



Minimum horizontal reinforcement

$$\begin{aligned}A_{v,hor} &= 0.0007 bt \\ &= 0.0007 (12 \text{ in})(9.625 \text{ in}) = 0.081 \text{ in}^2/\text{lf}\end{aligned}$$

Use truss-type reinforcement at 24 inches on-center or one No. 5 bar at 48 inches on center ($A_s = 0.08 \text{ in}^2/\text{lf}$)

7. Check tension

$$\begin{aligned}M_t &= A_s d F_s \\ &= (0.155 \text{ in}^2)(0.5)(9.625 \text{ in})(24,000 \text{ psi}) \\ &= 17,903 \text{ in-lb/lf} \\ M &= (1,132 \text{ ft-lb/lf})(12 \text{ in/ft}) \\ &= 13,584 \text{ in-lb/lf}\end{aligned}$$

$$M < M_t \quad \text{OK}$$

Conclusion

One vertical No. 5 bar at 24 inches on-center is adequate for the given loading combination. In addition, horizontal truss type reinforcement is recommended at 24 inches (i.e., every third course of block).

Load combination D+H controls design. Therefore, a check of D+L+H is not shown.

Table 4.5 would allow a 10-inch-thick solid unit masonry wall without rebar in soil with 30 pcf equivalent fluid density. This practice has succeeded in residential construction except as reported in places with “heavy” clay soils. Therefore, a design as shown in this example may be replaced by a design in accordance with the applicable residential codes’ prescriptive requirements. The reasons for the apparent inconsistency may be attributed to a conservative soil pressure assumption or a conservative safety factor in ACI-530 relative to typical residential conditions.



4.10 References

- ACI, *Building Code Requirements for Structural Concrete and Commentary*, ACI Standard 318-95, American Concrete Institute, Farmington Hills, MI, 1999.
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