Welcome to the University of Wisconsin–Madison Geoengineering Group—an interdisciplinary research group that comprehensively covers the tenets of geotechnical, geoenvironmental, geological, and geophysical engineering. We emphasize

- Critical thinking
- Analytical reasoning
- Effective written and oral communication

In this series of technical writing style guides, we outline the steps for writing high-quality technical prose, which incorporates each of these emphases and is multi-faceted.

To begin, the primary writer **must thoroughly grasp the subject matter**, such that

1. The theoretical background and scientific underpinnings are comprehensively researched and understood;
2. Experimental methods are appropriate, properly conducted, and consistently applied;
3. Analyses and models are technically correct, back checked, reasonable, and scientifically supported;
4. Multiple and supporting lines of evidence are presented.

As the Calvin and Hobbes cartoon by Bill Watterson amusingly suggests, knowledge of content is a prerequisite to any technical writing endeavor. Many graduate students may spend the majority of their first semester reading, reviewing, synthesizing, and understanding the work of other researchers in the area of application. Do not be concerned if you find yourself reading key publications multiple times—you are progressing from a novice to an expert in the subject area and are expected to struggle along this path.

After acquiring the necessary knowledge, **you must organize the content** prior to writing based on these fundamental building blocks of critical review and analytical reasoning. As French mathematician and physicist Jules Henri Poincaré points out,

*Science is built up with facts, as a house is with stones. But a collection of facts is no more science than a heap of stones is a house.*
Thus, remember that, in technical writing, an assemblage of facts in hodgepodge fashion is not enough. In fact, a document should add up to more than the sum of its parts, and you, as the writer, must make something out of these facts—shape them into or glue them together in a logical sequence and fill in the gaps between them.

**Strategies for Producing Excellent Technical Writing**

So, how do we journey toward a coherent, straightforward, and economical dissemination of our research? Here are the recommendations from our faculty:

1. Outline or summarize your reviewed literature into the essential details (example attached) that will support your theoretical development, materials and methods, analysis, and/or discussion;

2. Prepare a detailed annotated outline for review, discussion, and approval by your advisor before you begin writing (example attached);

3. Prepare a rough draft, which may be rambling and tentative at this point—this is okay. Most writers simply do not think in crisp, well-thought-out sequences, and the initial draft will reflect this;

4. Revise the draft according to the format, style, and conventions required by the target publication (journal or conference) and program faculty (see our Standard Style Guides for internal documents such as theses and research reports and external publication submittals) by
   - Fully following conventions of format and style (The Write Stuff–No. 2) and
   - Avoiding common errors in grammar, punctuation, and references (The Write Stuff–No. 3);

5. Remove the clutter and distractions from the document by focusing on
   - Simplicity (The Write Stuff–No. 4),
   - Parallel structure,
   - Consistency in format, and
   - Readability.

6. Provide sufficient notification and time for review to your advisor and/or co-authors;

7. Schedule and plan for multiple rounds of review and improvements to your document.

Captions are modified from Bill Watterson original comic.