Foundations can be built in many different ways although crawl spaces, slab-on-grades and basements are the three most commonly used in residential construction. Regardless of the type, all foundations must:

- hold the building up
- keep the groundwater out
- keep the soil gas out
- keep the water vapor out
- allow the water and water vapor out if it gets inside
- keep the wind out
- keep the heat in during the winter
- keep the heat out during the summer

http://www.buildingscience.com/documents/reports/rr-0206-foundations-moisture-resistant-construction

**WATER DRAINAGE IS THE SINGLE MOST IMPORTANT ASPECT OF BUILDING A HOUSE FOUNDATION.**

Water can be very destructive to foundations, basements and crawlspaces and will be very costly to repair.

**Foundation/Water**

- Capillary break beneath slab
- Slope away from patios, porches, walks, drives
- Slope away from home ≥ .05”/ft for at least 10 feet
Building envelope—what separates the inside from the outside

Building Envelope Defined: The building envelope (or building enclosure) is the physical separator between the interior and the exterior environments of a building. It serves as the outer shell to help maintain the indoor environment (together with the mechanical conditioning systems) and facilitate its climate control. Building envelope design is a specialized area of architectural and engineering practice that draws from all areas of building science and indoor climate control. (Wikipedia)

Air barrier—controls unintended movement of air into and out of a building.

Moisture barrier (water vapor retarder) – not to be used inside in hot humid climates.

Thermal boundary—insulation.
1. The Canadian Standards Association “Guideline on Durability in Buildings” (CSA S478-95, Rev. 2001):
“The ability of a building or any of its components to:
• perform its required functions
• in its service environment
• over a period of time
• without unforeseen cost for maintenance or repair.”

2. Building—materials and resources
   Occupants—IAQ
   Homeowner—education
   Planet—energy

Sustainability: “Forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs.”
Sustainability is a much broader concept, while durability focuses on length of performance.