AGENDA

Building and Property Committee

Tuesday, April 13, 2010
10:00 a.m.
Jury Assembly Room
Lower Level, Courthouse Annex

1. Call meeting to order
2. Approve agenda
3. Public Comment – Speakers will be limited to 5 minutes
4. Approve minutes of March 9th and 17th , 2010
5. Discuss/consider approving vouchers for Stephenson Public Library renovation project, action if any
6. Discuss/consider 2009 motor pool operational report, informational, no action requested (attachment)
7. Discuss/consider UPEA report on HVAC Engineering Services, action if any (attachment)
8. Discuss/consider issuing an RFP to install Carbon Monoxide detectors in University Avenue Law enforcement Center, action if any
9. Discuss/consider buildings or areas to be toured during May 2010 Buildings and Property Meeting, action if any
10. Discuss Facilities Director report:
    - Division labor forecast
    - Projected maintenance and repairs
    - Utilities cost update
    - Motor pool metrics
11. Future agenda items
12. Set next meeting date
13. Adjournment

cc:	Mike Behnke	Facilities Director	Media
	Russ Bousley	County Board Chair	Posting
	Carol Faucett	County Administrator	Library Director
	Vilas Schroeder	Corporation Counsel	Public Works Director
	Bill Walker	County Clerk	

PLEASE NOTE: AGENDA ITEMS MAY NOT BE CONSIDERED AND ACTED UPON IN THE ORDER LISTED

If you are an individual who needs a special accommodation while attending the meeting as required by the "Americans With Disabilities Act", please notify County Clerk Kathy Brandt, Marinette County Courthouse (715-732-7406) at least 24 hours prior to the meeting in order to make suitable arrangements. Thank you. (TDD 715-732-7760)

Marinette County Motor Pool 2009 Average Cost figures

Account number				Description	Debit	Credit	Loss or Gain
704	34	51480	291	Purchase of Service (Labor)	$15,862.00	$0.00	
704	34	51480	413	Printing	$15.00	$0.00	
704	34	51480	426	Advertising (Bids & Notices)	$547.41	$0.00	
704	34	51480	458	Fuel (Gas, oil & fluids)	$35,113.07	$132.93	
704	34	51480	468	Equipment Maintenance	$24,259.82	$2,741.70	
704	34	51480	511	Insurance	$4,198.00	$0.00	
704	34	51480	541	Depreciation	$86,653.78	$1,875.00	
704	34	48311		Sale of County Property	$0.00	$2,700.00	
704	34	47415		Central Motor Pool Charges	$0.00	$135,655.47	
					$166,649.08	$143,105.10	
				Net Loss or Gain			-$23,543.98
				Net Loss or Gain per mile			-$0.07

Need to discount depreciation by 28% (.277711) to net motor pool to ZERO ***OR***

Need to recover 28% on salvage/sale of motor pool vehicles

Cost per mile for expenses

Account number				Description	Debit	Credit	Cost/Mile
704	34	51480	291	Purchase of Service (Labor)	$15,862.00	$0.00	0.04748064
704	34	51480	413	Printing	$15.00	$0.00	0.000045
704	34	51480	426	Advertising (Bids & Notices)	$547.41	$0.00	0.001638594
704	34	51480	458	Fuel (Gas, oil & fluids)	$35,113.07	$132.93	0.104708073
704	34	51480	468	Equipment Maintenance	$24,259.82	$2,741.70	0.064411431
704	34	51480	511	Insurance	$4,198.00	$0.00	0.012566116
704	34	51480	541	Depreciation	$86,653.78	$1,875.00	0.253773217
				total			0.484622972
				Average 2009 operational cost			$0.485

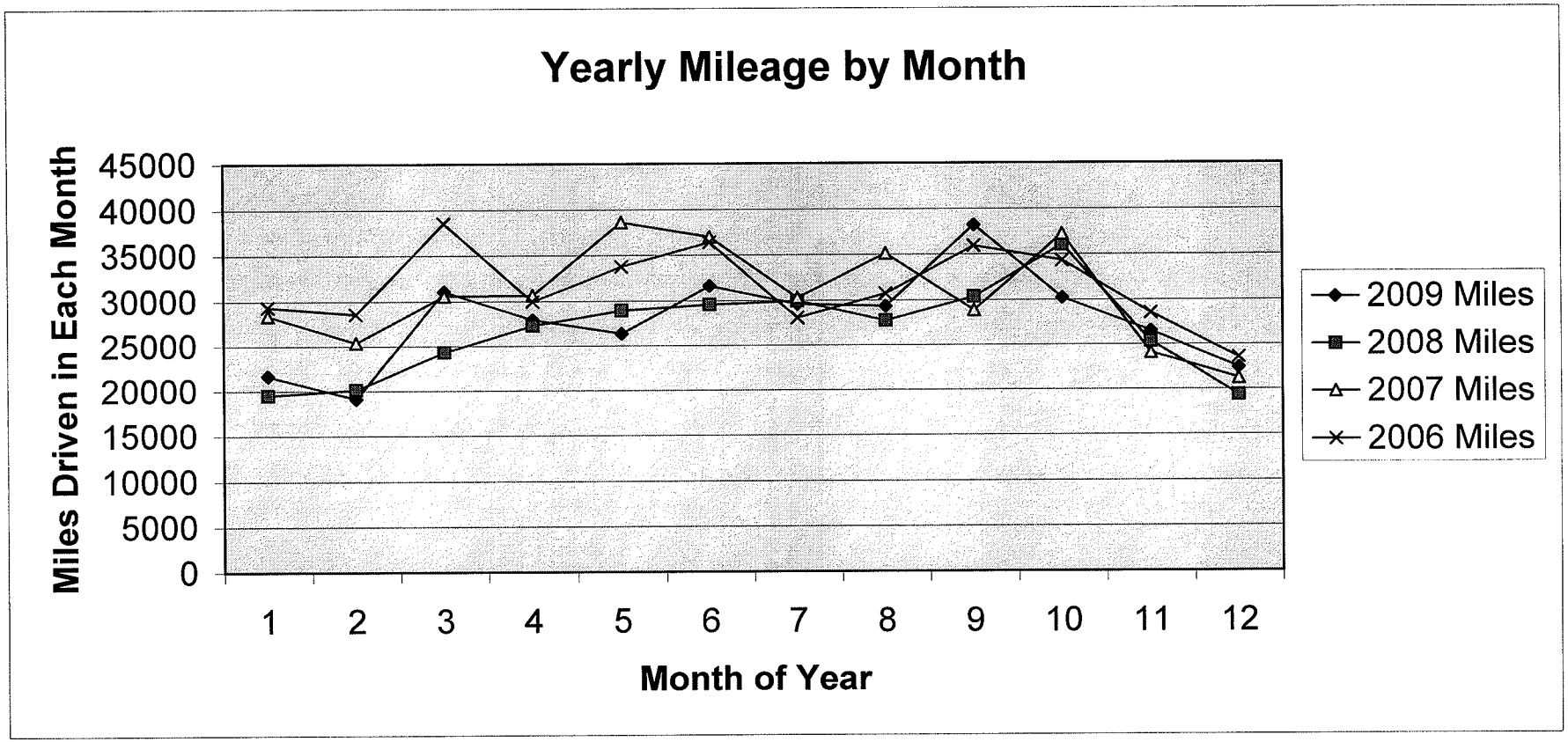
Marinette County Motor Pool 2009 Snap Shot

Tail #	Type	Location	Year	Make/Model	01/01/08 mileage	12/31/09 mileage	CY Miles	Revenue	Average miles	Purchase Date	**Points**	Age Months	Projected Points	est miles
#10	U	CH/DPW	2003	Ford Expedition	32,292	37,877	5,585	2569.1	37,460.77	1/1/09	50	12	99	75338
#11	U	CH/DPW	2007	Ford Explorer	33,961	38,697	4,736	2178.56	39,802.63	1/15/09	50	12	102	78500
#12	CT	PHS/DPW	2009	Chevrolet Silverado	0	4,497	4,497	2068.62	14,201.05	9/8/09	8	4	34	18698
#15	CT	DPW/Park	2009	Ford F-150 CC 4X4	49	7,875	7,826	3599.96	14,034.65	6/12/09	15	7	41	21910
#18	T	CH/Maint	1994	FORD F-150	51,928	54,192	2,264	1041.44	3,338.89	1/1/94	249	195	264	57531
#39	U	CH/Maint	1999	Chevy Blazer	89,915	90,854	939	431.94	8,539.80	7/7/99	219	128	239	99394
#60	ET	LWCD	2001	Dodge Ram EC	56,158	59,808	3,650	1679	6,865.71	5/31/01	164	105	183	66674
#61	T	CH/Maint	2001	GMC SIERRA 1/2T	67,002	70,482	3,480	1600.8	8,091.05	5/31/01	175	105	195	78573
#66	T	LWCD	2002	GMC SIERRA 3/4T	61,178	63,376	2,198	1011.08	8,272.43	6/13/02	155	92	176	71648
#76	T	CH/Maint	2003	GMC SIERRA 1/2T	52,778	54,913	2,135	790.0	8,185.79	5/22/03	**135**	81	156	63099
#77	S	HS	2005	FORD TAURUS	53,212	65,322	12,110	4,722.9	13,338.58	3/4/05	**124**	59	149	78661
#78	S	HS	2005	FORD TAURUS	57,131	70,180	13,049	5,089.1	14,511.66	3/26/05	**128**	58	155	84692
#79	S	HS	2005	Ford Focus	45,089	57,762	12,673	4,942.5	11,985.20	4/1/05	**116**	58	140	69747
#80	m	Rest.	2005	Dodge Grand Caravan	46,453	62,024	15,571	6,072.7	13,227.87	5/18/05	**118**	56	144	75252
#81	m	HS	2005	Dodge Grand Caravan	39,788	53,048	13,260	5,171.4	11,313.55	5/18/05	**109**	56	133	64362
#82	m	HS	2005	Dodge Grand Caravan	42,472	52,092	9,620	3,751.8	11,109.67	5/18/05	**108**	56	131	63202
#83	CT	LWCD	2005	Dodge Dakota CC	30,722	35,440	4,718	2,170.3	7,755.87	6/30/05	90	55	110	43196
#84	CT	LWCD	2005	Dodge Dakota CC	73,281	86,991	13,710	6,306.6	19,037.54	6/30/05	142	55	173	106029
#85	S	CH	2006	Chevrolet Malibu	52,897	72,208	19,311	7,531.3	19,355.83	4/28/06	**117**	45	148	91564
#86	S	CH	2006	Chevrolet Malibu	51,149	62,131	10,982	4,283.0	16,654.62	4/28/06	**107**	45	136	78786
#87	S	HS	2006	Chevrolet Malibu	26,922	37,593	10,671	4,161.7	10,077.05	4/28/06	**82**	45	104	47670
#88	V	HS	2006	Ford E350	14,130	20,515	6,385	2,937.1	5,819.86	7/11/06	63	42	81	26335
#89	M	CH	2007	Ford Freestar	34,627	44,115	9,488	3,700.3	12,263.63	6/15/06	**87**	43	112	56379
#90	M	HS	2007	Ford Freestar	29,089	38,776	9,687	3,777.9	10,779.43	6/15/06	**82**	43	105	49555
#91	S	CH	2007	Chevrolet Malibu	30,167	45,996	15,829	6,173.3	16,558.56	4/6/07	**79**	33	108	62555
#92	S	Niagara	2007	Chevrolet Malibu	32,773	47,851	15,078	5,880.4	17,226.36	4/6/07	**81**	33	110	65077
#93	S	CH	2007	Chevrolet Malibu	31,378	46,036	14,658	5,716.6	16,572.96	4/6/07	**79**	33	108	62609
#94	S	CH	2007	Ford Fusion	27,563	42,716	15,153	5,909.7	15,517.42	4/15/07	**76**	33	103	58233
#95	S	HS	2007	Ford Fusion	28,529	45,100	16,571	6,462.7	16,383.45	4/15/07	**78**	33	107	61483
#96	S	HS	2007	Ford Fusion	30,950	49,770	18,820	7,339.8	18,079.92	4/15/07	**83**	33	113	67850
#97	S	CH	2008	Ford Fusion	6,372	19,637	13,265	5,173.4	12,188.48	5/30/08	**39**	19	63	31825
#98	M	HS	2008	Ford Taurus "X"	7,445	26,584	19,139	7,464.2	17,368.86	6/28/08	**45**	18	74	43953
#99	CT	E-Gov	2008	Chevrolet Colorado	3,729	10,664	6,935	3,190.1	6,831.03	6/17/08	**29**	19	48	17495

Marinette County Motor Pool-2009 Monthly Mileage

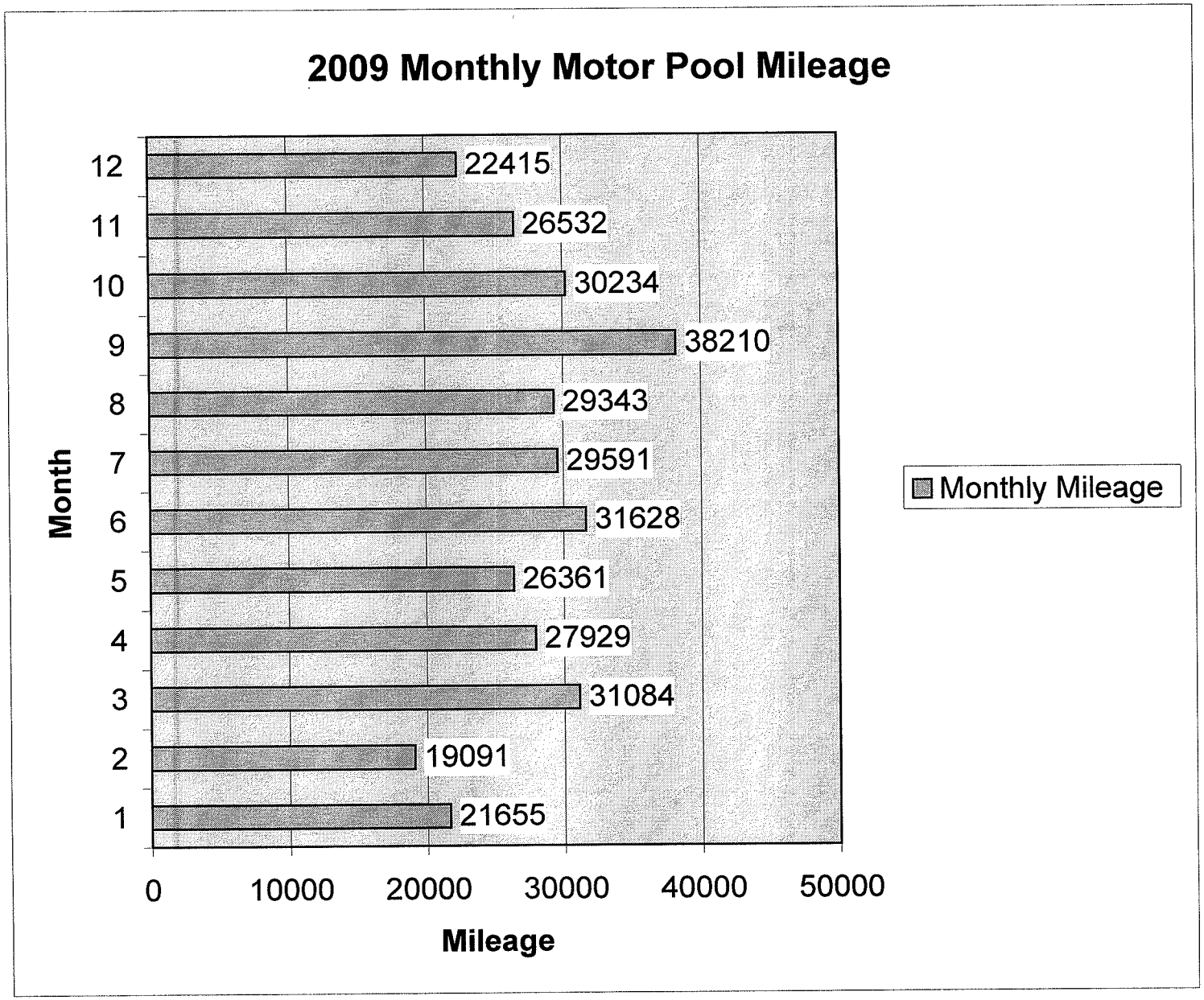
ID#	Slot ID	Unit #	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec	YTD total
18	Maint #1	#18	242	244	192	143	159	224	110	182	166	144	158	300	2264
39	DPW #2	#39	88	0	20	73	179	172	161	170	76	0	0	0	939
60	Land #1	#60	0	0	255	389	237	1062	492	491	323	171	170	60	3650
61	Maint #3	#61	389	384	241	338	162	294	264	223	403	177	128	477	3480
66	Land #2	#66	0	67	0	346	510	631	0	0	0	271	286	87	2198
76	Maint #4	#76	73	149	179	145	131	144	107	125	353	261	203	265	2135
77	HHS #6	#77	544	698	749	700	600	1334	1073	878	1183	1605	1447	1299	12110
78	HHS #4	#78	1018	1075	1491	1589	1258	1188	835	994	788	1114	744	955	13049
79	HHS #7	#79	1004	511	1059	1403	1047	821	1321	737	1445	1427	741	1157	12673
80	Rest #1	#80	1661	1138	1988	1955	926	1654	1423	840	1530	1122	971	363	15571
81	HHS #8	#81	577	817	860	869	1065	1605	1498	1366	1212	1260	1051	1080	13260
82	HHS #9	#82	657	498	605	675	676	861	1017	733	1106	855	529	1408	9620
83	Land #3	#83	0	0	635	175	701	1071	337	490	418	372	264	255	4718
84	Land #4	#84	523	0	194	605	1323	1675	1809	2240	1511	2007	1400	423	13710
85	HHS #1	85	1524	1029	2337	1535	1560	2336	1832	1562	1509	1362	1717	1008	19311
86	HHS #2	86	716	471	1484	576	932	721	833	1201	1349	1042	1231	426	10982
87	HHS # 10	87	891	646	954	1129	679	987	926	937	911	1275	483	853	10671
88	HHS #11	88	207	331	558	380	619	827	651	588	689	688	414	433	6385
89	CH# 1	89	498	755	520	503	525	879	485	1125	1368	1260	959	611	9488
90	Niagara	90	745	624	1349	1472	1009	506	483	438	1188	625	399	849	9687
91	CH #2	91	365	933	1229	1027	1744	1059	1049	1366	2123	1734	1754	1446	15829
92	HHS #13	92	813	1151	1008	1715	1258	2348	1112	1346	2101	1148	636	442	15078
93	CH #3	93	923	890	2273	921	1007	1195	775	1564	1006	1283	1931	553	14321
94	CH #4	94	1427	806	1038	2199	646	1726	1143	873	2454	860	594	1387	15153
95	HHS #3	95	1361	655	1878	1724	1767	1262	1517	1360	2341	957	1079	670	16571
96	HHS #5	96	1885	1787	1556	1398	1280	1272	1846	2102	1714	1832	1128	1020	18820
97	CH#5	97	1024	499	1659	811	1605	698	1135	926	1738	1155	1122	885	13257
98	HHS#12	98	1914	1760	2956	2230	1211	1452	2115	992	1945	1022	650	892	19139
99	EG #1	99	301	894	780	434	334	460	407	1024	545	427	569	703	6878
310	DPW-1	10	118	0	670	283	992	675	0	675	1256	175	1019	393	6256
711	Maint #2	11	167	279	367	187	219	489	311	479	1153	193	806	86	4736
912	DPW-3	912	0	0	0	0	0	0	0	0	628	1145	1224	1352	4349
913	DPW-4	913	0	0	0	0	0	0	0	0	0	0	0	0	0
914	DPW-5	914	0	0	0	0	0	0	0	0	0	0	0	0	0
915	DPW-6	915	0	0	0	0	0	0	2524	1316	1678	1265	725	277	7785
	Paid Monthly Mileage		21655	19091	31084	27929	26361	31628	29591	29343	38210	30234	26532	22415	334073

Marinette County Motor Pool 2009 Annual Mileage Summary



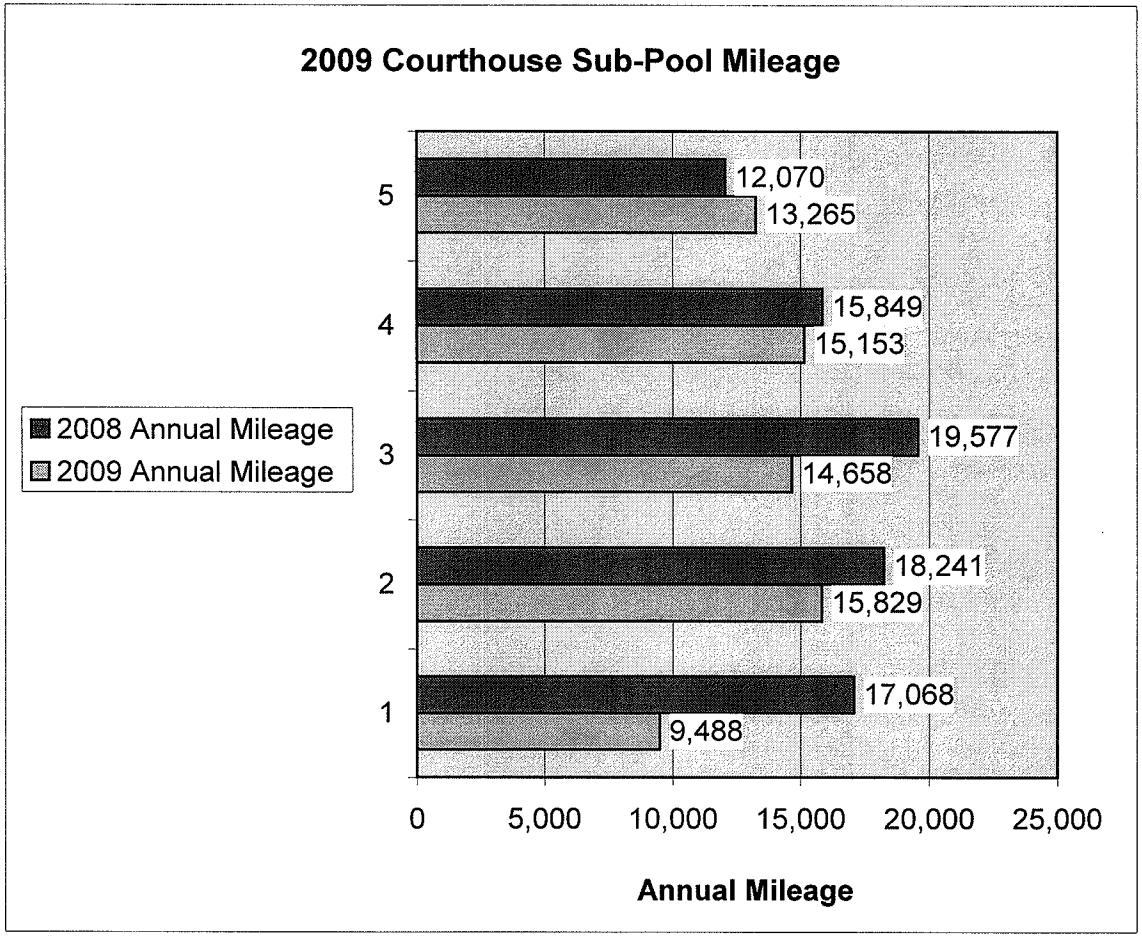
		Sedans		M. Vans/Crossovers		Trucks, SUVs & Van		
Year	Total Miles	Total Miles	Average	Total Miles	Average	Total Miles	Average	Savings
2009	334,073 miles	188,170	14,475	76,765	12,794	69,107	5,886	$48,609
2008	318,421 miles	195,033	15,002	68,608	11,435	54,780	5,478	$56,503
2007	367,394 miles	204,257	14,590	111,699	15,957	51,249	6,406	$53,999
2006	377,729 miles							

Marinette County Motor Pool 2009 Monthly Mileage Summary



2009 Mileage by Month	
January	21,655
February	19,091
March	31,084
April	27,929
May	26,361
June	31,628
July	29,591
August	29,343
September	38,210
October	30,234
November	26,532
December	22,415
Total	334,073

Marinette County Motor Pool- Courthouse SubPool 2009 Summary



Courthouse #5 2008
Ford Fusion

Courthouse #4 2007
Ford Fusion

Courthouse #3 2007
Chevrolet Malibu

Courthouse #2 2007
Chevrolet Malibu

Courthouse #1 2007
Ford Freestar

2007 Average Yearly Mileage	14,124
2008 Average Yearly Mileage	16,561
2009 Average Yearly Mileage	13,679

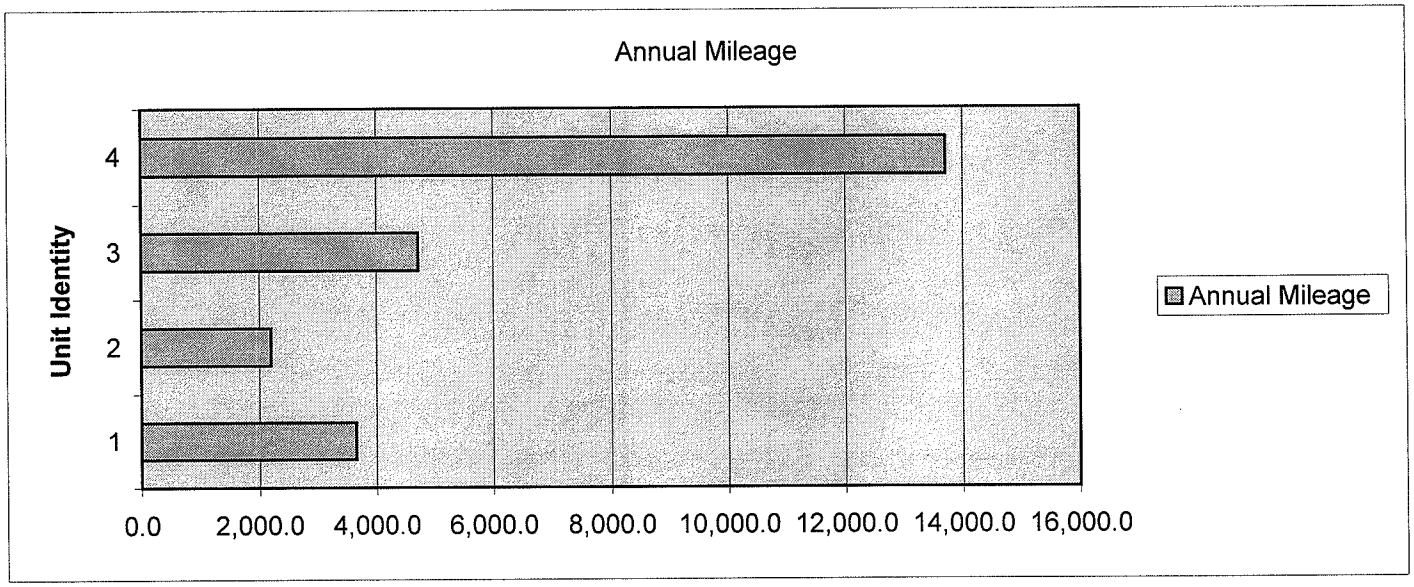
Marinette County Motor Pool-Land Information Office Sub Pool 2009 Summary

2005 Dodge Dakota Crew Cab

2005 Dodge Dakota Crew Cab

2003 GMC 3/4 Ton Extended Cab

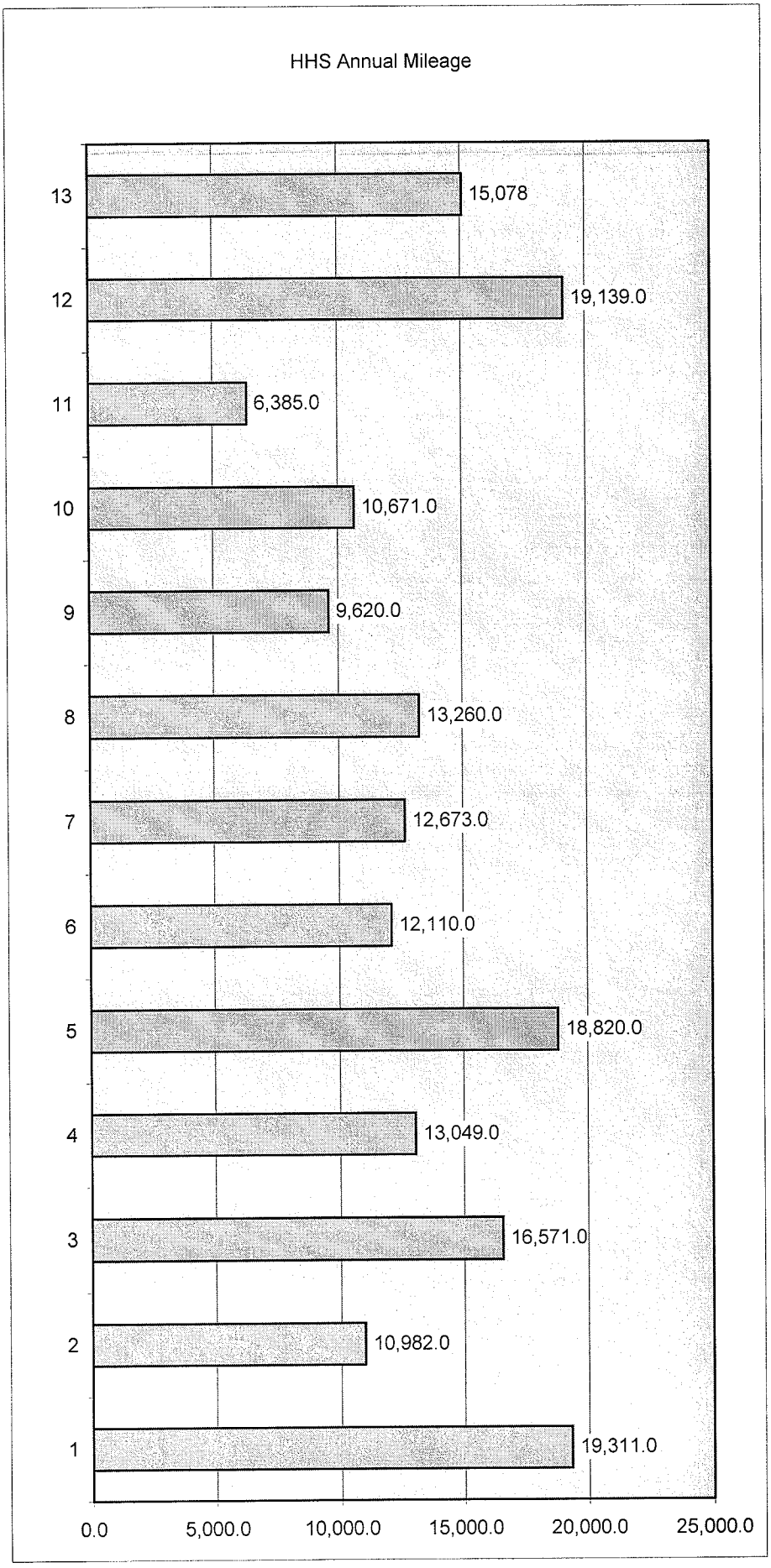
2001 Dodge Ram 1/2 T Extended Cab



Slot ID #	2009	2008	2007
Land #1	3,650.0	4,149.0	3,114.0
Land #2	2,198.0	1,417.0	4,791.0
Land #3	4,718.0	7,431.0	7,552.0
Land #4	13,710.0	17,905.0	19,750.0
total	24,276.0	30,902.0	35,207.0
Yearly Average	6,069	7,726	8,802
Monthly Average	2,023	2,575	2,934
Truck Equivalents	3.2368	4.120267	4.694267

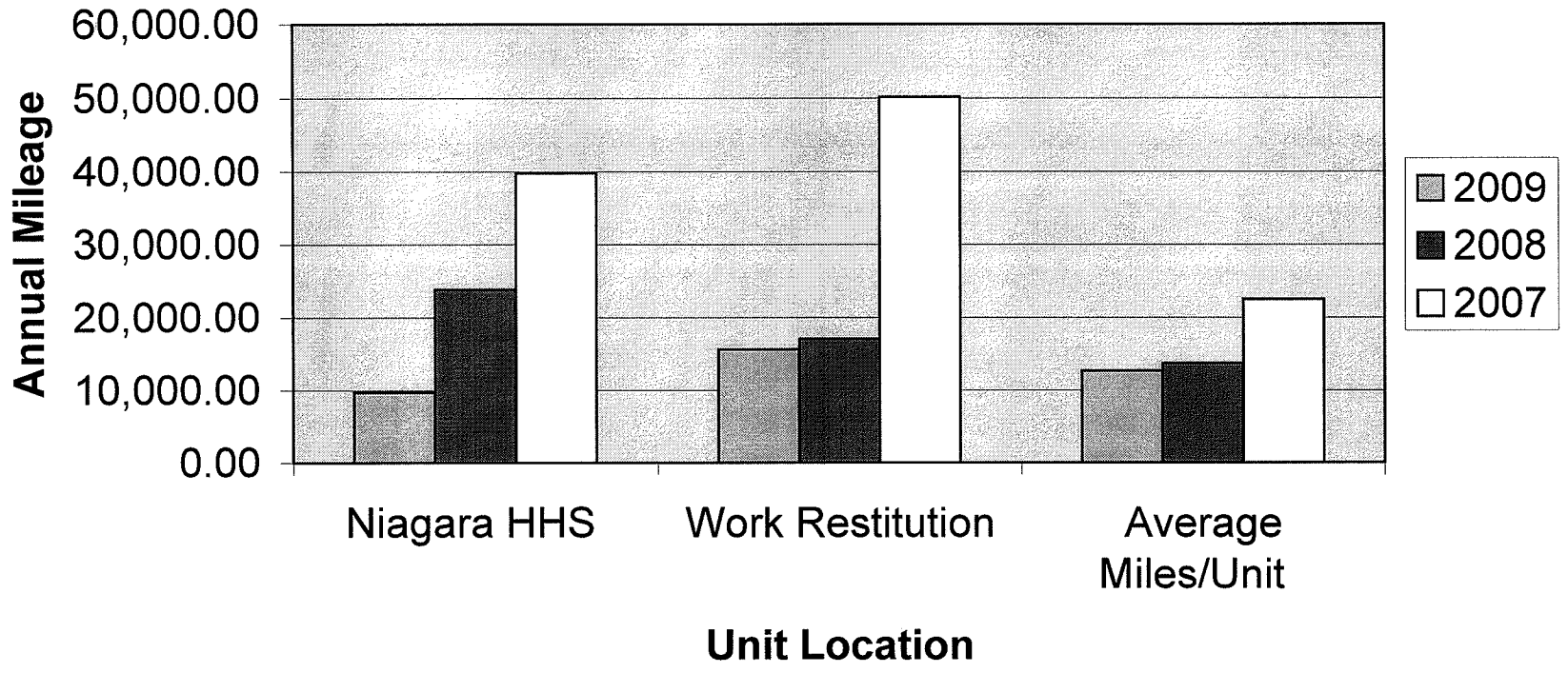
Marinette County Motor Pool-HHS Sub Pool 2009 Summary

2010 Sub pool Average	
All	13,667
Car Rate	14,274

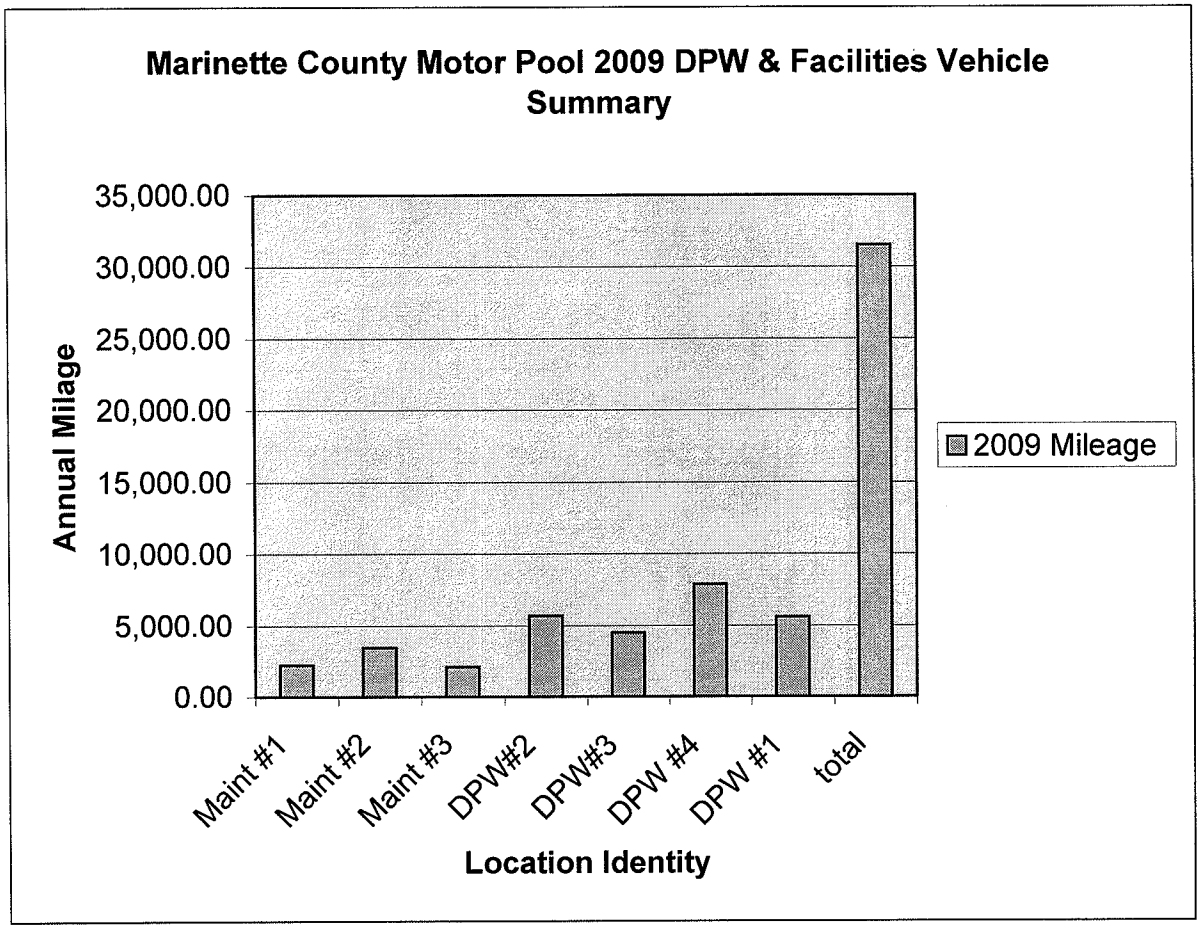


Unit Identification
2007 Malibu #92
2008 Taurus X #98
2006 Econoline # 88
2006 Malibu #87
2005 Caravan #82
2005 Caravan #81
2005 Focus #79
2005 Taurus #77
2007 Fusion #96
2005 Taurus #78
2007 Fusion #95
2006 Malibu #86
2006 Malibu #85

Marinette County Motor Pool 2009 HHS Satellite Vehicle Graph



Year	2009	2008	2007
Niagara HHS	9,687.00	23,864.00	39,784.00
Work Restitution	15,571.00	17,068.00	50,162.00
Average Miles/Unit	12,629.00	13,644.00	22,486.50



Slot	Miles	Months
Maint #1	2,264.00	12
Maint #2	3,480.00	12
Maint #3	2,135.00	12
DPW#2	5,675.00	12
DPW#3	4,497.00	4
DPW #4	7,875.00	6
DPW #1	5,585.00	12
total	31,511.00	70
ytd Avg	5,401.89	5.833333
mthly avg	450.16	

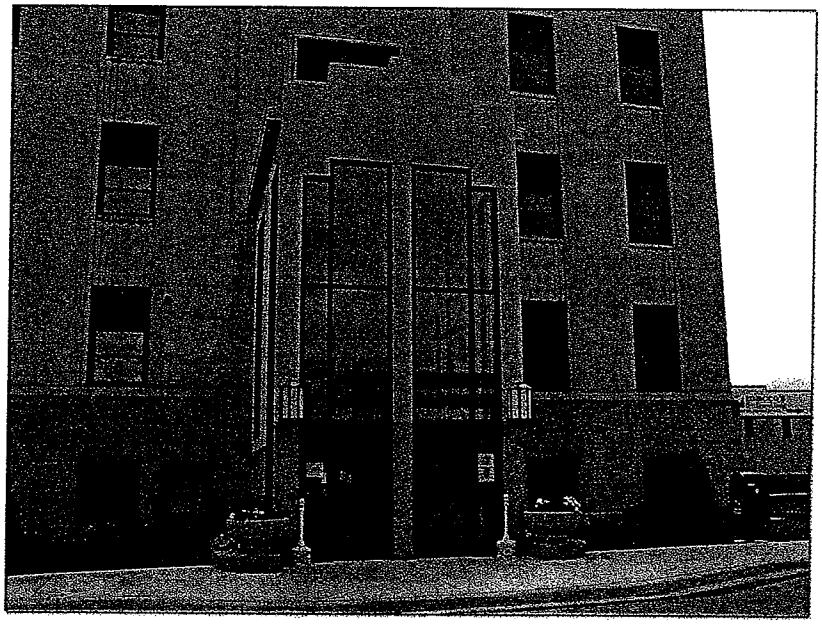
DPW #3 delivered in September 2009
DPW #4 delivered in June 2009
Only had an Average of 5.83 trucks available in sub pool for the year

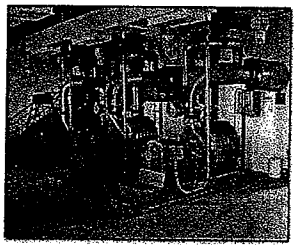
Marinette County Courthouse

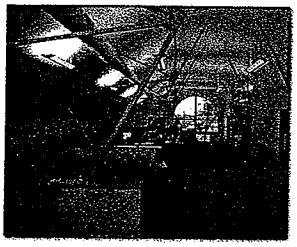
Report for HVAC Engineering Services

UPEA
ENGINEERS & ARCHITECTS

1701 Dunlap Avenue, Suite B
Marinette, WI 54143







Engineering
Architecture
Planning
Environmental
Surveying

UPEA
ENGINEERS & ARCHITECTS

November 11, 2009

Shawn B. Baker
Facilities Director
Marinette County
1926 Hall Avenue
Marinette, WI 54143-1717

RE: REPORT FOR HVAC ENGINEERING SERVICES IN THE MARINETTE COUNTY COURTHOUSE

Dear Mr. Shawn Baker,

Attached is a final report for HVAC engineering study in the Marinette County Courthouse and Courthouse Annex. We have developed solutions and cost estimates to correct the HVAC system deficiencies at the Marinette Courthouse Annex. U.P. Engineers & Architects, Inc. estimates the total capital required for correcting these difficulties to be $90,000.00, plus or minus 20%. We also feel that the energy savings will be approximately $10,000.00 annually, plus or minus 20%.

We certify that:

- Our report was made in the interest or on behalf of any person not named therein;
- We have not directly or indirectly induced or solicited any person to submit a false or misleading information;
- We have not in any manner sought by collusion to secure an advantage over any other vendor;
- We have thoroughly examined the RFP requirements, and our report covers all the services that we have indicated we can provide; and
- We acknowledge and accept all the terms and conditions included in the RFP

Sincerely,

W. Allen Walker P.E.
Project Manager

Table of Contents

EXECUTIVE SUMMARY

U.P. Engineers & Architects, Inc. (UPEA) has developed solutions and estimated costs to correct deficiencies identified in the HVAC system of the Marinette County Courthouse Annex. The recommended modifications are to improve performance of the building's Heating Ventilation and Air Conditioning (HVAC) system, and or building envelope. Modifications have been recommended to improve efficiency, comfort and security of the building.

The targeted areas of concern included the air intake, the mixing ox and air handler freeze up, the temperature issues in the judge's chambers, branch II courtroom. HR's director's office and the chiller reliability and efficiency, in addition, several inspections were made of the facility and equipment to understand the current working operations in order to develop solutions for this report.

UPEA understands that the report will become the property of Marinette County and become a matter of public record so any proprietary material or information should be marked as such and submitted as a supplement to the proposal to allow the county to protect such information as warranted.

OBJECTIVE

UPEA has provided engineering review and analysis to develop solutions and estimated costs to correct deficiencies identified in the HVAC system of the Marinette Country Courthouse Annex. The solutions developed are to improve building energy efficiency and support long-term sustainability of the Marinette County Court House complex. It was the county's desire that this report be done by UPEA as agreed in the signed agreement form found in the appendix. Completion date will be August 31, 2009.

SCOPE OF SERVICES

UPEA has provided a proposal that includes an in depth review and analysis all to provide solutions and a class 20 cost estimate to correct the deficiencies noted in the specifications section of this RFP.

A. UPEA has provided an energy feasibility study and report which includes the following:

1. A report summarizing the proposed solutions and expected energy impact of the proposed solutions

2. Preliminary Autocadd drawings and sketches of proposed solutions

3. A budgetary class 20 (+/- 20%) cost estimate for proposed solutions

4. A cost for additional services needed to bring the proposed solutions to the bid ready project stage

B. UPEA has addressed the following issues identified with the HVAC system of the Marinette County Courthouse Annex, this list is not considered all inclusive and in the course of developing solutions UPEA has brought to bring to Marinette County's attention other deficiencies that were identified.

1. The building fresh air intakes are located at street level in alley where debris, ice and snow may be clogging louvers and mixing equipment. UPEA reviewed the operation and offered a new location to reduce the possibility of foreign debris present so that equipment runs more efficiently and safer. This will also eliminate noxious fume concerns coming from truck traffic in the alley.

2. The mixing box and air handler freeze up, the current design of the air handlers serving the courthouse annex does not allow adequate mixing of return and make-up air. If the building needs additional make up air for cooling when the outside temperature is below 15 degrees we are unable to take in sufficient cool air without the air handlers tripping out on low temperature. The lack of proper mixing or stratification of air streams passing through air handlers limits our ability to effectively control air handler discharge temperatures. UPEA has proposed a design that will take in adequate outside air to satisfy building cooling requirements in cold weather and maintain control over air handler and air handler discharge temperatures.

3. The temperature issues in the Courthouse annex, especially the judge's chambers, Branch II's courtroom and the H.R. Director's office were evaluated. These office rooms have Eastern or Southeastern exposures with a lot of glass; their climate control systems have difficulty providing a comfortable environment for room occupants. On the other hand, the court room fills up fast with occupants and is difficult to maintain a comfortable temperature level while court is in session. Current climate control systems have very little ability to change temperatures in these rooms and on many days the county staff's best efforts result in only the ability to maintain the current temperature; if there is an upset in the system they are not able to provide adequate cooling to recover from the upset. UPEA has explored the feasibility of reducing excessive solar heat gain, not just increasing cooling provided to these areas. UPEA has also considered the need for low noise levels in the courtrooms and judge's chambers.

4. The courthouse chiller is old and has had a checkered performance history in the last few years. We want to evaluate the energy savings potential of a new chiller. The chilled water system upgrade must show significant energy cost savings and have the potential to receive grants or other assistance based on reduced energy use. An alternative that may be both energy saving and economically feasible is to examine the possibility of replacing a chiller in the University Avenue Law with one that provides free hot water (a liquid cooled chiller set up to heat water) providing hot water for the Kitchen, laundry and showers. This would free up a relatively new 100-ton chiller for the courthouse. This item was investigated and found not to be economical for this project.

C. UPEA is providing solutions that focus on the comfort, safety and security issues enumerated and provide tangible energy savings and support sustainable building operation. A significant portion of the capital costs to implement any solutions can be funded from energy cost avoidance and rebates or grants awarded for reduced energy use.

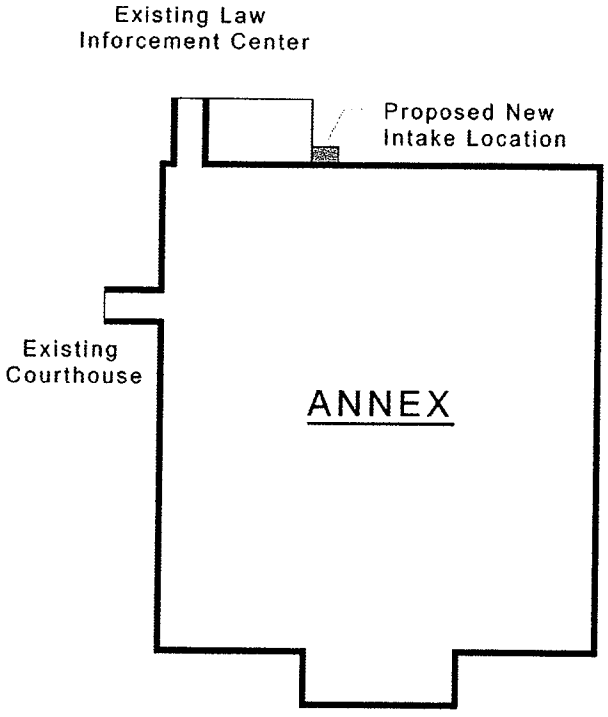
D. UPEA expects the completion of the final study within 60 days or by August 31, 2009, and has made available to the county the preliminary capital costs and anticipated energy savings of $90,000.00 and $10,000.00 respectively in order to meet fiscal budget requirements.

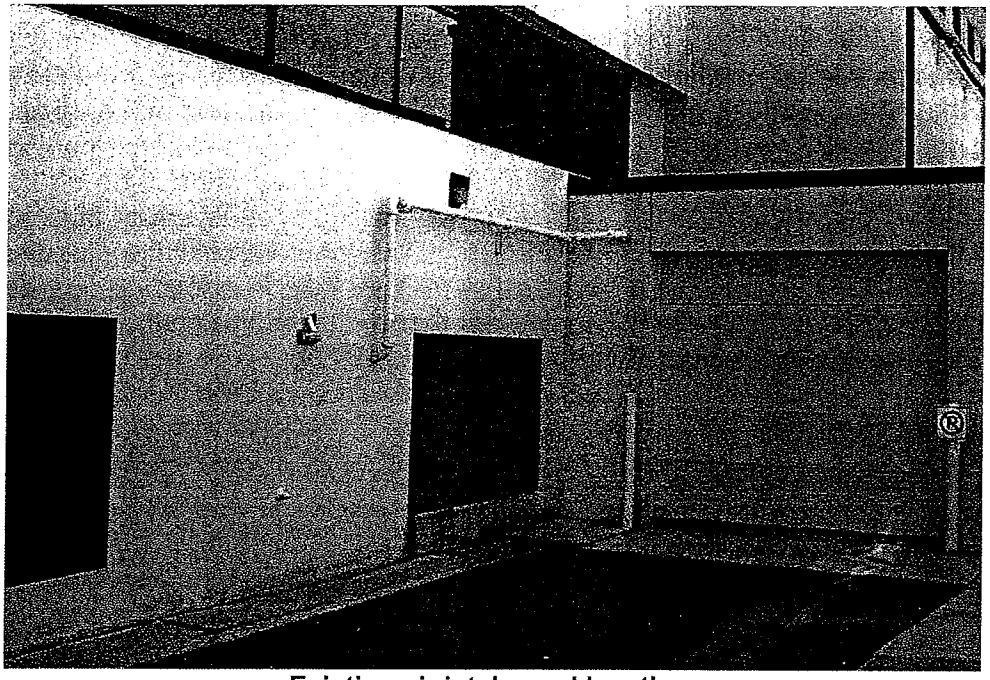
ITEM 1 – Annex Building Intakes

The building fresh air intakes are located at street level in alley where debris, ice and snow may be clogging louvers and mixing equipment. UPEA reviewed the operation and offered a new location to reduce the possibility of foreign debris present so that equipment runs more efficiently and safer. This will also eliminate noxious fume concerns coming from truck traffic in the alley.

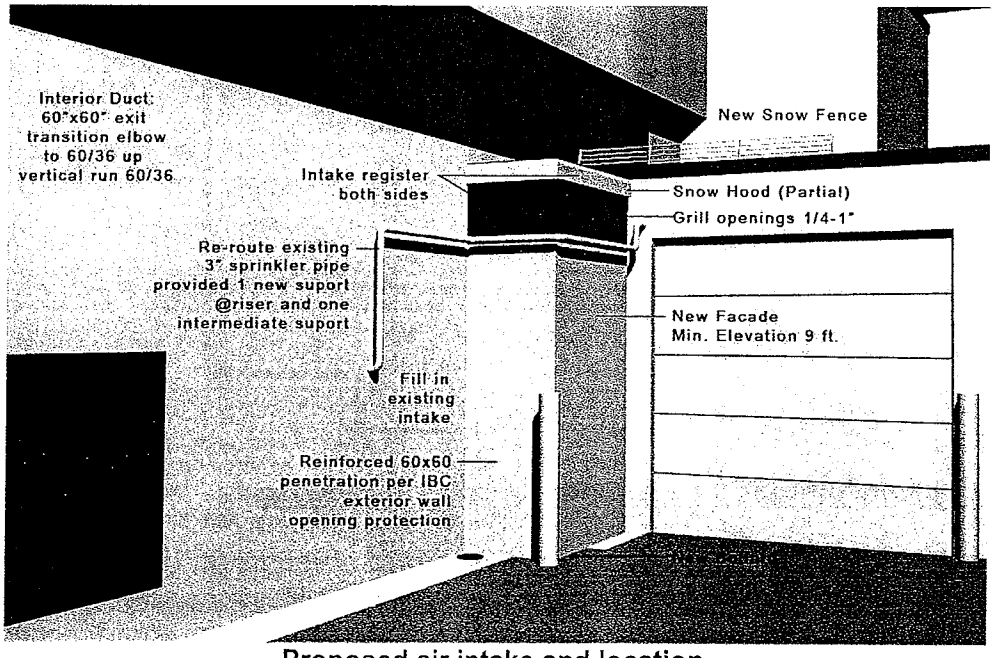
The proposed fresh air intake has been designed to replace the existing opening/location in the structure, but to accommodate for the projected height the new intake will protrude out from the building approximately three feet. The Sally Port addition and a storm drain access point limit the space available for the addition, but the allotted area is adequate for the square footage needed. Raised to a height of nine feet, the new air intake will be out of harm's way and safe from low lying debris and toxins. The structure of the shaft addition is to be constructed out of a steel stud system and then covered in an EIFS (Exterior Insulating Finish System) stucco decor to match the existing exterior wall covering. The original intake space not used will be filled in for a seamless finish. A snow fence and snow hood is to be added to protect the intake from collecting snow and debris from above. Please see the below diagrams for a more detailed description:

Intake location map





Existing air intake and location.

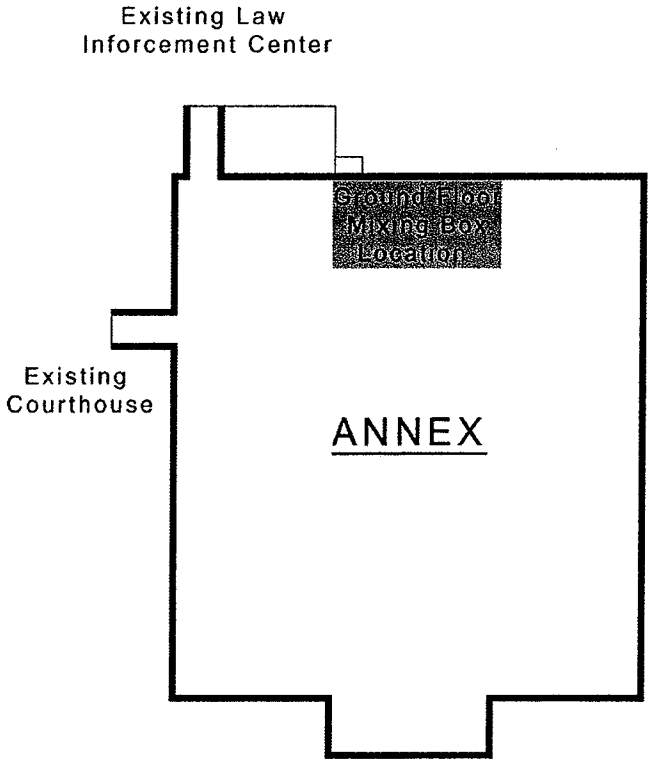


Proposed air intake and location.

ITEM 2 – Mixing Box Freeze Up

The mixing box and air handler freeze up, the current design of the air handlers serving the courthouse annex does not allow adequate mixing of return and make-up air. If the building needs additional make up air for cooling when the outside temperature is below 15 degrees the facility is unable to take in sufficient cool air without the air handlers tripping out on low temperature. The lack of proper mixing or stratification of air streams passing through air handlers limits our ability to effectively control air handler discharge temperatures. UPEA has proposed a design that will take in adequate outside air to satisfy building cooling requirements in cold weather and maintain control over air handler and air handler discharge temperatures.

Mixing Box location map



Outside air intake options for Marinette County Courthouse

Regarding coil freeze-up from air inlet, we have reviewed a number of potential solutions to the air handling unit mixing and thermal stratification issues with the courthouse ventilation system. There are some workable solutions to correct the condition or allow for continued operation of the air handling units.

We have reviewed the controls drawings provided by Mr. Baker, which identify termination points and input designations. They do not provide information relating to setpoints, process parameters, or system operational programming. The RFP identifies the system looks for increased fresh air for cooling during periods of cold weather, but with a building temperature of 55 degrees above ambient, there should be no cooling demand unless portions of the building were overheated. Based on the walkdown conducted, the fresh air return damper is operated only by a drag link from the second return air damper shaft, which means it is only operated in conjunction with the fresh air intake damper. If we validate this one fact, then the fresh air damper cannot be operated independently by the control system, which simplifies some of the options.

Freeze-up option 1: Setpoint change to allow continued operation of air handling unit

Per the Request for proposal, the air handling units begin to have freeze-up difficulties at an outdoor temperature of 28 degrees. Although the RFP eludes to air handling units tripping on low temperature, (mixed air low limit override), during discussions with the county personnel, identified instances where the coils have frozen during operation, which means the freeze protection provisions designed into the existing system do not function properly. Based on the county's research, the coil can show differential temperatures across its vertical height of up to 50 degrees due to inadequate mixing. As such, the existing sensing line measures an "average" temperature that, due to lack of mixing, is too high to engage the Mixed Air Low Limit Override setpoint prior to freezing of the coil.

Based on 70 degree return air temperature, and the witnessed 50 degree temperature differential, the top portion of the coil could be as cold as 20 degrees, when the sensing line is measuring an average temperature of (20+70/2) 45 degrees, or potentially higher. The setpoint change, to increase the Mixed Air Low Limit Override setpoint by 10-15 degrees such that the average "sensed" temperature would close the fresh air intake damper soon enough to prevent freezing of the coil during operation was investigated and determined to be unacceptable due to program difficulties and loss of control.

When the setpoint is reached, the fresh air damper would be closed until the coil recovers temperature, at which point it would open again. It is not prudent to "recommend" fresh air intake be closed off, even intermittently. It should be recognized that during the period where an air handling unit has the fresh air intake momentarily closed, the building is not choked off from fresh air intake unless both units have the same condition at the same time. This option will increase the cycling of the fresh air and return air dampers, could result in no fresh air and is not recommended.

Air Distribution Option 1: Reroute fresh air duct to fan section

For both air handling units, physically raise the fresh air inlet damper, extend the linkage and increase its diameter (to prevent buckling, which could cause leakage). For AHU-1, there should be adequate room in the vertical inlet riser. For AHU-2, a duct extension within the existing plenum would be required. Blank off the existing fresh air inlet to the air handling units and install a duct from the new damper location to the fan section, bypassing the coils. This option requires cutting a new inlet in the air handling unit frame. A simple check of the damper rated static pressure would be required (which should be as simple as looking up the manufacturer and model number) to ensure qualification as the static pressure in the fan chamber is higher than upstream of the coil (per the balancing report, for AHU-1 the reheat coil static pressure drop is .53"wg, and .024"wg for the filter section. For AHU-2, the cooling coil static pressure drop is .646" wg and .11 for the filter). Although this option bypasses the filters for the fresh air, an inline element can be installed in the new duct if this is a concern. Once the installation is complete, the new linkage will have to be adjusted to re-establish the design flow values.

Air Mixing option 1: Damper reversal and partial turning vanes in AHU

Although the walkdown conducted was not thorough enough to conclude whether the return inlet damper is equipped with symmetrical vanes and able to be operated in either direction (clockwise or counterclockwise), it is believed (based on memory) the return air inlet damper vanes direct flow downward during throttling. Reversing the operating linkages for the return air inlet dampers to a position 180 degrees from current orientation on the operator shaft would cause the damper to deflect the warm return air up into the top portion of the air handling unit instead of down during throttled operation. Outside air damper linkage would also have to be reversed. If not reversible in rotation, flipping the dampers 180 degrees and mounting operators on the opposite side of the air handling unit would accomplish the same thing. As the return air inlets are at the bottom of the unit, this would move the warm air stream higher in the air handling unit. As an example, if the damper vane is 3", this would lift the return air stream 3" (closer to the cold air), plus the vertical distance of redirection (while throttled).

Although the filter/mixing box is short on the existing air handling units, there is room to install static partial (45 degree) turning vanes to direct the flow of warm return air up higher in the upper half of the air handling unit to force mixture with the cold fresh air stratified along the upper surface of the air handling unit. Similarly, a single vane could be installed on the top of the unit to direct the cold incoming air down farther into the air stream to promote mixing. Although this option has the potential to resolve the freezing issues, it should be recognized these devices would likely be closer than the recommended 2 diameters upstream of the coil. Although the thermal stratification would be greatly improved, a steady, developed air flow would not be likely with this configuration.

For discussion purposes, AHU-1 will be used as it has a more significant problem in this area. The fresh air intake is 1277 cfm, coincident with a return air flow rate of 12,140 cfm based on the balancing report. At a fresh air inlet temperature of 15 degrees, with the return air at 70 degrees, the mean temperature should be about 65 degrees. Assuming the courthouse does not run antifreeze in the coils (which could also be an option), at least part of the coil is below 32 degrees, which confirms effectiveness of mixing in the current configuration is less than 34%. There is adequate warm air moving through the air handling unit that a modest improvement in mixing is likely to resolve the condition. Installation of static vanes internal to the air handling unit is a low cost solution.

Air mixing Option 2: Introduce Return air in the upper half of AHU

According to the design fresh air intake flowrates, and as reflected in the balancing report, the return air inlet velocities are much higher than the fresh air intake velocities (approx. 600 ft/min vs. 75 ft/min). Based on general dispersion patterns for higher velocity discharge, and the proximity (along the direction of flow) of the fresh air intake to the return air intake, the return air velocity pressure in the AHU is not expected to be fully distributed in the area of the fresh air intake. As the difference in velocities between the two air streams is significant, mixing effectiveness is low.

Both air handling units have secondary openings on the inlet side that are blanked off. These blanking plates could be removed, second return air dampers installed and connected to existing damper linkage, and a static restriction installed to provide return air flow, at a face velocity conducive to mixing, into the upper air handling unit opening. Preliminary calculations indicate allowable low velocity flow for mixing (approx. 700cfm for AHU-1 and 500 cfm for AHU-2) would be adequate to maintain the bulk temperature in the upper half of the air handling unit above freezing while drawing the design flowrate (1300 and 1000 cfm) at the operating minimum temperature setpoint of 10 degrees. Velocity pressure distribution in the AHU's should be measured during design phase (Sketches attached).

Air mixing Option 3: Install new mixing plenums
This is the most significant and expensive alternative being presented. New mixing plenums could be installed to replace the existing inlet duct sections. Due to the low inlet velocities for fresh air, pressure drop from ductwork should not be a significant factor in the design of an inlet mixing plenum.

For Air Handling Unit #1, this requires removal of the fresh air inlet transition piece, the last fresh air inlet elbow, the horizontal return air inlet duct, transition piece, and lower elbow. As the air handling unit width exceeds the distance between the inlet flange and the adjacent wall, the width of the plenum cannot be maintained at the existing AHU width,

which will necessitate replacement of the return air and fresh air inlet dampers.

For Air Handling Unit #2, it may be possible to re-use existing fresh and return air dampers. The replacement will still require removal of the return air inlet duct and first 2 elbows, the fresh air inlet transition piece by the intake, and the fresh air inlet transition piece attached to the AHU.

Thermal option 1: Install UL1996 listed tempering coils

Leaving all other things the same, the programmed operating point for closing outside air damper is currently 10 degrees. The desired result is to deliver air no colder than 35 degrees to the coil. A tube type tempering coil installed internal to the outside air ducts would produce minimal flow disruption. Normal discharge thermostat range starts at 40 degrees.

Cost is not accurate temperature of outside air.

Sizing of tempering coils:
Design outside air requirement for AHU-1 is 1300 cfm (H8)
Design outside air requirement for AHU-2 is 1000 cfm (H8)

Heat requirement for AHU-1 sensible heat is q=0.018*Vdot*Delta T = 0.018 * (1300 cfm*60 min/hr) * (40-10) = 42,120 BTU/hr. Duct size is 52/24.

Heat requirement for AHU-2 would be 42,000*1000/1300 = 32,400 BTU/hr. Duct size is 72/26.

This converts to duct heaters: 12.3kW output for AHU-1, and 9.46kW output for AHU-2.

Units could be wired to a manual switch, operated seasonally or as needed. They could also be wired to a circuit including an outside temperature element where the circuit would only be enabled at a specified outdoor air temperature (say, 20 degrees). The units are equipped with a flow sensor and only operate when there is duct flow.

Although the heater size seems large, this is not wasted heat. Heat delivered to the fresh air inlet is a direct reduction on heating system demand for the facility, the only difference seen in operating cost is the difference in energy rates.

As the conversion efficiencies for electric and gas heat are about equal (93% vs. 92%), the cost is just the difference in energy cost.

Electric heat: 12.3+9.46=21.76kW total. At average electric cost of $.0741/kWh (2009),

the units together would cost $1.61 per hour to operate.

The equivalent reduction in heating cost (per hour) is 42,120+32,400 = 74,520 BTU. At a 2009 average heating season cost (Jan through March) of $0.87 per therm (100,000 BTU), the net operating cost for the installation is $1.61-$0.65 = 96 cents per hour of operation. As the units can be purchased as slip-in or flanged, the installation cost is minimal.

A couple of representative manufacturers:
http://www.braschmfg.com/Download/Heaters/A102-1.pdf
http://www.nailor.com/onlinecatalogs/electric_duct_heaters/Duct_Heaters.pdf

Although this method will correct the existing condition, it does not save energy.

One other item for discussion is to run glycol in the coils, but this would require breaking (air gap) the potable water makeup for the heating portion, and the equipment survey may reveal some components are not compatible with glycol.

Mixing Box Freeze-up Issue

Item No.	Solution	Description	Anticipated Success Rate (percent)	Approximate Cost Estimate	Approximate Energy Savings	Note
1	Freeze-up Option No. 1	Setpoint change	100%	$500	tbd	Note 2
2	Freeze-up Option No. 2	Sensing line reroute	85%	$500	tbd	Note 3
3	Air Distribution Option No. 1	Reroute fresh air duct in fan selection	100%	$6-8,000	tbd	
4	Air Mixing Option No. 1	Damper reversal partial turning vanes	80%	$4-6,000	tbd	
5	Air Mixing Option No. 2	Intro return air in upper half of AHU	85%	$5-7,000	tbd	
6	Air Mixing Option No. 3	Install new Mixing Plenums	95%	>$10,000	tbd	
7	Thermal Option No. 1	Install tempering coils (or glycol)	95%	$4,500	2,500	Note 4

Note 1: Many of these options can be combined, or worked in order based on results. For example, sensing line reroute and partial turning vanes. Minor setpoint change if needed.

Note 2: This will correct the freeze-up condition, but will result in more frequent closure of fresh air inlet damper. Lowest possible setpoint determination will require observation to establish.

Note 3: It is possible setpoint change required in conjunction with this option, as determination of exact temp. Distribution requires observation or calculation.

Note 4: This will be a glycol conversion

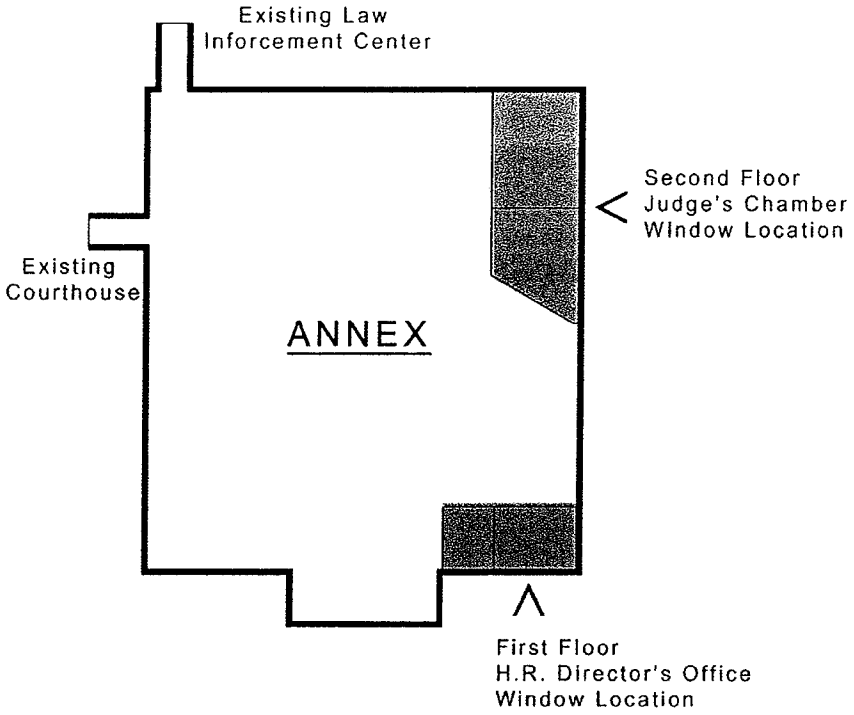
Any mixing option, by itself, is credited with less than 100% effectiveness to account for imperfect mixing. This does not mean the improvement gained will not correct the condition.

ITEM 3 – Annex Temperature Issues

The temperature issues in the Courthouse annex, especially the judge's chambers, Branch II's courtroom and the H.R. Director's office were evaluated. These office rooms have Eastern or Southeastern exposures with a lot of glass; their climate control systems have difficulty providing a comfortable environment for room occupants. On the other hand, the court room fills up fast with occupants and is difficult to maintain a comfortable temperature level while court is in session. Current climate control systems have very little ability to change temperatures in these rooms and on many days the county staff's best efforts result in only the ability to maintain the current temperature; if there is an upset in the system they are not able to provide adequate cooling to recover from the upset. UPEA has explored the feasibility of reducing excessive solar heat gain, not just increasing cooling provided to these areas. UPEA has also considered the need for low noise levels in the courtrooms and judge's chambers.

After Careful review of the issues regarding the window solar heat gain located in the Judge's chambers and the H.R. Director's office, there are three practical glazing applications available. Below is a detailed description of each option:

Window location map



Option A- Sun Louvers (Exterior Solar Shades)

The total solar infiltration of the existing **non-shaded,** double pane, low-e windows located in the H.R. Director's office (On a typical work day) generates 7,080 BTU/Hr. The total solar infiltration in the Judge's chambers is approximately 8,198 BTU/Hr. The most effective way to eliminate the solar heat gain is to eliminate the direct solar rays in contact with the window. This will also reduce the radiant heat produced by the interior shading application. To reduce the solar heat gain through glazing down to a factor of Zero BTU/Hr we recommend an Exterior Sun Louver. By intercepting sunlight, before it strikes the window glass, the sun louvers dramatically reduce solar heat gain within the structure and, at the same time, eliminates unwanted glare to keep occupants comfortable during daytime functions.

Heat and Cost savings for total exterior shade
Total Exterior Shade Savings: 1.273 Tons Cooling, $49.00 per year
Total Heat Saved: 7,080 BTU/Hr - H.R. Director's Office
8,198 BTU/Hr - Judges Chambers

These numbers are subjective due to occupant thermostat control. When an employee becomes uncomfortable, the thermostat settings affect multiple patrons and impacts the amount of energy used

to cool/heat a designated area.

A negative implication of the Sun Louver is that it obstructs the view to the outside and the external louver system is visible from the exterior (Possibly changing the overall look and design of the structure).

Option B- Interior Roller Shade with Control Film

As a previously used product on multiple window fixtures throughout the Marinette County Courthouse, Solar Roller Shades are an economical and cost efficient product. Solar Shades are a type of roller window shade generally made from a synthetic mesh fabric, like a screen. Solar window shades come in different levels of opaqueness, or openness, depending on how much light control you desire- the higher the percentage of openness of the solar shade, the more light the shade lets in. Solar shades are an excellent option for windows with a view. Solar screens reduce glare and improve energy efficiency by reducing solar heat gain and blocking harmful UV rays.

Due to the fact that a Roller Shade is attached to the interior window frame contributing to radiant heat gain, we recommend using a Control Film in parallel with the Solar Shade. Solar Control Window Films are multi-layered, optically clear polyester, sputter-coated with exotic metals including titanium, stainless steel, copper, gold, silver and aluminum. Depending on the combination of metals used and the density of construction, these films can greatly enhance the performance of your glass. Normally applied to the internal face and constructed with a scratch-resistant coating this advanced technological film can provide years of maintenance free benefits.

Heat and Cost Savings for Combination Treatment:
Combination Shade/Film Savings: $40.00 per year
Total Heat Saved: 5,800 BTU/Hr - H.R. Director's Office
6,726 BTU/HR – Judge's Chambers

Control Film Specifications:
47% Visible Light Transmitted
56 –79% Total Solar Energy Rejected
98% Ultraviolet Light Blocked
35% Interior Window Heat Loss
Resource: Nationwide Window Tinting Services

Negative Aspects to Interior Blinds:
Venetian blinds absorb 77% of the energy and reflect 23%. So to put these inside the windows, 77% of the original heat remains in the room (in the blinds), and the flux through the window increases by 23%, which will serve to increase the radiant

heat delivered to the room from the increased surface temperature. As the existing amount of solar heat produces a surface temperature of 100 degrees, (30 degree differential), this increase in flux would cause the temperature to go up as follows: 1.23*30 = 36.9 differential, for a new surface temperature of 106.9 degrees, from which the radiant heat is 0.92*sigma*(567**4-530**4)*74.26 = 2863 BTU/hr as opposed to the existing 2276 per hour, an increase of 587 BTU/hr.

Net effect:
23% reflected heat is 0.23*15,278 total BTU/hr = 3,514 BTU/hr reduction, and a 587 BTU/hr increase due to surface temp = 2,927 BTU/hr net reduction.

Option C – Permanent External Shade with Control Film

Much like the interior Roller Shade, an external application of a Solar Shade is a permanent framed-in system. Attached to the exterior window frame, this system offers the same benefits and cost savings of an interior shade, but also reduces the radiant heat emitted from an interior application. The radiant heat emitted from the office windows is the largest contributing factor in employee comfort. To reduce the amount of radiant heat in each office while not obstructing the view to the outside, an external shad application is the most effective system available. Because the frame is mounted to the exterior of the building the permanent screen is unprotected and vulnerable to the elements. Maintenance and cleaning will need to be done at least twice a year.

ITEM 4 – Courthouse Complex Chiller

The courthouse chiller is old and has had a checkered performance history in the last few years. We want to evaluate the energy savings potential of a new chiller. The chilled water system upgrade must show significant energy cost savings and have the potential to receive grants or other assistance based on reduced energy use. An alternative that may be both energy saving and economically feasible is to examine the possibility of replacing a chiller in the University Avenue Law with one that provides free hot water (a liquid cooled chiller set up to heat water) providing hot water for the Kitchen, laundry and showers. This would free up a relatively new 100-ton chiller for the courthouse. This item was investigated and found not to be economical for this project.

According to Trane, the replacement units are about $500 per ton. For a single 120T replacement, that's $60,000. If we issue a bid spec. for replacement as a like for like, to include installation, we shouldn't need engineering for anything to do the replacement, just the mfg. and installer. If that's the case, we anticipate removing the existing unit and installing the new for $10,000. Budgetary estimate $70k, let's say $75k. (Crane's a couple thousand a day, one day evolution)

If we want to split the units, the equipment cost itself will be about 15% higher for 2 units. Approximately two $35k units instead of one single $60k unit. If the unit install cost stays at $10,000. Just the basic cost to buy, set and plumb both units is up to $70 +$10+$10=$90k. There will be some engineering cost, as this requires identifying and qualifying a structural support, pulling a second power supply for the second unit, and a software and programming revision. If the Engineering could be completed for $10k, and we allow $5k for the controls vendor, the estimated installation cost is $105k. Allowing $5k for contingency, use $110k.

We would probably say a straight replacement budget of $75k is adequate, and a split unit budget of $110k is appropriate. With a split unit, the statistical failure rate is the same for each piece of equipment. Twice as many moving parts per the same tonnage. Twice as many failures, but half the consequence. If the interest is in having spare parts, we could recommend some of the additional money for the split unit be spent buying a replacement inventory of parts at the end of the manufacturer's warranty period for a straight replacement.

Item 5 – Estimated Appliance Energy Costs

We did a cursor walkthrough of the existing complex and found several small appliances, fans and portable heaters throughout the facility. Based on our sample study, we recommend that the County review the number of small units currently being used in this facility. A cost savings estimate is below.

1 Small refrigerator	$10.00/month
2 Coffee Maker	$5.00/month
3 Portable Heater	$20.00/month
4 Fan/Air Cleaner	$2.00/month
Estimated total*	$30.00/month
Assume 10 appliances each	10
→ Total building appliance cost	$300.00/month
→ Total annual energy use for in house appliances	$3,600.00/year

* Based on portable heater used for 6 months out of the year

SUMMARY OF UNDERSTANDING OF PROPOSED SERVICES

UPEA understands of the requested services and proposes to the following services for Marinette County.

1. UPEA will review all drawings, equipment, reports and energy related data where available and as it relates to historical temperatures and humidity levels in order to create a base line to help further define the four problem areas discussed above and other areas as they arise.

2. UPEA will confirm all data from item number one above with additional data collected over a time period of about 60 days during the review process. UPEA will utilize this data to further define the HVAC problems in the Marinette County Court House Annex.

3. UPEA will develop three to four solutions for each area of concern and check to see how they may be inter-related and how they will impact the overall operations of the HVAC system performance for the Marinette County Court House Annex building.

4. UPEA will further develop three to four overall solutions with class (20) estimates that include Autocadd drawings showing the proposed locations and preliminary design details that comply with the governing code requirements that solve the areas of concern and HVAC system performance.

5. UPEA will also assist the County in applying for the various study and implementation grants available though Focus on Energy and other available programs for this facility.

6. UPEA will complete a comprehensive report to present to the County of Marinette that summarizes all solution options along with associated cost estimates and grant money available developed from this study which includes all design calculations and data collection in the appendences.

PROPOSED COST OF SERVICES TO BRING TO BID READY STAGE

UPEA offers these services for a total fee of **$12,204.00**, twelve-thousand two-hundred four dollars and no-cents. The scope of this effort is to identify and describe solutions to the HVAC problems identified above.

A summary of the hours required for this work is attached.

The Scope for this work includes:

1. Design development drawings and specifications
2. County review
3. Formulate application to focus on energy county review.
4. Construction documents and specifications
5. County review
6. Advertise for bids
7. Pre-bid meeting
8. Assist with contractor selection
9. Award contractor
10. Assist with contractor administration.

Attachments

PROJECT BUDGET

Client # **M128**

Task No. (if applicable) **100**

Project/Client Name: **Marinette County Courthouse**

Task Name: **HVAC Engineering Bid Documents**

Labor Code	Title	Rate	Budgeted Hours	Total
1	Sr. Project Engineer	$142		0.00
4	Project Engineer III	$132		0.00
2	Project Engineer II	$126	20	2,520.00
5	Project Engineer I	$111	40	4,440.00
15	Engineer III	$101		0.00
16	Engineer II	$88		0.00
17	Engineer I	$77		0.00
22	Project Architect III	$133		0.00
23	Project Architect II	$109	16	1,744.00
24	Project Architect I	$103		0.00
26	Architect II	$95		0.00
28	Landscape Architect I	$111		0.00
29	Landscape Architect	$98		0.00
30	Senior Planner	$136		0.00
34	Planner I	$66		0.00
40	Project Surveyor	$107		0.00
46	Surveyor II	$82		0.00
47	Surveyor I	$69		0.00
55	Technician III	$77		0.00
56	Technician II	$64		0.00
57	Technician I	$59		0.00
58	Technician Aide	$48		0.00
59	Technician Aide I	$42		0.00
63	Designer V	$88		0.00
65	Designer III	$74		0.00
66	Designer II	$66		0.00
67	Designer I	$55	50	2,750.00
75	Clerical III	$58		0.00
76	Clerical II	$50		0.00
77	Clerical I	$45	10	450.00
78	Clerical Aide	$31		0.00
		Total Hours & Labor Budget:	**136**	**$11,904.00**

Expenses:			
	Travel		
	Meals		
	Motel		
	Reproductions	300.00	
	Misc Expenses		
	Tests		
	Consultants		
		Total Expense Budget:	**$300.00**

Total Budget: **$12,204.00**

3 Year Comparison - Service

Report Run On: 6/16/2009

Link to Fax Friendly Copy

MARINETTE COUNTY

1926 HALL AVE LAW CENTER
MARINETTE, WI 54143

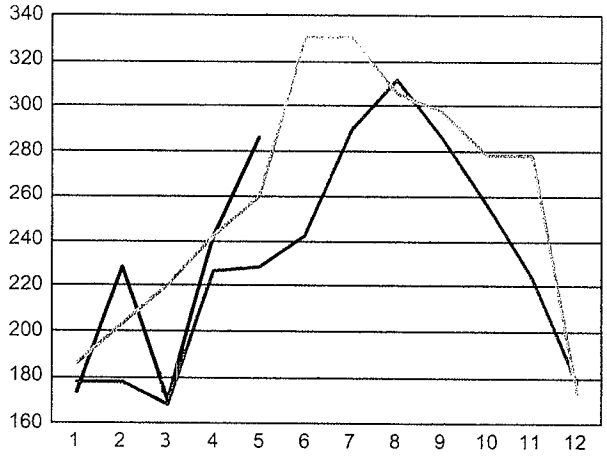
Account: **403120998-3**
Premise: **103091387**
Service: **1**

Service Type: **Electric**
Rate Schedule:**CG-1T**

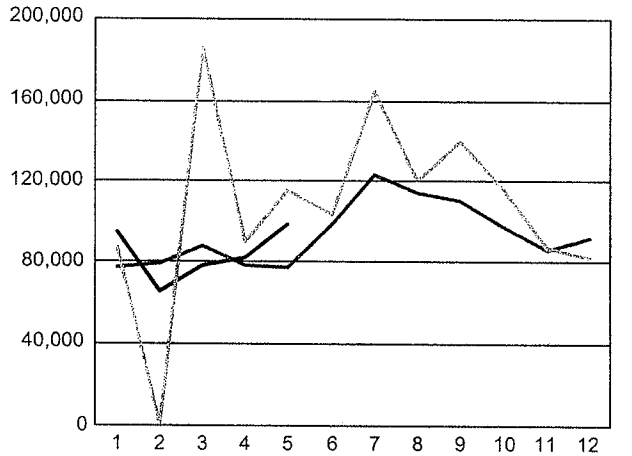
Company Offering: **WIEL000088**
Date Last Billed: **May-09**
Operating District: **MARINETTE**

	2009					2008					2007				
	kW	kWh	KWH Per Day	$ (w/o tax)	$/kWh Avg Cost	kW	kWh	KWH Per Day	$ (w/o tax)	$/kWh Avg Cost	kW	kWh	KWH Per Day	$ (w/o tax)	$/kWh Avg Cost
Jan	174	94,800	2,873	6,455.47	0.0681	178	77,000	2,655	5,217.12	0.0678	186	86,600	2,986	5,263.75	0.0608
Feb	228	65,800	2,632	5,442.59	0.0827	178	79,200	2,555	5,468.12	0.0690					
Mar	170	78,400	2,800	5,308.28	0.0677	168	87,600	2,655	5,840.34	0.0667	220	186,200	5,947	12,188.46	0.0655
Apr	242	82,200	2,652	6,309.01	0.0768	226	77,800	2,683	5,944.13	0.0764	242	89,600	3,200	5,286.61	0.0590
May	286	98,800	2,994	7,586.94	0.0768	228	77,600	2,985	5,943.02	0.0766	260	115,600	3,400	7,417.54	0.0642
Jun						242	99,200	6,350	7,862.30	0.0793	330	103,800	10,174	8,495.68	0.0818
Jul						290	123,000	3,618	9,945.40	0.0809	330	164,400	4,443	12,215.01	0.0743
Aug						312	114,800	4,100	9,800.88	0.0854	306	120,800	5,033	8,487.57	0.0703
Sep						286	110,800	3,693	9,330.54	0.0842	298	140,000	4,242	9,941.99	0.0710
Oct						256	97,600	7,167	7,507.96	0.0769	278	116,000	7,498	7,730.36	0.0666
Nov						224	85,600	2,761	6,413.22	0.0749	278	86,800	2,800	6,237.46	0.0719
Dec						178	92,200	2,712	6,330.91	0.0687	174	82,400	2,658	5,374.11	0.0652
		420,000		31,102.29	0.0741		1,122,400		85,603.94	0.0763		1,292,200		88,638.54	0.0686

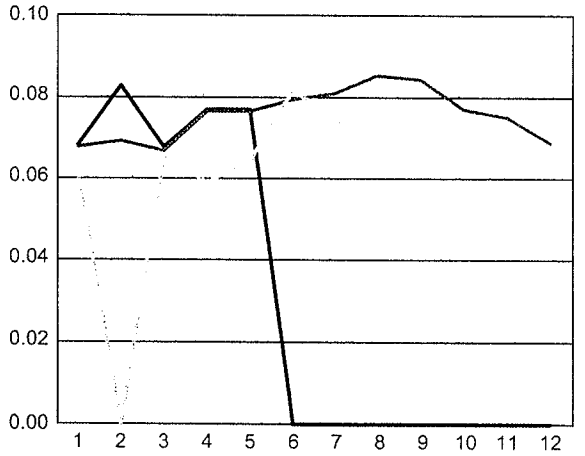
kW Per Month

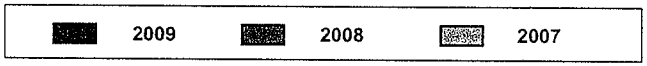


kWH Per Month



$ Avg Cost Per Month





3 Year Comparison - Service

Report Run On: 6/16/2009

MARINETTE COUNTY

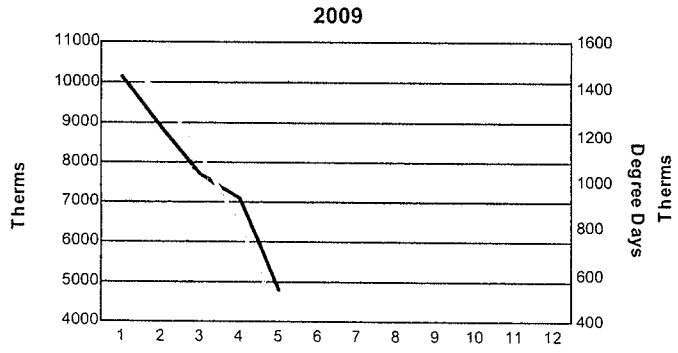
1926 HALL AVE LAW CENTER
MARINETTE, WI 54143

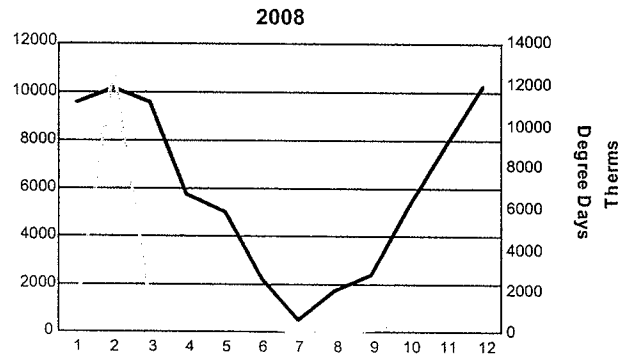
Account: **403120998-3**
Premise: **103091387**
Service: **5**

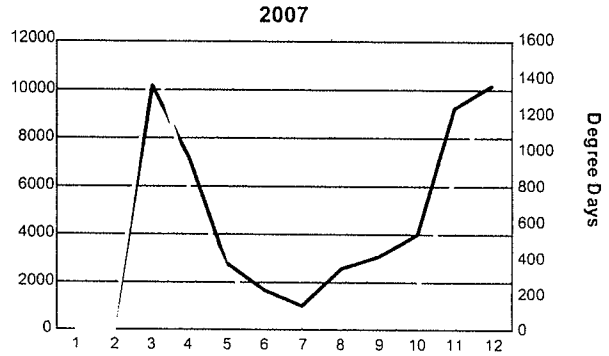
Service Type: **Gas**
Rate Schedule:**GCG-M**

Company Offering: **WINGO00008**
Date Last Billed: **Mav-09**
Operating District: **MARINETTE**

	2009						2008						2007					
	Therms	Heating DD	Therms /DD	Therms /Day	$ (w/o tax)	$/Therms Avg Cost	Therms	Heating DD	Therms /DD	Therms /Day	$ (w/o tax)	$/Therms Avg Cost	Therms	Heating DD	Therms /DD	Therms /Day	$ (w/o tax)	$/Therms Avg Cost
Jan	10,143.2	1,520	6.7	307.4	9,505.35	0.9371	9,563.6	1,264	7.6	341.6	8,412.89	0.8797						
Feb	8,866.3	1,376	6.4	385.5	7,672.43	0.8653	12,131.2	12,805	6.5	682.0	11,328.89	0.9339						
Mar	7,715.4	1,117	6.9	266.0	6,224.64	0.8068	9,571.1	1,375	7.0	368.1	9,585.62	1.0015	25,897.9	1,539	7.7	446.5	23,568.56	0.9101
Apr	7,090.2	814	8.7	214.9	4,559.18	0.6430	5,732.8	579	9.9	197.7	6,507.28	1.1351	7,137.5	787	9.1	216.3	6,501.47	0.9109
May	4,777.9	422	11.3	164.8	2,292.49	0.4798	5,020.0	492	10.2	167.3	5,747.80	1.1450	2,881.6	347	8.3	84.8	2,670.05	0.9266
Jun							2,282.4	201	11.4	84.5	2,859.68	1.2529	1,663.3	77	21.6	48.9	1,583.47	0.9520
Jul							545.3	14	39.0	15.6	872.60	1.6002	1,010.0	45	22.4	32.6	956.12	0.9467
Aug							1,750.7	22	79.6	58.4	1,873.28	1.0700	2,571.1	14	183.7	91.8	1,987.66	0.7731
Sep							2,410.4	137	17.6	77.8	2,273.20	0.9431	3,113.1	118	26.4	97.3	2,199.69	0.7066
Oct							5,321.2	387	13.7	177.4	4,072.54	0.7653	3,977.0	239	16.6	137.1	2,903.38	0.7300
Nov							7,834.0	811	9.7	237.4	6,170.08	0.7876	9,238.2	850	10.9	307.9	7,714.03	0.8350
Dec							10,209.1	1,453	7.0	340.3	8,946.66	0.8763	10,152.1	1,315	7.7	298.6	8,850.94	0.8718
	38,593.0				30,254.09	0.7839	72,371.8				68,650.52	0.9486	67,641.8				58,935.37	0.8713







Therms Month Degrees Day/Month

Projected Annual Savings
Marinette County Courthouse Annex Energy Study

Projected Annual Energy Savings 2009

No.	Energy Conservation Measures	Area Served (S.F.)	Estimated Annual Energy Savings Electrical	Estimated Annual Energy Savings Natural Gas (Therms)	Percent of the Baseline Consumption for the	Estimated Cost of Measures
1	**Fresh Air Intake Location**	30,000	0	0	0%	$10,000.00
2	**Mixing Box / Air Handeler Freeze Up (Glycol)**	30,000	0	2,500	35%	$4,500.00
3	**Sun Exposure / Solar Heat Gain (Film)**	30,000	0	1,040	15%	$1,700.00
4	**Courthouse Chiller**	100,000	0	0	0%	$70,000.00
5	**Appliance Improvements**	130,000	45,000	0	50%	$2,000.00
6	**Add East Annex Vestibule**	30,000	0	0	0%	$0.00
	Total:		**45,000**	**3,540**	**100%**	**$88,200.00**

Projected Annual Energy Savings 2010

No.	Energy Conservation Measures	Area Served (S.F.)	Estimated Annual Energy Savings Electrical (KWHs)	Estimated Annual Energy Savings Natural Gas (Therms)	Percent of the Baseline Consumption for the Measure, %	Estimated Cost of Measures
1	**Fresh Air Intake Location**	30,000	0	0	0%	$10,000.00
2	**Mixing Box / Air Handeler Freeze Up (Glycol)**	30,000	0	2,500	35%	$4,500.00
3	**Sun Exposure / Solar Heat Gain (Film)**	30,000	0	1,040	15%	$1,700.00
4	**Courthouse Chiller**	100,000	0	0	0%	$70,000.00
5	**Appliance Improvements**	130,000	45,000	0	50%	$2,000.00
6	**Add East Annex Vestibule**	30,000	0	0	0%	$0.00
	Total:		**45,000**	**3,540**	**100%**	**$88,200.00**

Projected Annual Energy Savings 2011

No.	Energy Conservation Measures	Area Served (S.F.)	Estimated Annual Energy Savings Electrical (KWHs)	Estimated Annual Energy Savings Natural Gas (Therms)	Percent of the Baseline Consumption for the Measure, %	Estimated Cost of Measures
1	**Fresh Air Intake Location**	30,000	0	0	0%	$10,000.00
2	**Mixing Box / Air Handeler Freeze Up (Glycol)**	30,000	0	2,500	35%	$4,500.00
3	**Sun Exposure / Solar Heat Gain (Film)**	30,000	0	1,040	15%	$1,700.00
4	**Courthouse Chiller**	100,000	0	0	0%	$70,000.00
5	**Appliance Improvements**	130,000	45,000	0	50%	$2,000.00
6	**Add East Annex Vestibule**	30,000	0	0	0%	$0.00
	Total:		**45,000**	**3,540**	**100%**	**$88,200.00**

APPENDIX

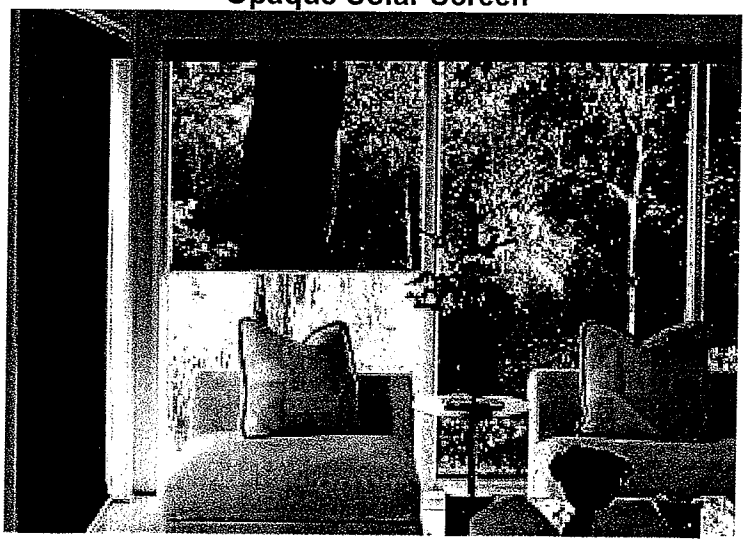
Table of Contents to Appendix

GLAZING

SOLAR SCREENS

As a previously used product on multiple window fixtures throughout the Marinette County Courthouse, Solar Roller Shades are an economical and cost efficient product. Solar Shades are a type of roller window shade generally made from a synthetic mesh fabric, like a screen. Solar window shades come in different levels of opaqueness, or openness, depending on how much light control you desire - the higher the percentage of openness of the solar shade, the more light the shade lets in. Solar shades are an excellent option for windows with a view. Solar screens reduce glare and improve energy efficiency by reducing solar heat gain and blocking harmful UV rays.

Opaque Solar Screen



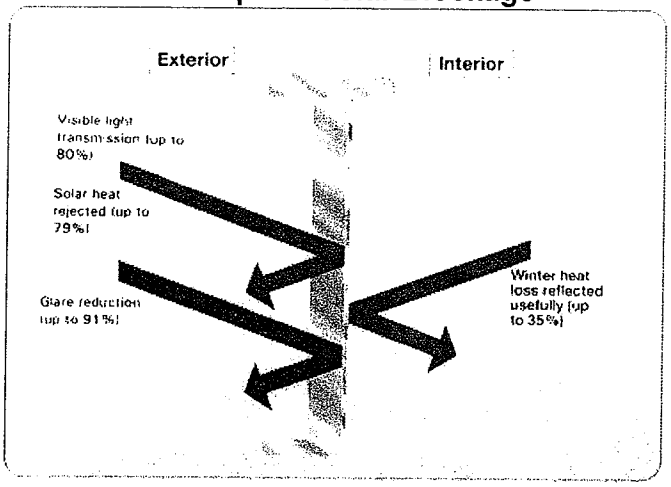
- Dramatically decreases the solar heat gain / visible light
- Allows maximum views to the outside

CONTROL FILMS

Solar Control Window Films are multi-layered, optically clear polyester, sputter-coated with exotic metals including titanium, stainless steel, copper, gold, silver and aluminum. Depending on the combination of metals used and the density of construction, these films can greatly enhance the performance of your glass.

Normally applied to the internal face and constructed with a scratch-resistant coating this advanced technology film can provide years of maintenance free benefits.

Conceptual Solar Blockage



Specifications:

47%	Visible Light Transmitted
56 – 79%	Total Solar Energy Rejected
98%	Ultraviolet Light Blocked
35%	Interior Window Heat Loss

Resource: Nationwide Window Tinting Services

SUN LOUVER (SOLAR SHADE)

By intercepting sunlight, before it strikes the window glass, the sun louvers dramatically reduce solar heat gain within the Structure and, at the same time, eliminates unwanted glare to keep occupants comfortable during daytime functions.

Kawneer's 1600 Sun Shade is economical, easy–to–install and can be used in both single–story and multi–story structures. Designed to integrate seamlessly into 1600 Wall System®1 or 5, 1600 Sun Shade saves installation time and money.

Type A

- (+) No Obstruction of view
- (-) No blockage of low solar angle heat gain

Type B

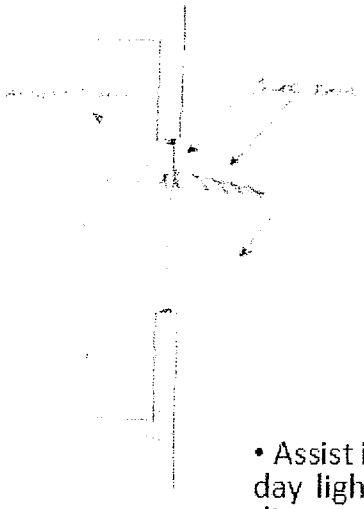
- (+) Blocks low solar angle heat gain
- (-) Obstructs view to the outside

LIGHT SHELF (SOLAR SHELF)

A light shelf is a horizontal reflective surface, at or above eye level, used both to passively channel natural daylight into an occupied space and provide shading. Sunlight is reflected from the upper surface of the light shelf into the room interior and particularly onto the ceiling where it provides additional diffuse light thus helping give uniform illumination and also allows sunlight to penetrate deeper into the interior of a building.

Some degree of control is possible by modifying the angle of the light shelf; either internally or externally in combination. Problems with low-angle winter sunlight penetration can give rise to glare. Difficulties can be experienced in cleaning light shelves, especially the external type. Under conditions of an overcast sky, light shelves cannot increase the lighting level. They operate most effectively in sunlight. In this context ceilings are designed to be higher than normal for best operation.

Light Shelf integrated with Solar Sun Louver



- Assist in achieving maximum day lighting while minimizing direct sunlight penetration and solar heat gain
- Possible obstruction of view to the outside