**Beam Length:** 360.0 in  
**Location:** 0.0 in

- **Deflection:**
  - -0.2420672 in
  - 0.7609698 in

- **Slope:**
  - 0.4623024 deg
  - -0.4623498 deg

- **Moment:**
  - -14899.95 lb-in
  - 13857600.0 lb-in

- **Shear:**
  - 0.0 lb
  - 154966.7 lb
  - -154966.7 lb

- **Bending Stress:**
  - Tensile: 0.0 lb/in²
  - Compressive: 0.0 lb/in²

- **Average Shear Stress:**
  - 0.0 lb/in²
  - 1324.501 lb/in²
  - 0.0 lb/in²
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

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
Beam Length: 360.0 in
Location: 0.0 in

Deflection

Slope

Moment

Shear

Bending Stress

Average Shear Stress
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 in⁴
  - 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