

# Principles of Mechanical Drawings – CONSTRUCTION OF NUTS & BOLTS

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# Construction of NUTS, BOLTS and STUDS

- General information about nuts, bolts and studs.



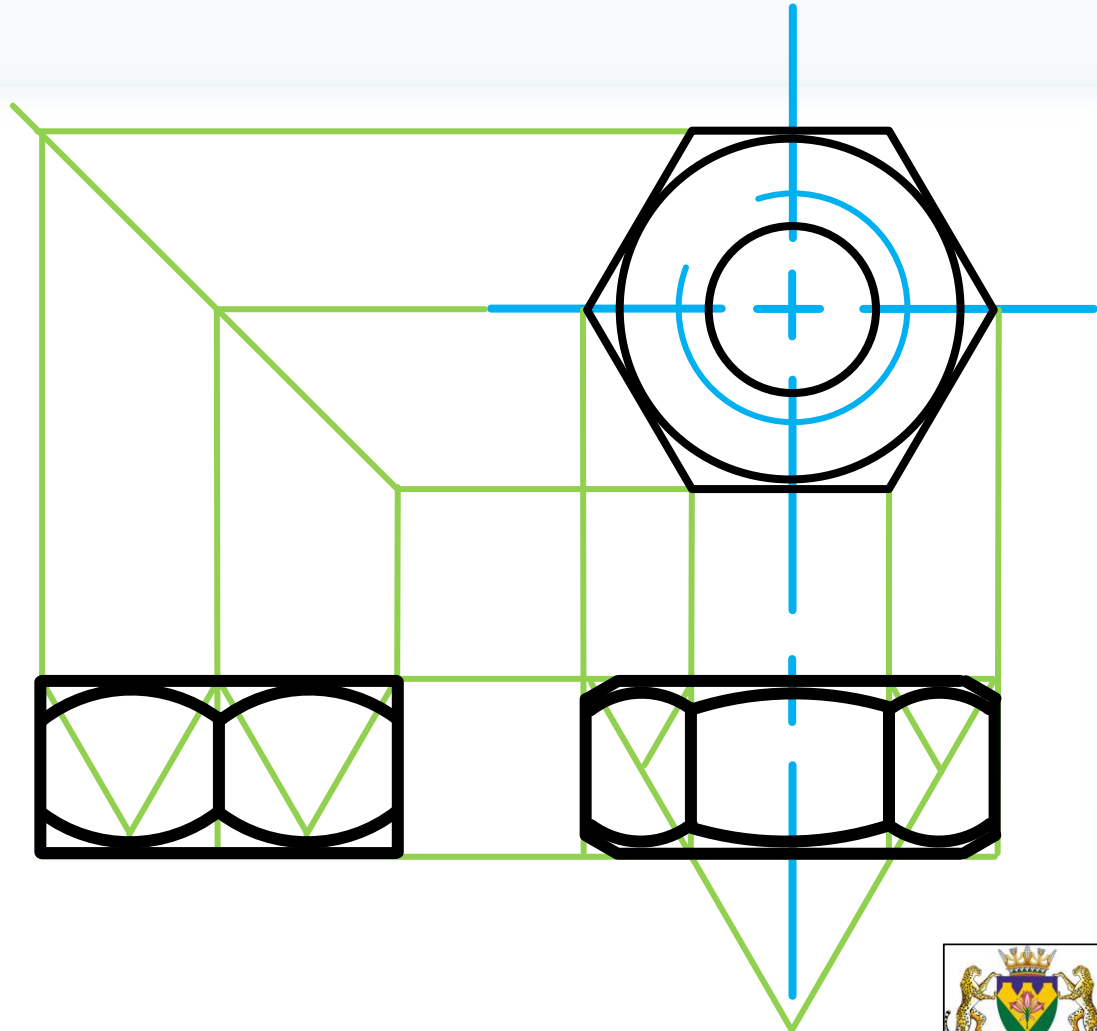
# Construction of NUTS, BOLTS and STUDS

- General terminology
  - **A NUT**



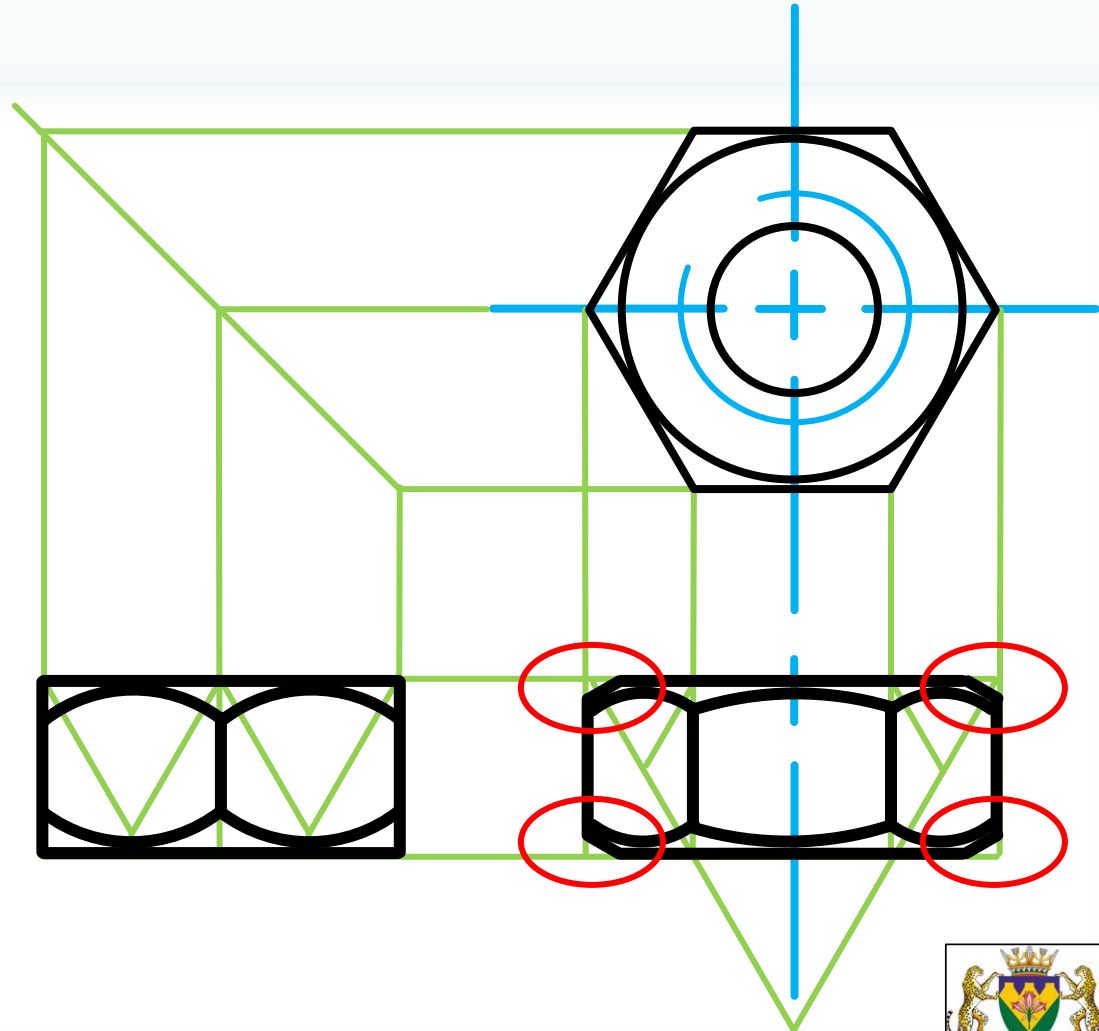
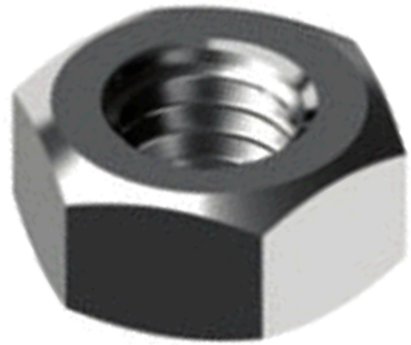
# Construction of NUTS, BOLTS and STUDS

► **Nuts** may **not** be sectioned.



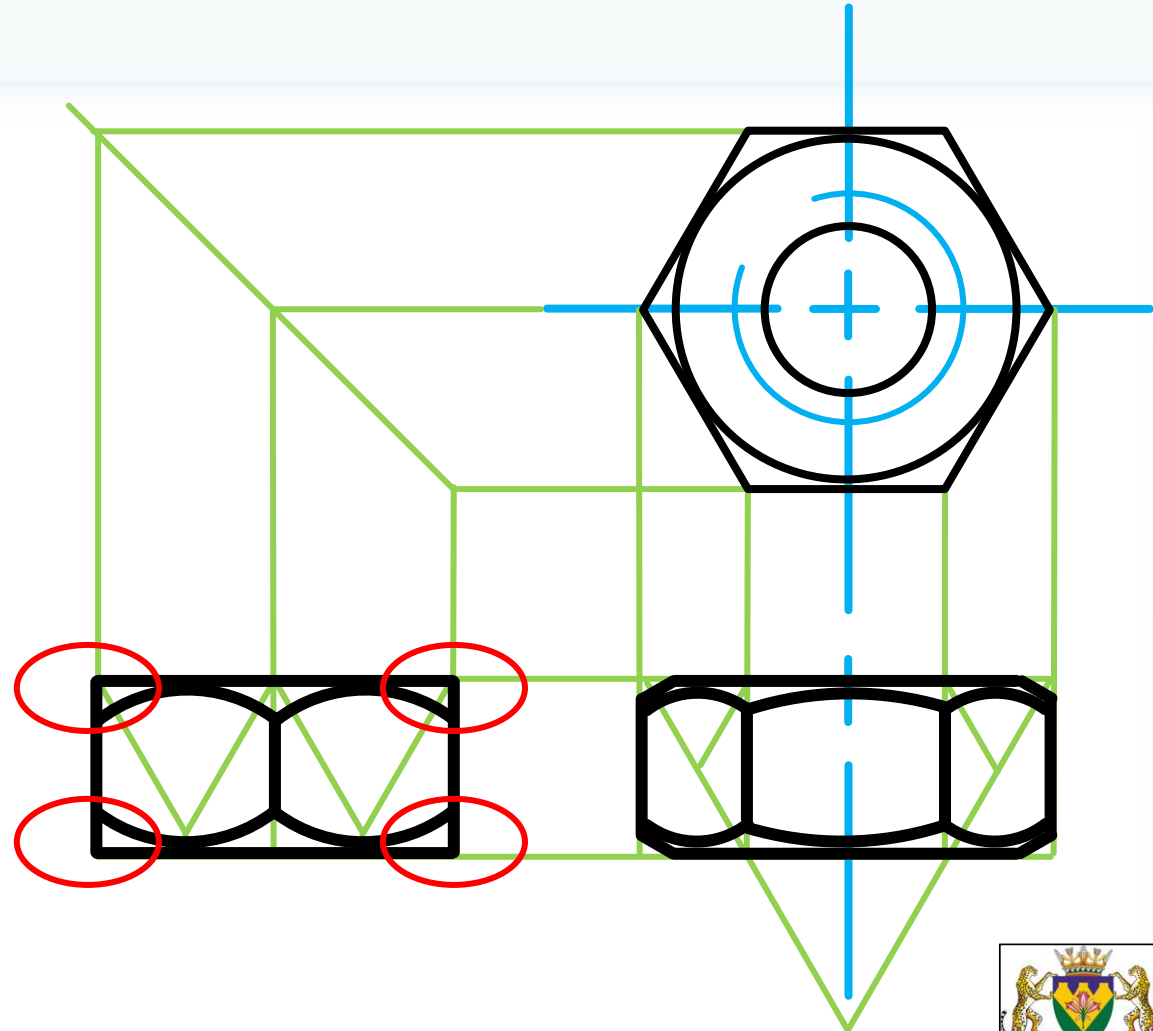
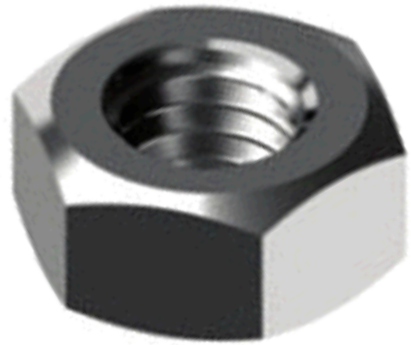
# Construction of NUTS, BOLTS and STUDS

► **Nuts** should be edged in the front view.



# Construction of NUTS, BOLTS and STUDS

► **Nuts** should NOT be edged in the left view.



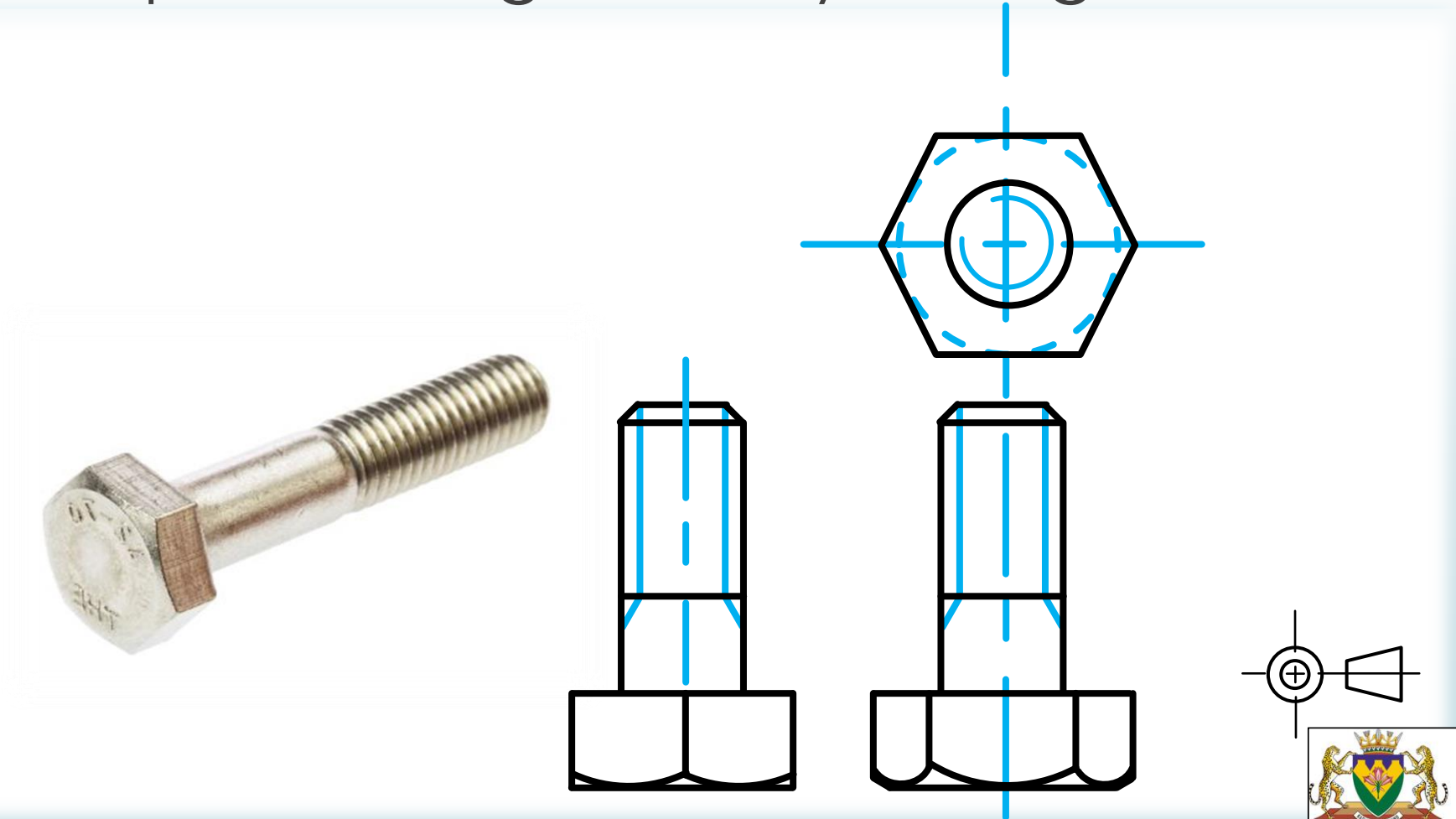
# Construction of NUTS, BOLTS and STUDS

- General terminology
  - **A BOLT**



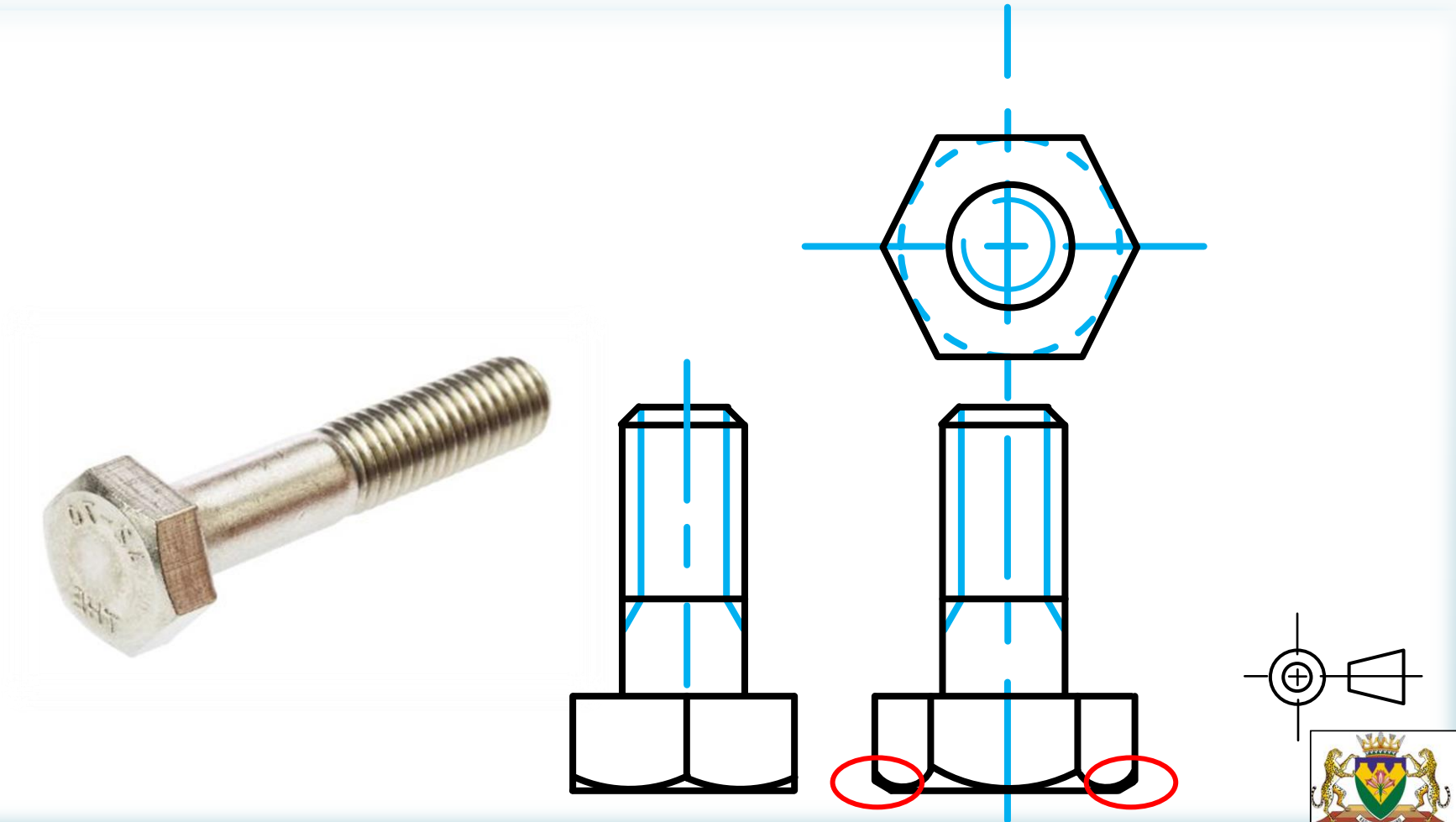
# Construction of NUTS, BOLTS and STUDS

- **Bolts** may **not** be sectioned when the cutting plane passes longitudinally through them.



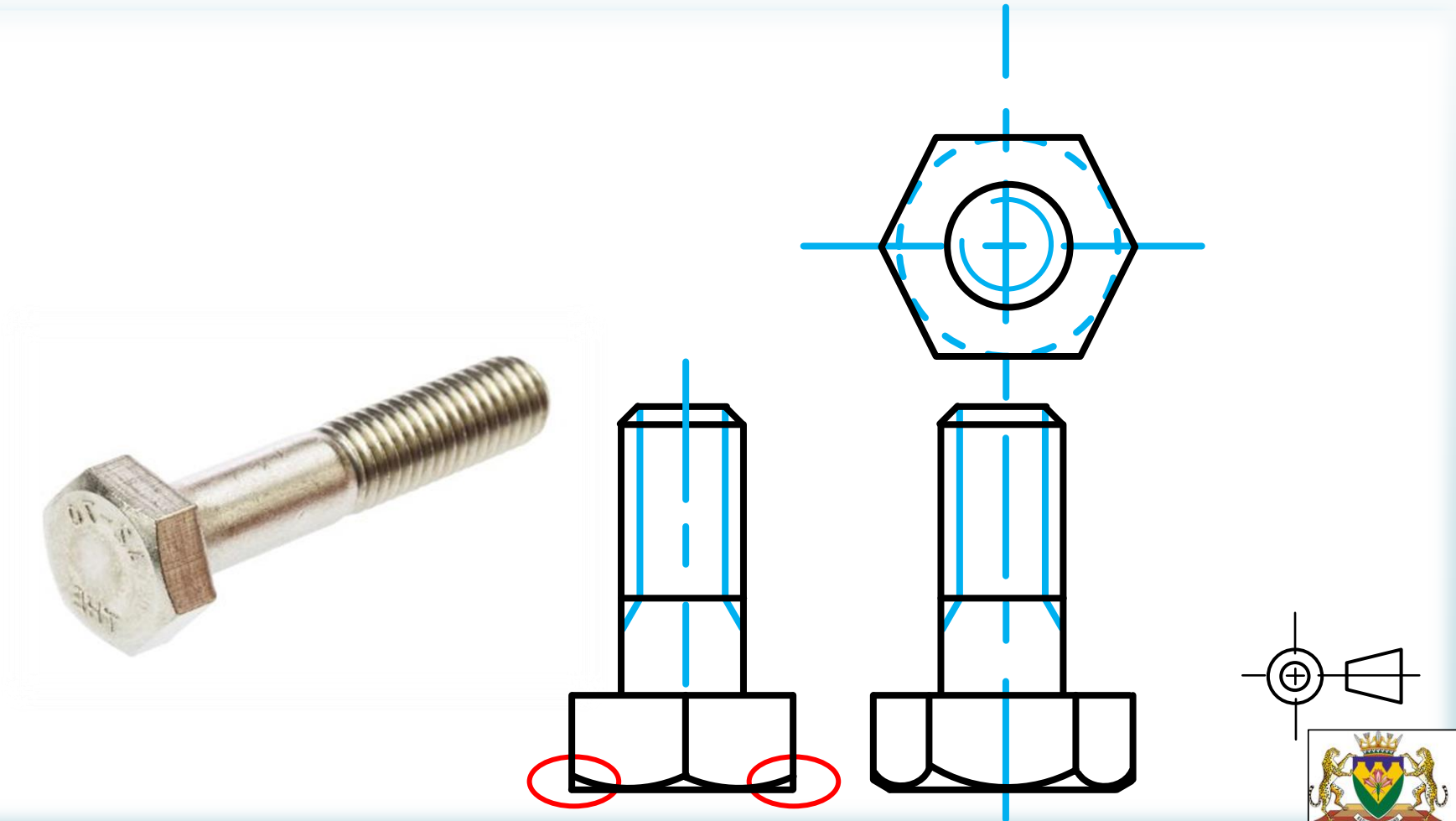
# Construction of NUTS, BOLTS and STUDS

► **Bolts** should be edged in the front view.



# Construction of NUTS, BOLTS and STUDS

► **Bolts** should NOT be edged in the left view.



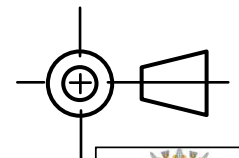
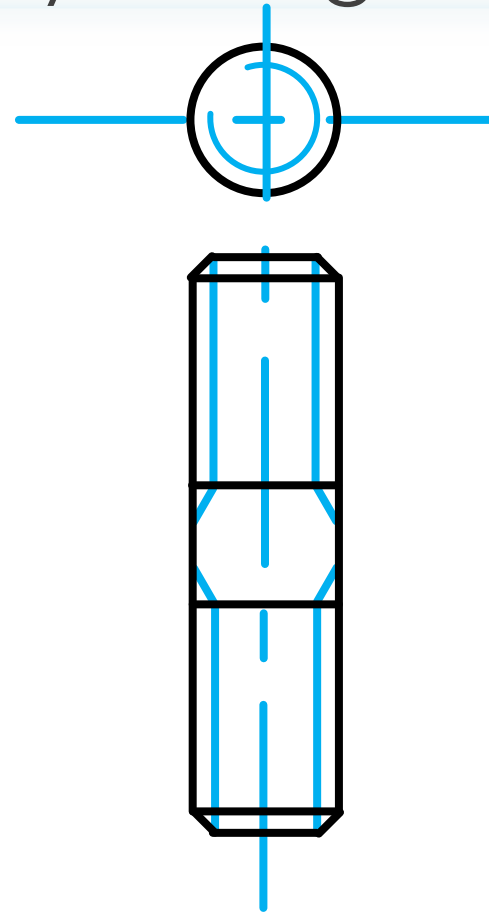
# Construction of NUTS, BOLTS and STUDS

- ▶ General terminology
  - ▶ **A STUD**



# Construction of NUTS, BOLTS and STUDS

- **Studs** may **not** be sectioned when the cutting plane passes longitudinally through them.



# Construction of NUTS, BOLTS and STUDS

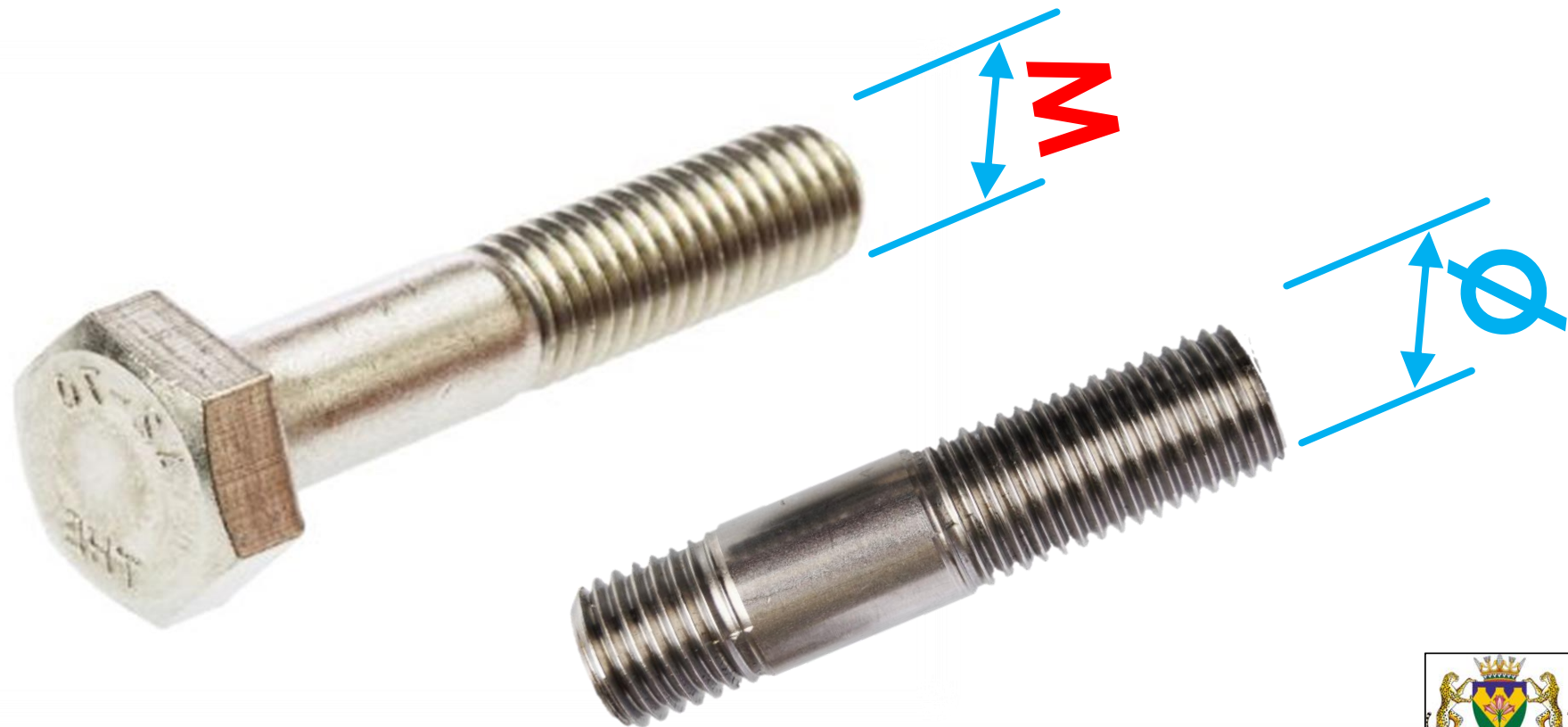
► General terminology

► DIAMETER ( $\varnothing$  or **M**)



# Construction of NUTS, BOLTS and STUDS

- The outer diameter of the bolt/stud will determine all the dimensions of the **nut** and **bolt**



# Construction of NUTS, BOLTS and STUDS

► General terminology

► **ACROSS FLAT (AF)**

► The **AF** will always be 1,5 of diameter

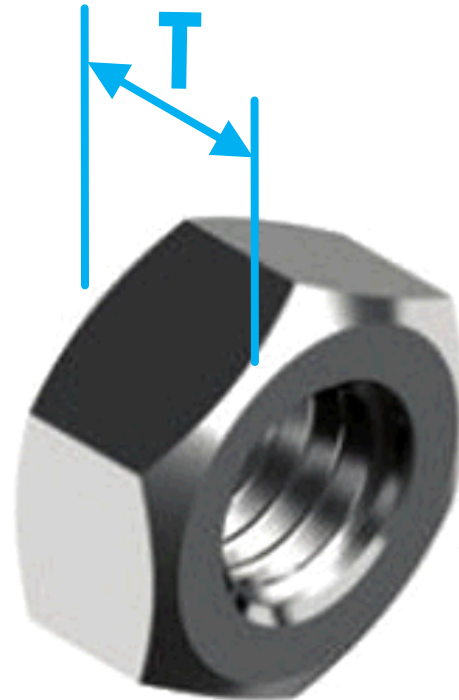


# Construction of NUTS, BOLTS and STUDS

► General terminology

► **THICKNESS OF THE NUT (T)**

► The thickness of the nut (**T**) will always be **0,8** of diameter

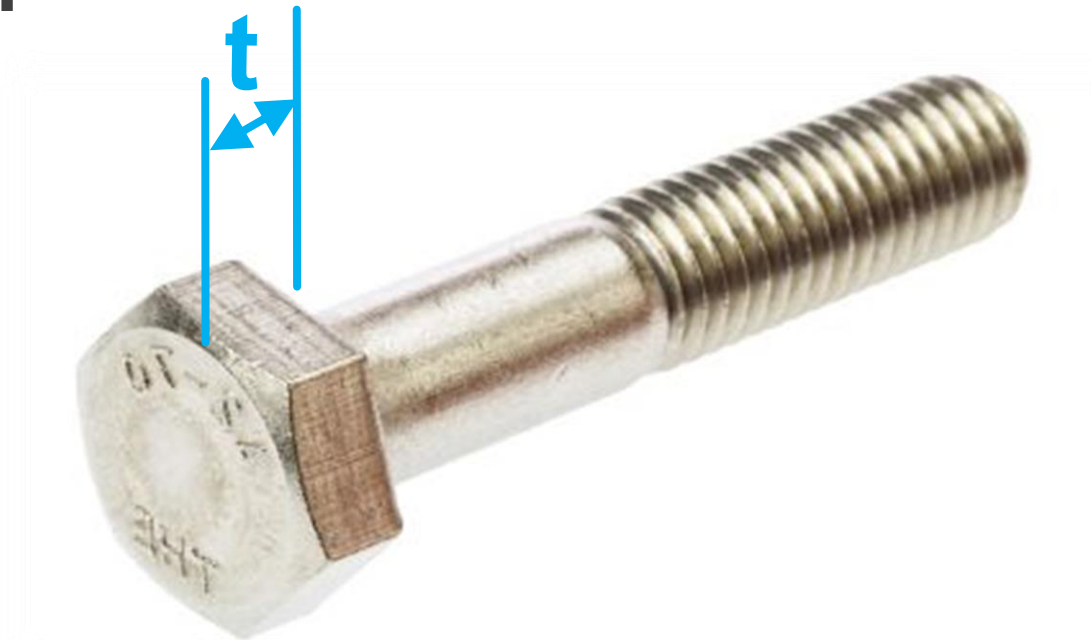


# Construction of NUTS, BOLTS and STUDS

► General terminology

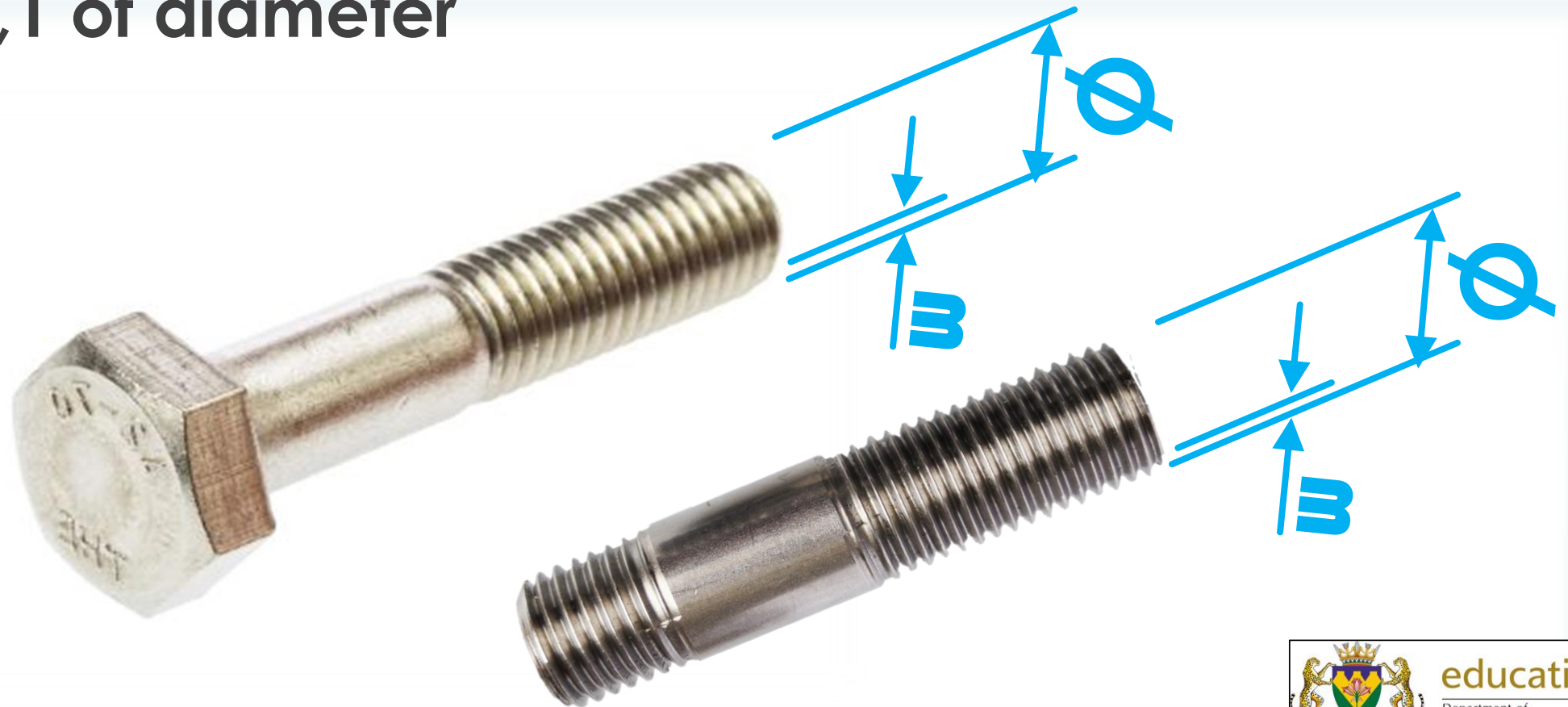
► **THICKNESS OF THE BOLT ( $t$ )**

► The thickness of the bolt ( $t$ ) will always be **0,7 of diameter**



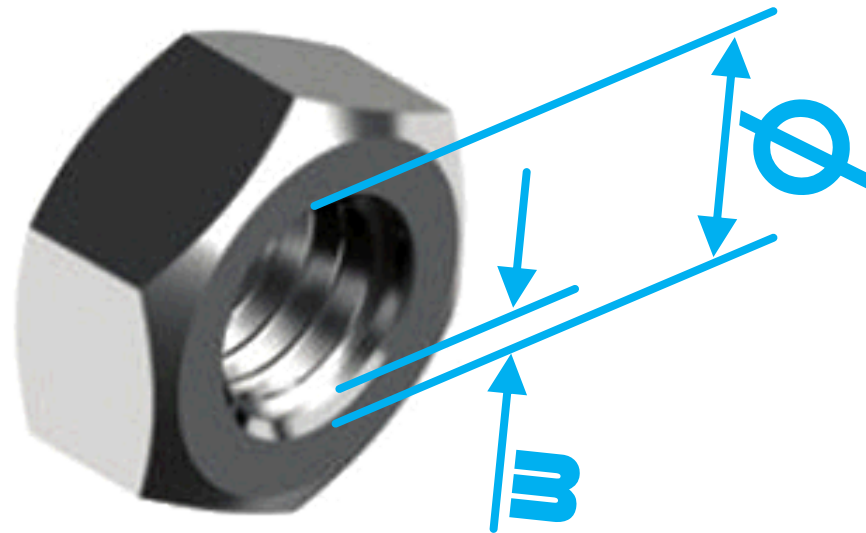
# Construction of NUTS, BOLTS and STUDS

- The thread size  $M$
- The thickness of the thread ( $M$ ) will always be **0,1 of diameter**



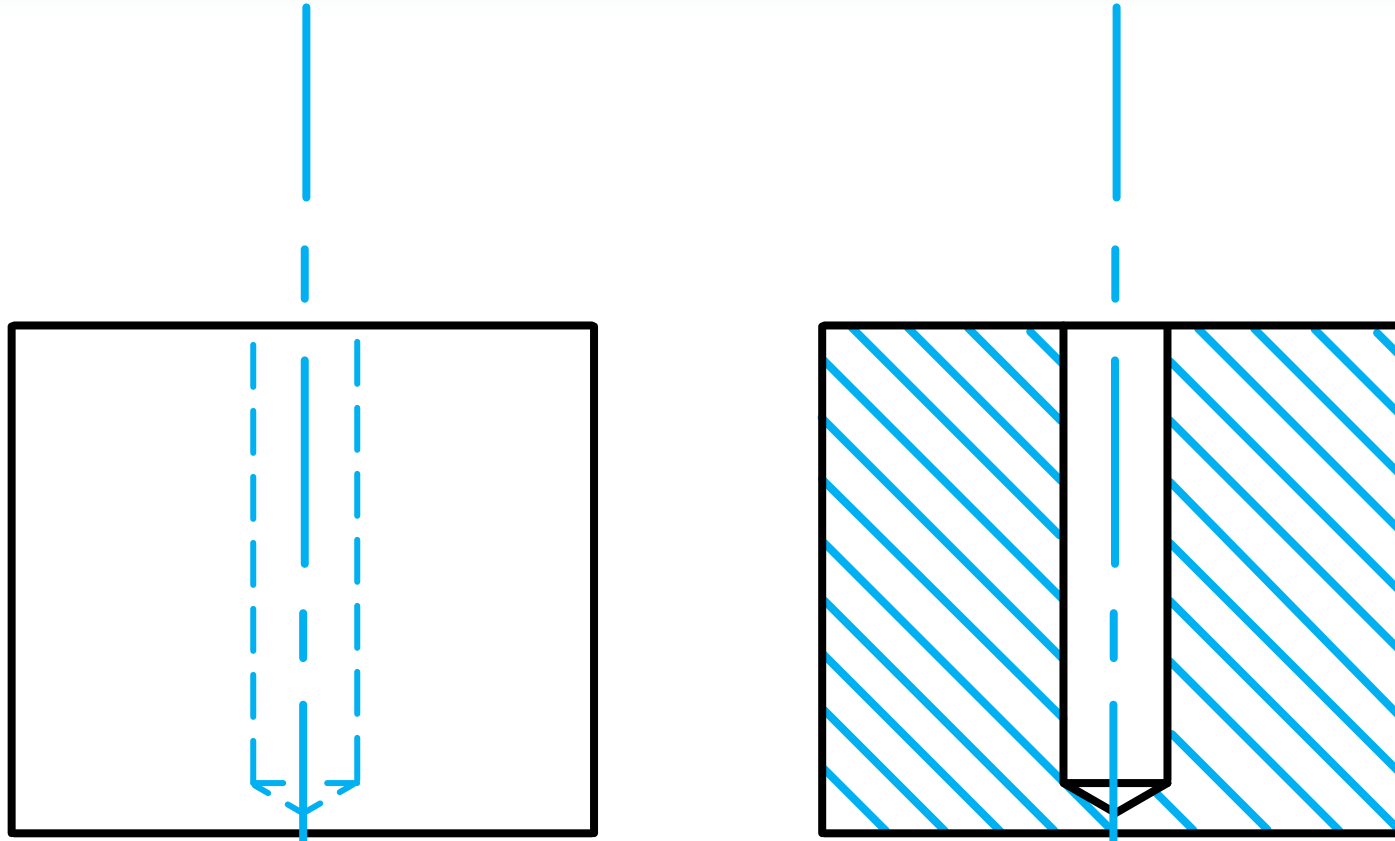
# Construction of NUTS, BOLTS and STUDS

- The thread size  $M$
- The thickness of the thread ( $M$ ) will always be **0,1 of diameter**



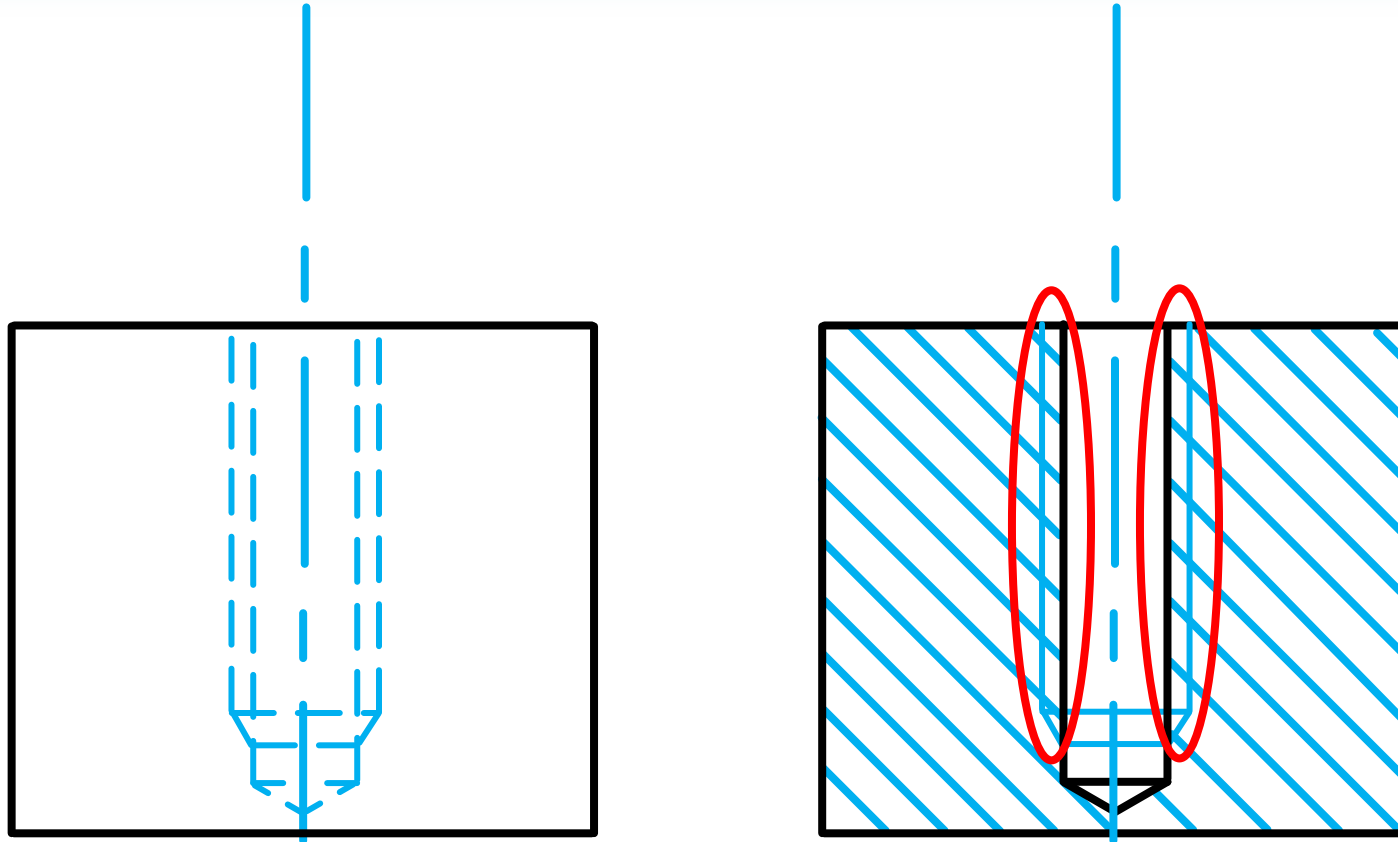
# Construction of NUTS, BOLTS and STUDS

- Hatching of an internal hole.



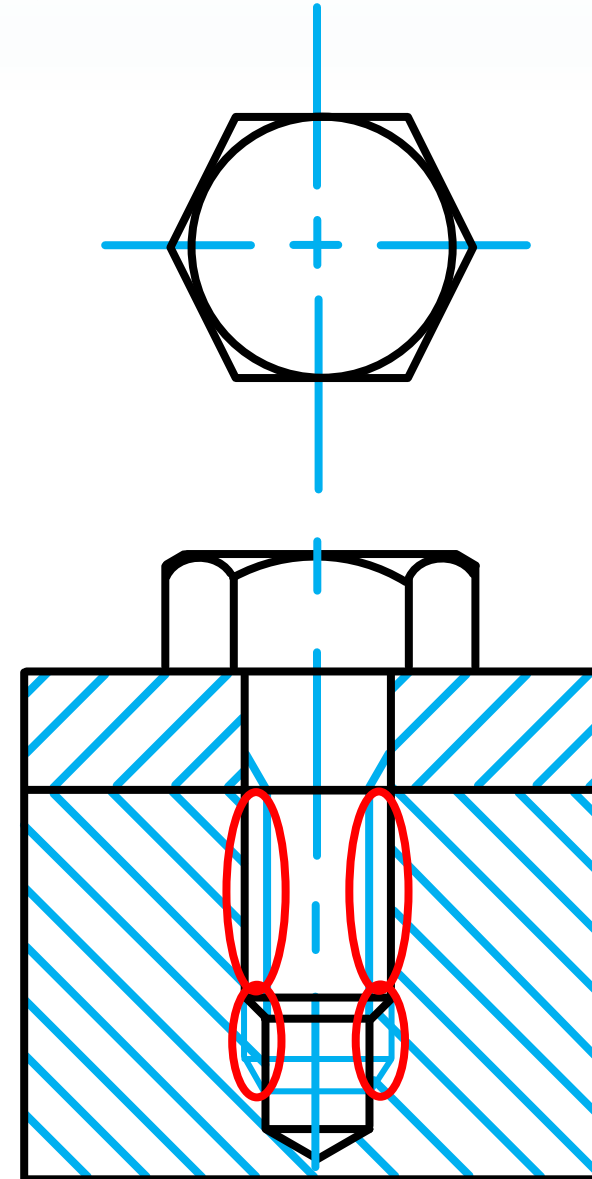
# Construction of NUTS, BOLTS and STUDS

- Hatching of an internal hole with thread.



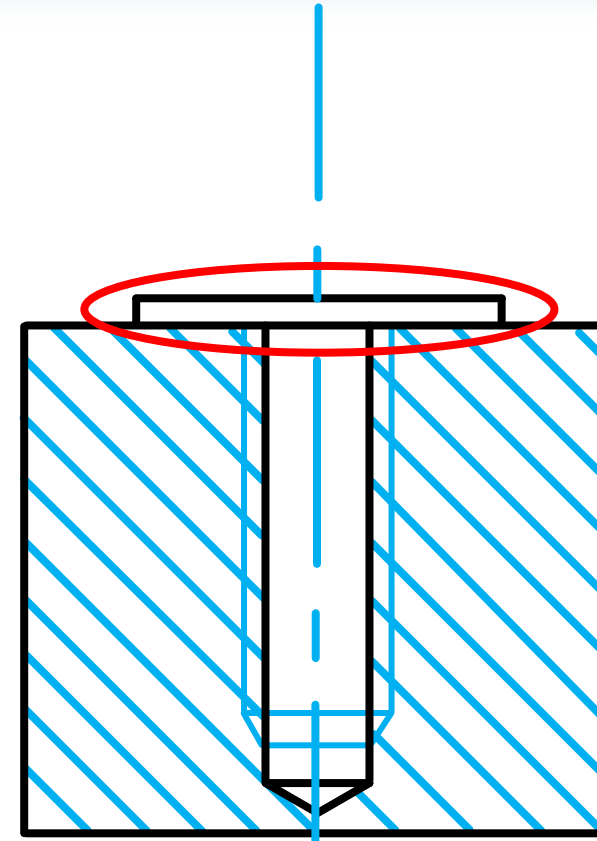
# Construction of NUTS, BOLTS and STUDS

- ▶ Hatching of an internal hole including a thread and a bolt.



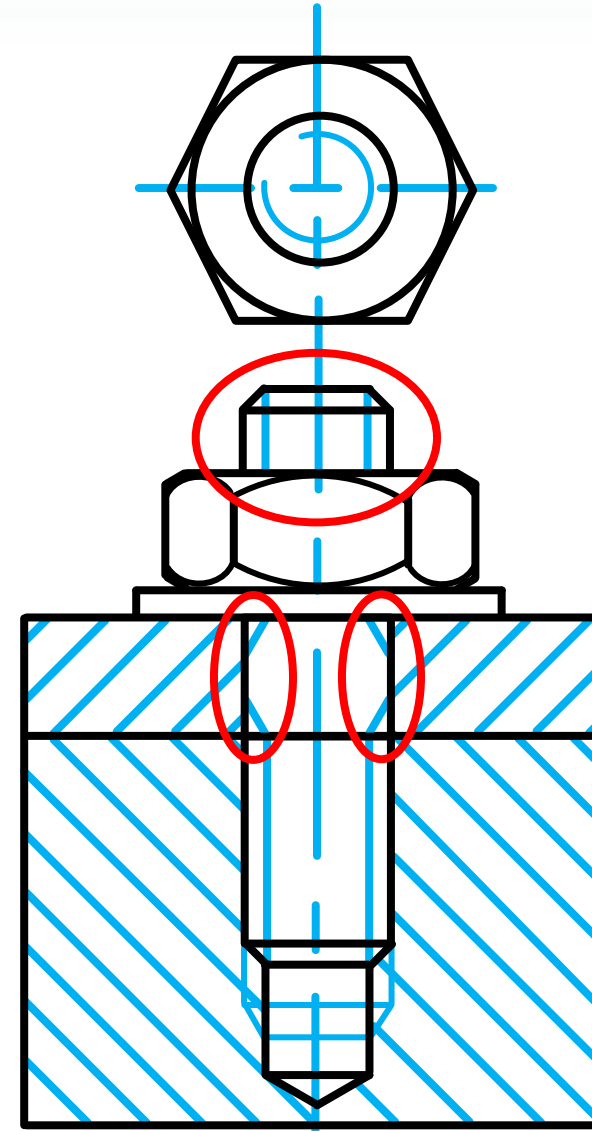
# Construction of NUTS, BOLTS and STUDS

- **Washers** may **not** be sectioned when the cutting plane passes longitudinally through them.



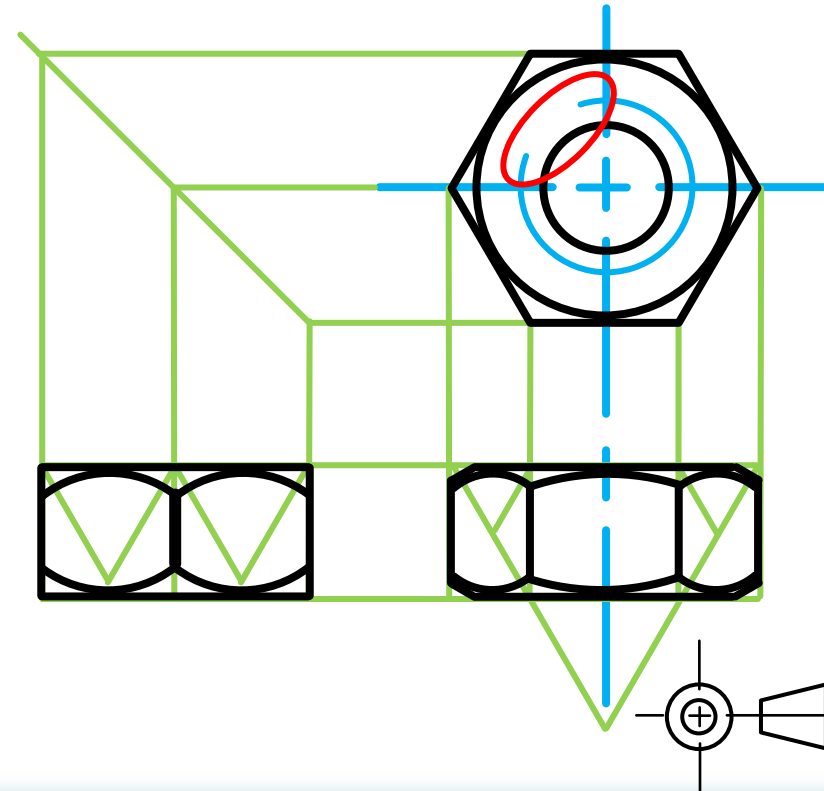
# Construction of NUTS, BOLTS and STUDS

- ▶ Hatching an internal hole including a thread, washer, nut and a stud.



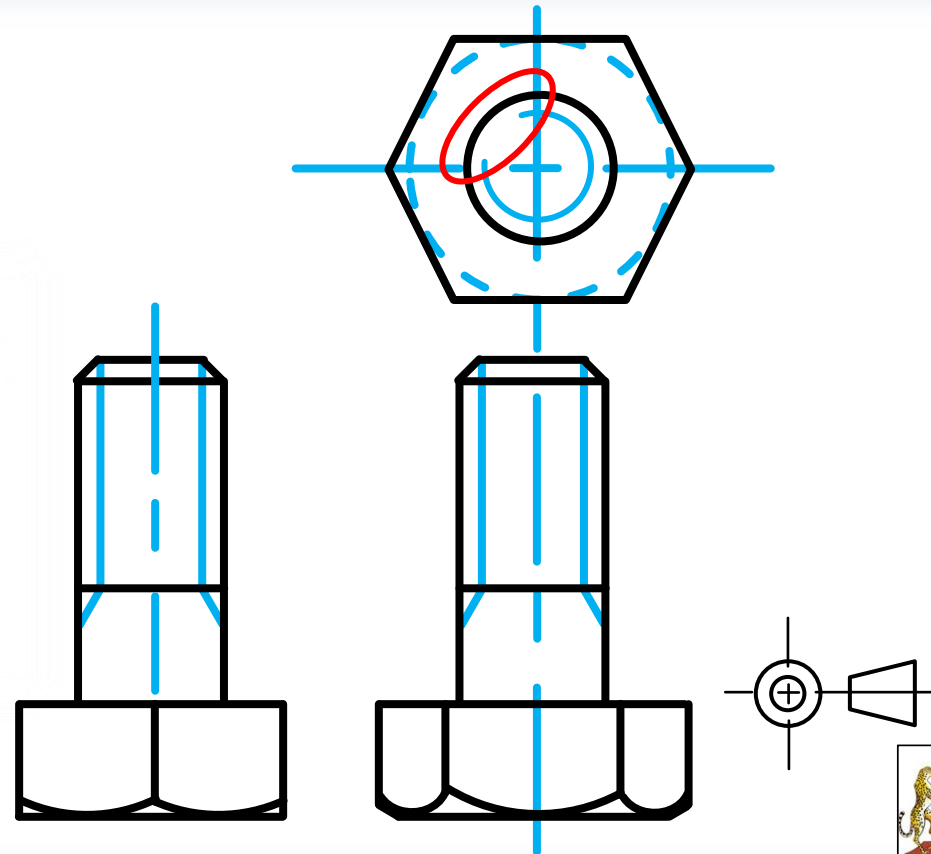
# Construction of NUTS, BOLTS and STUDS

- At the top view of a **nut**, the hole will be shown as a solid circle on the inside while the thread will be on the outside as a broken circle.



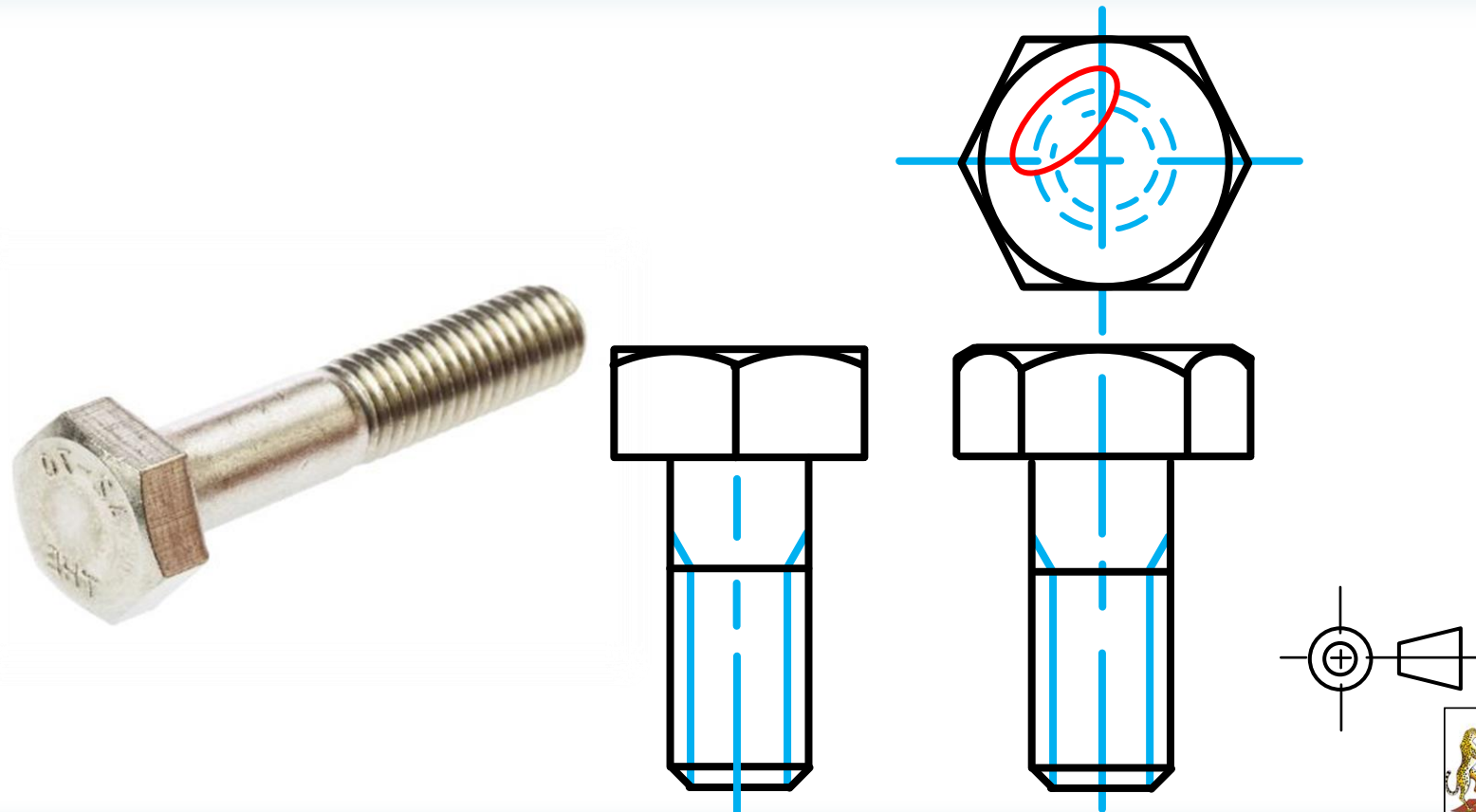
# Construction of NUTS, BOLTS and STUDS

- At the top view of a **bolt**, the shank will be the solid circle on the outside and the thread will be shown inside as a broken circle.



# Construction of NUTS, BOLTS and STUDS

- At the top view of a **bolt**, the shank will be the solid circle on the outside and the thread will be shown inside as a broken circle.



# Construction of NUTS, BOLTS and STUDS

- At the top view of a **stud**, the shank will be the solid circle on the outside and the thread will be shown inside as a broken circle.

