



# Instruction Manual Fuel Storage Tank Shop Fabrication

Client: Peyvand Golestan Cement Co.

Consultant: IID Co.

Department: Heavy Fuel Oil Storage Tank



## Scope

This shop fabrication Procedure will cover the minimum Requirements for heavy fuel oil main storage tank for Peyvand Golestan Cement Co.

### ۱. Applied code, standard and project specification.

- ۱- API 650 ( ۱۹۹۸ Edition)
- ۲- ASTM Standard ( For material )
- ۳- ANSI Standard ( For nozzle flange )
- ۴- ASME Sect IX ( ۱۹۹۸ Edition )

### ۲. Reference Documents

- ۱- Fabrication Drawing approved by IID.
- ۲- Quality Control Plan
- ۳- This Procedure
- ۴- Welding Procedure Specification WPS

### ۳. Scope of Shop Works

- ۱- Material identification with supply lists/Packing list and material certificate
- ۲- Charge and distribute of the materials
- ۳- Marking of the erection, cutting, bending, forming and drilling in accordance with the approved drawings
- ۴- Edge Preparation of the sketch Plates, other parts and jigs due to the used at site
- ۵- Prefabrication the following parts ( as per see attached sheets )
  - a) Nozzle, manhole with the cover flange
  - b) Annular plates, pad plates and top angle, etc
  - c) Rust preventing and painting
  - d) Shop inspection testing

### ۴. Special Note

General inspection and testing activities shall be performed according to Quality Control Plan.

### ۵. General Requirements

- a) Supplied raw material and welding rods shall be kept under the most careful control at shop and must not be used any other purposes or equipment.
- b) Raw material/parts will be supplied with each identification number in accordance with the supply no.
- c) As to visual inspection, the whole surface of the materials/ parts shall be visually inspected.
- d) The supplied material/parts will be classified and stocked each kind of the materials/parts at suitably lay-down area.

## **۷. Surplus Material Control**

Iran Industrial Design Co. will provide the following three areas to confirm the correct material control not for the fabrication but also the custom check.

- a) Original Supply Material Storage Area.
- b) Remaining Usable Material Storage Area.
- c) Not Used Remaining Material Storage Area.

## **۸. Material Receiving Inspection**

Visual inspection of incoming raw material shall be performed by the shop QC personnel to ensure that there is no injurious defect on the surface and cut edges.

Check on the identification number at steel mill by stencil paint and supply list shall be made against material certificate, quantities dimension.

## **۹. Material Trace ability Control**

The following prefabricated items required being traceable to the corresponding material certificate.

The shop QC personnel shall prepare a material identification record.

- a) Bottom plate
- b) Shell plate
- c) Roof plate

## **۱۰. Erection Mark**

In addition to the above identification marking, all prefabricated components shall be marked. The erection mark given on the relevant drawing. Iran Industrial Design Co. shall provide Marking Map for Bottom/Roof Plates and other structural parts.

An example Marking Map for Bottom / Shell / Roof plates and other structural Parts.

## **۱۱. Prefabrication**

### **۱۱.۱- Cutting**

- a. Cutting shall be affected by machining, shearing, gas cutting or plasma cutting.
- b. Defect such as notches exceeding ۱,۰ mm in depth and detachable oxidize scales shall be removed.
- c. After cutting the dimension of shell, annular, top angles etc. shall be checked in accordance with the following and surplus raw materials shall be stocked at lay down area.

Dimensional to learn of shell, bottom, roof plate and top angle are shown in tables ۱ & ۲ & ۳.

**Table ۱ – Shell Plate**

Dimension	Tolerance (mm )
Width	$\pm 1,0$
Length	$\pm 1,0$
Difference in Diagonals	$< 3,0$

**Table ۲ – Bottom & Roof Plate**

Dimension	Tolerance (mm )
Width	$\pm 1,0$
Length	$\pm 1,0$
AD-BC	$< 3,0$

**Table ۳ – Top Angle**

Dimension	Tolerance (mm )
Length	$+100,-0$
Wrap of Distortion	Max. ۳mm
Curvature	$\pm 3,0$

#### ۱۱.۲ – Joint Preparation

Welded edge shall prepared by machining / grinding and groove shapes and dimension shall be as specified in the approved fabrication drawings

#### ۱۱.۳ – Bending / Rolling

- After edge preparation, Shell and top angle etc. shall be cold rolled to correct curvature in accordance to the fabrication drawings.
- As to stainless steel plate, the roller shaft must be cleaned and protected from the contamination with the PVC sheet or painting.
- After bending / rolling. These plates shall be inspected.

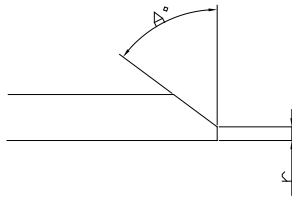
#### ۱۱.۴ – Welding

Welding at shop will be performed in according with welding procedure specification (WPS)

#### ۱۱.۵ – Shell Plate

After cutting and edge preparation, theses plates shall be cold rolled to correct curvature in accordance to Approved Drawings. Using proper template (if required) on rolling machine all plates shall completely form to required curvature according to drawings.

The dimensional tolerance of rove is shown in the table ۵:



**Table ۵ – Shell, Bottom Plate & Annular**

Shape of Groove	Tolerance (mm )
Single-V	$A = ۳,۵^{\circ}, r = ۱,۵ \text{ mm}$

#### ۱۱.۶- Annular Plate

After cutting, these plates shall be prepared the edge by machining o grinding in accordance to the drawings.

The dimensional tolerance of groove is shown in the above table ۵.

#### ۱۱.۷- Nozzle & Manhole with cover flange, hinge & davit (Prefabrication) Neck plate of nozzle

manhole shall be cut with flame planer or cutting machine in accordance to the drawings and the dimension of cutting Length shall be added the ۳۰ mm extra length indicated the drawing.

After cutting, it will become cold. Seam joint shall be welded and then flange shall be welded to neck.

In case of the neck pipe, cutting length shall be added + ۳۰ mm extra length.

Nozzle pipe shall be end beveled with pipe cutter and then flange shall be welded to nozzle pipe.

As to manhole, the cover flange of the installed manhole on the stainless tank shall be welded the lining plate on the carbon steel flange.

Allowable to tolerance shall be according to following:

#### ۱- Shall Manhole Tolerance

- Distance from the face of flange or centerline of manhole to reference line:  
(+ / -) ۱۳ mm.
- Deviation circumferentially measured on the outer surface of tank (from flange face):  
(+ / -) ۱۳ mm.

#### ۲- Nozzle, Coupling Tolerance (Which Are Not To Be Connected To Piping)

- Distance from the face of flange or centerline of nozzle or coupling to reference line:  
(+ / -) ۱۳ mm.
- Deviation circumferentially measured on the outer surface of tank (from flange face):  
(+ / -) ۱۳ mm.

#### ۳- Nozzle, Coupling Tolerance (Which Are To Be Connected To Piping)

- a) Distance from the face of flange or centerline of nozzle or coupling to reference line:  
(+ / -) ٦,٥ mm.
- b) Deviation circumferentially measured on the outer surface of tank (from flange face):  
(+ / -) ٦,٥ mm.

#### ١٢. Reinforcing Plate

Reinforcing plate shall be cut, opened with flame planer and curved in accordance with the drawings, beveled with the grinder and holed the telltale hole, threaded in the hole.

Other accessories shall be fabricated completely in accordance to drawings at the shop, and the erection marking shall be done.

#### ١٣. Rust preventing and painting

Rust preventing and painting shall be performed in accordance to relevant specification.

#### ١٤. Packing Check

- a) After completion and testing, the vessels shall be cleaned inside and outside and free of weld spatter, weld slag, flux deposit, butts and splinters. Loose mill scale and all other foreign matter.
- b) Completed parts shall be packed suitably and mark in accordance to relevant specifications.
- c) After preparation of the packing list and final QC check, fabricated equipments shall be transported to site.
- d) Finally QC group will check packing quality and prepare packing list and passed over the packed parts to final product stash.

#### ١٥. Transportation to Site

After the preparation of the packing list and final QC check prefabricated material / parts shall be transported to site.