

RoboCupRescue Robot League Arenas

MAJOR COMPONENT DESCRIPTIONS

Version 2008.1

ALL UNITS ARE IN MILLIMETERS

NOTE:

Regional open arena quantities are shown at the top of each page.
Double the quantities shown for Championship events needing concurrent arenas.

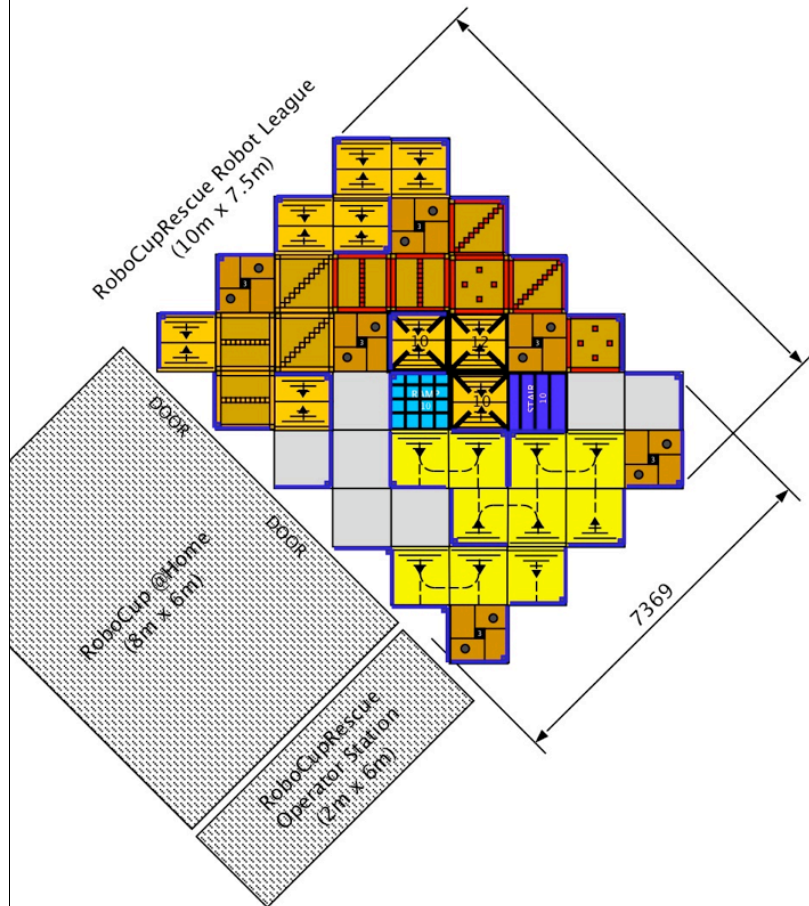
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RoboCupRescue Arena Design Overview



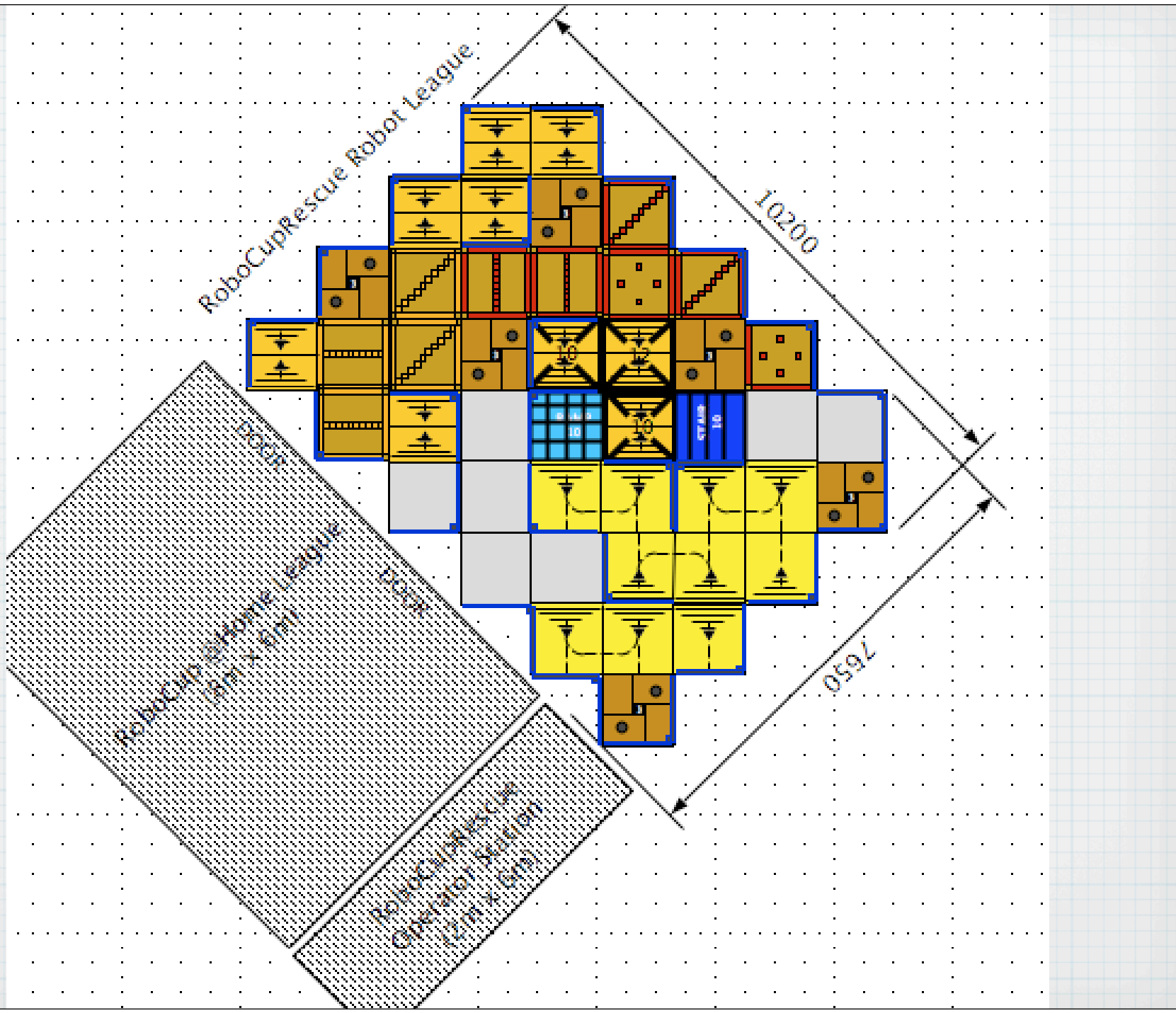
RoboCupRescue Robot League

10200

RoboCupRescue Robot League
12700 x 12700

RoboCupRescue Cup
Generator System
12700 x 12700

7650

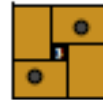


WALLS:



WALL CORNERS (FULL)
(1200 x 1200 x 11 PANELS)

OTHER:



BOX STACKS WITH HOLES (3 LEVELS = 12 BOXES)

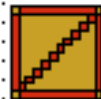


ELEVATED FLOORING
(10 = TOTAL POST HEIGHT IN CUBIC UNITS = 1000 MM)



ELEVATED FLOORING
(12 = TOTAL POST HEIGHT IN CUBIC UNITS = 1200 MM)

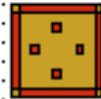
FLOORING:



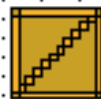
STEPFIELD DIAGONAL (FULL CUBIC - RED)



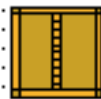
STEPFIELD HILL (FULL CUBIC - RED)



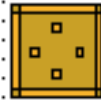
STEPFIELD FLAT (FULL CUBIC - RED)



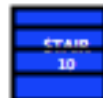
STEPFIELD DIAGONAL (HALF CUBIC - ORANGE)



STEPFIELD HILL (HALF CUBIC - ORANGE)



STEPFIELDS FLAT (HALF CUBIC - ORANGE)



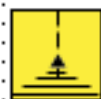
STAIRS (10 = TOTAL HEIGHT)



RAMP (10 = TOTAL HEIGHT)



DOORS WITH DIFFERENT KNOBS



ROLL RAMP (10 DEGREES)



PITCH RAMP (10 DEGREES)

Maze Walls

QUANTITY: (30) Corner Assemblies

MATERIALS (per assembly):

Oriented Strand Board (OSB)

(2) 1200 x 1200 x 11

Wood Block Joints

(2) 100 x 100 x 100

Fasteners

(4) M6 x 50 Phillips head screws



FABRICATION:

Locate blocks 50mm from top/bottom edges to allow room for pitch/roll ramps (pictures shown are too close to edges)

Screw OSB to blocks

Angle brackets are preferable if available but may require nuts/bolts due to limited thickness of plywood



Boxes For Box Stacks

QUANTITY: (60) Boxes

MATERIALS:

(60) Cardboard boxes: 600 x 450 x 450
with no text or logos if possible

(5) rolls of clear packing tape

(1) tape dispensers

FABRICATION:

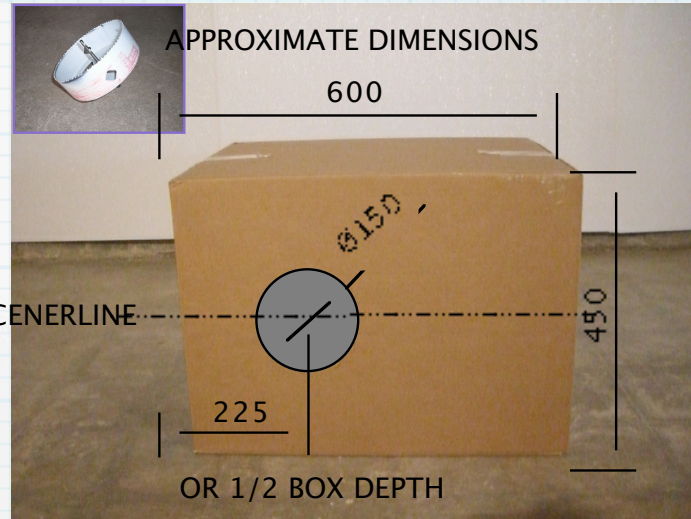
Tape all boxes closed on bottom side only
For 30 boxes: tuck in top flaps to leave
open as shown

For 30 boxes: leave top flaps loose
(untaped) and use 150mm diameter hole
saw to make hole as shown on large,
non-flap side of box

Assemble into layers with holes or
openings horizontal/vertical as shown

Eye charts and hazmat labels will be
placed inside along with simulated
victims

HOLE SAW 150MM DIAMETER



Roll and Pitch Ramps (all 10°)

QUANTITY: (1 0) Roll Ramps and (1 0) Pitch Ramps

MATERIALS (per assembly):

ROLL RAMP

Oriented Strand Board (OSB)

(1) 1200 x 1200 x 19 OSB

Wood posts

(2) 100 x 100 x 20

(1) 100 x 100 x 10

PITCH RAMP

Oriented Strand Board (OSB)

(2) 600 x 1200 x 19 OSB

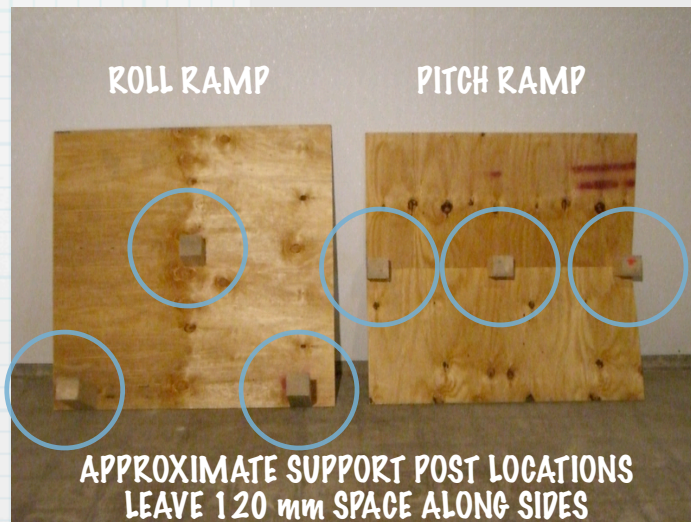
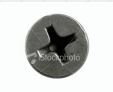
Wood posts

(3) 100 x 100 x 10 (with apex cut)

FABRICATION:

Cut posts to length with 10° angles

Screw posts in locations shown --
LEAVE 120 mm SPACE ALONG SIDES TO
allow room for maze wall joint blocks



Half-Cubic (Orange) Stepfield Pallets

QUANTITY: (2) Diagonals, (2) Hills

MATERIALS (per assembly):

Oriented Strand Board (OSB)

Base: (1) 1200 x 1200 x 11

Wood Posts

Border: (4) 50 x 100 x 980

Terrain: See Layouts Next Page

FABRICATION:

Center and fasten two borders to base on two 90° apart edges

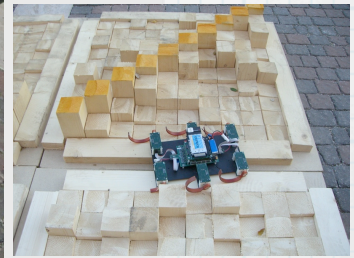
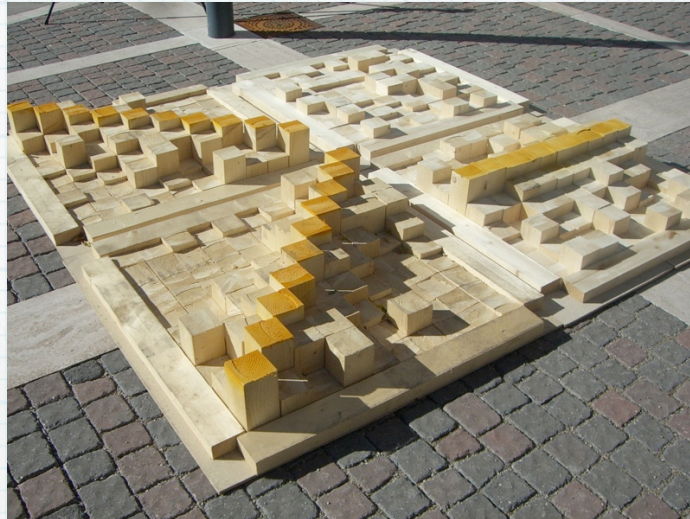
Insert all posts according to designs on following page (diagonal, hill, or flat)

Center remaining two borders on each remaining edge

Squeeze the posts against the already fastened borders

Fasten borders to tightly contain posts

Corners of base should remain empty to allow room for elevated floor posts



Half-Cubic (Orange) Stepfield Pallets

QUANTITY: (2) Diagonals, (2) Hills

DIAGONAL LAYOUTS

(6) 25 mm

(36) 50 mm

(28) 100 mm

(20) 150 mm

(10) 200 mm

0	0	0	0	1	1.5	0	1	1.5	2
00	0	1.5	1.5	1	1.5	0	1.5	2	1.5
0	1.5	1	0	1.5	0	1.5	2	1.5	1
1.5	0	0	1	1	1	2	1	1	0
0	1	1	0	1	2	1	1	0	1.5
1.5	0	0	1.5	2	1.5	1	0	1	0
1	0	1.5	2	1	0	1	0	0	0
0	1	2	1.5	1	1	0	00	00	0
1	2	1	0	1	1	1	00	0	00
2	1.5	0	0	1.5	0	0	0	0	00

FLAT LAYOUTS

(24) 25 mm

(48) 50 mm

(24) 100 mm

(4) 150 mm

00	00	0	00	00	00	1	1	1	1
0	1	1.5	0	0	1	0	1	1.5	1
1	0	0	00	0	00	00	0	0	00
0	0	00	00	0	1	0	0	1	0
00	00	1	1	0	0	0	00	1	0
00	0	0	0	0	00	00	0	00	0
0	1	0	00	0	1	00	0	0	00
1	1	1.5	0	0	0	1	1	1.5	0
0	0	0	1	00	0	00	1	1	0
0	0	1	0	0	0	0	0	00	0

HILL LAYOUTS

(8) 25 mm

(35) 50 mm

(29) 100 mm

(18) 150 mm

(10) 200 mm

1	1	0	0	1.5	2	1.5	0	1.5	1
1	0	1.5	0	1	2	1	1	0	0
0	0	1	1	1	2	1.5	1.5	1.5	0
0	0	0	1	1.5	2	1	0	0	0
00	0	0	0	1.5	2	1.5	0	00	0
0	00	1	00	1	2	1.5	0	1	0
00	0	1	0	1.5	2	1.5	0	1	0
0	00	1	00	1	2	1.5	1	1	0
1	1	1	0	1.5	2	1	1	1	0
00	0	1.5	0	1.5	2	1.5	1	1	0

Cubic (Red) Stepfield Pallets

QUANTITY: (2) Diagonals, (2) Hills, (2) Flats,

MATERIALS (per assembly):

Oriented Strand Board (OSB)

Base: (1) 1200 x 1200 x 11

Wood Posts

Border: (4) 100 x 100 x 980

Terrain: See Layouts Next Page

FABRICATION:

Center and fasten two borders to base on two 90° apart edges

Insert all posts according to designs on following page (diagonal, hill, or flat)

Center remaining two borders on each remaining edge

Squeeze the posts against the already fastened borders

Fasten borders to tightly contain posts

Corners of base should remain empty to allow room for elevated floor posts



2	0	0	0	0	2	0	1	0	1	1
0	0	1	0	0	0	2	2	2	2	1
1	2	3	1	1	2	1	2	3	2	1
2	1	1	0	1	0	0	1	1	0	0
1	1	0	0	1	2	1	1	2	1	1
0	0	2	2	1	1	1	0	2	1	1
0	1	1	1	1	0	0	1	0	1	1
1	2	1	0	1	2	0	1	1	0	2
2	2	3	1	1	1	2	2	3	1	1
1	1	1	2	0	1	0	2	2	1	2
1	1	2	1	1	1	1	1	0	1	1

1	1	1	2	2	4	2	2	2	1	0
2	2	1	1	3	4	3	1	3	2	1
2	1	3	1	2	4	2	2	1	1	0
1	1	2	2	2	4	3	3	3	1	2
1	1	1	2	3	4	2	1	1	1	0
0	1	1	1	3	4	3	1	0	1	2
1	0	2	0	2	4	3	1	2	1	0
0	1	2	1	3	4	3	1	2	1	0
1	0	2	0	2	4	3	2	2	1	1
2	2	2	1	3	4	2	2	2	1	1
0	1	3	1	3	4	3	2	2	1	2

1	0	1	1	3	1	1	3	1	2	4
1	1	1	1	2	3	1	2	3	4	3
0	1	3	3	2	3	1	3	4	3	1
1	3	2	1	3	1	3	4	3	2	0
3	1	1	2	2	2	4	2	2	1	1
1	2	2	1	2	4	2	2	1	3	2
3	1	1	3	4	3	2	1	2	1	0
2	1	3	4	2	1	2	1	1	1	1
1	2	4	3	2	2	1	0	0	1	1
2	4	2	1	2	2	2	0	1	0	2
4	3	1	1	3	1	1	1	1	0	1

Cubic (Red) Stepfield Pallets

QUANTITY: (2) Diagonals, (2) Hills, (2) Flats,

DIAGONAL LAYOUTS

(9) 50 mm

0	1	0	1	1	1	2	2	2	4
1	2	1	0	2	2	1	3	4	2
2	3	3	2	1	3	2	4	3	2
1	1	2	0	2	3	4	2	1	0
3	2	2	1	3	4	3	1	2	1
1	3	3	2	4	2	1	1	2	1
1	2	3	4	2	2	3	1	1	3
3	3	4	3	2	3	1	0	2	1
2	4	3	2	0	2	1	2	0	1
4	2	2	3	2	3	2	1	1	0

(27) 100 mm

(33) 200 mm

(21) 300 mm

(10) 400 mm

FLAT LAYOUTS (TWO DIFFERENT)

(17) 50 mm

1	1	1	2	1	1	1	2	1	1
1	1	3	1	1	0	2	1	3	1
1	2	2	1	0	2	1	1	1	2
2	1	2	1	2	0	1	0	1	1
1	1	1	1	0	1	0	1	0	2
2	1	2	0	1	1	1	0	1	0
0	1	1	2	0	1	0	2	1	1
2	2	3	1	2	0	2	2	3	1
1	1	1	2	0	1	2	1	1	1
1	2	2	1	1	1	2	0	2	0

(53) 100 mm

(26) 200 mm

(4) 300 mm

HILL LAYOUTS

(8) 50 mm

2	0	1	2	3	4	3	2	3	1
0	1	3	2	3	4	2	3	1	1
1	1	1	1	3	4	2	2	1	1
2	1	3	1	3	4	2	1	3	1
1	1	1	1	3	4	3	2	1	0
2	1	1	1	2	4	3	1	2	1
2	1	3	2	2	4	3	2	1	0
2	1	1	2	2	4	2	3	1	1
1	0	2	3	3	4	2	1	2	0
0	1	0	1	3	4	2	1	3	1

(39) 100 mm

(23) 200 mm

(20) 300 mm

(10) 400 mm

(19) 50 mm

1	1	1	1	0	1	2	1	2	1
2	2	2	0	1	3	2	1	2	1
0	1	1	1	0	2	1	1	1	1
2	0	1	0	1	0	1	1	1	2
0	2	3	1	0	2	1	1	3	1
1	2	1	2	2	0	1	1	1	0
1	1	1	1	0	2	1	1	2	2
1	0	1	0	1	3	1	0	1	1
2	1	0	2	2	2	1	1	1	1
1	1	1	0	1	0	2	2	1	0

(53) 100 mm

(24) 200 mm

(4) 300 mm

Elevated Floors

QUANTITY: (2) 1000 mm Tall Frames, (1) 1200 mm Tall Frames, (3) Stalactite Covers

MATERIALS (per assembly):

Oriented Strand Board (OSB)

(1) 1200 x 1200 x 19

(8) 300 x 300 x 11 Triangles

Wood Posts

Upper Frame

(4) 100 x 100 x 1000

Legs

(4) 100 x 100 x 1000

or

(4) 100 x 100 x 1200

Stalactites

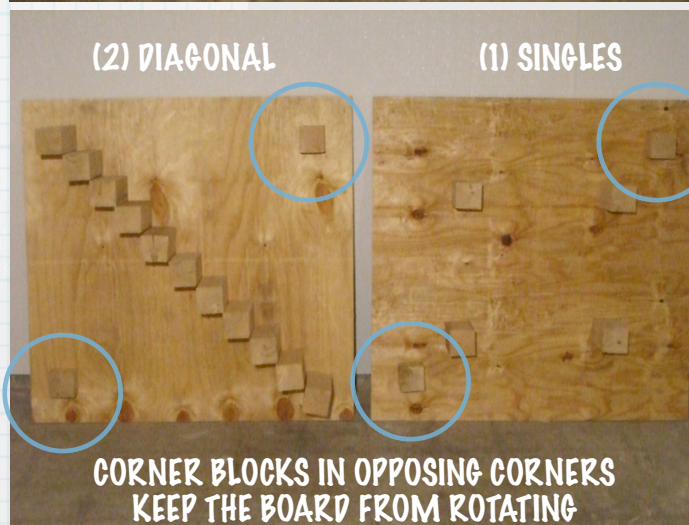
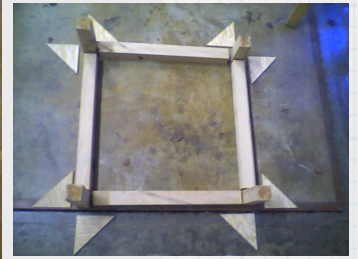
(10) 100 x 100 x 300

Fasteners

Phillips head screws M6 x 50



NOTE: Two corner blocks in opposing corners keep the board from rotating



PVC Pipes (for elevated floors)

QUANTITY: (4) 100mm outer diameter x 1200 mm long pipes

MATERIALS (per assembly):

(4) PVC pipes of near 100mm outer diameter x 1200 mm long.

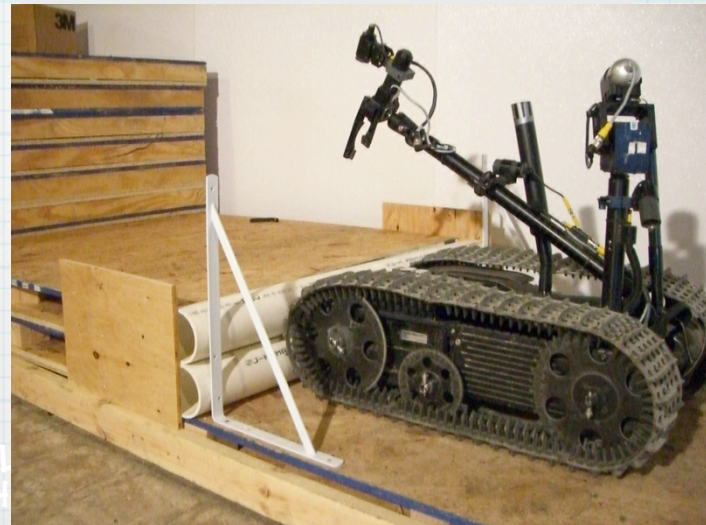
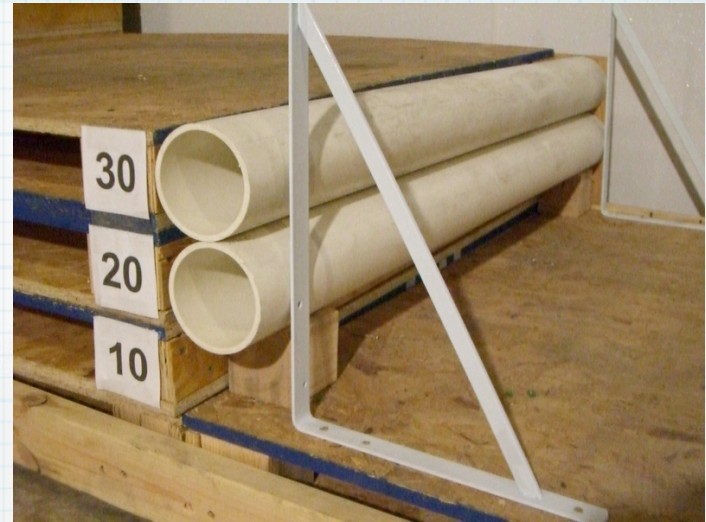
FABRICATION:

Elevated floor sections already have two 200mm step changes in elevation

Pipes should stack to cover face of step with top pipe flush to upper floor level (a filler might be required under pipes to make top flush within 2mm or so)

Angle brackets keep pipes against face

Side boards help to contain pipes laterally (shown in bottom picture)



CORNER BU
KEEP TH

Stairs

QUANTITY: (1) Stair Assembly

MATERIALS (per assembly):

Oriented Strand Board (OSB)

(2) 1200 x 1200 x 19

Stair Treads (5)

900 - 1200 wide

250 - 300 deep

metal or wood

Fastener bolts or heavy screws
(must carry human weight)

FABRICATION:

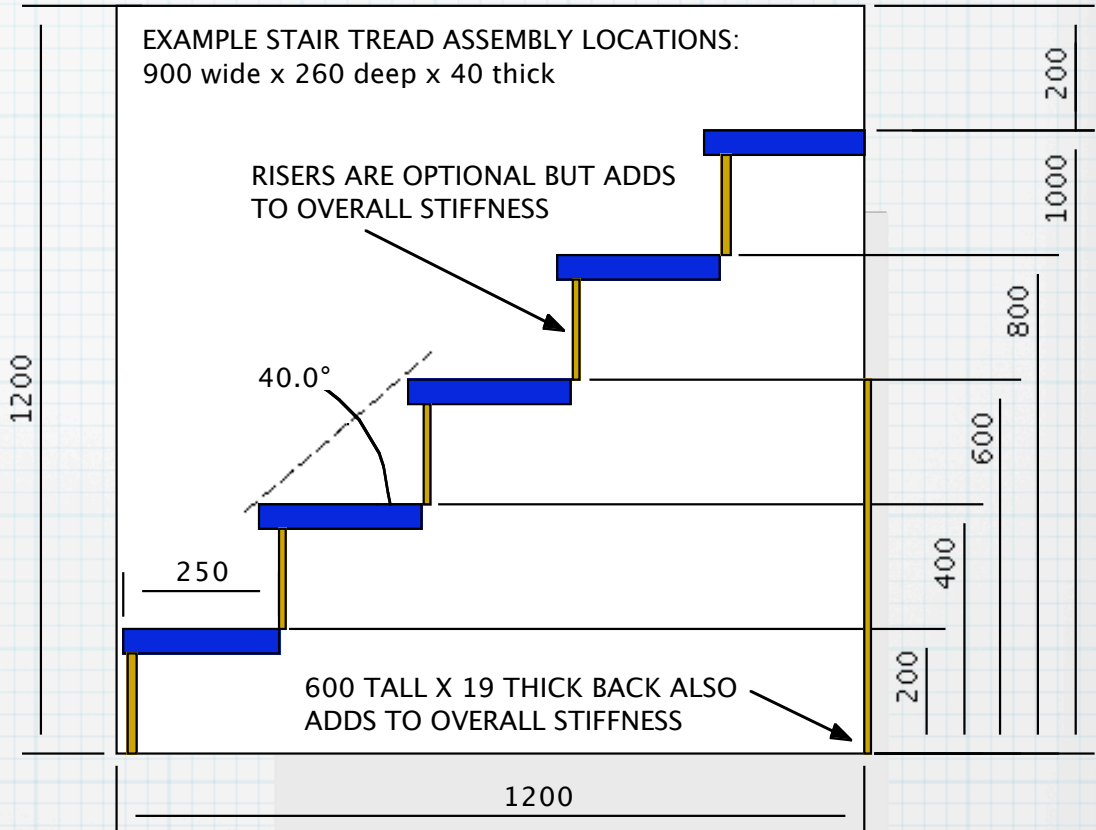
Fasten 1st step at 200 elevation

Each Step Height = 200

Fasten 5th step at 1000 elevation

Overlap if necessary depending on
tread depth

Add 19 mm thick back panel for
stiffness (risers are optional)



Ramp

QUANTITY: (1) Ramp Assembly

MATERIALS (per assembly):

Oriented Strand Board (OSB)

(3) 1200 x 1200 x 19

(2) 500 x 1200 x 19

3 sq. meters adhesive carpet squares

(2) large gate hinges

(4) M8 x 50mm bolts/nuts to bolt to OSB panels

(4) M8 x 50mm lag bolts to screw into elevated floor supports

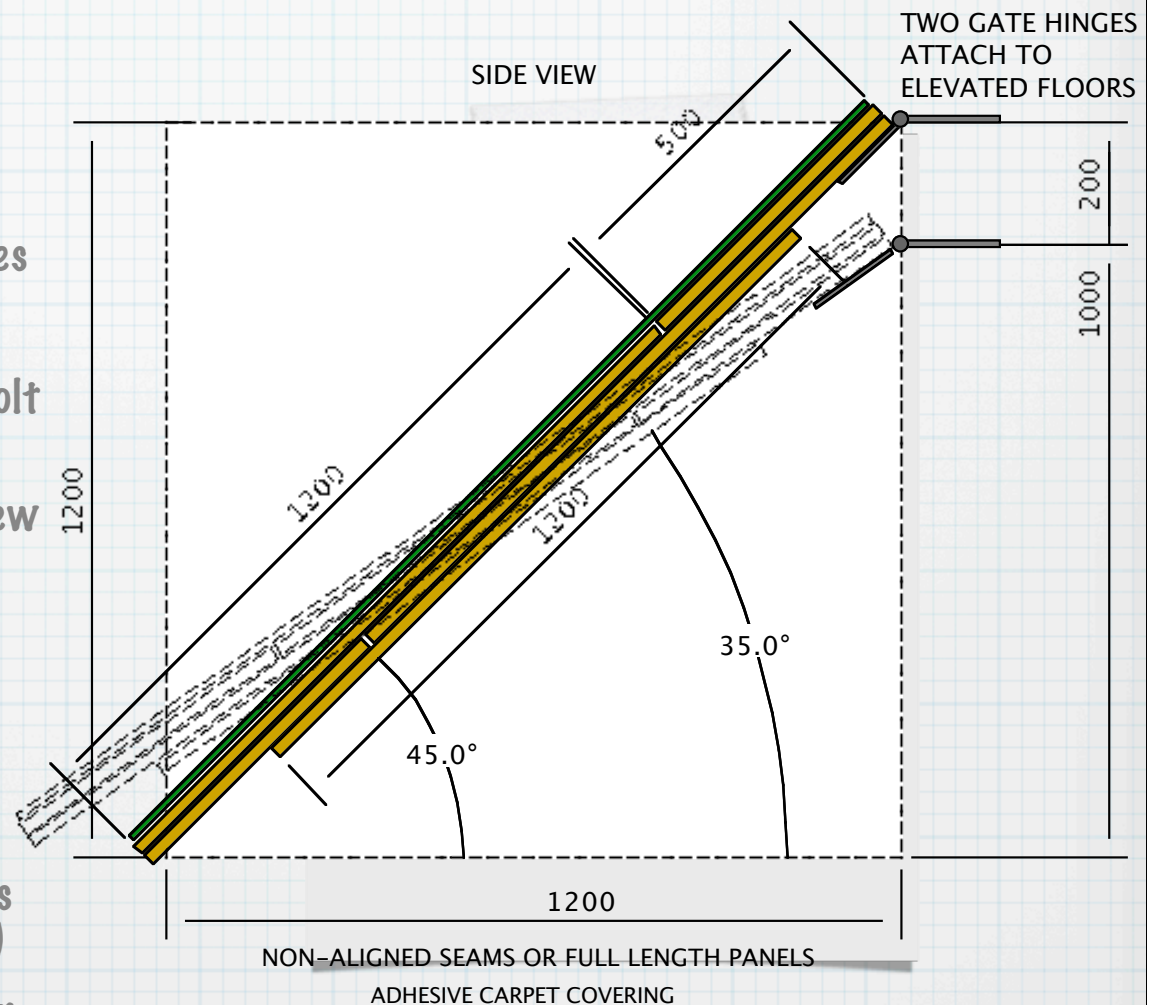
(8) M8 x 80mm bolts/nuts to assemble OSB panels

(16) Phillips head screws M6 x 50

FABRICATION:

Bolt/screw together OSB sections as shown (no sides, non-aligned seams)

Use hinges to attach OSB to 1000 or 1200 tall elevated floors



Simulated Victims

QUANTITY: (12) Simulated Victim Boxes

ITEMS INSIDE EACH VICTIM BOX:

[9] babies (moving/crying preferable)

[3] arms (moving preferable)

[13] heating pads (45cm x 60cm)
local power! (one spare)

[12] tape recorders -- one less for
every crying baby

[50] CO2 cartridges (small seltzer
type)

[1] CO2 cartridge puncture device



HEATING PAD
SAME SIZE AS BOX PREFERABLE
(LOCAL POWER)

EYE CHART AND
HAZMAT LABEL



BABY DOLL
CRYING & CRAWLING
(BATTERY OPERATED)

TAPE RECORDER
AND
LOOPING TAPE
(BATTERY OPERATED)

CO2 SMALL CARTRIDGES
WITH PUNCTURE DEVICE
OR
LARGER TANKS

AND/OR

MOVING ARM
(BATTERY OPERATED)

Sensory Obstacles

QUANTITY: shown below

Sensory obstacles for typical sensors:

Ultrasonic range sensors:

[4] absorptive ceiling tiles
(1200 x 1200)

[10] reflective corner angles
(50mm square posts x 1200mm)

Laser range sensors:

[8] absorptive dark felt/plastic
(1200 x 1200)

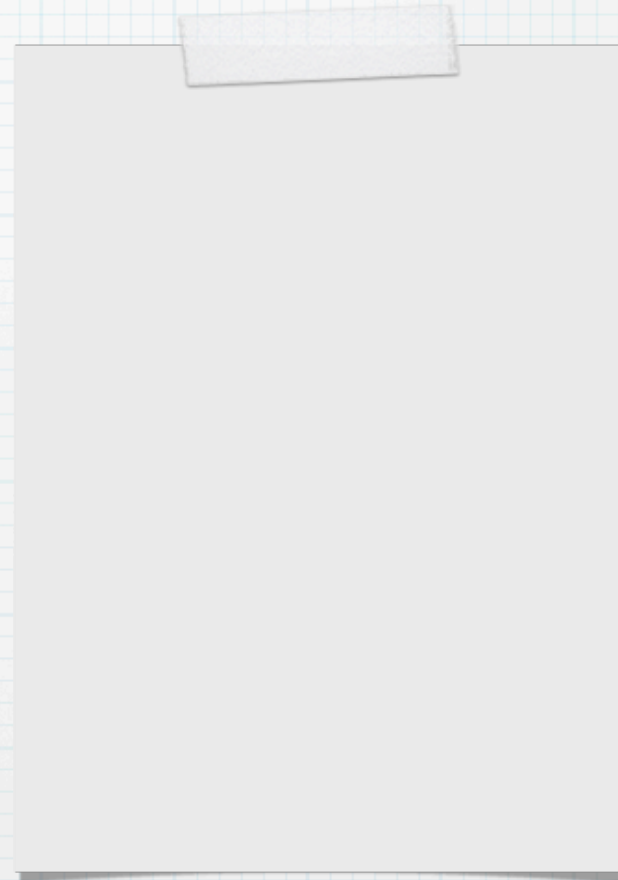
[2] reflective mirror/mylar surfaces
(1200 x 1200)

[2] transparent plexiglass
(1200 x 1200)

Victim identification sensors:

[1] oscillating fan (motion)

[1] halogen lights (heat, shadows)



Administrative items

QUANTITY: shown below

OPERATOR STATION ITEMS :

[3] projectors

[3] screens

[3] VGA cables (15 meter)

[1] color USB printer with driver CD,
paper, spare ink cartridges

[1] digital clock or timer

[5] operator station walls/dividers

[4] tables

[4] chairs

[4] multi-socket power strips

ARENA ITEMS :

[6] power cords (10 meter)

[6] three-socket power adapters

