

### **GDOT WFI-LRFD Process**

1. The Geotechnical Engineer (Geotech) receives WFI request and Wall Envelope from Roadway Designer or Structural Engineer. **Note that WFIs are not required for GDOT Standard Walls of any height up to the maximum heights specified in the detail, or any other wall type with a maximum height that is 5 feet or less. GDOT Standard walls are Gravity Walls (GDOT Detail 9031L), Type 2 Walls (GDOT Detail 4949B), Type 6 Walls (GDOT Detail 4949C), and Type P Walls (GDOT Detail PRW-1).**
2. Geotech performs investigation (to now involve drilling on both active and passive sides of wall), generates boring logs and determines soil parameters using Shallow Foundations Spreadsheet.
3. Geotech provides the soil parameters and the Factored Bearing Capacity vs. Footing Width Curve (Red line) to the Structural Engineer for external stability calculations.
4. After further design, Structural Engineer will provide Geotech a Wall Foundation Design Data letter which contains the following for each representative wall height section of the wall:
  - Station and/or Description of wall section
  - Strap Length or Base Width
  - Bearing Pressure and Effective Strap Length/Base Width in the Strength Limit State
  - Bearing Pressure and Effective Strap Length/Base Width in the Service Limit State
  - Surcharge loads for global stability analysis (250 psf live load and any additional load due to structures supported by wall)
5. Geotech will perform factored bearing capacity analysis, settlement analysis, differential settlement analysis and global stability analysis.
6. If large settlement magnitudes prompts the use of lightweight backfill, or global stability analysis prompts an increase in strap length/base width, the Structural Engineer should be notified. The following should take place as a result of this change:
  - a. The Structural Engineer should redesign external stability of the wall using the recommended strap length/base width.
  - b. Please note that this change could affect bearing capacity, settlement, and differential settlement, therefore updated bearing pressures and strap lengths/base widths should be provided by the Structural Engineer to the Geotech for due-diligence checks of the aforementioned parameters.
  - c. Geotech will rerun all analyses and finalize WFI report.

- d. The global stability runs with the appropriate strap lengths will be checked again on construction when the Wall Contractor submits them to the Geotechnical Bureau for review and approval.
- 7. Geotech will include all necessary recommendations in notes such as but not limited to undercutting and replacing with better soils (improving shear strength), use of fabric, use of temporary shoring, mitigation of groundwater conditions, use of lightweight backfill, deep foundation recommendation and analysis, and staging recommendations.
- 8. Geotech will present all information in a WFI (LRFD) report. Basic shallow foundation analyses results will be presented as follows:

Wall Height (ft)	Base Width / Strap Length (ft)	Nominal Bearing Resistance (ksf)	Factored Bearing Resistance (ksf)	Total Settlement (in)
XX	XX	XX	XX	XX
XX	XX	XX	XX	XX

- 9. Field (Wall Contractor) Verification of Global Stability of Wall
  - a. The Wall Contractor shall perform global stability analysis on the final version of the wall to be built on construction, since some changes to design and/or changes in the conditions on construction could potentially occur after WFI is performed in the preliminary design stage. Wall Contractor can either perform this analyses or employ the services of a Geotechnical Consultant.
  - b. All critical sections of the wall must be identified and global stability analyses should be ran at these sections. All global runs must meet the requirements of AASHTO LRFD Specifications, Seventh Edition, 2014 - Section 11.6.2.3.
  - c. Wall Contractor will be required to send their global stability analyses in to OMAT's Geotechnical Bureau for review and approval. This would have to be approved before wall construction commences.
  - d. A special provision has been created to contractually require global stability analysis of the final wall design on construction.
  - e. The WFI-LRFD report will be available to Wall Contractor for use in preparing field global stability analysis.