

Landmark.



NCC 

Excerpt from NCC Response to Request for Proposal



Lund University Building Operations - Division of Purchasing

Material Sourcing and Selection from:
Master Plan for Construction of Student Centre
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Table of Contents

1. Executive Summary	5
2. NCC Understanding of Requirements	6
2.1. In-Scope	6
2.2. Out of Scope	6
2.3. Assumptions.....	6
3. Proposed Approach for Materials	7
4. Case Studies.....	8
5. Final Word.....	9
6. Appendix – About the Foremen.....	10

1. Executive Summary

Lund University
Building Operations – Division of Purchasing
C/o Sustainergies Cup 2015

NCC proposes to construct a new student building for Lund University, per specifications outlined in the Request for Proposal (RFP) distributed. It will be a functional and aesthetically pleasing building that takes all environmental aspects into consideration. This project will be a **LANDMARK** for both NCC and Lund University, showcasing the commitment of both parties to reduction of the materiality of society.

The architectural plan presented in the RFP outlines the building's environmentally conscious design, which includes strong use of natural lighting, prevention of light pollution, use of passive heating, and installation of a green roof. NCC will continue this spirit by sourcing materials from disassembled buildings in the area. NCC will strive to reuse materials, and only recycle materials after all opportunities for direct reuse are exhausted.

NCC will prepare the site in such a way as to prevent contaminated or excessive runoff in the event of an accidental spill or weather event. The operations during the construction will go beyond minimum standards for health and safety requirements by engaging with union stakeholders to ensure that good site rules are put in place and maintained. Neighbours to the construction will also be considered and noise and dust barriers will be installed wherever possible. Barriers will expand existing infrastructure with natural screens and landscaping features, such as temporary shrubs. They will also be sourced from previous construction sites, and passed on for use in other local projects.

All reasonable efforts will be made to stay on budget without compromising the integrity of the building, or surrounding area. Communication between NCC and the University of Lund will be maintained and any issues arising will be brought immediately to the attention of the appropriate party.

NCC is excited to work with the University of Lund on a **LANDMARK** construction project. This student building will be a shining example of NCC's circular concepts for material usage, and the University's commitment to its students and sustainability.

2. NCC Understanding of Requirements

2.1. In-Scope

- Selection and sourcing of materials
- Preparation of site
- Construction of all components of the building
- Management of sub-contractors
- Clean-up of site prior to handing off to Lund University
- End of life considerations for the structure and materials

2.2. Out of Scope

- Architectural drawings
- Furnishing of building
- Selection of fixtures

2.3. Assumptions

- Lund University is not withholding any critical information from the request for proposal.

3. Proposed Approach for Materials

Construction waste accounts for 25-30% of all waste generated in the EU¹, and NCC is working actively to reduce this. The circular economy model requires companies to rethink waste. Disposal is a source of material for future projects², not a burden on current and past projects. This is exactly the mentality that NCC has incorporated into its construction projects and will use in this case.

The student building will be constructed from materials sourced from recently disassembled buildings that have come to the end of their useful lives. Several historic buildings, primarily on the university campus, have recently been reconstructed or retrofitted with materials left over. NCC does not consider these as waste, but an opportunity to prevent the purchase of new materials. Any hazardous materials (such as asbestos) are dealt with in an appropriate manner, and no materials which will be hazardous at their end of life are included in any new construction projects. All other materials are considered salvageable, and are harvested by NCC or through partnerships with other organizations.

Materials salvaged fall into two main categories: reusable, and recyclable. Materials that are reusable require minimal alteration before being assigned to their next building. Examples of these types of materials include stones used for roads or building features (such as corners and steps), bricks³, and undamaged windows. Materials which are recyclable include concrete and mortar, window frames, and detail pieces such as wainscoting. Concrete and mortar is ground or broken up and incorporated into new concrete or asphalt as a substitute for sand and gravel or laid down as covering for gravel walkways and bike storage spaces⁴. Window frames and other details may be ground and reprocessed into new versions of the same⁵ or composite materials such as plastic wood⁶ or fiber board⁷.

NCC sources materials from locally disassembled buildings to keep transportation costs and environmental impacts low. This has required strong cooperation between stakeholders, which NCC can facilitate due to its strong market presence. NCC considers end-of-life in the construction of buildings by reducing one-off solutions, and keeping elements such as window panel size, radiator length, and baseboard height as standard as possible. NCC also tries to maximize materials that may be reused, as opposed to those that may be recycled. According to the waste hierarchy, reuse of materials at end-of life is preferable to a recycling treatment as it requires less input into the material to create a useful product⁸. The waste hierarchy is an important component of the EU directive on waste management, and is also considered on a global scale.

Not only does the incorporation of circular economy thinking have significant environmental benefits, but value is added to materials as they have an extended useable lifetime. Instead of considering disposal of waste as a cost, the potential value of the materials is recognized so that it may be harvested by NCC and its contractors. Lund University benefits from this consideration as material costs (a significant aspect of construction costs) are reduced, municipal waste handling is reduced, and the environmental considerations of the **LANDMARK** construction project are enhanced.

¹ European Commission http://ec.europa.eu/environment/waste/construction_demolition.htm

² European Commission <http://ec.europa.eu/environment/circular-economy/>

³ <http://www.zerowasteeurope.eu/2014/01/rebrick-reuse-bricks-to-give-them-a-new-life/>

⁴ http://www.concretenetwork.com/concrete/demolition/recycling_concrete.htm

⁵ <http://www.thenationalwindowrecyclingcompany.co.uk/recycling-process>

⁶ <http://www.machinerydata.com/HowToMakePlasticWood.htm>

⁷ http://www.wpif.org.uk/LEED_Recycled_Content.asp

⁸ <http://ec.europa.eu/environment/waste/framework/>

4. Case Studies

NCC has a strong commitment to sustainability as evidenced by past projects.

- The Turning Torso is an internationally acclaimed project with high environmental standards⁹. It has become both a **LANDMARK** in the construction industry, environmental field, and local skyline.
- The Skyview is a popular attraction on the world's largest spherical building¹⁰. The project is another example of skyline definition by NCC.
- NCC not only constructs **LANDMARK** buildings, but also has smaller projects, such as the Svanen certified housing advertised in Lund, Sweden (see Figure 1).



Figure 1

Other organizations have demonstrated the potential of circular economy in the construction industry

- By focusing on materials and energy, FARO Architects have put together a cradle-to-cradle house, which fits into the definition of the circular economy. The materials and design are such that there is no waste or inefficiency in the building or lifecycle¹¹.
- The US EPA has several suggestions of material reuse opportunities. Fly ash may, instead of coming from coal as in the US, be sourced from waste incinerators at SYSAV or other local source¹².
- The Materials Opportunity section of the report from the Australian Government outlines several examples of actions undertaken in their context¹³.

⁹ <http://www.ncc.se/en/our-projects/turning-torso/>

¹⁰ <http://www.ncc.se/en/our-projects/skyview/>

¹¹ <http://www.ellenmacarthurfoundation.org/news/cradle-to-cradle-house-in-the-netherlands>

¹² <http://www.epa.gov/osw/conservation/imr/pdfs/recy-bldg.pdf>

¹³ <http://www.environment.gov.au/system/files/resources/b0ac5ce4-4253-4d2b-b001-0becf84b52b8/files/case-studies.pdf>

5. Final Word

Lund University has the opportunity to partner with NCC to construct a **LANDMARK** building for students. It will contribute to the Lund skyline and community, as well as the environment. This construction project will showcase the commitment of both parties to the environment, in particular the reduction of construction waste. NCC has chosen to focus on this area, because it is a significant issue in the industry, and one that NCC is developing expertise in. This will contribute to the portfolio of NCC, but also to reducing the environmental impact of Lund University. As with all aspects of the circular economy, stakeholder engagement is critical. NCC will engage with its wide range of contacts to acquire the necessary materials through engagement and salvage operations.

NCC is already a leader in environmental considerations during the development, design and construction process. **LANDMARK** projects alter city skylines and attract attention, communication is required to market and ensure that the environmental aspects are highlighted. To further the dialogue in sustainable development and circular economy, NCC recognizes the need to showcase our **LANDMARK** projects. Lund University will benefit through this partnership as the project showcase will also exhibit their environmental commitments. It will provide concrete actions and examples of Lund University's commitment, and become a marketable aspect of campus life. Benefits will be maximized as the circular economy grows, and partnership opportunities open up through current and prospective students, as well as returning alumnus, and other companies join the growing consensus on rethinking waste.

6. Appendix – About the Foremen

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Anna holds a B.Engg in Environmental Engineering from the University of Guelph, Canada. She is currently a Master's student in Environmental Management and Policy at IIIIEE, Lund University (expected graduation September 2015). She has experience working with governments in enforcement and research, and small and medium sized enterprises in consulting and administrative capacities. She speaks French and would love to learn more about different cultures while exploring the world. She is enthusiastic about combining her background with new knowledge from her Master's studies, and applying it to deal with contemporary environmental challenges. Further professional details: [se.linkedin.com/in/annabarford](https://www.linkedin.com/in/annabarford)

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Steven graduated from the Pennsylvania State University with a B.S. in Environmental Meteorology with emphasis on Watershed and Water Resource Management. Along with Anna, he began his Master's studies at the International Institute for Industrial Environmental Economics (IIIEE) in 2013 and looks to graduate with an MSc in Environmental Management and Policy in September 2015. He has worked with local government in permitting and monitoring environmental impacts of construction projects in American Samoa. Recently, he has turned his studies towards sustainable development, particularly in the energy and water sector. He is looking forward to contributing to the environmental field upon graduation. Further professional details: [se.linkedin.com/in/stevenkanecurtis/](https://www.linkedin.com/in/stevenkanecurtis/)