
INFRASTRUCTURE PLAN

CANDLESTICK POINT DEVELOPMENT

(VOLUME 1)

AND

HUNTERS POINT SHIPYARD

PHASE 2 DEVELOPMENT

(VOLUME 2)

AUGUST 3, 2010

ORDINANCE NOS. 210 AND 211-10

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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 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 (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 Project within 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). Section 7 describes the Project Alternative (“Non-Stadium Option”) and the changes to the Infrastructure that would be required as a result.

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 dedicated easements to provide for access and maintenance of Infrastructure facilities. In the event property necessary to provide the rights-of-way or easements for construction of improvements shown herein cannot be acquired by the Developer, alternate Infrastructure designs will be submitted by the Developer for consideration by the City. 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 will be allowed within the Project as may be necessary to service the development. 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.

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 TECHNICAL MEMORANDA

Each Infrastructure system described herein has been more fully described in a Technical Memorandum or other report that has been submitted separately to the City and reviewed. These documents identify the key design criteria and provide more detailed layouts of each Infrastructure system. These Technical Memoranda form the basis of what will become Master Plans for each utility system, to be approved by the City at a later date. Approval of this Infrastructure Plan does not imply approval of the respective utility system Technical Memoranda. 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.

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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.

The street structural sections will consist of three typical types: asphaltic concrete over concrete; asphaltic concrete over aggregate base; and a combination to meet and match existing streets. The City may allow flexible pavements in the CP Area as a modification to Sections 208 and 209 of Standard Specifications and the CP/HPS2 Subdivision Regulations that are in development for

the Project. Future feasibility studies will be conducted for locations within reconstructed roadway sections and parking lots for permeable or porous paving materials.

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 to be 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 – 2.1.2E 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 and the transit systems 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 132 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 / Bill Walsh Way
4. Arelious Walker Drive / Ingerson Avenue
5. Arelious Walker Drive / Gilman Avenue
6. Arelious Walker Drive / Egbert 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

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.

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 4 Street
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.

Changeable message signs will be constructed on- and off-site at intersections receiving high traffic on stadium event days and key entries and exits to the HPS2 Area as determined by the Developer in concurrence with San Francisco MTA. The typical message signs will consist of either a permanent pole with overhead electronic message sign and/or portable changeable message signs with the ability to communicate traffic information such as directions to freeways and bridges, lane increases or reductions and parking information. Overhead lane control signals will also be located at on and off site streets, they will be constructed at either end of the street segments with changeable direction lanes; if the street segment is more than 2300 ft or if the

vertical or horizontal roadway alignment is curved, intermediate overhead lane-use control signals will be constructed such that road users will at all times be able to see at least one signal indication along the roadway. Typical overhead lane control signals consist of signal faces/lights above each lane designated as changeable and supported by a pole on the side of the street. If the street is wide a support pole on both sides of the street may be necessary to span the entire street section. An alternate proven design in use either within or outside the United States may be employed with City approval.

Intersection Configuration / Circulation Plan

The Circulation Plans shown on Figures 2.1.2F - H 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 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 based on traffic triggers 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, PCC and/or AB, 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 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 (up to the top of the PCC base or a maximum of 3 inches) by grinding and placement of a new AC wearing surface. Resurfacing of streets shall include 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 between eastern curb return of Thomas Mellon Circle and Arelious Walker Drive initially in accordance with Figure 2.1.3 to accommodate two transit-only BRT lanes separated from mixed traffic flow by a median, while maintaining two travel lanes in each direction and a center turn lane with and exclusive left turn lanes at specific locations. Exclusive westbound right-turn lane(s) shall also be provided at specific locations as shown. 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 and installation of overhead lane control signals and overhead changeable message signs as needed to be used on event days to clarify any lane directional changes or other pertinent event day information. 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 the traffic triggers presented in Section 6, the Developer will construct further improvements to Harney Way between eastern curb return of Thomas Mellon Circle and Arelious Walker Drive as shown on Figure 2.1.4. Improvements include the addition of 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 landscape width will be narrowed to accommodate the widened roadway. Final configuration improvements will be coordinated with 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 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 extend BRT service on Harney Way and Geneva Avenue 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 based on Traffic Triggers and 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:

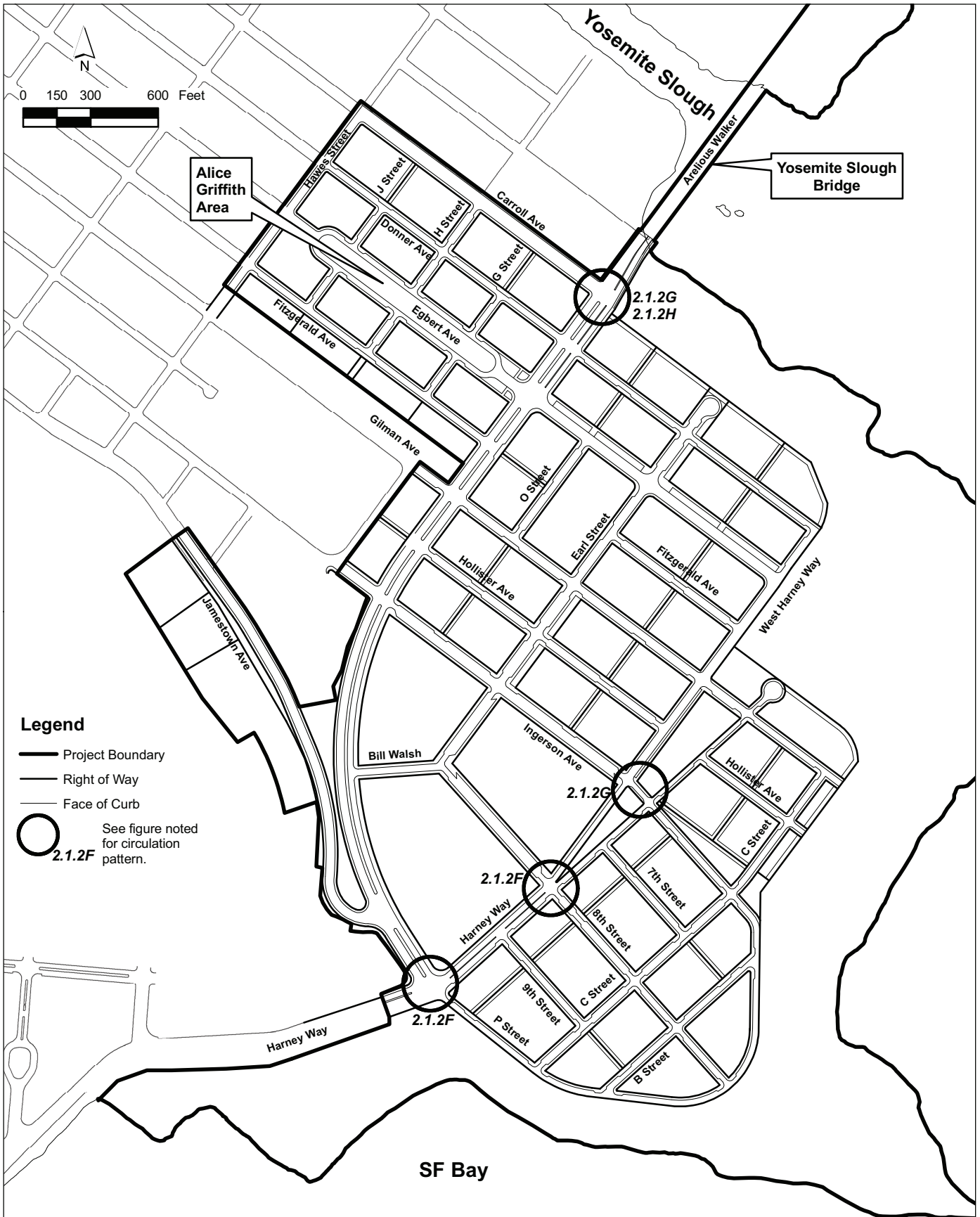
Table 2.1.1 Off-Site Intersection Improvements

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.

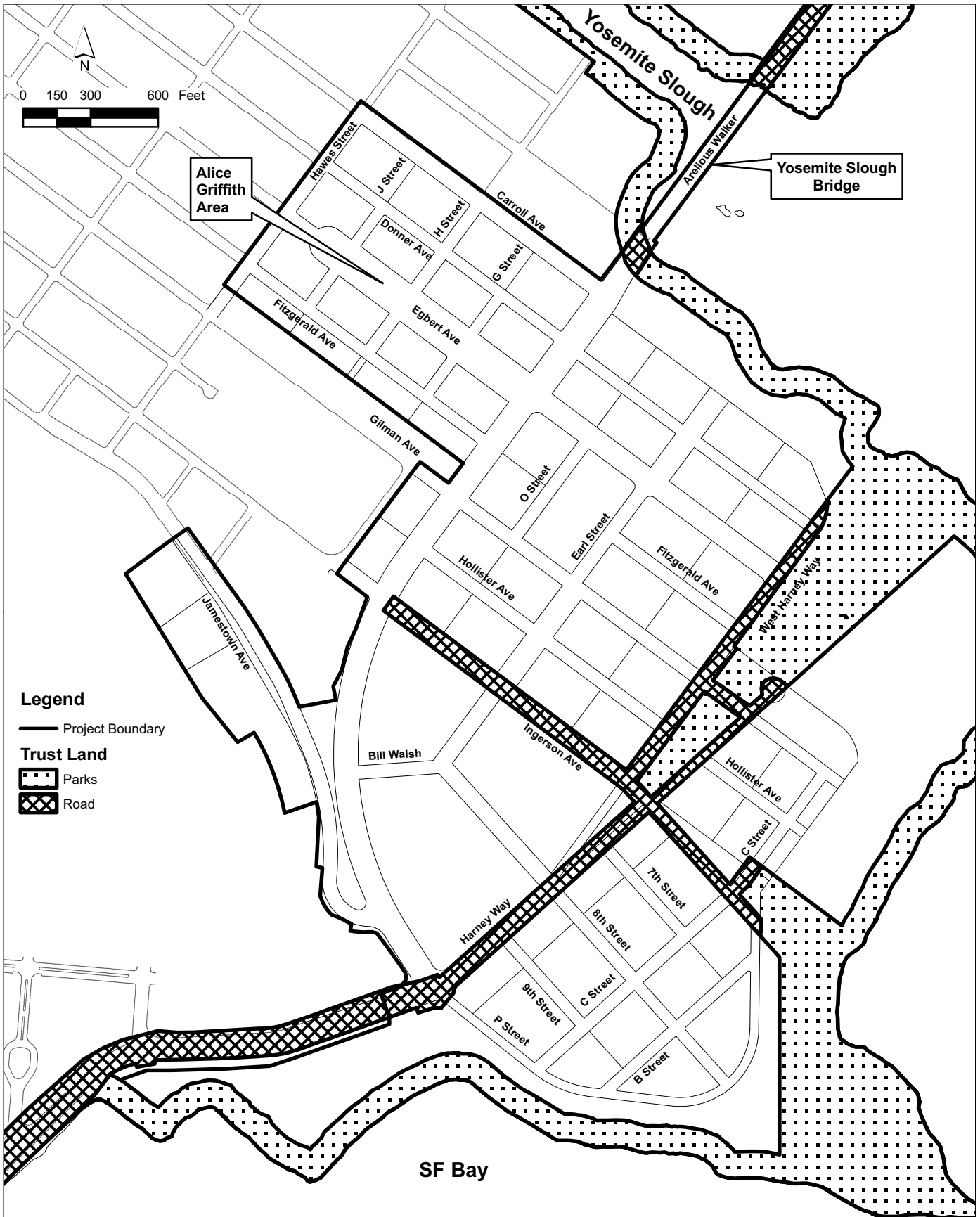
Note: Improvements at Tunnel Avenue and Blanken Avenue will be performed by SFMTA as part of mitigation for the Visitation Valley Redevelopment Program. The improvements listed above may be constructed as part of those improvements but if not they will be constructed separately by SFMTA when triggered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

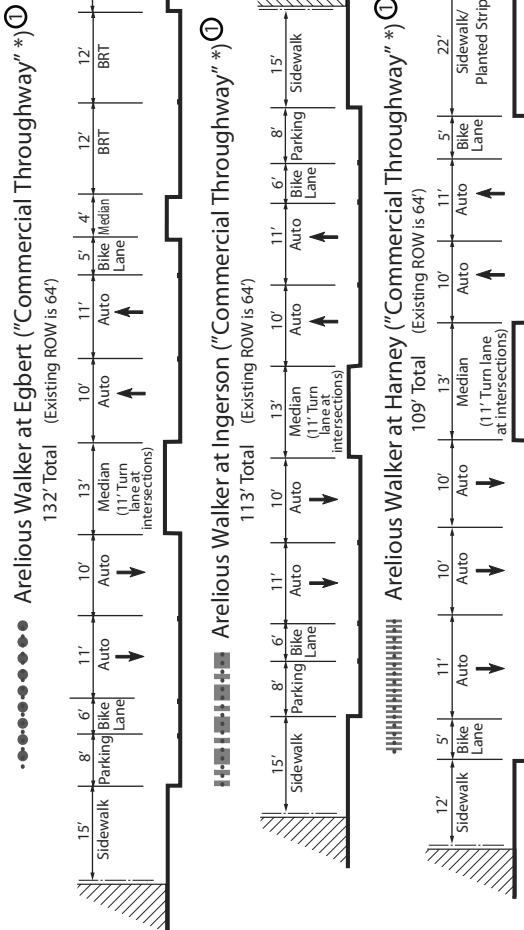


Candlestick Point Development		Figure 2.1.1B
Trust Land		



* Street type based on typology developed in the City of San Francisco Draft Better Street Plan, June 2008.

LEGEND
 Auto Route Alignment
 - - - - - BRT Route Alignment
 Heavy dashed line denotes roadway with exclusive BRT lane(s)



Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

- ① Roadways feature Game Day reversible lanes.
- ② If necessary, the section will be reconfigured to add an additional auto lane to serve increased traffic levels.

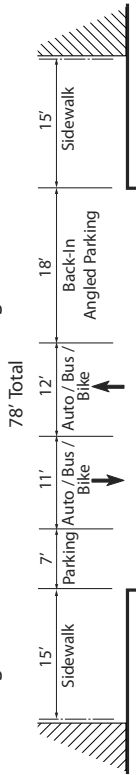
SECTIONS NOT TO SCALE

Candlestick Point Development On-Site Street Network - Arterials

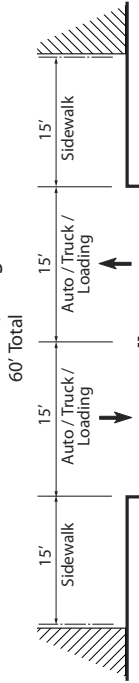
**Figure
2.1.2A**



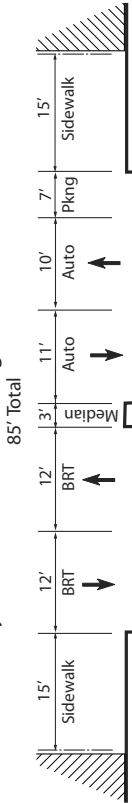
••••• Ingerson at Arellous Walker East ("Neighborhood Commercial Street" *)



■ ■ ■ ■ ■ Bill Walsh at Arellous Walker East ("Neighborhood Commercial Street" *)



■ ■ ■ ■ ■ Harney at Arellous Walker ("Neighborhood Commercial Street" *)



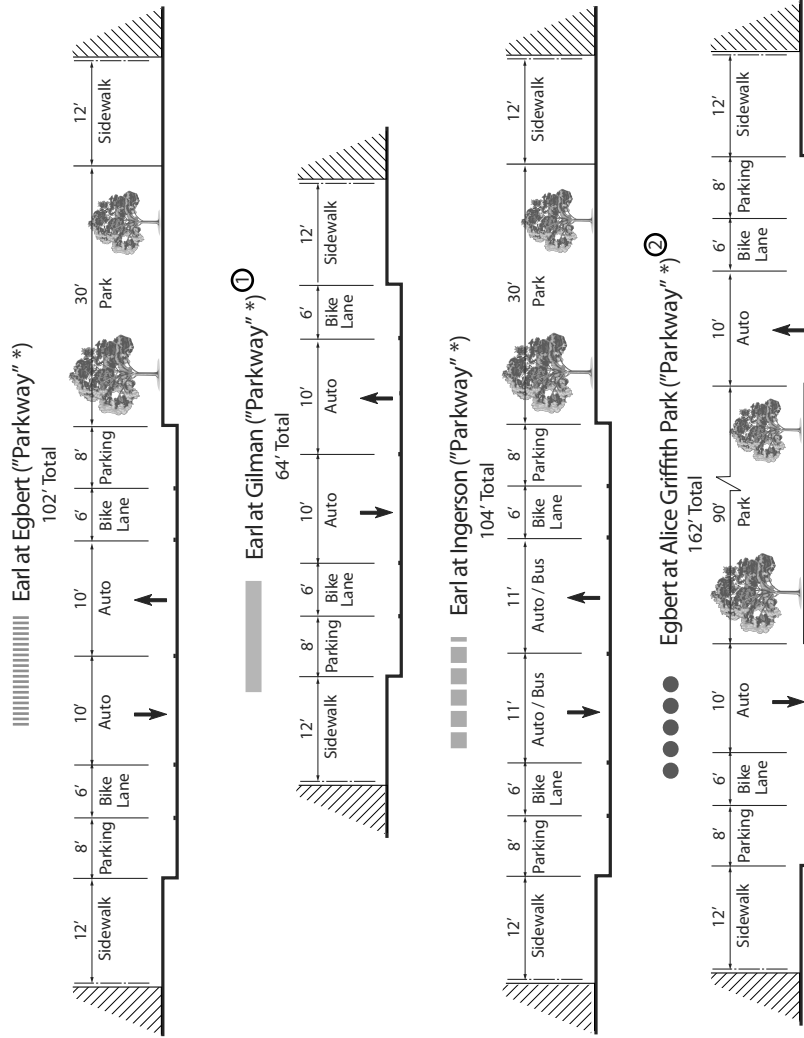
Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

Candlestick Point Development

On-Site Street Network - Collectors

Figure 2.1.2B

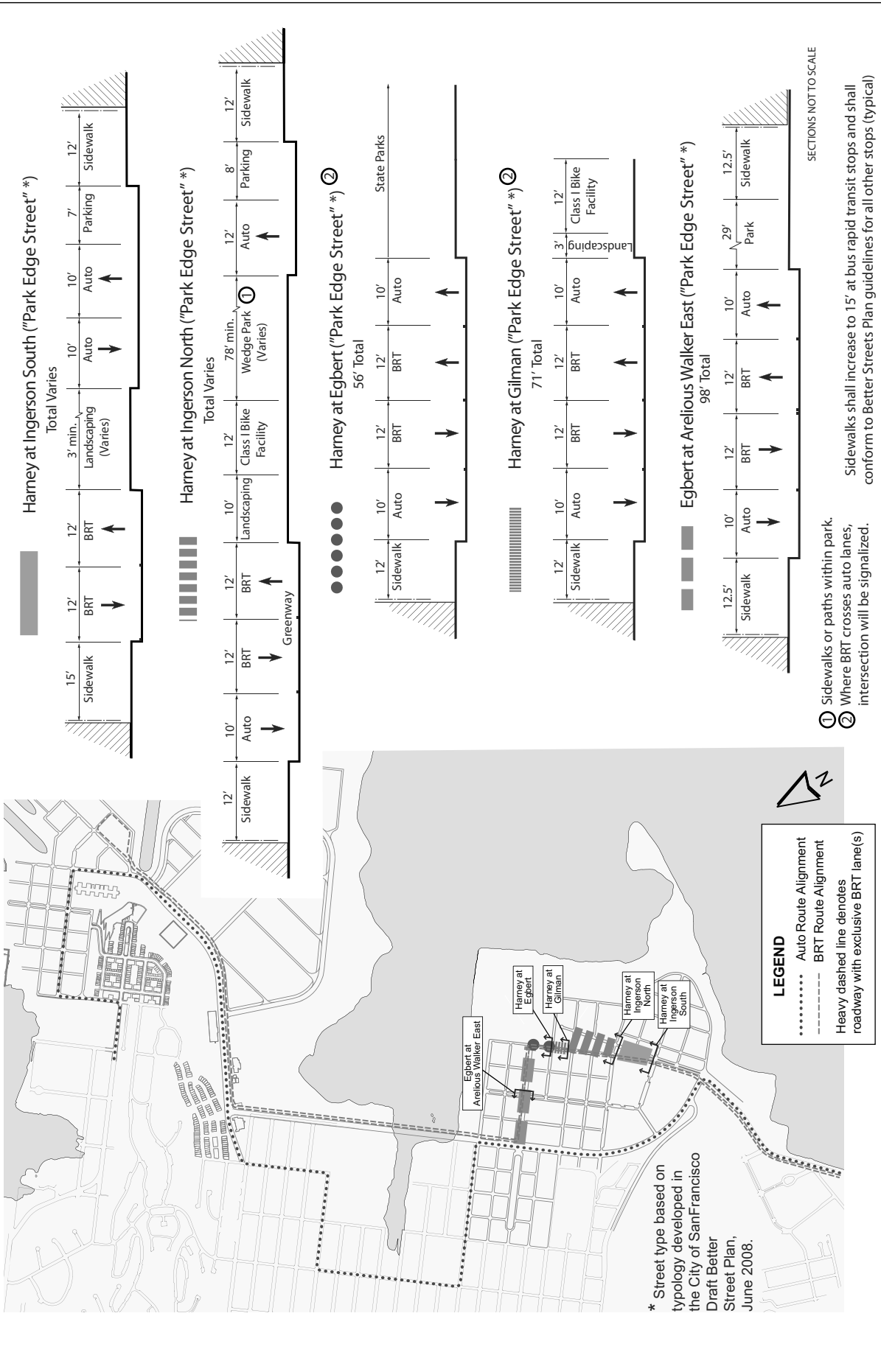


- ① If right-of-way becomes available, this section should be constructed identically to "Earl at Egbert".
 - ② Park ends and travel lanes come together at intersections with Arellous Walker Drive and Hawes Street.
- Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

Candlestick Point Development On-Site Street Network - Parkways

**Figure
2.1.2C**



SECTIONS NOT TO SCALE

① Sidewalks or paths within park.
 ② Where BRT crosses auto lanes, intersection will be signalized.

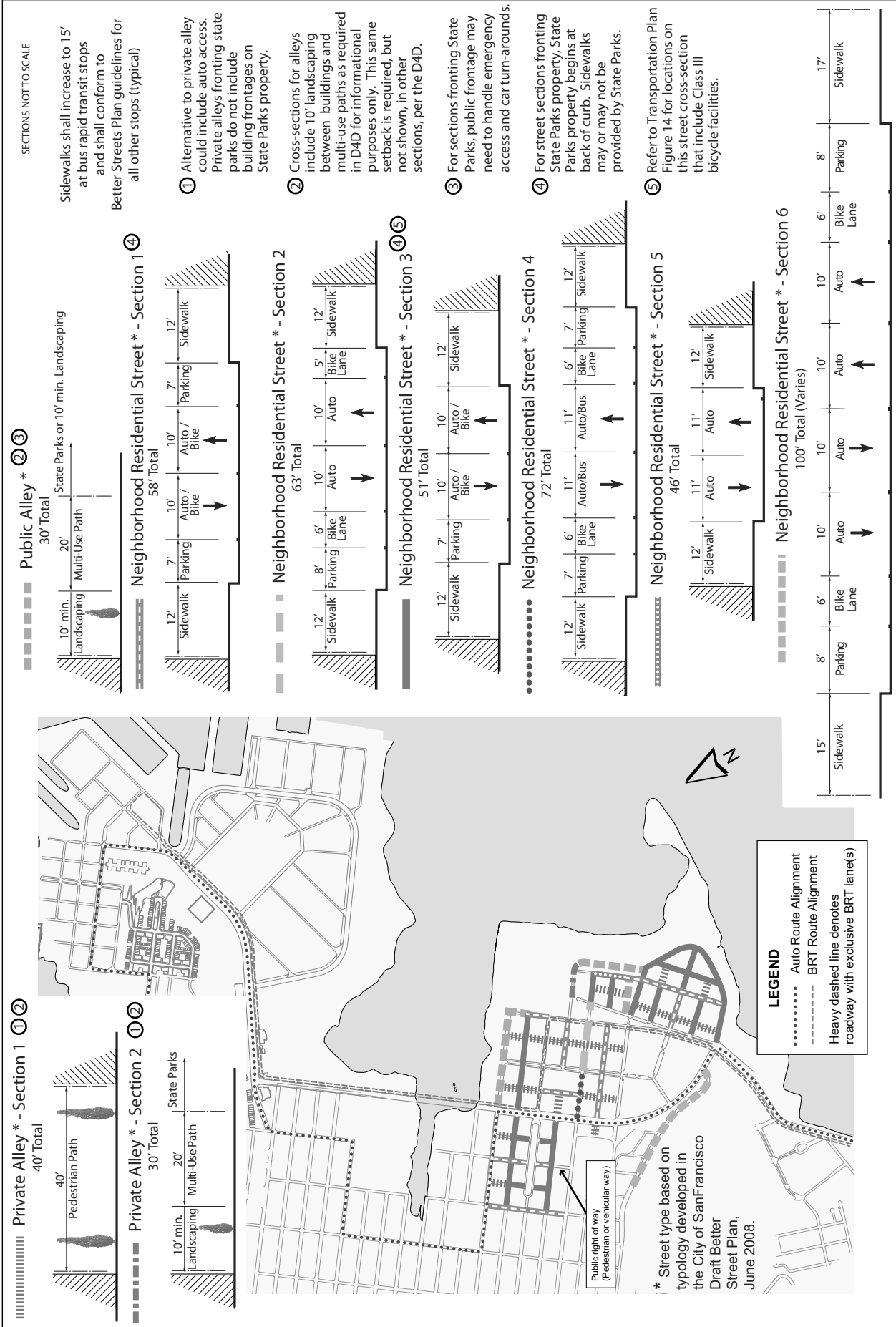
Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

Candlestick Point Development

On-Site Street Network - Park Edge Streets

Figure 2.1.2D

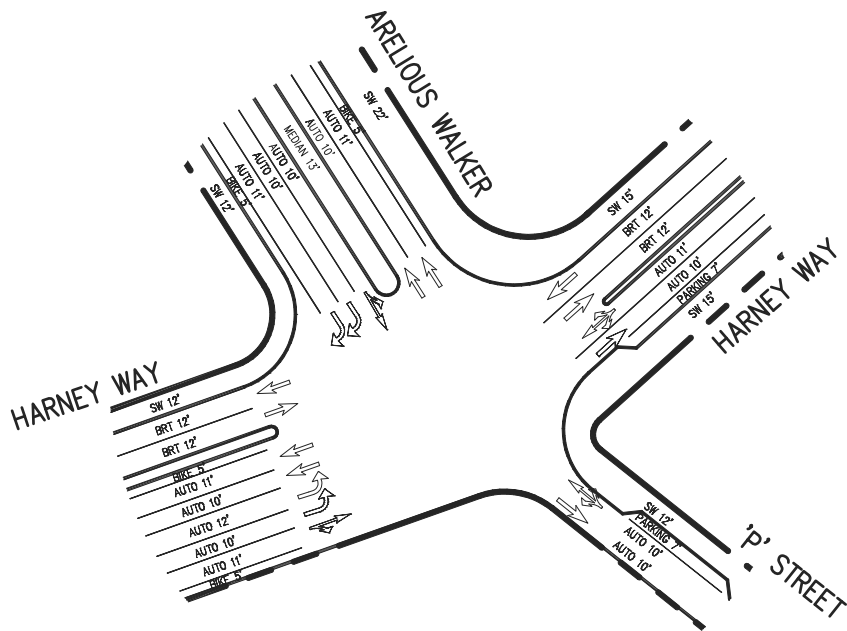
Source: Fehr & Peers



Candlestick Point Development
On-Site Street Network - Local Streets

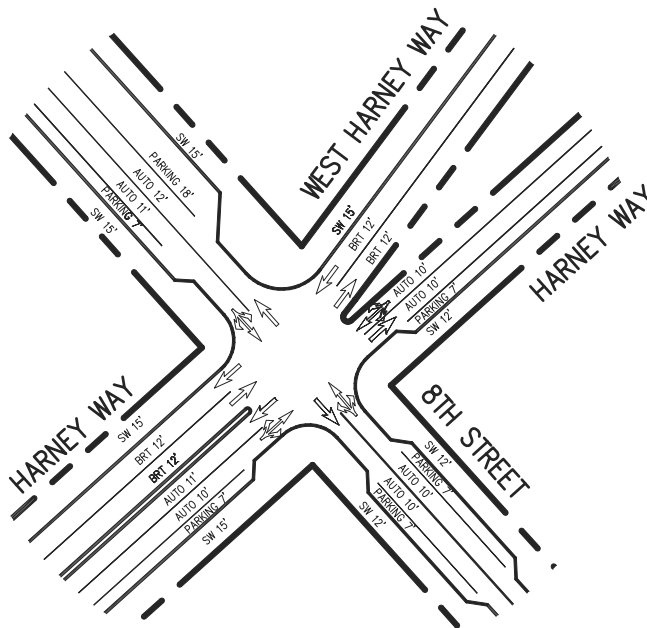
Figure 2.1.2E

Source: Fehr & Peers



ARELIIOUS WALKER AND HARNEY WAY (INITIAL CONFIGURATION)

SCALE: 1"=100'



HARNEY WAY AND 8th STREET

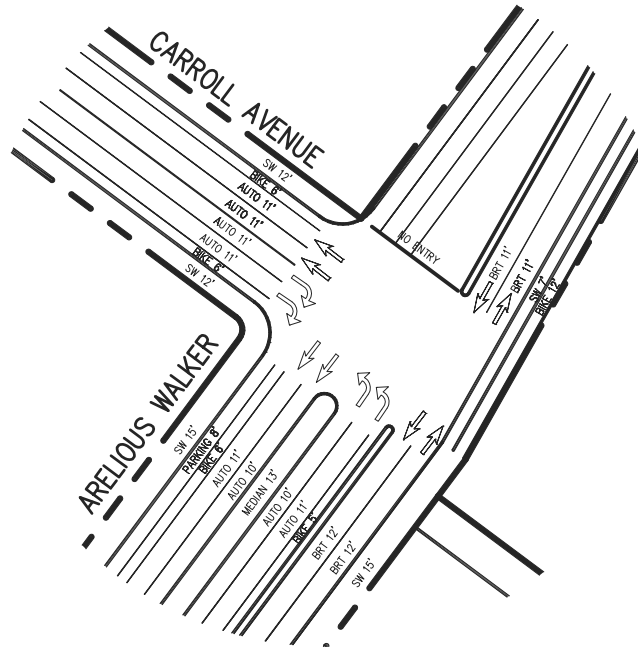
SCALE: 1"=100'



Candlestick Point Development
Major Intersection Circulation Details

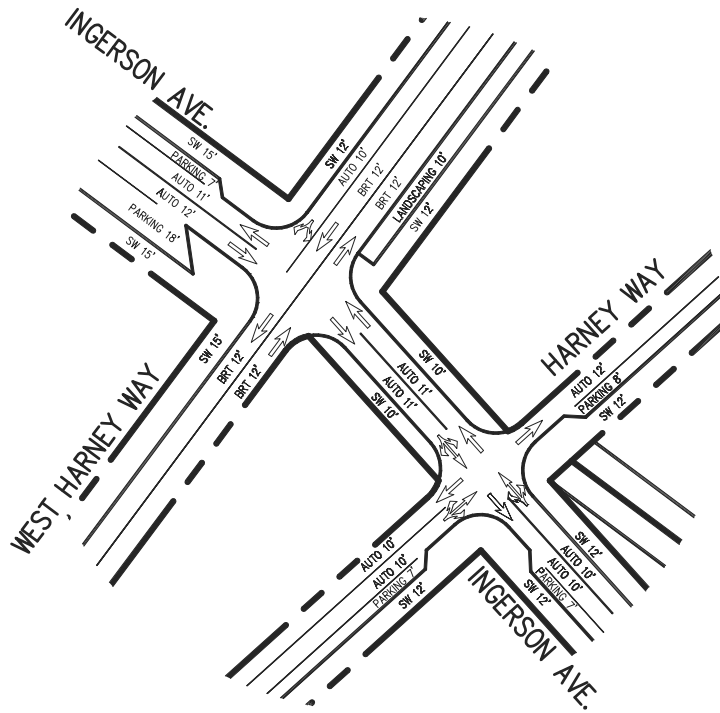
Figure 2.1.2F

SEE FIGURE
2.1.2H FOR
GAME DAY
POST GAME



ARELIIOUS WALKER AND CARROLL AVENUE (NON-GAME DAY)

SCALE: 1"=100'



HARNEY WAY AND INGERSON AVENUE

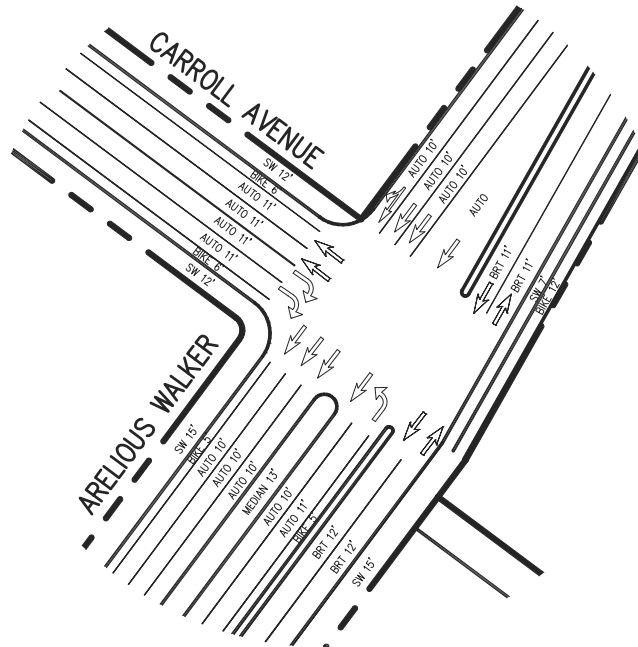
SCALE: 1"=100'



**Candlestick Point Development
Major Intersection Circulation Details**

**Figure
2.1.2G**

SEE FIGURE
2.1.2G FOR
NON-GAME DAY



ARELIIOUS WALKER AND CARROLL AVENUE (GAME DAY-POST GAME)

SCALE: 1"=100'



Candlestick Point Development

Major Intersection Circulation Details

**Figure
2.1.2H**

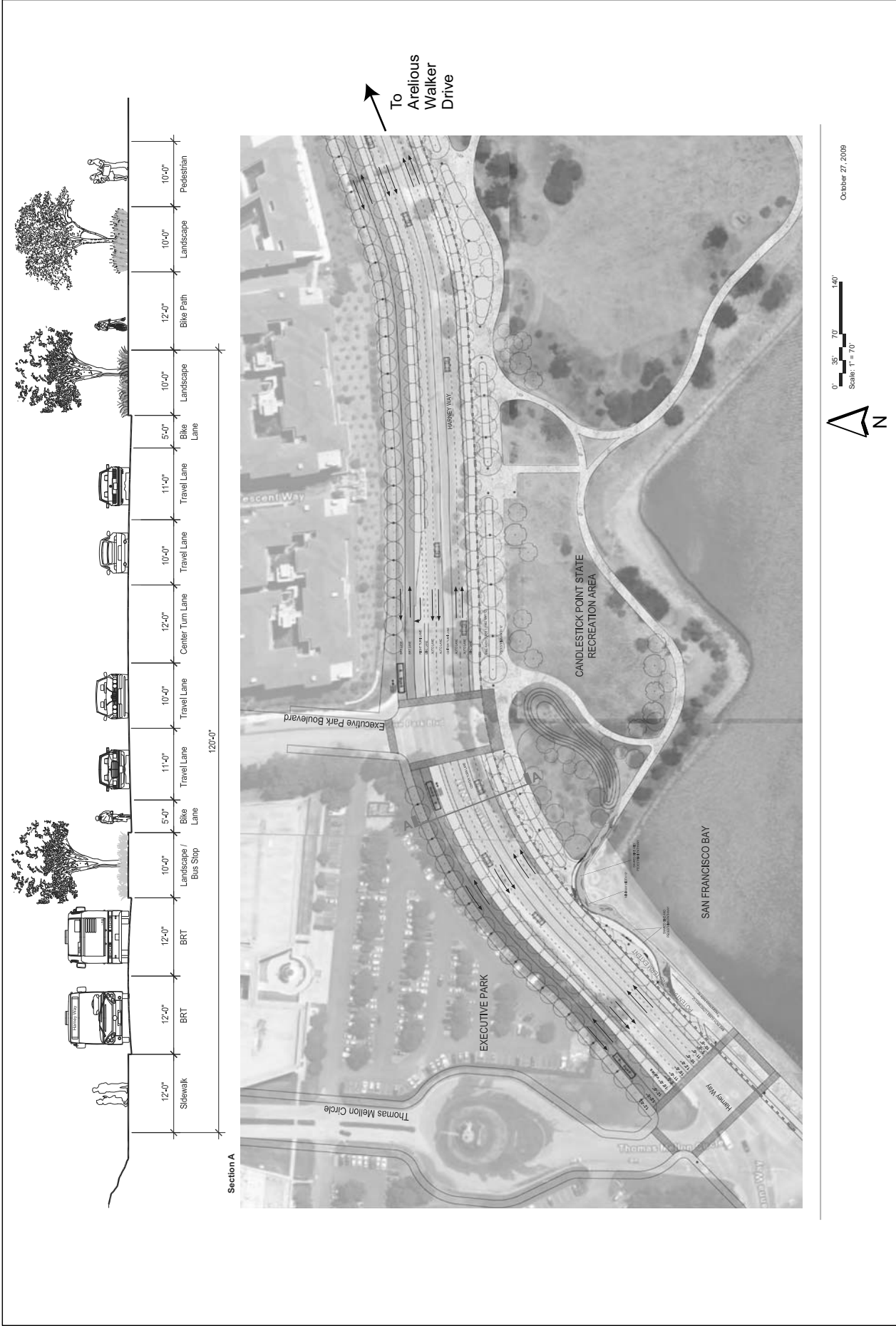
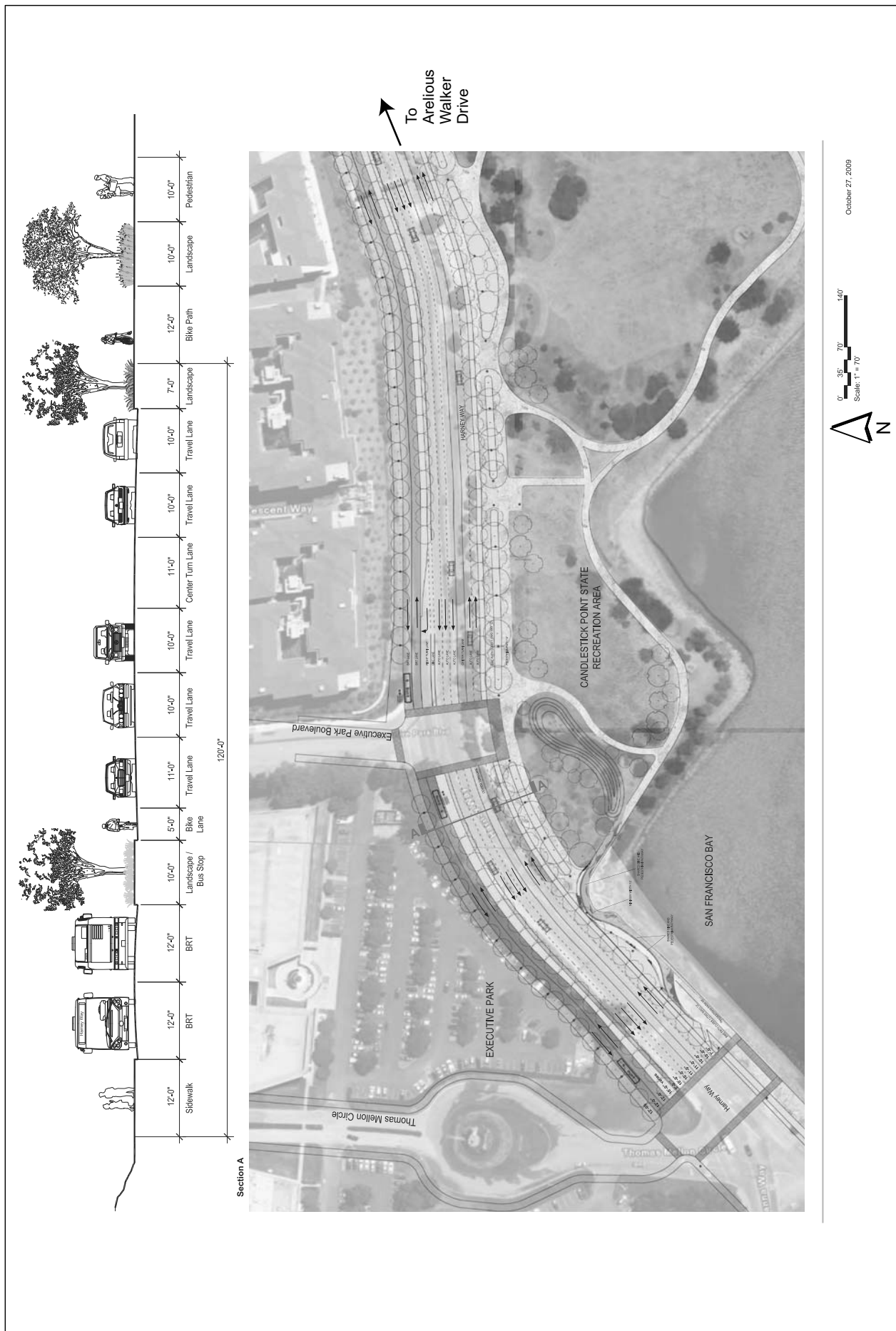


Figure 2.1.3

**Candlestick Point Development
Harney Way Widening - Initial Configuration**

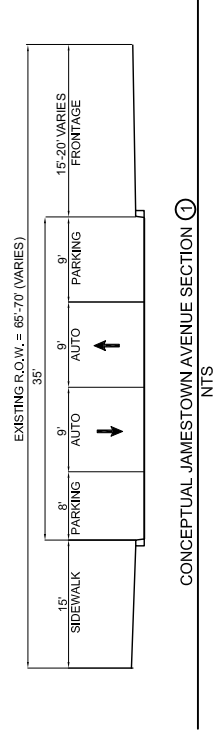
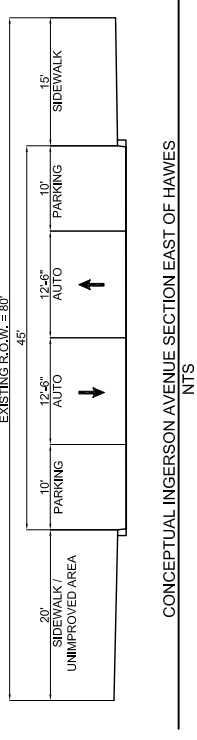
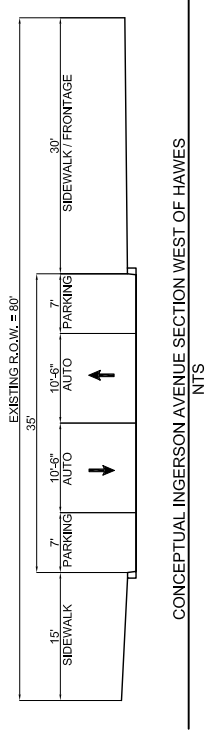
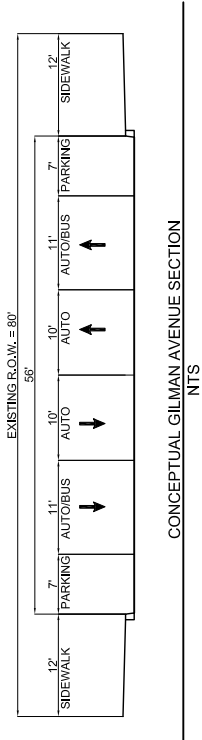
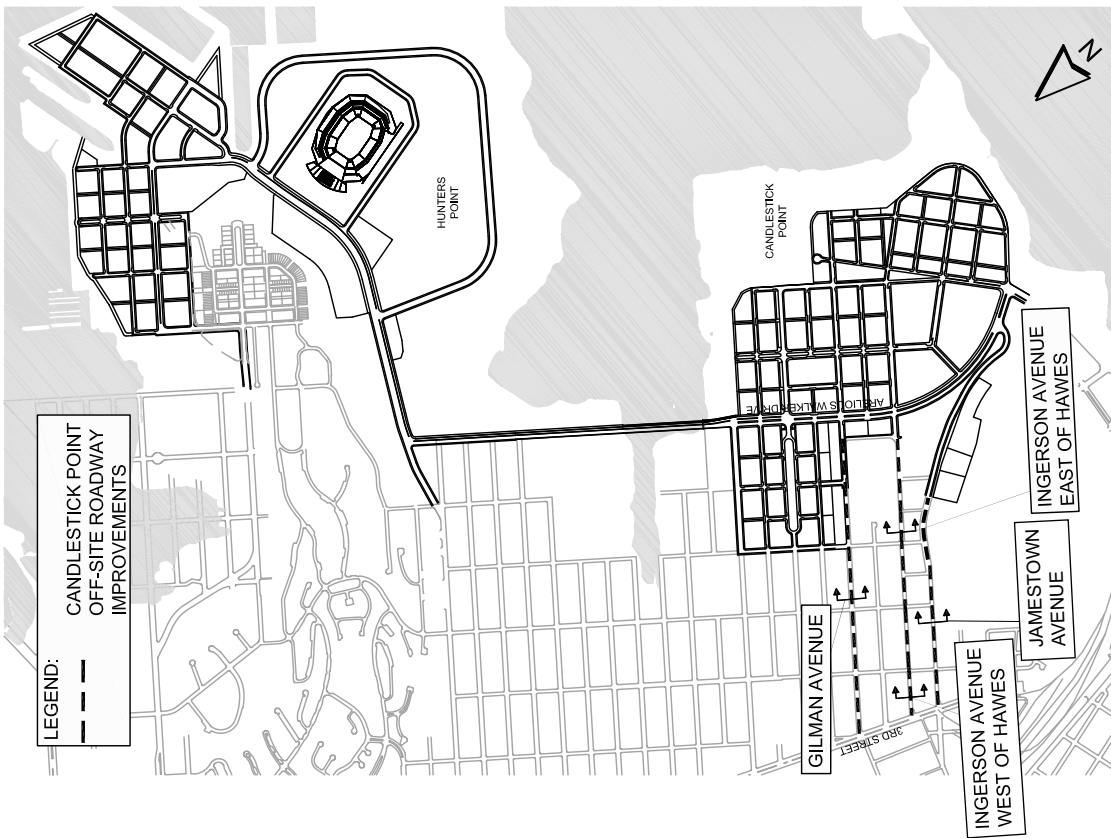
Source: Fehr & Peers



Candlestick Point Development
Harney Way Widening - Ultimate Configuration

Figure 2.1.4

Source: Fehr & Peers



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 833-988 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

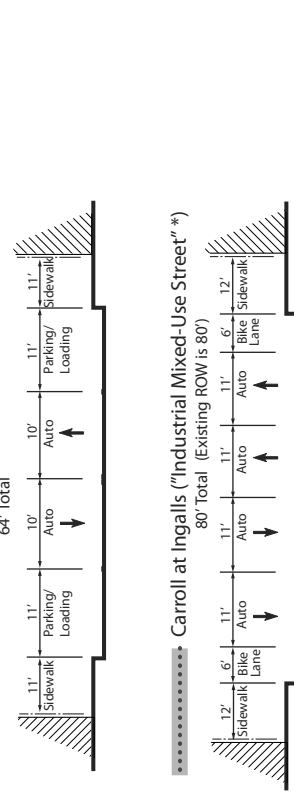
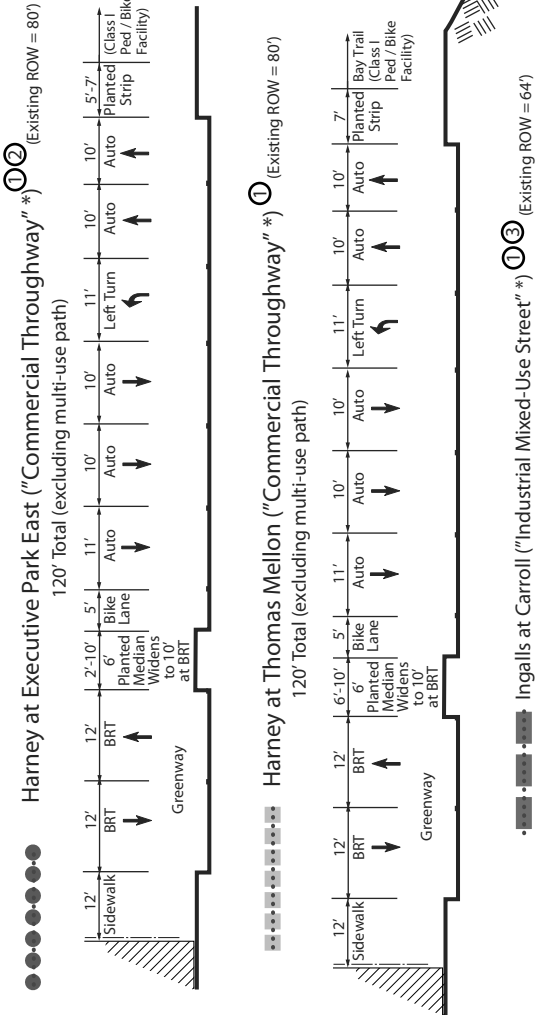
Figure 2.1.5



* Street type based on typology developed in the City of San Francisco Draft Better Street Plan, June 2008.

LEGEND

- Auto Route Alignment
- BRT Route Alignment
- Heavy dashed line denotes roadway with exclusive BRT lane(s)



- ① Roadways feature Game Day reversible lanes.
- ② Median separating BRT lanes and westbound auto/bike travel lanes narrows to 2' and planted strip narrows to 5' to accommodate 10' max westbound right-turn lane at Executive Park Boulevard East.
- ③ Truck loading is permitted on either side of Ingalls and Griffith from 6 AM to 4 PM; parking/loading lane becomes auto travel lane from 4 PM to 7 PM.

Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

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.

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 six-foot median that will widen to ten feet at the proposed BRT stops to allow for a passenger-loading platform. A BRT stop at the intersection of Harney Way and Thomas Mellon Circle will serve the proposed Executive Park development. An additional three 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.

Prior to construction of the CP Area retail center, the BRT service will initially travel along Harney Way to Arelious Walker Drive, and along Arelious Walker Drive, across the Yosemite Slough Bridge into the HPS2 site. Once the CP Area retail center is constructed, and the BRT lanes on Harney Way are extended to Egbert Avenue, the BRT will be re-routed from Arelious Walker Drive to its ultimate route, as illustrated on Figure 2.2.1. During the initial period, prior to construction of the CP Area retail center, when the BRT is operating along Arelious Walker Drive, the City shall install and maintain temporary transit shelters, including related furniture, adjacent to selected transit zones on land owned by the City (unless otherwise agreed by the Developer) along the initial BRT route. The precise location of such facilities shall be determined in consultation with the Developer. Upon re-routing of the BRT from its temporary route along Arelious Walker Drive to the CP Area retail center, and along Harney Way East and Egbert Avenue, the City shall remove all abandoned transit shelters and related furniture along Arelious Walker Drive.

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

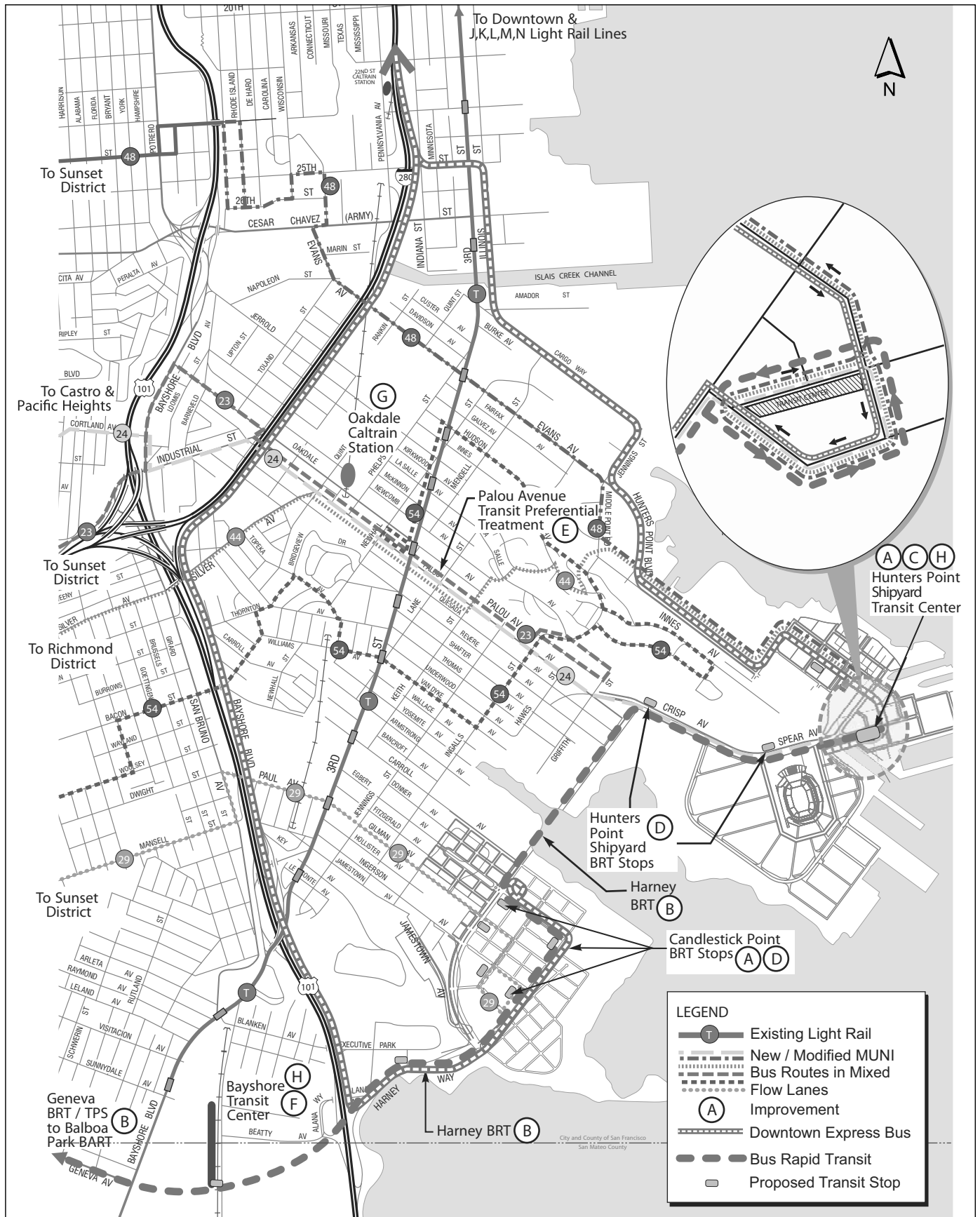
MUNI shall extend one existing motor coach route and create a new Downtown express route to serve the CP Area. The City shall install and maintain transit shelters, including related furniture, adjacent to selected transit zones on land owned by the City (unless otherwise agreed by the Developer) along 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.

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.

STADIUM TRANSPORTATION MANAGEMENT CENTER

A Stadium Transportation Management Center, which may control and/or monitor parts of the CP Area transportation systems on days of stadium events, will be provided as part of the Stadium Pad improvements described in Section 5.2 of the HPS2 Infrastructure Plan.



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 Technical Memorandum 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 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. This system will connect to the City's existing 81-inch combined gravity sewer in Arelious Walker Drive that drains into the 18-foot box sewer on Bancroft Street north of Carroll Avenue. The Developer will make the connections to the existing combined sewer as approved by the City. Rehabilitation of the existing combined gravity sewer pipeline and support system, if required by impacts from this Project, would be provided by the Developer for those portions of the system to be reused within the boundary of the CP Area. No improvements are required by the Developer to rehabilitate any portion of the City's combined sewer systems or City's pumping stations outside the boundary of the CP Area. Portions of the existing combined sewer within the CP Area development will be removed and or abandoned by the Developer where reuse is not compatible with Project objectives. No sanitary sewer service connection will be permanently interrupted.

The majority of the on-site system consists of 8-inch minimum diameter gravity sewer collection mains that will drain to one lift station. The lift station and gravity sewers will connect to the existing combined sewer. The CP North Area will receive gravity sewer flows from the CP Center Area in addition to the CP South Area. The CP North Area will have separated sanitary sewers and a lift station that will deliver all CP Area separated sanitary sewer flows to the City's

81-inch diameter pile-supported gravity main located in Arelious Walker Drive. The Alice Griffith Area will have separated sanitary sewer gravity mains that will directly connect to the existing 81-inch diameter pile-supported gravity main in Arelious Walker Drive.

The existing combined sewer pumping station within the Alice Griffith Area will be removed by the Developer and replaced if it is deemed necessary by the SFPUC to serve adjacent property owners. The existing combined sewer flows from the area west of Gilman Avenue and north of Giants Drive that serve development outside of the CP Area will remain connected to the existing 81-inch combined sewer in Arelious Walker Drive. In the Alice Griffith Area, the proposed separated sanitary sewer located one block west of Arelious Walker Drive is projected to surcharge when the existing combined sewer box in Bancroft fills to its maximum level. As a result, the garages of future properties located along the west side of Arelious Walker Drive may require pumps to deliver wastewater to the Separated Sanitary Sewer System. The elevated first floor units will have gravity flow to the Separated Sanitary Sewer System. The respective property owners will be responsible for operating and maintaining sewer pumps and associated force mains connecting these sewer flows to the combined sewer. Parcels affected by this condition will be noted on the appropriate Tentative and Final Maps.

The Separated Sanitary Sewer System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations and defined by the Separated Sanitary Sewer Technical Memorandum that has been submitted by the Developer to the City. 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 Technical Memorandum submitted by the Developer to the City.

The design criteria used for the development of the Separated Sanitary Sewer System is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments with separated sanitary sewer systems within the City and County of San Francisco. Design criteria have been presented to, and reviewed by, the SFPUC Wastewater Enterprise.

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.

Gravity manholes, pressure outlet manholes, sewage air and vacuum release valves, laterals and other appurtenances will be constructed as required to meet CP Area design standards.

Upon acceptance of the Separated Sanitary Sewer System by the City, the SFPUC will assume responsibility for the operation and maintenance of all facilities except private sewer pumps and force mains noted herein, including responsibility for compliance with all regulations and mitigation measures.

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 Technical Memorandum that has been submitted by the Developer to the City.

Reuse of any particular portion of the existing gravity combined sewer and support system in the manner described above shall be subject to further review by the SFPUC of the Developer's reuse proposal. Such review shall include an assessment of the condition of the existing pipe(s) performed by the Developer using a technical assessment methodology approved by the SFPUC prior to any construction or excavation work in the vicinity of the systems in question. 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.

2.3.2 INTENTIONALLY OMITTED

2.3.3 SEPARATED STORM DRAINAGE

The separated storm drain flows for the development will be conveyed by a Separated Storm Drainage System as shown on Figure 2.3.2. Most existing combined sewer drainage inlets/catch basins within the boundary of the CP Area will be disconnected from the existing combined sewer system and connected to the Separated Storm Drainage System. The Separated Storm

Drainage System will consist of Low Impact Design (LID) features to treat the 0.75-inch design storm, a 5-year piped collection system, and an overland release system.

The CP Area will be designed to comply with the City of San Francisco Stormwater Design Guidelines (SDG) and 2010 Stormwater Management Ordinance (SMO). Because the CP Area resides in a separated storm drainage / sanitary sewer area, per the SDG they must be designed to meet performance measures equivalent to LEED Sustainable Sites (SS) Credit 6.2, “Stormwater Design: Quality Control.” As also required by the SDG, the CP Area will develop a Stormwater Control Plan (SCP) that will be submitted concurrent with the final construction documentation for approval by the SFPUC Urban Watershed Management Program.

LID strategies will be used to meet the required LEED-based performance measures across the site. LID strategies 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. 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 as defined by the SDG before discharging into the 5-year piped system, which will flow via pump stations to San Francisco Bay.

The 5-year piped system will consist of gravity mains draining the two major drainage areas to the separated storm drainage pump stations. These pumping stations will deliver the stormwater in force mains to the San Francisco Bay consistent with the Project Storm Water Management Plan (SWMP) and the National Pollution Discharge Elimination System (NPDES) permit requirements. The overland flow releases for the 100-year minus 5-year flow will drain through pipes and over streets from back of sidewalk to back of sidewalk. Some portions of overland flow will be conveyed to a junction box and into a gravity pipe which will discharge into San Francisco Bay, while other portions which drain to the Bay from the street network through channels. The overland release system consists of the 5-year collection systems, the street network, 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 two (2) pumping stations for the 5-year storm events and three (3) overland release discharge facilities to San Francisco Bay for the 100-year minus 5-year storm events.

Grading of the CP Area shall be performed in compliance with a Project Soil and Groundwater Management Plan. The areas near San Francisco Bay will be set at a minimum top of curb elevation of 103.3 feet, Project datum. The minimum first floor building elevation shall be no lower than 103.8 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 Separated Storm Drainage System, including LID features, will be designed in accordance with the Subdivision Code and Project Subdivision Regulations and defined by the Separated Storm Drainage Technical Memorandum that has been submitted by the Developer to the City. In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Separated Storm Drainage System Infrastructure will be consistent with this Infrastructure Plan and the Separated Storm Drainage Technical Memorandum.

The design criteria used for the development of the Separated Storm Drainage System is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments with separated storm drain systems within the City of San Francisco. Design criteria have been presented to, and reviewed by, the City of SFPUC, which oversees the SDG for the City.

The proposed Separated Storm Drainage System has been configured to meet the stormwater flows based on the land use plan and defined development contained in the Plan or Plan Documents. Gravity manholes, drainage inlets, laterals and other appurtenances will be constructed as required to meet CP Area design standards. 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 compliance with all regulations and mitigation measures.

2.3.4 AUXILIARY WATER SUPPLY SYSTEM (AWSS)

The AWSS system and the Infrastructure to be constructed by Developer in connection therewith are identified on Figure 2.3.3. This system is also known as a high pressure-water supply system dedicated for fire protection, and is operated and maintained by the San Francisco Fire Department (SFFD). The City-wide system serves as a source of fire protection in industrial,

commercial and many residential districts. The system consists of cast iron or ductile iron pipe (DIP), high pressure hydrants, valves and fittings, suction intakes, and appurtenances.

The CP Area is not currently served by the AWSS. The SFFD 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 loop, which will connect to these extensions at the Project boundary, and several mains extending from this loop to the edges of the development as shown on Figure 2.3.3. The system shall also have one (1) electrically operated remotely controlled valve on the main at the Gilman Avenue connection point, three suction intakes at the shoreline, four (4) 75,000 gallon cisterns, and high pressure hydrants throughout the system.

The SFDPW will design the proposed AWSS improvements on behalf of the SFFD in the approximate locations shown on Figure 2.3.3. The Developer shall pay for the reasonable costs of designing and constructing the 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 Point	Hydraulic Grade at Connection Point (feet)⁽¹⁾					
	@0 gpm	@500 gpm	@1,000 gpm	@1,500 gpm	@ 2,000 gpm	@3,500 gpm
Harney Way/Jamestown	287	280	274	270	267	266
Gilman/Hawes	274	272	270	268	267	266
Jamestown	430	430	395	355	310	262

Notes: ⁽¹⁾ CP/HPS2 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 proposed distribution system consists of a backbone of 16-inch pipelines from the connection points and 12-inch (or smaller) pipelines throughout the majority of the development. Valves, blow-offs, air release valves, services, meters and other appurtenances will be constructed as necessary to meet system operational requirements.

The Low Pressure Water System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations and defined by a Low Pressure Water System Technical Memorandum that has been submitted by the Developer to the City. 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 Technical Memorandum.

The design criteria used for the development of the low pressure water system is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments within the City. Design criteria have been presented to, and reviewed by, the City Distribution Division of the City Water Department (SFWD), as well as the San Francisco Fire Department (SFFD).

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. Since the City currently does not have an operational recycled water source, the Project Recycled Water System will be supplied by the City's potable water distribution system until a recycled water supply is developed by the City. The Developer will develop a functional Recycled Water System for the CP Area with an interim connection to the City's potable water distribution system. 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. All work necessary to convert to the recycled water system and deliver recycled water to the site in the future will be provided by the City.

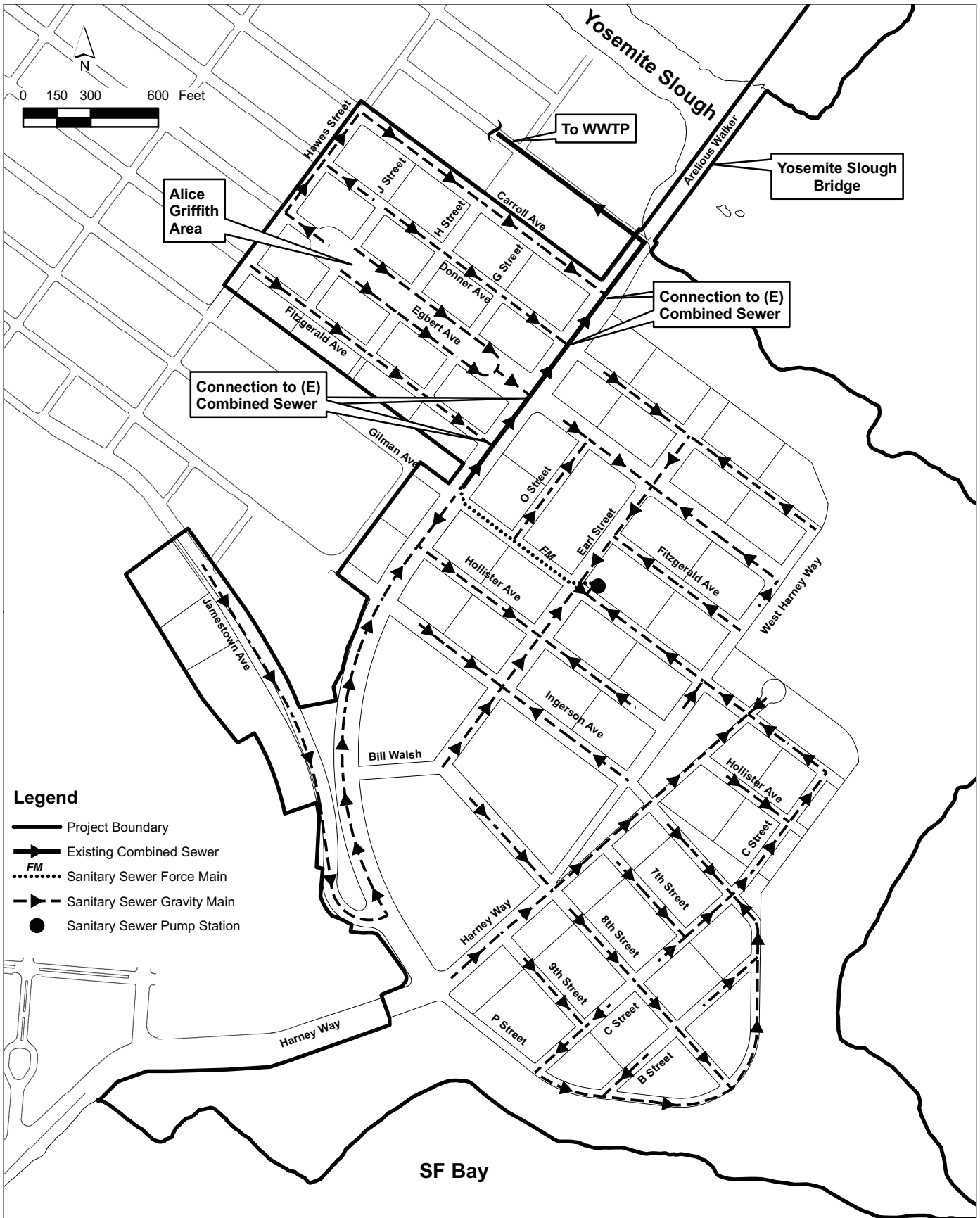
The Recycled Water System will be designed in accordance with the Subdivision Code and Candlestick Point / Hunters Point Shipyard Phase 2 Subdivision Regulations (to be developed separately) and defined by a Recycled Water System Technical Memorandum that has been submitted by the Developer to the City. 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 consistent with this Infrastructure Plan and the approved Recycled Water System Technical Memorandum.

The design criteria used for the development of the recycled water system is based upon established industry operations standards, regulatory agency requirements, and the Project Subdivision Regulations, and is consistent with criteria utilized for recent developments within the City. The design criteria have been presented to, and reviewed by, the SFWD City Distribution Division, and the SFPUC.

The proposed Recycled Water System will be connected to the Project Low Pressure Water System on an interim basis via reduced pressure principle backflow prevention devices located in the general vicinity of the connections of the Project Low Pressure Water System. These will occur in or near the following two intersections: 1) Gilman Avenue and Hawes Street; and 2) Harney Way and Jamestown Avenue. The locations of permanent connections to the City's yet-to-be-constructed recycled water system are also anticipated to be in the general vicinity of these same locations.

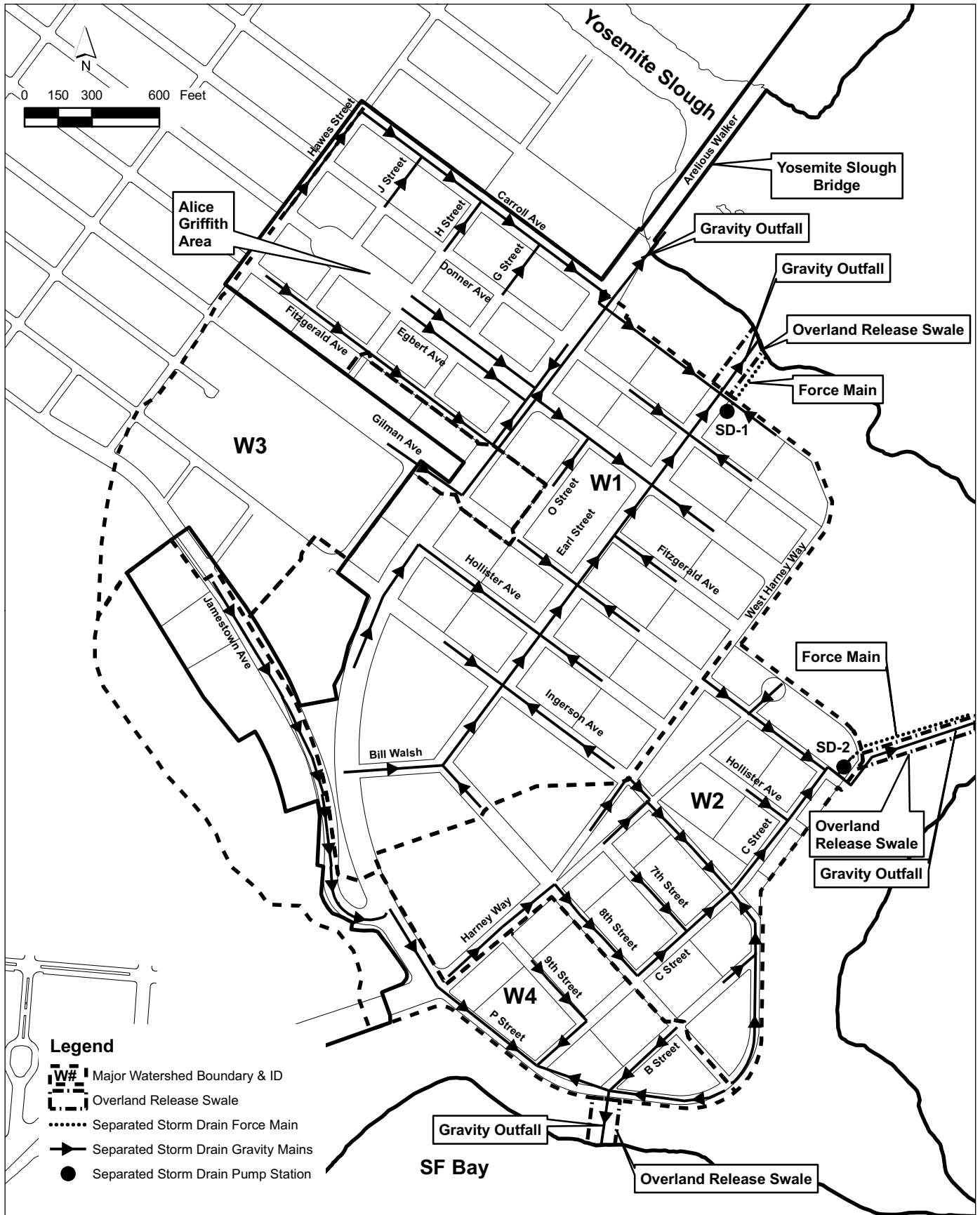
The proposed Recycled Water System has been configured to meet the recycled water demands, based on the land use plan and defined development contained in the Plan or Plan Documents. The recycled water system consists of 8-inch distribution pipelines throughout the development. Valves, blow-offs, air release valves, services, meters, purple hydrants/fill stations, and other appurtenances will be constructed as necessary to meet City design standards. The proposed Recycled Water System includes services to all buildings, including residential, in order to provide the opportunity for dual plumbing.

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.



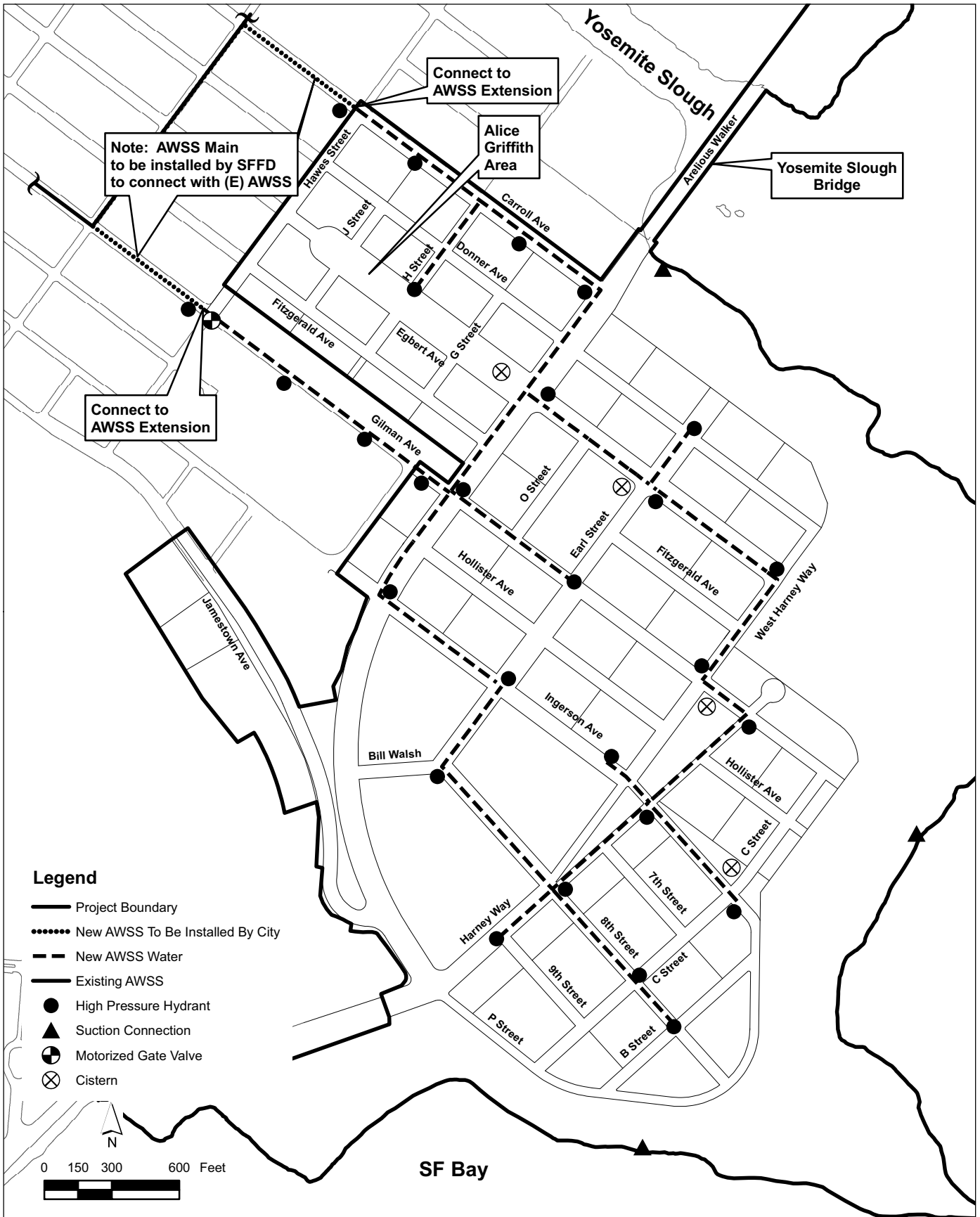
- Legend**
- Project Boundary
 - Existing Combined Sewer
 - FM — Sanitary Sewer Force Main
 - - - Sanitary Sewer Gravity Main
 - Sanitary Sewer Pump Station

	Candlestick Point Development	Figure 2.3.1
	Separated Sanitary Sewer Layout	

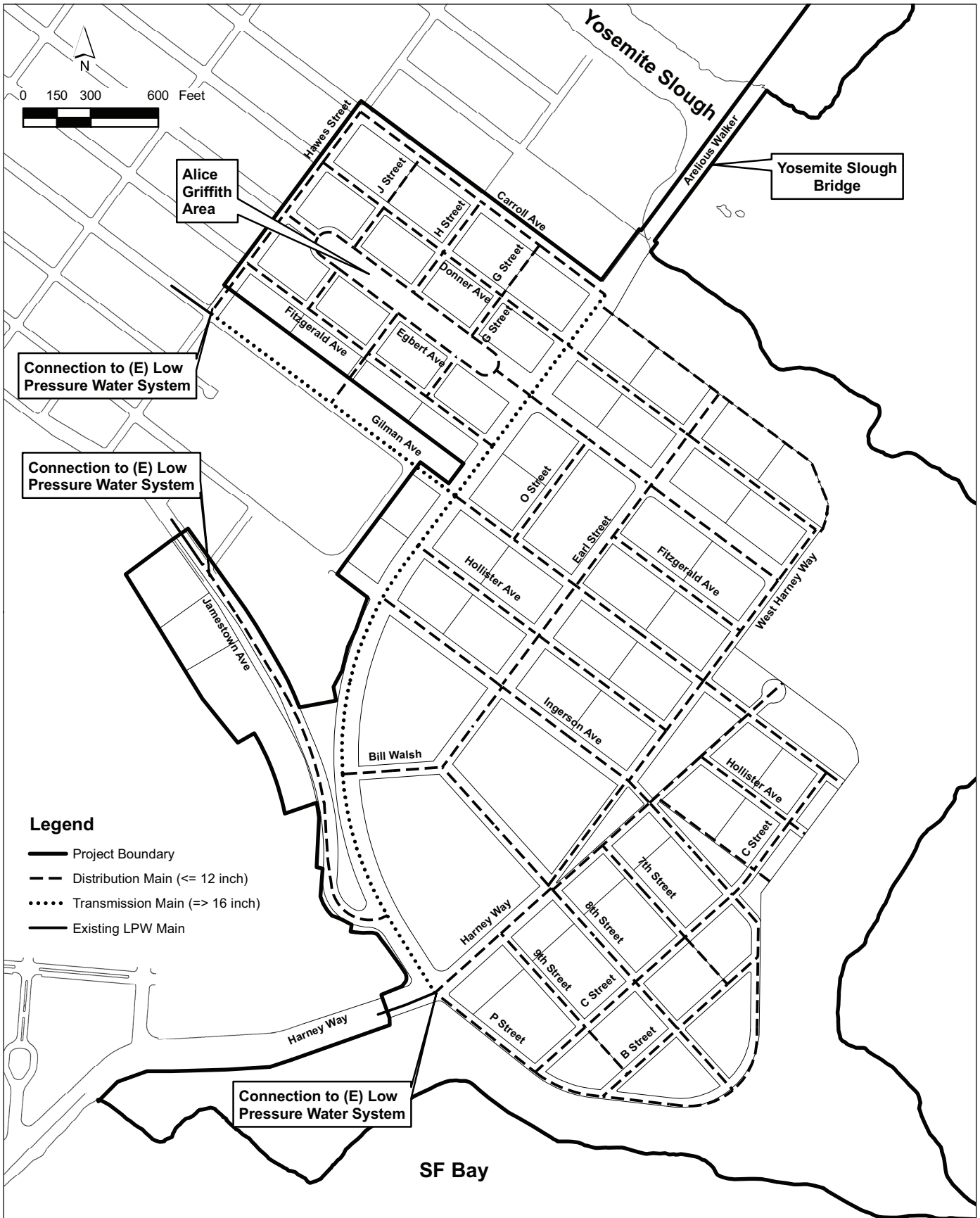


**Candlestick Point Development
Separated Storm Drainage Layout**

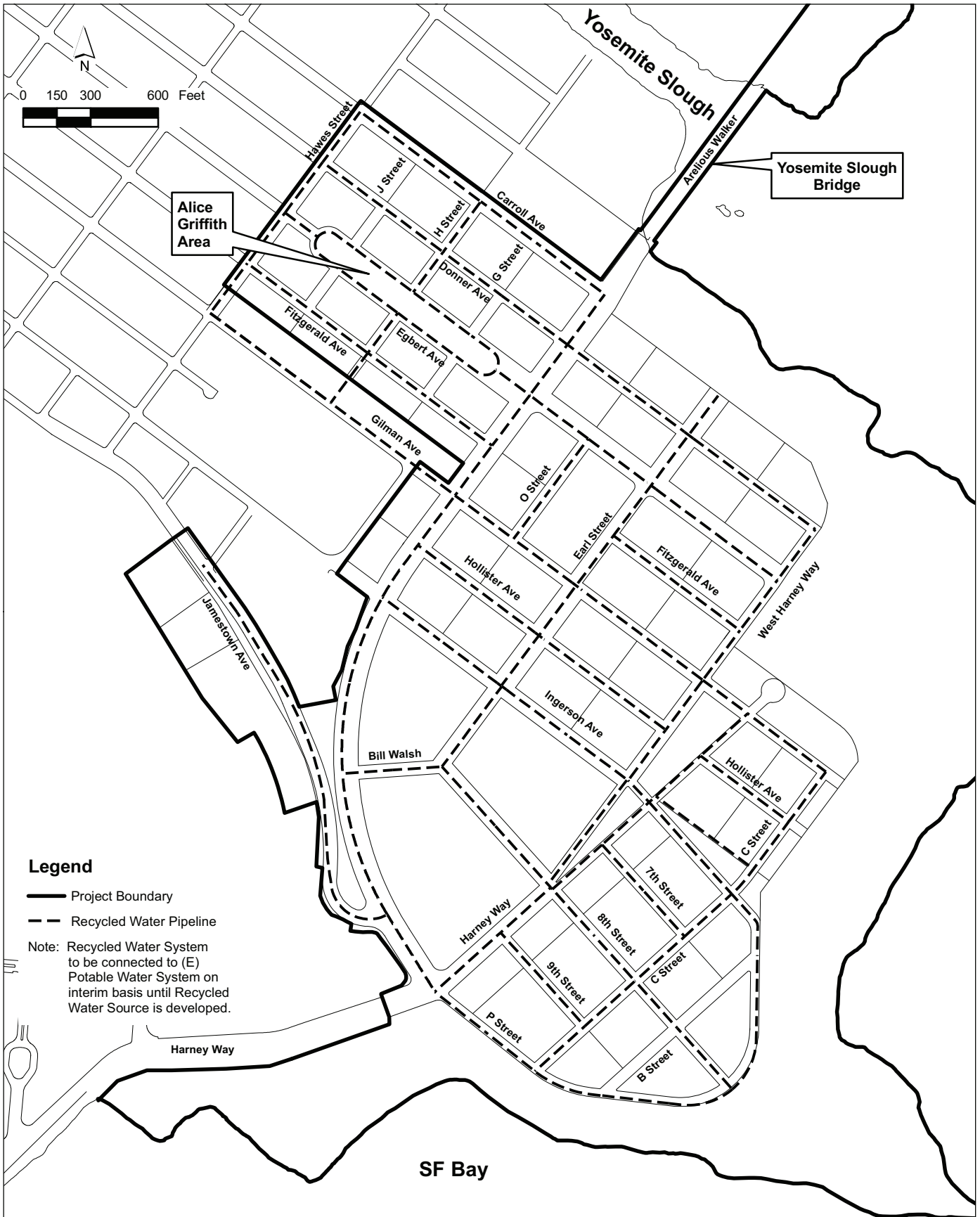
**Figure
2.3.2**



	Candlestick Point Development	Figure 2.3.3
	AWSS 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.

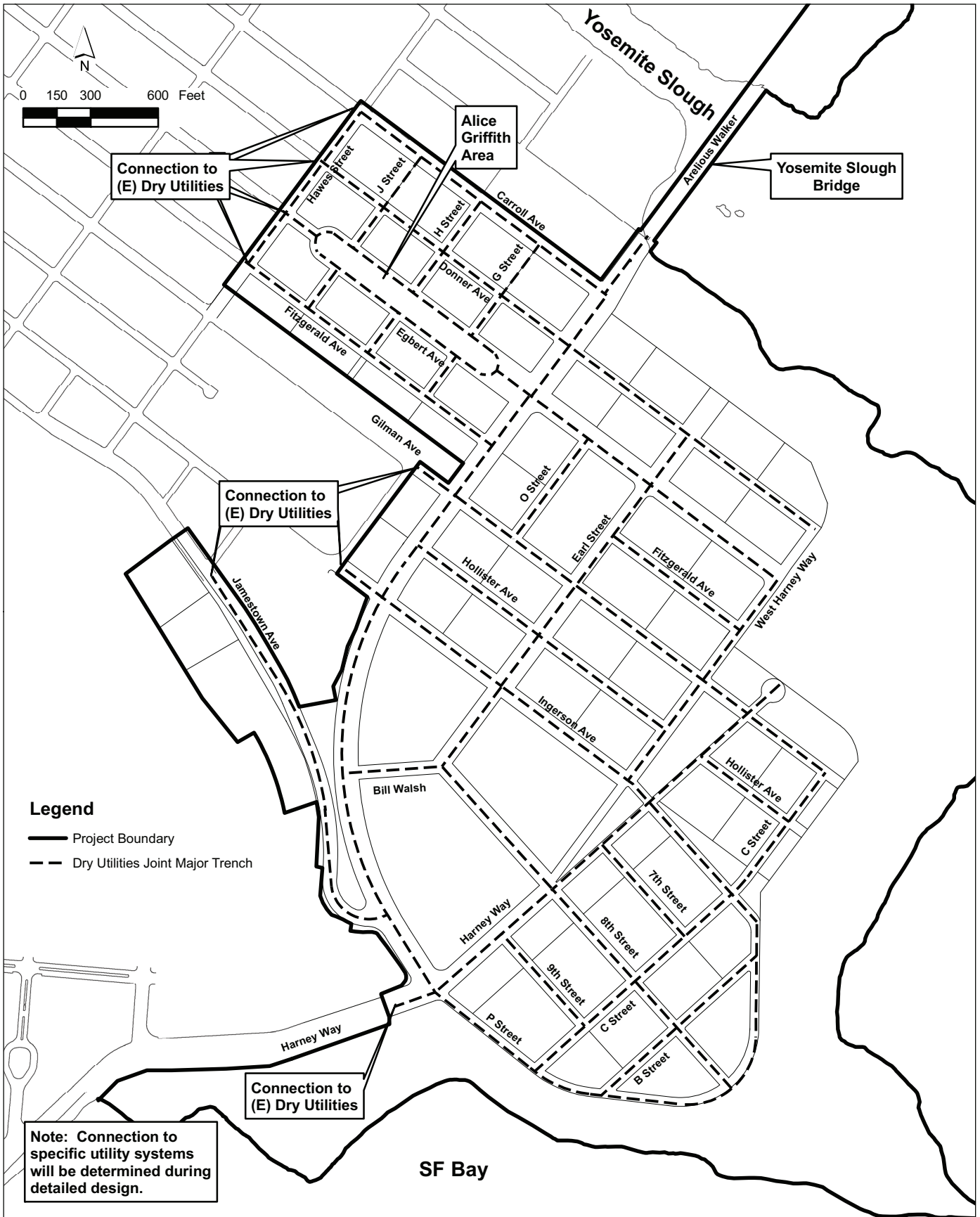
The existing electrical distribution system in the subject project area will be replaced as necessary and placed underground consistent with the timing of the development in phases as the project builds out, while maintaining service to existing customers.

The electric distribution system is planned to be in a joint or common trench which would include gas, phone, cable TV, and streetlight 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. Secondary power for LED street lighting shall be installed in a separate trench in accordance with City Regulations in effect at time of construction. 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		

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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 evolution of design strategies to address SLR is a process that is in its infancy. As a result, 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 SEA LEVEL RISE STRATEGIES

SLR will result in changing water levels that the project will need to accommodate. 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, and 36 inches for the development areas. 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 36 inches occurs. The mechanism for developing and implementing the AMP is described in Section 3.5.

The project has three zones that are impacted by 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.

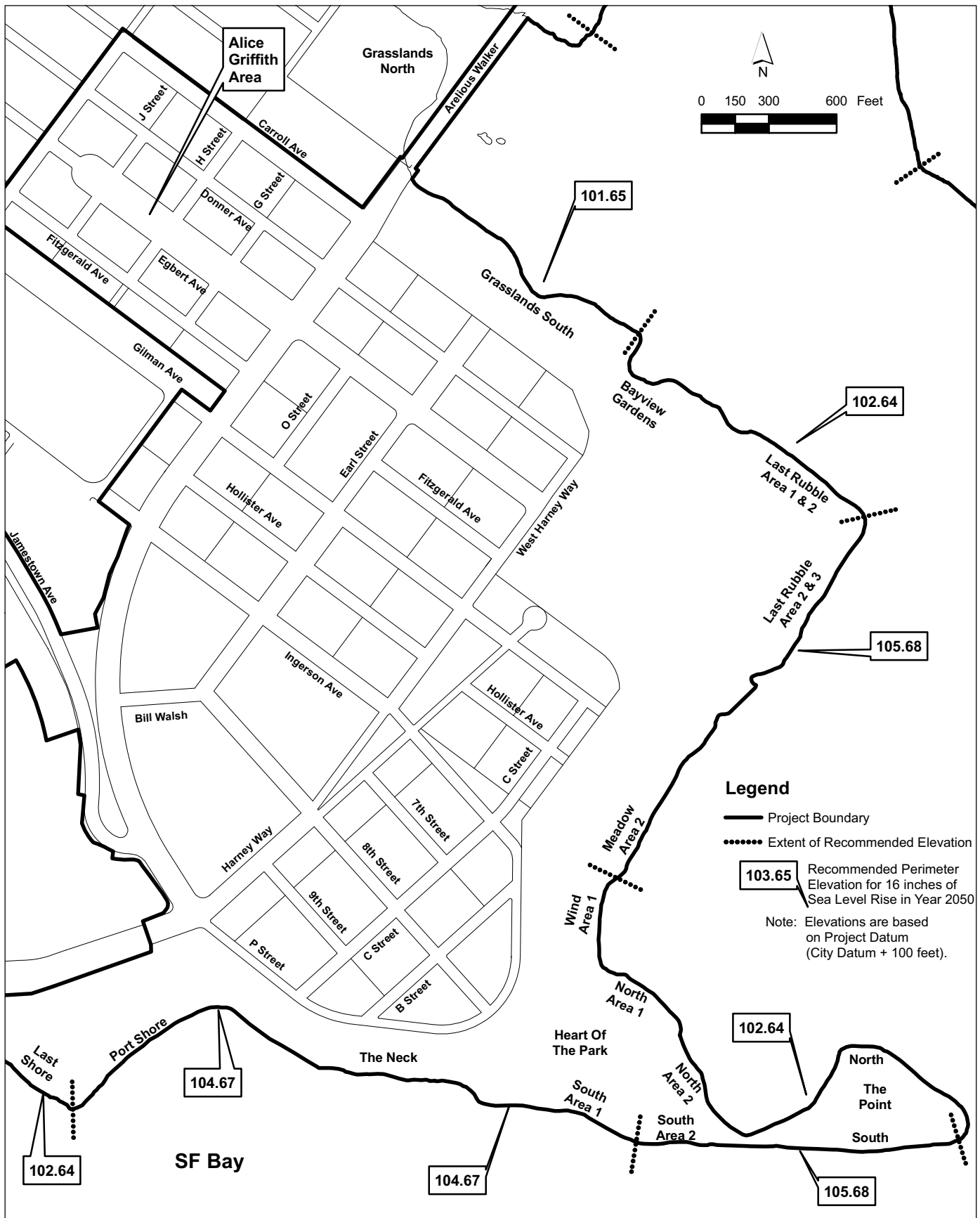
The present 100-year return period water level (100-year tide) for open space and development area design was estimated by M&N as elevation 98.2 feet, Project Datum. The 100-year return period water level does not include additional estimated allowance for wind-driven waves. The 1% annual chance storm elevation for shoreline design, which includes the effect of tides, storm surges, tsunamis, and waves, was also estimated by M&N and varies by location as described in various reports and summarized on Figure 3.1.1. The general initial strategies for the Project and the adaptive management strategies needed after the Project is constructed are described below.

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>Parameter</u>	<u>Criteria</u>	<u>Value</u>
Shoreline	At a minimum, provide an elevation to accommodate the 1% annual chance storm event (100-year high tide) with minimal overtopping plus 16 inches of SLR	Provide shoreline protection to minimum elevation as defined by Figure 3.1.1.
Parks and Open Space adjacent to the shoreline	At a minimum, provide an elevation to accommodate the 100-yr tide while allowing ponding during combined large rain and high tide events	For facilities that are to be dry for the initial 16 inches of SLR the minimum elevation of site to be 99.53 feet, Project Datum
Development Area Perimeter – Structures	Finished floor of occupied facilities shall be at a minimum elevation of the 100-yr tide plus 36 inches of SLR plus 6 inches of freeboard	Occupied facilities shall have a minimum first floor elevation of 101.8 feet, Project Datum. Based on SLR except where storm drainage system operation requires a minimum first floor elevation of 103.8 feet, Project Datum
Development Area Perimeter – Separated Storm Drainage System 5-Year Storm Event	Provide 2 feet freeboard between storm drainage system hydraulic grade line and the street finished grade with a 100-year tide plus 24 inches of SLR in San Francisco Bay	Minimum elevation of street centerlines is elevation 103.3 feet, Project Datum. Storm drainage system designs to accommodate a 24 inch SLR for system operation with 2 feet of freeboard between storm drain hydraulic grade line and the finished grade of the street. Less freeboard allowed where the elevation of 100-year overland release water surface is lower than the back of sidewalk.
Development Area Perimeter – Separated Storm Drainage System 5- to 100-Year Storm Event	With a 100-year tide in San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk	Drain overland release to shoreline/ San Francisco Bay



	Candlestick Point Development	Figure 3.1.1
	Sea Level Rise, Year 2050	

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 36 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. 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.
- Grasslands South – CPSRA will provide recommended perimeter shoreline protection to elevation 101.65 feet, Project datum, which accommodates 16 inches of SLR.
- Bayview Gardens North - CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, which accommodates 16 inches of SLR.
- The Last Rubble - CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, for Areas 1 and 2 North, and elevation 105.68 feet, Project datum, for Areas 2 and 3 East, which accommodates 16 inches of SLR per Figure 3.1.1.
- Wind Meadow – CPSRA will provide recommended perimeter shoreline protection to elevation 105.68 feet, Project datum, for Area 1 and elevation 102.64 feet, Project datum, for Area 2 which accommodates 16 inches of SLR.

- Heart of the Park - CPSRA will provide recommended perimeter shoreline protection to elevation 102.64 feet, Project datum, for Areas 1 and 2 on the north shore, elevation 104.67 feet, Project datum, for Area 1 on the south shore, and elevation 105.68 feet, Project datum, for Area 2 on the south shore which accommodates 16 inches of SLR.
- The Point – CPSRA will provide recommended perimeter shoreline protection to elevation 102.62 feet, Project datum, along the north shore and elevation 105.68 feet, Project datum, along the south shore 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 – CPSRA will provide recommended perimeter shoreline protection to elevation 104.67 feet, Project datum, along the northeasterly shoreline, and elevation 102.64 feet, Project datum, along the southwesterly shoreline 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 either 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 Year 2050 condition 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 segments: Grasslands North and South, Bayview Gardens North, The Last Rubble, Wind Meadow, Heart of the Park, The Point, The Neck, and Last Port.

3.4.3 DEVELOPMENT AREA PERIMETER

The perimeter edges of the developed areas shall be constructed such that the minimum elevations of street centerlines are no lower than 103.3 feet, Project Datum, which accommodates over 55 inches of SLR. Building occupied floors shall have a minimum elevation of 103.8 feet, Project datum. 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 DRAINAGE SYSTEM

The initial construction of the 5-year storm drainage system will comply with the Grading and Storm Drainage Technical Memorandum as submitted by the Developer and approved by the City. Additionally, the 5-year storm system shall operate with a 2-foot freeboard between street finished grade elevations and hydraulic grade line of the storm drain system pipelines. The 5-year piped system shall be designed to operate with a water level in San Francisco Bay of 100.17 feet, Project Datum, which will accommodate a SLR of almost 24 inches. Recommended perimeter elevations shown on Figure 3.1.1 are applicable only to shoreline structures and their related wave protection.

3.4.5 100-YEAR STORM DRAINAGE SYSTEM

The initial construction of the 5-year storm drainage system will comply with the Technical Memorandum titled “Grading and Storm Drainage Master Plan” as submitted by the Developer to the City. Additionally, for low areas, the storm system will convey the 100-year flow to San Francisco Bay, as noted below:

- Gilman Avenue West of Arelious Walker Drive – This area will have to drain the 100-year storm with SLR on a permanent basis. It may require a pump station for 36 inches of SLR.

- Gilman Avenue East of Arelious Walker Drive – This area is subject to acquisition. Should acquisition be delayed, the area would need to be connected to the storm drain system in Arelious Walker Drive.

3.5 ADAPTIVE MANAGEMENT STRATEGIES

As the 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 on a 5-to-10 year basis based on observed changes in sea levels as well as other effects of climate change (e.g., more or less extreme storm wave conditions).

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 36 inches occurs. The AMP shall specifically address each of the following elements for the 16-to-36 inch and greater-than-36 inches SLR scenarios: (1) gravity-drained low areas of Gilman Avenue west of Arelious Walker Drive , Gilman Avenue east of Arelious Walker Drive, and the CPSRA shoreline; (2) designated park areas of, Grasslands South, Bayview Gardens North, The Last Rubble, Wind Meadow, Heart Of The Park, The Point, The Neck, Last Port; and (3) any other Shoreline within the limits of the CPSRA not specifically included in the above.

In general, although these strategies refer to “minimum” standards, the initial constructed grades at the Development Perimeter for the project are substantially higher than the minimum standards. Therefore, a higher amount of SLR can be accommodated at the Development Area Perimeter as outlined in Section 3.4 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 through 16-to-36 inches of SLR to greater-than-36 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-36 INCHES

When it is known that SLR has occurred and is approaching 16-inches in 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 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 mean sea level rises up to 36-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 collection of 100-year overland release and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER

No change in constructed project required.

Within the developed perimeter for separated storm drainage systems, the 5-year storm event and 5- to 100-year storm events will require that operation of the separated storm drainage systems be provided with the following described capabilities:

- 5-year Storm Event –The operation of the 5-year collection system will normally operate with a freeboard of 2 feet, but as SLR occurs the system will require a minimum of 1-foot of freeboard for operation before the follow-on strategies are implemented and operational. When the SLR from the beginning of the project exceeds 24 inches, then the “Adaptive Management Strategies to Address Sea Level Rise” should be implemented, with analysis and planning commencing such that by the time the SLR value reaches 36 inches the physical improvements should be operational.

The only storm drainage outfall that must be addressed in the 16-to-36 inches of SLR condition is the gravity storm drain of Outfall 3. The sub-watershed draining to Outfall 3 drains a local system low point by gravity. This system must be converted to a pumped system when SLR is greater than or equal to 34 inches. At this time, the off-site 100-year minus 5-year overland release contribution must be pumped. Outfalls 1, 2 and 4 will require modifications as SLR occurs, which are described below in the 5- to 100-year storm events.

- 5- to 100-year Storm Events – With the 100-year high water on San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk. Some drainage basins must be converted to a pumped system when SLR is greater than or equal to 36 inches. Figure 3.5.4 identifies the SLR that will create 100-year flooding to rise to the elevation of the back of sidewalk at the lowest point in any particular drainage basin. Land area is to be reserved for future construction of pump stations or expansion of existing pump stations.

3.5.2 STRATEGIES TO ADDRESS SEA LEVEL RISE GREATER-THAN-36-INCHES

When it is known that SLR has occurred and is approaching 36-inches in 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, as 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 36-inches, allow more frequent flooding of the parks and open space during storm events greater than 5-year return period, raise elevation of facilities, provide wave berms, provide pumping stations and or enhance the capabilities of existing pumping stations to increase freeboard in the storm drainage systems. In addition, provide for the collection of 100-year overland release and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER

No change in constructed project required for up to approximately 55 inches of SLR. For SLR exceeding this magnitude, additional measures along the shoreline will be required to limit flooding conditions.

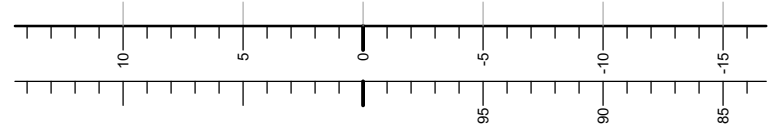
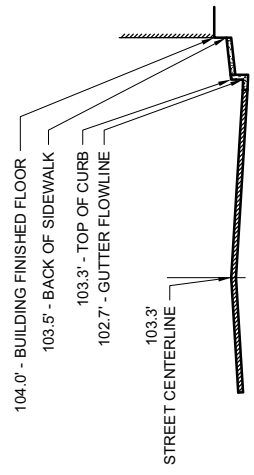
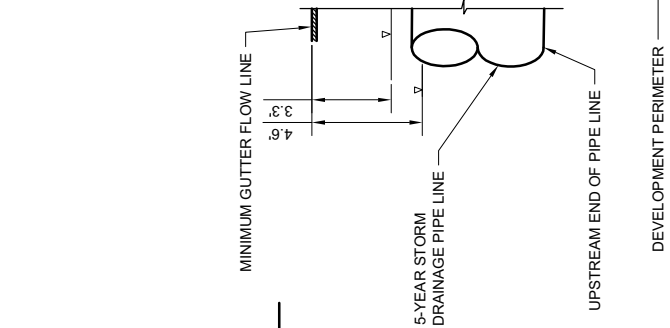
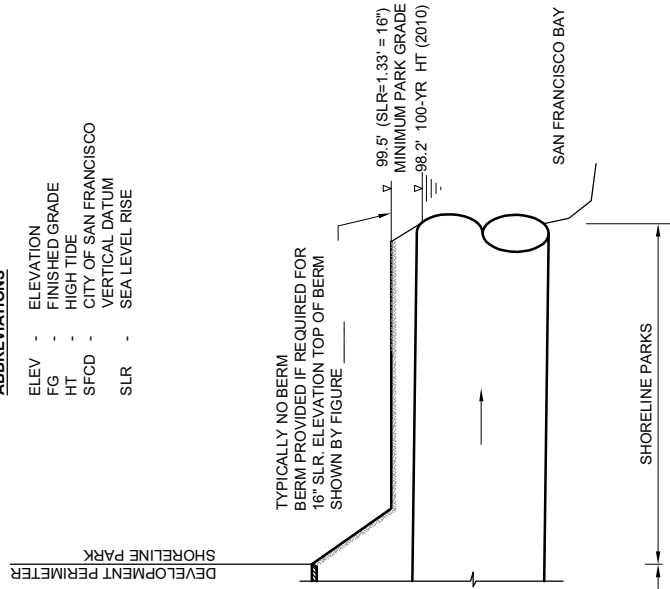
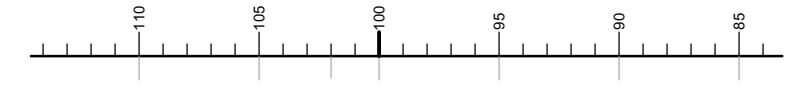
Within the developed perimeter for separated storm drainage systems, the 5-year storm event and 5- to 100-year storm events will require that operation of the separated storm drainage systems be provided with the following described capabilities:

- 5-year Storm Event –The operation of the 5-year collection system will normally operate with a freeboard of 2 feet, but as SLR occurs the system will require a minimum of 1-foot of freeboard for operation before the follow-on strategies are implemented and operational. When the SLR from the beginning of the project exceeds 24 inches, then the AMP should be implemented, with analysis and planning commencing such that by the time the SLR value reaches 36 inches any required improvements should be operational.

For the storm drainage outfalls for Outfall 1 and Outfall 2 (the initially constructed Pump Stations as shown on Figure 2.3.2) the pump station wet wells and pump selection will need to be modified. The change in pumps and wet well sizing is expected to be based on a range of downstream hydraulic grade line conditions bracketed by the current 100-year high tide and the current 100-year high tide plus SLR. When SLR reaches the level described in Figure 3.1.1 existing pump stations should be modified. For outfalls 3 and 4, gravity systems, area should be reserved for installation of future pumping stations required when SLR described by Figure 3.5.3 is predicted to occur in the near term.

- 5- to 100-year Storm Events – With the 100-year high water on San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk. When SLR exceeds a magnitude of 55 inches additional measures along the shoreline will be required to limit flooding conditions. These measures include adding pump stations to transport both the 5-year and 100-year storm events to San Francisco Bay. The level of SLR that requires these pump stations is described by Figure 3.5.3.

- ABBREVIATIONS**
- ELEV - ELEVATION
 - FG - FINISHED GRADE
 - HT - HIGH TIDE
 - SFCD - CITY OF SAN FRANCISCO
 - VERT - VERTICAL DATUM
 - SLR - SEA LEVEL RISE



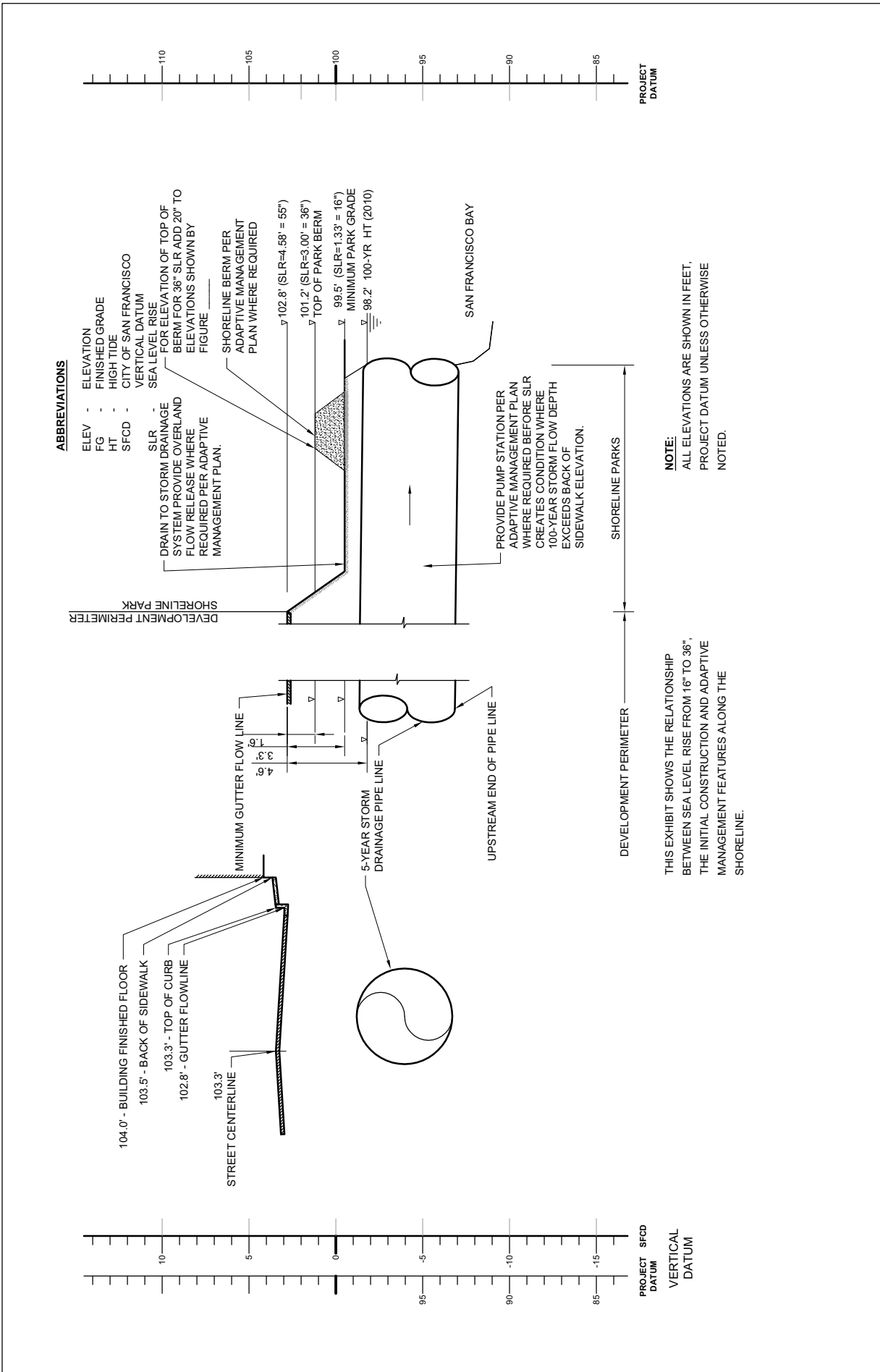
NOTE:
ALL ELEVATIONS ARE SHOWN IN FEET,
PROJECT DATUM UNLESS OTHERWISE
NOTED.

THIS EXHIBIT SHOWS THE RELATIONSHIP
BETWEEN SEA LEVEL RISE OF 16 INCHES
AND THE INITIAL CONSTRUCTION.

Candlestick Point Development

Figure 3.5.1

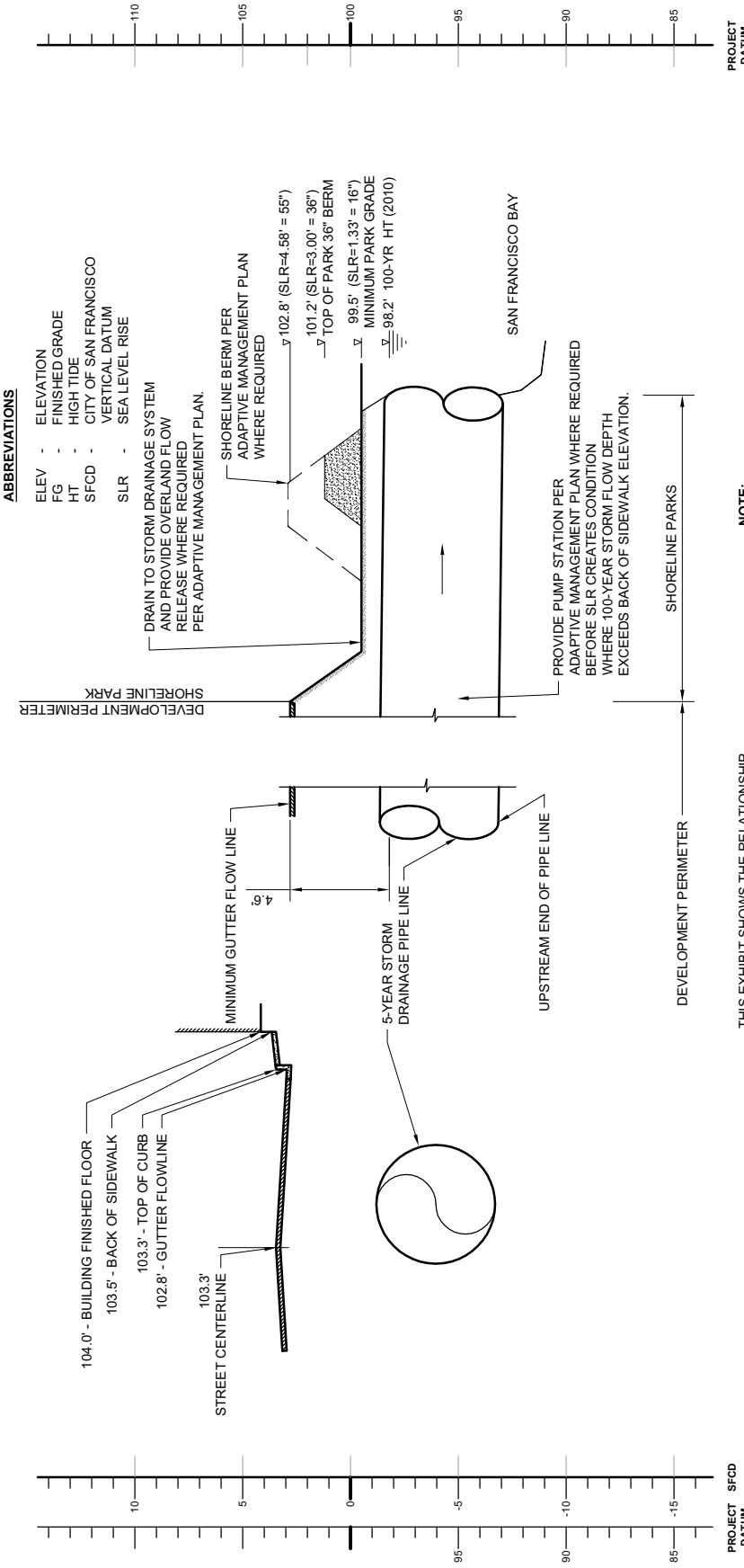
General Site Section For Base Year: 16" of Sea Level Rise



Candlestick Point Development

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

Figure 3.5.2



- ABBREVIATIONS**
- ELEV - ELEVATION
 - FG - FINISHED GRADE
 - HT - HIGH TIDE
 - SFCD - CITY OF SAN FRANCISCO
 - VERTICAL DATUM - VERTICAL DATUM
 - SLR - SEA LEVEL RISE

DRAIN TO STORM DRAINAGE SYSTEM AND PROVIDE OVERLAND FLOW RELEASE WHERE REQUIRED PER ADAPTIVE MANAGEMENT PLAN.

SHORELINE BERM PER ADAPTIVE MANAGEMENT PLAN WHERE REQUIRED

102.8' (SLR=4.58' = 55")
 101.2' (SLR=3.00' = 36")
 99.5' (SLR=1.33' = 16")
 MINIMUM PARK GRADE
 98.2' 100-YR HT (2010)

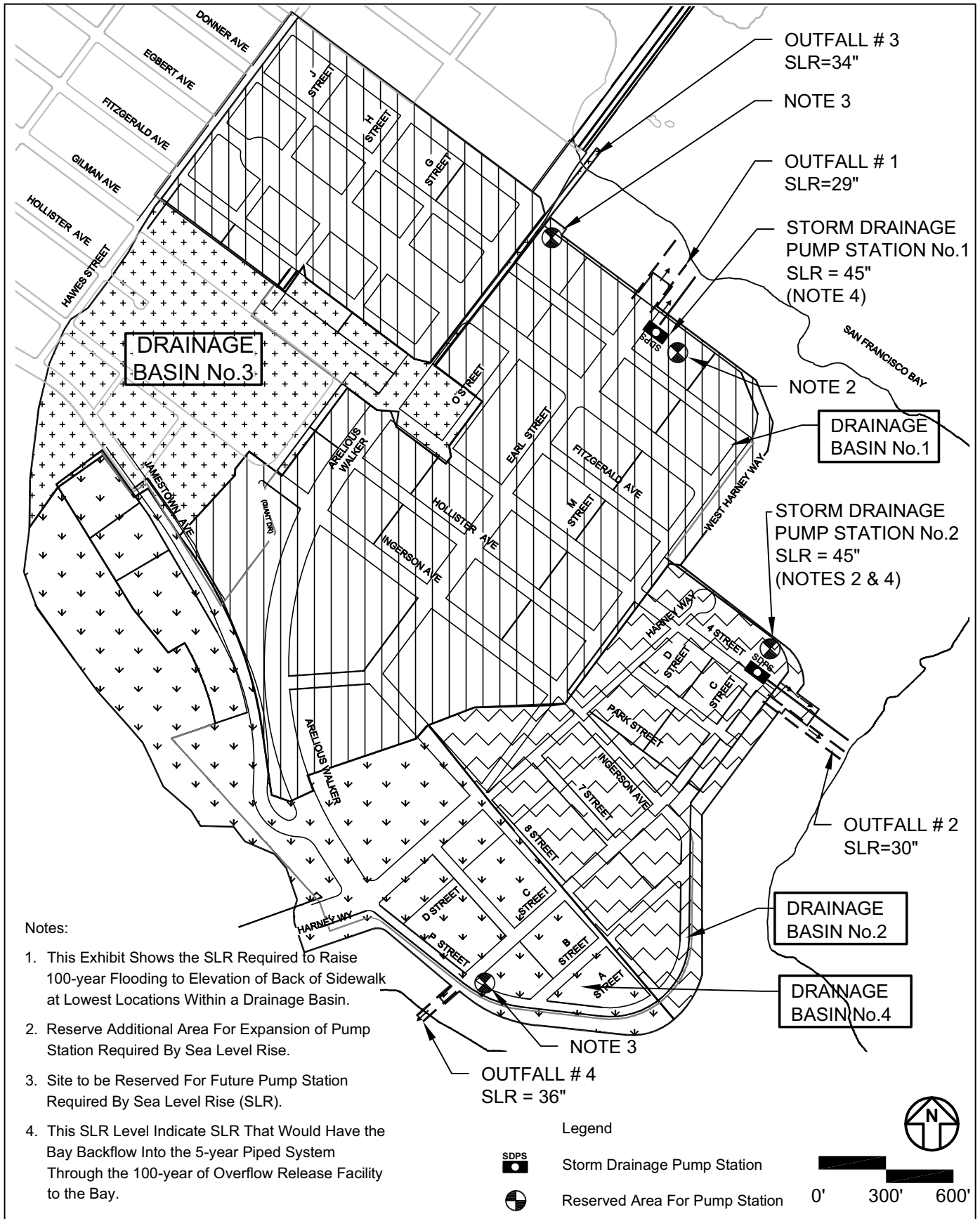
PROVIDE PUMP STATION PER ADAPTIVE MANAGEMENT PLAN WHERE REQUIRED BEFORE SLR CREATES CONDITION WHERE 100-YEAR STORM FLOW DEPTH EXCEEDS BACK OF SIDEWALK ELEVATION.

NOTE:
 ALL ELEVATIONS ARE SHOWN IN FEET, PROJECT DATUM UNLESS OTHERWISE NOTED.

THIS EXHIBIT SHOWS THE RELATIONSHIP BETWEEN SEA LEVEL RISE GRATER THAN 36", THE INITIAL CONSTRUCTION AND ADAPTIVE MANAGEMENT FEATURES ALONG THE SHORELINE.

Figure 3.5.3

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



Candlestick Point Development
Sea Level Rise For 100-Year Storm Flooding Limit

Figure
3.5.4

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 336.4 acres of parks (not counting Boulevard Parks, Hillside Open Spaces, and the Re-Gunning Crane Pier) will be provided in the CP Area and HPS2 Area combined, including a net offset of 23.5 acres for CPSRA land. The CP Area will include approximately 104.8 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>Acres (Approx.)</u>	<u>Park Role</u>	<u>Features</u>	<u>New / Existing Park</u>
New Parks				
Alice Griffith Neighborhood Park	1.4	Neighborhood Park	Tot Lot, Tree Grove, Seating, Bioswale, Lawn, Shade Pavilion, Community Gardens, Basketball / Tennis Court, Dog Run	New
Candlestick Point Neighborhood Park	3.1	Neighborhood Park	Open Lawn, Bioswale, Playground, Small Dog Area, Shade Pavilion, Community Gardens, Seating Plinths, Tree Groves, Sports Courts	New
Bayview Gardens/Wedge Park	2.5	Neighborhood Park	Planting, Plaza, Bus / BRT Shelter, Café / Kiosk, Tot Lot, Lawn, Shade Structures, Ornamental Gardens, Dog Play Area	New
Mini-Wedge Park	1.1	Neighborhood Park	Plaza, Tot Lot, Shade Structure, Small Dog Run, Lawn, Native Gardens	New
<i>Subtotal</i>	<i>8.1</i>			
State Park Land				
Grasslands South	10.3	CPSRA	Open Picnic Lawn, Native Grasslands, Overlook Terrace, Interpretive Play	Existing (rebuilt)
Bayview Gardens North	9.5	CPSRA	Bio-filtration Wetland Area, Native Eco-gardens	Existing (rebuilt)
The Last Rubble	24.5	CPSRA	Open Lawn, Native Grasslands, Overlook Terrace, Wetland Area, Interpretive Center Ranger Station, Parking, Great Meadow, Viewing Mound, Picnic Pods	Existing (rebuilt)
Wind Meadow	11.4	CPSRA	Native Grasslands, Picnic Pods, Native Eco-gardens, Parking, Beach	Existing (renovated)
The Point	6.1	CPSRA	Overlook Terrace, Viewing Tower, Fishing Pier	Existing (renovated)
The Heart of the Park (includes new State Parkland)	15.4	CPSRA	Open Lawn, Picnic Pods, Amphitheater, Native Grasslands	Existing (renovated)
The Neck (includes new State Parkland)	4.9	CPSRA	Kayak / Windsurf Launch, Overlook Terrace, Parking	Existing (renovated)
The Last Port (includes new State Parkland)	14.6	CPSRA	Beach, Native Grasslands, Open Lawn, Picnic Pods, Overlook Terrace, Parking	Existing (renovated)
<i>Subtotal</i>	<i>96.7</i>			
<i>Total</i>	<i>104.8</i>			

SOURCE: Lennar Urban, 2009.

- a. The 120.2-acre CPSRA lands contained within the Project boundary will be reduced by 29.2 acres, and increased by 5.7 acres for a net reduction of 23.5 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 (1a, 1b)

Alice Griffith Neighborhood Park (1a, 1b on Figure 4.1.1) 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 NEIGHBORHOOD PARK (2a)

The Candlestick North Neighborhood will include a 3.1 acre Candlestick Point Neighborhood Park. The location for this park shown on Figure 4.1.1 is subject to change; however, the park will remain 3.1 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.

BAYVIEW GARDENS/WEDGE PARK (3a)

The Bayview Gardens/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, playground / tot lot, dog play area, shade structures, café / information kiosk, an ecological garden, and LID stormwater features.

MINI-WEDGE PARK (4a)

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 (5a, 5b)

The hillside parks and open space includes the Bayview Hillside Open Space (5a) and the Jamestown/ Walker Slope (5b). The approximately 2.3 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/Arelious Walker Drive Slope contains a small portion of land that is part of the larger Bayview Hill Park, as well as a vegetated slope that is part of the existing Candlestick Stadium site. 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 (6a, 6b, 6c, 6d, 6e)

Portions of Egbert and Earl Streets will be designed as "Boulevard Parks," a hybrid of street and park, bringing broad fingers of green space into the urban neighborhoods, and linking interior parks with bayfront parks. These streets will have a strong pedestrian scale and quality, and serve as public 'front yards' for the neighborhoods. The parks will be configured along one side of the street between the curb and sidewalk and may provide plazas, seating, planting, LID stormwater features, and space for various recreational activities. A through sidewalk route will be located between the property line and the park zone.

The Boulevard Park along Egbert Street (6d, 6e) will be developed in two phases and will connect Alice Griffith Neighborhood Park with Candlestick Point Neighborhood Park and the CPSRA. The Earl Street Boulevard Park (6a, 6b, 6c) will link the CP Retail Center with Candlestick Point Neighborhood Park and the CPSRA.

4.1.3 CANDLESTICK POINT STATE RECREATION AREA

Specific areas of improvements in the CPSRA are in development through a separate process including the Developer and California State Parks. The discussion is presented to provide an overview of the conceptual design that is currently proposed; however, the ultimate configuration of each of these areas is outside the scope of this Infrastructure Plan. The Developer and California State Parks will determine the procedure for acceptance by the State of responsibility for the operation and maintenance of CPSRA facilities, including mitigation measures.

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.

GRASSLANDS NORTH AND SOUTH (7a, 7b)

This area of the existing State Park is largely undeveloped and has been used for game-day stadium parking. A new Grasslands area could be improved with native grasslands, glade lawns, and earthworks shaped to provide shelter from the wind and enhance views. Site features could include overlooks, restrooms, and parking. Much of Grasslands area is high enough to be protected from 36 inches of SLR.

BAYVIEW GARDENS NORTH (7c)

Formerly developed as a boat launch, siltation of the South Basin has caused this use to be abandoned. The existing paved parking area is used for game-day stadium parking. Located between the bay and the proposed Bayview Gardens / Wedge Park, the Bayview Gardens North area offers the greatest integration of urban and naturalized open spaces anywhere in the open space system and will be a strong visual gateway to the State Parks and the bay. Bioswales, storm water 'Eco-Gardens,' and a potential salt-marsh restoration are central features of this area. A portion of Bayview Gardens North may require shoreline improvements to protect from wave run-up and SLR.

THE LAST RUBBLE (7d)

Until recently, the Last Rubble area was characterized by large piles of rubble and debris, remnants of the site's previous use as a dumping ground. The California Integrated Waste Management Board completed a rubble and debris removal project in April 2009. As a result of

this, the majority of the rubble and debris was either removed or crushed on site. This area of the State Park remains underutilized and is not currently programmed for recreation, with the exception of a walking path. As the Last Rubble Area will be located adjacent to a substantial urban population, this area could be transformed into a new center for the State Park, with a wide variety of program elements. The park ranger station/visitor's center could be located here as well as a "Great Meadow" for passive recreation and park events. Other features may include parking, picnic areas, overlook terraces, restrooms, and a restaurant/café. Much of the Last Rubble is high enough to be protected from 36 inches of SLR.

WIND MEADOW (7e)

The Wind Meadow includes part of the existing State Park, including the Main Beach. This area will be reconfigured to meet the new urban development edge and interface with the Mini-Wedge neighborhood park. This area may contain a secondary entry and parking lot, and gateway entry kiosk for the State Park. Other features here may include new restrooms, picnic areas, waterfront overlooks, expanded tidal wetlands, and access to the water. A portion of the Wind Meadow may require shoreline improvements to protect from wave run-up and SLR. The existing beach may be expanded landward, providing a larger beach in the near term and a width of beach equal to current conditions in the event of 36 inches of SLR.

THE HEART OF THE PARK (7f)

The Heart of the Park is part of the existing developed State Park. New park area will be added and the existing landscape structure may be retained and enhanced. Planting and overall aesthetics could be improved, pedestrian pathways renewed and added, and program areas could be developed for greater use. Other site features could include upgraded restrooms, overlook terraces, large and small group picnic areas, and an interpretive amphitheater. A portion of the Heart of the Park may require shoreline improvements to protect from wave run-up and SLR.

THE POINT (7g)

The landscape of the Point may be revitalized with improvements focused on pedestrian circulation, safety and way finding; intensifying areas for increased use; improving the overall park aesthetics and landscape ecology; and reconnecting visitors to the bay shoreline. Native grasslands and shorelines could be restored and stabilized, providing areas for activities such as strolling, picnics, kite flying, and fishing. A portion of the Point may require shoreline improvements to protect from wave run-up and SLR.

THE NECK (7h)

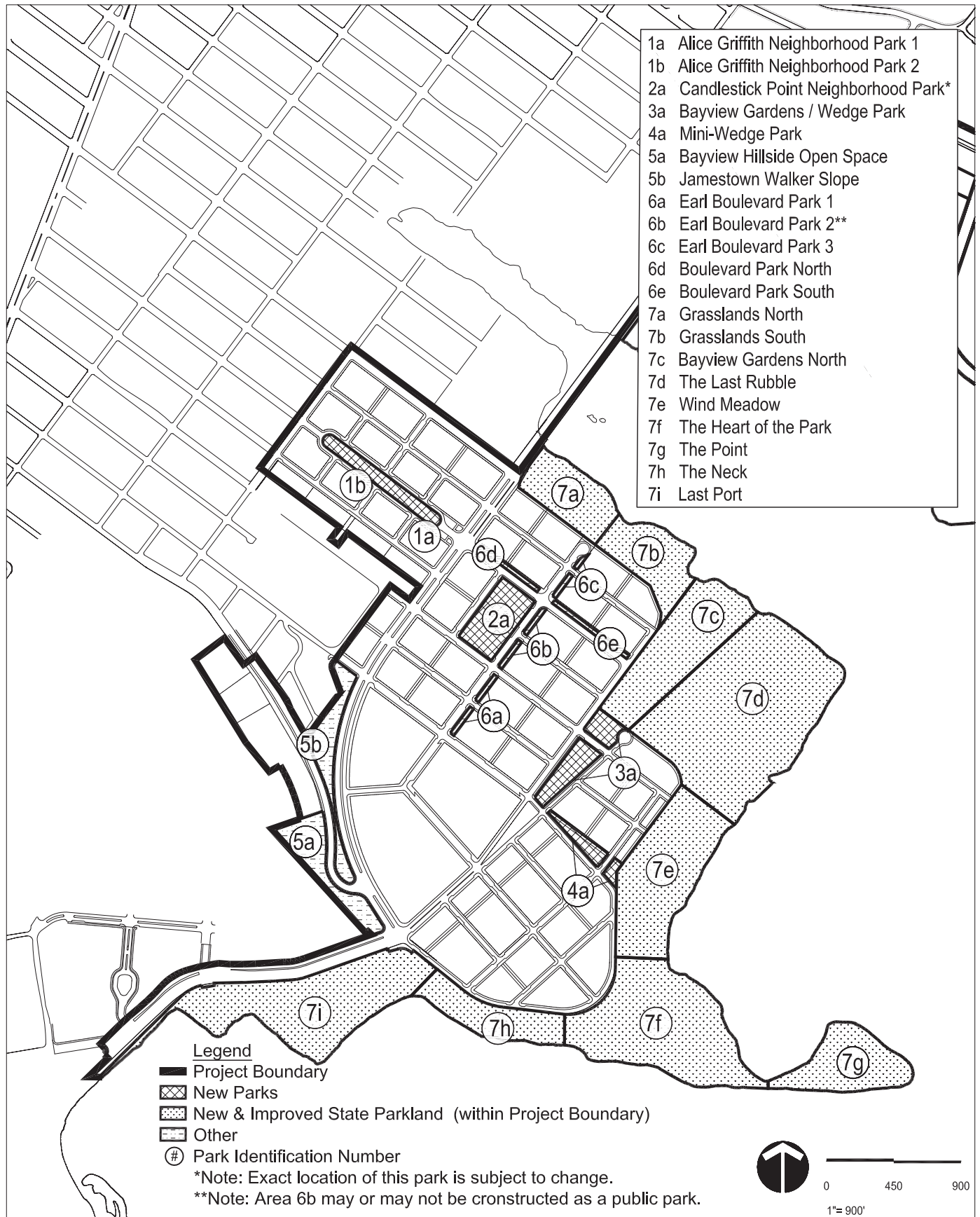
The existing Neck area is a narrow, eroded section of the State Park that includes a beach and pier. Park area will be added here to increase the width of the park and provide a continuous park experience along the shoreline. New features here could include a parking lot, windsurf and kayak launch areas, overlooks, and picnic areas. Much of the Neck may require shoreline improvements to protect from wave run-up and SLR. The existing beach at Hermit's Cove could be expanded in length and landward, to provide a larger beach in the near term and a width of beach equal to current conditions in the event of 36 inches of SLR.

THE LAST PORT (7i)

The landscape of the Last Port could be revitalized with improvements focused on pedestrian circulation, safety and way finding; intensifying areas for increased use; improving the overall park aesthetics and landscape ecology; and reconnecting visitors to the bay shoreline. Native grasslands and shorelines may be restored and stabilized, providing areas for activities such as strolling, picnics, kite flying, fishing, and direct access to the bay for swimming, kayaking, and windsurfing. Much of the Last Port is high enough to be protected from 36 inches of SLR.

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 may 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.



	<h2 style="margin: 0;">Candlestick Point Development</h2> <h3 style="margin: 0;">Open Space Parcels</h3>		<p>Figure 4.1.1</p>
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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.

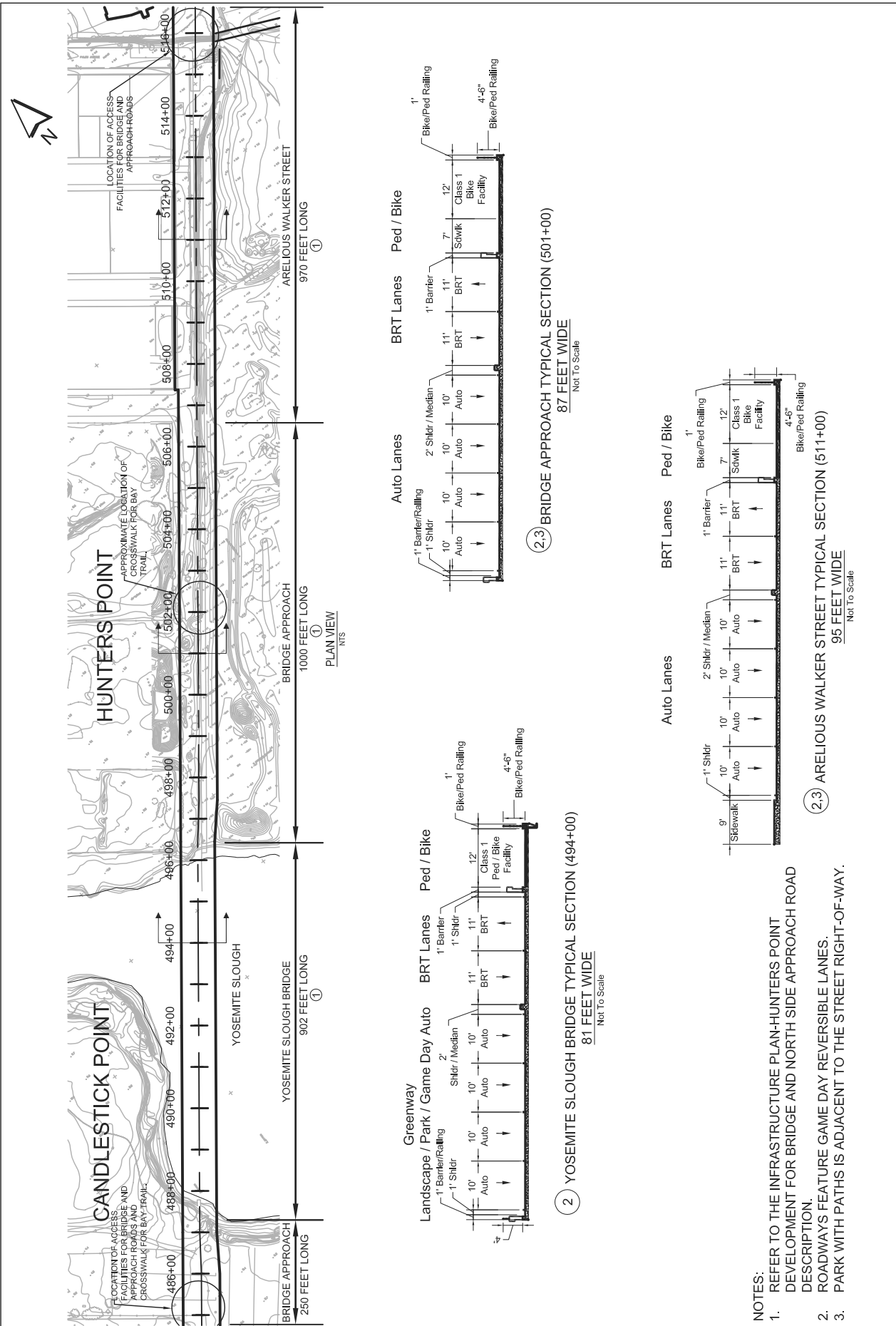
5.4 YOSEMITE SLOUGH BRIDGE

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 here in on Figure 5.4.1.

As described in the HPS2 Area Infrastructure Plan, the bridge approach streets on both sides of Arelious Walker will have facilities that prevent traffic from accessing the bridge on non-game days, but allow traffic on football game days. A barrier in the form of a gate, retractable bollards, or removable barriers will be installed to block the transit-only lanes such that only authorized buses and emergency vehicles can gain access, except as allowed on football game days. Photo enforcement at the bridge approach streets could also be used to monitor and restrict access.

5.5 GRADING & SURCHARGE

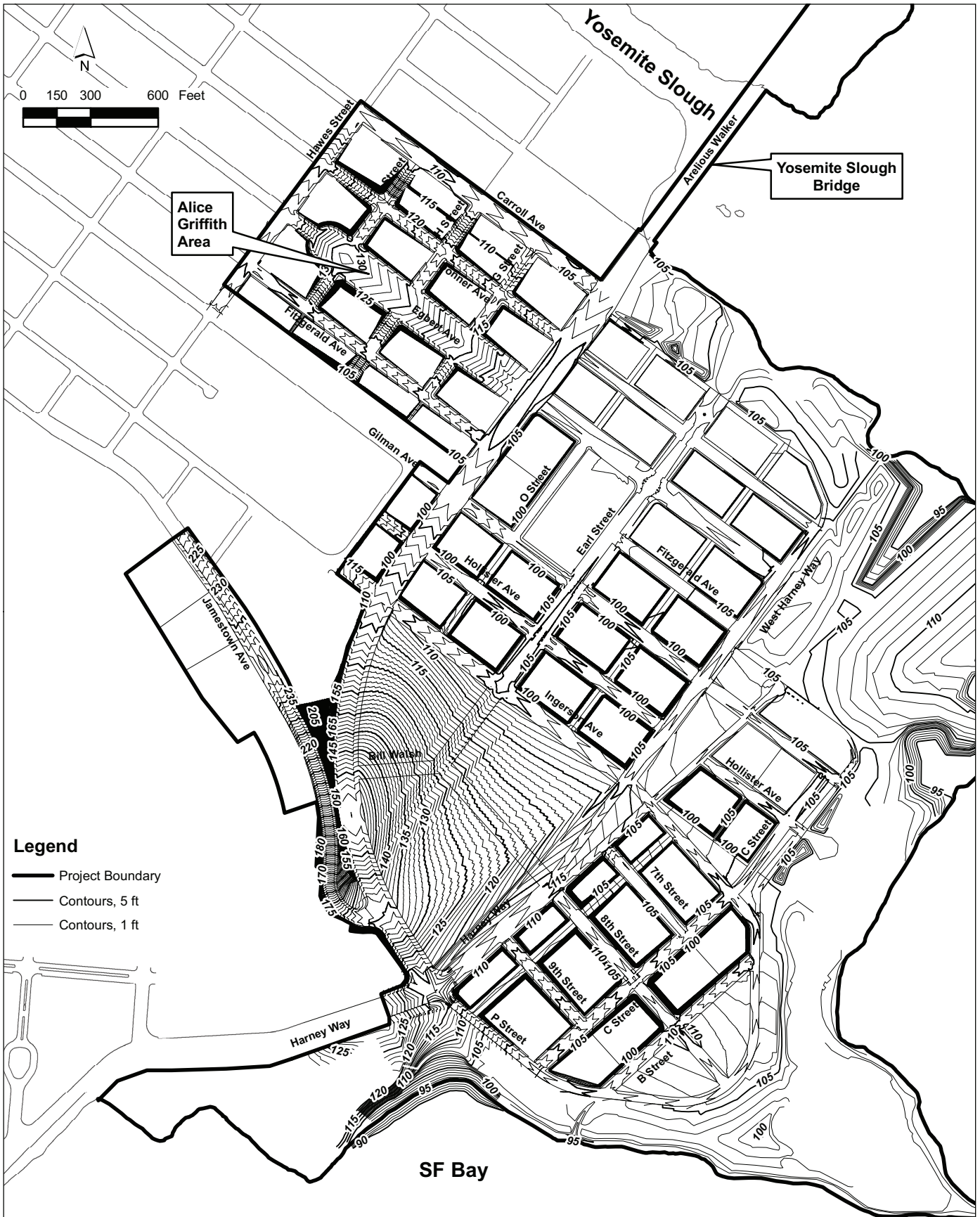
Grading, including preparation, import fill, excavation fill and compaction consistent with the Project Risk Management Plan and Soil and Groundwater Management Plan, will occur to some degree over certain portions of the CP Area. The preliminary site grading is shown on Figure 5.5.1. Final grades based 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



Candlestick Point Development
Yosemite Slough Bridge / Approach Roadways

Figure 5.4.1

Source: MACTEC ENGINEERING AND CONSULTING, Inc.



- Legend**
- Project Boundary
 - Contours, 5 ft
 - Contours, 1 ft

	<p>Candlestick Point Development</p> <p>Preliminary Site Grading</p>	<p>Figure 5.5.1</p>
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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. Upon acceptance of the retaining walls by the City, the underlying property owners will have all responsibility for their operation and maintenance. 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 Technical Memorandum, which has been submitted by the Developer to the City.

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 service to existing users. When feasible, all utilities should be installed in the locations provided for in the respective Technical Memoranda, 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 which can be used for a police station, fire station, school, or other community use as defined in the Candlestick Point and Phase 2 of the Hunters Point Shipyard Community Benefits Plan. 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:

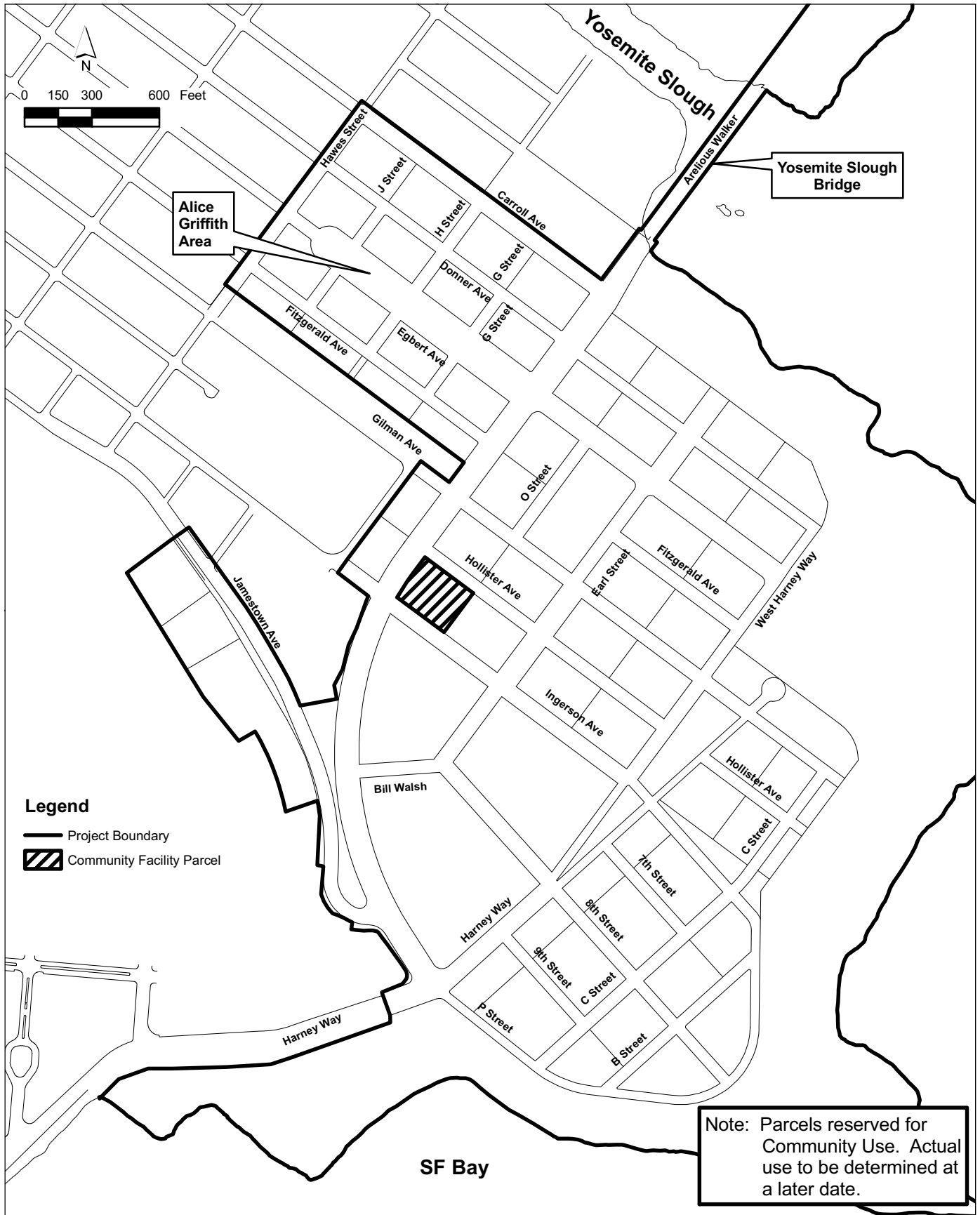
1. A final subdivision map for conveyance and financing of the Lot as a separate legal parcel has been recorded in the Official Records of the City and County of San Francisco, and applicable appeal periods for such approvals and the environmental clearances for such

- 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.

5.8 TRANSPORTATION MANAGEMENT SYSTEM

In conjunction with the roadway facilities and transportation improvements described herein, a transportation management system will be implemented. The system will allow for the coordination of signals at over 25 intersections in the Project area and surrounding area using fiber-optic or equivalent technology. On game-days, some intersections would be controlled by a Traffic Control Officer. Several variable message signs will be installed on roadways with reversible lanes. These signs will be able to convey messages for drivers, pedestrians and cyclists for game-day and emergency vehicle circulation. Software and hardware for a Transportation Management Center (TMC) on the stadium grounds will be developed. The TMC would be operated by the SFMTA on game days.



Candlestick Point Development		Figure 5.7.1
Community Facilities Lots Locations		

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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 - Arelious Walker Drive will be constructed adjacent to the development and including the intersection with Egbert Avenue.
- Development of Alice Griffith Blocks 4 and 5 - Arelious Walker Drive will be constructed adjacent to the development and extended 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 football stadium located at HPS2 is constructed.

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 number of p.m. (evening) peak hour vehicle trips that are likely to cause one or more intersections in the CP Area to deteriorate to unacceptable levels of service. As part of the review process for each Project, the number of p.m. peak hour vehicle trips generated will be estimated using the trip rates shown in Table 6.1.1 and added to the total calculated number of p.m. peak hour vehicle trips already generated by the developed portions of the CP/HPS2 Project, using the same trip rates. This number will determine which infrastructure Improvements must be implemented, other than those already required by the adjacency principle.

Table 6.1.1 Effective PM Peak Hour Vehicle Trip Generation Rates

<u>Land Use</u>	<u>Amount Provided</u>	<u>Unit</u>	<u>Effective PM Peak Hour Trip Generation Rate (Auto Trips Per Unit of Development)^a</u>
Residential	7,594	Dwelling Units	0.28
Retail	760	ksf	3.22

Hotel	220	Rooms	0.32
Office	150	ksf	1.25
Park	105	Acres	0.04
Community Services	50	ksf	1.42

SOURCE: Fehr & Peers, 2009.

- a. The effective rates are the total number of person trips forecasted to be generated by each use, with the mode split forecasts developed as part of the project's transportation impact study. Overall, the site was projected to experience a reduction, compared to standard rates from *Trip Generation* (ITE, 2007), of 32 percent based on the scale of development, the mix of uses, and the bicycle- and pedestrian-oriented design. For purposes of developing this table, the reduction was applied evenly to each use. Further, the number of auto trips generated per unit of development is dependent on both the size of development and the mix of uses proposed. As the project uses change, the vehicle trip generation rates per unit of development may not be constant. Thus, the rates presented in this table should be used cautiously.

Tables 6.1.2 and 6.1.3 identify the street intersections and street segments improvements, respectively, that are subject to cumulative development requirements and show the approximate amount of p.m. peak hour vehicle trips (or other metric, as applicable) that establish the need for each such Improvement. The number of p.m. peak hour vehicle trips shown in Tables 6.1.2 and 6.1.3 could result from a variety of project development schemes and land use combinations. The trip rates shown in Table 6.1.1 will be used to establish if a given mix of land use development requires Improvements to the street intersections and street segments listed in Tables 6.1.2 and 6.1.3.

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

Table 6.1.1.2 Project Intersection Improvements

<u>Intersection</u>	<u>Improvement</u>		<u>Project</u>		<u>Project Alternative</u>	
	<u>Improvement</u>	<u>Traffic Volume Trigger?^c</u>	<u>Improvement</u>	<u>Traffic Volume Trigger?^c</u>	<u>Traffic Volume Trigger?^c</u>	<u>Trigger</u>
<u>Project Improvements</u> Arelious Walker Drive/ Harney Way / P Street	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Jamestown Avenue	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Bill Walsh Way	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Ingerson Avenue	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Gilman Avenue	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Egbert Avenue	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency
Arelious Walker Drive / Carroll Avenue	New Traffic Signal	No	Construction of HPS Stadium	No	No	Adjacency

Table 6.1.1.2 Project Intersection Improvements

<u>Intersection</u>	<u>Improvement</u>	<u>Traffic Volume Trigger?</u> ^c	<u>Project Trigger</u>	<u>Traffic Volume Trigger?</u> ^c	<u>Project Alternative</u>
Harney Way / 8 Street	New Traffic Signal	No	Adjacency	No	Adjacency
Harney Way / Ingerson Avenue	New Traffic Signal	No	Construction of 4 th Intersection Leg/Adjacency	No	Construction of 4 th Intersection Leg/Adjacency
West Harney Way / Ingerson Avenue	New Traffic Signal	No	Adjacency	No	Adjacency
West Harney Way / Gilman Avenue	New Traffic Signal	No	Construction of 3 rd and 4 th Legs/Adjacency	No	Construction of 3 rd and 4 th Legs/Adjacency
West Harney Way / Egbert Avenue	New Traffic Signal	No	Adjacency	No	Adjacency
Earl Street / Egbert Avenue	New Traffic Signal	No	Adjacency	No	Adjacency
Harney Way / Executive Park East	New Traffic Signal, Reconfiguration ^a	Yes	Harney Way Widening (3,537 PM Peak Hour Vehicle Trips)	Yes	Harney Way widening (3,537 PM Peak Hour Vehicle Trips)
Harney Way / Thomas Mellon Drive	New Traffic Signal, Reconfiguration ^a	Yes	Harney Way widening (3,537 PM Peak Hour	Yes	Harney Way widening (3,537 PM

Table 6.1.1.2 Project Intersection Improvements

<u>Intersection</u>	<u>Improvement</u>	<u>Project</u> Traffic Volume <u>Trigger?</u> ^c	<u>Project Alternative</u> Traffic Volume <u>Trigger?</u> ^c
<u>Mitigation Measures</u> Tunnel Avenue / Blanken Avenue	Reconfiguration ^b	Yes 4,377 PM Peak Hour Vehicle Trips	Yes 4,377 PM Peak Hour Vehicle Trips

SOURCE: Fehr & Peers, 2009.

- a. Reconfiguration of Hamey Way intersections with Executive Park East and Thomas Mellon Drive to be completed based on separate and currently ongoing study of proposed Executive Park Project transportation impacts.
- b. 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.
- c. Assumes other background traffic increases as same rate as buildout of the Project.

Table 6.1.3 Project Street Segment Improvements

<u>Intersection</u>	<u>Improvement</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Trigger</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Alternative Trigger</u>
<u>Project Improvements</u>					
Arelious Walker Drive, Shafter Avenue to Carroll Avenue	Construct Yosemite Slough Bridge ^a	No	Construction of HPS Stadium or Implementation of BRT	No	Implementation of BRT
Arelious Walker Drive, Carroll Avenue to Gilman Avenue	See Figures 2.1.2A – 2.1.2G	No	Construction of HPS Stadium or Implementation of BRT	No	Implementation of BRT
Arelious Walker Drive, Gilman Avenue to Harney Way	See Figures 2.1.2A – 2.1.2G	No	Construction of HPS Stadium or Implementation of BRT	No	Implementation of BRT
Harney Way Widening (Near Term), Arelious Walker Drive to Thomas Mellon Drive	See Figure 2.13	Yes	3,537 PM Peak Hour Vehicle Trips	Yes	3,537 PM Peak Hour Vehicle Trips
Harney Way Widening (Long-Term), Arelious Walker Drive to Thomas Mellon Drive	See Figure 2.14	TBD ¹	Study Determines LOS Conditions Warrant	TBD ¹	Study Determines LOS Conditions Warrant

Table 6.1.3 Project Street Segment Improvements

<u>Intersection</u>	<u>Improvement</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Trigger</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Alternative</u>
Jamestown Avenue, Arelious Walker Drive to Third Street	Resurface and Restripe	No	Demolition of Candlestick Park	No	Demolition of Candlestick Park
Ingerson Avenue, Arelious Walker Drive to Third Street	Resurface and Restripe	No	Demolition of Candlestick Park	No	Demolition of Candlestick Park
Gilman Avenue, Arelious Walker Drive to Third Street	Reconstruct or Resurface and Restripe	No	Demolition of Candlestick Park	No	Demolition of Candlestick Park
Carrroll Avenue, Arelious Walker Drive to Ingalls Street	See Figures 2.1.2A – 2.1.2G	No	Construction of HPS Stadium	Yes	3,131 PM Peak Hour Vehicle Trips (CP & HP) ²
Ingalls Street, Carrroll Avenue to Thomas Avenue	See Figures 2.1.2A – 2.1.2G	No	Construction of HPS Stadium	Yes	3,131 PM Peak Hour Vehicle Trips (CP & HP) ²
<u>Mitigation Measures</u>					
San Bruno Avenue, Mansell Street to Silver Avenue	Signal Priority Treatments	No	Supplemental study Determines Transit Travel Times Have Degraded	No	Supplemental study Determines Transit Travel Times Have Degraded

Table 6.1.3 Project Street Segment Improvements

<u>Intersection</u>	<u>Improvement</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Trigger</u>	<u>Traffic Volume Trigger?^c</u>	<u>Project Alternative</u>
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	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	No	Supplemental study Determines Transit Travel Times Have Degraded

SOURCE: Fehr & Peers, 2009

- a. Refer to Figure 2.1.2A and 5.4.1 for configuration of Yosemite Slough Bridge.
- b. The isolated intersection analysis conducted for this study 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.

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 6.1.2 identifies the approximate levels of cumulative development that produces the number of vehicle trips to 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 6.1.2, the principal 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 6.1.3 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 6.1.3, the principal 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.

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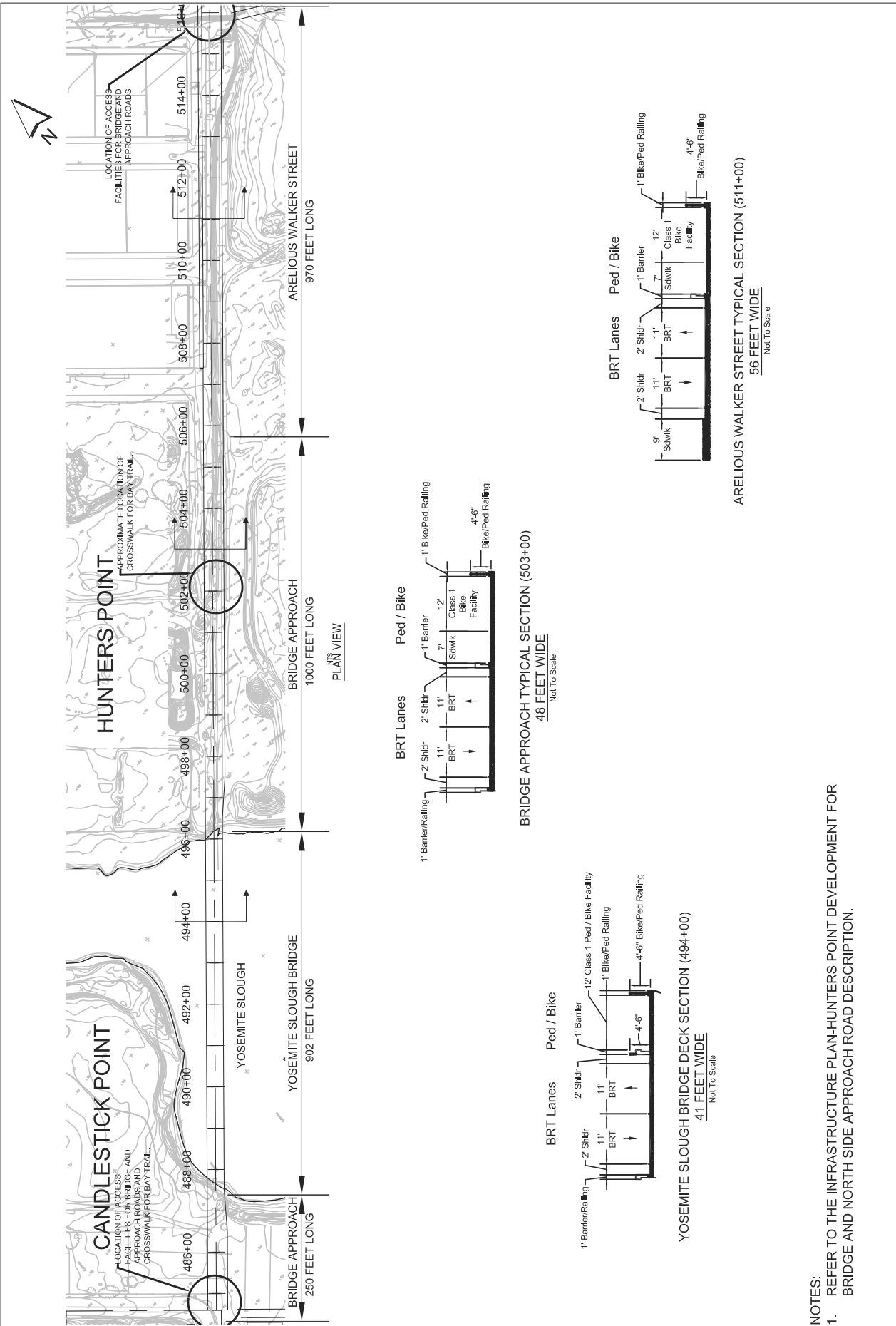
7. PROJECT ALTERNATIVE

7.1 PROJECT DESCRIPTION

The Project Alternative is Variant 2 as described in the EIR, which includes additional residential and R&D development in lieu of the proposed football stadium on the HPS2 Area development site. The Project Alternative does include minor modifications to the development land use types and densities within the CP Area, but the modifications are minor and do not alter any of the proposed infrastructure improvements outlined in the Infrastructure Plan. The main impact to the CP Area development is construction of a narrower bridge and approach roadway that does not allow automobile traffic, which will result in a smaller street cross-section between Carroll Avenue and the bridge along Arelious Walker Drive as shown on Figure 7.1.1. The only other significant difference is that the development along Jamestown Avenue has been eliminated. However, all the proposed street improvements along Jamestown Avenue as identified in the Infrastructure Plan will still be constructed.

7.2 ALTERNATIVE INFRASTRUCTURE UTILITIES

A number of alternative infrastructure utilities have been considered for the project, including district heating and cooling, automated waste collection, on-site wastewater treatment, and on-site generation of recycled water. These systems have been evaluated for use on the project, but have not been formally adopted as of the date of this Infrastructure Plan. Upon mutual agreement between the City and the Developer, future implementation of any of these systems could be integrated into the project design as project approvals progress, subject to environmental review. The infrastructure plans presented in this Infrastructure Plan would not preclude the future implementation of any of these systems.



Candlestick Point Development
Yosemite Slough Bridge / Approach Roadways (Project Alternative)

Figure 7.1.1

INFRASTRUCTURE PLAN

VOLUME 2

HUNTERS POINT SHIPYARD PHASE 2 DEVELOPMENT

AUGUST 3, 2010

ORDINANCE NOS. 210 AND 211-10

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INFRASTRUCTURE PLAN

HUNTERS POINT SHIPYARD PHASE 2 DEVELOPMENT

1. INTRODUCTION / PROJECT DESCRIPTION

1.1 PURPOSE

This Infrastructure Plan is an attachment to the Disposition and Development Agreement (DDA) between 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 Hunters Point Shipyard Phase 2 (HPS2) Development. The HPS2 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 Development) and Hunters Point Shipyard Phase 2 Development (Shipyard Site). A separate Infrastructure Plan covers the Candlestick Development. 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 HPS2 Area are described fully in the DDA.

1.2 INFRASTRUCTURE PLAN OVERVIEW

This HPS2 Infrastructure Plan will govern the construction and development of Infrastructure in the HPS2 Area and off-site work needed to support the HPS2 Development. 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 HPS2 Area and off-site work needed to support development of the HPS2 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). Section 7 describes the Project Alternative (“Non-Stadium Option”) and the changes to the Infrastructure Plan that would be required as a result.

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 dedicated easements to provide for access and maintenance of Infrastructure facilities. In the event property necessary to provide the rights-of-way or easements for construction of improvements shown herein cannot be acquired by the Developer, alternate Infrastructure designs will be submitted by the Developer for consideration by the City.

Public utility easements will be allowed within the Project as may be necessary to service the development. 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.

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 TECHNICAL MEMORANDA

Each Infrastructure system described herein has been more fully described in a Technical Memorandum or other report that has been submitted separately to the City and reviewed. These documents identify the key design criteria and provide more detailed layouts of each Infrastructure system. These Technical Memoranda form the basis of what will become Master Plans for each utility system, to be approved by the City at a later date. Approval of this Infrastructure Plan does not imply approval of the respective utility system Technical Memoranda. 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.

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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 selected 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 HPS2 Area, but may vary slightly by 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 STREET SURFACE IMPROVEMENTS

Street surface improvements consist of roadway reconstruction, preparation, excavation, fine grading, pavement section (including 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 Infrastructure described in this Infrastructure Plan, and action will be taken by the Developer prior to construction to minimize such settlements.

The street structural sections will consist of three typical types: asphaltic concrete over concrete; asphaltic concrete over aggregate base; and a combination to meet and match existing streets. The City may allow flexible pavements in the HPS2 Area as a modification to Sections 208 and 209 of Standard Specifications and the CP/HPS2 Subdivision Regulations that are in development for the Project. Future feasibility studies will be conducted for locations within reconstructed roadway sections and parking lots for permeable or porous paving materials.

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 to be 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 by the various City of San Francisco Municipal Codes. Responsibility for accepted street improvements for streets within the Public Trust 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 in a manner that minimizes the need for 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 may either make a right turn, or travel straight through the intersection.

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

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

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

Exclusive right-turn lane means a traffic lane from which a vehicle may 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 HPS2 Area in accordance with this Infrastructure Plan.

STREET SEGMENTS

The on-site street system for the HPS2 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 – 2.1.2E show on-site street cross sections within the HPS2 Area, including basic geometries within the rights-of-way such as numbers of lanes, their uses, their widths, and the full width of right-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.

INTERSECTION IMPROVEMENTS

The following specific intersection Improvements shall be provided by Developer in connection with the development of the HPS2 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 2.1.5), or as may be agreed upon by the City and Developer based on further information from a traffic engineer:

1. Crisp Road / Arelious Walker Drive
2. Crisp Road / Outer Ring Road (West)
3. Crisp Road / Inner Ring Road (West)
4. Crisp Road / Inner Ring Road (East)
5. Crisp Road / Outer Ring Road (East)
6. Fischer Street / Spear Avenue
7. Robinson Street / Fischer Street
8. Robinson Street / Donahue Street
9. Innes Avenue / Donahue Street
10. Arelious Walker Drive / San Francisco Bay Trail Crossing (just north of Yosemite Slough)

Certain traffic signals will have interconnection infrastructure as recommended by the Project Transportation Plan and shown on Figure 2.1.6, which may be amended by mutual agreement of the City and Developer from time to time.

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. Donahue Street, at Galvez Street
2. Robinson Street, between Donahue Street and Fischer Street
3. Spear Avenue, between Fischer Street and B Street

The Developer shall install stop sign and related traffic control Infrastructure at other intersections in the HPS2 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.

Changeable message signs will be constructed on- and off-site at intersections receiving high traffic on stadium event days and key entries and exits to the HPS2 Area as determined by the Developer in concurrence with San Francisco MTA. The typical message signs will consist of either a permanent pole with overhead electronic message sign and/or portable changeable message signs with the ability to communicate traffic information such as directions to freeways and bridges, lane increases or reductions and parking information. Overhead lane control signals will also be located at on and off site streets, they will be constructed at either end of the street segments with changeable direction lanes; if the street segment is more than 2300 ft or if the vertical or horizontal roadway alignment is curved, intermediate overhead lane-use control signals will be constructed such that road users will at all times be able to see at least one signal indication along the roadway. Typical overhead lane control signals consist of signal faces/lights above each lane designated as changeable and supported by a pole on the side of the street. If the street is wide a support pole on both sides of the street may be necessary to span the entire street section. An alternate proven design in use either within or outside the United States may be employed with City approval.

Intersection Configuration / Circulation Plan

The Circulation Plans shown on Figures 2.1.2F and 2.1.2G present detailed lane configurations based on the Project Transportation Plan for the approaches to major signalized intersections in the HPS2 Area. The Project Transportation Plan contains the detailed lane configurations for roadways throughout the HP Area. These major intersections include:

1. Arelious Walker Drive and Crisp Road
2. Crisp Road and Palou Avenue
3. Fischer Avenue and Robinson Street

2.1.3 OFF-SITE STREET SYSTEM

The following specific off-site improvements shall be provided by Developer in connection with the development of the HPS2 Development in accordance with this Infrastructure Plan:

STREET SEGMENTS

The Developer shall reconstruct or improve existing street segments outside of the HPS2 Area as described below, pursuant to a schedule based on traffic triggers 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. 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, PCC and/or AB, 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.

Repair and Resurface Streets – This street improvement includes 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 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 – This street improvement includes 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 – This street improvement includes placement of a new AC wearing surface overlay over the existing pavement surface without modification of the underlying pavement. Resurfacing of streets shall include adjustment of valve boxes and manhole 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 being improved are shown on Figures 2.1.3 and 2.1.4. Existing off-site roadways outside the project boundary, such as Thomas Avenue, Griffith Street, Innes Avenue (Including Innes Avenue / Hunters Point Boulevard / Evans Avenue), and Palou Avenue will be improved to serve the HPS2 Area. The intersection of Thomas Avenue and Ingalls Street is included as part of the HPS2 Infrastructure Plan; Ingalls Street is included in the Infrastructure improvements to be built to serve the CP Area. 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. Thomas Avenue

Work will consist of widening Thomas Avenue by three feet on each side of the street (within the existing right-of-way) between Ingalls Street and Griffith Street in accordance with Figure 2.1.3 (4 travel lanes, 2 parking lanes, and sidewalks on both sides of the street). Developer will implement the improvements identified in a technical memorandum, which likely will consist of Reconstruct Structural Section. In addition to Reconstruct Structural Section, additional improvements within this road segment will include new pedestrian lighting added to 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 and installation of overhead lane control signals and overhead changeable message signs as needed. Work does not include low impact development storm water quality treatment. A pre-design study for off-site 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 off-site road improvements.

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

B. Griffith Street

Work will occur on Griffith Street between Thomas Avenue and Palou Avenue in accordance with Figure 2.1.3 (2 travel lanes, 2 parking lanes (which may be converted to travel lanes) , and sidewalks on both sides of the street). 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 Griffith Street: Reconstruct Structural Section, Repair and Resurface Street, Resurface Street, Overlay Street and/or Restripe Street.

In addition to the improvements identified above, other improvements within this road segment may include street lights that need to be replaced or moved during construction will be upgraded with new fixtures and an additional pedestrian lighting 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 and installation of one overhead lane control message sign. Work does not include low impact development storm water quality treatment. A pre-design study for off-site 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 off-site road improvements.

C. Innes Avenue / Hunters Point Boulevard / Evans Avenue

Work will consist of widening the corridor consisting of Innes Avenue, Hunters Point Boulevard, and Evans Avenue by 2 feet on the southern side of the existing roadway between Earl Street (the Hunters Point Shipyard Phase 2 Development Area boundary) and Jennings Street in accordance with Figure 2.1.3 (4 travel lanes, 1 parking lane, 2 bike lanes and sidewalk on both sides of the street). Developer will implement the improvements identified in a Technical Memorandum, which consist of Reconstruct Structural Section as necessary.

In addition to Reconstruct Structural Section, additional improvements within this roadway segment include: upgrading of street lights that need to be replaced or moved during construction with new fixtures and new pedestrian lighting 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 the agreed Streetscape Plan between the Developer and the City. Street signage to be provided includes relocation of existing street signs and installation of 1 overhead lane control message sign. Work does not include irrigation system for the street trees or low impact development storm water quality treatment. A pre-design study for off-site 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 off-site road improvements.

A new traffic signal will be installed at the intersection of Evans Avenue / Middle Point / Jennings as discussed in the following section on Intersection Improvements.

D. Palou Avenue

Work will be performed on Palou Avenue between Griffith Avenue and the easternmost curb returns on Third Street in accordance with Figure 2.1.4 (2 travel lanes, 2 parking lanes, and

sidewalk on both sides of the street between Griffith Street and Keith Street; 3 travel lanes, 2 parking lanes and sidewalk on both sides of the street between Keith Street and Third Street).

From Third Street to Lane Street, the Developer will implement the improvements identified in a Technical Memorandum, which likely consists of Reconstruct Structural Section. From Lane Street to Griffith Street, the Developer will implement the improvements identified in a Technical Memorandum, which may include one or more of the following; Reconstruct Structural Section, Repair and Resurface Street, Resurface Street, Overlay Street and/or Restripe street.

Palou Avenue [Proposed Improvement] (Griffith Street to 3rd Street) – In addition to the improvements identified above other additional improvements may include street lights that need to be replaced or moved during construction will be upgraded to new fixtures and an additional pedestrian lighting 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 can include streetscape improvements, which are 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. The Developer is to provide accommodations for the Overhead Contact System to be constructed by a MUNI project to extend the 24 Divisadero trolley bus route to project boundary. 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. Work does not include irrigation system for the street trees or low impact development storm water quality treatment. A pre-design study for off-site 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 off-site road improvements. Work does not include irrigation system for the street trees.

Six new traffic signals will be installed at major intersections along Palou Avenue as discussed in the following section on Intersection Improvements.

Palou Avenue [Future Improvements to be constructed by the Developer only as a mitigation measure should future observed Project impacts and the Project entitlement documents require] (Griffith Street to Third Street) – Work includes Reconstruct Structural Section for area to be widened, removal of 3 feet sidewalk on each side of the street; curb ramps; curb and gutter; adjusting extension of drainage laterals and installation of new catch basins/ reuse of existing catch basins allowed; new street signage if required by change in traffic requirements; and traffic

striping. Work does not include streetscape improvements which are new street trees with grates, street benches, bicycle racks, and trash receptacles; street signage; additional overhead lane control signals; overhead changeable message signs; irrigation system for the street trees or low impact development storm flow treatment.

E. Illinois Street Improvements

As mutually agreed by the Developer and the City, the Developer will contribute its fair share for the improvement of the southbound approach of Illinois Street at Cargo Way. These improvements include widening the southbound approach on Illinois Street to provide a dedicated southbound left turn lane (approximately 100 feet long) and a dedicated right-turn lane, and extending the existing bicycle lane on Illinois Street to the Cargo Way intersection. Sidewalks, street lighting, signing, striping, pavement, and signal equipment will be replaced or relocated as made necessary by these changes.

INTERSECTION IMPROVEMENTS

The following specific off-site intersection Improvements shall be provided by Developer in connection with the development of the HPS2 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 based on Traffic Triggers and Infrastructure Phasing defined in Section 6:

1. Palou Avenue / Griffith Street*
2. Palou Avenue / Hawes Street*
3. Palou Avenue / Ingalls Street*
4. Palou Avenue / Jennings Street*
5. Palou Avenue / Keith Street*
6. Palou Avenue / Lane Street*
7. Middle Point Road / Evans Avenue / Jennings Street

8. Pennsylvania Avenue / 25th Street

9. Thomas Avenue / Ingalls Street

*New traffic signals along Palou Avenue should be equipped to provide transit signal priority, including traffic signal interconnect wiring. Interconnect wiring should extend to the Palou Avenue / Third Street intersection.

**Improvements along Thomas Avenue and improvements to the intersection of Thomas Avenue / Ingalls Street are included as part of the HPS2 Infrastructure Plan; improvements along Ingalls Street from Carroll Avenue to Thomas Avenue are included as part of the CP Infrastructure Plan.

New traffic signal locations are illustrated on Figure 2.1.5.

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.

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 Table 2.1.1 below at the intersections listed:

Table 2.1.1 Off-Site Intersection Lane Configuration Revisions

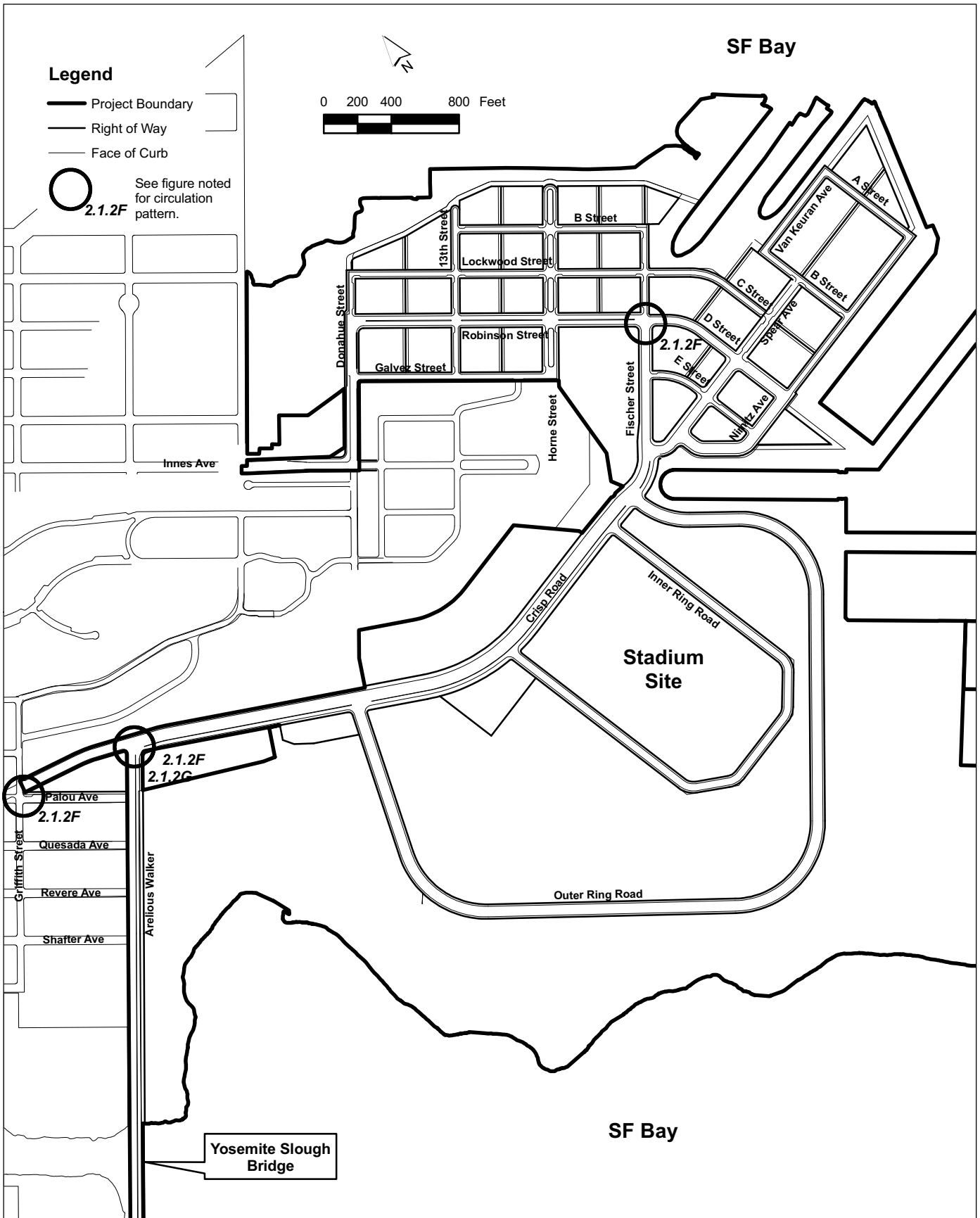
Intersection	Street	Direction	Lane Striping Configuration Revisions
Evans / Jennings / Middle Point	Evans	Eastbound Approach	Reconfigure existing 3 travel lanes (includes turn lanes) to provide a shared through and left-turn lane, through lane, and right-turn lane.
		Westbound Approach	Reconfigure existing 3 travel lanes (includes turn lanes) to provide a shared through and left-turn lane, through lane, and right-turn lane.
	Jennings	Southbound Approach	Reconfigure to provide a southbound left-turn pocket, a shared southbound through and right-turn lane. The reconfiguration of the southbound approach would require displacement of about 200 feet of on-street parking on the west side of Jennings Street, which would eliminate about 8 to 10 parking spaces.
Palou / Griffith / Crisp	Crisp	Southwest Approach	Remove southwest leg.

Table 2.1.1 Off-Site Intersection Lane Configuration Revisions

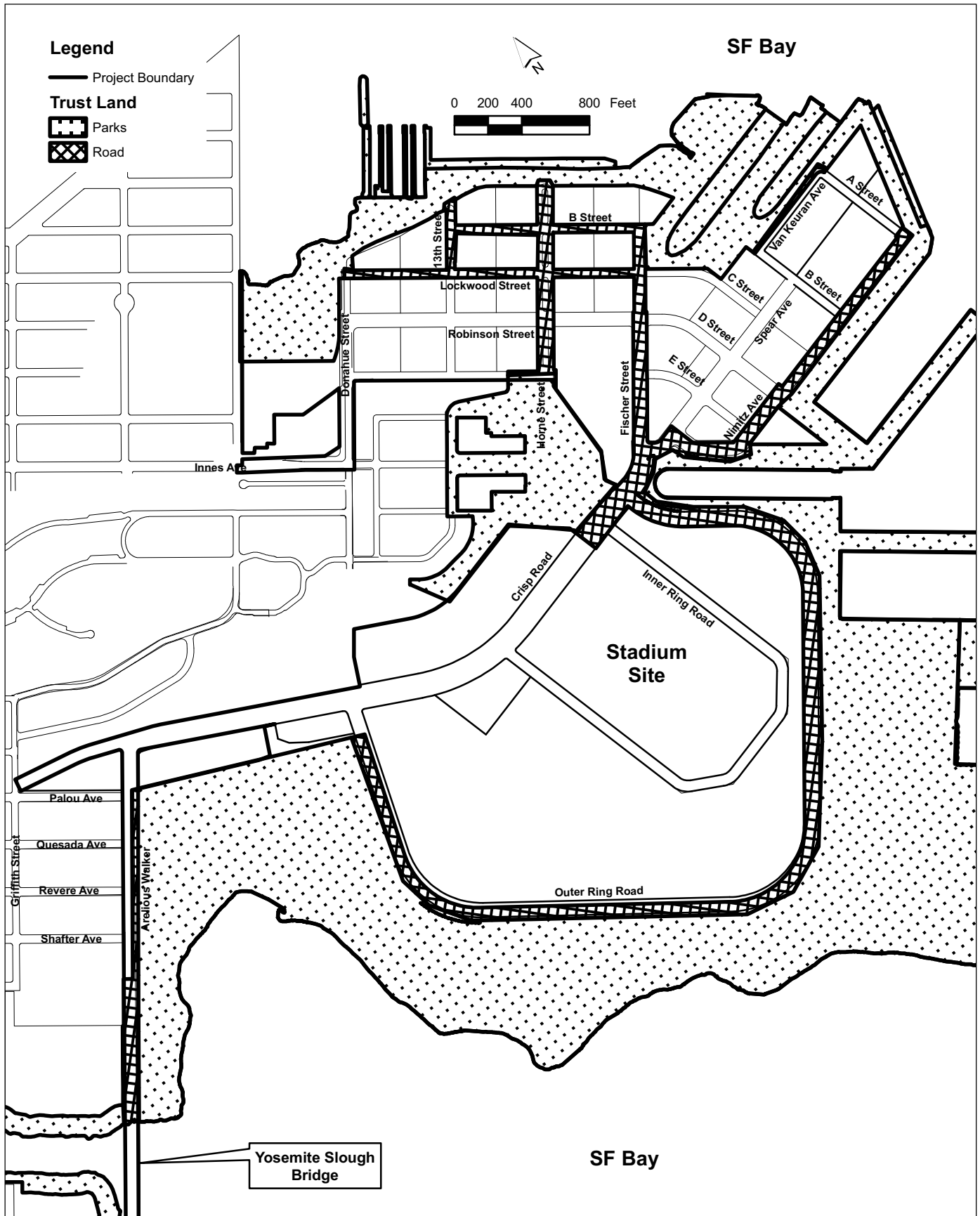
Intersection	Street	Direction	Lane Striping Configuration Revisions
		Westbound Approach	Re-stripe westbound approach to provide two approach lanes, a left-turn lane and a shared left/through/right lane.
	Griffith	Northbound Approach	Reconfigure to provide 2 approach lanes- a shared left/through/right-turn lane and a right-turn lane. The reconfiguration of the northbound approach requires displacement of approximately 200 feet of on-street parking on the east side of Griffith Street, which would eliminate about 8 to 10 parking spaces.
	Palou	Eastbound Approach	Reconfigure to provide 2 approach lanes - a left-turn lane, and a shared through and right-turn lane
Thomas / Ingalls	Thomas	Westbound Approach	Reconfigure to provide 2 lanes, a left-turn lane and a shared through and right-turn lane

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.

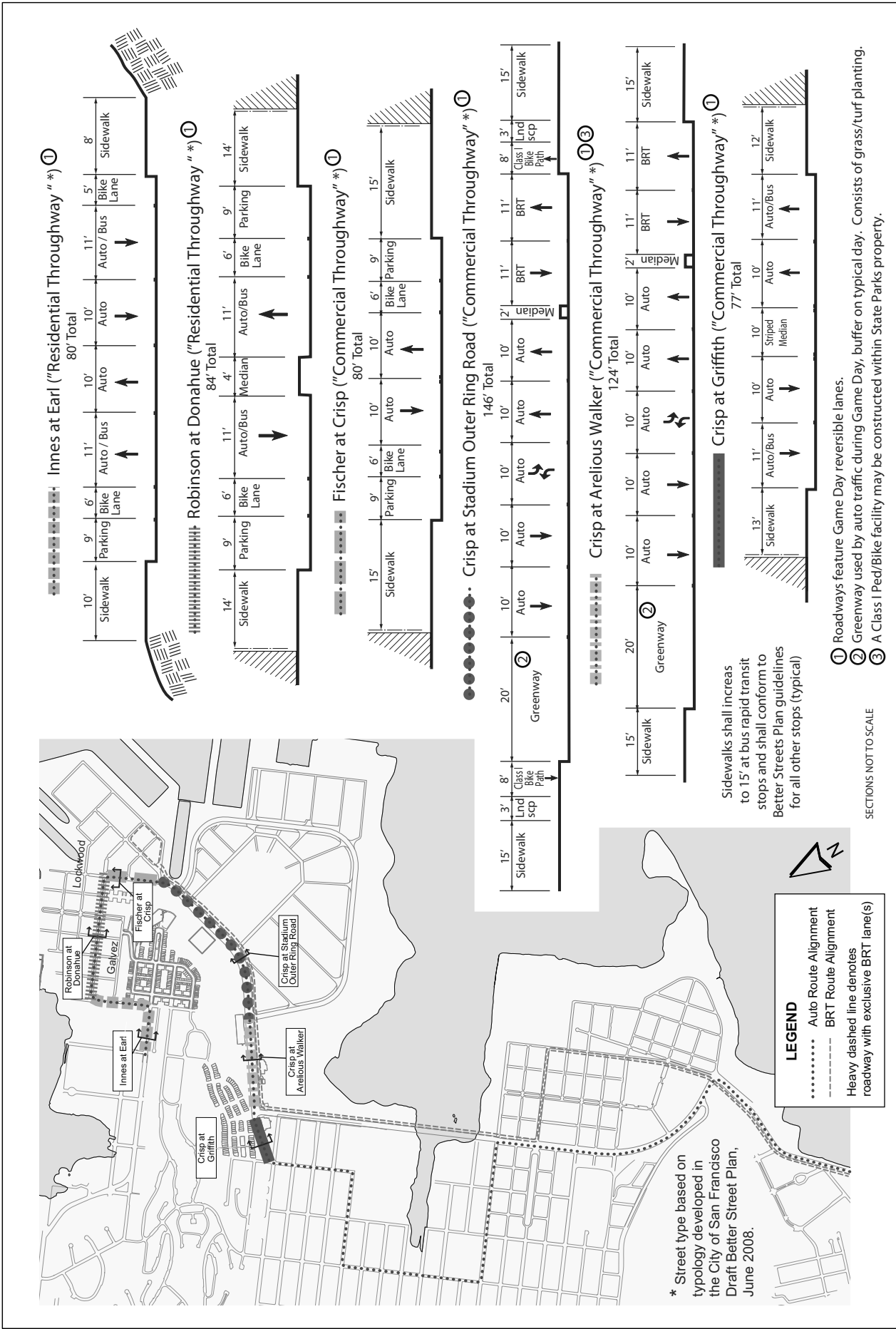


	Hunters Point Shipyard Phase II Development On-Site Roadway Network	Figure 2.1.1A
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Hunters Point Shipyard Phase II Development
Trust Land

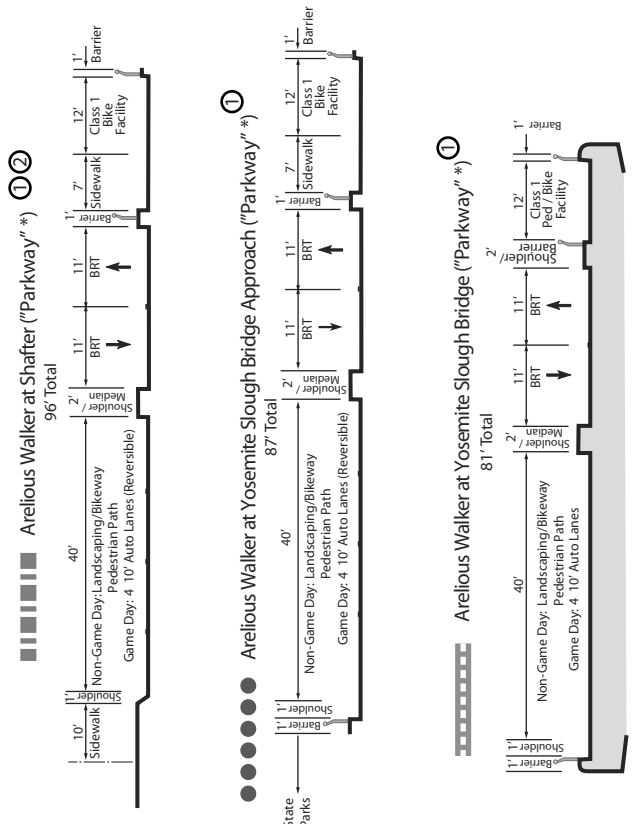
Figure 2.1.1B



Hunters Point Shipyard Phase II Development

On-Site Street Network - Arterials

Figure 2.1.2A



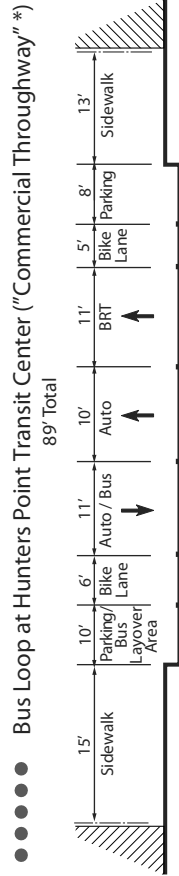
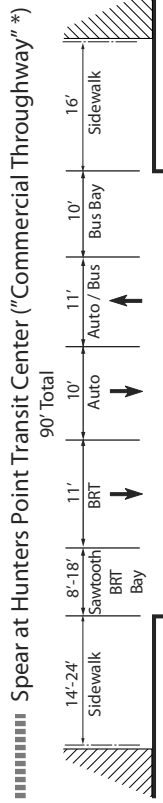
- ① Roadways feature Game Day reversible lanes.
 - ② Park with multi-use paths is adjacent to the street right-of-way.
- Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

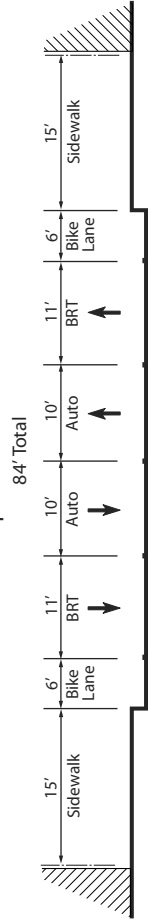
Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge Arterials

Figure 2.1.2B

Source: Fehr & Peers



— Spear at Fischer



Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

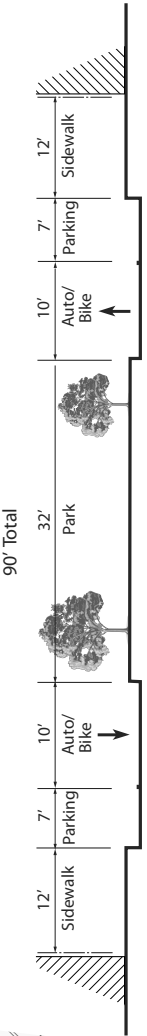
Hunters Point Shipyard Phase II Development
On-Site Street Network - Collectors

Figure 2.1.2C

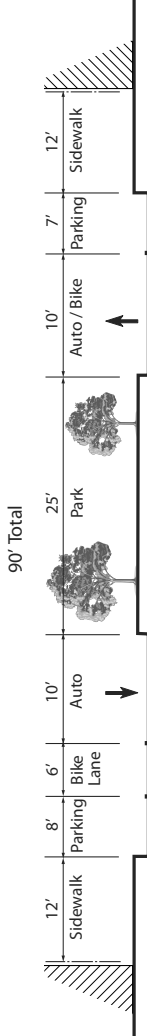
Source: Fehr & Peers



Home at Robinson ("Parkway"*)



Home at Galvez ("Parkway"*)



⓪ Class II bicycle lane provided in uphill direction.

Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

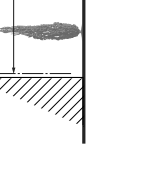
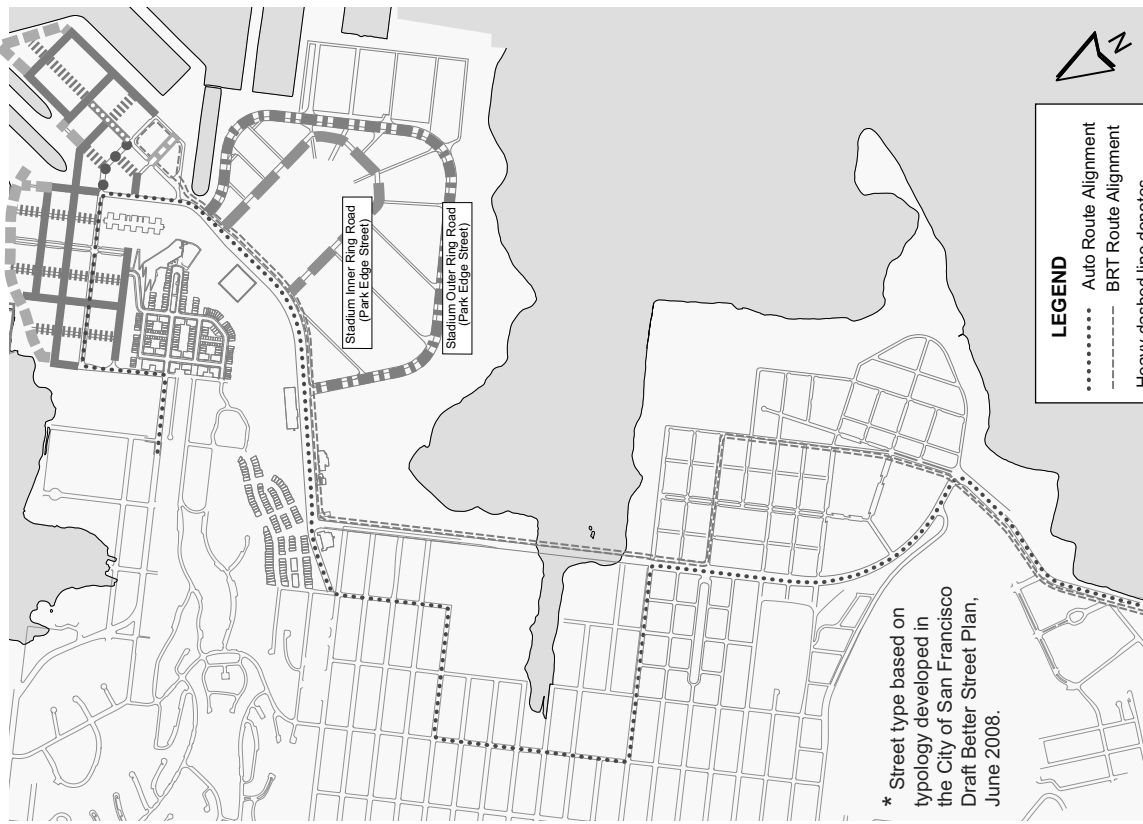
SECTIONS NOT TO SCALE

Hunters Point Shipyard Phase II Development

On-Site Street Network - Parkways

Figure 2.1.2D

Source: Fehr & Peers



- ① Alternative to private alley could include auto access.
- ② Cross-sections for alleys include 10' landscaping between buildings and multi-use paths as required in D4D for informational purposes only. This same setback is required, but not shown, in other sections, per the D4D.
- ③ May need to handle emergency access and car turn-arounds.
- ④ Includes R+D area in the shipyard.

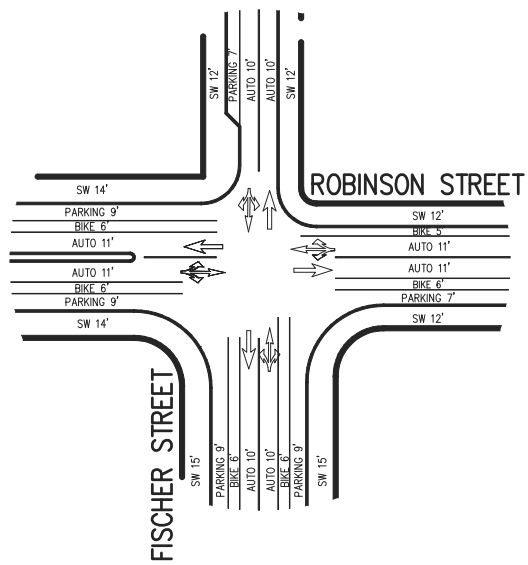
Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

Hunters Point Shipyard Phase II Development

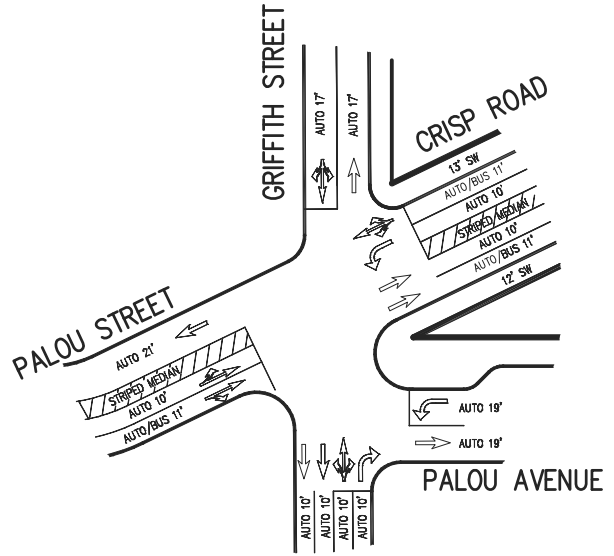
On-Site Street Network - Local Streets

Figure 2.1.2E



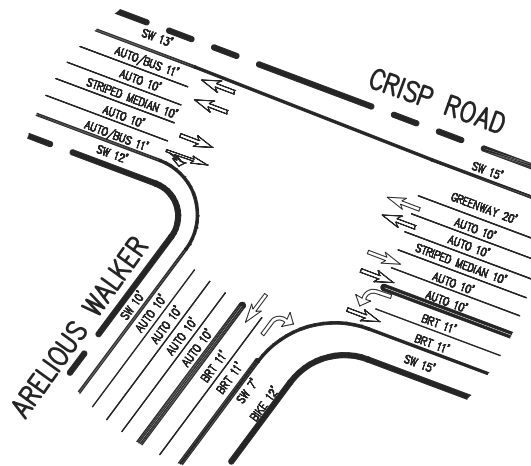
FISCHER ST. AND ROBINSON ST.

SCALE: 1"=100'



CRISP ROAD/GRIFFITH ST./PALOU ST.

SCALE: 1"=100'



SEE FIGURE 2.1.2G FOR GAME DAY POST GAME

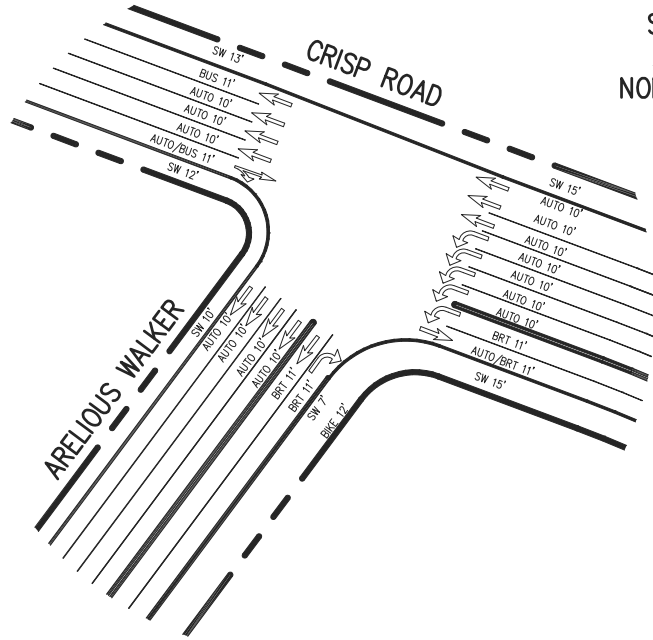
ARELIIOUS WALKER AND CRISP ROAD (NON-GAME DAY)

SCALE: 1"=100'



Hunters Point Shipyard Phase II Development
Major Intersection Circulation Details

Figure 2.1.2F



SEE FIGURE
2.1.2F FOR
NON-GAME DAY

ARELIOUS WALKER AND CRISP AVENUE (GAME DAY- POST GAME)

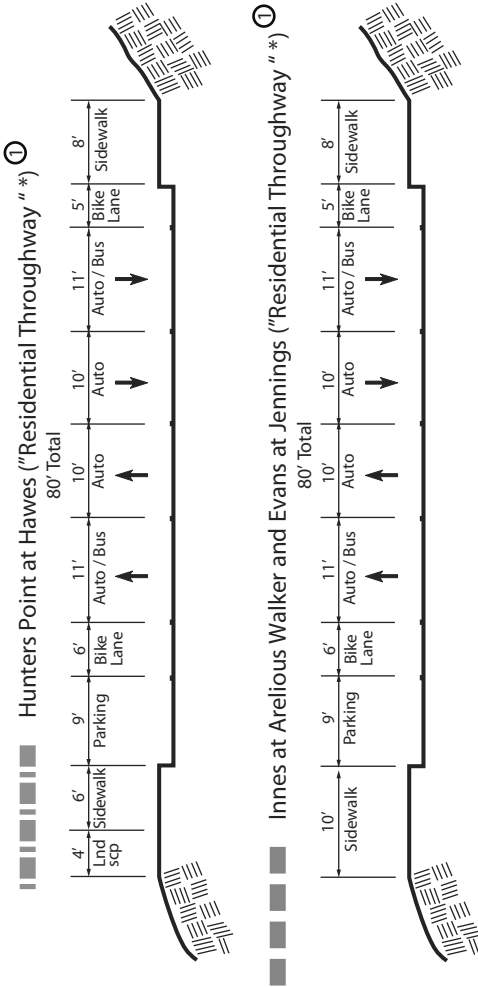
SCALE: 1"=100'



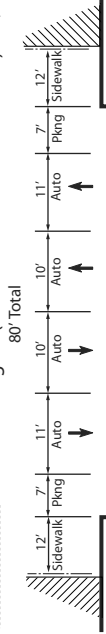
	<p>Hunters Point Shipyard Phase II Development</p>	<p>Figure 2.1.2G</p>
	<p>Major Intersection Circulation Details</p>	



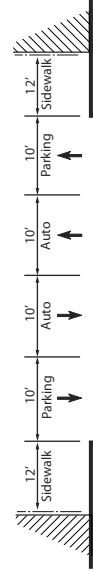
* Street type based on typology developed in the City of San Francisco Draft Better Street Plan, June 2008.



Thomas at Ingalls ("Industrial Mixed-Use Street" *) (Existing ROW = 80')



Griffith at Thomas ("Industrial Mixed-Use Street" *) (Existing ROW = 64')



- ① Roadways feature Game Day reversible lanes.
- ② Truck loading is permitted on either side of Ingalls and Griffith from 6 AM to 4 PM; parking/loading lane becomes auto travel lane from 4 PM to 7 PM.

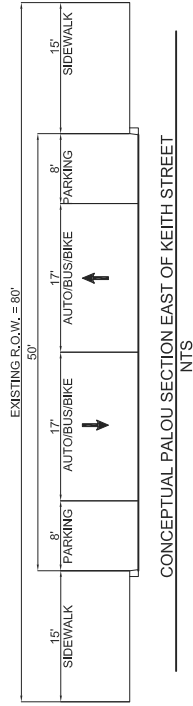
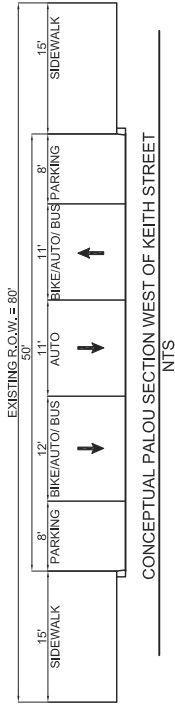
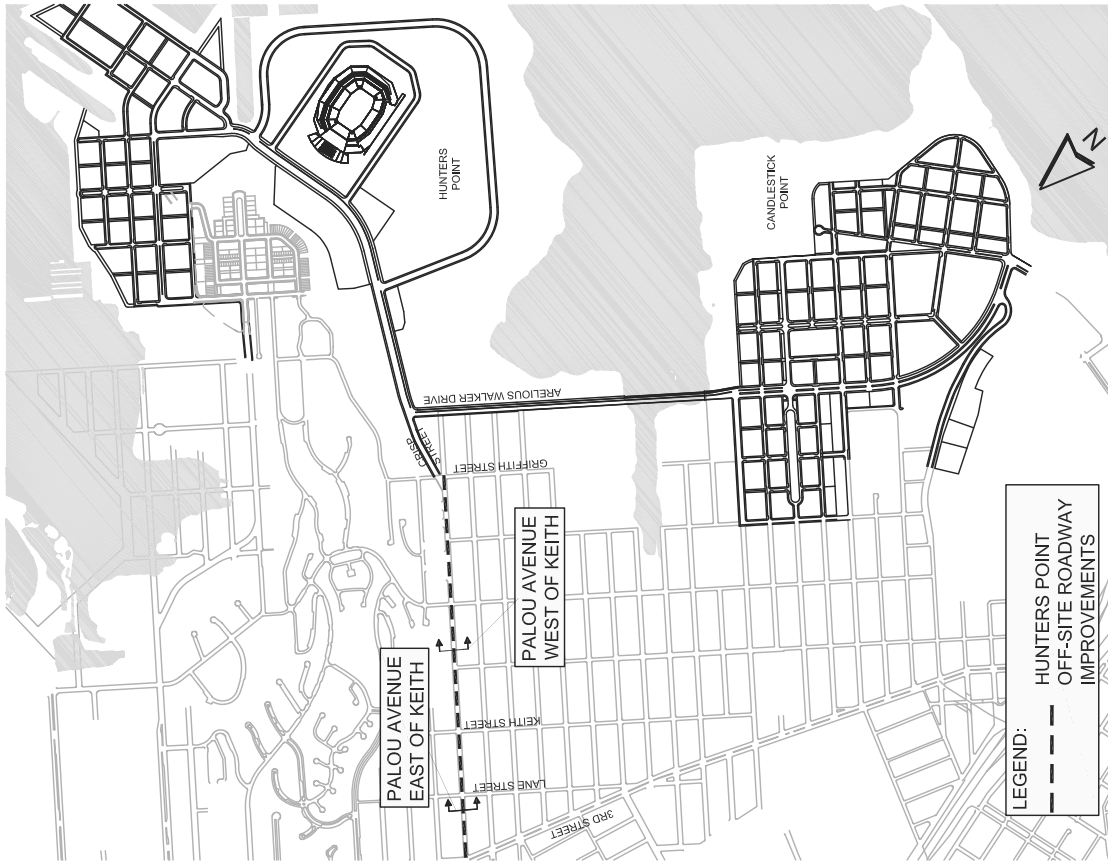
Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

SECTIONS NOT TO SCALE

Hunters Point Shipyard Phase II Development

Off-Site Roadway Improvements - Griffith Street, Thomas Avenue and Innes Ave/Hunters Point Blvd/Evans Ave

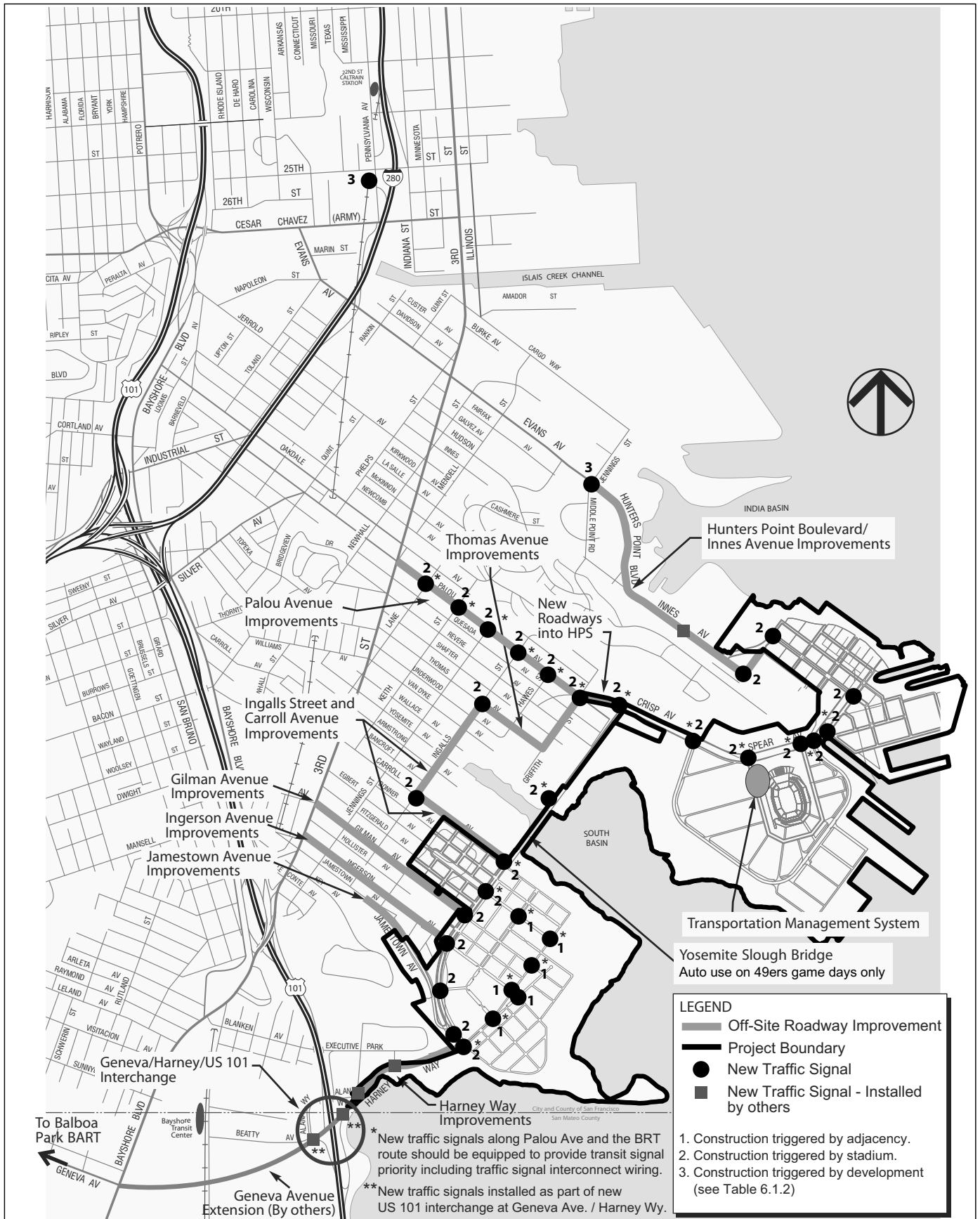
Figure 2.1.3



- REFERENCES:
1. CONCEPTUAL SECTION LAYOUTS PROVIDED BY F&P
 2. CITY AND COUNTY OF SAN FRANCISCO STREET SHAPE FILES DOWNLOADED JUNE 2009.
- NOTES:
1. FOR LIMITS OF WORK REFER TO TEXT DESCRIPTIONS OF IMPROVEMENTS.

Hunters Point Shipyard Phase II Development
Off-Site Roadway Improvements - Palou Avenue Corridor

Figure 2.1.4



Hunters Point Shipyard Phase II Development
Traffic Signal Improvements

Figure
2.1.5

2.2 MUNI IMPROVEMENTS

As described in the Project Transportation Plan, MUNI intends to provide an increased level of service to the HPS2 Area, including a new Bus Rapid Transit (BRT) route (extension of 28L-19th Avenue Limited), extension of one existing trolley bus route (24-Divisadero), extensions of several motor coach routes (23-Monterey, 24-Divisadero, 44-O'Shaughnessy, and 48-Quintara), and introduction of a new express motor coach route (HPS2X – Hunters Point Express). Service improvements that MUNI intends to operate are illustrated on Figure 2.2.1.

There may be necessary or desirable revisions to MUNI transit plans for services described herein, 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, Developer agrees to work with the City to accommodate such revisions as enumerated herein, including construction of poles, eyebolts and other facilities associated with the 24-Divisadero, at alternate locations; however, once initially designed or constructed, the cost of relocation of such facilities will not be Developer's responsibility and any such changes shall not adversely delay or affect Developer's ability to develop the HPS2 Area in accordance with the DDA 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 Developer and MUNI, as described herein:

HUNTERS POINT TRANSIT CENTER

In consultation with MUNI, the Developer will develop and provide a new Hunters Point Transit Center (Transit Center). Most of the bus lines serving Hunters Point Shipyard (including Muni lines 24-Divisadero, 44-O'Shaughnessy, and 48-Quintara) would be extended into Hunters Point Shipyard and would stop at the transit center allowing quick and immediate transfers to other lines. The Transit Center shall be located within the block encompassed by Spear Avenue, Nimitz Avenue, and D Street and shall include ten bus bays, shelters, ticketing kiosks, real-time transit information technology, a bike station, operator restrooms, and office space for the CP and HPS2 TDM Coordinator. If office space cannot be provided at the Transit Center, the Developer shall provide office space for the TDM coordinator at an alternate location. Once constructed, the City shall maintain the Transit Center, except for the TDM coordinator office space, which shall be maintained by Developer.

BUS RAPID TRANSIT (BRT)

Developer and City shall participate in the planning, design and construction of transit-only lanes and stations in the HPS2 area, as described herein, to accommodate new BRT service. Within the HPS2 area, transit only lanes will travel across the Yosemite Slough Bridge along Arelious Walker Drive, Crisp Road and Spear Avenue into the Hunters Point Transit Center. Three BRT stops will be constructed within the Hunters Point Shipyard Development Area, including the Hunters Point Transit Center. 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 mitigation measures. 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.

MOTOR COACH ROUTES (23-MONTEREY, 44-O’SHAUGHNESSY, 48-QUINTARA, HPX-HUNTERS POINT EXPRESS)

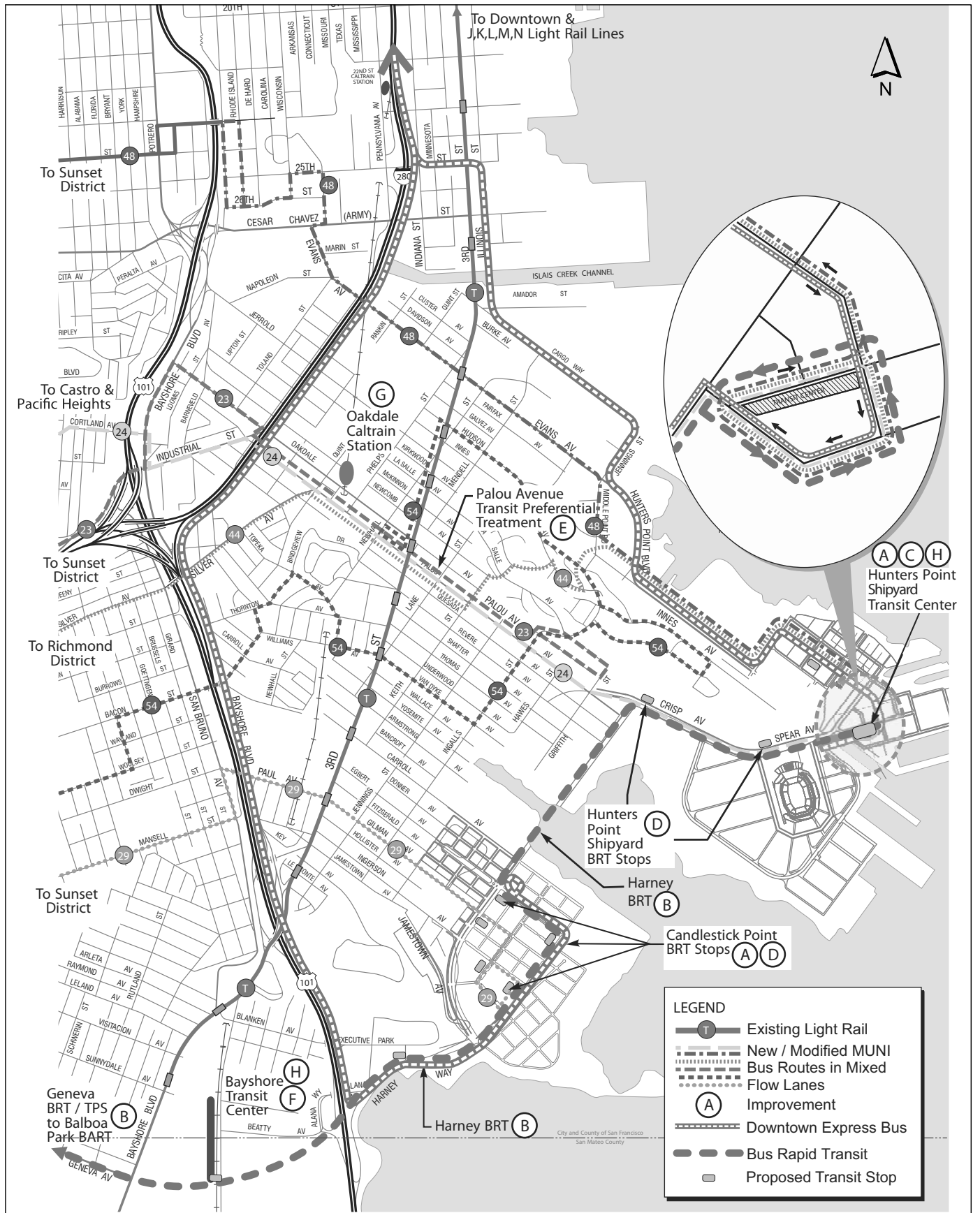
MUNI shall extend existing motor coach routes and create a new Downtown express route to serve the HPS2 Area. The City shall install and maintain transit shelters, including related furniture, adjacent to selected transit zones on land owned by the City (unless otherwise agreed by the Developer) along these routes, as depicted on Figure 2.2.1. The precise location of such facilities shall be determined in consultation with 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 mitigation measures. Developer will bear the reasonable costs of relocation of MUNI facilities if needed.

PALOU AVENUE TRANSIT PREFERENTIAL STREET (TPS) TREATMENTS

As part of installation of new traffic signals along Palou Avenue between Third Street and Griffith Street (see Section 2.1.3), Developer will provide or construct signal interconnect, equipped with transit signal priority devices.

STADIUM TRANSPORTATION MANAGEMENT CENTER

A Stadium Transportation Management Center, which may control and/or monitor parts of the HPS2 Area transportation systems on days of stadium events, will be provided as part of the Stadium Pad improvements described in Section 5.2.



Hunters Point Shipyard Phase II 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 HPS2 Area of the Project. For each wet utility system except AWSS, a Technical Memorandum 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 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 HPS2 Area development will be collected by a Separated Sanitary Sewer System as shown on Figure 2.3.1. The system consists of 8-inch diameter collection mains that drain to separated sanitary sewer pump stations. Separated sanitary sewers within Parcel B and Parcel C will drain by gravity to a separated sanitary sewer pump station located in the northeasterly corner of Parcel B near the intersection of Fischer Street and B Street. The force main from the pump station will traverse Crisp Road from the pumping station to the connection point to the Hunters Point Tunnel at Palou and Griffith Streets. The separated sanitary sewers in Parcels D and E will drain by gravity main to a separated sanitary sewer pump station in Parcel D-2. This pump station will manifold into the new sewer force main from the pump station in Parcel B. Two small duplex pumping stations will be provided on the extremities of the Stadium parking lot to service planned public restrooms and connect to the separated sanitary sewer system.

This system will have interim connections to the existing combined sewer in Innes Street (if approved by the City) and permanent connections of sewage force mains to the existing 60-inch diameter combined sewer gravity/pressure main known as the Hunters Point Tunnel in the vicinity of Palou Avenue and Griffith Street. The Developer will make connections to the existing facilities as approved by the City. Rehabilitation of the existing combined sewer system pipeline and pumping stations, if required by impacts from this Project, will be provided by the Developer

for those portions of the system to be reused within the boundary of the HPS2 Area. No improvements are required to rehabilitate any portion of the City's combined sewer system or the City's pumping stations outside the boundary of the HPS2 Area.

Four lots fronting Galvez Avenue near Donahue Street on the Hunters Point Phase I Hilltop project are currently designed with a separated sanitary sewer system that will be pumped on an interim basis to the Hilltop sanitary sewer gravity system. Upon completion of the HPS2 separated sanitary sewer system, these lots will be connected to the new sewer main in Galvez Avenue. The Developer will make this connection and abandon the small lift station and its force main once connection has been made to the HPS2 Area Separated Sanitary Sewer System. Rehabilitation of the existing combined gravity sewer pipeline and support system, if required, would be provided by the City. No improvements are required by the Developer to any portion of the City's combined sewer systems or City's pumping stations outside the boundary of the HPS2 Area development. Portions of the existing combined sewer within the HPS2 Area development may be removed and or abandoned by the Developer where reuse is not compatible with Project objectives. No sanitary sewer service connection will be permanently interrupted.

The Separated Sanitary Sewer System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations and defined by the Separated Sanitary Sewer Technical Memorandum that has been submitted by the Developer to the City. 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 Technical Memorandum submitted by the Developer to the City.

The design criteria used for the development of the Separated Sanitary Sewer System is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments with separated sanitary sewer systems within the City and County of San Francisco. Design criteria have been presented to, and reviewed by, the SFPUC Wastewater Enterprise.

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. Gravity manholes, pressure outlet manholes, sewage air and vacuum release valves, laterals and other appurtenances will be constructed as required to meet HPS2 Area design standards.

Upon acceptance of the Separated Sanitary Sewer 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.

Reuse of any particular portion of the existing gravity combined sewer and support system in the manner described above shall be subject to further review by the SFPUC of the Developer's reuse proposal. Such review shall include an assessment of the condition of the existing pipe(s) performed by the Developer using a technical assessment methodology approved by the SFPUC prior to any construction or excavation work in the vicinity of the systems in question. 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.

2.3.2 SEPARATED STORM DRAINAGE

The separated storm drainage flows for the development will be conveyed by a Separated Storm Drainage System as shown on Figure 2.3.2. In addition, overland flow drainage from the HP Phase I Development area along Donahue and Coleman Streets will flow towards the HPS2 Area development. Piped stormwater flows from HP Phase I development in Donahue Street will be treated on Parcel B consistent with SFPUC Stormwater Design Guidelines before discharging to San Francisco Bay.

The Separated Storm Drainage System will consist of Low Impact Design (LID) features to treat the 0.75-inch design storm, a 5-year piped collection system, and an overland release system. The HP Area will be designed to comply with the City of San Francisco Stormwater Design Guidelines (SDG) and 2010 Stormwater Management Ordinance (SMO). Because the HP Area resides in a separated storm drainage / sanitary sewer area, per the SDG they must be designed to meet performance measures equivalent to LEED Sustainable Sites (SS) Credit 6.2, "Stormwater Design: Quality Control." As also required by the SDG, the HP Area will develop a Stormwater Control Plan (SCP) that will be submitted concurrent with the final construction documentation for approval by the SFPUC Urban Watershed Management Program.

LID strategies will be used to meet the required LEED-based performance measures across the site. LID strategies 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. 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, as defined by the SDG, before discharging into the 5-year system and being delivered to San Francisco Bay.

The 5-year piped system will consist of gravity mains draining to San Francisco Bay. The overland flow releases for the 100-year minus 5-year flow will drain through pipes and streets from back-of-sidewalk to back-of-sidewalk, into a junction box, and through a gravity pipe that will discharge to San Francisco Bay via six outfalls. Discharges to the San Francisco Bay will be made consistent with the Project Storm Water Management Plan (SWMP) and the National Pollution Discharge Elimination System (NPDES) permit requirements. Mains range from 18-inch to 66-inch in diameter. The overland release system consists of the 5-year collection system, the street network, 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 several overland release discharge facilities to San Francisco Bay.

Grading of the HPS2 Area shall be performed in compliance with the Project Risk Management Plan. The areas near San Francisco Bay will be set at a minimum top of curb elevation of 103.3 feet, Project Datum. The minimum first floor building elevation shall be no lower than 103.8 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 Separated Storm Drainage System, including LID features will be designed in accordance with the Subdivision Code and Project Subdivision Regulations (to be developed separately) and defined by the Separated Storm Drainage Technical Memorandum that has been submitted by the Developer to the City. In subdivision processing, including the review and approval of subdivision improvement plans, the precise location and final design of the Separated Storm Drainage System Infrastructure will be consistent with this Infrastructure Plan and the Separated Storm Drainage Technical Memorandum.

The design criteria used for the development of the Separated Storm Drainage System is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments with

separated storm drain systems within the City of San Francisco. Design criteria have been presented to, and reviewed by, the SFPUC, which oversees the SDG for the City.

The proposed Separated Storm Drainage System has been configured to meet the stormwater flows based on the land use plan and defined development contained in the Plan or Plan Documents. Gravity manholes, drainage inlets, laterals and other appurtenances will be constructed as required to meet HPS2 Area design standards. 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 compliance with all regulations and mitigation measures.

2.3.3 AUXILIARY WATER SUPPLY SYSTEM (AWSS)

The AWSS system and the Infrastructure to be constructed by Developer in connection therewith are identified on Figure 2.3.3. This system is also known as a high pressure-water supply system dedicated for fire protection, and is operated and maintained by the San Francisco Fire Department (SFFD). The City-wide system serves as a source of fire protection in industrial, commercial and many residential districts. The system consists of cast iron or ductile iron pipe (DIP), high pressure hydrants, valves and fittings, suction intakes, and appurtenances.

The HPS2 Area is not currently served by the AWSS. The SFFD will extend the AWSS with transmission mains and appurtenances along Crisp Avenue from the intersection of Ingalls Street and Revere Avenue to the Project boundary and along Evans Avenue, Hunters Point Boulevard, Innes Avenue and Donahue Street from the intersection of Keith Street and Evans Avenue to the Project boundary. The Developer will provide a new AWSS loop connecting to these extensions at the Project boundary, a second loop in Inner Ring Road around the Stadium Pad, and several mains extending from this loop to the edges of the development as shown on Figure 2.3.3. The system shall also have two (2) electrically operated remotely controlled valves on the mains at the connection points, four suction intakes at the shoreline, high pressure hydrants throughout the system, a new seawater pump station, and two fireboat wharf manifolds.

The DPW will design the proposed AWSS improvements on behalf of the SFFD in the approximate locations shown on Figure 2.3.3. The Developer shall pay for the reasonable costs of designing and constructing the 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.

2.3.4 LOW PRESSURE WATER SYSTEM

Potable water and fire flow demands for the HPS2 Development 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 2.3.5 below.

The HPS2 Area will be supplied City water through connections to the City’s University Mound Pressure Zone at two locations: 1) Palou Avenue and Griffith Street; and 2) Innes Avenue and Earl Street. No improvements to the City water system between these connection points and the University Mound Reservoirs are required for the HPS2 Area development. The Project 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 Hunters Point Shipyard Phase 2 Boundary Conditions

Connection Point	<i>Hydraulic Grade at Connection Point (feet)⁽¹⁾</i>					
	<i>@0 gpm</i>	<i>@500 gpm</i>	<i>@1,000 gpm</i>	<i>@1,500 gpm</i>	<i>@ 2,000 gpm</i>	<i>@3,500 gpm</i>
Palau Ave/Griffith St	267	266	262	256	247	237
Innes Ave/Earl St	268	265	261	254	245	234

Notes: ⁽¹⁾ CP/HPS2 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 proposed distribution system consists of a backbone of 16-inch pipelines from the connection points and 12-inch (or smaller) pipelines throughout the majority of the development. Valves, blow-offs, air release valves, services, meters and other appurtenances will be constructed as necessary to meet system operational requirements.

The Low Pressure Water System will be designed in accordance with the Subdivision Code and Project Subdivision Regulations and defined by a Low Pressure Water System Technical Memorandum that has been submitted by the Developer to the City. 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 Technical Memorandum.

The design criteria used for the development of the low pressure water system is based upon established industry operations standards, regulatory agency requirements, and Project Subdivision Regulations, and is consistent with criteria utilized for recent developments within the City. Design criteria have been presented to, and reviewed by, the City Distribution Division of the City Water Department (SFWD), as well as the San Francisco Fire Department (SFFD).

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.

2.3.5 RECYCLED WATER SYSTEM

Recycled water demands for the HPS2 Area will be served by the Recycled Water System as shown on Figure 2.3.5. Since the City currently does not have an operational recycled water source, the Project Recycled Water System will be constructed by the Developer and supplied by the City's potable water distribution system via interim connections until a recycled water supply is developed by the City. The City is currently engaged in technical evaluations of siting and other considerations relating 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. All work necessary to convert to the recycled water system and deliver recycled water to the site in the future will be provided by the City.

The Recycled Water System will be designed in accordance with the Subdivision Code and Candlestick Point / Hunters Point Shipyard Phase 2 Subdivision Regulations (to be developed separately) and defined by a Recycled Water System Technical Memorandum that has been submitted by the Developer to the City. 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 consistent with this Infrastructure Plan and the approved Recycled Water System Technical Memorandum.

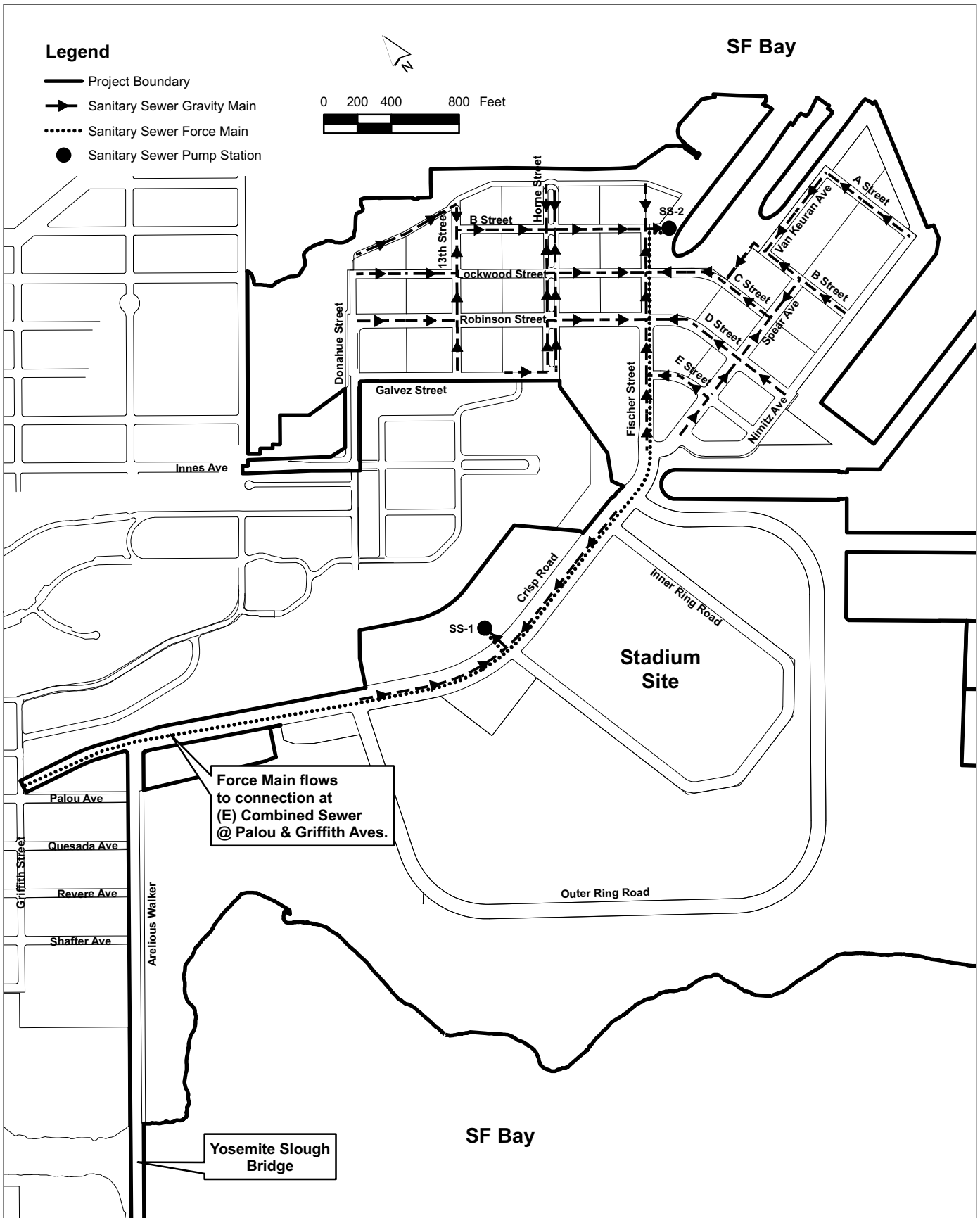
The design criteria used for the development of the recycled water system is based upon established industry operations standards, regulatory agency requirements, and the Project

Subdivision Regulations, and is consistent with criteria utilized for recent developments within the City. The design criteria have been presented to, and reviewed by, the SFWD City Distribution Division, and SFPUC.

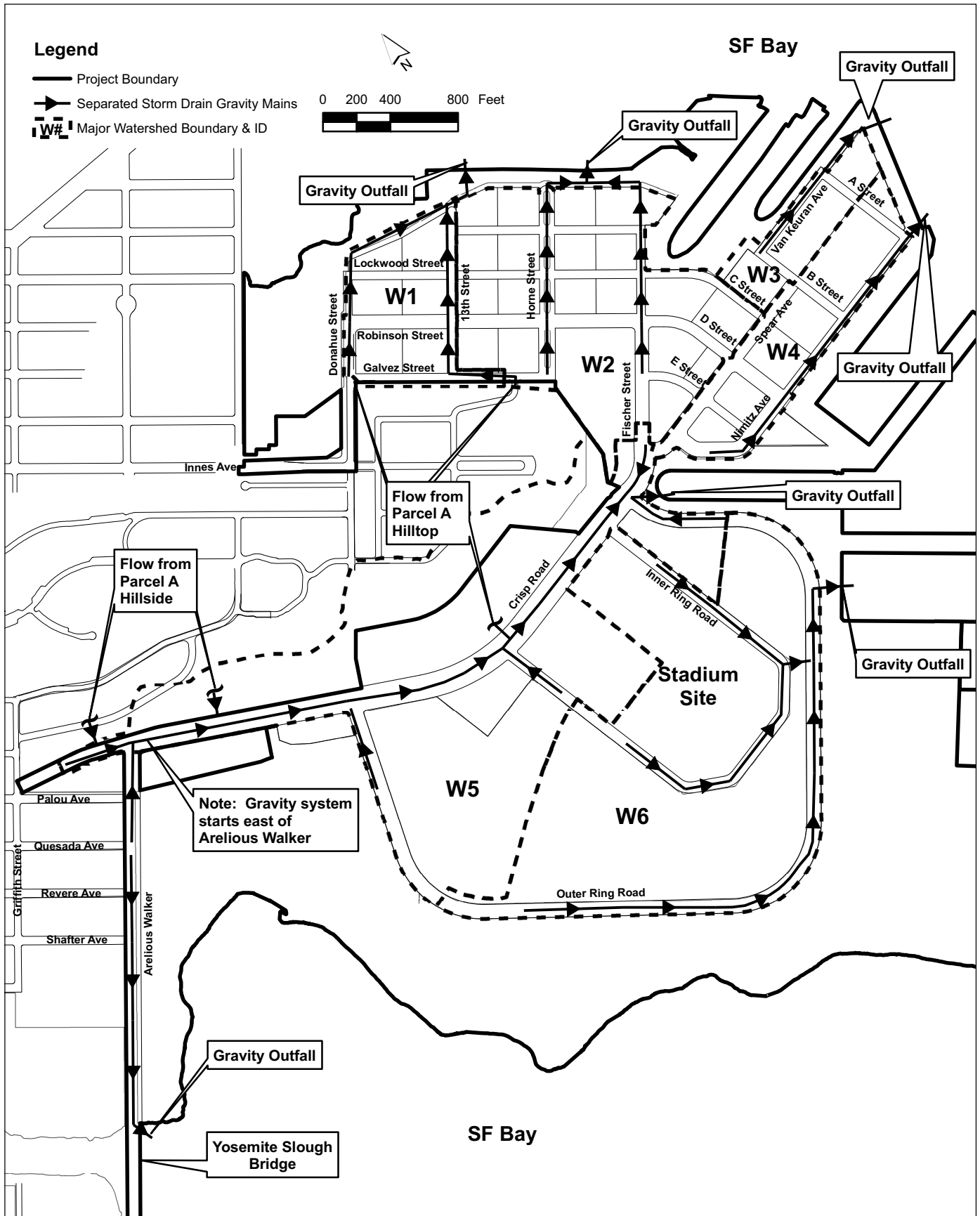
The proposed Recycled Water System will be connected to the Project Low Pressure Water System on an interim basis via reduced pressure principle backflow prevention devices located in the general vicinity of connections of the Project Low Pressure Water System. These will occur in or near the following two intersections: 1) Palou Avenue and Griffith Street; and 2) Innes Avenue and Earl Street. The locations of permanent connections to the City's yet-to-be-constructed recycled water system are also anticipated to be in the general vicinity of these same locations.

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 recycled water system is comprised of a backbone of 16-inch mains and 8-inch system piping in the majority of the network. An 8-inch diameter distribution pipe circumnavigates the stadium along Inner Ring Road and is required primarily for parks irrigation. Valves, blow-offs, air release valves, services, meters, purple hydrants/fill stations, and other appurtenances will be constructed as necessary to meet City design standards. The proposed Recycled Water System includes services to all buildings, including residential, in order to provide the opportunity for dual plumbing.

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.

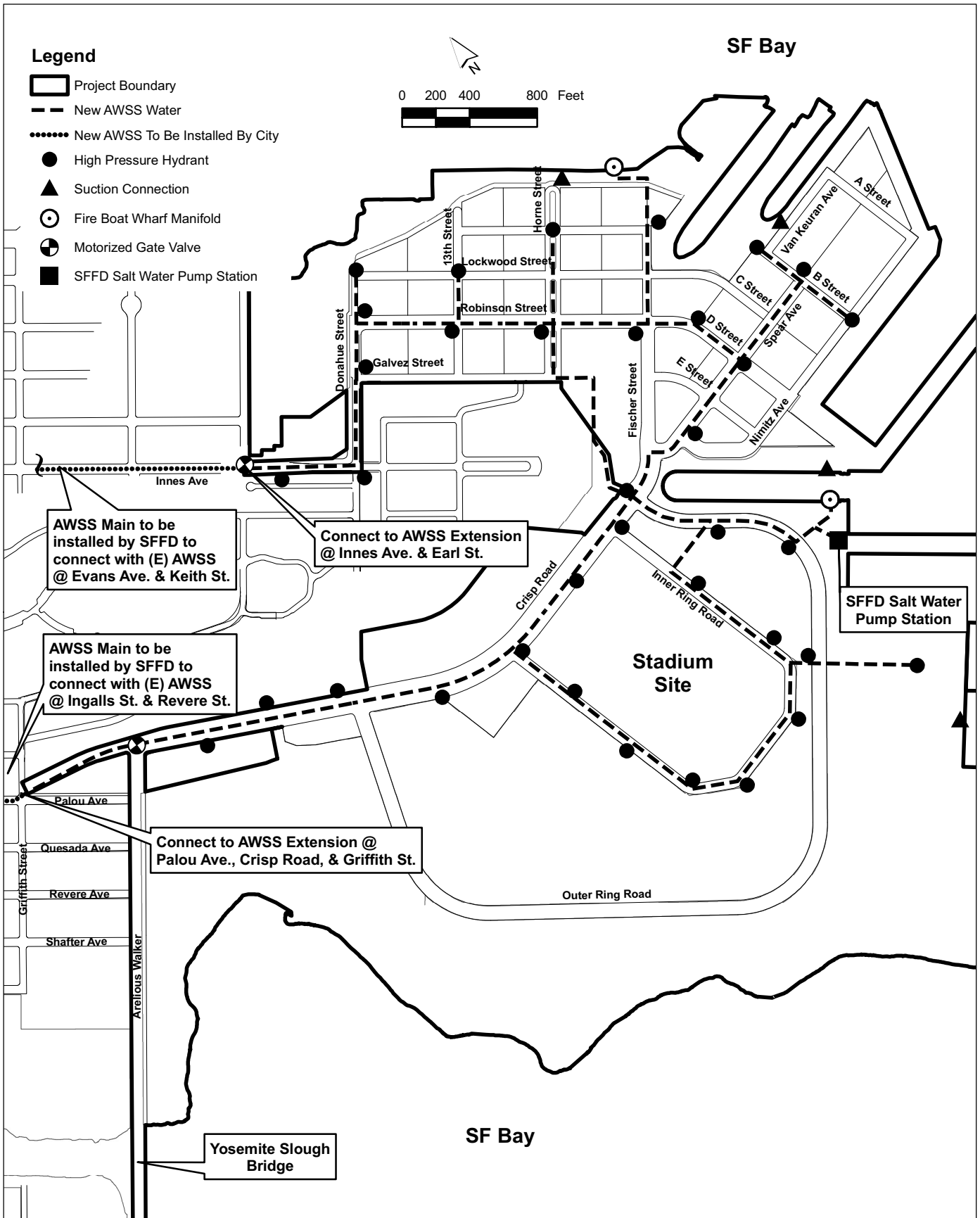


	Hunters Point Shipyard Phase II Development	Figure 2.3.1
	Separated Sanitary Sewer Layout	



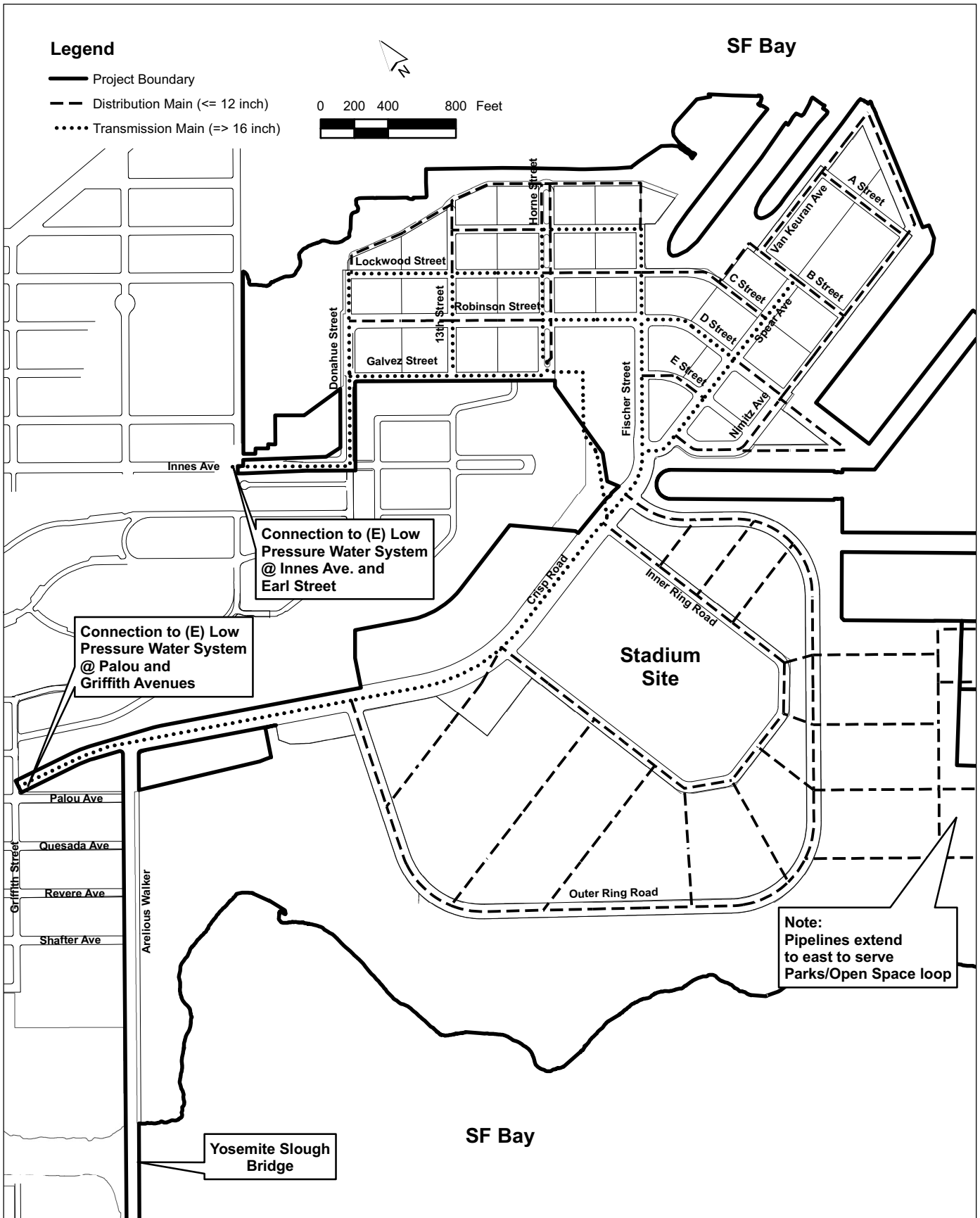
Hunters Point Shipyard Phase II Development
Separated Storm Drainage Layout

Figure 2.3.2

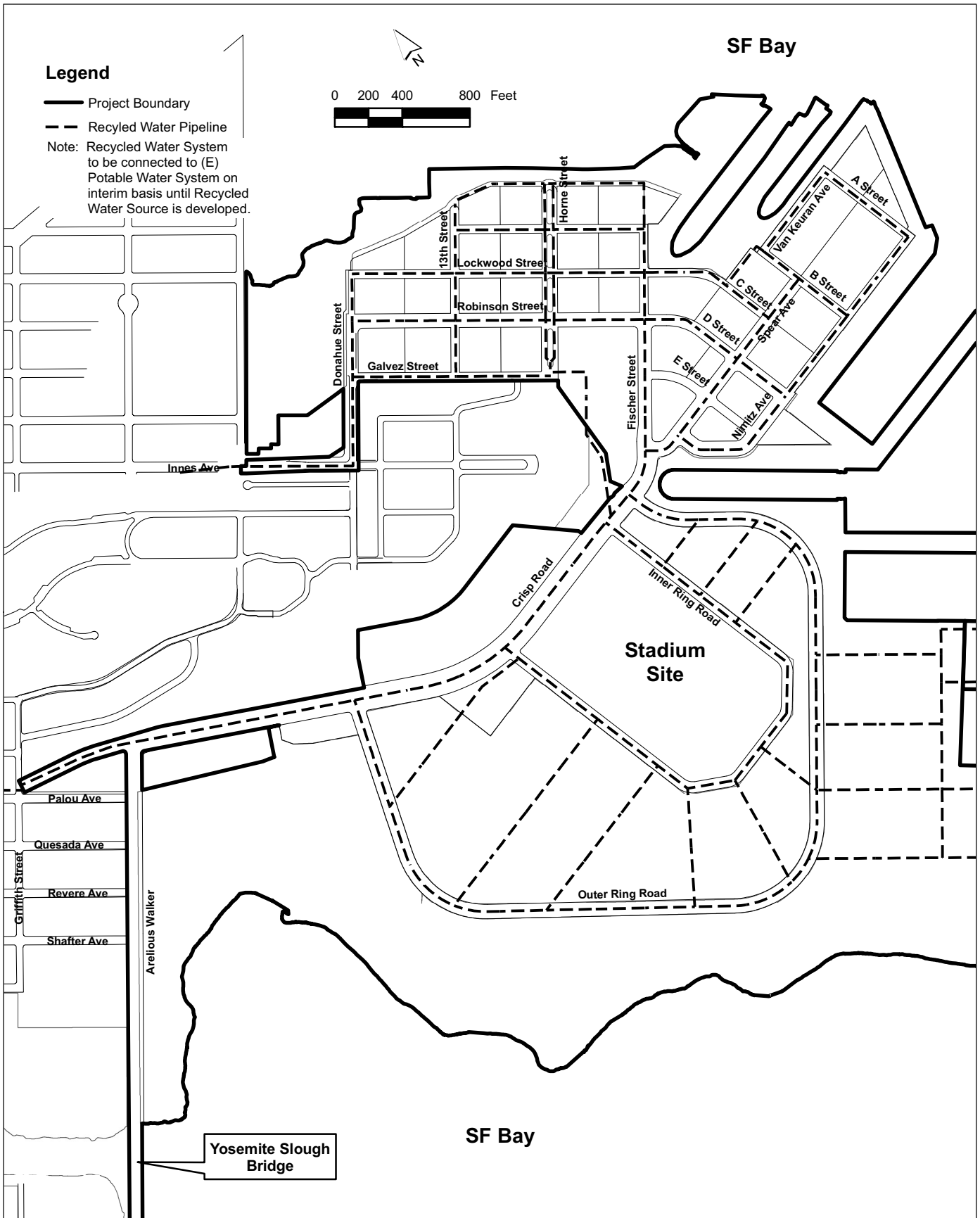


Hunters Point Shipyard Phase II Development		Figure 2.3.3
AWSS Layout		

Source: Winzler & Kelly
Infrastructure Plan



	Hunters Point Shipyard Phase II Development	Figure 2.3.4
	Low Pressure Water System Layout	



Hunters Point Shipyard Phase II Development		Figure 2.3.5
Recycled Water System Layout		

2.4 DRY UTILITY LAYOUTS

2.4.1 ON-SITE

GENERAL JOINT UTILITY TRENCH REQUIREMENTS

Work necessary to provide the joint trench for dry utilities (that lie in public streets and in the sidewalk area if at all 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, 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.

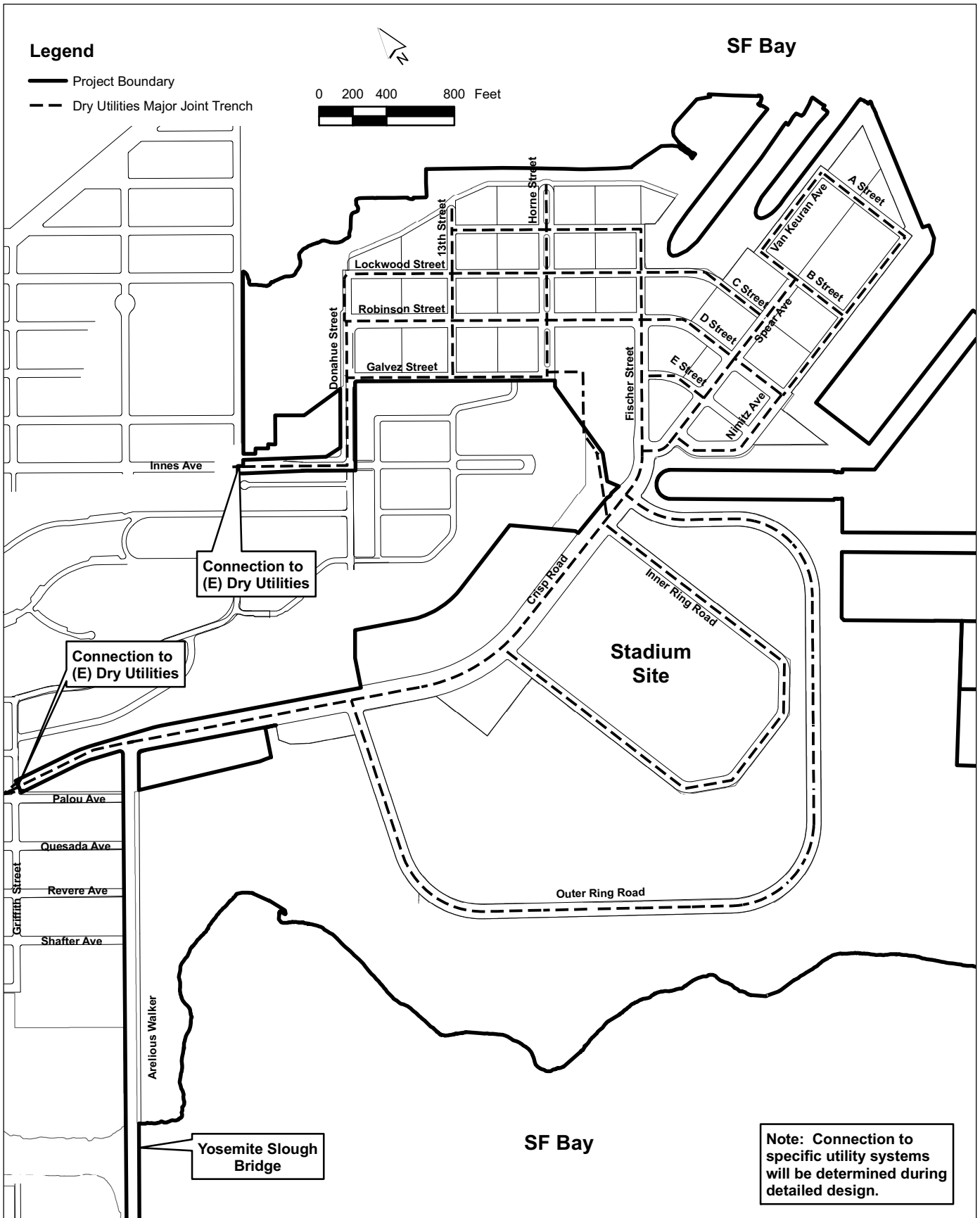
The existing electrical distribution system in the subject project area will be replaced as necessary and placed underground consistent with the timing of the development in phases as the project builds out, while maintaining service to existing customers.

The electric distribution system is planned to be in a joint or common trench which would include gas, phone, cable TV, and streetlight 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 HPS2 Area shall have LED fixtures as approved by the Bureau of Light, Heat, and Power. Secondary power for LED street lighting shall be installed in a separate trench in accordance with City Regulations in effect at time of construction. 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.



Hunters Point Shipyard Phase II Development		Figure 2.4.1
Dry Utility Joint Trench Layout		

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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 evolution of design strategies to address SLR is a process that is in its infancy. As a result, 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 SEA LEVEL RISE STRATEGIES

SLR will result in changing water levels that the project will need to accommodate. 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, and 36 inches for the development areas. 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 an SLR of 36 inches occurs. The mechanism for developing and implementing the AMP is described in Section 3.5.

The project has three zones that are impacted by 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.

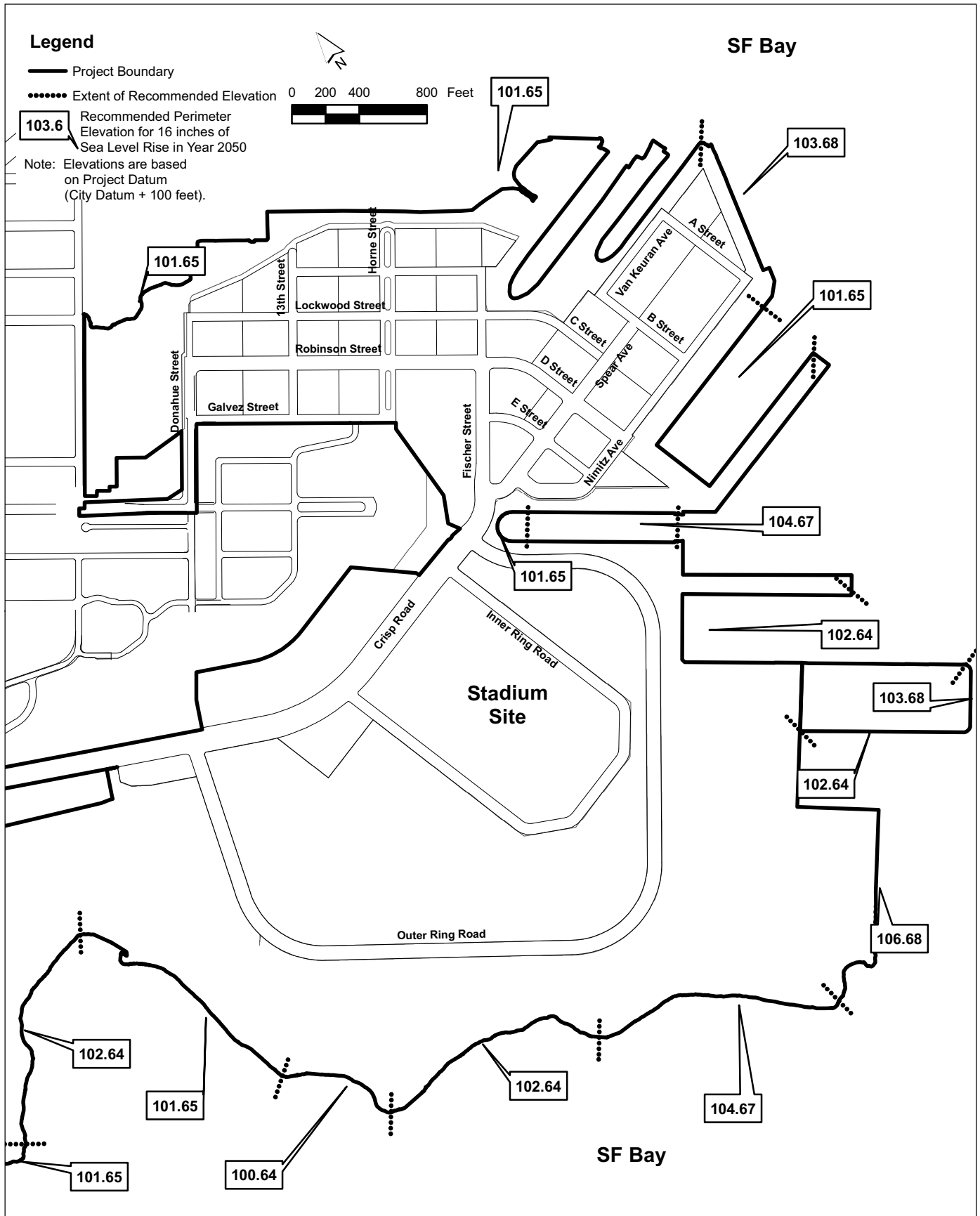
The present 100-year return period water level (100-year tide) for open space and development area design was estimated by M&N as elevation 98.2, Project Datum. The 100-year return period water level does not include additional estimated allowance for wind-driven waves. The 1% annual chance storm elevation for shoreline design, which includes the effect of tides, storm surges, tsunamis, and waves, was also estimated by M&N and varies by location as described in various reports and summarized on Figure 3.1.1. The general initial strategies for the Project and the adaptive management strategies needed after the Project is constructed are described below.

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>Parameter</u>	<u>Criteria</u>	<u>Value</u>
Shoreline	At a minimum, provide an elevation to accommodate the 1% annual chance storm event (100-year high tide) with minimal overtopping plus 16 inches of SLR	Provide shoreline protection to minimum elevation as defined by Figure 3.1.1.
Parks and Open Space adjacent to the shoreline	At a minimum, provide an elevation to accommodate the 100-yr tide while allowing ponding during combined large rain and high tide events	For facilities that are to be dry for the initial 16 inches of sea level raise the minimum elevation of site to be 99.53 feet, Project Datum
Development Perimeter – Structures	Finished floor of occupied facilities shall be at a minimum elevation of the 100-year tide plus 36 inches of SLR plus 6 inches of freeboard	Occupied facilities shall have a minimum first floor elevation of 101.8 feet, Project Datum. Based on SLR except where storm drainage system operation requires a minimum first floor elevation of 103.8 feet, Project Datum
Development Perimeter – Separated Storm Drainage System 5-Year Storm Event	Provide 2 feet freeboard between storm drainage system hydraulic grade line and the street finished grade with a 100-Year tide plus 24 inches of SLR in San Francisco Bay	Minimum elevation of street centerlines is elevation 103.3 feet, Project Datum. Storm drainage system designs to accommodate a 24 inch SLR for system operation with 2 feet of freeboard between storm drain hydraulic grade line and the finished grade of the street. Less freeboard will be allowed where the elevation of the 100-year overland release water surface is lower than the back of sidewalk.
Development Perimeter – Separated Storm Drainage System 5- to 100-Year Storm Event	With a 100-year tide in San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk	Drain overland release to shoreline/ San Francisco Bay



Hunters Point Shipyard Phase II Development		Figure 3.1.1
Sea Level Rise, Year 2050		

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 36 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. Improvements will address drainage of wave splash. Specific improvements to the various facilities are as follows:

- Northside Park - City will receive a reconstructed shoreline and land surface from the Navy for this park. The Navy is expected to reconstruct a shoreline edge as part of its site remediation plan. The Navy will place riprap to protect shoreline from erosion and flooding. The top elevation of the protection will prevent flooding and extreme tides in waves by accommodating the 1 percent annual chance storm event with minimal overtopping plus 36 inches of SLR. The Navy will provide shore protection to elevation 106.8 feet, Project Datum, which exceeds recommended perimeter elevation for 16 inches of SLR of 101.65 feet, Project Datum. The slope protection will be placed at 3:1 or flatter slopes (H:V). The Project provides no shoreline improvements.
- Submarine Drydocks (Waterfront Promenade 1) - The existing Shoreline edge is high enough to accommodate 16-inches of SLR, but the area immediately inland will not accommodate the 1 percent annual chance storm event with minimal overtopping plus 16 inches of SLR. As a result, this area will require a wave berm. The northern portion of the shoreline was used as a submarine mooring facility. The Navy is expected to remove the docks. The project will cut back the sea wall at a 2:1 slope and protect the slope. The southern portion of the shoreline is a wharf that will remain. The recommended perimeter elevation which accommodates the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 101.65 feet, Project Datum. The project will install the berm with shoreline protection riprap and the cut back slope with shore protection to prevent shoreline erosion.

- Wharf Along Berths 55 to 61 (Waterfront Promenade 2) - The existing wharf is high enough so that it is protected from the 100-year tide plus 16 inches of SLR to elevation 101.2, Project Datum. The elevation of the deck of the wharf ranges from 101.4 feet to 101.9 feet, Project Datum. The recommended perimeter elevation for the 1 percent annual chance storm event with minimal overtopping plus 16 inches of SLR is 101.65 feet, Project Datum. The project will provide a wave berm immediately inland of the existing wharf with minimum elevation of 101.65 feet, Project Datum.
- Rip-Rap Protected Slope East of Berth 55 (Heritage Park) - The existing Shoreline edge varies in elevation from 97.2 to 100.2 feet, Project Datum. The recommended perimeter elevation with 36 inches of SLR is 103.32 feet, Project Datum. The Navy is expected to reconstruct the northern shoreline edge as part of its site remediation plan. The Navy will place a wave berm with slope protection to protect shoreline from erosion and flooding to accommodate the 1 percent annual chance storm event with minimal overtopping plus 36 inches of SLR to an elevation of 103.32 feet, Project Datum. The south frontage adjacent to Dry Dock 3 will be raised by the project to accommodate the 1 percent annual chance storm event with minimal overtopping plus 16 inches of SLR, elevation 101.65 feet, Project Datum. The edge of Dry Dock 3 will be raised by extending the wall, if structurally sound, or by placement of berms or other methods to protect to elevation 101.65 feet, Project Datum. Space is reserved for wave barriers to protect against extreme tide and wave conditions greater than 36 inches of SLR. The project does not include any improvements to the wharf on the northwest of the site for SLR.
- Drydocks 2 and 3 (Heritage Park Frontage) - The recommended perimeter elevation which accommodates the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 101.65 feet, Project Datum. The edges of Dry Docks 2 and 3 will be raised by the project. Methods include raising the walls, if structurally sound, or placing berms to elevation 101.65 feet, Project Datum.
- Drydocks 2, 3, and 4 (Promenade Frontage (“MP2 Promenade 2”)) - The existing Shoreline is a concrete wharf which is at elevation 99.4. The recommended perimeter elevation which accommodates the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 103.68 feet, Project Datum. A wave berm will be provided by the Project immediately inland of the wharf to elevation 103.68 feet, Project Datum and the waves will overtop the wharf.

- Drydocks 2, 3, and 4 (Promenade Frontage (“MP2 Promenade 1”)) - The existing Shoreline elevation is 99.7 feet, Project Datum, with a recommended perimeter elevation which accommodates the 1% annual chance storm event with minimal overtopping plus 16 inches of sea level at elevation 101.65 feet, Project Datum. The project will raise the edge of the Shoreline to elevation 101.65 feet, Project Datum. The existing edge of shoreline is a timber crib wall that will be cut back on a 2:1 slope.
- Shoreline of Dry Dock No. 4 – The existing edge of Dry Dock 4 is approximately elevation 100.5 feet, Project Datum. The recommended perimeter elevation for the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 104.67 feet, Project Datum. The westerly 150 feet of the dry dock has a recommended perimeter elevation for the 1 percent annual chance storm event with minimal overtopping plus 16 inches of SLR of 101.65 feet, Project Datum. The project will raise the Shoreline edge so that it is at or above these elevations.
- Easterly Shoreline of Parcel D - The existing Shoreline elevation is approximately 100.2 feet, Project Datum. The recommended perimeter elevation for the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 105.68 feet, Project Datum, from Dry Dock 4 to 200 feet southerly, and 102.64 feet, Project Datum, from 200 feet to 1100 feet southerly of Dry Dock 4. The project will raise the shoreline edge grade of the park. The existing bulkhead will be cut back on a 2:1 slope and protected with riprap.
- Easterly Shoreline of Parcel E - The existing shoreline is at elevation 99.4 to 98.1 feet, Project Datum. The recommended perimeter elevation for the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is elevation 106.68 feet, Project Datum, along the east Shoreline. The project will raise the shoreline edge to elevation 106.68, project datum.
- Re-Gunning Crane Pier Habitats - This is the re-gunning pier. The existing surface elevations range from 99.6 to 98.4 feet, Project Datum. The recommended perimeter elevation for the 1% annual chance storm event with minimal overtopping plus 16 inches of SLR is 102.64 feet, Project Datum, to prevent flooding or wave overtopping. The bulkhead along the pier will be laid back at a slope of 5-to-8 vertical per 1 horizontal and the pier area will be re-vegetated as native habitat. While the foundations for the Re-Gunning Crane will be protected, the pier edges will not be protected and the habitat

areas will be allowed to adapt naturally over time in response to SLR. No shoreline improvements will be provided by Project to prevent impacts of SLR.

- Grasslands Ecology Park South - The eastern edge of this park has an existing elevation of 99.7 feet, Project Datum. The southern edge existing grade ranges from 99.5 feet to 101.0 feet, Project Datum. The recommended perimeter elevation for the 1% annual chance storm event with minimal overtopping plus 36 inches of SLR is forecasted to be 106.32 feet, Project Datum, from the easterly shoreline to 1000 feet westerly; 104.29 feet, Project Datum, from 1000 to 2800 feet westerly of the easterly shoreline; and 102.29 feet, Project Datum, from 2800 to 3600 feet westerly of the easterly shoreline. The Navy is expected to reconstruct the shoreline edge as part of its site remediation plan to the above elevations. The Navy will place wave berms with riprap or other slope protection to protect shoreline from erosion and flooding. The Navy is expected to provide the grading and embankment for the Bay Trail at elevation 103.0 feet, Project Datum. The project will grade and construct the Bay Trail to a minimum elevation of 105.0 feet.
- Grasslands Ecology Park North – The existing shoreline elevation ranges from 96.0 feet to 99.7 feet, Project Datum. From 3600 to 4600 feet westerly of the easterly shoreline of Parcel E, the Navy is expected to reconstruct the shoreline edge as part of its site remediation plan. The Navy will place wave berms with riprap or other slope protection to protect shoreline from erosion and flooding for the 1% annual chance storm event with minimal overtopping plus 36 inches of SLR to elevation 103.32. On the remaining 400 feet to the western edge of the park, the Navy shoreline edge improvements, which will be completed before land transfer to the City, will create a shoreline edge designed as a habitat zone where flooding is expected. Those berms that must protect the shoreline will be constructed to accommodate the 1% annual chance storm event with minimal overtopping plus 36 inches of SLR to elevation 104.31, Project Datum. The Navy is expected to construct embankment for the Bay Trail to a minimum elevation of 104.0 feet, Project Datum. The project will raise the grades of the Bay Trail to a minimum of elevation 106.0 feet, Project Datum. The Navy will raise the shoreline edge perimeter elevation at the Yosemite Slough Bridge north abutment to accommodate the 1% annual chance storm event with minimal overtopping plus 36 inches of SLR to elevation 103.32. be placed at a minimum elevation of 101.65 feet, Project Datum, which will extend 200 feet northeasterly along the adjacent shoreline.

3.4.2 OPEN SPACE AND PARK IMPROVEMENTS

Open Space and Park improvements within the shoreline zone shall be constructed such that the intended Year 2050 operation of the facilities with 16 inches of SLR is accommodated. Some existing 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 either are existing above the elevation, will be rehabilitated to above the elevation, or will be constructed at the time of initial construction to, Project Datum. 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 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:

- Northside Park - No project improvements are required to prevent SLR impacts for this park.
- Submarine Drydocks (Waterfront Promenade 1) - The grading for the new Park area will be a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum. A 20-foot wide space is reserved so that for greater than 16 inches of SLR various methods of wave protection can be constructed to protect against extreme tides and waves. The project will raise the elevation of the park to a minimum elevation of 99.54 feet, Project Datum.
- Wharf Along Berths 55 to 61 (Waterfront Promenade 2) - The grading for the new Park area will be a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum. A 20-foot wide space is reserved so that for greater than 16 inches of SLR wave barriers or other appropriate shore protection facilities can be constructed to protect against extreme tide conditions. The project will raise the elevation of the park to a minimum elevation of 99.54 feet, Project Datum.

- Rip-Rap Protected Slope East of Berth 55 (Heritage Park) - A 20-foot wide space is reserved so that with greater than 36 inches of SLR on the north and 16 to 36 inches on the south. Wave barriers or other facilities can be constructed to protect against extreme tides and wave conditions for the 100-year tide plus SLR as described for the shoreline. The project will not provide an increase in site elevation for the Heritage Alternative. For non-Heritage alternatives, the site is to be raised to a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum to elevation of 99.54 feet.
- Drydocks 2, 3, and 4 (Heritage Park Frontage) - A 20-foot wide space is reserved so that with greater than 16 inches of SLR wave barriers or other facilities can be constructed to protect against the 100-year tide plus 16 inches of SLR. The project will not provide an increase in site elevation for the Heritage Alternative. For non-Heritage alternatives, the site is to be raised to a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum to elevation of 99.54 feet, Project Datum
- Drydocks 2, 3, and 4 (Promenade Frontage (“MP2 Promenade 2”)) - A 20-foot wide space is reserved so that with greater than 16 inches of SLR wave barriers or other facilities can be constructed to protect against 100-year tide plus 16 inches of SLR. Adjacent to Dry Dock 3 there is limited space that may dictate that the wall be raised. The project will not provide an increase in site elevation for the Heritage Alternative. For non-Heritage alternatives, the site is to be raised to a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum.
- Drydocks 2, 3, and 4 (Promenade Frontage (“MP2 Promenade 1”)) - A 20-foot wide space is reserved so that with greater than 16 inches of SLR wave barriers or other facilities can be constructed to protect against 100-year tide plus 16 inches of SLR. The project will not provide an increase in site elevation for the Heritage Alternative. For non-Heritage alternatives, the site is to be raised to a minimum elevation of 99.54 feet, Project Datum.
- Shoreline of Dry Dock No. 4 - The edge of the existing Dry Dock 4 is at elevation 100.5 feet, Project Datum. The land immediately adjacent to the dry dock ranges in elevation from 100.2 to 100.6 feet, Project Datum. No project improvements are required to prevent SLR impacts for this park for SLR of 16 inches above the current 100-year tide of 98.2 feet, Project Datum.

- Easterly Shoreline of Parcel D - Elevations of the land inland of the shoreline are approximately 100.2 feet, Project Datum. The project will raise the elevation to a minimum of 16 inches above the current 100-year tide of 98.2 feet to minimum elevation of 99.54 feet, Project Datum.
- Easterly Shoreline of Parcel E - The project will raise the elevation of the land inland of the shoreline to a minimum of 16 inches above the current 100-year tide of 98.2 feet, Project Datum to elevation of 99.54 feet, Project Datum.
- Re-Gunning Crane Pier Habitats - No project improvements are required to prevent SLR impacts for this park for SLR as the area will be re-vegetated as habitat areas that will be allowed to adapt to SLR.
- Grasslands Ecology Park South - The Navy is expected to install a 3 foot thick cap over the land inland of the shoreline as part of its site remediation plan. The Navy is expected to grade the land inland of the shoreline to a minimum of 36 inches above the current 100-year tide of 98.2 feet, Project Datum to elevation of 101.2 feet, Project. No additional grading improvements will be provided by the Project.
- Grasslands Ecology Park North - Areas that are not intended as wetland areas by the Navy are expected to be capped as part of its site remediation plan. The Navy improvements are to be above 36 inches above the current 100-year tide of 98.2 feet, Project Datum to elevation of 101.2 feet, Project Datum. On the southern edge of the southwestern edge, the Navy shoreline improvements will create a shoreline edge designed as a habitat zone where flooding is expected. The Navy plans to remove certain contaminated soils in this general area and construct tidal wetlands. For areas that are to be protected, space will be reserved to accommodate for greater-than-36-inches SLR to allow for wave barriers or other facilities to protect against extreme conditions. No additional grading improvements will be provided by the Project.

3.4.3 DEVELOPMENT PERIMETER

The perimeter edges of the developed areas shall be constructed such that the minimum elevations of street centerlines are no lower than 103.3 feet, Project Datum, which accommodates over 55 inches of SLR. Building occupied floors shall have a minimum elevation of 103.8 feet, Project Datum. Parking floors can be lower, but must include pumps and other improvements to protect from flooding as well as comply with the RMP.

3.4.4 5-YEAR STORM DRAINAGE SYSTEM

The initial construction of the 5-year storm drainage system will comply with the Technical Memorandum titled “Grading and Storm Drainage Master Plan” as submitted by the Developer to the City. Additionally, the 5-year storm system shall operate with a 2-foot freeboard between street finished grade elevations and hydraulic grade line of the storm drain system pipelines. The 5-year piped system shall be designed to operate with a 2060 (50-year) SLR, determined by the City PUC to be 24 inches. This change in height does not include wind-driven wave. Wind-driven waves as shown by Figure 3.1.1 is applicable only to shoreline structures and related wave protection.

3.5 ADAPTIVE MANAGEMENT STRATEGIES

As the 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 on a 5-to-10 year basis based on observed changes in sea levels as well as other effects of climate change (e.g., more or less extreme storm wave conditions).

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. The AMP shall specifically address each of the following elements for the 16-to-36 inch and greater-than-36 inches SLR scenarios: Northside Park; MP1 Promenade 1; MP1 Promenade 2; MP1 Heritage Park; MP2 Heritage Park; MP2 Promenade 2; MP2 Promenade 1; Shoreline of Dry Dock No. 4; Easterly shoreline of Parcel D; Easterly Shoreline of Parcel E; Urban Recreation Area; Grasslands Ecology Park South; Grasslands Ecology Park North; and any other Shoreline within the limits of Hunters Point Shipyard Phase 2 not specifically included above.

In general, although these strategies refer to “minimum” standards, the initial constructed grades at the Development Perimeter for the project are substantially higher than the minimum standards. Therefore, a higher amount of SLR can be accommodated at the Development Area Perimeter as outlined in Section 3.4 above. Figure 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 through the 16-to-36 inches of SLR, to greater-than-36 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 FOR SEA LEVEL RISE FROM 16- TO-36-INCHES

When it is known that SLR has occurred and is approaching 16-inches in 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 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 mean sea level rises up to 36-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 collection of 100-year overland release and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER

No change in constructed project required.

Within the developed perimeter, for separated storm drainage systems, the 5-year storm event and 5- to 100-year storm events will require that operation of the separated storm drainage systems be provided with the following described capabilities:

- 5-year Storm Event –The operation of the 5-year collection system will normally operate with a freeboard of 2 feet, but as SLR occurs the system will require a minimum of 1-foot of freeboard for operation before the follow-on strategies are implemented and

operational. When the SLR from the beginning of the project exceeds 24 inches then the AMP should be implemented, with analysis and planning commencing such that by the time the SLR value reaches 36 inches any required improvements should be operational.

Building 813 along Crisp Road, which is tied to Outfall2, will need to install pumps to handle storm flows when SLR is greater than 24 inches and less than 36 inches.

- 5- to 100-year Storm Events – With the 100-year high water on San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk.

3.5.2 STRATEGIES FOR SEA LEVEL RISE GREATER-THAN-36-INCHES

When it is known that SLR has occurred and is approaching 36-inches in 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, as 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 36-inches, allow more frequent flooding of the parks and open space during storm events greater than 5-year return period, Raise elevation of facilities, provide wave berms, and enhance the capabilities of pumping stations to increase freeboard in the storm drainage systems. In addition, provide for the collection of 100-year overland release and its discharge to San Francisco Bay if the drainage path is blocked by a berm or other feature.

DEVELOPMENT PERIMETER

No change in constructed project required.

Within the development perimeter, for separated storm drainage systems, the 5-year storm event and 5- to 100-year storm events will require that operation of the separated storm drainage systems be provided with the following described capabilities:

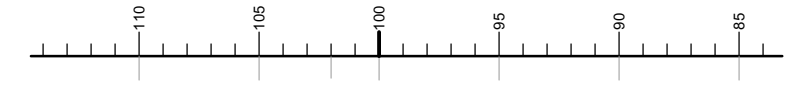
- 5-year Storm Event –The operation of the 5-year collection system will normally operate with a freeboard of 2 feet, but as SLR occurs the system will require a minimum of 1-foot of freeboard for operation before the follow-on strategies are implemented and

operational. When the SLR from the beginning of the project exceeds 24 inches then the AMP should be implemented, with analysis and planning commencing such that by the time the SLR value reaches 36 inches any required improvements should be operational.

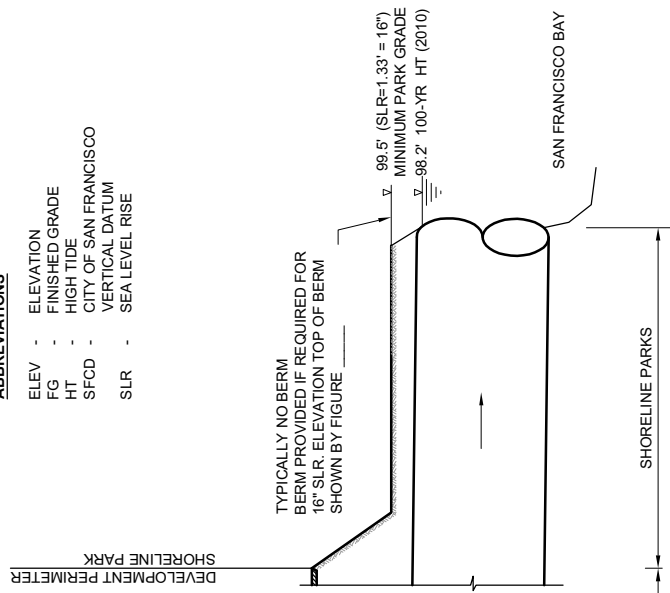
The storm drainage outfalls for the Project must address SLR when the SLR exceeds the outfall described by Figure 3.5.4 in the 5- to 100-year storm event.

- 5- to 100-year Storm Events – With the 100-year high water on San Francisco Bay, overland release in the streets is allowed to the edge of the City right-of-way commonly identified as the back of sidewalk. As SLR exceeds the values described by Figure 3.5.4, a pump station should be installed. An area for installation of a pump station should be reserved.

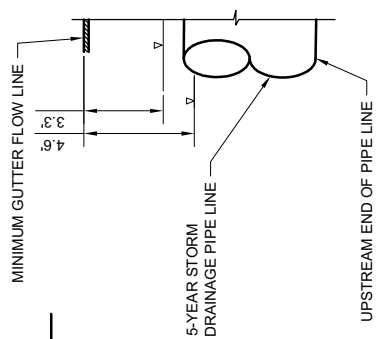
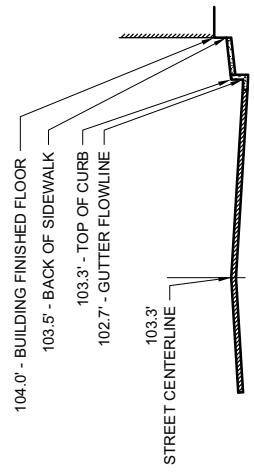
- ABBREVIATIONS**
- ELEV - ELEVATION
 - FG - FINISHED GRADE
 - HT - HIGH TIDE
 - SFCD - CITY OF SAN FRANCISCO
 - VERT - VERTICAL DATUM
 - SLR - SEA LEVEL RISE



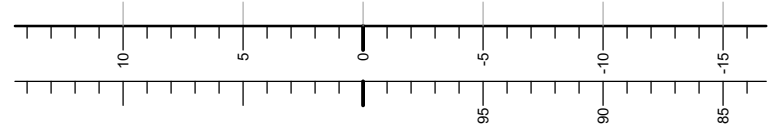
PROJECT DATUM



NOTE:
ALL ELEVATIONS ARE SHOWN IN FEET, PROJECT DATUM UNLESS OTHERWISE NOTED.



THIS EXHIBIT SHOWS THE RELATIONSHIP BETWEEN SEA LEVEL RISE OF 16 INCHES AND THE INITIAL CONSTRUCTION.

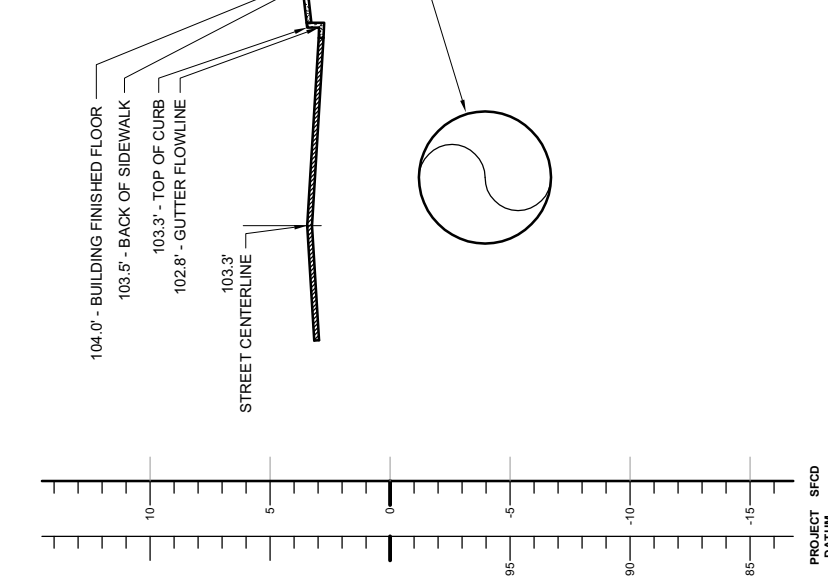
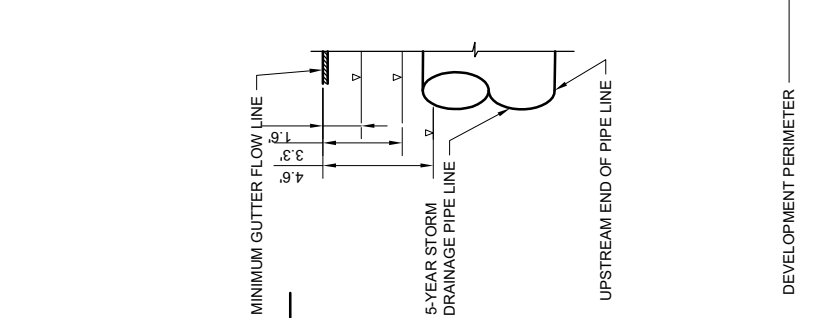
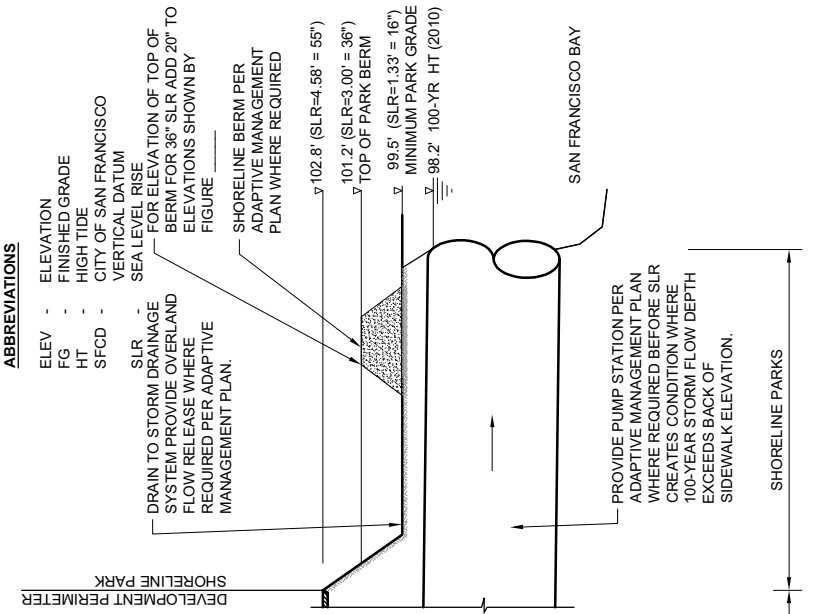
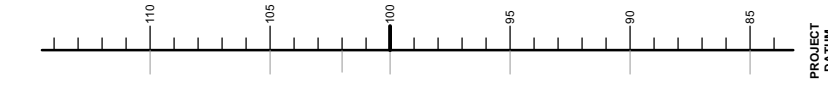


PROJECT SFCD VERTICAL DATUM

Hunters Point Shipyard Phase II Development

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

Figure 3.5.1



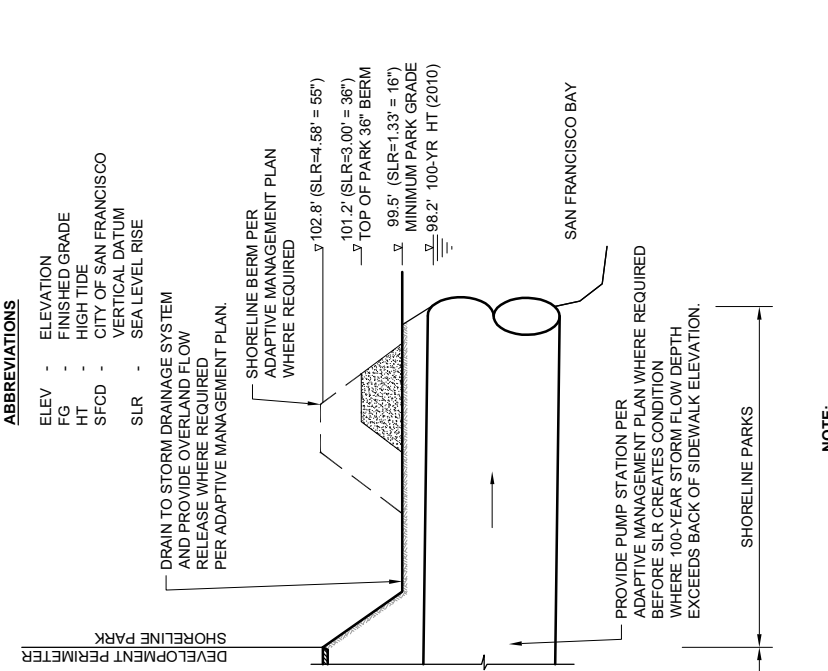
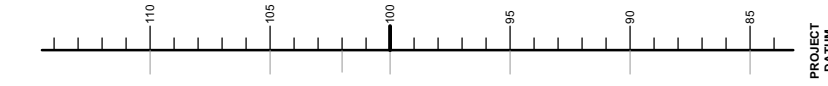
ABBREVIATIONS
 ELEV - ELEVATION
 FG - FINISHED GRADE
 HT - HIGH TIDE
 SFC - CITY OF SAN FRANCISCO
 V - VERTICAL DATUM
 SLR - SEA LEVEL RISE
 SLR - FOR ELEVATION OF TOP OF BERM FOR 36" SLR ADD 20" TO ELEVATIONS SHOWN BY FIGURE
 SHORELINE BERM PER ADAPTIVE MANAGEMENT PLAN WHERE REQUIRED
 DRAIN TO STORM DRAINAGE SYSTEM PROVIDE OVERLAND FLOW RELEASE WHERE REQUIRED PER ADAPTIVE MANAGEMENT PLAN.
 SAN FRANCISCO BAY
 DEVELOPMENT PERIMETER
 SHORELINE PARK
 SHORELINE BERM PER ADAPTIVE MANAGEMENT PLAN WHERE REQUIRED
 102.8' (SLR=4.58' = 55")
 101.2' (SLR=3.00' = 36")
 TOP OF PARK BERM
 99.5' (SLR=1.33' = 16")
 MINIMUM PARK GRADE
 98.2' 100-YR HT (2010)
 SAN FRANCISCO BAY
 PROVIDE PUMP STATION PER ADAPTIVE MANAGEMENT PLAN WHERE REQUIRED BEFORE SLR CREATES CONDITION WHERE 100-YEAR STORM FLOW DEPTH EXCEEDS BACK OF SIDEWALK ELEVATION.
 SHORELINE PARKS
 DEVELOPMENT PERIMETER

NOTE:
 ALL ELEVATIONS ARE SHOWN IN FEET, PROJECT DATUM UNLESS OTHERWISE NOTED.

THIS EXHIBIT SHOWS THE RELATIONSHIP BETWEEN SEA LEVEL RISE FROM 16" TO 36", THE INITIAL CONSTRUCTION AND ADAPTIVE MANAGEMENT FEATURES ALONG THE SHORELINE.

Figure 3.5.2

**Hunters Point Shipyard Phase II Development
 General Site Section For 16" to 36" of Sea Level Rise**



ABBREVIATIONS
 ELEV - ELEVATION
 FG - FINISHED GRADE
 HT - HIGH TIDE
 SFC - CITY OF SAN FRANCISCO
 VTD - VERTICAL DATUM
 SLR - SEA LEVEL RISE

DRAIN TO STORM DRAINAGE SYSTEM AND PROVIDE OVERLAND FLOW RELEASE WHERE REQUIRED PER ADAPTIVE MANAGEMENT PLAN.

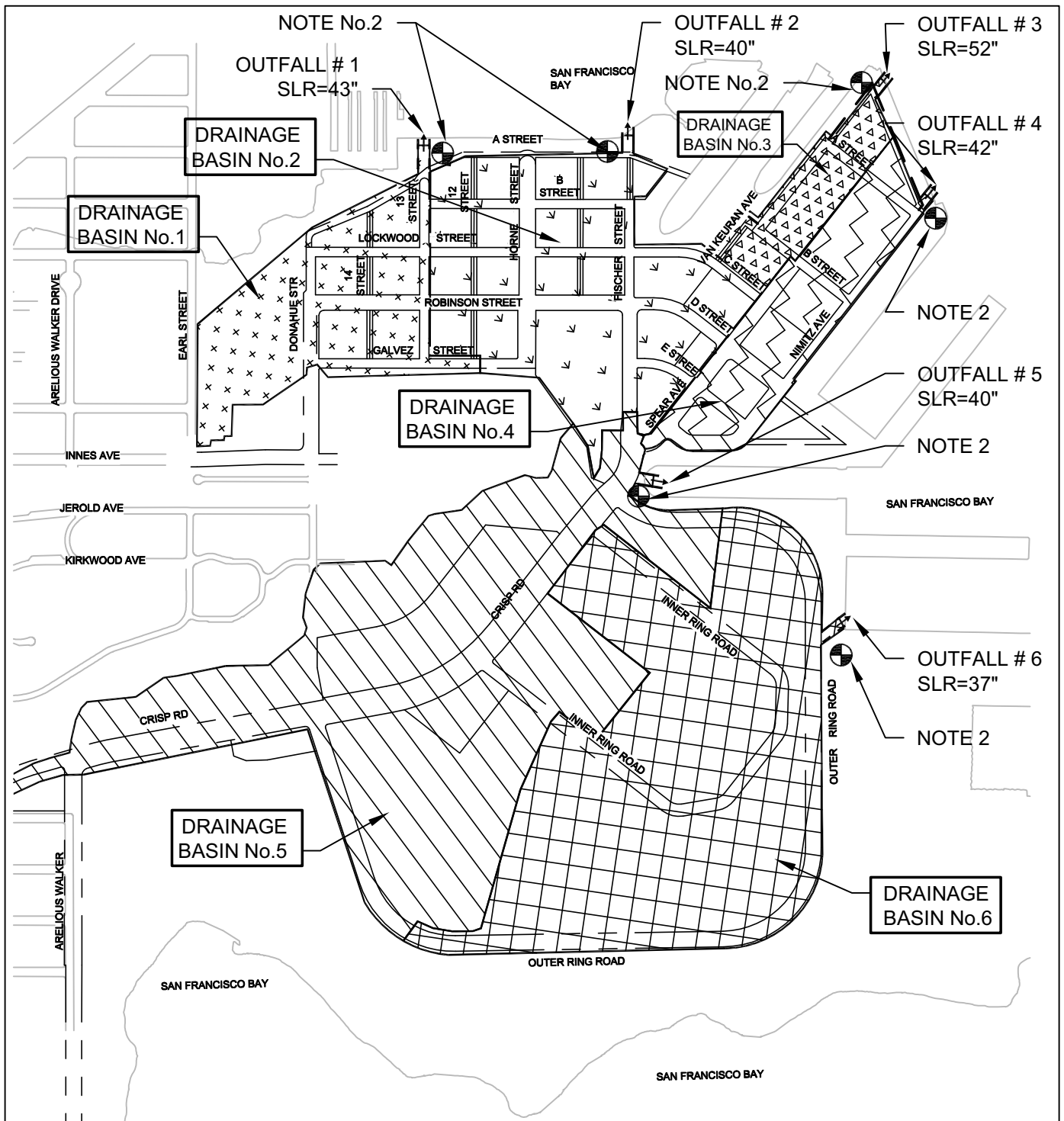
NOTE:
 ALL ELEVATIONS ARE SHOWN IN FEET, PROJECT DATUM UNLESS OTHERWISE NOTED.

THIS EXHIBIT SHOWS THE RELATIONSHIP BETWEEN SEA LEVEL RISE GRATER THAN 36", THE INITIAL CONSTRUCTION AND ADAPTIVE MANAGEMENT FEATURES ALONG THE SHORELINE.



Figure 3.5.3

**Hunters Point Shipyard Phase II Development
 General Site Section For Greater Than 36" of Sea Level Rise**



Notes:

1. This Exhibit Shows The SLR Required To Raise 100-year Flooding To Elevation Of Back Of Sidewalk At Lowest Locations Within A Drainage Basin.
2. Reserve Additional Area For Expansion Of Pump Station Required By Sea Level Rise.

Legend



Reserved Area For Pump Station



Hunters Point Shipyard Phase II Development
Sea Level Rise For 100 - Year Storm Flooding Limit

Figure
3.5.4

4 PUBLIC OPEN SPACE

4.1 OPEN SPACE PARCELS

The Open Space Parcels in the HPS2 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. Improvements to Open Space Parcels are described in the Parks, Open Space and Habitat Concept Plan and will be further defined in Design Document submittals to the Agency described under the DRDAP. The completed Open Space and Park Improvements will be provided on the schedule defined in the DDA.

Overall, the 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 HPS2 Area.

In total approximately 336.4 acres of parks (not counting Boulevard Parks, Hillside Open Spaces, and the Re-Gunning Crane Pier) will be provided in the CP Area and HPS2 Area combined, which includes a net reduction of 23.5 acres of CPSRA. The HPS2 Area will include approximately 231.6 acres of parks (Boulevard Parks, Hillside Open Spaces, and the Re-Gunning Crane Pier are not counted in the acreage total).

Table 4.1 (Proposed Parks and Open Space) presents the proposed park and open space in the HPS2 Area. Figure 4.1.1 illustrates the location of the proposed parks and open space. A brief description of the new parks and open space facilities, and the Bay Trail is provided in Table 4.1 below.

Table 4.1 Proposed Parks and Open Space

	<u>Acres (Approx.)</u>	<u>Park Role</u>	<u>Features</u>	<u>New / Existing Park</u>
New Parks				
Northside Park	12.8	Neighborhood	Water-wise Ornamental Gardens, Tennis, Basketball, African Market, Tot-Lot, Multi-use Lawn, Shade Pavilions, BBQ, Café	New
Waterfront Promenade (North and South)	29.5	Destination	Historic Landscape Elements, Open Lawns, Interpretive and Native Grasslands, Gardens, Plazas, Tree groves, Seating Areas, Marina	New
Heritage Park	15.6	Destination	Historic Buildings and Landscape Elements, Interpretive and Educational Areas, Visitor Center, Museum, Café	New
Grasslands Ecology Park South	44.9	Ecology Park	Native Grasslands, Interpretive Center, Native Plant Gardens, Picnic Pods and Shelters, Bay Nature Interpretive Play, Viewing Mounds, Overlook Terraces, Amphitheater / Outdoor Classroom	New
Grasslands Ecology Park North	37.2	Ecology Park	Freshwater Wetland, Tidal Wetland, Native Grasslands, Viewing Mounds, Viewing Pier	New
	Subtotal			
	<u>140.0</u>			
New Sports Fields and Active Urban Recreation				
Community Sports Field Complex	59.7	Sports Fields	Multi-use Lawn, Permanent Parking, Stadium, Sports Fields, Field House, Maintenance Yard, Game-day Parking	New
Waterfront Recreation and Education Park	6.7	Destination	Interpretive Center, Tree Grove, Seating, Open Lawn	New
Multi-Use Fields	25.2	Destination	Multi-use Lawn, Game-day Parking	New
	Subtotal			
	<u>91.6</u>			
	Total			
	<u>231.6</u>			

SOURCE: Lennar Urban, 2009.

Open Space development in the HPS2 Area of the Project will include an extensive network of parks.

4.1.1 NEIGHBORHOOD PARKS

The HPS2 Development will include the development of several neighborhood and regional parks, as noted below.

NORTHSIDE PARK (1a, 1b)

Northside Park (1a, 1b on Figure 4.1.1) which will be located on the north shore of the HPS2 Area, will offer a full suite of passive and active uses, and may include gardens, native planting, basketball, tennis and volleyball courts, shade pavilion, children's playground, open lawn, picnic/barbeque areas and shade shelters, waterfront pathways, kayak launch point, outdoor marketplace promenade, terraced viewing mound, and restroom/café. The park will provide multiple bicycle and pedestrian connections between India Basin and the Shipyard neighborhoods. The Bay Trail, along the shoreline of the park, will link the existing Bay Trail at India Basin Shoreline Park with the Bay Trail continuing along the Waterfront Promenaded North. Additionally, a bicycle and pedestrian route through the park will link a proposed bicycle path on Hudson Ave with bicycle lanes on Robinson Ave. and with the Bay Trail. A ramp or ramp with stairs will provide a pedestrian connection from the corner of Innes and Earl into the center of the park.

THE WATERFRONT PROMENADE (2a, 2b, 5a, 5b, 5c, 5d, 5e, 5f)

The Waterfront Promenade is composed of two primary sections (North and South) separated by the Heritage Park. The Waterfront Promenade North (2a, 2b) links the Northside Park with the Heritage Park, providing an outdoor meeting place for the nearby communities while also providing Bay Trail continuity. This section will have a softer feel with features such as native grasslands and small tree groves. The Waterfront Promenade South (5a, 5b, 5c, 5d, 5e, 5f) connects the Heritage Park with the Stadium, Marina, Community Sports Fields Complex, Re-Gunning Crane Pier Habitats, and the Grasslands Ecology Habitat Park to the south. In contrast with Waterfront Promenade North, this section is comprised of more hardscape. The promenade will highlight the maritime history of the site, featuring existing on-site elements of the industrial landscape. The Waterfront Promenade South may include restroom/café/concessionaire and marina support facilities and structures.

HERITAGE PARK (4a, 4b)

The primary program of this park is for educational and cultural activity related to the site's history. The design of the Heritage Park will retain and reuse historic resources and materials as much as possible. Historic buildings may be used for visitor centers, museums, or cafés and historic landscape features such as bollards, cleats, rail spurs, and crane tracks may be preserved

and integrated into the park design. Design of new park features will have a modern and industrial character. Other features may include a new kiosk/pavilion, plaza spaces, native planting area, open lawn, LID stormwater features, and a children's play area that interprets the historical and maritime qualities of the site.

GRASSLANDS ECOLOGY PARK SOUTH (8a, 8b)

Grassland Ecology Park is divided into two sections Grasslands Ecology Park South (at Parcel E) and Grasslands Ecology Park North (at Parcel E-2). The predominant feature of this passive recreational park will be large areas of restored native grasslands providing habitat and opportunities for environmental education. The Grasslands Ecology Park may contain trails, outdoor classroom/small amphitheater spaces for nature interpretation, interpretive native plant gardens, passive native meadow lawns, windbreak groves, picnic areas, overlooks, and landforms offering views of the bay and shoreline habitats. At Grasslands Ecology Park South, other site features may also include group picnic areas, a visitor/interpretive center, restrooms, parking, and a bay nature interpretive play area.

The 44.9-acre Grasslands Ecology Park South (at Parcel E) and the 37.2-acre Grasslands Ecology Park North (at Parcel E-2) are both contiguous to the CPSRA and may be offered to the CDPR by the Agency. Infrastructure provided will be: electrical, potable water, reclaimed water, irrigation, sewage, pathways and seating.

4.1.2 NEW SPORTS FIELDS, WATERFRONT RECREATION AND EDUCATION

New sports fields, waterfront recreation and education parks and open spaces that will be provided in the HPS2 Area of the Project may include:

COMMUNITY SPORTS FIELD COMPLEX (6a)

The Community Sports Field Complex will include multi-use playing fields, as well as warm-up fields, and a field house with restrooms, and space for food concessions and meeting spaces. The Community Sports Field Complex may be used for sporting events during both day and night-time hours. The surface of the fields will be seeded grass. The planting soil, sub-grade, and irrigation system will be designed to support vehicular parking and tailgating uses on 49ers game days while preventing rutting and damage to the fields. To achieve this, the design may employ a fiber-reinforcement system in which synthetic fibers are blended into the topsoil to provide greater shear strength. The topsoil will be fast-draining, sandy soils and sub-drainage systems will be used as necessary. Infrastructure provided will be: electrical, potable water, reclaimed water, irrigation, sewage, pathways and seating.

MULTI-USE FIELDS (6b)

A multi-use lawn area will provide event-day parking for events at the stadium. At other times, this large open space may provide for informal recreational activities, as well as an event or festival space as needed. Infrastructure provided will be: electrical, potable water, reclaimed water, irrigation, pathways, and seating.

The Sports Field Complex and the Multi-Use Fields both surround the proposed 49ers Stadium, providing parking for stadium-related events, as well as open space that may support a range of recreational activities, as described above. The surface of the fields will be seeded grass above top soil with synthetic fibers or other turf reinforcement systems and other base materials designed to support vehicle parking.

WATERFRONT RECREATION AND EDUCATION PARK (7a)

The Waterfront Recreation and Education Park will serve as a hub that links the activities of the Waterfront Promenade South, Re-Gunning Crane Pier Habitats, Grasslands Ecology Park, and Multi-Use Fields. This park may support these varied programs with a Waterfront Recreation & Education Center building that may contain restrooms, meeting spaces, and facilities for interpretive facilities focused on San Francisco Bay.

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 will 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 tip of the CPSRA to Indian Basin Flats. While the separate Yosemite Slough Restoration Project plans to construct the Bay Trail around Yosemite Slough, an additional segment of the Bay Trail may be incorporated into the Yosemite Slough bridge, which will serve bus transit and pedestrian and bicycle routes between Candlestick Point and HPS Phase 2.

4.1.3 OTHER PARKS AND OPEN SPACE

Other parks and open spaces that will be provided in the HPS2 Area of the Project may include:

HORNE BOULEVARD PARKS (3a, 3b)

A hybrid of street and park, the Horne Boulevard Park will bring a broad finger of green space into the Hunters Point North Neighborhoods, linking the Waterfront Promenade North with the Arts Center at Galvez Ave. and near pathways at Galvez that continue up to the Hunters Point Shipyard Phase 1 Hilltop Neighborhood and its parks. The Horne Boulevard Park street will have a strong pedestrian scale and quality, and will contain a broad landscaped median (approximately 30' wide) that may include native planting, interpretive elements, LID stormwater features, pathways, seating areas and will provide opportunities for neighbors and visitors to meet and socialize.

RE-GUNNING CRANE PIER HABITATS (7b)

The Re-Gunning Crane will be retained. Trails may lead to overlook points providing visitors with opportunities to view Bay wildlife. Infrastructure provided will be: pathways and seating.

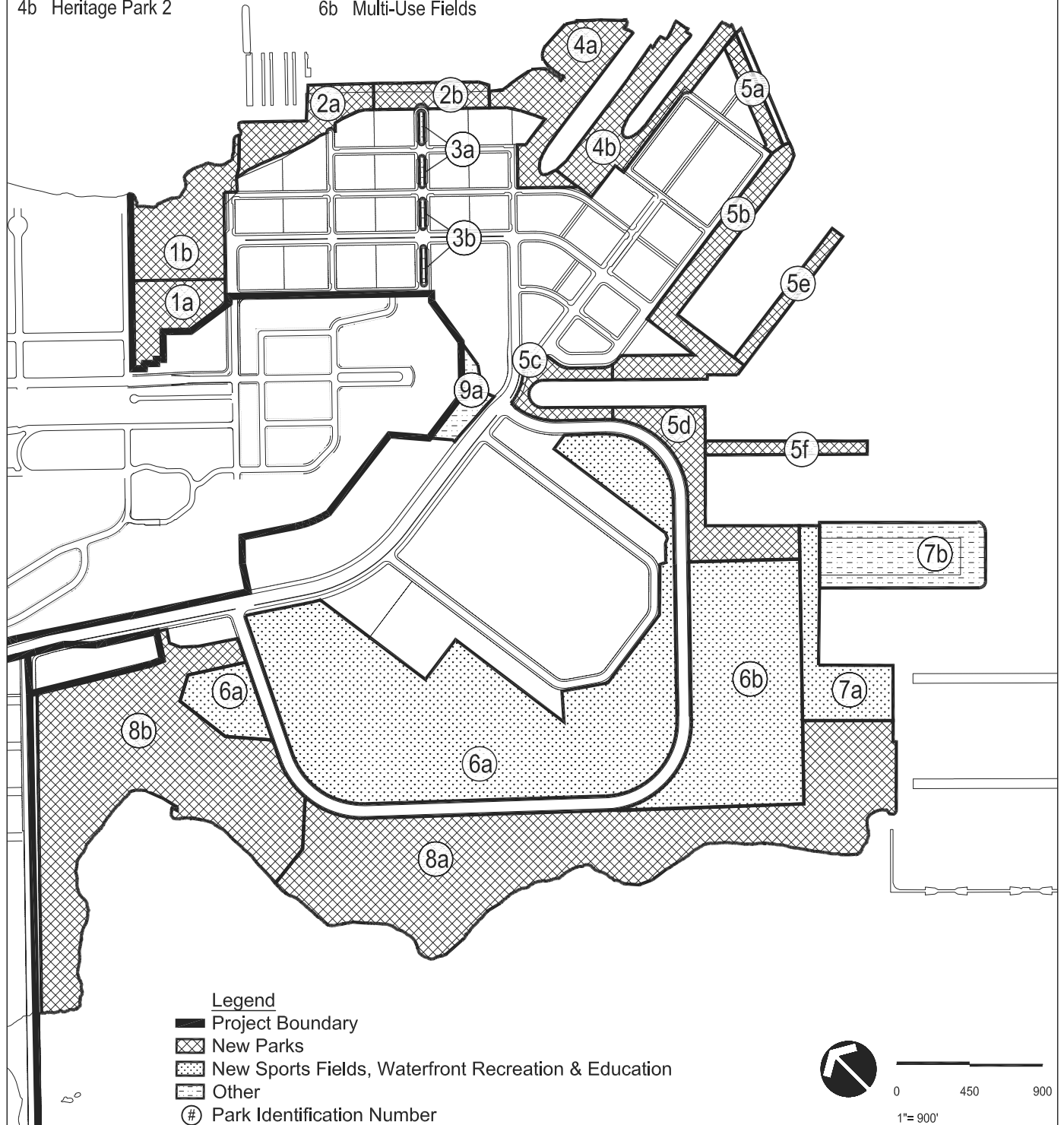
SHIPYARD HILLSIDE OPEN SPACE (9a)

A relatively small portion of the Hillside Park and Open Space located in the HPS2 Area north of Crisp Road may provide a connection to the existing Hillside Parks and Open Space constructed in the Hunters Point Phase I project.

- 1a Northside Park 1
- 1b Northside Park 2
- 2a Waterfront Promenade North 1
- 2b Waterfront Promenade North 2
- 3a Home Boulevard Park 1
- 3b Home Boulevard Park 2
- 4a Heritage Park 1
- 4b Heritage Park 2

- 5a Waterfront Promenade South 1a
- 5b Waterfront Promenade South 1b
- 5c Waterfront Promenade South 2a
- 5d Waterfront Promenade South 2b
- 5e Waterfront Promenade South North Pier
- 5f Waterfront Promenade South South Pier
- 6a Comm. Sports Field Complex / Maintenance Yard
- 6b Multi-Use Fields

- 7a Waterfront Rec. & Education Park
- 7b Re-gunning Crane Pier Habitats
- 8a Grasslands Ecology Park South
- 8b Grasslands Ecology Park North
- 9a Shipyard Hillside Open Space



<h2 style="margin: 0;">Hunters Point Shipyard Phase II Development</h2> <h3 style="margin: 0;">Open Space Parcels</h3>	<p>Figure 4.1.1</p>
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5. OTHER INFRASTRUCTURE

5.1 BUILDING DEMOLITION

Demolition of structures and other existing improvements within the HPS2 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 Hunters Point Shipyard Navy Transfer Risk Management Plan.

5.2 STADIUM PAD

The Developer shall provide a Stadium Pad and associated Stadium Pad Infrastructure as defined in the DDA. The Stadium Pad shall be located as defined in the DDA and is generally shown herein as “Stadium Site”. The grading of the Stadium Pad shall be to the elevations shown in the Grading & Storm Drainage Technical Memorandum. The Stadium Pad Infrastructure shall include those activities included in the DDA, as well as the installation of utility laterals to a point five feet inside the property line of the Stadium Pad. Utilities shall include low pressure water, recycled water, sanitary sewer, storm drainage, electric, gas, and telecommunications, and shall be of a size sufficient to meet Stadium peak utility load demands under currently applicable building codes as provided to the Developer by the 49ers or their designated designer. Utility points of connection shall be from Inner Ring Road. Prior to installation of utility laterals, the Developer shall coordinate preferred locations for points of connection with the 49ers or their designated designer. The Developer shall provide one point of connection for each utility. In addition, the Developer will provide fixtures and improvements as reasonably necessary for the monitoring and operation of the Stadium-related transportation systems for stadium events. These fixtures and improvements are to be located within the core and shell of the Stadium Transportation Management Center, which will be designed and constructed by the 49ers in consultation with the City MTA. Delivery of the Stadium Pad and Stadium Pad Infrastructure shall be per the schedule provided in the DDA.

5.3 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. For example, new storm and sanitary sewer segments may be temporarily connected to the City's combined sewer mains.

5.4 WATERFRONT TRANSPORTATION

Waterfront transportation improvements, including a passenger ferry terminal near the NFL Stadium site, may be implemented at a future time. These improvements are not part of the Project.

5.5 WATERFRONT IMPROVEMENTS

The existing waterfront of the HPS2 Area is characterized by a wide variety of conditions. Virtually the entire HPS2 Area shoreline consists of pile supported piers, timber crib walls, concrete bulkheads, riprap and similar shoreline protection structures. There are some areas of beach-fronted, unprotected slopes.

Except those Improvements noted as work to be performed by the Navy, the Developer will make Improvements to the shorelines to minimize, to the maximum extent practical, coastal flooding and to provide continuous public access along the San Francisco Bay. Shoreline Improvements in the HPS2 Area will be phased over a period of several years. The principal of adjacency described in Section 6 shall generally apply to the phasing of shoreline improvements. Proposed shoreline improvements and modifications along the HPS2 Area shoreline are defined below. The scope of Waterfront Improvements – rehabilitation, repair, abandonment and demolition – as presented herein are the basis of the Water Improvement funding stipulated in the DDA. The total scope of all Waterfront Improvements is limited to the total of the funding allocated to Waterfront Improvements by the DDA.

The improvements described below are based on a very preliminary engineering evaluation. The Developer will submit a Technical Memorandum on the Infrastructure to be implemented, including rehabilitation, or demolition and abandonment, of existing waterfront structures based on detailed marine structure and geotechnical engineering analysis. The Developer will provide improvement or demolition as recommended by the Technical Memorandum. If the structure is determined to be adequate, or repairable to current codes with relatively minor repairs, the Developer will conduct the repairs for continued public use as Open Space. If the investigation finds the structure to be significantly deficient or expensive to repair, the Developer will demolish the wharf portion, or allow it to remain in place with appropriate landscaping improvements that will deter public access. For reference, berth locations are show on Figure 5.5.1.

RIP-RAP PROTECTED SLOPE (NORTHSIDE PARK)

This portion of shoreline will be improved to a rip-rap revetment by the Navy.

SUBMARINE DRYDOCKS (WATERFRONT PROMENADE)

The Navy will demolish the timber portions of the drydocks, and excavate any contaminated sediments. As part of the redevelopment project, the Developer will make the following Improvements:

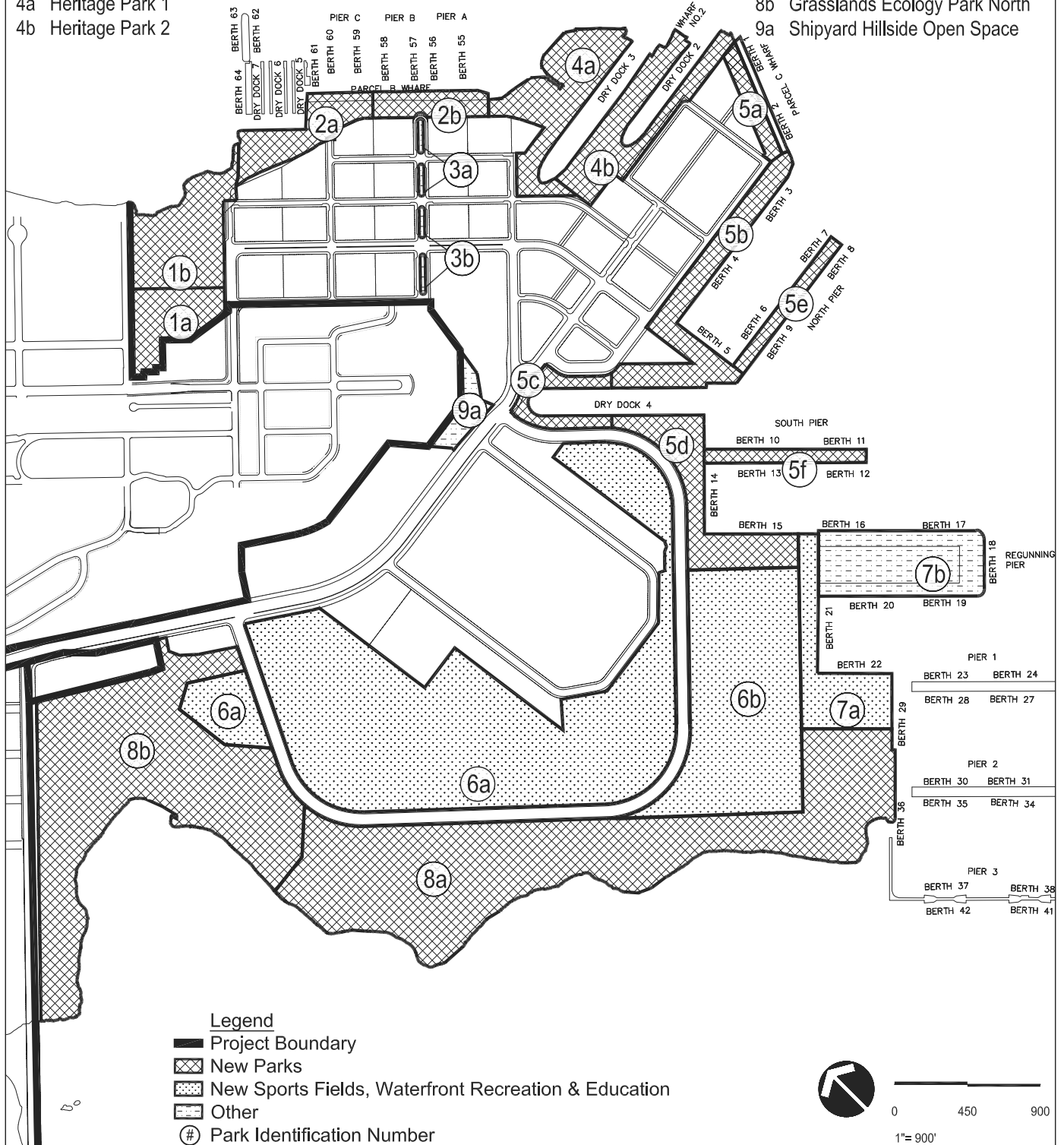
- Concrete bulkheads will be left in place but disconnected from the shoreline by demolishing the sections near the shoreline to prevent public access to the walls for safety reasons
- To provide waterfront slope stability, a rock buttress will be placed along the quay-wall extending from the bottom of the docks to about mid-tide level elevation. The extent of this work is to be determined after geotechnical studies are complete.
- Weep-holes will be constructed in the quay-wall above low tide elevation to relieve the loading from the backfill along the shoreline.

WHARF ALONG BERTHS 55 TO 61 (WATERFRONT PROMENADE)

The wharf at Berths 55 through 61 will be repaired and upgraded so that it can be used as a promenade for public access. The Developer will make the following repairs:

- Repairs to the 4-ft diameter steel caisson piles, which may range from limiting ongoing corrosion by wrapping or encasing the piles in concrete, to structural retrofit of piles by welding additional steel plates to the piles.

- 1a Northside Park 1
- 1b Northside Park 2
- 2a Waterfront Promenade North 1
- 2b Waterfront Promenade North 2
- 3a Home Boulevard Park 1
- 3b Home Boulevard Park 2
- 4a Heritage Park 1
- 4b Heritage Park 2
- 5a Waterfront Promenade South 1a
- 5b Waterfront Promenade South 1b
- 5c Waterfront Promenade South 2a
- 5d Waterfront Promenade South 2b
- 5e Waterfront Promenade South North Pier
- 5f Waterfront Promenade South South Pier
- 6a Comm. Sports Field Complex / Maintenance Yard
- 6b Multi-Use Fields
- 7a Waterfront Rec. & Education Park
- 7b Re-gunning Crane Pier Habitats
- 8a Grasslands Ecology Park South
- 8b Grasslands Ecology Park North
- 9a Shipyard Hillside Open Space



<h2 style="margin: 0;">Hunters Point Shipyard Phase II Development</h2> <h3 style="margin: 0;">Waterfront Improvements</h3>	Figure 5.5.1
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- Repairs to the reinforced concrete beams and deck slab, including spall repair, using shotcrete, grout, and/or epoxy injections.

RIP-RAP PROTECTED SLOPE EAST OF BERTH 55 (HERITAGE PARK)

This portion of shoreline will be improved to a rip-rap revetment by the Navy.

DRYDOCKS 2, 3, AND 4 (HERITAGE PARK, WATERFRONT PROMENADE)

The drydocks are to remain in their current configurations, with the following modifications to be made by the Developer to the extent they are consistent with the Technical Memorandum:

- Add weep holes on the sidewall from above the lowest tide to near the top of the dry dock walls.
- Add rock or sand buttress on the face of the dry dock walls at the bottom.
- Repair the exposed drydock walls by patching any spalls, exposed and corroded reinforcing bars, and broken concrete. This may include applying high strength concrete grout to exposed surfaces and/or epoxy mix application to cracks. Repairs will extend from below the lowest tide up to near the top of the dry dock walls.

WHARF AT OUTBOARD END BETWEEN DRYDOCKS 2 AND 3(HERITAGE PARK)

The existing timber structure will be demolished and removed by the Navy.

WHARF ALONG BERTHS 1 AND 2 (WATERFRONT PROMENADE)

The Developer will repair the waterfront structure in its present configuration. Repairs will be defined by a Technical Memorandum, and are anticipated to include:

- Construction of a new sheet pile bulkhead behind the existing steel bulkhead. The new sheet piles will be driven and tied back to form the new shoreline location.
- The Developer will conduct an inspection of the pile-supported wharf portion of the structure and assess the structural integrity of the deck and piles. If the structure is determined to be adequate, or repairable to current codes with relatively minor repairs, the Developer will conduct the repairs for continued public use as a waterfront promenade. If the investigation finds the structure to be significantly deficient or expensive to repair, the Developer will demolished the wharf portion, or allow it to remain in place with appropriate landscaping improvements that will deter public access and serve as open-space.

BERTHS 3, 4, AND 5 (WATERFRONT PROMENADE)

Preliminary visual evaluations indicate this structure can be repaired and left in its present configuration. The Developer will make the following repairs to the extent they are consistent with the Technical Memorandum:

- Remove the upper portions (10 to 15 ft) of the concrete wall facing including the timber cribbing and bank run rock fill. Lay back facing at a slope of 2 feet horizontally per foot vertically (2H:1V) and protect with rock facing.
- Patch exposed spalls, replace reinforcing bars that are exposed and deemed to be necessary, inject epoxy material to cracks, and fill visible holes and/or depressions.

BERTHS 6 THROUGH 9 (WATERFRONT PROMENADE)

The Developer will conduct an investigation to document the extent marine borers have attacked and potentially compromised the timber cribs. If additional investigations indicate that the timber cribs are beyond repair, the work to be performed at these berths may include complete demolition of the pier and replacement with a concrete or steel sheetpile bulkhead to serve as wave protection for the proposed marina in its lee. If these berths are repairable, the work would be similar to that described above for Berths 3, 4, and 5.

BERTHS 10 THROUGH 13 (WATERFRONT PROMENADE)

These berths shall be rehabilitated or modified in the same manner as Berths 6 through 9, described above. The Developer will conduct an investigation to document the extent marine borers have attacked and potentially compromised the timber cribs. If additional investigations indicate that the timber cribs are beyond repair, the work to be performed at these berths may include complete demolition of the pier and replacement with a concrete or steel sheetpile bulkhead to serve as wave protection for the proposed marina in its lee. If these berths are repairable, the work would be similar to that described above for Berths 3, 4, and 5.

BERTH 14 (WATERFRONT PROMENADE) AND WATERFRONT BETWEEN DRYDOCK 4 AND BERTH 10

These berths shall be rehabilitated or modified in the same manner as Berths 3, 4, and 5, described above.

BERTH 15 (WATERFRONT PROMENADE)

Preliminary observations show signs of advanced corrosion and deterioration, indicating that the steel sheetpile cellular bulkhead that provides the shoreline facing for the pier is beyond repair.

The Developer will remove the upper 10 to 15 feet of the sheetpile wall and existing sand fill. The facing shall be sloped back at a 2H:1V slope and protected with rock facing.

BERTHS 16 THROUGH 20 (URBAN RECREATION AREA)

Preliminary observations identified advanced corrosion and deterioration, indicating that the steel sheetpile cellular bulkhead that provides the shoreline facing for the pier is beyond repair. The Developer shall make the following modifications to these berths to make them compatible with use as a wildlife habitat:

- Lay back the upper portion of the slope by saw-cutting the concrete deck at some distance from the shoreline and removing the sand fill to generate a 5H:1V slope
- Cut the steel sheet piles at or below the low tide line (approximately mid-height of the existing sheet piles)
- Place a coarse sand layer over the excavated slope to serve as substrate for grasses and other plants
- Construct a trail along the length of the smaller peninsula created from the work described above

BERTHS 21, 22, AND 29 (WATERFRONT RECREATION)

These berths shall be rehabilitated or modified in the same manner as Berth 15, described above.

BERTHS 23 THROUGH 28 (SHOREBIRD HABITAT)

Preliminary observations show this pier is beyond its serviceable life. The Developer will detach it from shoreline to prevent public access and allow natural deterioration to convert to a habitat for the shorebirds that already use it.

BERTHS 30 THROUGH 35 AND 37 THROUGH 42 (SHOREBIRD HABITAT)

These berths shall be rehabilitated or modified in the same manner as Berths 23 through 28, described above.

BERTH 36 (GRASSLANDS ECOLOGY PARK)

These berths shall be rehabilitated or modified in the same manner as Berth 15, described above.

RIP-RAP PROTECTED SLOPE (GRASSLANDS ECOLOGY PARK)

This portion of shoreline will be improved to a rip-rap revetment by the Navy.

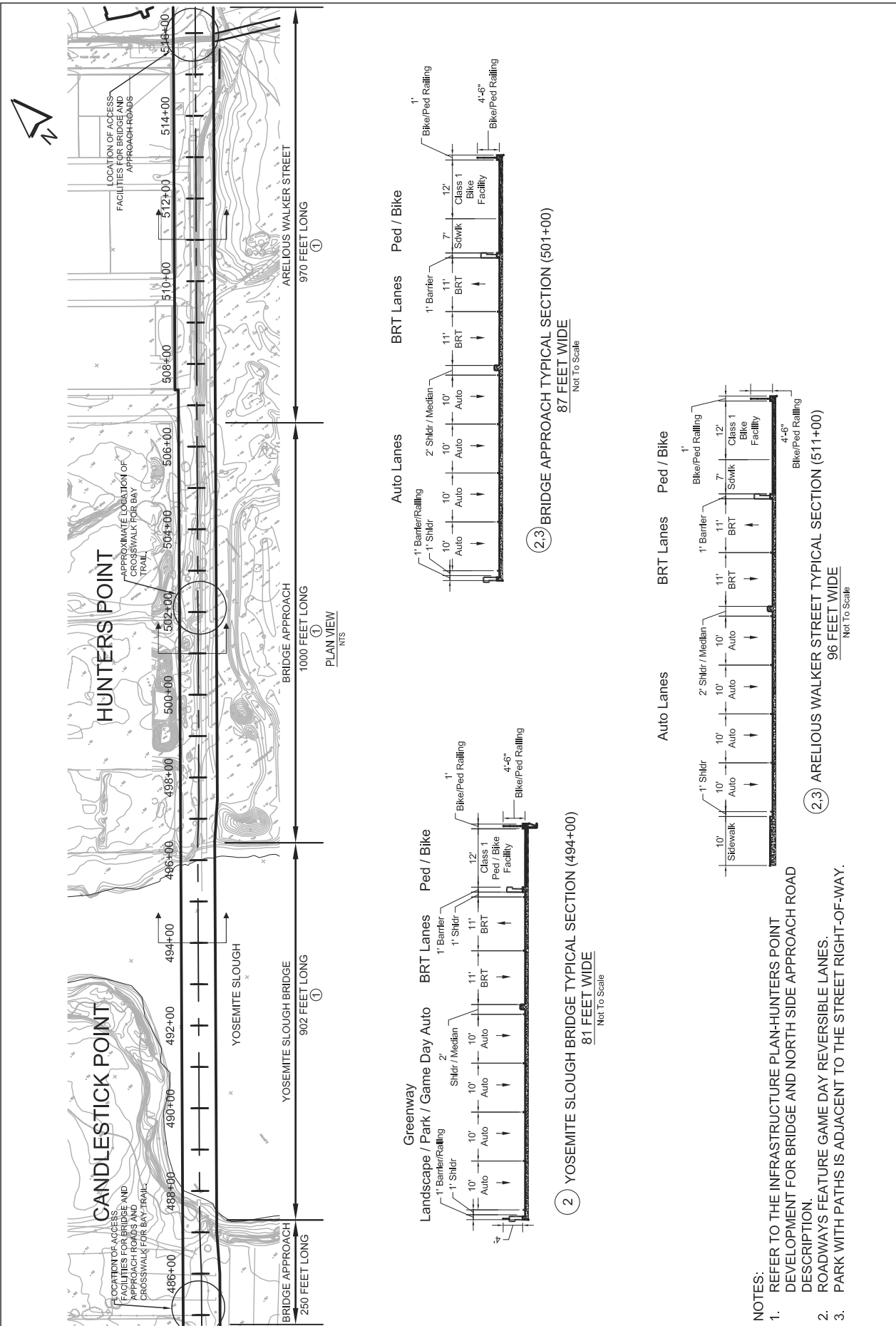
NATURAL EDGE AND RIP-RAP PROTECTED SLOPE (GRASSLANDS ECOLOGY PARK)

This portion of shoreline will be improved to a rip-rap revetment by the Navy. Where possible, new habitat areas exposed to tidal influence will be created by taking advantage of the existing sloped surface or by reducing slopes where needed.

5.6 YOSEMITE SLOUGH BRIDGE

A new Yosemite Slough bridge will be constructed to extend Arelious Walker Drive across Yosemite Slough from the CP Area to the HPS2 Area as shown on Figure 5.6.1. The 81-foot-wide, seven-lane bridge is intended to primarily function for transit, bicycle, and pedestrian use. The bridge will have two dedicated 11-foot-wide BRT lanes and a separate 12-foot-wide Class I bicycle / pedestrian facility, both of which would be open at all times. The bridge will also have a 40-foot-wide greenway, which will be converted to four peak direction auto travel lanes on 49ers game days only. The roadway surface on the bridge will be planted with grass and will be intended to serve as an open space amenity on all non-game days. One 4-foot tall barrier will separate the BRT lanes from the bicycle/pedestrian plaza. A 2-foot-wide, 6-inch tall median will separate the BRT lanes from the vehicle lanes. The bridge will be approximately 902 feet long with abutments on the north and south ends connecting the bridge to land. Preliminary studies indicate the bridge will be supported by 8 piers of four columns each. The bridge deck plan view, substructure and superstructure sections are shown on Figure 5.6.2.

The bridge would be served by approach streets from the Hunters Point side to the north and the Candlestick Point side to the south. The bridge approach on the Hunters Point side would consist of approximately 1,000 feet of new bridge approach roadway connected to 970 feet of new Arelious Walker Drive connecting Crisp Avenue to the bridge. The bridge approach street on the Candlestick Point side would consist of 250 feet of bridge approach roadway. The approach streets will have two dedicated 11-foot-wide BRT lanes and a separate 12-foot-wide Class I bicycle facility, both of which will be open at all times. Both approaches will also have a 7-foot-wide sidewalk between the BRT lanes and the Class I bicycle facility. Arelious Walker Drive will also have a 9-foot-wide sidewalk along the streets western side. Storm water from the bridge and approach streets will be subject to treatment under the Stormwater Design Guidelines. The bridge approach street layouts and sections are shown on Figure 5.6.1.



Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge / Approach Roadways

Figure 5.6.1

Source: MACTEC ENGINEERING AND CONSULTING, Inc.

LEGEND

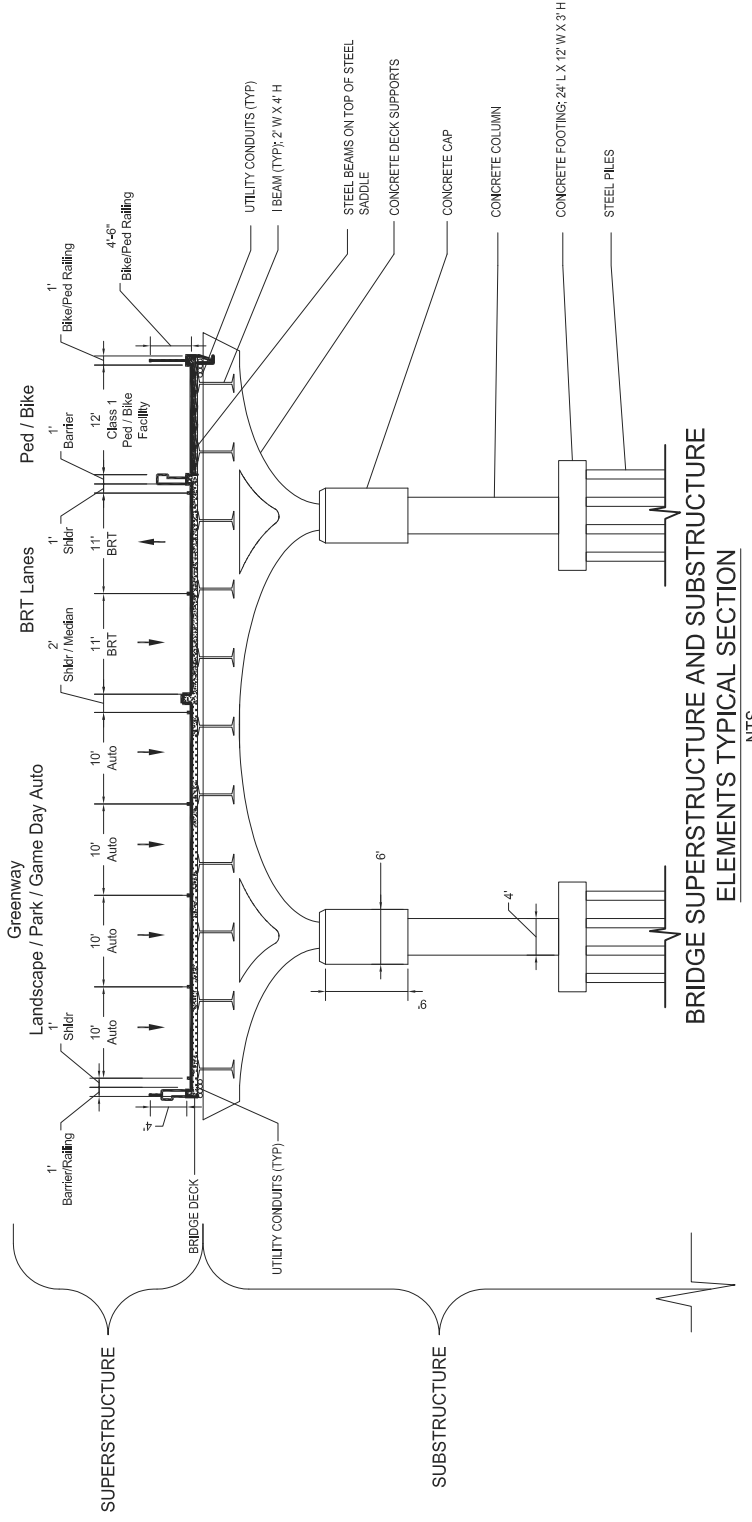
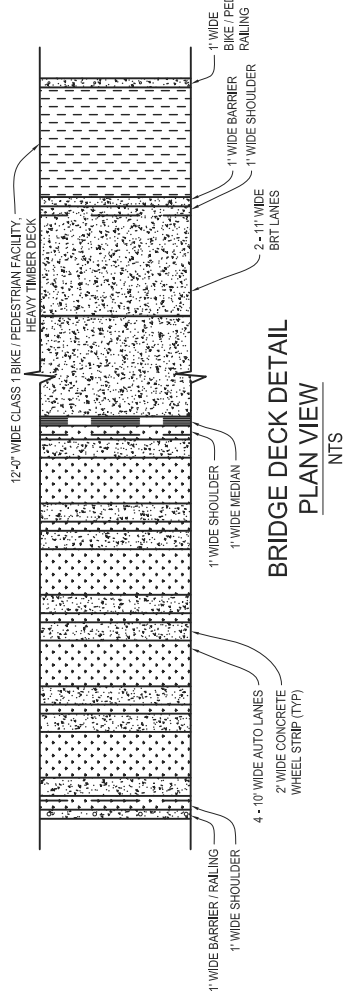
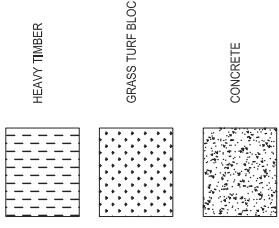


Figure 5.6.2

**Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge Plan and Section**

Source: MACTEC ENGINEERING AND CONSULTING, Inc.

The entrances to the bridge approach roadways along Arelious Walker Drive (both North and South of the bridge) will have barrier facilities that will prevent motorized vehicle traffic (except BRT vehicles) from accessing the bridge on non-game days, but allow traffic for stadium events. A barrier or other enforcement mechanism acceptable to the City will also be installed to block the BRT lanes, such that only authorized buses and emergency vehicles may gain access. These facilities will be further defined in the Infrastructure submittals required in the DRDAP, but would most likely be in the form of a gate, retractable bollards, removable barriers, or photo enforcement.

To facilitate a safe and continuous bay trail connection between Candlestick Point and Hunters Point appropriate crosswalks will be installed across the approach roads at points that will accommodate users of the bay trail. In Candlestick Point the crosswalk will be at Arelious Walker and Carroll and in Hunters Point it will likely be within the first 500 feet of the approach road following the bridge. The exact location of the bay trail in Hunters Point is not set yet, but will be coordinated with the slough restoration project to accommodate this crossing. The approximate locations of these crossings are shown on Figures 5.6.1. At the time the bridge and its approach roadways are accepted by the City for operation and maintenance, they will be designated by the City as public right-of-way with restrictions. The bridge and roadways will be restricted to transit-only use and closed to private vehicular traffic except for specified stadium-event related days and times. The remainder of the time, the auto and BRT lanes would be restricted to prevent private vehicular use of the BRT and auto lanes, but allow free passage of pedestrians and bicyclists.

5.7 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 HPS2 Area. The preliminary site grading plan is shown on Figure 5.7.1. 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 HPS2 Area as 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 HPS2 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.

Upon acceptance of the retaining walls by the City, the underlying property owners will have all responsibility for their operation and maintenance.

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 Technical Memorandum, which has been submitted by the Developer to the City.

5.8 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 service to existing users. When feasible, all utilities should be installed in the locations provided for in the respective Technical Memoranda, to avoid relocation. Although not defined in this Plan, relocations shall be delineated in the Tentative Map process and specifically detailed in the Improvement Plan process.

5.9 COMMUNITY FACILITIES LOTS

There are several Community Facilities Lots at the HPS2 area which include a fire station lot as well as lots for other community uses as defined in the Candlestick Point and Phase 2 of the Hunters Point Shipyard Community Benefits Plan. The locations of these Community Facilities Lots are shown on Figure 5.9.1.

5.9.1 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.

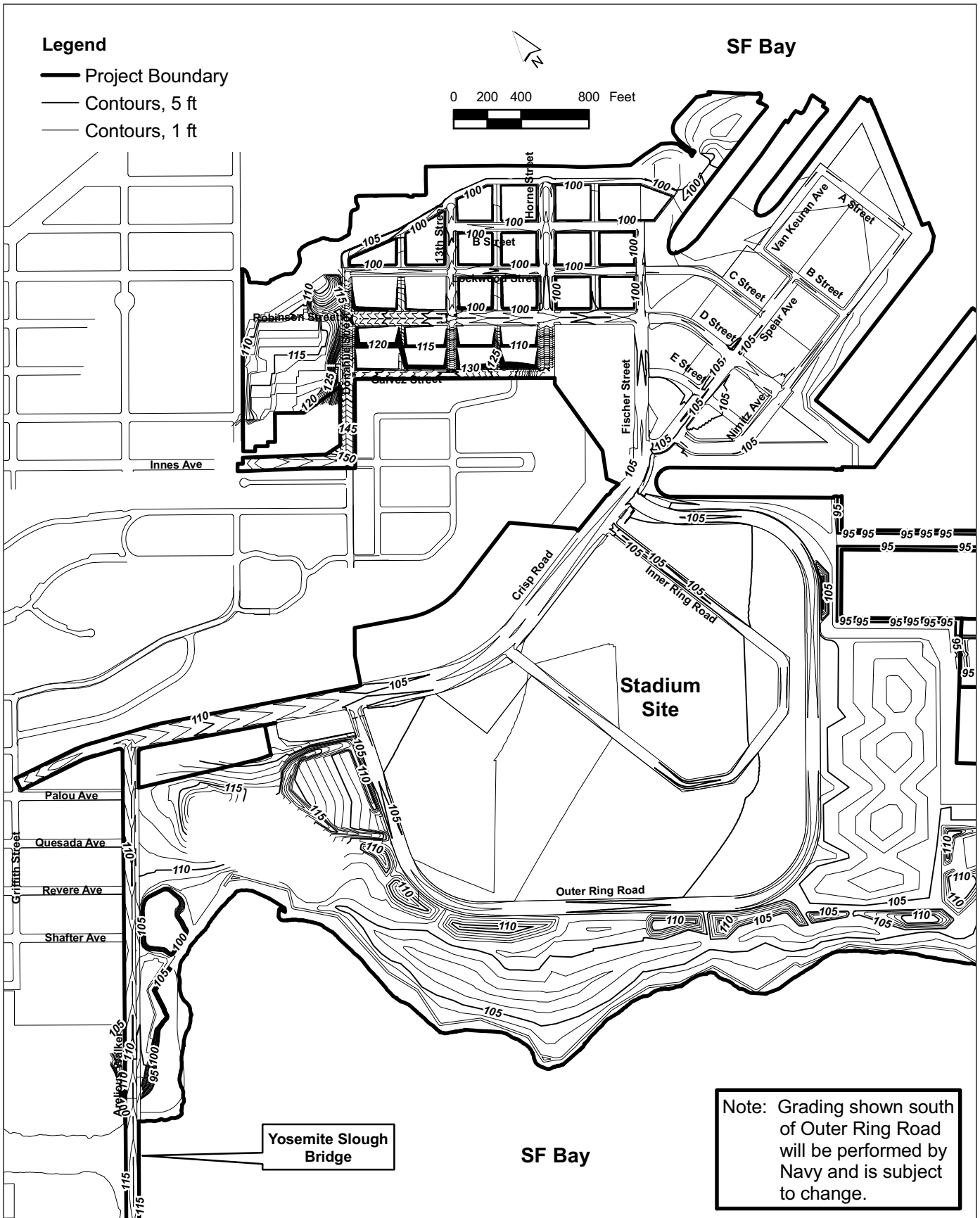
With respect to the Open Space Parcels, in addition to creating Developable Lots as set forth above, Developer shall also complete the surface improvements and utilities in accordance with the Park and Open Space Plan.

5.10 HILLPOINT PARK PATH

The Developer shall provide a pedestrian path from Hillpoint Park in the Hunters Point Shipyard Phase I area to the Spear / Crisp / Horne Avenue area as specified in California Senate Bill 792 and the Public Trust Exchange Agreement.

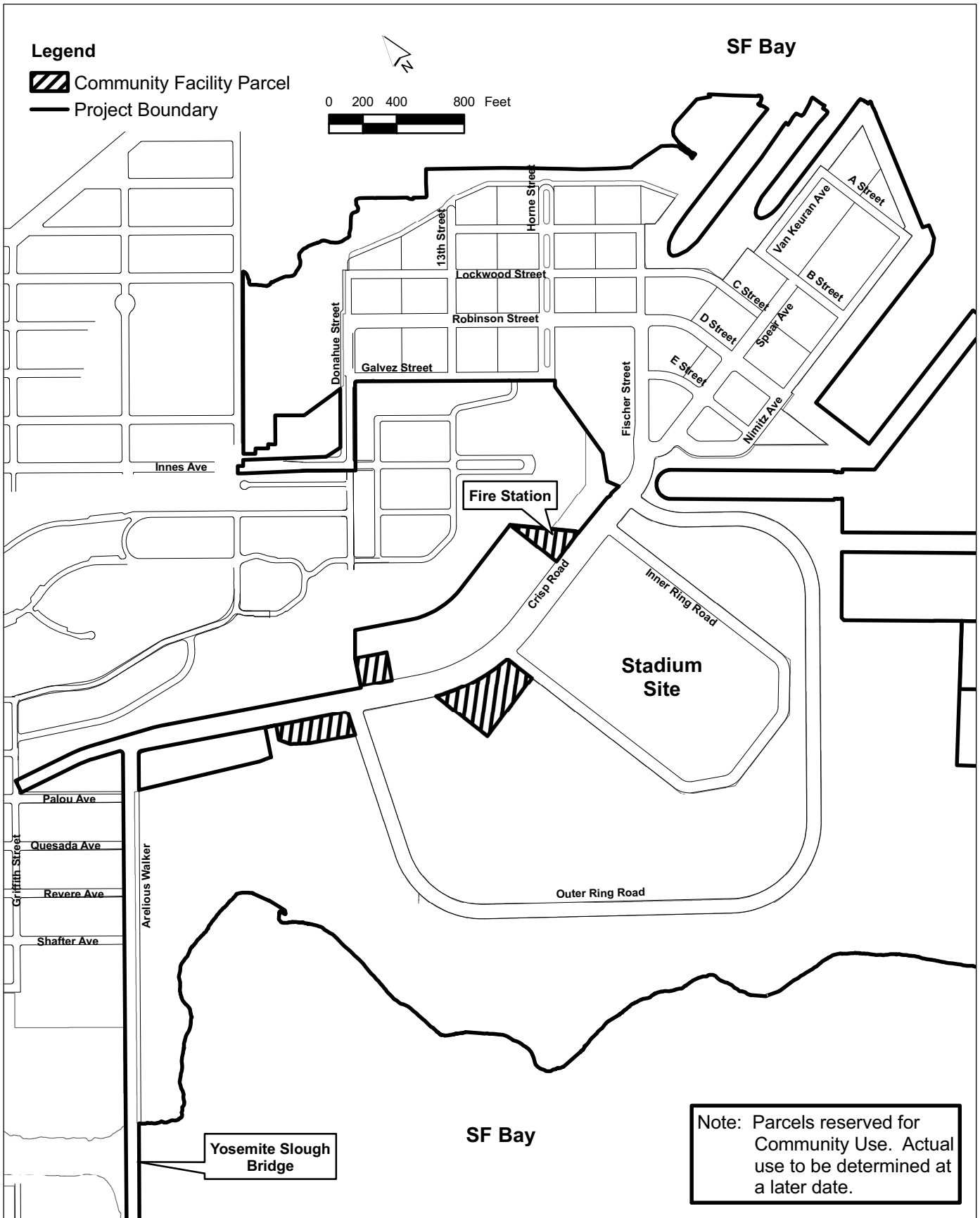
5.11 TRANSPORTATION MANAGEMENT SYSTEM

In conjunction with the roadway facilities and transportation improvements described herein, a transportation management system will be implemented. The system will allow for the coordination of signals at over 25 intersections in the Project area and surrounding area using fiber-optic or equivalent technology. On game-days, some intersections would be controlled by a Traffic Control Officer. Several variable message signs will be installed on roadways with reversible lanes. These signs will be able to convey messages for drivers, pedestrians and cyclists for game-day and emergency vehicle circulation. Software and hardware for a Transportation Management Center (TMC) on the stadium grounds will be developed. The TMC would be operated by the SFMTA on game days.



Hunters Point Shipyard Phase II Development
Preliminary Site Grading

Figure
5.7.1



Hunters Point Shipyard Phase II Development
Community Facilities Lots Locations

Figure 5.9.1

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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 HPS2 Area 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. 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 HPS2 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 Residential Blocks 1 and 4 - Construct Galvez Street adjacent to development and extend to existing artist buildings east of intersection with Horne Street.
- Development of Residential Block 10a and Mixed Use Block 10b - A turnaround will be provided along B Street to allow traffic circulation.

- Development of Residential Blocks 4b, 5b, 6b, 8 and 9 - Extend Fischer Avenue from south of Robinson Street to Crisp Road.
- Transit Center at Mixed Use Block 8 will be constructed when 20% of total project transit trips are reached, unless constructed with surrounding development first.
- Development of R&D Block 1 - Construct Crisp Road based on Project Alternative road section design at time of development. Crisp Road to be widened and improved to ultimate section with construction of stadium.
- Construction of the Crisp Road (full section), Yosemite Slough Bridge and Arelious Walker Drive south of Crisp Road will occur when the football stadium is constructed, along with adjacent improvements.

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 number of p.m. (evening) peak hour vehicle trips that are likely to cause one or more intersections in the HPS2 Area to deteriorate to unacceptable levels of service. As part of the review process for each Project, the number of p.m. peak hour vehicle trips generated will be estimated using the trip rates shown in Table 6.1.1, and added to the total calculated number of p.m. peak hour vehicle trips already generated by the developed portions of the CP/HPS2 Project, using the same trip rates. This number will determine which infrastructure Improvements must be implemented, other than those already required by the adjacency principle.

**Table 6.1.1 Effective PM Peak Hour Vehicle Trip Generation Rates
Hunters Point Shipyard Phase 2**

<u>Land Use</u>	<u>Amount Provided</u>	<u>Unit</u>	<u>Effective PM Peak Hour Trip Generation Rate (Auto Trips Per Unit of Development)^a</u>
Residential	2,650	Dwelling Units	0.28
Retail	125	Ksf	2.57
R&D	2,500	Ksf	0.38
Stadium/Artists	--	--	--
Park	232	Acres	0.03
Community Services	50	Ksf	1.42

SOURCE: Fehr & Peers, 2009.

- a. The effective rates are the total number of person trips forecasted to be generated by each use, with the mode split forecasts developed as part of the project's transportation impact study. Overall, the site was projected to experience a reduction, compared to standard rates from *Trip Generation* (ITE, 2007), of 29 percent based on the scale of development, the mix of uses, and the bicycle- and pedestrian-oriented design. For purposes of developing this table, the reduction was applied evenly to each use. Further, the number of auto trips generated per unit of development is dependent on both the size of development and the mix of uses proposed. As the project uses change, the vehicle trip generation rates per unit of development may not be constant. Thus, the rates presented in this table should be used cautiously.

Tables 6.1.2 and 6.1.3 identify the street intersections and street segments Improvements, respectively, that are subject to cumulative development requirements and show the approximate amount of p.m. peak hour vehicle trips (or other metric, as applicable) that establish the need for each such Improvement. The number of p.m. peak hour vehicle trips shown in Tables 6.1.2 and 6.1.3 could result from a variety of project development schemes and land use combinations. The trip rates shown in Table 6.1.1 will be used to establish if a given mix of land use development requires Improvements to the street intersections and street segments listed in Tables 6.1.2 and 6.1.3, respectively.

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

**Table 6.1.1.2 Project Intersection Improvements
Hunters Point Shipyard Phase 2**

<u>Intersection</u>	<u>Project</u>		<u>Project Alternative</u>	
	<u>Improvement</u>	<u>Traffic Volume Trigger^f</u>	<u>Traffic Volume Trigger^f</u>	<u>Trigger</u>
<u>Project Improvements</u>				
Crisp Road / Arelious Walker Drive	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Crisp Road / Outer Ring Road (West)	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Crisp Road / Inner Ring Road (West)	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Crisp Road / Inner Ring Road (East)	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Crisp Road / Outer Ring Road (East)	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Fischer Street / Spear Avenue	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Robinson Street / Fisher Street	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Robinson Street / Donahue Street	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Innes Avenue / Donahue Street	New Traffic Signal	No	Construction of HPS Stadium	No Adjacency
Palou Avenue / Griffith Street / Crisp Avenue	New Traffic Signal / Reconfiguration ^a	No	Construction of HPS Stadium	No Adjacency

**Table 6.1.1.2 Project Intersection Improvements
Hunters Point Shipyard Phase 2**

<u>Intersection</u>	<u>Project</u>		<u>Project Alternative</u>	
	<u>Improvement</u>	<u>Traffic Volume Trigger?</u> ^f	<u>Traffic Volume Trigger?</u> ^f	<u>Trigger</u>
Palou Avenue / Hawes Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Palou Avenue / Ingalls Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Palou Avenue / Jennings Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Palou Avenue / Keith Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Palou Avenue / Lane Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Palou Avenue / Ingalls Street	New Traffic Signal	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero
Ingalls Street / Carroll Avenue	New Traffic Signal / Reconfiguration ^b	No	Construction of HPS Stadium	Yes 3,131 PM Peak Hour Vehicle Trips (CP & HP) ^g
Ingalls Street / Thomas Avenue	New Traffic Signal / Reconfiguration ^c	No	Construction of HPS Stadium	Yes 3,131 PM Peak Hour Vehicle Trips (CP & HP) ^g
Hunters Point Boulevard / Evans Avenue / Jennings Street	New Traffic Signal / Reconfiguration ^d	Yes	1,515 PM Peak Hour Vehicle Trips	Yes 1,515 PM Peak Hour Vehicle Trips
Pennsylvania Avenue / 25 th Street	New Traffic Signal	Yes	1,926 PM Peak Hour Vehicle Trips	Yes 1,926 PM Peak Hour Vehicle Trips

**Table 6.1.1.2 Project Intersection Improvements
Hunters Point Shipyard Phase 2**

<u>Intersection</u>	<u>Improvement</u>	<u>Project</u>	<u>Project Alternative</u>
		Traffic Volume Trigger? ^f	Traffic Volume Trigger? ^f
Amador/Cargo/Illinois	Reconfiguration ^e	Yes Vehicle Trips	Yes Vehicle Trips
		2,121 PM Peak Hour	2,121 PM Peak Hour

SOURCE: Fehr & Peers, 2009.

- a. The Project will reconfigure the intersection by removing the southwest leg of Crisp Avenue and creating limited access for the eastern block of Palou Avenue. The Crisp Avenue westbound approach, which is a Project roadway, would be restriped to provide two approach lanes, a left turn lane and a shared left/through/right lane. The Project will also reconfigure the northbound Griffith Street approach to provide two lanes, a shared left/through/right turn lane and a dedicated right turn lane. The Project will also reconfigure the eastbound approach on Palou Avenue to provide two approach lanes, a left turn lane and a shared through/right turn lane.
- b. The Project will reconfigure Carroll Avenue to provide two travel lanes and a bicycle lane in each direction. This will allow for a shared left turn and through lane, and a shared through and right turn lane at both the east- and westbound approaches. The southbound approach will be reconfigured to allow for two approach lanes: a left turn lane, and a shared through and right turn lane. The reconfiguration of the southbound approach will require displacement of about 200 feet of on-street parking/loading on the west side of Ingalls Street.
- c. The Project will reconfigure the westbound approach of Thomas Avenue to provide two lanes, a left turn lane, and a shared through and right turn lane. Thomas Avenue will be reconfigured to provide two travel lanes in each direction and on-street parking on both sides of the street.
- d. The Project will reconfigure the existing three travel lanes on Evans Avenue in both the eastbound and westbound approaches to provide a shared through/left turn lane, a through lane, and a right turn lane. The Project will also reconfigure the southbound approach on Jennings Street to provide a southbound left turn pocket, a shared southbound through lane, and a right turn lane.
- e. Reconfigure the southbound approach to the intersection to provide one dedicated left-turn lane and one dedicated right turn lane. City is currently evaluating the feasibility of this mitigation measure.
- f. Assumes other background traffic increases as same rate as buildout of the Project.
- g. Combined total from CP and HP

Table 6.1.3 Project Street Segment Improvements

Hunters Point Shipyard Phase 2

<u>Intersection</u>	<u>Improvement</u>	<u>Project</u>		<u>Project Alternative</u>
		<u>Traffic Vol Trigger?^a</u>	<u>Trigger</u>	
<u>Project Improvements</u>				
Palou Avenue, Griffith Avenue to Third Street	Resurface and Restripe, Streetscape Amenities. See Figure 2.1.4	No	Construction of HPS Stadium	Yes Extension of 24-Divisadero (See Table 6.1.5)
Thomas Avenue, Ingalls Street to Griffith Street	See Figures 2.1.2A – 2.1.2E	No	Construction of HPS Stadium	Yes 3,131 PM Peak Hour Vehicle Trips (CP & HP) ^b
Griffith Street, Thomas Street to Palou Street	See Figures 2.1.2A – 2.1.2E	No	Construction of HPS Stadium	Yes Reconstruction of Crisp Avenue
Innes Avenue, Donahue Street to Earl Street	See Figures 2.1.2A – 2.1.2E	No	Construction of HPS Stadium	Yes 1,000 PM Peak Hour Vehicle Trips
Innes Avenue/Hunters Point Boulevard/Evans Street, Earl Street to Jennings Street	See Figure 2.1.3	No	Construction of HPS Stadium	Yes 1,000 PM Peak Hour Vehicle Trips
<u>Mitigation Measures</u>				
Palou Avenue, Crisp Avenue to Third Street	Narrow sidewalks to 12-foot, transit only lane in both directions	TBD	Supplemental study Determines Transit Travel Times Have Degraded	Supplemental study Determines Transit Travel Times Have Degraded
Evans Street, Jennings Street to Napoleon Street	Convert one lane in each direction to transit only	TBD	Supplemental study Determines Transit Travel Times Have Degraded	Supplemental study Determines Transit Travel Times Have Degraded
Third Street, Thomas Avenue to Kirkwood Avenue	Provide exclusive LRT right of way, remove parking as needed	TBD	Supplemental study Determines Transit Travel Times Have Degraded	Supplemental study Determines Transit Travel Times Have Degraded

SOURCE: Fehr & Peers, 2009

a. Assumes other background traffic increases as same rate as buildout of the Project.

b. Combined total from CP and HPS2

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 HPS2 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 or Project therein, until such time as the final or permanent Infrastructure Improvements are constructed. These interim Improvements may 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 6.1.2 identifies the approximate levels of cumulative development that produces the number of vehicle trips to require the implementation of the HPS2 Area intersection Improvements at each intersection. 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 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 signal analysis criteria warrant signalization.

STREET SEGMENTS

Table 6.1.3 identifies the approximate levels of cumulative development that would require the implementation of the HPS2 Area street segments Improvements. Even if not required by the land use intensity threshold shown in Table 6.1.3, 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, electric power facilities and joint trench utilities.

6.2.5 STADIUM REQUIREMENTS

Phasing of stadium requirements will conform with the DDA.

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7. PROJECT ALTERNATIVE

7.1 PROJECT DESCRIPTION

The Project Alternative is Variant 2A as described in the EIR Comments and Responses Document, with the addition of certain historic preservation measures. The Project Alternative includes additional residential and R&D development in lieu of the proposed football stadium. Section 7 presents only modifications to the Infrastructure proposed in Sections 1 through 6 of this Infrastructure Plan. Unless otherwise noted in this section, information presented in the Infrastructure Plan remains unchanged, and is not repeated herein.

7.2 PUBLIC INFRASTRUCTURE WITHIN THE STREET RIGHT-OF-WAY

7.2.1 ON-SITE STREET SYSTEM

The on-site street system for the Project Alternative is shown on Figure 7.1.1A. The following street modifications are included in the Project Alternative:

- The street layouts for B Street, Van Keuran Avenue, and A Street have been modified to accommodate historic structures to remain.
- Inner Ring Road surrounding the NFL stadium has been eliminated and several new roads have been added for the variant development.
- The Outer Ring Road remains; however, its function would be different as it would not be designed to accommodate large volumes of game day traffic. Consequently, it would be constructed with a much narrower cross-section. All new and revised roadway cross-sections related to the Project Alternative are shown on Figures 7.1.1B and 7.1.1C.
- Cross-sections and/or right-of-way widths have been modified on Arelious Walker Drive and at the Yosemite Slough Bridge, as shown on Figure 7.1.1D.
- Cross-sections and/or right-of-way widths have been modified on portions of Crisp Road, Donahue Street, Innes Avenue, Robinson Street, Fischer Street, B Street, Nimitz Avenue, Spear Avenue, and Van Keuran Avenue.
- Instead of four new signals along Crisp Avenue adjacent to the stadium as proposed by the Project (at Outer Ring Road West, Inner Ring Road West, Inner Ring Road

East and Outer Ring Road East, as shown previously on Figure 2.1.6), the Project Alternative would include only three new signals along this section of Crisp Avenue (at Outer Ring Road West, Outer Ring Road East and Crane Road).

7.2.2 OFF-SITE STREET SYSTEM

There are no modifications to the off-site street improvements for the Project Alternative.

7.2.3 WET AND DRY UTILITIES

Infrastructure requirements for the wet and dry utilities are modified to serve the development for the Project Alternative. Revised utility configurations are shown on Figures 7.2.1 through 7.2.6. In general, the modifications are limited to alignment of utilities within the revised street grid. One small sanitary lift station and one small storm drainage pump station will be added under the Project Alternative in the vicinity of the historic structures to remain.

7.3 PUBLIC OPEN SPACE

The revised street system and development configuration for the Project Alternative has resulted in addition of several parks and modifications to other parks and sports fields. As with the Project, improvements in the Park and Open Space parcels under the Project Alternative 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 HPS2 Area. A summary of all proposed parks and open spaces for the entire HPS2 development (not just the new or modified parks and open spaces) is shown in Table 7.3.1 and on Figure 7.3.1

**Table 7.3.1 Proposed Parks and Open Space
Project Alternative**

	<i>Acre (Approx.)</i>	<i>Park Role</i>	<i>Features</i>	<i>New / Existing Park</i>
New Parks				
Northside Park	12.8	Neighborhood	Water-wise Ornamental Gardens, Tennis, Basketball, African Market, Tot-Lot, Multi-use Lawn, Shade Pavilions, BBQ, Café	New
Waterfront Promenade (North and South)	32.4	Destination	Historic Landscape Elements, Open Lawns, Interpretive and Native Grasslands, Gardens, Plazas, Tree groves, Seating Areas, Marina	New

**Table 7.3.1 Proposed Parks and Open Space
Project Alternative**

	<u>Aces (Approx.)</u>	<u>Park Role</u>	<u>Features</u>	<u>New / Existing Park</u>
Heritage Park	15.6	Destination	Historic Buildings and Landscape Elements, Interpretive and Educational Areas, Visitor Center, Museum, Café	New
Grasslands Ecology Park South	45.2	Ecology Park	Native Grasslands, Interpretive Center, Native Plant Gardens, Picnic Pods and Shelters, Bay Nature Interpretive Play, Viewing Mounds, Overlook Terraces, Amphitheater / Outdoor Classroom	New
Grasslands Ecology Park North	38.2	Ecology Park	Freshwater Wetland, Tidal Wetland, Native Grasslands, Viewing Mounds, Viewing Pier	New
Shipyards South Park	2.0	Neighborhood	Tot Lot, Open Lawn, Tree Grove, Plaza	New
Shipyards Wedge Park	3.1	Neighborhood	Plaza, Ornamental and Native Plantings, Tree Grove, Open Lawn, Dog Run, Playground,	New
Shipyards Neighborhood Park	0.9	Neighborhood	Plaza, Tree Groves, Interactive Water Feature, Open lawn, Seating Areas	New
Shipyards Mini Park	0.7	Neighborhood	Tot Lot, Open Lawn, Plaza, Tree Groves, Picnic and Game Tables	New
<i>Subtotal</i>	<u>150.9</u>			
New Sports Fields and Active Urban Recreation				
Community Sports Field Complex	39.0	Sports Fields	Sports Fields, Field House, Maintenance Yard	New
Waterfront Recreation & Education Park	6.7	Destination	Interpretive Center, Tree Grove, Seating, Open Lawn	New
Multi-Use Fields	25.2	Destination	Multi-use Lawn, Game-day Parking	New
<i>Subtotal</i>	<u>70.9</u>			
Total	<u>221.8</u>			

SOURCE: Lennar Urban, 2009.

Modifications to Parks and Open Space for the Project Alternative include the following:

- Four new neighborhood parks are added: Shipyards South Park (2.0 acres); Shipyards Wedge Park (3.1 acres); Shipyards Neighborhood Park (0.9 acres); and Shipyards Mini Park (0.7 acres).

- The areas of the Community Sports Field Complex and Multi-use Fields are modified.
- The Community Sports Field Complex and Multi-use Fields no longer require the dual-use parking turf reinforcement system.
- A small boulevard park is added.

The following new neighborhood parks are proposed for the Non-Stadium Alternative:

SHIPYARD SOUTH PARK (10a)

Shipyards South Park will act as a park promenade, extending over several blocks and connecting Crisp Road with the landmark Re-Gunning Crane and its pier. The park will be structured as a set of garden “rooms” that may include tot lots, plazas, a café/kiosk, spaces for informal neighborhood gathering and picnicking, and other flexible open space areas. Additionally, the park may provide opportunities for LID stormwater treatment gardens.

SHIPYARD WEDGE PARK (11a)

Shipyards Wedge Park will serve as the “commons” for the Shipyards South Neighborhood and will function as part of a park and view corridor linking Fisher Street to the South Basin. Specific programming may include an ecological garden, a main plaza, open lawns, dog run, and children’s play areas. Additionally, the park may provide opportunities for LID stormwater treatment gardens.

SHIPYARD NEIGHBORHOOD PARK (12a)

Nestled within a larger block, the Shipyards Neighborhood Park may include interactive water features, plaza, open lawn, shaded seating areas, and LID stormwater treatment gardens.

SHIPYARD MINI PARK (13a)

The park opens up from a street end with views toward the Community Sports Field Complex and the Bay beyond. It may include a tot lot, open lawn, ornamental gardens and stormwater treatment gardens, and a shaded picnic grove with game tables.

SHIPYARD SOUTH BOULEVARD PARK (3c)

The Shipyards South Boulevard Park is a 30’ wide median park located on a street with R&D uses to the west and residential uses to the east. A hybrid of streetscape and park, this space may include planting, pathways, seating areas, and LID stormwater treatment gardens.

7.4 GRADING

The preliminary grading plan for the Project Alternative is shown on Figure 7.4.1.

7.5 OTHER INFRASTRUCTURE

The width of the Yosemite Slough Bridge and approach street rights-of-way are modified in the Project Alternative. The maximum bridge width is 41 feet. The bridge and approach street cross-sections are shown on Figure 7.5.1. The bridge plan and sections are shown on Figure 7.5.2.

No modifications to the proposed waterfront improvements are necessary for the Project Alternative.

The locations of community facilities lots have changed for the Project Alternative, as shown on Figure 7.6.1.

7.6 INFRASTRUCTURE PHASING METHODOLOGY

Improvements within the HPS2 Area as developed under the Project Alternative would be triggered as defined by Sections 5 and 6 of the Infrastructure Plan.

7.7 ALTERNATIVE INFRASTRUCTURE UTILITIES

A number of alternative infrastructure utilities have been considered for the project, including district heating and cooling, automated waste collection, on-site wastewater treatment, and on-site generation of recycled water. These systems have been evaluated for use on the project, but have not been formally adopted as of the date of this Infrastructure Plan. Upon mutual agreement between the City and the Developer, future implementation of any of these systems could be integrated into the project design as project approvals progress, subject to environmental review. The infrastructure plans presented in this Infrastructure Plan would not preclude the future implementation of any of these systems.

7.8 HISTORIC STRUCTURE PRESERVATION

7.8.1 HUNTERS POINT COMMERCIAL DRY DOCK AND NAVAL SHIPYARD HISTORIC DISTRICT

Dry Docks 2, 3, and 4, and four existing buildings (Buildings 140, 204, 205, and 207) in the Historic District have been identified by the EIR as historic resources in the Hunters Point Commercial Dry Dock and Naval Shipyard Historic District, which is eligible for listing under the National Register of Historic Places. In addition, Buildings 208, 211, 224, 231 and 253 have been identified as being eligible for listing under the California Register of Historic Resources.

7.8.2 HISTORIC PRESERVATION STRATEGY

The Project and the Project Alternative both propose to stabilize and preserve Dry Docks 2, 3 and 4 and Buildings 140 and 205 consistent with the Secretary of Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. In addition Buildings 204, 207, and 208 will be retained as features of the cultural landscape.

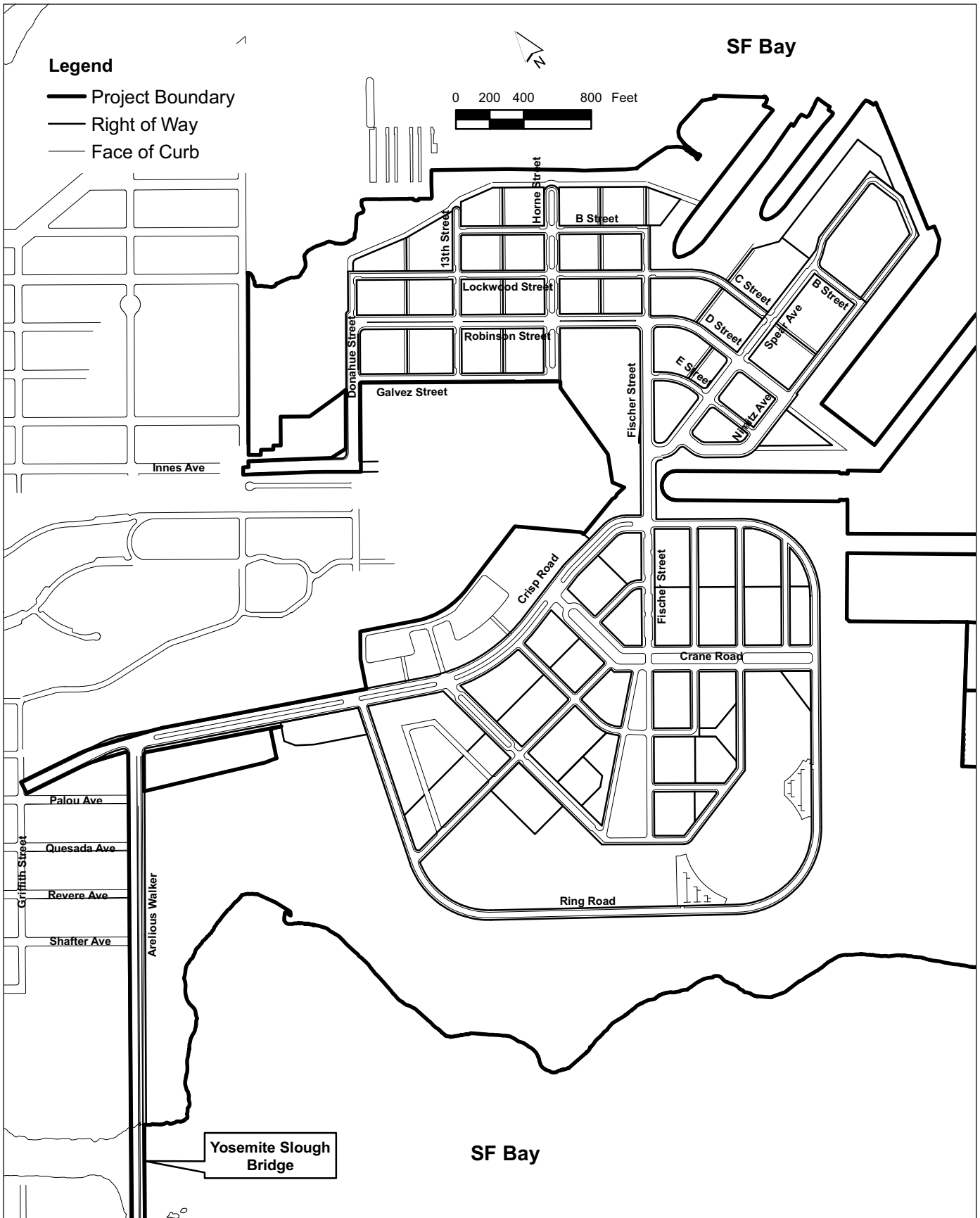
Rehabilitating Buildings 211, 224, 231 and 253 has been found to be financially infeasible and so they are proposed for demolition.

Under the Project Alternative, four Navy buildings within the Shipyard R&D District will be considered for retention, subject to an economic and physical feasibility analysis that will be undertaken in conjunction with the selection of the Project Alternative. The four buildings considered for full or partial retention are Building 211, Building 224, Building 231, and Building 253.

7.9 SEA LEVEL RISE STRATEGY

While improvements that are to be constructed as part of the HPS2 development are required to be a minimum of 42 inches above the existing base flood elevation to mitigate for SLR (as detailed in Section 3), all of the buildings in the proposed Historic District will remain at their current elevations, below this minimum criterion. The new development area will be accessed from the Historic District via a landscaped grading transition zone.

In addition to the SLR measures described in Section 3, barriers will be constructed to mitigate for SLR at the Historic District and to protect its buildings from flooding. The barriers will be designed to provide protection for up to 36 inches of SLR. To minimize the disruption of access and views from the Historic District to the shoreline, a higher level of protection will not be constructed during the initial phase of the project; however, an easement will be provided to allow future expansion of the barriers as needed to provide protection from more than 36 inches of future SLR.



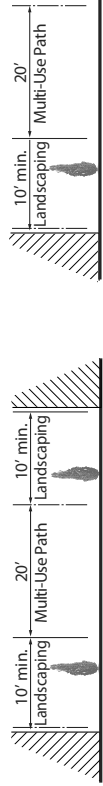
	Hunters Point Shipyard Phase II Development	Figure 7.1.1A
	Roadway Network (Project Alternative)	



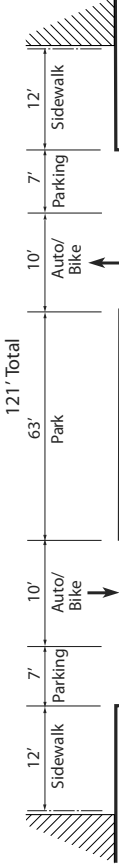
* Street type based on typology developed in the City of San Francisco Draft Better Street Plan, June 2008.

- LEGEND**
- Auto Route Alignment
 - BRT Route Alignment
 - Heavy dashed line denotes roadway with exclusive BRT lane(s)

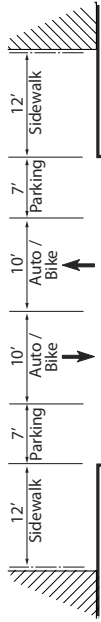
Public Alley * - Section 1
40' Total



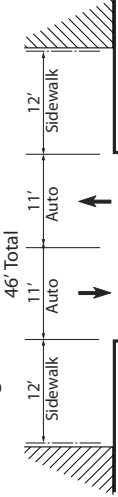
Crane Road ("Parkway" *)



"Neighborhood Commercial Street" * - Section 1
58' Total



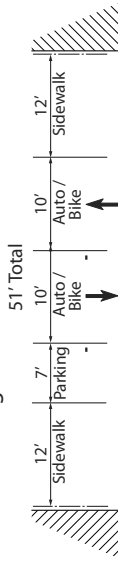
"Neighborhood Commercial Street" * - Section 2
46' Total



"Neighborhood Commercial Street (Parkway)" * - Section 3
90' Total



"Neighborhood Residential Street" * - Section 1
51' Total



"Neighborhood Residential Street" * - Section 2
58' Total



Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops (typical)

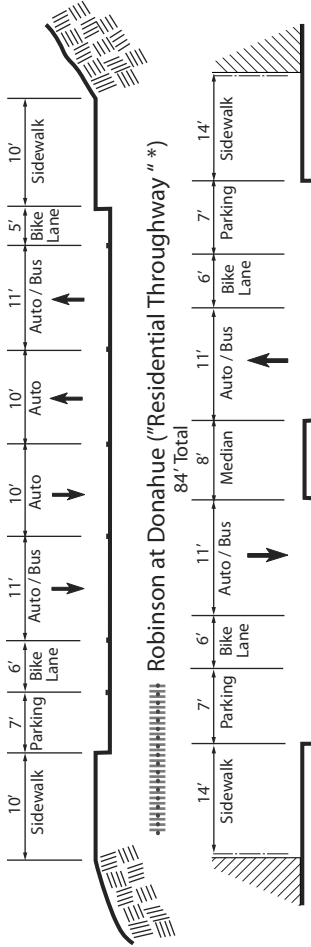
SECTIONS NOT TO SCALE

**Hunters Point Shipyard Phase II Development
On-Site Street Network - Local Streets (Project Alternative)**

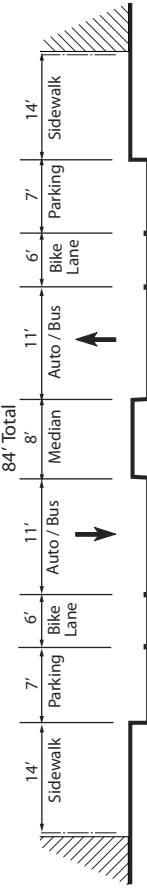
**Figure
7.1.1B**



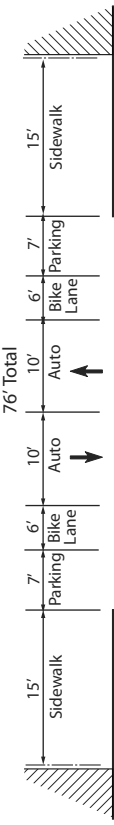
Innes at Earl ("Residential Thoroughway" *)
80' Total



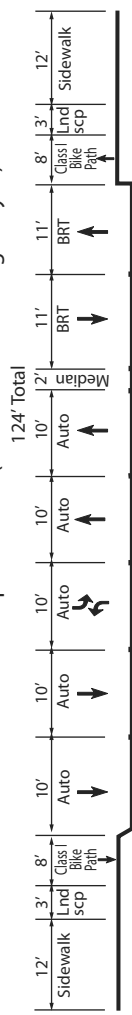
Roberson at Donahue ("Residential Thoroughway" *)
84' Total



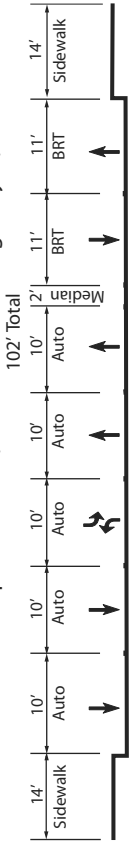
Fischer at Crisp ("Commercial Thoroughway" *)
76' Total



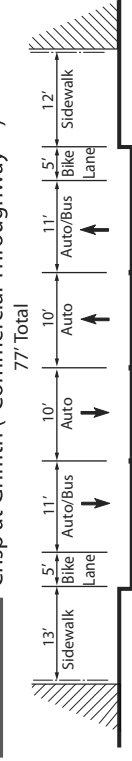
Crisp Road East ("Commercial Thoroughway" *)
124' Total



Crisp Road West ("Commercial Thoroughway" *)
102' Total



Crisp at Griffith ("Commercial Thoroughway" *)
77' Total

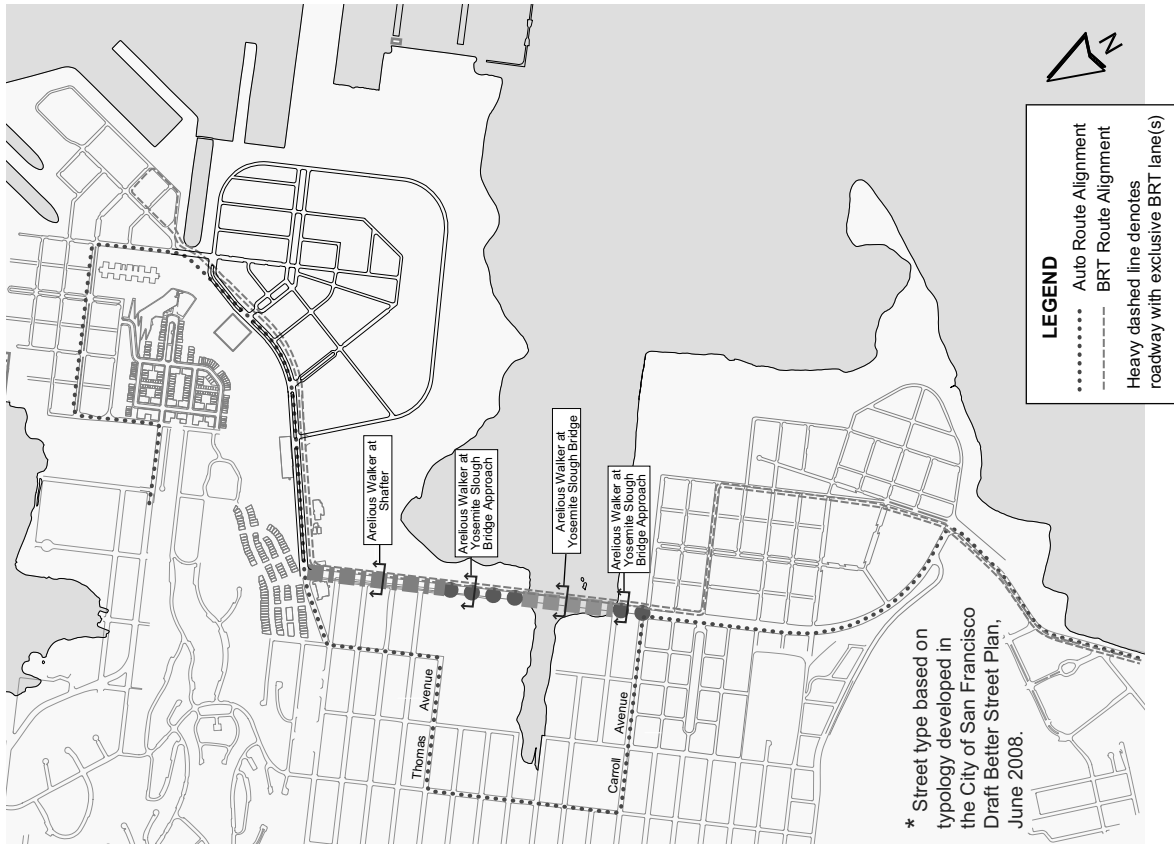


SECTIONS NOT TO SCALE

Sidewalks shall increase to 15' at bus rapid transit stops and shall conform to Better Streets Plan guidelines for all other stops. (typical)

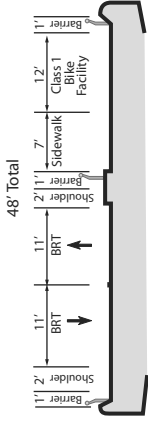
Hunters Point Shipyard Phase II Development
On-Site and Off-Site Street Network - Arterials (Project Alternative)

Figure 7.1.1C

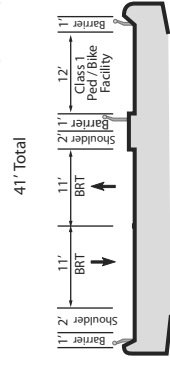


BRT / Pedestrian / Bicycle Bridge

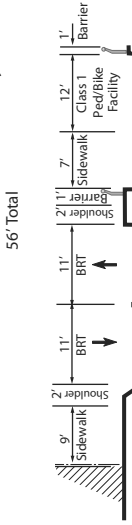
●●●●● Arelious Walker at Yosemite Slough Bridge Approach ("Parkway" *)



■ Arelious Walker at Yosemite Slough Bridge ("Parkway" *)



■ Arelious Walker at Shafter ("Parkway" *)

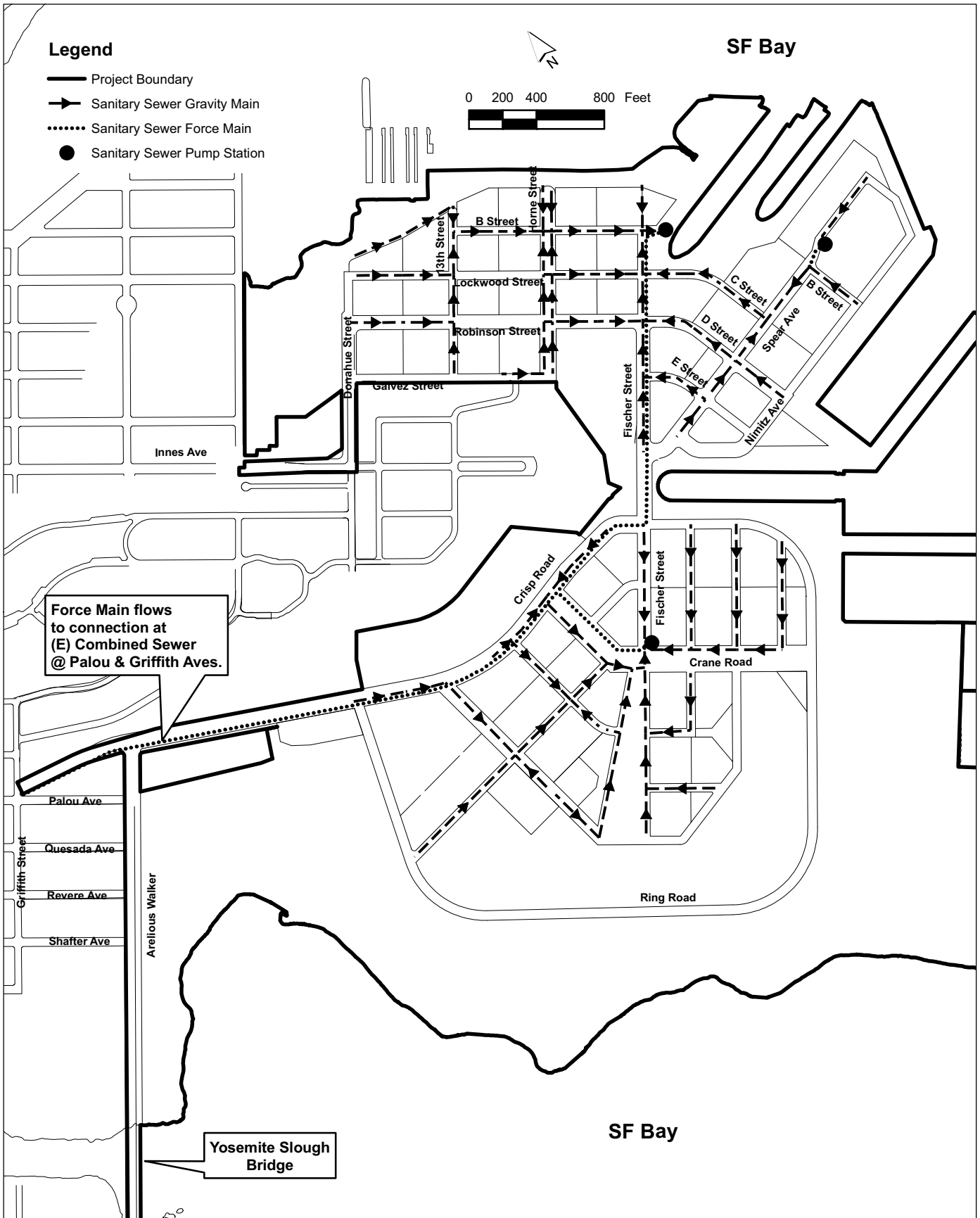


SECTIONS NOT TO SCALE

**Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge (Project Alternative)**

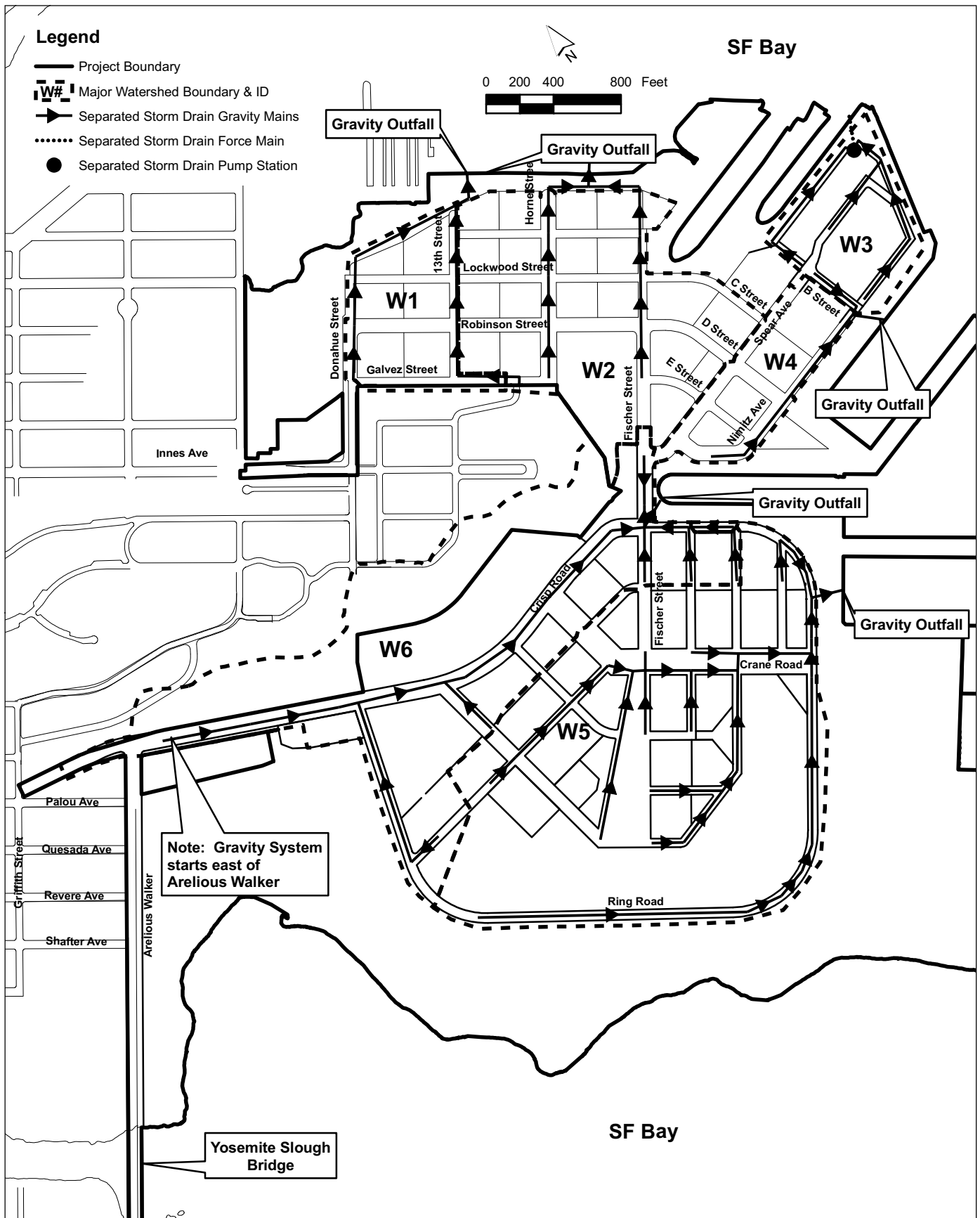
**Figure
7.1.1D**

Source: Fehr & Peers



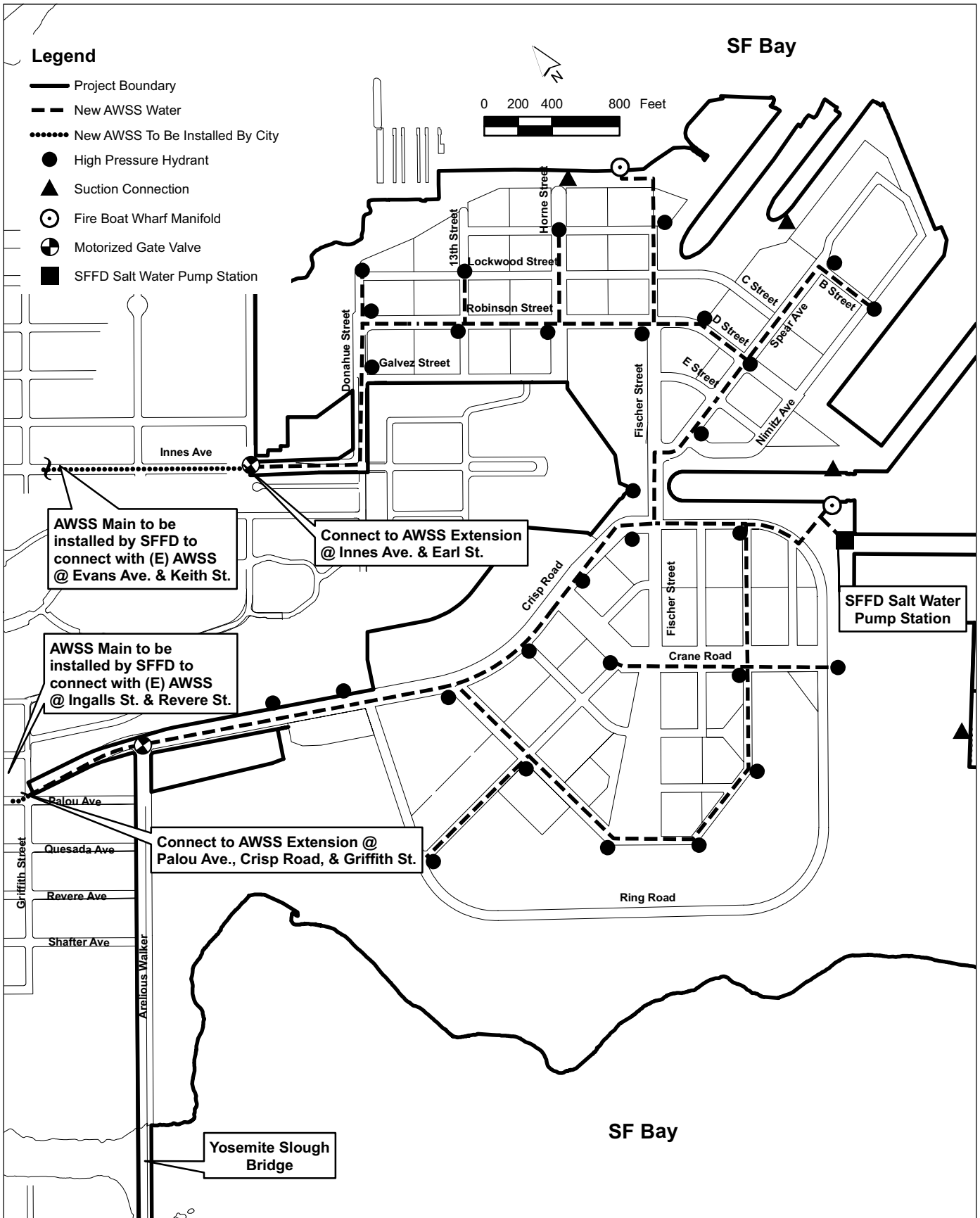
Hunters Point Shipyard Phase II Development
Sanitary Sewer Layout (Project Alternative)

Figure 7.2.1

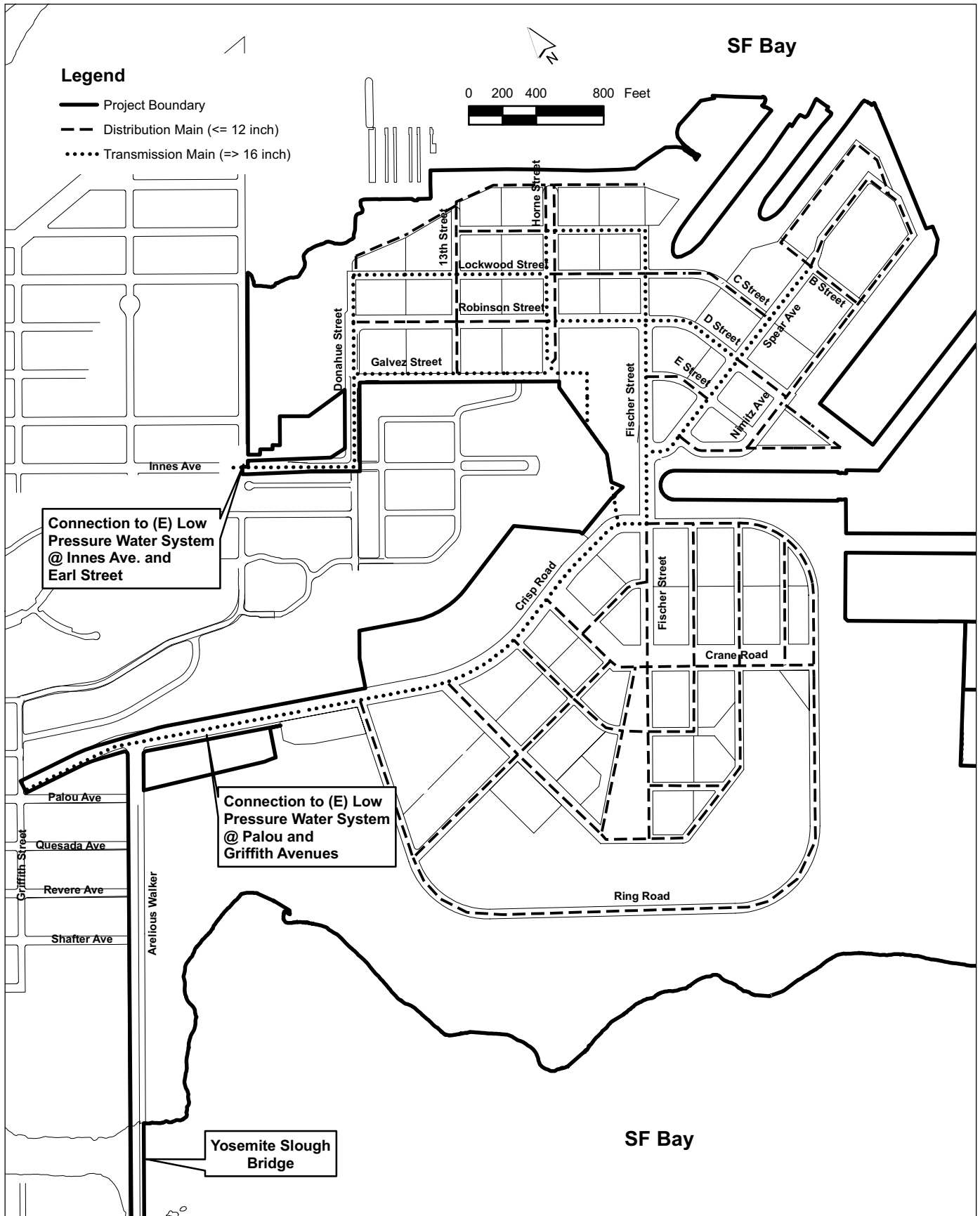


Hunters Point Shipyard Phase II Development
Separated Storm Drainage Layout (Project Alternative)

Figure 7.2.2

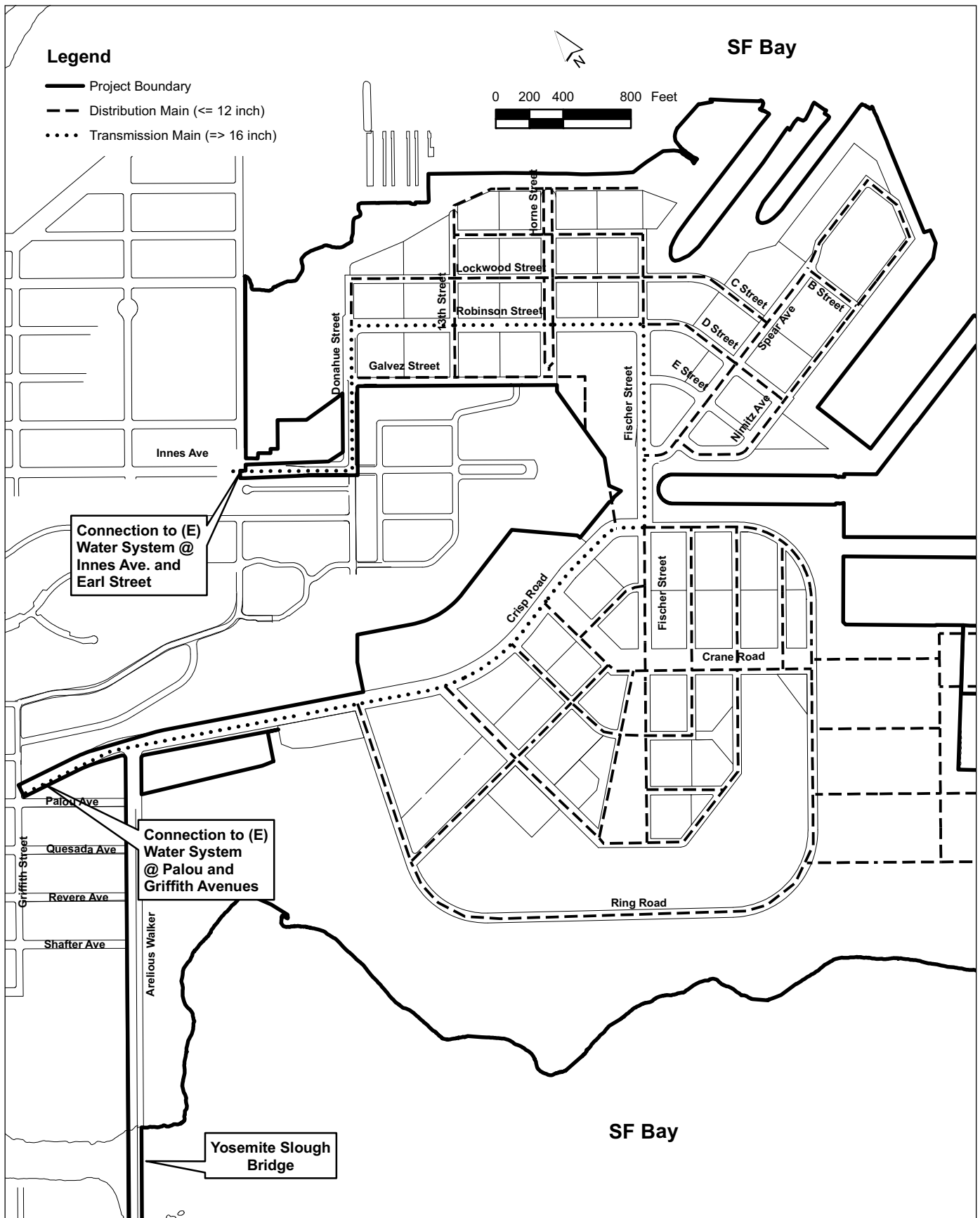


	Hunters Point Shipyard Phase II Development		Figure 7.2.3
	AWSS Layout (Project Alternative)		

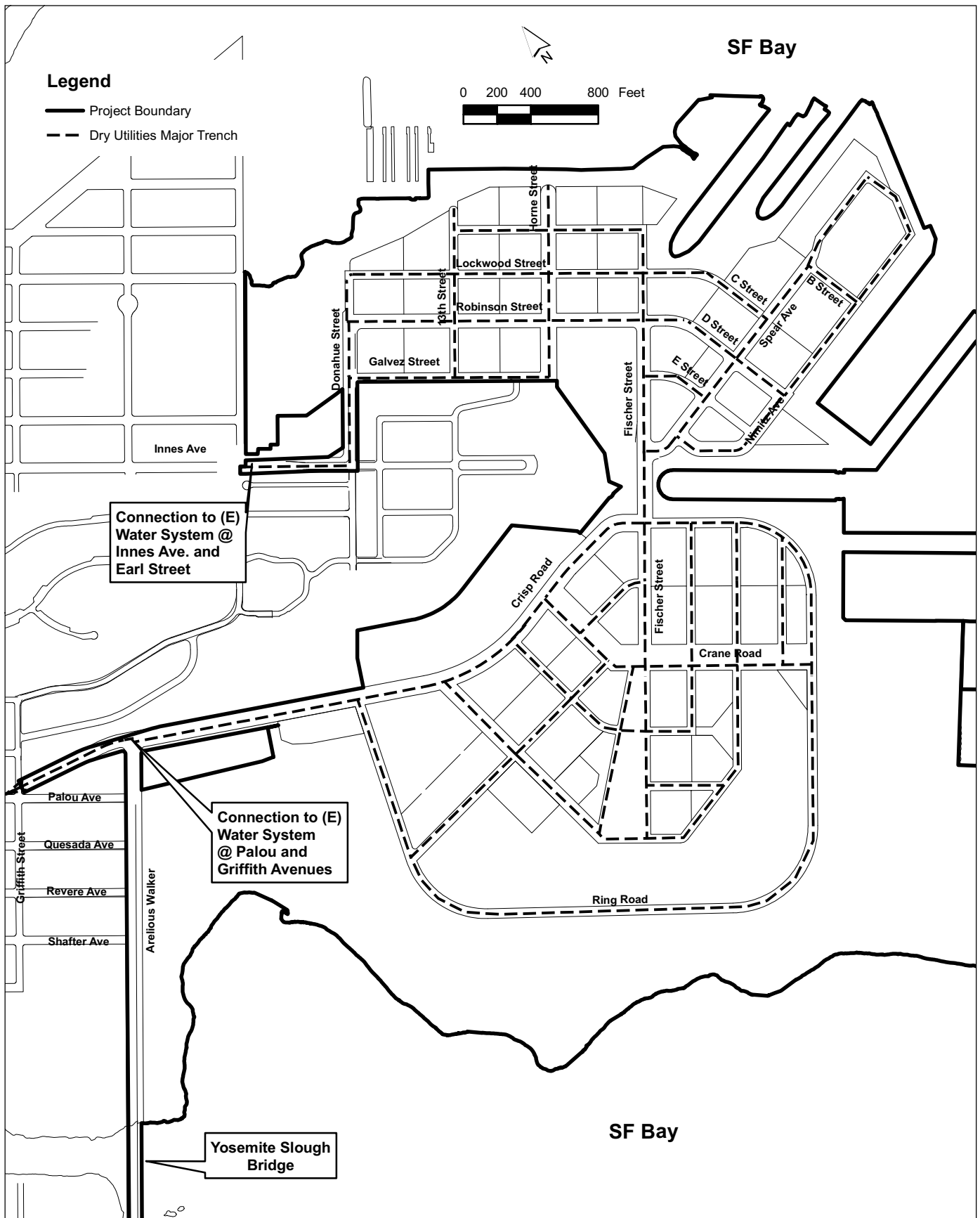


Hunters Point Shipyard Phase II Development
Low Pressure Water System Layout (Project Alternative)

Figure 7.2.4



	Hunters Point Shipyard Phase II Development	Figure 7.2.5
	Recycled Water System Layout (Project Alternative)	



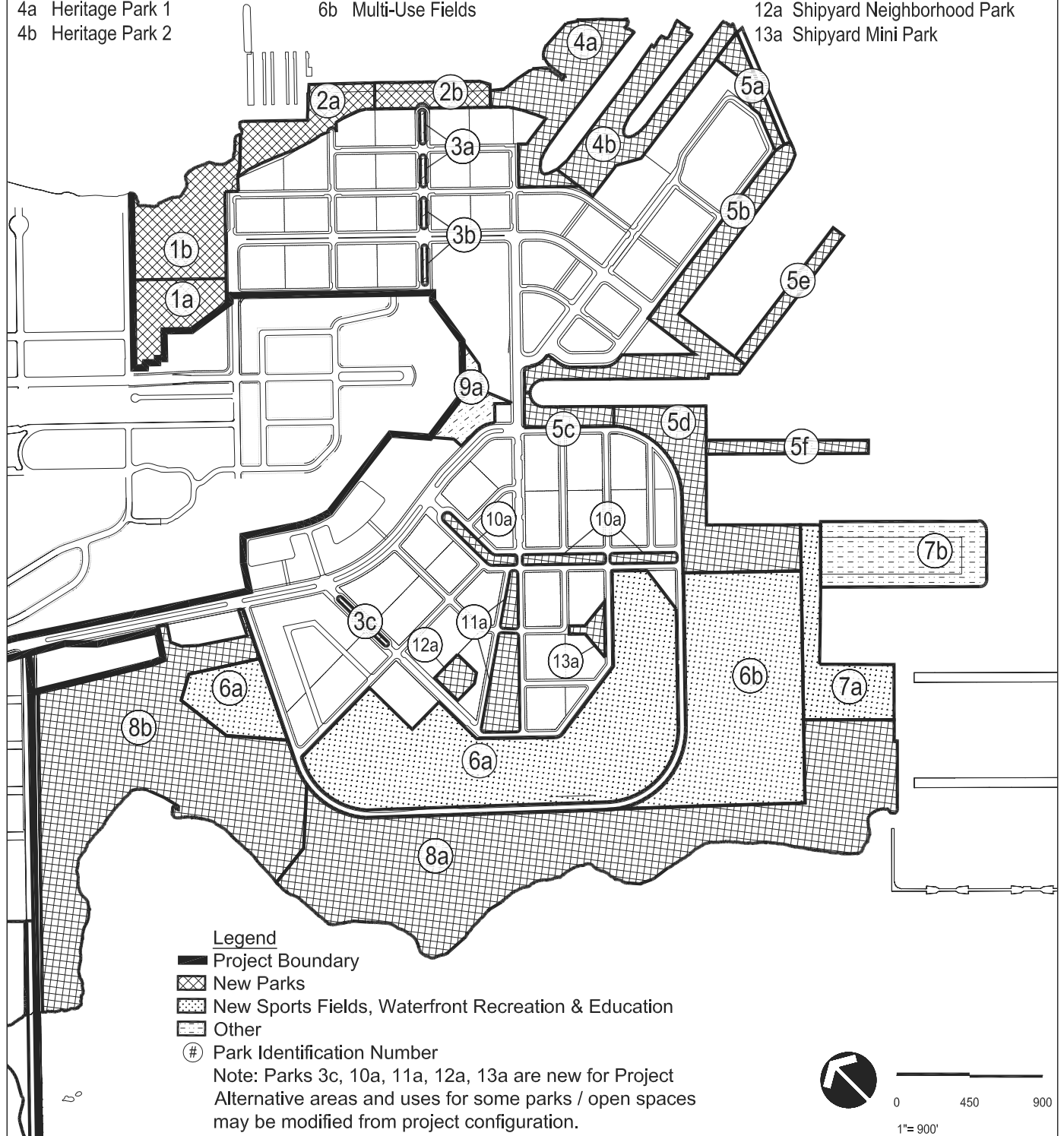
Hunters Point Shipyard Phase II Development
Dry Utility Joint Trench Layout (Project Alternative)

Figure 7.2.6

- 1a Northside Park 1
- 1b Northside Park 2
- 2a Waterfront Promenade North 1
- 2a Waterfront Promenade North 2
- 3a Horne Boulevard Park 1
- 3b Horne Boulevard Park 2
- 3c Shipyard South Boulevard Park
- 4a Heritage Park 1
- 4b Heritage Park 2

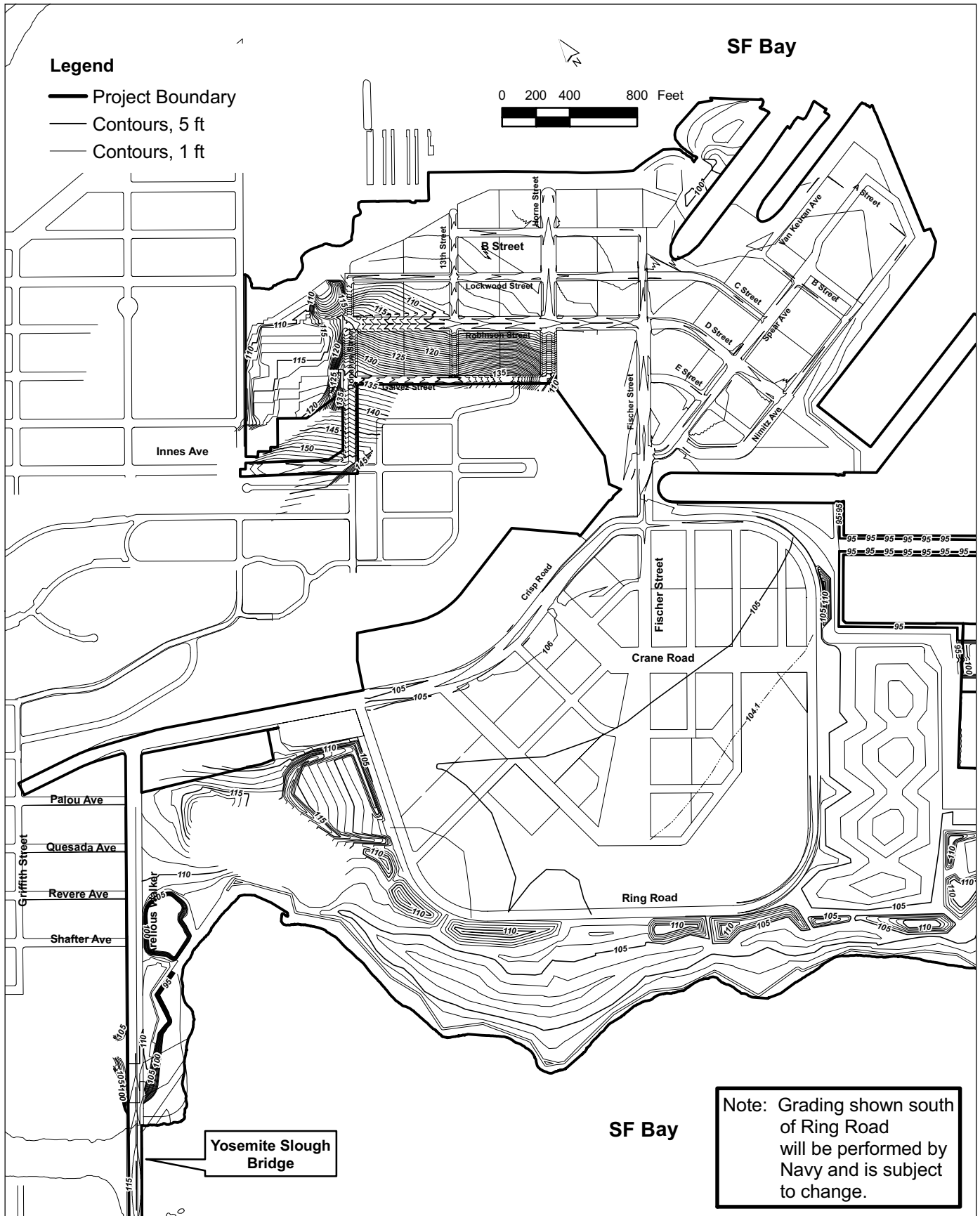
- 5a Waterfront Promenade South 1a
- 5b Waterfront Promenade South 1b
- 5c Waterfront Promenade South 2a
- 5d Waterfront Promenade South 2b
- 5e Waterfront Promenade South North Pier
- 5f Waterfront Promenade South South Pier
- 6a Comm. Sports Field Complex / Maintenance Yard
- 6b Multi-Use Fields

- 7a Waterfront Rec. & Education Park
- 7b Re-gunning Crane Pier Habitats
- 8a Grasslands Ecology Park South
- 8b Grasslands Ecology Park North
- 9a Shipyard Hillside Open Space
- 10a Shipyard South Park
- 11a Shipyard Wedge Park
- 12a Shipyard Neighborhood Park
- 13a Shipyard Mini Park



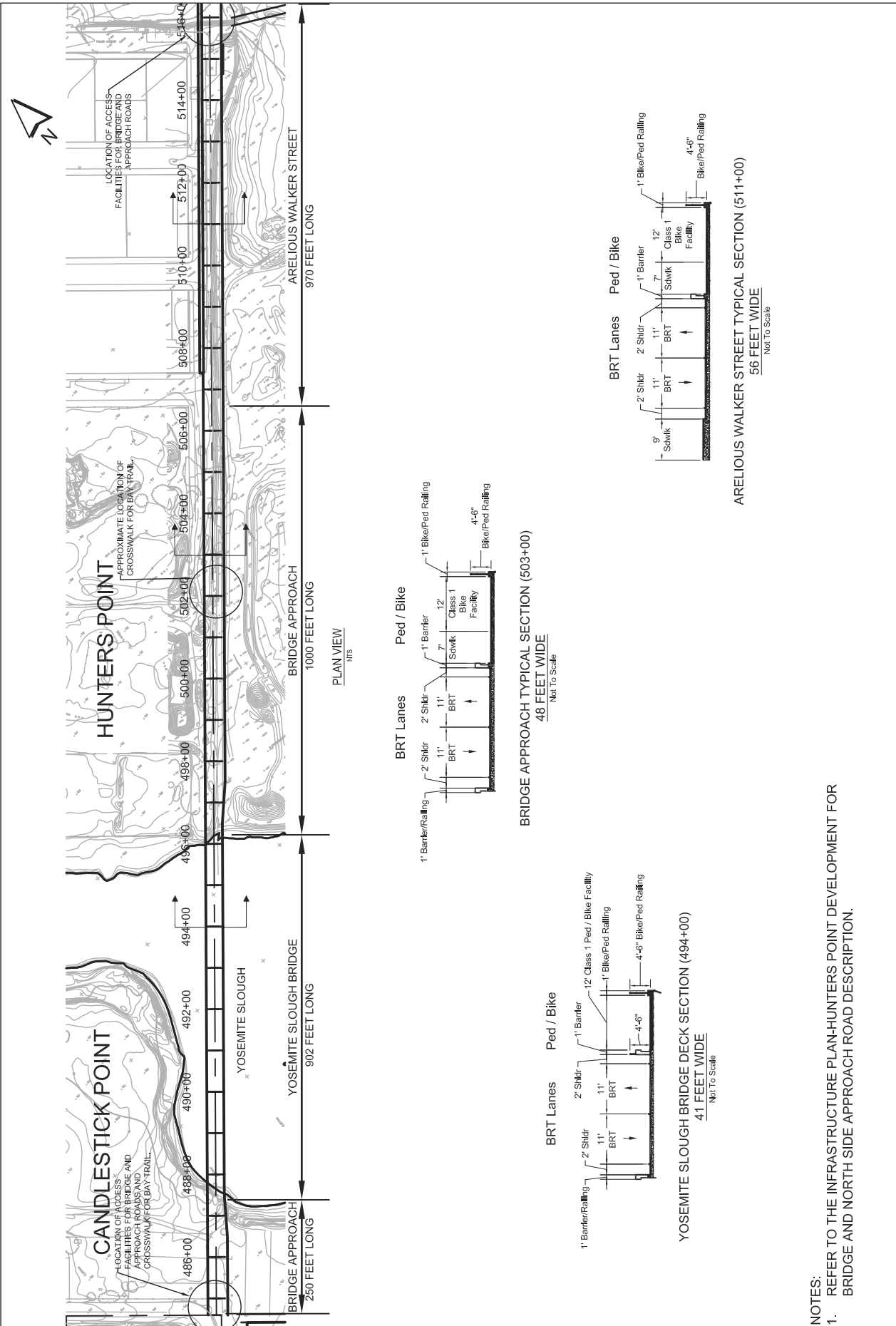
Hunters Point Shipyard Phase II Development
Open Space Parcels (Project Alternative)

Figure 7.3.1



Hunters Point Shipyard Phase II Development
Preliminary Site Grading (Project Alternative)

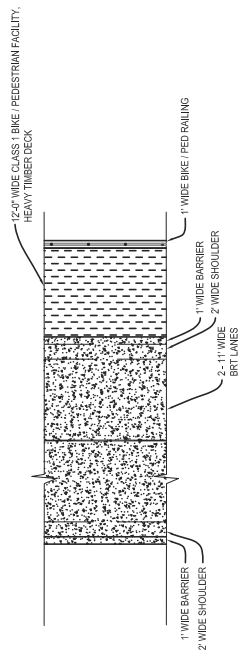
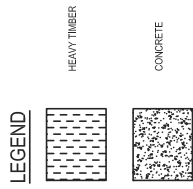
Figure
7.4.1



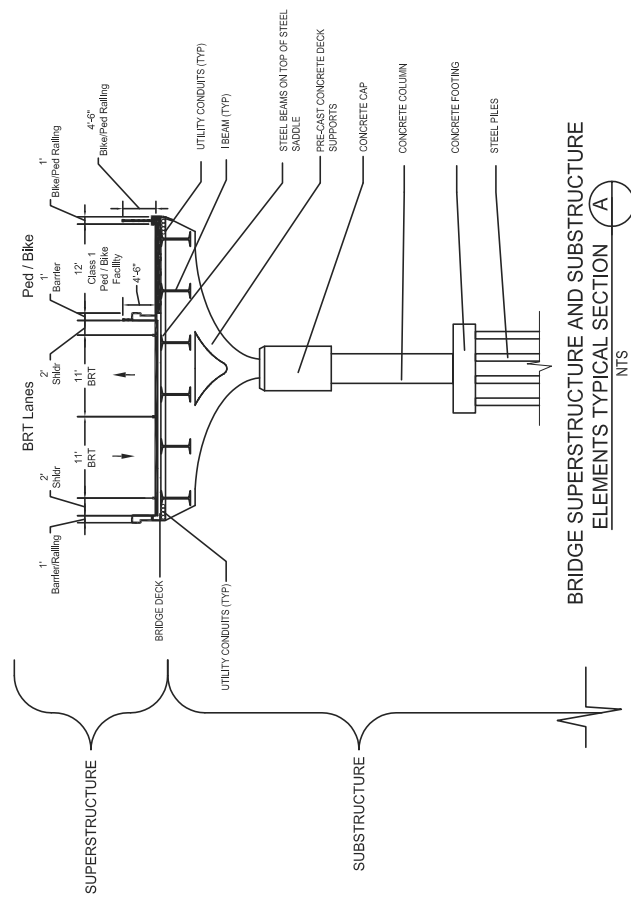
NOTES:
1. REFER TO THE INFRASTRUCTURE PLAN-HUNTERS POINT DEVELOPMENT FOR BRIDGE AND NORTH SIDE APPROACH ROAD DESCRIPTION.

Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge / Approach Roadways (Project Alternative)

Figure 7.5.1



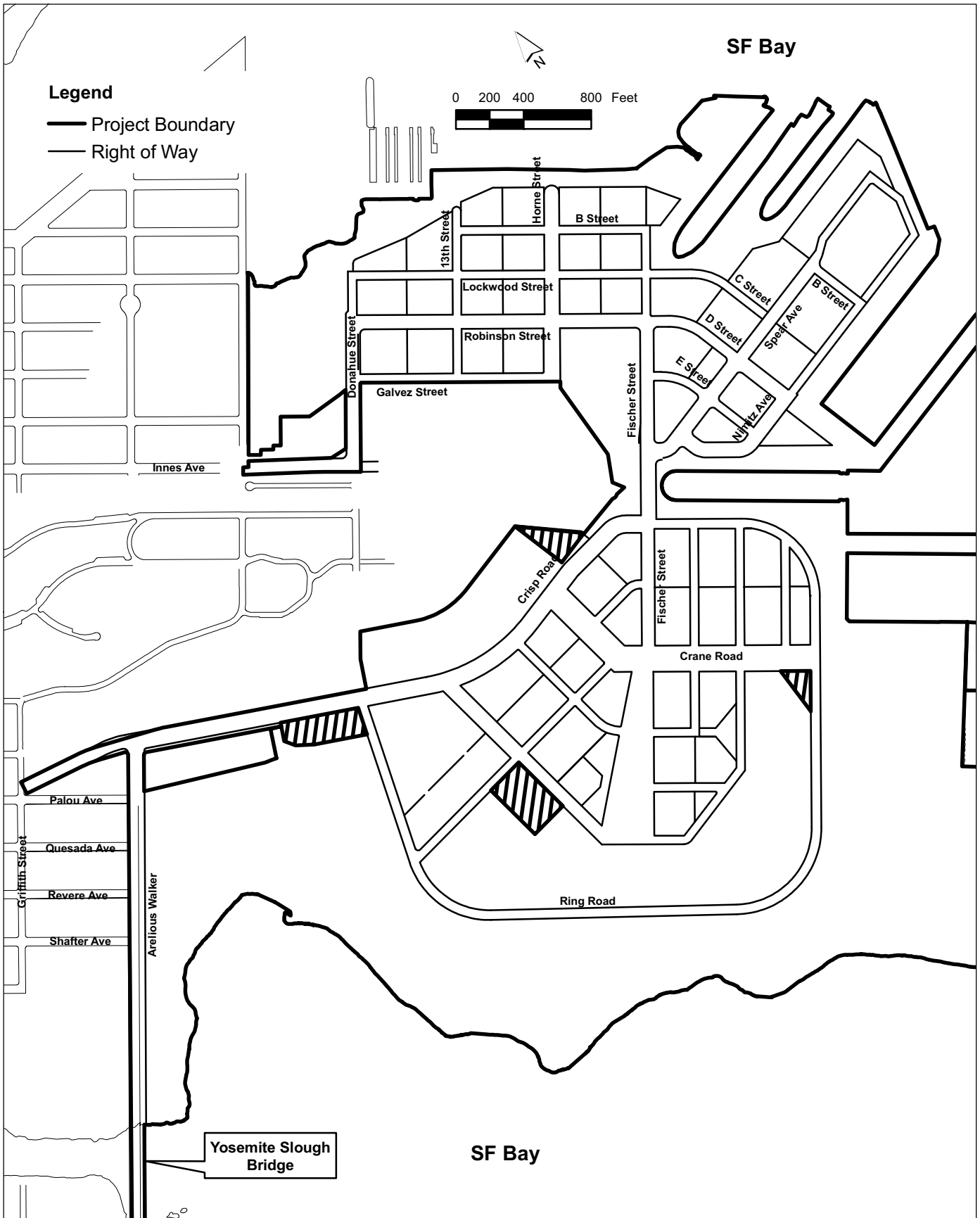
BRIDGE DECK DETAIL
PLAN VIEW
NTS



Hunters Point Shipyard Phase II Development
Yosemite Slough Bridge Plan and Section (Project Alternative)

Figure 7.5.2

Source: MACTEC ENGINEERING AND CONSULTING, Inc.



	<p align="center">Hunters Point Shipyard Phase II Development</p> <p align="center">Community Facilities Lots Locations (Project Alternative)</p>	<p align="center">Figure 7.6.1</p>
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Source: Winzler & Kelly
Infrastructure Plan

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