

# Retaining Wall Project Estimate

## Multi-Scenario Cost & Permitting Report

### EXECUTIVE SUMMARY

This independent report provides a comprehensive cost estimation and permitting roadmap for a proposed residential retaining wall project in the Roanoke region (including Roanoke County and the City of Roanoke). To provide the highest level of planning utility, this estimate evaluates a standard project length of **50 linear feet** across three height scenarios (**2 feet, 4 feet, and 6 feet**) and four regionally common material types. All calculations are structurally grounded in typical design specifications and utilize localized 2026 labor and material cost data.

### BASE PROJECT PARAMETERS

| Parameter                | Standard Value Used           | Notes & Source Reference                   |
|--------------------------|-------------------------------|--------------------------------------------|
| Project Length           | 50 Linear Feet                | Baseline yard perimeter / grading scenario |
| Soil Backfill Profile    | Level Backfill (No Surcharge) | Standard typical design assumption [70]    |
| Drainage Pipe            | 4" Perforated PVC             | Mandatory full-length water drainage [84]  |
| Base Material Unit Rates | Localized ProMatcher Costs    | Standard 2026 Roanoke market indexes [64]  |

### REGIONAL UNIT COST SUMMARY

The physical construction estimates are derived from the following Roanoke, Virginia average unit costs (labor and basic area preparation included) [64]:

- **Concrete Block:** \$8.03 per sq. ft. (typical range: \$7.15 to \$8.90) [65]
- **Brick Wall:** \$14.02 per sq. ft. (typical range: \$13.36 to \$14.68) [65]
- **Stone Wall (Natural):** \$16.35 per sq. ft. (typical range: \$15.71 to \$16.99; stone only) [65]
- **Poured Concrete:** \$35.39 per sq. ft. (typical range: \$33.88 to \$36.89; includes excavation and forms) [65, 66]

*Note: Standard rates do not account for massive site clearing, demolition of large existing walls, curved layouts, or highly challenging slope/soil profiles.*

## COST ANALYSIS BY HEIGHT SCENARIO

Height is the primary driver of retaining wall costs—not just because it increases surface area, but because taller walls trigger local municipal permitting requirements, professional engineering seals, and advanced drainage layers.

### Scenario A: Low-Height Wall (2 Feet / 24 Inches)

**Total Face Area:** 100 Sq. Ft. (50 LFT x 2 FT) | **Permitting Status:** Zoning permit only (City of Roanoke) [48]

| Wall Material Type      | Base Cost  | Est. Permits | Eng. Seal | 10% Contin gency | Total Est. Cost |
|-------------------------|------------|--------------|-----------|------------------|-----------------|
| Concrete Block (Cinder) | \$803.00   | \$25.00      | \$0.00    | \$82.80          | \$910.80        |
| Brick Masonry           | \$1,402.00 | \$25.00      | \$0.00    | \$142.70         | \$1,569.70      |
| Natural Stone           | \$1,635.00 | \$25.00      | \$0.00    | \$166.00         | \$1,826.00      |
| Poured Concrete (Solid) | \$3,539.00 | \$25.00      | \$0.00    | \$356.40         | \$3,920.40      |

### Scenario B: Medium-Height Wall (4 Feet / 48 Inches)

**Total Face Area:** 200 Sq. Ft. (50 LFT x 4 FT) | **Permitting Status:** Full building permit required. Roanoke County allows standard manufacturer designs up to 6ft without a custom PE seal [5].

| Wall Material Type      | Base Cost  | Est. Permits | Eng. Seal | 10% Contin gency | Total Est. Cost |
|-------------------------|------------|--------------|-----------|------------------|-----------------|
| Concrete Block (Cinder) | \$1,606.00 | \$107.00     | \$0.00    | \$171.30         | \$1,884.30      |
| Brick Masonry           | \$2,804.00 | \$107.00     | \$0.00    | \$291.10         | \$3,202.10      |
| Natural Stone           | \$3,270.00 | \$107.00     | \$0.00    | \$337.70         | \$3,714.70      |
| Poured Concrete (Solid) | \$7,078.00 | \$107.00     | \$0.00    | \$718.50         | \$7,903.50      |

### Scenario C: High-Height Wall (6 Feet / 72 Inches)

**Total Face Area:** 300 Sq. Ft. (50 LFT x 6 FT) | **Permitting Status:** Mandatory structural building plans bearing the official seal and stamp of a licensed Virginia Professional Engineer [5, 24].

| Wall Material Type      | Base Cost   | Est. Permits | Eng. Seal  | 10% Contin gency | Total Est. Cost |
|-------------------------|-------------|--------------|------------|------------------|-----------------|
| Concrete Block (Cinder) | \$2,409.00  | \$107.00     | \$1,200.00 | \$371.60         | \$4,087.60      |
| Brick Masonry           | \$4,206.00  | \$107.00     | \$1,200.00 | \$551.30         | \$6,064.30      |
| Natural Stone           | \$4,905.00  | \$107.00     | \$1,200.00 | \$621.20         | \$6,833.20      |
| Poured Concrete (Solid) | \$10,617.00 | \$107.00     | \$1,200.00 | \$1,192.40       | \$13,116.40     |

## REGULATORY REQUIRMENTS & FIELD STEPS

To ensure your project proceeds without delays or safety citations, you must integrate local building code requirements into your project budget and construction sequence.

### Expansive Soils Testing (Roanoke County Policy)

If your property's **County Tax ID number** begins with any of the designated high-clay, potential shrink-swell prefixes (such as 1-23, 25-33, 35-41, etc.), a formal soils report is required before building permit issuance [14, 15].

- **Field Borings:** Geotechnical engineers must drill a minimum of **two borings** within the proposed wall/structure footprint [16].
- **Boring Depth:** Must extend a minimum of **5 feet** or 12 inches below the bottom of the planned footing level [16].
- **Testing Standards:** Unified soil classification is **not acceptable**. Standard ASTM lab indexing must be utilized [17].
- **Expected Cost:** Retaining a local geotechnical firm for this testing and sealed report typically adds **\$1,200 to \$1,800**.

### Critical Construction Standards to Monitor

Your contractor must build in strict compliance with the typical detail drawings filed with the county [70]:

1. **Concrete Strength:** Concrete footings and solid walls must reach a minimum 28-day compressive strength of **3,500 psi** [73].
2. **Cure & Backfill Waiting Period:** Backfilling against concrete or masonry block walls is strictly prohibited until the structure has cured for at least **7 days** [83].
3. **Steel Reinforcement:** All steel rebar must be ASTM A615 Grade 60. Overlaps/splices must meet a minimum lap length of **20 inches** [73, 74].
4. **Joint Spacing:** Control joints must be placed no more than **20 feet on center** [81].

### Mandatory Inspections Timeline

Before covering or backfilling any portion of your new retaining wall, you must schedule and pass two official inspections with Roanoke inspectors [8]:

- **Footing Inspection:** Conducted after trenches are dug and rebar is placed, but prior to pouring concrete [8].
- **Final Inspection:** Conducted after the wall is complete, drainage pipes and filter-fabric gravel wraps are installed, and backfill is finalized [8].

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*Disclaimer: The cost rates used in this report are based on historical and localized averages. Actual quotes from licensed contractors in Roanoke may vary depending on material availability, labor demand, and specific property topography. The property owner bears ultimate responsibility for ensuring hired contractors possess the necessary licensing and liability insurance [45].*