

September 7, 1993

Mr. Peter Weiss
Senior Civil Engineer
City of Oceanside Engineering Department
300 North Hill Street
Oceanside, CA 92054

APPLICABILITY AND ENGINEERING MERITS OF GEOGRID REINFORCED EARTH RETAINING WALL SYSTEMS

Dear Mr. Weiss:

Woodward-Clyde Consultants is pleased to present this letter, which expresses our views pertaining to the applicability and engineering merits of geogrid reinforced earth retaining wall systems.

It is our geotechnical engineering staff's professional opinion that properly engineered, designed, and constructed geogrid wall systems are, in general, excellent devices for the retention of earth masses. It has been our experience that geogrid reinforcement products, such as Tensar and Miragrid, are noteworthy for their ability to be used in strengthening fill slopes, backfill soils, and landslides.

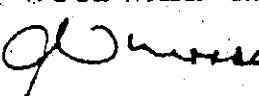
Proprietary retaining wall system products using geogrids have an accepted role in providing significant cost savings to owners and improving visual aesthetics at developed sites. To a greater degree, geogrid retaining wall systems are more easily constructed, are subject to greater quality control, and need less time to construct than conventional cast-in-place reinforced concrete retaining walls and even gravity cribwall systems.

Based on many substantiated case histories, it is our opinion that geogrid wall systems are the most suitable choice for development of most sites. However, as with all wall systems, it is imperative that the wall system be properly designed against internal and external forces and appropriate measures be taken to provide adequate internal drainage for hydrostatic relief; a sufficient level of quality control must also be performed during construction by the project geotechnical engineer.

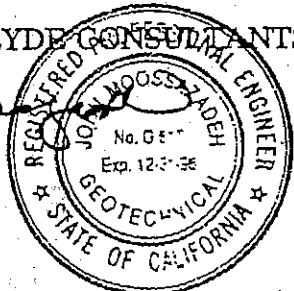
If you have any questions regarding our opinions presented herein, please feel free to give us a call.

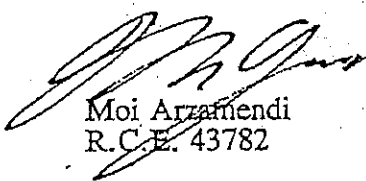
Very truly yours,

WOODWARD-CLYDE CONSULTANTS


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