

# Technical Drawing Tutorial

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October 18, 2012

# Drawing Basics

What is a technical drawing?

- A drawing that displays technical information to the reader through specific visuals, directions, notes, etc...
- A good technical drawing should be informative, clear, NEAT, unambiguous and not cluttered.

# Drawing Basics

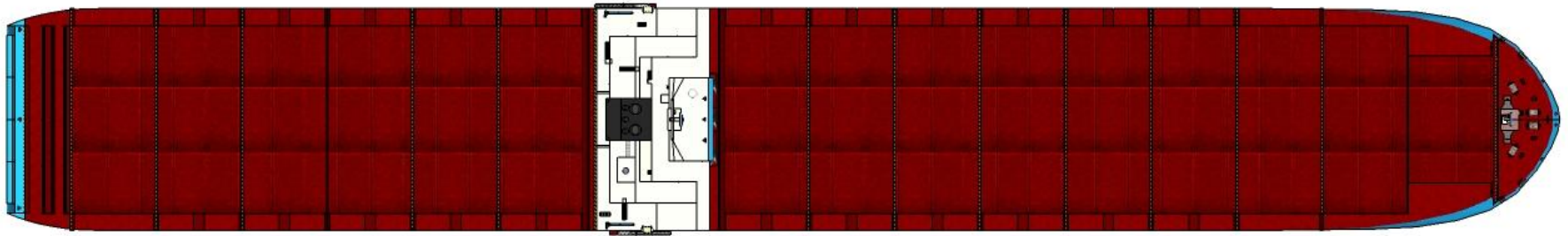
## Profile View



# Drawing Basics

## Plan View

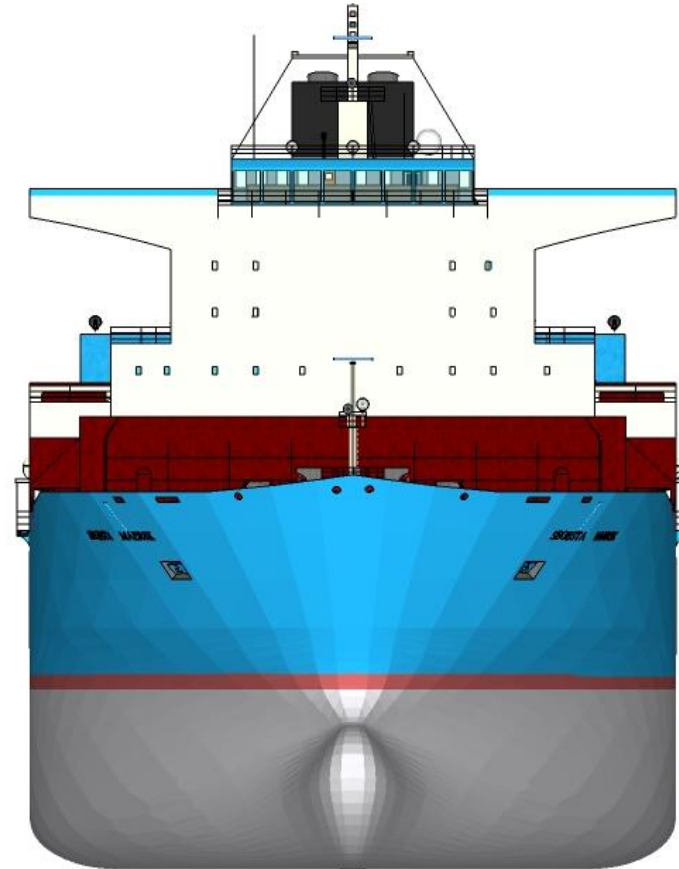
- Viewed from above



# Drawing Basics

FWD View (Bow view)

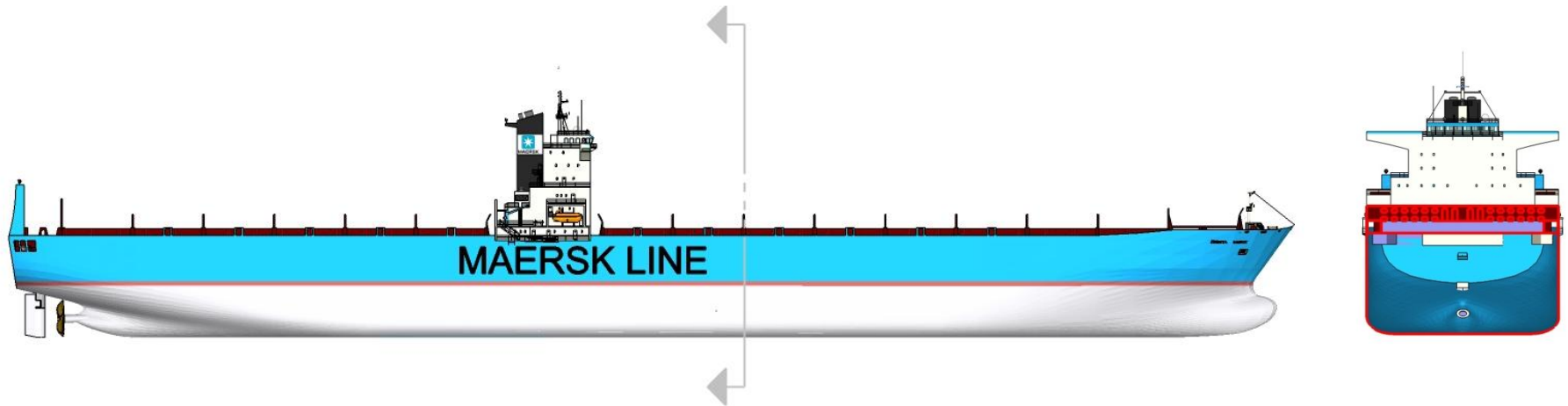
- FWD looking aft.



# Drawing Basics

## Section View

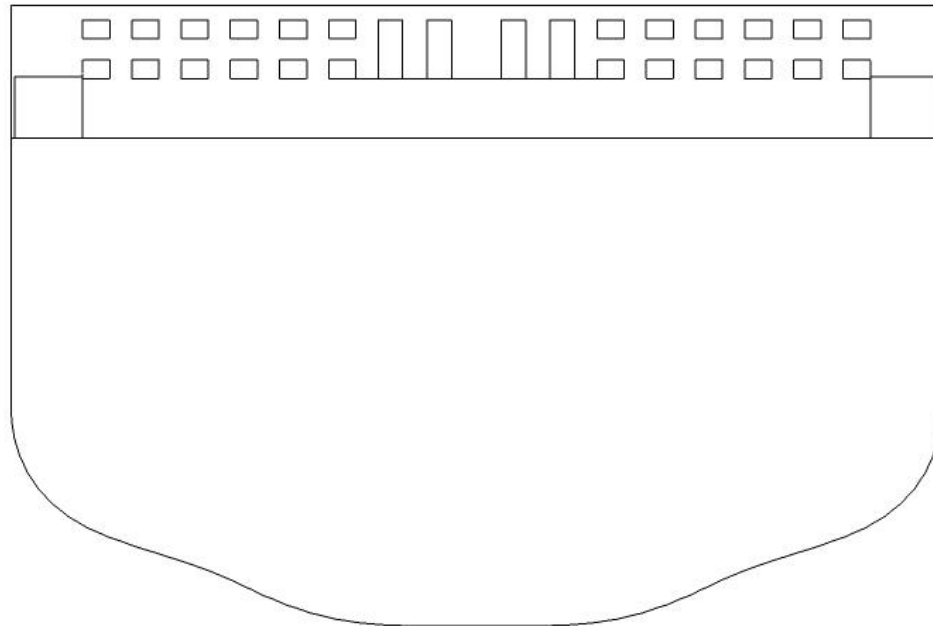
- Looking in direction of arrows



# Drawing Basics

## Station View

- Slice at that section



# Type of Ship Drawings

- **Lines Plan**
- **General Arrangements (Profile and Decks)**
- **Structural Drawings**

## Other Drawings

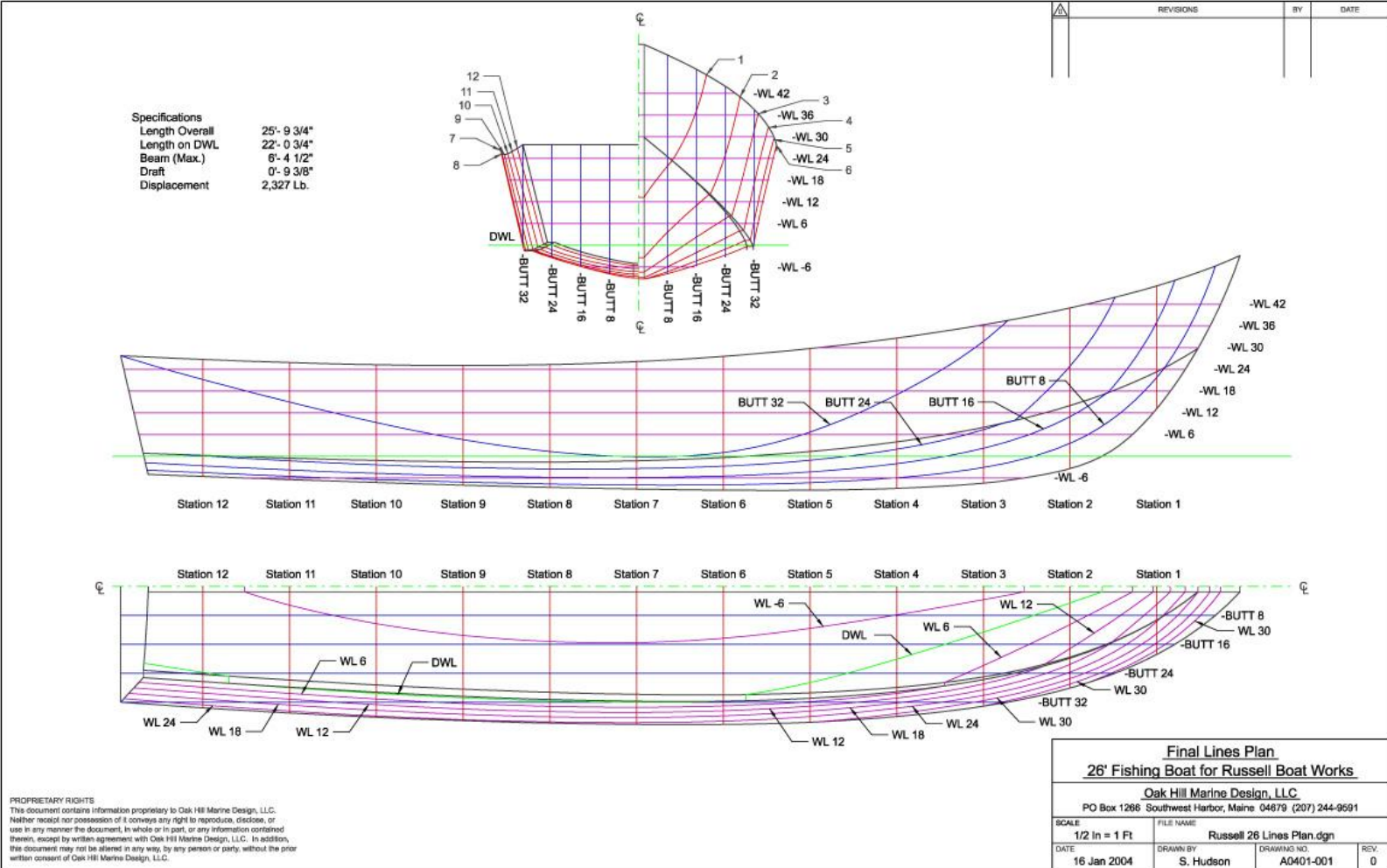
- System Drawings
- Fire and Safety Plan
- Escape Plan
- Etc...



# Lines Plan

- A collection of lines at well defined positions that are used to define a hull form
- Projections of straight lines on to the hull surface from X-Y-Z planes
- Produce Waterlines, Buttocks and Station curves

# Lines Plan



# Lines Plan

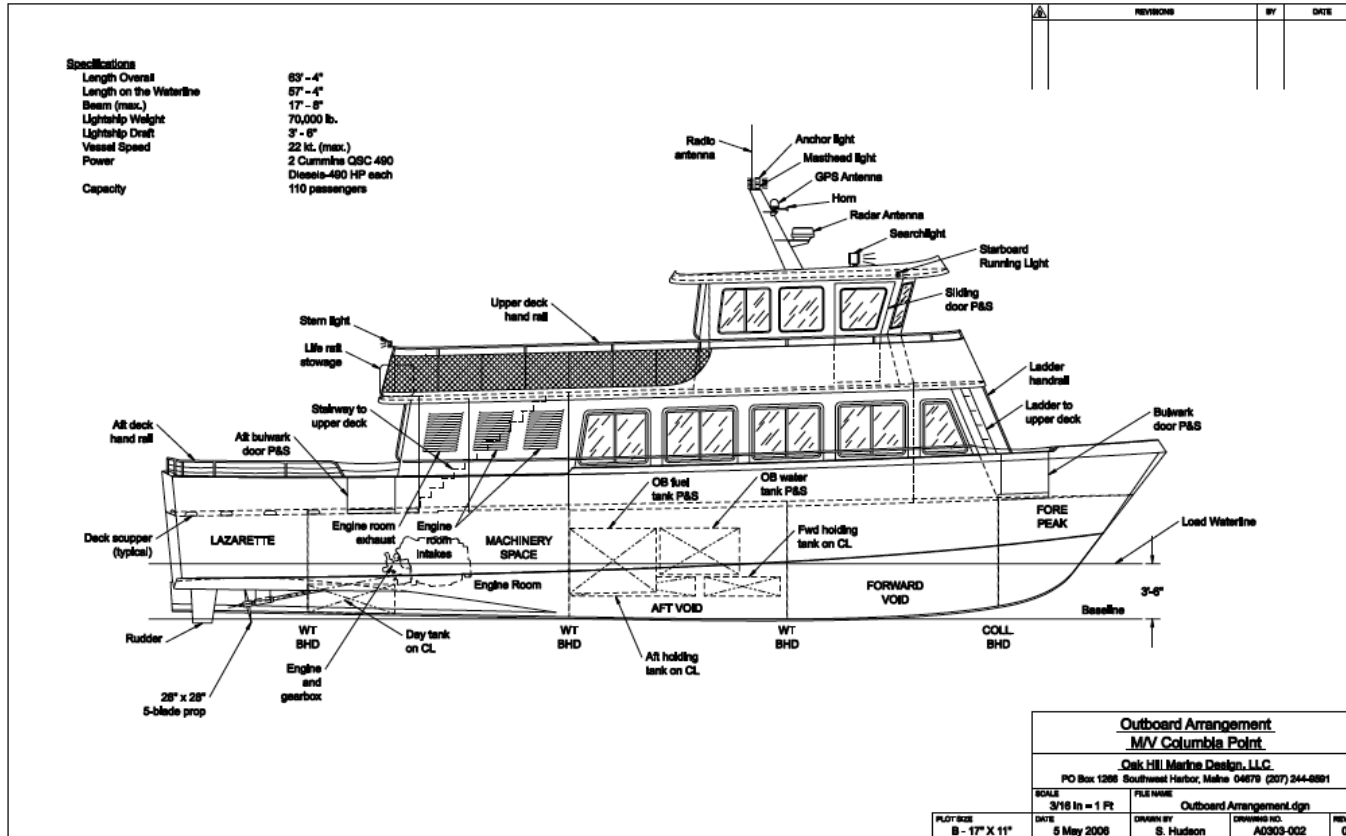


# General Arrangement

- General Arrangement of hull, bulkheads, decks and all machinery, equipment and outfitting
- Profile and Decks (sometimes FWD view as well)

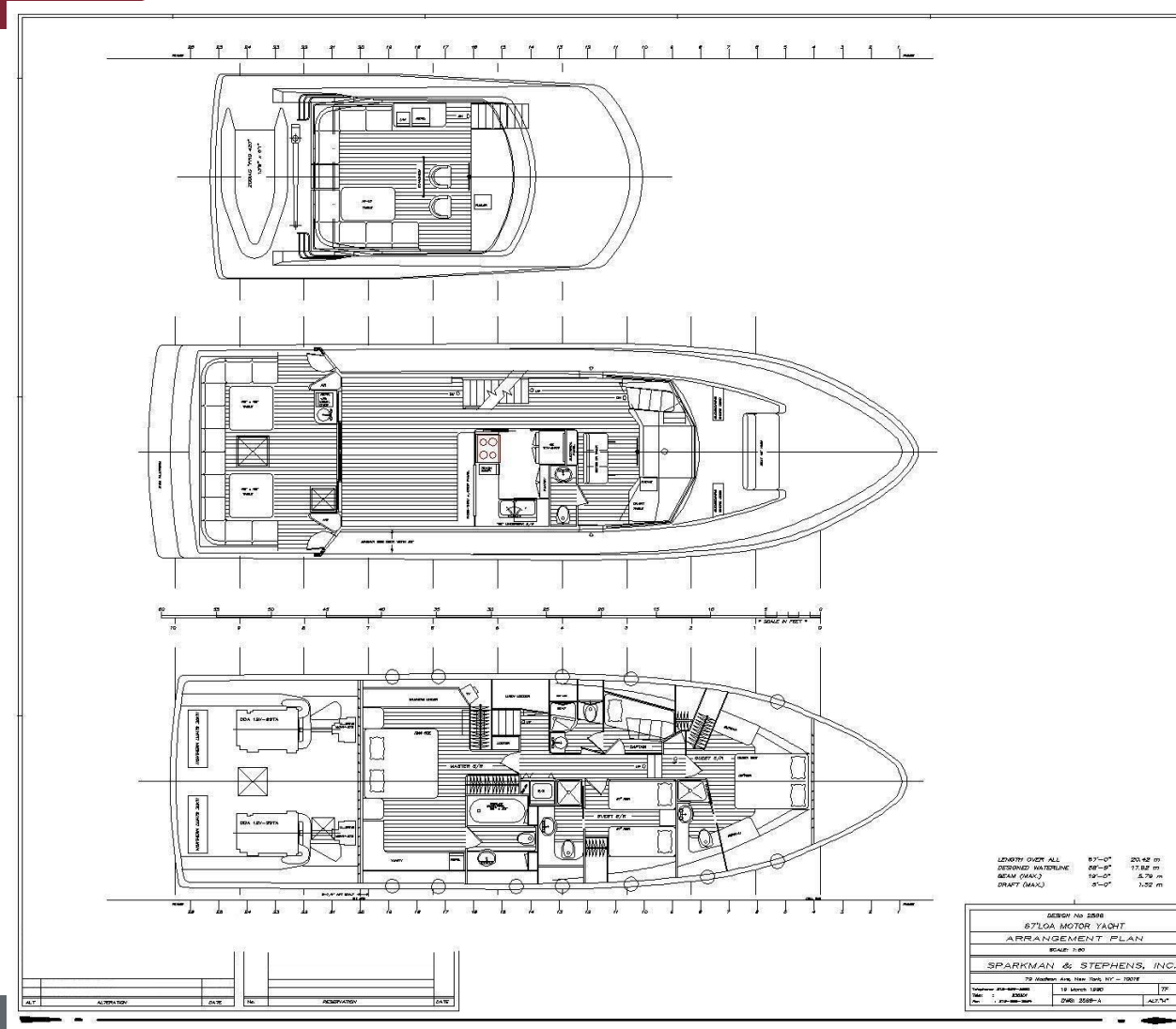
# General Arrangement

- Profile (outboard Profile)



# General Arrangement

- Decks



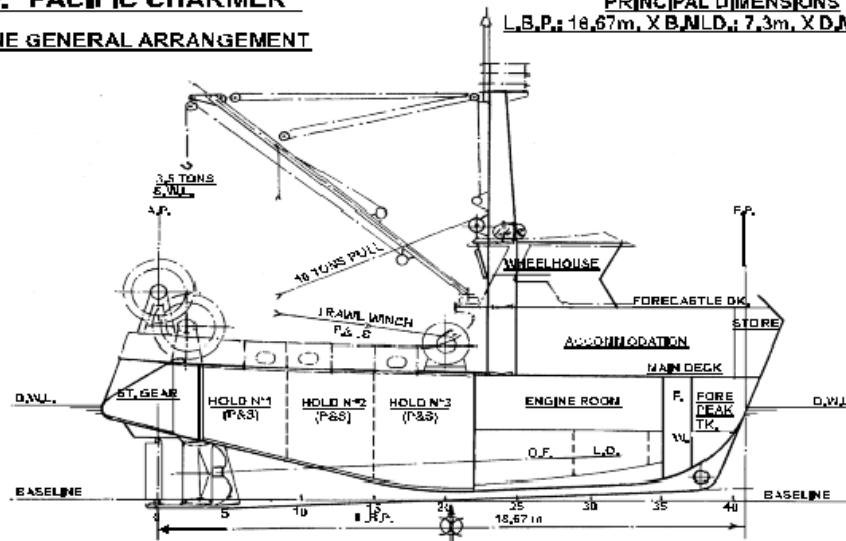
# General Arrangement

## S.F.V. "PACIFIC CHARMER"

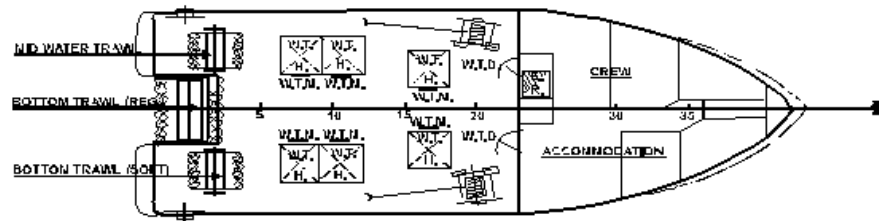
### OUTLINE GENERAL ARRANGEMENT

#### PRINCIPAL DIMENSIONS

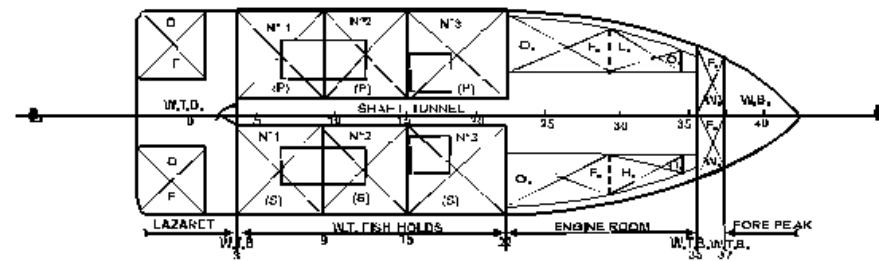
L, B, P.: 18,67m, X B, MLD.: 7,3m, X D, MLD.: 4,0m.



PROFILE @ B

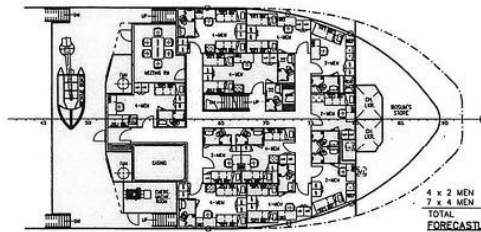
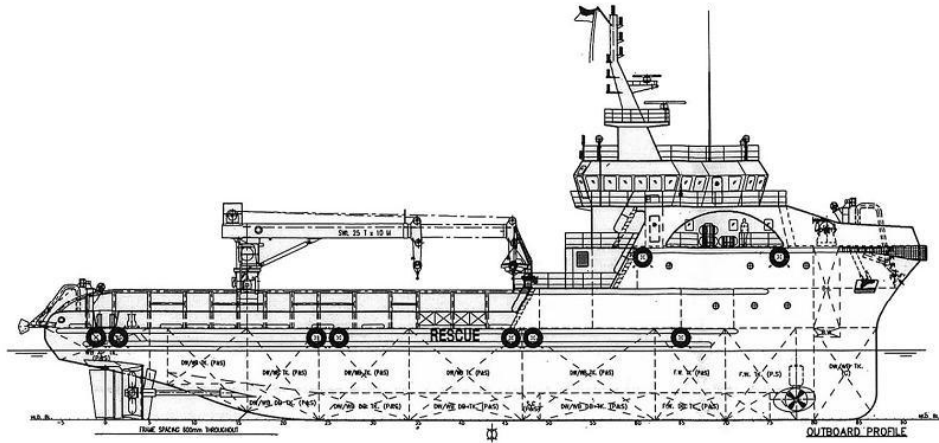


PLAN VIEW @ MAIN DECK

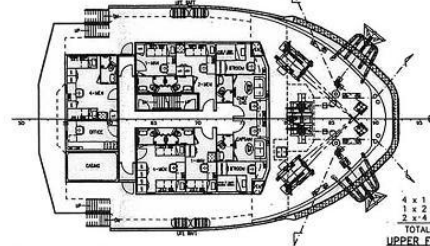


PLAN VIEW BELOW MAIN DECK

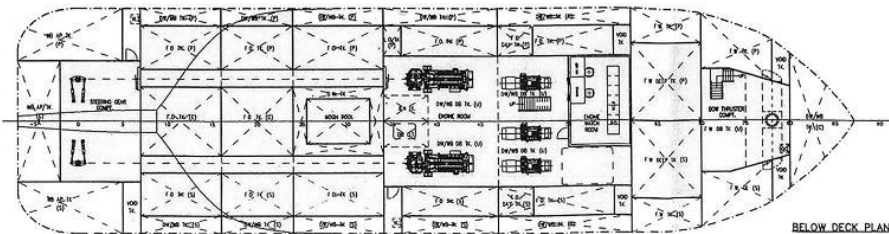
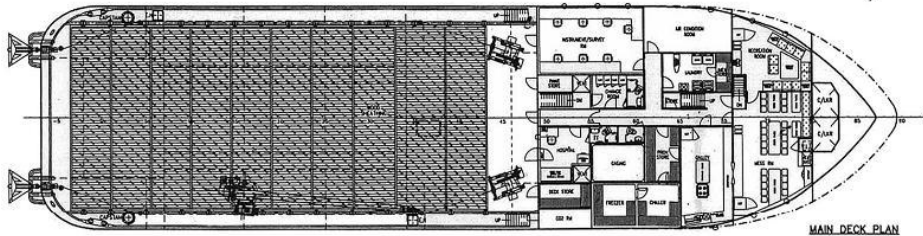
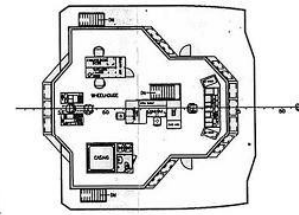
# General Arrangement



4 x 2 MEN = 8 MEN  
 7 x 4 MEN = 28 MEN  
 TOTAL = 36 MEN



4 x 1 MAN = 4 MEN  
 1 x 2 MEN = 2 MEN  
 2 x 4 MEN = 8 MEN  
 TOTAL = 14 MEN



## PRINCIPAL DIMENSIONS

LENGTH (O.A.)	59,250 M
LENGTH (W.L.)	56,000 M
LENGTH (B.P.)	52,200 M
BEAM (M.L.D.)	15,000 M
DEPTH (M.L.D.)	6,100 M
DESIGN DRAFT	4,600 M
FUEL OIL	700 M <sup>3</sup>
FRESH WATER	400 M <sup>3</sup>
DRILL WATER / W.B.	850 M <sup>3</sup>
CLEAR DECK AREA	350 M <sup>2</sup>
DECK CARGO (DECK LOADING = 7T/M <sup>2</sup> )	500 TONS
MAIN PROPULSION ENGINE	2 X 2100 BHP
SPEED (TRIALS)	12.5 KNOTS
COMPLEMENT	50 MEN

PROJECT	60m SUBSEA SUPPORT VESSEL			
TITLE	GENERAL ARRANGEMENT			
DESIGNER	HALL NO.			
DRAWN	CHECKED	SCALE	DRAWING NUMBER	REV.
		1:150		0

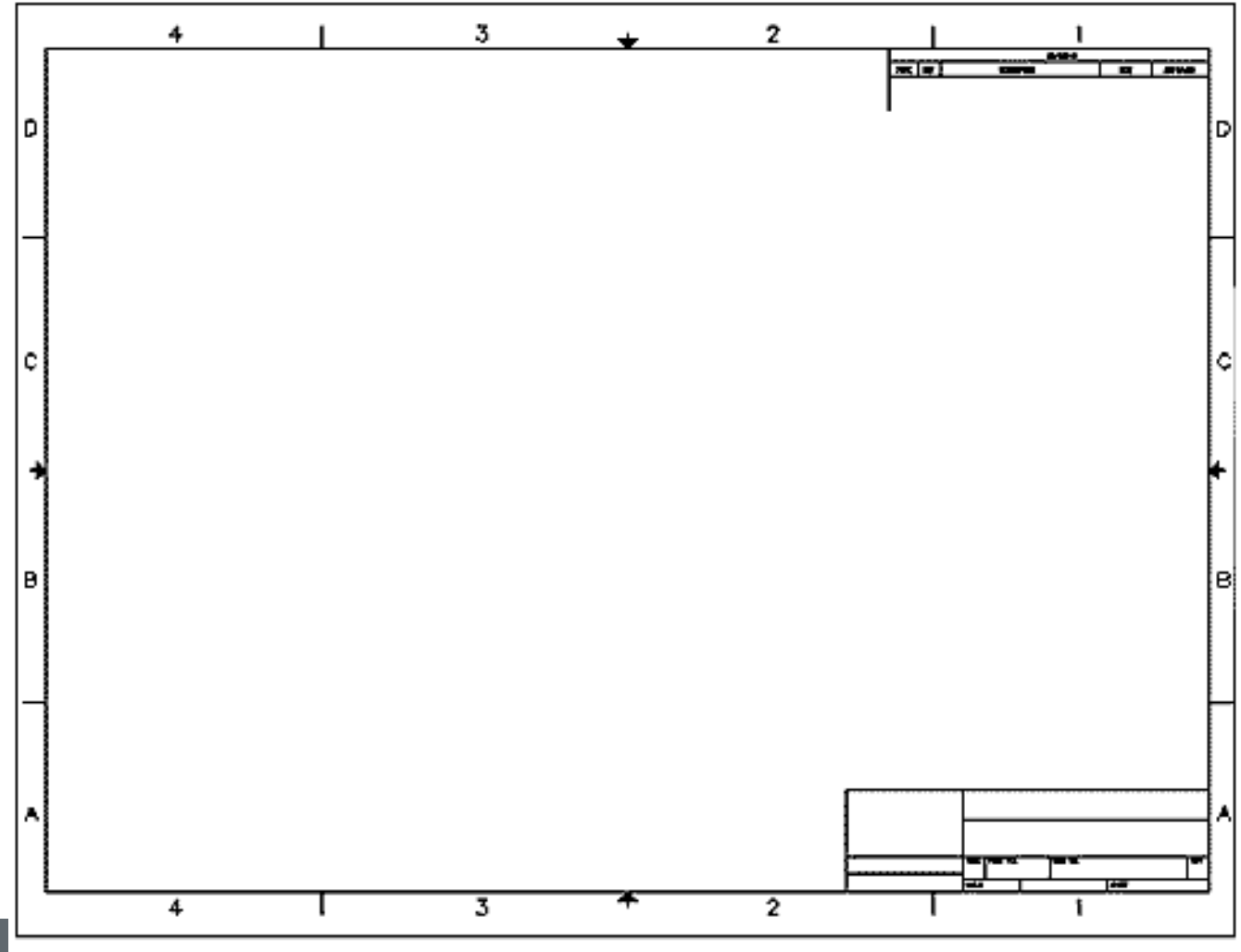


# Drawing Elements

- Title Block
- Baseline
- Centerline
- Labels

# Title Block

- Title
- Name
- Date
- LOGO
- Project Number
- Revision History
- Drawing Number
- Scale
- Etc...

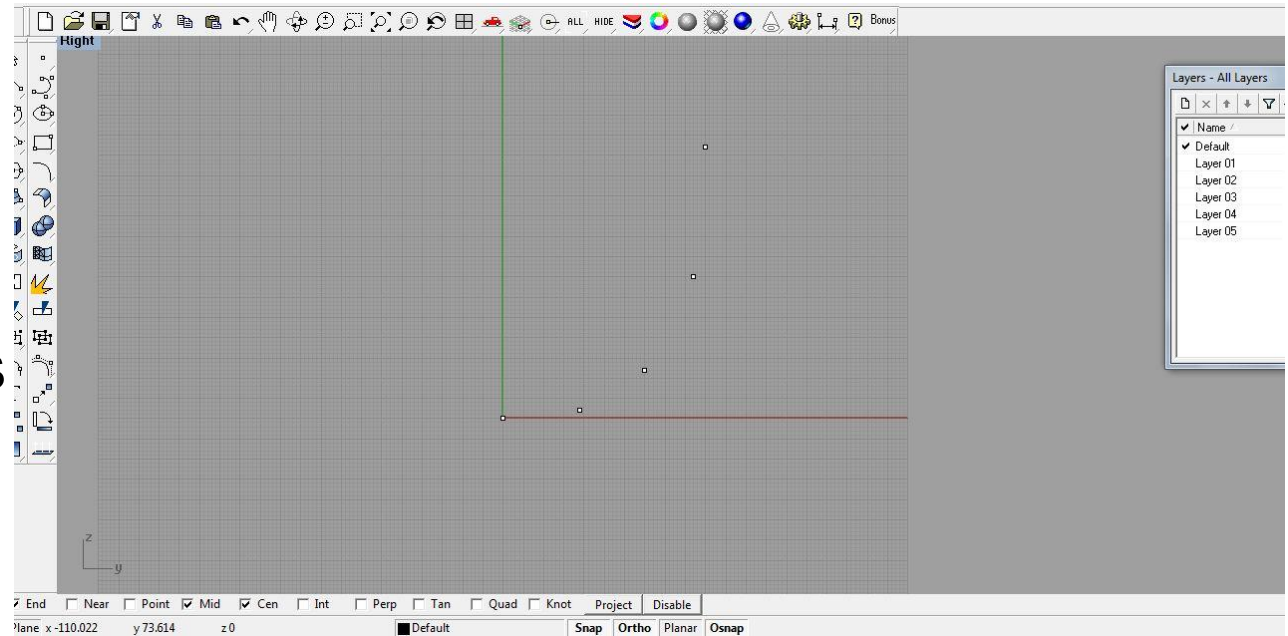


# Rhino3D

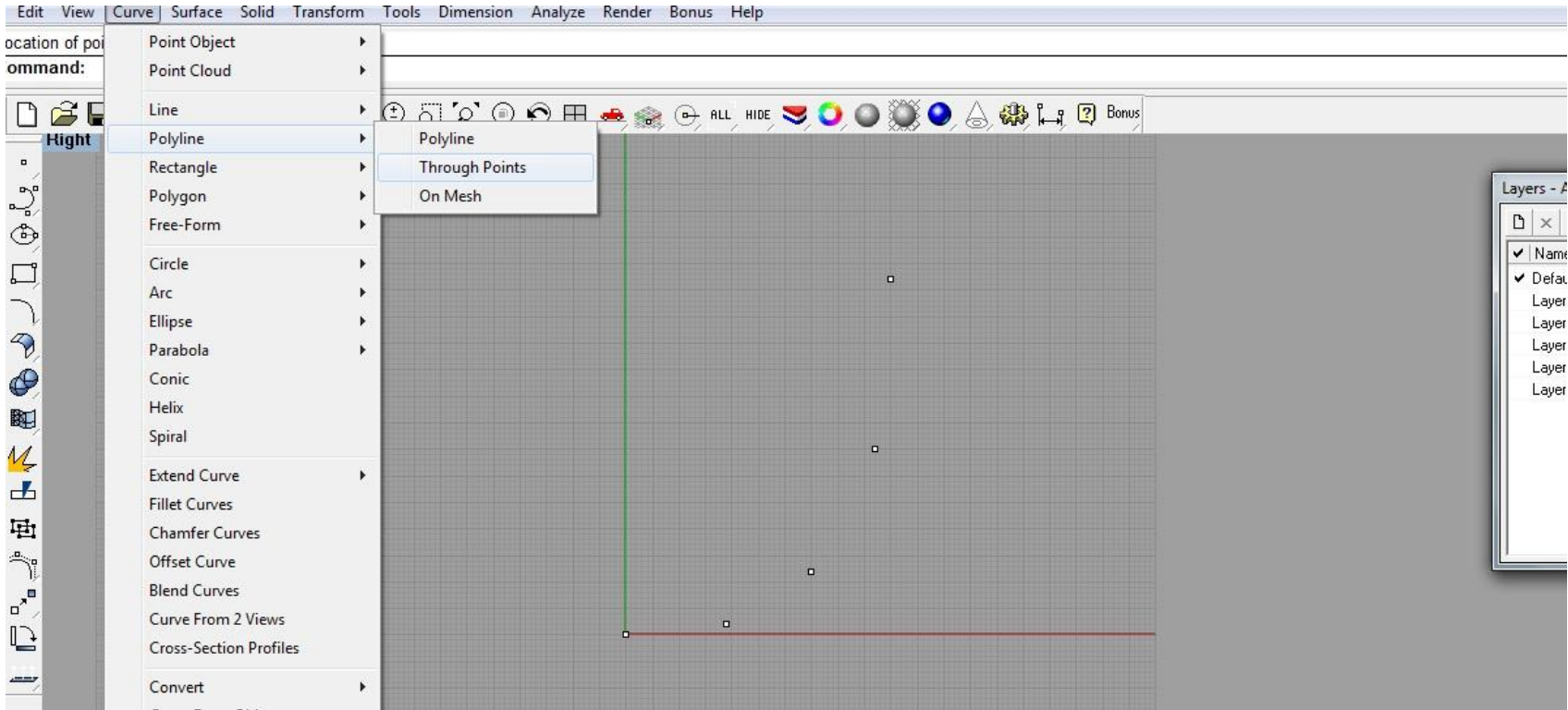
- Rhino3D is 3D modeling program
- Can also be a useful tool for technical 2D drawings
- Can be used to produce 2D technical drawings but tailored more towards 3D renderings than 2D line drawings
- Now create hull lines for a canoe hull.....

# Rhino3D

- Open "Right" viewport (Y-Z Plane)
- Arrange points that midship section will pass through.

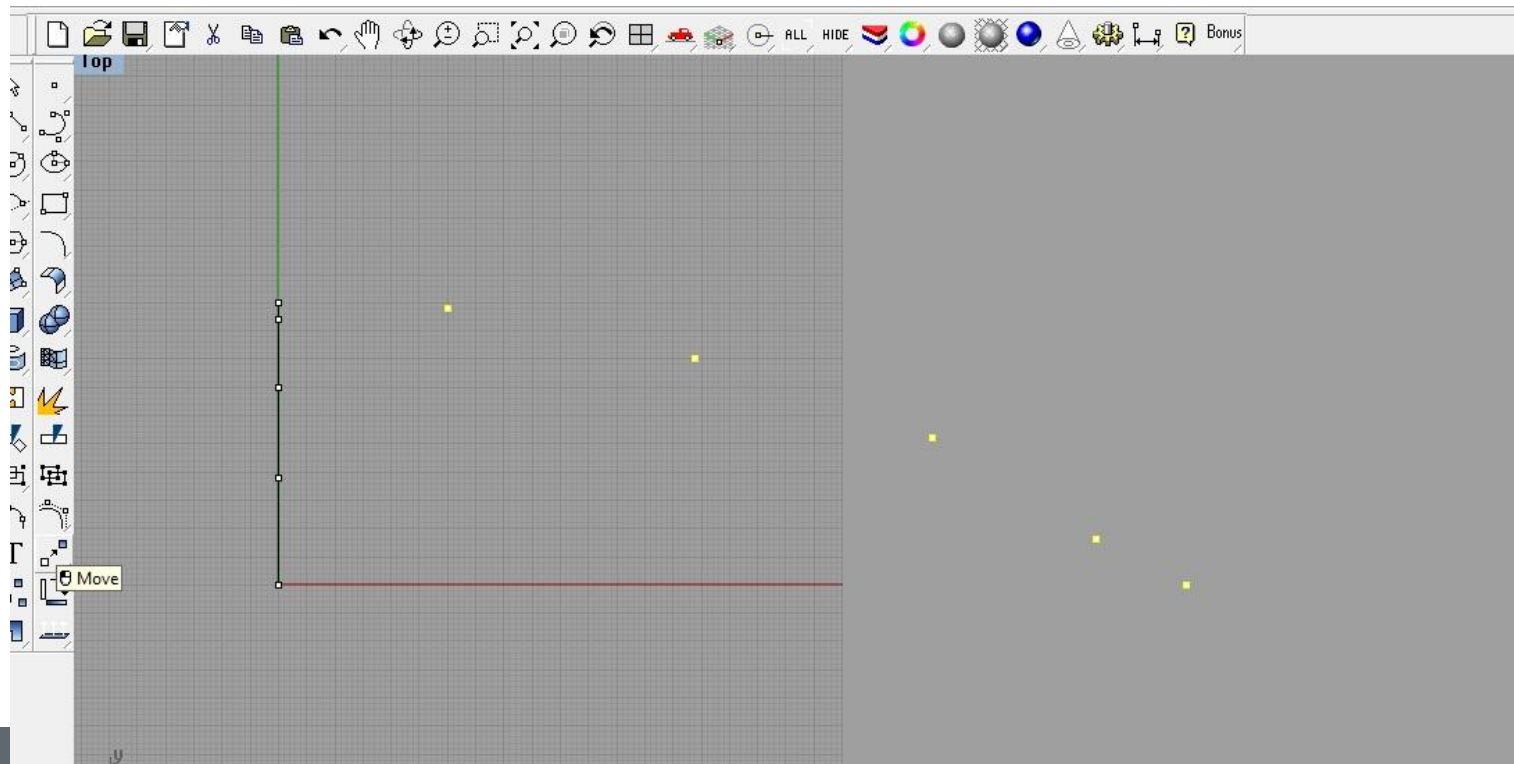


# Rhino3D



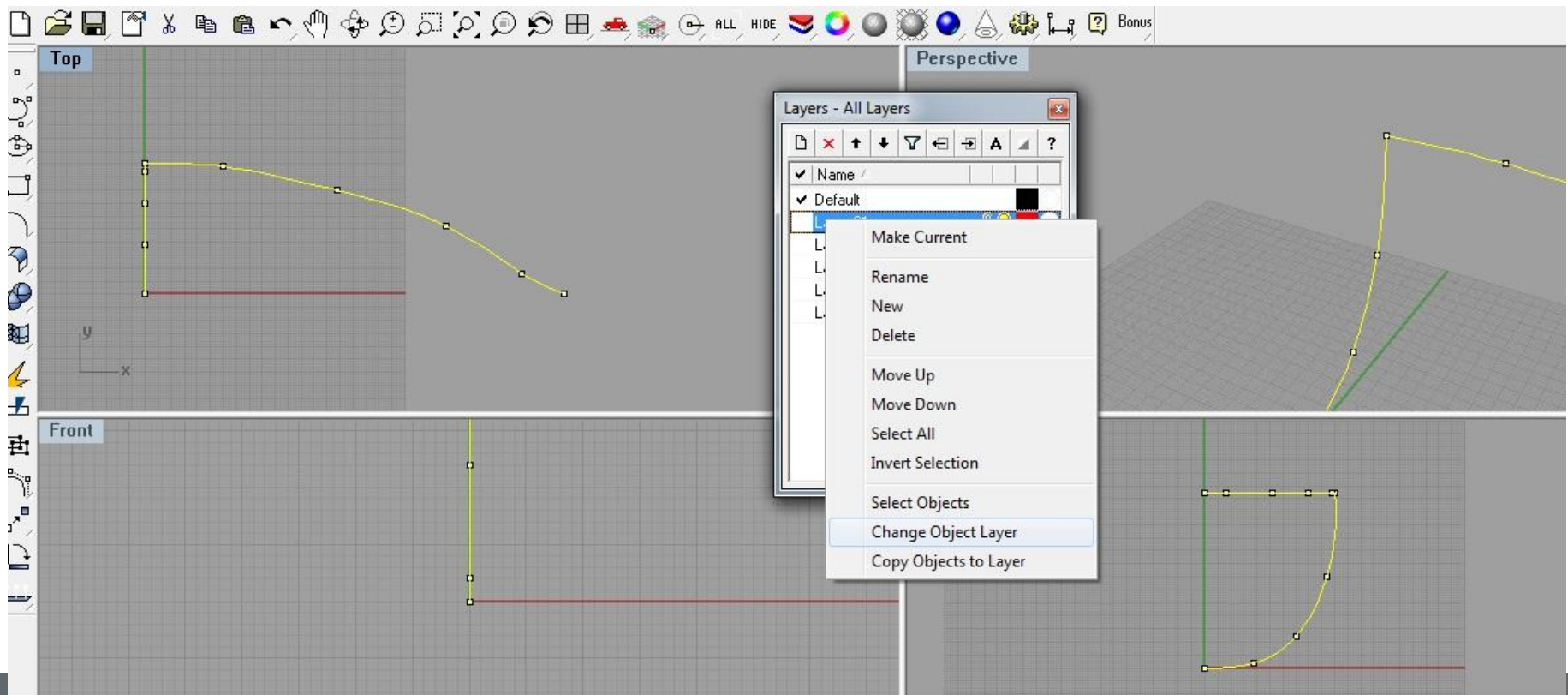
# Rhino3D

- Place points on X-Y Plane (TOP View) and Move points up to deck edge.
- Then draw polyline through points



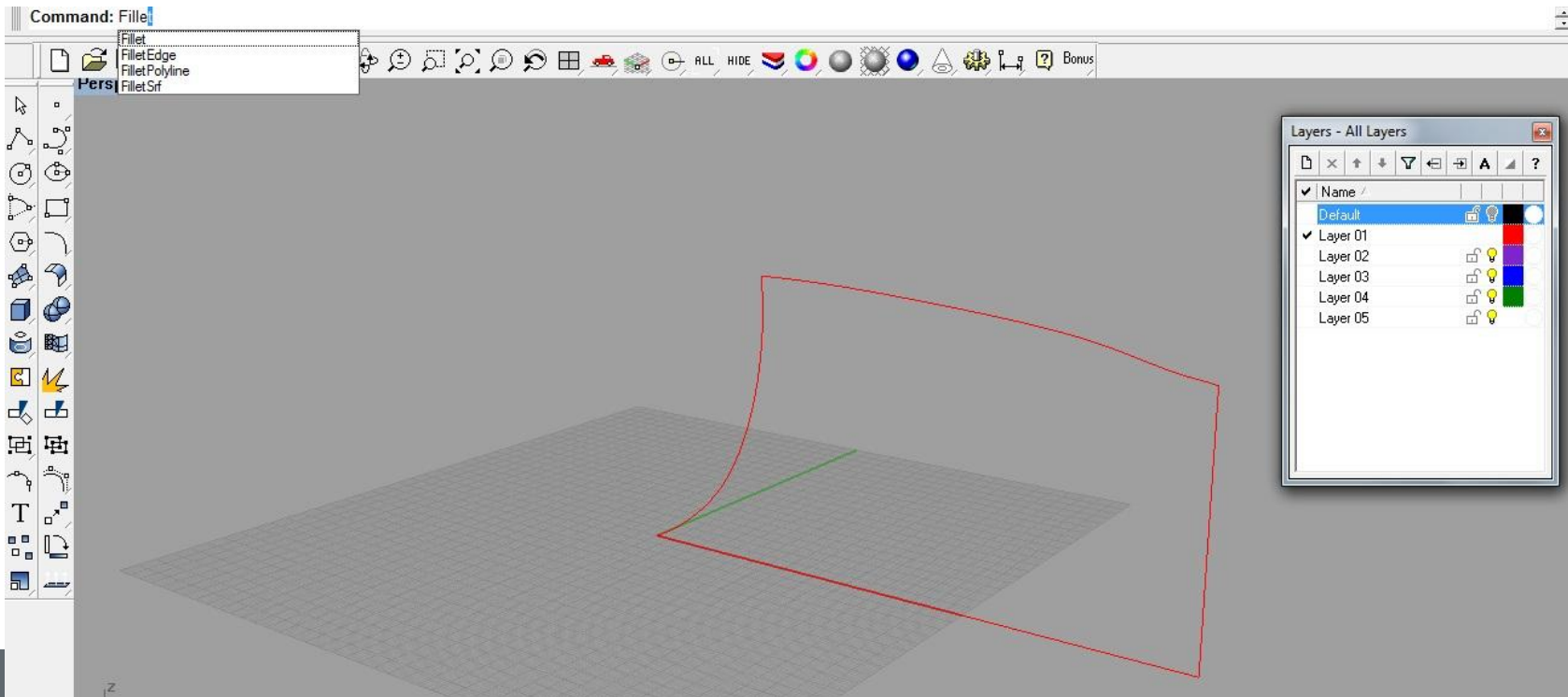
# Rhino3D

- Change lines to separate layer
- Then turn off layer with points



# Rhino3D

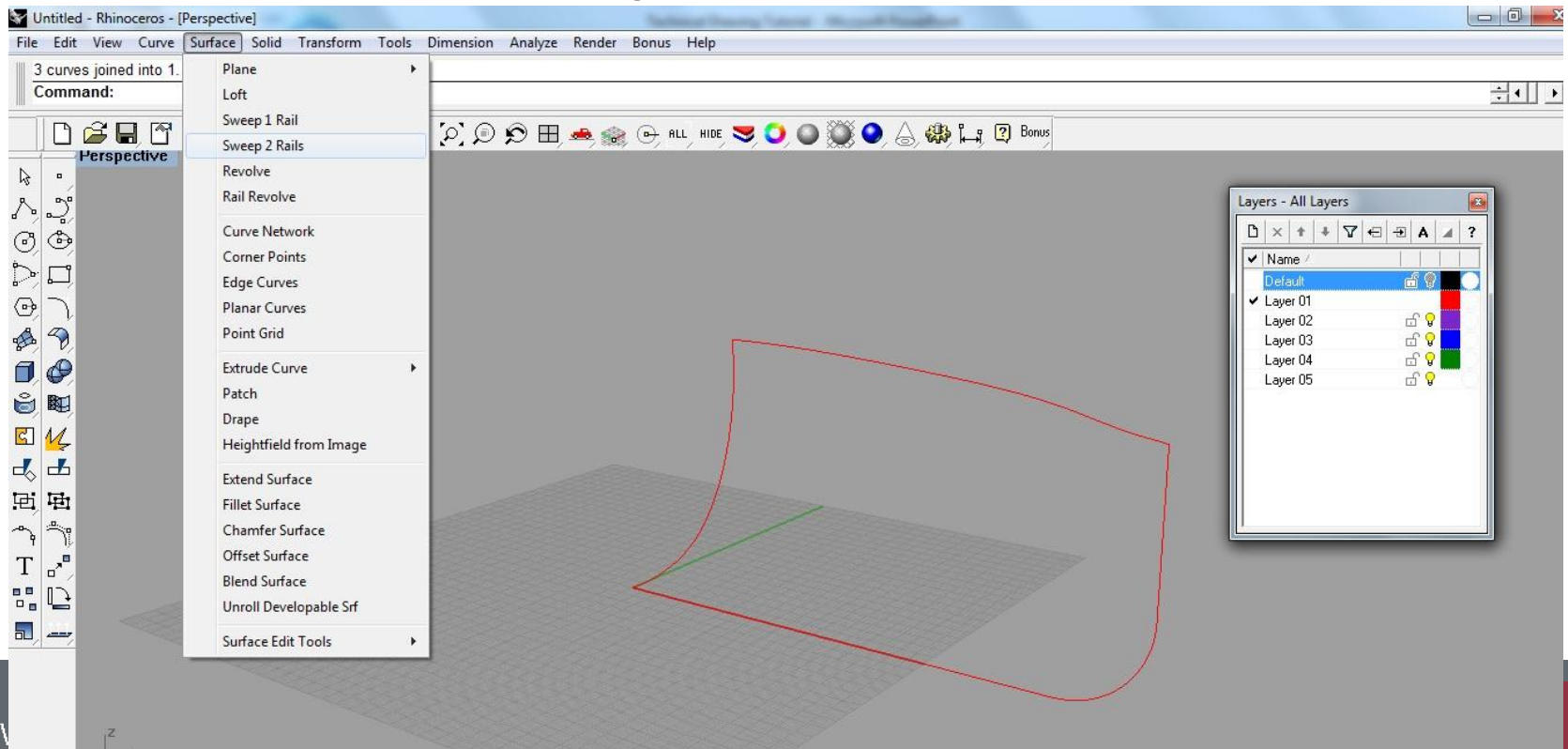
- Draw 2 lines from midship-centerline to the bow-deck
- Fillet edges
- Then join curves





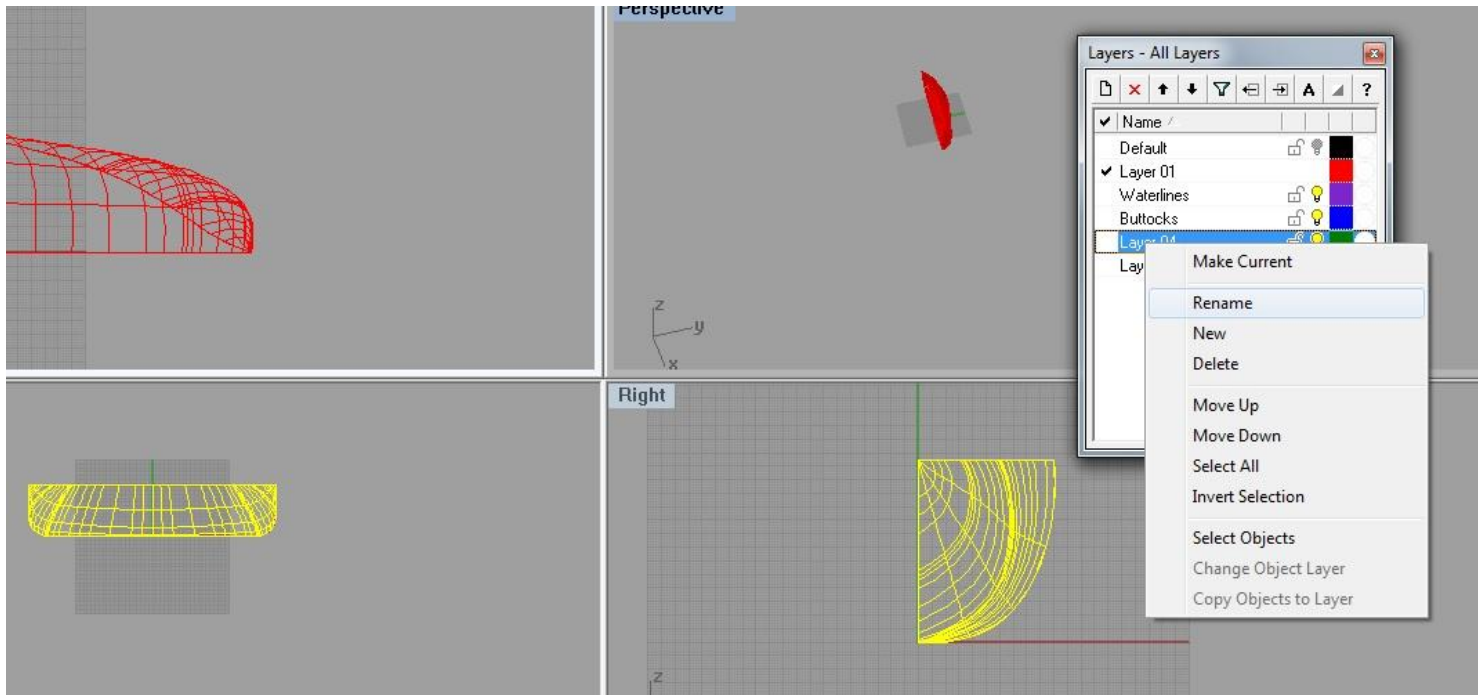
# Rhino3D

- Sweep 2 rails with the midship section as the cross curve
- Then mirror surface about the midship
- Then Join 2 surfaces together



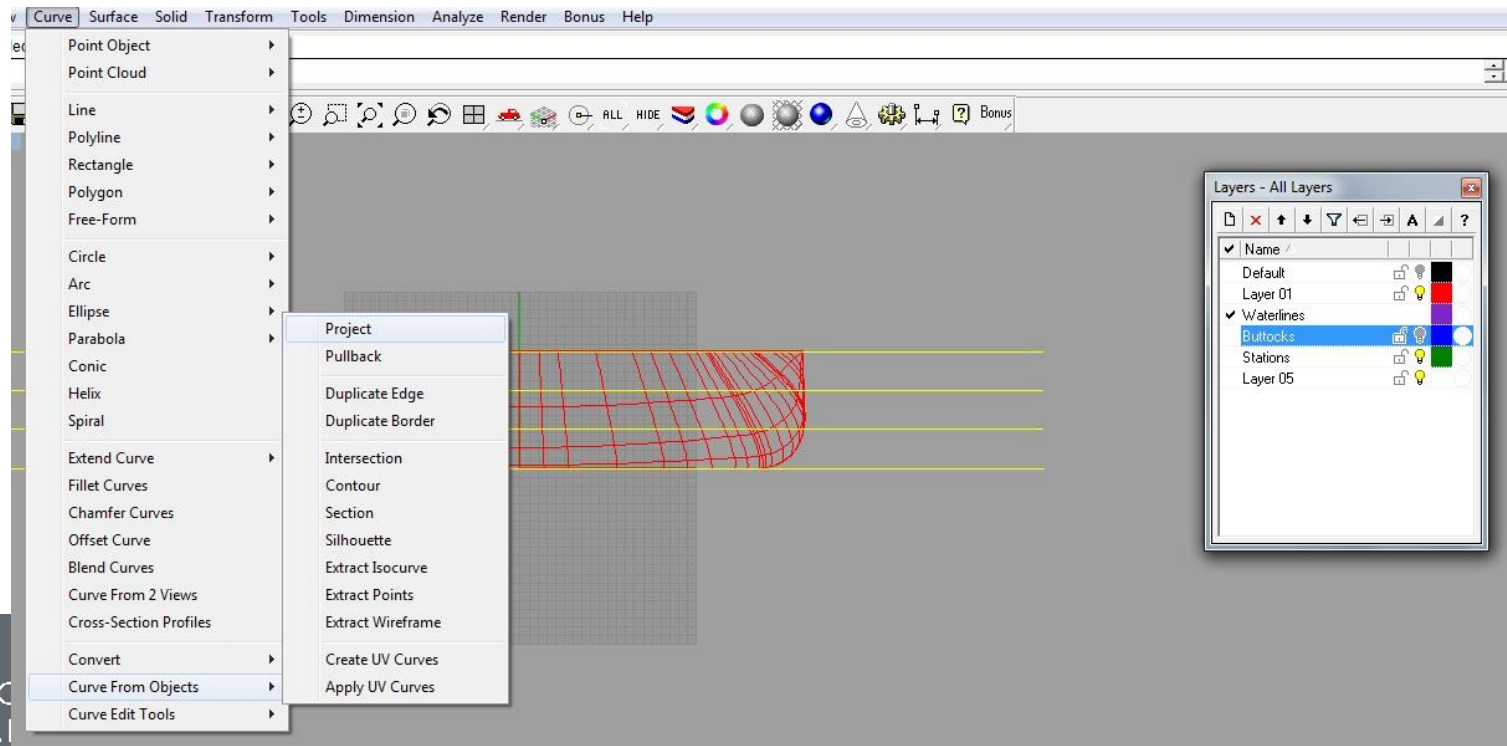
# Rhino3D

- Rename new layers
- Waterlines, Buttocks, Stations



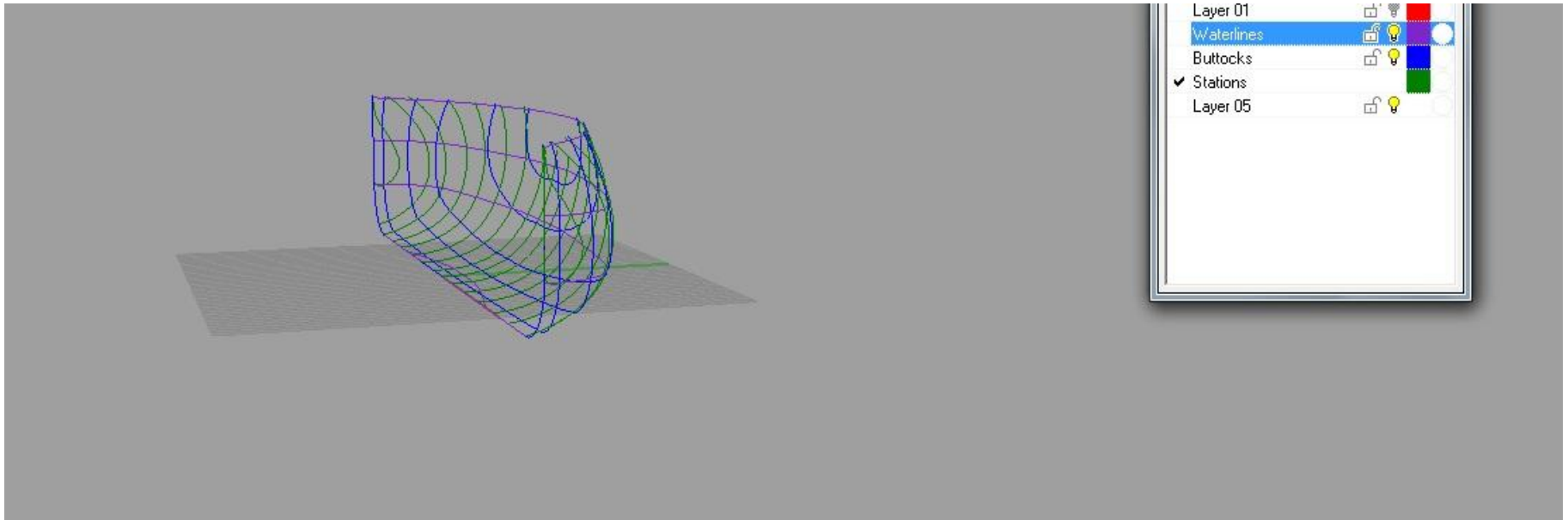
# Rhino3D

- Select the waterlines layer and place straight lines in the X-Z plane
- Then project curves onto surface using the front view
- Repeat for Buttocks and Stations in the respective views



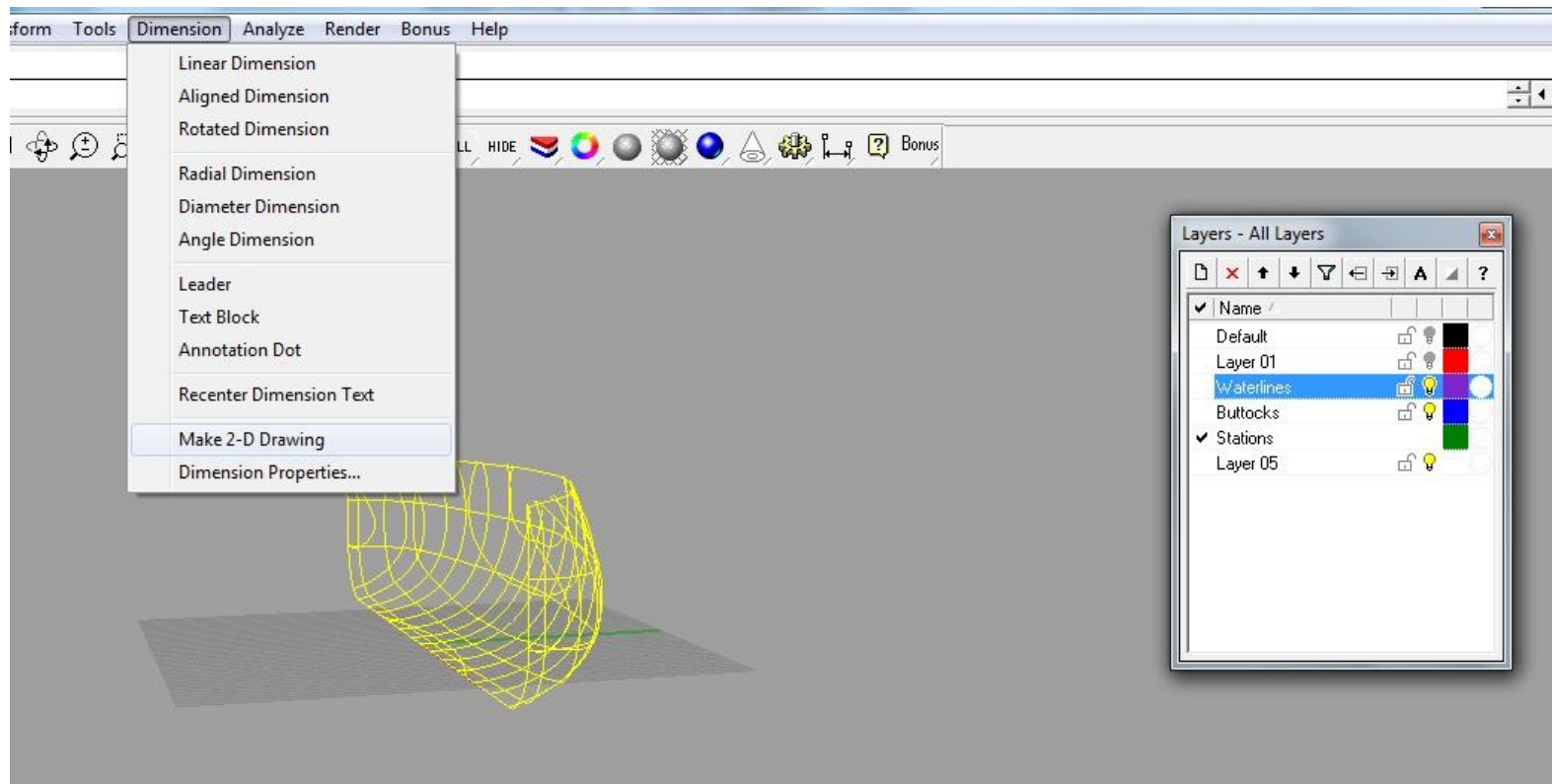
# Rhino3D

- Hull lines to define the ship geometry



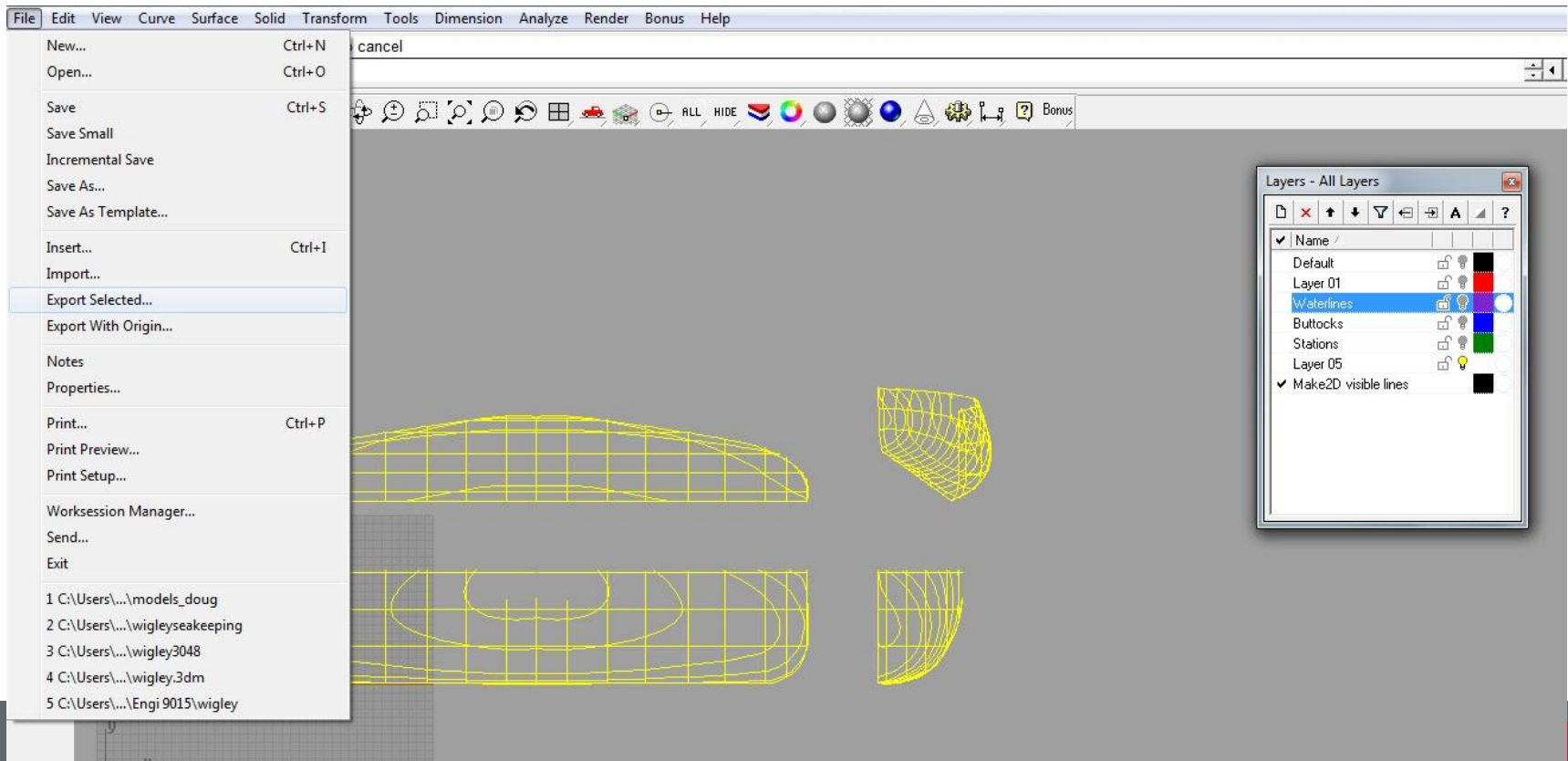
# Rhino3D

- Select lines and Make 2-D drawing



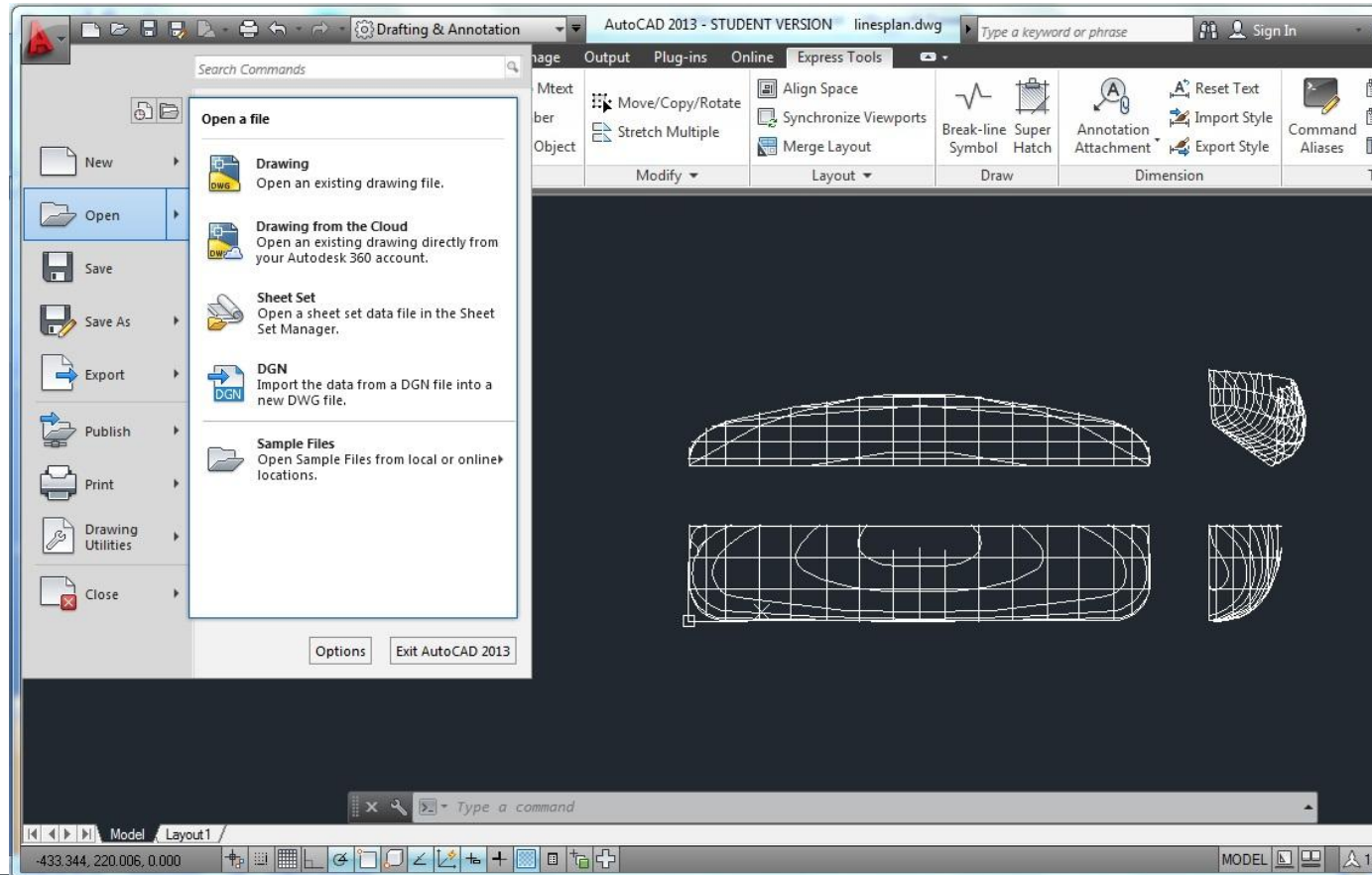
# Rhino3D

- Select 2D lines and export selected as .dwg file



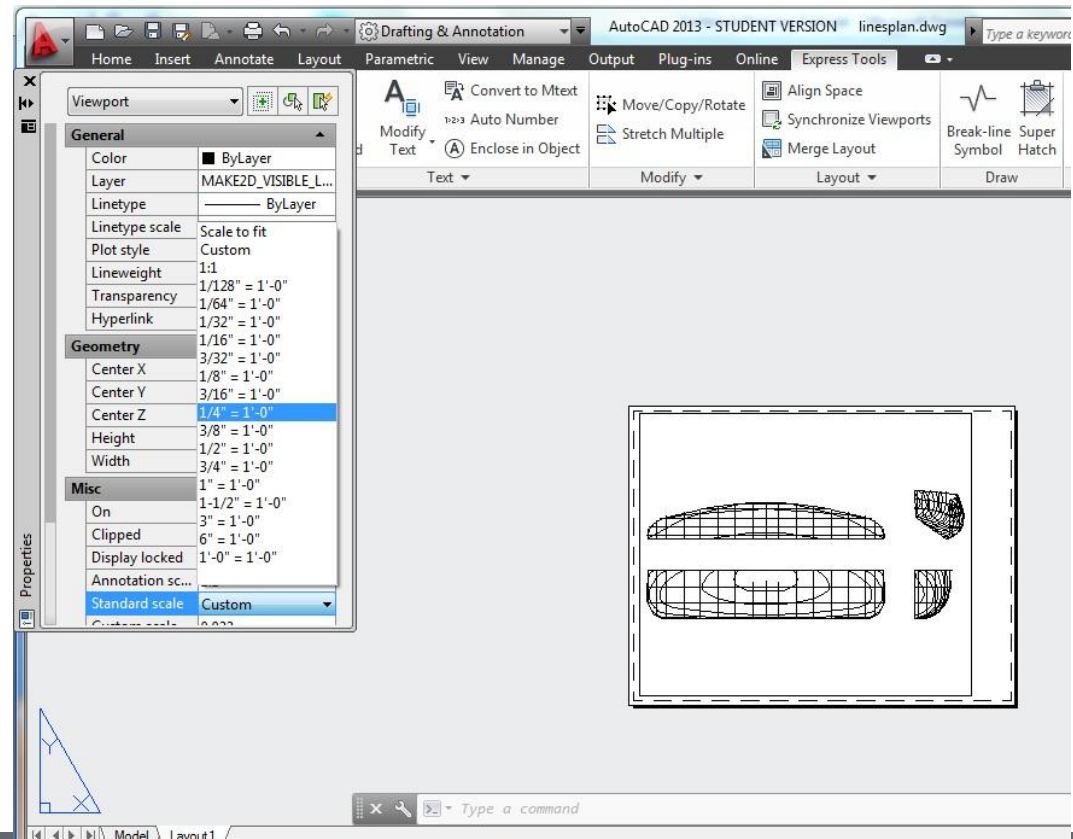
# AutoCad

- Import dwg to AutoCad



# AutoCad

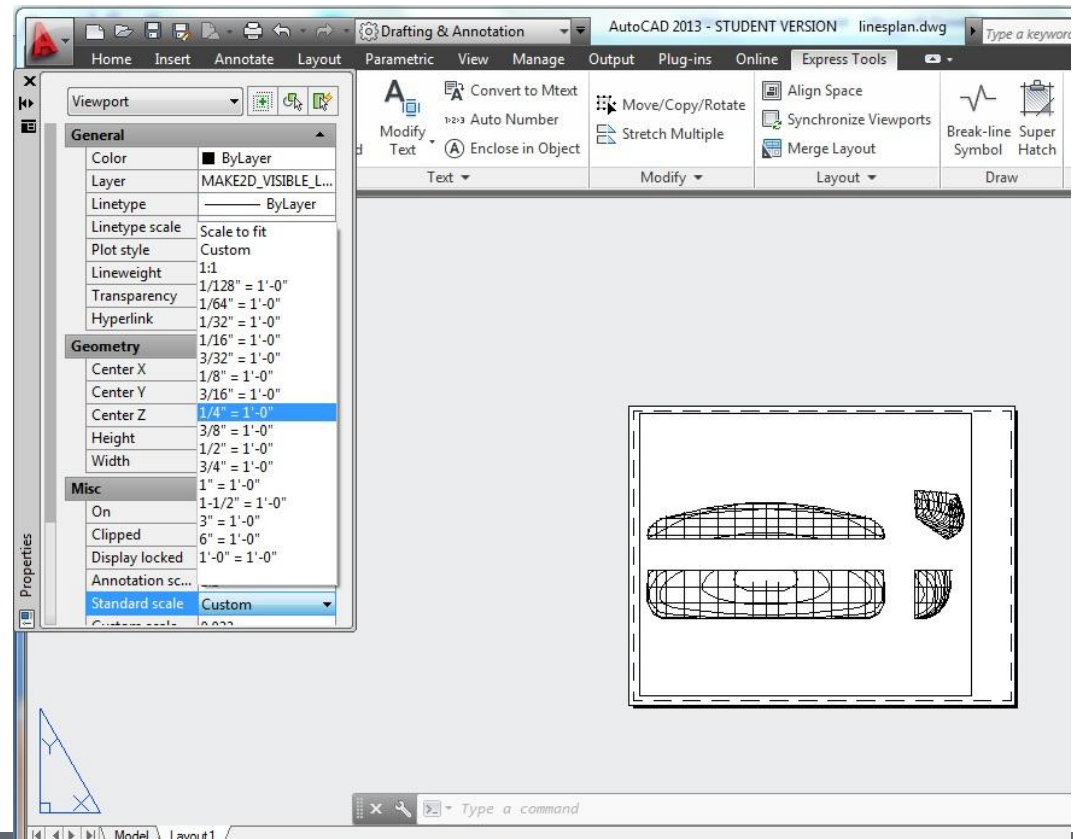
- Go to paper space (layout1)
- Select viewport
- Open properties window
- Play with scale to get an idea of the scale you will need
- Note: use page setup to set paper size.





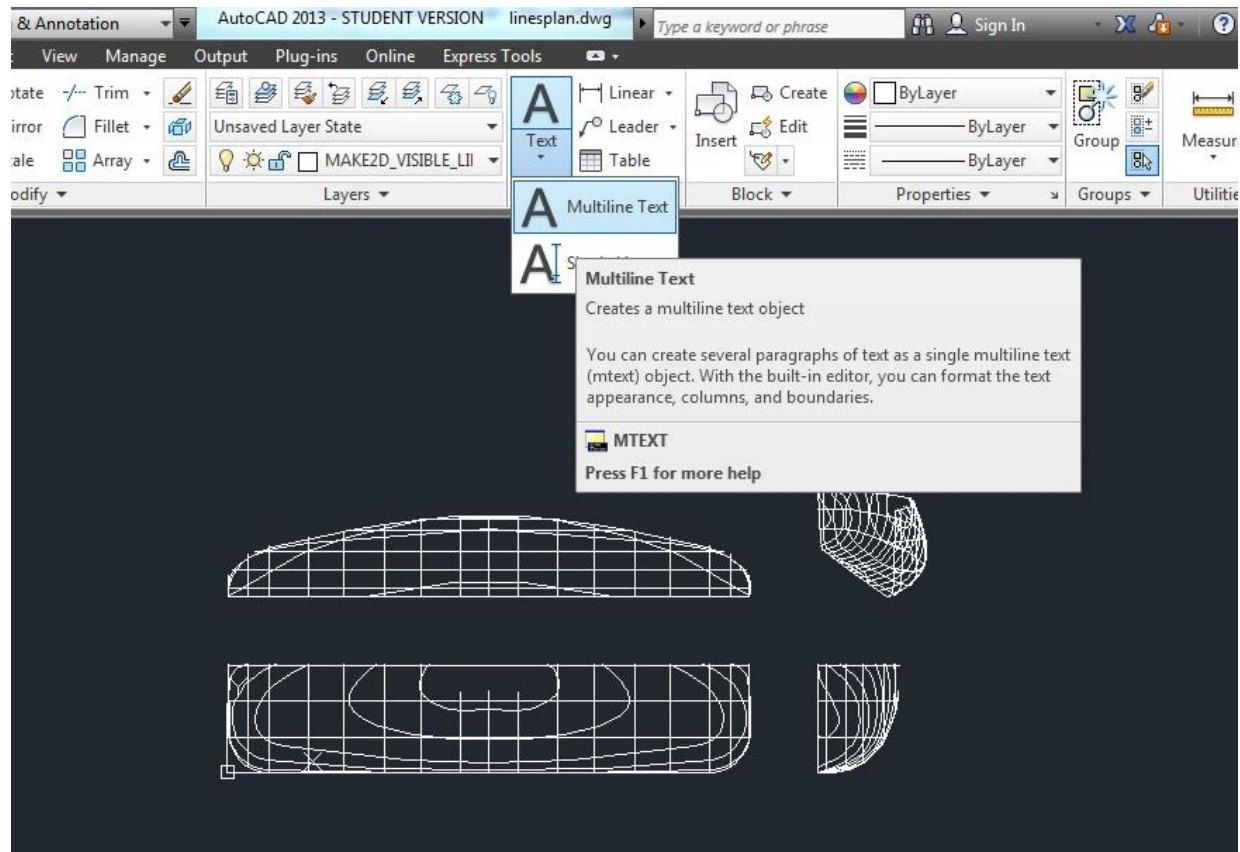
# AutoCad

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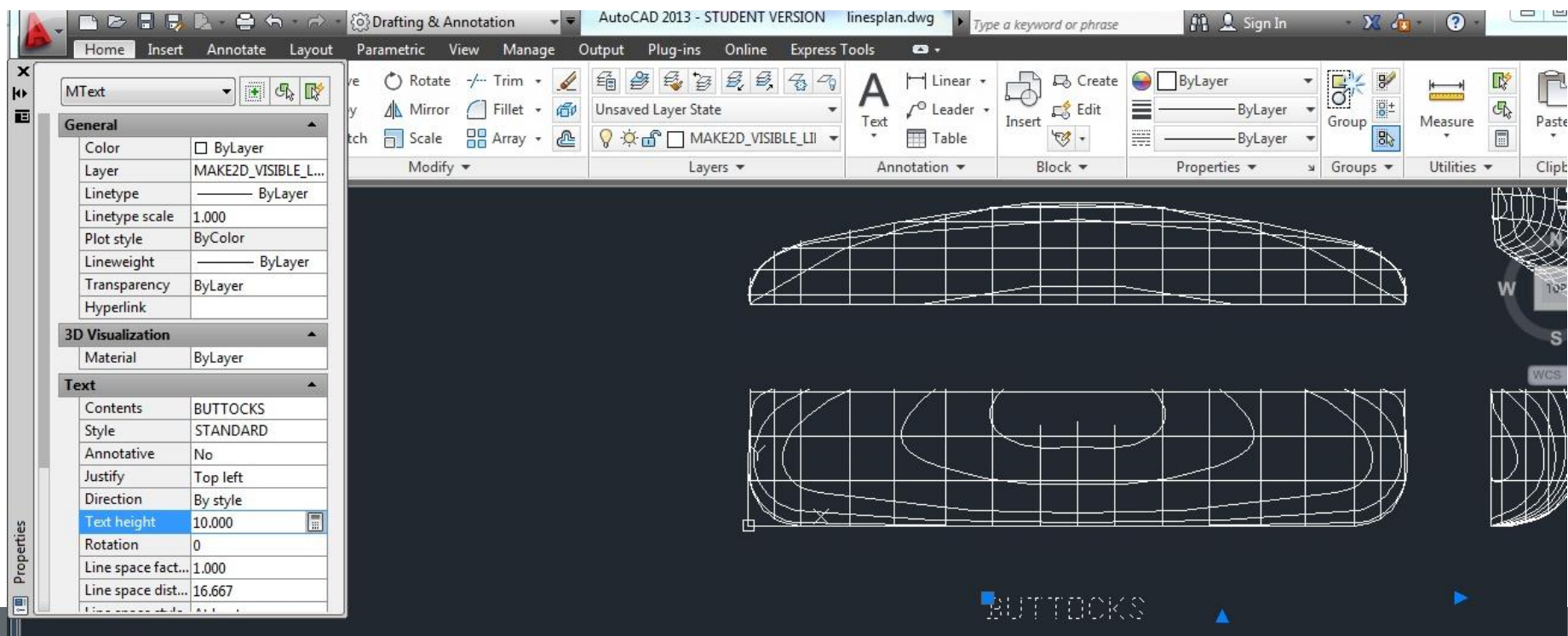
# AutoCad

- Add labels to views



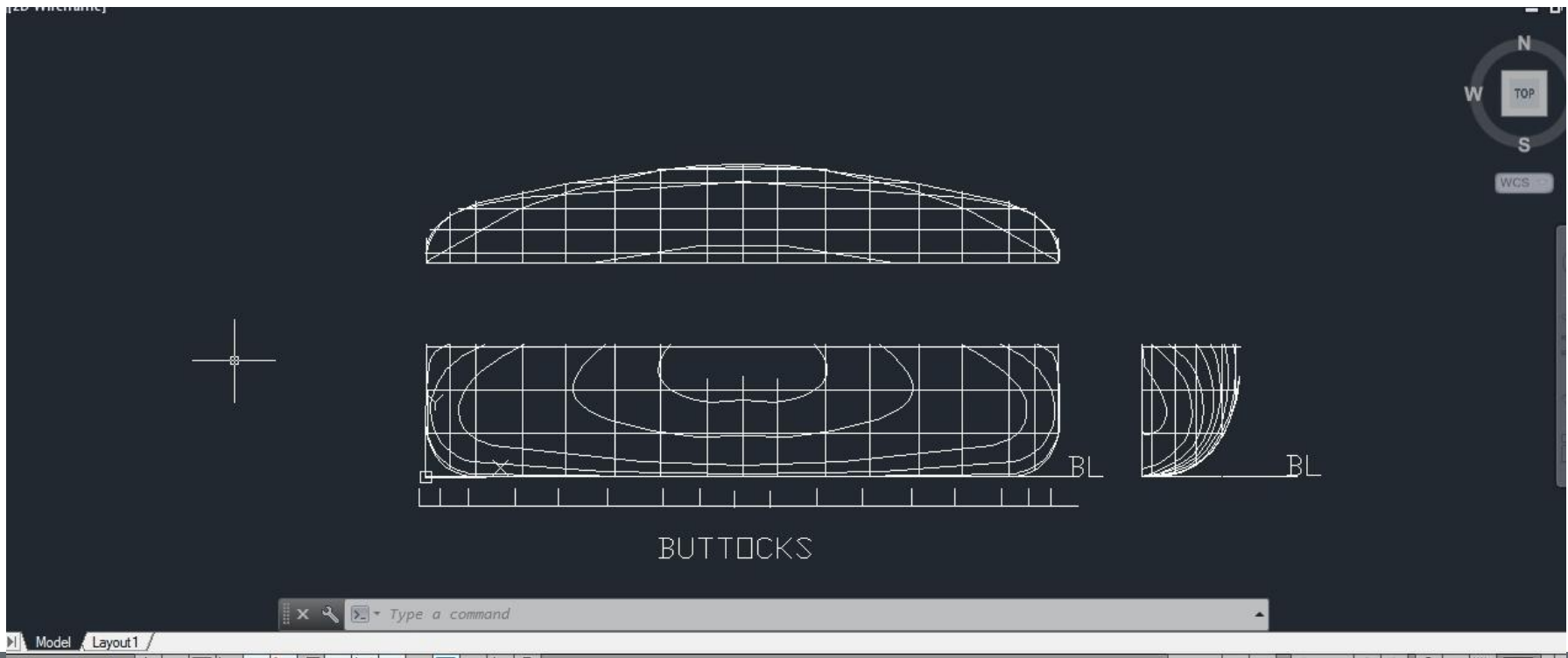
# AutoCad

- Adjust text height to appear correctly in paper space



# AutoCad

- Add Baseline, Centerline, Labels, Station numbering



# AutoCad

- After drawing is complete create title block
- Note: Better to draw title block in paper space then scale viewport inside the title block

# Technical Drawing

- Questions?