# Design Examples

**Given:**

**Foundation Repair of wall due to settlement.**

**Design load per pier = 18,000 lbs.**

**Underlying Soil Strata:**

**0 to 5 feet uncontrolled fill**

**Overlying stiff clay with N values of 20 at 10 feet, 40 feet at 20 feet, and 50 at 30 feet.**

**Factor of safety = 2**

**Find:**

**- Sizes of helix pier shaft and helix (helices) required to support the design load.**

**- Required installation torque.**

**- Required depth of pier below foundation grade.**

**- Required pier attachment to foundation.**

**Helical Pier Shaft:**

**1 ½ inch square shaft (ASTM A576, Grade C-1045)**

**- Working Capacity = 35 kips (F.S. = 2)**

**- Design Pier Load = 18 kips**

**Helix (Helices):**

**Single ½ inch thick, 8-inch diameter helix (ASTM A36)**

**- Working Capacity = 27.5 kips (F.S. = 2)**

**- Design Pier Load = 18 kips**

**Installation Torque:**

**- Torque required = 18,000 lbs / 10 ft-1**

**- 1,800 ft-lbs of torque**

**- Ultimate torque capacity = 6,000 ft-lbs**

**- Design Pier Load = 18 kips**

**- Required torque capacity = 1,800 ft-lbs of torque**

**Required Depth of Pier:**

**- Pier to extend through fill material, into stiff clay below.**

**- Pier depth to be determined when installation torque is attained.**

**- Minimum pier length is recommended to be 20 feet below foundation grade.**

**Required Pier Attachment:**

**- Standard Bracket (ASTM A36)**

**- Working Capacity = 27.5 kips (F.S. = 2)**

**- Design Pier Load = 18 kips**