

# 2020 Skills Ontario Robotics Questions and Answers

UPDATED: Feb 7, 2020

This document presents the Questions asked by Ontario Teams and the Answers provided (Bob Tone).

The process is:

- Questions are asked directly to the Tech Chair and/ or the Competitions Department
- Answers are sent directly to the Team asking the question, and the Competitions Department
- ALL Questions asked, and ALL Answers provided are shared to the website with the scope in this document for ALL Teams to view [www.SkillsOntario.com](http://www.SkillsOntario.com)
- It is a Team Responsibility to periodically check the web site for updates to this document/ Scope

## QUESTION #1

Q - Section 23 d) & e) are exactly the same. I'm assuming e) meant to read "top of stand" as opposed to "

A - Your observation regarding item 23 d & e is correct. This will be corrected in the Scope and updated

Updated Text: A Teleoperated Robot retrieving the Base Block from the Components Source Area delivering the Base Block to the Top Of the Stand will be awarded 2 Points.

## QUESTION #2

Q - Any more detailed info on golf course elements (e.g. ball size and composition, cup size)?

A - I do not know the dimension details you are seeking regarding the balls, cups or spools. Studica is providing six Tetrix 'Competition In A Box' kits for use at the provincial competition.

Schools wanting a Tetrix 'Competition In A Box' kit for use during their competition preparation activities will need to contact Derek at Studica and purchase a kit. This is outlined in the scope.

## QUESTION #3

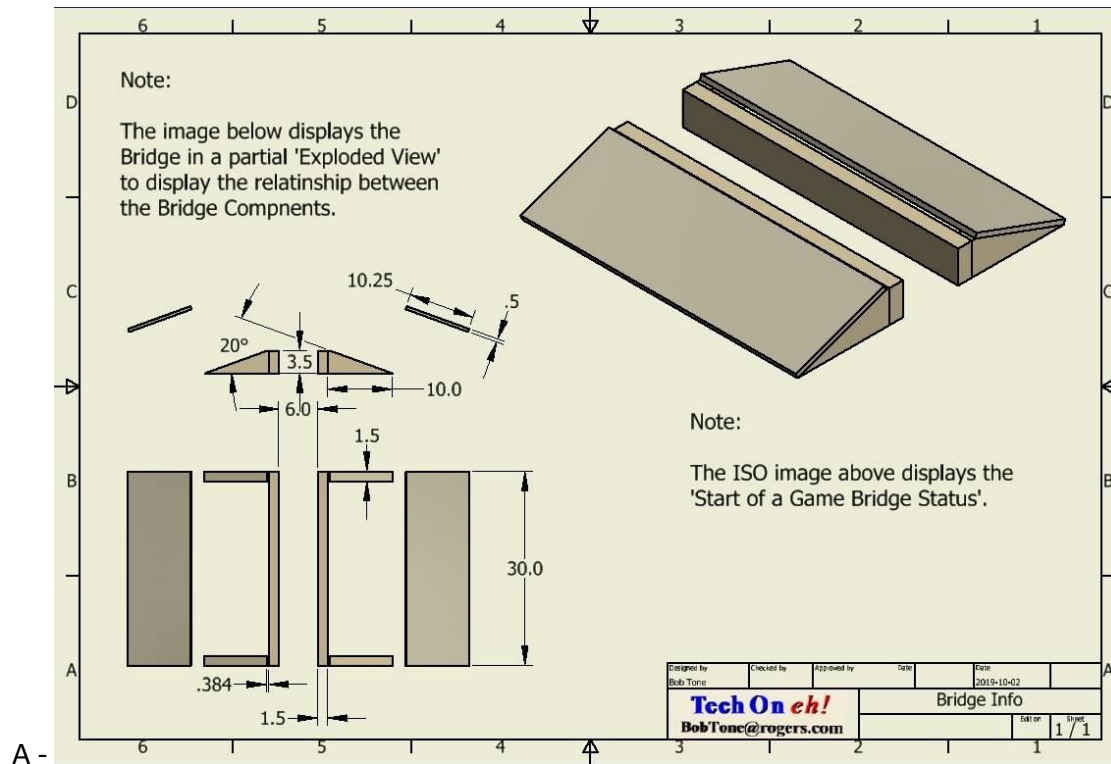
Q - Are the tees and cups affixed to the floor in any way?

A - Two-sided Tape will be used to secure the cups and tees in place.

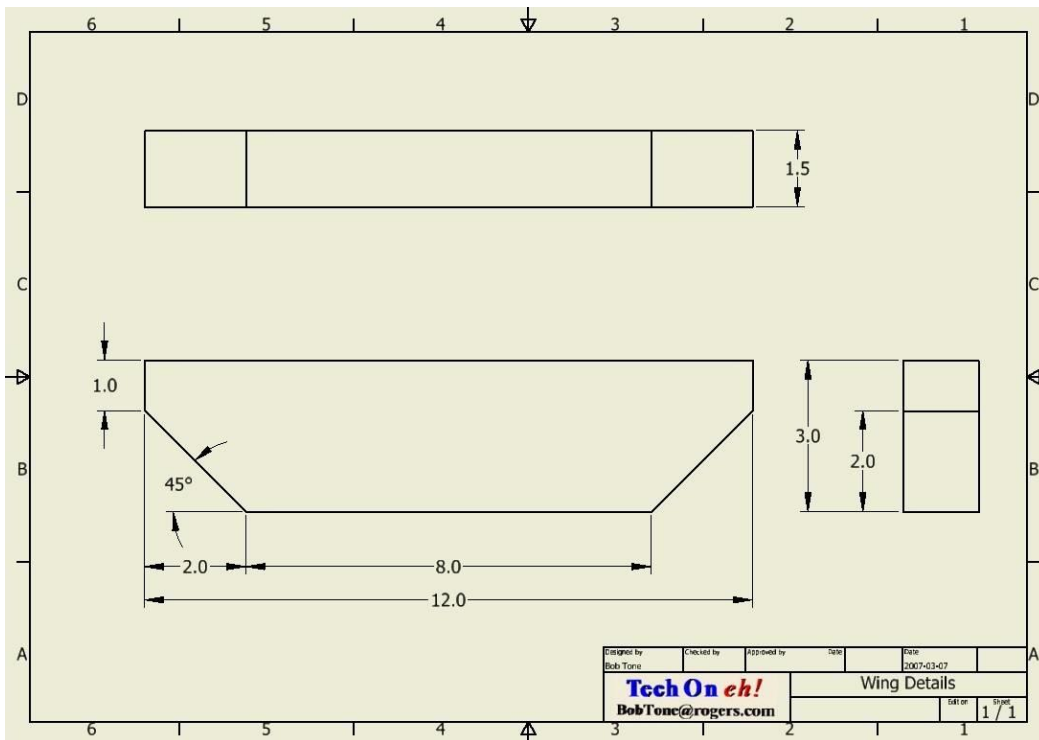
# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #4

Q - Any assembly drawings of the bridge available? Also, do you have the specific dimensions of the wing.



# 2020 Skills Ontario Robotics Questions and Answers



## QUESTION #5

The Ontario scope will be update by having this text inserted into page 17 of the Ontario scope.

**Note:** The points awarded based on the Layer a Block is placed in a Totem Pole are displayed in the Robot Marking Sheet Sample. Marks assigned increase by **ONE point per layer** as you move up the Totem Pole Structure.

- Totem Poles built on the Floor have a lower overall points value than Totem Poles built on the provided Stand given each component in an 'On the Floor Totem Pole' carries a Delivery Value of One Point while each component in an 'On the Stand Totem Pole' carries a Delivery Value of Two Points.

- Wing Blocks positioned on their Narrow Side will be awarded Bonus points.

**Note:** Bonus points will be awarded for Core Blocks positioned on the Narrow Side of a Wings Block or On a Block that is On the Narrow Side of a Wings Block.

**Note:** Robots may possess a **Maximum of ONE Totem Pole Component** at a time.

However, there is **NO RESTRICTION** on the Number of Bridge Roadway Plates that a Robot may possess at a single time during a game.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION # 6

Q - do we absolutely need to buy that kit?

A - It is a school decision whether to purchase or not purchase one of the Tetrix court kits.

Last year I had one teacher helping me and building / moving into position the Six 8 by 8 ft autonomous melamine courts and this was a significant challenge given their size and weight.

When I was offered the Tetrix courts I viewed it as an offer too good to refuse so I accepted the offer.

## QUESTION #7

Q - Is the floor going to be made of those same tiles etc?

A - YES the autonomous court floors at the provincial competition will be rubber tiles.

## QUESTION #8

Q - Any news on the specs for the bridge? Also, there appears to be some contradictions in the scope that have to do with point scoring and start of game base block possession or not.

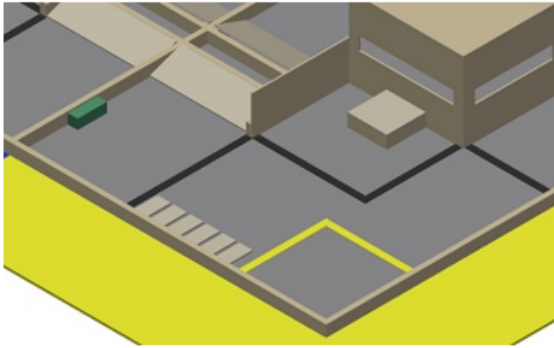
A - Regarding the bridge I expect the image below provides the needed details.

Regarding your points concerns the core point format is items placed in or totem poles built on the assembly area floor have a lower value than items placed on or totem poles built on the raised platform.

The image below displays text from the national scope that appears to have not made the journey to the Ontario scope. The Ontario scope will be updated to include this text and bring it into alignment with the national scope.

# 2020 Skills Ontario Robotics Questions and Answers

## 23.0 TOTEM POLE BASE BLOCK DELIVERY



If an Autonomous Robot is used to deliver the Totem Pole Base Block then the following Game Situation Applies:

- a) The Base Block will be positioned along the Center Wall complete just outside the Team's Home Area.
- b) An Autonomous Robot delivering the Base Block to the Assembly Area Floor will be awarded 3 Points.
- c) An Autonomous Robot delivering the Base Block onto the Top Of the Stand in the Assembly Area will be awarded 6 Points.
- d) A Teleoperated Robot retrieving the Base Block from the Components Source Area delivering the Base Block to the Assembly Area Floor will be awarded 1 Point.
- e) A Teleoperated Robot retrieving the Base Block from the Components Source Area delivering the Base Block to the Assembly Area Floor will be awarded 2 Points.

Robots will NOT be in possession of the Base Block at the start of the game as stated on page 12 of the Ontario scope.

*Note: Robot's attempting this autonomous task will NOT start in possession of the Totem Pole Base Component. The Base Block will be placed Outside the Team's Home Area.*

## QUESTION # 9

Hello Skills Ontario Robotics Community

I have participated in a discussion with the National Technical Committee regarding the question of placement of the Base Block and the images below are being provided to clarify the matter.

The Base Block will be placed 2 inches away from the center wall in the same manner as all of the Totem Pole Blocks.

In addition, I am sharing the following information provided by the Manitoba Technical Chair.

## 2020 Skills Ontario Robotics Questions and Answers

"I have made all the pieces out of foam and duct tape. They are very very light even with the tape.

Base Block = 54 grams

Totem Pole Cube Blocks = 18 grams

As a point of comparison, a fat sharpie marker is 18 grams so same as a Totem Pole Cube Block.

Bob

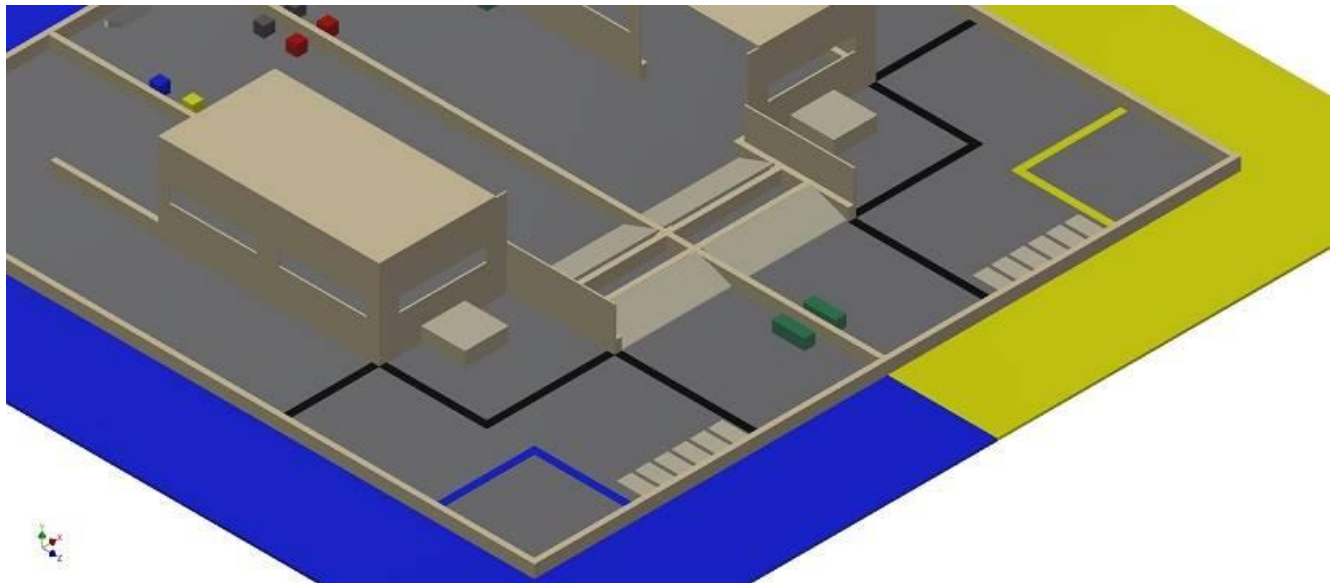


Figure 1: Floor plan of the experimental environment. The plan shows a rectangular room with various dimensions and labeled areas. Key dimensions include 30.0, 39.5, 60.5, 15.5, 2.0, 35.0, 11.5, 29.5, 12.0, 35.5, 24.0, 11.75, 6.0, 42.0, 60.5, 2.0, 6.0, 2.0, 30.0, and 2.0. Labeled areas include 'Teleop Managed Base Block Starting Position' and 'Aut Managed Base Block Starting Position'. The plan also shows a central corridor and several small rectangular blocks representing obstacles or equipment.

[https://www.studica.com/ca/en/SkillsCanada/ontario-autonomous-golf-competition-game-piece-set/am-3445\\_1.html](https://www.studica.com/ca/en/SkillsCanada/ontario-autonomous-golf-competition-game-piece-set/am-3445_1.html)

Q - The driver who is controlling the building of the Inukshuk is on the opposite side of the tunnel right?

Q - Where can the other driver go if we are planning on using two bots?

A - In answer to your questions 1 and 2. The only restriction on drivers is they cannot enter the opponent's space. If your team has one driver or two the rule is the same: Drivers are free to move anywhere along the three sides of their assigned game space.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #12

Q - Can you use more than 2 bots?

A - Teams can use a maximum of 2 Teleoperated robots. However, a team may also have an additional robot if it is an autonomous robot.

## QUESTION #13

Robotics is a Team of 4, however, you can compete as a Team of 2, but the Teleoperation and Autonomous competition elements both take place all day on both of the competition days (Monday and Tuesday). The possibility exists that a team could be called to participate in both courts at the same time, which would prove difficult for a team of two.

## QUESTION #14

Q - our teleoperated robots are going to be about 14" wide x 14" in length x 23" high for each of the two robots. It is simply an area calculation for the robots to fit within (30" x 30" square) and not volume is that correct?

A - There is a discrepancy between the National and Ontario scope text.

The text below is from the National scope.

Given it is critical for the Ontario Gold Medal Team to qualify to participate at the national competition in Vancouver we must give precedence to the National Scope Text.

The National SCNC20-23S-Project\_EN document states on page 18:

### **Overall Team Robot Entry Size**

- Complete Team Entries must fit within the 30 by 30 inch starting square at the start of each game.
- Complete Team Entries must not exceed an overall size of 4 cubic feet (6,912 cubic inches) at the start of each game.
- Team Entries may expand to a larger size once a game has started.



# 2020 Skills Ontario Robotics Questions and Answers

The two images below are from the Ontario scope. Page 18 does not reference the 4 cubic ft. size limitation but page 24 lists the 4 cubic ft. size limitation.

Page 21 of the Ontario Scope

## 29.0 OVERALL TEAM ROBOT ENTRY SIZE

29.1 Complete Team Entries must fit within the 30 by 30 inch starting square at the start of each game.

29.2 Team Entries may expand to a larger size once a game has started.

Page 21 of 31

*This document is to be used only in preparation for the Skills Ontario Competition. Ce document ne doit être utilisé que dans le cadre de la préparation aux Olympiades de Compétences Ontario.*

The following text must be added to page 21 of the Ontario scope.

- Complete Team Entries must not exceed an overall size of 4 cubic feet (6,912 cubic inches) at the start of each game.
- Team Entries may expand to a larger size once a game has started.

No change is required on Page 24 of the Ontario scope shown below.

## 35.0 PRE-INSPECTION FOR COMPLIANCE WITH SAFETY AND DESIGN RULES

- ☐ Mandatory Wiring Diagram provided.
- ☐ Tabletop Robot Stand
- ☐ Fits into the 30 by 30 Inch Starting Square
- ☐ Overall volume  $\leq 4 \text{ ft}^3$  or  $6,912 \text{ in}^3$
- ☐ No explosives/combustibles
- ☐ No lasers
- ☐ No Arial Robots

## QUESTION # 15

Q - Are we allowed to cross the bridge before it's completed?

A - There is no restriction stated in the scope regarding when a robot can cross over the bridge.

Robots can cross over the bridge whenever their robot's performance capabilities will support success.

# 2020 Skills Ontario Robotics Questions and Answers

This can be when there are:

- 6 Bridge Plates in position,
- 5 Bridge Plates in position,
- 4 Bridge Plates in position,
- 3 Bridge Plates in position,
- 2 Bridge Plates in position,
- 1 Bridge Plate in position, or,
- 0 Bridge Plates in position.

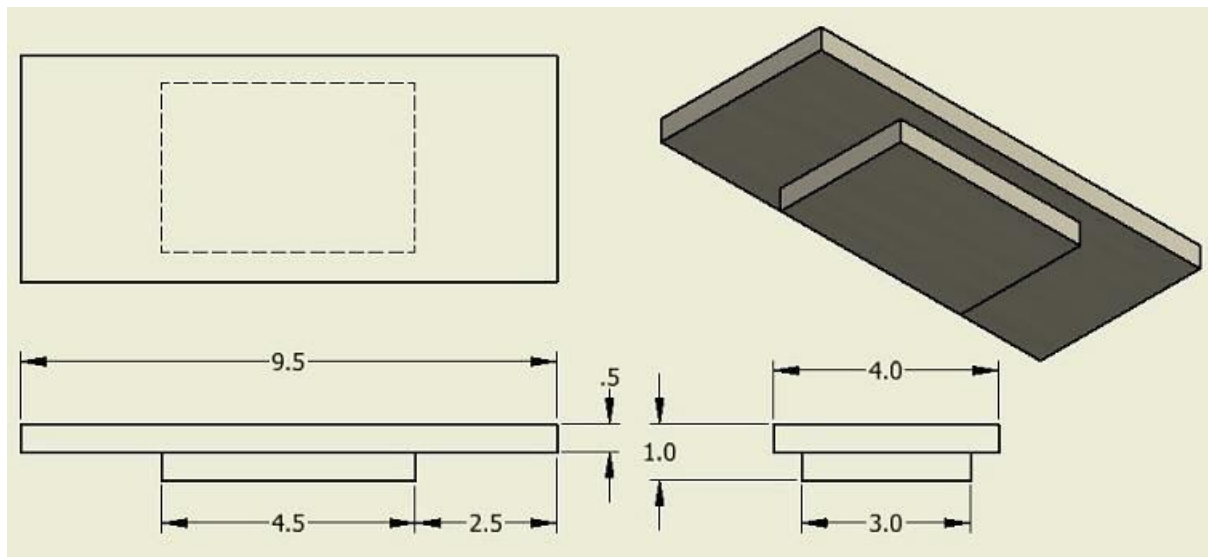
## QUESTION # 16

Q - How will the bridge pieces be put together? Will they be glued? Will they be screwed.? if screwed, will the screw holes be on the 1/2 " side or on the 3/4" inch side? Are we using regular plywood or plywood that is finished on one side?

A - There are no  $\frac{3}{4}$  inch elements in the Bridge Plates.

The plywood used will be Good one side with the rough sides facing one another where the two faces of the pieces meet.

$\frac{3}{4}$  inch screws will be used and inserted from the top.



# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION # 18

Q - The scope says the bottom smaller piece of the bridge piece is  $\frac{3}{4}$ ". Also, there is no sense in putting the screws from the top if the plywood is one side finished.

A - The Ontario scope says on page: 10

13.1 Teams have use of SIX Bridge Plates:

- (a) Each Bridge Plate is 9.5 by 4.0 by 0.5 in. and has a 4.5 by 3.0 by 0.75 in. Plate attached to the Bottom Side of the Bridge Plate.

The National scope says on page: 4

Teams have use of SIX Bridge Plates:

- (a) Each Bridge Plate is 9.5 by 4.0 by 0.5 in. and has a 4.5 by 3.0 by 0.5 in. Plate attached to the Bottom Side of the Bridge Plate.

We must follow the National scope to ensure the Ontario Team in Vancouver can complete problem free.

## QUESTION # 19

Hello Skills Ontario Robotics Community

Due to the kindness of Luca at Michael Power / Saint Joseph's Catholic High School 48 Bridge Plates have been made and offered for use at the Skills Ontario Competition.

He used  $\frac{1}{2}$ " plywood, Good One Side with the finished side on the top and at the bottom. Glued the top and bottom piece with wood glue and clamped it. They are extremely strong.

There will be no screws in the competition Bridge Plates.

Thank You Luca

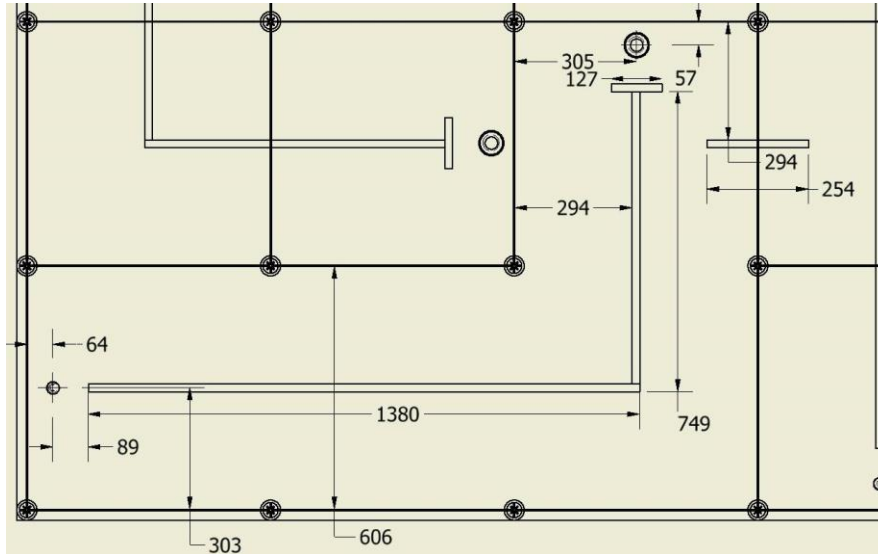
Bob

## QUESTION # 20

Q - What will be the starting position for the robot for the Auto/Golf Day 1 challenge?

## 2020 Skills Ontario Robotics Questions and Answers

A - On the First Hole Line, Facing the Tee but far enough back so that the robot must either reach out or move forward to take possession of the golf ball. Robots will not be allowed to be in a position where all they need to do is close their gripper to take possession of the ball.



## QUESTION #21

Q - Will the Day 2 Auto/Golf challenge holes be laid out in a sequential manner similar to Day 1?

A – yes

## QUESTION #22

Q - How many holes on Day 2?

A – not yet determined

## QUESTION # 23

Q - Rule 36.7 d) states, "The Golf Holes will have WhiteTape Lines leading to the Cup", yet the diagram shows the white line ending in a "Tee". Which is correct?

A - The image is correct s it is a Tee.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION # 24

Q - Does the white line leading to the ball tee end a consistent distance from the ball tee for all holes?

A – yes

## QUESTION # 25

Q - Can I assume that the golf course is an 8' x 8' square made up of 2' x 2' tiles?

A – yes

## QUESTION # 26

Q - bridges and plates, the scoring summary has an extra "Plate 1" scoring box. Not sure if this is intentional (for some reason) or not. Bonus points for moving Plate 1 into position twice?

A - there is only one Bridge Plate 1

Thank You for bringing this issue to light.

# 2020 Skills Ontario Robotics Questions and Answers

2020 Skills Canada Ontario Robotics Build a Bridge and a Totem Pole Scoring Sheet																	
Bridge Plates		Plate 1		Plate 2		Plate 3		Plate 4		Plate 5		Plate 6					
Bridge Plate Points Awarded 4 Points per Bridge Plate																	
		Delivered by Aut Bot		Delivered by Telop Bot		Bridge Building Points Total MAX Score 24											
Totem Pole Components		Base Block		Base Block		Core Block 1		Core Block 2		Core Block 3		Wings Block		Core Block 4			
Component Delivery to Assembly Space		On Floor	On Stand	On Floor	On Stand	On Floor	On Stand	On Floor	On Stand	On Floor	On Stand	On Floor	On Stand	On Floor	On Stand		
Points Value		3	6	1	2	1	2	1	2	1	2	1	2	1	2		
Points Awarded																	
Totem Pole Components Delivery Points Total MAX Score 16																	
BONUS																	
Component Position In a Totem Pole Assembly		Base Block On Level 1		Base Block On Level 1		Core Block or Wings On Level 2		Core Block or Wings On Level 3		Core Block or Wings On Level 4		Core Block or Wings On Level 5		Core Block or Wings On Level 6		Wings On Narrow Edge	Block On Narrow Wing Edge
Points Value		0		0		2		3		4		5		6		2	2
Points Awarded																	
Totem Pole Build Points Total																	
Total Game Score																	
Team Name:								Competitor Signature:									

## QUESTION # 27

Q - Rule 36.7 b) states "The Garden Hose Washer may be placed directly on the court floor, or, on top of a Spool". Will this be known in advance or is it random? e.g. holes 1 & 4 always have spools and 2 & 3 are on the floor.

A - Yes, teams will know in advance which holes have the ball on a washer that is on the floor and which has the ball on a washer on a spool.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION # 28

Q - Can a robot be in possession of multiple totem blocks at one time? Also, can a robot be autonomus to place the base totem block and after the operation done switch to teleoperated?

A - Carl's first question (below) has brought to light a discrepancy between the Ontario and National Robotics scopes.

The text below in italics is present in the National Competition document however it appears I made an error of omission when I was generating the Ontario document.

Given the Ontario Gold Medal Team must comply with the national scope the national scope must take precedent.

This means the response to Carl's question is: **Robots are NOT allowed to be in possession of more than one Totem Pole Element at a time.**

***Note:** The points awarded based on the Layer a Block is placed in a Totem Pole are displayed in the Robot Marking Sheet Sample. Marks assigned increase by **ONE point per layer** as you move up the Totem Pole Structure.*

*• Totem Poles built on the Floor have a lower overall points value than Totem Poles built on the provided Stand given each component in an 'On the Floor Totem Pole' carries a Delivery Value of One Point while each component in an 'On the Stand Totem Pole' carries a Delivery Value of Two Points.*

*• Wing Blocks positioned on their Narrow Side will be awarded Bonus points.*

*Note: Bonus points will be awarded for Core Blocks positioned on the Narrow Side of a Wings Block or On a Block that is On the Narrow Side of a Wings Block.*

***Note:** Robots may possess a **Maximum of ONE Totem Pole Component** at a time.*

*However, there is **NO RESTRICTION** on the Number of Bridge Roadway Plates that a Robot may possess at a single time during a game.*

The Ontario scope will be update by having this text inserted into page 18 of the Ontario scope.

Regarding Carl's second question.

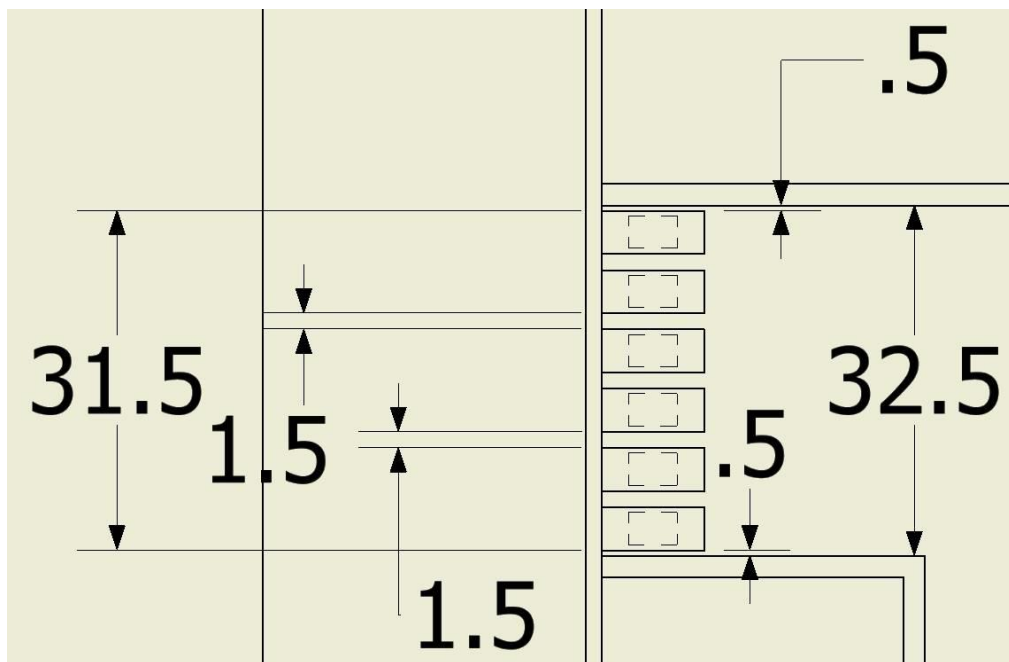
# 2020 Skills Ontario Robotics Questions and Answers

YES, a robot can be both an autonomous and a tele-operation robot. However, when it is operating as an autonomous robot then the competitor MUST NOT be in possession of their tele-operation control unit.

## QUESTION # 29

The NTC has decided to increase the space between Bridge Plates at the start of the game from 1-inch to 1.5 inches.

They are also confirming that the Bridge Plates at the start of the game will have their narrow end touching the court wall.



## QUESTION #30

Q - Will there be lines going from the tee to the hole, none are apparent on the diagram.

A - There will be no lines beyond those already shown in the scope images.



# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #31

Q - Will there be guiding lines between the holes and will these be sequential ( hole 2 is at the end of hole 1 etc...)

A - The Day 2 course layout will be setup following the same core parameters as the Day 1 course. The difference will be in the shape of the 'Fairways'. The holes will be played in sequence in the same manner as Day

## QUESTION #32

Q - In section 22, clause 22.7, it is mentioned that zero assembly points will be provided for the base block. However, Clause 22.3 also states that Two Points will be awarded for delivering the Base Totem Pole Block on to the Stand in the Totem Pole Assembly Area. We are confused regarding these seemingly contradicting statements, and would like to know what the actual scoring system is

A - There are NO assembly points related to the base block given as soon as you have delivered it into the assembly area either on the floor or onto the elevated stand you are done dealing with the base block. There is no additional action related to the base block required that could be described as an 'Assembly Task related action'.

## QUESTION #33

Q - We were wondering what surface the game will be played on As in, will the robots be operating on carpet, linoleum, etc.

A - The Totem Pole Game will be played directly on the facility concrete floor.

## QUESTION #34

Q - With regards to the rebuilding of the totem pole, if we build one already, are we able to break it and build another one for more points?

A - Teams are expected to build only one Totem Pole. Marking is done after the End of the Game Buzzer. It will be a team decision whether they want to take an assembly apart and construct a new assembly that has a higher value configuration. Keep in mind their mark will be awarded based on what ever assembly exists at the end of the game. Teams will

# 2020 Skills Ontario Robotics Questions and Answers

NOT be able to say our first Totem Pole was worth more points so we want that one to count instead of our second Totem Pole.

## QUESTION #35

Q - which side of the mats will be face up, the smooth side or the textured side?

A - The mats will be 'Bumpy Side Up' on Day 1. However, that does not guarantee they will be 'Bumpy Side Up' on Day 2.

## QUESTION #36

Q - With regards to the totem pole autonomous bonus points: Would a robot that has a purely autonomous mode which places the base block then switches to a tele-operated mode once the initial task is complete be eligible for the autonomous bonus points? Something like the FTC robots.

A - I have consulted the National Technical Committee regarding your question to ensure my reply is in line with what will take place at the national competition.

The NTC's decision is as follows:

- 1) There will be only one base block in play in a team's space during a game
- 2) If a team has an autonomous robot element as part of their entry, then only the autonomous base block will be in the team's space.
- 3) If a team does not have an autonomous robot element as part of their entry, then only the teleportation base block will be in the team's space.
- 4) If a team's autonomous robot fails to deliver the base block into the assembly area, then the team's teleoperated robot will be allowed to retrieve the base block and deliver it to either the floor in the assembly area or onto the raised platform assembly location.

**Note:** In this situation No Base Block Delivery Marks will be awarded. However, Build Marks will be awarded for all Totem Pole Blocks / Wings placed on this base block.

## QUESTION #37

Q - How about the layout of the field. Will it be random on both days or is the field on the first day the same as the picture in the scope?

A - The first day golf course will be the layout displayed in the scope document.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #38

Q - Wondering if we can use the distance sensor in the link below.

<https://www.robotshop.com/ca/en/tof-range-finder-sensor-breakout-board-voltage-regulator-vl53l0x.html>

A - YES your team can use the sensor referenced in your message below. It is expected teams will utilize whatever resources they have available at their school obtained from whichever source best meets their needs when building their robot.

## QUESTION #39

Q – “Can a robot that starts off operating autonomously but changes to a tele-operated mode after placing the base block still earn the autonomous bonus points?” In other words: Is a bot with any tele-operated controlled time during a round of competition considered tele-operated for the whole round?

A - The competitor who will eventually be the teleoperator of a ‘Dual Mode Autonomous / Teleoperation Robot will need to enable the referee to know exactly when the robot switches from autonomous control to teleoperated control mode.

The practice we will implement is:

- a) The radio / game controller unit that will eventually control the dual mode robot will need to be placed on the floor at the feet of the competitor.
- b) As soon as the competitor picks up this radio / game controller unit then the autonomous control period will be deemed to have ended.

**Note:** The competitor will be required to alert / inform the referee that they are going to switch control modes before they pick up the radio / game controller unit.

By way of an example:

If the robot in autonomous control mode has:

- Taken possession of the base block
- Has moved to a position where it is holding the base block above the raised platform in the assembly area
- But has not yet released / dropped the base block
- IF the control mode switch is made before the block is released / dropped then no delivery points would be awarded given the releasing / dropping of the block occurred after the autonomous control mode section had ended.

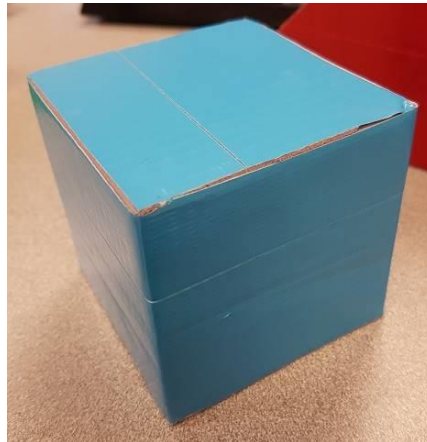
# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #40

Q - Can you send a picture of a block that you made with the tape on it? Just want to see how you handled the overlap and corners.

A - I have not made any blocks. The only one I know who has is the Manitoba Technical Chair. I will ask him to send me some pictures of the blocks he made.

Here are the one's made by the Manitoba Tech Chair. He made an effort to minimize having the tape overlap.



## QUESTION #41

Q - Quoted from an earlier answer:

The NTC's decision is as follows:

1. There will be only one base block in play in a team's space during a game
2. If a team has an autonomous robot element as part of their entry, then only the autonomous base block will be in the team's space.
3. If a team does not have an autonomous robot element as part of their entry, then only the teleportation base block will be in the team's space.
4. If a team's autonomous robot fails to deliver the base block into the assembly area, then the team's teleoperated robot will be allowed to retrieve the base block and deliver it to either the floor in the assembly area or onto the raised platform assembly location.

**Note:** In this situation No Base Block Delivery Marks will be awarded. However, Build Marks will be awarded for all Totem Pole Blocks / Wings placed on this base block.

Question: Can we be assured that there will be no flies in the arena that may affect our block during teleportation?

# 2020 Skills Ontario Robotics Questions and Answers

Real Question: For the Builder-Bot component can we have two Tele-Op robots AND one autonomous robot (total 3 bots) as long as they fit into the starting space?

A - If a team has a teleportation capability then I anticipate they have consulted with 'Scotty' and as long as this unit can teleport the block from one location to another within the court without causing harm to anyone then they can use it. They may also want to take out a patent on the device.

YES a team can have two teleoperated robots and one autonomous robot in their entry as long as all of them fit into the mandated start of the game space.

## QUESTION #42

Q - Where can I find a breakdown of the scoring system. I've only been able to find the scoring summary on page 9 of the scope:

- 100% Autonomous Tournament Results = 40 Marks
- Highest Scoring 100% Autonomous Tournament Team = 40 Marks
- All Other Teams awarded Autonomous Tournament Marks based on the following formula:
  - $(40) \times (\text{Individual Team Total Score} / \text{Highest Team Total Score})$  so if you scored half the points compared to the winning Team you will get 20.0 Marks.

How are these points earned within the game?

A - You are correct the mark break-down for the golf game is not currently in the document.

I will create a mark break-down for the golf game and share it soon

The marked elements include:

- Take possession of the Golf Ball
- Deliver the Golf Ball into the Cup

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION # 43

Q - In item 36.3 and subsequent stages, what does "move to tee" exactly mean? Does it mean upon completing a hole, the robot must autonomously drive to the next tee? Or does a person move the robot to the next tee and then autonomous operation starts again?

A - Regarding moving to the next tee there are two options available to teams.

- 1) The robot will move into position ready to start the next hole autonomously. If this is done independently by the robot then marks will be awarded for completing this process autonomously.
- 2) If a robot fails or is not programmed to move to the next hole autonomously then a competitor will be allowed to move the robot into position ready to play the next hole. No moving to the next hole marks will be awarded to the team in this situation.
- 3) Results are based on the total number of pints earned in all of their performance opportunities combined.

## QUESTION #44

Q - Are there any autonomous robot size restrictions or is the same as tele-operated?

A - There is no set size restriction for the golf game autonomous robots other than they need to be able to maneuver in the provided space.

## QUESTION #45

Q - What is the inside width of the course fairways? I am guessing just under 2 ½' between the dividing walls but a more accurate measurement would be helpful.

A - The width of a fairway is approximately 60 cms.

## QUESTION #46

Q - I am wondering about the effects of a robot contacting the dividing walls. Will the supports for the wall dividers be secured to the floor tiles or are they free standing?

# 2020 Skills Ontario Robotics Questions and Answers

A - These courts are made specifically to support robot performance experiences so I am not anticipating any issues with the walls.

## QUESTION #47

Q - Unfortunately my school's budget makes it difficult to purchase Studica's Competition in a box. I would like to get a single floor panel so that I know what the texture is like and also for sensor calibration. Will Studica sell a single tile (or pack of 4) or is there another supplier i.e. Home Depot that carries them?

A - I understand the floor tiles are the same as the rubber tiles for use in a garage or work bench area sold at Canadian Tire. The walls could be simulated with 1/8 inch Masonite.

Sorry I was mistaken. The tiles are not rubber. They are foam.

Here's where you can buy the mats.

[https://www.amazon.ca/dp/B00CVFJAM6/ref=sspa\\_dk\\_detail\\_5?psc=1&pd\\_rd\\_i=B00CVFJAM6&pd\\_rd\\_w=0x0Q2&pf\\_rd\\_p=4b7c8c1c-293f-4b1e-a49a-8787dff31bcb&pd\\_rd\\_wg=vzCl3&pf\\_rd\\_r=AVPW9M1DWEM80XF01ZKV&pd\\_rd\\_r=1d63affd-2d7e-4cfa-a6a6-68950ae77ce0&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyNVZTSTdDR0ozUUZFJmVuY3J5cHRlZElkPUEwMTg3NjA2M0hIMExZQzIRVElXMiZlbnNyeXB0ZWRBZElkPUEwODU1NzgyOEdVQjkxTVkzMFBKJndpZGldE5hbWU9c3BfZGV0YWlsJmFjdGlvb11jbGlja1JlZGl5ZWNOJmRvTm90TG9nQ2xpY2s9dHJ1ZQ==](https://www.amazon.ca/dp/B00CVFJAM6/ref=sspa_dk_detail_5?psc=1&pd_rd_i=B00CVFJAM6&pd_rd_w=0x0Q2&pf_rd_p=4b7c8c1c-293f-4b1e-a49a-8787dff31bcb&pd_rd_wg=vzCl3&pf_rd_r=AVPW9M1DWEM80XF01ZKV&pd_rd_r=1d63affd-2d7e-4cfa-a6a6-68950ae77ce0&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyNVZTSTdDR0ozUUZFJmVuY3J5cHRlZElkPUEwMTg3NjA2M0hIMExZQzIRVElXMiZlbnNyeXB0ZWRBZElkPUEwODU1NzgyOEdVQjkxTVkzMFBKJndpZGldE5hbWU9c3BfZGV0YWlsJmFjdGlvb11jbGlja1JlZGl5ZWNOJmRvTm90TG9nQ2xpY2s9dHJ1ZQ==)

## QUESTION #48

Q - Is the white tape standard electrical tape (3/4" width)?

A - I am expecting the tape to be a standard 3/4 inch width.

## QUESTION #49

Q - Asking for clarification regarding scope item 15.1 b) bullet 5 which talks about not passing Totem pieces over or through passageway walls to deliver into the assembly area. What if the robot isn't delivering the component to the assembly area. For example, could a robot throw totem pieces over the bridge if it wasn't completed? Could it throw it

## 2020 Skills Ontario Robotics Questions and Answers

through the tunnel to the other end of the tunnel? Could a robot deliver blocks over the wall at the opposite end of the tunnel from the assembly area?

A – No

### QUESTION #50

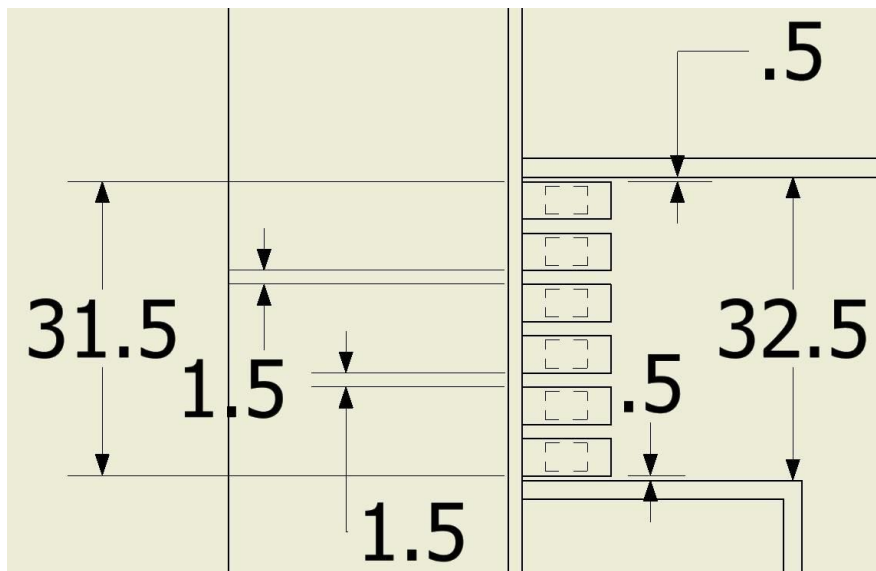
Q - Item 17.1 in the rules seems to contradict what is written in section 23 regarding whether the autonomous robot can be in possession of the base block at the beginning of the game. I'm assuming from the statement on the bottom of Question 8 in the QandA that 17.1 is to be omitted?

A - Sorry for any confusion. The autonomous robot cannot be in possession of the base block at the start of a game.

### QUESTION #51

Q - Is there a measurement of the space between bridge plates at the beginning of the game when they're on the floor.

A - See image below. The space between bridge plates is 1.5 inches at the start of a game.





# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #52

Q - In the scope, item 22.2 states 2 points per bridge plate, but the scoring sheet says 4 points per bridge plate. Can you please clarify which is correct?

A – Four points is the correct amount.

## QUESTION #53

Q - Regarding the building of the Totem, can the wing block be placed on the base block and still get points. Also, if the wing block is placed on its narrow edge and has 4 core blocks placed on top of it, does each block get a separate 2 bonus points, so 8 bonus points for the core blocks plus 2 bonus points for the wing on its narrow edge?

A - Yes the wing block can be the first element placed on the base block.

The scoring sheet sets a maximum of 6 points which accounts for only 3 blocks being on the wings when the wings are on their narrow side.

However, putting a fourth block on top of the narrow edge of a wing would be quite an accomplishment. I will ask the NTC if they are willing to increase the stated maximum to 8 points. I will share the NTC's response when I have it.

## QUESTION #54

Q - Can a robot be in possession of more than one piece at a time during the competition?

A - It appears the Gremlin that acted up during the generation of the Ontario scope based on the national scope was at it again.

The Ontario scope does not state the response to your question clearly but the national scope certainly does.

We will be following the restrictions defined in the national scope.

Page 12 of the national scope says:

**Note:** Robots may possess a **Maximum of ONE Totem Pole Component** at a time. However, there is **NO RESTRICTION** on the Number of Bridge Roadway Plates that a Robot may possess at a single time during a game.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #55

Q - Further to the question #54, if two robots are used can each be in possession of a block at the same time?

A – YES one piece per robot.

## QUESTION #56

Q - What is the process for initiating either the Golf autonomous robot or an autonomous/semi-autonomous robot in the BuilderBot competition?

A - The process for initiating the start of an autonomous robot is not defined in the scope.

The National Technical Committee has determined the following procedure options will be followed at the national competition to ensure teams are in compliance with the rule stating competitors cannot touch their robot once the referee has said 'GO'.

- The autonomous robot's power will be turned ON before the referee says Start Go as this is standard for the teleoperated robots.
- It will be a team responsibility to ensure their autonomous robot does not start moving before the referee finishes saying 1, 2, 3 Go.
- It is expected competitors will accomplish this by any of the following methods:
  - a) Program a 'Pause' that will last long enough to ensure the 1, 2, 3, Go countdown is completed before the robot starts to move.
  - b) Have their teleoperated robot push a button on the autonomous robot to initiate the program start.
  - c) Have their teleoperated robot positioned where it is depressing a pressure-based switch / button which will initiate the program start as soon as the teleoperated robot moves away.
  - d) Have a distance sensor focused on the distance between the autonomous robot and the teleoperated robot s that when it moves away the autonomous robot will sense this and start t move.
  - e) Any other method competitors can devise.

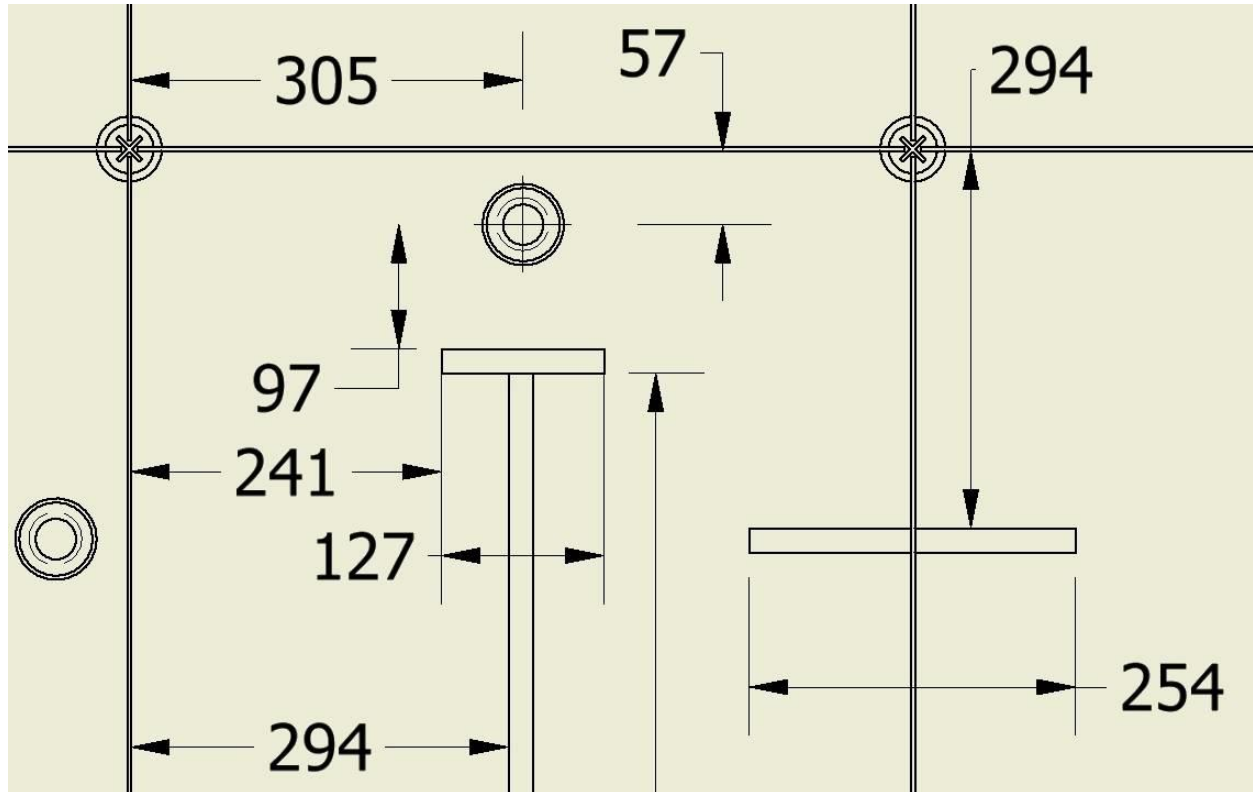
Regarding the Ontario only Golf Game competitors will be allowed to push a button on either their autonomous robot or laptop to start the program.

## 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #57

Q - With regards to the golf course, what will the length of the "T" line be at the end of the fairway, and how far away will the T be from the ball and from the cup? Just to confirm, the measurements are in mm? Also, where is this image from, I cannot find it in the scope

A – yes, measurements in mm. The image is new and not in the scope.



## QUESTION #58

Q - Is the robot allowed to transmit signals (data) of other types to an off the robot device?

A – yes. The scope states: Tele-operated Robots may not transmit audio/visual information to off the robot devices. (Ex: Having a camera transmit images real time to a computer near the driver, etc.)

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #59

Q - We had two questions regarding the robotics competition:

1) During the tele operated competition, it is stated that more points will be given if tasks are completed by an autonomous robot. If we were to use the same robot for tele operated and autonomous actions, would we still get the autonomous points? (e.g. if at the beginning we had a 15 second autonomous period on our robot and then transitioned to radio controlled system).

2) Regarding the kill switch, will the power button on the robot be sufficient, or will something that acts at a distance be required (e.g. a button on the remote)?

A – 1) Here is the situation regarding the autonomous robot element in the Totem Pole game.

Before the game starts teams will need to declare whether or not they intend to manage the Base Block Autonomously.

If they say YES, then the teleop base block will be removed from the court. Note: The only points related to managing a block autonomously are associated with the base block not any of the other blocks.

It is expected an autonomous unit would retrieve and deliver the base block right at the start of the game.

If they say NO, then the Autonomous base block will be removed from the court.

Only one base block will be present in the court during a single game.

If a team has a robot that can function in dual control modes, the competitor will be required to set their controller on the floor while the robot is functioning in autonomous control mode.

A team could decide that when their robot is out of sight in the tunnel, they want the robot to manage its' movement inside the tunnel autonomously. In this case the competitor / driver would use a button on their controller to switch to autonomous control mode when the robot is at the tunnel opening and back to teleop control mode when the robot exits the tunnel.

2) The on the robot kill switch is all that is required.

# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #60

Q - I was wondering if there is any chance that we might get a full schematic with measurements for the autonomous field?

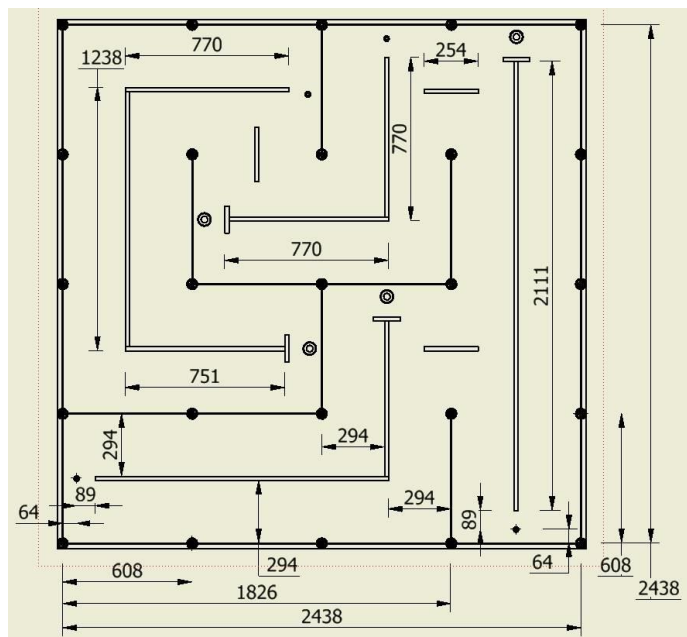
A - I expect the image below provides adequate measurement details to enable competitors to prepare for the Autonomous Golf Game.

Keep in mind that these measurements are based on an Inventor Model.

It is expected competitors will base their final competition files on actual measurements they have retrieved for themselves from the specific court to which they have been assigned.

It is impossible to guarantee the final court measurements will be 'Correct to the millimeter' when compared with the values displayed below.

**NOTE:** The scope references the robots at the start of a game must be ON the fairway tape line and have the ball OUT f reach by their object management system. To be consistent we will require the robot to be behind the first set of court wall posts (608 mm away from the wall behind the tee).

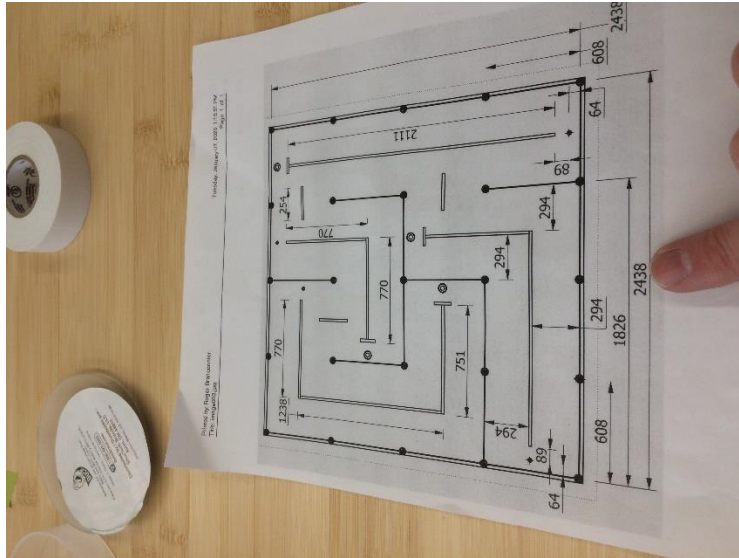


## 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #61

Q - We're having an issue with the given field measurements (autonomous) w.r.t. the kit field measurements.

From this picture, the edge measurement converted to imperial is 8 ft.



The distance between walls is supposed to be 24 in. from what we can see in the diagram. We're measuring 23 in. between walls (our tape is .75 in. wide from the kit not sure what it is in the diagram).

Any help or clarification would be appreciated.

# 2020 Skills Ontario Robotics Questions and Answers

A - I did not / do not have an actual court kit.

I created the drawings based on what I understood were the court details.

The expectation is teams will create control files at their school before coming to the competition using the provided in the document details.

However, work done in the competition space is also expected to be an important part of their competition experience.

Retrieving the actual measurements from the competition courts and making the necessary adjustments to their control files is an expected competitor performance requirement.

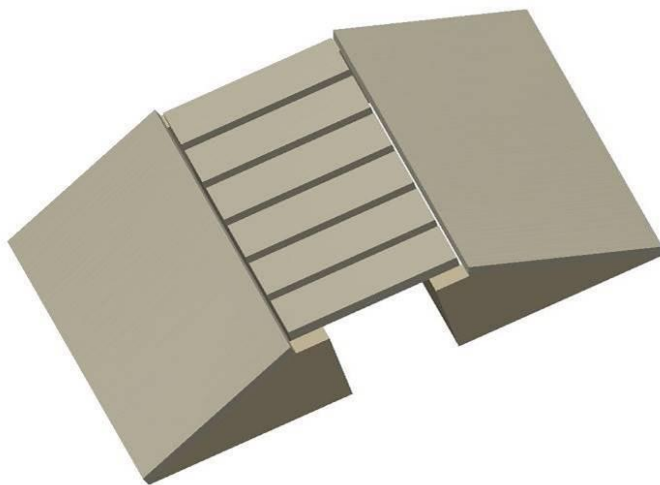
## QUESTION #62

Q - On Page 2 of the "2020 Skills Ontario Robotics Questions and Answers" document, our class has a question regarding the bridge assembly.

On the side view, the top of the bridge appears to be flush. However, on the isometric view, there's a small lip on the ramp side.

Our class was wondering which one of the drawings we should follow.

A - The Bridge Plates are not intended to be a tight fit when they are put in place.



# 2020 Skills Ontario Robotics Questions and Answers

## QUESTION #63

Q - Just two questions for the autonomous challenge.

1) is there a time limit for either day 1 or day 2 challenges?

2) if a robot inadvertently touches/nudges one of the walls (I mean very minor) is there any sort of penalty?

A – Please refer to the posted Golf Scoring Autonomous Document V2.

- 1) The time restriction is that all in the court practice and preparation activities must end by 2:30 PM.
- 2) The marking is based on 'End Results' so there will be no penalty if a robot bumps a wall. However, keep in mind if a robot's performance is so irregular that it is causing damage to the court then the Marked Attempt will be stopped.