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**FLOOD DAMAGE ANALYSIS PACKAGE (FDA) :
APPLICATION FOR MALAYSIAN ENVIRONMENT.**

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FIELD SURVEY AND INVENTORY PROCEDURES

A-1.0 Overview

Field reconnaissance and surveys are performed to inventory structure data used in estimating the flood damage potential of an area. The information and extensive of the field surveys vary with study requirements and resource availability. For some investigations, inventories of representative sampled areas are used to project existing or future development characteristics of the entire area for subsequent estimate of the associated damage potential. Other investigations are performed using inventoried data developed from a complete survey of all structures within the flood plain in the study area. The accuracy and scope of the field surveys and level of detail requirements are dependent upon the nature of the investigation and detail required for commensurate hydrologic and hydraulic evaluations.

A-2.0 Structure Inventory Information Requirements

The structure inventory process requires considerable forethought and initial preparation to actual information gathering. Information needs and the degree of detail required must be considered prior to inventory gathering and field surveys. Appropriate documentation and referencing of data for the present and future investigations must also be considered.

A list of the information needs pertinent to analysis of individual structures is provided below. The data may be compiled from previous studies, cartographic data (i.e., aerial photographs, topographic elevations), and general field reconnaissance or detailed field surveys. Typical structure data requirements are as follows :

- Structure identification -- identification number, code, or label of the structure.
- Structure location -- coordinates, street address, post codes, damage reach.
- Type of structure -- single or multistory, with or without basements, etc..
- Reference elevation of structure -- either ground or first floor.
- Reference flood elevation of structure -- the elevation of the designated flood profile for each structure.
- Value of the structure, contents and other items.
- Appropriate stage-damage functions for the structure, contents and other items.

Other structure attributes and information may be beneficial in evaluating the damage potential and physical feasibility of implementing nonstructural measures at the structure. These include the number and type of openings, foundation type, construction materials and square footage of the structure.

A-3.0 Structure Inventory Procedures

The procedures adopted to generate and develop structure inventory information for assessments of the flood damage potential of the area vary with the requirements needs, resources and experience

of the analyst. An example of what might be termed a "typical" procedure for performing a structure inventory data is provided below.

Preliminary Assessments :

This phase would include a review of previous study data and procedures of similar scope and requirements, delineation of the area to be investigated and an initial reconnaissance of the area to determine the nature of the flood threat and damage potential.

Structure Identification :

This aspect includes locating and establishing identification codes of existing structures using such criteria and methods as a coordinate system, street address, aerial photographs, etc..

Structure Reference Elevations :

Estimates of structure reference elevations and reference flood elevations at the structures should be obtained from cartographic data of field survey. Reference flood elevation assignments may be obtained from reference flood inundation boundary maps and water surface profiles as provided from hydraulic analyses. Structure reference elevations may be obtained using topographic maps and aerial photographs.

Stage-Damage Data

General stage-damage functions should be developed or adopted for the selected types of residential, commercial, industrial and other structures. Occasionally detailed structure damage potential assessment is developed from entering structures and cataloging the structural features and contents. This is done most often to verify an existing damage function or provide basic data to create a new one or modify an existing one. Damage categories to be used in the analysis would also be adopted at this stage.

Future Conditions :

Scenarios and projected future development patterns should be obtained from pertinent agency resources if possible. The nature, location and types of structures should be estimated. The "most probable future" and other future alternative development patterns should be identified.

Alternative Measures :

Identify potential alternative flood mitigation measures to be analyzed.

Field Survey :

Detailed field surveys should be conducted to verify reference elevations, estimate value assignments of structures and select