



December 5, 2016

Mr. David Lenig  
Lebanon VA Medical Center  
1700 South Lincoln Avenue  
Lebanon, PA 17042

Re: ECS Project 18.4296  
Laboratory B1 Subgrade  
VA Campus, Lebanon, PA

Dear Mr. Lenig,

Pursuant to our recent site visit on November 22, 2016, and based on our review of our previous work in the vicinity and the project geotechnical report ("Geotechnical Engineering Investigation – Preliminary Report" dated June 3, 2011 prepared by GAI Consultants), ECS Mid-Atlantic, LLC is pleased to provide you with this letter outlining our recommendations for the continuation of the Laboratory B1 construction project.

Project Background:

As you are aware, ECS was contacted by you to review and comment on the status of the excavation at the Laboratory B1 project. It is our understanding that the excavation to the current conditions occurred approximately 3 months ago, and included primarily rock excavation with rotary drum methods. We understand that the general contractor contracted for this work has requested an evaluation of the subgrade conditions by a Geotechnical Engineer prior to commencing construction due to the duration of the open excavation.

The ECS Geotechnical Engineer, J. Matthew Carroll, P.E., visited the site on November 22, 2016 to observe the site conditions. The conditions observed are documented in the attached photographs. In summary, the majority of the building footprint, primarily consisting of a below-grade laboratory, had been excavated to the rough subgrade elevation prior to our arrival. The approximate extents of our observation of the subgrade are depicted on the attached plan. ECS performed visual observation of the ground conditions and performed limited hand-probing of select locations while on-site. The unexcavated portion of the Laboratory B1 addition footprint appears to include some soil areas, which is apparently why they were not excavated previously, in order to preserve the subgrade and avoid unnecessarily exposing existing foundation elements to weather events and potential deterioration.

In addition to the visual observations, ECS also reviewed select structural plan sheets for the proposed addition, prepared by Astorino and dated 02/23/2012, and select structural foundation plan sheets of the existing building dated 09/28/1944. We were also provided with a "Geotechnical Engineering Investigation – Preliminary Report" dated June 3, 2011 prepared by GAI Consultants. In the Geotechnical Report, the results of 5 test borings associated with the proposed building are discussed. In those borings, bedrock was encountered at depths varying between 6 to 17 feet below grade at that time, with rock coring to lengths of up to 12 feet performed in the borings, exhibiting limestone bedrock. The report identifies bedrock at or near the proposed foundation elevations, and recommends that the building be supported on spread footings bearing on the rock and proportioned based on an allowable soil bearing pressure of 10,000 psf.

Observations:

The ECS Engineer visited the site to observe the site conditions, with an emphasis on evaluating the condition of the bedrock in the excavation for support of the proposed structure. The rough grading at the site appears to have included several feet of rock removal, with the exposed excavation sidewalls consisting of massive, hard, and intact limestone bedrock. In several areas, the foundations supporting the existing Building No.1, a 6-8 story hospital building were observed to be bearing directly on the bedrock. The bottom of the excavation had some areas of surficial loose aggregate-sized pieces and areas of shallow standing water. Hand probing was performed in these areas to explore for the presence of fractures or voids, but none were identified. Some seepage into the excavation was observed as coming from underneath the existing Building 1 in the southeast corner (see sketch). As previously mentioned, the north side of the excavation had not yet been completed due to the greater apparent percentage of soil.


Recommendations:

It is our opinion that the site preparation can be completed and the proposed Laboratory B1 addition can be constructed in accordance with the project plans, specifications, and the Geotechnical Report. ECS recommends that a representative of ECS be on-site to observe and document all of the foundation subgrade preparation, in order to verify that the subgrade is comprised of intact bedrock that is free of seams and voids that could affect foundation performance. The subgrade at the bottom of the excavation should be monitored and proof rolled with the heaviest roller/equipment that can access the excavation in order to facilitate this evaluation. In addition, we recommend that all below grade walls and the slab be protected from water intrusion with appropriate waterproofing measures. It is especially recommended that the new addition include a sump pump to remove groundwater seepage from beneath the building. If a sump pump system is not used to collect and remove groundwater seepage, water intrusion and related damages could occur in the new addition. Full design plans were not provided for our review, so it is not known if this is already incorporated into the design. Functionality of the sump system will also require the use of clean stone beneath the concrete slab to facilitate movement of the water to the sump location. ECS should be contacted to discuss additional details of this system if a sump is not already included in the design.

Based on our observations, the bedrock at this site is capable of providing the required 10,000 psf bearing capacity. The bearing conditions at all foundation areas should be verified prior to placement of reinforcing steel and concrete. Soil seams, rock fractures, or voids will require attention and repair prior to foundation placement, if encountered.

If additional consultation or review/development of construction specifications or field observation services for this project are required, ECS can also assist with these tasks. Please do not hesitate to contact the undersigned with additional questions.

Respectfully,  
**ECS Mid-Atlantic, LLC**

  
J. Matthew Carroll, P.E.  
Geotechnical Department Manager



Vice President

Enclosures: Site Photographs  
Site Sketch





SITE PHOTOGRAPHS  
November 2016



LEBANON VA MEDICAL CENTER  
Laboratory B1 Subgrade

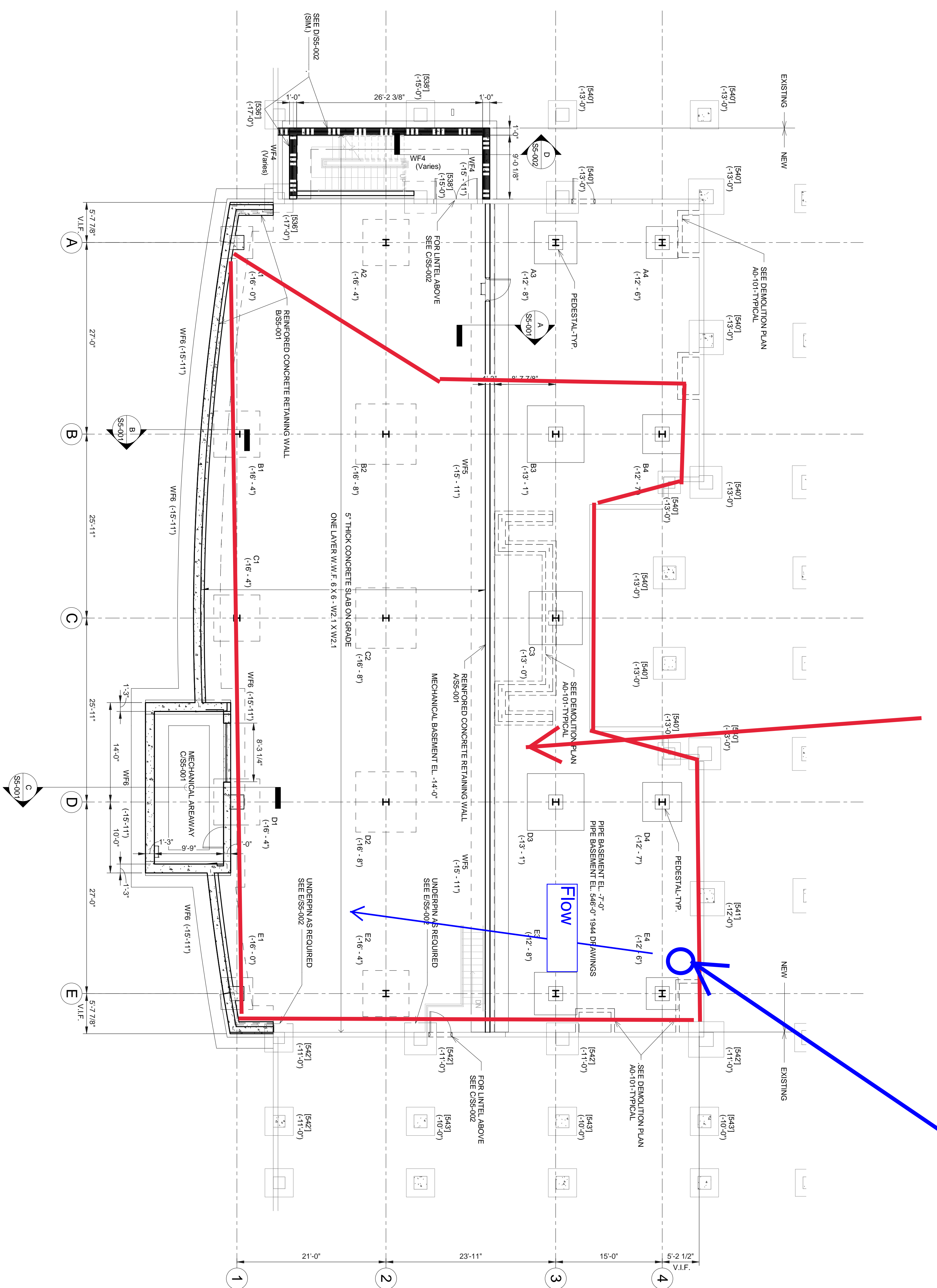




SITE PHOTOGRAPHS  
November 2016



LEBANON VA MEDICAL CENTER  
Laboratory B1 Subgrade



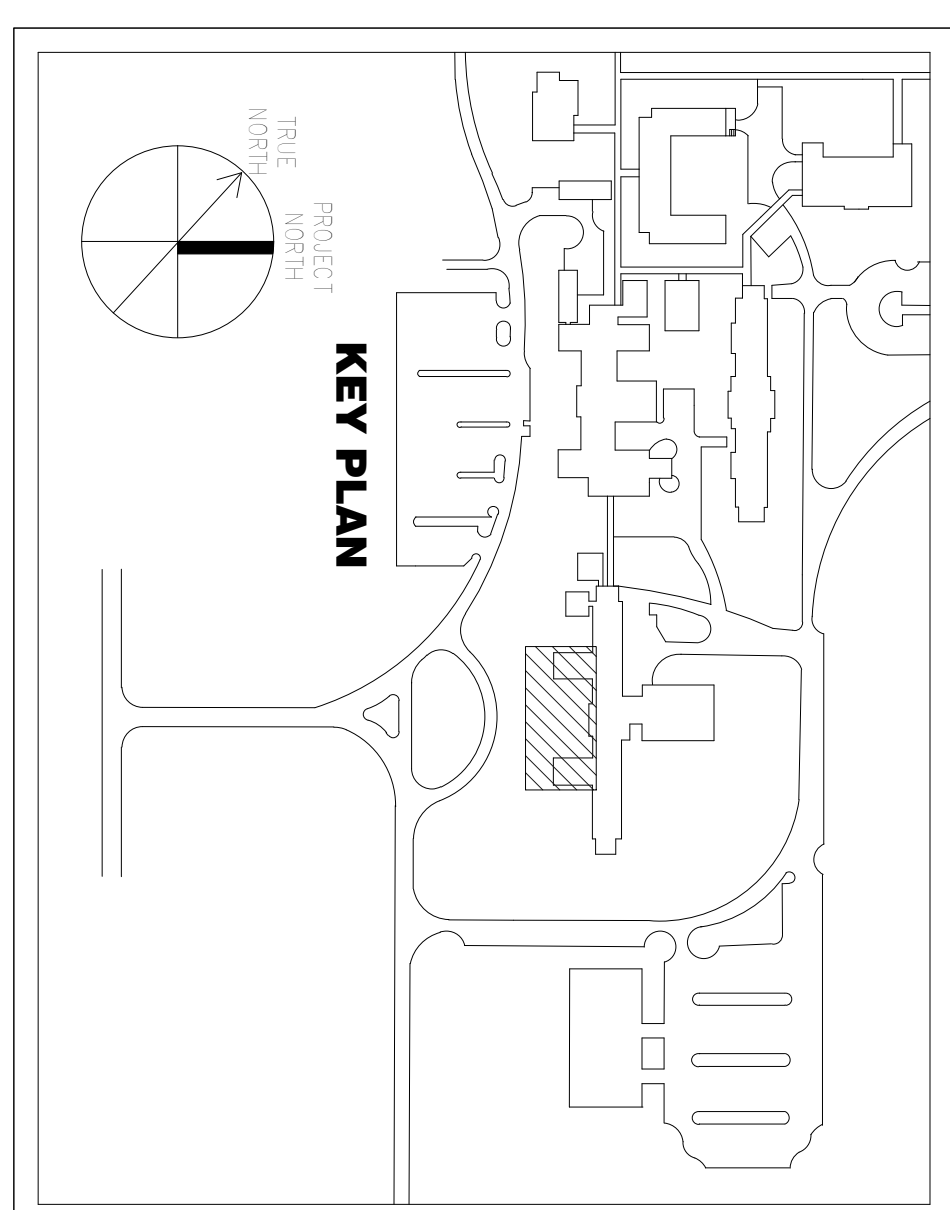
Approximate Extents of Excavated Area

Water Seepage Observed

FOOTING SCHEDULE				
Mark	Length	Width	Thickness	Reinforcing
A1	4'-6"	4'-6"	1'-0"	(4) #5 E.W. @ 16" O.C.
A2	6'-6"	6'-6"	1'-4"	(7) #6 E.W.
A3	6'-0"	6'-0"	1'-2"	(7) #6 E.W.
A4	4'-6"	4'-6"	1'-0"	(4) #6 E.W. @ 16" O.C.
B1	6'-6"	6'-6"	1'-4"	(7) #6 E.W.
B2	8'-6"	8'-6"	1'-8"	(7) #7 E.W.
B3	8'-0"	8'-0"	1'-7"	(6) #6 E.W.
B4	5'-6"	5'-6"	1'-1"	(6) #5 E.W.
C1	6'-6"	6'-6"	1'-4"	(7) #6 E.W.
C2	8'-6"	8'-6"	1'-8"	(7) #7 E.W.
C3	7'-6"	7'-6"	1'-6"	(7) #6 E.W.
D1	6'-6"	6'-6"	1'-4"	(7) #6 E.W.
D2	8'-6"	8'-6"	1'-8"	(7) #7 E.W.
D3	8'-0"	8'-0"	1'-7"	(6) #6 E.W.
D4	5'-6"	5'-6"	1'-1"	(6) #5 E.W.
E1	4'-6"	4'-6"	1'-0"	(4) #6 E.W. @ 16" O.C.
E2	6'-6"	6'-6"	1'-4"	(6) #6 E.W.
E3	6'-0"	6'-0"	1'-2"	(7) #6 E.W.
E4	4'-6"	4'-6"	1'-0"	(6) #5 E.W.

Wall Footing Schedule			
Mark	Width	Thickness	Cont. Reinforcing
WF4	4'-0"	1'-3"	(5) #5 CONT.
WF5	6'-0"	1'-3"	(6) #5 CONT.

Prime Reinforcing	
WF4	#5 X 3-6 AT 12"
WF5	#5 X 4-9 AT 12"
WF6	#5 X 5-6 AT 12"



CONSTRUCTION DOCUMENT SUBMISSION

FULLY SPRINKLERED

CONSULTANTS:

ARCHITECT/ENGINEERS:

Drawing Title  
**Mechanical  
Basement-Foundation Plan**

Project Title  
**VAMC-Lebanon-Renovation  
of Laboratory B1**

Office of  
Facilities  
Management

Number	Description	Date
Revision Schedule		

**1** Mechanical Basement-Foundation Plan  
FINISHED FLOOR EL. -14'-0" UNO.  
(08'-0") = BOTTOM OF FOOTING ELEVATION  
(08'-0") = EXISTING BOTTOM OF FOOTING 1944 DRAWINGS

**ASTORINO**  
ARCHITECTURE  
ENGINEERING  
INTERIOR DESIGN  
DESIGN/BUILD  
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Approved Project Director  
**Mechanical  
Basement-Foundation Plan**

Location  
Date  
**02/23/2012**

Checked  
MBB  
Drawn  
JPL  
Dwg. of  
**S1-100**

