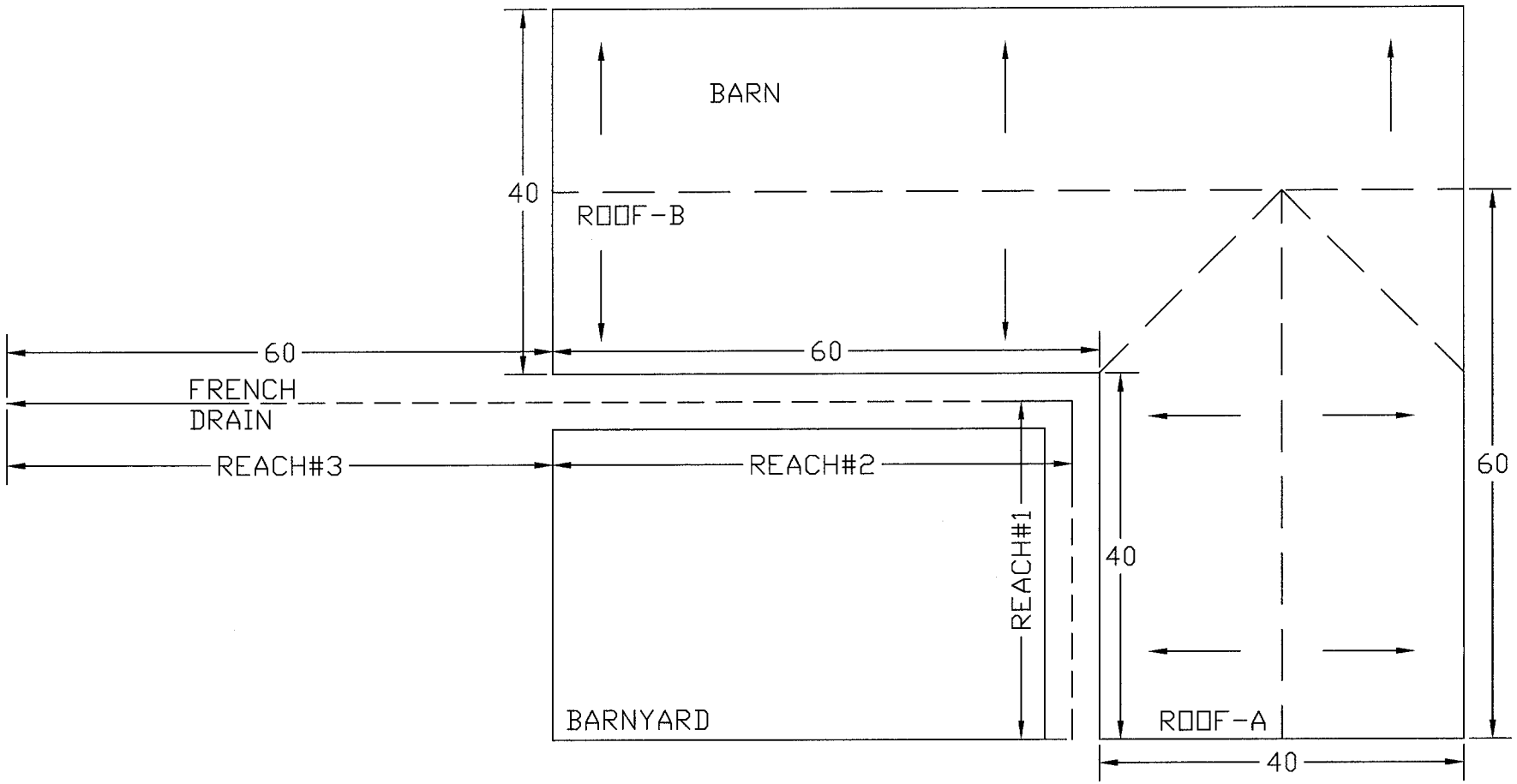
FRENCH DRAIN DESIGN PROCEDURE

Example: Design a french drain knowing the following:

1. The site is located in central Vermont.
2. Reach #1 - 40 Feet Long @ 1.0% Grade
3. Reach #2 - 60 Feet Long @ 2.0% Grade
4. Reach #3 - 60 Feet Long @ 0.5% Grade

SITE SKETCH



FRENCH DRAIN DESIGN PROCEDURE

Step #1: From site sketch or plans, compute the projected roof area contributing to the proposed french drain in square feet.

Step #2: Select the five minute rainfall (P_{5min}) from figure 1 or 2 of Vermont Standard 558 – Roof Runoff Structure. If proposed french drain is protecting a barnyard or waste storage facility, use the 25 year storm frequency in Figure 2.

Step #3: For each reach of proposed french drain, compute the roof runoff in cfs using the following equation:

$$Q = \frac{A_{(roof)} x P_{(5\,min)}}{3600}$$

Step #4: Select size of perforated corrugated plastic tubing using exhibit 8-6 in chapter 8 of the EFH, or select size of smooth interior perforated plastic pipe using exhibit 8-4. Pipe size is based on pipe grade and the discharge in cfs.

FRENCH DRAIN DESIGN PROCEDURE

Step #1: From site sketch or plans compute the projected roof area contributing to the proposed french drain.

Example:
A = (40+60)/2*20 = 1000 FT^2
B = (60+80)/2*20 = 1400 FT^2
Total = 2400 FT^2

Step #2: Select the five minute rainfall (P_{5min}) from Figure 1 or 2 on page VT558-2 of 558 - Roof Runoff Management Standard. If protecting a barnyard, waste storage facility or other high hazard site, use the 25 year storm frequency in Figure 2.

Example:
25 Year - Five Minute Rainfall for Central Vermont - P_{5min} = 0.50"

Step #3: For each reach, compute the roof runoff in cfs.

$$Q = \frac{A_{roof} * P_{5min}}{3600}$$

Example:		SUM
Reach1 - Q = (1000 x 0.50)/3600	= 0.13 cfs	0.13 cfs
Reach2 - Q = (1400 x 0.50)/3600	= 0.20 cfs	0.33 cfs
Reach3 -	= 0.00 cfs	0.33 cfs

Step #4: Select size of perforated corrugated plastic tubing using exhibit 8-6 in Chapter 8 of the EFH, or select size of perforated smooth interior plastic pipe using exhibit 8-4. Both exhibits can be found in Chapter 8 of the Engineering Field Handbook.

Example(Corrugated Plastic Tubing - Exhibit 8-6 EFH):
Reach1 - 0.13 cfs @ 1.0% grade = 4" CPT
Reach2 - 0.33 cfs @ 2.0% grade = 5" CPT, if available*
Reach3 - 0.33 cfs @ 0.5% grade = 6" CPT

Example(Smooth Interior Plastic Pipe - Exhibit 8-4 EFH)
Reach1 - 0.13 cfs @ 1.0% grade = 4" Plastic Pipe
Reach2 - 0.33 cfs @ 2.0% grade = 5" If available*
Reach3 - 0.33 cfs @ 0.5% grade = 6" Plastic Pipe

* - If 5" pipe is not available use next larger size pipe.

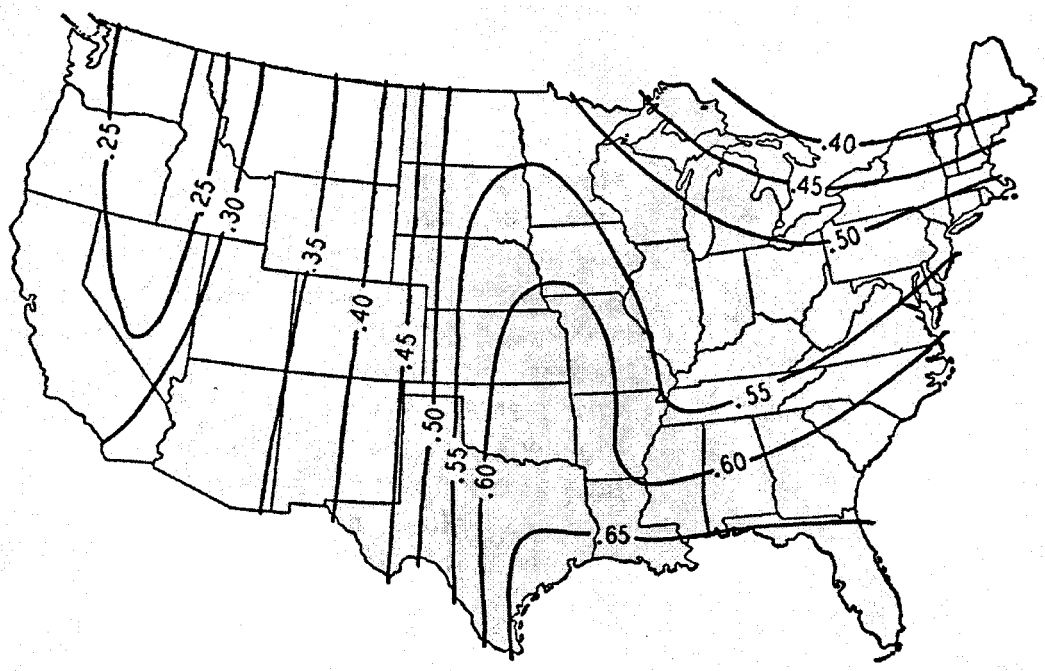


Figure 1.—Ten-year frequency, five-minute rainfall (inches).

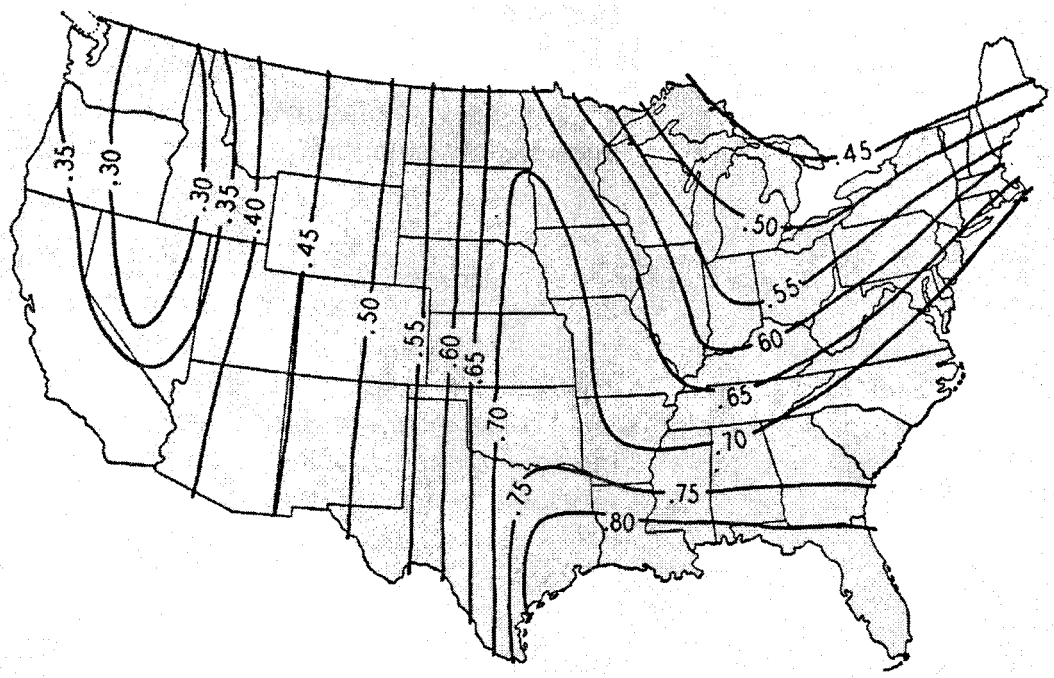
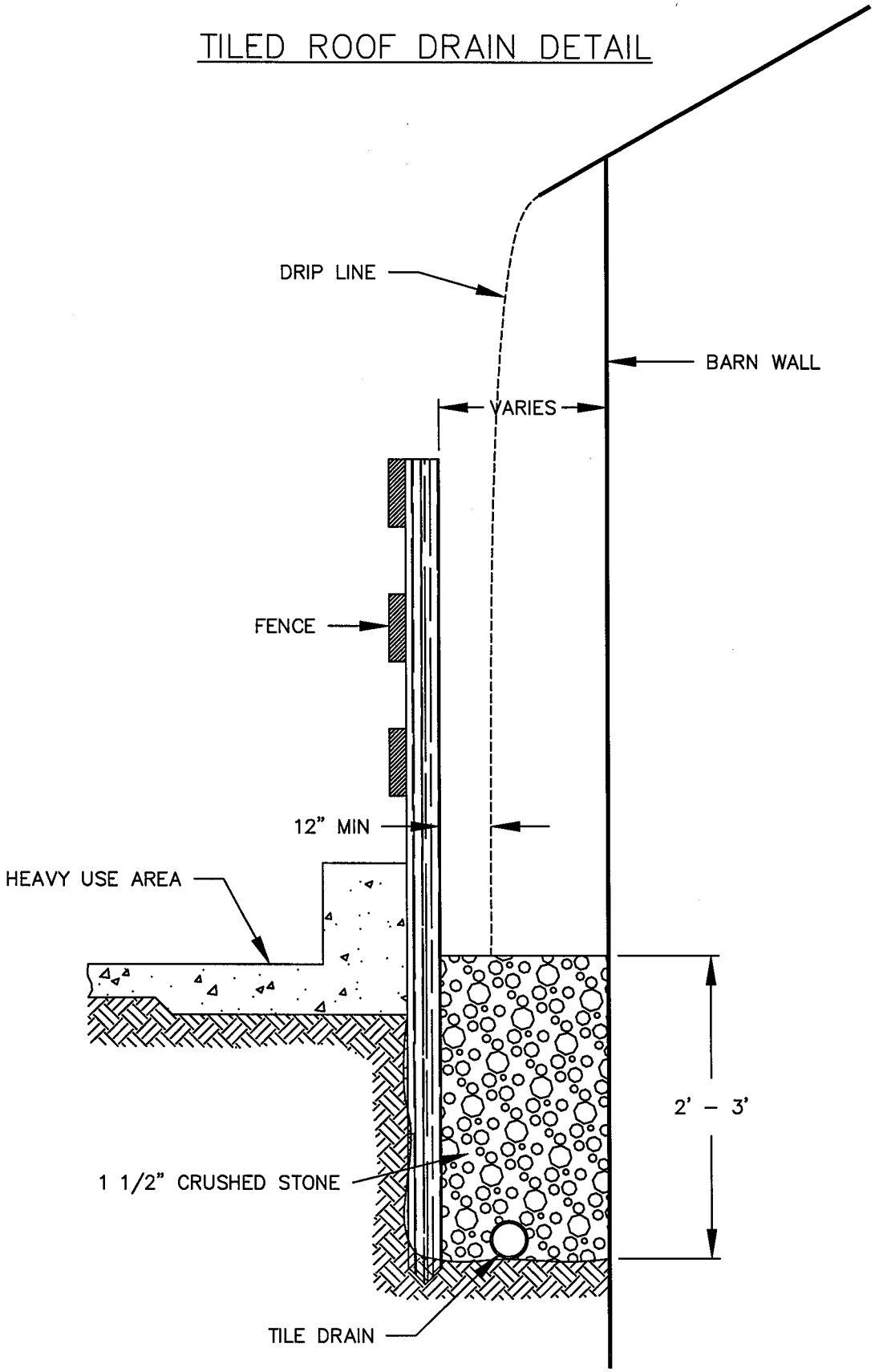


Figure 2.—Twenty-five-year frequency, five-minute rainfall (inches).

TILED ROOF DRAIN DETAIL



SIDE VIEW

NOTES:

- WIDTH OF TRENCH IS DEPENDENT ON DRIP LINE

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