BROWN ENGINEERING GROUP

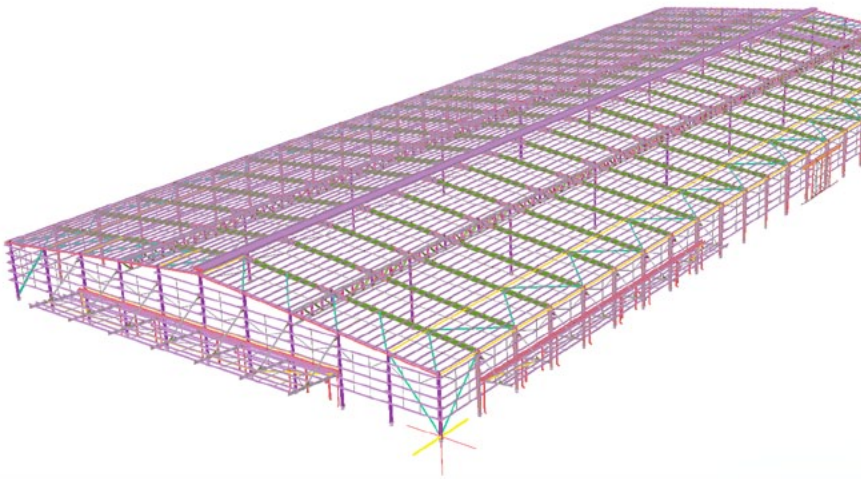
A SIMPLE GUIDE FOR ERECTING A STEEL STRUCTURE

Erecting a steel structure can be a massive undertaking. You can procure a steel structure and install it yourself, but we would recommend you go with a reputable steel contractor to do the process for you.

There are many areas to consider, such as positioning, alignment and ensuring that all components are secured correctly on prepared foundations to form a completed frame.

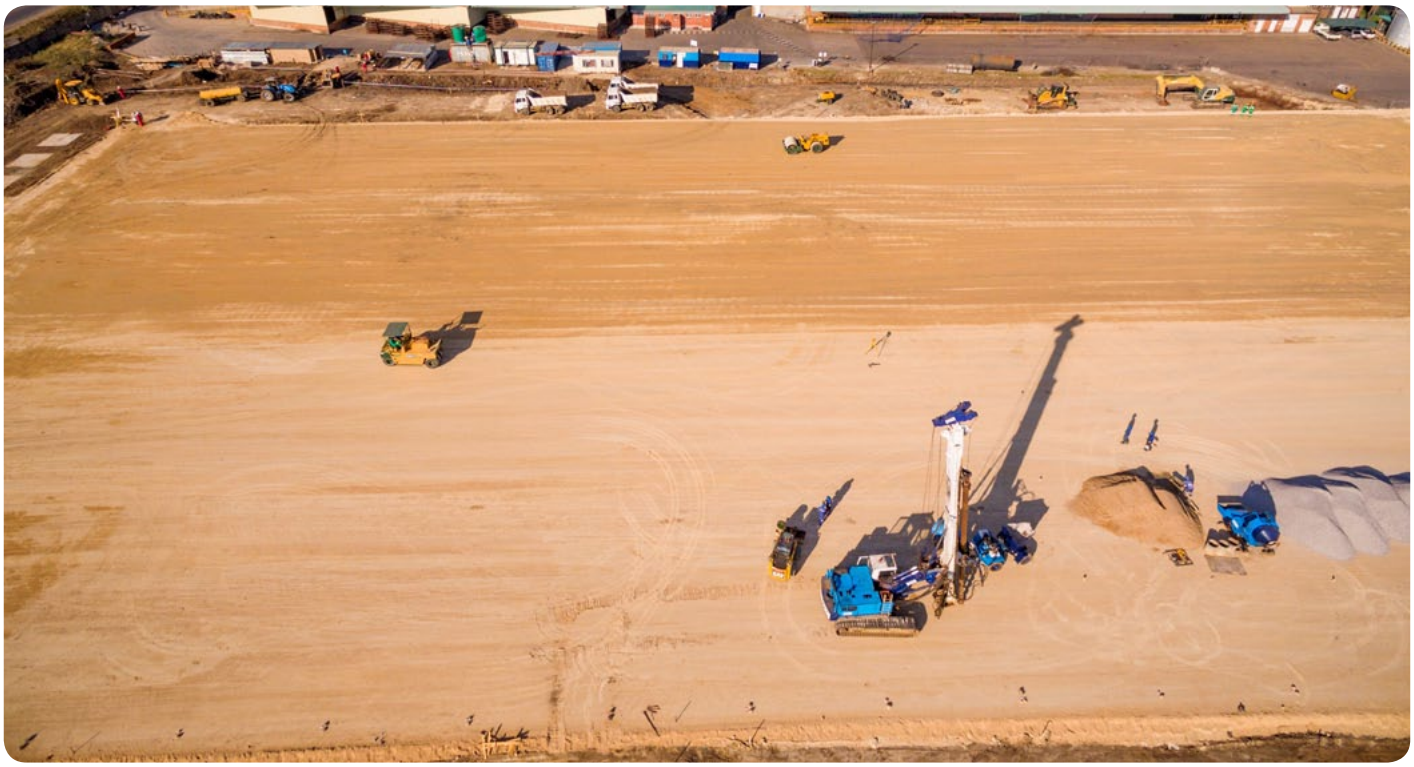
The process involves lifting and placing components into position, then connecting them together. If something is slightly out, it could cause structural defects and you might end up with a costly disaster on your hands!

IF YOU HAVEN'T DONE SO, PLEASE READ OUR *TOP TIPS* FOR BUILDING A STEEL STRUCTURE.



STAGE 1: FOUNDATIONS

Firstly, before any foundations are laid, it is imperative the building site is made level, once levelling has been done, excavation for the foundation can begin. Consult with your contractor regarding the type of foundation excavation required.



CONSTRUCTION OF MOST STEEL STRUCTURE STARTS WITH A STRONG FOUNDATION!

At a minimum, any foundation must do three things well:

- Support & anchor the structure
- Keep out groundwater
- Act as a barrier to water and soil vapor

Keep back some of the removed earth from your excavation for in-filling of small holes or final grading and leveling after the steel building is completed.

The type of foundation type used depends on the strength of the ground.

When there is a layer of weak soil at the surface, it cannot support the weight of the building, so the loads of the building must bypass this layer and be transferred to the layer of stronger soil or rock below.

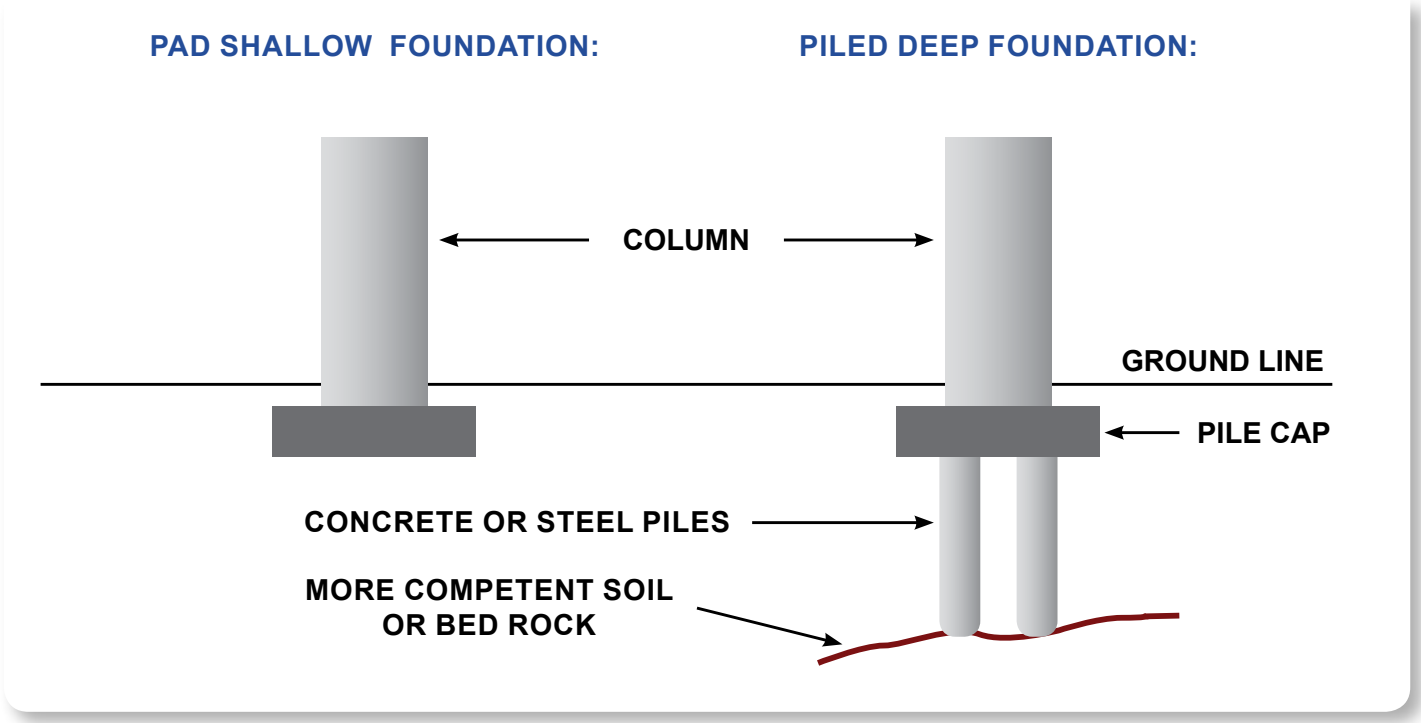
Where poor ground conditions are prevalent piled foundations will be typically used. This technique enables heavy loads from the structure to be transferred to competent ground. Steel bearing piles are driven into the ground to a depth determined from the site investigation and the design calculations. Pile caps and ground beams are used to transfer the loads from the structure to the ground.

Our soils in Zimbabwe

Use an expert to carry out groundwork right at the start, this will save you the time and cost involved in putting things right later.

The simplest and most preferred type of foundation for steel structures are pad foundations. These comprise of reinforced concrete pads which are sited under each column. Steel bolts are cast in the concrete ready to accept the factory-made components to ensure a solid anchoring of the steel structure. The width and depth of each pad foundation will depend on the soil conditions and building loads.

AT A GLANCE - Piled and Pad Foundation Types



The above are the more commonly used types of foundations, there are many alternatives, but your contractor should advise the most suitable option for your structure.

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STAGE 2: MANUFACTURING

While you are preparing the site for installation, your contractor will be busy looking after your order and making sure the manufacturing entity is fabricating the components as needed or pulling them from their inventory. When the building components are delivered, the site should already be prepared for the erection process.

STAGE 3: DELIVERY

It is important to coordinate delivery with you contractor. Make sure they have someone present to verify that everything you're getting billed for has arrived. Shortages or damaged materials must be noted by you; or you could find the supplier will not be held responsible! If construction is not taking place immediately, building materials must be adequately covered and protected.

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STAGE 4: ERECTING THE STRUCTURE

General erection consists of the setting of columns, the installation of purlins and girts (ribs) and the attachment of the roof and wall sheeting. The processes involve lifting and placing components into position, then connecting them together. Generally this is achieved through bolting but sometimes site welding is required.

The sequence and method of erection are generally dependent on the layout and arrangement of the structural components. Normally the following sequence of methods are followed.

STEP ONE

Before the building of the steel works starts, the sizes and the exact locations of the holding down bolts on the foundation and base are checked for any discrepancies. After these important checks are made, the following steps are carried out:-

STEP TWO

- Erect columns together with base plates.
- Align the columns.
- Use temporary bracings to hold the columns truly vertical so they don't sway in any direction.
- When the columns or stanchions are very long, they will be erected in sections and bolted onsite.
- Adjust the holding down bolts with adjustable screws underneath the base plate.

STEP THREE

- Erect the central portion of each rafter. In the case of a roof truss the whole section maybe erected in one go.
- Connect the Truss to the column ends with bolts to form the full structure frame.

STEP FOUR

- Install the vertical column bracing and roof bracings after the final adjustments of the frame positions to make the structure stable.

Good site co-ordination will facilitate a smooth-running project.

STEP FIVE

- Fasten all the roof purlins and sheeting rails to the structure with bolted connections.

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STEP SIX

- Fix the roof and side coverings
- Fill the underside of the base around the base plates with non shrink grout.

WE HOPE THIS INFORMATION WAS HELPFUL.

Want to know about steel or a specific type of structure?

FIND OUT MORE

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