May 14, 2018

ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

Elite Properties of America, Inc.
6385 Corporate Drive, Suite 200
Colorado Springs, CO 80919

Attn: Jon Carlson

Re: Excavation Observation
2541 Horsemanship Court
Colorado Springs, Colorado

Dear Mr. Carlson:

Personnel of Entech Engineering, Inc. have observed the foundation excavation at the site referenced above. Specific findings for the site are presented in this letter.

The recommendations presented in this letter are based on conditions observed on May 9, 2018. Entech Engineering, Inc. should be notified if changes in the conditions are encountered or if the excavation depth or location should change.

Soil Classification:

Soil types observed in the foundation excavation were found to consist of silty sand.

Allowable Bearing Capacity:

An allowable bearing pressure of 2400 psf, with an equivalent hydrostatic fluid pressure (in the active state) of 45 pcf is recommended for this site.

Soil Moisture Conditions:

Moist.

Expansion Potential:

Low.

Fill:

Overlot fill was encountered on the site. The foundation excavation penetrated the fill in all locations.

Foundation Type:

A spread footing (16")/stemwall foundation system is recommended. The footing design for the Model 885.2 by Entech Engineering, Inc. is appropriate for this site. The bottoms of exterior foundations should be located at least 30 inches below finished grade for frost protection.

Reinforcing:

Reinforcing should comply with that shown on the foundation design provided by Entech Engineering, Inc. No. 5 Grade 40 reinforcing bars may be used in place of No. 4 Grade 60 reinforcing bars, if desired.

Floor Slabs:

Floor slabs-on-grade, if any, should be separated from structural portions of the building and allowed to float freely. Interior partitions must be constructed in such a manner that they do not transmit floor slab movement to the roof or overlying floor. Backfill placed below floor slabs should be compacted to a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

Drainage and Grading:

The ground surface must be sloped away from the building to provide positive drainage away from the foundation. We recommend an equivalent slope of 6 inches in the first 10 feet (5%) surrounding the structure, where possible, or as required to quickly remove surface water. Where a 5% slope cannot be achieved practically, such as around patios, at inside foundation corners, and between a house and nearby sidewalk, we believe it is desirable to establish as much slope as possible and to avoid irrigation in the area. Roof downspouts should discharge beyond the limits of backfill. We recommend providing splash blocks and downspout extensions to discharge runoff beyond the limits of backfill.

Homebuyers should maintain the surface grading and drainage installed by the builder to assure water is not directed toward the foundations and does not pond near the house. Landscaping should be carefully designed to minimize irrigation adjacent to the foundation. We do not recommend use of impervious plastic membranes below landscaped areas near foundations; geotextile fabrics can control weed growth while allowing evaporation. Plants used close to foundation walls should be limited to those with low moisture requirements; irrigated grass should not be located within 5 feet of the foundation. Sprinklers should not discharge water within 5 feet of foundations. Irrigation should be limited to the minimum amount sufficient to maintain vegetation. Application of more water will increase the potential for slab and foundation movements.

Subdrain:

A subsurface drain is recommended around portions of the structure which will have useable space located below the finished ground surface. Typical drain details are included with this letter.

Backfill:

Backfill should be compacted to 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 in areas with flatwork. Backfill should be compacted to 85% of its maximum Modified Proctor Dry Density, ASTM D-1557 in landscaping areas. Backfill must be compacted by mechanical means. No water flooding techniques of any type should be used in the compaction of backfill on this site. Expansive soils are not to be used as foundation backfill.

Concrete:

Type II cement is recommended for all concrete on this site. Concrete should not be placed on frozen or wet ground. Care should be taken to prevent the accumulation and ponding of water in the footing excavation prior to the placement of concrete. If standing water is present in the excavation, it should be removed by installing sumps and pumping the water away from the building area. If concrete is placed during periods of cold temperatures, the concrete must be kept from freezing. This may require covering the concrete with insulated blankets and heating to prohibit freezing.

Remarks:

The recommendations provided in this letter are based upon the observed soil parameters, anticipated foundation loads, and accepted engineering procedures. The recommendations are intended to minimize differential movement resulting from the heaving of expansive soils or resulting from settlement induced by the application of building loads. It must be recognized that the foundation may undergo movement. In addition, concrete floor slabs may experience movement; therefore, adherence to those recommendations which would isolate floor slabs from columns, walls, partitions or other structural components is extremely important, if damage to the superstructure is to be minimized. Any subsequent owners should be apprised of the soil conditions and advised to maintain good practice in the future with regard to surface and subsurface drainage, framing of partitions above floor slabs, drywall and finish work above floor slabs, etc.

We trust this has provided you with the information you required. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

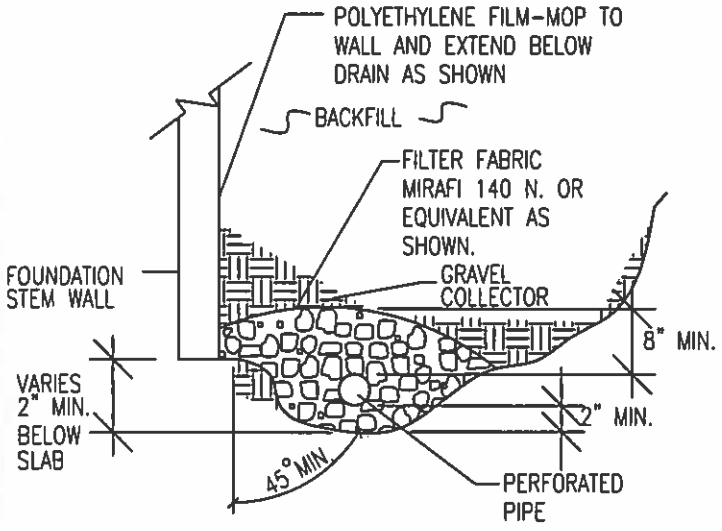
Tae Y. Yang

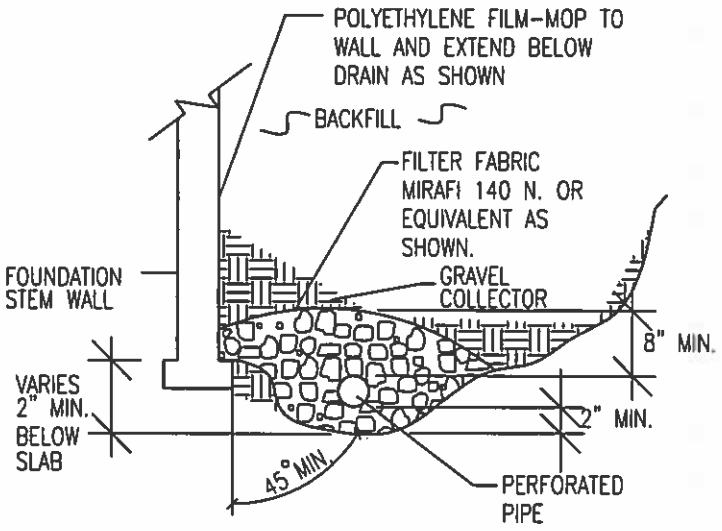
TYY/kp

Entech Job No. 180799
AAprojects/2018/180799 eo

Reviewed by:

Mark H. Hauschild, P.E.
Senior Engineer





NOTES:

-GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS-85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

-PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4-INCH DIAMETER IS MOST OFTEN USED.

-ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON-PERFORATED PIPE.

-FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

-MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

-DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

PERIMETER DRAIN DETAIL

DRAWN:	DATE DRAWN:	DESIGNED BY:	CHECKED:

JOB NO.:

FIG. NO.:

7541 horsemanship

May 30, 2018

ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

Elite Properties of America, Inc.
6385 Corporate Drive, Suite 200
Colorado Springs, CO 80919

Attn: Jon Carlson

Re: Exterior Perimeter Drain and Foundation Wall Waterproofing Observation
2541 Horsemanship Court
Colorado Springs, Colorado

Dear Mr. Carlson:

As requested, personnel of Entech Engineering, Inc. observed the exterior perimeter drain installation and the foundation wall waterproofing material on foundation wall at the above referenced site on May 25, 2018.

The drain consisted of a 4-inch diameter perforated flexible pipe surrounded by clean, coarse gravel. The drain was placed on the exterior portion of the foundation. A polyethylene membrane was mopped to the wall and appeared to extended beneath the drain. The top of the gravel layer was protected with a synthetic filter fabric material. Line and grade was spot checked and appeared adequate. The drain extended toward the under drain syetem. The under drain connection was not connected at this time. In general, the drain installation appears to be in substantial compliance with the drain detail provided by Entech Engineering, Inc.

The foundation walls were observed to have waterproofed material on the exterior.

We trust that this has provided you with the information you required. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Tae Yang

JM/jm

Reviewed by:

COLORADO LICENSED
ROBERT M KLINGSICK
28963
5/30/18
PROFESSIONAL ENGINEER

Robert M. Klingsick, P.E.
Senior Engineer

Entech Job No. 180799
AAprojects/2018/180799 epd&fwwo