Community Safety Element

Vision

One of the most fundamental qualities we value in Manhattan Beach is the safety of our neighborhoods. Manhattan Beach is highly regarded for its effective, community-oriented police and fire services, and particularly, the personnel and volunteers who comprise the Police and Fire Departments.

Manhattan Beach will continue to sustain and build on its commitment to community safety through a comprehensive approach to police and fire services, including public outreach and education, community awareness, and partnerships with public agencies and private businesses. Foresight and planning regarding land use decisions represent proactive approaches to enhancing safety in the community. The Community Safety goals and policies reflect our emphasis on addressing public safety proactively.

The Element includes sections on Natural Hazards and Fire Safety, Hazardous Materials Release, Emergency Preparedness and Response Services, and Law Enforcement Services.

Manhattan Beach's Police and Fire Departments are committed to providing community-oriented police and fire services to the community, including children.

Natural Hazards and Fire Safety

Section 9.84.01 of the Manhattan Beach Municipal Code establishes minimum standards for structural seismic resistance of unreinforced masonry in the result of an earthquake. Such buildings have caused substantial damage and danger when they have collapsed during past moderate to strong earthquakes.

Natural hazards present a variety of risks to residents of Manhattan Beach. Such hazards include seismic and geologic hazards, tsunamis, fires, and localized flooding caused by major storms.

Seismic and Geologic Hazards

Southern California lies on the edge of the Pacific Plate, one of the many puzzle-like pieces that fit together forming the Earth's crust. The continuous shifting and pushing of these crustal plates create ruptures and weaknesses termed "faults". Movement along a fault releases stored energy and tension, thereby producing earthquakes. In 1933, the Long Beach Earthquake caused significant damage in the City of Manhattan Beach, particularly to unreinforced masonry buildings. The earthquake fortunately produced no casualties in the City, but there were 120 deaths in and around the city of Long Beach.

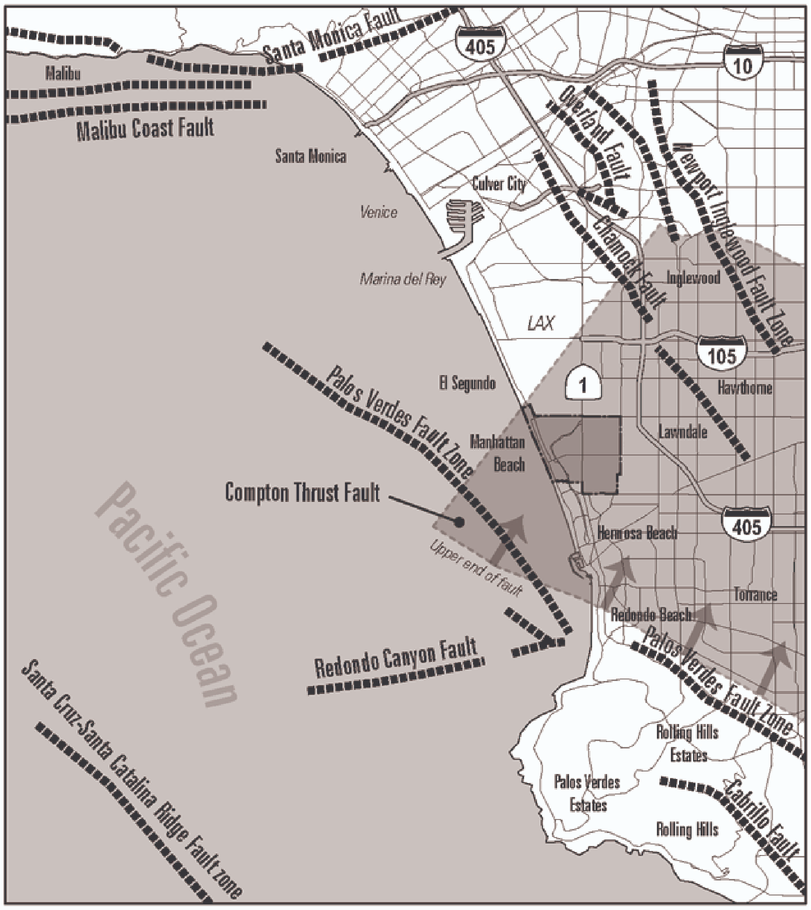
Although no surface faults are known to pass through Manhattan Beach, the City does lie above the Compton Thrust Fault. This type of fault does not rupture all the way up to the surface, so there is no evidence of it on the ground. It is "buried" under the uppermost layers of rock in the crust. In addition, several regional potentially active faults nearby can produce enough shaking to significantly damage structures and cause loss of life (see Figure CS-1 on the following page).

The level of damage in the City resulting from an earthquake will depend upon the magnitude of the event, the epicenter distance from the City, the response of geologic materials, and the strength and construction quality of structures. While groundshaking itself can cause damage, related effects such as liquefaction, landslides, and tsunami inundation are also of concern.

Measuring Earthquakes

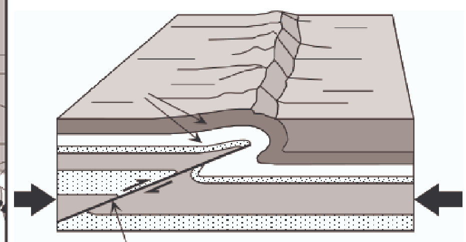
Earthquakes are often measured by the magnitude or the intensity of an earthquake. Magnitude measures the energy released at the source of the earthquake. It is a measure of the

Figure CS-1: Regional Faults



Sources: Southern California Earthquake Data Center, (http://www.scecdc.scec.org/lafault.html), October 2002.

Southern California is lined with many more faults than shown here that may potentially affect Manhattan Beach, including the San Andreas Fault located approximately 47 miles away. The cross-section below shows what the Compton Thrust Fault looks like underneath the Earth's surface. Blind thrust faults generated the 1994 Northridge and 1987 Whittier earthquakes.



size of the earthquake source and is the same number no matter where you are or what the shaking feels like. Magnitude is determined from measurements on seismographs. Intensity, on the other hand, measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, human structures, and the natural environment. Magnitude identifies the shaking and damage caused by the earthquake, and this value changes from location to location.

The intensity scale differs from the magnitude scale in that the effects of any one earthquake vary greatly from place to place, so there may be many intensity values (e.g. IV, VII, X using the Modified Mercalli Scale) measured from one earthquake. For example, an earthquake having an epicenter in northern Los Angeles County with a magnitude of 7.5 may also have an intensity of X at that same location (see Table CS-1 for magnitude and intensity comparisons). However, in Manhattan Beach, the intensity may be significantly lower because the earthquake occurred at a location nearly 40 miles away, but the magnitude of the earthquake is still registered as a 7.5. The following table compares intensities that are typically observed at locations near the epicenter of an earthquake to different magnitudes.

Table CS-1
Earthquake Magnitude and Intensity Comparison

Descriptor	Magnitude	Intensity	Description
Very Minor	1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
Minor	3.0 - 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
Light	4.0 - 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
Moderate	5.0 - 5.9	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
Strong	6.0 - 6.9	VIII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
Major Great	7.0 -7.9 8.0 and higher	X - XII	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: United States Geological Survey (USGS) National Earthquake Information Center, (http://neic.usgs.gov/neis/general/handouts/mag_vs_int.html), October 2002.

Maximum Credible Earthquake

Preparing for earthquakes requires preparing for the worst-case-scenario earthquake. Engineers construct dams and bridges to withstand the maximum credible earthquake (MCE) to prevent structural failure. The MCE is defined as the largest possible earthquake that could reasonably occur along the recognized faults or within a particular seismic source, and by definition has a very low probability of occurrence. City officials can prepare against the worst-case-scenario earthquake by understanding the potential effects of a MCE.

Table CS-2
Magnitude and Intensity of Maximum Credible Earthquake for Faults Potentially Impacting Manhattan Beach

Regional Fault Name	Distance to Manhattan Beach (miles)	Magnitude of MCE	Intensity Range of MCE [1]	Last Major Rupture
Compton Thrust Fault[2]	0.0	6.8	VIII-IX	N/A
Palos Verdes Fault	2.0 offshore 4.0 onshore	7.1	X-XII	Holocene[3], offshore
Newport-Inglewood Fault	4.5	6.9	VIII-IX	March 10, 1933, 6.4M – Long Beach Earthquake
Santa Monica Fault	11.0	6.6	VIII-IX	Late Quaternary[4]
Malibu Coast Fault	15.0	6.7	VIII-IX	Holocene, in part; otherwise Late Quaternary
San Andreas	47.0	7.1-7.8	X-XII	January 9, 1857 (Mojave segment); April 18, 1906 (Northern segment)

Source: Southern California Earthquake Data Center, http://www.scecdc.scec.org/.

Notes: (1) Intensity in Manhattan Beach will vary greatly depending on where the epicenter of the earthquake is located. The closer the epicenter is to Manhattan Beach, the higher the intensity scale.

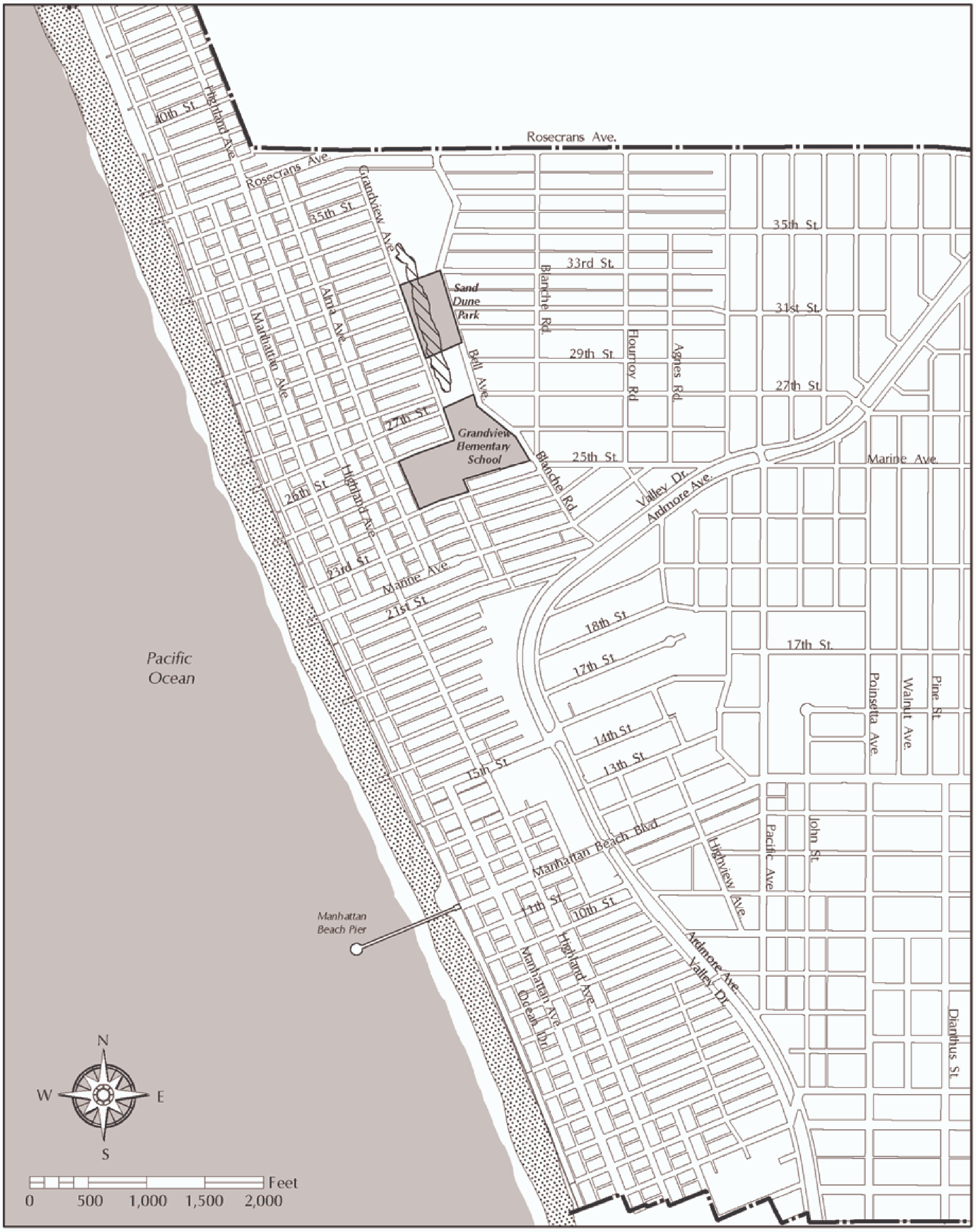
(2) A specific kind of reverse fault in which the dip of the fault is less than 45 degrees over much if not all of its length. It is characterized not so much by vertical displacement, but by horizontal compression.

(3) Holocene: The most recent geologic era; from about 10,000 years ago to the present.

(4) Quaternary: Late Quaternary refers to the time between 700,000 years ago and the present day.

Liquefaction

Liquefaction is a phenomenon in which the stiffness of a soil is reduced when ground shaking causes water-saturated soil to become fluid and lose its strength. Earthquake-induced liquefaction and related phenomena can cause significant damage, creating problems with buildings, buried pipes, and tanks. Liquefaction hazard areas in Manhattan Beach have been identified along the coast, particularly the sandy areas of the beach (Figure CS-2). Only lifeguard towers and a partial portion of the Pier are located in liquefaction areas.



Source: California Department of Conservation-Geologic Survey, Seismic Hazards Zones; September 1998.

Earthquake-Induced Landslides

Areas where previous occurence of landslide movement, or local topgraphic, geologic, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacement.

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements.

Figure CS-2

Geologic and Seismic Hazards

Landslides

The strong ground motions that occur during earthquakes are capable of inducing landslides, generally where unstable soil conditions already exist. Prior to the 1920s, when beach sand was hauled away to facilitate development, Manhattan Beach was known to have significantly large sand dunes, ranging from 50 to 70 feet in height. Past indication of these sand dunes are evidenced in the north end of the City, particularly at Sand Dune Park. The north end is the only area of the City where landslides hazards and unstable soil have been recognized (Figure CS-2).

Tsunami Inundation

A tsunami, the Japanese word for harbor wave, describes a series of traveling ocean waves of extremely long length and period generated by a major undersea earthquake or landslide occurring below or near the ocean floor. Large tsunamis can travel at speeds exceeding 600 miles per hour, and the length, from crest to crest, may be 60 miles or more. Yet the height of a tsunami, from trough to crest, may only be a few inches or feet and cannot be felt aboard ships in deep water.

The threat for tsunamis in California can be considered relatively low given the low recurrence frequencies from these phenomena. However, the threat of a seismically induced undersea landslide off the Southern California coast exists. Because locally generated tsunamis provide little time for warning, Manhattan Beach residents must be informed of the exact areas that could be inundated and the precise routes for self-evacuation. Topography in Manhattan Beach greatly reduces the risks for residents living further inland and away from the beaches.

Local Flooding

No portions of Manhattan Beach lie within any Federally designated flood zone. Localized flooding represents the only flood concern. Historically, localized flooding has resulted in damaged properties. Flooding can occur in low topographic areas or where storm drains are unable to accommodate peak flows during a storm event. Generally, localized flooding dissipates quickly after heavy rain ceases. The topographical features in the City, local drainage infrastructure, and proximity to the ocean reduce any serious threat of storm flooding within the City. City engineering records indicate that localized flooding of consequence occurs roughly every 20 years. This has been an issue that the Public Works Department has been addressing for a number of years, particularly in the Tree Section. There are areas of Manhattan Beach that regularly flood during heavy storm events.

The Storm Drainage section of the Infrastructure Element describes this system in detail.

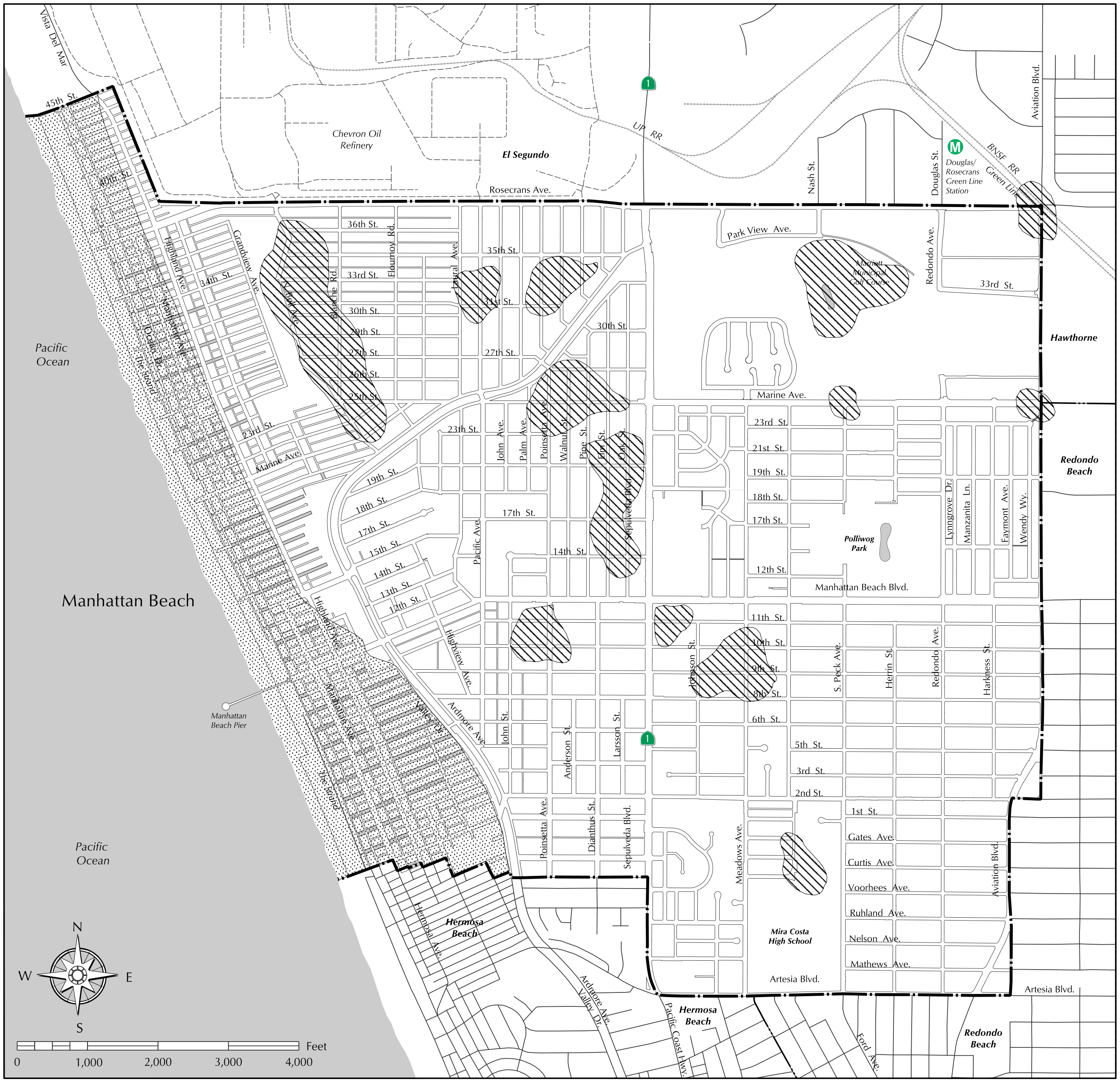
Figure CS-3 illustrates depression areas and coastal areas under 100 feet in elevation where localized flooding may occur during severe storm conditions. The Los Angeles County Department of Public Works (LACDPW) maintains the backbone flood control channels that carry away storm waters. The City maintains the smaller facilities that directly flow into the LACDPW system.

Fire Safety

Urban fires represent the sole fire threat in Manhattan Beach. The City's narrow streets and alleys, steep topography, densely developed housing, and extensive on-street parking can limit the access of fire trucks and other emergency vehicles, particularly longer vehicles. Several roadways in Downtown and North End/El Porto cannot accommodate longer wheelbase fire engines. The Fire Department has identified all impassible roadways and uses designated alternative routes to quickly gain access to all properties within the City. The Department also regularly practices maneuvering on narrow streets with large vehicles to analyze access limitations and develop routing alternatives in the event of responding to an emergency within an identified issue area.

Raleigh Studio with fourteen operating film sound stages, has a constant impact on the Prevention Division of the Fire Department due to multi-tenant short-term usage and the unique character of the film business. There are also several high-rise buildings, 55 feet or greater in height, in the Rosecrans corridor. The City had adopted more stringent local codes to regulate these high-rises. State and local codes require special construction design and annual inspections to ensure safety.

To quickly extinguish urban fires, the Fire Department must have sufficient water pressure and storage throughout the City. Insufficient water pressure can jeopardize fire-fighting capabilities and allow fire to spread uncontrollably, causing excessive damage to structures. The Public Works Department regularly monitors the water system to ensure sufficient water pressure and storage to meet daily fire-fighting needs. Given that the City is largely built out and General Plan policies call for continued low-scale development, no substantive changes to the water system are anticipated for fire protection services over the long term.



Flooding

- Depressions where localized flooding may occur under severe storm conditions
- Coastal area under 100 feet elevation
- City Boundary

Source: 1986 Manhattan Beach General Plan.

MANHATTAN BEACH GENERAL PLAN

Figure CS-3

Areas Subject to Flooding

MANHATTAN · BEACH · GENERAL · PLAN

Goals and Policies: Natural Hazards and Fire Safety

Goal CS-1:	**Minimize the risks to public health, safety, and welfare resulting from natural and human-caused hazards.**
Policy CS-1.1:	Prepare and disseminate information to residents and businesses on preparing for and responding to natural disasters and threats to public safety.
Policy CS-1.2:	Encourage and assist the school district in teaching children annually to respond appropriately in an emergency and to threats to personal safety.
Policy CS-1.3:	Ensure that public and private water distribution and supply facilities have adequate capacity and reliability to supply both everyday and emergency fire-fighting needs.
Policy CS-1.4:	Minimize the potential damage to structures and loss of life that may result from an earthquake.
Policy CS-1.5:	Require that new developments minimize stormwater and urban runoff into drainage facilities by incorporating design features such as detention basins, on-site water features, or other strategies.
Policy CS-1.6:	Protect critical facilities located within areas subject to flooding.
Policy CS-1.7:	Support the development and continued updating of public education programs on safety.
Policy CS-1.8:	Participate in Federal, State, and local earthquake preparedness and emergency response programs.

Hazardous Materials Release

Industrial processes and advancements create a myriad of products and materials that make life easier. However, these processes and materials can also use or generate substances known to be hazardous to human health. The current regulatory framework provides a high level of protection from the hazardous materials manufactured by, transported to, and stored in businesses in Manhattan Beach. Recognizing the hazards presented by such materials and ensuring that an educated public works with the City can minimize risks associated with these materials and helps create safe conditions citywide.

A hazardous material is any material that because of its quantity, concentration, or physical or chemical characteristics poses a significant present or potential hazard to human health or safety or the environment. Such materials may not be released through any spilling, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment. Many businesses in Manhattan Beach, such as drycleaners or automotive businesses, are allowed to handle and transport hazardous materials. The Federal Environmental Protection Agency (EPA) and other Federal, State, and County regulatory agencies closely monitor these businesses and sites.

Industrial uses in the adjacent city of El Segundo may have an impact on Manhattan Beach residents. The Chevron Oil Refinery, El Segundo Generation Station (ESGS), and other industrial uses occupy properties just north of Manhattan Beach and are adjacent to many homes. Northrop Grumman (formerly TRW, Inc. - Space and Electronics), with locations in Redondo Beach and Manhattan Beach, handles hazardous materials. Fire and/or spills of chemicals and petroleum can release hazardous materials into the air that may warrant an evacuation of surrounding areas. In January of 1996, a fire at the Chevron Oil Refinery required notification of 2,900 Manhattan Beach residents of the incident, although an evacuation was not necessary.

A report by the California Energy Commission identified three major types of hazards associated with the El Segundo Power (Generation Station) Redevelopment Project. These include the accidental release of ammonia, hydrazine vapor mishandling; fire; and explosion from natural gas. Mitigation measures have been introduced to reduce the threat of public exposures to these hazards, as well as alternative use of chemicals that are less hazardous[1].

The El Segundo Generating Station (ESGS) looks to upgrade the facility. The Noise Element discusses the potential ESGS noise impact to North End residents.

The Manhattan Beach Fire Department Fire Prevention Division participates in a local hazardous materials program through a joint agreement with the Los Angeles County Fire Department. Division responsibilities include cleanup of spills, leaks, and illegal dumping, and monitoring hazardous materials within businesses in Manhattan Beach.

Hazardous Waste Transport

All motor carriers and drivers involved in the transportation of hazardous materials must comply with the requirements of Federal and State regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol. When transporting explosives, inhalation hazards, and highway route-controlled quantities of radioactive materials, safe routing and safe stopping places are required. The driver is also required to display warning placards or markings while hauling hazardous waste. Given that Sepulveda Boulevard (State Route 1) serves as the primary north-south travel route through Los Angeles County coastal communities, the City must ensure quick response to any accident along the roadway involving hazardous waste transport vehicles.

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[1] Final Staff Assessment, El Segundo Power Redevelopment Project, California Energy Commission, September 2002.