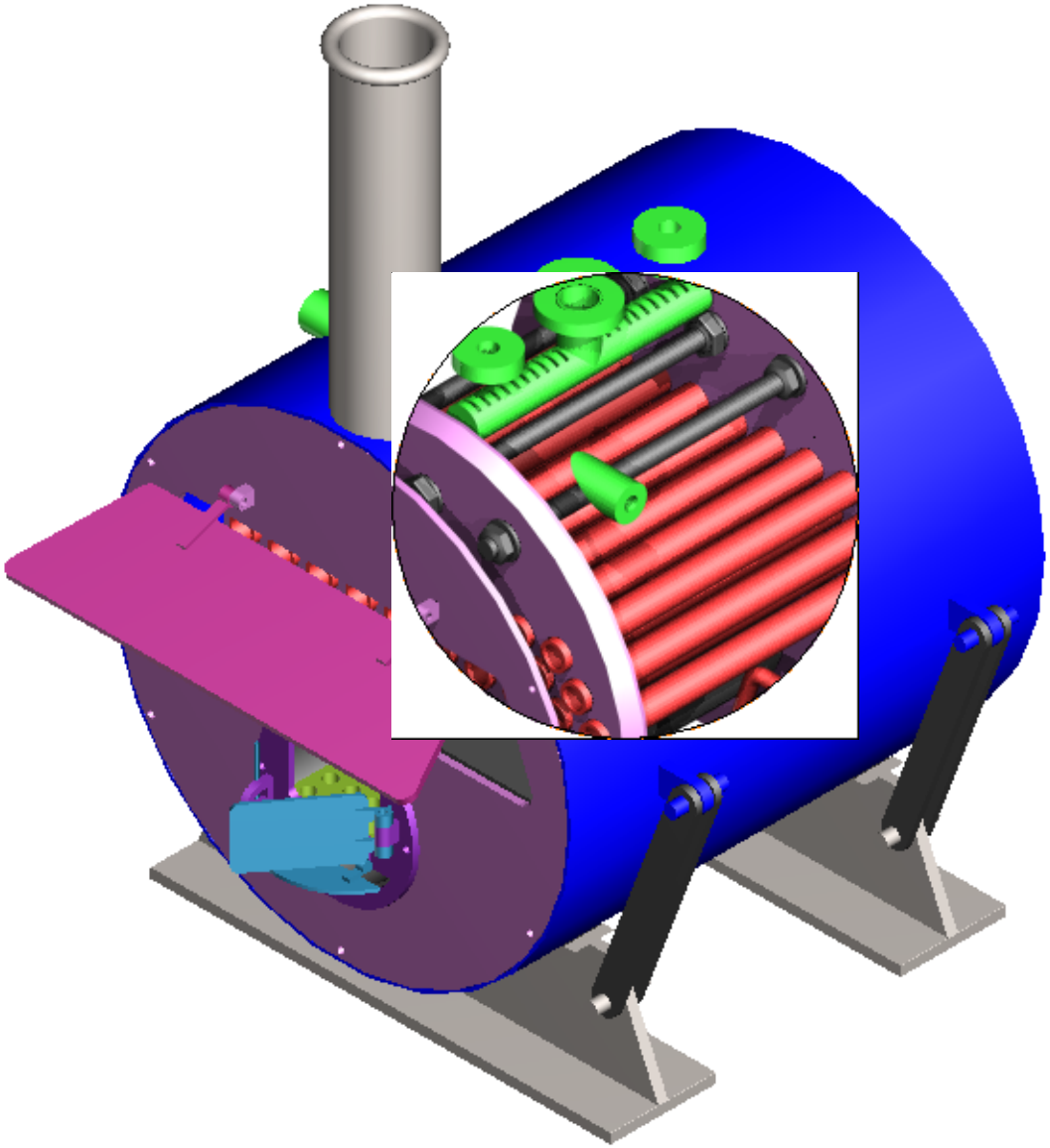


Part: General Assembly	Material: Principal = Boiler Plate		© BOB HOLME Engineering Service and Repair Mobile: AU 0466 979 291 Int 61+466 979 291 Email: bobngalina@adam.com.au
REV. / DATE / DESCRIPTION	Title: 8" Scotch Marine Boiler		
	Scale: 1 ; 2.5	Date: Feb 2012	

Model Boiler Design Calculations

Engine Details

Bore	0.875	Inch	0.602 Sq Inch
Stroke	1.500	Inch	
Swept Vol	0.902	Cu Inch	
Rpm	500.000		
Steam R	902.344	Cu Inch per min	

From Steam Tables

50 psig	405.000	Cu Inch	Steam per Cu Inch Water
75 psig	298.000	Cu Inch	Steam per Cu Inch Water
100 psig	237.000	Cu Inch	Steam per Cu Inch Water

Evaporation required

50 psig	2.228	Cu Inch per min
75 psig	3.028	Cu Inch per min

Engine Parameters

Bore	0.875	ins		
Stroke	1.500	ins		
RPM	500.000			
MAWP	50.000	psig	=	405.000 ins^3/ins

Steam Per minute

ins^3	901.981	

Evaporation required

ins^3/min	2.227	

Scotch Boiler evaporation rate 2 ins^3 per 100 ins^2 HS

HS Reqd	111.356	ins^2

HS of Frunace	43.197	ins^2
HS of tube	6.480	ins^2
No of tubes	18.000	
HS=	159.829	ins^2

Boiler Safety Calculations

Factor of Safety 8

Shell Thickness

Material 8" SD Steel Pipe. UTS 67000 lb/ins^2

T = P x D / 2t

			Actual
T=	0.024	ins	0.375

Furnace 2.625" SD Steel Pipe

T=	0.008	ins	0.125

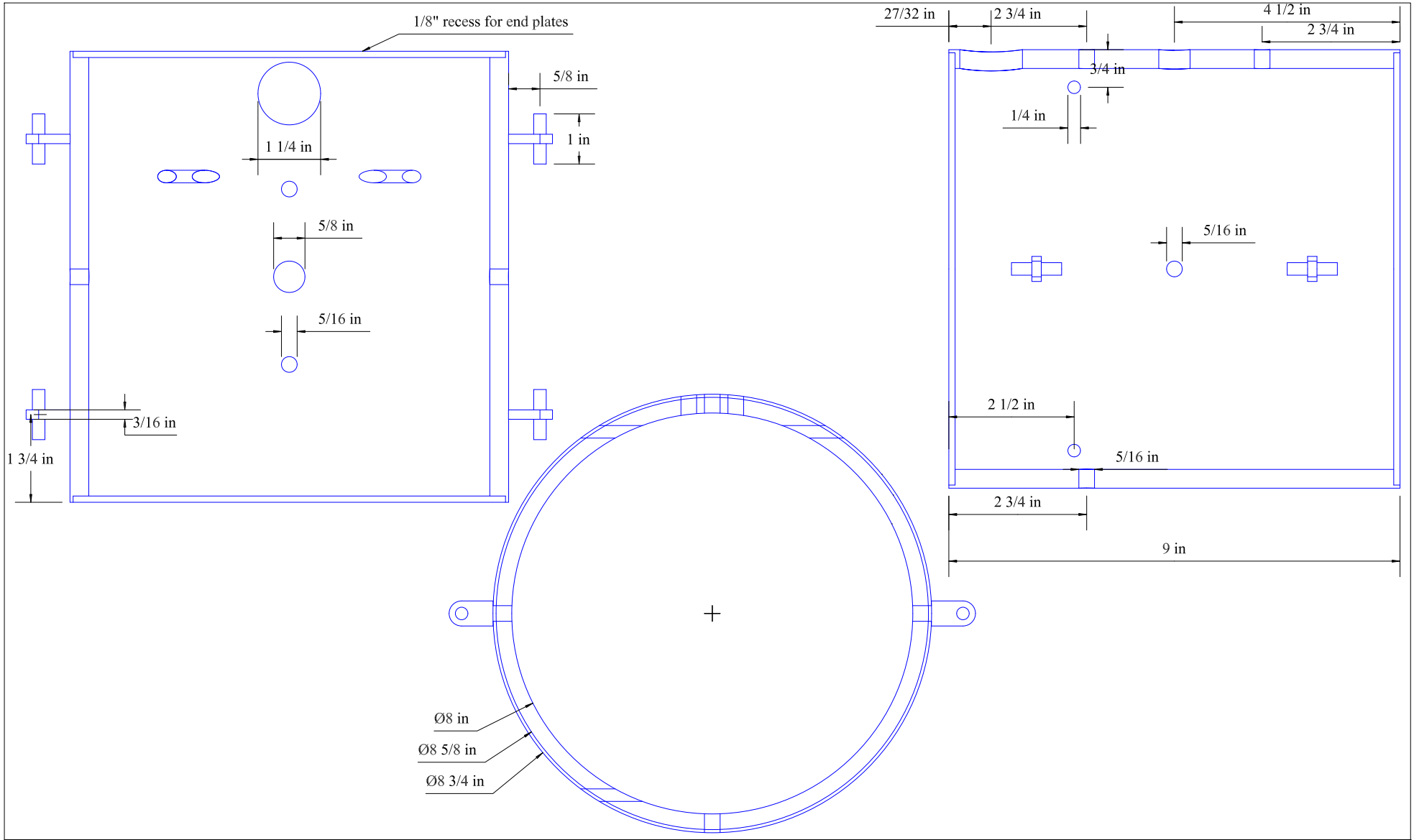
Tubes 1/2" SD Copper Pipe UTS 25000 lb/ins^2

T=	0.014	ins	0.028

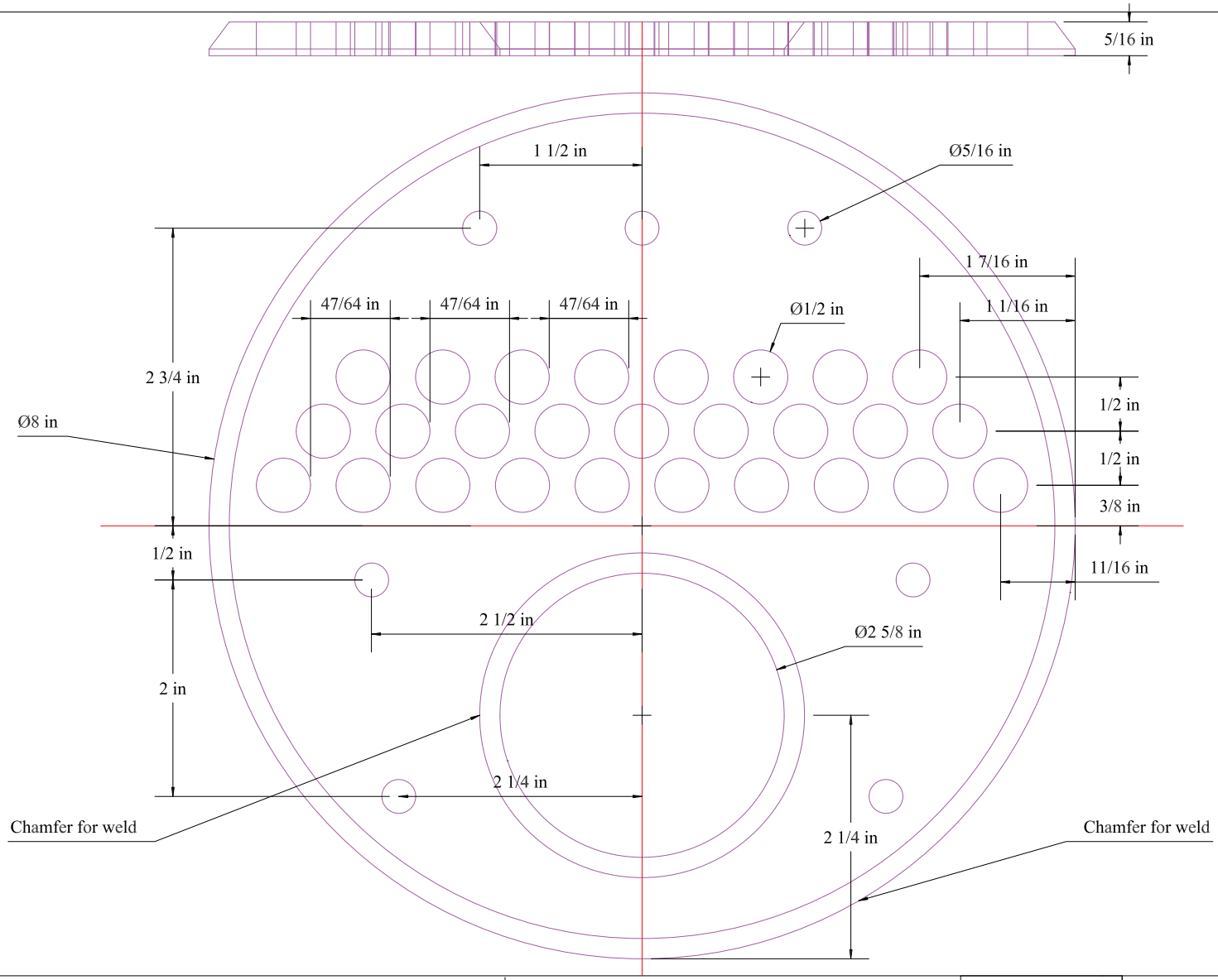
Stays MS 7 x 5/16" threaded Root Dia 0.241"

Area to be Stayed	39.663	ins^2
Area supported per stay	5.666	ins^2
Load per stay	283.304	lb
Safety Factor	10	
Stay X section Area	0.042	ins^2
Actual from above	0.046	ins^2

Tube plat	50.265	ins^2
Tube	3.534	ins^2
Furnace	7.069	ins^2
Unsuppo	39.663	ins^2



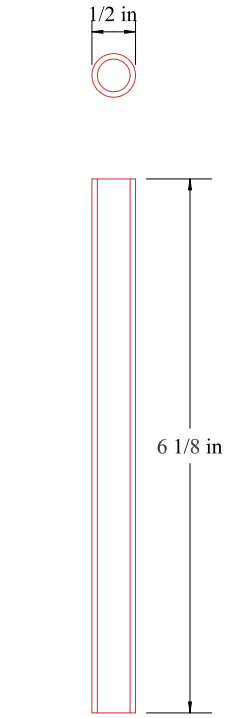
Part: Shell	Material: Boiler Tube	© BOB HOLME Engineering Service and Repair Mobile: AU 0466 979 291 Int 61+466 979 291 Email: bobngalina@adam.com.au
REV. DATE DESCRIPTION	Title: 8" Scotch Marine Boiler	
	Scale: 1 : 2.5 — Date: Feb 2012	



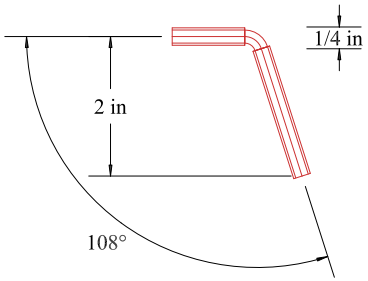
Part: Tube Plate 2 off	Material: Boiler Plate
Title: 8" Scotch Marine Boiler	
Scale	Date: Jul 2012

REV.	DATE	DESCRIPTION

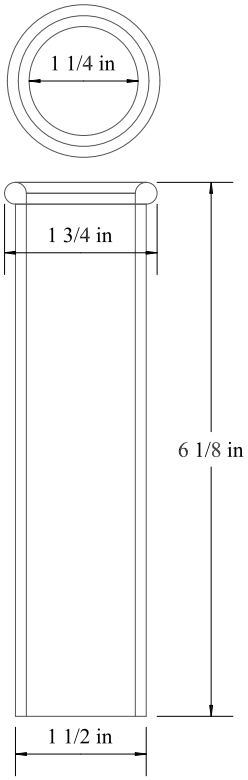
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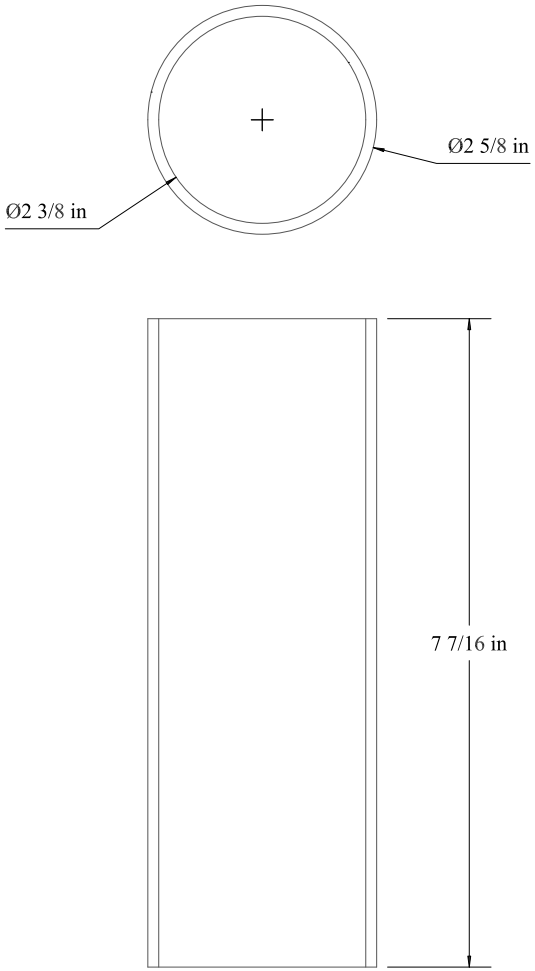
Boiler Tube 27 off



Feed Pipe 2 off

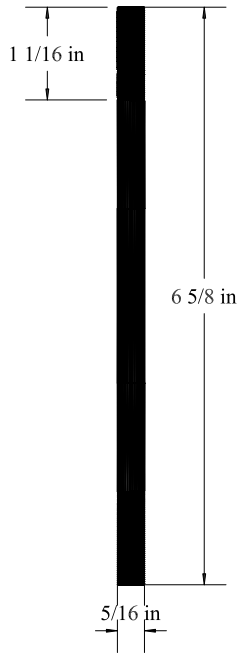


Funnel



Furnace

Part: Tubes - Funnel and Furnace	Material: Tube & Feed - Copper; Funnel & Furnace - Boiler Tube		© BOB HOLME Engineering Service and Repair Mobile: AU 0466 979 291 Int 61+466 979 291 Email: bobngalina@adam.com.au
REV. / DATE / DESCRIPTION	Title: 8" Scotch Marine Boiler		
	Scale: 1 : 2	Date: Feb 2012	



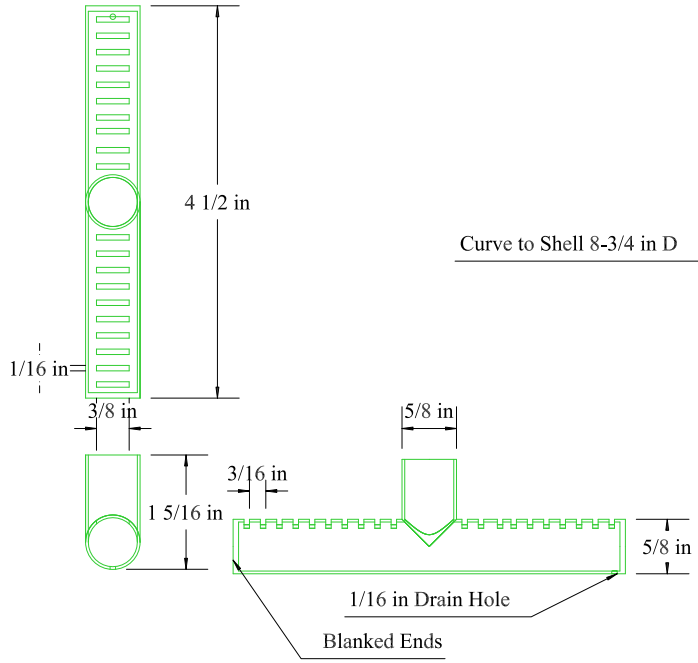
Stay Bolt 7 off



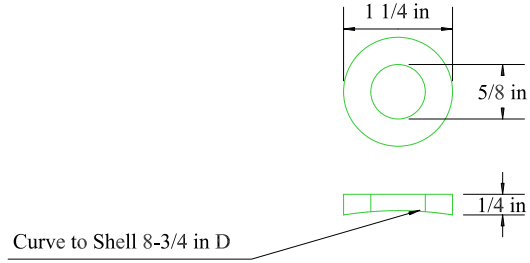
5/16" Nut 28 off



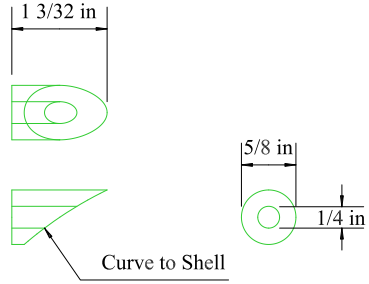
5/16" Machine Washer 28 off



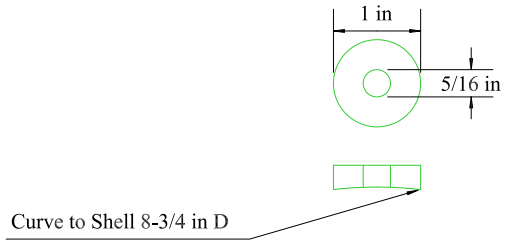
Dry Pipe



Main Stop Boss



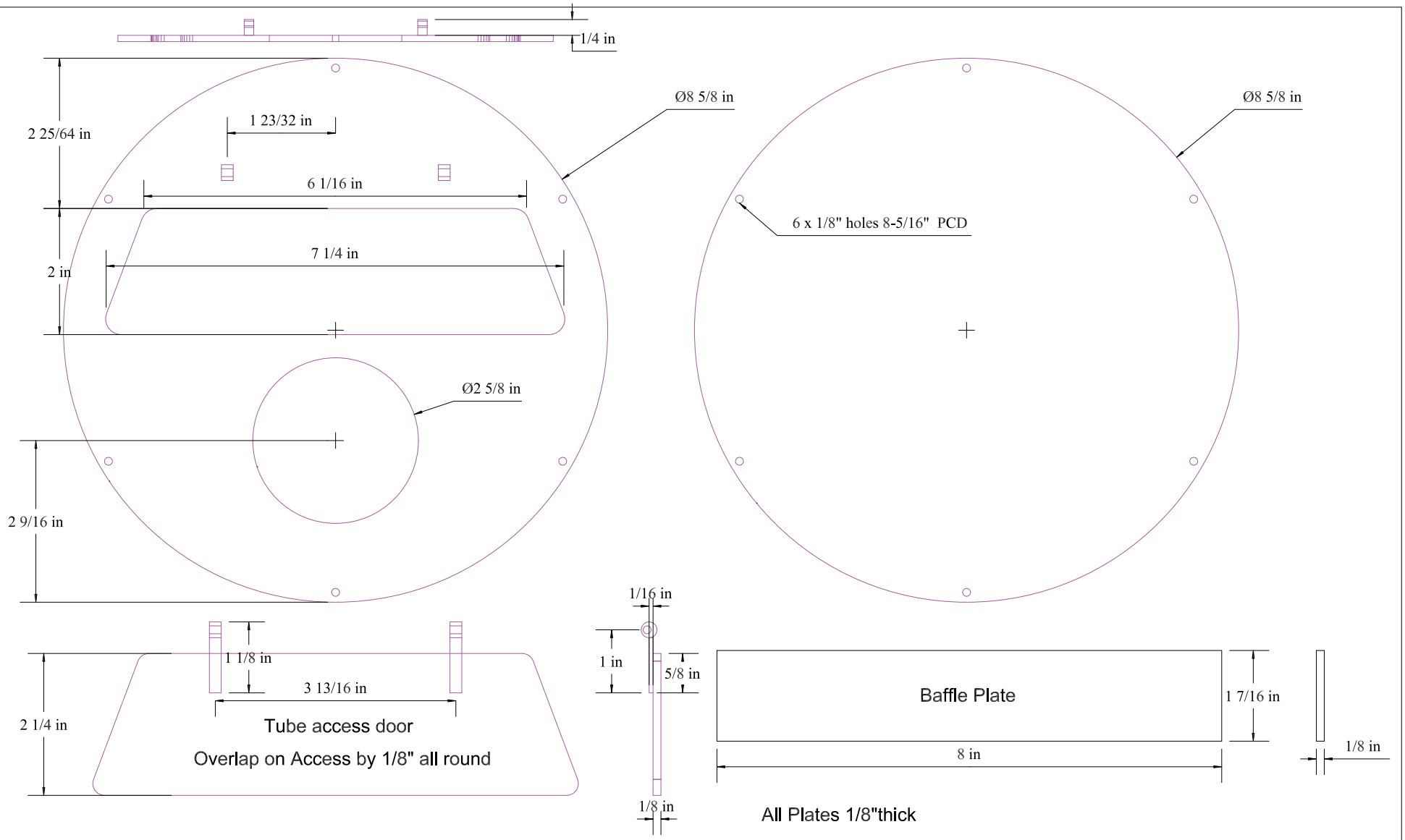
Pressure & Water Gauge Boss
3 off



Auxiliary, Safety, Blowdown, Feed Boss
5 off

Part: Fittings			Material: Mild Steel	
REV.	DATE	DESCRIPTION	Title: 8" Scotch Marine Boiler	
			Scale: 1 : 2	Date: Feb 2012

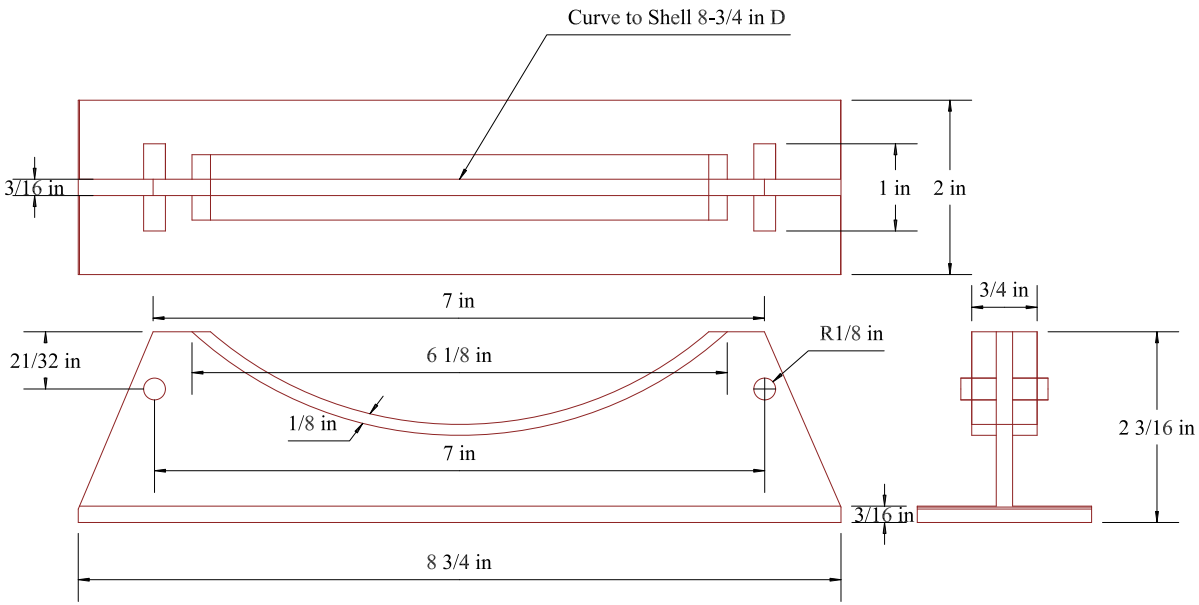
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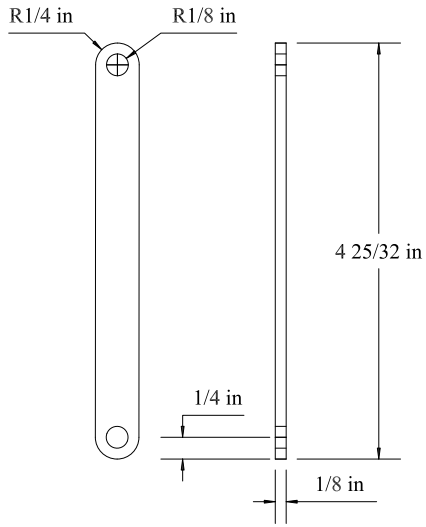
Part:	End and Baffle Plates
Material	Mild Steel
Title	8" Scotch Marine Boiler
Scale	1 : 2
Date:	Feb 2012

REV.	DATE	DESCRIPTION

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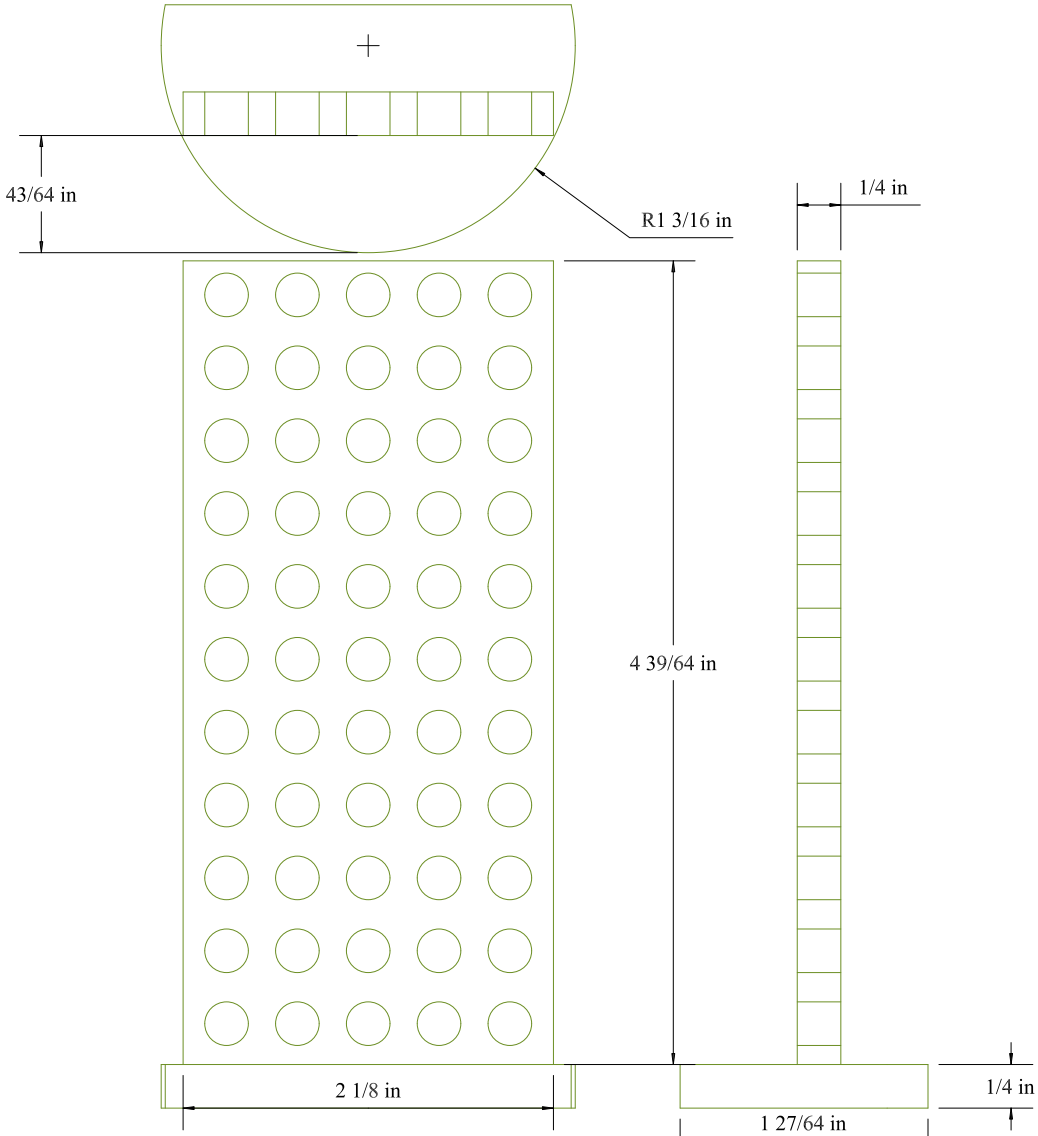
Boiler Foot 2 off



Expansion and support rods 8off

Part: Boiler Foot and Support/Expansion Rod		Material: Mild Steel	
REV. / DATE / DESCRIPTION	Title: 8" Scotch Marine Boiler		
	Scale: 1 : 2	Date: Feb 2012	

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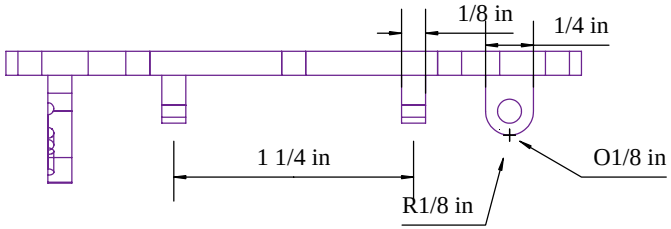


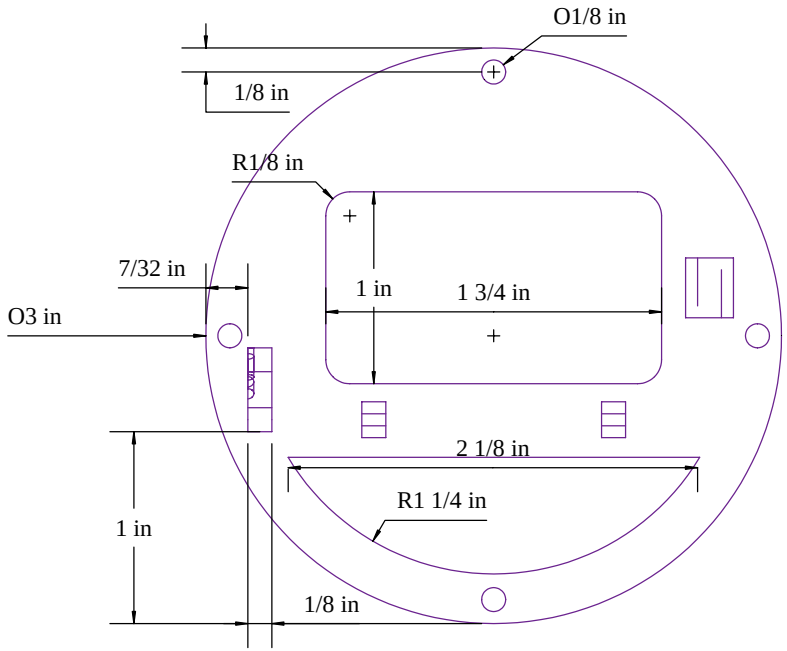
Part: Solid Fuel Grate	Material: Stainless Steel
Title: 8" Scotch Marine Boiler	
Scale: 1 : 1	Date: Feb 2012

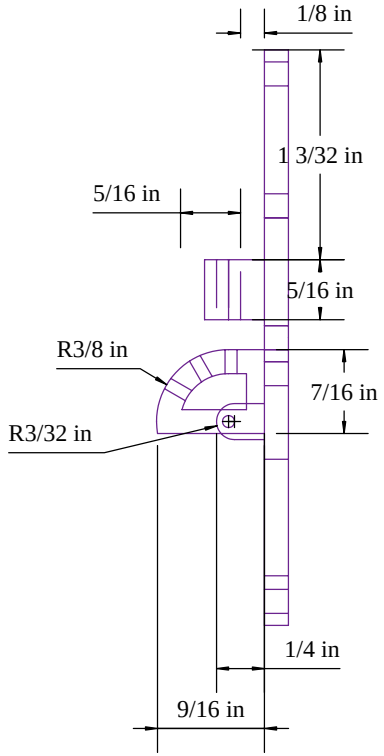
REV.	DATE	DESCRIPTION

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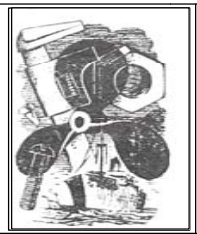




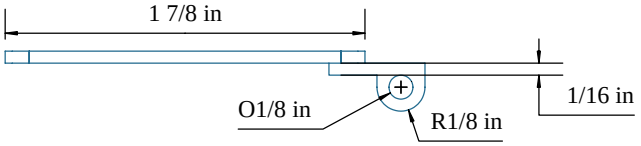


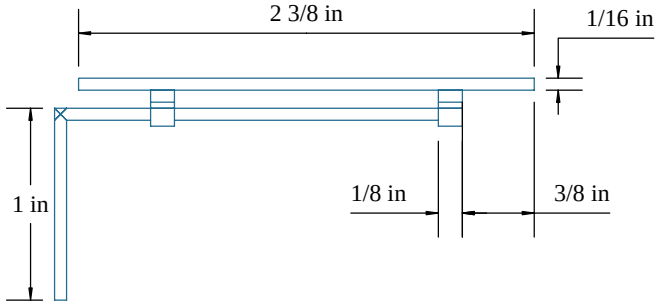
Part: Solid Fuel Furnace Front	Material: Mild Steel
Title: 8" Scotch Marine Boiler	
Scale: 1 : 1	Date: Feb 2012

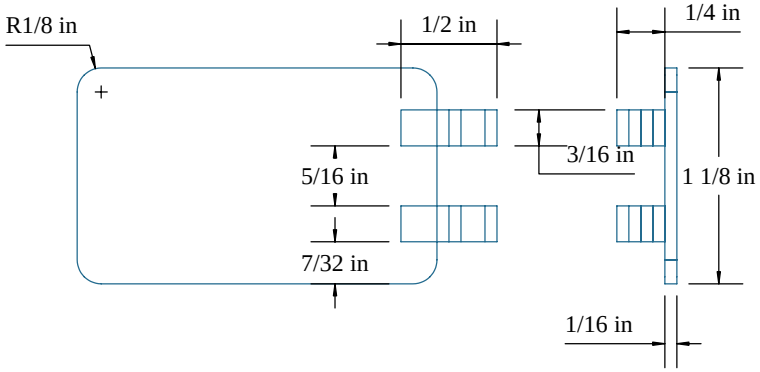
REV	DATE	DESCRIPTION

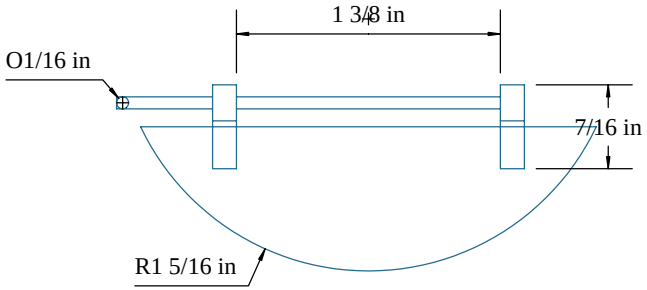


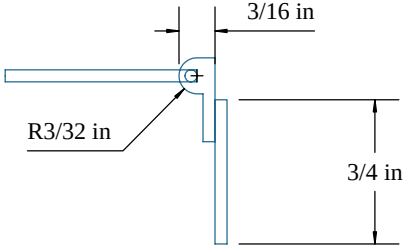
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Part: Solid Fuel Furnace Doors

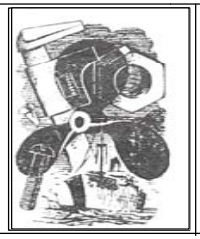
Material: Boiler Tube

REV	DATE	DESCRIPTION

Title: 8" Scotch Marine Boiler

Scale: 1 : 1

Date: Feb 2012



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