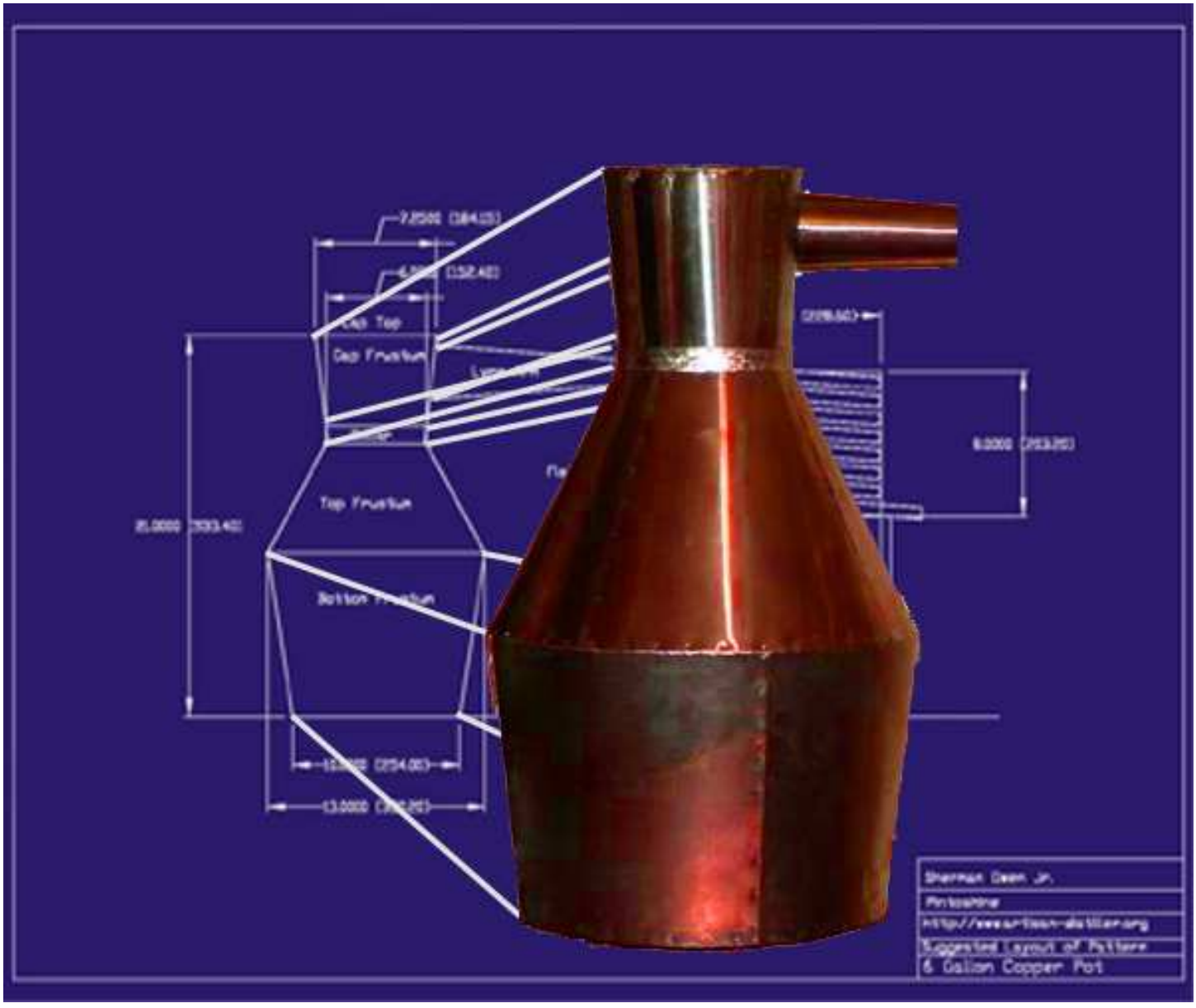
Pint O Shine's 6 Gallon Pot Still Design and Template



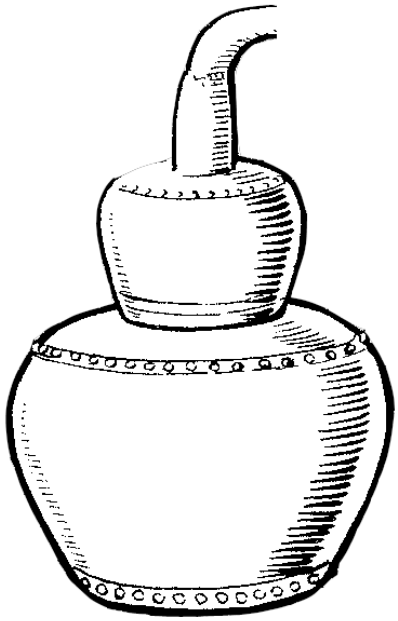
Warning!

I assume no responsibility to the use or accuracy of this document. It is intended for educational purposes only. I maintain all copyright ownership for all my original work. This document may be used freely and circulated freely but may not be sold for profit, or included in any other book or website for profit. This specifically applies to web sites that are for profit only and contain mostly advertising.

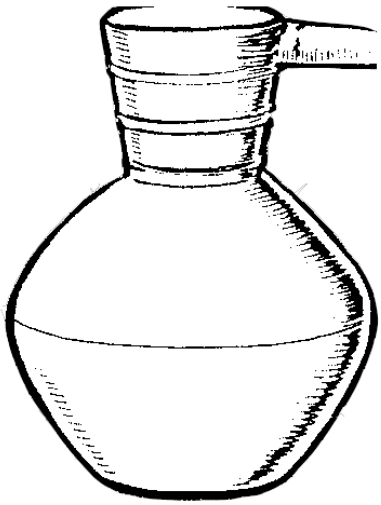
Sherman Owen ©2007

MOONSHINESTILLPLANS.COM

Traditional Moonshine Stills

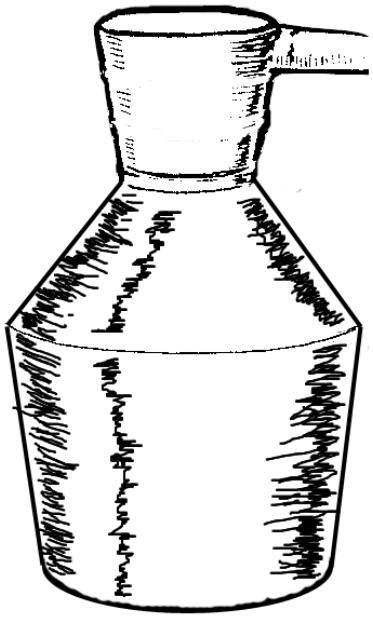


Turnip



Half Turnip

Upright Pot Still



Kentucky Still

Design Considerations

When I decided to design the 6 gallon, copper pot still, I had few criteria in mind. First I wanted to fit the whole thing on a single half sheet of copper. A half sheet is usually 3' x 4'. This size sheet is readily available by internet order. I have limited tools and limited skills at metal working so I decided to imitate a construction style found in the book: "More Mountain Spirits" by Joseph Earl Dabney.

I selected the Kentucky Still as my design. I research standard sheet metal layout patterns for cones thinking I could use one of those to create my templates. I was wrong in thinking the existing layout guidelines were accurate enough to make even cone sections. I later learned that the shape I was in need of to construct the still was actually called a frustum. A frustum is a right cone in which the top has been cut off parallel to the base of the cone.

I derived a series of calculations to allow me to lay out the flattened frustum in a drawing program to allow me to generate templates.

Another design criteria was that I wanted a small stove top model to be able to run experimental 2 to 5 gallon batches.

Software used to create this document

MOONSHINESTILLPLANS.COM

I used Cadopia's free version of IntelliCAD 2000 for Windows. I acquired this program whenever they were still giving it away for free. It is a very nice AutoCAD v14 compatible program with All versions of windows I have used over the years. It has all the standard AutoCAD functionality except for 3d rendering.

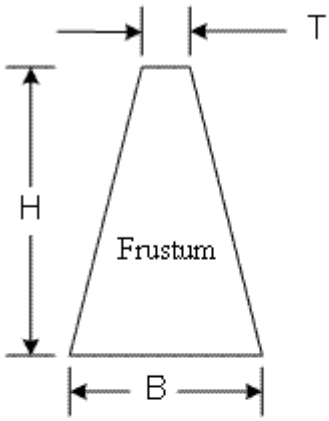
Of course Open Office Word Processor was used for the assembling the textual parts of the document.

I use Photoshop v6.0, Paint, and ACD Systems ACDSee v3.1 to create and modify graphics other than AutoCAD drawings.

The PDF file was generate using PDFCreator which is a free Open source PDF printer driver and spooler with great functionality for assembling documents from lots of different sources. I had difficulty running this in Vista but I figured out a work around.

Thank You for your interest and I hope it is useful for the educational purposes in which it was intended.

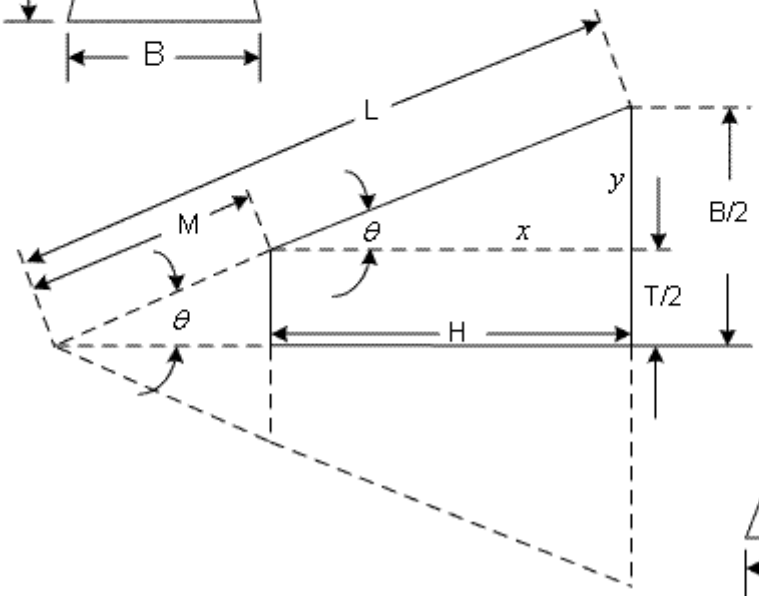
Still Frustum Design

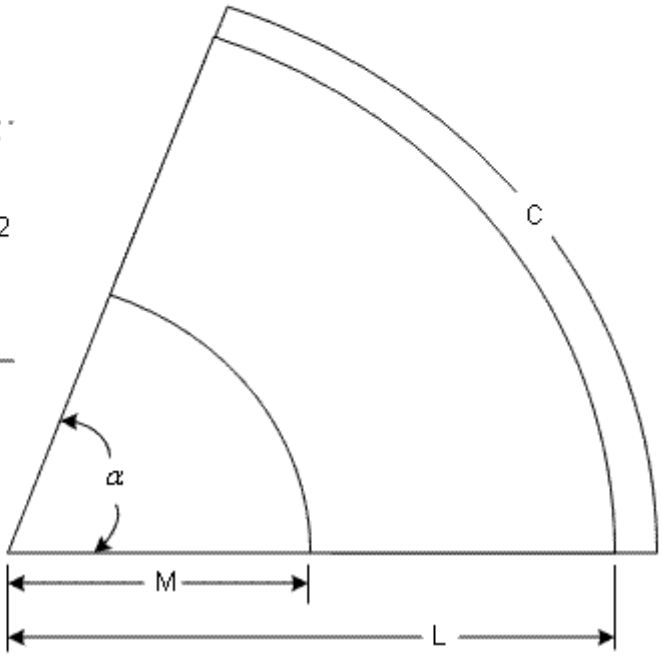


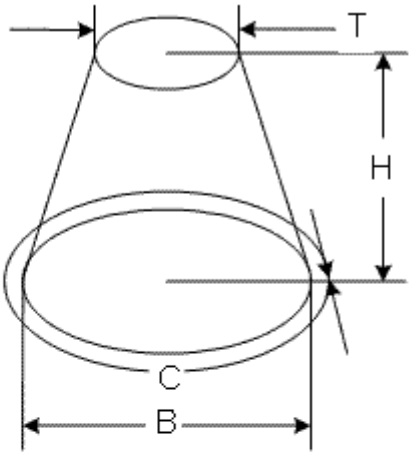
The volume of the frustum is calculated using the following calculation.

$R = B/2 \quad r = T/2$

$$V = \frac{H\pi}{3}(R^2 + Rr + r^2)$$







$$\tan(\theta) = \frac{y}{x} = \frac{B/2 - T/2}{H}$$

$$\theta = \tan^{-1}\left(\frac{B/2 - T/2}{H}\right) \qquad L = \frac{B/2}{\sin(\theta)} \qquad M = \frac{T/2}{\sin(\theta)}$$

$\varpi(radians)$

$arc = r\varpi$

$C = B\pi$

$arc = C$

$r\varpi = B\pi$

$$\varpi = \frac{B\pi}{r}$$

$$\deg rees = \frac{180 radians}{\pi}$$

$$\alpha = \frac{180 B\pi}{r\pi} \qquad \alpha = \frac{180 B}{L}$$

$r = L$

Calculation Results

I was aiming at a 6 Gallon pot for this project and I calculated on that was 5.99 gallons to the bottom of the collar. These are the calculation results.

	Bottom	Top	Cap	Lyne Arm
B(in)	13.000	13.000	7.250	3.000
H(in)	9.000	6.000	6.000	15.000
T(in)	10.000	6.000	5.750	1.000
θ(radians)	0.165	0.528	0.124	0.067
α(degrees)	59.184	181.394	44.653	23.947
L(in)	39.538	12.900	29.226	22.550
M(in)	30.414	5.954	23.179	7.517
			Total	
Volume(gallons)	4.069790483	1.9243955	Volume(g)	5.99

	Bottom	Top	Cap	Lyne Arm
B(mm)	330.200	330.200	184.150	76.200
H(mm)	228.600	152.400	152.400	381.000
T(mm)	254.000	152.400	146.050	25.400
θ(radians)	0.165	0.528	0.124	0.067
α(degrees)	59.184	181.394	44.653	23.947
L(mm)	1004.264	327.663	742.332	572.769
M(mm)	772.511	151.229	588.746	190.923
			Total	
Volume(Liters)	15.40415698	7.283836967	Volume(L)	22.69

MOONSHINESTILLS.COM

These are all the units I used to generate the drawings.

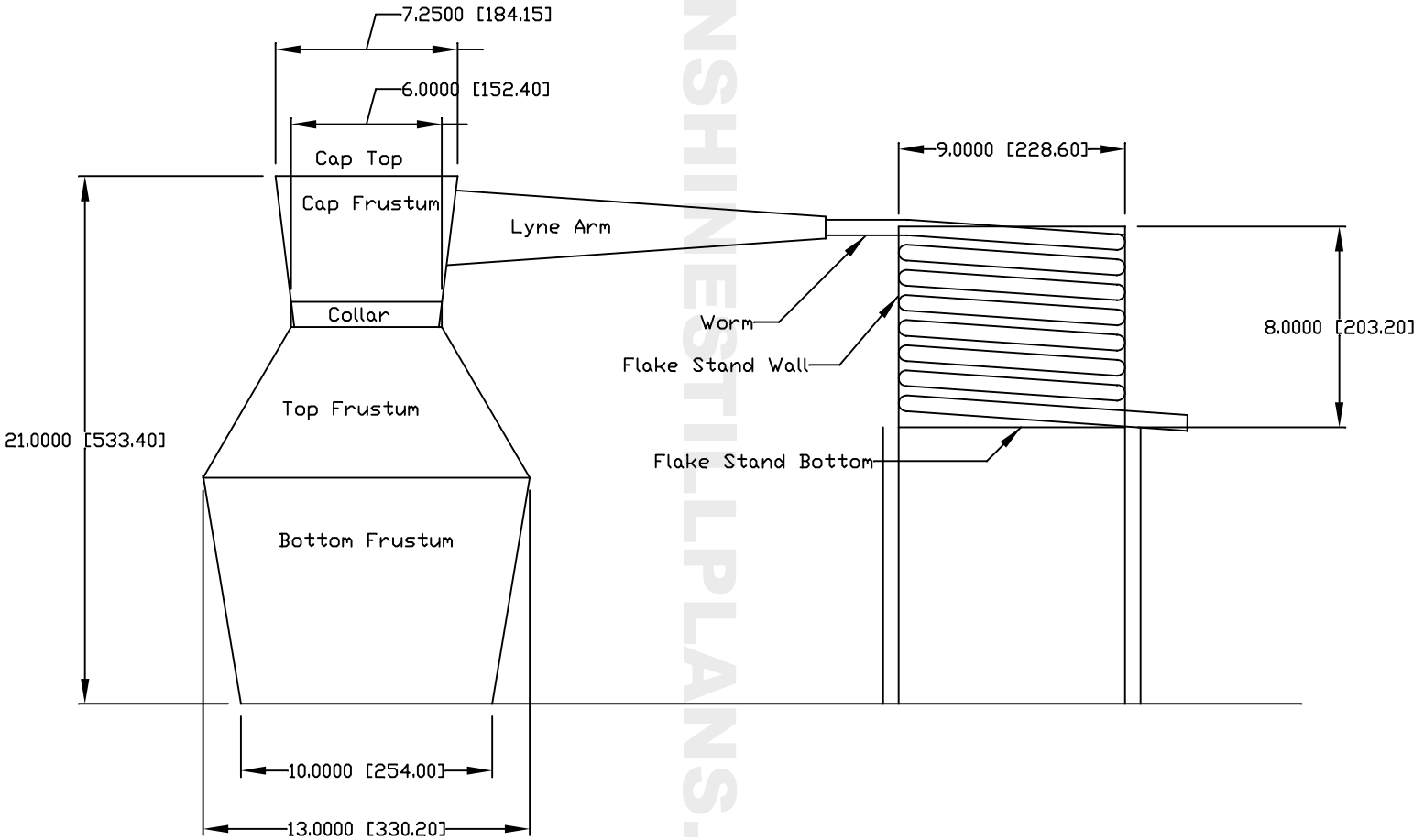
Circle Patterns and Assembly

The circles I cut from these templates have a ½" extension. Whenever I built my stainless steel model, I learned to hammer down the lip around the circle to create a pan. With stainless steel this is a arduous task because of its hardness. I have not done it yet but I intend to turn the lips on the circles the same way. I am hoping that the circles will be nice, flat pans that I can easily rivet to the frustums and solder.
If I am not able to create these nice hammered edges, I will cut tabs from the extension and bend them with pliers. This is the method I used for the stainless pot still.

Pattern Printing

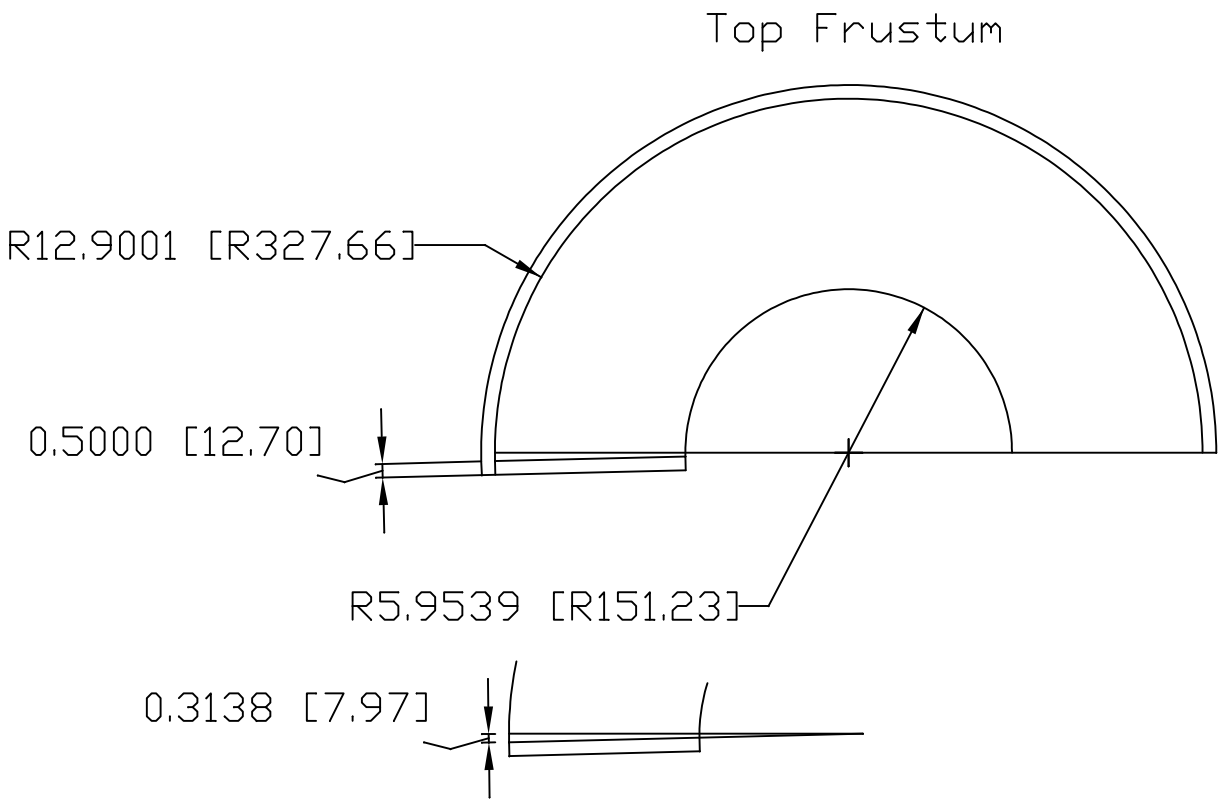
The end of the document contains a 28 page template that can be printed, assembled and used for a pattern to cut around like a dressmaker's pattern. This is the method I use to build the stainless model. When printing the pattern, make sure to set Adobe Acrobat to

print actual size. You may try a page or two to test the scale. The scale of the grid is in inches. One square should be 1”x1”. I have been having good luck with most of the printers I have used under the windows operating system.
When assembling the pattern, I cut off the top margin of the page to the solid line and the left margin to the solid line and taper the pages starting top left and going to bottom right. The easiest way is to assemble one page at a time to the template.
All parts are marked with the page number and the edges are marked with the adjoining pages.

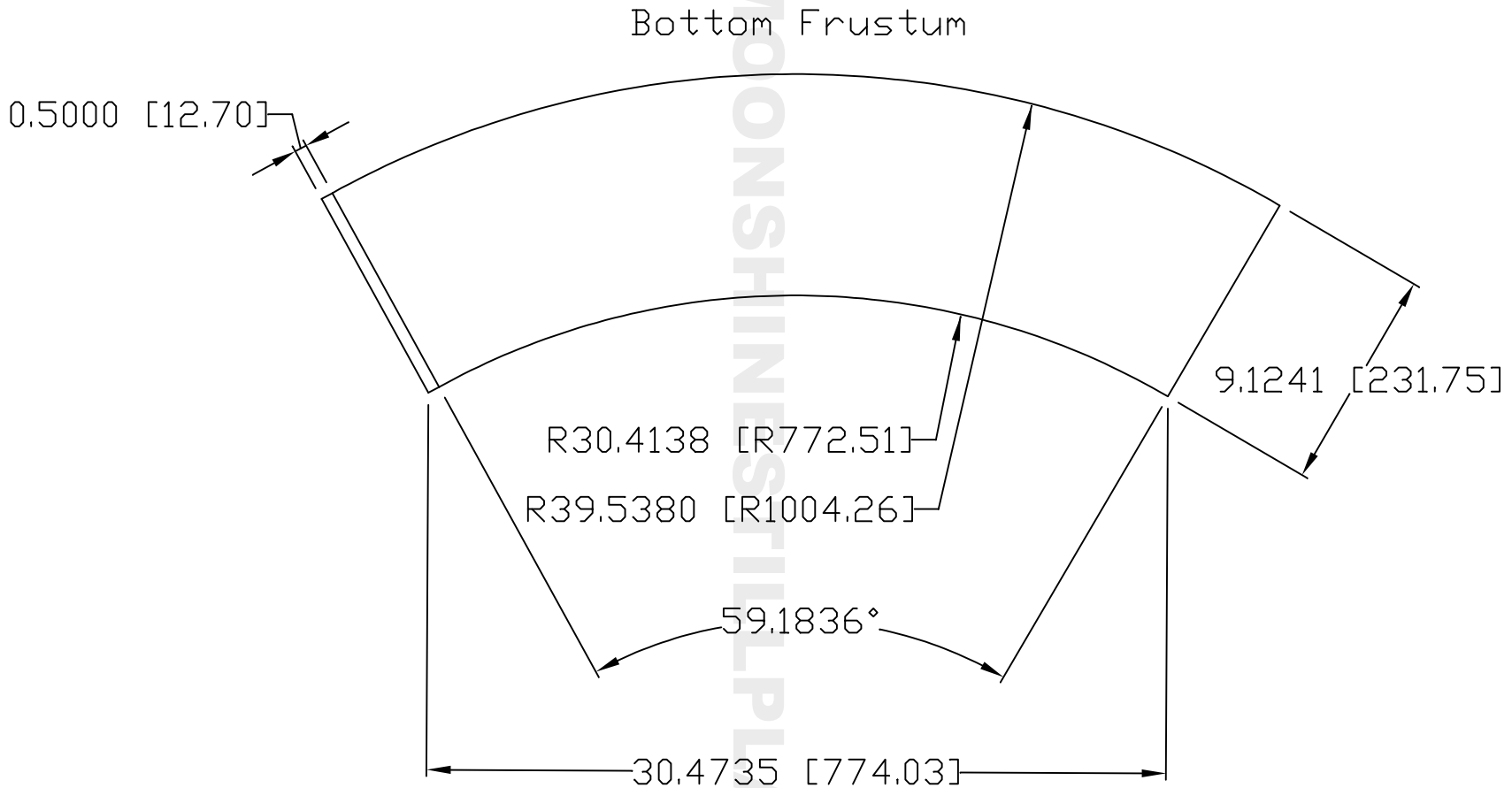


MOONSHINESTILLPLANS.COM

Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Suggested Layout of Pattern
6 Gallon Copper Pot

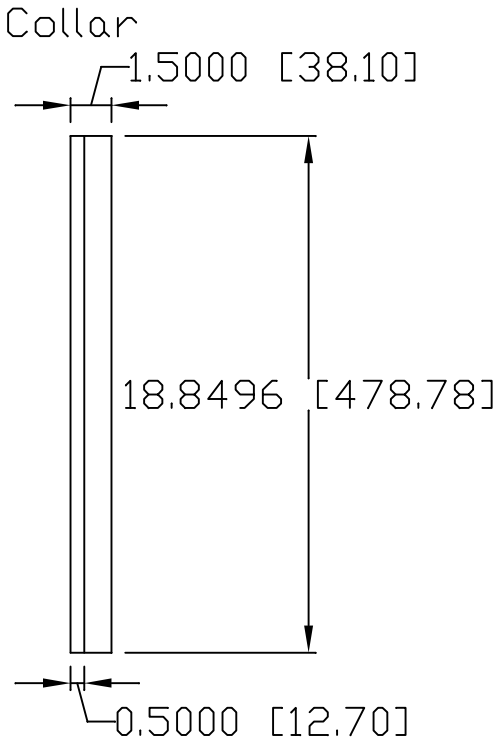


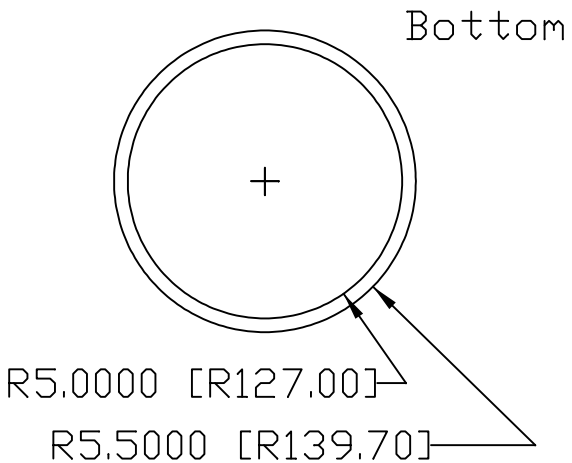
Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Top Frustum
6 Gallon Copper Pot

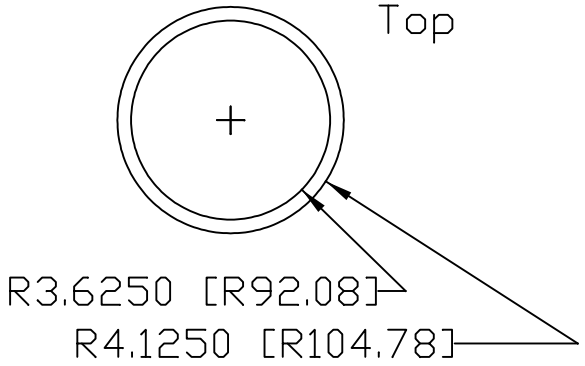


MOONSHINESTILLPLANS.COM

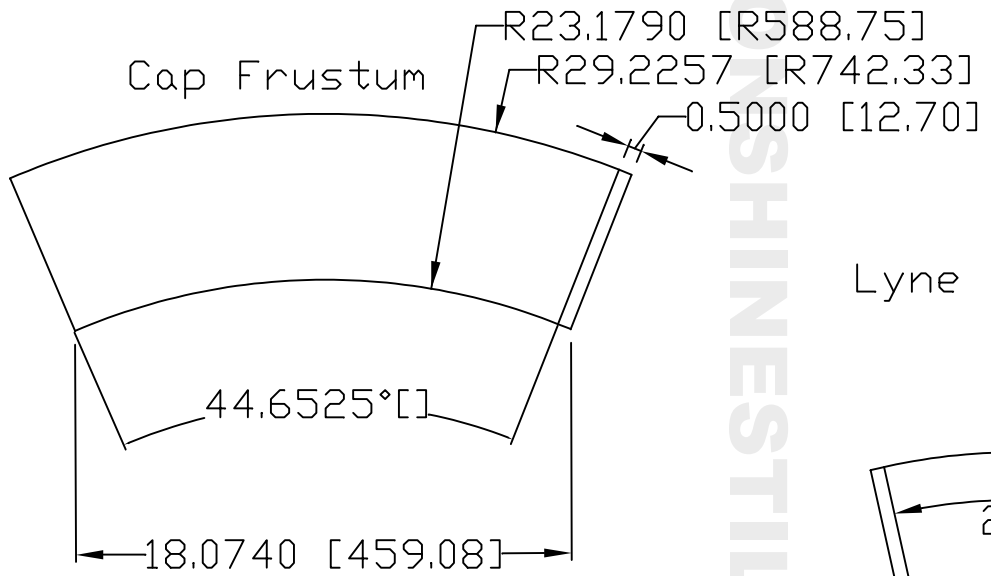
Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Bottom Frustum
6 Gallon Copper Pot

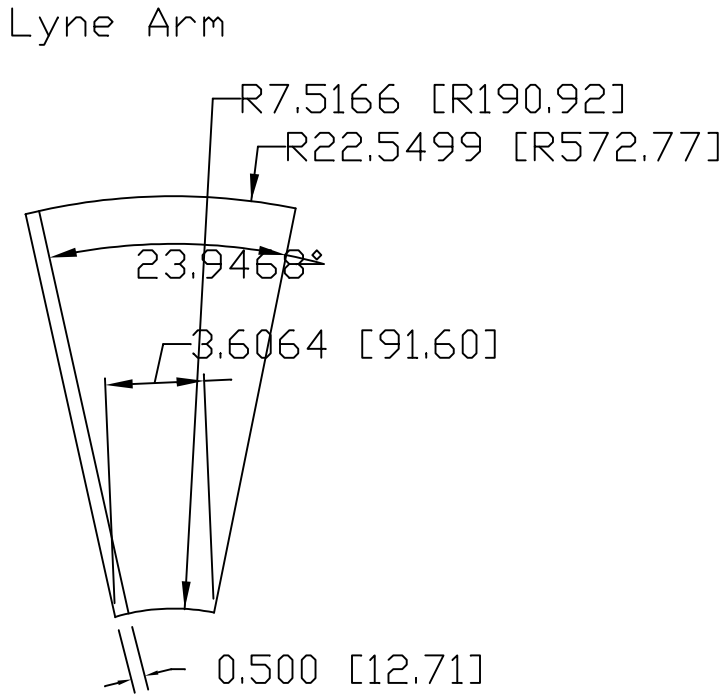






Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Top, Bottom, Collar
6 Gallon Copper Pot

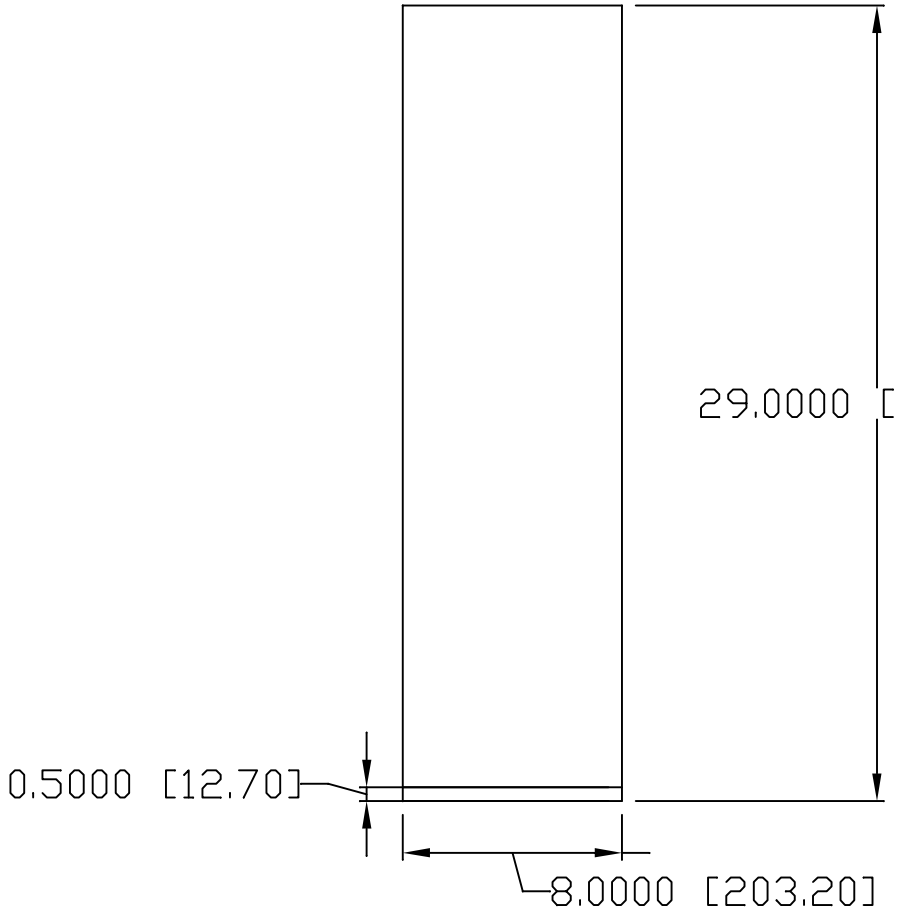




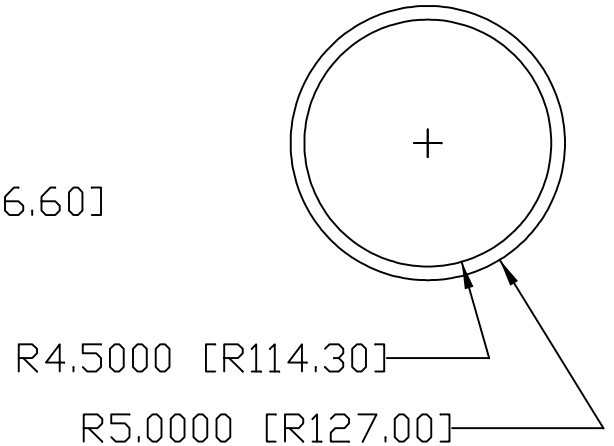
MOONSHINESTILLPLANS.COM

Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Cap Frustum, Lyne Arm
6 Gallon Copper Pot

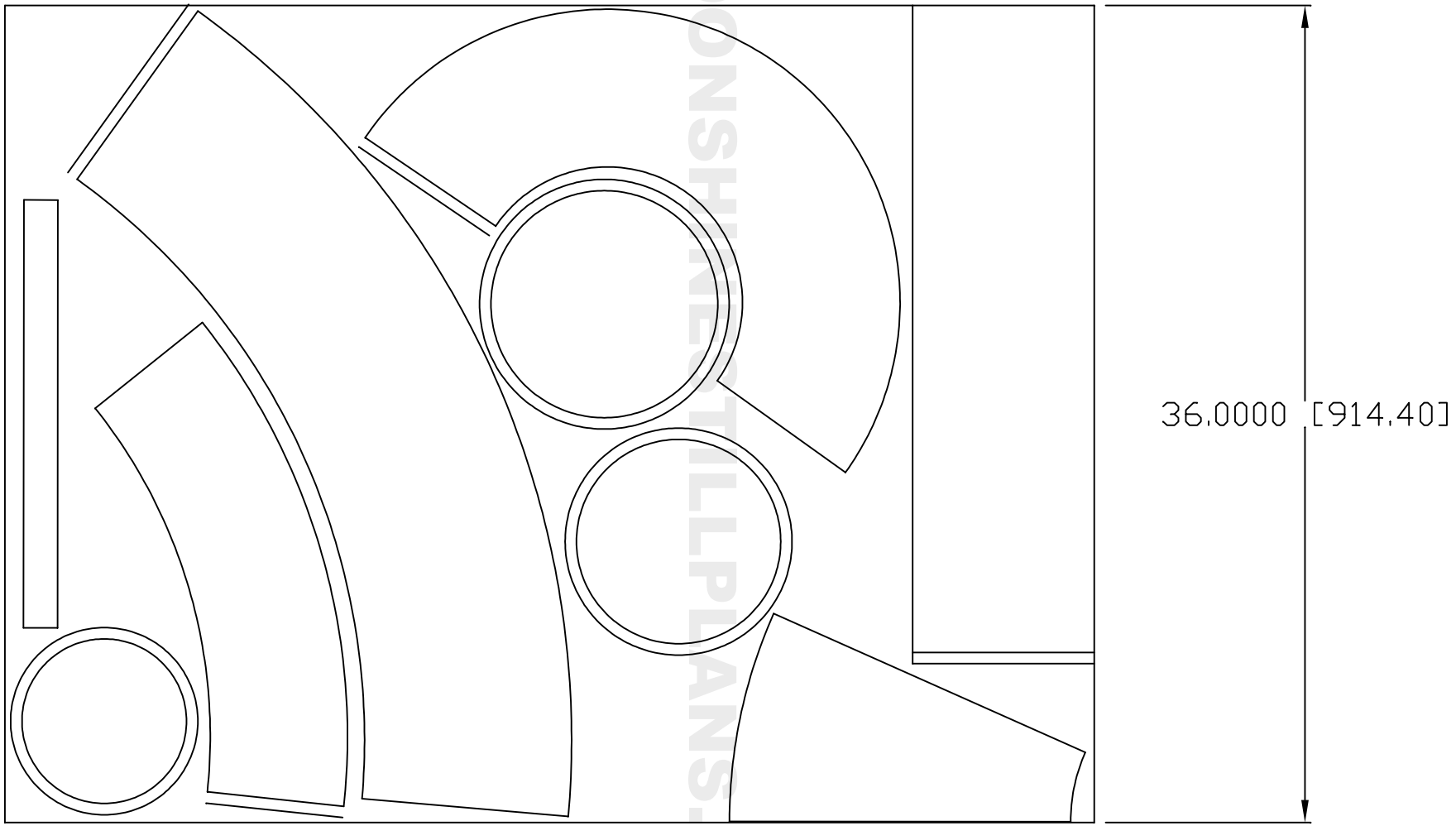
Flake Stand Wall



Flake Stand Bottom



Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Flake Stand Bottom and Wall
6 Gallon Copper Pot

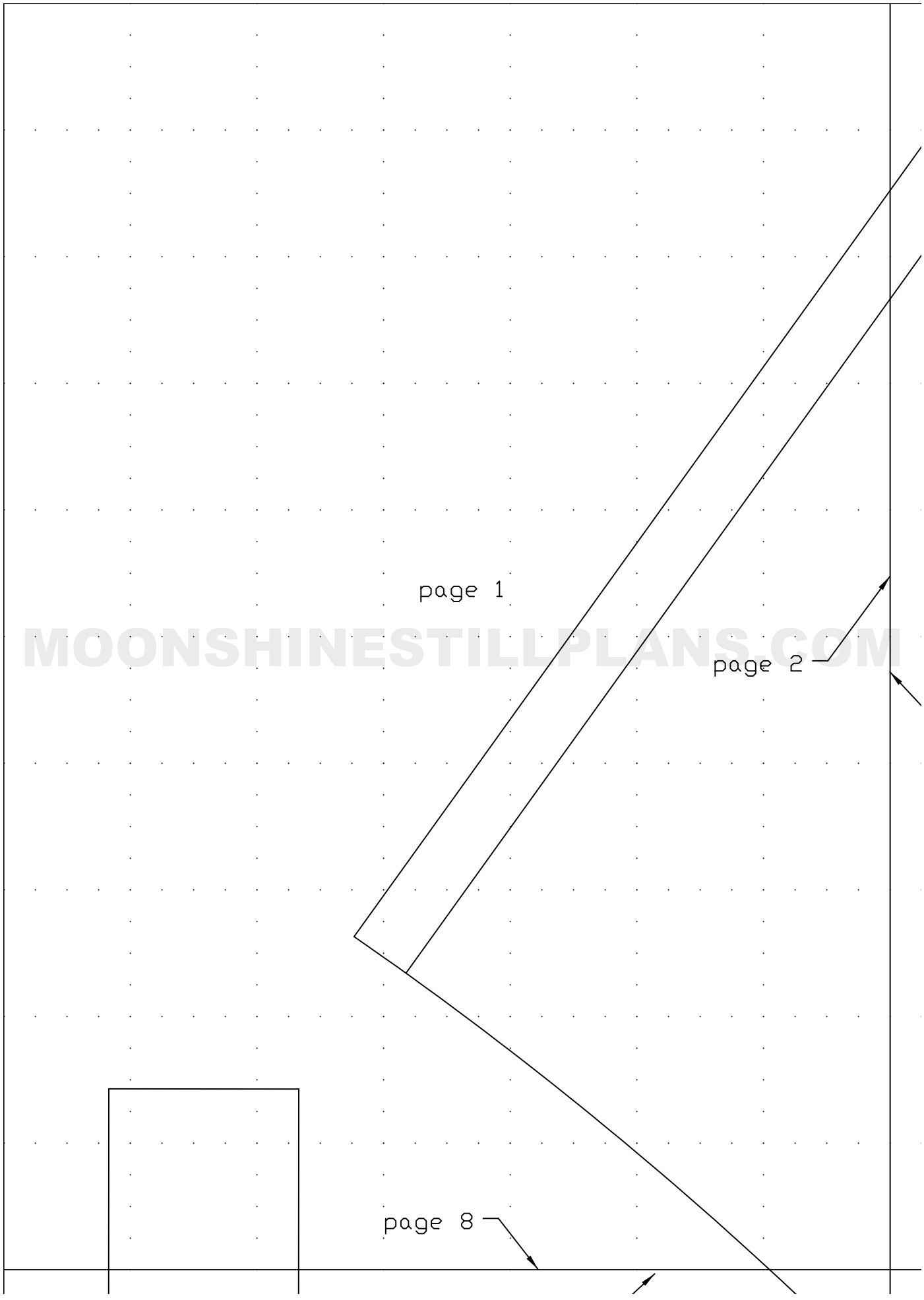


MOONSHINESTILLPLANS.COM

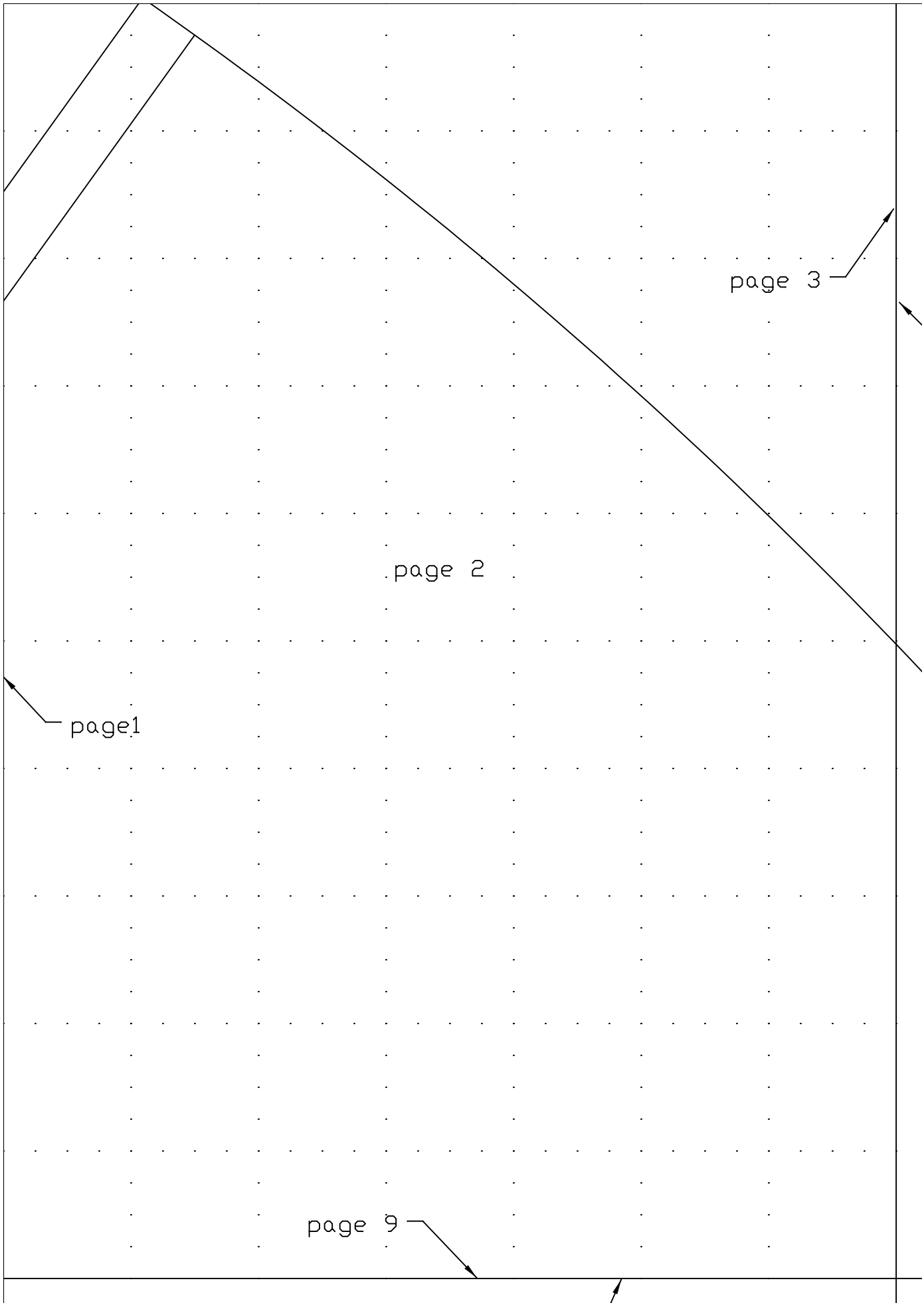
Sherman Owen Jr.
Pintoshine
http://www.artisan-distiller.org
Suggested Layout of Pattern
6 Gallon Copper Pot

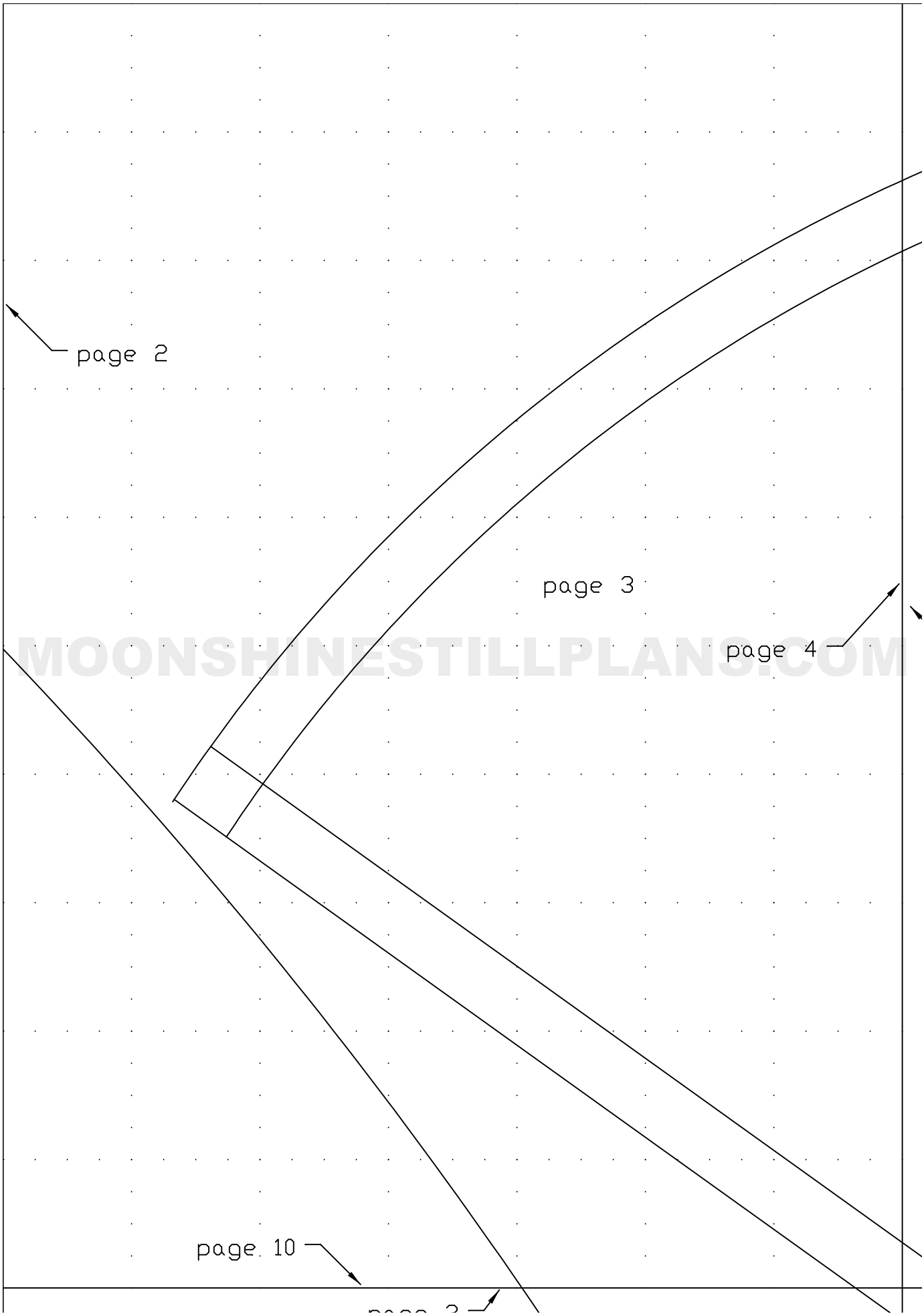
Template Page Layout

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

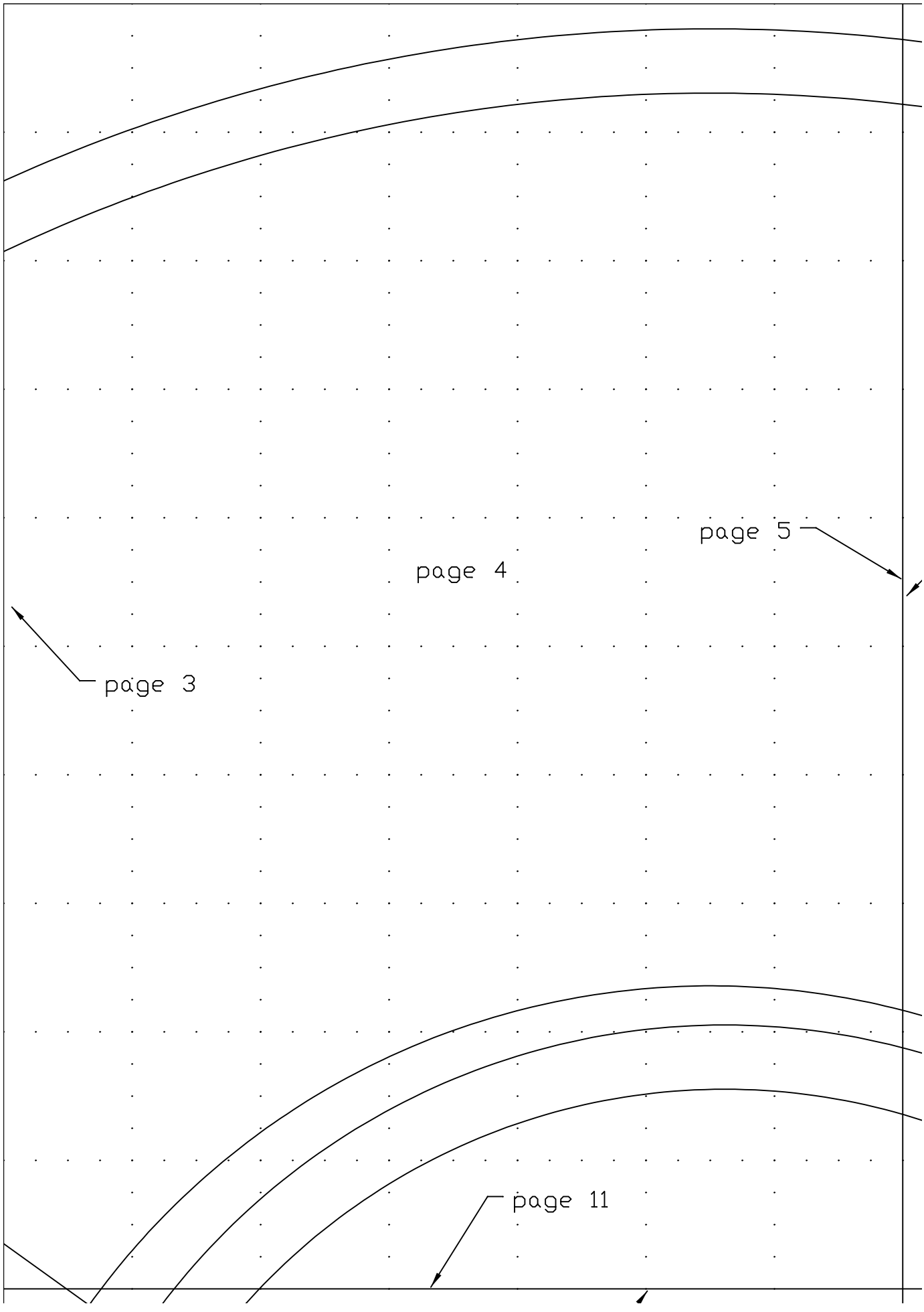


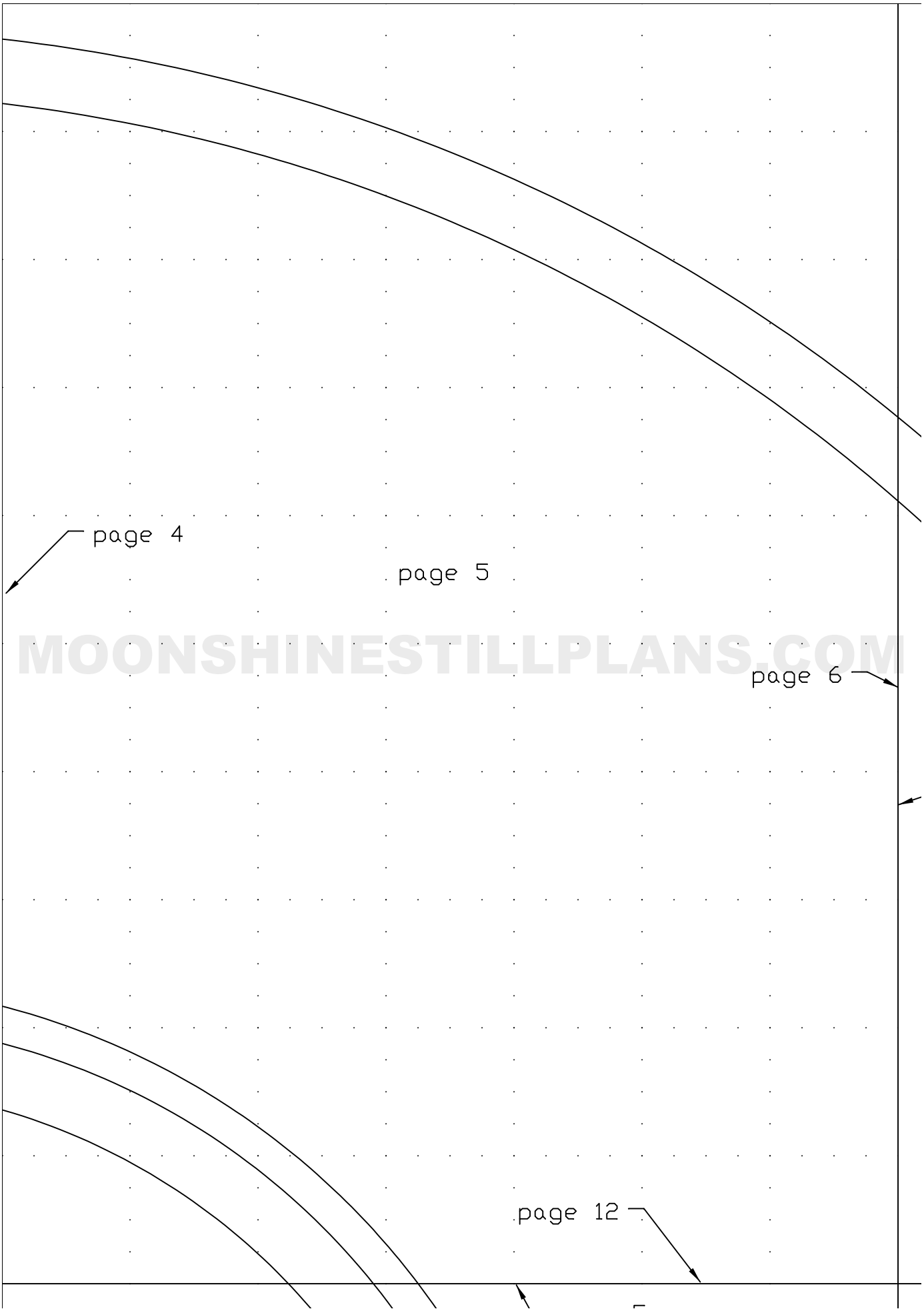
MOONSHINESTILLPLANS.COM


page 3
page 2
page1
page 9

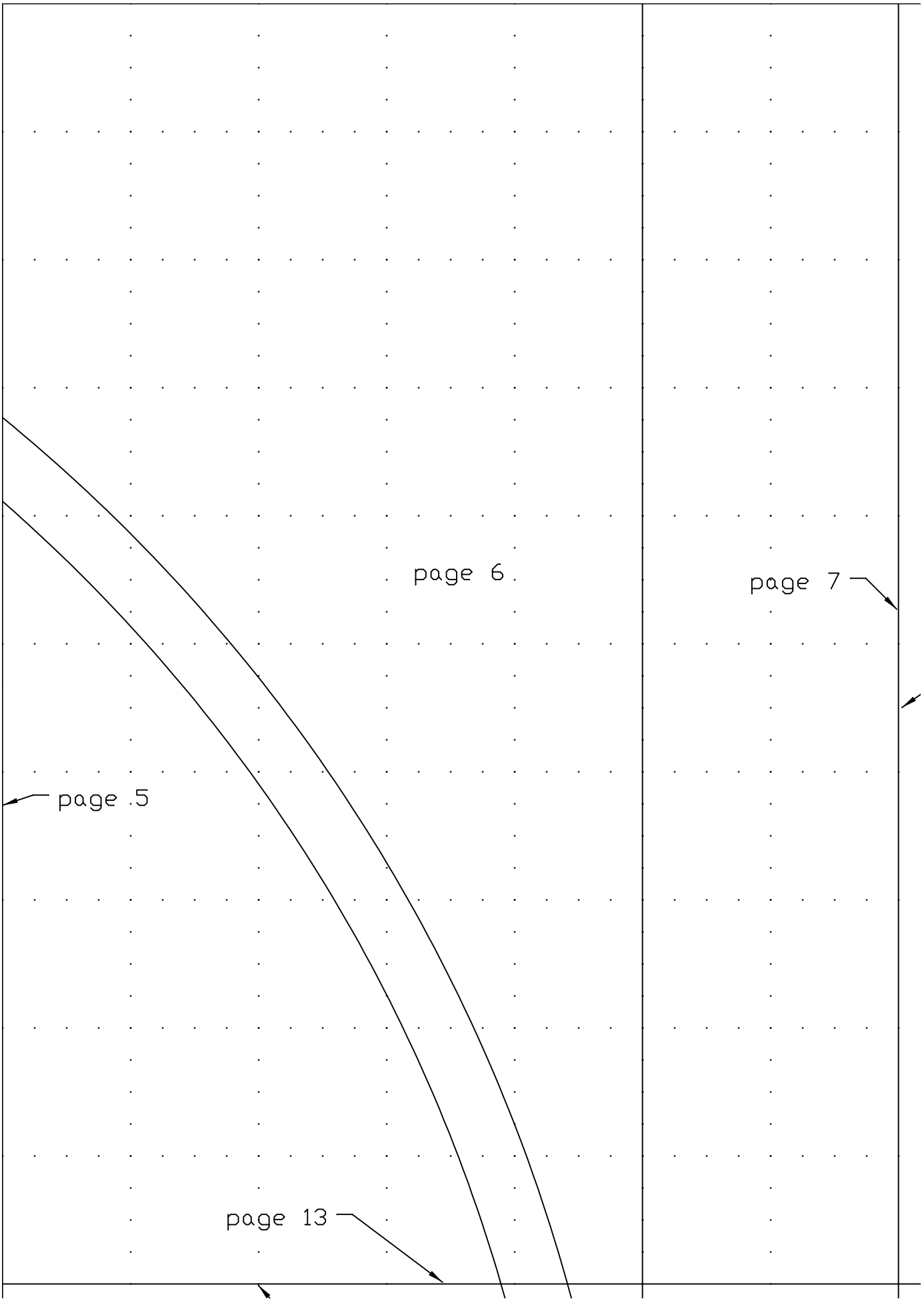


MOONSHINESTILLPLANS.COM


page 5
page 4
page 3
page 11



MOONSHINESTILLPLANS.COM

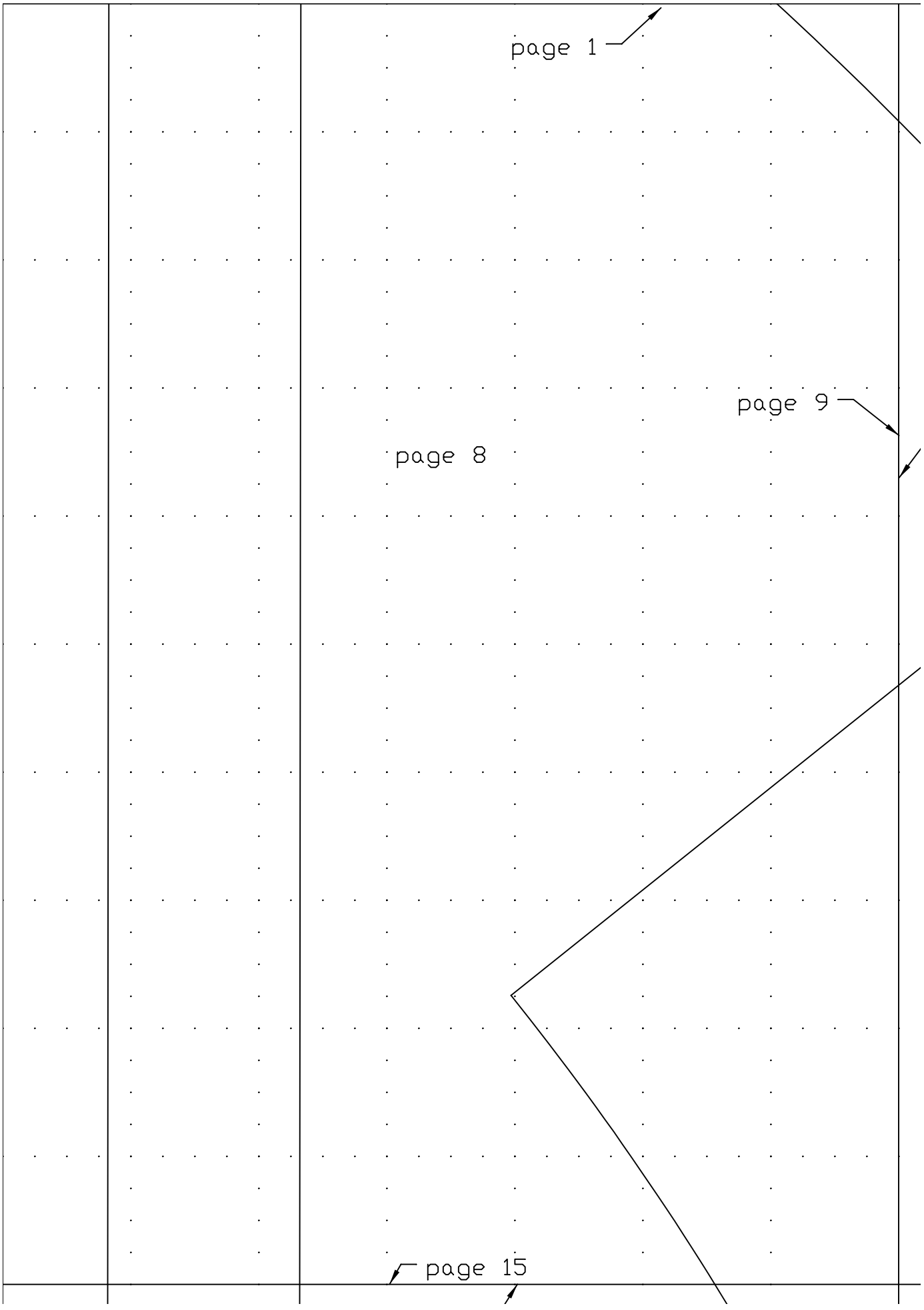

page 6
page 7
page 5
page 13

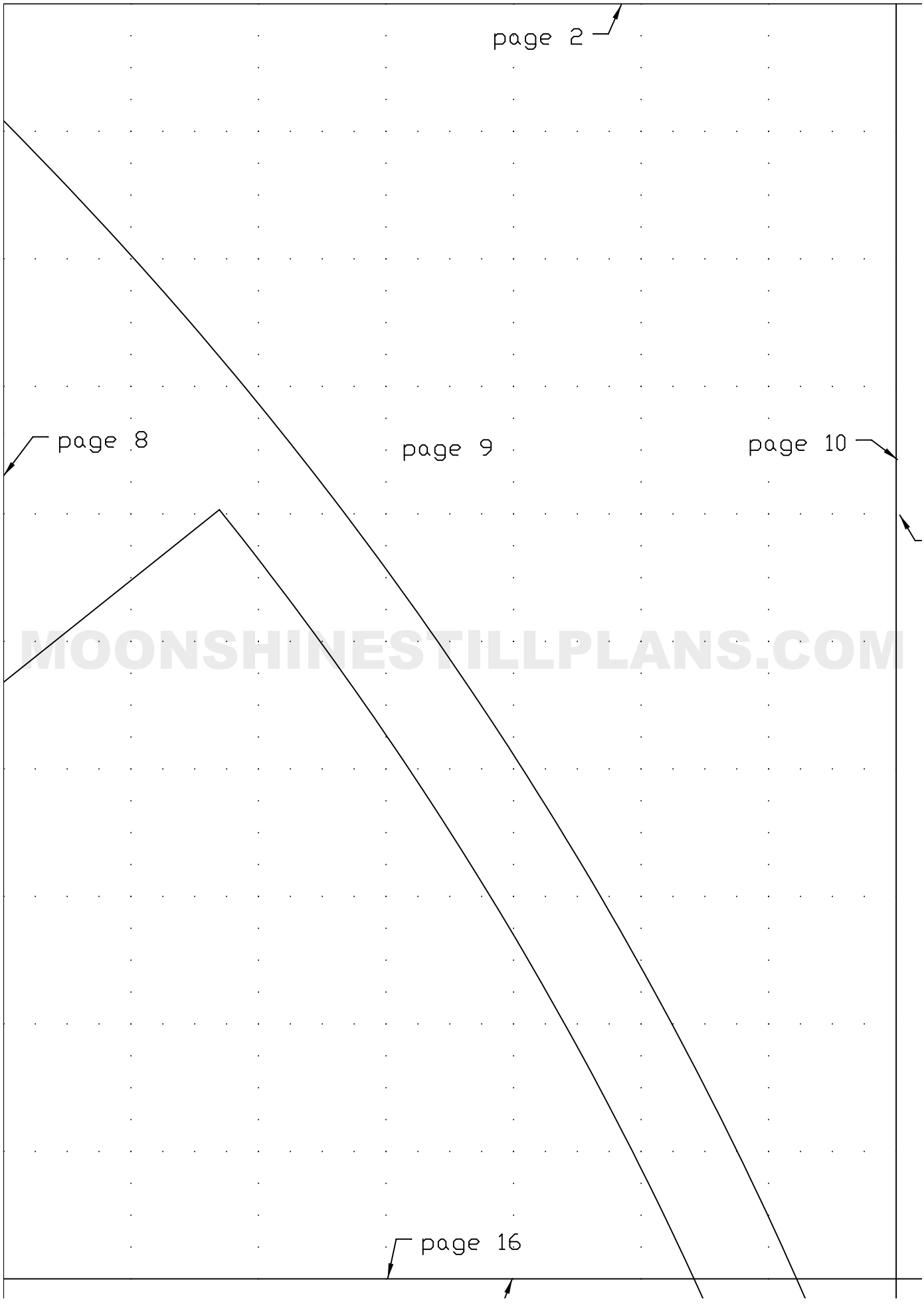
page 7

MOONSHINESTILLPLANS.COM

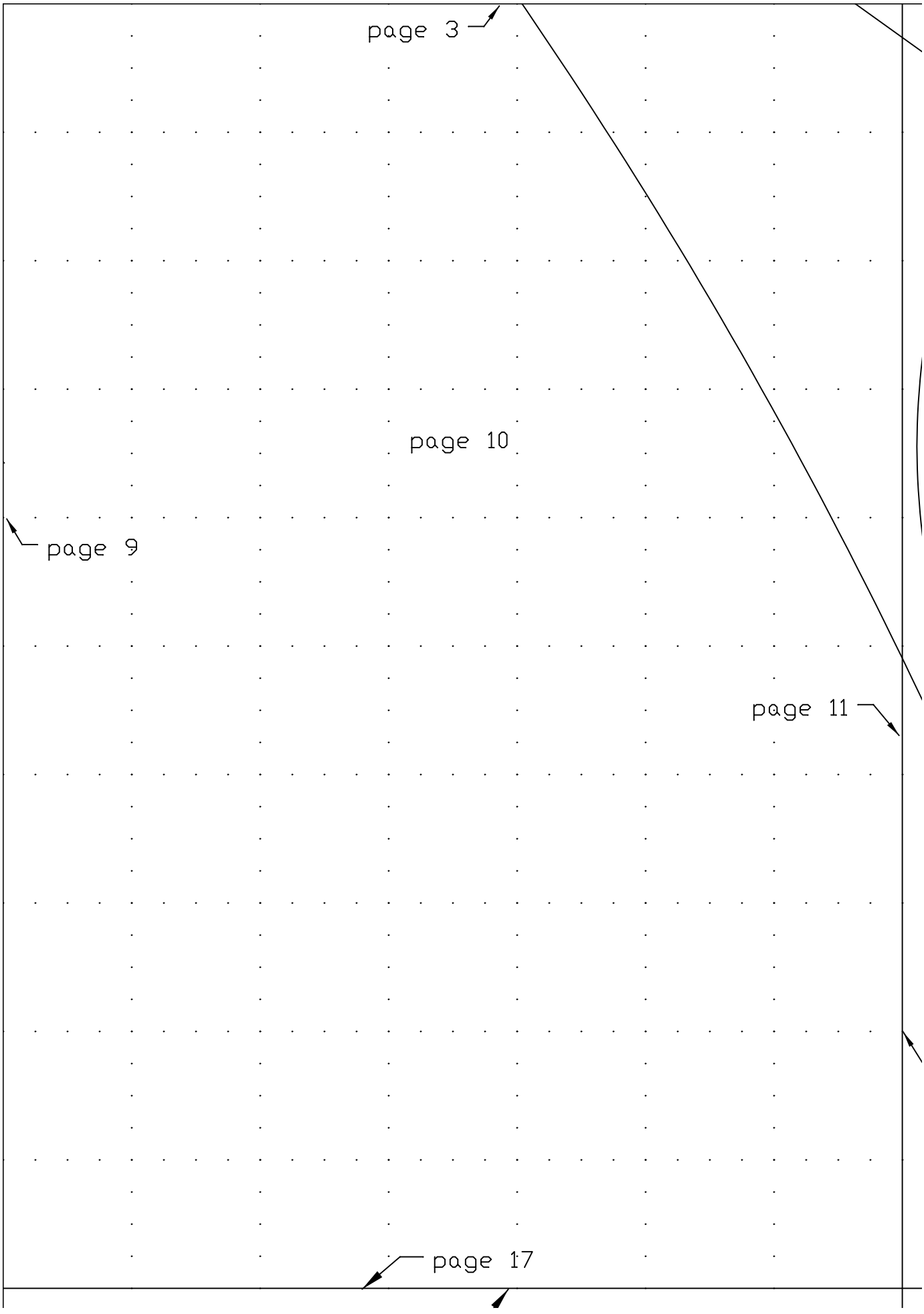
page 6

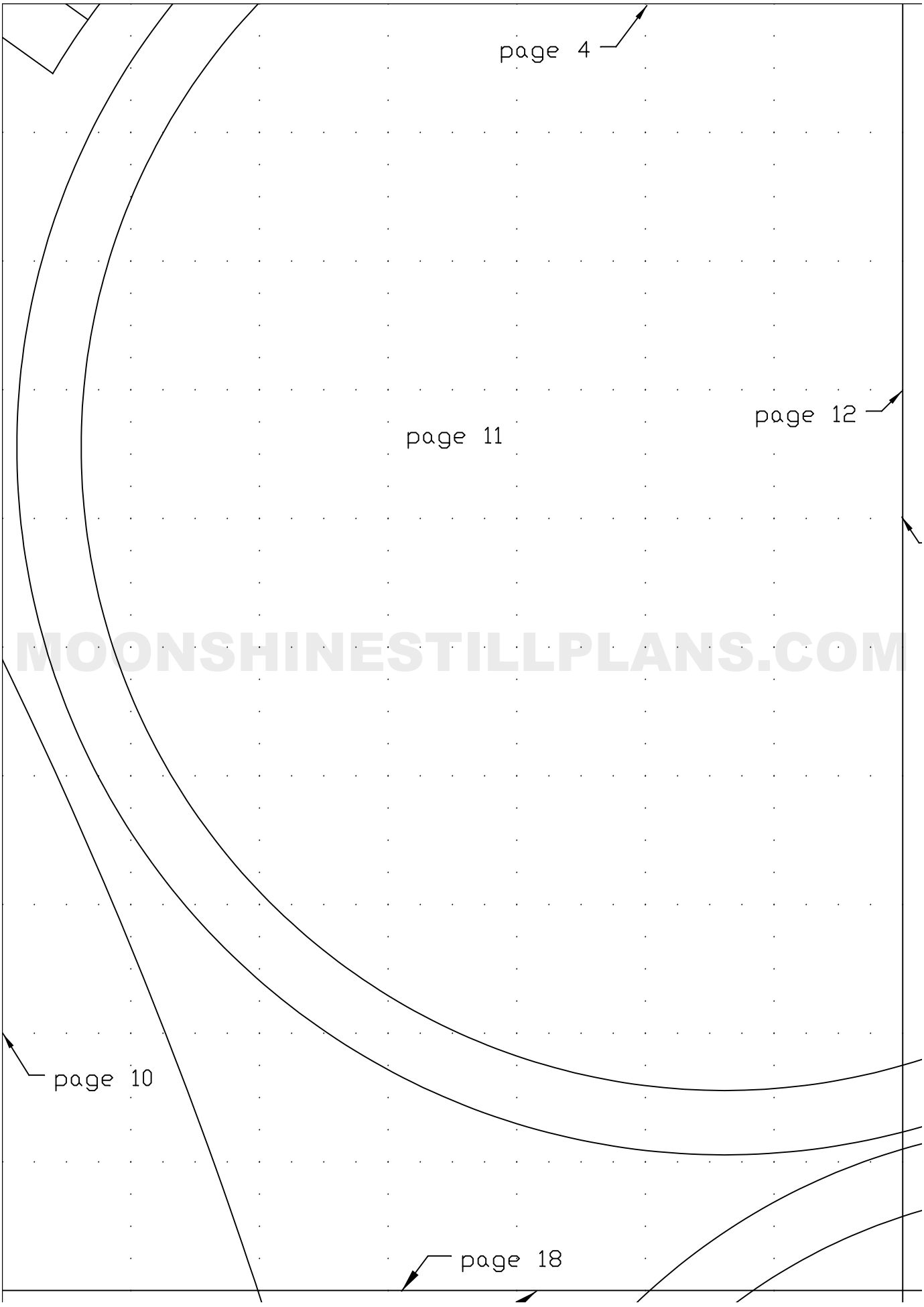
page 14


page 1
page 9
page 8
page 15

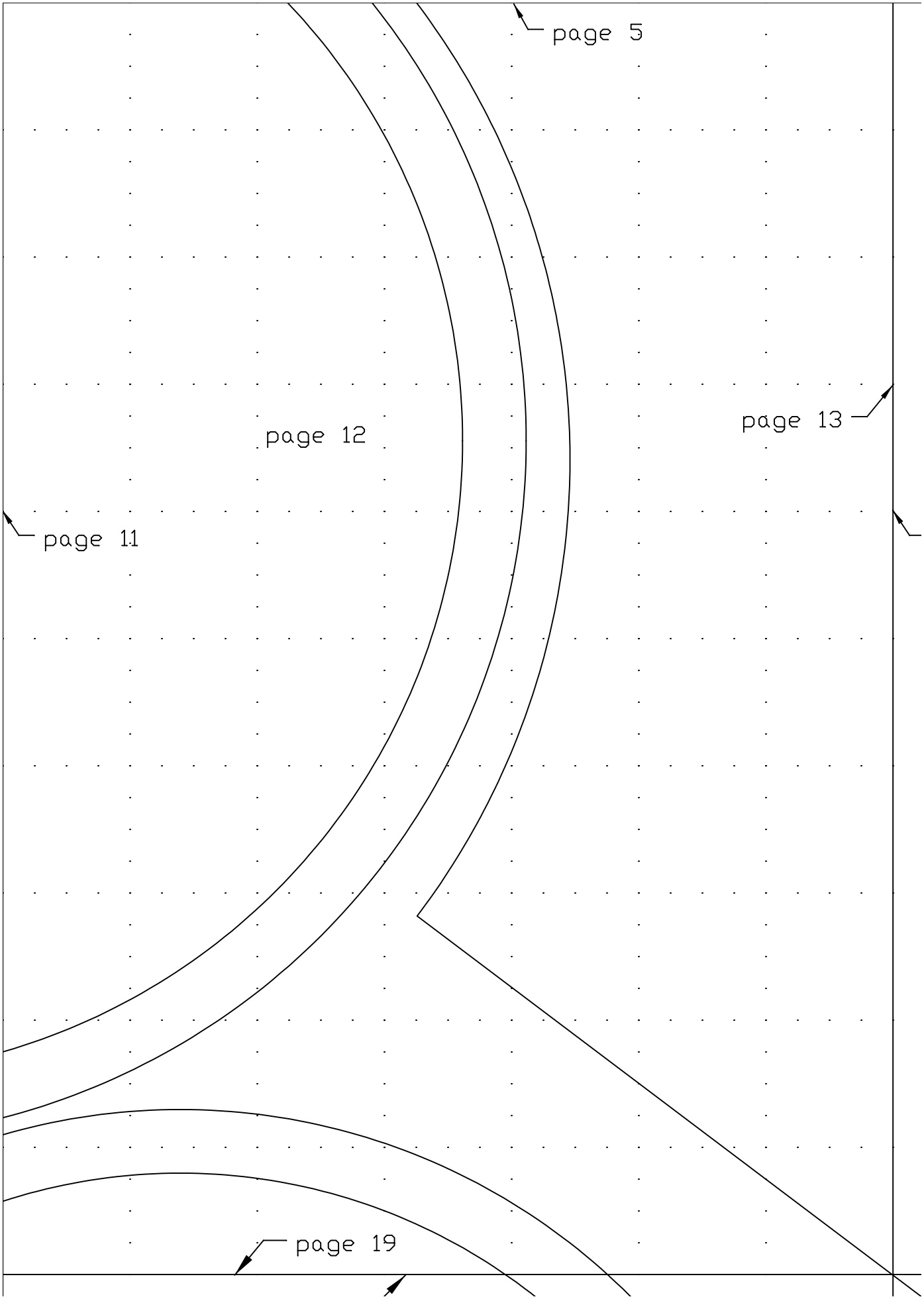


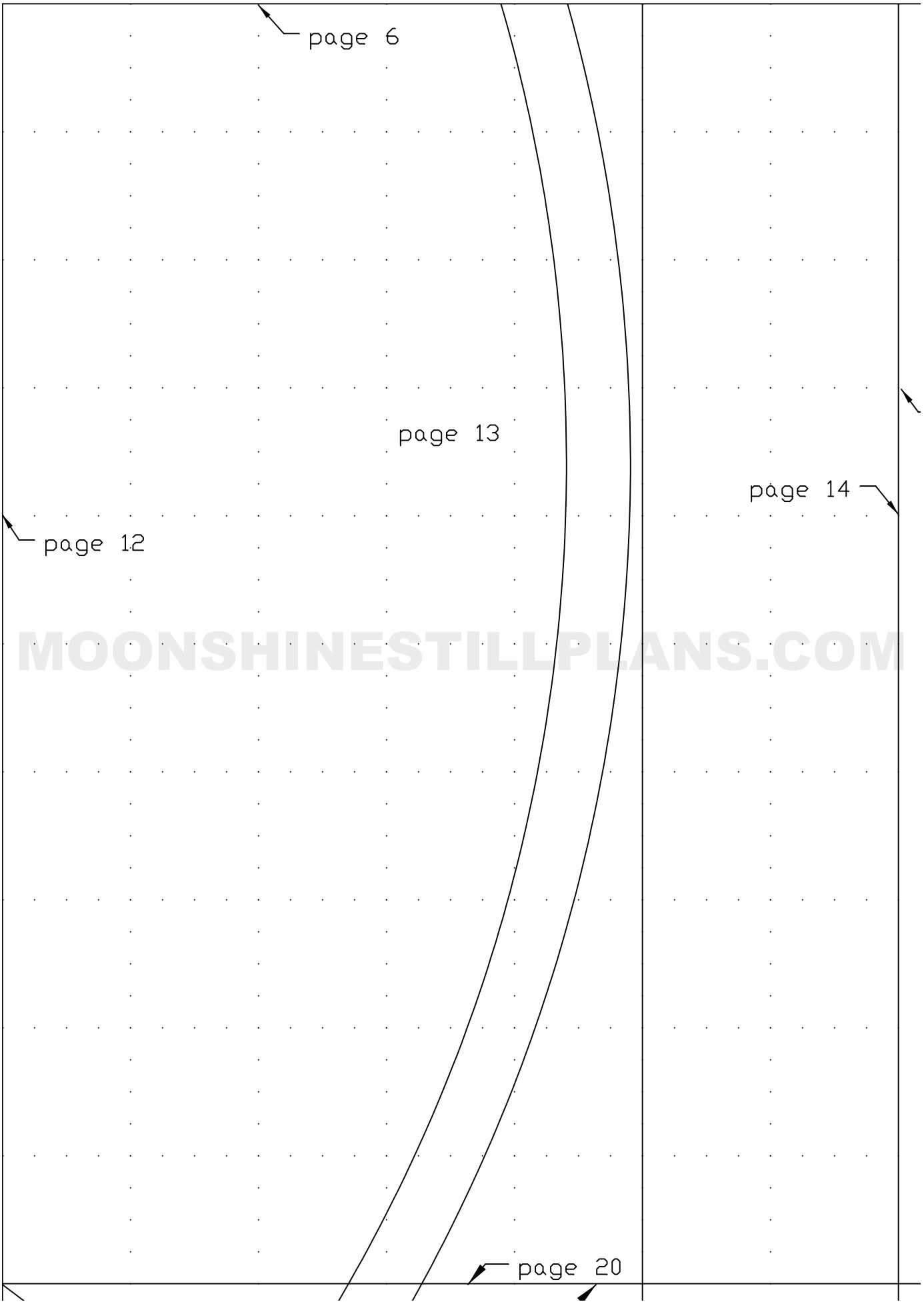
MOONSHINESTILLPLANS.COM


page 3
page 10
page 9
page 11
page 17

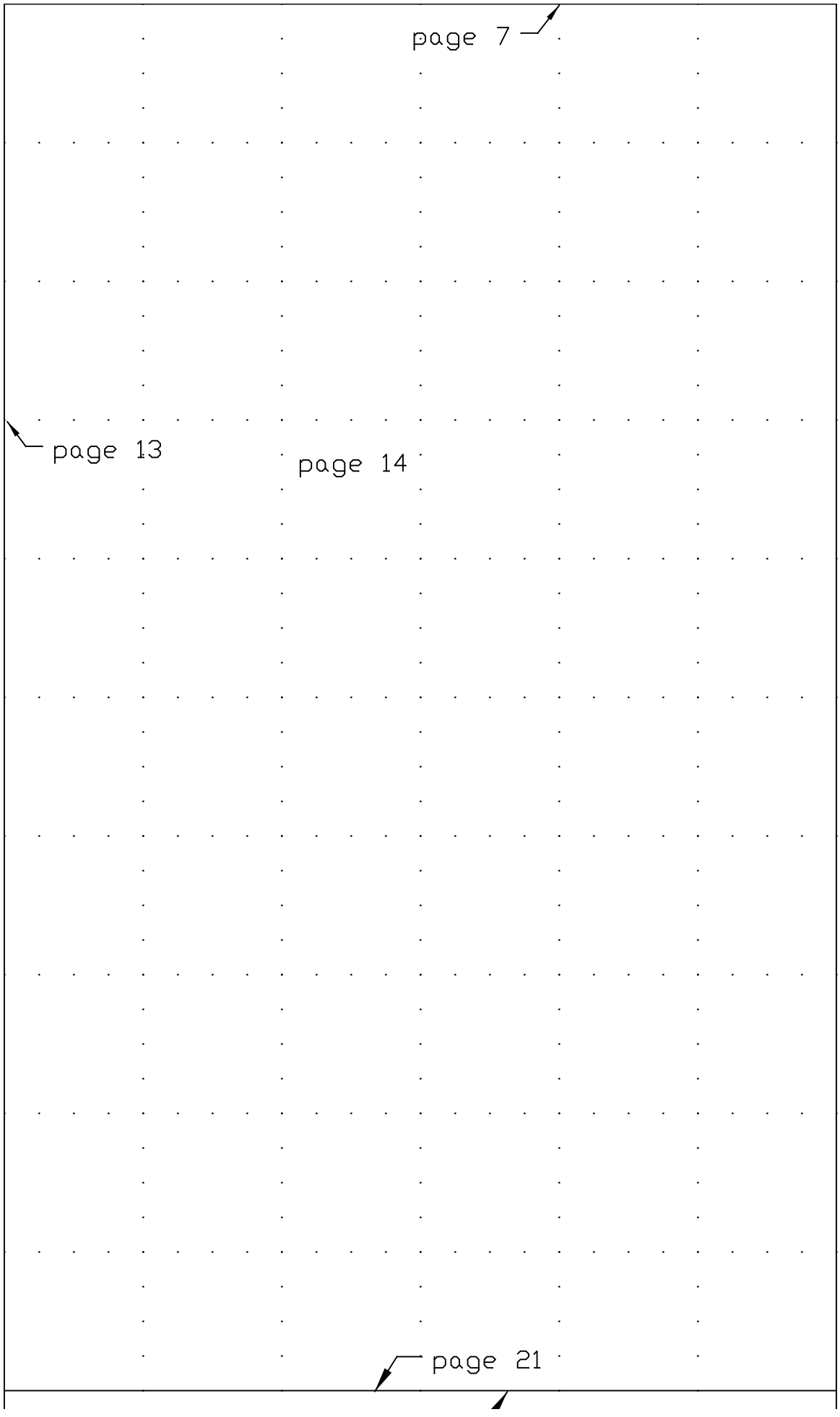


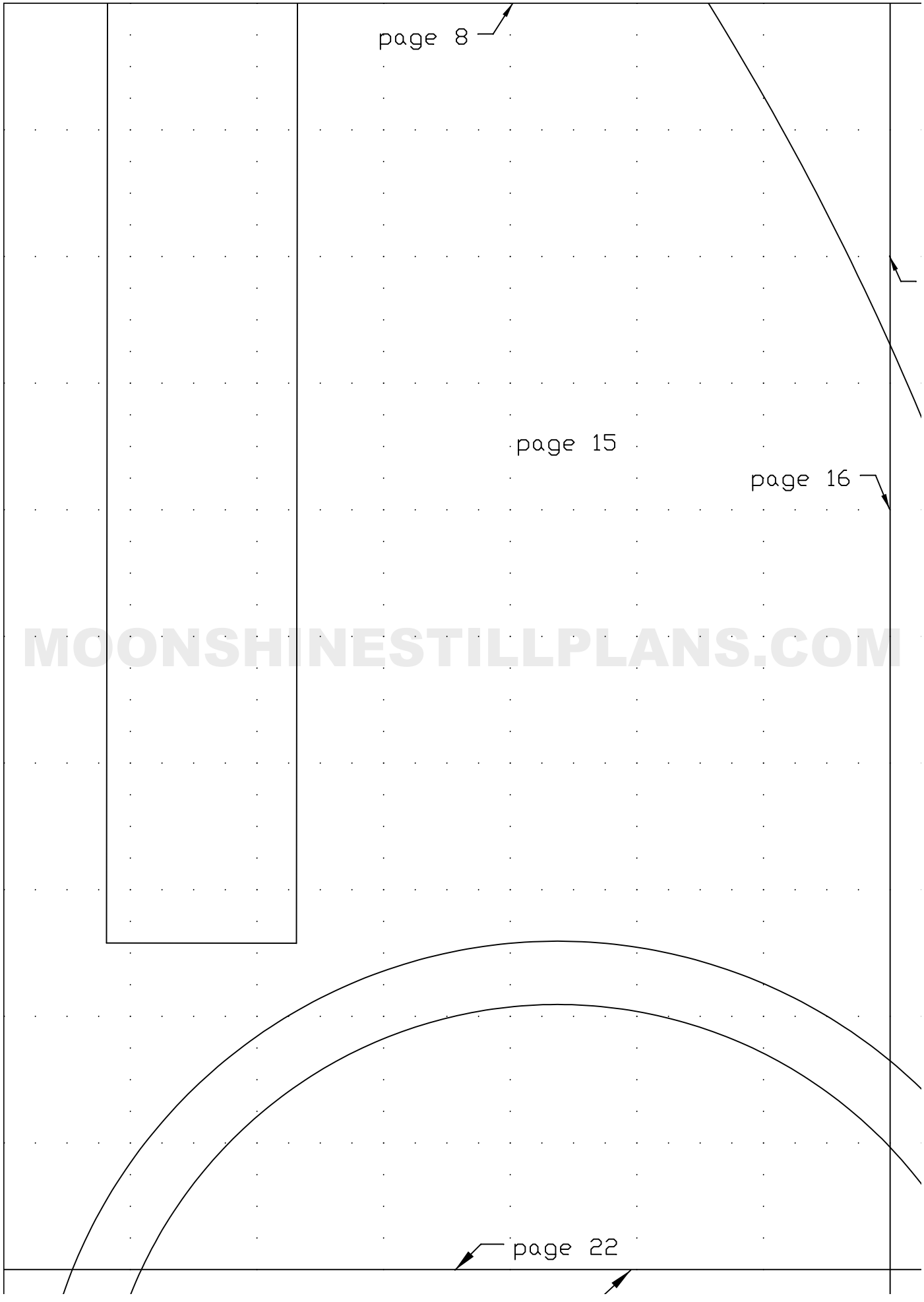
MOONSHINESTILLPLANS.COM


page 5
page 12
page 13
page 11
page 19

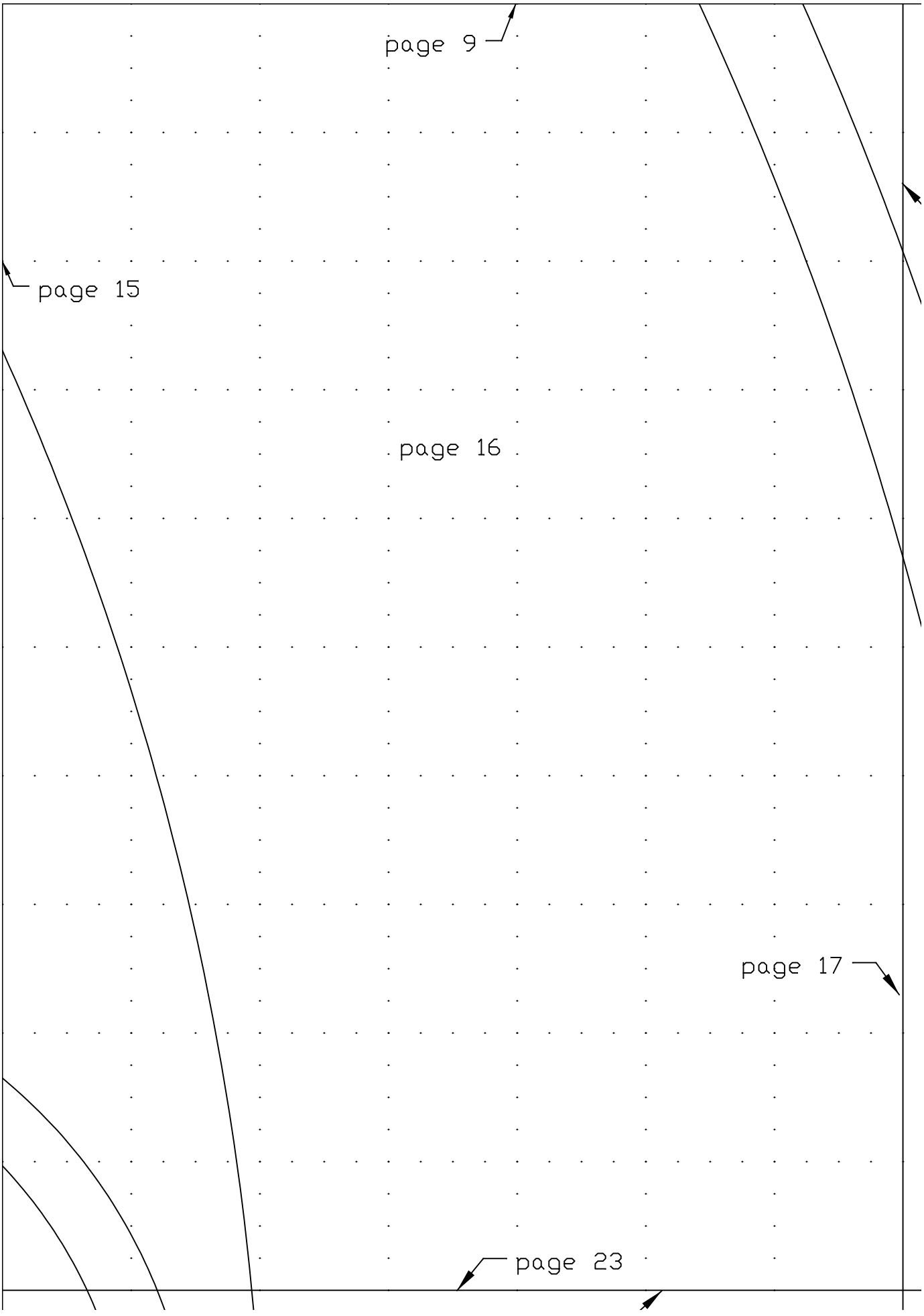


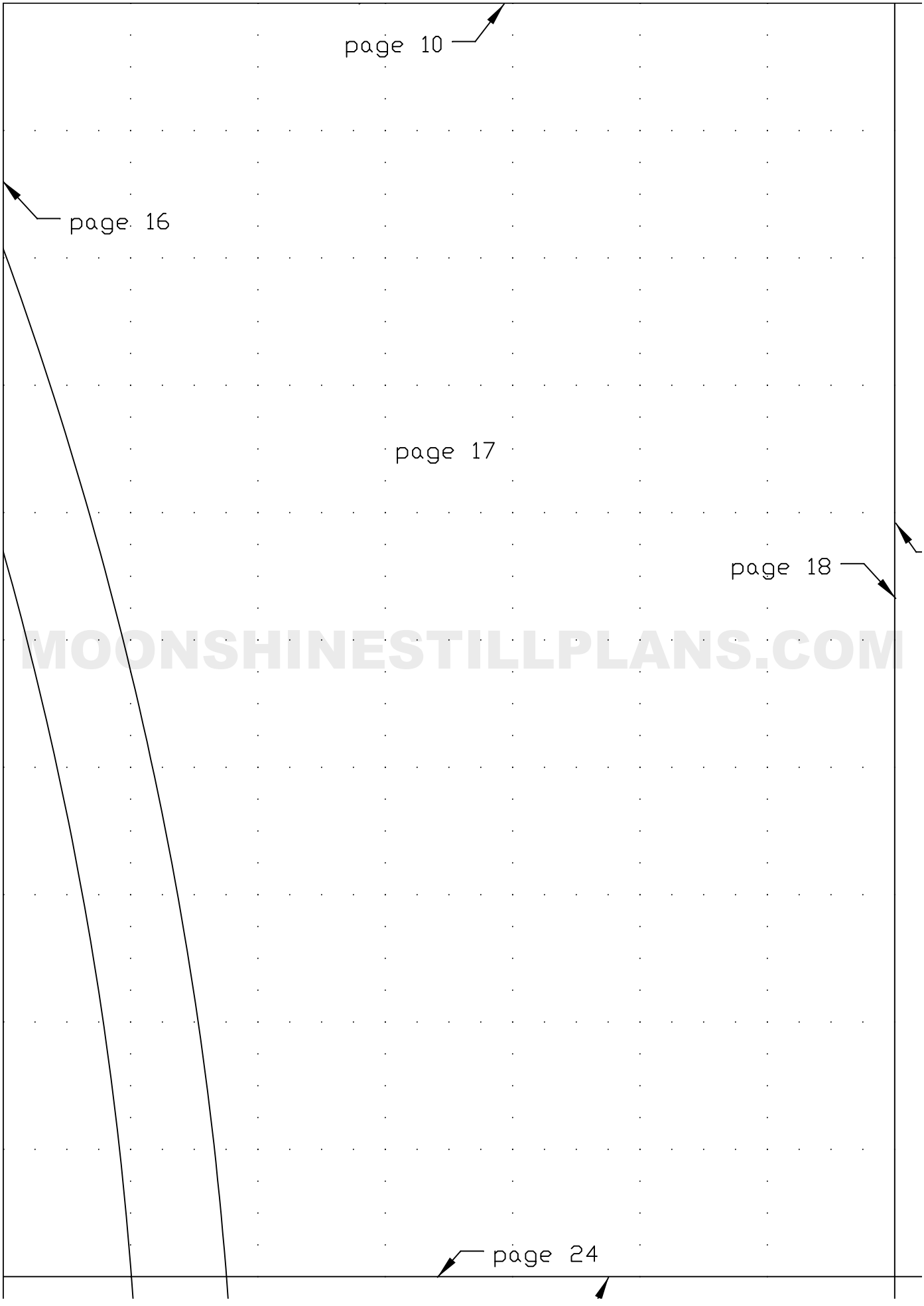
MOONSHINESTILLPLANS.COM


page 7
page 13
page 14
page 21

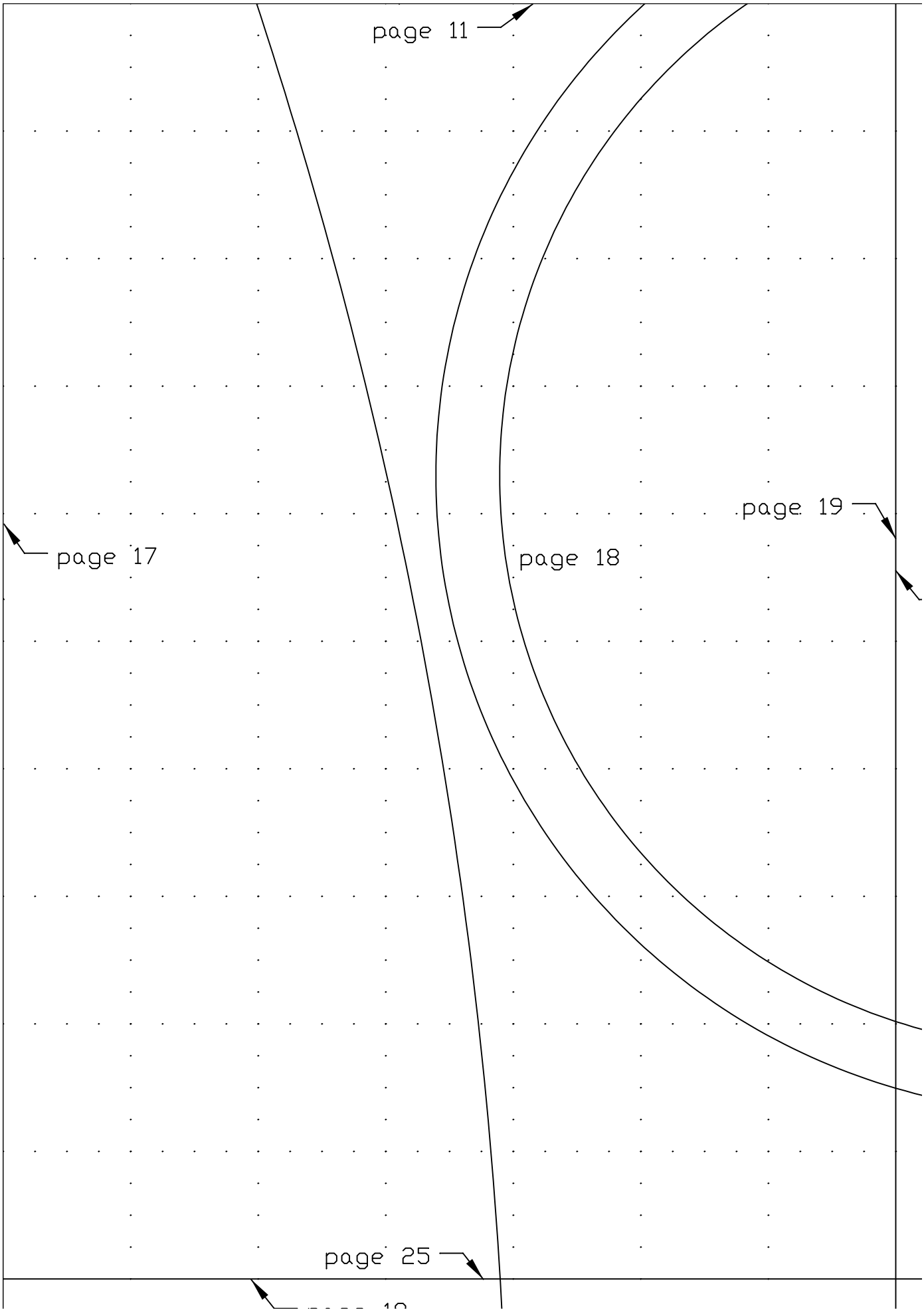


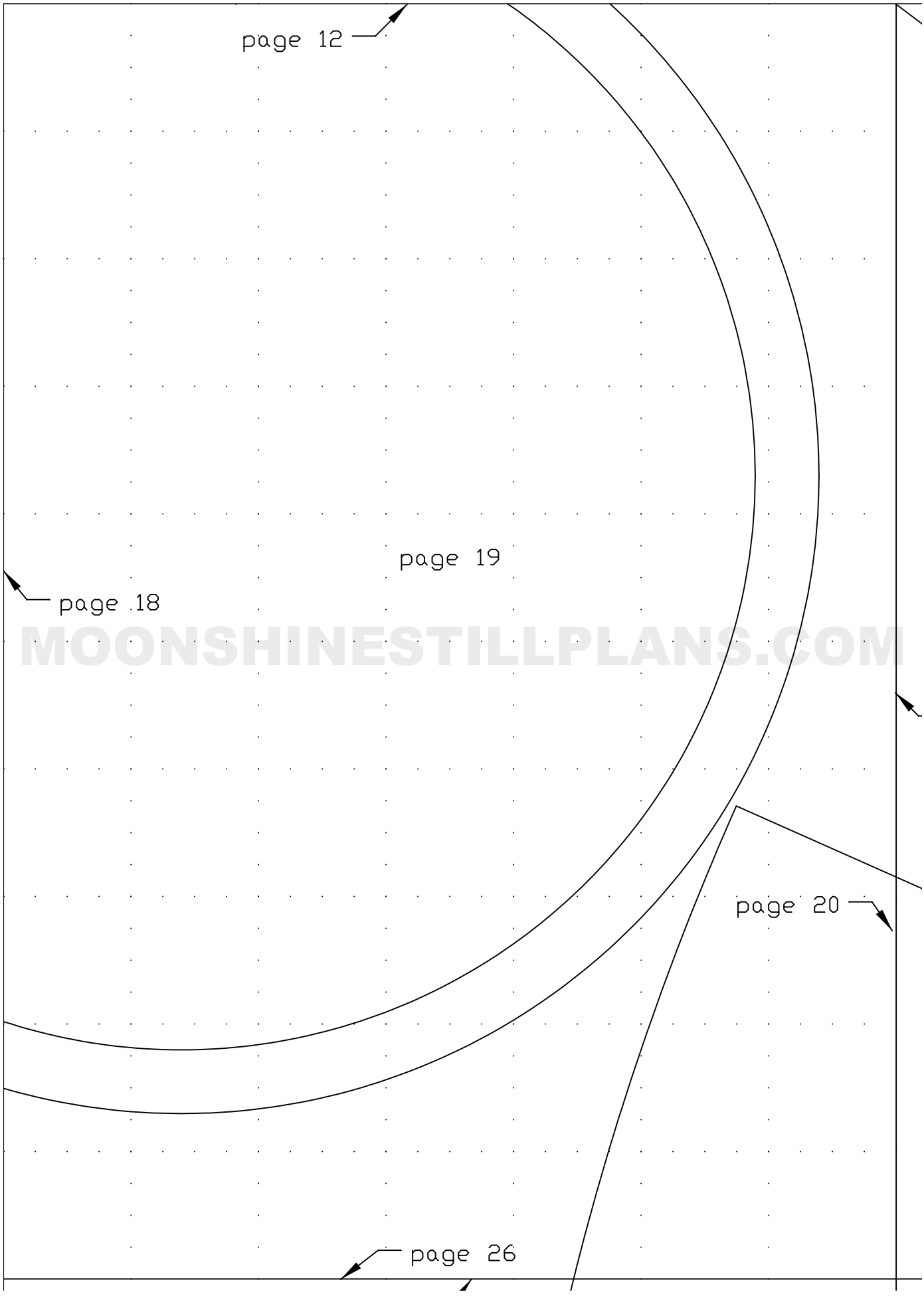
MOONSHINESTILLPLANS.COM


page 9
page 15
page 16
page 17
page 23

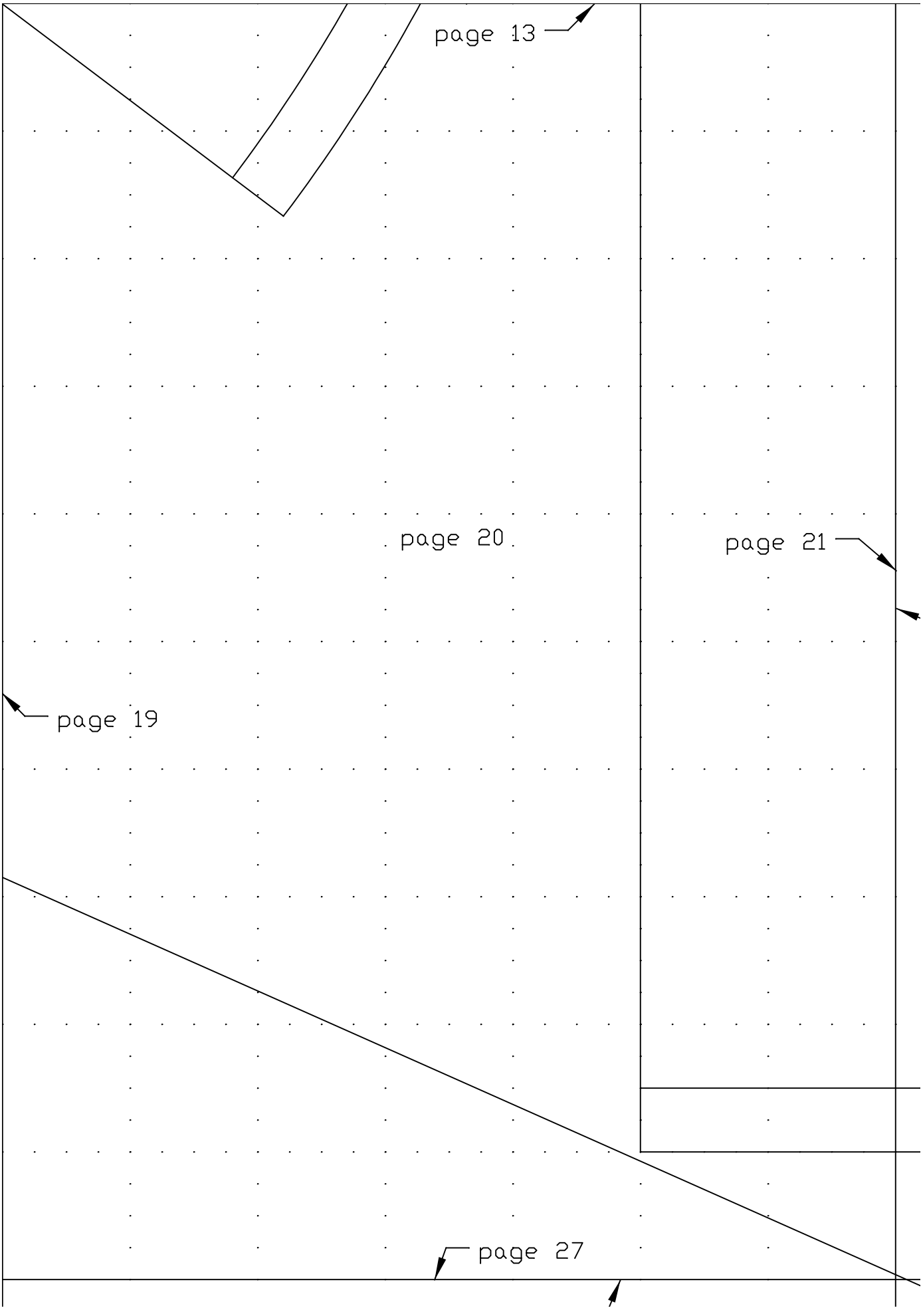


MOONSHINESTILLPLANS.COM


page 11
page 17
page 18
page 19
page 25



MOONSHINESTILLPLANS.COM


page 13
page 20
page 21
page 19
page 27

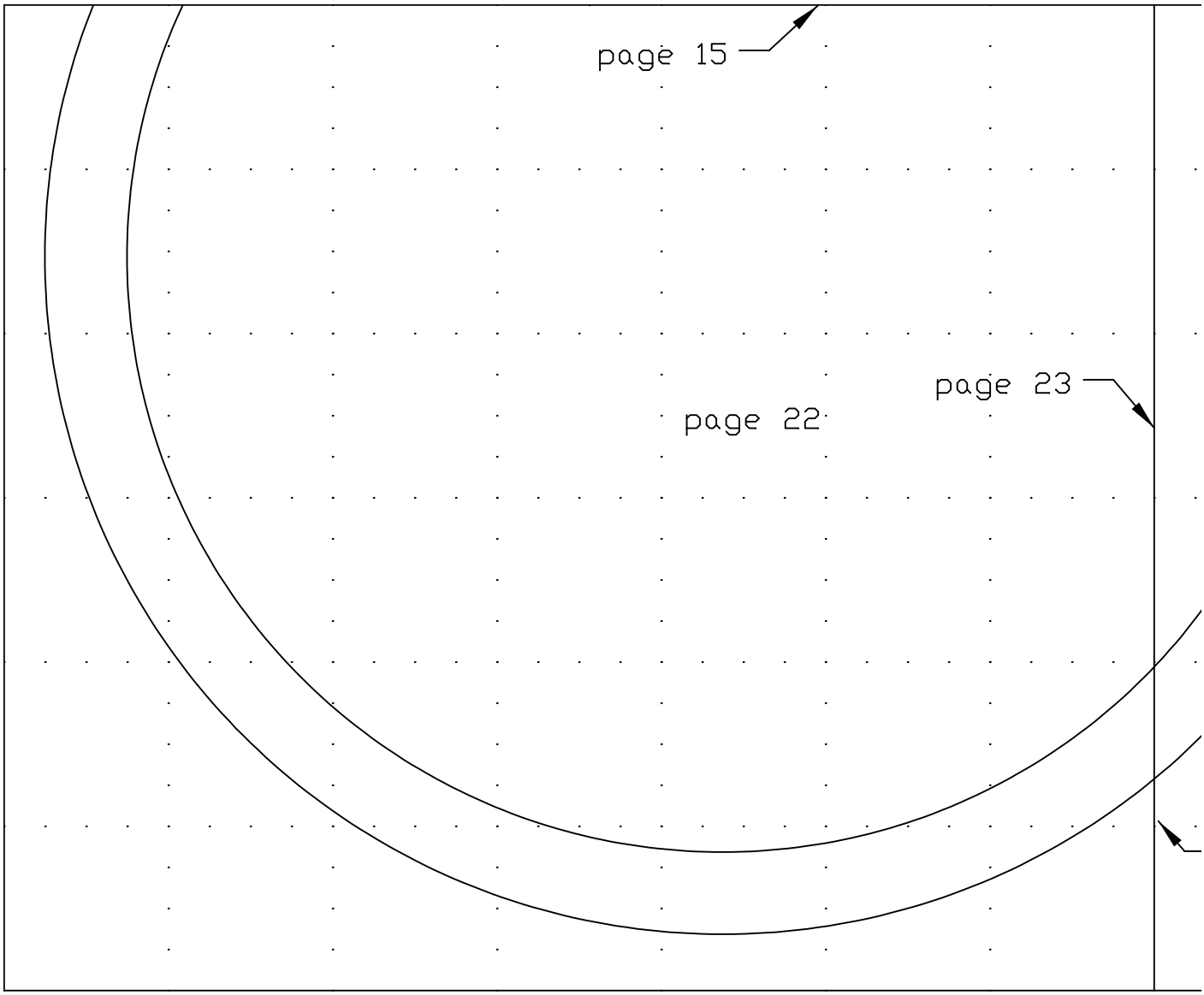
page 14

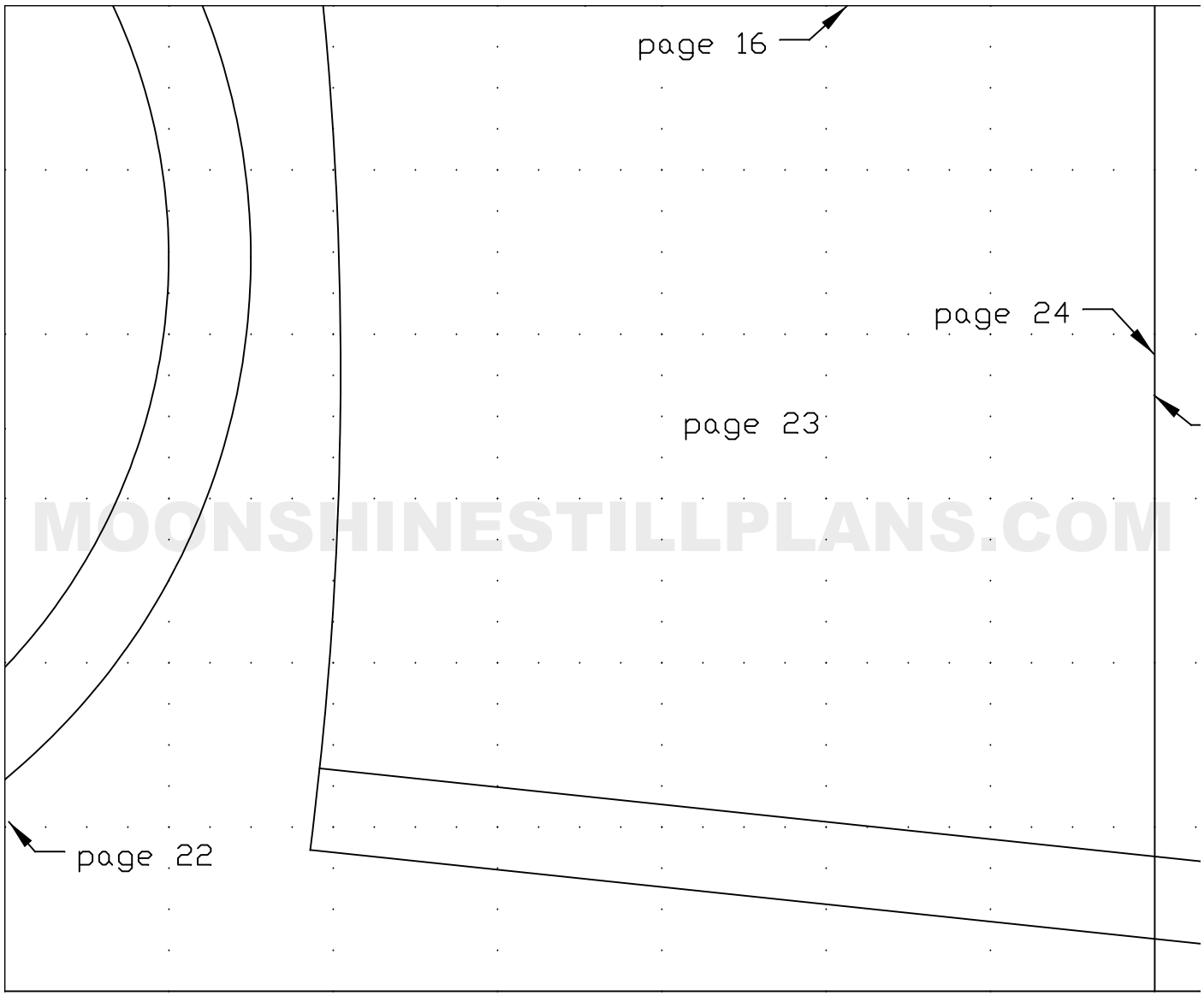
page 21

page 20

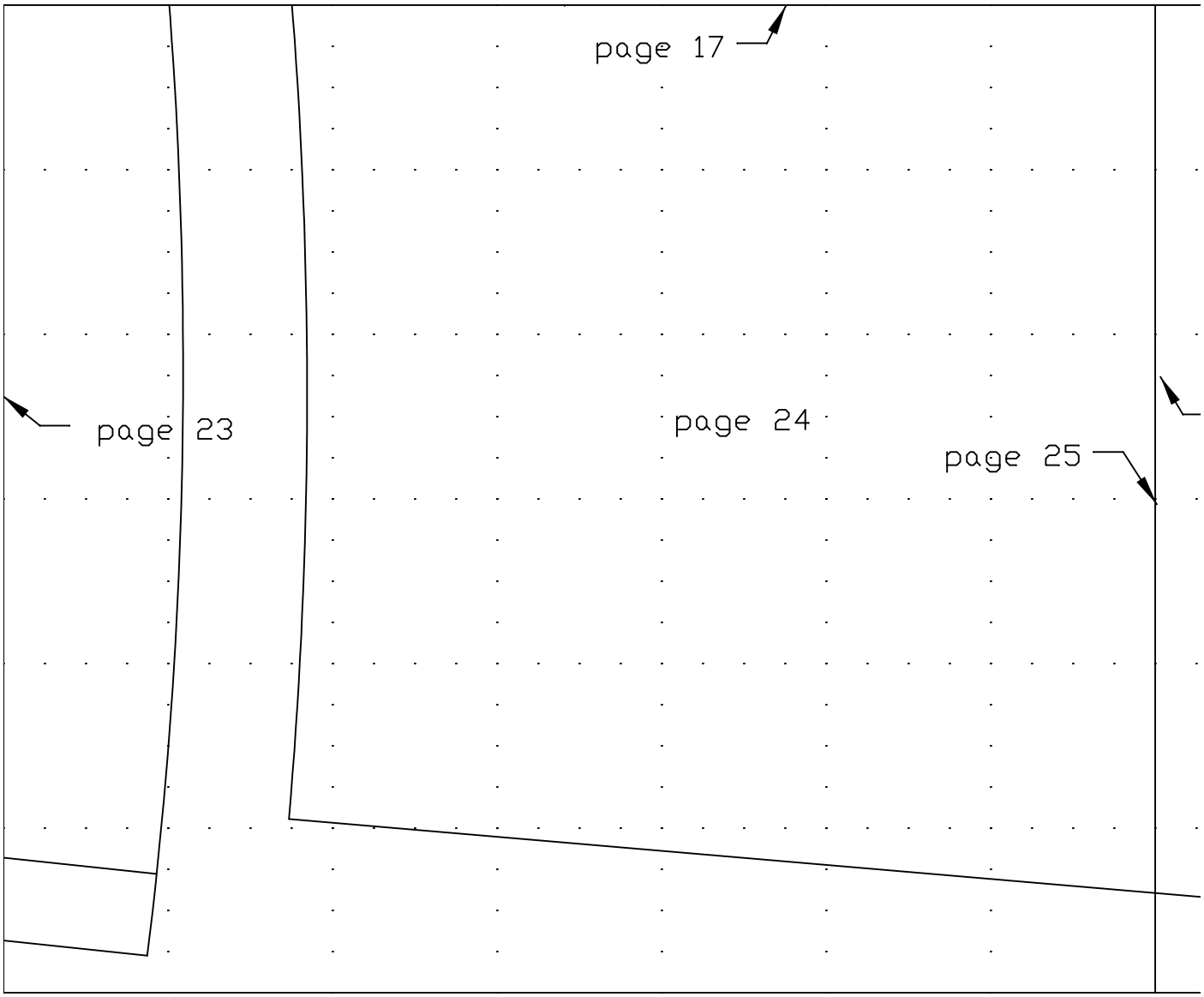
MOONSHINESTILLPLANS.COM

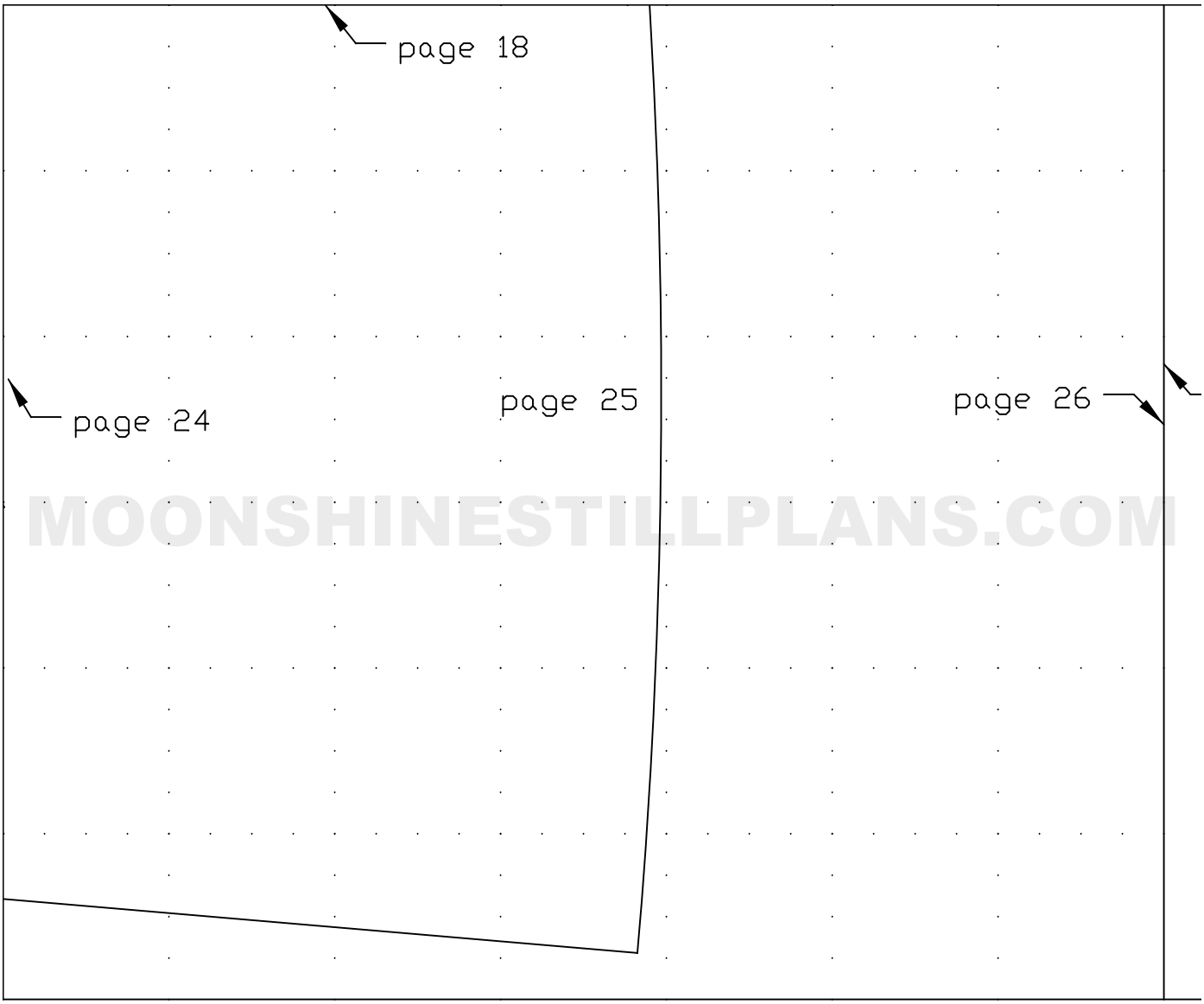
page 28


page 15
page 23
page 22

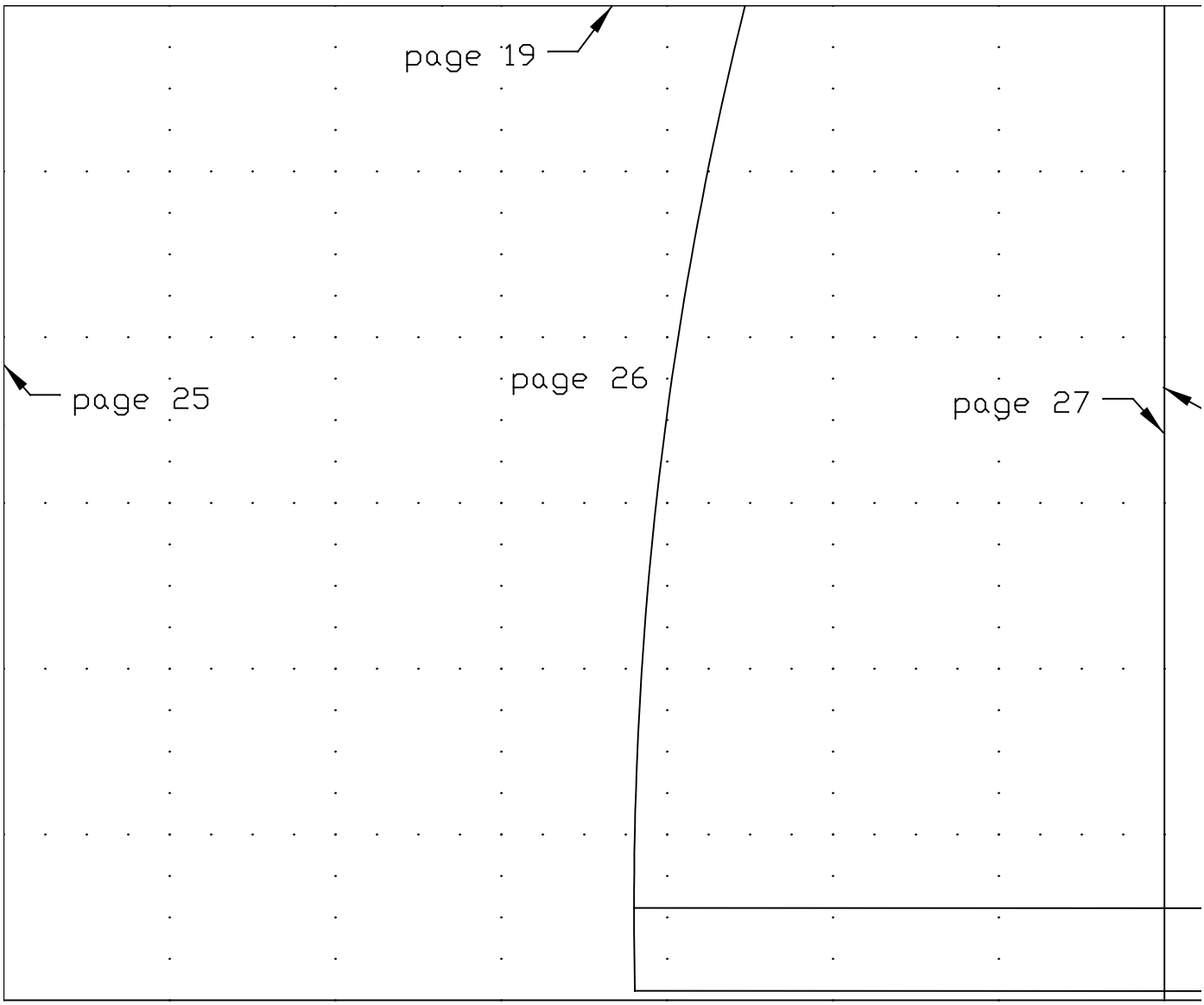


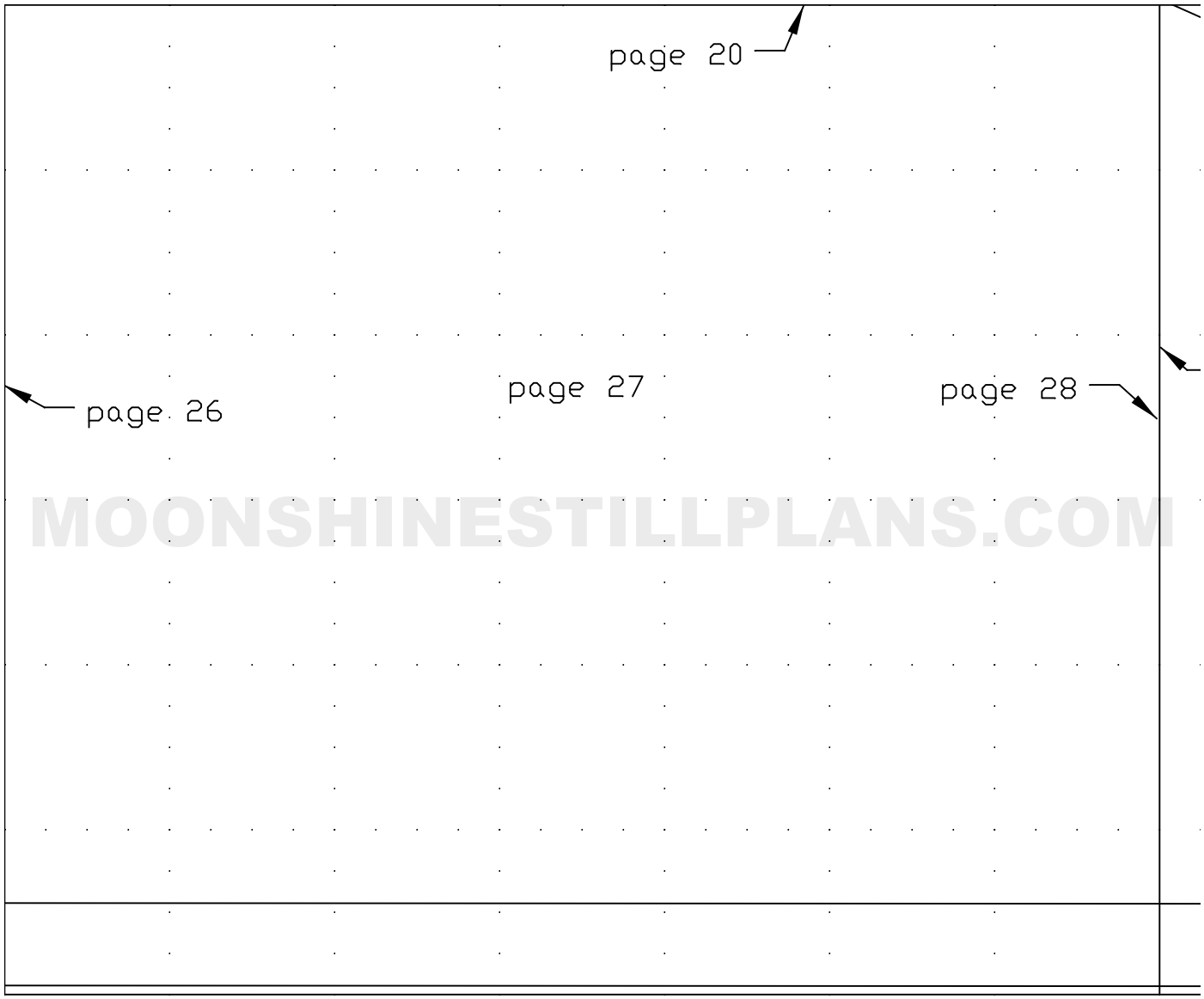
MOONSHINESTILLPLANS.COM


page 17
page 23
page 24
page 25

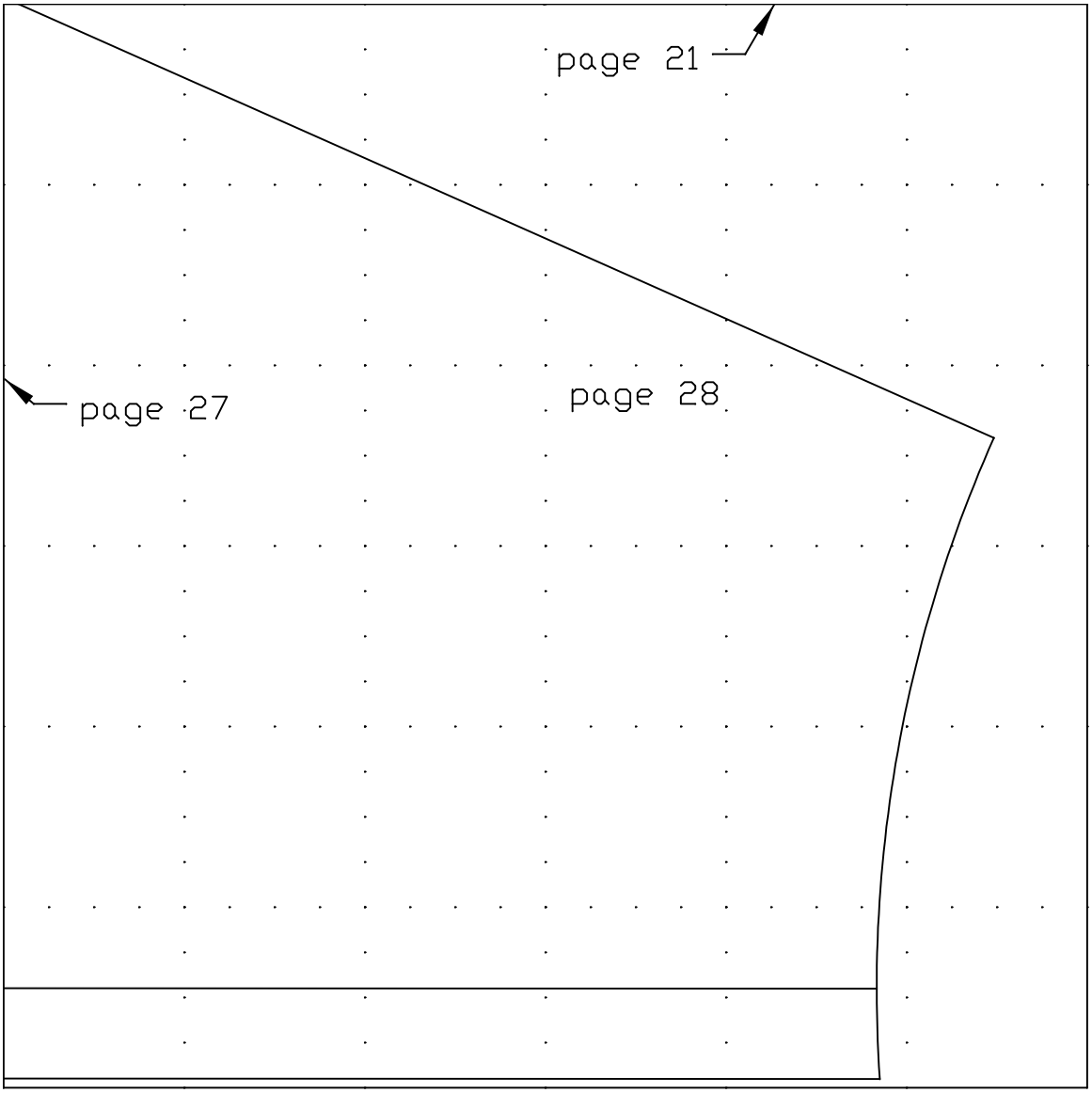


MOONSHINESTILLPLANS.COM


page 19
page 25
page 26
page 27



MOONSHINESTILLPLANS.COM


page 21
page 27
page 28