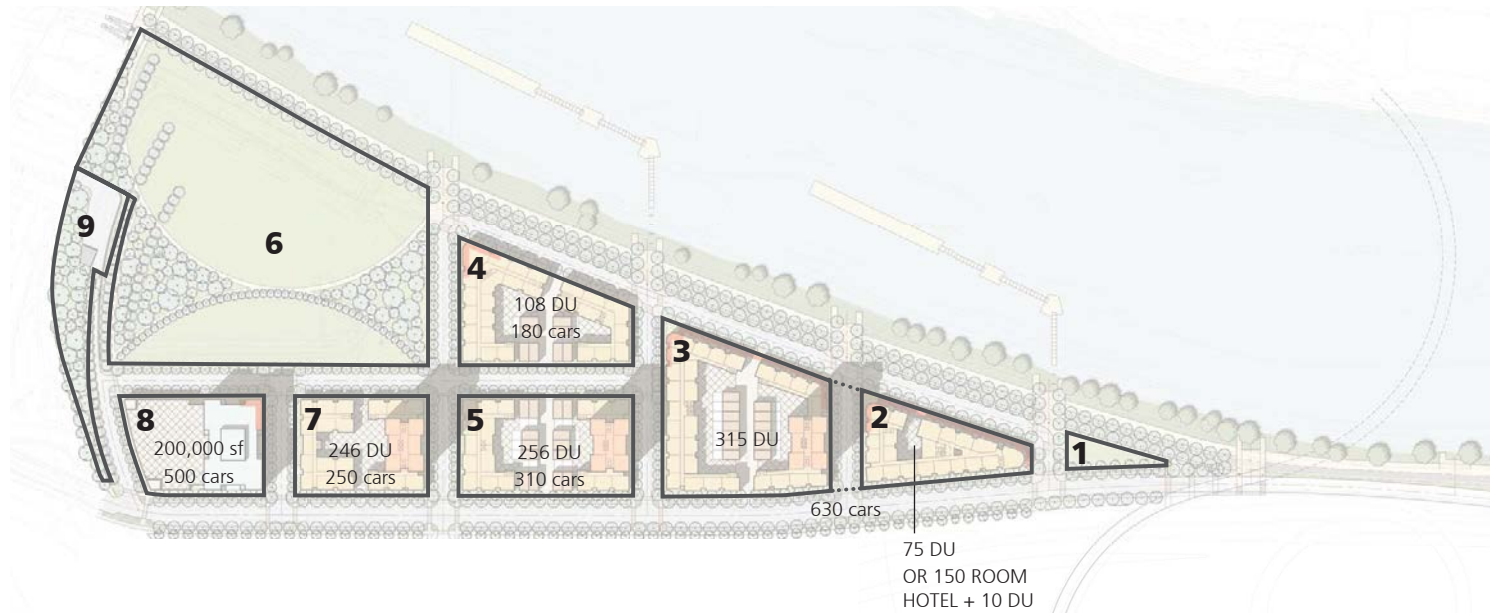


## Off-Street Parking

OPTION B



Land Use Plan



Office/Residential Development + Parking Summary



### Land Use - B

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)					Subtotal	Block Number	
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft	Hotel			
1	0.21	0.21										1	
2	1.05		21,000		21,000		65			10	75	2	
2' (hotel option)*	1.05		21,000		21,000					10	150	N.A.	2'
3	2.42		19,800		19,800	13	128	174			315	3	
4	1.60		1,500		1,500	8	100				108	4	
5	1.72					14	68	174			256	5	
6	8.18	8.18										6	
7	1.31						72	174			246	7	
8	1.31		1,000	200,000	201,000							8	
9	1.35	1.35**										9	
<b>TOTAL</b>	<b>19.15</b>	<b>9.74</b>	<b>43,300</b>	<b>200,000</b>	<b>243,300</b>	<b>35</b>	<b>433</b>	<b>522</b>	<b>10</b>	<b>N.A.</b>	<b>1,000</b>	<b>TOTAL</b>	

\*Hotel option does not count towards totals

\*\*Includes reservoir service area

### Parking - B

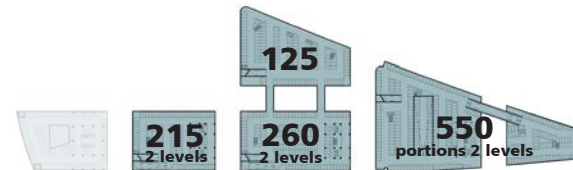
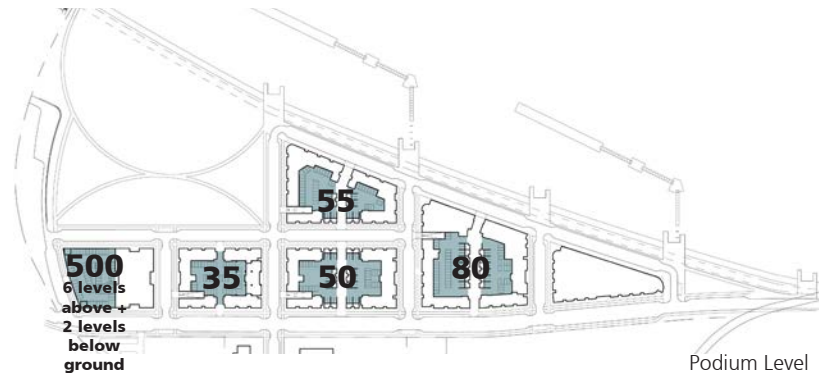
Block Number	Residential Parking Spaces				Parking Ratio (space/unit)	Office Parking Spaces		
	Underground	Podium Level	Subtotal	Dwelling Units		Underground	Podium Level	Subtotal
1								
2				75	1.6			
3	550	80	630	315				
4	125	55	180	108	1.7			
5	260	50	310	256	1.2			
6								
7	215	35	250	246	1.0			
8						180	320	500
9								
<b>TOTAL</b>	<b>1,150</b>	<b>220</b>	<b>1,370</b>	<b>1,000</b>	<b>1.4</b>	<b>180</b>	<b>320</b>	<b>500</b>

Additional On-Street Parking Total

420

Office Parking Ratio (space / 1k sf)

2.5



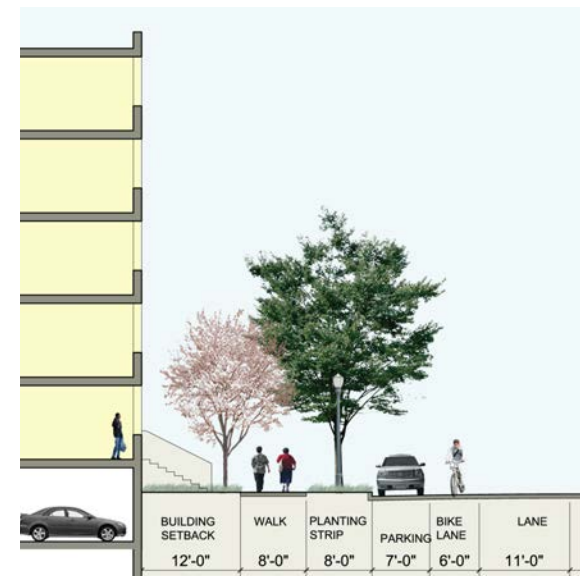
Underground Levels

### Off-Street Parking

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# CIRCULATION

The circulation system within the Docks Area is designed to provide a safe and efficient multi-modal transportation system for the new riverfront neighborhood. This chapter describes access to and circulation within the Docks Area Specific Plan, and identifies the elements of the plan that create efficient movement of pedestrians, bicyclists, and vehicles in and around the planning area, including connections to adjacent networks, improvements to existing facilities, and development of new facilities. The street design standards are consistent with the City’s Street Design Guidelines, although they have been adapted to meet the specific conditions of the Docks Area. Detailed street design guidance is located in the Public Realm section of the Docks Area Urban Design Guidelines companion document.



Walking, bicycling and transit provide an alternative to the private automobile in a balanced circulation system.

## Circulation Goals

The Central City Community Plan, which includes the Docks Area, states the following Transportation Goal:

*“Encourage the development of an overall balanced system of transportation which emphasizes public transit, protects residential neighborhoods, promotes alternatives to the single occupant automobile commuter, and which provides for safe, convenient and efficient movement of people and goods in and through the Central City.”*

The following circulation goals of the Docks Area Specific Plan reflect the specific characteristics of the Docks Area within the Central City Context:

- Goal 1. Provide a multi-modal transportation system that safely accommodates the vehicular traffic associated with the planned development while promoting transit, bicycle, and pedestrian modes of travel.
- Goal 2. Provide increased access to the Sacramento Riverfront, including bicycle and pedestrian connections to the Riverfront Promenade.
- Goal 3. Improve connectivity to adjacent areas, including Miller Park.
- Goal 4. Provide efficient access to the planned residential and commercial development.
- Goal 5. Facilitate new connections to West Sacramento to the extent possible.
- Goal 6. Maintain railroad access for Old Sacramento excursion trains and limited freight train use.
- Goal 7. Provide parking and high-quality non-motorized access to attract visitors to the neighborhood.

## Context and Access

### Regional Access

Regional automobile access to the Docks Area is provided primarily by the freeway system that serves Downtown Sacramento, including Interstate Route 5 (I-5) and US 50. Figure 4.1 illustrates the location of the Docks Area within the context of the existing transportation system.

Interstate 5 (I-5), a north-south freeway that extends from Canada to Mexico, is located just east of the Docks Area. To the north of the project area, I-5 provides access to the Richards Boulevard Area, South Natomas, I-80, and North Natomas in the City of Sacramento. I-5 continues to Sacramento International Airport. To the south, I-5 provides access to Land Park, the Pocket, and South Sacramento in the City of Sacramento. There is no direct access from I-5 to the Docks Area. From the north, I-5 access is via a ramp to Q Street east of I-5. To the north,

I-5 access is via a ramp from P Street east of I-5. From the south, I-5 access is via a ramp to Broadway east of I-5. To the south, I-5 access is via a ramp beginning at the intersection of 5th and W Streets.

US 50 (Business I-80) is an east-west freeway located just south of the Docks Area. There is no direct access from US 50 to the Docks Area. To and from the east or west, access is possible via the I-5 P Street and Q Street ramps mentioned previously. From the east, access is possible via the 10th Street ramp that leads to W Street. To the east, access is also possible via the 10th Street ramp that begins on X Street.

Regional access to the Docks Area is also provided via the Tower Bridge to and from West Sacramento.



Figure 4.1 illustrates the location of the Docks Area and its relationship to the existing transportation network. Access to the immediate Docks Area is from the north and the south via Front Street.

## Local Access

Downtown Sacramento is served by a grid street system. Numbered streets exist in a north-south orientation; lettered streets exist in an east-west orientation. The grid system is interrupted by the freeway network in the Docks Area. Local automobile access to the Docks Area is via Front Street to the north O Street and south from Broadway.

*Front Street* is a two-way north-south street between the Sacramento River and I-5 that passes through and provides direct access to the site. It extends from I Street on the north to Broadway and the Miller Park Marina on the south end. North of the project area, Front Street is discontinuous: as it diverts around the Embassy Suites Hotel, it passes under Capitol Avenue via Neasham Circle. Front Street consists of one lane each way, without left turn lanes. Front Street is accessed by O Street from the north and Broadway to the south.

*O Street* is a two-way east-west street that extends from 3rd Street on the east, over the I-5 freeway, to Front Street on the west. It provides the northern access to the site from the north via Front Street, and crosses the I-5 freeway via the only vehicular bridge between Broadway and Capitol Mall.

*Broadway* is a two-way east-west street at the south end of the downtown grid. It provides access to the site from the south via Front Street. It extends from the Sacramento River on the west end to 65th Street on the east end. West of Third Street, it consists of one lane each way, without left turn lanes.

*R Street* is a two-way east-west street that formerly accommodated freight rail tracks. The street's western terminus is at 2nd Street, where a rail bridge crosses over I-5 to Front Street and into the Docks Area. A bicycle and pedestrian path is proposed to be constructed on the rail bridge. To the east, R Street extends continuously to 19th Street. R Street is in poor physical condition in many segments, and generally accommodates relatively low traffic volumes. The street predominantly provides local access rather than accommodating through traffic.

*P and Q Streets* form an east-west one-way pair, or couplet, that extends across the Central City. P Street is one-way westbound, and Q Street is one-way eastbound. They provide direct access to I-5 near 2nd Street. To the east, they continue to Alhambra Boulevard, just east of Business Route 80.

*3rd Street* is a one-way southbound major street that parallels Interstate 5 along its east side from I Street to W Street, providing access to I-5 at several locations. The roadway generally maintains three southbound lanes, except for short sections of roadway north of L Street and south of R Street which contain northbound lanes. 3rd Street terminates at Broadway, which provides access to the Docks Area.

*5th Street* is a one-way northbound major street that begins south of Broadway and terminates at H Street. 5th Street generally maintains three northbound lanes, and is one-way northbound through much of the Central City, although it is two-way between J Street and L Street. 5th Street intersects with both Broadway and O Street, which provide access to the Docks Area.

## Transportation and Circulation Plan

A key objective of the Docks Area Specific Plan, and Goal 1 of this circulation chapter, is to provide safe and efficient access into and through the Docks Area for automobiles, bicyclists, pedestrians, and transit vehicles. The following policies provide for the implementation of transportation improvements to accomplish the goals of the Specific Plan:

- Policy 4.1 Upgrade Front Street to safely accommodate bicycle and pedestrian traffic.
- Policy 4.2. Design local streets to accommodate non-motorized vehicles.
- Policy 4.3 Design streets with sufficient, but not excessive, width to safely accommodate recurrent traffic demands.

Figures 4.2a and 4.2b illustrate the circulation and street typology of Options A and B, respectively, and their integration with the

existing roadway network. Both plans maintain a grid network typical of the Central City, adapted to conform to the Docks Area environs. The plan will continue to utilize Front Street to the north, and Front Street and Broadway to the south, as the primary points of access. Front Street provides access to Downtown and Old Sacramento via O Street and Neasham Circle, respectively. Broadway provides access to other areas of the City and to the freeway system.

### Functional Classification

The City’s Master Services Element provides the following definitions for City roadways:

*Expressway:* A roadway with limited access, high traffic volumes few cross streets (and no cross streets without signals), limited driveway access (infrequent driveways and no residential driveways), and no on-street parking.

*Major Arterial:* Provides mobility for high traffic volumes between various parts of the City and the region. Access to parcels is a secondary function and should be limited to the extent feasible. The City transportation network includes both suburban and urban arterials.

Suburban arterials have higher speeds and have the greatest access control. Urban arterials have generally lower speeds and less access control due to the intensity of the development in the urban environment.

*Minor Arterial:* A roadway that connects major facilities provides more access to adjacent land uses than a major arterial. Parking is allowed, but may be limited. Intersections with other arterials are signal controlled. Access is restricted, with no residential driveways except from multi-family units.

*Collector:* Connects residential uses to the major street system.

*Local:* Serves the interior of a neighborhood.

Based upon General Plan designations, Front Street is a collector and Broadway is a minor arterial. Other proposed roadways within the Docks Area are local.

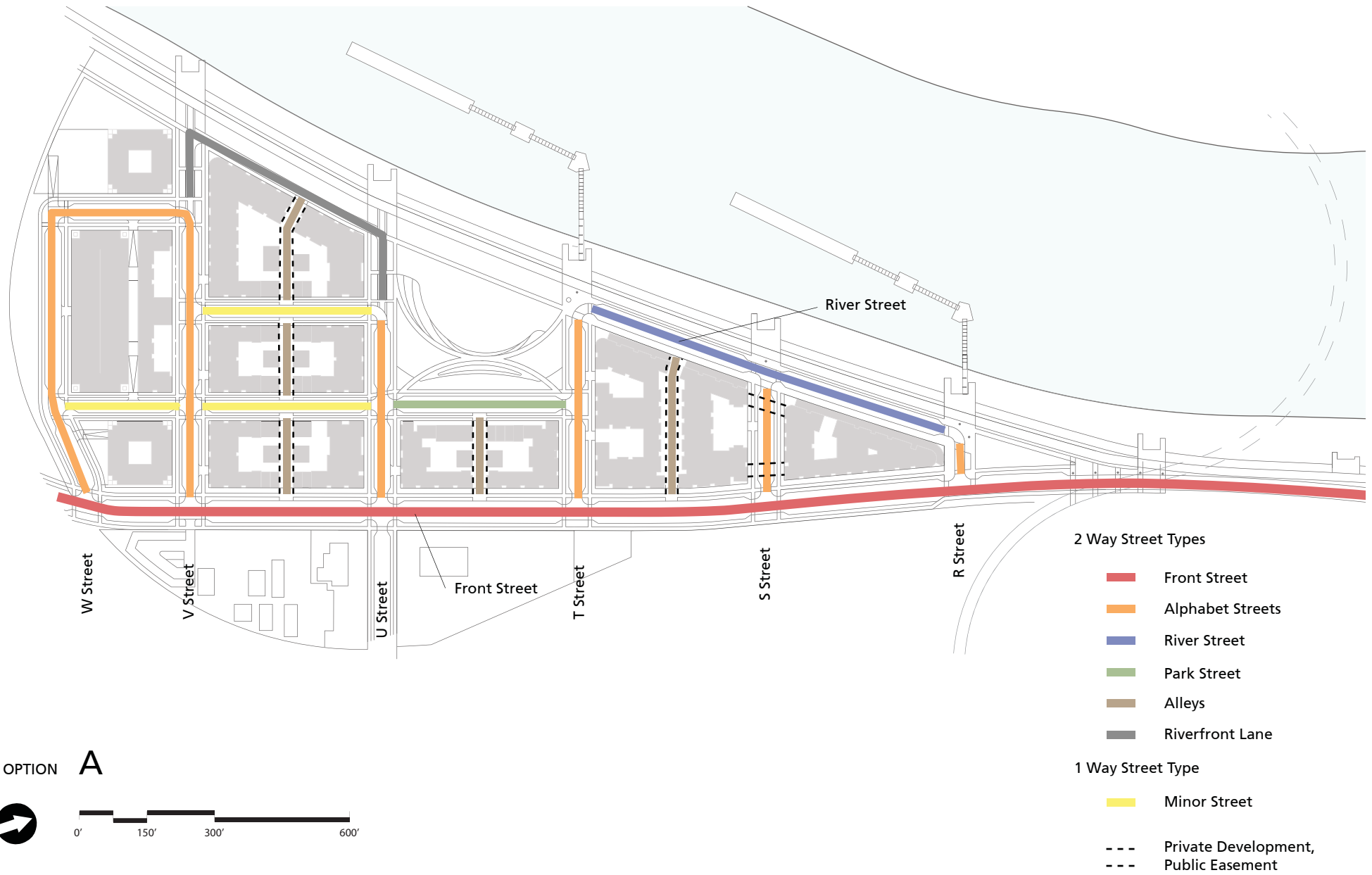


Figure 4.2a  
**SACRAMENTO DOCKS AREA**  
**CIRCULATION: STREET TYPES**



**Street Network**

Within the Docks Area, a network of local streets provides direct vehicular, pedestrian and bicycle access to the proposed land uses. Detailed street design standards are included in the Public Realm Section of the Urban Design Guidelines companion document.

*Front Street* is the north-south collector street that defines the east border of the Docks Area. Front Street is proposed as a two-way street with one travel lane and one bike lane in each direction, with parallel parking on both sides. Wide sidewalks on both sides are separated from the curb by continuous planting strips.

*River Street* runs parallel to the Docks Riverfront Promenade in the northwest portion of the Docks Area. This local street accommodates one travel lane in each direction, with parallel parking on both sides. Sidewalks are provided on both sides adjacent to the curb.

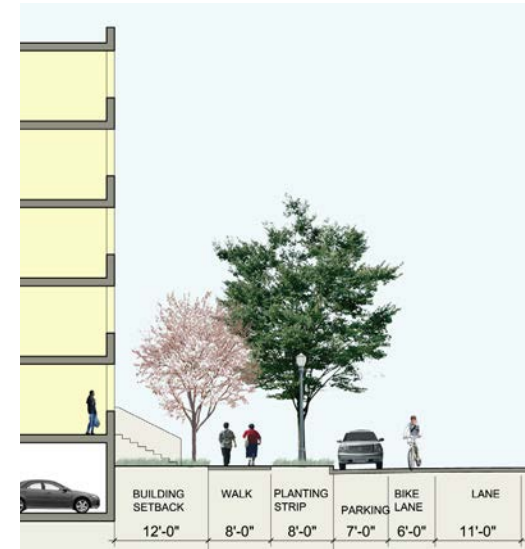
Alphabet streets refer to *R, S, T, U, V, and W Streets* that are east-west local streets. These streets accommodate one travel lane in each direction, with parallel parking on both sides. Intersections with neighborhood streets are marked by bulb-outs. Sidewalks on both sides are separated from the curb by continuous planting strips.

*S Street* is an east-west local street. It follows most design standards of Alphabet Streets, but differs slightly. It will contain public easements at both ends to allow for a connection between the underground parking spanning both adjacent blocks.

*Neighborhood Streets* are one-way streets parallel to Front Street in Option A. These local streets accommodate travel in one direction, with parallel parking on one side. Sidewalks on both sides are separated from the curb by continuous planting strips.

*Park Street* is a north-south local street that accommodates one travel lane in each direction, with parallel parking on both sides. Sidewalks on both sides are separated from the curb by continuous planting strips.

*Riverfront Lane (Option A)* extends U and V Streets to the railroad right-of-way, and connects U and V Streets parallel to the eastern edge of this right-of-way, which is also parallel to the river. It provides both emergency truck access and pedestrian access to the Promenade and riverfront at the southwest corner of the project area. Motorized vehicle circulation is prohibited.



Detailed street standards are located in Urban Design Guidelines: Public Realm



Figure 4.2b  
**SACRAMENTO DOCKS AREA**  
**CIRCULATION: STREET TYPES**

## Parking

On-street parking is permitted on Front Street from approximately S Street to V Street. On Broadway west of 3<sup>rd</sup> Street, on-street parking is prohibited. Parking is provided on both sides of most new streets, excluding Riverfront Lane (emergency vehicle access only), and Neighborhood Streets (3 block segments).

Within the Docks Area neighborhood, off-street parking is provided on several parcels associated with specific land uses. According to Sacramento's Central City Parking Master Plan (2006), the minimum requirement for multi-family units is one space per dwelling unit plus one guest space per 15 units, or 1.15 spaces per unit. Residential parking is provided within development parcels (off-street) at a rate of between 1.4-1.5 spaces per dwelling unit. Central City requirements for office parking are a minimum of one space per 450 square feet and a maximum of 1 space per 400 square feet. Within the Docks Area, office parking is provided at the rate of 2.5 spaces per 1,000 square feet, or one space per 400 square feet.

Detailed information on parking is provided in Chapter 3: Land Use and for on-street parking standards in the Urban Design Guidelines.

## Multi-modal Transportation

### Pedestrian System

Consistent with the City's emphasis on accommodating and encouraging alternative modes of travel, the Docks Area Specific Plan includes a pedestrian system that complements and augments the vehicular roadway system (see Figures 4.3a and 4.3b).

**Policy 4.5** Ensure that pedestrian access provides direct and convenient service within the planning area, as well as to adjacent areas.

Pedestrian access to the project site and downtown are provided at Capitol Avenue, O Street and the future R Street over-crossing. Pedestrian access will also be provided from the Riverfront Promenade. Consistent with General Plan and Community Plan policies, the system of pedestrian facilities serves the plan area internally as well as provides connections to adjacent areas.

Pedestrian facilities permeate the Docks Area. All streets in the Docks Area will include sidewalks or other walkways on both sides of vehicular travel. Alleys, while not having separate pedestrian elements, will also provide

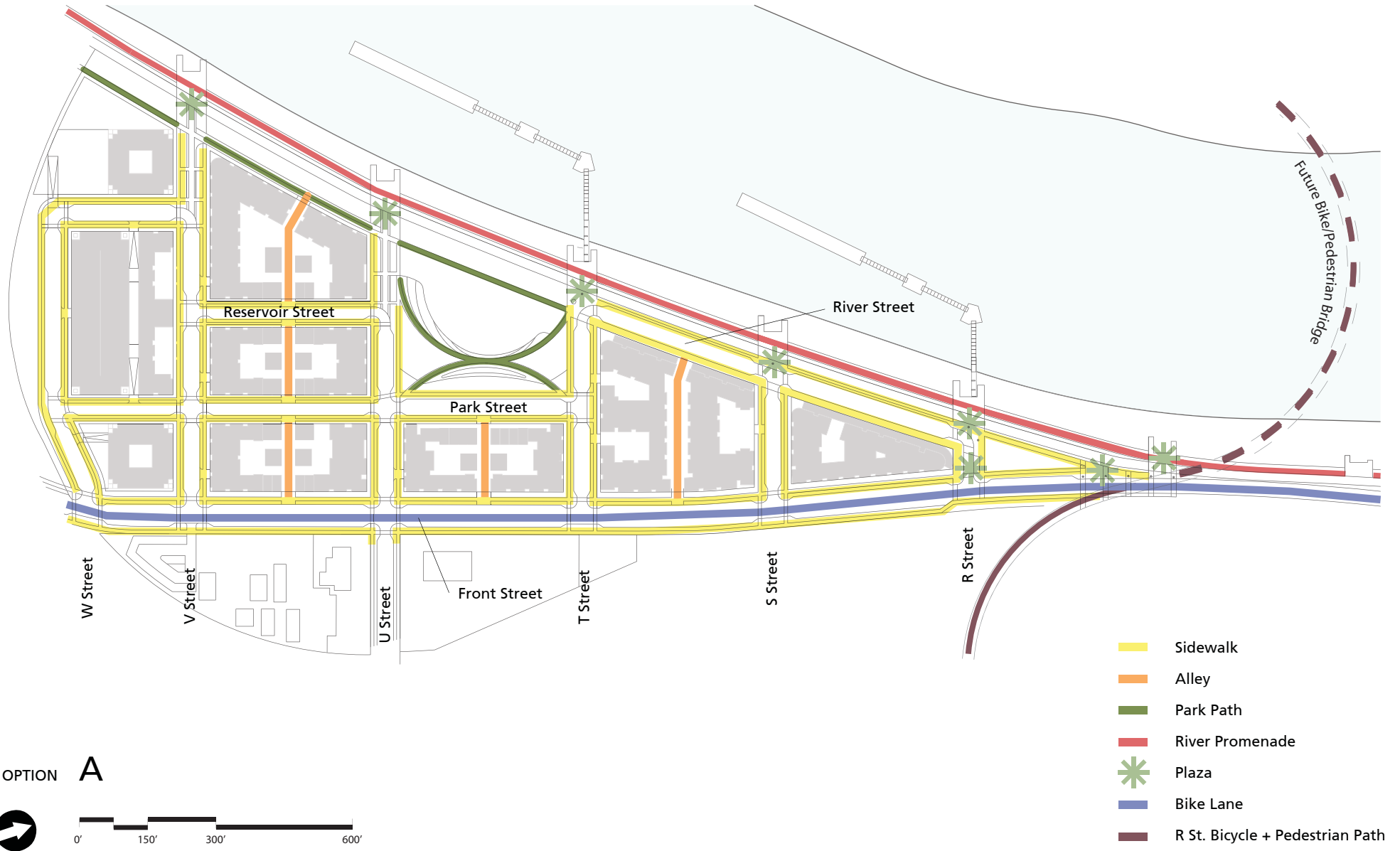


Figure 4.3a  
**SACRAMENTO DOCKS AREA**  
**CIRCULATION: PEDESTRIAN + BICYCLE**

additional connectivity. Pedestrian facilities will be provided along the riverfront as part of the Docks Riverfront Promenade. As previously mentioned, the current R Street railroad bridge over I-5 will be reconstructed or replaced to provide pedestrian and bicycle access.

### **Bicycle System**

Consistent with the City’s emphasis on accommodating and encouraging alternative modes of travel, the Docks Area Specific Plan includes a bicycle system that complements and augments the vehicular roadway system (see Figures 4.3a and 4.3b).

Policy 4.6     Ensure that bicycle access provides direct and convenient service within the planning area, as well as to adjacent areas.

The 2010 Bikeway Master Plan is a policy document that was prepared to coordinate and develop a bikeway system that will benefit and serve the recreational and transportation needs of the public. The Docks Area Specific Plan is consistent with the City’s Bikeway Master Plan. Officially designated bicycle facilities are classified as follows:

Class I:     Off-street bike trails or paths that are physically separated from streets or roads used by motorized vehicles.

Class II:    On-street bike lanes with signs, striped lane markings, and pavement legends.

Class III:   On-street bike routes marked by signs and shared with motor vehicles and pedestrians. Optional four-inch edge lines painted on the pavement.

Consistent with General Plan and Community Plan policies, the system of bicycle facilities serves the plan area internally as well as provides connections to adjacent areas. Primary elements of neighborhood bicycle access include bike lanes along Front Street (Class II), the Docks Riverfront Promenade (Class I), and the R Street Bridge connection to Downtown (Class I). Excluding Front Street, which is a collector with bike lanes, all street types within the Docks Area Neighborhood are local streets with projected low traffic volumes and design speeds, which would effectively become Class III facilities shared with vehicles. Bicyclists can access any part of the Docks Area.



Figure 4.3b  
**SACRAMENTO DOCKS AREA**  
**CIRCULATION: PEDESTRIAN + BICYCLE**

### Transit System

The Sacramento Regional Transit District (RT) operates 97 bus routes and 36.87 miles of light rail covering a 418 square-mile service area. Figure 4.3 illustrates RT services in the Central City. In the Docks Area, an RT shuttle (Route 141) currently provides transit services to the Calpers parking lot located west of Front Street under the Pioneer Bridge. The route operates on Front Street between the Calpers lot and Broadway, and on Broadway east of Front Street. Service is provided at 15-minute intervals during the a.m. commuter period, 1-hour intervals during midday, and 15-minute intervals during the p.m. commuter period. There is no evening, Saturday, Sunday, or holiday service.

Improving and increasing transit service to the Docks Area is a key aspect of its success as a vital urban neighborhood. As development occurs, it is envisioned that the level of transit service will increase to accommodate anticipated travel demand and to reduce the number of trips made by private automobile. Bus stops are proposed along Front Street at R Street, T Street, and V Street.

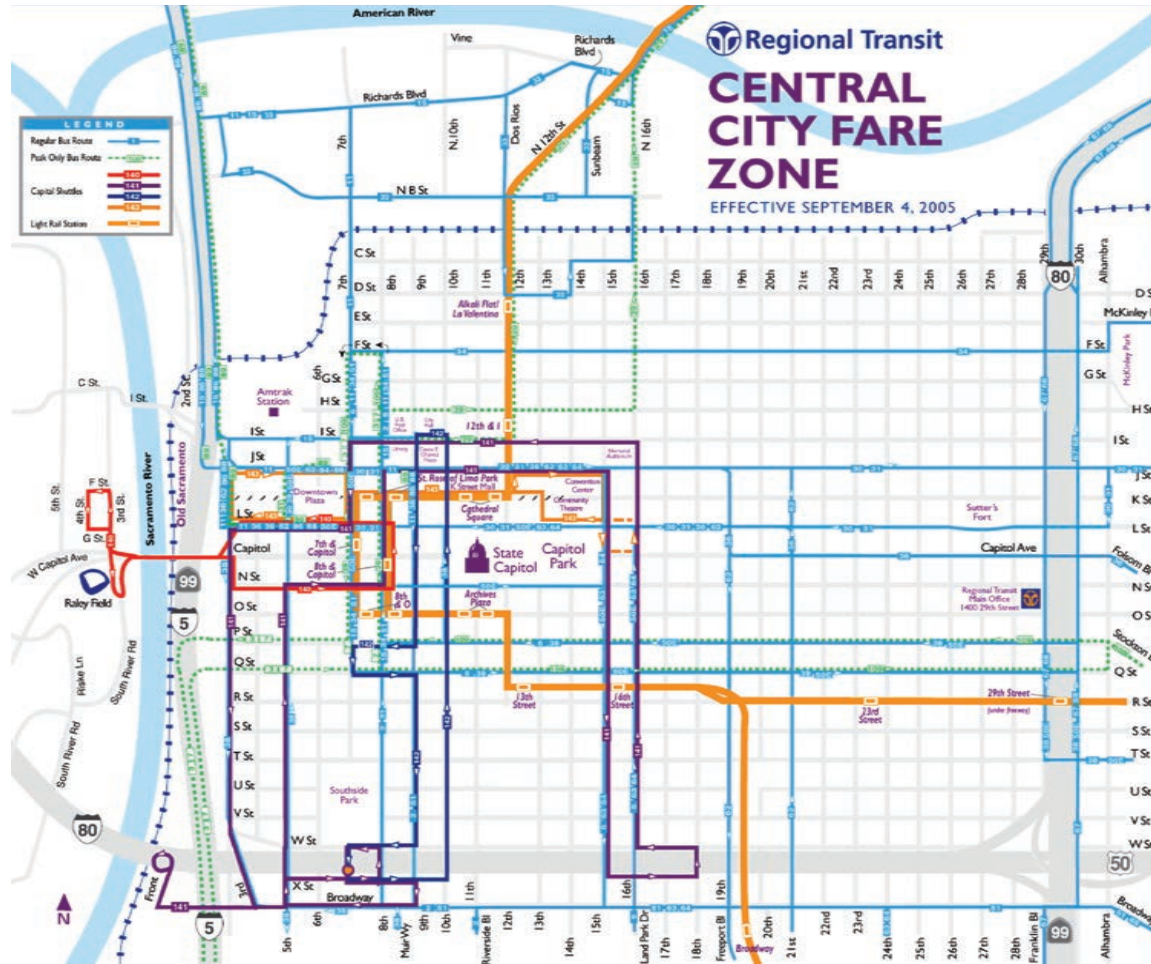


Figure 4.3 Existing Transit Service in Downtown Sacramento. Future transit improvements are planned for the Docks Area. Currently, Route 141 provides transit access via limited service to the southern end of the project area.

Policy 4.7 Work with Regional Transit to expand bus services in the Docks Area as development occurs. Bus stops shall have amenities such as shelters, benches, and information as appropriate.

The City of Sacramento, the City of West Sacramento, RT, and the Yolo County Transit District formed a partnership to study the reintroduction of the streetcar to connect their cities' downtowns and riverfront areas. Phase 1 of a feasibility study has been completed. During Phase 1, numerous streetcar alignments were considered, including an alignment serving the Docks Area. This alignment would extend along Front Street from Capitol Mall, and loop within the Docks Area. However, this alignment has not been included in the preferred initial alignment and possible extensions.

**Access to River and Riverfront Promenade**

Improving access to the Sacramento River is a key objective of the Circulation Plan (Goal 2). River Street will be constructed east of the railroad tracks parallel to the riverfront as an urban retail street with orientation and strong visual connections to the Sacramento River. Immediately west of and adjacent to the Docks Area, the Docks Riverfront Promenade project (separate from the Docks Area Project) will upgrade pedestrian, bicycle, and railroad facilities along the Sacramento riverfront connecting Old Sacramento to Miller Park. The non-motorized multi-use facility will be constructed from O Street to just south of W Street. Bicycle and pedestrian connections between the Docks Area and the Riverfront Promenade will be provided via at-grade rail crossings at Q, R, S, T, and U Streets. Option A includes access to an additional crossing at V Street, and Option B includes access to an additional crossing at W Street.



### **Motor Vehicle System Capacity and Performance Standards**

The transportation and circulation system for the Docks Area recognizes the transportation policies of the City General Plan and Central City Community Plan. The City of Sacramento General Plan includes a goal of maintaining Level of Service (LOS) “C” throughout the roadway network. Because of the constraints of existing development in the City, and because of other environmental concerns, this goal cannot always be met. The City is currently updating the General Plan, and the level of service goal may be changed. Caltrans utilizes a LOS “E” standard for the Sacramento urban freeway system. The adequacy of the City street system to serve the planned Docks development is addressed in the Transportation and Circulation analysis of the Docks Area Specific Plan EIR.

Policy 4.4 Roadway performance standards in the Docks Area shall be consistent with the performance standards established in the updated General Plan.

The local circulation plan has been developed to provide access to the project parcels from Front Street through a grid pattern of streets. This grid pattern disperses traffic among multiple streets and provides redundant access routes in the event

of an incident that blocks a specific street. The two-lane local street system will adequately serve anticipated a.m. and p.m. peak commuter hour traffic volumes within the City’s level of service goals.

### **Transportation Demand Management (TDM)**

The implementation of a Transportation Demand Management (TDM) plan that encourages a shift from the single-occupant automobile to other modes of transportation is an important element of the Circulation Plan. City Ordinance No. 2550 requires developers of projects that will accommodate 25 or more employees to comply with one of several Traffic System Management (TSM) measures to better utilize existing transportation facilities and to pay for capital improvements that would benefit the City’s downtown transportation network as fulfillments of the TSM measure. In addition to traditional TDM programs that focus on employment centers, it is recommended that the TDM plan shall also address the residential land uses within the Docks Area.

Policy 4.8. Project applicants shall develop a TDM plan for all commercial and office development in the Docks Area. The plan shall be subject to City review and approval.

The plan recommends consideration of the following transportation demand strategies:

- Participation in the Sacramento Transportation Management Association (TMA).
- Ride-sharing and ride-matching services.
- Transit subsidies.
- Support for alternative work schedules and telecommuting.
- Guaranteed-ride home programs.
- Bicycle parking facilities, and showers at employment sites.
- Transit passes included as part of residential development.

**Implementation of the Circulation Plan**

The Docks Area Circulation Plan will be implemented in a coordinated manner as development occurs. The following policies will guide the implementation of the circulation system:

Policy 4.9 The circulation system and improvements identified in the Specific Plan shall be implemented without substantial alteration, unless information becomes available that such improvements

are inadequate to safely and/or inefficiently accommodate the proposed project. If such is the case, other more appropriate solutions can be developed.

Policy 4.10 All streets shall be developed to the street standards identified in the Specific Plan. The design of all streets shall be subject to the review and approval by the City of Sacramento, including review for emergency vehicle access.

Policy 4.11 Interim roadway phases shall provide adequate access and capacity to serve each phase of development, including emergency vehicle access.

Policy 4.12 The City will require development agreements to specify responsibility for necessary roadway improvements to serve the development and mitigate traffic impacts. These agreements will guarantee access to all development district parcels as needed to allow development to occur.

# URBAN DESIGN INTENT

5

## Introduction

The Docks Area Urban Design Guidelines, located in a companion document, provide detailed guidance to direct the design of private and public improvements. The intent of the Guidelines is to ensure the transformation of the underutilized post-industrial landscape of the Docks Area into a vibrant neighborhood and a unique recreation destination. In order to realize this goal, the guidelines and standards in that document focus on achieving a series of specific objectives relative to the area's physical form and character. Overall, the design guidelines and development standards promote:

- A visually and aesthetically distinctive identity for public and private open spaces that links the urban area to the Sacramento River and Promenade.
- A pattern and scale of development that creates a well-defined, human-scale environment that incorporates active, pedestrian-oriented, street-level uses to animate and enliven the public realm;
- Well-designed buildings that contribute a sense of quality and permanence to the Docks Area;
- A system of public and private parking structures and rear-loaded parking areas that reduce the visual and spatial prominence of the automobile.



Docks Park (Option A)

- A safe and attractive system of streets and parks that provides graciously scaled public spaces that support and promote an active pedestrian environment;

Recognizing that these objectives address public as well as private property and will be implemented by both the City and private developers, the design guidelines and development standards address two broad categories: the public realm and the private realm. The public realm design guidelines address the design of improvements within public areas associated with the Docks Area's systems of parks and streets. The private realm guidelines address the design of all new private development within the blocks. The public and private design guidelines are intended to complement one another. However, the distinction between the public and private realms also recognizes that the challenge of creating a unique identity and sense of place for the Docks Area depends on the design contributions of both public and private realms.

## Topographic Conditions

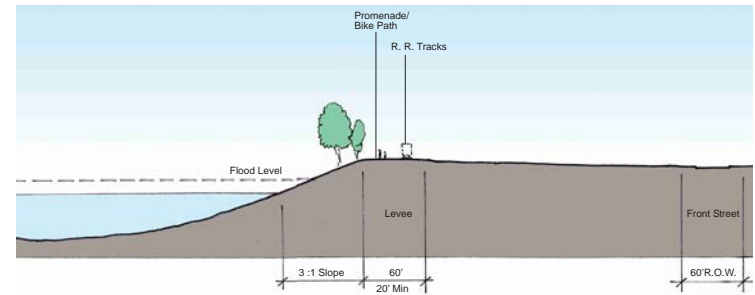
The levee condition in the Docks Area poses challenges as well as opportunities for the design of both public space and private development. In order to strengthen connections to the riverfront and protect against flooding, the specific plan seeks to raise the ground level through a multi-faceted strategy that includes public streets, parks and developed areas. Public parks for both Alternative A and B will be graded to maximize recreational areas that slope towards, and thereby provide views of, the Sacramento River. In Alternative B, the plan proposes reclaiming the reservoir's roof—roughly at the same level as the levee top—as usable park land. A new green roof will allow for the soil and plantings needed to create a park at a height that provides strong visual connections to the riverfront.

Similarly, the plan proposes to raise building grades up to the levee top along the riverfront to enhance views and connections to the parks and riverfront. Structured parking will elevate buildings' "ground floors" up to the levee level. New adjacent streets will be built on fill material at the level of the building entries, burying the

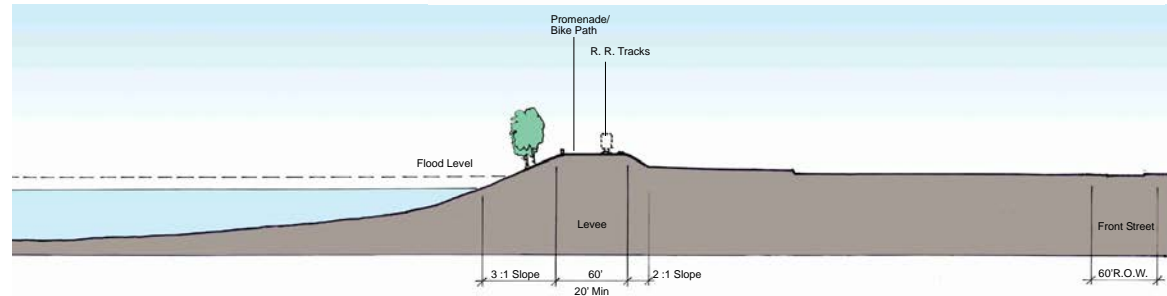
structured parking in relation to the north-south streets. The east-west Alphabet streets will slope from the levee level down to Front Street at its current level. Streets will be graded to maximize the amount of stormwater captured in the bioswale network, which will drain water away from the levee eastward and southward into a stormwater detention area. Most of the grade change will occur in the first block between Front Street and Park Street. (see grading diagram in Chapter 6: Infrastructure).

### Influences and Adjacencies

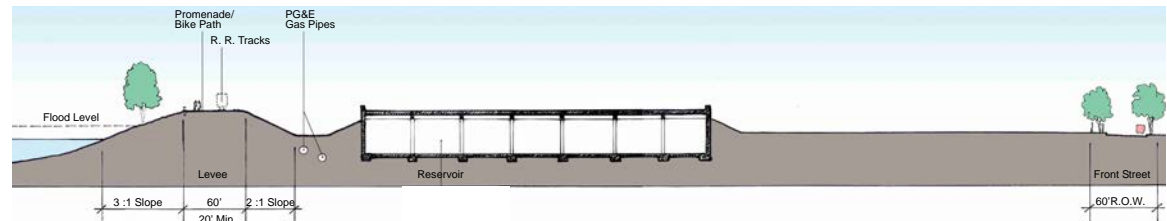
The Pioneer Bridge (Business 80 / SR 50) to the south and I-5 to the east cause significant impacts to the site, including shadows, noise and air pollution. The Specific Plan addresses these impacts on several levels. The land use plan locates residential uses away from the freeway, and places office uses on the blocks immediately adjacent to the freeway, which can be designed to address air and noise.



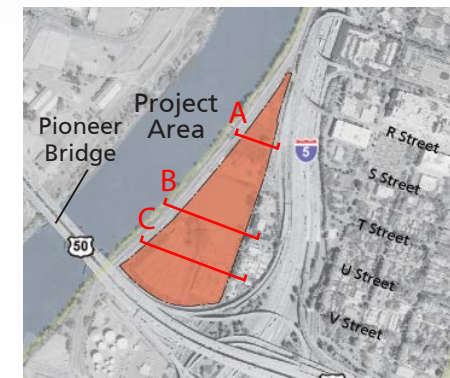
Section A: Existing Condition Through Project Site at S Street



Section B: Existing Condition Through Project Site at U Street



Section C: Existing Condition Through Project Site at Pioneer Reservoir



Key Plan: Existing Site

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# PRIVATE REALM

## Summary

The Urban Design Guidelines for the Private Realm address the design of private development for all areas outside of the public right-of-way. These are defined by the proposed street and block pattern that creates a series of parcels for development.

The guidelines define the following:

- Land use and building type locations, and building configurations
- Maximum bulk and heights allowed
- Mid-block passages intended to create a permeable framework for pedestrian access to the river
- Retail frontage locations
- Street-wall build-to lines and required setbacks
- Definition of façade articulation and permitted encroachments within the street-wall setbacks
- Preferred locations for building entrances and garages
- Parking garages



## Private Realm Policies

**Policy 5a.1:** New private development in the Docks Area shall contribute to a high quality street environment by creating a strongly defined street-wall and articulated facades providing interest and promoting “eyes-on-the-street” and social interaction.

**Policy 5a.2:** New private development in the Docks Area shall have a mix of uses that is predominately residential with some supporting retail and office in order to provide the critical mass of residents and workers to create an active and vibrant residential district on the Downtown waterfront.

**Policy 5a.3:** New private development in the Docks Area shall be scaled appropriately in terms of bulk and height to create a comfortable, pedestrian-scaled district which allows ample solar access and ventilation to streets, parks, courtyards, businesses and residences.

**Policy 5a.4:** A variety of building types and densities will provide variation in the district creating a sense of organic, varied, incremental growth and further promoting a sense of a pedestrian urban village.

**Policy 5a.5:** A mix of neighborhood-serving and visitor-serving retail will be concentrated in a limited area in order to promote synergy between retailers and restaurants and help create an active waterfront destination.

**Policy 5a.6:** Parking facilities other than on-street parking will be hidden from view either by being below grade, wrapped with residential or retail uses or screened with landscaping (as in the case of the office towers parking). None shall front on prominent streets in the district.

**Policy 5a.7:** Green design principles shall be applied to all buildings in the district and shall either follow LEED standards (for retail and commercial buildings) or Enterprise Green Communities or Green Multifamily Design Guidelines by the California Integrated Waste Management Board (for Multifamily residential buildings).



# PUBLIC REALM

## Summary

The network of public streets and parks that comprise the public realm will be the unifying element that establishes a consistent design character and quality for the entire neighborhood. These publicly-owned and controlled spaces should provide an attractive, well-designed physical structure that can graciously accommodate and connect the diverse array of privately developed buildings. The design of the public realm is especially important since the Docks Area neighborhood is likely to be built over many years. Since streetscape and other public realm improvements will precede private development, they can be used to establish a design standard that sets the tone for subsequent private development.

The “Public Realm” section of the Urban Design Guidelines lays out an integrated open space system that offers recreational opportunities to the greater Sacramento community while contributing to an attractive and distinctive identity for the neighborhood. This section has two components: “Landscapes” and “Streetscapes.” The “Landscapes” section identifies and guides the major landscape elements planned for the Docks Area, including two urban parks, a plaza, and public recreational elements outside of the project boundary that contribute to the overall open space system. The “Streetscapes” section includes design standards for all streets within the Docks Area, including a Street Tree Master Plan.



Plaza at R Street Park overlooking the river

## Public Realm Policies

**Policy 5b.1:** New development in the Docks

Area shall provide open space amenities, such as plazas and public seating areas, that promote pedestrian activity and give scale, structure, and identity to the district.

**Policy 5b.2:** New development shall provide

or contribute to the creation of improved parkland consistent with this Specific Plan and City standards for parkland dedication and in-lieu fees.

**Policy 5b.3:** R Street Park / Plaza shall

be implemented as Phase I improvements to help establish the character of the District and serve as catalysts for new development.

**Policy 5b.4:** Local streets shall be designed to

provide convenient, attractive, and pedestrian-friendly connections between urban parks and the Sacramento River.

For detailed Urban Design Guidelines for Private and Public Realms refer to companion document “Docks Area Urban Design Guidelines”.

# INFRASTRUCTURE

The provision of infrastructure that safely and efficiently serves the Docks Area will be essential to the area's function and quality of life. This Chapter describes new infrastructure and infrastructure improvements necessary to provide adequate water supply, sewer, storm water management and drainage, solid waste collection, and other utilities (i.e. natural gas, electricity, and telecommunication) to the proposed development in the Sacramento Docks Area. The layout of the proposed development considers two options, Option A and Option B. This chapter discusses the utility and infrastructure needs for both options. The infrastructure plan for each Option reflects its distinct street grid and land use intensity. In addition, Option A has two phasing options for density distribution--A1 and A2\*.

\*The site is currently designed to maintain pre-development levels of stormwater run-off. The volume and flow of water entering the City's drainage system can be optimized through the use of best management practices intended to meet the standard of "reducing pollutants in urban runoff to the maximum extent practicable" set forth in the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits issued by the Central Valley Regional Water Quality Control Board. The system proposed in the Docks Area Specific Plan (excluding the optional underground oversized pipe water storage system) is consistent with the recently published *Stormwater Quality Design Manual for the Sacramento and South Placer Regions, May 2007*--a manual of best management practices for the region. Oversized pipes, a method of gaining additional water storage capacity to irrigate during dry months are included in, but are not a requirement of, this plan. Such water reuse techniques are highly encouraged as a part of more detailed development proposals.

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\*Note: The demand calculations (e.g. water supply and natural gas) for Option A only consider A2, the option with higher demand.



Docks Area Development should incorporate water conservation features such as drought-resistant landscaping.

This chapter incorporates information on existing infrastructure in the project area in the *Technical Memorandum on Existing Infrastructure (NCE, 2005)* to determine available capacity and to consider future connection points for new utility lines.

The following sections describe the capacities of the existing infrastructure and necessary improvements to accommodate the build-out suggested for Option A and Option B. A general description of construction methods like pile driving for building foundations and engineered fill required to raise the existing ground east of the levee to accommodate the planned street grid is included as well.

Several figures and calculations are included to illustrate grading and stormwater management. Additional figures and calculations illustrating the proposed alignment of new utilities are located in Appendix 1. Preliminary calculations for the future demand from potable water supply, storm drain, sanitary sewer and natural gas are contained in subsequent appendices.

## Grading

The site is generally graded from +36 feet at the levee top to the south and east to Front Street at +20 feet.

The proposed grading raises the site up to or above the levee level to enhance views and connections to the Sacramento River. To achieve this, the site is generally graded from +20 feet at the south-east corner and most of the eastern edge along Front Street to +36 feet at the levee top.

Heading west from Front Street to the first cross-street (Park Street), slopes are maximized to ensure that higher grades are reached as soon as possible, resulting in enhanced river views and a gentler slope further west.

The steepest slopes approaching 5 percent occur on the Alphabet Streets between Front and Park Street.

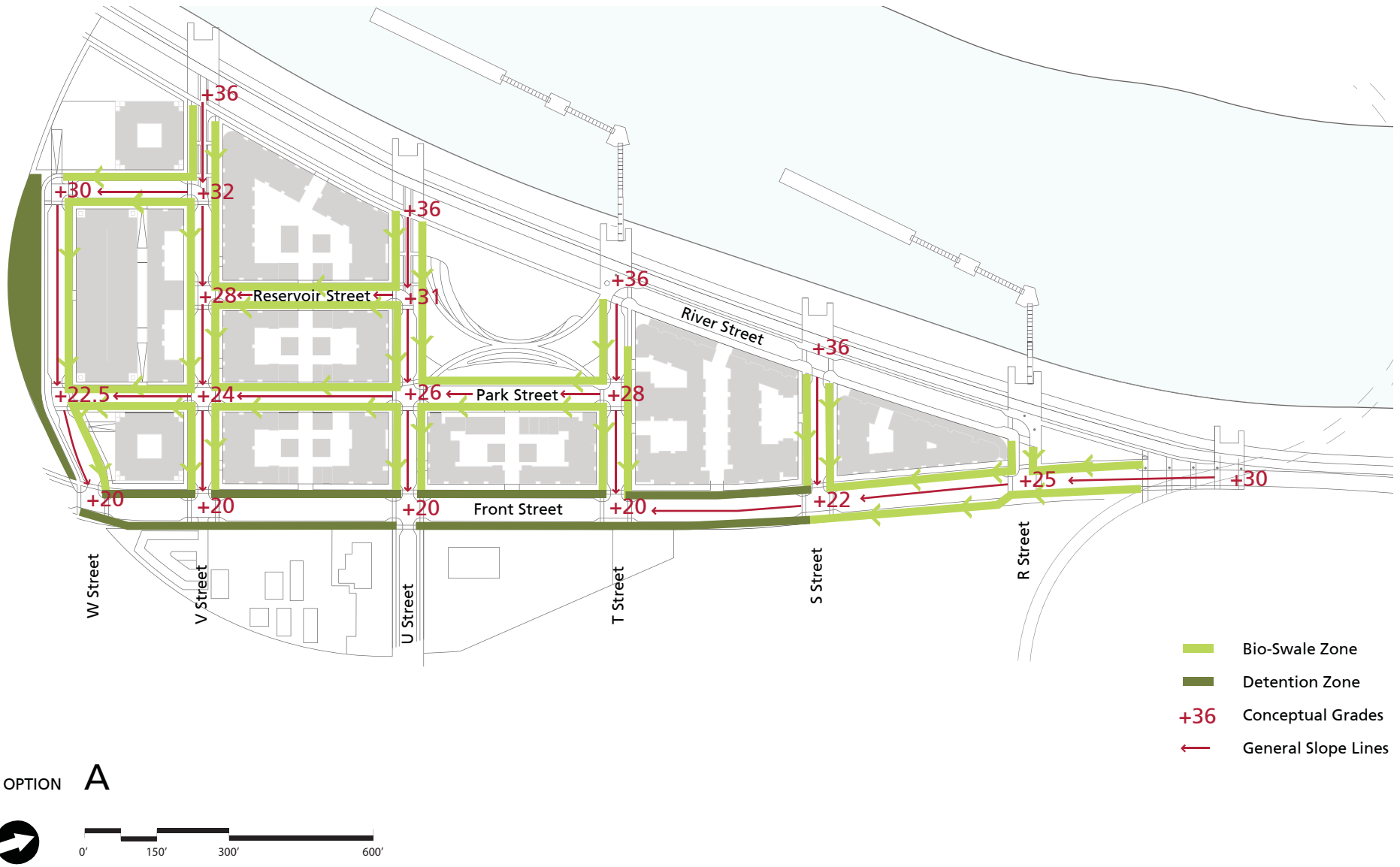
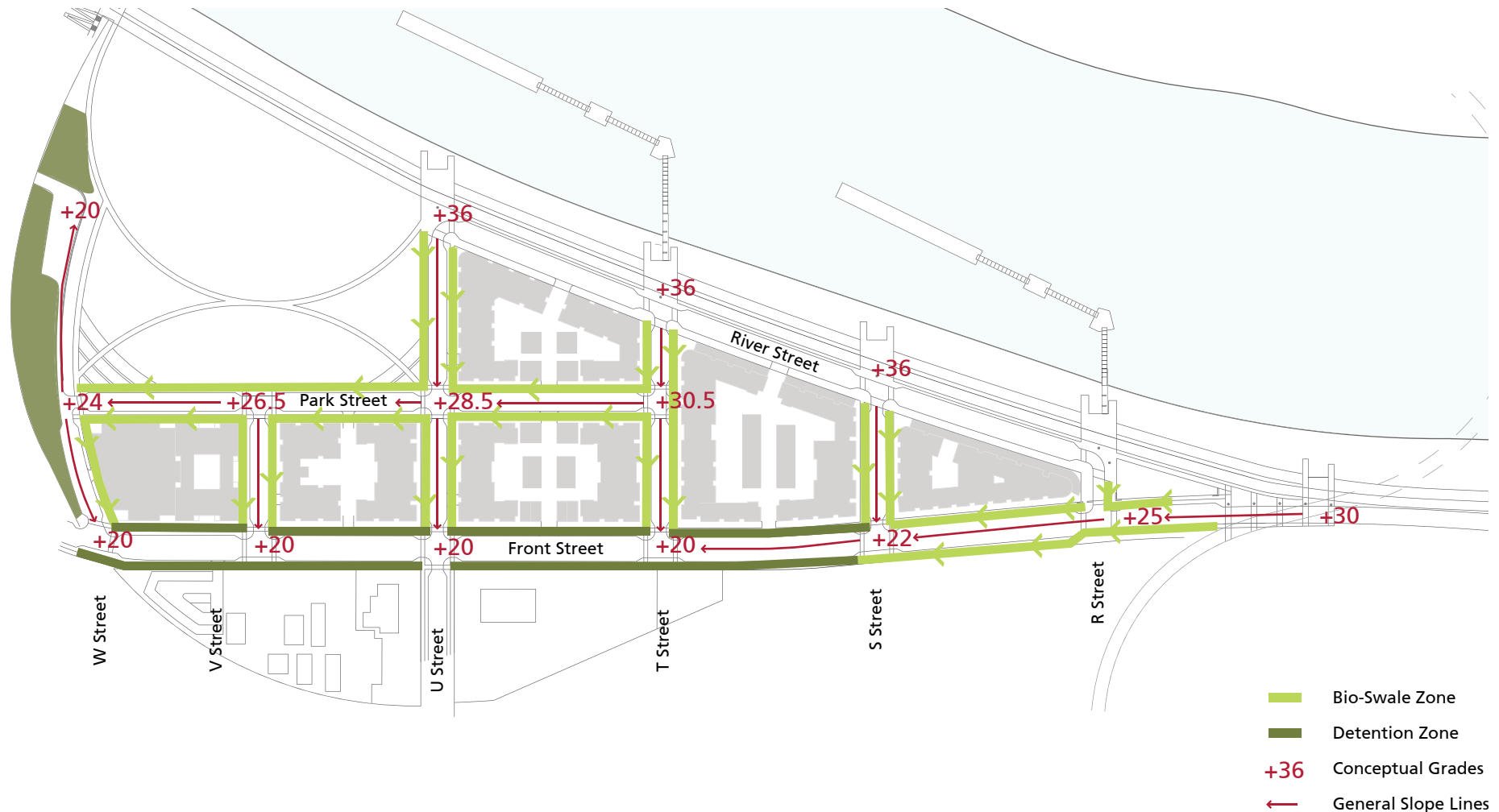


Figure 5.2

SACRAMENTO DOCKS AREA

GRADING/STORMWATER MANAGEMENT CONCEPT



OPTION **B**

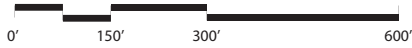


Figure 5.1  
SACRAMENTO DOCKS AREA  
GRADING/STORMWATER MANAGEMENT CONCEPT

## Proposed Infrastructure

As previously stated, Option A2 results in a higher demand for required infrastructure like water supply and natural gas, and thus was the basis for this analysis. Necessary infrastructure elements like water pipes, sewer and storm drain pipes, as well as underground conduit for electrical power and telecommunication will be located within the public right-of-way and will follow the alignment of the proposed street grid. The subsequent paragraphs describe new infrastructure elements, which are needed to support the proposed build-out options.

## Water Supply

### *General Information*

The City of Sacramento Department of Utilities provides water for drinking, household use, fire suppression, landscaping, commercial, and industrial use to the project area. The following paragraphs address future water demand based on the proposed build-out scenarios and describe necessary improvements to the existing water supply system in the project area.

Water supply needs can be reduced below the proposed levels through building specifications such as low-flush toilets and waterless urinals, implementation of grey-water and rainwater storage systems, the use of low-maintenance native plantings, and other methods.

### *Future Water Demand*

Future water demand is dependant on land use and density of the development area. The average day demand ( $Q_{Avg}$ ) can be estimated according to existing or proposed land use. The maximum day demand ( $Q_{Max}$ ) can be calculated by multiplying the average day demand by 1.8. The peak hour demand ( $Q_{Peak}$ ) can be calculated by multiplying the maximum day demand by 1.3.  $Q_{Avg}$  can be estimated using land use factors. The land usages for the project area according

to the Docks Area Specific Plan are open space (parks and recreation), neighborhood commercial (retail and office), and residential - high density. Common values for  $Q_{Avg}$  as outlined in the City of Sacramento Water Distribution System Design Criteria summary sheet are:

- Residential – High Density:  $Q_{Avg} = 4$  (acre-feet/acre-yr)
- Neighborhood Commercial (Retail):  $Q_{Avg} = 3$  acre-feet/acre-yr
- Parks and Recreation<sup>2</sup>:  $Q_{Avg} = 4.2$  acre-feet/acre-yr

#### **Future Water Demand - Option A2**

The preliminary average day demand is: 150,071 gpd, calculations are shown in Appendix 2. The maximum day demand is 270,128 gpd (= 11,255 gph) and the peak hour demand is 14,632 gallons per hour (gph)<sup>2</sup>.

The aforementioned water demands are preliminary and for planning purposes only. More precise water demand calculation shall be conducted during the design and permit phase of the project.

According to the City's Fire Protection Engineer, the fire flow demand shall be 2,000 gpm in areas with multifamily land use and 3,000 gpm in areas with commercial land use. The actual Source: Estimate of Ultimate Annual Water Use , Boyle Engineering, 1991

fire flow demand will be determined by the Fire Protection Engineer, but for this purpose it is assumed that fire flow demand in the project area will be 3,000 gpm. Therefore the  $Q_{Max}$  plus fire flow equals 3,188 gpm. At this flow the system pressure shall not be less than 20 pounds per square inch (psi). A water supply test at the existing 12-inch water main along Front Street resulted in 3,000 gpm at 20 psi residual pressure. The minimum system pressure at  $Q_{Peak}$  of 14,632 gph shall not be less than 30 psi.

The future demand calculations resulted in a demand of 3,188 gpm assuming a fire flow demand of 3,000 gpm (commercial development). This demand is slightly higher than the 3,000 gpm determined in the water supply test. Based on this result it appears that more precise water system modeling will be required as well as a final determination of fire flow demand to ensure that all water system design criteria for the proposed development can be met. The results of the water supply tests are included in Attachment 6 of the *Technical Memorandum on Existing Infrastructure (NCE, 2005)*.

#### **Future Water Demand - Option B**

The preliminary average day demand is: 141,590 gpd, calculations are shown in Appendix 2. The maximum day demand is 254,862 gpd



(=10,619 gph) and the peak hour demand is 13,805 gallons per hour (gph).

The aforementioned water demands are preliminary and for planning purposes only. More precise water demand calculation shall be conducted during the design and permit phase of the project.

The  $Q_{Max}$  plus fire flow equals 3,177 gpm. At this flow the system pressure shall not be less than 20 pounds per square inch (psi). The minimum system pressure at  $Q_{Peak}$  of 13,805 gph shall not be less than 30 psi.

The future demand calculations resulted in a demand of 3,177 gpm assuming a fire flow demand of 3,000 gpm (commercial development). This demand is slightly higher than the 3,000 gpm determined in the water supply test. Based on this result, it appears that a more precise water system modeling will be required as well as a final determination of fire flow demand to ensure that all water system design criteria for the proposed development can be met. The results of the water supply tests are included in Attachment 6 of the *Technical Memorandum on Existing Infrastructure* (NCE, 2005).

### **Proposed Water Line Layout**

The new water line layout in the development area will be determined by the proposed street grid. According to the City of Sacramento Water Distribution System Design Criteria, 12-inch diameter mains are proposed on one-half mile grids and eight-inch diameter mains within the remainder. The layout of the proposed water lines takes also into account that circulating or looped water mains shall not exceed a certain length depending on the size of the main. For example, the maximum length of a circulating eight-inch main is 2,000 feet.

Connection points will also be located along River Street to connect water lines in the future promenade to supply water for irrigation purposes, drinking fountains, and other uses (e.g. misting and shade structures). A series of gate valves, air release valves and hydrants will be located within the proposed water main grid according to the applicable design and fire protection criteria. Backflow preventers will be installed at the service connection points of buildings.

### **Proposed Water Line Layout – Option A**

The proposed water line layout includes approximately 2,485 linear feet (lf) of 8-inch water main and approximately 4,285 lf of 12-

inch water main (Appendix 1, Figure 1). The proposed water mains connect to the existing 12-inch water main along Front Street at the intersections of Front Street and R, S, T, U, and V Streets.

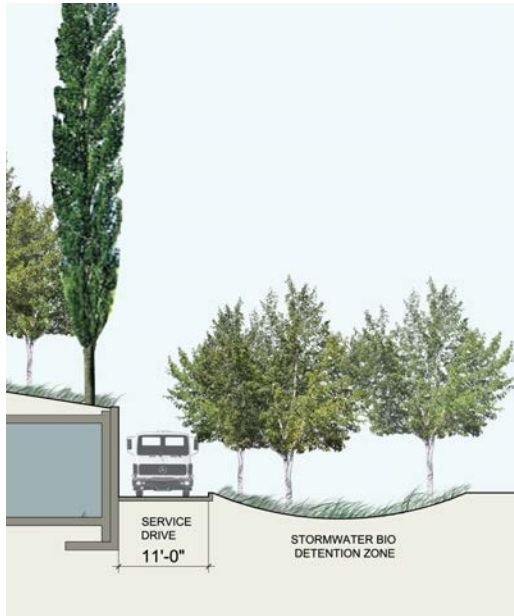
### **Proposed Water Line Layout – Option B**

The proposed water line layout includes approximately 1,505 linear feet (lf) of 8-inch water main and approximately 3,050 lf of 12-inch water main (Appendix 1, Figure 2). The proposed water mains connect to the existing 12-inch water main along Front Street at the intersections of Front Street and R, S, T, U, V and W Streets.

## **Coordination with Sacramento**

### **Riverfront Promenade Project**

The Docks Promenade Project includes a water main along the Promenade to provide water for irrigation and other purposes (e.g. drinking fountains, misting structures). Connection points (i.e. “tee” fittings and blind flanges) will be located along the Promenade waterline to allow for easy connection to the water lines for future Docks Area development. These future connections will allow an expansion of the looped water line system in the Docks Area.



Best management practices for stormwater management are incorporated into the design of the site, including vegetated roofs, bioswales, rain gardens, oversized storm pipes for water storage, and stormwater detention zones (see above).

## Storm Drain and Sanitary Sewer System

### Stormwater Management Goals

The main goals of stormwater management in the project are to:

- Reduce the rate and quantity of stormwater runoff from the site;
- Naturally treat stormwater runoff on site and reduce the load on municipal sewer system;
- Capture, filter, and potentially store and reuse as irrigation.

Strategies for stormwater management that have been incorporated in the design of the site include a number of “best management practices,” such as vegetated roofs, bioswales, rain gardens, stormwater detention zones, and optional oversized storm pipe for storage. These practices create a stormwater management system that:

- Collects runoff from roofs and roads;
- Retains runoff in bioswales and rain gardens;
- Potentially leads overflow to storage pipes and stores;
- Directs overflow to detention zones.

Major detention zones are located at the far south end of the site and along Front Street. Other detention areas are designed within the parks to retain the stormwater while providing aesthetic and educational functions.

Most streets feature bioswales and rain gardens adjacent to sidewalks. Oversized storm pipes for detention and storage are proposed along several streets, as described later in this chapter.

The plan recommends the site development:

- Reduce stormwater run-off rates by 25% from pre-development conditions;
- Implement best management practices capable of removing 80% of the average annual post-development total suspended solids.

### General Information

The following paragraphs describe necessary improvements to the existing storm drain and sanitary sewer system in the project area. A preliminary estimate of the future flow rate of sanitary sewage and storm water after the completion of the proposed development is

included in this section. Furthermore, this section addresses runoff reduction control measures for new development as outlined and described in the *Stormwater Quality Design Manual for the Sacramento and South Placer Regions, May 2007*. The existing condition of the storm drain and sanitary sewer system in the project area is described in the *Technical Memorandum on Existing Infrastructure (NCE, 2005)*.

### Proposed Storm Drain System

The storm drain system shall be designed according to the “separation strategy” outlined in Section 11.23 of the Drainage Design Standards of the City of Sacramento (August, 2000). This strategy says that “in the combined system, new drainage and sewer collection pipelines shall be separate and allowed to connect into the existing combined system.” Therefore, this section depicts separate storm drain and sewer pipelines as well as quantities and sizes for both. Since much of Downtown Sacramento features a combined sewer system, the new drainage and sewer pipelines shall be allowed to connect to the combined system (connection point at Sump 1/1A). One guiding principle for the proposed development is the implementation of runoff reduction control measures according to the *Storm Water Quality Design Manual For The Sacramento And South Placer Regions* (May 2007).

The proposed development will include best management practices to reduce runoff and to increase water quality of the storm water runoff.

The infrastructure plan considers bioswales along parking areas and sidewalks to reduce peak flows and treat runoff. Surface detention zones are proposed to reduce peak flows before entering the combined system or being absorbed to groundwater. Optional underground detention systems (in-line detention structures) are encouraged to reduce peak flows and to store stormwater runoff for later use (e.g. irrigation purposes during the summer months).

The location of drain inlets was chosen to ensure that gutter flow does not exceed a run of 400 linear feet. Manholes are proposed at junction points, changes in gradient, and connections to in-line detention structures. The proposed storm drain system will eventually discharge into the existing storm drain system. Drain inlets would either be breaks and depressions in the curb and gutter, (to allow flow into bioswales) or standard drop inlets. The bioswales would discharge via a 12-inch pipe into the storm drain. Bioswales along Front Street would also serve as detention zones.

Runoff from building roof drains will be discharged to rain gardens and runoff from roadway drain inlets will be discharged to the



Rain garden gutter detail - Portland, OR



Green street - 12th Ave., Portland, OR



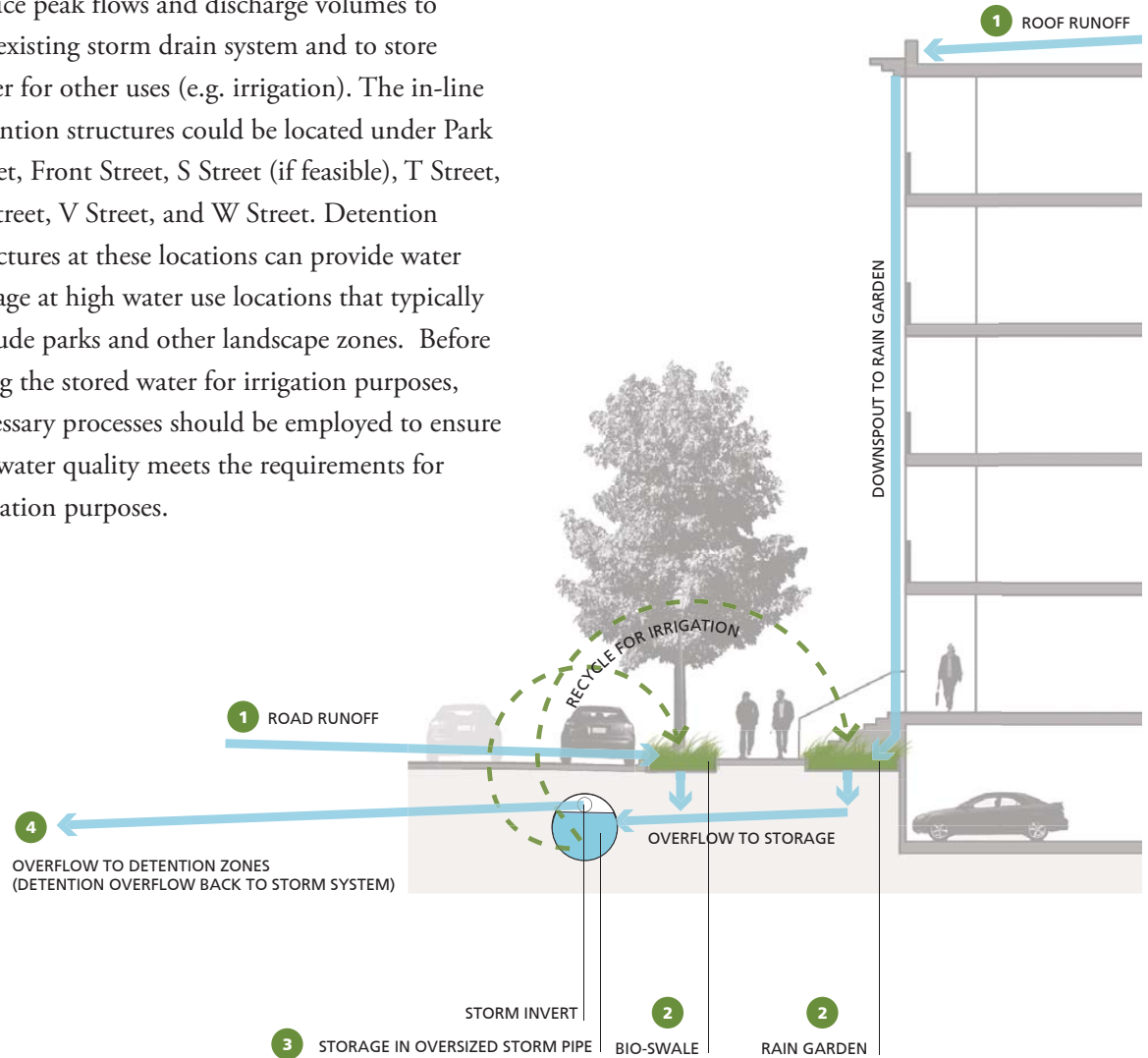
Rain garden detail - Portland, OR

bioswales located in the planter strips along the streets. The bioswales will be located between the sidewalk and curb, and will also function as a pervious disconnect between paved surfaces. Bioswales are proposed to reduce peak flows and runoff volumes, and to treat runoff to a certain extent. Roof drains will be connected to rain gardens, located adjacent to buildings, and could be connected to the detention structures (e.g. oversized storm drain pipe) in the street. The proposed rain gardens and bioswales will feature overflow structures to prevent flooding during a major storm event. The overflow structures will be connected to the main storm drain pipe located in the streets.

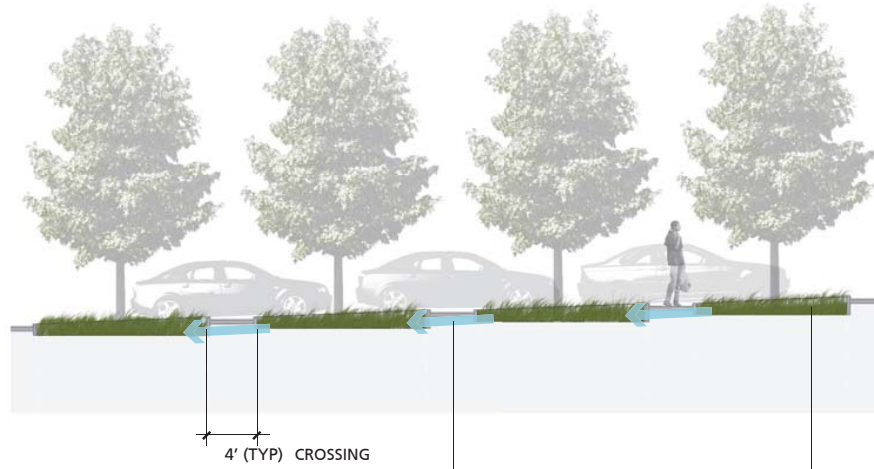
The bioswales will be approximately 6-feet wide and will be located between the sidewalk and the road/parking areas. The channel slope will be sufficient to maintain positive flow and reduce water ponding. To reduce the water infiltration into the raised area closer to the levy, bioswales constructed within approximately 400 feet of the banks of the Sacramento River will be lined with a geomembrane and geotextile liner. The liner will be covered with approximately 6 to 12 inches of native soil and gravel to allow revegetation. Bioswales approximately 400 feet beyond the banks of the river will be unlined, which will allow some water infiltration, hence reducing the storm water runoff into the storm drain system.

**Optional Underground Oversized Pipe Water Storage System**

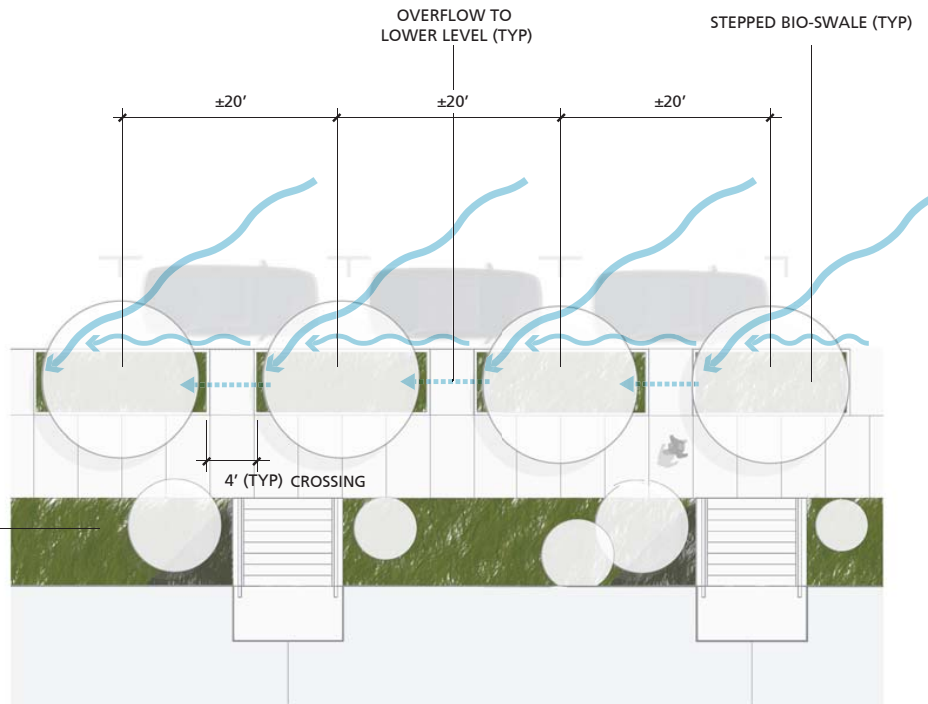
In-line detention structures are encouraged to reduce peak flows and discharge volumes to the existing storm drain system and to store water for other uses (e.g. irrigation). The in-line detention structures could be located under Park Street, Front Street, S Street (if feasible), T Street, U Street, V Street, and W Street. Detention structures at these locations can provide water storage at high water use locations that typically include parks and other landscape zones. Before using the stored water for irrigation purposes, necessary processes should be employed to ensure the water quality meets the requirements for irrigation purposes.



Proposed Stormwater Management System, including optional underground oversized pipes



Bioswale Longitudinal Section



Bioswale Plan Diagram

The in-line detention structures will be sized to store the runoff volume from impervious area in excess of the runoff volume generated from the pre-development during the design storm event and could be constructed from up to 10-foot diameter corrugated metal pipes buried under the roadway. The design storm event and the desired storage volume will be determined during the design phase of the project.

From the calculations shown in Appendix 3, a 100-year peak flow, 47 cubic feet per second (cfs), could be conveyed in a 30-inch pipe running less than 80% full. The maximum capacity of a 30-inch pipe would be approximately 57 cfs. More precise hydraulic calculations considering the new storm drain system including bioswales and detention structures need to be conducted during the design phase of the project to properly size all components of the system.

**Proposed Storm Drain System – Option A**

The proposed development features three new streets parallel to Front Street (Appendix 1, Figure 3). Reservoir Street, Park Street, and River Street are between 720 feet (ft) and 1,140 (ft) long and with the new sections of the lettered streets (R through W Street) create 12 new city blocks. The size of the city blocks varies between 0.21 acre to 2.53 acres. Together with the streetscape surfaces, the new developed area encompasses approximately 29.27 acres (13.3 acres development, 3.37 acres parks, and 12.6 acres public right-of-way). According to Section 11 of the City of Sacramento Drainage Design Standards of the Design and Procedures Manual, design runoff from areas of this size can be calculated by using the “Sacramento Method” or the “Rational Method.” Using the “Sacramento Method,” the peak flow for a 10-year storm event is approximately 32 cubic feet per second (cfs) and a 100-year storm event is approximately 47 cfs, see Appendix 3.

The proposed storm drain system for Option A features approximately 3,525 linear feet (lf) of 30-inch diameter storm drain pipe lines, approximately 4,790 lf of 12-inch diameter storm drain pipes connecting approximately 54 drain inlets, rain gardens, and bioswales to the storm drain pipes in the street (Appendix 1, Figure 3). Street side curb and gutter (roughly

13,795 lf), bioswales, detention zones, and in-line detention structures complete the storm drain system of the new development area.

The length of the lined bioswales is approximately 2,970 feet, while the length of the unlined bioswales is approximately 5,530 feet. Bioswales are proposed on either side of Front Street, Park Street, Reservoir Street, S Street, T Street, U Street, V Street and W Street (Appendix 1, Figure 3). The proposed location of the in-line detention structures are shown on the Option A Storm drainage plan (Figure 3 in Appendix 1).

**Proposed Storm Drain System – Option B**

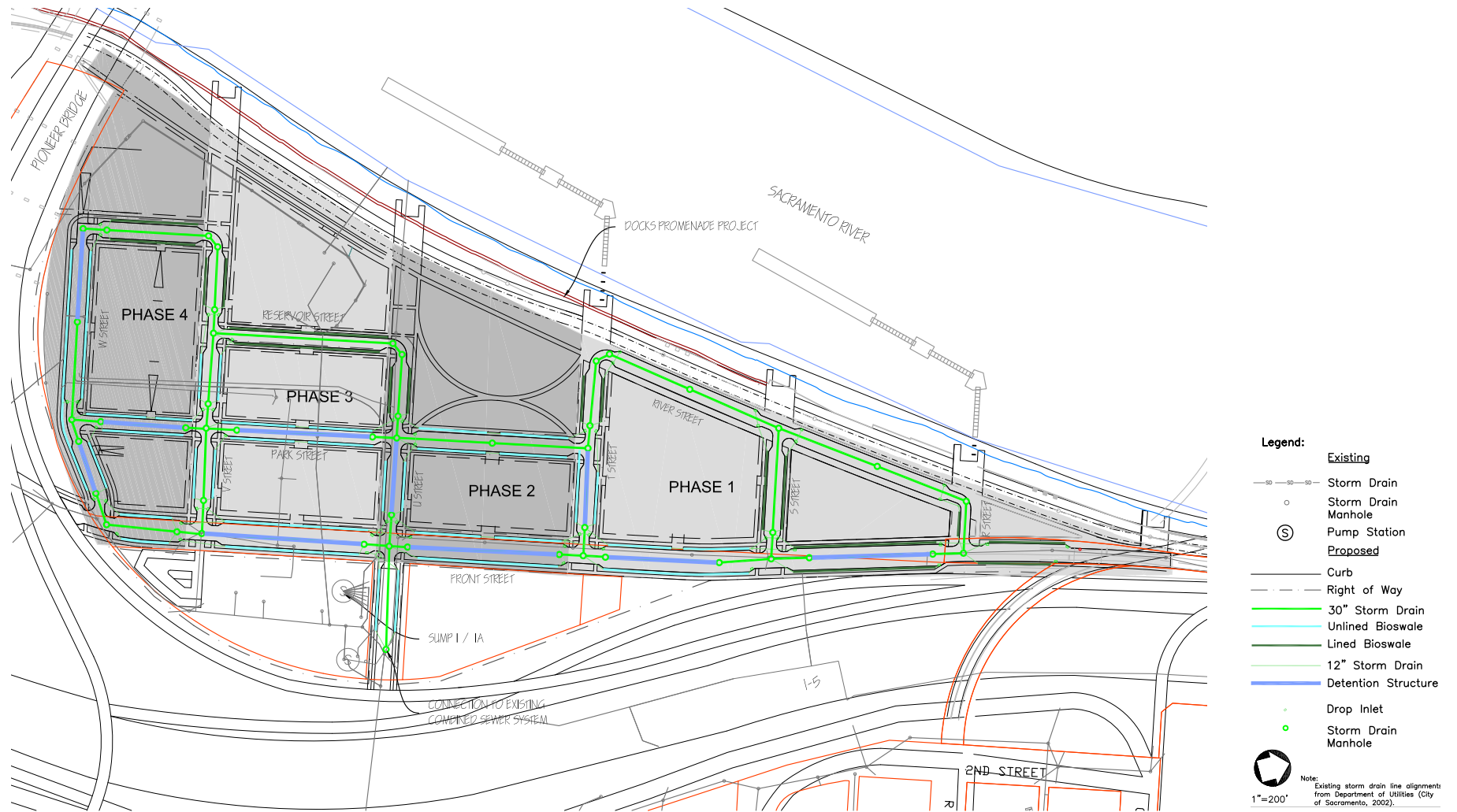
The proposed development features two new streets parallel to Front Street (Appendix 1, Figure 4). Park Street is approximately 1,140 feet (ft) long and River Street is approximately 1,330 ft long, and with the new sections of the lettered streets (R through W Street) creates 9 new city blocks. The size of the city blocks vary between 0.21 acres and 8.18 acres. Together with the streetscape surfaces, the new developed area encompasses approximately 29.27 acres (9.41 acres development, 9.74 acres parks, and 10.12 acres public right-of-way). Using the “Sacramento Method,” the peak flow for a 10-year storm event is approximately 30 cubic feet per second (cfs) and a 100-year storm event is

approximately 42 cfs (see Appendix 3).

The proposed storm drain system for Option B features approximately 3,355 linear feet (lf) of 30-inch diameter storm drain pipe lines, approximately 4,270 lf of 12-inch diameter storm drain pipes connecting approximately 49 drain inlets, rain gardens, and bioswales to the storm drain pipes in the street (Appendix 1, Figure 4). Street side curb and gutter (roughly 14,800 lf), bioswales, detention zones, and in-line detention structures complete the storm drain system of the new development area.

The bioswales will be constructed similar to the description given in the previous section. The length of the lined bioswales for Option B is approximately 1,850 feet, while the length of the unlined bioswales is approximately 5,345 feet. Bioswales are proposed on either side of Front Street, Park Street, R Street, S Street, T Street, U Street, V Street, and W Street. The proposed locations of the in-line detention structures are shown on the Option B Storm Drainage Plan (Figure 4 in Appendix 1).

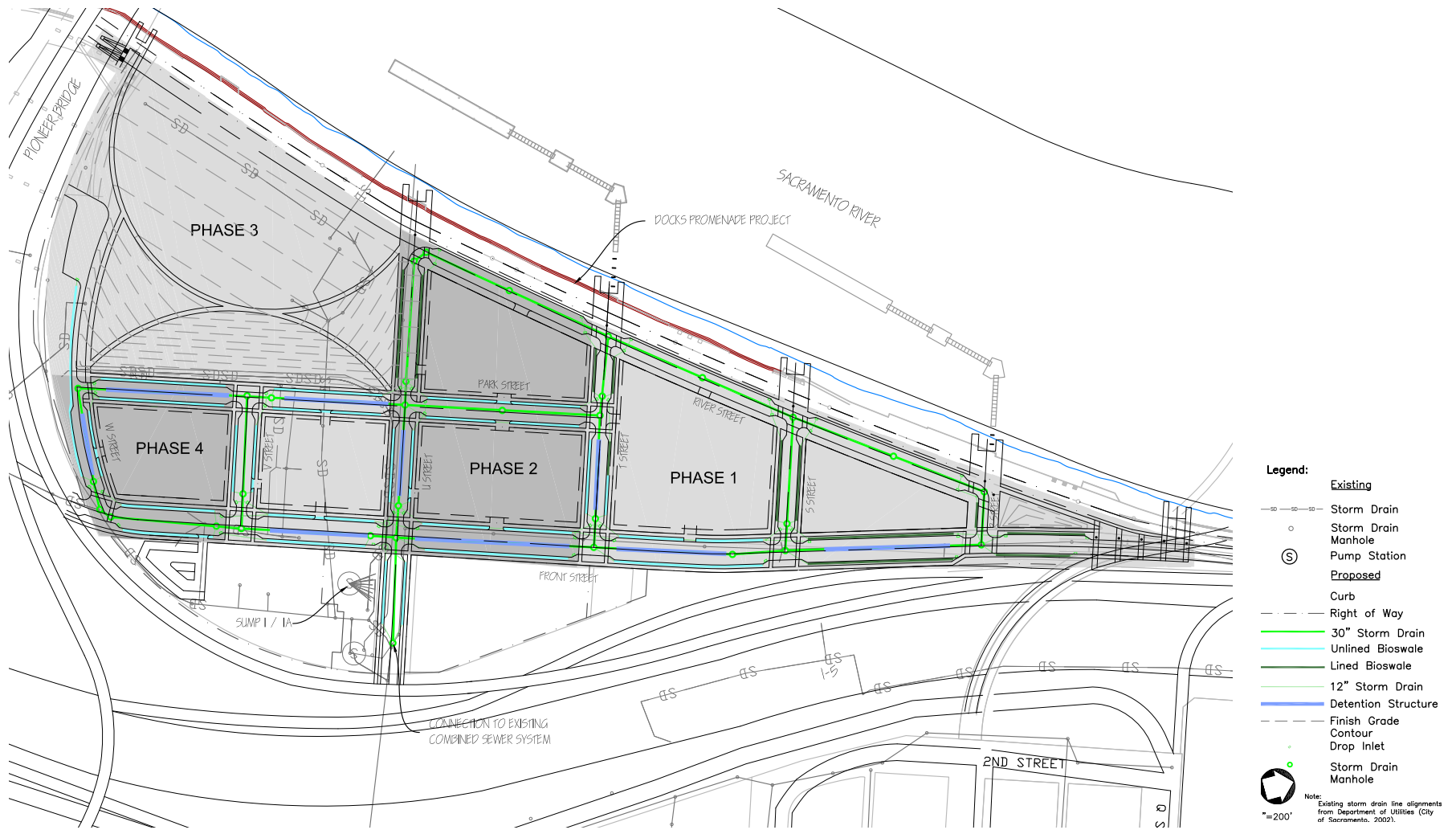
DRAFT



Source: NCE 2007

## A OPTION

# SACRAMENTO DOCKS AREA STORM DRAINAGE



Source: NCE 2007

**B** OPTION

**SACRAMENTO DOCKS AREA  
STORM DRAINAGE**



### Proposed Sanitary Sewer System

The sanitary sewer system will also be designed according to the “separation strategy” outlined in the Drainage Design Standards of the City of Sacramento. This strategy says “in the combined system, new drainage and sewer collection pipelines shall be separate and allowed to connect into the combined system.” Therefore, the Infrastructure Plan depicts separate storm drain and sewer pipelines as well as quantities and sizes for both, storm drain and sewer pipeline systems. Much of Sacramento features a combined sewer system, the new drainage and sewer pipelines shall be allowed to connect to the combined system (connection point at Sump 1/1A)

The design flow calculation for new development can be based on the actual number of units for residential development (lofts, flats, and townhouses) and on zoning acreage for commercial development per Section 9.1.1 of the Sanitary Sewer Design Standards. Flows shall be calculated using 100 gallons per person per day (gpd) and three persons per dwelling unit (DU). Therefore, the assumed flow rate for sewer design is 300 gpd per DU.

The new sewer main would be constructed along Front Street with sub-mains running along R, S, T, U, V, W, Park, Reservoir, and River Streets connecting to the new main at manholes located on Front Street, Option A is represented on Figure 5 and Option B is represented on Figure 6 (in Appendix 1). The sub-mains would be 12-inch diameter pipes while the main sewer line would be an 18-inch diameter pipe.

Pipe slopes, velocity and sizes shall be chosen based on Section 9.3 of the Sanitary Sewer Design Standards. Laterals for commercial and multiple residential developments shall be 12 inch in diameter. Main line pipes shall be designed to have a minimum velocity of 2 feet per second (fps) at the pipe flowing half full. The minimum slope for an 18-inch pipe considering the minimum velocity shall be 0.0012 feet per foot (0.12%).

***Proposed Sewer System – Option A2 (max)***

The maximum build-out for Option A assumes 1,155 (DU), 500,000 sf of office space and 40,500 sf of retail space for the development area. Therefore, using 300 gpd per DU, the estimated flow from the residential units calculates to 346,500 gpd. The retail and office space usage has been estimated by using 80 gpd per 1,000 sf (see Appendix 4) is 43,240 gpd. The average sewer flow from residential, retail, and office space in the new development is approximately 390,000 gpd. Infiltration into the sanitary sewer is based on groundwater infiltration of 500 gpd per inch diameter per mile of sewer system, which is approximately 8,700 gpd. Combining the infiltration and using a 2.6 peaking factor the daily flow would be 1,022,700 gpd (1.58 cfs), see Appendix 4 for the usage calculations.

The project would include construction of approximately 1,670 linear feet (lf) of 18-inch and 5,105 lf of 12-inch sewer pipe.

An 18-inch diameter pipe would convey 1.82 cfs at 2.06 fps which would be sufficient to convey the peak flow of 1.58 cfs above the required minimum velocity of 2.00 fps. (See Figure 5 in Appendix 1).

***Proposed Sewer System – Option B***

The maximum build-out assumes 1,000 dwelling units (DU) and 200,000 sf of office space, and 43,300 sf of retail space for the development area. Therefore, using 300 gpd per DU, the estimated flow from the residential units calculates to 300,000 gpd. The retail and office space usage has been estimated by using 80 gpd per 1,000 sf (see Appendix 4) is 19,464 gpd. The average sewer flow from residential units, retail, and office space in the new development is approximately 320,000 gpd. Infiltration into the sanitary sewer is based on groundwater infiltration of 500 gpd per inch diameter per mile of sewer system, which is approximately 8,295 gpd. Combining the infiltration and using a 2.6 peaking factor the daily flow would be 838,901 gpd (1.30 cfs), see Appendix 4 for the usage calculations.

The project would include construction of approximately 1,591 lf of 18-inch and 4,895 lf of 12-inch sewer pipe.

An 18-inch diameter pipe would convey 1.82 cfs at 2.06 fps which would be sufficient to convey the peak flow of 1.3 cfs above the required minimum velocity. (See Figure 6 in App. 1).

## Electrical Power

### General Information

The Sacramento Municipal Utility District (SMUD) provides electric power to the project area. The existing condition of the electrical power system in the project area is described in the *Technical Memorandum on Existing Infrastructure (NCE, 2005)*. The following paragraphs describe necessary improvements to the existing power grid in the project area.

### Proposed Electrical Power System –

#### Option A

SMUD estimates that the proposed site development requires an additional electrical load of about 4 mega watts (MW), based on the proposed land use projections of the overall project (i.e. 1,155 DU and 540,500 sf of commercial space). SMUD anticipates that the existing transmission and 21 kV distribution systems have adequate capacity to handle this additional load without adding major components.

New underground conduits and cables will be installed along the alignments of the proposed street layout in the project area to service the proposed buildings. It is anticipated that portions of the existing above ground electrical power lines within the project area (e.g overhead power lines along Front Street) will be relocated underground (approximately 3,080 linear feet). The new electrical power lines will be connected to the existing electrical power lines at various locations (Appendix 1, Figure 7). Based on the proposed street layout of the development area an estimated 4,580 linear feet (lf) of underground electrical conduit (duct bank with (6) 4-inch conduit) and cable will be required.

### Proposed Electrical Power System –

#### Option B

SMUD estimates that the proposed site development requires an additional electrical load of about 4 mega watts (MW), based on the proposed land use projections of the overall project (i.e. 1,000 DUs, 243,300 square feet of commercial space). SMUD anticipates that the existing transmission and 21 kV distribution

systems have adequate capacity to handle this additional load without adding major components.

New underground conduits and cables will be installed along the alignments of the proposed street layout in the project area to service the proposed buildings. It is anticipated that portions of the existing above ground electrical power lines within the project area (e.g overhead power lines along Front Street) will be relocated underground (approximately 3,080 linear feet). The new electrical power lines will be connected to the existing electrical power lines at various locations (Appendix 1, Figure 8). Based on the proposed street layout of the development area an estimated 6,345 linear feet (lf) of underground electrical conduit (duct bank with (6) 4-inch conduit) and cable will be required.

## Natural Gas

### General Information

Natural gas is supplied to the project area by Pacific Gas and Electric Company (PG&E). The existing condition of the natural gas system in the project area is described in the *Technical Memorandum on Existing Infrastructure (NCE, 2005)*. The following paragraphs describe necessary improvements to the existing natural gas pipeline system in the project area to accommodate the proposed development.

PG&E has stated previously that the existing gas infrastructure and supply will be adequate to serve the level of development proposed in the Sacramento Docks Area Specific Plan.

### Proposed Natural Gas Utility System– Option A

The proposed housing and commercial layout will require an approximately 935 linear feet extension of the existing 6-inch gas main along Front Street toward the north (from U Street to R Street) and the construction of six 6-inch gas mains along new R, S, T, U, V, Reservoir, River, and Park Streets segments (Appendix 1, Figure 9). The approximate total length of these 6-inch gas mains is 5,415 feet. New 2- to 4-inch service lines (approximately 900 feet) will be installed according to the proposed layout

of the individual buildings, between the main and the right-of-way. The total length of these new service lines to individual buildings is in the order of approximately 2,500 feet of ¾”, 1”, or 2” service pipe lines.

### Proposed Natural Gas Utility System– Option B

The proposed layout for Option B will also require an approximately 935 linear feet extension of the existing 6-inch gas main along Front Street toward the north (from U Street to R Street) and the construction of six 6-inch gas mains along new R, S, T, V, River, and Park Street segments (Appendix 1, Figure 10). The approximate total length of these 6-inch gas mains is 5,029 feet. New 2- to 4-inch service lines (approximately 2,600 feet) will be installed according to the proposed layout of the individual buildings within the city blocks. The total length of these new service lines to individual buildings is in the order of approximately 1,500 feet of ¾”, 1”, or 2” service pipe lines.

### 16-inch Natural Gas Transmission Lines

Two 16-inch natural gas transmission lines supply natural gas to the Load Center at the intersection of Front and U Street. These transmission lines follow the alignment of U Street in westerly direction towards the levee

along the eastern bank of the Sacramento River. There, the transmission lines turn in southerly direction and follow the landside of the levee between the levee and Pioneer Reservoir to a point just south of Pioneer Bridge, where the turn again in westerly direction to cross the Sacramento River. Proposed U Street will follow the alignment of the transmission lines and it is anticipated that close communication and coordination with PG&E will be required during the design phase of the project to resolve any conflicts that may surface.

In the area between the levee and Pioneer Reservoir, the two transmission lines are currently buried under the maximum cover allowable for the pipes. However, both options require that this area be filled to construct the proposed development (Option A) or a park (Option B). Therefore, it is proposed to construct new sections of pipe in this area, which would be located above the current pipes. The new pipes would be connected to the current pipes at U Street and Pioneer Bridge and the current pipes would be abandoned in place. Approximately 1,500 linear feet of new 16-inch transmission pipes would be required. Relocating the transmission lines to Front Street is another alternative to be considered. It is anticipated that a close dialogue with PG&E will be required during the design phase of the project.

## Telecommunication

### General Information

For the purpose of this infrastructure plan, telecommunication includes phone lines, high-speed internet, fiber optics, and cable TV. The existing condition of the telecommunication system in the project area is described in the *Technical Memorandum on Existing Infrastructure (NCE, 2005)*. The following paragraphs describe necessary improvements and additions to the existing telecommunication system to support the proposed development.

### Proposed Telecommunication Conduit Network – Option A

The future location of the conduits depends on the final development plan for the project area. The proposed telecommunication conduit network encompasses a (4) 4-inch diameter underground conduit bank along Front Street between O Street in the north and the freeway overpass in the south to relocate the existing above ground lines underground. The new conduits will connect to the existing underground conduits at O Street and U Street (Appendix 1, Figure 11). The total length of conduits for this portion of the new conduit network for telecommunication is approximately 3,185 linear feet (lf).

To facilitate the connection of the new city blocks, an additional 4,000 lf of (6) 4-inch conduit bank will be required. These conduits will be located along R, S, T, U, and V Streets between Front Street and proposed Park, Reservoir, and River Streets. To connect the individual buildings to the underground conduit network approximately 10,600 lf of 4-inch conduit will be necessary.

### Proposed Telecommunication Conduit Network – Option B

The proposed telecommunication conduit network for Option B requires a similar amount of (4) 4-inch diameter underground conduit bank to relocate the existing aboveground lines underground. To facilitate the connection of the new City blocks, an additional 5,864 lf (6) 4-inch conduit bank will be required. These conduits will be located along R, S, T, U, V, and W Streets and along Front Street, River Street and Park Street (Appendix 1, Figure 12). To connect the individual buildings to the underground conduit network approximately 11,800 lf of 4-inch conduit will be necessary.

## Construction Methods

### General

The proposed development will include roadways between Front Street and the levee (Promenade). In order to overcome the difference in elevation along the streets, engineered fill will be placed to construct uniform slopes (approximately 2% to 9%) towards the levee. Proposed buildings along the levee will be designed so that the elevation of the ground floor equals the elevation of the Promenade. Proposed buildings in the project area will also be constructed over parking structures to minimize the amount of soil brought to the site.

In order to minimize settlement, building foundations in the project area will likely require deep foundations such as pile foundations that are able to transfer the loads of buildings to strata of sands and gravel which are found below shallower clays and silts. The type of pile foundation to be used will be based on the building, underlying soils, and on a geotechnical investigation and its recommendations.

### Engineered Fill

In the Docks Area, engineered fill would be placed to accommodate the proposed development, roadways, bioswales, and

sidewalks. In Option B, engineered fill would be placed between the levee and Pioneer Reservoir to raise the land to top of levee and top of Pioneer Reservoir to allow for the construction of Reservoir Park. Approximately 20,000 cubic yards (cy) would be necessary to fill existing low areas and elevate them to the finished floor elevations of the proposed elevation of the park. The maximum depth of engineered fill in this area is approximately 16 feet. Another location where engineered fill would be practical is the area north of Pioneer Reservoir between the southern boundary of the PG&E property and the reservoir.

To construct the new street grid, which connects Front Street with the proposed Promenade, engineered fill would be placed and compacted. Approximately 65,000 to 70,000 cubic yards would be necessary to construct the street grid.

Suitable soil material from borrow areas would be hauled to the site, placed in lifts of 8 to 12 inches, moisture conditioned and compacted to approximately 90 percent compaction until the proposed elevation is reached. Compaction density testing would ensure that the specified compaction requirements have been met. Engineered fill necessary to fill existing low areas and to construct the street grid requires approximately 5,500 truck loads.

### Pile Driving

Pile driving may be necessary to construct the foundations for the proposed buildings in the development area. Several existing buildings in close proximity have pile foundations (e.g. Pioneer Reservoir, Embassy Suites Hotel) which allow the buildings to be supported on lower lying gravel horizons and at the same time being secured against uplift from high ground water conditions. The lithology of the development area is characterized quite well due to the fact that a large number of borings have been performed in the area which allow for a fairly detailed characterization of the underlying soils.

Pile driving operations require a geotechnical investigation and report, which would suggest the most suitable piling technology for the intended purpose of the pile. Piling methods include timber piles, steel piles, pre-cast concrete piles and cast-in-place concrete piles, among others.

# COMMUNITY & PUBLIC SERVICES

The provision of public facilities that safely and efficiently serve the Docks Area will be essential to the area's function and quality of life. Implications of development for services, such as police service, fire/emergency medical response, schools, parks and recreation, and solid waste disposal are discussed.



R Street Park will become an important gathering place for not only Docks Area residents, but also residents from other neighborhoods.



Members of the Sacramento Police Department



## Police Service

Police protection services for the project area are provided by the Sacramento Police Department (SPD). The SPD operates from the following stations:

- Police Headquarters: Public Safety Center, Chief John P. Kearns Administration Facility (5770 Freeport Boulevard).
- North Area: William J. Kinney Police Facility (3550 Marysville Boulevard).
- South Area: Joseph E. Rooney Police Facility (5303 Franklin Boulevard).

In addition to the SPD, the Sheriff's Department, the California Highway Patrol, UC Davis Medical Center Police Department, and the Regional Transit Police Department provide police protection within the project area. The SPD also contracts its services to the Regional Transit District, Sacramento City Unified School District, and Natomas Unified School District and maintains mutual aid agreements with Sacramento County and the surrounding jurisdictions.

## Fire and Emergency Medical Response

The Sacramento Fire District (SFD) provides fire protection and ambulance services to the entire City, which includes the project area, and some small areas just outside the City boundaries within the County limits. Fire stations are strategically located throughout the City to provide assistance to area residents. Each fire station operates within a specific district that comprises the immediate geographical area around the station; there are three fire stations within the Central City that serve the project area. Fire Station 1, located at 624 Q St with an Engine and Medic, and Fire Station 5 (HazMat), located at 731 Broadway with an Engine, Truck, and HazMat are closest to the project area. The Battalion 1 Headquarters and Fire Station 2 are located at 1229 I Street.



## Parks and Recreation

The City of Sacramento Parks and Recreation Department operates and maintains 210 parks, on- and off-road bikeways and trails, lakes/ponds, beaches, and extensive recreation facilities.

Currently, there are five existing City parks and recreational facilities within close proximity of the project area: Crocker Park, Old Sacramento State Historic Park, the Sacramento Marina/Miller Park, Smith School Park, and Southside Park, as well as the riverfront promenade from Capitol Mall to O Street. Boat docks at the Marina/Miller Park and Old Sacramento currently provide access to the Sacramento River. The City is also currently completing a bicycle/pedestrian trail along the top of the levee to connect Old Sacramento to the Marina/Miller Park.

Parks are generally categorized into three distinct park types by the Department of Parks and Recreation: neighborhood, community, and regional parks. Neighborhood and community parks contribute to a sense of community by providing gathering places for recreation, entertainment, sports, or quiet relaxation while

regional parks tend to be larger and serve the needs of the entire City. As indicated in the City's Parks and Recreation Master Plan, a service goal of five acres per 1,000 persons has been identified for neighborhood and community park acreage.

Neighborhood Parks are generally five to ten acres in size and are intended to be used primarily by residents within a half-mile radius. Urban Plazas/Pocket Parks generally fall under the category of neighborhood-serving parks and tend to be less than five acres in size. These parks are considered most appropriate for areas of denser urban and mixed-use development.

The Docks Area Specific Plan provides 3.37 to 9.74 acres of park to serve up to 1,155 dwelling units, as well as provide regional access to the Sacramento Riverfront Promenade. (The city is in the process of designing a riverfront promenade, which will provide 14 acres of recreation facilities from O St. to Miller Park). The R-Street Park and Plaza will provide .21 acres of park space. The larger Docks Park will either be 2.53 acres (Option A) or, if the reservoir stays on-site, 8.18 acres in size (Option B).



A pocket park functions as a green oasis amidst the urban environment.



Docks Park (Option A)

### Relevant City Regulations and Codes

City Code Chapter 12.72, Park Buildings and Recreational Facilities, includes regulations associated with building and park use.

City Code Chapter 16.64 provides standards and formulas for the dedication of parkland and in-lieu fees. These policies help the City to acquire new parkland. This chapter of the code sets forth the standard that five acres of property for each 1,000 persons residing within the City be devoted to local recreation and park purposes.

Where a recreational or park facility has been designated in the General Plan or a Specific Plan, and is to be located in whole or in part within a proposed subdivision to serve the immediate and future needs of the residents of the subdivision, the subdivider shall dedicate land for a local recreation or park facility sufficient in size

and topography to serve the residents of the subdivision.

The amount of land to be provided shall be determined pursuant to the appropriate standards and formula contained within the chapter. Under the appropriate circumstances, the subdivider shall pay a fee equal to the value of the land, in lieu of dedication of land, to be dedicated for recreational and park facilities that will serve the residents.

City Code Chapter 18.44 imposes a park development fee on residential and non-residential development within the City. Fees collected pursuant to Chapter 18.44 are primarily used to finance the construction of park facilities and reimburse the City for existing facilities.

## Solid Waste Disposal

The Solid Waste Division of the Department of Utilities provides City of Sacramento’s residential, commercial and industrial waste generators with cost-effective, environmentally sound, efficient services covering the full range of solid waste management including collection, recycling, planning and education. Residential trash collection, containerized yard waste collection, garden refuse, street sweeping and other services will be available to the planned development. Under the city’s existing agreement, solid waste is disposed of at the Kiefer landfill, which has adequate capacity to accommodate the Docks Area development.

All residential development in the Docks Area is considered multi-family, including townhouses. The City of Sacramento requires trash enclosures for multi-family units (5 units or more) and all commercial projects, unless a storage room is provided within the building or the Solid Waste Division has agreed to permit single can pick up. The trash enclosure requirements can be found in City Code Title 17.72.

Currently the city requires recycling. Requirements can be found in Title 17.72 of the City Code. According to the Code, the solid waste manager shall approve a statement of recycling information for new development prior to issuance of a building permit. A statement of recycling information shall include:

- A. Site plan to include the location and design specifications of the recycling and trash enclosure(s) and receptacle(s) that shall meet the volume and material requirements (Section 17.72.030 of this chapter) and the development standards (Section 17.72.040 of this chapter). Identify materials to be recycled.
- B. Demolition and construction plan to specify any proposed recycling of building material in the demolition of any structure on the site and to specify any recycled material to be used in the construction of the proposed development.
- C. Education/public relations program to instruct users of the development about the benefits of recycling and how to recycle. (Ord. 99-015 § 3-4-B)



All Docks Area users will participate in recycling to minimize the demand for new resources and impacts on landfill capacity.

## Schools

The Sacramento City Unified School District (SCUSD) is the provider of school services within the project area. There are also private elementary, middle, and high schools that serve residents throughout the City. SCUSD operates more than seventy schools throughout the City; the district includes traditional elementary, middle, and high schools, as well as alternative education and charter school facilities.



# IMPLEMENTATION

Development of the Docks Area will proceed as a public/private partnership between the City and developers of the site. The City will invest in elements of the Plan, as will the developer. The specifics will be developed during subsequent Developer Agreement negotiations. According to the “Planner’s Guide to Specific Plans (2001)” published by the Governor’s Office of Planning and Research:

A specific plan may be adopted by either resolution or ordinance. The planning commission and board or council must hold at least one public hearing each to consider the proposal prior to making the final decision (CGC Section 65453 and 65353). At least 10 days prior to each of these hearings, public notice of the place and time of the hearing must be given... The EIR or other environmental documentation must be certified by the legislative body prior to the adoption of the specific plan pursuant to CEQA Guidelines CGC Section 15092. (GOPR 12).

Possible funding mechanisms include:

- Mello-Roos Special District Tax
- General Obligation Bonds
- Public Enterprise Revenue Bonds
- Tax-Increment Financing
- Impact Fees and Exactions
- Special Assessment District



Phase F: Office as Initial Phase (Option A)



Phase F: Office as Initial Phase (Option B)

## Phasing

The general strategy for implementing the specific plan is to develop in four phases, from north to south, based on the planning assumptions stated in this Specific Plan. In view of unknown market conditions, phasing needs to remain flexible. The specific number of units to be developed will depend on many factors, including, most notably, market demand. For the purposes of the EIR, the highest density scenario will be analyzed.

One nuance from the generally north-to-south phasing strategy is the office element, Phase F. Office development in each scheme is a stand-alone component of the project. It doesn't necessarily need to be the last phase. It could move forward at any time, i.e. whenever the market is ready for it. It is therefore designated as Phase F (for "Flexible") in the phasing options that follow. However, a decision about whether the Reservoir will be relocated must be made prior to the development of the office phase.

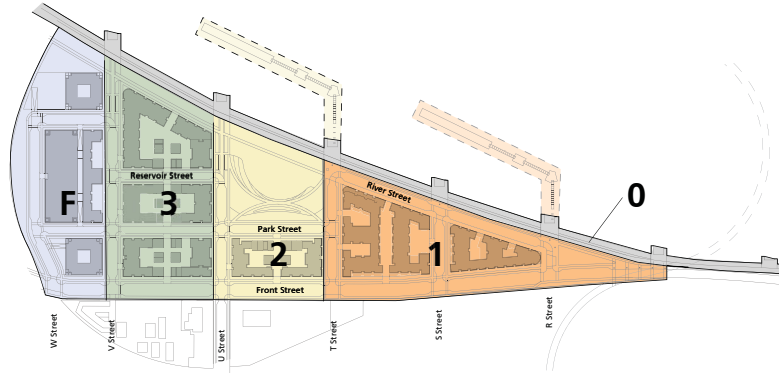
Phase 0 is the Docks Promenade project, which is a separate project from this Specific Plan, and will be implemented by the city through a separate planning process.



Phasing Diagram (Option 1)

# PHASING - OPTION A1

## PHASING PLAN



## BLOCK KEY PLAN



## LAND USE - A1

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)				Subtotal	Block Number	
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft			Hotel
<b>Phase 1</b>												
1	0.21	0.21										1
2	1.05		21,000		21,000		65		10		75	2
2' (hotel option)*	1.05		21,000		21,000				10	150	N.A.	2'
3	2.42		18,400		18,400	16	125	174			315	3
<b>TOTAL</b>	<b>3.68</b>	<b>0.21</b>	<b>39,400</b>		<b>60,400</b>	<b>16</b>	<b>190</b>	<b>174</b>	<b>10</b>		<b>390</b>	<b>TOTAL</b>
*Hotel option does not count towards totals												
<b>Phase 2</b>												
4	2.53	2.53										4
5	1.37					12	80				92	5
<b>TOTAL</b>	<b>3.90</b>	<b>2.53</b>				<b>12</b>	<b>80</b>				<b>872</b>	<b>TOTAL</b>
<b>Phase 3</b>												
6	2.00		500			10	150				160	6
7	1.29					12	80				92	7
8	1.34					12	52	174			238	8
<b>TOTAL</b>	<b>4.63</b>	<b>0.00</b>	<b>500</b>			<b>34</b>	<b>282</b>	<b>174</b>			<b>490</b>	<b>TOTAL</b>
<b>Phase F (Flexible Office Phase)</b>												
9	1.14		500	250,000	250,500						48	9
10	1.99										48	10
11	0.70		1,000	250,000	251,000							11
12	0.63	0.63										12
<b>TOTAL</b>	<b>4.46</b>	<b>0.63</b>	<b>1,500</b>	<b>500,000</b>	<b>501,500</b>		<b>48</b>				<b>48</b>	<b>TOTAL</b>

Public ROW	4.6
Open Space	0.2
Development	3.5
<b>TOTAL ACREAGE</b>	<b>8.3</b>

Public ROW	2.1
Open Space	2.5
Development	1.4
<b>TOTAL ACREAGE</b>	<b>6.0</b>

Public ROW	3.3
Open Space	0.0
Development	4.6
<b>TOTAL ACREAGE</b>	<b>7.9</b>

Public ROW	2.6
Open Space	0.6
Development	3.8
<b>TOTAL ACREAGE</b>	<b>7.1</b>

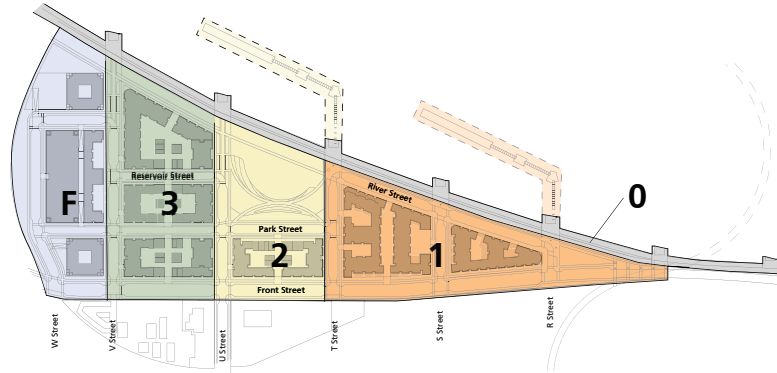


## PARKING - A1

Block Number	Residential Parking Spaces					Office Parking Spaces		
	Underground	Podium Level	Subtotal	Dwelling Units	Parking Ratio (space/unit)	Underground	Podium Level	Subtotal
<b>Phase 1</b>								
1								
2	550	80	630	75	1.6			
3				315				
<b>TOTAL</b>	<b>550</b>	<b>80</b>	<b>630</b>	<b>390</b>	<b>1.6</b>			
<b>Phase 2</b>								
4								
5	110	45	155	92	1.7			
<b>TOTAL</b>	<b>110</b>	<b>45</b>	<b>155</b>	<b>92</b>	<b>1.7</b>			
<b>Phase 3</b>								
6	160	75	235	160	1.5			
7	105	50	155	92	1.7			
8	240	50	290	238	1.2			
<b>TOTAL</b>	<b>505</b>	<b>175</b>	<b>680</b>	<b>490</b>	<b>1.4</b>			
<b>Phase 4</b>								
9						160		160
10	55		55	48	1.1	200	810	1010
11						80		80
12								
<b>TOTAL</b>	<b>55</b>		<b>55</b>	<b>48</b>	<b>1.1</b>	<b>440</b>	<b>810</b>	<b>1250</b>

# PHASING - OPTION A2

## PHASING PLAN



## BLOCK KEY PLAN



## LAND USE - A2

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)				Subtotal	Block Number	
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft			Hotel
<b>Phase 1</b>												
1	0.21	0.21										1
2	1.05		21,000		21,000		65		10		75	2
2' (hotel option)*	1.05		21,000		21,000				10	150	N.A.	2'
3	2.42		17,500		17,500	16	125	174			315	3
<b>TOTAL</b>	<b>3.68</b>	<b>0.21</b>	<b>38,500</b>		<b>59,500</b>	<b>16</b>	<b>190</b>	<b>174</b>	<b>10</b>	<b>N.A.</b>	<b>390</b>	<b>TOTAL</b>
<b>Phase 2</b>												
4	2.53	2.53										4
5	1.37					12	80				92	5
<b>TOTAL</b>	<b>3.90</b>	<b>2.53</b>				<b>12</b>	<b>80</b>				<b>92</b>	<b>TOTAL</b>
<b>Phase 3</b>												
6	2.00		500			10	111	174			295	6
7	1.29					12	80				92	7
8	1.34					12	52	174			238	8
<b>TOTAL</b>	<b>4.63</b>		<b>500</b>			<b>34</b>	<b>243</b>	<b>348</b>			<b>625</b>	<b>TOTAL</b>
<b>Phase F (Flexible Office Phase)</b>												
9	1.14		500	250,000	250,500							9
10	1.99						48				48	10
11	0.70		1,000	250,000	251,000							11
12	0.63	0.63										12
<b>TOTAL</b>	<b>4.46</b>	<b>0.63</b>	<b>1,500</b>	<b>500,000</b>	<b>501,500</b>		<b>48</b>				<b>48</b>	<b>TOTAL</b>

\*Hotel option does not count towards totals

Public ROW	4.6
Open Space	0.2
Development	3.5
<b>TOTAL ACREAGE</b>	<b>8.3</b>

Public ROW	2.1
Open Space	2.5
Development	1.4
<b>TOTAL ACREAGE</b>	<b>6.0</b>

Public ROW	3.3
Open Space	0.0
Development	4.6
<b>TOTAL ACREAGE</b>	<b>7.9</b>

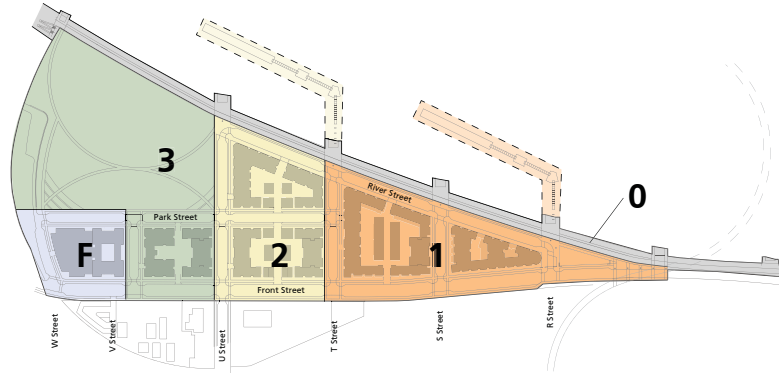
Public ROW	2.6
Open Space	0.6
Development	3.8
<b>TOTAL ACREAGE</b>	<b>7.1</b>

**PARKING - A2**

Block Number	Residential Parking Spaces					Office Parking Spaces		
	Underground	Podium Level	Subtotal	Dwelling Units	Parking Ratio (space/unit)	Underground	Podium Level	Subtotal
<b>Phase 1</b>								
1								
2	550	80	630	75	1.6			
3				315				
<b>TOTAL</b>	<b>550</b>	<b>80</b>	<b>630</b>	<b>390</b>	<b>1.6</b>			
<b>Phase 2</b>								
4								
5	110	45	155	92	1.7			
<b>TOTAL</b>	<b>110</b>	<b>45</b>	<b>155</b>	<b>92</b>	<b>1.7</b>			
<b>Phase 3</b>								
6	160	75	235	160	1.5			
7	105	50	155	92	1.7			
8	240	50	290	238	1.2			
<b>TOTAL</b>	<b>505</b>	<b>175</b>	<b>680</b>	<b>490</b>	<b>1.4</b>			
<b>Phase 4</b>								
9						160		160
10	55		55	48	1.1	200	810	1010
11						80		80
12								
<b>TOTAL</b>	<b>55</b>		<b>55</b>	<b>48</b>	<b>1.1</b>	<b>440</b>	<b>810</b>	<b>1250</b>

# PHASING - OPTION B

## PHASING PLAN



## BLOCK KEY PLAN



## LAND USE - B

Block Number	Acreage	Open Space (acres)	Commercial (square feet)			Residential (dwelling units)					Subtotal	Block Number	
			Retail	Office	Subtotal (sf)	Townhouse	Lowrise Flat	Highrise Flat	Loft	Hotel			
<b>Phase 1</b>													
1	0.21	0.21											1
2	1.05		21,000		21,000		65			10	75		2
2' (hotel option)*	1.05		21,000		21,000					10	150	N.A.	2'
3	2.42		19,800		19,800	13	128	174			315		3
<b>TOTAL</b>	<b>3.68</b>	<b>0.21</b>	<b>40,800</b>		<b>61,800</b>	<b>13</b>	<b>193</b>	<b>174</b>		<b>10</b>	<b>390</b>		<b>TOTAL</b>
*Hotel option does not count towards totals													
<b>Phase 2</b>													
4	1.60		1,500		1,500	8	100				108		4
5	1.72					14	68	174			256		5
<b>TOTAL</b>	<b>3.32</b>		<b>1,500</b>		<b>1,500</b>	<b>22</b>	<b>168</b>	<b>174</b>			<b>364</b>		<b>TOTAL</b>
<b>Phase 3</b>													
6	8.18	8.18											6
7	1.31						72	174			246		7
<b>TOTAL</b>	<b>9.49</b>	<b>8.18</b>					<b>72</b>	<b>174</b>			<b>246</b>		<b>TOTAL</b>
<b>Phase F (Flexible Office Phase)</b>													
8	1.31		1,000	200,000	201,000								8
9	1.35	1.35**											9
<b>TOTAL</b>	<b>2.66</b>	<b>1.35</b>	<b>1,000</b>	<b>200,000</b>	<b>201,000</b>								<b>TOTAL</b>

Public ROW	5.9
Open Space	0.0
Development	2.4
<b>TOTAL ACREAGE</b>	<b>8.3</b>

Public ROW	4.3
Open Space	0.0
Development	1.7
<b>TOTAL ACREAGE</b>	<b>6.0</b>

Public ROW	10.8
Open Space	0.0
Development	1.3
<b>TOTAL ACREAGE</b>	<b>12.1</b>

Public ROW	1.6
Open Space	0.0
Development	1.3
<b>TOTAL ACREAGE</b>	<b>2.9</b>

**PARKING - B**

Block Number	Residential Parking Spaces					Office Parking Spaces		
	Underground	Podium Level	Subtotal	Dwelling Units	Parking Ratio (space/unit)	Underground	Podium Level	Subtotal
<b>Phase 1</b>								
1								
2	550		630	75	1.6			
3		80		315				
<b>TOTAL</b>	<b>550</b>	<b>80</b>	<b>630</b>	<b>390</b>	<b>1.6</b>			
<b>Phase 2</b>								
4								
5	110	45	155	92	1.7			
<b>TOTAL</b>	<b>110</b>	<b>45</b>	<b>155</b>	<b>92</b>	<b>1.7</b>			
<b>Phase 3</b>								
6	160	75	235	160	1.5			
7	105	50	155	92	1.7			
8	240	50	290	238	1.2			
<b>TOTAL</b>	<b>505</b>	<b>175</b>	<b>680</b>	<b>490</b>	<b>1.4</b>			
<b>Phase 4</b>								
9						160		160
10	55		55	48	1.1	200	810	1010
11						80		80
12								
<b>TOTAL</b>	<b>55</b>		<b>55</b>	<b>48</b>	<b>1.1</b>	<b>440</b>	<b>810</b>	<b>1250</b>

## Infrastructure Cost Estimates

The preliminary construction costs below reflect the project phasing described elsewhere, as well as a construction cost summary for each option (excluding the optional underground water storage system).

### Docks Area Utility and Infrastructure Cost Summary

Alternative A		Utilities and Infrastructure									
Phase	Water Supply System	Sewer System	Storm Drain System *	Electrical Power System	Communication System	Natural Gas System	Roads	Engineered Fill (for road construction)			
1	\$ 188,943	\$ 142,117	\$ 351,139	\$ 300,083	\$ 297,867	\$ 164,493	\$ 652,628	\$ 1,095,672	\$ 3,192,942	Subtotal Phase 1	
2	\$ 114,302	\$ 139,467	\$ 162,122	\$ 172,694	\$ 74,300	\$ 39,683	\$ 471,467	\$ 346,740	\$ 1,520,776	Subtotal Phase 2	
3	\$ 236,400	\$ 108,350	\$ 308,010	\$ 153,861	\$ 152,389	\$ 1,115,989	\$ 580,842	\$ 561,954	\$ 3,217,795	Subtotal Phase 3	
4	\$ 102,603	\$ 54,256	\$ 240,353	\$ 61,583	\$ 47,200	\$ 571,305	\$ 467,291	\$ 218,243	\$ 1,762,834	Subtotal Phase 4	
	\$ 642,247	\$ 444,190	\$ 1,061,624	\$ 688,222	\$ 571,756	\$ 1,891,470	\$ 2,172,229	\$ 2,222,609	\$ 9,694,347	Subtotal	
	\$ 44,957	\$ 31,093	\$ 74,314	\$ 48,176	\$ 40,023	\$ 132,403	\$ 152,056	\$ 155,583	\$ 678,604	7%	Permits, bonds, insurance
	\$ 128,449	\$ 88,838	\$ 212,325	\$ 137,644	\$ 114,351	\$ 378,294	\$ 434,446	\$ 444,522	\$ 1,938,869	20%	Contingency
	\$ 815,654	\$ 564,122	\$ 1,348,263	\$ 874,042	\$ 726,130	\$ 2,402,167	\$ 2,758,730	\$ 2,822,714	\$ 12,311,821		Sub-total
	\$ 122,348	\$ 84,618	\$ 202,239	\$ 131,106	\$ 108,919	\$ 360,325	\$ 413,810	\$ 423,407	\$ 1,846,773	15%	Engineering Design
	\$ 938,002	\$ 648,740	\$ 1,550,502	\$ 1,005,149	\$ 835,049	\$ 2,762,492	\$ 3,172,540	\$ 3,246,121	\$ 14,158,594		Total

\* This cost estimate does not include optional oversized-pipe water storage, which would cost \$726,493 for Alt. A

Alternative B		Utilities and Infrastructure									
Phase	Water Supply System	Sewer System	Storm Drain System *	Electrical Power System	Communication System	Natural Gas System	Roads	Engineered Fill (for road construction)			
1	\$ 181,574	\$ 166,088	\$ 344,651	\$ 311,333	\$ 372,878	\$ 192,067	\$ 501,369	\$ 1,118,415	\$ 3,188,376	Subtotal Phase 1	
2	\$ 119,162	\$ 103,786	\$ 200,435	\$ 303,250	\$ 176,217	\$ 122,642	\$ 476,236	\$ 971,461	\$ 2,473,189	Subtotal Phase 2	
3	\$ 75,228	\$ 48,024	\$ 211,402	\$ 125,806	\$ 85,889	\$ 1,574,222	\$ 640,059	\$ 187,547	\$ 2,948,176	Subtotal Phase 3	
4	\$ 64,152	\$ 23,175	\$ 148,894	\$ 80,306	\$ 71,394	\$ 52,648	\$ 151,446	\$ 124,480	\$ 716,495	Subtotal Phase 4	
	\$ 440,115	\$ 341,074	\$ 905,382	\$ 820,694	\$ 706,378	\$ 1,941,578	\$ 1,769,110	\$ 2,401,904	\$ 9,326,236	Subtotal	
	\$ 30,808	\$ 23,875	\$ 63,377	\$ 57,449	\$ 49,446	\$ 135,910	\$ 123,838	\$ 168,133	\$ 652,836	7%	Permits, bonds, insurance
	\$ 88,023	\$ 68,215	\$ 181,076	\$ 164,139	\$ 141,276	\$ 388,316	\$ 353,822	\$ 480,381	\$ 1,865,247	20%	Contingency
	\$ 558,946	\$ 433,164	\$ 1,149,836	\$ 1,042,282	\$ 897,100	\$ 2,465,804	\$ 2,246,770	\$ 3,050,418	\$ 11,844,319		Sub-total
	\$ 83,842	\$ 64,975	\$ 172,475	\$ 156,342	\$ 134,565	\$ 369,871	\$ 337,015	\$ 457,563	\$ 1,776,648	15%	Engineering Design
	\$ 642,788	\$ 498,139	\$ 1,322,311	\$ 1,198,624	\$ 1,031,665	\$ 2,835,675	\$ 2,583,785	\$ 3,507,980	\$ 13,620,967		Total

\* This cost estimate does not include optional oversized-pipe water storage, which would cost \$904,607 for Alt. B

## Parks Cost Estimates

<b>R Street Park &amp; Plaza</b>				
Item Description	Quantity	Unit	Unit Price	Tot. Cost
<b>BONDS</b>				
Bonds	1	LS	\$ 39,000.00	\$ 39,000
<b>Subtotal</b>				\$ 39,000
<b>PROJECT COMMENCEMENT</b>				
Contractor Mobilization	1	LS	\$ 8,000.00	\$ 8,000
Construction Sign	1	LS	\$ 3,000.00	\$ 3,000
Construction Stacking	1	LS	\$ 7,000.00	\$ 7,000
<b>Subtotal</b>				\$ 18,000
<b>DEMOLITION, GRADING &amp; UTILITIES</b>				
Demolition: Paving, planters, clear & grub	14,700	SF	\$ 1.15	\$ 16,905
Haul demo material (1' depth, 20 mi r.t.)	544	CY	\$ 12.00	\$ 6,533
Grading (Assume 1' avg. depth)	14,700	SF	\$ 0.35	\$ 5,145
<b>Subtotal</b>				\$ 28,583
<b>HARDSCAPE</b>				
C.I.P Concrete Paving	4,720	SF	\$ 12.00	\$ 56,640
Enhanced Concrete Paving	920	SF	\$ 25.00	\$ 23,000
<b>Subtotal</b>				\$ 79,640
<b>FURNISHINGS</b>				
Bench	14	EA	\$ 1,500.00	\$ 21,000
Trash Receptacle	3	EA	\$ 1,500.00	\$ 4,500
Seat Wall	50	LF	\$ 100.00	\$ 5,000
Lighting Fixtures	1	LS	\$ 30,000.00	\$ 30,000
Water Fountain	1	LS	\$ 40,000.00	\$ 40,000
Interpretive signage	1	LS	\$ 5,000.00	\$ 5,000
<b>Subtotal</b>				\$ 105,500
<b>PLANTING</b>				
24" Box Tree	7	EA	\$ 500.00	\$ 3,500
Turf - Sod	9,060	SF	\$ 3.00	\$ 27,180
Soil Preparation	9,060	SF	\$ 0.75	\$ 6,795
Organic Mulch	2	CY	\$ 60.00	\$ 120
<b>Subtotal</b>				\$ 30,680
<b>LANDSCAPE MAINTENANCE AND PLANT ESTABLISHMENT</b>				
Replacement Trees	2	EA	\$ 500.00	\$ 1,000
Maintenance for 90 Days	1	LS	\$ 3,000.00	\$ 3,000
<b>Subtotal</b>				\$ 4,000
<b>IRRIGATION</b>				
Irrigation System	1	LS	\$ 20,000.00	\$ 20,000
<b>Subtotal</b>				\$ 20,000
<b>STORM DRAIN</b>				
Storm Drain System	1	LS	\$ 50,000.00	\$ 50,000
<b>Subtotal</b>				\$ 50,000
<b>UTILITIES</b>				
Portable Water System	1	LS	\$ 10,000.00	\$ 10,000
Electric System	1	LS	\$ 50,000.00	\$ 50,000
<b>Subtotal</b>				\$ 60,000
<b>CITY SOFT COST</b>				
Design and Engineering Fee	1	LS	\$ 39,000.00	\$ 39,000
Project Management, Bid Process, Permit, Construction Management Cost, etc.	1	LS	\$ 58,500.00	\$ 58,500
<b>Subtotal</b>				\$ 97,500
<b>SUBTOTAL CONSTRUCTION COST</b>				\$ 532,903
<b>20% CONTINGENCY</b>				\$ 106,581
<b>TOTAL CONSTRUCTION COST</b>				\$ 639,484

<b>Dock Area Park - Alt A</b>				
Item Description	Quantity	Unit	Unit Price	Tot. Cost
<b>BONDS</b>				
Bonds	1	LS	\$ 150,000.00	\$ 150,000
<b>Subtotal</b>				\$ 150,000
<b>PROJECT COMMENCEMENT</b>				
Contractor Mobilization	1	LS	\$ 50,000.00	\$ 50,000
Construction Sign	1	LS	\$ 3,000.00	\$ 3,000
Construction Stacking	1	LS	\$ 40,000.00	\$ 40,000
<b>Subtotal</b>				\$ 93,000
<b>DEMOLITION, GRADING &amp; UTILITIES</b>				
Demolition: Paving, planters, clear & grub	110,440	SF	\$ 1.15	\$ 127,006
Haul demo material (1' depth, 20 mi r.t.)	4,090	CY	\$ 12.00	\$ 49,084
Grading (Assume 1' avg. depth)	110,440	SF	\$ 0.35	\$ 38,654
<b>Subtotal</b>				\$ 214,744
<b>HARDSCAPE</b>				
DG Paving	11,750	SF	\$ 8.00	\$ 94,000
<b>Subtotal</b>				\$ 94,000
<b>FURNISHINGS</b>				
Bench	16	EA	\$ 1,500.00	\$ 24,000
Trash Receptacle	6	EA	\$ 1,500.00	\$ 9,000
Picnic Table	13	EA	\$ 2,000.00	\$ 26,000
Grill	5	EA	\$ 250.00	\$ 1,250
Interpretive signage	1	LS	\$ 5,000.00	\$ 5,000
Lighting Fixtures	1	LS	\$ 90,000.00	\$ 90,000
<b>Subtotal</b>				\$ 155,250
<b>PLANTING &amp; IRRIGATION</b>				
36" Box Tree	6	EA	\$ 800.00	\$ 4,800
24" Box Tree	24	EA	\$ 500.00	\$ 12,000
15 Gal. Tree	21	EA	\$ 300.00	\$ 6,300
Shrub and Groundcover	33,190	SF	\$ 10.00	\$ 331,900
Turf - Sod	65,830	SF	\$ 3.00	\$ 197,490
Soil Preparation	99,020	SF	\$ 0.75	\$ 74,265
Organic Mulch	200	CY	\$ 60.00	\$ 12,000
<b>Subtotal</b>				\$ 552,490
<b>LANDSCAPE MAINTENANCE AND PLANT ESTABLISHMENT</b>				
Replacement Trees	8	EA	\$ 500.00	\$ 4,000
Maintenance for 90 Days	1	LS	\$ 5,000.00	\$ 5,000
<b>Subtotal</b>				\$ 9,000
<b>IRRIGATION</b>				
Irrigation System	1	LS	\$ 80,000.00	\$ 80,000
<b>Subtotal</b>				\$ 80,000
<b>STORM DRAIN</b>				
Storm Drain System	1	LS	\$ 150,000.00	\$ 150,000
<b>Subtotal</b>				\$ 150,000
<b>UTILITIES</b>				
Portable Water System	1	LS	\$ 20,000.00	\$ 20,000
Electric System	1	LS	\$ 150,000.00	\$ 150,000
<b>Subtotal</b>				\$ 300,000
<b>CITY SOFT COST</b>				
Design and Engineering Fee	1	LS	\$ 150,000.00	\$ 150,000
Project Management, Bid Process, Permit, Construction Management Cost, etc.	1	LS	\$ 225,000.00	\$ 225,000
<b>Subtotal</b>				\$ 375,000
<b>SUBTOTAL CONSTRUCTION COST</b>				\$ 2,173,484
<b>20% CONTINGENCY</b>				\$ 434,697
<b>TOTAL CONSTRUCTION COST</b>				\$ 2,608,181

<b>Dock Area Park - Alt B</b>				
Item Description	Quantity	Unit	Unit Price	Tot. Cost
<b>BONDS</b>				
Bonds	1	LS	\$ 340,000.00	\$ 340,000
<b>Subtotal</b>				\$ 340,000
<b>PROJECT COMMENCEMENT</b>				
Contractor Mobilization	1	LS	\$ 100,000.00	\$ 100,000
Construction Sign	1	LS	\$ 6,000.00	\$ 6,000
Construction Stacking	1	LS	\$ 100,000.00	\$ 100,000
<b>Subtotal</b>				\$ 206,000
<b>DEMOLITION, GRADING &amp; UTILITIES</b>				
Demolition: Paving, planters, clear & grub	342,840	SF	\$ 1.15	\$ 394,266
Haul demo material (1' depth, 20 mi r.t.)	12,698	CY	\$ 12.00	\$ 152,373
Grading (Assume 1' avg. depth)	342,840	SF	\$ 0.35	\$ 119,994
<b>Subtotal</b>				\$ 666,633
<b>HARDSCAPE</b>				
DG Paving	21,100	SF	\$ 8.00	\$ 168,800
<b>Subtotal</b>				\$ 168,800
<b>FURNISHINGS</b>				
Bench	18	EA	\$ 1,500.00	\$ 27,000
Trash Receptacle	8	EA	\$ 1,500.00	\$ 12,000
Picnic Table	13	EA	\$ 2,000.00	\$ 26,000
Grill	5	EA	\$ 250.00	\$ 1,250
Interpretive signage	1	LS	\$ 5,000.00	\$ 5,000
Lighting Fixtures	1	LS	\$ 200,000.00	\$ 200,000
<b>Subtotal</b>				\$ 271,250
<b>PLANTING</b>				
36" Box Tree	6	EA	\$ 800.00	\$ 4,800
24" Box Tree	63	EA	\$ 500.00	\$ 31,500
15 Gal. Tree	47	EA	\$ 300.00	\$ 14,100
Shrub and Groundcover	37,000	SF	\$ 10.00	\$ 370,000
Turf - Sod	231,710	SF	\$ 3.00	\$ 695,130
Soil Preparation	268,710	SF	\$ 0.75	\$ 201,533
Organic Mulch	230	CY	\$ 60.00	\$ 13,800
<b>Subtotal</b>				\$ 1,330,863
<b>LANDSCAPE MAINTENANCE AND PLANT ESTABLISHMENT</b>				
Replacement Trees	16	EA	\$ 500.00	\$ 8,000
Maintenance for 90 Days	1	LS	\$ 12,000.00	\$ 12,000
<b>Subtotal</b>				\$ 20,000
<b>IRRIGATION</b>				
Irrigation System	1	LS	\$ 200,000.00	\$ 200,000
<b>Subtotal</b>				\$ 200,000
<b>STORM DRAIN</b>				
Storm Drain System	1	LS	\$ 300,000.00	\$ 300,000
<b>Subtotal</b>				\$ 300,000
<b>UTILITIES</b>				
Portable Water System	1	LS	\$ 30,000.00	\$ 30,000
Electric System	1	LS	\$ 300,000.00	\$ 300,000
<b>Subtotal</b>				\$ 600,000
<b>CITY SOFT COST</b>				
Design and Engineering Fee	1	LS	\$ 350,000.00	\$ 350,000
Project Management, Bid Process, Permit, Construction Management Cost, etc.	1	LS	\$ 525,000.00	\$ 525,000
<b>Subtotal</b>				\$ 875,000
SUBTOTAL CONSTRUCTION COST				\$ 4,678,546
20% CONTINGENCY				\$ 935,709
<b>TOTAL CONSTRUCTION COST</b>				<b>\$ 5,614,255</b>



# APPENDIX

<b>Appendix 1</b>	<b>Figures for Chapter 6: Infrastructure</b>
<b>Appendix 2</b>	<b>Preliminary Future Water Demand Calculations</b>
<b>Appendix 3</b>	<b>Preliminary Future Storm Drain System Calculations</b>
<b>Appendix 4</b>	<b>Preliminary Future Sanitary Sewer System Calculations</b>
<b>Appendix 5</b>	<b>Preliminary Future Natural Gas Demand Calculations</b>

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**Appendix 1**

**Figures for Chapter 6 : Infrastructure**

Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

- Legend:**
- Existing**
    - Water Line
    - Transmission Line
    - Hydrant
    - Water Valve
  - Proposed**
    - Curb
    - Right of Way
    - 12" Water Line
    - 8" Water Line
    - Hydrant
    - Water Valve

Note:  
Existing water line alignments from  
Department of UGR/ies (City of  
Sacramento, 2002).

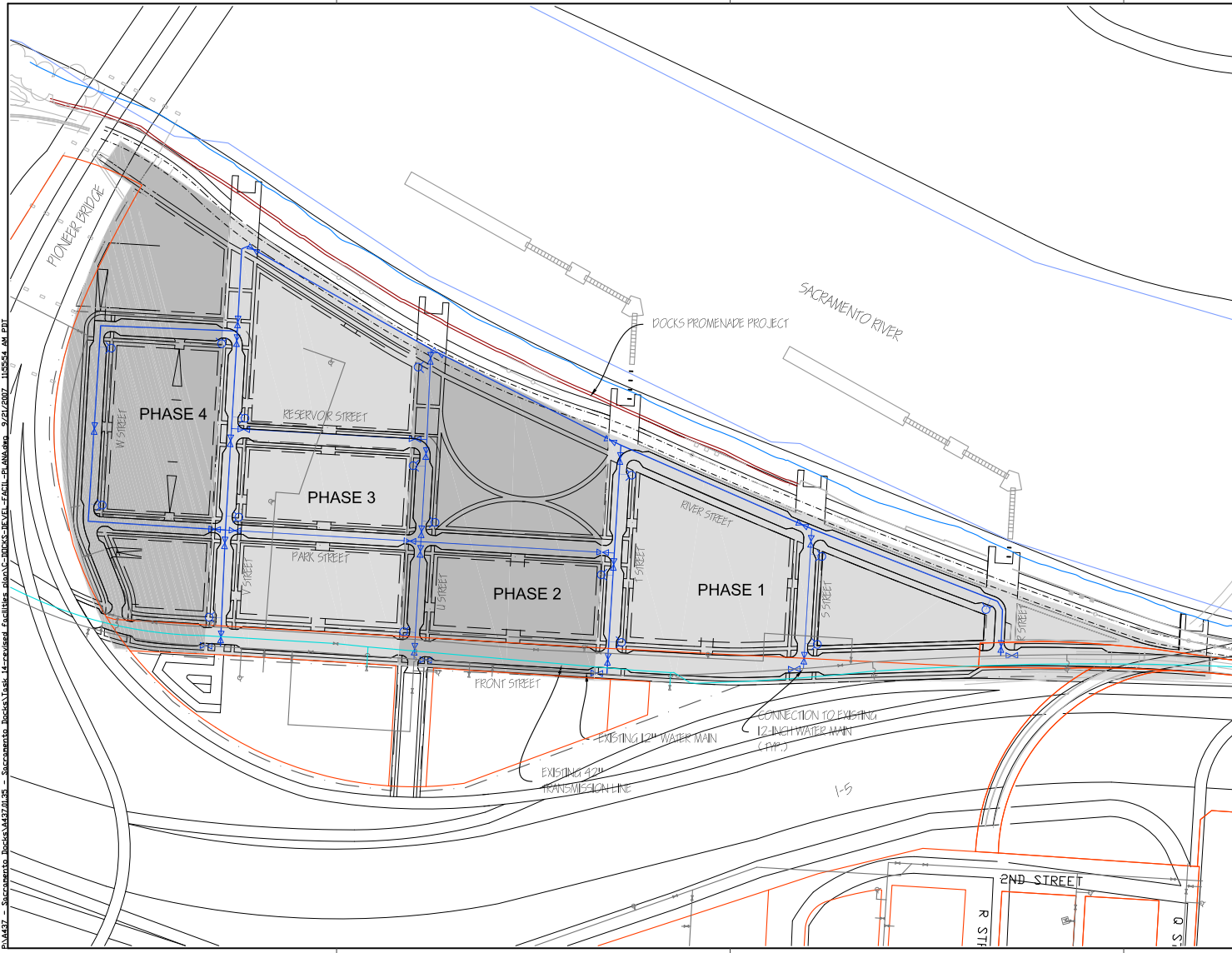
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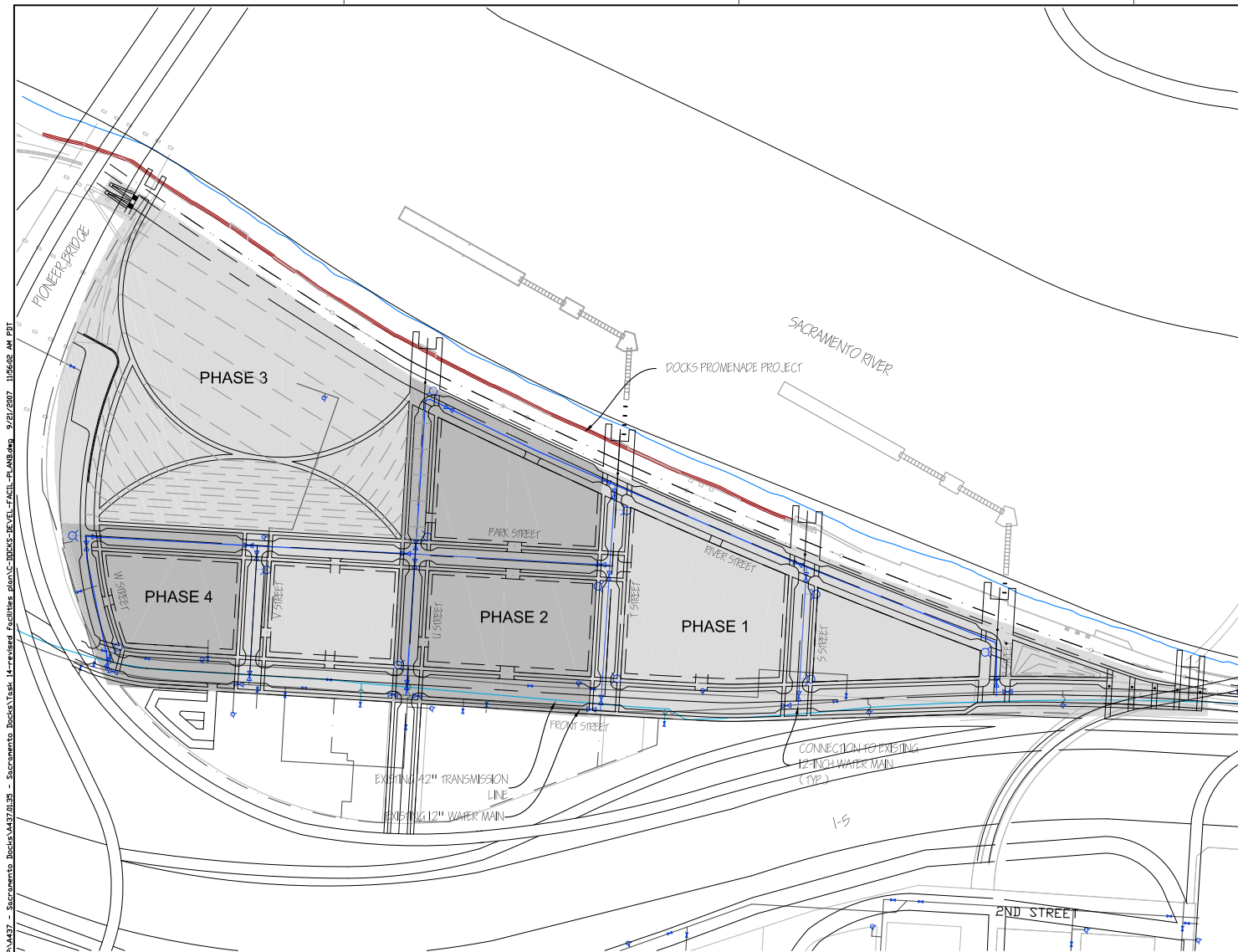
Date 24-SEPT-2007 Job Number A437.01.35

OPTION A -  
WATER SUPPLY

FIGURE

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

- Legend:**
- Existing**
    - Water Line
    - Transmission Line
    - Hydrant
    - Water Valve
  - Proposed**
    - Curb
    - Right of Way
    - 12" Water Line
    - 8" Water Line
    - Finish Grade Contour
    - Hydrant
    - Water Valve

Note: Existing water line alignments from Department of Utilities (City of Sacramento, 2002).

1" = 200'

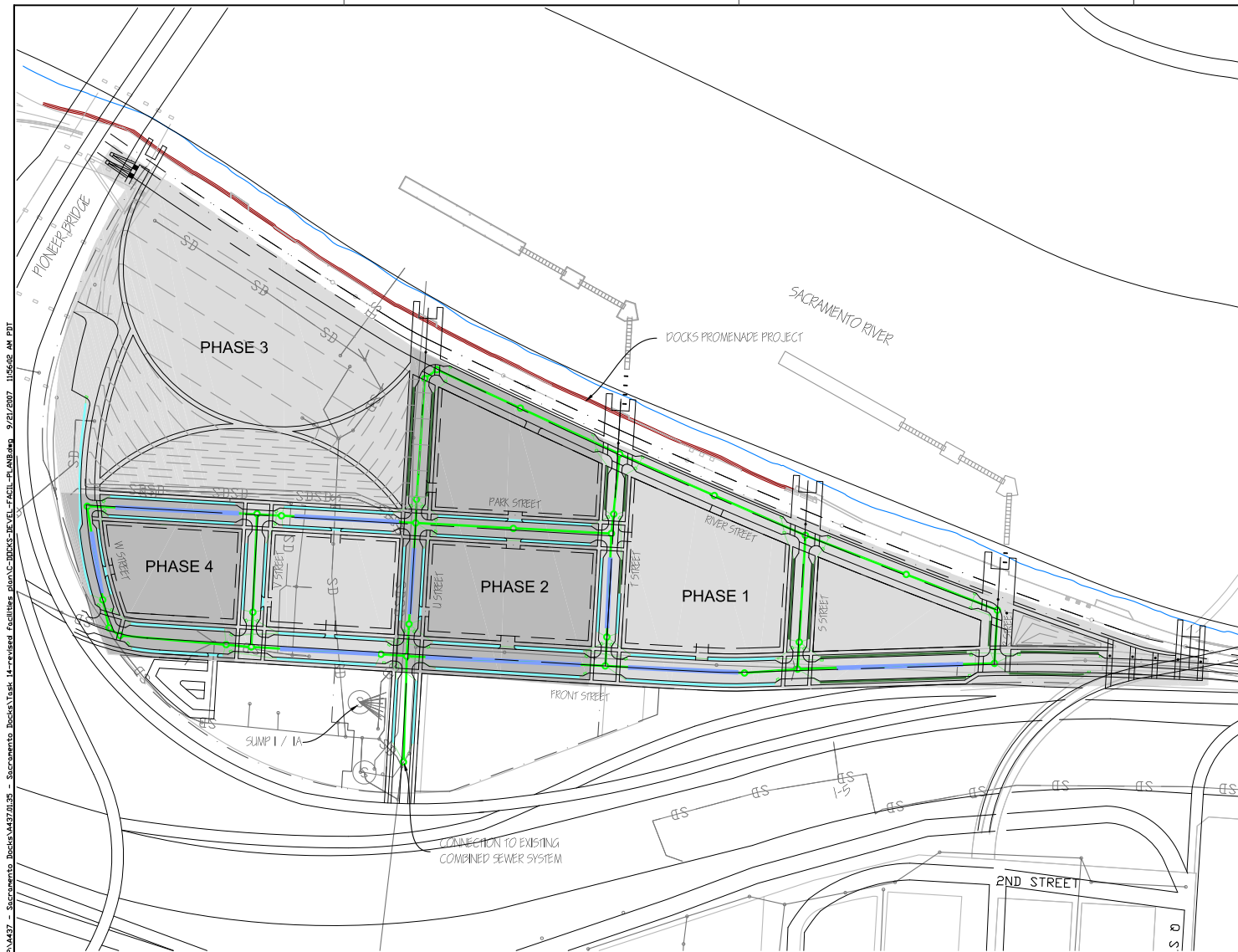
Date: 24-SEPT-2007      Job Number: A437.01.35

OPTION B - WATER SUPPLY

FIGURE 2

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

Legend:

- Existing**
- 50 — 50 — 50 — Storm Drain
  - Storm Drain Manhole
  - ⊙ Pump Station
- Proposed**
- Curb
  - - - Right of Way
  - 30" Storm Drain
  - Unlined Bioswale
  - Lined Bioswale
  - 12" Storm Drain
  - Detention Structure
  - - - Finish Grade Contour
  - Drop Inlet
  - ⊙ Storm Drain Manhole

Note:  
Existing storm drain line alignments  
from Department of Utilities (City  
of Sacramento, 2002).

1" = 200'  
Date: 24-SEPT-2007 Job Number: A437.01.35

OPTION B -  
STORM DRAINAGE

FIGURE  
4

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

- Legend:**
- Existing**
  - Sewer
  - Storm Drain
  - Manhole
  - Pump Station
  - Proposed**
  - Curb
  - Right of Way
  - Sanitary Sewer
  - Sanitary Sewer Manhole

Note:  
Existing sanitary sewer line  
alignments from Department of  
Utilities (City of Sacramento,  
2002).

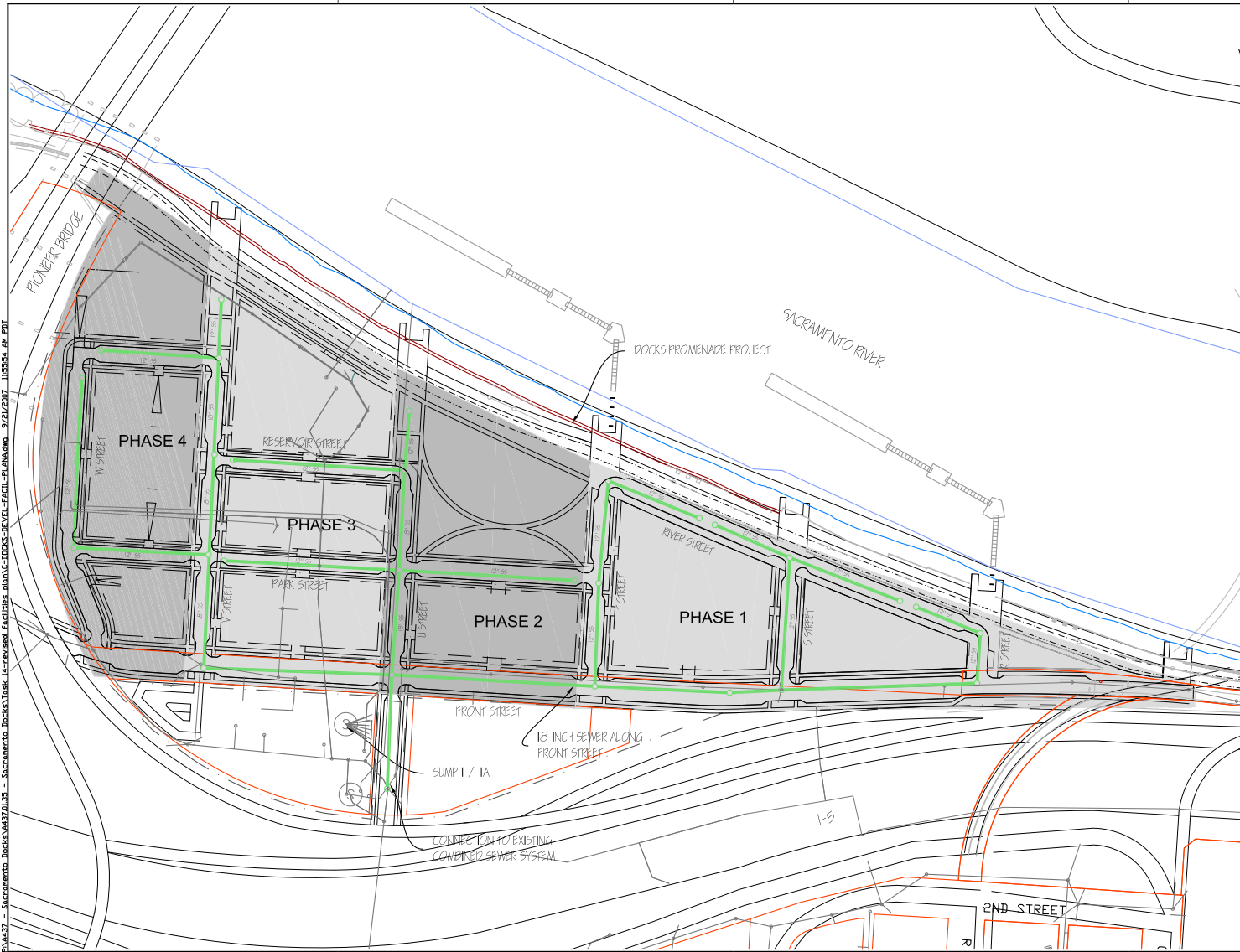
1" = 200'

Date: 24-SEPT-2007  
Job Number: A437.01.35

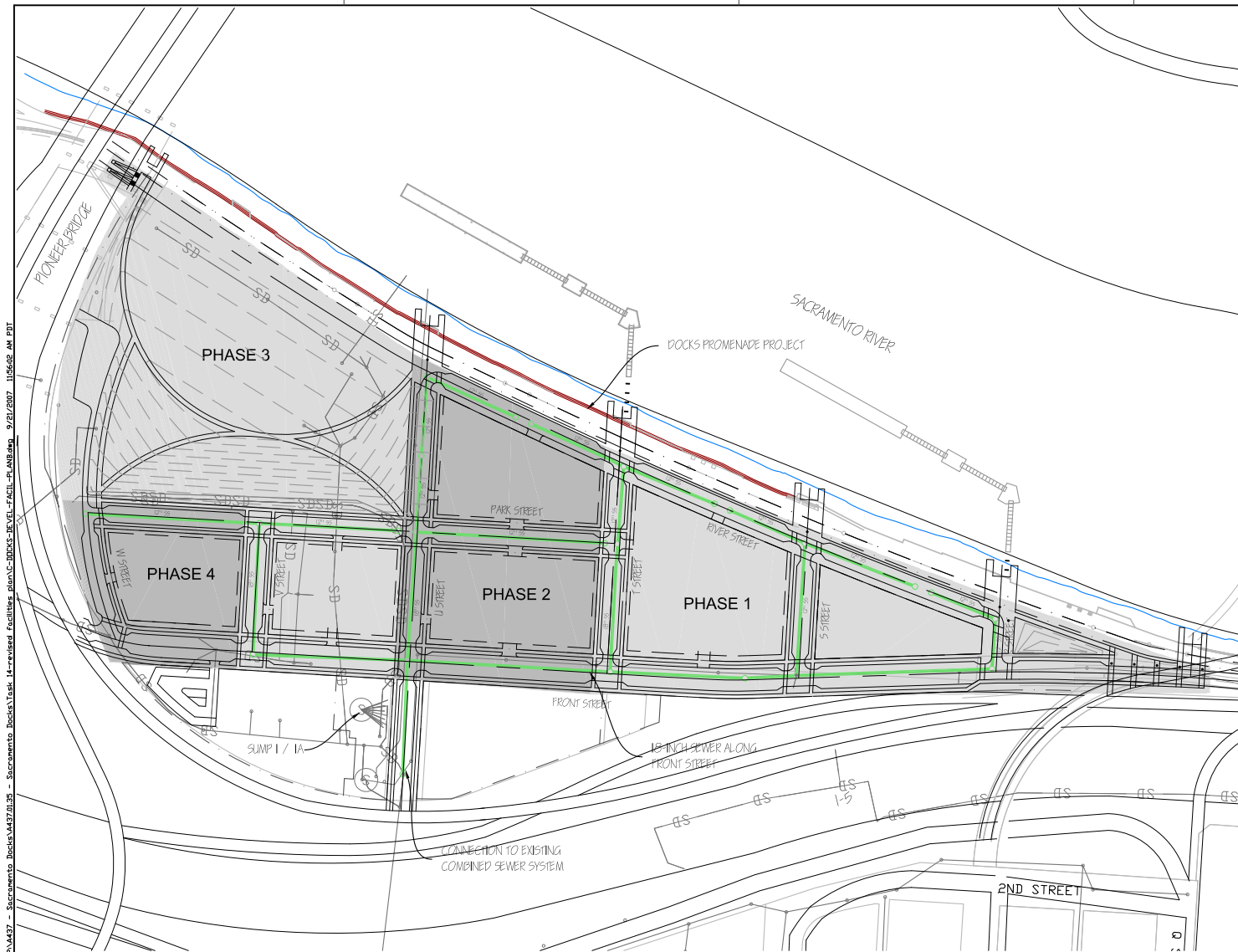
OPTION A -  
SANITARY SEWER

FIGURE  
5

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

**Legend:**

- Existing**
- Sewer
  - Storm Drain
  - Manhole
  - Ⓢ Pump Station
- Proposed**
- Curb
  - Right of Way
  - Sanitary Sewer
  - Finished Grade Contour
  - Sanitary Sewer Manhole



Note:  
Existing sanitary sewer line  
alignments from Department of  
Utilities (City of Sacramento,  
2002).

1" = 200'

Date  
24-SEPT-2007

Job Number  
A437.01.35

OPTION B -  
SANITARY SEWER

FIGURE  
6

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

Legend:

- Existing**
- OH — OH — Overhead Power
  - UG — UG — Underground Power
  - PP • Power Pole
- Proposed**
- Curb (New)
  - - - Right of Way
  - Electrical Duct Bank
  - Electrical Manhole/Vault



Notes:  
1. Mapping information obtained from SMUD and manually digitized from hardcopies.

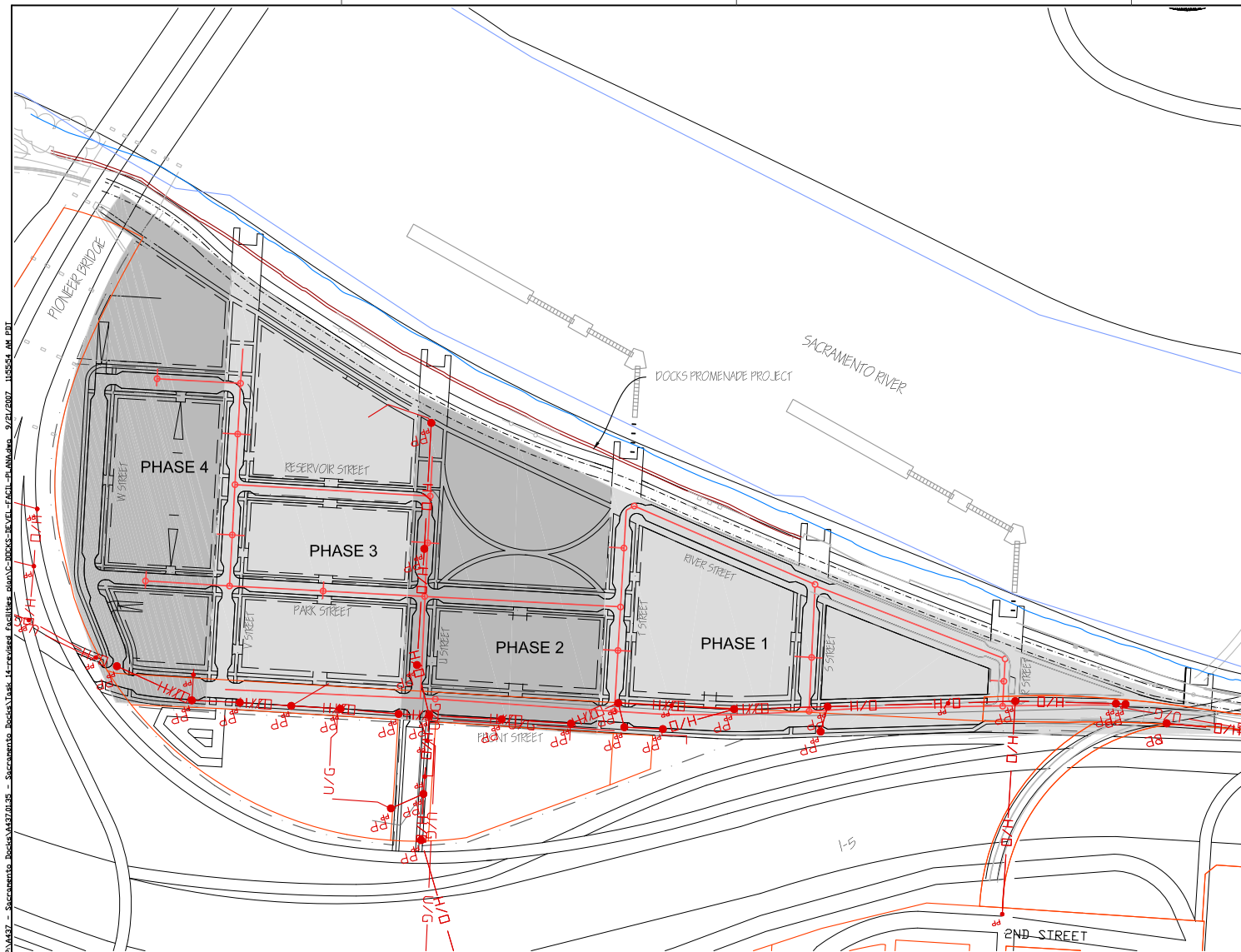
1" = 200'  
Date: 24-SEPT-2007 Job Number: A437.01.35

OPTION A -  
ELECTRICAL POWER

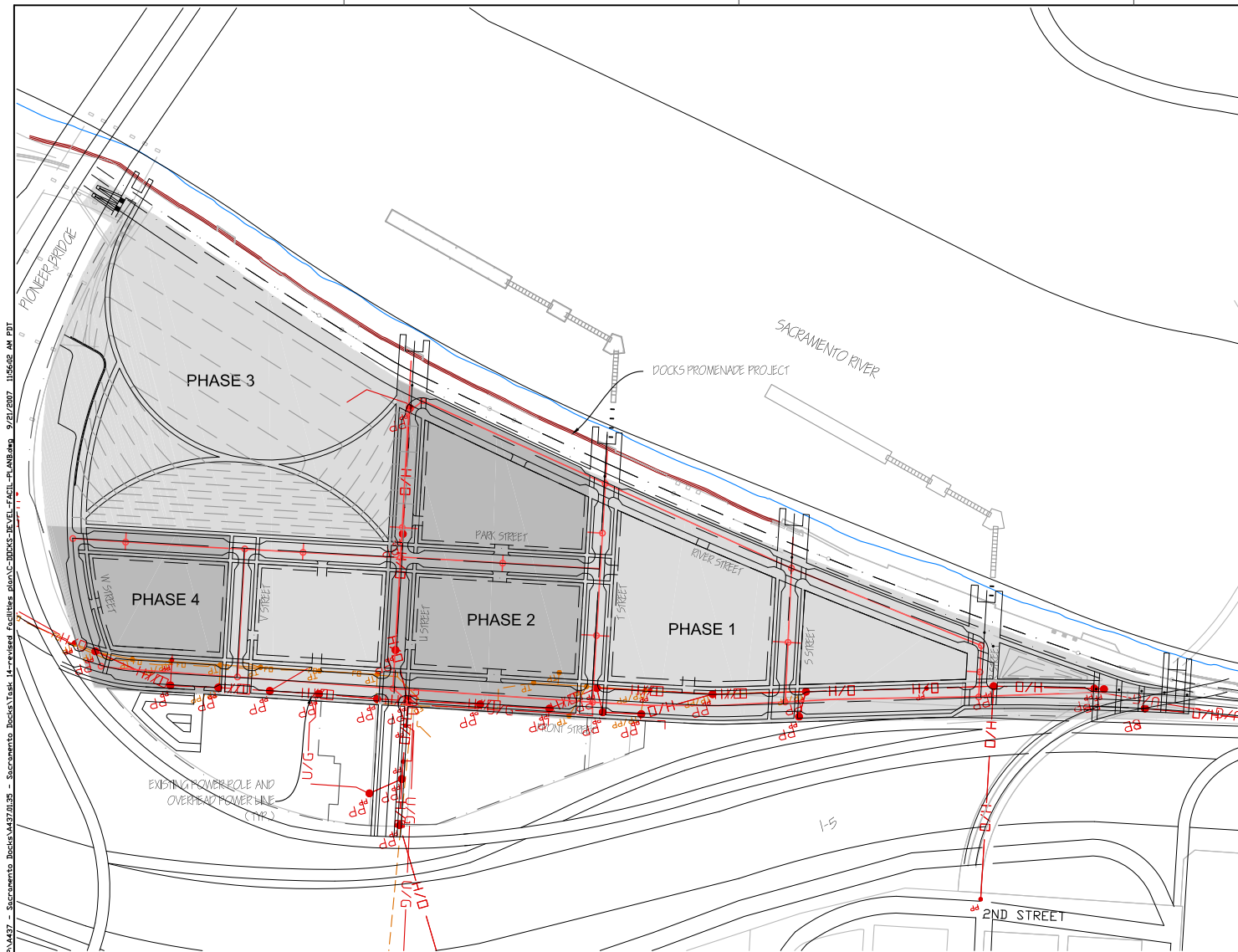
FIGURE

7

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

**Legend:**

- Existing**
- OH — Overhead Power
  - UG — Underground Power
  - PP ● Power Pole
- Proposed**
- Curb (New)
  - Right of Way
  - Finish Grade Contour
  - Electrical Duct Bank
  - Electrical Manhole/Vault



Notes:  
1. Mapping information obtained from SMUD and manually digitized from hardcopies.

1" = 200'  
Date: 24-SEPT-2007 Job Number: A437.01.35

OPTION B -  
ELECTRICAL POWER

FIGURE  
8

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

Legend:

- Existing**
- GAS
  - Gas Line (Existing)
  - Right of Way
- Proposed**
- 6" Gas Line (New)
  - Curb (New)
  - Gas Valve (New)

- Notes:
1. Gas main alignments are approximate. Alignments digitized from hard copies obtained from PG&E (last corrected 3/30/04).
  2. Numerous abandoned gas mains in project area not shown.
- 1"=200'

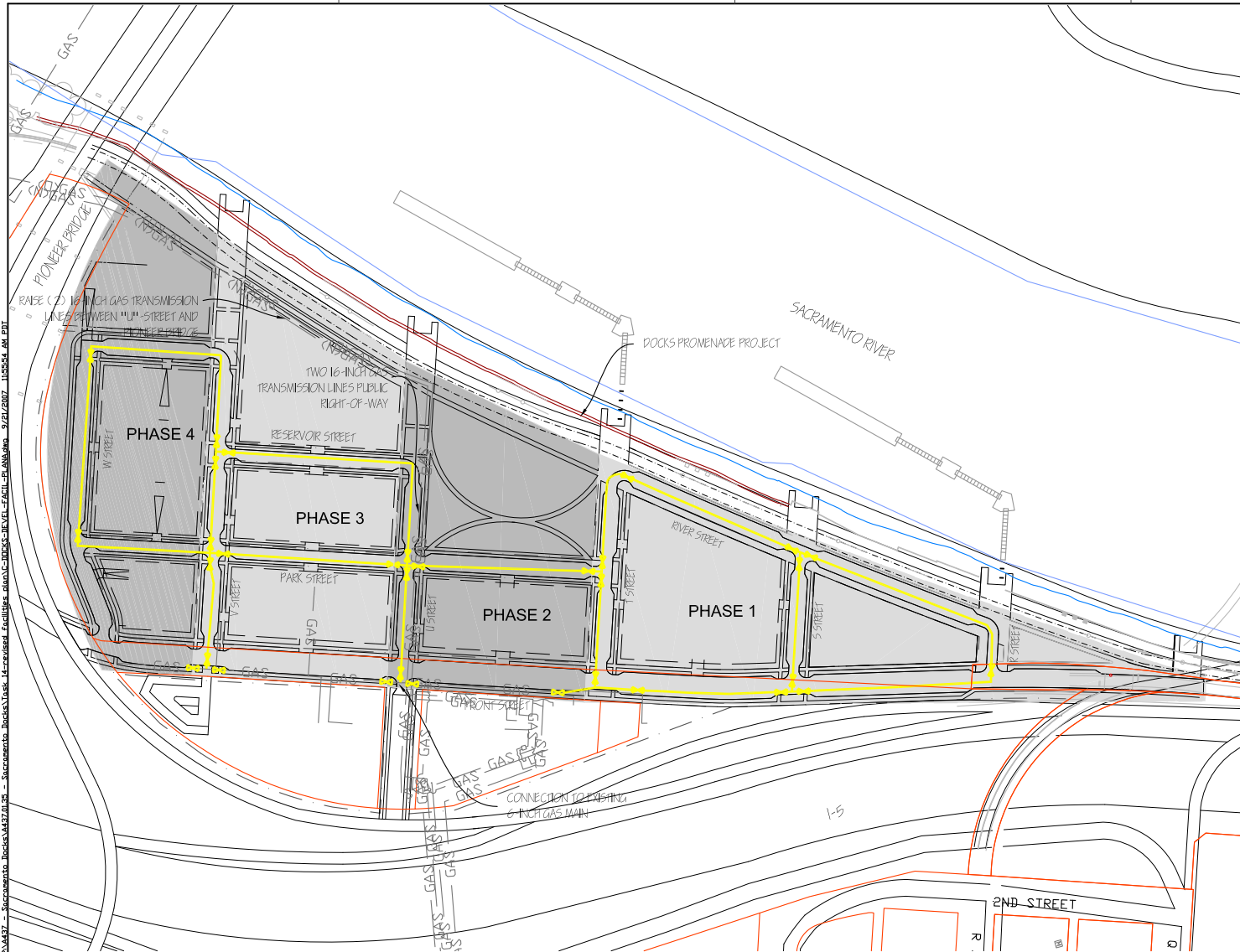
Date: 24-SEPT-2007      Job Number: A437.01.35

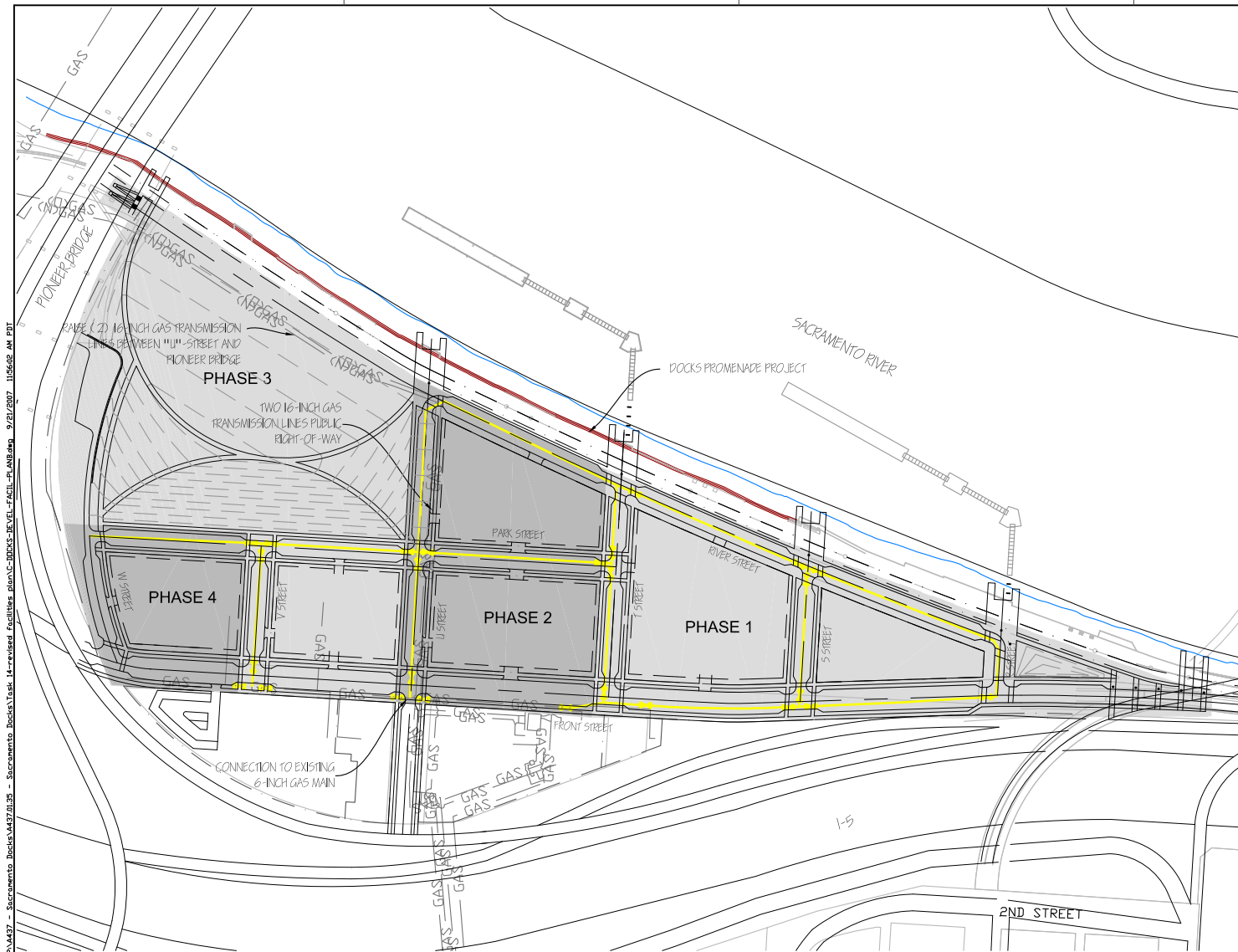
OPTION A -  
NATURAL GAS

FIGURE

9

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

- Legend:**
- Existing Gas Line (Existing)
  - Proposed 6" Gas Line (New)
  - Curb (New)
  - ⋈ Gas Valve (New)
  - Finish Grade Contour
  - Right of Way

Notes:  
 1. Gas main alignments are approximate. Alignments digitized from hard copies obtained from PG&E (last corrected 3/30/04).  
 2. Numerous abandoned gas mains in project area not shown.

1"=200'

Date	Job Number
24-SEPT-2007	A437.01.35

OPTION B -  
NATURAL GAS

FIGURE  
10

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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

Legend:

Existing

Telecomm Cable

Telecomm Pole

Proposed

Curb (New)

Right of Way

Telecomm, Cable TV, Fiber Optics (underground)

Telecomm Manhole/Vault



Notes:

1. Communication line alignment provided by SBC and transferred manually onto the drawing.

1"=200'

Date  
24-SEPT-2007

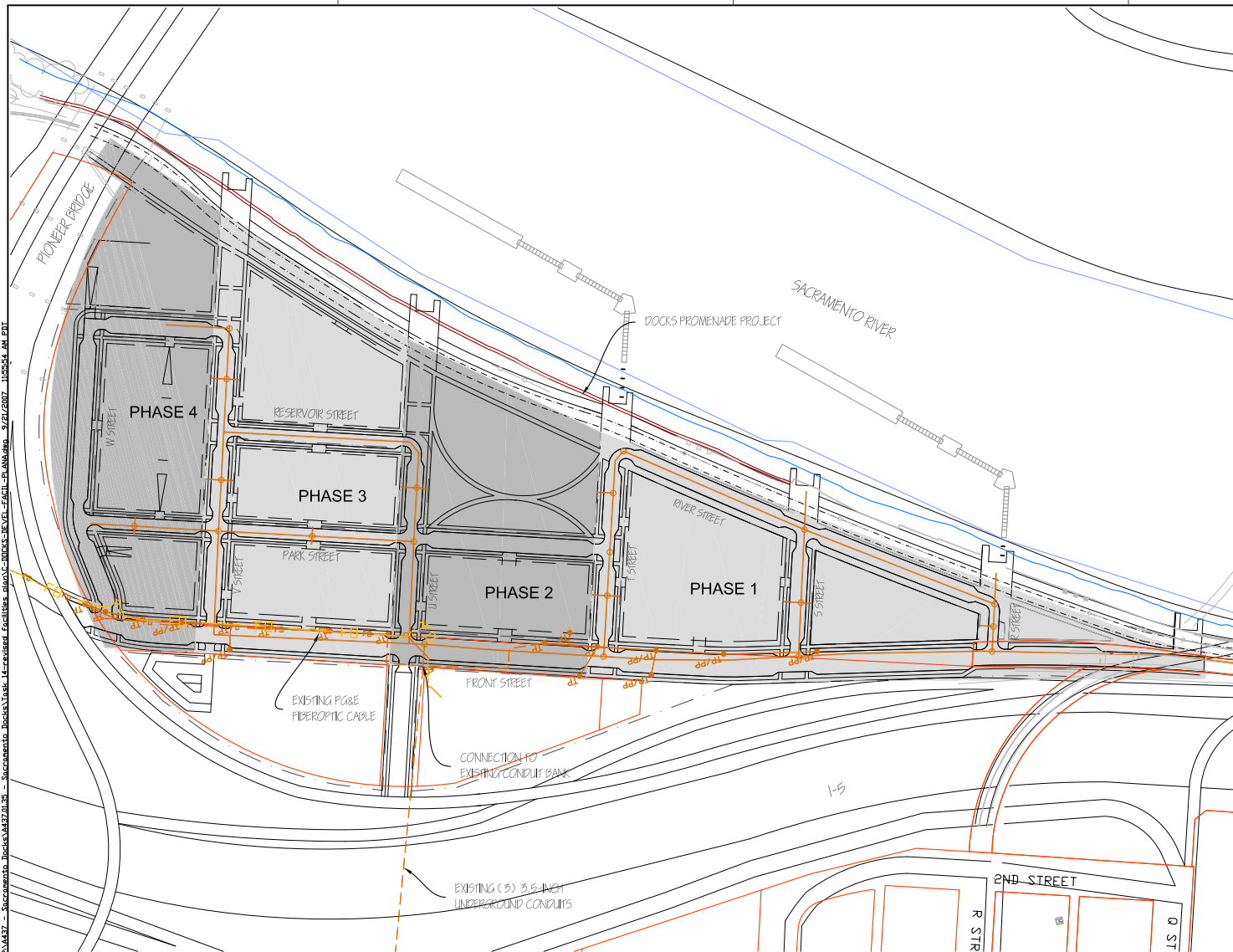
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A437.01.35

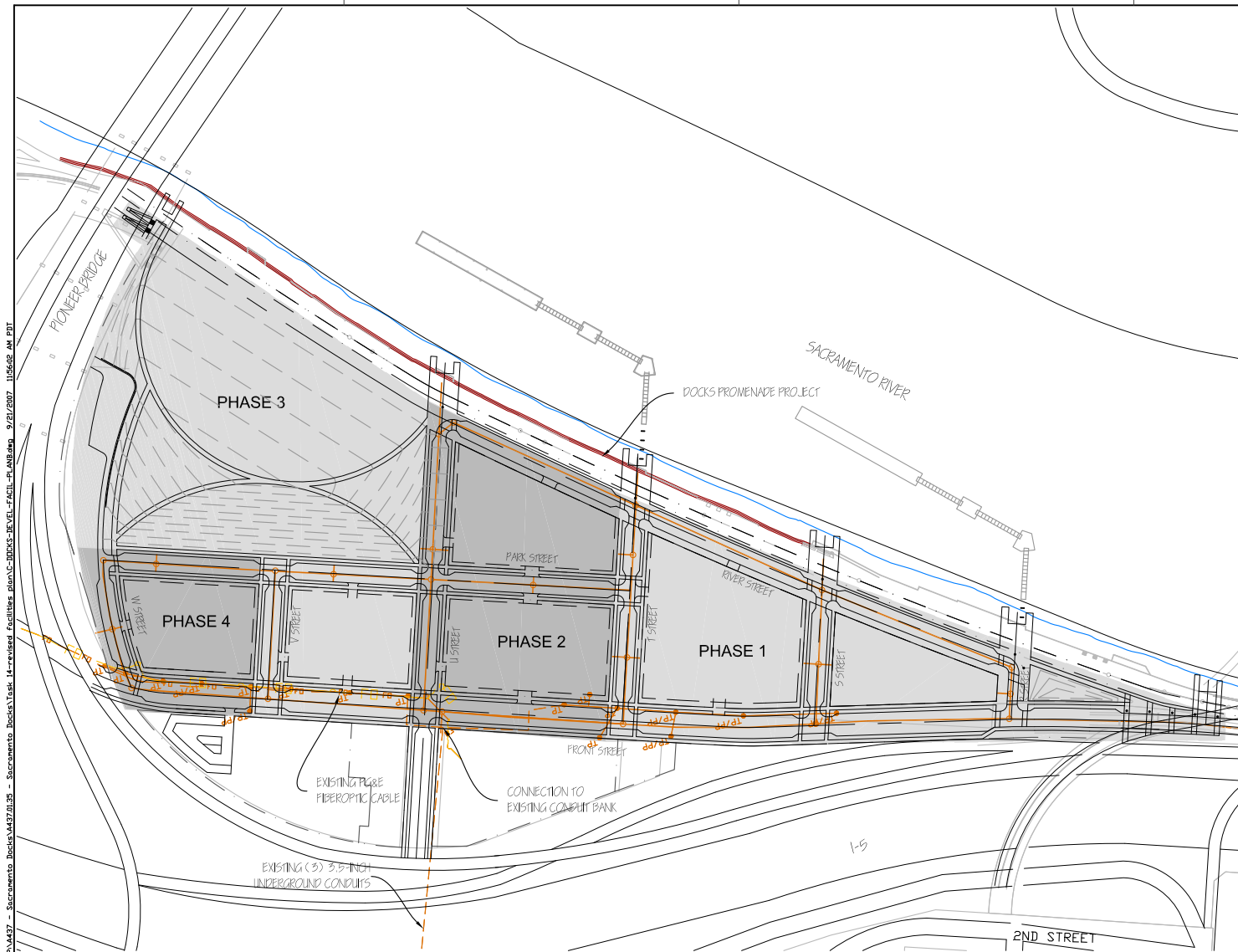
OPTION A -  
TELECOMMUNICATION

FIGURE



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Sacramento Docks  
Area Specific Plan  
Proposed  
Infrastructure Plan

**Legend:**

- Existing
- Telecomm Cable
- Telecomm Pole
- Proposed**
- Curb (New)
- - - Right of Way
- - - Finish Grade Contour
- Telecomm, Cable TV, Fiber Optics (underground)
- Telecomm Manhole/Vault



Notes:  
1. Communication line alignment provided by SBC and transferred manually onto the drawing.

1" = 200'

Date	Job Number
24-SEPT-2007	A437.01.35

OPTION B -  
TELECOMMUNICATION

FIGURE  
12

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## Appendix 2

### Preliminary Future Water Demand Calculations

Option A2

Planned:

- 29.17 acres Residential (1,155 DU, 1,100 sf per DU)
- 12.41 acres Commercial / Retail, and
- 3.37 acres of Parks

Given:

City of Sacramento average water demand by land use:

- Residential – High Density:  $Q_{Avg} = 4$  (acre-feet/acre-yr)
- Neighborhood Commercial (Retail):  $Q_{Avg} = 3$  acre-feet/acre-yr
- Parks and Recreation<sup>1</sup> :  $Q_{Avg} = 4.2$  acre-feet/acre-yr

Fire flow demand shall be 3,000 (gallons per minute) gpm in areas with commercial land use.

Find: Average day demand.

The average day demand based on the above numbers calculates to:

$$\begin{aligned}
 Q_{Avg} &= 4 \text{ acre-feet/acre-yr} \times 29.17 \text{ acres} = && 116.7 \text{ acre-feet/year} \\
 &+ 3 \text{ acre-feet/acre-yr} \times 12.41 \text{ acres} = && 37.2 \text{ acre-feet/year} \\
 &+ 4.2 \text{ acre-feet/acre-yr} \times 3.37 \text{ acres} = && 14.2 \text{ acre-feet/year} \\
 &= 168.1 \text{ acre-feet/year} \\
 &= 168.1 \times 1/365 \times 325,853 \text{ gal/acre-feet} = && 150,071 \text{ gpd}
 \end{aligned}$$

$Q_{Max}$  is calculated by multiplying  $Q_{Avg}$  by 1.8<sup>2</sup>.

$$Q_{Max} = 150,071 \text{ gpd} \times 1.8 = 270,128 \text{ gpd} (= 11,255 \text{ gph})$$

$Q_{Peak}$  is calculated by multiplying  $Q_{Max}$  by 1.3.

$$Q_{Peak} = 11,255 \text{ gph} \times 1.3 = 14,632 \text{ gallons per hour (gph)}$$

<sup>2</sup> Water District Master Plan, October 1996, Black & Veatch  
<sup>2</sup> Water District Master Plan, October 1996, Black & Veatch

$Q_{Max}$  plus fire flow equals:

$$\frac{270,128}{24 / 60} + 3,000 = 3,188 \text{ gpm.}$$

Option B

Planned:

- 25.25 acres Residential (1,000 DU, 1,100 sf per DU)
- 5.58 acres Commercial, and
- 9.74 acres of Parks

Given:

City of Sacramento average water demand by land use:

- Residential – High Density:  $Q_{Avg} = 4$  (acre-feet/acre-yr)
- Neighborhood Commercial (Retail):  $Q_{Avg} = 3$  acre-feet/acre-yr
- Parks and Recreation<sup>1</sup> :  $Q_{Avg} = 4.2$  acre-feet/acre-yr

Fire flow demand shall be 3,000 (gallons per minute) gpm in areas with commercial land use.

Find: Average day demand.

$$\begin{aligned}
 Q_{Avg} &= 4 \text{ acre-feet/acre-yr} \times 25.25 \text{ acres} = && 101.0 \text{ acre-feet/year} \\
 &+ 3 \text{ acre-feet/acre-yr} \times 5.58 \text{ acres} = && 16.7 \text{ acre-feet/year} \\
 &+ 4.2 \text{ acre-feet/acre-yr} \times 9.74 \text{ acres} = && 40.9 \text{ acre-feet/year} \\
 &= 158.6 \text{ acre-feet/year} \\
 &= 158.6 \times 1/365 \times 325,853 \text{ gal/acre-feet} = && 141,590 \text{ gpd}
 \end{aligned}$$

$Q_{Max}$  is calculated by multiplying  $Q_{Avg}$  by 1.8<sup>2</sup>.

$$Q_{Max} = 141,590 \text{ gpd} \times 1.8 = 254,862 \text{ gpd} (=10,619 \text{ gph})$$

<sup>1</sup> Estimate of Ultimate Annual Water Use , Boyle Engineering, 1991  
<sup>2</sup> Water District Master Plan, October 1996, Black & Veatch

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## Appendix 3

### Preliminary Future Storm Drain System Calculations

Option A2

Planned:

- 29.17 acres Residential (1,155 DU, 1,100 sf per DU)
- 12.41 acres Commercial / Retail, and
- 3.37 acres of Parks

Given:

The percent impervious is calculated as the area weighted value using 80% impervious for high density residential, 95% for parking/roadway, 90% for commercial, and 5% impervious for parks<sup>1</sup>.

Find: 10-yr and 100-yr storm event flow rate and require pipe size.

$$Q_{\text{peak}} = kA^n$$

In which

- Q = peak flow in cfs
- A = cumulative drainage area at a computational node point in acres
- k = coefficient which is a function of percent impervious and given in Table 11.31(a)
- n = exponent which is a function of percent impervious given in Table 11.31(a)

Using the given values, the weighted value for percent impervious calculates to approximately 80%. The following preliminary calculations estimate the expected peak flows once the project area has been developed. The portion of the project area that will be connected to a storm drain has an area of approximately 29.27 acres. Assuming that 80% of this area is impervious, the peak flow for the 10-year storm event calculates to

$$Q_{\text{peak}} = 2.04 \times 29.27^{0.819} = 32 \text{ cfs}$$

while the 100-year storm event calculates to

<sup>1</sup> Table 5-3 Sacramento City/County Drainage Manual, Volume 2

$$Q_{\text{peak}} = 3.15 \times 29.27^{0.798} = 47 \text{ cfs}$$

The minimum design velocity inside the storm drain pipes shall be two (2) feet per second (fps) while the maximum velocity shall not exceed 10 fps<sup>1</sup>. Storm drain lines not subject to surcharge (hydraulic grade line at or below top of pipe) shall be sized assuming the pipe is flowing at a depth of 0.8 the diameter (80% full). This means that the water depth in a 30-inch diameter pipe flowing at 80% is approximately 24 inches. Considering a minimum slope of 1 percent the maximum flow at 80% full in a new 30-inch PVC pipe would be approximately 52 cfs. The velocity would be approximately 12 fps.

Option B

Planned:

- 25.25 acres Residential (1,000 DU, 1,100 sf per DU)
- 5.58 acres Commercial, and
- 9.74 acres of Parks

Given:

The percent impervious is calculated as the area weighted value using 80% impervious for high density residential, 95% for parking/roadway, 90% for commercial, and 5% impervious for parks<sup>2</sup>.

Find: 10-yr and 100-yr storm event flow rate and require pipe size.

$$Q_{\text{peak}} = kA^n$$

In which

- Q = peak flow in cfs
- A = cumulative drainage area at a computational node point in acres

<sup>1</sup> Section 11, Drainage Design Standards

<sup>2</sup> Table 5-3 Sacramento City/County Drainage Manual, Volume 2

- k = coefficient which is a function of percent impervious and given in Table 11.31(a)
- n = exponent which is a function of percent impervious given in Table 11.31(a)

The percent impervious is calculated as the area weighted value using 80% impervious for high density residential, 95% impervious for roadway/parking, 90% impervious for commercial, and 5% impervious for parks<sup>1</sup>. Using these values, the weighted value for percent impervious calculates to approximately 60%. The following preliminary calculations should give an idea about the expected peak flows once the project area has been developed. The portion of the project area that will be connected to a storm drain has an area of approximately 29.27 acres. Assuming that 60% of this area is impervious, the peak flow for the 10-year storm event calculates to:

$$Q_{\text{peak}} = 1.9 \times 29.27^{0.813} = 30 \text{ cfs}$$

while the 100-year storm event calculates to

$$Q_{\text{peak}} = 2.86 \times 29.27^{0.797} = 42 \text{ cfs}$$

The minimum design velocity inside the storm drain pipes shall be two (2) feet per second (fps) while the maximum velocity shall not exceed 10 fps<sup>2</sup>. Storm drain lines not subject to surcharge (hydraulic grade line t or below top of pipe) shall be sized assuming the pipe is flowing at a depth of 0.8 the diameter (80% full). This means that the water depth in a 30-inch diameter pipe flowing at 80% is approximately 24 inches. Considering a minimum slope of 1 percent the maximum flow at 80% full in a new 30-inch PVC pipe would be 52.1 cfs. The velocity would be 12.38 fps.

<sup>1</sup> Table 5-3 Sacramento City/County Drainage Manual, Volume 2

<sup>2</sup> Section 11, Drainage Design Standards

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## Appendix 4

### Preliminary Future Sanitary Sewer System Calculations

**Option A2:**

Planned:

- Residential: 1,155 (DU)
- Commercial development = 540,500 sf

Given:

- 300 gpd flow per DU from Section 9, Sanitary Sewer Design Standards.
- Peaking factor found on Plate 9-2 of Section 9 to be 2.6.
- Average groundwater infiltration of 500 gpd per inch diameter per mile of sewer system.

Find: Design sewage flow rate.

Residential usage: 1,155 DU X 300 gpd = 346,500 gpd

Commercial development usage: 540,500 sf (12.4 acres) has approximately 8,200 gpd of sewer flow. (from the sewer flow graph in Section 9, Sanitary Sewer Design Standards).

Commercial development usage (alternative calculation):

(Basis: for infill areas where a sanitary sewer is existing the average flow for retail and office space (commercial) can be determined by using the flow of an Equivalent Single Dwelling unit (1 ESD = 400 gpd). Section 9.1.2 of the Sanitary Sewer Design Standards lists 0.2 ESD (80 gpd) per 1,000 sf of gross area for retail stores and office space. Therefore, the average flow from commercial spaces is estimated to be

$$Q = 540,500 / 1,000 \times 80 = 43,240 \text{ gpd}$$

This flow is considerably higher than the flow calculated using the average sewer flow curves. Considering the above calculated more conservative values the estimated average sewer flow is approximately

$$Q = 346,500 + 43,240 = 389,740 \text{ gpd}$$

The design flow shall be calculated by multiplying the average flow by a peaking factor, depending on the average flow, and adding average groundwater infiltration of 500 gpd per inch diameter per mile of sewer system. Based on an average flow of 390,000 gpd the peaking factor can be found on Plate 9-2 of Section 9 to be 2.6.

Infiltration rate:

$$1,700 \text{ ft long (18-inch)} \times 500 \text{ gpd per inch diameter per mile of sewer system} \times 1 \text{ mile} / 5,280 \text{ lf} \times 18 \text{ inch} = 2,898$$

+

$$5,100 \text{ ft long (12-inch)} \times 500 \text{ gpd per inch diameter per mile of sewer system} \times 1 \text{ mile} / 5,280 \text{ lf} \times 12 \text{ inch} = 5,795$$

$$= 8,693 \text{ gpd (8,700 gpd, approximately)}$$

Total design flow of approximately 390,000 x 2.6 + 8,700 = 1,022,700 gpd (1.58 cfs).

**Option B:**

Planned:

- Residential: 1,000 (DU)
- Commercial development = 243,300 sf

Given:

- 300 gpd flow per DU from Section 9, Sanitary Sewer Design Standards.
- Peaking factor found on Plate 9-2 of Section 9 to be 2.6.

Find: Design sewage flow rate.

Residential usage: 1,000 DU X 300 gpd = 300,000 gpd

Commercial development usage: 243,300 sf (5.6 acres) has approximately 8,200 gpd of sewer flow. (from the sewer flow graph in Section 9, Sanitary Sewer Design Standards).



Commercial development usage (alternative calculation):

(Basis: for infill areas where a sanitary sewer is existing the average flow for retail and office space (commercial) can be determined by using the flow of an Equivalent Single Dwelling unit (1 ESD = 400 gpd). Section 9.1.2 of the Sanitary Sewer Design Standards lists 0.2 ESD (80 gpd) per 1,000 sf of gross area for retail stores and office space. Therefore, the average flow from commercial spaces is estimated to be

$$Q = 243,300 / 1,000 \times 80 = 19,464 \text{ gpd}$$

This flow is considerably higher than the flow calculated using the average sewer flow curves. Considering the above calculated more conservative values the estimated average sewer flow is approximately

$$Q = 300,000 + 19,464 = 319,464 \text{ gpd}$$

The design flow shall be calculated by multiplying the average flow by a peaking factor, depending on the average flow, and adding average groundwater infiltration of 500 gpd per inch diameter per mile of sewer system. Based on an average flow of 320,000 gpd the peaking factor can be found on Plate 9-2 of Section 9 to be 2.6.

Infiltration rate:

$$1,600 \text{ ft long (18-inch)} \times 500 \text{ gpd per inch diameter per mile of sewer system} \times 1 \text{ mile} / 5,280 \text{ ft} \times 18 \text{ inch} = 2,727$$

+

$$4,900 \text{ ft long (12-inch)} \times 500 \text{ gpd per inch diameter per mile of sewer system} \times 1 \text{ mile} / 5,280 \text{ ft} \times 12 \text{ inch} = 5,795$$

$$= 8,295 \text{ gpd (8,300 gpd, approximately)}$$

Total design flow of approximately  $320,000 \times 2.6 + 8,300 = 840,300 \text{ gpd (1.30 cfs)}$ .

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## Appendix 5

### Preliminary Future Natural Gas Demand Calculations

Preliminary Future Gas Demand Calculation – Option A2

- Gas Demand Residential:

Planned: Proposed development = 1,155 DU (Dwelling Units)

Given: 0.05 mcf/hour-DU = 50 cf/ hour-DU; [1 mcf = 1,000 cf]

Calculate: Gas demand ( $G_{d,R}$ ) in cubic feet per day (cf/d)

$$G_{d,R} = 50 \text{ cf/hour-DU} \times 1,155 \text{ DU} = 57,750 \text{ cf/hour}$$

$$G_{d,R} = 57,750 \text{ cf/hour} \times 24 \text{ hour/day} = \underline{1,386,600 \text{ cf/day}}$$

- Gas Demand Light Commercial:

Planned: Proposed development = 540,500 sf

Given: 50 BTU/sf-hour  
Natural gas = 1,000 BTU/cf

Calculate: Gas demand ( $G_{d,C}$ ) in cubic feet per square foot and day (cf/sf-day)

$$G_{d,C} = 50 \text{ BTU/sf-hour} \times 24 \text{ hour/day} = 1,200 \text{ BTU/sf-day}$$

$$G_{d,C} = 1,200 \text{ BTU/sf-day} / 1,000 \text{ BTU/cf} = \underline{1.2 \text{ cf/sf-day}}$$

$$G_{d,C} = 1.2 \text{ cf/sf-day} \times 540,500 \text{ sf} = \underline{648,600 \text{ cf/day}}$$

- Total Demand Residential and Light Commercial:

$$G_{d,R} + G_{d,C} = \underline{1,386,600 \text{ cf/day}} + \underline{648,600 \text{ cf/day}} = \underline{2,035,200 \text{ cf/day}}$$

Preliminary Future Gas Demand Calculation – Option B

- Gas Demand Residential:

Planned: Proposed development = 1,000 DU (Dwelling Units)

Given: 0.05 mcf/hour-DU = 50 cf/ hour-DU; [1 mcf = 1,000 cf]

Calculate: Gas demand ( $G_{d,R}$ ) in cubic feet per day (cf/d)

$$G_{d,R} = 50 \text{ cf/hour-DU} \times 1,000 \text{ DU} = 50,000 \text{ cf/hour}$$

$$G_{d,R} = 50,000 \text{ cf/hour} \times 24 \text{ hour/day} = \underline{1,200,000 \text{ cf/day}}$$

- Gas Demand Light Commercial:

Planned: Proposed development = 243,300 sf

Given: 50 BTU/sf-hour  
Natural gas = 1,000 BTU/cf

Calculate: Gas demand ( $G_{d,C}$ ) in cubic feet per square foot and day (cf/sf-day)

$$G_{d,C} = 50 \text{ BTU/sf-hour} \times 24 \text{ hour/day} = 1,200 \text{ BTU/sf-day}$$

$$G_{d,C} = 1,200 \text{ BTU/sf-day} / 1,000 \text{ BTU/cf} = \underline{1.2 \text{ cf/sf-day}}$$

$$G_{d,C} = 1.2 \text{ cf/sf-day} \times 243,300 \text{ sf} = \underline{291,960 \text{ cf/day}}$$

- Total Demand Residential and Light Commercial:

$$G_{d,R} + G_{d,C} = \underline{1,200,000 \text{ cf/day}} + \underline{291,960 \text{ cf/day}} = \underline{1,491,960 \text{ cf/day}}$$









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