FOUNDATION PERFORMANCE ASSOCIATION

CHILDRESS
ENGINEERING SERVICES

"SlabTek Engineering Design"
June 13, 2013

"Knowledge is Power"
An Engineer's Perspective

Just Enough Information to Make You Dangerous.

Copyright Materials

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Learning Objectives

1. What is SlabTek?
2. How does SlabTek compare to other foundation types?
3. How is SlabTek built?
4. How is SlabTek Engineered?
5. How is SlabTek Drawn?

The Knack

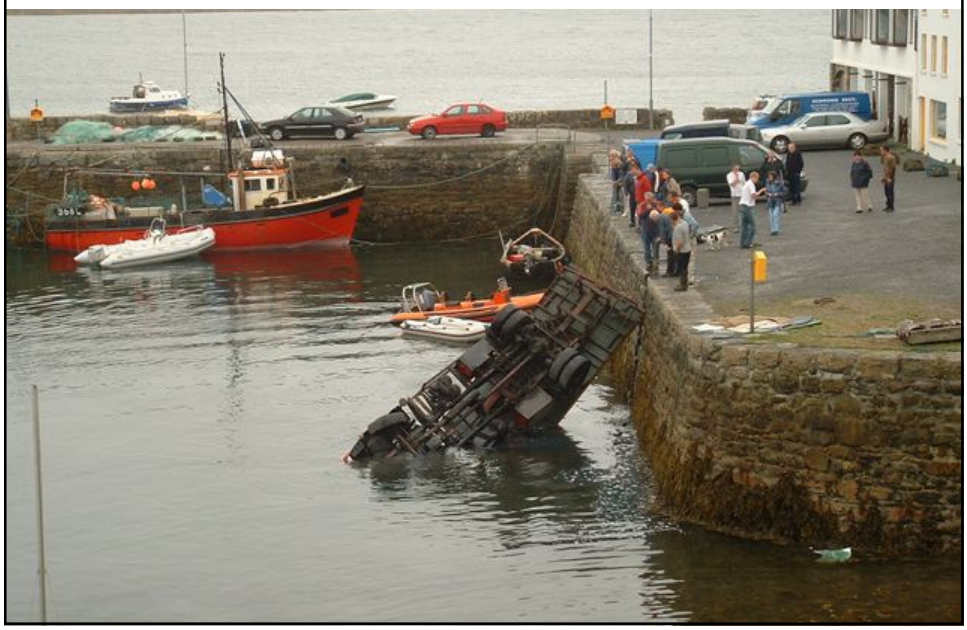
SIMPLE PROBLEM – FORGOT TO SET THE PARKING BREAK?

GET THE LOCAL WRECKER TO TAKE CARE OF IT!

I WONDER HOW MUCH A CAR WEIGHS FULL OF WATER?

I GUESS MORE THAN THE WRECKER CAN HANDLE

WELL…NOW WHAT?

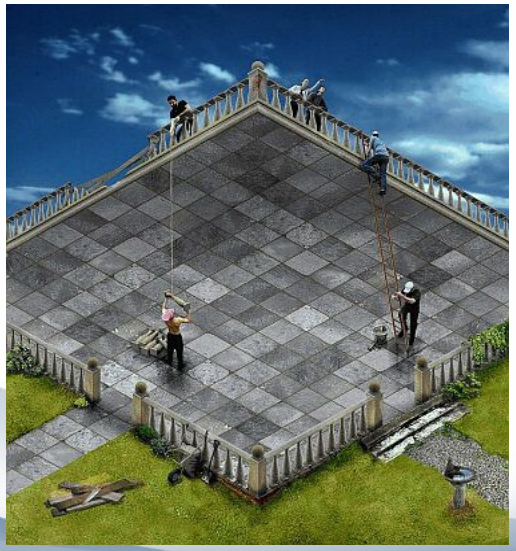


GET A BIGGER WRECKER…THAT MAKES SENSE. IT SHOULD WORK, RIGHT?

PICKED UP THE CAR LIKE A PIECE OF PAPER.

OK, THIS SHOULD BE NO PROBLEM...

OH WELL, NEVER MIND!

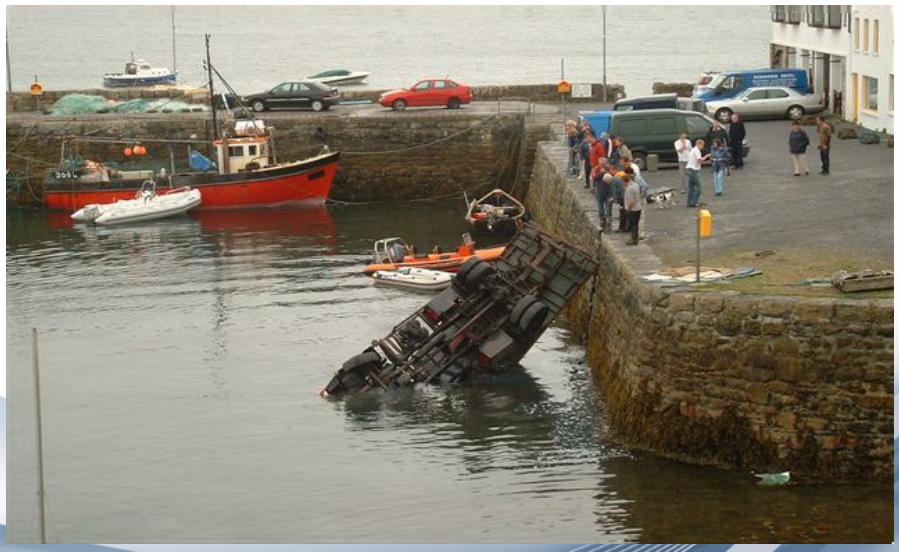


Lesson #2

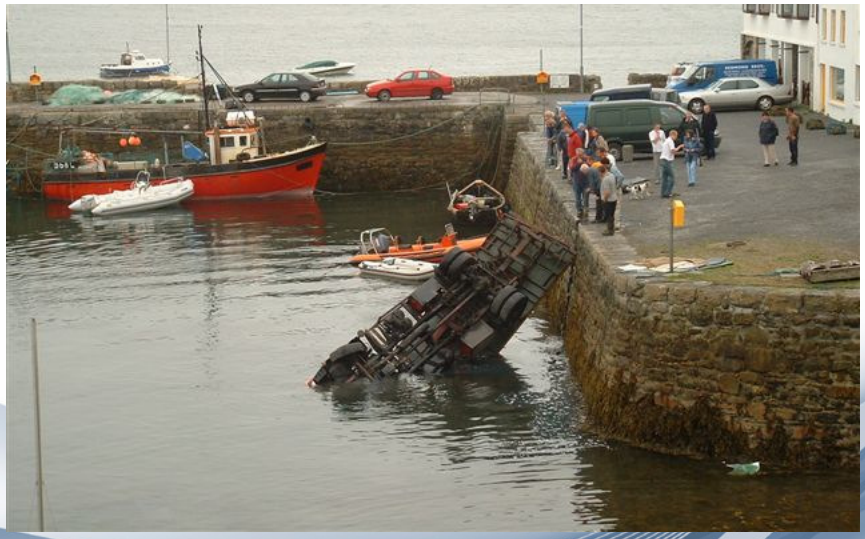
But be careful, things have to add up and make sense…thus our next lesson, Lesson #2.

THIS SHOULD WORK… THE ARMS NOT BENDING THAT BAD!

BUT CAN THIS REALLY HAPPEN? LOOK AT THE CARS IN THE BACKGROUND AND THE PEOPLE.



IT IS NOT WHAT IT APPEARS TO BE…



It has to add up and make sense

Things have to add up, it has to make sense. You do not need to be an engineer to follow the path of common sense. The expert engineers final solution should be clear and add up…if not, you have to look deeper.

Could not have…should not have…probably did not.
Be careful on what they are trying to sell you.

WHAT IS?

SlabTek
STRUCTURAL FOUNDATION SYSTEM

Time-lapse

SlabTek
STRUCTURAL FOUNDATION SYSTEM
1701 N Collins Blvd, Suite 3000, Richardson, TX 75080 phone 469.453.3959 fax 214.451.6631
www.slabtek.com

Introduction

Foundations are an essential component in the construction and stability of a house. Millions of dollars are spent annually trying to design for and anticipate soil movement, millions more are spent to repair damaged foundations

In studying the issues associated with foundation design for challenging soil environments, an innovative and revolutionary foundation design was needed to address the cost of construction and long-term performance and adjustability

2004 – Tony Childress, President, Childress Engineering Services, initiates research and development

2005 - SlabTek was introduced as an alternative "suspended" foundation solution.

2010 - The U.S. Patent Office issued a patent for the SlabTek system

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SlabTek Vision

"Our vision is to revolutionize the residential and light commercial foundation industry through engineering innovations and cost-efficient solutions."

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SlabTek Mission

SlabTek combines entrepreneurial ingenuity and engineering expertise to provide a technological innovation for the building industry that enables foundations to perform successfully regardless of soil conditions resulting in:

- ✓ *a superior foundation solution*
- ✓ *a competitive advantage for bids*
- ✓ *mitigated building warranty concerns*

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What is SlabTek?

SlabTek is a patented process of elevating a slab on grade foundation above the ground. This process is based upon proven engineering principles that allow structures to be stronger and take less time to install, yet are more economical than most traditional suspended foundation systems.

SlabTek is the preferred "smart start" that:

- ➢ *is effective on many different soil types*
- ➢ *eliminates costly construction days*
- ➢ *virtually eliminates warrant concerns*

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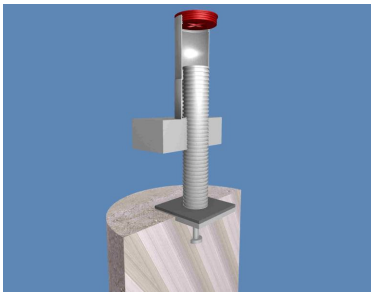
How does SlabTek compare to other foundation systems?



- *Pier and Beams?*
- *Suspended Slabs?*
- *Slab on Grade?*

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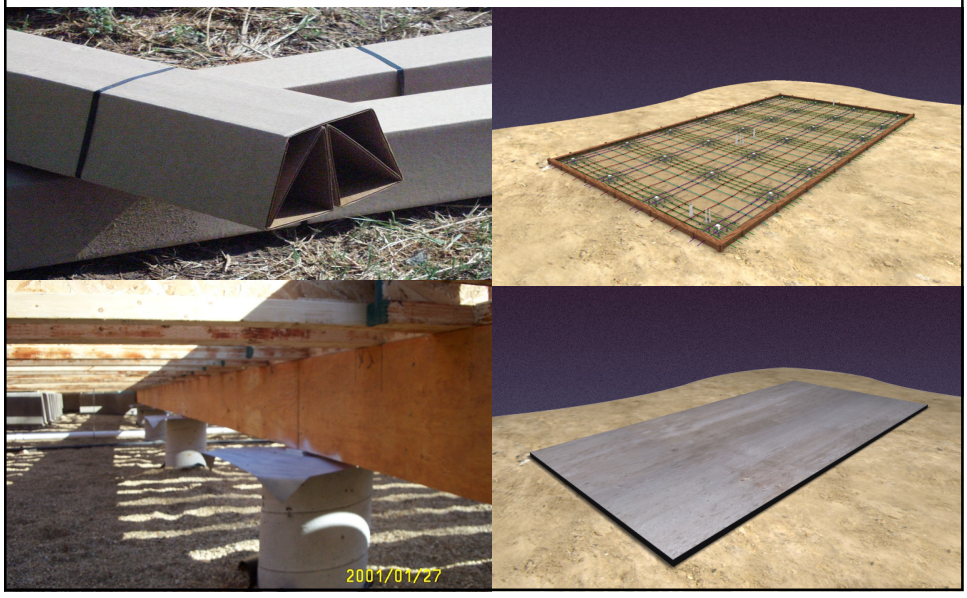
What types of Foundations are out there?



Types of Foundations:

Although there are various types of foundations, there are essentially two basic types: Suspended and Slab-on-Grade. Of these, the three most common residential foundations are:

- *Pier and Beam (suspended)*
- *Elevated Concrete (suspended)*
- *Slab-on-Grade (soil supported)*

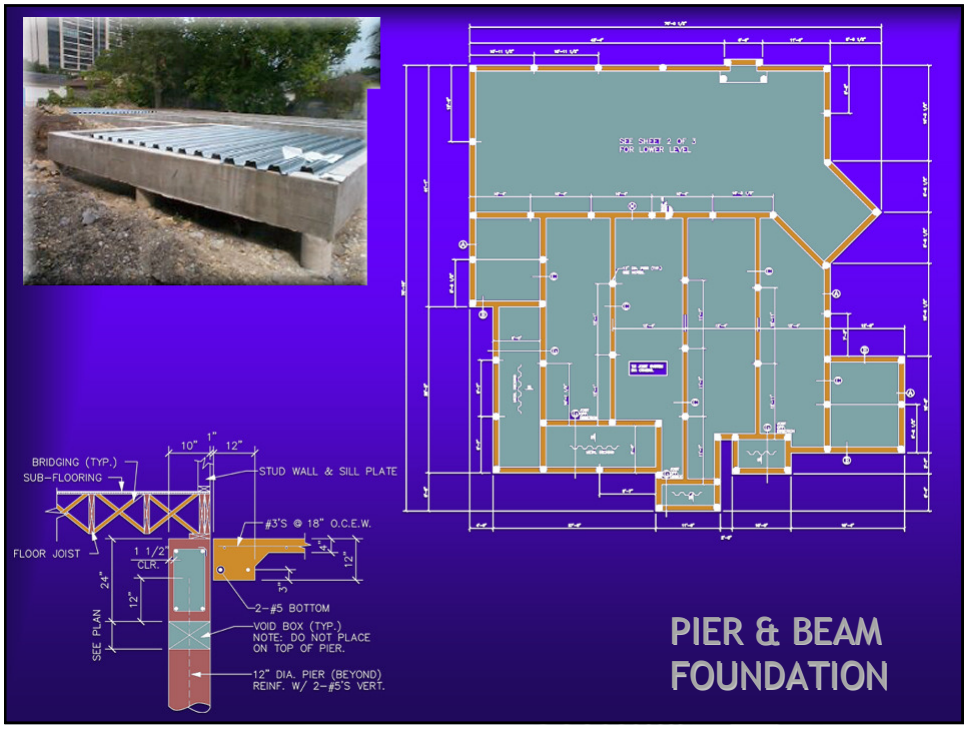
Pier and Beam

Pier and beam is the oldest and most traditional foundation system still in use today.

The floor system is typically supported by a series of beams that in turn are supported on piers. There is limited contact with the ground which prevents foundation movement.

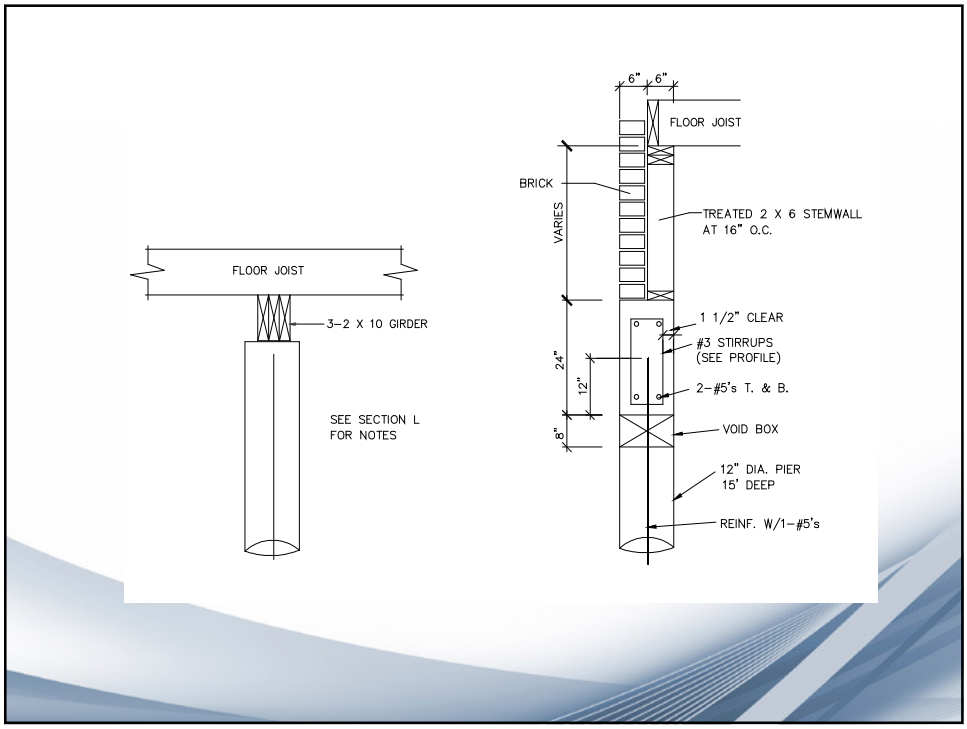
Homes built in the late 1800's and up to early 1900's used Bois d'arc tree trunks as piers 6 to 8' apart and usually had 2x6 or 2x8 floor joists spanning between wood girders.

Bois d'arc piers although very effective for its time has a life span of 75 years. Therefore any homes today with the Bois d'arc piers need to consider replacement.


SEE SHEET 2 OF 3
FOR LOWER LEVEL
BRIDGING (TYP.)
SUB-FLOORING
FLOOR JOIST
10"
1"
12"
STUD WALL & SILL PLATE
#3'S @ 18" O.C.E.W.
1 1/2"
CLR.
24"
12"
SEE PLAN
4"
12"
3"
2-#5 BOTTOM
VOID BOX (TYP.)
NOTE: DO NOT PLACE
ON TOP OF PIER.
12" DIA. PIER (BEYOND)
REINF. W/ 2-#5'S VERT.
PIER & BEAM
FOUNDATION


2001/01/27


2001/01/27


FLOOR JOIST
3-2 X 10 GIRDER
SEE SECTION L
FOR NOTES
6"
6"
FLOOR JOIST
BRICK
VARIES
TREATED 2 X 6 STEMWALL
AT 16" O.C.
1 1/2" CLEAR
#3 STIRRUPS
(SEE PROFILE)
24"
12"
2-#5's T. & B.
8"
VOID BOX
12" DIA. PIER
15' DEEP
REINF. W/1-#5's

Pier and Beam

Advantages:

- High Strength / Load carrying capacity
- Most resistive to soil movements
- Can be used almost anywhere

Disadvantages

- Most Expensive of all foundation types
- Takes longer to construct
- Moisture entrapment under the crawl space

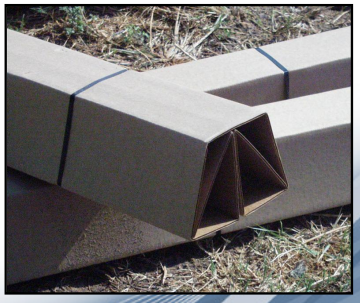
Suspended Foundations

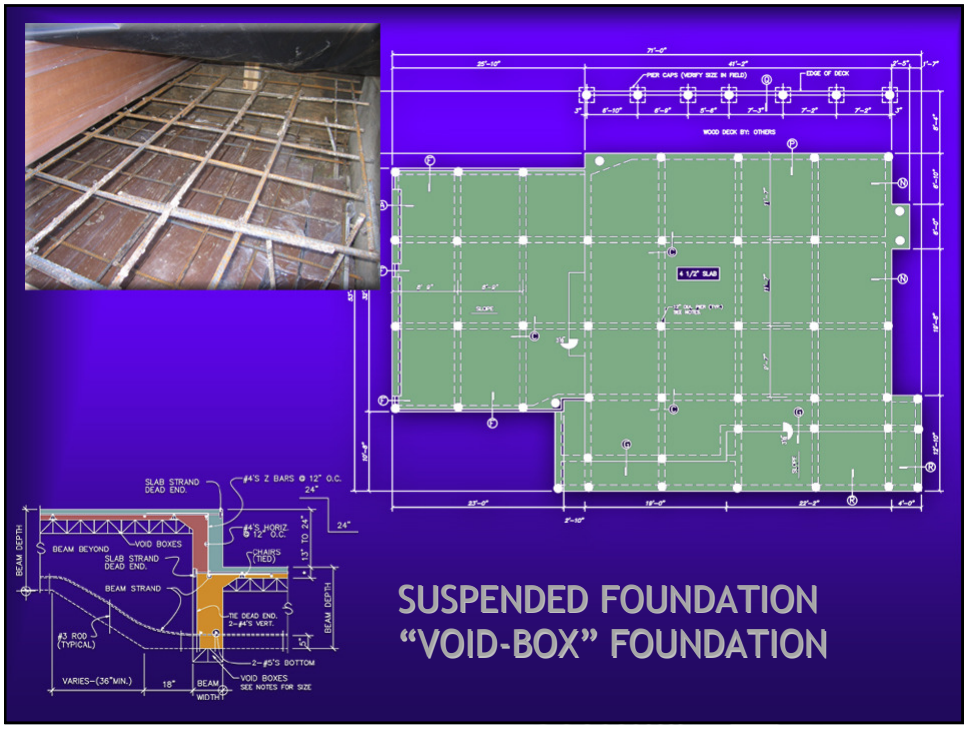
Suspended slabs are similar to pier and beam in the sense that they are suspended above the ground to avoid or limit foundation movement.

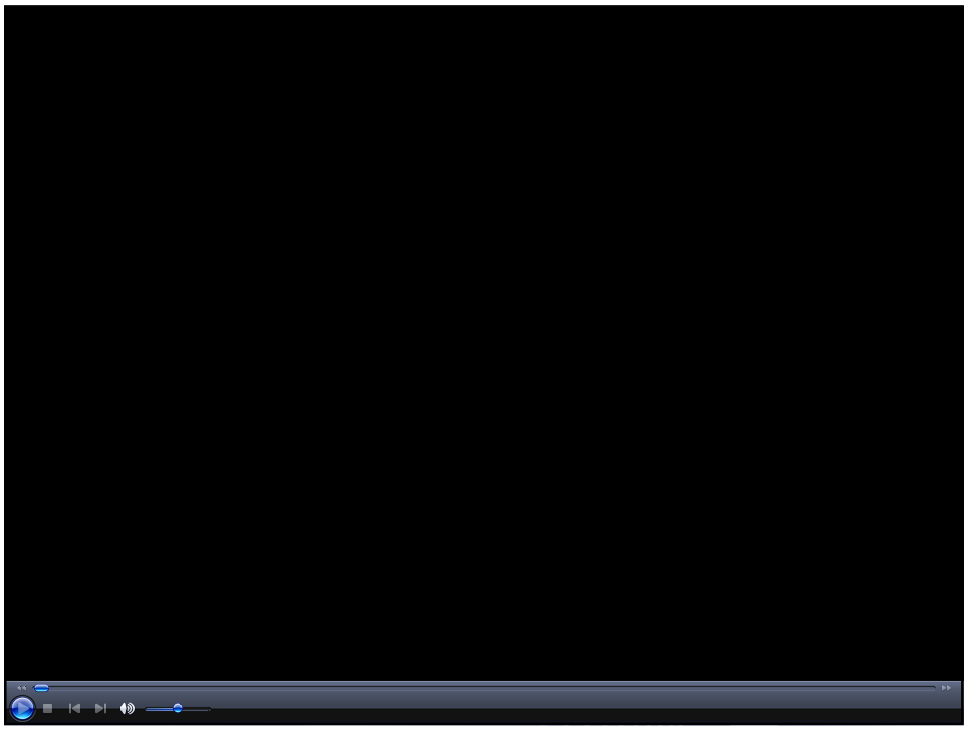
Typically this type of foundation uses a concrete mat foundation with stiffener beams resting on piers.

In between the piers and under the foundation, a series of void boxes are placed.

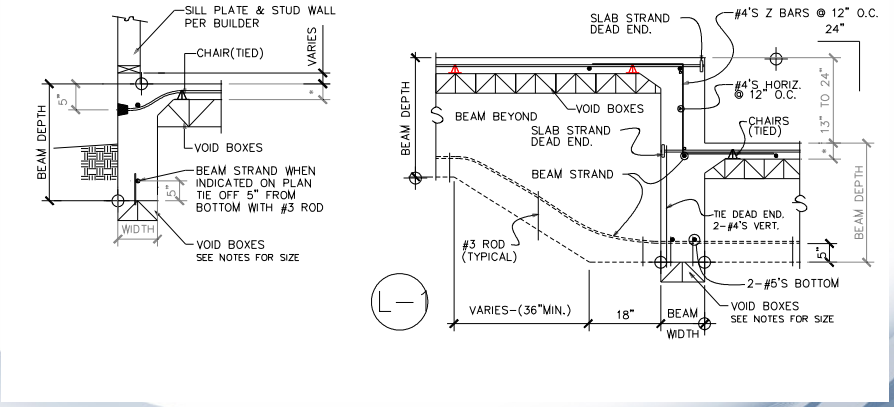
Void boxes are waxed carton forms that can support the weight of concrete during the pour and curing time but will crush and deteriorate under soil upheaval.




SUSPENDED FOUNDATION
"VOID-BOX" FOUNDATION
PIER CAPS (VERIFY SIZE IN FIELD)
EDGE OF DECK
WOOD DECK BY: OTHERS
4 1/2" SLAB
SLAB STRAND DEAD END.
#4'S Z BARS @ 12" O.C.
#4'S HORIZ @ 12" O.C.
BEAM BEYOND
VOID BOXES
SLAB STRAND DEAD END.
CHAIRS (TIED)
BEAM STRAND
TIE DEAD END. 2-#4'S VERT.
#3 ROD (TYPICAL)
2-#5'S BOTTOM
VOID BOXES SEE NOTES FOR SIZE
VARIES-(36"MIN.)
18"
BEAM WIDTH
BEAM DEPTH
13" TO 24"
24"



Suspended Slab Details



SUSPENDED FOUNDATIONS

Advantages:

- More affordable option than Pier & Beam
- Highly resistive to soil movements
- Least amount of maintenance concern between all foundation types.

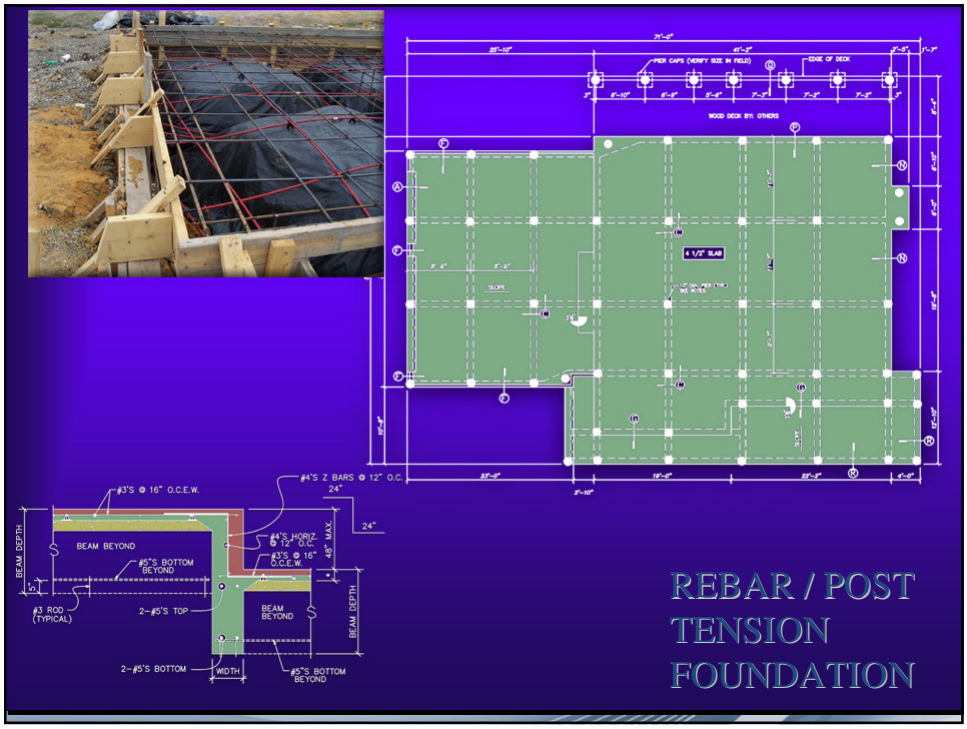
Disadvantages

- Cost less than Pier and Beam but more per square foot than slabs-on-grade.
- Hard to install (void boxes)
- Not very common / knowledge of how to install.

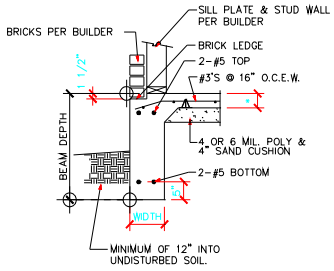
Slab-on-Grade

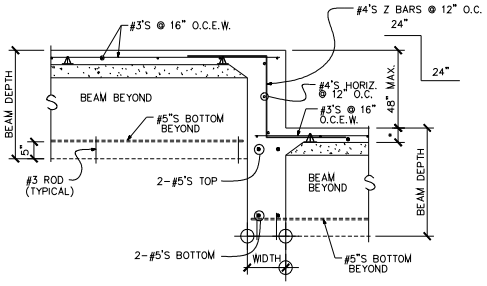
Slab-on-grade foundations are concrete foundations, either post-tensioned or conventionally reinforced (rebar) bearing on the soil (or soil supported).

The foundation consists of a mat foundation with stiffener beams. These foundations are highly susceptible to foundation movements and are design intensive as compared to the previous types of foundations.

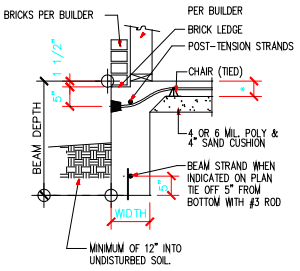


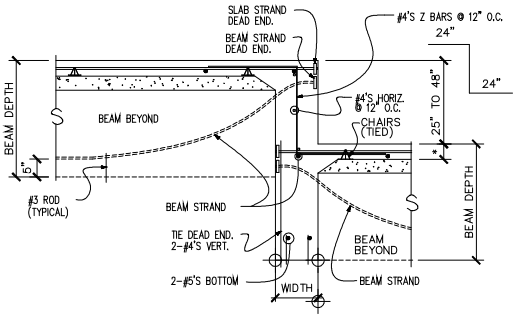
Rebar Details



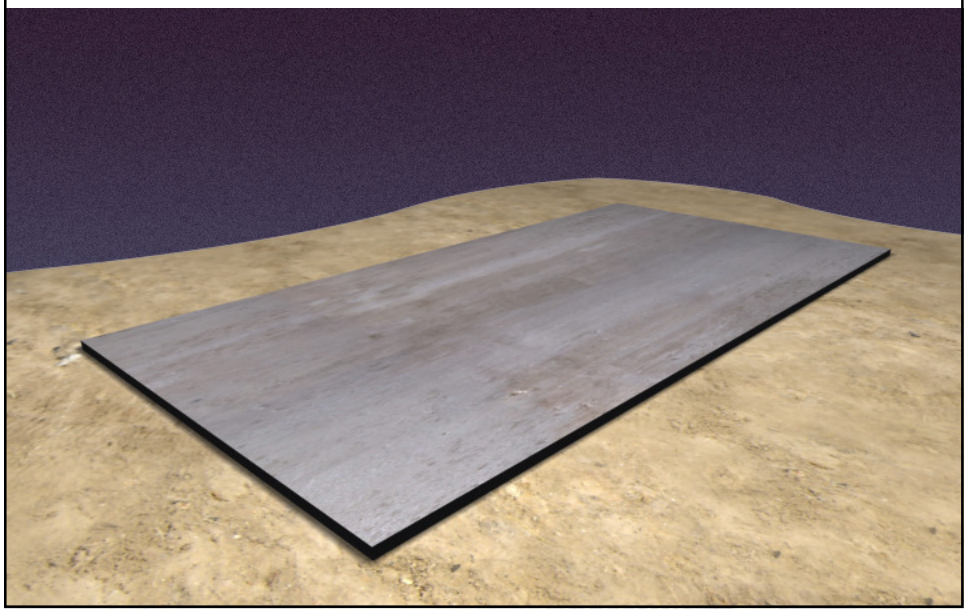


Post-Tension Details





Slab on Grade Installation Sequence



Slab-on-Grade

Slab-on-Grade

Advantages:

- Most cost effective of all types
- Most common / typical
- Proven through performance history

Disadvantages

- Susceptible to soil movements (PVR of 4 ½" or less)
- Soils must have sufficient bearing capacity and be properly compacted (or piers are required)
- Requires some maintenance (drainage / watering)

Builder Challenges

"I don't have reliable geotechnical data"

"I don't have time for soil remediation"

"I didn't budget for soil remediation"

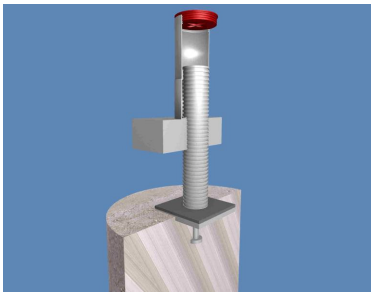
"I don't want to spend thousands in foundation warranty calls"

"I don't want to buy-back anymore homes"

"I need greater protection if a homeowner neglects to perform the required foundation maintenance"

Is there any other alternative?

How does SlabTek compare to other foundation systems?



- *Strength of Pier and Beam*
- *Performs like a Suspended Slab*
- *Built like a Slab on Grade*

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HOW IS THIS BUILT?

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Construction Process






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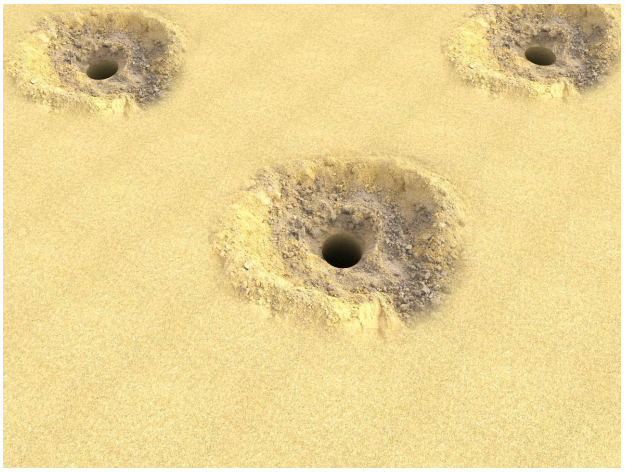
Pier Drilling



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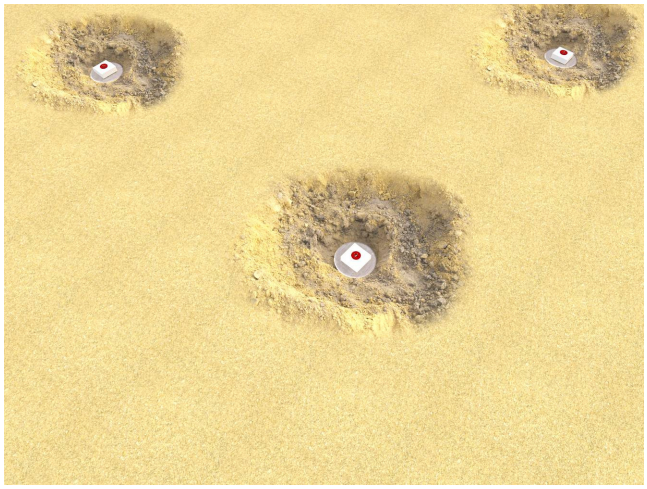
Lifting Mechanism Install



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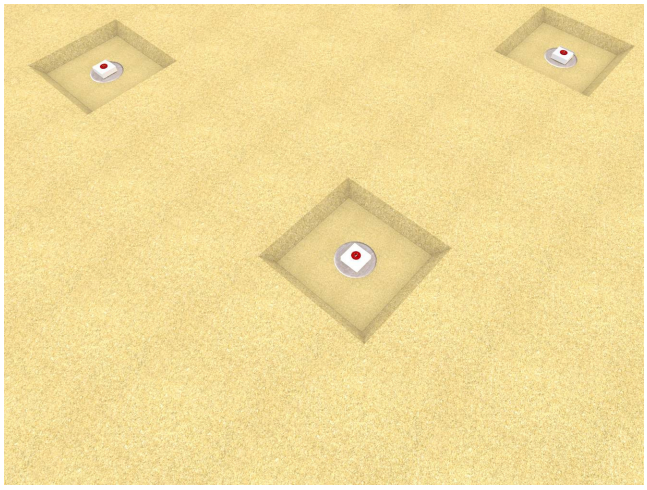
Pier Capitals



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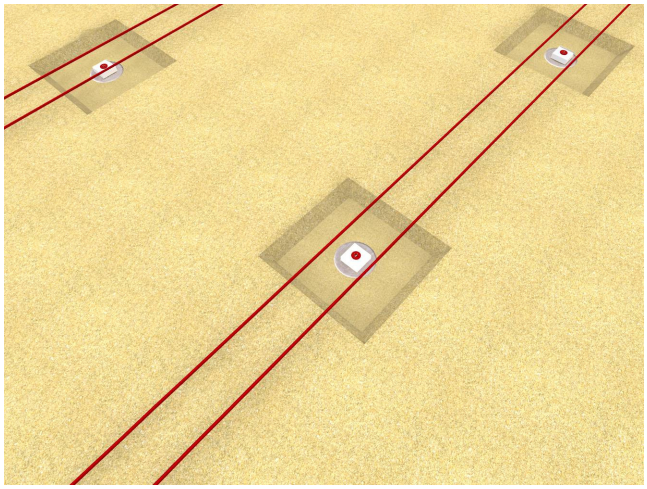
Cable Installation



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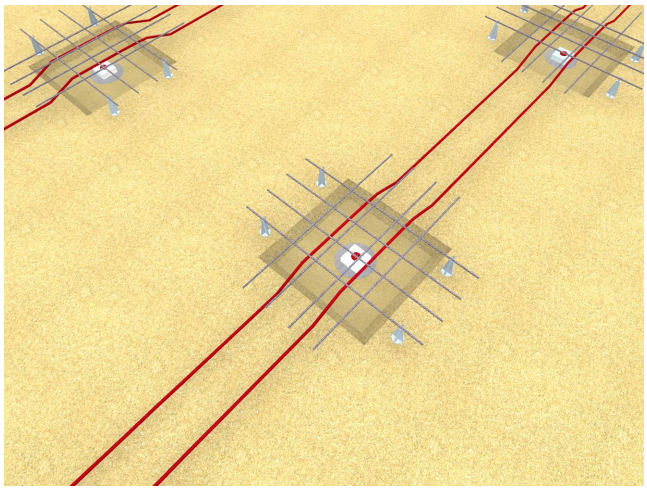
Steel Reinforcement



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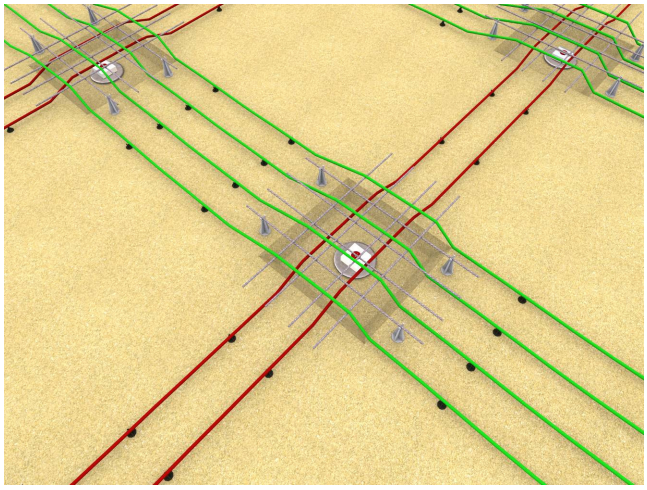
Profiling of Cables



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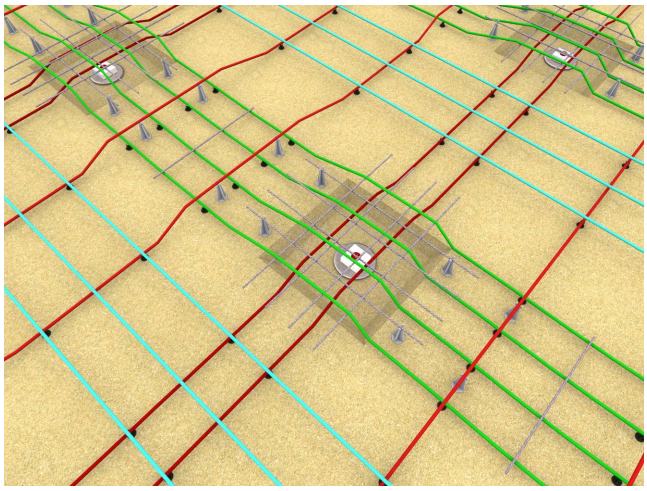
Complete Cable Installation



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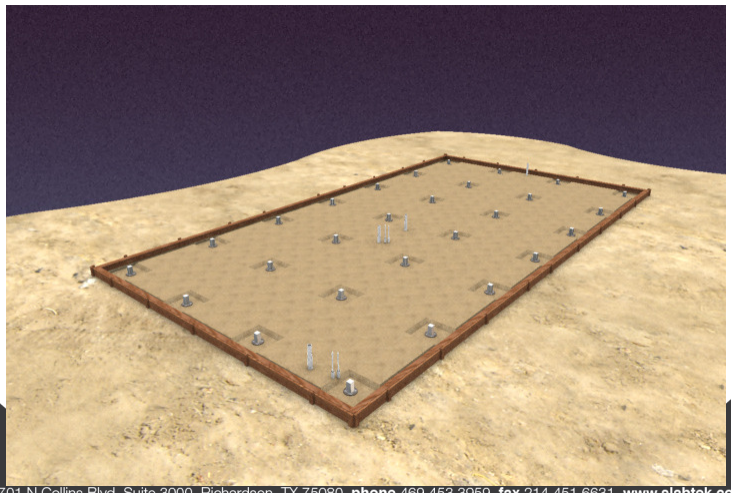
Installation Sequence



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ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK:
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