Federal Emergency Management Agency
Region X Federal Regional Center Bothell, Washington 98011

NOV 1 1984

Bob Scofield, Director
Skagit County Planning Department
~~Skagit County~~ Courthouse
205 Kincaid Street
Mount Vernon, Washington 98273

Dear Bob:

Following up our October 26, 1984 meeting in your office, enclosed are copies of three ordinances from other western Washington counties which require that new construction be built one foot above the base flood elevation. As I mentioned, most western Washington communities do make this requirement in their ordinances, and the enclosures are but a sampling of these communities. Following are reasons why the one foot of freeboard is so important:

1. Floodway/Flood Fringe Allowable Rise. The conventional analysis provided in flood insurance studies consists of a floodway and flood fringe making up the entire flood plain. Total encroachment is allowed within flood fringe areas on the condition that the floodway be kept free of encroachment, and if such encroachment in the fringe does occur, an allowable rise can also occur up to a maximum of one foot. In other words, a person building at the base flood elevation today may be subject to one additional foot of flooding in the future if and when someone encroaches on adjacent flood fringe property. The one foot of freeboard clearly accommodates this situation and has been suggested in model ordinances for the past 20 years.

2. Debris Jams and Other Unknown Blockages. Flood insurance studies do not recognize the existence of debris jams, log jams and the like, simply because they are not predictable. Because they cannot be predicted, they are not projected as conditions that would occur in a 100 year flood situation. However, as we all know they can occur and in all likelihood will occur, even though their location is not predictable. The one foot of freeboard serves to accommodate this kind of situation in many instances.

3. Flood of Greater than 100 Year Magnitude. The 100 year flood, which has been the standard not only of this agency but of virtually all Federal and State agencies through the years, is not, of course, the worst flood that can occur. Much worse floods can and often do occur; e.g., most of the damage wrought in the devastating Hurricane Agnes floods in 1972 were of a magnitude significantly greater than

the 100 year flooding that is depicted on all of our maps. If, for example, a 120 year flood were to occur along the Skagit, it is possible that significantly greater damage could occur, and the extra foot of freeboard also addresses this situation.

4. Uncertainties in Hydrologic Analyses. Although all studies such as ours, the Corps of Engineers and those of other agencies are prepared using the same basic techniques prescribed by the U.S. Water Resources Council, and are defendable as can be, they do, nevertheless, require statistical projections because of the limited years of record available anywhere in this country. The ideal situation would involve hundreds of years of records which could then be used to establish the base flood condition with a greater degree of accuracy, but obviously this cannot occur and that is why projecting flows statistically needs to be employed. Because of such uncertainties that will always be present in these studies, additional freeboard is highly recommended.

5. Lower Insurance Rates. Building new structures just one foot above the base flood elevation will result in significantly reduced insurance rates. The average rate for first layer structure coverage according to the insurance manual all agents must use, is reduced by 48% with construction elevated just one foot above the base flood level. These elevation rates are applicable in all A1-A30 zones which cover the bulk of the Skagit Delta as well as other detailed study areas of the county.

6. Unique Circumstances in the Skagit Delta. The flood plain analysis done for the Skagit River by the Corps of Engineers down to Sedro Woolley is a rather typical analysis with very predictable circumstances and results. This type of study is the norm in virtually all areas we deal with. However, the Skagit Delta analysis is anything but normal, since we had to ascribe a frequency to a flooding event that involved multiple levee failures, sheet flow conditions and uncertain flow paths. The net result is a depiction that we feel we can defend, but that may not realistically portray a flood that may occur in a particular area adjacent to a levee if that levee is overtopped or fails. Wherever a failure occurs, it is a certainty that our information will understate the hazard in the immediate area, since we did not attempt to portray levee failures along the levee system. As we have discussed at numerous past meetings, the initiative for protecting the public health and safety in this regard must be on local governments adopting ordinances, since our methodology could not accommodate such multiple levee break situations. The extra foot of freeboard is very minimal in this regard, but certainly can only serve to help those who may be affected by a levee break or overtopping.

In addition to our discussion on the extra foot of freeboard, we also discussed the need for a setback from the levees in the interest of protecting the public health and safety. Two separate types of zones were discussed, first a zone where all new construction would be prohibited and, second, a zone where special building techniques and engineering certifications would be required. In our discussions, we concluded that a 100 foot setback would be desirable and realistic in view of the real hazard posed by levees that could break at any point. Likewise, because of the possibility of such breaks, an additional setback necessitating special building techniques between 100 and 500 feet from the levees was judged to be appropriate. These techniques would involve use of post, pier, pile, or column construction, with water able to flow under the foundations, and would need to be certified by a registered engineer as being able to sustain at least overtopping velocities. These two strips would also serve as additional conveyance areas to complement that which is described in the next paragraph.

Concerning conveyance areas, we agreed that the work Bob Boudinot is doing to designate secondary drainage channels, such as the Gages Slough, as areas for which building cannot occur, as well as designating areas adjacent to such channels as areas in which buildings must be elevated using post, pier, pile, or column techniques, would be desirable and would probably comply with the encroachment provision found at Section 60.3(c)(10) when combined with the additional strip available along the levees discussed in the previous paragraph. We agreed that construction in these areas would not need to be certified against velocities as they would for the strip adjacent to the river and levees.

Finally, we had long discussions on types of uses adjacent to the levees and agreed that highly susceptible uses should not be allowed because of the real hazard posed by potential overtopping and breakouts. This includes uses such as hospitals, nursing homes, convalescent homes, day care centers, elderly housing projects, and similar uses where the threat to life and public safety is very high. Such provisions should be incorporated into the flood plain management ordinance or into appropriate sections of zoning ordinances.

In summary, I believe that many of the steps all jurisdictions are taking at this time to come up with safety factors in the local ordinances address the very real concerns raised by the State and others relative to protecting the public health and safety. Adoption of these measures will also comply with Federal regulations and, if adopted as described here, will most assuredly comply with the very difficult encroachment standards spelled out at Section 60.3(c)(10) of the Federal regulations.

I believe that the efforts of all local governments in the Skagit Delta have been very prudent and I look forward to continued close cooperation over the next several weeks, keeping in mind that the January 3, 1985 deadline is inviolate and extensions cannot be granted. Let me know if you have any questions concerning this summary of our meeting.

Sincerely,

Charles L. Steele, Chief
Natural and Technological
Hazards Division

Enclosure

cc: Ed Hammersmith, Dept. of Ecology
Steve West