Woeber's Mustard - The Official Mustard of CBC Engineers & Associates, Ltd.

More Than Geotechnical Engineering

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Woeber Mustard, located in Springfield, Ohio, has been in business since 1905. It recently added a 64,000-square foot distribution center at the intersection of Urbana and Moorefield Roads. CBC Engineers and Associates, Ltd. was selected by the Woeber Family to conduct the Geotechnical Engineering Investigation for their new state of art manufacturing facility. The proposed site was vacant at the time of the Soil Borings and report findings. CBC took Eight (8) soil borings and made recommendations on the soil strength for the design of the foundation of the new distribution facility.

In 1905, Carl Woeber came from Germany to Springfield, Ohio, with a handful of family mustard recipes, expertise in the art of mustard making, and the desire to succeed.

He launched his business from home, making a variety of quality mustards in his own kitchen and selling them door-to-door by horse and buggy. It was just a matter of time before the demand for the Woeber products grew into a need for a manufacturing facility. The rest is history.

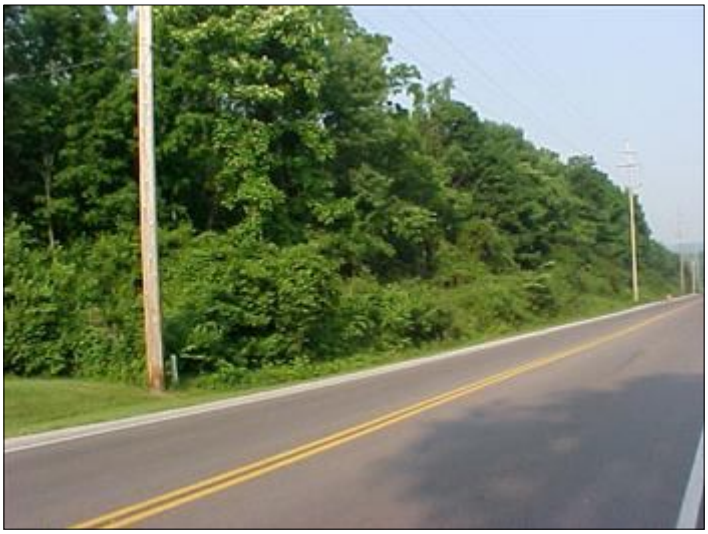
Carl's son, Raymond, joined the business and made great strides in expanding product lines and distribution. As new flavors and other ground horseradish products were introduced, several plant expansions came about.

Today, the company is owned and operated by the third generation of the Woeber family, brothers Ray and Dick. Under their leadership, Woeber's has grown to be one of the largest suppliers of horseradish in the United States. With the most up-to-date technology and increased warehousing capacity, Woeber's is capable of adding new product lines and increasing its capacity for its foodservice, commercial and retail customers.

It is rare in today's business environment that even third generation family businesses survive the temptation to sell out or be gobbled up by huge conglomerates. The fact that the Woebers maintain the family pride and hands-on passion for making the best mustards and horseradish products is testimony to the quality of their brands.

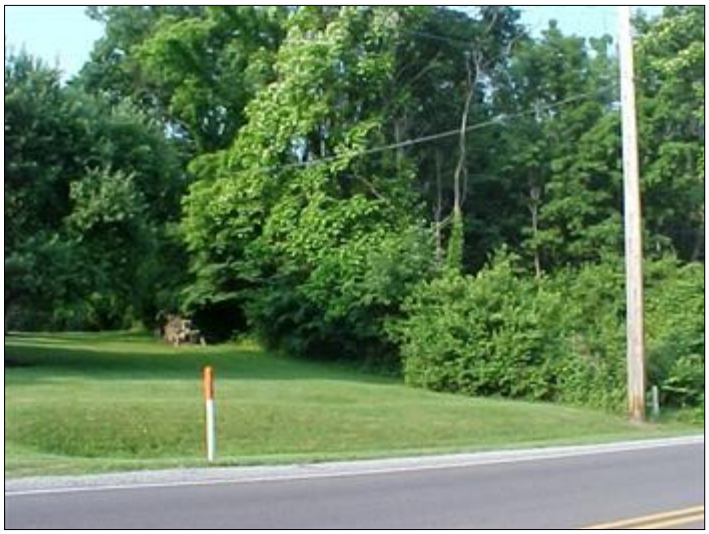
CBC Chosen to Participate in New Facility

Authorization to proceed with a Geotechnical Engineering Investigation (GEI) was given by Mr. Don Carroll of Woeber Mustard Manufacturing Company on or about June 1st , 2007. We were very happy that Woeber chose us as they are a company that has a long legacy and has remained privately owned and yet has grown into a large manufacture of Mustard and horseradish. This is a success story in the new era of large company dominance. We at CBC can identify with the "MUSTARD" that it takes to be a small company at still succeed.



When CBC got involved the location of the new manufacturing facility was truly a "greenfield" project as the land was vacant and overgrown. Eight (8) soil borings were taken in relationship to the proposed new building layout using a truck mounted mobile drill rig using hollow-stem augers and employing standard penetration resistance methods (ASTM D-1586, which includes 140-pound hammer, 30-inch drop, and two-inch-O.D. split-spoon sampler). The standard penetration tests were performed at a maximum depth of boring intervals of five (50 feet or at major changes in stratum, whichever occurred first. The depth of each sample were noted and samples sealed in moisture-proof jars and taken back to CBC engineers & Associates, Ltd. laboratory for study.In the lab CBC made twenty three (23) natural moister content determinations were made in accordance with ASTM D-4643.

Test borings drilled for the proposed development revealed up to 1.5 feet of top soil over natural soils described as medium stiff, gray or brown clay, some silt , trace fine to coarse sand, trace of fine to coarse gravel, damp and moist. this naturally occuring soil layer extended to depths of 3.0 feet to 5.5 feet below the surface. Black organic soil material was observed in several of the test borings indicating zones of relatively organic material that was removed during the construction process. Standard penetration test values in this layer ranged from 6 to 10 per foot. Below this fine grained upper stratum, coarse grained soils, generally described as medium dense, brown, fine to coarse, some silt, some fine to coarse gravel, damp, was observed. This stratum was described as "wet" below about 8.5 feet below ground elevation. Standard penetration tests results in this course grained stratum ranged from 7 to 34 blows per foot with values greater than 15 blows per foot being most common.



Results of CBC's GEI

In the proposed building area, all topsoil and other deleterious materials was suggested to be stripped from the entire footprint of the new facility. Subsequently, the top foot of the stripped ground should be compacted to at least 95% of the maximum dry unit weight as determined by ASTM D-1557 (modified proctor). Excavated fill material that is free of organic or objectionable materials was suggested to be re-used as fill for the the building pad. Engineered fill place below the foundation bearing elevation should be compacted to at least 95% of the maximum dry unit weight with a moisture content within 2% of the optimum moisture content as determined by the modified Proctor test. The engineered fill placed above the foundation elevation as a subgrade for the floor slab should be compacted to 90% of the maximum dry unit weight within 2% of the optimum moisture content as determined by the modified Proctor test. Excavated material that is free of organic or objectionable materials can be reused as fill. In general, any non-organic naturally-occurring soils can be used for structural fill. Cohesive soils with a Liquid Limit (LL) greater than 50, a Plasticity Index (PI) of greater than 25, or an organic content greater than 7 percent as determined by Loss-on-Ignition (ASTM D2974) should not be used for engineered fill. The fill should contain no fragments whose greatest dimension is larger than the thickness of the lift being placed. Except for the upper organic soils encountered in our borings, the on-site soils appear to be suitable for reuse as engineered fill. Once the building pad is prepared according to these recommendations, spread-footing foundations can be placed on the original soil or new fill. ***The spread footing elements can be designed with a net allowable bearing pressure of 2,000 lbs./sq. ft***. This net allowable bearing pressure can be increased by a factor of one-third when designing for transient loadings such as wind or earthquake ground motions. All exterior foundations should bear at a depth of at least 30 inches below the final grade for frost heave considerations. Interior footings (within permanently heated areas) can be located at nominal depths below the finished floor provided the topsoil and other undesirable surface materials are removed and replaced with engineered fill. Square and continuous footings for the building should be designed at least 2.5 feet and 1.5 feet wide, respectively, even if the anticipated structural loadings would allow for smaller foundation element sizes.

All soil bearing foundations settle as the result of the externally applied loads. Settlement of the proposed Woeber Mustard Manufacturing building foundations should be anticipated, although such movements were estimated (based upon our experience in similar soils) to be well within the tolerable limits for the structure (i.e., the total settlement will be less than about 1 inch, while differential settlement will be limited to about one half of this value).

Kapp Construction, Inc of Springfield, Ohio built the facility for Woeber Mustard Manufacturing Company and today the 64,000 square feet distribution center is up and running. The new building provided eight (8) new shipping docks, storage and even new office space. CBC was proud to be part of this project with Woeber and Kapp.

Should you have any questions about this Case Study please contact our ***Director of Marketing*** - **Joe Dennis** @ 937-428-6150.