
INFRASTRUCTURE PLAN

VOLUME 1

CANDLESTICK POINT DEVELOPMENT

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INFRASTRUCTURE PLAN

CANDLESTICK POINT DEVELOPMENT

1. INTRODUCTION / PROJECT DESCRIPTION

1.1 PURPOSE

This Infrastructure Plan is an attachment to the Disposition and Development Agreement (DDA) between the Successor Agency to the Redevelopment Agency of the City and County of San Francisco, a public body, corporate, and politic of the State of California, together with any successor public agency, (the Agency) and CP Development Co., LP, a Delaware limited partnership, together with its successors (the Developer), and is an exhibit to the Interagency Cooperation Agreement (ICA) between the City and County of San Francisco (City) and the Agency. This Infrastructure Plan defines the Public Infrastructure for the Candlestick Point Area (CP Area). The CP Area is a portion of the overall Candlestick Point/Hunters Point Shipyard Phase 2 Development Project (Project). The Project is organized into two major sub-components: Candlestick Point Development (Candlestick Site) and Hunters Point Shipyard Phase 2 Development (Shipyard Site). A separate Infrastructure Plan covers the Shipyard Site. Collectively, these Infrastructure Plans comprise the Project Infrastructure Plan. Capitalized terms used but not otherwise defined shall have those meanings set forth in the DDA.

The overall Project description, location, and the nature of the Development within the CP Area are described fully in the DDA.

1.2 INFRASTRUCTURE PLAN OVERVIEW

This CP Infrastructure Plan will govern the construction and development of Infrastructure in the CP Area and off-site work needed to support the Project within the CP Area. This Infrastructure Plan may be modified to the extent such additional Infrastructure is mutually agreed to by the Agency and the Developer consistent with the terms of the DDA and the ICA.

This Infrastructure Plan defines Infrastructure improvements to be provided by the Developer for the CP Area and off-site work needed to support development of the CP Area. While some Infrastructure improvements to be provided by City Agencies and other governmental agencies are described, their inclusion herein is not intended to be inclusive of all improvements to be provided by City Agencies and other governmental agencies.

This Infrastructure Plan and the Candlestick Point / Hunters Point Shipyard Phase 2 Subdivision Regulations (to be developed separately) will establish the design standards, criteria and specifications of Infrastructure in the Project, including streets, low pressure water, recycled water, auxiliary water supply system, joint trench, street lighting, street furniture, separated storm and sewer systems, low impact design (LID) storm water treatment features, open space parcels, and other Infrastructure. During subdivision processing and approval by the City, including the review and approval of subdivision improvement plans, the final design of Infrastructure will be consistent with this Infrastructure Plan. This Infrastructure Plan focuses on the Infrastructure required to build the Project as described in the Project Environmental Impact Report (EIR).

1.3 PROPERTY ACQUISITION, DEDICATION, AND EASEMENTS

The Mapping, Street Vacations, property acquisition, dedication and acceptance of streets and other Infrastructure improvements will occur through the Subdivision Map process in accordance with the Candlestick Point/Hunters Point Shipyard Phase 2 Subdivision Code and Subdivision Regulations. Except as otherwise noted, all Infrastructure described in this Infrastructure Plan shall be constructed within the public right-of-way or within dedicated easements to provide for access and maintenance of Infrastructure facilities. In the event the Developer cannot acquire property necessary to provide the rights- of-way or easements for construction of improvements shown herein, the Developer will submit alternate Infrastructure designs for the City to consider. Certain easements may be required across State lands within the boundaries of the Candlestick Point State Recreation Area (CPSRA). The terms of these acquisitions are the subject of separate negotiations between the Developer, the City, and the State.

Public utility easements may be allowed within the Project to service the development, as determined by the City in its reasonable discretion. Utilities in these areas will be installed in accordance with the standards in this Infrastructure Plan and applicable City Regulations for public acquisition and acceptance within public utility easement areas, including provisions for maintenance access; however, such areas shall not be required to be dedicated as public right-of-ways or improved to public right-of-way standards. Public utility easements will be on the City Attorney's Office form of easement. The City strongly prefers public utilities be installed within public rights-of-way. In the event of a conflict between the Infrastructure Plan and the tentative map conditions, the tentative map conditions shall control.

1.4 PROJECT DATUM

Elevations are referred to herein in reference to the “CP/HPS2 Datum” or “Project Datum.” “CP/HPS2 Datum” and “Project Datum” are both defined as City Datum plus one hundred feet.

The definitions of development-related terms as defined in the DDA shall apply to this Infrastructure Plan.

1.5 INFRASTRUCTURE MASTER PLANS

Each Infrastructure system described herein has been more fully described in a Master Plan submitted separately to the City and reviewed. These Master Plan documents identify the key design criteria and provide more detailed layouts of each Infrastructure system. Approval of this Infrastructure Plan does not imply approval of the respective utility system Master Plan. Each utility will be constructed according to the provisions of relevant City Standard Plans and Specifications as provided for in the DDA and this Infrastructure Plan. All facilities will be located within the public right-of-way or dedicated easements to provide for access and maintenance to facilities.

1.6 CONFORMANCE WITH EIR & ENTITLEMENTS

This Infrastructure Plan has been developed to be consistent with Project mitigation measures required by the Environmental Impact Report (EIR) and other entitlement documents. Regardless of the status of their inclusion in this Infrastructure Plan, all mitigation measures of the EIR shall apply to the Project. Compliance with Project mitigation measures shall be the responsibility of the Developer or its Contractor until acceptance of the related Infrastructure by the Agency, City, or on-site development entity.

2. PUBLIC INFRASTRUCTURE WITHIN THE STREET RIGHTS-OF-WAY

2.1 STREET IMPROVEMENTS

A new on-site street system, comprised of proposed new and reconstructed streets, and improvements to some off-site roadways outside the project boundary, will be constructed to serve the project, as described in Section 2.

The following Infrastructure descriptions apply generally to streets in the CP Area, but may vary slightly from street to street based on particular requirements, as shall be determined during the review of the applicable subdivision improvement plans and in accordance with the procedure for granting exceptions as set forth in the CP/HPS2 Subdivision Code and the Project DDA. The street improvements will be implemented at specific stages of development, on-site street improvements will be implemented as-triggered by the adjacency principle described in Section 6 and off-site street improvements will be implemented based on traffic triggers as discussed in Section 6.

2.1.1 ON-SITE STREET SURFACE IMPROVEMENTS

Street surface improvements consist of roadway reconstruction, preparation, excavation, fine grading, pavement section (including concrete base and asphalt concrete wearing surface), combined concrete curbs and gutters, concrete sidewalk and curb ramps, traffic control signs and striping, street landscaping and trees, low impact design stormwater treatment facilities, and appurtenant improvements. Grading will be performed by cutting existing grades and redistributing the resulting soil for placement on site, or by importing fill for placement in order to provide sufficient gradient to accommodate the 100-year overland flow requirements and the projected sea level rise, as described in Section 3. Consideration will be made during design of potential settlement that may result by the addition of loads to existing compressible soils by the Infrastructure described in this Infrastructure Plan, and action will be taken by the Developer prior to construction to minimize such settlements.

Streetscape improvements of the on-site streets will include sidewalk, a planting area, street trees and street furnishings, as approved by the Agency and City. These improvements will be further defined by the Streetscape Master Plan submitted by the Developer for approval by the City and/or Agency in accordance with the Design Review and Document Approval Procedure (DRDAP). Street furnishings include, but are not limited to, benches, trash cans, bike support facilities and pedestrian scale lighting.

Upon acceptance of these street improvements by the City, responsibility for the operation and maintenance of the roadway and streetscape elements will be designated as defined in the various City of San Francisco Municipal Codes. Responsibility for accepted street improvements for streets within the Public Trust, as shown in Figure 2.1.1B, will be determined separately.

At the time of new permanent street construction, all Infrastructure under the pavement, including utility crossings at intersections, will be installed prior to final street pavement. For major utilities such as water lines, the facilities are to be installed and tested for acceptance. For minor conduits, such as for future traffic signal wires, sleeves (or individual conduits if detailed data is available at the time) will be installed to minimize future street cuts. Spare conduits will be provided within the joint trench where necessary for future installation of twelve (12) conductor cable to synchronize intersections. The foundations for underground utilities shall be determined by the geotechnical and civil engineering requirements for the location.

The following lane use definitions shall apply to this Infrastructure Plan:

Shared right-through lane means a traffic lane from which a vehicle can either make a right turn, or travel straight through the intersection.

Shared left-through lane means a traffic lane from which a vehicle can either make a left turn, or travel straight through the intersection.

Exclusive through lane means a traffic lane from which a vehicle can only travel straight through the intersection.

Exclusive left-turn lane means a traffic lane from which a vehicle can only make a left turn.

Exclusive right-turn lane means a traffic lane from which a vehicle can only make a right turn.

The following bicycle facility definitions shall apply to this Infrastructure Plan:

Class I bicycle facility means an off-road bicycle path, generally shared with pedestrians. Class I facilities may be adjacent to an existing roadway, or may be entirely independent of existing vehicular facilities.

Class II bicycle facility means striped bicycle lanes on roadways.

Class III bicycle facility means a signed bicycle route. Class III facilities do not have striped, reserved right of way for bicycles, but are signed and designed to accommodate and encourage bicycle traffic. These facilities are often demarcated by “sharrows” indicating the shared use of the lane by both motorized vehicles and bicycles.

2.1.2 ON-SITE STREET SYSTEM

The following specific on-site street improvements shall be provided by the Developer in connection with the development of the CP Area in accordance with this Infrastructure Plan.

STREET SEGMENT IMPROVEMENTS

The on-site street system for the CP Area, including existing and proposed streets, is shown on Figure 2.1.1A. Streets and parks within the Public Trust lands, which are subject to separate acceptance procedures and post-acceptance regulations, are shown on Figure 2.1.1B. Figures 2.1.2A – 2.1.2I show on-site street cross sections within the CP Area, including basic geometries within the rights-of-way such as numbers of lanes, their uses, their widths, and the full width of the rights-of-way. These sections demonstrate the transportation functionality of the roadways and may not be inclusive of all features and utilities that will be included in the final street sections. Curb ramps and crosswalks are shown diagrammatically and will be designed to align across pedestrian paths of travel. The precise locations of these features will be subject to approval through the design process. Street names for proposed roadways are only to identify particular roadway segments and are subject to final determination at a later time.

The CP Center retail area final roadway layout will be determined at the time that the retail center application is approved. If the roads are to be held as private, the Developer will need to demonstrate how the utilities will be accommodated.

In addition to constructing new streets within the CP Area, some existing streets are being rebuilt in accordance with the Infrastructure Plan and the Transportation Master Plan for the Project.

The following is a summary of those existing on-site street improvements:

Arelious Walker Drive

The Developer will rebuild Arelious Walker Drive from Gilman Avenue to Carroll Avenue. These improvements include widening the right-of-way from 64 feet to between 83 feet and 109 feet. The acquisition of private property along the southeastern edge of Arelious Walker Drive is required to complete these improvements as described. An alternate plan to complete Arelious

Walker Drive Infrastructure improvements has been developed and will be implemented in the event the private property cannot be obtained by the Developer.

INTERSECTION IMPROVEMENTS

The following specific intersection Improvements shall be provided by Developer in connection with the development of the CP Area in accordance with this Infrastructure Plan:

New Traffic Signals

The Developer shall install new traffic signal poles, masts, and heads, pedestrian count-down indicators and other related infrastructure in each corner of the intersection, and install a new traffic signal controller at the following intersections (as shown on Figure 2.1.7), or as may be agreed upon by the City and Developer based on further information from a traffic engineer:

1. Arelious Walker Drive / Harney Way / P Street
2. Arelious Walker Drive / Jamestown Avenue
3. Arelious Walker Drive / Ingerson Avenue
4. Arelious Walker Drive / Gilman Avenue
5. Arelious Walker Drive / Egbert Avenue
6. Arelious Walker Drive / Donner Avenue
7. Arelious Walker Drive / Carroll Avenue
8. Harney Way / 8 Street
9. Harney Way / Ingerson Avenue
10. West Harney Way / Ingerson Avenue
11. West Harney Way / Gilman Avenue
12. West Harney Way / Egbert Avenue
13. Earl Street / Egbert Avenue
14. Earl Street / Gilman Avenue

Certain traffic signals will have interconnection infrastructure as recommended by the Project Transportation Plan and shown on Figure 2.1.7, which may be amended by mutual agreement of the City and Developer from time to time. All traffic signals will be designed and constructed to SFMTA standards.

Other Traffic Control

At intersections on major roadways where traffic signals are not installed, the Developer shall install stop signs on streets intersecting the following major roadways:

1. Arelious Walker Drive, between Harney Way and Carroll Avenue
2. Harney Way, between Arelious Walker Drive and Gilman Avenue
3. West Harney Way, between 8 Street and Donner Avenue

The Developer shall install stop sign and related traffic control Infrastructure at other intersections in the CP Area, with configuration (all-way or side-street) to be determined in consultation with the City prior to approval of Improvement Plans. All other streets shall have traffic control as recommended by the Project Transportation Plan, which may be amended by mutual agreement of the City and Developer from time to time.

Intersection Configuration / Circulation Plan

The Circulation Plans shown on Figures 2.1.2H - I present detailed lane configurations based on the Project Transportation Plan for the approaches to major signalized intersections in the CP Area. The Project Transportation Plan contains the detailed lane configurations for roadways throughout the CP Area. These major intersections include:

1. Arelious Walker Drive and Carroll Avenue
2. Arelious Walker Drive and Harney Way
3. Harney Way and 8 Street
4. Harney Way and Ingerson Avenue

2.1.3 OFF-SITE STREET SYSTEM

The following specific off-site improvements shall be provided by the Developer in connection with the development of the CP Area in accordance with this Infrastructure Plan.

STREET SEGMENTS

The Developer shall reconstruct or improve existing street segments outside of the CP Area as described below, pursuant to a schedule defined by Section 6. The proposed street improvements are generally limited to the sidewalk (including curb ramps) and street sections within the existing right-of-way, except for Harney Way, which will be widened and the existing ROW increased to accommodate the additional Bus Rapid Transit (BRT) and auto lanes. The acquisition of additional ROW for Harney Way is not addressed within this IP but addressed within DDA documents. Limited areas of streetscape improvements may be included in off-site street segments or along certain off-site corridors as described herein. A Technical Memorandum will recommend one or more of the following types of roadway improvements for the street pavement section based on site reconnaissance, topographic survey and geotechnical investigation completed prior to the final design and any proposed construction. These recommendations will be mutually agreed upon by both the Developer and SFDPW prior to final design.

Site reconnaissance will consist of a site walk to document the existing conditions within the ROW including pavement and sidewalk conditions and above ground utilities requiring protection and/or potential relocation during work activities. A topographic survey of existing surface elevations including location of surface utilities will be completed following site reconnaissance. Existing pavement conditions will be evaluated and documented by performing a limited geotechnical investigation.

Because the proposed work activities are needed to improve access to the project area per the Transportation Plan, all the proposed improvements by the Developer are limited to pavement and sidewalk improvements within the right of way. Therefore, any primary subsurface utilities that are present below the existing off-site roadway and sidewalk sections will be not be redesigned or reconstructed.

All off-site street and streetscape improvements will be constructed per recommendations of a Technical Memorandum discussing Off-Site Street Pavement Rehabilitation and Replacement and per the approved Plans and Specifications per current City requirements.

Based on the above documents the types of offsite roadway improvement work expected to be performed are defined as:

Reconstruct Structural Section – This street improvement includes removal of the existing roadway pavement section between roadway structural joints and/or expansion joints as necessary

– including asphalt concrete (AC) pavement, portland cement concrete base (PCC), aggregate base (AB) and sidewalk as needed. Following removal a new roadway structural section will be constructed, which will include placement of a new AC wearing course and PCC, adjustment of valve boxes and manhole frames and covers to grade, placement of new traffic markings / striping and construction of new sidewalk as needed per current City requirements within the existing ROW or within additional ROW acquired for Harney Way widening.

Repair and Resurface Streets – These street improvements include partial removal of the existing AC wearing surface (up to the top of the PCC base or a maximum of 3 inches) by grinding, assessment and replacement of the concrete roadway structural section in those areas demonstrating visible signs of structural failure (e.g., cracks more than 1/8-inch in thickness, differential settlement of more than 1/2-inch, etc.) and removal of sidewalk sections with visible signs of failure. Repairs of the PCC in areas with affected structural sections shall be made from structural joint to structural joint. Following these activities the failed road pavement sections will be repaired or replaced, a new AC surface will be placed (up to 3 inches), including adjustment of valve boxes and manhole frames and covers to grade, and placement of new traffic markings / striping. Sidewalk sections will be repaired or replaced. This work will be completed per current City requirements within the existing ROW. The extent of this type of repair is intended to correct areas of deficient structural sections without replacing an entire roadway segment, as agreed by the Developer and City.

Resurface Streets – These street improvements include removal of the existing AC wearing surface (down to the top of the PCC base or a maximum of 3 inches in depth) by grinding and placement of a new AC wearing surface. Resurfacing of streets shall include adjustment of valve boxes and manhole frames and covers to grade and placement of new traffic markings / striping.

Overlay Streets – These street improvements include placement of a new AC wearing surface overlay over the existing pavement surface without modification of the underlying pavement. Overlaying of streets shall include adjustment of valve boxes and manhole frames and covers to grade and placement of new traffic markings / striping.

Restripe Street – This work is defined as the removal of existing pavement delineation, obliterating of prior pavement markings, and placement of new pavement delineation and pavement markings.

Existing off-site roadways outside the project boundary, such as Gilman Avenue, Jamestown Avenue, Ingerson Avenue, Carroll Avenue, Ingalls Street, and Thomas Avenue will be improved and new facilities, such as a widened Harney Way, will be built to serve the CP Area. Off-site Infrastructure included in the CP Area includes Ingalls Street south of its intersection with Thomas Avenue. The intersection of Thomas Avenue and Ingalls Street is included as part of the HPS2 Infrastructure Plan.

For each segment of improved street pavement, improvements to street pavement at street intersections will continue into the crossing street and up to the curb returns on either side of the crossing street. The City may choose to incorporate additional design elements into these off-site roadways at City cost. These may include LID features to address the flow rate of storm water flows into the combined sanitary sewer system, major curb and gutter replacement (where not called for by the Technical Memorandum) and/or curb bulb-outs.

These terms as defined above are used in describing the work at specific locations delineated below:

A. Harney Way (Initial Configuration)

Work will consist of widening Harney Way from the eastern curb return of Thomas Mellon Circle to Arelious Walker Drive as shown in Figure 2.1.3. Harney Way will have a sidewalk, two transit-only BRT lanes separated from mixed traffic flow by a landscaped median, two travel lanes in each direction, a center turn lane with exclusive left turn lanes at specific locations, a landscape zone, and a two-way Class I cycletrack. The cycletrack will connect to the Class I cycletrack within the development area. An exclusive westbound right-turn lane will also be provided at Executive Park Boulevard East.

It is anticipated that additional improvements on Harney Way West of Thomas Mellon Circle will be constructed by others as identified in the inter-jurisdictional Bi-County Transportation Study (BTS). The Developer will complete the Harney Way improvements described in this Infrastructure Plan and will make every effort to coordinate work efforts with the BTS for continuity. The Developer will implement the improvements identified in a Technical Memorandum which will consist of Reconstruct Structural Section.

In addition to Reconstruct Structural Section additional improvements include: earthwork necessary to cut, re-grade and install a retaining wall along the northern edge of Harney Way

between Thomas Mellon Circle and Executive Park Boulevard within the newly acquired ROW; construction of 2 dedicated BRT lanes and associated medians; upgrade street lights that need to be replaced or moved during construction with new fixtures and an additional pedestrian light added to the existing pole when possible; extension of drainage laterals and installation of new catch basins; and relocation of low pressure water system fire hydrants if necessary. Work includes streetscape improvements which can include new street trees with grates, street benches, bicycle racks, and trash receptacles. Street signage to be provided includes relocation of existing street signs. The improvements include BRT Stops. A pre-design study for offsite roadways targeted for reconstruction will include possible use of LIDs; implementation of any LID elements is not part of the Developer's scope of work for offsite road improvements. Work will include an irrigation system for the street trees within the new median but not along the sidewalks; operation and maintenance of the irrigation system and sidewalk trees will be per current City requirements by owner or other agencies.

Right of way shall be set aside, according to Figure 2.1.3, to accommodate potential future widening of Harney Way.

Two new traffic signals will be installed at the intersections of Harney Way and Thomas Mellon Circle and Harney Way and Executive Park Boulevard as discussed in the following section on Intersection Improvements.

B. Harney Way (Ultimate Configuration)

If Harney Way reaches traffic levels described in Section 6, the Developer will construct further improvements to Harney Way from the eastern curb return of Thomas Mellon Circle to Arelious Walker Drive as shown on Figure 2.1.4. Improvements include one additional westbound travel lane, while maintaining exclusive BRT lanes and left- and right-turn lanes at specific locations. The overall right-of-way width will not change; however, the two-way cycletrack will be removed to accommodate the widened roadway. A Class II bicycle lane would be provided in the westbound direction, and both eastbound and westbound cyclists could use the existing trail system within State Parks land. The final configuration of the improvements will be coordinated with the improvements west of Thomas Mellon Circle done by the BTS.

Work includes adjusting valve box and manhole frame and covers to grade and extension of drainage laterals and installation of new catch basins, if required, and traffic striping. No other work is required.

C. Jamestown Avenue

Work will occur on Jamestown Avenue between the southeastern property line of 833-989 Jamestown Avenue and the easternmost curb returns on Third Street as shown on Figure 2.1.5. The Developer will implement the improvements identified in a Technical Memorandum, which describe the limits of work for each of the following potential types of work on Jamestown Avenue: Resurface Street, Overlay Street and/or Restripe Street.

Design of improvements on Jamestown Avenue will be coordinated with a separately funded improvement of Jamestown Avenue by the owners of 833-989 Jamestown Avenue. The Developer will not be responsible for funding of design, construction, or maintenance of these separately funded improvements.

D. Ingerson Avenue

Work will occur on Ingerson between Arelious Walker Drive and the easternmost curb returns on Third Street as shown on Figure 2.1.5 (2 travel lanes, 2 parking lanes and sidewalk on both sides of the street where currently existing). The Developer will implement the improvements identified in a Technical Memorandum, which describe the limits of work for each of the potential types of work on Ingerson Avenue: Resurface and Restripe Ingerson Avenue between Arelious Walker Drive and Third Street. Where existing striping does not change, the Developer will replace existing striping in accordance with Figure 2.1.5.

E. Gilman Avenue

Work will occur on Gilman Avenue between Arelious Walker Drive and easternmost curb returns on Third Street as shown on Figure 2.1.5 (4 travel lanes, 2 parking lanes and sidewalk on both sides of the street). Sidewalk widths will be reduced from 15 feet to 12 feet on both sides of Gilman Avenue. Developer will implement the improvements identified in a Technical Memorandum which will consist of Reconstruct Structural Section.

In addition to Reconstruct Structural Section, additional improvements include: upgrade of street lights that need to be replaced or moved during construction with new fixtures and an additional pedestrian light added to the existing pole when possible; extension of drainage laterals and installation of new catch basins; and relocation of low pressure water system fire hydrants. Work includes streetscape improvements which can include new street trees with grates, street benches, bicycle racks, and trash receptacles (as per agreed streetscape plan between the Developer and the

City). Street signage to be provided includes relocation of existing street signs. Bulb-outs are to be provided. Bulb-outs will have a minimum radius of 10 feet at the outside of the bulb and 20 feet at the inside of the bulb. New catch basins will be installed where necessary at the bulb-outs to facilitate drainage and will be connected to the existing combined sewer system. A pre-design study for offsite roadways targeted for reconstruction will include possible use of LID's, implementation of any LID elements is not part of the Developer's scope of work for offsite road improvements. Work does not include irrigation system for the street trees.

F. Carroll Avenue

Work will occur on Carroll Avenue between Hawes Street and Ingalls Street, including the intersections with both, as shown on Figure 2.1.6 (4 travel lanes, 2 bike lanes and sidewalk on both sides of the street). Developer will implement the improvements identified in a Technical Memorandum which will consist of Reconstruct Structural Section.

In addition to Reconstruct Structural Section additional improvements include: removal of existing rail road tracks and ties; upgrade street lights that need to be replaced or moved during construction with new fixtures and an additional pedestrian light added to the existing pole when possible; extension of drainage laterals and installation of new catch basins; and relocation of low pressure water system fire hydrants. Street signage to be provided includes relocation of existing street signs. A pre-design study for offsite roadways targeted for reconstruction will include possible use of LIDs, implementation of any LID elements is not part of the Developer's scope of work for offsite road improvements.

G. Ingalls Street

A new traffic signal will be installed at the intersection of Carroll Avenue and Ingalls Street, as discussed in the following section on Intersection Improvements.

Work will occur on Ingalls Street between Carroll Avenue and Thomas Avenue as shown on Figure 2.1.6 (2 travel lanes, 2 parking/loading lanes and sidewalk on both sides of the street). Between Carroll Avenue and Yosemite Avenue, sidewalks will be narrowed from 15 feet to 11 feet. Between Yosemite Avenue and Thomas Avenue, sidewalks will be widened from 7 feet to 11 feet. Developer will implement the improvements identified in a Technical Memorandum which will consist of Reconstruct Structural Section.

In addition to Reconstruct Structural Section, additional improvements include: upgrade street lights that need to be replaced or moved during construction with new fixtures and an additional pedestrian light added to the existing pole when possible; extension of drainage laterals and installation of new catch basins; and relocation of low pressure water system fire hydrants. Street signage to be provided includes relocation of existing street signs. A pre-design study for offsite roadways targeted for reconstruction will include possible use of LID's, implementation of any LID elements is not part of the Developer's scope of work for offsite road improvements.

H. Geneva Avenue Extension

Developer will contribute its fair share to the construction of The Geneva Avenue Extension project. The final designs for this improvement shall be formulated by others through the BTS. As mutually agreed by the Developer and the City, the Developer shall contribute its fair share to the Geneva Avenue Extension project based upon the SF-CHAMP model or such other model used by the SFCTA in the BTS. If the BTS is terminated prior to identification of required mitigation measures and adoption of fair share funding obligations, the City and County of San Francisco, the SFCTA, the Office of Community Investment and Infrastructure, and the City of Brisbane shall meet and confer to establish an alternate method for determination of the respective fair shares of project costs, including amounts to be contributed by the Developer, using the SF-CHAMP model or such other model agreed upon by the agencies.

These improvements will extend BRT service on Harney Way and Geneva Avenue (or other comparable route) to the Geneva Avenue/Bayshore Boulevard intersection. Additional transit preferential treatments planned on Geneva Avenue west of Bayshore Boulevard will be constructed and funded by others.

I. Geneva Avenue / Harney Avenue / US-101 Interchange

Developer will contribute its fair share to the construction of the Geneva Avenue / Harney Avenue / US-101 Interchange project. The final designs for this improvement shall be formulated by others through the BTS. As mutually agreed by the Developer and the City, the Developer shall contribute its fair share to the Geneva Avenue / Harney Avenue / US-101 Interchange project based upon the SF-CHAMP model or by such other model used by the SFCTA in the BTS. If the BTS is terminated prior to identification of required mitigation measures and adoption of fair share funding obligations, the City and County of San Francisco, the SFCTA, the Redevelopment Agency and the City of Brisbane shall meet and confer to establish an alternate

method for determination of the respective fair shares of project costs, including amounts to be contributed by the Developer, using the SF-CHAMP model or such other model agreed upon by the agencies.

These improvements will connect a widened Harney Way to the Geneva Avenue Extension and will include a reconstructed interchange with US-101.

INTERSECTION IMPROVEMENTS

The following specific off-site intersection Improvements shall be provided by Developer in connection with the development of the CP Area in accordance with this Infrastructure Plan:

New Off-Site Traffic Signals

The Developer shall install new traffic signal poles, masts and heads, pedestrian count downs and other related infrastructure in each corner of the intersection, and install a new traffic signal controller at the following intersections (or at a nearby location as agreed upon by the City and Developer based on further information from a traffic engineer), pursuant to a schedule for Infrastructure Phasing defined in Section 6:

1. Ingalls Street / Carroll Avenue
2. Harney Way / Executive Park Drive East
3. Harney Way / Thomas Mellon Circle

New traffic signals will be installed along Harney Way, between U.S. 101 and Arelious Walker Drive with fair share funding to be allocated between the City, the Developer, and others as provided for in the BTS. As noted earlier, improvements along Ingalls Street from Carroll Avenue to Thomas Avenue up to the southern curb return at the intersection of Thomas Avenue and Ingalls Street are included as part of the CP Infrastructure Plan. Improvements to the intersection of Carroll Avenue and Thomas Avenue are included as part of the HPS2 Infrastructure Plan.

New traffic signal locations are illustrated on Figure 2.1.7.

Other Off-Site Traffic Control

At intersections on major roadways where traffic signals are not installed, the Developer shall install stop signs on streets intersecting the following major roadways at such time as traffic triggers require the improvements:

1. Ingalls Street, between Carroll Avenue and Thomas Avenue
2. Carroll Avenue, between Ingalls Street and Arelious Walker Drive

Traffic control at other off-site intersections would remain the same as existing conditions.

Intersection Lane Configuration Revisions

In addition to signalization and other traffic control, the Developer will restripe the intersection approaches to provide revised lane configurations as described in the table below at the intersections listed:

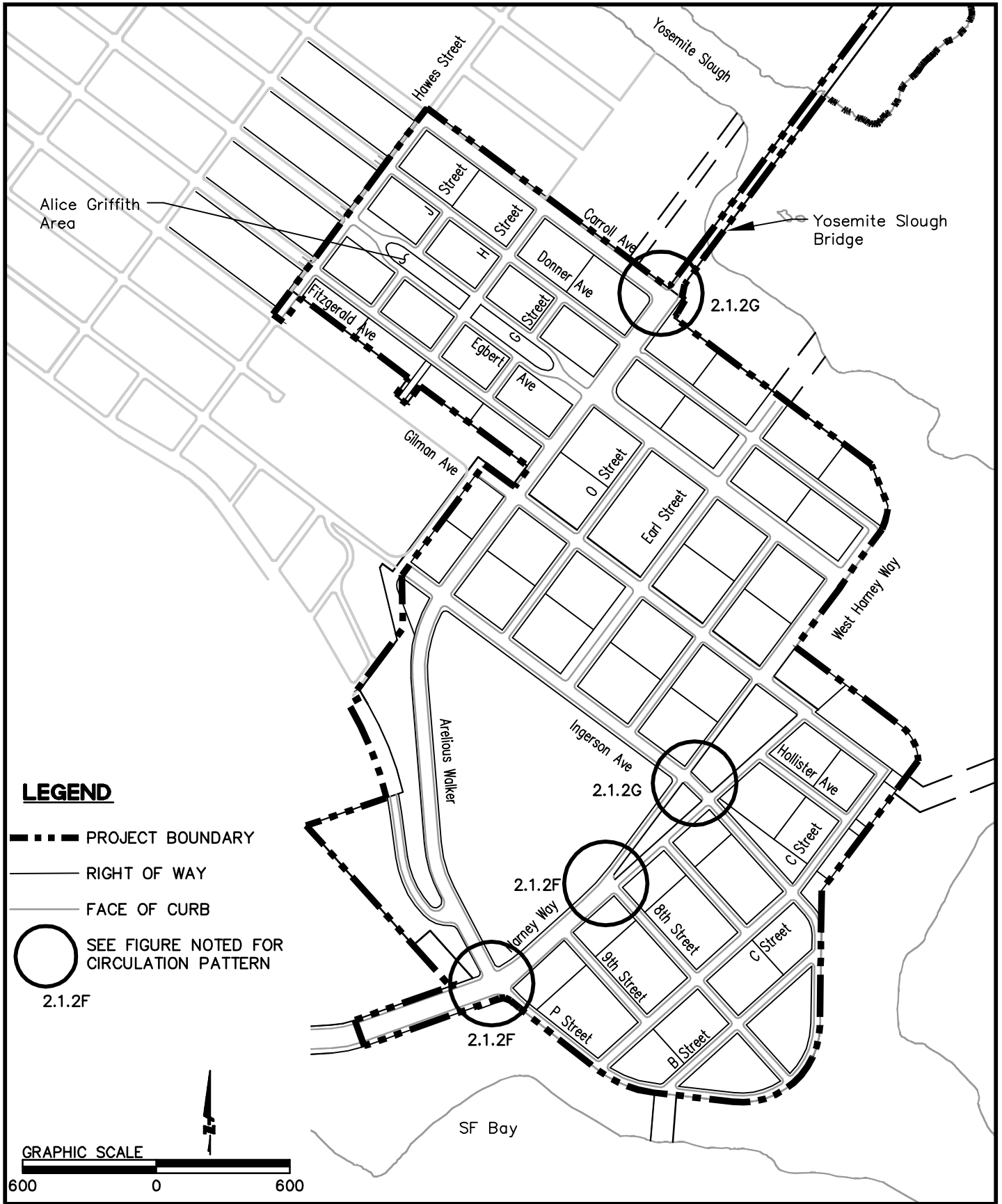
Table 2.1.1 Off-Site Intersection Improvements

Intersection	Street	Direction	Lane Striping Configuration Revisions
Carroll / Ingalls	Carroll	Eastbound Approach	Provide 2 travel lanes (shared left-turn and through lane, shared through and right-turn lane) and a bicycle lane.
		Westbound Approach	Provide 2 travel lanes (shared left-turn and through lane, shared through and right-turn lane) and a bicycle lane.
	Ingalls	Southbound Approach	Reconfigured to allow for 2 approach lanes; a left-turn lane and shared through and right-turn lane. The reconfiguration of the southbound approach would require displacement of about 200 feet of on-street parking/loading on the west side of Ingalls Street.
Tunnel / Blanken	Tunnel	Northbound Approach	Provide an approximately 100-foot long dedicated left-turn lane adjacent to a shared through and right-turn lane. Prohibit on-street parking on the east side of Tunnel for approximately 100 feet south of Blanken Avenue.
		Southbound Approach	Provide an approximately 160-foot-long dedicated left-turn lane adjacent to a shared through and right-turn lane. Prohibit on-street parking on the west side of Tunnel for approximately 160 feet north of Blanken Avenue.

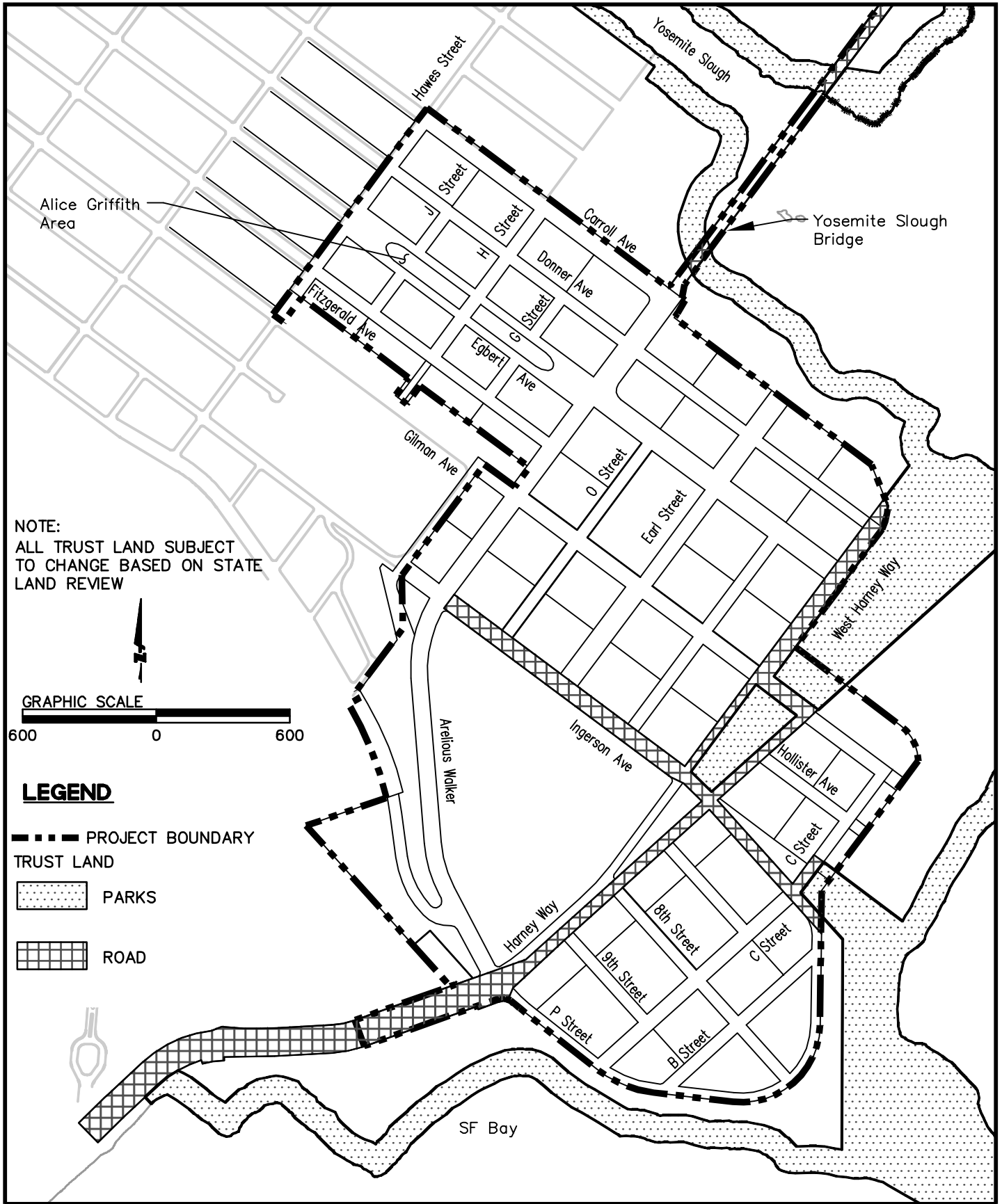
Note: Improvements at Tunnel Avenue and Blanken Avenue will be performed by SFMTA as part of mitigation for the Visitacion Valley Redevelopment Program. The improvements listed above may be constructed as part of those improvements but if not they will be constructed separately by SFMTA when triggered as described in Table 6.1.2.

Other Traffic Control

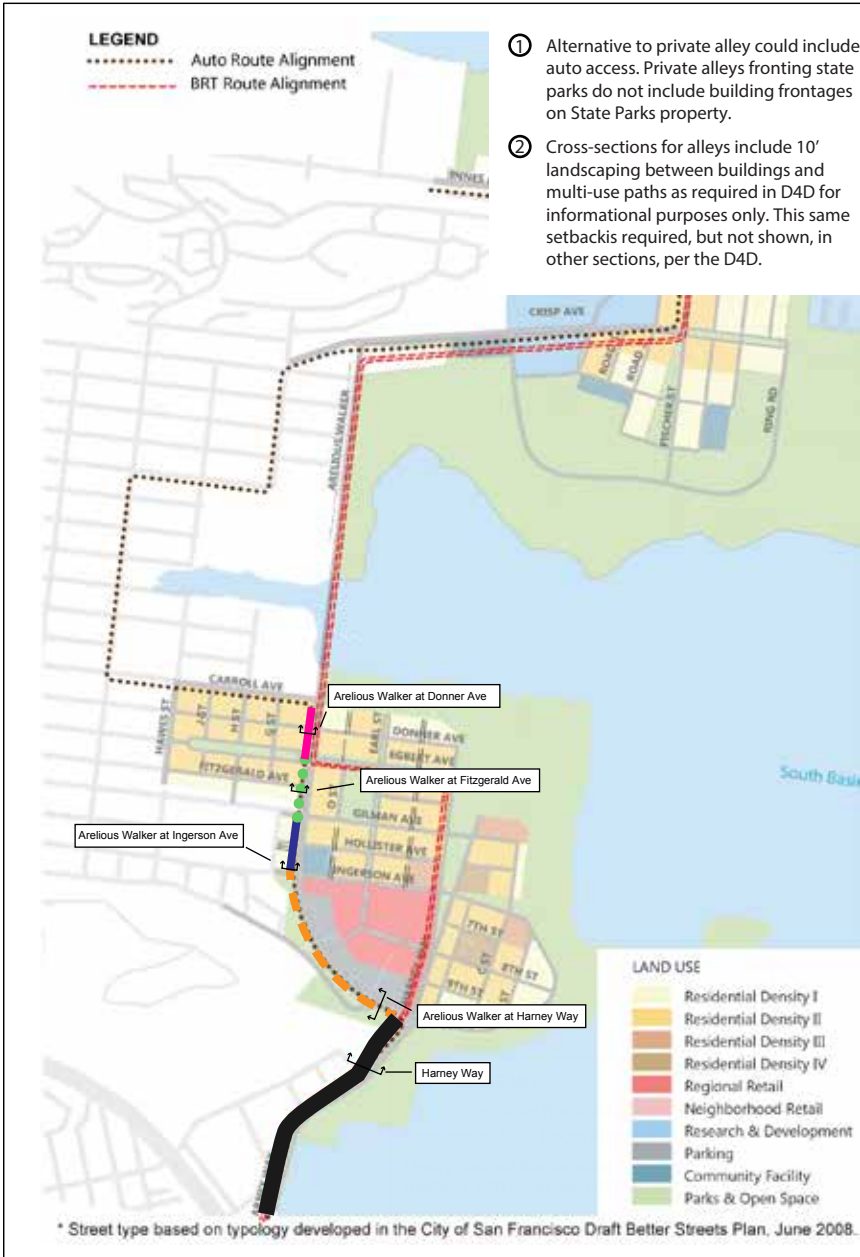
At other off-site intersections on roadways being reconfigured or modified by the project, where traffic signals are not installed, traffic control devices shall remain the same as existing conditions. New traffic control devices will not be required at other off-site intersections unless specifically identified in this Infrastructure Plan.



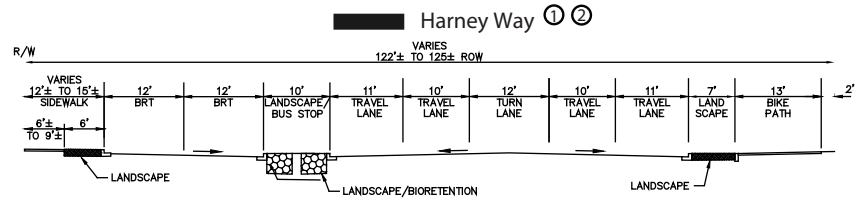
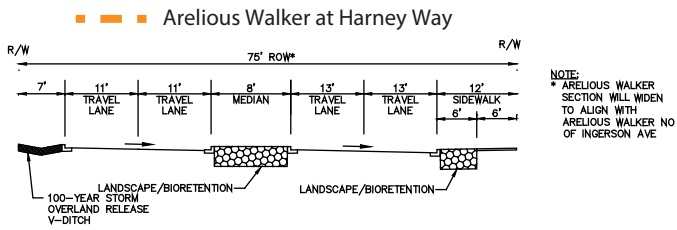
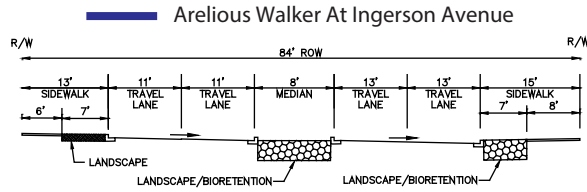
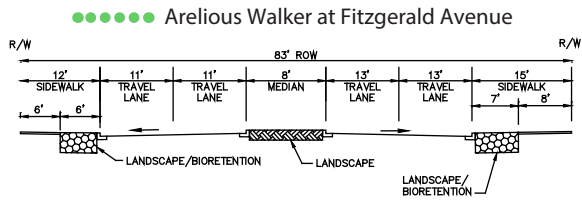
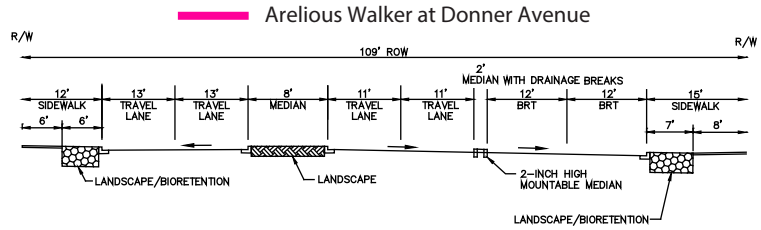
	Candlestick Point Development	Figure 2.1.1A
	On - Site Roadway Exhibit	



Candlestick Point Development		Figure 2.1.B
Trust Land		



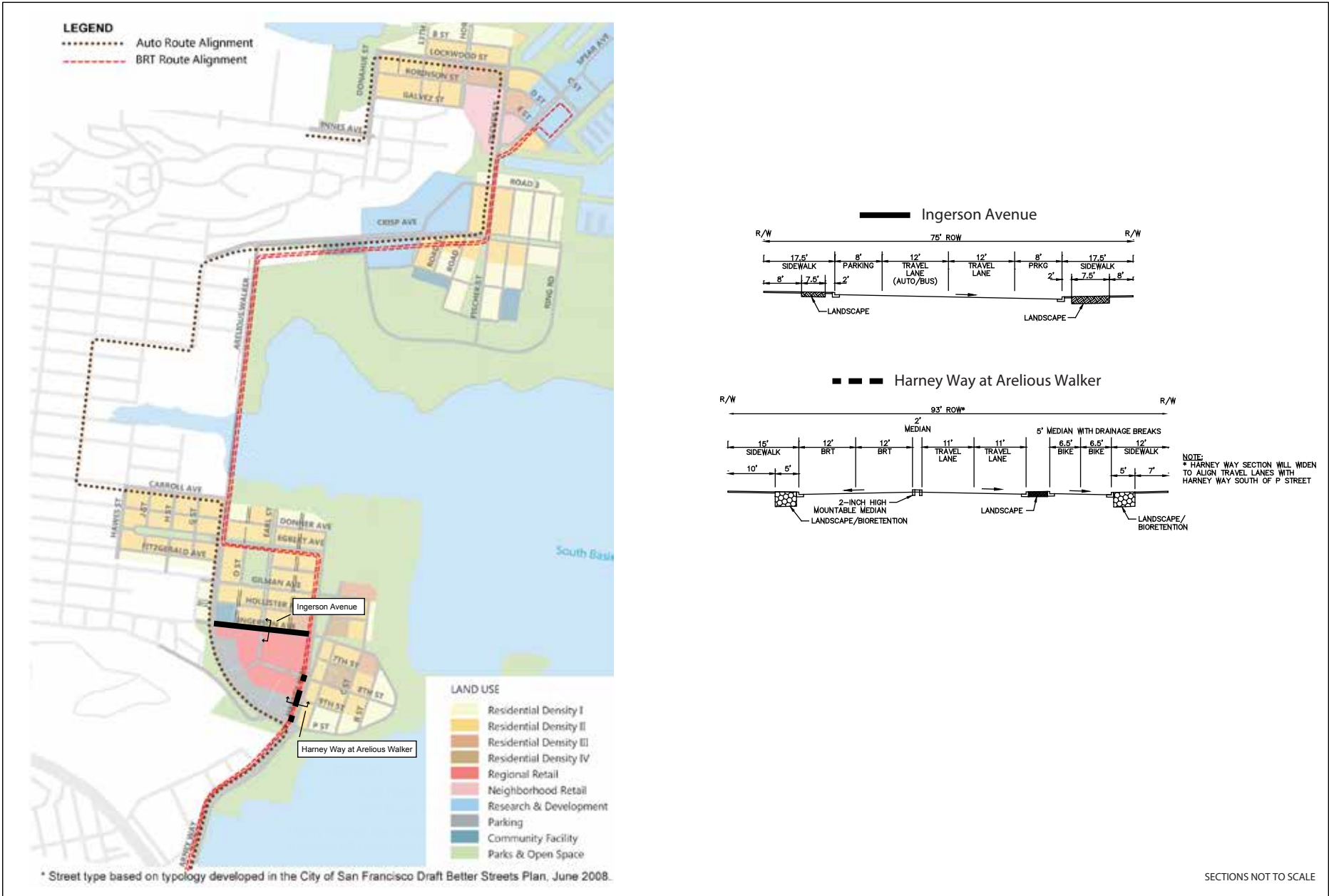
- Alternative to private alley could include auto access. Private alleys fronting state parks do not include building frontages on State Parks property.
- Cross-sections for alleys include 10' landscaping between buildings and multi-use paths as required in D4D for informational purposes only. This same setbacks required, but not shown, in other sections, per the D4D.



SECTIONS NOT TO SCALE

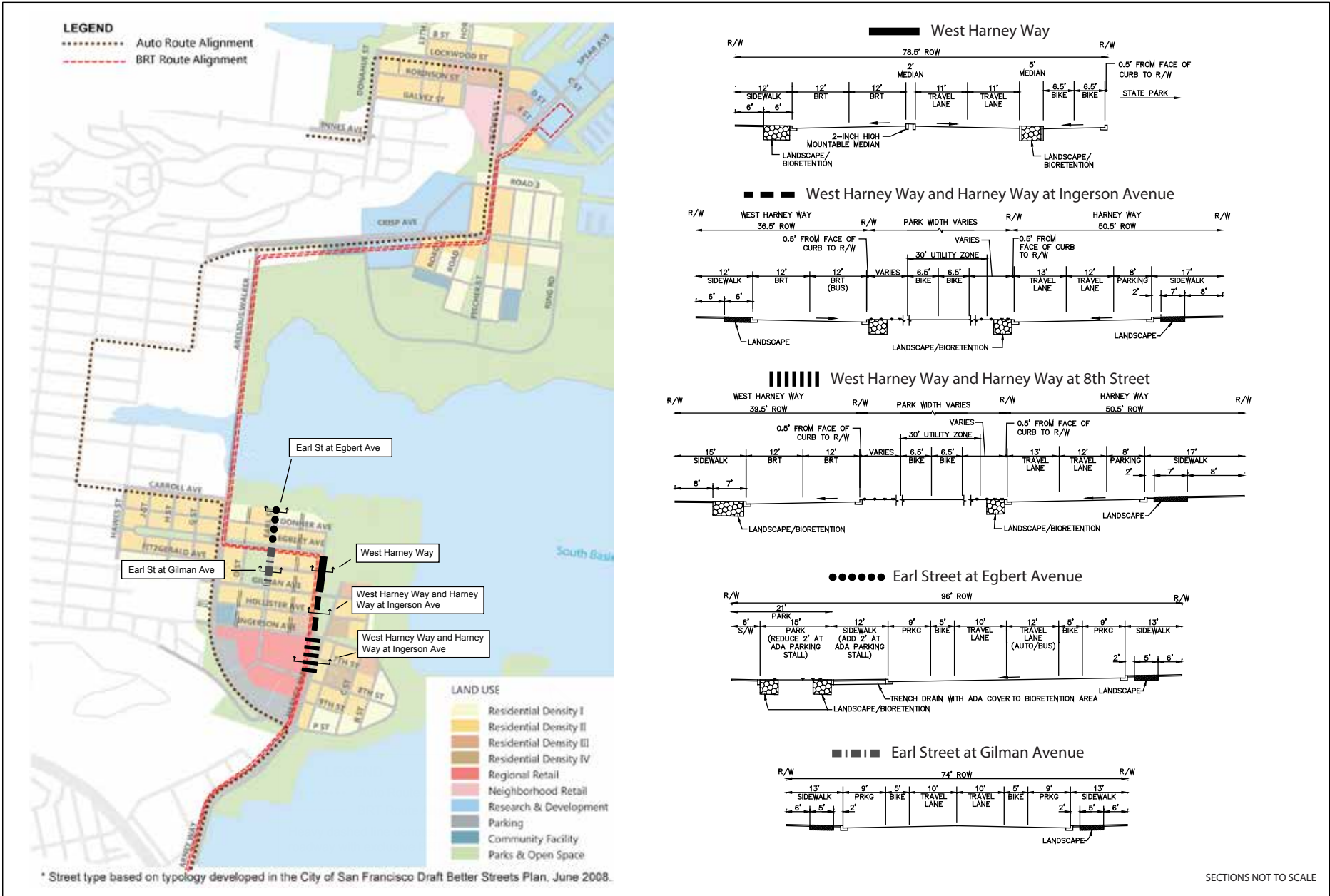
**Candlestick Point Development
On-Site Street Network - Arterials**

**Figure
2.1.2A**



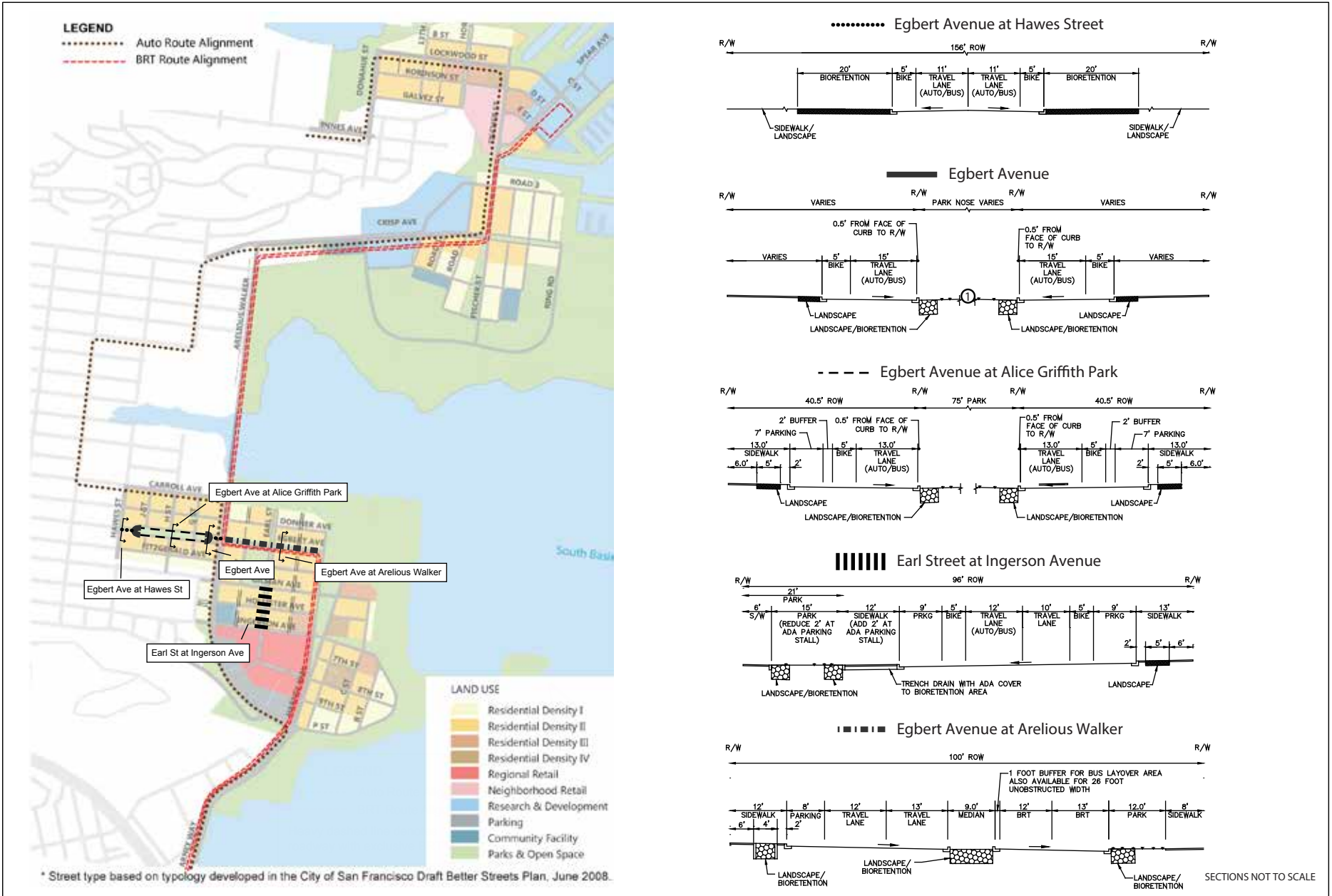
**Candlestick Point Development
On-Site Street Network - Collectors**

**Figure
2.1.2B**



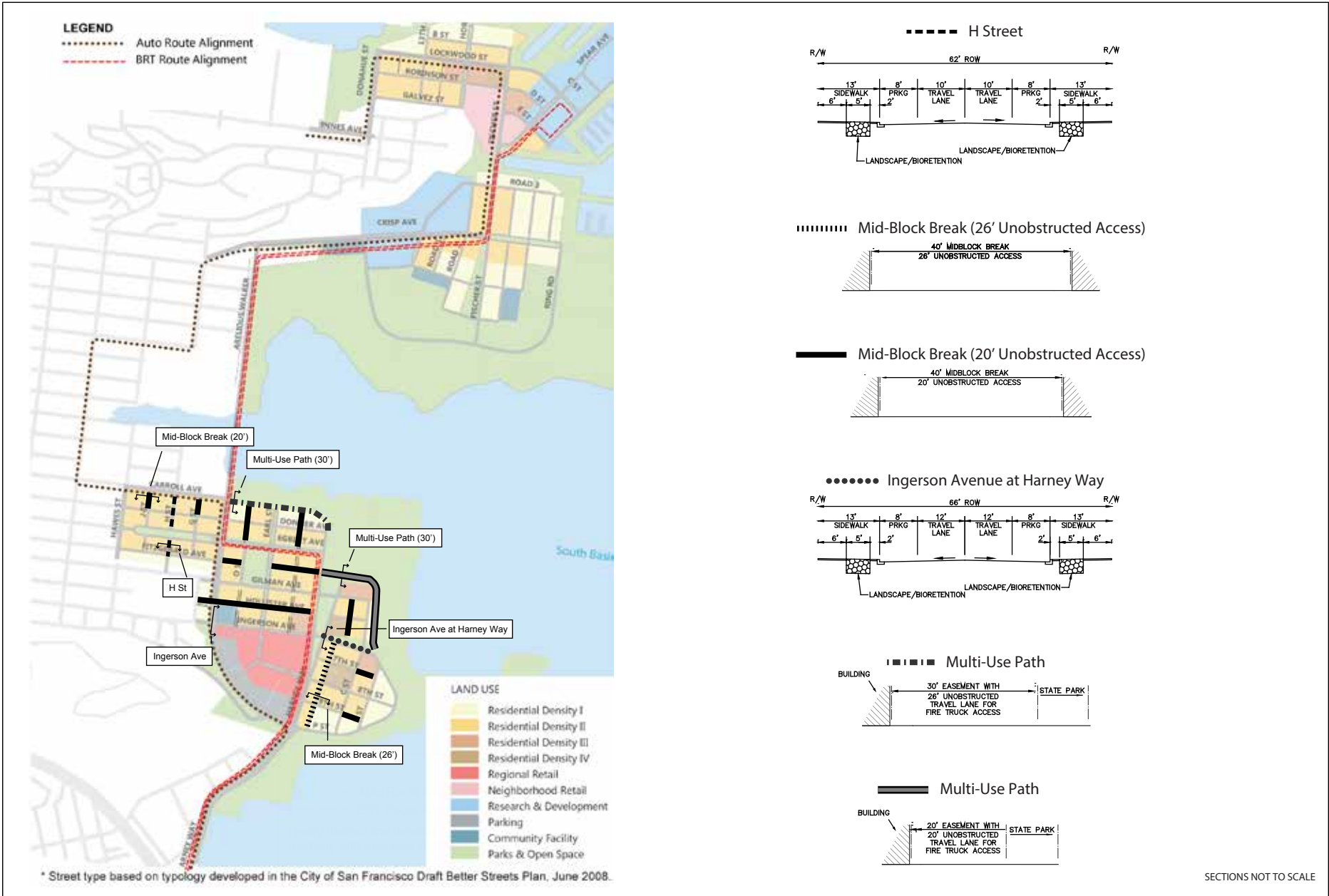
**Candlestick Point Development
On-Site Street Network - Park Streets**

**Figure
2.1.2C**



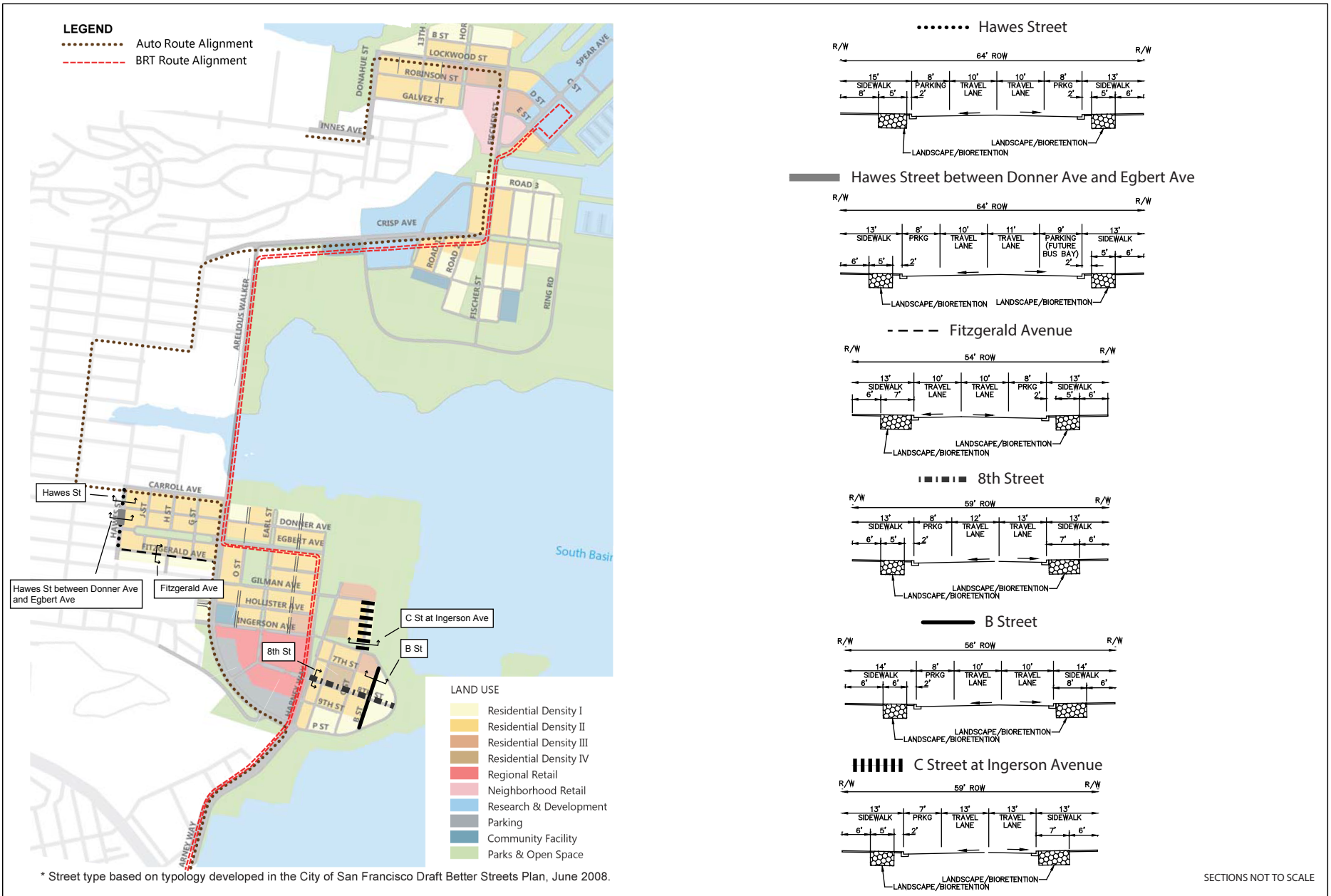
Candlestick Point Development
On-Site Street Network - Park Streets

Figure 2.1.2D



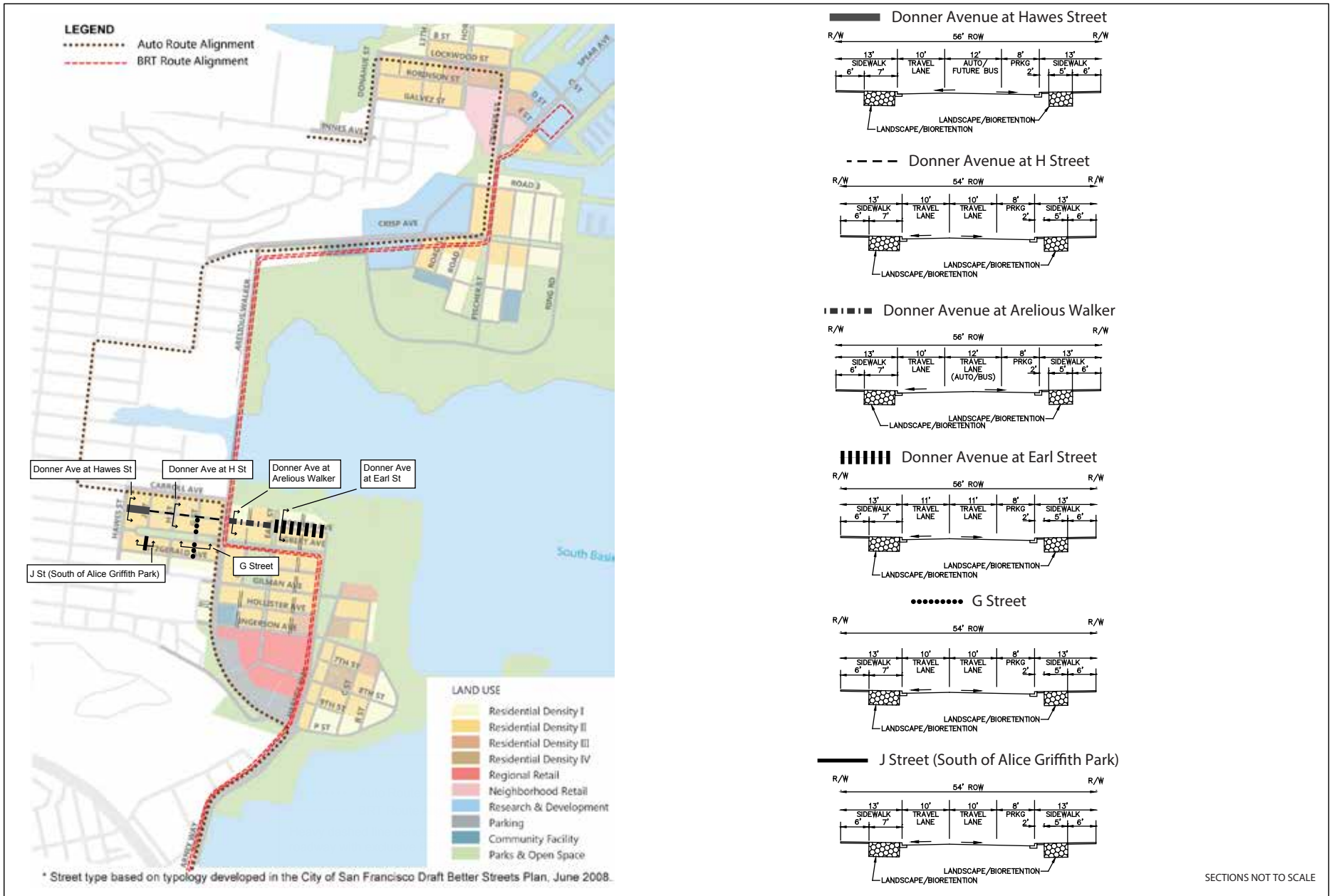
**Candlestick Point Development
On-Site Street Network - Local Streets**

**Figure
2.1.2E**



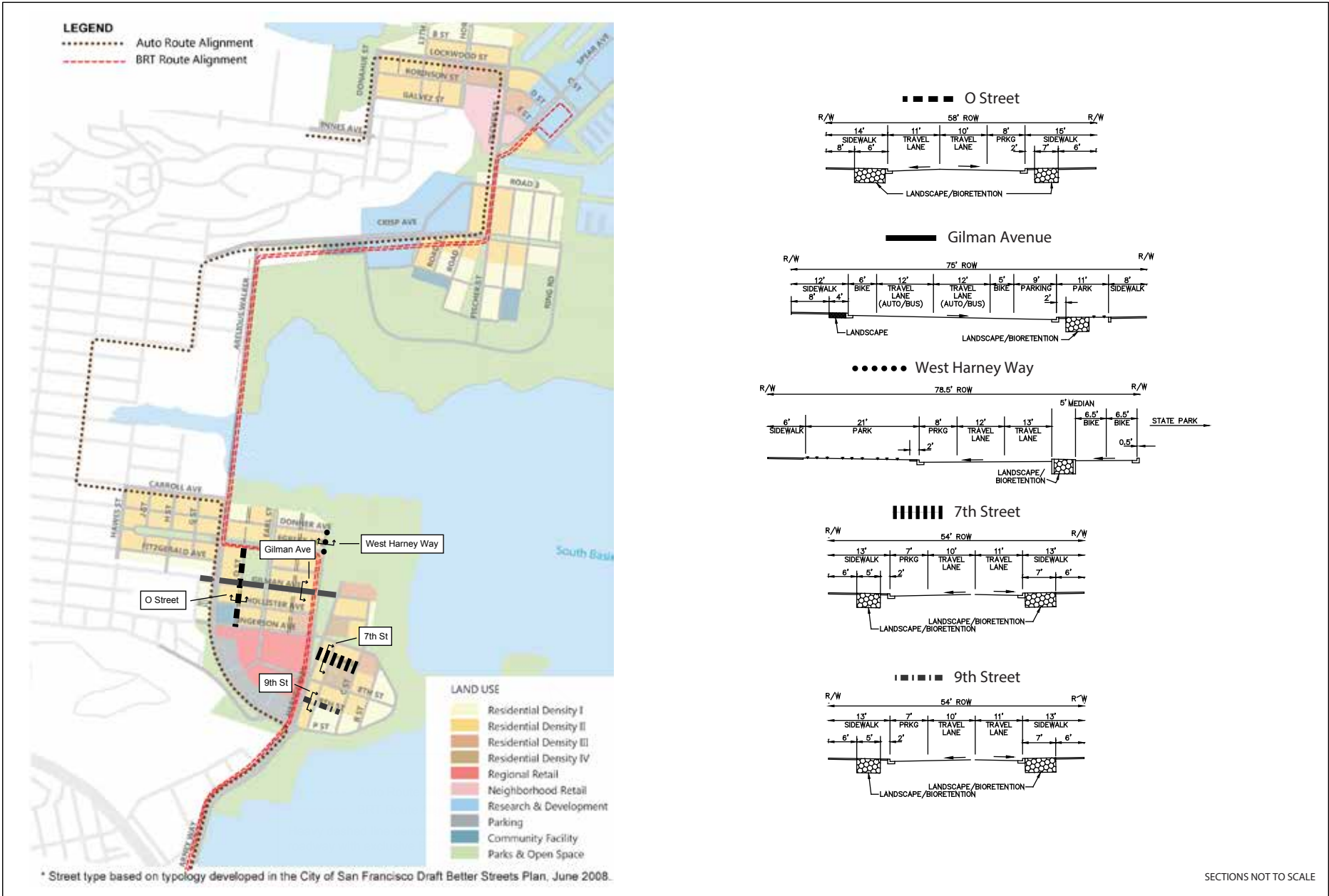
Candlestick Point Development
On-Site Street Network - Local Streets

Figure 2.1.2F



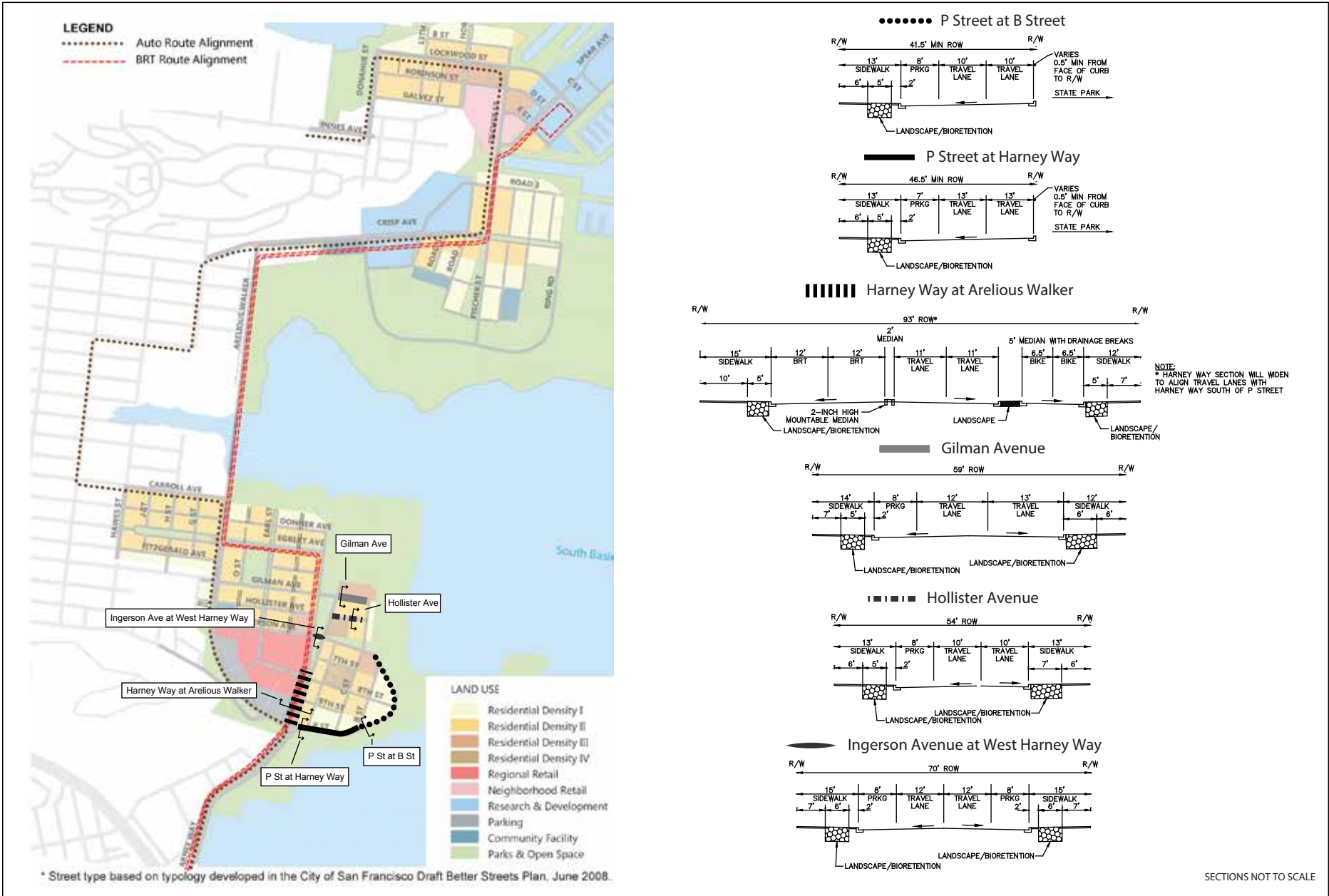
Candlestick Point Development
On-Site Street Network - Local Streets

Figure 2.1.2G



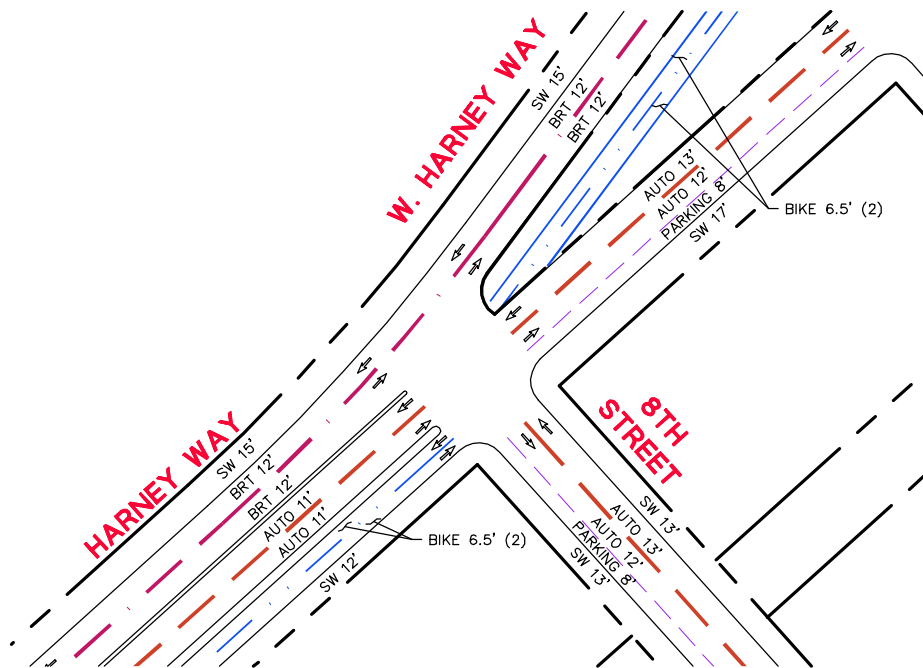
Candlestick Point Development
On-Site Street Network - Local Streets

Figure 2.1.2H



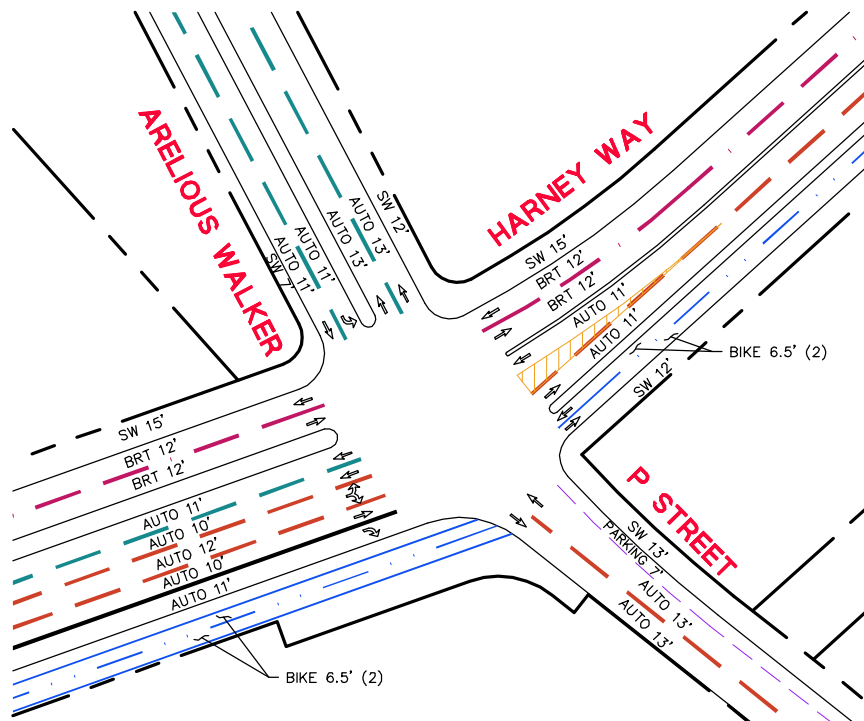
**Candlestick Point Development
On-Site Street Network - Local Streets**

**Figure
2.1.21**



HARNEY WAY AND 8TH STREET

SCALE 1" = 100'

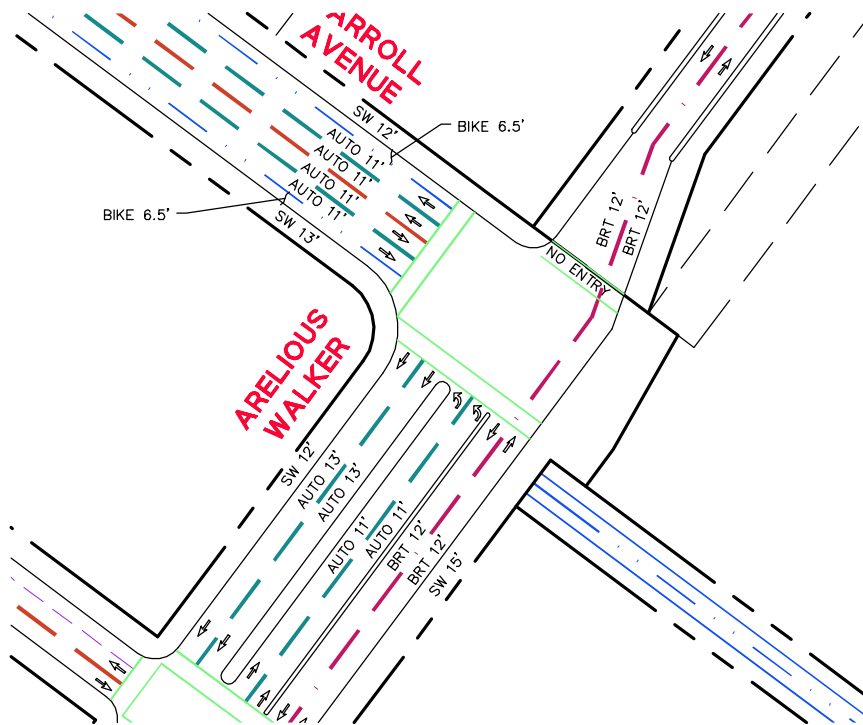


ARELIIOUS WALKER AND HARNEY WAY

SCALE 1" = 100'

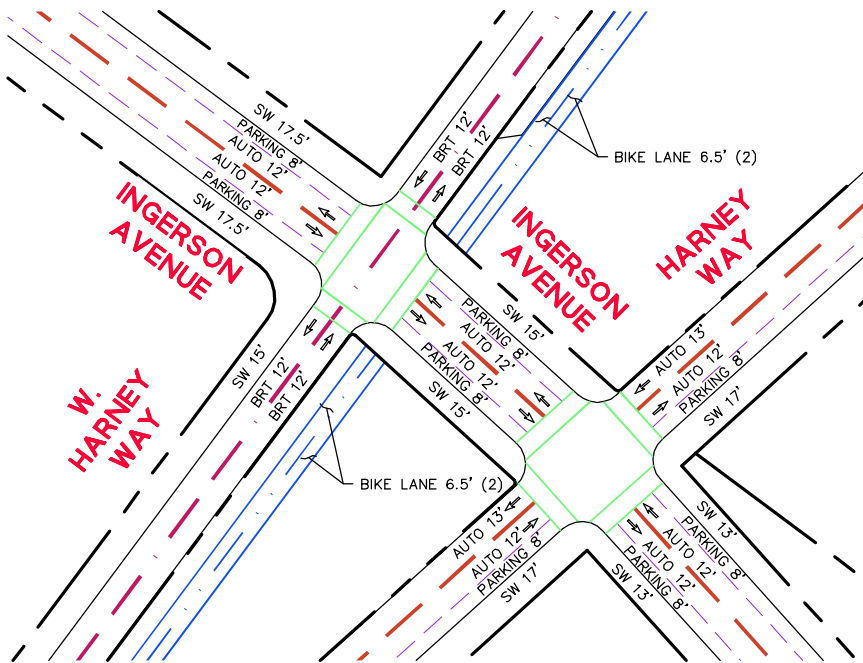


	<p>Candlestick Point Development</p>	<p>Figure 2.1.2H</p>
	<p>Major Intersection Circulation Details</p>	



ARELIIOUS WALKER AND CARROLL AVENUE

SCALE 1" = 100'

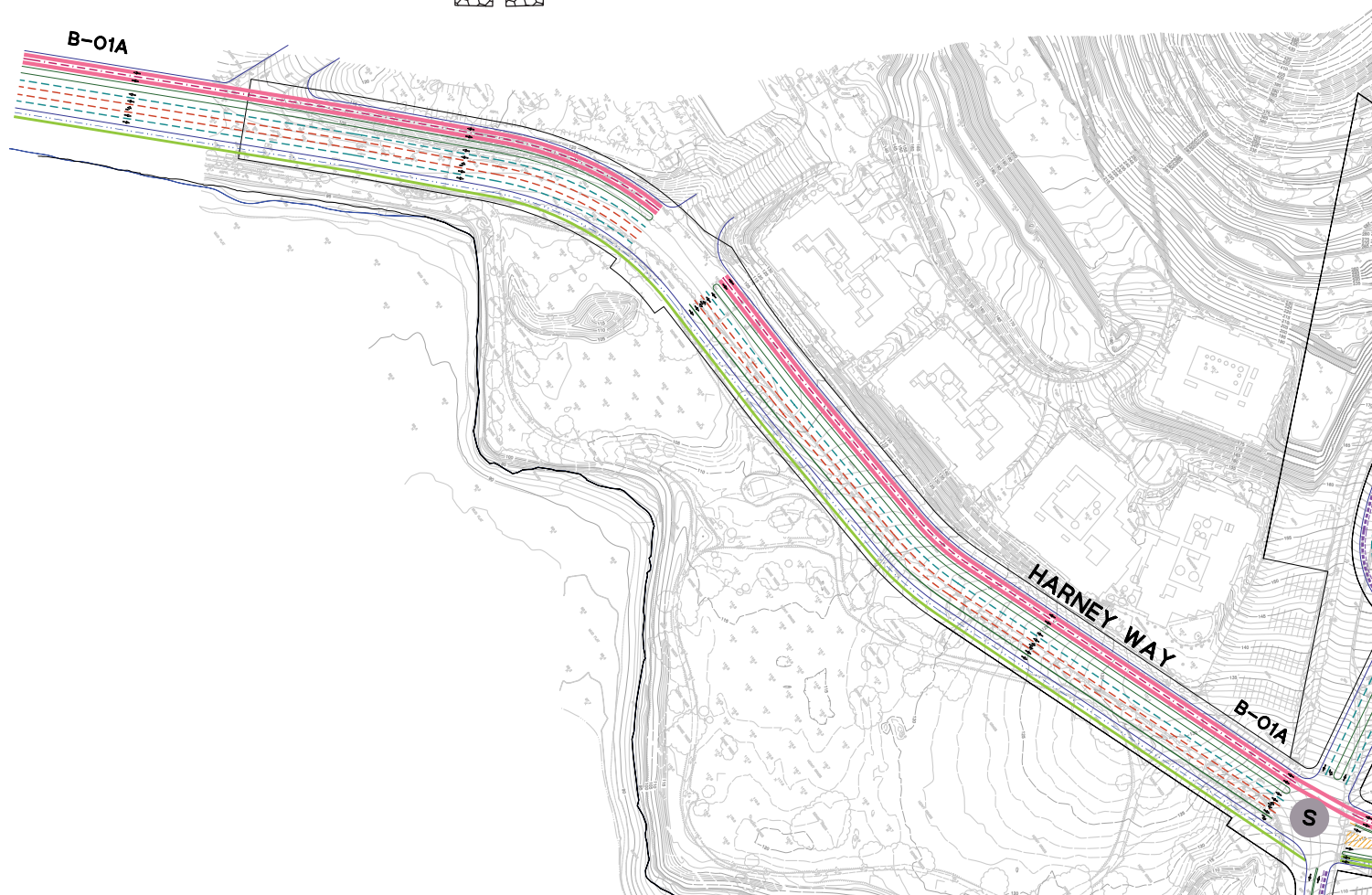
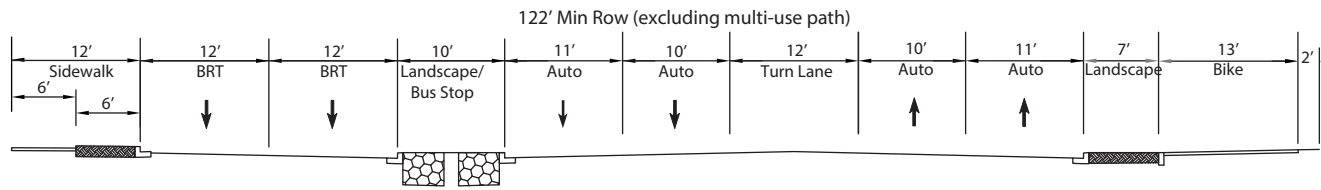


HARNEY WAY AND INGERSON AVENUE

SCALE 1" = 100'

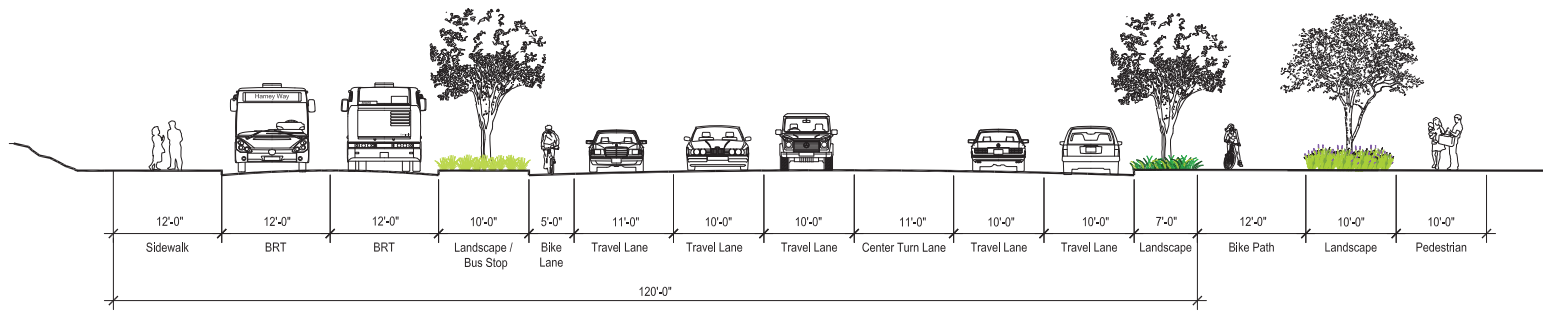


	Candlestick Point Development	Figure 2.1.2I
	Major Intersection Circulation Details	



Candlestick Point Development
Harney Way Widening - Initial Configuration

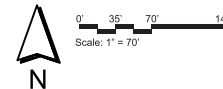
Figure
2.1.3



Section A



→
To
Arelious
Walker
Drive

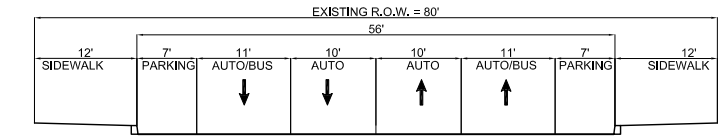
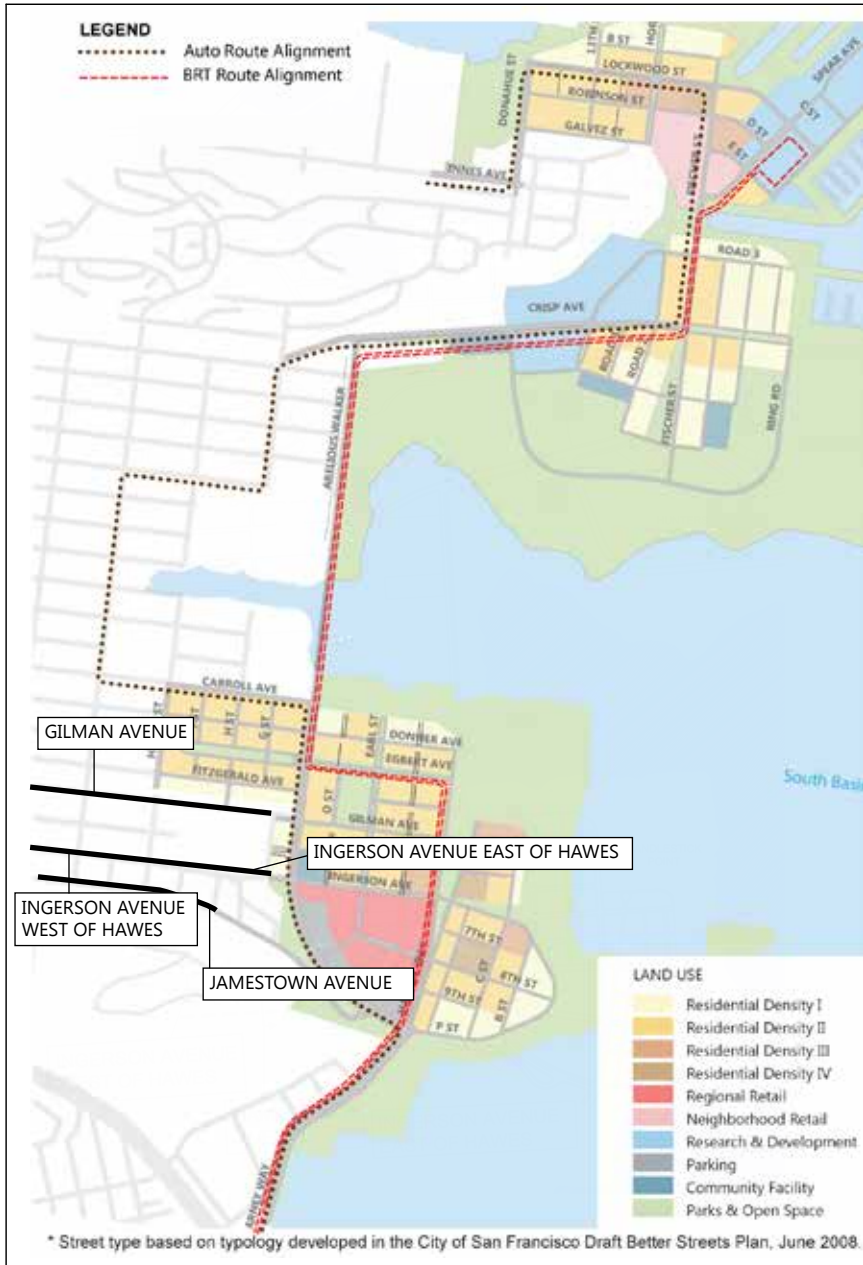


October 27, 2009

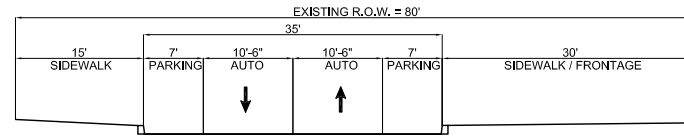
Candlestick Point Development

Harney Way Widening - Ultimate Configuration

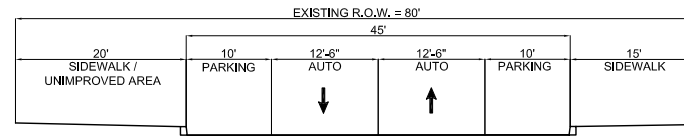
**Figure
2.1.4**



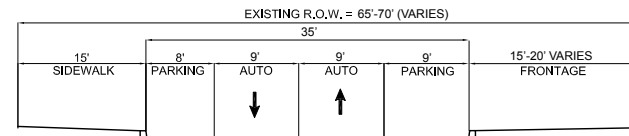
CONCEPTUAL GILMAN AVENUE SECTION
NTS



CONCEPTUAL INGERSON AVENUE SECTION WEST OF HAWES
NTS



CONCEPTUAL INGERSON AVENUE SECTION EAST OF HAWES
NTS



CONCEPTUAL JAMESTOWN AVENUE SECTION ①
NTS

REFERENCE:

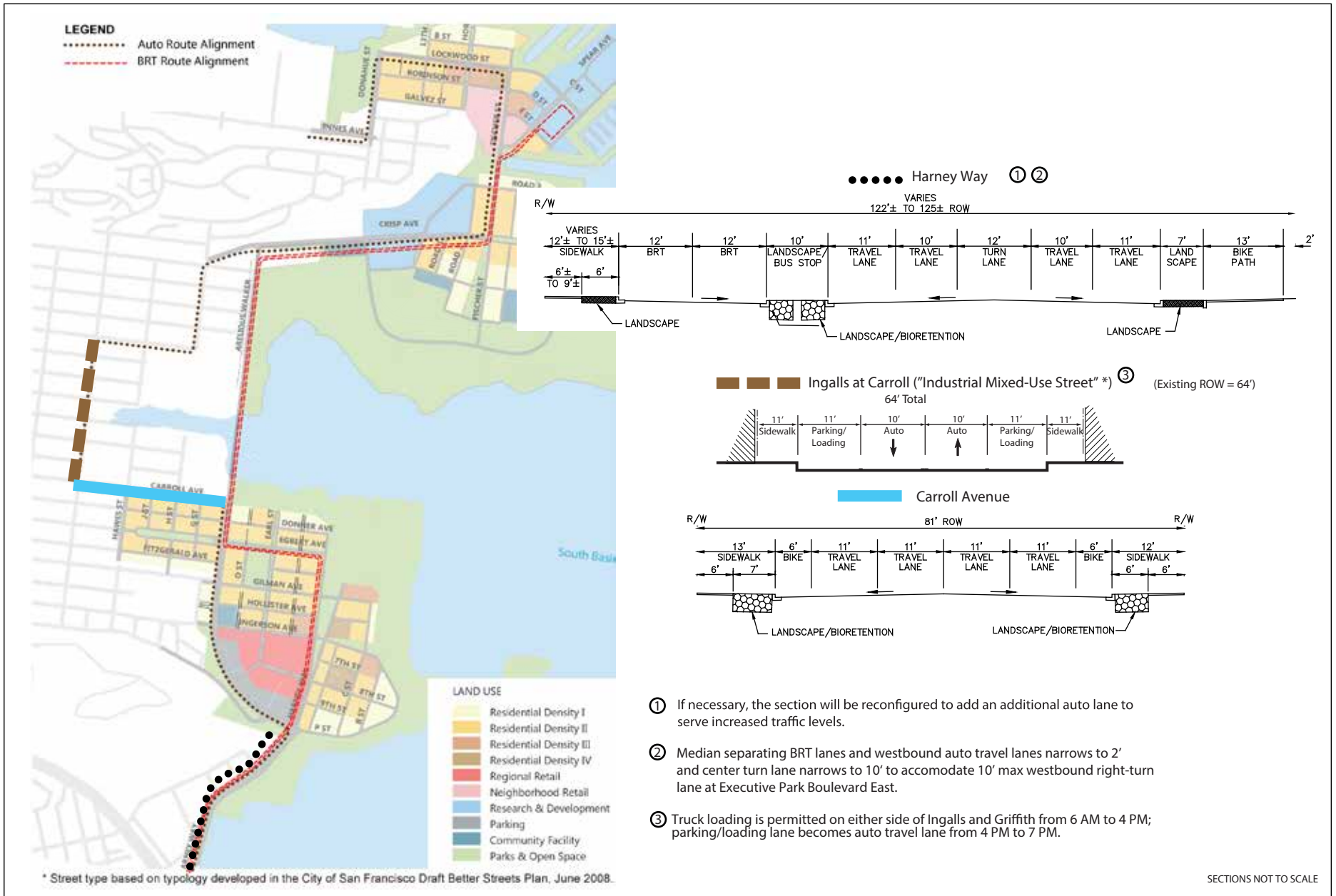
1. CITY AND COUNTY OF SAN FRANCISCO STREET SHAPE FILES DOWNLOADED JUNE 2009.

NOTES:

1. IMPROVEMENTS SHALL CONSIST OF REPAVING AND/OR REPLACING EXISTING STRIPING ONLY, EXCEPT AS REQUIRED BY AND COORDINATED WITH THE 833-989 JAMESTOWN AVENUE PROJECT.
2. FOR LIMITS OF WORK REFER TO TEXT DESCRIPTIONS OF IMPROVEMENTS.

Candlestick Point Development
Off-Site Roadway Improvements - Gilman, Ingerson and Jamestown Avenues

Figure 2.1.5



Candlestick Point Development

Off-Site Roadway Improvements - Ingalls Street, Carroll Avenue, and Harney Way

Figure 2.1.6



**Candlestick Point Development
Traffic Signal Improvements**

**Figure
2.1.7**

2.2 MUNI IMPROVEMENTS

As described in the Project Transportation Plan, MUNI intends to provide an increased level of service to the CP Area, including a new BRT route (extension of 28L-19th Avenue Limited), extension of one existing motor coach route (29-Sunset), and introduction of a new express motor coach route (CPX – Candlestick Point Express). Service improvements that MUNI intends to operate are illustrated on Figure 2.2.1. (Note that in the near-term, prior to initiation of the BRT route and the CPX, MUNI will extend the 56 Rutland to serve the CP retail center, and will increase the route’s frequency from 20 minutes to 15 minutes. This extension will be terminated upon initiation of the CPX and/or BRT route.)

Revisions to MUNI transit plans for service described herein may be necessary or desirable as a result of the review and legislative approval process associated with service implementation, the development of proposals which better serve the CP Area or the HPS2 Area of the Project and/or their adjacent neighborhoods, integration with changes to MUNI service elsewhere in the City, particularly the southeast quadrant of the City, or other reasons. Should this occur, the Developer agrees to work with the City to accommodate, such revisions as enumerated herein, at alternate locations; however, once initially designed or constructed, the cost of relocation of such facilities will not be the Developer’s responsibility and any such changes shall not adversely delay or affect the Developer’s ability to develop the CP Area in accordance with the DDA and Plan Documents. Final design details and design adjustments, consistent with this Infrastructure Plan will, as necessary or appropriate, accommodate trolley route extensions.

The following transit services will be provided by the Developer and MUNI, as described herein:

BUS RAPID TRANSIT (BRT)

The Developer and City shall participate in the planning, design and construction of transit-only lanes and stations in the CP Area, as described herein, to accommodate new BRT service. As part of the Project, the existing four-lane Harney Way will be widened to the north of its existing alignment to accommodate two BRT-only lanes. They will be separated from the roadway by a ten-foot median that will allow for a passenger- loading platform at BRT stops. A BRT stop at the intersection of Harney Way and Thomas Mellon Circle will serve the proposed Executive Park development. An additional four BRT stops will be constructed within the CP Area. BRT stops shall be designed and constructed according to standards developed for other ongoing BRT studies in San Francisco at the time of adoption of this Plan, including along Geary Boulevard and Van Ness Avenue.

The Developer will provide facilities for bus stop locations, including but not limited to: a 10-inch thick PCC bus pad, electric service pull box, communication system pull box, and minimum 8-foot wide sidewalk to provide clearance for potential future transit shelters that might be provided by others. The precise location of such facilities shall be determined in consultation with the City. If the Developer modifies entrances and/or exits that affect MUNI facilities, such as bus terminal areas or bus stops, the Developer will work with MUNI to develop acceptable alternative equivalent facilities. The Developer will bear the reasonable costs of relocation of MUNI facilities if needed.

Planning of the BRT right-of-way will be designed to meet “rail ready” standards for a potential future conversion to light rail transit (LRT), although such conversion (including construction of rails, overhead power, and construction of typical LRT stations) is not contemplated in this Project and is outside the scope of this Infrastructure Plan. If LRT is pursued in the future by the SFMTA, all required coordination and approvals by other City Agencies will be sought.

MOTOR COACH ROUTES (29-SUNSET, CPX-CANDLESTICK POINT EXPRESS)

MUNI shall extend one existing motor coach route and create a new Downtown express route to serve the CP Area. The City shall install and maintain transit shelters, including related furniture, adjacent to selected transit zones on land owned by the City (unless otherwise agreed by the Developer) along these routes, as depicted on Figure 2.2.1. The precise location of such facilities shall be determined in consultation with the Developer. If the Developer modifies entrances and/or exits that affect MUNI facilities, such as bus terminal areas or bus stops, the Developer will work with MUNI to develop acceptable alternative equivalent facilities. The Developer will bear the reasonable costs of relocation of MUNI facilities if needed.

Prior to initiation of the BRT and CPX routes, MUNI shall extend the 56 Rutland route to serve the CP retail center area. This temporary service will terminate upon initiation of the BRT and/or CPX routes, at such time as the transit service would be commensurate with the level of development.

BAYSHORE STATION

The Developer will contribute its fair share to the construction of improvements at the Bayshore Station. The final designs for these improvements shall be formulated by others through the BTS. As mutually agreed by the Developer and the City, the Developer shall contribute its fair share to the improvement project based upon the SF-CHAMP model or by such other model used by the SFCTA in the BTS. If the BTS is terminated prior to identification of required mitigation

measures and adoption of the fair share funding obligations, the City, the SFCTA, the Agency, and the City of Brisbane shall meet and confer to establish an alternate method for determination of the respective fair shares of project costs, including amounts to be contributed by the Developer, using the SF-CHAMP model or such other model agreed upon by the agencies.



**Candlestick Point Development
Regional Transit Improvements**

**Figure
2.2.1**

2.3 WET UTILITIES

The following section describes Infrastructure for the separated sanitary sewer, separated storm drainage, low pressure water, recycled water and Auxiliary Water Supply System (AWSS), which shall, except as otherwise indicated, be provided by the Developer in connection with the development of the CP Area of the Project. For each wet utility system except AWSS, a Master Plan presenting the hydraulic analysis and planning criteria for proposed build-out development for each utility system of the Project has been prepared by the Developer and submitted to the SFPUC. Improvements delineated in this Infrastructure Plan summarize the major elements of the respective systems. Pursuant to SFPUC policy at the time of the adoption of this agreement, all Infrastructure that will be owned by the City or a department thereof will be placed on dedicated public rights-of-way prior to acceptance. Other utilities may be placed in public utility easements pursuant to the criteria of the respective utility providers. Locations of utilities shown in this Infrastructure Plan are schematic and subject to final alignment design and easement or dedication through the Subdivision Land Act Mapping process.

2.3.1 SEPARATED SANITARY SEWER

The separated sanitary sewer flows for the CP Area development will be collected by a Separated Sanitary Sewer System as shown on Figure 2.3.1. The system consists of gravity mains, force mains, and lift and pump stations. The sanitary sewer flows will drain to the City's existing combined gravity sewer in Arelious Walker Drive, which drains into an 18-foot box sewer in Bancroft Street. The Developer will make the connections to the existing combined sewer as approved by the City.

When the existing combined box sewer in Bancroft Street fills to its maximum level, the proposed separated sanitary sewer gravity mains connected directly to the existing combined sewer will surcharge. Future developments with sanitary sewer laterals connecting to surcharged mains may require sewer ejector pumps to ensure proper building sanitary sewer drainage. The respective property owner will determine if ejector pumps are required, and if so, will be responsible for providing, maintaining, and operating the sewer pumps. Parcels bordering surcharged sanitary sewer mains will be noted on the appropriate Tentative and Final Maps.

The majority of the on-site system consists of 8-inch minimum diameter gravity sewer collection mains. The layout for the sewer system in the different areas of the project site is shown on Figure 2.3.1. All of the sewer flow from the project will connect to the existing 81-inch line in Arelious Walker. The Alice Griffith neighborhood north of Arelious Walker will include one lift

station near the intersection of G Street and Fitzgerald and one pump station near the corner of Hawes and Carroll Avenue. The CP Area south of Arelious Walker will include one lift station near the intersection of Earl and Egbert Street, one pump station near the intersection of West Harney Way and Gilman, one pump station near the intersections of Ingerson Avenue and Harney Way, and one pump station near the intersection of P and B Streets.

The existing combined sewer within the CP Area development will be relocated and/or removed except for the combined sewer in Arelious Walker. The existing combined sewer pump station within the Alice Griffith Area will be demolished and removed by the developer.

The existing combined sewer flows from the area south of Gilman Avenue and west of Arelious Walker that serve the existing development outside of the CP Area will connect to a relocated 54-inch combined sewer in Gilman Avenue. No sanitary sewer service connection will be interrupted. Combined sewer services for the existing development outside CP that relies on the 81" Arelious Walker Sewer shall not be interrupted at any time

Rehabilitation of the existing combined gravity sewer pipeline and appurtenances to be reused within the boundary of the CP Area, if required by impacts from this Project, will be provided by the Developer. No improvements are required by the Developer to rehabilitate any portion of the City's combined sewer systems or City's pump stations outside the boundary of the CP Area unless those improvements are required only because of direct impacts of this project.

Reuse of the existing gravity combined sewer system will be subject to further review by the SFPUC of the Developer's reuse proposal. The Developer shall submit video inspections to document the pre-construction condition of the sewer prior to any construction or excavation work in the vicinity of the systems in question using a technical assessment methodology approved by the SFPUC. Any video inspection performed by the Developer shall be subject to the review and approval of the SFPUC. The assessment of the condition of the existing of the existing pipe(s) will be performed by the developer with review and approval by the SFPUC. The SFPUC may perform the condition assessment, as needed. Video inspections for a condition assessment performed by the Developer shall be submitted to the SFPUC for review and approval. Any conclusion and recommendation provided by the developer shall be reviewed and approved by the SFPUC in addition to methodology. Such review shall also take into account the system in which the existing combined sewer is proposed for reuse and the proposed rehabilitation methodology. The SFPUC will bear costs of rehabilitation if and to the extent the technical assessment of the sewer pipe reveals conditions that the SFPUC would address under its

typical practice with respect to maintaining and rehabilitating combined sewer pipes. Typical practice of maintaining existing sewers explicitly excludes new structural impacts and reduction of access.

The proposed Separated Sanitary Sewer System has been configured to handle the sewer flows based on the land use plan and defined development contained in the Plan or Plan Documents. Any land use change from the Plan or Plan Documents will require remediation by the Developer. The design of the Separated Sanitary Sewer System is described in the Separated Sanitary Sewer Master Plan that has been submitted by the Developer to the City.

The Separated Sanitary Sewer System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations. The design criteria used for the development of the Separated Sanitary Sewer System is based upon established industry operations standards and regulatory agency requirements. Design criteria have been presented to, and reviewed by, the SFPUC.

In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Separated Sanitary Sewer System Infrastructure will be consistent with this Infrastructure Plan and the Separated Sanitary Sewer Master Plan.

Upon acceptance of the Separated Sanitary Sewer System by the City, the SFPUC will assume responsibility for the operation and maintenance of all public separate sanitary sewer facilities, including responsibility for the compliance with all applicable regulations and mitigation measures.. The developer shall provide performance bonds and payment bonds (or other acceptable security), and warranties as described in the Candlestick Point/Hunters Point Shipyard Subdivision Code adopted by the Board of Supervisors Ordinance #209.

In addition to the new Separated Sanitary Sewer System, certain portions of the existing combined sewer in the CP Area will remain in service. Where possible, existing storm drainage inlets will be connected to the proposed Separated Storm Drainage System. Any replacement, rehabilitation, or improvement of the existing combined sewer system in order to adequately serve the CP Area will be the responsibility of the Developer. The changes to the combined sewer are briefly identified herein and more fully described in a Separated Sanitary Sewer Master Plan that has been submitted by the Developer to the City.

2.3.2 INTENTIONALLY OMITTED

2.3.3 GRADING AND SEPARATED STORM DRAINAGE

Grading of the CP Area shall be performed in compliance with a Project Soil and Groundwater Management Plan. The street elevations shall accommodate 2 feet of freeboard between the 5-year storm drain system hydraulic grade line and the street gutter flow line. The minimum finished floor building elevation shall be no lower than 101.7 feet, Project datum. Subterranean levels may be included, with appropriate protection measures as required by the City Health Department to be designed by the respective property owners at the time of building design. The grading will accommodate overland flow.

The 5-year stormwater runoff from the development will be conveyed by a Separated Storm Drainage System as shown on Figure 2.3.2. The storm drain system will consist of gravity mains draining to San Francisco Bay.

The 100-year storm will be conveyed by the storm drain system and overland flow. Overland flow will be in either be streets, from face of curb to face of curb, or open space areas and other designated areas or approved corridors, some or all of which may require easements from State agencies. The Project will require multiple overland release discharge facilities to San Francisco Bay. Developer will facilitate retrieving easements from relevant government agencies and transference to relevant City agencies. The Project will provide overland flow analysis for future project submittals as described in the project Subdivision Regulations that will be submitted.

The CP Area will be designed to comply with the City of San Francisco Stormwater Design Guidelines (SDG) and Stormwater Management Ordinance (SMO). Because the CP Area resides in a separated storm drainage / sanitary sewer area, the project must be designed to meet the separate sewer area stormwater performance measures per the SDG. The Separated Storm Drainage System will consist of Low Impact Design (LID) approach and stormwater features to treat the specified design storm. The CP Area will develop Stormwater Control Plans (SCPs) that will be submitted to the SFPUC Urban Watershed Management Program.

LID strategies will be used to meet the required LEED-based performance measures across the site. LID strategies may include, but are not limited to, infiltration trenches, vegetated swales, vegetated rock filters, bioretention devices, flow-through planters, permeable pavements, tree well filter units, and other LID technologies as approved by the SFPUC. The selection of LID features will be made through studies and through the design process and will involve the use of context-sensitive features that complement the proposed streetscape, open spaces, and

accompanying Infrastructure. Runoff will be treated per the SDG before discharging into San Francisco Bay.

The proposed Grading and Separated Storm Drainage System has been configured to convey the stormwater flows based on the land use plan and defined development contained in the Plan or Plan Documents. Any land use change from the Plan or Plan Documents will require remediation by the Developer. The design of the Grading and Separated Storm Drainage System is described in the Grading and Separated Storm Drainage Master Plan that has been submitted by the Developer to the City.

The Separated Storm Drainage System, including LID features, will be designed in accordance with the Subdivision Code and Project Subdivision Regulations, and Grading and Separated Storm Drainage Master Plan. The design criteria used for the development of the Separated Storm Drainage System is based upon established industry operations standards and regulatory agency requirements. Design criteria have been presented to, and reviewed by, the SFPUC.

In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Grading and Separated Storm Drainage System Infrastructure will be consistent with this Infrastructure Plan and the Grading and Separated Storm Drainage Master Plan.

Upon acceptance of the Separated Storm Drainage System by the City, the City will assume responsibility for the operation and maintenance of all facilities, including responsibility for the compliance with all regulations and mitigation measures. Only LID facilities accepting drainage solely from the public realm will be accepted for maintenance by the City. Per the Stormwater Design Guidelines, facilities managing stormwater from any private parcels must be operated and maintained by the owner of such parcels. The developer shall provide performance bonds and payment bonds (or other acceptable security), and warranties as described in the Candlestick Point/Hunters Point Shipyard Subdivision Code adopted by the Board of Supervisors Ordinance #209.

Any temporary storm drain connections to the existing combined sewer system will require an approved backflow device .

2.3.4 AUXILIARY WATER SUPPLY SYSTEM (AWSS)

The AWSS system and the Infrastructure to be constructed by the Developer in connection therewith are identified on Figure 2.3.3. The system is also known as a high pressure water

supply system dedicated for fire protection and is operated by the San Francisco Fire Department (SFFD) and is maintained by the SFPUC. The City-wide system serves as a source of fire protection in industrial, commercial, and many residential districts. The system consists of ductile iron pipe (DIP), high pressure hydrants, valves and fittings, suction intakes, and appurtenances.

The CP Area is currently not served by the AWSS. The City will extend the AWSS with transmission mains and appurtenances along Gilman Avenue and Carroll Avenue to the project boundary to provide two connection points. The Developer will construct a new AWSS that will connect to these extensions at the Project boundary. AWSS mains will extend through the development. The system will have electronically-operated control valves at each connection point, three suction intakes at the shoreline, and high pressure hydrants throughout the system.

The SFFD will design the proposed AWSS improvements on behalf of the City. The Developer shall pay for the reasonable costs of designing and constructing the on-site AWSS system. The City will submit design plans to the Developer for coordination purposes. The City will use its best efforts to control the costs as agreed by the City and the Developer in the ICA, DDA, and other Plan Documents. Upon acceptance of the Auxiliary Water Supply System by the City, the SFFD will assume responsibility for the operation and maintenance of all facilities, including responsibility for compliance with all regulations and mitigation measures.

2.3.5 LOW PRESSURE WATER SYSTEM

Potable water and fire flow demands for the CP Area will be served by the Low Pressure Water System as shown on Figure 2.3.4. The Low Pressure Water System will deliver water supplied by the City, and will also serve as the supply for the recycled water system until such time as a recycled water supply is developed as described in Section 2.3.6 below.

The majority of the CP Area will be supplied City water through connections to the City's University Mound Pressure Zone at two locations: 1) Gilman Avenue and Hawes Street; and 2) Harney Way and Jamestown. In addition, the Jamestown Street area is located at an elevation that requires a connection to the McLaren Pressure Zone along Jamestown Avenue. No improvements to the City water system between these connection points and the University Mound Reservoirs will be required for the CP Area development. The CP Area water system has been designed to meet hydraulic grade line (HGL) elevations at the boundary conditions as shown in the following table:

**Table 2.3.1
Candlestick Point Boundary Conditions**

Connection Number	Connection Location	Hydraulic Grade at Connection Point (feet) ⁽¹⁾								
		@0 gpm	@500 gpm	@1,000 gpm	@1,500 gpm	@2,000 gpm	@2,500 gpm	@3,000 gpm	@4,000 gpm	@5,000 gpm
#1	Harney Way and Jamestown	286.6	279.7	274.0	269.9	267.35	265.54	259.0	245.0	226.0
#2	Gilman and Hawes	274.48	271.6	269.43	267.99	266.99	265.29	263.0	257.0	248.0
#3	Jamestown	430	430	394.5	354.5	310.4	262.0	--	--	--

Note: ⁽¹⁾ CP/HP Datum

The proposed Low Pressure Water System has been configured to meet the water demands based on the land use plan and defined development contained in the Plan or Plan Documents. The design of the Low Pressure Water System is described in the Low Pressure Water System Master Plan that has been submitted by the Developer to the City.

The Low Pressure Water System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations. The design criteria used for the development of the low pressure water system is based upon established industry operations standards and regulatory agency requirements. Design criteria have been presented to, and reviewed by, the SFWD City Distribution Division and the San Francisco Fire Department (SFFD).

In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Low Pressure Water System Infrastructure will be generally consistent with this Infrastructure Plan and the approved Low Pressure Water System Master Plan.

Upon acceptance of the Low Pressure Water System by the City, the SFPUC will assume responsibility for the operation and maintenance of all facilities, including responsibility for compliance with all regulations and mitigation measures.

2.3.6 RECYCLED WATER SYSTEM

Recycled water demands in the CP Area will be served by the Recycled Water System as shown on Figure 2.3.5. The City currently does not have an operational off-site recycled water source. The Project Recycled Water System will be supplied by the City's potable water distribution system through interim connections until a recycled water supply is developed by the City.

The proposed Recycled Water System will connect to the Project Low Pressure Water System on an interim basis. The Recycled Water System will connect to the University Mound Zone Low

Pressure Water System near the following intersections: 1) Gilman Avenue and Hawes Street and 2) Harney Way and Jamestown Avenue. The recycled water main in Jamestown Avenue area will connect to the McLaren Pressure Zone Low Pressure Water System. Each interim connection will have a reduced pressure principal backflow preventer assembly.

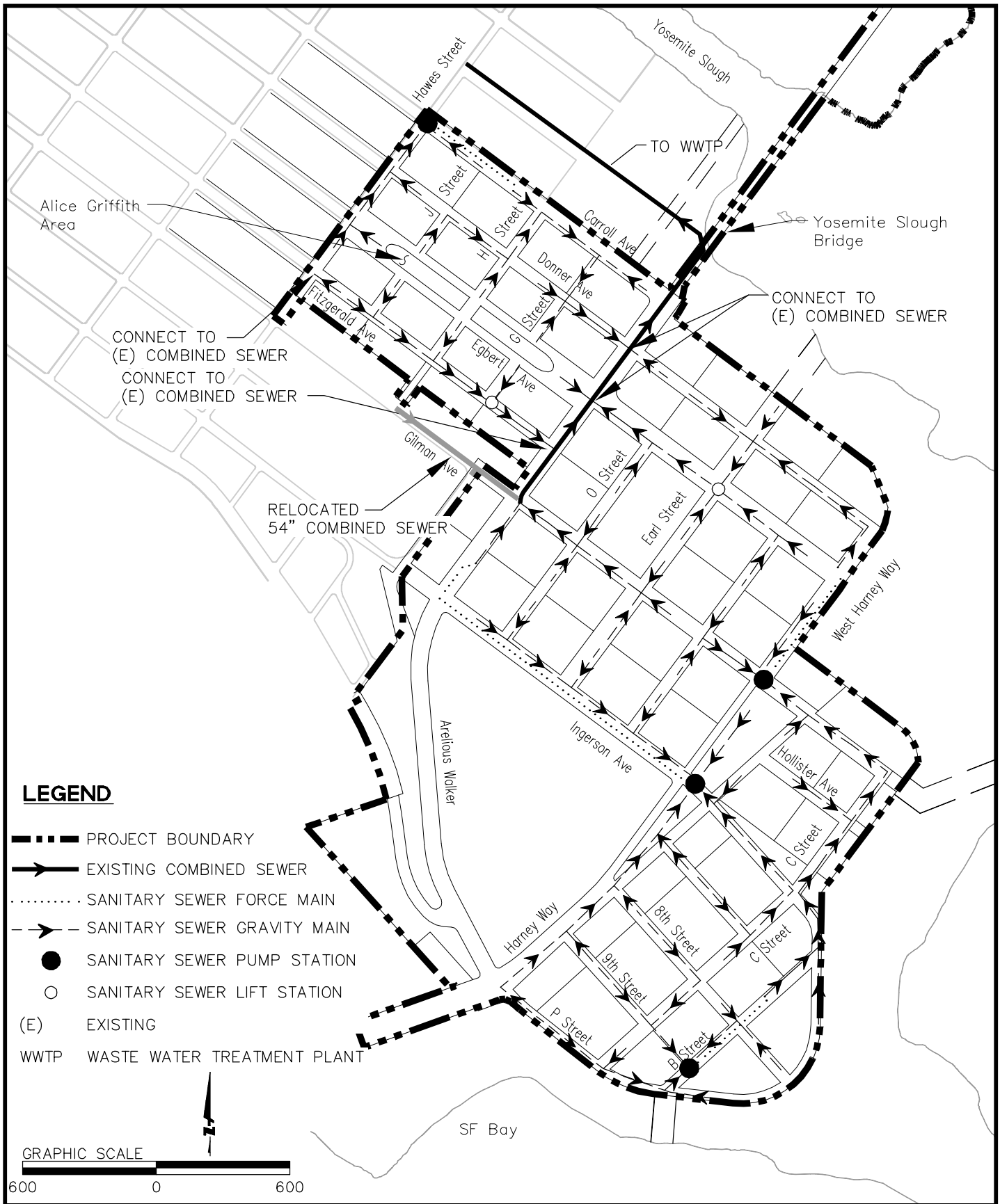
The City is currently engaged in technical evaluations of siting and other considerations related to the design and construction of a recycled water source, storage system, and transmission system. If, after the completion of all necessary reviews and approvals, such a project is constructed, the City will disconnect the interim Project low pressure water system connections and connect the Project recycled water supply mains to the Project Recycled Water System at one location anticipated to be in the general vicinity of one of the interim connection locations. The final connection point will be determined by the SFPUC. All work necessary to connect to the off-site recycled water system and deliver recycled water to the site in the future will be provided by the City.

The proposed Recycled Water System has been configured to meet the recycled water demands based on the land use plan and defined development contained in the Plan or Plan Documents. The design of the Recycled Water System is described in the Recycled Water System Master Plan that has been submitted by the Developer to the City.

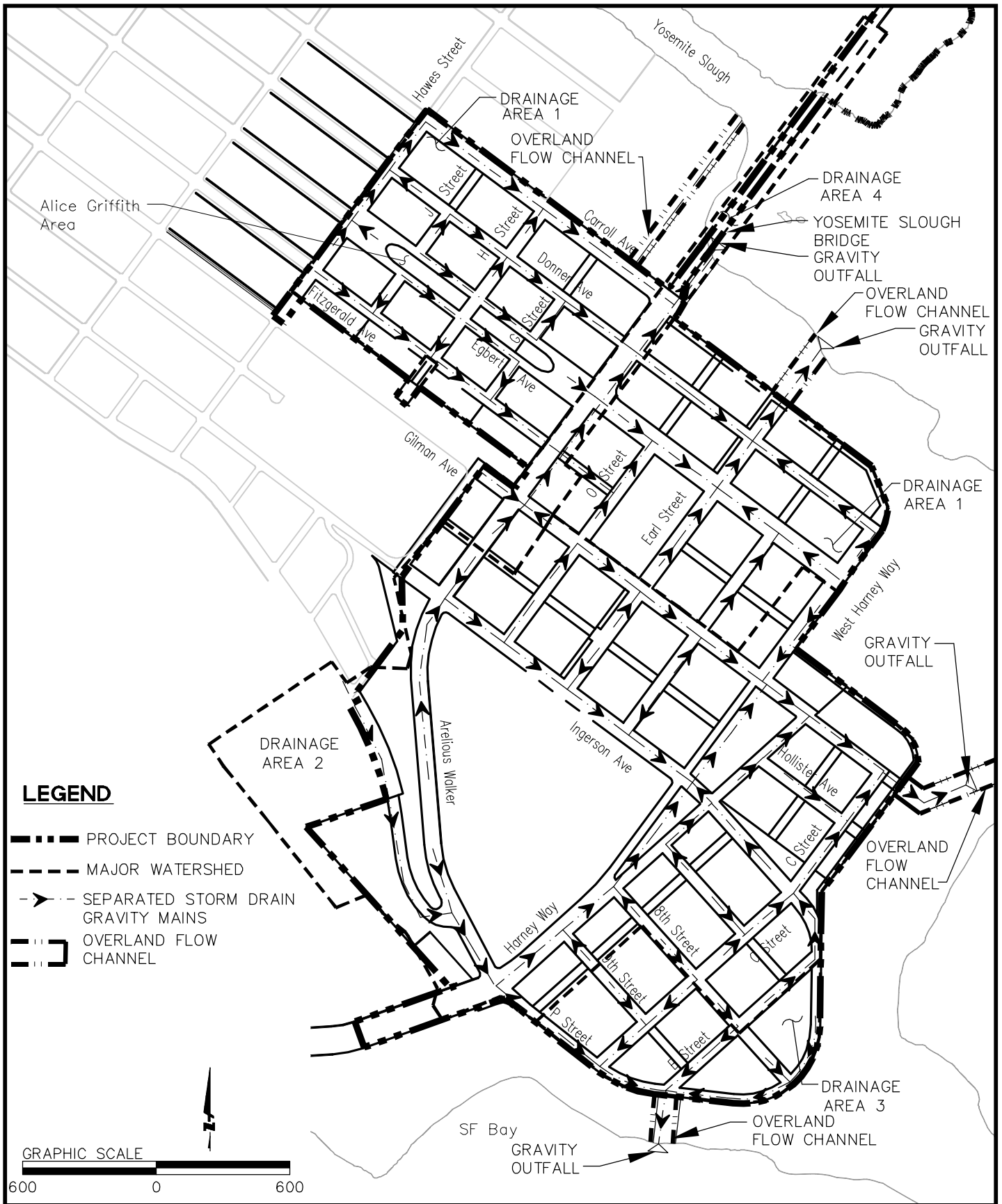
The Recycled Water System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations. The design criteria used for the development of the recycled water system is based upon established industry operations standards and regulatory agency requirements. The design criteria have been presented to, and reviewed by, the SFPUC City Distribution Division .

In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Recycled Water System Infrastructure will be generally consistent with this Infrastructure Plan and the approved Recycled Water System Master Plan.

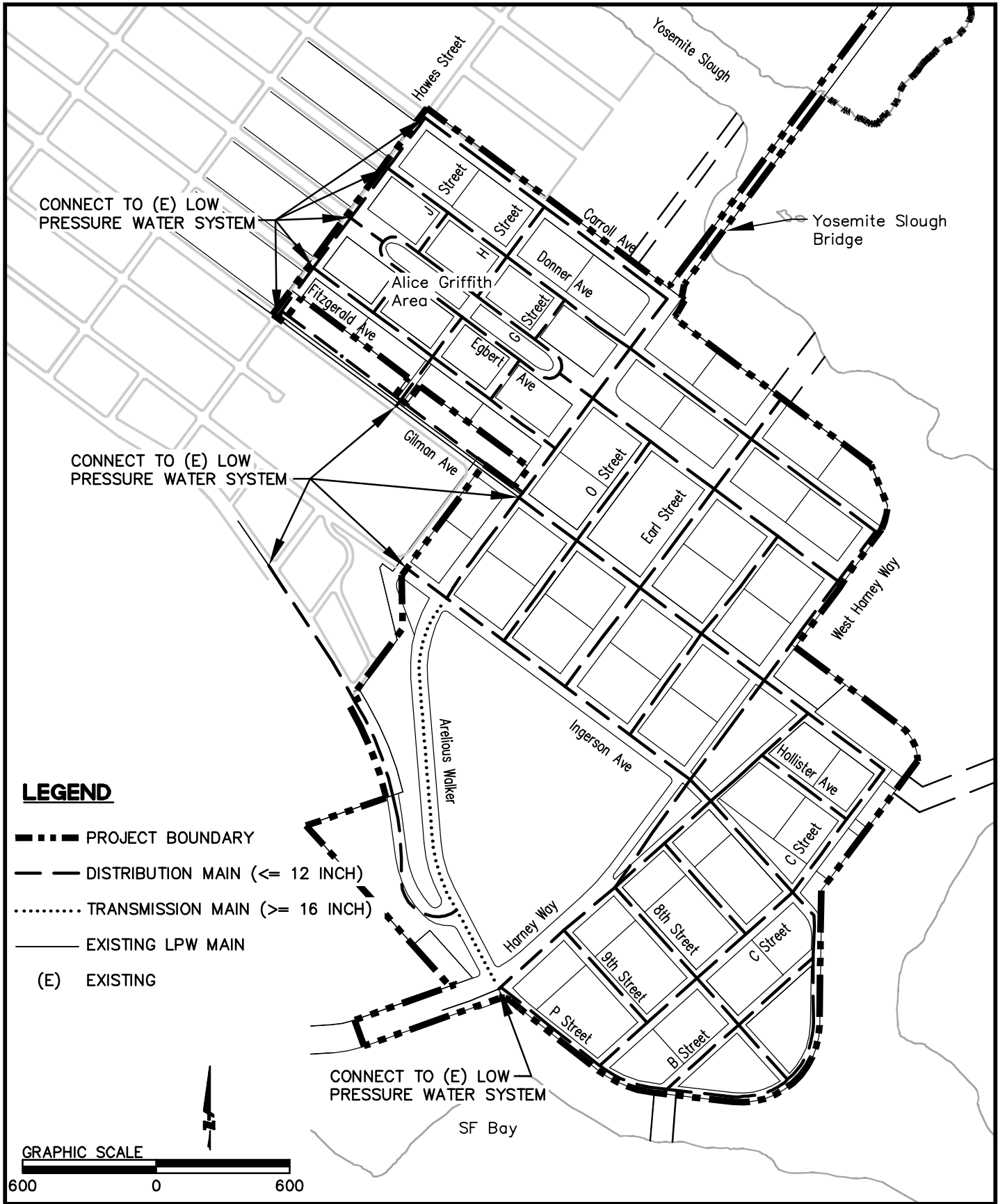
Upon acceptance of the Recycled Water System by the City, the SFPUC will assume responsibility for the operation and maintenance of all facilities, including responsibility for compliance with all regulations and mitigation measures.



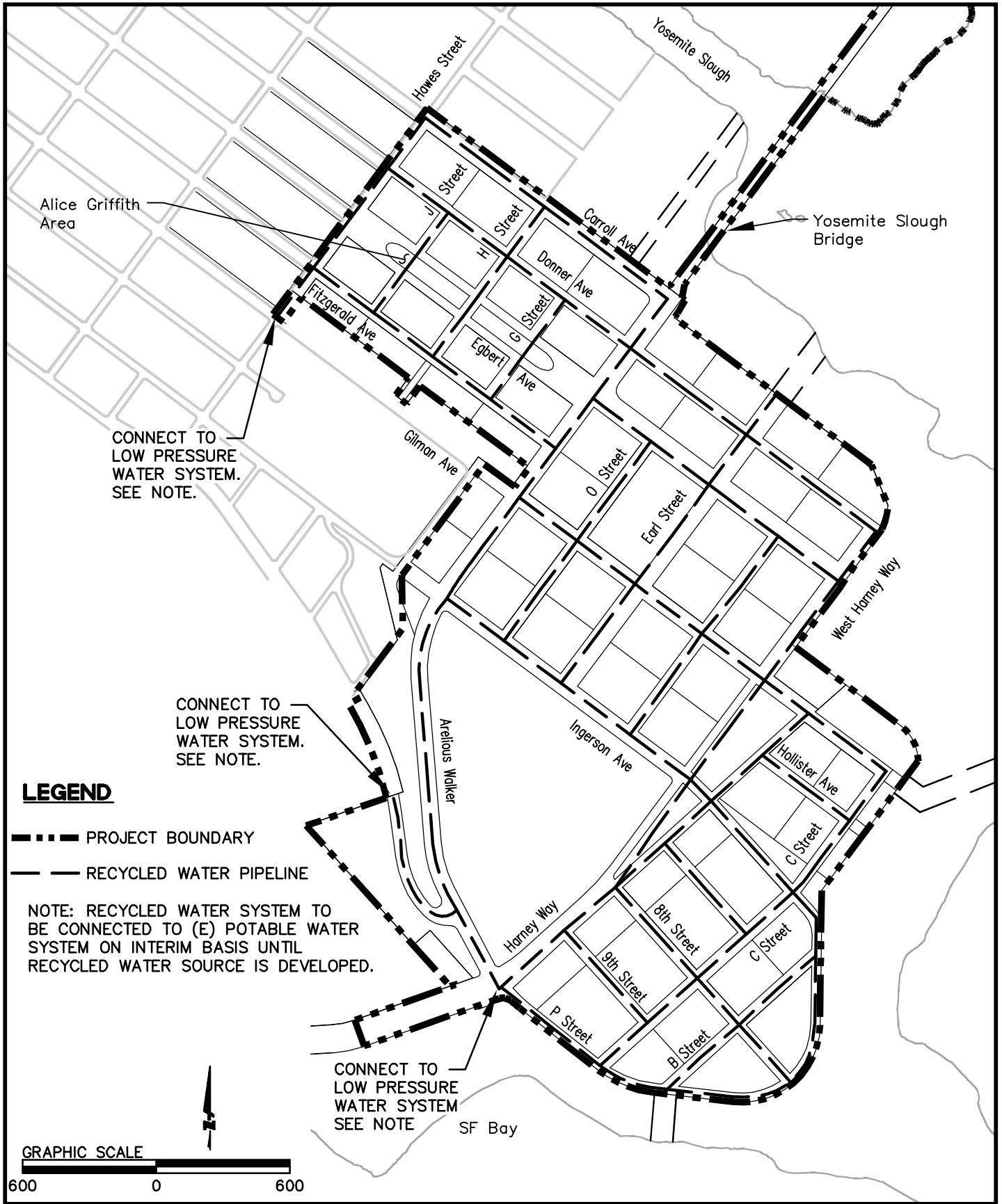
	Candlestick Point Development	Figure 2.3.1
	Separated Sanitary Sewer Layout	



	Candlestick Point Development	Figure 2.3.2
	Separated Storm Drainage Layout	



	Candlestick Point Development	Figure 2.3.4
	Low Pressure Water System Layout	



	Candlestick Point Development	Figure 2.3.5
	Recycled Water System Layout	

2.4 DRY UTILITY LAYOUTS

2.4.1 ON-SITE

GENERAL JOINT UTILITY TRENCH REQUIREMENTS

The work required to provide the joint trench for dry utilities (in public streets and sidewalks when possible) consists of trench excavation and installation of conduit ducts for telephone, cable, fiber optic, electrical, gas, fire and police alarm systems operated by the City Department of Technology (“DT Systems”), DPT, and MUNI. The overall layout of these systems is shown on Figure 2.4.1. Additionally, space for utility vaults, splice boxes, and street lights and bases will be provided. The utility owner/franchisee (e.g., MUNI, AT&T, SFPUC, PG&E, fiber optic companies, etc.) will install facilities such as transformers and wire, and be responsible for making these systems operational.

All necessary and properly authorized Public Utility Infrastructure for which franchises are authorized by the City shall be designed and installed in the public right-of-way in accordance with governing codes, rules and regulations (in effect at time of construction), and approved by DPW. Joint trenches or utility corridors will be utilized wherever feasible. The location and design of joint trenches/utility corridors in the public right-of-way must be approved by DPW during the subdivision review process.

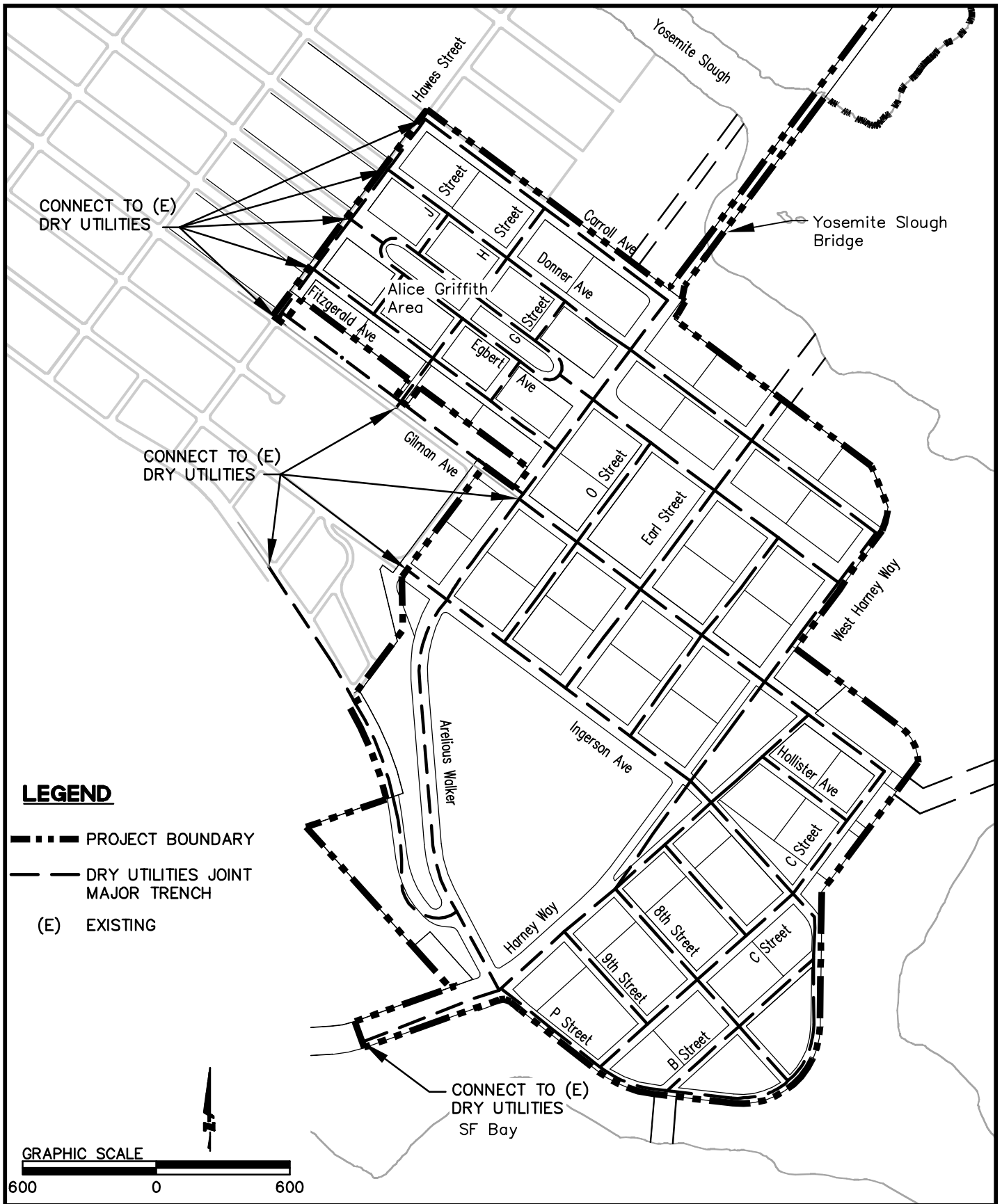
The existing electrical distribution system in the subject project area will be replaced as necessary and placed underground consistent with the timing of the development in phases as the project builds out, while maintaining service to existing customers.

The electric distribution system is planned to be in a joint or common trench which would include gas, phone, cable TV, and street light facilities. Redundancy for the proposed electrical distribution system would be achieved by providing looped circuits where necessary, and providing circuit ties to different substation feeders. Spare conduits will be provided to the extent reasonably required and approved by the City.

STREET LIGHTS

All street lights in the CP Area shall have LED fixtures as approved by the Bureau of Light, Heat, and Power. Sections 937 through 943 of the San Francisco Public Works Code in effect at the time of adoption of this Infrastructure Plan contain specific requirements for street lighting and are hereby incorporated by reference. Upon acceptance of the street lighting system by the City, the SFPUC will assume responsibility for the operation and maintenance of all facilities,

including the light fixtures; poles, secondary power conduit and pull-boxes, and shall assume responsibility for compliance with all regulations and mitigation measures.



	Candlestick Point Development	Figure 2.4.1
	Dry Utility Joint Trench Layout	

3. SEA LEVEL RISE

3.1 GENERAL

Sea Level Rise (SLR) will result in changing water levels in the San Francisco Bay that the Project will need to accommodate. The design criteria employed at the time of this Infrastructure Plan are based on the best scientific forecasts and potential design strategies currently available. The forecasts will very likely change over time and will provide guidance for the future.

3.2 100-YEAR TIDE AND SEA LEVEL RISE STRATEGIES

The project has three zones that are impacted by tides and SLR:

- Shoreline -- The land or marine structures that are at the edge of San Francisco Bay.
- Parks and Open Space -- the public land located from the shoreline upland to the edge of the Development Area.
- Development Area Perimeter -- the closest element of the development area to the shoreline that will have structures and/or facilities that are to be elevated above the adopted SLR elevation values.

100-YEAR TIDE

The 100-year return period water elevation is defined as the water elevation that is exceeded on average once every 100 years. Stated another way, the 100-year return period water elevation is the water elevation with a 1% annual chance of occurrence.

The present 100-year return period water level (100-year tide) for the open space/development area and the shoreline area was estimated by Moffatt & Nichol (M&N). The 100-year return period water elevation is different for the open space/development area and for the shoreline areas.

The 100-year return period water elevation for the design of the open space and development area (Base Flood Elevation or 100-year high tide) is 98.2 feet, CP/HP datum. The 100-year return period water elevation for the open space and development area includes the effects of tides, storm surges, and tsunamis.

The 100-year return period water elevation for the design of the shoreline varies by wave exposure. The 100-year return period water elevation for the shoreline includes the effects of

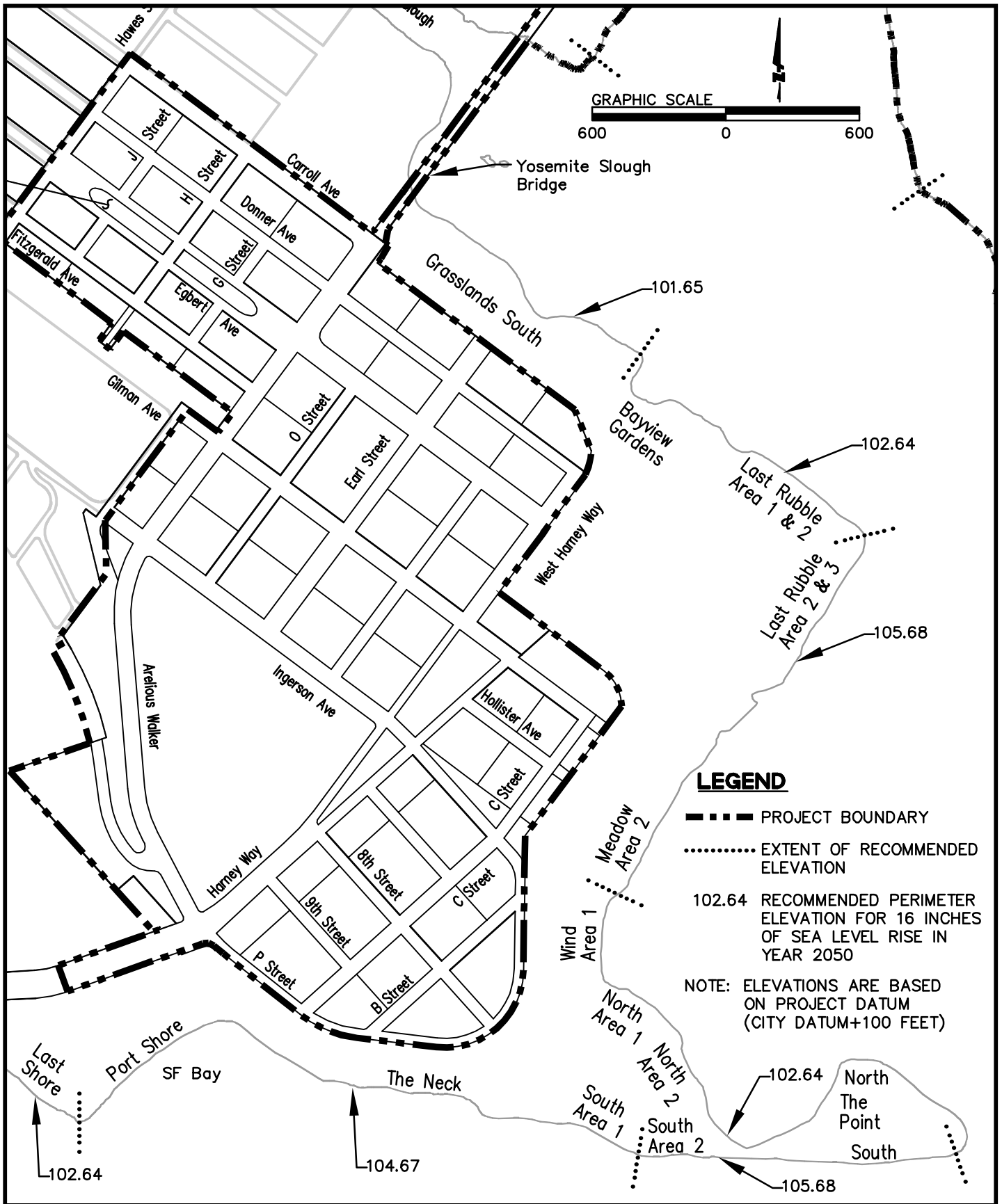
tides, storm surges, tsunamis, and wind-driven waves. The 100-year return period water elevation for the shoreline is described in various reports and summarized on Figure 3.1.1.

SEA LEVEL RISE

SLR will result in changing water levels that the project will need to accommodate. SLR estimates for the project were developed by Moffatt & Nichol (M&N).

The SLR values adopted for this project for implementation purposes are 16 inches for the shoreline, 36 inches for the structures along the Development Area Perimeter, and 24-inches for the streets along the Development Area Perimeter. SLR exceeding these values will be addressed by a Project “Adaptive Management Plan to Address Sea Level Rise,” (AMP) to be developed separately by the City before SLR of 24 inches occurs. The mechanism for developing and implementing the AMP is described in Section 3.5 and in the Project Subdivision Regulations.

The general initial strategies for SLR and the adaptive management strategies needed after the Project is constructed are described below.



	Candlestick Point Development	Figure 3.11
	Sea Level Rise, Year 2050	

3.3 PROJECT DESIGN CRITERIA

The constructed Project will incorporate SLR strategies that are based on the design criteria provided in Table 3.3.1 below.

Table 3.3.1 Sea Level Rise Design Criteria

<u>Area</u>	<u>Minimum Design Criteria</u>
Shoreline	The minimum shoreline elevation shall accommodate 16 inches of SLR above the 1% annual chance of occurrence water elevation with minimal overtopping.
Parks and Open Space adjacent to the shoreline	Provide a minimum parks and open space elevation of 98.2 feet (100-year high tide elevation) while allowing ponding during combined large rain and high tide events.
Development Area Perimeter – Streets	<p>The street elevation shall accommodate 2 feet of freeboard between the 5-year storm drain system hydraulic grade line and the street gutter flow line.</p> <p>The starting hydraulic grade line design elevation for the storm drain system and LID features shall be 100.2 feet (98.2 feet 100-year high tide + 24 inches of SLR).</p>
Development Area Perimeter – Structures	Provide a minimum finished floor elevation of 101.7 feet (98.2 feet 100-year high tide elevation + 36 inches of SLR + 6 inches of freeboard) for occupied facilities.
Development Area Perimeter – Separated Storm Drainage System	The starting hydraulic grade line design elevation for the storm drain system and LID features shall be 100.2 feet (98.2 feet 100-year high tide + 24 inches of SLR).
5-Year Storm Event	Provide a minimum 2 feet of freeboard between the storm drain system hydraulic grade line and the street gutter flow line.
Development Area Perimeter – Separated Storm Drainage System	<p>Provide a starting hydraulic grade line design elevation for the overland flow of 99.53 feet (98.2 feet 100-year high tide elevation + 16 inches of SLR).</p> <p>Overland flow shall not be conveyed in easements across private property. Overland flow can be conveyed in easements across public property.</p>
5- to 100-Year Storm Event	<p>Overland flow shall be conveyed either within the City right-of-way, between the face of curb to face of curb, or within public property in channels.</p> <p>Overland flow within the City right-of-way shall be contained between the face of curb to face of curb with no freeboard unless otherwise approved by the Director with the consent of the PUC on a case-by-case basis. Curb overtopping is allowed for the overland flow at the edge of the Project to flow into San Francisco Bay. When the overland flow overtops the curb at the edge of the Project and flows into San Francisco Bay, the overland flow water level shall be below the top of curb on the side of the street adjacent to structures such as buildings.</p> <p>Overland flow within channels shall have 1 foot of freeboard measured from the highest point between the channel and the edge of easement except where the depth of flow is less than 1 foot. For cases where the depth of flow is less than 1 foot, the freeboard shall be equal to the depth of flow.</p>

3.4 PROJECT INITIAL CONSTRUCTION

The initial construction will provide the required improvements to address 16 inches of SLR at the Shoreline and within the parks and open space areas. It will also provide the required improvements to address a minimum of 24 inches of SLR at the development perimeter.

3.4.1 SHORELINE IMPROVEMENTS

The shoreline improvements shall be constructed to accommodate a minimum of 16 inches of SLR above the 1 percent annual chance storm event with minimal overtopping. The elevation of shoreline improvements will include consideration for wind-driven waves when constructed to the recommended perimeter elevations shown on Figure 3.1.1. Recommended perimeter elevations shown on Figure 3.1.1 are applicable only to shoreline structures and their related wave protection. Improvements will address drainage of wave splash. Specific improvements to the various facilities are as follows:

- CPSRA Shoreline - The shoreline of the CP Area is defined by the CPSRA Shoreline. The park is designated into small areas for description of work within the overall park. For all the designated park areas identified below, State Parks will control the shoreline improvements. Neither the City nor the Developer will control these improvements or construct these improvements. These criteria are provided to present the definition of conditions expected to withstand the expected 16 inches of SLR along the shoreline of the CPSRA.
- South Basin Shoreline – CPSRA will provide recommended perimeter shoreline protection to elevation 101.65 feet, Project datum, which accommodates 16 inches of SLR.
- Candlestick Meadows
 - Area 1 – CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, which accommodates 16 inches of SLR.
 - Area 2 – CPSRA will provide recommended perimeter shoreline protection to elevation 105.68 feet, Project datum, which accommodates 16 inches of SLR.
- Heart of the Park
 - Area 1 - CPSRA will provide recommended perimeter shoreline protection to elevation 105.68 feet, Project datum, which accommodates 16 inches of SLR.

- Area 2 – CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, which accommodates 16 inches of SLR.
- Area 3 – CPSRA will provide recommended perimeter shoreline protection to elevation 105.68 feet, Project datum, which accommodates 16 inches of SLR.
- Area 4 – CPSRA will provide recommended perimeter shoreline protection to elevation 104.67 feet, Project datum, which accommodates 16 inches of SLR.
- The Point
 - North – CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, which accommodates 16 inches of SLR.
 - South – CPSRA will provide recommended perimeter shoreline protection to elevation 105.68 feet, Project datum, which accommodates 16 inches of SLR.
- The Neck – CPSRA will provide recommended perimeter shoreline protection to elevation 104.67 feet, Project datum, which accommodates 16 inches of SLR.
- Last Port
 - Area 1 – CPSRA will provide recommended perimeter shoreline protection to elevation 104.67 feet, Project datum, which accommodates 16 inches of SLR.
 - Area 2 - CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, which accommodates 16 inches of SLR.

3.4.2 OPEN SPACE AND PARK IMPROVEMENTS

Open Space and Park improvements shall be constructed such that the intended operation of the facilities accommodates a minimum of 16-inches of SLR. Some facilities will always be above the water, some will always be flooded at some point in time, and some will experience occasional tidal flooding and be subject to both wet and dry conditions.

DRY FACILITIES

Dry facilities are those facilities that will be required to be above the water level of San Francisco Bay, and are existing above the elevation, will be rehabilitated to above the elevation, or will be constructed at the time of initial construction to accommodate a minimum of 16 inches of SLR above the current 100-year tide of 98.2 feet, Project datum.

WET FACILITIES

Wet facilities are those facilities that will be allowed to flood and be allowed to convert back to wetlands and/or marshes and will remain unchanged.

The specific Open Space and Park facilities and their condition to accommodate the 100-year tide plus 16 inches of SLR are as follows:

- With the exception of CPSRA Development edge slope easement and 100-year storm overland flow easements, grading within the CPSRA will be under direct control of State Parks and not controlled by the City or the Developer. They will generally be well above an elevation of 101.2 feet, Project datum, which will accommodate over 36-inches of SLR. CPSRA includes the following park areas: South Basin Shoreline, Candlestick Meadows, Heart of the Park, The Point, The Neck, and Last Port.

3.4.3 DEVELOPMENT AREA PERIMETER

The perimeter edges of the developed areas will be constructed such that the minimum elevations of street low points, i.e. the gutter flow line, are no lower than 103.3 feet, Project Datum, which accommodates over 55 inches of SLR. Parking floors can be lower, but must include pumps and other improvements to protect from flooding as well as comply with the Article 31 Soil and Ground Water Monitoring Plan.

3.4.4 5-YEAR STORM

The initial design and construction of the storm drain system will convey the 5-year storm. The minimum freeboard between the storm drain system 5-year hydraulic grade line and the street gutter flow line will be 2-feet. The storm drain system will be designed to operate with a starting water level in San Francisco Bay of 100.2 feet, Project Datum, which will accommodate a SLR of 24 inches.

3.4.5 100-YEAR STORM

The initial design and construction of the Project will convey the 100-year storm in storm drain pipes and/or streets, from face of curb to face of curb. The conveyance of the 100-year storm runoff will be designed to operate with a starting water level in San Francisco Bay of 100.2 feet, Project Datum, which will accommodate a SLR of 24 inches.

3.5 ADAPTIVE MANAGEMENT STRATEGIES

As SLR is experienced, the projections of the magnitude of future SLR will be adjusted based on actual SLR conditions. Adjustments of the shoreline, parks and open space, and the development perimeter may be needed. A Project-specific SLR adaptation strategy will be implemented that will provide guidance, identify relevant stakeholders, define appropriate management actions and triggers, and establish a Project-specific funding mechanism. It will be administered by an entity for the Project as defined by the DDA, such as a Geologic Hazard Abatement District (GHAD),

Community Facilities District (CFD), or other similar public entity with similar funding responsibility.

The strategies for SLR and the improvement alternatives will be further defined by an AMP that will define specific triggers for action based on observed changes in sea level. The plan will require updates at least once every 5 years or more frequently if required by new regulations or an increase in public health hazard or safety associated with flooding.

The adaptive management strategies for the Project in general are outlined below. An AMP detailing strategies for each of the individual elements of the shoreline, adjacent Parks and Open Space, and the Development Perimeter will be developed by the City before a SLR of 24 inches occurs. The AMP shall specifically address each of the following elements for the 16-to-24 inch and greater-than-24 inches SLR scenarios: (1) gravity-drained low areas of Gilman Avenue west of Arelious Walker Drive , and the CPSRA shoreline; (2) designated park areas of South Basin Shoreline, Candlestick Meadows, Heart of the Park, The Point, The Neck, and Last Port; and (3) any other Shoreline within the limits of the CPSRA not specifically included in the above.

Figures 3.5.1, 3.5.2, and 3.5.3 show the progression of Adaptive Management through the successive rise of sea level from the initial 16 inches of SLR condition to the 16-to-24 inches of SLR, to the greater-than-24 inches of SLR.

The improvements required by the AMP are to be funded by the financial plan described in the DDA and Plan Documents.

3.5.1 STRATEGIES TO ADDRESS SEA LEVEL RISE FROM 16-TO-24-INCHES

When it is known that SLR has occurred and is approaching 16-inches, the following AMP strategies or more current AMP strategies should be planned and implemented to protect the shoreline, waterfront improvements, and Project such that by the time the SLR value reaches 24-inches any required improvements are operational.

SHORELINE

Accommodate 1 percent annual chance storm event with minimal overtopping plus 20-inches of SLR, (shoreline has already experienced 16-inches of SLR) or updated SLR, based on guidance at the time. Modify shoreline protection and marine structures to provide same level of protection as initial constructed conditions.

PARKS AND OPEN SPACE

As sea level rises to 24-inches, allow more frequent flooding of the parks and open space during storm events greater than 5-year return period, raise ground level of facilities, or install wave protection berms. In addition, provide for the conveyance of the 100-year storm overland flow and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER GRADING

No change required.

DEVELOPMENT AREA

As sea level rises to 24-inches, the capacity of the storm drain system must be increased to retain the conveyance design criteria the 5-year and 100-year storm. To increase the capacity of the storm drain system, new pump stations at each storm drain outfall will be required. Land will be reserved to accommodate these future pump stations.

The storm drain system is designed to convey the 5-year storm during the 100-year high tide + 24-inches of sea level rise while providing 2-feet of freeboard between the 5-year storm HGL and the gutter flow line. An increase in the capacity of the storm drain system will maintain the 2-feet of freeboard criteria as sea levels rise.

The storm drain system and street network is designed to convey 100-year storm during the 100-year high tide + 24-inches of sea level rise. Overland flow will occur during the 100-year storm. Overland flow within the City right-of-way will be contained between the face of curb to face of curb with no freeboard unless otherwise approved by the Director with the consent of the PUC on a case-by-case basis. Figure 3.5.4 shows the SLR that can occur before the overland flow exceeds the top of curb. An increase in the capacity of the storm drain system will keep the overland flow below the top of curb.

3.5.2 STRATEGIES TO ADDRESS SEA LEVEL RISE GREATER-THAN-24-INCHES

When it is known that SLR has occurred and is approaching 24-inches of increase, the following strategies or more current strategies should be implemented to protect the particular shoreline or waterfront improvements.

SHORELINE

Accommodate 1 percent annual chance storm event with minimal overtopping plus appropriate SLR, based on guidance at the time. Modify shoreline protection and marine structures to provide same level of protection as initial constructed conditions.

PARKS AND OPEN SPACE

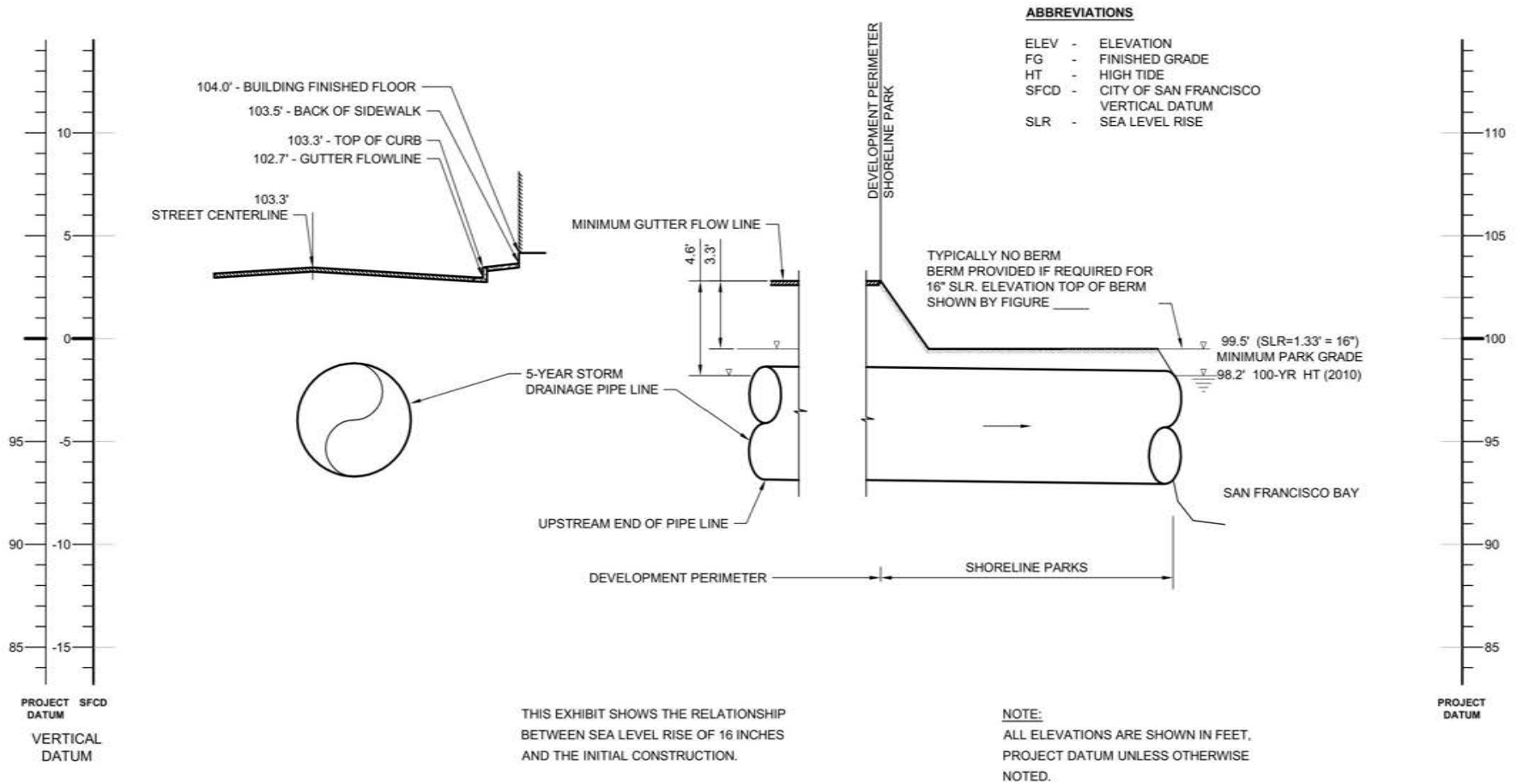
As mean sea level rises beyond 24-inches, allow more frequent flooding of the parks and open space during storm events greater than the 5-year return period, raise ground level of facilities, install wave protection berms, or increase the capacity of existing pumping stations to increase freeboard in the storm drainage systems. In addition, provide for the conveyance of the 100-year storm overland flow and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER GRADING

No change required.

DEVELOPMENT AREA

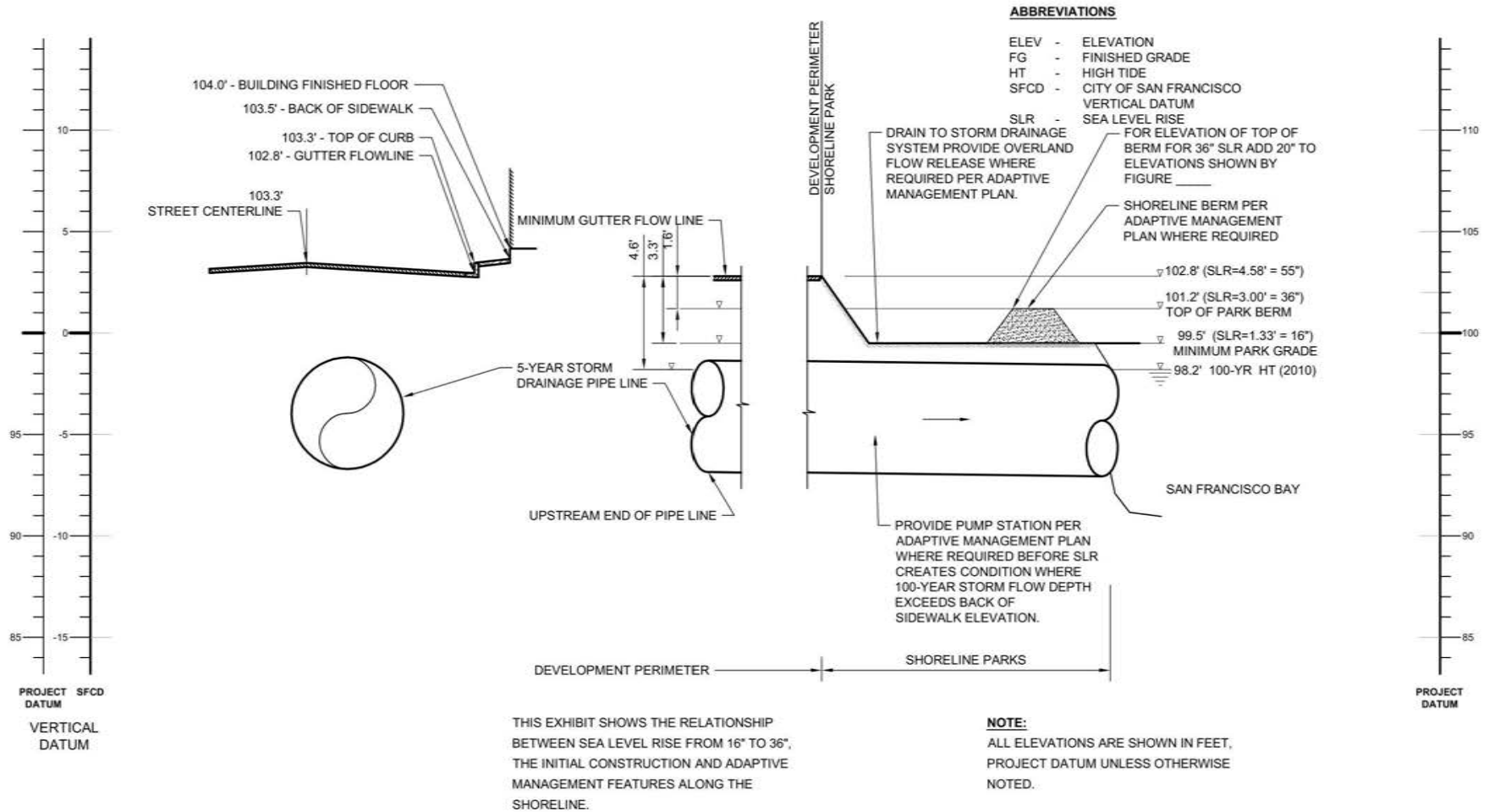
As sea level rises more than 24-inches, the capacity of the storm drain system must be increased to retain the conveyance design criteria the 5-year and 100-year storm. To increase the capacity of the storm drain system, the pump station capacity at each storm drain outfall must be increased. Land will be reserved to accommodate the expansion of the pump stations.



The minimum depth of cover for separated storm drains within the main development area shall be six (6) feet, except if the City Engineer with the consent of the PUC approves an alternate design. Under such circumstances, the minimum depth of cover over storm drains in street areas shall not be less than four (4) feet in order to distribute surface loads and to provide clearance for utility service facilities. The City Engineer or the PUC may require additional support over the pipe or high strength pipe. For storm drains located in the parks and open space not subject to vehicular traffic, the minimum depth of cover shall be three (3) feet. The City Engineer or the PUC may require additional support over the pipe or high strength pipe based on a case by case review of the proposed uses above the pipe.

Candlestick Point Development
General Site Section For Base Year: 16" of Sea Level Rise

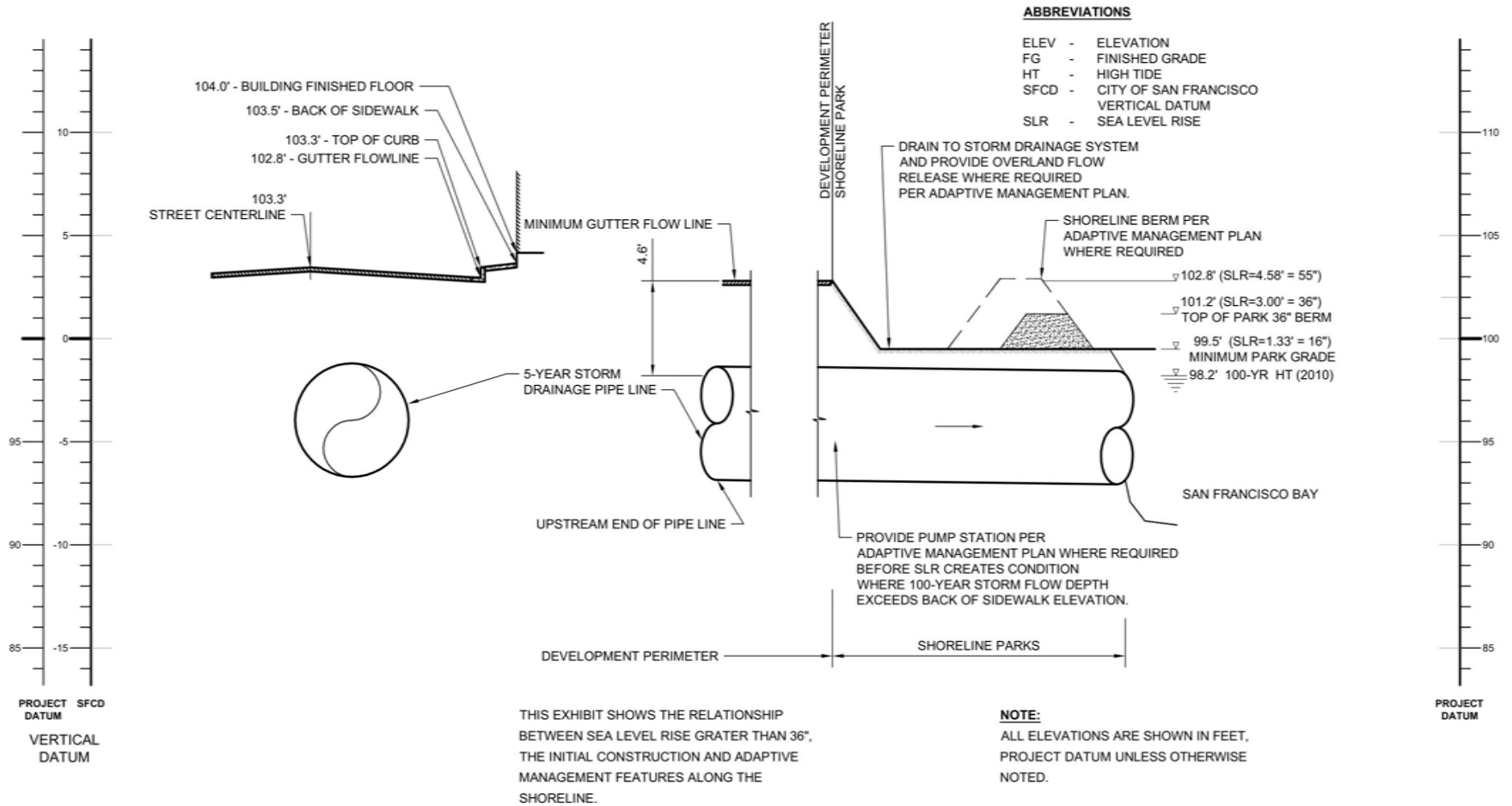
Figure 3.5.1



The minimum depth of cover for separated storm drains within the main development area shall be six (6) feet, except if the City Engineer with the consent of the PUC approves an alternate design. Under such circumstances, the minimum depth of cover over storm drains in street areas shall not be less than four (4) feet in order to distribute surface loads and to provide clearance for utility service facilities. The City Engineer or the PUC may require additional support over the pipe or high strength pipe. For storm drains located in the parks and open space, the minimum depth of cover shall be three (3) feet. The City Engineer or the PUC may require additional support over the pipe or high strength pipe based on a case by case review of the proposed uses above the pipe.

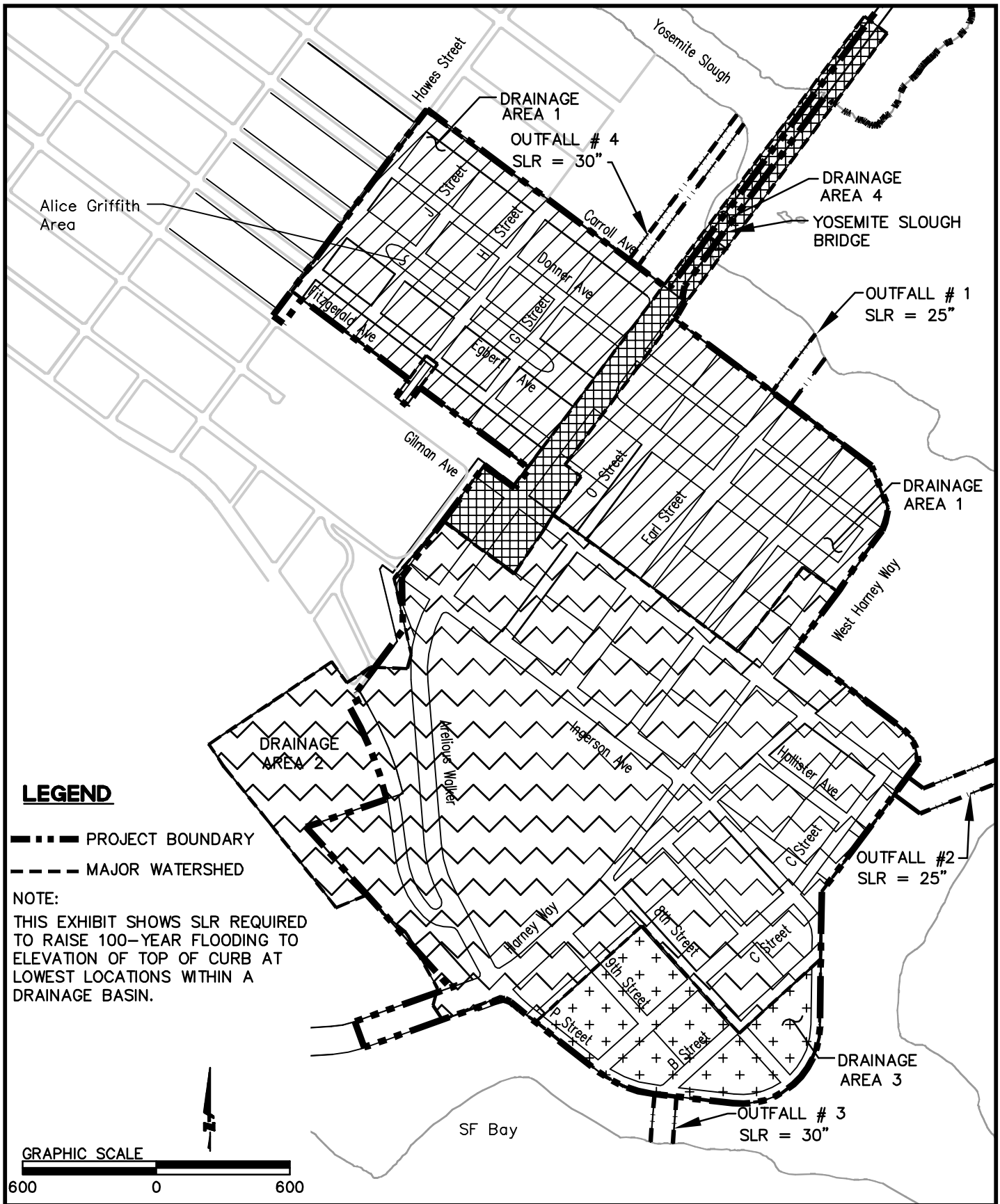
Candlestick Point Development
General Site Section For 16" to 36" of Sea Level Rise

Figure 3.5.2



The minimum depth of cover for separated storm drains within the main development area shall be six (6) feet, except if the City Engineer with the consent of the PUC approves an alternate design. Under such circumstances, the minimum depth of cover over storm drains in street areas shall not be less than four (4) feet in order to distribute surface loads and to provide clearance for utility service facilities. The City Engineer or the PUC may require additional support over the pipe or high strength pipe. For storm drains located in the parks and open space, the minimum depth of cover shall be three (3) feet. The City Engineer or the PUC may require additional support over the pipe or high strength pipe based on a case by case review of the proposed uses above the pipe.

Candlestick Point Development		Figure 3.5.3
General Site Section For Greater Than 36" of Sea Level Rise		



Candlestick Point Development		Figure 3.5.4
Sea Level Rise for 100-Year Storm Flooding Limit		

4. PUBLIC OPEN SPACE

4.1 OPEN SPACE PARCELS

The Open Space Parcels in the CP Area of the Project shall be developed in accordance with the Project Open Space Master Plan, and as summarized herein. Except as provided herein, the Developer shall construct all of the Improvements in the Open Space Parcels, other than improvements in the CPSRA, which is within the control of the California State Parks. Improvements to Open Space Parcels are described in the Parks, Open Space and Habitat Concept Plan and will be further defined in future submittals to the Agency as described under the DRDAP. The construction completion schedule of the Open Space and Park Improvements will be provided on the schedule defined in the DDA.

Overall, the CP/HPS2 Project will involve the creation of new parks and recreational opportunities, provide park improvements, and create new access to the shoreline. New parks will include destination parks, neighborhood parks, a sports field complex and multi-use lawn, the waterfront promenade, the waterfront recreation area, and the extension of the Bay Trail through the Project site. Improvements in the Park and Open Space parcels will be subject to a site-specific storm water management plan, which may include the presence of LID features as part of a comprehensive storm water management approach for the CP Area.

In total approximately 326.8 acres of parks (not counting Boulevard Parks and Hillside Open Spaces) will be provided in the CP Area and HPS2 Area combined, including a net reduction of 23.4 acres for CPSRA land. The CP Area will include approximately 105.9 acres of parks, including the CPSRA (but not counting the Boulevard Parks and Hillside Open Spaces). The Developer is responsible for all improvements to the Park and Open Space parcels described herein and consistent with the DDA.

Table 4.1 (Proposed Parks and Open Space) presents the proposed park and open space in the CP Area of the Project. Figure 4.1.1 illustrates the location of the proposed parks and open space. A brief description of the CPSRA, new parks and open space facilities, and the Bay Trail is provided below.

Table 4.1 Proposed Parks and Open Space

	<u>Acre (Approx.)</u>	<u>Park Role</u>	<u>Features</u>	<u>New / Existing Park</u>
New Parks¹				
Alice Griffith Neighborhood Park	1.44	Neighborhood Park	Tot Lot, Tree Grove, Seating, Bioswale, Lawn, Shade Pavilion, Community Gardens, Basketball / Tennis Court, Dog Run	New
Candlestick Point Neighborhood Park	3.11	Neighborhood Park	Open Lawn, Bioswale, Playground, Small Dog Area, Shade Pavilion, Community Gardens, Seating Plinths, Tree Groves, Sports Courts	New
Wedge Park	3.74	Destination Park	Planting, Bioswale, Plaza, Bus / BRT Shelter, Café / Kiosk, Tot Lot, Lawn, Shade Structures, Ornamental Gardens, Dog Play Area	New
Mini-Wedge Park	0.82	Destination Park	Plaza, Tot Lot, Shade Structure, Small Dog Run, Lawn, Native Gardens	New
<i>Subtotal</i>	<u>9.11</u>			
State Park Land^{1,2}				
South Basin Shoreline	10.4	CPSRA	Interpretive Signage/Art, Family Gathering Areas, Bay Overlook, Outdoor Classroom/Interpretive Center, Fishing & Viewing Pier	Existing (rebuilt)
Candlestick Meadows	34.0	CPSRA	Active Play Lawn, Group Gathering Areas, Information Kiosk, Restroom, Rain gardens, Public Parking Area	Existing (rebuilt)
Heart of the Park (includes new State Parkland)	26.8	CPSRA	Non-motorized Boat Launch, ADA- Accessible Viewing Pier, Boatbuilding Center, Bike & Boat Rentals, Concession Stands, Beach Enhancements, Parking Areas	Existing (renovated)
The Point	6.1	CPSRA	Bay Viewing Area, Boat-Landing Beach, Bike Or Boat-In Campsites, Interpretive Signage/Art, Landforms	Existing (renovated)
The Neck (includes new State Parkland)	4.9	CPSRA	Windsurfer Staging And Launching Facilities, Fitness Circuit, Beach	Existing (renovated)
The Last Port (includes new State Parkland)	14.6	CPSRA	Picnic Area, Trails, Beaches, Art, Interpretive Plaza	Existing (renovated)
<i>Subtotal</i>	96.8			
<i>Total</i>	<i>105.91</i>			

SOURCE: Lennar Urban, 2014.

¹ The 'New Parks' at Candlestick Point are within the area of the Vesting Tentative Subdivision Map No. 7878, dated June 19, 2014. The 'New Parks' acreages are based on the final street and block alignments, and have been measured to the nearest hundredth of an acre. The CPSRA acreages have not been measured to this level of precision, and are estimated to the nearest tenth of an acre.

² The 120.2-acre CPSRA lands contained within the Project boundary will be reduced by 29.1 acres and increased by 5.7 acres, for a net reduction of 23.4 acres. The Neck, The Heart of the Park, and The Last Port are the three locations where new State Park Land will be added.

4.1.1 NEIGHBORHOOD PARKS

Development of the CP Area will include several neighborhood parks which will be connected to other neighborhoods and open spaces within the community by way of pedestrian-friendly green streets.

Specific neighborhood parks include the following:

ALICE GRIFFITH NEIGHBORHOOD PARK

Alice Griffith Neighborhood Park will extend for several blocks through the Alice Griffith Neighborhood in the center of Egbert Avenue. The east-west orientation of the park makes this park a part of a green park and street corridor linking the existing Bayview neighborhood at Hawes, with Boulevard Parks on Egbert east of Arelious Walker and connecting to the State Park. The park will provide a variety of active and passive spaces that may include community gardens, playground / tot lot, basketball or tennis court, small dog run, open lawn areas, and LID stormwater features.

CANDLESTICK POINT NORTH NEIGHBORHOOD PARK

The Candlestick North Neighborhood will include a 3.4 acre Candlestick Point North Neighborhood Park. The location for this park shown on Figure 4.1.1 is subject to change; however, the park will remain 3.4 acres in size and will be located somewhere within the Candlestick Point North Neighborhood. The park will offer a mix of active and passive areas and may include a large multipurpose open lawn, playground / tot lot, community gardens, sport courts, small dog run, community gardens, and LID stormwater features.

WEDGE PARK

The Wedge Park will serve as the “commons” for the CP Area and will link the interior of the development area to the CPSRA through an expansive view corridor. The park will include a bicycle and pedestrian path linking the Mini-Wedge Park to the south, and the State Recreation Area to the north. Specific park features may include a main plaza, open lawns, bioswale, playground / tot lot, dog play area, shade structures, café / information kiosk, an ecological garden, and LID stormwater features.

MINI-WEDGE PARK

The Mini-Wedge Park in the southern portion of the CP Area will serve as a primary connector between the development in the CP Area and the CPSRA Main Beach area. The northern edge of the park will be bordered by a bicycle and pedestrian path corridor linking the Wedge Park to the

CPSRA. Specific features of this park may include plaza, tot lot, shade structure, small dog run, open lawn, and LID stormwater features.

4.1.2 OTHER PARKS AND OPEN SPACE

Other parks and open spaces that will be provided in the CP Area of the Project include the following:

HILLSIDE PARKS AND OPEN SPACE

The hillside parks and open space includes the Bayview Hillside Open Space and the Jamestown Walker Slope. The approximately 3.6 acre Bayview Hillside Open Space is located on Bayview Hill's southeastern slope, mostly within the existing Bayview Hill Park. This area has been significantly graded and consists of quarry faces and terraces with thin, rocky soils over bedrock, and is partially vegetated with stands of non-native, invasive blue gum eucalyptus and French broom. The lowest portion of the site contains a small parking lot. Following recommendations of the Recreation and Park Department's Bayview Hill Natural Areas Plan, this park area will be enhanced with native plantings to increase that habitat value and create a better habitat link between Bayview Hill and the Bay.

The Jamestown Walker Slope contains a small portion of land that is part of the larger Bayview Hill Park, as well as a vegetated slope between Jamestown and Arelious Walker Drive. The roadways here will be reconfigured, and the site will require significant terracing and retaining walls. The slope and terraces will be planted with native plants where possible.

BOULEVARD PARKS

Earl Street will be designed as a "Boulevard Park," a hybrid of street and park with a strong pedestrian scale and quality. The Earl Street Boulevard Park is planned for the west side of the street to provide a continuous green space that connects the CP Retail Center with Candlestick Point North Neighborhood Park and the CPSRA. The park may provide plazas, seating, planting, LID stormwater features, and space for various recreational activities.

4.1.3 CANDLESTICK POINT STATE RECREATION AREA

The California State Park and Recreation Commission approved the Department of Parks and Recreation's General Plan and certified the Environmental Impact Report prepared for the Candlestick Point State Recreation Area in January 2013. The discussion below is quoted from the Plan and is presented to provide an overview of the conceptual design that is currently proposed; however, the development of each of these areas is outside the scope of this Infrastructure Plan.

In certain areas of the CPSRA, but not all, improvements may be necessary to raise the shoreline and provide protection from wave run-up and SLR. An adaptive management zone free of park structures may also be reserved to accommodate mounds and embankments that protect from 36 inches of sea level of rise. In certain zones, waters may be allowed to rise and form new wetland habitats. Due to the varied environmental, structural, and topographical conditions, site-specific solutions would be necessary.

SOUTH BASIN SHORELINE

Proposed uses include low-impact recreation (e.g., trail use, wildlife viewing, picnicking) and nature-based education and interpretation. New facilities may include extension of the Bay Trail, paved and natural surface trails, a boardwalk underpass beneath the proposed bridge included in the planned Candlestick Point-Hunters Point Shipyard Phase 2 Project, interpretive signage/art, family gathering areas, a bay overlook, an outdoor classroom and interpretive center, and a new fishing and viewing pier. The South Basin Shoreline may also accommodate 100 year excess overland flow of stormwater in an area that may function as a rain garden during the wet season.

CANDLESTICK MEADOWS

Proposed uses include low-impact recreation and active play, family and community events and gatherings, and educational opportunities. New facilities in the northern portion of Candlestick Meadows may include a lawn for active play, family and group gathering areas, an information kiosk for visitors, a restroom, seasonal rain gardens that treat stormwater and provide educational opportunities, and a public parking area. The remaining portion of Candlestick Meadows may include natural-surface trails, smaller family gathering areas, landforms for wind protection and spatial definition, a nature theater for small community events, and a restroom.

HEART OF THE PARK

The focus of the Heart of the Park is improved access to the Bay and water-oriented recreational opportunities. New facilities may include a non-motorized boat launch, ADA-accessible viewing pier, boatbuilding center with educational boating programs, bike and boat rentals, concession stands, beach enhancements, additional family and group gathering areas, an information kiosk, interpretive signage/art, parking areas, and landforms that provide shelter from the wind.

THE POINT

The Point will provide enhanced access to the Bay, while preserving the area's current character as a quieter area of the park. New facilities may include a new bay viewing area, boat-landing beach, bike or boat-in campsites that may also serve as day-use facilities, family gathering areas,

interpretive signage/art, and landforms to provide shelter from the wind. The existing pier will continue to provide fishing opportunities and views of the Bay.

THE NECK

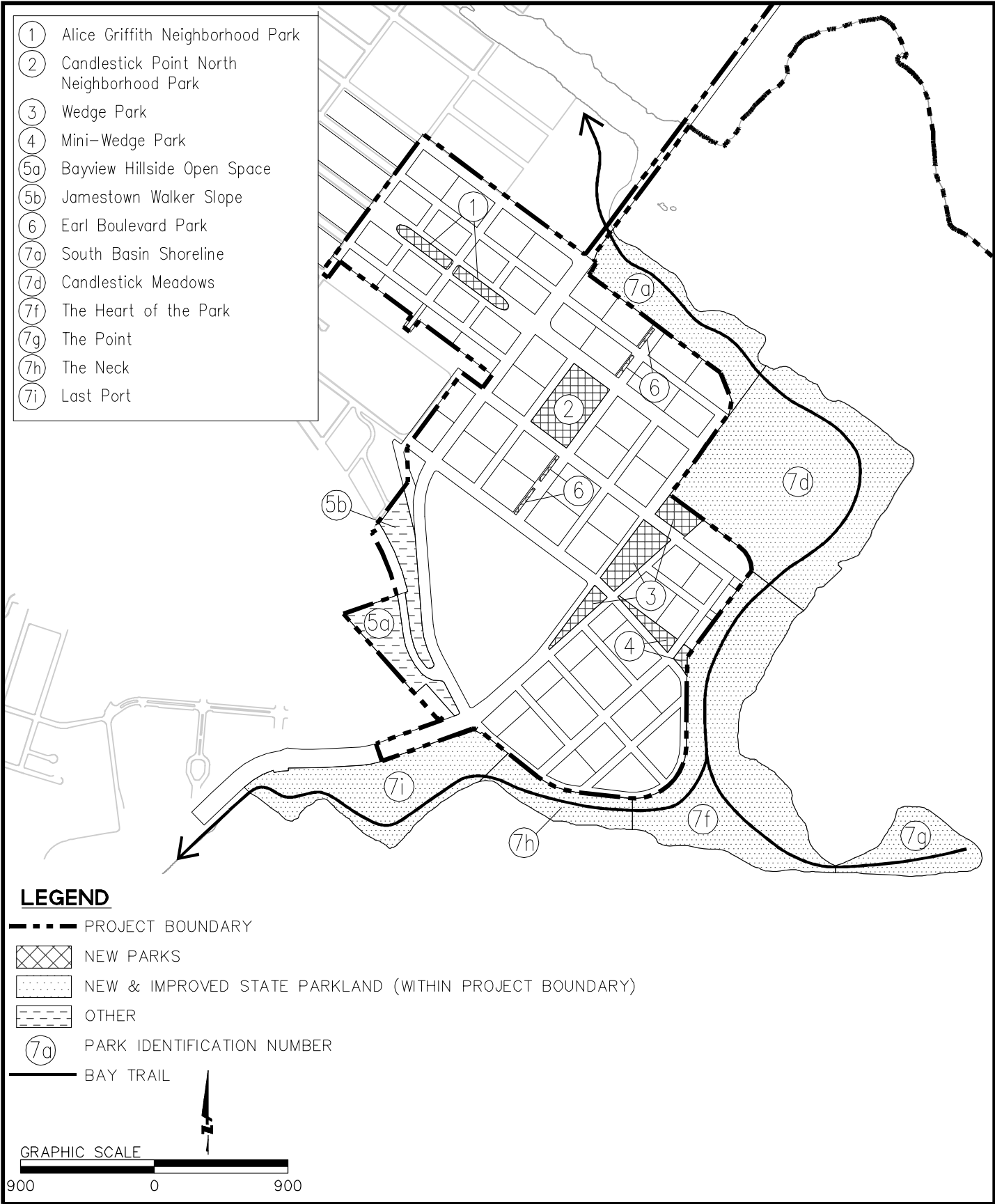
This area will focus on expanding active recreational opportunities and access to the Bay through improving the existing windsurfer staging and launching facilities, fitness circuit, and beach at Hermit's Cove. The existing pier at The Neck may also be relocated slightly to the west and reconstructed as a groyne to facilitate the accretion of sand and expansion of the beach at Hermit's Cove, and an information kiosk may be constructed near the intersection of Harney Way and Arelious Walker Drive. Habitat terraces may also be created behind the beach at Hermit's Cove to reduce the grade change and facilitate easy access to the beach, and parking adjacent to Harney Way would ensure access to The Neck. The Neck may also accommodate overland flow of stormwater.

THE LAST PORT

Plans for improvement will build upon the existing uses and facilities in the area, which include picnicking, trails, and beaches. New facilities may include iconic art that marks the entrance to the park, an interpretive plaza overlooking the Bay, a small lawn for picnicking and active play, family gathering areas, and enhancements to the beach at Candlestick Cove. A parking area along the northern edge of the Last Port would provide access to this area.

THE BAY TRAIL

The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 400-mile network of bicycling and hiking trails. The Bay Trail will be incorporated into the design of new shoreline park facilities, such as the Waterfront Promenade, Heritage Park, Grasslands Ecology Park, and the CPSRA. It will tie together the entire waterfront park system, providing clear connections to regional greenways and connections to waterways. The Bay Trail will encourage users from adjacent neighborhoods and other areas of San Francisco to utilize the new open spaces of the development and provide increased access to the shoreline. More specifically, the Project may include connections to the existing and new parks from the western boundary of Candlestick Point near the Harney Way/US-101 interchange, through the CPSRA, Yosemite Slough, and HPS Phase 2 shoreline to India Basin, connecting a gap in the Bay Trail that currently exists between the CPSRA to Indian Basin Flats.



	Candlestick Point Development	Figure 4.1.1
	Open Space Parcels	

5. OTHER INFRASTRUCTURE

5.1 BUILDING DEMOLITION

Demolition of structures and other existing improvements within the CP Area shall be executed in compliance with City regulations and with the Project Risk Management Plan. As a minimum standard, materials resulting from demolition activities shall be recycled to the extent required by City codes and regulations and in compliance with the Project Risk Management Plan.

5.2 INTERIM OPERATIONAL REQUIREMENTS

Essential to the function of site infrastructure are the interim improvements which may be required to serve an early phase of the development. An early phase of work may trigger a need for interim parking, drainage, water mains, sewer mains, dry utilities, or modifications to existing utilities for a locale prior to it receiving its final Improvements per the Infrastructure Plan. A specific example is a vehicular turn-around area needed at the terminus of a new street prior to the ultimate extension of the street. Construction and maintenance of such interim improvements shall be by the Developer subject to the DRDAP process and other DDA requirements. These interim improvements shall be removed, relocated or abandoned by the Developer, with approval by Department of Public Works, after final Improvements are in place.

Normally, the wet utilities within City right of way will be installed per the requirements of this Infrastructure Plan when the new street is constructed; however, the Developer reserves the right to request of the City the ability to connect these new wet utilities to the existing City facilities. City concurrence shall not be unreasonably withheld, provided City system capacities are not exceeded. City approval would also be contingent on bonding and the Developer minimizing damage to the existing City streets. For example, new storm and sanitary sewer segments may be temporarily connected to the City's combined sewer mains.

5.3 WATERFRONT IMPROVEMENTS

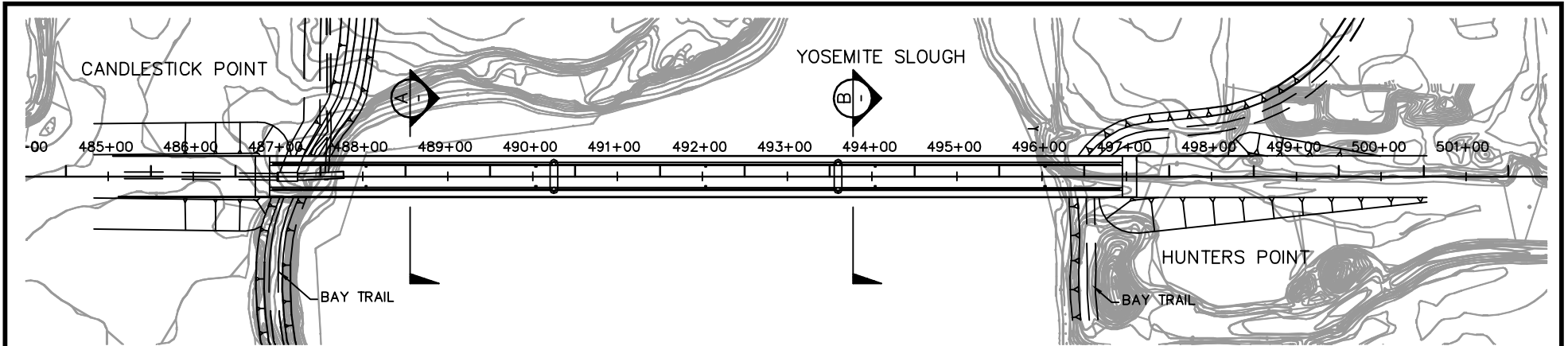
As part of the Project, the Developer will make improvements to the shorelines outside the jurisdiction of the CPSRA to minimize, to the maximum extent practical, the effects of coastal flooding and to provide continuous public access along San Francisco Bay. The existing waterfront of the CP Area is characterized by either slopes protected by riprap or concrete debris, or beach-fronted, unprotected slopes. The existing top of bank ranges from elevation 104 feet, Project Datum (a localized low spot only) to as much as 122 feet, Project Datum.

Waterfront improvements in the CPSRA will be at the discretion of, and pursuant to a separate agreement with, the California State Parks through the ongoing planning process for the CPSRA.

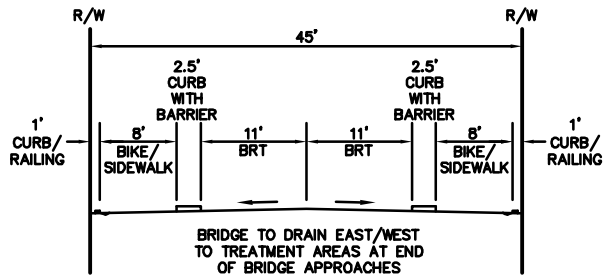
Shoreline Improvements that are part of the development in the CP Area are the slope protection for the south abutment of the Yosemite Slough Bridge and storm drainage outfalls to the Bay. These will be phased over a period of several years. The timing of Waterfront improvements shall be consistent with the Project phasing of the DDA, and with principal of adjacency described in Section 6. Upon acceptance of the waterfront improvements by the City, the City will assume responsibility for the operation and maintenance of all facilities, including responsibility for compliance with all regulations and mitigation measures. Acceptance of waterfront improvements at CPSRA will be defined by a separate agreement.

5.4 YOSEMITE SLOUGH BRIDGE

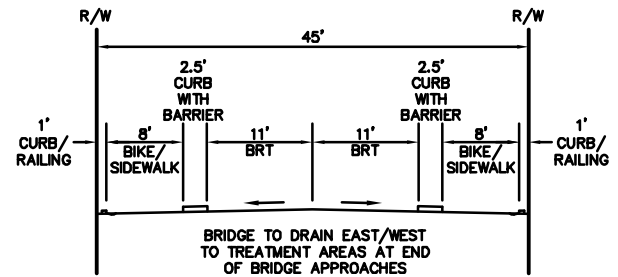
A new Yosemite Slough bridge will be constructed to extend Arelious Walker Drive to the HPS2 Area. A 250-foot long section of Arelious Walker Drive in the CP Area east of Carroll Avenue would serve as the western bridge approach roadway. The new bridge and approach roadways, their lane configurations and operations, are more fully described within the HPS2 Area Infrastructure Plan and shown herein on Figure 5.4.1.



YOSEMITE SLOUGH BRIDGE PLAN
NTS



SECTION A (B-07)
NTS



SECTION B (B-08)
NTS

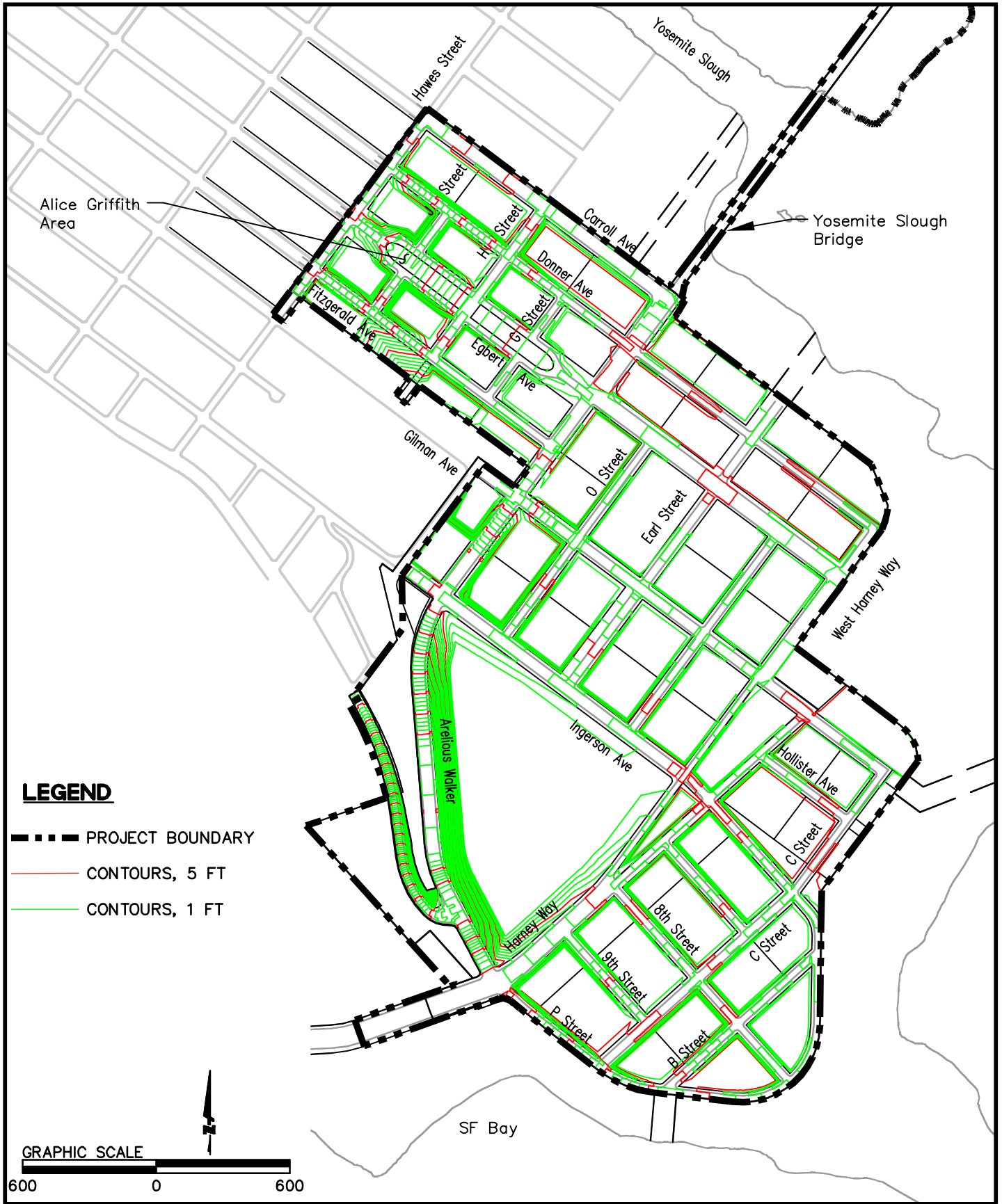
Candlestick Point Development		Figure 5.4.1
Yosemite Slough Bridge/Approach Roadways		

5.5 GRADING & SURCHARGE

Grading, including preparation, import fill, excavation fill and compaction consistent with the Project Risk Management Plan and Soil and Groundwater Management Plan, will occur to some degree over certain portions of the CP Area. The preliminary site grading is shown on Figure 5.5.1. Final grades based on this preliminary site grading plan will be determined through the design review and approval process. The degree of grading will vary depending upon the needs of each zone within the CP Area determined by gravity utilities, access requirements, projections of SLR, and/or other criteria. Grades in all areas of the Project will be adequate to accommodate the storm drain overland flow considerations.

In addition to grading, retaining walls may need to be constructed by the Developer in specific portions of the CP Area. These retaining walls may be needed in major landslide hazard areas as required by the Geotechnical Analysis of the site. Retaining walls may also be needed on sloped parcels to create a level pad.. The Project will develop a private maintenance entity to maintain the retaining walls.

Surcharge techniques may be utilized in particular zones, including right of way areas, in order to accelerate consolidation. The grading will be defined by a Grading and Storm Drainage Master Plan, which has been submitted by the Developer to the City.



Candlestick Point Development		Figure 5.5.1
Preliminary Site Grading		

5.6 UTILITY RELOCATION

A number of existing utilities may require relocation during the course of Project development. Additionally, undefined relocations may be necessary to accommodate the installation of Infrastructure described elsewhere in this Infrastructure Plan. It will be the responsibility of the Developer and utility companies to maintain uninterrupted service to existing users. When feasible, all utilities should be installed in the locations provided for in the respective Master Plans, to avoid the need for future relocation. Although not defined in this Plan, relocations shall be delineated in the Tentative Map process and specifically detailed in the Improvement Plan process.

5.7 COMMUNITY FACILITIES LOTS

There is approximately 1.0 acre of land in the CP Area identified in the Land Use Plan as a Community Facilities Lot. Under the Community Benefits Plan, this land can be used for a police station, fire station, school, or transferred to the Developer for its development. The location of this Community Facilities Lot is shown on Figure 5.7.1.

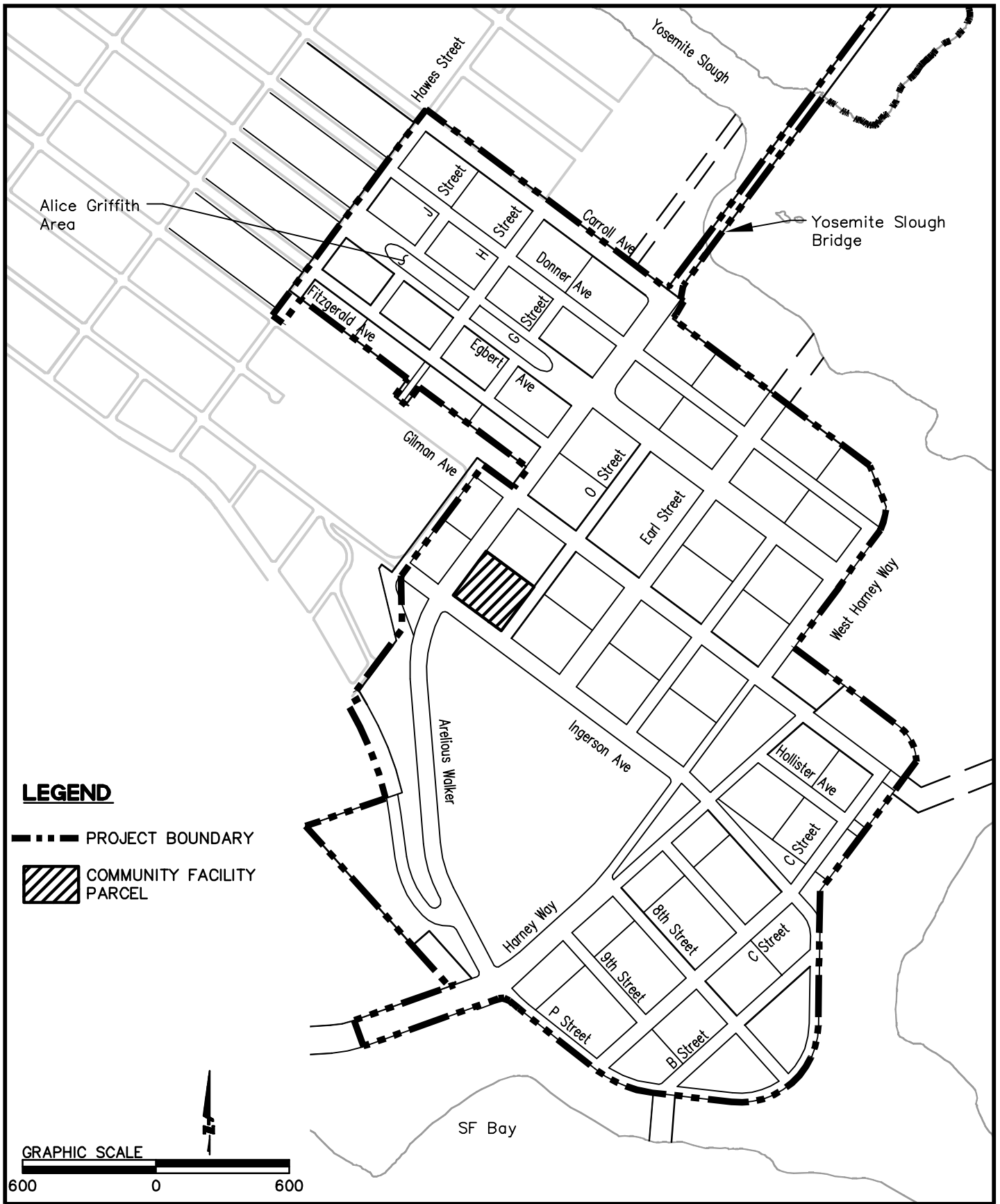
5.7.1 CONDITION OF AGENCY PARCELS

In coordination with the requirements of the DDA and as part of the Project Infrastructure, the Developer shall complete all work necessary to create Developable Lots for Community Facilities within the Project Site, and shall deliver such Lots to the Agency. To be a Developable Lot, the following conditions shall be met:

1. A final subdivision map for conveyance and financing of the Lot as a separate legal parcel has been recorded in the Official Records of the City and County of San Francisco, and applicable appeal periods for such approvals and the environmental clearances for such approvals have expired without appeal, or if there has been an appeal, a final non-appealable judgment has been entered in a court or administrative agency of competent and final jurisdiction affirming the approvals and environmental clearances that were issued for the building site;
2. The Lot has been graded and soil compacted in accordance with the grading plans approved by the Agency, including necessary elevations;
3. The Lot is served by the Infrastructure described in this Infrastructure Plan with respect to the Lot;

4. The Lot is in the environmental regulatory condition required by the DDA based upon the proposed use of the Lot; and
5. All other obligations outside the boundaries of the Lot as required by all applicable Governmental Agencies have been fulfilled, or appropriate guarantees, bonds and/or subdivision improvement agreements acceptable to the City are in place, to enable a Vertical Developer to obtain a building permit to commence construction on the Lot.

With respect to the Open Space Parcels, in addition to creating Developable Lots as set forth above, Developer shall also complete the surface improvements and utilities in accordance with the Park and Open Space Plan.



Candlestick Point Development		Figure 5.7.1
Community Facilities Lots Location		

6. INFRASTRUCTURE PHASING METHODOLOGY

6.1. INFRASTRUCTURE PHASING

Infrastructure improvements will be constructed in accordance with the development phasing plan presented in the DDA. Improvements will be constructed in accordance with the Adjacency principle or based on cumulative development requirements as described more fully below.

6.1.1 ADJACENCY

Adjacency is a primary underlying principle of the phasing of improvements described in this CP Infrastructure Plan, and unless otherwise specifically provided in the DDA and Plan Documents, Infrastructure will be constructed based on this principle. When development occurs in a Major Phase, Sub-Phase, or for a discrete portion of the development (Block) therein, the adjacent Infrastructure necessary for access and for utilities, such as streets (including Infrastructure Improvements therein, if any), curbs, gutters, sidewalks and open space will be constructed. Adjacent Infrastructure refers to Infrastructure which is near to and may share a common border or end point with a Major Phase, Sub-Phase or Block but which may not be immediately adjoining or contiguous with a Major Phase, Sub-Phase, or Block. This may specifically include Arelious Walker Drive, Gilman Street, Harney Way, and others. Infrastructure will be constructed in accordance with the adjacency principle, unless other specific criteria described below applies.

Similarly, the construction of low pressure water, recycled water, storm drainage (including LID measures), sewer, and other utility facilities will be constructed as part of the roadway infrastructure. Infrastructure improvements necessary to make the utility facilities operable, whether located in the CP Area or off-site, are required to be constructed in unison.

Proposed infrastructure improvements are anticipated to be constructed by the adjacency principle, with the exception of the following improvements:

- Development of Alice Griffith Blocks 1 and 2 - Two lanes of Arelious Walker Drive (west of the planned median) will be constructed adjacent to the development from the intersection with Carroll Avenue to and including the intersection with Egbert Avenue.
- Development of Alice Griffith Blocks 4 and 5 - Two lanes of Arelious Walker Drive (west of the planned median) will be constructed adjacent to the development and extended from Earl Street south to include the intersection with Gilman Avenue.

- Development of Candlestick South Blocks 6a, 8a, 9a and 11a - The existing Jamestown Avenue and Hunters Point Expressway must remain in service to allow access to this development when it is constructed.
- Development of Candlestick North Blocks 8 and 9 - Extend Arelious Walker Drive from south of Gilman Avenue to, and including, the intersection with Harney Way, and construct Jamestown Avenue improvements.
- Construction of the Yosemite Slough Bridge approach (Arelious Walker Drive north of Carroll Avenue) will occur when the BRT route is implemented.

6.1.2 CUMULATIVE DEVELOPMENT REQUIREMENTS

The second principle of infrastructure phasing is "cumulative development requirements". Due to the effect of cumulative traffic growth, some key intersections or street segments may begin to reach congested conditions before development occurs on sites adjacent to those intersections or street segments, and before improvements would be constructed due to Adjacency.

Therefore, thresholds have been established for each applicable traffic infrastructure improvement, based on the amount of cumulative development likely to cause one or more intersections in the CP Area to deteriorate to unacceptable levels of service.

Tables 6.1.1 and 6.1.2 identify the street intersections and street segments improvements, respectively, that are subject to cumulative development requirements and show the Major Phase and Sub-Phase at which each improvement will be required.

Transit service improvements shall be gradually increased to anticipate development build-out as described in the Transit Operating Plan.

Table 6.1.1 – Project Intersection Improvements			
Intersection	Improvement	Traffic Volume Trigger?	Trigger
Project Improvements			
Arelious Walker Drive / Harney Way / P Street	New Traffic Signal	No	CP-02 (Adjacency)
Arelious Walker Drive / Jamestown Avenue	New Traffic Signal	No	CP-02 (Adjacency)

Arelious Walker Drive / Ingerson Avenue	New Traffic Signal	No	CP-02 (Adjacency)
Arelious Walker Drive / Gilman Avenue	Construct Intersection (Stop-Control)	No	CP-01 (Adjacency)
	New Traffic Signal	No	CP-02
Arelious Walker Drive / Egbert Avenue	Construct Intersection (Stop-Control)	No	CP-01 (Adjacency)
	New Traffic Signal	No	CP-02
Arelious Walker Drive / Donner Avenue	Construct Intersection (Stop-Control)	No	CP-01 (Adjacency)
	New Traffic Signal	No	CP-06 (Implementation of BRT)
Arelious Walker Drive / Carroll Avenue	Construct Intersection (Stop-Control)	No	CP-01 (Adjacency)
	New Traffic Signal	No	CP-06 (Implementation of BRT)
Harney Way / 8 Street	New Traffic Signal	No	CP-02 (Adjacency)
Harney Way / Ingerson Avenue	New Traffic Signal	No	CP-02 (Adjacency)
West Harney Way / Ingerson Avenue	New Traffic Signal	No	CP-02 (Adjacency)
West Harney Way / Gilman Avenue	New Traffic Signal	No	CP-06 (Implementation of BRT)
West Harney Way / Egbert Avenue	New Traffic Signal	No	CP-06 (Implementation of BRT)
Earl Street / Egbert Avenue	New Traffic Signal	No	CP-06 (Implementation of BRT)
Harney Way / Executive Park East	New Traffic Signal, Reconfiguration	No	CP-02
Harney Way / Thomas Mellon Drive	New Traffic Signal, Reconfiguration	No	CP-02

Mitigation Measures			
Tunnel Avenue / Blanken Avenue	Reconfiguration ^a	Yes	CP-13 (Approximately 4,400 PM peak hour vehicle trips)
a. Reconfigure the northbound and southbound approaches to the intersection of tunnel Avenue / Blanken Avenue to provide dedicated left-turn lanes adjacent to shared through/right-turn lanes. Approximate number of project-related and background cumulative traffic growth expected to necessitate need for improvement at construction of CP-13, based on latest development phasing schedule as of February 2014.			

Table 6.1.2 – Project Street Section Improvements			
Street	Improvement	Traffic Volume Trigger?	Trigger ^b
Project Improvements			
Arelious Walker Drive, Shafter Avenue to Carroll Avenue	Construct Yosemite Slough Bridge	No	CP-06 (Implementation of BRT)
Arelious Walker Drive, Carroll Avenue to Gilman Avenue	Interim Two-Lane Condition	No	CP-01 (Adjacency)
	Ultimate Condition (See Figures 2.1.2A – 2.1.2G)	Yes	CP-06 (Approximately 3,500 PM Peak Hour Vehicle Trips) or Implementation of BRT
Arelious Walker Drive, Gilman Avenue to Harney Way	See Figures 2.1.2A – 2.1.2G	No	CP-02 (Adjacency)
Harney Way Widening, Arelious Walker Drive to Thomas Mellon Drive	See Figure 2.1.3	No	CP-02 (Adjacency)
	See Figure 2.1.4	Yes/TBD ^a	Study Determines LOS Conditions Warrant
Jamestown Avenue, Arelious Walker Drive to Third Street	Resurface and Restripe	No	CP-09
Ingerson Avenue, Arelious Walker Drive to Third Street	Resurface and Restripe	No	CP-09
Gilman Avenue, Arelious Walker Drive to Third Street	Reconstruct or Resurface and Restripe	No	CP-02
Carroll Avenue, Arelious Walker Drive to Ingalls Street	See Figures 2.1.2A – 2.1.2G	Yes	CP-04 (Approximately 3,200 PM Peak Hour Vehicle Trips, CP & HP)
Ingalls Street, Carroll Avenue to Thomas Avenue	See Figures 2.1.2A – 2.1.2G	No	HP-06 (Reconstruction of Crisp Avenue) ^c

Mitigation Measures			
San Bruno Avenue, Mansell Street to Silver Avenue	Signal Priority Treatments	No	Supplemental Study Determines Transit Travel Times Have Degraded
Gilman Avenue, Arelious Walker Drive to Third Street	Full-time WB transit only lane and PM peak hour EB transit only lane	No	Supplemental Study Determines Transit Travel Times Have Degraded
Paul Avenue, Third Street to Bayshore Boulevard	Full-time WB transit only lane	No	Supplemental Study Determines Transit Travel Times Have Degraded
<p>a. An isolated intersection analysis conducted for the project refinements proposed and approved in January 2014 shows that the two intersections along Harney Way would operate acceptably with the near-term configuration even with full buildout of the project. However, because Harney Way is part of a complex series of roadway improvements and due to the inherent uncertainty in traffic forecasts, a study will be conducted prior to construction of each development phase to determine whether conditions are better or worse than projected. The results of that study will indicate whether additional development can be accommodated under the near-term configuration while maintaining acceptable LOS or whether widening is required.</p> <p>b. When a sub-phase is listed as the trigger, the improvement shall be fully constructed and operational prior to occupancy of the sub-phase.</p> <p>c. Although improvements to Ingalls Street were proposed as part of the Candlestick Point development, they, along with improvements to Thomas Avenue and Griffith Street will not be necessary until development levels at Hunters Point Shipyard necessitate the provision of a southern access roadway via Crisp Avenue. Until this time, there will not be a complete route to connect Candlestick Point and the Hunters Point Shipyard and these roadway improvements offer no meaningful benefit.</p>			

Another type of improvement subject to the cumulative development principle relates to overland flow facilities. As development in certain regions of the planning area increases, storm runoff due to increases in impervious land areas will also increase. Streets will often provide the drainage corridors for these flows, but it is possible that temporary or permanent drainage pipes, basins or swale corridors will need to be constructed in various locations in the CP Area until ultimate drainage systems are completed.

6.2. SPECIFIC ADDITIONAL FACTORS AND CRITERIA INFLUENCING INFRASTRUCTURE PHASING

Several other factors or specific criteria will affect the timing and nature of Infrastructure construction. Except as provided below, the general phasing principles in this Section as well as those described in the DDA shall control the construction of Infrastructure Improvements.

6.2.1 INTERIM OPERATIONAL REQUIREMENTS

The interim operational requirements as described above shall be provided as necessary to adequately serve a Major Phase, until such time as the final or permanent Infrastructure improvements are constructed. These interim Improvements will be removed and/or abandoned, as determined by the Department of Public Works, when the balance of development occurs. See Section 5.2 for additional discussion.

6.2.2 INTERSECTION & STREET SEGMENT IMPROVEMENTS

INTERSECTION IMPROVEMENTS

Table 6.1.1 identifies the approximate levels of cumulative development that require the implementation of the CP Area intersection improvements at each intersection. Even if not required by the land use intensity threshold shown in Table 6.1.1, the Principle of Adjacency will require the construction of intersection improvements with development of an adjacent Project, regardless of the amount of overall cumulative development. In some cases, interim improvements may be constructed until such time as the ultimate improvements are warranted. Intersections will remain stop sign controlled until the traffic triggers as specified warrant signalization.

STREET SEGMENTS

Table 6.1.2 identifies the approximate levels of cumulative development that would require the implementation of the CP Area street segments improvements. Even if not required by the land use intensity threshold shown in Table 6.1.2, the Principle of Adjacency will require the construction of street segments with the development of an adjacent Project as described above

6.2.3 OPEN SPACE

Timing of open space development will be delineated by the schedule of performance outlined in the DDA.

6.2.4 INTERCONNECTING INFRASTRUCTURE

The following interconnecting Infrastructure systems should be provided based upon cumulative development requirements as follows: low pressure water, recycled water, separated sanitary sewer, separated storm drainage, dry utilities and joint trench.