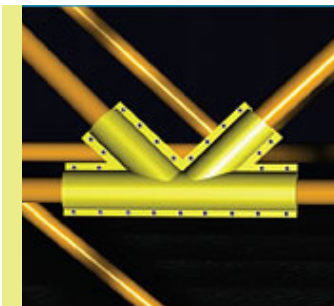




*Grouted clamp in situ*



*Typical 4 leg grouted clamp*



*Member grout filling trials*

## GOOD TO KNOW

### Hazardous zone 2

FoundOcean structural repair and strengthening equipment is suitable for working in hazardous Zone 2 areas

Repairs and strengthening for offshore structures and pipelines may be required for a number of reasons; the most common include **fatigue**, **collision damage**, and **amendments to certification regulations**.

**Planned changes**, such as the installation of new process modules, may increase topside loads, and require further stiffening or bracing of the substructure.

The major advantage of using grouted connections is that the grouted annulus offers a large tolerance and therefore reduces fit-up problems. For this reason they are most suited to the repair of damaged areas of structures where deformations from the as-built geometry have occurred such as impact dents.

Filling a member with grout offers the advantage of not increasing member diameter (as an outer sleeve would) or wave loading.

Grouting a tubular member may be carried out for the following reasons:

- To increase **axial compressive strength** of the member
- To improve overall **member strength and stability**
- To improve **strength at a tubular joint**

Recognised advantages of grouted repair techniques:

- Normal fabrication imperfections are easily accommodated by grout
- Geometrical damage is easily accommodated
- Full strength of damaged sections can easily be restored
- Increased strength can readily be provided
- Uses known and proven technology
- Repairs can be carried out at any depth within the range of the structure

FoundOcean provides grout mixing and pumping equipment specially designed for use on live production platforms and the structural repair equipment is suitable for working in hazardous Zone 2 areas.

FoundOcean can provide advice and assistance with the analysis and design of structural repair solutions.