

June 17<sup>th</sup>, 2021

Attn: Brent Miller  
Sauk County Administrator  
Sauk County West Square Building  
Room #134  
505 Broadway  
Baraboo, WI 53913

Attn: Bill Devine  
Devine Construction Inc.  
W8351 Bedrock Rd.  
Portage, WI 53901

**RE:** Proposal for a Geotechnical Investigation  
Sauk County Highway and Transportation Facility  
Baraboo, WI

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Dear Mr. Devine:

Westwood Infrastructure, Inc. (Westwood), formerly OMNNI Associates, Inc., thanks you for the opportunity to present this proposal and cost estimate to provide a subsurface investigation and geotechnical design and construction recommendations for a proposed Highway and Transportation Facility for the Sauk County Highway Department. This proposal is intended to present a work scope and cost estimate for Westwood's services.

## PROJECT INFORMATION

Westwood understands that the Sauk County Highway Department is proposing to replace their existing combined office and equipment facility. The current and proposed facility are both located on the north side of Linn Street which is also State Trunk Highway (STH) 136. Preliminary architectural, structural, and site topographic plans were provided as well as approximate building loads. The proposed facility will predominantly be constructed in a vacant grassy space northeast of the existing facility building, and the development will also extend into a current wooded region northwest of the vacant grassy space. The region for the new facility has a shallow slope with existing surfaces within the proposed development region of elevation 950 feet in the wooded region in the northwest corner to elevation 890 feet in the grassy region in the southeast corner.

It is also our understanding that preliminary site work will be performed by the Sauk County Highway Department that will consist of general clearing and grubbing, stripping topsoil, and removing cut soils to within 1 foot of grade in planned areas of site cut. Cut soils will be stockpiled in the quarry just north and west of the site and topsoil will be stockpiled in a separate pile. As part of the overall construction project, the site earthwork contractor will be required to remove any site soils to final plan slab section subgrade elevations (slab plus base fill depth) in areas of cut that the County has removed soil to within 1 foot of planned grades.

Sauk County will not clear and grub/strip topsoil in planned areas of site fill. The clearing and grubbing, stripping of topsoil and placement of structural fill in planned structural fill areas will be required during building construction by the site earthwork contractor. Also, it is our understanding that structural fill soil used to construct the planned building pad will be required to be constructed using imported structural fill meeting project gradation and testing requirements as provided by the geotechnical engineer. The imported structural

fill will be required in all areas of structural fill beneath the building and extending to the perimeter road shoulder east and south of the planned building. Structural fill will then extend downward from the shoulder point at a 1:1 slope. It should also be noted that with deeper structural fills required to build up the site and with little tolerance for differential settlement, imported structural fill soil will likely be specified to be compacted to a higher degree of compaction with moisture control.

All fill placed outside the 1:1 slope on embankment fills could consist of existing site material as excavated and stockpiled by the County or structural fill at the earthwork contractor's choice assuming the fill can be compacted to the specified degree of compaction. Also, in placing the structural fill and any embankment fill placed on existing native sloping surfaces, the existing surface will be recommended to be benched such that all fill placed on the native ground will be placed on horizontal, not sloping, surfaces. It is anticipated that the geotechnical engineer will provide cross sections in areas of structural fill and/or embankment fill indicating benching and depths of cut to remove topsoil or unsuitable bearing soil prior to beginning placement and compaction of embankment or structural fill.

The new highway facility building will generally be rectangular-shaped at approximate dimensions of 550 feet in a north-south orientation and 300 feet in an east-west direction. Building utilization will consist of office space in the central region and garage space for parking in the southern region and for repair in the northern region. The building is proposed to be a slab-on-grade building consisting of precast wall panels and steel framing. The preliminary provided building load estimates were as follows: maximum interior column loads of 155 kilo-pounds (kips), maximum interior strip footings of 12.6 kips-per-linear foot (klf), and maximum exterior strip footings of 6.6 klf. The finished floor was initially proposed at elevation 914 feet, but it is our understanding that the finished floor elevation may be lowered to approximately 911 feet. Based on the initially proposed finish floor elevation and planned location of the new facility, portions of the building and surrounding pavement will be located in areas of cut and portions of the building and surrounding pavement will be in deeper fill. Fill depths of greater than 15 feet are anticipated in the southeasterly portion of the building and surrounding pavement. Cut depths of up to 10 feet are anticipated in the far northwesterly portion of the proposed building area and up to 15 feet in the surrounding northwesterly pavement areas.

In addition to the planned new Highway and Transportation Facility, a new salt shed is being proposed in the far southwesterly portion of the site and generally south and west of the existing County Highway Facility. The salt shed will likely be a timber structure with shallow concrete retaining wall foundations and a slab on grade. For purposes of this proposal, two additional geotechnical borings to a depth of 15 feet each were estimated in this region. Depths of these borings may vary depending on final grades which were not available at the time of this proposal.

Westwood recommends performing a total of nineteen (19) soil borings with thirteen (13) borings within the building, one (1) boring upslope of the northwest corner of the proposed building, two (2) borings along the existing slope east and southeast of the proposed building and near the toe of the proposed deeper fills, one (1) boring in the parking lot west of the proposed building, and two (2) borings in the salt shed area south and west of the proposed building. Soil boring depths within the building area were based on the estimated building foundation loads as well as the estimated soil bearing and originally planned site grades. Borings in the proposed building area are recommended to extend to a depth of 30 feet beneath the proposed finished floor grade within the interior of the building and to a depth of 20 feet beneath the proposed finished floor grade along the perimeter of the building. Due to the sloping site grade, the existing grades throughout the site are often either above or below the finished floor; therefore, borings in the northwestern region are to generally extend deeper, up to 30 feet beneath existing ground surface (bgs), and borings in the southeastern region are to generally terminate at more shallow depths, as shallow as 10 feet bgs. Boring depths are recommended to extend to 10 feet bgs for the parking lot, 20 ft bgs for the drive area northwest of the building and fill areas on the south and

east ends of the building, and to 15 feet bgs for the salt shed area. A preliminary boring location plan with proposed boring depths and estimated existing surface elevations is provided as Figure A1.

Westwood proposes to perform the subsurface exploration as outlined above and as shown on the accompanying proposed soil boring plan. The subsurface exploration would be subcontracted to Geotechnical Drilling Contractors, LLC (GDC). The geotechnical reports, soil boring logs and any associated laboratory testing would be performed by Westwood. The geotechnical report is to be a comprehensive report that will be included in the project specification package and will provide design and construction recommendations required for building foundations, slabs on grade, structural and embankment fills, site preparation, utility construction, roadway construction, retaining structures (salt shed), slope stability, site testing requirements, etc.

#### **GEOTECHNICAL SCOPE OF WORK**

1. Confirm boring quantities, locations, and depths with the Client/Architect prior to drilling.
2. Westwood to provide horizontal coordinates using GPS equipment. Borings would be staked, and surface elevations would be obtained by the Sauk County Highway Department.
3. Drilling subcontractor to contact Diggers Hotline for public utility locates prior to performing the on-site subsurface exploration.
4. Perform the following on-site subsurface exploration.
  - a. Mobilize a truck-mounted drill rig to each location.
  - b. Perform the soil borings using standard penetration test (SPT) sampling methods with the drill rig. Samples to be obtained at 2.5-ft intervals until boring completion.
  - c. Obtain subsurface water levels, if encountered, at the time of exploration.
  - d. Perform a total of nineteen (19) soil borings at the following locations and depths as indicated on the attached proposed soil boring plan:
    - i. Building: Perform thirteen (13) soil borings to depths ranging from 10 feet below existing ground surface (bgs) to 30 feet bgs based on the correlation of the existing sloped surface, estimated foundation loads, and the proposed finished floor at elevation 911 feet.
    - ii. Parking Lot and Drive Areas: Perform two (2) soil borings to depths of 10 to 20 feet bgs.
    - iii. Salt Shed Area: Perform two (2) soil borings each to a depth of 15 feet bgs.
    - iv. Deep Fill Area: Perform two (2) soil borings each to a depth of 20 feet bgs each near the toe of the slope on the south and east end of the proposed building for determining suitability of soils near the toe of the slope for placement of fill and planned foundation loads and for determining stability of the fill slope on existing soils.
  - e. Fill the boreholes in compliance with Wisconsin Department of Natural Resources (WDNR) Chapter NR 141 abandonment requirements. Patch all asphalt pavement penetrations with asphalt cold mix.
  - f. Dispose of all soil cuttings for all borings on the site.
  - g. Return samples obtained to the Westwood laboratory.
5. Perform standard classification by a geotechnical engineer according to Unified Soils Classification System (USCS) classification on all soil borings.
6. Perform laboratory testing of soils to aid in classification of soils and to provide required engineering design parameters. Laboratory testing of soils to be based on soils encountered and representative samples of the soil. Anticipated laboratory testing to include:
  - a. Moisture content of all soil samples.
  - b. Where finer grained soils are encountered, spring penetrometer testing for estimates of unconfined compressive strength will be performed from split-spoon soil samples.
  - c. Atterberg Limit Tests, one within the approximate stormwater pond basin.
  - d. Organic Content Tests if any organic soils are encountered, one test.
7. Prepare a written geotechnical report to include the following items:
  - a. Recommendations for support of building foundation, slab-on-grade, and retaining structures including:
    - i. Foundation types and applicable soil and water engineering properties including:

1. Total and differential settlement estimates.
2. Soil unit weights, internal angle of friction and cohesion.
3. Allowable soil bearing pressures.
4. Equivalent fluid pressure.
5. Lateral earth pressure recommendations pending any below grade walls including active, at-rest, and passive earth pressure coefficients.
6. Average frost depth.
- ii. Recommendations for modulus of subgrade reaction for slabs on grade, seismic site class classification, and the coefficient of friction between the soils and concrete will also be provided.
- b. Design and construction recommendations for the pavement area including:
  - i. Site preparation information including placement and compaction of engineered fill, control of groundwater, and improvement of unstable soil.
  - ii. Recommendations for asphalt and base course materials and thickness for proposed parking and drive areas.
  - iii. Provide design parameters for pavement design.
- c. Construction recommendations for both building and pavement components including:
  - i. Site preparation considerations including cut and fill recommendations.
  - ii. Provide sections for embankment fill areas for benching fill soil and removing topsoil/unsuitable soil for embankment fill support.
  - iii. Excavation and backfill methods for proposed structures as well as utility installation.
  - iv. Ground and surface water control considerations including damp proofing, water proofing and/or drain tile recommendations.
- d. Provide stability modeling of deep fills and cuts and based on existing and proposed fill soils. Based on stability modeling, provide recommendations for construction of deep fill, suitability of existing site soils for construction of deep fills, stability of fill on existing soils, and fill/cut slope recommendations based on soil slope stability.
- e. Computer generated soil boring logs following USCS criteria, laboratory test results, surface and subsurface site conditions, water level information, exploration procedures, and a soil boring location plan drawing.
8. Provide project coordination and project administration services to complete the subsurface exploration and reporting.

### ADDITIONAL SCOPE OF WORK

The following services are not initially included in the cost of this proposal, but should they be required, could be provided with an additional fee. Additional work scope items would be as follows:

1. Additional borings beyond the nineteen (19) borings or to a depth deeper than indicated in the provided soil boring map.
2. Drill cutting soil disposal off site.
3. Site restoration due to drill rig mobilization to the soil boring locations.
4. The cost for an authorized Westwood representative to accompany the drillers during on-site drilling operations.
5. Costs for any specialized laboratory testing such as direct shear and/or triaxial tests, consolidation or swell tests, resistivity tests, or laboratory/field CBR tests.
6. Site design services or permitting.
7. Environmental investigation and/or soil testing for potential contamination.
8. Survey services required to locate borings and determine elevations at boring locations.

### CLIENT RESPONSIBILITIES

Client shall perform and/or provide the following in a timely manner so as not to delay the Services of Consultant. Unless otherwise provided in this proposal, Client shall bear all costs incident to compliance with the following:

1. Confirm/advise soil boring quantities, depths, and locations prior to commencing drilling operations.
2. Any changes in building site layout and building loads are requested to be provided.
3. Provide access to the site as well as permission to drill on the proposed site.
4. Stake boring locations and obtain surface elevations.
5. Clear trees at the proposed locations for soil borings B03, B14, and B17.
6. Notify Consultant of any known or suspected hazardous substances that Consultant employees may encounter.
7. Provide private utility locates for any privately owned site utilities.

### GEOTECHNICAL SCHEDULE

Westwood's performance schedule for the geotechnical work would generally be as follows:

- Perform the geotechnical drilling the week of July 5, 2021.
- Drilling services would generally be completed in **three (3) days**.
- Complete the soil classification, soil logs and laboratory work within **two (2) weeks** of completion of the drilling.
- Provide soil bearing capacity/settlement estimates for the Highway and Transportation Building within two weeks of completion of drilling.
- Complete the final geotechnical investigation report with the finished soil logs delivered to the Client within **four (4) weeks** of completion of laboratory testing.

**GEOTECHNICAL FEES**

Based on Westwood's current schedule of fees and fees provided by the drilling subcontractor, GDC, the geotechnical work scope within this proposal would be performed for a total fee of \$18,300.00. Fee components are as follows:

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|---|-------------|
| • Geotechnical Drilling Contractors, LLC (GDC) (Drilling Subcontractor) | \$ 9,190.00 |
| • USCS and Lab Testing  | \$ 3,860.00 |
| • Reporting/Administration  | \$ 5,250.00 |

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<b>Total</b>	<b>\$ 18,300.00</b>
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If the soil borings are to be located and staked on-site by Westwood including obtaining surface elevations, this service could be performed for an additional \$750.00.

The following unit prices are proposed for additional services, if necessary, beyond the original subsurface investigation:

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|---|-----------|
| • Additional Borings Cost                 |           |
| ○ Drilling (per linear foot)              | \$ 14.00  |
| ○ Abandonment (per linear foot)           | \$ 4.00   |
| • Geotechnical Engineering Fee (per hour) | \$ 105.00 |

**REMARKS**

If you have any questions regarding this proposal, please do not hesitate to contact me at 920-830-6150.

Sincerely,  
Westwood Infrastructure, Inc.



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Tim Bolwerk, P.E.  
*Senior Geotechnical Engineer / Project Manager*

Attachment 1 – Preliminary Soil Boring Plan – Figure A1 - 6/15/2021





Project Manager: JCW  
Project Engineer: JCW  
Drawn By: JCW  
Checked By: JCW  
Date: 6/15/2021

**SAUK COUNTY HIGHWAY FACILITY  
PROPOSED SOIL BORING LOCATIONS**

**Westwood**  
1 Systems Drive  
Appleton, WI 54914  
(920) 735-6900  
[www.westwoodps.com](http://www.westwoodps.com)

SCALE:  
1" = 150'  
PROJECT NO.  
**P3001318.00**  
FIGURE NO.  
**A-1**