



## Built to Protect Against Floods, Windstorms, and Earthquakes

### Full Mitigation Best Practice Story

#### *Columbia County, Oregon*

**Astoria, OR** - In 2000, Randy Stemper, life-long resident of Astoria and owner of Astoria Builders Supply Co., decided to design a new building for his business. The original owner built the first business structure in 1942, and since then the building had been damaged by flood and windstorms and had been repaired several times.



Stemper's family bought the business in 1961, and he purchased the business from his family in 1987. During the 1996 severe flooding/high windstorm, the old building, which had been elevated, again suffered significant damage and loss of inventory. Randy began doing research to see what could be done to reduce or eliminate damages to his business.

"Astoria is a great town, but we will always have storms to deal with, and I wanted to build a structure that would last," said Stemper.

Stemper hired engineers to design a building that would protect his investment from damages and his employees from injuries resulting from floods, windstorms, and earthquakes. The storm drainage system was re-engineered, and the entire structure incorporates the best features of continuous load-bearing construction.

Now, the building is anchored on pilings set 60 feet into the bedrock. The all-steel exterior is reinforced from the roof down to the floor and then secured to the pilings, and the roof sections were machined together so that there are no seams to catch the wind.

"When you use this type of construction," said Stemper, "there are no screws, nails, or seams that the wind can get hold of and cause damage."

David Pearson, the curator of the Columbia River Maritime Museum in Astoria, said that "Randy worked very closely with the city planners in developing an exterior design that would enhance the city. This town has a great maritime history and keeping with this theme is very important for the community."

The Astoria Builders Supply Co. building was completed in 2001, and the construction was tested during the extreme high winds that hit Astoria in December 2007. The building withstood the storm with virtually no damage, saving thousands of dollars, and the business kept operating. The community benefited by having the supplies ready when they needed them.

"I have used this type of continuous load-bearing construction on other buildings, including my new home," stated Stemper, "and these techniques will be used on the new Astoria hospital."

The winds that hit Astoria in December 2007 were significant. According to Wolf Read, meteorological consultant for the Oregon Climate Service, "The Great Coastal Gale brought hurricane-force winds, with peak gusts of 85 miles per hour at the Astoria airport."

The December 2007 windstorm caused major damage to buildings in Astoria as well as in other communities along Oregon's northwest coast. The undamaged Astoria Builders Supply Co. is testament to the rewards of building "stronger and smarter."

For free booklets mailed to you direct, call 1-800-480-2520 and order FEMA # 499 "Home Builders Guide to Coastal Construction," FEMA #103 "Flood Proofing Non-Residential Structures," and FEMA # 312 "Homeowners Guide to Retrofitting."

### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region X**

State: **Oregon**

County: **Columbia County**

### Key Activity/Project Information

Sector: **Private**

Hazard Type: **Severe Storm**

Activity/Project Type: **Flood-proofing**

Structure Type: **Steel Frame**

Activity/Project Start Date: **05/1997**

Activity/Project End Date: **07/2001**

Funding Source: **Business Owner**

### Activity/Project Economic Analysis

Cost: **Amount Not Available**

Non FEMA Cost: **0**

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **Yes**

Federal Disaster #: **1107 , 03/19/1996**

Federal Disaster Year: **1996**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **1733 , 12/08/2007**

Repetitive Loss Property? **Unknown**

### Reference URLs

Reference URL 1: <http://www.fema.gov/hazard/flood/index.shtm>

Reference URL 2: <http://www.fema.gov/hazard/earthquake/index.shtm>

## Main Points

- In 2000, Randy Stemper, owner of Astoria Builders Supply Co., decided to design a new building for his business.
- The original owner built the first business structure in 1942, and since then the building had been damaged by flood and windstorms and had been repaired several times.
- Stemper hired engineers to design a building that would protect his investment from damages and his employees from injuries resulting from floods, windstorms, and earthquakes.
- The storm drainage system was re-engineered, and the entire structure incorporates the best features of continuous load-bearing construction.
- The building is anchored on pilings set 60 feet into the bedrock.
- The all-steel exterior is reinforced from the roof down to the floor and then secured to the pilings.
- The roof sections were machined together so that there are no seams to catch the wind.
- The building was completed in 2001, and the construction was tested during the extreme high winds that hit Astoria in December 2007. The building withstood the storm with virtually no damage, saving thousands of dollars, and the business kept operating.
- The community benefited by having the supplies ready when they needed them.



Front View of the building



Exterior load-bearing construction



Interior load-bearing construction