

Survey Control Stations Guideline

(as of July 2012)

Maldives Land and Survey Authority (MLSA),
Ministry of Housing and Infrastructure.

Control Stations which are used as origin, intermediate check, and closure points such as but not limited to, inter-visible station pairs and/or RTK base station points are recommended to be permanent in nature. Examples include and are not limited to, poured-in-place concrete monuments with uniquely stamped disks, feno rods with disks, steel rods with caps uniquely identifiable, and drill holes in solid foundations.

General Rules for Control Stations

- Establishment or replacement of any permanent control station should be done under the direct supervision of a Surveyor registered by the Ministry of Housing and Environment. The Registered Surveyor should take utmost care and professional practice when establishing and determining its coordinates.
- Locality Diagram of the control station must be either sketched close-to-scale with recovery ties and should contain descriptions in a text format to fully identify the station.
- For all the Control Stations except where horizontal positioning is irrelevant a Visibility Obstruction Diagram should be prepared.
- All Permanent Station Marks (PSM) should be named and labeled according to the guideline set by MLSA.

Note: **Control Station Information Form** available from MLSA should be completed for each Permanent Station Mark and submitted to MLSA.

Naming of the station marks.

The name and other details of PSM should be engraved on a stainless steel plate as below and fixed on the monument. If monument is completely buried the name plate can be fixed to a nearby long lasting object such as a quay wall.

Example:



Please contact Maldives Land and Survey Authority for further information regarding the numbering sequence.

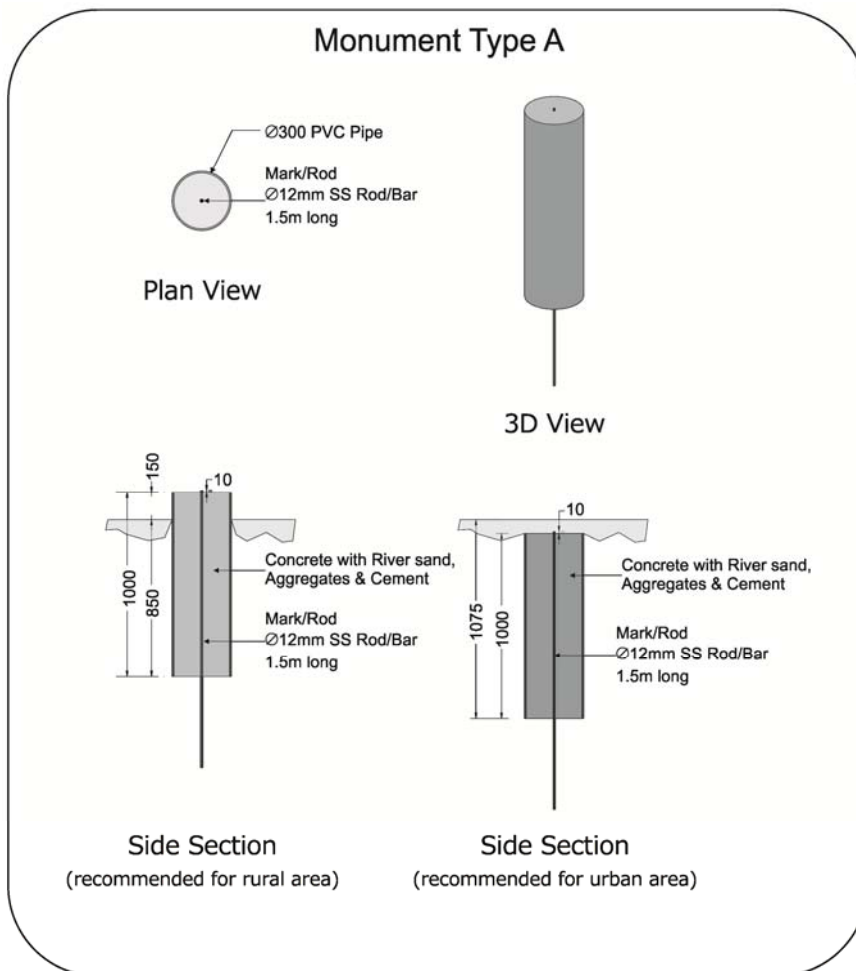
Permanent Station Mark (PSM)

Permanent Station Mark (PSM) is the main control station for all the surveys of every island. Minimum of three (3) PSMs are to be established in each island. **Approval from the Maldives Land and Survey Authority should be obtained before establishing a PSM.** The names of PSMs will be issued from Maldives Land and Survey Authority.

- The horizontal coordinates (Easting, Northing) of the first PSM of any island should be determined if possible relative to the Male' IGS Station. If relative positioning is not possible single point localization should be done for more than six hours with a GNSS receiver or minimum of 20 minutes of static data should be observed with baselines to all other PSM's by using High precision static GNSS or any other equivalent or better method.
- The vertical coordinate (Height) of the first PSM of any island should be related to the mean sea level which should be determined after an analysis of local tide with relation to the prediction provided by Department of Meteorology.
- All successive PSMs of any island should be related to first PSM of that island within an accuracy
 - Horizontal accuracy 0.010m (10mm)
 - Vertical accuracy 0.010m (10mm)
- All monuments of PSM shall be constructed to the *Monument Type A* specification.
- If the use of an existing structure or a solid rock is more suitable, both in stability and location wise, construction of a Type A monument is not necessary. Any survey mark should be made of either stainless steel or brass.

Monument Type A.

- The mark / stainless steel rod should be placed in the top of a concrete block cast in-situ and shaped as shown below.
- In urban areas it is recommended to bury the whole monument until the top is about 75mm below the surface of the ground.
- In rural areas it is recommended to bury the monument leaving the top 150mm above the surface of the ground.
- A stainless steel bar with a diameter between of 12mm should be inserted from the top of the concrete as the mark.
- One CM of the rod should be left above the top surface of the concrete in order to place the leveling staff.
- This bar/rod should be lengthy enough to reach the hard ground.
- Any two PSM should be inter-visible.



Materials required for per Monument.

Item	Bags
Cement	1
Sand	2
Aggregate	3