COMPETITION REGULATIONS
RTC CUP

Appendix No. 2: Points Assessment System and Conditions of Passing the Ground Sections.

The points shall be given for passing of the maze and tests, riding through the field sections, collection and placement of the beacons according to the color zones.

Robot's automated actions: autonomous crossing through sectors or automated finding and lifting of a beacon by a robot. The participants shall inform the judges in advance of the actions their robots perform automatically. If actions are performed automatically from the start to the end (passage of a sector, performance of a task), the points for passage of such sector shall be **doubled** (by default). Points given for autonomous passage of certain sectors may be increased **in 5-7 times**. Full list and detailed description of such sectors is provided in Appendix No. 3: Automatics on the Proving Ground.

Penalty for interference with the robot's operation (when the robot gets stuck, hung up, requires a reboot or repair) totals **70 points.** Option of intervention may be used only once.

Points for passing of the sections of the **Maze** shall be given separately for each passed cell (block) of the Maze. Test or cell shall be considered passed, if the robot entered the cell through one doorway and left it through another. The points given for a cell shall be determined in accordance with complexity of its passage. Cell may contain or not contain a test.

Opening of the **Door** at the start shall be assessed in the following way.

60 points for **pulling** the Door.

15 points for **pushing** the Door behind locker (the Door is to be opened at 90°). Therefore the passage through the second doorway. Hereupon it **is forbidden** to move backwards through the door or begin from the open start.

Points and methods of passing the sections are provided in Table 1.

Beacons Collection

Collection of Beacons in the **Field**

15 points are given for lifting a beacon at more than 20 mm for not less than 3 seconds. This is not an obligatory requirement, a beacon can be pushed or pulled to the respective zone.

30 points are given for moving the first beacon in the **Field** to the respective color zone. Points given for moving of each subsequent beacon shall be increased by **10 points**.

Collection of beacons in the **Maze**

15 points are given for lifting of a beacon in the same conditions as in the Field.

50 points are given for moving the first beacon in the **Maze** to the respective color zone. Points given for moving of each subsequent beacon shall be increased by **10 points**.

High Beacon is a beacon located at an elevation representing a miniature copy of the Tower. **60 points** are given for the beacon's displacement from the Tower. Beacon shall be gripped by the robot's manipulator.

Beacon in the **Tower**

15 points are given for lifting of the beacon in the same conditions as in the Field.

100 points are given for moving down with the beacon gripped.

50 points are given additionally if the robot delivers the gripped beacon to the white zone.

80 points are given additionally if the robot grips the white beacon from the **Tower** and delivers it to the white zone in another way.

If the beacon is displaced from the **Tower** by dropping, no points are given.

The operator's presence in the Tower is strictly **forbidden**.

Beacon is considered placed within a zone if it touches the zone field by any its part.

If a beacon is placed in a wrong zone, points shall not be scored and beacon may not be further used.

If a beacon touches the field of the respective colored zone and falls away from this zone, the points will be scored.

If a beacon is placed in any zone or dropped beyond the stand edge, the robot may not touch this beacon (in this case no points are given).

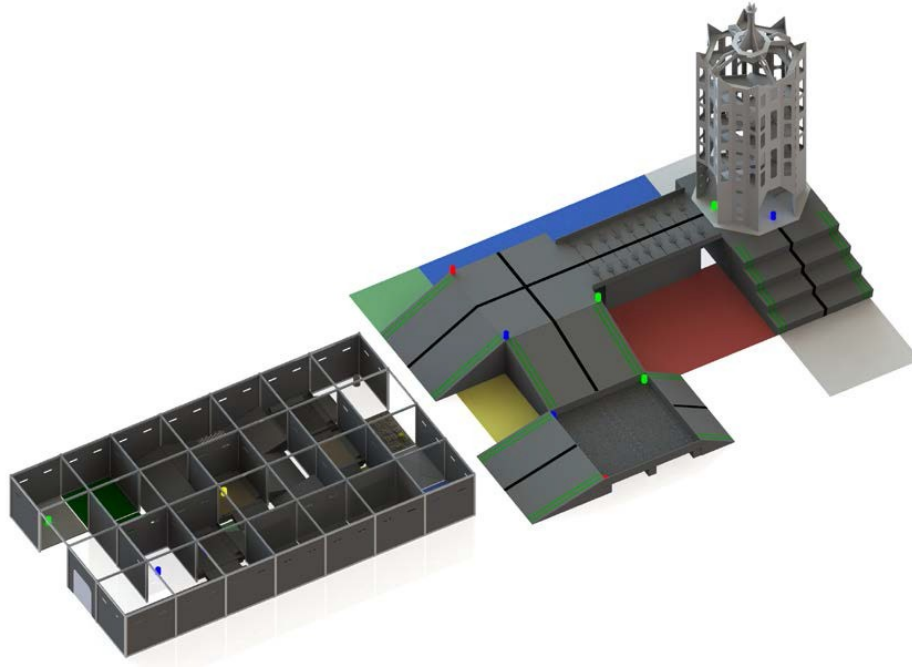Possible allocation of zones, beacons and sectors is shown in Figure 1.

Figure 1. Possible Beacons Allocation on the Field

Allocation and quantity of beacons shall be determined by the judges before the competition start.

Driving over the obstacles on the **Variable Geometry Bridge** is forbidden. Points shall not be given for the passage of this sector in such a way.

When passing through the **Gravel Sector** the robot shall move through the middle of the section, otherwise no points are given.

Table 1. Passage Methods and Scored Points

Section	Passage Method	Points (manual / automated operation)
Movement along the start line (only in automatic mode)		
Movement along the line	Automated operation	40
Beacon Grip	Automated operation	45
Turn with a beacon and movement to finish	Automated operation	25
Stop at finish	Automated operation	15

Obstacles in the Maze		
Door	Pulling of the door and movement through the doorway	60
	Pushing of the door and movement through the doorway	15
Doorway	Passage	20
Ice	Passage	25
Button	Pushing by any means	15
Grass (1 cell)	Passage	20
15° Inclined Surface	Moving up	15
Transparent Partitions (1 cell)	Passage	10
Marble	Passage	25
Ball Pool	Passage	80
Fog (1 cell)	Passage	20
Stones	Passage	40
Sand (1 cell)	Passage	45
Ice Slope (15° angle)	Passage	25
Grass Slope (15° angle)	Passage	30
Stony Slope (15° angle)	Passage	35
Mire	Passage	45
Roof	Crossing over along the straight line	40
	Crossing over with a turn	50
Swing	Passage	60
Turn	Moving through (without shortcuts)	45
Net	Passage	35
Expanded Clay	Passage	25
Deadlock	Entrance and exit	15
Tower with a beacon	Lifting of a beacon from the tower	60
Obstacles in the Field		
Interbedded Platform	Passage	
15° Inclined Surface	Moving up	15
15° Interbedded Slope	Moving up	15
30° Inclined Surface	Moving up	40
30° Short Slope	Moving up	25
35° Inclined Surface	Moving up	65
45° Inclined Surface	Moving up	70
Staircase	Moving up	400
	Descending by any means	90
Gravel Sector	Passage	30

Version 1.2015.00

Sand	Passage	60
Variable Geometry Bridge/Slalom	Passage	10/70(90)
Serpentine	Passage	10/50
Tunnel	Passage	5/30
Hanging Bridge	Passage	35
Tower	Moving at the bottom	10/20
	Passage to the second level	60/120
	Passage to the third level	70/140
	Passage to the fourth level	100/200
	Descending	50/100
TOWER Beacon (White)	Beacon Grip	15
	Descending with the gripped beacon	100
	Delivery of the gripped beacon to white zone	50
	Delivery to white zone by any other means	80
Beacon Grip	Grip	15/45
Beacon Movement to Color Zone	Field	30 (+ 10 for each subsequent)
	Maze	50 (+ 10 for each subsequent)