

## OPTIMIZATION OF INDUSTRIAL PLANT STRUCTURES

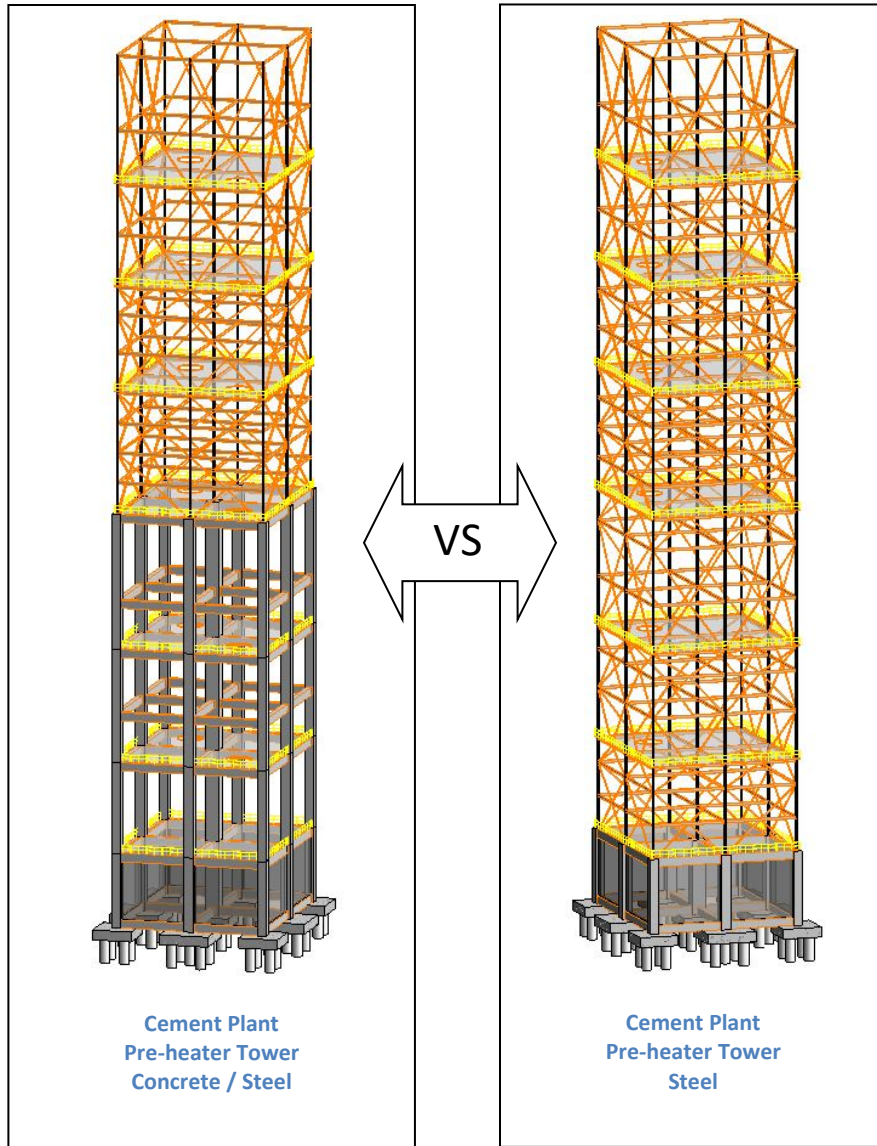
The goal of optimizing a structure is to find the most efficient option using reliable methods. Decisions are based on the quantities of materials determined for each option.

In order to identify options and to be as objective as possible, a chart is created with a set of apparent design options and the criteria influencing each of the options. The criteria influencing each of these options refer to an importance factor unique to the project under evaluation. From this chart, a set of allowable solutions is chosen.

The following are variables to be taken into consideration while optimizing a structure:

|   | <b>VARIABLES</b>     | <b>ALTERNATIVES</b>  |
|---|----------------------|--|
| 1 | Soils condition      | Evaluate bearing capacity and, based on this determine the type of foundation required.  |
| 2 | Foundations          | Spread/matt foundation or piles. If piles are chosen, then the alternatives should be evaluated:<br><br>Type of piles: Steel Piles, Micro Piles (steel concrete mix) or just Drilled Concrete Piles. |
| 3 | Main structure frame | All concrete, all steel or a mixture of both. The choices are not clear cut.<br><br>The variables coming into play are too many to be intuitive.   |
| 4 | Materials prices     | Evaluate the in situ cost of materials. If the steel is imported evaluate the costs delivered to the job site.   |
| 5 | Installation prices  | Evaluate the availability of local contractors to do complex structures.<br><br>Obtain budgetary pricing for construction  |
| 6 | Seismic forces       | Is the site under seismic forces, and if so are they enough to govern the design over wind?  |

|   |                                 |  |
|---|---------------------------------|--|
| 7 | Schedule                        | Delivery of materials  |
| 8 | Schedule of structural assembly | Concrete vs. steel   |
| 9 | Architectural                   | Architectural preference of the Owner: appeal vs. efficiency and cost. |



There are many variables in considering an optimal structural system. An optimization study can result in significant project cost savings and schedule optimization.

