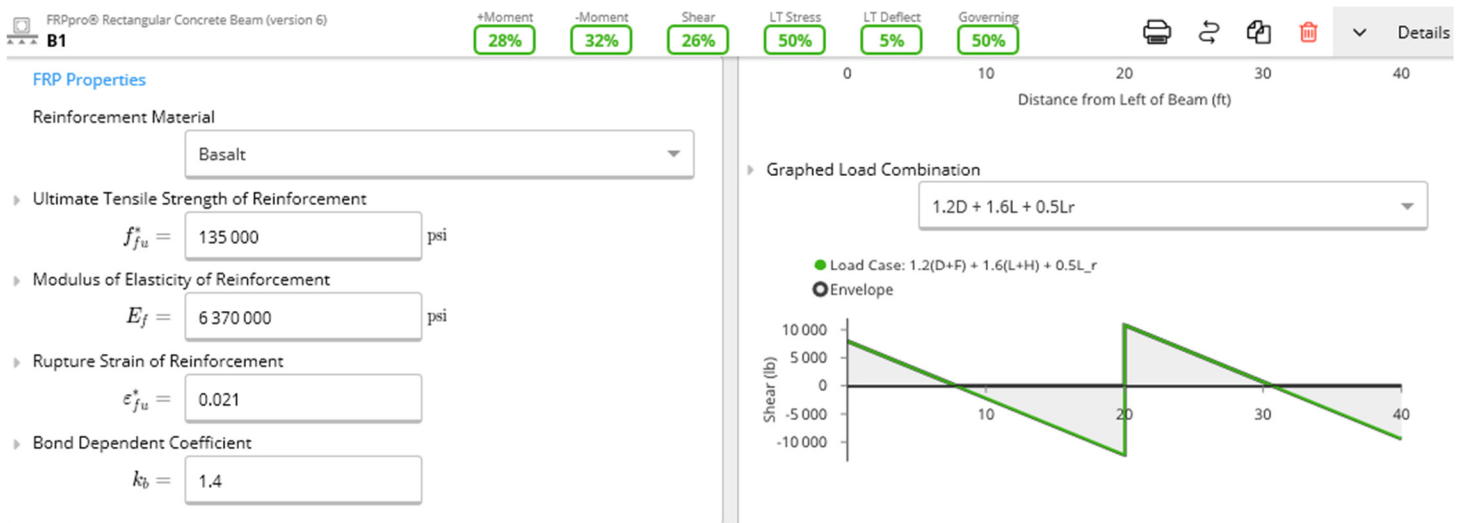
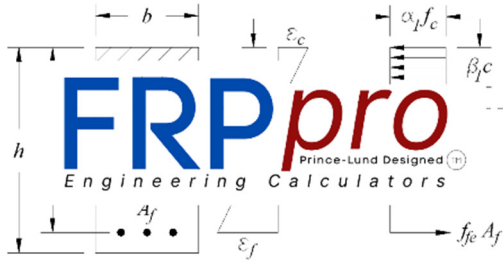


## FRPpro™ Manufacturer Private Design Bundle



(partial screenshot of the FRPpro™ Calculator)



## FRPpro™ Overview

FRPpro™ calculators, designed by Prince-Lund Engineering, PLC, is a cloud computing set of calculations used to calculate the strength and adequacy of concrete structural members reinforced with fiber reinforced polymers (FRPs).

FRPpro™ calculators are powered by the ClearCalcs™ platform, a cloud computing service that hosts various types of structural engineering calculators.

## FRPpro™ Benefits

- ✓ Design FRP reinforced members easily
      - ✓ Finite element load analysis
      - ✓ Self-checking
    - ✓ User friendly section and FRP bar configurations
  - ✓ Displays the math – No “black box” calculations
    - ✓ ACI 318 and 440.1 compliant
    - ✓ Cloud Computing – Design from any connected computer
- ✓ Automated calculations after each input

## FRPpro™ Private Design Bundle

Created and pre-populated with a manufacturer’s FRP bar material properties, Prince-Lund Engineering offers a Private Design Bundle of FRPpro™ calculation tools, training, and support. Included in the FRPpro™ Private Design Bundle:

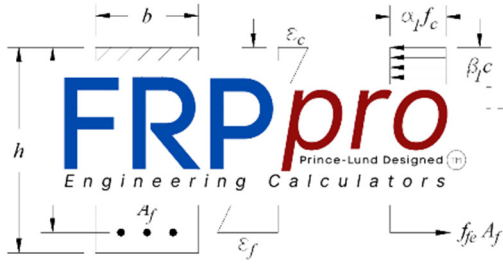
### **1. FRPpro™ Calculator License**

One full FRPpro™ Calculator user license. This license grants the user with the ability to design FRP reinforced concrete members in the current versions of ACI 440.1 and ACI 318. A manufacturer will be able to design FRP reinforced concrete beams, girders, walls, and one-way structural slabs (walls and slabs are modeled as strips) using its own material properties and a powerful finite element analysis of beams. Currently, the FRPpro Calculator user license includes:

Inputs:

Member length, height, and width  
 Concrete strength, weight classification, and cover  
 Coarse aggregate size  
 Multiple spans and support types  
 Bond and environmental coefficients

Crack width and deflection limits  
 Longitudinal bar size and layers  
 Stirrup bar size, number of legs, spacing, and angle of inclination  
 Distributed, line, point, and moment loads



**Analysis, Checks, and Results:**

Load combination and cracked section analysis  
 Moment demand and capacity  
 Creep rupture stress limits  
 Crack widths  
 Main and bent bar development length  
 Lap splices

Shear strength at supports  
 Deflection analysis  
 Governing load case for positive and negative moments  
 Shear demand and capacity  
 Maximum and sustained bar stress level  
 Critical live, long-, and short-term deflections

**Project Management Features:**

In addition, the FRPpro™ Calculator license will allow a manufacturer to manage multiple design projects, create multiple structural members for each project, produce and print simple or detailed reports, copy or duplicate calculations, change between U.S. Standard and metric (SI) units, and more.

**2. Manufacturer branded FRPpro™ calculator.**

Embed code will be provided to the FRP bar manufacturer to install the FRPpro™ calculator on its website. The manufacturer may brand the embedded calculator as it wishes, require a user to “sign up” in order to use the calculator thereby acquiring user contact information, or other marketing needs.

An embedded FRPpro™ Calculator will allow a user the same features of the full license described above, but without the project management features and the ability save his/her work. Manufacture Benefits: User generated, warm leads to designers and specifiers.

**3. Training and Support**

- ✓ FRPpro™ initial user training session(s) covering basic operational procedures, including project management, user inputs, calculation checks, and calculation results (up to 10 hours).
- ✓ Additional training, education, consulting, or other correspondence (up to 10 hours per month). Additional time may be available at an hourly rate.