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| SPEC. NO. TCE.7784A-3057- 01 | Khutani Hydroelectric Project (21MW), Uttarakhand | SHEET i OF i |

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15 PRECAST CONCRETE

15.1 SCOPE OF WORK

- i) This section deals with the manufacturing and erection of plain or reinforced precast concrete members.
- ii) Type of precast members shall be as shown on the drawings.
- iii) Prestressed precast members are not covered under this specification.

15.2 CODES AND STANDARDS

In addition to the relevant Indian Standards and codes as mentioned under Standard Technical Specification for “Concrete”, the following additional Indian Standards, Codes etc. referred to here below are applicable. In case of discrepancy between this specification and those mentioned herein the more stringent of the two shall govern. A copy of all these documents shall generally be available at site, with the Contractor.

SP: 7 (PART 7) National Building Code Structural design of VI/Sec. Prefabrication and systems building.

IS: 432 Mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.

IS: 456 Code of practice for plain and reinforced concrete.

IS: 1566 Hard-drawn steel wire fabric for concrete reinforcement.


IS: 1786 High strength deformed-steel bars and wires for concrete reinforcement.

IS: 2502 Code of practice for bending and fixing of bars for concrete reinforcement.

IS: 10297 Code of practice for design and construction of floor and roofs using precast reinforced/prestressed concrete ribbed or cored slab units.

IS: 10505 Code of practice for construction of floors and roofs using precast concrete waffle units.

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IS: 11447 Code of practice for construction with large panel prefabricates.

15.3 **SUBMITTALS**

The technical specification for cement concrete, formwork, and reinforcement covered under Technical Specification for “Concrete” and other pertinent works shall be deemed to form a part of this specification.

The Chapter covers furnishing of all labour, materials and equipment and performing all operations required for manufacture and transportation of precast concrete items, hoisting and fixing them in position to the correct lines and levels, filling in joints and otherwise finishing, cutting of the lifting hooks etc. complete and testing of pre-cast members. Steel or other embedments, if any, indicated on the working drawings shall also be embedded on precast members.

The precast members shall be manufactured in a fenced yard at the project site. The yard shall have hard and levelled platform. The Contractor shall arrange for all the necessary facilities like shed, casting bed, curing tank, handling equipment and transportation etc. complete.

The grade of the concrete and the type of precast element to be used shall be as called for in the Bill of Quantities or as shown on the drawings. Unless otherwise specified, minimum M-20 grade of concrete shall be used.


The Contractor shall provide a complete scheme of casting of precast concrete units with erection programme for the approval of the Project Manager. However, this approval shall not relieve the Contractor of his sole responsibility for safe and sound work.


15.4 **MATERIALS**

15.4.1 **CONCRETE MIX**

- i) The concrete mix for various types of precast units shall conform to relevant Indian Standards. The grade of concrete for different pieces of construction shall be as per construction drawings.

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| <div> <div>ii)</div> <div>Aggregates shall be mixed by weight and the water cement-ratio shall be controlled so as to obtain a dense concrete of the required strength. The size of aggregate shall not be more than 20 mm.</div> </div> <div> <div>15.4.2</div> <div><u>FORM WORK</u></div> </div> <div> <div>i)</div> <div>The formwork for the precast members shall be made up of steel, plywood, or wood lined with galvanised mild steel sheeting so as to obtain a smooth surface. The Contractor shall submit detailed drawings of formwork. Vibration shall be carried out to obtain proper compaction and a good finish. In addition, roding shall be done to ensure that the concrete material evenly fills all inaccessible regions to the vibrator. The top exposed surface shall be finished with cement mortar (1:3) wherever required.</div> </div> <div> <div>15.4.3</div> <div><u>REINFORCEMENT</u></div> <div>The reinforcement and bending, binding and placement of reinforcement shall conform to relevant Indian Standards as per construction drawings.</div> </div> <div> <div>15.4.4</div> <div><u>EXECUTION</u></div> <div>Structural steel in the form of angles, flats, etc which shall be supplied and fabricated by the Contractor shall be transported and embedded in position in various precast members to correct lines and levels by means of welding.</div> </div> <div> <div>15.4.5</div> <div><u>HANDLING</u></div> <div> <div>i)</div> <div>Each precast members shall be suitably marked to indicate the top of the members and its location and orientation in the structure and date of casting in order to facilitate in distinguishing the dates of casting of various members.</div> </div> <div> <div>ii)</div> <div>The Contractor shall also maintain a register indicating the date of casting of various members, curing, transportation and erection.</div> </div> <div> <div>iii)</div> <div>To ensure minimum damage during handling, the Contractor shall provide suitable cranes capable of lifting the heavy pieces on to the curing tanks, stacking shed and on to the places of erection.</div> </div> <div> <div>iv)</div> <div>The responsibility for any damage for whatsoever reasons shall be that of the Contractor and he shall replace any damaged pieces.</div> </div> </div> <div> <div>ISSUE</div> <div>P0</div> </div> | | |

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15.4.6 CURING

Either natural curing with water or an accelerated curing using steam shall be followed. Water curing shall be carried out for a period of 7 (seven) days from the day of casting.

15.5 SAMPLING, TESTING AND QUALITY ASSURANCE

- i) All the relevant clauses pertaining to the technical specifications for concrete and other pertinent works shall be applicable. This shall include testing of concrete mix.
- ii) Load tests shall also be carried out for the type of members as agreed with the Owner.
- iii) Tolerance on dimension of precast units shall be as follows:
 - a) Length: + / - 0.1 percent subject to maximum tolerance of + / - 4 mm,
 - b) Cross-sectional dimensions: + / -3 mm or + / - 0.1 per cent whichever is greater,
 - c) Straightness of Members: The misalignment shall be at most 1/750 of the length subject to maximum tolerance of + / - 3 mm,
 - d) Squareness: When considering the squareness of the corner the length of the two adjacent sides being checked shall be taken as the base line. The shorter side shall not vary in length from the preparations by more than 5mm,
 - e) Flatness: The maximum deviation from a 1.5 m straight edge placed in position on a nominal plane surface shall not exceed 3 mm.

End of Chapter

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