

If you operate heavy equipment in Sacramento, you live with two realities every day: the ground is full of utilities, and California regulators are paying attention. Whether you are thinking about a career as an excavator operator or planning to run a vacuum excavation (Vac-Ex or hydrovac) crew, you need the right mix of certifications, training, and common sense to stay legal and keep people safe.

I will focus on Sacramento and California practice, but the basic principles apply across most of the United States. Regulations change, so always verify details with Cal/OSHA, the California DMV, and your local building or public works department before you stake a project on anything you read online.

## **Excavators, Vac-Ex, and what we are really talking about**

An excavator in this context is a conventional piece of heavy equipment: tracked or wheeled, with a boom, stick, and bucket. Typical examples in Sacramento civil work are 20-ton class machines like a Cat 320. Those are common on subdivision pads, sewer mains, water lines, and general earthwork. Among the three types of excavators you see most often in town are standard crawlers, compact or mini excavators, and wheeled excavators for street work. You will also see long-reach units on levee projects, but they are less common.

Vacuum excavation is a different animal. When people ask what is vacuum excavation, they usually mean one of two things:

- Air vacuum excavation, sometimes just called vacuum excavation: you cut or loosen the soil with high pressure air, then suck it into a debris tank with a powerful vacuum.
- Hydro excavation (hydrovac): same vacuum concept, but you use high pressure water to cut the soil instead of air.

Both are considered soft-dig or non-destructive methods around utilities. Sac County, SMUD, PG&E, the City of Sacramento, and telecom owners all like vacuum excavation for potholing and daylighting. You are much less likely to take out a fiber line or gas main with a hydrovac wand than with a steel tooth on a mini.

When you search around, you will see people ask what is the difference between hydro excavation and vacuum excavation. In casual construction talk, many operators use “vac-ex” to mean both. Strictly speaking, hydro excavation uses water, air vacuum excavation uses air, but the regulations and certifications are very similar. What matters more for licensing is the truck and how you move it than whether you use air or water.

(If you have fallen into search rabbit holes about “Is vacuum delivery painful” or “How risky is vacuum delivery”, that is a different kind of vacuum entirely, relating to childbirth. Likewise, “What is the rarest hour to be born” or the “5 3 1 rule for labor” have nothing to do with excavation. The term “vacuum” confuses search engines as much as people.)

## **Who regulates excavation work in Sacramento**

Four sets of rules matter when you look at what certifications you need to run an excavator or Vac-Ex in Sacramento:

Cal/OSHA and Federal OSHA: Worker safety, excavation rules, trench safety, training, and the requirement that operators be competent. Cal/OSHA generally adopts and enforces standards that match or exceed federal OSHA.

California DMV and DOT: Commercial driver licensing for the trucks that haul your equipment and the hydrovac units. This is where CDL and tanker endorsements come into play.

Contractor licensing: The California Contractors State License Board (CSLB) handles the C-12 Earthwork and Paving, C-34 Pipeline, and other licenses your company needs to legally contract for excavation work. That is a company or qualifying individual license, not an operator badge, but it still matters for your career path.

Local jurisdictions: The City of Sacramento, County of Sacramento, and nearby cities specify right-of-way permits, traffic controls, and, in some cases, how you expose or cross utilities. For example, some agencies require vacuum excavation for certain depths or when crossing critical lines.

None of these bodies issues a card that simply says "Certified Excavator Operator, State of California." Instead, the system works on a combination of employer-provided training, formal safety courses, and driving credentials.

## Core credentials at a glance

If you want to run an excavator or Vac-Ex in Sacramento in a professional setting, these are the core pieces you should expect to hold:

1. Company equipment operator qualification or card specific to each machine type.
2. OSHA or Cal/OSHA excavation and trench safety training, with a competent person course if you run crews.
3. For Vac-Ex trucks on the road, a Class B or Class A CDL, often with an air brake endorsement, and sometimes a tanker endorsement depending on the hydrovac configuration and your carrier's policy.
4. General OSHA safety training, typically OSHA-10 or OSHA-30 construction.
5. For long term career growth, a formal apprenticeship, NCCER or similar craft certification, and documented hours operating different classes of equipment.

Everything else plugs into one of those buckets.

## Excavator operation certifications in Sacramento

The basic legal answer to what certifications do you need to run an excavator in Sacramento is surprisingly simple: OSHA and Cal/OSHA require that you be trained and competent for the equipment you operate, and that your employer can prove it. They do not name a specific brand of card.

In practice, most reputable contractors structure this in a few layers.

### Employer operator qualification

Every serious outfit I have worked with issues its own operator qualification or "card" for each class of equipment: mini excavator, 20-ton, 35-ton, and so on. You are not handed the keys to a 320 because you ran a skid steer for a month.

Typically, you:

Spend time as a laborer or oiler around the machine, learning spotting, hand signals, rigging, and trench safety.

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Complete documented equipment-specific training. That can be in-house or through a third party, but it must cover controls, safe operation, load charts when applicable, and maintenance checks.



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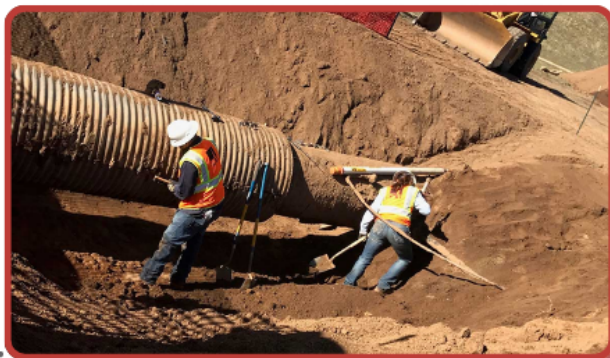
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Log supervised seat time under a foreman or lead operator. Employers often keep daily or weekly evaluation sheets during this period.

Demonstrate competence: clean trench bottom to grade, efficient benching, safe loading of trucks, no utility strikes.

Cal/OSHA inspectors will ask for training documentation if there is an incident, so companies that care about staying in business keep that paperwork tight.

### Excavation and trench safety training

Trench work is where operators really get into regulatory territory. Federal OSHA has specific rules under 29 CFR 1926 Subpart P, and Cal/OSHA has corresponding standards. A few concepts you will hear often in Sacramento:

The 4 foot rule in excavation: once a trench is 4 feet deep, OSHA requires safe means of egress such as ladders or ramps. Ladders must be within 25 feet of lateral travel for workers. People sometimes mix this up with the 19 inch rule.

The 19 inch rule: in OSHA terminology, a break in elevation of 19 inches or more requires a [Sacramento Vacuum Excavation](#) ladder or steps. You see this more in general access questions, but it sometimes pops up in trench entry issues.

How deep can you dig without shoring: the technical answer is that in stable rock you might not need a protective system at all, and in some soil types you can slope instead of shore. Practically, in Sacramento clays and fills, once you are past 5 feet, you should expect inspectors, owners, and safety managers to demand either a shield, shoring, or engineered sloping. Many companies treat 4 feet as their internal trigger.

You may hear field mnemonics like the 5 4 3 2 1 rule for excavation or the 3/4/5 rule for excavation. Different contractors use those shorthand phrases for slightly different safety yardsticks, but they usually tie back to five basic OSHA requirements around excavations: protective systems, access and egress, daily inspections by a competent person, spoil pile setback, and atmospheric testing in some cases.

Speaking of OSHA, people often ask what is OSHA's 3 most cited violation. The exact ranking changes year to year, but fall protection, hazard communication, and scaffolding violations frequently top the list. On excavation jobs, inspectors commonly focus on access/egress, protective systems, and spoil pile distance.

Most Sacramento contractors either send foremen and lead operators to a one or two day excavation competent person class or hire someone who already has that certificate. The competent person is the one on site who can classify soil, approve protective systems, and stop work when conditions change.

## **Optional national certifications**

For cranes and some specialized equipment, OSHA requires third party certification. For straight excavators that do not pick or swing suspended loads beyond certain thresholds, those rules usually do not apply.

That said, operators who invest in programs like NCCER Heavy Equipment Operator, IUOE apprenticeship programs, or community college certificates in heavy equipment technology tend to move up faster. If you ever want to work on larger infrastructure or industrial projects, or chase the highest salary for an excavator operator, having a paper trail beyond company training helps. In Northern California, good excavator operators with years of experience can see total compensation in the low six figures on prevailing wage work, especially with night and overtime premiums.

## **Age and career changes**

A question that comes up more often than you might expect is whether 50 is too old to become a heavy equipment operator. It is not, provided you can pass the physical demands of the job, handle early mornings, and are willing to start as a laborer or spotter. I have watched former truck drivers and tradespeople in their 40s and 50s slide into operator roles successfully because they bring discipline and situational awareness that younger workers sometimes lack.

## **Driving and Vac-Ex: CDL and endorsements**

When you move from a tracked excavator to a vac-ex or hydrovac unit, a new set of credentials steps in. The truck itself is subject to California vehicle laws and federal motor carrier rules, even if all your work is local around Sacramento.

### **Is a CDL required for hydrovac jobs?**

In almost every practical scenario, yes. Hydrovac units and larger air vacuum trucks typically fall well above the 26,001 pound GVWR threshold that triggers CDL requirements. Most Sacramento area hydrovac drivers hold a Class B CDL at minimum, often a Class A if they also pull lowboys or larger trailers.

You will almost always need an air brake endorsement, since these trucks very rarely use hydraulic brakes.

Whether you need a tanker endorsement for a hydrovac truck is a more nuanced question. Federal rules for the tanker endorsement look at whether you are hauling liquids or gases in individual tanks of 119 gallons or more, with a combined capacity of 1,000 gallons or more. Many hydrovac units carry fresh water and slurry in separate tanks that easily exceed that. Some companies operate under the guidance that the material is "intermediate

processing” and not cargo in the traditional sense, but many insurers and safety departments insist on the tanker endorsement to be safe. If you are job hunting, assume you will eventually be asked for it.

You may see drivers talk about the 7 3 rule in trucking, which relates to hours of service and sleeper berth splits in long haul situations. Most hydrovac work in Sacramento is local, daylight, and falls under different rules or exemptions, but once you operate commercial vehicles, you live in the same regulatory universe as long haulers. Know the basics, even if you only run across town.

## Training specific to vacuum excavation

What kind of training is required for vacuum excavation beyond the CDL piece depends largely on the employer and the type of work.

You need standard OSHA construction safety training, often OSHA-10 at a minimum.

You need excavation and trench safety training, because you often work alongside other excavation methods and you are still entering and working near excavations.

You need task specific training: high pressure water handling, hose management, lockout for utilities where applicable, hearing protection, confined space recognition, and slurry handling.

The limitations of vacuum excavation also feature in good training. Hydrovacs cut beautifully in most Sacramento clays and fills, but extremely rocky soil slows production dramatically. Very deep work hits practical limits related to boom reach and vacuum lift. People often ask how deep can you vacuum excavation or how deep can vacuum excavation go. In real conditions, hydrovacs commonly daylight utilities down to 15 to 20 feet, but production falls as you go deeper and as spoil handling becomes more complex. Beyond that, you are usually looking at staged shoring, bigger cranes, and serious engineering.

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Vacuum excavation is not magic. High plasticity clays, cobbles, and tight access can make it much slower than a compact excavator. Strong operators know when to combine methods instead of forcing vac ex to do a job it is poorly suited for.

## **Comparing hydro and air vacuum excavation**

Contractors argue endlessly over whether hydrovac or air vac is better. It depends on soil, environmental rules, and the sensitivity of the utilities. In much of Sacramento's mixed fill, hydrovacs dominate. A quick comparison:

1. Hydro excavation cuts faster in most clays and compacted soils. Air excels in dry, loose, or sandy ground.
2. Hydro generates slurry that is heavier and may require specific dump sites or solidification. Air vac leaves dry spoil that can sometimes be reused for backfill.
3. Around sensitive electrical or gas facilities, some owners prefer air to avoid water contact. Others specify hydrovac because of local experience.
4. Hydro trucks often demand more water logistics. In dry months, simply staging water can shape your production rate.
5. Air rigs can be noisier and dustier. Hydrovacs add water hazards and freeze risk on cold mornings in the foothills, less so in the Sacramento valley itself.

## **Safety rules that operators actually feel**

Beyond the formal excavation depth rules, a handful of safety ideas shape an operator's day whether you are running steel or vacuum.

You will hear people talk about how deep you can excavate without shoring, but the operator's practical translation is simpler: if I would not send my own family into that hole, I do not let the crew in either. Many companies enforce internal standards that go beyond Cal/OSHA. Spoil piles must be kept back a specified distance from the edge, trenches must be benched or boxed once they reach a certain depth, and a competent person must inspect excavations daily and after weather changes.

Some owners and safety managers reference things like the 35 foot rule in specific contexts, usually related to fall protection or reach limits near power lines. The exact numbers come from OSHA or utility company tables. As an operator, you do not have to memorize every subsection, but you do need the habit of stopping when you are close to a limit and calling your safety lead.

Rule 1413 for excavation is one of those references you may hear in safety meetings. In California, excavation protections are detailed in Title 8 of the California Code of Regulations, particularly sections around 1541.3 for sloping and benching. The details evolve. Your responsibility is to know where to find the current rules and to listen to your competent person when they tighten standards after a near miss.

## **Productivity, pricing, and reality checks**

Certifications keep you legal. Production keeps you employed. Operators and small contractors constantly juggle questions like how much does vacuum excavation cost, how much to excavate 200 cubic yards, or how long does it take to dig a 100 ft trench. The honest answer is always "it depends," but experience lets you bracket the possibilities.

Vacuum excavation cost in Sacramento is often billed hourly. A hydrovac with crew might run anywhere from 350 to 500 dollars per hour, sometimes more for specialized work, night shifts, or short-duration callouts. People

search both how much does it cost for a vac excavation and how much does vacuum excavation cost, but the spread is huge because the mix of soil, traffic control, dump fees, and water access matters.

How much can a vac ex excavate in a day varies even more. In easy conditions, shallow potholing in clean fill with short dumps, you might see 10 to 20 cubic yards pulled in a day. In tight alleys, sticky clays, or deep exposures around congested utilities, getting 5 yards may be a fight. Those are the limitations of vacuum excavation that you learn to respect early.

On the excavator side, questions like how much does an excavator excavate in one hour or what does excavation cost per hour require the same caution. A mid-size excavator in open cut, loading trucks with no interference, can chew through well over 100 cubic yards per hour. Put the same machine in a backyard with limited swing, tree roots, and hand dig zones around utilities, and you might be closer to 10 or 20 yards per hour.

When someone asks how much to excavate 200 cubic yards, you need to parse the scope. Is it a clean, accessible pad in Elk Grove with sandy soil and nearby spoil? Or a deep, shored trench in downtown Sacramento with traffic control and night work? Roughly, a straightforward 200 yard mass excavation job might run a few thousand dollars in machine time and labor. A 200 yard deep utility trench with shoring, trucking, and restoration can easily climb into the tens of thousands.

For bigger numbers, like how much would it cost to excavate 10 acres of land or what is the cost of 1000 sq ft of cut and fill, the only honest approach is to break the problem into quantities. That is where the "divide by 27 for cubic yards" rule comes in. There are 27 cubic feet in a cubic yard. If you strip 1 foot of soil from 10 acres, you compute the volume in cubic feet, then divide by 27 to convert to yards, then apply your unit price per yard for excavation, hauling, and disposal. Without those intermediate steps, any "per acre" number is just a guess.

Vacuum excavation equipment is a serious capital investment. People often ask how much is a vac ex to buy or how much is a vacuum excavation truck. New hydrovac trucks can easily range from 400,000 to 600,000 dollars or more, depending on size and options. Used units can be half that, but come with maintenance questions. That is exactly why hourly rates look high at first glance. You are not just paying the driver. You are covering equipment payments, insurance, fuel, disposal, and a stack of permits and compliance costs.

Questions like can I dig a trench with a pressure washer or is it better to dig a hole when the ground is wet or dry speak to the temptation to improvise. Yes, people have stripped small trenches with pressure washers in very loose soils, but you give up control and safety compared to real vacuum excavation systems. As for soil moisture, slightly damp ground often digs more cleanly, but saturated soil invites cave-ins. Operators learn to read the ground and err on the side of safety.

If you are bidding your own work, learning how to price out excavating jobs is almost its own trade. You balance machine production rates, crew costs, mobilization, permits, traffic control, restoration, and risk. Two jobs that both involve "100 feet of trench" can have completely different true costs. That is why savvy owners ask not just how long does it take to dig a 100 ft trench, but also at what depth, in what soil, with what restoration.

## **Getting trained in the Sacramento region**

If you are new to the field and based around Sacramento, you have several realistic paths into excavator or Vac-Ex work.

Union apprenticeship: The International Union of Operating Engineers (IUOE) runs structured apprenticeship programs that combine classroom training with paid on-the-job learning. Entry is competitive, but the training is strong and wages are good once you are in.

Community college and trade schools: Some regional colleges offer heavy equipment technology or operator programs. They give you basic seat time, safety training, and [Sacramento Vacuum Excavation](#) maintenance skills. Employers like seeing candidates who have already shown enough commitment to complete a program.

On the job as a laborer: Many local contractors still promote from within. You start with a shovel and a grade rod. If you show up on time, work safely, and keep your eyes open, most foremen will eventually give you time as a spotter, then short stints in the seat.

CDL schools: If you know you want to be around hydrovacs or lowboys, getting your CDL through a reputable school gives you a big advantage. Many hydrovac operators start as drivers, then pick up wand and boom skills on the job. Ask up front whether a potential employer will help you add endorsements, including tanker if their units require it.

## **Final thoughts for would-be operators**

Running an excavator or Vac-Ex in Sacramento is less about collecting a wall of certificates and more about building a coherent package of skills and documented training that holds up when a safety manager, owner, or inspector starts asking hard questions.

You need your basic OSHA safety education, your excavation and trench training, and your employer's operator qualifications. If you are in a vac-ex truck, you almost certainly need a CDL with appropriate endorsements. Around that core, you add real world judgment: knowing how deep you can dig without shoring before the job crosses from efficient to reckless, knowing when vacuum excavation is the right tool and when a compact excavator with a cautious hand dig crew is better, and knowing how to price and plan work so that you are still in business a year from now.

Excavation looks simple from the street. The bucket goes down, dirt comes up. In practice, you are threading between utilities, regulations, and physics. Certifications are not just paperwork. They are your way of proving that you take that responsibility seriously.