



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

ENGINEERING STANDARD
FOR
STORM WATER DRAINAGE SYSTEM

NPCS-ES-GC-08

REVISION : 0

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SCOPE

This standard describes the minimum Engineering Requirements for storm water drainage system in an industrial complex.

STANDARDS AND CODES

Following Engineering Standards shall be applicable.

- NPCS-ES-GC-16 Engineering Standard for Site Data.
- NPCS-ES-GC-07 Engineering Standard for Capacities of Storm Water Ditches.

DESIGN CRITERIA

1 Followings basic data shall be used

1.1.1 Rainfall

- Design rainfall intensity mm/hr.
- 24 hr rainfall mm/hr.

Using intensity-duration curve, if available, is preferred.

1.1.2 Run off Coefficient

- Paved areas 1.0
- Graded areas (comacted area) 0.7
- Open areas 0.4

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4 FLOW CALCULATIONS

4.1 Water used for fire protection may have higher quantities than storm water and may be used for design of storm ditches. Engineering standard for Fire Fighting System, NPCS-ES-GC-10, shall be used for calculation of fire water quantities. It shall be assumed that only one area is under fire for storm water di-tch or pipe calculations.

4.2 The entire area shall be divided into a number of drainage zones based on topography and levels of the area. The main ditches shall be laid for each zone in such a way that under normal circumstances, the ditch depth does not exceed 1.5 m within plant limits. The main ditches should lead to an outfall ditch which shall have a suitable section and slope to cater to the entire flow.

4.3 Although exact configuration of the paved and compacted area is not available at design stage of storm water' system, areas left open are *however* known. Therefore it is necessary that some assumptions are made at the design stage. A detailed area calculation for this **purpose is time consuming** and therefore not desirable. Based on experience the following guide lines could be used for basic engineering requirements:

Area	Run off Coefficient	Cage for	Area Ditches %
Unit area, centre to centre (c/c) of roads	0.8		70
Tank-farm area,c/c of roads	0.6		30
Utility-block,c/c of roads	0.8		70
Ware house, workshop block	0.7		100
Substation, switch yard	0.7		100
Open areas, expansion area	0.4		100
Truck loading facilities	0.8		100
Railway yards	0.7		90