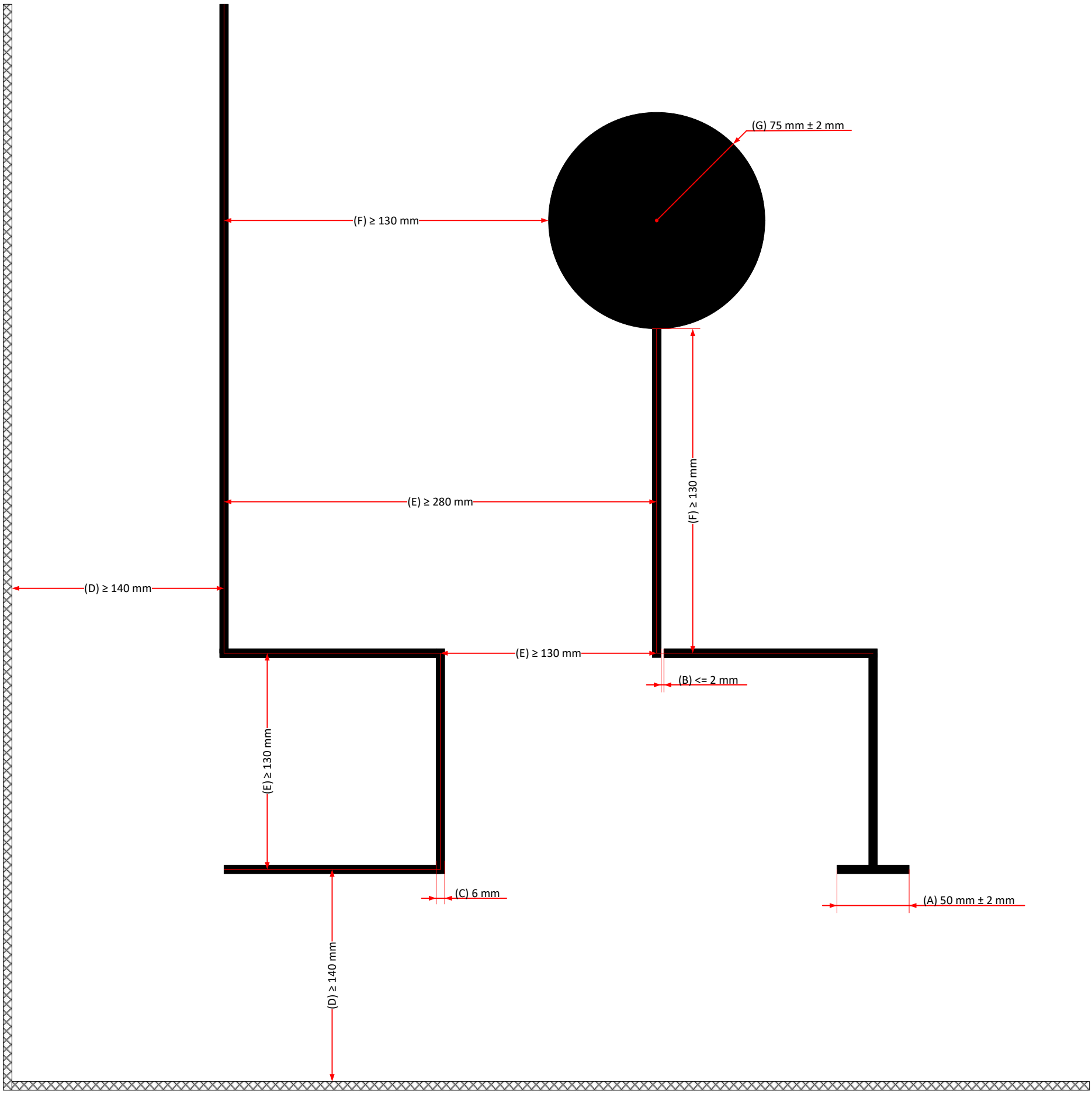
Maze Definition

- Maze is 2.4 meters by 2.4 meters
- Maze has a start tee where robot starts from
- Maze has an end circle which robot must reach
- Maze is built on white glossy PVC sheets, due to large size several PVC sheets can be assembled into one maze (care will be taken so gap is very small)
- Maze is built from roughly horizontal and vertical lines which intersect at roughly 90 degrees
- Maze lines are made from black matte chart tape 6 mm wide
- Maze can contain any number of loops
- Maze can have some line groups not connected to other line groups. So not all lines are reachable by robot if it follows rules
- Lines can terminate without any warning (deadline)
- Lines intersect at nodes which have roughly defined coordinates (see figures below)

Rules

- Robot has 3 attempts each lasting 3 minutes to find an exit
- Maze stays the same between each attempt
- Robot starts from the same point in each attempt
- Robot attempt time is either 3 minutes or the time at which robot drove over the end circle whichever is smaller
- Robot can continue exploring after it drove over the end circle, but robot MUST STOP before 3 minutes run out, otherwise it will be disqualified (if robot drives longer it can keep collecting data about the maze). You can compare / update robot clock with reference clock before the start
- You can play on test maze before competition start to calibrate the robot (for lighting conditions and materials)
- After robot leaves start tee, it MUST NEVER driver over it again during the current attempt
- Robot must have dimension of less than or equal to 150 mm * 150 mm * 150 mm
- Robot must always follow lines (with some part of the robot over the line) and must never jump between disconnected lines
- At all times some part of a robot must be over a line, if robot is fully on white space it will be disqualified
- Robot must be fully self-contained and must not communicate with any external hardware (any form of wireless, laser, sound, wired or any other form of communication is allowed)
- Robots must not be modified after maze is revealed, nor any commands can be provided (you can only power it on to start the run)
- Between runs you are allowed only to put robot to sleep to conserve charge and wake it up to start the run, no other modifications or commands or interactions are allowed
- Robots must complete all 3 runs on the same battery (if non-rechargeable) or on one charge (if rechargeable)



A – Starting position shape (tee which is 50 mm ± 2 mm wide).

B – Places where lines connect might have discontinuities of up to 2 mm.

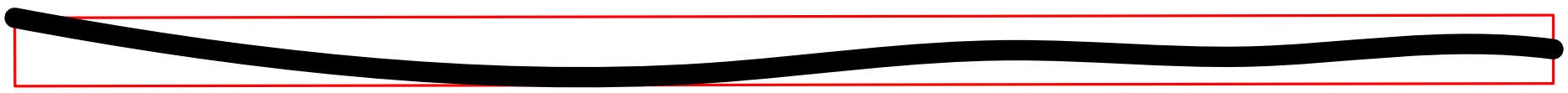
C – Line is a black matte chart tape 6 mm wide.

D – Distance from line center to the end of the maze (can be a small drop so do not drive there) is at least 140 mm.

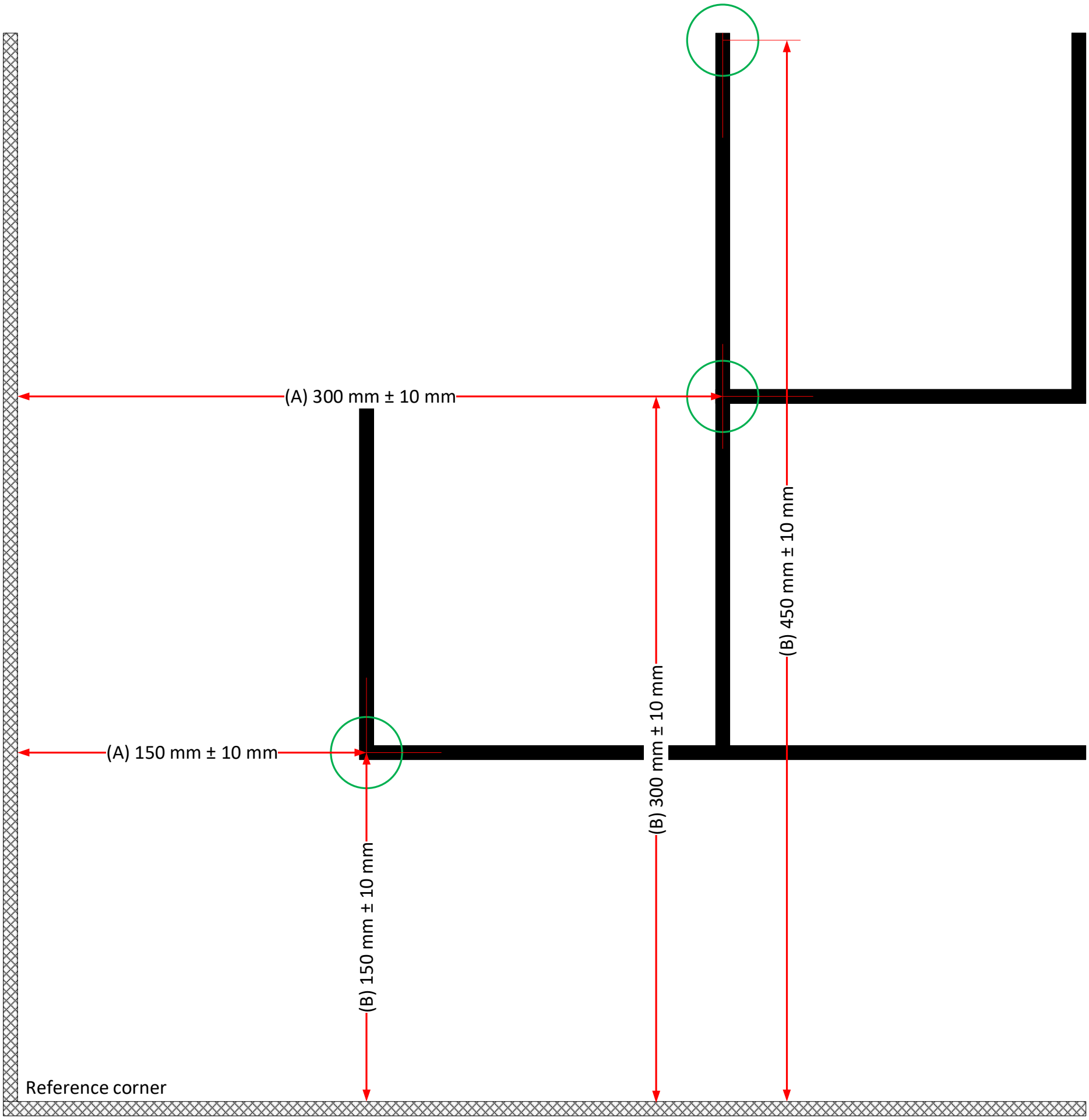
E – Distance between any 2 lines' centers is at least 130 mm if lines have ordinal numbers difference equal to one. In general, it is D = (150 * L - 10) – (150 * S + 10), where S is # of a line with a smaller ordinal number, and L is # of a line with a larger ordinal number. E.g. S = 1, L = 3, D = (150 * 3 – 10) – (150 * 1 + 10) = 280 mm.

F – Line centerlines are at least 130 mm away from the circle.

G – End of the maze is a circle with radius of 75 mm.



If line center stays within tolerances (± 10 mm) line can weave a bit but care will be taken to make it straight. Straight lines won't have sharp corners (apart intersections between 2 lines which are approximately at 90 degrees). Red box is a tolerance box, black is an example of a line.



All lines are measured from the reference corner. Please note that any corner can be a reference corner (doesn't really matter which one is it, the main point is that all distances are measured from the same reference).

A – distance of horizontal lines from origin's Y axis can be calculated as X = 150 * A ± 10 mm, where A is an ordinal number of intersection (left-most is 1, next one to the right is 2, and so on).

B – distance of vertical lines from origin's X axis is calculated in a similar fashion as Y = 150 * B ± 10 mm, where B is an ordinal number of intersection (bottom-most is 1, next one up is 2, and so on).

Please note that care will be taken to make lines parallel and all corners be as close as possible to (150 * A, 150 * B) but stuff happens, so don't count on it 😉.