

ABU ASIA-PACIFIC ROBOT CONTEST 2027 SOLO, INDONESIA



Theme & Rules **“The Pursuit of Mustika Nusantara”**

August 2026 (V1.0)
Asia-Pacific Robot Contest 2027 Solo, Indonesia
Organising Committee
<http://www.aburobocon2027.id>

Contents

Background and Concept	5
The Importance of Safety	5
Contest	5
Contest Dates	6
1. Game Field and Object	7
2. Terms and Definitions	8
3. Game Outline	11
3.1 Method of the Match	11
3.2 Operating Zones	12
3.3 Start of the Match	12
3.4 Handling of Game Objects	12
3.5 Tower Construction and Interaction	13
3.6 Sanctuary Mandate and Mustika	13
3.7 End of the Match	14
4. Game Procedure	14
4.1 Setup of Robots and Objects	14
4.2 Match Start and Duration	15

4.3 Operating Zones and Constraints	15
4.4 Handling and Transfer of Objects	16
4.5 Sanctuary Mandate and Mustika Retrieval	16
4.6 End of Match and Scoring State	16
5. Retry	16
5.1 Retry Protocols	17
5.2 Requesting a Retry	17
5.3 Retry Procedure	17
6. Violation	18
6.1 No-Pushing Rule	18
6.2 Zone Violation	18
6.3 Handover Violation	18
6.4 Out of Bounds	18
6.5 Dropped Objects	18
6.6 Blocking and Interference (Shared Areas)	19
6.7 Unauthorized Touching	19
7. Disqualifications	19
7.1 Intentional Damage	19
7.2 Displacement of Placed Blocks	19
7.3 Safety Violations	19
7.4 Unsportsmanlike Conduct	19
8. Scoring	20
8.1 Transfer Points (TR Tasks)	20
8.2 Individual Block Scoring (Tower Placement)	20
8.3 Ownership and Individual Counting	20
8.4 Multi-Team Towers	21
8.5 Mission Points (The Mustika)	21
8.6 Invalid Scoring Scenarios	21
9. Deciding the Winner	21
9.1 Match Duration	21

9.2 Total Score Calculation	22
9.3 Tie-breaking Criteria	22
9.4 Scoring State and Objections	22
10. Teams	23
11. Robot	23
12. Safety	24
13. Other	25
14. Colors and Materials Specification	25

Background and Concept

Long before modern technology existed, ancient visionary engineers constructed monumental temple circuits to harmonize the raw forces of nature. These structures were far more than just stone monuments; they functioned as a massive, interconnected energy network. At the very peak of this architecture sat the Mustika—a radiant artifact that activated and stabilized the grand Nusantara energy grid across the archipelago. Over the centuries, time has scattered these perfect foundations, leaving the ancient grid completely silent. Now, a new generation of bold robotics teams is called upon to resurrect this sacred stone architecture and restore its lost power.

To accomplish this task, teams must design machines that combine raw lifting strength with sophisticated automation. The Transporter Robot (TR) acts as the agile gatherer, navigating the lower terrain to harvest the heavy Earth Blocks and delivering them to the designated transfer zone. The Builder Robot (BR), a fully autonomous master architect, precisely stacks these foundations to rebuild the lost pillars, sealing the energy circuit by placing the crowning Sky Block at the very top. The ultimate test unfolds in the fiercely contested central zone, where rival builders race to enshrine the Mustika on the highest pillar and reboot the grid. The competition is designed as a grueling, three-minute marathon of relentless vertical logistics.

The Importance of Safety



Safety is the highest priority in ABU Robocon. Teams must prioritize safety during all stages, including robot design, manufacturing, and contest participation. Full cooperation with organizers is required to ensure a safe environment for everyone involved (team members, spectators, officials, and the surroundings). All team members must wear organizer-specified safety gear during games and practice sessions.

Contest

All domestic competitions selecting teams for ABU Robocon 2027 Solo, Indonesia must adhere to the rules in this rulebook. However, if specified materials are unavailable for domestic contests, local organisers should use the best possible replacements available in their country/region.

Contest Dates

Date	Event
27/8/2027 (Fri)	Arrival
28/8/2027 (Sat)	Test-run, Rehearsal
29/8/2027 (Sun)	Contest Date
30/8/2027 (Mon)	ABU General Meeting
31/8/2027 (Tue)	Departure

Contest Venue: Edutorium UMS, Solo, Indonesia

1. Game Field and Object

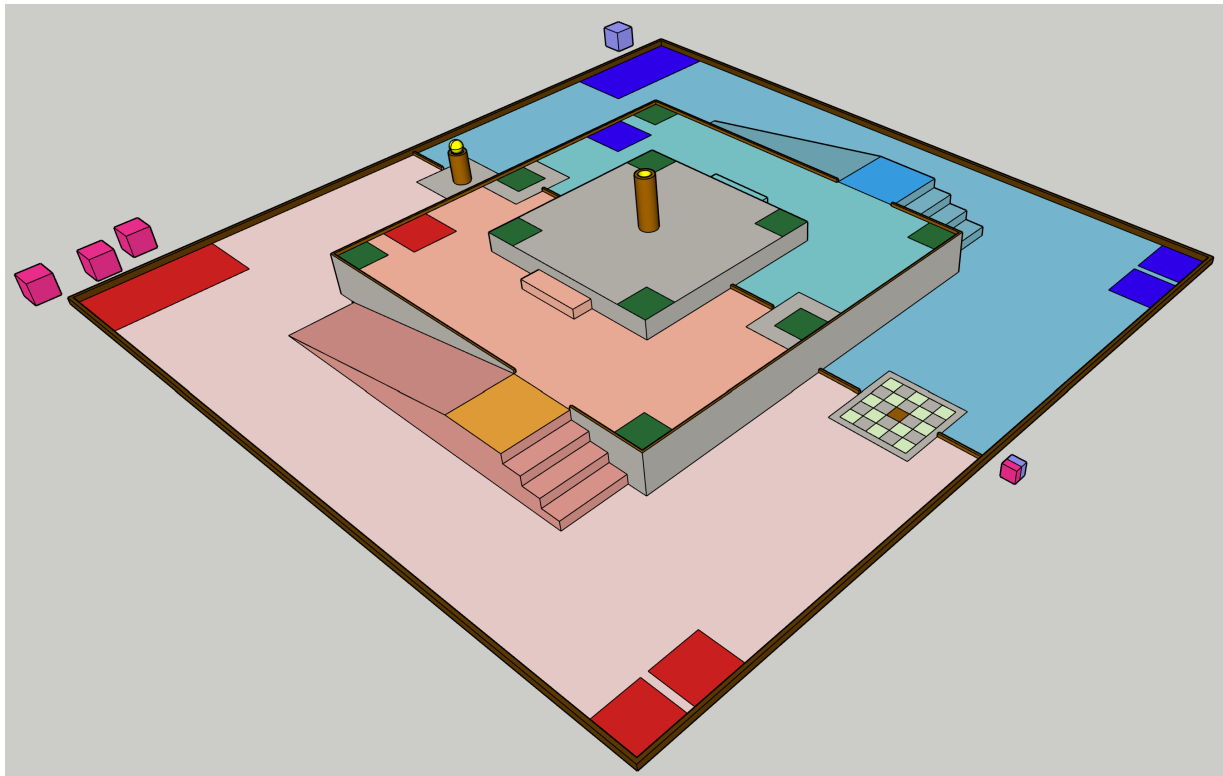


Figure 1: Game Field Overview — ABU Robocon 2027

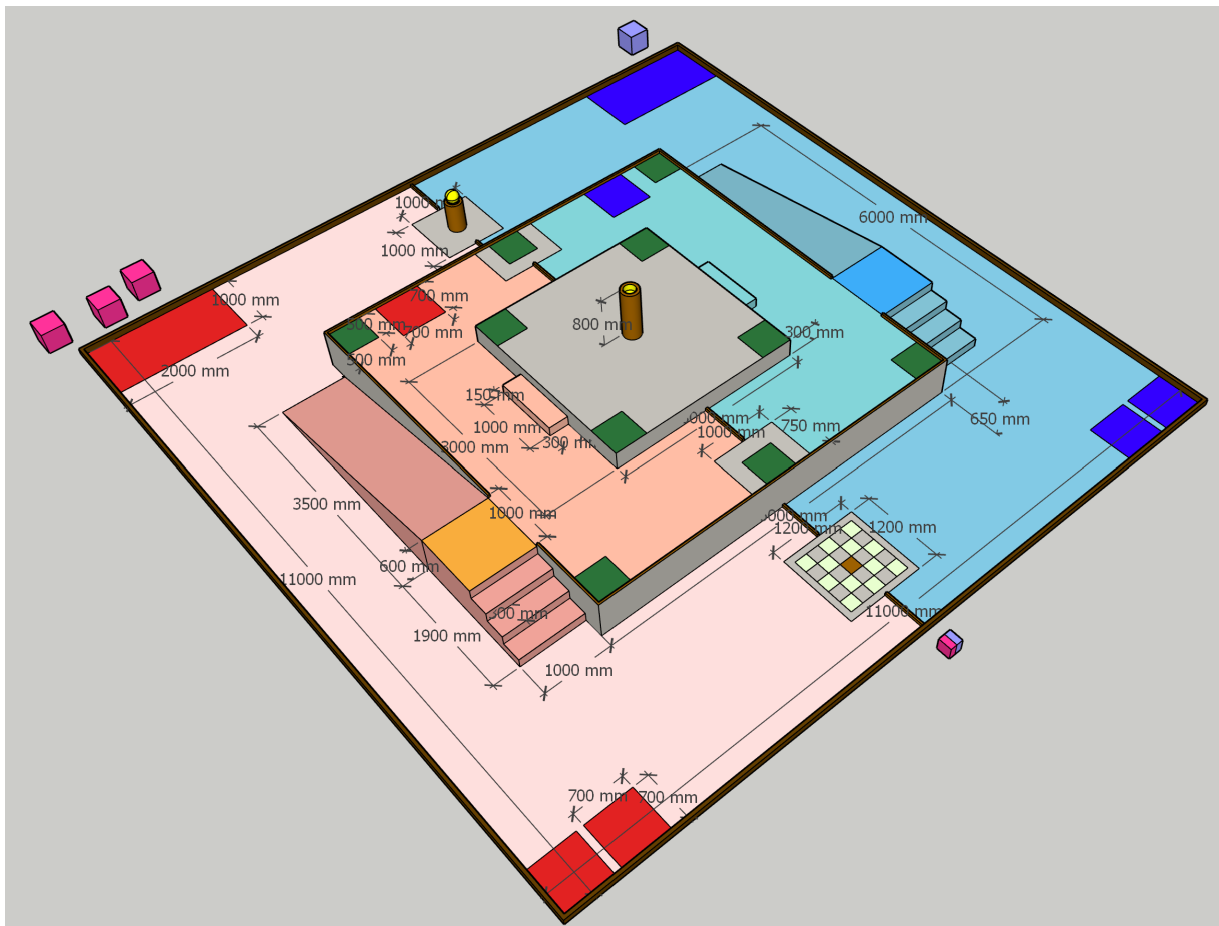


Figure 2: Game Field Dimensions — ABU Robocon 2027

2. Terms and Definitions

Terms	Definitions
Game Field	The main contest venue measuring 11000 mm × 11000 mm, divided into specific operational zones for both teams.
Ground Area	The lowest flat surface of the Game Field where the Start Zone, Storage Area, Shared Area, and Mustika Pillar are located, serving as the primary operating ground for the Transporter Robot (TR).
Start Zone	Two designated boxes measuring 700 mm × 700 mm each in the Ground Area. Teams have the strategic freedom to choose which box is for the Transporter Robot (TR) and which is for the Builder Robot (BR).

Terms	Definitions
Retry Zone (Ground)	The same physical location as the Start Zone. During a retry, the malfunctioning robot must be returned to its Start Zone before it can resume operation.
Retry Zone (L1)	A designated area on Level 1 measuring 700 mm × 700 mm, located on each team's side. During a retry, BR may be returned to the L1 Retry Zone instead of the Ground Start Zone, allowing faster recovery when operating on the upper levels.
Storage Area	The exclusive area in each team's Ground Area measuring 1000 mm × 2000 mm. This is where 20 Earth Blocks are initially placed for the team to harvest.
Ground Shared Area	The central contested zone in the Ground Area measuring 1200 mm × 1200 mm. This area holds 12 Sky Blocks placed in an alternating pattern and can be accessed by both teams. An additional shared area of 1000 mm × 1000 mm is located around the Mustika Pillar and can also be accessed by both teams.
Mustika Pillar	A cylindrical pedestal located in the Ground Area where the Mustika is placed at the start of the match. Dimensions: height 500 mm, diameter 270 mm, with a concave receptacle at the top (diameter 180 mm, depth 100 mm) to securely hold the Mustika before retrieval by the robots.
Transporter Robot (TR)	A manually or automatically controlled robot (maximum starting size: 700 mm × 700 mm) that harvests blocks and the Mustika from the Ground Area and delivers them to the Transfer Area.
Builder Robot (BR)	An automatic robot (maximum starting size: 700 mm × 700 mm) that picks up or receives objects from TR at the Transfer Area, constructs towers on Level 1 and Level 2, and is responsible for enshrining the Mustika on the Central Pillar.
Earth Block	A cubic object measuring 350 mm × 350 mm × 350 mm (±5%) used as the foundation and middle section of a tower. Each team is provided with 20 units. Material: 3-layer corrugated cardboard box, all six sides covered with stickers. Approximate weight: 600 grams per unit (±20%).

Terms	Definitions
Sky Block	A cubic shared object measuring 200 mm × 200 mm × 200 mm ($\pm 5\%$), colored red on one side and blue on the other, used to cap the top of a tower. There are 12 units available in the Share Zone. Material: 3-layer corrugated cardboard box, all six sides covered with stickers, featuring reinforced claws/hooks to prevent the box from opening when lifted by suction mechanisms. Approximate weight: 220 grams per unit ($\pm 20\%$).
Mustika	The Great Artifact in the shape of a sphere (approximately 210 mm diameter), worth 250 points, to be enshrined on the Central Pillar. A Mikasa V300W volleyball (Size 5, circumference 65–67 cm) shall be used in its original condition without additional paint or coating. Approximate weight: 260–280 grams.
Level 1 (L1)	The first elevated platform, standing 600 mm above the Ground Area, measuring 6000 mm × 6000 mm. Accessed from the Ground Area via a ramp (3500 mm in length) or stairs. Stairs: Steps connecting the Ground Area to Level 1, with each step measuring 300 mm (length) × 1000 mm (width) × 150 mm (height).
Level 2 (L2)	The highest elevated platform, standing 300 mm above Level 1 (900 mm above the Ground Area), measuring 3000 mm × 3000 mm. Accessed from Level 1 via stairs, with a step measuring 300 mm (length) × 1000 mm (width) × 150 mm (height). L2 Shared Area: The entire platform of Level 2, which is open to both teams for building towers.
Transfer Area	A designated 1000 mm × 1000 mm zone at the boundary of L1 where TR and BR exchange game objects. TR may hand over objects directly to BR or place them on the floor within this boundary for BR to retrieve.

Terms	Definitions
Building Spot	The green-colored target squares with a built-in tolerance measuring 500 mm × 500 mm, located on L1 (exclusive and shared) and L2 (all shared) where Complete Towers must be constructed by the Builder Robot. L1 Shared Area: The contested zone located on the boundary between the Red and Blue sides of Level 1.
Central Pillar	The tallest cylindrical structure on Level 2 where the Mustika must be enshrined to complete the ultimate objective. Dimensions: height 800 mm, diameter 270 mm, with a concave receptacle at the top (diameter 180 mm, depth 100 mm) for Mustika enshrinement.
Fence / Barrier	Vertical partition walls and edge barriers used to define zone boundaries on the Game Field. Two types are used: Center Divider: A fence running along the center line of the Ground Area and Level 1, separating the Red Zone from the Blue Zone. L1 Perimeter Barrier: A barrier along the outer edges of Level 1 to prevent robots and objects from falling off the elevated platform.
Complete Tower	A fully constructed structure consisting of exactly two Earth Blocks stacked vertically and crowned with one Sky Block facing the correct team color, placed in order on a Building Spot.
Sanctuary Mandate	The strategic requirement to build at least two Complete Towers, with at least one of those towers located in an upper shared zone (either L1 Shared Area or L2 Shared Area), to unlock the eligibility to place the Mustika.

3. Game Outline

3.1 Method of the Match

3.1.1 A match is contested between a red team and a blue team.

3.1.2 The match lasts for exactly three minutes.

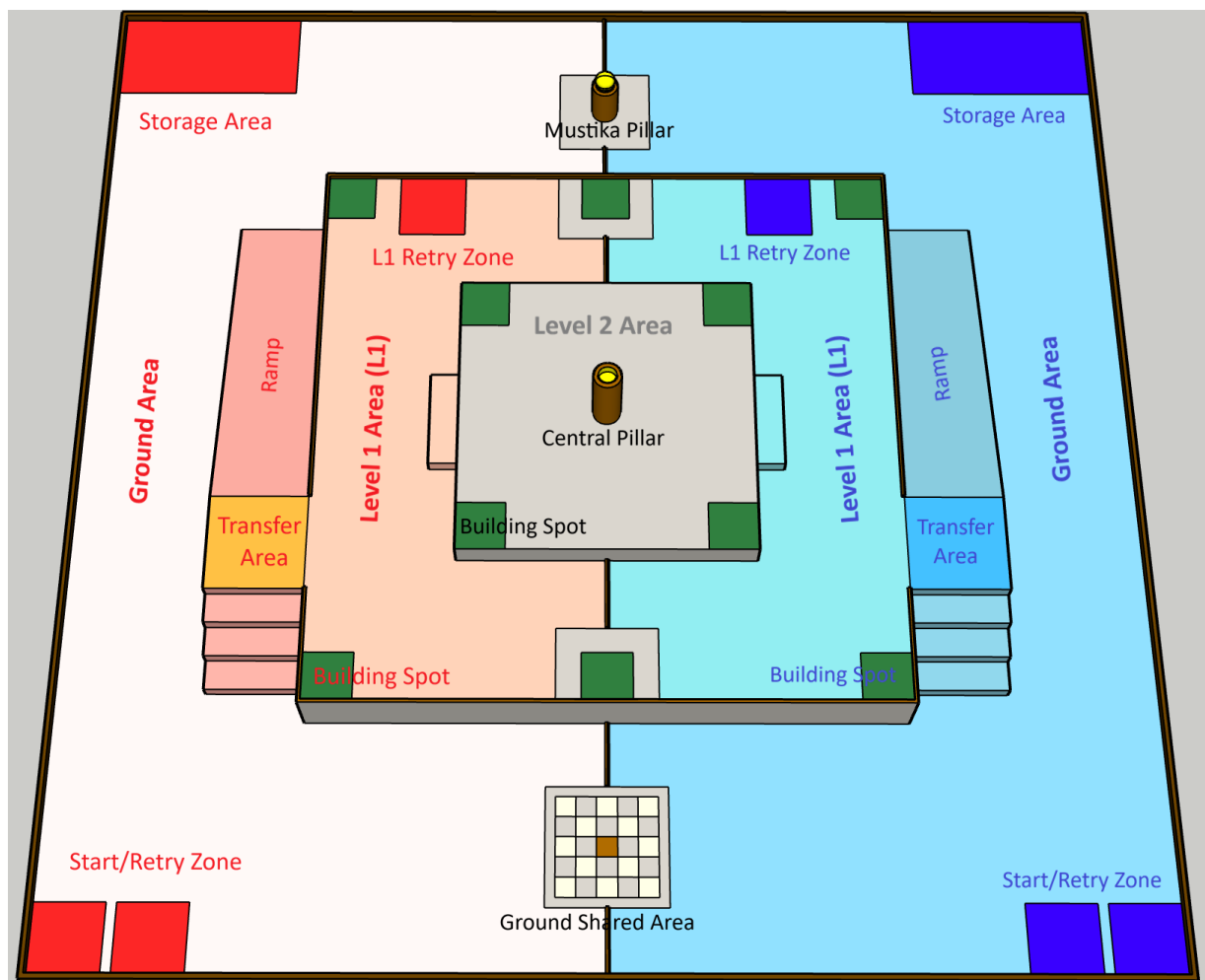


Figure 3: Game Field Labeled Area Names — ABU Robocon 2027

3.1.3 The winner is decided by the total accumulated score at the end of the match.

3.2 Operating Zones

3.2.1 Transporter Robot (TR) is permitted to operate in the Ground Area and reach the Transfer Area. TR is strictly prohibited from entering any other parts of Level 1 (L1) or Level 2 (L2).

3.2.2 Builder Robot (BR) is permitted to operate in the Transfer Area, Level 1 (L1), and Level 2 (L2).

3.3 Start of the Match

3.3.1 At the start of the match, TR and BR must be positioned within their respective Start Zones.

3.3.2 The match begins upon the start signal from the referee.

3.4 Handling of Game Objects

3.4.1 TR harvests Earth Blocks from the Storage Area and Sky Blocks from the Ground Share Area.

- 3.4.2** TR transports these objects to the Transfer Area on Level 1 (L1).
- 3.4.3** TR is permitted to carry a maximum of three (3) blocks at any time.
- 3.4.4** BR is permitted to carry a maximum of two (2) blocks at any time.
- 3.4.5** In the Transfer Area, TR may hand objects directly to BR or place them on the floor within the area's boundary for BR to retrieve. While touching the Ground Area, TR cannot place objects on the Transfer Area.

3.5 Tower Construction and Interaction

- 3.5.1** BR is fully responsible for constructing Complete Towers on the designated Building Spots (500 mm × 500 mm) in L1 and L2.
- 3.5.2** A Complete Tower must be assembled by stacking two Earth Blocks vertically (serving as the foundation and middle section) and crowning them with one Sky Block (top) in that specific order.
- 3.5.3** Robots are prohibited from dragging or pushing blocks along the floor of the Game Field to the Building Spot; blocks must be actively lifted or carried during the assembly process.
- 3.5.4** To place a Sky Block on a tower located in the L2 Shared Area, BR must be physically present on Level 2 (L2).
- 3.5.5** Earth Blocks that have been correctly placed on a Building Spot must not be moved, removed, or interfered with by the opposing team. A team's own robot may reposition its own Earth Blocks on a Building Spot, provided there is no opponent's Sky Block on top of them.
- 3.5.6** Sky Blocks are scored based on the color of their top surface. A team only receives points for a Sky Block if its top surface color matches the team's designated color (Red or Blue).
- 3.5.7** The team whose Sky Block color is facing up on top of a tower is considered to have completed that tower (Complete Tower), even if the Earth Blocks beneath it were initially placed by the opposing team.
- 3.5.8** Teams are permitted to flip or change the position of a Sky Block on any tower to ensure their color faces upward, effectively "stealing" the tower from the opponent.

3.6 Sanctuary Mandate and Mustika

- 3.6.1** A team fulfills the Sanctuary Mandate by successfully constructing at least two (2) Complete Towers, provided that at least one (1) of those towers is located in a Shared Area (L1 Shared Area or L2 Shared Area).
- 3.6.2** Once the Sanctuary Mandate is achieved, the mandate is considered permanently fulfilled even if the team's towers are later modified by the opponent.
- 3.6.3** TR retrieves the Mustika and transfers it to BR at the Transfer Area.

3.6.4 BR then transports and enshrines the Mustika on the Central Pillar located on L2 to complete the ultimate objective.

3.6.5 Teams may continue to build towers or flip Sky Blocks to accumulate points until the match time expires.

3.7 End of the Match

3.7.1 The match concludes the exact moment the three-minute duration has elapsed.

3.7.2 The final score is tallied based on the state of the blocks and the Mustika at the exact moment the match ends. The team with the higher score is declared the winner.

4. Game Procedure

4.1 Setup of Robots and Objects

4.1.1 Before the match begins, teams are granted one (1) minute to set up their robots and finalize their strategy on the field.

4.1.2 Both Transporter Robot (TR) and Builder Robot (BR) must be positioned completely within the two provided Start Zones before set up time ends. Teams have the strategic freedom to choose which specific Start Zone box accommodates the TR and which accommodates the BR based on their own field strategy. No part of the robots (including mechanisms, grippers, or sensors) may exceed the vertical boundary of their chosen Start Zone during the setup phase.

4.1.3 Teams are responsible for placing their twenty (20) Earth Blocks within their designated Storage Area. Teams are permitted to stack the blocks, but stacking is strictly limited to a maximum height of two (2) Earth Blocks per column. All columns must be completely within the Storage Area boundaries.

4.1.4 The 12 Sky Blocks in the Ground Shared Area shall be placed by the organizer before the setup time begins.

- The blocks will be positioned in an alternating chessboard pattern on a 5×5 grid, leaving the exact center spot empty.
- The placement pattern shall follow the layout shown in Figure 4.

4.1.5 The Mustika shall be placed on the Mustika Pillar by the organizer before the setup time begins.

4.1.6 Three team members and up to three pit crew members are allowed to participate in the set-up.

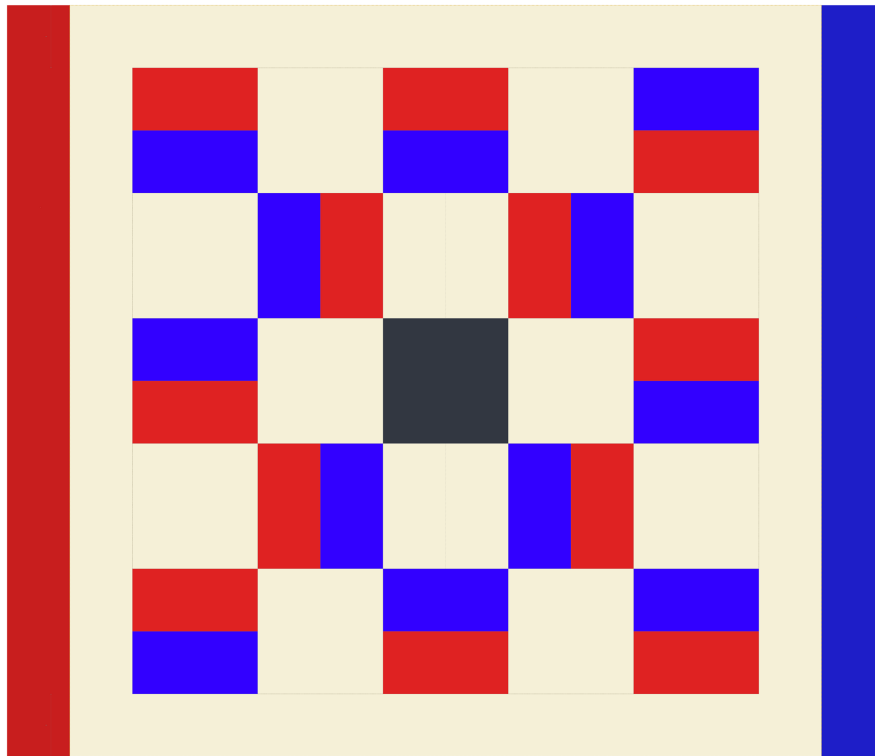


Figure 4: Sky Block Initial Layout — Mirror-Symmetric Color on 5×5 Grid

4.2 Match Start and Duration

- 4.2.1** The match begins immediately upon the sound of the referee's buzzer or whistle.
- 4.2.2** Every match lasts for exactly three (3) minutes (180 seconds).
- 4.2.3** The match will not end early, even if the Mustika is enshrined. Teams may continue to score transfer point and tower points until the full time elapses.
- 4.2.4** Once the match starts, team members are strictly prohibited from touching the robots, the game field, or any game objects, except during an authorized Retry.

4.3 Operating Zones and Constraints

To maintain the specialized roles of the robots, strict zone boundaries are enforced.

- 4.3.1** Transporter Robot (TR) is permitted to operate in the Ground Area and enter the Transfer Area. TR is strictly prohibited from entering any other part of Level 1 (beyond the Transfer Area boundary) or Level 2.
- 4.3.2** Builder Robot (BR): Permitted to operate in the Transfer Area, Level 1 (L1), and Level 2 (L2). BR may come into contact with the Ground Area during retries or while navigating onto the L1 Stairs.
- 4.3.3** Zone violations are judged by the vertical projection of any part of the robot crossing into a restricted area.

4.4 Handling and Transfer of Objects

4.4.1 Robots must lift and carry blocks to move them. Pushing, dragging, or sliding blocks along the floor to a Building Spot or Transfer Area is a violation.

4.4.2 TR may carry a maximum of three (3) blocks at any time, BR may carry a maximum of two (2) blocks at any time.

4.4.3 Transfer Protocol:

- When picking up or receiving an object from the Transfer Area, BR is permitted to touch only objects that are within the Transfer Area, including the airspace above it.
- TR may hand the object directly to BR or place it on the floor within the Transfer Area for BR to retrieve.
- If an object falls or is released outside the Transfer Area, it is considered a Handover Violation.
- Physical contact between TR and BR during the handover phase is permitted, provided that the portions of the robots that are in contact are within the Transfer Area boundary, even if other parts of either robot extend beyond it.

4.5 Sanctuary Mandate and Mustika Retrieval

4.5.1 TR is only permitted to retrieve the Mustika once the team has fulfilled the Sanctuary Mandate (successfully constructing at least two Complete Towers, with at least one located in the L1 Shared Area or L2 Shared Area).

4.5.2 TR retrieves the Mustika from the Mustika Pillar and delivers it to BR at the Transfer Area. BR then carries the Mustika to Level 2 for enshrinement on the Central Pillar.

4.6 End of Match and Scoring State

4.6.1 When the 3-minute buzzer sounds, all robots must stop immediately.

4.6.2 The final score is tallied based on the position of blocks and the Mustika at the moment the buzzer sounds.

4.6.3 Any object still being touched, gripped, or supported by a robot when the match ends will not be counted for points.

5. Retry

5.1 Retry Protocols

5.1.1 A retry can be requested by a team. A team may request a retry at any time by calling out "Retry". The robot is returned to its Start Zone, and any objects held by the robot are returned to their starting positions (Storage Area or Ground Share Area).

5.1.2 Referees will call a forced retry if a robot commits violation.

5.1.3 If a retry is called while a robot is in possession of the Mustika, the Mustika must be returned to the Mustika Pillar.

5.2 Requesting a Retry

5.2.1 A team may request a retry at any time if their robot malfunctions, gets stuck, or if the team wishes to reset their strategy.

5.2.2 The team leader must signal the referee by raising their hand and shouting "Retry!".

5.2.3 A retry begins only after the referee acknowledges the request.

5.3 Retry Procedure

5.3.1 Robot Reset: The affected robot(s) must be moved back in their respective Retry Zone.

- TR must always be returned to the Start Zone (Ground Retry Zone).
- BR may be returned to either the Start Zone (Ground Retry Zone) or the L1 Retry Zone, at the team's discretion. To be able to use the L1 Retry Zone, BR must have completely entered L1 at least once during the match.

5.3.2 Object Handling:

- Any game objects (Earth Blocks or Sky Blocks) held by the robot at the time of the retry request may be retained by the robot upon restart.
- If the Mustika was being carried during a retry, it must be returned to the Mustika Pillar.
- Objects already correctly placed on a Building Spot or the floor of the Transfer Area (and not touched by the robot at the time of the retry) shall remain in place.

5.3.3 Restart: Robots may restart immediately after acknowledged by the referee.

5.3.4 Non-Interference:

- A retry shall be carried out in a manner that does not interfere with the opposing team's actions.
- When the opposing team has been granted a retry, no team shall intentionally interfere with the retry process.
- During a retry, both teams must make every reasonable effort not to interfere with the actions of the opposing team.

- Violation of any of these provisions may result in a warning or a forced retry at the referee's discretion.

6. Violation

A violation results in a Forced Retry. The referee will call the violation, and the team member must immediately stop the offending robot. The robot must then return to the Start Zone following the retry procedure.

6.1 No-Pushing Rule

Robots must lift or carry blocks (Earth Blocks and Sky Blocks). Pushing, dragging, or sliding a block along the floor to a Building Spot or Transfer Area is strictly prohibited.

6.2 Zone Violation

6.2.1 TR (Transporter Robot): Any part of TR (including mechanisms) crossing the vertical boundary into Level 1 (beyond the Transfer Area) or Level 2.

6.2.2 Opponent's Territory: Any part of a robot crossing into the opponent's territory except the shared areas.

6.3 Handover Violation

If BR touches objects which are not completely inside of Transfer area.

6.4 Out of Bounds

If a robot knocks a block (Earth Block or Sky Block) out of the game field, the block is permanently removed from play. If the Mustika is knocked out, it is immediately returned to the Mustika Pillar by the referee.

6.5 Dropped Objects

If a robot drops a block, it must be picked up by actively lifting it. Pushing a dropped block to correct its position is a violation of the No-Pushing Rule. If the Mustika is dropped at any point, it must be immediately returned to the Mustika Pillar. The Referee is responsible for resetting dropped game objects (such as the Mustika) to their initial positions on the field.

6.6 Blocking and Interference (Shared Areas)

In the Shared Areas (Ground Share Area, L1 Shared Area, and L2 Shared Area), any physical contact or action that clearly results in interfering with the opposing team's manipulation of game objects shall be considered a violation. A robot must not intentionally block the opponent's path or obstruct the opponent's robot from performing its tasks in these areas. Upon determination of interference by the Referee, a Forced Retry will be called on the offending robot.

6.7 Unauthorized Touching

A team member physically touching the robots, the Game Field, or any game objects without the referee's explicit permission or without an authorized Retry declaration.

7. Disqualifications

A team will be disqualified and lose the match (score set to 0) if they commit any of the following:

7.1 Intentional Damage

Intentionally damaging the Game Field, game objects (Earth Blocks, Sky Blocks, or the Mustika), or the opponent's robot(s).

7.2 Displacement of Placed Blocks

Intentionally removing, displacing, or interfering with an opponent's Earth Block that has already been correctly placed on a Building Spot.

7.3 Safety Violations

Operating a robot that poses a danger to people, the venue, or the field infrastructure (e.g., sharp parts flying off, battery smoke, or fire).

7.4 Unsportsmanlike Conduct

Refusing to follow the referee's instructions, aggressively arguing with match officials, or engaging in behavior that violates the spirit of fair play.

8. Scoring

The final score for each team is calculated based on the final state of the game objects on the field at the exact moment the three-minute match duration elapses (signaled by the buzzer). Any object that is still in contact with or being physically controlled by a robot when the match ends will yield zero (0) points for its specific task.

8.1 Transfer Points (TR Tasks)

Points are awarded to the team for the successful logistics performed by the Transporter Robot (TR).

- **Point Value:** 5 points are awarded for each block (Earth Block or Sky Block) successfully delivered to the Transfer Area.
- **Condition:** A block is considered “delivered” once it has been released by the TR and remains entirely within the vertical boundaries of the 1000 mm × 1000 mm Transfer Area.
- **Permanence:** Transfer points are awarded immediately and remain with the team even if the Builder Robot (BR) later retrieves the block to construct a tower.

8.2 Individual Block Scoring (Tower Placement)

Points are awarded for blocks successfully placed on Building Spots. Unlike the “Transfer Points,” these points depend on the level (L1 or L2) where the block is positioned.

Game Object / Position	Level 1 (L1) Points	Level 2 (L2) Points
Earth Block (First / Bottom Layer)	10 Points	20 Points
Earth Block (Second / Middle Layer)	20 Points	40 Points
Sky Block (Top Layer)	40 Points	80 Points

8.3 Ownership and Individual Counting

To ensure fairness, each block in a tower is scored independently based on the team that placed it, with the exception of the Sky Block.

8.3.1 Points are awarded to the team that successfully placed the block on the Building Spot. Once an Earth Block is correctly placed (either as a foundation or middle layer), its points are “locked” to that team and cannot be claimed by the opponent, even if the opponent adds more blocks on top of it.

8.3.2 Points for a Sky Block are awarded based on the color facing upward at the end of the match.

- If a Sky Block shows Red on top, the Red Team receives the points (40 or 80 pts).
- If the Blue Team flips that same block to show Blue, the points shift to the Blue Team.

- 8.3.3** Flipping a Sky Block does not grant ownership of the Earth Blocks beneath it. Those foundational blocks always score for the team that originally placed them.

8.4 Multi-Team Towers

In the L1 Shared Area and L2 Shared Area, a tower may be composed of blocks from both teams. Example: If the Red Team places the first Earth Block on L2 (20 pts) and the Blue Team stacks the second Earth Block on top of it (40 pts), the Red Team keeps their 20 points, and the Blue Team earns their 40 points.

8.5 Mission Points (The Mustika)

The enshrinement of the Mustika represents the completion of the ultimate objective.

- 8.5.1** Mustika Enshrinement: 250 points.
- 8.5.2** The Mustika must be placed on the Central Pillar (L2) and remain stable at the exact moment the match ends.
- 8.5.3** Mustika points are awarded to the team that successfully places it, provided they have fulfilled the Sanctuary Mandate requirements.

8.6 Invalid Scoring Scenarios

No points shall be awarded for:

- 8.6.1** Any object still being touched, gripped, or supported by a robot when the buzzer sounds.
- 8.6.2** Any block placed out of Building Spots or out of the required Complete Tower sequence (must strictly follow: Earth Block → Earth Block → Sky Block).
- 8.6.3** Blocks that have been knocked out of the building spots.
- 8.6.4** Blocks that were pushed, dragged, or slid along the floor to the Building Spot rather than actively lifted/carried.

9. Deciding the Winner

The winner of a match is determined by the total accumulated points at the end of the full match duration.

9.1 Match Duration

- 9.1.1** Each match lasts for a fixed duration of exactly three (3) minutes.
- 9.1.2** There is no early victory or “instant win.” Even if a team successfully enshrines the Mustika,

the match continues until the timer reaches zero.

- 9.1.3** The final scoring state is determined by the exact position and condition of all game objects at the exact moment the end-of-match buzzer sounds.

9.2 Total Score Calculation

The winner is the team with the highest Total Score, calculated as the sum of:

- 9.2.1** 5 points for every block (Earth Block or Sky Block) successfully delivered to the Transfer Area by TR.
- 9.2.2** Individual points for every Earth Block and Sky Block correctly placed on Building Spots in L1 and L2 by BR.
- 9.2.3** 250 points for the successful enshrinement of the Mustika on the Central Pillar.

9.3 Tie-breaking Criteria

If both teams have the same Total Score at the end of the 3-minute match, the winner will be determined by the following tie-breakers in descending order of priority:

- 9.3.1** The team that successfully enshrined the Mustika on the Central Pillar.
- 9.3.2** The team with the higher number of Sky Blocks showing their designated team color facing up on top of towers across the entire Game Field.
- 9.3.3** The team with the higher total number of blocks (Earth Blocks and Sky Blocks) correctly placed on Level 2 (L2) Building Spots.
- 9.3.4** The team with the higher total number of blocks (Earth Blocks and Sky Blocks) correctly placed on Level 1 (L1) Building Spots.
- 9.3.5** If a tie still persists, the referee panel will uniquely determine the winner based on a final assessment of technical merit and sportsmanship during the match.

9.4 Scoring State and Objections

- 9.4.1** Once the buzzer sounds, the referees will evaluate the field. Robots must be stopped immediately and must not be touched by any team member until the evaluation is complete.
- 9.4.2** Any object still in contact with or being physically supported by a robot at the 3-minute mark will be excluded from the final score.
- 9.4.3** The Team Leader must review and sign the official score sheet after the match. Any objections must be raised immediately before the score sheet is signed. Once the score sheet is signed, the result is absolute and cannot be contested.

10. Teams

- 10.1** Each participating country or region shall be represented by one (1) team. Indonesia, as the hosting region, will be represented by two (2) teams.
- 10.2** A team must consist of exactly three (3) student members and one (1) instructor. All team members and the instructor must belong to the same higher education institution (university, college, or polytechnic).
- 10.3** Up to three (3) additional students from the same institution may be registered as Pit Crew members. Pit Crew members are permitted to assist exclusively during preparation in the designated Pit Area and are strictly prohibited from entering the Game Field during the match.
- 10.4** Participation as a team member or Pit Crew is restricted to undergraduate or diploma students. Postgraduate students are strictly prohibited from participating in these roles.

11. Robot

- 11.1** Each team is allowed to bring two (2) robots: one Transporter Robot (TR) and one Builder Robot (BR).
- 11.2** TR may be manually controlled by an operator or be an automatic robot capable of operating independently.
- 11.3** BR must be a fully automatic robot capable of operating independently without any manual intervention.
- 11.4** The initial dimensions of both TR and BR must each strictly fit within 700 mm × 700 mm × 700 mm (Length × Width × Height) before the game starts.
- 11.5** During the game, when fully extended, the dimensions of TR must not exceed 1000 mm × 1400 mm × 1200 mm (Width × Length × Height).
- 11.6** During the game, when fully extended, the dimensions of BR must not exceed 1000 mm × 1400 mm × 1200 mm (Width × Length × Height).
- 11.7** The weight of each individual robot, including its respective batteries, manual operating devices, and cables, must not exceed 50 kg per robot.
- 11.8** For radio frequency communication between the manual operating devices, and the robot, teams are only permitted to use Wi-Fi (IEEE 802.11), Zigbee (IEEE 802.15), and Bluetooth.
- 11.9** The Organizer will not control or guarantee the environmental quality of Wi-Fi, Zigbee, or Bluetooth signals at the competition venue.

- 11.10** TR and BR are strictly prohibited from any communication with each other during the game.
- 11.11** Teams may only use batteries, compressed air, and/or elastic force as power sources for their robots.
- 11.12** The nominal voltage of any battery used in the robots, controllers, or any other related devices during the game must not exceed 24V. When connecting batteries in series, the total combined nominal voltage must be 24V or less.
- 11.13** The power circuits of the robots must be designed so that any actual maximum voltage in the circuits does not exceed 42V. If the power supply system includes multiple isolated circuits, the voltage in each individual system must remain 42V or less.
- 11.14** Teams using compressed air must use either a purpose-built pneumatic container or a plastic bottle in pristine condition prepared safely and appropriately. The air pressure in the system must not exceed 600 kPa.
- 11.15** The following devices and components are strictly prohibited:
 - 11.15.1** Lead-acid batteries, adhesive-sealed batteries, explosive or high-temperature energy sources, and any items that pose a risk of damaging the Game Field or hindering the competition.
 - 11.15.2** Unsafe lasers. When using lasers, teams must strictly use Class 1 or Class 2 products that comply with the IEC 60825-1 standard and must implement safety measures based on those exact standards.
- 11.16** Robot Transportation: The Organising Committee will arrange the transportation of robots for all participating teams. Each team is permitted to prepare a maximum of one (1) transportation box. The box must have maximum dimensions of 1500 mm × 800 mm × 900 mm (Length × Width × Height). The maximum gross weight of the transportation box must not exceed 180 kg.
- 11.17** Suction mechanisms are permitted on robots, provided they do not leave any residue on or physically damage the game field objects or surfaces.

12. Safety

- 12.1** The design and construction of all robots must not pose any kind of physical danger to any person at the competition venue.
- 12.2** All robots (both TR and BR) must be equipped with a clearly visible and easily accessible red emergency “STOP” button. Additionally, a remote emergency stop switch is permitted and strongly encouraged for enhanced safety.
- 12.3** Robots must be designed, manufactured, and operated to ensure the absolute safety of team

members, opposing teams, surrounding event staff, and the Game Field infrastructure.

- 12.4** Team members must wear appropriate safety gear as mandated by the Organizer during all matches, test runs, and setup phases.
- 12.5** The use of dangerous power sources, hazardous materials, or mechanisms that could damage the Game Field or harm participants is strictly prohibited.
- 12.6** The use of flying mechanisms or drones as part of the robot design is strictly prohibited due to safety concerns and conflicts with the intended game mechanics.

13. Other

- 13.1** Situations not expressly mentioned in this Rulebook shall be subject to the final decisions of the Panel of Judges and the Organising Committee.
- 13.2** The dimensions, weights, and other physical specifications of the Game Field and game objects described in this Rulebook may have a manufacturing tolerance of $\pm 5\%$ unless otherwise specified.
- 13.3** All official inquiries should be directed to the official website of ABU Robocon 2027. An FAQ (Frequently Asked Questions) section will be provided and regularly updated on the contest's website.
- 13.4** Any changes, updates, or addendums to the Competition Rules will be officially published on the website of the ABU Robocon 2027 Organising Committee.
- 13.5** Teams must strictly comply with all instructions given by the Organising Committee and the referees at all times to ensure the absolute safety of the robots, participants, and all personnel involved.

14. Colors and Materials Specification

The following table outlines the material composition and specific RGB color codes for all primary elements of the 2027 Game Field. Teams and domestic organisers should refer to this table when constructing or painting local game fields to ensure uniformity and visual consistency across all ABU Robocon 2027 venues.

Game Field Item	Material Specification	Color (R-G-B)	Swatch
Ground Level			

Game Field Item	Material Specification	Color (R-G-B)	Swatch
Ground Area (Red)	Plywood, Water Paint	240-210-210	
Ground Area (Blue)	Plywood, Water Paint	170-210-230	
Ground Shared Area	Plywood, Water Paint	245-240-200	
Start Zone / Retry Zone (Red)	Plywood, Water Paint	223-34-34	
Start Zone / Retry Zone (Blue)	Plywood, Water Paint	50-0-255	
Storage Area (Red)	Plywood, Water Paint	240-210-210	
Storage Area (Blue)	Plywood, Water Paint	170-210-230	
Mustika Pillar	PVC pipe (Ø270 mm) with wooden cap, Oil Paint	100-62-0	
Transition Elements (Ground to L1)			
L1 Stairs (Red)	Plywood, Water Paint	235-180-160	
L1 Stairs (Blue)	Plywood, Water Paint	150-215-220	
Ramp (Red)	Plywood, Water Paint	200-150-140	
Ramp (Blue)	Plywood, Water Paint	130-180-200	
Level 1			
Level 1 Area (Red)	Plywood, Water Paint	235-180-160	
Level 1 Area (Blue)	Plywood, Water Paint	150-215-220	
Building Spot (L1)	Plywood, Water Paint	40-100-50	
L1 Shared Area	Plywood, Water Paint	245-240-200	
Transfer Area (Red)	Plywood, Water Paint	245-170-60	
Transfer Area (Blue)	Plywood, Water Paint	60-170-245	
L1 Perimeter Barrier	Plywood, Water Paint	190-190-185	
L1 Retry Zone (Red)	Plywood, Water Paint	223-34-34	
L1 Retry Zone (Blue)	Plywood, Water Paint	50-0-255	
L1 Side Wall	Plywood, Water Paint	190-190-185	
Transition Elements (L1 to L2)			
L2 Stairs (Red)	Plywood, Water Paint	235-180-160	

Game Field Item	Material Specification	Color (R-G-B)	Swatch
L2 Stairs (Blue)	Plywood, Water Paint	150-215-220	
Level 2			
Level 2 Area	Plywood, Water Paint	190-190-185	
Building Spot (L2)	Plywood, Water Paint	40-100-50	
Central Pillar	PVC pipe (Ø270 mm) with wooden cap, Oil Paint	100-62-0	
L2 Side Wall	Plywood, Water Paint	190-190-185	
Boundaries and Barriers			
Game Field Boundary	Plywood, Water Paint	100-62-0	
Center Divider Fence	Plywood, Water Paint	100-62-0	
Game Objects			
Earth Block (Red)	3-layer corrugated cardboard box, stickers on all six sides Approx. weight: 600 g (±20%)	223-34-34	
Earth Block (Blue)	3-layer corrugated cardboard box, stickers on all six sides Approx. weight: 600 g (±20%)	50-0-255	
Sky Block (Red Face)	3-layer corrugated cardboard box, stickers on all six sides, with reinforced claws/hooks. Outer surface: Matte BOPP. Wall: single-wall corrugated board Approx. weight: 220 g (±20%)	223-34-34	

Game Field Item	Material Specification	Color (R-G-B)	Swatch
Sky Block (Blue Face)	3-layer corrugated cardboard box, stickers on all six sides, with reinforced claws/hooks. Outer surface: Matte BOPP. Wall: single-wall corrugated board Approx. weight: 220 g ($\pm 20\%$)	50-0-255	
Mustika (Sphere)	Mikasa V300W volleyball (Size 5, $\varnothing 210$ mm), used in original condition Material: Synthetic leather Closest Pantone colors: Yellow: Pantone 1235C, Blue: Pantone 3591C Approx. weight: 260–280 g	Original ball color	—