

Vacuum excavation looks simple from the sidewalk. A hydrovac truck pulls up, someone fires up a hose, the debris disappears into a tank, traffic moves on. From the operator's seat, it is not simple at all. You are running a high-pressure water system or a powerful air lance, a large vacuum, and a heavy commercial vehicle on public streets while working inches away from live utilities and the public.

In Sacramento, CA, that combination of risk and responsibility means you need more than a quick orientation. You need a blend of formal safety training, equipment-specific instruction, commercial driving qualifications, and local knowledge.

This guide walks through what that actually looks like in practice.

## **First, what is vacuum excavation?**

Vacuum excavation is a non-mechanical digging method that removes soil using either high-pressure water (hydro excavation) or compressed air, then vacuums the slurry or dry material into a debris tank. It is used mainly for exposing existing utilities, trenching in congested corridors, and working where traditional buckets, augers, or backhoes are too risky.

Contractors in Sacramento rely on vac ex for:

- Potholing to locate PG&E gas lines or SMUD electrical conduits
- Trenching for fiber in downtown streets without tearing up every other utility
- Working around aging water and sewer lines in older neighborhoods
- Caltrans work along state routes with tight work windows

On a typical job you may be daylighting a 4 inch gas main at 3 feet deep, or trenching 100 feet along a narrow easement with multiple unknown crossings. That is why the question is not just, "What is vacuum excavation?" but "What kind of training is required for vacuum excavation so the work is actually safe and efficient?"

## **Hydro excavation vs air vacuum excavation**

Sacramento contractors use both.

Hydro excavation uses high-pressure water, often in the 2,000 to 3,000 psi range, to cut soil and create a slurry that is vacuumed into the tank. It cuts faster and handles hard, compacted or wet soils better. It also carries more risk of damaging sensitive utilities if mishandled.

Air or dry vacuum excavation uses compressed air to fracture soil so it can be vacuumed out as loose material. It is slower in dense clay but safer for delicate utilities and avoids the need to dispose of slurry as liquid waste.

From a training standpoint, the core operator skill set overlaps, but there are differences that must be covered:

- Water pressure selection and safe distances to prevent coating damage
- Soil classification and how it affects air lance effectiveness
- Slurry handling versus dry spoil handling
- Freeze systems and winterization for hydrovac units, if you work outside the valley

If you hear someone ask, "What is the difference between hydro excavation and vacuum excavation?" the simplest operational answer is that hydro uses water cutting and creates slurry, while air uses compressed air and keeps

spoil dry. A proper training program takes that simple difference and connects it to real-world procedure.

## The regulatory backdrop in Sacramento

Training is not just “good practice.” It is tied directly to regulations from several layers of government.

In Sacramento, vacuum excavation operators typically fall under:

- Federal OSHA excavation and general industry standards
- Cal/OSHA, which often has stricter requirements than federal OSHA
- FMCSA regulations for the commercial motor vehicle side
- Local permitting rules from the City of Sacramento and Sacramento County
- Utility owner requirements from PG&E, SMUD, telecoms, and water districts

Anyone working around excavations should understand basic OSHA excavation rules such as the 4 foot rule in excavation, which requires a ladder or way out within 25 feet of workers if the trench is 4 feet or deeper, and the 5 foot threshold where protective systems (sloping, shoring, or shielding) are typically required in most soils. A common question on jobs is how deep you can excavate without shoring. The practical answer: rarely beyond 4 to 5 feet in typical Sacramento soils without some form of protective system, and only after a competent person evaluates the conditions.

Vacuum excavation operators spend a lot of time in shallow excavations for potholing, but they still work within **Sacramento Vacuum Excavation** those same standards, especially when access holes get deeper than anticipated.

## Core safety and excavation training

At a minimum, anyone operating vacuum equipment in Sacramento should have formal excavation safety training that covers:

- OSHA excavation basics, including soil classification and protective systems
- The concept of a competent person and how that applies to the crew
- Surface marking, tolerance zones, and working near marked lines
- Emergency procedures for line strikes and cave-ins

Many contractors provide or require OSHA 10-hour Construction for new hires, then OSHA 30 for foremen and supervisors. While OSHA does not list a “3/4/5 rule for excavation” as a formal term, effective training does walk through depth thresholds: at 4 feet you need egress and atmospheric evaluation in some cases, at 5 feet you need protective systems unless rock or a rare exception, and beyond that, increasing scrutiny and engineering.

Cal/OSHA also stresses hazard communication, lockout/tagout where applicable, and fall protection at the edges of large pits or shafts. When you hear sometimes informal references to “the 5 OSHA requirements,” people are often summarizing that OSHA expects hazard identification, proper training, necessary protective systems, safe access/egress, and emergency planning. Any serious Sacramento outfit builds those into its in-house training.

Because so much utility work involves traffic, many agencies and industrial clients also require flagger training and basic work zone safety, especially when you are operating on state routes or near light rail.

## Equipment-specific training: hydrovac and air vac

Once the basics of excavation safety are in place, the next step is hands-on, equipment-specific training. This is where a new operator learns how deep you can vacuum excavation in a real working day without abusing the truck, how to handle 8 inch vac hoses safely, and how to avoid turning a utility locate into a utility strike.

On modern hydrovac trucks, training usually covers:

- Safe startup and shutdown, including PTOs and interlocks
- Boom operation, hose handling, and vacuum relief
- Selecting water pressure and nozzle tips for different soils
- Managing spoil levels so you do not overfill the debris body
- Winterization and wash-down procedures
- Routine pre-trip and post-trip inspections

With air vacuum units, training also covers compressor operation and air lance technique. Operators must understand the limitations of vacuum excavation in hard, dry clay or cobble, and when it may be more practical to use a small excavator or combine methods.

New operators regularly ask how deep vacuum excavation can go. From a pure reach standpoint, some units can excavate 30 feet or more with the right setup. In Sacramento's utility work, most potholes are in the 2 to 8 foot range. Deeper shafts are possible but need a solid soil plan and may need shoring or shielding just like any traditional excavation.

## **Driving and CDL requirements**

A vacuum excavation operator in Sacramento is usually also a commercial driver. Hydrovac trucks, in particular, are heavy. A fully loaded unit can be in the 60,000 to 70,000 pound range, well above the threshold for a commercial driver's license.

Is a CDL required for hydrovac jobs? In practice, yes, almost always. Most hydrovac units sit squarely in Class B or Class A territory, depending on configuration and whether there is a trailer involved. That CDL requirement is one of the biggest practical filters for who can operate the unit legally.

On top of the CDL, many operators ask whether you need a tanker endorsement for a hydrovac truck. Requirements vary with the jurisdiction and how the vehicle is registered, but if your vacuum truck is transporting liquid slurry in quantities above certain thresholds, a tanker endorsement is often required or strongly recommended. Many Sacramento companies require it as a matter of policy, regardless of the technical edge cases, to avoid compliance questions roadside.

Training on the driving side generally covers:



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- FMCSA hours of service, which sometimes leads to questions like, "What is the 7 3 rule in trucking?" That refers to one of the split sleeper options where a driver can split rest periods into 7 and 3 hour blocks, within the more complex HOS framework.
- Sacramento-specific truck routes, low-clearance bridges, and restricted residential areas
- Loading, securing hoses and tools, and spill prevention
- Backing practices on crowded city streets and industrial sites

You cannot separate safe vacuum excavation from safe truck operation. A strong operator is confident in both.

## **Certifications relevant to vacuum excavation operators**

There is no single California license labeled "vacuum excavation operator." Instead, the work touches several existing certifications and endorsements. Many employers in the Sacramento area look for or provide:

1. OSHA 10-hour Construction for basic safety awareness
2. OSHA 30-hour Construction for foremen or lead operators
3. Confined space awareness, and full permit-required confined space training if entering vaults or manholes
4. First aid and CPR certification, often from the Red Cross or equivalent
5. Traffic control / flagger certification where required by cities or Caltrans

On the excavation side more broadly, operators sometimes ask, "What certifications do you need to run an excavator?" There is no statewide excavator license, but NCCER and other bodies offer recognized operator qualification programs. Those translate well to vacuum units in terms of safety mindset and equipment respect.

Locally, some public agencies and industrial clients have their own in-house cards or orientations that become de facto requirements: utility-specific safety orientations, refinery safety cards, or rail corridor access training. An operator who accumulates those credentials becomes far more marketable.

## **Company programs and the “competent person” role**

On paper, OSHA requires that every excavation job have a competent person who can identify existing and predictable hazards in the surroundings and has authority to take prompt corrective measures. That is not just for big trenches. If you are cutting a line of vacuum excavation potholes along a major feeder, someone on that crew must be competent in excavation safety and utility work.

In practice, Sacramento contractors accomplish this by:

- Sending lead operators or foremen to dedicated excavation safety or “competent person” classes
- Having safety managers ride along with new operators during their first months
- Building standard operating procedures for locating, potholing, and backfilling

For a new hire, the path often looks like this: a few days of classroom work, a period as a Swamper or laborer handling hoses and observing, then gradually taking control of the boom, pressure settings, and finally the truck itself. The training is partly formal, partly apprenticeship, but the better companies treat each stage as structured, not improvisational.

The best indicator of a healthy training culture is how they talk about near misses. If every utility scrape is “no big deal,” that is a red flag. If each one turns into a tailgate talk and updated procedure, you are in safer hands.

## **Local factors in Sacramento: utilities, soils, and permits**

Vacuum excavation training in Sacramento needs a local flavor. Operators are not just moving dirt; they are working in a city with:

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- Aggressive undergrounding of utilities in older neighborhoods
- Wide swings between saturated winter clays and rock-hard summer soils
- Tight urban corridors around downtown and the railyards
- Canal systems, levees, and high groundwater in some areas

That affects training content. Operators must recognize when saturated soils may hide voids or when a levee or canal bank has restrictions that limit how close a truck may park. They need to know when to ask an engineer about the 35 foot rule or similar agency-specific stand-off distances from critical structures.

Every operator should know how to use 811. Before asking "Is it illegal to dig a hole in your backyard?" in a place like Sacramento, it is smarter to ask, "Have we called 811 and are we within our ticket window?" Homeowners and small contractors alike can be liable for damage if they skip locates, even on private property. A trained operator assumes that anything unmarked might still be live and still deserves potholing within the tolerance zone.

Local utilities often specify how they want potholing done: water pressure caps, required clearances, or whether they accept air excavation only near certain assets. Hydrovac operators need to know those owner-specific rules, not just generic OSHA wording.

### **Productivity training: depth, volume, and cost awareness**

Training that focuses only on safety tends to produce operators who are cautious but slow. On real jobs, you must balance safety with production and cost reality.

Operators are often asked:

- How deep can you vacuum excavation quickly in our soil?

- How much can a vac ex excavate in a day?
- How long does it take to dig a 100 ft trench with this setup?
- How much does vacuum excavation cost per hour to run?

There are no one-size-fits-all answers, but training should teach you how to estimate. For example, a hydrovac crew in average Sacramento soil might pothole 20 to 40 locations per day at 3 to 5 feet deep, or trench 100 to 150 feet at 12 to 18 inches wide, depending on obstructions and traffic control. That gives a ballpark for answering questions like how much to excavate 200 cubic yards or how much would it cost to excavate 10 acres of land when using vac ex as part of the plan.

Understanding basic earthwork math helps. Operators should know why you divide by 27 for cubic yards: because 27 cubic feet make one cubic yard. That simple conversion helps translate dimensions on a sketch into tank volumes and load counts.

A well-trained operator learns to protect the machine and still keep up with bid expectations. When you know what the truck burns in fuel per hour, what the crew costs, and what disposal fees look like, you have a better sense of what excavation cost per hour really means, rather than treating it as someone else's problem.

## **Age, career path, and pay potential**

Vacuum excavation has become a strong niche for operators who like both equipment and problem-solving. I have seen people move into hydrovac operations from dump trucking, from traditional excavator work, and even from completely different trades.

A common question is, "Is 50 too old to become a heavy equipment operator?" In this specific world, often not. Hydrovac work can be physically demanding, but it relies heavily on judgment, communication, and patience near utilities. Many companies value older hires who bring maturity from other driving or construction roles. The key is being willing to learn the technology and the safety expectations.

Pay in Sacramento varies by company, experience, and union status. Entry-level Swampers may start in the low to mid 20s per hour. A seasoned hydrovac operator with a clean CDL, multiple certifications, and a track record of safe production can reach much higher. The highest salary for an excavator operator in specialty roles, including hydrovac, can reach into the six-figure range annually when you include overtime and prevailing wage projects. That is not every job, but it sets a target for what strong skills and safety records can command.

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## Practical skills that separate good operators from the rest

Formal classes cover OSHA rules, but the most valuable training pieces are often very practical:

- Reading locate marks and asking “what is missing” rather than assuming the markings are complete
- Knowing when to switch from water to air or to a smaller nozzle near an old cable
- Understanding soil behavior so you can answer questions like, “Is it better to dig a hole when the ground is wet or dry?” In loose Sacramento loams, a slightly moist soil can cut and hold shape better, while fully saturated or bone-dry clays each bring their own issues.
- Recognizing when a trench or pothole is approaching the depth where shoring or shielding is required, not just relying on the question, “How deep can you dig without shoring?” in the abstract

That blend of book knowledge and field sense is exactly what the better Sacramento employers build into their mentoring programs. Crew leaders pull new operators aside to talk through why a particular pothole took too long, or how to adjust method around an unexpected duct bank.

## Frequently asked side questions, addressed briefly

Because vacuum excavation work overlaps with so many other topics, operators often hear wider questions on site. A few examples:

- “Can I dig a trench with a pressure washer?” On a job site, the answer is no, not as a substitute for proper hydrovac equipment. Pressure washers are not designed for controlled soil removal around utilities, and you lose the vacuum component that keeps the area clean and visible.



- “How deep can vacuum excavation go?” Technically very deep with the right hoses and setup, but from a training and safety perspective, once you pass roughly 5 feet in depth, you shift from simple potholing into true excavation, which ties back to trench safety rules.
- “What are the limitations of vacuum excavation?” Tough cobble, solid rock, high groundwater, tight noise restrictions, or limited disposal options can make vac ex slow or unsuitable. Training teaches when to say, “We need a different method here.”
- “What are the three types of excavators?” In equipment talk that could mean crawler, wheeled, and suction (vacuum) excavators. Understanding where vac ex sits in that family helps explain to clients why you chose it.

Most of these side topics do not change your formal training requirements, but a thoughtful operator keeps learning around the edges. When you can explain why a hydrovac truck might cost several hundred thousand dollars to buy, or roughly how much a vacuum excavation truck rental might cost per day, you build trust with clients and foremen.

## **How to pursue training if you are starting from scratch in Sacramento**

If you are looking at hydrovac or vacuum excavation as a career move in the Sacramento area, the realistic steps are straightforward:

1. Obtain or upgrade your CDL, ideally with tanker endorsement, and keep your driving record clean.
2. Take OSHA 10-hour Construction and basic first aid/CPR to show you are serious about safety.
3. Apply with contractors or utility service companies that run vac ex trucks and are known to invest in training.
4. Expect to start as a laborer or Swamper, absorbing hands-on training before you touch the controls.
5. Pursue excavation safety or competent person classes as you gain experience, so you can lead crews and supervise work.

From there, every job becomes part of your real training program. You learn how long it actually takes to dig that 100 ft trench your estimator promised, what happens when a locate is wrong, and how to keep yourself, your crew, and Sacramento’s maze of underground utilities safe while you work.

When all of those pieces come together, “vacuum excavation operator” stops being a generic job title and becomes a skilled trade in its own right, built on training, practice, and a healthy respect for what lies under the pavement.