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Designing Melbourne's E-Gate Brownfield: A novel urban renewal strategy foregrounding ecological performance and toxicity.

Abstract

As one of the fastest growing urban regions in the Western world, Melbourne is implementing extensive renewal projects to cope with its surging population. The Docklands precinct, for example, represents the current trend of developer led master planning and urban design which transforms prominent brownfield sites into high density residential and commercial zones. However, this renewal methodology, which is successful in alleviating growth pressures, is often criticised for disregarding the temporal and ecological attributes of the extensively modified urban landscape. Rather than celebrating disturbed ecological conditions through design, the qualities that define Melbourne's brownfield sites, such as emergent plant communities, contaminated soils and ruined buildings, are routinely substituted by static pocket parks and streetscapes. While landscape architects have limited agency in influencing government backed developers, they have great capacity in proposing alternative renewal schemes that foreground temporal change and modified ecological processes through design.

This paper reflects on an outcome from a recent RMIT design research studio that focused on E-Gate, a brownfield site, which explored the agency of landscape architects in addressing the real-world challenge of Melbourne's urban growth. Significantly, this studio critiqued the city's existing renewal approach by harnessing E-Gate's disturbed ecosystem to offer a speculative proposition grounded in ecological thinking. The studio utilises advanced computational simulation programs to evaluate relationships between E-Gate's topography, water currents, emergent plant growth and contaminated soils. The outcome, which includes a phased master plan, balances the competing forces of renewal and growth by foregrounding the performative qualities of E-Gate's modified ecosystem. Arguably, this approach presents an evolved methodology for the planning and design of Melbourne's brownfield sites which has implications for future landscape and urban design projects.

Introduction

Melbourne is Australia's fastest growing urban region. Between 2017 and 2018, 119,400¹ new immigrants increased the city's population to 4.96 million²; and, if current projections manifest, Melbourne will overtake Sydney as Australia's largest metropolis by 2026³. To manage the rapid annual growth, which currently sits at 2.5%⁴, the Victorian Government has implemented numerous urban renewal projects and extensive infrastructure building. The Docklands precinct, which is located west of Melbourne's colonial central business district, is a prominent example of the state government's current approach towards urban revitalisation that seeks to increase Melbourne's residential capacity and strengthen its economic standing in the Asia Pacific region.

While the Docklands, in addition to emerging projects such as Fishermans Bend and E-Gate, are successful in relieving Melbourne's growth pressures, the recent master plans disregard the unique ecologies and materials – such as emergent plants and toxic soils – that compose these types of post-industrial spaces. This scenario is problematic for two reasons. First, it asks planners and designers to produce outcomes similar to those that have been previously criticised (and therefore limits innovation); and second, the city's approach overlooks an extensive list of landscape precedents and theory that highlight the social, economic and environmental potentials of engaging disturbed urban conditions through ecological design practice. As Melbourne is becoming increasingly concerned with these ideas in a time of rapid change, landscape architects must have greater agency in evolving the city's conventional approach to urban revitalisation in future projects such as E-Gate.

Melbourne's Existing Approach to Brownfield Design

Local scholars have criticised Melbourne's renewal methodology for producing sub-standard master planned communities at the expense of innovative design practice, an unfortunate scenario considering the inventive potentials that reside in the ecological systems of disturbed urban sites. For example, the Docklands precinct has been evaluated as a missed opportunity for the state as well as the City of Melbourne. Academics and local government representatives, including Kim Dovey, Rohan Leppert and Heike Rahmann, are critical of recent projects that they believe are disconnected from the precinct's broader context – such as expansive water bodies – and reflect poor strategic planning by developers and state government ministers.

In one critique, Dovey⁵ argues that the government's focus on economic outcomes, rather than a well-conceived master plan, is a major influence on the suite of underwhelming projects

that characterise the Docklands⁶. Similarly, City of Melbourne councillor Rohan Leppert argues that the planning of the precinct is a missed opportunity, stating that the designs do not produce the “best possible outcome for... Melbourne”; significantly, he suggests that a “much clearer... plan” is required for Fishermans Bend and E-Gate⁷ to resolve this issue in the future. Expanding on the previous viewpoints, Rahmann⁸ suggests that planning policy must first evolve before innovative designs can emerge in Melbourne's brownfields. She states that:

“positive change only occurs where policy embraces design as a strategy for urban revitalisation... Creativity means the... production of something novel and visionary... that has not been there before in this form and that is unexpected⁹.”

In this way, the observers note that the ongoing prioritisation of economic and political outcomes, among other factors, limits the designer's agency in proposing revolutionary schemes for Melbourne's renewal.

Whereas Dovey, Rahmann and Leppert outline valuable points, it must be acknowledged that balancing Melbourne's economic and residential requirements alongside innovative design is a complex scenario. It not only challenges local and state governments to advance their urban renewal strategies but asks multiple creative disciplines – including landscape architects, urban planners, designers and architects – to unify their approaches towards brownfield development. While this pursuit is difficult, global precedents such as False Creek, a 1970s-renewal project in Vancouver, demonstrates how transformative designs are achieved when co-operative approaches, including partnerships with the community, are championed by all stakeholders¹⁰.

Landscape architecture's history of urban revitalisation – and its ability to operate across design, ecology and philosophy – means that the discipline is highly capable in offering an alternative approach to brownfield master planning in precincts such as E-Gate. By drawing on numerous theories of urban disturbance, ecology and landscape architecture, this paper explores the potential of E-Gate's post-industrial ecology, including its spontaneous plant communities and toxic soils, as a catalyst for influencing changes to Melbourne's existing renewal strategies.

To position the study in a broader lineage of landscape architecture practice, the paper reflects on an ecologically sensitive master plan from a recent design research studio, titled Filthy

Gorgeou\$, that explores the agency of landscape architects in addressing the real-world challenge of Melbourne's urban growth. This studio critiques the city's existing approaches towards brownfield design – which often perceives the landscape as an empty terrain – by harnessing E-Gate's disturbed ecosystem to offer a speculative proposition grounded in ecological thinking. The studio utilises advanced computational simulation programs to evaluate relationships between E-Gate's topography, its water currents, emergent plants and contaminated soils. This approach presents an alternative methodology for the planning and design of the city's expansive brownfields and offers exciting opportunities for future landscape projects in Melbourne.

This paper has three sections. The first part discusses the major shifts in ecological design philosophy from the 1960s onwards that have influenced the students' master plan for E-Gate. Concepts such as Clément's Third Landscape and de Sola Morales' Terrain Vague, among others, are referenced to position their approach in a lineage of landscape architectural thinking and ecological design practice. The second section introduces the creative research methods that guide the students' analysis of E-Gate, such as composite mapping and photo essays, before concluding with an overview of the ecologically inspired master plan for the precinct (section three).

Shifts in Ecological Design Thinking from the 1960s Onwards

Since the late 1960s, landscape architects working in the United States and Europe have produced new ecological theory and explored alternative design methodologies to engage the modified conditions of urban brownfields. Evolved concepts include Ian McHarg's ecologically minded master planning approach, Gilles Clément's Third Landscape theory, Joan Nassauer's position on order and messiness and Ignasi de Sola Morales' Terrain Vague concept. These philosophies, together with a suite of innovative landscape architecture projects such as Richard Haag's Gasworks Park and Peter Latz + Partners Duisburg Nord¹¹, evolved how designers perceived and treated urban brownfields in the second half of the 20th century.

The combination of ecological thinking and landscape architecture practice gained prominence in the late 1960s with the publication of Ian McHarg's seminal writing *Design with Nature* (1969). McHarg was an important figure in the landscape discipline and renowned for his pioneering application of ecological principles in the master planning process. By harnessing new computer technologies such as Geographic Information Systems (GIS), McHarg's approach foregrounded the importance of urban ecosystem resilience into design, stating that the "ecological method" allows the landscape architect to "understand form as an

explicit point in the evolutionary process¹²." Importantly, by embedding ecological thinking into the landscape discipline, McHarg's method gave landscape architects and planners the ability to enhance and direct environmental processes in the design of extensive open space networks.

A decade later the publication *Nature in Cities* (1979) reinforced the potential of engaging ecological thinking in the design of disturbed urban sites. This book, that was edited by Ian Laurie, included a collection of essays with contributions from diverse disciplinary backgrounds such as design, urban planning and urban ecology. A notable inclusion was Herbert Sukopp's essay, 'The Soil, Flora, and Vegetation of Berlin's Waste Lands' which studied the novel ecologies of Berlin's war-torn spaces and argued for the retention of ruderal flora in the design and planning of the city's brownfields¹³. As he wrote, emergent species would be the "prevailing plants of the future" owing to their abilities to "adjust themselves best to man-made sites¹⁴." In this way, Sukopp embraced the performative qualities of Berlin's disturbed ecosystems, such as resilience and spontaneous growth, and argued that landscape architects engaged such qualities through future urban park design.

While McHarg, Laurie and Sukopp's positioning outlines some prominent developments in ecological thinking between the 1960s and 1970s, frameworks of ecology were extended in the 1990s with the introduction of new eco-design philosophy. Evolved concepts include Clément's Third Landscape theory, Nassauer's position on order and messiness, and de Sola Morales' theorisation of the Terrain Vague, which drew attention to new design approaches towards, and the unexpected ecological configurations of, open-ended ecosystems in disturbed landscapes. As Waldheim explains, practitioners working in these decades "articulated the potential for ecological systems to be seen as self-organising and open-ended while affording a strategic framework for urban intervention¹⁵." Importantly, the evolved positions introduced new ways of theorising and engaging the ecological conditions of abandoned sites from the 1990s onwards.

French gardener and philosopher Gilles Clément played a significant role in extending established ecological design thinking, such as McHarg's and Sukopp's, through the production of progressive ecological concepts, namely the Third Landscape. The Third Landscape is an assemblage of spontaneous plant species that inhabit the landscape through processes of migration and succession. Clément (cited in Rocca 2008) defines the Third Landscape as a "space of indecision, and the living things that occupy it act freely", modify our "interpretation of territory" and attribute "value to the places that are normally neglected¹⁶."

Significantly, his ideas expanded established definitions of ecology by allowing the landscape discipline remarkable flexibility in its interpretation of foundational ecological principles, such as succession and disturbance. For instance, what might be considered undesirable through scientific frameworks, such as the distribution of invasive species within the landscape, could also be interpreted as an inherent performance of an open-ended ecosystem which had exciting implications for designing alongside living materials.

The idea that plants were free to self-organise meant that ecological communities, whether composed of natives or exotics, could be considered an inherent part of a system's operation. When applied in landscape architecture, this conceptualisation presents new ways for conceiving ecology through design. Nassauer, for instance, explained that by acknowledging the "distinction between ecological function and natural appearance, we can... critically analyse the cultural language of naturalness and use it as a language to intentionally communicate ecological function¹⁷." Nassauer's position, which shares some similarities with Clément's philosophy, challenged cultural perceptions of naturalness in landscape practice and offered designers new ways to conceive and implement constructed ecologies.

While Clément and Nassauer investigated ideas of abandonment and naturalness from the perspective of ecology and design, authors such as Ignasi de Sola Morales', through his publication of the *Terrain Vague* (1995), considered deserted urban spaces through the creative mediums of fine arts. Principally, de Sola Morales (1995) defines the *Terrain Vague* as existing:

...outside the city's effective circuits and productive structures... industrial areas, railway stations, ports, unsafe residential neighbourhoods, and contaminated places are where the city is no longer... Unincorporated margins, interior islands void of activity, oversights... they are foreign to the urban system, mentally exterior in the physical interior of the city, its negative image¹⁸.

Within this definition are several descriptions of spontaneous systems. These include unforeseen ecological modifications, for example, contamination; "islands void¹⁹" of human occupation, which imply a level of eco-spontaneity; and the description of an unsafe community in addition to cultural neglect. In each case, the overarching concept is that the *Terrain Vague* is a peripheral space that supports unregulated eco-cultural systems.

Building on the preceding ecological design ideas is the discipline's growing interest in self-organising systems. Concepts such as infrastructural landscapes, ecological and landscape urbanism, encourage a move away from a static landscape master plan (or a closed scheme) to the design of open-ended systems. Gary Strang's influential essay 'Infrastructure as Landscape, Landscape as Infrastructure' (1996) argued that landscape architects must play a dominant role in shaping the urban form owing to their deep knowledge of dynamic processes and ecology²⁰. Similarly, Waldheim's *Landscape Urbanism* understands the landscape discipline as "uniquely capable of responding to temporal change, transformation, and adaptation", highlighted by its agency to engage "open-endedness, indeterminacy, and change demanded by contemporary urban conditions²¹." When considered together, these statements signify an ambition to design the city by engaging fundamental principles of ecology, such as flows and networks, alongside the spontaneous attributes of the metropolis.

The preceding eco-theory raises valuable questions and exciting opportunities for landscape architecture students concerned with the design and planning of E-Gate. Frameworks such as the Third Landscape, among others, allow them to position the site's disturbed ecosystem in a way that is mostly untested in the Australian context²². For instance, as opposed to positioning the project through a lens of ecological revegetation, the philosophy encourages them to perceive E-Gate's spontaneous flora and toxicity as valuable design materials. Additionally, it allows them to propose radical designs that celebrate the attributes of urban disturbance on the one hand, and balance the city's population growth and economic requirements on the other. These ideas are explored in the following section which interrogates the students' propositional master plan for E-Gate. This discussion articulates how the site's disturbed ecology, in addition to landscape processes such as phytoremediation and hydrology, are utilised to produce a phased master plan.

Analysing E-Gate's Disturbed Ecosystem through Creative Methods

E-Gate is located on the western end of Melbourne's colonial Hoddle Street Grid (Figure 1). The site is close to some of Melbourne's oldest suburbs, such as North Melbourne, and more recent renewal precincts including the Docklands. While E-Gate occupies a central position, the landscape is detached from the city in multiple ways. From its eastern edge, the site is disconnected due to multiple rail lines, on its southern boundary access is obstructed by an eight-lane highway and Moonee Ponds Creek restricts entry from the western side. Lastly, the West Gate Tunnel²³ project – which is currently under construction and due to open in 2022 – will further segregate the site by creating a series of irregular spaces that limits the cohesion of the space.

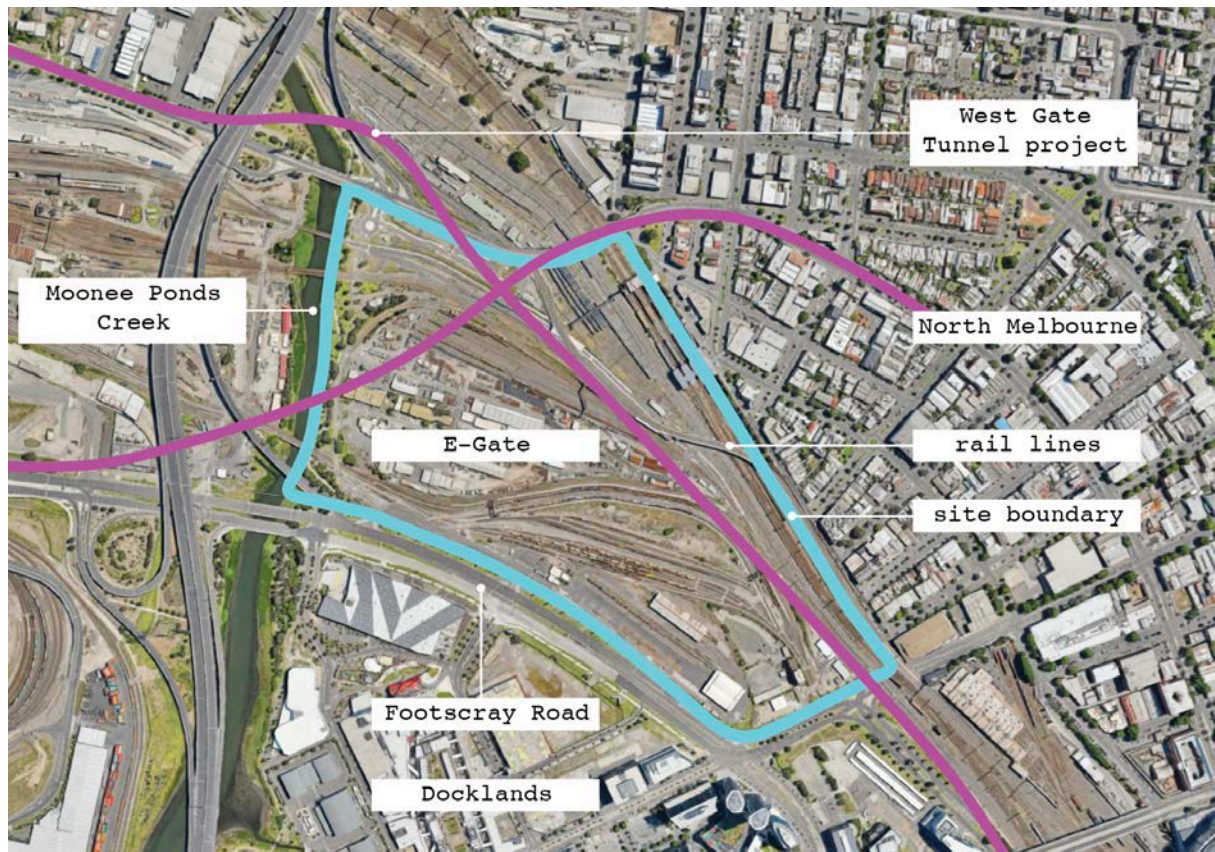


Figure 1. E-Gate's boundary (blue) is bordered by the Docklands and North Melbourne. The West Gate Tunnel will further dissect E-Gate (shown in pink).

The isolation of E-Gate strongly influenced the studio's positioning of this landscape as a Terrain Vague and Third Landscape ecology. Within the site are numerous conditions, as shown in Figure 2, that mirror the descriptions outlined previously by de Sola Morales and Clément. E-Gate houses abandoned architectural elements such as derelict sheds and crumbling fences, in addition to a diverse collection of ruderal plants including *Cerastium* species (chickweeds), *Malva australiana* (native hollyoak), *Conyza sumatrensis* (tall fleabane) and *Brassica fruticulosa* (twiggy turnip) that have come to dominate this landscape's surface.

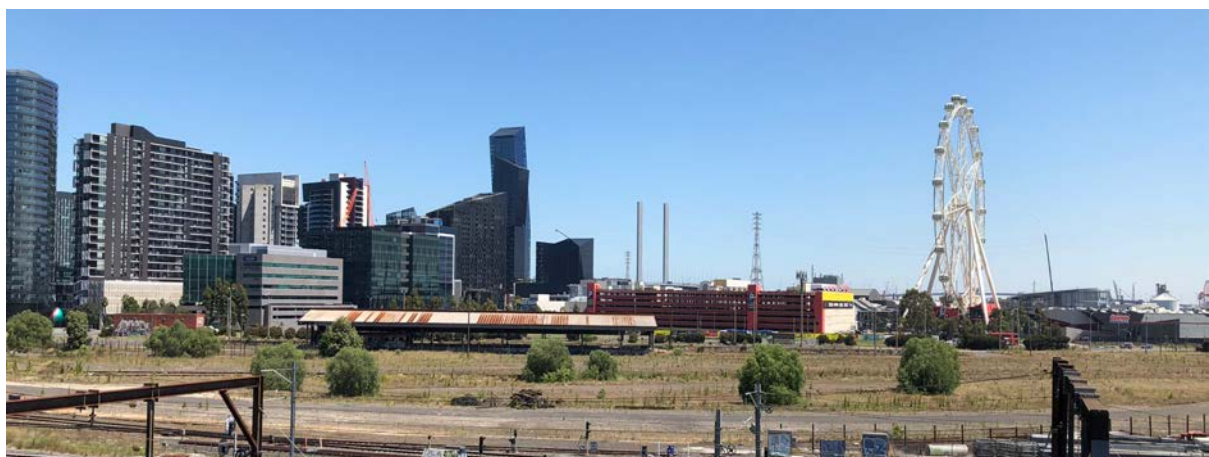


Figure 2. A photograph showing E-Gate's spontaneous ecosystem and architectural relics.

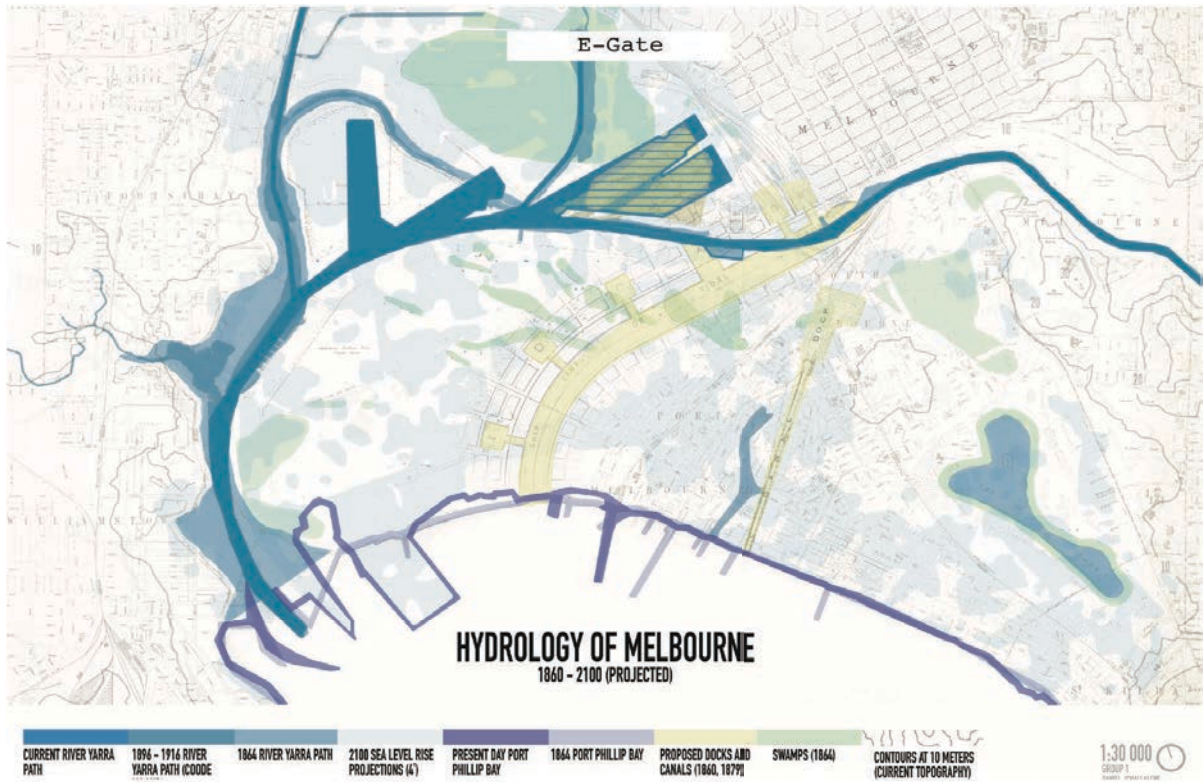


Figure 3. A composite map showing the extensive changes to Melbourne's ecology.

To analyse the extent of E-Gate's evolved ecosystem, the students applied three design research methods including composite mapping, a photo essay and an ecological transect. These techniques formed the basis of the group's ecological knowledge before the design phase of the studio. The composite maps, which are built from early topographical depictions of Melbourne, illustrate how E-Gate originally formed part of a wetland system that dictated Melbourne's settlement patterns and industrial development. Whereas residential and commercial expansion was focused on higher ground with stable geology to the north, infrastructure such as rail lines and factories – in addition to industrial sites – were situated on the lower wetlands that were perceived by new settlers as less valuable for development, as shown in Figure 3.

The Yarra's modifications, which included deepening and straightening the water course, also impacted the plant communities that were capable of surviving following European settlement. Whereas E-Gate was originally composed of brackish wetland species, salt tolerant shrubs, heathy woodlands and chenopod shrubs; the site is now dominated by *Malva*, *Conyza*, *Brassica*, *Aster*, *Bidens* and *Cerastium* species, in addition to *Foeniculum vulgare* (fennel), *Schinus molle* (peppercorn tree), *Solanum nigrum* (black nightshade) and *Verbascum Thapsus* (Great mullein), as shown in Figure 4, an ecological transect.

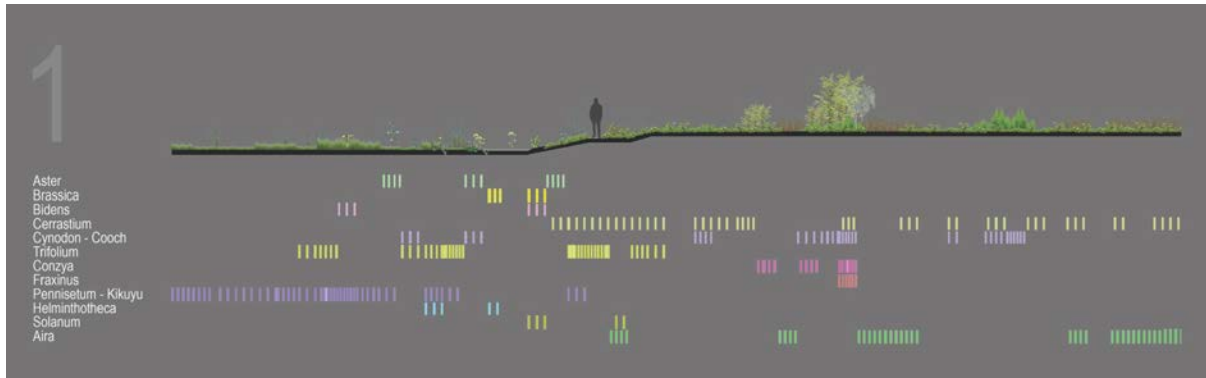


Figure 4. Transect data showing the distribution of E-Gate's spontaneous plant communities.

Additionally, photo essays and diagrams were composed by students to map the aesthetic, environmental and experiential qualities of E-Gate's Terrain Vague conditions. A common theme of the investigations included the impact of isolation on the landscape's constructed elements and emergent plant communities. The essay shown in Figure 5, titled *What Lies Within / What Borders Its Edge* (Ichallalene 2018), examined the dichotomy between E-Gate's boundary and its spontaneous plants by interrogating the concepts of division, isolation, periphery and tangibility through photography and drawing. The discovery of a constantly evolving ecology, together with E-Gate's abandoned atmosphere, was a major influence on the first phases of the master plan.

Studio participants also analysed the findings of Victoria's Environmental Protection Agency's (EPA) audit into the Dockland's Digital Harbour precinct to contemplate how E-Gate's industrial history may have contaminated the site's geology. Digital Harbour, which is located immediately adjacent to E-Gate, was discovered to be significantly contaminated by arsenic, lead, zinc and benzo(a)pyrene and polycyclic aromatic hydrocarbons (PAH) which are detrimental to human health. Using the report's findings as a guide, the students speculated on the extent of E-Gate's contaminated soil and considered how this disturbance might influence their design approach.



Under the established canopy of utility lines, lies an understory of opportunistic species engaging with the ground below. The soil long contaminated by infrastructural imposition, is slowly remediated in pockets through species, purifying the ground through their growth



Above ground, power lines proliferate in a rhizome, commanding the landscape. Although highly considered, they arise with a perceived spontaneity, they impose themselves and grow tall, a series of connected monoliths.



In an area of immediate densification and immense structures, E-Gate possesses flat open land – a rare site suspended in ambiguity.

Figure 5. A photo essay exploring the impact isolation on E-Gate's spontaneous plants.

Lastly, the local community's ambition for E-Gate was considered as students refined their proposal. They disseminated the Melbourne City Western Connection's²⁴ preliminary vision for the landscape – which includes a new public open space, improved pedestrian connections to the Docklands, additional car parking and an open grassland²⁵ – to position their scheme alongside public expectations. This understanding allowed the designers to balance the residents' requirements alongside the government's renewal agenda in their proposition.

The final scheme for E-Gate is a dynamic landscape that harnesses the site's evolved ecology to dictate the form, function and location of a new master planned community and open space in Melbourne. The phased design, which unfolds in four stages – resilience, treatment, experience and post-remediation – utilises the site's spontaneous plants to treat its toxic soils and render the landscape safe for public habitation. Following the treatment process, E-Gate is then divided into residential and commercial zones while retaining a portion of the site as a 'designed' third landscape.

Master Planning E-Gate through Ecological Design

The first phase, 'resilience', manipulates E-Gate's topography to develop new drainage patterns that direct excess water into a central tank located beneath the surface. The flow channels (Figure 6), which are developed with the assistance of a Grasshopper plug-in, establish a system of collection and retention that future proofs the precinct against extreme

HYDROLOGY ANALYSIS

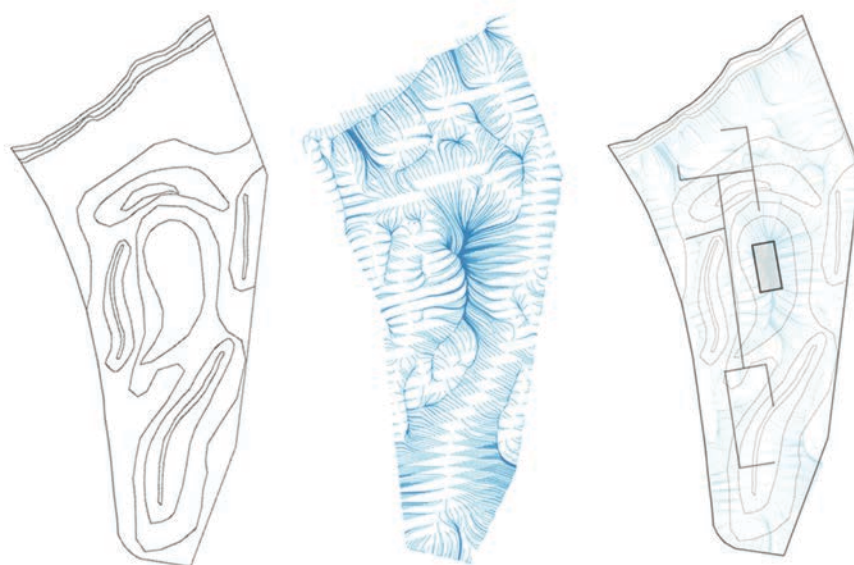


Figure 6. A diagram showing E-Gate's new topography and hydrological system.

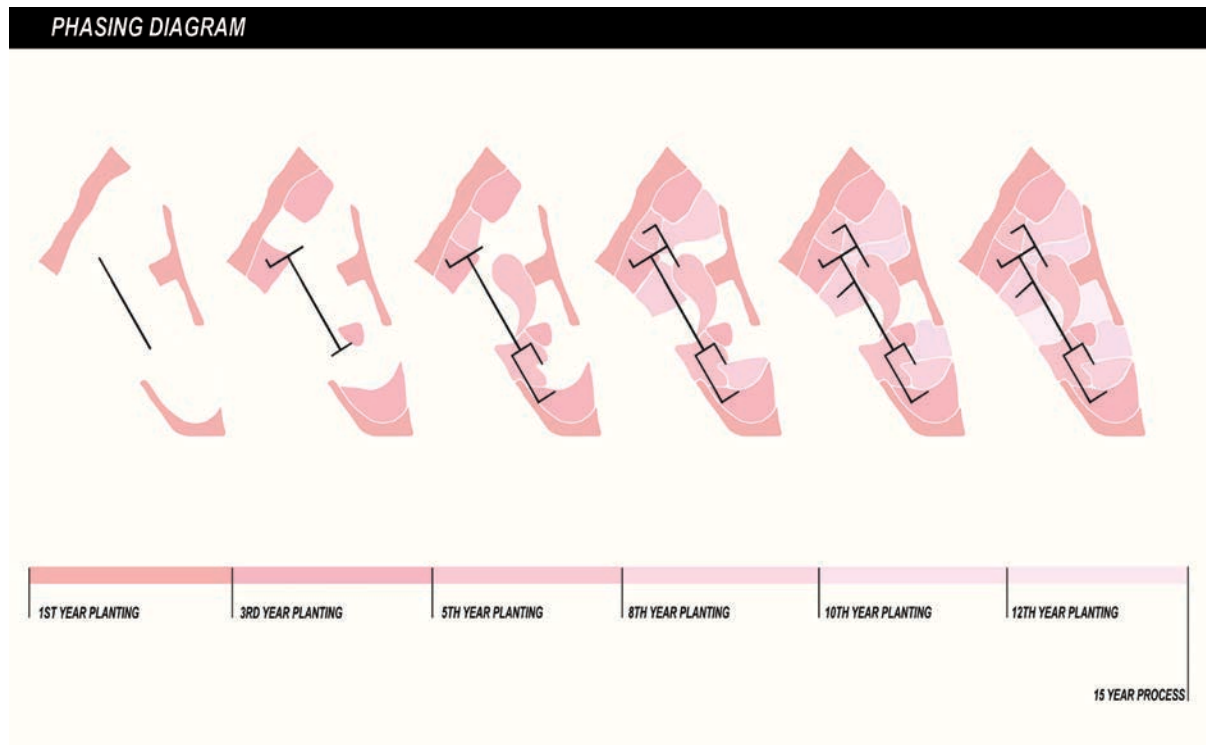


Figure 7. E-Gate's six stage planting process that unfolded over fifteen years.

drought and reduces the risk of flooding. The second gesture, 'treatment', sees the propagation and mass planting of E-Gate's existing flora. This phase occurs in six stages (Figure 7) over the course of fifteen years. Spontaneous species such as *Brassica juncea*, *Pteris vittata*, *Helianthus annuus*, *Conyza sumatrensis* and *Festuca arundinacea*, among other species are utilised in the phytoremediation process to reduce the levels of arsenic, lead, zinc and PAHs in E-Gate's soils (Figures 8 and 9). To strengthen the rigour of the preliminary planting design students ran a sun path analysis in Ladybug, a digital tool that draws on Melbourne's sun arc data to determine the spectrum of solar energy on the site. This method shows how structural elements, including the site's elevated freeway and propositional path networks, impact growing conditions which dictates planting patterns across the landscape.

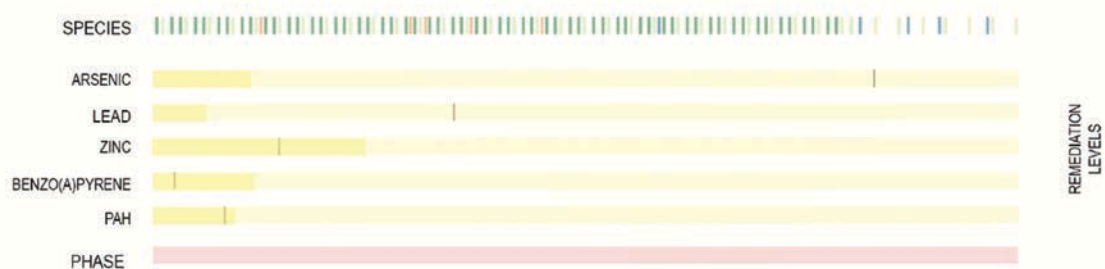


Figure 8. A diagram showing the relationship between plant growth and phytoremediation.

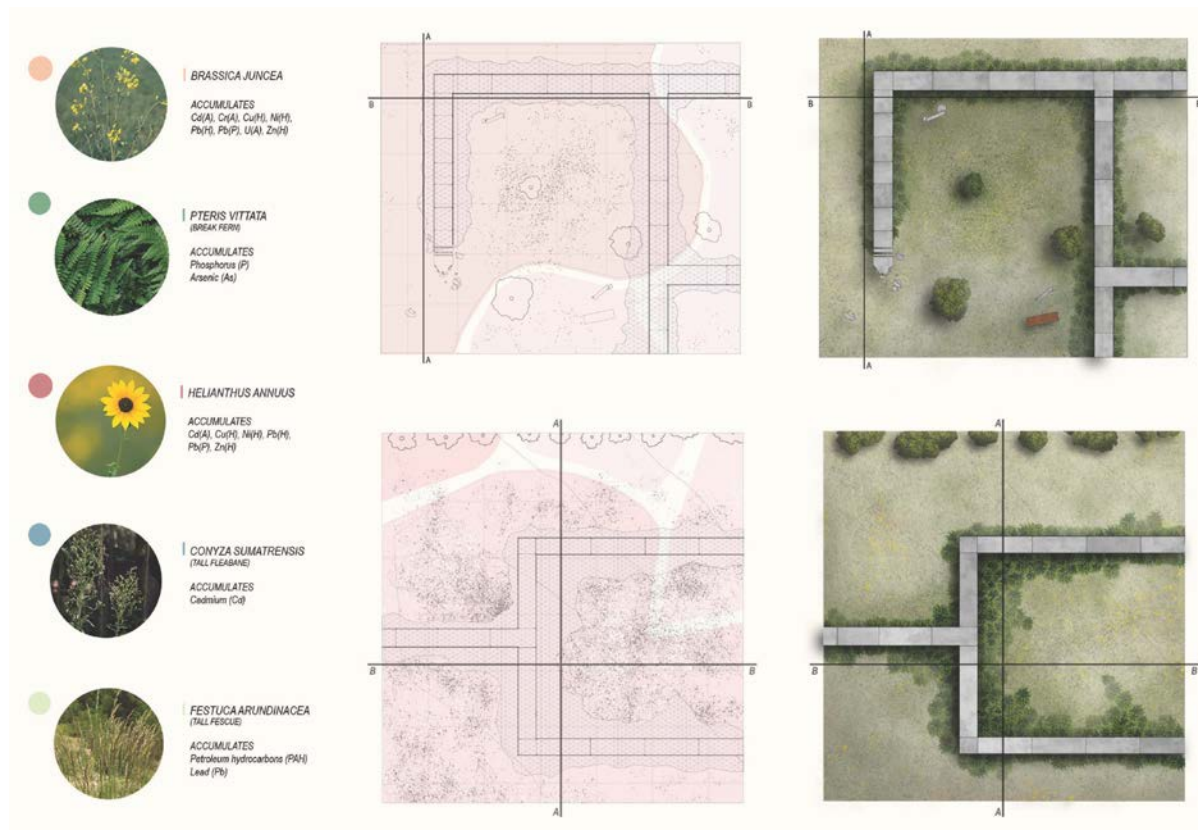


Figure 9. *Brassica juncea*, *Pteris vittata*, *Helianthus annuus*, *Conyza sumatrensis* and *Festuca arundinacea* were planted to treat E-Gate's contaminated soil. The drawings (middle / right) show how the inserted pathway brings park users into proximity of the phytoremediation process.

As the planting design evolves, the third phase of the master plan emerges. This stage, named 'experience', sees the construction of exploratory paths over the site. While simple in their composition, the paths are significant for allowing E-gate to perform as an open space during the phytoremediation process. The network establishes opportunities for light recreation, such as walking and running, and moments for users to experience E-Gate's decontamination first hand (Figure 10). Similarly, the pathway acknowledges the Melbourne City Western Connection's desire for stronger links between West Melbourne and the Docklands by establishing a direct link between the two suburbs and North Melbourne station (Figure 11).

The experience phase is an exciting proposition for Melbourne. By foregrounding toxicity and decontamination through design, the landscape architects demonstrate the cyclical nature of spontaneous plant species as they evolve over time and adjust to E-Gate's varying environmental conditions. In this way, the application of and interaction with an alternative landscape typology aims to present the concept of a dynamic third landscape to the residents of central Melbourne.



Figure 10. The pathway allowing public access while the site is treated.

The fourth and final phase, 'post-remediation', begins in the fifteenth year of the master plan. Here the designers tackle the city's growth requirements by inserting residential, commercial and mixed-use zones into E-Gate. To maximize the success of the precinct, the landscape architects intend to collaborate with urban designers and architects to combine expert knowledge from a range of creative disciplines. The proposal achieves multiple outcomes, as shown in Figure 11. First, it retains a large portion of the site's spontaneous environments in the form of a public park, a necessary result considering the area's limited open space. Second, it delivers both public and private housing in an attempt to mediate the city's growing

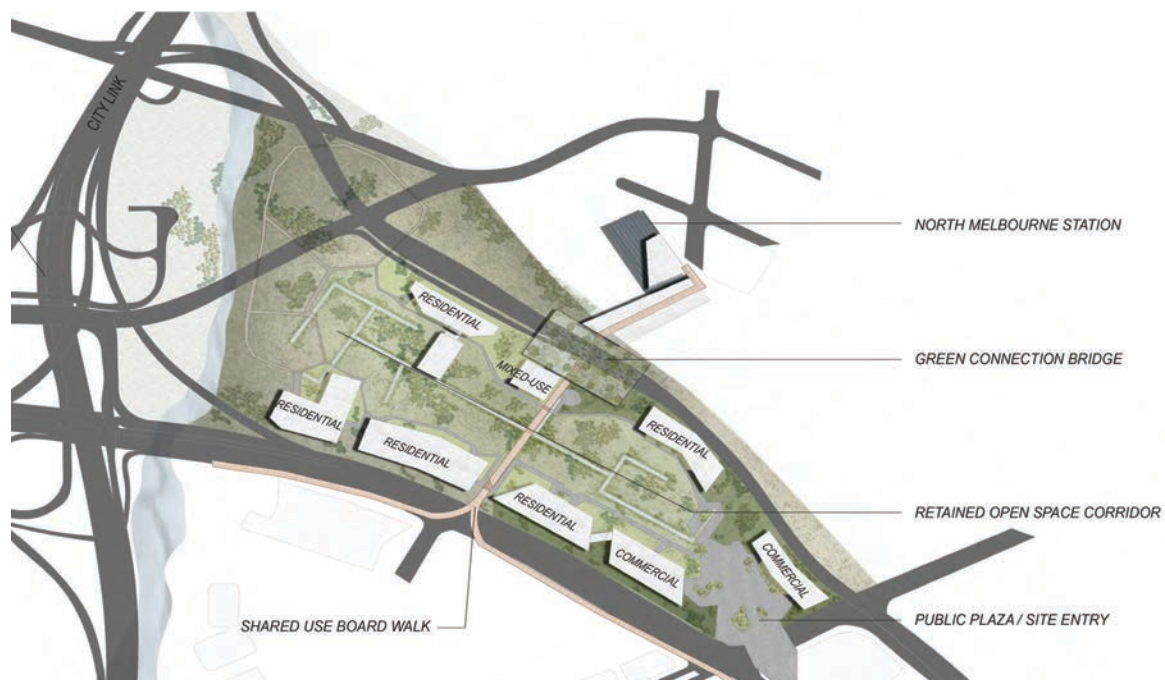


Figure 11. E-Gate following the final 'post-remediation' construction phase.

population and issues of affordability. Lastly, the plan extends existing pedestrian and cycling links between the Docklands, North Melbourne and Moonee Ponds Creek to solve the major connectivity issues identified by residents of the surrounding neighbourhoods.

Together, these interventions result in a fluid precinct which achieves multiple outcomes concurrently. The design establishes a new open space typology in the centre of Melbourne, namely a 'designed' third landscape, that exhibits the inherent qualities of this site's post-industrial history and disturbed ecology. Similarly, by engaging these attributes through design the proposition offers an alternative approach to brownfield development that challenges the city's status quo of renewal. Lastly, by working with varying theories of ecological design that are presently untested in Melbourne – and by working in collaboration with other creative disciplines – the landscape architects have generated a plan that balances the city's growth alongside the creation of a new public open space in West Melbourne (Figure 12).



Figure 12. A perspective of E-Gate's new public open space.

Conclusion

The Filthy Gorgeou\$ design research studio reveals exciting potentials for Melbourne's approach to urban revitalisation. By foregrounding their ecological knowledge through master plan design, the students' have demonstrated the agency of landscape architects in negotiating the city's growth requirements in addition to providing new public and private spaces for its surging population. The scheme acknowledges the government's economic and political agenda by providing new residential and commercial zones; and, the community's desire for stronger connections to surrounding areas has manifested through the design of expansive pathways and a formalised urban park that references the site's disturbed ecosystem. Nevertheless, it is acknowledged that to successfully achieve this alternative

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approach to renewal, varying design disciplines – in addition to a strong engagement with local communities and multiple levels of government – is necessary to conceptualise, design and produce the propositional master plan.

Endnotes

- ¹ Australian Bureau of Statistics. 2019. "Regional Population Growth, Australia, 2017-18." Accessed June 10, 2019. <https://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3218.0>
- ² Australian Bureau of Statistics. 2019. "Regional Population Growth, Australia, 2017-18." Accessed June 10, 2019. <https://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3218.0>
- ³ Write and Sakkal. March 27, 2019. "Booming Melbourne to become nation's largest city by 2026." Accessed June 15, 2019. <https://www.smh.com.au/politics/federal/booming-melbourne-to-become-nation-s-largest-city-by-2026-20190327-p5186v.html>
- ⁴ Australian Bureau of Statistics. 2019. "Regional Population Growth, Australia, 2017-18." Accessed June 10, 2019. <https://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3218.0>
- ⁵ Kim Dovey is a Professor of Architecture and Urban Design at the Melbourne School of Design (The University of Melbourne).
- ⁶ Dovey, Kim. *Fluid City: Transforming Melbourne's Urban Waterfront*. (Sydney: University of New South Wales Press, 2005). p.215
- ⁷ Leppert, Rohan cited in Cheng, Linda. March 10, 2019. "Forest of towers' approved for Melbourne's Docklands." Accessed June 12, 2019. <https://architectureau.com/articles/forest-of-towers-approved-for-melbournes-docklands/#>
- ⁸ Dr. Heike Rahmann is a senior lecturer in landscape architecture at RMIT, Melbourne.
- ⁹ Rahmann, Heike. October 14, 2011. "Locals ignored as Docklands development treads a familiar path." Accessed June 12, 2019. <https://www.smh.com.au/politics/federal/locals-ignored-as-docklands-development-treads-a-familiar-path-20111014-1l0o7.html>
- ¹⁰ Ley, David. 'Styles of the times: Liberal and neo-conservative landscapes in inner Vancouver, 1968–1986.' *Journal of Historical Geography*, 13,1 (1987) 40-56. P.46
- ¹¹ Seattle's Gas Works Park (Richard Haag 1975), for instance, cleanses the site's contaminated conditions through hydrology, microbiology and topographic gestures. Similarly, Duisburg Nord (Latz + Partners 1991) adapts infrastructure, landscape conditions and systems for programmatic reinterpretation, innovative design moves that show an acceptance of post-industrial conditions and a desire to exhibit them as the principal aesthetics and ecology of the site.
- ¹² McHarg, Ian L., and American Museum of Natural History. *Design with Nature*. 1st Ed.] ed. (Garden City, N.Y.: Published for the American Museum of Natural History [by] the Natural History Press, 1969). P.43
- ¹³ Sukopp, H., Blume, H. P., Kunick, W. "The soil, flora, and vegetation of Berlin's waste lands", in Laurie, I. C (ed.), *Nature in cities: the natural environment in the design and development of urban green space*. (Wiley: Chichester, 1979). p.130.
- ¹⁴ Sukopp, H., Blume, H. P., Kunick, W. "The soil, flora, and vegetation of Berlin's waste lands", p.121.
- ¹⁵ Waldheim, Charles. *Landscape as Urbanism: A General Theory*. (Princeton, New Jersey; Woodstock, Oxfordshire: Princeton University Press, 2016). p.32
- ¹⁶ Clément, Gilles cited in Rocca, Alessandro. *Planetary Gardens: The Landscape Architecture of Gilles Clément*. (Basel : London: Birkhäuser ; Springer [distributor], 2008). p.27
- ¹⁷ Nassauer, Joan. "Messy Ecosystems, Orderly Frames." *Landscape Journal* 14, no. 2 (1995): 161-170. p. 163
- ¹⁸ Ignasi, de Solà Morales. "Terrain Vague." *Anyplace*. (1995): 118-123. p.120
- ¹⁹ de Solà Morales. p.120
- ²⁰ Strang, Gary L. "Infrastructure as Landscape, Landscape as Infrastructure." *Places Journal*, 10, 3 (1996), 8-15. p.15
- ²¹ Waldheim, *Landscape as Urbanism: A General Theory*, p.15

²² For instance, recent texts on Australian landscape architecture support this. Reviews of major Australian landscape publications, such as *New Conversations with an Old Landscape* (Bull 2002), *Contemporary Australian Landscape Design* (Mossop 2006), *Design with Landscape: Australia* (Mackenzie 2011), *Sunburnt: Landscape Architecture in Australia* (Raxworthy & Ware 2011), *Making Landscape Architecture in Australia* (Saniga 2012) and *Taylor Cullity Lethlean: Making Sense of Landscape* (Lee and Ware 2013) reveal that few projects intentionally engage with spontaneous urban flora through design (One exception includes the Brick Pit (2005) at Sydney's Millennium Parklands. This landscape, a post-industrial space, supports a population of endangered green and golden bell frogs that re-established themselves in the modified conditions following the factory's closure).

²³ The West Gate Tunnel is a \$6.7 billion underground road currently under construction. It is due for completion in 2022.

²⁴ The Melbourne City Western Connection is a non-profit organisation composed from local residents. Their official website is <http://www.westernconnection.org.au/>

²⁵ Melbourne City Western Connection. No date. "Our vision." Accessed September 17, 2019. <http://www.westernconnection.org.au/our-vision>

Figures

Figure 1. Author image, *E-Gate context map*, 2019, digital diagram.

Figure 2. Author image, *E-Gate's spontaneous ecosystem and architectural relics*, 2019, digital photograph.

Figure 3. Ichallalene, D., Cook, A., Carbone, M., *Hydrology of Melbourne*, 2018, digital composite map.

Figure 4. Ichallalene, D., Cook, A., Carbone, M., *Ecological transect of E-Gate*, 2018, digital drawing.

Figure 5. Daniel Ichallalene, *What Lies Within / What Borders Its Edge*, 2018, digital photo essay.

Figure 6. Daniel Ichallalene, *Hydrology analysis*, 2018, digital drawing.

Figure 7. Ichallalene, D., Cook, A., Carbone, M., *Phasing diagram*, 2018, digital drawing.

Figure 8. Daniel Ichallalene, *Decontamination process*, 2018, digital diagram.

Figure 9. Daniel Ichallalene, *Planting design and E-Gate plan*, 2018, digital drawing.

Figure 10. Daniel Ichallalene, *Render*, 2018, digital collage.

Figure 11. Ichallalene, D., Cook, A., Carbone, M., *Final phase of E-Gate master plan*, 2018, digital drawing.

Figure 12. Michael Carbone, *E-Gate's perspective*, 2018, digital collage.

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