



A U S T R A L I A

RoboCup Junior Australia

Rescue Line Rules 2026

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Preface

Spirit

It is expected that all participants, students and mentors, will respect the aims and ideals of RoboCup Junior as set out in our mission statement. In turn, the volunteers, referees and officials will act within the spirit of the event to ensure the event is competitive, fair and most importantly fun. "It is not whether you win or lose, but how much you learn that counts."

Sharing

It is the overall desire of RoboCup Junior events that any technological and curricular developments will be shared with other participants after the events. Any developments including new technology and software examples, may be published on the RoboCup Junior website after the event, furthering the mission of RoboCup Junior as an educational initiative. Participants are strongly encouraged to ask questions of their fellow competitors to foster a culture of curiosity and exploration in the fields of science and technology.

Local Variations

These rules will be in use for the RoboCup Junior Australia Australian Open for the titled year. State and Regional events may implement variations of these rules. These variations will be communicated to the participants through email and/or on the relevant State Webpage on the RoboCup Junior Australia website prior to the state or regional event.

General Rules

All RoboCup Junior challenges are governed by our General Rules, which cover rules that are consistent across all the challenges including team make-up, robot configuration and more. Please ensure you read the General Rules, which can be downloaded from the [Rescue Line Challenge Page](#) on the RoboCup Junior Australia Website.

Notes/Advice vs. Rules

This document may include notes/advice to participants and mentors, plus rules that are firm. This has been done to remove ambiguity. There is a notation to indicate whether the content of this document is to be read as a note/advice or as a rule. Advice is noted in **green**. Rule changes for the new year are noted in **red**.



Change Log

Revision	Change(s) Made
26.0	<p>Initial release for the season. Key changes from 2025 include:</p> <ul style="list-style-type: none"> • Changes to the “Secondary” and “Open” division categories (see sections 1.2.3 and 1.2.4). • Logic Pool 3 removed from tile sets (see section 2.1.1). • Removal of 90-100mm elevation increment rule – riser height based on tile size and 20° slope limit (see section 2.5.1). • Clarification on ‘tunnel’ height under elevated sections per division (see section 2.5.2). • Change to doorway height for Secondary division to 270mm (see section 2.6.1.1). • Introduction of phrase “Rescue Zone” to define both the Chemical Spill (Riley Rover/Primary/Secondary) and Evacuation Zone (Open) as the location for victims based on division (see section 2.7). • Change to division that can have one or more Evacuation platforms in a Chemical Spill from Open to Secondary (see section 2.7.2.2). • Change to size requirements for Evacuation Platform width (see section 2.7.2.2) • Rules added for new Evacuation Zone for Open division (see section 2.7.3). • Introduction of new Rescue Capsule for Open division (see section 2.9) • Removal of empty capsule for Chemical Spills (see section 2.9.3) • Note included on size requirements for international robots for any teams interested in building their robot to suit international standards (see section 3.1.1) • Rule added limiting the number of robots teams are allowed to bring to the competition to ONE (1) only (see section 3.1.5) • Change to the electronic submission requirements to require an Annotated Code and b) Digital Technical Poster (see section 4.1) • Removal of Journal/Logbook requirement for all teams (see Section 4) • Clarification on interview requirements (see section 4.3) • Change to gameplay and calibration windows (see section 6.1) • Change to rescue requirements for Secondary (see section 6.3.8.2) and Open (see section 6.3.8.3) • Change to score allocations for Secondary and Open victim rescue (see section 6.6.4) • Addition of points for completion of all scorable elements (see section 6.6.7) • Removal of maximum touch penalty rule based on completion time (see section 6.6.7) • Removal of maximum time rule for teams who finish without completing all course elements (see section 6.6.9)



Table of Contents

1	The Challenge.....	5
1.1	The Scenario.....	5
1.2	Event Divisions	5
2	Playing Field	6
2.1	Tiles	6
2.2	Lines	7
2.3	Intersection Markers.....	7
2.4	Speed bumps, Debris and Obstacles.....	8
2.5	Ramps and Elevated Tiles	8
2.7	Rescue Zone	9
2.8	Start Locations & Drop Zones	9
2.9	Rescue Capsule	10
2.10	Game Zone	10
3	Robot.....	11
3.1	Robot Configuration.....	11
3.2	Robot Control.....	11
3.3	Inspection.....	12
3.4	Violations	12
4	Validation of Work.....	13
4.1	Electronic Submission	13
4.1.1	Annotated Code Submission.....	13
4.2.2	Digital Technical Poster Submission.....	13
4.3	Interviews.....	14
5	Divisions	15
6	Game Play	16
6.1	Length of a Game.....	16
6.2	Pre-Game	16
6.3	Game Play	16
6.4	Lack of Progress	17
6.5	Following the Line.....	18
6.6	Scoring.....	18
6.7	Preliminary Rounds.....	19
6.8	Finals	20
6.9	Special Circumstances.....	20



1 The Challenge

1.1 The Scenario

1.1.1 A terrible disaster has hit the city and caused a large chemical storage unit to rupture spilling thousands of litres of toxic chemicals in the centre of the city. There is a Victim trapped in a sinking Rescue Capsule in the chemical spill. Rescue crews are having trouble entering the city with the amount of rubble around, and rescue from the air has also been ruled out due to the noxious gases rising from the toxic chemicals directly above the spill. It has been decided that the best form of rescue is the deployment of an autonomous robot that can navigate to the chemical spill, rescue the victim, and exit the chemical spill.

Your team has been asked to design, make, and appraise a robot to complete this challenge.

1.2 Event Divisions

1.2.1 Riley Rover: The robot must navigate to the Chemical Spill, find, and then rescue the Victim by pushing or dragging the Rescue Capsule out of the Chemical Spill.

1.2.2 Primary: The robot must navigate to the Chemical Spill, find and then rescue the Victim by pushing or dragging the Rescue Capsule out of the Chemical Spill. The robot must then save itself by exiting the Chemical Spill via the 'Spill Access Point'.

1.2.3 Secondary: The robot must autonomously navigate the course to reach the Chemical Spill and rescue the Victim contained within a Rescue Capsule.

The robot must control the Rescue Capsule and **either** manoeuvre it out of the Chemical Spill area **or lift and place it onto the Evacuation Platform**. The robot must then save itself by exiting the Chemical Spill Zone via the 'Spill Access Point'. The evacuation zone may contain one or more Rescue Capsules - Rescue Capsules with a Victim are silver (see 2.9.1). **Rescuing the Victim will earn the team points for a successful control and rescue and additional points for placing on the evacuation platform.**

1.2.4 Open: Robot must autonomously navigate the course to reach the **evacuation zone**. **The robot is required to locate and rescue three Victims: two living Victims and one dead Victim.**

Living Victims are silver, reflective, and electrically conductive, and must be controlled by the robot and then placed at the green Evacuation Point.

Dead Victim is black and not electrically conductive, and must be controlled by the robot and placed at the red Evacuation Point. After completing the rescues, the robot must safely exit the spill area via the designated access point.

Subject to age limitations and other criteria, Open Division teams who perform well in the National Event may qualify for the annual RoboCup Junior International Event. Other international events may have other divisions/qualification requirements.



2 Playing Field

All measurements in the rules have a tolerance of 5%.

2.1 Tiles

2.1.1 Tiles will fall into one of five pools, as described in the table below:

Pool Name	Tile Characteristics
Base Pool	Tiles that consist of continuous black lines with white background including intersections without markers
Physical Pool 1	Inclines not to exceed 20° from the horizontal Tiles with an obstacle
Physical Pool 2	Tiles with speed bumps or debris
Logical Pool 1	Tiles with intersections marked with an intersection marker on a single side of the line immediately prior to the intersection
Logical Pool 2	Tiles with discontinuous lines

2.1.2 Tiles will be selected for each division as in the table below:

	Base Pool	Physical Pool 1	Physical Pool 2	Logical Pool 1	Logical Pool 2
Riley Rover	✓	✓			
Primary	✓	✓	✓	✓	
Secondary	✓	✓	✓	✓	✓
Open	✓	✓	✓	✓	✓

The field will consist of tiles, with differing patterns. Tiles may include but are not limited to the designs shown below:

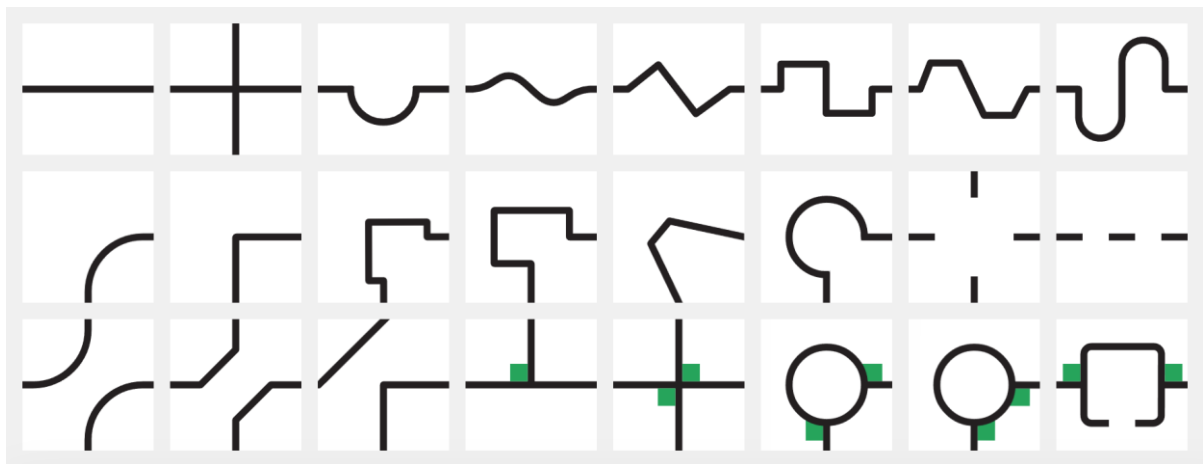


FIGURE 1 - EXAMPLE TILE PATTERN DESIGNS THAT MAY BE PRESENT ON THE FIELD

Tiles will typically be either ‘Small Tiles’, sized 297 mm x 297 mm, or ‘Large Tiles’ sized 594 mm x 594 mm. Small Tiles can be printed on A3 paper, and Large Tiles on A2 paper (A2 printing is commonly available at Officeworks).

- Example Tiles can be downloaded from the RCJ CMS here: https://rcja.app/rcj_cms/line/tiles
- The official RCJA tile sets can be purchased from the store on the RCJA website: <https://www.robocupjunior.org.au/shop/>



- 2.1.3 Tiles can be of various sizes with the minimum tile size of 297 mm x 297 mm. Tiles can be any shape or thickness and be made from any material that provides adequate traction for the robot (e.g., melamine, flute board, banner material).
- 2.1.4 Tiles will have a uniform background colour of white allowing the line to be distinguishable from it by common light, colour, and vision sensors.
- 2.1.5 There will be a minimum of 4 tiles in addition to the chemical spill tile in a Preliminary Round or Head-to-Head Round.
- 2.1.6 The arrangement of tiles may vary between rounds.
- 2.1.7 The top surface of adjacent tiles may differ in height up to 5 mm and be separated by up to 5 mm.
- 2.1.8 The final selection of tiles and their arrangement will not be revealed until the day of the event.

2.2 Lines

- 2.2.1 The line on the tiles will be black and have a width between 15 mm and 20 mm
- 2.2.2 The internal radius of a curved line will be a minimum of 40 mm.
- 2.2.3 The minimum distance from the edge of the tile to the line should be 90 mm. Where this is not the case, support material will be added to the field to support the robot.
- 2.2.4 Lines may meet or form an intersection at any angle.

2.3 Intersection Markers

- 2.3.1 Intersection markers can be placed anywhere except in the chemical spill.
 - 2.3.1.1 Intersection markers are green and 40 mm x 40 mm in dimension and indicate the suggested path to follow. If no intersection markers are placed before an intersection, the robot must continue straight.
 - 2.3.1.2 The colour of intersection markers will be consistent across a single path leading to the Chemical Spill.
 - 2.3.1.4 In the path leading to the Chemical Spill, intersection markers will be placed immediately before the intersection. See image below for possible cases and expected robot response for each case:

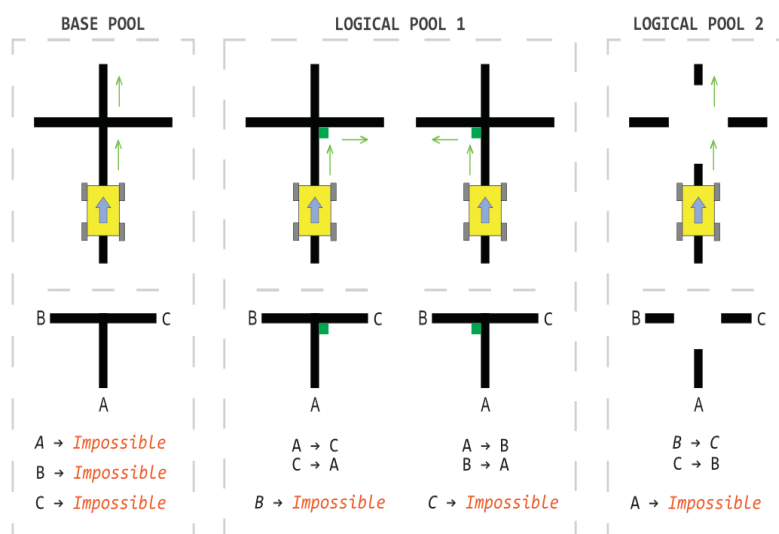


FIGURE 2 - POSSIBLE CASES FOR INTERSECTION MARKERS BASED ON LOGIC POOL



2.4 Speed bumps, Debris and Obstacles

- 2.4.1 Speed bumps have a maximum height of 10 mm. They are a similar colour to the tile's background.
- 2.4.2 Speed bumps will be fixed on the tile. They may not be perpendicular to the line and may vary in shape.
- 2.4.3 Debris have a maximum height of 3 mm and are not fixed on the tile. They are small materials such as toothpicks, paper, skewers, etc. The reflected colour of the debris cannot be a colour otherwise used on the course.
- 2.4.4 Debris may be spread across the tile.
- 2.4.5 Obstacles may consist of bricks, blocks, weights and other large, heavy items, which provide resistance when pushed or knocked by the robot. Obstacles will be a minimum of 150 mm high and have a base with a maximum diameter or diagonal length of 150 mm. Obstacles will not be placed closer than 250 mm from the edge of the field (including edges of tiles that are elevated by ramps) and inclined tiles.
- 2.4.6 An obstacle may not cover more than one line.
- 2.4.7 A Robot is expected to navigate around obstacles and reacquire the line within 30 cm of the obstacle. Obstacles that are moved in any way will remain where they are moved to, even if it ends up prohibiting the robot from proceeding. Where the obstacle has been moved teams may receive points for the tile and not the additional obstacle points.

2.5 Ramps and Elevated Tiles

- 2.5.1 Tiles on different levels are connected by ramp tiles. A ramp will not exceed an incline of more than 20° from the horizontal surface.

Note: tiles may be elevated in various increments however these will not exceed 180mm with the 594mm tiles or 90mm with the 297mm tiles.

- 2.5.2 Tiles may be elevated off the floor by risers placed in the corner of the tile. Risers may also be placed on a supporting tile to ensure consistent 'Tunnel' height underneath raised course sections. The minimum height of tunnels will be 180mm high for Riley Rover and Primary and 270mm for Secondary and Open.
- 2.5.3 Risers may only be re-positioned to provide robot clearance by an official.
- 2.5.4 No provision will be made to assist robots that drive off a tile, from getting back on the tile.

2.6 Doorways

- 2.6.1 The Doorway height will be based on division:
 - 2.6.1.1 **Secondary and Open: 270 mm wide and 270 mm high**
 - 2.6.1.2 **Riley Rover and Primary: 180 mm wide and 180 mm high**
- 2.6.2 A doorway may be placed on a straight section of the line with the two uprights approximately equidistant from the line. It will be free standing and will not be mounted or taped directly to the tile.
- 2.6.3 If a doorway is present on the course the robot must have passed through it before the score for the round will be recorded (see 3.1.1).

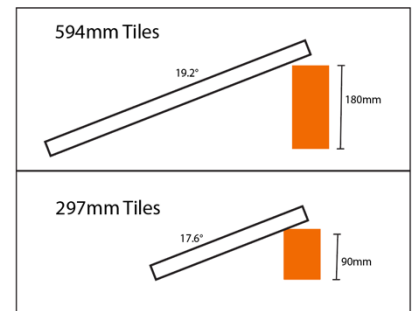


FIGURE 3 – TILE ELEVATION EXAMPLES



FIGURE 4 - EXAMPLE OF TUNNEL UNDER ELEVATED SECTION



FIGURE 5 - DOORWAYS FOR RILEY ROVER/PRIMARY (FRONT) AND SECONDARY/OPEN (BEHIND)



2.7 Rescue Zone

2.7.1 The Rescue Zone is the tile/section that contains the victim(s) for rescue. The Rescue Zone selected for each division as in the table below:

Division	Rescue Zone
Riley Rover	Chemical Spill
Primary	Chemical Spill
Secondary	Chemical Spill
Open	Evacuation Zone

2.7.2 A Chemical Spill will be green in colour and be distinguishable from the background colour of the tile by common light and vision sensors. It may be any shape and size.

2.7.2.1 At the point where the black line meets a Chemical Spill, there will be a piece of smooth reflective tape (the Spill Access Point) to indicate that the robot is entering the Chemical Spill. The Spill Access Point will have a minimum size of 70 mm x 20 mm.

2.7.2.2 For **Secondary only**, Chemical Spills will have one Evacuation Platform located opposite the Spill Access Point fixed to the tile. There may be more than one Chemical Spill in a Preliminary Round or Head-to-Head Round. An Evacuation Platform will be a distinguishable colour, from **180-200 mm wide**, and a height and depth of 70 mm.

2.7.3 For **Open only**, the Evacuation Zone is 1188 mm x 891 mm with walls around the four sides at least 100mm high and coloured white. The black line will end at the Spill Access Point of the Evacuation Zone.

2.7.3.1 At the point where the black line meets an Evacuation Zone the black line will end.

2.7.3.2 At the entrance to the Evacuation Zone (Spill Access Point), there will be a piece of smooth reflective tape with a minimum size of 25mm x 250 mm.

2.7.3.3 Safe Evacuation Points are defined by right-angled triangles with sides of 280mm x 280mm and are coloured as follows:

- One red Evacuation Point where the dead victim must be placed by the robot and,
- One green Evacuation Point where the living victims must be placed by the robot.

2.7.3.4 The Evacuation Points will have 60 mm walls height and a hollow centre.

2.7.3.5 The referee can place the Evacuation Points in any non-entry/exit corners in the evacuation zone.

2.7.3.6 The organizers will fix the Evacuation Points to the floor. Still, teams should be prepared for slight movements in the evacuation points.

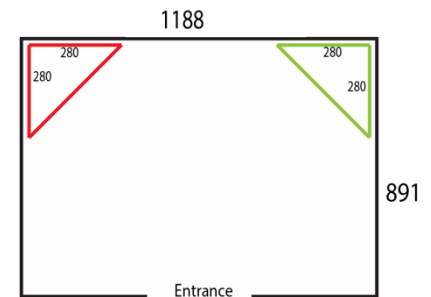


FIGURE 6 - OPEN EVACUATION ZONE LAYOUT
All measurements in mm.

2.8 Start Locations & Drop Zones

2.8.1 The field can have at most two start locations, the City Limits and the Drop Zone

2.8.2 The City Limits tile consists of a lead-in black line and does not count for any points. Robots are to start behind the join between the City Limits and the first course tile.

2.8.3 Robots must start from the City Limits at the start of the scoring run.



2.8.4 The join between two tiles may be nominated as the Drop Zone and may be used as a start location after at least one Lack of Progress has occurred. The Drop Zone may not be used as the first start location at the start of the scoring run unless there is no City Limits present on the course.

2.8.4.1 The Drop Zone must be at least two tiles away from the Rescue Zone. Once the game timer has started, the Drop Zone cannot be changed (unless a Restart is called). **The nominated Drop Zone can be different for each round.**

2.8.4.2 A Drop Zone Marker of a suitable size and colour to be easily identified by the Robot Handler and referees without interfering with the robot will be used to mark the Drop Zone.

2.8.5 If a Lack of Progress occurs, the robot must be repositioned at either one of the Start Locations and started.

2.9 Rescue Capsule

2.9.1 Victims for rescue are represented as follows:

- a. Riley Rover, Primary and Secondary (Chemical Spill) - standard 375 ml aluminium can, standing upright, wrapped in silver tape ([available on the RoboCup Junior Australia Store](#)). Rescue Capsules will contain material such as rice bringing the weight of the Rescue Capsule to a maximum of 100 gm. A liquid will not be used to add weight to the can.
- b. **Open (Evacuation Zone) - a 40-50 mm diameter sphere with an off-centre centre of mass and a maximum weight of 80 g.**

Example of how to make open rescue capsules can be found here:

<https://junior.forum.robocup.org/t/weighted-victims-definition-and-build-guide/3488>

2.9.2 In a Chemical Spill, the Rescue Capsule will be located in a new position for each round. The Rescue Capsule will not be placed on the Chemical Spill until the robot has commenced moving. Within a round, the positioning of the Rescue Capsule may not be the same for each team, but it will be placed in a position that is considered to be of equivalent difficulty to find and rescue.

2.9.2.1 The Rescue Capsule or Capsules in a Chemical Spill will be moved and repositioned in an upright orientation only after a Restart but not under any other circumstance (see 6.4.7).

~~2.9.4 Open Rescue Line: A Rescue Capsule contaminated by the chemical spill without a Victim inside will be represented by a standard 375 ml aluminium can, standing upright, painted matt black or wrapped with black tape. This capsule will be referred to as an empty capsule.~~

2.9.3 **Evacuation Zones contain two types of victims:**

- a. **Dead Victims – Black and not electrically conductive**
- b. **Living Victims – Silver, reflect light and are electronically conductive**

2.9.3.1 **In an Evacuation Zone, organisers will locate victims randomly anywhere on the floor of the Evacuation Zone. There will be precisely two Live Victims and one Dead Victim placed in the Evacuation Zone.**

2.10 Game Zone

2.10.1 The area around the Preliminary Round or Head-to-Head Round will be designated as the Game Zone. Only officials, referees, and the Robot Handler may enter the Game Zone.

2.10.2 Each team can have only one robot in the Game Zone.

2.10.3 Access to the Game Zone by participants prior to the start of the event will be allowed at the discretion of the RoboCup Junior Australia Rescue Coordinator or other relevant person.



3 Robot

3.1 Robot Configuration

There are some robot configuration rules that are consistent across all Challenges. Please ensure you read the [General Rules](#), which can be downloaded from the [Rescue Line Challenge Page](#) on the RoboCup Junior Australia Website, for robot configuration requirements.

- 3.1.1 Robot must be able to pass through the Doorway without moving it significantly from its original position. The robot must do this autonomously during the scoring run. Any robot that is unable to pass through the Doorway will be declared ineligible for that round, unless a restart is called, and the robot is modified to allow passage.

Note: International Rescue Line rules impose a maximum robot size of **250 mm × 250 mm**. Teams intending to compete at this level should design their robot with this limitation in mind.

- 3.1.2 Riley Rover and Primary robots must not increase in size, extend, or use a device intended to sweep the Victim. Robots must demonstrate a search algorithm to find the Rescue Capsule as specified in 1.2.
- 3.1.3 Secondary and Open robots must have a functioning and demonstrable mechanism with the potential to control AND rescue the Victim as specified in 1.2. There will be no points given for a round where this mechanism cannot be seen by the referees.
- 3.1.4 Robots should be well engineered and constructed. The robot should not fall apart during the game. If the robot has substantially failed mechanically, fallen apart (see 6.3.5) or is unable to complete the challenge, the robot will be deemed damaged and the Robot Handler will be asked to remove the robot from the field. The Robot Handler may choose to restart according to 6.4.7, otherwise the round is deemed to have ended.
- 3.1.5 Each team is permitted to compete with one (1) robot only for the duration of the competition. The same robot must be used for all runs and rounds of the event.

Teams may make repairs, adjustments, and incremental improvements to their robot during the competition, provided the robot continues to comply with all competition rules and requirements.

Replacing the robot with a different robot during the competition is not permitted. Significant modifications or major rebuilds that substantially alter the robot's structure, drive system, or overall design must be approved by the judges or Organising Committee before the robot is permitted to compete again.

- 3.1.6 A team will not be able to compete with a robot substantially the same as another team's robot.
- 3.1.7 A team will not be able to compete with a robot that is identical to another team's robot from previous years.

3.2 Robot Control

- 3.2.1 Robots cannot be started from a secondary device, such as a laptop, tablet, or mobile phone. Robots must have their program downloaded to them and be able to be started/restarted manually by the Robot Handler.
- 3.2.2 Robots must be autonomous in operation. If the robot has the capability for remote or any other wireless control (such as by Bluetooth, Wi-Fi or another form of wireless communication), the team must prove that they have disabled the capability for third party operation in some way. This could be by software, hardware or degree of human interaction. Robots that do not comply may face immediate disqualification from the event. Distributed control is allowed but must operate without human interaction after the robot has started the round.
- 3.2.3 Pre-mapping and/or any type of dead reckoning (i.e., configuring the robot's program based on predefined locations, tiles, obstacles, location of victim, number of victims etc. before game play) is prohibited.
- 3.2.4 The use of remote control of any kind is forbidden.



3.3 Inspection

- 3.3.1 Teams may be scrutinised to establish the ownership of robot design and programming.
- 3.3.2 The robot will be inspected by a panel of referees before/during or after the event to ensure that the robot adheres to all relevant rules.
- 3.3.3 It is the responsibility of teams to have their robot re-inspected if their robot is modified at any time during the event.

3.4 Violations

- 3.4.1 Any violations of the inspection rules will prevent the robot from competing in a round until modifications have been made to the robot to ensure compliance.
- 3.4.2 Modifications must be made within the time schedule of the events. Rounds will not be delayed due to late teams.
- 3.4.3 If a robot fails to meet all specifications (including modifications) the robot will be disqualified from that round (but not the event).
- 3.4.4 If it is determined that the work on the robot is not substantially the original work of the team members or the construction or programming of the robot be deemed not that of the team, the team will be referred to officials. Should the Rescue Coordinator (or other relevant person) on the advice of the officials then uphold the view of the scrutiniser, the team may be disqualified from the event.



4 Validation of Work

4.1 Electronic Submission

Each team is expected to submit two (2) digital elements prior to competition based on dates provided by the organisers:

- a. Annotated Code
- b. Digital Poster

4.1.1 Annotated Code Submission

4.1.1.1 Teams must submit a copy of the most recent version of their competition code. The code must be clearly annotated with comments that explain the purpose and function of key sections of the program, including (where applicable) sensor use, decision-making logic, and actuator control.

Note: Teams are permitted to continue updating their code after the digital submission deadline, but must maintain an up-to-date version of their annotated code. Students may be asked to show this updated code to judges upon request.

4.1.1.2 The submitted code must accurately reflect the robot used in competition.

4.1.1.3 Teams who fail to submit their annotated code will not be permitted to compete.

NOTE: This can be submitted as a power point, screen shots with annotations, doc, etc..

4.2.2 Digital Technical Poster Submission

4.2.2.1 Each team must submit one (1) poster that communicates their team and robot design if the team wishes to be considered for special awards.

Note: this poster may be shared publicly. Teams must not include any information that can't be publicly shared (e.g. student personal information other than first name, photos that would allow personal identification, etc.).

4.2.2.2 The poster must be A3 size and must include all of the following information:

- 1 Team name
- 2 Team member first names and roles
- 3 One interesting/innovative feature of the robot's design or engineering
- 4 A challenge encountered during development and how it was overcome
- 5 What the team has learned through participation in the competition

4.2.2.3 The poster must be clear, well-presented, and suitable for display. Teams may generate the poster using any software they chose (PowerPoint, Canva, Paint, etc.) or make a physical poster and submit a photo/scan of the poster. The poster must be the team's own original work.

4.2.2.4 Teams who fail to submit a poster will not be eligible for special awards.

Note: Teams are encouraged to bring a physical copy of their poster to display at the competition, however this is not mandatory.



4.3 Interviews

- 4.3.1 Teams may be required to attend a technical interview to explain the operation of their robot to verify that the design, construction and programming of the robot is the students' work. There are no set questions. If interviews are being conducted, either a schedule will be released, or teams will be advised to go for an interview throughout the event well in advance of the Head-to-Head Round.
- 4.3.2 **The format, timing, and selection of teams for interview will be determined by the Organising Committee. Teams will be required to bring an up-to-date version of their annotated code to any requested interviews.**
- 4.3.3 Interviews are not scored and do not contribute to overall team score.
- 4.3.4 Team member(s) will be asked questions about their preparation efforts, and they may be requested to answer surveys and participate in videotaped interviews for research purposes.



5 Divisions

There are some Division rules that are consistent across all Challenges. Please ensure you read the General Rules, which can be downloaded from the [Rescue Line Challenge Page](#) on the RoboCup Junior Australia Website, for division rules that are consistent across all Challenges.

- 5.1 Students will participate in only one of the four Rescue Line divisions: Riley Rover, Primary, Secondary or Open. Teams can also compete in Rescue Maze.
- 5.2 The eligibility requirements for each Rescue Line Challenge Division are:
 - 5.2.1 **Riley Rover:** Open to students at an age that would typically be studying at either a primary or secondary provider. This is open to students who are new to Rescue Line or attempting a new challenge such as creating a robot based on an Arduino or Raspberry Pi controller programmed with a text-based coding language. Teams will only be allowed to enter this division where all students have not participated in Rescue Line in a prior year. Additionally, if the team significantly changes hardware and/or software e.g. changing from a LEGO robot to a custom Arduino Robot, it is deemed the years of participation resets to zero. Students should be guided to a higher division by their mentor as capability increases.
 - 5.2.2 **Primary:** Open to students at an age that would typically be studying at a recognised primary study provider. Team members can compete any number of times whilst they are enrolled at a recognised primary study provider.
 - 5.2.3 **Secondary:** Open to all students at an age that would typically be studying at a recognised secondary study provider. Team members are only eligible to compete for a total of two years in this division after which they must participate in Open Rescue Line.
 - 5.2.4 **Open:** Open to all students at an age that would typically be studying at a recognised primary or secondary study provider.
- 5.3 For each round, one team member is to be nominated as the Robot Handler. Only the Robot Handler is permitted to enter the Game Zone and handle the robot during the round. All other team members must remain outside the Game Zone unless authorised by the Referee, Official or other relevant person.
- 5.4 The Robot Handler is the only team member permitted to communicate directly with the Referees, and Officials.
- 5.5 In the Game Zone no secondary device, such as a laptop, tablet, or mobile phone are allowed



6 Game Play

Games will be organised into Preliminary Rounds, then a Head-to-Head Round.

6.1 Length of a Game

- 6.1.1 Organisers will ensure that the field design will be a suitable length for the time limit.
- 6.1.2 A robot will have a maximum time limit to complete the course. Time limits are:

Division	Game Length (sec)
Riley Rover Rescue	120
Primary Rescue Line	120
Secondary Rescue Line	180
Open Rescue Line	300

All teams have up to 30 seconds (optional) for calibration time and course checking before they must start.

- 6.1.3 Time limits may be extended for any round. This is at the discretion of the Rescue Coordinator. Participants will be informed of the change prior to the running of the round.

6.2 Pre-Game

- 6.2.1 The Referee will ask the Robot Handler if they would like to nominate a Drop Zone. If the Robot Handler elects a Drop Zone, the join between tiles will be marked with the Drop Zone Puck.
- 6.2.2 The Referee will ask the Robot Handler if they are happy with the course. After positive acknowledgement, the Robot Handler may place the robot on the City Limits ready to start.
- 6.2.3 The robot must start from the City Limits (see 2.8). The entire robot must be behind the join between the City Limits and the next course tile.
- 6.2.4 The Referee will ask the Robot Handler if they are ready to start. The Robot Handler must indicate to the Referee they wish to commence the Rescue run.

6.3 Game Play

- 6.3.1 Once a team is ready to perform a scoring run, they must notify the Referee. The Referee will indicate to the Robot Handler that they may proceed. At this point the round begins and the Referee starts the game timer for the round.
- 6.3.2 Robots may move in any direction from the Drop Zone. The entire robot must be behind the join between the two tiles.
- 6.3.3 Once the round has begun, the robot is not permitted to leave the Game Zone for any reason.
- 6.3.4 Modifying a robot, once a round has begun, is prohibited until the run is over or a Restart is called (see 6.4.7). This includes adding, removing, or remounting parts, or changing the program.
- 6.3.5 Any parts that have fallen off during a round, intentionally, or otherwise, are to be left in the Game Zone and cannot be moved or removed by the Robot Handler until the run is over or a Restart is called (see 6.4.7).
- 6.3.6 The robot must pass over the Spill Access Point (2.7.2) to enter the Chemical Spill or Evacuation Zone.
- 6.3.7 Once the robot has entered the Chemical Spill or Evacuation Zone it is no longer required to follow the line. It may enter the Chemical Spill or Evacuation Zone in any orientation in its efforts to rescue the Victim(s).



6.3.8 To rescue the Victim:

6.3.8.1 **Riley Rover Rescue** and **Primary Rescue Line**: The Victim is considered rescued when the Rescue Capsule is completely outside the Chemical Spill.

6.3.8.2 **Secondary Rescue Line**: Control of the Rescue Capsule is defined as the Rescue Capsule moving with the robot in any direction (forwards, backwards, or rotation), either while in contact with the field surface or while being lifted and maintained under the robot's control during movement. A Victim is considered rescued when the Rescue Capsule has been released by the robot in an upright, top-up orientation, either completely outside the Chemical Spill area or placed onto the Evacuation Platform. Any Rescue Capsule placed on the Evacuation Platform will be removed ("airlifted") by the referee to allow space for the placement of additional Rescue Capsules, if required.

6.3.8.3 **Open Rescue Line**: Control of a Victim is defined as the robot having securely lifted the Victim and maintaining that lift while moving in any direction. The Victim must remain under the robot's control without relying on contact with the field surface. Control is required before a Victim may be placed into an Evacuation Point.

6.3.9 The round is considered complete when any one or more of the below conditions has been reached:

6.3.9.1 The maximum possible points for the round are achieved, not including deductions (known as the Gross Score).

6.3.9.2 The game timer has run out.

6.3.9.3 The Robot Handler declares an end to the scoring run. **If the robot handler declares an end before time runs out the maximum lack of progress deduction will be applied (see 6.6.7.)**

6.3.10 It is the responsibility of the Robot Handler before exiting the Game Zone to double check with the referee that their team score, time, penalties and other data recorded has been entered correctly and this has been indicated on the scoring system.

6.4 Lack of Progress

6.4.1 A Lack of Progress occurs when any one or more of the below conditions has been reached:

6.4.1.1 The robot is touched by a human.

6.4.1.2 The Robot Handler calls a Lack of Progress (for example, if the robot is about to fall and be damaged or the robot is malfunctioning).

6.4.1.3 The robot knocks over the Doorway or moves it significantly from the original position. If this occurs, the Doorway will be returned to its original position.

6.4.1.4 The robot is stuck in the same place.

6.4.1.5 The robot moves completely out of the field.

6.4.1.6 The robot exits the Chemical Spill in a direction other than via the 'Spill Access Point' or exits without attempting to rescue the Victim.

6.4.1.7 The robot ceases to follow the line. Robots are not allowed to take shortcuts within a tile, the line shape must be substantially followed on that tile unless there is an obstacle on that tile that must be avoided (see 2.4.7), or the line is discontinuous (see 6.5.2).

6.4.1.8 The robot fails to reacquire the line before exiting the tile.

6.4.2 A robot travelling towards, and then exits the field via the City Limits, may re-start the course with no Lack of Progress penalty.

6.4.3 If a Lack of Progress occurs, the robot must be repositioned at either one of the Start Locations (see 2.8) and started.



- 6.4.4 Only the Robot Handler is allowed to start the robot.
- 6.4.5 There is no limit to the number of touches due to lack of progress within a round.
- 6.4.6 The game clock will continue running during all lack of progress touches and Restarts.
- 6.4.7 The Robot Handler may call for a Restart to the Scoring Run up to three times. This allows the team to change their program, modify the robot, retrieve any components of the robot lost on the course and set a new Drop Zone.
 - 6.4.7.1 During a restart, the game clock does not stop, however all points earned or lost prior to the Restart are invalid and scoring begins again from zero points once the robot commences a new Scoring Run.
 - 6.4.7.2 The course will be reset back to its original state upon call of a Restart.
- 6.4.8 The Robot Handler may choose to make further attempts at the course to earn additional points available for completing tiles, obstacles, speed bumps, etc. that have not already been earned by calling a Lack of Progress and starting from a designated Start Location (see 2.8).

6.5 Following the Line

- 6.5.1 Where the line is discontinuous, and there is no continuous path through the tile, the robot may search for the recommencement of the line but must not completely leave the tile before re-finding the line.
- 6.5.2 A robot is considered to be following the line as long as some part of the robot is over the line while being viewed from directly above the robot by the referee.
- 6.5.3 Where a line exists, some portion of the line segment should be under the robot (see 6.4.1.7 and 6.4.1.8).

6.6 Scoring

- 6.6.1 Teams will be awarded 10 points for each line follow tile that their robot successfully negotiates. For example, robots reaching the fourth tile would have successfully negotiated three tiles and be awarded 30 points.
- 6.6.2 Teams will gain an extra five points for each intersection marker they correctly follow. For example, if a robot correctly follows both shortcut markers on the roundabout, it will be awarded 10 points for completing the line follow of the tile and 10 points (five plus five) for correctly following the two shortcut markers.
- 6.6.3 Rescue Teams will be awarded an additional 20 points for fully exiting the Chemical Spill via the Spill Access Point. The robot must reacquire the line and successfully complete one full tile **after** rescuing the Victim or attempting to rescue the Victim before the points are awarded.
- 6.6.4 **Scoring Summary:**

Action Completed	Points Scored
Tile with continuous line	10
Tile with discontinuous line	15
Follow an intersection marker	+5
Bridge, See-Saw or equivalent	+5
Speed bumps	+5
Debris	+5
Obstacle	+10



Action Completed	Points Scored
Rescue Victim (Riley Rover and Primary)	50 for Rescue
Per Rescue Victim (Secondary) Rescue points can only be awarded following award of Control points	50 for Control 50 for Rescue 30 if placed on evacuation platform
Per Rescue Victim (Open) Rescue points can only be awarded following award of Control points	10 for control 15 for rescue 15 if placed in the correct evacuation point
Exit the chemical spill via the spill access point and reacquire the line (this applies to Primary, Secondary and Open Rescue Line divisions)	20
Completion of all scorable elements of course	20

6.6.5 Points will be awarded only once for successful completion of an element of the course.

6.6.6 Five points will be deducted from the score for each Lack of Progress, up to a maximum of 20 points deducted.

~~6.6.7 A Secondary or Open Rescue team that elects to end their scoring run before the round timer has run out will receive the maximum deduction of 20 Lack of Progress points.~~

~~For example, a Secondary Rescue Line team has received two Lack of Progress deductions (10 points in total) and has now elected to end their scoring run before the round timer has run out. The team will receive a maximum Lack of Progress deduction of 20 points.~~

6.6.7 Teams who successfully complete all scorable elements of the course will receive a bonus 20 points

6.6.8 No team can end a round with a negative score. A score of zero will be awarded in this case.

~~6.6.9 Teams who do not successfully complete all scorable elements of the course will receive the maximum time for the round.~~

6.7 Preliminary Rounds

6.7.1 A Scoring Run will be based on the sum of all points scored (see 6.6.4) minus penalties (6.6.6).

6.7.2 There may be multiple Preliminary Rounds, depending on the time constraints of the event.

The RCJA National Event will aim to hold a minimum of five Preliminary Rounds.

6.7.3 Each team will have one scoring run per round.

6.7.4 Officials at the event will determine the order and nature of how each round will be conducted. All teams will be briefed by the officials at the start of the event to be informed on how the Preliminary Rounds will be run.

6.7.5 After the Preliminary Rounds have been run, teams will be ranked according to their Cumulative Score. This will be calculated by the addition of the result of the Scoring Run from each round. In the event that scores are identical, the team with the lower total time will be ranked higher.



6.8 Finals

- 6.8.1 The first, second and third placed teams will be determined by the Head-to-Head Round.
- 6.8.2 There will (typically) be three teams in the Head-to-Head Round. The teams will be determined by selecting the top ranked teams from the Preliminary Rounds. It is permissible for the number of teams in the Head-to-Head Round to vary.
- 6.8.3 The finalists will rotate through and attempt each of the courses in the Head-to-Head Round. The team with the highest cumulative score from courses completed in the Head-to-Head Round will be judged the winner. Second and third placings are also determined through ranking this cumulative score. In the event that scores are identical, the team with the lower total time will be ranked higher.

6.9 Special Circumstances

- 6.9.1 Specific modifications to the rules to allow for special circumstances, such as unforeseen problems and/or capabilities of a team's robots, may be agreed to at the time of the tournament, provided a majority of the teams agree.