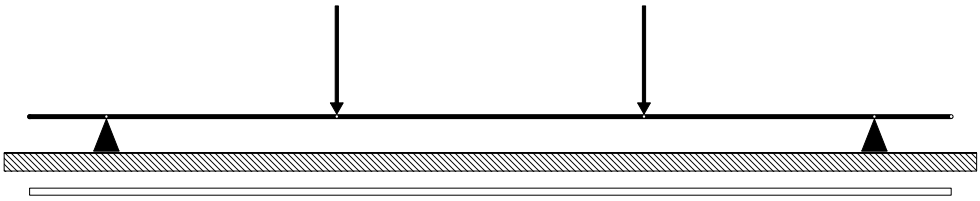
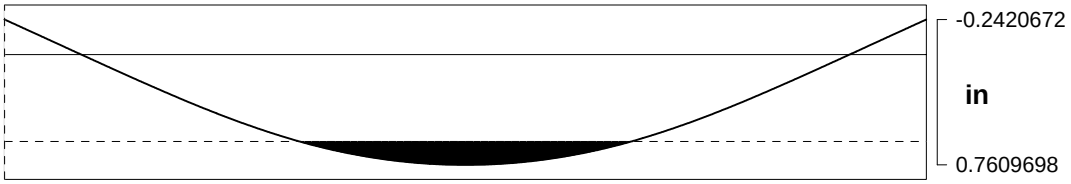
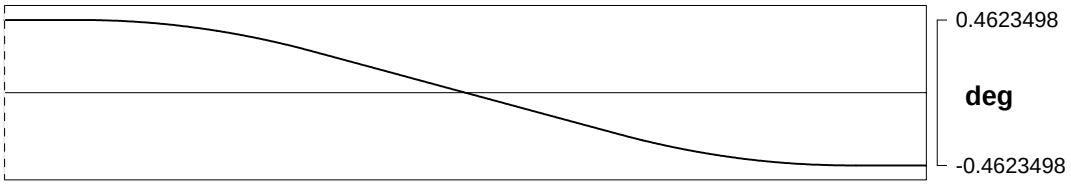
Inv ng sample1



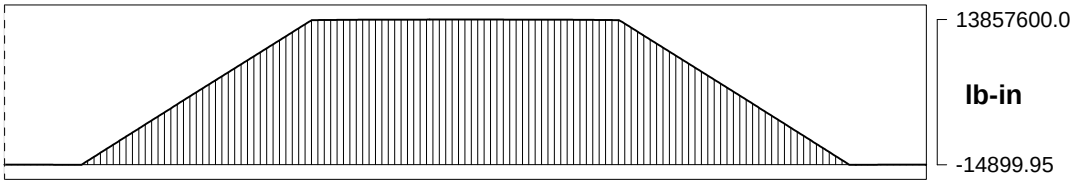
Beam Length: 360.0 in Location: 0.0 in



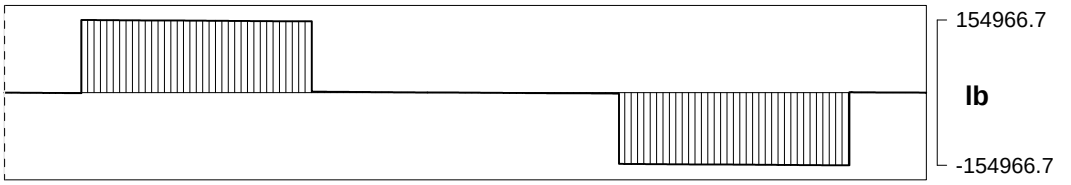
Deflection -0.2420672



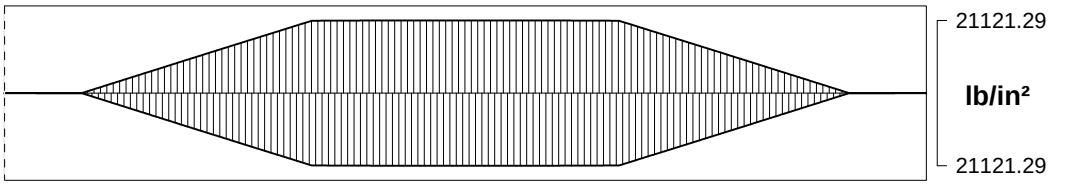
Slope 0.4623024



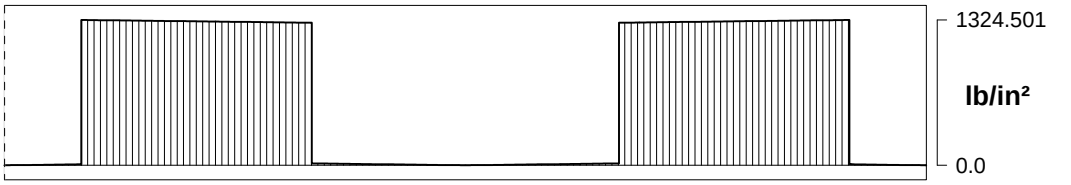
Moment 0.0



Shear 0.0



Bending Stress Tensile: 0.0 Compressive: 0.0



Average Shear Stress 0.0

** Inv ng sample1 **

  This loading is with one support 2.5ft in from each end. Self weight of the beam
  is included here.

BEAM LENGTH = 360.0 in

MATERIAL PROPERTIES
  Modulus of elasticity = 30000000.0 lb/in²
  Density = 0.283 lb/in³

CROSS-SECTION PROPERTIES
  W14x398 X:
  Moment of inertia = 6000.0 in^4
  Top height = 9.145 in
  Bottom height = 9.145 in
  Area = 117.0 in²

EXTERNAL CONCENTRATED FORCES
   150000.0 lb at 120.0 in
   150000.0 lb at 240.0 in

LIMITS - ABSOLUTE
  Limit per CMAA #74:
  Tensile = 21600.0 lb/in²
  Compressive = 21600.0 lb/in²
  Shear = 12600.0 lb/in²
  Deflection = 0.6 in

SELF WEIGHT LOADS ***
  Load #1: 33.111 lb/in at 0.0 over 360.0 in
          Total self weight = 11919.96 lb

SUPPORT REACTIONS ***
  Simple at 30.0 in
  Reaction Force =-155960.0 lb

  Simple at 330.0 in
  Reaction Force =-155960.0 lb

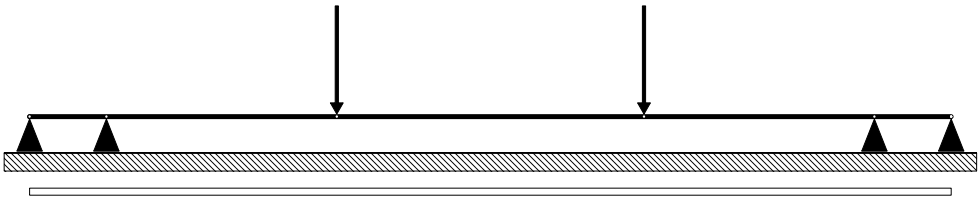
MAXIMUM DEFLECTION ***
   0.7609698 in   at   180.0 in
  Over Limit Factor =1.27 : 0.1609697 in

MAXIMUM BENDING MOMENT ***
   13857600.0 lb-in   at   180.0 in

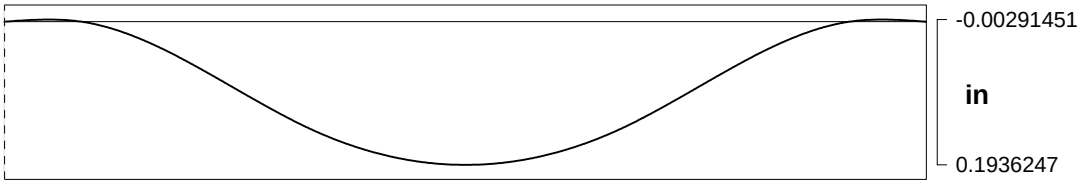
MAXIMUM SHEAR FORCE ***
   154966.7 lb   at   30.0 in
  -154966.7 lb   at   330.0 in

MAXIMUM STRESS ***
  Tensile   = 21121.29 lb/in²   Safety Factor =1.023
  Compressive = 21121.29 lb/in²   Safety Factor =1.023
  Shear (Avg) = 1324.501 lb/in²   Safety Factor =9.513

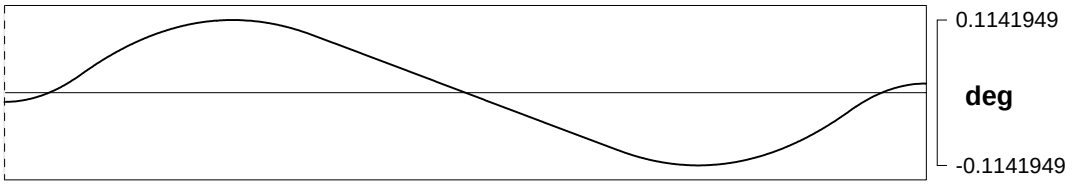
INV NG Sample2



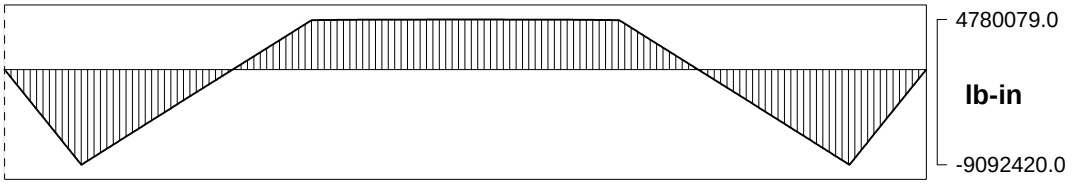
Beam Length: 360.0 in Location: 0.0 in



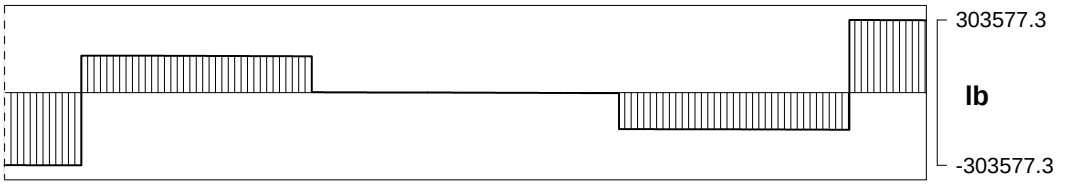
Deflection 0.0



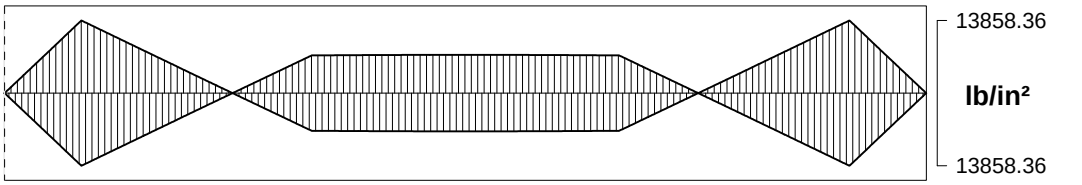
Slope -0.01445918



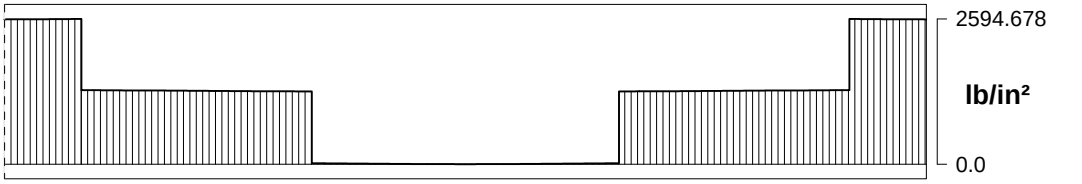
Moment 0.0



Shear -302584.0



Bending Stress Tensile: 0.0 Compressive: 0.0



Average Shear Stress 2586.188

** INV NG Sample2 **

  This is the calculations with one support 2.5ft from each end and an additional one
  added at each end for a total of 4 supports. This includes the self weight of the beam.

BEAM LENGTH = 360.0 in

MATERIAL PROPERTIES
  Modulus of elasticity = 30000000.0 lb/in²
  Density = 0.283 lb/in³

CROSS-SECTION PROPERTIES
  W14x398 X:
  Moment of inertia = 6000.0 in^4
  Top height = 9.145 in
  Bottom height = 9.145 in
  Area = 117.0 in²

EXTERNAL CONCENTRATED FORCES
   150000.0 lb at 120.0 in
   150000.0 lb at 240.0 in

LIMITS - ABSOLUTE
  Limit per CMAA #74:
  Tensile = 21600.0 lb/in²
  Compressive = 21600.0 lb/in²
  Shear = 12600.0 lb/in²
  Deflection = 0.6 in

SELF WEIGHT LOADS ***
  Load #1: 33.111 lb/in at 0.0 over 360.0 in
          Total self weight = 11919.96 lb

SUPPORT REACTIONS ***
  Simple at 0.0 in
  Reaction Force = 302584.0 lb

  Simple at 30.0 in
  Reaction Force =-458544.0 lb

  Simple at 330.0 in
  Reaction Force =-458544.0 lb

  Simple at 360.0 in
  Reaction Force = 302584.0 lb

MAXIMUM DEFLECTION ***
   0.1936247 in   at   180.0 in
  Safety Factor =3.099
  Safety Margin = 0.4063752 in

MAXIMUM BENDING MOMENT ***
  -9092420.0 lb-in   at   30.0 in
  -9092420.0 lb-in   at   330.0 in

MAXIMUM SHEAR FORCE ***
  -303577.3 lb   at   30.0 in
   303577.3 lb   at   330.0 in

MAXIMUM STRESS ***
  Tensile   = 13858.36 lb/in²   Safety Factor =1.559
  Compressive = 13858.36 lb/in²   Safety Factor =1.559
  Shear (Avg) = 2594.678 lb/in²   Safety Factor =4.856