



AGENDA
MUNICIPAL FACILITIES COMMITTEE MEETING
Friday, November 03, 2006
City Hall - South Conference Room
10:30 AM

1. Lights at Wooten Park - Scott Romano
2. Purchase of Surplus Marine Travel Lift - Joe
3. Update on Marina Rate Study Project – Paul Sorenson, BST Associates

INTOLIGHT[®]

355 110th Avenue NE
PO Box 90868, EST 9W
Bellevue, Washington 98009-0868

(425) 456-2496 ph
(425) 462-3149 fx

Lighting Services from Puget Sound Energy

October 18, 2006

Mr. Scott Romano
City of Des Moines Inc.
Department of Public Works
21650 - 11th Avenue South
Des Moines, WA 98198-6317



Re: Wooten Park

Dear Scott:

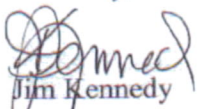
This purpose of this letter is explain what PSE can do regarding the pathway lighting at Wooten Park. The lights there now have out-lived their usefulness and are probably becoming a maintenance hassle. You sent me a description of a pole and luminaire that the City would like to replace them with and have asked PSE install, own and maintain the new installation.

Enclosed is a picture of a pole and luminaire combination that approximates the City's selection. The Hapco pole shown in the attachment is aluminum and the luminaire is from King, both reliable manufacturers. The base plate will be specially made to fit the existing bolt pattern there at the park now, 4" x 6". I suggest the luminaire be 150 watt high pressure sodium. This ten light system can be installed using the existing concrete bases and circuitry for \$29,840.

We will "slug" the meter and bill the lights under Rate Schedule 52. The monthly energy and maintenance cost for all 10 lights will be about \$113 per month.

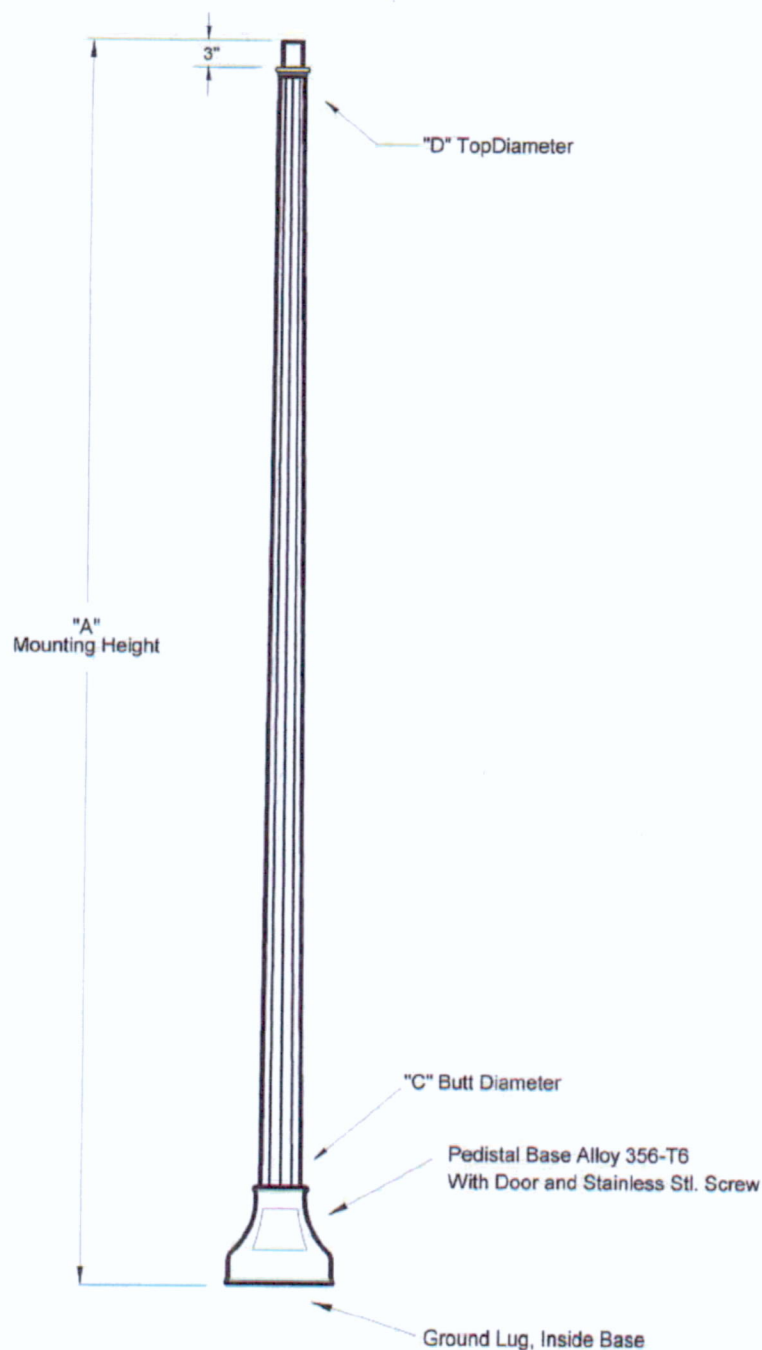
Please let me know what else you need from me on this issue. If the City wants to proceed with this installation, let me know and I will send the contracts. Also, what does the City want to do with the old poles and luminaires?

Sincerely,


Jim Kennedy
Account Manager

Enclosures

BRS14B6-TF0-**



(4) NC Galvanized Steel Anchor Bolts,
AASHTO M314-90 Grade 55, 10" of
Threaded End Galvanized Per
ASTM A153.

(4) NC Galvanized Steel Hex. Nuts
(4) Galvanized Steel Lockwashers
(4) Galvanized Steel Flatwashers

Pedestal Base Alloy 356-T6 With Door And
Stainless Stl. Screw



STANDARD FINISHES: (add as suffix)
BA Black Powder Paint
BH White Powder Paint
BM Bronze Powder Paint
BV Dark Green Powder Paint
01 Satin

General Shaft Assembly	A	B	C	D	E	F	G				H	Maximum EPA				
	Mtg Hgt	Wall Thick.	Butt Dia.	Top Dia.	Base Dia.	Bolt Circle	Bolt Project	Net Weight	Lum Weight	Anchor Bolts	Arm Length	70	80	90	100	110
BRS	14	.125	6	4.57	14.5	10	2			.75 x 17 x 3						

26252 Hillman Highway, Abingdon, VA 24210 Phone: 1-800-368-7171 Fax: 1-276-628-7707 Web: <http://www.hapco.com>

Your Name:

Customer P.O. #:

Date:

Project Name:

Finish:

Quantity:

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KING LUMINAIRE

O R N A M E N T A L L I G H T I N G

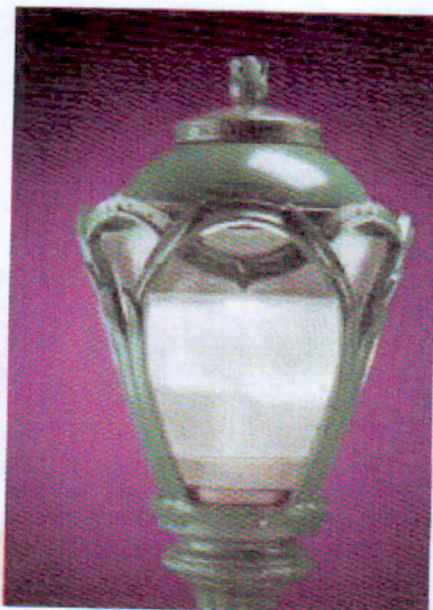
K 1 3 4 Y O R K & K 1 3 6 R E G E N C Y P O S T T O P

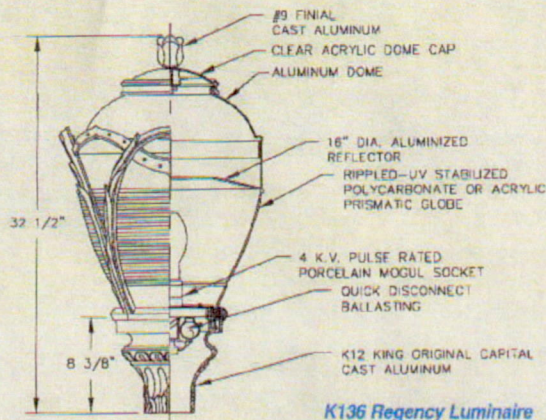


The K134 York Luminaire (photo on left) offers a contemporary look with a hint of the traditional and is equally at home in both themes. The K136 Regency Luminaire (photo below) follows the classic architectural look and complements many types of landscape designs.

Both are available with either low glare semi-cut-off reflector or highly efficient non-cut-off external refractor optical systems for any project where good looks and good maintenance features are of importance.

Both K134 and K136 decorative post top luminaires can be utilized in virtually any application whether the mood is contemporary or traditional. Offering good looks and good lighting, either one could be the right choice for your next project.





K136 Regency Luminaire

LUMINAIRE STYLE

K134 - York Post Top
K136 - Regency Post Top

IES LIGHTING CLASSIFICATION

II - Type II (external only)
IV - Type IV (internal only)
V - Type V (all)

LIGHT SOURCE

MV - Mercury Vapour
MH - Metal Halide
ID - Incandescent
HPS - High Pressure Sodium
LPS - Low Pressure Sodium

OPTIONS

PEC - Photo electric button cell
PCB - Photo button cell in capital
Finner - Optional finials are available
Color - Unless otherwise stated
capitals will be black with
fitting and lining grid

K136 EAR II 150 HPS 120 K12 PR

OPTICAL SYSTEM

EAR - External Acrylic Rippled
EPR - External Polycarbonate
Rippled
IPR - Internal Polycarbonate
Rippled
NPR - Indirect Polycarbonate
Rippled
NPW - Indirect Polycarbonate Opal

DESIRED WATTAGE

Maximum available
wattage
MV - 250
MH - 250
ID - 200
HPS - 250

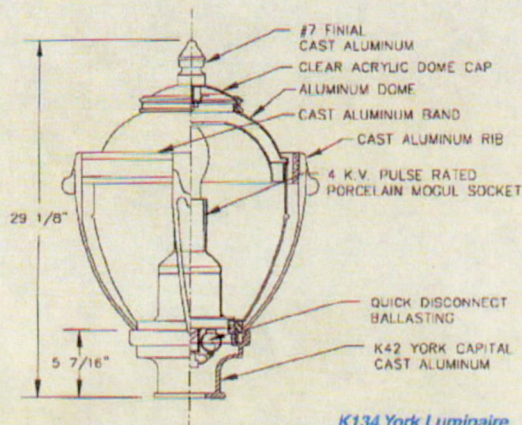
LINE VOLTAGE

Most standard line
voltages are available
including multi-tap (MT)
and dual voltages (DV)
When specifying multi-tap
state voltage unit to be
wired to i.e. MT/240

POLE ADAPTER

K12 - Original King
capital
K16 - Original
Washington
capital
K5 - Ambient capital
- others are available
- please see arms and
capital section of King
catalog

*K136 is available with K12 only.



K134 York Luminaire

Compare the Photometrics

The K134 York Luminaire

with integral reflector and external refractor,
one 150w metal halide lamp and lumen
rating of 13,000 LMS.

Report #: LSC 5802 • Catalog #: K134-EAR-V

Luminaire Efficiency

Downward:	Streetside	31.1%
	Houseside	31.1%
	Total	62.2%
Upward:	Streetside	5.1%
	Houseside	5.1%
	Total	10.2%
Total Efficiency		72.4%

Mounting Height for ISOFC 15.0 Ft.

Iso footcandle

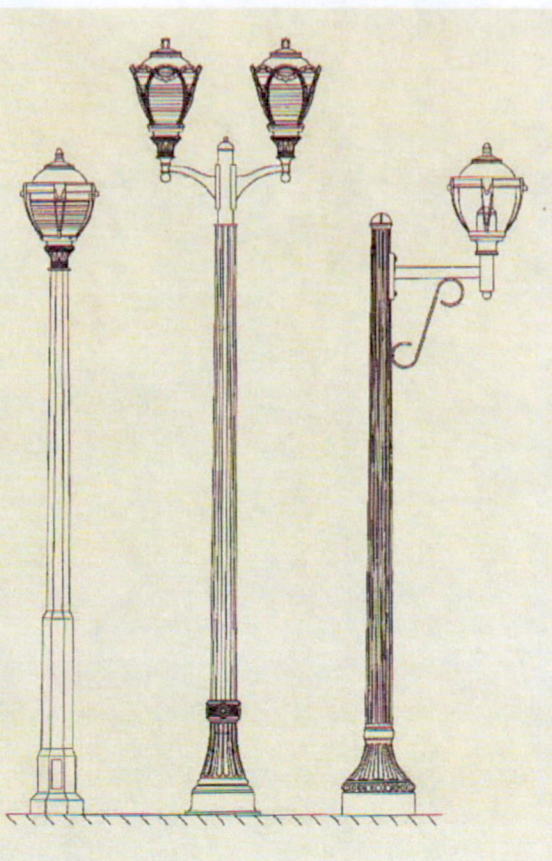
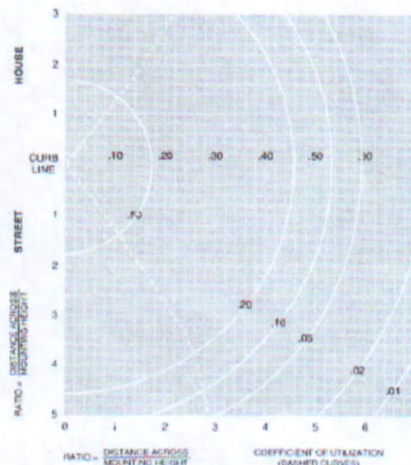
Values based on 15 foot mounting height

Lamp 150w metal halide

Lumen Rating = 13000 LMS

Type V semi-cutoff - Prismatic Lens

Coefficient of utilization (dashed curves)



The K136 Regency Luminaire

with integral reflector and external refractor,
one 150w clear high pressure sodium lamp
and lumen rating of 16,000 LMS.

Report #: LSC 5541 • Catalog #: K136-EAR-II

Luminaire Efficiency

Downward:	Streetside	23.2%
	Houseside	8.2%
	Total	31.4%
Upward:	Streetside	0.9%
	Houseside	1.1%
	Total	2.0%
Total Efficiency		33.5%

Mounting Height for ISOFC 15.0 Ft.

Iso footcandle

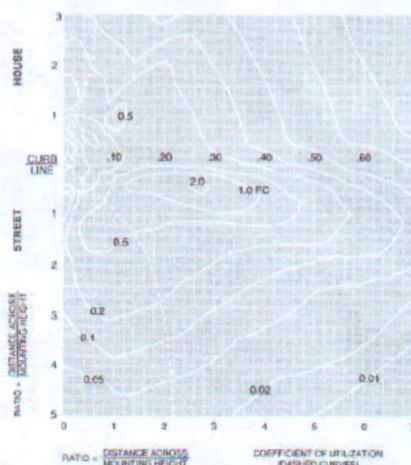
Values based on 15 foot mounting height

Lamp 150w clear HPS

Lumen Rating = 16000 LMS

Type II non-cutoff - Prismatic Lens

Coefficient of utilization (dashed curves)



KING LUMINAIRE
COMPANY INC.

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P.O. Box 266, Jefferson Ohio 44047

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Alabama 35476-3442

840 Walker's Line, P.O. Box 7,
Burlington Ontario L7R 3X9

Toll Free: 1 800 268-7809 • Fax: (905) 632-8116 • www.kingluminaire.com

Des Moines Marina Rate Study 1st Meeting with Municipal Facilities Committee



November 3, 2006

Agenda

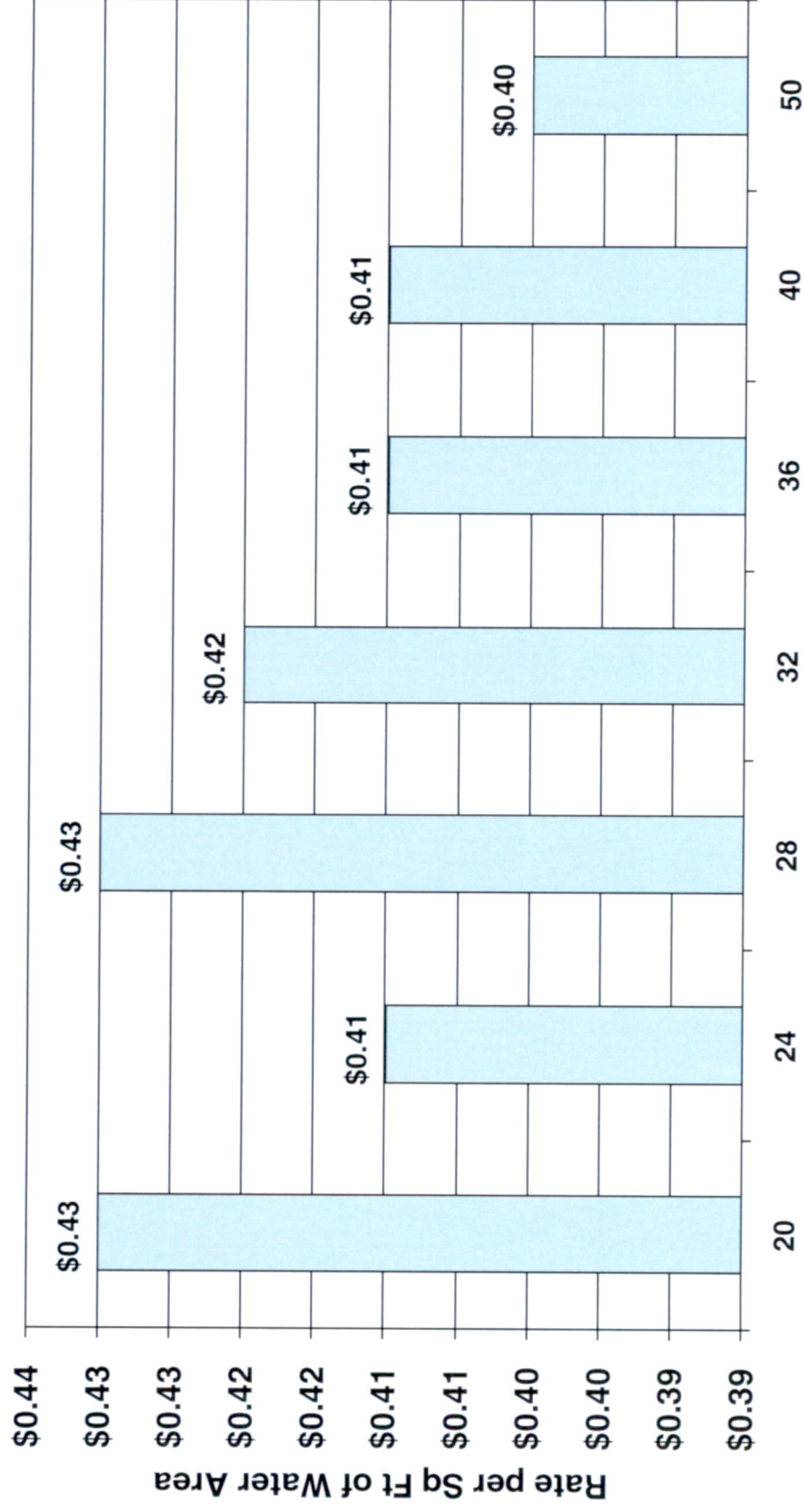
- Introduction
- Review of Cost Replacement Square Foot Model
 - Application of Model to Des Moines
 - Preliminary Conclusions
 - Please note these are not the recommended rates Defining the Des Moines Marina Market
- Comparison of Rates
 - Preliminary Conclusions
 - Compare rate comps with SqFt rates from Cost Replacement Model
 - Please note these are not the recommended rates.
- Next Meeting

Reason for Square Foot Rates

- Converting to SF moorage will be for the purpose of INCREASING EQUITY within the marina.
 - Smaller boats pay higher SF rates than longer boats when a flat lineal rate is applied
 - Square foot rates mean the lineal rate increases as the boat length increases
- The market conditions are tighter for longer boats than for shorter boats
 - Smaller boats are negatively impacted by lack of fishing opportunities
 - Tighter market means that higher rates can be charged for longer boats but needs to consider market forces
- The SF rate structure is simple, straightforward, and easy to implement.

Des Moines Marina

Existing Covered Rates (SqFt)



Cost Replacement Approach

- O&M/G&A
 - Direct operating and maintenance expenses
 - General administrative allocations
 - Adjust to next year based upon historical cost trends.
- Cost replacement values
 - Annualize based on asset value and longevity of assets.
 - Adjust to next year based upon construction cost index.
- Return on Investment (established as a % of asset value)
- Total cost to recover (add above three components)
- Divide by square feet of moorage space and by 12 to obtain \$/SqFt/month
- Recommend a phase in process to allow tenants to adjust.

Cost Replacement Rate Model

- $\frac{((A+B)*(1+C))+(D*(1+E))+F}{G/12} = \text{MONTHLY MOORAGE/Sq Ft}$
 - A= Direct Operating & Maintenance Expenses
 - B= G&A Overhead
 - C= O&M Cost Trend
 - D= Capital Replacement Cost (Annual)
 - E= Capital Cost Index
 - F= Return on Investment
 - G= Total Square Feet of Billable Moorage

Net Marina O&M Expenses Applied to Moorage

Component	2005
Marina expenses for all LOBs	
Direct Labor	428,531
Indirect Labor	286,336
Cost of Goods Sold	916,960
Expenses	393,255
subtotal	2,025,082
Less Revenues from non-Moorage LOBs	
Storage	168,619
Services & Retail Sales	1,176,190
Utilities	86,178
Leases	54,472
Other	45,828
Total	1,531,287
Net Marina Expenses attributed to Moorage	
Net Expenses	493,795

Estimates the residual operation/maintenance expenses that are applied to moorage customers by subtracting gross revenues from other LOBs from total marina O&M expenses. This is "A" in the formula.

Des Moines Marina

Interfund Transfer

- Historical Trends (Policy Decisions)
 - 2003 = \$687,000
 - 2004 = \$490,000
 - 2005 = \$550,000
 - 2006 Budget = \$600,000
 - Direct allocation of City Expenses to Marina = \$250,000
 - This is “B” in the formula – direct expenses incurred at City Hall related to the marina (parks, fire, police, finance etc)
 - Return on Investment = \$350,000
 - This is “F” in the formula – direct transfer to the general fund.
 - New Estimate (2007 if approved)
 - \$413,000
 - Direct allocation to Marina = \$250,000
 - Return on Investment = \$163,000

Marina Asset Value

Annual Replacement Cost

Item	Units	Cost/Unit	Unit Type	2006 Value	Estimated Lifetime	Annual Value
In-Water						
Gangways	34,540	\$177	SqFt	\$6,113,568	50	\$122,300
Floats	86,760	\$177	SqFt	\$15,356,567	50	\$307,100
Roof	237,428	\$56	SqFt	\$13,279,555	30	\$442,700
Subtotal	121,300			\$34,749,690		\$872,100
Dredging			Lump Sum	\$100,000	10	\$10,000
Seawall			Lump Sum	\$7,059,200	100	\$70,600
Breakwater	2,000	\$8,000	Feet	\$16,000,000	100	\$160,000
Total In Water				\$57,908,890		\$1,112,700
Uplands						
Office	2,606	\$221	SqFt	\$575,926	30	\$19,200
Office restroom	484	\$172	SqFt	\$83,054	30	\$2,800
South Restroom	442	\$172	SqFt	\$75,847	30	\$2,500
Dry Sheds	28,496	\$100	SqFt	\$2,849,600	30	\$94,987
Subtotal				\$3,584,428		\$119,487
Paved surfaces/roads			Lump Sum	\$200,000	20	\$10,000
Fuel Tanks			Lump Sum	\$200,000	30	\$6,700
Utilities			Lump Sum	\$200,000	30	\$6,700
Total Upland				\$4,184,428		\$142,887
GRAND TOTAL				\$62,093,318	say	\$1,255,600

Estimates the annual cost to replace the marina as currently configured.
This is "D" in the formula.

Des Moines Marina

Indices for Model

- We need an index to estimate next year's O&M and capital costs based upon the current year's costs (i.e., using 2005 actual costs to estimate the costs for 2006).
- O&M Cost Trends
 - Has averaged around 5% per year at other marinas we have studied.
 - Should be based on 5-year average but changes to the Des Moines accounting system only allow three year comparison.
 - This is "C" in the formula.
- Capital Cost Trends
 - Has averaged around 5%+ per year at other marinas we have studied.
 - Based on published indices (Engineering News Record, Producer Price Index or actual cost of construction).
 - This is "E" in the formula.

Des Moines Marina Assets

Billable Moorage Space

Class	# of Slips	Width**	SqFt/Slip	Total Sq Ft
20 Covered	29	11	220	6,387
24 Covered	141	12	287	40,399
28 Covered	166	13	374	62,126
32 Covered	50	15	480	24,003
36 Covered	40	16	592	23,670
40 Covered	26	19	743	19,322
50 Covered	11	19	954	10,497
subtotal	463			186,403
20 Open	13	11	215	2,789
24 Open	48	11	260	12,503
28 Open	103	12	340	35,007
32 Open	20	13	420	8,397
36 Open	30	14	507	15,203
40 Open	39	17	664	25,893
50 Open	16	20	977	15,639
subtotal	269			115,430
TOTAL	732			301,833
Adjustment for vacancies (4%)				289,760

Des Moines Marina

Cost Replacement Model

Preliminary 1st Estimate

Formula	Category	Des Moines Prelim Est.
A	Direct Operating Expenses (2005)	493,795
B	G&A Overhead (2005)	250,000
	Subtotal	743,795
C	O&M Cost Trend	5.0%
	Subtotal Adjusted 2006	781,271
D	Annual Cost Replacement (2006)	1,255,600
E	Capital Cost Index (Avg 01-05)	0.0%
	Subtotal adjusted to (2006)	1,255,600
F	Return on investment	350,000
	Total	2,386,871
G	Square feet of Billable Moorage	289,760
	Rate Basis per sq ft/month (2006)	0.686
	Open Rate	0.515
	Covered Rate	0.796
	Differential (Covered/Open)	1.547

Based upon 2006 interfund transfer of \$600,000 (\$250,000 in admin expenses allocated to marina and \$350,000 in return on investment).

Des Moines Marina

Lineal Rate Comparisons

Preliminary 1st Estimate – 2006 rates

	w/out LHT			
	Covered	Proposed	Existing	Difference % Chnge
20		\$8.77	\$6.34	\$2.43 38%
24		\$9.51	\$6.49	\$3.02 46%
28		\$10.64	\$7.01	\$3.63 52%
32		\$11.95	\$7.71	\$4.24 55%
36		\$13.09	\$8.46	\$4.63 55%
40		\$14.79	\$8.88	\$5.91 67%
50		\$15.20	\$9.03	\$6.17 68%
	Open	Proposed	Existing	Difference % Chnge
20		\$5.52	\$5.10	\$0.42 8%
24		\$5.59	\$5.31	\$0.28 5%
28		\$6.25	\$5.64	\$0.61 11%
32		\$6.75	\$6.23	\$0.52 8%
36		\$7.25	\$6.87	\$0.38 5%
40		\$8.55	\$7.23	\$1.32 18%
50		\$10.06	\$7.33	\$2.73 37%

Based upon 2006 interfund transfer of \$600,000 (\$250,000 in admin expenses allocated to marina and \$350,000 in return on investment).

Des Moines Marina

Cost Replacement Model

Preliminary 2nd Estimate

Formula	Category	Des Moines Prelim Est.
A	Direct Operating Expenses (2005)	493,795
B	G&A Overhead (2005)	250,000
	Subtotal	743,795
C	O&M Cost Trend	5.0%
	Subtotal Adjusted 2006	781,271
D	Annual Cost Replacement (2006)	1,255,600
E	Capital Cost Index (Avg 01-05)	0.0%
	Subtotal adjusted to (2006)	1,255,600
F	Return on investment	163,000
	Total	2,199,871
G	Square feet of Billable Moorage	289,760
	Rate Basis per sq ft/month (2006)	0.633
	Open Rate	0.475
	Covered Rate	0.734
	Differential (Covered/Open)	1.547

Based upon 2007 budgeted interfund transfer of \$413,000 (\$250,000 in admin expenses allocated to marina and \$163,000 in return on investment).

Des Moines Marina

Lineal Rate Comparisons

Preliminary 2nd Estimate – 2006 rates

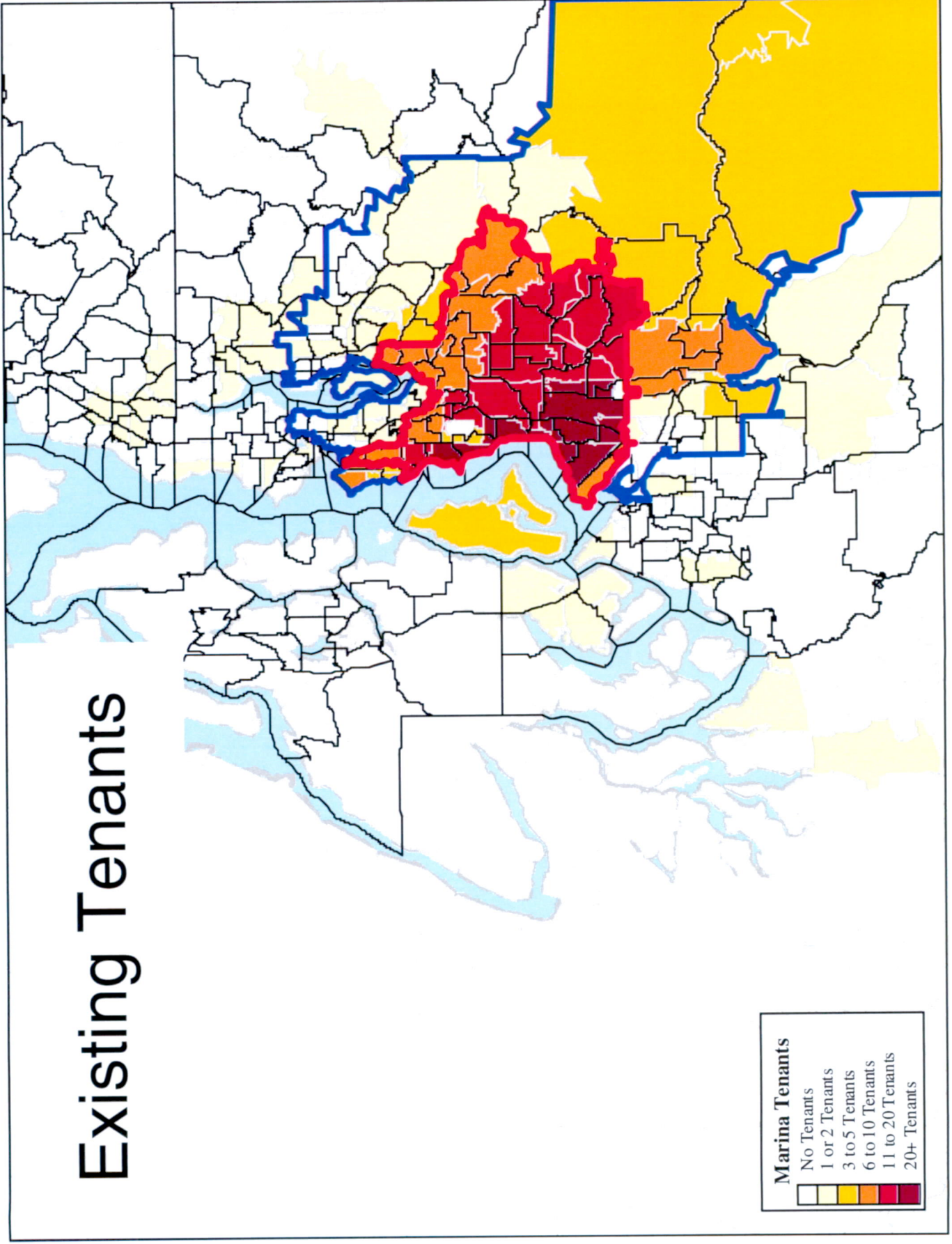
		w/out LHT		
Covered	Proposed	Existing	Difference	% Chnge
20	\$8.08	\$6.34	\$1.74	27%
24	\$8.76	\$6.49	\$2.27	35%
28	\$9.81	\$7.01	\$2.80	40%
32	\$11.01	\$7.71	\$3.30	43%
36	\$12.06	\$8.46	\$3.60	43%
40	\$13.63	\$8.88	\$4.75	54%
50	\$14.01	\$9.03	\$4.98	55%
Open	Proposed	Existing	Difference	% Chnge
20	\$5.09	\$5.10	-\$0.01	0%
24	\$5.15	\$5.31	-\$0.16	-3%
28	\$5.76	\$5.64	\$0.12	2%
32	\$6.23	\$6.23	\$0.00	0%
36	\$6.68	\$6.87	-\$0.19	-3%
40	\$7.88	\$7.23	\$0.65	9%
50	\$9.28	\$7.33	\$1.95	27%

Based upon 2007 budgeted interfund transfer of \$413,000 (\$250,000 in admin expenses allocated to marina and \$163,000 in return on investment).

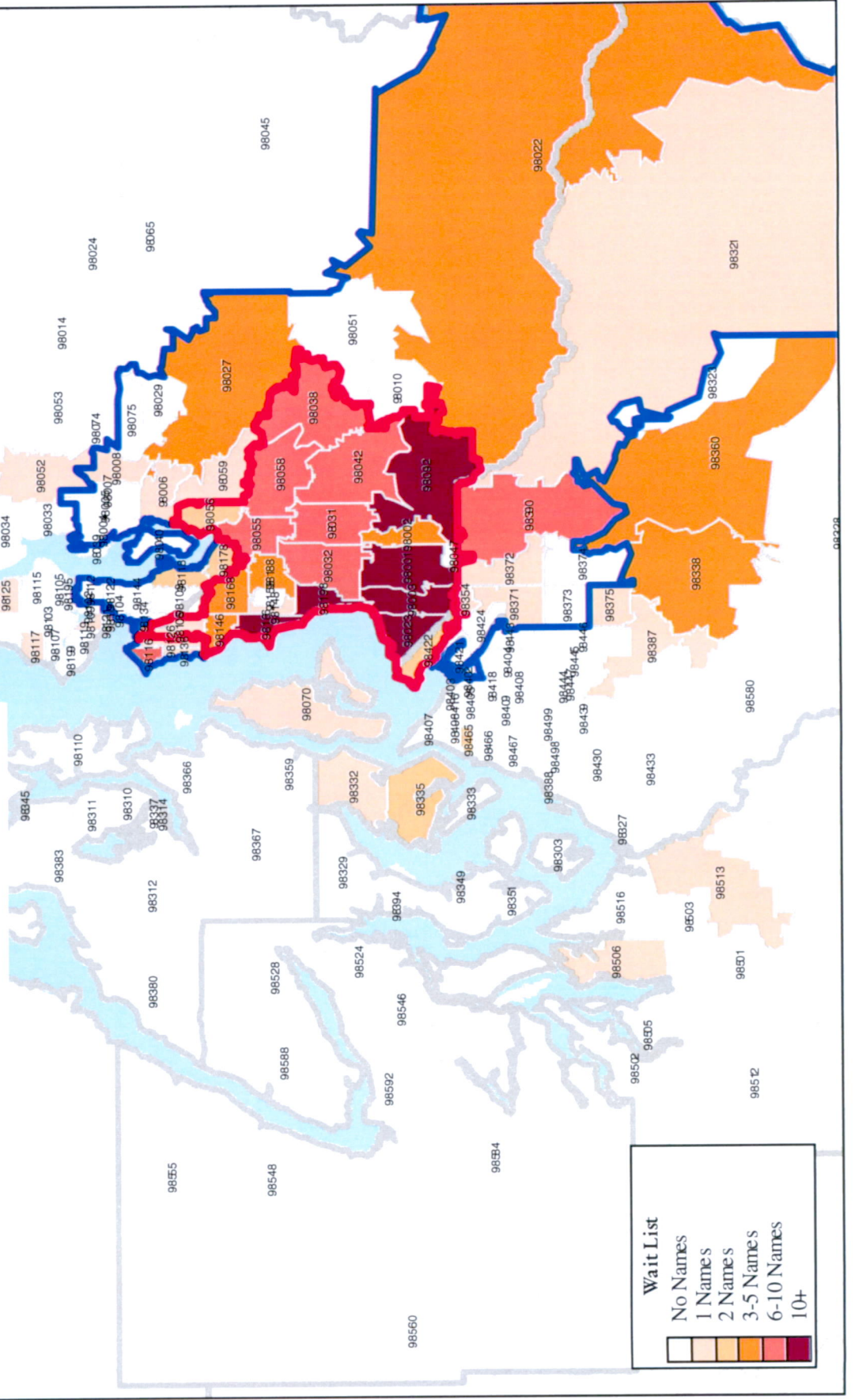
Defining the Market Area

- Define where current customers are located
 - Existing Tenants
 - The primary market runs from Dash Point on the south to Shorewood in the north, and east into the Green River Valley.
 - The secondary market region reaches as far north as Magnolia in Seattle, east to Redmond, and south to Puyallup.
 - Waitlist
 - Stretches a little farther north and south of the existing tenant base.
- Perspectives:
 - If tenants were to relocate, what is the appropriate market to consider.
 - Are slips available?
 - If marina needed new tenants, where would they come from.

Existing Tenants



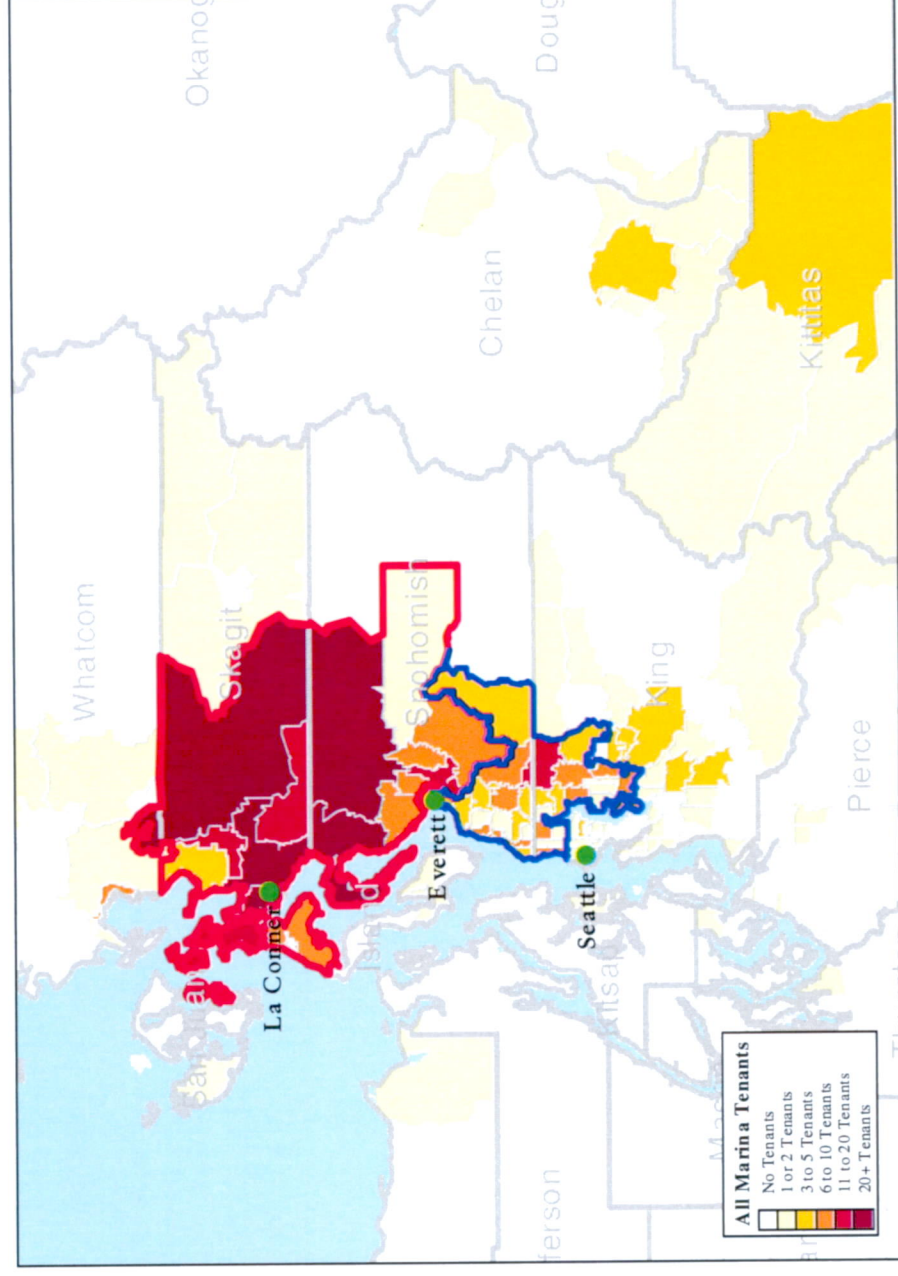
Market Area for Wait List



Waitlist Trends – 1996 to 2005

- Geographic distribution of the current wait list is similar to that from 1996, although there has been an increase in the share of demand generated from outside the primary and secondary market regions.
 - In 1996 the primary market (defined to include those ZIP codes with more than 10 current tenants) accounted for 75.3% of all names on the wait list, and this declined slightly to 73.0% in 2005.
 - Demand from the secondary market area (defined to include most of the contiguous area to the primary market) fell from 10.5% of all names in 1996 to 9.7% of names in 2005.
 - The total share of names on the wait list from outside the primary and secondary market areas increased from 14.1% to 17.3%.
 - Strongest market for new boats appears to be outside the primary and secondary market areas

La Conner Moorage Market (2005)



Half of the tenants come from Skagit County, northern Snohomish County and Camano Island. About 25% come from SW Snohomish County and Northern King County. Rest are from other parts of Washington State and elsewhere.

Comparative Marinas

- Marinas located from Pierce to King County:
 - Pierce County
 - Tacoma
 - Foss Waterway
 - Hylebos Marina
 - Narrows Marina
 - Tyee Marina
 - Breakwater Marina
 - Chinook Landing
 - Gig Harbor
 - Gig Harbor Marina
 - Pleasurecraft Marina
 - Peninsula Yacht Basin
 - King County
 - Shilshole Bay Marina
 - South Park Marina
 - Harbor Island Marina
- Large public saltwater marinas that offer both covered and open moorage.
 - Edmonds
 - Everett
 - La Conner

Covered Rates (w LHT, fees)

Marina	Area	Ownership	20	24	28	32	36	40	50
Gig Harbor Marina	Gig Harbor	Private				10.13	9.00	8.48	
Pleasurecraft Marina	Gig Harbor	Private			10.00	10.00	10.00	10.00	
Peninsula Yacht Basin	Gig Harbor	Private				11.43	11.43	11.90	
Foss Waterway	Tacoma	Private			10.25	10.25	10.25	10.25	
Narrows Marina	Tacoma	Private			9.13	8.81			
Tyee Marina	Tacoma	Private			9.03	9.03	9.03	9.03	9.03
Chinook Landing	Tacoma	Private						9.24	9.24
Edmonds	Snohomish	Public			8.95	11.37	12.69	13.64	15.32
Everett	Snohomish	Public	7.30	8.92	8.92	10.05	11.63	12.39	13.16
La Conner	Skagit	Public		8.66	8.92	10.05	11.63	12.32	14.13
		High	7.30	8.92	10.25	11.43	12.69	13.64	15.32
		Low	7.30	8.66	8.92	8.81	9.00	8.48	9.03
		Mean	7.30	8.79	9.31	10.12	10.71	10.81	12.17
		Median	7.30	8.79	9.03	10.05	10.84	10.25	13.16
		Upper Quartile	7.30	8.86	9.57	10.25	11.63	12.32	14.13
Des Moines	Existing Rates	Public	7.15	7.32	7.91	8.70	9.55	10.02	10.19
% under market	Existing Rates	% under mean	-2%	-17%	-15%	-14%	-11%	-7%	-16%
% under market	Existing Rates	% under top quartile	-2%	-17%	-17%	-15%	-18%	-19%	-28%

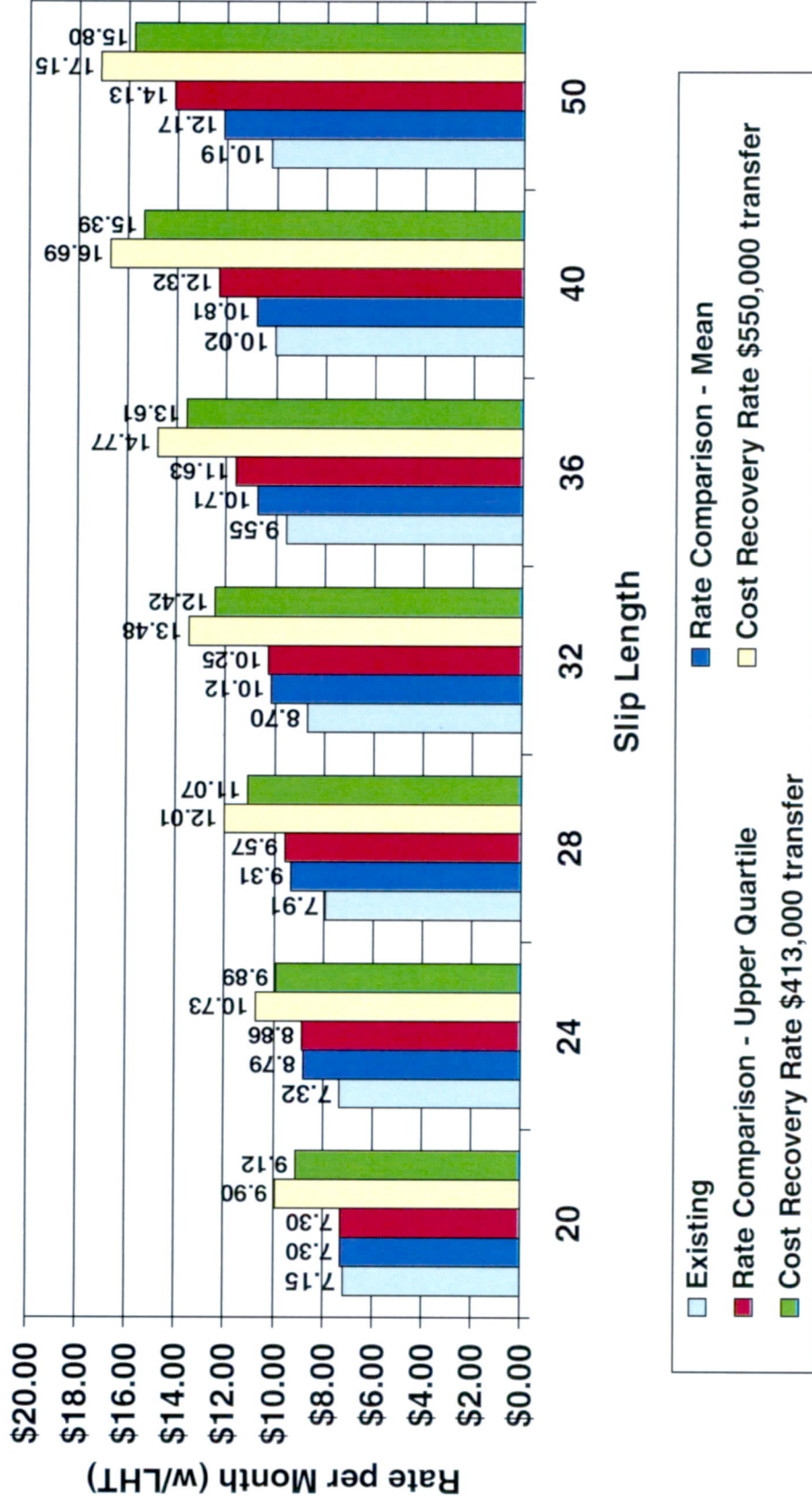
Des Moines marina is close to market for 20 foot slips but between 7% and 28% below market on other slips.

Open Rates (w LHT, fees)

Marina	Area	Ownership	20	24	28	32	36	40	50
Gig Harbor Marina	Gig Harbor	Private	6.87	6.87	7.07	8.10	8.00	8.00	8.80
Foss Waterway	Tacoma	Private			7.27	7.27	8.00	8.00	9.00
Hylebos Marina	Tacoma	Private				5.50	5.50	5.50	5.50
Tyee Marina	Tacoma	Private			6.66	7.22	7.22	7.22	7.22
Breakwater Marina	Tacoma	Private			6.88	7.19	7.19	7.19	7.82
Chinook Landing	Tacoma	Private				6.25	6.94	6.88	6.35
Shilshole Bay Marina	King	Public			9.34	9.34		10.39	11.57
South Park Marina	King	Private	7.00	7.00	7.00	7.00	7.00	7.00	
Harbor Island Marina	King	Public		8.80	8.80	8.80	8.80	8.98	9.15
Edmonds	Snohomish	Public	7.19	6.73	6.85	7.90	8.24	9.13	10.15
Everett	Snohomish	Public	4.93	6.08	6.05	7.10	7.63	8.16	10.01
La Conner	Skagit	Public				6.30	6.76	10.04	11.09
		High	7.19	8.80	9.34	9.34	8.80	10.39	11.57
		Low	4.93	6.08	6.05	5.50	5.50	5.50	5.50
		Mean	6.50	7.10	7.32	7.33	7.39	8.04	8.79
		Median	6.94	6.87	7.00	7.21	7.22	8.00	9.00
		Upper Quartile	7.05	7.00	7.27	7.95	8.00	9.02	10.08
Des Moines	Existing Rates	Public	5.75	5.99	6.36	7.03	7.75	8.16	8.27
% under market	Existing Rates	% under mean	-11%	-16%	-13%	-4%	5%	1%	-6%
% under market	Existing Rates	% under top quartile	-18%	-14%	-12%	-12%	-3%	-10%	-18%

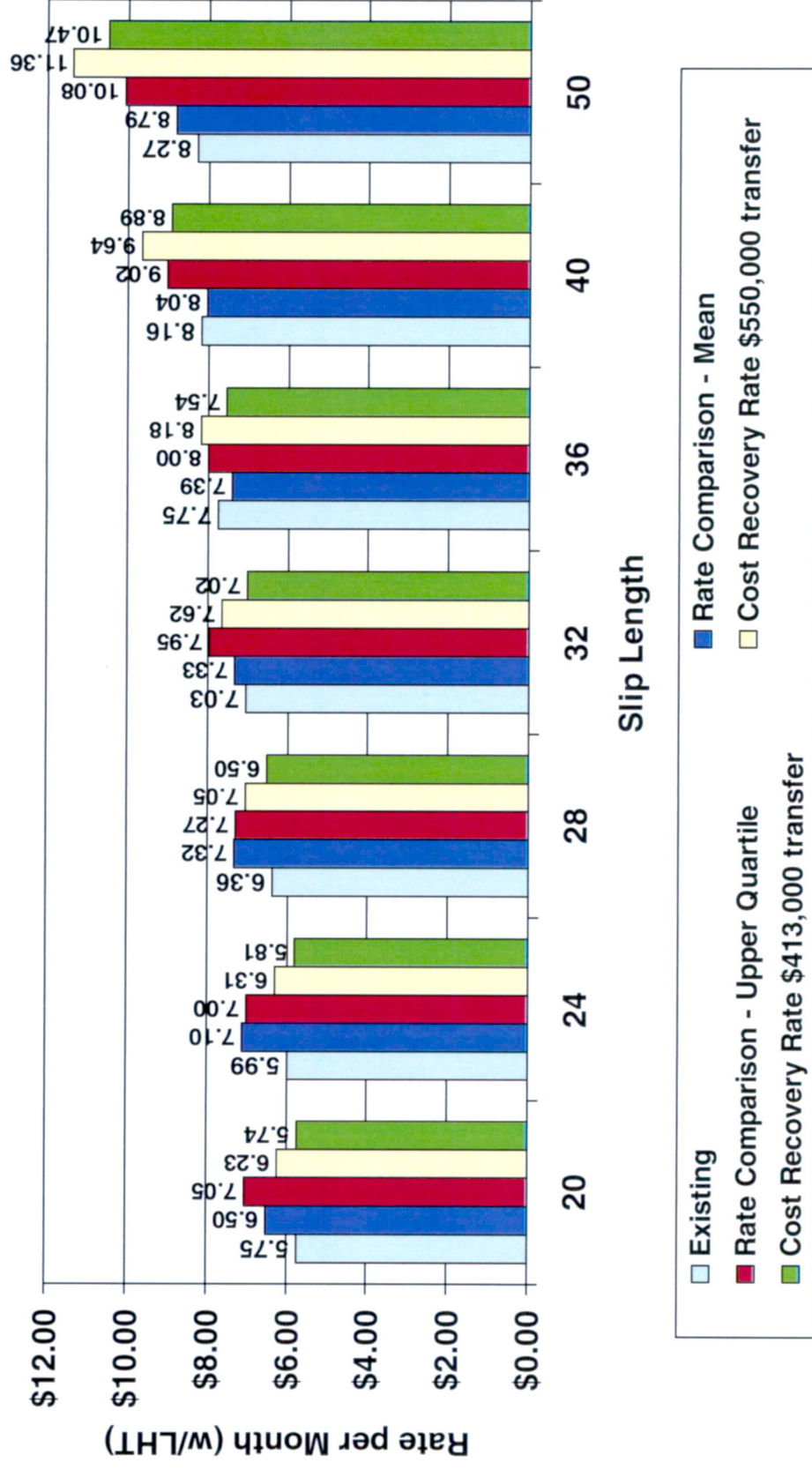
Des Moines marina is close to market for 36 and 40 foot slips (under the median rate comparison) but between 6% and 18% below market on other slips.

Rate Comparison – Covered Slips (w/LHT)



Please note: these are not the recommended rates

Rate Comparison – Open Slips (w/LHT)



Please note: these are not the recommended rates

Preliminary Conclusions

- Higher rates are supportable with some caveats:
 - Open rates are closer to market than covered rates.
- Cost recovery model yields rates that are not supported in the market place:
 - This means that full cost recovery is not likely
 - The combination of the interfund transfer in conjunction with full capital replacement cannot be borne fully by rate payers.
 - Rates should cover partial cost recovery.

Des Moines Marina

Next Steps

- Next Meeting with tenant rate committee
 - Adjust preliminary rate estimates,
 - Establish rates and rate process for 2007.
- Finish Master Plan
 - Assess financial implications of master plan improvements.

TECHNICAL MEMORANDUM



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Public & Dry Store Launch Evaluation (DRAFT)

TO: Joe Dusenbury
City of Des Moines

FROM: Mike Hemphill

DATE: August 24, 2006

JOB NUMBER: 5350-02

ATTACHMENTS: (1) Detailed Pier Assessment Table

INTRODUCTION

This memorandum summarizes observations of the Public and Dry Store Boat Launch timber conditions. The scope of the work was to provide initial low tide observations of the Public Launch pier and document the general condition of decking, stringers, pile caps, and pilings. Overhead observations of the timber elements of the hoists were also included in the scope of work, though the piles associated with the hoists were not included in the observations. During the course of the field work, observations of the Dry Store Boat Launch and hoist, as well as the movable hoist pier were also made as time allowed.

Field observations occurred on August 4, 2006 during a predicted low tide of approximately +0.3 feet at 7:27 AM and a predicted high tide of 9.4 feet at 3:43 PM. These observations were conducted on foot and in a small boat provided by the City of Des Moines Marina. Two M&N engineers performed the observations. The first field observation started at Bent 1 at the north end of the Public Boat Launch and proceeded to the south, ending on Bent 18. During the observations, a hammer and a drill were used to evaluate the soundness of the timber, including piling, pile caps, and stringers. The drill was not used below elevation of +11 MLLW or on piles to avoid penetrating the creosote shell and risk promoting marine-borer infestation.

Following the Public Boat Launch pier observations, the Dry Store Boat Launch pier was observed from the riprap as the tide permitted. Field observations started at Bent 1 at the north end of the pier and proceeded south to Bent 5. The field evaluations consisted of observing the lower portions of the piling, the pile caps, stringers and decking where accessible.

Following the under-pier observations, the overhead timber elements of the public and dry store boat hoists were observed with a marina-supplied lift truck. This observation included

DRAFT

looking at timber-to-timber connections, as well as the timber-to-metal connections of the hoist mechanism.

Under-pier observations of the public boat launch pier resumed at approximately 1:00pm, at which time the rising tide enabled additional access to the pile caps, stringers, and decking.

A pier assessment summary describing the condition of the public and dry store launches follows. Specific inspection notes are included as an attachment.

PUBLIC BOAT LAUNCH ASSESSMENT

GENERAL FIELD OBSERVATIONS

Drawings of the pier dated 1988 were obtained from the City of Des Moines and were compared to the field observations. The observed pile configuration was consistent with the 1988 set of drawings. Timber piles, pile caps and all other timber consisted of a creosote shell with the exception of the decking, and bull rail. Typical timber pile sections were 12-inch, pile caps were 12-inch x 20-inch, and stringers and decking were 4-inch x 12-inch. The observed timber structure appeared to be consistent with previous drawings.

Refer to Figure 1 for the pile numbering convention.

SUPERSTRUCTURE

The superstructure of the public boat launch pier, which includes the stringers, pile caps, and decking, all appeared to be in FAIR condition; however there were a few exceptions.

- The load-bearing surface between pile 1A and the pile cap was limited to a small (2-inch by 4-inch by 8-inch) wedge.
- A bolted connection on Pile 1 B had negative thread exposure.
- Pile cap 2 B appeared to have experienced minor overloading with a small horizontal crack 3" long.
- Pile caps 1, 4, 7, 12, and 17, as well as several stringers, were all drilled in selected areas that showed signs of persistent or frequent moisture exposure. None were observed to be undergoing any rotting and the drilled holes were subsequently filled with silicone sealant.

SUBSTRUCTURE

The timber piling was observed to be in FAIR condition with isolated exceptions. Piles 8 C, 18 C, and 23 A were observed to have moderate levels of checking with the maximum penetration being 1-inch on Piles 8 C and 23 A. Pile 18 C has experienced slightly more severe checking and possibly some borer damage.

BULKHEAD

Though not formally observed as part of this field visit, the timber wale along the base of the bulkhead wall was noted to be severely degraded, with several sections being completely hollow. Some level of retrofitting with concrete filled sacks has taken place.

UTILITIES

Utilities were not formally observed but an electrical conduit that serves the attendant booth under the public boat launch pier in the vicinity of pile 8 A was noted to be unsupported as a result of the mounting clips being broken or corroded.

BOAT HOIST

The timber structure of the public boat hoist was observed to be in FAIR condition, with most discrepancies being minor connection issues. Contrary to common construction

specifications, a bolt connection on pile 21 A exhibited zero thread exposure past the nut. Additionally, piles 19 F and 20 D also had bolt connections exhibiting minimal thread protrusion (though greater than zero). A bolted wedge at the connection of a batter pile and pile 24 A was loose with all 4 bolt connections being loose.

The brackets that connect the wire guide rail (the small rail parallel to the hoist mechanism) to the timber structure all exhibited accelerated corrosion, though none appeared to suffer from any significant section loss.

A beam supporting the hoist mechanism in the vicinity of pile 19.5 is missing a washer plate underneath the support block between it and the hoist rail such that only one bolt is supporting both the rail at this location.

DRY STORE BOAT LAUNCH OBSERVATIONS

Following the scoped observations of the public boat launch, observations were performed on the dry store and moveable launch piers as the opportunity presented itself. These observations were performed from the riprap along the bulkhead wall during the rising tide conditions of midmorning and from the floating dock along side them. In general, the piles appeared to be in FAIR condition though a marina employee did mention at least one pile on the dry store launch pier was in a more degraded condition. This could not be confirmed due to the damage being below the waterline at the time of observation.

The dry store boat hoist was also inspected with the lift truck. It was observed to be in FAIR condition with the diagonal bolt connection on top of hoist pile 7 B being loose.

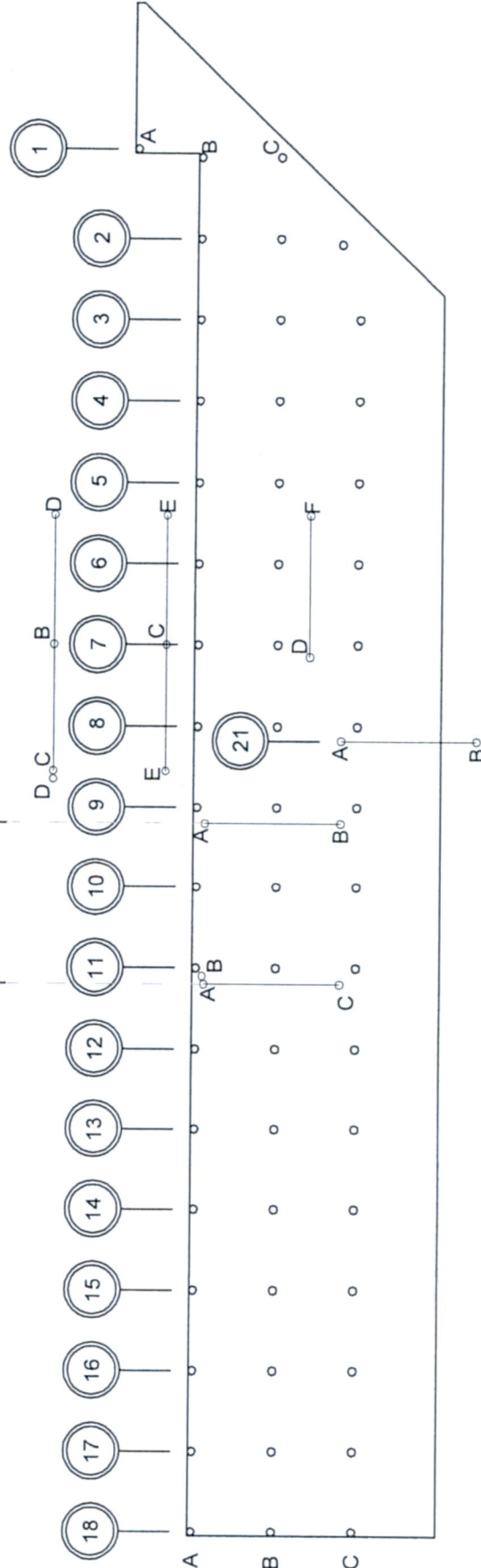
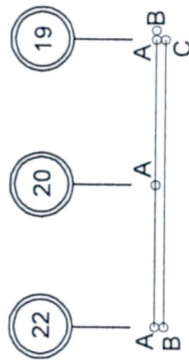
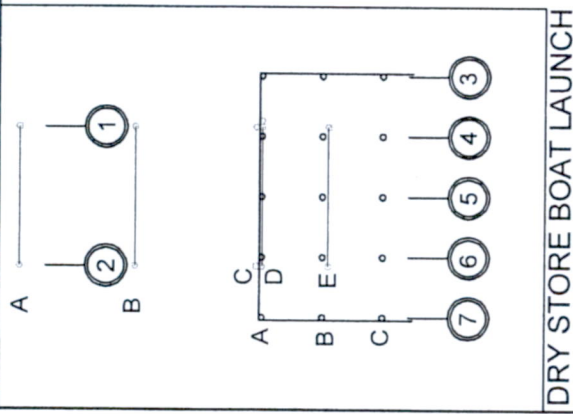
GENERAL CONCLUSIONS

The field observation of these facilities qualitatively identified the existing condition of the piers. The condition of each pier component (superstructure, substructure, and hoist) was ranked according to the categories described in Table 1. The evaluation was limited to visual inspections and internal condition spot checks (performed by drilling a 1/2-inch hole into the element to at least 50 percent depth to check for internal degradation). This subjective ranking serves as a basis for estimating the wharf's maintenance needs. The general condition of each wharf component was categorized as follows:

Table 1: General Condition Categories

NEW	(N)	Component found to be new or in like-new condition, free from noticeable wear.
New components have an estimated service life of more than 15 years		
GOOD	(G)	Component found to be in like-new or nearly new condition, generally free from noticeable wear.
Good components have an estimated service life between 10 and 15 years		
FAIR • Superstructure w/ exceptions • Substructure w/ exceptions • Hoist structures w/ exceptions	(F)	Component found to be serviceable but not in good condition. Lightly worn usually due to normal wear or climatic conditions.
Fair components have an estimated service life between 5 and 10 years		
WORN	(W)	Component found to exhibit cracking, corrosion, or other indicators of deterioration. The component is still serviceable but requires maintenance attention to achieve or extend its service life.
Worn components have an estimated service life of less than 5 years		
REPLACE	(R)	Component found to be worn to the state of needing immediate replacement or major repair.
These components should be replaced in 1 to 2 years		

Note: The service life provided in Table 1 are based on normal wear, regular maintenance, and regular inspection.



NOT TO SCALE

Moffatt & Nichol

Prepared by:

Date: 08/24/06

DES MOINES MARINA PIER ASSESSMENT

PUBLIC & DRY STORE BOAT LAUNCH
PILE DESIGNATIONS

FIGURE

1

TIMBER PILE INSPECTION RECORD

LOCATION: DES MOINES MARINA										DATE: 8/4/06		INSPECTOR: SHAWN HARDY/ JON GAGE						
PIER NAME/NO.: PUBLIC BOAT HOIST										PILE TYPE: ☒ BEARING ☐ FENDER ☐ SHEET ☒ PILE CAPS, STRINGERS, DECKING								
WATER DEPTH: N/A										TIME OF DAY: 07:55 PDT		TIDE: +1						
BENT NO.	PILE NO.	NOT INSP	OBSERVED PILE CONDITION			TYPE OF DAMAGE						GAUGE DEPTH AT DAMAGE (FT)	DIMENSION OF DAMAGE (INCHES)			COMMENTS		
			NEW	MIN	MOD	SEV	BOR	ROT	CHK	O L	PEL		ABR	HDW	HGT		WIDTH	PENETR
PUBLIC BOAT LAUNCH PIER (SUBSTRUCTURE)																		
16	B			X														
18	C				X													Observed @ 4' above waterline
24	A			X														
23	A			X														Minor indication @ WL 08:11 PDT
8	C			X														Observed @ 2' above mudline
8	C			X														Observed @ 3' above mudline
6	B			X														Observed @ 3' above mudline
6	A			X														Observed @ 2' above; 08:36 PDT
5	A			X														Observed @ 2' above mudline; 08:37 PDT
6	A			X														Observed @ 5' above waterline; 08:40 PDT; vertical crack is potential for moderate
1	A																	Pile bearing load only on wedge in between Cap & Pile- wedge dim: 2"x4"x8" long

Pile Condition Description:

New - "As new" condition

Minor - No significant deterioration noted except for light checking, light grooving, and delamination. Section loss is less than 10%.

Moderate - Moderate checking and some cracking; moderate gouging and delamination; areas of rot. Section loss is > 10% but < 35%.

Severe - Severe splitting, extensive delamination; large and deep voids with areas of rot. Section loss is > 35%. Broken or non-bearing piles.

Type of Damage:

Borer Attack - Marine borer of limnoria or teredo.

Fungal Rot - Discoloration / softening of wood. Requires air so only occurs above water.

Checking - Vertical cracking of surface due to drying and shrinking.

Overloading - Severe Vertical cracks that cross grain, breakage, or bulging.

Peeling - Delamination of the outer surface of the timber w/ minor separation of outer fibers.

Abrasion - Reduction of the timber surface due to continual rubbing by debris, ice, etc.

Hardware Corrosion - Pins and bolts that connect timber members.

TIMBER PILE INSPECTION RECORD																			
LOCATION: DES MOINES MARINA										DATE: 8/4/06		INSPECTOR: SHAWN HARDY/ JON GAGE							
PIER NAME/NO.: PUBLIC BOAT HOIST										PILE TYPE: ☒ BEARING ☐ FENDER ☐ SHEET ☒ PILE CAPS, STRINGERS, DECKING									
WATER DEPTH: N/A										TIME OF DAY: 08:54 PDT		TIDE: +2							
BENT NO.	PILE NO.	NOT INSP	OBSERVED PILE CONDITION			TYPE OF DAMAGE						GAUGE DEPTH AT DAMAGE (FT)	DIMENSION OF DAMAGE (INCHES)			COMMENTS			
			NEW	MIN	MOD	SEV	BOR	ROT	CHK	O L	PEL		ABR	HDW	HGT		WIDTH	PENETR	
18	A			X											6	4	1/8	Minor Peeling	
Pile Caps 1,4,7,12,17																			
PUBLIC BOAT LAUNCH PIER (HOIST STRUCTURE) : 09:45 PDT																			
21	A																	Bolt connection: north cross brace nut has no thread exposure	
19	F																	Beam/ Cap connection - nut only has 2 threads exposed	
19-20	A-F																	Brackets for wire guides are all corroded	
20	D																	Beam/ Cap connection - nut only has 1.5 threads exposed	
19.5	BEAM																	(#1 of 2) washer plate is missing between block and steel rail	
24	A																	Wedge connections between nut & pile are are loose - all 4 connections	
DRY STORE BOAT LAUNCH (HOIST STRUCTURE) : 10:15 PDT																			
1	B																	Nut thread has negative threads showing	
2	B			X														Lateral Beam has minor overloading	

Pile Condition Description:

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Moderate - Moderate checking and some cracking; moderate gouging and delamination; areas of rot. Section loss is > 10% but < 35%.

Severe - Severe splitting, extensive delamination; large and deep voids with areas of rot. Section loss is >35%. Broken or non-bearing piles.

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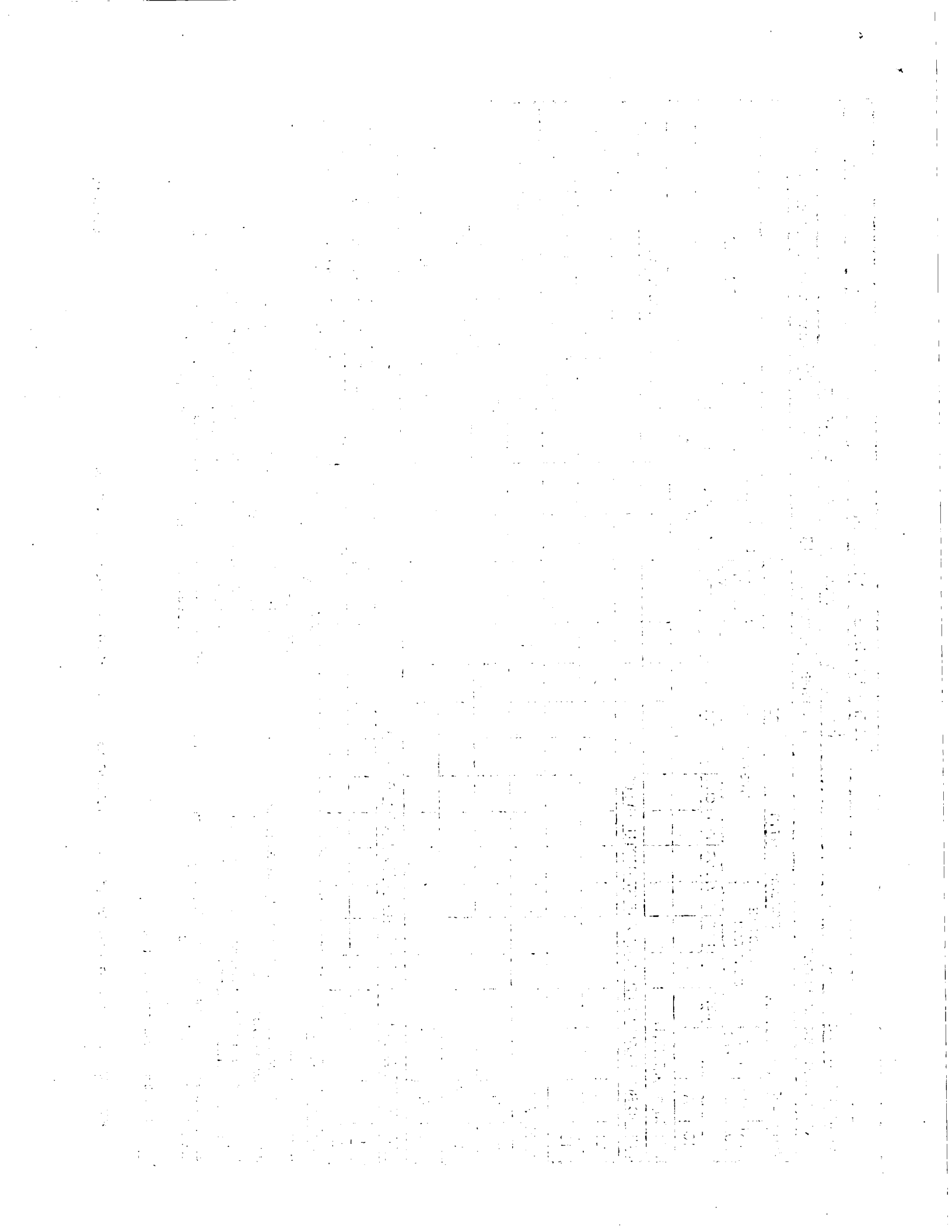
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Abrasion - Reduction of the timber surface due to continual rubbing by debris, ice, etc.

Hardware Corrosion - Pins and bolts that connect timber members.

☐ Shaded portions observed from lift truck



TIMBER PILE INSPECTION RECORD																	
LOCATION: DES MOINES MARINA										INSPECTOR: SHAWN HARDY/ JON GAGE							
PIER NAME/NO.: PUBLIC BOAT HOIST & DRY STORAGE BOAT HOIST										DATE: 8/4/06							
WATER DEPTH: N/A										PILE TYPE: ☒ BEARING ☐ FENDER ☐ SHEET ☒ PILE CAPS, STRINGERS, DECKING							
TIME OF DAY: 12:00 PDT										TIDE: +4.5							
BENT NO.	PILE NO.	NOT INSP	OBSERVED PILE CONDITION			TYPE OF DAMAGE					GAUGE DEPTH AT DAMAGE (FT)	DIMENSION OF DAMAGE (INCHES)			COMMENTS		
			NEW	MIN	MOD	SEV	BOR	ROT	CHK	O L		PEL	ABR	HDW		HGT	WIDTH
2	D																Loose Bolt - tie rod bolt (Dry Store Hoist)
PUBLIC BOAT LAUNCH PIER (SUBSTRUCTURE)																	
8	A			X													
8	B				X												Conduit to shack - unsupported
9	B			X													1.5' above waterline; 12:20 PDT
7	C				X												1.5 ft
7	C							X									Checking
23	B			X													Borer
24	B			X					X								
15	A			X													
15	A			X					X								
DRY STORE BOAT LAUNCH PIER (SUBSTRUCTURE)																	
1	B			X													
3	C			X													

Pile Condition Description:

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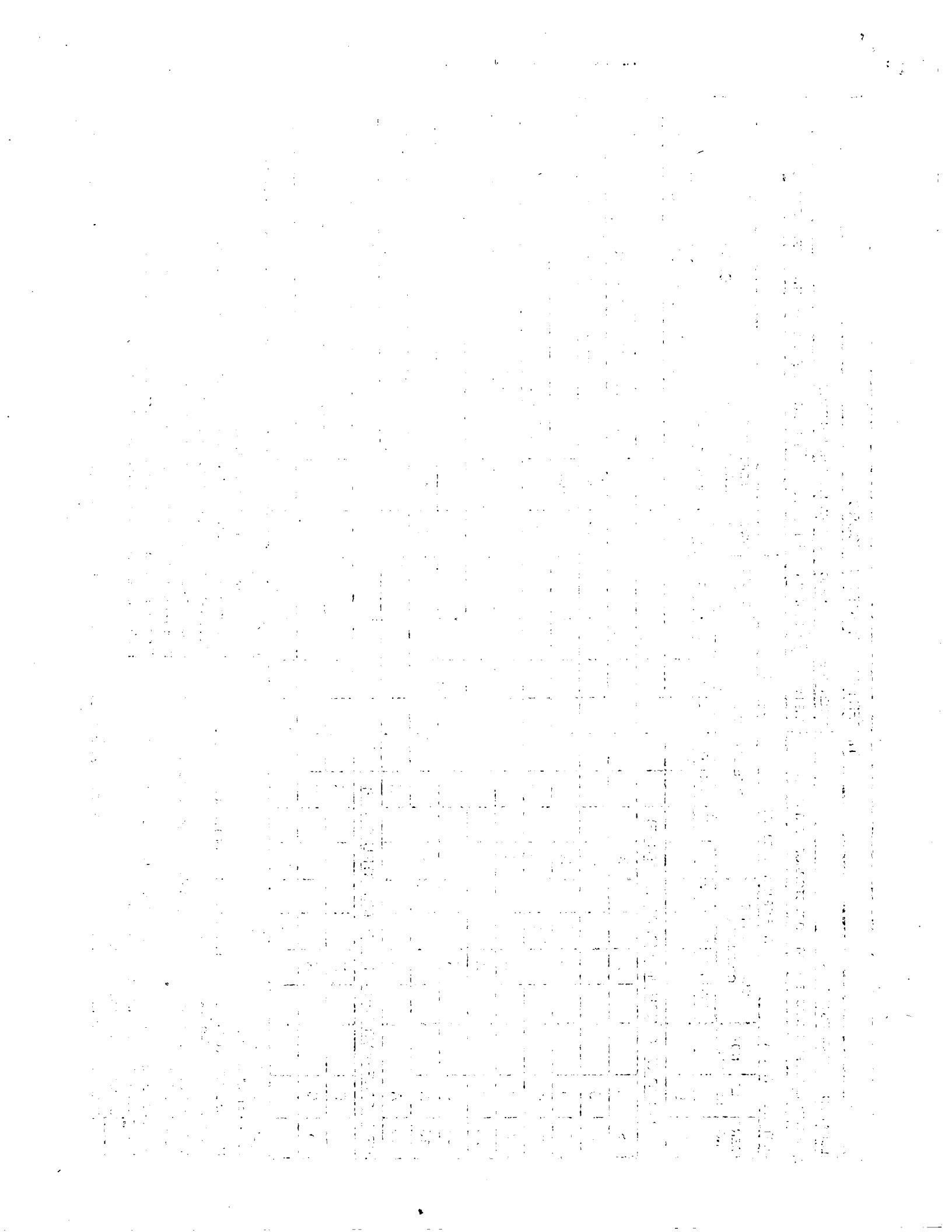
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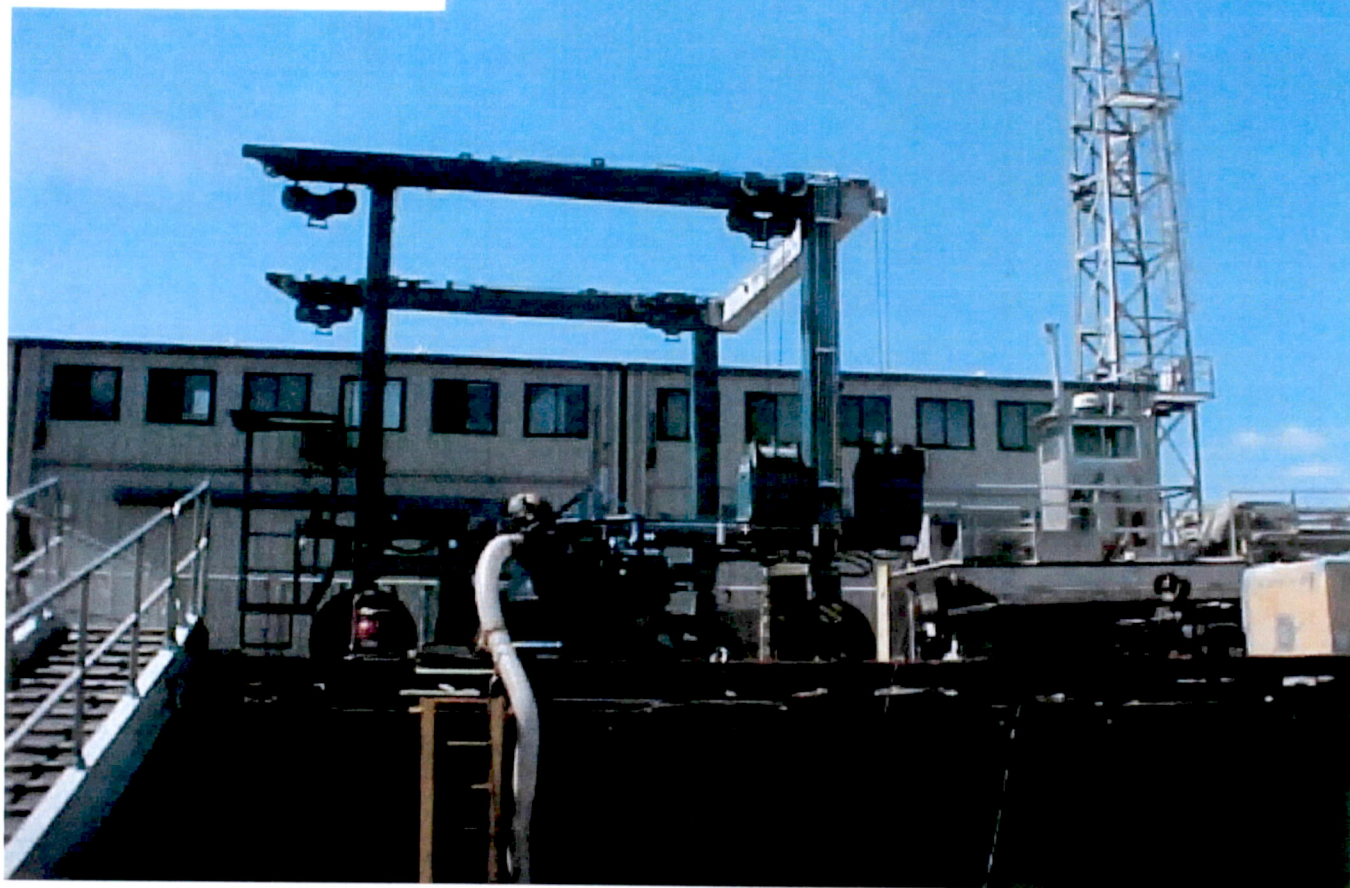
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