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SUCTION AND DISCHARGE FORMWORK FOR CONCRETE VOLUTE PUMP

1.0 SCOPE :

This standard specifies the technical requirements of formwork required for Concrete volute pump with regard to the following.

- Supply of suction wooden formwork (pattern)
- Supply of discharge wooden formwork (pattern)
- Supervision services for erection of above formwork at site.

2.0 MATERIALS OF CONSTRUCTION :

2.1 The skin of formwork shall be made of marine grade plywood (IS:710) of at least 16mm thickness for top and side faces and 10mm thickness for the bottom face.

2.2 The runner members of the formwork supporting the skin shall be made of un-deformed solid wood.

2.3 Moisture content in the wooden members should be appropriate such that excessive contraction or expansion of the members, resulting in dimensional changes of formwork do not occur due to weather changes.

2.4 The wooden members shall be treated for pest control.

3.0 TECHNICAL REQUIREMENTS :

3.1 The dimensions of suction and discharge formwork shall be as per the neatlines drawing indicated in the variant table.

3.2 The formwork surface shall be smooth and should not contain undulations. In producing a concrete suction (draft tube) & discharge (volute) passage, the surface finish required from the use of suitable formwork, should be equivalent of a first class finish on cast iron casting. The permissible surface inequalities on water passage surface should not be greater than 0.1” over a minimum length of 3”. Refer figures 1 & 2.

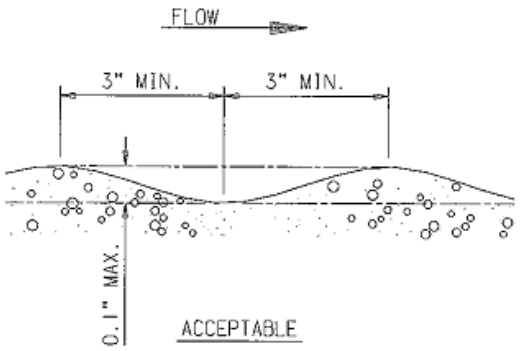

Fig.1, Acceptable condition of inequalities on water passage concrete surface

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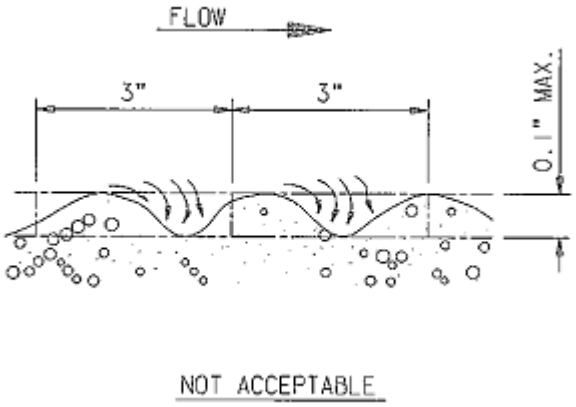

Fig.2, Unacceptable condition of inequalities on water passage concrete surface

3.3 The formwork assembly shall be structurally stable and should not deflect excessively either during or after concrete casting at site. The loads arising from reinforcement steel, embedments, concrete and its casting, and permissible inequalities for water passage surface mentioned in cl.3.2, shall be considered while designing the formwork's internal frame and external support members including their spacing.

3.4 The supply of nails, nuts and bolts required for formwork assembly shall be in scope of vendor.

3.5 The vendor shall also supply temporary struts required for supporting formwork at the time concreting.

3.6 Grouting holes shall be provided in formwork as per drawing.

3.7 The surface of formwork which would form the water passage path shall be painted with 2 coats of enamel paint after appropriate primer application.

3.8 There shall not be any gaps in joints of formwork to prevent leakage of concrete.

4.0 TECHNICAL DATA :

4.1 BHEL DRAWINGS TO BE PROVIDED AFTER AWARD OF WORK:

- Neatlines of suction formwork
- Neatlines of discharge formwork
- GA drawing CV-CW pump
- Sectional Assembly drawing of CV-CWP
- Discharge pipe outline and foundation drawing
- Discharge lip outline drawing

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- Suction embedded part & Pump sole plate drawing
- Procedure for installation of various embedded parts & concrete casting of CVP casing.
- RCC drawings of CVP concrete casing.
- Field Quality plan.

4.2 DRAWINGS/DOCUMENTS TO BE SUBMITTED BY VENDOR FOR APPROVAL:

- Suction channel drawing within 10 days of placing PO
- Discharge channel drawing within 20 days of placing PO
- Internal quality plan
- Schedule for erection of suction and discharge formwork at site
- Installation procedure at site
- Guidelines for storage of formwork at site stores
- Guidelines for pouring concrete on formwork

5.0 INSPECTION AT VENDOR WORKS :

5.1 100% of Suction & Discharge formwork assemblies shall be offered for BHEL inspection at vendor works.

5.2 The dimensions and tolerances shall be as per approved drawing, which shall be measured by calibrated tape arranged by the vendor.

5.3 Templates shall be prepared by vendor for checking radii and curvatures.

5.4 The center lines of pump shall be marked on suction and discharge formwork. Centerline of discharge shall also be marked on discharge formwork.

5.5 Match marks with numbers shall be made with paint at parting planes of formwork sub-assemblies.

6.0 PACKING AND TRANSPORTATION :

6.1 After successful inspection at shop, the formwork assembly shall be dismantled for packing and transportation. All the sub-assemblies shall be numbered for easy identification.

6.2 The dismantled formwork shall be packed in suitable wooden boxes after being wrapped thoroughly with polythene sheet. The wooden boxes used for packing shall be lined with 5mm thick waterproof plywood. Care shall be taken that there is no ingress of rainwater or moisture into the packed box.

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6.3 The packing shall be done in such a way that there is no damage to the formwork while loading, unloading using wire rope sling and transportation.

6.4 The maximum dimensions of width, height and length of the packing box shall be 7', 7' and 12' respectively.

6.5 The packing box shall be designed and manufactured to take the loads arising from weight of formwork, loading and unloading.

7.0 SUPERVISION FOR ERECTION AT SITE :

The following is the scope of supervision by the formwork vendor.

a. Assembly of formwork for suction channel for all CV pumps.
b. Assembly of formwork for discharge channel for all CV pumps.
c. The vendor shall make sure that formwork is assembled in correct position and locked properly such that the formwork is not displaced while concreting.
d. The vendor shall also make sure that suitable extra supports/struts are provided to formwork to ensure that there is no deformation due to concrete loading.
e. Supervisor shall also be deputed at the time of relevant concrete casting stages to monitor formwork integrity.
f. Dis-assembly of formwork for suction channel after concreting.
g. Dis-assembly of formwork for discharge channel after concreting.

8.0 INSPECTION AT SITE :

8.1 The dimensions of formwork assemblies are once again measured by vendor's supervisor in the presence BHEL's representative and end customer's representative after erection at site, and shall confirm by the formwork drawing.

8.2 The alignment, elevations, centerlines and spacing of formwork assemblies shall also be checked after formwork's locking as per the CV pump layout drawing and field quality plan.

8.3 Vendor's supervisor shall perform final inspection of formwork dimensions and position after placing of reinforcement and steel embedment, before concrete casting. However, this final inspection may be waived off with the concurrence of end customer.

9.0 GUARANTEE :

Vendor shall be responsible for any incident caused by formwork's material defects effecting the concrete casting and surface finish of concrete, and shall repair or replace without additional charges.

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10.0 VARIANT TABLE :

Var No.	Description	Project	Qty (set)	Neatlines drawing reference	Material Code
01	Suction formwork	TANGEDCO Udangudi TPS-I	6	31801495214	FP9750702018
02	Discharge formwork	TANGEDCO Udangudi TPS- I	6	31801495215	FP9750702026

Note: The latest revision of neatlines drawing shall be applicable.

RECORD OF REVISIONS

Rev. No.	Date	Revision Details	Revised By	Approved By

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