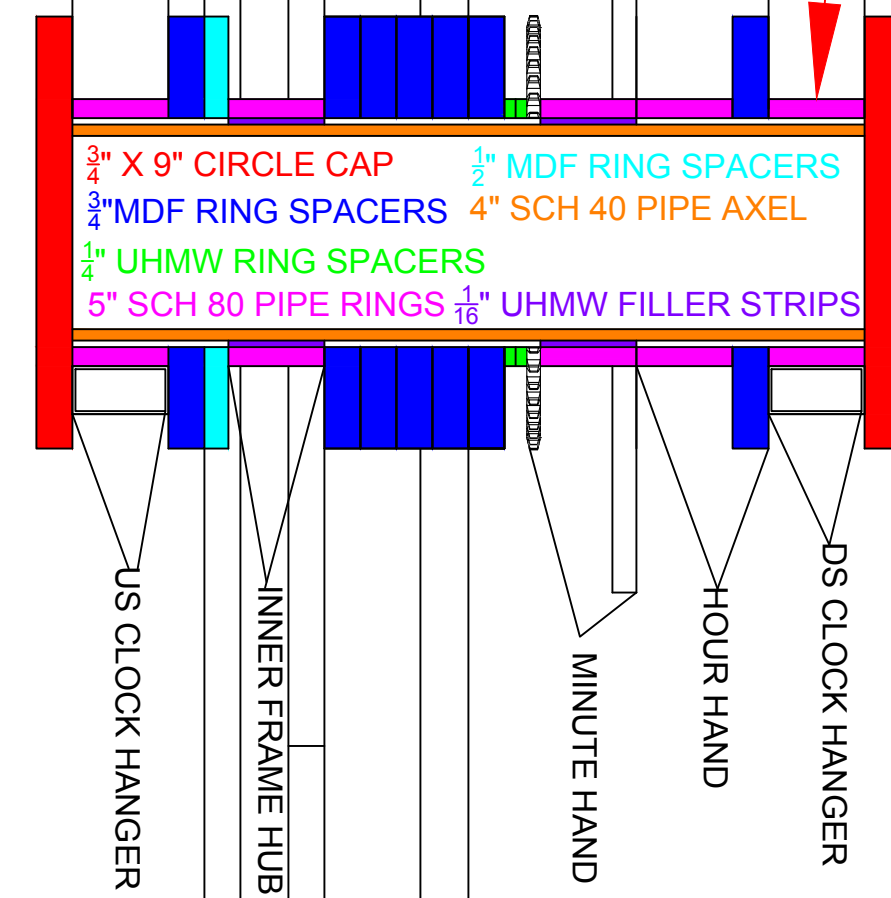
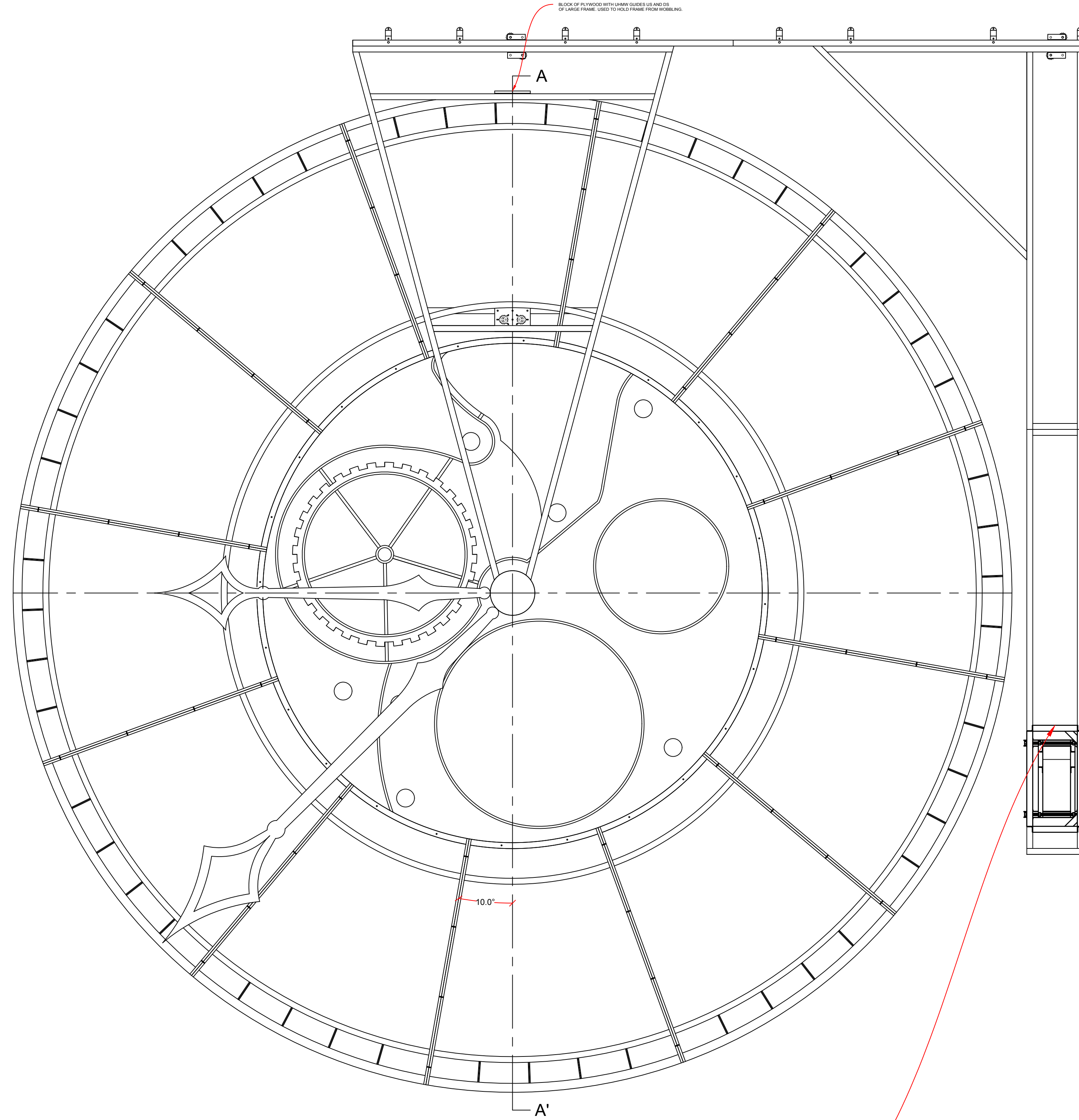
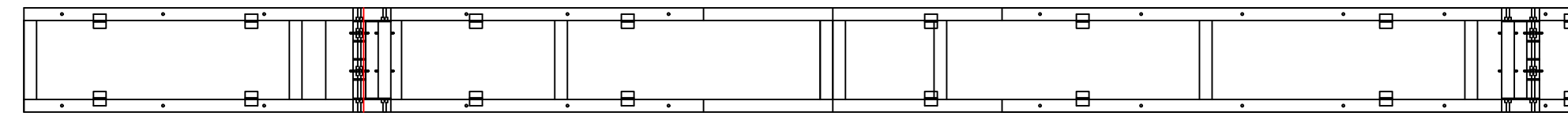
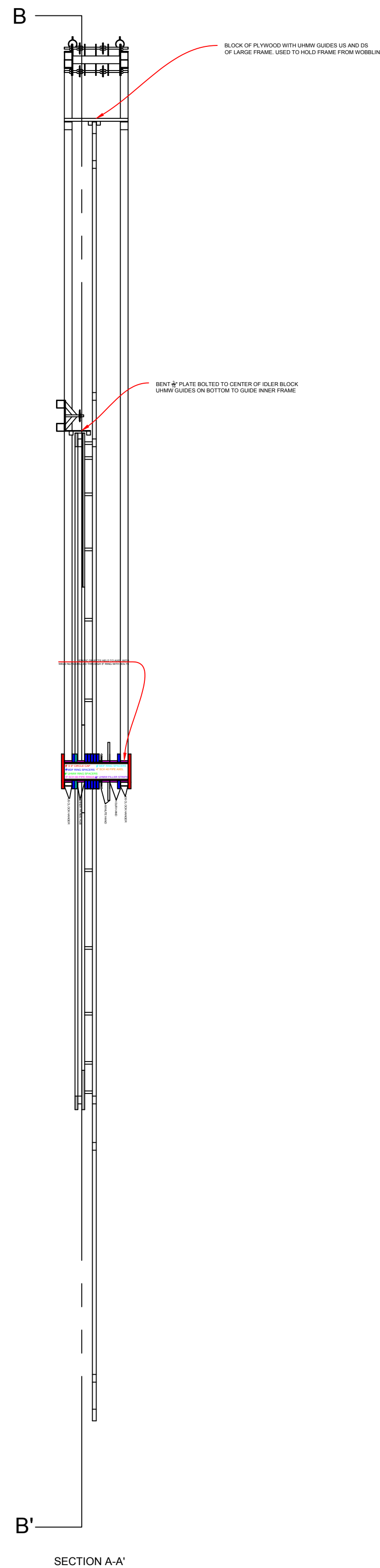
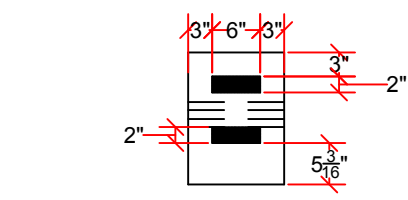


STATIC OBJECTS HELD TO AXEL WITH WELD NUTS DRILLED THROUGH 5" RING WITH BOLTS



SCALE 3" = 1'-0"



MOTOR MOUNTED TO UNISTRUT FOR TENSION ADJUSTMENT

SCALE 1/2" = 1'-0"

! REVISED 11/17/15

CLOCK ASSEMBLED VIEW

NOTES:

- BUILD 1
- USE 3/8" PIPE SPACERS WHEN BOLTING 2 RINGS TOGETHER
-

CUT LIST:

3/8" PIPE
 24 @ 2"

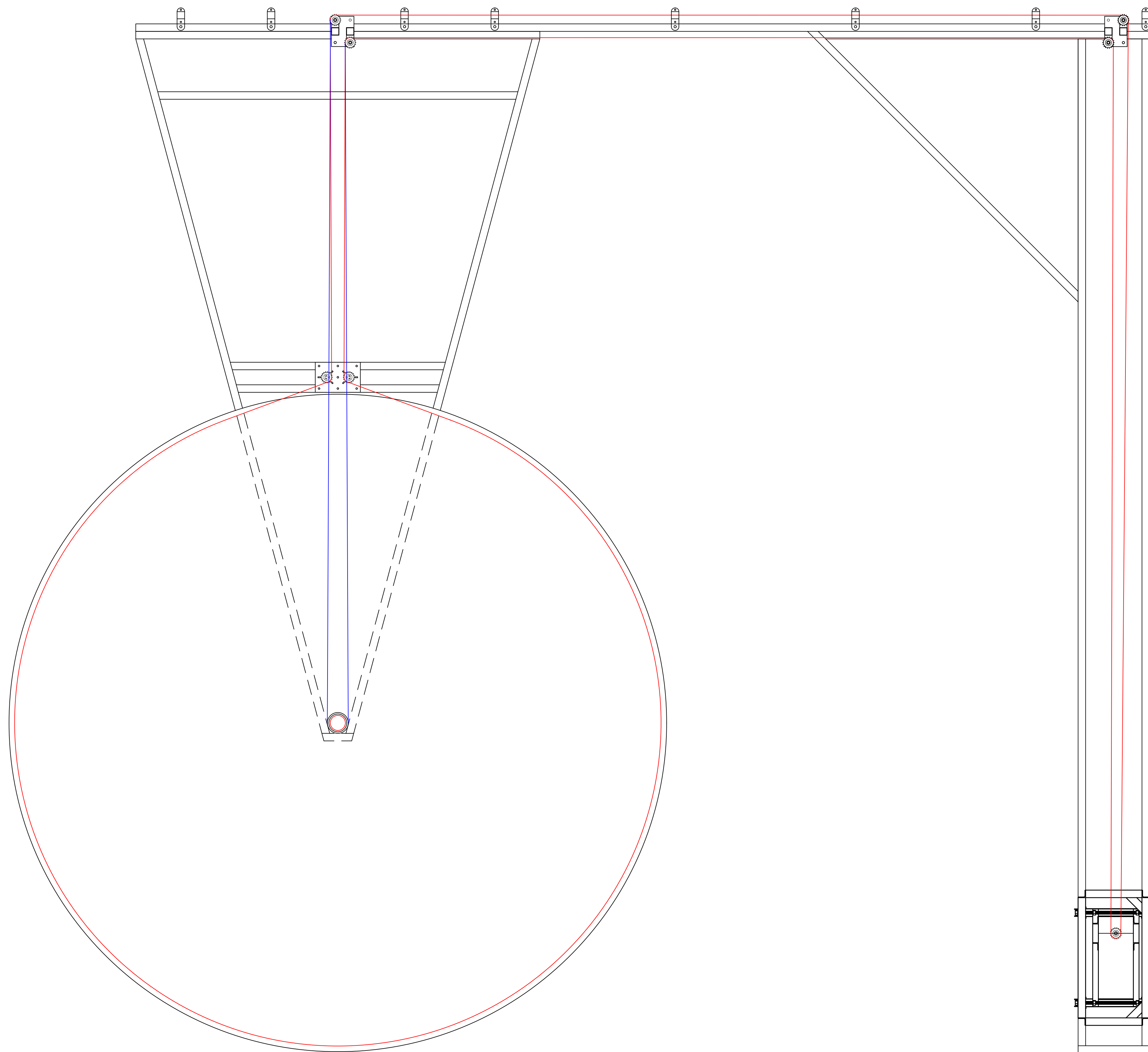
4" SCH 40 PIPE
 1 @ 1'-4 1/2"

3/4" MDF
 3 @ 9" X 9", CUT INTO RINGS. OUTER R = 4 1/2" & INNER R = 2 3/8"

HARDWARE (ALL NUTS NYLOCK)

- 16 PIPE HANGERS
- 48 @ 1/4" X 2" HEX BOLTS, NUTS/WASHERS X2
- 16 @ 3/8" X 3" HEX BOLTS, NUTS/WASHERS X2
- 24 @ 3/8" X 5" HEX BOLTS, NUTS/WASHERS X2
- 24 @ 3/8" X 6" HEX BOLTS, NUTS/WASHERS X2
- 8 @ 1/2" X 1" HEX BOLTS, NUTS/WASHERS
- 6 @ 1/2" X 3" HEX BOLTS, NUTS/WASHERS X 2
- 8 @ 1/2" X 1" HEX BOLTS
- 8 @ 1/2" STRUT NUTS
- 24 @ 1/2" COLLARS WITH SET SCREW
- 8 @ 1" BORE 17T BY #40 IDLER SPROCKET
- 6 1/2" WELD NUTS (McMaster 90596A033)

PORTLAND CENTER STAGE		CL-1
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMMA	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1/2" = 1'-0"	REV: 11/04/15
		APPROV:



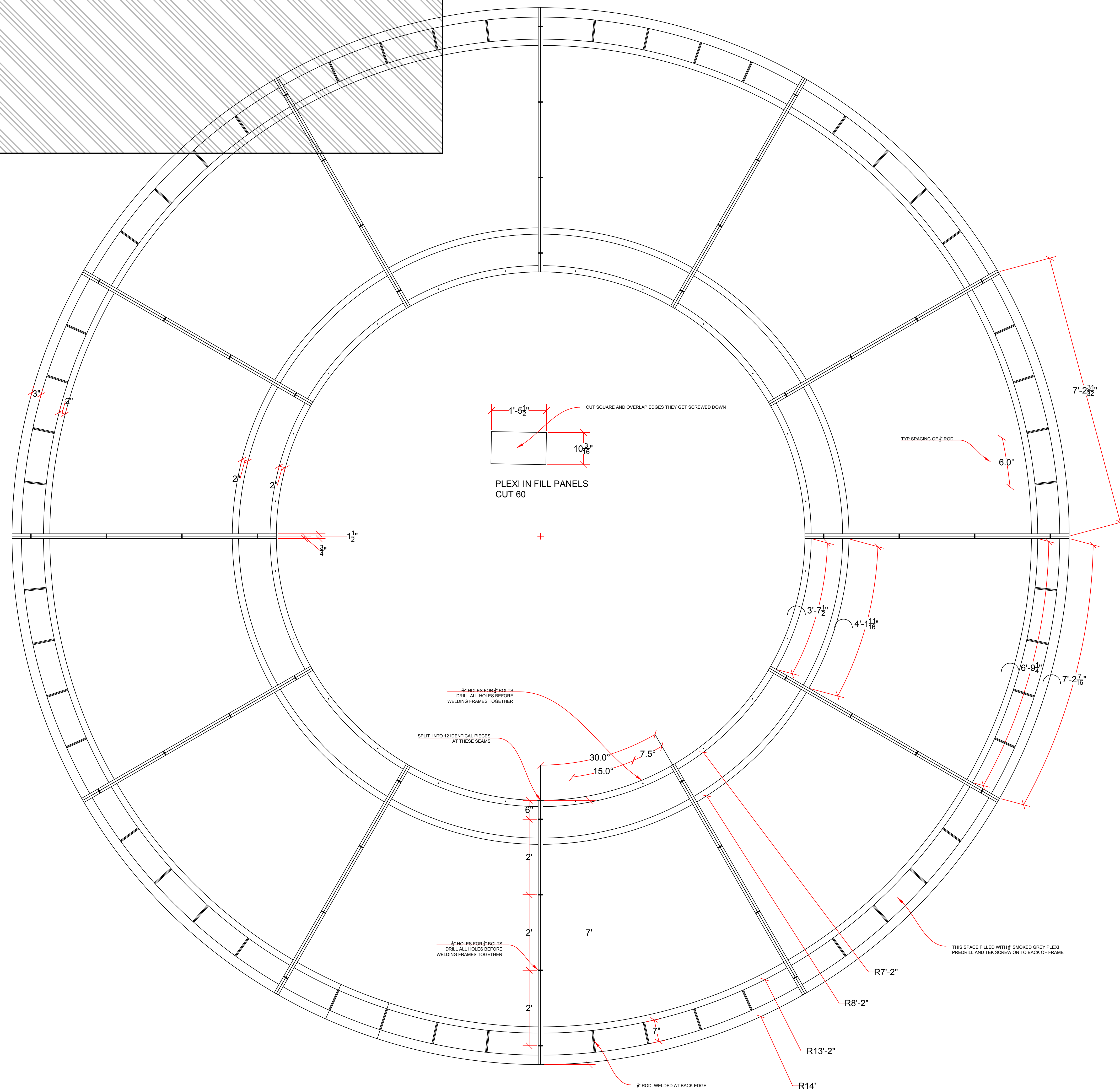
CLOCK CHAIN ROUTING

- NOTES:
- APPROX. 136' OF CHAIN FOR LARGE LOOP
 - APPROX. 50' OF CHAIN FOR MINUTE HAND LOOP
 -

SECTION B-B'

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMFORD		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 3/4" = 1'-0"	REV: 11/04/15	APPROV:

CL-2



CLOCK OUTER FRAME

NOTES:

- BUILD 1
- ALL BUILT OUT OF STEEL, WELDED AND ROUND
- FRAME OUTER RING OUT OF 1X3" STEEL TUBE LAID FLAT, PRE BENT
- FRAME INNER RINGS OUT OF 1X2" STEEL TUBE
- SPOKES ARE MADE OF 1" x 3/4" STEEL TUBE
- SECOND MARKS ARE MADE OF 1/2" MILD STEEL ROD
- 530lbs

CUT LIST

- 3/4" X 1" STEEL TUBE
24@ 7'-0"
- 1" X 2" STEEL TUBE
12@ 6'-9 1/4", BENT TO 13'-2" OUTER RADIUS
12@ 4'-1 11/16", BENT TO 8'-2" OUTER RADIUS
12@ 3'-7 1/2", BENT TO 7'-2" OUTER RADIUS
- 1" X 3" STEEL TUBE
12@ 7'-2 7/16", BENT TO 14'-0" OUTER RADIUS
- 1/2" STEEL ROD
48@ 0'-7"
- 1/8" SMOKED PLEXI TAP PLASTICS SKU9999
60@ 0'-10 3/16" X 1'-5 1/2"

FRONT VIEW

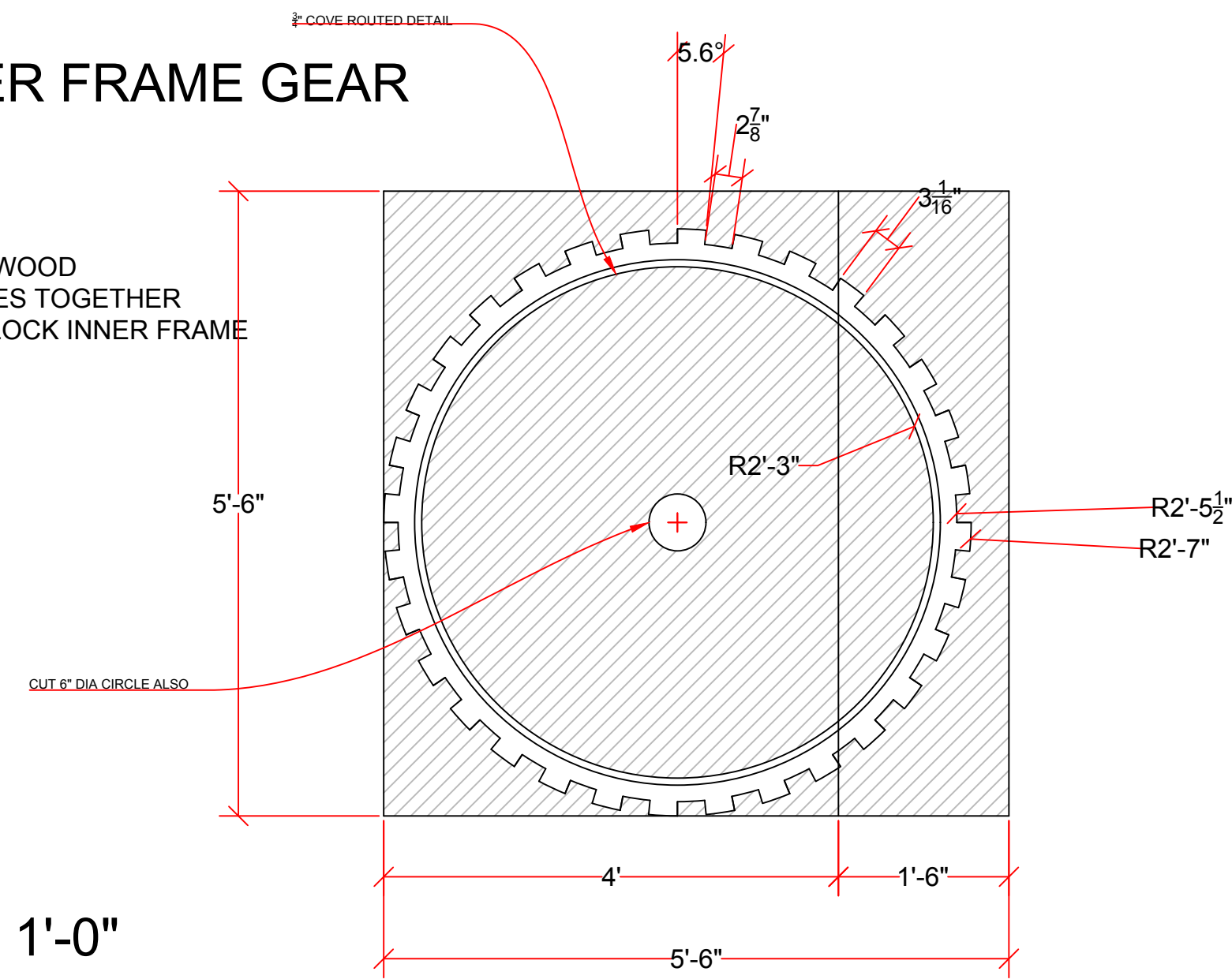
PORTLAND CENTER STAGE		CL-3
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	APPROV:
DWG DATE: 10/28/15	SCALE: 3/4" = 1'-0" REV: 11/04/15	

CLOCK INNER FRAME GEAR

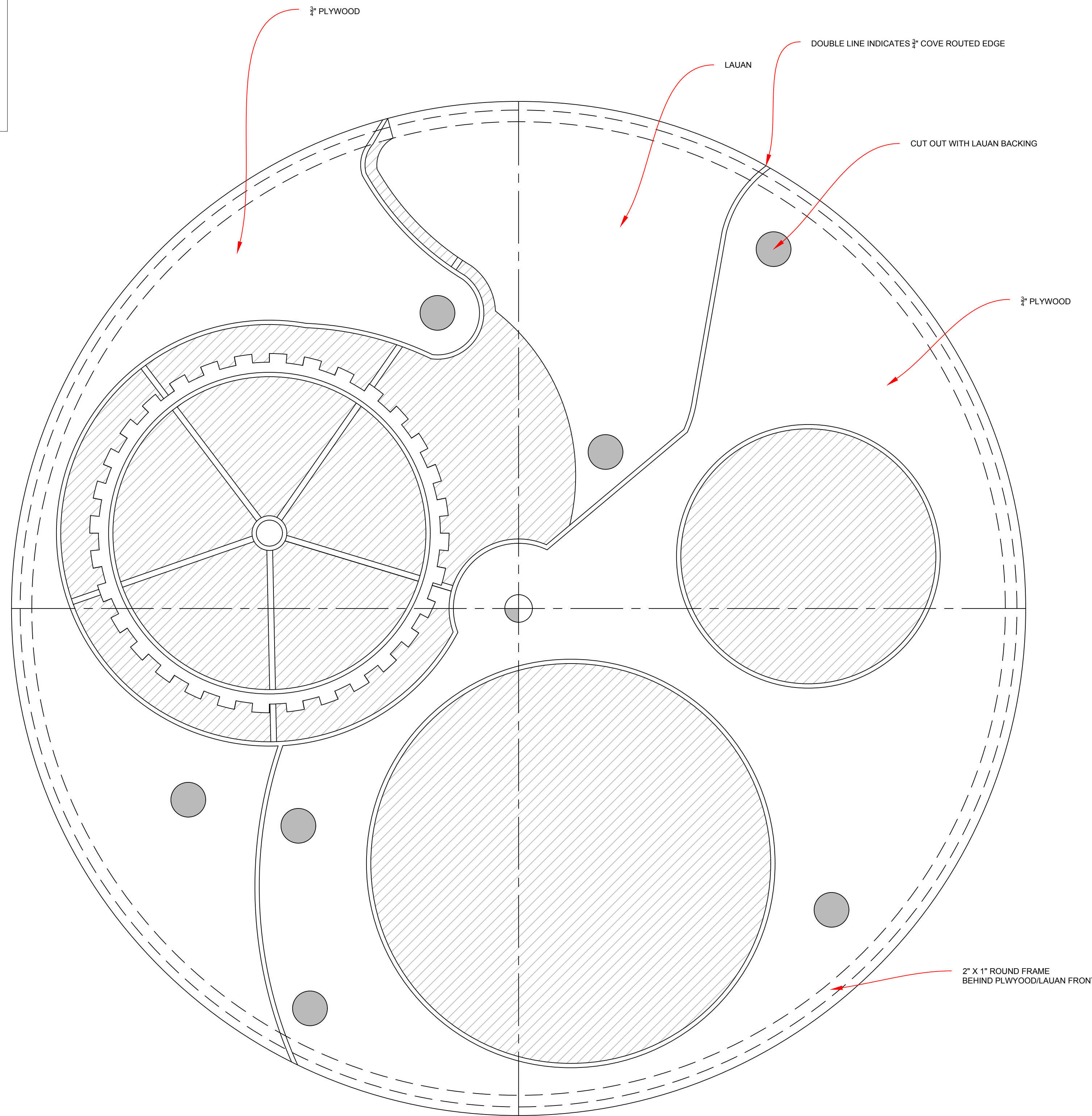
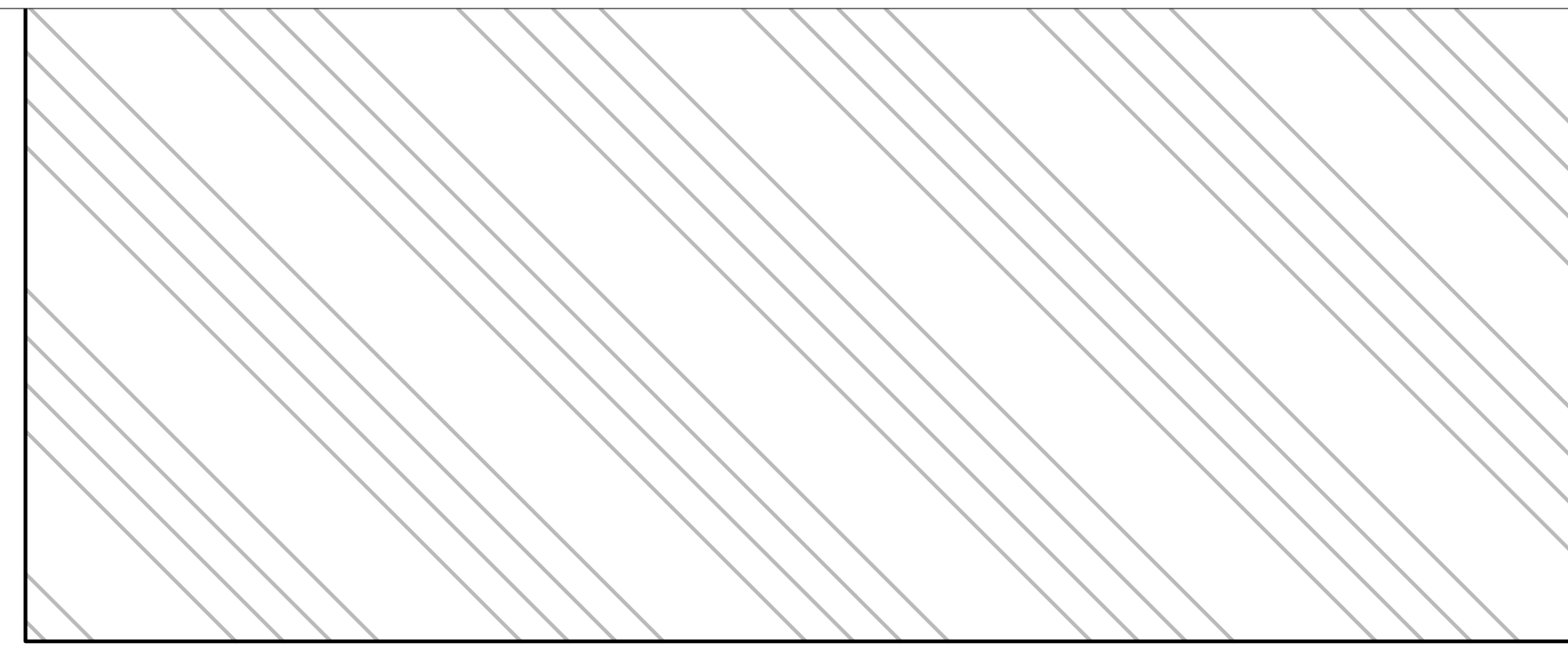
- NOTES:
- BUILD 1
 - CUT OUT OF 3/4" AC PLYWOOD
 - SCAB SEPARATE PIECES TOGETHER
 - GETS SCREWED TO CLOCK INNER FRAME

CUT LIST

- 3/4" AC PLYWOOD
- 1 @ 4'-0" X 5'-6"
- 1 @ 1'-6" X 5'-6"



SCALE 3/4" = 1'-0"



FRONT VIEW

CLOCK INNER FRAME

NOTES:

- BUILD 1
- STEEL FRAME COVERED WITH PORTIONS OF 3/4" AC PLYWOOD AND LAUAN
- HATCHED AREAS INDICATED OPEN AREAS
- SCAB SHEETS TOGETHER AS NEEDED AND FILL ALL SEAMS THAT DON'T BREAK APART
- 480lbs

CUT LIST

PORTLAND CENTER STAGE		CL-4
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMAW	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15 APPROV:

 REVISED 11/17/15

CLOCK INNER FRAME (FRAMING)

NOTES:

- BUILD 1
- ALL BUILT OUT OF STEEL, WELDED
- FRAME OUTER RING OUT OF 1X2" STEEL TUBE LAID FLAT, PRE BENT
- INNER FRAME IS 1" SQ STEEL TUBE

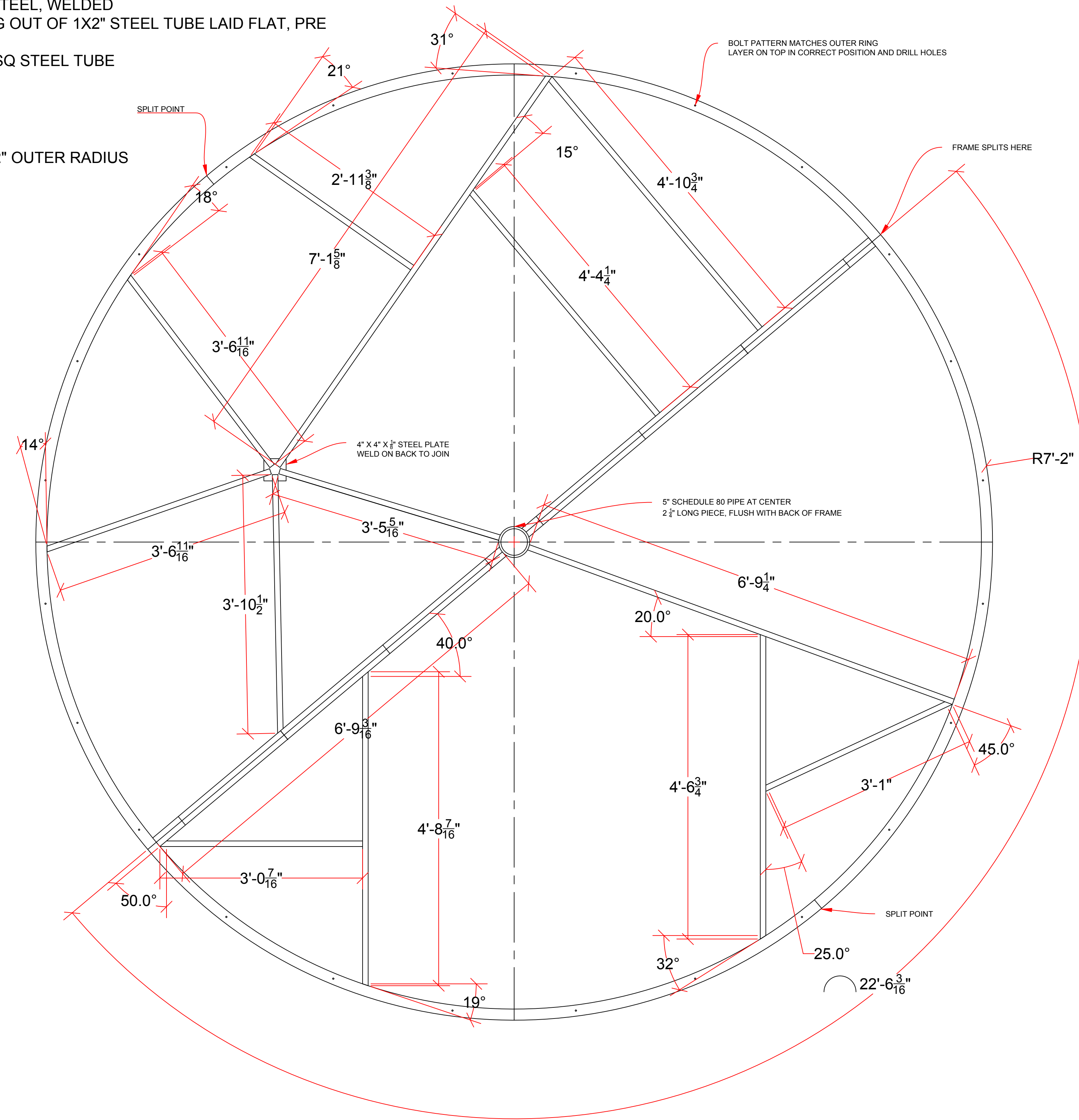
CUT LIST

1" X 2" STEEL TUBE
2@ 22'-6 ³/₁₆" , BENT TO 7'-2" OUTER RADIUS

1" SQ STEEL TUBE

- 1@ 7'-1 ⁵/₈" , <31°
- 4@ 6'-9 ³/₁₆"
- 1@ 6'-9 ¹/₄"
- 1@ 4'-10 ³/₄" , <15°
- 1@ 4'-8 ⁷/₁₆" , <19°>40°
- 1@ 4'-6 ³/₄" , <20°>32°
- 1@ 4'-4 ¹/₄" , <15°
- 1@ 3'-6 ¹¹/₁₆" , <14°
- 1@ 3'-6 ¹¹/₁₆" , <18°
- 1@ 3'-5 ⁵/₁₆"
- 1@ 3'-1" , <25°>45°
- 1@ 3'-0 ⁷/₁₆" , <50°
- 1@ 2'-11 ³/₈" , <21°

5" SCH 80 PIPE
1@ 2"



FRONT VIEW

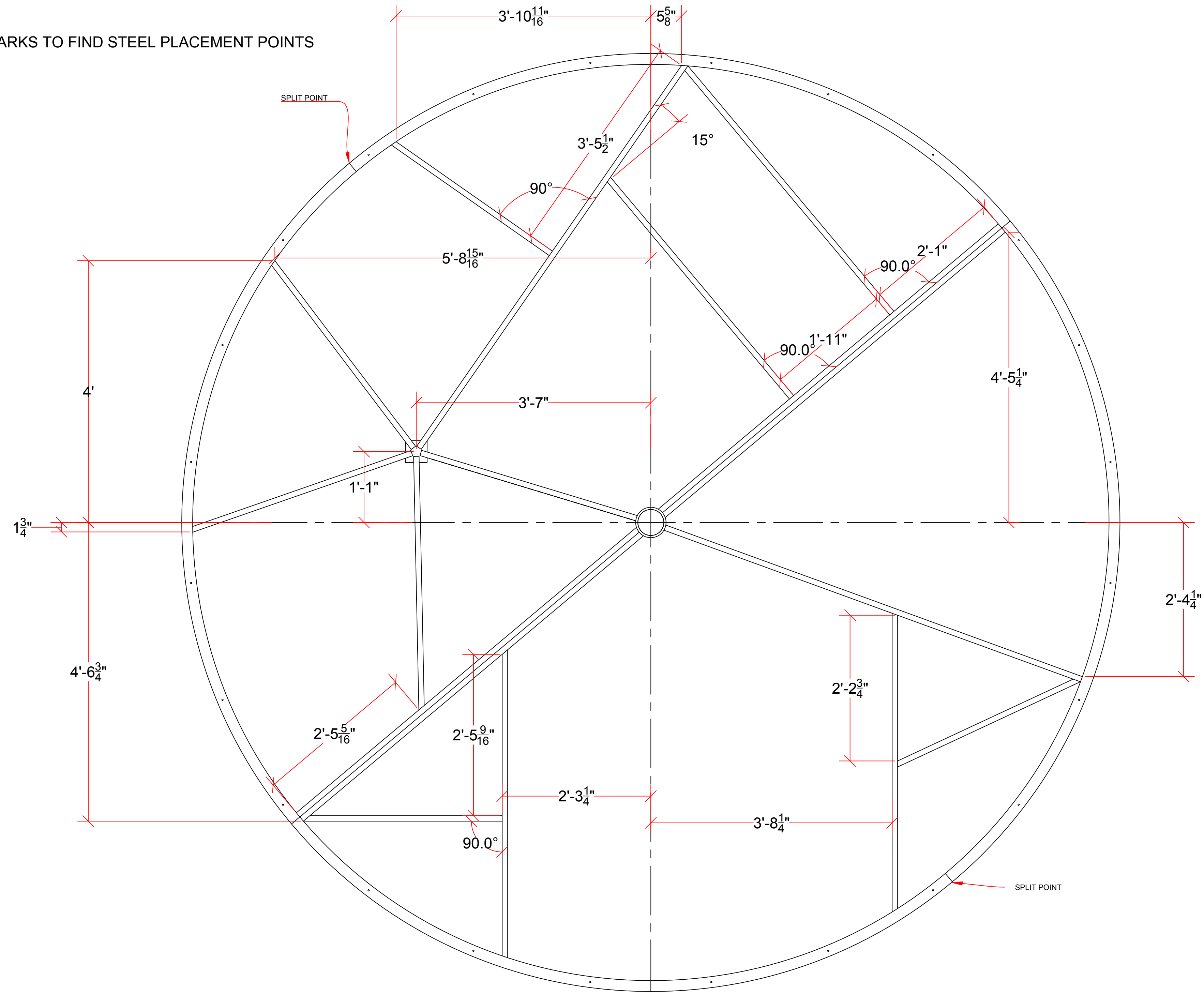
PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON		
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE		
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-5

 REVISED 11/17/15

CLOCK INNER FRAME (STEEL POSITIONING)

- NOTES:
- USE CENTER MARKS TO FIND STEEL PLACEMENT POINTS



FRONT VIEW

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON		
DESIGNER: CHRISTOPHER MUMMA	DRAFTER: DSE		
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-6

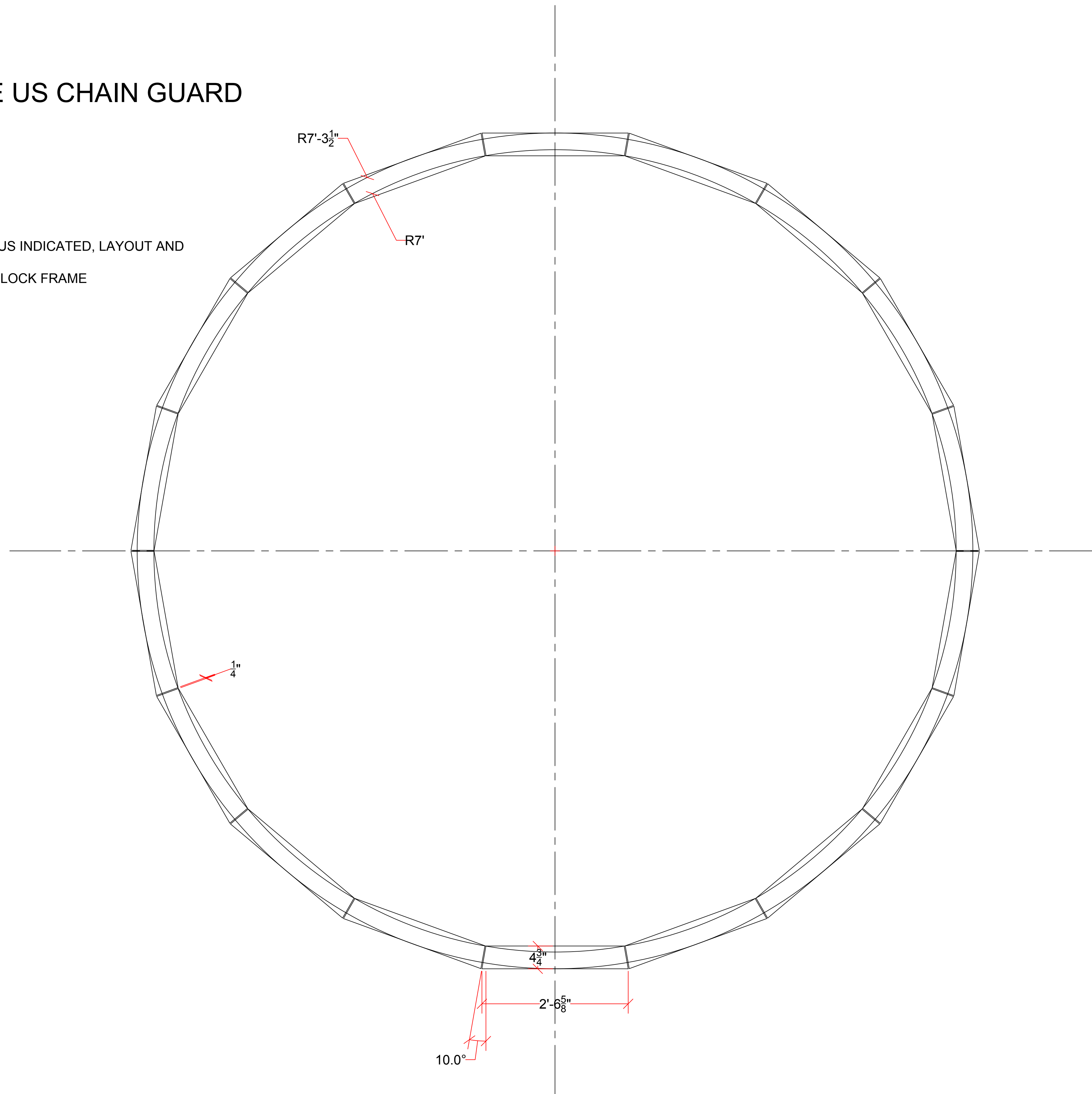
CLOCK INNER FRAME US CHAIN GUARD

NOTES:

- BUILD 1
- OSB STRIPS RIPPED AND CUT TO RADIUS INDICATED, LAYOUT AND TRACE RADIUS TO CUT.
- SCREWED TO BACK OF INNER STEEL CLOCK FRAME

CUT LIST:

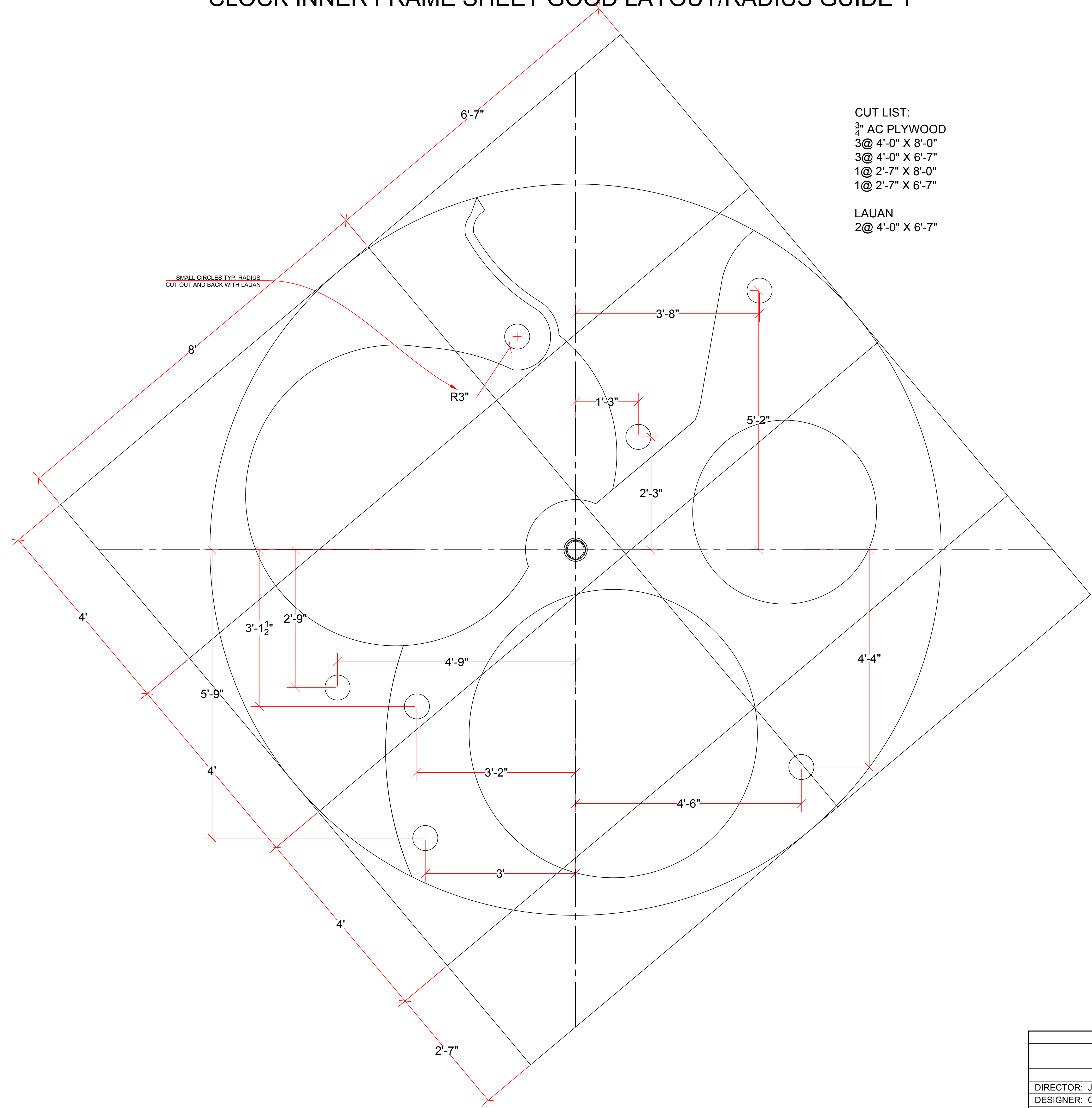
$\frac{3}{4}$ " OSB
 18@ 0'-4 $\frac{3}{4}$ " X 2'-6 $\frac{5}{8}$ " , <10°>10° FLAT



PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMMA		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-7

CLOCK INNER FRAME SHEET GOOD LAYOUT/RADIUS GUIDE 1



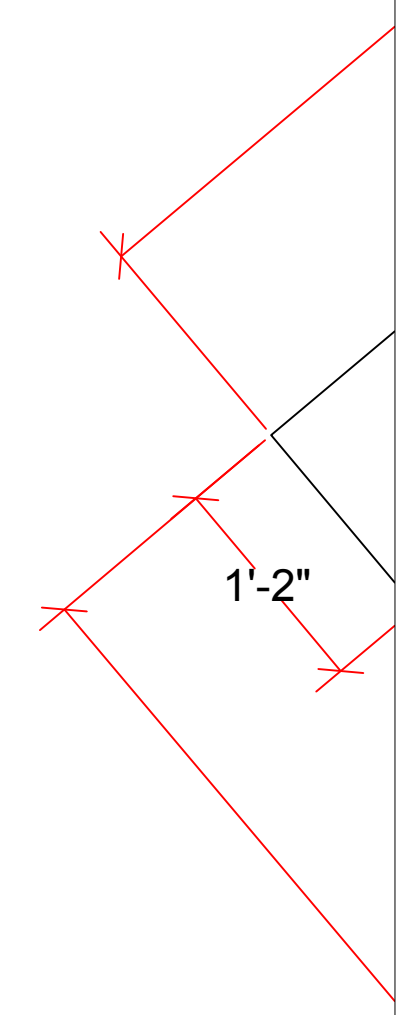
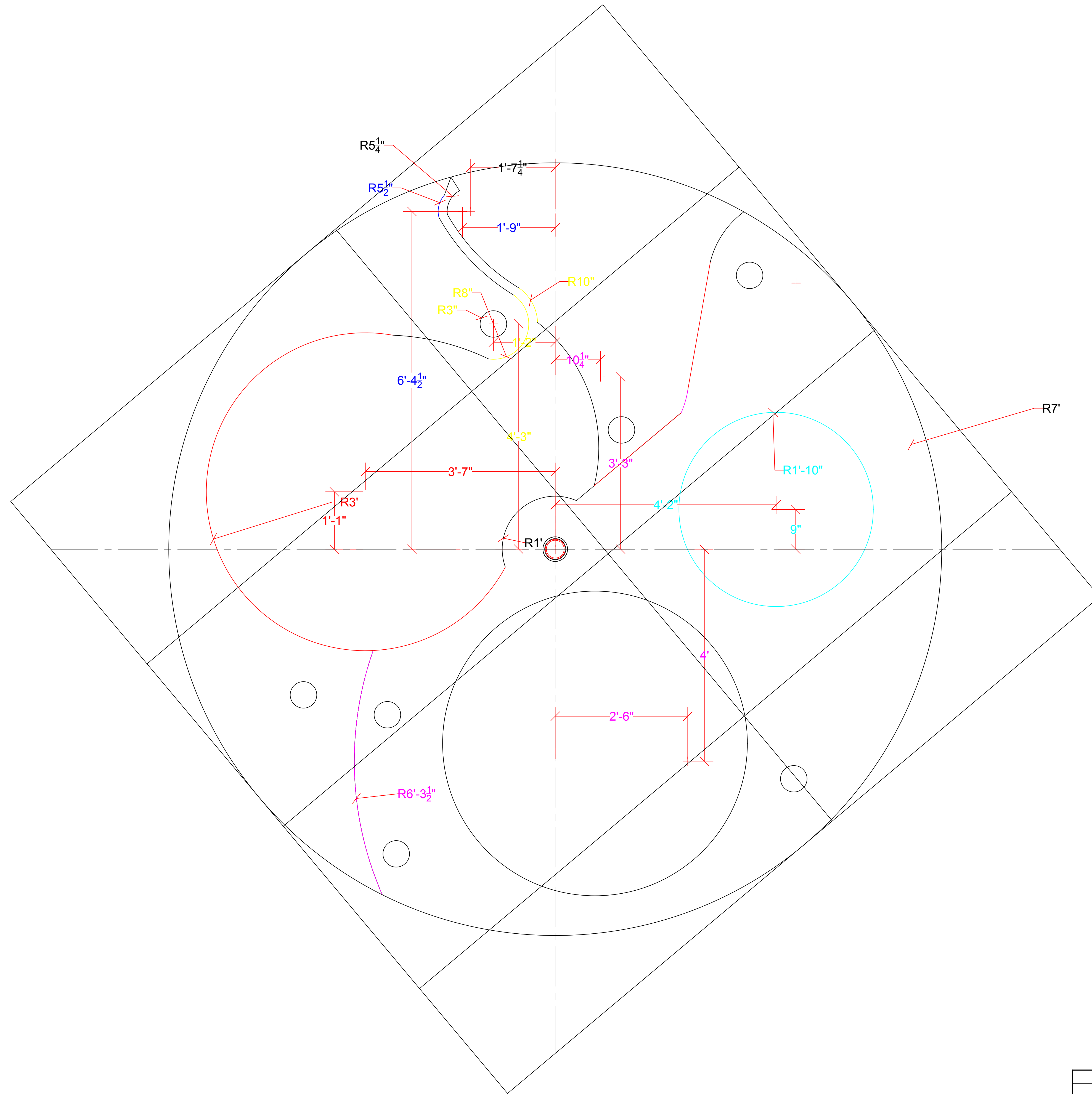
- CUT LIST:
 3/4" AC PLYWOOD
 3@ 4'-0" X 8'-0"
 3@ 4'-0" X 6'-7"
 1@ 2'-7" X 8'-0"
 1@ 2'-7" X 6'-7"

 LAUAN
 2@ 4'-0" X 6'-7"

SMALL CIRCLES TYP. RADIUS
 CUT OUT AND BACK WITH LAUAN

PORTLAND CENTER STAGE		CL-8
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	APPROV:
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0" REV: 11/04/15	

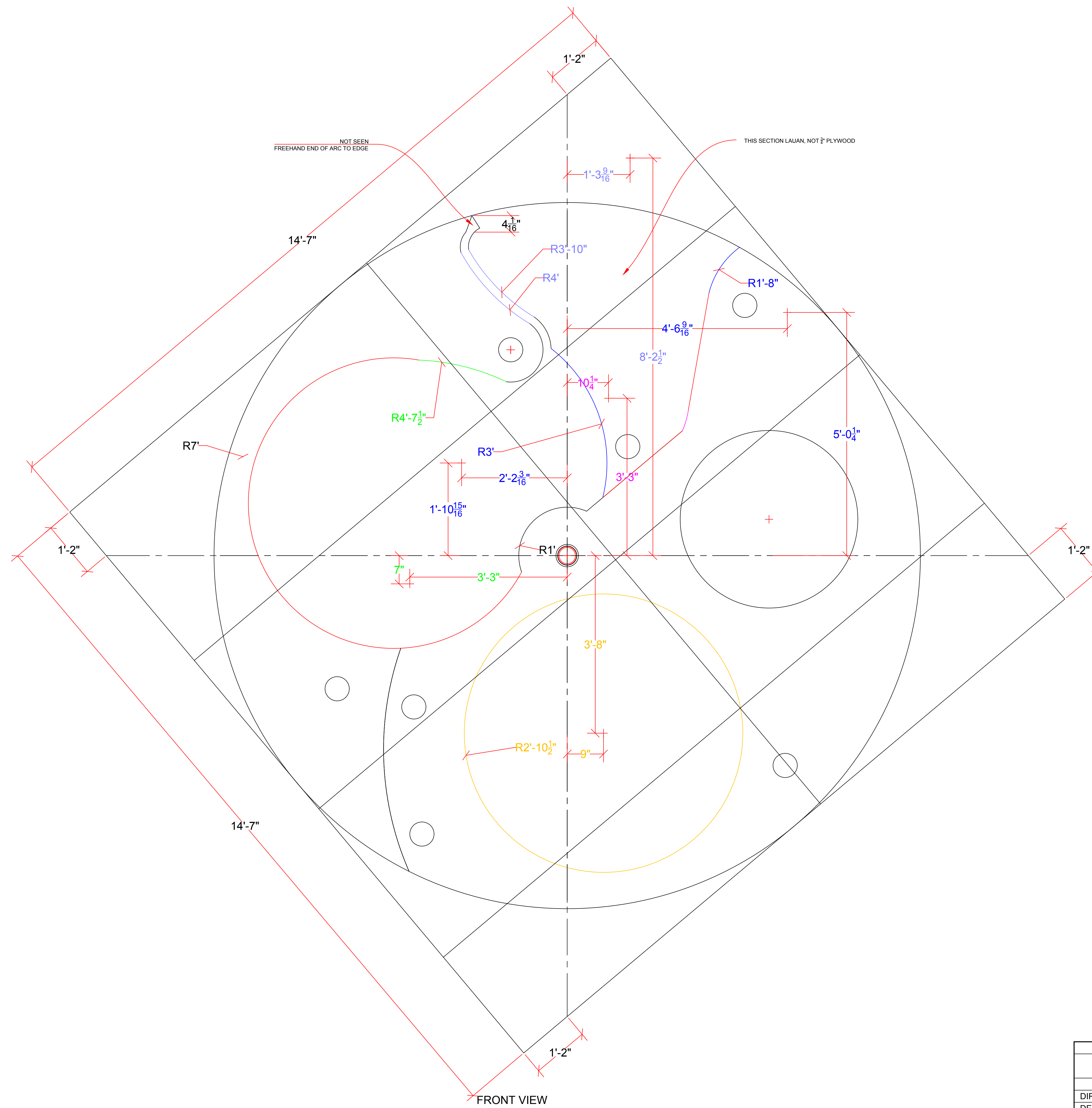
CLOCK INNER FRAME SHEET GOOD LAYOUT/RADIUS GUIDE 2



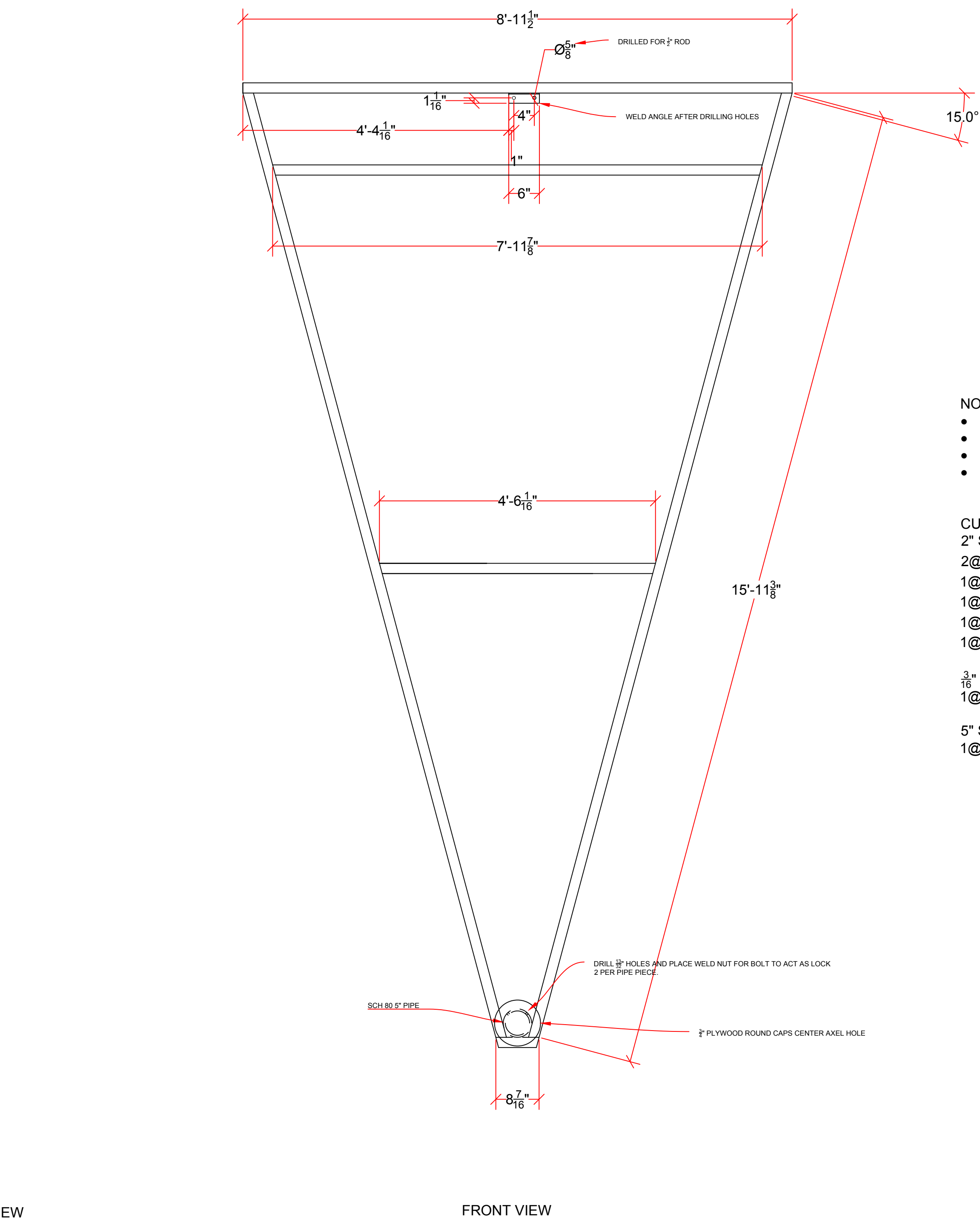
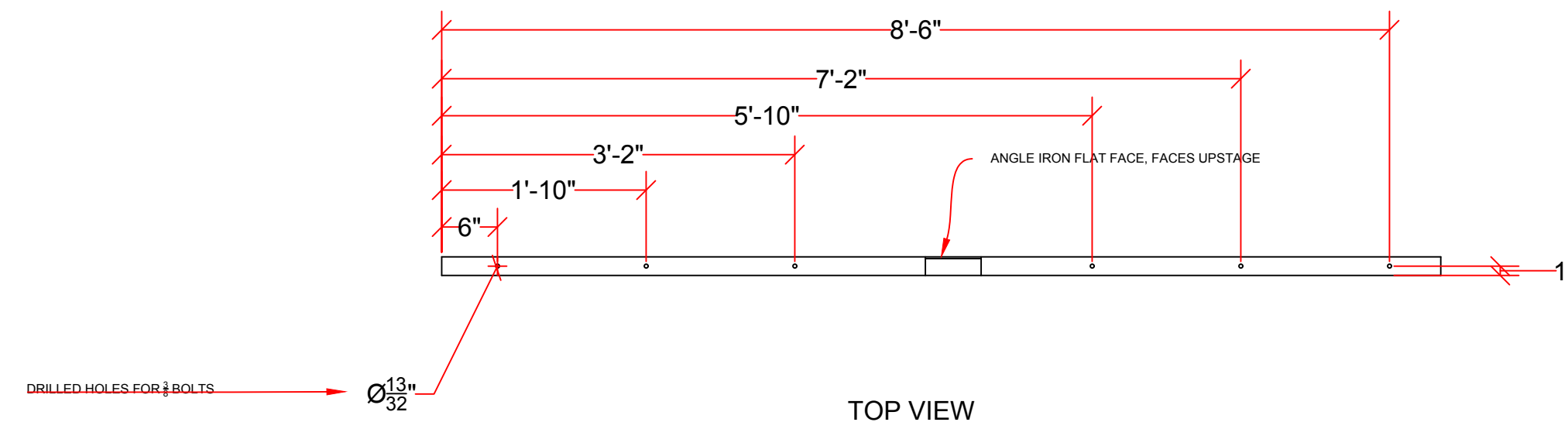
FRONT VIEW

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMAW		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-9



PORTLAND CENTER STAGE				CL-10
GREAT EXPECTATIONS				
CLOCK ASSEMBLY				
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON			APPROV:
DESIGNER: CHRISTOPHER MUMMA	DRAFTER: DSE			
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15		

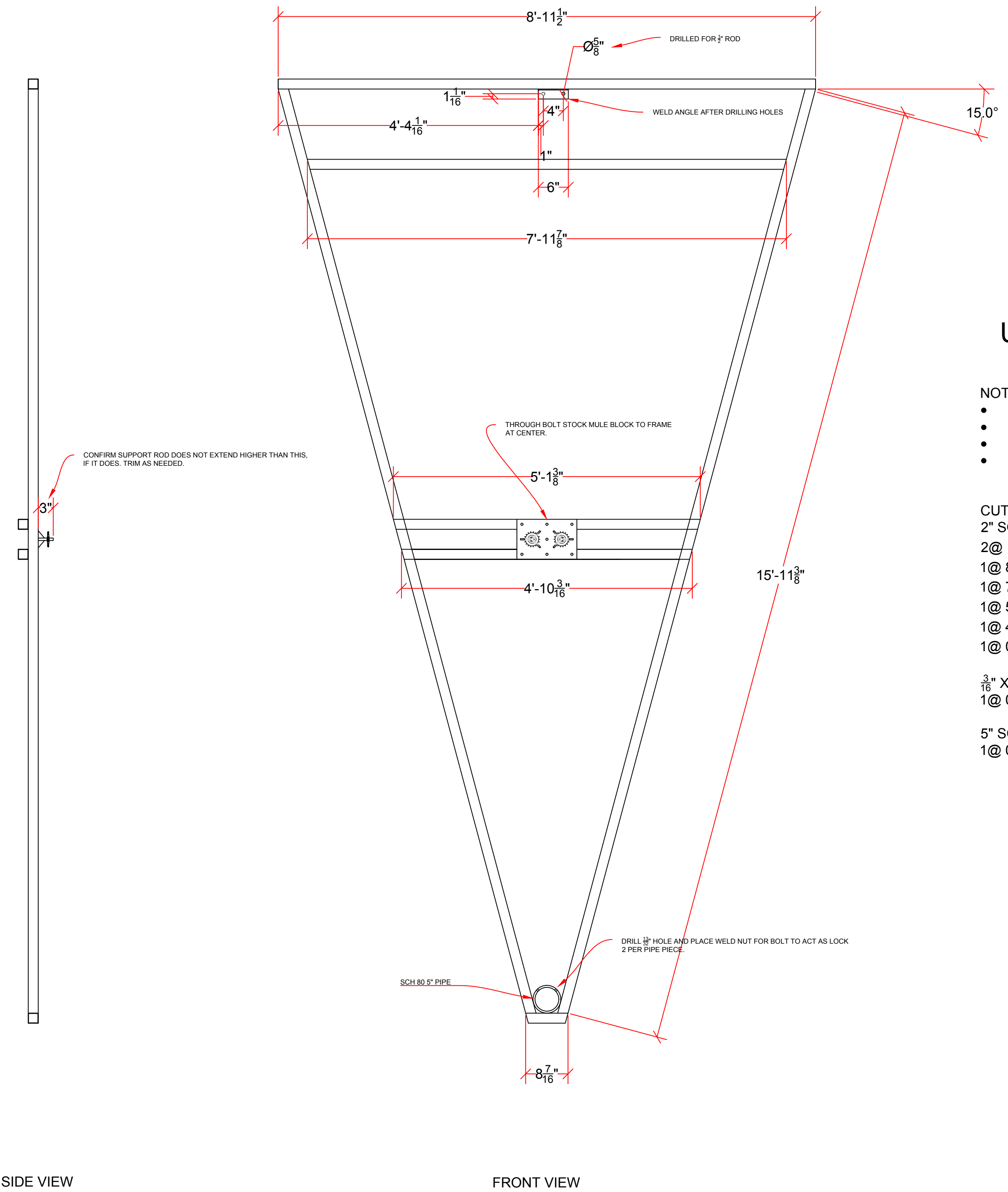
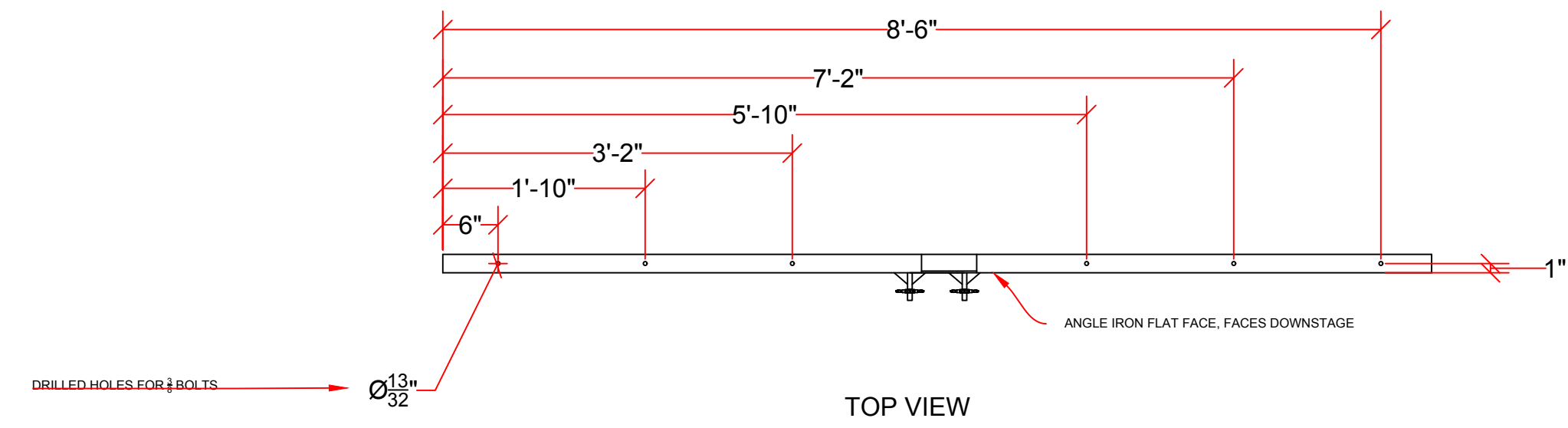


DS CLOCK HANGER

- NOTES:
- BUILD 1
 - FRAME OUT OF 2" SQ STEEL TUBING
 - WELD AND GRIND ALL JOINTS

- CUT LIST:
- 2" SQ STEEL TUBING
 - 2@ 15'-11 3/8", <15°>15°
 - 1@ 8'-11 1/2"
 - 1@ 7'-11 7/8", <15°>15°
 - 1@ 4'-6 1/16", <15°>15°
 - 1@ 0'-8 7/16", <15°>15°

- 3/16" X 2" X 2" ANGLE IRON
- 1@ 0'-6"
- 5" SCH 80 PIPE
- 1@ 0'-2"



US CLOCK HANGER

- NOTES:
- BUILD 1
 - FRAME OUT OF 2" SQ STEEL TUBING
 - WELD AND GRIND ALL JOINTS

- CUT LIST:
- 2" SQ STEEL TUBING
 - 2@ 15'-11 3/8", <15°>15°
 - 1@ 8'-11 1/2"
 - 1@ 7'-11 7/8", <15°>15°
 - 1@ 5'-1 3/8", <15°>15°
 - 1@ 4'-10 3/8", <15°>15°
 - 1@ 0'-8 7/16", <15°>15°

- 3/16" X 2" X 2" ANGLE IRON
- 1@ 0'-6"
- 5" SCH 80 PIPE
- 1@ 0'-2"

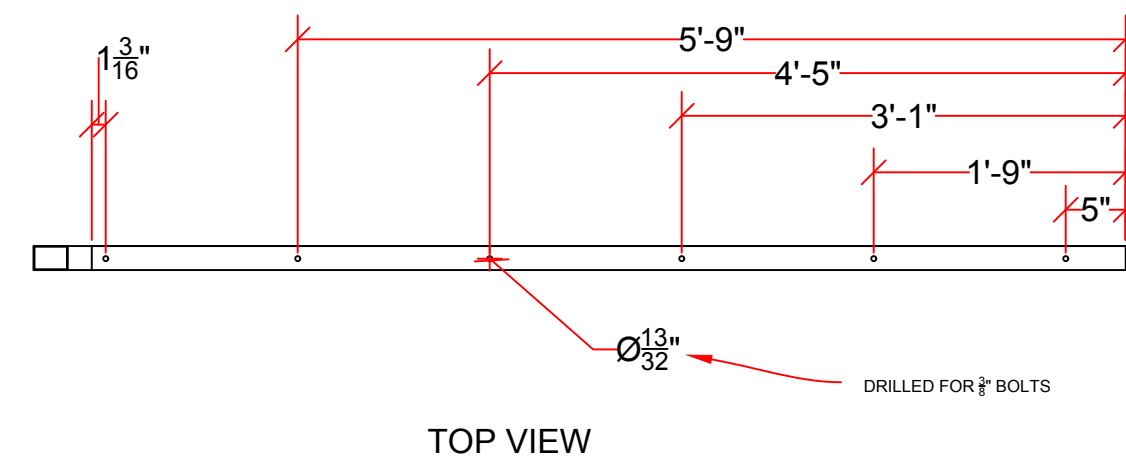
SIDE VIEW

FRONT VIEW

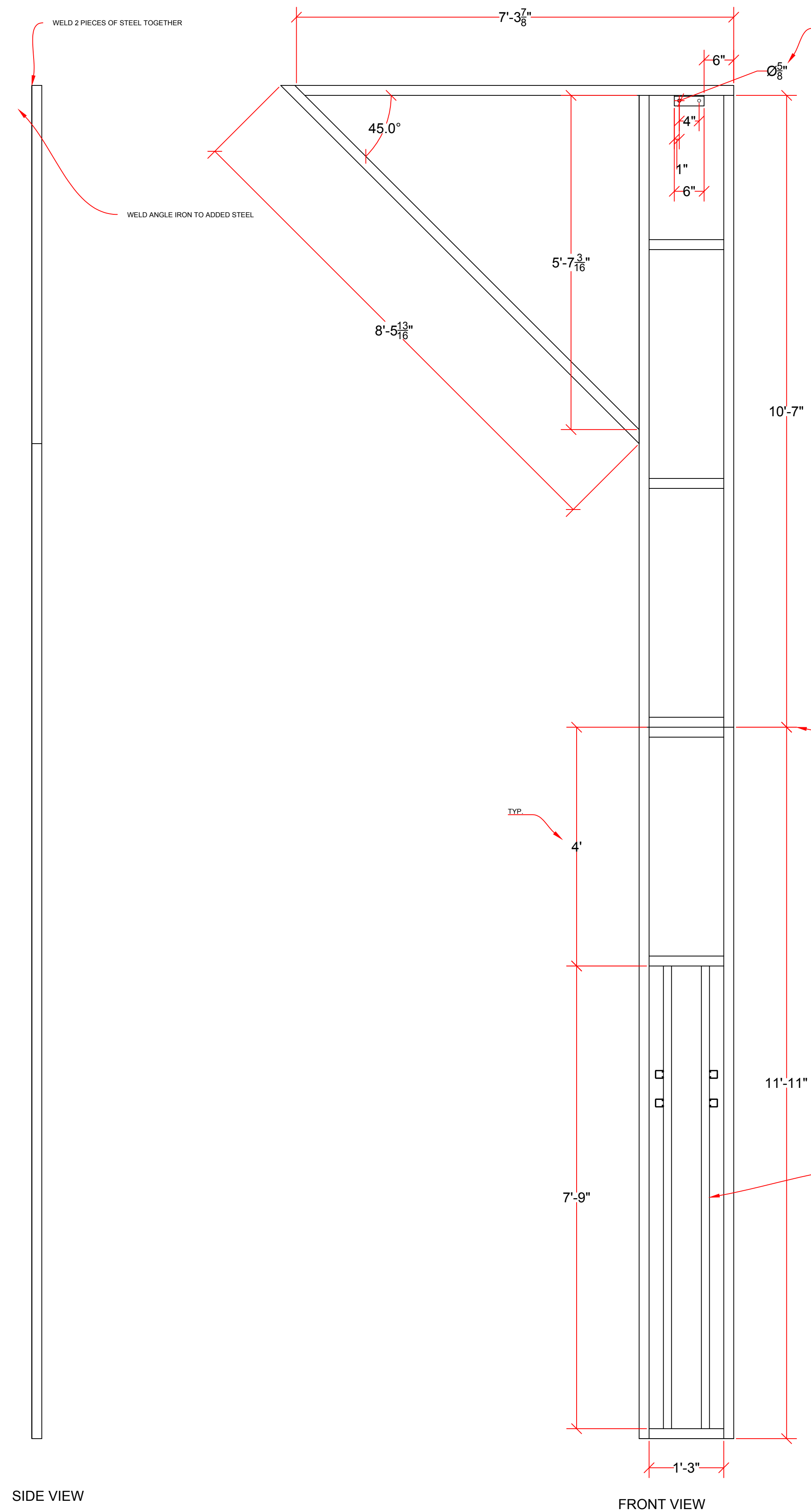
SIDE VIEW

FRONT VIEW

PORTLAND CENTER STAGE		CL-11
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	APPROV:
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0" REV: 11/04/15	



TOP VIEW



FRONT VIEW

SIDE VIEW

**⚠ REVISED 12-15-15
CLOCK MOTOR HANGER**

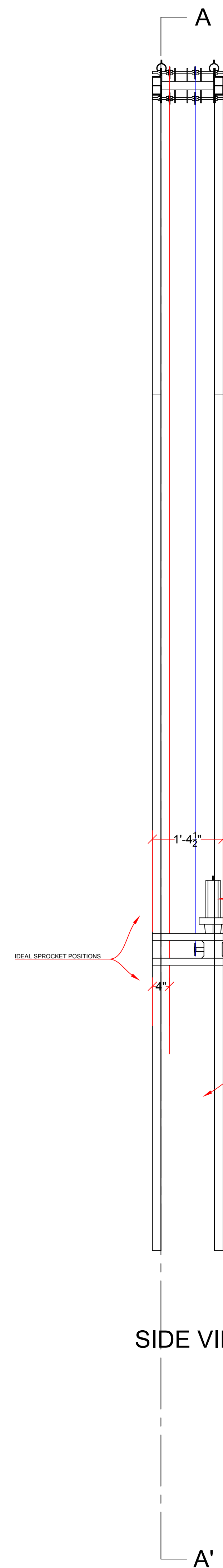
- NOTES:
- BUILD 2 R/R
 - FRAME OUT OF 2" SQ STEEL TUBING
 - WELD AND GRIND ALL JOINTS

- CUT LIST:
- 2" SQ STEEL TUBING
 - 4@ 11'-11"
 - 4@ 10'-7"
 - 2@ 8'-5 13/16", <45°>45°
 - 2@ 7'-3 7/8", <45°>
 - 10@ 1'-3"

- UNISTRUT
- 4@ 7'-9"
 - 4@ 1'-4 1/2"
- 3/16" X 2" X 2" ANGLE IRON
- 2@ 0'-6"

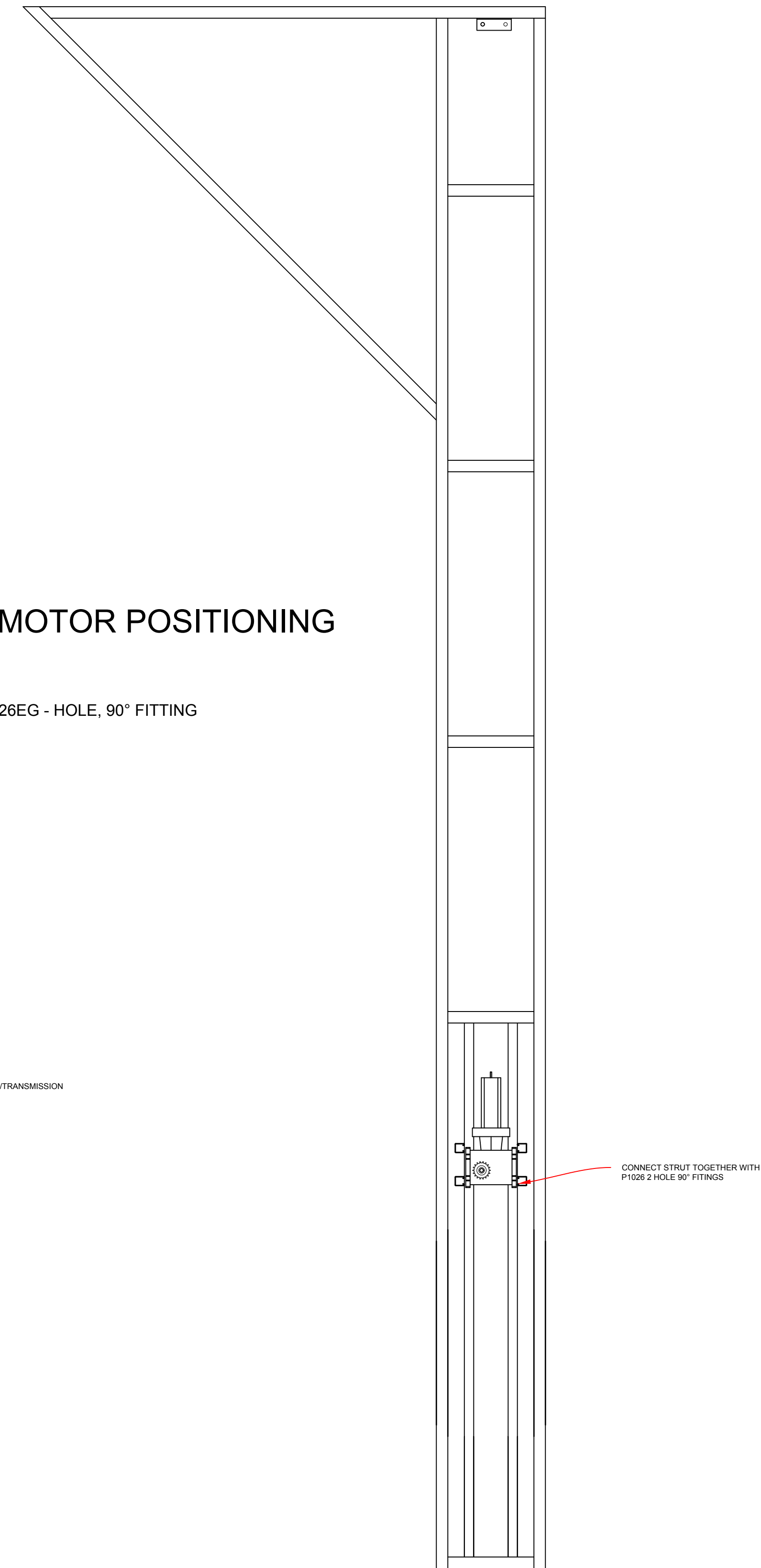
SPLIT POINT, BOLT TOGETHER

2 VERTICAL LENGTHS OF UNISTRUT, WELDED INTO FRAME
LEFT/RIGHT SPACING TBD ON MOTOR MOUNTING HOLES.
POSSIBLE NEED TO DRILL ADDITIONAL HOLES IN MOTOR CAGE.



SIDE VIEW

A'



SECTION A-A'

CLOCK MOTOR POSITIONING

- PARTS LIST:
- 8@ UNISTRUT P1026EG - HOLE, 90° FITTING

PORTLAND CENTER STAGE		CL-12
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 11/11/15	SCALE: 3/4" = 1'-0"	REV: 11/04/15
APPROV:		

 REVISED 11/17/15

CLOCK RIGGING CONNECTION

NOTES:

- BUILD 1
- FRAME OUT OF 2" SQ STEEL TUBING
- WELD AND GRIND ALL JOINTS
-

CUT LIST:

2" SQ STEEL TUBING

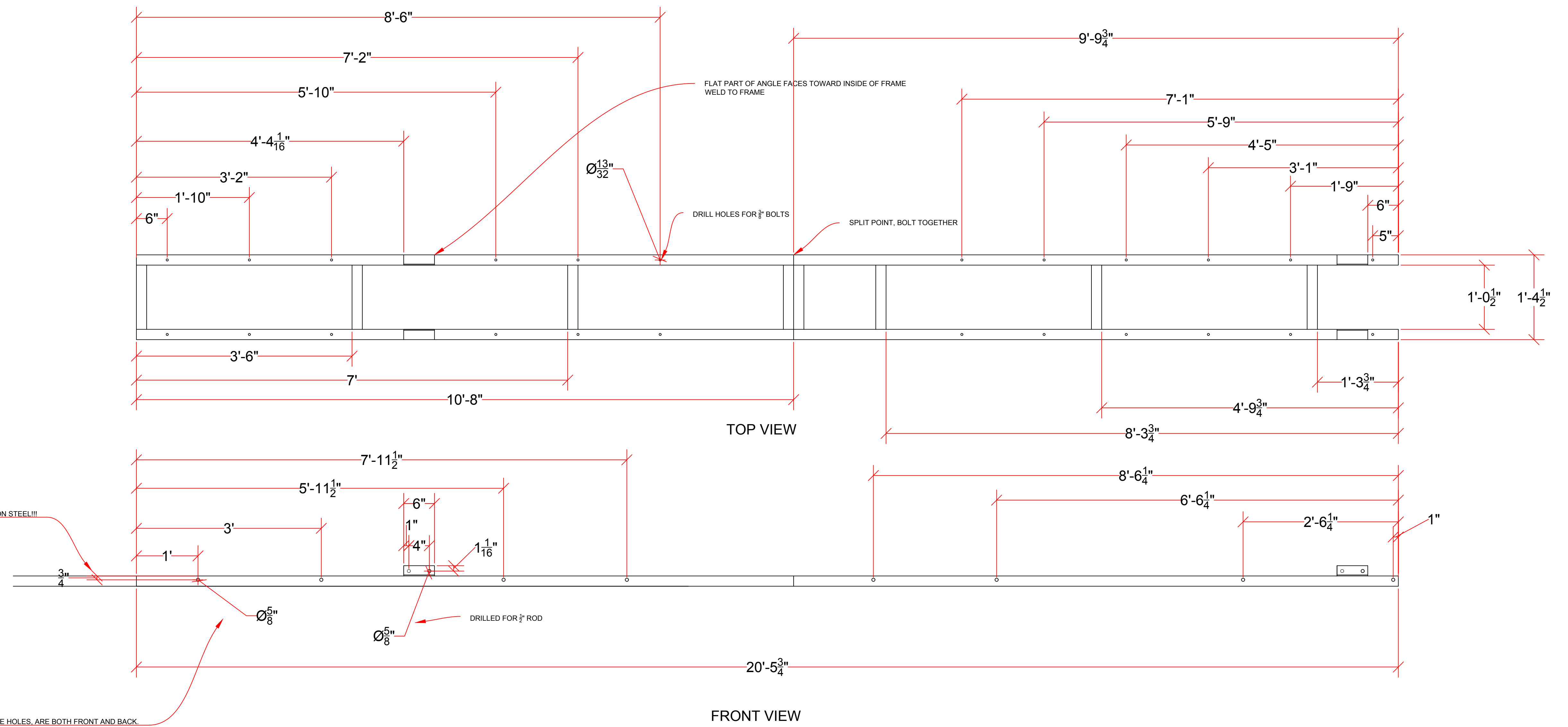
2@ 9'-9 3/4"

2@ 10'-8"

7@ 1'-0 1/2"

3/16" X 2" X 2" ANGLE IRON

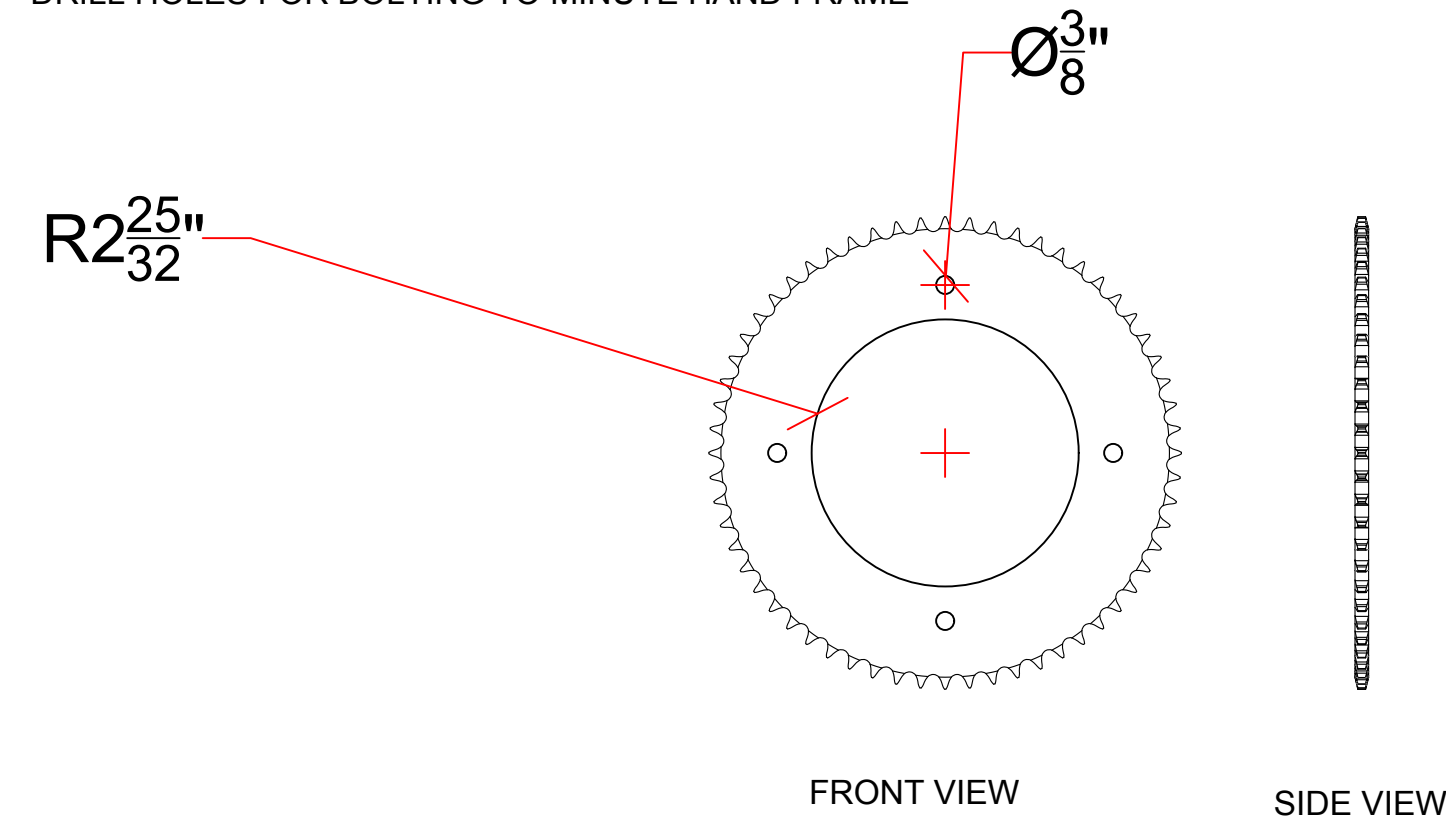
4@ 0'-6"



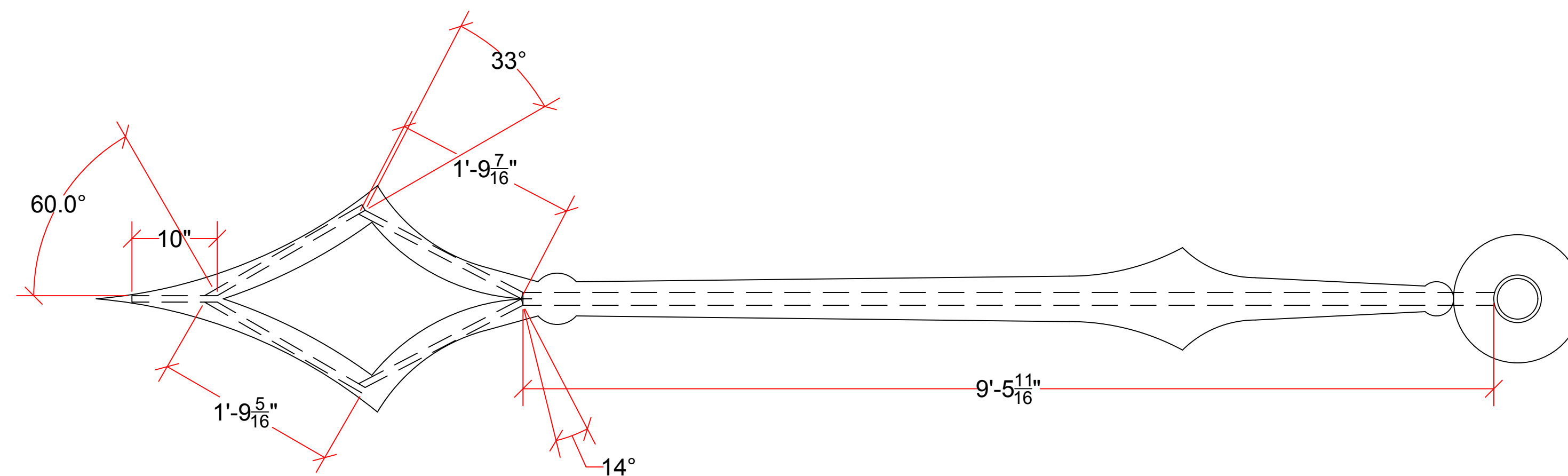
PORTLAND CENTER STAGE		CL-13
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	APPROV:
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 11/11/15	SCALE: 1" = 1'-0" REV: 11/04/15	

CLOCK MINUTE HAND SPROCKET

- NOTES:
- BUILD 1
 - PURCHASE McMaster 2299K36
 - HAVE MACHINED FOR BORE TO MATCH 5" SCH 80 PIPE OD
 - DRILL HOLES FOR BOLTING TO MINUTE HAND FRAME



SCALE 3" = 1'-0"



FRONT VIEW FRAMING

CLOCK MINUTE HAND

- NOTES:
- BUILD 1
 - CUT OUT OF 1/2" MDF
 - ROUND ALL EDGES OF MDF
 - BACKING FRAME IS 3/4" SQ STEEL AND 3/4" X 1 1/2" STEEL TUBE WELDED
 - HUB IS 5" SCH. 80 PIPE WELDED ON

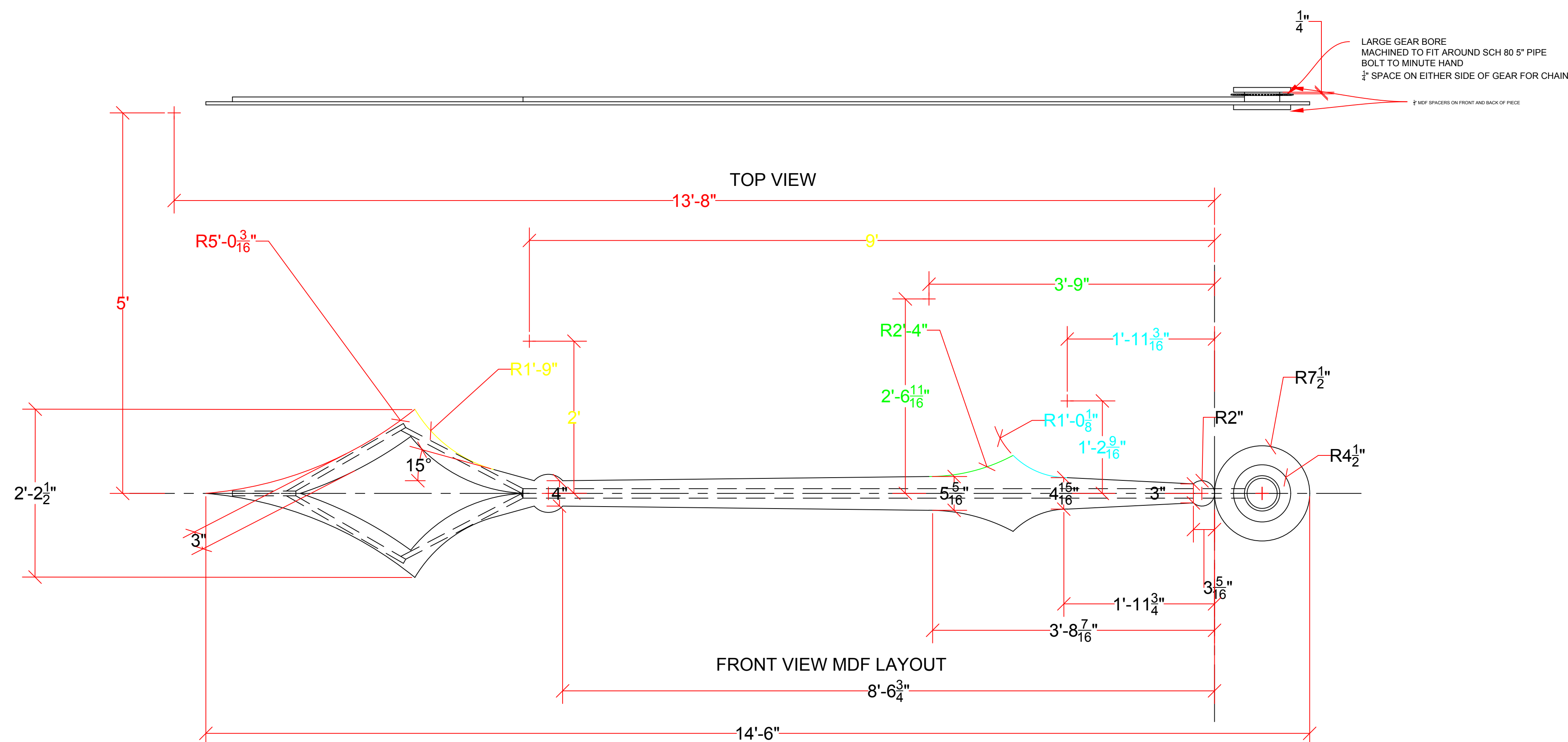
CUT LIST:

3/4" X 1 1/2" STEEL TUBE
1 @ 9'-5 11/16"

3/4" SQ STEEL TUBE
2 @ 1'-9 7/16", <33°>14°
2 @ 1'-9 5/16", <60°>
1 @ 0'-10"

3/4" MDF
2 @ 9" X 9", CUT INTO RINGS. OUTER R= 4 1/2" & INNER R= 2 3/8"

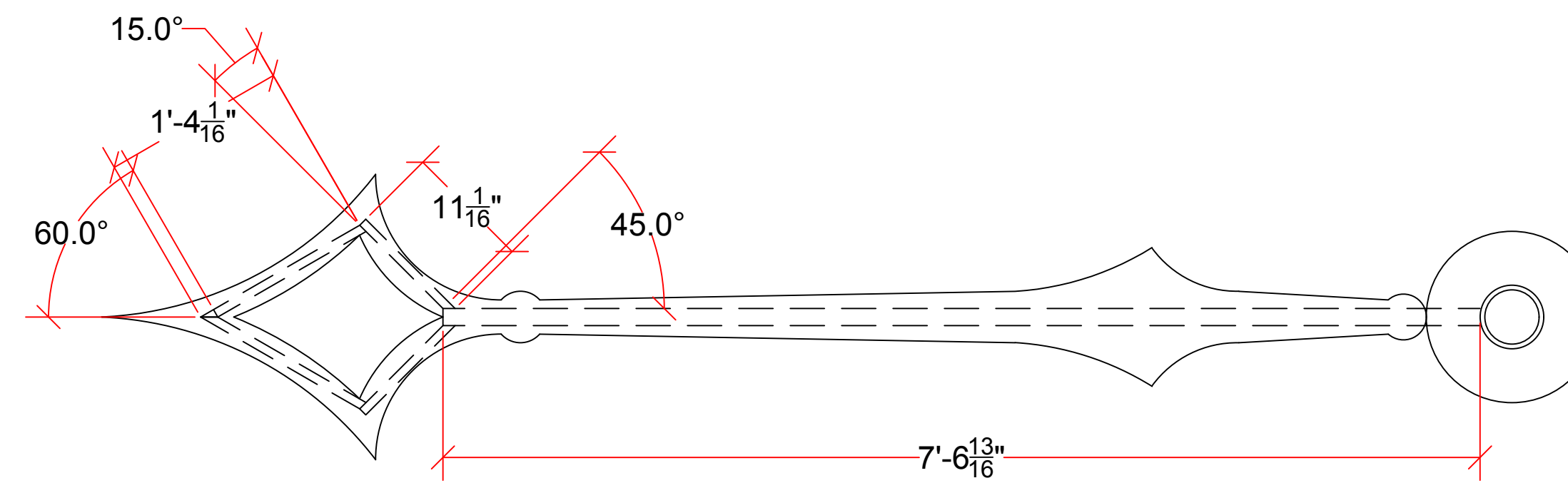
1/2" MDF
36 SQ FT, ESTIMATE FOR COVERING



FRONT VIEW MDF LAYOUT

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMAW		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-14



FRONT VIEW FRAMING

! REVISED 11/17/15

CLOCK HOUR HAND

NOTES:

- BUILD 1
- CUT OUT OF $\frac{1}{2}$ " MDF
- ROUND ALL EDGES OF MDF
- BACKING FRAME IS $\frac{3}{4}$ " SQ STEEL AND $\frac{3}{4}$ " X $1\frac{1}{2}$ " STEEL TUBE WELDED
- HUB IS 5" SCH. 80 PIPE WELDED ON

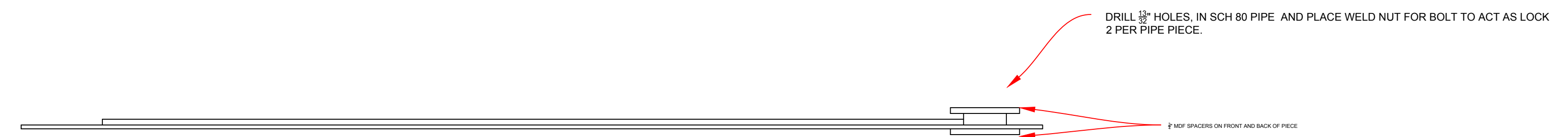
CUT LIST:

$\frac{3}{4}$ " X $1\frac{1}{2}$ " STEEL TUBE
1 @ 7'-6 $\frac{13}{16}$ "

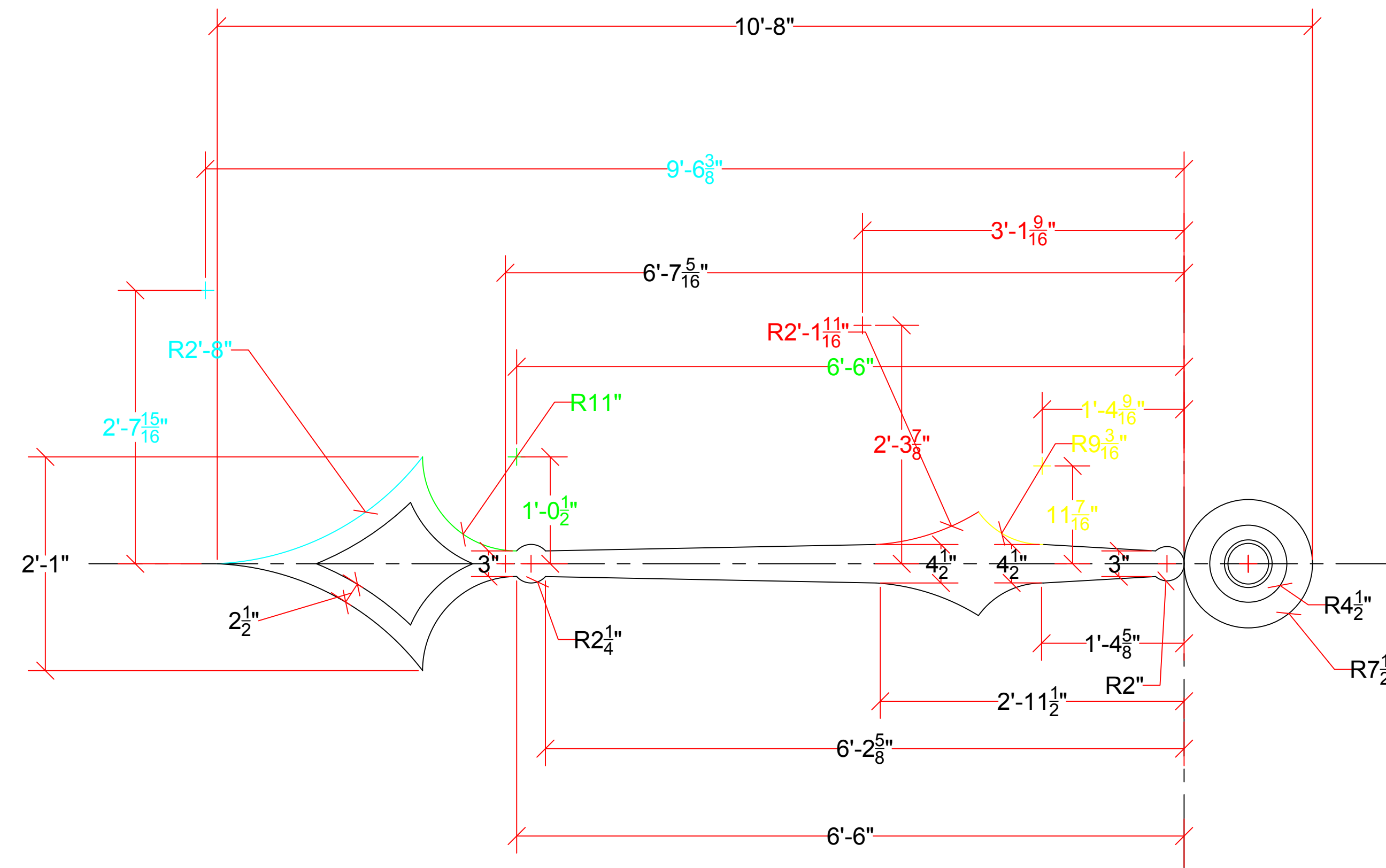
$\frac{3}{4}$ " SQ STEEL TUBE
2 @ 0'-11 $\frac{1}{16}$ ", <45°
2 @ 1'-4 $\frac{1}{16}$ ", <15°>60°

$\frac{3}{4}$ " MDF
2 @ 9" X 9", CUT INTO RINGS. OUTER R= 4 $\frac{1}{2}$ " & INNER R= 2 $\frac{3}{8}$ "

$\frac{1}{2}$ " MDF
36 SQ FT, ESTIMATE FOR COVERING



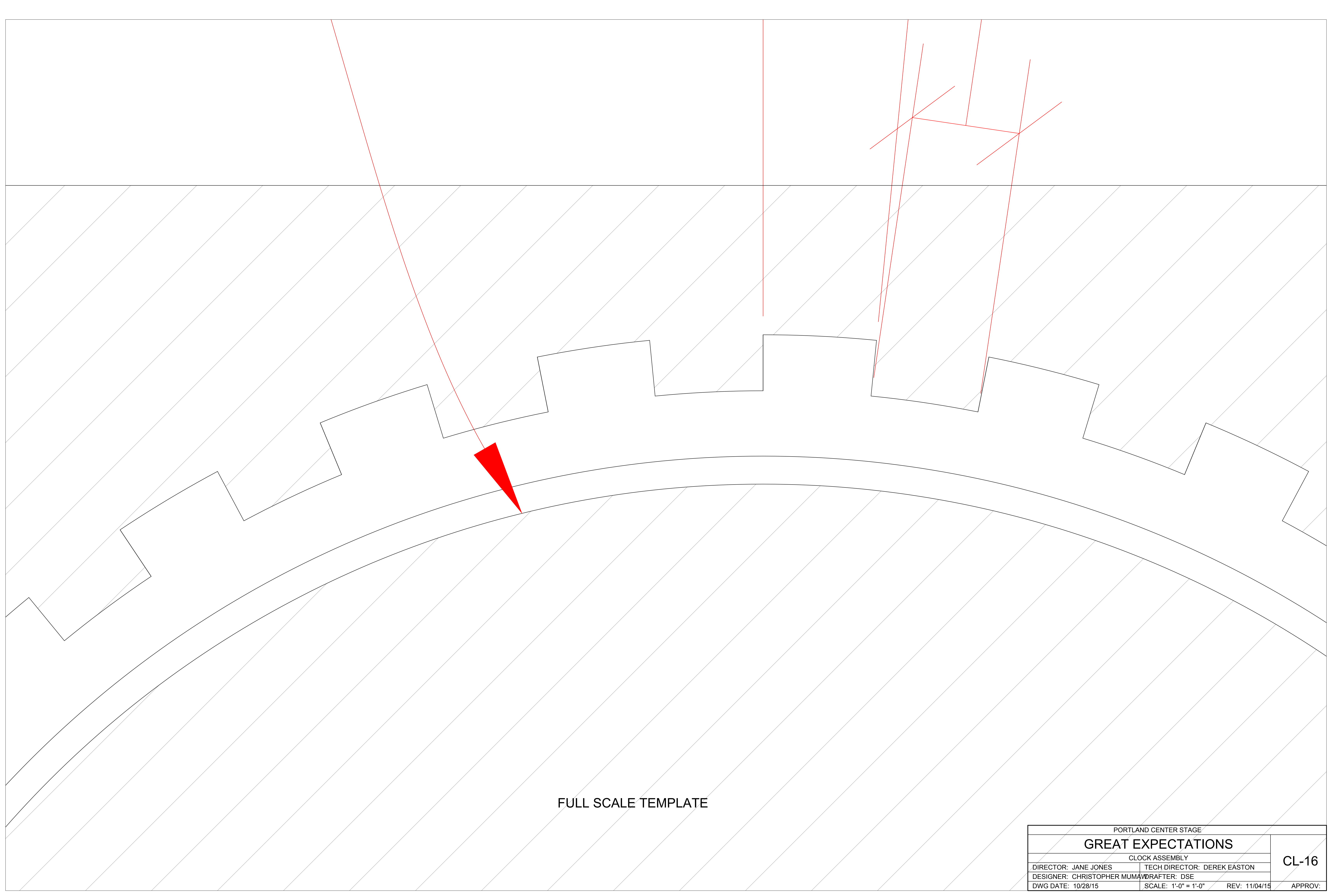
TOP VIEW



FRONT VIEW MDF LAYOUT

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMMA		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1" = 1'-0"	REV: 11/04/15	APPROV:

CL-15



FULL SCALE TEMPLATE

PORTLAND CENTER STAGE			
GREAT EXPECTATIONS			
CLOCK ASSEMBLY			
DIRECTOR: JANE JONES		TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMMA		DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1'-0" = 1'-0"	REV: 11/04/15	APPROV:

CL-16

CLOCK CHAIN MULE BLOCKS

NOTES:

- BUILD 2 R/R
- FRAME OUT OF STEEL WELDED
- GETS BOLTED TO CLOCK HANGER FRAME

CUT LIST:

2" SQ STEEL TUBING

4@ 1'-0 ¹/₈"

¹/₂" STEEL ROD

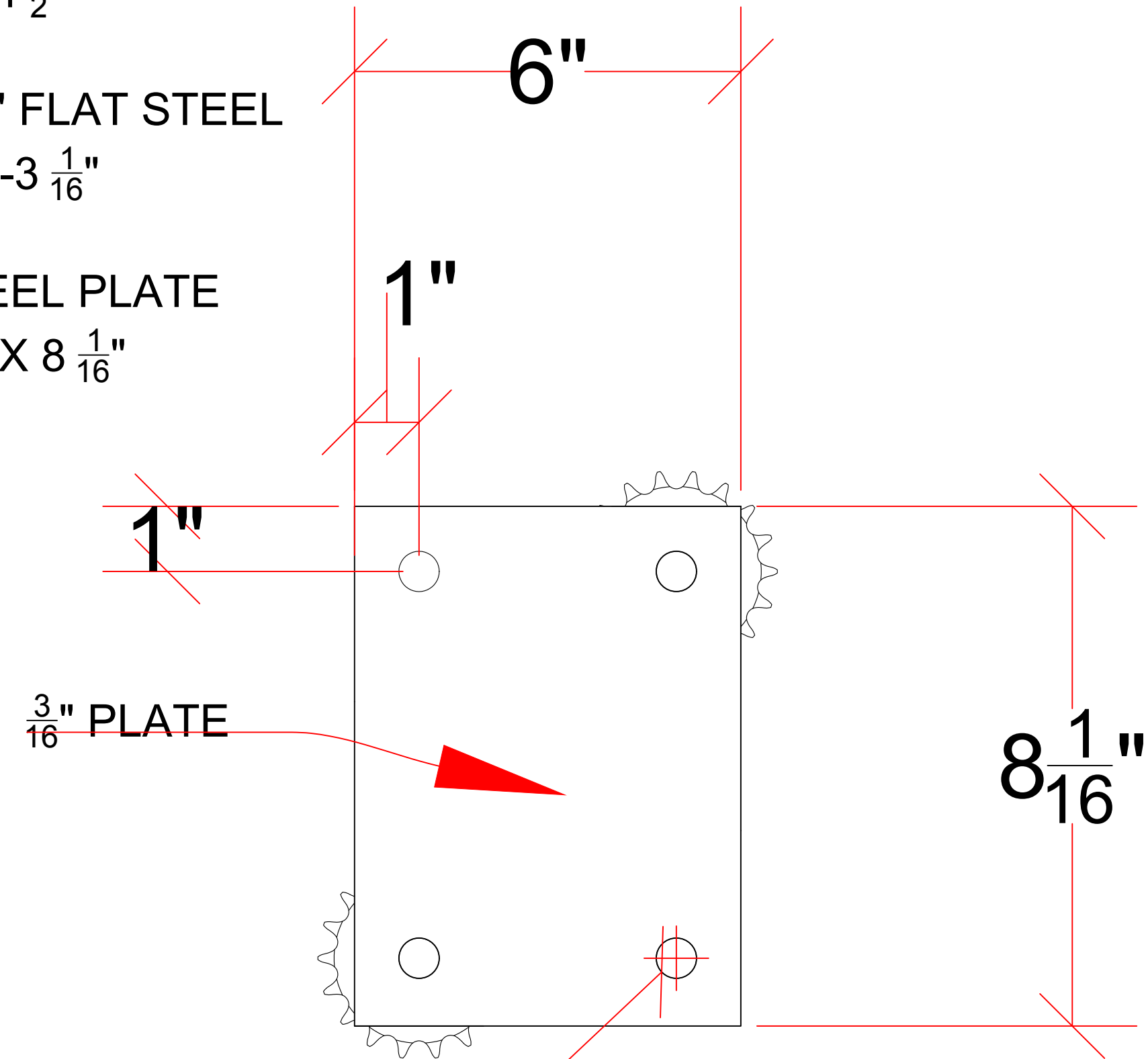
4@ 1'-4 ¹/₂"

³/₁₆" X 2" FLAT STEEL

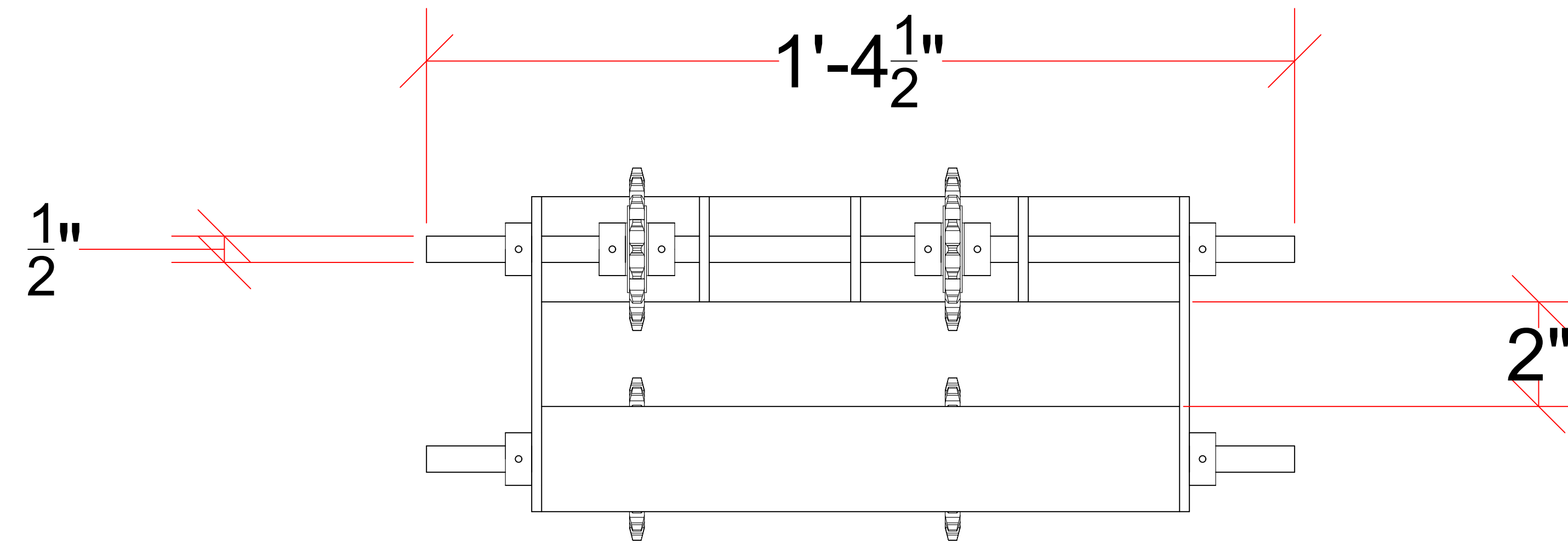
12@ 0'-3 ¹/₁₆"

³/₁₆" STEEL PLATE

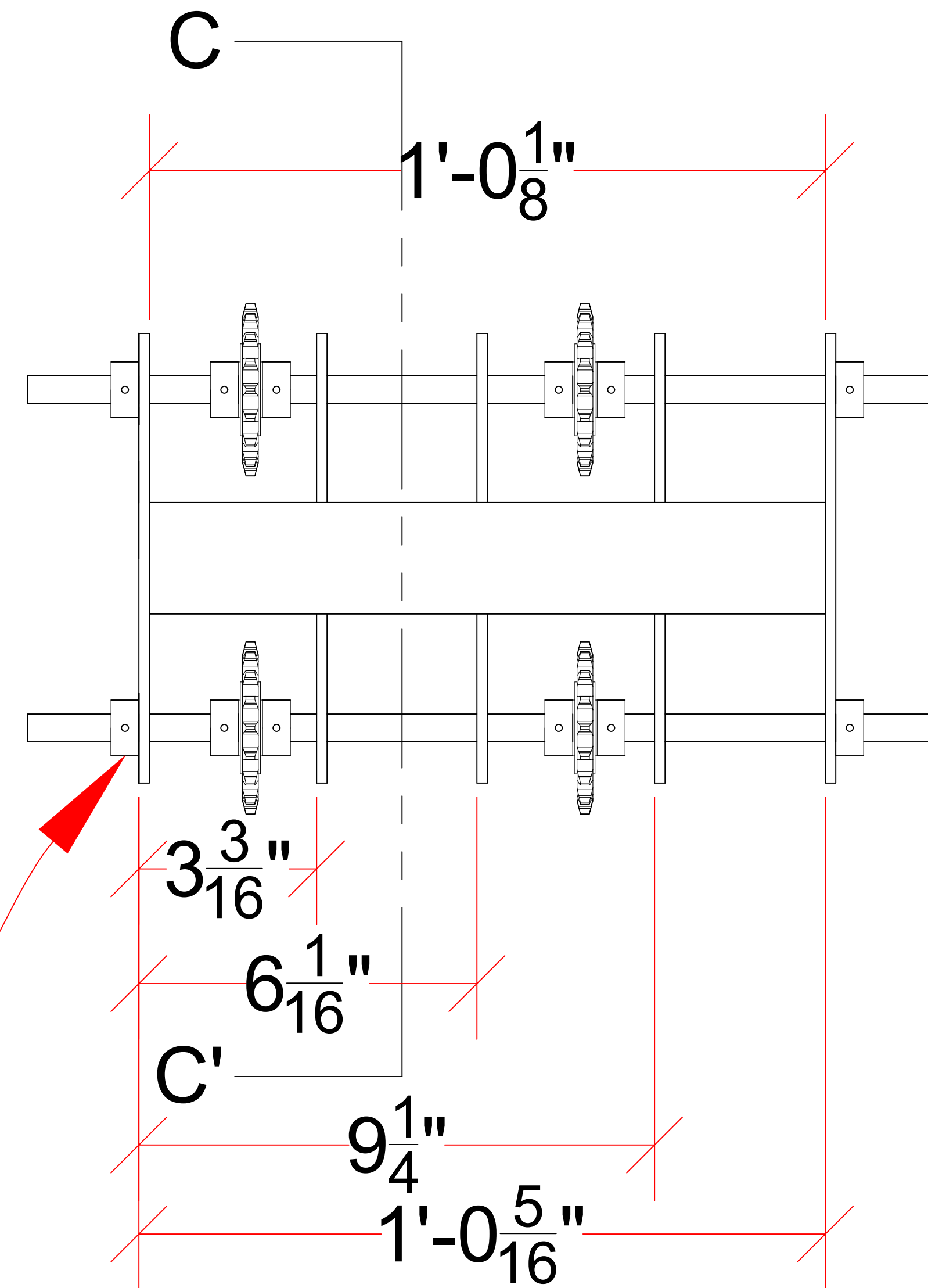
4@ 6" X 8 ¹/₁₆"



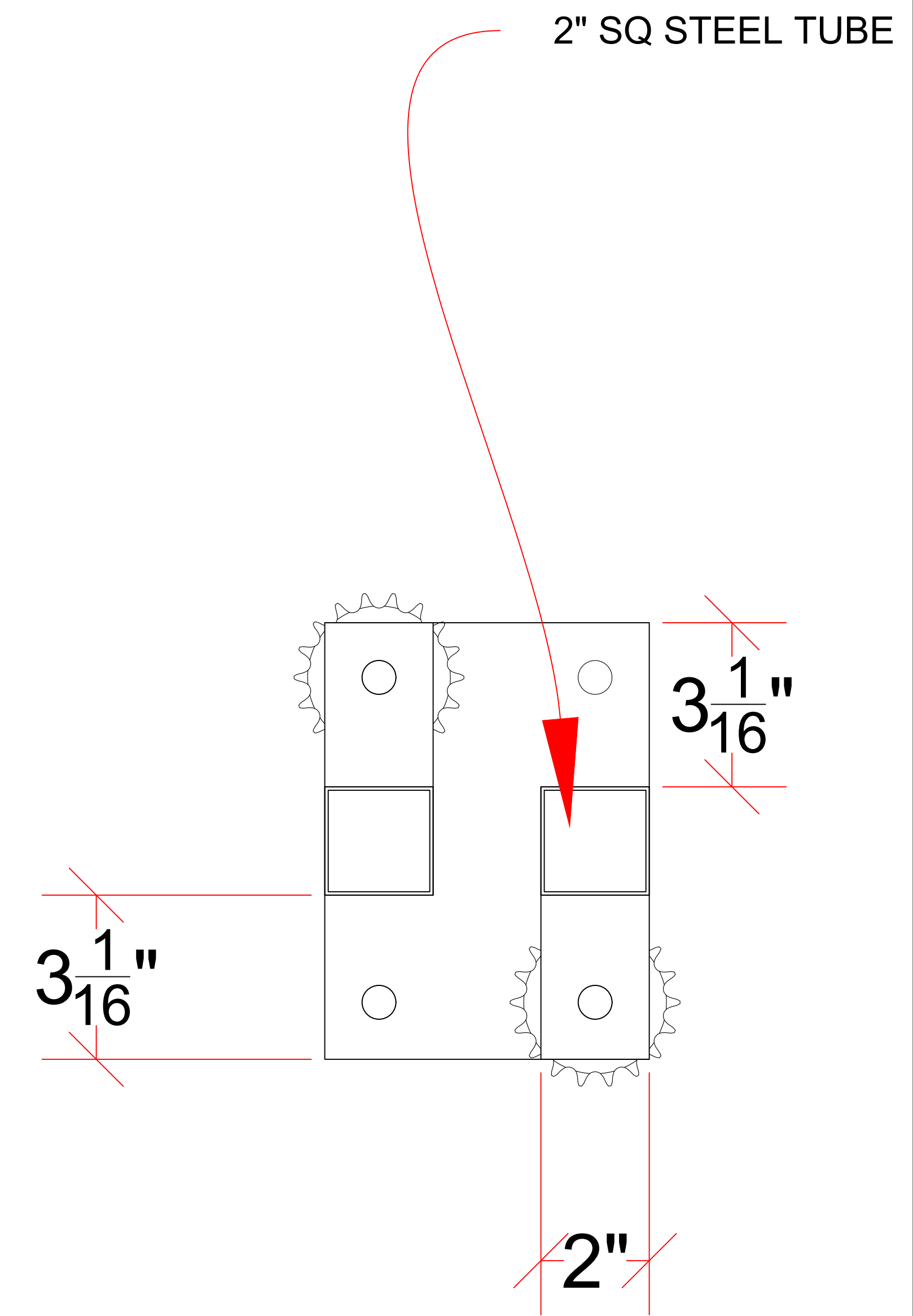
REAR VIEW



TOP VIEW



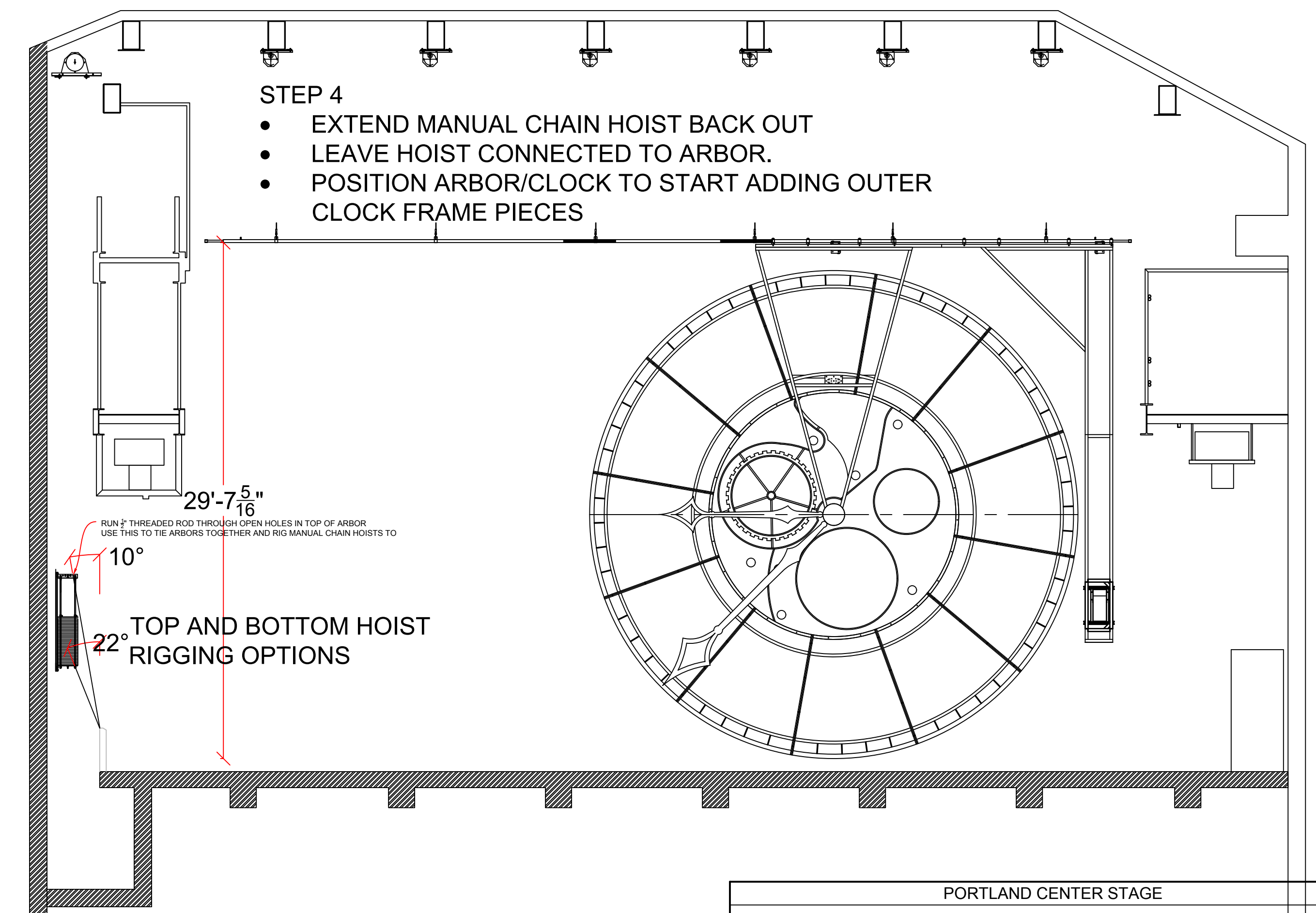
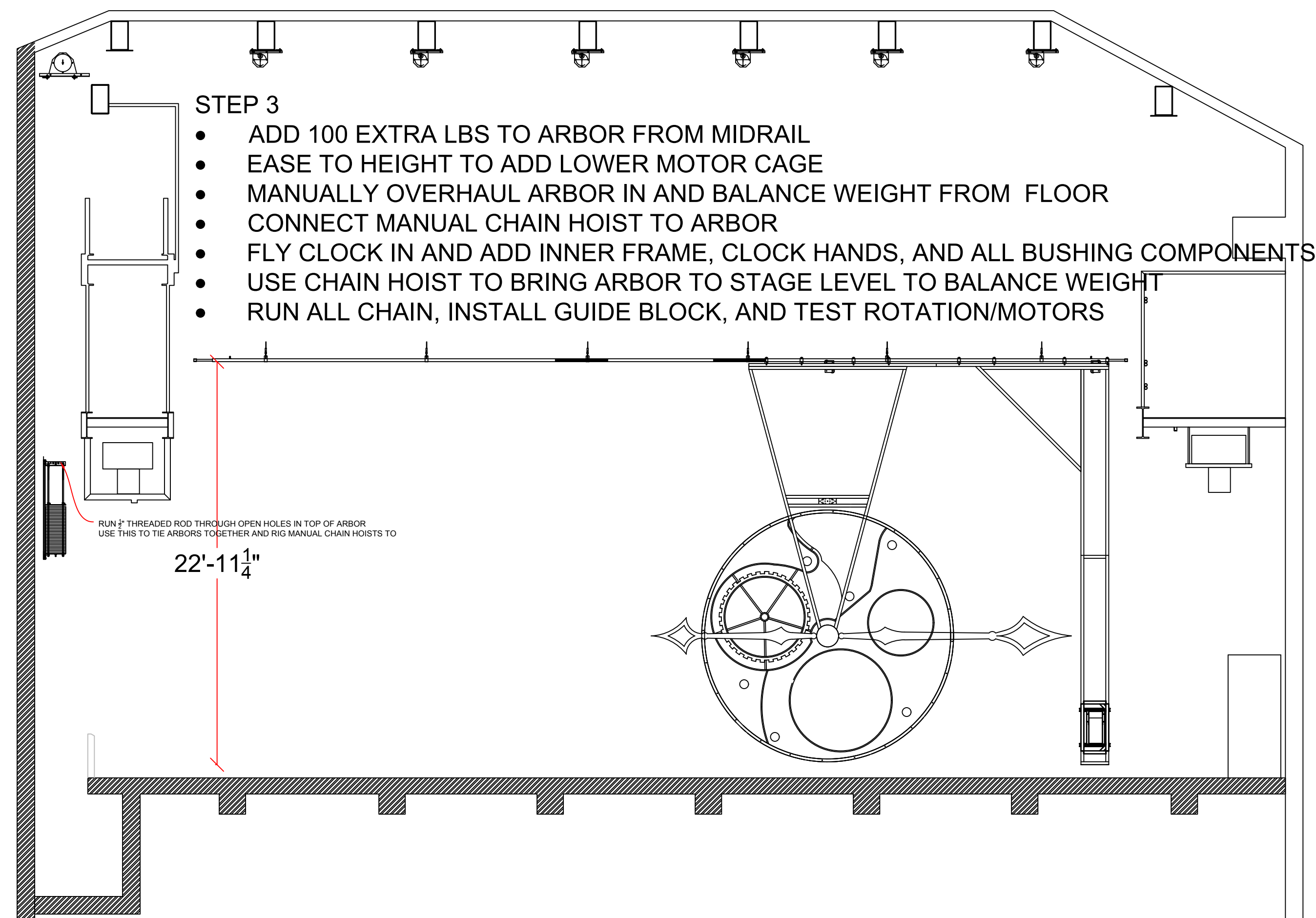
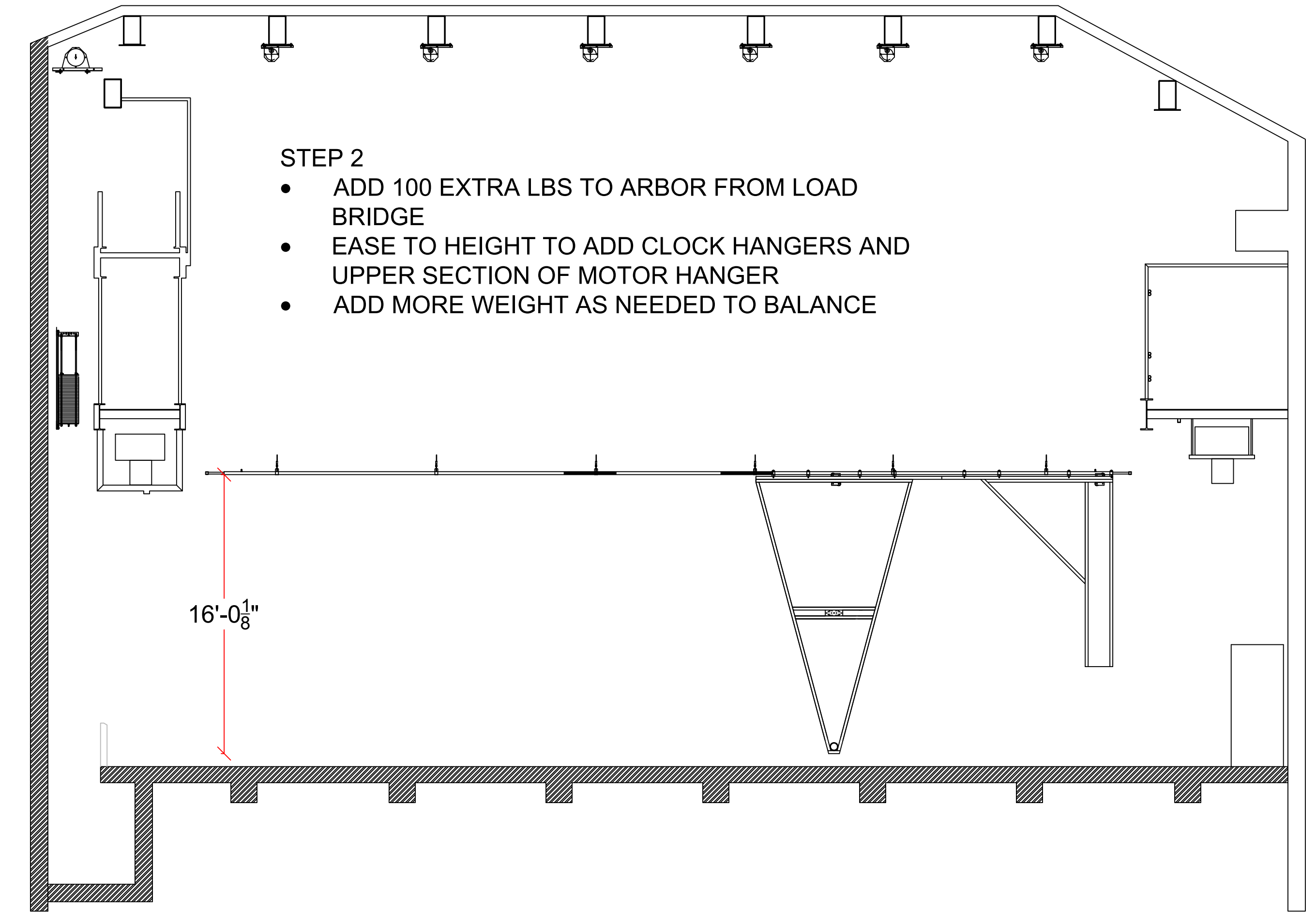
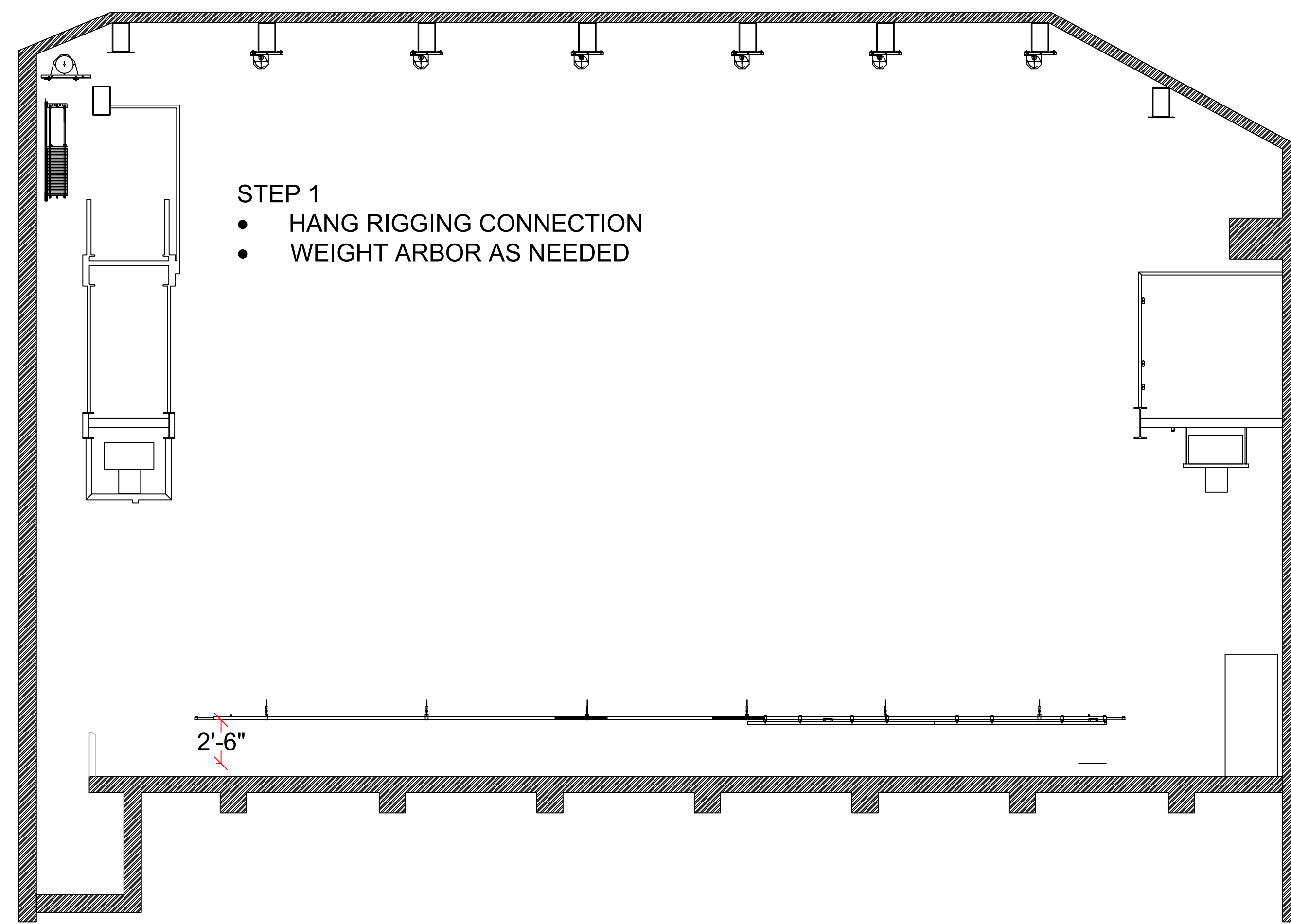
SIDE VIEW



SECTION C-C'

SCALE 6" = 1'-0"

PORTLAND CENTER STAGE		CL-17
GREAT EXPECTATIONS		
CLOCK ASSEMBLY		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	APPROV:
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 1'-0" = 1'-0" REV: 11/04/15	



PORTLAND CENTER STAGE		CL-18
GREAT EXPECTATIONS		
CLOCK INSTALLATION		
DIRECTOR: JANE JONES	TECH DIRECTOR: DEREK EASTON	
DESIGNER: CHRISTOPHER MUMFORD	DRAFTER: DSE	
DWG DATE: 10/28/15	SCALE: 3/16" = 1'-0"	REV: 11/04/15 APPROV: