Summary of corrigendum

1. **Tender Submission due date extended from 27.03.2020 13:00PM to 06.04.2020 13:00PM**
2. **Floating System Installation Manual-2 added.**

Quant Solar
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Floating System Installation Manual

QuantSolar
Floating Solar PV Systems

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1. PURPOSE

This document elaborates on the various aspects of the installation methodology to be adopted for the modular installation of Floaters and other related components to develop the complete Floating Solar Plant.

2. SITE PREPARATION

2.1 Site Assessment

Site assessment is the first step towards developing a working plan for engineering works at site and the site preparation for installation work.

Site assessment shall be intended for following purposes:

- To identify space in the area adjacent to the waterbody for material storage and minor engineering works
- Site preparation for the proper handling of various materials
- Safety assessment to work in water environment
- To assess the sequence of Floats installation
- To set up a site office to manage day to day operation

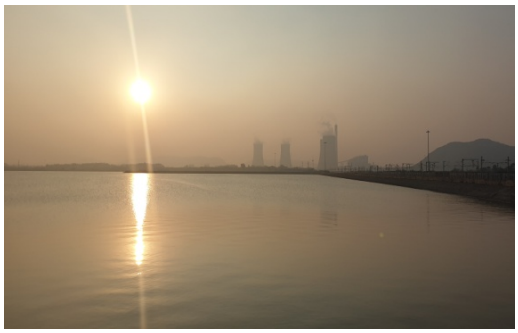


Figure 1: Site Image

2.2 Site preparatory activities

Subsequent to the site assessment, site preparation activities begin that encompasses the following:

- Developing access to the site for the uninterrupted supply of installation material
- Removal of all roadblocks to ensure a safe and convenient access to the point of installation
- Completion of all formalities pertaining to the logistics of site workers
- Establishing security arrangements for the material stored at site
- Development of temporary platform to launch the floaters to water

3. MATERIAL DELIVERY AND STORAGE

3.1 Key Material Components

The Floating Platform consists of the following components:

- PV Floats
- Walkway Floats
- Module Mounting Structure

- Connectors
- Clamps
- Fasteners

All the above-mentioned components are modular by design and can be handled easily with little precaution to avoid any damage.

3.2 Material Storage

Various components of Floating Platform can be conveniently stacked together at an even ground. Some of the precautions that need to be taken for the safe storage is as below:

- All the items should be stored slightly away from the water so that these should not fall in water accidently.
- There should not be any sharp protrusions on the storage area floor
- Dragging of Floaters on the ground must be avoided and only lifting should be the way to move it from one place to other

Figure 2: Storage of Floats at site

Electrical equipments like inverters, Switchboards, and transformers should be stored indoors or under a canopy to protect them from dust and rain until they are properly deployed.

4. PLATFORM TO LAUNCH FLOATS

4.1 Identification of Launching Area

A certain section of ground with appropriate dimensions adjacent to the water body shall be identified first for the launching area. The identified area should be such that several rows and columns of floats can be laid there and assembled together before launching in the

water. An area with some slope intersecting with water surface should always be preferred over a flat area for launching of Floats assembly.

Figure 3: Identifying launching site

4.2 Preparation of Launching Platform

Once the area is identified for launching of Floating System, it needs to be prepared and made suitable for the smooth installation of assembly of floaters. For this purpose, the area needs to be cleaned, reinforced, even and beveled with hard soil or concrete, if needed. The stretch of this platform along the water line should be adequate to launch the floats and assemble them through clamps, fasteners etc.

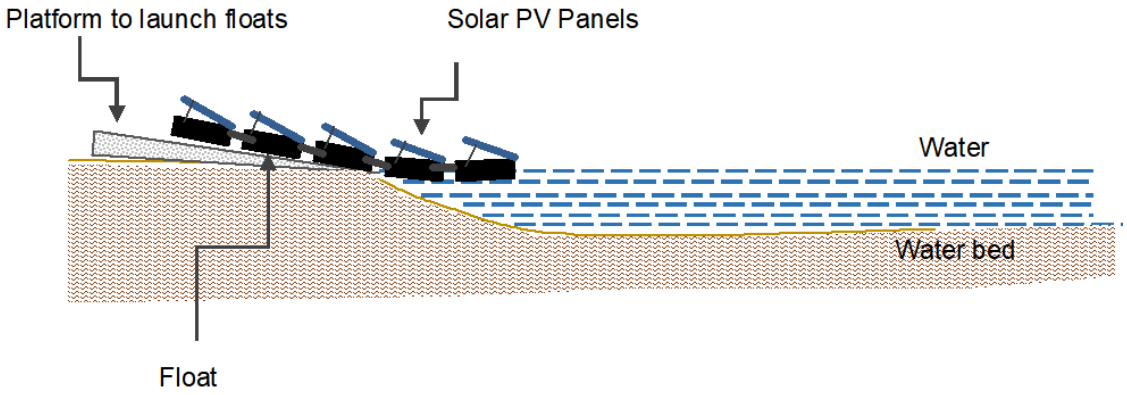


Figure 4: Platform to launch Floats

5. FLOATS ASSEMBLY

5.1 Assembly Sequence

Once the site preparation is done and the launching platform is ready with all the components of Floating System at site, the assembly of floating platform can be initiated.

Usually, small mini-blocks are developed from the components with solar PV panels installed upon the floaters. As more and more such rows of mini blocks are launched in water, these mini blocks can be connected together to develop the final bigger block. The entire assembly methodology can be summarized as below:

- Walkway floaters and PV Floaters are laid down on the launching platform to constitute few rows
- The laying of floaters is according to the final plant layout
- All the laid floaters are connected to each other through the connectors
- The Module Mounting Structure (MMS) is fitted on each of the PV Floaters with fasteners
- Solar PV panels are installed onto the MMS for each of the PV Floaters
- Once a mini-block of few rows and few columns is ready with all components integrated, it is pushed down in the water
- Similar such mini-blocks are launched in water subsequently
- Electrical interconnections are carried out as per the approved design for each of the mini-blocks
- These mini-blocks are then towed to the final location and connected to each other to develop the final Layout
- The final layout is then connected to the pre-installed anchoring and mooring system
- AC & DC cablings are done finally to connect the Floating Solar Plant to the Inverters.

6. SAFETY RECOMMENDATIONS

6.1 Safety of Personnel

Following are some safety considerations to be taken into account while performing the installation:

- All personals at site should undergo Basic Safety Training for all the installation activities
- All those working at site must have personal safety gears
- Life jackets should be mandatorily used by all personals irrespective of ranks while working near the water body and especially while boarding and walking on the floating platform
- There should be a full time Safety Officer especially appointed to oversee the installation works
- Rescue arrangements should be thoroughly assessed from time to time
- Supervisors and workers should be trained on emergency and evacuation procedures, including the conduct of regular drills pertaining to work over water/in the vicinity of water

6.2 Safety of Floating Plant

Following precautions should be taken while carrying out the assembly and installation work:

- The orientation of floats should be properly checked before connection begins
- All the floats should be connected properly before the mini-blocks are released in water
- The Module Mounting Structures (MMS) should be properly erected without any misalignments
- The Solar PV Panels installed on MMS must be properly aligned
- All the cables in the Floating Solar Plant must have sufficient slack to prevent any damage due to motions and water level variations
- Relevant standards should be followed for Lightening Arrestor and plant earthing
- All the standard guidelines should be followed during installation of electrical components

7. ASSEMBLY OVERVIEW

The image below represents a sample mini-block consisting of various components of Floating Solar Plant assembled together. These include PV Floaters, Walkway Floaters, Solar PV Panels, Module Mounting Structure, connectors etc.

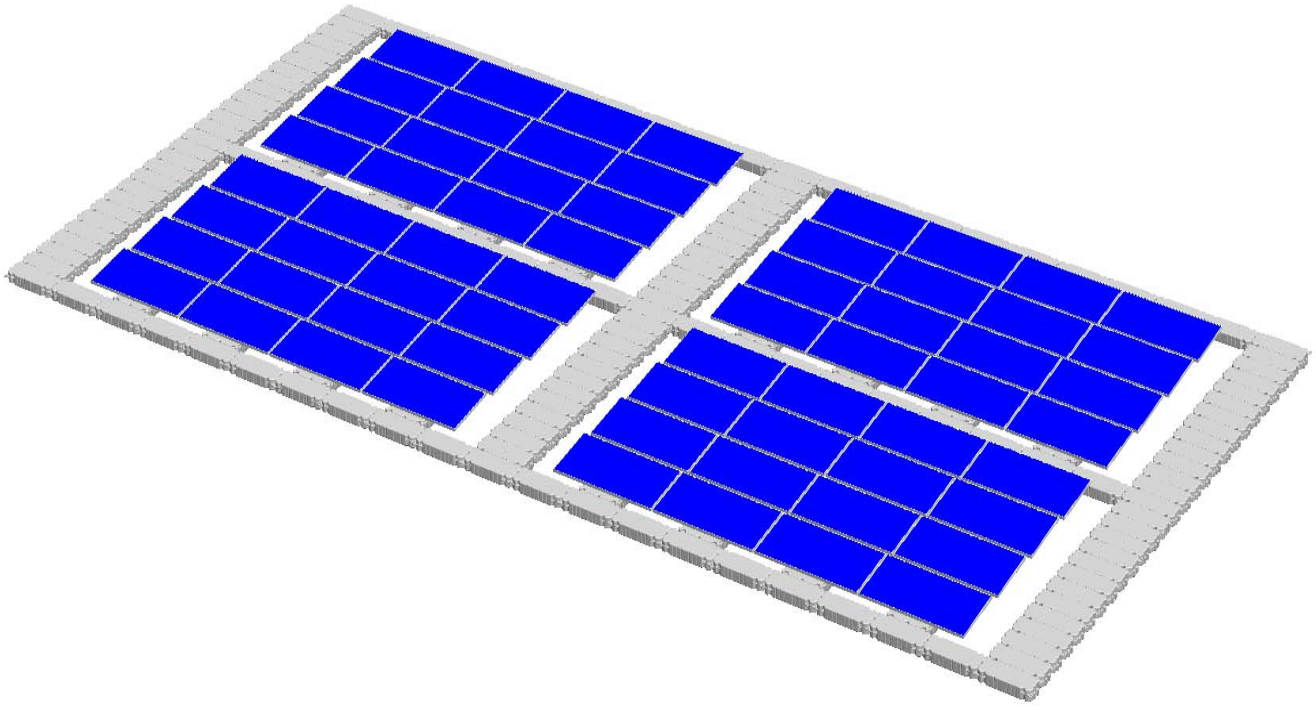
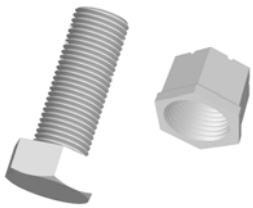


Figure 5: Assembly Overview

7.1 Detailed Specification of Components

The table below depicts the description of each component of the Floating System.

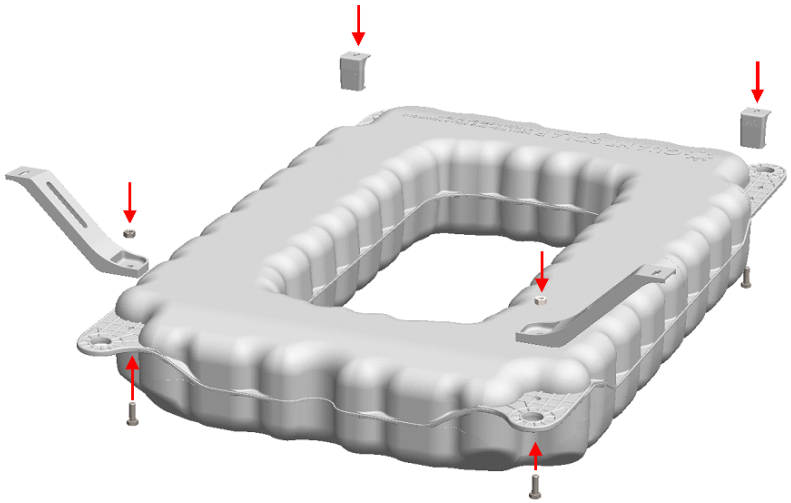
PV Float		
	Overall Dimensions (mm)	1200 x 800 x 150
	Buoyancy (kgs)	90
	Dry Weight (kgs)	8
	Production Method	Blow Molding
Walkway Float		
	Overall Dimensions (mm)	1000 x 400 x 150
	Buoyancy (kgs)	60
	Dry Weight (kgs)	4.5
	Production Method	Blow Molding
Module Mounting Structure		
	Overall Dimensions (mm)	As per design
	Buoyancy (kgs)	NA
	Dry Weight (kgs)	NA
	Production Method	INJ Molding
Interconnecting Fasteners		
	Overall Dimensions (mm)	M30x75
	Buoyancy (kgs)	NA
	Dry Weight (kgs)	NA
	Production Method	INJ Molding

Z Clamp		
	Overall Dimensions (mm)	As per design
	Buoyancy (kgs)	NA
	Dry Weight (kgs)	NA
	Production Method	Metal Extrusion

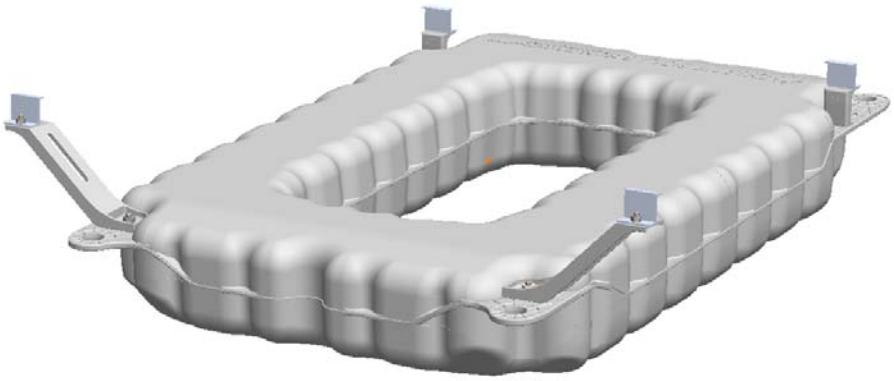
7.2 Step by Step Installation Sequence

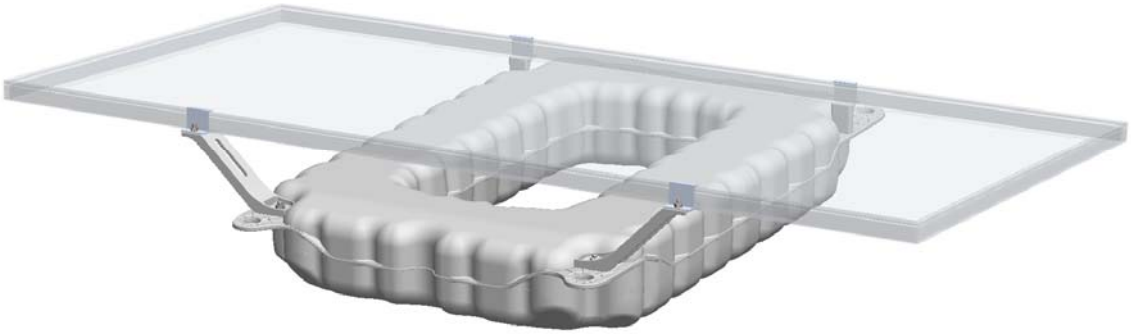
Subsequent to the preparation of launching platform and bringing all the components at site, following guide can be followed step by step for the purpose of installation:

Step 1: Installation of Module Mounting Structure onto PV Float

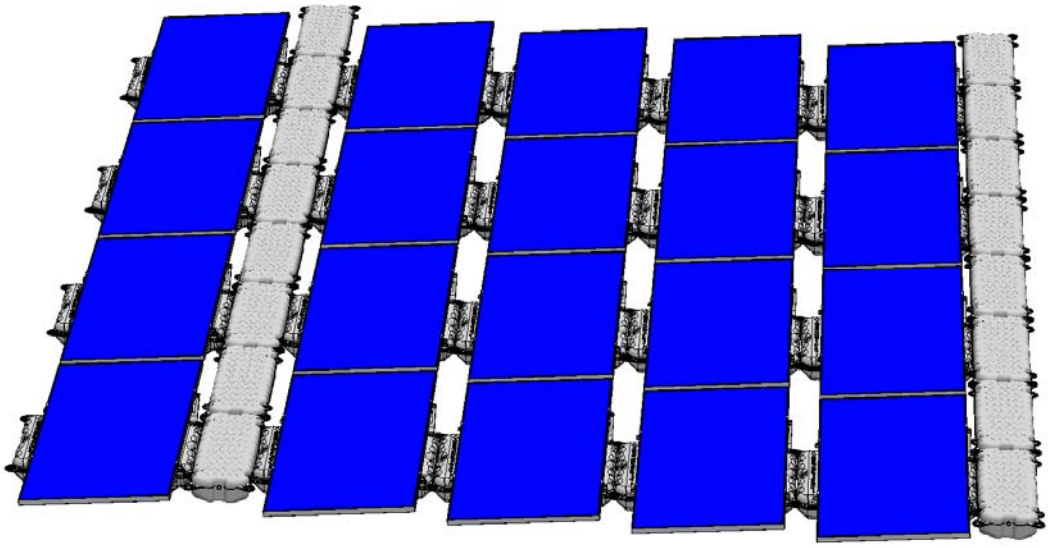


Step 2: Installation of Solar PV Panels onto PV Float





Step 3: Connection of PV Floaters and Walkway Floaters to each other to develop the mini-block



Step 4: Pushing the rows in water through inclined platform

Step 5: Connecting several mini-blocks to form one single Floating Plant