



Coastal Ordinance Provisions in Wisconsin Communities



Coastal Ordinance Provisions

In

Wisconsin Communities

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THE WISCONSIN COASTAL MANAGEMENT PROGRAM, part of the Wisconsin Department of Administration, and overseen by the **WISCONSIN COASTAL MANAGEMENT COUNCIL**, was established in 1978 to preserve, protect and manage the resources of the Lake Michigan and Lake Superior coastline for this and future generations.

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Foreword

High Great Lakes water levels in the 1950s and again in the 1970s caused widespread bluff recession, damaging millions of dollars' worth of coastal development. In 1978, flood damages in Wisconsin were \$140 million (Pielke 2002). The Wisconsin Coastal Management Program (WCMP) funded several studies following this damaging high lake level period, including the Wisconsin Shore Erosion Plan: An Appraisal of Options and Strategies by Springman and Born (1979).

The Wisconsin Shore Erosion Plan identified erosion hazard areas, analyzed various structural and nonstructural damage reduction options, and recommended state policy to reduce erosion hazard damage. The focus of the plan was on before-the-fact strategies rather than after-the-fact emergency measures due to the fact that "erosion control or structural strategies have generally not proved cost-effective over the short and long term". The report stated that – "In spite of the controversial nature of structural approaches, e.g. cost effectiveness, adverse impacts, shoreline management implications, the present state policy framework does little to officially discourage structural approaches." The report highlighted the approach utilized by the California Coastal Commission wherein structural approaches can only be considered after all other non-structural options have been examined. However, it was recognized that there is a continuing amount of riparian and local government interest in structural approaches.

Non-structural options such as building setbacks and hazard area zoning were highlighted as viable options in developing and rural areas. The plan noted that one non-structural option, relocation, was receiving greater consideration for developed areas and that land and water management practices were increasingly being incorporated into preventive approaches. In particular, bluff dewatering and vegetative stabilization techniques were being used more frequently. The plan recommended coastal erosion setbacks in undeveloped areas and acquisition, relocation and hazard disclosure for developed areas.

Yanggen (1981) followed up the work of Springman and Born by developing a model coastal recession setback ordinance. While the Wisconsin legislature has not to date enacted legislation making coastal setbacks mandatory statewide, communities have been encouraged to adopt them to protect critical facilities, infrastructure, and new development from coastal hazards.

When high water levels on the Great Lakes returned in 1985, a number of counties amended their local ordinances to include provisions for increased setbacks in areas with unstable bluffs. The counties that took a progressive step toward managing risks were Douglas, Bayfield, Kewaunee, Manitowoc, Sheboygan, Ozaukee, and Racine.

The adoption of increased setbacks along the Great Lakes coastline has significantly reduced the risk to new development in the unincorporated areas of these counties. However, new development on the rest of Wisconsin's Great Lakes coastal bluffs is not subject to setbacks that address bluff instability or coastal recession.

Introduction

Much of the Wisconsin coastline consists of relatively high (50 to 200 feet) bluffs composed of glacial till and glacial lake deposits. During periods of high water, waves attack at the base of these bluffs eroding the bluff toe making them less stable. These bluffs are prone to landslides, surface rill, and soil creep putting development on bluff tops at risk.

In response to damages to bluff top development in the 1970s, the Wisconsin Coastal Management Program funded the development of the Wisconsin Shore Erosion Plan (Springman and Born 1979). The plan recommended coastal erosion setbacks in undeveloped areas. Yanggen (1981) followed up the work of Springman and Born by developing a model coastal recession setback ordinance.

Studies conducted in the 1970s demonstrated that the need for a slope angle of 2 and 1/2 to one on Lake Michigan and Three to One on Lake Superior for stable conditions. The model ordinance developed included setbacks from unstable portion of bluff tops based upon these stable bluff slope conditions. Where wave erosion at the base of bluffs is ongoing, the ordinance also included setbacks to address bluff recession over time.

In the early 1980s, the Wisconsin Coastal Management Program, Wisconsin Department of Natural Resources and the University of Wisconsin Sea Grant Advisory Services, made a concerted effort to convince coastal counties to include coastal setback provisions in their local ordinances. The need for setbacks was reinforced when water levels rose again in 1985. As a result, a number of Wisconsin counties and municipalities along Lake Michigan adopted and enforce coastal setback requirements.

This report provides a compilation of community zoning ordinance provisions that have been adopted to reduce the risks to development permitted by the community. In addition to the potential for catastrophic damage to structures and infrastructure, development on the coast can adversely impact the beaches, dunes and natural resources on the coast. Community ordinance language that attempts to limit adverse impacts on coastal resources is also included in this report. The map on the next page shows the coastal counties in Wisconsin that have adopted ordinance provisions to address risks associated with coastal development.

Wisconsin's standard 75 foot State shoreland setback requirement that applies to unincorporated areas that has been adopted by all counties in Wisconsin. Since this setback is generally inadequate to address coastal erosion hazards it is not included in this inventory. Floodplain zoning ordinances are also not included.

Wisconsin Communities with Coastal Regulations



WI Counties with Coastal Regulations

The following excerpts include language (highlighted in yellow) specifically related to the coasts found in county, city, village, and town ordinances in Wisconsin. The inventory is separated into Lake Superior communities and Lake Michigan communities. The Lake Superior communities are listed in order they are found along the coast from West to East. The Lake Michigan communities are listed in the order they are found along the coast from North to South.

DOUGLAS COUNTY

Lake Superior Coastal Waters

1. Setback

For lots that abut on navigable waters the following setback regulation shall apply:

(a) All permanent installations including soil absorption system, seepage pits and holding tanks; but not including piers and boathouses, shall be setback from all points along the bluff edge by the distance shown on the Lake Superior Shoreland Setback Table. Boathouses or similar structures which require waterfront location shall not be used for habitation nor extend toward the water beyond the ordinary high water elevation. The Zoning Administrator or his representative shall determine the setback for those cases not shown on the Setback Table, but in no case shall the setback be less than 75 feet from all points along the bluff edge.

(b) A setback equal to the average setback of existing principal buildings within 500 feet of a proposed building site shall be permitted where such existing buildings do not conform with the appropriate setback line. A minimum setback of 75 feet from all points along the bluff edge shall be required in all such cases.

(c) Private sewage disposal systems shall conform to subparagraph 4.42.1.a of this ordinance and the applicable rules, regulations and laws as set forth in the Wisconsin Statutes and the Wisconsin Administrative Code.

(d) The County Zoning Administrator, or his representative, shall determine the bluff edge.

2. Removal of Shoreline Cover

The cutting of trees and shrubbery shall be regulated to protect scenic beauty, control erosion and reduce the flow of effluents and nutrients from the shoreland. In the strip 35 feet inland from the bluff edge, no more than 30 feet in any 100 feet shall be clear cut. In other areas, trees and shrub cutting shall be governed by consideration of the effect on water quality and should be in accord with the accepted management practices. Natural shrubbery shall be preserved as far as practicable.

4. Filling, grading, lagooning and dredging of any watercourse may be permitted only in accord with local, state and federal law and where protection against erosion, sedimentation, and impairment of fish and aquatic life has been assured.

SETBACK TABLE @3.0 FEET/YEAR EROSION RATE - Slope Height (feet)

Slope Angle Degrees	5	10	15	20	25	30	35	40	45	50	55	60	65	70
16	170	183	184	186	187	189	191	192	193	194	195	196	197	199
18	172	187	190	195	198	201	205	209	212	215	218	221	224	227
20	174	191	195	201	206	212	217	223	227	232	236	241	245	252
22	175	193	198	206	212	219	226	232	238	244	250	255	260	270
24	175	195	201	211	218	226	234	242	248	256	263	270	275	285
26	175	197	205	215	223	232	241	250	258	266	274	282	290	300
28	175	199	207	218	227	237	246	256	265	274	283	291	300	311
30	175	200	209	221	231	241	251	262	271	281	290	300	309	321
32	175	202	211	224	234	245	256	267	277	288	298	308	318	331
34	176	203	212	226	237	249	260	272	282	294	304	315	325	339
36	176	203	213	228	240	252	264	276	287	299	310	321	332	348
38	176	204	214	230	242	255	268	280	291	304	316	327	339	353
40	176	204	214	232	244	257	271	284	295	308	320	332	344	359
42	176	205	215	232	246	259	274	287	299	312	325	338	349	364
44	176	205	216	234	250	261	277	290	302	316	329	342	354	369
46	176	206	217	236	252	263	279	293	305	320	333	347	359	374
48	177	206	218	238	253	265	281	295	308	323	336	351	363	379
50	177	207	219	240	254	267	283	297	311	326	339	355	367	383
52	177	208	220	240	255	269	285	299	314	329	342	359	371	387
54	177	209	221	241	256	271	287	301	316	332	345	363	375	391
56	177	210	222	242	257	272	289	303	318	335	348	366	379	394
58	177	211	223	243	258	274	291	305	320	337	351	368	381	397
60	177	212	224	244	259	275	292	306	323	339	354	369	384	399

BAYFIELD COUNTY

Sec. 13-1-32 Inland Lake Classification and Shoreland Development Requirements.

c) Lake Superior Lot Requirements. Lots having frontage on Lake Superior and any improvements thereon shall be subject to the requirements applicable to lots on Class 1 lakes, except that if a lot has a bank or a bluff fronting the lake, the top of which is discernible due to evidence of erosion, (including but not limited to exposed rock), the required shoreline setback shall be 75 feet back from the top edge of the bank or bluff, and if a lot is located in an area of active or potential erosion designated on a map entitled Erosion Hazard Areas—Bayfield County, a greater setback may be required as determined by the Zoning Committee or its duly designated agent, based on projected shoreland recession rates.

e) Multiple Unit Developments providing shoreline access to navigable waters shall be subject to the following minimum requirements: Lake Superior – 200 ft setback from OHWM.

Sec. 13-1-22 Setbacks and Height Restrictions.

c) Greater Setbacks. In cases of adverse soil to topographical conditions, the Zoning Administrator and/or Zoning Committee may require greater setbacks.

DOOR COUNTY

5.05 Dunes.

(1) Purpose. Dunes are an uncommon Door County landform formed by the dynamic forces of water and wind acting upon the land. The purposes of these regulations are to perpetuate the existence and intactness of the dunes as unique habitat areas and to protect the visual integrity of the dunes.

(2) Dunes which are at least 20 feet in height are subject to the requirements in this section.

(3) Determination. The location of dunes shall be determined by reference to a map entitled "*Door County Natural Features Map*" on file in the office of the Planning Department.

(4) Requirements.

(a) Dunes shall not be mined, or in any other way removed, in part or in total, except for customary excavation necessary to construct foundations for permitted buildings or for utilities which serve permitted buildings.

(b) For any lot, the total area of the building footprints of all buildings placed on a dune shall not exceed 10% of the surface area of that portion of a dune located on the lot.

KEWAUNEE COUNTY - Shoreland Zoning Ordinance

5.0 Setbacks - 5.2 Setbacks From the Water - 5.22 Lots that Abut on Lake Michigan

(1) Finding of fact: Lake Michigan possesses unique ecological characteristics, water level fluctuations and erosion hazards not found on other surface waters in Kewaunee county. Storms and record high Great Lake water levels have caused shoreline erosion, flooding and property damage that have posed a threat to the health, safety and general welfare of Kewaunee County; therefore, setbacks from Lake Michigan shall be increased from that for inland waters and Green Bay.

(2) Required Minimum Setback. The minimum setback for all buildings and structures, except piers, boat hoists, decks, and boathouses which may require a lesser setback shall be set back at least 75 feet from the ordinary high water mark where the shore bluff height is 10 feet or less and 125 feet from the ordinary high water mark where the shore bluff height is greater than 10 feet.

(3) Reduced Building Setback-Variance. The Board of Adjustment...may approve a modification of the setback to no less than 75 feet upon submittal of acceptable engineering studies prepared by a licensed or certified engineer documenting the recession rate and the stable slope distance for the property. The recession rate is the horizontal distance the bank bluff edge is expected to recede from the high water mark during the useful life of the structure, and the stable slope distance is the horizontal distance necessary for the bluff face to recede to a stable slope.

MANITOWOC COUNTY

Chapter 9 Shoreland/Floodplain Zoning

9.05 General Regulations

(5) The minimum setback for all structures, except piers, wharves, bridges, dams, and boathouses, patios, and walkways and stairways which are necessary to provide pedestrian access to the shoreline, from the ordinary high water mark shall be seventy-five feet. In addition, a greater setback for permanent principal structures and accessory uses shall be required in areas where the shoreline has been receding and/or where bluffs of ten feet or more in height which rise ten feet or more vertically for every twenty-five feet of horizontal distance exist. In these cases, the setback line shall be established by the Code Administrator by use of the following procedures:

(a) A stable slope angle setback shall be established for bluffs at a ratio of 2.5 feet of horizontal distance for every one foot of vertical distance. The measurement shall be made from the ordinary high water mark perpendicular to the shoreline. There shall be two such measurements made for every one hundred feet of shoreline at points not less than fifty feet apart. The stable slope angle setback shall be a line connecting these two points or such line extended. In cases of highly irregular shoreline, more than two measurement points per one hundred feet may be required by the Code Administrator.

(b) A recession rate setback shall be established for all receding shorelines by multiplying the average annual long term recession rate, which is two feet per year adjacent to Lake Michigan, by a structural design life of fifty years for principal or conditional uses or a structural design life of twenty-five years for accessory uses.

(c) In areas where both shoreline recession and bluffs exist, the stable slope angle setback shall be added to the recession rate setback to arrive at the required setback for permanent principal structures. In areas where only one condition exists, either shoreline recession in areas without bluff, or a bluff along shoreline, which is not receding, only the applicable setback shall apply. The seventy-five foot setback from the ordinary high water mark shall be the minimum in all cases.

(d) Notwithstanding any other provisions of this ordinance to the contrary, the Manitowoc County Board of Adjustment may permit a setback less than seventy-five feet but not less than the development pattern on adjacent lots on inland lakes of the County where an existing development pattern exists. (An existing development pattern shall be deemed to exist when all zoning lots within three hundred feet (300') of the property in question have been developed with a permitted principal use). The Board shall use the following criteria when considering the establishment of a setback less than seventy-five feet:

1. The subject property has unusual topography that significantly limits its development potential.
2. The lot dimensions are such as would significantly limit the lot's development potential.
3. Surface water drainage or ground water flow would be adversely affected if the reduced setback is not permitted.

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SHEBOYGAN COUNTY

Chapter 72 Shoreland Ordinance

72.16 Setbacks

(1) SETBACKS FROM THE WATER. NOTE: Setbacks hereunder are to be measured at right angles from lot lines or the ordinary high water mark (OHWM), horizontally, to the closest projection of the structure or integral part thereof, including attached decks, porches, balconies, attached covered stairs and landings, chimneys, such architectural projections as sills, eaves, and belt courses, and attached garages.

(b) Lake Michigan.

1. Findings of Fact. Lake Michigan possesses unique ecological characteristics, water level fluctuations, and erosion hazards, not found on other surface waters in Sheboygan County. The coast north of the City of Sheboygan consists almost entirely of steep bluffs ± 50 feet in height; the coast south of the City consists almost entirely of low dunes and beaches. Despite this contrast, long-term recession (erosion) rates of ± 2 feet per year have been recorded along both coastal reaches. To protect property and life and minimize costly damage, the setback from Lake Michigan shall be based upon the long-term recession rate of two feet per year and a fifty year period as the useful life of a typical residence. In addition, on steep bluffs it shall also be necessary to determine an additional setback distance based upon a stable slope angle of two and one-half feet horizontal distance for every one foot vertical distance.

[To illustrate, 50-year design life: 2 feet per year recession rate = 100-foot setback. If on the 50 foot high bluff; 2-1/2 feet (stable slope angle) 50 feet (bluff height) = 125-foot setback. TOTAL SETBACK = 225 feet (100 + 125).]

2. Required Setbacks. All structures, except playground apparatus, piers, wharves, boat hoists, boathouses, patios, open fences, bridges, dams, and walkways and stairways which are necessary to provide pedestrian access to the shoreline, shall be set back at least one hundred feet from the ordinary high water mark (OHWM) for the entire coastal reach extending from the North County Line to the South County Line. Additionally, to achieve the added degree of protection for major structural investments as described in Subsection (1)(b)1, above, all Principal Buildings as herein defined shall be set back two hundred twenty-five feet from the ordinary high water mark (OHWM) for the coastal reach extending from the City of Sheboygan north to the North County line. Structures which require authorization or permits from the DNR pursuant to Wis. Stat. chapters 30 and 31 or which are to be located below the ordinary high water mark (OHWM), namely bridges, dams, culverts, piers, wharves, navigational aids, and waterway crossings of transmission lines shall comply with all applicable federal, state, county, and local regulations, but shall not require the issuance of a Shoreland/Floodplain Zoning Permit where the standards of this Ordinance are complied with.

3. Procedure to Reduce Setback of Principal Buildings. For the coastal reach extending from the City of Sheboygan north to the North County line, a lesser setback may be achieved for the principal building on an individual site where it is determined by a registered professional engineer or surveyor that the height of the bluff is less than fifty feet and, therefore, that the stable slope angle setback (2-1/2:1) would be less than the one hundred twenty-five feet established above. Measurement of the stable slope angle setback shall be made from the ordinary high water mark (OHWM) perpendicular to the shoreline. There shall be two such measurements for every one hundred feet of shoreline at points not less than fifty feet apart. The setback shall be a line connecting these two points, or such line extended. The Board of Adjustments may approve, as a variance under the provisions of Section 72.26 of this Code, a modification of the erosion hazard setback upon presentation by the applicant of acceptable engineering studies documenting:

- A. Lower recession rates;
- B. More stable slope conditions;
- C. Plans for structural protection against wave attack; and
- D. Plans for stabilization of the bluff or shoreline.

F. Stairways, Walkways, Piers, and Wharves. Stairways and walkways and that portion of piers and wharves landward of the ordinary high water mark (OHWM) are exempted from the shoreland setback requirements provided that the structure is necessary to access the shoreline because of steep slopes, impending turf destruction and erosion, or wet, unstable soils. Further, the structure shall be located so as to minimize earth disturbing activities and shoreland vegetation removal during construction and to be visually inconspicuous and screened by vegetation as viewed from the adjacent waterway and public thoroughfares. The structure shall conform with all applicable handicapped accessibility requirements and unless inconsistent therewith, shall not be more than four feet (4') wide (outside dimension) for single- and two-family residential uses. For multi-family residential, commercial, industrial, institutional, and recreational uses, the four feet (4') standard may be exceeded only upon the granting of a Conditional Use Permit pursuant to Section 72.12 of this Code. Open railings are permitted only where required by safety concerns; canopies, roofs, and closed railings/walls on such structures are prohibited; stairways shall be supported on piles or footings rather than being excavated from erodible soils on steep slopes or a bluff face; and, landings are permitted only where required by safety concerns and shall not exceed forty (40) square feet in area for single- and two-family residential uses. For multi-family residential, commercial, industrial, institutional, and recreational uses, the forty (40) square feet standard may be exceeded only upon the granting of a Conditional Use Permit pursuant to Section 72.12 of this Code.

G. Retaining Walls. Retaining walls and terracing shall only be allowed in the shoreline setback area where the applicant demonstrates that there is a current erosion problem that cannot be remedied by resloping and revegetation of the area or other means consistent with natural shoreline aesthetics. Walls and terracing shall only be permitted to the extent that they resolve a continuing erosion problem and shall not be used to provide level outdoor living space in the near-shore area. Elevated stairs or walkways shall be employed to provide shoreline access rather than terracing, as set forth in Subsection (1)(f), above.

H. On-Site Private Sewage Disposal Systems. On-site private sewage disposal systems shall be set back at least fifty feet (50') from the ordinary high water mark (OHWM) of navigable waters, and shall fully conform with the requirements of the SANITARY ORDINANCE, Chapter 70, of this Code.

72.27 Definitions.

(66) Ordinary High Water Mark. [F]or zoning purposes only, the Ordinary High Water Mark (OHWM) for the coastal reach of Lake Michigan extending from the City of Sheboygan south to the South County line shall be determined by an elevation at 582.7 feet NGVD (National Geodetic Vertical Datum, also known as MSL, Mean Sea Level), an elevation equivalent to 581.4 feet IGLD (International Great Lakes Datum), as determined by the Bureau of Water Regulation & Zoning, Wisconsin Department of Natural Resources. Elevations shall be determined by a registered professional surveyor, employing not less than five (5) uniformly distributed points of elevation, tied to a fixed reference point. The OHWM shall be a line connecting these points.

OZAUKEE COUNTY

Chapter 7 Shoreland and Floodplain Zoning Ordinance Section 7.0300 Lot, Site, and Setback Requirements

7.0308 Erosion Hazard Setback from Bluffs.

A. All Buildings and Structures in the Lake Michigan bluff area shall be set back the greater of the following distances:

1. A distance equal to a slope ratio of 2.5 feet horizontal distance to every one foot vertical distance, measured horizontally from the toe of the bluff, calculated using the most severe angle of slope as determined by a registered professional engineer or a surveyor and approved by the Zoning Administrator, and based on the following graph (see Figure 1). Measurement of the stable slope angle setback shall be made from the toe of the bluff perpendicular to the shoreline. There shall be two such measurements for every 100 feet of shoreline at points not less than 50 feet apart. The setback shall be a line connecting these two points, or such line extended.

2. A minimum setback of 75 feet from the edge of any bluff.

B. Seepage Pits and Soil Absorption Fields in the Lake Michigan bluff area shall be set back a minimum of 75 feet from the edge of any bluff, unless a stipulated permit is granted in accordance with Section 7.0905 to allow a lesser setback.

7.0309 Erosion Setback from Ravines.

A. Except as set forth in Subsection B, all buildings, structures, seepage pits, and soil absorption fields shall be set back the greater of the following distances in the Lake Michigan ravine area:

1. A distance equal to a slope ratio of 2.5 feet horizontal distance to every one foot vertical distance measured horizontally from the toe of the ravine, calculated using the most severe angle of slope, as determined by a registered professional engineer or a surveyor and approved by the Zoning Administrator, and based on the following graph (see Figure 1).

2. A minimum setback of 75 feet from the edge of any ravine.

3. When a detailed subsurface investigation report by a Wisconsin Registered

Geotechnical Engineer indicates that a ravine is a stable formation; the setback shall be as recommended in the report, subject to a minimum setback of 40 feet from the edge of that particular ravine, and subject to the approval of the Board of Adjustment.

B. Setback from Shallow Ravines. In the case of shallow ravines in the Lake Michigan ravine area, all buildings, structures, seepage pits, and soil absorption fields shall be set back a minimum of 40 feet from the edge of the angle of repose based on a slope ratio of three feet horizontal distance to every one foot vertical distance. The vertical distance of a specific site is measured from the bottom of the ravine to the horizontal level of the land adjacent to the ravine.

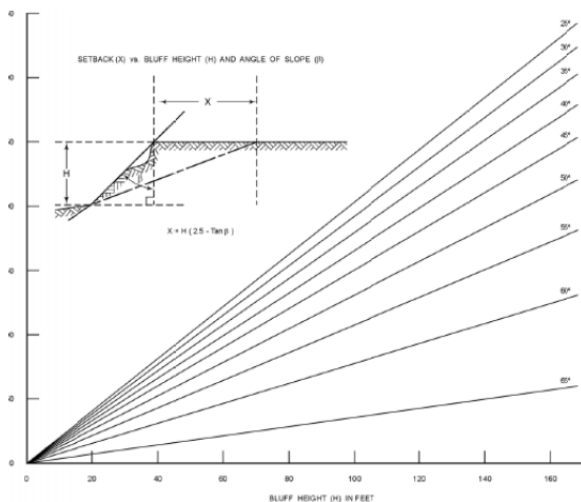


Figure 1.

MILWAUKEE COUNTY

INCORPORATED COMMUNITIES WITH COASTAL REGULATIONS

Village of Bayside, Milwaukee County

Chapter 14 Buildings and Building Regulations

Sec. 14-5 Requirements for building on ravines and the bluff of Lake Michigan.

(a)*Purpose.* The regulations set forth in this section are established because of the danger of adding to the problem of erosion of the banks of the ravines and lake bluff and the possibility of disturbing the natural runoff of surface and percolating water; to promote the public health, safety and welfare; to preserve the natural beauty of ravines and bluffs, and to protect the ecological balance.

(b)*Basic restrictions.* Except as hereinafter provided, no building or structure shall be erected on or over the face or slope of ravines or of the lake bluff in the village.

(c)*Limitation of construction on bluff of lake lots.*

(1)All foundations or footings for any building or structure built on the lake bluff shall be on or below the surface of the flat area located at the top of the bluff.

(2)No building or structure may be built on the flat area of a lot at the top of the lake bluff unless a registered professional engineer has certified that in his or her opinion the footings and method of construction of the building and materials are adequate from an engineering standpoint so as not to disturb the natural runoff of surface and percolating water or create or add to a problem of erosion on the bank of the lake bluff and also so that any such excavation for the construction shall not adversely affect the structural integrity of any structure located on adjoining lots.

(3)The village manager or building inspector may require the applicant for a permit, as a condition of the granting of the building permit, specify that any structure or building shall be set back a specified number of feet from the edge of the bluff of the lake. Cantilever over the lake bluff is prohibited.

(f)*Slope or foot of bluff or ravine.* Except for retaining walls, no structures or buildings (except for accessory buildings as defined in section 14-4) may be built wholly or partially on the slope, foot, plateau or level area below the bluff of Lake Michigan or any ravine in the village.

(g)*Retaining walls.* Retaining walls which are built solely and expressly for the purpose of preventing and retarding erosion and slippage of the lake bluff may be built. Application and plans for retaining walls must be prepared by a registered professional engineer. Before any such retaining wall is built, a building permit shall be obtained as for the construction of any other structure in the village. Plans for such retaining wall shall be submitted to the village manager. If in his or her opinion the footings and method of construction and materials are suitable to serve the purpose for which such retaining wall is being built and adequate provision is made for the flow of surface and percolating water, he or she shall notify the building inspector accordingly. No building permit shall be issued except in accordance with this subsection.

(h)*Restriction on cutting.* Wherever in the village the slope of the ravine or lake bluff averages 12 degrees or over, no one shall prune, cut, kill or remove any natural vegetation, including trees, shrubs, bushes, plants, flowers and grasses without first obtaining a permit as hereinafter provided.

(1)An application for the proposed pruning, cutting, killing or removing shall be filed with the village clerk, which application shall give the name of the owner and address of the property on which the work is proposed, and the name of the person, company or corporation who will do the work. The clerk shall refer the application to the village manager. The village manager shall examine the application and shall view the location of the proposed work. If after such viewing it is the opinion of the village manager that the proposed work is minor in nature and primarily for the improvement and care of the plant life involved, he or she shall issue the permit.

(2)If after the delivery of an application to the village manager and a view of the premises as above provided the village manager is of the opinion that subsection (1) above does not apply, he or she shall refer the matter to the architectural review committee. The architectural review committee shall

consider the application at a duly called meeting; notice of the meeting shall be given to the applicant and to the owners of abutting lots. Such notice shall be in writing mailed not less than six days or delivered to a person on the premises not less than five days before the day of the meeting. Persons to whom notice is required to be given may attend the architectural review committee meeting and may be heard.

If upon the evidence produced at such meeting the architectural review committee is of the opinion that the proposed work will not increase erosion or slippage of soil or the danger thereof and will not unreasonably and unnecessarily damage or destroy the beauty of the natural vegetation, it shall direct that the requested permit be issued. Otherwise, it shall deny such permit or may modify the proposed work and authorize the issuance of a permit if the owner agrees to such modifications.

(3)The village manager may delegate his or her responsibility and authority under this section to the village building inspector.

(4)This subsection does not apply to the area on which a building or structure is authorized to be built, the perimeter of such area to be the outside of the foundation extended five feet in all directions, nor does it apply to the area reasonably required for a driveway.

Village of Fox Point, Milwaukee County

Chapter 14 Zoning

14.07 Accessory Uses and Structures

(2) Permanent Structures

4. Permanent Structures. Lake, Bluffs, Ravines. Where property abuts Lake Michigan, or is located on a bluff or a ravine in such a locale that construction of a fence, wall, architectural screening device, driveway gate or arbor would materially obstruct the aesthetic views of adjoining and surrounding property owners, the Building Inspector may deny a permit based upon his determination that there is a substantial negative impact upon the aesthetic enjoyment of surrounding properties. Any affected party may appeal the Building Inspector's determination to the Board of Appeals within thirty days of the Building Inspectors' determination.

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Village of Whitefish Bay, Milwaukee County

Chapter 16 Zoning Code

16.04 District 1 – Lake Shore Residence District

(4) In the event that the property is on the bluff of Lake Michigan, the following requirements shall also apply:

(a) A registered professional engineer, having a minimum of ten (10) years of geotechnical experience involving foundation investigation/engineering and shoreline slope stability evaluation, and who is hired by the owner of the lot, shall certify to the Village that the construction of any proposed building and structure(s) proposed to be located within 100' of the top edge of the bluff will be safe. Specifically, he shall certify that:

1. The design of any building or structure(s), the method of constructing such building or structure(s), and the materials used therefore are structurally adequate and will protect the public health and safety;
2. The proposed building and structure(s) will not in any way adversely affect the structural integrity or safety of any building, or structure(s) located on adjoining or adjacent sites;

3. The proposed building and structure(s) will not adversely disturb ravine and bluff slopes, interfere with surface or subsurface drainage, or create new or exacerbate existing problems of erosion and recession;

4. **The drainage system will not adversely affect the adjacent and adjoining properties;**

5. There is no danger to the proposed or existing buildings or structures and its occupants from slippage of the slope above and/or below the proposed structure.

(b) The engineer shall make a technical report accompanying the certificate which shall include at a minimum:

1. Recommendations regarding site preparation, foundation design, lateral earth pressure and support of slabs on grade;

2. The stability of the slope before, during, and after construction;

3. The effect of the construction on the natural drainage in the areas including any measures, such as "weepers" which are designed to improve natural drainage in the area.

(c) The owner of the property shall certify to the Village that he/she is aware of potential problems of lake shore erosion, including but not limited to the possibility of adding fill of various types to stabilize the bluff area, is aware of the requirement for securing of a fill permit from the Village for any such filling, is aware of the provisions of said fill permit ordinance, and is further aware of the potential cost involved.

(d) A memorandum of said certifications, including the legal description of the property, shall be recorded with the Register of Deeds of Milwaukee County.

Village of Shorewood, Milwaukee County

Chapter 8 Land Divisions, Zoning and Planning

Section 8- 304 Zoning Districts

C. Residence Districts: Zones R-1 through R-10 serves the fully developed residential districts within the Village. Their primary intent is to maintain the particular character of each residential area, mainly with respect to building bulk, setback, and land coverage. As needed, additional measures are stated where topography restricts land usage.

1. R-1 Lake Drive Residence District No. 1

Principal Use: One-Family Dwellings

Conditional Uses: See Section 8-305

Lot: Width Minimum: 100 ft. (on N. Lake Drive)

Area Minimum: 24,000 square ft.

Building: Area Minimum: 1200 square ft.

Height Maximum: 30 ft.

Setback: Front Minimum: 100 ft.

Side Minimum: 10 ft.

Rear See specific requirements for bluff areas which follow hereafter

Lot Coverage: Maximum: 30% of land area for principal structure plus up to 10% for accessory structure

Additional Requirements:

Land Divisions, Zoning and Planning. All land between the water's edge of Lake Michigan and elevation 680 ft. mean sea level, shall not be included as part of the required land area under Sec. 8-304F.3.b of the Village Code. The rear setback shall be at least such distance as to insure the stabilization of the bluff area; sufficient distance from the bluff area as to prevent injury or damage to adjacent property; sufficient distance from the bluff area to provide for the natural runoff of surface and percolating water or provide for an approved drainage according to applicable law. A registered professional engineer

hired by the owner of the lot shall certify to the Village that the footings and method of constructing any building or structure and the materials used therein are adequate from an engineering standpoint so as not to adversely disturb the natural runoff of surface and percolating water or create or add to a problem of erosion on the bank of the lake bluff and shall not adversely affect the structural integrity of any structure located on adjoining or adjacent lots.

R-4 Lake Drive Residence District No. 4

Principal Use One Family Dwellings

Conditional Uses: See Section 8-305

Lot: Width Minimum: 60 feet

Area Minimum: 18,000 square feet

Building: Area Minimum: 1200 square feet

Height Maximum: 30 feet

Setback: Front Minimum: 25 feet or the average of existing setbacks on the east side of N. Lake Drive as established between the two closest intersecting streets extended, whichever is greater.

Side Minimum: 5 feet

Rear See specific requirements for bluff area which follow hereafter.

Lot Coverage: Maximum: 30% of lot for principal structure; plus up to 10% for accessory structure.

Additional Requirements:

All land between the water's edge of Lake Michigan and elevation 680.00 feet mean sea level shall not be included as part of the required land area under Sec. 8-304F.3.b of the Village Code.

The rear setback shall be at least such distance as to insure the stabilization of the bluff area; sufficient distance from the bluff area as to prevent injury or damage to adjacent property; sufficient distance from the bluff area to provide for the natural runoff of surface and percolating water or provide for an approved drainage according to applicable law. A registered professional engineer hired by the owner of the lot shall certify to the Village that the footings and method of constructing any building or structure and the materials used therein are adequate from an engineering standpoint so as not to adversely disturb the natural runoff of surface and percolating water or create or add to a problem of erosion on the bank of the lake bluff and shall not diversely affect the structural integrity of any structure located on adjoining or adjacent lots.

RACINE COUNTY

Chapter 20 Zoning

Article 6 District Regulations

Division 1 Generally

20-217 Setback Overlay Districts

(a) Boundaries of the structural and nonstructural setback overlay districts shall be determined as follows. The boundaries of the SSO structural setback overlay district shall be determined through the use of the following equation establishing a setback distance from the existing Lake Michigan bluff edge: SSO structural setback overlay district distance = Horizontal distance required to achieve one on two and one-half stable bluff slope + Minimum facility setback distance

(b) The stable slope distance and the minimum facility setback distance are described in section 20-916 et seq.

(c) The boundaries of the NSO nonstructural setback overlay district shall be determined through the use of the following equation establishing a setback distance from the existing Lake Michigan bluff edge:

NSO nonstructural setback overlay district distance = Horizontal distance required to achieve one on two and one-half stable bluff slope + (Average annual bluff recession rate x 50 years) + Minimum facility setback distance

Division 36 SSO Structural Setback Overlay District.

Sec. 20-916 Purpose: The SSO structural overlay district is intended to be used to protect people and property from shore erosion damage in Lake Michigan shoreland areas which are recommended to be protected by properly designed, constructed and maintained shore protection structures.

Sec. 20-917 Application: The SSO structural overlay district applies to those Lake Michigan shoreline areas which are located south of the northern one-half of Township 4 North, Range 23 East, Section 8, in the Town of Caledonia and Mt. Pleasant. In addition, the SSO district applies to the northernmost one thousand three hundred (1,300) feet of Lake Michigan shoreline in Section 6 of the Town of Caledonia, Township 4 North, Range 23 East, which is covered by fly ash deposits. All new development within this overlay district shall be adequately protected by properly designed, constructed, and maintained shore protection structures or measures. Such structural protection structures or measures shall meet the criteria established in Recommendations of the Racine County Technical Subcommittee on Shoreland Development Standards to the Racine County Land Use Committee, 1982.

Sec. 20-918 Stable slope: (a) In delineating the SSO structural setback overlay district, the required recession or regrading of the bluff needed to form a stable slope, plus a minimum facility setback distance, shall be computed. The provision of the stable slope provides protection against further major bluff recession, as long as the shore protective structures are effective. This stable slope distance is measured from the existing bluff edge. The minimum facility setback distance is then measured from the edge of the regraded bluff needed to form a stable slope. The minimum facility setback distance provides a safety factor against possible failure of the protective structures during extreme storm events or other natural occurrences, and provides a buffer area which helps protect the regraded bluff edge from excessive surface water runoff and from the potential bluff instability which could be caused by the additional weight of buildings being placed close to the bluff edge. In addition, the minimum facility setback distance provides an area which may be effectively utilized to facilitate surface water and subsurface water drainage and control.

(b) The distance required to achieve a one (1) on two and one-half (2 1/2) stable slope is set forth in Table 12, page 65, of SEWRPC Community Assistance Planning Report No. 86, A Lake Michigan Coastal Erosion Management Study for Racine County, Wisconsin, and shall be used to determine the stable

slope distance. Minimum facility setback distances measured from the edge of the net stable slope distance shall be as follows:

(1) Two hundred (200) feet for all structures except public utilities, public recreational facilities and single-family residential units.

(2) One hundred (100) feet for public utilities, public recreational facilities, and single family residential units. The minimum setback distance may be reduced in areas of existing facility development to be at least the average distance from the edge of the net stable slope distance to adjacent principal structures located on abutting parcels (excluding public right-of-ways and easements), although the minimum setback distance shall not be less than fifty (50) feet from the edge of the net stable slope distance. If an abutting parcel is vacant, a setback of one hundred (100) feet will be assumed for purposes of averaging.

Sec. 20-919 Modification: The calculated SSO structural setback overlay district distance may be modified upon submittal by an applicant or property owner of acceptable engineering analyses which indicated that the required distance for a stable slope is different than as defined in SEWRPC Community Assistance Planning Report No. 86, or that the height of the bluff is different than the assumed height.

Sec. 20-920 Permitted uses: The following uses are permitted in the SSO structural setback overlay district:

(1) *Principal uses.* Surface and subsurface water drainage and control; general farming activities, not including the erection of structures; open space; outdoor recreation; yard; storage of portable equipment and supplies; accessory buildings such as storage sheds; and minor structures such as driveways, sidewalks, patios and fences.

(2) *Conditional uses.* Tree cutting and shrubbery clearing, land disturbance and earth movements, and shore protection structures. See section 20-1291.

Sec. 20-921 Structures prohibited: New, permanent or relocatable residential, institutional, commercial, industrial, and agricultural structures designed for human habitation or the confinement of animals are prohibited in the SSO structural setback overlay district.

Division 37 NSO Nonstructural Setback Overlay District.

30-941 Purpose: The NSO nonstructural setback overlay district is intended to be used to protect people and property from shore erosion damage in Lake Michigan shoreland areas which are not protected by properly designed, constructed, and maintained shore protection structures.

30-942 Application: The NSO nonstructural setback overlay district applies to those Lake Michigan shoreline areas which are located north of the southern one-half of Township 4 North, Range 23 East, Section 8, Town of Caledonia, except for the northernmost one thousand three hundred (1,300) feet of Lake Michigan shoreline in Section 6 of the Town of Caledonia, which is covered by fly ash deposits.

30-943 Stable slope: (a) In delineating the NSO nonstructural setback overlay district, the expected bluff recession over a fifty-year period, plus the required recession, or regrading the bluff needed to form a stable slope, plus a minimum facility setback distance from the regraded bluff edge, shall be computed. The NSO district thus includes those Lake Michigan shoreland areas which, based on historical bluff recession rates, are expected to be lost due to bluff recession, and the formation of a stable slope, over a fifty-year period, plus a minimum facility setback distance.

(b) The distance required to achieve a one (1) on two and one-half (2 1/2) stable slope is set forth in Table 12, page 65, of SEWRPC Community Assistance Planning Report No. 86, A Lake Michigan Coastal Erosion Management Study for Racine County, Wisconsin, and shall be used to determine the stable

slope distance. Minimum facility setback distances measured from the edge of the net stable slope distance shall be as follows:

(1) Two hundred (200) feet for all structures except public utilities; public recreational facilities and single-family residential units.

(2) One hundred (100) feet for public utilities, public recreational facilities, and single-family residential units. The minimum setback distance shall be reduced in areas of existing facility development to the average distance from the regraded bluff edge to adjacent structures within one hundred (100) feet of the structure, although the minimum setback distance shall not be less than fifty (50) feet from the edge of the net stable slope distance.

30-944 Modifications: The calculated NSO nonstructural setback overlay district distance may be modified upon submittal by an applicant or property owner of acceptable engineering analyses which indicate that the actual bluff recession rate is different than as set forth in SEWRPC Community Assistance Planning Report No. 86, that the required distance for a stable slope is different, or that the height of the bluff is different than the height presented in the report.

30-945 Permitted uses: The following uses are permitted in the NSO nonstructural setback overlay district:

(1) *Principal uses.* General farming activities, not including the erection of structures; open space, outdoor recreation; yard; storage of portable equipment and supplies; accessory buildings such as storage sheds; and minor structures such as driveways, sidewalks, patios and fences.

(2) *Conditional uses.* Tree cutting and shrubbery clearing, land disturbance and earth movements, shore protection structures, and the placement of structures or buildings which may be relocated at a cost not to exceed 30 percent of the equalized value of the structure.

30-946 Structures prohibited: New, permanent residential, institutional, commercial, industrial and agricultural structures designed for human habitation or the confinement of animals are prohibited in the NSO nonstructural setback overlay district.

Article 7 Supplementary District Regulations and Requirements

ec. 20-1041. Relocatable structures.

Within the NSO nonstructural setback overlay district, relocatable structures may be allowed as a conditional use provided that:

(1) The property extends sufficiently outside the NSO nonstructural setback overlay district so that the structure can be relocated outside the NSO district in the future; and

(2) The structure is certified by a professional building moving contractor as being relocatable at a cost not exceeding thirty (30) percent of the estimated equalized value of the structure.

This conditional use requires review, public hearing, and approval by the planning and development committee and approval by the zoning administrator in accordance with section 20-1141 et seq.

Relocatable structures are not allowed as conditional uses within the SSO structural setback overlay district.

Sec. 20-1045. No structure permitted within shoreland setback area.

Within the shoreland setback area in conformance with the regulations of the Wisconsin Department of Natural Resources, no structures are permitted. "Structures" includes fences, ice fishing shanties, accessory buildings other than boathouses, minor structures, and any retaining wall not approved by the Wisconsin Department of Natural Resources.

ec. 20-1046. Mitigated shore yard structure.

Notwithstanding section 20-1045 above, special zoning permission shall be granted for the construction or placement of a structure on property in a shore yard setback area if all of the following apply:

(1) The part of a structure that is nearest to the water is located at least thirty-five (35) feet landward from the ordinary highwater mark.

(2) The total floor area of all of the structures in the shore yard setback area of the property will not exceed two hundred (200) square feet. In calculating this square footage, boathouses shall be excluded.

(3) The structure that is the subject of the request for special zoning permission has no sides or has open or screened sides.

(4) Once the location of the structure is approved by the county, a plan must be submitted by the applicant(s) for county approval. The plan must be implemented by the owner of the property to preserve or establish a vegetative buffer zone that covers at least seventy (70) percent of the half of the shore yard setback area that is nearest to the water. The plan shall contain the following information:

a. Location of mitigated structure.

b. Location of vegetative buffer.

c. Number, type and size of proposed native vegetation to be installed or identification of existing plant/materials to be maintained.

d. Installation schedule/deadline.

e. Erosion control measures.

f. Maintenance plan to replace dead/diseased vegetation.

g. Before and after photographs of vegetative buffer area.

h. Description of how the project is to be implemented.

(5) The structure meets the height and street, side and rear yard setback requirements for the zoning district in which it is located.

(6) The structure shall not be used for principal or accessory uses not allowed in the district.

(7) Such structure shall be colored in earth tones to decrease the visual intrusion near the natural shoreline.

For purposes of this section, special zoning permission includes, but is not limited to the following: shoreland contract, conditional use, special exception, special permit, zoning variance, conditional permit and words of similar intent.

Article 8 Conditional Uses

Sec. 20-1294. Shore protection structures.

(a) Shore protection structures for the Lake Michigan shoreline include such items as groins, revetments, breakwaters, bulkheads, and piers, and may be permitted. All such structures shall meet the criteria set forth in recommendations of the Racine County Technical Subcommittee on Shoreland Development Standards to the Racine County Land Use Committee, 1982.

(b) The planning and development committee or the zoning administrator shall request a review of such shore protection structures by the county technical subcommittee on shoreland development standards and await their recommendations before taking final action, but not to exceed sixty (60) days.

Sec. 20-1295. Relocatable structures.

(a) The placement of relocatable structures or buildings within the NSO district may be permitted.

(b) The property owner shall submit a report from a professional building moving contractor certifying that the structure can be feasibly moved at a cost not to exceed thirty (30) percent of the equalized value of the structure. In addition, the property shall extend sufficiently outside the NSO district so that the structure can be relocated in the future outside the NSO district. Relocatable structures are not permitted within the SSO structural setback overlay district.

Summary

Most of the more heavily-populated coastal communities with unstable eroding bluffs have adopted setbacks for new development to reduce the risk of damages due to bluff slumps and bluff recession. In addition:

Douglas, Sheboygan and Manitowoc Counties adopted ordinance language with both stable slope and recession setback requirements for the bluff portions of their coastlines.

Ozaukee County adopted an ordinance with a stable slope setback for the bluff portions of their coastline with a minimum of 75 feet from the bluff top. In addition, they require a 75 foot setback from the bluff top in ravines.

Racine County has adopted an ordinance with a stable slope setback and a requirement for shore protection to prevent erosion of the bluff toe.

Kewaunee County requires a 125 foot setback from the Ordinary High Water Mark (usually the bluff toe) where the coastal bluff is greater than 10 feet high.

Bayfield County requires a 75 foot setback from the top of bluffs.

In addition, some communities have enacted regulations to protect coastal resources and limit adverse impacts on neighboring properties. Examples include:

Door County has enacted regulations are to “perpetuate the existence and intactness of the dunes as unique habitat areas and to protect the visual integrity of the dunes”.

The Village of Whitefish Bay, Milwaukee County requires a registered professional engineer certify: “The proposed building and structure(s) will not in any way adversely affect the structural integrity or safety of any building, or structure(s) located on adjoining or adjacent sites.”

These regulations highlight proactive steps communities on the Wisconsin coast have enacted to manage risk to coastal development and limit the adverse impact of coastal development on the coastal resource and neighboring properties.

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