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## Technical Services Guide

To ensure a successful project, customers using Versa-Lok retaining wall systems often have technical issues that need to be addressed. These issues include planning, estimating, engineering, and installation. Versa-Lok has a full-time staff of engineers and installation technicians ready to assist you. Versa-Lok also has numerous materials available for engineers, architects, and contractors; including technical data, details, installation literature estimating guides, and specifications.

Versa-Lok can provide the following technical services. Each of these listed services is further described in the following paragraphs.

- Planning Assistance
- Feasibility Review
- Preliminary Engineering
- References for Wall Design Engineers (P.E.'s)
- Material Quantity Estimates
- Wall Shop Drawings
- Installation Training
- On-Site Visits
- Technical Information

### Planning and Feasibility Review

Versa-Lok engineers can review proposed projects to help determine the feasibility of Versa-Lok for the planned application. Engineering reviews can address issues such as the suitability of site soils, practicality of the desired wall alignment, and general economic feasibility. Versa-Lok can provide preliminary guidance about geogrid lengths, unit embedment depths, and special concerns that may add unusual costs.

When planning a wall, a design professional such as a site civil engineer, landscape architect, or architect usually will provide the wall layout. The layout should include wall location, length, and heights at various sections. While Versa-Lok engineers can review the planned wall for stability and feasibility, they do not provide layout services. However, Versa-Lok's technical staff can assist the wall designer with suggestions regarding cost efficient, functional, and aesthetic ways to arrange the walls.

### Preliminary Engineering Designs

For estimating purposes, Versa-Lok engineers can provide preliminary engineering designs for planned walls. The preliminary designs generally include a cross section for one or more critical portions of the planned wall. These designs show anticipated geogrid elevations and lengths, embedment depths, and drainage systems. However, these preliminary designs are not final construction drawings and should not be used as such.

## References for Final Design Engineers (P.E. Stamped Plans)

For retaining walls over four feet high, most building codes require a final geogrid-reinforced wall design prepared by registered, professional Civil Engineer (P.E.), licensed in the state of the project. Often the general project engineers do not wish to provide the geogrid-reinforced wall design or the designer specifying the wall is not an engineer. In these cases, an independent, professional engineer must be retained to prepare and stamp the final engineering wall design.

While Versa-Lok engineers do not provide final, stamped designs, Versa-Lok and its suppliers can provide references for locally licensed engineers from a nationwide network. The engineering firms in this network are independent companies that Versa-Lok refers because they are actively designing retaining walls and are familiar with Versa-Lok walls.

Often projects must be bid based on only a wall layout; no final engineering of the wall is available yet. In these cases, the Versa-Lok suppliers often supply the contractors with estimated wall material costs and anticipated final wall engineering costs so the contractor can bid the project. When the project is awarded to a contractor, the local Versa-Lok supplier can then refer a professional engineer to prepare the final engineering wall design.

## Material Quantity Estimates

For simple commercial walls or low height landscape projects, contractors can usually estimate the quantity of wall units needed. For taller walls and complex sites, the specifier or contractor may need assistance to estimate material quantities, in particular, the amount of geogrid. The estimating charts on pages 32, 33, and 34 of Versa-Lok's Design and Installation Guide provide approximate geogrid amounts for walls from 4 to 12 feet high that meet certain specific site conditions.

For walls that do not match the charts or for large walls with complicated layouts, a project specific, preliminary engineering design from Versa-Lok can help estimate geogrid quantities. Versa-Lok engineers also may provide estimated block quantities as part of a preliminary design. However, bidding contractors should always verify the wall areas for themselves. While Versa-Lok prepares preliminary designs as accurately as possible, these designs often are based on general or assumed information. Exact quantities can only be determined when accurate site conditions are available, final wall layout is determined, and final engineering is completed by a locally registered, professional Civil Engineer (P.E). **Once material quantity estimates are completed, the local Versa-Lok supplier can provide pricing per unit of wall materials. In some cases, the Versa-Lok supplier can provide the pricing for geogrid, while in other case, a separate geogrid vendor supplies this pricing.**

## **Shop Drawings**

Occasionally, engineers prepare generic engineering designs (without product specific details) or designs for other wall units. If the engineer approves, Versa-Lok can provide shop drawings showing specifically how Versa-Lok units would work for such projects. The shop drawings are prepared in accordance with the engineer's original design. The engineer reviews them for approval. Shop drawings are more complete and specific than preliminary designs done for estimating. However, the final engineering is still the responsibility of the wall design engineer of record (P.E.).

Generally, geogrid reinforcement varies little with the type of retaining wall unit used. Shop drawings showing Versa-Lok units as an alternate often require only slight modifications from the original geogrid elevations. When needed, Versa-Lok engineers can provide stability calculations that verify the Versa-Lok shop drawings meet the wall engineer's design criteria.

## **Installation Training and On-site Assistance**

Versa-Lok provides trainings for contractors at key regional areas throughout the U.S., often in the form of one-day seminars. Versa-Lok staff provides installation assistance to contractors via phone and fax and extensive installation literature is available. While local Versa-Lok suppliers often supply a list of contractors who actively install walls, they cannot "certify" contractors. Despite the extensive assistance offered, Versa-Lok cannot control the quality or consistency of an independent contractor's work. When owners hire a wall installer, they are contracting with that independent company. Versa-Lok staff can provide references to standard installation methods but cannot act as a contract interpreter between the owner and installer.

On larger projects, the local Versa-Lok supplier may be able to send a sales representative to the site when construction begins, if the scheduling is feasible. The sales representative can provide unit installation training to a contractor but the sales person is not a field engineer. Issues regarding proper installation must be directed to the wall design engineer of record. Any needed construction observation and testing should be performed by independent, Civil Engineers (P.E.'s) hired by the owner. Versa-Lok does not provide construction inspection and cannot make recommendation or revisions to the wall engineer's design. However, Versa-Lok engineers can assist the project engineers by discussing industry standards for proper installation.

## **Technical Literature and Tools**

Versa-Lok offers a variety of free technical information to anyone interested in designing or installing a Versa-Lok wall. These materials include a Design and Installation Guide, construction Technical Bulletins, residential and commercial installation videos, CAD details and specifications on CD-ROM, and testing data. If you wish to receive any of these materials or have immediate technical questions, please call Versa-Lok at (800) 770-4525 or consult our website at the address: [www.versa-lok.com](http://www.versa-lok.com).

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