City of Lufkin
TCSS Manual

DETENTION FACILITIES

DETENTION FACILITIES

A. General Design Requirements

1. Detention Basin Location and Geometry

Detention basins should typically be located in areas in which ground elevations are lower than those in the area proposed to drain facilities. Wherever possible, detention facilities should be located immediately adjacent to the stream into which they will discharge storm runoff.

Detailed Drawing 01 illustrates the basic geometry of a typical detention facility. Side slopes of detention basins should be no steeper than 3 horizontal to 1 vertical. All berms are to compacted to 95% standard proctor with erosion control. The transverse slope of the channel bottom should be 1% or steeper. A concrete pilot channel 12 feet in width should be provided in the bottom of the basin as indicated on Detailed Drawing 02, which illustrates a typical basin cross-section. The pilot channel should be 6 inches deep. The minimum slope for concrete pilot channels shall be 0.10%. Earthen pilot channels with a minimum depth of 2 feet may be substituted for concrete pilot channels. The minimum flow-line slope for earthen pilot channels shall be 0.20%. Side slopes of earthen pilot channels shall be no steeper than 3 horizontal to 1 vertical.

2. Maintenance

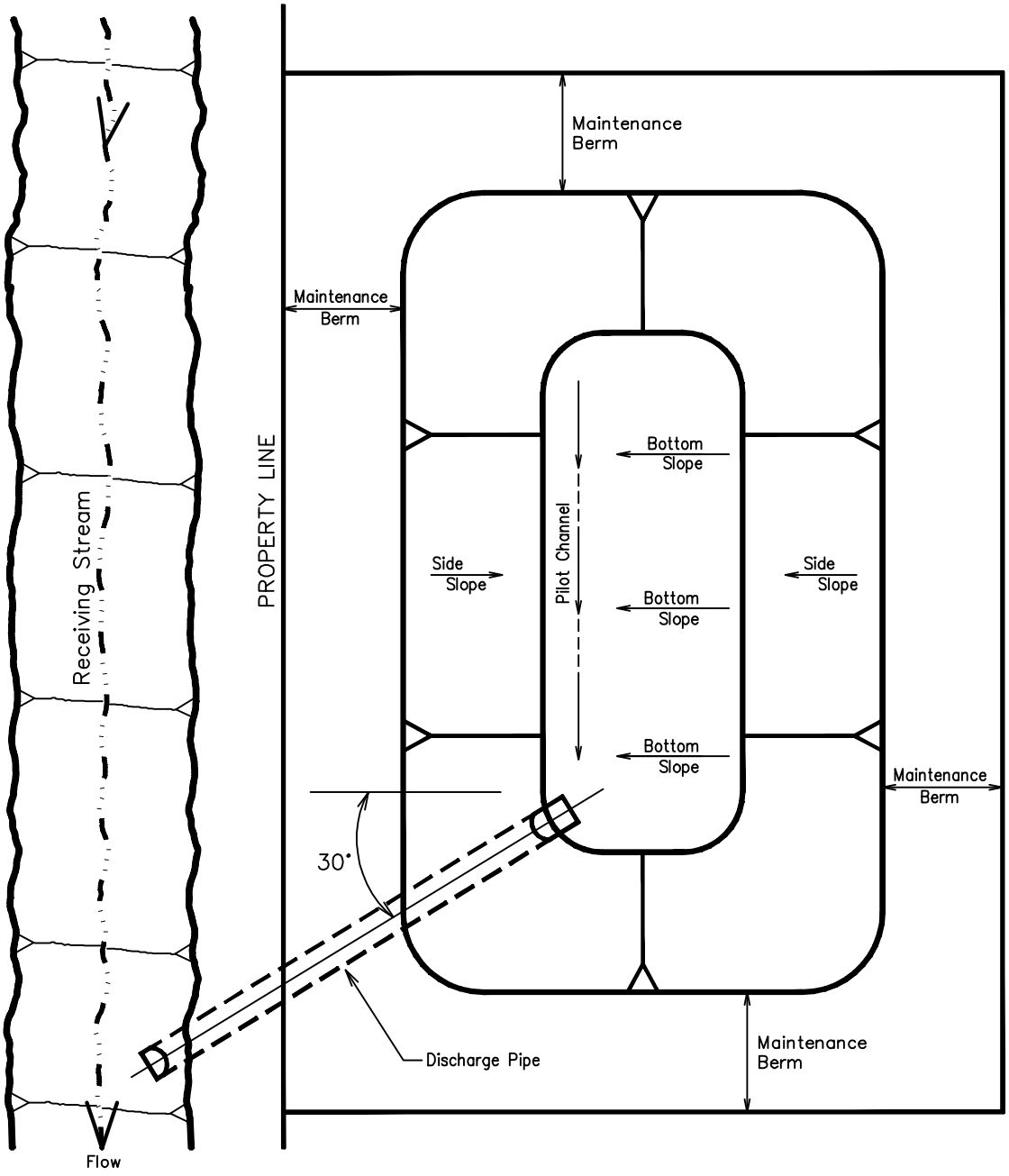
All detention facilities shall be located in readily accessible areas. Wherever possible, two access routes should be provided. Maintenance activities, including mowing, slope repairs, removal of accumulated sediments, and repairs to discharge structures, shall be completed on a regular basis. A schedule for maintenance activities should be prepared in connection with the detention design and maintained by the agency or entity responsible for the maintenance of the detention facility. The City of Lufkin will not be responsible for the maintenance of detention facilities designed and constructed to serve individual developments or infrastructure improvement projects. The City will maintain only those regional

detention facilities which are called for in Master Drainage Plans prepared for watersheds which contain incorporated areas of the City of Lufkin.

3. Design of Detention Outlet Structures

Primary detention outlet structures should be designed to carry peak design discharges from detention facilities. The design peak discharge for a particular basin may be based on a 25-year, 50-year, or l00-year storm frequency, depending upon the size of the detention drainage area. In order to size a detention structure, the water surface elevation in the basin should be assumed to be equal to its maximum design value. The elevation in the receiving stream should be set equal to the corresponding water surface elevation (25-year, 50-year, or 100-year) in the receiving stream. Standard hydraulic methods may be used to determine the required dimensions of primary outlet structures, which may include culverts, weirs, orifice openings, approved culvert material: HDPE, PVC, concrete reinforced pipe, or any other material approved by the City Engineer.

For detention basins with drainage areas less than 250 acres, an additional overflow structure must be provided so that the basin can accommodate the runoff from a 100-year, 24-hour storm event without overtopping the banks of the basin.



REF: CITY OF LUFKIN
DRAINAGE CRITERIA MANUAL
SECTION 8 – DESIGN OF
DETENTION FACILITIES
EXHIBIT 8–1

01-TYP DETENTION BASIN CONFIGURATION.Dwg

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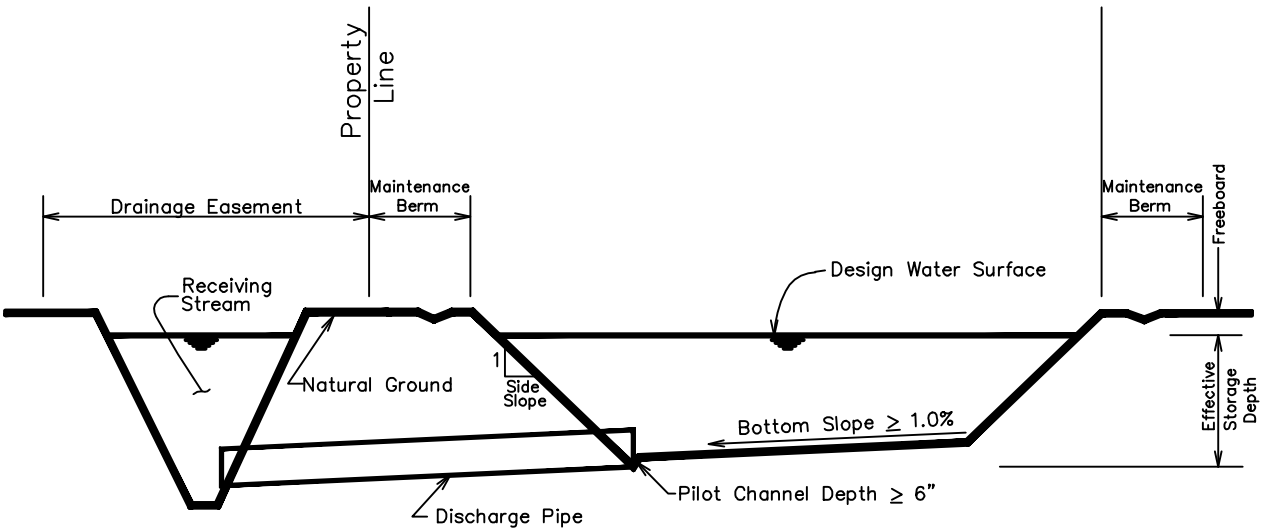
DETENTION FACILITIES

TYPICAL DETENTION BASIN CONFIGURATION

01

7-30-08



REF: CITY OF LUFKIN
DRAINAGE CRITERIA MANUAL
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EXHIBIT 8–2

02-TYP DETENTION BASIN CROSS-SECTION.Dwg

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DETENTION FACILITIES

TYPICAL DETENTION BASIN CROSS-SECTION

02

7-30-08