

Vacuum excavation has become the go to method for digging around utilities in Sacramento. If you are planning to expose gas lines, install new conduit, or cut trenches through a tight urban site, you have probably heard of hydrovac or air vacuum trucks. The big question is always the same: what will it cost to excavate a given area, for example 1,000 square feet?

I work with excavation pricing often enough to know there is no single number that fits every job. Soil conditions, access, depth, disposal, and safety requirements matter as much as the raw square footage. That said, you can build a realistic range if you understand how vacuum excavation works and how contractors think about production.

This guide walks through those moving parts, using Sacramento conditions and a 1,000 square foot example as the reference point.

What vacuum excavation actually is

At its core, vacuum excavation uses high pressure air or water plus a powerful vacuum to break up and remove soil. The loosened material is sucked into a debris tank on a truck for later disposal. Instead of a bucket or a backhoe tooth, you have a hose.

Two terms often get mixed:

- Hydro excavation, usually shortened to hydrovac, uses high pressure water to cut the soil, with the vacuum removing the slurry.
- Air vacuum excavation uses compressed air to loosen the soil, which is then vacuumed up dry.

People often ask what is the difference between hydro excavation and vacuum excavation. Technically, both are vacuum excavation. Hydrovac is water based vacuum excavation, and air vacuum excavation is air based vacuum excavation. In practice, contractors in Sacramento say "vac truck" or "hydrovac" when they mean water based, and "air vac" when they mean dry.

Hydrovac typically cuts faster in our hardpan and clay, but it generates slurry that must be disposed of properly. Air vac is slower in dense soils, but you get dry spoils that are easier to reuse or stockpile and it avoids saturating an area that needs to stay dry.

Vacuum excavation is popular because it is non destructive around buried utilities. When someone asks how deep can you vacuum excavation or how deep can vacuum excavation go, the honest answer is that the limit is usually hose length, spoil capacity, safety, and economics, not the technology. Depths of 15 to 20 feet are common, and 30 feet or more is possible with the right setup. For utility locating, most work is in the 3 to 10 foot range.

Typical Sacramento conditions that affect cost

Prices in a vacuum vary about as much as soil types. Sacramento brings a few specific factors to the table that affect how much vacuum excavation costs:

Clay and hardpan. Much of the region has stiff clay and compacted layers. Hydrovac performs well here, but production can still slow once you hit harder zones or cobbles. Air vac often needs more time in the same conditions.

Existing utilities everywhere. Older neighborhoods and busy corridors have crowded subsurface environments. You may see power, gas, telecom, and water stacked vertically. That calls for careful, slower digging.

Water table and weather. In low lying parts of the Valley, wet seasons and high groundwater influence how messy hydrovac spoils get, and whether you can reuse them at all. That feeds directly into disposal costs.

Local labor and equipment markets. By 2024, typical hydrovac truck rates in the Sacramento region often range roughly from 250 to 450 dollars per hour for truck plus operator, depending on the contractor, scope, and safety requirements. Air vac may be at the lower end of that range, but not always, because some specialty operators command a premium.

When people ask how much is a vacuum excavation truck or how much is a vac ex to buy, they are often surprised: a new hydrovac truck can run 450,000 to over 700,000 dollars. That heavy capital cost is a big part of why day rates feel high.

How vacuum excavation is priced

You will hear a few different pricing methods when you start calling around. The structure is usually some blend of:

1. Hourly rate for truck and crew, often with minimum hours.
2. Daily rate with a cap on hours and production expectations.
3. Unit rates, such as per cubic yard, per linear foot of trench, or per pothole.

Support items add to the total:

- Mobilization and demobilization, sometimes a flat fee inside a certain radius, higher if the truck comes from outside the metro area.
- Disposal fees, higher for wet hydrovac spoils and restricted materials.
- Traffic control or lane closures, especially downtown or near arterials.
- Standby charges if the crew is held up waiting on other trades or utility markouts.

So when you ask how much does vacuum excavation cost or what does excavation cost per hour, you are really buying a package: truck, crew, fuel, compliance, insurance, and risk. In Sacramento, I often see total all in rates between 280 and 500 dollars per hour once you include fees and overhead, even if the base "truck" rate is a bit lower.

Turning 1,000 square feet into something you can price

Square footage by itself does not pay a bill. Volume is what matters, because excavation effort tracks how many cubic yards you are moving, not just how wide the surface cut is.

It helps to walk through the math slowly, because this is where a lot of bids go sideways.

From square feet to cubic yards

Say you want to excavate 1,000 square feet in plan view. That might be a slab removal area, a pad for a small building, or several utility trenches that add up to that footprint.

Depth is the first big question. For vacuum excavation in Sacramento you might see a few common scenarios:

Shallow stripping to 1 or 2 feet, for daylighting utilities or removing contaminated topsoil.

Service trenches at 3 to 4 feet.

Deeper utility work, sometimes 6 to 8 feet, particularly for sewer.

Let us run a few examples.

Volume (in cubic feet) equals area in [Sacramento Vacuum Excavation](#) square feet multiplied by depth in feet.

Then, to convert to cubic yards, you divide by 27. People often ask why do you divide by 27 for cubic yards. One cubic yard is 3 feet by 3 feet by 3 feet, so you multiply 3 times 3 times 3, which is 27 cubic feet per cubic yard.

So for 1,000 square feet:

At 2 feet deep:

$1,000 \text{ sq ft} \times 2 \text{ ft} = 2,000 \text{ cubic feet}$. $2,000 \div 27 \approx 74 \text{ cubic yards}$.

At 4 feet deep:

$1,000 \times 4 = 4,000 \text{ cubic feet}$. $4,000 \div 27 \approx 148 \text{ cubic yards}$.

At 6 feet deep:

$1,000 \times 6 = 6,000 \text{ cubic feet}$. $6,000 \div 27 \approx 222 \text{ cubic yards}$.

Someone might also phrase this as how much to excavate 200 cubic yards. That is essentially your 1,000 square feet at about 6 feet deep.

Because soil swells when excavated, the loose volume in the debris tank will be somewhat more than the in place volume, but hydrovac contractors already account for that in their production numbers.

How much can a vac ex excavate in a day?

The next piece is production rate: how much can a vac ex excavate in a day, and how much does an excavator excavate in one hour in similar conditions.

For hydrovac in Sacramento clay, I tend to use rough bands rather than a single number:

Tight utility potholing, with lots of hand probing and verification, may only yield 5 to 10 cubic yards per day.

Moderate trenching or daylighting, good access and not too many obstructions, may yield 15 to 25 cubic yards per day.

Open, well planned work in softer soils can reach 30 or even 40 cubic yards per day, but that is less common inside built up areas.

On a per hour basis, that is something like 2 to 5 cubic yards per hour under realistic conditions. A large conventional excavator, if it had room and no utility conflicts, might move several times that volume in open cut, which is why vacuum excavation is usually reserved for sensitive zones rather than mass grading.

This is why excavating 10 acres of land by vacuum truck would be wildly uneconomical; hydrovac is for precision, not for bulk earthwork.

For a sense of trench speed, many crews figure that hydrovac digging a narrow utility trench in typical conditions might advance 20 to 60 feet per hour at depths around 3 to 4 feet. That means how long does it take to dig a 100 ft trench might be anywhere from a couple of hours of productive digging to most of a day, depending on obstacles and how clean the trench needs to be.

Estimating cost for 1,000 square feet in Sacramento

Let us put numbers to a realistic scenario. Assume the following for a Sacramento project:

Access for the truck is fair but not perfect. The hose run is 50 to 100 feet.

Soil is clayey but not rock. Utilities are present, but locating is complete.

You need a 1,000 square foot area excavated to an average depth of 4 feet, which is about 148 cubic yards.

Hydrovac truck plus operator and swamper runs about 325 dollars per hour, with an 8 hour minimum, and disposal is an additional 500 to 900 dollars per full debris tank, depending on the dump site.

Production: a realistic target might be 18 to 22 cubic yards per day of actual excavation, net of setup, moves, and cleanup, for work around existing utilities.

Under these assumptions:

$148 \text{ cubic yards} \div 20 \text{ cubic yards per day} \approx 7.5 \text{ working days.}$

At 8 hours per day, that is about 60 hours of truck time.

$60 \text{ hours} \times 325 \text{ dollars per hour} \approx 19,500 \text{ dollars.}$

Add mobilization, traffic control if needed, disposal of slurry from several truckloads, and supervision, and a total project cost in the 22,000 to 30,000 dollar range would not be surprising.

That seems high compared to a simple "cost of 1,000 sq ft" question, but remember you are not paying for just area. You are paying for safe excavation in a congested subsurface environment using specialized equipment.

If the depth were only 2 feet, the volume drops to about 74 cubic yards. At the same production rate, you might be in the 4 day range, and the total could land closer to 12,000 to 18,000 dollars. Strong access and fewer utility conflicts could improve production and reduce cost.

Safety rules that influence production and price

Vacuum excavation is often used to manage safety risks around utilities, but excavation safety rules still apply. OSHA views a hydrovac trench much like a backhoe trench in terms of collapse hazard.

Contractors think about several safety rules that the public sometimes hears about in pieces:

What is the 4 foot rule in excavation? Once a trench hits 4 feet deep, OSHA requires a safe way in and out, such as a ladder, and evaluation for potential hazardous atmospheres.

How deep can you dig without shoring? For most soil conditions, 5 feet is the trigger depth where protective systems such as shoring, sloping, or shielding are required, unless the excavation is in stable rock. So how deep can you excavate without shoring is usually up to 5 feet, with exceptions for cave in hazards.

You may also see references to a 19 inch rule. In excavation context, this often relates to ladder rungs and access: ladder rungs should be evenly spaced, usually not more than about 12 inches apart, and ladders used to access trenches must extend adequately above the landing, often 3 feet or more. In some safety manuals, 19 inches is the maximum distance a worker should have to step from a ladder to the work surface.

The 35 foot rule can arise in fall protection: for some tasks, workers above certain heights require fall protection, and ladder safety rules specify climb distances before rest platforms. While the exact phrasing of a 35 foot rule varies by standard, contractors will default to conservative ladder and access planning in deep excavations.

Then you hear phrases like the 5 4 3 2 1 rule for excavation or the 3 4 5 rule for excavation. These are shorthand teaching tools some safety trainers use to remember key depths and clearances. For example, 5 feet equals shoring, 4 feet equals ladder access and atmosphere testing, 3 feet above landing for ladder extension, and so on. Different companies use different mnemonics, but the goal is the same: keep crews from guessing in the field.

When someone asks what are the 5 OSHA requirements related to excavation, professionals think of things like:

1. Protective systems for trenches 5 feet and deeper, unless in stable rock.
2. Safe access and egress at 4 feet deep and greater.
3. Daily inspections by a competent person.
4. Keeping spoil piles and loads a safe distance, often at least 2 feet, from the edge.
5. Protection from water accumulation and atmospheric hazards.

OSHA's 3 most cited violation categories overall, not just in excavation, are often fall protection, hazard communication, and ladders or scaffolding. Excavation violations also show up often, particularly related to missing shoring and poor access.

All of this affects production and cost. A trench that stays under 4 feet deep may go faster because you avoid ladders, testing, and shoring. Once you pass 5 feet, expect more setup and inspection time. If a contractor talks about the 5 4 3 2 1 rule for excavation or rule 1413 for excavation in their corporate manual, what they are really doing is pricing time for safe work into your job.

Training, certifications, and who can run the equipment

Homeowners sometimes ask if it is illegal to dig a hole in your backyard. The digging itself is not illegal, but you must call 811 before you dig, follow local ordinances, and avoid damaging utilities. The moment you move from a shovel to mechanized equipment, more rules and liability show up.

For vacuum excavation trucks, two questions pop up often:

Is a CDL required for hydrovac jobs? Yes, almost always. Hydrovac trucks are heavy commercial vehicles. Drivers typically need a commercial driver's license, often a Class A or B CDL, depending on tank size and configuration.

Do you need a tanker endorsement for a hydrovac truck? Many hydrovac trucks qualify as tank vehicles because they carry liquid or slurry in large tanks, so a tanker endorsement is commonly required. Here is where the 7 3 rule in trucking and similar hours of service rules matter. Federal and state regulations limit how many hours a CDL driver can be on duty and driving, which caps how long that hydrovac can legally operate on your site in a given day.

What kind of training is required for vacuum excavation? Beyond the CDL, operators and laborers need:

Competent person excavation training under OSHA.

Confined space awareness in some cases.

Utility locating and damage prevention training.

Equipment specific training for the vacuum system, pressure systems, and lockout procedures.

For traditional excavators, people ask what certifications do you need to run an excavator. Many employers want operator cards from recognized training programs and proof of competence, even if the law does not mandate a specific piece of paper for every machine. In union environments, there are clear classifications and training paths.

These labor and training requirements push wage rates up. On the higher end of the market, what is the highest salary for an excavator operator or hydrovac operator can reach six figures annually in some regions, especially with overtime and specialty work. That cost builds into your hourly excavation rate.

Some prospective workers wonder is 50 too old to become a heavy equipment operator. Many operators start later in life and do quite well, provided they can handle the physical and safety demands and commit to training. The industry is often more interested in reliability and attention to detail than age.

Using vacuum versus conventional excavation

Vacuum excavation is not the only option. There are three types of excavators people commonly talk about in the field: standard crawler excavators, wheeled excavators, and mini excavators. You also see backhoes and skid steers. The most used excavator size on many civil jobs is in the 20 ton class, such as a Cat 320, which is indeed roughly a 20 ton excavator.

People sometimes ask what is stronger than a bulldozer. In terms of raw digging and breakout force for a trench, a large excavator beats a dozer every time. Dozers excel at pushing and grading, not deep digging.

For your 1,000 square feet project, a contractor might choose vacuum excavation in sensitive utility zones and then bring in a mini excavator or mid size excavator to bulk out the rest, if access allows. This hybrid approach can drop your average cost, because traditional excavation on open sections is cheaper per cubic yard.

Trying to improvise with homeowner tools usually backfires. Can I dig a trench with a pressure washer is a question that comes up occasionally. The short answer is that using a pressure washer as a makeshift hydrovac wand is unsafe, inefficient, and unlikely to meet any professional standard. You do not have the debris handling, pressure control, or safety systems of a real hydrovac truck.

Another common curiosity is whether it is better to dig a hole when the ground is wet or dry. For hydrovac, slightly moist soil can cut faster, but saturated ground can collapse easily and generate soupy slurry that is hard to handle. For conventional excavation, too dry can mean hard digging and dust, too wet can cause stability problems. Contractors in Sacramento schedule around storms for a reason.

How to price out excavating jobs more reliably

For owners and general contractors, the key is to write scopes that match how excavation contractors estimate. Vacuum crews do not love vague one liners like "hydrovac as needed." They want volume, depth, soil type, utility density, and access details.

A sane way to price out excavating jobs with vacuum excavation in mind goes roughly like this:

1. Define the geometry: area in square feet, target depth, and any overdig or benching needed for safety.
2. Convert to cubic yards and categorize the work: potholing, trenching, or bulk removal.
3. Classify soil and risk: expected material, groundwater, and utility congestion.
4. Choose the right method or combination: pure vacuum, vacuum around utilities plus mechanical elsewhere.
5. Apply local production rates and hourly costs, then add realistic allowances for mobilization, traffic, and disposal.

If you go to bid with those five elements clearly spelled out, your proposals come back much tighter. You also avoid the trap of comparing a vacuum excavation number apples to a conventional excavator number that quietly assumes wide open space and no utilities.

A quick note on unrelated "vacuum" and "labor" questions

Because search engines mix topics, some people land on excavation pages while looking for very different questions, like is vacuum delivery painful or how risky is vacuum delivery during childbirth, or what is the 5 3 1 rule for labor, or even what is the rarest hour to be born. Those are medical and demographic topics, not construction, and you should seek professional medical sources for them. The only connection is the shared word "vacuum."

Keeping that distinction clear matters, because safety and training standards in excavation are tailored for soil and machinery, not human medicine.

Pulling it all together for Sacramento

So what is the cost of 1,000 sq ft of vacuum excavation in Sacramento? The honest answer is a range, but we can frame it:

Shallow utility locating at 1 to 2 feet might land in the low to mid five figures, particularly if work is scattered and access is tight.

Moderate depth work around 4 feet, with real utility congestion, often sits somewhere around 15,000 to 30,000 dollars depending on production and disposal.

Deep or complex work, closer to 6 feet and beyond, can push well above that, especially [Sacramento Vacuum Excavation](#) once shoring, traffic control, and extra safety measures kick in.

These numbers feel very different from what it might cost to remove 1,000 square feet of topsoil with a skid steer on a clean rural lot. That is the point. Vacuum excavation is a specialist tool. You purchase precision, reduced utility strike risk, and regulatory compliance, not just moved dirt.

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If you treat your 1,000 square feet as a simple unit without thinking about depth, soil, utilities, and safety, your budget will almost certainly be wrong. If you translate it into cubic yards, align it with realistic local production, and respect the safety rules that govern depth and access, your estimates start to match what experienced Sacramento contractors actually bid.