

National Flood Insurance Program (NFIP) and Flood Insurance Rate Map (FIRM)

San Francisco Port Commission

October 23, 2007



Flood Insurance Rate Map (FIRM)

- FEMA manages the NFIP using a nationwide system of flood maps
- The FIRM:
 - Shows areas with 1% annual chance of flooding (100-year flood)
 - Includes bay and coastal flood hazards
 - Reflects current conditions
 - Does not reflect future conditions, such as sea level rise due to climate change
- Used as the basis for:
 - Insurance rating
 - Local floodplain management ordinance

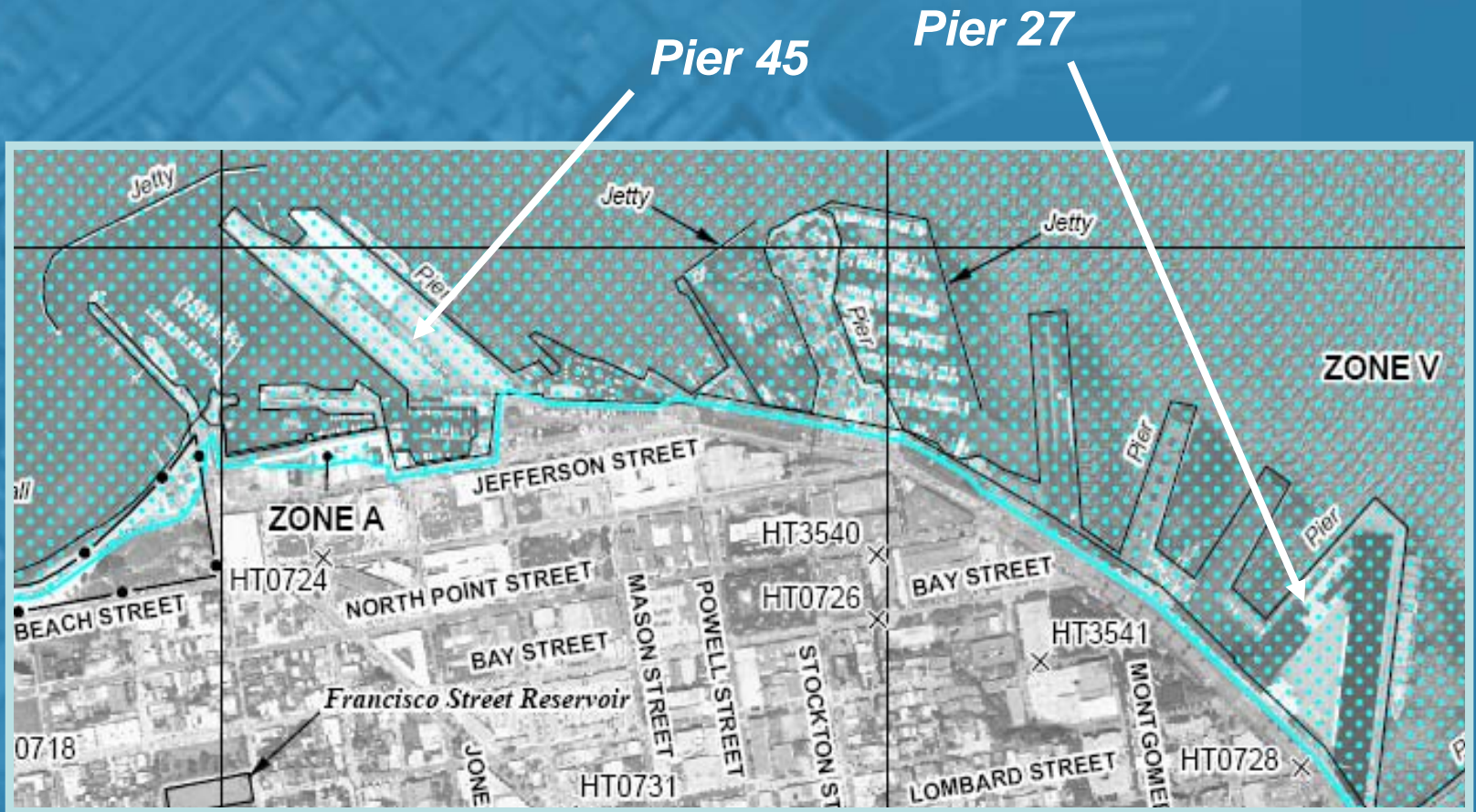


Flood Zones

- Flood zones shown on the preliminary FIRM for San Francisco:
 - Zone A: Area of coastal flooding with no wave hazard, or waves less than 3 feet in height
 - Zone V: Area of coastal flooding subject to wave hazards
 - Zone X: minimally floodprone



Flood Zones on Preliminary FIRM North Waterfront



Flood Zones on Preliminary FIRM Mission Bay Area

Sixth Street
Off-Ramp

AT&T Park



Basic Requirements

- New and substantially improved structures in flood zones must be:
 - Elevated to or above flood elevation
 - Designed below flood elevation to resist flood damage



Mission Bay Area

Protection of Structures in Zone A

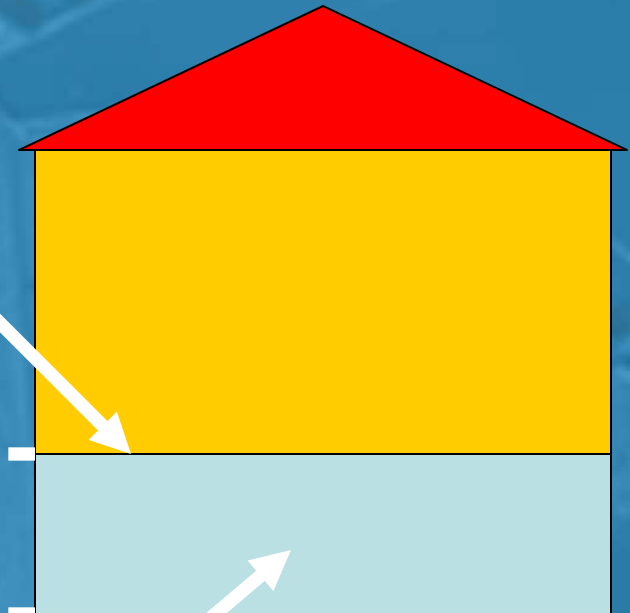
Residential Structures

Lowest floor of living space must be at or above flood elevation

Flood Elevation — — — — —

Ground Elevation — — — — —

Area below flood elevation must be constructed of flood-resistant materials



Protection of Structures in Zone A

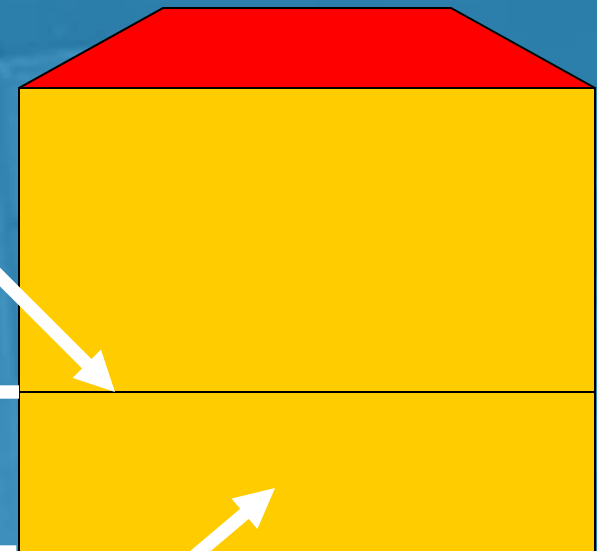
Commercial Structures

May be “floodproofed” to or above flood elevation

Flood Elevation — — — — —

Ground Elevation — — — — —

Area below flood elevation must be watertight



Protection of Structures in Zone V

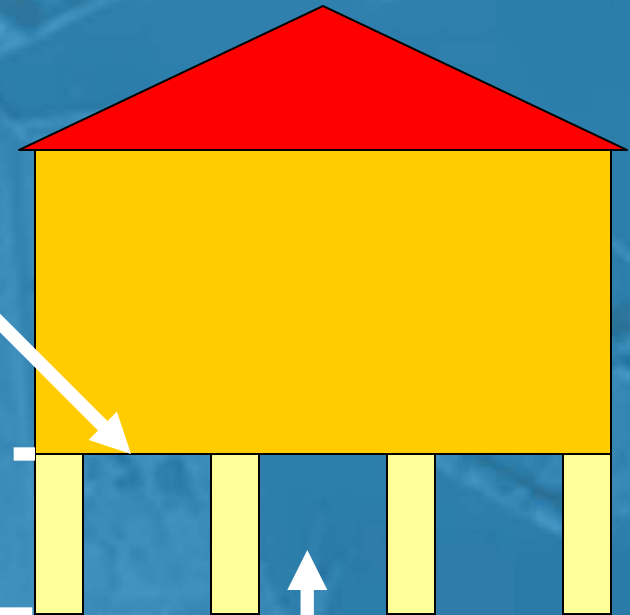
All Structures

Lowest horizontal member must be at or above wave height

Wave Height Elevation

Ground Elevation

Walls below wave height elevation must be constructed of breakaway materials



Basic Requirements

- No new construction or substantial improvement seaward of mean high tide in Zone V
- Exceptions: extraordinary hardship or historic preservation



Pier 27-31 Area



Strategies for Addressing Piers

- Variances can be implemented for:
 - Historic structures
 - “Functionally dependent” uses, e.g. maritime uses requiring proximity to water
- FEMA may consider map change to remove Zone V designation based on height of waves and structural integrity of piers



Implementation of Ordinance

- Identify structures/parcels located in flood zones
- Incorporate elevation requirements into permitting process for new or substantially improved structures
- Check design details for elevation, use of flood resistant materials, design/calculations for floodproofing
- Require preparation/submittal of Elevation Certificates documenting lowest floor elevations
- Consider exempting piers in Embarcadero Historic District



Implementation of Ordinance

- City Administrator will serve as floodplain administrator
- City Attorney preparing floodplain management ordinance based on minimum NFIP criteria
- Procedures to be developed through collaboration among:
 - DBI
 - DPW
 - Planning
 - Port
 - PUC
 - Redevelopment
 - SFO
 - Treasure Island Project Office



Further Analysis of Piers

- Port staff has requested wave elevations under Piers 27-31, Piers 15-17 and Piers 30-32 from FEMA's consultants
- Port staff will supply additional data regarding the fill characteristics of Pier 45 and breakwaters (Fisherman's Wharf, Pier 14, South Beach)
- Initial Port staff analysis indicates most piers are **above** the Total Water Elevation projected by FEMA



Table 1: Comparison of Selected Port Facility Elevations to FEMA Projections for Total Water Level (TWL) During a 100 Year Storm Event

Facility or Pier No.	Elevation (ft.)	Preliminary TWL (ft.)	Elevation Diff. (ft.)
Hyde St. Pier	12	14.76	-2.73
47	10.8	13.48	-2.7
45	13.4	13.48	-0.11
45 inner	11.8	13.48	-1.7
31	12.8	8.86	3.96
29	12.2	8.86	3.34
27	12.2	8.86	3.3
23	12.3	9.91	2.43
17	12.5	9.61	2.87
15	12.7	9.61	3.06
Ferry Plaza	11.6	9.78	1.8
Agriculture Building	11.1	9.78	1.3
30/32	13	10.47	2.51
48	12.1	10.99	1.09
94 (N end)	11.5	12.07	-0.53
94 (S end)	13.9	12.07	1.85
96	13.1	12.07	1.03

Table 1 Note: All elevations refer to NAVD 88 Datum.



Questions Regarding the FIRM and the NFIP:

Ed Byrne and Brad Benson, Port
Ed.Byrne@sfport.com,
Brad.Benson@sfport.com

Ed Lee, City Administrator
CAO@sfgov.org

