**The Flowering Desert**

On the north western edge of Masdar, a deep rectangular void is cut into the ground as a receptacle for energy. It contains a desert. The aeolian forms of desert sand dunes rise and fall, floating along the horizon line. The vast surface of the dunes is comprised of a myriad of desert flowers: 42432 translucent dye-sensitised solar cells coloured like the tough resilient flora of the desert. The Flowering Desert is impossible to touch and impossible to perceive its scale and its quantity of elements. The void is a sunken fortress, that acts as a city portal like the monuments of old across the emirate. A fortress that frames a series of cool gardens shaded by the floating dunes above. It is a land art that returns to its source, it conducts photo energy and visualises the exchange of energy in the desert.

**Desert Flower**

The abstract form of the sand dunes is reimagined as a field of colours. The tough, resilient and often toxic desert flowers of the desert are abstracted and translated as a field of dyed hues for the DSSC panels across the form of the floating sand dunes. Providing shades for the sunken fortress and gardens below.

**Sand Dunes and Aeolian Form**

The Aeolian barchanoid form of sand dunes, shaped by the prevailing wind of the desert, is abstracted as a repeatable pattern. The form is articulated to gently rise and fall above the ground level and create a series of spaces with varying proportion below.

**Sunken Fortress**

Ancient fortresses stand proud across the vast desert as city portals and guardians of oasis. One of the unique characters of Arab fortresses is the inclusion of a large public square within the complex for public activities, especially evident in the Al Jahili Fort. In the proposal, a large fortress complex is sunken as an empty void within the ground to contain the flowering desert floating above and to shelter a series of gardens within. The sunken fortress is a cool shaded space for gathering, relaxing and events.

**Masdar**

The form of the sand dunes is articulated to the sun path and the potential shadow of the surrounding future buildings. The site is located across group rapid transit, and near-by the eco villa prototype and the Masdar Institute of Science and Technology. It is the western end of one of the green corridors of the masterplan. There is an opportunity for the site to as one of the city portals. It provides an alternate public space for future residents.

**Environment Impact & Energy Technology**

**Landscape**

160,000m3 of earth is excavated to from the sunken fortress. The excavated earth is used to build the various landforms along the green corridors of the overall landscape masterplan of Masdar. The sunken fortress provides a cool shaded greenhouse to cultivate a spectrum of UAE flora that cannot flourish otherwise in the full exposure of the sun.

**Material**

The overall dimension of the proposal is 260 m (w) x 52 (l), with a depth of 12 m. The primary material to construct the Flowering Desert will have a low carbon foot print. The main lightweight structure and frame supporting the span on the DSSC panels will be fabricated with 90% Recycled Aluminium. The main walls of the sunken fortress will be constructed with Ultra-Low Carbon Cement, which uses by-products of power plants as a component. The estimated cost of the proposal will be 4500 Dirham per m2.

**Waste vegetable oil conversion & Energy Storage**

When Masdar is fully developed and occupied, it can generate a vast amount of waste vegetable oil from the kitchens of domestic homes, restaurants and canteens of Masdar Institute of Science and Technology. The oil can be brought to the lower sunken fortress where specialist conversion and storage facilities are housed. The biofuel produced will be stored underground and used for transportation fuel.

**Dye-sensitised Solar Cell**

The 42432 petals are fabricated using dye-sensitised Solar Cell, or DSSC, is a form of regenerative photo-electro-chemical cells that convert sunlight energy into electric current but they do not store energy. DSSC uses low cost materials and it is very easy to manufacture. To generate the current, DSSC uses a sensitizer dye and nano particles of the semiconductor Titanium Dioxide, a cheap and widely available material used as pigment. It is a low cost alternative to silicon based photovoltaic cells, but it also has lower efficiency.

Size of each petal = 0.2 m2

Total Number of Petals = 42432

Total Area of Petals = 8486.4 m2

Typical DSSC Power = 100 W/m2

**Daily kWh = 3392 kWh (under average site conditions)**

This is the equivalent daily power consumption of 212 homes. Average homes consume 16 kWh per day.

**Annual kWh = 1,238,080 kWh (under average site conditions)**