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Shoreditch
Overground
Deconstruction
/ Reconstruction
Method Statement
CONTENT:

1.0 DECONSTRUCTION AND RECONSTRUCTION

1.1 WHY ARE BUILDINGS ‘DECONSTRUCTED’?
1.2 HOW ARE BUILDINGS ‘DECONSTRUCTED’?
1.3 WHY ARE BUILDINGS ‘RECONSTRUCTED’?
1.4 HOW ARE BUILDINGS ‘RECONSTRUCTED’?

2.0 REFERENCES

2.1 DECONSTRUCTION FOR RECONSTRUCTION - WARE HALL HOUSE, NORFOLK, ENGLAND 1992
2.2 DECONSTRUCTION FOR RECONSTRUCTION - TEMPLE OF DEBOD, MADRID, SPAIN 1971
2.3 DECONSTRUCTION FOR RECONSTRUCTION - LONDON BRIDGE, LAKE HAVASU CITY, ARIZONA, USA 1967
2.4 DECONSTRUCTION FOR RECONSTRUCTION - OBELISK OF LUXOR, PLACE DE LA CONCORDE, PARIS, FRANCE 1836
2.5 DECONSTRUCTION FOR RECONSTRUCTION WITHIN RELOCATION - ALDEIA DA LUZ, PORTUGAL 2002
2.6 DECONSTRUCTION FOR REUSE - THE WALL, TOKYO, JAPAN 1990
2.7 RELOCATION (VERTICAL) WITHOUT RECONSTRUCTION - LAS ARENAS, BARCELONA, SPAIN 2011
2.8 RELOCATION (VERTICAL) WITHOUT RECONSTRUCTION - HOUSE IN GURGAON, INDIA 2008
2.9 RELOCATION (HORIZONTAL) WITHOUT RECONSTRUCTION - WELLINGTON’S MUSEUM HOTEL, NEW ZEALAND 1993
2.10 RELOCATION (HORIZONTAL) WITHOUT RECONSTRUCTION - MOSCOW, RUSSIA PRE-WAR 1930’s
2.11 RECONSTRUCTION WITH REINTERPRETATION - NATURAL HISTORY MUSEUM, BERLIN 2010

3.0 THE DECONSTRUCTION AND RECONSTRUCTION OF SHOREDITCH STATION

3.1 PREPARATION
3.2 PROCEDURE – DECONSTRUCTION
3.3 PROCEDURE – RECONSTRUCTION
3.4 STRATEGIC ACTION TO PROMOTE DECONSTRUCTION

4.0 CONCLUSION
1.0 DECONSTRUCTION AND RECONSTRUCTION

1.1 WHY ARE BUILDINGS ‘DECONSTRUCTED’?
This procedure consists of selective surgical deconstruction of building components, also referred to as “construction in reverse”, and it is mostly known for being inherently connected to environmental sustainability and extending the building’s life. There is great ecological benefit in this, the aim being to minimize waste by dismantling elements for reuse. Deconstruction significantly improves waste management, the main reasons for the process being:

- Reuse of materials
- Recycling of materials
- Conservation of materials

Essentially this approach is an alternative to demolition and sensibly cares about the heritage and identity of the buildings, as well as rescuing the materials. Instead of choosing to demolish a building, which clearly is the most convenient process, this recycling procedure is increasing in popularity as its techniques are evolving and people are becoming more conscious of sustainability and the reuse of buildings.

Deconstruction is also a way of highlighting the uniqueness of each building; it incorporates local knowledge and history. The process is not only about the environmental sustainability and the technical challenge of dismantling an existing building, but also involving a deep analysis of the local environment such as materials, climate, resources and public opinion.

1.2 HOW ARE BUILDINGS ‘DECONSTRUCTED’?
Deconstruction is generally differentiated between structural or non-structural application. Non-structural is also known as ‘soft-stripping’, and involves the reclaiming of non-structural components, materials and details. This is a common procedure and considered to be a mature market in many locales. Structural deconstruction is an expensive method of retrieving usually rare materials that structurally support a building. It is most common for brick or stone due to their durability and colour change over time, however timber recovery is becoming more commonplace.

The deconstruction methodology is a complex and rigorous process. The technical aspect is not the only important part of the procedure. It also demands an interaction between client, design team and contractor preferably from the beginning of the project. Steps include the following:

- Surveying the existing materials and elements and identifying them for reuse or waste
- Categorizing structural elements from non-structural, for scheduling the deconstruction process
- Calculating the retention of materials, accounting for resulting waste, and planning for the transportation and storage of these materials
- Accounting for specialist labour and equipment, timetables and costs

1.3 WHY ARE BUILDINGS ‘RECONSTRUCTED’?
Reconstruction is a broad term that describes the construction of a building in reference to itself or another building from the past, sometimes using the same materials or details. The Burra Charter refers to reconstruction as returning a damaged building to a known earlier state by the introduction of new materials, however the process can utilize the building’s former materials, and can be in the same or an alternative location. Reasons for doing this include:

- Restoration or preservation of heritage
- Change of function or programme
- Relocation of a building for change of use of a site
- Cultural exchange, statement of history, spoils of war

1.4 HOW ARE BUILDINGS ‘RECONSTRUCTED’?
Reconstruction utilizes similar steps to deconstruction, but relating directly to the new building. The following steps may be appropriate to different projects:

- Surveying and identifying any existing materials available for reuse, or alternatively, carefully selecting a similar or contrasting material suitable for the project
- Gathering of relevant information and drawings of former buildings for new construction
- Categorizing existing structural elements from non-structural if appropriate for relocation
- Accounting for specialist labour and equipment, timetables and costs

From a conservation point of view, the Burra and Venice Charter should consult and inform the reconstruction process. These documents argue that new construction should be distinguishable from the original, and should only be carried out if sufficient information of the former state of the building is available.
2.0 REFERENCES

2.1 DECONSTRUCTION FOR RECONSTRUCTION - WARE HALL HOUSE, NORFOLK, ENGLAND 1992
In 1969, in an effort to conserve a 15th century house from demolition, the Ware Hall House in Hertfordshire was dismantled, transported to Norfolk and reconstructed using the same materials and design. As the timber beams, bricks and roof tiles were salvaged they were coded as to ease the rebuilding process in as similar a way to the original as possible.

2.2 DECONSTRUCTION FOR RECONSTRUCTION - TEMPLE OF DEBOD, MADRID, SPAIN 1971
The Templo de Debod or Temple of Debod was built in the 4th century in Nile Valley of Egypt, 31km away from Aswan. When the new Aswan Dam threatened the temple, the Egyptian government decided to give it to Spain in gratitude for its help in saving Abu Simbel. The temple was carefully dismantled in 1969-70, then put on a ship to Valencia followed by a train to Madrid. There it was reconstructed and opened to the public in 1971.

2.3 DECONSTRUCTION FOR RECONSTRUCTION - LONDON BRIDGE, LAKE HAVASU CITY, ARIZONA, USA 1967
London Bridge is a bridge in Lake Havasu City, Arizona, United States, that is the reconstruction of the 1831 London Bridge that spanned the River Thames in London, England until it was dismantled in 1967. The Arizona Bridge is a reinforced concrete structure clad in the original masonry of the 1830s bridge, that was bought by Robert P. McCulloch from the City of London.

2.4 DECONSTRUCTION FOR RECONSTRUCTION - OBELISK OF LUXOR, PLACE DE LA CONCORDE, PARIS, FRANCE 1836
The center of the Place de la Concorde in Paris is occupied by a giant Egyptian obelisk. This 3300 year-old structure, together with a twin obelisk which remains in Egypt, once marked the entrance for the Luxor Temple. It was given to the French in 1829, arriving in Paris in 1833 and placed in the center of the Place de la Concorde in 1836.
2.5 DECONSTRUCTION FOR RECONSTRUCTION WITHIN RELOCATION - ALDEIA DA LUZ, PORTUGAL 2002

In 2002 the town of Aldeia da Luz was moved to allow the land to be used as a flood plain for the completion of a nearby dam. The town was rebuilt based on its original layout. Due to their significance, the church and cemetery were deconstructed and reconstructed, proving a major conservation feat.

2.6 DECONSTRUCTION FOR REUSE - THE WALL, TOKYO, JAPAN 1990

This project is an example of material recycling, not reconstruction. In order to create a new building that "looked as though it had been there forever", Nigel Coates Architects implemented a portion of a Roman wall into the facade of a new mixed use development in Tokyo. The stitching and blocking out of the stairs and windows give the design the impression of being endlessly adapted and reused.

2.7 RELOCATION (VERTICAL) WITHOUT RECONSTRUCTION - LAS ARENAS, BARCELONA, SPAIN 2011

A renovation of Las Arenas in Barcelona, Spain was completed by Richard Rogers Architects in 2011. The building was listed, but with the last bullfight in 1977, it hosted many functions, ultimately becoming a carpark. The project involved the excavation of the base of the facade and the insertion of composite arches to support the existing wall and create new spaces for shops and restaurants, re-establishing a new, open public realm around the base of the building. With the removal of the internal arena, the external wall was braced with a steel frame from within the building to stabilize it during repositioning.
The building envelope was braced from the inside and outside during elevation.

The building during and after relocation.

2.8 RELOCATION (VERTICAL) WITHOUT RECONSTRUCTION - HOUSE IN GURGAON, INDIA 2008

In 2008, a two storey brick house in Gurgaon, India was raised 3.4m and a new floor was inserted. The earth around the walls of the house was dug away up to 700mm with a 700mm wide channel created around the house. The floor of the house was chipped off from the side and 275 screw jacks inserted, to increase the height of the house. The walls were elevated at a rate of approximately 100mm per day, ensuring that all the jacks were raised evenly as not to compromise the structural integrity of the building. A new brick foundation was created and the jacks removed gradually. This process could be replicated for the Station proposal using hydraulic jacks in order to achieve the required height.

Screw jacks raising the house for the insertion of a new floor beneath.

2.9 RELOCATION (HORIZONTAL) WITHOUT RECONSTRUCTION - WELLINGTON’S MUSEUM HOTEL, NEW ZEALAND 1993

Wellington’s Museum Hotel was moved across the road to make way for Te Papa museum. This 5 storey building with 35000-tone structure was the largest building ever relocated in New Zealand and one of a few in the world. The chosen method for this building is known as "railway carriage". It moved 120metres at a speed of 5-10metres per hour.

‘Midway through the hotel’s move, a 90 degree change of course was required. For this to be accomplished each of the 96 bogie sets had to be rotated individually… After the first set of rails was cut away, the bogies were lowered and rotated onto the new rail set. Steel packers were used to fill the resulting gap between the steel frame and bogie.’ (Museum Hotel’s website - A historic move). This process took four months to separate the building from its foundations and two days just to move it along the rail.

The moving of the hotel and its path.
2.10 RELOCATION (HORIZONTAL) WITHOUT RECONSTRUCTION - MOSCOW, RUSSIA PRE-WAR 1930’s
In order to make streets wider and for redevelopment in pre-war Moscow, about 100 houses and buildings were moved. They were shifted together with lodgers, and during the moving process plumbing, sewage etc. were still operating. This was the first time that hydraulic jacks were used for moving a building from its place.

2.11 RECONSTRUCTION WITH REINTERPRETATION - NATURAL HISTORY MUSEUM, BERLIN 2010
After being nearly destroyed by bombing during WWII, the architects took a unique approach to its reconstruction and preservation. Using silicon molds taken from the surviving exterior shell, a replication of the existing facade was cast in concrete, down to the detailed level of each individual brick. Due to the light-sensitive nature of the exhibits within, some existing windows were bricked up, and the new concrete cast windows were given the original mullion details. The result is an interesting patchwork highlighting the building’s history; a dialog between it’s original form, destruction, and reconstruction.
3.0 THE DECONSTRUCTION AND RECONSTRUCTION OF SHOREDITCH STATION

3.1 PREPARATION
Like all the references above, the Shoreditch Station was not designed to be deconstructed. Dismantlement and reconstruction is one feasible technique to accommodate the relocation of the Station. Keeping the old Shoreditch Station in its original location while elevating the building on top of the new development will not only minimize the costs of transportation, but will maintain its memory giving a sense of place.

The method is quite a multifaceted and complex process. According to ‘SEDA Design Guidelines for Scotland’, such preparation should be the starting point for the deconstruction:

1. Statement of strategy for the deconstruction of the building
   - Develop a clear strategy behind the recovery and reuse of materials, and describe best practice to ensure they are handled in a way that preserves maximum reusability.
2. List building elements
   - Provide an inventory of all materials and components reused in the project together with full specifications.
   - Analyse and describe the quality and service life of materials to be retained.
   - Identify best options for reuse, reclamation, recycling and waste to energy for all recovered elements.
3. Provide instructions on how to deconstruct elements
   - Providing up-to-date location plans and elevations for identifying information on how to deconstruct buildings.
   - Where necessary, add additional information to the “as built” set of drawings to demonstrate the optimum technique for removal of specific elements.
   - Describe the equipment required to dismantle the building, the sequential processes involved and the implications for health and safety requirements.
   - Ensure that the plan advises the deconstruction contractor on the best means of categorizing, recording and storing dismantled elements.
4. Distribution of Deconstruction Plan
   - Revise the plan as necessary and re-issue to all parties at the handover stage, so that there is maximum awareness of the deconstruction requirements for the future, including building owner, architects and builder.
   - Place copies of the revised Deconstruction Plan with the legal deeds of the building, the Health and Safety file and the maintenance file.

3.2 PROCEDURE - DECONSTRUCTION
• Collate an accurately measured drawing and photographic survey of the exterior, including every brick detail, and catalogue each brick for reuse.
• Calculate the brick quantity resulting from deconstruction and the requirements for reconstruction.
• Estimate an allowance for waste during dismantlement (20-50%).
• Dismantle the solid brick walls. Yellow gauged London stock brick is traditionally laid with lime motor, which will assist in the deconstruction process as this binding material is weaker than the brick.
• Store the brick in a secure, dry place during the rest of construction. Dispose of remaining waste material.

3.3 PROCEDURE – RECONSTRUCTION
• If additional brick quantities are required for reconstruction, matching reconstituted London stock will be sourced. Expectation for this project is for dismantlement to result in excess material, which can be sold.
• Reconstruction commences in the traditional brick construction method. Recovered bricks are utilized as an outer leaf cladding.
• Flush pointing is carried out (as per usual with London stock brick) to avoid water leakage, and more modern Portland cement replaces the lime motor to increase strength.

3.4 STRATEGIC ACTION TO PROMOTE DECONSTRUCTION
Supporting these procedures, the ‘SEDA Design Guidelines for Scotland’ also present a strategic action to promote deconstruction for reconstruction in accordance with RIBA plan of work stages, which explains how the roles of the client, design team and contractor interact to develop the deconstruction process.

TABLE 1

<table>
<thead>
<tr>
<th>RIBA Plan of work stages</th>
<th>Client</th>
<th>Design team</th>
<th>Contractor</th>
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</thead>
<tbody>
<tr>
<td>A to B Planning and feasibility</td>
<td>appoint design team members who are informed of deconstruction techniques - ensure appropriate clauses inserted into appointment documentation - appoint contractor as early as possible to identify material recovery opportunities, ideally through partnering agreements</td>
<td>brief client on the deconstruction and reconstruction strategy - demonstrate best practice of deconstruction to client - ascertain the degree to which deconstruction can be applied in the project and develop initial dismantlement strategic plan - assess which building elements are most cost effective to dismantle</td>
<td>provide audit demonstrating waste minimisation strategies - obtain initial briefing and training on deconstruction</td>
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<tr>
<td>C to E Proposals</td>
<td>brief design team to ensure that deconstruction proposals fit in with requirements for reconstruction and reuse of these materials</td>
<td>organise pre-site meetings with contractor (where possible) to identify reusable materials for the reconstruction process</td>
<td>attend pre-site meetings with design team and client (where possible) - advise design team on deconstruction processes and potential salvage</td>
</tr>
<tr>
<td>F Detail Design and Production drawings</td>
<td>check with design team that blueprints enable upgrading, adaptability and flexibility in use</td>
<td>are to cover as many of the deconstruction principles as possible - carry out a design check by producing a detailed plan for the reconstruction of the building and ensuring that the design proposals match this</td>
<td>advise design team on implications for deconstruction in relation to design and detailing (where possible)</td>
</tr>
<tr>
<td>G to L Contract</td>
<td>allow for additional time in contract period to promote recovery of materials through careful deconstruction practices - insist in integrated drawings and specifications “as built” as per CDM requirements</td>
<td>make sure that contractors invited to tender are made fully aware of the commitment to reconstruction through the detailed deconstruction plan and briefed accordingly to allow for this in the tender - make salvage requirements explicit in tender documents</td>
<td>identify good deconstruction practice to promote material recovery and advise design team accordingly - train sub-contractors as necessary</td>
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<tr>
<td>M Maintenance</td>
<td>ensure that ALL maintenance staff and future contractors are fully briefed on deconstruction strategy - instigate feedback strategy on building performance</td>
<td>monitor performance of project over time (where possible) and build in the evaluation into future deconstruction for reconstruction</td>
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</table>
4.0 CONCLUSION
The relocation of the former Shoreditch Station can be practically carried out by following the steps outlined above. As for the process of dismantling and rebuilding the components of the building, the existing graffiti may help relocating the brick is feasible, as this can act as a mapping tool alongside careful survey work. The aim of moving the building to the top of the new development is to replicate the appearance of the old station and reinstate the social significance of the building. Therefore, if the graffiti can be used as an instrument to simplify the division of the various components of the Station, it will not be retained on the walls; after the reconstruction the graffiti can be removed.