Site Investigation Report

The Site Investigation report aims to assign a single “Site Classification” to the intended building site. This Site Classification gives an indication of the expected amount of movement of the soils across the intended building site, which indicates the reactivity of the soils in that particular location.
All on-site features as well as the climatic conditions need to be taken into consideration when a Site Classification is assigned. These factors can have an effect on the extent of soil movement and differential effects over the area.
The Site Classification concerns the site as a whole, and not just the reactivity of the soil.

The soils on the Darling Downs and surrounding areas are quite variable and include rock, sands, sandy clays and clays with varying expansive properties. The more expansive soils are well known to exhibit moderate to extreme movements depending on where the site is located. Soil movement occurs two ways:

1. SWELL - occurs when clay layers absorb moisture into their structure and expand:
2. SHRINK - occurs when they dry out and these clay layers lose moisture.
The degree of such movement is affected by the types and proportions of clay minerals present.

Class P Sites

Class P sites are those sites that may contain some of the features described in the table below. The “P” Classification acts as a “warning bell” to the footing/slab designer that particular site feature/s need to be considered when designing the footings. These features may cause abnormal conditions in the underlying soils that will adversely effect the expected amount of soil movement that would occur under normal conditions.
“P” sites may not necessarily be “Bad Sites”, ie particularly reactive or expensive to build on, depending on the assessment of the Footing Designer. Such an assessment may conclude that the influence of the “Feature” is either minor (or even negligible), or significant enough to warrant specific design. If the on-site factors are negligible then standard footings may be designed but if it is more severe then design by Engineering Principles may be required. Additional requirements for footings, which often result, can add some cost to building construction.

Incorrect classification can lead to building distress and damage, and it is therefore imperative that the site be investigated thoroughly, and classified appropriately.

Australian Standards

AS2870-1996 is the Australian Standard that deals with Site Classification and Residential Footing Design. The standard designates a Site Classification that is appropriate to the expected amount of movement at the surface under normal conditions. The standard then designates standard footings for this classification. It also designates a “P” Classification under abnormal site conditions and depending on the severity of the feature/s, standard footings (from the building code) or Engineer-designed footings may be applied. These site classifications are described in the table below.

Class	Expected Surface Movement (Ys)	Explanation
A	**0mm**	Includes many sand, gravel and rock sites with no clays. These sites have no expected movement and as a result zero moisture variation.
S	**0 - 20mm**	Slightly reactive sites which exhibit only small movements with moisture variation.
M	**20 - 40mm**	Moderately reactive sites exhibit moderate amounts of movement with moisture variation. These sites commonly include red/brown silty soils, some sandy clays and loamy soils.
H1	**40 - 60mm**	Highly reactive sites exhibit high amounts of movement with moisture variation. These sites include some silty clays in the Toowoomba area

		and many of the sandy clays and basaltic clays in the Lockyer Valley.
H2	**60 - 75mm**	Highly reactive sites exhibit high amounts of movement with moisture variation. These sites include some silty clays in the Toowoomba area and many of the sandy clays and basaltic clays in the Lockyer Valley.
E	**>75mm**	Extremely reactive sites which exhibit greater than 75mm of surface movement. Typically, these sites include deep reactive clays, such as black and dark brown soils on the Darling Downs, but are also found throughout the Lockyer Valley and parts of Toowoomba. These sites typically demand quite expensive footing systems.

P As indicated previously, the Site Classification must consider many aspects of the site, not just the reactivity of the soil. P sites are those that include other factors that need to be brought to the attention of the owner, builder and footing designer. A “P” classification does not indicate a specific Ys value and is described as a “Problem” site.

The reasons for a P classification include:

Growth &/or Removal of Trees will cause Abnormal moisture conditions in the subsurface soils;

Unusually high moisture conditions caused by water flow, ponds, dams etc;

Sites with Loose fill which can be either “controlled” or “uncontrolled”. The P Classification depends upon the depth and type of fill;

Sites with poor bearing capacity, soft soils, or soils which are prone to collapse;

Sites prone to mine subsidence, land slip, piping or coastal erosion;

Sites which for one reason or another cannot be classified as normal sites;