



**EPS**

Insulation under the slab is typically 150 mm (6”) EPS with offset joints. The R-value of this insulation is R24 (RSI 4.2 in SI units). EPS is used strictly in accordance with manufacturers instructions.

Legalett typical design practice for EPS:

- Long term - dead load (>500 days), deformation <1%
- Short term - live load (100 days) deformation <2%
- Rolling loads - 70% of compressive stress limit with 5% deformation


	<b>USA</b>
EPS is governed by: ASTM C578-06 Standard for Rigid, Cellular Polystyrene Thermal Insulation	


	<b>CANADA</b>
EPS is governed by: CAN/ULC-S701-05 Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering. (Type 2 EPS is the material of choice). In some applications Type 3 is used for its higher compressive strength and lower susceptibility to creep under load.	

**CONCRETE**

The Legalett GEO-Slab System is an Engineered Product. This means that the resulting structural design is engineered to suit the specific project. A Legalett GEO-Slab is a modified raft foundation and is a hybrid design based on a combination of reinforced and non-reinforced concrete and integral structural Expanded Polystyrene (EPS) insulation.


Our heated foundation system combines energy storage (thermal mass) and delivery, building structural requirements, as well as moisture control and thermal management for a frost protected shallow foundation (GEO-Slab). Our GEO-Slabs are thermally stable and are not in contact with the sub-grade material. The Legalett design includes full structural modeling to verify site specific reinforcing requirements in accordance with the National Building Code.


	<b>USA</b>
Building Code Requirements for Structural Concrete - ACI 318	

	<b>CANADA</b>
"Design of Concrete Structures" - CSA A23.3	


**HEATERS**


A water or electric coil heater and a fan are located in the heating unit. The heating unit is placed flush with the top of the floor. The heating unit is accessible via an inspection hatch.

	<b>USA</b>
CSA - US approved	

	<b>CANADA</b>
CSA approved	

**FROST PROTECTED SHALLOW FOUNDATIONS**

	<b>USA</b>
IRC (International Residential Code) section is R403.3 Frost protected shallow foundations.	
ASCE SEI/ASCE 32-01 Design and Construction of Frost Protected Shallow Foundations	

	<b>CANADA</b>
The slab is designed in accordance with part IV of the NBC for frost protection.	

Background: In 1994, the US Department of Housing and Urban Development conducted several demonstration and monitoring projects, to verify the performance of existing European design practices. As a result an FPSF Design Guide was developed, to serve as a basis for building code acceptance and standardization in the United States by the National American Home Builders Research Center.

Legalett uses state of the art finite element modeling software to predict frost penetration for its GEO-Slabs.