# CONFIDENTIAL CLIENT
# WELLHEAD PLATFORM INSTALLATION

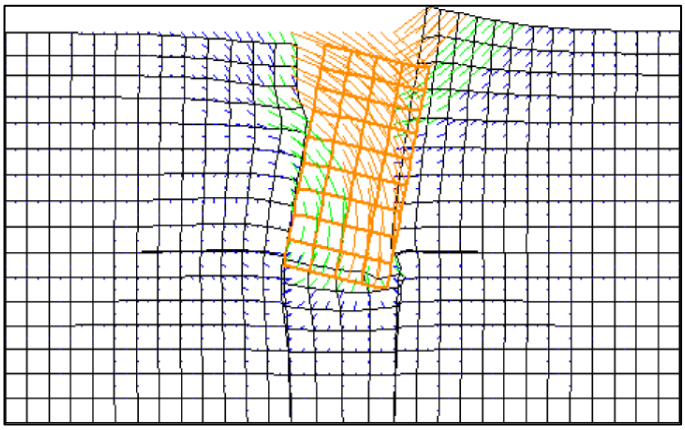
## Basic Design for Suction Piled Foundation, SE Asia

ICON Engineering was engaged by a Confidential Client to carry out a concept and preliminary design of a suction can foundation to support the Client's standard three leg jacket and topsides.

The objective of the concept study in changing the traditional driven piles to suction piled foundation, was to reduce the installation costs by utilising the Client's installation assets and reducing the installation time.

The scope of work covered the following activities:

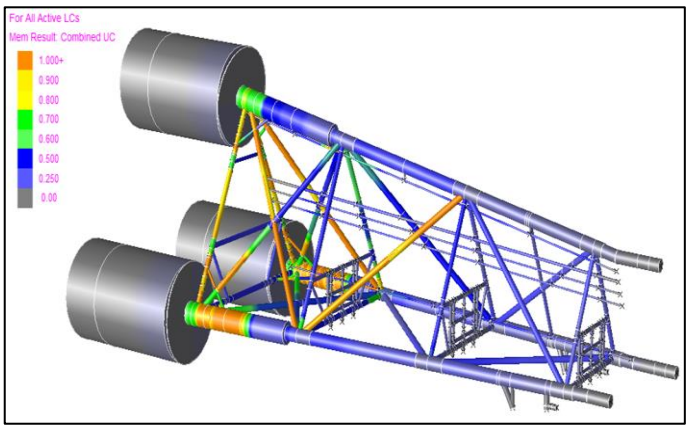
- Assessment of input data, such as geological conditions, water depth, type of offshore platform, meteorological conditions, topside and jacket structure, construction equipment and lifting crane;
- Development of basis of design for the suction pile foundations;
- Assessment of the feasibility of using suction piles at the locations specified by the Client;
- Produce a concept design for the substructure including the suction pile foundation;
- Identify and prepare strategies for reducing installation risks; and
- Perform preliminary installation engineering.



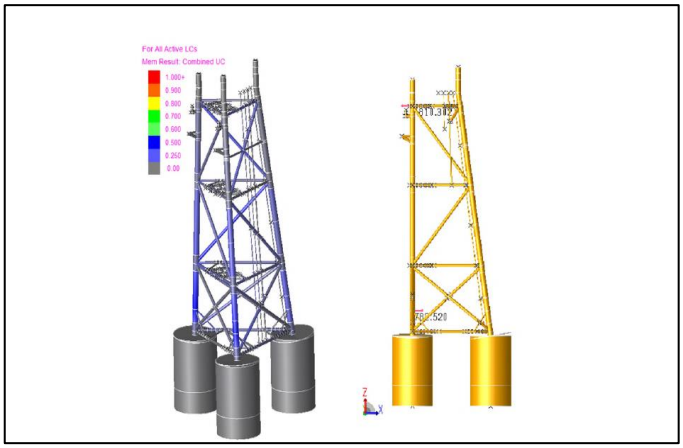
**Exaggerated soil deformation / vectors.**

The geotechnical assessments required to determine a site's suitability for a suction can foundation are complex in nature and require consideration of the in-place and installation conditions. Each site was assessed separately - the highly variable soils require different foundation designs.

ICON's experience in designing and installing suction piled foundations allowed the Client to add value to the existing WHP designs with a credible and robust engineering solution.




**Substructure transport (SACS model).**




**Substructure in place (SACS model).**

The study provides the following key findings:

- Not all locations had soils that were technically feasible for suction can foundations;
- Suction can weight during transportation governs the lower jacket member design. Novel transportation techniques should be used to reduce the leg loading during transit and jacket weight;
- Transportation and installation optimisations are possible with a two-piece substructure. Two-piece substructures are potentially jackup rig installable;
- The suction can foundation design concept could be extended to the Client's range of larger jacket designs; and
- Novel suction pumping systems are required to reduce the installation risk and cost.



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