



# Capability Statement

SFDesign 2019

## OUR MISSION

Is to be known as the best design company in Australia and to have happy clients that we get to develop long lasting relationships with.

## WHAT WE DO

We have a complete design solution to suit any sized job. We work with individuals and large companies and have arrangements that can cater to all your needs.



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## Our Aim

At SFDesign, we pride ourselves on providing high quality Engineering Services at affordable rates, underpinned by extensive design and engineering experience across a range of industry sectors, supported by our core operating values.

We deliver complete solutions through the expertise and flexibility of a focused and specialist Engineering team.

Our design team consists of over thirty Perth based employees ranging from Principal Engineers, Project Engineers, Design Engineers in each engineering discipline, Lead Designers, Piping / Structural / Mechanical Designers, and draftsman. We have a team to meet any sized project.

## Core Values

### **We always do the right thing**

We're not here to just 'sell something'. We listen, speak openly and honestly and only offer the best solution for our client's needs. If that means they need to talk to someone else, we'll make sure they are connected.

### **We believe optimism and commitment beat any challenge**

We love what we do and aim to be the best at it. Sometimes unplanned things happen, but we maintain an attitude at all times that keeps everyone focused on delivering solutions.

### **We stay on the edge**

We are always out the front! We constantly assess innovations and stay closely connected to our clients to make sure we understand the best solutions for their needs.

### **We love being local**

We live, work and love being local. We understand and support local business because we're one too.

### **We're part of a team**

No ego's here. We work together to make sure our clients have access to all the expertise available in our team. As a team, we make sure everyone takes some time for relationships and dreams to ensure a balance that keeps us friendly and helpful.



# Why choose SFDesign?

*SFDesign is a privately owned, multi-disciplinary engineering and design house located in Perth, Western Australia. We have the unique position where we can offer our customers design and engineering capabilities all from under the same roof at our headquarters in Applecross.*

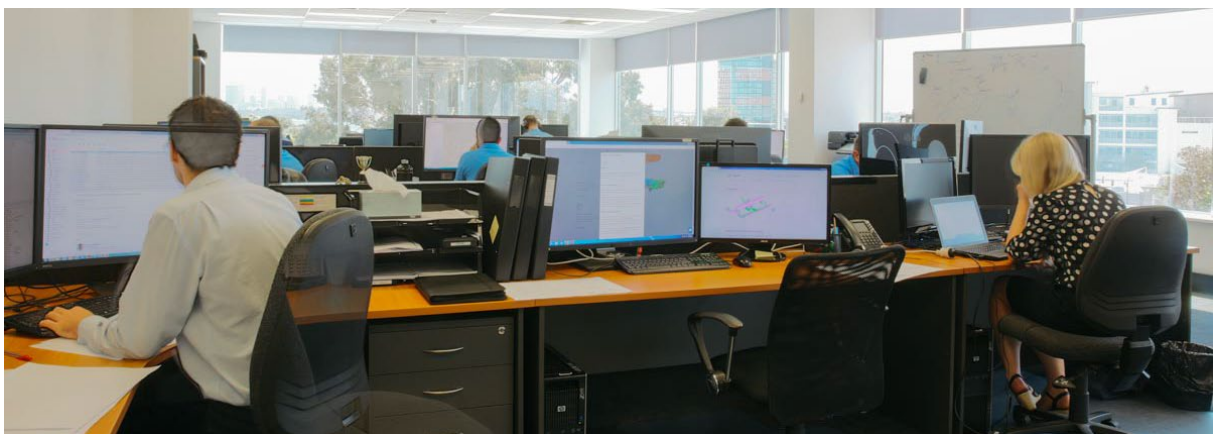
## We invest in **local** people.

At SFDesign we believe in crafting long-lasting relationships with our clients, that's why we serve WA first.

We have key relationships with Curtin University and the University of Western Australia's Mechanical Engineering faculties, through our graduate engineering program – employing Western Australia's best rising talent and offering all the guidance and practical education our experienced team leaders have to offer.

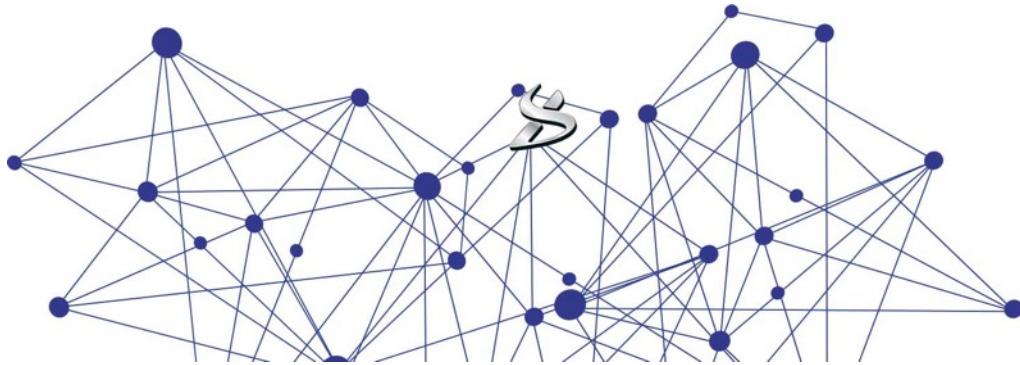


Our employees are all full time, or on the path to full time work, which has a wide reaching positive impact on the business. The culture at SFDesign is the product of a workplace that supports discovery and innovation, underpinned with consistent education and growth opportunities.





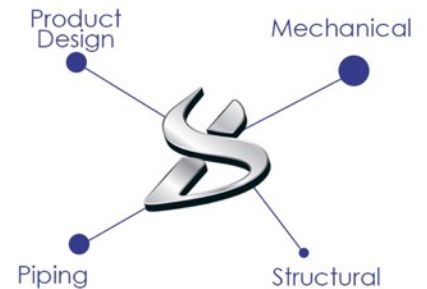
## We are **Connected.**



SFDesign is the leader in parametric software and integrated PDM systems here in WA, with a history of providing SolidWorks sales and service to companies across WA and interstate. This has given SFDesign key relationships with software developers at internationally leading 3D design software providers. SFDesign is better positioned to take full advantage of capabilities in parametric software due to these relationships and our employees recognition as certified parametric software professionals in programs like SolidWorks, Inventor, Creo and SolidEdge.

## Our **Multidisciplinary** Approach.

As part of our commitment to offer a full range of engineering and design services, we have assembled a diverse team of experts, and emerging talent from local universities across the full spectrum of engineering and design services. As a result, our capabilities span civil, structural, mechanical and piping for use across a range of different applications.



## Cost-effective designs.

SFDesign currently employs over 30 engineers, designers and draftsmen. This results in the most cost-effective design solutions, as lead designers are not left working on shop detailing, and vice versa. SFDesign has been working as a team of this size for many years and have fine-tuned processes to ensure that we can deliver the best possible design produced in the most cost-effective way.



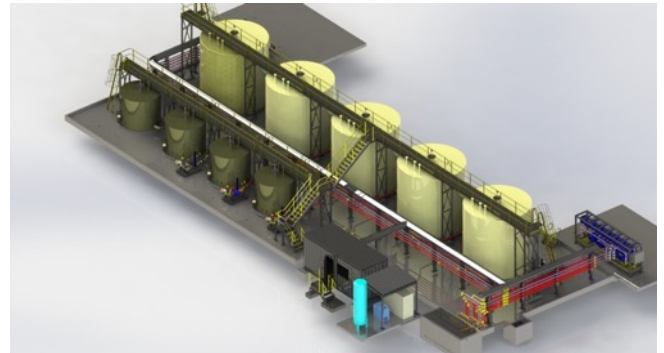
# Turnkey Design Solutions & Project Execution

We utilise a sound and proven methodology to deliver successful projects across Australia. Our process has been refined through years of our team's projects experiences, whilst incorporating current best practices.

Our technical Expertise sets the standard in engineering knowledge through parametric modelling techniques. Through our extensive experience we have gained a reputation in delivering quality solutions.

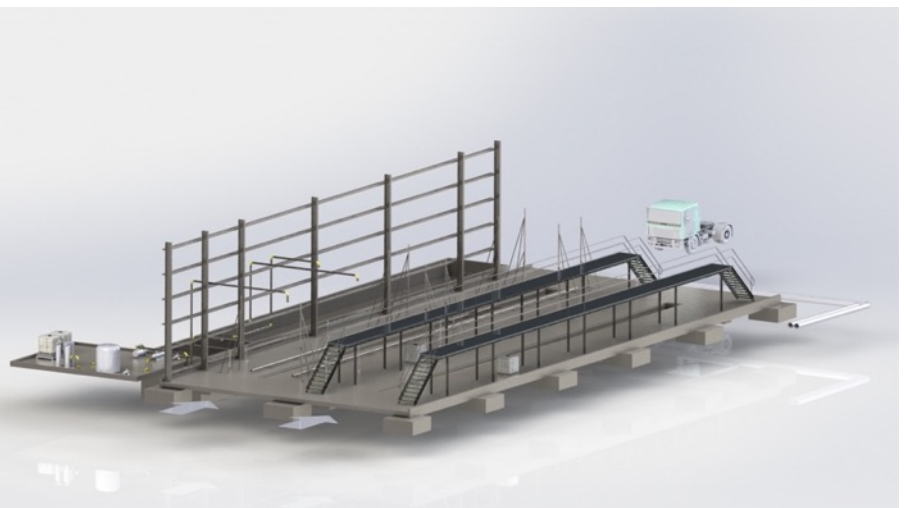
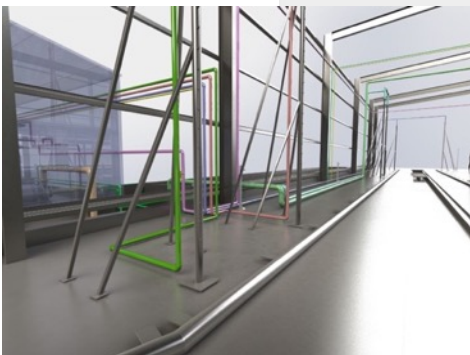
This capability combined with our highly qualified industry experienced principal Engineers in each of the engineering disciplines, ensures the final design far exceeds our client's expectations.

SFDesign will take full responsibility for the procurement throughout a capital project. Our services span from the creation of technical and commercial bid specifications through vendor qualifications, bidding selection to final contract negotiations.



## Capabilities

- Small to medium sized Design and Construction Projects
- Lime Slaking facilities
- Hydrocarbon storage and distribution facilities
- Bulk handling facilities
- Mining Infrastructure





**SMP** Structural  
Mechanical  
Piping

# Engineering

Our Value is defined through all phases of our client's projects

## Conceptual Phase

Our extensive 3D library of scalable parametric models enables projects to be assembled and feasibility studies commenced.

## Feasibility Phase

Combining our industry knowledge and key project requirements to enhance your 3D model

## Definitive Engineering Phase

This is where we deliver proven design knowledge and advanced software knowledge and establish how to showcase the design to all major stakeholders

### Projects:

#### Saraji Coal Mine Light Vehicle Wash Bay

The Saraji Coal Mine is a coal mine located near Dysart in Central Queensland. The mine has coal reserves amounting to 648 million tonnes of coking coal.

SFDesign was engaged to design a light vehicle wash bay encompassing Civil and Piping design with the provision of installation and maintenance manuals.



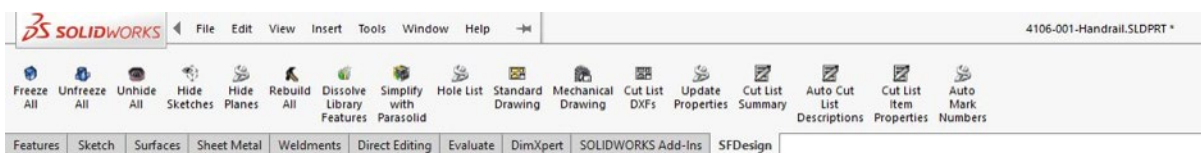


# Education & Consulting

With our background in CAD software sales and support, we offer full design office software support service from industry experienced experts. We at SF Design have a team that consists of over twenty full time Perth based employees with expertise ranging from Principal Engineers Project Engineers, Design Engineers in each engineering discipline, Lead Designers, Piping / Structural / Mechanical Designers, and draftsman.

## We offer

- Full Design Office Software Support
- On site & Remote Consultancy



As “SolidWorks Experts”, SFDesign is one of the most experienced and advanced users of the SolidWorks CAD platform in Australia. We know how to get the best out of SolidWorks and can develop software to enhance your specific requirements of SolidWorks – like our own ‘Toolbar’ that automates many of the frequently required tasks in the design and drafting process.





# Product Design & Innovation

At SF Design, we love supporting product innovation and new ideas. Over the years of offering services to different industries we have met many inventors and innovators looking to bring their ideas to life. SF Design offers a full product design and innovation service and can help with any stage of your product design process. Our expert team are here to cater to your needs and are capable of all matter of product design projects and will ensure they safely comply with Australian Standards.

## Capabilities

- Concept Designs
- 3D Scanning, modelling and 2D drafting
- Reverse Engineering
- Industrial Design
- 3D renders for presentations, Mechanical 3D animation
- Engineered Designs
- Production quality control – to millimetre standards



Pictured: Funky Monkey Bars



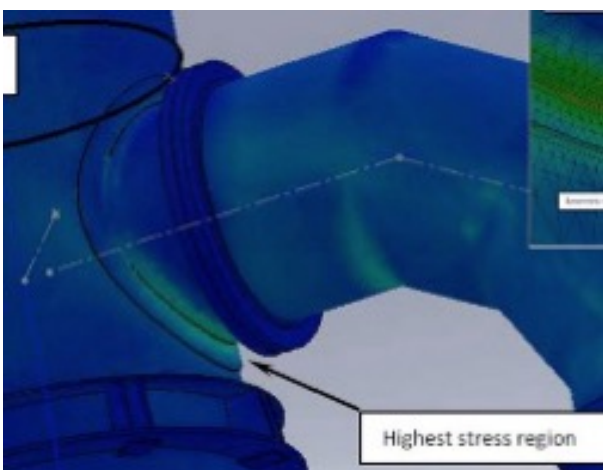
# Pressure Vessel Design and Verification

SFDesign has capability to design and verify pressure vessels to comply with various design standards including but not limited to AS1210-2010, ASME VIII-I, AD2000 (German Code for Pressure Equipment), CODAP 2000 (French Code for Pressure Equipment) etc.

Our chartered status engineers have extensive experience in design and verification of pressure vessels range from separators, shell and tube heat exchangers, rectangular heat exchanger, digesters, filters, pig launchers etc.

We have worked with our clients in modification to existing vessel and achieve compliance to standards to fully comply with regulations (Occupational Safety and Health Regulation 1996). We can also help our clients with design registration of vessels.

Where necessary, we can also perform FEA (finite element analysis) on non-standard pressure vessels to comply with standards and regulations.



## Projects

Blue water power station project:

The Bluewaters Power Station contained 20 pressure vessels for the boiler feedwater system that required design registration and individual registration with WorkSafe WA. The vessels were originally designed to the German standard (AD2000) but verified to the British standard (PD5500) for compliance with the local regulations. The team at McDowall Affleck worked with the manufacturer to ensure the fabrication of the vessels could be completed with minimal changes.

Finite element analysis for flash vessel, ducts and barometric vessels for Worsley Alumina in Collie:

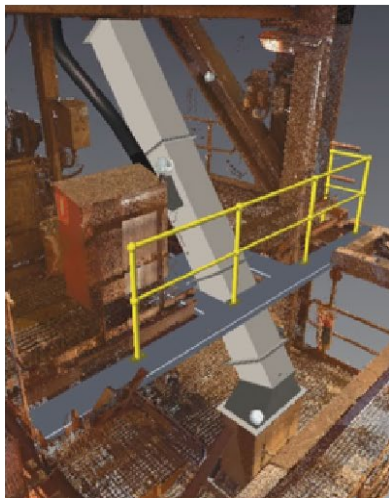
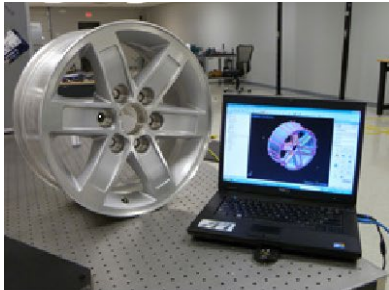
In 2009, we were engaged by Jord International to complete finite element analysis for numerous assemblies of Flash Vessels, Ducts and Barometric Vessels for the Worsley Alumina site in Collie.

The main objectives of the analysis were to allow determination of the stresses and deflections induced at key areas of the vessel assembly during very high temperature caustic wash and seismic conditions. The stress levels found were compared against AS1210 – 1997 to determine compliance. Key concerns were flexibility and thermal growth of the vessels and the potential for flange leakage under seismic loads due to caustic contents.

The vessels ranged in size up to 7500mm diameter, with the ducts connecting the flash vessel and barometric vessel being 1500mm diameter. Various load cases were applied to the assemblies, including pressure, temperature, mechanical loads, wind and seismic loads. The bolted flange connections were analysed in the FEA model to assess leakage of the joint. The bolt preload in some of the flanged connections was found to be insufficient, and a higher preload was recommended to maintain a sealed joint.



# Laser Scanning



**Terrestrial scanning** - Long range scanning  
Terrestrial scanning is typically used for large equipment as it can scan to 120 – 300m and the accuracy is down to 2mm. The scan file is typically a cloud file.

**Metrology scanning** - High accuracy scanning

Metrology scanning is typically used for small equipment as the laser scanner is attached to a tripod and has around a 3m reach but has accuracy of 200microns. The scan file is typically a mesh file.

**Point cloud conversion** - Turning scan data into useful models

Having a point cloud can be useful to many clients if they don't have the right software and hardware to turn that information into usable data. SFDesign can do not only the scanning but we can also turn that scan data into useful 3D geometry

**Reverse Engineering** - Creating real world models

Advancements in laser measuring technology has now made it accessible and affordable for many brown-field applications. 3D laser scanning is accurate over 100's metres with as low as 0.5mm tolerance resulting in considerable time saving during measuring and design.

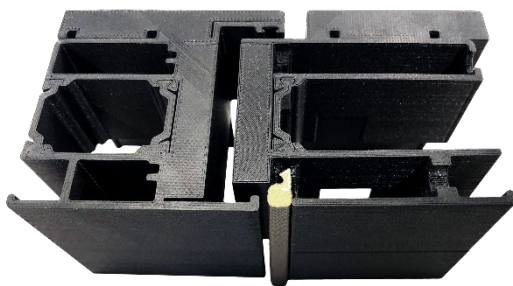


# Additive Manufacturing

## Markforged Industrial 3D Printers

SFDesign is uniquely positioned as Additive Manufacturing Experts here in Western Australia offering Design for Additive Manufacturing Services, and Sale and Support of Markforged 3D Printers to Western Australia.

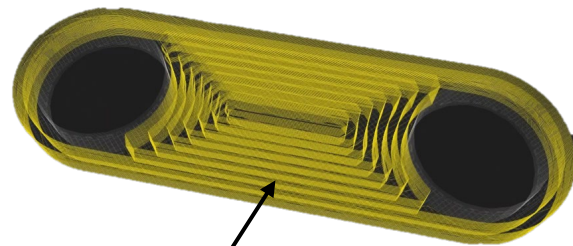
SFDesign has experience in both Design for Additive Manufacturing and Best Practices for 3D Printing. Alongside our offering of 3D printers, we are able to provide Education & Consultation, Design Services and Temporary Staff for Complex Design Problems.



|                    | Time    | Cost  |
|--------------------|---------|-------|
| <b>Traditional</b> | 156 hrs | \$800 |
| <b>Markforged</b>  | 12 hrs  | \$10  |
| <b>Savings</b>     | 93%     | 99%   |

### Design for Additive Manufacturing (DFAM)

Given the differences in the manufacturing processes SFDesign can assess design solutions to provide improvement with DFAM in mind. Produce industry leading solutions with SFDesign.



Custom Fibre Reinforcing

### Education & Training

SFDesign offer courses and consulting to help you get the most out of your Markforged printer. Learn how to correctly reinforce your parts, understand DFAM design thinking and how to push the printers to the leading edge of the technology. Understand features like embedded parts, finishing methods and surfaces with 50um precision.

### Sales & Support

SFDesign is Western Australia's only locally owned and operated reseller, from our offices in Applecross. We offer the full range of composite and fibre-reinforced printers – both desktop and industrial, plus all spare parts, consumables and materials. All backed up by our team of professional design draftspersons with DFAM experience.

**Learn more at [sfdesign.com.au/markforged-3d-printers](https://sfdesign.com.au/markforged-3d-printers)**

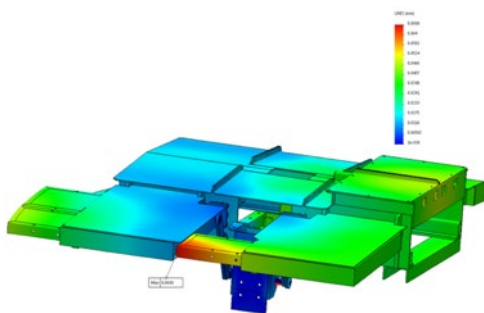


# Advanced Analysis

## FEA Analysis

*Numerical Solutions to highly complicated stress problems are now readily obtained using FEA.*

SFDesign has experience in both FEA and measurement. This ensures that we can create realistic computer modelling of both static and dynamic systems. SFDesign has the capability to analyse very large structures, to a high level of detail. We can optimise designs and push the design envelope, testing numerous variations in a short time-frame.



Our resources include:

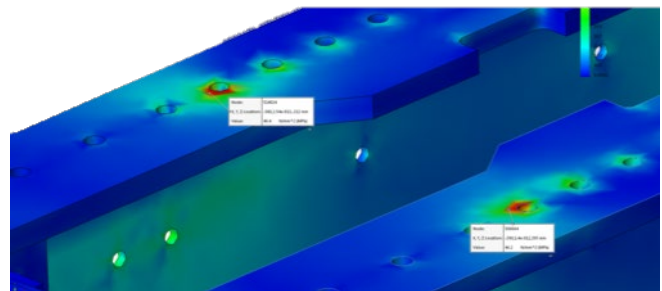
- Nei-Nastran
- SolidWorks
- Strand7

Capabilities:

- Static and dynamic stress analysis – linear/non-linear
- Critical buckling failure analysis
- Fatigue life cycle analysis
- Normal mode and natural frequency dynamics
- Transient and harmonic response analysis

## Fatigue Analysis

*SFDesign can assess design solutions to accurate levels with the help of specialist fatigue analysis software.*



## Dynamic Analysis

*Dynamic Analysis considers the response of structures and equipment that are in motion as a result of applied forces.*

## Computational Fluid Dynamics (CFD)

*CFD is used to model fluid flows, anywhere from highly viscous to low viscous fluids.*



# Design & Drafting

## Complete Drafting & Design Solutions

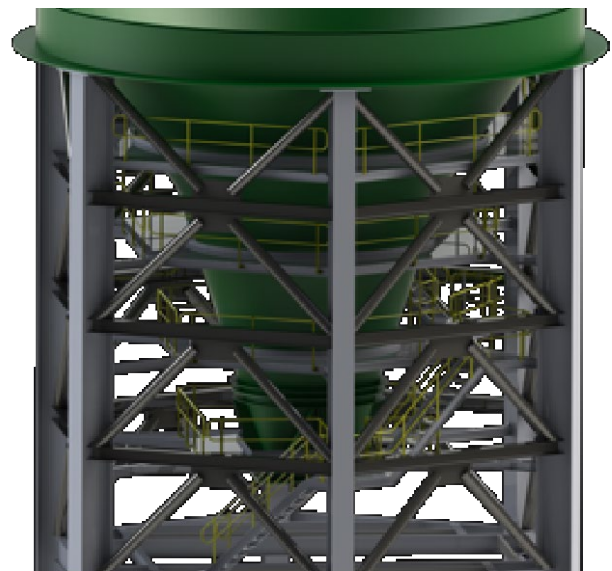
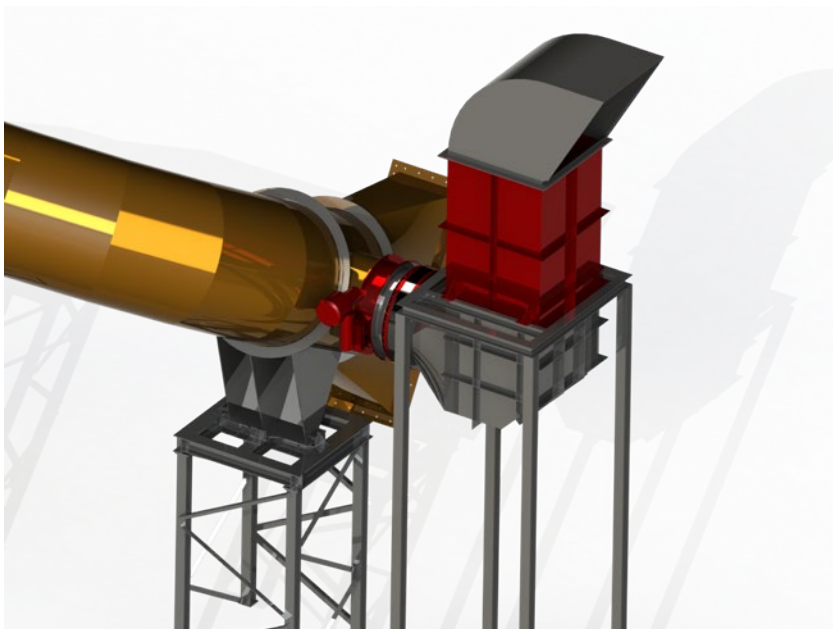
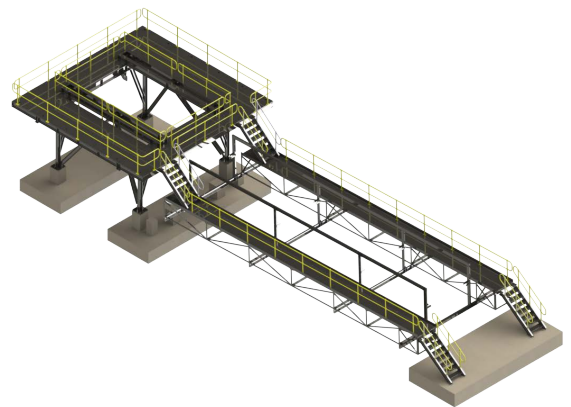
We have a great team of experienced & talented designers, drafters, engineers and managers.

Mechanical Design has never been easier with our innovative 3D design solutions. We can rapidly produce concept and detail models, all the way through to plate developments and detail drawings for all of your fabrication needs.

On completion of your 3D design models, we can produce technical documentation, operating manuals, realistic rendered images and Walkthroughs/Flythrough to effectively communicate your designs to your stakeholders

## Capabilities

- Chutes, Hoppers, Bins and Tanks
- Piping Isometrics
- Machine Design
- As-built Refits and Modifications
- Mechanical 3D Animation
- Engineered Designs
- Concept Designs





# Leadership Team



## James Staples – Design Manager

James founded SFDesign in 2008 based on a need for Perth intelligent engineering and design services that were skilled across a range of industries and provided scalable resources across the life cycle of projects. With over 14 years of experience using SolidWorks, James has developed systems that enable the team at SFDesign to provide cost effective engineering and drafting services in multiple industries. James also brings many years of experience in workshop fabrication and shop detailing to SFDesign. James also has extensive on-site experience as a Project Engineer and Commissioning Engineer on multiple projects. James possesses a unique combination of professional experience in business, engineering and construction in both the design office and on-site environments. With extensive experience which includes mining, manufacturing, machine design, and software implementation.



## Magnus Whittall – Operations Manager

Starting as a Welder/Fabricator for the Aluminium Shipbuilding Industry in Henderson, Magnus went onto study Product Design at Curtin University and upon graduation worked in London as Point of Sale designer winning Shop-fitting display awards. For the last 7 years Magnus has become a highly qualified SolidWorks technician winning ANZ Top Applications Engineer in 2010. His strengths are his ability to understand how CAD software can provide solutions for companies and in doing so has implemented PDM design and drafting procedures for SFDesign. The SFDesign office acts as a showcase example of the benefits this software can provide to small, medium and large Engineering companies.

### **Their key strengths include:**

- Extensive experience which includes mining, manufacturing, machine design, product development and software implementation.
- Established background working as workshop fabricators and shop detailers
- 21 years of combined SolidWorks experience.
- Experience implementing PDM design and drafting procedures.

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Individual Résumés available upon request.



# Leadership Team

## Design



SFDesign's Design leadership team has a wide range of experience with just some of the following highlights;

- 27 years' work experience across structural, mechanical, piping design, and construction projects – primarily for the mining and resources sector.
- Design and verification of Pressure Vessels to AS1210, ASME, PD 5500 standards.
- Design of tanks to API 650 standard.
- Excellent skills in parametric 3D modelling, model structure and library features/components.
- Sound knowledge of 3D point cloud data conversion from terrestrial scanners

### **Their key strengths include:**

- FEA Simulation for engineering review
- Engineering drawings for engineering sign off
- Conversion of 3D cloud point data into conceptual design for client comments

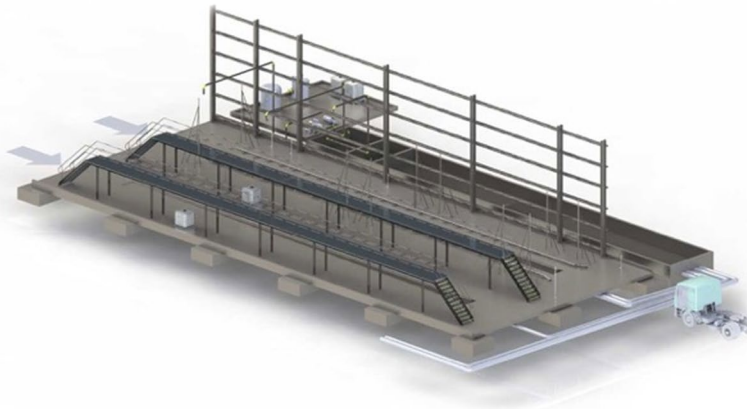
### **Projects:**

Alpha Tanks – Mobile Lubrication and Diesel Vehicle – Conversion from a Cat 775 Haul Pack

Fuel Tank and Pipe – Fuel unloading and loading Facilities; BHP Jimblebar

Malcolm Thompson Pumps – Fabrication drawings for numerous pump units

Austin Mintech – Maintenance upgrade projects onsite.







# Drafting Team

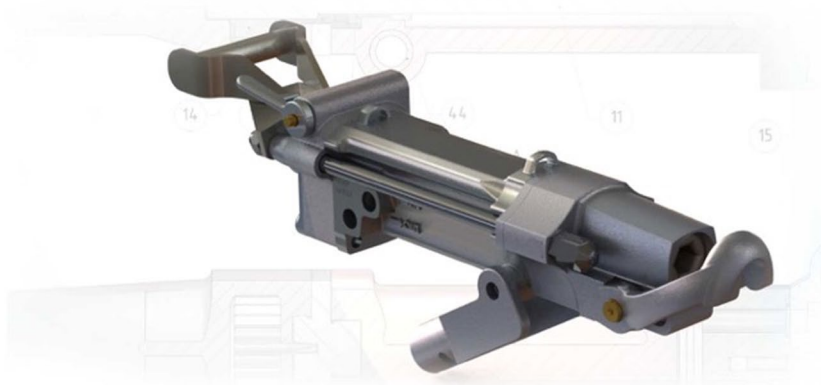


SFDesign's Drafting leadership team has a wide range of experience with just some of the following highlights;

- More than 10 years' experience developing projects and designing machines with Solidworks and AutoCAD
- Drawings prepared for laser cutting machines
- Photo realistic renders for websites
- More than 10 years of detailed tooling design
- More than 10 years of multi-disciplined experience in subsea design, both mechanical and structural
- Fabrication drawings for steel structures including weld detailing and surface finishing

## **Their key strengths include:**

- Producing concepts and detailed models
- Technical documentation, operating manuals and realistic rendered images for marketing purposes
- Innovative 3D design solutions





# Engineering Team



SFDesign's engineering leadership team has a wide range of experience with just some of the following highlights;

- 17 years solving mechanical and structural problems using finite element (FE tools)
- 7 years solving problems in the automotive, aerospace, defence, medical, oil & gas, semiconductor, monorail and general machinery industries.
- 10 years applying FE skills in the oil and gas industry as subsea pipeline specialists, solving problems in advanced analysis fields of lateral buckling, pipeline walking, structural analysis and fracture mechanics (ECA).
- FEA, mechanical design and pressure vessel verification expertise.
- 14 years working across structural, mechanical, piping design and construction projects for the mining and resources industry in WA.
- Exposure to a variety of disciplines such as mechanical assembly, fabrication and site construction.
- Registration on National Engineering Register in areas of Mechanical and Pressure Equipment Design Verification
- Extensive experience in the design and verification of pressure equipment, piping, tanks and mechanical equipment.

## **Their key strengths include:**

- Advanced finite element analysis (FEA)
- Mechanical design
- Subsea pipeline lateral buckling, pipeline walking analysis and general subsea pipeline design.
- Structural and dynamic analysis using finite element (FE) tools.
- Fatigue and Fracture Mechanics.
- Software programming (Python, C, Java, Visual Basic, Php, HTML, Swift).
- Familiar with DNV and Australian Standards (AS1210, AS3990 and AS4100 among others)

## **Projects:**

Wheatstone Project – Design and verification of vessels

Ichthy's Project – Design and verification of air cooled heat exchangers

Bluewaters Power Station – Verification of heat exchangers and pressure vessels for the boiler feedwater



# Technical Resources

Our expertise in design software includes:

## FEA - Linear and Non-Linear

- NX
- Abaqus
- Ansys
- SolidWorks
- Strand7
- 

## Mechanical and Piping

- Inventor
- SolidWorks
- Product Data Management
- Smap3d (Isometric and PI&D's)
- AutoCAD
- Microstation including CAD Conform
- Creo
- SolidEdge

## Turnkey Solution

- NavisWorks

## Structural using BIM

- Revit
- Advanced Steel
- Tekla

## Civil

- 12D
- AutoCAD



What **Industries** do we work with?

Mining/Resources  
 Infrastructure  
 Mineral Processing  
 Heavy Equipment  
 Oil and Gas  
 Product Design  
 Agriculture Equipment  
 + Many More

## Our Capabilities Include

- |                             |                           |
|-----------------------------|---------------------------|
| • Consignment Designers     | • Fixed Price Engineering |
| • Engineering Certification | • Consignment Engineering |
| • Technical Documentation   | • Engineering Design      |
| • Drafting Services         | • Construction Management |
| • CAD Conform               | • FEA Analysis            |
| • Laser Scanning            | • Work Safe Compliance    |
| • Animations                |                           |
| • Marketing Material        |                           |





# We are the Complete 3D Solution

SFDesign is a privately owned, multi-disciplinary engineering and design house located in Perth, Western Australia. We have the unique position where we can offer our customers design and engineering capabilities all from under the same roof at our headquarters in Applecross.

SFDesign have a proven history of successful projects and service a growing list of over 300 clients who rely on us for our expertise and industry-based solutions, and we are often an integral part of our client's processes.

To see how SFDesign can help you and your business, please contact us at your convenience for a fast and specialised reply.





Learn more online:  
[sfdesign.com.au](http://sfdesign.com.au)