CITY OF PACIFICA
COUNCIL AGENDA SUMMARY REPORT

9/12/2016

SUBJECT:

Developer Selection and Authorization to Prepare and Agreement to Negotiate Exclusively for Development at 2212 Beach Boulevard

RECOMMENDED ACTION:

Move to approve the selection of recommended development team, James H. Friend of Friend Development Group LLC, based on the proposed hotel and restaurant concept submitted for 2212 Beach Blvd.; and authorize the City Manager to prepare an Agreement to Negotiate Exclusively (ANE) with the selected developer for subsequent City Council review and approval, and take all necessary steps to do so.

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BACKGROUND/DISCUSSION:

The transformation of the City's former waste water treatment plant site into a modern development that could contribute to the City's economic base has been envisioned since the late 1990s. Over the years, a number of efforts have been attempted but not completed.

The most recent effort that culminates in tonight's recommended action began in 2010. More information follows below.

City Council Launches Planning for Site Development in 2010

During the period from 2010 through early 2013, the City of Pacifica engaged in comprehensive, multi-disciplinary development planning for the site at 2212 Beach Boulevard. This approximately 3.5 acre site was available for re-use after the closure of the former City Waste Water Treatment Plant in 2000. The property offers 350 feet of ocean frontage and is one of the very few coastal development sites close to San Francisco and the Peninsula, and is considered one of the best hotel sites available anywhere on the California coast. Surrounded by visitor amenities such as the Golden Gate National Recreation site at Mori Point, the Sharp Park Golf Course, the Pacifica Pier, and the seven-plus mile Coastal Trail that connects to the Devil's Slide Trail south of Pacifica, the property at 2212 Beach Boulevard is a rare site ideally suited to a visitor-serving hotel.

During the 2010 - 2013 planning phase, the city, community members, and a consultant team

worked together in a joint effort that identified key project goals:

- Anchor the Palmetto 'Main Street' project
- Strengthen Pacifica's economy
- Increase tax revenues-transient occupancy tax in particular

The technical planning was extensive. Multiple approvals by the City Council authorized technical studies, concept planning for new uses on the site, and certification of an environmental impact report (2013 EIR) in connection with amendments to the City's General Plan and zoning.

The planning work was done during the Great Recession, a time when financing was largely unavailable for new real estate projects and hotel development was non-existent. The concept plan proposed a hotel, a new library and housing. One City report acknowledged the troubled economy, recognizing that, "this is the time to plan, so we can move forward when the market is strong again."

California Coastal Commission Staff State Preference for Hotel in 2014

In a November 2014 letter, the California Coastal Commission stated its preference for visitor serving uses such as a hotel as their top priority and the library as a second priority. Residential development was identified as being the Commission staff's least preferred land use because it doesn't contribute to public access to the coastline nor serve visitors. Given this preference, City staff focused on simplifying the project to align with the Commission's preferences in order to streamline the project consideration process when it comes before the Commission for approvals and permits.

City Goals and Strong Hotel Market Align in 2015

In 2015 the City Council developed a set of goals and adopted a work plan that evaluated the many overarching issues facing the City as a whole. The Council assigned top priority to "economic development" as the best way to achieve fiscal sustainability. Consistent with that, the Council identified development of 2212 Beach Boulevard and completing the Palmetto Streetscape as its second priority among a list of 20 projects and initiatives.

As staff worked to move the Council's priorities forward, discussions with hotel industry professionals produced information that the hotel market was strong and our timing to solicit proposals for the site was optimal. The hotel market appeared to be aligned with the goals for the 2212 Beach Boulevard site and the Council priority for economic development for the first time.

Council Approves Developer Selection Criteria for Hotel in October 2015

On October 26, 2015, City Council approved a two-step selection process to seek qualified development teams for the site: first, a Request for Qualifications (RFQ) was distributed widely

to prospective developers and, later, a Request for Proposals (RFP) would be addressed to finalists. At that time, staff recommended the effort focus on the hotel and library as the primary uses for the site because of the site's relatively small size (3.5 acres) and to ease and shorten the expected approval process through the City and the Coastal Commission. Given the City's motivation for fiscal sustainability, the primary objectives became the hotel and library as anchors for Palmetto Avenue (as the City's new "Main Street") and generating the associated tax revenues from hotel operations.

This action also approved developer selection criteria, which are provided for reference as Attachment A of this staff report. The criteria focused heavily on the experience of the developer that demonstrated capacity to finance, plan, entitle, build and operate a hotel, including restaurant and related amenities, and experience in business districts, coastal areas, local government, and Business Improvement Districts. These criteria are the basis on which the developer selection is recommended, as presented later in this report.

Developer Response Affirms Beach Boulevard Site for Hotel Development in 2016

Six development teams submitted qualifications for City consideration in January 2016. The qualifications were presented to the City Council at its meeting on March 28, 2016 along with an update on the findings of the developer selection process that included a summary of the hotel market. The summary report is repeated here for ease of reference.

The number and quality of RFQ responses confirmed that Pacifica can gain from the current strong market cycle. Despite the fact that Pacifica has long been considered a tertiary market at best, and rarely recognized for its proximity to San Francisco or SFO, it obviously attracted six competitive hotel developers/operators. This presented a never-before opportunity to strengthen Pacifica's hospitality sector. The submitted visions and proposals showed how much possibility they saw in the site, the coastline setting, and easy proximity to San Francisco and SFO.

Hotel developers considering the RFQ repeatedly said Pacifica's hotels are performing well in this market, and the market for additional hotel rooms, particularly for new product and a broader range of choices is highly attractive. The City's hotel consultant (retained to assist in the selection process) who studies the Pacifica market and the larger Bay Area market stated the following:

- The additional variety of accommodations and price points at the proposed new hotel would strengthen Pacifica as a hotel market, and solidify its place in the San Francisco area hotel market.
- Pacifica's geographic proximity to San Francisco, SFO, the San Francisco Peninsula and to BART will become better known among business travelers and will help fill hotel rooms and restaurants more easily during the weekdays.
- The hotels suggested by the competing developers represent brands and or market

segments not currently in Pacifica. Each proposed hotel would bring in loyal customers via their central reservation systems or by target marketing. In effect, this will increase Pacifica's visibility as a travel destination overall.

Additional Recent Council Direction Related to 2212 Beach Boulevard

As the 2212 Beach Boulevard Developer selection process has been underway, the City Council has also taken action on the following important related matters:

- **New Pacifica Library**
  Related to the development of Beach Boulevard is the realization of the community's vision for a new Pacifica Library that will occupy a portion of the site, and also is listed in the City Council's Work Plan as a high priority (#9). At its meeting of July 11, 2016, the Council acted to place a measure on the November ballot to obtain voter approval for the sale of general obligation bonds to pay for the proposed library. Additionally, the Council authorized staff to hire Group 4 as the project architect and to undertake the Schematic Design Phase. (Schematic is the first phase of building design, addressing what is included in the building, how the parts of the building relate to one another, the overall shape and placement of the building, etc.).

- **Coastal Hazards Report**
  The 2013 Environmental Impact Report (EIR) had assessed coastal hazards and identified the site as buildable. With recent increased concerns about sea level rise, staff engaged Moffat and Nichol, Inc., to develop an updated study for the 2212 Beach Boulevard site that was presented at the City Council meeting of July 11, 2016. The study evaluates the risk of coastal hazards through 2100 including wave overtopping, sea level rise and tsunami. This additional study addresses sea level rise data that has been released as part of regional studies since the 2013 EIR, and analyzes that data with regard to development of this site; a copy of the study is included as Attachment B.

  The Moffat and Nichol report concluded that the site is buildable, with the only risk of significant flooding being a very rare, worst case tsunami as calculated for extreme emergency purposes by the State. This report addressed the entire City property at 2212 Beach Boulevard, which is proposed site for both the hotel and new library. A representative of Moffat and Nichol will be present at tonight's meeting to review the report and to address any questions the Council or public may have.

- **Palmetto Streetscape**
  On August 8, 2016 City Council approved design recommendations for the Palmetto Avenue Streetscape Project - Phase I with the expectation that it will be advertised for bids in October 2016 with a construction start date of first quarter 2017.

ACTIONS BEFORE THE CITY COUNCIL TONIGHT

There are two related actions presented to the City Council tonight: (1) Select a developer; and

(2) direct staff to move forward with preparing an agreement to negotiate exclusively with that developer. To support these decisions, staff has conducted an extensive process to solicit development proposals and evaluate them with the assistance of professional experts from a variety of fields.

Action 1: Select a Developer to engage in more indepth determination of a hotel project

The hotel proposals and development teams were evaluated based on all the selection criteria approved by the City Council and the capacity to achieve the City's stated goals for the site (see Attachment B). The criteria emphasized demonstrated experience in securing permits, financing (predevelopment, construction and permanent project phases), and operating a hotel. Experience is a strong indicator of the ability to carry out public review for Planning Commission, City Council and Coastal Commission approvals, construct a complex site, and ultimately a completed and operating hotel.

Six teams responded to the RFQ; all were invited to submit proposals; four continued their interest and submitted proposals. They represented a range of experience in development, hotel operation with branded and independent boutique hotels, and working relationships in the hotel industry. Two of the respondents had won awards within the last six months recognizing their work and several had strong industry recognition. Two of the four finalists pursued combined hotel and condominium projects and two presented stand-alone hotel proposals. Summaries of their proposal are shown below:

- **A F Canta** - a 123-room independent boutique hotel coupled with 62 condominiums, with a restaurant, retail space and a spa/fitness facility. Underground parking.
- **Friend Development Group LLC** - A 120-room, select service hotel under the Hilton family of brands with surface parking that tucks under the hotel building; restaurant, snack shop and meeting room supported by extensive outdoor deck space and rooftop bar along Beach Boulevard.
- **The Peebles Corporation** - A select service 116-room hotel under the Starwood family of brands with underground parking adjacent to 51 condominiums with above grade structured parking. A restaurant is one of several amenities including space for an arts center.
- **StonePark Capital** - A 109-room branded select service hotel divided into three buildings to maintain the neighborhood scale. An above-ground parking garage interior to the site that provides parking for all site uses (with City paying for library spaces) A cafe off the lobby at the southwest corner of the property, and retail space fronts Palmetto south of the proposed library.

A team of consultants assisted staff in assessing the proposals in relation to the selection criteria, real estate and hotel industry factors, design issues and coastal hazards. The team

reviewed the business terms, design proposals (now posted on the City website at <www.cityofpacifica.org/BeachHotel>), and conducted two sets of interviews with proponents.

The team of staff and consultants analyzed the proposals and the capacity of each development team to meet the City goals, and to complete and operate the hotel. The team also took into consideration the Coastal Commission staff's preferences in relation to the type of land use being proposed by the various development teams.

- **Recommendation for Developer Selection**

Based on the full analysis and all information available, the developer judged to be best able to meet the City goals is **Friend Development Group LLC**, owned by James H. Friend. Staff's recommendation is based on the expert opinions of professionals in the finance, real estate, hotel and urban design fields and is summarized by Mr. Tim Kelly of Keyser Marston Associates in a memo included as Attachment C. Mr. Kelly is present to address the City Council and respond to questions as needed.

Mr. Friend's interest in this site is based on his longstanding association with the Peninsula, having grown up and attended school here, and he remains in close touch with family members who still reside in the immediate area. After a brief two year stint as a practicing lawyer, Mr. Friend launched his career in the real estate industry initially as a Project Manager at Stanford University and later moved into real estate sales and financing. Mr. Friend founded Friend Development Group in 1985 and has spent most of his career in the New York area.

Mr. Friend is known for his willingness to tackle difficult projects, his ability to resolve technical challenges, and his record of building hotels that are memorable because they recognize local character and history, and reflect the community in which they are located. For example, the hotel Friend built near Hyde Park, New York, features photographs from the Roosevelt Library at Hyde Park. His hotels are also known for designs that exceed the standard corporate requirements and are unique to individual properties.

More information on Mr. Friend's track record in the hotel industry is included in the Keyser Marston Associates report attached to this report, and the Qualifications and Proposal submittals on the City web site.

Each of the proposals met the City's goals in some ways but only one offered a comprehensive package that was strong across the board. The Friend Development Group LLC's proposal was deemed most responsive for a variety of reasons including the following:

◊ Strong team track record. The proposed group has worked together to deliver at least four successful hotels in metropolitan areas similar to Pacifica.

◊ Distinguished select service hotel designs. Their previous hotel designs offer a special experience to visitors that reflect the community and are not "cookie cutter".

◊ Strong financial relationships with lending institutions and investors needed to bring a plan to fruition.

- ◊ Friend is only one of two respondents able to make a stand-alone hotel work financially; the two respondents that included residential development as part of their proposals were asked to submit a hotel-only project but declined.

- ◊ Experience with and support for business improvement districts (BIDs); in fact, Mr. Friend currently serves on the board of directors for a BID.

- ◊ A site design that locates hotel rooms along the southern edge of the property and dedicates the ocean front property edge to public serving, visitor uses such as a stand-alone restaurant on the comer of Montecito Avenue and Beach Boulevard, meeting room space, rooftop bar, an interesting combination of indoor/outdoor uses that create a destination not just for the hotel patrons but equally so for the general public including Pacifica residents.

- ◊ Mr. Friend has a reputation for being able to take on challenging projects and persist with seeing them through to completion, a very important quality for this project.

In sum, Friend Development Group LLC proposed the strongest, most complete and best overall package in response to the City's solicitation.

Action 2: Authorize the City Manager to Prepare an Agreement to Negotiate Exclusively (ANE) with the Selected Developer

This recommendation launches the next phase in the multi-year process leading to a hotel on the 2212 Beach Boulevard site. The purpose of the Agreement to Negotiate Exclusively (ANE) is to provide the developer assurances that the City will work exclusively with it, while the developer funds the cost of refining the design of the hotel and the studies associated with the environmental review (CEQA) of the project necessary to obtain the land use approvals (from the Planning Commission, City Council and Coastal Commission) for the project. The term of the ANE is expected to last approximately eighteen months. During this time period the developer will engage the community as the design of the hotel is refined. This current proposal reflects the developer's preliminary conceptual vision; it is not necessarily the final design.

The ANE itself does not commit the City to selling or the developer to buying the property. It is a contract whereby the City and Developer agree to negotiate in *good faith* during the term of the ANE to prepare a Disposition and Development Agreement (DDA) for future consideration by the City Council. The DDA would be presented to the City Council for its consideration at the same time the necessary land use entitlements for the proposed hotel project are presented to the City Council. Thus, if the necessary land use approvals are granted and the DDA is approved, the DDA would provide for the conveyance of fee title to the site to the Developer and the development of the site by the Developer with the hotel project as approved by the City. However, as the ANE will provide, the City Council will continue to retain its discretion whether to approve the necessary land use entitlements for the proposed hotel project and the terms of a proposed DDA, and failure to approve such matters will not constitute a default or breach of the terms of the ANE.

At the same time the design work is underway, the selected developer and City staff will be evaluating the business terms necessary to achieve the project and which would be included in the DDA. This includes the development schedule and the date and terms of the sale of the property. These terms cannot be determined at this time when many aspects of the project are still unknown and subject to future entitlements. City staff will negotiate with the selected developer the terms to be included in the DDA, based on direction from the City Council. The final design, project plans, schedule and business terms will be the result of these processes.

At the end of a successful ANE period, the City Council would be asked to consider and approve a DDA that is a binding obligation between the City and the Developer to sell the land and build the hotel as approved through the City's planning process.

In summary, this recommended action before the Council is to authorize the City Manager to negotiate an ANE with a selected developer. The ANE, which will be brought back for Council consideration at a future meeting, will provide for the developer to apply for and pay all expenses related to the land use entitlements and environmental review needed for the proposed hotel project, while the City and Developer engage in exclusive, good faith negotiations regarding the terms of a DDA for the sale and development of the property with a hotel.

CONCLUSION

The developer selection process illustrates (through the proposals received and staff and consultant analysis) that the long-established goals for development of the property at 2212 Beach Boulevard can be achieved to do the following:

- Anchor Palmetto Avenue 'Main Street'
- Strengthen Pacifica's hotel sector
- Increase Transient Occupancy Tax revenues

The City has been fortunate to receive proposals from four high-quality development teams and appreciates the work and expense that each has expended to participate in the RFQ and RFP processes. Staff is very pleased to present the results of the process and to recommend a very solid development team with whom to begin negotiations toward the property transfer and ultimately a new hotel and related amenities.

The recommendation of Friend Development Group LLC is based on the expert opinions of professionals in the finance, real estate, hotel and urban design fields as summarized by Tim Kelly of Keyser Marston (see Attachment C) and with which staff agrees. While all proposals offered elements that were of interest to the City, Friend offered the best combination of elements to achieve the City's vision for the site.

With Council direction tonight, staff will move forward with the next step of this process, preparing an ENA, as quickly as possible.

FISCAL IMPACT:

There will be costs associated with staff time involved in preparing the ENA and continuing the negotiation process that are difficult to quantify but important to note. In addition, the fiscal impact of the property transfer is difficult to estimate until the terms are negotiated.

The potential tax revenue expected from a hotel on the site is conservatively estimated at $700,000 - $900,000 annually.

ORIGINATED BY:

City Manager's Office

ATTACHMENT LIST:

Attachment A: Developer Selection Criteria, Excerpt from City Council Staff Report October 26, 2015 (PDF)
Attachment B: Executive Summary and Technical Report, Moffat & Nichol (PDF)
Attachment C: Beach Boulevard Site: Developer Selection, Keyster Marston (PDF)

ATTACHMENT A

Developer Selection Criteria
Excerpt from City Council Staff Report, October 26, 2015

Developers will be evaluated at the RFQ phase based on criteria that include:

- Financial history and financial relationships for past hotel developments (equity and debt)
- History of relationships with hotel designers, architects and operators, and with restaurants and services or retailers that are potential hotel tenants
- Prior experience and demonstrated capacity to develop and manage a hotel with proximity to a "main street" and/or a coastline
- Prior experience developing and operating a hotel through a development agreement with the local government, including delivery of required public benefits such as coordination with the library development and operations
- Prior experience and demonstrated capacity to develop and manage a hotel that functions as a destination, including:
    - High quality design (architecture, finishes and fixtures)
    - Hotels that *function as an anchor and provide synergy* to attract or support visitor serving uses (restaurant, retail and activities) to nearby sites on Palmetto Avenue
    - History of long-term ownership and re-positioning or tenanting over time to maintain the desirability of the property and customer loyalty
    - History of building and maintaining project working relationships, and participating in local community relationships and efforts
    - Demonstrated knowledge and expertise in securing permits
- Statement of vision for the site that describes the type and character and extent of the hotel development envisioned, its ambience, and how it would create a unique and special place

At the RFP stage, the criteria for evaluating the hotel proposals will include:

- Evidence that the development proposal is for a destination hotel that builds on and complements existing visitor features and amenities (the oceanfront, Pier, coast trail, golf course and Mori Point) and the future library and Palmetto Avenue "Main Street"
- Factual information demonstrating that the number of hotel rooms, the development layout and design, and the on-site amenities create an ambience that transforms the site into a hotel destination of choice in and of itself
- Evidence that the size of the hotel operation and amenities can be financially successful for the long term
- Identification of the anchor restaurant tenant and any other visitor serving amenities that help sustain the interest of the destination visitor, and anchor the Palmetto "Main Street".
- Quality of design, furniture, fixtures and finishes to support a destination hotel
- How the hotel will relate to the other uses on the site
- Price of land and the timing of the land payment
- Proposed development schedule and the likelihood to achieve it.
- *At the RFP evaluation, first priority will be given to offers with a date specific commitment to construct consistent with the approved plans and the developer who has direct experience with comparable hotel developments.*
- *Second priority will be given to offers with a date specific commitment to construct consistent with approved plans.*

Note: The italicized priorities are intended to reduce the market risk of delay and gain commitment to start construction.

Coastal Hazards Study

2212 Beach Boulevard, Pacifica

Prepared for:

TECHNICAL REPORT WITH EXECUTIVE SUMMARY

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June 2016
M&N Project No: 9246

City of Pacifica Coastal Hazards Study
2212 Beach Boulevard Development

EXECUTIVE SUMMARY

Introduction

The City of Pacifica owns a 3½ acre property located at 2212 Beach Boulevard and is taking steps for redevelopment to include a public library and visitor-serving uses such as a hotel, restaurant and retail space. The oceanfront site is located in one of Pacifica's oldest neighborhoods and provides unique opportunities for public access to the coast.

The City completed a variety of planning processes and environmental review by 2013. Since then, there has been increasing focus on regional studies[1] that document known risks that affect the City of Pacifica such as bluff erosion and sea level rise. These regional studies recognize the need for local government to evaluate specific locations and determine short, medium and long term risk. These local studies will provide decision-makers with an understanding of the hazards and a basis for developing solutions.

In response the City commissioned this additional study of potential coastal hazards for 2212 Beach Boulevard including tides, waves, and sea level rise; tsunamis; and bluff erosion. A summary of the conclusions is provided in this Executive Summary. A detailed description of the analysis can be found in the following Coastal Hazards Study Technical Report for 2212 Beach Boulevard.

Coastal Hazards

Present-day coastal hazards found to affect the project site are limited, and related to flooding caused by wave overtopping during high tides and the very rare occurrence of a significant tsunami event.

<u>Flooding from Tides, Waves and Sea Level Rise</u>

Water levels during high tides do not pose a flood hazard in themselves. Current water levels during high tide are on the order of +7.4 feet (with respect to NAVD88[2] datum), while the 1% annual flood event would raise the sea level to +8.7 feet NAVD88. These values combined with sea level rise projected for both mid-century and end-of-century are well below the crest of the seawall (+26 feet NAVD88) that fronts the 2212 Beach Boulevard property.

With respect to waves, given the presence of the beach and seawall, present day hazards are limited to the combination of high wave conditions and high tides, which result in elevated water levels and increase the potential of wave overtopping. Present day wave overtopping typically causes limited ponding on the street and promenade immediately behind the seawall. Wave overtopping would not directly affect the 2212 Beach Boulevard property.

With mid-century (2050) and end-of-century (2100) projections for sea level rise[3], currently estimated to range from 5 to 24 inches by 2050 and 17 to 66 inches by 2100, wave overtopping

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[1] These include the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT 2013) State of California Sea-Level Rise Guidance Document, March 2013 Update; FEMA 2014 Preliminary Flood Insurance Study for San Mateo County, California; Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future; San Francisco Littoral Cell Coastal Regional Sediment Management Plan (2015-6); and others (See References: pages 18 and 19 of Technical Report).

[2] North American Vertical Datum of 1988 establishes a point of reference for measuring coastal conditions.

[3] Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future (NRC, 2012).

of the seawall will increase correspondingly. Given that the beach and the seawall will continue to be maintained, it is estimated that water from wave overtopping would be generally limited to a distance of approximately 40 feet from the seawall, and at its maximum, reaching only the road adjacent to it. (The site at 2212 Beach Boulevard is separated from the seawall by a landscape area, as well as the promenade and Beach Boulevard.) When the beach narrows, as may occur after a significant storm, wave overtopping could lead to temporary ponding in the road area and parking area fronting the Beach Boulevard property. This is shown in Figures 1 and 2.

Tsunami

Temporary inundation from rare tsunamis represents a potential hazard for the Beach Boulevard property and surrounding areas of the City. A tsunami event with a 0.4% annual chance of occurrence (one that occurs on average once every 250 years) such as the USGS SAFRR scenario could result in short term inundation of a few inches (less than 1 foot of ponding) for existing conditions, as shown in Figure 3. A very large and even more infrequent event, such as the CalEMA scenario (0.1% annual chance of occurrence, which occurs on average once every 750 to 1000 years) would result in more inundation, as shown in the CalEMA maps. This is also shown in Figure 3. Such a large tsunami has a low probability of happening because many causal factors have to occur simultaneously, such as:

- A very large earthquake would have to occur (of a magnitude greater than the 1906 San Francisco Earthquake).
- The earthquake would have to occur precisely at a location that would impact Pacifica significantly. This means the earthquake would have to be in the subduction zone of Alaska or along the Aleutian Islands. (Tsunamis from the South Pacific tend to dissipate by the time they reach Pacifica).
- The earthquake would have to result in a very large rupture of the earth's crust, with a significant deformation of the ocean floor.

Bluff Erosion

Bluff erosion (also referred to as bluff retreat[4]) is not estimated to be a direct hazard to development of 2212 Beach Boulevard, as the existing seawall prevents erosion and encroachment into the project site. This report assumes that the seawall and other protection in place are properly maintained.

Conclusion

The presence of the beach and seawall, and continued maintenance of these elements, limits exposure to flooding from tides, waves and sea level rise, and to bluff erosion. However, based on the analysis summarized above, rare and infrequent tsunamis are the one hazard that could potentially result in inundation along the City's coastline, including the site at 2212 Beach Boulevard. The buildings' design can take these risks into account and engineering solutions can be applied to address them.

[4] Bluff retreat is what is observed, while erosion is the process causing the retreat.

Figure 1 - Limits of overtopping hazard accounting for the projected 2100 sea level rise.

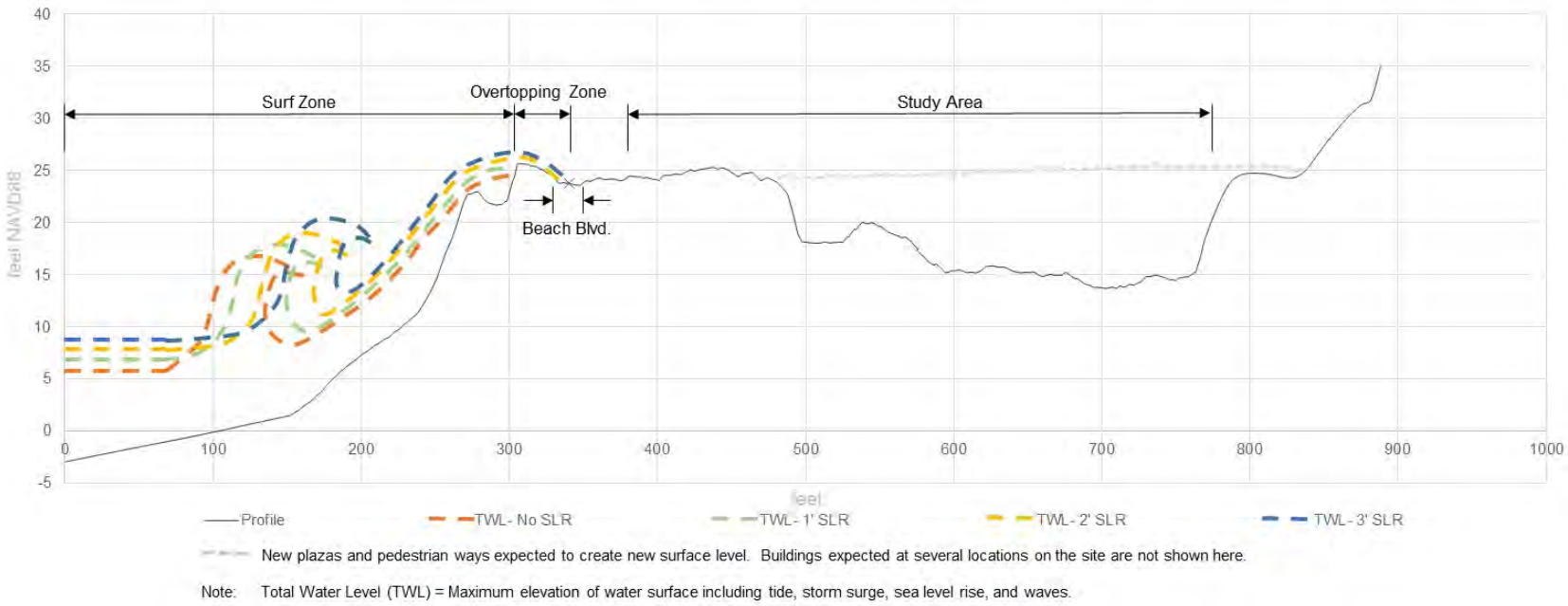
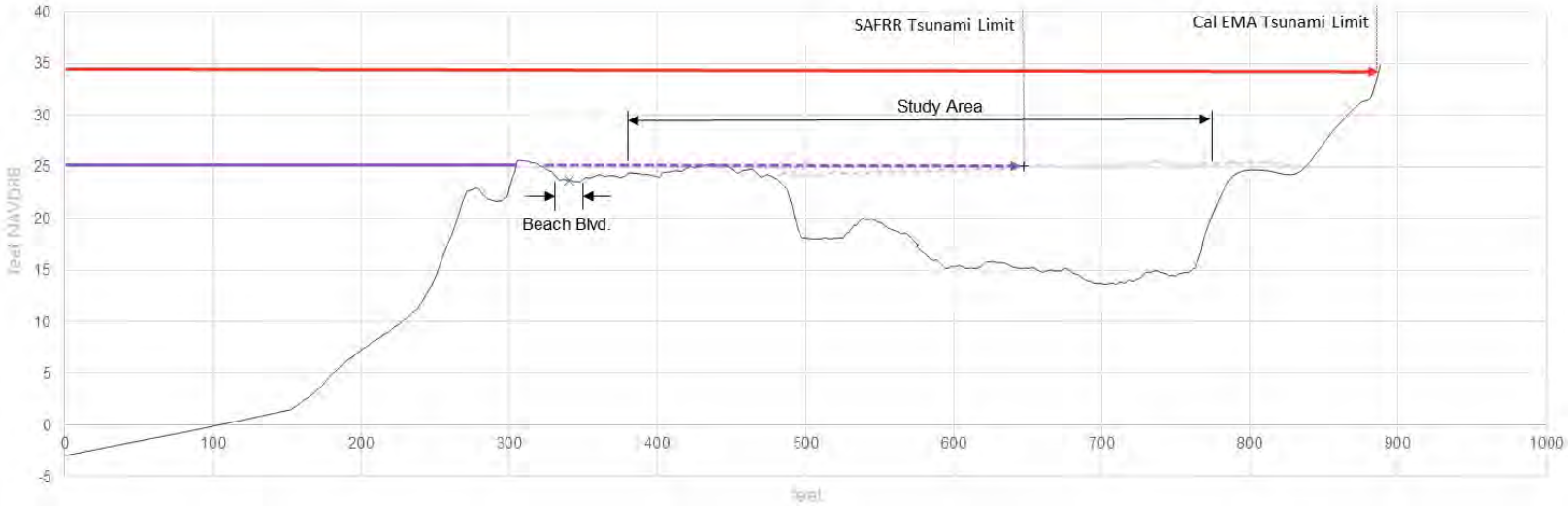


Figure 2 - Elevation view of wave overtopping hazards associated with sea level rise.



New plazas and pedestrian ways expected to create new surface level. Buildings expected at several locations on the site are not shown here.

SAFRR Tsunami: Hypothetical but plausible tsunami scenario based on magnitude 9.1 earthquake offshore of the Alaskan peninsula.
Cal EMA Tsunami: A combination of maximum considered tsunami scenarios, developed for emergency planning purposes.

Figure 3 - Elevation view of tsunami hazards.

Coastal Hazards Study

2212 Beach Boulevard, Pacifica

Prepared for:

TECHNICAL REPORT

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June 2016
M&N Project No: 9246

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1. INTRODUCTION

1.1 Background

The City of Pacifica owns a 3½ acre property located at 2212 Beach Boulevard and is taking steps for redevelopment to include a public library and visitor-serving uses such as a hotel, restaurant and retail space. The oceanfront site is located in one of Pacifica's oldest neighborhoods and provides unique opportunities for public access to the coast.

The site was formerly used for the Sharp Park Waste Water Treatment Plant (SPWWTP). The SPWWTP was demolished in 2000 after the completion of the Calera Creek Water Recycling Plant replaced it as the area's water treatment plant. Currently, the site contains the Council Chambers Building, a Thickening Building, Pump Station, and a small garage. Only the pump station is expected to remain during the redevelopment.

The City completed a variety of planning processes thru 2013. In recent years, studies done at the regional level suggest that the coast in the City of Pacifica is exposed to coastal hazards such as progressive bluff erosion and sea level rise which may put infrastructure and improvements at risk. These regional studies recognize that local government can undertake further studies of specific locations. For this reason, there is a need for local feasibility studies that evaluate present conditions and determine short, medium and long term risk. These local studies will provide decision-makers with an understanding of the hazards and a basis for developing solutions.

In response the City commissioned this additional study of potential coast hazards for 2212 Beach Boulevard. This 2212 Beach Boulevard Technical Report evaluates the project site's exposure to coastal hazards including tides, waves, and sea level rise; tsunamis, and bluff erosion.

1.2 Purpose

The purpose of the study is to assess the site's exposure to the coastal hazards listed below:

- Tides
- Coastal Flooding
- Waves
- Tsunamis
- Bluff Retreat
- Sea Level Rise

This study identifies risks associated with these conditions and provides potential developers with an understanding of the potential coastal hazards and a basis for development of solutions to address these risks.

1.3 Scope of Work

This study examines relevant data including existing topographic information, water level and wave conditions, and tsunami inundation information. Additionally, this study applies this information to develop flood hazard maps. These maps show areas of the site that are subject to coastal flooding from high tides, storms, tsunamis, and future sea level rise.

Data sources for each coastal hazard listed above as well as the agencies providing regulatory guidelines are provided in Table 1.

Table 1: Coastal Hazards and Data Sources

Coastal Hazards	Agency	Data Sources	Data available at…
Tides	National Oceanic and Atmospheric Administration (NOAA)	National Oceanic and Atmospheric Administration (NOAA)	www.tidesandcurrents.noaa.gov
Coastal Flooding	Federal Emergency Management Agency (FEMA)	FEMA Flood Insurance Rate Maps (FIRMs)	https://msc.fema.gov/portal
Waves	Federal Emergency Management Agency (FEMA)	National Data Buoy Center (NOAA NDBC)	http://www.ndbc.noaa.gov
		Coastal Data Information Program (CDIP)	https://cdip.ucsd.edu/
Tsunamis	California Governor's Office of Emergency Services	California Emergency Management Agency (Cal EMA)	http://caloes.ca.gov/cal-oes-divisions/earthquake-tsunami-volcano-programs/tsunami
		US Geological Survey (USGS) Science Application for Risk Reduction (SAFRR)	http://www.usgs.gov/natural_hazards/safrr/projects/tsunamiscenario.asp
Bluff Retreat	US Geological Survey (USGS)	US Geological Survey (USGS)	http://coastal.er.usgs.gov/shoreline-change/ USGS Open File Report 2007-1133
		Our Coast Our Future (OCOF)	http://data.prbo.org/apps/ocof/index.php?page=flood-map
SLR	California Coastal Commission (CCC)	National Research Council (NRC)	http://www.opc.ca.gov/webmaster/ftp/pdf/docs/2013_SLR_Guidance_Update_FINAL1.pdf

Figure 1 and Figure 2 show the site location map and site boundaries, respectively.

Figure 1: Site Location Map

Figure 2: Site Boundary

2. SITE CHARACTERISTICS

The subsequent sections provide information on geology, ground elevations, tides, waves, tsunamis, bluff retreat, and sea level rise relative to 2212 Beach Boulevard.

2.1 Site Geomorphology

Much of the coastline of San Mateo County is classified as stable or unstable based on the weak sedimentary rock underlying the terrace and loose dune deposits (Lajoie and Mathieson 1998). The coastline near Beach Boulevard is categorized as unstable, consisting of a low cliff of terrace deposits, defined as soft, non-resistant sand and gravel, overlaying weakly indurated rock. The area fronting the study site features a seawall and wide beach. The adjacent segments of coastline include riprap armoring. The winter season total water level (still water level + waves) is approximately +8.9 feet NAVD88.

Pacifica is considered a dissipative beach (Collins 2004) as characterized by the Iribarren number (Battjes, 1974) ranging from 0.3 to 0.6. Dissipative beaches are considered high energy beaches with a wide and flat surf zone (Kamphius 2000). The wave energy, and subsequently the beach profile, are seasonally variable. Winter, as defined by months November through April, experiences an average offshore significant wave height of 6.9 feet, 25% higher than the summer (May through October) offshore significant wave height of 5.3 feet. (NOAA/NDBC). Wave periods also vary seasonally, with an average period of 8.2 seconds during winter and 6.8 seconds during summer. The beach in front of the bluff is higher and wider during the summer months and erodes to a lower, narrower profile over the winter.

Net sediment transport along the coast of California is in a predominantly southerly direction, driven by North Pacific swell and northwest wind waves (Hapke et al. 2006). Pacifica is part of the San Francisco littoral cell, which stretches from Fort Point to Point San Pedro. A littoral cell is defined as a reach, or compartment, of the shoreline in which sediment transport is bounded. The shoreline change along the littoral cell is considered erosional, with an average long-term (since 1800s) shoreline change rate of -0.7 ± 0.3 feet per year and an average short-term (since 1970s) shoreline rate change of -1.6 ± 1.3 feet per year (Hapke et al. 2006). The beach in front of Beach Boulevard is seasonably variable, with a beach width ranging between 20 and 170 feet (ESA 2016).

2.2 Ground Elevations

Topographic elevations and bathymetry data in the vicinity of the project site were derived from the 2013 NOAA Coastal California TopoBathy Merge Project (NOAA 2013) . The data was collected and analyzed by the NOAA Office for Coastal Management, the CA Coastal Conservancy, CA Ocean Protection Council, and CA Department of Water Resources and is a combination of LiDAR and sonar bathymetry. The vertical and horizontal accuracy is estimated at 4 inches and 40 inches, respectively.

Figure 3 and Figure 4 show the elevations of the site and approximately 350 feet offshore. The beach is backed by a seawall that reaches approximately +26 feet NAVD88 in front of site. The maximum elevation occurs along Beach Blvd at approximately +25 feet NAVD88. The project area ground elevations range between +12 and +25 feet NAVD88. The southern portion of the site is between +20 and +22 feet NAVD88 and the northwestern portion is approximately +25 feet NAVD88. The center of the site has elevations ranging between +16 and +20 feet NAVD88, while the northeast corner is at the lowest elevation, approximately +15 feet NAVD88 with pockets as low as +13 feet NAVD88.

2.3 Water Levels

Water level measurements from NOAA 9414290 tide gauge at San Francisco were used to evaluate the water levels along the coast. The water levels measured at this station include astronomical tide, storm surge, and El Niño effects but not wave action.

The tidal datums are presented in Table 2, referenced to the North American Vertical Datum of 1988 (NAVD88) and to Mean Lower Low Water (MLLW).

Table 2: Tidal Datums for NOAA Station 9414290

Datum	feet NAVD88	feet MLLW
Highest Observed Water Level*	+8.72	+8.66
Mean Higher High Water	+5.90	+5.84
Mean High Water	+5.29	+5.23
Mean Sea Level	+3.18	+3.12
Mean Low Water	+1.19	+1.13
Mean Lower Low Water	+0.06	0.00
NAVD88	0.00	-0.06
Lowest Observed Water Level**	-2.82	-2.88

**Max: 1/27/1983*

***Min: 12/17/1933*

Water level data from NOAA Station 9414290 is available from 1898 to the present. Since the water level data has been adjusted to the present tidal epoch (1981-2001) by NOAA, the data must be de-trended back to the epoch of their period to remove effects of sea level rise (SLR). This analysis was conducted on 63 years of data between 1945 and 2007 by Moffatt & Nichol (2008) for the Treasure Island Development Project. Return period water levels were determined by performing an extreme value analysis on this 63 year dataset of water levels using the Method of Annual Maxima. This method applies the best fit probability distribution to the highest annual recordings in the dataset. For this analysis, 63 annual extreme water level events were fit to a Weibull distribution to estimate the 2-, 5-, 10-, 25-, 50-, and 100-year return period water levels. These values are presented in Table 3.

Table 3: Return Period Water Levels

Return Period (years)	Water Level (feet NAVD88)
2	+7.5
5	+7.9
10	+8.1
25	+8.4
50	+8.6
100	+8.8

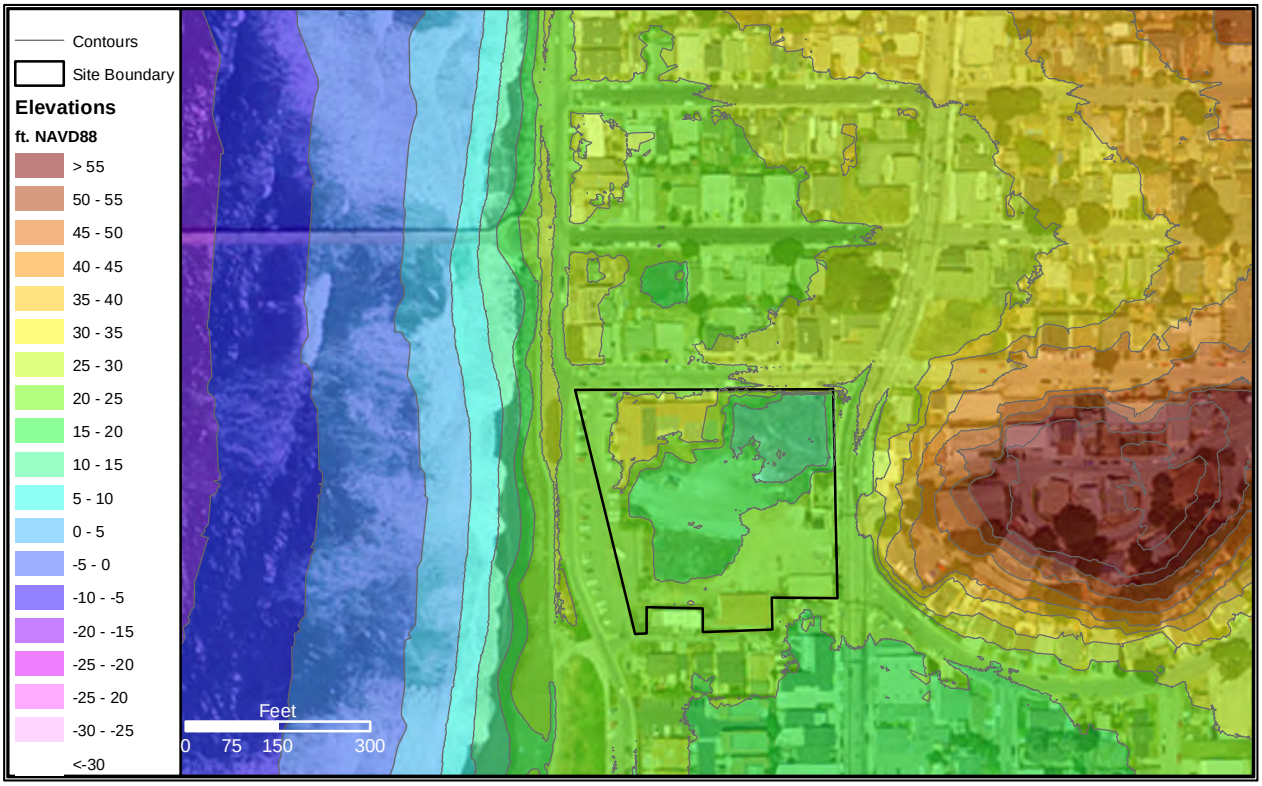

Figure 3: Site Vicinity Elevation Map

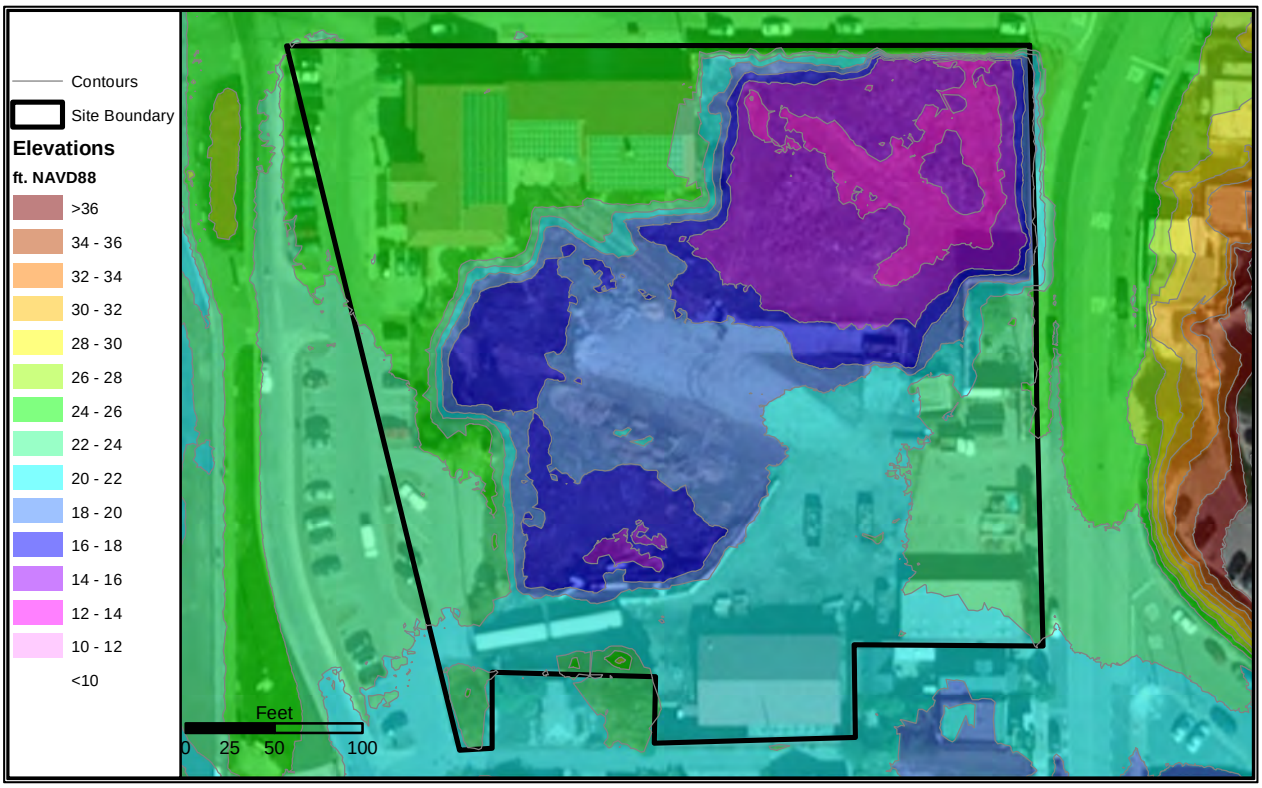

Figure 4: Site Elevations

2.4 Waves

Wave data from offshore NDBC buoy 46237 at the San Francisco Bar and NDBC buoy 46026 San Francisco was obtained online from the NOAA National Data Buoy Center. The 46237 buoy at the San Francisco Bar contains data measurements between July 2007 to present and the 46026 San Francisco buoy contains measurements between January 2007 and present. The data consists of significant wave height, peak wave period, and mean wave direction. In the case of buoy 46026 San Francisco, the data also includes wind speed and wind direction. Wave height roses and frequency tables are presented in Appendix A. The following are some key observations:

- Waves primarily approach from the northwest to west sector.
- Predominant waves (over 85% of the waves) are above 8 seconds in wave period. These wave periods indicates that the wave field is dominated by swell; that is, waves of long period not locally generated by the wind, but by distant storm systems in the Pacific Ocean.

The 46026 San Francisco buoy and the 46237 San Francisco Bar buoy are both located offshore; thus, they do not provide an accurate representation of nearshore conditions. In order to determine the flooding potential due to waves, nearshore waves must be examined. The Coastal Data Information Program (CDIP) took measurements near the end of the pier at Pacifica between August 1980 and December 1982. These measurements were taken in approximately 33 feet of water depth.

An additional source of wave data is the Coastal Storm Modeling System (CoSMoS) program released by the Our Coast Our Future (OCOF) project of the USGS California Coastal and Marine Science Center (PCMSC). For the Pacifica shoreline, maps are created to show the effects of storms and different scenarios of SLR. The maps provide estimated nearshore wave heights along the shoreline for the annual, 20-year, and 100-year return period wave heights. The results of the modeling effort were checked against the CDIP data at the Pacifica Pier for the 100-year wave conditions and appear to be in good agreement with the highest values measured between 1980 and 1982.

For this analysis, a wave height of 11.5 feet was chosen as the 100-year nearshore wave height along the coast at Pacifica. This value produces close estimates to the Total Water Level (TWL) determined in the FEMA Flood Insurance Study (FIS) for the coastline of Pacifica, discussed in the subsequent section.

2.5 Coastal Flooding Potential

FEMA flood maps have the area along the seawall mapped as a Zone X-0.2% or *area of moderate flood risk* (pink zone in Figure 5). This is not considered a Special Flood Hazard Area (SFHA) and, therefore, does not require the purchase of flood insurance. Additional information from the effective FEMA Flood Insurance Rate Map (FIRM) is summarized in Figure 5. A preliminary FIRM has also been released by FEMA, both the effective and the preliminary FIRMs are provided in Appendix B.

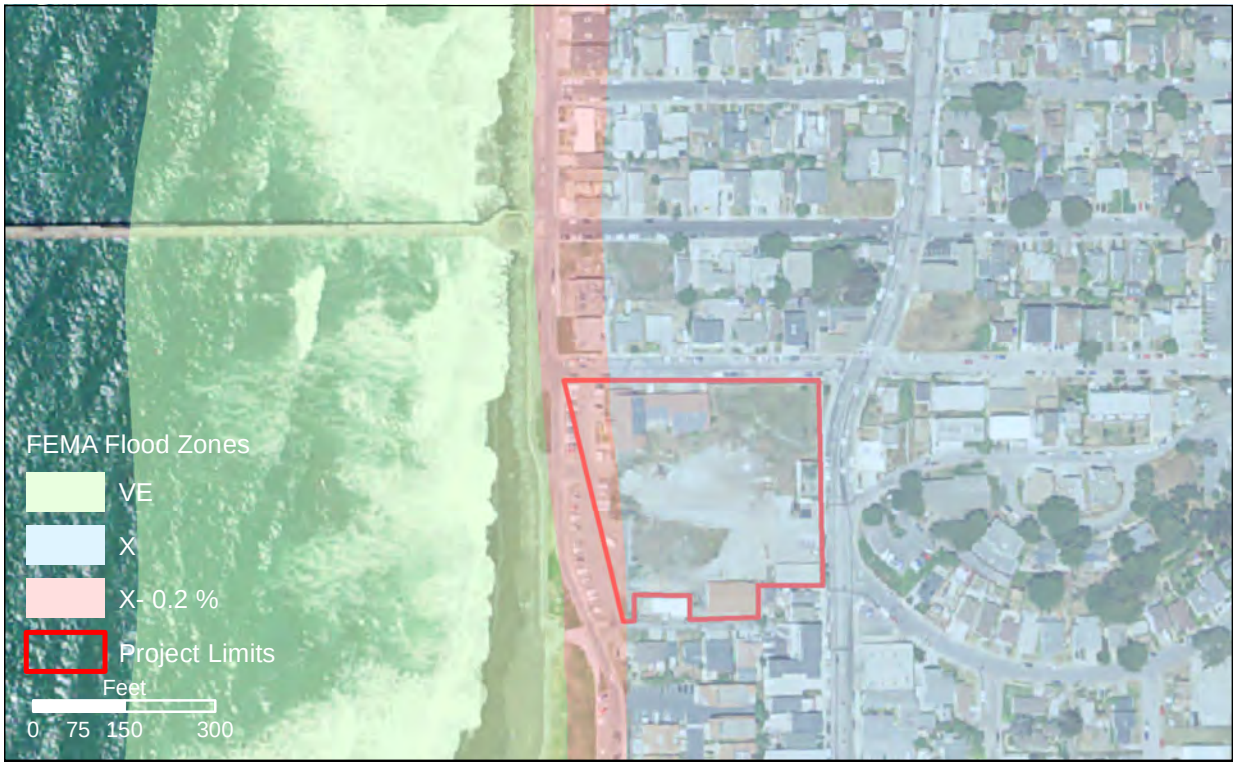

Figure 5: FEMA Flood Zones in Project Area

The area west of Beach Blvd. is mapped as a SFHA Zone VE, which refers to an area of high flood risk due to wave action. The Base Flood Elevation (BFE) of this area is +24 feet NAVD88. Based on the preliminary Flood Insurance Study (FIS) published for San Mateo County, the Total Water Level (TWL) for the 1% annual chance flood event is +24.4 feet NAVD88 (FEMA 2014). Immediately inland from Beach Blvd., the area is mapped as a Zone X- 0.2%. This indicates an area outside of the 1% annual chance floodplain but within the 0.2% annual chance (500-year) floodplain. The area behind this Zone is an area of minimal flood hazard (area outside of the 500-year floodplain).

2.6 Tsunamis

Because site specific tsunami studies for the coast of Pacifica have not been conducted, two relevant tsunami studies were reviewed and are summarized in this section. The results of each study and the flooding extents in the study area are provided.

2.6.1 Tsunami Inundation Maps for Emergency Planning

The University of Southern California (USC) Tsunami Research Center conducted a series of numerical model simulations for the development of tsunami inundation maps for emergency planning for the State of California. The project was funded by the National Tsunami Hazard Mitigation Program through the California Emergency Management Agency (Cal EMA). By defining the tsunami inundation area, the maps are intended to aid cities and counties in identifying areas vulnerable to tsunami hazard and in developing adequate emergency and evacuation practices. These maps are estimated to portray tsunami inundation extents for a return period of approximately 1,000 years (M&N 2015).

The maps were created by modeling a suite of distant tsunami sources based on hypothetical, but realistic, seismic events. Local tsunami sources include large submarine landslides and fault

movement. MOST (Method of Splitting Tsunamis), a computational program that presents wave evolution over variable bathymetry and topography was utilized for the inundation extent mapping. The events modeled pertaining to the project site are shown in Table 4.

Table 4: Tsunami Sources Modeled for the San Mateo County Coastline

Sources		Magnitudes
Local Sources	Point Reyes Thrust Fault	-
	Rodgers Creek-Hayward Fault	-
	San Gregorio Fault	-
Distant Sources	Cascadia Subduction Zone - full rupture	M9.0
	Central Aleutians Subduction Zone #1	M8.9
	Central Aleutians Subduction Zone #2	M8.9
	Central Aleutians Subduction Zone #3	M9.2
	Chile North Subduction Zone	M9.4
	1960 Chile Earthquake	M9.3
	1964 Alaska Earthquake	M9.2
	Japan Subduction Zone #2	M8.8
	Kuril Islands Subduction Zone #2	M8.8
	Kuril Islands Subduction Zone #3	M8.8
	Kuril Islands Subduction Zone #4	M8.8
	Marianas Subduction Zone	M8.6

The map that is relevant to the site is the map corresponding to San Mateo County, San Francisco South Quadrangle, published on June 15, 2009 (State of California, 2009), shown in Appendix B. Per this map, as shown in Figure 6 on the following page, the project site is entirely within the projected tsunami inundation extent. According to the elevation data, the inundation extent reaches elevations of about +36 feet NAVD88 in the project area.

2.6.2 SAFRR Tsunami Scenario

In 2013, the Science Application for Risk Reduction (SAFRR) tsunami study was conducted in order to numerically model a hypothetical, but plausible, far-field tsunami event for the purpose of mapping inundation along the coast of California for emergency, mitigation, and evacuation purposes. The work was carried out by the United Stated Geological Survey (USGS) in collaboration with NOAA, the California Geological Survey (CGS), and the California Office of Emergency Services (Cal OES). The study was published in 2013 (Ross et al. 2013).

Defined by the USGS Tsunami Source Working Group, the scenario is set in the Semidi subduction sector off the Pacific coast of the Alaska Peninsula, with a moment magnitude (M_w) of 9.1 and a rupture length of 360 km. This geographical setting was selected based on the knowledge that tsunamis originating from this region of Alaska (e.g., 1946 and 1964 events) pose the greatest threat to the California coastline. The tectonic source properties were chosen to resemble those of the 2011 Tohoku tsunami in Japan. The scenario was set to occur on the 50th anniversary of the 1964 Alaskan earthquake at high tide (MHW + 0.66 feet). The approximate return period of this event is estimated at 200-250 years (M&N 2015).

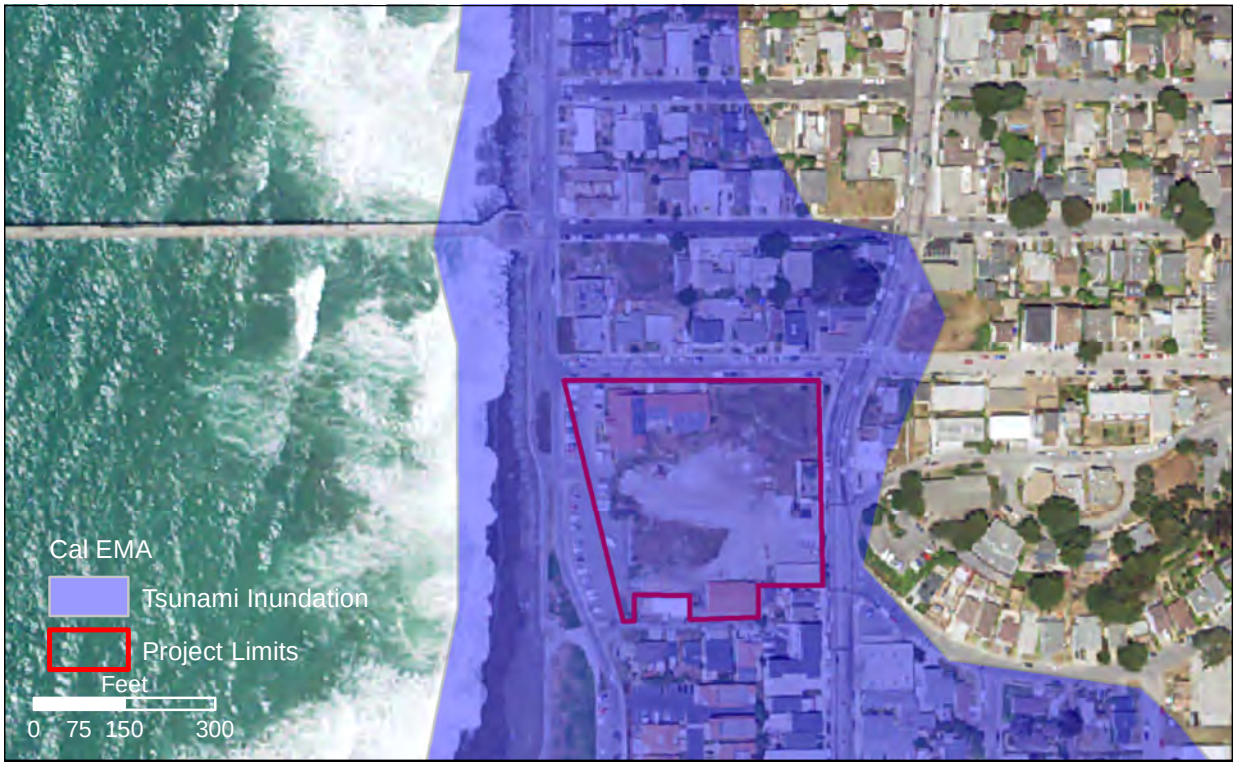

Figure 6: Cal EMA Tsunami Inundation of the Study Area

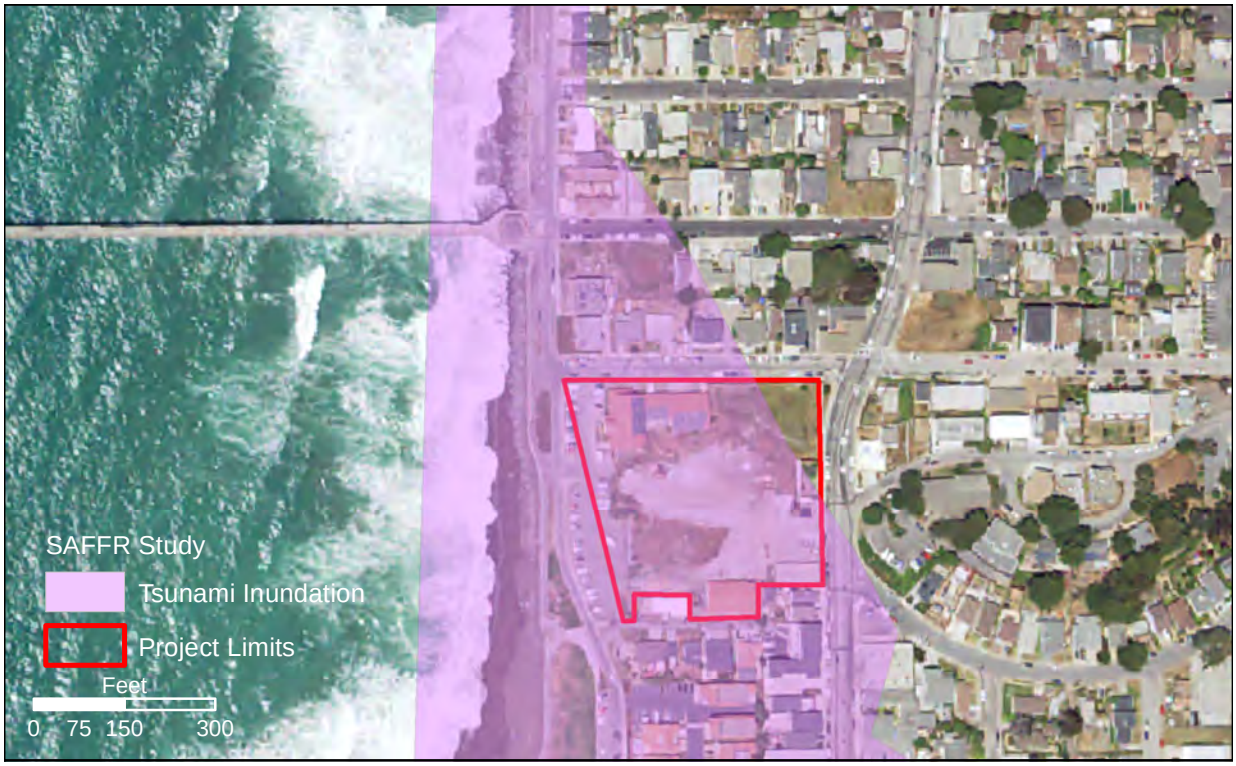

Figure 7: SAFRR Tsunami Inundation of the Study Area

2.7 Bluff Retreat

The bluff along Beach Boulevard is currently protected by a seawall. If this seawall was either removed or not maintained, bluff retreat would occur. If coastal processes were to continue to erode the bluff, the bluff face would continue to move farther and farther inland since the geology of this area shows that terrace deposits are backed by weak or fragmented sedimentary rock.

Studies have shown multiple causes for bluff retreat along the coastline of Pacifica. Lajoie and Mathieson (1998) concluded that wave action was the primary erosive process along the San Mateo County coast by eroding the base of the bluffs, resulting in an overly steep and unstable slope. Another study performed by Hampton and Dingler (1998) suggested that groundwater-induced seepage failures are primarily responsible for bluff erosion.

Collins and Sitar (2008) performed a study examining coastal erosion of multiple coastal bluffs in Pacifica over five storm (winter) seasons. The study showed that when the maximum total water level was above the toe of the bluff, wave-induced bluff erosion could be expected to occur. Specifically, the threshold value for wave-induced erosion for the maximum daily total water level is +12.5 feet NAVD88, 3.6 feet above the season average. They also found that seepage-induced erosion occurred when the 48-hour precipitation exceeded 1.4 inches, approximately 0.8 inches above the seasonal average.

Recently, the US Geological Service has conducted an assessment of shoreline changes and cliff erosion for coastlines around the U.S. For the analysis, the USGS compares historic shoreline and cliff edge locations, typically derived from aerial photography, to recent shoreline and cliff edge positions determined from LiDAR technologies. For the coastal cliff retreat study for the California coastline, topographic maps (T-sheets) provided from the NOAA National Ocean Service (NOS) with cliff edge positions between 1920 and 1935 were compared to LiDAR obtained in 1998 or 2002. The study divided the California coastline into 15 regions; the 158 mile San Francisco South region pertains to this study area. Approximately 50 miles of this reach consists of coastal cliffs. For this segment, the cliff edge position was determined from NOS T-sheets developed between 1929 and 1932 and LiDAR data collected in 1998. The average retreat for the cliff edge during this time frame is 54 feet ± 36 feet. This results in an annual average retreat rate of 0.7 feet per year with an uncertainty of ± 0.7 feet per year.

In 2014, the Our Coast Our Future (OCOF) project of the USGS California Coastal and Marine Science Center (PCMSC) released the Coastal Storm Modeling System (CoSMoS) for the San Francisco Bay area. The CoSMoS model uses a combination of global, regional, and local models to make detailed predictions of storm-induced coastal flooding, erosion, and cliff failures over large geographic scales (USGS PCMSC). It should be noted that this study effort does not take the seawall into account.

2.8 Coastal Regional Sediment Management Plan: San Francisco Littoral Cell.

A Coastal Regional Sediment Management (CRSMP) plan has been developed for the San Francisco Littoral Cell, which includes Pacifica. The objective of the plan is to evaluate sediment management needs within the littoral cell and promote regional, system-wide solutions to address these. The San Francisco Littoral Cell CRSMP, focuses on the Pacific coastline in San Francisco, Daly City and Pacifica and addresses existing and expected future coastal erosion on coastal stretches where mitigation measures are or will be crucial.

The study analyzes geologic, geomorphic, ecological and economical information along the littoral cell to identify critical areas of erosion. In the City of Pacifica, five study reaches are identified as Critical. The proposed mitigation alternatives are a combination of soft and hard engineering measures and are described in the following:

1. Beach Nourishment: Placement of sand to widen the beach for the length of the study reach. This alternative requires new sand placement every time the beach width is reduced to an established minimum. Backshores at each study reach have different treatments, such as being erodible or holding a particular line at existing armor.
2. Beach Nourishment and Multipurpose Reefs: The sand placement component is treated in the same manner as in alternative 1. An offshore reef that further promotes beach widening and provides shelter against waves is added.
3. Armor: Maintaining and/or addition of new coastal armor (e.g., seawalls, revetments) to hold the line against coastal and bluff retreat.
4. Hybrids with managed realignment: A combination of the measures to accomplish the goal of mitigating coastal erosion. Portions of each reach are treated with different measures such as holding the line at existing armor, placement of sand and allow erosion.

The economic impacts associated with sediment management alternatives as well as the net economic benefits at each study reach were estimated. Additionally, a range of governance structure schemes that could address sediment management in a regional sense and achieve the objectives of the CRSMP are proposed.

The cost-effectiveness of each alternative differs per study reach and so does the projected extension of the Coastal Erosion Hazard Zones. However the study concludes that the high risk to which infrastructure at Pacifica is exposed can be controlled with implementation of sediment management alternatives, but will increase if no action is taken.

Based on these findings, further analysis in the present study assumes that the 2212 Beach Boulevard property is and will be excluded from the projected Coastal Erosion Hazard area if the existing seawall and armoring is maintained to hold the backshore limit at its current position.

2.9 Sea Level Rise

In March 2013, the Sea-Level Rise Task Force of the California Climate Action Team (CO-CAT 2013) released their State of California Sea-Level Rise Guidance Document based on the recently published (June 2012) NRC Sea-Level Rise for the Coasts of California, Oregon, and Washington (NRC 2012). Table 5 summarizes the sea level rise projections, including the low and high range values, for the San Francisco Bay area.

Table 5: SLR Projections in San Francisco Bay *(source: NRC 2012)*

Year	Projections	Ranges
2030	6 ± 2 in	2 to 12 in
2050	11 ± 4 in	5 to 24 in
2100	36 ± 10 in	17 to 66 in

Using the maximum of the range for 2030, i.e. 1 foot, the seawall is still of adequate elevation to prevent significant wave overtopping, though some overtopping will be present. With 2 feet of SLR (maximum of 2050) range, significant overtopping of the seawall will occur. In order to determine if this overtopping will result in flooding of the project area, the horizontal limit of splash due to this overtopping was estimated. Also called the limit of overtopping hazard, the value is sensitive to the wind speed experienced during the overtopping event. Figure 8 shows the limit of wave overtopping. For this analysis, the estimated 1% annual chance wind speed of 52 mph was used, as approximated using the wind data available from the NBDC gage 46026 with 20 years of wind data (1996-2016). Applying the maximum SLR for 2100 of 5.5 feet (66

inches), the extent of overtopping hazard with the 1% annual chance wind speed is approximately 40 feet from the seawall. This extent reaches Beach Boulevard but does not directly impact the study site. Figure 9 shows the approximate extent of overtopping hazard in front of the site development area.

Figure 8: Limits of Overtopping Hazard with SLR

The overtopping hazard does not reach the study area, but there is a potential for runoff and ponding due to overtopping waves. Since the frequency and volume of overtopping will increase with sea level rise, this hazard also increases.

Figure 9 provides a section view of hazard limits discussed in this section.

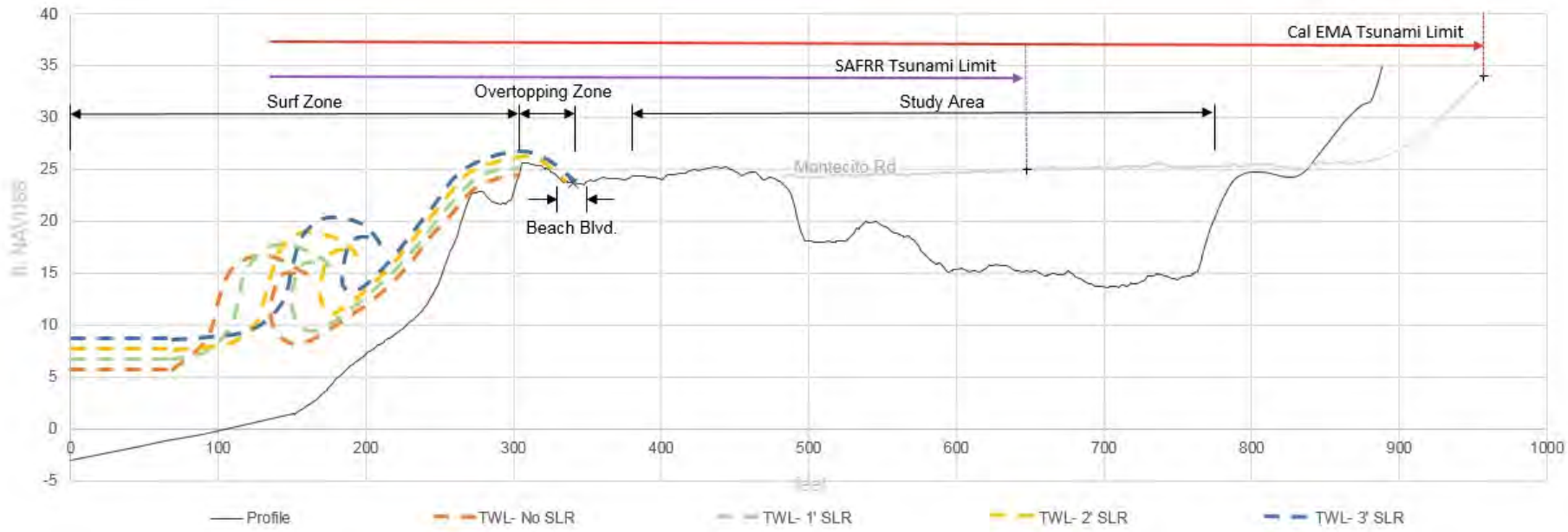

Figure 9: Inundation Zones for a Transect through the Study Area

3. CONCLUSIONS

This section evaluates potential implications that the coastal hazards described previously could have on the development of 2212 Beach Boulevard in Pacifica.

3.1 High Tides

High tides along the coast of Pacifica are not the primary factors associated with coastal flooding and erosion. Additionally, tidal action does not play a large role in sediment movement along the beach. The seawall along Beach Boulevard has an approximate crest elevation of 25 feet NAVD88, providing adequate freeboard above tide levels. Even with 3 feet of SLR (2100 projected value), the tide levels will not reach elevations high enough to result in flooding due to high tides only.

Present day hazards attributed to tides are primarily due to the elevated water levels on high tides, which increases the potential for wave overtopping. Wave overtopping is addressed in the following section.

Neither present day tides, nor tides combined with the mid-century (2050) and end-of-century sea level rise projections pose a flood hazard in themselves. Projected ocean levels combining high tides and sea level rise are well below the crest of the seawall (Figure 9).

3.2 Waves

Wave action is the dominant driving factor for sediment transport and bluff erosion along the coastline of Pacifica. Riprap is present in front of the seawall to protect against wave attack. Large waves erode the beach profile during the winter months, consequently exposing the seawall to waves. Beach erosion is further increased due to the presence of the riprap fronting the seawall.

Present day hazards attributed to waves are primarily due to high surf conditions combined with elevated water levels on high tides, which increases the potential for wave overtopping. Wave overtopping is already evident along the Pacifica seawall, in particular during the winter season, at times when high surf coincides with King Tides. Because the peak of high tides are limited to a few hours, wave overtopping is consequently limited, but recurring.

Present day flooding associated with wave overtopping is typically limited to ponding and local flooding in limited areas. Wave overtopping would not directly affect the 2212 Beach Boulevard property.

Subject to the mid-century (2050) and end-of-century projections for sea level rise, wave overtopping of the seawall will increase correspondingly. However, it is estimated that wave overtopping would still be generally limited to the roadway along the seawall. At worst, wave overtopping could lead to temporary ponding in the road area and parking fronting the 2212 Beach Boulevard property.

Mitigations could (on a regional scale) include protecting the shoreline, e.g. with beach nourishment or armoring as studied under the Coastal Regional Sediment Management Plan, and/or raising the crest elevation of the seawall. Localized mitigations could include provisions for maintaining drainage, or building up low berms such as landscape features along the property.

3.3 Tsunamis

Based on the inundation maps developed by SAFRR and Cal EMA, a tsunami hazard exists at the project site. Though the approximate depth of inundation was not analyzed in this study, topographic information in the vicinity of the project site shows the extent of inundation reaches as high as +26 feet NAVD88 for the SAFRR study (approx. return period of 200-250 years) and +36 feet NAVD88 for Cal EMA (approx. return period of 1,000 years). For comparison, the elevation of the seawall is around +26 feet NAVD88 while site elevations generally range from +25 to +27 feet NAVD88. This shows that tsunami risk exists but at a very low risk of occurrence.

A review of the SAFRR tsunami inundation maps provides the indication that a tsunami event of this magnitude is around the threshold where the 2212 Beach Boulevard property potentially could be affected or remain unaffected. Per Figure 9, the inundation depth along Montecito Road on the north side of the property would be limited to inches (less than a foot).

It is not clear if the SAFRR study included sufficient detail to incorporate the seawall as a protective element. It is therefore estimated that a tsunami event such as investigated under the SAFRR study, or an event slightly larger, could slightly overtop the seawall. On the contrary, the indication is that a lesser event would not overtop the seawall and the 2212 Beach Boulevard property would, in that case, remain unaffected.

In perspective, the estimated return period of the SAFRR event is 200-250 years.

The typical mitigation would be to incorporate a low, continuous wall around the property, which would work as flood protection in the case of tsunami inundation. If building space below ground level is planned for at the 2212 Beach Boulevard property, the flood potential needs to be carefully considered. Typical mitigations would include incorporating a low floodwall around the property site, preventing any openings of water ingress, and locating access on the eastern portion of the property.

Projections for the Cal EMA tsunami are substantially more onerous. This study was focused on emergency planning and therefore depicts the greatest extent of inundation based on several combined scenarios. In the case of such an event, tsunami flood inundation depths could be on the order of several feet. The approach for mitigation of such an event should follow tsunami guidelines for structural design, and could include breakaway walls on the ground level floor of future buildings on the property. In terms of prevention of loss of human life in such an event, it is estimated that warning times for pre-tsunami flooding would be on the order of several hours, but at least 30 minutes (for an earthquake on the Cascadia Fault, local to the West Coast). Means of egress from building(s) should follow codified guidance, and be coordinated with means of egress (to higher ground) for the Pacifica area. To put this scenario in context, the return period estimated for such an event is around 1,000 years.

Per correspondence with the City of Pacifica, it is understood that the City receives immediate notice from the NOAA Pacific Tsunami Warning Center if there is any indication of potential tsunami hazard. Additionally, the City adheres to the San Mateo County protocol for tsunami watches and warnings and provides residents and business owners within potential inundation areas with multiple forms of notification of the hazard (City of Pacifica correspondence).

3.4 Bluff Retreat

Though the cliffs along the coastline of Pacifica are experiencing significant bluff retreat, the seawall at Beach Boulevard prevents erosion at the project site. Bluff retreat is not estimated to be a direct hazard to development of the 2212 Beach Boulevard property. There is still a wide swath of beach maintained along the coast fronting the 2212 Beach Boulevard property, and

sediment transport along the coast is directed south, so a continued influx of sediment to the beach is expected.

If shoreline recession were to continue to the point where mitigations are necessary, local armoring with rock could be an alternative. This would be supplemental to the rock already in place in front of the seawall. Additionally, the Beach Boulevard property would likely be helped by any regional mitigation efforts.

3.5 Sea Level Rise

Short-term SLR (2030) is not expected to increase the potential for flooding for the area along Beach Boulevard because the seawall is of adequate elevation to prevent significant flooding.

Long-term SLR is expected to increase the frequency of overtopping events if the wall is maintained at its current elevation. This increased hazard is expected to apply to a SLR greater than 1 foot (12 inches), the higher end of the 2050 projections. However, even with 5.5 ft. (66 inches) of SLR, the estimated overtopping hazard limit does not encroach on the eastern boundary of Beach Boulevard. However, if the seawall is not maintained, the bluff could retreat and overtopping into the study area can be expected as early as 2050.

It should be noted that the Coastal Regional Sediment Management Plan does call for shoreline maintenance in this area. The current options include sand placement, an artificial reef, seawall maintenance, armor protection or a combination of these solutions.

Guidance for mitigating sea level rise is provided in the California Coastal Commission Sea Level Rise Policy Guidance. Per the Coastal Act Sections 30006.5 and 30335.5, the guidance is to: 1) Recognize and address sea level rise as necessary in planning and permitting decisions; and 2) use best available science to determine locally relevant sea level rise projections and potential impacts for all Coastal Act planning processes, project design, and permitting reviews[1].

The best available science to determine sea level rise projections is currently expressed in the NRC (2012) sea level rise projections (summarized in Table 5).

[1] Note: additional guidance in items 3 through 20 of the CCC Sea Level Rise Policy Guidance

4. REFERENCES

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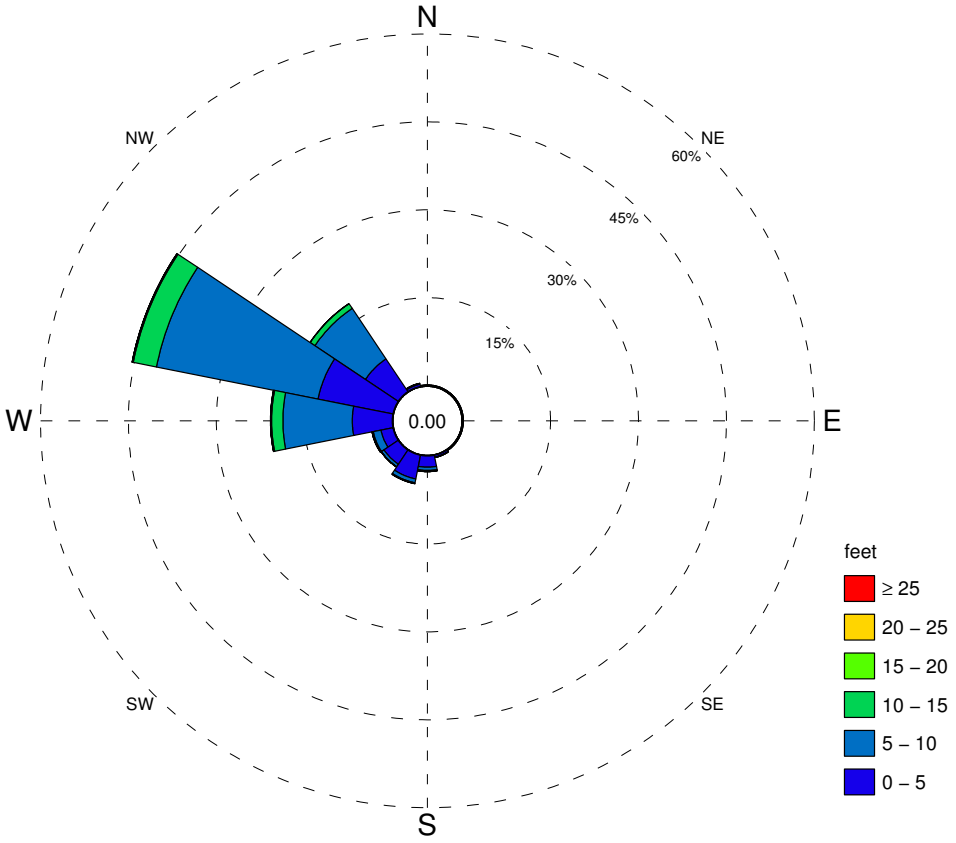
APPENDIX A
Wave Roses

Significant Wave Height (Annual)
Station 46026 – San Francisco
Period 17–Jan–2007 to 16–Feb–2016



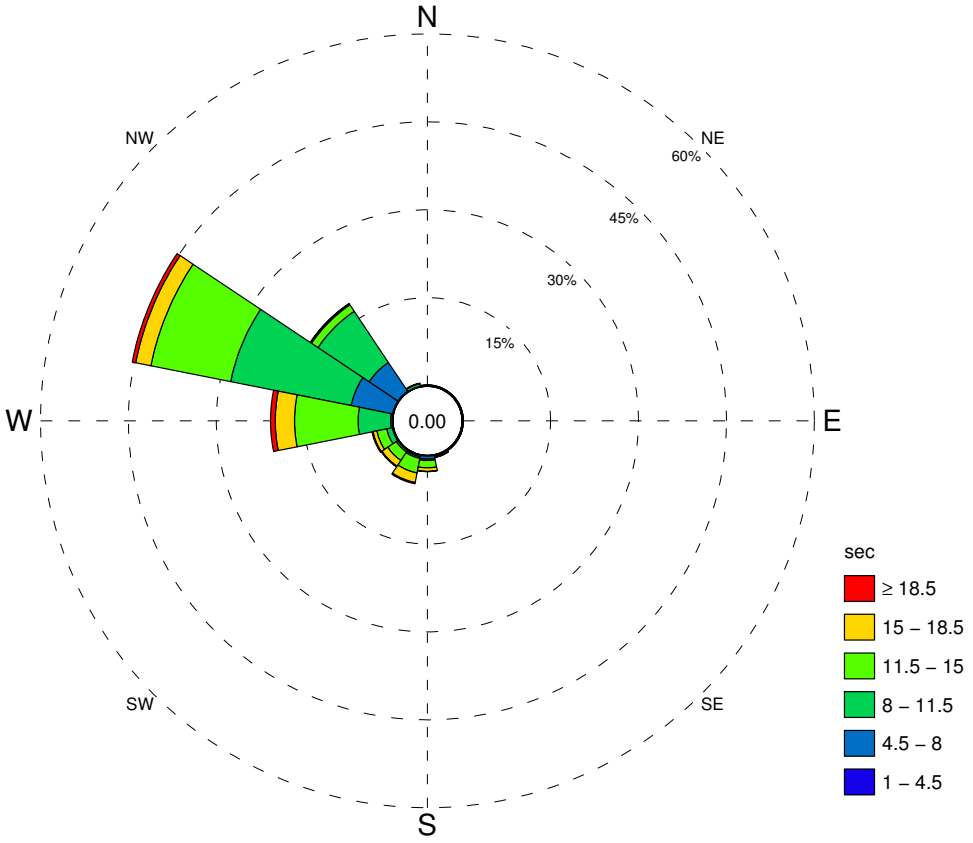
Direction FROM is shown
Center value indicates calms below 0 feet
Total observations 71977, calms 0
About 8.39% of observations missing

Percentage of Occurrence

Significant Wave Height, feet	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total								0.38	2.66	4.94	3.48	3.64	20.76	45.36	18.07	0.54	100.00
25																	
20																	
15													0.15	0.17			0.41
10									0.17	0.13		0.19	1.93	4.05	0.98		7.50
5									0.56	0.66	0.52	1.33	11.84	28.09	10.35	0.16	53.60
0								0.30	1.91	4.12	2.91	2.09	6.83	13.03	6.73	0.38	38.43

A- 1: Wave Height Rose for NDBC Station 46026 San Francisco

Peak Wave Period (Annual)
Station 46026 – San Francisco
Period 17–Jan–2007 to 16–Feb–2016



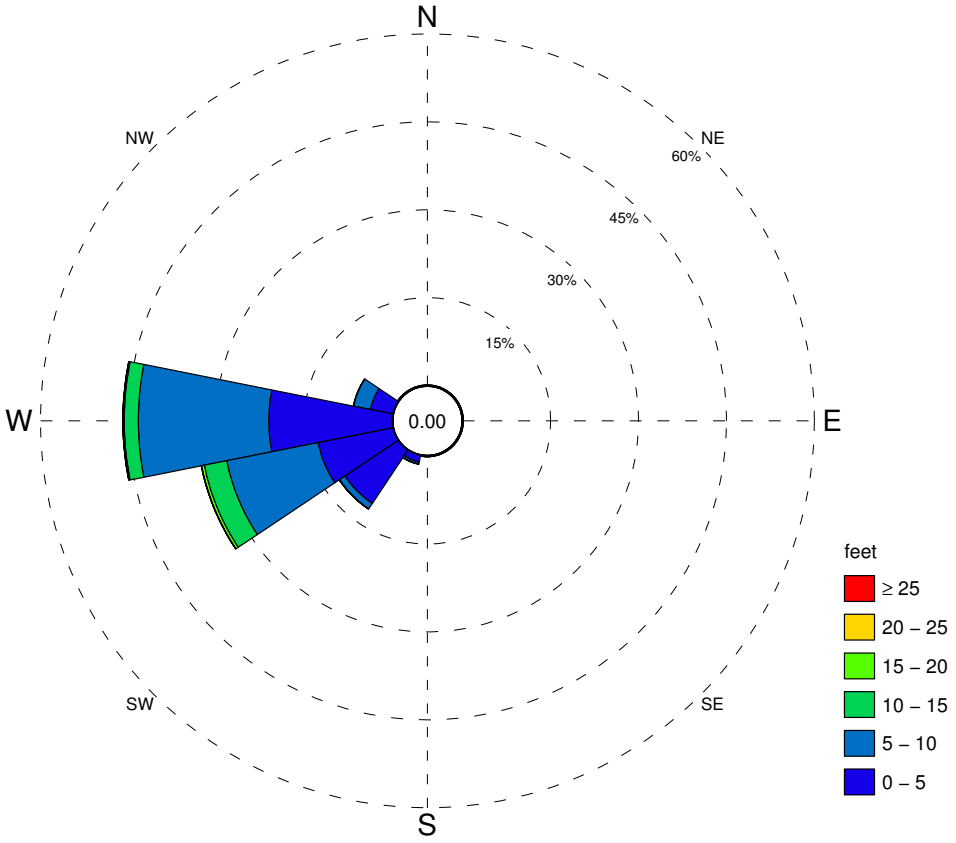
Direction FROM is shown
Center value indicates calms below 1 sec
Total observations 71977, calms 0
About 8.39% of observations missing

Percentage of Occurrence

Peak Wave Period, sec	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total								0.38	2.66	4.94	3.48	3.64	20.76	45.36	18.07	0.54	100.00
18.5										0.21	0.16	0.18	0.82	0.61			2.15
15									0.60	1.66	1.18	0.67	3.28	2.66	0.20		10.40
11.5								0.18	1.24	2.53	1.74	1.72	10.85	13.87	1.32		33.56
8									0.24	0.28	0.31	0.96	5.53	20.96	10.49	0.43	39.24
4.5									0.51	0.26		0.11	0.29	7.19	5.91		14.45
1																	0.20

A- 2: Wave Period Rose for NDBC Station 46026 San Francisco

Significant Wave Height (Annual)
Station 46237 – San Francisco Bar
Period 30–Jan–2008 to 18–Feb–2016



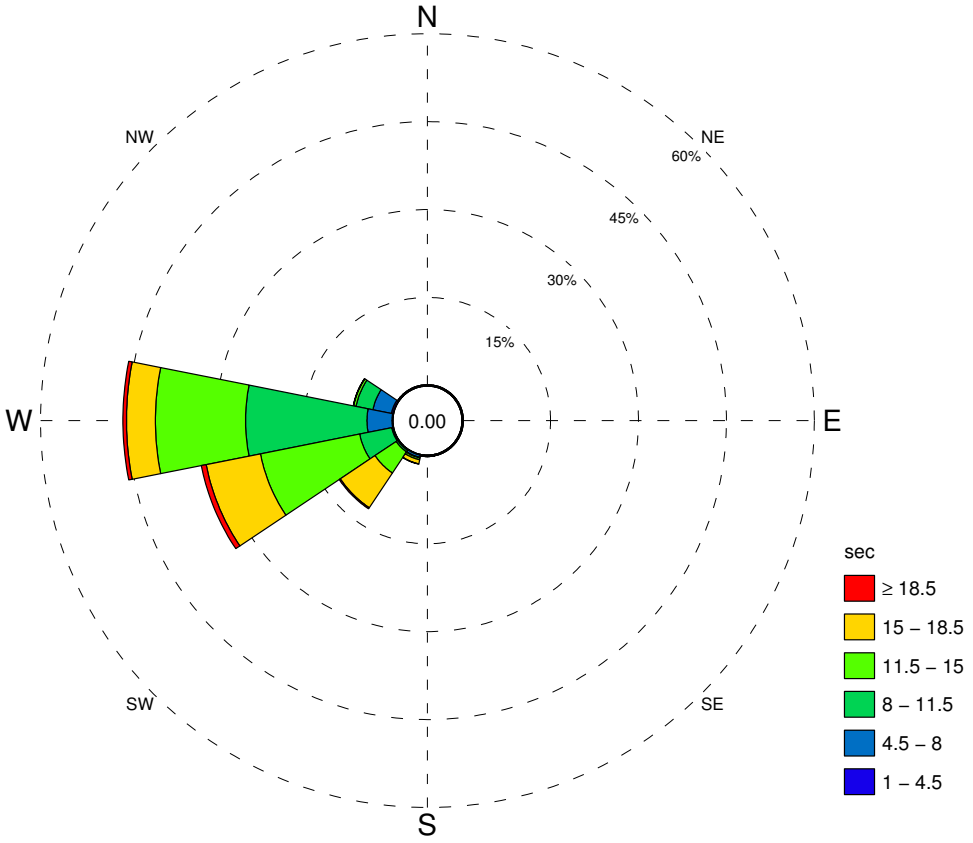
Direction FROM is shown
Center value indicates calms below 0 feet
Total observations 110121, calms 0
About 20.5% of observations missing

Percentage of Occurrence

Significant Wave Height, feet	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total									0.13	1.57	12.09	33.32	45.95	6.90			100.00
25																	
20																	
15												0.49	0.22				0.72
10												3.90	2.41				6.45
5										0.35	1.11	15.88	22.25	2.93			42.58
0										1.16	10.94	13.02	21.06	3.92			50.21

A- 3: Wave Height Rose for NDBC Station 46237 San Francisco Bar

Peak Wave Period (Annual)
Station 46237 – San Francisco Bar
Period 30–Jan–2008 to 18–Feb–2016



Direction FROM is shown
Center value indicates calms below 1 sec
Total observations 110126, calms 0
About 20.5% of observations missing

Percentage of Occurrence

Peak Wave Period, sec	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total									0.13	1.57	12.09	33.32	45.95	6.89			100.00
18.5											0.22	0.83	0.60				1.72
15										0.72	7.12	9.44	4.93				22.27
11.5										0.30	4.34	17.27	15.38	0.42			37.71
8										0.12	0.31	5.58	20.71	2.93			29.65
4.5										0.37	0.10	0.21	4.26	3.22			8.25
1														0.26			0.40

A- 4: Wave Period Rose for NDBC Station 46237 San Francisco Bar

APPENDIX B
Published Maps

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
OTHER AREAS	NO SCREEN Areas of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike or Floodwall
	Non-accredited Levee, Dike or Floodwall
	E 18.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	B Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base Map information shown on this FIRM was derived from Coastal California LiDAR and digital imagery dated 2011. USDA NAIP imagery dated 2010 is used in areas not covered by the Coastal California digital imagery.

SCALE

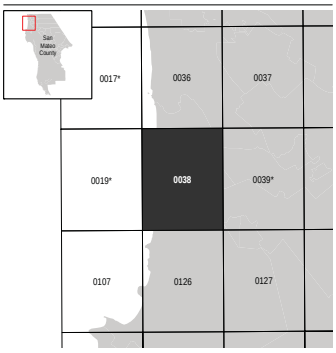
Map Projection:
Universal Transverse Mercator Zone 10N; North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

SAN MATEO COUNTY, CALIFORNIA
and Incorporated Areas

PANEL 38 OF 510

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
DALY CITY, CITY OF	060317	0038	F
PACIFICA, CITY OF	060323	0038	F
SAN BRUNO, CITY OF	060326	0038	F
SAN MATEO COUNTY	060311	0038	F
SOUTH SAN FRANCISCO, CITY OF	065062	0038	F

PRELIMINARY
9/14/2015

VERSION NUMBER
2.3.2.1

MAP NUMBER
06081C0038F

MAP REVISED

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10N. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the USDA National Agriculture Imagery Program (NAIP). This information was photogrammetrically compiled at a scale of 1:24,000 from aerial photography dated 2005.

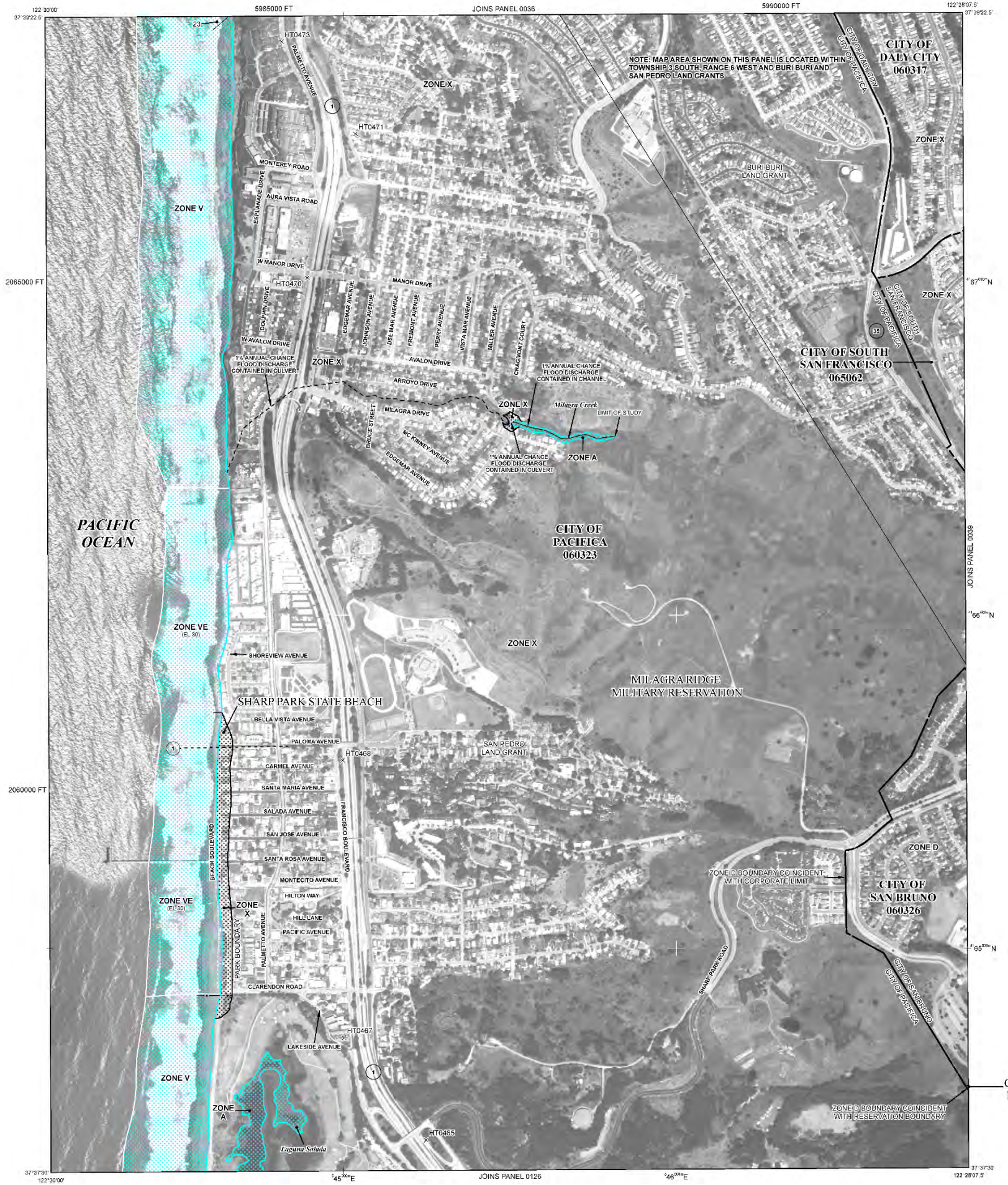
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous **FIRM** may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA Boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
	Culvert, Flume, Penstock or Aqueduct
	Road or Railroad Bridge
	Footbridge
92° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
67000FT E	1000-meter Universal Transverse Mercator grid values, Zone 10
600000 FT	5000-foot grid ticks: California State Plane coordinate system, Zone II (FIPSZONE 0402), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL
OCTOBER 16, 2012

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038E

FIRM

FLOOD INSURANCE RATE MAP

SAN MATEO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 38 OF 510

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

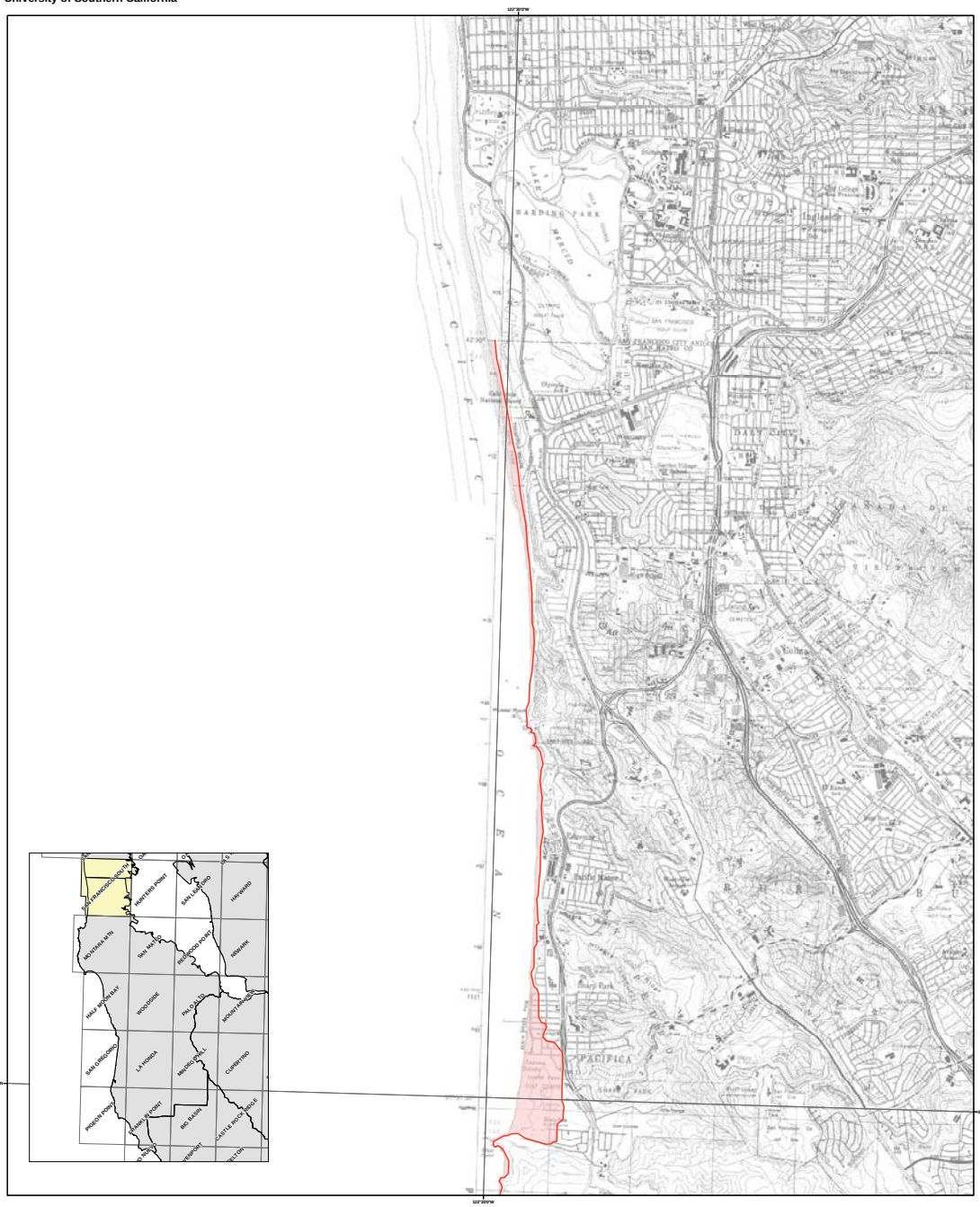
COMMUNITY	NUMBER	PANEL	SUFFIX
DALY CITY, CITY OF	060317	0038	E
PACIFICA, CITY OF	060323	0038	F
SAN BRUNO, CITY OF	060326	0038	E
SOUTH SAN FRANCISCO, CITY OF	065062	0038	E
SAN MATEO COUNTY	060311	0038	F

Notice to User: The **Map Number** shown below should be used when placing map panels; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06081C0038E

EFFECTIVE DATE
OCTOBER 16, 2012

Federal Emergency Management Agency



METHOD OF PREPARATION

Initial tsunami modeling was performed by the University of Southern California (USC) Tsunami Research Center funded through the California Emergency Management Agency (CalEMA) by the National Tsunami Hazard Mitigation Program. The tsunami modeling process utilized the MOST (Method of Splitting Tsunamis) computational program (Version 0), which allows for wave evolution over a variable bathymetry and topography used for the inundation mapping (Titov and Gonzalez, 1997; Titov and Synolakis, 1998).

The bathymetric/topographic data that were used in the tsunami models consist of a series of nested grids. Near-shore grids with a 3 arc-second (75- to 90-meters) resolution or higher, were adjusted to "Mean High Water" sea-level conditions, representing a conservative sea level for the intended use of the tsunami modeling and mapping.

A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near-shore landslides (Table 1). Local tsunami sources that were considered include offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides capable of significant seafloor displacement and tsunami generation. Distant tsunami sources that were considered include great subduction zone events that are known to have occurred historically (1960 Chile and 1964 Alaska earthquakes) and others which can occur around the Pacific Ocean "Ring of Fire."

In order to enhance the result from the 75- to 90-meter inundation grid data, a method was developed utilizing higher-resolution digital topographic data (3- to 10-meters resolution) that better defines the location of the maximum inundation line (U.S. Geological Survey, 1993; Intermap, 2003; NOAA, 2004). The location of the enhanced inundation line was determined by using digital imagery and terrain data on a GIS platform with consideration given to historic inundation information (Lander, et al., 1993). This information was verified, where possible, by field work coordinated with local county personnel.

The accuracy of the inundation line shown on these maps is subject to limitations in the accuracy and completeness of available terrain and tsunami source information, and the current understanding of tsunami generation and propagation phenomena as expressed in the models. Thus, although an attempt has been made to identify a credible upper bound to inundation at any location along the coastline, it remains possible that actual inundation could be greater in a major tsunami event.

This map does not represent inundation from a single scenario event. It was created by combining inundation results for an ensemble of source events affecting a given region (Table 1). For this reason, all of the inundation region in a particular area will not likely be inundated during a single tsunami event.

References:

Intermap Technologies, Inc., 2003, Intermap product handbook and quick start guide: Intermap NEXTmap document on 5-meter resolution data, 112 p.

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TSUNAMI INUNDATION MAP FOR EMERGENCY PLANNING

State of California ~ County of San Mateo

SAN FRANCISCO SOUTH QUADRANGLE (PACIFIC COAST)

June 15, 2009

SCALE 1:24,000

Table 1: Tsunami sources modeled for the San Mateo County coastline.

Sources (M = moment magnitude used in modeled event)		Areas of Inundation Map Coverage and Sources Used	
		San Francisco Bay	Pescadero
Local Sources	Point Reyes Thrust Fault	X	
	Rodgers Creek-Hayward Faults	X	
	San Gregorio Fault	X	
Distant Sources	Cascadia Subduction Zone-full rupture (M9.0)	X	
	Central Aleutians Subduction Zone #1 (M8.9)	X	X
	Central Aleutians Subduction Zone #2 (M8.9)	X	
	Central Aleutians Subduction Zone #3 (M9.2)	X	X
	Chile North Subduction Zone (M9.4)	X	
	1960 Chile Earthquake (M9.3)	X	
	1964 Alaska Earthquake (M9.2)	X	X
	Japan Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #3 (M8.8)	X	
	Kuril Islands Subduction Zone #4 (M8.8)	X	
	Marianas Subduction Zone (M8.6)	X	X

MAP EXPLANATION

Tsunami Inundation Line

Tsunami Inundation Area

PURPOSE OF THIS MAP

This tsunami inundation map was prepared to assist cities and counties in identifying their tsunami hazard. It is intended for local jurisdictional, coastal evacuation planning uses only. This map, and the information presented herein, is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose.

The inundation map has been compiled with best currently available scientific information. The inundation line represents the maximum considered tsunami runup from a number of extreme, yet realistic, tsunami sources. Tsunamis are rare events; due to a lack of known occurrences in the historical record, this map includes no information about the probability of any tsunami affecting any area within a specific period of time.

Please refer to the following websites for additional information on the construction and/or intended use of the tsunami inundation map:

State of California Emergency Management Agency, Earthquake and Tsunami Program:
http://www.oes.ca.gov/WebPageloeswebsite.nsf/Content/B1EC51BA215931768825741F005E8D807?OpenDocument

University of Southern California – Tsunami Research Center:
http://www.usc.edu/dept/tsunamis/2005/index.php

State of California Geological Survey Tsunami Information:
http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/index.htm

National Oceanic and Atmospheric Agency Center for Tsunami Research (MOST model):
http://nctr.pmel.noaa.gov/time/background/models.html

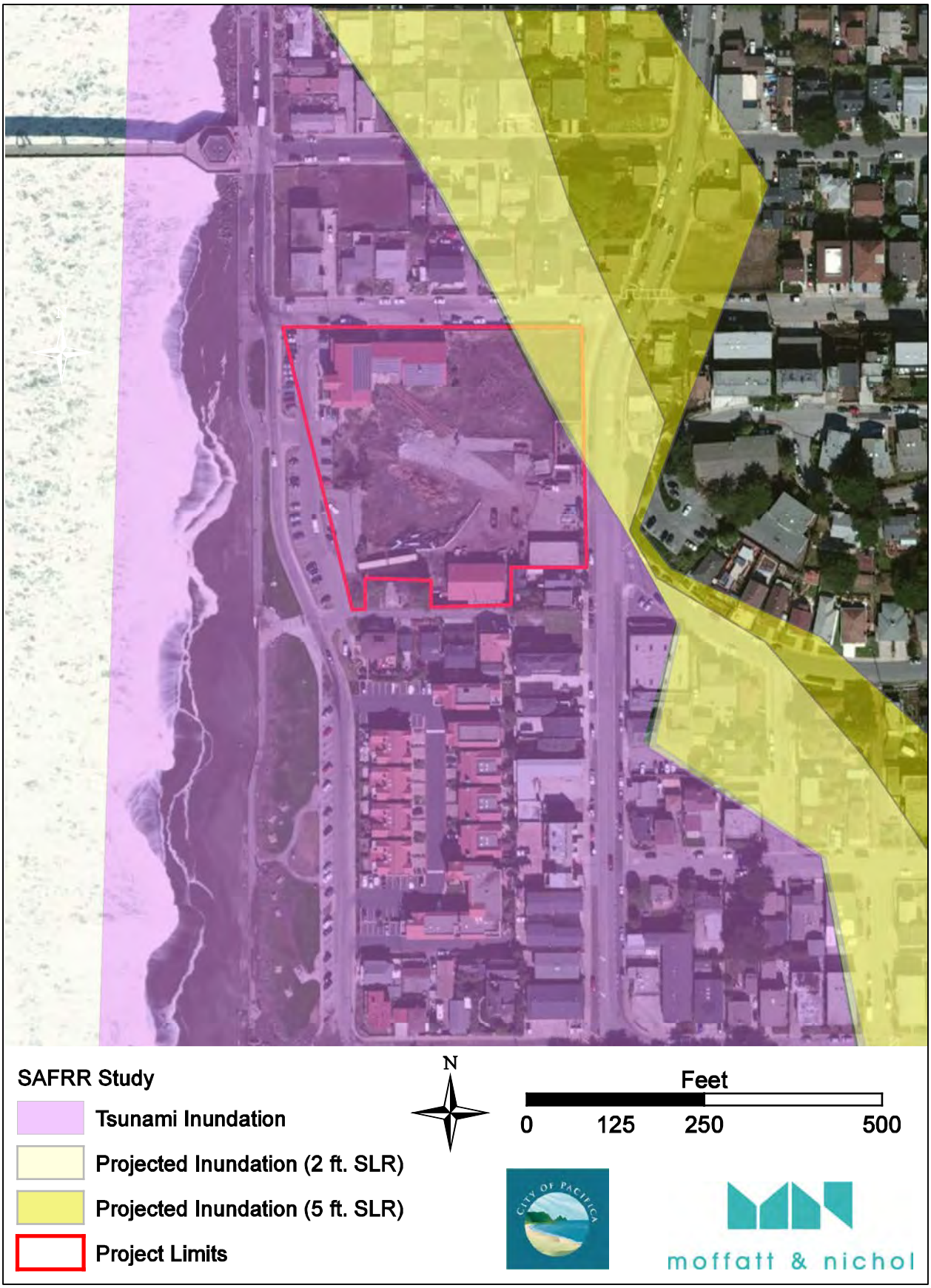
MAP BASE

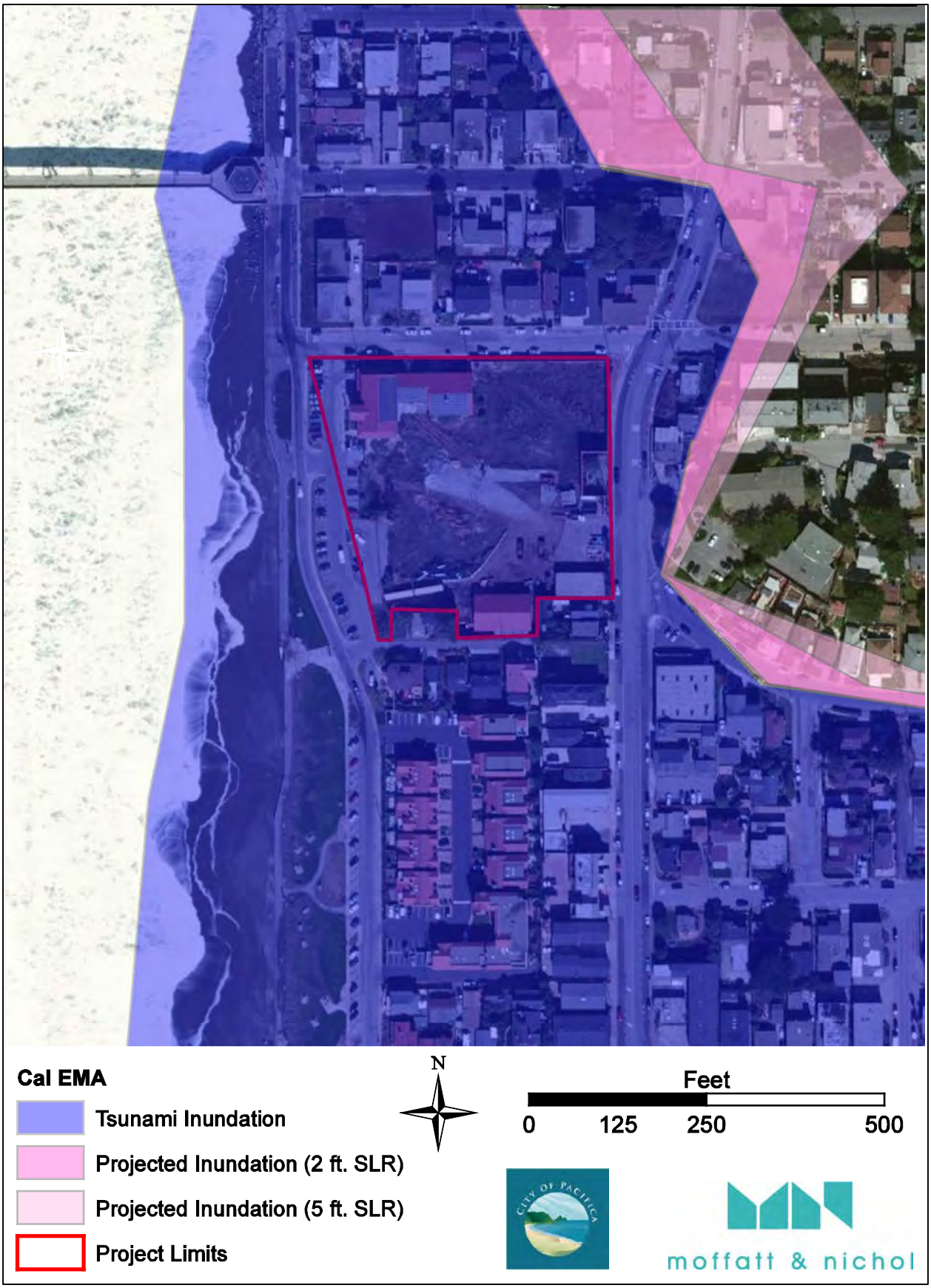
Topographic base maps prepared by U.S. Geological Survey as part of the 7.5-minute Quadrangle Map Series (originally 1:24,000 scale). Tsunami inundation line boundaries may reflect updated digital orthophotographic and topographic data that can differ significantly from contours shown on the base map.

DISCLAIMER

The California Emergency Management Agency (CalEMA), the University of Southern California (USC), and the California Geological Survey (CGS) make no representation or warranties regarding the accuracy of this inundation map nor the data from which the map was derived. Neither the State of California nor USC shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

APPENDIX C:
INUNDATION MAPS


SAFRR Study
Tsunami Inundation
Projected Inundation (2 ft. SLR)
Projected Inundation (5 ft. SLR)
Project Limits
N
Feet
0
125
250
500
CITY OF PACIFICA
moffatt & nichol


Cal EMA
Tsunami Inundation
Projected Inundation (2 ft. SLR)
Projected Inundation (5 ft. SLR)
Project Limits
N
Feet
0
125
250
500
CITY OF PACIFICA
moffatt & nichol

KEYSER MARSTON ASSOCIATES
ADVISORS IN PUBLIC/PRIVATE REAL ESTATE DEVELOPMENT

MEMORANDUM

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SAN DIEGO
PAUL C. MARRA

To: Lorie Tinfow, City Manager
Anne Stedler, Economic Development Manager
City of Pacifica

From: Tim Kelly

Date: September 9, 2016

Subject: Beach Blvd Site: Developer Selection

Keyser Marston Associates, Inc. (KMA) has been requested by the City of Pacifica to evaluate the development proposals submitted. The focus of KMA assessment is on developer qualifications and proposed business terms. The Beach Blvd site is approximately 3 acres. In October 2015, the City approved a developer selection process.

Summary

The respondents to the RFP and their proposals were evaluated with a primary goal of having a hotel development on the site. The reasons include:

- Market supports a new hotel project
- Benefits to the City, e.g. catalyst project and impact on Palmetto Avenue 'Main Street' and business and leisure travel in Pacifica
- Revenue to the City: 12% transient occupancy tax (TOT) and land sale proceeds
- Coastal Commission's stated preference for visitor-serving amenities such as hotel and stated identification of housing as the third and lowest priority at this location

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WWW.KEYSERMARSTON.COM

The criteria considered in evaluating the proposals included:

- Experience in developing hotels
- Understanding the local hotel market and the opportunity
- Relationship with a major hotel brand or comparable evidence of standards and competitive marketing/reservation capacity
- Understanding the process with approvals yet to be obtained from the City and the Coastal Commission
- Financial resources to fund entitlement process and construction
- Concept and vision for catalyst project to strengthen Pacifica with an active and vibrant destination

Also consideration was given to the feasibility of the hotel not being dependent on other land uses beyond the hotel and restaurant, that is the hotel and restaurant should be able to proceed as a standalone project since the hotel is the City's priority. The feasibility and program of a hotel should not be subject to the inclusion of another major land use component.

The desire is for the hotel to proceed as quickly as possible, subject first to review from the public, the Planning Commission, the City Council and the Coastal Commission. A Purchase and Sale Agreement will not be presented to the City Council for its consideration until CEQA is completed and decisions have been reached on general project layout, design, and other related matters. The Purchase and Sale Agreement will be subject to review and approval by the City Council.

The respondent selected by the City Council will be required to fund all costs related to regulatory approvals, including applying for entitlements from the City and the Coastal Commission. The respondent will be required to fund CEQA. The respondent's financial obligation to fund predevelopment and regulatory costs are under the condition that there is no guarantee of approvals, either from the City or the Coastal Commission.

KMA concludes that Friend Development Group, LLC is the respondent that best fits the requirements to develop a hotel on the Beach Blvd. site. The proposed project includes:

- Approximately a 120 key select service hotel
- Affiliation with Hilton Hotels & Resorts
- Restaurant space of approximately 6,000 square feet serving three meals per day
- Roof top deck and lounge overlooking the Pacifica Pier and the ocean and offering amenities serving both hotel guests and residents with connection to restaurant space
- Replacement of the 58 public parking spaces on site.

Friend Development Group, LLC recently has developed several major hotels, including:

- Hyatt Place in Yonkers, New York with 155 keys
- Hampton Inn Brooklyn Downtown with 117 keys; a second phase with 148 keys is under construction
- Hampton Inn & Suites by Hilton in Poughkeepsie, New York with 130 keys
- Homewood Suites by Hilton in Stratford, Connecticut with 135 keys

James H. Friend is the managing member of Friend Development Group, LLC. The following is an excerpt on his background:

> "Specialize in hotel development both in the U. S. and overseas. Many years of active, hands-on development expertise. Have developed numerous hotels for own account as well as in advisory capacity. Excellent knowledge of all major hotel brands and their particular requirements, including Hilton, Marriott, Hyatt, Starwood, Intercontinental, numerous luxury brands as well as independent luxury and boutique hotels. Have extensive experience in ground-up development, renovations, adaptive re-use, mixed-use developments, urban, suburban, resort, major and minor mixed-use developments. Particular expertise regarding real estate entitlement matters.
>
> Have arranged financing for more than $500 million of hotel and real estate transactions. Extensive experience financing large and complicated real estate projects. Have partnered with and advised NYSE companies, major institutions, REIT's, high net worth family offices, banks and privately held companies in a wide range of real estate product types including hotels, retail, assisted living, multi-family, mixed-use and more. My personal legal expertise brings considerable added value. In addition, since 2011 I have been on the board of Condor Hospitality Trust, Inc. and in 2012 became chairman of the board of directors."

Friend Development Group, LLC has a long relationship with Hilton Worldwide. The branding of the hotel with Hilton is an important element in the success of the project from Friend's perspective. Friend understands the context of the location and how the hotel would fit within the overall hotel market on the north peninsula. Friend also understands that the project needs to be special and distinctive in the marketplace and not simply a traditional select service hotel.

Stonehill & Taylor Architects, P.C. of New York City are the architect for the proposed hotel. The firm is an architecture and interior design firm and was established in 1986. One of the primary focuses of the firm is hospitality. The firm has designed dozens of select service, full service, and resort hotels throughout cities in the United States, including New York City, Boston, Minneapolis, New Orleans, Phoenix and San Francisco.

Significant economic benefits to the City will be realized with the opening of the hotel. The benefits include:

- Catalyst project representing an approximately $30 million investment that will serve visitors to Pacifica as well as residents
- 35,000 occupied room nights at stabilization
- Annual TOT (transient occupancy tax) of approximately $900,000 at stabilization
- Other municipal revenues, such as property taxes and sales taxes
- Land payment

In conclusion, KMA has identified Friend Development Group, LLC as the respondent that has the best experience with hotel development for a site that requires significant effort and resources to undertake the process for regulatory approvals and understands that the project needs to be special and distinctive in the marketplace and not simply a traditional select service hotel.