

Part 650 – Engineering Field Handbook

Chapter 7 – Grassed Waterways

IL650.0704 (a) Minimum Standard Design

- A. A series of minimum standard design parabolic waterways are presented in this supplement as a streamlined option to a full grassed waterway design for sites with small drainage areas within specified slope ranges. The State of Illinois is divided into three design zones based on rainfall and generalized soil groupings.

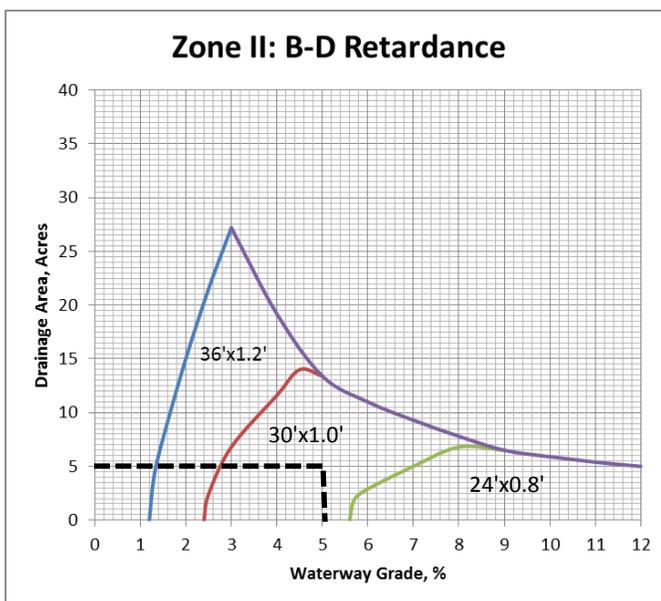


(210-VI-EFH, Notice IL60, March 2013)

- B. The minimum standard design waterways are valid for soils which can withstand 4.0 feet per second flow velocity in the vegetated channel.
- C. For each Zone, two strategies for retardance are presented. Select the retardance strategy which matches the vegetation that will be planted in the grassed waterway.
- B-D Retardance: the grassed waterway is sized for flow capacity with tall grass at B retardance, and for stability with shorter grass at D retardance. The designer should note that with the D retardance for stability, the waterway may experience difficulty in getting the vegetation established if significant rainfall is encountered during the establishment period. Mulching is strongly advised.
 - C-E Retardance: the grassed waterway is sized for flow capacity at C retardance and for stability at E retardance. Select this option only when the vegetation will not be more restrictive than the C retardance (through species selection or mowing), as outlined in Illinois Conservation Practice Standard 342 – Critical Area Planting.
- D. Each chart in the Exhibits beginning on the following page presents three (3) different sizes of standard design parabolic grassed waterways. Each parabolic size is described by top width and total depth. The charts are organized by drainage area and waterway grade. For a site specific design, plot the intersection of drainage area and grade to determine which standard design applies. When the plotted intersection falls under the curve in the Exhibit, one or more of the following standard designs is valid for the site:
- 36 ft wide x 1.2 ft deep applies under all curves
 - 30 ft wide x 1.0 ft deep applies under both the middle and the smallest curve
 - 24 ft wide x 0.8 ft deep applies only under the smallest curve
- E. Example:

For a proposed grassed waterway site in Zone II, the drainage area is 5 acres and the waterway grade is 5%. The soil is adequate to support a 4 ft/second maximum velocity, and the vegetation will be maintained to the B-D retardance.

Determine which size(s) of standard design waterway may be used.



Answer for Example:

The plotted intersection falls under the middle curve. There are two standard designs which may be used:

Option 1: **36' x 1.2'**

Option 2: **30' x 1.0'**

Exhibit IL7-1 Standard designs for Zone I

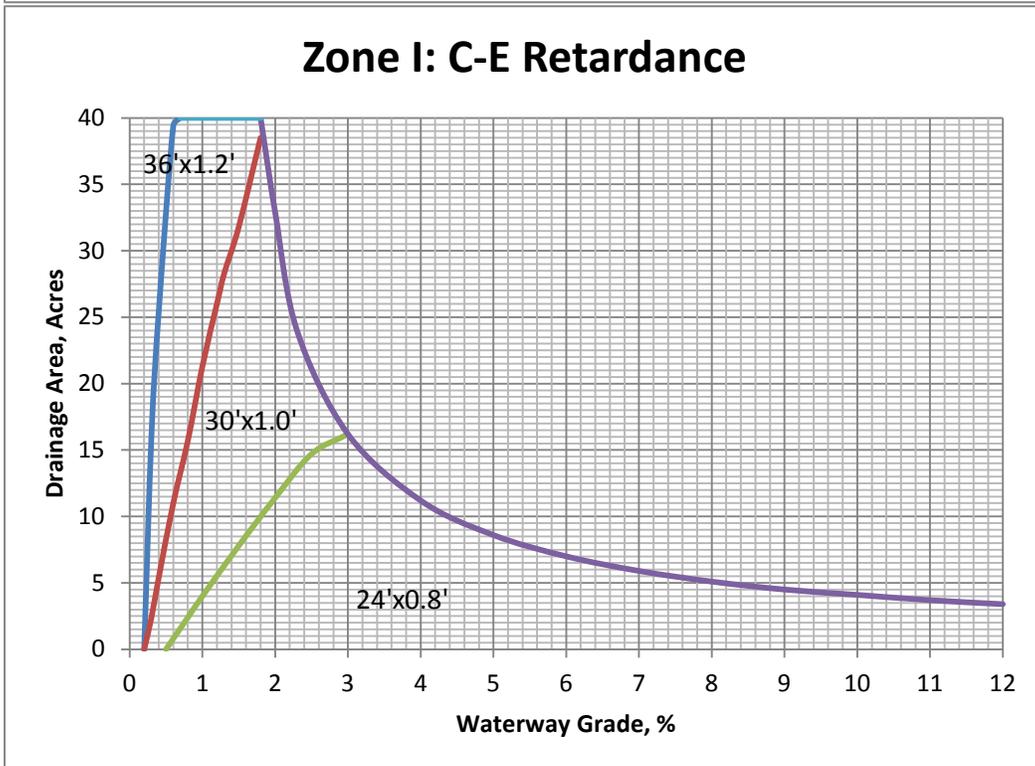
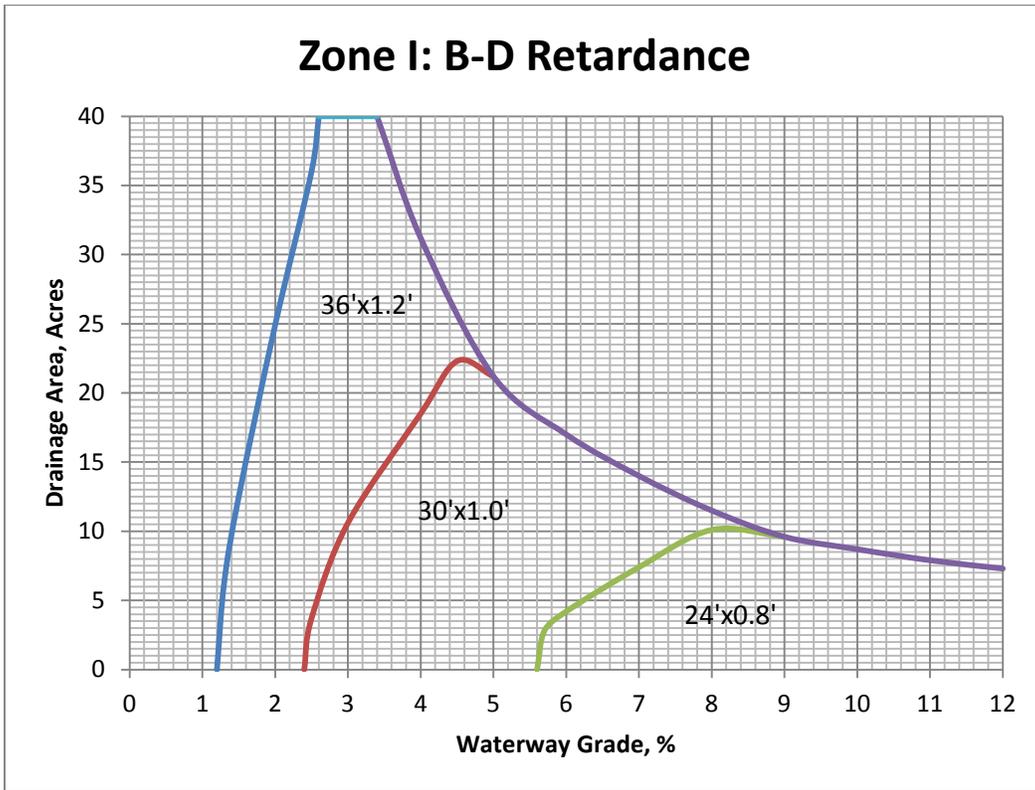


Exhibit IL7-2 Standard designs for Zone II

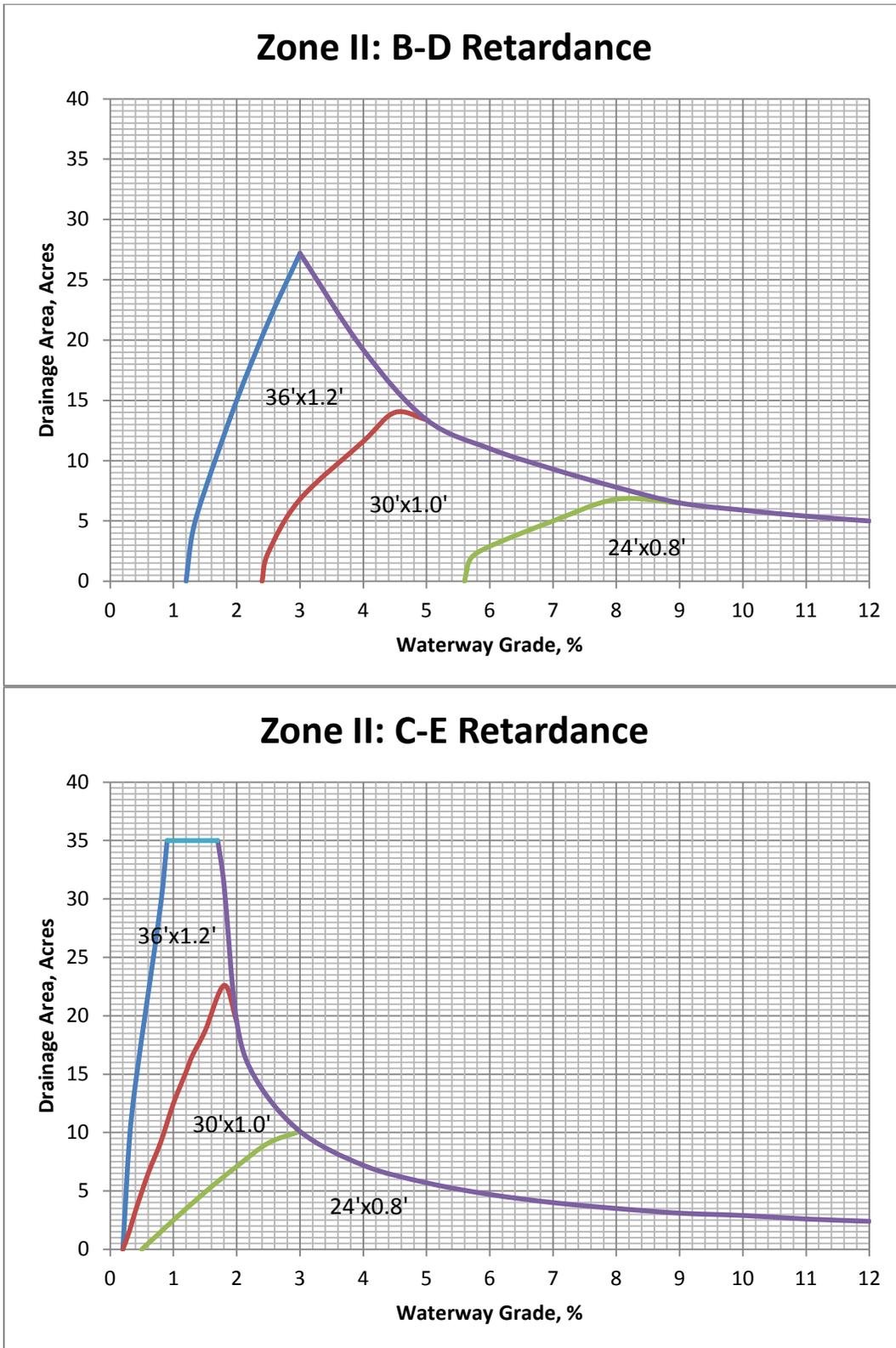


Exhibit IL7-3 Standard designs for Zone III

