



Please review and understand all of the information in this package prior to purchasing materials or beginning field construction. Additional information can be extracted from the full field model.

Drawing Format Information

The drawing number format is: 20XXYYZZ

The drawing number allows for multiple levels of sub-assemblies, and drawing numbers have a hierarchical sequence except for pieces that are used in multiple sub-assemblies, which have XX=00.

The letters XX and YY designate assemblies and sub-assemblies.

When a part number has ZZ equal to 00, it is an assembly (or sub assembly). A non-zero number for ZZ indicates a part that is (typically) used in an assembly designated by the XX and YY numbers.

At the bottom of each drawing in the title block are is an indication of the material used for the part (if it is a discrete part) and an indication of the quantity needed for a complete field.

Note that each drawing also includes a sheet number. Some parts/assemblies require multiple sheets (pages) to fully describe the part/assembly. In these cases, each page will have a different sheet number, but the drawing number will remain the same.

The drawings are intended to provide only the views that are necessary to define the part. For example, there will not be “edge” views of Masonite parts since the material definition provides the needed information on the part thickness.

Material Notes

Ensure that 2x4 and 1x2 materials used for construction are of sufficient quality for the task. 2x4s used for the game pieces should be relatively clear of knots and other identifiable marks since the intent of the game pieces is to appear the same (although internally different).

Field Kit for Distribution to Teams

The bill of materials lists the material amounts needed for a 1/4-field construction that will be built by the individual teams.

- This include two 2x4s and two lengths of 1/2” pipe. These can be cut in half for distribution to the teams.
- The masonite squares should be cut to finish size and distributed.
- The 1x2s needed should also be cut to the finish size and distributed.
- Other parts should be distributed as indicated.
- It is expected that teams can use the robot kit glue for building the field and can use that glue with sawdust to create a simple wood filler. If a hub is willing to incur the additional cost of providing additional glue and wood filler, they are welcome to do so.
- If 60 yd long tape rolls are out of stock and a 55 yd length roll is used, there are two grid lines that should be left off for the classroom version of the field. The drawings indicate this.
- Even with the 60 yd tape roll, driver and spotter boxes should not be taped for the classroom version since there is not enough tape to do so.

2020 Game - Outbreak - Bill of Materials

Teams 32

Sheet Material

Part No	Description	Source	1/4 Field Qty	Field Qty	# per SKU	Cost	Order Qty	Total Cost	Order Qty	Total Cost
15483	1/8" Masonite, 4x8 sheet (cut in 15.75" squares)	Lowe's	2	8	18	\$ 8.38	1	\$ 8.38	4	\$ 33.52

Lumber

Part No	Description	Source	1/4 Field Qty	Field Qty	# per SKU	Cost	Order Qty	Total Cost	Order Qty	Total Cost
1206	1x2 x 8 ft (premium) (cut to 3.5" pieces)	Lowe's	2	8	26	\$ 5.24	1	\$ 5.24	3	\$ 15.72
6005	2x4 x 8 ft	Lowe's	1	4	1	\$ 2.80	4	\$ 11.20	32	\$ 89.60

PVC

Part No	Description	Source	1/4 Field Qty	Field Qty	# per SKU	Cost	Order Qty	Total Cost	Order Qty	Total Cost
23966	1/2 inch PVC Pipe, 10ft long, S40	Lowe's	2	8	1	\$ 2.06	8	\$ 16.48	64	\$ 131.84
1144120	1/2-inch PVC Elbow, 90 Degree, slip x slip	Lowe's	12	48	60	\$ 12.92	1	\$ 12.92	7	\$ 90.44

Hardware

Part No	Description	Source	1/4 Field Qty	Field Qty	# per SKU	Cost	Order Qty	Total Cost	Order Qty	Total Cost
97828A635	1" Finish Nail, 1/8" head, 0.054 diameter	McMaster Carr	24	96	1400	\$ 7.25	1	\$ 7.25	1	\$ 7.25
5862K101	1/8 X 1/8 Neodymium Magnet	McMaster Carr	24	96	1	\$ 0.26	96	\$ 24.96	768	\$ 199.68

Miscellaneous

Part No	Description	Source	1/4 Field Qty	Field Qty	# per SKU	Cost	Order Qty	Total Cost	Order Qty	Total Cost
755158041	Pressureless Tennis Ball	Walmart	3	12	24	\$ 18.95	1	\$ 18.95	4	\$ 75.80
B07YV48NN1	Mini Compass, 0.59" diameter, 0.25" tall	Amazon	2	8	200	\$ 19.99	1	\$ 19.99	1	\$ 19.99
B07WX7NYP2	*Gaffers Tape, 1" x 60Yd, White	Amazon	1	5	1	\$ 9.99	5	\$ 49.95	32	\$ 319.68

*Note: supply teams with 1 roll of tape each, but 5 rolls are needed to complete the field for a full competition.

Total \$ 175.32 \$ 983.52
Per Team \$ 30.74

Alternate Tape Source

67680 Gaffers Tape, 1" x 60Yd, White www.tapedepot.com 1 \$ 6.93
 (Be sure to select the 1" width.)

2

1

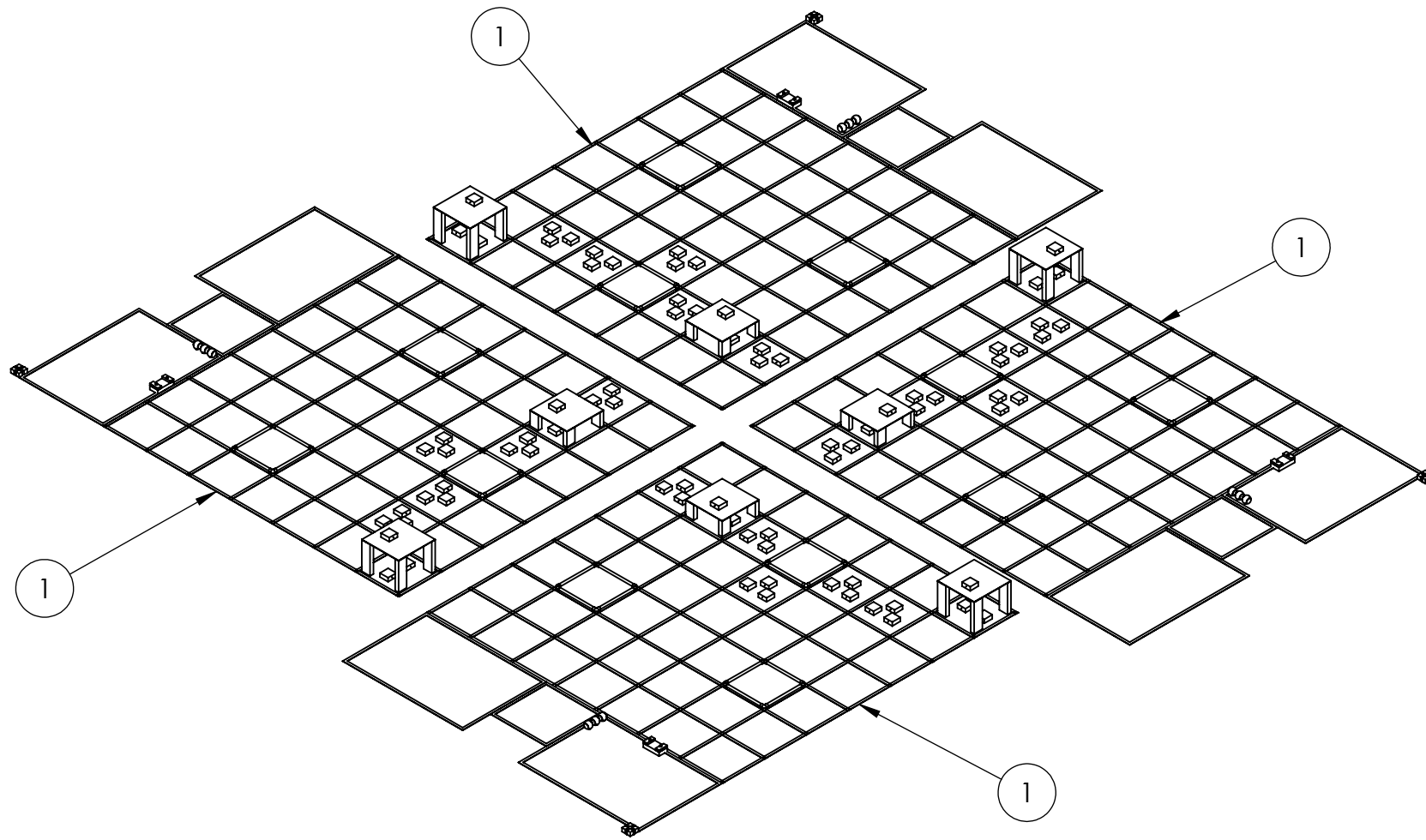
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20000100	QUARTER FIELD	4

B

B

A

A



DIMENSIONS ARE IN INCHES

TITLE: FULL FIELD

MATERIAL

DO NOT SCALE DRAWING

BEST 2020: OUTBREAK

SIZE **A** DWG. NO. 20000000

REV

SCALE: 1:50 FIELD QTY:

SHEET 1 OF 2

20000000

2

1

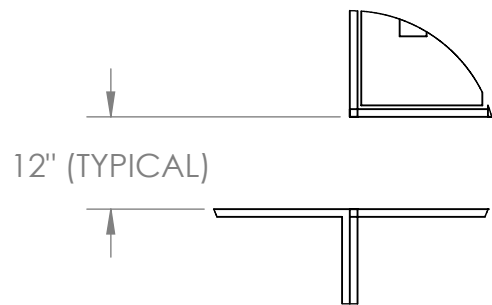
3

2

1

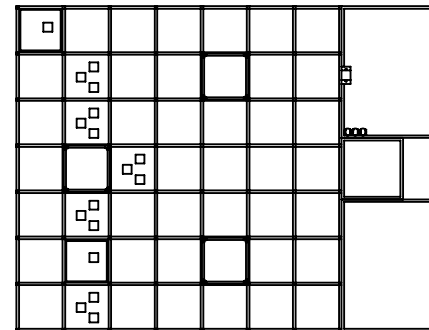
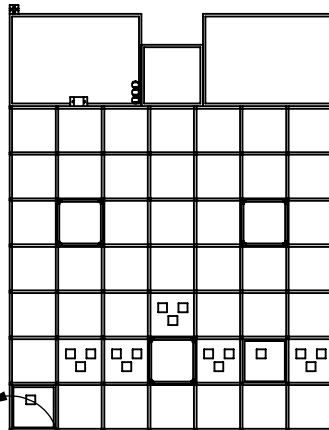
B

B

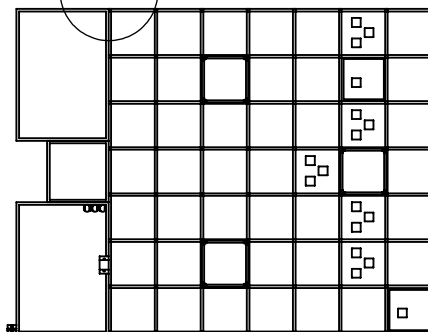


DETAIL A
SCALE 1 : 25

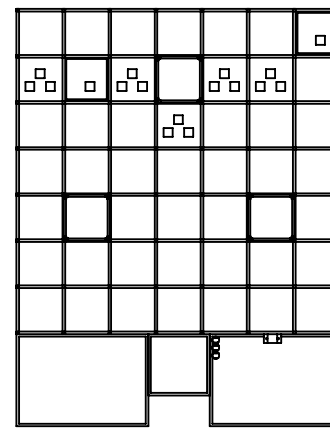
GREEN TEAM



YELLOW TEAM



RED TEAM



BLUE TEAM

NOTES:

- 1. SEE 20000100 FOR GRID DIMENSIONS.
- 2. EACH QUADRANT IS SPACED PER DETAIL A.

A

A



DIMENSIONS ARE IN INCHES

TITLE: FULL FIELD

MATERIAL

DO NOT SCALE DRAWING

BEST 2020: OUTBREAK

SIZE DWG. NO. REV
A 20000000

SCALE: 1:75 FIELD QTY:

SHEET 2 OF 2

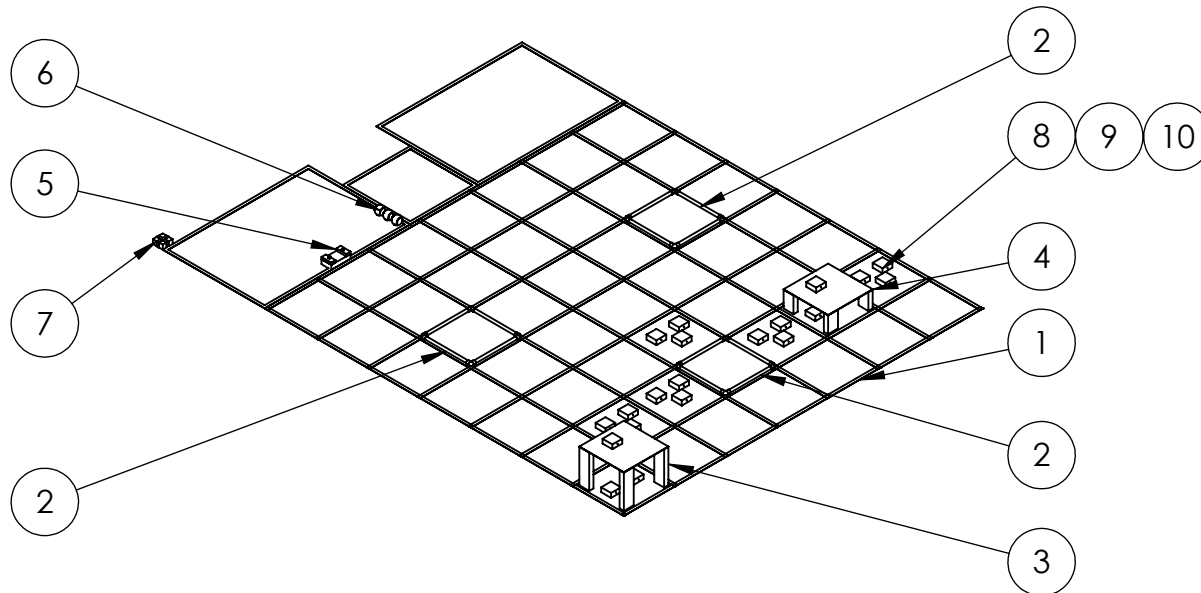
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B07RQPZQM3	1-INCH GAFFER TAPE	1
2	20020000	FRAME ASSEMBLY	3
3	20010200	HIGH PLATFORM	1
4	20010100	LOW PLATFORM	1
5	20030000	BLOCK TESTER	1
6	755158041	TENNIS BALL	3
7	20110000	SUPER VACCINE	1
8	20100100	UNINFECTED CELL	12
9	20100200	IMMUNE CELL	6
10	20100300	INFECTED CELL	3

B

B



A

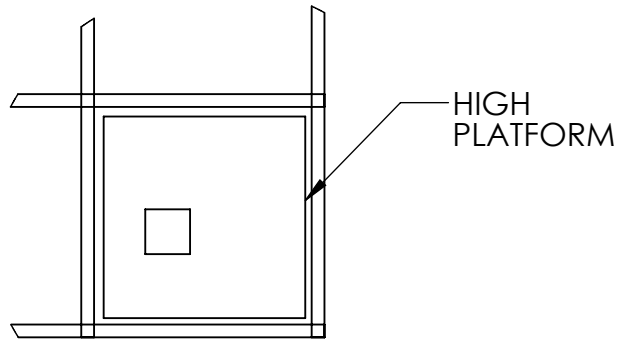
A



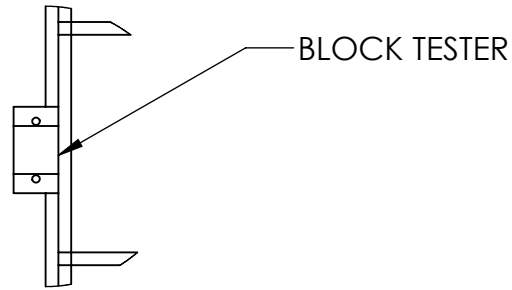
DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK	
TITLE: QUARTER FIELD		SIZE: A	DWG. NO.: 20000100
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:48	FIELD QTY: 4
		SHEET 1 OF 3	

2

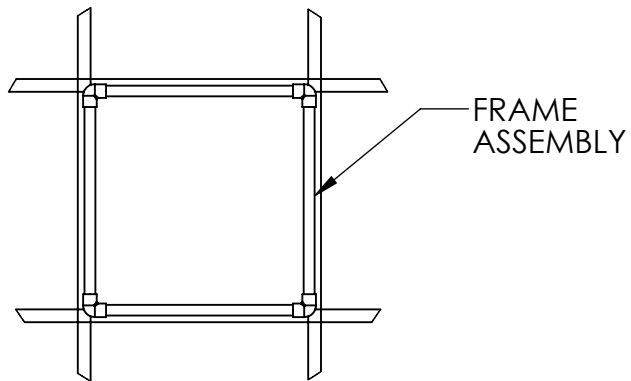
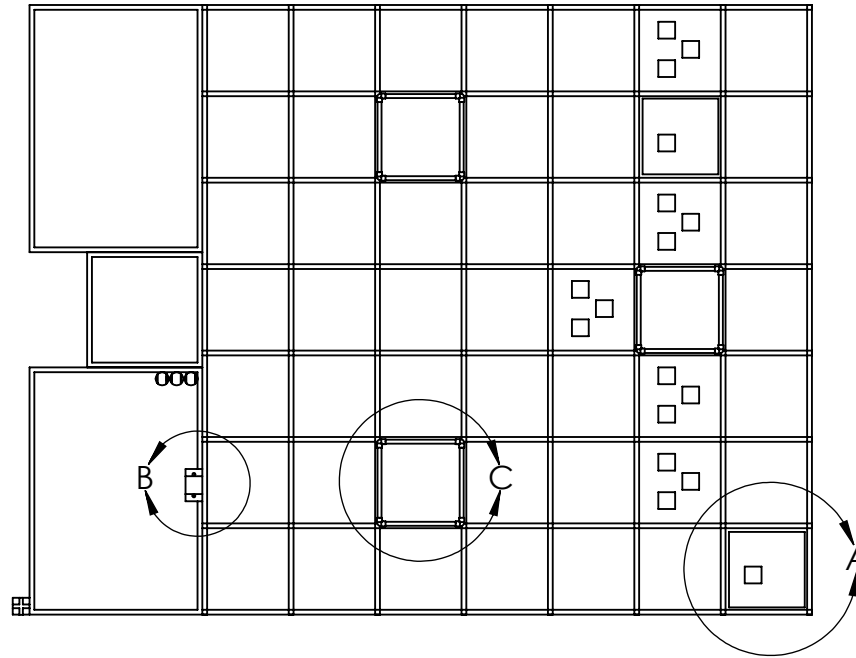
1



DETAIL A
SCALE 1 : 15



DETAIL B
SCALE 1 : 15



DETAIL C
SCALE 1 : 15

NOTES:

1. PLATFORMS AND FRAMES ARE NOMINALLY CENTERED IN GRID SPACE AS SHOWN IN DETAIL A AND DETAIL C.
2. TESTER IS NOMALLY CENTERED AS SHOWN IN DETAIL B.
3. CELLS ARE PLACED WITHIN SPACES WITH THE LARGEST SURFACE ON GROUND BUT NO OTHER ORIENTATION OR POSITION IS SPECIFIED.



DIMENSIONS ARE IN INCHES

TITLE: QUARTER FIELD

MATERIAL

DO NOT SCALE DRAWING

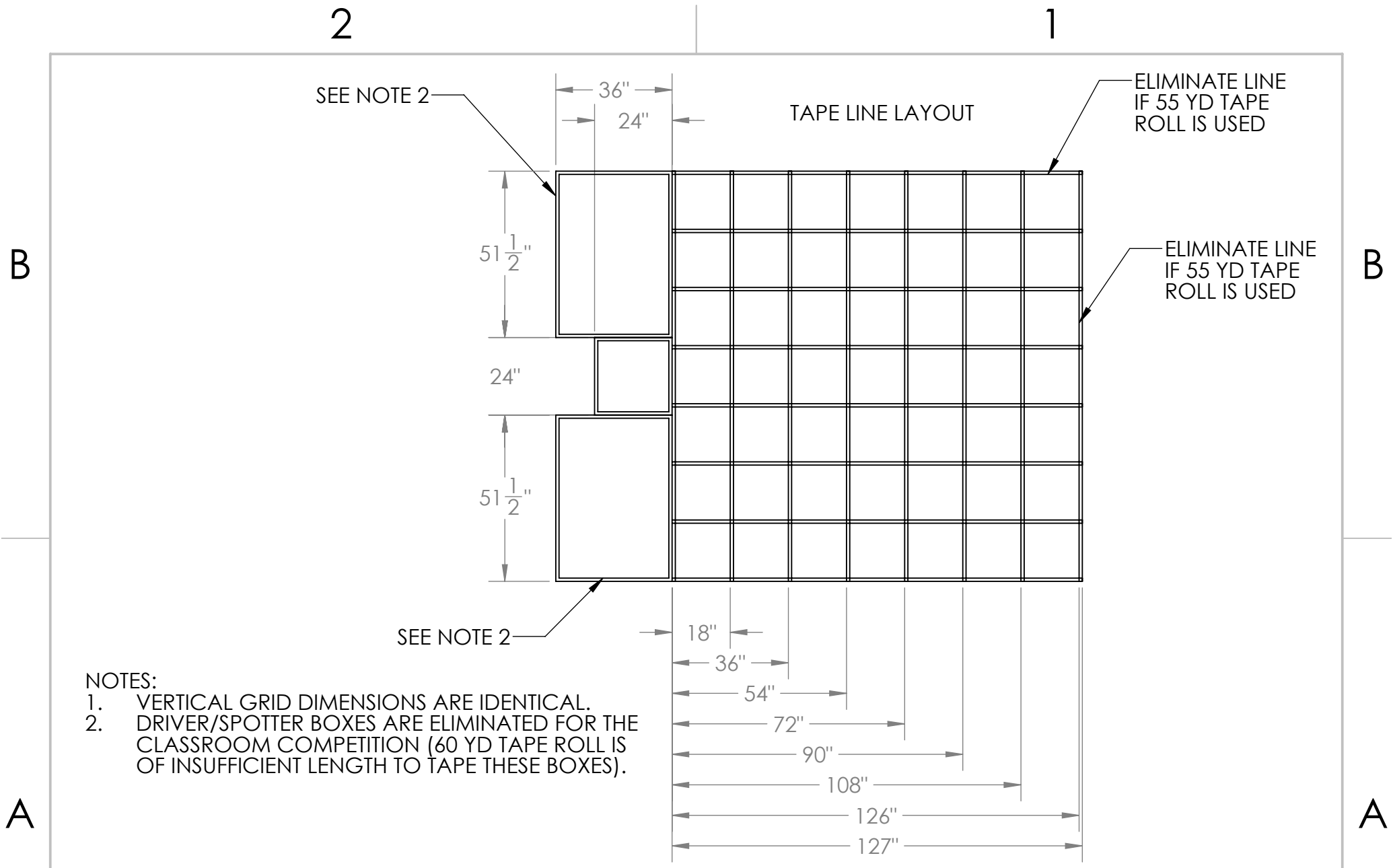
BEST 2020: OUTBREAK

SIZE **A** DWG. NO. 20000100

REV

SCALE: 1:40 FIELD QTY: 4

SHEET 2 OF 3



- NOTES:
1. VERTICAL GRID DIMENSIONS ARE IDENTICAL.
 2. DRIVER/SPOTTER BOXES ARE ELIMINATED FOR THE CLASSROOM COMPETITION (60 YD TAPE ROLL IS OF INSUFFICIENT LENGTH TO TAPE THESE BOXES).



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK	
TITLE:	QUARTER FIELD	SIZE	DWG. NO.
		A	20000100
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:40	FIELD QTY: 4
			SHEET 3 OF 3

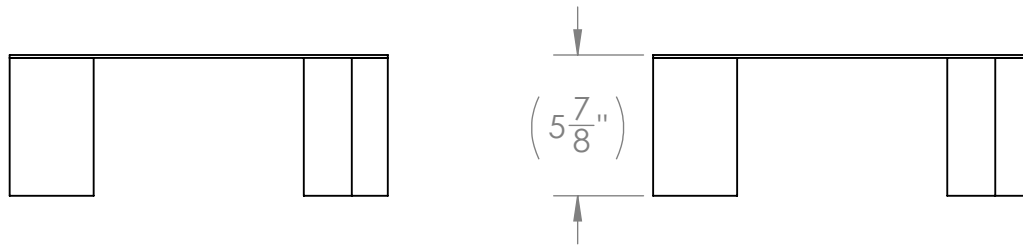
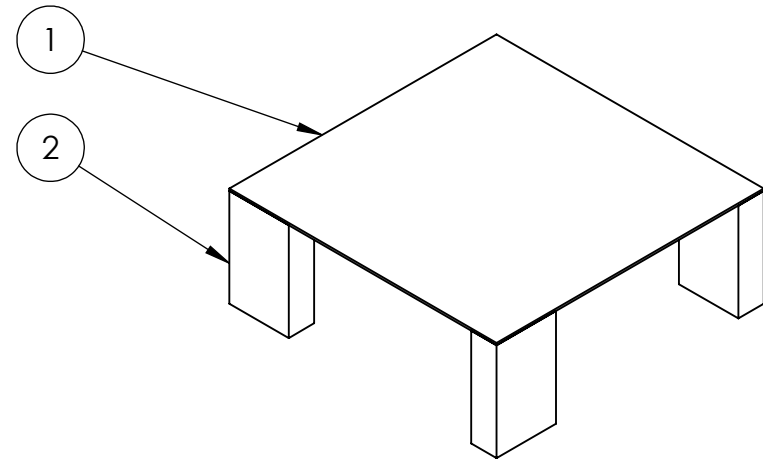
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20010101	PLATFORM TOP	1
2	20010102	SHORT LEG	4

B

B



NOTES:

1. ALIGN LEGS AS SHOWN.
2. ATTACH EACH LEG TO BASE WITH THREE 1-INCH FINISHING NAILS AND WOOD GLUE.

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK	
TITLE:	LOW PLATFORM	SIZE	DWG. NO.
		A	20010100
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:8	FIELD QTY: 4
			SHEET 1 OF 1

2

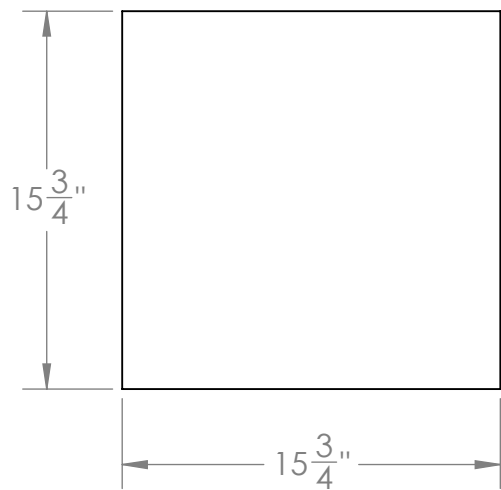
1

2

1

B

B



A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE:	PLATFORM TOP	SIZE	DWG. NO.	REV
		A	20010101	
MATERIAL	1/8" MASONITE	DO NOT SCALE DRAWING	SCALE: 1:8	FIELD QTY: 8
				SHEET 1 OF 1

2

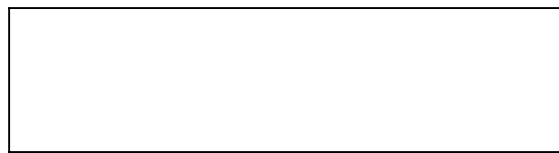
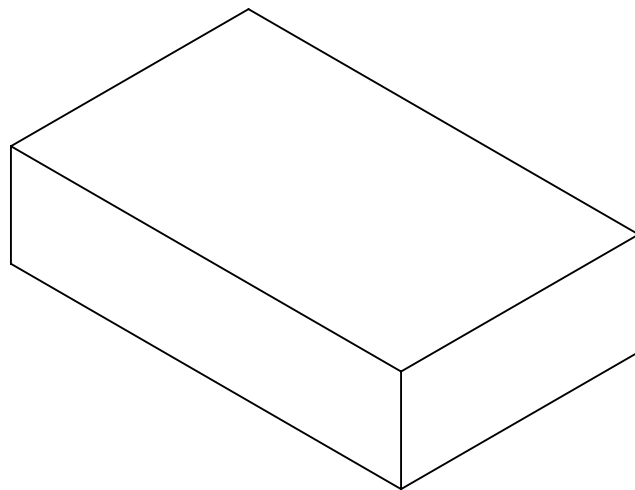
1

2

1

B

B



← 5 ³/₄ " →

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE: SHORT LEG		SIZE: A	DWG. NO.: 20010102	REV:
MATERIAL: 2X4 LUMBER	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 16	SHEET 1 OF 1

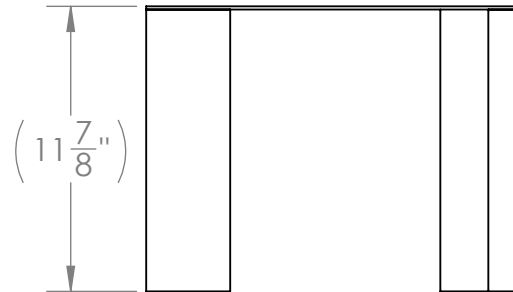
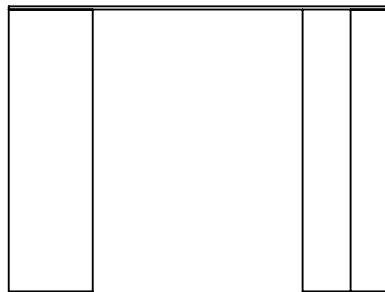
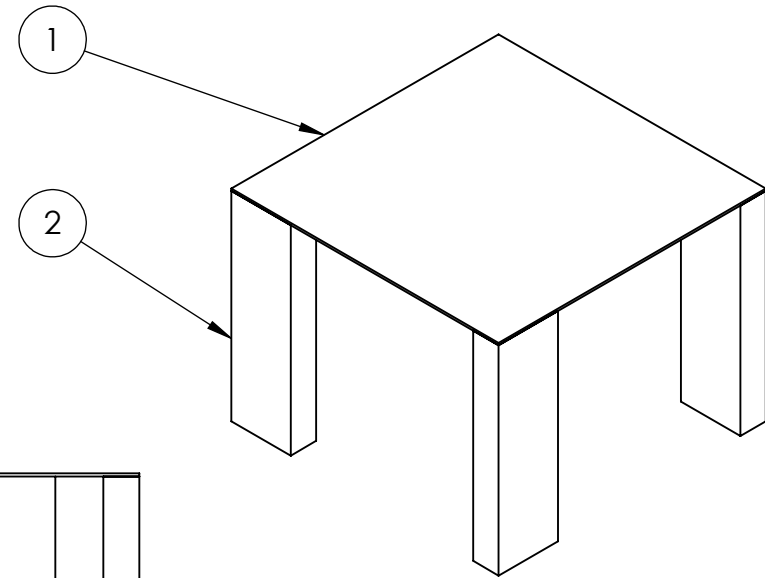
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20010101	PLATFORM TOP	1
2	20010202	LONG LEG	4

B

B



(11 ⁷/₈")

A

A

NOTES:

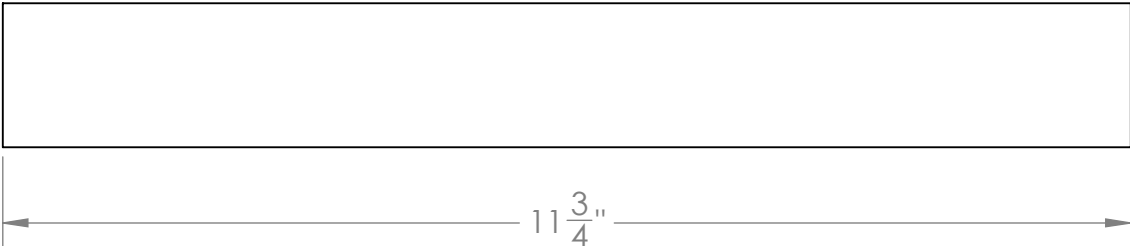
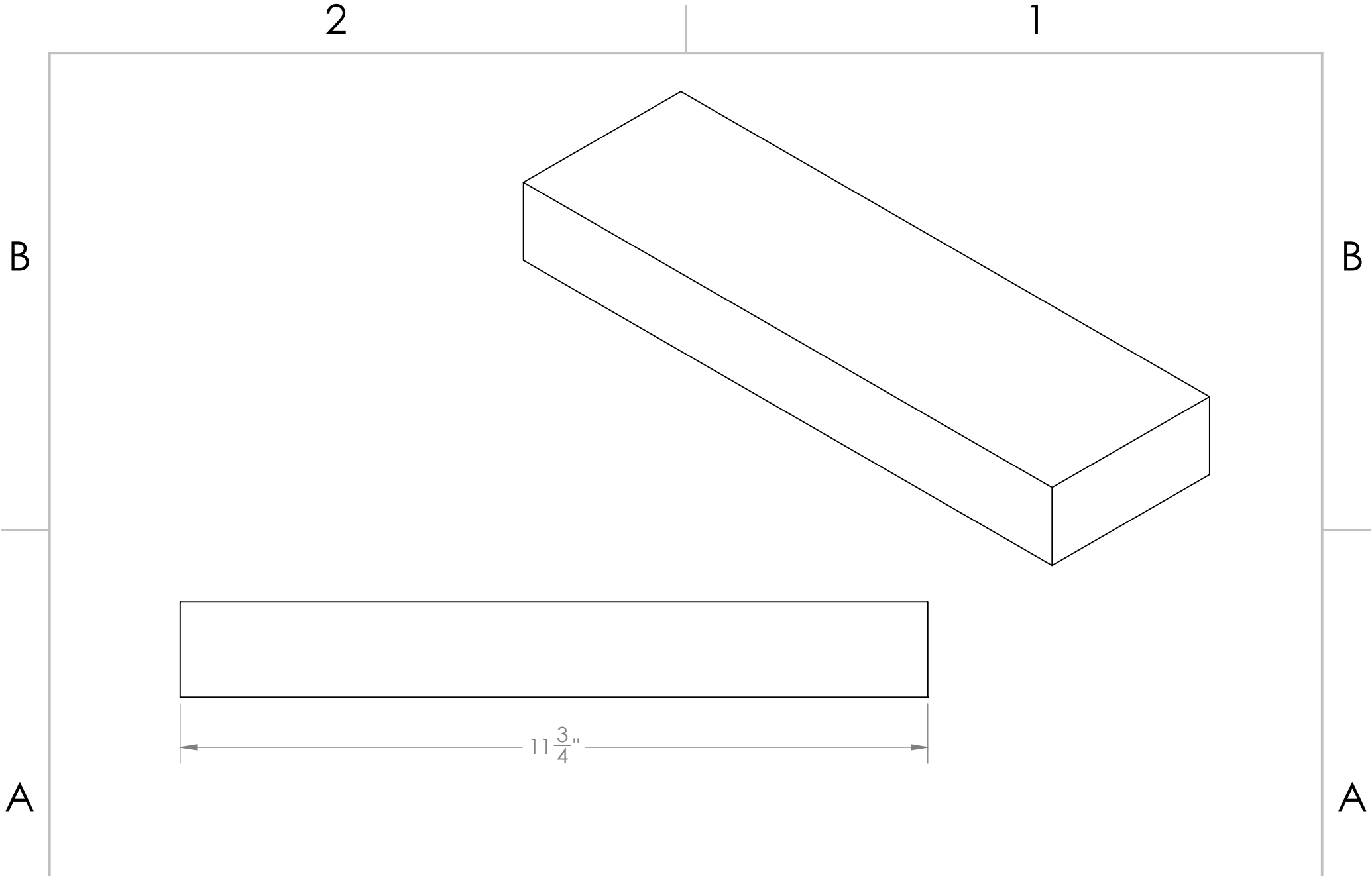
1. ALIGN LEGS AS SHOWN.
2. ATTACH EACH LEG TO BASE WITH THREE 1-INCH FINISHING NAILS AND WOOD GLUE.



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE: HIGH PLATFORM		SIZE: A	DWG. NO.: 20010200	REV:
MATERIAL:	DO NOT SCALE DRAWING	SCALE: 1:8	FIELD QTY: 4	SHEET 1 OF 1

2

1



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE: LONG LEG		SIZE: A	DWG. NO.: 20010202	REV:
MATERIAL: 2X4 LUMBER	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 16	SHEET 1 OF 1

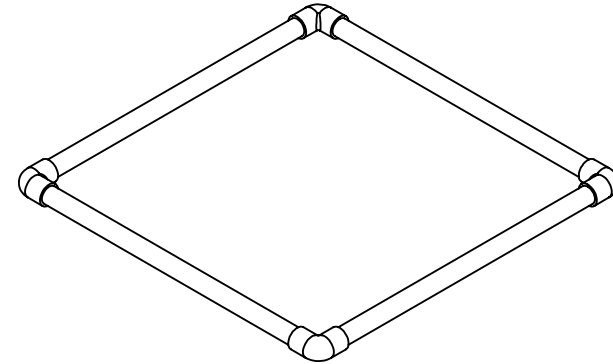
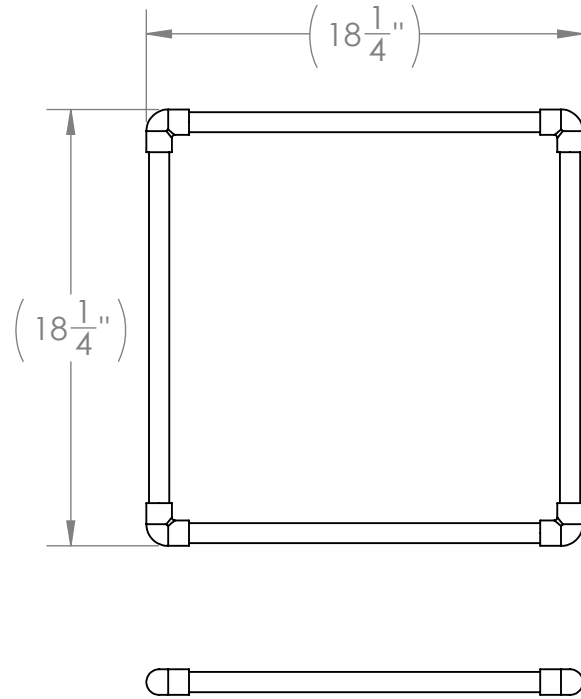
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1144120	0.5 ELBOW - 90	4
2	20020001	FRAME SIDE	4

B

B



A

A

NOTE:

1. GLUE IF DESIRED, BUT IT IS NOT REQUIRED.
2. OVERALL DIMENSION IS APPROXIMATE.



DIMENSIONS ARE IN INCHES

BEST 2020: OUTBREAK

TITLE: FRAME ASSEMBLY

SIZE	DWG. NO.	REV
A	20020000	

MATERIAL

DO NOT SCALE DRAWING

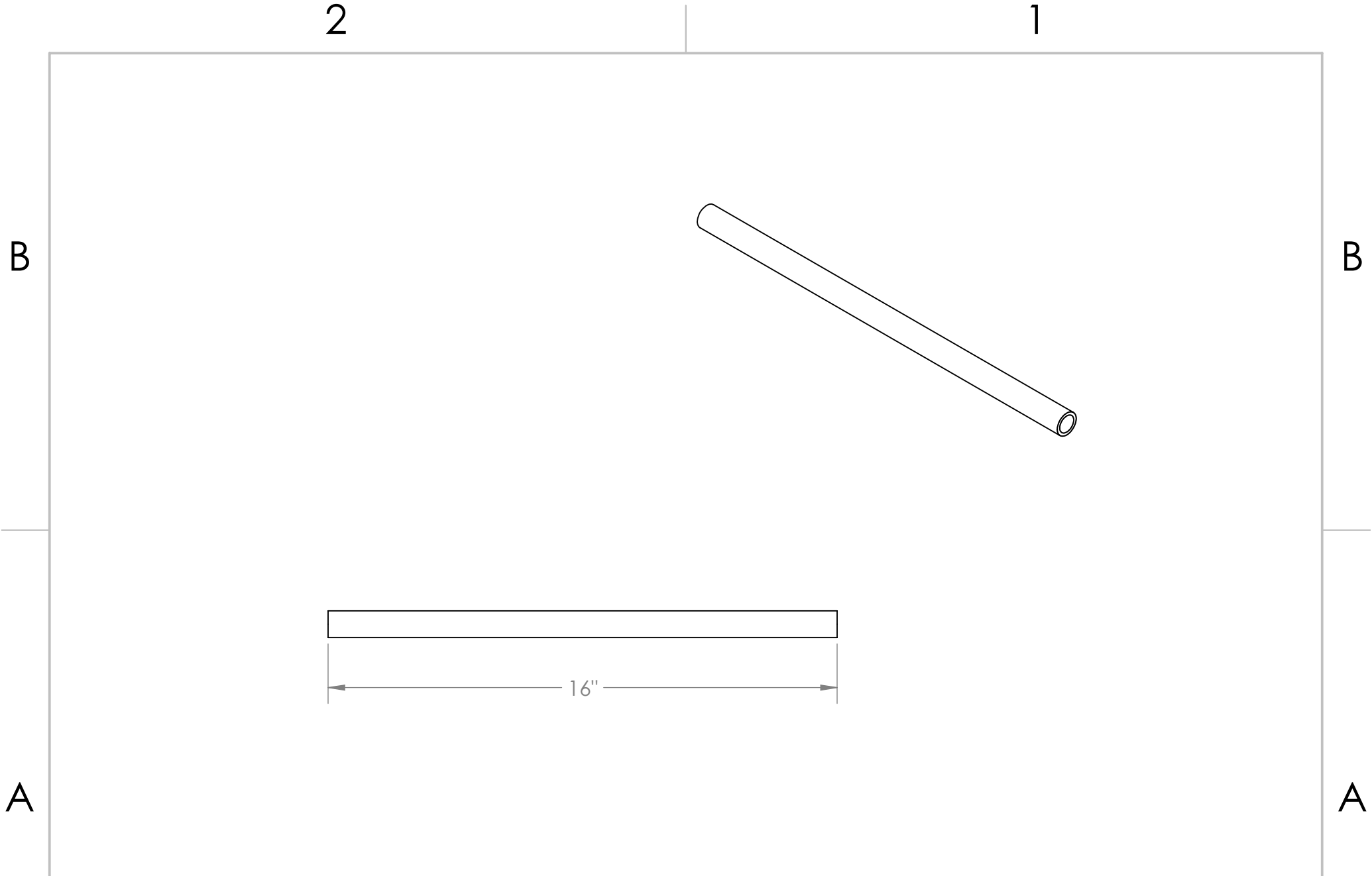
SCALE: 1:8

FIELD QTY: 12

SHEET 1 OF 1

2

1



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE: FRAME SIDE		SIZE: A	DWG. NO.: 20020001	REV:
MATERIAL: 1/2-INCH PVC PIPE	DO NOT SCALE DRAWING	SCALE: 1:4	FIELD QTY: 48	SHEET 1 OF 1

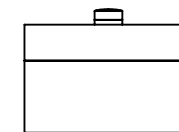
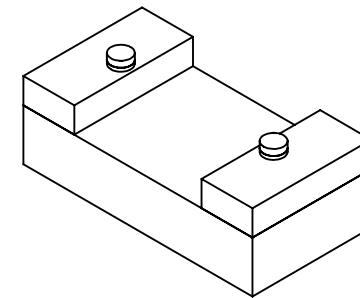
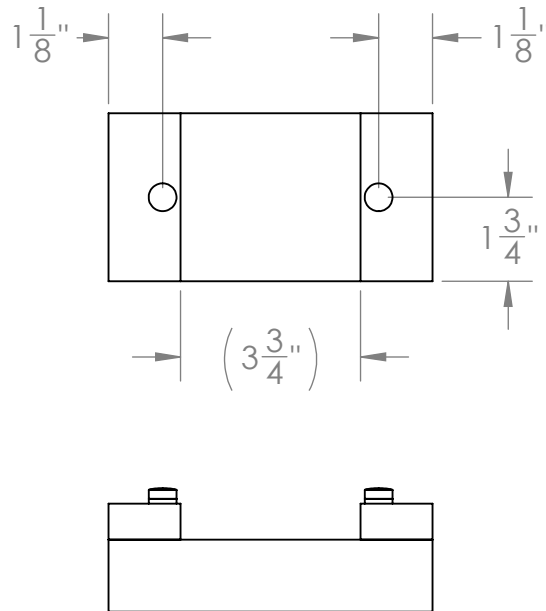
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20030001	TESTER BASE	1
2	B07YV48NN1	COMPASS	2
3	20030002	TESTER TOP	2

B

B



NOTES:

1. ASSEMBLY WOODEN PIECES TOGETHER AS SHOWN USING WOOD GLUE
2. DO NOT USE NAILS/BRADS FOR THIS ASSEMBLY.
3. ATTACH COMPASSES IN PLACE AS SHOWN USING WOOD GLUE.

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK	
TITLE: BLOCK TESTER		SIZE: A	DWG. NO. 20030000
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 4
		SHEET 1 OF 1	

2

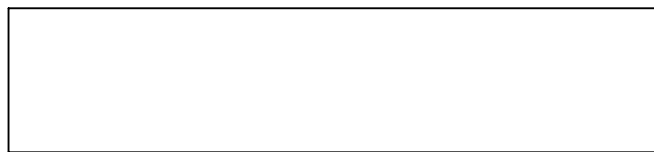
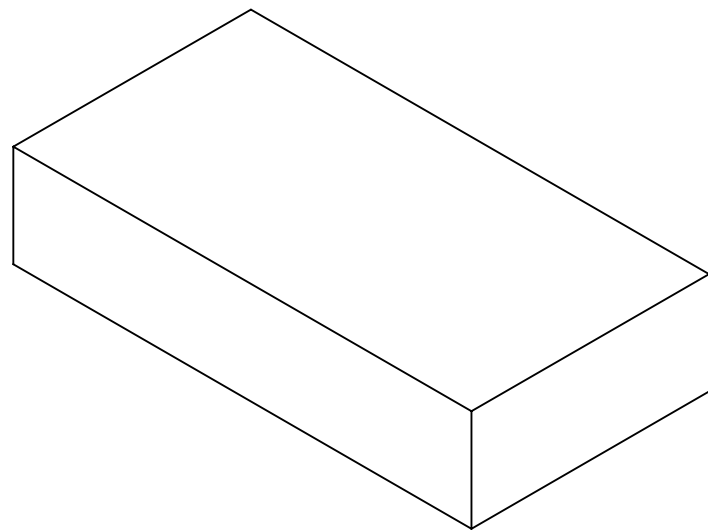
1

2

1

B

B



6 ³/₄''

A

A



DIMENSIONS ARE IN INCHES

BEST 2020: OUTBREAK

TITLE:

TESTER BASE

SIZE

A

DWG. NO.

20030001

REV

MATERIAL

2X4 LUMBER

DO NOT SCALE DRAWING

SCALE: 1:2

FIELD QTY: 4

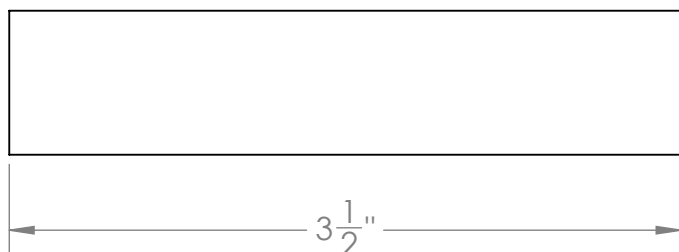
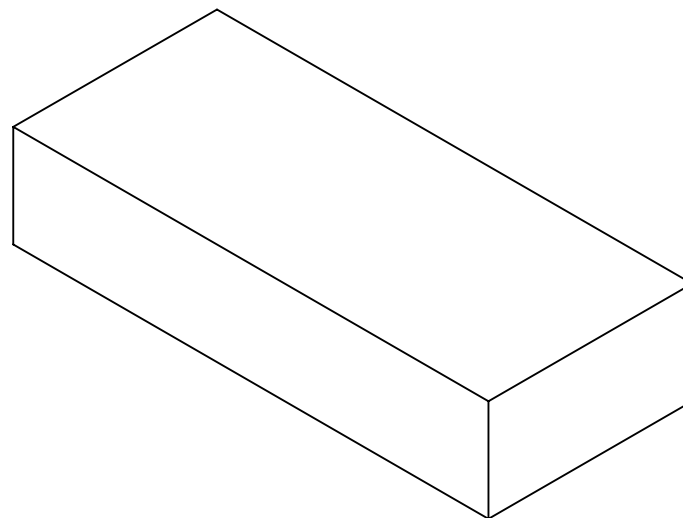
SHEET 1 OF 1

2

1

B

B



A

A



DIMENSIONS ARE IN INCHES

BEST 2020: OUTBREAK

TITLE:

TESTER TOP

SIZE

A

DWG. NO.

20030002

REV

MATERIAL

1X2 LUMBER

DO NOT SCALE DRAWING

SCALE: 1:1

FIELD QTY: 8

SHEET 1 OF 1

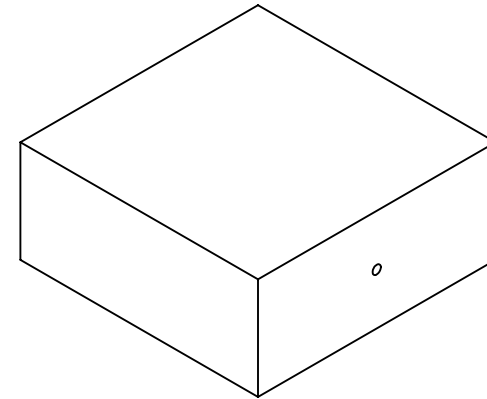
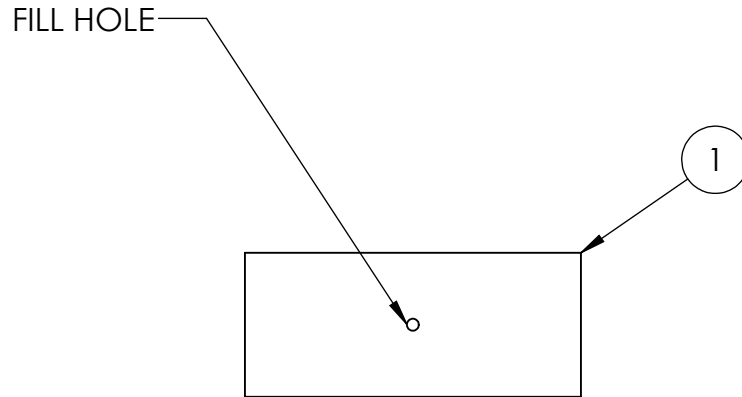
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20100101	GAME BLOCK	1

B

B



NOTES;

1. FILL BOTH HOLES WITH WOOD FILLER AND SAND SMOOTH.
2. EVEN THOUGH HOLES ARE FILLED, THEY MUST BE PRESENT IN THE BLOCK.

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK	
TITLE:	UNINFECTED CELL	SIZE	DWG. NO.
		A	20100100
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 48
			SHEET 1 OF 1

2

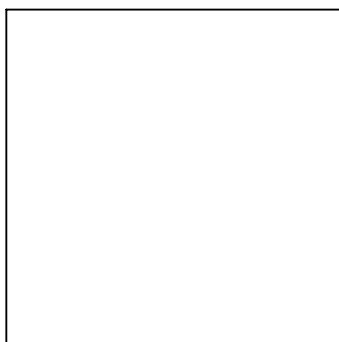
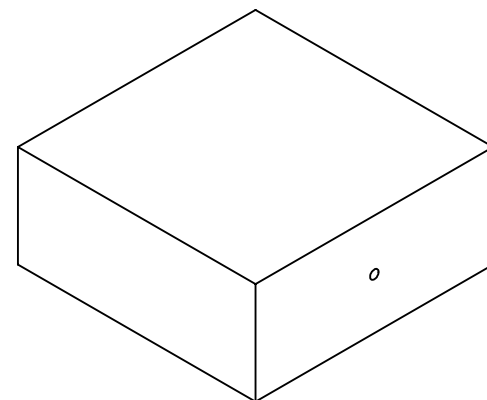
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2

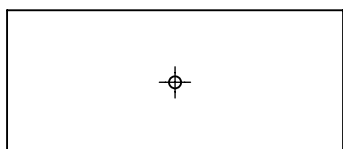
1

B

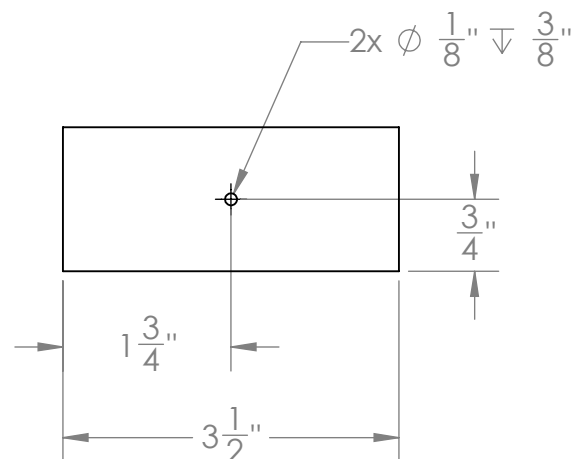
B



CUT SIDE OF LUMBER



$(3\frac{1}{2}'')$



2x $\varnothing \frac{1}{8}'' \nabla \frac{3}{8}''$

$1\frac{3}{4}''$

$3\frac{1}{2}''$

$\frac{3}{4}''$

NOTES:

1. DRILL HOLES IN UNCUT SIDE OF LUMBER.
2. HOLE DEPTH IS IMPORTANT.
3. ALL CELL BLOCKS SHOULD BE PREPARED WITH TWO HOLES AS SHOWN.
4. SUPER VACCINE BLOCK DOES NOT NEED HOLES.

A

A



DIMENSIONS ARE IN INCHES

BEST 2020: OUTBREAK

TITLE:

GAME BLOCK

SIZE

A

DWG. NO.

20100101

REV

MATERIAL

2X4 LUMBER

DO NOT SCALE DRAWING

SCALE: 1:2

FIELD QTY: 88

SHEET 1 OF 1

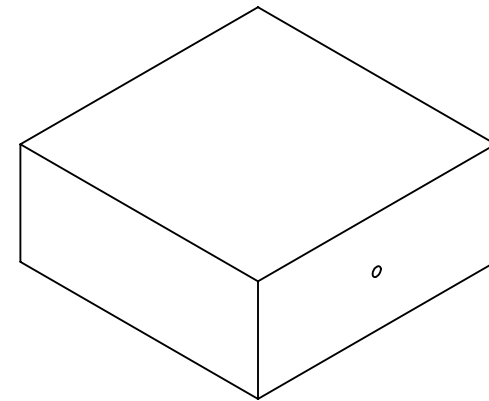
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1

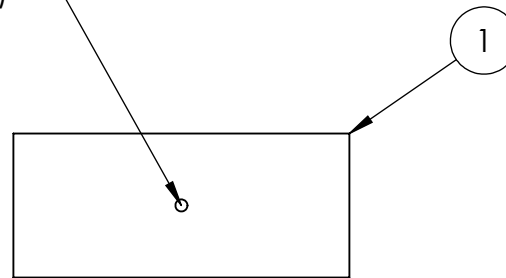
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20100101	GAME BLOCK	1
2	5862K101	NEODYMIUM MAGNET	2

B

B



INSERT TWO MAGNETS
(ONE SIDE ONLY)



NOTES;

1. INSERT FIRST MAGNET IN THE HOLE UNTIL THE MAGNET CONTACTS THE BASE OF THE HOLE.
2. INSERT SECOND MAGNET SO THAT POLARITY MATCHES FIRST MAGNET.
3. SUGGEST KEEPING THE SAME POLARITY OUTWARD FOR ALL MAGNETS.
4. FILL BOTH HOLES WITH WOOD FILLER AND SAND SMOOTH.

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE:	IMMUNE CELL	SIZE	DWG. NO.	REV
		A	20100200	
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 24	SHEET 1 OF 1

2

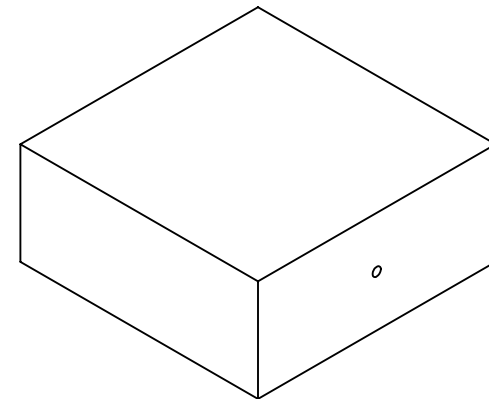
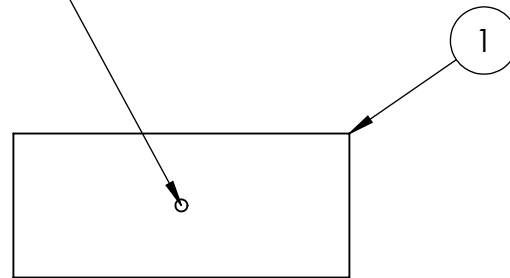
1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20100101	GAME BLOCK	1
2	5862K101	NEODYMIUM MAGNET	4

B

B

INSERT TWO MAGNETS
IN EACH HOLE



NOTES;

1. INSERT FIRST MAGNET IN THE HOLE UNTIL THE MAGNET CONTACTS THE BASE OF THE HOLE.
2. INSERT SECOND MAGNET SO THAT POLARITY MATCHES FIRST MAGNET.
3. SUGGEST KEEPING THE SAME POLARITY OUTWARD FOR ALL MAGNETS.
4. FILL BOTH HOLES WITH WOOD FILLER AND SAND SMOOTH.

A

A



DIMENSIONS ARE IN INCHES		BEST 2020: OUTBREAK		
TITLE: INFECTED CELL		SIZE A	DWG. NO. 20100300	REV
MATERIAL	DO NOT SCALE DRAWING	SCALE: 1:2	FIELD QTY: 12	SHEET 1 OF 1

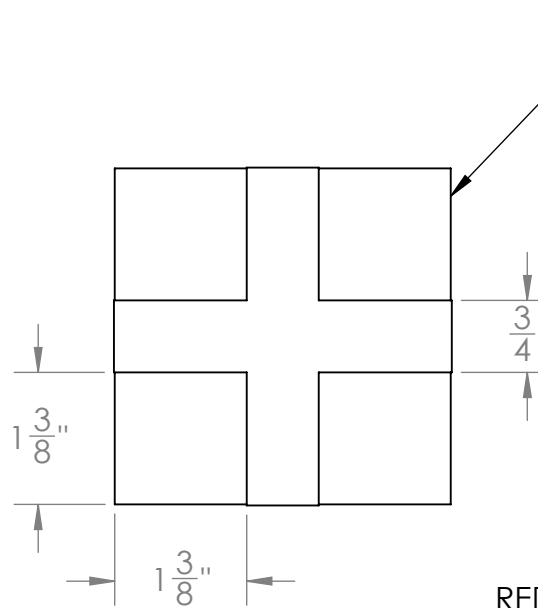
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1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	20100101	GAME BLOCK	1

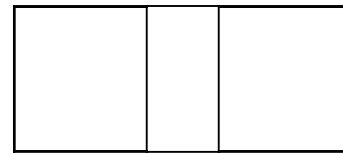
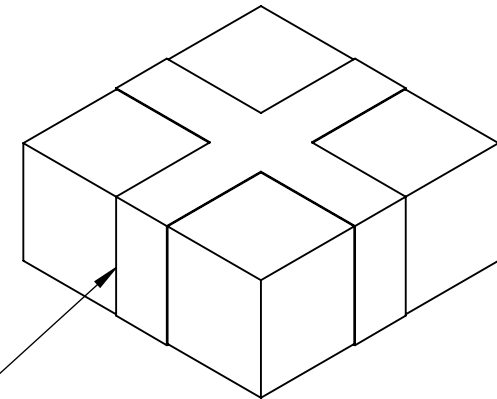
B

B



1

RED STRIPE



NOTES:

1. RED STRIPES MAY BE MADE WITH TAPE, MARKER, OR PAINT.
2. STRIPES CONTINUE ON ALL SIDES OF BLOCK.
3. STRIPE SHOULD BE CENTERED ON BLOCK AS SHOWN.

A

A



DIMENSIONS ARE IN INCHES

BEST 2020: OUTBREAK

TITLE: SUPER VACCINE

SIZE DWG. NO. 20110000

REV

MATERIAL

DO NOT SCALE DRAWING

SCALE: 1:2

FIELD QTY: 4

SHEET 1 OF 1