

***PRE-ENGINEERING FOR
DECONSTRUCTION OF BF 4 COOLING
TOWER***

Deconstruction Method Statement

**Asset Integrity-Pre-Engineering Department
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1. Background information

During standard inspections carried by the Tata Asset Integrity team, severe corrosion was identified in many structural members of the BF 4 cooling tower located at east side of blast furnace 4 raising concerns around safety of the Plant. This cooling tower is defunct and is in distressed condition. TSUK is planning to deconstruct the defunct BF-4 cooling tower considering all safety practices and ensuring all stability of the existing nearby facilities.

De-construction of piping and utilities comprising cooling fans and cooling water pumps, hot & cold-water piping need to be carried out. De-construction of fan motors, cable & cable trays, JB, local panels, which are presently supported from the Cooling tower need to be carried out. RCC cooling water basin will not be de-constructed. After disassembling of cooling tower super structure, handrailing and stairways will be constructed for the RCC cooling water basin.

The BF4 cooling tower is a structure of size 36'x48'in plan and 51' in height approximately. Hence, de-construction of BF4 Cooling Tower, requires a systematic planning.

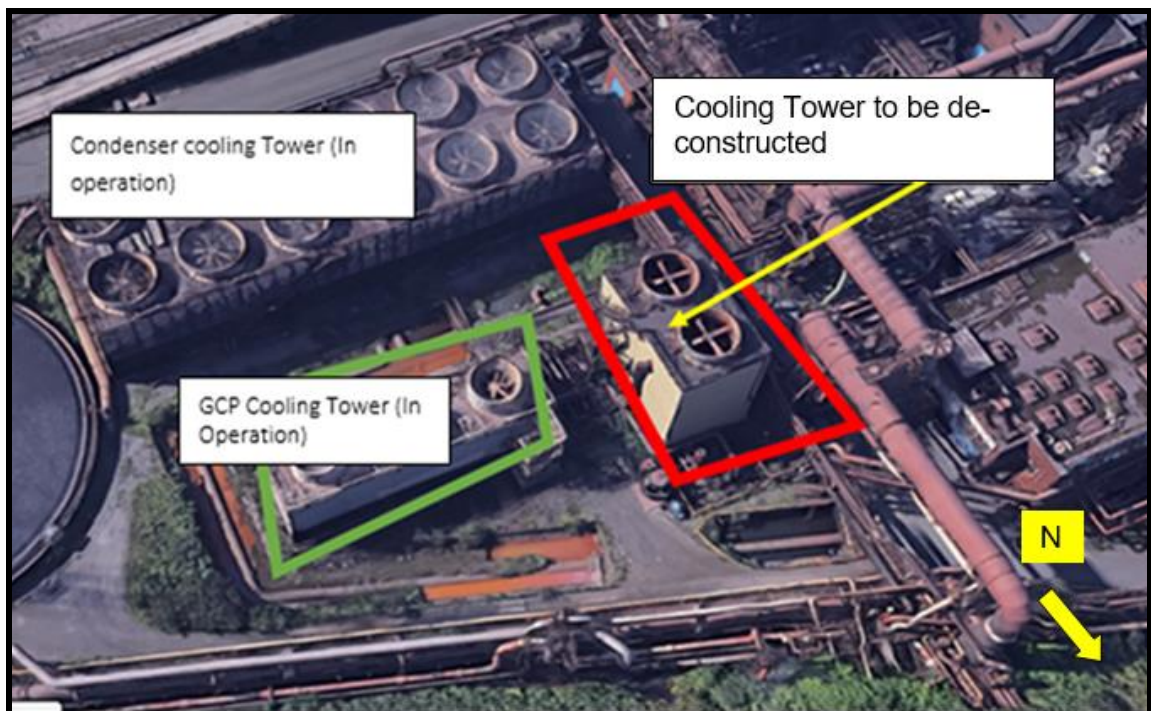


Figure -1 : Exhibits Cooling Tower Location

2. Deconstruction Method Statement

All deconstruction of the BF-4 cooling tower will be under the CDM regulations.

2.1 CDM Site

Preparation of CDM site including facilities, connection with Tata services, electricity, ground cleaning, barriers, etc. assessing if the structural members and existing services contain asbestos, risk assess it and plan secure deconstruction and correct disposal to be done.

2.2 Deconstruction of the wooden structural members /utilities comprising cooling fans and cooling water pumps, hot & cold-water piping, fan motors, cable & cable trays

- i. Asbestos refurbishment survey has been conducted (No. J000065 dated 24.10.2021 and 24.1.2021) by Monolithic Environmental Services Ltd. As per existing asbestos survey report, presence of asbestos was found at certain locations as mentioned in table below. Asbestos needs to be removed prior to deconstruction.

Asbestos Product Type	Location Area(s)		Survey Comments	Licensed Contractor Required
Asbestos Textiles/Paper	External – E.001	From pipework valve, East Side external, Ground level, BF4 redundant cooling Tower, Margam B.	Gasket	No
Asbestos Textiles/Paper	External – E.001	From pipework valve, East Side external, Ground level, BF4 redundant cooling Tower, Margam B.	Gasket	No
Asbestos Textiles/Paper	External – E.001	From pipework flange, East Side external, Ground level, BF4 redundant cooling Tower, Margam B.	Gasket	No
Asbestos Textiles/Paper	External – E.001	From pipework flange, North Side external, Ground level, BF4 redundant cooling Tower, Margam B.	Gasket	No
Asbestos Textiles/Paper	External – E.001	From pipework, North Side external, Ground level, BF4 redundant cooling Tower, Margam B.	Gasket	No

- ii. DN300 pipe to be disconnected from filtration pumps, provide blank flange, and new structural support for retained part to be installed.
- iii. DN750 return pipe from Blast Furnace-4 will be retained as per original arrangement, only the bleed line DN 50 will be dismantled, and blank flange will be provided at cut-off point.

- iv. All Electrical items needs to be disconnected/isolated (ref: Area Electrical Engineer) except main pumps which will have still visible physical electrical connections. Before commencement of work, the Area Electrical Engineer is to be consulted on remaining disconnections and is to be involved on a regular basis/ query during the Works.
- v. Access to the structure shall be done by erection of scaffolding, MEWP or mobile crane with man basket/ Telehandler.
- By Scaffolding: design to be completed by specialist contractor, access of the ground level to check if the leg loading can be safely transferred to the ground. Temporary works documentation should ensure all checks are done. Site clearance required. In case support is taken from any existing structure, adequacy of the existing structure to be pre-assessed by the contractor/ TSUK consent to be taken.
 - By MEWP: Temporary works documentation should check if the ground can take the loading as per GBPT results. Site clearance required.
 - By Crane: Access of the area to check if any obstructions are in place. Crane lifting plan should be designed by specialist contractor to ensure that the selected crane can support and lift safely the deconstructed members. Temporary works documentation should ensure all checks on the ground are done. Site clearance required.
- vi. Deconstruction of Main Tower: Riser Pipes, staircase & cladding will be dismantled one by one.
- vii. Site Inspection prior to dismantling / Installation of supports:
Assessment of the strength of the cooling tower frame will be done from a MEWP. All safety aspects and stability of the structures [if required, with installation of additional stability members] during all phases of the de-construction will be the responsibility of the Contractor.
- viii. Filtration pumps and pipework to still be present in the sump area until cooling tower is dismantled. Scaffold platform to be installed around the pipework and pumps on North side of tower. The scaffold is to include a platform walkway from ground level with a self-supporting tower and HAKI stairs for ease of access to the cooling tower roof deck for inspection.
- ix. Roof deck to be inspected & proper rehabilitation work shall be carried if the deck is not found safe to move around on the deck. The fire preventative covering will be removed. The waste material will be placed in the hanging pack cage situated close to the tower via telehandler.
- x. Dismantling of Cooling Tower Fans and Motors shall be carried out by the two (2) nos of workers attached to separate fall arrest blocks on the crane hook. The fan and gearbox will then be attached to the crane and lifted from the roof and lowered to the ground, Similarly, this is done for the motor and other steelwork. Safety concern in the entire process and compliance of statutory norms shall be responsibility of contractor.

- xi. Removal of Deck Boards and Distribution Level shall be carried out using MEWP.
- xii. The remaining structure is deconstructed level by level (Working transversely and longitudinally and with the same method as the roof deck and distribution level, cutting manageable sections and placing them into the pack cage and loading into the correct skips.
- xiii. Removal of Scaffolding from the sump leaving the HAKI stair as required.
- xiv. Low Lift Cooling Pumps and associated piping will be dismantled by using crane/scaffold as suitable for this and following activities.
- xv. Filtration Pumps and associated piping shall be carried out.
- xvi. The DN 300 Return pipe will be dismantled approx. 1 m away from its existing nearest support on the trestle.
- xvii. From common DN 600 Dock water header, a branch line of DN 200 make-up line is connected at the east side of cooling tower basin which will be completely dismantled from pipe bridge up to the cooling tower basin.
- xviii. New handrail around the sump & stair for accessing the sump base shall be erected.
- xix. Permanent Lock off gates & signage to be employed around the site for the safety of personnel.
- xx. New RC walls between Cooling Tower basin and Sump Pits will be constructed.
- xxi. New & retained structural elements need to be duly painted.
- xxii. Any deconstructed portion of BF 4 cooling tower should be rightly disposed as follows.
 - I. Arrangement to be done for correct disposal/management of copper chrome arsenic timbers (CCA), GRP cladding and recycling of steelwork.
 - II. The contractor will have to liaise with Paul Johnson - Site Service Engineer Regen & Waste regarding the planning and logistics of recycling and removing waste from site.
 - III. All transport and skips to be managed by contractor for the removal of waste from site efficiently
 - IV. Contractor shall consider Copper Chrome Arsenic (CCA) Timbers to be disposed of by correct methods e.g., transported to disposal contractor Trackwork, Doncaster.
 - V. The contractor shall use fire safety systems such as a water bowser and hoses.
 - VI. Contractor is to include provision for the removal of temporary works site cleaning & handover after completion of the job.

3. Planning

The work is normally to be carried out during weekdays 12hrs (7:00 to 19:00) per day. The contractor shall plan work to be carried out during the summer months between June, July & August due to weather conditions.

4. Environment

The deconstruction should be risk assessed before any works starts. An asbestos survey has been carried out to check requirement of asbestos control during the execution. Appropriate control of asbestos should be done. Lack of information regarding probable instability of wooden framework of locally collapsed cooling tower structure and maintaining safety of nearby live facilities during deconstruction work is the main risk envisaged.

The internal wooden frames have been depicted in 3D model where condition of the damaged wooden members has been highlighted as per photographs/ internal drone survey. The portion above the distribution level was not accessible by the internal drone survey. Hence it has been indicated as "Not Inspected" members. Although the damaged members have been highlighted, during deconstruction, all members shall be inspected for adequacy of remaining strength and unidentified damages, if any before start of deconstruction and ensure all measures including creation of temporary supporting arrangements (with appropriate connections to existing framework) to ensure safety during de-construction.

Noise can be controlled during the deconstruction, assessing the noise level (dBs) to ensure the work is within the accepted levels. All the work should take into consideration safe diversion of any pedestrians and vehicles routes. Any deconstructed portion of BF 4 cooling tower should be rightly disposed.