KEMENTERIAN PERHUBUNGAN
BADAN PENELITIAN DAN PENGEMBANGAN
PUSLITBANG TRANSPORTASI LAUT, SDP

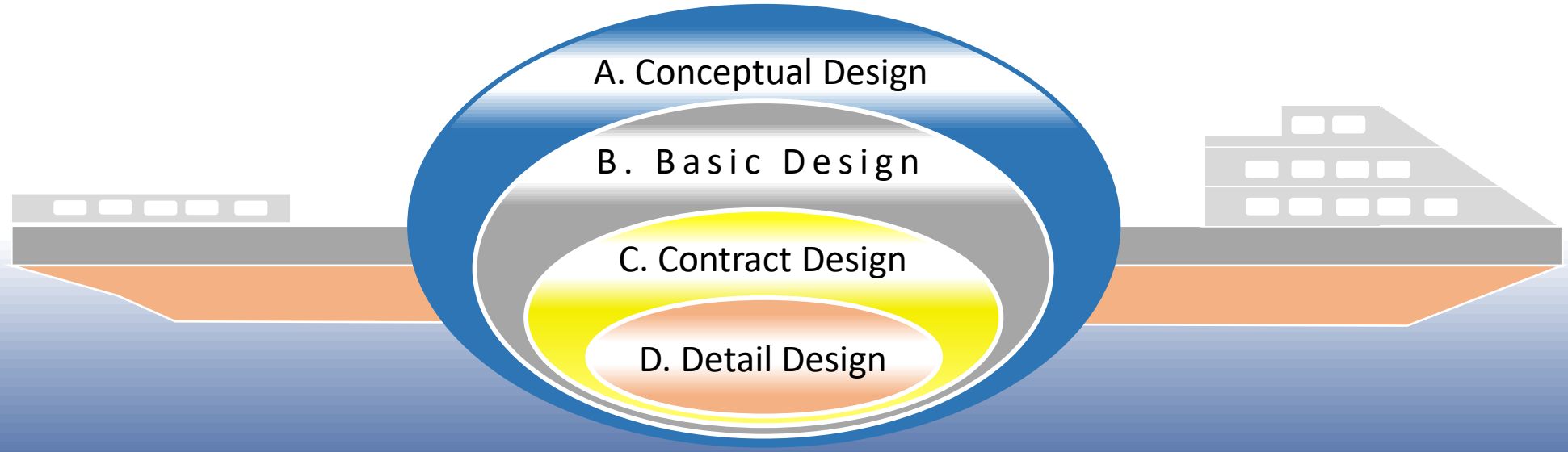
Masukan Terhadap Laporan Pendahulaun Penelitian "Basic Design dan Key Plan MCB untuk Mengurangi Beban Lalu Lintas Angkutan Jalan Jakarta – Surabaya

MOTORIZED CONTAINER BARGE (MCB) DESIGN PROCESS

(Syamsul Asri)

Jakarta,
23 April 2019

MOTORIZED CONTAINER BARGE
design process



A. CONCEPTUAL DESIGN

MISSIONS REQUIREMENT

Pay loads :
1000 TEUs

Kecepatan :
≥ 10 knots

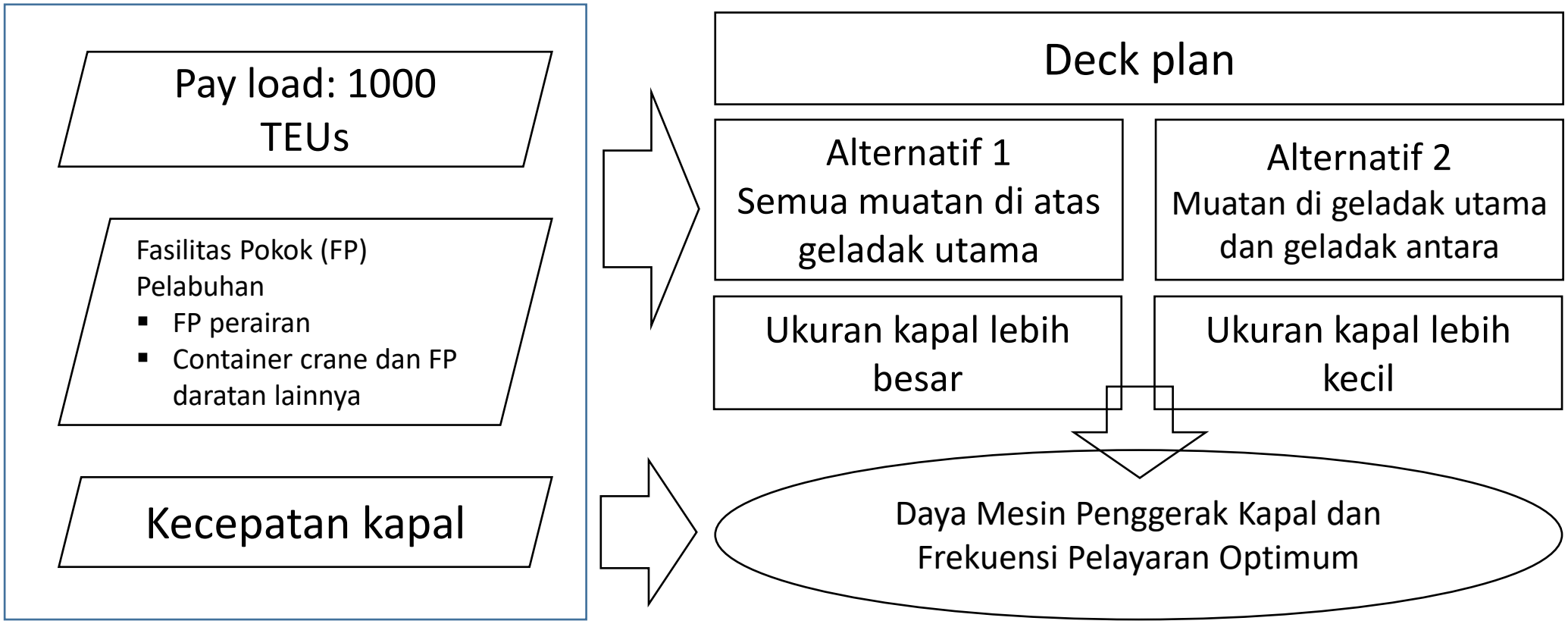
- Trayek : T. Priok – T. Perak (519 mil)
- ??? Fasilitas pelabuhan
  - Fasilitas pokok perairan: kolam tambat, kolam labuh, kolam putar, alur pelayaran
  - Container crane
  - Dll.

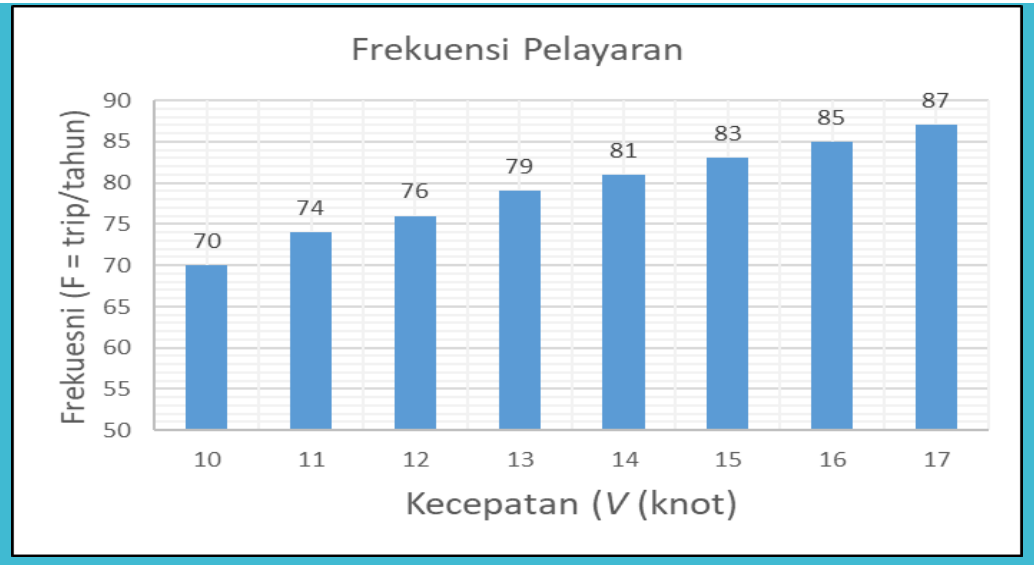
PROPORTIONS & PRELIMANARY POWERING

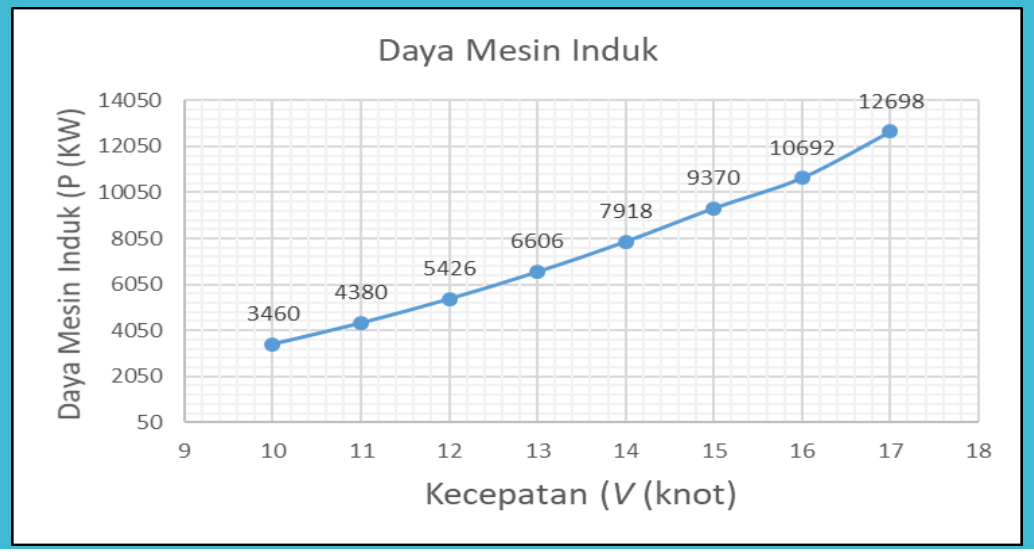
Ukuran Utama

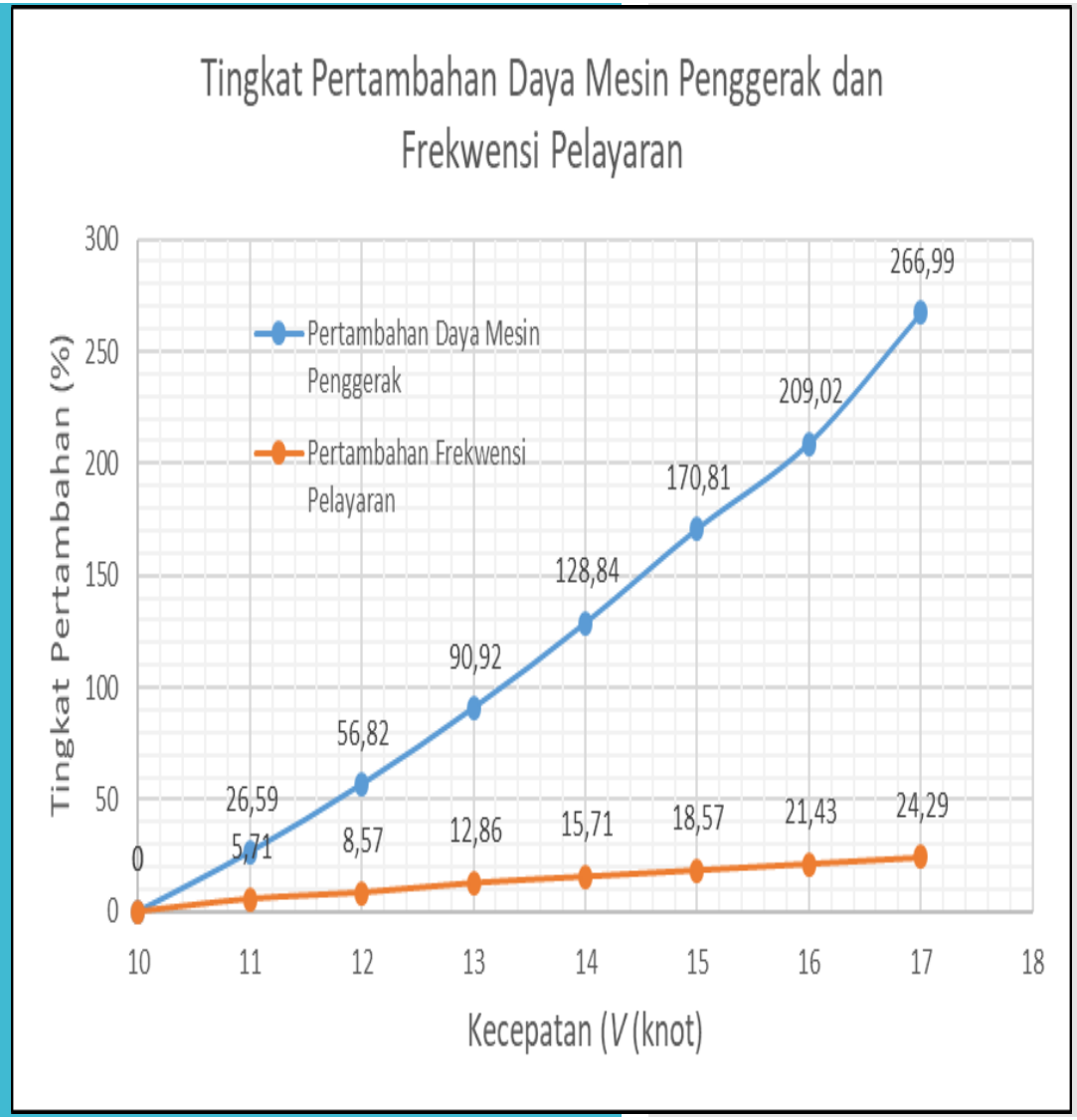
LOA	=	202,585	m.
LD	=	200,527	m.
LWL	=	197,600	m.
LBP	=	190,000	m.
B	=	36,360	m.
H	=	7,926	m.
T	=	4,290	m.

Penajaman analisis yang diperlukan:

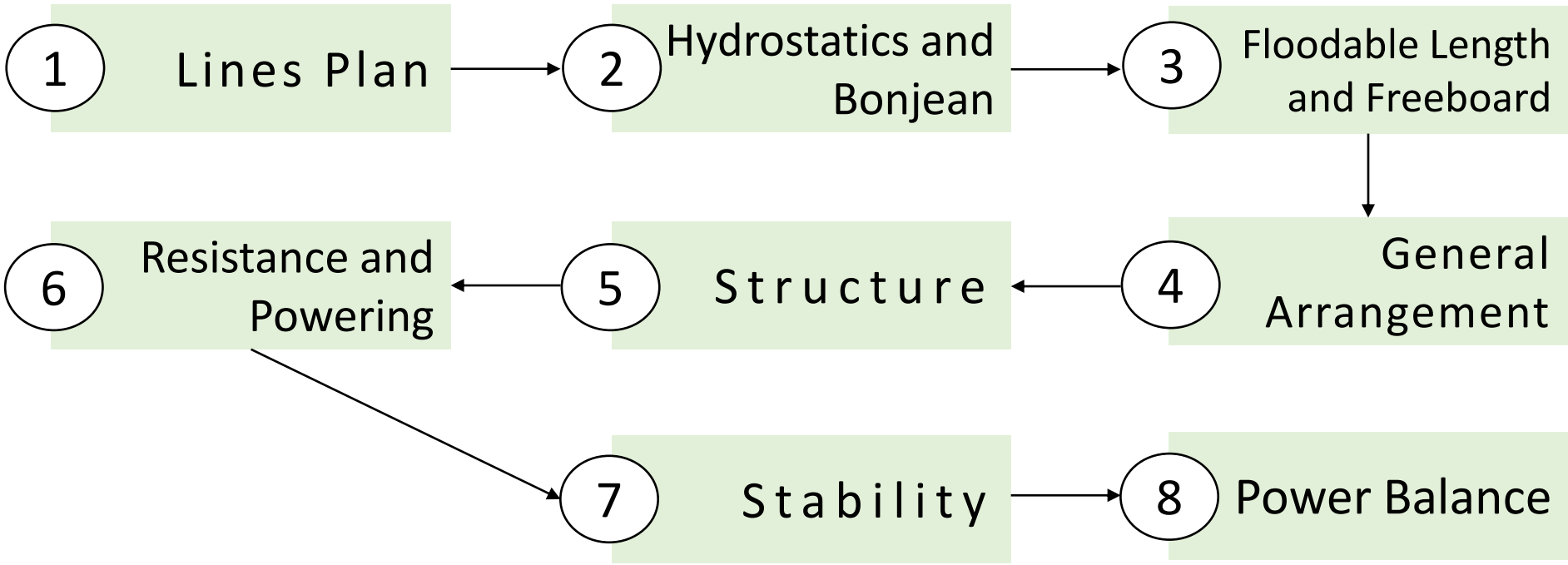



Frekuensi Pelayaran
Frekuesni (F = trip/tahun)
90
85
80
75
70
65
60
55
50
70
74
76
79
81
83
85
87
10
11
12
13
14
15
16
17
Kecepatan (V (knot)

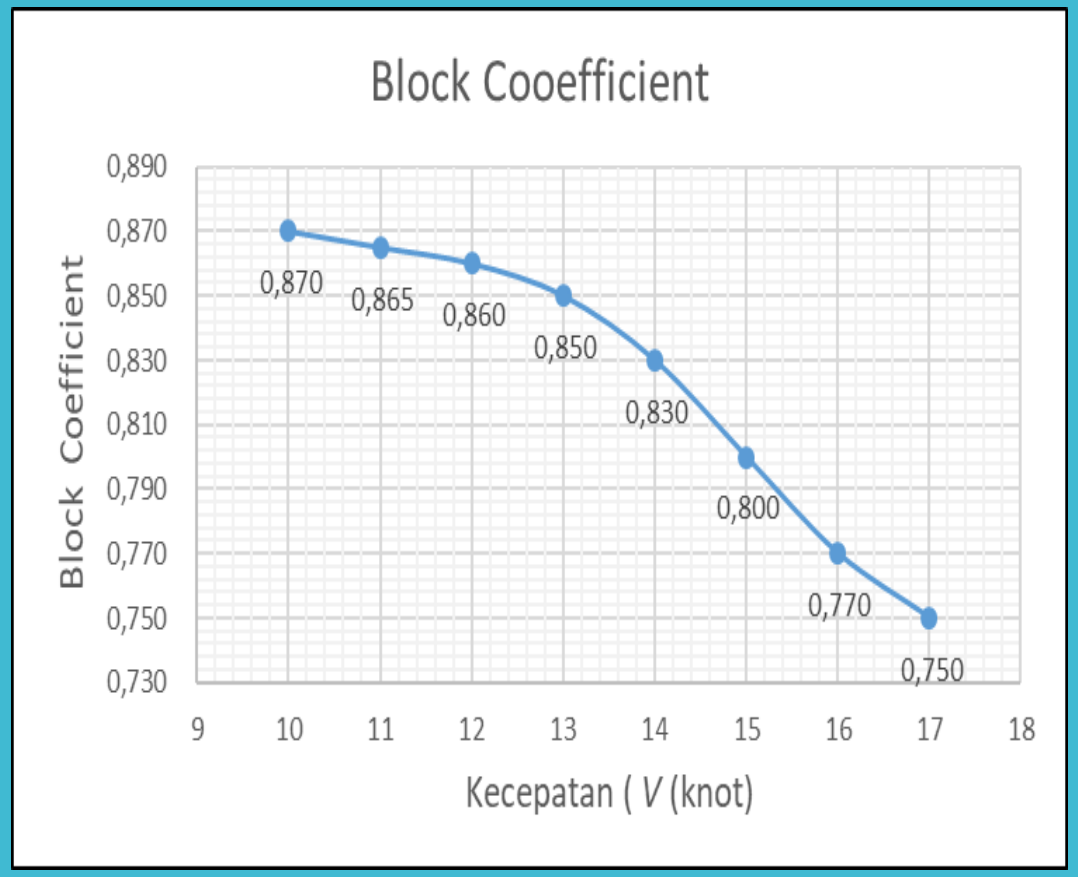

Daya Mesin Induk
Daya Mesin Induk (P (KW)
14050
12050
10050
8050
6050
4050
2050
50
3460
4380
5426
6606
7918
9370
10692
12698
9
10
11
12
13
14
15
16
17
18
Kecepatan (V (knot)

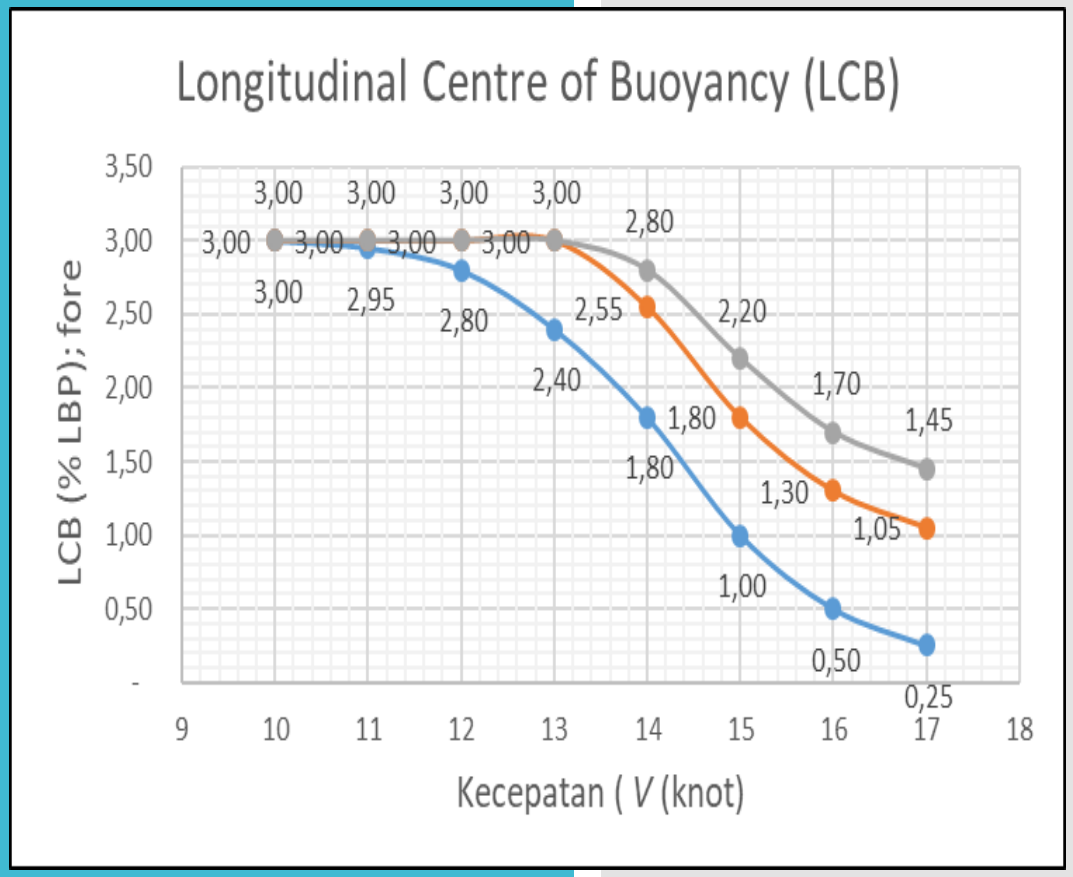

Tingkat Pertambahan Daya Mesin Penggerak dan Frekwensi Pelayaran
Tingkat Pertambahan (%)
300
250
200
150
100
50
0
Pertambahan Daya Mesin Penggerak
Pertambahan Frekwensi Pelayaran
0
26,59
56,82
90,92
128,84
170,81
209,02
266,99
0
5,71
8,57
12,86
15,71
18,57
21,43
24,29
10
11
12
13
14
15
16
17
18
Kecepatan (V (knot)

B. BASIC DESIGN



LINES PLAN

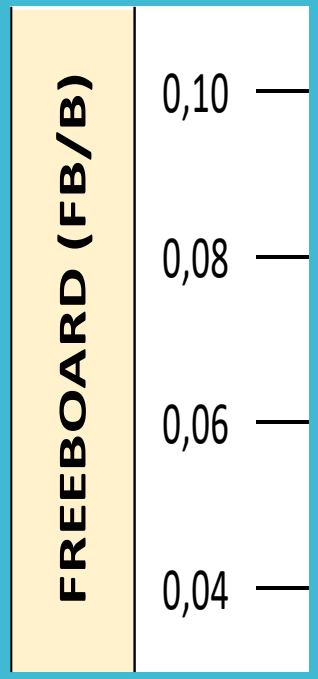

Block Cooefficient
Block Coefficient
0,890
0,870
0,850
0,830
0,810
0,790
0,770
0,750
0,730
0,870
0,865
0,860
0,850
0,830
0,800
0,770
0,750
9
10
11
12
13
14
15
16
17
18
Kecepatan (V (knot)


Longitudinal Centre of Buoyancy (LCB)
LCB (% LBP); fore
3,50
3,00
2,50
2,00
1,50
1,00
0,50
-
3,00
3,00
3,00
3,00
3,00
3,00
3,00
3,00
3,00
2,95
2,80
2,40
1,80
1,00
0,50
0,25
2,80
2,55
2,20
1,80
1,70
1,45
1,30
1,05
9
10
11
12
13
14
15
16
17
18
Kecepatan (V (knot)

FLOODABLE LENGTH AND FREEBOARD

Kebocoran

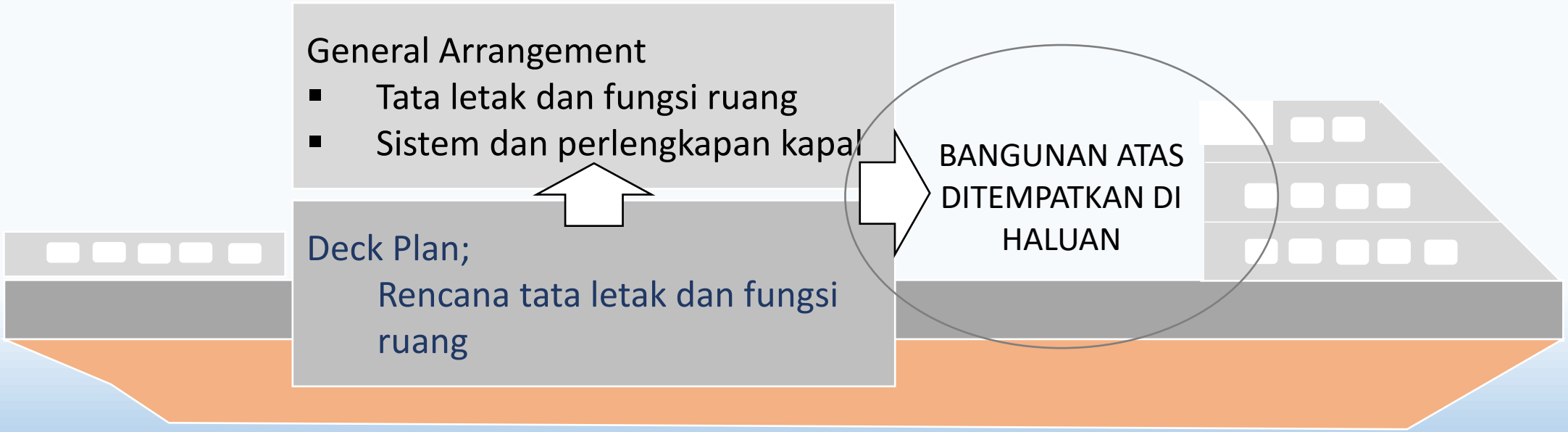
Floodable Length
- Trans. Bulkead
- Long. bulkhead



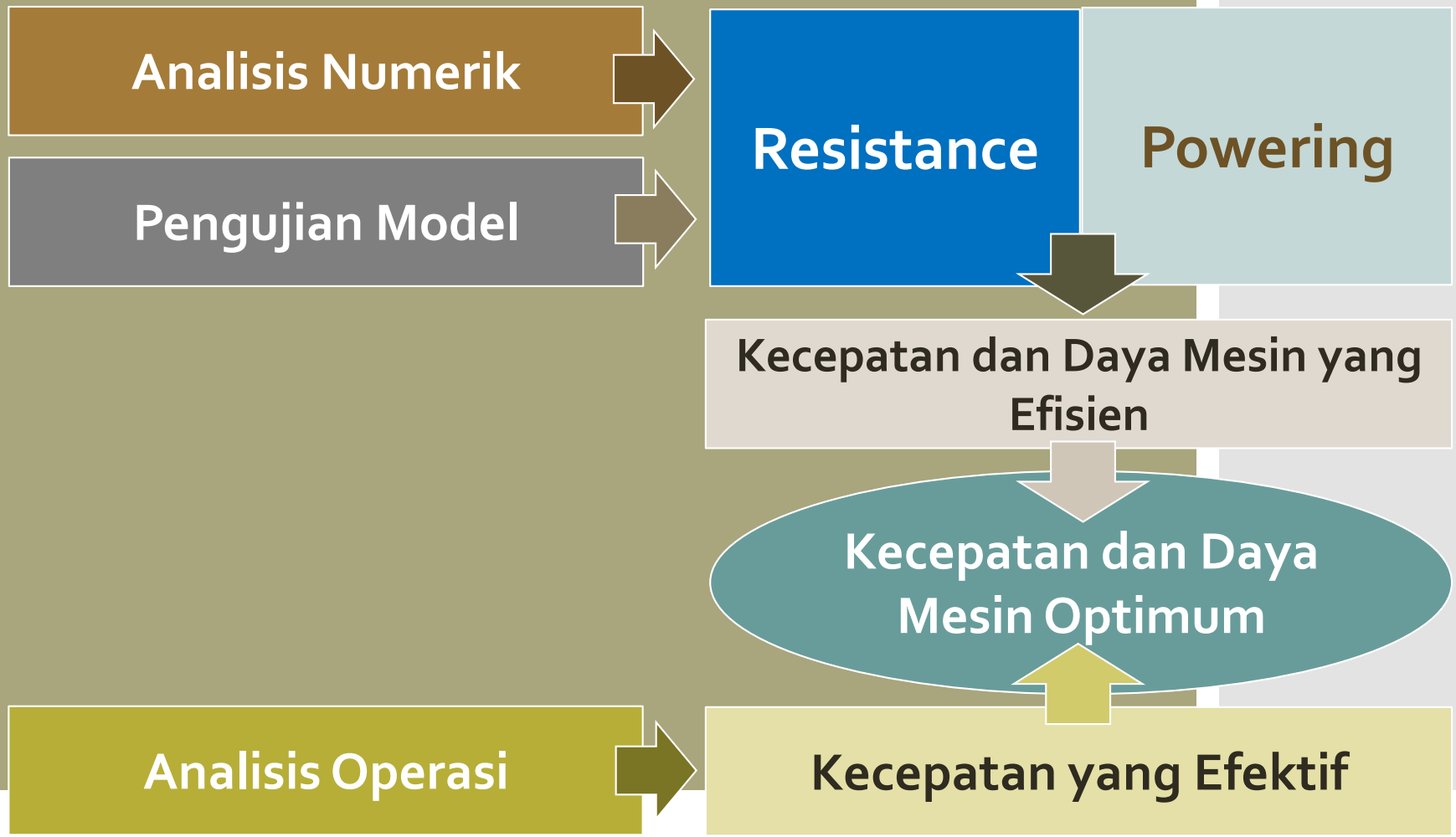
- Limiting KG lebih besar
- Lengan stabilitas maksimum lebih besar; perubahan tidak pada FB/B > 0,08
- Rentang stabilitas dan tinggi mtetasentra lebih kecil
- FB/B < 0,06; Z pada $\varphi < 25^{o}$;
- B/T > 2,5 ; Z boleh pada $\varphi \geq 15^{o}$;

Stabilitas

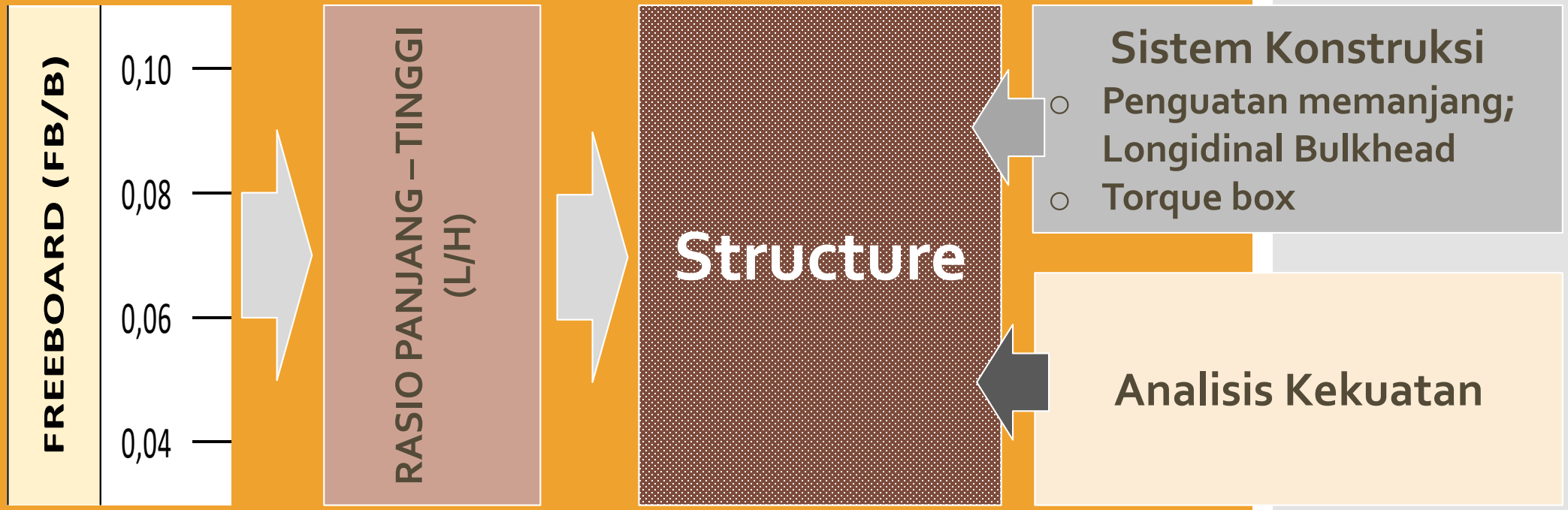
ARRANGEMENT



RESISTANCE AND POWERING



STRUCTURE


FREEBOARD (FB/B)
0,10
0,08
0,06
0,04
RASIO PANJANG – TINGGI (L/H)
Structure
Sistem Konstruksi
Penguatan memanjang;
Longidinal Bulkhead
Torque box
Analisis Kekuatan

STABILITY

MCB;
Muatan di atas geladak, KG besar

Stability

- = f (ukuran bentuk, KG actual)

Preliminary Stability

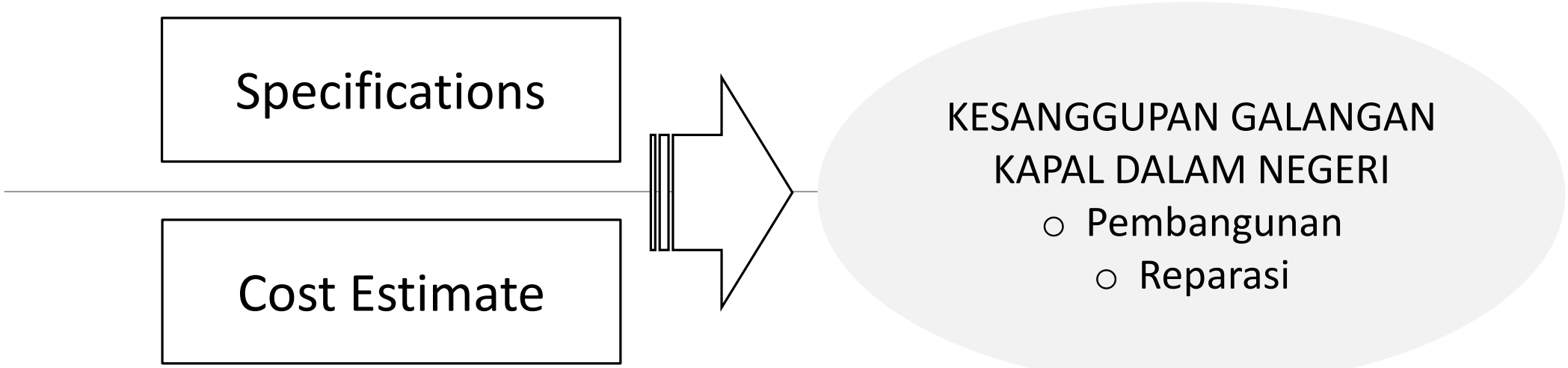
- = f (ukuran, bentuk, FB)
- Limiting KG

Intact Stability

Damaged Stability

Petunjuk Pemuatan

C. CONTRACT DESIGN



D. DETAIL DESIGN

HULL AND STABILITY

1. General Arrangement
2. Midship Section
3. Construction Profile
4. Shell Expansion
5. Transverse & Long. Bulkhead
6. Fore & After Construction
7. Hatch Construction & Closing arr
8. Rudder & Rudder Stock
9. Main Engine Foundation
10. Container Stack Foundation
11. Superstructure & Deck House
12. Long. Strength L > 65 m
13. Lines Plan
14. Cargo securing manual
15. Stowage and Lashing Arrangement
16. Shaft Bracket / Skeg (Mana yg aplicable)
17. Stability Booklet
18. NDT Plan
19. Welding Schedule
20. Cathodhic Protection

MACHINERY

1. Engine Room Lay out
2. Fuel Oil System
3. Air Pipe, Filling, Sounding System
4. Lubricating Oil System
5. Bilge , Ballast and Fire System
6. Fresh Water System
7. Cooling System
8. Shafting Arrangement
9. Propeller Shaft & Stern tube
10. Steering Gear System
11. Propeller

ELECTRICAL

1. Wiring Diagram
2. Main Switch Board
3. Power Ballance Calculation

STATUTORI

1. Safety Plan
2. Fire Plan

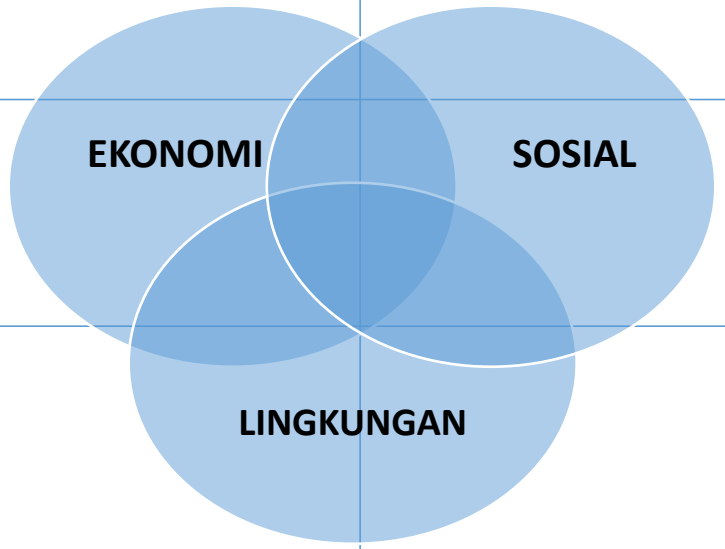
PENILAIAN EKONOMI

ANGKUTAN LAUT | **ANGKUTAN DARAT**

MANFAAT

- **Pemilik**
  - Investasi
  - Tingkat keuntungan
- **Masyarakat**
  - Lapangan kerja
  - Kelancaran distribusi
  - Tarif
- **Negara**
  - Investasi dan pemeliharaan infstruktur
  - Penerimaan negara

DAMPAK LINGKUNGAN



Terima kasih