CONCRETE FOUNDATION MINIMUM REQUIREMENTS FOR BENDPAK LIFTS

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1.0 Overview

a. ***BendPak strongly recommends consulting a Concrete Specialist early in your planning process for a Lift installation. Concrete specialists will possess the knowledge and skills required in design, construction and processes validated by the American Concrete Institute. The recommendations presented in this document are generic in nature and cannot cover all situations. A Concrete Specialist will adjust these recommendations to account for national, state, and local building codes as well as local weather conditions, soil composition, base preparation, load bearing, seismic requirements, and any other structural concerns that may arise.***

b. ***Never drill or cut into a Post-Tension Concrete Foundation! Cutting a Post-Tensioned Cable can result in severe injury or death.*** Post-Tensioned Foundations are compressed by high-strength steel tendons after the concrete has cured. Pressures on the steel tendons can be quite high. A qualified technician is required to identify cable locations prior to cutting or drilling. Post-Tension Slabs in many homes are indicated by a warning stamped into the concrete, often found near the garage door. Older structures may have a plastic or paper sign fastened to the wall. If there are no signs indicating a Post-Tension Slab, undertake a careful examination of the exterior of the slab looking for small circular patching areas about 1.5 in. to 3 in. in diameter, typically 2 to 4-feet apart. These patches indicate the ends of the Post-Tension Cables. Another source of information is your local department of Building and Safety. This department may retrieve the structural plans to determine if the building has a Post-Tensioned Slab.

> ⚠ **WARNING**
> **POST-TENSION SLAB**
> **DO NOT CUT OR CORE**

c. **Pre-Existing Concrete Foundations — refer to Section 2.0 and Table 1**. Information in this section is presented to aid in determining the suitability of pre-existing concrete for BendPak Lift installations.

d. **New Concrete Foundations — refer to Section 3.0 and Tables 2 and 3**. Information in this section is presented as design recommendations for new concrete foundations for BendPak Lift installations.

e. **Drilling in Concrete — refer to Section 4.0**. Drilling accurate holes for Expansion Anchors in concrete is both critical and challenging. If the holes for the anchors are too big, the anchor will not expand correctly and ultimately will not embed in the hole with enough force to make a strong anchor. If the holes are too small, the anchor will be damaged as it is driven in and will not expand to embed correctly. If the hole is drilled at an angle, the bolt or nut head will not engage the Lifts' base Plate with maximum holding power.

SECTION 2.0

PRE-EXISTING CONCRETE FOUNDATION MINIMUM REQUIREMENTS

The information in this section is presented as an aid to determine the suitability of Pre-Existing Concrete Foundations for BendPak Lift installations.

a. Do **not** install the Lift on any surface other than concrete conforming to the minimum compressive strength, aging, reinforcement, and thickness provided in this document.

b. All Pre-Existing Concrete Foundations **must** have a minimum compressive strength of 3,000 psi. A core sample and test to confirm the compression strength of existing concrete is required.

c. The **maximum** allowable slope of the pre-existing concrete is 3-degrees.

d. When investigating the foundation properties, consult the building architect or the local building and safety department for drawings to verify proper foundation reinforcement.

e. **Never** install a Lift on damaged or defective concrete.

f. **Never** install the Lift over concrete expansion or control joints of any kind.

g. **All** Anchors **must** be a minimum of 6 in. (152 mm) away from any expansion seams, control joints or other inconsistencies in the concrete.

h. ***Never*** install a Lift on hand-mixed concrete.

i. Do **not** install a Lift on a secondary floor level or on any ground floor with a basement beneath, without written authorization from the building Architect and prior approval of BendPak Inc.

j. The Pre-Existing Concrete Floors **must** be test drilled to determine the actual thickness of the concrete at the location you wish to install the lift.

k. All Pre-Existing Concrete **must** have been cured for a minimum of 28 days to American Concrete Institute Specifications.

l. Refer to **TABLE 1 / PRE-EXISTING CONCRETE FOUNDATION MINIMUM REQUIREMENTS.**

TABLE 1 / PRE-EXISTING CONCRETE FOUNDATION MINIMUM REQUIREMENTS

TWO-POST LIFTS	MIN. THICKNESS	MIN COMP. STRENGTH	REINFORCEMENT	REBAR SPACING
M7K	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in. (305 mm)
GP-7 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in. (305 mm)
XPR-9 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in. (305 mm)
XPR-12 SERIES	6 in. (152 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	10 in. (254 mm)
XPR-15/18 SERIES	8 in. (203 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	10 in. (254 mm)
10AP (incl. SRT MODEL)	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in. (305 mm)
12AP (incl. SRT MODEL)	6 in. (152 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	10 in. (254 mm)
16AP/20AP SERIES	8 in. (203 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	10 in. (254 mm)
4-POST LIFTS	**MIN. THICKNESS**	**MIN COMP. STRENGTH**	**REINFORCEMENT**	**REBAR SPACING**
HD-7/9 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
GP-9 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
PL-6K SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
HDS-14 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
HDS-18/27 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
HDSO-14 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in. (305 mm)
HD-973P/PX	6.5 in. (165 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
HDS27 SERIES	6.5 in. (165 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
HDS40 SERIES	6.5 in. (165 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
PARKING LIFTS	**MIN. THICKNESS**	**MIN COMP. STRENGTH**	**REINFORCEMENT**	**REBAR SPACING**
PL-12000 SERIES	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
PL-6000DC (Multiple Posts)	6 in. (152 mm)	4,000 psi / 28 Day Aging	ACI Aging Only[1]	WWF Only[1]
SCISSOR LIFTS	**MIN. THICKNESS**	**MIN COMP. STRENGTH**	**REINFORCEMENT**	**REBAR SPACING**
LR-10000	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
MD-6XP	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
MDS-6EX/LP	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
MDS-6EXTF/LPF**	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
P-9000	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
P-9000F[2]	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
SP-7XE	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.
SP-7XEF[2]	4.25 in. (108 mm)	3,000 PSI / 28 Day Aging	#6 Rebar	12 in.

[1]The floor must be properly aged to American Concrete Institute specifications. A minimum of welded wire mesh is recommended for all floors.
[2] Min. concrete under the Lift. Refer to the specific Lift model's installation and operation manual for concrete requirements on flush Lift models.

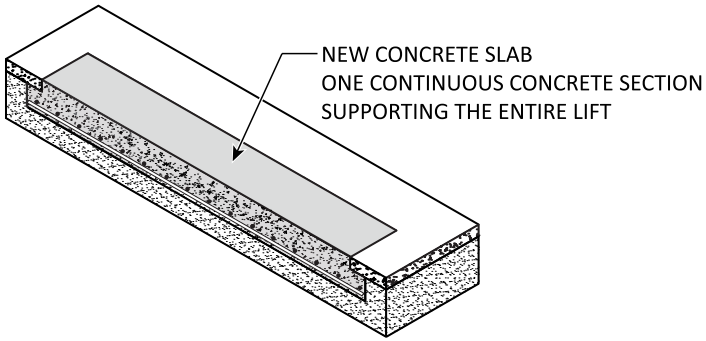
Section 3.0

NEW CONCRETE FOUNDATION MINIMUM REQUIREMENTS

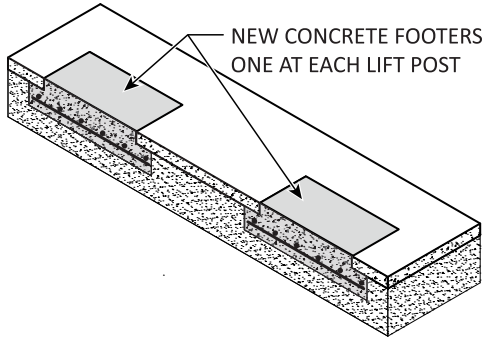
The information in this section presents design recommendations and requirements for new concrete foundations created for BendPak Lift installations. The information contained in this document supersedes any information provided in the installation manual accompanying the Lift. Please read all instructions carefully before producing a new foundation. ***Consult a concrete specialist (refer to §1.0a).***

a. **All properties** of new foundations are mandatory and at a minimum must conform to the requirements stated in this document before the concrete is deemed acceptable for a Lift installation.

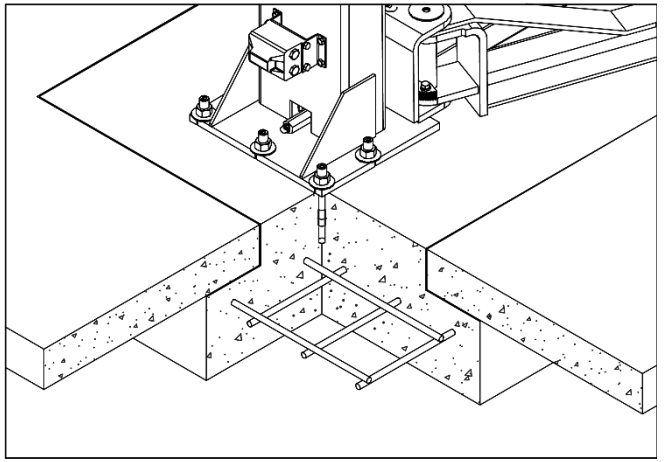
b. A new concrete **Slab** is a new pour concrete section that accommodates the installation of the entire Lift on a single section of concrete. Slabs for lift installations must be completely surrounded by and tied into the existing concrete on all sides. Tie-in may be accomplished through **Anchor Dowels** embedded into the existing surrounding concrete or through a **Key-In** undercutting the existing concrete by 6 in. (152 mm) minimum on all four sides of the Slab.



c. A new concrete **Footer** is a new pour concrete section positioned at each Lift Column or Post. Footers for Lift installations must be completely surrounded by and tied into the surrounding concrete on all sides. Tie-in may be accomplished through **Anchor Dowels** embedded into the surrounding existing concrete or through a **Key-In** undercutting the existing concrete by 6 in. (152 mm) minimum on all four sides of the footer.



d. **New Concrete Footers and Slabs are to be Flush** to the existing concrete.
e. **Maximum Allowable Slope** of the new pour concrete is 3-degrees.
f. **Compressive strength** of the NEW CONCRETE FOUNDATIONS and NEW CONCRETE SLABS/FOOTERS is to be 4,000 psi minimum. Certified strength documentation should be obtained from the firm supplying the concrete mixture at the time of the pour.
g. **All Reinforcing Steel** (Rebar) detailed in this document is Grade 60 - #4 Deformed Steel Rebar Ø.5 in. (Ø12.7 mm) Nominal Diameter, conforming to ASTM A615-60.
h. **Rebar Spacing** as per the data and illustrations on the following pages. The tolerance applied to spacing of the reinforcing bars in each direction shall be ±1 inch.
i. Long Bars (Temperature bars) are steel rods placed in rectangular concrete slabs/footers for prevention of cracks due to temperature changes or drying; placed perpendicular to the Short Bars (Main Reinforcing Bars). Temperature bars are placed at right angles to the Main Reinforcing Bars. The Temperature Bar/Main Bar distinction is meaningless in a square Slab or Footer. In that case, a square grid of rebar is indicated.
j. **Position Reinforcing Mesh and Bars** away from Anchor Positions, to avoid drilling into Reinforcing Steel while installing Expansion Anchors. Drilling into Rebar damages the Drill Bit and will likely cause the hole to be oversized by forcing the drill off center.
k. **All Lift Anchors must** be a minimum of 6 in. away from any inconsistency in the concrete, (e.g., Isolation, Expansion Joints, Control Joints, or Cracks).



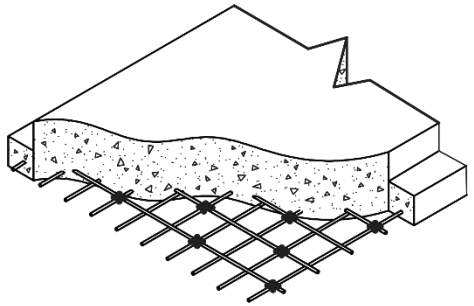
l. **Curing of the new concrete** requires 28 days minimum to American Concrete Institute specifications. Concrete becomes hard within hours after it has been mixed but requires a minimum of 28 days to attain up to 90% of its design strength. Curing is essential to obtaining the maximum design strength. The ideal temperature for curing concrete is 73°F (22.7°C). New pour concrete must be protected from temperatures below 40°F (4.4°C), and moisture must be present above 50°F (10°C). High Temperatures accelerate curing and may induce cracking from an uneven cure. ***Consult a Concrete Specialist.***
m. **Never** pour concrete directly on frozen ground. Fresh concrete that has frozen during curing should be removed and replaced. Ice crystals in the concrete will prevent it from reaching its designed compressive strength.
n. **Never** install a Lift on hand-mixed concrete.
o. **An adequate Soil Support System is critical!** The concrete dimensions and reinforcing detailed in this document are for a Foundation Bed allowable bearing capacity of not less than 2,000 lbs. / sq. ft. Many clays, and most all firm clay, hard clay, sand and clay mixes, dry sands, coarse dry sands, dry sand and silt mixes, sand and gravel mixes, and gravel type soils meet or exceed this allowable bearing capacity. Situations where the allowable bearing capacity of the soil is lower than this value will require special attention. If there is a question regarding the allowable bearing capacity of the foundation bed, a soils test engineer must be consulted.

p. **Base Course** material should be a compactable granular fill that will remain stable.

q. **Lift owners** are responsible for any special regional, structural, and/or seismic anchoring requirements specified by any other agencies and/or codes such as the Uniform Building Code (UBC) and/or International Building Code (IBC).

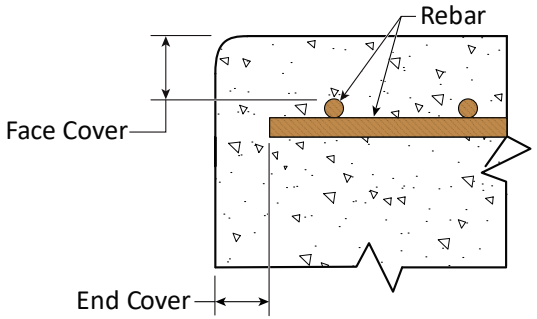
r. **In addition to the Rebar**, a layer of 6 x 6 – 10/10 WWF 10 ga. Welded Wire Fabric Mesh positioned at 1/3 of the foundation depth, measured from the top, is advisable in any extremely hot or cold climate to control cracking due to temperature fluctuations and shrinkage.

s. **The Reinforcing Bars** should be tied to each other to keep them in position during the concrete pour. Every fourth or fifth Rebar intersection should be sufficient to keep the bars in place. There is no requirement to tie every Rebar intersection. Refer to the figure on the right.



t. **All Reinforcement Steel** should be properly supported to keep the reinforcement at the correct depth in the new pour concrete. Consult a Concrete Specialist for guidance in choosing supports for the reinforcing steel.

u. **All Reinforcing Steel for foundations** detailed in this document require a minimum of 3 in. (76.2 mm) coverage of concrete on both the Face and End to protect it from corrosion. Refer to the figure on the right.



v. Refer to **TABLE 2 / NEW CONCRETE FOUNDATION MINIMUM REQUIREMENTS FOR TWO POST AND FOUR-POST LIFTS.**

w. Refer to **Table 3 NEW SLAB/FOOTER MINIMUM FOUNDATION REQUIREMENTS FOR SCISSOR LIFTS**

TABLE 2 / NEW CONCRETE FOUNDATION MINIMUM REQUIREMENTS FOR TWO POST AND FOUR-POST LIFTS

2-POST LIFTS	MIN. SLABTHK	W MIN. SLAB WIDTH	L MIN. SLAB LENGTH	R REINFORCEMENT SIZE	S1 & S2 REINFORCEMENT SPACING (See §3.1)	D ANCHOR DIA.	I ANCHOR LENGTH
M7K	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.875 in. (22mm)	5 in. (127mm)
GP-7 SERIES	12 in. (305mm)	48 in. (1,219mm)	12 in. Wider Than OA Width of Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	6.3 in. (160mm)
XPR-9 SERIES	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	6.3 in. (160mm)
XPR-15/18 SERIES	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	7 in. (178mm)
10AP (INCL. SRT MODEL)	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	6.3 in. (160mm)
12AP (INCL. SRT MODEL)	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	7 in. (160mm)
16AP/20AP SERIES	12 in. (305mm)	48 in. (1,219mm)	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	7 in. (160mm)
4-POST LIFTS	**MIN. FOOTER THK.**	**W MIN. FOOTER WIDTH**	**L MIN. FOOTER LENGTH**	**R REINFORCEMENT SIZE**	**S1 & S2 REINFORCEMENT SPACING**	**D ANCHOR DIA.**	**I ANCHOR LENGTH**
HD-7 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
HD-9 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
GP-9 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
PL-6K SERIES[4]	12 in. (305mm)	30 in. (762mm)	30 in. (762mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	6.3 in. (160mm)
HDSO-14 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
HD-973P/PX[4]	12 in. (305mm)	48 in. (1,219mm)	48 in. (1,219mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	6.3 in. (160mm)
HDS-14 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
HDS-18 SERIES[4]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
HDS-27/40 SERIES[4]	12 in. (305mm)	48 in.	48 in. (1,219mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in.(121mm)
PARKING LIFTS	**MIN. FOOTER THK.**	**W MIN. FOOTER WIDTH**	**L MIN. FOOTER LENGTH**	**R REINFORCEMENT SIZE**	**S1 & S2 REINFORCEMENT SPACING**	**D ANCHOR DIA.**	**I ANCHOR LENGTH**
PL-6000DC[3]	12 in. (305mm).	24 in. (607mm)	72 in.(1,829 mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.625 in. (16mm)	5.0 in. (127mm)
PL-12000 SERIES[5]	12 in. (305mm)	24 in. (607mm)	24 in. (607mm)	#4 Bars	6 x 6 in.(152x152mm) – Square Grid Pattern	Ø.75 in. (19mm)	4.75 in. (121mm)

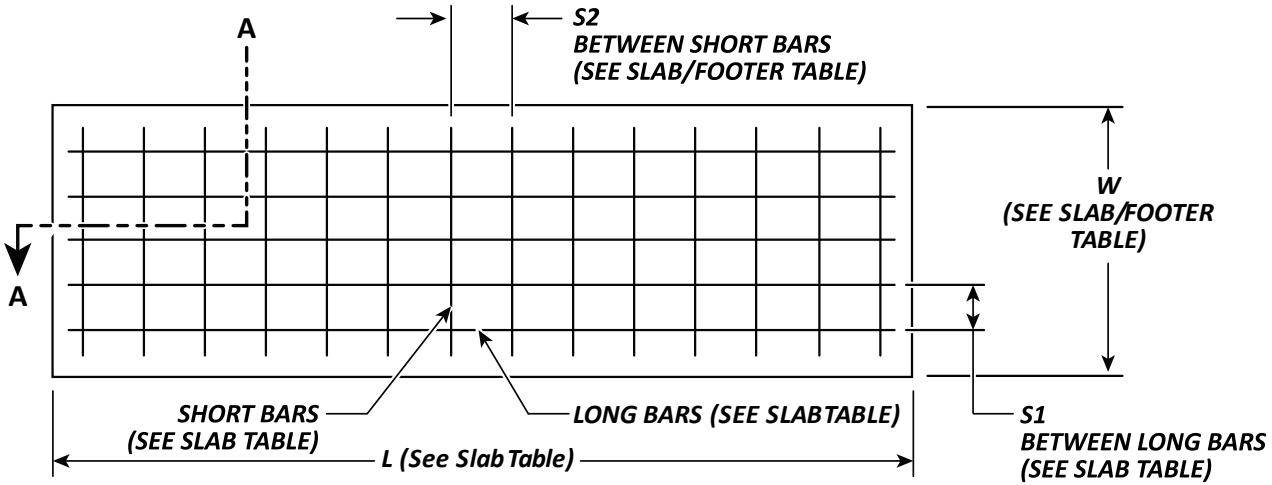
[3] PL-6000DC - Multiple Lift Posts are possible – create one Footer at each Lift Post.
[4] Four Separate Footers - one formed at each Lift Post.
[5] PL-12000 Series -Five Separate Footers - one formed at each post.

TABLE 3 / NEW SLAB/FOOTER MINIMUM FOUNDATION REQUIREMENTS FOR SCISSOR LIFTS

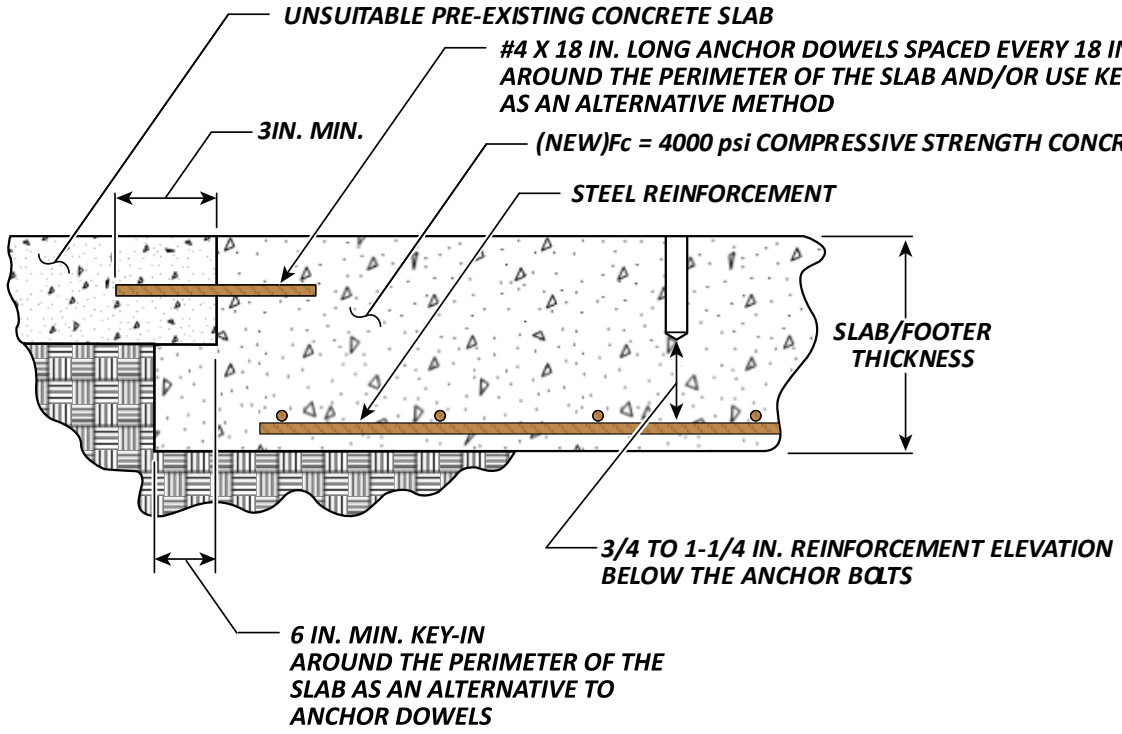
SCISSOR LIFT MODEL	MIN. SLAB THICKNESS	W MIN. SLAB WIDTH	L MIN. SLAB LENGTH	R REINFORCEMENT SIZE	S1 & S2 REINFORCEMENT SPACING (See §3.1)	D ANCHOR DIA.	I ANCHOR LENGTH
LR-10000	4.25 in. (108 mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	4.75 in. (121mm)
MD-6XP *(Portable)*	4.25 in. (108 mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	N/A	N/A
MDS-6EXT/LP	4.25 in. (108 mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	5.0 in. (127mm)
MDS-6EXTF/LPF[6]	10 in. (254mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	5.0 in. (127mm)
SP-7XE	4.25 in. (108 mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	4.75 in. (121mm)
SP-7XEF[6]	11 in. (279mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	4.75 in. (121mm)
P-9000	4.25 in. (108 mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	4.75 in. (121mm)
P-9000F[6]	10 in. (254mm)	12 in. (305mm) Wider Than OA Width of the Lift	12 in. (305mm) Wider Than OA Width of the Lift	All Rebar Grade 60-#4 Ø.5 in. (12.7mm) Nom. Dia.	6 in. (152mm) - Long Bar Spacing 8 in. (203mm) - Short Bar Spacing	Ø.75 in. (19mm)	4.75 in. (121mm)

[6]Refer to the specific Lift model's installation and operation manual for concrete requirements on flush lift models.

3.1 Reinforcing Steel Detail — Refer to Tables 2 and 3



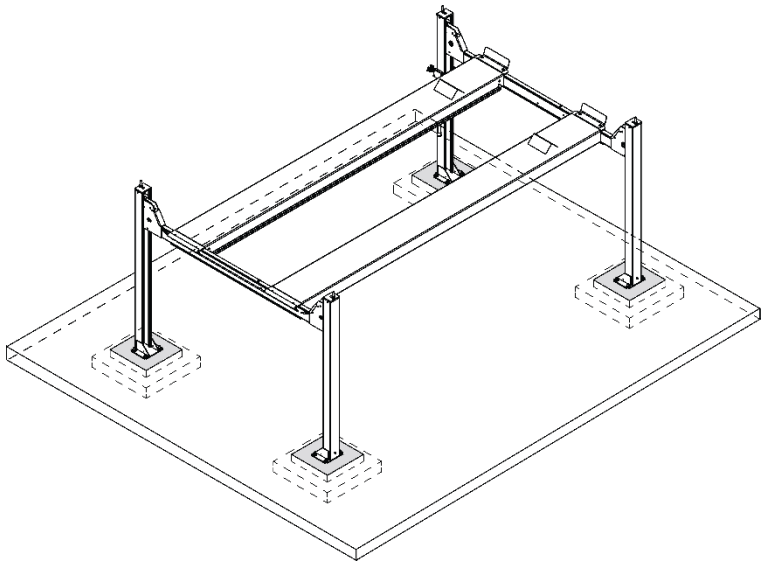
SECTION VIEW A-A

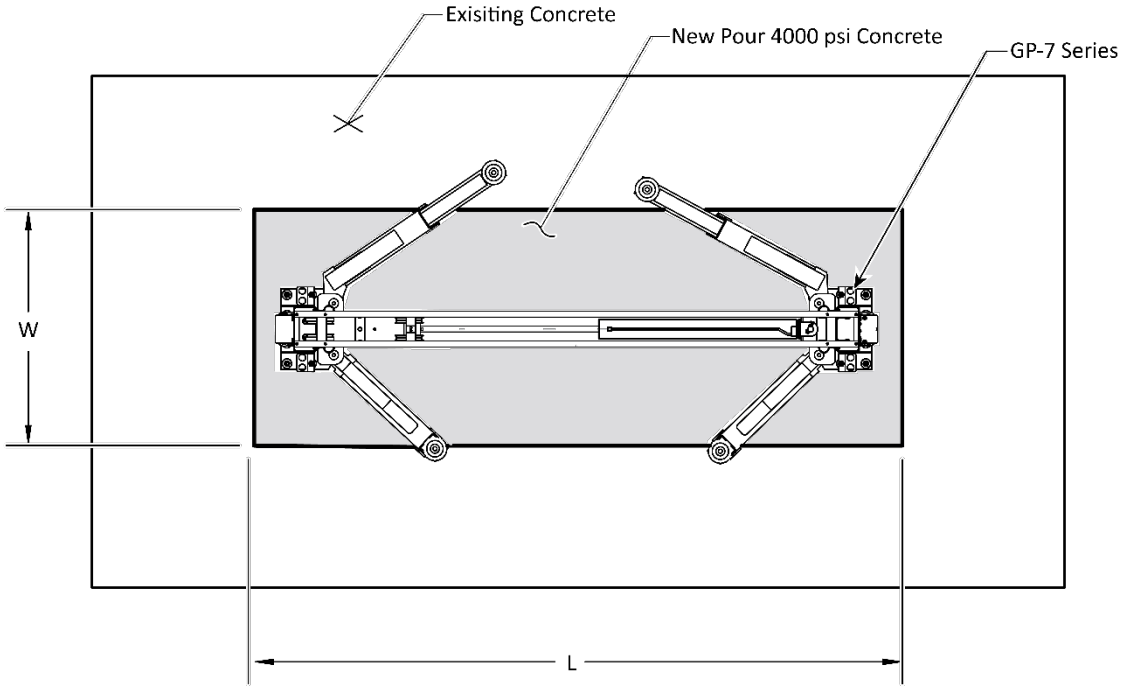


3.2 Footer Foundation Example — Refer to Table 2

On the HDS-14 Four Post Lift, four 24 in. Square x 12 in. deep Footers are required. Refer to the figure on the right. The Footer locations are centered on the Lift posts. In the case pictured to the right, a **Key-In** is used to **Tie-In** the new pour concrete Footers to the existing concrete. The Key-In undercuts the existing concrete by 6 in. around the perimeter of the Footer.

An optional method of tying-in to existing concrete utilizes **Anchor Dowels** embedded 3 in. into the existing concrete and 15 in. into the new pour.





3.3 Slab Foundation Example — Refer to Table 2: Center the Two-Post Lift on the new Slab to maintain a minimum of 6 in. (152 mm) between the Anchors and the edge of the New Slab.

4.0 Drilling in Pre-Existing or New Pour Concrete

Drilling accurate holes for Expansion Anchors in concrete is both critical and challenging. If the holes for the anchors are too big, the anchor will not expand correctly and ultimately will not embed in the hole with enough force to make a good anchor. If the holes are too small, the anchor will be damaged as it is driven in and will not expand to embed correctly. If the hole is drilled at an angle the bolt or nut head will not engage the Lifts' base Plate with maximum holding force.

4.1 Drilling Round, Straight Holes in Concrete:

a. **Use appropriate safety gear** including ear protection, safety glasses, dust mask, gloves, steel-toed work boots and heavy work clothes.
b. **Use the right tools**. A powerful Hammer Drill with new Drill Bits intended for Rotary Hammer and Masonry use. Ensure the Drill Flutes are at least as long as the depth of the hole you are drilling to remove the material from the hole as you drill.
c. **Check the size of the Drill Bit *before* you begin!** The drill may be dull and undersized from excessive use. An undersized hole is just as bad as an oversized hole. Undersized holes deform the anchor and do not allow it to embed correctly.
d. **Drill a Pilot Hole.** If the final hole size is to be Ø.75 in. (19 mm), drill a Ø.375 in. (9.5 mm) to Ø.5 in. (12.7 mm) pilot hole first. Pilot holes allow straighter, cleaner drilling by removing the material directly in the center of the final drill. This reduces the amount of force required to keep the drill straight and perpendicular to the floor.
e. **Find the Rebar!** Steel Reinforced concrete is ideal for strong construction, but terrible for drill bits. Rebar can and will ruin a Masonry Drill Bit, as well as push the drill off center and ruin the Anchor Hole by making the hole out of round or too big. Hire a contractor to find the rebar in the location you wish to install your Lift. Many contractors use ground penetrating radar to accurately locate rebar.
f. **If Rebar** embedded in the concrete is struck and the anchor hole has not been ruined by making it too big or out of round, switch to a rebar cutting drill bit. Slow the drill speed to avoid overheating the drill bit. Continue drilling until you are past the Rebar.
g. **Use a Depth Gauge** or place masking tape on the Drill Bit to indicate the final hole depth.
h. **Do not rush**. Pull the drill out of the hole at regular intervals to clear the material out from hole as you drill.
i. **If you see sparks,** stop, the drill has struck rebar. See **4.1(f)** above.
j. **Vacuum, brush and blow out** the hole frequently as you drill to clean out the hole.
k. **When the drill has reached its final depth,** clean the hole using a brush, vacuum and/or compressed air.

CAUTION! Always use proper personal protective equipment when drilling in concrete! Common PPE for drilling in concrete includes leather gloves, steel toed boots, safety glasses, ear, and lung protection.