



**OneShoreline**  
Building Solutions for a Changing Climate



**Planning Policy Guidance**  
**To Protect and Enhance**  
**Bay Shoreline Areas of San Mateo County**  
**June 2023**

# ACKNOWLEDGEMENTS

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County of San Mateo

Bay Conservation and Development Commission

City/County Association of Governments of San Mateo County

San Francisco Estuary Institute

PlaceWorks

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## PREFACE

During the winter of 2022-23, California went from the three driest years on record to the three wettest weeks on record. In San Mateo County, this dramatic change from drought to deluge was a repeat of 2021, when two atmospheric river storms brought almost 3/4 of all precipitation that year and led to major flooding and two deaths. Flooding from storms is likely to become more intense and commonplace, particularly in the low-lying areas affected by tides from San Francisco Bay. This is largely due to continued sea level rise, which by itself is expected to threaten this county more than any other in California. This document was created to help communities in these areas become resilient to the direct and indirect impacts of sea level rise.

Meanwhile, the development and redevelopment of our cities and unincorporated areas goes on, guided by the key local planning documents – general plans, specific plans, and zoning ordinances – that reflect our values and priorities regarding issues like housing affordability and supply, economic vitality, transportation routes, safety, equity, and open space. While weather extremes in recent years have impacted these key aspects of our communities, until recently climate change has not materially impacted the planning documents that guide them and local decision-making regarding where and how development should occur.

This began to change in San Mateo County with a state law requiring that climate risks and resilience strategies be included in the Safety Element of cities' General Plans and in 2021 the City of Burlingame went a step further. As part of the process to update its citywide zoning ordinance, Burlingame reached out to the San Mateo County Flood and Sea Level Rise Resiliency District for assistance in developing a chapter focused on sea level rise resilience for new developments. The District, also known as OneShoreline, was established by State legislation in January 2020 as the first countywide government agency in California to build regional resilience to the water-related impacts of climate change.

The objective of that chapter of Burlingame's Zoning Ordinance (adopted in December 2021) is to ensure that upcoming developments within areas impacted by the Bay, particularly those along a creek or shoreline, can both function for their intended lifespan as our environment changes and enable or contribute to the resilience of surrounding areas. Building on its work with Burlingame, in 2022, OneShoreline engaged with the cities of South San Francisco, San Carlos, and San Mateo to include in their core planning documents considerations of future conditions brought on by climate change.

Following the experience of recent winters and extreme tides, and with a greater understanding of what is to come, OneShoreline aims for all jurisdictions to plan for and build this long-term resilience. At OneShoreline, two core concepts drive our work to make this happen:

- we can no longer plan our future by looking in the rear-view mirror, and
- we are all in this together.

This Planning Policy Guidance is intended to be a resource for the twelve cities within San Mateo County and the County itself that are directly impacted by the Bay. While each city has different priorities and processes to shape its future, the transformative impacts of climate change, including extreme storms and rising sea level and groundwater, do not respect their jurisdictional boundaries. Thus, through this voluntary planning guidance, as well as ongoing engagement with each city and project proponents, OneShoreline seeks to align the long-term protection and enhancement of our communities and serve as a model for the many areas facing similar challenges.

Dave Pine  
Chair, OneShoreline Board of Directors  
President, San Mateo County Board of Supervisors

Len Materman  
Chief Executive Officer  
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June 2023

## HOW TO USE THIS DOCUMENT<sup>1</sup>

OneShoreline’s Planning Policy Guidance is intended to be a standardized yet evolving resource for cities and the County to account for climate-driven flooding, stormwater, shallow groundwater rise, and sea level rise in planning documents (general plan, specific plan, zoning ordinance) and approvals of projects in areas near the Bay subject to foreseeable climate impacts.

<b>This document IS:</b>	<b>This document IS <u>NOT</u>:</b>
<b>Voluntary guidance</b>	<b>Mandatory regulations</b>
<i>Including the provisions in this document within a jurisdiction’s key planning documents and processes is voluntary but highly encouraged in order to maximize each jurisdiction’s resilience to climate change and to align that resilience with their neighbors.</i>	
<b>An actionable template</b>	<b>A reference document only</b>
<i>While accounting for future conditions does require a perspective shift, OneShoreline seeks to make this shift as implementable as possible by designing this document to enable cities and the County to insert template text into pre-existing processes and documents. In addition, the document highlights situations where site-specific exceptions may be granted.</i>	
<b>Focused on new/substantial private development</b>	<b>Focused on existing development or public facilities and infrastructure</b>
<i>This document contains recommendations for new or substantial private development rather than guidance for existing development, as OneShoreline’s current focus is to ensure private development is sited and designed with future conditions in mind. Also, while this document includes template policies that pertain to public facilities and infrastructure (particularly in Chapter II), the document does not provide detailed guidance on how to implement those policies. In 2024, OneShoreline anticipates issuing a complementary guidance document on the critical task of integrating climate risks into capital planning. In the interim, jurisdictions are invited to discuss major capital projects with OneShoreline.</i>	
<b>Focused on the County Bayside</b>	<b>Focused on the County Coastside</b>
<i>Like jurisdictions along San Mateo County’s San Francisco Bay shoreline, the changing climate significantly affects land use decisions along our treasured Pacific coastline. However, the specific hazards and jurisdictional landscape along the County’s Pacific coast are substantially different from the Bayside and thus guidance on how to plan and develop for long-term future conditions is also substantially different. At this time, OneShoreline recommends that jurisdictions on the coast review the <a href="#">California Coastal Commission’s resources for sea level rise planning assistance for Local Coastal Programs</a>.<sup>2</sup></i>	
<b>Evolving</b>	<b>Static</b>
<i>OneShoreline intends to periodically update this document as new climate science – including projections regarding storms, sea level rise, and shallow groundwater rise – become available, and as lessons are learned from the implementation of this Guidance by local jurisdictions.</i>	

## HOW TO USE THIS DOCUMENT

The intended audience of this document is the County of San Mateo and the twelve cities within its boundaries that are directly impacted by sea level rise from the Bay, including:

- Belmont
- Brisbane
- Burlingame
- East Palo Alto
- Foster City
- Menlo Park
- Millbrae
- Redwood City
- San Bruno
- San Carlos
- San Mateo
- South San Francisco

# ONESHORELINE'S BAY PROTECTION STANDARD

## WHY A SINGLE PROTECTION STANDARD?

A community's decision around establishing a standard to protect against a hazard is the result of several factors: the nature of the threat, associated costs, and tolerance for risk. Perhaps no standard for protection is more complex to determine than for the interrelated hazards driven by climate change. Add subjective considerations to this technical uncertainty – like risk tolerance and the sliding scale of the financial, land use, and ecological costs accompanying various mitigation approaches – and it is no wonder that most communities have not begun to build climate resilience.

Meanwhile, it is evident that climate change poses a clear and present danger; that many areas of the shoreline are proposed for development; and that designing, permitting, and building resilience takes a long time. Therefore, a standard must be chosen based upon the best available climate science.

Because the timeline for specific levels of sea rise is unclear, rather than focus on a specific time horizon, OneShoreline's approach to meeting the urgency of today and the uncertainty of tomorrow is to focus on a specific elevation standard and enable further adaptation. With all of this in mind, OneShoreline has

developed an objective, the Bay Protection Standard, to be both meaningful and achievable.

## ADDING LOCAL NUANCE TO THE BAY PROTECTION STANDARD

There is great interest in adding local context to OneShoreline's Bay Protection Standard in order to capture different shoreline conditions, hazards, and community interests along the San Mateo County Bay Shoreline. As climate science – and our understanding of its application for local conditions – rapidly advances, there will likely be updates to the Bay Protection Standard that allow for this nuance. As OneShoreline explores improvements to the Bay Protection Standard in concert with local jurisdictions, stakeholders, and technical experts, it is moving forward with this Standard, given the urgent need for Bay shoreline communities to plan for and build resilience today.

## DIFFERENT ADAPTATION STRATEGIES AND THE BAY PROTECTION STANDARD

While OneShoreline's Bay Protection Standard is a protection strategy that is focused on coastal hazards connected to the Bay, adaptation to climate-driven flooding, shallow groundwater rise, and sea level rise must utilize a suite of strategic approaches that – in tandem and/or in sequence – guide a community's response to changing conditions. These approaches include creating physical barriers to reduce risk (*protect*), limiting exposure to the hazard (*avoid*), minimizing the consequences of the hazard when exposed (*accommodate*), and re-locating development out of areas exposed to the hazard (*managed retreat*).<sup>3</sup> This guidance document includes all of these strategies, which can work together to address different interrelated hazards, such as when increased [lowest floor elevations](#) (*accommodation*) and [creek buffer zones](#) (*avoidance/managed retreat*) protect against creek and rising groundwater flooding, while [shoreline infrastructure](#) (*protection*) addresses waves and flooding from the Bay.

There is much discussion of managed retreat given increasing concerns over developing in San Mateo County's historic Baylands. While future iterations of this document may include more

## ONE SHORELINE'S BAY PROTECTION STANDARD

substantial guidance in this regard, at this time, managed retreat is included in terms of the strongly recommended Buffer Zones along the Bay shoreline or creek banks (see Section XX.XX.050D in Chapter III's Sea Level Rise Overlay District) and a proposed General Plan Action on economic incentives to encourage development in locations with reduced hazards (see Goal CR-5, Action D in Chapter II). OneShoreline remains focused on ensuring that developments that are considered for approval by local jurisdictions and regulatory agencies account for Future Conditions and allow for a transition of land uses if mandated by climate change and local communities. Useful references for managed retreat case studies and market-based tools include [BCDC's Adaptation Roadmap](#)<sup>4</sup> and [Georgetown Climate Center's Managed Retreat Toolkit](#).<sup>5</sup>

### WHAT IS ONE SHORELINE'S BAY PROTECTION STANDARD?

OneShoreline's Bay Protection Standard is the Base Flood Elevation (BFE) of San Francisco Bay plus 6 feet. The BFE is defined by the Federal Emergency Management Agency (FEMA) as the water-surface elevations of the 1% annual-chance (or commonly called "100-year") flood.<sup>6</sup> In coastal areas impacted by waves, the BFE incorporates tides, storm surge, and wave runup on the existing coastal structure.<sup>7</sup> To determine the OneShoreline Protection Standard at the shoreline location of interest, the FEMA BFE can be found on FEMA Flood Insurance Rate Map (FIRM) for the area. Zone VE elevations should be used where available; otherwise, Zone AE elevations should be used. Based on the current FEMA FIRMs published for San Mateo County in 2019, the BFE Bay water level along the shoreline ranges from 10 feet to 16 feet NAVD88. Therefore, the Bay Protection Standard ranges from 16 feet to 22 feet NAVD88.

### WHAT IS NAVD88?

The North American Vertical Datum of 1988 (NAVD88) is the official vertical datum of the United States.

Therefore, numbers referenced based on NAVD88 are relative to a national standard and not to the ground level near the shoreline (for context, the average daily high tide along the San Mateo County Bay shoreline is approximately 7 feet NAVD88).

### WHAT IS SHORELINE INFRASTRUCTURE?

The Bay Protection Standard represents the minimum, post-settlement elevation required at the top of any shoreline infrastructure along the San Francisco Bay Shoreline. For pump stations and other flood protection infrastructure along the shoreline, jurisdictions are invited to consult with OneShoreline until it issues a complementary guidance document on capital planning, anticipated in 2024.

For the purposes of this document, shoreline infrastructure is defined as engineered structures that are designed to prevent overtopping from coastal hazards – sea level rise, storm surge, wave runup – and meet requirements to be accredited by FEMA so that areas on the landward side of the infrastructure are not mandated to purchase flood insurance. FEMA Technical Report 89-15<sup>8</sup> currently identifies four primary functional types of coastal flood protection: gravity seawalls, pile-supported seawalls, anchored bulkheads, and dikes/levees.



In addition to the structures required for FEMA accreditation described above, this Guidance prioritizes the incorporation of Natural Infrastructure<sup>9</sup> in shoreline protection to the greatest extent feasible. The appropriate use of Natural Infrastructure is location dependent – useful resources to evaluate this include the Operational Landscape Unit framework set forth by the [San Francisco Bay Shoreline Adaptation Atlas](#)<sup>10</sup> and the technical guidance on natural shoreline infrastructure (Chapter 3) in [California's Nature Shoreline Infrastructure Guidance](#).<sup>11</sup>

Because natural features alone – without including any human-engineered structures – are not currently eligible for FEMA accreditation, this Guidance recommends hybrid approaches for shoreline infrastructure that incorporate both engineered and natural features to promote ecosystem functions and provide federally-recognized flood protection. An example of a hybrid approach for protection infrastructure is an ecotone levee – a vegetated, gentle slope connected to tidal marsh that protects and is backed by a FEMA-accredited levee.

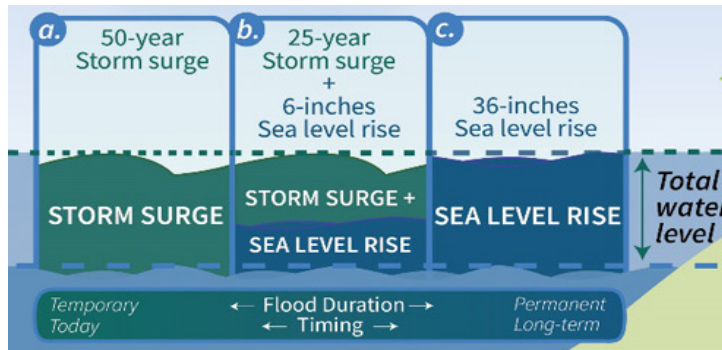
### NATURAL INFRASTRUCTURE

Throughout this Guidance, the term “Natural Infrastructure” refers to the use or restoration of natural ecological systems or processes to reduce vulnerability to climate change related hazards while increasing the long-term adaptive capacity of coastal and inland areas. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as beaches, dunes, tidal marshes, reefs, seagrass, parks, rain gardens, and urban tree canopies. It also includes engineered systems and practices that use or mimic natural processes – such as permeable pavement, bioswales, and ecotone levees – to conserve ecosystem values and functions, which benefit people and wildlife.

### ALIGNMENT WITH STATE SEA LEVEL RISE GUIDANCE

The latest (2018) planning guidance from the State of California outlines sea level rise scenarios ranging from 1 to 10 feet by 2100, based on low and high emissions scenarios. The guidance also provides recommendations for what sea level rise projections to use in low, medium-high, or extreme risk aversion decisions. In February 2022, the California Ocean Protection Council released a State Agency Sea Level Rise Action Plan, which recommended minimum sea level rise adaptation planning for 3.5 feet by 2050 and 6.0 feet by 2100. As discussed previously, given the wide range of potential outcomes due to uncertainty in future greenhouse gas emissions and their geophysical effects, and variable risk aversion among shoreline communities, OneShoreline has defined its Bay Protection Standard based on a specific elevation (FEMA BFE + 6 feet) rather than based on a time horizon or associated sea level rise scenario. The Bay Protection Standard provides long-term resilience in two ways:

1. **Protecting against overtopping from a Bay Total Water Level:** The term “Total Water Level” collapses the complex array of coastal processes that affect Bay water level into a single representative elevation. Combinations of temporary conditions (storm surge, wave runup, tides, seasonal events such as El Niño) and permanent sea level rise scenarios can result in the same Total Water Level (see Figure 1).<sup>12</sup>



**Figure 1. Sample of Multiple Combinations of Conditions that Result in the Same Total Water Level**

(Source: [BCDC's Adapting to Rising Tides Program](#); Note that this figure and BCDC's use of the term "Total Water Level" does not include wave runup, while "Total Water Level" as referenced in this Guidance includes wave runup.)<sup>viii</sup>

- Accounting for FEMA freeboard requirements:** Freeboard is defined as an additional height above a design elevation to provide a buffer/factor of safety to compensate for unknown factors that could contribute to flood height.<sup>13</sup> Generally, FEMA requires freeboard for coastal levees to be at least 2 feet above the 100-year stillwater elevation or 1 foot above the 100-year total water level (which includes wave runup), whichever is greater.<sup>14</sup> This requirement – along with the locally-adopted floodplain management regulations satisfying FEMA's minimum criteria<sup>15</sup> – is necessary for a levee to be accredited by FEMA so that areas on the landward side of the levee are not mandated to purchase flood insurance. The Bay Protection Standard exceeds FEMA's current requirements to prevent a situation where a project is completed, only to have the community mapped into the FEMA floodplain upon the next FEMA map revision and subject to the flood insurance mandate once again.

## THE BAY PROTECTION STANDARD: KEY TAKEAWAYS

There are 4 key takeaways about OneShoreline's Bay Protection standard of FEMA BFE + 6 feet:

- OneShoreline currently defines its Bay Protection Standard based on a specific Bay water elevation rather than a time horizon or sea level rise scenario, as these scenarios have great uncertainty and include site-dependent factors such as the influence of waves.
- The maximum height reached by waves on the shore, known as wave runup, depends on the type and design of shoreline protection infrastructure. Thus, the shoreline infrastructure selected for a given project has a significant impact on the performance of infrastructure built to the Bay Protection Standard. Vertical walls generally result in greater wave runup than sloped and vegetated levees. As a result, protection measures using more gradual slopes with natural elements not only provide much greater ecological benefits, but also reduce the height needed to protect from higher waves, and are thus recommended by this Guidance.
- This Guidance allows for flexibility in how new construction contributes to regional shoreline infrastructure built to the Bay Protection Standard. This includes options for phasing – as long as space and land rights are provided that enable the jurisdictions to build to the Bay Protection Standard later – and options for site-specific reductions to the Bay Protection Standard if natural infrastructure results in demonstrated wave-reduction and/or flood protection benefits.
- The FEMA BFE is based on historical data that likely underestimates current and future coastal hazards. While imperfect, FEMA flood maps published for San Mateo County in 2019 remain the most comprehensive, widely accepted, and available dataset for coastal hazards along the Bay shoreline. As a result, the Bay Protection Standard utilizes FEMA's BFE and adds a substantial 6-foot buffer to account for an increase in hazards as sea levels rise. Future iterations of this document may take a different approach to calculating the Bay Protection Standard.

# CHAPTER I | IMPLEMENTATION AND INTERAGENCY DEVELOPMENT REVIEW

## IMPLEMENTATION

This document is intended to help elected officials and staff at jurisdictions along San Mateo County's Bay shoreline incorporate aligned protection against the water-related impacts of climate change into land use planning, policies, and decisions.

### REGULATORY CONTEXT

In October 2015, Governor Brown signed [Senate Bill 379](#) (Jackson), which amended Government Code Section 65302(g) to require all cities and counties in California to incorporate climate adaptation and resiliency into the general plan safety element.

SB 379 requires cities and counties to:

1. Review and update the safety element as necessary to address climate adaptation and resiliency strategies;
2. Complete a vulnerability assessment;
3. Develop adaptation and resilience goals, policies, and objectives; and
4. Develop feasible implementation measures.

SB 379 also allows other planning documents, such as climate adaptation plans, local hazard mitigation plans, or others, to fulfill the climate adaptation planning requirements, provided that the alternative plan is consistent with statutes and is adopted and incorporated by reference into the general plan safety element. Per SB 379, by 2022, local governments were required to take action to update the safety element per the above requirements.

[SB 1035](#) (2018, Jackson), further amended Government Code Section 65302(g) to require local agencies to review and, if necessary, update the flood, fire hazards, and climate adaptation portions of the safety element following the housing element update

## PLANNING FOR SEA LEVEL RISE IN SAN MATEO COUNTY

In 2018, the County of San Mateo released a [Sea Level Rise Vulnerability Assessment](#) to understand how sea level rise will affect San Mateo County residents, businesses, community services, and infrastructure. The County's Assessment maps future risk scenarios and assesses vulnerability of assets and recommends actions and solutions.

Building upon the County's Assessment and with support from the County's Climate Ready SMC program, in 2020, the City of Millbrae updated its [Sea Level Rise Adaptation Assessment](#).

Similarly, in 2019, the City of Burlingame also prepared [Sea Level Rise Adaptation Strategies](#) and [Risks and Vulnerability Memorandum](#).

Burlingame later completed a comprehensive update of the zoning ordinance in 2021, which includes [Public Access, Flood and Sea Level Rise Performance Guidelines](#) for Bayfront Developments.

The City of South San Francisco also recently completed a General Plan Update and Zoning Code Update in 2022. The General Plan includes a [Community Resilience](#) chapter, which addresses Climate Change and Sea Level Rise, and the [Zoning Code](#) includes a Floodplain/Sea Level Rise Overlay District.

## I. IMPLEMENTATION AND INTERAGENCY DEVELOPMENT REVIEW

at least every eight years, ensuring a regular update cycle to climate change considerations.

Additionally, [SB 272](#) (Laird, introduced in January 2023), would require local governments within the coastal zone or the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC) to plan for sea level rise through a Local Coastal Program approved by the California Coastal Commission or a subregional San Francisco Bay shoreline resiliency plan approved by BCDC by January 2034. This timeline does not reflect the urgency of the challenge for San Mateo County, which is a primary reason for the creation of this Planning Policy Guidance at this time.

### CLIMATE ADAPTATION PLANNING TOOLS

In addition to the State’s existing and pending requirements for climate adaptation planning, cities and counties have a range of voluntary planning tools that can address and integrate climate change adaptation. Those include:

- General plans, comprehensive plans, specific plans, or area plans;
- Zoning code and other land development codes, ordinances, and resolutions;
- Climate action plans (CAPs), climate change action plans, climate adaptation plans, climate adaptation and resilience plans, climate mitigation and adaptation plans;
- Capital improvement plans/programs;
- Integrated regional water management plans;
- Local coastal program (LCP);
- Local hazard mitigation plans; and
- Emergency operations plan.

While OneShoreline strongly supports integration of climate change adaptation into all of the above documents, this guidance document specifically focuses on general and specific plans and zoning ordinances. Resilience policies can be integrated into these broad planning documents, or as a stand-alone initiative. To help cities and the County tailor policies to their jurisdiction’s specific needs, recommended template language is provided in the following Chapters.

### CAPACITY BUILDING FUNDING

Incorporating resilience to future conditions caused by climate change requires additional time and resources that many local jurisdictions do not currently have the funding for. State and federal grant programs continue to be rolled out that seek to help close this capacity gap so jurisdictions can take critical steps in planning for climate adaptation. Some examples are featured below:

The [Governor’s Office of Planning and Research ICARP Programs](#) provide funding to help fill local, regional, and tribal adaptation planning and resilience needs, provide resources, and support the development of a pipeline of climate resilient projects.

The [California Strategic Growth Council Regional Climate Collaboratives Program](#) is a new capacity-building grant program that enables community-rooted and cross-sectoral partners to deepen their relationships and develop the processes, plans, and projects that will drive and sustain climate action.

FEMA’s Building Resilient Infrastructure and Communities (BRIC) Program funds [Capability- and Capacity-Building Activities](#), which result in a resource, strategy, or mitigation product that will increase resiliency to future natural hazards.

## I. IMPLEMENTATION AND INTERAGENCY DEVELOPMENT REVIEW

### IMPLEMENTING THE PLANNING POLICY GUIDANCE

The sample text in this document has been designed to be integrated into local policies and regulations as seamlessly as possible. However, each community is unique and thus local governments will adapt the sample text provided in Chapters II and III to reflect their priorities, and conditions, and to harmonize this text with existing policies and regulation. OneShoreline can provide assistance to facilitate these implementation efforts and recommends the following course of action:

- Review the Sea Level Rise and Shallow Groundwater Rise Overlay Districts using the [Map of Future Conditions](#) to understand the extent of affected areas, land uses, and zoning districts;
- Conduct community outreach to these areas about vulnerabilities to current and future flood and sea level rise risks and gather feedback on adaptation strategies and regulations;
- Receive feedback from local decision-making bodies: City Council, County Board of Supervisors, Planning Commissions, etc.;
- Integrate template policies into general plans and text amendments into zoning ordinances according to local regulatory context and community preferences; and
- Adopt local resilience policies and regulations as a stand-alone initiative, or in concert with planned general plan and zoning code updates if those updates are imminent.

### TECHNICAL ASSISTANCE

In addition to this guidance document, OneShoreline provides cities and the County technical assistance with integrating current and future flooding and sea level rise hazards into land use planning, policies, and regulations. Specific forms of technical assistance include:

- Presenting on climate change, climate resilience, land use, and the intersection of these at meetings of a City Council, County Board of Supervisors, and their commissions;
- Providing maps and other data of areas and critical assets vulnerable to these hazards;
- Reviewing and providing comments on long-range planning initiatives, such as general plan updates or amendments, new or amended specific plans, zoning ordinance updates, and climate adaptation plans;
- Reviewing and providing comments on capital projects; and
- Reviewing and providing comments on proposals and design documents for private projects vulnerable to flooding and sea level rise that are currently undergoing the entitlement process (further outlined in “OneShoreline’s Role in Local Development Review” section below).

### ONESHORELINE’S ROLE IN LOCAL DEVELOPMENT REVIEW

Rather than only focus on current threats to its specific project site, major development and infrastructure projects must be built to function for their intended life span as the climate changes, as well as enable and integrate with regional climate resilience efforts.

## I. IMPLEMENTATION AND INTERAGENCY DEVELOPMENT REVIEW

OneShoreline would like to work with cities and the County early in the development review process to ensure that new developments evaluate water-related risks, incorporate resilient design practices, and align with regional protection projects. This is particularly true of projects where any portion of the parcel is located in the San Francisco Bay Buffer Zone or a Creek Buffer Zone (OneShoreline Review Threshold). To review the criteria that OneShoreline uses to review and comment on new development proposals, see the Project Review Checklist in Chapter IV, which closely follow the Development Standards outlined in the Sea Level Rise and Shallow Groundwater Rise Overlay Districts in Chapter III.

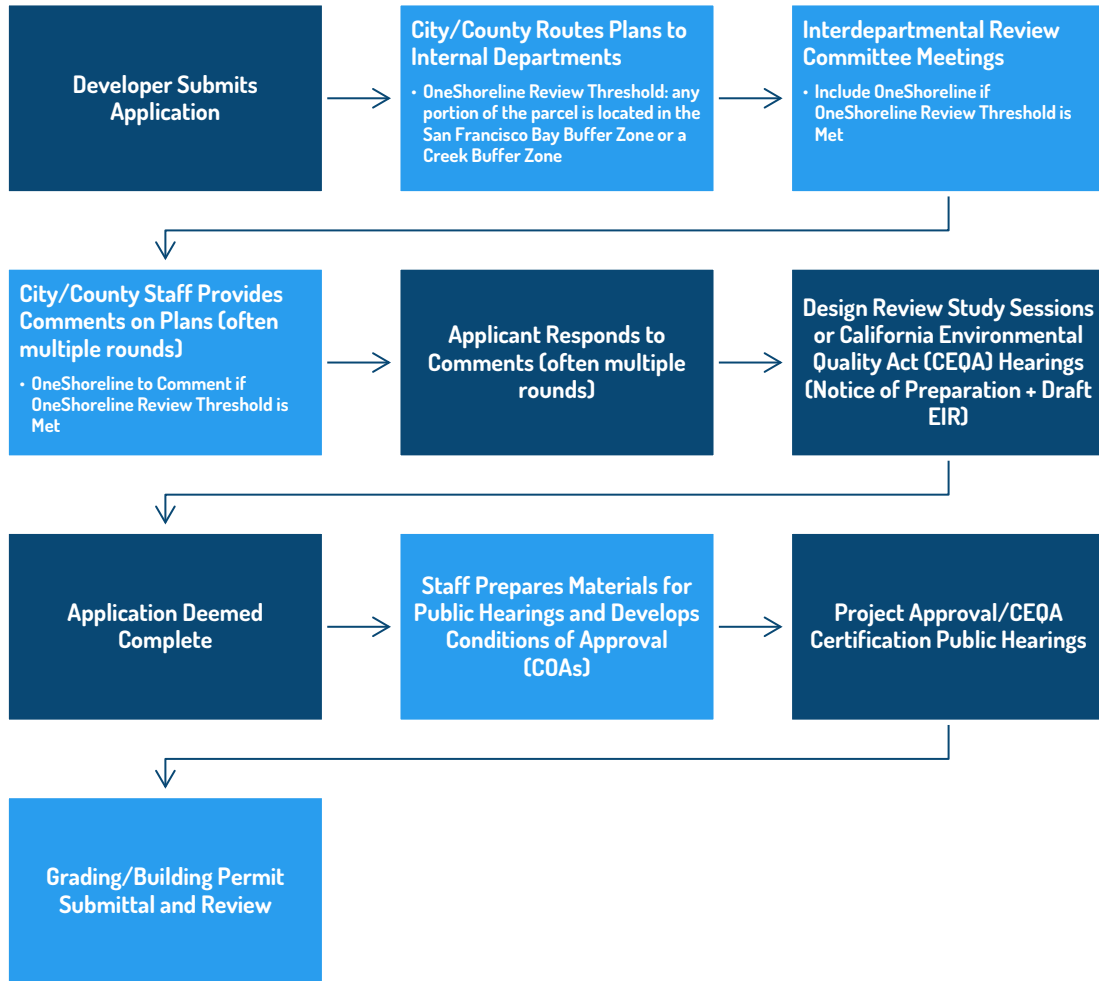
OneShoreline understands that the [Permit Streamlining Act](#) limits the time allowed for development reviews and adding another review may require additional time and effort. The first step to reducing the complexities and uncertainties in these reviews is the incorporation of clear resilience requirements in local land use planning documents. From there, a potential process to incorporate a review by OneShoreline is described in Figure 2. OneShoreline will work with each jurisdiction to maximize the added value of this review to the development approval process. Some development projects may require approval from other county, state, and federal agencies, which would occur outside of the process outlined below. However, OneShoreline would seek consistency with the requirements of these agencies.

As with any recommendations in the OneShoreline Planning Policy Guidance, engagement by cities and the County with OneShoreline is voluntary. Inclusion of OneShoreline in development review procedures is meant to assist cities as they implement regulations and standards to increase climate resilience and align that resilience with their neighbors.

### ONESHORELINE REVIEW THRESHOLD

At a minimum, OneShoreline would like to work with jurisdictions to review projects with any portion of the parcel located in the San Francisco Bay Buffer Zone or a Creek Buffer Zone to ensure that new developments evaluate water-related risks, incorporate resilient design practices, and align with regional protection projects. OneShoreline recommends that projects that are not located in Buffer Zones, but in areas subject to sea level and shallow groundwater rise (e.g., within the Sea Level Rise and Shallow Groundwater Rise Overlay Districts recommended in Chapter III) are reviewed using the criteria that OneShoreline uses to review and comment on new development proposals outlined in the Project Review Checklist in Chapter IV. This Review Threshold is subject to change in the future.

Figure 2. Representative Local Jurisdiction Development Review Process Model



## BUFFER ZONES

Throughout this Guidance, the term “Buffer Zones” refers to space to accommodate and maintain built and natural infrastructure for flood protection, habitat restoration, and public access off the San Francisco Bay Shoreline, Bay shoreline water bodies other than San Francisco Bay, and creeks, as defined below:

**San Francisco Bay Buffer Zone:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined by Government Code Section 66610, which is the statutory provision of the BCDC’s originating law (the McAteer-Petris Act) that specifies BCDC’s jurisdiction.

**Buffer Zone for Bay shoreline water bodies other than San Francisco Bay:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined by BCDC’s originating law.

**Creek Buffer Zone:** Minimum of 35 feet from the Top of Creek Bank, where there is substantial grade change between the creek bank and the property.

# CHAPTER II | TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

The following text includes template goals, policies, and actions that could be incorporated into a general plan’s safety element, recreation and open space element, land use, and/or environmental justice element. Specific plan policies could also be based on this language and refined to suit the more specific geographic scope of the specific plan area.

## SAFETY OR LAND USE ELEMENTS

### COMMUNITY RESILIENCE

#### GOAL CR-1: INCORPORATE FUTURE CONDITIONS INTO LAND USE PLANNING

*Protect new and/or substantial construction from Future Conditions brought on by climate change by incorporating climate science into land use planning and the development review process.*

#### *Policies*

- A. **Future Conditions Data and Monitoring.** In partnership with OneShoreline, review and use the best available science and projections on Future Conditions and regularly identify the areas of the [City/County] that are vulnerable to these impacts. Use this information to continue to develop or adjust planning and adaptation strategies.<sup>16</sup>
- B. **Future Conditions Planning.** Integrate planning for Future Conditions into all relevant [City/County] processes related to development, including specific plans, zoning ordinance updates, and [City/County] entitlement of new and/or substantial construction.
- C. **Buffer Zone.** Develop a Buffer Zone of 100 feet – at a minimum – from the San Francisco Bay Shoreline and 35 feet – at a minimum – from Top of Creek Bank to provide space to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
- D. **Future Conditions Protection for the Built Environment.** Ensure that new and/or substantial construction is planned and designed to accommodate Future Conditions for the life of the project.

#### FUTURE CONDITIONS

References to “Future Conditions” in the policies and regulations within this document focus on water-related hazards associated with climate change, including increases in flooding, sea level rise, and shallow groundwater rise. However, cities and the County can broaden this definition to include a range of climate change hazards, including wildfire, extreme heat, and drought.

This definition intentionally does not specify a time horizon for “future” (e.g., “mid-century” or “end-of-century”), given the wide range of potential outcomes by the end of the century due to uncertainty in future greenhouse gas emissions and their geophysical effects.



## II. TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

### Actions

- A. **Sea Level Rise Adaptation Plan.** Using the County’s [2018 Sea Level Rise Vulnerability Assessment](#)<sup>17</sup> as a basis, develop a [City/County] Sea Level Rise Adaptation Plan to develop a clearly defined and locally supported suite of adaptation strategies for Future Conditions. Through inclusive, transparent, and sustained engagement with impacted communities, this Plan should expand the understanding of sea level rise risks to the [City/County], communicate these risks to the public, and develop implementable adaptation strategies that pairs updated land use policies, zoning and building code revisions, improved data collection/monitoring, and built and Natural Infrastructure project planning. For any infrastructure project measures, the Plan should include specific recommendations to plan, fund, design and construct such measures and discuss opportunities for regional collaboration and coordination with OneShoreline and other jurisdictions within the same Operational Landscape Unit as set forth by the [San Francisco Bay Shoreline Adaptation Atlas](#).<sup>18</sup>
- B. **Future Conditions Mapping Data.** Maintain and update mapping data pertaining to hazards from Future Conditions, and make this information easily available to the public (either via a [City/County] resource or OneShoreline’s Map of Future Conditions). Updates should occur at least every 5 years.
- C. **Future Conditions Staff.** Identify [City/County] staff who will be responsible for leading the [City/County]’s sea level rise and shallow groundwater rise planning efforts, including coordinating internally with [City/County] departments and externally with relevant agencies.
- D. **Development Standards.** Collaborate with OneShoreline to evaluate, and amend if necessary, the [City/County]’s building code, zoning ordinance, and other development standards to ensure that new and/or substantial construction adequately incorporating major storms, sea level rise, shallow groundwater rise, and other climate impacts into siting and design. Regularly review (at least every five years) and update the building code, zoning ordinance, and development standards to align with best practices, including:

### ONESHORELINE MAP OF FUTURE CONDITIONS

OneShoreline has developed an interactive [online Map of Future Conditions](#) to accompany this guidance document. The Map illustrates 3 data layers: the Bay Protection Standard layer (which contains information on the numeric value of OneShoreline’s Bay Protection Standard for planning purposes) and the Sea Level Rise and Shallow Groundwater Rise Overlay District layers (which illustrates the proposed boundaries of these Overlay Districts recommended in Chapter III). The Map is only available in an online, interactive format to allow frequent updates to keep the Map current with the best available scientific data.

OneShoreline is exploring the potential of using the Map of Future Conditions to host a wider suite of data for coastal, fluvial, and groundwater hazards in San Mateo County, as well as select data on human and asset vulnerability to these hazards. In the meantime, there are a suite of online maps and dashboards that illustrate this data, including the [Our Coast Our Future Hazard Map](#), BCDC’s [Adapting to Rising Tides Bay Shoreline Flood Explorer](#) and [Tidal Datums Tool](#), USGS’s [Hazard Exposure and Reporting Analytics website](#), and the [San Mateo County Hazard Exposure Dashboard](#).

## II. TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

- Develop [City/County] Sea Level Rise Overlay and Shallow Groundwater Rise Overlay District Maps or criteria, illustrating areas prone to hazards due to sea level rise and shallow groundwater rise and subject to relevant resilience regulations;
- Establish Buffer Zones on the Bay shoreline and creeks;
- Require improvements to the Bay Trail and/or access to the Bay Trail where possible;
- Require new and/or substantial construction on properties within 100 feet of the San Francisco Bay to contribute to regional shoreline infrastructure that incorporates natural features to the greatest extent feasible;
- Require new and/or substantial construction proposed in areas subject to hazards to meet a minimum Lowest Floor elevation and elevate critical equipment;
- Require any new stormwater infrastructure to be designed to function under Future Conditions for the life of the project;

## SAFETY ELEMENT

### COMMUNITY RESILIENCE

#### GOAL CR-2: PROTECT CRITICAL FACILITIES AND PUBLIC INFRASTRUCTURE FROM FUTURE CONDITIONS

*Ensure that essential services provided by Critical Facilities<sup>39</sup> and the [City/County]'s planned and existing infrastructure are resilient to Future Conditions.*

#### *Policies*

- Future Conditions Protection.** Ensure that public and Critical Facilities and the [City/County]'s planned and existing infrastructure are planned and designed to accommodate Future Conditions for the life of the project.
- Future Conditions Adaptation.** Provide protection for or relocate public and Critical Facilities in areas vulnerable to Future Conditions over the life of the project to prevent damage and ensure continuity of public and essential services.
- Capital Improvement Projects.** Plan and prioritize capital improvement projects required to protect public and Critical Facilities and services from Future Conditions.
- Future Conditions Planning for Stormwater Infrastructure.** Prepare stormwater systems for Future Conditions to ensure safe conveyance, treatment, and management of stormwater as sea level and groundwaters rise, flooding increases, and rainfall amounts and intensities change over time for the life of the project.

#### CRITICAL FACILITIES

References to "Critical Facilities" in the policies and regulations within this document refer to the elements of the infrastructure that support essential services in a society, including hospitals, fire stations, police stations, storage of critical records, communications systems, major electrical and natural gas distribution facilities, water and waste-water treatment facilities, and similar land uses. These facilities should be sited and designed to a higher standard of protection so that they can continue to function and provide services during and after hazard events, as well as under daily Future Conditions.

## II. TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

### Actions

- A. Develop Sea Level Rise Capital Planning Policy.** Develop a policy and process to analyze and plan capital projects vulnerable to Future Conditions over the life of the project. The process should evaluate set forth an Adaptation Pathway for capital projects based on project lifespan, vulnerability to damage and closure during a storm event, and risk of costly repairs and impact of disruption of public services.
- B. Assess Vulnerability of Existing Critical Facilities and Public Infrastructure and Plan for Adaptation.** Identify Critical Facilities and public infrastructure vulnerable to Future Conditions over the life of the project and plan upgrades to these facilities with consideration for future increases in flooding, sea level rise, and shallow groundwater rise that may occur over the anticipated life of the asset. In cases where facilities cannot be sustainably maintained, relocation should be evaluated. Where facilities can be safely sited for the near term, but future impacts are likely, require an Adaptation Pathway detailing steps for maintenance, retrofitting, and/or relocation.
- C. Siting and Designing New Critical Facilities and Public Infrastructure.** Site new Critical Facilities and public infrastructure in areas that are not vulnerable to Future Conditions. If new Critical Facilities and public infrastructure cannot be located outside of areas prone to flooding, sea level rise, and shallow groundwater rise, ensure that facilities are constructed to appropriate standards to maintain operations under these Future Conditions over the life of the project.
- D. Develop and Maintain Resilient Infrastructure Standards.** Develop and periodically adjust infrastructure design standards to address asset-specific vulnerabilities associated with future flooding, sea level rise, and shallow groundwater rise.
- E. Incorporating Future Conditions into Design of New Stormwater Infrastructure.** Incorporate Future Conditions – including changes in hydrology and extreme precipitation events like atmospheric rivers under future climate scenarios – into the design of all new public and private stormwater infrastructure.

### CAPITAL PLANNING FOR THE IMPACTS OF FUTURE CONDITIONS

While this guidance document contains General Plan policies that pertain to critical facilities and public infrastructure, it does not provide specific guidance on a process for capital planning or Adaptation Pathways for existing public assets impacted by Future Conditions.

In 2024, OneShoreline anticipates issuing a complementary guidance document on integrating Future Conditions into capital planning. In the meantime, cities and the County are welcome to contact OneShoreline for technical assistance in reviewing capital projects that may be vulnerable to anticipated increases in flooding, sea level rise, and shallow groundwater rise. For reference, similar capital planning guidance documents have been prepared by the County of San Mateo and the City of San Francisco. The City of San Francisco has developed a [Sea Level Rise Capital Planning Guidance Document](#) and [Checklist](#). The County of San Mateo has developed a [Sea Level Rise Policy for County-Owned Assets](#).

### GOAL CR-3: ADAPT TO HAZARDS CAUSED BY SHALLOW GROUNDWATER RISE

*Adapt to existing and future hazards caused by rising shallow groundwater associated with sea level rise.*

## II. TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

### *Policies*

- A. **Private Development Vulnerability Assessment and Mitigation.** Based on the geotechnical data collected onsite, new and/or substantial construction shall assess the project's vulnerability to shallow groundwater rise and incorporate project measures that will monitor and mitigate seasonal and permanent impacts, including buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards.

### *Actions*

- A. **Shallow Groundwater Rise Vulnerability Assessment.** Coordinate with OneShoreline and adjacent jurisdictions as appropriate to establish a detailed understanding of the effects of rising shallow groundwater on people, ecological assets, and the built environment in the [City/County]. This includes buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards. This assessment should have an interactive map component (either via a [City/County] resource or OneShoreline's Map of Future Conditions) that will be updated based on site-specific geotechnical and topographic data submitted by new developments.
- B. **Shallow Groundwater Rise Adaptation.** Coordinate with OneShoreline and adjacent jurisdictions as appropriate to incorporate regionally coordinated adaptation strategies for shallow groundwater rise into the [City/County]'s Sea Level Rise Adaptation Plan. Adaptation strategies can include updated land use policies, building code revisions, infrastructure investments, better monitoring systems, and nature-based solutions. As a first step, ensure new development and substantial construction, and adjacent areas, account for rising groundwater levels in project design.

### **GOAL CR-4: ALIGN WITH EXISTING FLOODPLAIN MANAGEMENT AND FEMA PROGRAMS**

*Synchronize new policies and regulations related to Future Conditions with existing floodplain management and associated FEMA requirements, as well as increase participation in FEMA programs.*

### *Policies*

- A. **Alignment with FEMA Floodplain Management Regulations.** Per Title 44, Section 59 of the Code of Federal Regulations, in order to qualify for the sale of federally subsidized flood insurance through FEMA's National Flood Insurance Program (NFIP), a community must adopt floodplain management regulations, satisfying FEMA's minimum criteria to reduce or avoid future flood damages. These floodplain management regulations should be updated to align with State and OneShoreline recommendations and incorporate Future Conditions.
- B. **Increase Uptake in Flood Insurance.** Explore educational and cost-share methods of increasing uptake in flood insurance in households that are not required to purchase insurance, but that reside in areas with increasing flood risk.
- C. **Maximize the Benefits of the National Flood Insurance Program's Community Rating System (CRS).** FEMA has established the CRS, which credits community efforts that go beyond the minimum standards established for floodplain management and awards reduced flood insurance premiums for the community's property owners. The [City/County]

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should establish participation in CRS and realize the full extent of the program's benefits, which reduce flood insurance premiums and can help save lives and property when a flood occurs.

### Actions

- A. **Floodplain Ordinance Update.** Update the [City/County] Floodplain Ordinance to align with State and OneShoreline recommendations and incorporate Future Conditions.
- B. **Coordination with Floodplain Administrator.** Per Title 44, Section 59 of the Code of Federal Regulations, in order to qualify for the sale of federally subsidized flood insurance through FEMA's National Flood Insurance Program, a community must appoint or designate an official responsible to develop and implement floodplain management regulations and submit all required reporting concerning the community participation in the NFIP. This floodplain administrator should collaborate directly with [City/County] staff responsible for sea level rise and shallow groundwater rise planning efforts and OneShoreline to synchronize relevant management and reporting efforts, including the review of specific developments in the Sea Level Rise and Shallow Groundwater Rise Overlay Districts.
- C. **Establish Participation in CRS.** Work with OneShoreline to apply to participate in the CRS to allow for opportunities for property owners in the floodplain to achieve reductions in their flood insurance premiums. This includes submitting a letter of interest to FEMA and appointing a CRS coordinator to serve as the liaison between the community and FEMA.
- D. **Host CRS Training.** Work with OneShoreline and FEMA to host a CRS training with all relevant [City/County] staff that provides an overview of the CRS program, including eligible activities and required documentation to maintain participation in CRS.
- E. **Earn CRS Credit and Achieve Premium Discounts.** Work with OneShoreline to initiate and document activities to earn CRS credit and achieve premium discounts, focused on activities that can be used by all jurisdictions to lower insurance rates for their property owners and on preparing documentation that verifies any already-ongoing eligible CRS activities. This includes working with the floodplain administrator to document elevation certifications for all buildings built in the FEMA Special Flood Hazard Area (SFHA) after the date of application to the CRS and maintaining these records for public inspection.

### COMMUNITY RATING SYSTEM SUPPORT FROM ONSHORELINE

Only 4 of the 20 cities in San Mateo County, and San Mateo County itself, currently participate in the CRS program, despite all Cities having at least one property (and many have hundreds) participating in the National Flood Insurance Program (NFIP). Further, the jurisdictions that do participate in CRS often do not realize the full extent of the program's benefits. Anecdotal evidence suggests there is a lack of city staff capacity to enroll in CRS and coordinate related activities. Many of these activities can be done most efficiently in a multi-jurisdictional context, which is why, with funding from the County, OneShoreline plans to provide support to all cities that wish to apply for and fully participate in CRS. Please reach out directly to OneShoreline to explore what support OneShoreline can provide for your city.

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### GOAL CR 5: PRIORITIZE AND SUPPORT NATURAL INFRASTRUCTURE AND SENSITIVE HABITATS

*Prioritize Natural Infrastructure to the greatest extent feasible when adapting to Future Conditions.*

#### *Policies*

##### A. **Natural Infrastructure in Shoreline**

**Protection.** Prioritize the use of Natural Infrastructure, including the protection, restoration, and expansion of existing coastal habitats, consistent with the Open Space and Conservation element habitat conservation policies. Shoreline infrastructure projects should evaluate the use or restoration of natural features and ecosystem processes – such as tidal marshes, eelgrass, mudflats, beaches, and oyster reefs – and incorporate these features to the greatest extent feasible to conserve ecosystem values and functions, which benefit people and wildlife.<sup>20</sup>

B. **Shoreline Barrier Location.** Require that shoreline barriers are sited as landward as possible within the Buffer Zone to provide as much space as possible for rising Bay water levels, incorporation of natural elements, sensitive habitats, and future Bayland-upland transition zone habitat migration.

C. **Future Conditions Protection for Ecological Assets.** Protect critical existing ecological assets from Future Conditions brought on by climate change by accounting for these assets in land use planning and shoreline infrastructure project development. This includes protecting sensitive habitats within Buffer Zones adjacent to planned shoreline infrastructure projects, as well as planning for and accommodate upland migration of habitats vulnerable to sea level rise.

D. **Intertidal and Subtidal Habitat Conservation and Restoration.** Promote the conservation, restoration, and enhancement of intertidal and subtidal habitats, which can help reduce impacts on shoreline infrastructure.

E. **Strengthen Creek-to-Baylands Connections.**<sup>21</sup> Enhance creek-to-Baylands connections and increase sediment delivery to link sediment transport from upland watersheds to coastal habitats, and support upland migration of wetlands due to sea level rise.

#### **MIGRATION OF THE SHORELINE**

The location of the proposed Bay Buffer Zone is based off the location of the San Francisco Bay Shoreline, as defined by the same statutory provision that specifies BCDC's jurisdiction. Since this provision defines the Bay Shoreline by the location of the Mean High Tide line, the Bay Shoreline as defined by the State - and thus the Bay Buffer Zone proposed by OneShoreline – will be subject to landward migration as the sea level rises. This landward migration will provide space for Bayland-upland transition zone habitats. In addition, designating a wider Buffer Zone where feasible plays an important role in accommodating habitat migration.

#### *Actions*

A. **Habitat Buffers.** By requiring a Buffer Zone wider than the minimum where feasible, encourage shoreline development projects and associated infrastructure to be sited such that they do not encroach upon Bayland-upland transition zone habitats and provide adequate space to accommodate upland migration of habitats vulnerable to sea level rise.

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- B. **Native Plants.** Require that shoreline development projects and other projects including habitat restoration include native plantings consistent with BCDC Policies and Design Guidelines.
- C. **Removal of Hard Infrastructure.** To allow opportunities to restore ecological value to shorelines and creek banks and restore natural floodplain processes for increased flood protection, existing hard protection should be removed when the structure(s) no longer requires a hard protective structure (e.g., redeveloped or demolished).
- D. **Economic Incentives.**<sup>22</sup> Use Transfer of Development Rights (TDR) programs, tax credits, and other strategies to encourage transition of development away from the shoreline in areas identified as high opportunity for nature-based adaptation.

### GOAL CR-6: REGIONAL COLLABORATION

*Develop regionally coordinated climate adaptation measures, programs, and resilience projects.*

#### *Policies*

- A. **Regional Coordination.** Coordinate with OneShoreline, adjacent jurisdictions, neighboring counties, and regional, state, and federal agencies to develop and implement coordinated approaches to sea level rise with other jurisdictions and asset owners in San Mateo County.
- B. **Cross-Jurisdictional Collaboration.** Promote cross-jurisdictional project scoping and planning to position all neighborhoods equitably for success.
- C. **Cross-Sector Collaboration.** Promote cross-sector project scoping and planning to leverage resources and expertise from local government, community-based organizations, and private businesses.
- D. **Cross-Disciplinary Collaboration.** Promote cross-disciplinary project scoping and planning to incorporate climate resilience into all areas impacting community life and well-being, including water, ecology, energy, land use, housing, transportation, and safety.

#### **BCDC'S REGIONAL STRATEGY**

Through its [Bay Adapt](#) program, BCDC is currently undergoing a process to develop a regional sea level rise adaptation strategy for the nine-county Bay Area. OneShoreline believes that climate change is already upon us and the existential challenge it presents requires all levels of government to act now. Just as OneShoreline engaged with BCDC when developing this Planning Policy Guidance, BCDC's Bay Adapt program has expressed interest in learning from the development and implementation of this document in San Mateo County.

#### *Actions*

- A. **Requirement for OneShoreline Review of Development in Flood Zones.** For proposed developments in the San Bruno Creek Flood Zone and Colma Creek Flood Zone that require modification of site storm drain systems and site runoffs, the [City/County] shall include OneShoreline in the project/plan review process, as OneShoreline is the administrator of these property tax-funded Zones and also has land rights in these Zones.
- B. **Multi-Agency Review of Development in Areas Vulnerable to Future Conditions.** Coordinate with OneShoreline, BCDC, and other responsible agencies early in the development review process to ensure that new development where any portion of the

## II. TEMPLATE LANGUAGE FOR GENERAL PLAN AND SPECIFIC PLANS

parcel is located in the San Francisco Bay Buffer Zone or a Creek Buffer Zone evaluates water-related risks, incorporates resilient design practices, and aligns with regional protection projects.

### EMERGENCY READINESS AND EMERGENCY OPERATIONS

#### GOAL ER-1: EMERGENCY RESPONSE

*Provide efficient, effective, and equitable emergency response in the immediate aftermath of a disaster caused by natural or manmade hazards.*

#### *Policies*

- A. **Flood Early Warning.** Collaborate with OneShoreline to provide flood early warning for flood-prone areas of the [City/County] through OneShoreline’s flood early warning notification system, as needed.
- B. **Access to Emergency Shelters and Evacuation Points.** Ensure that shelters and temporary evacuation points are fully accessible to all community members, regardless of access and functional needs, language spoken, age, or immigration status.
- C. **Equitable Emergency Communications.** Make emergency communications and information available in multiple languages and conduct multilingual community outreach to ensure all residents subscribe to the appropriate emergency notification systems.
- D. **Community-Centered Disaster Response.** Educate and engage with hazard-prone communities to facilitate improved household- and neighborhood-level preparedness and knowledge of how to respond to a disaster.
- E. **Collaboration with Community Partners.**<sup>23</sup> Establish ongoing partnerships and regular communication with Community Emergency Response Teams (CERTs), Community Organizations Active in Disaster (COADs), and community-based organizations, and nonprofits to support community education and preparedness and to coordinate community-centered disaster response.
- F. **Build Social Support Networks.** Support efforts by residents and community-based organizations to strengthen social support networks to improve local preparedness and respond to and recover from incidents. This includes coordination with OneShoreline on its [name relevant Emergency Action Plan currently being developed, if applicable].

#### *Actions*

- A. **Emergency Notification System.** Participate in OneShoreline’s flood early warning notification system to alert flood-prone neighborhoods and businesses before, during, and after a climate hazard event and assist in their evacuation, if needed.
- B. **Emergency Action Plans.** Where OneShoreline is not currently developing a multi-jurisdictional Emergency Action Plan (EAP),<sup>24</sup> develop an EAP for [insert flood-prone watershed here] with the cities of XXX [name adjacent jurisdictions in watershed] to define flood management and mitigation responsibilities before, during and after flood events, amongst key partners (including agency staff and community-based organizations), and outline methods to develop and deliver key flood data to these partners and the public in case of a flood emergency.



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- C. **Emergency Access Routes.** Evaluate existing emergency access routes for risk of flooding and develop alternative routes and other approaches to reduce risk and ensure access route viability during flood events.

## PUBLIC ACCESS, RECREATION, AND CONNECTIVITY

### GOAL PA-1: PUBLIC ACCESS

*Expand and maintain Public Access along and to the San Francisco Bay shoreline and creeks [insert specific waterbodies as applicable locally].*

#### Policies

- A. **Public Access in Buffer Zones.** Require that new development in higher density residential or commercial areas adjacent to the San Francisco Bay shoreline or creeks provide and maintain Public Access within the Bay and Creek Buffer Zones based on the [City/County]-adopted guidelines and BCDC Policies and Design Guidelines. Public Access along these water bodies shall be provided in perpetuity, including dedicating appropriate access easements to the [City/County] at no cost to the public in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties.
- B. **Public Access to Buffer Zones.**<sup>25</sup> Require that new development in higher density residential or commercial areas adjacent to the San Francisco Bay shoreline or creeks provide Public Access through a site to/from the Bay and Creek Buffer Zones, based on BCDC Policies and Design Guidelines. Public Access to these water bodies shall be provided in perpetuity, including dedicating appropriate access easements to the [City/County] at no cost to the public in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties.
- C. **Future Conditions for Public Access.** Require Public Access to remain viable in the event of future flooding, sea level rise, and shallow groundwater rise, or provide equivalent access consistent with the project as existing access is impacted by Future Conditions over the life of the project in accordance with BCDC Policies and Design Guidelines.

#### PUBLIC ACCESS

Consistent with BCDC Policies and Design Guidelines, Public Access includes physical access such as Bay shoreline trails, access to those trails from other locations, as well as visual public access to the Bay from other public spaces. Public Access also includes services and amenities that encourage Bay-related activities, such as plazas, parking spaces, landscaping, site furnishings, overlooks, and viewing opportunities along the shoreline.

#### Actions

- A. **Gaps in the Bay Trail.** Eliminate gaps in the Bay Trail [where applicable](#)<sup>26</sup> in coordination with the Metropolitan Transportation Commission/Association of Bay Area Governments Bay Trail Program by requiring new shoreline development and redevelopment to construct missing Bay Trail segments.

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- B. **Low-impact Design.** Employ siting, design and management strategies that avoid or minimize adverse effects on sensitive wildlife and habitats for all new Public Access facilities.

## ENVIRONMENTAL JUSTICE AND EQUITY

### **GOAL EJ-1: PRIORITIZE DISADVANTAGED, VULNERABLE, AND UNDERREPRESENTED COMMUNITIES.**

*Prioritize the disadvantaged, vulnerable, and underrepresented communities in risk reduction strategies related to climate change impacts and protect from current practices and policies harmful to these communities.*

#### *Policies*

- A. **Define Disadvantaged, Vulnerable and Underrepresented Communities.** Define the following communities throughout [City/County] planning documents and processes, using definitions outlined by the San Francisco Bay Conservation and Development Commission's (BCDC's) Bay Plan<sup>27</sup>:
- i. **Disadvantaged Communities:** Communities disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation; and communities that are of low-income, high unemployment, low levels of home ownership, high rent burden, sensitive populations, or low levels of educational attainment (California Health and Safety Code §39711).
  - ii. **Vulnerable Communities:** Communities co-located in areas with current/future flood risk and in areas with high concentrations of households exhibiting factors that can reduce access to or capacity for preparedness and recovery.
  - iii. **Underrepresented Communities:** Communities that have been historically and are still systematically excluded from political and policy-making processes.
- B. **Identify Disadvantaged, Vulnerable and Underrepresented Communities.** Review environmental and past/present population characteristics to identify and map Disadvantaged, Vulnerable, and Underrepresented Communities in the [City/County].
- C. **Prioritize Disadvantaged, Vulnerable and Underrepresented Communities.** Ensure that planning and implementation prioritizes Disadvantaged, Vulnerable and Underrepresented Communities, by developing risk reduction measures in these Communities that address the dual burden of environmental injustice and climate change impacts.
- D. **Community Capacity Building.** Reduce barriers and strengthen Disadvantaged, Vulnerable and Underrepresented Communities' capacity to participate and lead local planning and decision-making around adaptation to Future Conditions.
- E. **Invest in Existing Community-Based Efforts.** Identify synergies in the [City/County] mission and goals with those of community-based organizations already doing relevant work and invest resources in those organizations to build capacity and empowerment.
- F. **Transparency.**<sup>28</sup> Continually build accountability, transparency, and accessibility into [City/County] programs and processes.

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- G. **Compensation.** Provide fair compensation for time and expertise of community members and community-based organizations for efforts in service to a project. All partnerships with community-based organizations should involve a funding agreement, unless explicitly noted and mutually agreed upon by all parties.
- H. **Contaminant Mobilization.** Study and develop mitigation measures to reduce community exposure to contaminants, particularly those that may be mobilized through shallow groundwater rise.
- I. **Anti-Displacement Policy.** Reduce the harmful impacts of displacement from climate change on individuals, families, and communities by pursuing strategies to create opportunities for existing residents to benefit from adaptation efforts by:
- Creating local employment and economic opportunities for low-income residents and local small businesses;
  - Expanding and preserving existing housing opportunities available to low-income residents;
  - Connecting low-income residents to resources available at the city, county, state, and federal levels to increase resilience;
  - Siting new affordable housing projects outside of areas vulnerable to Future Conditions or incorporating flood-resilient development techniques if site selection is constrained;
  - Preserving cultural and social resources; and
  - Creating and implementing tools to evaluate and mitigate the potential displacement caused by large-scale investment and infrastructure.

### *Actions*

- A. **Culturally and Linguistically Appropriate Communication.**<sup>29</sup> Provide culturally and linguistically appropriate communication related to [City/County] climate change risk reduction efforts, including targeted outreach efforts to Underrepresented Communities (including low-income people, working people, parents and guardians, people of color, people that have limited English language skills, people with disabilities, people with limited transportation options, and others).
- B. **Project Outreach.**<sup>30</sup> Provide consistent community outreach and engagement from the start of a project and throughout project design, permitting, and construction, with outreach beginning as early as possible in the project planning process, ideally at project onset. Define the metrics used to measure successful and consistent outreach and assess performance against these metrics at regular intervals throughout the project.
- C. **Provide Technical Support to Community-Based Organizations.**<sup>31</sup> Develop long-term and sustained programs and trusted partnerships with community-based organizations. These programs should equip communities with the tools and knowledge needed to participate and lead in adaptation planning and decision-making, such as grant writing assistance programs, and trainings to improve technical and political literacy related to sea level rise adaptation. Therefore, when technical plans and projects are developed, community members are better situated to understand and merge technical knowledge with a localized, place-based understanding to inform decision-making impacting their community.

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- D. **Elevate Communities to Lead.**<sup>32</sup> If they do not already exist, create community-led decision-making bodies and/or voting representatives that are well-positioned to shape and provide ongoing direction in adaptation planning, projects, and priorities in the [City/County]. Such an effort shall elevate community members to positions of authority in planning decisions beyond advisory roles and provide community members the tools to succeed in those positions to ensure that adaptation is grounded in local vision and needs.
- E. **Partner with Tribal Governments.**<sup>33</sup> Develop or strengthen formal partnerships and coordination with tribal governments to (a) recognize the California Native American communities who first inhabited the Bay Area and their cultural connection to the natural resources of the region, and (b) incorporate tribal history and cultural resources into adaptation plans, projects, and priorities in the [City/County].
- F. **Identify and Mitigate Disproportionate Project Impacts.**<sup>34</sup> Identify whether a community would experience disproportionate adverse economic, environmental, and social impacts from flooding, sea level rise, and shallow groundwater rise projects, and if so, seek to mitigate these impacts.
- G. **Staff Training.**<sup>35</sup> Host trainings for [City/County] staff on topics including general environmental justice and local histories, community mapping, culturally appropriate communication, meaningful community engagement at all phases of project planning, use of community benefit agreements, alternative approaches to traditional cost-benefit analyses that elevate community value and measuring successful engagement.

### WHAT DOES COMMUNITY-LED ADAPTATION PLANNING LOOK LIKE?

Some examples of community-led programs, which offer models for how to meaningfully engage community members in adaptation planning in the Bay Area, include [Climate Resilient Communities](#), [North Fair Oaks Community Alliance](#), the [East Oakland Neighborhood Initiative](#), the [Marin City People's Plan](#), and the [West Oakland Environmental Indicators Project \(WOEIP\)](#).

Other key resources to help jurisdictions and agencies meaningfully embed equity into policies and programs focused on climate adaptation and community resilience include the [Greenlining Institute's Guidebook](#), the [WOEIP's Equity Checklist and Sample Partnering Agreement](#), and the [Bay Area Regional Health Inequities Initiative \(BARHII\) Farther Together Guidebook](#).

# CHAPTER III | TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

The following text includes sample Sea Level Rise Overlay District and Shallow Groundwater Rise Overlay District Zoning Text Amendments. Key documents consulted to develop sample language include the City of Boston [Coastal Flood Resilience Overlay District](#) (Article 25A), City of Burlingame [Public Access, Flood and Sea Level Rise Performance Guidelines](#) (Section 25.12.050), [City of South San Francisco Flood Plain/Sea Level Rise \(SLR\) Overlay District](#) (Chapter 20.180), and [Shallow Groundwater Response to Sea-Level Rise: Alameda, Marin, San Francisco, and San Mateo Counties](#) (prepared by Pathways Climate Institute and San Francisco Estuary Institute).

The Overlay Districts’ regulations intend to enhance the resilience of private development and surrounding communities that are vulnerable to sea level rise, through the following key methods:

- **Buffer Zones:** Providing space and land along the San Francisco Bay and creeks for human-designed and Natural Infrastructure to protect against floodwaters and accommodate rising sea levels;
- **Shoreline Protection:** Requiring private developers of shoreline properties to construct shoreline infrastructure meeting the Bay Protection Standard;
- **Elevating Development:** Requiring Lowest Floor elevations above FEMA’s Base Flood Elevation to improve resilience to multiple hazards, including fluvial flooding and sea level rise;
- **Stormwater Drainage Updates:** Requiring changes in hydrology due to climate change to be incorporated into the design of any new stormwater infrastructure; and
- **Shallow Groundwater Rise:** Establishing development standards to protect the community from existing and future threats from the response of shallow groundwater to sea level rise.

The Shallow Groundwater Rise Overlay District overlaps with the Sea Level Rise Overlay District in many geographic areas. Should a project be located in both the Sea Level Rise

## BCDC POLICIES AND DESIGN GUIDELINES

New and/or substantial construction in BCDC’s jurisdiction will require a BCDC permit and thus be subject to a determination as to whether the project meets BCDC Policies and Design Guidelines. While there are many synergies between the objectives and recommendations of this guidance document and BCDC Policies and Design Guidelines, there are also areas where OneShoreline and BCDC objectives currently differ. That should not be surprising, given that this guidance document is the first-of-its-kind in the Bay Area and that incorporating climate resilience into land use planning is an evolving area of State and local policy. Inconsistencies between provisions adopted by cities based on this document and BCDC Policies and Design Guidelines can be resolved through discussions among these agencies and project proponents.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

Overlay District and the Shallow Groundwater Rise Overlay District, the standards of both Districts must be met.

Jurisdictions may want to increase the scale of these measures if a location is at particularly high risk, the land use is sensitive, or if the building is a critical facility that must maintain operations and access during flood events. At a minimum, it is critical that landowners and developers provide adequate space for future infrastructure development and the land rights to use that space in order to build resilience into communities.

## SEA LEVEL RISE OVERLAY DISTRICT

### XX.XX.010 DEFINITIONS

- A. **Application Date:** The Application Date is the date a complete application is accepted by the [City/County], which is distinct from the date the application is deemed complete.
- B. **Adjacent:** Directly abutting, having a boundary or property line(s) in common or bordering directly, or contiguous to.
- C. **Bay Protection Standard:** The Bay Protection Standard is the FEMA Coastal Base Flood Elevation of the water at that shoreline location plus 6 feet (FEMA Coastal BFE + 6 feet).
- D. **Buffer Zone:** Space to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access off the San Francisco Bay Shoreline, Bay shoreline water bodies other than San Francisco Bay, and creeks. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
  - i. **San Francisco Bay Buffer Zone:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined in XX.XX.010.O.
  - ii. **Bay shoreline water bodies other than San Francisco Bay:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined in XX.XX.010.O.
  - iii. **Creek Buffer Zone:** Minimum of 35 feet from the Top of Creek Bank, as defined in XX.XX.010.R.

### BFE + 3 vs BFE + 6

The Guidance includes two elevation standards for different purposes:

**BFE + 3 (or the SLR-BFE)** defines the recommended Lowest Floor elevation for a building located in the Sea Level Rise Overlay District.

**BFE + 6 (or the Bay Protection Standard)** defines the recommended minimum elevation required at the top of any shoreline infrastructure along the San Francisco Bay Shoreline.

These two elevation standards can work together to address different interrelated hazards, as increased Lowest Floor elevations can protect structures against creek and rising groundwater flooding, while shoreline infrastructure addresses waves and flooding from the Bay.

For pump stations and other flood protection infrastructure along the shoreline, jurisdictions are invited to consult with OneShoreline until it issues a complementary guidance document on capital planning, anticipated in 2024.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- E. **Critical Equipment:** Critical Equipment means building equipment, instrumentation, controls, or systems whose malfunction or failure would likely result in a high-consequence event that would compromise the safety of those in the building, or whose proper operation is required to mitigate the consequences of such an event.
- F. **Critical Facilities:**<sup>36</sup> Critical facilities are elements of the infrastructure that support essential services in a society, including hospitals, fire stations, police stations, storage of critical records, communications systems, major electrical and natural gas distribution facilities, water and waste-water treatment facilities, and similar land uses. These facilities should be sited and designed to a higher standard of protection so that they can continue to function and provide services during and after hazard events.
- G. **Dwelling Units:** Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking, and sanitation, for not more than one family (one or more persons living together as a single nonprofit housekeeping unit). Members of a family need not be related by blood but are distinguished from a group occupying a hotel, club, fraternity or sorority house.
- H. **Existing Grade:** The existing elevation (prior to grading) of the ground surface adjacent to the proposed building footprint at a given point.
- I. **Future Conditions:** Anticipated increases in flooding, sea level rise, and shallow groundwater rise due to climate change. This definition intentionally does not specify a time horizon for “future” (e.g., “mid-century” or “end-of-century”), given the wide range of potential outcomes by the end of the century due to uncertainty in future greenhouse gas emissions and their geophysical effects.
- J. **Health Care Facility:** Any facility that is organized, maintained, and operated for the diagnosis, care, prevention, and treatment of human illness, physical or mental, for one or more person, to which the persons are admitted for a 24-hour stay or longer for any of the following or similar purposes: skilled nursing facility, intermediate care facility, congregate living health facility, nursing facility, or chemical dependency recovery hospital.
- K. **Lowest Floor:**<sup>37</sup> The lowest floor of the lowest enclosed area of a building (including basement).
- L. **Natural Infrastructure:**<sup>38</sup> The use or restoration of natural ecological systems or processes to reduce vulnerability to climate change related hazards while increasing the long-term adaptive capacity of coastal and inland areas. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as beaches, dunes, tidal marshes, reefs, seagrass, parks, rain gardens, and urban tree canopies. It also includes engineered systems and practices that use or mimic natural processes – such as permeable pavement, bioswales, and ecotone levees – to conserve ecosystem values and functions, which benefit people and wildlife.
- M. **Public Access:**<sup>39</sup> Consistent with BCDC Policies and Design Guidelines, Public Access includes physical access such as Bay shoreline trails, access to those trails from other locations, as well as visual public access to the Bay from other public spaces. Public Access also includes services and amenities that encourage Bay-related activities, such as plazas, parking spaces, landscaping, site furnishings, overlooks, and viewing opportunities along the shoreline.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- N. **Resilience Infrastructure Project:** A Resilience Infrastructure Project is a sea level rise adaptation project along San Mateo County's San Francisco Bay Shoreline or along the tidally influenced reaches of creeks and other waterbodies that is built to the Bay Protection Standard. The implementation of this Standard can be realized in phases, as long as Buffer Zones and easements are provided now through the development approval process.
- O. **San Francisco Bay Shoreline:** As defined by Government Code Section 66610, which is the statutory provision of the BCDC's originating law (the McAteer-Petris Act<sup>40</sup>) that specifies BCDC's jurisdiction.
- P. **Sea Level Rise Base Flood Elevation (SLR-BFE):** The SLR-BFE is defined as 3 feet above the project site's Base Flood Elevation (BFE) on the FEMA Flood Insurance Rate Map in effect at the time of the Application Date. Where no BFE exists, the SLR-BFE shall be at least 3 feet above the existing grade. If the site is sloped, the average existing grade shall be used.
- Q. **Stormwater Management Feature:**<sup>41</sup> Examples of stormwater management features that may be used to reduce the peak flow and/or runoff volume to undeveloped conditions include drywells, detention basins, bioretention areas, subsurface infiltration systems, infiltration trenches, and pervious pavement.
- R. **Top of Creek Bank:** The line connecting all the points where there is substantial grade change between the creek bank and the property as determined by the applicant's engineer and subject to the review and approval of the [City/County] Engineer. Where a fully channelized waterway exists, Top of Creek Bank is the highest edge of the engineered channel.

#### XX.XX.020 PURPOSE AND INTENT

The Sea Level Rise Overlay District is intended to protect the community from existing and future overland flooding and sea level rise by establishing locally sensitive and regionally coordinated regulations addressing these hazards. New development and substantial improvement projects are intended to function for decades, during which time the impacts of climate change will grow, and thus these projects should be designed to function under Future Conditions, including higher sea levels and more intense storms, and be synchronized with regional solutions to address this transformative challenge. Incorporating climate resilience into the siting and building of these assets now will avoid the much more difficult and costly effort to retrofit these assets later. The specific purposes of the Sea Level Rise Overlay District are to:

- A. Minimize damage to and destruction of life and property.
- B. Establish development standards that are aligned across jurisdictions to ensure synchronized resilience on a regional scale in San Mateo County.
- C. Sustain the viability of built assets in the floodplain over their proposed project life.
- D. Adapt to Future Conditions by providing protection along creeks and the Bay shoreline built to a standard design elevation.



### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- E. Work with nature to the greatest extent feasible by creating space and Natural Infrastructure to enable diverse, self-sustaining shoreline habitats that can survive future climate conditions over time.
- F. Establish standards consistent with the guiding principles and objectives of OneShoreline.

#### XX.XX.030 APPLICABILITY

##### A. Geography.

1. **Sea Level Rise Overlay District Boundaries.** The provisions of this chapter shall apply to all areas of the [City/County] within the Sea Level Rise Overlay District. The Sea Level Rise Overlay District includes the area identified in the Our Coast, Our Future Hazard Map<sup>42</sup> as the 100-year flood plus 6.6 feet of sea level rise (based on modeling results<sup>43</sup> from the U.S. Geological Survey).
2. **Sea Level Rise Overlay District Map.**<sup>44</sup> The [City/County] Sea Level Rise Overlay District Map (SLR Map) was adopted by the [City Council/County Board of Supervisors] based on the criteria in subsection (1) of this section to provide community resilience to sea level rise and storms. The SLR Map may be revised by the [City Council/County Board of Supervisors] based on updates to the FEMA Federal Insurance Rate Map, sea level rise science, monitoring results, and shoreline and creek conditions. The applicable SLR Map to a development application shall be the SLR Map currently in effect at the time of the Application Date.
3. **Parcel Applicability.** Any parcel with a portion of land located within the Sea Level Rise Overlay District, as defined in subsection (1) and illustrated by the SLR Map in subsection (2), shall be considered to be within the Sea Level Rise Overlay District and the regulations of this Chapter shall apply to the entirety of the parcel.
4. **Additional Areas.** In addition, the [City/County] Engineer or Community and Economic Development Director may require that standards of the Sea Level Rise Overlay District apply to properties outside the Overlay District based on maps and other studies, which document the existence of potential flooding or sea level rise hazards that warrant evaluation.
5. **Appeals.** The [City/County] Engineer or Community and Economic Development Director shall make interpretations, where needed, as to the exact boundaries of the Sea Level Rise Overlay District. If the sea level rise or flood hazard information on which the

#### MAP ADOPTION APPROACH

The language provided in Section XX.XX.030 provides flexibility for jurisdictions to either simply define the overlay area by the criteria in subsection (1) *or* to define the criteria *and* adopt a Map as set forth in subsection (2).

OneShoreline does not recommend rezoning specific properties by Ordinance, as the map should be reviewed and may need to be adjusted at least every 5 years to reflect the most current sea level rise projections.

OneShoreline recommends any map actions occur via resolution of the City Council or County Board of Supervisors. Regardless of the map approach taken, cities/the County should incorporate a Sea Level Rise Overlay Map layer onto interactive GIS platforms so that the information is transparent and accessible to the public. OneShoreline is available to provide technical assistance to jurisdictions on this mapping effort.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

boundaries of the Overlay District are based does not reflect actual site conditions, the [City/County] Engineer or Community and Economic Development Director may determine that a location is within or outside the Overlay District, based on site-specific data provided by a licensed professional surveyor or licensed professional engineer retained by the applicant. The [City/County]'s determination may be appealed to the [Board of Appeal] under the provisions of Section [Appeal Chapter/Section] of this Code.

- B. **Project Type.** The provisions of this Section [XX] shall apply to the following project types within the Sea Level Rise Overlay District boundaries:

[Note to City/County staff: Two options are provided for consideration in this section, one of which relies upon a size threshold and the other of which relies upon wall demolition. Both options include retrofit thresholds based on improvement cost relative to building value, which is consistent with FEMA standards for the floodplain ordinance. City and County staff should consider this as a menu of options and select the most appropriate thresholds to harmonize with existing regulations. All Shoreline Developments should be considered to be in the Sea Level Rise Overlay District.]

1. **Shoreline Development.** Any development lying in whole or in part within the San Francisco 100-foot Bay Buffer Zone or within the Creek 35-foot Buffer Zone.

[Size Threshold Option]<sup>45</sup>

2. **New or Addition of Gross Floor Area.** New construction or expansion of one or more buildings that results in the addition of an aggregate gross floor area of [xx] or more square feet.
3. **Dwelling Units.** Any proposed project for the construction of [xx] or more Dwelling Units (but not including rehabilitation or alteration projects unless they result in a net increase of [xx] or more Dwelling Units).
4. **Change of Use.** The change of the permitted or conditionally permitted uses of a gross floor area of [xx] or more square feet.
5. **Substantial Improvement.**<sup>46</sup> The renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building and that has, or will have after rehabilitation, a gross floor area of [xx] or more square feet.

[All Substantial Development Option]

6. **Substantial Construction.** Construction of a wholly new building, or removal or reconstruction of 50% or more of the exterior walls of a building.
7. **Substantial Improvement.**<sup>47</sup> The renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building.

- C. **Exemption for Low-Density Residential Land Uses.** Single-family homes, duplexes, and low-density multi-family residential housing with less than [insert City/County-selected threshold] units shall only be subject to the following provisions within this Section (and exempt from all others):

1. Buffer Zone setback requirements, as set forth by Section XX.XX.050(D)(1) and (2).
2. Land rights/easement dedication over Buffer Zone area, consistent with the standards set forth by Section XX.XX.050(E)(2)(b).

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

#### XX.XX.040 LAND USE REGULATIONS AND ALLOWABLE USES

- A. **Land Use Regulations.** Regulations applicable to the underlying zone that are not in conflict with the provisions of this chapter shall apply. Provisions elsewhere in the Development Code also may apply.
- B. **Conditionally Permitted Uses.**<sup>48</sup> The following uses are discouraged within the Sea Level Rise Overlay District:
1. Emergency command centers/communications facilities.
  2. Emergency shelters.
  3. Fire stations.
  4. Hospitals and Health Care Facilities.
  5. Schools.
  6. Major Electrical and Natural Gas Distribution Facilities.
  7. Subsurface parking.

These uses can be conditionally permitted with the following additional requirement: an Adaptation Pathway shall be prepared by the applicant and reviewed by the approval body. The Adaptation Pathway shall demonstrate that the structure will be functional and accessible with ingress and egress for the lifetime of the structure and identify any adaptation measures that will need to be implemented as sea levels rise. Adaptation measures shall be conditions of approval on the project.

- C. **Permitted Uses.** Land uses permitted and conditionally permitted in the underlying zoning district not in conflict with the provisions of this chapter shall apply.

#### XX.XX.050 DEVELOPMENT STANDARDS

- A. **Lowest Floor Elevation.** For all properties within the Sea Level Rise Overlay District, the Lowest Floor elevation shall be the Base Flood Elevation (BFE) on the FEMA Flood Insurance Rate Map in effect at the time of the Application Date, plus at least 3 feet (Sea Level Rise Base Flood Elevation or SLR-BFE). Where no BFE exists, the Lowest Floor elevation shall be at least 3 feet above the existing grade. If the site is sloped, the average existing grade shall be used. Upon the completion of the structure, the Lowest Floor elevation shall be certified by a licensed professional engineer or licensed surveyor retained

#### RESIDENTIAL HOUSING

While many of the regulations set forth in this sample zoning text apply to larger development projects along the San Francisco Bay shoreline, many jurisdictions have a substantial amount of single-family and multi-family housing (density ranging from duplex to high-density) within shoreline or inland areas that are vulnerable to sea level rise and shallow groundwater rise. Depending on applicability thresholds adopted by local jurisdictions, additional modifications to address the smaller scale of single-family and low-density housing could be needed. Some approaches could include:

- Incentivize residential projects to implement optional resilience design guidelines;
- Optional or required floodproofing measures for new construction and additions; and
- Planning and construction of comprehensive shoreline infrastructure that protects residential neighborhoods and development, potentially funded via Community Benefits/ Development Agreements or Impact Fees.

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by the applicant and verified by the [City/County] building inspector to be properly elevated. Such certification shall be provided to the floodplain administrator.

1. **Exception Process.** Exceptions may be granted when there is no feasible way to accommodate Americans with Disabilities Act (ADA) access at the SLR-BFE due to site-specific constraints. Should an exception be granted, an Adaptation Pathway shall be prepared by the applicant and reviewed by the approval body. The Adaptation Pathway shall demonstrate that the building will be functional and accessible with ingress and egress for the lifetime of the structure and identify any adaptation measures that will need to be implemented as sea levels rise. Adaptation measures shall be conditions of approval on the project.
- B. **Building Height.** Building height within the Sea Level Rise Overlay District will be measured from the Sea Level Rise Base Flood Elevation (SLR-BFE).<sup>49</sup> [Note to City/County staff: This provision intends to provide relief from existing height measurement regulations for projects that are increasing site or Lowest Floor elevation to increase resilience to sea level rise. Depending on existing rules of measurement, this may or may not be necessary. Height maximums imposed by the Federal Aviation Administration (FAA) shall prevail when applicable.]
- C. **Floodproofing Critical Equipment.** Critical Equipment shall be elevated above the SLR-BFE or be dry floodproofed (per methods outlined by FEMA<sup>50</sup>) to ensure operation during flood events.
- D. **Buffer Zones.**<sup>51</sup> Buffer Zones are intended to provide space to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access. Below- and above-grade encroachments that are not related to these uses are prohibited within Buffer Zones, unless otherwise allowed below.
  1. **San Francisco Bay Buffer Zone.** A Buffer Zone of 100 feet – at a minimum – from the San Francisco Bay Shoreline shall be developed and maintained as follows. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
    - a. **On San Francisco Bay.** A Buffer Zone of 100 feet – at a minimum – from the San Francisco Bay Shoreline is required to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access consistent with guidelines of the San Francisco Bay Trail Project and BCDC Policies and Design Guidelines.
    - b. **On [Bay shoreline water bodies other than San Francisco Bay].** A

#### WHY 100 FEET FOR THE BAY BUFFER ZONE?

A Buffer Zone of 100 feet provides additional space for a higher water level in the Bay, as well as flexibility in the types of shoreline infrastructure that can be used to protect against storms and sea level rise. Rather than being limited to vertical sea walls, greater space allows infrastructure to include recreational features and more gradual slopes with shoreline habitat. Also, 100 feet generally aligns with the statutory provision that specifies BCDC's jurisdiction (although it is important to note that BCDC's Shoreline Band is not a buffer zone). A 100-foot Buffer Zone is a minimum standard, and jurisdictions are encouraged to include a Buffer Zone greater than 100 feet where feasible to provide greater flexibility for natural infrastructure and to accommodate habitat migration.

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Buffer Zone of 100 feet – at a minimum – from [Bay shoreline water bodies other than SF Bay] is required to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access consistent with guidelines of the San Francisco Bay Trail Project and BCDC Policies and Design Guidelines.

- c. **Exception Process.** Below- and above-grade encroachments that are not related to infrastructure for flood protection, habitat restoration, and/or Public Access may be accommodated within the 100-foot Buffer Zones when the Buffer Zone would preclude development on a parcel or when there is no other feasible alternative, provided that the applicant provides a site plan by the Application Date demonstrating that their proposal does not encroach upon the space needed to accommodate and maintain a Resilience Infrastructure Project, habitat restoration, and Public Access required by the BCDC, and the [City/County] approves this determination in consultation with OneShoreline.
2. **Creek Buffer Zone.**<sup>52</sup> A Buffer Zone of 35 feet – at a minimum – from the Top of Creek Bank is required to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
  - a. **Exception Process.** Below- and above-grade encroachments that are not related to infrastructure for flood protection, habitat restoration, and/or Public Access may be accommodated within the 35-foot Buffer Zones when the Buffer Zone would preclude development on a parcel or when there is no other feasible alternative, provided that the applicant provides a site plan by the Application Date demonstrating that their proposal does not encroach upon the space needed to accommodate and maintain a Resilience Infrastructure Project, habitat restoration, and Public Access required by the BCDC (if applicable), and the [City/County] approves this determination in consultation with OneShoreline.
3. **Public Access.** Public Access shall be provided and maintained within the Bay and Creek Buffer Zones based on [City/County]-adopted guidelines and BCDC Policies and Design Guidelines. Public Access within the Buffer Zones shall be provided in perpetuity, including dedicating appropriate access easements to the [City/County] at no cost to the public in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties.

#### WHY 35 FEET FOR THE CREEK BUFFER ZONE?

Most cities in San Mateo County have creek setback requirements, though these predate the recent intensity and frequency of atmospheric rivers. Like with the 100-foot Bay Buffer Zone, OneShoreline’s Creek Buffer Zone of 35 feet from the Top of Creek Bank (70 feet total in additional creek width when implemented on both sides) provides additional space and flexibility in the types of flood protection infrastructure that can be used to protect from increased storm runoff and sea level rise. A 35-foot Creek Buffer Zone is a minimum standard, and jurisdictions are encouraged to include a Buffer Zone greater than 35 feet where feasible to provide greater flexibility for natural infrastructure and to accommodate habitat migration.

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- E. **Shoreline Infrastructure.**<sup>53</sup> For properties within 100 feet of the San Francisco Bay Shoreline and [Bay shoreline water bodies other than SF Bay], new construction must contribute to regional shoreline infrastructure in **one of the following three ways**:
1. **New construction includes shoreline infrastructure built to a top, post-settlement elevation equal to the Bay Protection Standard (the FEMA BFE + 6 feet).** Shoreline infrastructure shall meet FEMA’s requirements for accreditation (conforming to Title 44, Section 65.10 of the Code of Federal Regulations or a similar relevant Title and Section of the Code, if updated), as certified by a licensed professional engineer retained by the applicant.
  2. **New construction includes shoreline infrastructure built to a top, post-settlement elevation equal to the FEMA BFE + 3.5 feet.** Shoreline infrastructure shall meet FEMA’s requirements for accreditation (conforming to Title 44, Section 65.10 of the Code of Federal Regulations or a similar relevant Title and Section of the Code, if updated), as certified by a licensed professional engineer retained by the applicant. **In addition to meeting this interim elevation requirement, the applicant shall also meet the following requirements:**
    - a. Providing a detailed plan to guide how the [City/County] and/or OneShoreline can build to the Bay Protection Standard later within the context of the proposed development site plan; and
    - b. Providing land rights/an easement to the [City/County] associated with the Bay and Creek Buffer Zones that enables the [City/County] and/or OneShoreline to build to the Bay Protection Standard within the easement.
  3. **New construction does not include any shoreline infrastructure.** The applicant shall meet the following requirements, which include:
    - a. Providing a detailed plan to guide how the [City/County] and/or OneShoreline

#### FEES AND FINANCIAL MEASURES

If a developer along the Bay does not construct shoreline infrastructure as part of its development, then in addition to requiring space and land rights for that infrastructure, jurisdictions could impose a requirement for developers to fund that infrastructure through the following methods:

- **In-lieu fees** would be based on the cost to the City/County of building the required shoreline infrastructure if a development project does not privately construct it.
- **Impact fees** could be proportionally assessed on new developments vulnerable to Future Conditions to fund construction or expansion of shoreline infrastructure identified on an agency’s Capital Improvements Project (CIP) list.
- **Community Benefits** could be negotiated via Development Agreements to design, construct, or fund shoreline infrastructure projects.

While an in-lieu fee amount would be directly related to the cost of shoreline infrastructure not provided by a development, an impact fee could be assessed more broadly based on development projects in an area that would benefit from shoreline protection. Community benefits, on the other hand, are more flexible, do not require nexus findings, and could be negotiated to fund all phases of shoreline infrastructure.

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can build to the Bay Protection Standard later within the context of the proposed development site plan; and

- b. Providing land rights/an easement to the [City/County] associated with the Bay Buffer Zone + 50 feet and the Creek Buffer Zone + 10 feet that enables the [City/County] and/or OneShoreline to build to the Bay Protection Standard within the easement.
- F. **Natural Infrastructure.**<sup>54</sup> Shoreline infrastructure shall evaluate the use or restoration of natural features and ecosystem processes – such as tidal marshes, eelgrass, mudflats, beaches, and oyster reefs – and incorporate these features to the greatest extent feasible to conserve ecosystem values and functions, which benefit people and wildlife.
1. **Bay Protection Standard Exception Process for Natural Infrastructure.** If the applicant provides a site-specific coastal hazard analysis prepared by a licensed professional engineer retained by the applicant demonstrating meaningful wave-reduction and/or flood protection benefits from the use of Natural Infrastructure on the site and the [City/County] approves this determination in consultation with OneShoreline, local reductions to the Bay Protection Standard may be allowed. The coastal hazard analysis shall be a condition of approval on the project.
- G. **Additional Requirements for Shoreline Barriers.** If the project proposes to use barriers as part of shoreline infrastructure, the following requirements shall apply:
1. **Protecting Sensitive Habitat.** Shoreline barriers shall be designed to protect sensitive habitat, consistent with existing Federal, State, and Local regulatory requirements, and prioritize habitat connectivity.
  2. **Shoreline Barrier Location.** The centerline of the top of the shoreline barrier shall be located as far landward as possible within the Buffer Zone to protect from rising Bay waters, protect sensitive habitat and provide space for habitat migration.
  3. **Accounting for Rising Groundwater in Barrier Stability.** Seepage from shallow groundwater resulting from future sea level rise, which can impact the stability of shoreline barriers put in place to protect from sea level rise, shall be considered in the design of any shoreline barriers.
  4. **Accounting for Rising Groundwater Inland of Barrier.**<sup>55</sup> Management of rising groundwater on the inboard side of the proposed barrier shall be considered in the design of any shoreline barriers. This especially applies to strategies that break the connection between the Bay and the inland areas (e.g., cutoff walls), which could limit inland shallow groundwater rise due to sea level rise, but also exacerbate groundwater rise due to extreme precipitation by preventing the natural outmigration of groundwater toward the Bay.
  5. **Stormwater Conveyance Through Barriers.** Stormwater pipes that are on the Bayside of a barrier can become pathways for flooding behind the barrier. This stormwater conveyance infrastructure should be designed (e.g., through elevations, backflow valves, tide gates) such that backflow is prevented during a Bay water level equivalent to the Base Flood Elevation (BFE) defined by FEMA plus 6 feet (Bay Protection Standard).

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6. **Pedestrian Connectivity.** Shoreline barriers and associated grading shall be designed to support pedestrian connections and meet Americans with Disabilities Act (ADA) requirements over the life of the project.

#### H. Trail Connectivity

1. **San Francisco Bay Access.** Any property within the jurisdiction of the BCDC shall be required to provide, as a part of the on-site landscaping plan and shoreline infrastructure, connectivity improvements by constructing a new or improved portion of the Bay Trail along the site, including improving access to the Bay Trail from and through the site. The trail shall be consistent with specifications of the [City/County] Public Works Department, San Francisco Bay Trail Project guidelines, and BCDC Policies and Design Guidelines. Each such trail segment shall connect directly to the trail segment of adjacent properties.
2. **Creek Access.** Any property within 35 feet of [name specific flood-prone creeks] shall be required to provide, as a part of the on-site landscaping plan, an improved public-access trail along the top of the bank for the portion of the creek bank on the site. The trail shall be consistent with specifications of the [City/County] Public Works Department and BCDC Policies and Design Guidelines where applicable. Each such trail segment shall connect directly to the termination of the publicly accessible trail segment along the shoreline (e.g., the Bay Trail) or the creek bank on each adjacent property.
3. **Exception Process.** If it is demonstrated to the satisfaction of [City/County] staff that publicly accessible trails along the Bay or creek meeting the requirements above are not feasible due to unique site constraints or conflict with BCDC Policies and Design Guidelines, the applicant may propose an alternative Public Access benefit.

### THE NEED TO UPDATE STORMWATER STANDARDS

Recent atmospheric river storms have demonstrated that stormwater drainage standards based on historical rainfall data will not protect people and property going forward. The proposed stormwater drainage template provisions in Section XX.XX.0501 seek to incorporate anticipated changes in precipitation and extreme storm events into drainage requirements as climate change progresses. This template language was developed based on consultation with multiple cities on their current requirements and a review of all 12 Bayside city municipal codes, as well as the following resources: [Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan](#), [County Draft Drainage Manual](#), the Water Board's C.3 Requirements in [the latest reissuance of the Municipal Regional Permit](#), [California's Fourth Climate Change Assessment](#), [recent academic literature](#), and [local stream gage data from December 2022 and January 2023 storms](#). While these references – particularly the Climate Adaptation Risk Analysis for the Sustainable Streets Master Plan – provide a good first-order estimate for Future Conditions, additional work is needed to develop a more robust dataset for future precipitation and volume calculations to inform improved standards. OneShoreline plans to facilitate a dedicated, accelerated effort – in partnership with the cities, County, the City/County Association of Governments of San Mateo County – to update relevant data and establish improved meaningful and implementable standards to address the new reality around stormwater impacts.



### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- I. **Stormwater Drainage:** Changes in hydrology due to climate change, including changes in extreme precipitation events like atmospheric rivers, shall be incorporated into the design of any new stormwater drainage infrastructure.
  1. **Peak Flow Rate and Volume Control Design Criteria.**<sup>56</sup> The post-development stormwater runoff peak flow rate and volume must be less than or equal to the undeveloped stormwater runoff peak flow rate and volume at each point of discharge from the project parcel, unless an alternative discharge point is otherwise approved by [City/County] staff. Peak flow rate and volume calculations showing existing and future discharge rates must be submitted for review and approval.
    - a. **Undeveloped Conditions Assumptions.** If undeveloped conditions of the project site are unknown, a runoff coefficient of  $C=0.3$  shall be used for undeveloped peak flow calculations, per the County of San Mateo Draft Drainage Manual.<sup>57</sup>
    - b. **Design Storm.** New and/or substantial private construction shall use the future 10-year design storm for all runoff peak flow and volume calculations, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>58</sup>
    - c. **Storm Duration.**<sup>59</sup> New and/or substantial private construction shall use at least a 6-hour storm duration for all runoff peak flow and volume calculations. If the time of concentration for the tributary drainage area for which the calculations are being performed is greater than 6 hours, then the storm duration shall be at least equal to the time of concentration.
    - d. **Rainfall Intensity.** New and/or substantial private construction shall use rainfall intensity data derived from the rainfall depth data, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>60</sup>
  2. **Stormwater Management Feature.**<sup>61</sup> If it is determined that the post-development runoff peak flow rate and/or volume exceeds the undeveloped runoff peak flow and/or volume for any point of discharge, an on-site Stormwater Management Feature must be designed and incorporated into proposed new and/or substantial private construction to reduce runoff peak flow rate and volume to undeveloped conditions.
    - a. **Natural Features.**<sup>62</sup> Stormwater Management Features shall evaluate the use or restoration of natural features and ecosystem processes – such as vegetated swales, open space retention areas, and preservation of existing trees and vegetation – and incorporate these features to the greatest extent feasible to conserve ecosystem values and functions, which benefit people and wildlife.
    - b. **Stormwater Storage Factor of Safety.**<sup>63</sup> If new and/or substantial private construction proposes to use storage of stormwater as a Stormwater

#### NATURAL STORMWATER MANAGEMENT FEATURES

The [Green Infrastructure Design Guide](#), issued by the San Mateo Countywide Water Pollution Prevention Program in 2020 (particularly in Chapter 2), provides a useful overview of green infrastructure measures and opportunities that can be incorporated into Stormwater Management Features to maximize the use or restoration of natural features and ecosystem processes.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

Management Feature, the calculated minimum amount of storage needed to meet the requirements shall be multiplied by a minimum factor of safety of 1.2 to determine the required minimum storage volume.

- c. **Stormwater Storage Drawdown Requirements.**<sup>64</sup> If new and/or substantial private construction proposes to use storage of stormwater as a Stormwater Management Feature, drainage facilities must have capacity for a second future 10-year design storm within 24 hours, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>65</sup> In addition, drainage facilities must completely drain within 5 days.
3. **Future Conditions in Design of Stormwater Conveyance Infrastructure.**<sup>66</sup> Changes in hydrology due to climate change over the life of the project, including changes in extreme precipitation events like atmospheric rivers, shall be incorporated into the design of any new stormwater conveyance infrastructure proposed in new and/or substantial private construction.
  - a. **Conveyance Infrastructure Sizing – Minor Drainage Facilities.** Minor drainage facilities/pipes, as defined by [City/County] staff, shall be sized for at least a future 10-year design storm, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>67</sup>
  - b. **Conveyance Infrastructure Sizing – Secondary Drainage Channels and Conduits.** Secondary drainage channels and conduits, as defined by [City/County] staff, shall be sized for at least a future 25-year design storm, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>68</sup>
  - c. **Conveyance Infrastructure Sizing – Major Drainage Channels and Conduits.** Major drainage channels and conduits, as defined by [City/County] staff, shall be sized for the future 100-year design storm, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.<sup>69</sup>
  - d. **Allowance for Tidal Action with Sea Level Rise.**<sup>70</sup> Where applicable, stormwater drainage facilities proposed in new and/or substantial private construction shall account for tidal action and sea level rise. Conveyance infrastructure should be designed (e.g., through elevations, backflow valves, tide gates) such that backflow is prevented during a Bay water level equivalent to the Base Flood Elevation (BFE) defined by FEMA plus 6 feet (Bay Protection Standard).
4. **Compensatory Storage.**<sup>71</sup> New and/or substantial private construction that displace floodwaters require certification from a licensed professional engineer retained by the applicant that compensatory storage is provided and that no reduction in floodway conveyance through the property or effect to adjacent properties will result. Compensatory storage can be provided either on-site or at a hydraulically connected offsite location. A floodplain hydraulic study prepared by a licensed professional engineer retained by the applicant may be required to verify compliance. In lieu of an engineering study, the applicant may be able to provide adequate information that demonstrates an understanding of floodplain conveyance and compliance with this provision.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

5. **Incorporating Future Conditions into Design of Pump Stations.** Pump stations proposed in new and/or substantial private construction shall be designed to withstand flooding from future storms and sea level rise for the life of the project. Elevations of power supplies, motor starters, stand-by generation or any other electrical or mechanical equipment shall be above the Sea Level Rise Base Flood Elevation (SLR-BFE).
- J. **Exceptions.** The [City Council/County Board of Supervisors] shall have the authority to allow exceptions to particular standards in this section, provided that the applicant provides a site plan by the Application Date demonstrating that their proposal does not inhibit the [City/County's] ability to establish resilience to Future Conditions for this site and surrounding properties.

#### XX.XX.o6o PERFORMANCE STANDARDS

- A. **Bay Access Maintenance.** All areas improved for Public Access within the jurisdiction of the BCDC shall be maintained by the property owner and shall be available to the public in perpetuity, as determined by BCDC. Therefore, as existing access is impacted by Future Conditions over the life of the project, Public Access within BCDC jurisdiction should either be modified to remain viable, or equivalent access should be provided, consistent with BCDC direction.<sup>72</sup>
- B. **Shoreline Infrastructure Maintenance.**<sup>73</sup> As a condition of project approval, the applicant shall execute an agreement with the [City/County] identifying the landowner's ongoing maintenance obligations for any shoreline infrastructure approved as part of the development and granting a maintenance easement to the [City/County] for maintenance of any additional shoreline infrastructure that is constructed by the [City/County] and/or OneShoreline later. Where applicable, this agreement shall be consistent with conditions outlined in BCDC's permit language.
- C. **Shoreline Infrastructure Determination of Compliance.**<sup>74</sup> Prior to issuance of a Building Permit, a licensed professional engineer retained by the applicant shall certify that the design, specifications, and plans for the construction of any shoreline infrastructure are in accordance with FEMA's requirements in Title 44, Section 65.10 of the Code of Federal Regulations (or a similar relevant Title and Section of the Code, if updated) as of the Application Date.
- D. **Topographic Data Collection.**<sup>75</sup> Applicant shall submit two topographic surveys of the property, such as a LiDAR or field survey, prepared by a licensed professional land surveyor: one within 12 months of the Application Date and prior to construction, and one after completion of site grading, but prior to Certificate of Occupancy. Such surveys shall be at the landowner or applicant's expense and shall be conducted in consultation with [City/County] staff to be approved as compliant with [City/County] survey standards.
- E. **Real Estate Disclosure of Hazards.**<sup>76</sup> In any contract for the sale of real estate located in the Sea Level Rise Overlay District indicated on the current Sea Level Rise Overlay Map adopted by the [City/County], the seller shall include in the contract a real estate disclosure of all hazards associated with anticipated sea level rise, geologic hazards, groundwater inundation, or coastal and fluvial flooding. Any site-specific analyses related to sea level rise must also be disclosed in real estate transactions.<sup>77</sup>

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

#### XX.XX.070 ADDITIONAL FINDINGS

Prior to the decision-making body approving a [permit type—CUP/design permit/etc.], all of the following findings must be made with respect to the application, in addition to findings required by Chapter[s] [XX].

- A. The project is consistent with General Plan goals and policies [list specifics as applicable] regarding resilience to Future Conditions.
- B. The project building and site design will withstand Future Conditions during the life of the project – or provide a site plan by the Application Date demonstrating that their proposal does not inhibit the [City/County’s] ability to establish resilience to these impacts for this site and surrounding properties.
- C. The project site design will not increase impacts from Future Conditions to existing development on nearby properties.
- D. The project’s landscaping, site design, and grading plan supports pedestrian connections and meets Americans with Disabilities Act (ADA) requirements.
- E. The project enhances – or, at a minimum, demonstrates no adverse impact to – natural habitat, recreational, and Public Access opportunities within and adjacent to the site.

### SHALLOW GROUNDWATER RISE OVERLAY DISTRICT

#### XX.XX.010 DEFINITIONS

- A. **Application Date:** The Application Date is the date a complete application is accepted by the [City/County], which is distinct from the date the application is deemed complete.
- B. **Adjacent:** Directly abutting, having a boundary or property line(s) in common or bordering directly, or contiguous to.
- C. **Buffer Zone:** Space to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access off the San Francisco Bay Shoreline, Bay shoreline water bodies other than San Francisco Bay, and creeks. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
  - i. **San Francisco Bay Buffer Zone:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined in XX.XX.010.G.
  - ii. **Bay shoreline water bodies other than San Francisco Bay:** Minimum of 100 feet from the San Francisco Bay Shoreline, as defined in XX.XX.010.G.
  - iii. **Creek Buffer Zone:** Minimum of 35 feet from the Top of Creek Bank, as defined in XX.XX.010.H.
- D. **Future Conditions:** Anticipated increases in flooding, sea level rise, and shallow groundwater rise due to climate change. This definition intentionally does not specify a time horizon for “future” (e.g., “mid-century” or “end-of-century”), given the wide range of potential outcomes by

#### LIMITED AMENDMENT APPROACH

The findings shown in Section XX.XX.070 could also be incorporated into existing Use Permit or Design Permit Review Findings in-lieu of creating a new overlay zone.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

the end of the century due to uncertainty in future greenhouse gas emissions and their geophysical effects.

- E. **Natural Infrastructure:**<sup>78</sup> The use or restoration of natural ecological systems or processes to reduce vulnerability to climate change related hazards while increasing the long-term adaptive capacity of coastal and inland areas. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as beaches, dunes, tidal marshes, reefs, seagrass, parks, rain gardens, and urban tree canopies. It also includes engineered systems and practices that use or mimic natural processes – such as permeable pavement, bioswales, and ecotone levees – to conserve ecosystem values and functions, which benefit people and wildlife.
- F. **Public Access:**<sup>79</sup> Consistent with BCDC Policies and Design Guidelines, Public Access includes physical access such as Bay shoreline trails, access to those trails from other locations, as well as visual public access to the Bay from other public spaces. Public Access also includes services and amenities that encourage Bay-related activities, such as plazas, parking spaces, landscaping, site furnishings, overlooks, and viewing opportunities along the shoreline.
- G. **Resilience Infrastructure Project:** A Resilience Infrastructure Project is a sea level rise adaptation project along San Mateo County’s San Francisco Bay Shoreline or along the tidally-influenced reaches of creeks and other waterbodies that is built to the Bay Protection Standard. The implementation of this Standard can be realized in phases, as long as Buffer Zones and easements are provided now through at the development approval process.
- H. **San Francisco Bay Shoreline:** As defined by Government Code Section 66610, which is the statutory provision of the BCDC’s originating law (the McAteer-Petris Act<sup>80</sup>) that specifies BCDC’s jurisdiction.
- I. **Top of Creek Bank:** The line connecting all the points where there is substantial grade change between the creek bank and the property as determined by the applicant’s engineer and subject to the review and approval of the [City/County] Engineer. Where a fully channelized waterway exists, Top of Creek Bank is the highest edge of the engineered channel.

#### XX.XX.020 PURPOSE AND INTENT

The Shallow Groundwater Rise Overlay District is intended to protect the community from existing and future threats from the response of shallow groundwater to sea level rise, including buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards, by establishing regionally coordinated regulations addressing these hazards. While the impacts of rising groundwater on our built and natural environments are emerging fields of study, it is clear that shallow groundwater rise is one of the most consequential impacts of sea level rise and the best available science indicates that low-lying communities located inland from the Bay could experience flooding impacts from rising shallow groundwater long before sea level rise overtops the Bay shoreline.<sup>81</sup> Therefore, incorporating resilience to shallow groundwater rise into the siting and building of new development and substantial improvement projects now will avoid the much more difficult and costly effort to modify these assets later. The specific purposes of the Shallow Groundwater Rise Overlay District are to:

- A. Increase awareness and understanding of the impacts of shallow groundwater rise, which are anticipated to occur earlier and farther inland than coastal overland flooding;<sup>82</sup>
- B. Minimize damage to and destruction of life and property;
- C. Establish development standards that are aligned across jurisdictions to ensure synchronized resilience on a regional scale in San Mateo County;
- D. Sustain the viability of built assets in the anticipated areas impacted by shallow groundwater rise over their proposed project life;
- E. Incentivize the use of Nature Infrastructure in adapting to the impacts of shallow groundwater rise ; and
- F. Establish standards consistent with the guiding principles and objectives of OneShoreline.

#### HAZARDS FROM SHALLOW GROUNDWATER RISE

While this overlay district does not capture all potential hazards resulting from rising groundwater, it seeks to address the following key hazard types including:

- **Buoyancy:** Rising groundwater can exert buoyant forces on foundations, buried utility lines, pipes, roads, and other infrastructure, causing these structures to float or shift.
- **Seepage/Infiltration:** Subsurface structures and utilities can be subject to flooding via groundwater seepage through permeable places in the walls/floor or infiltration through pipe cracks/joints.
- **Liquefaction:** Loose and saturated soils can behave like a liquid during an earthquake.
- **Corrosion:** An increase in groundwater salinity can worsen corrosive effects.
- **Contaminant Mobilization:** Sea level rise may change or accelerate the movement of contaminated groundwater plumes.

XX.XX.030 APPLICABILITY

A. Geography.

1. **Shallow Groundwater Rise Overlay District Boundaries.** The provisions of this Section [XX] shall apply to all areas of the [City/County] within the Shallow Groundwater Rise Overlay District. The Shallow Groundwater Rise Overlay District includes the area identified in the Our Coast, Our Future Hazard Map<sup>83</sup> that may experience shallow (water table between 1-2m depth) to emergent (water table at surface) groundwater with 6.6 feet of sea level rise, assuming a moderate groundwater flow factor<sup>84</sup> (based on modeling results from the U.S. Geological Survey<sup>85</sup>).
2. **Shallow Groundwater Rise Overlay District Map.** The [City/County] Shallow Groundwater Rise Overlay District Map (GW Map) was adopted by the [City Council/County Board of Supervisors] based on the criteria in subsection (1) of this section to provide community resilience to shallow groundwater rise. The GW Map may be revised by the [City Council/County Board of Supervisors] based on updates to sea level rise and shallow groundwater rise science and monitoring results. The applicable GW Map to a development application shall be the GW Map currently in effect at the time of the Application Date.
3. **Parcel Applicability.** Any parcel with a portion of land located within the Shallow Groundwater Rise Overlay District, as defined in subsection (1) and illustrated by the GW Map in subsection (2), shall be considered to be within the Shallow Groundwater Rise Overlay District and the regulations of this section shall apply to the entirety of the parcel.
4. **Additional Areas.** In addition, the [City/County] Engineer or Community and Economic Development Director may require that standards of the Shallow Groundwater Rise Overlay District apply to properties outside the Overlay District based on maps and other studies, which document the existence of potential groundwater-related hazards (e.g., liquefaction) that warrant evaluation.
5. **Appeals.** The [City/County] Engineer or Community and Economic Development Director shall make interpretations, where needed, as to the exact boundaries of the Shallow Groundwater Rise Overlay District. If the groundwater-related hazard information on which the boundaries of the Overlay District are based does not reflect actual site conditions, the [City/County] Engineer or Community and Economic Development Director may determine that a location is within or outside the Overlay District, based on site-specific data provided by a licensed professional surveyor or licensed professional engineer. The [City/County]'s determination may be appealed to the [Board of Appeal] under the provisions of Section [Appeal Chapter/Section] of this Code.

**OVERLAPPING GEOGRAPHY OF OVERLAY DISTRICTS**

As illustrated in the OneShoreline's online [Map of Future Conditions](#), the Shallow Groundwater Rise Overlay District overlaps with the Sea Level Rise Overlay District in many geographic areas. Should a project be located in both the Sea Level Rise Overlay District and the Shallow Groundwater Rise Overlay District, the standards of both Districts must be met.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- B. **Project Type.** The provisions of this Section [XX] shall apply to the following project types within the Shallow Groundwater Rise Overlay District boundaries:

[Note to City/County staff: Two options are provided for consideration in this section, one of which relies upon a size threshold and the other of which relies upon wall demolition. Both options include thresholds based on improvement cost relative to building value, which is consistent with FEMA standards for the floodplain ordinance. City and County staff should consider this as a menu of options and select the most appropriate thresholds to harmonize with existing regulations.]

1. **Shoreline Development.** Any development lying in whole or in part within the San Francisco 100-foot Bay Buffer Zone or within the Creek 35-foot Buffer Zone.

[Size Threshold Option]<sup>86</sup>

2. **New or Addition of Gross Floor Area.** New construction or expansion of one or more buildings that results in the addition of an aggregate gross floor area of [xx] or more square feet.
3. **Dwelling Units.** Any proposed project for the construction of [xx] or more Dwelling Units (but not including rehabilitation or alteration projects unless they result in a net increase of [xx] or more Dwelling Units).
4. **Change of Use.** The change of the permitted or conditionally permitted uses of a gross floor area of [xx] or more square feet.
5. **Substantial Improvement.**<sup>87</sup> The renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building and that has, or will have after rehabilitation, a gross floor area of [xx] or more square feet.

[All Substantial Development Option]

6. **Substantial Construction.** Construction of a wholly new building, or removal or reconstruction of 50 % or more of the exterior walls of a building.
  7. **Substantial Improvement.**<sup>88</sup> The renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building.
- C. **Exemption for Low-Density Residential Land Uses.** Single-family homes, duplexes, and low-density multi-family residential housing with less than [insert City/County-selected threshold] units shall be exempt from the provisions within this Section.

#### XX.XX.040 DEVELOPMENT STANDARDS

- A. **Future Conditions in Design Groundwater Levels.**<sup>89</sup> When geotechnical investigations are conducted, a design groundwater level is recommended based on historical maximum groundwater conditions. Given that historical conditions are no longer a reliable predictor of future groundwater levels, project design shall consider a higher design groundwater level that is representative of projected Future Conditions with at least 6 feet of sea level rise, based on a site-specific geotechnical study (or – in the absence of such a study – modeling results from the U.S. Geological Survey<sup>90</sup>). The design groundwater level shall assume a moderate groundwater flow factor<sup>91</sup> if local data on the groundwater or geology characteristics are unknown.



### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- B. **Creek Buffer Zone.**<sup>92</sup> Preserving and creating open space adjacent to existing channels increases flexibility for future modifications to increase channel capacity for groundwater flows in addition to stormwater runoff. Therefore, a Buffer Zone of 35 feet – at a minimum – from the Top of Creek Bank is required to accommodate changing groundwater conditions, as well as accommodate and maintain built and Natural Infrastructure, habitat restoration, and Public Access. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.
1. **Exception Process.** Below- and above-grade encroachments that are not related to infrastructure for flood protection, habitat restoration, and/or Public Access may be accommodated within the 35-foot Buffer Zones when the Buffer Zone would preclude development on a parcel or when there is no other feasible alternative, provided that the applicant provides a site plan by the Application Date demonstrating that their proposal does not encroach upon areas of future emergent groundwater, and does not encroach upon the space needed to construct a Resilience Infrastructure Project, habitat restoration, and Public Access required by the BCDC (if applicable), and the [City/County] approves this determination in consultation with OneShoreline.
- C. **Natural Infrastructure.**<sup>93</sup> Measures incorporated into the project that will mitigate seasonal and permanent rising groundwater impacts shall evaluate the use or restoration of natural features and ecosystem processes – such as siting open spaces to allow more groundwater and stormwater detention – and incorporate these features to the greatest extent feasible to conserve ecosystem values and functions, which benefit people and wildlife.
- D. **Contaminated Sites**<sup>94</sup> New and/or substantial construction on contaminated sites shall account for impacts of rising shallow groundwater on contaminant mobilization in project design and all steps of the site remediation process, in coordination with the relevant agencies responsible for the remediation plan for the site. This shall be documented in a vulnerability assessment and adaptation plan, which will also include a groundwater monitoring plan.
- E. **Liquefaction.** New and/or substantial construction sited in “High” or “Very High” Liquefaction Susceptibility areas in the Bay Area Liquefaction Susceptibility Map provided by the U.S. Geological Survey<sup>95</sup> shall account for liquefaction hazards and the impacts of rising shallow groundwater on liquefaction severity in project design. Sites most sensitive to increases in liquefaction susceptibility caused by sea level rise are those located on artificial fill around the Bay Area margins where the water table is already shallow.

#### ONGOING CHANGES TO REMEDATION REGULATIONS

Many current remediation regulations from the State Water Resources Control Board (SWRCB), San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), or Department of Toxic Substances Control (DTSC) do not account for a rising groundwater table and require updates that are currently underway. SFBRWQCB recently revised its waste discharge requirements to require Bayfront landfills to identify strategies for landfill protection from both sea level and shallow groundwater rise ([Order No. R2-2022-0031](#)) and DTSC recently released its [Sea Level Rise Guidance for Project Managers](#), which requires Responsible Parties to account for SLR across all phases of project cleanup.

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

- F. **Belowground Structures.**<sup>96</sup> Impacts from shallow groundwater rise shall be considered and mitigated in the design of subsurface parking structures, foundations, basements, and other underground structures, which can be subject to destabilization, corrosion, infiltration, and increased buoyancy with shallow groundwater. Mitigation strategies can include constructing slab-on-grade foundations, conducting regular inspections, and utilizing corrosion-inhibiting materials.
- G. **Subsurface Utilities and Stormwater.**<sup>97</sup> Impacts from shallow groundwater rise shall be considered and mitigated in the design of new subsurface utilities, including sewer, stormwater, and underground electrical systems.
1. **Pump Stations.** Pump station capacity shall account for anticipated increases in infiltration to the stormwater system from shallow groundwater rise over the pump station's anticipated service life.
  2. **Green Infrastructure.** Impacts from shallow groundwater rise shall be considered and mitigated in the design of green infrastructure, as projects designed to current groundwater levels may not function as well when shallow groundwater rises nearer to the ground surface. Underdrains connected to the stormwater system can help ensure green infrastructure installations continue to function even if rising groundwater levels slow infiltration rates.
- H. **Roadway Subgrades.**<sup>98</sup> To avoid roadway deterioration due to shallow groundwater rise, new and/or substantial construction involving roadway design shall incorporate mitigation measures, such as pavement structural modifications to the base-layer materials and/or AC thickness modification, to avoid premature pavement failure.
- I. **Exceptions.** The [City Council/County Board of Supervisors] shall have the authority to allow exceptions to particular standards in this section, provided that the applicant provides a site plan by the Application Date demonstrating that their proposal does not inhibit the [City/County's] ability to establish resilience to Future Conditions for this site and surrounding properties.

#### XX.XX.050 PERFORMANCE STANDARDS

- A. **Geotechnical Data Collection.** Applicant shall submit representative, site-specific boring data and an associated geotechnical study, prepared by a licensed professional geotechnical engineer, within 12 months of the Application Date and prior to building permit issuance. This study shall be at the landowner or applicant's expense and shall be conducted in consultation with [City/County] staff to be approved as compliant with [City/County] standards.
- B. **Topographic Data Collection.**<sup>99</sup> Applicant shall submit two topographic surveys of the property, such as a LiDAR or field survey, prepared by a licensed professional land surveyor: one within 12 months of the Application Date and prior to construction, and one after completion of site grading, but prior to Certificate of Occupancy. Such surveys shall be at the landowner or applicant's expense and shall be conducted in consultation with [City/County] staff to be approved as compliant with [City/County] survey standards.
- C. **Vulnerability Assessment and Mitigation.** Based on the geotechnical data collected onsite, the applicant shall submit an assessment of the project's vulnerability to shallow groundwater rise along with a list of measures incorporated into the project that will

### III. TEMPLATE LANGUAGE FOR ZONING AMENDMENTS

monitor and mitigate seasonal and permanent rising groundwater impacts, including buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards. Measures shall include any applicable measures set forth by XX.XX.040 Development Standards at a minimum.

- D. **Real Estate Disclosure of Hazards.**<sup>100</sup> In any contract for the sale of real estate located in the Shallow Groundwater Rise Overlay District indicated on the current Shallow Groundwater Rise Overlay Map adopted by the [City/County], the seller shall include in the contract a real estate disclosure of all hazards associated with anticipated shallow groundwater rise, including buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards. Any site-specific analyses related to shallow groundwater rise must also be disclosed in real estate transactions.<sup>101</sup>

# CHAPTER IV | PROJECT REVIEW CHECKLIST

OneShoreline development review comments are based on the criteria below, which closely follow the provisions set forth in the Sea Level Rise and Shallow Groundwater Rise Overlay Districts in Chapter III. City or County staff are highly recommended to review and incorporate into their review of private development projects seeking jurisdictional approvals.

## IMPLEMENTATION CAN START TODAY

The Project Review Checklist in Chapter 4 and Standard Conditions of Approval in Chapter 5 can be incorporated into a City or County review of projects currently in the entitlement process today, regardless of whether general plan and zoning code updates have been adopted.

### 1. **Project Type**

- a. Is the project a substantial construction or improvement project<sup>1</sup>?
  - i. If no, end review.
  - ii. If yes, then proceed with Step 1b.
- b. Is the project a low-density residential land use<sup>2</sup>?
  - i. If no, then proceed with Step 2.
  - ii. If yes, then review for/encourage compliance with the following Sea Level Rise Overlay District Development Standards (and exempt from all others in Steps 2, 3, 4, and 5 below):
    1. [XX.XX.050D. Buffer Zones](#)
    2. Land rights/easement dedication over Buffer Zone area, consistent with the standards set forth by [Section XX.XX.050\(E\)\(2\)\(b\)](#).

### 2. **Is any portion of the parcel owned by OneShoreline or located in a Flood Zone, right of way, or other area managed or controlled by OneShoreline?**

- a. If no, then proceed with Step 3.
- b. If yes, then review for/require compliance with the following Development Standards:
  - [XX.XX.050D. Buffer Zones](#)
  - [XX.XX.050I Stormwater Drainage](#)

### 3. **Is any portion of the parcel located in the Sea Level Rise Overlay District<sup>3</sup>?**

- a. If no, then proceed with Step 4.

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<sup>1</sup> Substantial construction is defined as the construction of a wholly new building, while substantial improvement is defined as the renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building (per FEMA, 44 CFR 59.1).

<sup>2</sup> Single-family homes, duplexes, and low-density multi-family residential housing with less than 25 units.

<sup>3</sup> See relevant layer in [OneShoreline Map of Future Conditions](#) at [OneShoreline.org/Planning-Guidance](#). The Sea Level Rise Overlay District includes the area identified in the [Our Coast, Our Future Hazard Map](#) as the 100-year flood plus 6.6 feet of sea level rise (based on [modeling results](#) from the U.S. Geological Survey).

#### IV. PROJECT REVIEW CHECKLIST

- b. If yes, then review for/encourage compliance with the following Sea Level Rise Overlay District Development Standards:
- [XX.XX.050A. Lowest Floor Elevation](#)
  - [XX.XX.050C. Floodproofing Critical Equipment](#)
  - [XX.XX.050D. Buffer Zones](#)
  - [XX.XX.050E. Shoreline Infrastructure](#)
  - [XX.XX.050H. Trail Connectivity](#)
  - [XX.XX.050I. Stormwater Drainage](#)
- c. If yes, then review for/encourage compliance with the following Sea Level Rise Overlay District Performance Standards:
- [XX.XX.060A. Bay Access Maintenance](#)
  - [XX.XX.060B. Shoreline Infrastructure Maintenance](#)
  - [XX.XX.060C. Shoreline Infrastructure Determination of Compliance](#)
  - [XX.XX.060D. Topographic Data Collection](#)

**4. Is any portion of the parcel located in the Shallow Groundwater Rise Overlay District<sup>4</sup>?**

- a. If no, then proceed with Step 5.
- b. If yes, then review for/encourage compliance with the following Shallow Groundwater Rise Development Standards:
- [XX.XX.040A. Future Conditions in Design Groundwater Levels](#)
  - [XX.XX.040B. Creek Buffer Zone](#)
  - [XX.XX.040C. Natural Infrastructure](#)
  - [XX.XX.040D. Contaminated Sites](#)
- c. If yes, then review for/encourage compliance with the following Shallow Groundwater Rise Overlay District Performance Standards:
- [XX.XX.050A. Geotechnical Data Collection](#)
  - [XX.XX.050B. Topographic Data Collection](#)
  - [XX.XX.050C. Vulnerability Assessment and Mitigation](#)
- d. Is any portion of the parcel located in “High” or “Very High” Liquefaction Susceptibility areas<sup>5</sup>?
- If no, then proceed with next step.
  - If yes, then review for/encourage compliance with Shallow Groundwater Rise Development Standard [XX.XX.040E. Liquefaction](#)
- e. Does the project include any subsurface structures or utilities?
- If no, then proceed with next step.

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<sup>4</sup> See relevant layer in [OneShoreline Map of Future Conditions](#) at [OneShoreline.org/Planning-Guidance](#). The Shallow Groundwater Rise Overlay District includes the area identified in the [Our Coast, Our Future Hazard Map](#) that may experience shallow (water table between 1-2m depth) to emergent (water table at surface) groundwater with 6.6 feet of sea level rise, assuming a [moderate groundwater flow factor](#) (based on [modeling results](#) from the U.S. Geological Survey).

<sup>5</sup> Based on areas illustrated in the Bay Area Liquefaction Susceptibility Map provided by the U.S. Geological Survey ([Where can liquefaction happen: Bay Area susceptibility map](#)).

#### IV. PROJECT REVIEW CHECKLIST

- ii. If yes, then review for/encourage compliance with the following Shallow Groundwater Rise Development Standards:
    - [XX.XX.040F. Belowground Structures](#)
    - [XX.XX.040G. Subsurface Utilities and Stormwater](#)
  - f. Does the project include any roadway construction?
    - i. If no, proceed with next step.
    - ii. If yes, then review for/encourage compliance with Development Standard [XX.XX.040H. Roadway Subgrades](#)
- 5. Is any portion of the parcel located in the FEMA Special Flood Hazard Area<sup>6</sup>?**
- a. If no, then complete review.
  - b. If yes, then review for/encourage compliance with the following Sea Level Rise Overlay District Performance Standards:
    - [XX.XX.050A. Lowest Floor Elevation](#)
    - [XX.XX.050C. Floodproofing Critical Equipment](#)
    - [XX.XX.050D. Buffer Zones](#)
    - [XX.XX.050I. Stormwater Drainage](#)

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<sup>6</sup> See relevant layer in [OneShoreline Map of Future Conditions](#) at [OneShoreline.org/Planning-Guidance](#).

## CHAPTER V | STANDARD CONDITIONS OF APPROVAL

The following Chapter provides template Conditions of Approval (COAs) based on the provisions set forth in the Sea Level Rise and Shallow Groundwater Rise Overlay Districts in Chapter III. The applicability of the COA to projects located in the Sea Level Rise Overlay District are indicated by [SLRO]; COA applicability to projects in the Shallow Groundwater Rise Overlay District are indicated by [SGRO]. As described in Chapter III (Section XX.XX.030(C)), Low-density Residential Housing is exempt from most requirements, but COAs 4 and 11 have been developed to address the limited requirements applicable to Low-density Residential Housing.

### GENERAL

1. [SLRO] Any shoreline infrastructure shall be eligible to be accredited by FEMA and conforming to Title 44, Section 65.10 of the Code of Federal Regulations or a similar relevant Title and Section of the Code, if updated.
2. [SLRO; For Exceptions to Lowest Flood Elevation provision XX.XX.050(A)(1)] The project shall implement all adaptation measures identified by the approved Adaptation Pathway to ensure that the building will be functional and accessible with ingress and egress for the lifetime of the structure.
3. [SLRO] Public Access shall be provided and maintained within the shoreline and creek Buffer Zones based on [City/County]-adopted guidelines and BCDC Policies and Design Guidelines. Public Access within the Buffer Zones shall be provided in perpetuity, including dedicating appropriate access easements to the [City/County] at no cost to the public in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties.
4. [SLRO and SGRO; Low-density Residential Housing] Below- and above-grade encroachments that are not related to infrastructure for flood protection, habitat restoration, and/or Public Access are prohibited within Buffer Zones.
5. [SLRO] The areas and improvements within the [XX] square-foot Public Access shall be permanently maintained by and at the expense of the property owner or their assignees. Such maintenance shall include, but is not limited to: repairs to all path surfaces; replacement of any plant materials that die or become unkempt; repairs or replacement as needed of any Public Access amenities such as signs, benches, trash containers, and lights; periodic cleanup of litter and other materials deposited within the access areas; removal of any encroachments into the access areas; assurance that the Public Access signs remain in place and visible; and repairs to any Public Access areas or improvements that are damaged by future subsidence or uneven settlement, flooding, or inundation caused by sea level rise, including raising land elevations or redesigning Public Access features to protect and ensure the usability of the Public Access areas and improvements at all times. Within 30 days after notification by [City/County] and/or BCDC staff, the property owner shall correct any maintenance deficiency noted in a staff inspection of the

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- site. The permittees shall obtain approval by or on behalf of the BCDC of any maintenance that involves more than in-kind repair and replacement.
6. [SLRO and SGRO] Applicant shall submit a property maintenance and management plan for the entire property, which shall include but not be limited to:
    - a. General cleaning of litter and debris on-site.
    - b. Maintenance of all exterior building materials.
    - c. Maintenance of all landscaping.
    - d. Maintenance of all stormwater treatment and drainage measures.
    - e. Maintenance of all shoreline infrastructure.
    - f. Maintenance of all Public Access.
  7. [SLRO] The applicant shall submit a Comprehensive Master Signage Plan with clear Public Access signage.

### PRIOR TO GRADING PERMIT ISSUANCE

8. [SLRO; If located in BCDC's jurisdiction] The project shall receive approval from BCDC prior to grading permit issuance.
9. [SLRO] The peak flow rate and volume calculations showing existing and future discharge rates shall be submitted for review and approval to demonstrate that post-development stormwater runoff peak flow rate and volume is less than or equal to the undeveloped stormwater runoff peak flow rate and volume at each point of discharge from the project parcel, unless an alternative discharge point is otherwise approved by [City/County] staff.
10. [SLRO] For new and/or substantial private construction that displaces floodwaters, certification is required from a licensed professional engineer retained by the applicant that compensatory storage is provided and that no reduction in floodway conveyance through the property or effect to adjacent properties will result. A floodplain hydraulic study prepared by a licensed professional engineer retained by the applicant or alternative report/information shall be submitted by the applicant verify compliance with compensatory storage requirements.

### PRIOR TO BUILDING PERMIT ISSUANCE

11. [SLRO and SGRO; Low-density Residential Housing] Land rights or an easement shall be dedicated to the [City/County] associated with the Bay and Creek Buffer Zones to enable the [City/County] and/or OneShoreline to build to the Bay Protection Standard within the easement.
12. [SLRO] A licensed professional engineer retained by the applicant shall certify that the design, specifications, and plans for the construction of shoreline infrastructure are in accordance with FEMA's requirements in Title 44, Section 65.10 of the Code of Federal Regulations (or a similar relevant Title and Section of the Code, if updated) as of the Application Date.
13. [SLRO] The applicant shall execute a long-term maintenance agreement with the City/County, covering ownership and maintenance of the Public Access areas, landscaping, and streetscaping.



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14. [SLRO] The applicant shall execute an agreement with the [City/County] identifying the landowner's ongoing maintenance obligations for any shoreline infrastructure approved as part of the development, and granting a maintenance easement to the [City/County] for maintenance of any additional shoreline infrastructure that is constructed by the [City/County] and/or OneShoreline later, if required.
15. [SLRO; For applicants that opt to meet an alternative set of requirements set forth by XX.XX.050(E)(2)] The applicant shall provide a detailed plan to guide how the [City/County] and/or OneShoreline can build to the Bay Protection Standard later within the context of the proposed development site plan; and provide land rights/an easement to the [City/County] associated with the Bay and Creek Buffer Zones that enables the [City/County] and/or OneShoreline to build to the Bay Protection Standard within the easement.
16. [SLRO; For applicants that opt to meet an alternative set of requirements set forth by XX.XX.050(E)(3)] The applicant shall provide a detailed plan to guide how the [City/County] and/or OneShoreline can build to the Bay Protection Standard later within the context of the proposed development site plan; and provide land rights/an easement to the [City/County] associated with the Bay Buffer Zone + 50 feet and the Creek Buffer Zone + 10 feet that enables the [City/County] and/or OneShoreline to build to the Bay Protection Standard within the easement.
17. [SLRO] The applicant shall dedicate a Public Access easement over any trails or parks included in the project to meet Municipal Code Requirements. The term of the easement shall be in perpetuity.
18. [SGRO] The applicant shall submit an assessment of the project's vulnerability to shallow groundwater rise along with a list of measures incorporated into the project that will monitor and mitigate seasonal and permanent rising groundwater impacts, including buoyancy, seepage, infiltration, liquefaction, corrosion, and contaminant mobilization hazards. Measures shall include any applicable measures set forth by XX.XX.040 Development Standards at a minimum.
19. [SGRO] The applicant shall submit current, representative, and site-specific boring data and an associated geotechnical study, prepared by a licensed professional geotechnical engineer, prior to Building Permit issuance. This study shall be at the landowner or applicant's expense and shall be conducted in consultation with [City/County] staff to be approved as compliant with [City/County] standards.

## PRIOR TO CERTIFICATE OF OCCUPANCY

20. [SLRO and SGWRO] The applicant shall record a real estate disclosure of all hazards associated with anticipated flooding, sea level rise, and shallow groundwater rise with the San Mateo County Clerk. Any site-specific analyses related to these hazards must also be disclosed in real estate transactions.
21. [SLRO] Applicant shall submit a topographic survey of the property, such as a LiDAR or field survey, prepared by a licensed professional land surveyor after completion of site grading and prior to Certificate of Occupancy. Such survey shall be at the landowner or applicant's expense and shall be conducted in consultation with [City/County] staff to be approved as compliant with [City/County] survey standards.

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22. [SLRO; For applicants who meet Shoreline Infrastructure requirements of Section XX.XX.050(E)(1) or (2)] A licensed professional engineer or land surveyor shall certify that the top, post-settlement elevation of the shoreline infrastructure meets the elevation requirements of Section XX.XX.050(E)(1) or Section XX.XX.050(E)(2).
23. [SLRO] The Lowest Floor elevation shall be certified by a licensed professional engineer or licensed surveyor retained by the applicant and verified by the [City/County] building inspector to be properly elevated in accordance with the Sea Level Rise Base Flood Elevation requirements set forth by Section XX.XX.050(A). Such certification shall be provided to the floodplain administrator.

## GLOSSARY

**Adaptation Pathway:**<sup>102</sup> An adaptation pathway is a decision-making tool comprised of a sequence of manageable steps or decision points in response to climate change impacts over time. Each step on the adaptation pathway is triggered by some measurable, environmentally driven change (e.g., high tide rises beyond a certain elevation, more than two flood events in a 12-month period) and results in incremental progress toward resilience over the asset's project life.

**Buffer Zone:** Space to accommodate and maintain built and Natural Infrastructure for flood protection, habitat restoration, and Public Access off the San Francisco Bay Shoreline, Bay shoreline water bodies other than San Francisco Bay, and creeks. A wider Buffer Zone to accommodate habitat migration shall be included where feasible.

- i. **San Francisco Bay Buffer Zone:** Minimum of 100 feet from the San Francisco Bay Shoreline
- ii. **Bay shoreline water bodies other than San Francisco Bay:** Minimum of 100 feet from the San Francisco Bay Shoreline
- iii. **Creek Buffer Zone:** Minimum of 35 feet from the Top of Creek Bank

**Critical Equipment:** Critical Equipment means building equipment, instrumentation, controls, or systems whose malfunction or failure would likely result in a high-consequence event that would compromise the safety of those in the building, or whose proper operation is required to mitigate the consequences of such an event.

**Critical Facilities:**<sup>103</sup> Critical facilities are elements of the infrastructure that support essential services in a society, including hospitals, fire stations, police stations, storage of critical records, communications systems, major electrical and natural gas distribution facilities, water and waste-water treatment facilities, and similar land uses. These facilities should be sited and designed to a higher standard of protection so that they can continue to function and provide services during and after hazard events.

**Future Conditions:** Anticipated increases in flooding, sea level rise, and shallow groundwater rise due to climate change. This definition intentionally does not specify a time horizon for "future" (e.g., "mid-century" or "end-of-century"), given the wide range of potential outcomes by the end of the century due to uncertainty in future greenhouse gas emissions and their geophysical effects.

**Habitat Restoration:**<sup>104</sup> The rehabilitation of the physical, chemical, or biological characteristics of a site with the goal of returning the majority of natural functions to lost or degraded native habitat.

**Lowest Floor:**<sup>105</sup> The lowest floor of the lowest enclosed area of a building (including basement).

**Natural Infrastructure:**<sup>106</sup> The use or restoration of natural ecological systems or processes to reduce vulnerability to climate change related hazards while increasing the long-term adaptive capacity of coastal and inland areas. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as beaches, dunes, tidal marshes, reefs, seagrass, parks, rain

## V. STANDARD CONDITIONS OF APPROVAL

gardens, and urban tree canopies. It also includes engineered systems and practices that use or mimic natural processes – such as permeable pavement, bioswales, and ecotone levees – to conserve ecosystem values and functions, which benefit people and wildlife.

**NAVD88:** The North American Vertical Datum of 1988 (NAVD88) is the vertical datum for orthometric heights established for vertical control surveying in the United States of America based upon the General Adjustment of the North American Datum of 1988. A vertical datum is a reference system used by surveyors, engineers, and mapping professionals to measure and relate elevations to the Earth's surface. Using a fixed reference point as a baseline (i.e., a zero-elevation point), elevation values can be consistently measured and compared among various maps and surveys.

**Public Access.**<sup>107</sup> Consistent with BCDC Policies and Design Guidelines, Public Access includes physical access such as Bay shoreline trails, access to those trails from other locations, as well as visual public access to the Bay from other public spaces. Public Access also includes services and amenities that encourage Bay-related activities, such as plazas, parking spaces, landscaping, site furnishings, overlooks, and viewing opportunities along the shoreline.

**San Francisco Bay Shoreline:** As defined by Government Code Section 66610, which is the statutory provision of the BCDC's originating law (the McAteer-Petris Act<sup>108</sup>) that specifies BCDC's jurisdiction.

**Substantial Construction:** Construction of a wholly new building, or removal or reconstruction of 50 percent or more of the exterior walls of a building; change to accessory structures is not included in this definition.

**Substantial Improvement:**<sup>109</sup> The renovation, rehabilitation, or expansion of a building where the cost of work is greater than 50% of the appraised value of the building.

**Top of Creek Bank:** The line connecting all the points where there is substantial grade change between the creek bank and the property as determined by the applicant's engineer and subject to the review and approval of the [City/County] Engineer. Where a fully channelized waterway exists, Top of Creek Bank is the highest edge of the engineered channel.

**Vulnerable Community:** Vulnerable communities experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality.<sup>110</sup>

**Zone VE:** Zone VE is the FEMA flood insurance rate zone that corresponds to the 1% annual chance (or 100-year) coastal floodplain that have additional hazards associated with storm waves. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

**Zone AE:** Zone AE is the FEMA flood insurance rate zone that corresponds to the 1% annual chance (or 100-year) floodplains. Base flood elevations derived from detailed hydraulic analyses are shown at selected intervals within these zones.

## ENDNOTES

- <sup>1</sup>Adapted from California Coastal Commission Sea Level Rise Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits. November 2018, page 5 – How to Use this Document. [https://documents.coastal.ca.gov/assets/slr/guidance/2018/o\\_Full\\_2018AdoptedSLRGuidanceUpdate.pdf](https://documents.coastal.ca.gov/assets/slr/guidance/2018/o_Full_2018AdoptedSLRGuidanceUpdate.pdf)
- <sup>2</sup> California Coastal Commission Sea Level Rise Webpage. <https://www.coastal.ca.gov/climate/slr/>.
- <sup>3</sup> Perrin-Martinez, J.M. March 2022. Adaptation Roadmap: A Practitioner's Guide to Plan and Implement a Collaborative, Equitable, Integrative, and Flexible Approach for Sea Level Rise Adaptation. San Francisco Bay Conservation and Development Commission. Section 4.3.2, page 132. Accessed online at <http://www.adaptingtorisingtides.org/project/adaptation-roadmap>.
- <sup>4</sup> Perrin-Martinez, J.M. March 2022. Adaptation Roadmap: A Practitioner's Guide to Plan and Implement a Collaborative, Equitable, Integrative, and Flexible Approach for Sea Level Rise Adaptation. San Francisco Bay Conservation and Development Commission. Section 4.4.1, page 139. Accessed online at <https://www.adaptingtorisingtides.org/project/adaptation-roadmap/>.
- <sup>5</sup> Georgetown Climate Center Managed Retreat Toolkit. <https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/introduction.html>.
- <sup>6</sup> Guidance for Flood Risk Analysis and Mapping: Mapping Base Flood Elevations on Flood Insurance Rate Maps. November 2022. Section 2 – Background. [https://www.fema.gov/sites/default/files/documents/fema\\_mapping-base-flood-elevation-flood-insurance-rate-maps\\_112022.pdf](https://www.fema.gov/sites/default/files/documents/fema_mapping-base-flood-elevation-flood-insurance-rate-maps_112022.pdf)
- <sup>7</sup> Guidance for Flood Risk Analysis and Mapping: Coastal Floodplain Mapping. November 2022. Section 2 – Identification of Special Flood Hazard Areas. [https://www.fema.gov/sites/default/files/documents/fema\\_coastal-floodplain-mapping\\_112022.pdf](https://www.fema.gov/sites/default/files/documents/fema_coastal-floodplain-mapping_112022.pdf);
- Guidance for Flood Risk Analysis and Mapping: Coastal Water Levels. May 2016. Section 1 – Topic Overview. [https://www.fema.gov/sites/default/files/2020-02/Coastal\\_Water\\_Levels\\_Guidance\\_May\\_2016.pdf](https://www.fema.gov/sites/default/files/2020-02/Coastal_Water_Levels_Guidance_May_2016.pdf)
- <sup>8</sup> Prepared by U.S. Army Corps of Engineers for FEMA. December 1989. Technical Report CERC-89-15: Criteria for Evaluating Coastal Flood-Protection Structures. <https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/12445/1/TR-CERC-89-15.pdf>.
- <sup>9</sup> Definition in blue box sidebar adapted from Section 65302 of the California Government Code: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201920200AB65](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB65)
- <sup>10</sup> San Francisco Estuary Institute. San Francisco Bay Shoreline Adaptation Atlas. <https://www.sfei.org/adaptationatlas>.
- <sup>11</sup> Newkirk, Sarah, Sam Veloz, Maya Hayden, Walter Heady, Kelly Leo, Jenna Judge, Robert Battalio, Tiffany Cheng, Tara Ursell, Mary Small. (The Nature Conservancy and Point Blue Conservation Science). 2018. Toward Natural Infrastructure to Manage Shoreline Change in California. California's Fourth Climate Change Assessment, California Natural Resources Agency. Publication number: CCA4-CNRA-2018-011. [https://www.energy.ca.gov/sites/default/files/2019-12/Oceans\\_CCA4-CNRA-2018-011\\_ada.pdf](https://www.energy.ca.gov/sites/default/files/2019-12/Oceans_CCA4-CNRA-2018-011_ada.pdf).
- <sup>12</sup> BCDC Adapting to Rising Tides Planning Support Webpage. <https://explorer.adaptingtorisingtides.org/about>.
- <sup>13</sup> FEMA's definition of "freeboard." <https://www.fema.gov/glossary/freeboard>.
- <sup>14</sup> Guidance for Flood Risk Analysis and Mapping - Levee Guidance. Section 4.1.3 – Coastal Freeboard, page 28. [https://www.fema.gov/sites/default/files/2020-02/Levee\\_Guidance\\_Nov\\_2019\\_v2.pdf](https://www.fema.gov/sites/default/files/2020-02/Levee_Guidance_Nov_2019_v2.pdf).
- <sup>15</sup> Referenced in Title 44, Section 59 of the Code of Federal Regulations.
- <sup>16</sup> Adapted from California Coastal Commission Residential Adaptation Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs. March 2018. Section G.1.c – Management of Sea Level Rise Hazards. <https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf>

## ENDNOTES

- <sup>17</sup> County of San Mateo Office of Sustainability. County of San Mateo Sea Level Rise Vulnerability Assessment. 2018. [https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12\\_SLR\\_VA\\_Report\\_2.2018\\_WEB\\_FINAL.pdf](https://seachangesmc.org/wp-content/uploads/2018/03/2018-03-12_SLR_VA_Report_2.2018_WEB_FINAL.pdf)
- <sup>18</sup> San Francisco Estuary Institute. San Francisco Bay Shoreline Adaptation Atlas. <https://www.sfei.org/adaptationatlas>.
- <sup>19</sup> Adapted from FEMA definition. <https://www.fema.gov/glossary/critical-facility> and Inter-agency Network for Education in Emergencies definition (<https://inee.org/eie-glossary/critical-facilities>).
- <sup>20</sup> Adapted from California Coastal Commission Residential Adaptation Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs. March 2018. Section F.2 – Prioritization of Types of Shoreline Protection. <https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf>
- <sup>21</sup> Inspired by the San Francisco Estuary Institute’s “Sediment for survival: A Strategy for the Resilience of Bay Wetlands in the Lower San Francisco Estuary.” April 2021. [https://www.sfei.org/sites/default/files/biblio\\_files/Sediment%20for%20Survival%20042121%20ome d%20ores.pdf](https://www.sfei.org/sites/default/files/biblio_files/Sediment%20for%20Survival%20042121%20ome d%20ores.pdf).
- <sup>22</sup> More details on market-based tools can be found in the Georgetown Climate Center Managed Retreat Toolkit: <https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/market-based-tools.html>.
- <sup>23</sup> Adapted from City of South San Francisco. Shape SSF: 2040 General Plan. Policy CR-1.1. <https://shapessf.com/community-resilience/>
- <sup>24</sup> <https://oneshoreline.org/projects/flood-ews/>
- <sup>25</sup> Adapted from BCDC Public Access Policy 10.
- <sup>26</sup> Metropolitan Transportation Commission. Bay Trail Interactive Map. <https://mtc.ca.gov/operations/regional-trails-parks/san-francisco-bay-trail/bay-trail-interactive-map>.
- <sup>27</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>28</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>29</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>30</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>31</sup> Adapted from BCDC Bay Adapt Joint Platform, Action 2: Elevate communities to lead, <https://www.bayadapt.org/joint-platform-people/#action-2>.
- <sup>32</sup> Adapted from BCDC Bay Adapt Joint Platform, Action 2: Elevate communities to lead, <https://www.bayadapt.org/joint-platform-people/#action-2>.
- <sup>33</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, Finding C. [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>34</sup> Adapted from BCDC Bay Plan, Environmental Justice and Social Equity Findings and Policies, [https://www.bcdc.ca.gov/plans/sfbay\\_plan.html#40](https://www.bcdc.ca.gov/plans/sfbay_plan.html#40).
- <sup>35</sup> Adapted from BCDC Bay Adapt Joint Platform, Action 2: Elevate communities to lead, <https://www.bayadapt.org/joint-platform-people/#action-2>.
- <sup>36</sup> Adapted from FEMA definition (<https://www.fema.gov/glossary/critical-facility>) and Inter-agency Network for Education in Emergencies definition (<https://inee.org/eie-glossary/critical-facilities>).
- <sup>37</sup> Per “Lowest Floor” definition in FEMA’s National Flood Insurance Program. See Page 16 of NFIP Technical Bulletin o: User’s Guide to Technical Bulletins. [https://www.fema.gov/sites/default/files/documents/fema\\_technical-bulletin-o\\_users-guide\\_1-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_technical-bulletin-o_users-guide_1-2021.pdf).
- <sup>38</sup> Definition adapted from Section 65302 of the California Government Code: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201920200AB65](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB65)
- <sup>39</sup> BCDC Bay Plan Public Access Policy 8.

## ENDNOTES

- <sup>40</sup> The McAteer-Petris Act Webpage. [https://bcfdc.ca.gov/plans/mcateer\\_petris.html](https://bcfdc.ca.gov/plans/mcateer_petris.html).
- <sup>41</sup> County Drainage Manual. PDF page 46.
- <sup>42</sup> USGS and Point Blue Conservation Science. Our Coast Our Future Hazard Map. <https://ourcoastourfuture.org/hazard-map/>.
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- <sup>45</sup> Adapted from City of Boston. Zoning Code, Coastal Flood Resilience Overlay District. Article 25A - 4 Applicability. [https://library.municode.com/ma/boston/codes/redevelopment\\_authority?nodeId=ART25ACOFLEOVDI](https://library.municode.com/ma/boston/codes/redevelopment_authority?nodeId=ART25ACOFLEOVDI)
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- <sup>50</sup> See National Flood Insurance Technical Bulletin 3: Requirements for the Design and Certification of Dry Floodproofed non-Residential and Mixed-Use Buildings Located in Special Flood Hazard Areas. [https://www.fema.gov/sites/default/files/documents/fema\\_technical-bulletin-3\\_1-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_technical-bulletin-3_1-2021.pdf).
- <sup>51</sup> Adapted from California Coastal Commission Residential Adaptation Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs. March 2018. Section G.1.h – Management of Sea Level Rise Hazards and Section E.1 – Habitat Buffers. <https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf>; adapted from City of Norfolk Zoning Ordinance. January 2018. Article 3.9.7.J(2) – General Standards for Flood Plain / Coastal Hazard Overlay. <https://www.norfolkva.gov/norfolkzoningordinance/>; adapted from County of Kauai. Ordinance 979, Section 8-27.3 – Shoreline Setback Determination. [https://www.kauai.gov/Portals/0/Planning/Ord\\_979\\_Shoreline\\_Setback.pdf](https://www.kauai.gov/Portals/0/Planning/Ord_979_Shoreline_Setback.pdf)
- <sup>52</sup> Redwood City Municipal Code, Sidewalk, Setback, and Landscaping Regulations by Sub-District, Supplemental Development Standards for the MUC-RC Sub-District, Section 53.5(A)(2): [https://library.municode.com/ca/redwood\\_city/codes/zoning\\_code?nodeId=ART53MIECOZODI\\_53.5\\_SISELARE](https://library.municode.com/ca/redwood_city/codes/zoning_code?nodeId=ART53MIECOZODI_53.5_SISELARE); San Carlos Municipal Code, Stream Development and Maintenance (SDM) Overlay District, Stream Setback Requirements, Section 18.14.030(A): <https://www.codepublishing.com/CA/SanCarlos/#!/SanCarlos18/SanCarlos1814.html#18.14.030>; San Mateo Downtown Area Plan, Policy I.6 San Mateo Creek Flood Protection: <https://www.cityofsanmateo.org/DocumentCenter/View/55327/2009-Downtown-Area-Plan?bidId=>; Burlingame Municipal Code, Public Access, Flood and Sea Level Rise Performance Guidelines, Creek Access – Buffer Zones, Section 25.12.050(G): [https://library.qcode.us/lib/burlingame\\_ca/pub/municipal\\_code/item/title\\_25-article\\_2-chapter\\_25\\_12-25\\_12\\_050](https://library.qcode.us/lib/burlingame_ca/pub/municipal_code/item/title_25-article_2-chapter_25_12-25_12_050); City of South San Francisco. Zoning Code, Section 20.180.004. [http://shapessf.com/wp-content/uploads/2022/11/LWC\\_SSF\\_Code-Update\\_October-2022.pdf](http://shapessf.com/wp-content/uploads/2022/11/LWC_SSF_Code-Update_October-2022.pdf)
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<sup>72</sup> Acceptable flood thresholds may be different along different locations of the Bay, and BCDC will evaluate this threshold on a project-by-project basis in accordance with the San Francisco Bay Plan Climate Change Policy Guidance Document. Recent permits that set forth public access flood thresholds include the Foster City Levee Project, the Treasure Island Redevelopment Project (BCDC Permit No. 2016.005.00), or the Oyster Point Redevelopment Project (BCDC Permit No. 2017.007.00). The following threshold was defined by BCDC in their Alameda Landing permit (2018.004): existing access is deemed to be impacted by Future Conditions when annual king tides prevent access more than 2 times in a 12-month period.

<sup>73</sup> Adapted from City of Norfolk Zoning Ordinance. January 2018. Article 3.9.7.K(2) – Specific Standards for the Coastal High Hazard and Coastal Floodplain Districts. <https://www.norfolkva.gov/norfolkzoningordinance/>

<sup>74</sup> Adapted from City of Norfolk Zoning Ordinance. January 2018. Article 5.12.5.C – Installation and Maintenance of Resilience Quotient Development Activities Required. <https://www.norfolkva.gov/norfolkzoningordinance/>

<sup>75</sup> Adapted from California Coastal Commission Residential Adaptation Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs. March 2018. Section D.3 Mean High Tide Line Survey Conditions. <https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf>

<sup>76</sup> Adapted from California Coastal Commission Residential Adaptation Policy Guidance: Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs. March 2018. Section A.7 – Real Estate Disclosure of Hazards. <https://documents.coastal.ca.gov/assets/climate/slr/vulnerability/residential/RevisedDraftResidentialAdaptationGuidance.pdf>; Adapted from Broward County. Broward County Code of Ordinances Sec. 39-408 – Required disclosure in contracts for sale of real estate. [bit.ly/37K9hmF](http://bit.ly/37K9hmF).

<sup>77</sup> Note that Civil Code Section 1103.4(c)(2) specifies certain exemptions from liability for transfers of residential property where a licensed engineer, land surveyor, geologist or expert in natural hazard discovery delivers a report which provides notice that the property is within BCDC's jurisdiction, including subject to its regulatory authority.

<sup>78</sup> Definition adapted from Section 65302 of the California Government Code: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201920200AB65](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB65)

<sup>79</sup> BCDC Bay Plan Public Access Policy 8.

<sup>80</sup> The McAteer-Petris Act Webpage. [https://bcdc.ca.gov/plans/mcateer\\_petris.html](https://bcdc.ca.gov/plans/mcateer_petris.html).

<sup>81</sup> May CL, Mohan A, Plane E, Ramirez-Lopez D, Mak M, Luchinsky L, Hale T, Hill K. 2022. Shallow Groundwater Response to Sea-Level Rise: Alameda, Marin, San Francisco, and San Mateo Counties. Prepared by Pathways Climate Institute and San Francisco Estuary Institute. [doi.org/10.13140/RG.2.2.16973.72164](https://doi.org/10.13140/RG.2.2.16973.72164)

<sup>82</sup> May CL, Mohan A, Plane E, Ramirez-Lopez D, Mak M, Luchinsky L, Hale T, Hill K. 2022. Shallow Groundwater Response to Sea-Level Rise: Alameda, Marin, San Francisco, and San Mateo Counties. Prepared by Pathways Climate Institute and San Francisco Estuary Institute. [doi.org/10.13140/RG.2.2.16973.72164](https://doi.org/10.13140/RG.2.2.16973.72164)

<sup>83</sup> USGS and Point Blue Conservation Science. Our Coast Our Future Hazard Map. <https://ourcoastourfuture.org/hazard-map/>

<sup>84</sup> USGS and Point Blue Conservation Science. How does subsurface geology affect groundwater levels? [https://data.pointblue.org/apps/ocof2\\_flood\\_map/images/infographics/groundwater\\_geology.png](https://data.pointblue.org/apps/ocof2_flood_map/images/infographics/groundwater_geology.png).

<sup>85</sup> Befus, K.M., Barnard, P.L., Hoover, D.J., Finzi Hart, J.A., and C.I. Voss. 2020. Increasing threat of coastal groundwater hazards from sea-level rise in California. Nat. Clim. Chang. 10, 946–952. <https://doi.org/10.1038/s41558-020-0874-1>

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<sup>88</sup> Adapted from FEMA, 44 CFR 59.1. Substantial improvement definition. FEMA Technical Bulletin o: User's Guide, Page 21: [https://www.fema.gov/sites/default/files/documents/fema\\_technical-bulletin-o\\_users-guide\\_1-2021.pdf](https://www.fema.gov/sites/default/files/documents/fema_technical-bulletin-o_users-guide_1-2021.pdf).

<sup>89</sup> San Francisco Estuary Institute, with technical review by ESA & Pathways Climate Institute. Sea-level Rise Impacts on Shallow Groundwater in Moffett Park: A technical addendum to the Moffett Park Specific Plan. November 2021, page 25. <https://static1.squarespace.com/static/5e38a3dd6f9db304821e8e5e/t/61a7b37743ec4b770e11ee73/1638380421678/Moffett+Park+Specific+Plan+Groundwater+Addendum.pdf>

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<sup>91</sup> USGS and Point Blue Conservation Science. How does subsurface geology affect groundwater levels? [https://data.pointblue.org/apps/ocof2\\_flood\\_map/images/infographics/groundwater\\_geology.png](https://data.pointblue.org/apps/ocof2_flood_map/images/infographics/groundwater_geology.png).

<sup>92</sup> Redwood City Municipal Code, Sidewalk, Setback, and Landscaping Regulations by Sub-District, Supplemental Development Standards for the MUC-RC Sub-District, Section 53.5(A)(2): [https://library.municode.com/ca/redwood\\_city/codes/zoning\\_code?nodeId=ART53MIECOZODI\\_53.5\\_SISELARE](https://library.municode.com/ca/redwood_city/codes/zoning_code?nodeId=ART53MIECOZODI_53.5_SISELARE); San Carlos Municipal Code, STREAM DEVELOPMENT AND MAINTENANCE (SDM) OVERLAY DISTRICT, Stream setback requirements, Section 18.14.030(A): <https://www.codepublishing.com/CA/SanCarlos/#!/SanCarlos18/SanCarlos1814.html#18.14.030>;

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