**Section 3706.530 Providing Flood Protection**

The following are acceptable methods for providing flood protection:

a) Permanent Landfills

 Permanent landfills may be permitted as a means of providing safe construction sites, provided:

1) The landfill, except in exceptional circumstances, is contiguous with the boundary of the regulatory flood plain and shaped, in plan, so as not to create adverse velocities or current patterns.

2) The surface of the landfill is at or above the regulatory flood protection level.

3) The channelward face of the fill shall be protected against erosion. If protected by vegetative cover, slopes shall be no steeper than 3 horizontal to 1 vertical. Steeper slopes shall be protected by riprap. A vertical bulkhead may be used if adequately founded and protected against scour.

4) Fill shall be of such material and so compacted to provide adequate support under saturated conditions and shall be otherwise suitable for the use intended.

5) Adequate provision is made for conducting drainage across the fill.

b) Elevated Structures

 Structures may be permitted provided:

1) The superstructure and its major access is raised above the regulatory flood protection elevation by elevating members.

2) The structure and its intended use will not be damaged by the regulatory flood.

3) The elevating members are designed to withstand saturated conditions, hydrostatic pressure, and to minimize scouring.

4) The size, shape, spacing, and alinement of elevating members are selected to minimize turbulence and deflection of current patterns, and to facilitate easy passage of ice and debris.

5) Superstructures and major access shall have low steel or low concrete at or above the regulatory flood protection elevation.

6) Utility services to the structure shall be elevated above the regulatory protection elevation or adequately floodproofed.

c) Structural floodproofing

 Structural floodproofing will be permitted only in special circumstances where other techniques for flood protection are impossible or impractical. Floodproofing measures shall be designated consistent with the regulatory flood protection elevation for the particular area, flood velocities, durations, rate of rise, hydrostatic and hydrodynamic forces, and other factors associated with regulatory flood. The Department may require that the applicant submit a plan or document certified by a registered professional engineer that the floodproofing measures are consistent with the regulatory flood protection elevation and associated flood factors for the particular area. The following floodproofing measures may be required (without limitation because of specific enumeration):

1) Anchorage to resist flotation and lateral movement.

2) Installation of watertight doors, bulkheads, and shutters, or similar methods of construction.

3) Reinforcement of walls to resist water pressures.

4) Use of paints, membranes, or mortars to reduce seepage of water through walls.

5) Addition of mass or weight to structures to resist flotation.

6) Installation of pumps to lower water levels in structures.

7) Construction of water supply and waste treatment systems so as to prevent the entrance of floodwaters.

8) Pumping facilities or comparable practices for subsurface drainage systems for buildings to relieve external foundation wall and basement flood pressures.

9) Construction to resist rupture or collapse caused by water pressure or floating debris.

10) Installation of valves or controls on sanitary and storm drains which will permit the drains to be closed to prevent backup of sewage and storm waters into the buildings or structures. Gravity draining of basements may be eliminated by mechanical devices.

11) Location of all electrical equipment, circuits, and installed electrical appliances in a manner which will assure they are not subject to flooding and to provide protection from inundation by the regulatory flood.

12) Location of any structural storage facilities for chemicals, explosives, buoyant materials, flammable liquids or other toxic materials which could be hazardous to public health, safety, and welfare in a manner which will assure that the facilities are situated at elevations above the height associated with the regulatory flood protection elevation or are adequately floodproofed to prevent flotation of storage containers, or damage to storage containers which could result in the escape of toxic materials into floodwaters.