

YOUR FREE READER'S COMPANION

The Retaining Wall Field Pack

A companion to The Retaining Wall Building Bible · by Wade Brunner

Thanks for picking up the book. This is the companion you fold into your back pocket on the day you stake the wall out, and the one you read before you ever order a pallet: the wall-type chooser that matches your height and your site to the right wall, the drainage detail behind seven out of ten wall failures, the base and batter numbers you'll reach for in the trench, the height table that tells you exactly when the job leaves your hands and goes to an engineer, and a material takeoff so you buy your first course once instead of making the second trip. Print it, fold it, keep it in the truck.

Walls almost never fail from too much weight on top. They fail from water trapped behind them with nowhere to go. A retaining wall is a drainage structure that happens to be made of block. Get the water out, get the base flat, lean it back into the hill — and the wall will outlive you.

1. The Wall-Type Chooser

There is no best retaining wall. There's the right wall for your height, your soil, your skill, and your eye. Match it off the table below and off the situation, not off a magazine photo. Every one of these walls — every single one — still needs the same three things: drainage stone and a pipe behind it, a compacted base below frost under it, and a backward batter built into it. The wall type is the part you see. The three killers don't care what you stacked.

Wall type	Cost / ft (2026, US avg)	DIY skill	Lifespan	Max practical DIY height	Look
SRW block (segmental)	\$25–45/ft	Moderate	40–75+ yrs	4 ft; taller w/ geogrid	Clean, manufactured
Poured concrete	\$50–90/ft	Pro / very high	75–100+ yrs	Not a DIY wall	Plain, can be faced
CMU block (mortared)	\$40–70/ft	High (masonry)	50–75 yrs	4 ft w/ skill	Plain, faceable
Timber / tie	\$15–30/ft	Low–moderate	15–20 yrs	3–4 ft	Rustic, warm
Boulder / stone	\$35–80/ft	High + machine	75–100+ yrs	Limited by rock size	Natural, premium
Gabion (wire baskets)	\$30–55/ft	Low–moderate	40–60 yrs	4–6 ft	Industrial, modern
Dry-stone (no mortar)	\$40–90/ft	Very high (art)	100+ yrs	3 ft	Classic, handcrafted

My straight answers by situation

- Low garden wall, under 3 ft, nice yard, you're the builder. SRW block. It's the easiest good-looking permanent wall a homeowner can build, and the setback is built into the unit so you can't forget to lean it back. This is the default and it's the right default.
- Rustic and cheap, don't mind rebuilding someday. Timber tie — eyes open that it's a 15-to-20-year wall against wet clay. Or a gabion if you like the modern look and want it to last longer with less skill.
- Three to four feet, holding a real slope. SRW block with geogrid (see section 4). The grid is what takes it from a garden wall to a structural one — and the number of layers follows the height: one layer every two to three courses, which puts a full four-foot wall at two layers, not one.
- Over four feet, or a driveway/pool/second wall loading the top. Stop. That's engineered territory — see the table in section 4. Don't freelance a tall wall.
- Natural and permanent, with machine access and stone nearby. Boulder gravity wall. Nothing looks better in twenty years.

The honest trade-off: block forgives the most and does the most jobs well, and it is the default for the great majority of homeowner walls. Timber saves money today and costs you a rebuild in two decades.

Boulder and dry-stone buy a lifetime of looks but want a machine or an artist. Pick the tool, not the picture.

2. The Drainage Detail Behind 7 Wall Failures Out of 10

If you read one page in this pack, read this one. Water kills more walls than bad block, soft base, missing geogrid, frost, and tree roots combined — and it's not close. A four-foot column of trapped water shoves on the back of your wall with roughly 500 pounds on every foot of length, down low where the wall has the least leverage. Stretch that across a 20-foot wall and you've got five tons leaning on the bottom every wet week. A drained wall never sees it, because the water runs out the bottom as fast as it comes in and never stacks up. Give the water a way out and it stops being a weapon.

A proper drainage system is five parts, built bottom to top. Skip one and you've weakened the whole chain.

#	Part	The detail that matters
1	Perforated drain pipe	4-in pipe at the base on the pad, holes facing DOWN toward the stone, laid on a fall of at least 1/8 in/ft (1/4 in/ft better) toward the outlet
2	Gravel chimney	Minimum 12 in of clean #57 stone (3/4-in, no fines) directly behind the block, full height — NOT the crusher-run you used for the pad
3	Filter-fabric burrito	Non-woven geotextile wrapping the back, bottom, and top of the stone so soil fines can't silt up the chimney — the cheapest insurance on the job, the most often skipped
4	Daylight or weep	Run the pipe out the low end above where the ground falls away (rodent guard on it), OR leave weep gaps in the bottom course every 6–8 ft so it dribbles out the face
5	Cap & grade	Fold the fabric over, put 4–6 in of clay cap on top, and slope the surface to shed water AWAY from the wall — cut a swale across the hill above if a slope drains toward it

Three drainage rules I'll never bend

1. Two different stones, two different jobs. Dense crusher-run (21A / road base) for the leveling pad because it packs hard. Clean #57 for the chimney because it stays open and drains. Mix them up and you've got either a pad that won't hold flat or a drain that won't drain.
2. Never, ever backfill with the clay you dug out. That excavated clay is exactly the wrong thing behind a wall — it holds water and pushes. The day you shovel it back in is the day you built a dam instead of a wall. Clay goes on top as the cap, or it gets hauled off.
3. The best drainage is the water that never gets there. Surface grading and a swale above the wall stop most of it before it can soak in. Belt and suspenders: move surface water on top, let the chimney handle whatever's left.

3. Base & Batter Quick Reference

The wall can only be as good as the pad it sits on. You can have the right block, perfect drainage, and the cleanest joints in the county — if the leveling pad is sloppy, you've built a wall that copies the slop. The base is the one thing you absolutely cannot fix later without tearing the wall apart. Slow down here.

Trench, pad, and the buried first course

Exposed wall height	Trench depth below low-side grade	Pad thickness (compacted)	Bury this much of the wall
Up to 2 ft	8–10 in	6 in	6 in (one course)
2–3 ft	10–12 in	6 in	6 in (one course)
3–4 ft	12–14 in	6–8 in	6 in min, more on soft soil
Over 4 ft	Per engineer	Per engineer (often 8+ in)	Per engineer

- Bury one course — rule of thumb: 1 inch of buried block for every foot of exposed height, 6-in minimum no matter how short. That buried toe is what stops the bottom from kicking out and gets the base below frost's reach.
- Trench width: at least twice the block depth plus a foot behind for drainage stone — for a standard 12-in block that's a trench around 2 ft wide, often more. Cramped trenches are how people end up with no room for stone and backfill clay by mistake.

Compact in lifts — never all at once

A plate compactor only densifies the top few inches. Below that, loose stone settles under your wall later. So a 6-in pad is two lifts, not one.

Tool	Max lift it'll truly compact	Passes per lift
Plate compactor (vibratory)	3–4 in	3–4 overlapping
Jumping jack / rammer	4–6 in	3–4 overlapping
Hand tamp (small jobs)	2 in	Until it stops moving

Spread a lift, wet it lightly if it's bone dry, run the plate in overlapping passes until the plate stops sinking and the engine note changes, then the next lift. Screed the final lift dead flat with a 2x4 across two rails, and check it with a long level (4-ft minimum, 6-ft better) along the run, across front-to-back, and on the diagonal — a short torpedo level will lie to you about a wall. On any run over 20 ft, shoot it with a laser.

Batter — let the block lean it back for you

SRW units have a built-in backward lean, a lip or pin that sets each course back from the one below — commonly about $\frac{1}{8}$ in per course, roughly a 1-inch setback per foot of height (varies by unit, check your block's spec). This lean is the wall's main defense: it uses the weight of the block and soil to resist the push

from behind instead of standing straight up to get shoved over. Seat each block so the lip or pin engages fully and the setback happens automatically. And stack in running bond — break every vertical joint so no seam runs straight up the wall. Front-to-back, the block must be level or pitched the smallest hair back into the hill, never tipped forward toward the yard.

4. When You Need an Engineer — and the Geogrid Numbers

Know the height where the job leaves your hands. Four feet is the most common trigger, and here's the part people measure wrong: it's measured from the bottom of the footing (the buried base course and pad) to the top of the wall, not from the ground you see. A wall that looks like 42 inches of exposed face can easily be 52–54 inches bottom-of-footing to top once you add the buried course and base. Measure it the code's way and call your building department before you order a single block — every time. The call to the county comes before the call to the block yard.

Situation	Common rule of thumb	Reality check
Exposed face under 4 ft, nothing loading the top	Often no permit	Still call — measure bottom-of-footing to top
Bottom-of-footing to top ≥ 4 ft	Permit + engineered design	The big one; most failures sit here
Any surcharge within $\sim 1 \times$ wall height behind	Permit + engineer at ANY height	Driveway, pool, parking pad, shed, stockpile, slope above
Tiered walls close together (upper within $\sim 2 \times$ lower's height)	Treated as one tall wall	Two 3-ft terraces can be an engineered 6-ft wall
Flood zone, easement, or right-of-way	Special review regardless of height	Utility/county can make you tear it out

An engineer's stamp runs roughly \$800–\$2,500 for a residential wall. It sizes the geogrid, base, drainage, and batter for your soil and your surcharge, it carries the liability, and practically speaking it's what gets your permit issued and your inspection passed. You can still swing the shovel yourself — you're paying for the brain and the liability, not a crew.

The geogrid rule of thumb (good soil, no surcharge, under ~6 ft)

Geogrid ties the block face to a deep wedge of soil so the wall and the dirt act as one heavy block. Past four feet, the block alone isn't the wall anymore — the dirt is, and grid is how you put the dirt to work. The one number that matters most: grid length back into the hill $\geq 0.6 \times$ total wall height, never less than 4 ft. Total height includes the buried course.

Total wall height	$0.6 \times H$	Grid length to use (min 4 ft)
4 ft	2.4 ft	4 ft
5 ft	3.0 ft	4 ft
6 ft	3.6 ft	4 ft
7 ft	4.2 ft	4.5 ft
8 ft	4.8 ft	5 ft

- Layer spacing: a layer every 2 to 3 courses (about 16–24 in of height), lowest layer near the base. Taller

walls and weaker soil want them closer (every 2 courses).

- Lay it taut, strong direction back. Pin the grid under the next course at the face, walk to the back, pull it tight and flat, stake it — slack grid doesn't grab until the wall has already moved.
- Compact OVER the grid, never drive on the block. Keep the heavy plate 3 ft off the face, hand-tamp close to it. A track machine sitting at the back of the face is a surcharge that'll push the wall out before you finish.
- The honest limit: these rules build a sound wall in the 4-to-6-ft range in decent ground. Over ~6 ft, or any surcharge, or soft wet clay — you build to a stamped drawing. That's the difference between a wall and a lawsuit.

5. Material Takeoff — One Starter SRW Course

Here's the wall most people actually want, costed so you can buy the first course without a second trip: a 3-ft (0.9 m) SRW segmental garden wall, ~20 ft (6 m) long, on stable ground, no geogrid needed at this height. Five courses of 8-in block make 40 in of wall; one course goes underground, so about 2 ft 8 in shows above grade, plus the cap. Figure the better part of a long weekend for two people. There is a little waste built into the counts, because you will break a few block, and you'd rather have one extra than drive back to the yard.

Wall math: ~20 ft long, 5 courses, bottom buried. Total height 40 in, about 32 in exposed. Standard SRW block ~12-in face — ~20 block per course — 100 block set, plus caps.

Item	Qty	Use
SRW block (~8 in H × 12 in face)	~105	100 set (5 × 20) + 5% for cuts
Cap units (~12 in)	~22	20 running feet, plus cuts and end returns
Flexible block adhesive (10 oz tubes)	4	Caps + top course
Base gravel — crushed ¾-in road base / 21A (cu yd)	~1	6-in pad × 2-ft trench
Drainage stone — clean #57 (cu yd)	~3	12-in chimney full height (58 cu ft) + block cores (17 cu ft)
Perforated drain pipe, 4 in (ft)	~20	Full length of the wall, holes down
Solid outlet pipe, 4 in (ft)	~10	Carries the drain out to daylight
Non-woven filter fabric (sq ft)	~120	Burrito-wrap the stone
Compactible / native backfill (cu yd)	~1	Behind the drainage zone

Ballpark cost (materials, 2026 dollars): roughly \$850–\$1,400, or about \$43 to \$69 a running foot, plus \$120–\$180 for a couple of days on a rented plate compactor. Step up to a 4-ft wall with two layers of geogrid (~150 block, ~200 sq ft of grid, deeper base) and you're at roughly \$1,250–\$2,075.

Build sequence for the starter wall

1. Call 811 and mark utilities; lay out the line with string and marking paint.
2. Excavate the base trench (~6-in pad + the buried course), over-excavate 12 in behind for drainage stone.
3. Build and compact the leveling pad dead flat, in lifts.
4. Set the buried base course — level front-to-back and side-to-side, sweep and check every block.
5. Set the drain pipe at the back of the base, holes down, pitched to daylight, wrapped per the filter-fabric burrito.
6. Stack courses 2–5 in running bond, engaging the setback so the wall leans back; backfill the #57 chimney and compact native fill behind as you go.
7. Finish ends and corners; glue the cap with a 1-in overhang.

8. Top off the drainage stone, fold the fabric over, cap with clay/topsoil, and grade surface water away.

6. The Printable Build & Drainage Checklist

Tape this to the tailgate. Work it top to bottom — every box is a step that has taken a wall apart when somebody skipped it.

Before you order a block

- ☐ Call the building department. Ask: do I need a permit at this height; what are my setbacks; any height or foundation limit? Measure your height bottom-of-footing to top — the 4-ft rule.
- ☐ Check for a surcharge. Driveway, pool, parking pad, shed, second wall, or a slope above within $\sim 1 \times$ the wall height = engineer at any height.
- ☐ Find your property line and easements off the survey pins and the plat — not the fence. The wall, footing, AND drainage gravel all live inside your setback.
- ☐ Get the engineer's stamp if you're over 4 ft, tiered, or carrying a surcharge — then build to the drawing.
- ☐ Call 811. Every time, even for a short wall.

Base

- ☐ Trench dug to depth, wide enough for the block plus a foot of drainage stone behind.
- ☐ Bottom firm — soft/organic spots dug out and replaced with compacted stone, not padded over.
- ☐ Crushed road base (not clean #57) for the pad, compacted in lifts of 3–4 in.
- ☐ Pad screeded dead flat, checked with a long level every direction; laser on runs over 20 ft.
- ☐ First course buried per the table, level front-to-back (or a hair back into the hill, never forward).

Drainage (the chapter that saves the wall)

- ☐ 4-in perforated pipe at the base, holes down, on a fall toward the outlet.
- ☐ 12+ in of clean #57 stone chimney behind the block, full height.
- ☐ Stone wrapped in non-woven filter fabric — burrito, top flap folded over.
- ☐ Pipe daylighted out the low end (rodent guard) or weep holes every 6–8 ft.
- ☐ Top of stone capped with clay/soil; surface graded to shed water away; swale cut above if needed.
- ☐ No excavated clay in the drainage zone — clean stone only.

Build

- ☐ Sweep every course clean before the next lands on it.
- ☐ Running bond — break every vertical joint, start courses with a half block to offset.
- ☐ Seat each block so the lip/pin engages and the setback/batter happens automatically.
- ☐ Geogrid (if used): right length ($0.6 \times H$, min 4 ft), every 2–3 courses, laid taut, compacted over the grid, never drive on the block.
- ☐ Caps glued with a 1-in overhang, cuts hidden.

Inspection

- [] Stamped plan on site if required.
 - [] Drainage and geogrid visible for the inspector before any soil covers them — don't bury what they need to see.
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That's the pack. The one habit worth more than any tool in the truck: get the water out and the base flat before you set a single block — everything above that is just stacking. Build the 3-ft garden wall first to learn the moves, then step up to the 4-ft reinforced wall when you're ready — both are drawn up complete with materials lists and step sequences in the back of the book. When you've stood up your first wall on a base that drains, I'd love to hear about it, and in a couple of emails I'll tell you how a quick word from you helps this book reach the next person standing at the bottom of a slope wondering where to start.

Drain it, base it, lean it back,

Wade Brunner