TSGENCO BHADRADRI NATURAL DRAFT COOLING TOWER ENQUIRY

TECHNICAL AMENDMENT -3

TECHNICAL SPECIFICATION NO.: PE-TS-411-165-N001 (REV.0)

1) Clause # 4.10 – Section D1 (Datasheet A): The depth of CW Channel (w.r.t to FGL) shall be (-)3.35m instead of (-)4.1m stated earlier.

2) Clause # 4.12 – Section D1 (Datasheet A): The maximum allowable effective velocity through Cold water channel at Min. water level shall be 1.0 m/sec instead of 0.6 m/sec stated earlier.

3) Clause # 6.0 – Section D1 (Datasheet A): Hot water supply header details: The CW return piping size shall be 2400 NB instead of 2500NB stated earlier.

4) Section D1 (Datasheet A): Annexure-1: Sketch for Cold water channel TP: Revised Annexure-1 is enclosed.

5) Section D1 (Datasheet A): Annexure-2: Sketch for Key Plan with TP details: Revised Annexure-2 is enclosed.

6) Section C3 (Civil):The Amendment for Civil Section is enclosed in subsequent pages of this amendment.

TSGENCO MAUGURU NATURAL DRAFT COOLING TOWER ENQUIRY
TECHNICAL AMENDMENT

TECHNICAL SPECIFICATION NO.: PE-TS-411-165-N001(REV.0)

Section C3 (CIVIL)

1) Clause # 3.01.02 (Sub para) Wind load –

"The above circumferential wind pressure coefficient (p1) shall be increased by multiplying it by 1.43 to account for turbulence in the incident wind and load intensification due to turbulence induced by the adjacent cooling tower or the other structures of significant dimensions. Therefore, the actual design circumferential net wind pressure coefficient (p) shall be computed as p=1.43(p1), where (p1) is the wind pressure coefficient as per IS: 11504-1985. Enhancement factor 1.43 is considered to take the interference effect of adjacent structures of significant dimensions into account. 10% increment shall be considered (i.e: 1.43 x 1.1) for the imperfection in construction as per IS :11504. However, the foundations, pedestals and raker columns shall be designed for wind pressure coefficient specified as per IS 11504-1985 to a multiplying factor as 1.1x1.1 (in absence of model test result)."

Stands Amended as

"The above circumferential wind pressure coefficient (p1) shall be increased by multiplying it by 1.43 to account for turbulence in the incident wind and load intensification due to turbulence induced by the adjacent cooling tower or the other structures of significant dimensions. Therefore, the actual design circumferential net wind pressure coefficient (p) shall be computed as p=1.43(p1), where (p1) is the wind pressure coefficient as per IS: 11504-1985. Enhancement factor 1.43 is considered to take the interference effect of adjacent structures of significant dimensions into account. 10% increment shall be considered for the imperfection in construction as per IS :11504. This factor (1.43 X 1.1) shall be increased further by 10% during foundation, raker column, pedestals design in absence of model test results. If the model is for C/L of shell, wind load shall be appropriately augmented to cater to the increase in diameter of the shell (O.D)."

2) Clause # 3.01.03 Earthquake Forces –

"The seismic analysis shall be carried out in accordance with IS:1893 (all latest parts) by modal analysis for the hyperbolic cooling towers or any other method as approved by the Owner. The earthquake analysis of the shell and its support columns including the foundations shall be carried out by response spectrum method. For the fill supporting structures (RCC frames) response spectrum method is permitted. The modulus of elasticity for concrete shall be obtained from IS: 456-2000. All the analysis shall be carried out as per the theory of elasticity.

Entire analysis and designs adopted shall be fully supported with authenticated literatures/documents along with relevant reference where the same has been successfully implemented."

Stands Amended as

"The structure shall be designed for seismic zone-III. The seismic analysis shall be carried out in accordance with IS: 1893 (all latest parts) by modal analysis for the hyperbolic cooling towers or any other method as approved by the Owner. The earthquake analysis of the shell and its support columns including the foundations shall be carried out by response spectrum method. For the fill supporting structures (RCC frames) response spectrum method is

permitted. The modulus of elasticity for concrete shall be obtained from IS: 456-2000. All the analysis shall be carried out as per the theory of elasticity.
Entire analysis and designs adopted shall be fully supported with authenticated literatures/documents along with relevant reference where the same has been successfully implemented."`

3) Clause # 3.02.03 D.Minimum Thickness of shell

"The thickness of the shell shall be minimum 220 mm or more as per design."

Stands amended as

"The thickness of the shell shall be as per design criteria and as per site conditions. At any case it shall not be less than 220mm."

4) Clause # 3.05.00 Requirements for Concrete and Reinforcement –

The minimum grade of concrete of structural components of cooling towers shall be as follows in accordance with IS: 456.

e) Piles (with OPC/PPC/PFC) : M-25 grade
f) Tower foundation: M-25 grade

Stands amended as

The minimum grade of concrete of structural components of cooling towers shall be as follows in accordance with IS: 456.

e) Piles (with OPC/PPC/PFC) : M-30 grade
f) Tower foundation : M-30 grade

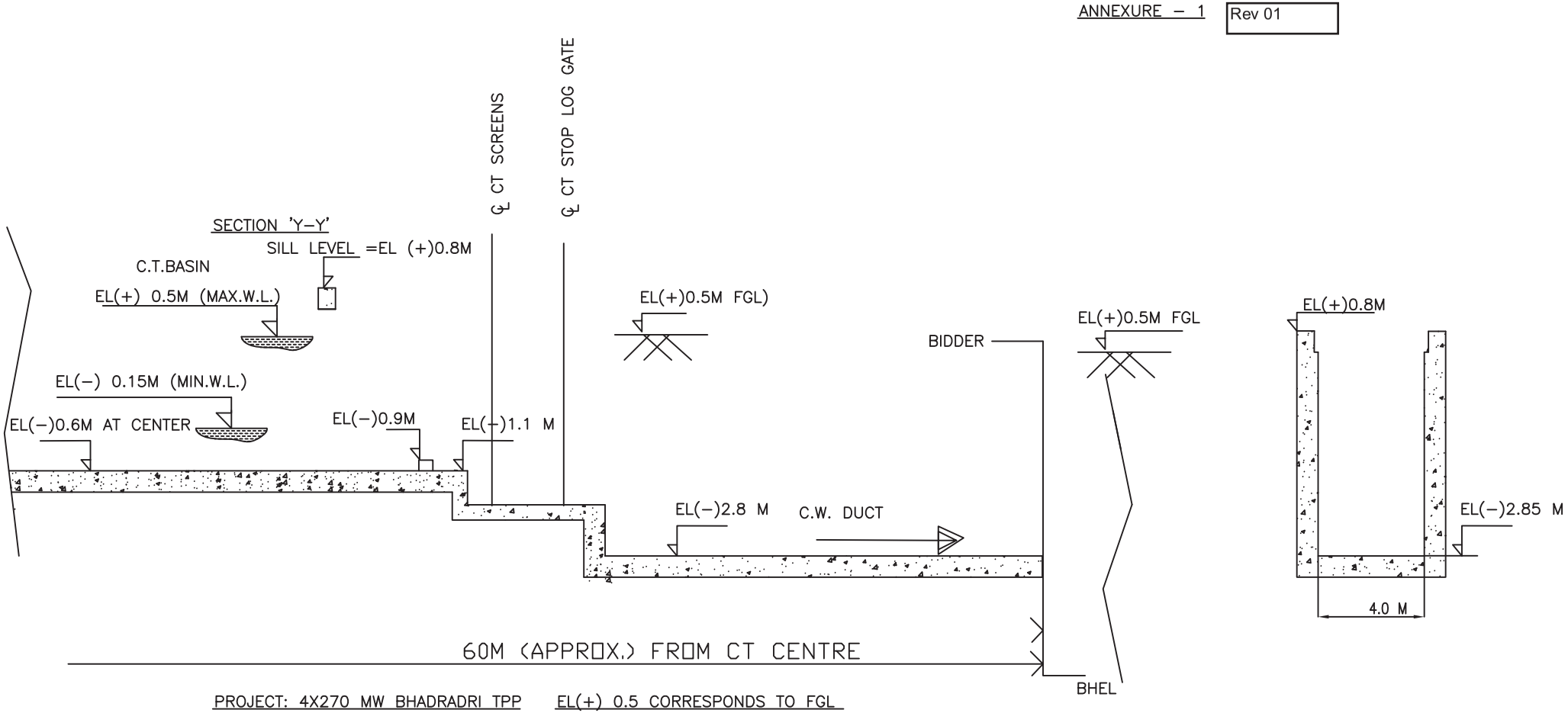
5) Clause # 3.09.00(f) General requirements-

f) Fill will be of film type supported on RCC beam. Film fill should be characterized by reduced air pressure losses, and shall not susceptible to clogging. Design and facing of the film fill shall be such as to expose high air/water surface with minimum air pressure drop.

Stands amended as

f) Fill will be of splash type both in PVC or Polypropylene (PP**)** supported on RCC beam. Fill should be characterized by reduced air pressure losses, and shall not susceptible to clogging. Design and facing of the fill shall be such as to expose high air/water surface with minimum air pressure drop.

ANNEXURE – 1 Rev 01

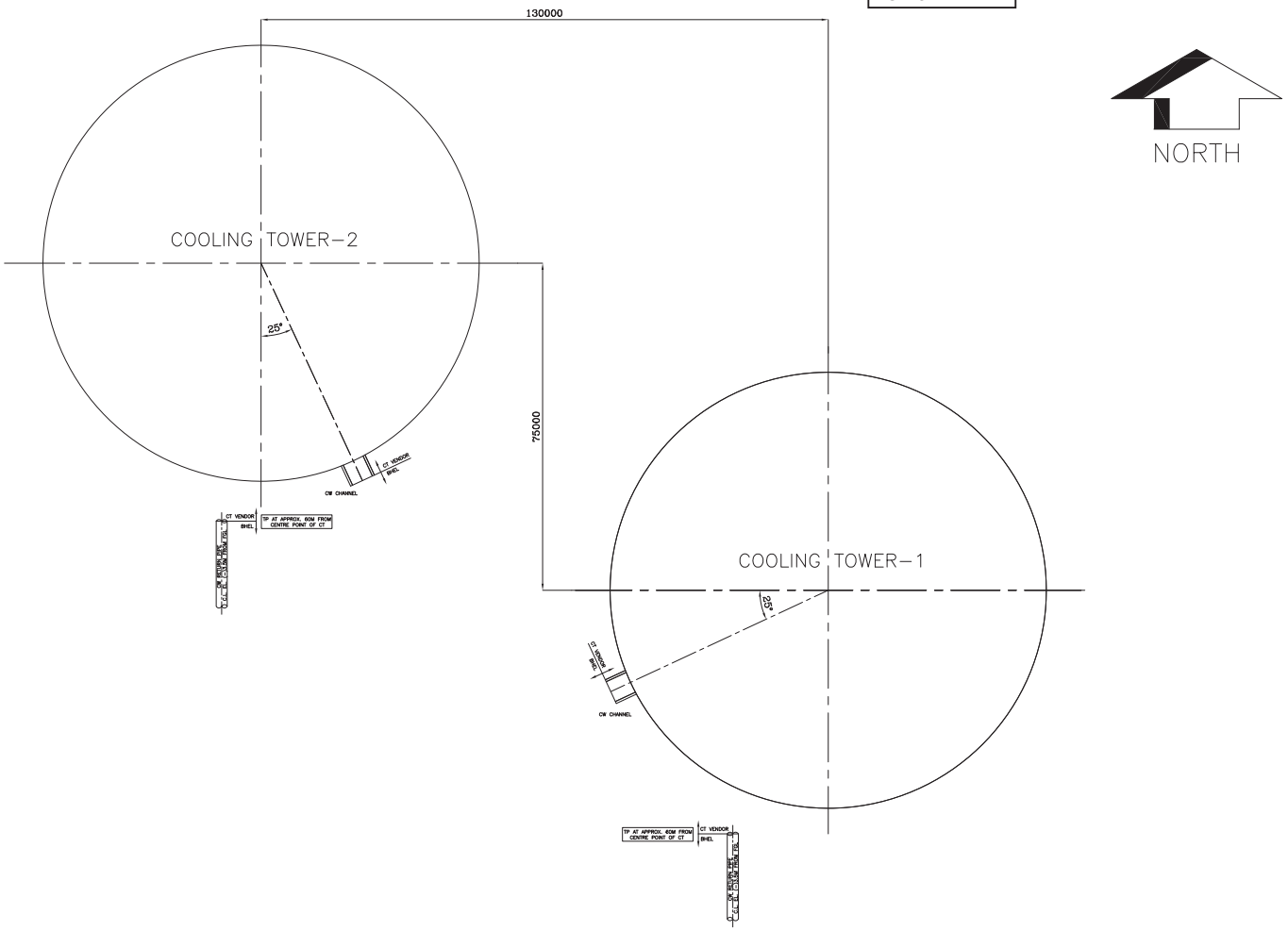


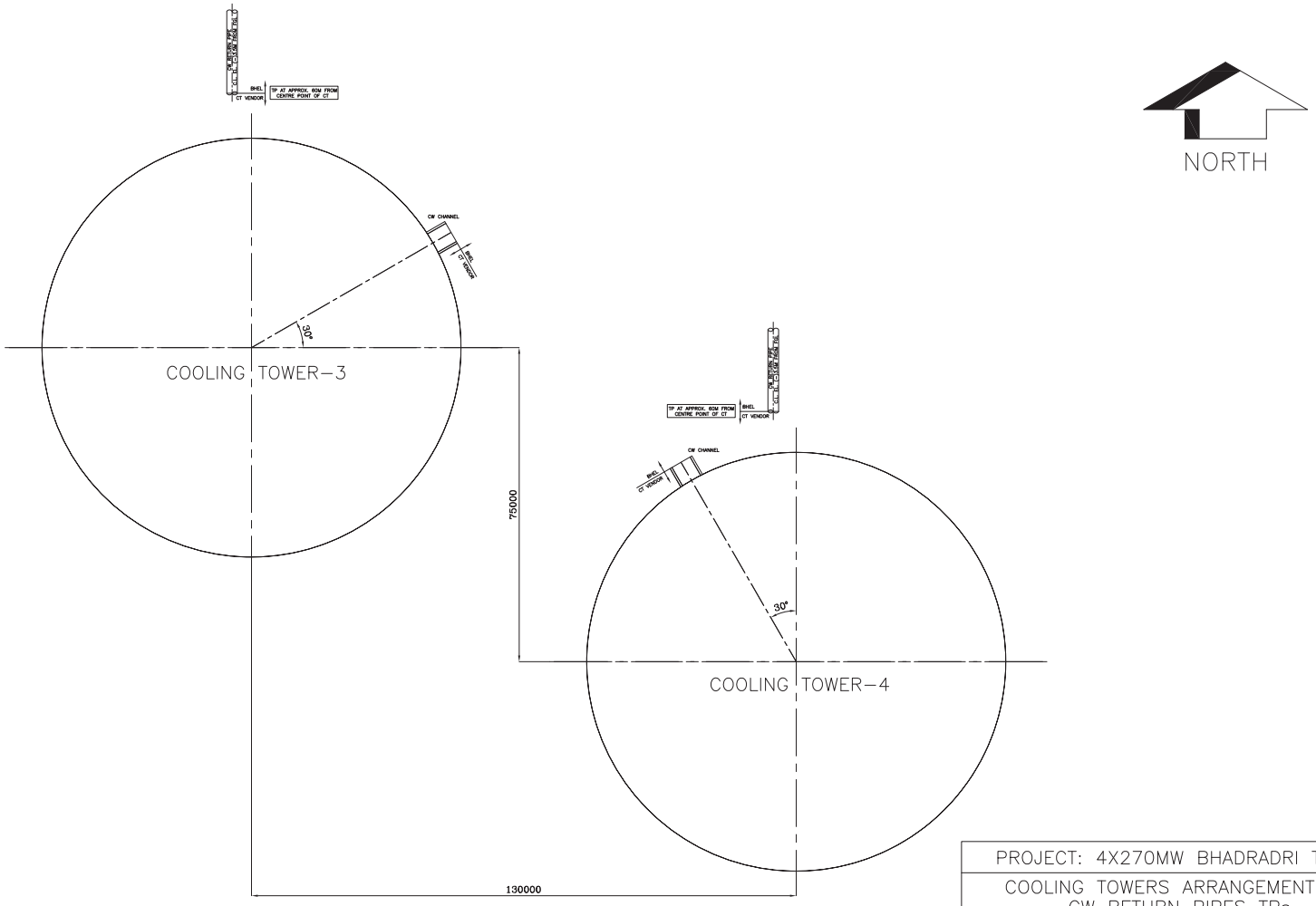
PROJECT: 4X270 MW BHADRADRI TPP EL(+) 0.5 CORRESPONDS TO FGL

COOLING TOWER SPECIFICATIONS

COOLING TOWER COLD WATER OUTLET WITH CT BASIN WATER LEVELS

Annexure-2
Rev 01





PROJECT: 4X270MW BHADRADRI TPS
COOLING TOWERS ARRANGEMENT & CW RETURN PIPES TPs
REV. 01 DATE: 10.04.2015