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Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:



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1. EXECUTIVE SUMMARY

A Preliminary Energy Assessment (PEA) site visit for the City of Plainview was conducted during the month of September 2010 for the purpose of identifying viable Energy Conservation Measures (ECMs). This report documents that investigation.

This service is provided by Jacobs at no cost to the City of Plainview by the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO). This program promotes and encourages an active partnership between SECO and local political subdivisions for the purpose of planning, funding, and implementing cost-effective energy conservation measures. The goal is to reduce energy consumption of existing facilities and ultimately reduce regional emissions and facility energy costs.

The following ECMs were investigated and recommended for implementation or further detailed analysis:

ECM 1: Lighting Retrofit City Hall: Replace existing T12 fluorescent lamps and ballasts with new T8 fluorescent lamps and ballasts.

ECM 2: Lighting Retrofit City Hall: Replace existing incandescent lamps with compact fluorescent lamps (CFL).

ECM 3: Lighting Retrofit Police Station: Replace existing T12 fluorescent lamps and ballasts with new T8 fluorescent lamps and ballasts.

ECM 4: Lighting Retrofit Police Station: Replace existing incandescent lamps with compact fluorescent lamps (CFL).

ECM 5: Lighting Retrofit Library: Replace existing T12 fluorescent lamps and ballasts with new T8 fluorescent lamps and ballasts.

ECM 6: Lighting Retrofit Library: Replace existing T8 fluorescent lamps and ballasts with more efficient T8 fluorescent lamps and ballasts

ECM 7: Lighting Retrofit Library: Replace existing incandescent lamps with compact fluorescent lamps (CFL).

ECM 8: Lighting Retrofit Water Treatment Plant: Replace existing T12 fluorescent lamps and ballasts with new T8 fluorescent lamps and ballasts.

ECM 9: Installation of new programmable thermostats in the Water Treatment Plant

ECM 10: Lighting Retrofit Sewage Treatment Plant: Replace existing T12 fluorescent lamps and ballasts with new T8 fluorescent lamps and ballasts.

ECM 11: Replacement of six existing condensing units.

The following ECM was investigated and not recommended for implementation or further detailed analysis:

ECM 12: Replacement of single paned windows with double paned units in the original portion of the Library.

A preliminary energy and cost savings evaluation was conducted on each recommended measure listed above. Descriptions of these measures and a summary of each evaluation are presented in the following sections. An overall summary of the results is presented in the ECM Table (Table 3). Each proposed utility evaluation was based on the prevalent utility costs at the time of the audit.

As seen in the ECM table, the recommended measures provide for a combined estimated annual savings of up to \$8,471.86 with an estimated capital requirement of \$76,469.47 thus yielding a composite simple payback period of 9.0 years. Overall, it is estimated that by implementing these measures electric utility consumption in the buildings surveyed can be reduced by 4.4%.

Descriptions and calculations for the recommended measures can be found within this report. A follow-up visit can be scheduled to address questions regarding the report, project financing options, implementation schedules, or any other aspect of this program or its implementation.

SECO is committed to providing whatever assistance is required in planning, funding, and implementing the recommendations of this report. The City of Plainview is encouraged to direct any questions or concerns to either of the following:

SECO	Jacobs
Stephen Ross	Scott West
1-800-531-5441, ext 3-1896	817-347-5370

Included in the appendix of this report is also a list of websites that can be utilized in learning more about SECO, Senate Bill 12, various funding solutions, energy saving projects, and various state and federal agency services and programs.

2. FACILITY DESCRIPTIONS

Jacobs reviewed 5 of the buildings that the City of Plainview owns and operates.

2.1. City Hall

The City Hall building is located at 901 Broadway, Plainview, TX 79072. The exterior of the City Hall building is brick veneer and tar is the predominant roofing material. All the windows in the building are double pane. The entire building is 5,542 square feet and was originally built in the mid 1960s.

The lighting fixtures in the building are a mixture of T12 fluorescents with magnetic ballasts and indoor flood lights.

Climate in the building is controlled by two DX, split systems. The two 8 ton condensers are on the roof and are in very bad shape. Programmable thermostats control the system.

2.2. Police Station

The Police Station is located at 104 W 9th Street, Plainview, TX 79072. The exterior of the building is brick veneer and tar is the predominant roofing material. All the windows in the building are double pane. The entire building is 3,490 square feet and was originally built in 1967.

The lighting fixtures in the building are a mixture of T12 fluorescents with magnetic ballasts and indoor flood lights.

Climate in the building is controlled by three DX, split systems. The condensing units are all from different manufactures and include a 2.5 ton unit, a 10 ton unit and an 8 ton unit. Programmable thermostats control the system.

2.3. Library

The Library is located at 825 Austin Street, Plainview, TX 79072. The exterior of the building is brick veneer and tar is the predominant roofing material. The windows in the building are a mixture of double pane and single pane units. The entire building is approximately 9,000 square feet and was built in two portions, the last of which was completed in 1967.

The lighting fixtures in the building are a mixture of T12 fluorescents with magnetic ballasts and indoor flood lights.

Climate in the building is controlled by four DX, split systems. The condensing units are all from different manufactures and include two 3 ton units and two 10 ton units.

2.4. Water Treatment Plant

The Water Treatment Plant is located at 3500 W 16th St., Plainview, TX 79072. The exterior of the building is brick veneer and tar is the predominant roofing material. All the windows in the building are double pane. The entire building is approximately 2,250 square feet and was originally built in 1968.

The lighting fixtures in the building are T12 fluorescents with magnetic ballasts.

Climate in the building is controlled by one DX, split system. The 10 ton condensing unit is from Lennox. The system is controlled by an on/off switch.

The Water Treatment Plant also houses seven pumps from various manufacturers

2.5. Sewage Treatment Plant

The Sewage Treatment Plant is located at 1059 County Road Y, Plainview, TX 79072. The exterior of the building is brick veneer and tar is the predominant roofing material. All the windows in the building are double pane. The entire building is approximately 4,000 square feet and was originally built in 1968.

The lighting fixtures in the building are T12 fluorescents with magnetic ballasts.

Climate in the building is controlled by two DX, split systems. The system is controlled by a programmable thermostat.

The Sewage Treatment Plant houses three pumps, one 75 horsepower pump and two 150 horsepower pumps. It also houses two blowers for aerating the effluent.

3. FACILITY ENERGY PERFORMANCE

Based on current utility data, the City of Plainview buildings have the following annual electric costs, Energy Use Index (EUI), and Energy Cost Index (ECI):

Energy Cost and Consumption Benchmarks - Plainview											
Building	Electric			Natural Gas			Total	Total	EUI	ECI	SF
	kWh/Yr	MMBTU/Yr	\$Cost/Yr	MCF/Yr	MMBTU/Yr	\$Cost/Yr	\$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	\$/SF/Yr	
1 City Hall	216,720	739	\$12,346.63	N/A	N/A	N/A	\$12,346.63	739	133	\$2.23	5,542
2 Police Station	174,600	596	\$9,000.05	N/A	N/A	N/A	\$9,000.05	596	171	\$2.58	3,490
3 Library	102,840	351	\$6,160.92	N/A	N/A	N/A	\$6,160.92	351	39	\$0.68	9,000
4 Water/Waste water Treatment Plant	3,157,249	10773	\$140,165.95	N/A	N/A	N/A	\$140,165.95	10,773	1724	\$22.43	6,250
	kWh/Yr	MMBTU/Yr	\$Cost/Yr	MCF/Yr	MMBTU/Yr	\$Cost/Yr	\$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	\$/SF/Yr	SF
	3,651,409	12,459	\$167,673.55	0.0	0	\$0.00	\$167,673.55	12,459	517	\$6.98	9,032

Table 1 - Energy Benchmarking

The utility data collected can be found in Appendix A.

The EUI, an estimate of the energy consumption performance, is measured in thousands of BTUs per square foot per year. Likewise, the ECI, an estimate of the energy cost performance, is measured in dollars per square foot per year.

4. ENERGY ACCOUNTING

ENERGY ACCOUNTING DESCRIPTION

Energy is accounted for through monthly utility bills.

AVERAGE UTILITY RATES

Utility	Average Rates
Electricity	\$0.053 per kWh
Gas	\$0.00 / MCF

Table 2 - Utility Rates

5. RECOMMENDATIONS

ENERGY CONSERVATION MEASURES (ECMs)

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 1	Replace T12 fluorescent lights with T8 (City Hall)	\$11,637.19	30,180	\$1,599.53	7.3
ECM 2	Replace incandescent lights with CFLs (City Hall)	\$2,754.71	42,202	\$2,236.72	1.2
ECM 3	Replace T12 fluorescent lights with T8 (Police Station)	\$7,385.48	10,377	\$549.98	13.4
ECM 4	Replace incandescent lights with CFLs (Police Station)	\$429.55	6,988	\$370.36	1.2
ECM 5	Replace T12 fluorescent lights with T8 (Library)	\$20,825.20	30,935	\$1,639.56	12.7
ECM 6	Replace T8 fluorescent lights with more efficient T8 (Library)	\$3,468.19	3,729	\$197.66	17.5
ECM 7	Replace incandescent lights with CFLs (Library)	\$147.07	1,846	\$97.84	1.5
ECM 8	Replace T12 fluorescent lights with T8 (Water Treatment Plant)	\$5,887.03	7,011	\$371.59	15.8
ECM 9	Install programmable thermostats (water Treatment Plant)	\$212.44	6,604	\$350.03	0.6
ECM 10	Replace T8 fluorescent lights with more efficient T8 (Sewage Treatment)	\$1,549.52	1,678	\$88.95	17.4
ECM 11	Replacement of existing condensing units	\$22,173.08	18,295	\$969.66	22.9

Table 3 – City of Plainview ECMs

ECM 1 involves replacing the existing T12 fluorescent lamps and magnetic ballasts within the City Hall with T8 lamps and electronic ballasts in order to reduce energy usage through lighting and cooling. The energy cost savings compared to materials and labor costs make for an attractive payback period.

ECM 2 involves replacing incandescent lamps with CFLs at the City Hall. CFLs are readily available at home/hardware stores and the labor cost is assumed to be negligible making for an attractive payback period.

ECM 3 involves replacing the existing T12 fluorescent lamps and magnetic ballasts within the Police Station with T8 lamps and electronic ballasts in order to reduce energy usage through lighting and cooling. Although less lucrative, the energy cost savings compared to materials and labor costs associated with this project provide for an attractive payback period

ECM 4 involves replacing incandescent lamps with CFLs at the Police Station. CFLs are readily available at home/hardware stores and the labor cost is assumed to be negligible making for an attractive payback period.

ECM 5 involves replacing the existing T12 fluorescent lamps and magnetic ballasts within the Library with T8 lamps and electronic ballasts in order to reduce energy usage through lighting and cooling. The energy cost savings compared to materials and labor costs make for an attractive payback period.

ECM 6 involves replacing the existing T8 fluorescent lamps and electric ballasts within the Library with higher efficiency T8 lamps and ballasts in order to reduce energy usage through lighting and cooling. Although not as viable as other recommended measures within this report the energy cost savings compared to materials and labor costs still make for an acceptable payback period.

ECM 7 involves replacing incandescent lamps with CFLs at the Library. CFLs are readily available at home/hardware stores and the labor cost is assumed to be negligible making for an attractive payback period.

ECM 8 involves replacing the existing T12 fluorescent lamps and magnetic ballasts within the Water Treatment facility with T8 lamps and electronic ballasts in order to reduce energy usage through lighting and cooling. Although reduce lighting run times have lengthened the payback time of this measure the energy cost savings compared to materials and labor costs provide an acceptable payback period.

ECM 9 Involves installing programmable thermostats on the heating and cooling equipment within the Water treatment Facility in order to reduce the HVAC units annual run times. Due to the relative ease of installation this ECM has an extremely attractive payback time.

ECM 10 involves replacing the existing T8 fluorescent lamps and electric ballasts within the Sewage Treatment facility with higher efficiency T8 lamps and ballasts in order to reduce energy usage through lighting and cooling. Although not as viable as other recommended measures within this report the energy cost savings compared to materials and labor costs still make for an acceptable payback period.

ECM 11 involves replacing six condensing units that are greater than 10 years old. Both of the 8 ton units at the City Hall, the 8 and 10 ton units serving the Police Station, the 3 and 10 ton units serving the Library are specified to be replaced. SEER 14 equipment was specified for all replacements A SEER rating of 14 helps ensure measurable energy savings and a reasonable payback time.

ENERGY CONSERVATION MEASURES (ECMs) EXPLORED BUT NOT RECOMMENDED

ECM 12 – Replacement of the windows within the original section of the library was considered due to the age of the existing glazing. An energy savings calculation and preliminary economic analysis was performed for replacement of 14 aging windows in the library to determine the economic viability of this project. Replacement windows were presumed to be

½” double insulated units equipped with low-E glass. Additionally, the installation of the new windows was expected to renew the weather stripping and calking around the replaced units. With all savings accounted for, the savings approximated \$70 annually and the payback period extended beyond 75 years using a rough project cost of \$400 per window installed. This project was not recommended due to poor economic and utility savings. Savings calculations are included at the end of Appendix B for inspection.

MAINTENANCE AND OPERATIONS RECOMMENDATIONS (M&Os)

N/A

FACILITY IMPROVEMENT MEASURES (FIMs)

N/A

RECOMMENDATIONS SUMMARY

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 1	Replace T12 fluorescent lights with T8 (City Hall)	\$11,637.19	30,180	\$1,599.53	7.3
ECM 2	Replace incandescent lights with CFLs (City Hall)	\$2,754.71	42,202	\$2,236.72	1.2
ECM 3	Replace T12 fluorescent lights with T8 (Police Station)	\$7,385.48	10,377	\$549.98	13.4
ECM 4	Replace incandescent lights with CFLs (Police Station)	\$429.55	6,988	\$370.36	1.2
ECM 5	Replace T12 fluorescent lights with T8 (Library)	\$20,825.20	30,935	\$1,639.56	12.7
ECM 6	Replace T8 fluorescent lights with more efficient T8 (Library)	\$3,468.19	3,729	\$197.66	17.5
ECM 7	Replace incandescent lights with CFLs (Library)	\$147.07	1,846	\$97.84	1.5
ECM 8	Replace T12 fluorescent lights with T8 (Water Treatment Plant)	\$5,887.03	7,011	\$371.59	15.8
ECM 9	Install programmable thermostats (water Treatment Plant)	\$212.44	6,604	\$350.03	0.6
ECM 10	Replace T8 fluorescent lights with more efficient T8 (Sewage Treatment)	\$1,549.52	1,678	\$88.95	17.4
ECM 11	Replacement of existing condensing units	\$22,173.08	18,295	\$969.66	22.9
Project totals		\$76,469.47	159,846	\$8,471.86	9.0

Table 4 – Recommendation Summary

6. EMISSIONS CALCULATIONS

	Annual kWh Reduction	Pollution Prevention Factors			Equivalent to:		
		CO2	NOx	SO2	Annual Number	Annual Number	Annual Number
		Carbon Dioxide	Nitrogen Oxide	Sulphur Dioxide	of Cars Taken	of Acres of	of American Homes
		(Pounds)	(Grams)	(Grams)	Off the Road	Trees Planted	Electricity Needs
				lbs CO2 / 10,000	lbs CO2 / 7,300	kWh / 10,000	
City Hall	78,386	92,966	108,173	174,017	9	13	8
Police Station	23,780	28,203	32,816	52,792	3	4	2
Library	42,387	50,271	58,494	94,099	5	7	4
Water WasteWater	15,293	18,137	21,104	33,950	2	2	2
Total	159,846	189,577	220,587	354,858	19	26	16

Table 5 - Emission Calculations

With the energy savings shown above, the resulting reduced amount of pollution has been calculated. Making the proposed improvements is equivalent to 19 cars being taken off the road, planting 26 acres of trees, and powering 16 American homes.

APPENDIX A: UTILITY ANALYSIS DATA

CITY HALL

SERVICE ADDRESS	PREMISE #	METER #
901 BROADWAY	300263777	SS27090977
	AMOUNT BILLED	KILOWATT- HOURS USED
SEPTEMBER 2009	\$ 842.67	13,440
OCTOBER 2009	\$ 793.00	12,420
NOVEMBER 2009	\$ 804.42	12,720
DECEMBER 2009	\$ 817.23	12,900
JANUARY 2010	\$ 936.66	16,620
FEBRUARY 2010	\$ 920.35	16,740
MARCH 2010	\$ 1,065.66	19,860
APRIL 2010	\$ 1,265.88	23,640
MAY 2010	\$ 1,044.77	19,380
JUNE 2010	\$ 1,282.86	24,000
JULY 2010	\$ 1,254.14	22,560
AUGUST 2010	\$ 1,318.99	22,440
TOTAL	\$ 12,346.63	216,720

POLICE DEPARTMENT

SERVICE ADDRESS	PREMISE #	METER #
104 W 9TH ST	300311880	SS27072789
	AMOUNT BILLED	KILOWATT- HOURS USED
SEPTEMBER 2009	\$ 756.61	16,200
OCTOBER 2009	\$ 712.93	13,300
NOVEMBER 2009	\$ 616.95	12,200
DECEMBER 2009	\$ 626.62	13,100
JANUARY 2010	\$ 590.78	12,000
FEBRUARY 2010	\$ 587.86	11,500
MARCH 2010	\$ 587.86	11,500
APRIL 2010	\$ 763.87	14,600
MAY 2010	\$ 778.14	15,100
JUNE 2010	\$ 930.07	17,800
JULY 2010	\$ 1,006.11	18,700
AUGUST 2010	\$ 1,042.25	18,600
TOTAL	\$ 9,000.05	174,600

LIBRARY

SERVICE ADDRESS	PREMISE #	METER #
825 AUSTIN ST	300600115	SS27101383

	AMOUNT BILLED	KILOWATT- HOURS USED
SEPTEMBER 2009	\$ 542.51	10,260
OCTOBER 2009	\$ 534.13	8,700
NOVEMBER 2009	\$ 455.12	7,560
DECEMBER 2009	\$ 439.94	7,920
JANUARY 2010	\$ 398.19	7,260
FEBRUARY 2010	\$ 375.40	6,780
MARCH 2010	\$ 405.60	6,660
APRIL 2010	\$ 511.04	7,980
MAY 2010	\$ 541.09	8,640
JUNE 2010	\$ 657.88	10,620
JULY 2010	\$ 631.71	10,560
AUGUST 2010	\$ 668.31	9,900
TOTAL	\$ 6,160.92	102,840

WATER TREATMENT PLANT

SERVICE ADDRESS	PREMISE #	METER #
1/2 M E ON HWY 70 1/2 M S FR O	300216046	W76497T

	AMOUNT BILLED	KILOWATT- HOURS USED
SEPTEMBER 2009	\$ 44.32	780
OCTOBER 2009	\$ 49.93	720
NOVEMBER 2009	\$ 62.48	960
DECEMBER 2009	\$ 78.74	1,260
JANUARY 2010	\$ 82.24	1,320
FEBRUARY 2010	\$ 66.05	1,020
MARCH 2010	\$ 59.52	900
APRIL 2010	\$ 60.48	900
MAY 2010	\$ 46.94	660
JUNE 2010	\$ 47.62	660
JULY 2010	\$ 45.28	600
AUGUST 2010	\$ 50.01	660
TOTAL	\$ 693.61	10,440

APPENDIX B: ECM INFORMATION

ECM 1: City Hall Lighting retrofit: T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview		PROJECT NO FEWE0701-PLAIN				
PROJECT LOCATION:	City Hall		ESTIMATOR: K. Popp				
SUBMITTAL:	PEA Cost Estimates		DATE: 9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Replace I		CHECKED BY: T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	99	EA	\$ 42	\$ 4,133	\$ 32	\$ 3,168	\$ 7,301
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	44	EA	\$ 25	\$ 1,078	\$ 23	\$ 1,012	\$ 2,090
Replace T12 fluorescents with T8s 48" length - 1 lamps/fixture	13	EA	\$ 25	\$ 319	\$ 20	\$ 260	\$ 579
<p style="text-align: center;">THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$6,659.75		\$5,670.00	\$9,969.75
CONTINGENCIES			15.0%				\$1,495.46
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$171.98
TOTAL							\$11,637.19

Energy	4 lamp	QUANTITY		USAGE		ENERGY US
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR
T-12 Fluorescents (172W/fixture)		99	EA	12	365	74,583
T-8 Fluorescents (120W/fixture)		99	EA	12	365	52,034
Estimated Annual Savings						22,548

Energy	2 lamp	QUANTITY		USAGE		ENERGY US
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR
T-12 Fluorescents (86W/fixture)		44	EA	12	365	16,574
T-8 Fluorescents (60W/fixture)		44	EA	12	365	11,563
Estimated Annual Savings						5,011

Energy	1 lamp	QUANTITY		USAGE		ENERGY US
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR
T-12 Fluorescents (46W/fixture)		13	EA	12	365	2,619
T-8 Fluorescents (32W/fixture)		13	EA	12	365	1,822
Estimated Annual Savings						797

Total Energy Savings Calculations ECM #1

Facility Name:	City Hall				City:	Plainview
Site Address:					County:	Hale
ECM Number:	1				Building Area:	5,524 SF
ECM Description:	T12 - T8 lighting retrofit					
Existing T12 lighting in City Hall could be upgraded to T8 lighting						
					Elec Rate=	0.053
	4 lamps	2 lamps	1 lamps			
Existing Conditions:	99	44	13	Number of florescent fixtures in area observed		
	172	86	46	Wattage of fixtures observed in area		
	120	60	32	Wattage of fixtures after retrofit		
	4,380	4,380	4,380	Annual lighting hours		
	5.148	1.144	0.182	kW savings due to lighting consumption		
	22548	5011	797	Annual kWh savings due to lighting consumption		
	1.44	1.44	1.44	Assumed kW/ton of cooling		
	1.46	0.33	0.05	Peak tons of cooling saved from lighting retrofit		
	2.11	0.47	0.07	kW savings due to cooling load reduction		
	1,450	322	51	Annual kWh savings due to cooling load reduction		
	8.87			Total Annual kW savings		
	30,180			Total Annual kWh savings		
	\$1,600			Total Cost Savings		
	\$0			Estimated Cost		
	0.0			Simple Payback		

ECM 2: City Hall Lighting Retrofit: Incandescent lights to CFLs

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview		PROJECT NO: FEWE0701-PLAIN				
PROJECT LOCATION:	City Hall		ESTIMATOR: K. Popp				
SUBMITTAL:	PEA Cost Estimates		DATE: 9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Replace I		CHECKED BY: T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Incandescents (Flood) with 120 Watt Incandescent to 23 Watt CFLs	77	EA	\$ 10	\$ 770	\$ 12	\$ 924	\$ 1,694
Replace Incandescents (Flood) with 60 Watt Incandescent to 16 Watt CFLs	36	EA	\$ 10	\$ 360	\$ 9	\$ 306	\$ 666
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%		\$0.00		\$0.00
SUBTOTAL					\$6,659.75		\$5,670.00
CONTINGENCIES			15.0%				\$354.00
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$40.71
TOTAL							\$2,754.71

Energy	Incandescent to CFLs		QUANTITY		USAGE		ENERGY US
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR		
120 Watt Incandescent	77	EA	12	365	40,471		
23 Watt CFLs	77	EA	12	365	7,757		
Estimated Annual Savings						32,714	

Energy	Incandescent to CFLs		QUANTITY		USAGE		ENERGY US
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR		
60 Watt Incandescent	36	EA	12	365	9,461		
16 Watt CFLs	36	EA	12	365	2,523		
Estimated Annual Savings						6,938	

Total Energy Savings Calculations ECM #2

Facility Name:	City Hall				City:	Plainview	
Site Address:					County:	Hale	
ECM Number:	2				Building Area:	5,524	SF
ECM Description:	Incandescent to CFLs Lighting retrofit						
	Existing Incandescent lighting in the City Hall could be upgraded to CFLs						
					Elec Rate=	0.053	
		120 Watt	60 Watt				
Existing Conditions:		77	36	Number of incandescent fixtures in area observed			
		120	60	Wattage of fixtures observed in area			
		23	16	Wattage of fixtures after retrofit			
		4,380	4,380	Annual lighting hours			
		7.469	1.584	kW savings due to lighting consumption			
		32714	6938	Annual kWh savings due to lighting consumption			
		1.44	1.44	Assumed kW/ton of cooling			
		2.12	0.45	Peak tons of cooling saved from lighting retrofit			
		3.06	0.65	kW savings due to cooling load reduction			
		2,104	446	Annual kWh savings due to cooling load reduction			
			12.76	Total Annual kW savings			
			42,202	Total Annual kWh savings			
			\$2,237	Total Cost Savings			
			\$2,755	Estimated Cost			
			1.2	Simple Payback			

ECM 3: Police Station Lighting retrofit: T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview		PROJECT NO.:	FEWE0701-PLAIN			
PROJECT LOCATION:	Police Station		ESTIMATOR:	K. Popp			
SUBMITTAL:	PEA Cost Estimates		DATE:	9/1/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla		CHECKED BY:	T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	65	EA	\$41.75	\$2,713.75	\$32.00	\$2,080.00	\$4,793.75
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	26	EA	\$24.50	\$ 637	\$23.00	\$ 598	\$1,235.00
Replace T12 fluorescents with T8s U-Shape - 2 lamps/fixture	3	EA	\$24.50	\$ 74	\$75.00	\$ 225	\$298.50
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$3,664.25		\$3,031.00	\$6,327.25
CONTINGENCIES		15.0%					\$949.09
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$109.15
TOTAL							\$7,385.48

Energy	4 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)		65	EA	12	365	42,136
T-8 Fluorescents (120W/fixture)		65	EA	12	365	34,164
Estimated Annual Savings						7,972
Energy	2 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		26	EA	12	365	8,427
T-8 Fluorescents (60W/fixture)		26	EA	12	365	6,833
Estimated Annual Savings						1,594
Energy	2 lamp (U-Shape)	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		3	EA	12	365	972
T-8 Fluorescents (60W/fixture)		3	EA	12	365	788
Estimated Annual Savings						184

Total Energy Savings Calculations ECM #3

Facility Name:	Police Station			City:	Plainview	
Site Address:				County:	Hale	
ECM Number:	4	Building Area:			3,490 SF	
ECM Description:	T12 - T8 lighting retrofit					
Existing T12 lighting in Police Station could be upgraded to T8 lighting						
				Elec Rate=	0.053	
		4 lamps	2 lamps	2 lamps (U-Shape)		
Existing Conditions:	65	26	3	Number of florescent fixtures in area observed		
	148	74	74	Wattage of fixtures observed in area		
	120	60	60	Wattage of fixtures after retrofit		
	4,380	4,380	4,380	Annual lighting hours		
	1.820	0.364	0.042	kW savings due to lighting consumption		
	7972	1594	184	Annual kWh savings due to lighting consumption		
	1.44	1.44	1.44	Assumed kW/ton of cooling		
	0.52	0.10	0.01	Peak tons of cooling saved from lighting retrofit		
	0.75	0.15	0.02	kW savings due to cooling load reduction		
	513	103	12	Annual kWh savings due to cooling load reduction		
	3.14				Total Annual kW savings	
	10,377				Total Annual kWh savings	
	\$550				Total Cost Savings	10,377
	\$7,385				Estimated Cost	
	13.4				Simple Payback	

ECM 4: Police Station Lighting Retrofit: Incandescent lights to CFLs

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview	PROJECT NO.:	FEWE0701-PLAIN				
PROJECT LOCATION:	Police Station	ESTIMATOR:	K. Popp				
SUBMITTAL:	PEA Cost Estimates	DATE:	9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla	CHECKED BY:	T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Incandescents with CFLs 150 Watt Incandescent to 40 Watt CFLs	1	EA	\$10.00	\$ 10	\$11.00	\$ 11	\$21.00
Replace Incandescents with CFLs 100 Watt Incandescent to 23 Watt CFLs	7	EA	\$10.00	\$ 70	\$5.00	\$ 35	\$105.00
Replace Incandescents (Flood)with CFLs 80 Watt Incandescent to 20 Watt CFLs	4	EA	\$10.00	\$ 40	\$8.50	\$ 34	\$74.00
Replace Incandescents with CFLs 60 Watt Incandescent to 13 Watt CFLs	12	EA	\$10.00	\$ 120	\$4.00	\$ 48	\$168.00
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$3,664.25		\$3,031.00	\$368.00
CONTINGENCIES		15.0%					\$55.20
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$6.35
TOTAL							\$429.55

Energy	Incandescent to CFLs	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
100 Watt Incandescent		7	EA	12	365	3,066
23 Watt CFLs		7	EA	12	365	705
Estimated Annual Savings						2,361

Energy	Incandescent to CFLs	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
80 Watt Incandescent Floods		4	EA	12	365	1,402
20 Watt CFLs (Floods)		4	EA	12	365	350
Estimated Annual Savings						1,051

Energy	Incandescent to CFLs	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
60 Watt Incandescent		12	EA	12	365	3,154
13 Watt CFLs		12	EA	12	365	683
Estimated Annual Savings						2,470

Total Energy Savings Calculations ECM #4

Facility Name:	Police Station					City:	Plainview	
Site Address:						County:	Hale	
ECM Number:	4					Building Area:	3,490	SF
ECM Description:	Incandescent to CFLs Lighting retrofit							
Existing Incandescent lighting in the Police Station could be upgraded to CFLs								
Elec Rate=							0.053	
	150 Watt	100 Watt	80 Watt (Floods)	60 Watt				
Existing Conditions:	1	7	4	12	Number of incandescent fixtures in area observed			
	150	100	80	60	Wattage of fixtures observed in area			
	23	16	16	16	Wattage of fixtures after retrofit			
	4,380	4,380	4,380	4,380	Annual lighting hours			
	0.127	0.588	0.256	0.528	kW savings due to lighting consumption			
	556	2575	1121	2313	Annual kWh savings due to lighting consumption			
	1.44	1.44	1.44	1.44	Assumed kW/ton of cooling			
	0.04	0.17	0.07	0.15	Peak tons of cooling saved from lighting retrofit			
	0.05	0.24	0.10	0.22	kW savings due to cooling load reduction			
	36	166	72	149	Annual kWh savings due to cooling load reduction			
	2.11				Total Annual kW savings			
	6,988				Total Annual kWh savings			
	\$370				Total Cost Savings			6,988
	\$430				Estimated Cost			
	1.2				Simple Payback			

ECM 5: Library Lighting retrofit: T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview		PROJECT NO.: FEWE0701-PLAIN				
PROJECT LOCATION:	Library		ESTIMATOR: K. Popp				
SUBMITTAL:	PEA Cost Estimates		DATE: 9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla		CHECKED BY: T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	231	EA	\$41.75	\$9,644.25	\$32.00	\$7,392.00	\$17,036.25
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	7	EA	\$24.50	\$171.50	\$23.00	\$161.00	\$332.50
Replace T12 fluorescents with T8s U-Shape - 4 lamps/fixture	5	EA	\$24.50	\$122.50	\$70.00	\$350.00	\$472.50
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$11,705.50		\$9,233.00	\$17,841.25
CONTINGENCIES		15.0%					\$2,676.19
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$307.76
TOTAL							\$20,825.20

Energy	4 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)		231	EA	12	365	149,743
T-8 Fluorescents (120W/fixture)		231	EA	12	365	121,414
Estimated Annual Savings						28,330

Energy	2 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		7	EA	12	365	2,269
T-8 Fluorescents (60W/fixture)		7	EA	12	365	1,840
Estimated Annual Savings						429

Energy	2 lamp (U-Shape)	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		5	EA	12	365	1,621
T-8 Fluorescents (60W/fixture)		5	EA	12	365	1,314
Estimated Annual Savings						307

Total Energy Savings Calculations ECM #5

Facility Name:	Library				City:	Plainview	
Site Address:					County:	Hale	
ECM Number:	5				Building Area:	9,000	SF
ECM Description:	T12 - T8 lighting retrofit						
Existing T12 lighting in Library could be upgraded to T8 lighting							
					Elec Rate=	0.053	
		4 lamps	2 lamps	2 lamps (U-Shape)			
Existing Conditions:	231	7	5		Number of florescent fixtures in area observed		
	148	74	74		Wattage of fixtures observed in area		
	120	60	60		Wattage of fixtures after retrofit		
	4,380	4,380	4,380		Annual lighting hours		
	6.468	0.098	0.070		kW savings due to lighting consumption		
	28330	429	307		Annual kWh savings due to lighting consumption		
	1.44	1.44	1.44		Assumed kW/ton of cooling		
	1.84	0.03	0.02		Peak tons of cooling saved from lighting retrofit		
	2.65	0.04	0.03		kW savings due to cooling load reduction		
	1,822	28	20		Annual kWh savings due to cooling load reduction		
		9.35			Total Annual kW savings		
		30,935			Total Annual kWh savings		
		\$1,640			Total Cost Savings		
		\$20,825			Estimated Cost		
		12.7			Simple Payback		

ECM 6: City Hall Lighting retrofit: T8 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview		PROJECT NO.:	FEWE0701-PLAIN			
PROJECT LOCATION:	Library		ESTIMATOR:	K. Popp			
SUBMITTAL:	PEA Cost Estimates		DATE:	9/1/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla		CHECKED BY:	T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace current T8 fluorescents with 48" length - 4 lamps/fixture	39	EA	\$41.75	\$ 1,628	\$32.00	\$ 1,248	\$2,876.25
Replace current T8 fluorescents with 48" length - 2 lamps/fixture	2	EA	\$24.50	\$ 49	\$23.00	\$ 46	\$95.00
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$11,705.50		\$9,233.00	\$2,971.25
CONTINGENCIES		15.0%					\$445.69
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$51.25
TOTAL							\$3,468.19

Energy	4 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-8 Fluorescents (140W/fixture)		39	EA	12	365	23,915
T-8 Fluorescents (120W/fixture)		39	EA	12	365	20,498
Estimated Annual Savings						3,416
Energy	2 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-8 Fluorescents (70W/fixture)		2	EA	12	365	613
T-8 Fluorescents (60W/fixture)		2	EA	12	365	526
Estimated Annual Savings						88

Total Energy Savings Calculations ECM #6

Facility Name:	Library				City:	Plainview	
Site Address:					County:	Hale	
ECM Number:	6				Building Area:	9,000	SF
ECM Description:	T8 - T8 (lower watt) lighting retrofit						
Existing T8 lighting in Library could be upgraded to more energy efficient T8 lighting							
					Elec Rate=	0.053	
		4 lamps	2 lamps				
Existing Conditions:	39	2	Number of florescent fixtures in area observed				
	140	70	Wattage of fixtures observed in area				
	120	60	Wattage of fixtures after retrofit				
	4,380	4,380	Annual lighting hours				
	0.780	0.020	kW savings due to lighting consumption				
	3416	88	Annual kWh savings due to lighting consumption				
	1.44	1.44	Assumed kW/ton of cooling				
	0.22	0.01	Peak tons of cooling saved from lighting retrofit				
	0.32	0.01	kW savings due to cooling load reduction				
	220	6	Annual kWh savings due to cooling load reduction				
		1.13	Total Annual kW savings				
		3,729	Total Annual kWh savings				
		\$198	Total Cost Savings				
		\$3,468	Estimated Cost				
		17.5	Simple Payback				

ECM 7: Library Lighting Retrofit: Incandescent lights to CFLs

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview	PROJECT NO.:	FEWE0701-PLAIN				
PROJECT LOCATION:	Library	ESTIMATOR:	K. Popp				
SUBMITTAL:	PEA Cost Estimates	DATE:	9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla	CHECKED BY:	T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Incandescents with CFLs	9	EA	\$10.00	\$ 90	\$4.00	\$ 36	\$126.00
60 Watt Incandescent to 16 Watt CFLs							
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$11,705.50		\$9,233.00	\$126.00
CONTINGENCIES		15.0%					\$18.90
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$2.17
TOTAL							\$147.07

Energy	Incandescent to CFLs	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
60 Watt Incandescent		9	EA	12	365	2,365
13 Watt CFLs		9	EA	12	365	512
Estimated Annual Savings						1,853

Total Energy Savings Calculations ECM #7

Facility Name:	Library		City:	Plainview	
Site Address:			County:	Hale	
ECM Number:	7		Building Area:	9,000	SF
ECM Description:	Incandescent to CFLs Lighting retrofit				
Existing Incandescent lighting in the Library could be upgraded to CFLs					
			Elec Rate=	0.053	
		60 Watt			
Existing Conditions:	9	Number of incandescent fixtures in area observed			
	60	Wattage of fixtures observed in area			
	16	Wattage of fixtures after retrofit			
	4,380	Annual lighting hours			
	0.396	kW savings due to lighting consumption			
	1734	Annual kWh savings due to lighting consumption			
	1.44	Assumed kW/ton of cooling			
	0.11	Peak tons of cooling saved from lighting retrofit			
	0.16	kW savings due to cooling load reduction			
	112	Annual kWh savings due to cooling load reduction			
	0.56	Total Annual kW savings			
	1,846	Total Annual kWh savings			
	\$98	Total Cost Savings			
	\$147	Estimated Cost			
	1.5	Simple Payback			

ECM 8: Water Treatment Plant Lighting retrofit: T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview	PROJECT NO.:	FEWE0701-PLAIN				
PROJECT LOCATION:	Water Treatment	ESTIMATOR:	K. Popp				
SUBMITTAL:	PEA Cost Estimates	DATE:	9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla	CHECKED BY:	T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	22	EA	\$41.75	\$918.50	\$32.00	\$704.00	\$1,622.50
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	52	EA	\$24.50	\$1,274.00	\$23.00	\$1,196.00	\$2,470.00
Replace T12 fluorescents with T8s U-Shape - 2 lamps/fixture	8	EA	\$24.50	\$196.00	\$70.00	\$560.00	\$756.00
Replace T12 fluorescents with T8s Circline - 1 lamp/fixture	6	EA	\$24.50	\$147.00	\$8.00	\$48.00	\$195.00
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$2,535.50		\$2,508.00	\$5,043.50
CONTINGENCIES			15.0%				\$756.53
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$87.00
TOTAL							\$5,887.03

Energy	4 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)		22	EA	12	365	14,261
T-8 Fluorescents (120W/fixture)		22	EA	12	365	11,563
Estimated Annual Savings						2,698
Energy	2 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		52	EA	12	365	16,854
T-8 Fluorescents (60W/fixture)		52	EA	12	365	13,666
Estimated Annual Savings						3,189
Energy	2 lamp (U-Shape)	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)		8	EA	12	365	2,593
T-8 Fluorescents (60W/fixture)		8	EA	12	365	2,102
Estimated Annual Savings						491

Energy	1 lamp (Circline)								
	QUANTITY				USAGE		ENERGY USE		
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR				
T-12 Fluorescents (40W/fixture)	6	EA	12	365	1,051				
T-8 Fluorescents (32W/fixture)	6	EA	12	365	841				
Estimated Annual Savings								210	

Total Energy Savings Calculations ECM #8

Facility Name:	Water Treatment				City:	Plainview
Site Address:					County:	Hale
ECM Number:	6				Building Area:	4,000 SF
ECM Description:	T12 - T8 lighting retrofit					
Existing T12 lighting in Water Treatment could be upgraded to T8 lighting						
					Elec Rate=	0.053
	4 lamps	2 lamps	lamps (U-Shapl	lamp (Circline)		
Existing Conditions:	22	52	8	6	Number of florescent fixtures in area observed	
	148	74	74	40	Wattage of fixtures observed in area	
	120	60	60	32	Wattage of fixtures after retrofit	
	4,380	4,380	4,380	4,380	Annual lighting hours	
	0.616	0.728	0.112	0.048	kW savings due to lighting consumption	
	2698	3189	491	210	Annual kWh savings due to lighting consumption	
	1.44	1.44	1.44	1.44	Assumed kW/ton of cooling	
	0.18	0.21	0.03	0.01	Peak tons of cooling saved from lighting retrofit	
	0.25	0.30	0.05	0.02	kW savings due to cooling load reduction	
	174	205	32	14	Annual kWh savings due to cooling load reduction	
	2.12				Total Annual kW savings	
	7,011				Total Annual kWh savings	
	\$372				Total Cost Savings	
	\$5,887				Estimated Cost	
	15.8				Simple Payback	

Energy Savings Calculations ECM #9

Facility Name:	Water Treatment Plant			City:	Plainview	
Site Address:	204 4th Street			County:	Hale	
ECM Number:	9			Building Area:	4,000	SF
ECM Description:	Install Programmable Thermostats					
Opportunity: When the space is unoccupied, setpoint temperature can change to reduce heating/cooling load						
Assumed U-Values Walls	0.124	Btu/hr-ft ² -F				
Assumed Wall Area	3,098	ft ²		Electric Rate:	0.053	
Assumed U-Values Roof	0.064	Btu/hr-ft ² -F				
Assumed Roof Area	6,000	ft ²				
Heating Season Thermostat Setpoint	70	F				
Heating Season Thermostat Setback	60	F				
Heating Season Setback Hours	1,456	hrs				
Heating Equipment Efficiency	100%					
Cooling Season Thermostat Setpoint	72	F				
Cooling Season Thermostat Setback	85	F				
Cooling Season Setback Hours	3,276	hrs				
Performance of Cooling System	1.22	kW/ton				
Total Envelope UA - Value	768	Btu/hr-F				
Electric Heating Energy Savings	3,278	kWh/yr				
Electric Heating Cost Reduction	174	\$/yr				
Cooling Energy Savings	3,326	kWh/yr				
Estimated Electricity Rate	\$0.053	per kWh				
Cooling Cost Savings	176	\$/yr				
Annual Cost Savings	\$350					
Installed cost	\$212					
Simple Payback	0.6	years				

ECM 10: Sewage Treatment Plant Lighting retrofit: T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Plainview	PROJECT NO.:	FEWE0701-PLAIN				
PROJECT LOCATION:	Sewage	ESTIMATOR:	K. Popp				
SUBMITTAL:	PEA Cost Estimates	DATE:	9/1/2010				
SYSTEM DESCRIPTION:	Replace T12 with T8s and Repla	CHECKED BY:	T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace current T8 fluorescents with 48" length - 4 lamps/fixture	18	EA	\$41.75	\$ 752	\$32.00	\$ 576	\$1,327.50
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$751.50		\$576.00	\$1,327.50
CONTINGENCIES		15.0%					\$199.13
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$22.90
TOTAL							\$1,549.52

Energy	4 lamp	QUANTITY		USAGE		ENERGY USE
		NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-8 Fluorescents (140W/fixture)		18	EA	12	365	11,038
T-8 Fluorescents (120W/fixture)		18	EA	12	365	9,461
Estimated Annual Savings						1,577

Total Energy Savings Calculations ECM #10

Facility Name:	Sewage			City:	Plainview		
Site Address:				County:	Hale		
ECM Number:	7			Building Area:	2,500	SF	
ECM Description:	T8 - more energy efficient T8 lighting retrofit						
	Existing T8 lighting in Sewage could be upgraded to more energy efficient T8 lighting						
				Elec Rate=	0.053		
		4 lamps					
Existing Conditions:	18	Number of florescent fixtures in area observed					
	140	Wattage of fixtures observed in area					
	120	Wattage of fixtures after retrofit					
	4,380	Annual lighting hours					
	0.360	kW savings due to lighting consumption					
	1577	Annual kWh savings due to lighting consumption					
	1.44	Assumed kW/ton of cooling					
	0.10	Peak tons of cooling saved from lighting retrofit					
	0.15	kW savings due to cooling load reduction					
	101	Annual kWh savings due to cooling load reduction					
	0.51	Total Annual kW savings					
	1,678	Total Annual kWh savings					
	\$89	Total Cost Savings					
	\$1,550	Estimated Cost					
	17.4	Simple Payback					

Energy Savings Calculations

Facility Name:	City Hall/Police Station			City:	Plainview
Site Address:				County:	Hale
ECM Number:	11			Building Area:	
ECM Description:	Replace Condensing Units			Predominate Use:	Air Cooling
Sheet 1 of 1					
Opportunity:	Replace C100GD condensing unit with a higher efficiency unit			Elec. Rate=	0.053
		3	Number of units		
		8	Tons per unit		
		9.0	Estimated existing EER		
		1.33	Estimated existing kW/ton		
		14.0	New equipment EER		
		0.86	New equipment kW/ton		
		788	Estimated equivalent full load hours		
Estimated peak kW Savings:	11.4	kW			
Total Estimated kWh Savings:	9,006	kWh per year			
Cost Savings:	\$477	per year			
Estimated Cost:	\$9,724				
Simple Payback:	20.4	years			

Facility Name:	Library			City:	Plainview
Site Address:				County:	Hale
ECM Number:	11			Building Area:	
ECM Description:	Replace Condensing Units			Predominate Use:	Air Cooling
Sheet 1 of 1					
Opportunity:	Replace 661BP036-E condensing unit with a higher efficiency unit			Elec. Rate=	0.053
		1	Number of units		
		3	Tons per unit		
		10.0	Estimated existing EER		
		1.20	Estimated existing kW/ton		
		14.0	New equipment EER		
		0.86	New equipment kW/ton		
		788	Estimated equivalent full load hours		
Estimated peak kW Savings:	1.0	kW			
Total Estimated kWh Savings:	811	kWh per year			
Cost Savings:	\$43	per year			
Estimated Cost:	\$2,399				
Simple Payback:	55.8	years			

Facility Name:	Library				City:	Plainview	
Site Address:					County:	Hale	
ECM Number:	11				Building Area:		
ECM Description:	Replace Condensing Units				Predominate Use:	Air Cooling	
							Sheet 1 of 1
Opportunity:	Replace 38AB016570 condensing unit with a higher efficiency unit				Elec. Rate=	0.053	
		1	Number of units				
		10	Tons per unit				
		8.0	Estimated existing EER				
		1.50	Estimated existing kW/ton				
		14.0	New equipment EER				
		0.86	New equipment kW/ton				
		788	Estimated equivalent full load hours				
Estimated peak kW Savings:		6.4	kW				
Total Estimated kWh Savings:		5,066	kWh per year				
Cost Savings:		\$268	per year				
Estimated Cost:		\$5,025					
Simple Payback:		18.7	years				

Facility Name:	Police Station				City:	Plainview	
Site Address:					County:	Hale	
ECM Number:	11				Building Area:		
ECM Description:	Replace Condensing Units				Predominate Use:	Air Cooling	
							Sheet 1 of 1
Opportunity:	Replace LSA120C-2Y condensing unit with a higher efficiency unit				Elec. Rate=	0.053	
		1	Number of units				
		10	Tons per unit				
		9.3	Estimated existing EER				
		1.29	Estimated existing kW/ton				
		14.0	New equipment EER				
		0.86	New equipment kW/ton				
		788	Estimated equivalent full load hours				
Estimated peak kW Savings:		4.3	kW				
Total Estimated kWh Savings:		3,413	kWh per year				
Cost Savings:		\$181	per year				
Estimated Cost:		\$5,025					
Simple Payback:		27.8	years				

ECM 12: Replacement windows at the Library (not recommended)

Weather-stripping and Calking ECM					
Data needed for calculations:					
A)	185	<i>sqft</i>		Approximate area of existing windows	
B)	0	<i>sqft</i>		Approximate area of existing exterior doors	
C)	0	<i>#</i>		Number of exterior wall penetrations	
D)	0	<i>cfm/sqft</i>		Existing Door infiltration rate	
E)	0.119577	<i>cfm/sqft</i>		Existing Window infiltration rate	
F)	0.057606	<i>cfm/sqft</i>		Existing Framing infiltration rate	
G)	0	<i>cfm/penetration</i>		Existing Wall penetration infiltration rate	
H)	0	<i>cfm/sqft</i>		New Door infiltration rate	
I)	0.020879	<i>cfm/sqft</i>		New Window infiltration rate	
J)	0.030723	<i>cfm/sqft</i>		New Framing infiltration rate	
K)	0	<i>cfm/penetration</i>		New Wall penetration infiltration rate	
L)	47	<i>° F</i>		Average outdoor temp. during heating season	
M)	82	<i>° F</i>		Average outdoor temp. during cooling season	
N)	72	<i>° F</i>		Indoor occupied cooling set point	
O)	72	<i>° F</i>		Indoor unoccupied cooling set point	
P)	72	<i>° F</i>		Indoor occupied heating set point	
Q)	72	<i>° F</i>		Indoor unoccupied heating set point	
R)	450	<i>hours</i>		Occupied hours during cooling season	
S)	255	<i>hours</i>		Unoccupied hours during cooling season	
T)	925	<i>hours</i>		Occupied hours during heating season	
U)	1000	<i>hours</i>		Unoccupied hours during heating season	
V)	80%	<i>%</i>		System heating efficiency	
W)	9	<i>Btu/Watt</i>		System cooling performance	
X) \$	6	<i>Mcf</i>		Gas Rate	
Y) \$	0.053	<i>/kWh</i>		Electrical energy rate	
Z) \$	0	<i>/kW-mo</i>		Electrical Demand Rate	
AA) \$	5600			Installed Cost of ECM	(rough estimate @ \$400/unit)

Window replacement with higher R-Value		
Additional data for new window units		
Existing unit R value	0.85	R-value
Proposed unit R-Value	3.1	R-value
Heating Gas consumed (pre retrofit)	7.01	MMBtu
Heating Gas consumed (post retrofit)	1.92	MMBtu
Cooling energy consumed	94.00	kWh
Cooling energy consumed (post retrofit)	25.77	kWh
Cooling Savings	68.23	kWh
Heating Savings	5.09	MMBtu
Cooling Savings	3.62	\$
Heating Savings	30.52	\$
Total savings	34.14	\$

Window replacment and caulking ECM benefits		
Current CFM infiltration	32.78	cfm
Retrofit CFM infiltration	9.55	cfm
Current window electrical utility cost	10.51	\$
Retrofit window electrical utility cost	2.91	\$
Current window gas Consumption	14.84	MMBtu
Retrofit window gas Consumption	4.11	MMBtu
Annual Gas Utility Cost Savings	62.54	\$
Total Annual Utility Cost Savings	70.14	\$
ECM Simple Payback	79.8	years

APPENDIX C: ENERGY STAR – PORTFOLIO MANAGER

Energy Star is a joint program between the US Environmental Protection Agency (US EPA) and the Department of Energy (US DOE) that promotes the efficient use of energy in multiple industries. One focus of the Energy Star program is on energy efficiency of existing buildings.

Portfolio Manager was created as an industry tool to aid those that work with existing buildings in benchmarking energy performance. Portfolio Manager benchmarking data is based on the Commercial Buildings Energy Consumption Survey administered by the US DOE Energy Information Administration every four years. The survey includes energy use figures from thousands of buildings throughout the United States for various end uses. For a particular building type (e.g. an office building), the building is compared statistically to similar buildings in the survey and assigned a score of 1-100. A score of 50 indicates an average building in terms of energy performance. A score of 1 means that the building is in the lowest 1% of buildings for energy performance and a score of 100, indicates performance in the top 1%.

Energy Star - Portfolio Manager			
Building	Site EUI (kbtu/sf/yr)	Source EUI (kbtu/sf/yr)	Energy Star Rating (1-100)
Example Town Hall	68.1	145.3	79

Site Energy Use Intensity (EUI) uses figures of metered energy (electrical, kWh and any other fossil fuel types, such as natural gas, MCF) to the building and then converts them to kBtus. This is the same procedure used for EUI earlier in this report. Portfolio Manager also calculates source EUI for easier comparison among fuel types. Source EUI takes into account energy losses from the original fuel source. For electricity, the original fuel consumption occurs at the power plant where electrical conversion efficiencies are often 30-40% for traditional fossil fuel sources. Portfolio Manager uses a source-site factor (or ratio) to convert site energy to source energy and it uses the same figure for all grid-supplied electricity. This ratio is specific to the type of energy used. Grid purchased electricity has a Source-Site Ratio of 3.340; Natural Gas has a ratio of 1.047.

Incomplete natural gas consumption information was provided for the City of Plainview, consequently no Energy Star Rating was computed for benchmarking. One full contiguous year of utility consumption data is necessary in order to submit to Energy Star for the purpose of achieving the Energy Star label

APPENDIX D: FUNDING AND PROCUREMENT

NON-TRADITIONAL FUNDING METHODS

When traditional means of funding projects are not available, non-traditional funding may be desirable in order to implement beneficial projects. Energy and operational cost savings can be used to fund projects such as the ones recommended in this report. A couple of options are available when considering funding projects with cost savings.

The first way would be to secure a low interest loan and fund the projects internally by “fixing” the operational budgets over the term of the loan and use the savings to pay back the loan. Low interest loans are available through the State’s Texas LoanSTAR (Saving Taxes and Resources) Program.

The LoanSTAR Program has served as a national model for state and federal loan programs for energy efficiency retrofits, and is SECO’s most highly visible program. Legislatively mandated to be funded at a minimum of \$95 million at all times, to date the LoanSTAR Program has saved Texas taxpayers over \$250 million through energy efficiency projects, financed for state agencies, institutions of higher education, school districts, and local governments. The program’s revolving loan mechanism allows borrowers to repay loans through the stream-of-cost savings generated by the funded projects. The program will fund energy saving projects with a maximum combined simple payback of 10 years.

The interest rate for the LoanSTAR Program is based on several factors which include money market rates and LoanSTAR administrative cost. Rates are evaluated and set every fiscal year, from 9/01 - 8/31.

In order to qualify for funding from the LoanSTAR Program, a detailed energy audit or energy assessment report (EAR) must be completed for the facility/department by a licensed professional engineer in the State of Texas. The purpose of the EAR is to validate the savings estimated in this PEA, through a very detailed approach, as well as confirm the scope of work required for each project.

To assure the borrower that projects are constructed according to the EAR and LoanSTAR technical guidelines, SECO performs design specification review and on-site construction monitoring at 50% and 100% complete.

Another non-traditional solution to funding these projects is to secure the services of a performance contractor. Performance contractors can finance projects in the same manner as the LoanSTAR program by using energy and operational savings as funding for the projects. Performance contractors can package projects with paybacks up to 20 years and pull from a large variety of financial resources for low-interest funding (including the LoanSTAR Program). For more information on this subject feel free to visit the SECO website or call Jacobs at the number shown on the front cover of this PEA.

APPENDIX E: GOVERNMENT LEGISLATION AND STANDARDS

Energy Efficiency Programs in Political Subdivisions

Senate Bill 12

An Act relating to programs for the enhancement of air quality, including energy efficiency standards in state purchasing and energy consumption.

House Bill 3693

An Act relating to energy demand, energy load, energy efficiency initiatives, energy programs, and energy performance measures.

HB 3693 and SB 12 Rules

The State Energy Conservation Office (SECO) has published rules on House Bill (HB) 3693 and Senate Bill (SB) 12 for persons who have an interest in the adoption of energy codes to have an opportunity to comment on newly published editions of the International Energy Conservation Code and the International Residential Code. The code manuals can be purchased at the **International Code Council** web site.

BACKGROUND

In 2001, the 77th Texas Legislature passed **Senate Bill 5 (SB5)**, also known as the Texas Emissions Reduction Plan, to amend the Texas Health and Safety Code. The legislation required ambitious, fundamental changes in energy use to help the state comply with federal Clean Air Act standards. It applied to all political subdivisions within 38 designated counties, later expanded to **41 counties**.

In 2007, the 80th Texas Legislature passed **Senate Bill 12 (SB 12)** which among other things extended the timeline set in SB 5 for emission reductions. Where SB 5 required political subdivisions to reduce their electrical consumption by five percent (5%) for five years beginning January 1, 2002, the SB 12 legislation requires that such entities establish a goal to make the five percent (5%) reductions each year for six years, effective September 1, 2007.

SB 12 amended the Health and Safety Code Section 388.005, in part, by requiring affected political subdivisions to: implement all cost-effective energy-efficiency measures, establish a goal to reduce electricity consumption by 5 percent each year for 6 years, and report efforts and progress annually to the State Energy Conservation Office (SECO). The report details the efforts being undertaken by SECO to provide assistance and information to affected entities, as well as the progress and efforts made by political subdivisions in meeting the energy efficiency mandates of SB 5/SB 12.

Meeting Your Energy Efficiency Goals

In terms of energy efficiency, the biggest step is requiring new buildings to meet the state's energy performance standards. These standards call for better weather stripping, more efficient air conditioners, stricter insulation guidelines, switches to turn off water heaters, tighter building envelopes and energy-efficient windows for new buildings. Under the new law, municipalities and counties can continue to make local amendments to the state energy codes as long as they are not less stringent than the statewide standard.

Source: <http://www.seco.cpa.state.tx.us/sb5compliance.htm>

APPENDIX F: SERVICE AGREEMENT



Local Governments and Municipalities

Preliminary Energy Assessment Service Agreement

Investing in our communities through improved energy efficiency in public buildings is a win-win opportunity for our communities and the state. Energy-efficient buildings reduce energy costs, increase available capital, spur economic growth, and improve working and living environments. The Preliminary Energy Assessment Service provides a viable strategy to achieve these goals.

Description of the Service

The State Energy Conservation Office (SECO) will analyze electric, gas and other utility data and work with City of Plainview, hereinafter referred to as Partner, to identify energy cost-savings potential. To achieve this potential, SECO and Partner have agreed to work together to complete an energy assessment of mutually selected facilities.

SECO agrees to provide this service at no cost to the Partner with the understanding that the Partner is ready and willing to consider implementing the energy savings recommendations.

Principles of the Agreement

Specific responsibilities of the Partner and SECO in this agreement are listed below.

- ✓ Partner will select a contact person to work with SECO and its designated contractor to establish an Energy Policy and set realistic energy efficiency goals.
- ✓ SECO's contractor will go on site to provide walk through assessments of selected facilities. SECO will provide a report which identifies no cost/low cost recommendations, Capital Retrofit Projects, and potential sources of funding. Portions of this report may be posted on the SECO website.
- ✓ Partner will schedule a time for SECO's contractor to make a presentation of the assessment findings key decision makers.

Acceptance of Agreement

This agreement should be signed by your organization's chief executive officer or other upper management staff.

Signature: [Handwritten Signature]

Date: December 23, 2009

Name (Mr./Ms./Dr.): Mr. Greg Ingham

Title: City Manager

Organization: City of Plainview

Phone: (806) 296-1106

Street Address: 901 Broadway, Plainview, Texas 79072

Fax: (806) 296-1125

Mailing Address: 901 Broadway, Plainview, Texas 79072

E-Mail: ingham@ci.plainview.tx.us

County: Hale

Contact Information:

Name (Mr./Ms./Dr.): Mr. Greg Ingham

Title: City Manager

Phone: (806) 296-1106

Fax: (806) 296-1125

E-Mail: ingham@ci.plainview.tx.us

County: Hale

Please sign and mail or fax to: Stephen Ross, Local Governments and Municipalities Program Administrator, State Energy Conservation Office, 111 E. 17th Street, Austin, Texas 78774. Phone: 512-463-1770. Fax 512-475-2569.

Jacobs 5/13/10
SR ✓