Introduction: -

While the International Electrotechnical Commission (IEC) does not have a specific standard outlining manhole chamber dimensions for optical fiber joints, best practices and typical industry standards can guide the design. Manhole chambers for optical fiber joints should be designed to accommodate the cable size, splicing equipment, and provide sufficient space for splicing and maintenance.

Key Considerations for Manhole Chamber Dimensions:

Cable Capacity:
The number of optical fiber cables and their size will determine the required space within the chamber.
Splicing Equipment:
Splicing machines and other tools used for jointing fibers will need space to operate.
Access and Maintenance:
The chamber should allow for easy access to cables, splicing equipment, and other components, as well as provide enough space for maintenance tasks.
Duct Installation:
If the manhole is connected to a duct system, the duct entrance and exit points will need to be accommodated within the chamber.
Environmental Protection:
The chamber should be designed to protect the optical fibers and splicing equipment from moisture, dust, and other environmental factors.
Safety:
The chamber should be designed with safety in mind, including adequate lighting, ventilation, and emergency exit routes.

Typical Manhole Chamber Dimensions:

Length:
Manhole chambers can vary in length, but a typical length for a standard optical fiber manhole is around 1600 mm. Also available 900 mm and 1200 mm.
Width:
The width of the chamber will depend on the number of cables and the size of the splicing equipment.
Depth:
The depth of the chamber will depend on the depth of the duct system and the need for additional space for splicing and maintenance.

Specific IEC Standards:

IEC 60794-1-101: This standard applies to optical fibre cables for use with telecommunication equipment and devices.
IEC 60794-1: This standard covers general specifications for optical fibre cables.

Manholes and Handholes:

Manholes (MH) and handholes (HH) shall be positioned as far away as possible from road junctions. MHs and HHs must to be built according to prescribed dimensions and specifications.




Before any concrete is placed the Contractor shall examine the shuttering for firmness and correctness of position and remove all dirt and other foreign matter.

Hand mixing of concrete is permitted in exceptional cases but only with written permission of the client. Concrete mix shall be such that a strength of 20MPa (2.5:2.5:1) is obtained 28 days after pouring.

Duct entry points into HHs / MHs must be drilled, without cracking or damaging the surrounding structure. Ducts shall enter and exit HHs / MHs in line with the direction of the route, for them to be coupled thru without any obvious effort, as a continuous duct.

HH / MH external labelling should be done on the coping and NOT the lid, as lids can get damaged and be replaced. GPS coordinates for the location must be recorded. On completion of a HH / MH, the Contractor shall re-instate the area around the HH / MH to its original state or better.
HH / MH covers shall be finished flush with the surface area.

Where bricks are used to construct HHs the following must apply:

- Written permission obtained from the client.
- Use only baked quality clay bricks sourced from an approved manufacturer.
- The wall thickness must be double brick or better.
- Re-enforce every third layer of bricks.
- The outer wall must be waterproofed.
- Use an approved footway-type or roadway-type frame and cover.

HH Installation:

- All duct entries and exits at the HHs must be a watertight seal.
- All ducts in HHs shall be coupled through.
- Incoming ducts must have a watertight seal.
- Ducts must be sealed with a watertight coupling cast or inserted into the wall of the HH
- HH covers must be watertight or must have at least a double seal.
- HH covers should be 150 mm (6 inches) above natural ground level with the fill shaped back to natural ground level in a 2 m (6.5 feet) radius around the HH cover.
- On paved sidewalks or verges, next to roads or streets, a cast in-situ concrete or asphalt backfilling shall be sloped to not impede pedestrian traffic. In these instances, the HH installation shall be such that it is not more than 50 mm higher than the surrounding paved sidewalk.
- The inside surface of the HH shall be sealed using an approved bituminous product.

HH / MH Inspection:

- Splice closures are secured.
- Cable slack neatly stored and secured with no compromise to the bending radius.
- Left tidy and clean.
- Ducts sealed in-between wall.
- End Caps fitted to empty ducts.
- Used ducts sealed in-between cable and duct.
- Cables and ducts are clearly labelled.
- HH/MH clearly marked on the coping.
- Locating disk in position.

Safe HH / MH Working Procedures:

- Obtain a HH / MH entry ref for the work to be undertaken.
- At least 2-persons must be present before entering a MH.
- Ensure that the vehicles are parked in such a manner that they do not create an obstruction or hazard to traffic and/or pedestrians.
- Use barricades and cones that are clearly visible around the HH / MH.
- Pour water around the lid of the HH / MH, to prevent creating a spark when opening it.
- Lift HH / MH covers using your legs and place the cover at least 2 m (6.5 feet) away from the opening.
- Before entering the confined space, test at 3-levels (bottom, middle, and top) for: Oxygen content Flammable or explosive gases Hydrogen sulphide
- Each level must be tested for a minimum of 60 seconds.
- Use only an approved calibrated gas detector.
- Ensure that the gas detector is in operation the entire time spent in the MH.

- An aluminium ladder in good operating condition must be used to enter the MH.
- Raise or lower tools and/or equipment into a MH using a rope or bucket.
- Never place equipment or tools near the edge of a HH / MH.
- Constant ventilation is required when performing work within a MH.
- Water in a MH (not containing object-able content) shall be pumped-out into the storm water system. If not possible, or onto area, a suitable distance away, with positive drainage.
- Never fusion splice in a HH or MH.

Manholes readymade (Pre-Cast) available (RCC & FRP):



Wall Thickness: **100 mm**
Brand: **CKE**
Material: **RCC**
Grade: **M30**
Color: **Grey**
Diameter: **1000 mm**
Height: **1000mm**
Length: **1000 mm**
Shape: **Round**
Type: **OFC Splice Chamber**
Unit Of Measure: **Set**
Crack Resistance: **Yes**
Usage/Application: **Telecom Industry**
Manhole Diameter: **1000mm**
Concrete Grade: **M30**
Reinforcement Grade: **Fe 415**
Cover Diameter: **890mm**
Cover Thickness: **100mm**





Fiber Joint placed in Manhole Chamber:

