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Methods Document: Ballast Point Park

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Overview of CSI: This investigation was conducted as part of the Landscape Architecture Foundation's 2017 *Case Study Investigation* (CSI) program. CSI matches faculty-student research teams with design practitioners to document the benefits of exemplary high-performing landscape projects. Teams develop methods to quantify environmental, economic and social benefits and produce Case Study Briefs for LAF's *Landscape Performance Series*.

The full case study can be found at: https://landscapeperformance.org/case-study-briefs/ballast-point

ENVIRONMENTAL BENEFITS

- **Diverted 22,200 tons of construction waste from landfills, about twice the weight of the Eiffel Tower, by repurposing it for use in gabion retaining walls**

Method

The following recycled materials were used in the construction of the rubble-faced (gabion-style) walls:

- 3,196,703 lbs of recycled construction waste rubble. The original design intention was to have construction waste rubble produced by the demolition work on site processed for reuse on site. However, it was significantly less expensive for the demolition rubble to be shipped off-site for processing, with an equivalent amount of processed and graded construction waste rubble then returned to site from the recycling facility (this may not therefore have been the original material). Processing on site would have reduced the CO_2 emissions incurred during transportation, but ultimately a decision based upon economic cost and time efficiency was made.
- 39,683,207 lbs of site soils. Because much of the original soil on site had to be removed due to contamination from the former use, new fill had to be obtained for the backfill. Uncontaminated waste site-soil from other construction excavations was obtained from the construction waste material recycling facility to serve this purpose.
- 1,543,236 lbs of additional recycled rubble sourced from the construction waste recycling facility was also used for filling the gabion walls.

Adding together the weights of all recycled materials obtained from the construction waste recycling facility for the rubble-faced retaining walls gives an aggregate amount of recycled materials used in this aspect of the design (McGregor Coxall nd.).

3,196,703 + 39,683,207 + 1,543,236 = 44,423,146 lbs

44,423,146 lbs = 22,211.573 tons

Calculation for the Eiffel Tower:

16,093,745 (puddled iron) + 6,172,943 (non-metal components) = 22,266,688 lbs

44,423,146 (diverted landfill) / 22,266,688 (Eiffel Tower) = 1.995

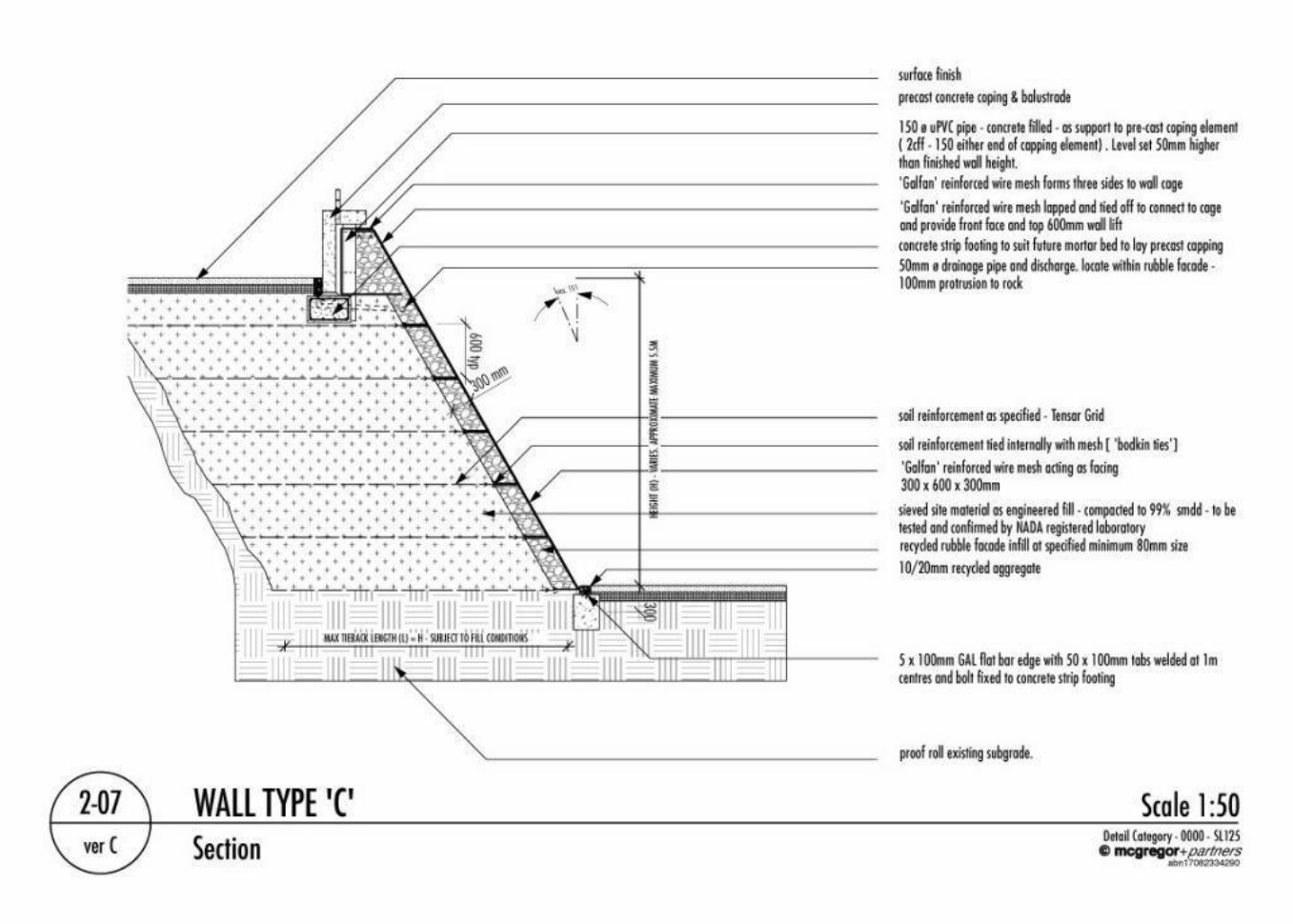

*FIGURE 1: Section detail of the gabion walls at Ballast Point Park (*Landezine *2010).*

It was the advocacy of the design team (in keeping with the community-driven masterplan) in proposing to "create a sustainable design that incorporates best practice and ESD" (McGregor Coxall, Sustainability Book 3.7 nd.) that enabled the project to argue for the re-use of rubble "ballast" (from which the site takes its name). The designers considered this a poetic, yet pragmatic solution to add to the sustainable credentials of the park.

Sources

Landezine 2010. Ballast Point Park. Accessed 04/07/2017 from http://www.landezine.com/index.php/2010/11/ballast-point-park-by-mcgregorcoxall-landscape-architecture/

McGregor Coxall nd. *Ballast Point Park*.

McGregor Coxall nd. *Sustainability Book* 3.7.

Société d'éxploitation de la Tour Eiffel, Paris nd. *The Tower in Figures*. Accessed 27/07/2017 from http://www.toureiffel.paris/images/PDF/supports-pedagogiques/EN/en_10_la_tour_en_chiffres.pdf

Limitations

It was not possible to calculate the exact savings of virgin materials that resulted if a different design solution had been applied (ie, one that did not specify recycled rubble gabions from the outset), as this exercise would require too many assumptions about differences in configuration that would have resulted from a different design solution.

- **Incorporated 582 tons of coal power plant waste into concrete used throughout the site. The concrete mix includes waste fly ash and slag, aggregate, and ground slag.**

In the attempt to increase the sustainable components of the park, the designers found that upcycling coal power plant waste in the mix of concrete pours also introduced a desirable aesthetic component in the resulting blue hue of the concrete. This altered mix contained:

- 40% of the sand was replaced with fly ash and slag - 339,512 lbs
- 20% of the aggregate was replaced with recycled aggregate - 485,017 lbs
- 20% of the cement was replaced with recycled ground slag - 339,512 lbs

Adding together the weights of the various elements of the components of the concrete mix coming from recycled coal plant waste results in:

33,912 + 485,017 + 339,512 = 1,164,041 lbs

1,164,041 lbs = 582.0205 tons

Sources
McGregor Coxall nd. *Ballast Point Park*.

Limitations
There are few precise metrics surrounding the re-use of fly-ash into concrete in an Australian context in landscape architecture projects, however the percentages indicated give some indication of the magnitudes of savings in the concrete.

- **Saved 30,620 linear ft of virgin timber by using recycled Australian Jarrah hardwood for all timber used in the project.**

Method

The use of recycled Jarrah hardwood timber purchased from rubbish dumps saved a large volume of virgin timber. Furthermore, due to substantial variations of the recycled timber, ripping the timber successfully exposed the attractive grain, provided a more even surface quality, and ultimately saved 30,620 linear feet of wood.

Sources

Coxall, P. 2017. *Personal Communication.*

McGregor Coxall nd. *Ballast Point Park*.

Limitations

The quantity of recycled timber used was affected by numerous factors throughout the design and construction process: the availability of relatively consistent and obtainable recycled material shaped a number design and specification decisions. Reliable and consistent supplies of recycled timber could not necessarily have been relied upon, and if circumstances had been different, a different approach to design and specification could have resulted that still sought to meet the environmental objectives of the project.

SOCIAL BENEFITS

- **Provides waterfront access in a previously inaccessible area for local residents as well as non-local users, with 68% of 34 surveyed respondents reporting themselves as being from the area.**

Method

In January 2014, researchers from the Queensland University of Technology conducted random surveys of users during a two week period on weekdays, weekends and a public holiday, between 7:30am and 7pm. Thirty-four survey responses were collected to questions including “Do you live in the area?” (Ozgun et al., 2015).

68% (23 respondents) reported living in the area; 32% (11 respondents) reported that they did not live in the area.

After initial test observations, we decided to rely on this earlier survey data rather than conduct our own survey because the seasonal period of the survey (winter) meant that park usage was

reduced compared to other seasons. The 2014 survey was conducted in the middle of summer during a period when daylight savings time applies.

The earlier researchers conclude that the park is “inaccessible to a large number of regional users”. Although this may be true, in our view, one-third of users describing themselves as not living in the area is still a significant number of non-local users for a park located away from easily accessible public transport routes.

We also analysed 73 reviews posted on Google. Of the 73 reviews, 48 contained written comments beyond a mere star-rating. We coded the 48 written comments according to subject matter to determine repeated themes that emerged among users – responses were categorised according to whether they included implicit or explicit references to design/aesthetics; harbor front/view; amenities/activities; and heritage/history. Comments often contained statements addressed several of the coding categories; the percentage totals thus indicate the proportion of the total written comments that raised that particular coded theme.

Analysis of 48 written comments provided in Google Reviews of Ballast Point Park between 2010 and July 2017		
Coded response	**No. of responses (frequency)**	**Percent of total written comments**
Aesthetics/design	34	71%
Harbor front/view	32	67%
Amenities/activities	26	54%
Heritage/history	10	21%

TABLE 1 (Data derived from Google Reviews of Ballast Point Park)

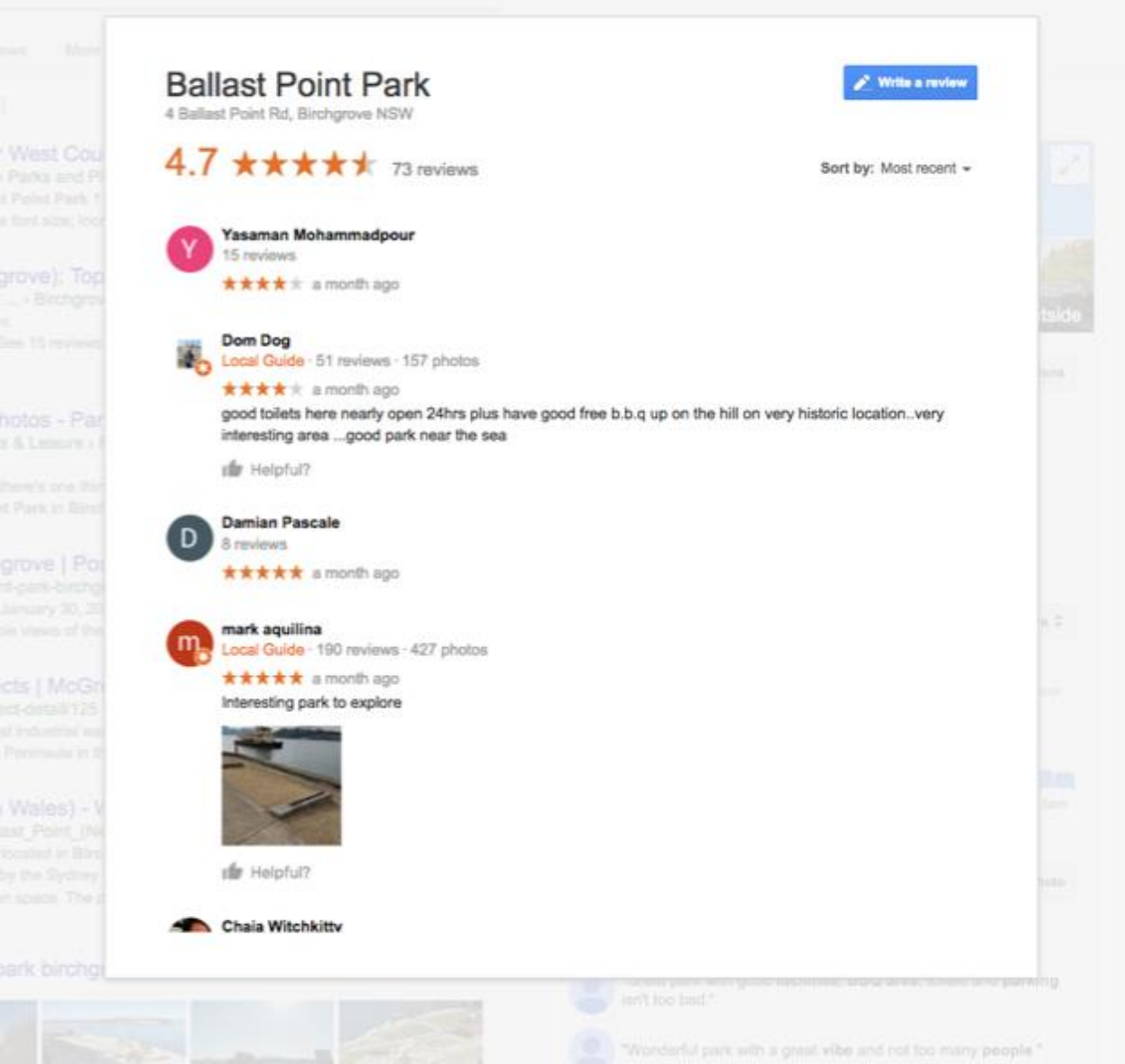

FIGURE 2: Screen capture of part of the 73 Google Reviews posted by users for Ballast Point Park.

Sources

google.com.au. Accessed July 8, 2017.

Ozgun, K., Flanders Cushing, D., & Buys, L. 2015. Renewable energy distribution in public spaces: Analyzing the case of Ballast Point Park in Sydney, using a triple bottom line approach. *Journal of Landscape Architecture*, 10(2), 18-31.

Limitations

The survey in Ozgun et al (2015) was conducted in early January in the middle of summer, and the timing and seasonal context may have affected the types of users in the park. Early January

is the height of the summer holiday season in Australia, and it is likely that the park attracts a higher number of regional visitors at this time.

The Google Review data is not a representative sample of park users but only reflects those with the inclination to write a review on Google. In addition, the categorisation of written comments within our four categories involved the exercise of judgment as to whether a statement implicitly or explicitly invoked subject matter falling into that category. Some comments like “Nice park!” could have been motivated by reasons that could have fallen within a number of the categories, but there was not sufficient evidence to make a judgment, so they were not counted, even though the commenter was likely to have been motivated by reasons falling into one of the categories.

ECONOMIC

- Contributed to an over 50% increase in residential property values within a 500-yard radius.

Method

Annual land valuations made by the New South Wales Valuer General were obtained for each of the 49 freehold residential properties on the two streets adjacent to Ballast Point Park (Ballast Point Road and Wharf Road) between 2002 and 2016. These were then compared to land valuations for a random sample of other properties within the surrounding district.

In general, the rate of increase in land values for all properties across all years was roughly within the range of 2%–15%. However, between 2005 and 2006, the year in which the plans to redevelop the former industrial site into a park were confirmed, the valuations for those properties within an immediately surrounding area (there were 30 affected properties) increased between 30%–100%. The average increase across these 30 properties was 63.3%.

FIGURE 3: The 30 residential properties in the immediate vicinity of Ballast Point Park which witnessed increases in land valuations of between 30%–100%.

Sources

NSW Government nd. *Valuer General*. Accessed 26/07/2017 from http://www.valuergeneral.nsw.gov.au/services/lvs.htm?execution=e2s1

Limitations

Although the dominant change in the suburb and its surroundings was the construction of Ballast Point Park, there will inevitably be other impacts, both micro- and macroeconomic that will have an effect on residential property values. Our sample largely concentrated on properties in close proximity Ballast Point Park to verify the impact of the park, but also selected a range of properties of varying distance from the park to draw comparison. It should also be noted that no comparisons were made with increases in land values in other locations outside the district or across Sydney as a whole.

References

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Hawken, S. 2009. Ballast Point Park in Sydney. *Topos*, *69*(6).

Hawken, Scott. 2009. ‘Ballast Point Park in Sydney’, *Topos*, 69 (2009): 46–51.

https://mcgregorcoxall.com/project-detail/125

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Macgowan, Tempe. 2010. ‘The Broken Rubble Route’, *Indesign*, 40 (March/May 2010): 124–128.

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