

2017 ASABE Student Robotics Competition

Rules Clarifications and Example Board.

The following clarifications should help clear up any confusion created by gaps or mistakes in the original release of the rules. No significant changes have been made to the overall competition.

Board Layout and Canes: Rule 3g.

- Should read: "**Grids** without canes will not have a cane holder in them, and the hole will be exposed."

Question: Is there any specific requirement for the cutting location? For example, it has to be at least 4 inches below the top of the cane.

Answer: There must be at least 4 inches of cane above the cut, otherwise, it can be cut anywhere between the top of the holder and that point. There will be at least 6 inches of cane exposed, so you will have a roughly 2" region above the top of the holder where you can cut the cane.

Question: It is stated that the robots cannot drive over the tops of the cane. What if the canes are cut? Can the robot drive over the cut canes and holders? What punishment will there be if the robots drive over the canes?

Answer: Even after the canes are cut, it is unlikely that there will be enough room for the robots to navigate within the row (zones 1-5). Some example board layouts will be made available next month to show this better. Parts of the robot can protrude into the row without penalty, but the robots cannot be driven into the row or over the top of the row. Think about those over-the-row sprayers used in corn production; that kind of movement would not be allowed. Any canes cut by driving over the row would count as 0 points.

Question: Are the robots allowed to move beside the two rows? In other words, can the robots move in the blank areas?

Answer: The robots are intended to move in the blank areas. The 1" black vinyl tape is there to provide navigational guidance for the robot, if needed. The "Row" as written in the rules refers only to the two areas defined by zones 1-5.

Question: Are the balsa wood strips cylindrical? If not, what is the width of the strips? It appears from the .stl files of the holders that they would be cylindrical, but I wanted to double check.

Answer: The balsa strips will be square. The holder is designed so that the balsa can be easily taken out after being cut, thus the round shape. There will be 1/16" and 1/8" balsa strips.

Question: Can we drive over the balsa wood after the balsa wood has been cut?

Answer: Once the balsa is cut, your team can choose to leave the cut portion of the cane within the row (zone 1-5) or move it outside of the row for extra points. Whether you carry the cane on your robot, drop it off the edge of the board, or leave it in the travel area outside of the rows is up to you. You cannot, however, remove the cut canes from the row by hand. Any canes removed in this manner will count as zero score.

Question: Could you define removal of cane in more detail. Does it have to be off the zone or off the black tape boundary to be considered removed? Would it be considered removed as long as it is contained on the robot?

Answer: To be considered "removed", the cane needs to be outside of the row (which consists of zones 1-5). If any part of the cane extends into the row, it will not be considered removed. Refer to the figures at the end of this document for a visual explanation.

Question: What is an intervention?

Answer: An intervention is any human contact with the robots, canes, or the board after autonomy has started.

There are two types of interventions: *Scoring Penalized* and *Cane Penalized*.

Scoring Penalized interventions are:

- Short interactions such as course adjustments or clearing of obstructions.
- The robot cannot touch or cut a cane during the intervention.

In this case, interventions will be penalized once per touch at a rate of 5 points per touch. Each touch, no matter how short the time in between touches, will be penalized as a new touch.

Cane Penalizing interventions are:

- Long interactions, lasting 3 seconds or more.
- Interactions which cause the robot to touch or cut a cane.

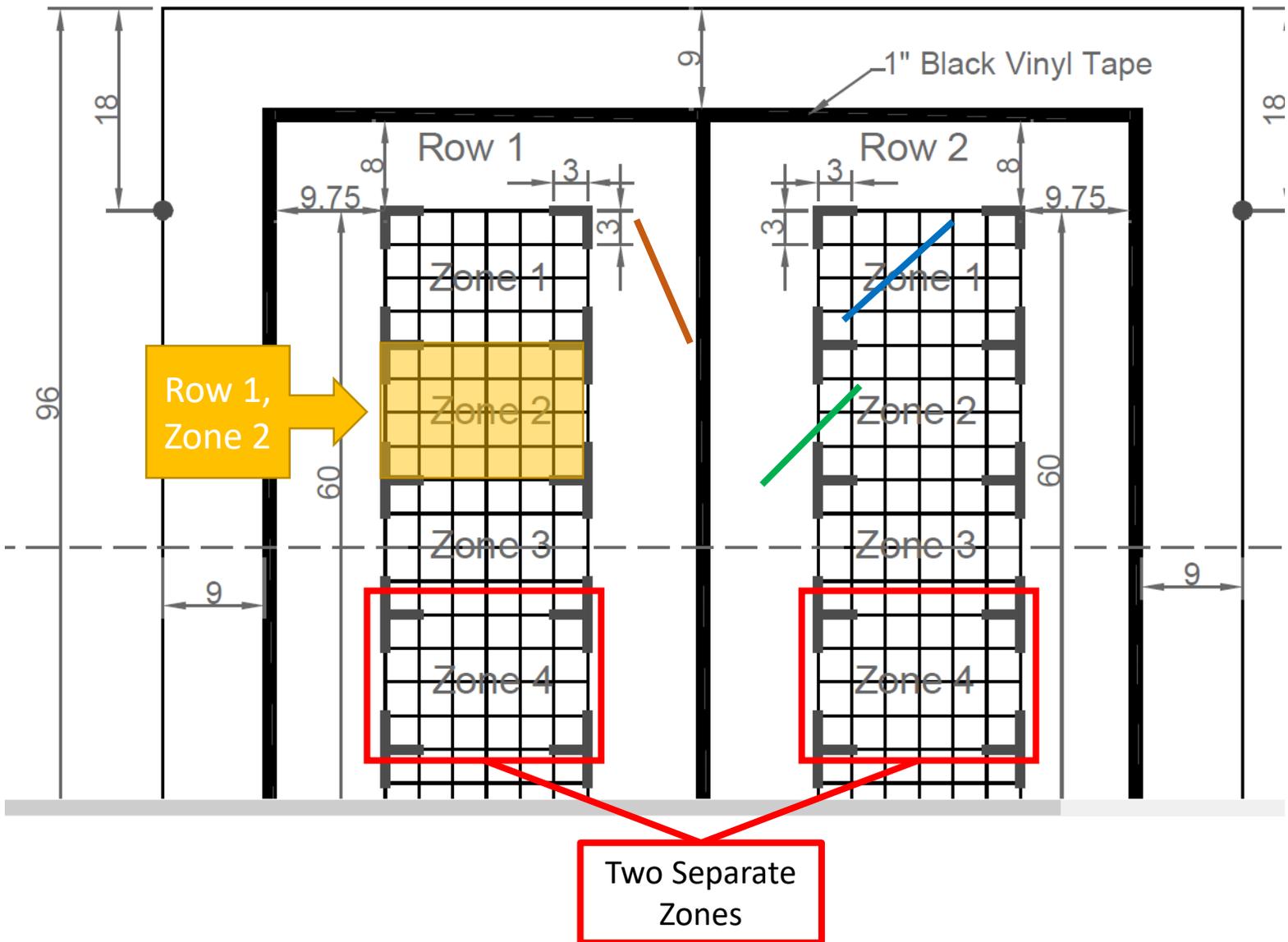
In this case, interventions will be penalized once per touch at a rate of 5 points per touch, and no points will be awarded for the canes touched by the robot during the course of the intervention. Each touch, no matter how short the time in between touches, will be penalized as a new touch.

Interventions in which the robot is lifted from the board, or the robot is moved a significant distance, will be reviewed by the judges at the end of the round. If an intervention is determined to provide a significant unfair advantage for the team, the team may be disqualified or have additional points penalties applied.

Question: What color will the balsa holders be?

Answer: White.

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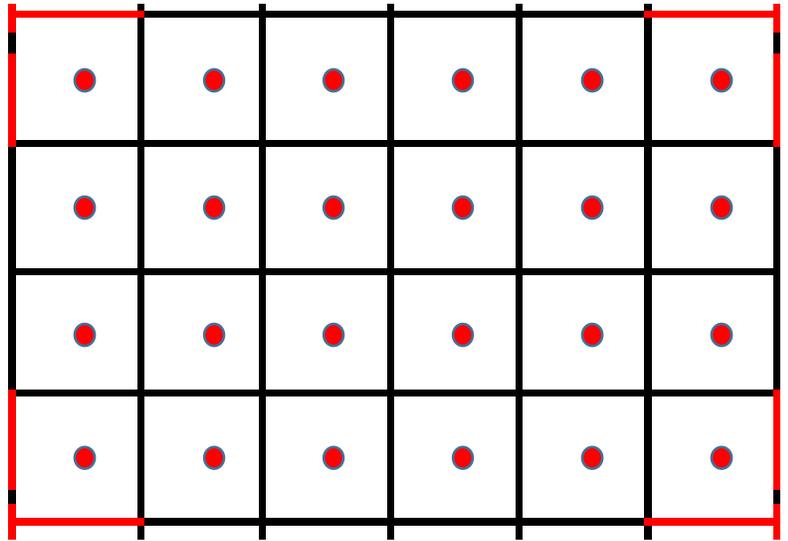
The yellow region shows the limits of Row 1, Zone 2. This is one “zone” as referred to in the rules. There are 2 rows with 5 zones each for a total of 10 zones.

The red zones at the bottom show that adjacent zones in opposite rows are considered independent rows.

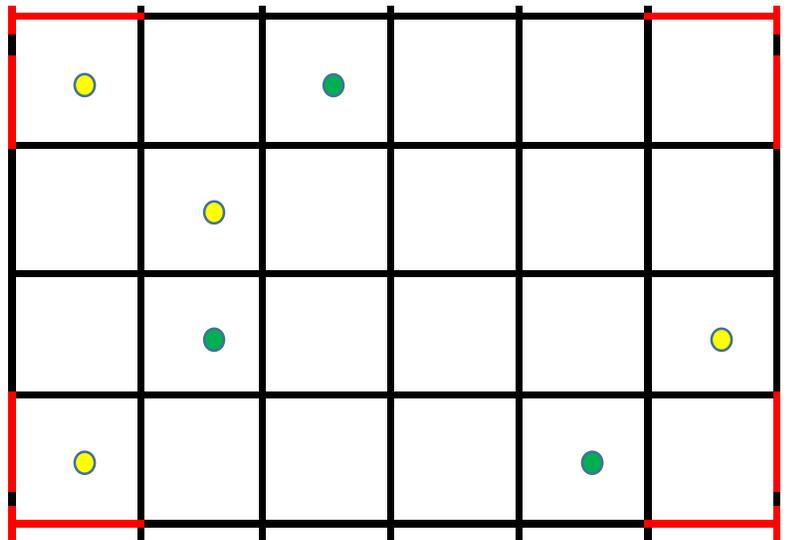
Trial Runs and Scoring: Rule 6c

- The orange cane next to row 1, zone 1 is considered “Removed” from the row because no portion of it is within the row.
- The green cane in row 2, zone 2 is not considered “Removed” because part of the cane extends into the row.
- The blue cane in Row 2, zone 1 is not considered “Removed” because the entire cane is within row 2.

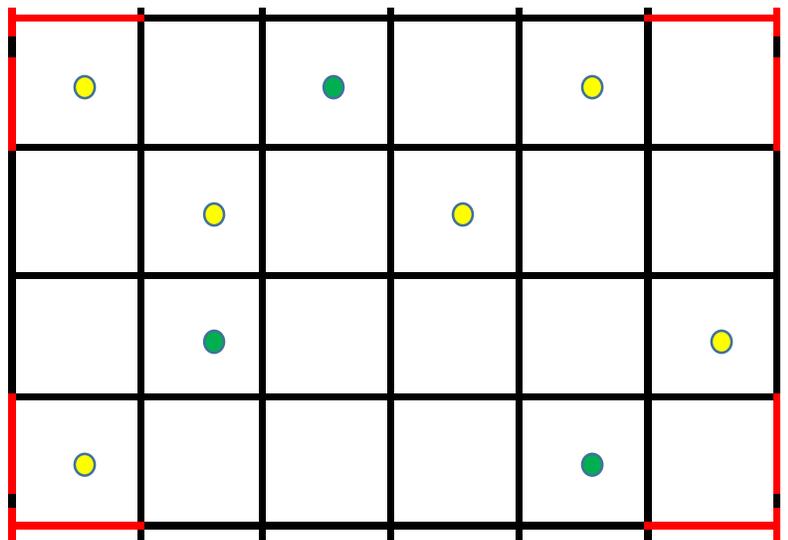
The red dots show the possible locations of cane holders with any zone. Each “Grid” may only have once cane holder in it. Keep in mind that if there is no cane holder in a given grid, the hole will be exposed.



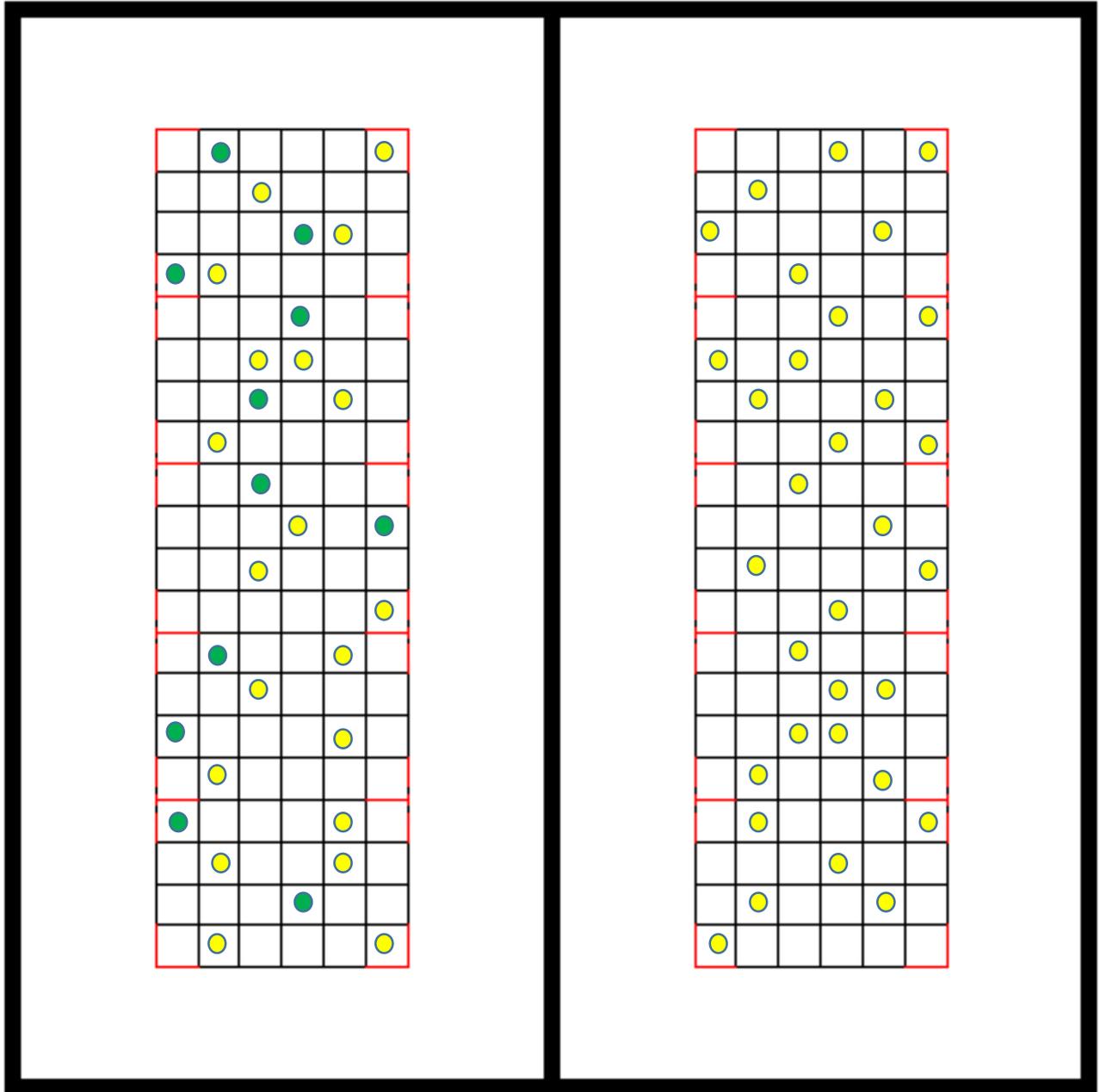
Row 1 zone 2 is shown. The yellow dots represent strong canes and the green dots represent weak canes. This zone shows one possible layout that may be used during the competition. Notice that no canes are obstructed when viewed from both sides (per “Board Layout and Canes: Rule 6”).



Row 1 zone 2 is shown. The yellow dots represent strong canes and the green dots represent weak canes. This zone shows an **impossible** layout that **cannot be used** during the competition. Notice that the weak at the top is obstructed from view on both sides and that there are more than 5 strong canes, both of which violate the rules.



Here is an example of what a randomized board might look like during the competition.



- Strong Cane
- Weak Cane

Here is a blank sample board for you to create your own random board layout.

