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	Water Resources Policies and Authorities FLOOD DAMAGE REDUCTION MEASURES IN URBAN AREAS	
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DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington, D.C. 20314

DAEN-CWR-R

Regulation
No. 1165-2-21

30 October 1980

Water Resources Policies and Authorities
FLOOD DAMAGE REDUCTION MEASURES IN URBAN AREAS

1. Purpose. This regulation provides policies and guidance for Corps of Engineers participation in urban flood damage reduction projects and establishes criteria to distinguish between improvements to be accomplished by the Corps under its flood control authorities and storm sewer systems to be accomplished by local interests.

2. Applicability. This regulation is applicable to all OCE elements and all field operating activities having Civil Works responsibilities.

3. References:

a. Executive Order 11988 - Floodplain Management, dated 24 May 1977

b. U.S. Water Resources Council, Floodplain Management Guidelines, (43FR6030), 10 February 1978

c. ER 1105-2-811

d. ER 1140-2-302

e. ER 1140-2-303

f. EP 1165-2-2

4. Definitions. For purposes of this regulation the following definitions apply:

a. "Urban areas" are cities, towns, or other incorporated or unincorporated political subdivisions of States that:

(1) Provide general local government for specific population concentrations, and,

(2) Occupy an essentially continuous area of developed land, containing such structures as residences, public and commercial buildings, and industrial sites.

This regulation supersedes ER 1165-2-21, dated 8 May 1978

b. "Flood damage reduction works in urban areas" are the adjustments in land use and the facilities (structural and non-structural) designed to reduce flood damages in urban areas from overflow or backwater due to major storms and snowmelt. They include structural and other engineering modifications to natural streams or to previously modified natural waterways. Flood damage reduction works are designed to modify flood behavior typified by temporary conditions of inundation of normally dry land from the overflow of rivers and streams or from abnormally high coastal waters due to severe storms.

c. "Storm sewer systems" are the facilities in urban areas designed to collect and convey runoff from rainfall or snowmelt in the urban area to natural water courses or to previously modified natural waterways. They include storm drains, inlets, manholes, pipes, culverts, conduits, sewers and sewer appurtenances, on-site storage and detention basins, curbs and gutters, and other small drainageways that remove or help to manage runoff in urban areas. Storm sewer systems are designed to solve storm drainage problems, which are typified by excessive accumulation of runoff in depressions; overland sheet flow resulting from rapid snowmelt or rainfall; and excessive accumulation of water at the facilities listed in this paragraph because of their limited capacity.

5. Comprehensive Planning. Coordinated comprehensive planning at the regional or river basin level, or for an urban or metropolitan area, can help to achieve solutions to flood problems that adequately reflect future changes in watershed conditions, and help to avoid short-sighted plans serving only localized situations. This planning is particularly important in areas where significant portions of a watershed are expected to be urbanized in the future. Changes in land use may result in major alterations of the runoff characteristics of the watershed. Hydrologic changes must be projected for the period of analysis. In this effort, responsible local planning organizations should provide information and assist the Corps in development of projected land uses and expected practices for collection and conveyance of runoff over the period of analysis. Conversely, the Corps may be able to provide non-Federal interests with valuable information about water related consequences of alternative land uses and drainage practices.

6. General Policy.

a. Satisfactory resolution of water damage problems in urban areas often involves cooperation between local non-Federal interests and the Federal flood control agencies. In urban or urbanizing areas, provision of a basic drainage system to collect and convey the local runoff to a stream is a non-Federal responsibility. This regulation should not be interpreted to extend the flood damage reduction program into a system of pipes traditionally recognized as a storm drainage system. Flood damage reduction works generally address discharges that represent a

serious threat to life and property. The decision criteria outlined below therefore exclude from consideration under flood control authorities small streams and ditches with carrying capacities typical of storm sewer pipes. Location of political boundaries will not be used as a basis for specifying project responsibility. Project responsibilities can be specified as follows:

(1) Flood damage reduction works, as defined in this regulation, may be accomplished by the Corps of Engineers.

(2) Construction of storm sewer systems and components thereof will be a non-Federal responsibility. Non-Federal interests have responsibility to design storm sewer systems so that residual damages are reduced to an acceptable level.

b. Consideration will be given to the objectives and requirements of Executive Order 11988 (reference 3a) and the general guidelines therefor by the U.S. Water Resources Council (reference 3b).

7. Decision Criteria for Participation.

a. Urban Flood Control.

(1) Urban water damage problems associated with a natural stream or modified natural waterway may be addressed under the flood control authorities downstream from the point where the flood discharge of such a stream or waterway within an urban area is greater than 800 cubic feet per second for the 10-percent flood (one chance in ten of being equalled or exceeded in any given year) under conditions expected to prevail during the period of analysis. Those drainage areas which lie entirely within the urban area (as established on the basis of future projections, in accordance with paragraph 5 above), and which are less than 1.5 square miles in area, shall be assumed to lack adequate discharge to meet the above hydrologic criteria. Those urban streams and waterways which receive runoff from land outside the urban area shall not be evaluated using this 1.5 square mile drainage area criterion.

(2) A number of conditions within a drainage area may limit discharges for the 10-percent flood, without proportionately reducing discharges for larger floods, such as the one-percent flood. Examples include the presence of extremely pervious soils, natural storage (wetlands) or detention basins or diversions with limited capacity. Other conditions could result in a hydrological disparity between the 10-and one-percent flood events.

(3) Division Engineers, except for NED and POD, are authorized to grant exceptions to the 800 cfs, 10-percent flood discharge criterion specified in paragraph 7a(1) above whenever both of the following criteria are met:

(a) The discharge for the one-percent flood exceeds 1800 cfs; and

(b) The reason that the 10-percent flood discharge is less than 800 cfs is attributable to a hydrologic disparity similar to those described in paragraph 7a(2) above.

Requests for exceptions to the hydrologic criterion contained in paragraph 7(a)(1) from NED and POD should be submitted to HQDA (DAEN-CWP) WASH DC 20314.

(4) Flood damage reduction works must conform to the definition in paragraph 4b and must be justified based on Corps of Engineers evaluation procedures in use at the time the evaluation is made. Flood reduction measures, such as dams or diversions, may be located upstream of the particular point where the hydrologic criteria (and area criterion, if appropriate) are met, if economically justified by benefits derived within the stream reach which does qualify for flood control improvement. Similarly, the need to terminate flood control improvements in a safe and economical manner may justify the extension of some portions of the improvements, such as levee tiebacks, into areas upstream of the precise point where Federal flood control authorities become applicable.

b. Storm sewer system. Water damage problems in urban areas not consistent with the above criteria for flood control will be considered to be a part of local storm drainage to be addressed as part of the consideration of an adequate storm sewer system. The purpose of this system is to collect and convey to a natural stream or modified natural waterway the runoff from rainfall or snowmelt in the urbanized area.

c. Man-made conveyance structures.

(1) Man-made conveyance structures will be assumed to be a part of storm sewer systems except when: (a) A natural stream has been or is to be conveyed in the man-made structure; or (b) The man-made structure is a cost-effective alternative to improvement of a natural stream for flood damage reduction purposes or is an environmentally preferable and economically justified alternative. Water damage associated with inadequate carrying capacity of man-made structures should be designated as a flood problem or a local drainage problem in a manner consistent with the structure's classification as flood damage reduction works or a part of a storm sewer system.

(2) Man-made structures that convey sanitary sewage or storm runoff, or a combination of sanitary and storm sewage, to a treatment facility will not be classified as flood damage reduction works. Flows discharged into a natural or previously modified natural waterway for the purpose of conveying the water away from the urbanized area will be assumed to be a part of the flow thereof regardless of quality characteristics.

d. Joint Projects. Certain conditions may exist whereby the Corps of Engineers and the Department of Housing and Urban Development (HUD), or another Federal agency, could jointly undertake a project that would be impractical if one agency were to undertake it alone. The Corps may, for example, under provisions of Section 219 of the Flood Control Act of 1965, *** or *** a project that is part of a larger HUD plan for an *** 40-2-302). Such efforts should be undertaken only when *** cannot be handled better by one agency acting alone. If a joint effort is preferable, then the Corps may participate as required.

e. Disagreements. If a disagreement arises between the Corps and another Federal agency that cannot be resolved at the field level, the matter will be forwarded to HQDA (DAEN-CWR) WASH DC 20314 for guidance.

8. Other Participation. In addition to providing flood damage reduction works in urban areas, the Corps may provide related services to State and local governments on a reimbursable basis. Under Title III of the Inter-governmental Cooperation Act of 1968, specialized or technical services for which the Corps has specific expertise may be furnished only when such services cannot be procured reasonably and expeditiously from private firms (see ER 1140-2-303).

9. Local Cooperation.

a. Cost sharing and other provisions of local cooperation shall be in conformity with applicable regulations for structural and non-structural flood damage reduction measures.

b. Responsible non-Federal entities will be required to provide satisfactory assurances that they will adopt, enforce, and adhere to a sound, comprehensive plan for flood plain management for overflow areas of communities involved. To this end, District Engineers will inform HUD, and other concerned Federal and non-Federal planning and governing agencies, *** plain management services available under Section 206 of the Flood Control Act of 1960, as amended (*** USC 709a).

10. Coordination with Other Federal Agencies. In conducting flood damage reduction studies, reporting officers shall comply with the 1965 Agreement between the Soil Conservation Service and the Corps (contained in EP 1165-2-2) in determining the responsible Federal agency. Corps personnel should also keep abreast of the public works programs administered by other Federal agencies, such as the Environmental Protection Agency, the Department of Housing and Urban Development, Farmers Home Administration and the Department of Commerce, in order to coordinate flood control improvements with storm sewer system improvements and to avoid program overlap. Coordination of planning

activities with A-95 clearinghouses will help to achieve this objective (see ER 1105-2-811).

FOR THE CHIEF OF ENGINEERS:

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