Proto 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.

Post-Tensioned Concrete and Masonry

- **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. 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™ 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.

- **Thinner Walls**
  Proto II™ has greater than 60% of its weight in cmu and less than 40% in concrete – the inverse of conventional walls. Proto II™ design can significantly reduce the amount of digging, dirt displacement, and concrete consumption compared to conventional walls.

**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 and 2019 CBC**

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**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™.

**Post Tensioned Masonry**

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™.

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**Post 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

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**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. 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™.

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