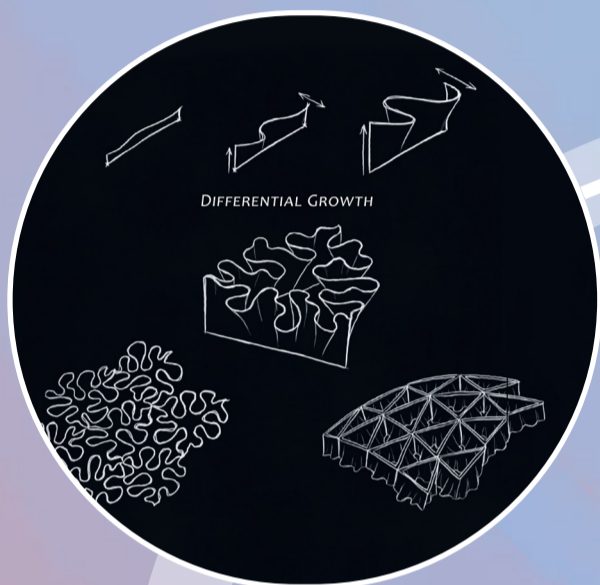


1. CONCEPT

Our parametric design process begins with the formation of a strong base concept defining the desired form and assembly approach. This concept is entirely unique to your project, and can be directed by client-found inspiration and/or project context and response to site as applicable to each individual instance.

GRIDSHELL

In the case of our developed GridShell System (pictured) the base concept takes inspiration from Australia's beautiful coral reefs, with awareness of the devastating effect climate change and pollution have had on reefs and ocean-life at large. Keeping in mind the brief to create a 3D printable, adaptable shell system, the resulting base concept combines natural patterns of differential growth with a logical triangular grid to form a biophilic cellular system reminiscent of bleached coral formations.

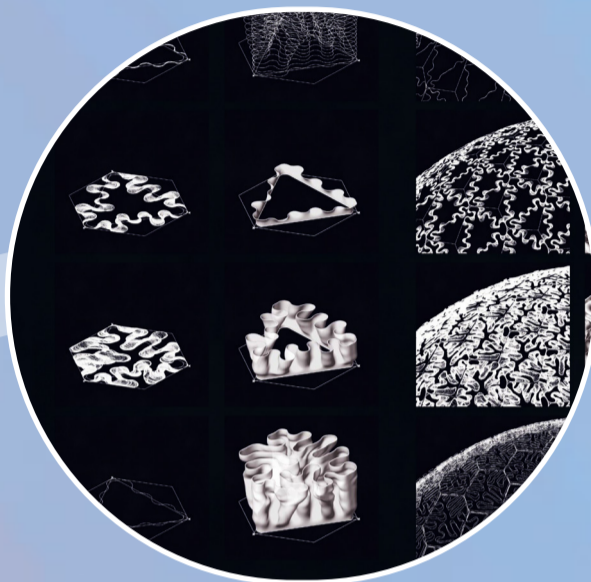


2. SCRIPTING

Once the system's base concept is defined we begin the parametric scripting process using Rhino's Grasshopper plugin to generate a fully parametric digital model of the system. We create our scripts from scratch every time to ensure full control over the model and quality of the design outcome. The complexity of a system's script is highly dependent on the desired form and assembly requirements; down to intricate joints and fixings as required.

GRIDSHELL

The GridShell system required a highly complex script capable of 'growing' a discernibly organic form within a controlled cellular structure, complete with a wholly unique printable three-way joint system.

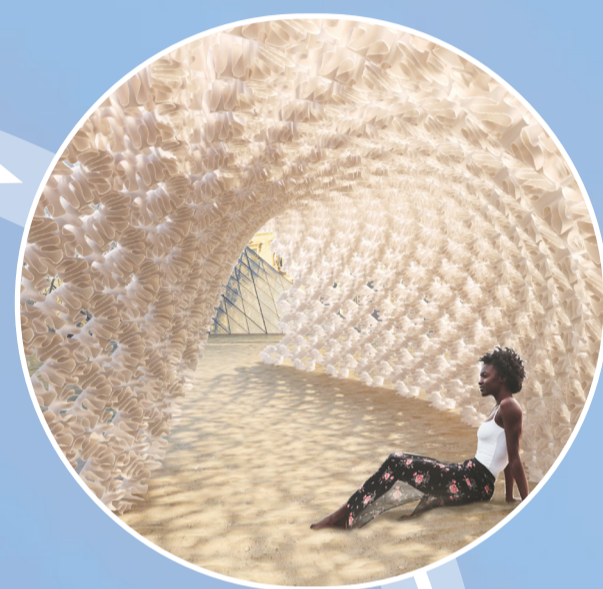


3. VISUALISATION

When the initial parametric scripting is complete, we use rendered visualisations in conjunction with scaled drawings to test the system's success in meeting our and clients' expectations in a design sense, as well as the practical functionality of the system in achieving the brief requirements. This process allows us to refine the system design efficiently and collaboratively before we commence the prototyping process as required.

GRIDSHELL

As the GridShell system was conceived as a fully-adaptable shell system capable of a range of applications, we applied the system to a selection of forms and built 'briefs' throughout this process as we refined the functionality and appearance of the cells.



CSA

- PARAMETRIC DESIGN PROCESS -
GRIDSHELL SYSTEM



6. LIFE BEYOND

Our passion for sustainable design is firmly imbued in all our projects from the get-go, and does not stop at the completion of a build. We believe that true sustainable practice, should consider life beyond the briefed form of the project, both as a whole as well as the broken down elements of its assembly.

GRIDSHELL

We wanted the GridShell Arbour to be inherently sustainable in all elements of assembly, as well as having a rich life beyond its initial planned purpose as the arbour for our wedding. As a base line of sustainable practice we used recycled filament to print the 172 cells and 4 'feet' comprising the arbour, and sourced a beautiful plank of locally culled Camphor Laurel - an invasive species - to form the sturdy base. Initially, the Arbour will find life beyond in its current form at exhibitions and events. When we 'retire' the Arbour, the cellular arch will be reconfigured into a series of three light features in our home/studio, whilst the base plank will be crafted into our dining table.



5. PRODUCT

Once the parametric system has been refined through the prototyping process into a finalised design, the finished product is created. Depending on the scale, materiality and composition of the designed system, the fabrication of system parts and following assembly can be facilitated in-house or by appropriate fabrication specialists and contractors.

GRIDSHELL

While we envision future potential of the GridShell system in forming structures of a grander scale, the successful fabrication and assembly of our Arbour - a life-sized prototype in itself - proudly proved the feasibility of our GridShell system as a self-supporting 3D printable structure, whilst forming a stunning centerpiece for our wedding celebrations.

4. PROTOTYPING

At Costa Syme we prefer a hands-on approach to fabrication to best ensure the functionality and quality of our built designs. Depending on the materiality and assembly requirements of a designed system, we can utilise our in-house 3D printer to prototype your parametric system, or work in conjunction with trade and/or fabrication specialists as required.

GRIDSHELL

Prototyping was paramount to the eventual success of the GridShell system; taking a complex scripted concept to a constructible, self-supporting cellular shell system printable on any fused deposition 3D printer and requiring only basic fixings (screws) to assemble. Early print runs identified areas of issue with the printing process itself that were quickly remedied, followed by comprehensive testing of the system joints and strength of the assembled cells that led to a refined system capable of assembly.

