State of California
Business, Transportation and Housing Agency
Department of Transportation

Prepared By:
Jim Nicholas
Program Manager,
Transportation Programming
(916) 654-4013

PROGRAM AMENDMENTS
STIP Amendment 98S-105
Notice Item
CTC Meeting: February 22-23, 2000

Agenda Item: 2.1b.(12)

PROPOSED

Original Signed By
Jim Nicholas for
W. J. EVANS, Deputy Director
Finance
February 1, 2000

STIP AMENDMENT 98S-105 NOTICE

SUMMARY

This amendment programs $432,000 from the $800,000 unused Alameda County Shares to refurbish the Express II Ferry in FY 2000-01. The unused Alameda County Shares originated from the $800,000 exchange between Grandfathered TEA funds and Proposition 116 funds for the Oakland Embarcadero Bay Trail, on February 17, 1999. The total cost to refurbish the Express II Ferry is $795,000, including $363,000 in local funds.

RECOMMENDATION

The Alameda County Congestion Management Agency (CMA), with concurrence from the Metropolitan Transportation Commission (MTC), is requesting this amendment. The Department recommends approval of this amendment.

RESOLUTION

Resolved, that the California Transportation Commission (CTC) revise the 1998 State Transportation Improvement Program (STIP) at the end of the 30 day notice period as follows:

Adds:

Project Information								
County:	CT District:	PPNO:	EA:	Element:	Const Year:	PM Back	PM Ahead	Route/Corridor
Alameda	**04**	**1003**		**LA**	**2000/2001**		---	
Project Title:	**Refurbish Express II Ferry**							
Sponsor:	**City of Alameda**							
Resp. Agency:	**City of Alameda**							
RTPA/CTC:	**Metropolitan Transportation Commission**							
Location:	**The ferry will be refurbished in a shipyard dry dock**							
Description:	**Propulsion, hull and structural modifications as well as engine/gear box improvements**							

STIP Programming - RIP			**(Dollars in Thousands)**					
Component	PRIOR	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	Total
PA&ED								
PS&E								
R/W SUP								
CON SUP								
R/W								
CON				**$432**				**$432**
TOTAL				**$432**				**$432**

Contributor 1 – STP			**(Dollars in Thousands)**					
Component	PRIOR	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	Total
PA&ED			**$1**					**$1**
PS&E			**$68**					**$68**
R/W SUP								
CON SUP								
R/W								
CON				**$96**				**$96**
TOTAL			**$69**	**$96**				**$165**

Contributor 2 – Local Developer Fees			**(Dollars in Thousands)**					
Component	PRIOR	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	Total
PA&ED								
PS&E			**$9**					**$9**
R/W SUP								
CON SUP								
R/W								
CON				**$189**				**$189**
TOTAL			**$9**	**$189**				**$198**

TOTALS			**(Dollars in Thousands)**					
Component	PRIOR	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	Total
PA&ED			**$1**					**$1**
PS&E			**$77**					**$77**
R/W SUP								
CON SUP								
R/W								
CON				**$717**				**$717**
TOTAL			**$78**	**$717**				**$795**

BACKGROUND

This amendment programs $432,000 from the $800,000 unused Alameda County Shares to refurbish the Express II Ferry in FY 2000-01. The unused Alameda County Shares originated from the $800,000 exchange between Grandfathered TEA funds and Proposition 116 funds for the Oakland Embarcadero Bay Trail, in February 17,1999. The total cost to refurbish the Express II Ferry is $795,000, including $363,000 in local funds.

This project will improve reliability, ride quality and compatibility with new docking facilities. The work involves propulsion, hull, and structural modifications, as well as, engine and gear box improvements. The total project cost of $795,000 will be split among three sources: $432,000 from unused Alameda County Shares, $165,000 provided through a federal STP grant, and $198,000 from local developer fees.

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION IX
Arizona, California,
Hawaii, Nevada, Guam
American Samoa,
Northern Mariana Islands

201 Mission Street
Suite 2210
San Francisco, CA 94105-1839
415-744-3133
415-744-2726 (fax)

MAR 2 7 2000

REC'D BY CTC

MAR 2 8 2000

Mr. Robert I. Remen
Executive Director
California Transportation Commission
1120 'N' Street Room 2221
Sacramento, CA 95814

Attn: Robert Chung

Dear Mr. Remen: Bob

A question was raised at the February 2000 California Transportation Commission (CTC) Meeting regarding funding of the City of Alameda's Express II Ferry Rehabilitation project. I am writing to confirm that this activity is eligible for funding through the Federal Transit Administration (FTA).

Under Section 5 of Chapter I of FTA Circular 9030.1C (dated October 1, 1998), 'Flexible' Funds, including Surface Transportation (STP) and Congestion Mitigation and Air Quality (CMAQ), may be used for any non-operating purpose eligible under the Urbanized Area Formula Program. As stated in Section 4b. of Chapter III (Eligible Grant Activities) of FTA Circular 9030.1C, ferry boats are considered fixed guideways, and Section 8d3 (Vehicle Overhaul for Fixed Guideways Rolling Stock) of Chapter I of FTA Circular 5010.1C (dated October 1, 1998) further identifies the overhaul of fixed-guideway vehicles as an eligible capital project.

This project was previously approved for STP funding by the FTA and FHWA through MTC TIP Amendment 99-10 (Project ID ALA991003). The substitution of regional STP funds with State STP funds does not change FTA's previous programming approval for this project.

Please contact Jerome Wiggins of my staff at (415) 744-3115 if you need further information.

Sincerely,

Leslie Rogers
Regional Administrator

Cc: Therese McMillan, MTC

City of Alameda • California

REC'D BY CTC

APR 06 2000

April 5, 2000

Robert Remen, Executive Director
California Transportation Commission
1120 N Street MS-52
Sacramento, CA 95814

Dear Mr. Remen:

At the Regular Meeting of April 4, 2000, the Alameda City Council unanimously adopted Resolution No. 13203, "Authorizing an Exchange of Funds from TEA 21 STP/CMAQ to Unused County Share of ISTEA, TEA and Proposition 116 Funds for Harbor Bay Express II Repair Project and Approving Conditions of the Use of Harbor Bay Express II Settlement Money." Herewith enclosed is a certified copy for your information and files.

If you have any questions, please contact the Public Works Department.

Sincerely,

Diane B. Felsch, CMC
City Clerk

Enclosure - 1

Office of the City Clerk

2263 Santa Clara Avenue, Room 380
Alameda, California 94501
510 748.4506 • Fax 510 748.4503 • TDD 510 522.7538

CITY OF ALAMEDA RESOLUTION NO. 13203

AUTHORIZING AN EXCHANGE OF FUNDS FROM TEA 21 STP/CMAQ TO UNUSED COUNTY SHARE OF ISTEA, TEA AND PROPOSITION 116 FUNDS FOR HARBOR BAY EXPRESS II REPAIR PROJECT AND APPROVING CONDITIONS OF USE OF HARBOR BAY EXPRESS II SETTLEMENT MONEY

WHEREAS, in 1992, the City of Alameda received $1.1 million in State Proposition 116 Funds to purchase a high speed catamaran for the East End Ferry Service; and

WHEREAS, in 1994, the City purchased the Harbor Bay Express II ("Express II") from USA Catamarans, Inc., which was subsequently taken out of service due to its inability to perform on a reliable basis; and

WHEREAS, the City of Alameda sued the manufacturer of the Express II for breach of contract, and on May 29, 1999, a judgment was entered in favor of the City of Alameda and damages were awarded to the City; and

Approved as to Form
CITY ATTORNEY

WHEREAS, in 1998, the City of Alameda applied for and received approval for $575,000 in TEA-21 STP/CMAQ funds to repair the Express II; and

WHEREAS, the Alameda County Congestion Management Agency (ACCMA) has requested that the City of Alameda consider an exchange of funds for the Express II repair project, substituting TEA-21 monies for older ISTEA funding; and

WHEREAS, in return for this exchange of funds, ACCMA agreed to provide Alameda an additional $22,000 in federal funds for the Express II repair project, as well as to reprogram an additional $125,000 in future year TEA-21 funds for the future Encinal ferry refurbishment project; and

WHEREAS, in February, 2000, the California Transportation Commission (CTC) reprogrammed the TEA-21 funds that had previously been approved for this project, thereby necessitating the proposed exchange of funds; and

WHEREAS, in February 2000, the California Transportation Commission requested the City of Alameda to adopt a resolution restricting any monies recovered from the Harbor Bay Express II litigation to be used for ferry purposes.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Alameda authorizes an exchange of funds from TEA 21 STP/CMAQ to unused County Share of ISTEA, TEA and Proposition 116 Funds for the Harbor Bay Express II repair project; and

BE IT FURTHER RESOLVED that the City Council of the City of Alameda approves conditions of use of Harbor Bay Express II settlement money as follows:

> Harbor Bay Express II settlement funds which are in excess of costs and actual damages (fees and costs of litigation and collection, costs of City and City agent repairs, and costs of providing alternative ferry service while ferry was disabled) up to the value of the original Proposition 116 grant ($1.1 million) shall be committed to ferry purposes. Ferry purposes are defined to include any and all capital and operating expenses necessary to establish, operate, maintain, and upgrade City of Alameda ferry service; and

BE IT FURTHER RESOLVED that the City Clerk is hereby directed to forward a certified copy of this resolution to the California Transportation Commission and the Alameda County Congestion Management Agency.

* * * * *

I, the undersigned, hereby certify that the foregoing Resolution was duly and regularly adopted and passed by the Council of the City of Alameda in regular meeting assembled on the 4th day of April, 2000, by the following vote to wit:

AYES:	Councilmembers Daysog, DeWitt, Johnson, Kerr and Mayor Appezzato - 5.
NOES:	None.
ABSENT:	None.
ABSTENTIONS:	None.

IN WITNESS, WHEREOF, I have hereunto set my hand and affixed the official seal of said City this 5th day of April, 2000.

Diane Felsch, City Clerk
City of Alameda

City of Alameda • California

May 17, 2000

Mr. Frank Furgher
Alameda County Congestion Management Agency
1330 Broadway
Oakland, CA 94612

Re: Express II Exchange of Funds

Dear Frank:

This confirms our conversation that the Resolution passed by the Alameda City Council regarding the Express II Exchange of Funds commits the City to the following:

Of any settlement funds that the City receives from its judgement against the Express II Boatbuilder the City will:

First recompense itself for costs that the City or City's agent expended to repair the vessel, provide an alternate vessel, and to pursue litigation. The total costs expended for these activities were approximately $1,400,000. These expenses were paid from borrowed monies, (City and developer funds). No interest is being charged on these monies.

Second the City would commit the next $1,100,000 toward for ferry transportation purposes. The City has conditioned a portion of the proceeds for ferry purposes in recognition that the original grant purpose was met in an unconventional manner and to acknowledge that the recovery of these funds were justified in part based on ferry transportation needs which still exist.

Third: Any monies collected which are in excess of the afore-mentioned claims will be programmed to offset the other damages which accrued to the City due to loss of service and reduced farebox revenues which were estimated at $573,000. These damages also included anticipated additional remedial measures required to repair the vessel which had been estimated at $889,000. Some of these are already being identified as offsets to the increase in local share required for the Express II conversion.

Finally: Any monies collected beyond the amounts identified above would be associated with Punitive Damages. These amounts are available to the City for whatever purposes they so choose.

The City believes this allocation to be fair and reasonable. The City's application required that the City continue service for 2.5 years beyond the date of the grant. In fact the City continued service well beyond that date and the City continues even now to subsidize this service. The City committed

Public Works Department

Alameda Point, Building 1
950 West Mall Square, Room 110
Alameda, CA 94501-7552
510 749.5840 • Fax 510 749.5867 • TDD 510 522.7538

over $910,000 in correction of defects for the Express II prior to initiating litigation. The City also obligated over $426,000 in continuing service using alternate means during this period. The City chose to pursue the litigation at its own expense incurring legal costs of over $65,000. The City has also anticipated additional damages to repair the vessel and in lost revenues as a result of having not had a reliable vessel.

It was understood that the acquisition of this particular vessel posed a higher than average risk because the foil assisted surface piercing propulsion craft was truly an experimental vessel. Even so, the City had taken all reasonable precautionary measures to ensure that the original work product would be delivered as specified. Those measures included hiring qualified consultants for developing the specifications and conducting a peer review of the vessel including construction requirements that the builder be bonded and insured. The City, through its Risk Management office, verified all bonds and insurance and in fact rejected two prior bonds requiring an A rated firm yet the bond company ultimately filed for bankruptcy and the City had to sue. The City did not shirk from its duties and ultimately pursued both the builder and the individuals involved and was granted a judgement. The City has continued to pursue collection in Florida. Although it would seem unlikely that the City could collect the entire judgement, the City expects to collect a portion of the total $5.8 million dollar judgement and has committed a total of $1.4 million toward past ferry expenses, $1.1 million to future ferry purposes and has intended that a portion of any of the remainder ($889,000) also be used for necessary ferry upgrades.

Sincerely,

Matthew T. Naclerio
Public Works Director

Cheri R. Sheets dl

By: Cheri R. Sheets
Deputy Public Works Director/
City Engineer

CRS:dl

cc: Maria Shanle
Ernest Sanchez

G:\PUBWORKS\ENG\CHERI\EXPII.WPD

Hage-Marine, Inc.

911 Western Avenue Suite 399 ~ The Maritime Building ~ Seattle, Washington. 98104
Phone (206) 467 9554 ~ Fax (206) 467 9569 ~ Email hagemail@seanet.com

3/31/2000
Refer: 9723\Feasibility3

Mr. Ernest Sanchez, Manager of Ferry Services
City of Alameda
530 Water Street, 3rd Floor
Oakland CA 94607

Subject: Feasibility Study for the Modification of the HARBOR BAY EXPRESS II
Using Conventional Propellers and Drive Arrangement with Extended Length

Enclosures: 1) Current Cost Estimate for Conventional Drive Arrangement (5 pages)
(with minimum cosmetic upgrades)
2) Conventional Drive with Extended Length Arrangement Sketch (1 page)

Reference: a) Preliminary Feasibility Study 1, dtd March 20, 2000
b) Preliminary Feasibility Study 2, dtd March 23, 2000

Gentlemen,

At your direction, the Enclosures are forwarded for further review and discussion.

This modification strategy is based on allowing the vessel's Length Overall to exceed 65 feet. Within the USCG regulations for Sub-Chapter "T" Passenger Vessels (under 100 Gross Tons), the change in overall length alters the subject vessel's classification from "S" (small) to "L" (large).

Significantly, the regulations focused on survival with damaged compartments (flooding) change dramatically, as does the formality of the Stability Test. Other than the work involved, the latter is not a problem. However, as an "L" vessel, we must now specifically show by computation that survival is assured with any one compartment flooded (open to the sea). Currently, the vessel's compartmentation was set by having the watertight bulkheads simply located as specified in the rules, without resorting to checking survivability. The basis of this regulatory section is based on "rule of thumb" gained by experience. There is also a change in the fire fighting /bilge pumping regulations of fairly minor consequence.

In the event this arrangement is approved as "affordable", we must first bring the weight estimate and hull lines current with the proposal in order to conduct the necessary sub-division calculations. It is possible we may have difficulties with the last compartments which have now grown quite long. In the event this is true, we would correct that issue by either the addition of foam in part of that space, or by making it one frame longer plus adding a mid-compartment watertight bulkhead.

The added length voids the earlier concerns over excessive stern heaviness, along with all the attendant performance issues. Therefore, all expenses associated with equipment relocations for trimming have been removed in Enclosure (1).

In order to achieve true sub-cavitating propeller performance, it is necessary to have gear reduction ratios in the order of 2.5 : 1.0. The earlier V-Drive arrangement was set up this way, so we carry the cost of a gear ratio change, to the present gear boxes, which are now retained. The shafting, struts, seals, and rudder costs are all the same as the V-Drive arrangement.

Costs for strengthening the cross structure and main foil removal have been deleted, while costs for the added hull length have been added.

Costs for the Pilot House relocation are also retained.

On the performance side, the total change in hull running length (as seen by the water at speed) is now longer by more than 10 feet ! This will result in extraordinary differences in vessel behavior, particularly through the transition speeds between 12 and 20 knots. The former symptoms of extreme pitch angles and power hump (with attending speed instabilities) through this speed range will now become benign and not worthy of note. This is largely due to:

a) That the foil lift and the new hull's pitching center are aligned. Foil lift changes will not cause pitching.

b) The LCG location with respect to the hull's length is now within the preferred design range, yielding moderate hull trimming angles throughout the operating range.

A new speed calculation must now include the foil's lift and drag. This will take a little time, but be assured that loaded speeds near 30 knots will be possible, and 2100 RPM cruising will easily be over 25. We retain the transom mounted trim tab installation as a hedge against slamming forward by providing the operator the ability to drop the bow as he wishes.

We look forward to discussing this with you further

Very truly yours,
HAGE-MARINE, Inc.

Edward C Hagemann, PE

cc: Cheri Sheets
Charles Walther
Archie Nichols
Paul Bishop

ENCLOSURE (1)

CURRENT COST ESTIMATE, HARBOR BAY EXPRESS II MODIFICATIONS AS CONVENTIONAL DRIVE / PRO
Dated: 3/31/2000 WITH HULL EXTENSION AND MINIMUM COSMETIC UPGRADES

1 REMOVALS

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
300	REMOVE FWD CANARDS AND REFAIR BOT		2	$600.00	
				MATERIAL	$720.00
	LABOR HRS	300	45	LABOR	$13,500.00

2 56" HULL EXTENSIONS AND NEW TRANSOMS

1600	EXTEND HULLS W/ NEW BOTTOM INCLU. (All Flat Plate Work)		2	$3,200.00	
				MATERIAL	$3,840.00
	LABOR HRS	1100	45	LABOR	$49,500.00

3 CUT WHL HS FROM DECK AND RAISE

530	LBS NEW ALUM MATERIAL(INCLDG MAST)		$2.00	$1,060.00	
	FITTING/WELDING HRS	880	45	$39,600.00	
				MATERIAL	$1,272.00
				LABOR	$39,600.00

4 ALUM FAB NEW TRUSS STRUCTURE

220	LBS NEW BOTT STRUCT'R, (BHDS 3-8)		$2.00	$440.00	
	FITTING/WELDING HRS	320	45	$14,400.00	
				MATERIAL	$528.00
				LABOR	$14,400.00

5 MAIN ENGINES AND GEAR

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
1	REBUILD OF ONE MAIN ENGINES W/MTS		85000	$85,000.00	
2	NEW GEAR RATIOS,(2.517 : 1.000)		12000	$24,000.00	
2	NEW BELL HOUSINGS w/ BLOCK DRIVE		5500	$11,000.00	
2	SET UP FOR EXISTING CONTROLS		100	$200.00	
				MATERIAL	$144,240.00
	LABOR HRS FOR INST AND ALIGNMENT	390	45	LABOR	$17,550.00

6 PROPELLER DRIVE TRAIN

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	PROPELLER SHAFT, 3 1/2" AQUA22, X 15'		7500	$15,000.00	
2	STERN TUBES, 4"SCHED 80 5086, x 3 1/2 '		200	$400.00	
2	"PSI" DRIPLESS SEAL		2300	$4,600.00	
2	V-STRUT, BEARING, HOUSING ASS'Y		300	$600.00	
4	PROPELLER, 38" X 45", 5 BLADE, (2 spare)		3750	$15,000.00	
				MATERIAL	$18,000.00
	LABOR HRS	480	45	LABOR	$21,600.00

7 RUDDERS & STEERING GEAR

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	5 sqft. URETHANE COATED, S/S ASS'LY		4300	$8,600.00	
2	NEW TILLERS, CYLINDERS, CONTROLS		8500	$13,000.00	
				MATERIAL	$25,920.00
	LABOR HRS FOR COMPLETE INSTALL'N	560	45	LABOR	$25,200.00

8 AUX GEN SETS

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	GEN SETS (NO CHANGES)		0	$0.00	
				MATERIAL	$0.00
	LABOR HRS	0	45	LABOR	$0.00

ENCLOSURE (1)

9 PROPULSION ENG GOV/REV CONTROLS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	REFURBISH/MODIFY EXISTING	2800	$5,600.00		
				MATERIAL	$6,720.00
	LABOR HRS FOR COMPLETE INSTALLATION	340	45	LABOR	$15,300.00

10 HYDRAULIC TRIM TABS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	ALUM FABRICATION MATERIALS	350	$700.00		
1	HYDRLCS & CONTROLS PKG	6500	$6,500.00		
				MATERIAL	$8,640.00
	LABOR HRS FOR COMPLETE INSTALLATION	480	45	LABOR	$21,600.00

11 ELECTRICAL DC 24V

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
6	NEW BATTS	150	$900.00		
				MATERIAL	$1,080.00
	LABOR HRS ALL ELECTR.FITNG&WELDING	20	45	LABOR	$900.00

12 COMPRESSED AIR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	REFURBISH	250	$250.00		
				MATERIAL	$300.00
	LABOR HRS	30	45	LABOR	$1,350.00

13 SEWAGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	NEW PUMP(RV STYLE)	200	$200.00		
				MATERIAL	$240.00
	LABOR HRS	60	45	LABOR	$2,700.00

14 FIRE/BILGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	REVISED SUCTION PIPING/HOSE	200	$400.00		
2	NEW PUMPS/PIPING FOR "L" RULES	2500	$5,000.00		
2	NEW SEA CHEST	200	$400.00		
				MATERIAL	$6,960.00
	TOTAL LABOR HRS FOR COMPLT INSTLLAT	420	45	LABOR	$18,900.00

15 EXHAUST SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	WATER INJECTOR RING FOR MAINS	200	$400.00		
2	COWL MUFFLERS(DOUBLE INLET)	2800	$5,600.00		
2	NO CHANGES ON AUX EXHST	0	$0.00		
2	PIPING,FLEX JNTS,FITTINGS,HANGERS,	2800	$5,600.00		
	INSULATION,PENETRATIONS(W/RAW WTR)				
				MATERIAL	$13,920.00
	TOTAL LABOR HRS FOR COMPLT INSTLLAT	540	45	LABOR	$24,300.00

ENCLOSURE (1)

16 COOLING WTR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	RAW WTR FROM NEW SEA CHESTS(MAINS)	500	$1,000.00		
2	RAW WTR FROM NEW SEA CHESTS(AUXS)	100	$4,600.00		
				MATERIAL	$6,720.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		250	45	LABOR	$11,250.00

17 FUEL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	MODS TO SUIT MAIN ENG RELOCATION	250	$500.00		
				MATERIAL	$600.00
LABOR HRS		60	45	LABOR	$2,700.00

18 LUBE OIL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
	NO CHANGES	0	$0.00		
				MATERIAL	$0.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		0	45	LABOR	$0.00

19 ACCOMODATION VENTILATION SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	NEW CENTRIFUGAL BLOWERS	800	$1,600.00		
1	INTAKES/DUCTING/FITGS/GRILLS/ETC	4500	$4,500.00		
				MATERIAL	$7,320.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		220	45	LABOR	$9,900.00

20 INSULATION

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	NO CHANGES	0	$0.00		
				MATERIAL	$0.00
LABOR HRS FOR COMPLETE INSTALLATION		0	45	LABOR	$0.00

21 JOINER WORK

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1000	REPAIR, REATTACH CEILING SYSTEM	0.5	$500.00		
250	REPAIR COVERINGS(SQ FT)	0.5	$125.00		
1	NEW P.HS CONSUL	1400	$1,400.00		
				MATERIAL	$2,430.00
TOTAL LABOR HRS		280	45	LABOR	$12,600.00

22 FURNISHINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
132	REPAIR / CLEAN SEATING UPHOLSTERY	5	$660.00		
				MATERIAL	$792.00
TOTAL LABOR HRS		80	45	LABOR	$3,600.00

23 FLOOR COVERINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
110	CARPET (YDS)	30	$3,300.00		
80	ALUM ENG RM FLOORING(MODS)	10	$800.00		
				MATERIAL	$4,620.00
(MOST LABOR HRS INCLUDED IN MATERIAL		80	45	LABOR	$3,600.00

ENCLOSURE (1)

24 DOORS & WINDOWS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
10	NEW FIXED GLASS SIDE WINDOWS	Defered	$0.00		
6	NEW SLIDING GLASS SIDE WINDOWS	Defered	$0.00		
2	NEW P.HS. SIDE WINDOWS	550	$1,100.00		
2	ALUM EXTER. DOORS (WHL HOUSE)	1900	$3,800.00		
1	NEW DOOR UNDER WHEEL HS	900	$900.00		
				MATERIAL	$6,960.00
LABOR HRS INSTAL WINDOWS/DOORS		190	45	LABOR	$8,550.00

25 NAVIGATION, ELECTRONICS AND AUDIOVISUAL EQ

	DESCRIPTION	PRICE	SUBTOTAL		
2	MOVE RADAR ANTENAES	200	$400.00		
1	REPAIR ALARM/MONITORING SYST(W/WIRI	5000	$5,000.00		
1	NAV/COM SYSTMS(MOVE ANTENAES)	100	$100.00		
				MATERIAL	$6,600.00
LABOR HRS		300	45	LABOR	$13,500.00

26 HATCHES & MOORING GEAR

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	FABD NONWT DECK HATCH	100	$100.00		
				MATERIAL	$120.00
LABOR HRS FAB		30	45	LABOR	$1,350.00

27 EXTERIOR RAILING / LADDERS

	DESCRIPTION	PRICE	SUBTOTAL		
1	NEW EXTERIOR HAND GRABS MATERIALS	225	$225.00		
3	NEW LADDERS TO WHEEL HS	100	$300.00		
				MATERIAL	$630.00
LABOR HRS		200	45	LABOR	$9,000.00

28 PAINT,PREP,CATHODIC PROTECTION

	DESCRIPTION	PRICE	SUBTOTAL		
	BOTTOM PAINT SYSTEM, TOPSIDE REPAIR		$10,000.00		
	ALL ANODES		$1,200.00		
				MATERIAL	$13,440.00
LABOR HRS		550	45	LABOR	$24,750.00

29 LIFE SAVING EQUIPMT

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
3	25 PERSON LIFE FLOATS W/PADDLES	1200	$3,600.00		
1	MANOVRBD RESCUE EQUIPMT	2000	$2,000.00		
				MATERIAL	$6,720.00
LABOR HRS INSTALLATION		20	45	LABOR	$900.00

30 ADD TONNAGE OPENING TO CABIN

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	MISC ALUM, BOLTS, REUSE EXIST DOOR	400	$400.00		
				MATERIAL	$480.00
LABOR HRS INSTALLATION		180	45	LABOR	$8,100.00

31 BULDERS RISK INSURANCE $8,000.00 $9,600.00

32 TESTING

ALL USCG AND SHIPYARD QC AND TESTING(NDT)			$3,500.00		
				MATERIAL	$4,200.00
LABOR FOR TESTING		100	45	LABOR	$4,500.00

ENCLOSURE (1)

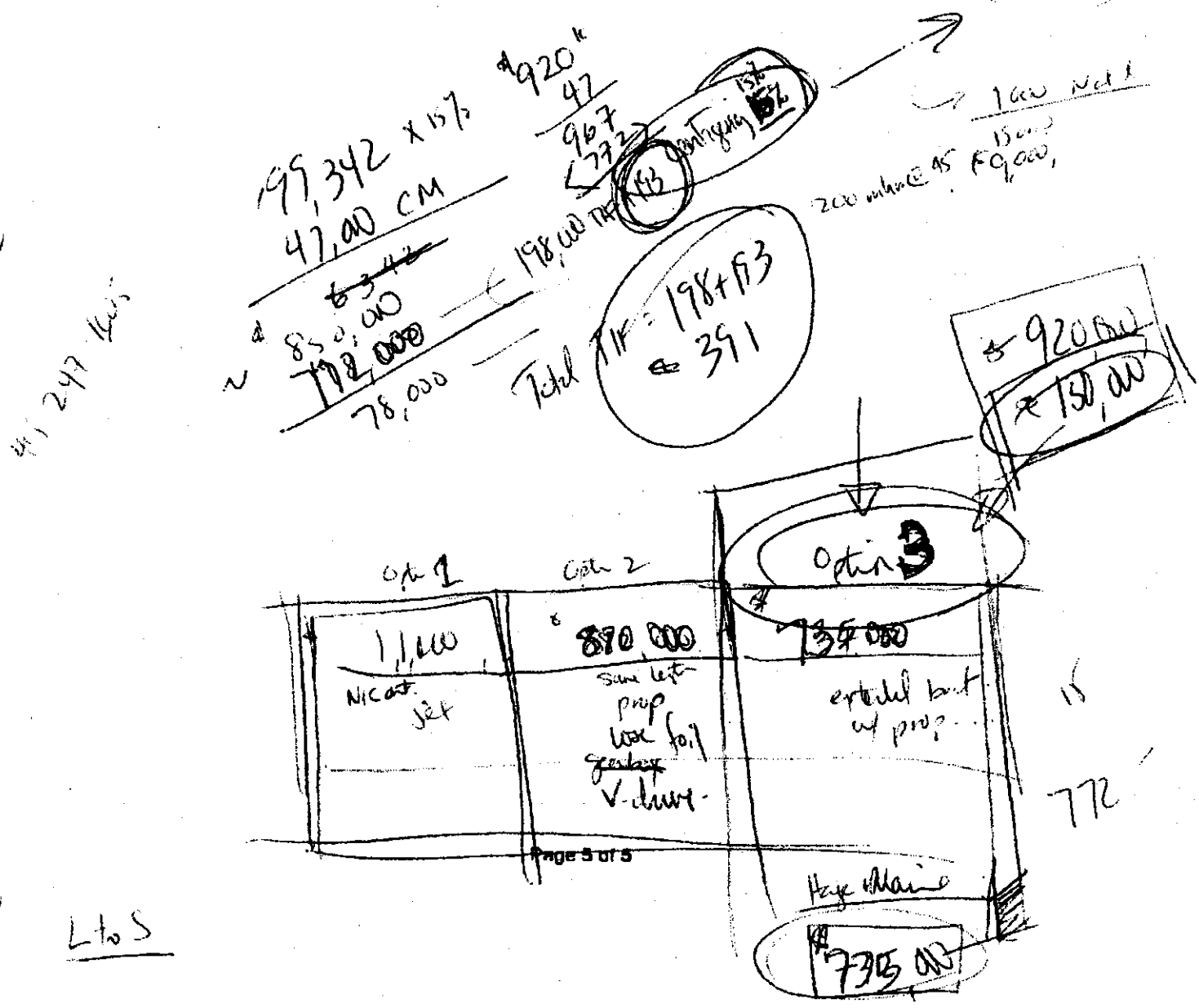
33 ENGINEERING AND REGULATORY

SUBCONTRACT PROPULSION TORSIONAL ANALYSIS			$1,500.00	
DEVELOPEMENT CF DWGS			$1,000.00	
CERTIFICATION COSTS			$4,500.00	
STABILITY TEST AND MISC OUTSIDE ENGRG			$7,500.00	
			MATERIAL	$17,400.00
TOTAL IN HOUSE WORK DWGS	600	45	LABOR	$27,000.00

34 LAUNCH AND SEA TRIALS

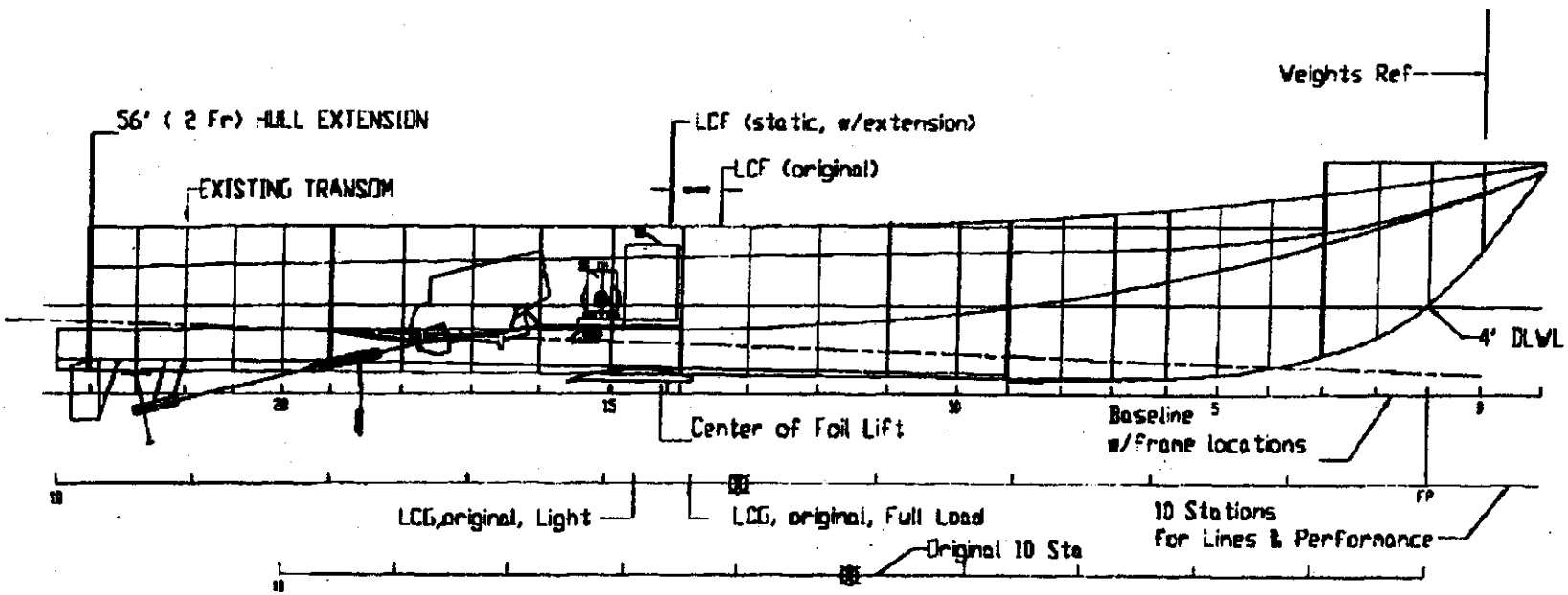
FUEL, FOOD, SUPPLIES & CONSUMABLES			$1,600.00	
			MATERIAL	$1,920.00
LABOR HRS	80	45	LABOR	$3,600.00

TOTAL HRS	9140	SUM, S/Y TOTAL COST (INCLUDES SHIPYARD PROFIT & SG&A)	$734,532.00
		ADD CURRENT ENGINEERING/ADMIN	$64,810.00
		CURRENT PROJECT COST W/O INSPECTION	**$799,342.00**



CONVENTIONAL PROPELLER W/ EXISTING GEARBOXES (new ratio: 2.517)

HARBOR BAY EXPRESS II MARCH 30, 2000



HAGE-MARINE, INC.

NAVAL ARCHITECTURE MARINE ENGINEERING

THE MARITIME BUILDING • 911 WESTERN AVE., SUITE 206 • SEATTLE, WA 98104 • PHONE (206) 467-9554 • FAX: (206) 467-9569

HARBOR BAY MARITIME
Pier 48-B
San Francisco, CA 94107

Attention: Mr. Paul Bishop, General Manager

Subject: Harbor Bay Express II, Hydrofoil Assisted 65" Aluminum Catamaran

Enclosures: 1) Resume, E. C. Hagemann
2) Specific Hydrofoil Experience

Dear Mr. Bishop,

We have reviewed arrangement plans, various sea trial results, and dry-dock photos of the subject vessel. On the basis of this review, and with help from you during discussions regarding the vessel's actual behavior when underway, it is quite clear that there are several inter-related and fundamental problems associated with the hydrofoil assist arrangement, propulsion, and steering. The vessel's high transitional trim angles is caused in part by the "step" installed aft over the propellers, and the substantial power hump prior to planing is partially to this hull detail.

Enclosures (1) offers an overview to the writers experience. Enclosure (2) has been prepared to document specific hydrofoil experience. Our interest in vessel hydrodynamics is ongoing, as much of our consulting workload is related to vessel performance problems. We are also heavily involved in fundamental research at B.C. Research, an experimental model basin located in Vancouver British Columbia, Canada. This year alone, we have been there 4 times.

The following discussion and comments address some of the reasons behind the boat's dynamic behavior and characteristics. Alternatives to the vessel design arrangements are briefly indicated as appropriate. Finally, on the basis of your needs, a concluding recommendation for action is made.

The subject catamaran is distinguished by the installation of a hydrofoil (wing) across the clear space between the hulls, at the elevation of the keels, behind the vessel's center of gravity. This configuration is labeled as a "canard", a term adopted from the aircraft industry. A small pair of wings (canards), mounted well forward on each hull serve to counter balance the lift from the main aft wing. The purpose of the hydrofoils is to take advantage of the *potential* superior performance of a wing over a planing hull by transferring some of the lift (weight) from the poorer performing hull to the better performing foil when at speed. While the idea is quite old, it is uncommon in practice.

ENCLOSURE (1)

AUX GEN SETS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	GEN SETS (NO CHANGES)	0	$0.00

LABOR HRS 0 45

MATERIAL	$0.00
LABOR	$0.00

PROPULSION ENG GOV/REV CONTROLS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	REFURBISH/MODIFY EXISTING	2800	$5,600.00

LABOR HRS FOR COMPLETE INSTALLATION 340 45

MATERIAL	$8,720.00
LABOR	$15,300.00

HYDRAULIC TRIM TABS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	ALUM FABRICATION MATERIALS	350	$700.00
1	HYDRLCS & CONTROLS PKG	6500	$6,500.00

LABOR HRS FOR COMPLETE INSTALLATION 480 45

MATERIAL	$8,640.00
LABOR	$21,600.00

ELECTRICAL DC 24V

QUAN	DESCRIPTION	PRICE	SUBTOTAL
4	MOVE 8D BATTS/BOXES TO ENG RM	100	$400.00
2	RECONNECT BATT CABLES & CHARGERS	50	$100.00
6	NEW BATTS	150	$900.00

LABOR HRS ALL ELECTR,FITNG&WELDING 190 45

MATERIAL	$1,680.00
LABOR	$8,550.00

COMPRESSED AIR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	REFURBISH	250	$250.00

LABOR HRS 30 45

MATERIAL	$300.00
LABOR	$1,350.00

SEWAGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	NEW PUMP(RV STYLE)	200	$200.00

LABOR HRS 60 45

MATERIAL	$240.00
LABOR	$2,700.00

POTABLE WTR SYSTEM.

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	POSITV DSPLCMNT RV PUMPS	200	$400.00
2	NEW PLASTIC WTR TANKS	650	$1,300.00
1	PIPING,HOSE,FITTINGS,HANGERS,	1200	$1,200.00
	TK LVL SENSORS,VALVES,etc		

TOTAL LABOR HRS FOR COMPLT INSTLLAT 380 45

MATERIAL	$3,480.00
LABOR	$17,100.00

FIRE/BILGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	REVISED SUCTION PIPING/HOSE	200	$400.00
2	NEW SEA CHEST	200	$400.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 260 45

MATERIAL	$960.00
LABOR	$11,700.00

ENCLOSURE (1)

CO2 SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	MOVE CO2 BOTTLES TO STA #9	250	$500.00		
1	USCG APRVL AND TESTNG AFTR ASSM'LY	750	$750.00		
2	PIPING,HOSE,FITTINGS,HANGERS,etc	200	$400.00		
				MATERIAL	$1,980.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		165	45	LABOR	$7,425.00

EXHAUST SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	WATER INJECTOR RING FOR MAINS	200	$400.00		
2	COWL MUFFLERS(DOUBLE INLET)	2800	$5,600.00		
2	NO CHANGES ON AUX EXHST	0	$0.00		
2	PIPING,FLEX JNTS,FITTINGS,HANGERS,	2800	$5,600.00		
	INSULATION,PENETRATIONS(W/RAW WTR)				
				MATERIAL	$13,920.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		540	45	LABOR	$24,300.00

COOLING WTR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	RAW WTR FROM NEW SEA CHESTS(MAINS)	500	$1,000.00		
2	RAW WTR FROM NEW SEA CHESTS(AUXS)	100	$4,600.00		
				MATERIAL	$6,720.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		250	45	LABOR	$11,250.00

FUEL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	MODS TO SUIT MAIN ENG RELOCATION	250	$500.00		
				MATERIAL	$600.00
LABOR HRS		60	45	LABOR	$2,700.00

LUBE OIL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
	NO CHANGES	0	$0.00		
				MATERIAL	$0.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		0	45	LABOR	$0.00

ACCOMODATION VENTILATION SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	NEW CENTRIFUGAL BLOWERS	800	$1,600.00		
1	INTAKES/DUCTING/FITGS/GRILLS/ETC	4500	$4,500.00		
				MATERIAL	$7,320.00
TOTAL LABOR HRS FOR COMPLT INSTLLAT		220	45	LABOR	$9,900.00

INSULATION

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	NO CHANGES	0	$0.00		
				MATERIAL	$0.00
LABOR HRS FOR COMPLETE INSTALLATION		0	45	LABOR	$0.00

ENCLOSURE (1)

JOINER WORK

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1000	REPAIR, REATTACH CEILING SYSTEM	0.5	$500.00
250	REPAIR COVERINGS(SQ FT)	0.5	$125.00
1	NEW P.HS CONSUL	1400	$1,400.00

TOTAL LABOR HRS	280	45	MATERIAL	$2,430.00
			LABOR	$12,600.00

FURNISHINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
132	REPAIR / CLEAN SEATING UPHOLSTERY	5	$660.00

TOTAL LABOR HRS	80	45	MATERIAL	$792.00
			LABOR	$3,600.00

FLOOR COVERINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
110	CARPET (YDS)	30	$3,300.00
80	ALUM ENG RM FLOORING(MODS)	10	$800.00

(MOST LABOR HRS INCLUDED IN MATERIAL	80	45	MATERIAL	$4,920.00
			LABOR	$3,600.00

DOORS & WINDOWS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
10	NEW FIXED GLASS SIDE WINDOWS	Defered	$0.00
6	NEW SLIDING GLASS SIDE WINDOWS	Defered	$0.00
2	NEW P.HS. SIDE WINDOWS	550	$1,100.00
2	ALUM EXTER. DOORS (WHL HOUSE)	1900	$3,800.00
1	NEW DOOR UNDER WHEEL HS	900	$900.00

LABOR HRS INSTAL WINDOWS/DOORS	190	45	MATERIAL	$6,960.00
			LABOR	$8,550.00

NAVIGATION, ELECTRONICS AND AUDIOVISUAL EQ

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	MOVE RADAR ANTENAES	200	$400.00
1	REPAIR ALARM/MONITORING SYST(W/WIRI	5000	$5,000.00
1	NAV/COM SYSTMS(MOVE ANTENAES)	100	$100.00

LABOR HRS	300	45	MATERIAL	$6,800.00
			LABOR	$13,500.00

HATCHES & MOORING GEAR

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	FABD NONWT DECK HATCH	100	$100.00

LABOR HRS FAB	30	45	MATERIAL	$120.00
			LABOR	$1,350.00

EXTERIOR RAILING / LADDERS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	NEW EXTERIOR HAND GRABS MATERIALS	225	$225.00
3	NEW LADDERS TO WHEEL HS	100	$300.00

LABOR HRS	200	45	MATERIAL	$830.00
			LABOR	$9,000.00

ENCLOSURE (1)

PAINT,PREP,CATHODIC PROTECTION

	DESCRIPTION		PRICE	SUBTOTAL	
	BOTTOM PAINT SYSTEM, TOPSIDE REPAIR			$10,000.00	
	ALL ANODES			$1,200.00	
				MATERIAL	$13,440.00
LABOR HRS		550	45	LABOR	$24,750.00

LIFE SAVING EQUIPMT

QUAN	DESCRIPTION	PRICE	SUBTOTAL	
3	25 PERSON LIFE FLOATS W/PADDLES	1200	$3,600.00	
1	MANOVRBD RESCUE EQUIPMT	2000	$2,000.00	
			MATERIAL	$5,720.00
LABOR HRS INSTALLATION		20	45 LABOR	$900.00

ADD TONNAGE OPENING TO CABIN

QUAN	DESCRIPTION	PRICE	SUBTOTAL	
1	MISC ALUM, BOLTS, REUSE EXIST DOOR	400	$400.00	
			MATERIAL	$480.00
LABOR HRS INSTALLATION		180	45 LABOR	$8,100.00

BULDERS RISK INSURANCE $8,000.00 $9,600.00

TESTING

ALL USCG AND SHIPYARD QC AND TESTING(NDT)			$3,500.00	
			MATERIAL	$4,200.00
LABOR FOR TESTING	100	45	LABOR	$4,500.00

ENGINEERING AND REGULATORY

SUBCONTRACT PROPULSION TORSIONAL ANALYSIS			$1,500.00	
DEVELOPEMENT OF DWGS			$1,000.00	
CERTIFICATION COSTS			$4,500.00	
STABILITY TEST AND MISC OUTSIDE ENGRG			$5,000.00	
			MATERIAL	$14,400.00
TOTAL IN HOUSE WORK DWGS	600	45	LABOR	$27,000.00

LAUNCH AND SEA TRIALS

FUEL, FOOD, SUPPLIES & CONSUMABLES			$1,600.00	
			MATERIAL	$1,920.00
LABOR HRS	80	45	LABOR	$3,600.00

TOTAL HRS 10835 SUM, S/Y TOTAL COST $870,027.00
(INCLUDES SHIPYARD PROFIT & SG&A)

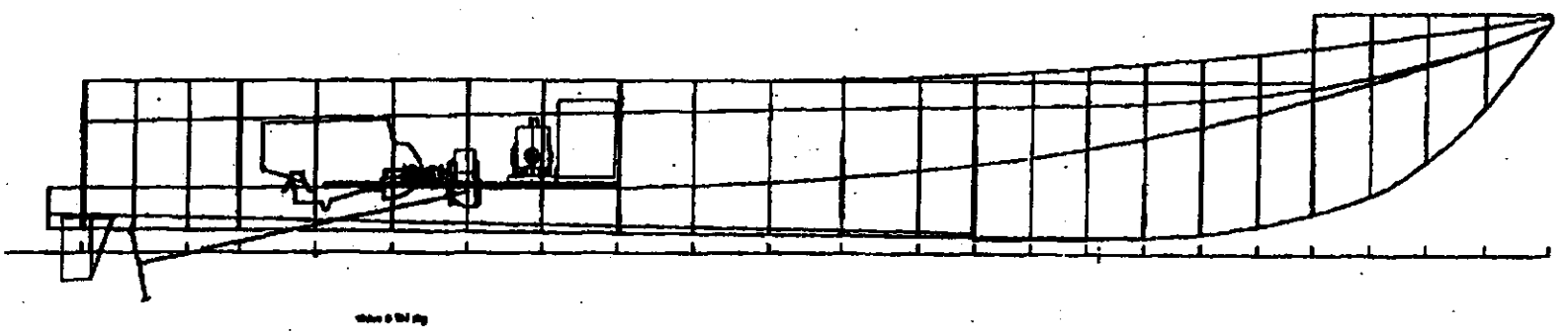
ADD CURRENT ENGINEERING/ADMIN $64,810.00

CURRENT PROJECT COST W/O INSPECTION $934,837.00

42
984

981
772,000 AVAILABLE
$ 210

Enclosure (2)



practical 12°
textbook 15° & propeller

CONVENTIONAL PROPELLER / V-DRIVE ARRANGEMENT SKETCH

HARBOR BAY EXPRESS II MARCH 22, 2000

65' Catamaran report

HYDROFOIL ARRANGEMENT

There are three properties unique to hydrofoils (as opposed to aircraft wings) which are at play here, and they account for some of the vessel's problems:

1) Most hydrofoils are intended to operate solely in water, and they will abruptly loose up to 75 % of their lift if exposed to air from the atmosphere. Because of the intense low pressures on their upper surfaces, foils will not only tend to attract air (in bubbles or sheets) but they will also tend to retain any air thus captured for prolonged periods of time (many seconds). The result of this characteristic is erratic and unpredictable lift, especially in the presence of waves.

The canards on this boat are a special design (super-cavitating) which tolerate this phenomena, yielding predictable lift in the presence of air. However, this style has very poor performance (a very low lift to drag ratio). It will also leave a considerable amount of entrained air in the foil's wake, and this is undoubtedly a major source of the air known to disturb the more efficient sub-cavitating main wing, especially when traveling in waves.

In the interests of reliable lift in waves, the shallow running forward canards might best left as super-cavitating types. Sub-cavitating, surface piercing foil design technology could be used in a main foil redesign to obtain an air shedding feature to tolerate the air stream off the canards.

2) Hydrofoils strongly sense the presence of the water surface, especially when close. They react by loosing lift when approaching the surface, and gain lift with increasing depth, provided no air has been taken. The main wing on the present design spans about 8 foot-6 inches, and has a chord length of about 6 feet. Were this wing to run at a 6 foot depth, its reaction to waves would be mild. However, at an operating of less than 2 feet, there will be a very strong reaction to waves, thus greatly affecting passenger ride quality.

A main foil redesign would seek to increase the operating depth and reduce the chord length to markedly increase the *effective* operating draft, and reduce the wave sensitivity.

3) The nearby presence of the free surface also affects foil performance as measured by the lift to drag ratio. A shallow running foil produces a significant surface wave disturbance which can clearly be seen just behind, and this is the signature of the unnecessary lost energy. The redesign of item (2) above would simultaneously improve the foil resistance characteristics.

PROPULSION

The propellers on the subject boat are of the type popularly known as an "Arneson". This trade named propeller is actually of the super-cavitating design propeller family, most often found in racing boats. Their performance superiority over other propulsors begins in the 50 to 60 knot speed range, and they can be seen in use at speeds well in excess of 100 knots. These propellers depend on access to air for proper operation, and are therefore usually arranged to operate with the upper half of the propeller out of the water.

Sub-cavitating propellers on the other hand must be totally protected from air contamination. They are unarguably superior in performance to other alternative propulsors when vessel design speeds are below 30 knots or so, at which point water jet propulsion begins to look reasonably attractive. For design speeds in the mid-30's and up, jet propulsion is probably the unarguable champion for both propulsive efficiency and trouble free operation.

In the present case, concerns over air contamination may have forced the decision to use the ventilated propeller design; an otherwise poor choice. Note that auxiliary air supply tubes have been installed to ensure sufficient air supply, especially through intermediate speeds before the step is cleared and provides the necessary air. As propeller efficiency would be especially poor through this transition, the hull's tendency to produce a power hump due to excess trim is exaggerated. The trim tab in front of the propeller further complicates matters considerably, since the propeller's power absorption at the higher speeds is very sensitive to the water level at the prop, a design element which changes with trim tab use.

Alternative sub-cavitating propeller or waterjet installations would significantly improve power efficiency, especially through the hump provided the air contamination issue is resolved first.

STEERING

The present rudder arrangement is subject to air contamination from the considerable quantities of air contained in the prop wash, if not also from the candard wing wash. As the rudder blade is basically a hydrofoil, it will respond inconsistently depending on the amount of air available at any given time and the speed of operation at the moment.

Under the present circumstances, especially with the Arneson type propeller installed, any rudder type installed behind the wheels will prove to be either troublesome or prone to very high drag.

RECOMMENDATIONS

You have mentioned that the subject vessel's future use will only be as a backup vessel. In view of its limited size and revenue potential in this capacity, it then makes no sense to pursue what is a fairly comprehensive and expensive hydrofoil redesign and construction program to deal with the ventilation problems and the poor ride quality. The present inter-related problems do not lend themselves to a single, simple solution.

On the other hand, reconfiguring the vessel as an ordinary catamaran is quite straight forward. An outline of the scope of work is:

1) Remove the canard and main foil.
2) Remove the existing propeller shafts, seals, and propellers
3) Remove the existing rudders, stocks, and steering gear
4) Install a pair of Hamilton Model 521 water jet units. (steering/reverse buckets integral)

65' Catamaran report

The waterjet installation would involve replating the bottom of the lazarette to both adapt the structure to the pumps, and to eliminate the hull step aft. This latter change both adds buoyancy aft and will markedly reduce the excess trim angles and associated hull drag through the transitional (hump) speed. The main engines will also need to be realigned to a new set of cardan shafts installed internal to the hull, passing into the lazarette through a set of bulkhead seals. Adapting the controls over to the pumps will not prove difficult.

Thus configured, we judge that her speed will be in excess of 25 knots, and that her presently notable power hump will largely disappear. We can be more precise about speed predictions at a later date, given a little more technical information. The vessel's new ability to maneuver around docks, plus the degree of vessel command and control available at speed will be superb compared to what is available today.

If there are any questions or comments, please call.

Very truly yours,
HAGE-MARINE, INC.

E. C. Hagemann, PE

Hage-Marine, Inc.

911 Western Avenue Suite 399 ~ The Maritime Building ~ Seattle, Washington. 98104
Phone (206) 467 9554 ~ Fax (206) 467 9569 ~ Email hagemail@seanet.com

3/20/2000
Refer: 9723\Feasibility1

Mr. Ernest Sanchez, Manager of Ferry Services
City of Alameda
530 Water Street, 3rd Floor
Oakland CA 94607

1000 horsepower
millers

Subject: Feasibility Study for the Modification of the HARBOR BAY EXPRESS II

Enclosures: 1) Outline of Deficiencies found by Analysis and Surveys (2 pages)
2) Current Cost Estimate for Recommended Modifications (5 pages)
3) Cost Estimate for New Work Items (extracted from Encl.(2)) (3 pages)
4) Running Trim and Lines of Sight Sketch (1 page)

Gentlemen,

The Enclosures are considered preliminary in form. We believe the content to be complete, but in outline form without the significant volume of supporting documentation developed to date. We have been delayed by a number of design problems encountered for which we felt it necessary to resolve. Enclosure (1) reports on those findings.

By the Deadweight Survey, we have found the vessel to presently weigh a bit under 61, 100 pounds, (if complete) and that the modifications described herein would add another 5200. By this examination, we find the vessel may be fairly described as being exceptionally lightly built, and more stern heavy than desired.

Consultation with the Propulsion Engine builder has resulted in their recommendation that the present 1000 Horsepower rating be retained. In the event it is desired to obtain 10,000 hour overhaul intervals, they advise normal engine operating speeds be at reduced RPM (about 200 below the 2300 rating).

As modified, with a full load of passengers and fuel, calculations indicate the vessel will go near 27 knots *at full power*, or 30 when empty. However, operations at reduced RPM when loaded will fall a little below 25 knots. With the hydrofoils removed, there will be no speed instabilities, and any given throttle setting will result in a set speed as determined by the conditions at hand.

As modified, we anticipate improvement in passenger ride quality, with a reduction in the pounding presently experienced forward. Authoritative, adjustable trim tabs are to be installed to assist in the maintenance of draft forward when traveling with lighter passenger loads. We also expect there will be a significant reduction in noise and vibration levels which are largely caused by the present surface piercing propellers. This removal should also markedly reduce the generalized deck wetting over the embarkation area aft, although this wetting is unlikely to entirely disappear under all conditions.

Unfortunately, we have not yet found space to install effective main engine mufflers.

Enclosure (1) outlines several areas of concern and the recommended actions for each, save one. Calculations for the bottom bow plating have revealed it to be too thin for the service, and apparently some damage has already occurred in the form of permanently deformed (dished in) plate panels on the bottom, outboard of the canard assembly. This "hungry horse" appearance (the ribs show in shadow due to the set-in panels) will have to be examined frequently for fatigue cracks. Replacement of this plate is not considered economically reasonable.

Enclosures (2) is a cost estimate of all the proposed modifications. Enclosure (3) is extracted from (2), and lists only those work items discussed in Enclosure (1), and considered "new" as a result of survey and analysis based on the survey findings. The cost difference between Enclosures (2) and (3) would then be the "original" work scope, and this comparison is made at the bottom of the last Enclosure.

I look forward to discussing this with you to answer any questions you may have.

Very truly yours,
HAGE-MARINE, Inc.

Ed Hagemann

Edward C Hagemann, PE

cc: Cheri Sheets
Charles Walther
Archie Nichols

ENCLOSURE 1

HARBOR BAY EXPRESS II FEASIBILITY STUDY
OUTLINE OF VESSEL DEFICIENCIES FOUND BY ANALYSIS AND SURVEYS

VISIBILITY FROM THE PILOT HOUSE

a) Pilot House is located well aft with lower window sills near cabin roof.
b) Line of sight to water, ahead of vessel, blocked by cabin roof with modest running trim angles. (950 feet at 3.5 degrees, an angle achieved only at top speed; lower speeds yield higher angles)
c) Various standards of care all require lines of sight well under 200 feet for this case.
d) USCG has informally advised of their displeasure with the current situation.
e) Proposed house relocation yields about 100 foot visibility *at 3.5 degrees running trim.*
f) Finally, consider the potential civil liabilities incurred by the present arrangement.

HULL STRUCTURAL ANALYSIS

a) The Cross Structure between hulls has been found inadequate with the foil removed.
    1) Various reinforcement schemes of existing structure also prove inadequate.
    2) The recommended replacement of Bulkheads 3 and 22 (transom), relieves the existing structure and is a similar design tactic as applied to the "Bay Breeze" and her sisters.
    3) Alternatively, retaining the foil was explored.
        a) The rather broad speed instability would remain. (That is, steady state speeds between the low teen's and mid 20's cannot be maintained)
        b) Slamming loads (rough ride) occurring near the Canard assembly would remain.
b) The forward Bottom Plating is inadequate (too thin)
    1) The USCG allowable stress recommendation of 12,000 psi is exceeded by some 30%
    2) Fatigue fractures over the long term is the principal concern.
    3) Slamming loads from wave encounters at high speed cause pressure spikes, where the first signs of distress are permanent deformations (yielding) of plating.
    4) Dry Dock photos show this has already occurred on bottom plating outboard of the Canard assembly where the plating is dished in between internal framing members.
    5) Re-plating the bottom, aft to at least frame 10 of 22, would be prohibitively expensive.
c) Bottom Web Frames between #3 and 9 have excessive spans, and require midspan support.
    1) Webs forward of # 3 already have trusses
    2) Webs aft of #9 are supported by longitudinal girders (these are extended engine girders).
    3) The subject main bottom webs can be upported by simple pipe struts, forming a truss.
    4) The bottom half webs located between the main webs can be midspan supported by a light girder spanning the 30 inch distance between trusses
    5) The hazard here is outright collapse (by buckling) of these webs from encountering a particularly steep wave while at speed, especially if fully loaded.
d) The bottom longitudinal members are good.
e) The watertight bulkheads each have a slightly overstressed stringer of questionable stability, so intermediate lateral supports will need to be added.

STERN HEAVINESS AND OPERATING TRIM ANGLES

a) Problem

1) further Pilot House visibility reduction

2) unnecessary increase in required horsepower

b) Compensations

1) relocation of: equipment

a) Engines and Gears, forward 22" (to be realigned in any event)

b) C02 Bottles. from stern lockers to void forward

c) water tank, from aft cross structure to void forward

d) Main engine start batteries, from lazarette to engine room

d) remove house "fins" aft, simplify radar mast, move PH forward 3ft.

e) consider installation of up to 2000 lbs. fixed ballast forward

2) Install 2 ft by hull width, hydraulically adjustable Trim Tabs behind transoms

3) Block off aft seating during part load operations, move preferred tables forward

c) The vessel's weight is located too far aft, and the passenger seating arrangement is too far forward. With a full load, the vessel actually balances reasonably well. However, at part loads, trims will vary considerably, hence the installation of a powerful *adjustable* Trim Tab set.

PROPULSION REDUCTION GEAR RATIO CHANGE

a) Jet model 521 requires 1.75 : 1.00 ratio, vessel presently has a 2.00 : 1.00 ratio.

b) The larger 571 model could use the existing gear, but costs more and worsens stern heaviness.

c) The conventional SAE Bell Housing connection between propulsion engines and gears has been modified by the builder, and is now useless. Fortunately, this particular model alssembly may be repaired with bolt-on parts.

DOCUMENT TONNAGE

a) USCG Regulations require that "T" boats admeasure to be less than 100 Gross Register Tons (GRT).

b) A formal re-admeasuremnt (precipitated by this modification program) will reveal that this vessel is currently over 100 GRT.

c) The (normal) exemption of the Passenger Cabin volume will require that a tonnage opening be installed in the aft cabin bulkhead.

ENCLOSURE (2)

CURRENT COST ESTIMATE, HARBOR BAY EXPRESS II MODIFICATIONS
Dated: 3/17/2000

REMOVALS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	REMOVE FOIL & GRIND CNCTN POINTS	100	$100.00
2	REMOVE FWD CANRDS AND REFAIR BOTT	300	$600.00
2	REMOVE AFT BTTM & REPLACE W/NEW	900	$1,800.00

LABOR HRS 940 45

MATERIAL	$3,000.00
LABOR	$42,300.00

CUT WHL HS FROM DECK AND RAISE

530	LBS NEW ALUM MATERIAL(INCLDG MAST)	$2.00	$1,060.00
	FITTING/WELDING HRS. 880	45	$39,600.00

MATERIAL	$1,272.00
LABOR	$39,600.00

ALUM FAB & INSTALL OF NEW CROSS BRIDGES

1800	LBS NEW ALUM MATERIAL	$2.00	$3,600.00
	FITTING/WELDING HRS 1600	45	$72,000.00

MATERIAL	$4,320.00
LABOR	$72,000.00

ALUM FAB NEW TRUSS STRUCUTRE

220	LBS NEW(BOTT STRCTR BHD 3-9)	$2.00	$440.00
	FITTING/WELDING HRS 320	45	$14,400.00

MATERIAL	$528.00
LABOR	$14,400.00

MAIN ENGINES AND GEAR

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	REBUILD OF MAIN ENGINES W/NEW MTS	58000	$116,000.00
2	REBUILD GEAR W/NEW REDUCTION	25000	$50,000.00
2	NEW BELL HOUSINGS	1500	$3,000.00
2	NEW ELECTRONIC CONTROLS GOV/GEAR	3500	$7,000.00

LABOR HRS FOR INST AND ALIGNMENT 340 45

MATERIAL	$211,200.00
LABOR	$15,300.00

WATER JETS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	COMPLETE WTR JET ASMLYS W/INTAKES	95000	$190,000.00
	& W/CNTRLS,HYDR,WIRE HARNESSES,ETC		

LABOR HRS 550 45

MATERIAL	$228,000.00
LABOR	$24,750.00

AUX GEN SETS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	GEN SETS (NO CHANGES)	0	$0.00

LABOR HRS 0 45

MATERIAL	$0.00
LABOR	$0.00

PROPULSION ENG/STEERING CONTROLS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	ELECTRONIC ENGINE/GEAR CONTROLS	0	$0.00
	W/WTR JET PKG (PREWIRED PLUG IN)		

LABOR HRS FOR COMPLETE INSTALLATION 220 45

MATERIAL	$0.00
LABOR	$9,900.00

ENCLOSURE (2)

HYDRAULIC TRIM TABS

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	ALUM FABRICATION MATERIALS	350	$700.00
1	HYDRLCS & CONTROLS PKG	6500	$6,500.00

LABOR HRS FOR COMPLETE INSTALLATION 480 45

MATERIAL	$8,640.00
LABOR	$21,600.00

ELECTRICAL DC 24V

QUAN	DESCRIPTION	PRICE	SUBTOTAL
4	MOVE 8D BATTS/BOXES TO ENG RM	100	$400.00
2	RECONNECT BATT CABLES & CHARGERS	0	$0.00
2	NEW BATTS W/CHARGERS FOR CONTROLS	1400	$2,800.00

LABOR HRS ALL ELECTR,FITNG&WELDING 190 45

MATERIAL	$3,840.00
LABOR	$8,550.00

COMPRESSED AIR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	DISCONNECT AIR CONTROLS & REMOVE	0	$0.00

LABOR HRS 30 45

MATERIAL	$0.00
LABOR	$1,350.00

SEWAGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	NEW PUMP(RV STYLE)	200	$200.00

LABOR HRS 60 45

MATERIAL	$240.00
LABOR	$2,700.00

POTABLE WTR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	POSITV DSPLCMNT RV PUMPS	200	$400.00
2	NEW PLASTIC WTR TANKS	650	$1,300.00
1	PIPING,HOSE,FITTINGS,HANGERS, TK LVL SENSORS,VALVES,etc	1200	$1,200.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 380 45

MATERIAL	$3,480.00
LABOR	$17,100.00

FIRE/BILGE SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	REVISED SUCTION PIPING/HOSE	200	$400.00
2	NEW SEA CHEST	200	$400.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 260 45

MATERIAL	$800.00
LABOR	$11,700.00

CO2 SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	MOVE CO2 BOTTLES TO STA #9	250	$500.00
1	USCG APRVL AND TESTNG AFTR ASSM'LY	750	$750.00
2	PIPING,HOSE,FITTINGS,HANGERS,etc	200	$400.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 165 45

MATERIAL	$1,980.00
LABOR	$7,425.00

ENCLOSURE (2)

EXHAUST SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	WATER INJECTOR RING FOR MAINS	200	$400.00
2	NO CHANGES ON AUX EXHST	0	$0.00
2	PIPING,FLEX JNTS,FITTINGS,HANGERS,	2800	$5,600.00
	INSULATION,PENETRATIONS(W/RAW WTR)		

TOTAL LABOR HRS FOR COMPLT INSTLLAT	540	45	MATERIAL	$7,200.00
			LABOR	$24,300.00

COOLING WTR SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	RAW WTR FROM NEW SEA CHESTS(MAINS)	500	$1,000.00
2	RAW WTR FROM NEW SEA CHESTS(AUXS)	100	$4,600.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT	250	45	MATERIAL	$6,720.00
			LABOR	$11,250.00

FUEL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	MODS TO SUIT MAIN ENG RELOCATION	100	$200.00

LABOR HRS	30	45	MATERIAL	$240.00
			LABOR	$1,350.00

LUBE OIL SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
	NO CHANGES	0	$0.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT	0	45	MATERIAL	$0.00
			LABOR	$0.00

ACCOMODATION VENTILATION SYSTEM

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	NEW CENTRIFUGAL BLOWERS	800	$1,600.00
1	INTAKES/DUCTING/FITGS/GRILLS/ETC	4500	$4,500.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT	220	45	MATERIAL	$7,320.00
			LABOR	$9,900.00

INSULATION

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	NO CHANGES	0	$0.00

LABOR HRS FOR COMPLETE INSTALLATION	0	45	MATERIAL	$0.00
			LABOR	$0.00

JOINER WORK

QUAN	DESCRIPTION	PRICE	SUBTOTAL
950	NEW CEILING SYSTEM(SQ FT)	12	$11,400.00
900	NEW WALL COVERINGS(SQ FT)	4	$3,600.00
1	NEW P.HS CONSUL	1400	$1,400.00

(MOST LABOR HRS INCLUDED IN MATERIAL	650	45	MATERIAL	$19,680.00
			LABOR	$29,250.00

ENCLOSURE (2)

FURNISHINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
132	RENEW SEATING UPHOLSTERY	150	$19,800.00		
				MATERIAL	$23,760.00
(MOST LABOR HRS INCLUDED IN MATERIAL		80	45	LABOR	$3,600.00

FLOOR COVERINGS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
110	CARPET AND VINYL FLOOR CVRNGS(YDS)	30	$3,300.00		
2	ALUM ENG RM FLOORING(MODS)	200	$400.00		
				MATERIAL	$4,440.00
(MOST LABOR HRS INCLUDED IN MATERIAL		80	45	LABOR	$3,600.00

DOORS & WINDOWS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
10	NEW FIXED GLASS SIDE WINDOWS	550	$5,500.00		
6	NEW SLIDING GLASS SIDE WINDOWS	700	$4,200.00		
2	NEW P.HS. SIDE WINDOWS	550	$1,100.00		
2	ALUM EXTER. DOORS (WHL HOUSE)	1900	$3,800.00		
1	NEW DOOR UNDER WHEEL HS	900	$900.00		
				MATERIAL	$18,600.00
LABOR HRS INSTAL WINDOWS/DOORS		250	45	LABOR	$11,250.00

NAVIGATION, ELECTRONICS AND AUDIOVISUAL EQ

	DESCRIPTION	PRICE	SUBTOTAL		
2	MOVE RADAR ANTENAES	200	$400.00		
1	NEW ALARM/MONITORING SYST(W/WIRING	35000	$35,000.00		
1	NAV/COM SYSTMS(MOVE ANTENAES)	100	$100.00		
				MATERIAL	$42,600.00
LABOR HRS		200	45	LABOR	$9,000.00

HATCHES & MOORING GEAR

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
1	FABD NONWT DECK HATCH	100	$100.00		
				MATERIAL	$120.00
LABOR HRS FAB		30	45	LABOR	$1,350.00

EXTERIOR RAILING / LADDERS

	DESCRIPTION	PRICE	SUBTOTAL		
1	NEW EXTERIOR HAND GRABS MATERIALS	225	$225.00		
3	NEW LADDERS TO WHEEL HS	100	$300.00		
				MATERIAL	$630.00
LABOR HRS		200	45	LABOR	$9,000.00

SHAFTS & GLANDS

QUAN	DESCRIPTION	PRICE	SUBTOTAL		
2	CARDON SHAFT ASSEMBLIES W/MTG CPLG	4500	$9,000.00		
2	BHD GLANDS	2300	$4,600.00		
				MATERIAL	$16,320.00
LABOR HRS INSTALLATION		180	45	LABOR	$8,100.00

ENCLOSURE (2)

PAINT,PREP,CATHODIC PROTECTION

DESCRIPTION		PRICE	SUBTOTAL	
ENTIRE PAINT SYSTEM (bottom only)			$25,000.00	
ALL ANODES			$1,200.00	+ labor
LABOR HRS	1100	45	MATERIAL	$31,440.00
			LABOR	$49,500.00

optional
incl w/

$30,000 - 40,000

LIFE SAVING EQUIPMT

QUAN	DESCRIPTION	PRICE	SUBTOTAL	
3	25 PERSON LIFE FLOATS W/PADDLES	1200	$3,600.00	
1	MANOVRBD RESCUE EQUIPMT	2000	$2,000.00	
LABOR HRS INSTALLATION	20	45	MATERIAL	$6,720.00
			LABOR	$900.00

Subcontract

safety
USCG
Capt

ADD TONNAGE OPENING TO CABIN

QUAN	DESCRIPTION	PRICE	SUBTOTAL	
1	MISC ALUM, BOLTS, REUSE EXIST DOOR	400	$400.00	
LABOR HRS INSTALLATION	180	45	MATERIAL	$480.00
			LABOR	$8,100.00

Volume Tonnage

Inventory

BULDERS RISK INSURANCE $8,000.00 $8,000.00 Actual Cost

TESTING

ALL USCG AND SHIPYARD QC AND TESTING(NDT)			$3,500.00	
LABOR FOR TESTING	100	45	MATERIAL	$4,200.00
			LABOR	$4,500.00

ENGINEERING AND REGULATORY

DEVELOPEMENT OF DWGS			$1,000.00	
CERTIFICATION COSTS			$4,500.00	
STABILITY TEST AND MISC OUTSIDE ENGRG			$0.00	
TOTAL IN HOUSE WORK DWGS	200	45	MATERIAL	$6,600.00
			LABOR	$9,000.00

inc
OMI

LAUNCH AND SEA TRIALS

FUEL, FOOD, SUPPLIES & CONSUMABLES			$1,600.00	
LABOR HRS	80	45	MATERIAL	$1,920.00
			LABOR	$3,600.00

TOTAL HRS	10805	SUM, S/Y TOTAL COST (INCLUDES SHIPYARD PROFIT & SG&A)	$1,160,675.00
		ADD CURRENT ENGINEERING/ADMIN	$64,810.00
		CURRENT PROJECT COST W/O INSPECTION	$1,225,485.00

1,200.00
$ 255
cost bid

* 45/hr Labor includes $22.50
Nall - 20%

→ Load weights in front of prop.

$ 190.00

→ What about V drive w/ prop ... bussing in stern
→ exhaust to middle of hull

ENCLOSURE (3)

NEW WORK ITEM COSTS, HARBOR EXPRESS II MODIFICATIONS
These items extracted from current Cost Analysis dated 3/17/2000
Dated: 3/18/2000

CUT WHL HS FROM DECK AND RAISE (Visibility)

530	LBS NEW ALUM MATERIAL(INCLDG MAST)		$2.00	$1,060.00	
	FITTING/WELDING HRS	880	45	$39,600.00	
				MATERIAL	$1,272.00
				LABOR	$39,600.00

ALUM FAB & INSTALL OF NEW CROSS BRIDGES (Transverse Bending Strength)

1800	LBS NEW ALUM MATERIAL		$2.00	$3,600.00	
	FITTING/WELDING HRS	1600	45	$72,000.00	
				MATERIAL	$4,320.00
				LABOR	$72,000.00

MAIN ENGINES AND GEAR (Required Gear ratio change to match Jet, repair Bell housings)

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	REBUILD GEAR W/NEW REDUCTION		$25,000	$50,000.00	
2	NEW BELL HOUSINGS		1500	$3,000.00	
				MATERIAL	$53,600.00
	LABOR HRS FOR INST AND ALIGNMENT	340	45	LABOR	$15,300.00

HYDRAULIC TRIM TABS (Trim Compensation, stern heavy design)

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	ALUM FABRICATION MATERIALS		350	$700.00	
1	HYDRL'CS & CONTROLS PKG		6500	$6,500.00	
				MATERIAL	$8,640.00
	LABOR HRS FOR COMPLETE INSTALLATION	480	45	LABOR	$21,600.00

ELECTRICAL DC 24V (Trim compensation)

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
4	MOVE 8D BATTS/BOXES TO ENG RM		100	$400.00	
2	RECONNECT BATT CABLES & CHARGERS		0	$0.00	
2	NEW BATTS W/CHARGERS FOR CONTROLS		1400	$2,800.00	
				MATERIAL	$480.00
	LABOR HRS ALL ELECTR,FITNG&WELDING	190	45	LABOR	$8,550.00

SEWAGE SYSTEM (repair)

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
1	NEW PUMP(RV STYLE)		200	$200.00	
				MATERIAL	$240.00
	LABOR HRS	60	45	LABOR	$2,700.00

POTABLE WTR SYSTEM (Trim compensation)

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	POSITV DSPLCMNT RV PUMPS		200	$400.00	
2	NEW PLASTIC WTR TANKS		650	$1,300.00	
1	PIPING,HOSE,FITTINGS,HANGERS, &		1200	$1,200.00	
	TK LVL SENSORS,VALVES,etc				
				MATERIAL	$3,480.00
	LABOR HRS	380	45	LABOR	$17,100.00

ENCLOSURE (3)

CO2 SYSTEM **Trim compensation)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	MOVE CO2 BOTTLES TO STA #9	250	$500.00
1	USCG APRVL AND TESTNG AFTR ASSM'LY	750	$750.00
2	PIPING,HOSE,FITTINGS,HANGERS,etc	200	$400.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 165 45

MATERIAL	$1,980.00
LABOR	$7,425.00

ACCOMODATION VENTILATION SYSTEM **(Habitability improvement)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	NEW CENTRIFUGAL BLOWERS	800	$1,600.00
1	INTAKES/DUCTING/FITGS/GRILLS/ETC	4500	$4,500.00

TOTAL LABOR HRS FOR COMPLT INSTLLAT 220 45

MATERIAL	$7,320.00
LABOR	$9,900.00

JOINER WORK **(Repair)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
950	NEW CEILING SYSTEM(SQ FT)	12	$11,400.00
900	NEW WALL COVERINGS(SQ FT)	4	$3,600.00
1	NEW P.HS CONSUL	1400	$1,400.00

(MOST LABOR HRS INCLUDED IN MATERIAL 650 45

MATERIAL	$16,680.00
LABOR	$29,250.00

FURNISHINGS **(Repair)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
132	RENEW SEATING UPHOLSTERY	150	$19,800.00

(MOST LABOR HRS INCLUDED IN MATERIAL 80 45

MATERIAL	$23,760.00
LABOR	$3,600.00

FLOOR COVERINGS **(Repair)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
110	CARPET AND VINYL FLOOR CVRNGS(YDS)	30	$3,300.00
2	ALUM ENG RM FLOORING(MODS)	200	$400.00

(MOST LABOR HRS INCLUDED IN MATERIAL 80 45

MATERIAL	$4,440.00
LABOR	$3,600.00

DOORS & WINDOWS **(2/3 originally unknown, remainder is PH move/visibility)**

QUAN	DESCRIPTION	PRICE	SUBTOTAL
10	NEW FIXED GLASS SIDE WINDOWS	550	$5,500.00
6	NEW SLIDING GLASS SIDE WINDOWS	700	$4,200.00
2	NEW P.HS. SIDE WINDOWS	550	$1,100.00
2	ALUM EXTER. DOORS (WHL HOUSE)	1900	$3,800.00
1	NEW DOOR UNDER WHEEL HS	900	$900.00

LABOR HRS INSTAL WINDOWS/DOORS 250 45

MATERIAL	$18,600.00
LABOR	$11,250.00

ENCLOSURE (3)

NAVIGATION, ELECTRONICS (Alarm system non-functional, rest is PH move)

QUAN	DESCRIPTION	PRICE	SUBTOTAL
2	MOVE RADAR ANTENAES	200	$400.00
1	NEW ALARM/MONITORING SYST(W/WIRING	35000	$35,000.00
1	NAV/COM SYSTMS(MOVE ANTENAES)	100	$100.00
			$0.00

LABOR HRS	200	45	MATERIAL	$42,600.00
			LABOR	$9,000.00

EXTERIOR RAILING / LADDERS (PH move / visibility)

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	NEW EXTERIOR HAND GRABS MATERIALS	225	$225.00
3	NEW LADDERS TO WHEEL HS	100	$300.00

LABOR HRS	200	45	MATERIAL	$830.00
			LABOR	$9,000.00

ADD TONNAGE OPENING TO CABIN (corrects original error)

QUAN	DESCRIPTION	PRICE	SUBTOTAL
1	MISC ALUM, BOLTS, REUSE EXIST DOOR	400	$400.00

LABOR HRS INSTALLATION	180	45	MATERIAL	$480.00
			LABOR	$8,100.00

TOTAL HRS 5775

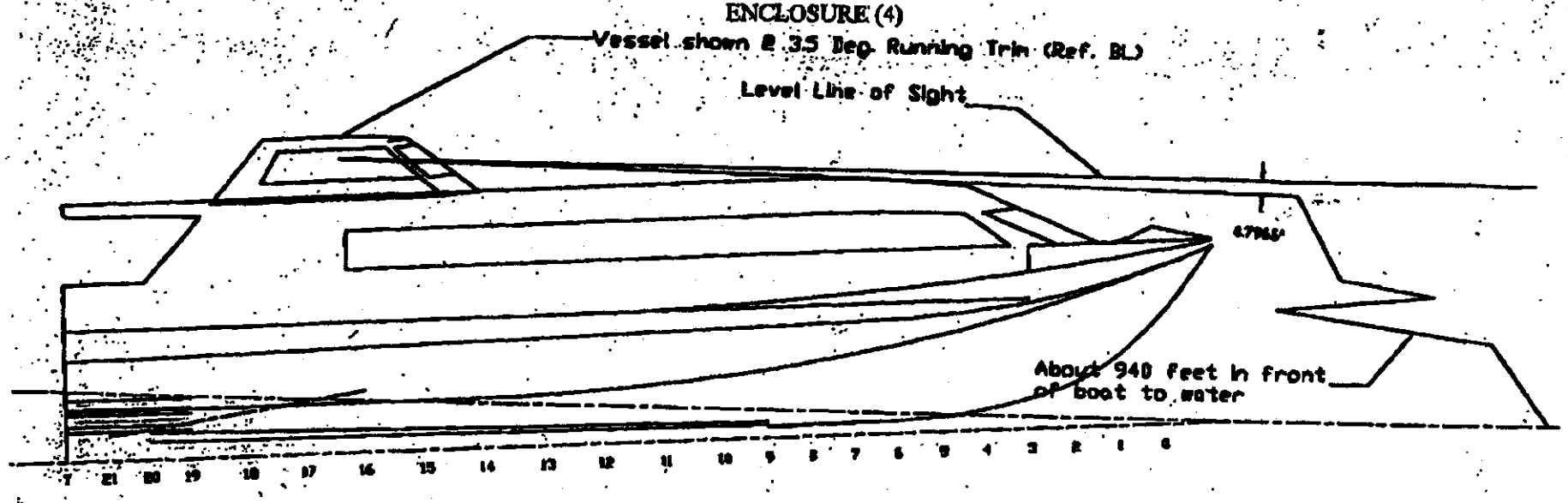
SUM, EXTRA COSTS $469,497.00
(INCLUDES SHIPYARD PROFIT & SG&A)

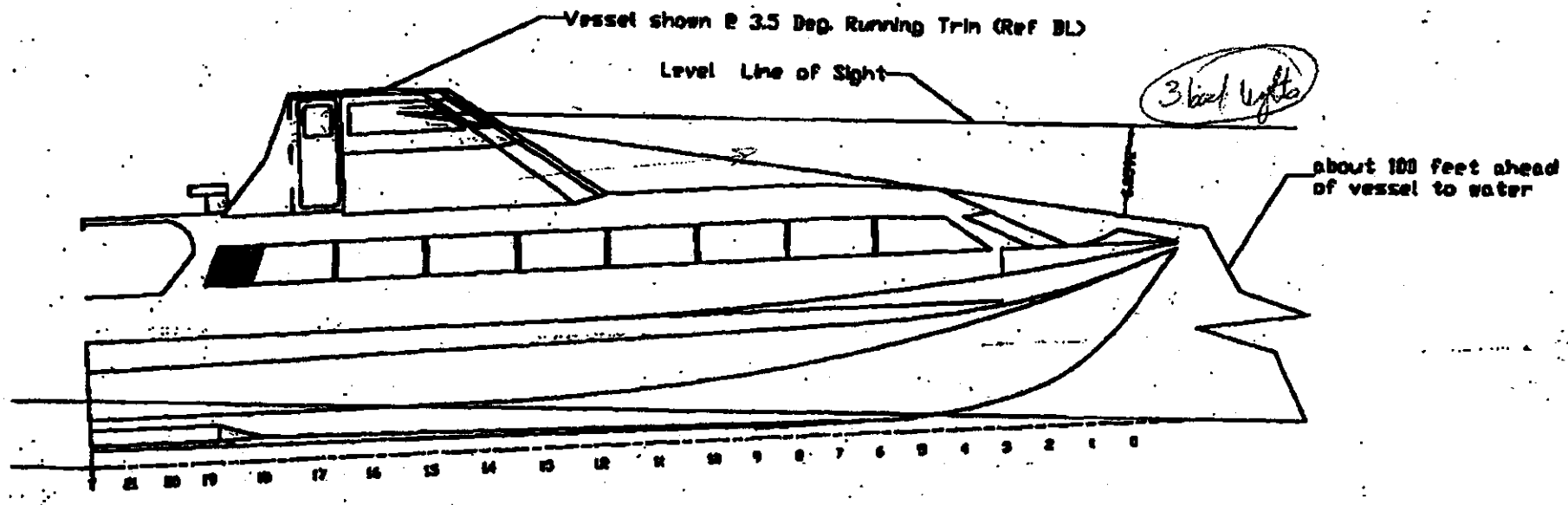
RECAP:

SUM, CURRENT S/Y WORK ESTIMATE	$1,160,675.00
ADD CURRENT ENGINEERING/ADMIN	$64,810.00
CURRENT PROJECT COST W/O INSPECTION	$1,225,485.00
CURRENT PROJ. COST LESS ABV EXTRAS	$755,988.00
DEDUCT CURRENT ENGR'G COSTS	($64,810.00)
ADD ORIGINAL ENGR'G COSTS	$45,000.00
TO COMPARE, ORIGINAL ESTIMATE	$736,178.00

(Note the original estimate is 3 years old)

ENCLOSURE (4)


Vessel shown @ 3.5 Deg. Running Trim (Ref. BL)
Level Line of Sight
About 940 feet in front of boat to water


Vessel shown @ 3.5 Deg. Running Trim (Ref BL)
Level Line of Sight
3 bird lights
about 100 feet ahead of vessel to water

copy 6 - 4:45 am
Friday - 10:00

Hage-Marine, Inc. FaxForm

911 Western Avenue Suite 399 ~ The Maritime Building ~ Seattle, Washington. 98104
Phone (206) 467 9554 ~ Fax (206) 467 9569 ~ Email hagemail@seanet.com

Date 3/27/2000
File Ref: 9723/feasibility2
To: 510.525.0060
Attention: **Mr. Charlie Walther**
Subject: Harbor Bay Express II Mods, V-Drive Feasibility
Pages (including this cover): 9

Charlie,

Here is the V-Drive arrg't and sketch. The costing this time is "bare bones". Trim and speed should be a bit better, but draft and propeller vulnerability might be issues. The machinery space will be tight.

Regards, Ed H.

Subchapter 11.

ARP - Chase down H

Hage-Marine, Inc.

911 Western Avenue Suite 399 ~ The Maritime Building ~ Seattle, Washington. 98104
Phone (206) 467 9554 ~ Fax (206) 467 9569 ~ Email hagemail@seanet.com

3/23/2000
Refer: 9723\Feasibility2

Mr. Ernest Sanchez, Manager of Ferry Services
City of Alameda
530 Water Street, 3rd Floor
Oakland CA 94607

Subject: Feasibility Study for the Modification of the HARBOR BAY EXPRESS II
Using Conventional Propellers / V-Drive Arrangement

Enclosures: 1) Current Cost Estimate for V-Drive Arrangement (5 pages)
(with minimum cosmetic upgrades)
2) V-Drive Arrangement Sketch (1 page

Reference: a) Preliminary Feasibility Study 1, dtd March 20, 2000

Gentlemen,

At your direction, the Enclosures are forwarded for further review and discussion. Principal changes from Reference (a) are:

1) The elimination of Water Jet Drive,
2) The substitution of V-drive Reverse/Reduction Gearboxes
3) Machinery and Propeller and shafting re-arrangement to suit.
4) Deletion of cosmetic repairs/replacement on a deferred basis
5) Cost of rebuilding main engines reduced to 1 @ $ 85,000.

Be aware that this design strategy will increase the required navigational water depths from the earlier 4 foot requirement to more than 6 feet ! Grounding protection for the propellers and rudders is not shown (and would be difficult to integrate into this hull form).

As the propellers are also vulnerable to debris damage, one set of spares has been included in the enclosed costing.

It is estimated this V-Drive strategy will weigh about 2 short tons less (of 48 at full load) than the earlier version. Most of the reduction is in the elimination of the Jet assemblies with entrained water. Although a formal weight analysis will show a reduction in stern heaviness, the trim compensation cost items have been for the time being, retained in Enclosure(1).

With a full load of passengers and fuel, calculations indicate that this modification version will go over 27 knots *at full power*. Operations at reduced RPM when loaded should be near 25 knots. There continue to be no speed instabilities with this arrangement.

We anticipate the improvements in passenger ride and reduced noise levels as described in Reference (a).to remain unchanged. We retain the adjustable trim tabs to control trim changes occurring with differing passenger loads.

The end- for-end swapping of the main engines has opened the possibility of installing Cowl type mufflers in the lazarette; giving this version a noise reduction advantage over the earlier version. They are not shown on the sketch, Enclosure (2).

Also be aware that the congested Engine Room will become even more crowded. The present access and cross passage just aft of the auxiliary generators will become very tight as the new V-Drive gearboxes are quite close.

You will find the technical deficiency list (Enclosure (1) of Reference (a)) remains valid except for the reduced stern heaviness. The new V-Drive gear boxes make the existing gears surplus.

I look forward to discussing this with you to answer any questions you may have.

Very truly yours,
HAGE-MARINE, Inc.

Edward C Hagemann, PE

cc: Cheri Sheets
Charles Walther
Archie Nichols
Paul Bishop

ENCLOSURE (1)

CURRENT COST ESTIMATE, HARBOR BAY EXPRESS II MODIFICATIONS AS V-DRIVE / PROPELLER
Dated: 3/22/2000 WITH MINIMUM COSMETIC UPGRADES

REMOVALS

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
1	REMOVE FOIL & GRIND CNCTN POINTS		100	$100.00	
2	REMOVE FWD CANRDS AND REFAIR BOTT		300	$600.00	
2	REMOVE AFT BTTM & REPLACE W/NEW		900	$1,800.00	
				MATERIAL	$3,000.00
LABOR HRS		940	45	LABOR	$42,300.00

CUT WHL HS FROM DECK AND RAISE

530	LBS NEW ALUM MATERIAL(INCLDG MAST)		$2.00	$1,060.00	
	FITTING/WELDING HRS	880	45	$39,600.00	
				MATERIAL	$1,272.00
				LABOR	$39,600.00

ALUM FAB & INSTALL OF NEW CROSS BRIDGES

1800	LBS NEW ALUM MATERIAL		$2.00	$3,600.00	
	FITTING/WELDING HRS	1600	45	$72,000.00	
				MATERIAL	$4,320.00
				LABOR	$72,000.00

ALUM FAB NEW TRUSS STRUCUTRE

220	LBS NEW(BOTT STRCTR BHD 3-9)		$2.00	$440.00	
	FITTING/WELDING HRS	320	45	$14,400.00	
				MATERIAL	$528.00
				LABOR	$14,400.00

MAIN ENGINES AND GEAR

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
1	REBUILD OF ONE MAIN ENGINES W/MTS		85000	$85,000.00	
2	NEW V-DRIVES (BW 190 - V, 2.448 ratio)		35000	$70,000.00	
2	NEW BELL HOUSINGS w/ BLOCK DRIVE		5500	$11,000.00	
2	ENGINE / GEAR CARDAN SHAFT		1600	$3,200.00	
2	CARDAN SHAFT GUARDS		150	$300.00	
2	SET UP FOR EXISTING CONTROLS		100	$200.00	
				MATERIAL	$203,640.00
LABOR HRS FOR INST AND ALIGNMENT		390	45	LABOR	$17,550.00

PROPELLER DRIVE TRAIN

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	PROPELLER SHAFT, 3 1/2" AQUA22, X 15'		7500	$15,000.00	
2	STERN TUBES, 4"SCHED 80 5086, x 3 1/2 '		200	$400.00	
2	"PSI" DRIPLESS SEAL		2300	$4,600.00	
2	V-STRUT, BEARING, HOUSING ASS'Y		300	$600.00	
4	PROPELLER, 36" X 45", 5 BLADE. (2 spare)		3750	$15,000.00	
				MATERIAL	$16,000.00
LABOR HRS		480	45	LABOR	$21,600.00

RUDDERS & STEERING GEAR

QUAN	DESCRIPTION		PRICE	SUBTOTAL	
2	5 sqft. URETHANE COATED, S/S ASS'LY		4300	$8,600.00	
2	NEW TILLERS, CYLINDERS, CONTROLS		6500	$13,000.00	
				MATERIAL	$25,920.00
LABOR HRS FOR COMPLETE INSTALL'N		560	45	LABOR	$25,200.00