



**S.W. COLE**  
ENGINEERING, INC.

• Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

10-0507

September 15, 2010

Becker Structural Engineers, Inc.  
Attention: Dan Burne, P.E.  
75 York Street  
Portland, ME 04101

Subject: Supplemental Micropile Information  
Proposed Building Renovation  
258 Commercial Street  
Portland, Maine

Dear Dan:

Based on our discussions, we are providing the following supplemental information to our geotechnical report, dated August 7, 2010 (S.W. COLE ENGINEERING, INC. project number 10-0507) for your preliminary design. We understand that actual pile and foundation design will be provided by others likely as a design-build process.

- Lateral Soil Capacity – Because of the loose and variable nature of the fills at the site, no lateral support should be assumed from the fill. All lateral support should be provided by the piling.
- Downdrag – In our opinion, downdrag should not be an issue if no new surface loads are applied near piling.
- Spoils - S. W. COLE ENGINEERING, INC. was not asked to do environmental assessment or testing. At this time, until further information is provided by the environmental consultant, it can be assumed that all spoils created during pile installation and earthwork activities to be disposed of properly off site. Environmental testing should be performed on the fills to assess the need for special disposal by the environmental consultant.
- Micropile Capacity – For preliminary design, assume an 80 ton compressive working capacity for an 8-inch diameter pile cased to bedrock and socketed into bedrock. Additionally, assume a 75 ton tensile working capacity and that all tensile working capacity will be provided by the micropile central reinforcing bar(s). This assumes:
  - 9 $\frac{5}{8}$  inch OD casing ( $\frac{1}{2}$  inch thick), 36 ksi min
  - Assume  $\frac{1}{8}$  inch corrosion on casing

GRAY, ME OFFICE

286 Portland Road, Gray, ME 04039-9586 ■ Tel (207) 657-2866 ■ Fax (207) 657-2840 ■ E-Mail [infogray@swcole.com](mailto:infogray@swcole.com) ■ [www.swcole.com](http://www.swcole.com)

Other offices in Augusta, Bangor, and Caribou, Maine & Somersworth, New Hampshire

- Assume a range of ultimate bond strength between bedrock and grout of 120 to 200 psi and a working bond strength of 25 to 50 percent of ultimate (Post Tension Institute guidelines)
- Assume center reinforcing steel, Grade 75 minimum, # 20 bar (2 ½-inch diameter)
- Assume 4ksi minimum grout strength
- Assume 10 foot min bedrock embedment with an 8-inch socket
- Assume battered piles have same axial capacity as vertical piles with similar or adjusted bedrock embedment

**Note:** These preliminary design values are based on discussions with multiple contractors experienced with the design and construction of micropile foundations. While we understand these values are relatively typical, it must be anticipated final micropile design will differ.

- As discussed in our geotechnical report, the contractor should be aware that the site consists of filled land and should anticipate that wood, cobbles, boulders, cribwork, timber piles, etc. will be encountered which may require specialized drilling and/or offset piles to achieve the necessary pile depths. Additional subsurface investigation may be needed to obtain further subsurface information, including potential obstructions.
- The contractor should assess the subsurface conditions encountered at the borings, general site conditions, anticipated structural loads provided by the structural engineer, as well as any state and local building codes when evaluating a cost-effective pile design
- All performance/Proof load testing, as well as materials testing should be performed by the contractor as part of their own quality control plan developed for the project.
- Actual final pile design, including but not limited to pile type and sizes, spacing, reinforcing, installation methods, capacities, performance verification, etc. should be provided by the contractor.



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We trust this preliminary information meets your needs at this time. If you have any questions, please call.

Sincerely,

**S. W. COLE ENGINEERING, INC.**

A handwritten signature in black ink, appearing to read "E. M. Walker", written in a cursive style.

Evan M. Walker, E.I.  
Geotechnical Engineer

Paul F. Kohler, P.E., President  
Senior Geotechnical Engineer

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