# Technical Memorandum

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| **Via Email:** | jfitch@scarboroughmaine.org |
| **To:** | Jami Fitch, Town of Scarborough |
| **From:** | Leila Pike, P.E. (GEI), Ilan Gasko, E.I. (GEI) |
| **Date:** | August 20, 2025 |
| **Re:** | Ordinance Review Memo<br>Flood Vulnerability Assessment<br>Scarborough, Maine |
| **Project No.** | 2403961 |

GEI Consultants, Inc. (GEI) conducted a review of four ordinances from the Town of Scarborough, Cumberland County, Maine (the "Town") (Figure 1), to identify opportunities within the ordinances for enhancing the Town's resilience to flood risks. This memorandum is organized by each ordinance reviewed, highlighting specific section where revisions may be beneficial. The review was conducted as part of Task 4 of our proposal dated April 1, 2024.

While specific ordinance language was not developed as part of this task, we have included example language from other coastal New England municipalities to illustrate potential updates. Many of these ordinance examples were provided by the Metropolitan Area Planning Council (MAPC), which compiled examples of regulatory language and policies used for climate resilience and land use strategies in the greater Boston area (MAPC, 2024). Other references used for this review include the Southern Maine Planning and Development Commission (SMPDC) "Municipal Guidance for Coastal Resilience: Model Ordinance Language for Maine Municipalities" (SMPDC, 2022), and the City of Portland, ME Land Use Code (Portland, 2024).

The ordinances used in reference, for example language are provided in Appendix A. These examples are intended to serve as reference for future discussions and are not proposed for direct adoption. Ordinance language revisions would require careful review and input from municipal staff, state staff, local boards, stakeholders, and legal counsel, as applicable.

## 1.0 Overview of Town Ordinances Reviewed and Recommendations

At the request of the Town, the following four ordinances were reviewed:

- Chapter 405, Zoning Ordinance
- Chapter 405B, Site Plan Review Ordinance
- Chapter 405C, Shoreland Zoning Ordinance
- Chapter 406, Subdivision Ordinance

Our proposal initially included the review of Chapter 405A, Floodplain Management Ordinance. It was determined during the kickoff meeting with the Town Vulnerability Assessment Working Group on May 29, 2024, that GEI should no longer review Chapter 405A due to recent changes to the ordinance. In its stead, Chapter 406 was chosen by the working group; however, we still reviewed Chapter 405A to understand its relevance to the Town's resiliency planning but did not highlight sections to be addressed.

For each ordinance, we have extracted sections that we suggest could be revised, followed by our suggested revisions below the quoted sections. The extracted sections are organized in block quote format in italics.

In some cases, we have suggested using language around areas of "high flood risk," however, we have not defined "high flood risk" as part of this review. "High flood risk" may vary depending on the area of Town or resource that the ordinance is referring to (i.e., coastal area or freshwater wetland). We recommend the Town develop a formal definition of "high flood risk" for specific ordinances if it is used within ordinance language. For example, "high flood risk" could refer to areas within the Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA) or areas likely to be inundated during Highest Astronomical Tide (HAT) in 2050. It may be appropriate to have varied definitions of "high flood risk" for different ordinances.

The recommendations in this memo emphasize reducing long-term risk, aligning local standards with state and federal requirements, and supporting natural systems that buffer the shoreline from wave action. These recommendations are intended to help the Town adapt to sea level rise and coastal storms by steering growth to safer areas, minimizing repeated damages, and maintaining the protective capacity of dunes, wetlands, and beaches. Key themes and suggested changes include:

- **Ordinance Consistency** – revise ordinances to be consistent between ordinances and aligned with state rules.
- **Account for Changing Flood Risk** – revise ordinances to include the effect of sea level rise in defining areas high water lines or areas of high flood risk.
- **Promotion of Proactive Resilience Measures** – revise ordinances to promote or incentivize resilient development, such as using Transfer of Development Rights in areas of high flood risk, supporting resilient design measures, and adding a coastal flood resilience overlay zone.
- **Protect Natural Resources** – revise ordinance language to strengthen limits on foot traffic, vegetation removal, and alteration of sand dunes.

# 2.0 Chapter 405, Zoning Ordinance

## *2.1 Section III(C)(1)(b): Nonconformance, Non-Conforming Buildings or Structures*

> *The elevation of an existing structure required for the purpose of meeting the minimum elevation standards in the Scarborough Floodplain Management Ordinance or Maine Department of Environmental Protection Chapter 355 – Coastal Sand Dune Rules, shall not be considered an expansion, enlargement or increase in height. (03/02/16)* (Scarborough, 2025a)

The Town may consider adding the Scarborough Shoreland Zoning Ordinance to the list in addition to the Scarborough Floodplain Management Ordinance and the Maine Department of Environmental Protection Chapter 355 – Coast Sand Dune Rules.

## *2.2 Section IV(I)(4)(f): Administration, Special Exception Permits, Standards for Special Exceptions*

> *If located in a shoreland zone as depicted on the Town of Scarborough Official Shoreland Zoning Map, the proposed use will comply with all of the requirements of the Town of Scarborough Shoreland Zoning Ordinance. (8/5/92)* (Scarborough, 2025a)

The Town may consider requiring proposed land use in applications for a special exception permit to comply with all requirements of Chapter 405A if in an area of special flood hazard, using language similar to the above-cited text.

## *2.3 Section VII.A(B)(1)(c): Conservation Subdivision Design – Flexible Development Standards for Lower Density Residential Districts, Applicability, Required Conservation Subdivisions*

> *Required conservation subdivisions. Conservation subdivision design is required in the RFM, RF and R-2 Districts when:*
>
> > *c. Twenty percent (20%) or more of the land to be subdivided is within the Shoreland Zone under the Town of Scarborough Shoreland Zoning Ordinance.* (Scarborough, 2025a)

The Town may also consider requiring conservation subdivision design when a certain amount (i.e., 20% or more) of the land to be subdivided is within an area of special flood hazard as defined in Chapter 405A.

## *2.4 Section VII.A(F)(6)(g): Conservation Subdivision Design – Flexible Development Standards for Lower Density Residential Districts, Conservation of Open Space*

> *When parking areas are proposed, they shall be designed and constructed with pervious and semi-pervious alternatives to bituminous pavement, if possible. Such alternatives may include porous pavement blocks, grassed interlocking paving systems, re-enforced turf and stone dust materials. These alternative parking surfaces are intended to minimize storm water run-off and facilitate infiltration and natural hydrological functions to the extent feasible.* (Scarborough, 2025a)

The Town may consider also applying this ordinance section to areas of the town beyond conservation subdivisions, such as in neighborhoods that are near water bodies, tributary streams, or wetlands, in an effort to reduce the runoff intensity into these features. Expanding the area in Town where pervious and semi-pervious pavers are used could reduce storm water run-off, potentially reducing flood risk and increasing resilience to flooding from rainfall events.

## *2.5 Section VII.D(A): Development Transfer Provisions, Purpose*

> *To provide a mechanism that will enable the transfer of residential development from the Town's limited and very low density growth areas to the Town's growth areas in order to maintain the rural character and development pattern of the limited and very low density growth areas, while directing growth to the higher density, more urban growth areas of the Town.* (Scarborough, 2025a)

The Town may consider expanding the purpose to include enabling the transfer of residential development from areas of high flood risk, either for present-day conditions or conditions in the future (i.e., 2050 with 1.5 feet of sea level rise). Expanding the Transfer of Development Rights (TDR) to include areas of high flood risk could promote coastal resiliency by designating flood-prone coastal zones as "sending areas" and safer inland zones as "receiving areas." In this system, landowners in high-risk areas sell their unused development rights, which are permanently retired through easements, while developers purchase those rights to gain additional density in upland growth areas. This market-based tool would compensate coastal property owners, direct growth to safer locations, and could gradually reduce the number of structures at risk of flooding or discourage new structures from being built in areas of high flood risk. By expanding Scarborough's existing TDR framework to include areas of high flood risk as "sending zones," the Town could increase resiliency, align with floodplain management goals, and steer development toward resilient growth areas without relying solely on public funds.

If the purpose of Section VII.D is revised to include areas of high flood risk, additional subsections of Section VII.D should be revised to include areas of high flood risk within "sending" areas, including (G) Use of Development Transfer Fees, (H) Transfer of Development Rights, and (I) Registry and Landowner Assistance.

## *2.6 Section IX(F)(2)(m): Performance Standards, Transmission Towers, Standards for Transmission Towers, Shoreland Zoning*

> *Transmission towers shall not be allowed within any Shoreland Zoning District, including the Shoreland Overlay District and the Resource Protection District. Land within a Shoreland Zoning District however can be counted toward the minimum lot size and/or setback requirements provided the siting of the transmission tower is outside any Shoreland Zoning District.* (Scarborough, 2025a)

The Town may consider also prohibiting transmission towers from areas of special flood hazard as defined in Chapter 405A, Floodplain Management Ordinance. Expanding prohibitions on transmission tower locations to areas of special flood hazard could prevent telecommunications infrastructure from being located in high flood risk areas.

The Town may also consider applying similar standards to other critical infrastructure, like hospitals, emergency response, water/sewer, etc.

## *2.7 Section XI(F)(2): Off-Street Parking Regulations, Parking Design and Construction – General*

> *Where off-street parking for any use other than single or two-family dwellings is required or provided, the following construction requirements shall apply: [Adopted 01/04/2023]*
>
> > *The surface of driveways, maneuvering areas and parking areas shall be uniformly graded with a subgrade consisting of gravel or equivalent materials at least six inches in depth, well compacted and with a wearing surface equivalent in qualities of compaction and durability of fine gravel. Unless otherwise specifically approved by the Planning Board, the surface of driveways, maneuvering areas and parking areas in all Business Zones shall be paved.* (Scarborough, 2025a)

The Town may consider allowing driveways, maneuvering areas, and parking areas to be designed and constructed with pervious and semi-pervious alternatives to bituminous pavement. The Town may consider requiring alternatives to bituminous pavement in areas near water bodies, tributary streams, or wetlands as a way to reduce rainfall runoff into these features.

Allowing pervious and semi-pervious pavers could reduce stormwater runoff, potentially reducing flood risk and increasing resilience. Requiring pervious and semi-pervious pavers would likely lead to more implementation of these resilient design methods.

See Appendix A for example language from the Town's Chapter 405B: Site Plan Review Ordinance, IV(G)(2) (Scarborough, 2025b).

## *2.8 Section XV.I(B) Article 3 (B): Higgins Beach Character-Based Zoning Districts, Coastal Overlay Districts, Floodplain*

This ordinance section requires that elevations of the lowest floor and horizontal framing members be one foot above base flood as determined by the methods under Chapter 405A. The Town may consider changing this to two feet to be consistent with Chapter 405A, Floodplain Management Ordinance.

# 3.0 Chapter 405B, Site Plan Review Ordinance

## *3.1 Section IV(A)(3): Performance & Design Standards, Site Utilization and Layout Amended, General Standards*

> *Structures and impervious areas shall be designed around, and away from, resource areas such as wetlands, steep slopes, water bodies and other unique natural features.* (Scarborough, 2025b)

The Town may consider refining this language to add specifics about what "around" and "away from" mean with respect to resource areas. Additionally, the Town may consider expanding this list to include areas of high flood risk.

## *3.2 Section IV(C): Performance and Design Standards, Stormwater Management*

> *Adequate provisions shall be made for the control, collection and disposal of all stormwater runoff from the site. Drainage plans, details, and calculations shall address the two, ten and twenty-five year, twenty-four hour storm events. These plans shall be designed to complement the hydrology and natural features of the site and shall not cause adverse impacts to abutters, downstream properties, or receiving waters. Post-development stormwater flow rates must be equal to or less than pre-development stormwater flow rates.* (Scarborough, 2025b)

The Town may consider increasing the design storm requirement beyond the 25-year event. The Town may also consider increasing stormwater flow rates by 15 to 20% to account for a projected increase in rainfall intensity due to climate change.

As an example, the Town of Wellfleet, MA has a model bylaw which allows the reviewing body to require an applicant to design stormwater management components for the 500-year flood frequency event period (SMPDC, 2022).

# 4.0 Chapter 405C, Shoreland Zoning Ordinance

## *4.1 Section 3: Applicability*

> *This Ordinance applies to all land areas within 250 feet, horizontal distance, of the*
>
> - *normal high-water line of any great pond or river*
> - *upland edge of a coastal wetland, including all areas affected by tidal action, or*
> - *upland edge of a freshwater wetland and all land areas within 75 feet, horizontal distance, of the normal high-water line of a stream. (amended 07/15/2009)*
>
> (Scarborough, 2025c)

The Town may consider including sea level rise projections in this ordinance. For example, the ordinance may apply to land areas within a certain distance of the likely Highest Astronomical Tide (HAT) elevation in 2050 due to sea level rise. If the Town adopts modifications to the applicable land use areas, confirm that the modification is applied throughout the ordinance wherever applicable. By including effects from climate change and future water elevations in this ordinance, the Town could reduce future flood risk and improve resilience within vulnerable areas.

See Appendix A for example language from the Town of Swampscott, MA, Zoning By-Law 4.2.0.0 (Swampscott, 2023).

## *4.2 Section 13(A): Establishment of Districts, Resource Protection District*

> *The Resource Protection District includes areas in which developments would adversely affect water quality, productive habitat, biological ecosystems, or scenic and natural values.*
> (Scarborough, 2025c)

The Town may consider including areas subject to future sea level rise, storm surge, marsh migration, and/or sand dune migration as part of this ordinance, which could promote future ecological function, reduce future flood risk, and improve resilience.

See Appendix A for example language from SMPDC Municipal Guidance for Coastal Resilience (SMPDC, 2022).

## *4.3 Section 15(B)(1): Land Use Standards, Principal and Accessory Structures*

> *All new principal and accessory structures shall be set back from the highest annual tide for lands subject to tidal action; the normal high water line of other water bodies, tributary streams, or the upland edge of a wetland….* (Scarborough, 2025c)

The Town may consider including sea level rise projections in this ordinance. For example, the structures might be required to be set back a certain distance from anticipated HAT in 2050 due to sea level rise or another tidal scenario and sea level rise amount as determined by the Town. Including effects from climate change in this ordinance could reduce future flood risk and improve resilience.

See Appendix A for example language from the Town of Swampscott, MA, Zoning By-Law 4.2.0.0 (Swampscott, 2023).

## *4.4 Section 15(B)(3): Land Use Standards, Principal and Accessory Structures*

> *The lowest floor elevation or openings of all buildings and structures including basements shall be elevated at least one foot above the elevation of the 100 year flood, the flood of record, or in the absence of these, the flood as defined by soil types identified as recent floodplain soils. Accessory structures may be placed in accordance with the standards of Chapter 405A, Town of Scarborough Floodplain Management Ordinance, and need not meet the elevation requirements of this paragraph. (amended 07/15/2009) (amended 06/03/2020, effective date 10/01/2020)* (Scarborough, 2025c)

The Town may consider changing the required elevation of the lowest floor to 2 ft above the 100-year flood elevation to be consistent with Chapter 405A, Floodplain Management Ordinance.

## *4.5 Section 15(J)(1): Land Use Standards, Septic Waste Disposal*

> *All subsurface sewage disposal systems shall be installed in conformance with the State of Maine Subsurface Wastewater Disposal Rules and the requirements of the Scarborough Plumbing Ordinance, and the following: a) clearing or removal of woody vegetation necessary to site a new system and any associated fill extensions, shall not extend closer than seventy-five (75) feet, horizontal distance, from the normal high-water line of a water body or the upland edge of a wetland and b) a holding tank is not allowed for a first-time residential use in the shoreland zone. (amended 07/15/2009)* (Scarborough, 2025c)

The Town may consider including sea level rise projections in this ordinance. For example, the ordinance may prohibit septic disposal systems within a certain distance of anticipated HAT in 2050 due to sea level rise or another tidal scenario and sea level rise amount as determined by the Town.

See Appendix A for example language from the Town of Swampscott, MA, Zoning By-Law 4.2.0.0 (Swampscott, 2023).

## *4.6 Section 15(M)(2): Land Use Standards, Agriculture*

> *Manure shall not be stored or stockpiled within seventy-five (75) feet horizontal distance, of water bodies, tributary streams, or wetlands. All manure storage areas within the shoreland zone must be constructed or modified such that the facility produces no discharge of effluent or contaminated storm water. (amended 07/15/2009)* (Scarborough, 2025c)

The Town may consider including sea level rise projections in this ordinance to account for the likely changing boundary of tidally influences water bodies, tributary streams, or wetlands. For example, the ordinance may prohibit manure storage within a certain distance of the anticipated boundaries of these areas by 2050 given sea level rise projections.

See Appendix A for example language from the Town of Swampscott, MA, Zoning By-Law 4.2.0.0 (Swampscott, 2023).

## *4.7 Section 15(N)(6)(g)(iv): Land Use Standards, Timber Harvesting, Crossings of waterbodies, Bridge and Culvert Sizing*

> *River, stream and tributary stream crossings allowed under Section 15(N), but located in flood hazard areas (i.e. A zones) as identified on a community's Flood Insurance Rate Maps (FIRM) or Flood Hazard Boundary Maps (FHBM), must be designed and constructed under the stricter standards contained in that community's National Flood Insurance Program (NFIP). For example, a water crossing may be required to pass a 100- year flood event.* (Scarborough, 2025c)

The Town may consider establishing the 100-year event as the lowest recurrence interval event that a water crossing must be able to pass. The Town may consider also adding projected increased flows or water levels to their requirements for water crossing capacity (i.e., a 100-year precipitation flood event increased by 15 to 20% for stream crossings in A-zones, or a 100-year tidal flood event plus sea level rise for areas in coastal flood zones).

## *4.8 Section 15(S)(5): Land Use Standards, Erosion and Sedimentation Control*

> *Natural and man-made drainage ways and drainage outlets shall be protected from erosion from water flowing through them. Drainage ways shall be designed and constructed in order to carry water from a twenty-five (25) year storm or greater, and shall be stabilized with vegetation or lined with riprap.* (Scarborough, 2025c)

The Town may consider increasing the design storm minimum requirement beyond the 25-year storm. The Town may also consider including increasing storm flows by 15 to 20% to account for an increase in precipitation due to climate change.

The Town of Wellfleet, MA has a model bylaw which allows the reviewing body to require an applicant to design stormwater management components for the 500-year flood frequency event period (SMPDC, 2022).

# 5.0 Chapter 406, Subdivision Ordinance

## *5.1 Section 4(M): Purpose, and Interpretation, and Review Criteria*

> *Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant, the Planning Board shall determine whether the subdivision is in a flood-prone area. If the subdivision, or any part of it, is in such an area, the subdivider shall determine the 100-year flood elevation and flood hazard boundaries within the subdivision. The proposed subdivision plan must include a condition of plan approval requiring that principal structures in the subdivision will be constructed with their lowest floor, including the basement, at least one foot above the 100-year flood elevation*; (Scarborough, 2025d)

The Town may consider changing the required elevation of the lowest floor to two feet above the 100-year flood elevation to be consistent with Chapter 405A, Floodplain Management Ordinance.

# 6.0 Additional Ordinance Language

In this section we have provided additional ordinance language and/or sections the Town may consider adding to existing ordinances. These are drawn from similar ordinances used in nearby coastal communities. We have provided those examples for reference.

## *6.1 Coastal Flood Resilience Overlay Districts*

The Town should consider creating coastal flood resilience overlay districts for neighborhoods with high coastal flood risk, such as Higgins Beach and Pine Point. The City of Portland recently created a Coastal Flood Resilience Overlay Zone that introduces specific zoning requirements aimed at enhancing the resilience of new development and redevelopment within vulnerable flood areas (Portland, 2024). The Town should consider this approach in future zoning amendments.

When creating new coastal overlay districts, the Town should create robust purpose statements to enact and defend high standards. Limiting new development and incentivizing resilient design could reduce present-day and future flood risk to buildings and developments.

See Appendix A for example language on:

- Purpose, as it pertains to flood risk: Town of Millis, MA, Zoning By-law, XI(A)(1) (Millis, 2022)
- Incentivizing resilient design: Town of Hull, MA, Zoning By-Law, III(39B)(12) (Hull, 2018)

- Sea-level Design Flood Elevation: City of Portland, ME, Land Use Code, Articles 3 and 8. (Portland, 2024)

## *6.2 Resilient Design*

Establishing a quantitative framework for measuring the resilience of new development or significant alterations to existing development could increase resilience of individual developments. See Appendix A for example language from the City of Norfolk, VA, Zoning Ordinance, 5.12.1 (Norfolk, 2022). The City of Norfolk uses a point system to quantify resilient development activity as a way to promote resilient design. New developments are required to achieve a certain number of points, depending on the number of dwelling units.

## *6.3 Beach Management*

The Town may consider implementing ordinance language designed to maintain the ecological health of Scarborough's beaches and sand dunes. The language could consider limiting foot and vehicle traffic in sand dunes and limiting removal of vegetation from dune systems. The purpose of such an ordinance would be to help sand dune systems remain intact and healthy which would allow them to continue acting as natural barriers that can absorb wave energy and trap windblown sand, which could reduce erosion.

## *6.4 SMPDC Municipal Guidance for Coastal Resilience*

SMPDC published a Municipal Guidance for Coastal Resilience, providing model ordinance language for Maine municipalities (SMPDC, 2022). GEI recommends that the Town review the suggestions and model language included in the SMPDC guidance when revising ordinance language.

## *6.5 Relationship with Other Laws*

The City of Portland has the following statement in their most recent Land Use Code (Portland, 2024):

> *Where conditions, standards, or requirements imposed by any provision of this Land Use Code are found to be inconsistent with a provision listed in the law or regulations of the State of Maine or federal government, the more restrictive provision shall control.*

The Town of Scarborough could use similar language within its ordinances to account for standards that may overlap between ordinances or with state or federal regulations.

# 7.0 Limitations

This memo provides a high-level review of four ordinances within the Town of Scarborough to identify sections within the ordinances that could be revised in order to increase the Town's resiliency against flood risk. The intent of this document is to highlight areas where additional language or revisions within these four ordinances could be beneficial to the Town's goals. We did not review ordinances beyond the four specified in this memo: Chapter 405, Chapter 405B, Chapter 405C, and Chapter 406. Additionally, we have not recommended specific language for ordinance revisions. Ordinance language revisions

would require careful review and input from municipal staff, state staff, local boards, and legal counsel, as applicable.

This review relied on readily available online information, including a review of municipal ordinances throughout New England, published guidance documents, and our professional judgement.

Reuse of this report for any purposes, in part or in whole, is at the sole risk of the user.

# 8.0 References

GEI (2025). Scarborough Flood Vulnerability Analysis Memo. March 27.

Hull, MA, Town of (2018). Zoning By-Law. Amended 2018.

Metropolitan Area Planning Council (MAPC) (n.d.). Climate Resilient Land Use Strategies: Regulatory Language and Policy Examples, Floodplain Overlay Districts. Accessed on July 31, 2024 from: https://www.mapc.org/resource-library/floodplain-overlay-districts/.

Millis, MA, Town of (2022). Zoning By-Law. Amended May 2, 2022.

Norfolk, VA, City of (2024). Zoning Ordinance. Updated April 23, 2024.

Portland, ME, City of (2024). Land Use Code. December 2024.

Scarborough, Town of (2025a). Chapter 405: Zoning Ordinance. Amended May 7, 2025.

Scarborough, Town of (2025b). Chapter 405B: Site Plan Review Ordinance. Amended January 22, 2025.

Scarborough, Town of (2025c). Chapter 405C: Shoreland Zoning Ordinance. Amended May 21, 2025.

Scarborough, Town of (2025d). Chapter 406: Subdivision Ordinance. Amended January 22, 2025.

Scarborough, Town of (2024). Chapter 405A: Floodplain Management Ordinance. Effective June 20, 2024.

SMPDC, (2022). Municipal Guidance for Coastal Resilience: Model Ordinance Language for Maine Municipalities, April.

Swampscott, MA, Town of (2023). Zoning By-Law. Updated May 15, 2023.

Woburn, MA, City of (2024). Zoning Ordinances. Amended April 10, 2024.

Sincerely,

**GEI CONSULTANTS, INC.**

Leila Pike, P.E.
Project Manager

Ilan Gasko, E.I.
Staff Professional

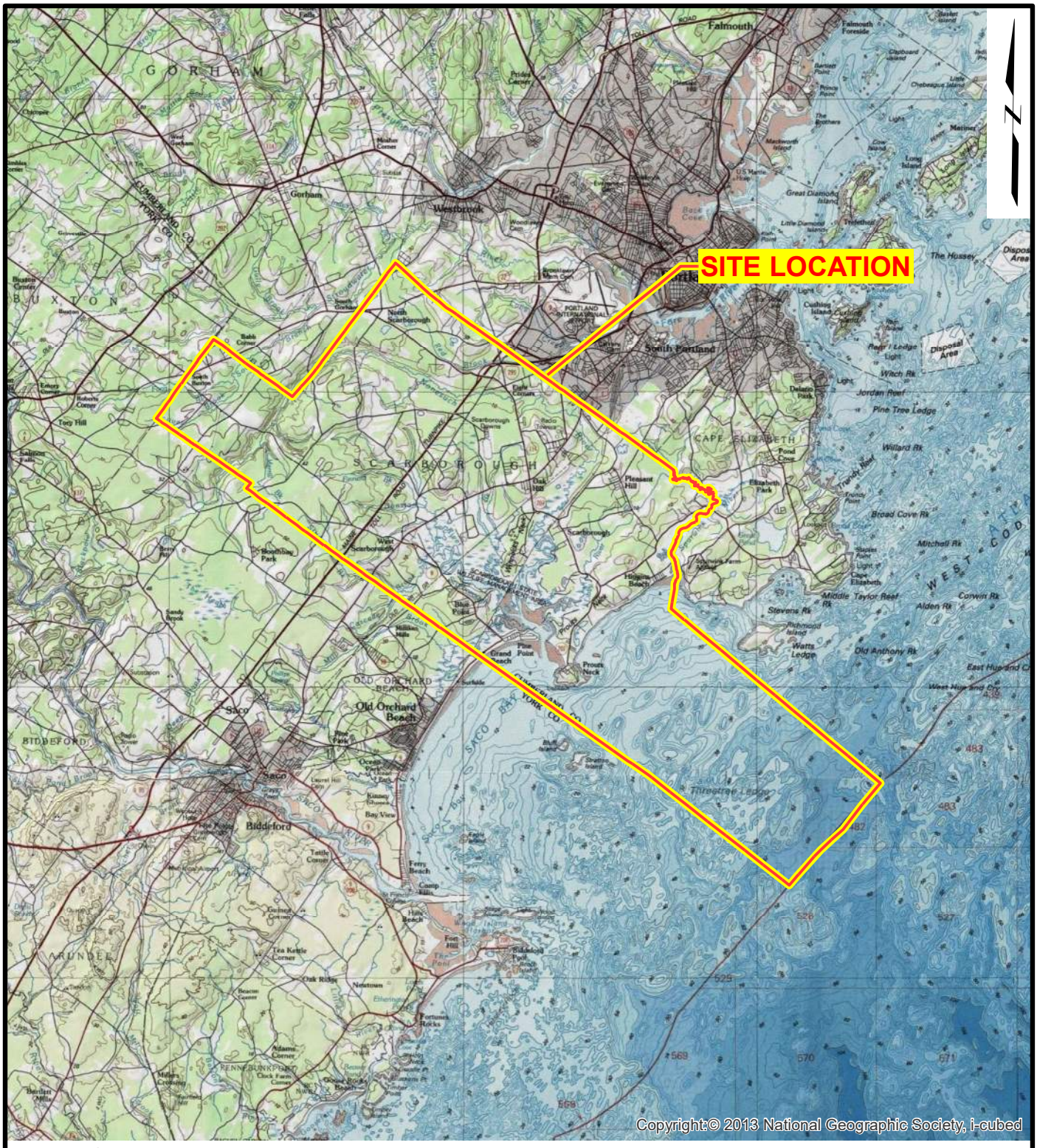
Attachments

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| Figure 1 | Site Location |
| Appendix A | Example Ordinance Language |

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# Figures

## Figure 1 Site Location






0 7,500 15,000 30,000

Feet

| | | |
|---|---|---|
| Flood Vulnerability Assessment<br>Scarborough, Maine | GEI Consultants | SITE LOCATION |
| Town of Scarborough<br>Scarborough, Maine | Project 2403961 | August 2025 Fig. 1 |

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# Appendix A Example Ordinance Language

**A.1. Town of Scarborough, ME, Chapter 405B: Site Plan Review Ordinance, IV(C)(2): Performance and Design Standards, Stormwater Management [amended 04/21/2021] (Scarborough, 2025b)**

**A.2. Town of Millis, MA, Zoning By-law, XI(A)(1): Special Flood Hazard District ("SFH" District), Purpose (Millis, 2022)**

**A.3. Town of Hull, MA, Zoning By-Law III(39B)(12): Establishment of Districts, Nantasket Beach Overlay District, Incentives for constructing buildings that are adapted to and resilient to the impacts of climate change on coastal communities in designated floodplain districts. (Hull, 2018)**

**A.4. Town of Swampscott, MA, Zoning By-Law, 4.2.0.0: Special Regulations, Coastal Flood Area Overlay District (Swampscott, 2023)**

**A.5. SMPDC Municipal Guidance for Coastal Resilience, 3.3 Zone Areas of Sea Level Rise and Marsh Migration as Protected Resources (SMPDC, 2022)**

**A.6. City of Portland, ME, Land Use Code (Portland, 2024)**

**A.7. City of Norfolk, VA, Zoning Ordinance, 5.12: Resilience Quotient (Norfolk, 2024)**

## A.1. Town of Scarborough, ME, Chapter 405B: Site Plan Review Ordinance, IV(C)(2): Performance and Design Standards, Stormwater Management [amended 04/21/2021] (Scarborough, 2025b)

*When areas of the site are to be paved they may be designed and constructed with pervious and semi-pervious alternatives to bituminous pavement. Alternative parking surfaces, such as porous pavement, are intended to minimize storm water run-off and facilitate infiltration and natural hydrological functions to the extent feasible.*

## A.2. Town of Millis, MA, Zoning By-law, XI(A)(1): Special Flood Hazard District ("SFH" District), Purpose (Millis, 2022)

*The purpose of this district is to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:*

1. *To protect human life and health;*
2. *To minimize expenditure of public money for costly flood control projects;*
3. *To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;*
4. *To minimize prolonged business interruptions;*
5. *To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;*
6. *To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;*
7. *To insure that potential buyers are notified that property is in an area of special flood hazard; and*
8. *To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions;*
9. *To promote the preservation of the natural flood control characteristics and the water storage capacity of the areas of special flood hazard.*
10. *To promote the safety and purity of water;*
11. *To promote the control and containment of sewage.*

## A.3. Town of Hull, MA, Zoning By-Law III(39B)(12): Establishment of Districts, Nantasket Beach Overlay District, Incentives for constructing buildings that are adapted to and resilient to the impacts of climate change on coastal communities in designated floodplain districts. (Hull, 2018)

*12.1. The purpose of this section is to encourage construction that will withstand increased flood elevations and frequency and intensity of storm events for new buildings and those being substantially improved (costs equal or exceed 50 % of the appraised market value).*

*12.2. This Section provides the following incentives:*

> *12.2.1. The Planning Board will permit projects under S. 12 through the Special Permit procedures (S. 3 of the NBOD). Projects permitted under this Section will be eligible for a rebate of up to $500 on the building permit fees through the Town's established administrative process for "freeboard" rebate.*
>
> *12.2.2. Buildings will be eligible for insurance savings from the National Flood Insurance Program based on their elevation above the National Flood Insurance Program (NFIP) minimum height requirements. Projects proposed under S.12 must determine and report on their potential insurance savings allowed from NFIP due to their proposed "freeboard."*
>
> *12.2.3. In order to provide storm and flood protection for new and existing buildings within a Special Flood Hazard Area, as defined by the latest edition of 780 CMR, the Planning Board may allow building heights up to a maximum of forty (40) feet above a non habitable lowest floor (as defined in S. 42 of this Bylaw) which must be a "Market Hall". The height of the "Market Hall" will be calculated by adding the required flood elevation plus up to six (6) feet of freeboard. Therefore the total building height is calculated by adding the flood elevation plus the allowed freeboard up to six (6) feet and up to the maximum allowed forty (40) feet of habitable space. Buildings cannot exceed the elevation required to comply with 780 CMR by more than six (6) feet.*

*12.3. In order to receive these incentives, the project must incorporate the following elements into the proposed development:*

> *12.3.1. All buildings must comply with existing Floodplain Regulations as set forth in S. 42 of this Zoning Bylaw.*
>
> *12.3.2. The lowest floor or story of a building shall not contain habitable space, regardless of the property's location within the Floodplain Districts set forth in S. 37 and 42 of this Zoning Bylaw and the property's designation within special flood hazard areas by the Plymouth County Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for the administration of the National Flood Insurance Program. Instead, open commercial lowest floor space will be used for temporary non-habitable uses as inspired by the traditional Market Hall that provide utility and ideally, contribute to economic and social activity of the NBOD.*
>
> *12.3.3. Lowest floor uses may include but are not limited to:*

*12.3.3.1. Farmer's markets, vendor stalls.*

*12.3.3.2. Art exhibition and performance art.*

*12.3.3.3. Beach Reservation Visitors' Center and historic exhibits.*

*12.3.3.4. Temporary outdoor eating spaces, such as café tables for seasonal restaurants.*

*12.3.3.5. Parking, provided that the space allotted to parking does not occupy more than 50 percent of the total lowest floor square footage and is screened from other uses by three (3) to five (5) feet height screening with minimum 50% opacity.*

*12.3.3.6. Facilities to access the habitable floors of the structure, including enclosed stairways, foyers, elevators and similar facilities.*

*12.3.4. Mechanical, electrical service and HVAC equipment shall not be located on the lowest floor, but rather shall be located on roof or upper stories and screened or enclosed as an integral part of the building design and not an add on feature.*

*12.3.5. Generators sized to meet the emergency electrical demands of the building are located on roof or upper stories.*

*12.3.6. Underground utility lines and submersible electrical transformers are required where appropriate and feasible.*

*12.3.7. To the greatest extent possible buildings will be constructed to the highest storm and flood resistant standards for the A Zone, as described in 780 CMR 120 G Flood Resistant Construction and Construction in Coastal Dunes.*

*12.3.8. To the greatest extent possible, proponents shall incorporate in their buildings and developments the standards for building construction, architecture and site design for "Green Building" as defined in S. 4 of the NBOD.*

*12.3.9. To the greatest extent possible built landscape features that function to provide storm and flood protection shall be constructed and maintained*

## A.4. Town of Swampscott, MA, Zoning By-Law, 4.2.0.0: Special Regulations, Coastal Flood Area Overlay District (Swampscott, 2023)

*4.2.2.1. Long-Term Sea Level Rise: The estimated relative increase in mean sea level over the design life of a proposed building or structure. The effects of long-term sea level rise, as referenced in the CFAOD , shall be determined using the "Highest" curve from the U.S. National Climate Assessment (Global Sea-Level Rise Scenarios for the United States National Climate Assessment, NOAA Technical Report OAR CPO-1, December 12, 2012) and local rates of land subsidence for a 50 year time horizon, unless the approving authority determines that other, more appropriate methods for determining sea level rise or other time horizons, are more appropriate for the specific project. Table 1.1 in the Town of Swampscott Coastal Climate Change Study Final Report (dated June 2016) provides relative seal level rise estimates for years 2020 through 2100 in 10-year increments, considering a start year of 2013.*

**TABLE 1.1**
**SEA LEVEL RISE ESTIMATES FOR SWAMPSCOTT**

| Scenarios | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 |
|---|---|---|---|---|---|---|---|---|---|
| Global SLR (from 2013-year of interest) "Highest" (feet) | 0.21 | 0.61 | 1.10 | 1.70 | 2.40 | 3.21 | 4.11 | 5.12 | 6.23 |
| Land subsidence (feet) @ 0.04 in./yr. | 0.02 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.22 | 0.25 | 0.29 |
| **Total Relative SLR - "Highest" (feet)** | 0.24 | **0.66** | 1.19 | 1.82 | 2.56 | **3.39** | 4.33 | 5.37 | 6.52 |

*4.2.6.1. Permitted Uses - AE and VE Zones. Building permits for new construction or alteration of structures shall be approved subject to the following:*

*4.2.6.2. Flood Proofing Regulations A and V Zones: Any new construction or substantial improvement to be undertaken within Zones AE and VE shall be in accordance with the Massachusetts State Building Code (780 CMR), and shall take into consideration the long-term effects of sea level rise and storm surge in determining additional freeboard height above the minimum freeboard required by the Massachusetts State Building Code (780 CMR).*

*4.2.6.3. Storm drainage systems shall be designed in accordance with the Massachusetts State Building Code (780 CMR), and shall take into consideration the long-term effects of sea level rise and storm surge.*

*4.2.6.4. No mobile homes shall be placed within the areas designated on the Town's Flood Insurance Rate Maps (FIRM) as AE or VE Zones.*

*4.2.6.5. All public utility systems, including power, communications and gas, shall be designed in accordance with the Massachusetts State Building Code (780 CMR) and shall take into consideration the long-term effects of sea level rise and storm surge. Critical elements of all public utility systems that are sensitive to water exposure shall not be permitted below the base flood elevation, and shall take into consideration the long-term effects of sea level rise and storm surge in determining additional freeboard height above the base flood elevation.*

## A.5. SMPDC Municipal Guidance for Coastal Resilience, 3.3 Zone Areas of Sea Level Rise and Marsh Migration as Protected Resources (SMPDC, 2022)

*Coastal hazard areas - all areas identified as impacted by [X FEET] of sea level rise, [X FEET OF STORM SURGE], [AND/OR] all areas identified as able to support future marsh migration as shown on [REFERENCE SPECIFIC OFFICIAL MUNICIPAL MAP(S) BASED ON INUNDATION SCENARIO AND MARSH MIGRATION AREAS]. Such a resource protection district would be statutorily authorized through Title 30-A after adoption of a consistent Comprehensive Plan, but is not authorized if only pursuant to Title 38 §435.*

# A.6. City of Portland, ME, Land Use Code (Portland, 2024)

## Amendment 3: Definitions

*Sea Level Rise-Base Flood Elevation (SLR-BFE). 13 feet NAVD88, or the predicted height of flood waters that may occur as the result of a 100 year storm in conjunction with 3.9 feet of base sea level rise.*

## Amendment 8.1: Coastal Flood Resilience Overlay (CFROZ)

### 8.1.6 Use and dimensional requirements

*A. Sea level rise design flood elevation (SLRDFE). The required SLR-DFE shall be determined by use classification. For mixed-use developments that contain uses in different classifications sharing a ground floor, each use shall be addressed independently.*

*1. Critical uses. The SLR-DFE for all critical uses (SLR-DFE-C), including the critical systems serving such uses, shall be a minimum of one foot above SLR-BFE, as defined in Article 3. In a proposed project containing critical uses, the following building and site elements are permitted to be located below the SLR-DFE:*

*a. Lobbies, entries, egress stairs, and elements required for vertical circulation from the SLR-DFE to grade, such as elevators, ramps, and stairs.*

*b. Parking.*

*c. Storage.*

*d. Flood protection equipment.*

*2. Non-critical uses. The SLR-DFE for noncritical uses (SLR-DFE-NC), including the critical systems serving those uses, shall be no lower than two feet below SLR-BFE, as defined in Article 3. The minimum elevation of the underside of the beams supporting the second floor in a multistory building, or the roof in a one-story building, shall be no less than 13 feet above SLR-BFE. In a proposed project containing non-critical uses, the following building and site elements are permitted to be located below SLR-DFE:*

*a. Lobbies, entries, egress stairs, and elements required for vertical circulation from the SLR-DFE to grade, such as elevators, ramps, and stairs.*

*b. Parking.*

*c. Storage.*

*d. Flood protection equipment.*

*3. Exempt uses. Exempt uses shall not be subject to dimensional requirements with respect to SLR-BFE.*

# A.7. City of Norfolk, VA, Zoning Ordinance, 5.12: Resilience Quotient (Norfolk, 2024)

*5.12.1. Purpose*

*The City of Norfolk is committed to being the coastal community of the future, with the capacity to endure and quickly recover from climatic and environmental shocks and stresses and bounce back quickly and stronger. All proposed development shall be reviewed to identify how it will enhance resilience for both the development specifically and the city generally. This section is intended to ensure development practices that promote resiliency in the following ways:*

*A. Reduce risks from flooding;*

*B. Conserve energy;*

*C. Promote the use of alternative energy;*

*D. Conserve water resources;*

*E. Protect water quality;*

*F. Manage stormwater;*

*G. Support walkable, mixed-use development in appropriate places;*

*H. Support multiple modes of mobility;*

*I. Promote a healthy landscape;*

*J. Support urban agriculture; and*

*K. Promote healthy and safe lifestyles*

*5.12.2. Applicability*

*Unless exempted by this section, all development shall comply with the resilience quotient standards of this section.*

*A. Exempted Development*

*The following development is exempted from the standards of this section:*

> *(1) New buildings or redevelopment that have achieved or will achieve LEED requirements necessary to receive certification from the U.S. Green Building Council at the gold level or above;*
>
> *(2) Renovation or rehabilitation of a building constructed prior to March 1, 2018 when the cost of the work is less than 50 percent of the appraised value of the development prior to the renovation or rehabilitation; and*

*(3) Expansion of a building constructed prior to March 1, 2018 whose expansion is less than 50 percent of the gross floor area of the building.*

*(4) Historic or architecturally significant buildings which meet at least one of the following criteria:*

*(a) Individually listed on the US Department of the Interior's National Register of Historic Places; or*

*(b) Individually listed in the Virginia Landmarks Register; or*

*(c) Noted as a contributing structure in a district listed within the US Department of the Interior's National Register of Historic Places or the Virginia Landmarks Register or a local historic district designated in accordance with this Ordinance; or*

*(d) Designated as a Norfolk Historic Landmark in accordance with Section 3.9.20, HL: Historic Landmark Designation.*

*5.12.3. Timing of Review*

*Review for compliance with the standards of this section shall occur during review of a development application for either a conditional rezoning (see Section 2.4.4, Conditional Rezoning), planned development (see Section 2.4.5, Planned Development District), conditional use (see Section 2.4.8, Conditional Use Permit), site plan (see Section 2.4.18, Major Site Plan, or Section 2.4.19, Minor Site Plan), or Zoning Certificate (see Section 2.4.14, Zoning Certificate), as appropriate.*

*5.12.4. Compliance with Resilience Quotient Standards*

*A. Generally*

*Unless an alternative option is specified below, all new development and redevelopment to which the resilience quotient applies shall undergo site plan review during which the following conditions shall be reviewed and addressed:*

*(1) Reducing risks from flooding;*

*(2) Managing stormwater;*

*(3) Promoting energy resilience including the use of alternative energy;*

*(4) Conserving water resources and protecting water quality;*

*(5) Supporting multiple modes of mobility, specifically including walkability and bikeability;*

*(6) Developing in a manner that promotes healthy and safe environments and lifestyles; and*

*(7) Providing inclusionary dwelling units within mixed-income residential or mixed-use developments.*

*B. Documentation Required*

*Applicants shall provide documentation of techniques that will be utilized to satisfy the requirements of this section at the time of submittal of a development application. Documentation for items that may not be visually verified as part of an inspection may be provided in the form of invoices, receipts, or delivery confirmation for the items in question.*

*C. Installation and Maintenance of Resilience Quotient Development Activities Required*

*All Resilient Development Activities approved as a part of a development shall be installed, maintained and perpetuated. Failure to do so shall be a violation of this Ordinance and subject to the remedies and penalties prescribed in Article 7, Enforcement.*

*D. Determination of Compliance*

*The ZA shall determine whether the Resilient Development Activities proposed meet the requirements of this Ordinance. In carrying out this responsibility, the ZA may seek advice and counsel from other City staff and outside subject matter experts prior to issuing a determination. To the extent practicable, all determinations shall be rendered in writing stating the reasons therefor.*

*5.12.5. Resilience Quotient Compliance for Single Family Development*

*A. Applicability*

*Any proposed development that includes only single family detached dwellings may elect to comply with the resilience quotient standards for single family development in this subsection in lieu of the site plan review process established in Section 5.12.4, Compliance with Resilience Quotient Standards, above.*

*(1) Risk Reduction*

*The lowest habitable floor and all significant electrical and mechanical equipment shall be elevated at least 16 inches above the highest existing grade adjacent to the front façade of the structure unless a greater elevation is required by the provisions of the FPCH-O district.*

*(2) Stormwater Management*

*Either of the following shall be implemented:*

*(a) Roof drainage shall be intercepted and detained on site within a system providing no less than 200 gallons of total storage capacity; these requirements shall be memorialized in an agreement in lieu of a plan for stormwater.*

*(b) For each 25 ft. of lot frontage, rounded down (but never less than one (1)), one of the following shall be preserved or planted on site in accordance with Table 5.2.5(B), Minimum Tree and Shrub Size:*

*(i) One healthy, medium tree.*

*(ii) One healthy, large tree.*

*(iii) Two healthy, small trees.*

*(3) Energy Resilience*

*The electrical systems of the dwelling shall be designed with pre-installed wiring and connections to allow safe use of a generator during electricity outages and/or connection of solar, wind, or other locally-generated electricity source.*

*The ZA, for good cause shown, may authorize in writing minor deviations from the above requirements that achieve the same resilience goals to an equal or greater extent.*

*5.12.6. Resilience Quotient Compliance for Multiple Dwelling Unit Residential Development*

*A. Applicability*

*The following types of development shall comply with the resilience quotient standards of this subsection:*

*(1) Any proposed multi-family residential development other than one or two single family dwellings not part of a common plan of development; or*

*(2) Any proposed development that includes one or more dwelling units as part of a mixed-use development. In this case, the standards of this subsection shall apply only to the residential portion of the development.*

*B. Generally*

*Any multi-family residential development shall fully address all of the factors in Section 5.12.4, Compliance with Resilience Quotient Standards, during site plan review and shall comply with the following standards in so doing:*

*(1) The lowest habitable floor and all significant electrical and mechanical equipment shall be elevated at least 16 inches above the highest adjacent grade unless a greater elevation is required by the provisions of the FPCH-O district.*

*(2) 100% of the drainage from impervious surfaces on the site shall be captured and retained on site with sufficient storage to keep the first 1.25 inches of rainwater from an individual rain event on site without discharging onto neighboring properties or rights-of-way unless a regional stormwater management system is available to the development and the specific discharges into it have been approved by the Director of Public Works.*

*C. Alternative Minimum Requirements*

*Any multiple dwelling unit residential development may elect to comply with the resilience quotient standards for residential development in this subsection in lieu of the portion of the site plan review*

*process established in Section 5.12.4, Compliance with Resilience Quotient Standards, above. The point system provides options within each of three components and each development shall achieve a minimum number of points from the menu of options shown in Table 5.12.6, Resilient Point System for Residential Development, based on the number of dwelling units within the development as shown below.*

*(1) 1 to 5 units: 4 points total, no less than 1 point per component.*

*(2) 6 to 29 units: 5 points total, no less than 1.5 points per component.*

*(3) 30 to 89 units: 6 points total, no less than 1.5 points per component.*

*(4) 90 to 199 units: 8 points total, no less than 2 points per component.*

*(5) 200 or more units: 10 points total, no less than 2 points per component.*

*Any actions taken to meet the general requirements of Section 5.12.6.B for which points are available shall be included when tabulating the number of points achieved within each component.*

**Table 5.12.6: Resilient point system for Residential development**

| Resilient Development Activity | Points Earned |
|---|---|
| **Component 1: Risk Reduction** | |
| Construct building to meet 110-mile wind load design requirements of the VUSBC | 2.00 |
| Elevate the ground story finished floor and all significant electrical and mechanical equipment no less than 3 feet above highest adjacent grade | 1.00, plus<br>0.50 per ft. above 3 ft. |
| Construct an impact-resistant (hail, tree damage) roof | 0.50 |
| Install impact (hurricane or wind) resistant windows | 0.50 |
| Install operable storm shutters | 0.50 |
| Establish operating procedures for how the project will handle loss of off-site or grid power, transition to a backup source of power, and transition back to normal operation | 0.50 |
| **Component 2: Stormwater Management** | |
| Install a green roof on at least 50 percent of the total roof area (25 percent for renovated buildings) and only plant materials permitted in Section 5.2, Landscaping Standards | 2.00 |
| Install a green roof on at least 25 percent of the total roof area and only plant materials permitted in Section 5.2, Landscaping Standards | 1.00 |
| Provide rain gardens, street-side swales, soil and turf management or other appropriate storm water infiltration system(s) to capture and infiltrate a minimum of 25 percent of site-generated stormwater | 1.00 |
| Use pervious or grass paving systems on at least 50% of parking lot and driveway area in the development | 1.00 |
| Provide a fenced, centrally-located community garden space (which may be located as a rooftop garden) for residents and for urban gardening purposes at a ratio of 50 square feet per residential dwelling unit | 1.00 |
| Retain at least 20 percent of existing pre-development natural, non-exotic vegetation | 0.75 |

| Table 5.12.6: Resilient point system for Residential development | |
|---|---|
| Preserve healthy, large native species trees on site (large tree defined in accordance with Table 5.2.5(B)) | 0.50 per tree preserved |
| Provide a percentage of open space greater than that required in Table 5.5.4(A), Required Open Space Set-Asides | 0.50 per additional 5% preserved |
| For new tree plantings, enhance tree pits with specially engineered soils and native plants to absorb and filter runoff | 0.25 |
| Planting or preservation of trees in addition to the requirements of Section 5.1, Parking, Loading, and Bicycle Standards, Section 5.2, Landscaping Standards, and Section 5.3, Perimeter Buffers | 0.25-0.50 per tree planted or preserved [1] |
| Preserve established large, trees that have not yet reached maturity on site (large tree defined in accordance with Table 5.2.5.(B)) | 0.25-0.50 per tree preserved [1] |
| Addition of tree canopy on the site above the 20-year canopy standard established in Section 5.6.4.C, Tree Canopy | 0.10 for each additional 5% increment above the minimum |
| **Component 3: Energy Resilience** | |
| Generate no less than 75% of the electricity expected to be used by the development from on-site solar and/or wind energy sources | 3.00 |
| Generate no less than 50% of the electricity expected to be used by the development from on-site solar and/or wind energy sources | 2.00 |
| Install a cool roof on at least 50 percent of the total roof area of the development | 1.50 |
| Generate no less than 25% of the electricity expected to be used by the development from on-site solar and/or wind energy sources | 1.00 |
| Generate no less than 25% of the electricity needed expected to be used by the development from on-site solar and/or wind energy sources | 1.00 |
| Install a geothermal energy heating & cooling system serving all residential units and common areas | 1.00 |
| Install a conditioned crawlspace under each primary structure | 1.00 |
| Install green walls on a minimum of 50 percent of the primary building's walls | 1.00 |
| Adopt an energy efficient site lighting budget (based on the International Dark Sky Association's designations for allowable lumens per square foot of specified use or type of hardscape) | 1.00 |
| Equip the project with at least one alternative, independent source of electricity supply so that the project is capable of fully operating if a primary source of power experiences interruption | 1.00 |
| Pre-wire all dwelling units to accept power provided by on-site solar panels and/or wind turbines | 1.00 |
| Install a 20+ SEER HVAC system in each dwelling unit | 1.00 |
| Re-use or repurpose an historic building that is listed on a national, state, or local register, or at least 75% (based on surface area) of existing historic structures | 1.00 |
| Install a cool roof on at least 25 percent of the total roof area of the development | 0.75 |
| Install a 16-19 SEER HVAC system in each dwelling unit | 0.50 |
| Install multi-room mini-split heating and cooling systems in each dwelling unit | 0.50 |
| Install a solar or tank-less water heating system in each dwelling unit | 0.50 |

| Table 5.12.6: Resilient point system for Residential development | |
|---|---|
| Install no fewer than 2 operable windows on no fewer than two exterior walls in each dwelling unit | 0.50 |
| Install a generator for power generation to keep critical functions (refrigerator, freezer, basic lighting, healthcare appliances, etc.) working in the event of power failure | 0.50 |
| Provide shade, open-grid pervious pavement, or solar-reflective paving on 50% of total area of roads, sidewalks, and parking areas in the development | 0.50 |
| Provide electric vehicle (EV) level 3 charging stations, located in a parking structure or off-street parking lot, that are made available for use by residents | 0.50 for every two stations |
| Plant vegetation so that 50% of the eastern and western building facades are shaded at noontime on the summer solstice within 10 years of planting | 0.50 |
| Use vegetation or vegetated structures to shade each dwelling's HVAC unit | 0.25 |
| Automatically turn off all outdoor signage and lighting between the hours of 10:00 p.m. and 7:00 a.m. except for security lighting | 0.25 |
| Provide a minimum of five percent of required automobile parking spaces that are signed and reserved for hybrid/electric/low energy vehicles in preferred locations near primary building entrances | 0.25 |
| Provide electric vehicle (EV) level 2 charging stations, located in a parking structure or off-street parking lot, that are made available for use by residents | 0.25 for every two stations |
| Re-use or repurpose an existing non-historic building, or at least 75% (based on surface area) of existing structures | 0.25 |
| Install highly-reflective blinds/shades to reduce solar gain | 0.25 |
| NOTES:<br>[1] As determined by the ZA | |

*5.12.7. Resilience Quotient Compliance for Non-Residential Development*

*A. Applicability*

*Any proposed development that includes non-residential development. In the case of mixed-use development, the standards of this subsection shall only apply to the non-residential portion of the development.*

*B. Generally*

*Any non-residential development to which the resilience quotient is applicable shall fully address all of the factors in Section 5.12.4, Compliance with Resilience Quotient Standards, during site plan review and shall comply with the following standards in so doing:*

> *(1) The lowest habitable floor and all significant electrical and mechanical equipment shall be elevated at least 8 inches above the highest adjacent grade unless a greater elevation is required by the provisions of the FPCH-O district.*
>
> *(2) 100% of the drainage from impervious surfaces on the site shall be captured and retained on site with sufficient storage to keep the first 1.25 inches of rainwater from an individual rain event on site without discharging onto neighboring properties or rights-of-way unless a regional*

*stormwater management system is available to the development and the specific discharges into it have been approved by the Director of Public Works.*

*C. Alternative Minimum requirements*

*Any non-residential development may elect to comply with the resilience quotient standards for non-residential development in this subsection in lieu of the portion of the site plan review process established in Section 5.12.4, Compliance with Resilience Quotient Standards, above. The point system provides options within each of three components and each development shall achieve a minimum number of points from the menu of options shown in Table 5.12.7.*

*(1) Total square footage of structures less than 10,000 sq. ft.: 3 points total, no less than 1 point per component.*

*(2) Total square footage of structures 10,000 to 25,000 sq. ft.: 4 points total, no less than 1.5 points per component.*

*(3) Total square footage of structures 25,000 to 50,000 sq. ft.: 6 points total, no less than 1.5 points per component.*

*(4) Total square footage of structures above 50,000 sq. ft.: 10 points total, no less than 2 points per component.*

*Any actions taken to meet the general requirements of Section 5.12.7.B, Generally, for which points are available shall be included when tabulating the number of points achieved within each component.*

**Table 5.12.7.: Resilient point system for Non-residential development**

| Resilient Development Activity | Points Earned |
|---|---|
| **Component 1: Risk Reduction** | |
| Construct building to meet 110-mile wind load design requirements of the VUSBC | 2.00 |
| Equip the project with at least one alternative, independent source of electricity supply so that the project is fully capable of operating if a primary source of power experiences an interruption | 1.50 |
| If the project involves a critical facility that is intended to remain operational in the event of a flood, or whose function is critical for post-flood recovery, design the facility to be protected and operable at the water levels represented by a 0.2% annual chance (500-year) flood | 1.00 |
| Elevate the ground story finished floor and all significant electrical and mechanical equipment no less than 3 feet above highest adjacent grade or to an elevation of 11 (NAVD ’88) | 1.00, plus 0.50 per ft. above 3 ft. |
| Install a generator for power generation in the event of power failure sufficient to keep critical operations functional | 0.50 |
| Establish operating procedures for how the project will handle loss of off-site or grid power, transition to a backup source of power, and transition back to normal operation | 0.50 |
| **Component 2: Stormwater Management** | |

| Table 5.12.7.: Resilient point system for Non-residential development | |
|---|---|
| Install a green roof on at least 50 percent of the total roof area (25 percent for renovated buildings) and only plant materials permitted in Section 5.2, Landscaping Standards | 2.00 |
| Install a green roof on at least 25 percent of the total roof area and only plant materials permitted in Section 5.2, Landscaping Standards | 1.00 |
| Provide rain gardens, street-side swales, turf and soil management or other appropriate storm water infiltration system(s) to capture and infiltrate a minimum of 25 percent of site generated stormwater | 1.00 |
| Use pervious pavement on at least 50% of parking lot and driveway area in development | 1.00 |
| Retain at least 20 percent of existing pre-development natural, non-exotic vegetation | 0.75 |
| Preserve healthy, large native species trees on site (large tree defined in accordance with Table 5.2.5(B)) | 0.50 per tree preserved |
| Provide a percentage of open space greater than that required in Table 5.5.4.A, Required Open Space Set-Asides | 0.50 per additional 5% preserved |
| For new tree plantings, enhance tree pits with specially engineered soils and native plants to absorb and filter runoff | 0.25 |
| Planting or preservation of trees in addition to the requirements of Section 5.1, Parking, Loading, and Bicycle Standards, Section 5.2, Landscaping Standards, and Section 5.3, Perimeter Buffers | 0.25-0.50 per tree planted or preserved [1] |
| Preserve established large healthy trees that have yet to reach maturity on site (large tree defined in accordance with Table 5.2.5(B)) | 0.25-0.50 per tree preserved [1] |
| Addition of tree canopy on the site above the 20-year canopy standard established in Section 5.6.4.C, Tree Canopy | 0.10 for each additional 5% increment above the minimum |
| **Component 3: Energy Resilience** | |
| Generate no less than 75% of the electricity expected to be used by the development from solar and/or wind energy sources | 3.00 |
| Generate no less than 50% of the electricity expected to be used by the development from solar and/or wind energy sources | 2.00 |
| Install a cool roof on at least 50 percent of the total roof area of the development | 1.50 |
| Generate no less than 25% of the electricity expected to be used by the development from solar and/or wind energy sources | 1.00 |
| Install a geothermal heating and cooling system serving all parts of the project | 1.00 |
| Install a conditioned crawlspace under each primary structure | 1.00 |
| Install green walls on a minimum of 50 percent of the primary building's walls | 1.00 |
| Install 20+ SEER HVAC systems throughout the project | 1.00 |
| Re-use or repurpose an historic building that is listed on a national, state, or local register, or at least 75% (based on surface area) of existing historic structures | 1.00 |
| Preserve or provide trees on the site which will within 10 years growing time will provide tree canopy over no less than 50% of the total site | 1.00 |
| Install a cool roof on at least 25 percent of the total roof area of the development | 0.75 |
| Install 16-19 SEER HVAC systems throughout the project | 0.50 |
| Install mini-split heating and cooling systems throughout the project | 0.50 |
| Install solar or tank-less water heating systems throughout | 0.50 |

| Table 5.12.7.: Resilient point system for Non-residential development | |
|---|---|
| Provide shade, open-grid pervious pavement, or solar-reflective paving on 50% of total area of roads, sidewalks, and parking areas in the development | 0.50 |
| Provide electric vehicle (EV) level 3 charging stations, located in a parking structure or off-street parking lot, that are made available for use by users of the project | 0.50 for every two stations |
| Plant vegetation so that 50% of the eastern and western building facades are shaded at noontime on the summer solstice within 10 years of planting | 0.50 |
| Orient buildings within 20 percent of east-west axis for maximum solar exposure | 0.50 |
| Provide operable windows on at least 2 façades on each floor which provide flow-through ventilation | 0.25 |
| Use vegetation or vegetated structures to shade HVAC units | 0.25 |
| Automatically turn off all outdoor signage and lighting between the hours of 10:00 p.m. and 7:00 a.m. except for security lighting | 0.25 |
| Provide a minimum of five percent of required automobile parking spaces that are signed and reserved for carpools, hybrid, electric, and low energy vehicles in preferred locations near primary building entrances | 0.25 |
| Provide electric vehicle (EV) level 2 charging stations, located in a parking structure or off-street parking lot, that are made available for use by users of the project | 0.25 for every two stations |
| Re-use or repurpose an existing non-historic building, or at least 75% (based on surface area) of existing structures | 0.25 |
| Install highly-reflective blinds/shades to reduce solar gain | 0.25 |
| Provide skylights in an amount necessary to ensure natural lighting is provided to at least 25 percent of the habitable rooms in the structure | 0.25 |
| NOTES:<br>[1] As determined by the ZA | |

*5.12.8. Minor Deviation from Resilience Quotient Compliance*

*A. Applicability*

*Any proposed development subject to the resilience quotient provisions and electing to utilize the point system in lieu of having the resilience quotient be fully reviewed and implemented as a part of the site plan review process may propose minor deviations or alternative Resilient Development Activities for consideration.*

*B. Zoning Administrator Authority*

*(1) The ZA, for good cause shown, may authorize in writing minor deviations from the resilient quotient requirements specified in the sections above provided that those resilience goals are still achieved to an equal or greater extent.*

*(2) Any proposed deviation determined by the ZA to be more than a minor deviation shall not be approved by the ZA and the development shall, instead, utilize the site plan review process for a complete review of the resilience quotient factors contained in Section 5.12.4, Compliance with Resilience Quotient Standards.*

*(3) The ZA shall review any alternative Resilient Development Activities that may be proposed and, if determined in writing that the alternative Resilient Development Activities will achieve the same resilience goals to an equal or greater extent, the ZA will assign point value(s) to the alternative Activities. The ZA shall maintain an online log of all approved alternative Resilient Development Activities and the point value assigned.*