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POLICY PAPER ON MITIGATION OF FLASH FLOODS, EROSION AND SILTATION

Prepared by

**Water Resources Technical Division
&
Environmental Engineering Technical Division
Special Joint Task Force**

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DEDICATION

IEM would like to dedicate this Policy Paper to the memory of **Ir. Dr. Hiew Kim Loi**, formerly the Deputy Director General of D.I.D., former Chairman of the Water Resources Technical Division of IEM and Committee Member of the Task Force on “Mitigation Of Flash Floods, Erosion And Siltation, “ who passed away in 2002.

EXECUTIVE SUMMARY

IEM POLICY PAPER ON MITIGATION OF FLASH FLOODS, EROSION AND SILTATION

PURPOSE

The purpose of this paper is to outline the position of IEM on “Mitigation Of Flash Floods, Erosion And Siltation.”

BACKGROUND

Frequent flash floodings have occurred recently in major cities around the country. These events have resulted in damage to properties costing millions and affected the livelihood of thousands. With the wide coverage in the press and the electronic media, these events are now becoming issues of great public concern.

Realising the importance of the above, the Institution of Engineers Malaysia (IEM) has facilitated the formation of a Special Joint Task Force in September 1999 by the Water Resources Technical Division and Environmental Engineering Technical Division of IEM.

The main objective of the Task Force is the preparation of a Policy Paper with the aim of recommending effective policies and procedures for the consideration and implementation by the Federal Government.

The Task Force has organised two public forums on 23-9-2000 and 16-12-2000 with the participation of individuals and representatives from interested parties and groups to provide input to the preparation of the Policy Paper.

Described in the following sections are the major findings of the Task Force.

ISSUES NOTED BY IEM ON MITIGATION OF EROSION AND SILTATION

- 1. Voluntary registration of drainage engineer by IEM.** It is proposed that a directory of competent drainage engineers be maintained by IEM which will serve as a reference centre for such expertise. In order to be registered, engineers must show evidence of their professional competency through their work experience as well as having attended certain trainings conducted by professional bodies, government agencies and institutions of higher learning. It is emphasised that the registration is voluntary and is not compulsory for an engineer to practice in the field.
- 2. Appointment of external checker to review design of important hydraulic structures.** It is proposed that an independent checker be engaged to review the hydrologic aspect of the design of all major hydraulic structures where failure could result in loss of lives and damage to properties. At present, the independent review is required only for the design of dams.
- 3. Review and periodic audit by an independent expert appointed by local authority for any development project above 50 hectares.** Among the main causes of flash floods are siltation from construction sites and the ineffectiveness of silt traps. To address these issues, an independent drainage consultant should be engaged by local authority to review any development project above 50 hectares and to carry out periodic audit of the project to ensure compliance with local authority regulations and to report to the authority on any non-compliance.
- 4. Use of DID's drainage charges for appointment of independent checker and monitoring requirement.** It is proposed that the Government should consider using DID's drainage charges for the appointment of expert checker and the enforcement of monitoring requirement as referred to in (2) and (3).
- 5. Involvement of DID in State Planning Committee.** Under the present Local Government Act, DID is not a member of the State Planning Committee, and as a result DID's role is confined to giving technical comments. There have been instances in the past where developments were permitted without regard to the technical advice given by DID. The Government should revise the Local Government Act to make DID or other relevant departments a member of the State Planning Committee.
- 6. Formation of high power planning division on drainage.** Formation of a high powered Flood Control Authority (FCA) under a relevant ministry

which will have the appropriate legal authority over issues pertaining to development in flood plain zones. The primary function of FCA is to bid for a national budget for a national flood control programme; to prioritize and integrate the planning and implementation of both structural and non-structural measures; and to co-ordinate with the efforts of the state governments to mitigate floodings. FCA can also serve in the advisory role to the state governments and local authorities on Best Management Practices (BMPs) with regard to catchment management. The FCA will then function as the focal point for co-ordinated efforts between the Federal and State governments to deal with flooding issues and to become a centre of excellence for flood warning and flood forecasting.

7. **Submission of plans to local council for approval.** All local councils must ensure that developers submit the relevant plans for approval before they are allowed to commence work on their project. These plans include: Earthwork Plan, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) and Erosion and Sediment Control Plan (E&SCP).
8. **Engage qualified engineers in local councils.** Presently, many local councils in the country do not have enough qualified professionals to approve drawings and plans. The Forum recommends that local councils should engage qualified engineers for such purpose, or if this is not possible then they should have access to such expertise outside.
9. **Regular and proper maintenance by local authorities and DID.** The Task Force has identified one of the major causes of flash floods is the lack of maintenance in drainage system. It is proposed that local councils and DID must provide regular, adequate and proper maintenance of waterways and drainage system within their jurisdiction.
10. **Discourage development activities in river reserve.** In recent years, certain development activities in river reserve have been known to contribute to flash floodings in the major cities. The Government should not allow new development activities over rivers and in river reserve areas to alleviate the problem of flash floods.
11. **Drainage design report should include operation and maintenance requirements of a drainage system.** At present, drainage design reports submitted by engineering consultants do not cover the operation and maintenance aspect of a drainage system. As a result, this aspect of the work is often overlooked by all parties concerned. It is proposed that in future drainage design report submitted by consultants should include the operation and maintenance requirements of the drainage system.

12. **Funding for research works.** An issue raised in the Forum is the lack of fundamental research data on the processes involved in flash floods, erosion and siltation due to inadequate funding by the Government. It is proposed by the Forum that the Government make available more funds and resources for collaborative research works by local universities and government agencies.
13. **More funds for flood mitigation works.** Another issue raised in the Forum is the inadequate funding by the Federal Government on flood mitigation works. The Forum proposes that the Government make available more funds for the purpose. One way is for the Government to consider treating drainage works as part of basic infrastructure in terms of cost.
14. **Implement DID's new "Urban Stormwater Management Manual for Malaysia."** The new Manual was launched by DID in 2001 and has been approved by the Federal and State Governments for implementation beginning the same year. The Manual contains many new methods and approaches on flood mitigation including the control at source approach. The Government should ensure the smooth implementation of the new Manual by DID.
15. **Public education and awareness.** The present level of public awareness on the causes of flash flood, erosion and siltation is generally low. The public needs to be educated about their role in reducing these occurrences. The Government can do so through the educational system and through the print and electronic media.

RECOMMENDATIONS

1. Regulate the skill of professional engineers through voluntary registration of drainage engineer by IEM.
2. Promote monitoring and review by qualified engineers by:
 - Appointment of external checker to review design of important hydraulic structures.
 - Monthly monitoring by consulting engineer competent in drainage work during the construction and post-construction stages of development.
 - Use of DID's drainage charges for appointment of independent checker and monitoring requirement.
3. Formulate new government policies and legislations through:
 - Involvement of DID in State Planning Committee.
 - Formation of high power planning division on drainage.
4. Ensure effective enforcement by regulating authorities by:
 - Submission of relevant plans to local council for approval.
 - Engage qualified engineers in local councils.

- Regular and proper maintenance by local authorities and DID.
- Discourage development activities in river reserve.
- Include operation and maintenance requirements of a drainage system in drainage design report.
- 5. Allocate more government fundings through:
 - Funding for research works.
 - More funds for flood mitigation works.
- 6. Implement new design guideline and education
 - Implement DID's new "Urban Stormwater Management Manual for Malaysia."
 - Public education and awareness.