

Do-It-Yourself:

How to Build a Dry Stone Wall

An instructional guide for beginners



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Introduction:

Whether for pure aesthetics or practical functionality, dry stone walls employ the craft of carefully stacking and interlocking stones without the use of mortar to form earthen boundaries, residential foundations, agricultural terraces, and rudimentary fences. If properly constructed, these creations will stand unabated for countless years, requiring only minimal maintenance and repairs.

The ability to harness the land and shape it in a way that meets one's needs through stone walling allows endless possibility and enjoyment after fundamental steps and basic techniques are learned.

How to Build a Dry Stone Wall provides a comprehensive reference for beginners looking to start and finish a wall project the correct way. A list of essential resources and tools, a step-by-step guide, and illustrations depicting proper construction will allow readers to approach projects with a confidence and a precision that facilitates the creation of beautiful stonework.

If any terminology poses an issue, simply reference the glossary provided in the back of the booklet.

NOTE: Depending on property laws and building codes, many areas do not permit stone walls. Check with respective sources to determine if all residential rules and regulations will abide stonework. Also, before building anything on a property line, always consult your neighbor(s) and get their written consent.

Tools, Equipment, and Supplies:

TOOLS:

- Wood Stakes
- Speed Square
- Measuring Tape
- Rubber Mallet
- Brick Hammer
- Mason's Chisel
- Mason's Line
- Hand Tamper
- Spade Shovel
- 3-Foot Level

EQUIPMENT:

- Masonry Gloves
- Steel Toe Boots
- Safety Glasses

SUPPLIES:

- 1/3 Small Stones
- 1/3 Medium Stones
- 1/3 Large Stones

NOTE: In order to work safely and prevent injury, account for all tools, equipment, and supplies using this list. In preparation for stone, calculate the amount needed with the formula provided on page 5.

CALCULATING STONE SUPPLY:

If you live in an area abundant in stone, you are in luck; either your residence will harbor a supply of free rocks, or people will allow you to cart numerous loads from their land for a nominal price. However, if you live in an area that offers little to no stone, getting a supply can be costly. By calculating the amount of stone needed, you can begin to determine if the time, the money, and the energy you have allotted are feasible and worthwhile investments.

Follow these steps to calculate the amount of stone needed per project:

- 1) Measure the selected area for the average length, the average height, and the average width in feet. Take into consideration the additional measurement of foundation height and sloping batter.
- 2) Multiply the measured length, width, and height together to get the cubic feet.
- 3) Divide the cubic feet by 15, because 15 cubic feet generally amounts to 1 ton of stackable stone.
- 4) Add an additional 5% of weight to the tonnage, planning for unusable and damaged material.

NOTE: In order to calculate accurately, be sure to include an additional 1 foot in foundation depth per every three feet of aboveground height. Walls surpassing two feet in height need a wider base than the top, known as a batter. For every foot of height, the base should be two inches wider than the top. Providing a solid base and consistent batter ensures strength and stability.

HERE IS AN EXAMPLE:

1) Average Length = 12', Average Height = 3', Average Width = 1' 4" [Add an Additional 1' to height to account for the foundation of wall].

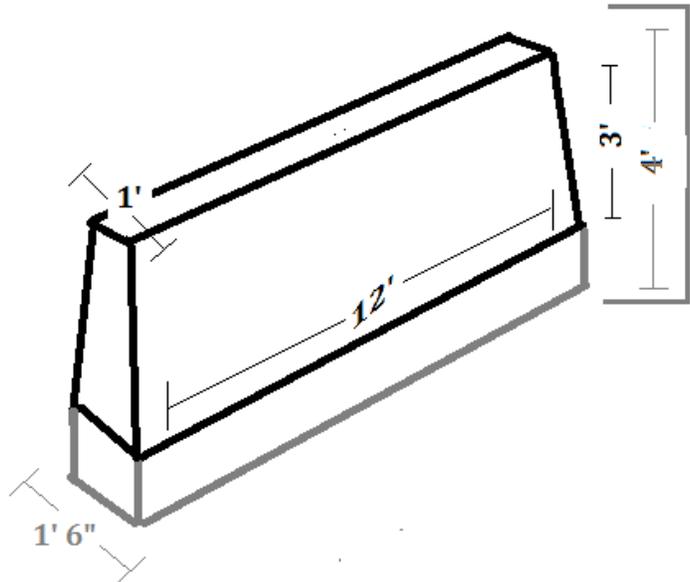
2) $(12' \times 4' \times 1' 4") = 62.4$ Cubic Feet

3) $(63 / 15) = 4.16$ Tons

4) $(4.16 / 100) \times 5 =$

.208 Tons of extra material
needed

$.208 + 4.16 = 4.368$ Tons of Stone

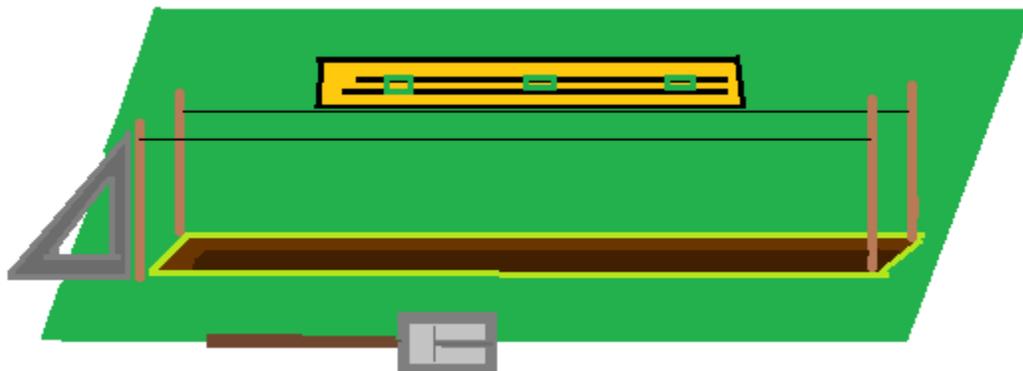


Groundwork:

LAYOUT:

With tools, equipment, and stone supply in order, the next step involves laying out and excavating an exact location for your dry stone wall. Equip masonry gloves and steel toe boots.

- 1) Nail two wooden stakes into the ground, parallel to each other and separated by the desired foundation width.
- 2) String a separate mason's line from each stake and walk the distance of the wall's length.
- 3) At this location, nail two additional wooden stakes into the ground, parallel to each other and separated by the desired foundation width.
- 4) Tightly string the ends of each mason's line to their respective partner stake.
- 5) Ensure the string sits level—off the ground by about a foot—using a speed square and a 3-foot level.
- 6) Dig the wall's foundation with a spade shovel to the required depth. Use the overall height to calculate this and the mason's line to guide the excavation.
- 7) Tamp the pitted bottom-soil with the hand tamper until the ground is level and solid along the entire span of the layout.



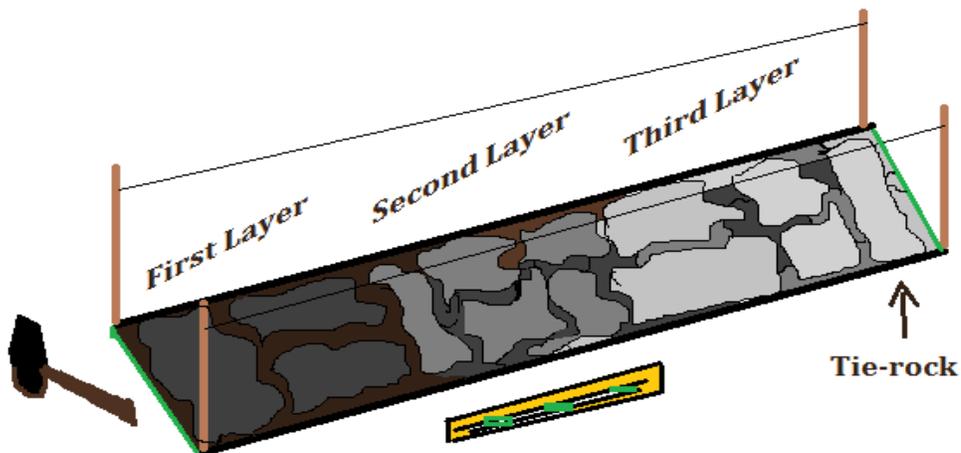
NOTE: Do not forget to account and measure for additional foundation width. Failure to do so will result in an inability to batter the wall.

Foundation:

LAY THE FOUNDATION:

Now that the trench for the foot of your wall runs level and the stake lines are in place, begin laying the foundation.

- 1) If the wall spans uneven landscape, start at the lowest elevation and work towards the highest point.
- 2) Select the largest rocks available and line the tamped soil in a layer of stone, firmly hammering each rock in place with a rubber mallet.
- 3) Level each stone with the 3-foot level. An unlevel foundation will cause an unlevel wall.
- 4) Anchor the wall every three or four feet by spanning its entire width with a large stone—a tie-rock. This will help lock the foundation in place and aid in stability.
- 5) Fill in any voids with loose rocks.
- 6) Repeat steps 1-5, until the foundation reaches ground level. Do not hammer additional courses.

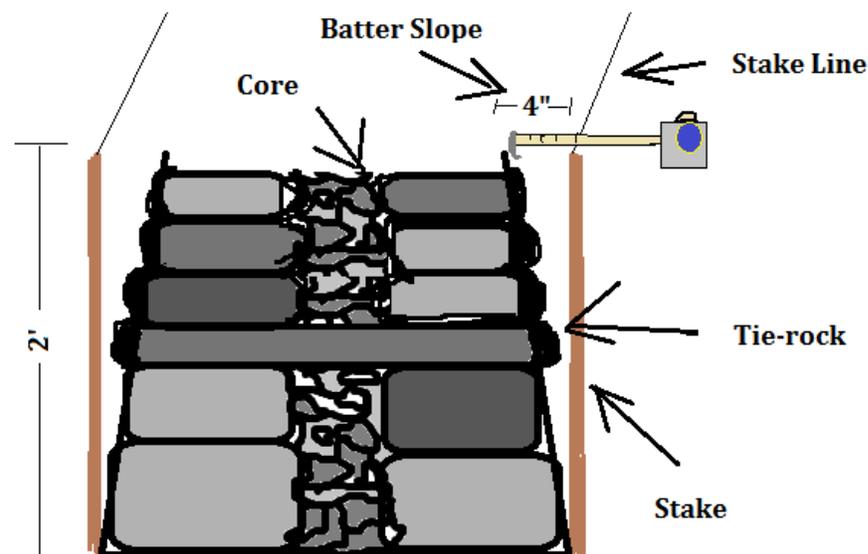


Coursing:

LAYER THE WALL:

With a solid foundation to layer your wall on, begin selecting stones that are more desirable and moderate in size for coursing.

- 1) Lay each stone in a manner that splices two joints below it. This creates an interlocking pattern that helps hold the wall together. If necessary, use the brick hammer and mason's chisel to shape stone to fit.
- 2) With the selection of moderately sized stones, lay two lines of rock parallel with one another along the length of the wall. Be sure to display the most desirable and straightest side outward.
- 3) Between the two lines of rock, fill the wall with core material gathered from loose stone and shale.
- 4) Level each line consistently to ensure stability.
- 5) Anchor the wall every three or four feet by spanning its entire width with a tie-rock.
- 6) Repeat steps 1-5 for each course, reducing the wall's width two inches for every foot in elevation to accommodate batter.
- 7) To assure a consistent batter and an accurate plumb, elevate the mason's line to the relevant wall height. Use a measuring tape to measure from the mason's line to the façade to calculate the batter.



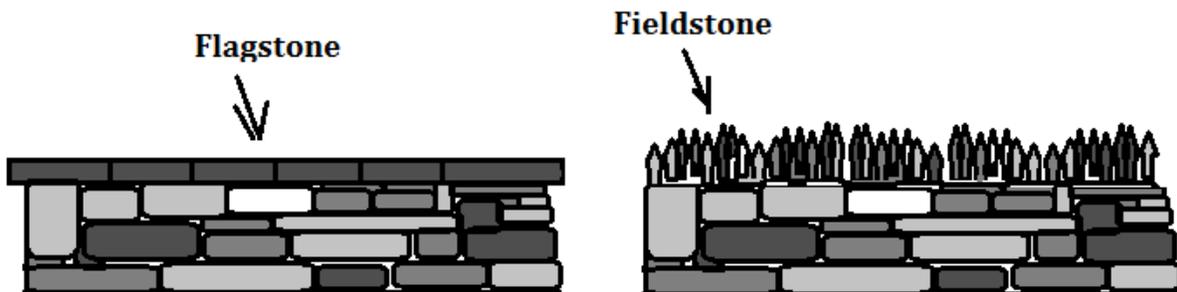
NOTE: Before beginning the following steps, equip safety glasses.

Coping:

CAP THE WALL:

When the wall stands at the desired height, prepare the top for coping. This final addition not only provides character; it protects your hard work from the elements and ensures that the weight of the wall transfers downward to the foundation with the batter.

- 1) Before capping, layer a final course with flat stones that span the entire width of the wall. This layer acts as a unified tie-rock that evenly distributes the weight of the wall coping.
- 2) Select desired stones to top your wall. Flagstones and fieldstones are practical wall coping. Experiment with each type and determine what looks best with the surrounding environment.
- 3) If flagstone seems appropriate due to its flat and smooth appearance, place each stone atop the wall snug with adjacent pieces. Allow an overhang of one inch on each side.
- 4) If fieldstone seems appropriate due to its rustic and rough appearance, place each stone atop the wall to stand snug with adjacent pieces in a perpendicular fashion. Allow minimal overhang on each side.



Glossary:

Batter- the slope of the face of a wall that recedes gradually backwards and upwards

Bottom-soil- soil found beneath the top soil of land, often differing in color and moisture

Coping- a finishing or protective course or cap to an exterior masonry wall or the like

Core- the inner chamber within a stone wall, often filled with rock, shale, dirt, or gravel

Coursing- to lay (bricks, stones, etc.) in courses

Façade- front or outer appearance

Flagstone- a flat stone slab used especially for paving

Shale- a rock of fissile or laminated structure formed by the consolidation of clay or argillaceous material

Stake line- wound string used to perform layouts and measurements

Tamp- to force or pack down firmly by repeated blows

Tie-rock- a rock within a stone wall that further anchors the structure's interlinking stones