

Proto-II™ Wall Systems

Post Tensioned Masonry



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Post Tensioned Masonry

Post-tensioning of concrete has been in use for more than sixty years, and is commonly employed as a means to maximize the loading capabilities of concrete elements. Post tensioned concrete is typically employed in parking structures, office buildings, and many other structures where service loads are substantial. Residential builders are familiar with its use in floor slabs.

The specific application of post-tensioning to Proto-II™ fencing has been in use for more than thirty years, and utilizes the internationally recognized benefits of post-tensioning concrete and masonry structures. It is a solidly established method of design.

Proto II's adaptation of this technology provides a site wall unlike anything obtainable with conventional masonry methods, or other less-durable, flimsy, or even toxic fencing options.

Proto-II and 2019 CBC

Seismic loads now govern fence walls over wind in most cases. Proto II's lighter, more efficient design provides advantages over heavier conventional.

Proto-II

- Will not burn
- Will not melt or release toxins or volatile gases when heated
- Will not warp or degrade over time
- Is the most environmentally friendly from cradle-to-grave of any other system
- Has the lowest embodied energy
- Has the greatest lifespan of any fence material
- Uniquely offers lower cost AND greater strength
- Is more likely to resist catastrophic forces than any other system
- Is more likely to be repairable after catastrophic events with minimal, if any, material replacement

Minimized Cost Volatility

Concrete and grout prices can be highly variable. Proto-II™ on average consumes 50% less grout/concrete than conventional systems. Concrete masonry units (cmu) are, by far, the most price-stable material in masonry fences. Proto-II™ has greater than 60% of its weight in cmu and less than 40% in concrete – the inverse of conventional walls.

Higher Strengths

The post-tensioned method yields high strength from system materials through active compression of the entire structure.

Thinner Walls

With higher structural values, less structural material is needed than required by conventional grout/rebar methods to accomplish the same end.

Smaller Footings, Less Dirt Displacement

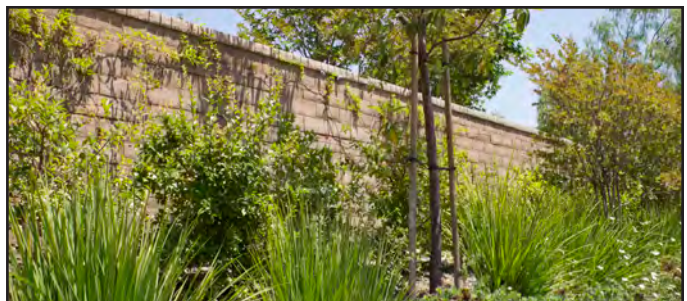
Proto II's design includes footing options that can greatly reduce the amount of digging, dirt displacement, and concrete consumption compared to conventional walls.

No Rebar and Grout Required for Fences Up to 6'-8"

Above the footing, conventional walls depend upon the passive combination of rebar and grout. Proto-II™ fencing uses the controlled, active method of post-tensioning to create structural integrity. The elimination of the grouting process in walls up to 6'-8" in height saves considerable time and cleanup.

Standard Plan Status

Proto II™ has been approved by most jurisdictions throughout California cities and counties, including the City of Los Angeles Standard Plan #520.

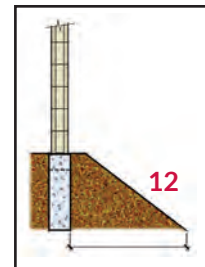
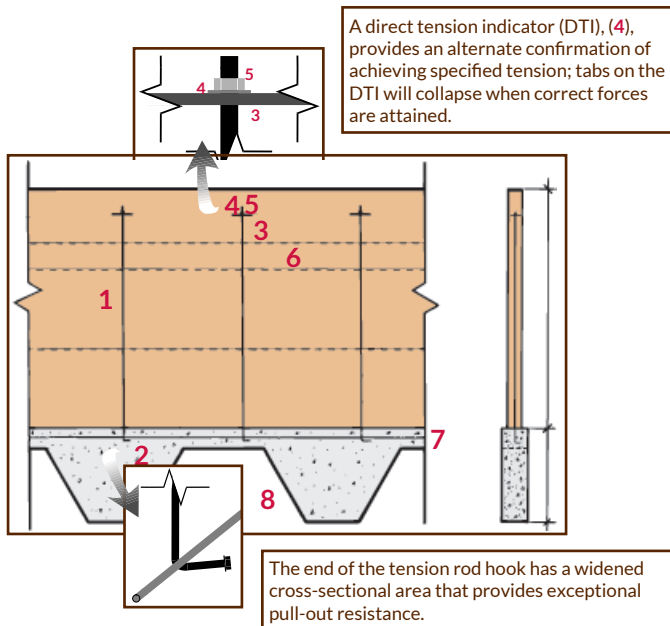
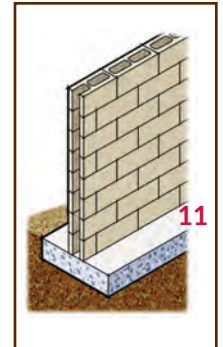
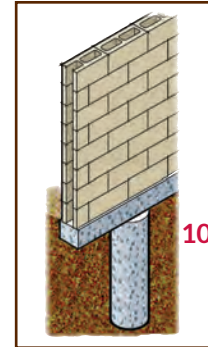
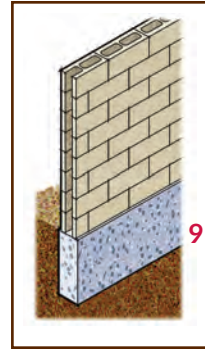


Proto-II™ Systems

The Basic Proto-II™ System

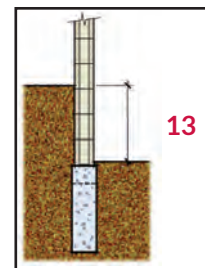
Consists of high strength steel tension rods (1) “L” hooked under a single rebar (2) in the footing, a 1/4” steel plate washer (3), direct tension indicator (4) and tensioning nut (5), and joint reinforcement (6) at specified locations. Walls over 6 feet in height may have additional requirements.

Four footing types accommodate a variety of site conditions: Dip Footing uses a setting pad (7) spanning a series of “dips” (8); Trench Footing (9); Pier Footing (10); and Spread Footing (11). Slumpstone™.



5 Foot to Daylight 2:1 Slope

Standard Proto-II™ footings in Dip Footing or Trench Footing design meet the 5' to daylight requirement without increased footing depths or buried block (12), - first course is at or near grade. The amount of soil displaced can be one-third to one-fourth that of conventional footings with a corresponding reduction in concrete volume, resulting in significant savings.



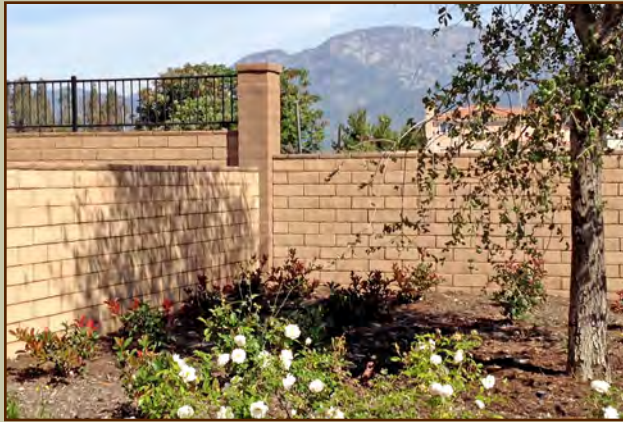
Retaining

Measured in terms of “low soil” to “high soil” (13), Proto-II™ walls are engineered with retaining capabilities in the basic wall design:

- 6' wide retains up to 3 feet with 6'-4" Proto-II wall on top.

Engineering is also available for conditions that exceed the base design, including combinations of retaining walls for lower courses and Proto-II™ for upper courses.

Cmu conforming to ASTM C90 are used in the construction of Proto-II™, so the completed wall will look like traditional cmu walls in every respect, including available face textures in precision, split, and Slumpstone™.



For More Information

Proto-II™ Wall Systems: Details and statements regarding Proto-II design, engineering, construction, and performance provided by Pyramid Builders Corp., owners of Proto-II Wall Systems.

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