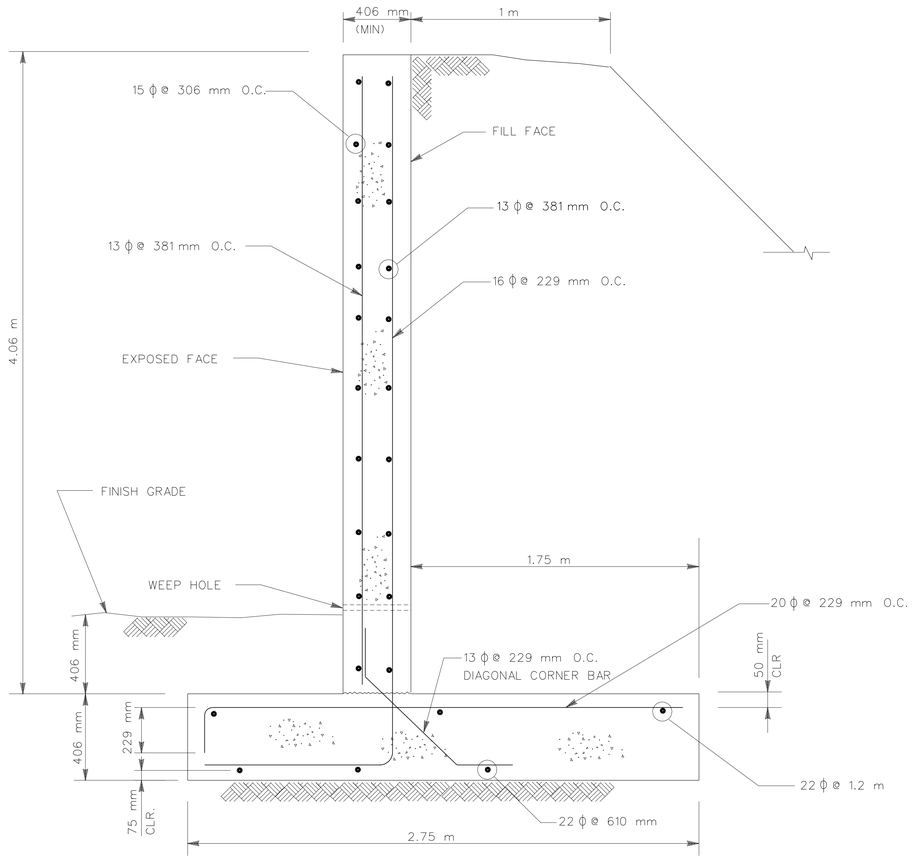

BARRICADE EXAMPLE

DESIGN EXAMPLE OF A BARRICADE

1. Reference: Concrete Reinforcing Steel Institute,(CRSI), 1984

2. Assumptions:

a. Assume Class B soil which includes granular soils, mixed grain sizes, dense enough to cause low permeability. Weight of soil is 2162 kilograms per cubic meter.

b. Level backfill with no surcharge.

c. Determine height of wall, h_w, from top of base or footing to top of wall.

1). Tunnel entrance height = 3.12m

2). Barricade standoff distance = 3.0m

3). Additional height required based on paragraph 5.C.5. and Figure 5-4 of reference DOD 6055.9-STD.

Additional height = 3.0 × tan 10° = 0.53m

4). Top of base located 0.41m below finish grade.

5). Total height of wall, h_w = 3.12 + 0.53 +0.41 = 4.06m

d. Wall thickness, t_w, is the greater of 0.3m or $0.1h_w$ as per Chapter 5 of reference DOD 6055.9-STD.

$$t_w = 0.1 \times 4.06m = .406m > 0.3m$$

e. Concrete shall develop compressive strength, fc' = 28MPa in 28 days.

f. Reinforcing steel shall be ASTM A-615M, Grade 400.

3. Solution: From CRSI reference.

a. Heel length = 1.75m
b. Base depth = 406mm
c. Base width = 2.75m
d. No key required
e. Diagonal corner bars = 13 ϕ @ 229mm on-center
f. Base reinforcement
  1). Top Bars = 19 ϕ @ 229mm on-center
  2). Longitudinal Bars
    a). Top = 22 ϕ @ 1.22m on-center
    b). Bottom = 22 ϕ @ 610mm on-center
g. Wall (Stem)
  1). Fill Face
    a). Vertical Bars = 16 ϕ @ 229mm on-center
    b). Horizontal Bars = 13 ϕ @ 381mm on-center
  2). Exposed Face
    a). Vertical Bars = 13 ϕ @ 381mm on-center
    b). Horizontal Bars = 16 ϕ @ 279mm on-center

US Army Corps of Engineers

Symbol	Description	Date	Approved	Symbol	Description	Date	Approved

Designed by: WAW
Dwn by: RLA
Ckd by:
Reviewed by:
Submitted by:
Date: 15 NOV 96
Design file no. 83071
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File name: WWUNS5.DGN
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U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE
HUNTSVILLE, ALABAMA

DEFINITIVE DRAWINGS
UNDERGROUND AMMUNITION STORAGE FACILITY
BARRICADE EXAMPLE

Sheet reference number:
S - 5
Sheet of

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