GRLWEAP Wave Equation Analysis is a one-dimensional software program that models the pile driving process. The program simulates the motions and forces in a pile foundation as it is installed with either an impact or vibratory hammer. It can be used to perform a bearing graph analysis (blow count and stresses versus capacity for multiple capacities), an inspector’s chart analysis (blow count and stresses versus stroke for a single capacity), or a driveability analysis (blow count and stresses for a calculated capacity at a given penetration depth or multiple penetration depths).

**Benefits of Wave Equation Analysis**

- Assists in selection of appropriate pile driving equipment and pile installation procedures
- Computes the blow count vs capacity and blow count vs driving stress relationships for a given hammer-pile-soil system
- Predicts driving stress levels which can be used to reduce the risk of pile damage
- Predicts hammer performance which can be used to optimize hammer selection and driving time
- Models both onshore and offshore pile installations

GRLWEAP Bearing Graph Output
Analysis Procedure

The GRL engineer assembles the project information necessary to perform a wave equation analysis, including details on the proposed pile hammer as well as the hammer cushion, helmet, and, for a concrete pile, the pile cushion. The engineer also obtains the pertinent project details including pile type, pile length, required ultimate capacity, specified driving stress limits, and geotechnical information. Details on any special pile installation procedures such as predrilling or jetting, if proposed, are also gathered, to determine their influence on the soil modeling. Appropriate wave equation input parameters for the hammer, pile, and soil models are then selected based on this information and input into the GRLWEAP program. Depending upon the project needs or requirements, a wave equation bearing graph, inspectors chart, or driveability analysis is performed. The GRL engineer prepares a final report summarizing the wave equation analyses performed, the analysis results, and applicable pile installation recommendations.

For additional information on Wave Equation Analysis or any other GRL Engineers service please contact info@GRLengineers.com or visit us at www.GRLengineers.com.

GRLWEAP Driveability Analysis Graphical Results

GRLWEAP Driveability Analysis Numerical Results

GRLWEAP Inspector’s Chart