Termites never announce themselves with drama. You notice a floor that dips near a bearing wall, or a door that rubs when humidity rises. Someone pokes the rim joist with a screwdriver and it sinks in a half inch. By the time the damage becomes obvious, the structural fibers that carry your home’s loads may have been chewed to lace. When a primary beam or header is compromised, repairs have to do more than fill gaps. They have to reestablish a reliable load path. That is where steel flitch plates earn their keep.



I have used flitch plates under kitchens crawling with plumbing, under 1920s living rooms with old-growth joists, and in tight crawlspaces where replacing the beam outright would have required lifting half the house. When engineered and installed correctly, a flitch plate can restore capacity with minimal disruption, sometimes exceeding the original strength while keeping the character and geometry of the framing intact.

What a flitch plate really does

A flitch plate is a length of structural steel, usually a flat plate, sandwiched against wood and bolted to act compositely with the existing member. Think of it as an armor plate that shares bending and shear with the wood. The steel delivers tensile muscle, the wood stabilizes and distributes compression, and the bolts pass the forces back and forth. In termite beam repair, that partnership helps you keep as much of the original member as is sound, while the steel quietly takes the lion’s share of the new work.

Most flitch plates for residential beams fall between 3/8 and 1/2 inch thick, cut to match beam depth minus a small top and bottom reveal so the edges do not snag or telegraph through finishes. In crawlspaces I often specify 3/8 inch A36 or A572 steel to limit weight and keep drilling manageable by hand. Where spans are long, loads high, or damage severe, a 1/2 inch plate or a pair of plates on opposite faces of the beam may be appropriate. The plate length needs to extend well beyond the damaged zone, typically at least two feet past the last questionable wood fiber, and more if loads demand it.

When steel beats sistering and when it does not

Traditional “sistering” with new dimensional lumber still has its place. If a termite colony only grazed the bottom corner of a nonbearing joist, a full-length sister may solve the problem quickly. Termite floor joist repair often lands in this category. For primary beams and headers, especially over open spans or under bearing walls, the equation shifts. Sistering with like-for-like lumber may not regain enough capacity because you are constrained

by depth and bearing, and long stock may be difficult to maneuver. Flitch plates slip into tight spaces, deliver high strength per inch, and can be customized to odd lengths.

Situations where flitch plates tend to shine:

- Limited access spaces where dropping in a full replacement beam is impractical
- Historic or high-finish interiors where demolition would be costly
- Beams or large headers with partial but not total section loss
- Mixed-material repairs that need stiffness without adding depth
- Cases where you want capacity gains verified by an engineer without oversizing wood

They are not magic. If the beam is powder and the remaining fibers cannot clamp or hold hardware, the wood component is too compromised. In those cases I prefer a full replacement or an independent steel member with proper bearing. Likewise, if the sill is rotten for six feet along the foundation, you start with termite sill plate repair, not beam reinforcement.

Start with the biology, not the steel

Before anyone touches a wrench, the termites must be eliminated and the moisture conditions corrected. I like to see at least two to four weeks after treatment, with fresh frass and mud tubes absent and moisture readings trending down. If subfloor humidity still spikes because of a crawlspace leak, any structural repair is at risk. Paint and patch have a way of hiding clues, so I ask for sections of baseboard or drywall to be removed for honest viewing of studs, plates, and ends of beams. Termite wall repair, termite subfloor repair, and termite drywall repair after termite treatment often become a coordinated set of scopes, and it pays to stage them in the right order so you do not bury damage behind new finishes.

A quick refresher on loads and section properties

Termites rarely remove uniform chunks of wood. They carve galleries that leave a skin and some webs, which means the remaining wood does not behave like a perfect rectangle. For design, you evaluate the “effective section” and then add steel to restore or exceed the original section modulus, which governs bending strength, and the moment of inertia, which governs stiffness and deflection.

The beauty of flitch construction is that you can calculate a transformed section. The steel’s area is multiplied by a modular ratio based on the modulus of elasticity difference between steel and wood, then combined with the wood to arrive at a composite property. In practical terms, a 3/8 inch steel plate on a 7.25 inch deep nominal 2x8 beam can more than double capacity if bolted properly. Bolts are not decoration. They have to be sized and spaced to transfer shear between materials, which is what allows the parts to act as one.

In the field, I carry a pocket chart and a calculator rather than running finite element models. On residential work, typical bolt spacing ranges from 12 to 16 inches on center in staggered rows, with edge distances maintained so wood does not split. The plate is held off the beam edges by about half an inch for drill clearance and so the plate does not crush vulnerable corners of old wood.

Field assessment that keeps you out of trouble

I start with a moisture meter and an awl. If the bottom third of a beam around midspan is soft but the top fibers and bearing zones are intact, that is a textbook flitch candidate. If the bearing points at columns or foundation pockets are destroyed, then you are dealing with support failures as well, and the scope expands. For termite

attic wood repair, the damage often concentrates around ventless soffits and warm chimneys. Attic beams and purlins can be reinforced with flitch plates too, but you must watch fire ratings and penetrations if the space is conditioned or finished.

Look carefully at what bears on the member. A flitch-reinforced beam that feeds termites in its supports will not serve you. I insist on probing sill plates, rim boards, and the first couple of inches of studs. Spot damage in joist ends calls for termite framing repair at those connections - often small saddles, bearing blocks, or joist hangers paired with sisters.

A real job that shows the calculus

We reinforced a 1926 craftsman's central beam last spring. The client had a sunken dining room, down roughly five eighths of an inch over 13 feet. The crawlspace offered 21 inches of clearance at best and was laced with pipes and a gas line. The beam, a built-up trio of 2x10s, had termite channels along the bottom faces for about seven feet, right under a bearing wall that had been relocated in the 1980s. The sill along the same run read at 18 percent moisture and had some surface grooves, but the fibers resisted a screwdriver. The pest company had treated the structure three weeks earlier.

Replacing the beam would have meant shoring a maze of joists and dismantling finish flooring. We opted for a 3/8 inch by 9 inch A36 steel plate, 14 feet long, notched for pipes and drilled for bolts in a staggered pattern at 14 inches on center. We added a 1/2 inch HDPE isolation strip between steel and wood to prevent future corrosion from condensed crawlspace humidity, used 1/2 inch hot-dip galvanized carriage bolts with fender washers against the plate, and blocked discreetly at supports to afford proper bearing. Once we tightened the system in stages, the deflection pulled back about a quarter inch, and a light shim at one column finished the correction. The tile above did not crack, and the homeowner kept their plaster cove intact. That job is a perfect example of surgical termite beam repair that aligns with budget, access, and performance.

The installation workflow that keeps crews efficient

If you asked me to distill years of trial and error into a clean sequence, this is the rhythm that delivers predictable results without unnecessary drama.

1. Stabilize and shore. Place adjustable posts and beams to carry tributary loads so the damaged member can be unloaded slightly. Aim for neutral, not aggressive jacking, to avoid cracking brittle finishes.
2. Prepare the wood. Remove loose, punky fibers until you reach sound wood. Treat exposed areas with a borate solution as belt and suspenders, and let them dry. Plane or sand high spots so the steel will bear uniformly.
3. Fit and isolate the steel. Dry-fit the flitch plate, mark penetrations and obstacles, and predrill on a bench if possible. Install a capillary break - HDPE, EPDM, or bituthene - to reduce steel-to-wood moisture transfer.
4. Bolt it together. Start bolts at midspan, working toward supports in a staggered pattern. Use large-diameter washers under both heads and nuts. Tighten in passes, not all at once, to allow the plate to seat gradually.
5. Restore connections. Reattach joists with hangers if necessary, add blocking, and correct any compromised bearing points. Only then remove temporary shoring a little at a time while monitoring for movement.

This sequence works under living rooms, kitchens, and bedrooms equally well. For termite floor joist repair that uses a flitch-like concept, I sometimes spec narrower plates that span only a few joists, but the bolting and isolation logic is the same.

Fasteners, spacing, and what the numbers look like in practice

Residential crews often reach for lag screws because they are familiar and fast. Lags have their place, but for true composite action I prefer through-bolts. The clamp force and steel-to-steel contact across washers distribute bearing safely and resist loosening over time. On a typical 12 to 14 foot run, you may end up installing 16 to 22 bolts depending on spacing, with edge distances of at least 1.5 inches from any wood edge, and distances from plate ends of at least two bolt diameters.

Bolt diameter often runs 1/2 inch for 3/8 and 1/2 inch plates. I avoid 3/8 inch bolts in termite structural repair because the wood around the holes may be brittle and the smaller bearing area can crush fibers. Pre-drilling undersize in wood and full size in steel, then reaming the wood carefully, prevents tear-out. If the home is near the coast or the crawlspace is damp, hot-dip galvanized or stainless hardware pays for itself over time.

Working around utilities and finishes

Crawlspace work brings surprises. Electrical cables https://www.asesoriabeta.com/consultenos/#comment-36166 stapled to the bottom of joists, copper with minimal clearance, HVAC flex draped across the beam. I like to stage a pre-move day to gently reroute lines with the appropriate trades. A clean plate path saves hours of field drilling. Where you must notch steel for small intrusions, keep notches shallow and well away from midspan if you can. Any cut edges should be deburred and painted immediately.

In finished spaces, especially where termite wall repair and termite drywall repair after termite treatment are in the scope, coordinate with the finish team. A flitch plate stiffens the beam, which can shift hairline cracks elsewhere as the system finds a new static position. Gentle preloading with shoring over a few days helps the house settle into the new geometry slowly.

Sill plates and bearing - the unsung heroes

Termite sill plate repair is not flashy, but it is critical. The best-reinforced beam will not perform if it bears on a rotten or crushed plate. If I see staining, soft fibers, or daylight between sill and foundation, I stop and address that line. Short, staged sill plate replacements under the flitch beam may be needed. Use treated lumber rated for ground contact, slip a self-adhered flashing membrane between concrete and wood, and install a termite shield where appropriate. Anchor bolts should engage solid concrete with proper embedment, not crumbly mortar.

Attics, headers, and oddball cases

Flitch plates can solve more than crawlspace problems. In attics, I have reinforced ridge beams and purlins where subterranean termites climbed up plumbing chases. Steel in an attic wants paint or a wrap to keep condensation off, and you must check clearances to sheathing nails. For termite attic wood repair, heat makes borate treatment flash off faster, so timing and ventilation matter.

Large window and door headers in termite-prone walls benefit from steel reinforcement too. A plate can be hidden behind drywall on the room side, which helps when exteriors are clad in brick or stucco and removal is expensive. Fireblocking and insulation should be restored around any new steel, and any termite wall repair should address the sheathing behind, not just interior plaster.

Permits, engineering, and documentation

Most jurisdictions require a permit and, for anything beyond like-for-like repairs, a detail or letter from a licensed engineer. This is not bureaucratic fluff. An engineer can set bolt spacing, plate thickness, and bearing details with math-backed confidence. On termite structural repair projects, I keep a field log with photos before and after, moisture readings, and pest treatment paperwork. That packet helps with resale and gives the homeowner a clear maintenance baseline.

Costs, timelines, and what influences both

Every house is a custom job, but you can bracket costs. A straightforward single-plate reinforcement over 10 to 14 feet with standard access and minimal utilities often falls between 2,500 and 6,000 dollars in my region, which includes steel, hardware, labor, and basic finishes. Add shoring, heavy utility relocation, tight access, or tandem plates, and ranges climb to 7,000 to 12,000 dollars. Full beam replacement can run higher once demolition and restoration are factored in. Termite damage restoration writ large, when you combine sill, joists, subfloor patches, and finishes, can look like a broader renovation, which is why surgical reinforcement has real value.

Time on site is usually one to three days for a single beam, not counting pest treatment lead time. Occupied homes can remain livable, especially if work is contained to crawlspaces and basements.

Mistakes that come back to haunt you

The most common failure I see is installing a beautiful steel plate over a beam that never had its true problems solved. Moisture and pests do not care about hardware. If damp air still condenses on cold masonry, if gutters dump water at the foundation, if ventilation is poor, the risk remains. Skipping isolation between steel and wood invites corrosion prints years later. Over-tightening a bolt pattern in one pass can crush old fibers and leave the plate slightly bowed off the wood, which kills composite action. Setting bolt spacing “by feel” rather than to a plan can leave you with under-capacity or stress concentrations that telegraph as squeaks and pops when loads cycle.

Coordinating with other termite damage repair scopes

On a typical project we touch several related items:

- Termite subfloor repair where thin webs of plywood give underfoot
- Termite floor joist repair at sisters and hangers that feed into the reinforced beam
- Termite framing repair at studs that bear on the same line, to prevent differential movement
- Selective termite wall repair to restore shear strength if the lower plate area was compromised
- Finish stages like termite drywall repair after termite treatment, sequenced after structural stabilization

Done in this order, you solve from the bottom up. You do not trap an active or wet condition behind crisp drywall, and the home starts to behave like one continuous structure again.

Choosing the right contractor near you

Searches for termite repair near me or termite damage repair near me yield a whirlwind of options. You want someone who can speak fluently about structure and not just cosmetics. If the company also offers termite repair services but cannot tell you bolt grade or plate thickness without calling a supplier, keep interviewing. Ask to see a past project with photos, and ask how they confirm composite action. Do they own shoring gear or rent it? Do they bring moisture meters to the estimate? If a bid never mentions bearing or edge distances, I worry.

For homeowners who prefer local termite damage repair providers, check whether they collaborate with structural engineers who know your jurisdiction. A good termite damage contractor near me will know the local inspectors by first name and will be comfortable discussing load paths, not just patching wood. If your project leans more wood-centric, a wood repair contractor termite damage near me can still be the right lead, provided they bring in steel specialists as needed. For complex beams and quirky spans, you might even look for teams advertising structural termite repair near me, which usually signals crews comfortable with steel and engineered wood hybrids.

Maintenance after the fix

A flitch plate is not a free pass to ignore the building envelope. Keep gutters clean and downspouts extended. Monitor crawlspace humidity, aiming for 30 to 55 percent depending on climate. Once a year, pop the access hatch and check for new frass, mud tubes, or corrosion blooms on hardware. A quick wipe of the plate and a visual check of bolt heads and washers is enough. On one lakefront home we service, the owner puts a calendar reminder each spring to walk the perimeter, check vents, and peek at the beam we reinforced years ago. Ten minutes, zero drama.

If you ever notice new cracking, unusual squeaks under load, or a fast change in door behavior, call the contractor. Often the cause is seasonal movement, but a safe home is a watched home. Prompt response is part of thorough termite wood repair and termite damage repair, and the professionals you want in your corner are those who answer the phone in a week, not three.

A final thought from the crawlspace

Steel flitch plates are quiet heroes. They slip into dark spaces, shoulder heavy jobs, and ask only for good calculations and respectful installation. I have crawled out from under houses where a beam looked like a violin back that sat in a pond, and a day later that same beam felt like a railroad tie. Not because we hid the problem, but because we honored the structure’s intent: carry gravity cleanly from roof to soil.

If your house needs termite beam repair, do not be shy about asking for steel as part of the conversation. Used wisely, it brings real strength, small footprints, and minimal disruption. Paired with honest assessment, proper termite treatment, and solid craft, a flitch plate can turn a scary diagnosis into a straightforward, durable fix.