



Performance Services

—
**TIPTON COMMUNITY SCHOOL
CORPORATION**

Annual Report

YEAR 4



Performance Services, Inc.

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TABLE OF CONTENTS

GUARANTEE RESULTS	Page #:
Executive Summary	1
Savings Summary – Actual vs. Guaranteed	2
Detailed Energy Savings Breakdown	3
Utility Bill Vs. Actual Savings Comparison	4
Utility Data – Tipton High School	5
Utility Data – Tipton Middle and Elementary Schools	6
High School Equipment Runtimes Quarter 1	7
High School Equipment Runtimes Quarter 2	8
High School Equipment Runtimes Quarter 3	9
High School Equipment Runtimes Quarter 4	10
Fan Motor Runtimes Savings for Middle and Elementary	11
Constant Volume to Variable Speed Fan Conversion	12
Heating and Air-conditioning Savings Due to CO₂ Control	13
Jockey Boiler Installation Savings	14

Executive Summary

This Year 4 Annual Guarantee Report contains the savings results for the period of time between January 1, 2017 and December 31, 2017. This report is intended to provide an update on the savings performance to date and to help uncover potential operating problems.

ENERGY SAVINGS:

Actual Measured Energy Savings:	\$62,194 (electric)
	<u>\$29,326 (gas)</u>
	\$91,520

Guarantee Savings (12 months) **\$73,554**

Actual energy savings for the fourth guarantee year exceeded guaranteed energy savings by \$17,966 after adjusting for utility rate changes, operating schedule variations, and owner overrides. The Guarantee is based on a combination of measured, verified, and calculated savings that are the most accurate methods of determining actual savings.

OPERATIONAL SAVINGS:

Operational savings were estimated and agreed to up-front as part of the Guarantee. Therefore, the operational savings estimated as part of the Guarantee have been used in this Guarantee Report and will be used in each of the following Annual Guaranteed Reports. Annual operational savings is \$443,218.

LEARNING ENVIRONMENT:

Performance Services works hard to provide our customers with an optimal learning environment for their students. We have optimized the HVAC systems to provide consistent and appropriate comfort.

NEXT REPORT:

We will provide the Year 5 Annual Guarantee Report in Feb 2018. Please feel free to contact us at 888-390-2700 with any questions or comments.

CONTACTS:

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- Chris Rainey, Engineering Manager
- Scott Morris, Operations Vice President
- Scott Zigmond, Sales and Marketing Vice President
- Tim Thoman, President
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Annual Guaranteed Savings Report Summary

Year 4 - Quarter 4 (January 1, 2017- December 31, 2017)

Description	Guaranteed Savings	Calculated Savings	Net Difference
ENERGY SAVINGS			
Tipton High School			
* Electric	23,368	32,625	9,257
* Gas	10,972	12,243	1,270
	34,340	44,867	10,527
Tipton Middle & Elementary School			
* Electric	23,839	29,570	5,730
* Gas	15,375	17,083	1,708
	39,214	46,653	7,439
Sub-Total	73,554	91,520	17,966
OPERATIONAL SAVINGS			
Tipton High School			
* HVAC Renovation	204,512	204,512	-
Tipton Middle School & Elementary School			
* HVAC Renovation	238,706	238,706	-
Sub-Total	443,218	443,218	-
SAVINGS	516,772	534,738	17,966

Energy Savings Summary

Year 4 - Quarter 4 (January 1, 2017 - December 31, 2017)

Improvements	Electric Savings			Gas Savings			Total Savings		
	Guaranteed Ytd	Calculated Ytd	Difference Ytd	Guaranteed Ytd	Calculated Ytd	Difference Ytd	Guaranteed Ytd	Calculated Ytd	Difference Ytd
TIPTON COMMUNITY SCHOOLS									
Phase 1 Tipton High School Savings									-
* Savings due to installation of high efficiency jockey boiler	-	-	-	3,133	3,474	341	3,133	3,474	341
* Savings due to replacement of RTU	-	-	-	-	-	-	-	-	-
* Savings due to reducing fan speed on AHUs	10,378	14,154	3,776	-	-	-	10,378	14,154	3,776
* Savings due to reducing speed on hot water pumps	2,500	3,410	910	-	-	-	2,500	3,410	910
* Savings due to fan runtime reduction	9,434	13,621	4,187	-	-	-	9,434	13,621	4,187
* Savings due to controlling outside air with CO2 sensors	1,055	1,439	384	7,839	8,769	930	8,894	10,208	1,314
Phase 1 Savings Subtotal:	23,368	32,625	9,257	10,972	12,243	1,270	34,340	44,867	10,527
Phase 2 Tipton Middle School and Tipton Elementary School							-	-	-
* Savings due to fan runtime and speed reduction - Middle School	12,097	15,432	3,336	-	-	-	12,097	15,432	3,336
* Savings due to fan runtime and speed reduction - Elementary School	6,618	8,443	1,825	-	-	-	6,618	8,443	1,825
* Savings due to installation of additional roof insulation	5,125	5,694	569	15,375	17,083	1,708	20,500	22,778	2,278
Phase 2 Savings Subtotal:	23,839	29,570	5,730	15,375	17,083	1,708	39,214	46,653	7,439
TOTAL FOR ALL PHASES	\$ 47,207	\$ 62,194	\$ 14,987	\$ 26,347	\$ 29,326	\$ 2,979	\$ 73,554	\$ 91,520	\$ 17,966

No. of winter months into guarantee	7
No. of summer months into guarantee	5
Total	12

Utility Bill VS. Actual Savings Comparison			
Year 4			
Description	Utility Bill Savings	Owner Override Impact	Anticipated Utility Bill Change
UTILITY SAVINGS			
Tipton High School			
* Electric (not weather adjusted)	48,232	5,576	53,808
* Gas (weather adjusted)	3,182	681	3,863
Tipton Middle School/Elementary School			
* Electric (not weather adjusted)	68,309		68,309
* Gas (weather adjusted)	4,385	-	4,385
SAVINGS	124,109	6,257	130,366

Weather Adjusted Utility Bill Savings (Excludes all adjustment less weather)

Buildings:

Tipton High School

Timeframe			ELECTRIC								
			Utility: Tipton Utilities								
Base Year	Current Year	Month	Current Year			Base Year			Savings		
			Usage (kWh)	Rate (\$ / kWh)	Raw Costs (\$)	Raw Usage (kWh)	Rate (\$ / kWh)	Raw Costs (\$)	Usage (kWh)	Rate (\$ / kWh)	Savings (\$)
2011	2017	Jan	125,100	\$ 0.1119	\$ 13,943	189,000	\$ 0.0911	\$ 16,974	63,900	\$ 0.1119	\$ 7,149
2011	2017	Feb	134,400	\$ 0.1119	\$ 14,866	166,500	\$ 0.0911	\$ 15,136	32,100	\$ 0.1119	\$ 3,591
2011	2017	Mar	117,900	\$ 0.1119	\$ 13,711	161,400	\$ 0.0911	\$ 14,827	43,500	\$ 0.1119	\$ 4,867
2011	2017	Apr	112,200	\$ 0.1119	\$ 13,122	141,000	\$ 0.0911	\$ 13,147	28,800	\$ 0.1119	\$ 3,222
2011	2017	May	120,600	\$ 0.1119	\$ 13,990	142,200	\$ 0.0911	\$ 13,245	21,600	\$ 0.1119	\$ 2,417
2011	2017	Jun	124,500	\$ 0.1119	\$ 13,698	173,400	\$ 0.0911	\$ 16,024	48,900	\$ 0.1119	\$ 5,471
2011	2017	Jul	97,200	\$ 0.1119	\$ 11,030	127,200	\$ 0.0911	\$ 12,162	30,000	\$ 0.1119	\$ 3,356
2010	2017	Aug	120,000	\$ 0.1119	\$ 13,529	140,400	\$ 0.0911	\$ 12,488	20,400	\$ 0.1119	\$ 2,282
2010	2017	Sep	139,800	\$ 0.1119	\$ 15,158	173,400	\$ 0.0911	\$ 15,324	33,600	\$ 0.1119	\$ 3,759
2010	2017	Oct	115,500	\$ 0.1119	\$ 12,789	150,600	\$ 0.0911	\$ 13,510	35,100	\$ 0.1119	\$ 3,927
2010	2017	Nov	120,000	\$ 0.1119	\$ 13,228	150,000	\$ 0.0911	\$ 13,462	30,000	\$ 0.1119	\$ 3,356
2010	2017	Dec	116,400	\$ 0.1119	\$ 12,449	159,600	\$ 0.0911	\$ 14,572	43,200	\$ 0.1119	\$ 4,833
Total			1,443,600	\$ 0.1119	\$ 161,513	1,874,700	\$ 0.0911	\$ 170,872	431,100	\$ 0.1119	\$ 48,232

Total: \$ 51,415

Timeframe			GAS												
			Utility: Vectren												
Base Year	Current Year	Month	Current Year				Base Year						Savings		
			Weather (HDD)	Usage (Therms)	Rate (\$ / Therm)	Raw Costs (\$)	Weather (HDD)	Raw Usage (Therms)	Rate (\$ / Therm)	Raw Costs (\$)	Weather Adjustment	Adj. Usage (Therms)	Usage (Therms)	Rate (\$ / Therm)	Savings (\$)
2011	2017	Jan	925	8,863	\$ 0.5933	\$ 5,025	1,269	11,418	\$ 0.9218	\$ 9,917	0.73	8,323	(540)	\$ 0.9218	\$ (498)
2011	2017	Feb	599	5,210	\$ 0.5933	\$ 3,119	878	9,605	\$ 0.9218	\$ 8,195	0.68	6,553	1,343	\$ 0.9218	\$ 1,238
2011	2017	Mar	651	4,198	\$ 0.5933	\$ 2,427	660	5,992	\$ 0.9218	\$ 5,333	0.99	5,910	1,712	\$ 0.9218	\$ 1,578
2011	2017	Apr	190	3,340	\$ 0.5933	\$ 1,973	276	4,340	\$ 0.9218	\$ 3,617	0.69	2,988	(352)	\$ 0.9218	\$ (324)
2011	2017	May	147	1,924	\$ 0.5933	\$ 1,204	151	2,632	\$ 0.9218	\$ 2,209	1.00	2,632	708	\$ 0.9218	\$ 653
2011	2017	Jun	3	470	\$ 0.5933	\$ 277	-	657	\$ 0.9218	\$ 689	1.00	657	187	\$ 0.9218	\$ 172
2011	2017	Jul	-	87	\$ 0.5933	\$ 206	-	220	\$ 0.9218	\$ 335	1.00	220	133	\$ 0.9218	\$ 123
2010	2017	Aug	-	210	\$ 0.5933	\$ 272	-	179	\$ 0.9218	\$ 262	1.00	179	(31)	\$ 0.9218	\$ (29)
2010	2017	Sep	29	363	\$ 0.5933	\$ 353	19	849	\$ 0.9218	\$ 944	1.00	849	486	\$ 0.9218	\$ 448
2010	2017	Oct	251	534	\$ 0.5933	\$ 441	230	1,714	\$ 0.9218	\$ 1,985	1.09	1,870	1,336	\$ 0.9218	\$ 1,232
2010	2017	Nov	624	4,450	\$ 0.5933	\$ 2,592	601	3,587	\$ 0.9218	\$ 4,445	1.04	3,724	(726)	\$ 0.9218	\$ (669)
2010	2017	Dec	1,069	7,977	\$ 0.5933	\$ 4,436	1,220	8,185	\$ 0.9218	\$ 7,585	0.88	7,172	(805)	\$ 0.9218	\$ (742)
Total			4,488	37,625	\$ 0.5933	\$ 22,324	5,304	49,378	\$ 0.9218	\$ 45,517	0.85	41,077	3,452	\$ 0.9218	\$ 3,182

Weather Adjusted Utility Bill Savings

(Excludes all adjustment less weather)

Buildings:

Tipton Middle and Elementary Schools

Timeframe			ELECTRIC								
			Utility: Tipton Utilities								
Base Year	Current Year	Month	Current Year			Base Year			Savings		
			Usage (kWh)	Rate (\$ / kWh)	Raw Costs (\$)	Raw Usage (kWh)	Rate (\$ / kWh)	Raw Costs (\$)	Usage (kWh)	Rate (\$ / kWh)	Savings (\$)
2011	2017	Jan	150,300	\$ 0.1057	\$ 17,026	222,300	\$ 0.0921	\$ 20,278	72,000	\$ 0.1057	\$ 7,611
2011	2017	Feb	162,900	\$ 0.1057	\$ 18,276	191,700	\$ 0.0921	\$ 17,777	28,800	\$ 0.1057	\$ 3,044
2011	2017	Mar	136,800	\$ 0.1057	\$ 16,245	188,100	\$ 0.0921	\$ 17,609	51,300	\$ 0.1057	\$ 5,423
2011	2017	Apr	131,400	\$ 0.1057	\$ 15,688	158,400	\$ 0.0921	\$ 15,162	27,000	\$ 0.1057	\$ 2,854
2011	2017	May	149,400	\$ 0.1057	\$ 17,547	171,900	\$ 0.0921	\$ 16,275	22,500	\$ 0.1057	\$ 2,378
2011	2017	Jun	146,700	\$ 0.1057	\$ 16,450	225,900	\$ 0.0921	\$ 20,994	79,200	\$ 0.1057	\$ 8,372
2011	2017	Jul	128,700	\$ 0.1057	\$ 14,691	158,400	\$ 0.0921	\$ 15,352	29,700	\$ 0.1057	\$ 3,140
2010	2017	Aug	145,800	\$ 0.1057	\$ 2,055	194,400	\$ 0.0921	\$ 17,285	48,600	\$ 0.1057	\$ 5,137
2010	2017	Sep	154,800	\$ 0.1057	\$ 17,203	243,000	\$ 0.0921	\$ 21,443	88,200	\$ 0.1057	\$ 9,324
2010	2017	Oct	135,900	\$ 0.1057	\$ 15,360	206,100	\$ 0.0921	\$ 18,507	70,200	\$ 0.1057	\$ 7,421
2010	2017	Nov	117,000	\$ 0.1057	\$ 13,518	170,100	\$ 0.0921	\$ 15,644	53,100	\$ 0.1057	\$ 5,613
2010	2017	Dec	108,900	\$ 0.1057	\$ 12,328	184,500	\$ 0.0921	\$ 16,789	75,600	\$ 0.1057	\$ 7,992
Total			1,668,600	\$ 0.1057	\$ 176,387	2,314,800	\$ 0.0921	\$ 213,115	646,200	\$ 0.1057	\$ 68,309

Total: \$ 72,695

Timeframe			GAS											
			Utility: Vectren											
Base Year	Current Year	Month	Current Year				Base Year				Savings			
			Weather (HDD)	Usage (Therms)	Rate (\$ / Therm)	Raw Costs (\$)	Weather (HDD)	Raw Usage (Therms)	Rate (\$ / Therm)	Raw Costs (\$)	Weather Adjustment	Adj. Usage (Therms)	Usage (Therms)	Savings (\$)
2011	2017	Jan	925	16,723	\$ 0.5171	\$ 8,129	1,269	23,311	\$ 0.9386	\$ 21,597	0.73	16,992	269	\$ 0.9386 \$ 252
2011	2017	Feb	599	11,716	\$ 0.5171	\$ 5,839	878	19,552	\$ 0.9386	\$ 18,345	0.68	13,339	1,623	\$ 0.9386 \$ 1,524
2011	2017	Mar	651	10,778	\$ 0.5171	\$ 5,374	660	14,096	\$ 0.9386	\$ 13,286	0.99	13,904	3,126	\$ 0.9386 \$ 2,934
2011	2017	Apr	190	6,039	\$ 0.5171	\$ 3,387	276	8,815	\$ 0.9386	\$ 7,905	0.69	6,068	29	\$ 0.9386 \$ 28
2011	2017	May	147	4,507	\$ 0.5171	\$ 2,695	151	4,218	\$ 0.9386	\$ 3,895	1.00	4,218	(289)	\$ 0.9386 \$ (271)
2011	2017	Jun	3	1,366	\$ 0.5171	\$ 1,089	-	778	\$ 0.9386	\$ 1,178	1.00	778	(588)	\$ 0.9386 \$ (552)
2011	2017	Jul	-	1,038	\$ 0.5171	\$ 1,031	-	531	\$ 0.9386	\$ 993	1.00	531	(507)	\$ 0.9386 \$ (476)
2010	2017	Aug	-	1,083	\$ 0.5171	\$ 1,036	-	632	\$ 0.9386	\$ 1,036	1.00	632	(451)	\$ 0.9386 \$ (423)
2010	2017	Sep	29	1,516	\$ 0.5171	\$ 1,256	19	1,510	\$ 0.9386	\$ 1,671	1.00	1,510	(6)	\$ 0.9386 \$ (5)
2010	2017	Oct	251	4,332	\$ 0.5171	\$ 2,748	230	3,810	\$ 0.9386	\$ 3,761	1.09	4,158	(174)	\$ 0.9386 \$ (163)
2010	2017	Nov	624	12,072	\$ 0.5171	\$ 5,712	601	10,052	\$ 0.9386	\$ 10,068	1.04	10,437	(1,635)	\$ 0.9386 \$ (1,535)
2010	2017	Dec	1,069	19,293	\$ 0.5171	\$ 8,479	1,220	25,755	\$ 0.9386	\$ 22,389	0.88	22,567	3,274	\$ 0.9386 \$ 3,073
Total			4,488	90,462	\$ 0.5171	\$ 46,774	5,304	113,060	\$ 0.9386	\$ 106,123	0.85	95,134	4,672	\$ 0.9386 \$ 4,385

Actual Equipment Usage

Year 4 - Quarter 1 (January 1, 2017 - March 31, 2017)

Building	System ID	January					February					March					1st Quarter Savings								
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	Savings (\$)	
		31	31				28	28				31	31				90	90							
																		0	0						
Tipton High School	AHD-A1 Auditorium	272	234	290	56	38	245	211	241	30	34	272	234	280	46	38	788	679	811	132	110	18.7	\$ 0.112	\$ 229	
Tipton High School	AHD-A2 Stage	272	234	289	56	38	245	211	241	30	34	272	234	280	46	38	788	679	811	132	110	4.7	\$ 0.112	\$ 57	
Tipton High School	AHD-A3 Music Office	272	254	289	36	18	245	229	241	12	16	272	254	280	26	18	788	737	810	73	52	0.7	\$ 0.112	\$ 4	
Tipton High School	AHD-A4 Stage Craft	272	234	686	452	38	245	211	611	400	34	272	234	381	147	38	788	679	1,678	999	110	1.5	\$ 0.112	\$ 18	
Tipton High School	AHD-A5 Auditorium Lobby	272	234	410	177	38	245	211	303	92	34	272	234	364	130	38	788	679	1,077	399	110	13.6	\$ 0.112	\$ 167	
Tipton High School	AHB-A6 Music Area	300	234	290	56	66	271	211	241	30	60	300	234	280	46	66	870	679	811	132	192	4.7	\$ 0.112	\$ 100	
Tipton High School	AHD-A7 Art Room	292	234	490	256	58	264	211	385	173	53	292	234	413	179	58	849	679	1,288	609	170	3.0	\$ 0.112	\$ 57	
Tipton High School	AHD-B1 Aux Gym	300	154	260	106	146	271	139	234	95	132	300	154	282	128	146	870	447	776	329	423	14.0	\$ 0.112	\$ 662	
Tipton High School	AHD-B2 Aux Gym	300	154	130	(25)	146	271	139	27	(112)	132	300	154	54	(100)	146	870	447	211	(237)	423	14.0	\$ 0.112	\$ 662	
Tipton High School	AHZ-B1 Locker Rooms	281	234	297	63	47	254	211	236	25	43	281	234	278	45	47	816	679	812	133	137	9.3	\$ 0.112	\$ 143	
Tipton High School	AHZ-B2 Upper Gym	300	234	477	244	67	271	211	138	(73)	60	300	234	234	-	67	872	679	850	171	193	7.0	\$ 0.112	\$ 151	
Tipton High School	AHU-D1 Cafeteria	281	234	471	237	47	254	211	221	10	43	281	234	234	-	47	816	679	926	247	137	9.3	\$ 0.112	\$ 143	
Tipton High School	AHU-2 Main Gym	300	234	243	9	66	271	211	50	(162)	60	300	234	234	-	66	870	679	526	(153)	192	4.7	\$ 0.112	\$ 100	
Tipton High School	AHU-A1 Wood Shop	286	234	649	415	52	258	211	240	29	47	286	234	234	-	52	829	679	1,123	444	151	4.7	\$ 0.112	\$ 79	
Tipton High School	AHU-A2 Metal Shop	281	234	652	418	47	254	211	240	29	43	281	234	234	-	47	816	679	1,126	447	137	4.7	\$ 0.112	\$ 71	
Tipton High School	AHU-A3 Ag Shop	286	234	667	433	52	258	211	262	50	47	286	234	234	-	52	829	679	1,163	484	151	4.7	\$ 0.112	\$ 79	
Total																								\$ 2,721	

*Hours in Yellow are guaranteed hours since the runtimes could not be accessed by the system

Building	System ID	1st Quarter Cost of Adjustments											
		Jan-Feb-Mar											
									Motor Unit	Motor Total	Heat Unit	Heat Total	
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	(\$ / Hour)	(\$ / Period)	(\$ / Hour)	(\$ / Period)	
Tipton High School	AHD-A1 Auditorium	788	679	811	132	110	18.7	\$ 0.112	\$ 2.09	\$ 275	\$ 0.42	\$ 55	
Tipton High School	AHD-A2 Stage	788	679	811	132	110	4.7	\$ 0.112	\$ 0.52	\$ 69	\$ 0.11	\$ 15	
Tipton High School	AHD-A3 Music Office	788	737	810	73	52	0.7	\$ 0.112	\$ 0.08	\$ 6	\$ -	\$ -	
Tipton High School	AHD-A4 Stage Craft	788	679	1,678	999	110	1.5	\$ 0.112	\$ 0.17	\$ 167	\$ 0.04	\$ 43	
Tipton High School	AHD-A5 Auditorium Lobby	788	679	1,077	399	110	13.6	\$ 0.112	\$ 1.52	\$ 606	\$ 0.55	\$ 218	
Tipton High School	AHB-A6 Music Area	870	679	811	132	192	4.7	\$ 0.112	\$ 0.52	\$ 69	\$ -	\$ -	
Tipton High School	AHD-A7 Art Room	849	679	1,288	609	170	3.0	\$ 0.112	\$ 0.33	\$ 203	\$ (0.04)	\$ (24)	
Tipton High School	AHD-B1 Aux Gym	870	447	776	329	423	14.0	\$ 0.112	\$ 1.56	\$ 515	\$ 0.48	\$ 158	
Tipton High School	AHD-B2 Aux Gym	870	447	211	(237)	423	14.0	\$ 0.112	\$ 1.56	\$ (371)	\$ 0.48	\$ (114)	
Tipton High School	AHZ-B1 Locker Rooms	816	679	812	133	137	9.3	\$ 0.112	\$ 1.04	\$ 138	\$ -	\$ -	
Tipton High School	AHZ-B2 Upper Gym	872	679	850	171	193	7.0	\$ 0.112	\$ 0.78	\$ 134	\$ -	\$ -	
Tipton High School	AHU-D1 Cafeteria	816	679	926	247	137	9.3	\$ 0.112	\$ 1.04	\$ 258	\$ 0.95	\$ 235	
Tipton High School	AHU-2 Main Gym	870	679	526	(153)	192	4.7	\$ 0.112	\$ 0.52	\$ (80)	\$ 1.13	\$ (173)	
Tipton High School	AHU-A1 Wood Shop	829	679	1,123	444	151	4.7	\$ 0.112	\$ 0.52	\$ 232	\$ 0.23	\$ 103	
Tipton High School	AHU-A2 Metal Shop	816	679	1,126	447	137	4.7	\$ 0.112	\$ 0.52	\$ 233	\$ 0.23	\$ 103	
Tipton High School	AHU-A3 Ag Shop	829	679	1,163	484	151	4.7	\$ 0.112	\$ 0.52	\$ 252	\$ 0.36	\$ 172	
Total										\$ 2,706		\$ 792	

Actual Equipment Usage

Year 4 - Quarter 2 (April 1, 2017 - June 30, 2017)

Building	System ID	April					May					June					2nd Quarter Savings								
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	Savings (\$)	
		30	30				31	31				30	30				91	91							
																		0	0						
Tipton High School	AHD-A1 Auditorium	263	226	191	(35)	37	272	234	241	7	38	209	72	180	108	137	743	532	612	79	211	18.7	\$ 0.112	\$ 441	
Tipton High School	AHD-A2 Stage	263	226	191	(35)	37	272	234	241	7	38	209	72	180	108	137	743	532	611	79	211	4.7	\$ 0.112	\$ 110	
Tipton High School	AHD-A3 Music Office	263	246	191	(54)	17	272	254	241	(13)	18	209	168	180	11	41	743	668	611	(56)	76	0.7	\$ 0.112	\$ 6	
Tipton High School	AHD-A4 Stage Craft	263	226	212	(14)	37	272	234	230	(4)	38	209	72	201	129	137	743	532	643	110	211	1.5	\$ 0.112	\$ 35	
Tipton High School	AHD-A5 Auditorium Lobby	263	226	228	2	37	272	234	274	40	38	209	72	244	172	137	743	532	746	214	211	13.6	\$ 0.112	\$ 321	
Tipton High School	AHB-A6 Music Area	290	226	191	(35)	64	300	234	241	7	66	240	168	180	11	71	830	629	612	(17)	201	4.7	\$ 0.112	\$ 105	
Tipton High School	AHD-A7 Art Room	283	226	277	51	57	292	234	247	13	58	231	168	201	33	63	807	629	725	97	178	3.0	\$ 0.112	\$ 59	
Tipton High School	AHD-B1 Aux Gym	290	149	203	54	141	300	154	209	54	146	240	72	194	122	168	830	375	605	230	454	14.0	\$ 0.112	\$ 711	
Tipton High School	AHD-B2 Aux Gym	290	149	4	(145)	141	300	154	1	(154)	146	240	72	38	(34)	168	830	375	42	(333)	454	14.0	\$ 0.112	\$ 711	
Tipton High School	AHZ-B1 Locker Rooms	272	226	200	(27)	46	281	234	209	(25)	47	219	168	194	25	51	772	629	602	(26)	144	9.3	\$ 0.112	\$ 150	
Tipton High School	AHZ-B2 Upper Gym	291	226	111	(115)	64	300	234	144	(90)	67	240	168	166	(3)	72	831	629	421	(208)	203	7.0	\$ 0.112	\$ 159	
Tipton High School	AHU-D1 Cafeteria	272	226	181	(45)	46	281	234	204	(30)	47	219	72	166	94	147	772	532	552	20	240	9.3	\$ 0.112	\$ 250	
Tipton High School	AHU-2 Main Gym	290	226	-	-	-	300	234	18	(216)	66	240	168	150	(18)	71	539	402	169	(234)	137	4.7	\$ 0.112	\$ 72	
Tipton High School	AHU-A1 Wood Shop	276	226	203	(23)	50	286	234	229	(5)	52	224	72	180	108	152	786	532	612	80	254	4.7	\$ 0.112	\$ 133	
Tipton High School	AHU-A2 Metal Shop	272	226	203	(23)	46	281	234	229	(5)	47	219	72	180	108	147	772	532	612	80	240	4.7	\$ 0.112	\$ 125	
Tipton High School	AHU-A3 Ag Shop	276	226	208	(18)	50	286	234	229	(5)	52	224	72	180	108	152	786	532	617	85	254	4.7	\$ 0.112	\$ 133	
Total																								\$ 3,521	

Building	System ID	2nd Quarter Cost of Adjustments											
		Apr-May-Jun											
									Motor Unit	Motor Total	Heat Unit	Heat Total	
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	(\$ / Hour)	(\$ / Period)	(\$ / Hour)	(\$ / Period)	
Tipton High School	AHD-A1 Auditorium	743	532	612	79	211	18.7	\$ 0.112	\$ 2.09	\$ 166	\$ 0.42	\$ (15)	
Tipton High School	AHD-A2 Stage	743	532	611	79	211	4.7	\$ 0.112	\$ 0.52	\$ 41	\$ 0.11	\$ (4)	
Tipton High School	AHD-A3 Music Office	743	668	611	(56)	76	0.7	\$ 0.112	\$ 0.08	\$ (5)	\$ -	\$ -	
Tipton High School	AHD-A4 Stage Craft	743	532	643	110	211	1.5	\$ 0.112	\$ 0.17	\$ 18	\$ 0.04	\$ (1)	
Tipton High School	AHD-A5 Auditorium Lobby	743	532	746	214	211	13.6	\$ 0.112	\$ 1.52	\$ 325	\$ 0.55	\$ 1	
Tipton High School	AHB-A6 Music Area	830	629	612	(17)	201	4.7	\$ 0.112	\$ 0.52	\$ (9)	\$ -	\$ -	
Tipton High School	AHD-A7 Art Room	807	629	725	97	178	3.0	\$ 0.112	\$ 0.33	\$ 32	\$ (0.04)	\$ (2)	
Tipton High School	AHD-B1 Aux Gym	830	375	605	230	454	14.0	\$ 0.112	\$ 1.56	\$ 360	\$ 0.48	\$ 26	
Tipton High School	AHD-B2 Aux Gym	830	375	42	(333)	454	14.0	\$ 0.112	\$ 1.56	\$ (521)	\$ 0.48	\$ (70)	
Tipton High School	AHZ-B1 Locker Rooms	772	629	602	(26)	144	9.3	\$ 0.112	\$ 1.04	\$ (27)	\$ -	\$ -	
Tipton High School	AHZ-B2 Upper Gym	831	629	421	(208)	203	7.0	\$ 0.112	\$ 0.78	\$ (163)	\$ -	\$ -	
Tipton High School	AHU-D1 Cafeteria	772	532	552	20	240	9.3	\$ 0.112	\$ 1.04	\$ 21	\$ 0.95	\$ (43)	
Tipton High School	AHU-2 Main Gym	539	402	169	(234)	137	4.7	\$ 0.112	\$ 0.52	\$ (122)	\$ 1.13	\$ -	
Tipton High School	AHU-A1 Wood Shop	786	532	612	80	254	4.7	\$ 0.112	\$ 0.52	\$ 42	\$ 0.23	\$ (5)	
Tipton High School	AHU-A2 Metal Shop	772	532	612	80	240	4.7	\$ 0.112	\$ 0.52	\$ 42	\$ 0.23	\$ (5)	
Tipton High School	AHU-A3 Ag Shop	786	532	617	85	254	4.7	\$ 0.112	\$ 0.52	\$ 44	\$ 0.36	\$ (7)	
Total										\$ 245		\$ (124)	

Actual Equipment Usage

Year 4 - Quarter 3 (July 1, 2017 - September 30, 2017)

Building	System ID	July					August					September					3rd Quarter Savings							
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	Savings (\$)
		31	31				31	31				30	30				92 0	92 0						
Tipton High School	AHD-A1 Auditorium	216	74	156	82	142	230	116	227	111	115	263	226	209	(18)	37	709	416	592	176	293	18.7	\$ 0.112	\$ 611
Tipton High School	AHD-A2 Stage	216	74	83	9	142	230	116	201	85	115	263	226	209	(18)	37	709	416	492	76	293	4.7	\$ 0.112	\$ 153
Tipton High School	AHD-A3 Music Office	216	135	157	22	81	230	121	226	106	110	263	246	223	(22)	17	709	502	607	105	207	0.7	\$ 0.112	\$ 17
Tipton High School	AHD-A4 Stage Craft	216	74	199	124	142	230	116	237	121	115	263	226	203	(23)	37	709	416	638	222	293	1.5	\$ 0.112	\$ 49
Tipton High School	AHD-A5 Auditorium Lobby	216	74	243	169	142	230	116	322	206	115	263	226	279	53	37	709	416	843	427	293	13.6	\$ 0.112	\$ 446
Tipton High School	AHU-A6 Music Area	248	135	155	20	112	261	116	225	109	146	290	226	223	(3)	64	799	477	603	126	321	4.7	\$ 0.112	\$ 168
Tipton High School	AHD-A7 Art Room	239	135	198	63	104	253	116	237	121	137	283	226	211	(15)	57	775	477	646	169	298	3.0	\$ 0.112	\$ 99
Tipton High School	AHD-B1 Aux Gym-	248	74	159	85	173	261	95	144	49	166	290	149	74	(75)	141	799	319	376	58	480	14.0	\$ 0.112	\$ 752
Tipton High School	AHD-B2 Aux Gym	248	74	57	(18)	173	261	95	263	168	166	290	149	239	89	141	799	319	559	240	480	14.0	\$ 0.112	\$ 752
Tipton High School	AHZ-B1 Locker Rooms	227	135	173	38	91	241	116	140	25	125	272	226	238	12	46	739	477	552	74	262	9.3	\$ 0.112	\$ 273
Tipton High School	AHZ-B2 Upper Gym	248	135	54	(81)	113	262	116	143	28	146	291	226	140	(87)	64	801	477	337	(140)	323	7.0	\$ 0.112	\$ 253
Tipton High School	AHU-D1 Cafeteria	227	74	9	(66)	152	241	116	184	69	125	272	226	220	(6)	46	739	416	413	(3)	323	9.3	\$ 0.112	\$ 337
Tipton High School	AHU-2 Main Gym	248	135	54	(82)	112	261	116	2	(113)	146	290	226	0	(226)	64	799	477	57	(421)	321	4.7	\$ 0.112	\$ 168
Tipton High School	AHU-A1 Wood Shop	232	74	0	(74)	157	246	116	182	66	130	276	226	209	(17)	50	754	416	391	(25)	338	4.7	\$ 0.112	\$ 176
Tipton High School	AHU-A2 Metal Shop	227	74	0	(74)	152	241	116	182	66	125	272	226	209	(17)	46	739	416	391	(25)	323	4.7	\$ 0.112	\$ 168
Tipton High School	AHU-A3 Ag Shop	232	74	0	(74)	157	246	116	191	75	130	276	226	216	(10)	50	754	416	407	(10)	338	4.7	\$ 0.112	\$ 176
Total																								\$ 4,597

Building	System ID	3rd Quarter Cost of Adjustments											
		Jul-Aug-Sep											
										Motor Unit	Motor Total	Heat Unit	Heat Total
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	(\$ / Hour)	(\$ / Period)	(\$ / Hour)	(\$ / Period)	
Tipton High School	AHD-A1 Auditorium	709	416	592	176	293	18.7	\$ 0.112	\$ 2.09	\$ 367	\$ 0.42	\$ -	
Tipton High School	AHD-A2 Stage	709	416	492	76	293	4.7	\$ 0.112	\$ 0.52	\$ 40	\$ 0.11	\$ -	
Tipton High School	AHD-A3 Music Office	709	502	607	105	207	0.7	\$ 0.112	\$ 0.08	\$ 9	\$ -	\$ -	
Tipton High School	AHD-A4 Stage Craft	709	416	638	222	293	1.5	\$ 0.112	\$ 0.17	\$ 37	\$ 0.04	\$ -	
Tipton High School	AHD-A5 Auditorium Lobby	709	416	843	427	293	13.6	\$ 0.112	\$ 1.52	\$ 650	\$ 0.55	\$ -	
Tipton High School	AHU-A6 Music Area	799	477	603	126	321	4.7	\$ 0.112	\$ 0.52	\$ 66	\$ -	\$ -	
Tipton High School	AHD-A7 Art Room	775	477	646	169	298	3.0	\$ 0.112	\$ 0.33	\$ 56	\$ (0.04)	\$ -	
Tipton High School	AHD-B1 Aux Gym-	799	319	376	58	480	14.0	\$ 0.112	\$ 1.56	\$ 90	\$ 0.48	\$ -	
Tipton High School	AHD-B2 Aux Gym	799	319	559	240	480	14.0	\$ 0.112	\$ 1.56	\$ 376	\$ 0.48	\$ -	
Tipton High School	AHZ-B1 Locker Rooms	739	477	552	74	262	9.3	\$ 0.112	\$ 1.04	\$ 77	\$ -	\$ -	
Tipton High School	AHZ-B2 Upper Gym	801	477	337	(140)	323	7.0	\$ 0.112	\$ 0.78	\$ (110)	\$ -	\$ -	
Tipton High School	AHU-D1 Cafeteria	739	416	413	(3)	323	9.3	\$ 0.112	\$ 1.04	\$ (3)	\$ 0.95	\$ -	
Tipton High School	AHU-2 Main Gym	799	477	57	(421)	321	4.7	\$ 0.112	\$ 0.52	\$ (219)	\$ 1.13	\$ -	
Tipton High School	AHU-A1 Wood Shop	754	416	391	(25)	338	4.7	\$ 0.112	\$ 0.52	\$ (13)	\$ 0.23	\$ -	
Tipton High School	AHU-A2 Metal Shop	739	416	391	(25)	323	4.7	\$ 0.112	\$ 0.52	\$ (13)	\$ 0.23	\$ -	
Tipton High School	AHU-A3 Ag Shop	754	416	407	(10)	338	4.7	\$ 0.112	\$ 0.52	\$ (5)	\$ 0.36	\$ -	
Total										\$ 1,404		\$ -	

Actual Equipment Usage

Year 4 - Quarter 4 (October 1, 2017 - December 31, 2017)

Building	System ID	October					November					December					4th Quarter Savings								
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	Savings (\$)	
		31	31				30	30				31	31				92 0	92 0							
Tipton High School	AHD-A1 Auditorium	272	234	260	27	38	263	226	269	42	37	272	234	254	21	38	806	694	783	89	112	18.7	\$ 0.112	\$ 234	
Tipton High School	AHD-A2 Stage	272	234	260	27	38	263	226	269	42	37	272	234	254	20	38	806	694	783	89	112	4.7	\$ 0.112	\$ 58	
Tipton High School	AHD-A3 Music Office	272	254	260	7	18	263	246	269	23	17	272	254	254	0	18	806	753	783	30	53	0.7	\$ 0.112	\$ 4	
Tipton High School	AHD-A4 Stage Craft	272	234	254	20	38	263	226	538	312	37	272	234	742	508	38	806	694	1,534	840	112	1.5	\$ 0.112	\$ 19	
Tipton High School	AHD-A5 Auditorium Lobby	272	234	309	75	38	263	226	330	104	37	272	234	328	94	38	806	694	967	273	112	13.6	\$ 0.112	\$ 170	
Tipton High School	AHB-A6 Music Area	300	234	261	27	66	290	226	269	42	64	300	234	254	20	66	890	694	783	89	196	4.7	\$ 0.112	\$ 102	
Tipton High School	AHD-A7 Art Room	292	234	294	61	58	283	226	427	201	57	292	234	512	278	58	867	694	1,234	540	173	3.0	\$ 0.112	\$ 58	
Tipton High School	AHD-B1 Aux Gym	300	154	9	(145)	146	290	149	46	(103)	141	300	154	91	(63)	146	890	457	147	(311)	432	14.0	\$ 0.112	\$ 677	
Tipton High School	AHD-B2 Aux Gym	300	154	262	107	146	290	149	288	139	141	300	154	294	139	146	890	457	843	386	432	14.0	\$ 0.112	\$ 677	
Tipton High School	AHZ-B1 Locker Rooms	281	234	262	28	47	272	226	287	61	46	281	234	294	60	47	834	694	843	149	140	9.3	\$ 0.112	\$ 146	
Tipton High School	AHZ-B2 Upper Gym	300	234	170	(63)	67	291	226	245	19	64	300	234	261	27	67	891	694	677	(17)	198	7.0	\$ 0.112	\$ 155	
Tipton High School	AHU-D1 Cafeteria	281	234	218	(16)	47	272	226	228	2	46	281	234	209	(25)	47	834	694	655	(39)	140	9.3	\$ 0.112	\$ 146	
Tipton High School	AHU-2 Main Gym	300	234	2	(232)	66	290	226	204	(22)	64	300	234	261	27	66	890	694	467	(227)	196	4.7	\$ 0.112	\$ 102	
Tipton High School	AHU-A1 Wood Shop	286	234	224	(10)	52	276	226	247	21	50	286	234	266	32	52	848	694	736	42	154	4.7	\$ 0.112	\$ 80	
Tipton High School	AHU-A2 Metal Shop	281	234	224	(10)	47	272	226	247	21	46	281	234	266	32	47	834	694	737	43	140	4.7	\$ 0.112	\$ 73	
Tipton High School	AHU-A3 Ag Shop	286	234	228	(6)	52	276	226	254	27	50	286	234	322	88	52	848	694	804	110	154	4.7	\$ 0.112	\$ 80	
Total																								\$ 2,782	

Building	System ID	4th Quarter Cost of Adjustments											
		Oct-Nov-Dec											
									Motor Unit	Motor Total	Heat Unit	Heat Total	
		Base Yr. (Hours)	Guar. (Hours)	Actual (Hours)	Adjusted (Hours)	Saved (Hours)	Power (kW)	kWh Rate (kWh / Hr)	(\$ / Hour)	(\$ / Period)	(\$ / Hour)	(\$ / Period)	
Tipton High School	AHD-A1 Auditorium	806	694	783	89	112	18.7	\$ 0.112	\$ 2.09	\$ 187	\$ 0.42	\$ 38	
Tipton High School	AHD-A2 Stage	806	694	783	89	112	4.7	\$ 0.112	\$ 0.52	\$ 47	\$ 0.11	\$ 10	
Tipton High School	AHD-A3 Music Office	806	753	783	30	53	0.7	\$ 0.112	\$ 0.08	\$ 2	\$ -	\$ -	
Tipton High School	AHD-A4 Stage Craft	806	694	1,534	840	112	1.5	\$ 0.112	\$ 0.17	\$ 140	\$ 0.04	\$ 36	
Tipton High School	AHD-A5 Auditorium Lobby	806	694	967	273	112	13.6	\$ 0.112	\$ 1.52	\$ 415	\$ 0.55	\$ 149	
Tipton High School	AHB-A6 Music Area	890	694	783	89	196	4.7	\$ 0.112	\$ 0.52	\$ 47	\$ -	\$ -	
Tipton High School	AHD-A7 Art Room	867	694	1,234	540	173	3.0	\$ 0.112	\$ 0.33	\$ 180	\$ (0.04)	\$ (21)	
Tipton High School	AHD-B1 Aux Gym	890	457	147	(311)	432	14.0	\$ 0.112	\$ 1.56	\$ (486)	\$ 0.48	\$ (149)	
Tipton High School	AHD-B2 Aux Gym	890	457	843	386	432	14.0	\$ 0.112	\$ 1.56	\$ 604	\$ 0.48	\$ 185	
Tipton High School	AHZ-B1 Locker Rooms	834	694	843	149	140	9.3	\$ 0.112	\$ 1.04	\$ 156	\$ -	\$ -	
Tipton High School	AHZ-B2 Upper Gym	891	694	677	(17)	198	7.0	\$ 0.112	\$ 0.78	\$ (13)	\$ -	\$ -	
Tipton High School	AHU-D1 Cafeteria	834	694	655	(39)	140	9.3	\$ 0.112	\$ 1.04	\$ (40)	\$ 0.95	\$ (37)	
Tipton High School	AHU-2 Main Gym	890	694	467	(227)	196	4.7	\$ 0.112	\$ 0.52	\$ (118)	\$ 1.13	\$ (256)	
Tipton High School	AHU-A1 Wood Shop	848	694	736	42	154	4.7	\$ 0.112	\$ 0.52	\$ 22	\$ 0.23	\$ 10	
Tipton High School	AHU-A2 Metal Shop	834	694	737	43	140	4.7	\$ 0.112	\$ 0.52	\$ 22	\$ 0.23	\$ 10	
Tipton High School	AHU-A3 Ag Shop	848	694	804	110	154	4.7	\$ 0.112	\$ 0.52	\$ 57	\$ 0.36	\$ 39	
Total										\$ 1,221		\$ 14	

FAN MOTOR RUNTIME SAVINGS - TIPTON MIDDLE AND ELEMENTARY SCHOOLS

Building	System ID	Motor HP	Break HP / Motor HP	kW / HP	Fan Speed	Fan kW	Saved Hrs / Yr	Motor Efficiency	Savings (kWh)	Rate (kWh)	Savings (\$)
Tipton Middle School/Elementary School	MZU-1 North Classrooms	20.00	1.00	0.746	100%	19	3,492	80%	65,131	\$ 0.106	\$ 6,885
Tipton Middle School/Elementary School	MZU-2 South Classrooms	20.00	1.00	0.746	100%	19	3,209	80%	59,839	\$ 0.106	\$ 6,326
Tipton Middle School/Elementary School	MZU-3 West Central Classrms	20.00	1.00	0.746	100%	19	3,436	80%	64,073	\$ 0.106	\$ 6,773
Tipton Middle School/Elementary School	MZU-4 FACS	3.00	1.00	0.746	100%	3	3,436	75%	10,252	\$ 0.106	\$ 1,084
Tipton Middle School/Elementary School	MZU-5 Administration Area	7.50	1.00	0.746	100%	7	3,436	80%	24,027	\$ 0.106	\$ 2,540
Tipton Middle School/Elementary School	MZU-9 Music Offices	1.50	1.00	0.746	100%	1	3,379	75%	5,041	\$ 0.106	\$ 533
Tipton Middle School/Elementary School	MZU-10 Media Center	15.00	1.00	0.746	100%	14	3,379	80%	47,261	\$ 0.106	\$ 4,996
Tipton Middle School/Elementary School	VAV-1 Music Offices	2.00	1.00	0.746	80%	1	(2,314)	75%	(2,356)	\$ 0.106	\$ (249)
Tipton Middle School/Elementary School	VAV-2 Classrooms	60.00	1.00	0.746	80%	29	(2,471)	80%	(70,788)	\$ 0.106	\$ (7,483)
Tipton Middle School/Elementary School	VAV-3 South Classrooms	20.00	1.00	0.746	80%	10	(2,471)	80%	(23,596)	\$ 0.106	\$ (2,494)
Tipton Middle School/Elementary School	VAV-4 Administration Area	7.50	1.00	0.746	80%	4	(2,597)	80%	(9,300)	\$ 0.106	\$ (983)
Tipton Middle School/Elementary School	VAV-5 Media Center	20.00	1.00	0.746	80%	10	(2,471)	80%	(23,596)	\$ 0.106	\$ (2,494)
Subtotal									145,989		\$ 15,432
Elementary School	MZU-6 West Classrooms	20.00	1.00	0.746	100%	19	3,379	80%	63,015	\$ 0.106	\$ 6,661
Elementary School	MZU-7 Southeast Classrooms	20.00	1.00	0.746	100%	19	3,265	80%	60,898	\$ 0.106	\$ 6,437
Elementary School	MZU-8 Cafeteria	10.00	1.00	0.746	100%	9	2,868	80%	26,745	\$ 0.106	\$ 2,827
Elementary School	VAV-6 Classrooms	60.00	1.00	0.746	80%	29	(2,471)	80%	(70,788)	\$ 0.106	\$ (7,483)
Subtotal									79,869		\$ 8,443

Total Fan Savings: \$ 23,875

Constant Volume to Variable Speed Fan Conversion

Electric Motor Savings

Description	Full Load Power		Fan Speed		Average kW Savings (kWh)	Future Operating Hours	Savings (kWh)	Composite Consumption Rate (\$)	Utility Savings (\$)
	(HP)	(kW)	Current Average Amount	Future Average Amount					
Tipton High School									
AHD-A1 Auditorium	20.00	14.042	100%	60%	11.01	2,314	25,471	\$ 0.112	\$ 2,850
AHD-A2 Stage	5.00	3.511	100%	60%	2.75	2,314	6,368	\$ 0.112	\$ 712
AHD-A3 Music Office	0.75	0.527	100%	80%	0.26	2,651	681	\$ 0.112	\$ 76
AHD-A4 Stage Craft	1.50	1.053	100%	60%	0.83	2,314	1,910	\$ 0.112	\$ 214
AHD-A5 Auditorium Lobby	20.00	14.042	90%	60%	9.88	2,314	22,862	\$ 0.112	\$ 2,558
AHB-A6 Music Area	5.00	3.511	100%	80%	1.71	2,471	4,233	\$ 0.112	\$ 474
AHD-A7 Art Room	3.00	2.106	100%	80%	1.03	2,471	2,540	\$ 0.112	\$ 284
AHZ-B1 Locker Rooms	10.00	7.021	100%	60%	5.50	2,471	13,602	\$ 0.112	\$ 1,522
AHZ-B2 Upper Gym	7.50	5.266	100%	60%	4.13	2,471	10,202	\$ 0.112	\$ 1,141
AHU-D1 Cafeteria	10.00	7.021	100%	60%	5.50	2,314	12,735	\$ 0.112	\$ 1,425
AHU-2 Main Gym	5.00	3.511	100%	60%	2.75	2,471	6,801	\$ 0.112	\$ 761
AHU-3 Main Gym	5.00	3.511	100%	60%	2.75	-	-	\$ 0.112	\$ -
AHU-4 Main Gym	5.00	3.511	100%	60%	2.75	-	-	\$ 0.112	\$ -
AHU-5 Main Gym	5.00	3.511	100%	60%	2.75	-	-	\$ 0.112	\$ -
AHU-6 Main Gym	5.00	3.511	100%	60%	2.75	-	-	\$ 0.112	\$ -
AHU-7 Main Gym	5.00	3.511	100%	60%	2.75	-	-	\$ 0.112	\$ -
AHU-A1 Wood Shop	5.00	3.511	100%	60%	2.75	2,314	6,368	\$ 0.112	\$ 712
AHU-A2 Metal Shop	5.00	3.511	100%	60%	2.75	2,314	6,368	\$ 0.112	\$ 712
AHU-A3 Ag Shop	5.00	3.511	100%	60%	2.75	2,314	6,368	\$ 0.112	\$ 712
Subtotal							126,510		\$ 14,154
TOTAL							126,510		\$ 14,154

Variable speed motor savings are Stipulated Energy Savings; calculations are based on the fan laws as shown in the 2008 ASHRAE HVAC Systems and Equipment Handbook, Chapter 20, Table 2.

Constant Volume to Variable Speed Pumping

Electric Motor Savings

Description	Full Load Power		Fan Speed		Average kW Savings (kWh)	Future Operating Hours	Savings (kWh)	Composite Consumption Rate (\$)	Utility Savings (\$)
	(HP)	(kW)	Current Average Amount	Future Average Amount					
Tipton High School									
Hot Water Pump P-4	10.00	7.021	100%	60%	5.50	2,769	15,239	\$ 0.112	\$ 1,705
Hot Water Pump P-5	10.00	7.021	100%	60%	5.50	2,769	15,239	\$ 0.112	\$ 1,705
Subtotal							30,479		\$ 3,410
TOTAL							30,479		\$ 3,410

Heating and Air-conditioning Savings Due to CO₂ Control

Building	Unit Type	Quantity	Occupied Hours		Heating OA		Air-conditioned OA		Occupied Energy Change		Savings	
			Winter (Hours)	Summer (Hours)	Current (CFM)	Future (CFM)	Current (CFM)	Future (CFM)	Heating (BTU)	Cooling (BTU)	Heating \$	Cooling \$
Tipton High School	AHD-A1 Auditorium	1	1,901	413	1,370	250	1,370	250	(80,844,826)	(12,488,389)	\$ 801	\$ 117
Tipton High School	AHD-A2 Stage	1	1,901	413	450	150	450	150	(21,654,864)	(3,345,104)	\$ 215	\$ 31
Tipton High School	AHD-A4 Stage Craft	1	1,901	413	160	45	160	45	(8,301,031)	(1,282,290)	\$ 82	\$ 12
Tipton High School	AHD-A5 Auditorium Lobby	1	1,901	413	1,600	150	1,600	150	(104,665,176)	(16,168,003)	\$ 1,037	\$ 151
Tipton High School	AHD-A7 Art Room	1	1,901	570	270	375	270	375	7,579,202	1,617,489	\$ (75)	\$ (15)
Tipton High School	AHD-B1 Aux Gym	1	1,253	341	1,650	375	1,650	375	(60,658,227)	(11,737,037)	\$ 601	\$ 110
Tipton High School	AHD-B2 Aux Gym	1	1,253	341	1,650	375	1,650	375	(60,658,227)	(11,737,037)	\$ 601	\$ 110
Tipton High School	AHU-D1 Cafeteria	1	1,901	413	2,970	450	2,970	450	(181,900,858)	(28,098,875)	\$ 1,803	\$ 263
Tipton High School	AHU-2 Main Gym	1	1,901	570	3,750	750	3,750	750	(216,548,640)	(46,213,975)	\$ 2,146	\$ 433
Tipton High School	AHU-A1 Wood Shop	1	1,901	413	990	375	990	375	(44,392,471)	(6,857,464)	\$ 440	\$ 64
Tipton High School	AHU-A2 Metal Shop	1	1,901	413	990	375	990	375	(44,392,471)	(6,857,464)	\$ 440	\$ 64
Tipton High School	AHU-A3 Ag Shop	1	1,901	413	1,320	375	1,320	375	(68,212,822)	(10,537,078)	\$ 676	\$ 99
Subtotal									(884,650,410)	(153,705,227)	\$ 8,769	\$ 1,439
Total											\$ 8,769	\$ 1,439

Gas and electric savings due to CO₂ control are Stipulated Energy Savings based on standard air calculations as shown in 2009 ASHRAE Fundamentals, Chapter 18.

JOCKEY BOILER INSTALLATION SAVINGS

Tipton High School

Existing Boiler Data

* Number of boilers:	2
* Catalog boiler seasonal efficiency:	80%
* Jacket losses (radiation & convection)	3%
* Burner firing rate losses	7%
* Average seasonal efficiency	70%
* Fuel type:	Natural gas
* Cost of fuel:	\$0.92 / therm
* Fuel conversion factor:	100,000 BTU / therm
* Total heating cost (March, April, May, Sept, Oct, N	\$19,932 / year
* Domestic HW heating costs:	\$1,500 / year
* CO ₂ Gas Savings (prorated for these months)	\$4,384 / year
* Building heating costs:	\$14,048 / year
* Building heating requirement boiler output:	1,066,768,476 BTU / year

Proposed Boiler Data

* Number of boilers:	1
* Proposed boiler seasonal heating efficiency:	93%
* Building heating costs:	\$10,574 / year

Boiler replacement savings:	\$3,474 / year
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Gas savings from the installation of the jockey boiler are Stipulated Energy Savings based on historical data.