



RoboMission ミドル競技 Senior Game Rules

Ver. 1.0



Earth Allies Force of Nature

Official Game Rules for WRO RoboMission Senior.
Version: January 15th 2024
(Note: Rules for local WRO events may vary!)

WRO International Premium Partner



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Important information for reading this document:

- These game rules are made for local and national competitions.
- National Organizers in WRO countries are allowed to simplify the missions.
- For the International Final, one extra mission will be released on October 8th 2024. The extra challenge will work with the same game mat and brick set. It is not mandatory to do this extra mission to participate in the event.
- Because of possible surprise rules and the extra mission for the International Final, the game field may contain areas and markings that are not used at local or national events.
- For greater clarity, the robot missions are explained in multiple sections. But the teams can decide which missions they will do and which order.
- The game missions have easy and more complicated tasks. This makes the competition suitable for beginning and more experience teams. It is not necessary to solve all missions to enjoy a WRO participation.
- General information on game table setup and fixing of game objects on the field you find in the WRO RoboMission General Rules, chapter 6.

We wish everyone much success and a lot of fun with our WRO 2024 challenges!

Your team of World Robot Olympiad Association

※ このルールブックは、WRO 2024 RoboMission Seniorのルールをもとに、WRO Japan RoboMission 競技委員会がWRO 2024 Japan決勝大会 ミドル競技 Senior 部門用に一部を修正し、作成しています。

1. Introduction

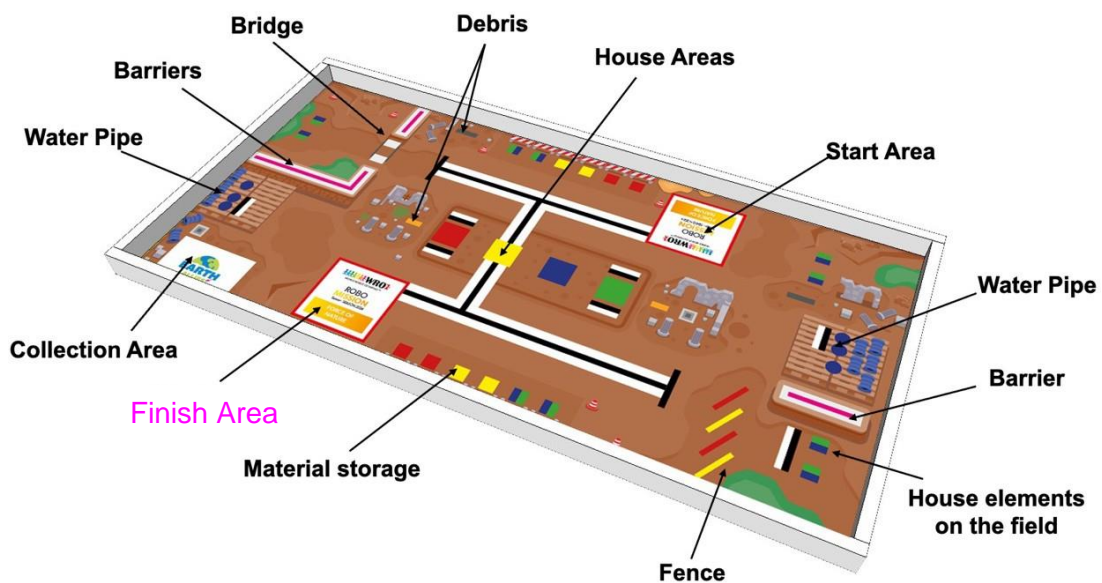
The forces of nature are powerful and unpredictable. We need to be prepared for the possibility of major disasters in many places in the world where people live. We need to develop new technologies and strategies to help us mitigate the effects of these disasters and to rebuild our communities after they occur.

Robots are an example of one of these new technologies. They can help to warn us in advance for a coming disaster. They can also help us to prevent excess damage from and to help with rescues and rebuilding after a disaster has hit.

On the Senior game field, the robot will help restoring a city after a natural disaster. The robot will rebuild houses, clean the streets from debris and will repair water pipes.

2. Game Field

The following graphic shows the game field with the different areas.



If the table is larger than the game mat, centre the mat in all directions.

3. Game Objects, Positioning, Randomization

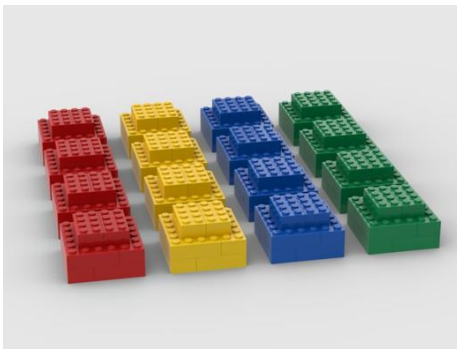
Start area and finish area

Start area is fixed on the upper side. Finish area is fixed on the lower side.

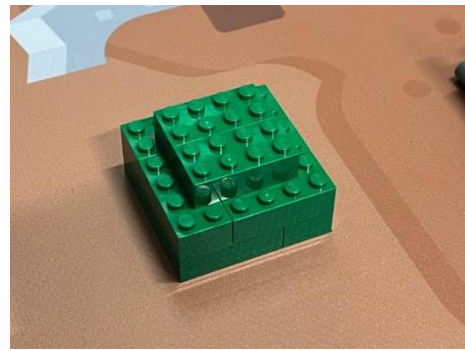
House elements

There are 8 house elements (2 red, 2 yellow, 2 blue, 2 green) on the field:

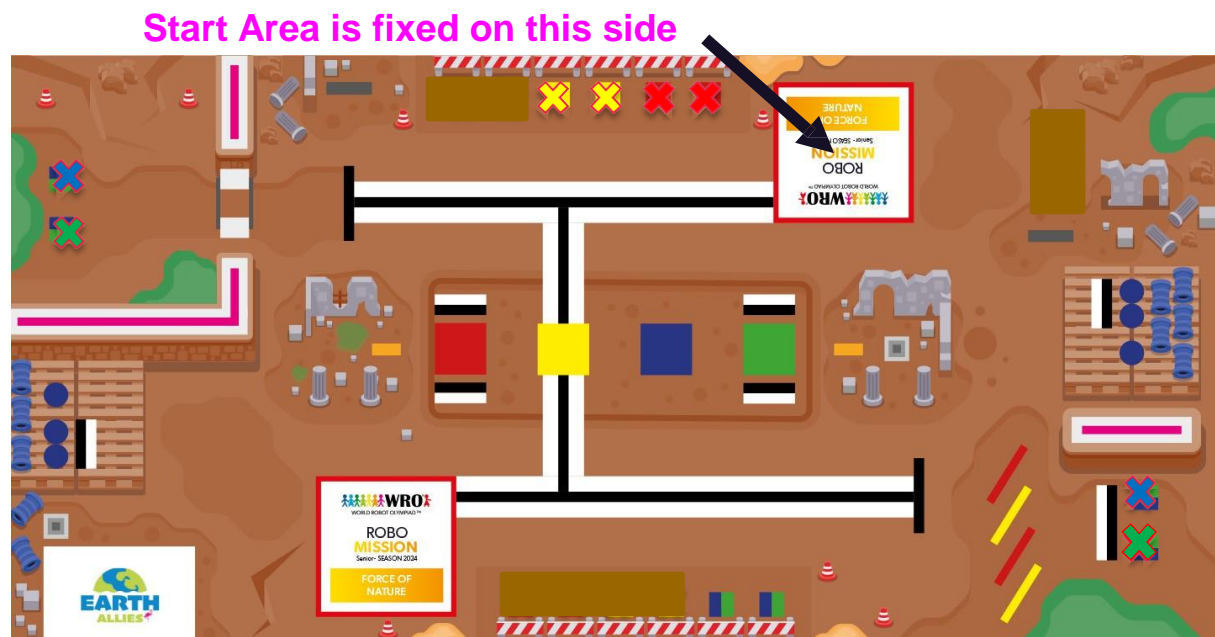
- **2 red and 2 yellow house elements will always be placed** next to the start area
- **2 blue and 2 green house elements will be randomized** and placed on the different positions on the field: 2 elements top-left, 2 bottom-right



House elements

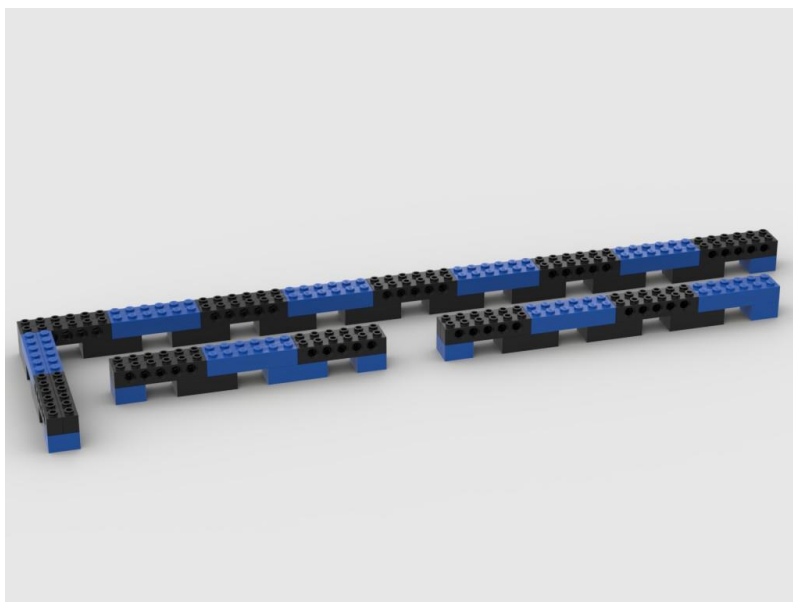


Example of a house element on a start position



Barriers

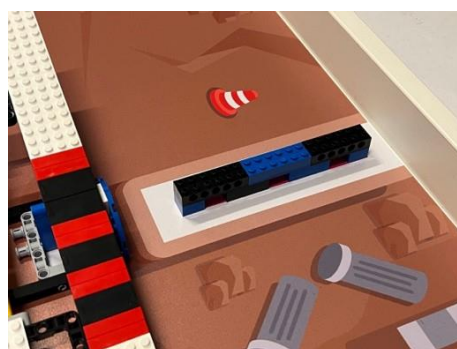
There are **3 barriers** on the game field (2 surrounding the top-left corner, one on the right side of the game field). All barriers should not be to be moved or damaged.



Barriers



Placement around top-left area



Placement around top-left area



Placement on the right side

4. Robot Missions

4.1 Rebuild houses



The robot should help rebuilding houses after an earthquake in the city:


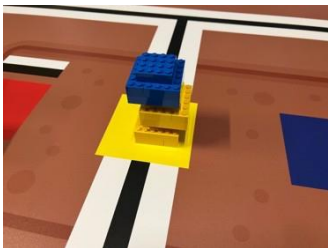
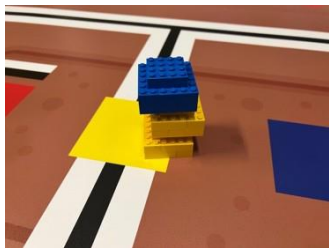
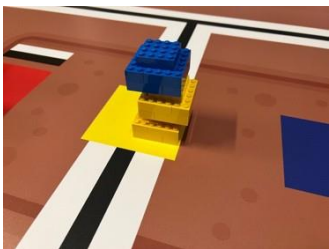
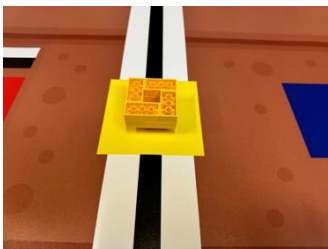
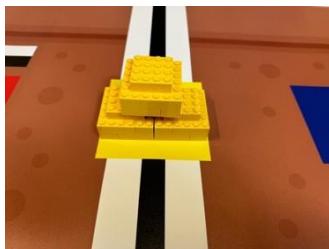
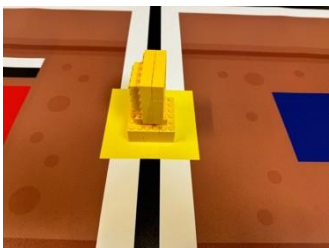
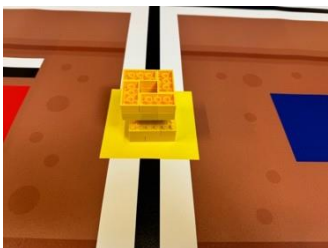
- 4 houses – one in each colour (red, yellow, green, blue) – should be built in the different coloured areas on the field (e.g. red house in red area).
- Every house can have two floors. Maximum points are awarded if all two houses are built with 4 house elements of the colour matching the colour of the area below.

For the scoring of the house elements please note the following:

- The lowest element (floor 1) must always be completely inside a coloured house area and the colour of the lowest floor element must match the colour of the area, otherwise no points are awarded for the entire house. Completely means that the game object is only touching the coloured area.
- If the lowest level (floor 1) element is only partly inside the colored house area, the obtained score is half of that.
- All house elements must always be stacked with the studs facing upwards. House elements cannot be upside down or on the side.
- House elements stacked on the 1st element can only be supported by the element below it. They cannot be supported by anything else, like the floor or another element.
- Only one house per coloured area counts. If there are two houses in an area that could score points, then the house with the most points will be scored.

The following table shows the scoring of this task and the photos show scoring situations that apply for all kind of coloured houses.

	Each	Max.
House with one floor (Half point when partly inside)	6	
OR: House with two floors (Half point when partly inside)	10	40
Additionally: House with exactly 2 floors + all elements have the same colour as the coloured area below.	4	16
<div>  <p>6 points (one floor)</p> </div> <div>  <p>10 + 4 points (2 floors + only yellow + correct area)</p> </div>		

		
	0 points (floor 1 element is red and not yellow)	
		
	10 points, no extra points because house should have exactly 2 floors	5 points (floor 1 is partly in the coloured area)
		
10 points (2 floors, floor 1 is completely in and it is OK if the other floors are outside in projection view)	0 points (studs not up)	6 points (only for one element in first floor)
		
6 points (only for one element in first floor)	6 points (only for one element in first floor)	



40 + 16 points – ideal solution, all houses are completely built (2 floors) and placed in the correct coloured area.

4.2 Bonus for barriers

Barriers should not be moved outside of the white surrounding area and should not be damaged. If those objects are not damaged and not moved (outside of the white surrounding area), you will always get the bonus points.

The following table shows the scoring of this task and the photos show scoring situations that apply for all of barriers.

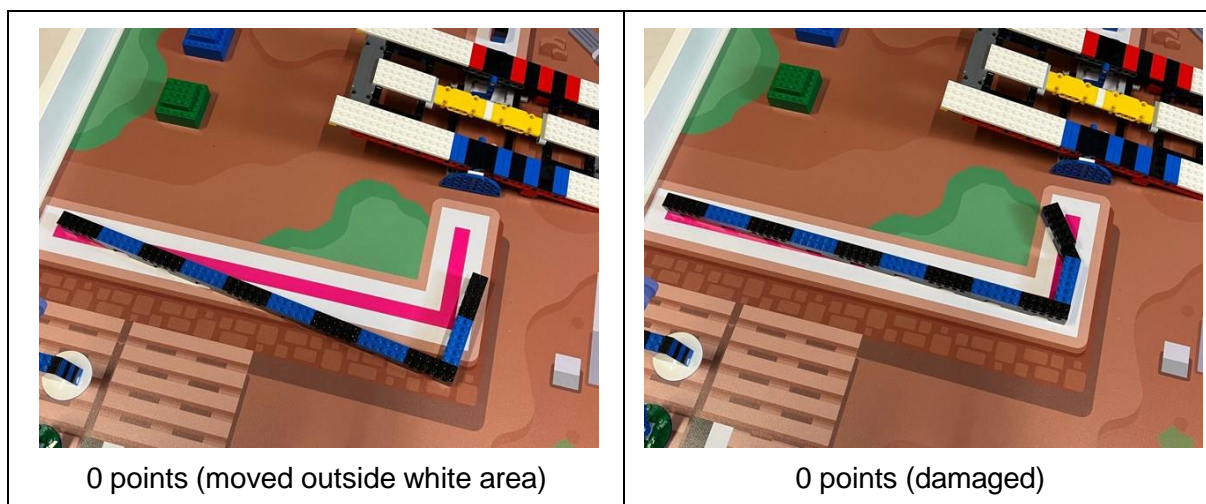
	Each	Max.
Barrier not moved or damaged	5	15



5 points (not moved)



5 points (moved inside white surrounding area)



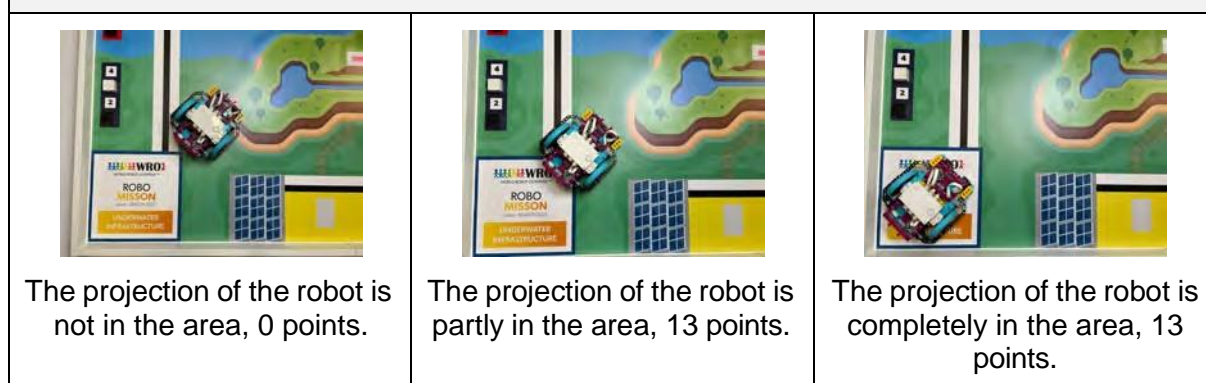
4.3 Park the robot

The mission is complete when the robot returns to the Finish area, stops, and the projection of the robot is **partly (top-view)** within the Finish area.

	Each	Max.
Projection of the robot is partly in the Finish Area (only if other points, not bonus, are assigned)		13

Projection of the robot is partly in the Finish Area
(only if other points, not bonus, are assigned) → 13 points

Please note: The red line surrounding the area does not belong to the area, the project has to be over the white inner area. Cables only do not count for the projection of the robot.



5. Scoring Sheet

Team name: _____

Round: _____

Tasks	Each	Max.	#	Total
Rebuild houses				
§ Only points for any house if the lowest floor is completely in a coloured area and the lowest floor is matching the colour of the coloured area.				
§ Only one house, the one with more points, counts per coloured area.				
House with one floor (Half point when partly inside)	6			
OR: House with two floors (Half point when partly inside)	10	40		
Additionally: House with exactly 2 floors + House only coloured with elements of the colour matching the coloured area.	4	16		
House element is completely out of the initial square area.	2	16		
Bonus for barriers				
Barrier not moved or damaged	5	15		
Park the robot				
Projection of the robot is partly in the Finish Area (only if other points, not bonus, are assigned)		13		
Maximum Score		100		
Surprise Rule				
Total Score in this run				
Time in full seconds				

In case a game object is damaged, please see the RoboMission General Rule 6.8.