Appendix D

Visual Impact Assessment
M2 Macquarie Park Art Installation
Visual Impact Assessment Report
## Document Control

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</table>
Contents
Contents ........................................................................................................... ii

01 Introduction.................................................................................................. 1
02 Methodology................................................................................................. 1
03 Site Context.................................................................................................. 1
04 Proposed Site Improvements ................................................................. 3
05 Visibility of Proposal and Key Viewpoints ........................................ 6
06 Visual Impact Assessment.......................................................................... 9
07 Summary..................................................................................................... 12

APPENDICIES
01 Introduction

Transurban, the operator of The Hills M2 motorway, is planning to restore a degraded roadside area adjacent to the M2 motorway at Macquarie Park that was used as a construction site during an upgrade of the motorway in 2012. The site is located opposite the Herring Road intersection with the M2 and is bounded by Khartoum Road to the east, Shrimpton’s Creek to the west and Lane Cove National Park to the north.

The main aspect of the restoration involves minor modifications and revegetation with native bushland species to restore ecological integrity to this parcel of land adjoining the National Park. To achieve this Transurban has partnered with Landcare Australia to carry out the ecological restoration of the site.

In conjunction with the ecological restoration Transurban are also planning to incorporate an iconic art installation that makes a positive and memorable contribution to the motorway landscape and local community of Macquarie Park.

This report has been prepared as part of a Review of Environmental Factors (REF) for the proposed works to assess the visual impact of the public art installation and the associated site improvements.

02 Methodology

The visual impact assessment has been undertaken in accordance with the methodology described in Roads & Maritime Services (RMS) Environmental Impact Assessment Practice Note EIA-N04 – Guideline for Landscape Character and Visual Impact Assessment (Version 2.0, 2013), Section 6.

The tasks required for the assessment are broadly as outlined below:

- Describe design proposal and associated works
- Describe existing site conditions and context
- Assess visibility of proposal and identify key viewpoints
- Assess visual impacts
- Summarise findings and impact mitigation strategies (if required)

03 Site Context

The Macquarie Park site is an area in the order of 8ha located opposite the Herring Road off-ramp immediately to the north of the M2 motorway, between Khartoum Road to the east, Christie Road to the west and Lane Cove National Park along the northern boundary. Immediately to the south of the motorway is the Macquarie Park commercial precinct and Macquarie University campus. To the east is a medium density residential precinct serviced by Khartoum Road and Fontenoy Road.

Part of the overall site was used as a construction compound as part of the motorway upgrade in 2013. This was an area of approximately 1 hectare, adjoining the motorway that was cleared, filled and leveled to facilitate construction support activity. The margins of the compound comprise relatively steep embankments with relatively heavy weed infestation. The wider 8ha site also carries significant weed cover in the understory layers.
On completion of the motorway upgrade works, the compound site appears to have been cultivated, topsoiled and seeded as part of a revegetation process. The entire site drains into the Lane Cove River that occurs a few hundred metres to the north.

Figure 1 Location Plan
04 Proposed Site Improvements

There are two main aspects to the proposed site improvements. The first involves rehabilitation of the site to re-establish native bushland plant communities and the second is the installation of a landmark artwork.

04.1 Site Rehabilitation

The site rehabilitation work will be undertaken by Landcare Australia generally seeks to achieve the following objectives:

- Rehabilitate the M2 Macquarie Park Motorscapes Project site of approximately 5 ha improve native bushland condition and ecological functionality;
- Reduce current off-site impacts on adjoining properties, particularly Lane Cove National Park, through weed control, revegetation, vertebrate pest management, creek riparian zone stability and improvements to site drainage;
- Introduce an indigenous vegetation community comprising Hornsby Enriched Sandston Exposed Woodland and appropriate selected species of the STIF critically endangered ecological community;
- Establish and protect bushland vegetation communities, inclusive of a healthy groundcover stratum as a natural stabiliser of the soil surface through an intensive maintenance programme;
- Improve water quality in Shrimptons and Industrial Creeks which drain the site;
- Manage known areas of soil contamination;
- Undertake community engagement activities;
- Complete the majority of works within 12 months; and
- Deliver the works safely and cost effectively.

Further details of the site landscape and rehabilitation works will be developed in conjunction with detailed design development of the preferred artwork installation, in order to achieve a co-ordinated design outcome and spatial setting for the artwork. Further consideration will also be given to relocating two large existing motorway advisory signs on the northern edge of the eastbound carriageway.

04.2 Artwork Installation

In relation to the artwork installation, Transurban are in the process of further evaluation of a preferred artwork that was selected following an ideas competition for the site. The competition was run in October and November of 2015 and sought ideas from designers and artists that showcased innovative solutions that could demonstrate ecological, social and economic sustainability and that were both meaningful and relevant to the setting and could also be readily implemented. Figure 2. shows the general site structure approach and preferred location for the artwork installation.

The general site for the artwork has been selected to maximize visibility from the motorway for eastbound and westbound motorists. The site nominated is approximately 50 metres long by 15metres wide and is set back approximately 5metres from the top of the existing drainage swale embankment running along the northern edge of the motorway.
Figure 2 Site Structure Plan

- Old construction compound site subject to rehabilitation
- Indicative artwork installation site 50m x 15m (nom)
- Eastbound sightline into site
- Westbound sightline into site

Figure 3 View east from Christie Road Bridge

- Notional development envelope for artwork installation
- Relocation of existing advisory signs to be considered
04.3 Preferred Artwork Selection

The outcome of the ideas competition was the selection of three preferred ideas, which then went through a further feasibility assessment prepared by Urban Art Projects (UAP) for Transurban that considered materials and finishes, structural feasibility, fabrication and installation issues, anticipated maintenance requirements and cost. From this process one, ‘Kinetica’ [refer Figure 4 below] was selected as the preferred option. However, for the purposes of this visual impact assessment, all three of the proposed ideas were considered. The UAP Feasibility Study incorporating details of all the three preferred ideas is included in Appendix A. Details of the three original submissions are also included in Appendix B.
An extract from the UAP Feasibility Study of the preferred artwork ‘Kinetica’ is provided below to further explain the artwork and provide a summary description of matters considered by the feasibility study.

‘Concept Design Intent
A playful graphic narrative of the Australian flora on scale, depicting the cycle of nature. Bold in scale and colour Kinetica will have a visual presence in the landscape.

Recommended Materials and Finishes
- Laser cut corten steel, laser cut aluminium plate
- Automotive/Powdercoat exterior grade paint finish
- Mechanical fixings, motor for Waratah element.
- Solar panels & LED lighting fixtures

Structure
The structural delivery of the work deemed feasible. The visual aesthetic of the concept will continue to develop significantly in future phases, however because the basis for this design is a 2d graphic image, this development is expected to help preserve and improve the original visual intent rather than challenge it.

Fabrication & Installation
Conceptually based around movement, the proposal of moving elements is deemed to be not appropriate based on cost and maintenance implications and visibility given the speed of most artwork viewers. Some movement can be retained, but can be reduced and simplified. Initial concept included identical elements on rear facing artwork, this is not recommended, due to lack of sight lines.

Anticipated Maintenance
- Annual inspection for structure and moving parts
- Recommended re-paint on site after 15-year period
- Recommended refurb of moving parts on 10-year cycle
- Annual cleaning recommended

The installation would include approximately nine individual sculptures ranging from approximately 2 metres to 10.5 metres tall and will be illuminated for night time effect and visual interest. The artwork proposal is essentially, a conceptual idea at this time and is subject to further detail design development and site planning considerations in relation to sight lines from the M2 motorway and other road safety considerations.
The following images, [UAP Feasibility Study 11-03-2016] provide conceptual, illustrative views of the preferred sculpture in relation to the eastbound and westbound carriageways of the motorway. Note that the proposed bushland regeneration around the artwork is not illustrated.

Figure 6 Illustrative view of preferred artwork from eastbound carriageway

Figure 7 Illustrative view of preferred artwork from westbound carriageway
05 Visibility of Proposal and Key Viewpoints

The visibility of the site is the extent of adjoining areas that the proposal will be visible from, this is illustrated in the Visual Envelope Map in Figure 8 below. The project site is primarily visible from the M2 motorway and partially visible from the upper floors of a number of commercial buildings and serviced apartments located to the south of the motorway and a medium density residential precinct adjoining the north eastern boundary.

In relation to the commercial properties south of the motorway, access to these properties was not possible, however it is likely that views from the upper floors [the site is not visible from street level] would be dominated in the foreground by the M2 motorway, tolling gantries, road signage, lighting and the constant traffic on the motorway with background views over Land Cove National Park and the suburb of West Pymble to the north. These facilities are reasonably well screened from the motorway by existing vegetation and, over time, it is anticipated that views of the site from these buildings will further diminish as constructed landscape buffer zones between these buildings and the motorway mature.

Figure 8 Visual Envelope Map & Key Viewpoint Locations
The medium density residential precinct adjoining the site to the north east consists primarily of three storey apartment buildings serviced by Khartoum Road, Leisure Close, Durham Close and Carlisle Close. The artwork installation site is not visible from these properties areas due to extensive vegetation cover. However, the north eastern areas of the site, including Industrial Creek, adjoining the residential boundary will be visible from the perimeter driveway of the apartment complex accessed from Leisure Close and the apartments facing the project site. These areas will be subject to site rehabilitation works including, primarily, creek bank stabilization, weed removal and revegetation.

There are two key viewpoints that have been identified for impact assessment, both of these are from the motorway, one from the eastbound carriageway and one from the westbound carriageway. This project is somewhat different from most that undergo a visual impact assessment as the whole intention is to provide a landmark artwork installation that requires maximum visibility for the most number of viewers possible in order for a meaningful and successful outcome to be achieved.

06 Visual Impact Assessment
The visual impact of the proposal is determined by evaluating the sensitivity to change of the view and the magnitude of the proposal in that view.

Magnitude is the expression of change in a view created by the interaction between the proposal and the existing environment. Assessment issues include:

- changes to landform;
- changes to vegetation patterns;
- the nature, density and scale of existing attributes and proposed works.

Visual sensitivity depends on a range of user group characteristics and the author’s knowledge or public perception of the quality of particular land uses and landscape settings. Characteristics considered in this assessment include:

- the perceived cultural value of the visual environment and elements within it;
- user groups [residents, workers, motorists];
- frequency [the number of viewers or the frequency of views for an individual];
- duration of views, and
- the distance of the proposed works from viewers.

The visual impact is calculated using the landscape character and visual impact grading matrix provided in RMS Practice Note EIA–ND4 [refer Figure 9 below].

![Figure 9 EIA-ND4 Landscape character and visual impact grading matrix.](image-url)
Viewpoint 01: View from westbound carriageway

Viewpoint 01 depicts the motorist view on the westbound carriageway approaching the Herring Road exit to Talavera Road. Two images are indicated, image 01a, which is approximately 300 metres from the site, and image 01 b, which is about 150 metres from the site. The viewpoints are consistent with a typical motorway landscape of continual traffic movement, noise walls, motorway signage and various landscapes each side of the motorway.

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The magnitude of the landscape rehabilitation works in these views will be minor given the extensive vegetation cover in the views. The rehabilitations works proposed beyond the extent of the old compound site will not be visible. Similarly the magnitude of the artwork envelope is generally consistent with typical motorway landscapes that include various roadside structures, signage and road furniture.

High volume and with short duration views are experienced by motorway users. There is low sensitivity to change, as the background views of vegetation will remain constant.

Figure 10 Viewpoint 01a - westbound

Figure 11 Viewpoint 01b - westbound
**Viewpoint 02: View from eastbound carriageway**

Viewpoint 02 depicts the motorist view on the eastbound carriageway entering from the Christie Road on-ramp to the motorway. Two images are indicated, image 02a, which is approximately 325 metres from the site, and image 02b, which is approximately 250 metres from the site. The viewpoints are consistent with a typical motorway landscape of continual traffic movement, noise walls motorway signage and various landscapes each side of the motorway.

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As for viewpoint 01, the magnitude of the landscape rehabilitation works in these views will be minor given the extensive vegetation cover in the views. Similarly the magnitude of the artwork envelope is generally consistent with typical motorway landscapes that include various roadside structures, signage and road furniture.

High volume and with short duration views are experienced by motorway users. There is low sensitivity to change, as the background views of vegetation will remain constant.

Figure 12 Viewpoint 02a – eastbound

Figure 13 Viewpoint 02b – eastbound
Minor visual impacts

Other visual impacts associated with the project are primarily related to the construction phase of the project, and directly related to site disturbance, providing construction access from the motorway and weed removal throughout the site. The site will be fenced off from the motorway and therefore the construction activity on the old construction compound site will be largely screened from view. The majority of work being undertaken here is related to site revegetation, all of which will provide a significant visual improvement over the existing prevailing site conditions.

At the north eastern corner of the site, the rehabilitation works will involve removal of exotic weeds, creek bank stabilisation works, mulching and planting of indigenous species as part of the revegetation process. Existing native trees and understorey plants will be retained and protected. The majority of exotic vegetation removal occurs in the ground storey layer. The removal alone of the extensive weed cover and installation of a mulch layer will provide a significant visual improvement, which will be further improved by planting of indigenous species throughout the rehabilitation areas.

Overall visual impact

The proposed works to the M2 Macquarie Park site are considered to be generally consistent with the overall M2 Motorway landscape.

The proposed landscape and bushland regeneration works will significantly improve the visual amenity of the site through simply restoring vegetation cover that once existed and so, there is no negative visual impact, only a positive one.

In terms of the artwork installation, there will be an impact to existing views from the motorway, however the scale and magnitude of the selected preferred artwork, as well as the two other preferred artworks is considered to be consistent with the scale and frequency of various roadside infrastructure elements and structures. As with the site restoration works, it is considered that there will be no appreciable negative impacts, only a positive one.

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Overall Impact Low
07 Summary

The site regeneration and artwork installation will only bring positive outcomes for the overall motorway landscape and wider community.

An important consideration for on-going design development of the selected artwork, is further assessment of the location on site in relation to sightlines into the site and setbacks from the motorway along with resolution of the overall scale and detailing of the installation and the selection of plant species and surface finishes around the final installation. It will need to be of a scale that will enable it become a memorable landmark along the motorway. There is a risk that the artwork, if not of a suitable scale, could become lost within the landscape and the scale of the motorway and the various motorway infrastructure elements that exist within the road corridor.

It is recommended that additional design studies been developed to test the visibility and presence of the final selected artwork, through a series of photomontages and models, to ensure that the right balance is achieved to enable the installation to be appreciated in a meaningful way and without any road safety impacts. This should also consider relocation of the two existing roadside advisory signs, which in their current location will impede views of the artwork.
APPENDICIES

APPENDIX A –

UAP Feasibility Study
M2 FEASIBILITY STUDY
EXECUTIVE SUMMARY

INTERLEAVES

CONCEPT DESIGN INTENT
An iconic representation of native Australian gum leaves, pod and blossoms evoke a sense of natural beauty and wonder with metallic soft reflections by day and warm lighting elements of the stamen at night.

RECOMMENDED MATERIALS AND FINISHES
- Rolled stainless steel rod & CHS, polished
- Panelised polished stainless steel
- Spring steel rod
- Automotive/exterior grade paint finish (on nominal items)
- Solar panels & custom LED lighting fixtures

STRUCTURE
The structural delivery of the work is considered to have a medium level of risk, however it is expected this risk can be minimised through design adjustments which do not have a great impact on the visual intent.

FABRICATION & INSTALLATION
Fabrication anticipated to range between mid – high level complexity. It is also noted that the artist has been highly collaborative and provided additional works to assist with the project’s development, outside of his initial scope.

ANTICIPATED MAINTENANCE
- Inspection of structure and LED stamen lighting fixtures annually
- Recommended re-paint after 15 year period (potential to disassemble and paint the limited components off site)
- Annual cleaning recommended

KINETICA

CONCEPT DESIGN INTENT
A playful graphic narrative of the Australian fauna on scale, depicting the cycle of nature. Bold in scale and colour Kinetica will have a visual presence in the landscape.

RECOMMENDED MATERIALS AND FINISHES
- Laser cut corten steel, laser cut aluminium plate
- Automotive/Powdercoat exterior grade paint finish
- Mechanical fixings, motor for Waratah element.
- Solar panels & LED lighting fixtures

STRUCTURE
The structural delivery of the work deemed feasible. The visual aesthetic of the concept will continue to develop significantly in future phases, however because the basis for this design is a 2d graphic image, this development is expected to help preserve and improve the original visual intent rather than challenge it.

FABRICATION & INSTALLATION
Conceptually based around movement, the proposal of moving elements is deemed to be not appropriate based on cost and maintenance implications and visibility given the speed of most artwork viewers. Some movement can be retained, but can be reduced and simplified. Initial concept included identical elements on rear facing artwork, this is not recommended, due to lack of sight lines.

ANTICIPATED MAINTENANCE
- Annual inspection for structure and moving parts
- Recommended re-paint on site after 15 year period
- Recommended refurb of moving parts on 10 year cycle
- Annual cleaning recommended

SOLAR WEAVE

CONCEPT DESIGN INTENT
Solar Weaves expansive concentric circles that form over arching members will provide a large scale artwork that responds to a transitioning perspective.

RECOMMENDED MATERIALS AND FINISHES
- Rolled mild steel 356mm diameter CHS (Concept visualisation shows 200mm)
- International Protective coating Interfine 979 paint finish
- LED strip lighting

STRUCTURE
The structural delivery of the work has a high level risk. There is significant risk that engineering requirements could change the visual aesthetic detrimentally due to the concept’s reliance on simplicity and elegance. The engineering risk could also have cost implications, extra structural members may be required and increase steel tonnage.

FABRICATION & INSTALLATION
Rolled steel with interlocking concealed bolted connections.

ANTICIPATED MAINTENANCE
- Recommended re-paint on-site after 15 year period
- Annual cleaning recommended
MATERIALS AND FINISHES

INTERLEAVES

CONCEPT DESIGN
ARTIST PROPOSED MATERIALS
- 3 x leaf forms - combination of stainless steel chs & rod
- Pod - combination of stainless steel chs & rod
- Flower stem - combination of stainless steel chs & rod
- Flower cup - combination of stainless steel chs & rod
- Flower sepal - combination of stainless steel chs & rod
- Flower stamen filament - combination of stainless steel chs & rod
- LED lighting & solar panels

SUITABILITY OF MATERIALS
The majority of the work is proposed for fabrication in stainless steel, providing a durable, stable & rust resistant finish. The robustness of the material is suitable for a work with long lifespan with minimal maintenance. Stainless steel negates the need for an additional coating which may be a positive from an environmental perspective, only limited components are paint finished for visual impact.

DESIGN DEVELOPMENT
UAP RECOMMENDED MATERIALS
- Pod - panelised stainless steel formed to shape, reducing material quantities & fabrication labour, front face to remain as chs & rod
- Flower stem - panelised stainless steel formed to shape, reducing material quantities & fabrication labour
- Sepal - panelised stainless steel formed to shape, reducing material quantities & fabrication labour
- Flower stamen - painted spring steel rod
- LED lighting - custom fabricated solar lights, to avoid wiring being necessary and simplify maintenance (ie custom designed garden light)s

KINETICA

CONCEPT DESIGN
ARTIST PROPOSED MATERIALS
- Rolled mild steel 200 diameter chs
- Interfine 979 painted finish
- Flexible LED strip light & solar panels

SUITABILITY OF MATERIALS
Mild steel with a long-life paint finish is a suitably robust delivery option. Arcs of a smaller radius may require induction rolling to achieve the appropriate bend without defects. LED IP rating is suitable, IP rating 65-66 would also be suitable, potentially at improved price point. Materials are appropriate however section size is under-estimated.

DESIGN DEVELOPMENT
UAP RECOMMENDED MATERIALS
- Selected materials suitable for installation
- Rolled mild steel tube, approx 356mm diameter chs with long life paint finish
- Flexible LED strip suitable, specification to be further investigated. Strip arrangement will require consideration for ease of maintenance (segmented sections for part replacement rather than replacement of greater lengths is recommended).

SOLAR WEAVE

CONCEPT DESIGN
ARTIST PROPOSED MATERIALS
- Laser cut aluminium
- Recycled timber
- Recycled windmill components
- Painted finish
- Elements with anodised finish
- LED lighting & solar panels

SUITABILITY OF MATERIALS
Anodising aluminium offers a significant advantage to lifespan however not advised on this scale due to limitations of process & component size. Recycled windmill components not recommended due to risk to lifespan and engineering certification. Recycled timber could be incorporated as a cladding material, risk is related to availability and sourcing limitations. Painted aluminium is a suitable material, robust when finished properly and lightweight to allow possible kinetic movement - heavier materials may limit the potential of movement unless a power source is also incorporated. Structural steel will need to be incorporated.

DESIGN DEVELOPMENT
UAP RECOMMENDED MATERIALS
- Laser cut mild steel and aluminium with paint finish
- Rolled steel/aluminium sheet to form curves of warratah leaf petals
- Laser cut corten steel for 2 x banksia forms
- New bearings & hubs for longevity and maintenance
- Reduction of kinetic elements to key items only, to preserve intent and limit maintenance
ENGINEERING PRELIMINARIES

KINETICA

STRUCTURAL OVERVIEW, AS PER CONCEPT DESIGN
The structural delivery of the work has a high level of risk. The work has a high radius of gyration, and the member size of 200mm is optimistic given the span of 51m. Preliminary studies suggest this member size is likely to be closer to 356mm.

The long slender item is vulnerable to wind-induced vibration. It is a risk that the form will require stiffeners to the ground to reduce vibration. Overall, there is significant risk that engineering requirements could change the visual aesthetic detrimentally due to the nature of the design's simplicity and elegance.

MATERIAL TONNAGE
Mild steel pipe (grade 350LO) = 130.1915 ton.
Mild steel plate (grade 250) = 15.525 ton.
Concrete = 83.49 ton.

ARTWORK LOAD ESTIMATE
Total Weight Excl. Footing = 145.7165 ton.

SOLAR WEAVE

STRUCTURAL OVERVIEW, AS PER CONCEPT DESIGN
The structural delivery of the work deemed feasible. The work is large scale and all components depend on a central vertical structural member. It is expected the widths and ratios of the design elements will require adjustment as the design is developed further. All elements will have a thickness and a significant depth.

The concept requires a high level of development and adjustment from the initial design. Placement of motor is recommended at ground level.

The visual aesthetic of the concept will continue to develop significantly in future phases; however, because the basis for this design is a graphic image, this development is expected to help preserve the original visual intent rather than challenge it.

MATERIAL TONNAGE
Hot Rolled (grade 250) = 0.2875 ton.
Mild steel plate (grade 250) = 21.8155 ton.
Mild steel plate (Bis80) = 8.973 ton.
Aluminium = 2.53 ton.
Concrete = 97.405 ton.

ARTWORK LOAD ESTIMATE
Total Weight Excl. Footing = 33.608 ton.

INTERLEAVES

STRUCTURAL OVERVIEW, AS PER CONCEPT DESIGN
The structural delivery of the work is considered to have a medium level of risk, however it is expected this risk can be minimised through design adjustments which do not have a great impact on the visual intent.

The design of the concept allows for a large degree of cross-bracing through its detail and materiality. It is expected that adjustments would be necessary to deliver the concept and meet engineering requirements.

Tube sizes may need to be increased and further embedding at ground may be ideal. The positioning/form of the leaves will need to adjust to touch the ground at more than two points.

These adjustments are considered low risk of detracting from the concept intent, and it is expected the visual impact/general aesthetic will be achievable.

MATERIAL TONNAGE
Stainless Steel plate (grade 316) = 2.0746 ton.
Stainless Steel tube (grade 316) = 1.403 ton.
Concrete = 41.745 ton.

ARTWORK LOAD ESTIMATE
Total Weight Excl. Footing = 16.1046 ton.
CONCEPT DESIGN INTENT
The iconic gum nut is a highly charged symbol of the Australian Bush reminding us of the regenerative forces of nature and our shared custodianship of the land. Evocative of the surrounding hills and river valleys, this flowing, sinuous artwork magnifies the natural beauty of nature. Using soft metallic reflections by day and warm lighting elements at night, the artwork seamlessly integrates into the site.

CONCEPT APPROACH
The proposed concept Interleaves has a relatively high level of fabrication complexity and medium volume of material. UAP were provided with an additional component by Artist Matthew Harding, “Pod”, for consideration and potential incorporation into the design. The construction method for all elements consists of 3 or 4 chs layers.

- a rolled outer edge chs
- mid range chs lateral members formed through jigs and welded
- smaller diameter rod formed through jigs / rolled and welded

Proposed flower elements consist of an array of solar panels integrated into the form, which play on the idea of photosynthesis. Lighting plays an integral role as Interleaves blooms at night. Initial concept proposed that the stamen filaments could be translucent acrylic or light emitting carbon fibre tubes.

Integrated landscaping to compliment the artwork into the site is of high importance to the artist. The spine design of the leaves could capture water runoff and feed into surrounding rock swales providing a haven for native fauna.

PROPOSED DEVELOPMENT
UAP recommend reducing the complexity in fabrication methodology and reducing the overall volume of material. In turn a cost saving in fabrication time and material.

This is to be achieved by replacing the flower stem / cup and sepals from rods and tubes to panelised polished stainless steel. The body of the pod would be fabricated also of panelised polished stainless steel with the front face maintaining the original rods and tubular fabrication process. Matthew Harding and Ben Storch agreed with this approach.

UAP recommend stamen filaments to be fabricated from spring steel rod for longevity and strength. LED lighting nodes to be independent fixtures with solar cells similar to garden variety lights. This integration of lighting allows for ease of maintenance and lack of wiring.

UAP recommend a reduction of stamen filaments from initial concept approx 320 to approx 180 per flower. They may need to overlap to increase stability and crossbracing.

Additional LED lighting incorporated into the outer edge of the flower at the base of stamen filaments will provide uplighting at night.
INTERLEAVES
VIEW FROM WESTBOUND APPROACH
INTERLEAVES
ELEVATIONS, PLAN & GENERAL DIMENSIONS

ALL DIMENSIONS IN MILLIMETRES - DO NOT SCALE
ALL DIMENSIONS INDICATIVE ONLY, PENDING FURTHER DESIGN DEVELOPMENT

PLAN VIEW

FRONT ELEVATION

SIDE ELEVATION
NOTE: DIMENSIONS TO ROADSIDE KERB

ALL DIMENSIONS IN MILLIMETRES - DO NOT SCALE

ALL DIMENSIONS INDICATIVE ONLY, PENDING FURTHER DESIGN DEVELOPMENT
MATERIALS & ANTICIPATED MAINTENANCE

1. STAINLESS STEEL CHS
   - Low maintenance
   - Cleaning & polishing recommended on an as needs basis, annually as a minimum

2. PAINTED SPRING STEEL ROD
   - Low maintenance
   - Cleaning recommended on an as needs basis, annually as a minimum
   - Automotive/exterior grade paint finish recommended re-paint after 15 years. Colour fade will occur due to specification of red, however finish integrity will be warrantable and the red will still be high impact visually

3. SOLAR PANEL INTEGRATION
   - Robust technology, dependant on specification of product however typical lifespan of approximately 25 years

4. LIGHTING
   - LED in ground lighting, IP65 or higher rating recommended
   - LED lighting within flower base to structure to light stamen at night
   - Independent LED lights affixed to end of stamen, intent for these units to be custom manufactured fixtures with inbuilt solar element, screw on and off for ease of maintenance and replacement, however will also have typical long lifespan of LED
   - Cleaning recommended on an as needs basis
   - Annual inspection recommended
KINETICA
CONCEPT SUMMARY

CONCEPT DESIGN INTENT
Kinecta pays tribute to the NSW floral emblem of the Warrath and celebrates the unique diversity of Australia's flora. Harnessing the natural elements of wind and sun, the artwork is a dynamic, colourful and kinetic promotion of renewable energy, rejuvenation and growth. Its bold presence will visually locate the work within the site, whilst also referencing its natural surroundings.

CONCEPT APPROACH
The concept of Kinecta was presented as a 2 dimensional graphic representation of Australian flora with a variety of laser cut painted or anodised aluminium forms. Proposed elements could incorporate recycled windmill components and recycled timbers.

- Elements proposed to be identical both on the front and rear faces.
- Banksia - proposed to have eyes with the larger forms to be blink slowly four times daily.
- Golden Wattles - arms to turn mechanically in a slow controlled motion.
- Warratah - centrepiece of the design to have 3 layers of petals that rotate mechanically in a slow controlled motion.

PROPOSED DEVELOPMENT
UAP recommend:

- a reduced number of elements for budgetary purposes, as the concept develops further there may be opportunity to increase elements pending final engineering detail
- forms to have greater width to provide stability and structure for footings
- forms are to be manufactured from laser cut mild steel, rolled and painted with automotive/ exterior grade paint finish, some smaller attachments may be aluminium, fixed and separated from the steel
- elements are not duplicated on the rear side as they are not seen from a key view
- Banksia elements to be static. Complexity in mechanics of blinking eyes, the ability to recognise by passing commuters, maintenance and cost implications (the backing form to be corten steel with eyes painted and pin-fixed to front face)
- Golden Wattles to have 3 x large flower forms to be fixed to bearing hub to allow free spinning, dependant on wind, other elements fixed.
- Warratah to have the larger outer form as flat and static. Inner 2 layers to be rolled and mechanically driven in opposing directions in a slow controlled motion.
KINETICA
APPROXIMATE SITE LOCATION

ALL DIMENSIONS IN MILLIMETRES - DO NOT SCALE
ALL DIMENSIONS INDICATIVE ONLY, PENDING FURTHER DESIGN DEVELOPMENT

NOTE: DIMENSIONS TO ROADSIDE KERB

PLAN VIEW
1. PAINTED MILD STEEL
   - Low maintenance
   - Cleaning recommended on an as needs basis, annually as a minimum
   - Automotive exterior grade paint finish recommended for repainting after 15 years. Colour fade will occur due to weathering and the colours will still be high impact and high contrast visually

2. CORTEN STEEL - BANKSIA BACKING PANEL
   - Low maintenance
   - Cleaning recommended on an as needs basis

3. MOTOR AND MOVING COMPONENTRY
   - To be inspected annually as a minimum
   - Recommendation for warratah element to be chain driven with motor based at ground level for ease of access
   - Annual inspection recommended

4. LIGHTING
   - LED in ground uplighting allowed, IP65 or higher rating recommended
   - Annual inspection recommended on an as needs basis

MATERIALS AND MAINTENANCE

KINETICA
CONCEPT DESIGN INTENT
Reminiscent of a sun flare, the artwork is fuelled by the sun's light striking upon its graceful flowing surface and signifies the ever changing and responsive environment that we inhabit. Further, it captures the surrounding solar energy and converts it into woven strips of light for a dynamic night-time presence. Its delicate woven nature allows multiple perspectives of views that change as one transitions about the work.

CONCEPT APPROACH
An expansive installation proposed as an overall length of near 125 x 11.5m high offering commuters a changing perspective upon approach and from either direction.

Designed to be an iconic example of renewable energy art in practice.

Flexible strip LED to affixed to rolled CHS painted mild steel provide visual presence in the night time environment.

Powered by Tesla Powerwall battery storage systems or similar self contained units.

PROPOSED DEVELOPMENT
Significant engineering required. Concept shown at original 200mm diameter pipe, expected diameter required of circa 350mm diameter.

Design development required for housing of transformers to led strip lighting. Ideally transformers would be located below ground level in housing cabinet. May impact upon the voltage and effect the final light output and required further investigation. Specified flexible lighting elements are 10m lengths, lengths installed to be considered for ease of maintenance.

Engineering preliminaries have raised concerns about wind induced vibration. Development of the design is required to understand full implication of cross-bracing and stiffeners that may be necessary to run to ground.

Artist also intends to further investigate colour and finish selection.
SOLAR WEAVE
VIEW FROM WESTBOUND APPROACH
SOLAR WEAVE
ELEVATIONS, PLAN & GENERAL DIMENSIONS

ALL DIMENSIONS IN MILLIMETRES - DO NOT SCALE
ALL DIMENSIONS INDICATIVE ONLY, PENDING FURTHER DESIGN DEVELOPMENT

PLAN VIEW

FRONT ELEVATION

SIDE ELEVATION

44,750
16,200
124,160
63,230

3,825
11,425
17,100
APPROXIMATE SITE LOCATION

SOLAR WEAVE

ALL DIMENSIONS IN MILLIMETRES - DO NOT SCALE

ALL DIMENSIONS INDICATIVE ONLY, PENDING FURTHER DESIGN DEVELOPMENT

NOTE: DIMENSIONS TO ROADSIDE KERB
SOLAR WEAVE
MATERIALS AND MAINTENANCE

1. PAINTED MILD STEEL
   - Low maintenance
   - Cleaning recommended on an as needs basis, annually as a minimum
   - Exterior grade paint finish recommended re-paint after 15 years. Colour fade will occur, however finish integrity will be warrantable and the colour will still be high impact visually

2. SOLAR PANELS AND TESLA POWERWALL
   - Robust technology, dependant on specification of product however typical lifespan of approximately 25 years

3. LIGHTING
   - Olight Reflex Flexible LED strip lighting, IP68 rating specified by artist, further investigation required however option is feasible. IP Rating of 65 or above is required
   - Recommended that transformers are housed in below ground cabinet, for ease of access
   - Consideration of LED strip lengths to allow replacement of modules in smaller units if required over life of work
   - Annual inspection recommended
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APPENDIX B

Design entries selected for further development and assessment

1. 'Kinetica'
2. 'Interleaves'
3. 'Solar Weave'
1. ‘Kinetica’
Kinetica is an artwork designed to complement Landcare Australia’s regeneration concept plan and pay tribute to the community’s love of contemporary art and nature. This body of work is an outrageously colorful composition of line, shape, and form, depicting the resilience and complexity involved in the reproduction and life cycle of flora and fauna. Kinetica explores the cycle of fire and growth, emphasizing the role of fire in the survival of many of Australia’s native flora. By using aluminium, these floral forms, united by industry and design, encapsulate the growth of the Australian landscape, encompassing the cyclical nature of the environment and the changing, ever-growing, society on the move.

Kinetica is a wonderland of abstracted, deconstructed and reconstructed national favourites integrated in an explosion of color. Bold shades of red, green, yellow and blue are a response to Australia’s colorful landscape, generating a sense of harmony and familiarity through an otherwise non-discriminatory body of work. Kinetica is an exciting and contemporary body of work, resulting in an uplifting sense of diversity and inclusivity in the choice and content of its visual presentation.

The display of public art in any environment is a valuable method of creating a deeper appreciation and understanding of its contextual meaning. Kinetica is a nod to Australia’s colorful landscape, celebrating the resilience and complexity of nature through artistic expression.
**Self-Sustainable & Eco-Friendly**

Solar energy will power both the slow-turning arms, blinking eyes and LED lights. Solar power draws pure, clean energy from the sun, reducing greenhouse gas emissions and our reliance on fossil fuels. Timers will control the responsiveness of the LED lights as the sun rises and sets making this work self-sustainable.

**Location Plan**

The installation will be visible to passing traffic and neighbouring properties, and will complement the environmental assets of the location. The M2 site is separated from the Macquarie Park commercial and residential centre by the Hills M2 Motorway, which forms the southern site boundary. The site is bounded in the east by Khartoum Road. Importantly, Lane Cove National Park adjoins the majority of the northern boundary and a nature reserve is on the western boundary. A small number of medium density residential properties also adjoin the northern boundary.

**Artwork**

Approximately 8-10 x Free-standing Sculptures

**Materials, Treatments & Colours**

1. **Materials**

   The specified materials for this project are basic metals. A blend of recycled metal & treated aluminium is the selected material for this project as it is robust and allows flexibility for colour treatment. The main sculptures will comprise of laser cut sheet metal (10-20mm thickness). Concrete will be used to set the art pieces permanently into place.

   LED lighting will also be strategically placed in and around the sculptures/seating to be illuminated after hours, for the full effect of the laser cutting.

   The LED lighting will be installed/ fixed into the ground and within the structure to create a soft, subtle ambience in cohesion with the conceptual theme of rejuvenation and growth.

2. **Treatments**

   As this body of work will be placed outdoors, they will need to withstand all the elements of the natural environment. The exterior of the sculpture and seats will have a polished spray paint-like gloss finish to avoid any or much oxidation/ corrosion. An anodising treatment maybe needed to help further protect the surface. A further varnish will be applied to help protect the artwork from vandalism, such as graffiti.

3. **Colours/ Patterns**

   A wide range of bright and evanescent colours will be used to depict the abundance of the culturally diverse people within the community. Ultimately, the colour palette for this body of work will aim to inspire, attract and embark the viewer on an imaginative and creative whimsical journey.

**Fabrication / Installation / Maintenance**

1. **Fabrication Engineering & Planning**

   A mapping out and final model of the works must be calculated to ensure all the pieces of the work together as a whole. This will then allow correct steps for the laser cutting and installation of the metal pieces. **Estimated time of completion:** 5 weeks

   **Laser Cutting of Aluminium Sheet Metal**

   This process is quick and easy step. **Estimated time of completion:** 3 weeks

2. **Installation**

   This body of work comprises of approximately 8 to 10 larger-than-life sculptural pieces. The body of sculptures will not be functional. The main sculptural piece “Waratah” will contain 3 layered motif pieces and will need intensive and calculated labour. The finished pieces will need to be transported and permanently installed with bolts and concrete bases to hold each piece. Local fabricators can be sourced. **Estimated time of completion:** 2 weeks.

3. **Maintenance**

   These final works will be of low-maintenance. Durable and sustainable materials will be used which are robust and easily maintained. Minimal graffiti removal and general cleaning duties are the only exceptions. **Estimated Time for Project:** 8-10 months

**Registration No.: M2104**

M2 | Macquarie Park | Landcare Australia
2. ‘Interleaves’
Gum nuts and gum leaves are iconic symbols of the Australia bush. In many ways their shape and form have become commercialized and stigmatized as low culture, relegated to tourism, marketing, cottage crafts and children stories. This artwork seeks to re-elevate their status, not only as potent symbols of our nations character and unique ecology and geology, but importantly as a potent symbol for regeneration, reinforcing our connection to land and place; serving as agent for ecological change; hallmark of shared custodianship, inventive thinking and sustainable action.

We are proposing a public art installation, which is monumental, create a series of formally coherent works, evocative of natural and organic forms, which are utilized as part of the planned flora regeneration and bio-filtration system.

Aesthetically the flowing sinuous curves of the gum leaf are synonymous with the rolling contours of Sydney’s hills and river valleys. The artwork becomes a metaphor for the regenerative qualities of the Australian bush. The inclusion of the gum nut may symbolize the regenerative quality of human spirit; to rise from the ashes of hardships and elements or adversity. From the seed of our ideas we germinate the fruits of our labour; from the inner vitality of the quiescent seed hidden potential awaits favorable conditions for alchemy and growth.

Our main focus is to magnify the beauty of nature rather than trying to copy it, to encourage people to remember what we owe to nature, that we can’t live without it.

Purposefulness:
These works are not mere objects in the landscapes but shelter, bower or haven forms which offer windbreaks and protection for the regeneration of native flora. The artworks strengthen the connection with the regenerating environment, a functioning screen between the encroachments of the urban upon the natural.

Materiality:
The sculptural forms will be fabricated from stainless steel tube in a skeletal structure, the reflective qualities of this material allow it to morph and abstract its environment, creating interest and playfulness.

Light:
The skeletal structures offer the play of light, moiré patterns and a trellis of shadows. Day and night light will have an elemental interaction with the work, creating visual engagement within the simple beauty of the forms. The intention would be to use hidden solar panels that could be house behind the artwork on the earth mounds to drive sustainable LED lighting mounted within the sculptural forms.

Scale:
The scale is designed to be as large as feasible, this work would be a bold, strong statement about the relationship of the organic and the inorganic- played out in the juxtaposition of the hard man-made material language and the fluid, organically influenced forms.
**Our main focus is to magnify the beauty of nature rather than trying to copy it, to encourage people to remember what we owe to nature, that we can’t live without it.**

Light: Using sustainable solar LED lighting, the skeletal structures offer the play of light, moiré patterns and a trellis of shadows.
3. ‘Solar Weave’
Solar Weave
M2 Macquarie Park Iconic Art Installation Ideas Competition

Solar Weave is a 125m long sculpture consisting of 850 LED luminaires fixed to a lightweight structural frame. The LED luminaires are powered by solar cells which convert the sun’s energy into electricity.

Solar Weave is a large scale renewable energy installation. The resultant blanket of light at night both acts as a local signifier as well as an iconic example of renewable energy art in practice.

Solar Weave hopes to engage with the local community and through engagement raise awareness of current applications and future possibilities of renewable energy infrastructure.

Whether it be through further research with Macquarie University or local corporate partnerships, the Macquarie Park community is the ideal testing ground for this installation due to its business and educational makeup.

Solar Weave aims to align with Transurban’s sustainability pillars and strategy focusing on reducing their energy consumption by 10% by 2023.

Building upon Transurban’s recent initiatives and LED solutions for the Bolte Bridge in Melbourne and the Lane Cove Tunnel, Solar Weave seeks to continue this body of work and fuse together creativity and technical innovation.
Renewable energy art, as described by *Land Art Generator Initiative*, is a fairly new genre that incorporates renewable energy into the design of the artwork.

**Solar Weave** consists of a number of recycled plastic tubular elements, each affixed with a series of flexible solar cell arrays interspersed with LED luminaires at regular intervals. All collected power from the solar arrays are stored in a central battery housing for use at night.

The specified LED luminaire will have a lux level suitable to its motorway adjacency and the positioning of the luminaires will minimise the risk of glare to motorists and reduce 'light spill'.

The overall height and setback of the installation allows for a clear distinction between roadway lighting and the sculptural LED lighting. The installation has no flashing lights.

**Solar Weave** is an abstracted linear form suggestive of movement and fluidity. Conceptually, it draws on the Lane Cove River and comes from an abstraction of both water rippling & land topography. The Lane Cove National Park, adjoining the majority of the northern boundary, is a 372 hectare national park which tracks the Lane Cove River. The river winds through a peaceful bushland valley and is hidden away from the surrounding neighbourhoods. Solar Weave seeks to give the waterway another presence, an abstracted and symbolic gesture, celebrating the significance of this local feature.

Whilst the installation sits outside the specified footprint it consciously remains within the zone allocated for small shrub and groundcover species. The overall permeability of the installation will allow for the sculpture and plant life to engage with one another over time. As the vegetation matures it will begin to conceal and grow over the base of the installation allowing it to be read as embedded into the natural landscape, as if these curvilinear ‘ripples’ were flowing in and out of the ground.