APPENDIX A

VESSEL CHARACTERISTICS DATA

This appendix supplements the Section VI.B. discussion of the vessels to be berthed at the MHP and presents the summary of characteristics of the vessels, (primary and alternative). These characteristics data were used to determine the mooring loads due to the wind and current load on the vessels, discussed in Section IX.B.2.

VESSEL CHARACTERISTICS – ASSUMPTION FOR SHIP CHARACTERISTICS

Wind

A. We will use area associated with light condition to maximize the wind force

B. Windage area was updated for small vessels (4/25/01) based on ship characteristics database

C. When we couldn't obtain enough information from database, we approximated the windage area using other references, such as:

1. Advance Pier Concept User's Guide
2. James Fighting Ships
3. Facility Planning Criteria for LPD17 Draft November 2000

Current

A. Current load will be larger for fully loaded conditions. However, since wind force dominates, we will use current load due to light condition

B. When we couldn't obtain enough information from database, we approximated using:

1. Advance Pier Concept User's Guide
2. James Fighting Ships
3. Facility Planning Criteria for LPD17 Draft November 2000

C. When we have draft (T) and displacement (D) for only loaded conditions, we approximated.

Project: MHP PH II
Designer: KAP
File: O:\2001\A01047\ENGR\Design Criteria\[Shipchract.xls]Ship

Subject: Ship Characteristics

Reference: Ship Characteristics Database (Based on Mil-HDBK 26.6)
Advance Pier Concept User Guide
James Fighting Ships
Facicility Planning Criteria For LPD17 Draft Nov,2000

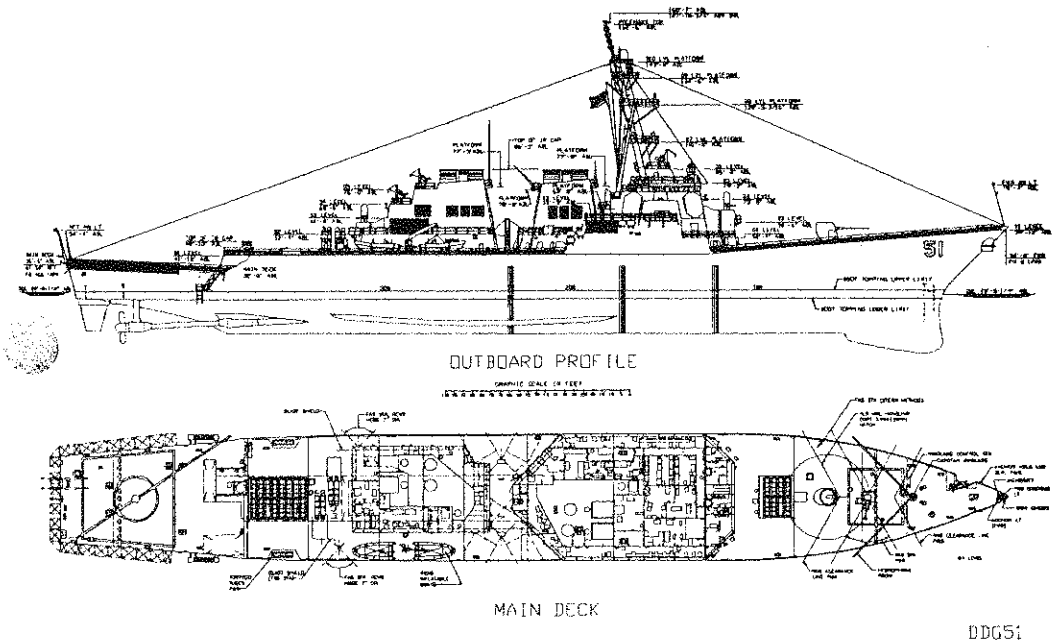
	FFG 7	DDG 51	CG 47	DD963	LPD 17	LHA 1	LHD 1
Broad Side Area (ft^2)	16000	20500	27000	25850	52000	76750	67500
Frontal Area (ft^2)	2500	4500	5600	4400	11025	11500	10000
Area_Hull (ft^2)	9370	12200	17255	13850	30800	61400	50640
hh (ft)	23.0	26.2	32.6	26.2	45.0	80.3	65.1
Area_Superstructure (ft^2)	6600	8231	9745	12000	21000	15350	16800
hs (ft)	46.2	46	83	64	60	61	60
Length at the water (ft)	408	466	530	529	684	765	778
Breadth, Moulded Maximum (ft)	45	59	55	55	45	106	106

	FFG 7	DDG 51	CG 47	DD963	LPD 17	LHA 1	LHD 1
T, Draft _Light (ft)	12.7	16	31	21	23	26	26.6
T, Draft _Loaded (ft)	14.4	20	23.4	17.7	14.5	18.9	19.3
D, Disp_LIGHT (LongTon)	2744	6513	7392	6570	24900	25555	27839
D, Disp_LOADED (LongTon)	3624	8276	9962	8923	18177	39251	40674

EXAMPLES OF VESSEL DATA

Ships Characteristic Database Management System

DDG-51



SHIPS CHARACTERISTIC DATABASE SYSTEM

General Characteristics

(References: MIL-HDBK 1025/1, Table 1; DM 26.6, Table 2)

Classification
Type
Group
Class Name — Hull
Ship Name — Designation

WARSHIP

SURFACE COMBATANT

DESTROYERS

ARLEIGH BURKE

ARLEIGH BURKE — DDG-51

Overall Length	505.0	ft	Forward Draft	19.87	ft
Length @ Waterline	466.0	ft	Displacement	8276	long tons
Maximum Beam	66.0	ft	Per Inch Immersion	52.0	long tons
Beam @ Waterline	59.0	ft	Complement w/o Air Wing or Troops	325	Personnel
Max Navigational Draft	30.0	ft			

Notes: General Characteristics data are for the Fully Loaded Condition.

SHIPS CHARACTERISTIC DATABASE SYSTEM

Physical Characteristics

(References: MIL-HDBK 26.6, Table 2)

Classification
Type
Group
Class Name — Hull
Ship Name — Designation

WARSHIP

SURFACE COMBATANT

DESTROYERS

ARLEIGH BURKE

ARLEIGH BURKE DDG-51

	Fully Loaded	1/3 Stores/Cargo/Ballast	Lightly Loaded	
Beam @ Waterline	59.0			ft
Length @ Waterline	466.0			ft
Transverse Area Above Waterline				sq ft
Transverse Area Below Waterline				sq ft
Longitudinal Area Above Waterline				sq ft
Longitudinal Area Below Waterline				sq ft
Displacement	8276		6513	long tons
Wetted Surface Area				sq ft
Avg Height of Hull Above Waterline				ft
Avg Height of Superstructure				ft
Avg Draft				ft
Aft Draft	20.68 ft			
Max Navigational Draft	30.0 ft			
Forward Draft	19.87 ft			

Limiting Condition

Limiting Draft Forward	22.25 ft
Limiting Draft Mid Ship	22.25 ft
Limiting Draft Aft	22.25 ft

SHIPS CHARACTERISTIC DATABASE SYSTEM

Analytical Characteristics

Classification
Type
Group
Class Name

Class
Designation

WARSHIP

SURFACE COMBATANT

DESTROYERS

ARLEIGH BURKE DDG- 51

Hull Structure

Alowable Hull Contact Pressure	8	psi

Mooring Constants

Hull Type		
Location of Superstructure		
Type of Superstructure		
Longitudinal Area of Superstructure	8231	sq ft
Hull Shape		
Propeller Expanded Blade Area		sq ft
Lateral Wind-Force Drag Coefficient (CYW)		

Mooring Dynamics

Natural Period in Roll (fn)		sec
Roll Moment of Inertia (Ir)		ft 4
Pitch Moment of Inertia (Ip)		ft 4
Yaw Moment of Inertia (Iy)		ft 4
Damping Coefficient in Roll (C)		
Vertical Center of Gravity (VCG)	24.83	ft
Longitudinal Center of Gravity (LCG)		ft

Coefficients of Form

	Fully Loaded	1/3 Stores/Cargo/Ballast	Lightly Loaded
Block Coefficient	0.5198		
Midships Coefficient	0.827		

Note:
1. Allowable Hull Pressures depend on the type of fendering system that resists the applied load. Contact the NAVFAC Criteria Office for assistance.
2. Analytical Characteristics data are for the fully loaded condition.
3. The allowable pressure is based on contact at the middle 60 percent of the ship's length at waterline.

Following only applies to MSO ships

4. Assumed value. MSO has a wooden hull capable of accepting high contact pressures.