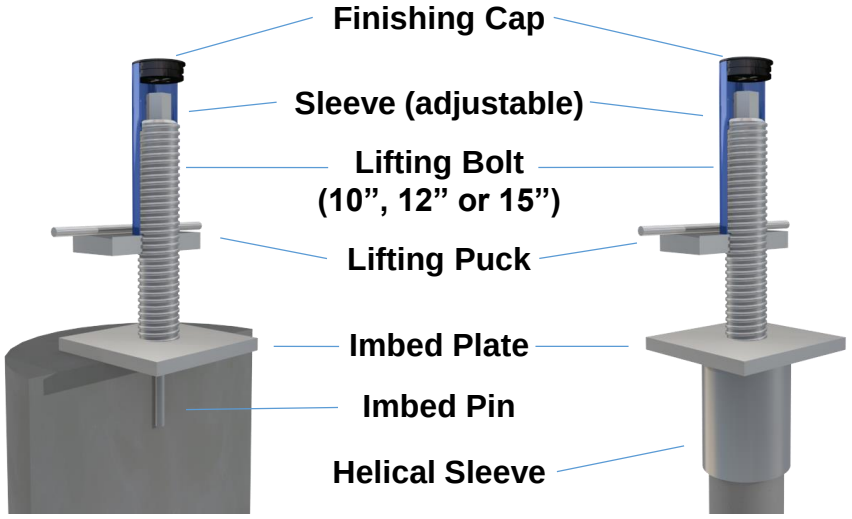
The SlabTek Lifting Mechanism is the enabling component in a proven and patented process of elevating a slab-on-grade foundation above the ground to create a protective void between the slab and soil. This innovation isolates the foundation, helping to protect it from damaging soil swells, contractions, and movements.

The SlabTek lifting system is based on commercial engineering principles that have been in practice for over 50 years. SlabTek Lifting Mechanisms have been installed in foundations for over a decade. SlabTek provides a 10-year Warranty on all Lifting Mechanisms.



Mech for Concrete Piers

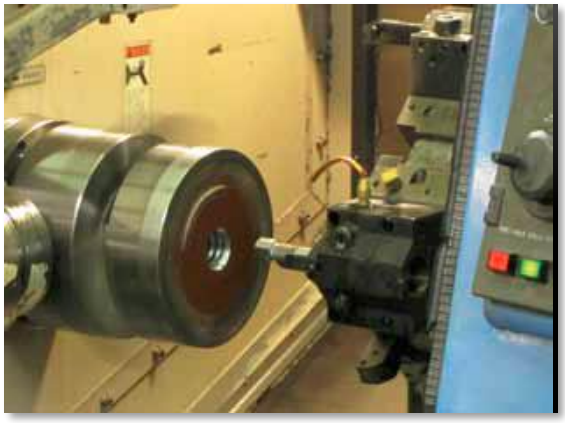
Mech for Steel Helical Piers

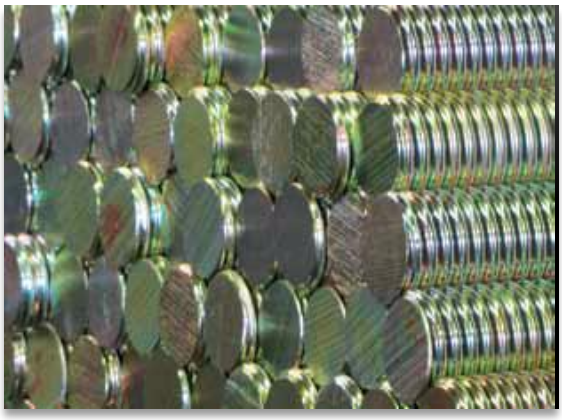
Part	Dimensions Standard Mechanism	Dimensions Heavy Duty Mechanism	Material
Base Plate	6" x 6" x ½"	8.25" x 8.25" x ½"	ASTM-A36/A50
Imbed Pin	½" Ø x 4"	½" Ø x 4"	ASTM-A108
Lifting Puck	4 ¾" x 4 ¾" x 1"	6 ¾" x 6 ¾" x 1½"	ASTM A572 Grade 50
Adjustable Sleeve	2½" Ø x 7 – 8 ¾"	3½" Ø x 7 – 8 ¾"	HDPE
Lifting Bolt	1½" Ø x 10", 12", 15"	$2^{7}/_{16}$" Ø x 10", 12", 15"	Williams Form Grade 75
Finishing Cap	2⅜" Ø x ¾"	3⅜" Ø x ¾"	LDPE

Lifting Bolt is Electro-deposited with Zinc Coating per ASTM AB633
Lifting Puck, Imbed Plate, Imbed Pin and Helical Sleeve all Hot Dip Galvanized per ASTM A153

Manufacturing

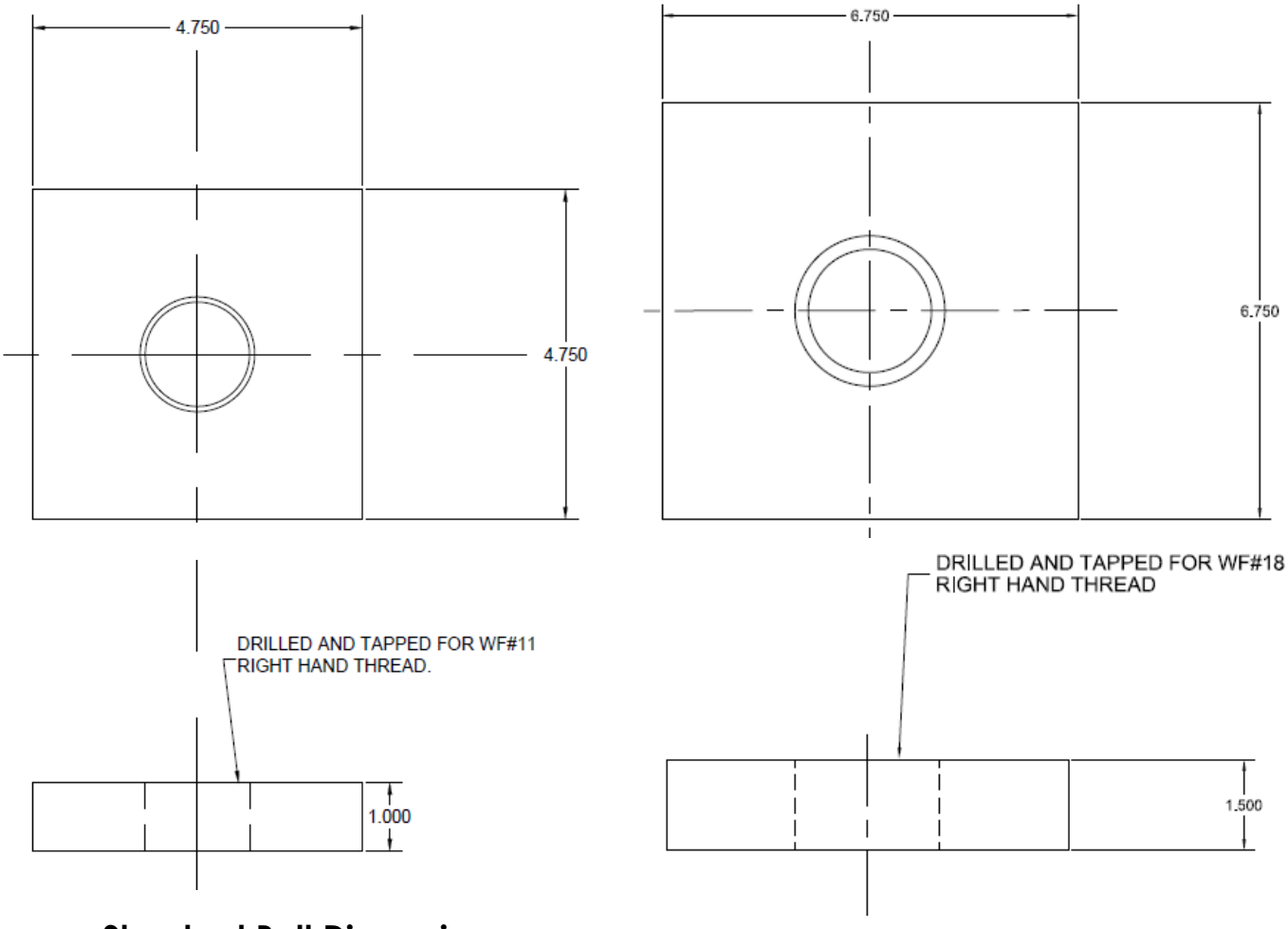
SlabTek Lifting Mechanisms are designed, tested and manufactured to meet or exceed design requirements utilizing state-of-the-art manufacturing processes and quality materials.





All SlabTek Lifting Mechanism are manufactured in the United States.

Lifting Puck Dimensions



Standard Bolt Dimensions

Approximate Thread Major Diameter	Bar Designation Diameter and Pitch (nom.)	Minimum Net Area Thru Threads	Minimum Ultimate Strength	Minimum Yield Strength	Nominal Weight
1-1/2" (38.1 mm)	#11 - 1-3/8 - 3 (36 mm)	1.56 in2 (1006 mm2)	156 kips (694 kN)	117 kips (521 kN)	5.3 lbs/ft (7.85 Kg/M)

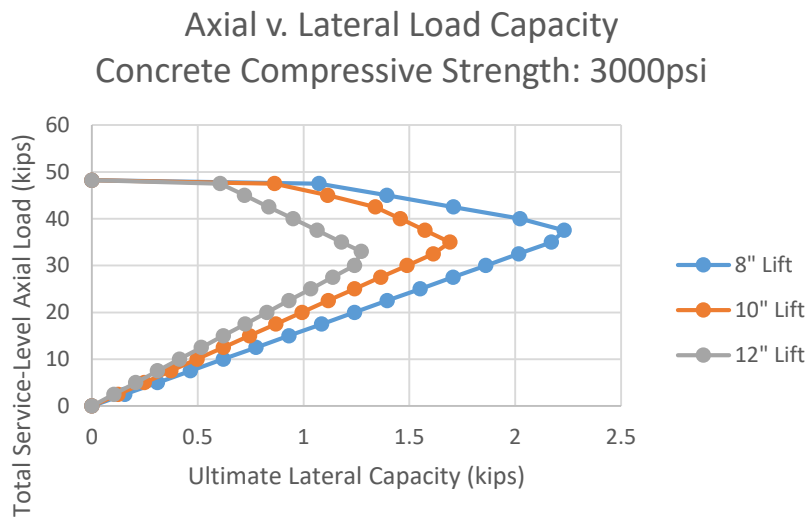
Heavy-Duty Bolt Dimensions

Approximate Thread Major Diameter	Bar Designation Diameter and Pitch (nom.)	Minimum Net Area Thru Threads	Minimum Ultimate Strength	Minimum Yield Strength	Nominal Weight
2-7/16" (61.9 mm)	#18 – 2-1/2"-3 (57 mm)	4.00 in2 (2581 mm2)	400 kips (1780 kN)	300 kips (1335 kN)	13.6 lbs/ft (19.6 Kg/M)

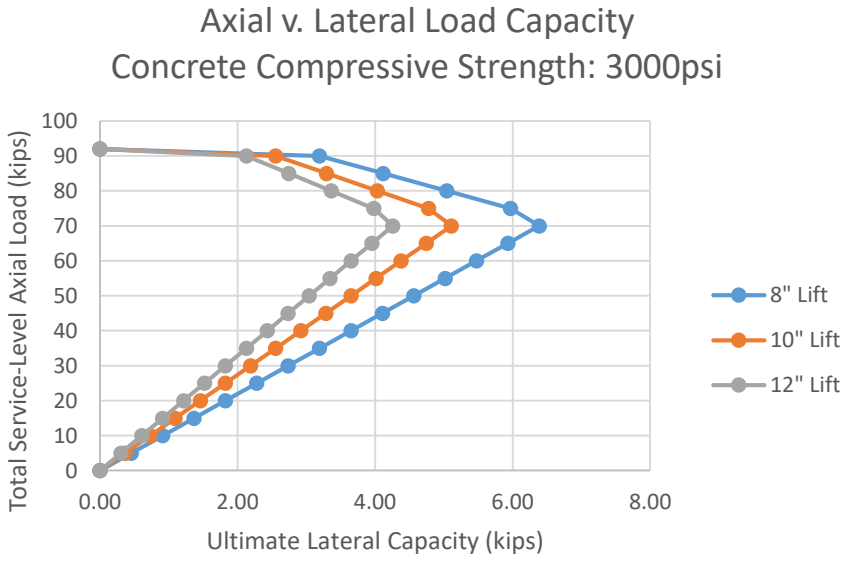
Williams Form Grade 75 All-Thread Rebar has a cold rolled, continuous, rounder course thread form. Williams special thread (deformation) pattern projects ultra-high relative rib area at 3 times that of conventional rebar.

Lifting Mechanism Capacities

The overall capacity of the SlabTek lifting mechanism is governed by several modes: concrete bearing strength, lifting puck bending capacity, global rotation of the lifting puck, combined axial and bending capacity of the bolt, and sliding. The relationship between lateral and axial capacity differs for each mode, and the percentage of total load that is comprised of dead, live, and live roof loads will also affect the results per load case combinations required by ASCE 7. Because of this, analysis of specific cases will vary slightly from the charts presented. The graphs for lateral versus axial capacity are shown for the standard and heavy-duty mechanism with a concrete compressive strength of 3000 psi. Puck rotation governs the lateral capacity of both mechanisms until a point is reached where either bolt capacity or concrete bearing control the overall mechanism capacity. Charts on the next page illustrate the effect of increasing concrete compressive strength on the overall capacity of the lifting mechanism. From this information, it is seen that the Heavy Duty mechanism's capacity is primarily controlled by concrete bearing strength.

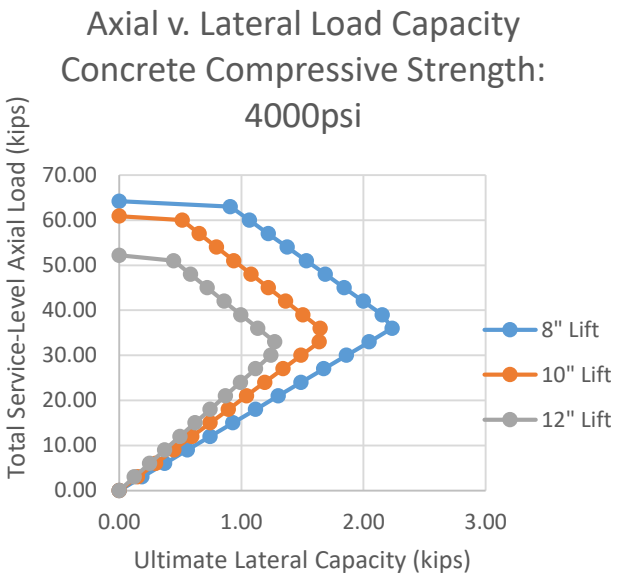


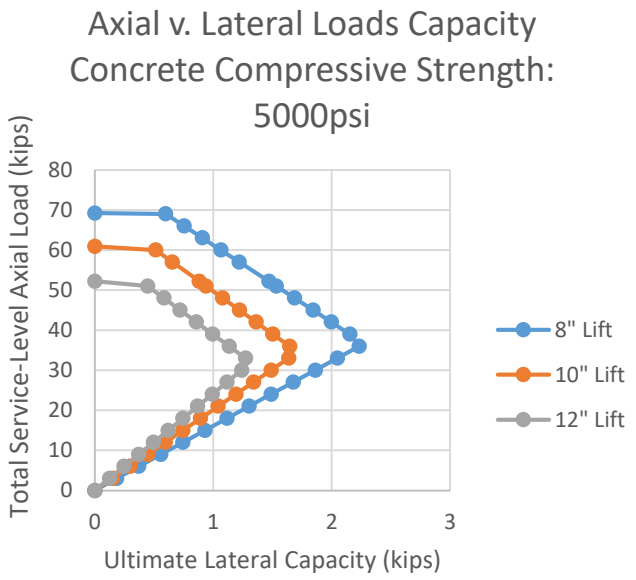
Standard Lifting Mechanism



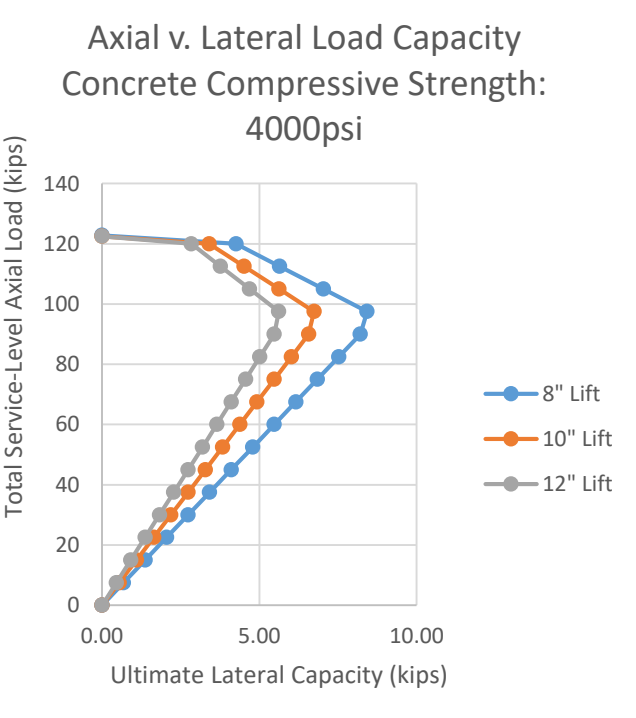
Heavy Duty Lifting Mechanism

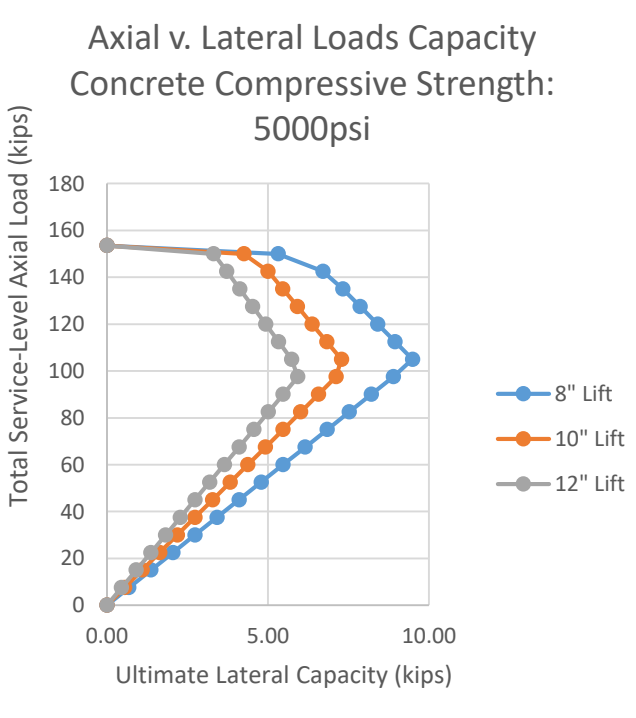
Lifting Mechanism Capacities (Continued)





Standard Lifting Mechanism





Heavy Duty Lifting Mechanism

100-Year Lifting Mechanism Life Expectancy

SlabTek retained CTL Group to perform an analysis of its lifting mechanism with respect to corrosion over a structure's lifetime. Using the International Organization for Standardization's method 9223, "Corrosion of Metals and Alloys", CTL concluded that the loss would be maximum of 30 mils after 110 years of exposure to an environment with high corrosivity (C4) and 32 mils after 120 years of exposure to an environment with medium corrosivity (C3).

> *"Based on the results given in Table 4 and Table 5 [of the CTL report], the total estimated depth of steel corrosion after 100 years ranges from 314 µm to 758 µm (12 to 30 mils). For electroplated zinc-coated elements (coated in accordance with ASTM B633), the zinc coating with a thickness of 1 mil will require approximately 20 years to corrode under exposure class C3 and 10 years in class C4."*
>
> **Jose Pacheco, PhD**
> Materials & Mechanics
> CTL GROUP

The SlabTek lifting bolt is designed using American Institute of Steel Construction (AISC) 360-10, and it is treated as a solid, round column with fixed-pinned end conditions subjected to combined bending and axial stresses. Section loss in the lifting bolt corresponds to decreases in the bolt's radius of gyration and its section modulus which results in decreased capacity for axial loading and the bending forces associated with lateral loads. The impact of 60 mils of diametral section loss under the assumed set of loading conditions is illustrated below.

ASSUMED LOADING	
Dead	115 psf
Live	70 psf
Live Roof	20 psf
Lateral Force	1000 lbf
Bolt Tributary Area	144 ft^2

Typical loading associated with a production one- or two-story structure, loading conditions will vary and need to be specifically evaluated.

Lifting Mechanism Life Expectancy

INITIAL SECTION PROPERTIES		
Bolt Yield Strength	75	ksi
Modulus of Elasticity	29000	ksi
Bolt Diameter	1.5	in
Effective Length Factor	2	
Plastic Section Modulus	0.56	in^3
Radius of Gyration	0.375	in
Elastic Section Modulus	0.33	in^3
Cross-Sectional Area	1.77	in^2
Lift Height	8	in
Factored Axial Capacity	97.6	kips
Factored Bending Capacity	35.7	kip-in
% of Combined Capacity Required	58	%

Initial Section Properties Table lists the physical properties of lifting bolt prior to corrosion.

SECTION PROPERTIES (110 YRS, C4)		
Bolt Yield Strength	75	ksi
Modulus of Elasticity	29000	ksi
Bolt Diameter	1.44	in
Effective Length Factor	2	
Plastic Section Modulus	0.50	in^3
Radius of Gyration	0.36	in
Elastic Section Modulus	0.29	in^3
Cross-Sectional Area	1.63	in^2
Lift Height	8	in
Factored Axial Capacity	88.5	kips
Factored Bending Capacity	31.6	kip-in
% of Combined Capacity Required	64	%

Section Properties (110 YRS, C4) Table lists the changes in the bolt's physical properties after exposure to 110 years in a corrosive environment.

Under the assumed loading conditions, the demand requires only 58 percent of the bolt's initial capacity, and after the 30 mils of loss associated with 110 years of exposure to an environment with high corrosivity, the demand requires 64% of the bolt's available capacity. In both cases. The bolt's capacity is adequate for the given load demand.

SlabTek Lifting Mechanism
Product Specification
Release Date – April 14, 2017

This product and implementation of suspended slabs using this product are protected by the following United States and Canadian Patents which are owned exclusively by SlabTek. US Patents: 8458984, 8671627, 8407898, 8678712, 7823341 B2, 8069620 B2. Canadian Patent: 2628422

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