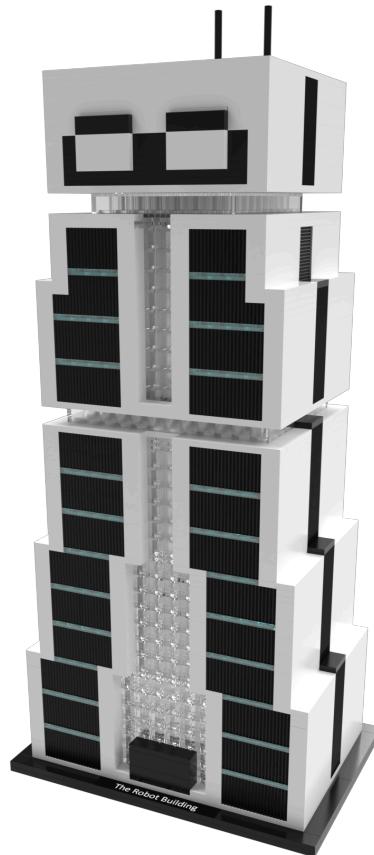


The Robot Building

United Overseas Bank's Bangkok Headquarters.

LEGO Structure Design Package
Jordan Patten (netid: pjordan1) | R2.0 | 24 Mar 2025
ME EN 272

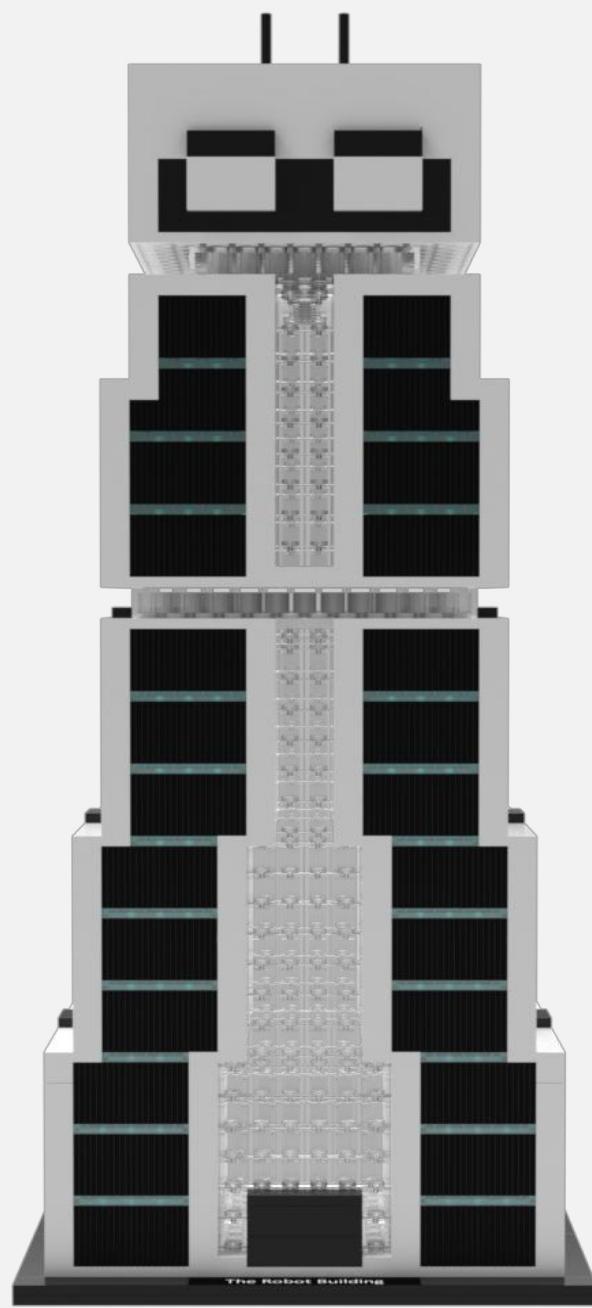


This document provides the following design artifacts for the LEGO Project:

1. Title page with rendering of final assembly
2. Photo Illustration of LEGO Structure next to actual building in same orientation
3. Full page rendering of the LEGO Structure with black background and text
4. Hand sketch of LEGO 2x4 Brick
5. Hand sketch of CAD strategy for LEGO Brick
6. Hand sketches that communicate approach and CAD strategy for assembly
7. Assembly Drawing of the LEGO Structure
8. Engineering Drawing of the 2x4 LEGO Brick

Revision History

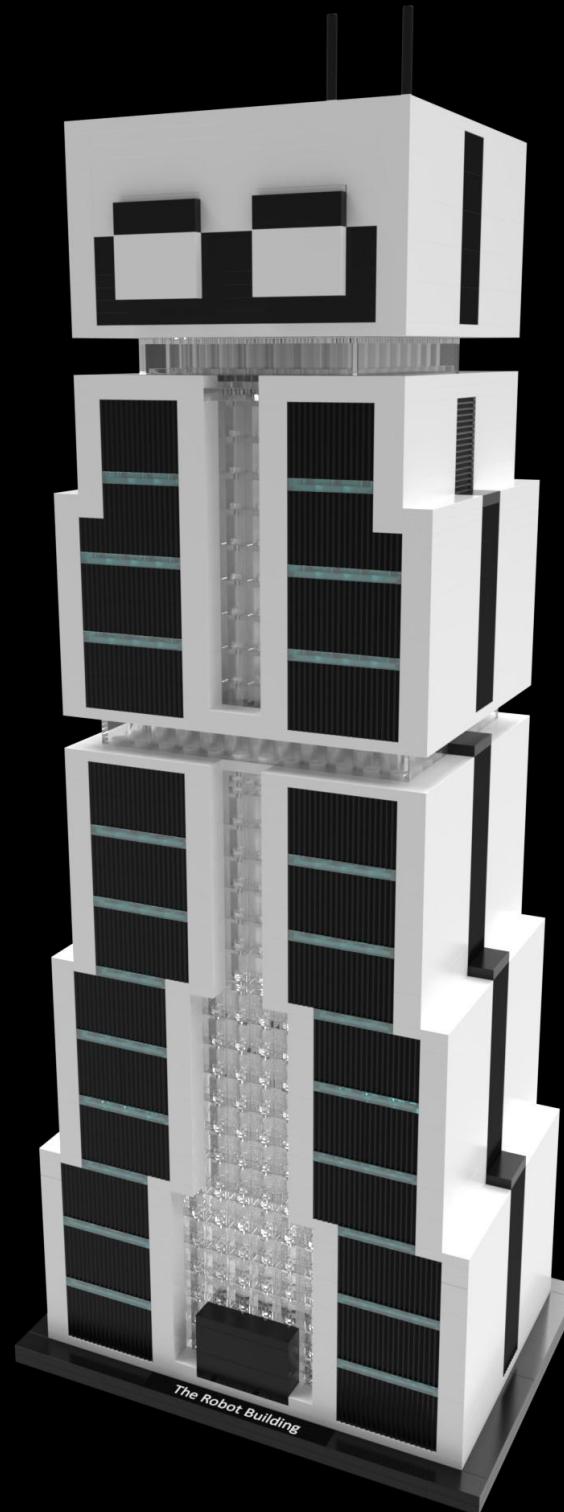
Revision	Date	Description
R1.0	22 Feb 2025	Initial Release
R2.0	24 Mar 2025	Revision 1



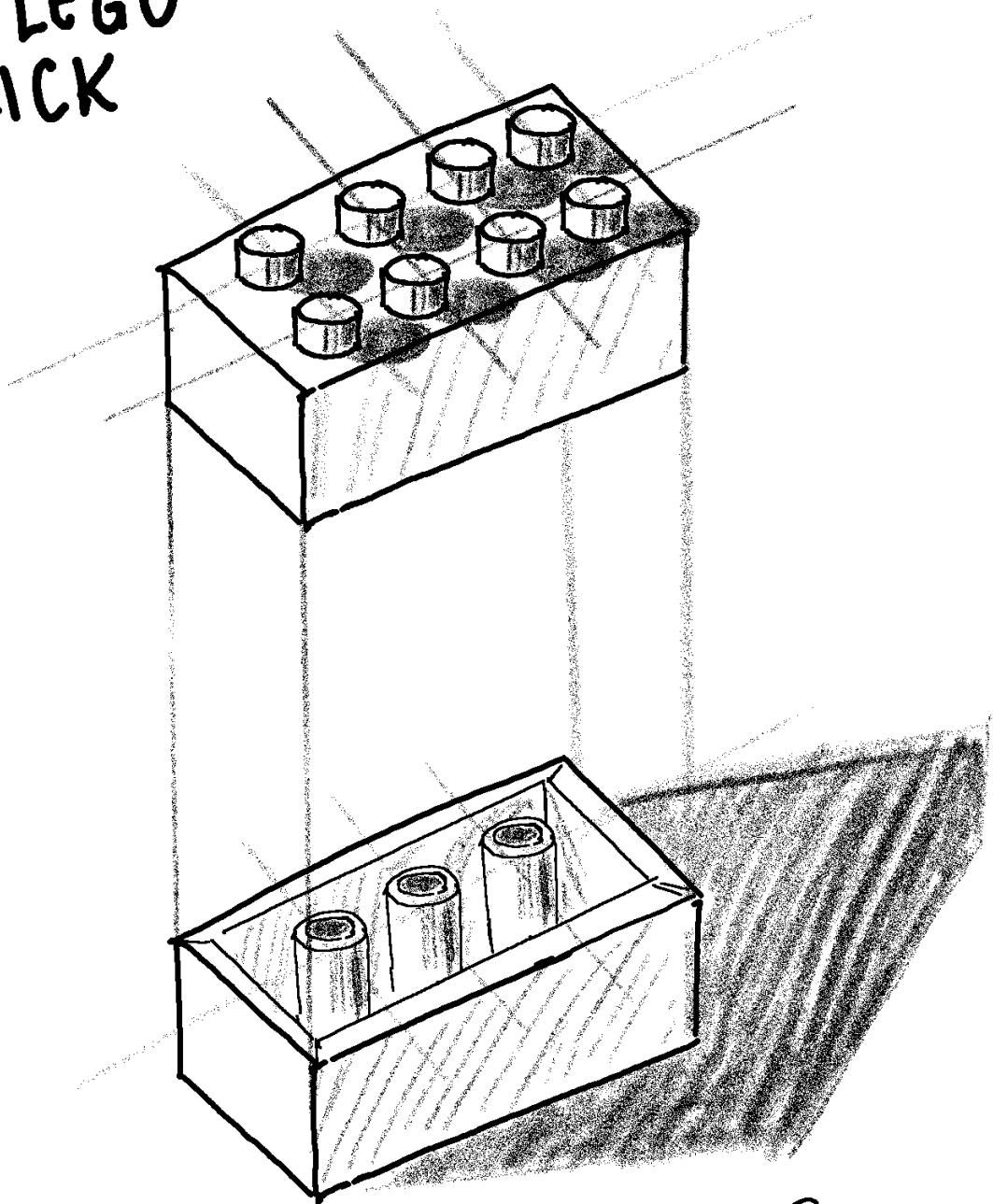
The Robot Building

Bangkok, Thailand

283 pcs/pzs
60 unique pcs/pzs



2x4 LEGO
BRICK

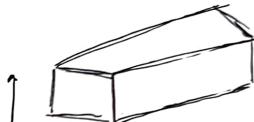


Jordan Patten
06 FEB 2025

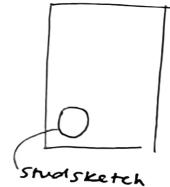
① Sketch rectangle
on top plane



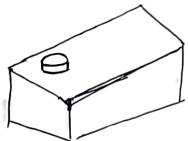
② Extrude Rectangle



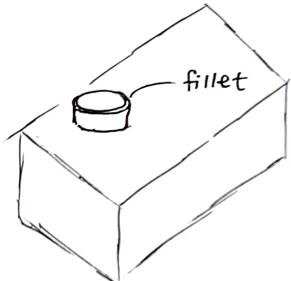
③ Sketch stud on top of
extrude



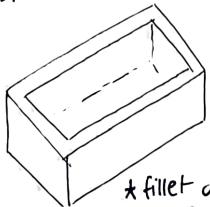
④ Extrude stud



⑤ Add fillet to Stud

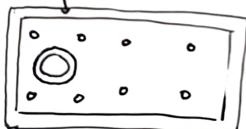


⑦ Shell the bottom face
and add fillets

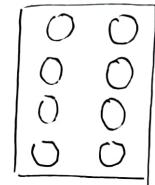


* fillet all edges
except under
tubes + inside
cavities

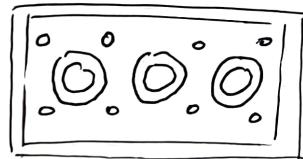
⑧ Sketch tube on shell
face + extrude up to
face



⑥ Linear Pattern w/ two directions
↳ for studs + fillets



⑨ Add linear pattern in two
directions

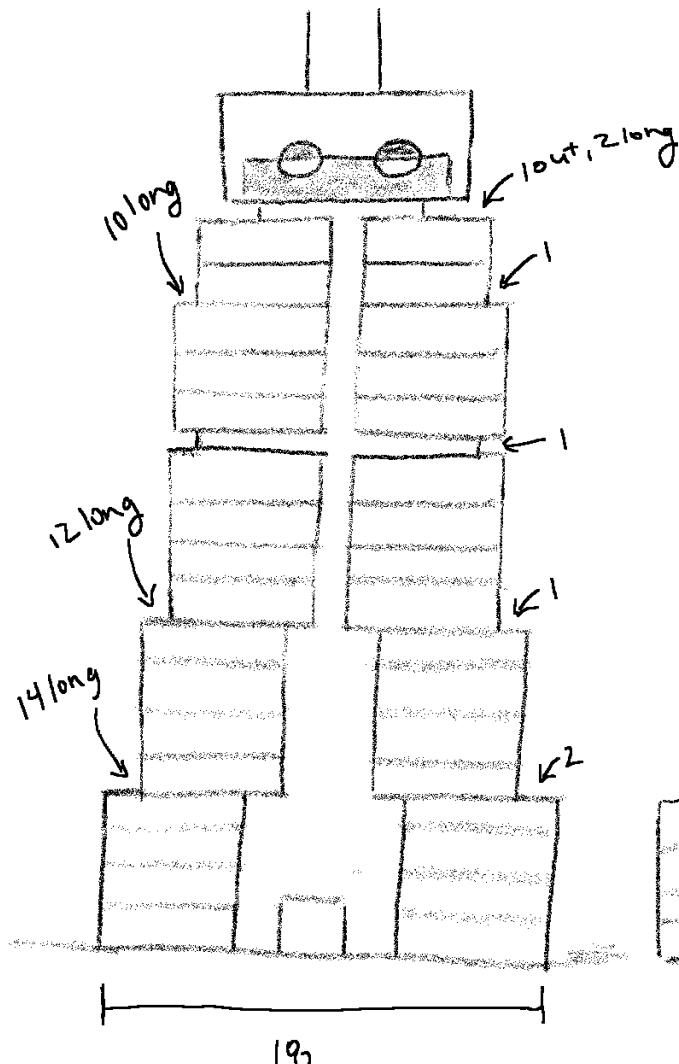


ROBOT BUILDING (BANGKOK, THAILAND)

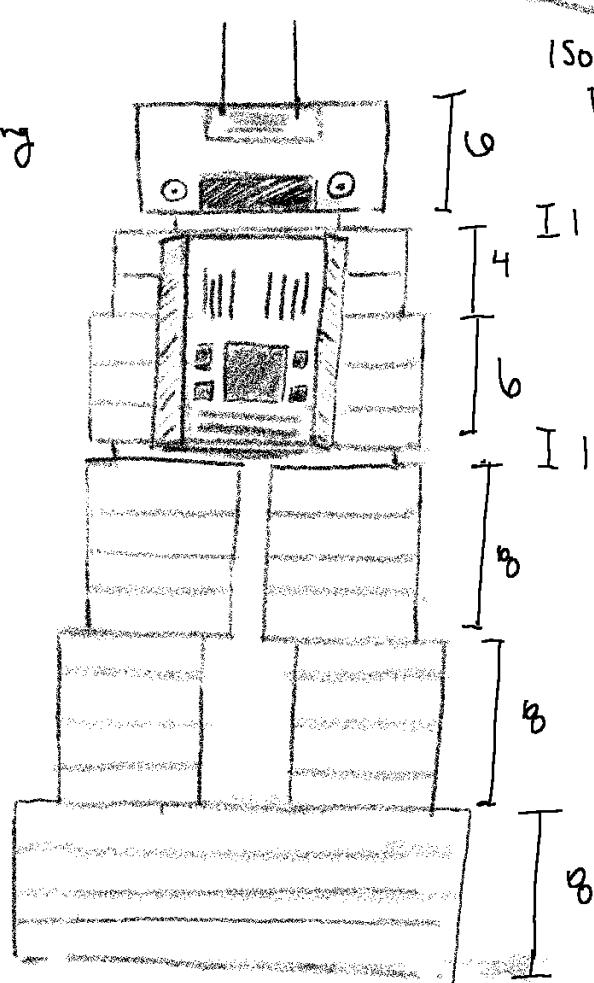
DEFINING CHARACTERISTICS:

- BLUE STRIPES
- EYES + ANTENNA
- SMALLER FLOOR SECTIONS WITH INCREASING HEIGHT
- EXTRUDES ON BACK AND SIDES (TUBES)
- TEXTURED FACE

FRONT:

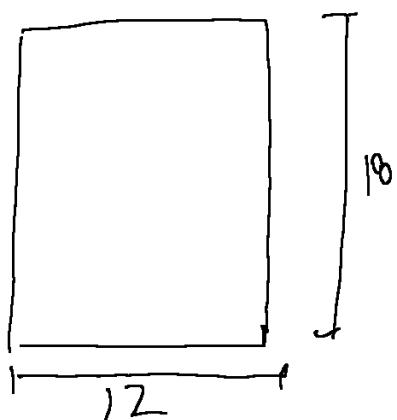


BACK:



ISOMETRIC BACK

BASE

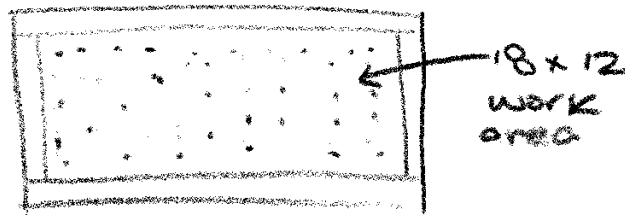
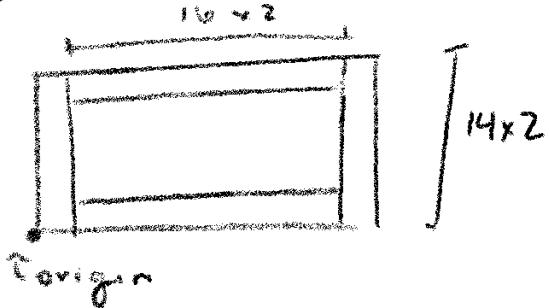


18

12

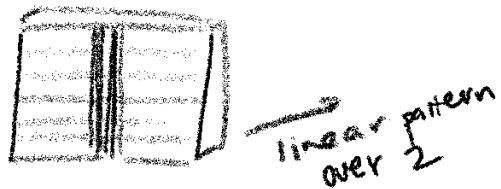
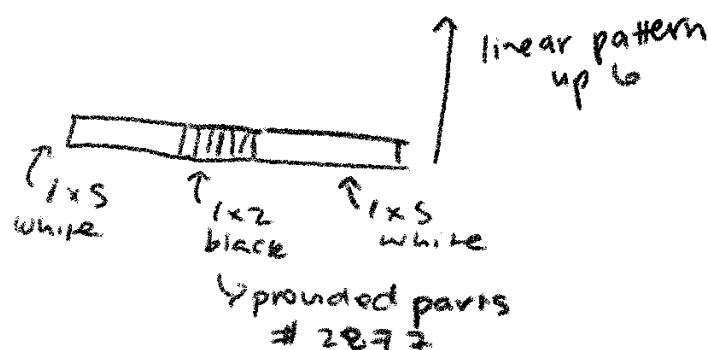
18

① Create Base (20x14)

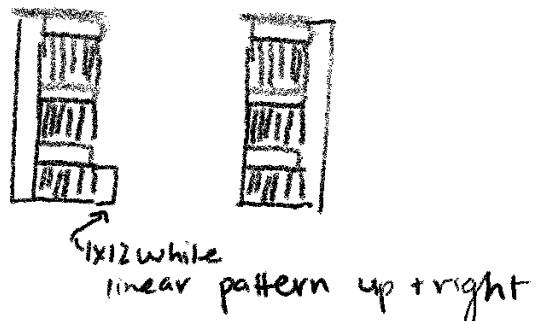
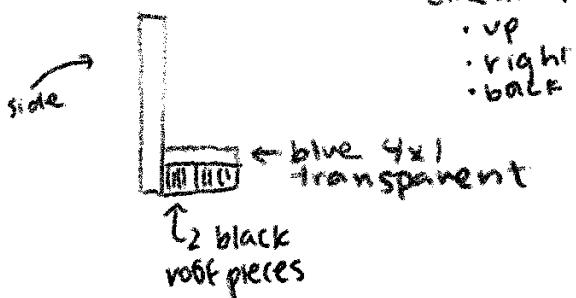


② Layer 1

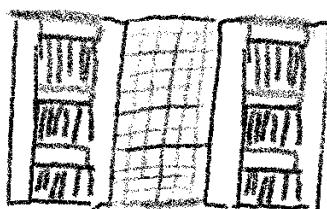
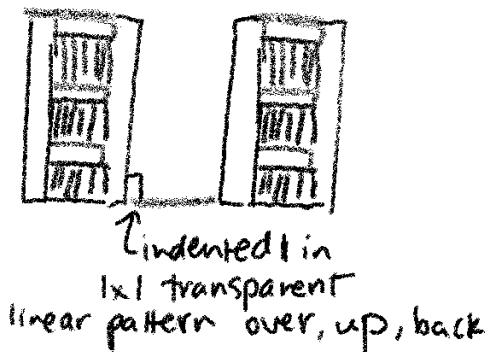
A Sides



B Front Walls

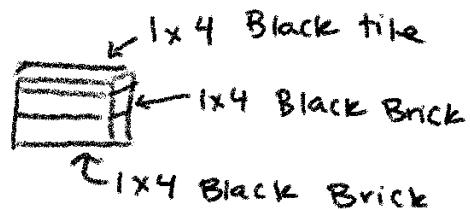
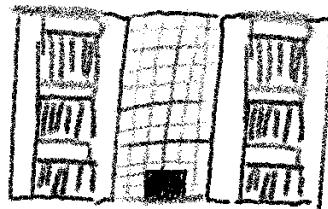


C Inside Windows

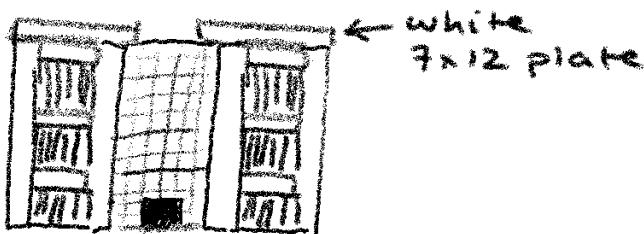


② Layer 1

D Door

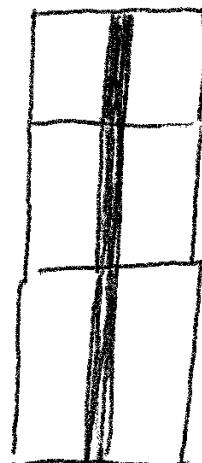
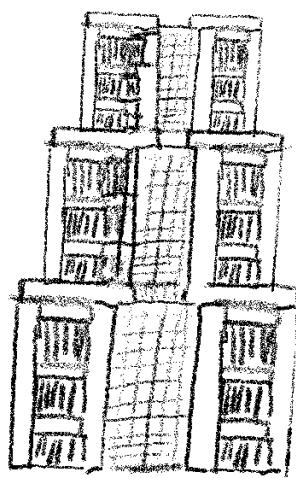


E Layer Cap



③ Layer 2 - 3

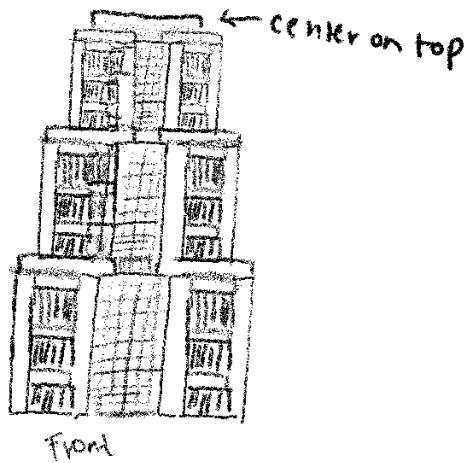
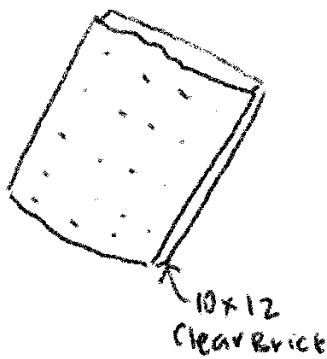
Repeat step 2 (not D) twice, a unit smaller on either side each layer up.



front

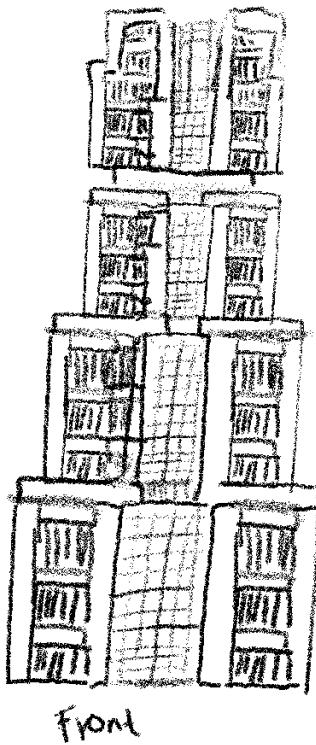
side

④ Add glass room



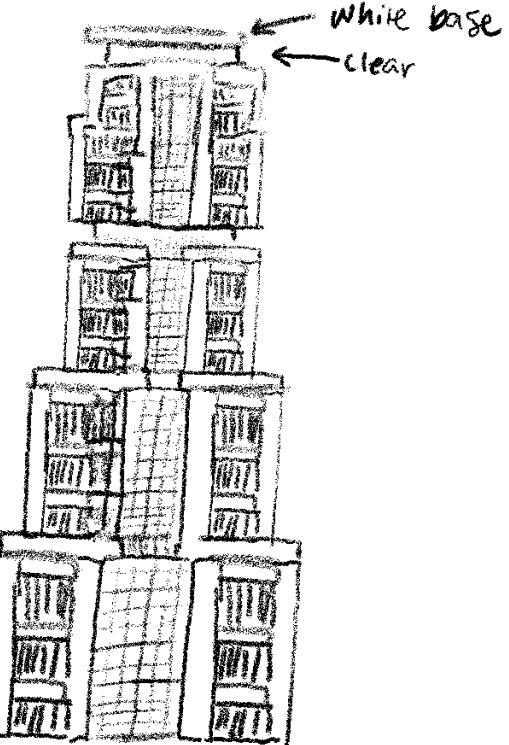
Front

⑤ Layer 4 / 5
repeat step 2 (minus D and E)



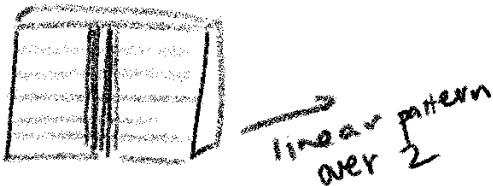
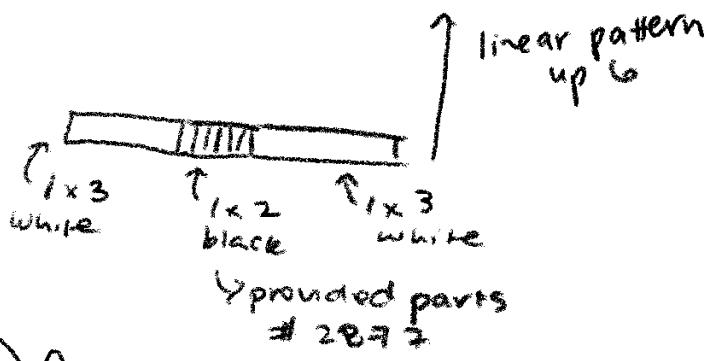
front

⑥ Glass room pt. 2
repeat step 4

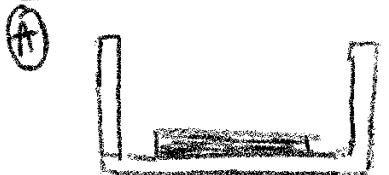


front

⑦ sides of top layer

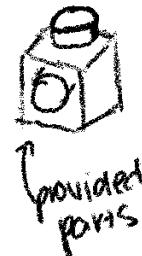


⑧ front of the top layer

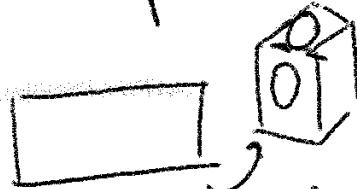


↳ black piece
linear row up

⑨ Eyes



→ linear row sideways
attach rectangular plates

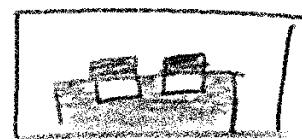


⑧ front of top layer

(C)

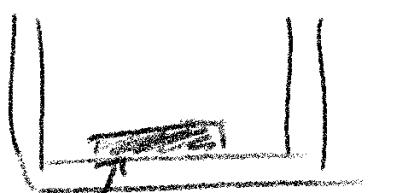


Fill in front
white layer w/
linear patterns



⑨ back of top layer

(A)



black piece,
linear pattern up

(B)

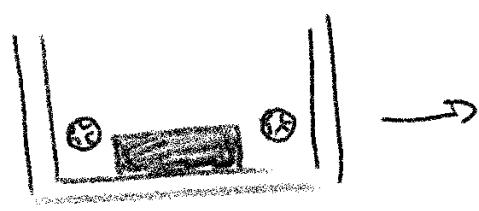


provided part



provided part,
put parts on sides use as gear

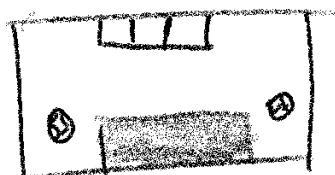
(C)



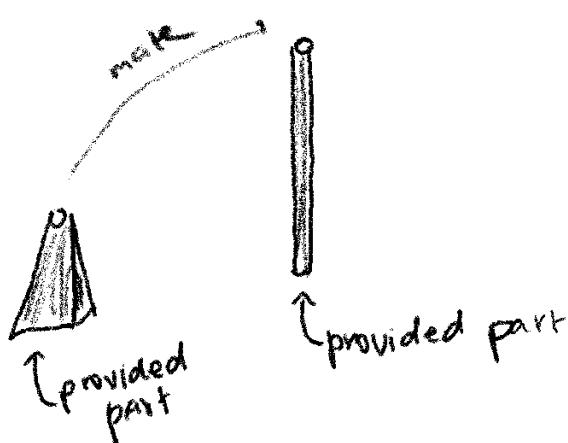
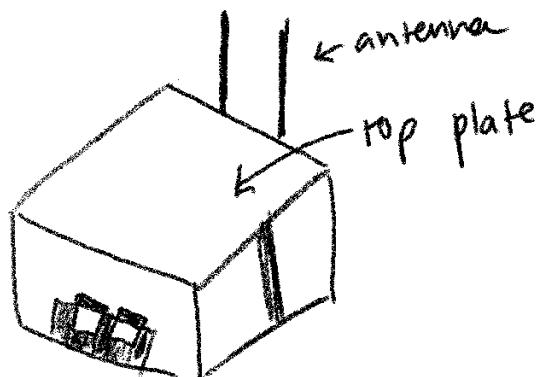
put in top grate



provided part, linear pattern x3

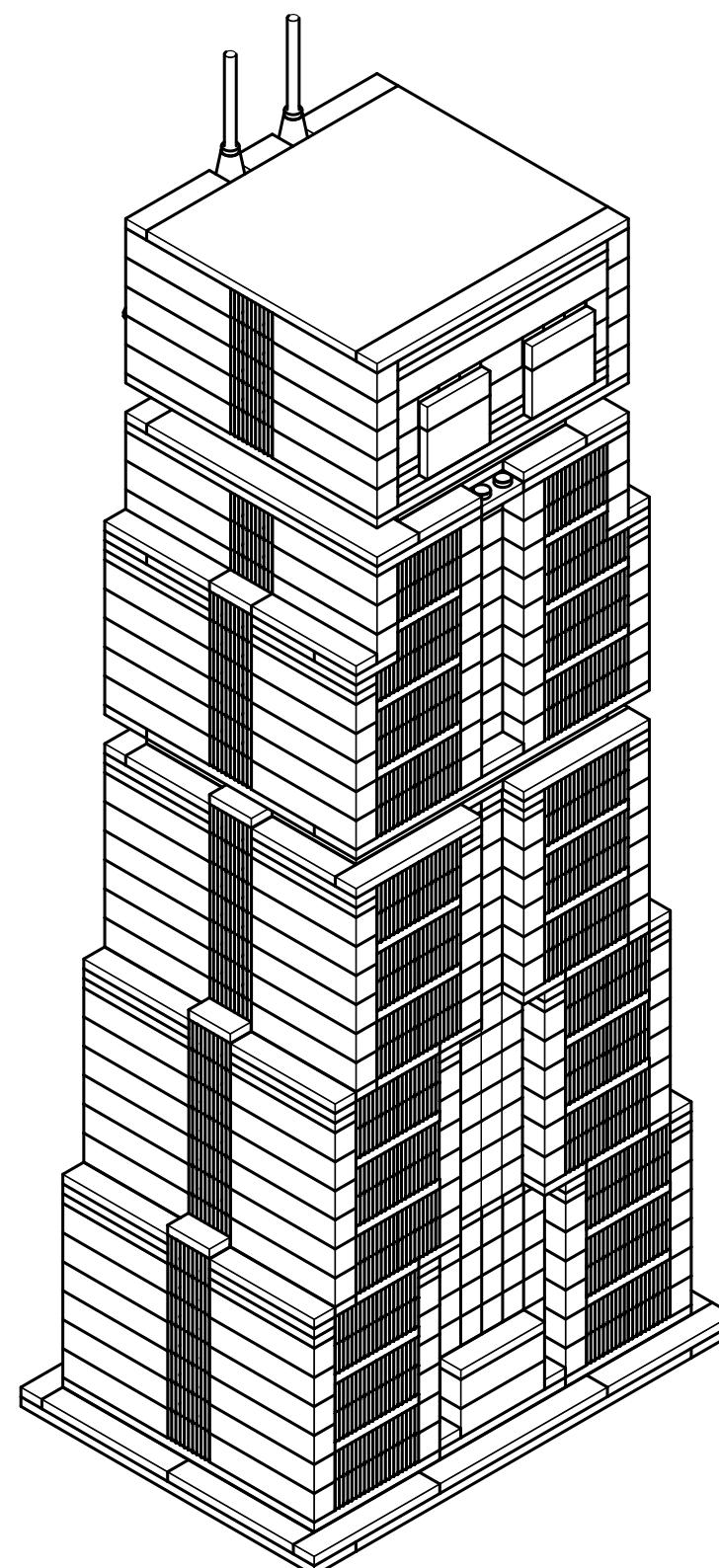


⑩ Add top plate + antenna



provided
part

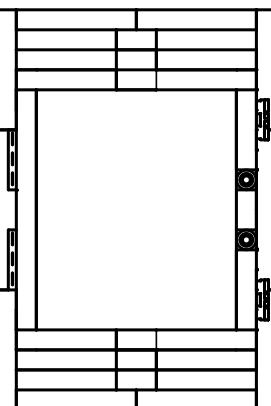
provided part



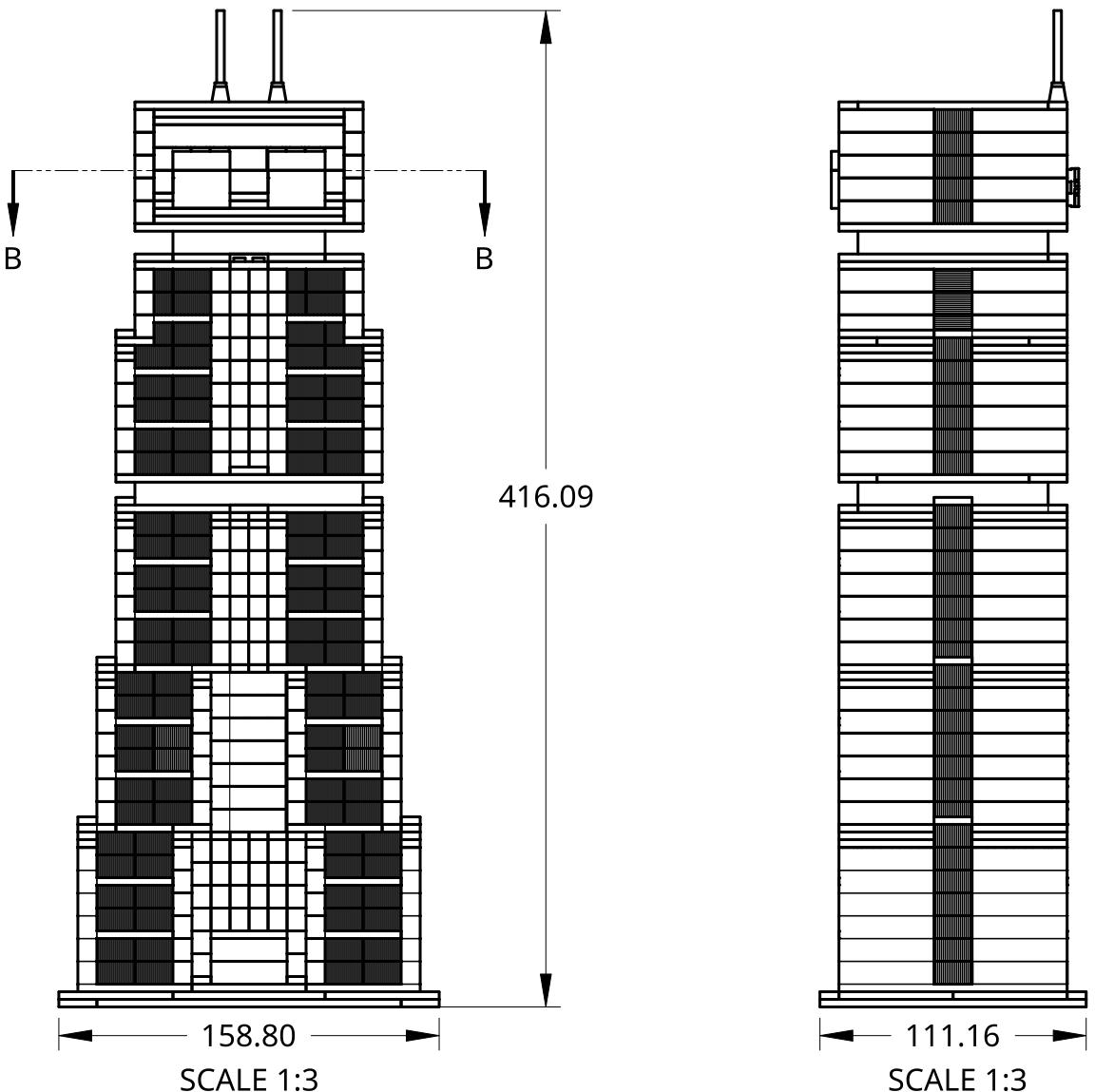
SCALE 1:2

		REVISION HISTORY			
REV.	DESCRIPTION		DATE		
A	INITIAL RELEASE			02/21/2025	
Item	Quantity	Part Number	Description		
1	4	3001	2x14 BLACK PLATE		
2	2	3002	2x12 BLACK PLATE		
3	2	3003	2x16 BLACK PLATE		
4	8	3004	1x6 BLACK TILE		
5	1	3005	1x8 BLACK LABELED TILE		
6	1	3006	1x8 BLACK TILE		
7	3	3007	6x12 WHITE PLATE		
8	126	3008	1x5 WHITE BRICK		
9	266	2877	1x2 BLACK TEXTURED BRICK		
10	54	3009	1x12 WHITE BRICK		
11	32	3010	1x4 TRANSPARENT BLUE PLATE		
12	16	3011	1x12 WHITE PLATE		
13	33	3012	1x5 WHITE PLATE		
14	14	3013	1x5 WHITE TILE		
15	8	3014	1x2 BLACK TILE		
16	32	3015	1x1 CLEAR PLATE		
17	188	3016	1x1 TRANSPARENT BRICK		
18	2	3017	1x4 BLACK BRICK		
19	1	3018	1x4 BLACK TILE		
20	2	3019	1x1 WHITE TILE		
21	12	3020	1x3 TRANSPARENT BLUE PLATE		
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE		NAME	DATE	BYU ENGINEERING	
INCH:	MM:	J. PATTEN	02/19/2025	TITLE	
0.0 = ±0.02	0. = ±0.50	I. CARPENTER	02/21/2025	LEGO ROBOT BUILDING ASSEMBLY	
0.00 = ±0.01	0.0 = ±0.25	MATERIAL ABS			
0.000 = ±0.005	0.00 = ±0.15	FINISH HARD PLASTIC			
ANGULAR: 0.0 = ±1 0.00 = ±0.5		COMMENTS			
 DO NOT SCALE DRAWING		SIZE	PART NUMBER	REVISION	
		B	19702-1	A	
		SCALE	1:6	WEIGHT	804.73
				SHEET	1 of 3

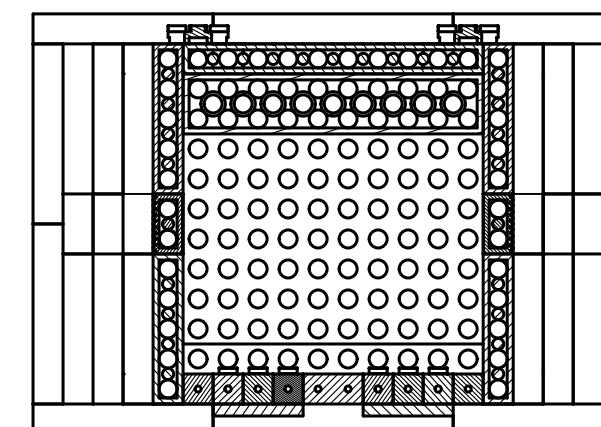
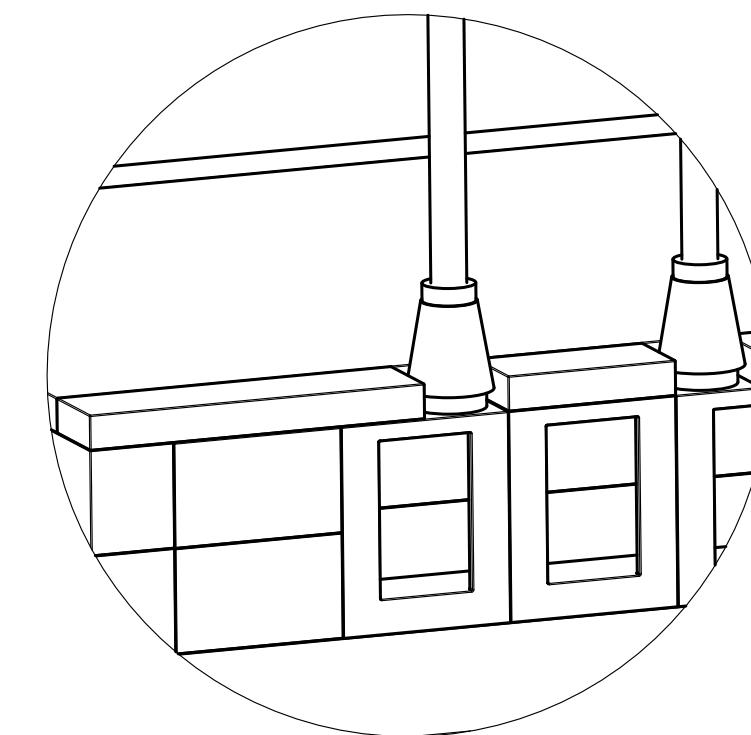
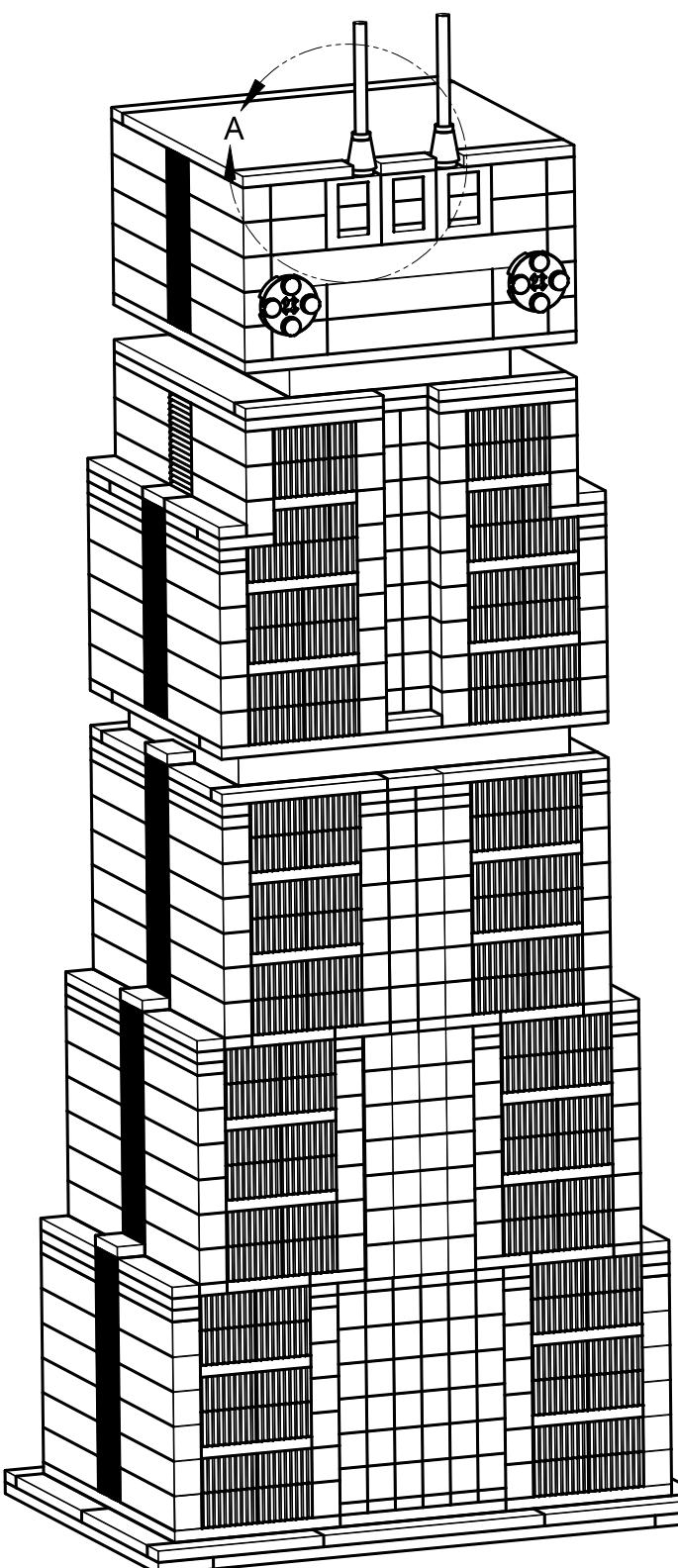
D



SCALE 1:3

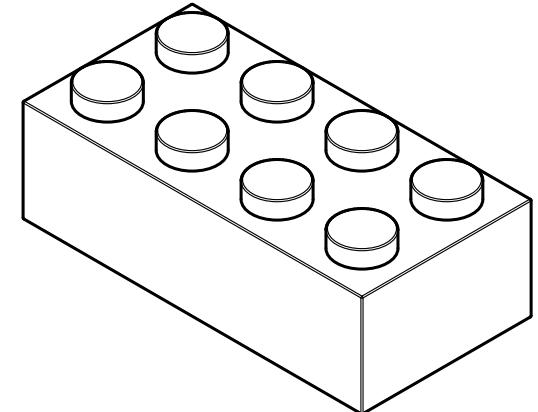
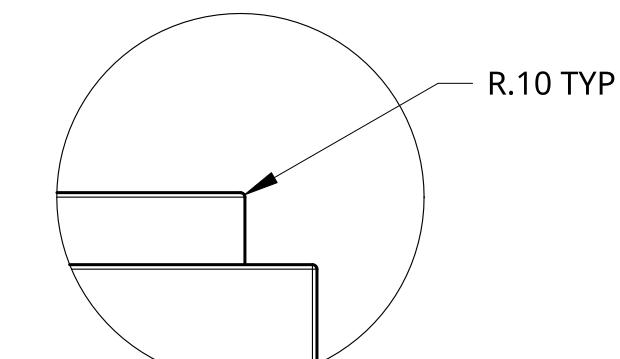
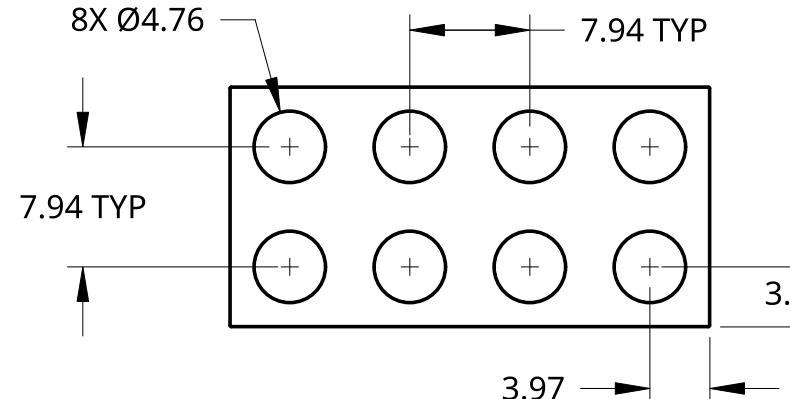


Item	Quantity	Part Number	Description
22	12	3021	2x2 WHITE PLATE
23	2	3022	1x8 WHITE PLATE
24	4	3023	1x6 WHITE TILE
25	6	3024	1x4 WHITE TILE
26	1	3025	10x12 TRANSPARENT PLATE
27	1	3026	1x2 TRANSPARENT TILE
28	1	3027	10x12 TRANSPARENT BRICK
29	2	3028	2x14 WHITE PLATE
30	2	3029	2x9 WHITE PLATE
31	12	2878	1x1 BLACK TEXTURED BRICK
32	4	3030	1x3 WHITE PLATE
33	2	3031	5x12 WHITE PLATE
34	1	3032	2x12 TRANSPARENT PLATE
35	1	3033	8x10
36	1	3034	8x10 TRANSPARENT PLATE
37	2	3035	2x11 WHITE TILE
38	3	3036	1x2 WHITE TILE
39	2	3037	1x4 WHITE PLATE
40	2	3038	1x6 WHITE BRICK
41	2	3039	1x3 WHITE TILE
42	1	3040	12x12 WHITE PLATE
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE			
INCH: 0.0 = ±0.02 MM: 0. = ±0.50			
0.00 = ±0.01 0.0 = ±0.25			
0.000 = ±0.005 0.00 = ±0.15			
0.000 = ±0.05			
ANGULAR: 0.0 = ±1 0.00 = ±0.5			
DRAWN J. PATTEN 02/19/2025			
CHECKED I. CARPENTER 02/21/2025			
UNITS MILLIMETER			
MATERIAL ABS			
FINISH HARD PLASTIC			
COMMENTS			
 DO NOT SCALE DRAWING			
BYU ENGINEERING			
TITLE LEGO ROBOT BUILDING ASSEMBLY			
SIZE B PART NUMBER 19702-1 REVISION A			
SCALE 1:3 WEIGHT 804.73 SHEET 2 of 3			

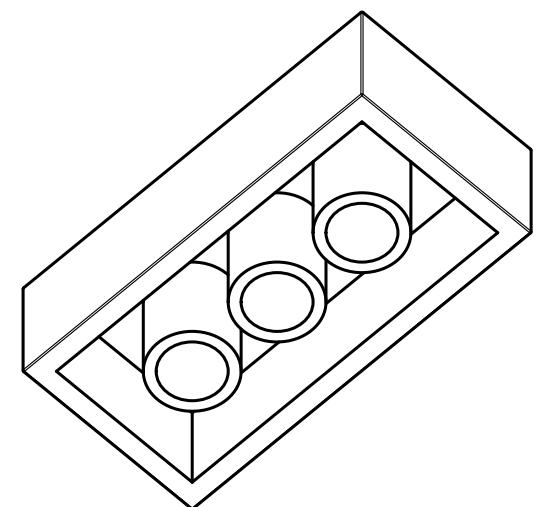
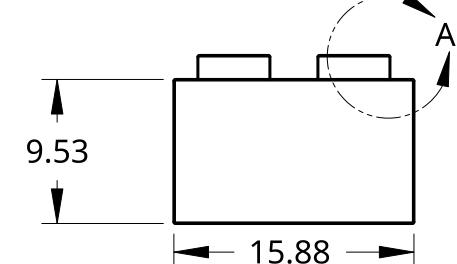
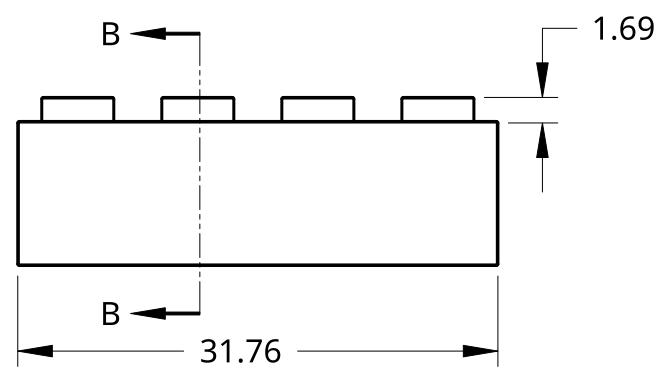


Item	Quantity	Part Number	Description
43	4	3041	2x10 WHITE PLATE
44	2	4032	2x2 CIRCULAR
45	2	3042	2x3 WHITE TILE
46	2	3043	1x1 BLACK BRICK
47	2	3044	1x10 WHITE BRICK
48	4	3045	1x1 WHITE BRICK
49	2	3046	1x3 BLACK TILE
50	2	3047	1x10 WHITE PLATE
51	3	60592	1x2x2 BLACK WINDOW
52	8	4733	1x1 WHITE BRICK WITH STUDS
53	7	3048	1x2 WHITE BRICK
54	5	3049	2x10 WHITE BRICK
55	1	3050	1x12 WHITE TILE
56	1	3051	10x12 WHITE TILE
57	2	87994	BAR 3L
58	2	4589	1x1 BLACK CONE
59	6	60593	1x1 BLACK BRICK WITH STUDS
60	1	3001	1x2 BLACK BRICK
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE		NAME	DATE
INCH: 0.0 = ±0.02 0.00 = ±0.01 0.000 = ±0.005		DRAWN J. PATTEN	02/19/2025
MM: 0. = ±0.50 0.0 = ±0.25 0.00 = ±0.15 0.000 = ±0.05		CHECKED I. CARPENTER	02/21/2025
UNITS MILLIMETER		MATERIAL ABS	
ANGULAR: 0.0 = ±1 0.00 = ±0.5		FINISH HARD PLASTIC	
COMMENTS			
 DO NOT SCALE DRAWING		BYU ENGINEERING LEGO ROBOT BUILDING ASSEMBLY SIZE B PART NUMBER 19702-1 REVISION A SCALE 1:3 WEIGHT 804.73 SHEET 3 of 3	

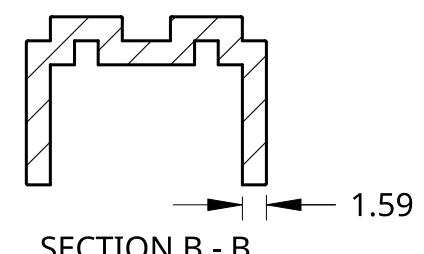
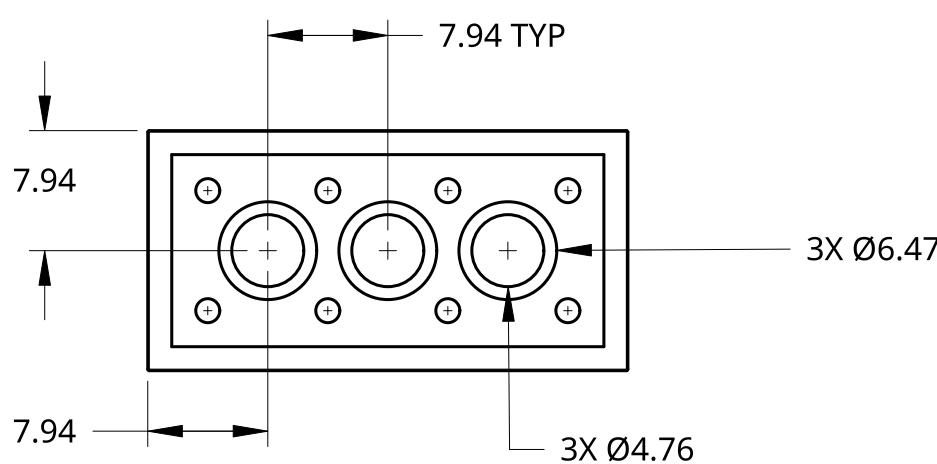
D



C



B

**NOTES:**

1. ALL EDGES EXCEPT THOSE ON THE UNDTUBES AND INSIDE CAVITY HAVE FILLETS.

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE		NAME	DATE	
INCH:	MM:	J. PATTEN	02/10/2025	
0.0 = ±0.02	0. = ±0.50	CHECKED	J. LEHNHOF	
0.00 = ±0.01	0.0 = ±0.25	02/11/2025		
0.000 = ±0.005	0.00 = ±0.15	UNITS MILLIMETER		
ANGULAR:		MATERIAL	ABS	
0.0 = ±1	0.00 = ±0.5	FINISH	HARD PLASTIC	
COMMENTS				
 DO NOT SCALE DRAWING				

BYU ENGINEERING**2X4 LEGO BRICK**

SIZE	PART NUMBER	REVISION
B	3001	A
SCALE 2:1	WEIGHT 2.611 G	SHEET 1 of 1