



# **INTEGRATING ENERGY SERVICES FOR STATE BUILDINGS**

## **An Energy Action Plan for Tennessee Buildings**

*Developed in Partnership with  
the  
U. S. Department of Energy's Rebuild America Program  
and the  
U. S. Environmental Protection Agency's Energy Star Program*



Prepared by:

**Department of Finance and Administration  
Division of Capital Projects & Real Property Management  
State Building Energy Management Program**

**July, 2001**

With oversight by Capital Projects Management for the  
**STATE BUILDING COMMISSION**  
of Tennessee

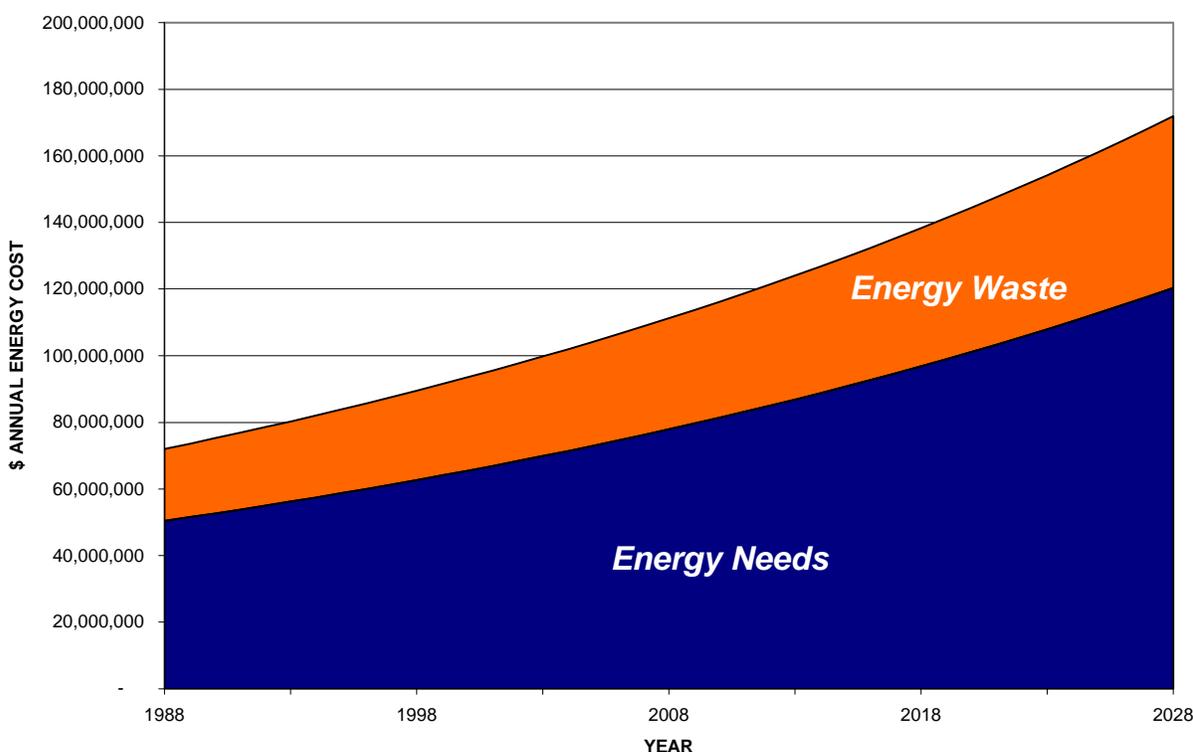
# CONTENTS

Overview .....	2
Plan Objectives .....	2
Vision / Mission .....	4
Plan Concept .....	4
Five Year Goals.....	5
Organization .....	5
Steps to Success .....	6
Essential Elements of the Plan .....	7
Agreements .....	7
Authority.....	8
Management.....	8
Performance .....	8
Guaranteed Savings .....	10
Approved Energy Specific Budget Policy .....	10
Standard Procurement Process.....	11
Resources.....	11
EPA Energy Star Buildings Program.....	11
Available Resources .....	12
Expected Benefits .....	13
Partnership Agreement .....	14
Supporting Documents:	
Tennessee Integrated Energy Services Process .....	Annex A
Annual Building Energy Costs.....	Annex B
Commissioning Guidelines.....	Annex C
Performance Contracting Guidelines .....	Annex D
Engineering Building Assessment Forms.....	Annex E
Energy Star Buildings Program .....	Annex F
State Owned Building Inventory .....	Annex G
State Building Energy Management Handbook .....	Annex H

# Overview

The State of Tennessee spent approximately \$72 million for energy to operate state-owned buildings in 1988. In 1998, that annual bill grew to between \$80 and \$90 million. Projected out to the next ten years, at a 2% growth rate, the bill approaches \$120 million. This report summarizes the vision, priorities, goals and organization that, if successfully implemented, will establish an effective, self-funded program to reduce the growth of energy costs and reduce deferred maintenance in State buildings. Specifically, it addresses how the State Building Energy Management Program (SBEM) can provide leadership in a statewide strategic plan that will improve the operation, maintenance, energy efficiency and working environment in all state-owned buildings while reducing energy costs.

## STATE BUILDING ENERGY COSTS (2.2% ANNUAL INCREASE)



## Plan Objectives

The broad objectives of this plan are:

- **Reduce energy consumption** and costs in State buildings (through energy efficiency / maintenance improvements and operational measures)
- **Retrofit 60 million square feet of state-owned space in 15 years**
- **Maintain current energy budget levels** to fund program activities (budget verified savings back to agencies through the program)

- **Provide performance incentives to agencies and service providers**
- **Reduce or eliminate current deferred (unaccomplished) maintenance** in State buildings
- **Incorporate energy efficiency in the planning and design** of new facilities

A plan of this scope, magnitude and complexity requires careful planning and coordination if it is to be effective and well documented. It is also extremely important that fundamental issues regarding budget and finance are dealt with early in the planning process so that quick payback measures aren't implemented without "capturing" the savings for use later.

An initial screening of building stock should be performed as each agency comes into the program in order to identify those buildings that represent the best candidates for O&M improvements and energy savings renovations. Candidate buildings will be ranked according to the overall priorities and goals as follows: (*note:  $\ddot{O}$  indicates objective achieved*)

- **Start-up Objectives:**
  - $\ddot{O}$  - **Identify and select a pilot agency** to test the integrated process outlined here (*Middle Tennessee State University*)
    - **Identify buildings and complete engineering building assessments** for the buildings with the highest energy use within the inventory and commission as appropriate
  - $\ddot{O}$  - **Complete pilot projects** on building commissioning and performance contracting
    - **Establish an incentive** to agencies that will encourage their continued support of the plan (e.g. some share of the savings)
  - $\ddot{O}$  - **Establish standards** for "building commissioning" and energy savings performance contracts (ESPC) (*see Annex C*)
    - **Establish a recognition and awards program** for outstanding achievement of the goals and objectives of the program
  - $\ddot{O}$  - **Develop and approve this plan** for state-wide implementation (*approved August 1999 by the State Building Commission*)
  - $\ddot{O}$  - **Approve a process that can integrate energy services** to all State agencies. Such a process is described in detail as an attachment (Proposed Tennessee Integrated Energy Services Process or T.I.E.S.) In this process, an engineering assessment is the first step from which integrated multi-disciplined energy programs and services are provided to State agencies as appropriate. (*see Annex A*)
- **Mid-term Objectives:**
  - $\ddot{O}$  - **Extend this plan into other state agencies** (*see Current State Agency Partners, page 6*)
  - $\ddot{O}$  - **Begin implementation** of energy conservation savings measures (ECSM's) at partner agencies and report progress (*has begun*)
  - $\ddot{O}$  - **Market the plan** to other State agencies (*in progress*)
- **Longer-term Objectives:**
  - **Adopt and implement this plan state-wide**
  - **Establish a continuing, comprehensive facilities management program** within each State agency that owns or operates buildings to improve the comfort and productivity of building occupants at the least possible energy cost.

# Vision / Mission

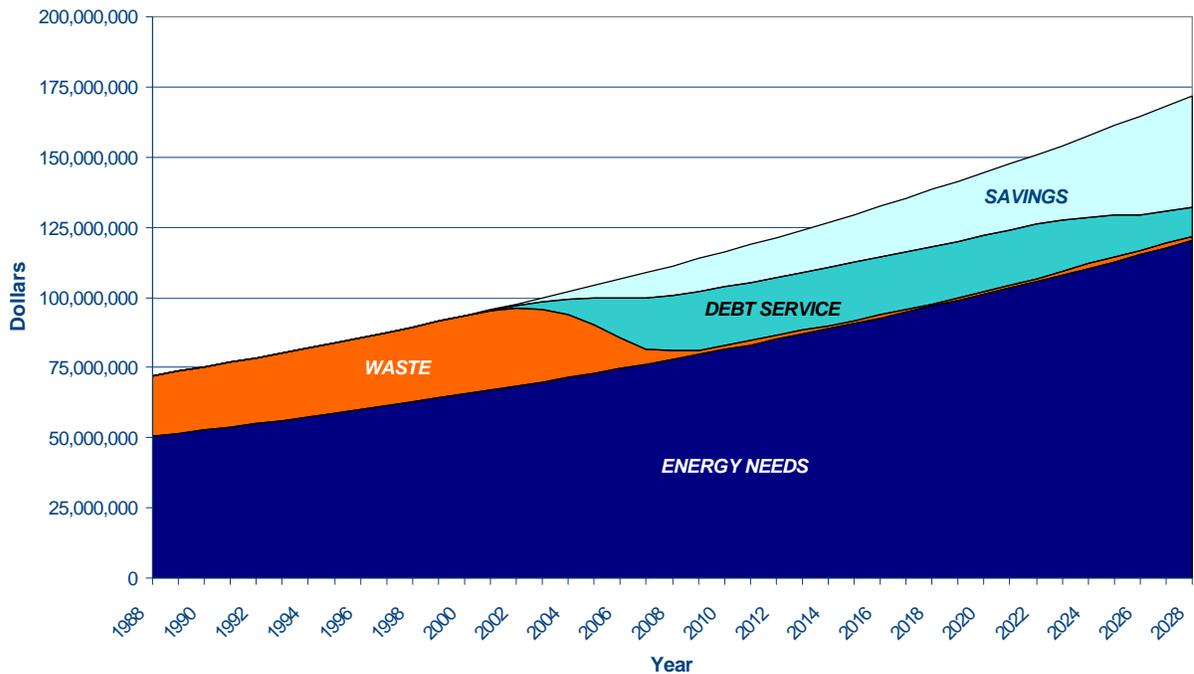
**Our vision** is that all State buildings provide a safe, comfortable and productive work environment while operating at optimum energy efficiency

**Our mission** is to introduce, initiate and implement programs that will improve safety, comfort and energy efficiency at all State buildings

# Plan Concept

This plan is designed to be self-funded by using the savings generated from facility modifications to provide debt service for the investment capital required to fund the modifications. Under this concept,

**State Building Energy Costs/Savings  
1988 - 2028**



verified program savings are provided to the annual agency budgets to pay for debt service, program costs and performance period costs at existing buildings. Any additional savings could be used to fund energy or related projects. Long-term, net savings would accrue to the General Fund. Traditional funding sources will be used to finance energy efficient design and construction of new facilities.

This plan is modeled after the U. S. Department of Energy's (DOE) Rebuild America Program. State agencies will voluntarily become partners in this program through a letter of commitment. Partner agencies will receive technical support, implementation standards, coordination of program resources including DOE and the U.S. Environmental Protection Agency (EPA), and follow-up monitoring and verification of savings from SBEM. A pilot agency will be selected to test the implementation process and gauge the resource requirements for a more aggressive implementation of the plan statewide.

# Attainable, 5 Year Goals

- Achieve an average 30% operational cost saving (\$8,000,000) per year in selected State facilities each year for the first five years of full implementation under Scenario B. (20% net improvement from energy efficiency improvements and 10% savings from related O&M improvements. The following estimates are based upon average energy costs of \$ 1.22/SF/YR for DGS office buildings)
- Achieve environmental pollution reductions equivalent to 4,000 fewer cars
- Implement all appropriate efficiency measures in buildings brought into the plan over the next five years as follows:

## Scenario A

This scenario represents a reasonable effort given existing resources and existing level of interest from other state agencies.

## Scenario B (*recommended*)

In this scenario, a more aggressive approach will require additional resources to be provided to the program.

## Scenario C

This represents a considerably more aggressive approach that also would require additional program resources.

The following table illustrates the significance of these goals on a statewide basis. If these goals are met, the following results are possible, based upon an estimated potential viable square footage of about 60 million square feet (80% of total 72 M SF):

	<b>Goal for 5-yr period</b>	<b>Time to Complete All Viable SF</b>	<b>Attainable with Current Resources</b>
<b>Scenario A</b>	<i>7 million square feet</i>	<b>39 years</b>	Yes
<b>Scenario B</b>	<i>20 million square feet</i>	<b>15 years</b>	No
<b>Scenario C</b>	<i>30 million square feet</i>	<b>10 years</b>	No

# Organization

A partnership has been formed between the State Building Energy Management Program, the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) for the purpose of developing and implementing this plan. Other State agencies will become vital partners in the implementation process. The primary authority for this plan is the State Building Commission with plan leadership and administration provided by the State Building Energy Management Program (SBEM). State agencies should appoint a full-time energy manager with primary responsibility for coordinating all agency activities with the “management team”. DOE under their Rebuild America Program, and EPA under their Energy Star Buildings Program will provide technical and other vital program resources including: software tools, implementation planning assistance, marketing resources, public recognition of partners and many others. Other “Rebuild” (DOE) and “Energy Star” (EPA) partners in the state (for example Middle Tennessee State University, and the Department of Corrections) will provide additional program development support as pilot agency partners.

## Current State Agency Partners:

AGENCY / CAMPUS	SQUARE FOOTAGE
Department of General Services	5,000,000
Tennessee Board of Regents	25,439,850
University of Tennessee System	18,503,400
Department of Environment & Conservation	1,330,200
Tricorp (Dept. of Corrections industry)	8,200
<b>SUB-TOTAL</b>	<b>50,281,650</b>

## Prospective State Agency Partners:

AGENCY / CAMPUS	SQUARE FOOTAGE
Department of Correction	4,971,300
Wildlife Resources Agency	65,000
TN School for the Blind	630,000
<b>SUB-TOTAL</b>	<b>5,666,300</b>

## Steps to Success

The following logical steps are all equally vital to the successful implementation of the plan and should be completed in sequence as each new agency is brought on board:

1. **Establish a statewide standard energy accounting system** to identify and report energy consumption and costs at all state facilities.
2. **Establish facility specific energy management plans** at all state facilities to improve the energy efficiency and reduce operational costs. These plans should be based upon guidance given in the State Building Energy Management Handbook, Second Edition, 1996 published and provided by the Department of Finance and Administration's State Building Energy Management Program. These plans will focus on operations and maintenance measures as-well-as low-cost / no-cost energy efficiency measures.
3. **Perform agency needs assessments** of the agency's management and engineering capability and building inventory. Using assessment tools developed by U.S. Department of Energy (DOE), and the U.S. Environmental Protection Agency (EPA), and the State Building Energy Management Program (SBEM), estimates of savings potential and implementation costs will be prepared for the gross square footage targeted by new partners. This step also serves to establish verifiable baselines for comparisons that will determine resulting savings. The assessments are intended to provide the following information:
  - Agency technical support needs
  - Annual energy use and demand for the selected buildings
  - Inventory of building systems and major equipment and current condition

- Highest energy use equipment of groups of equipment
  - Building operational schedules
  - Major maintenance and operational problems
  - Potential energy efficiency retrofits and associated costs and savings
4. **Utilize standard energy savings performance contracts (ESPC's)** as approved by the State Building Commission. Performance contracting is perhaps the most significant tool available to the State in implementing this plan. It can effectively guarantee successful accomplishment of the plan's goals and objectives. The State Building Commission has approved standard documents and a standard process. The State Building Energy Management Program can provide assistance in implementing and monitoring this process.
  5. **Select and prioritize buildings** for repairs, tune-up and retrofit. In this step, managers wisely select which buildings to include in the program and what priority each selected building should have in the competition for valuable program resources.
  6. **Perform operational repairs and tune-up** energy consuming systems based upon the facility energy plan established under step number two above. It is during this step that an appropriate commissioning of existing building systems is completed. Building commissioning (Cx) is a process that insures that buildings perform as they were intended. For a more detailed discussion of commissioning and Tennessee's efforts to date, see Annex C of this plan.
  7. **Perform detailed engineering studies**, if warranted by the engineering assessment and the commissioning activities. Such studies will clearly establish the potential costs and savings from major energy management retrofits as part of an energy savings performance contract (ESPC); or, they may simply become the engineering / design phase for more traditional energy management retrofit projects (still performance oriented).
  8. **Complete all economically feasible energy management retrofits.** This step also includes building operator training for maintenance and operational requirements of new systems and controls.
  9. **Monitor and verify results (savings)** and report to management. If an ESPC has resulted, it will also include ongoing operations and maintenance support and follow-up for the duration of the contract period.
  10. **Perform annual checkup inspections** to verify new performance efficiencies are being maintained.

## Essential Elements of the Plan

### Agreements

There must be documented commitments from all partners in the form of executed agreements, an executive order or legislative mandates.

## Authority

Under the broad authority of the State Building Commission and the Administration, plan administrators and facility managers need the program and budget authority to make decisions regarding appropriate changes in the long-term maintenance and operation of their facilities.

## Management

Qualified energy managers are needed to ensure that accurate performance “baselines” and operational needs are established at each building under the plan. Building systems should then undergo an appropriate level of commissioning to ensure that building energy systems perform at their best before evaluations of energy efficiency retrofit options are completed. Neither the prospective agencies nor the State Building Energy Management Program currently have the existing resources/expertise to implement a significant program statewide.

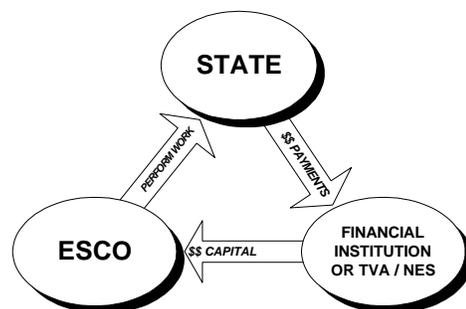
There also must be documented commitments from all partners in the plan. All partner agencies will commit in writing to support and participate in the Tennessee Action Plan. Partners will identify a full-time, qualified energy manager who will coordinate agency activities with the State Building Energy Management Program (SBEM). With assistance from SBEM, each agency will prepare a plan for their agency including measurable goals and objectives that support the State plan. Finally, partners agree to provide SBEM follow-up information on project status, savings achieved and overall program status.

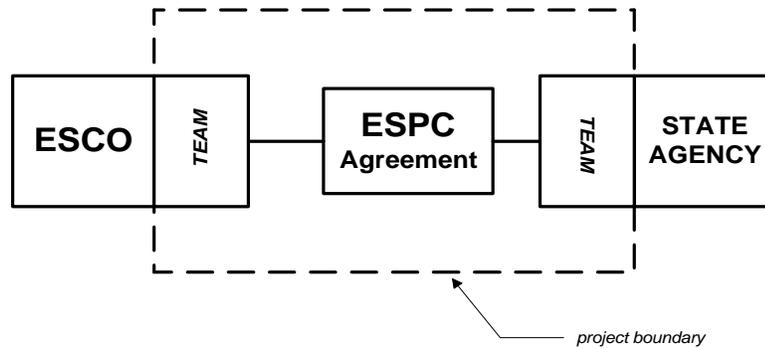
## Performance

Performance contracting is perhaps the single most important element of this plan as it can provide a significant statewide impact by providing projects that “work” while not requiring large amounts of up-front capital.

Performance contracting is one of those things that sounds too good to be true. A building owner can increase energy and operational efficiency without making any initial capital investment. An owner (the state) can decrease energy, operating and maintenance costs and simultaneously reserve available capital for other needs, or be able to complete such projects that could not otherwise be completed because of lack of funds. This last option is the most attractive benefit of performance contracting to State and local governments with growing deferred maintenance lists.

Performance contracting is now an approved procurement process in many state governments including Florida, Ohio, Maryland, California and others, because it can be a win-win situation. Everyone comes out ahead - business, government and the taxpayer. Under such agreements, a third party (energy services company “ESCO”) provides a service package that typically includes the





financing, engineering, installation and maintenance of energy-saving capital improvements.

The customer uses the resulting energy savings to pay for the improvements.

The State Building Energy Management Program has reviewed in some detail how the Federal Energy Management Program (FEMP), and other states use performance contracting to accomplish major energy management retrofit projects. Also, Oak Ridge National Laboratory (ORNL) is using the “Super ESPC” approach in creative ways that provide improved competition and eliminates much of the “mystery” associated with performance contracting.

Based on this work, Tennessee has developed and proposed standards for the use of performance contracting with the following characteristics:

1. Program is based upon the FEMP Energy Savings Performance Contract model
2. Features indefinite delivery, indefinite quantity (IDIQ) type of contract and best value procurement
  - a) General ordering agreement for energy products and services only (no projects awarded at time of selection of ESCO’s)
    - three evaluation criteria including: pricing model (using contractor margins), qualifications and past performance addressed in a written proposal, followed by an oral presentation / interview with the evaluation team
  - b) Bilateral task orders to establish projects, clearly defining owner and ESCO requirements, with the following elements:
    - Scope of energy saving measures
    - Operations and maintenance requirements
    - Health, safety and environmental issues
    - Energy baselines for each project
    - Measurement and verification requirements
    - Acceptable economic terms
    - Other project specific requirements

The diagram above, illustrates the relationships established between the owner agency and the ESCO through the performance contract. Once the Super ESPC contract is awarded, the technical and administrative team for both the State agency and the ESCO collaborate under the terms of the contract to develop a scope of work for each individual project and specific requirements that will be issued as Delivery Orders.

Even when ESPC's are not utilized, specifications for procurement of energy projects and services should be "performance based" to insure that the program achieves the desired results.

Following is a table including examples of products and services that can be provided under the plan:

- *Energy efficient lighting*
- *HVAC maintenance & repair*
- *HVAC automation*
- *thermal storage systems*
- *lighting controls*
- *training services*
- *boiler modernization*
- *commissioning services (Cx)*
- *indoor air quality analysis*
- *modernize temperature controls*
- *high efficiency heat pumps*
- *ground source heat pumps*
- *variable speed drives*
- *energy efficient motors*
- *chiller modernization*
- *advanced utility metering*

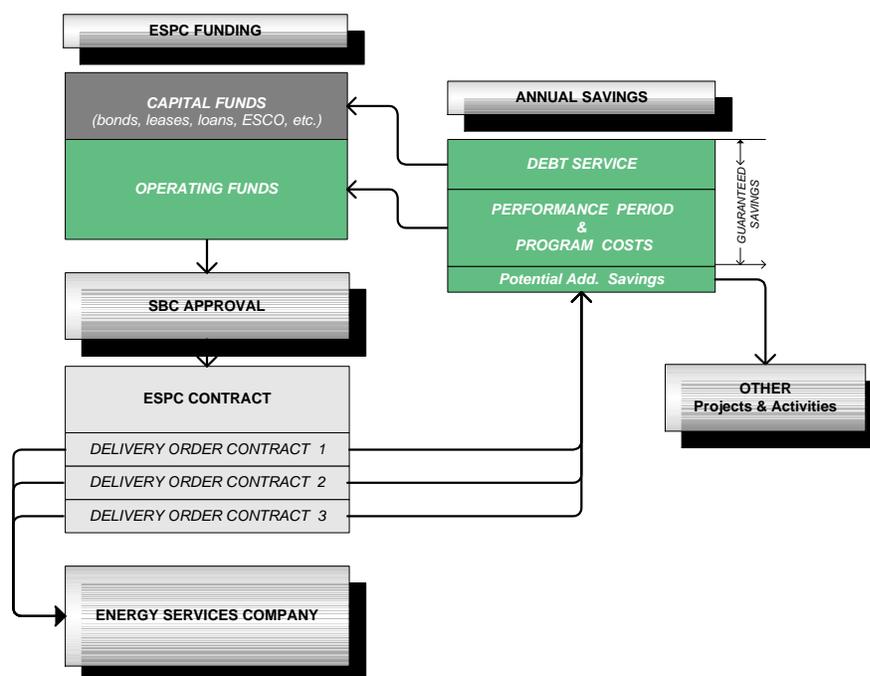
See Annex D for a detailed discussion of performance contracting and draft guidelines. Energy Savings Performance Contracts can provide the resources and expertise to accomplish a significant energy retrofit effort statewide in a relatively short period of time.

### Guaranteed Savings

Performance contractors can guarantee the energy savings resulting from implementation of energy cost savings measures (ECSMs) and operations and maintenance (O&M) measures. This insures that the savings are real and available to the program. These guarantees can be provided to the State where the risk of not achieving the desired savings is high and the cost of the guarantees is reasonable.

### Approved Energy Specific Budget Policy

Specific new budgetary policy has been established with respect to the accounting for and utilization of savings generated by the plan. When developing and implementing energy efficiency projects in State buildings, including the use of Energy Savings Performance Contracting (ESPC), the energy related cost savings must be made available for use as the payment source for specific project and program related costs throughout the debt-service period of the projects. Any additional savings could

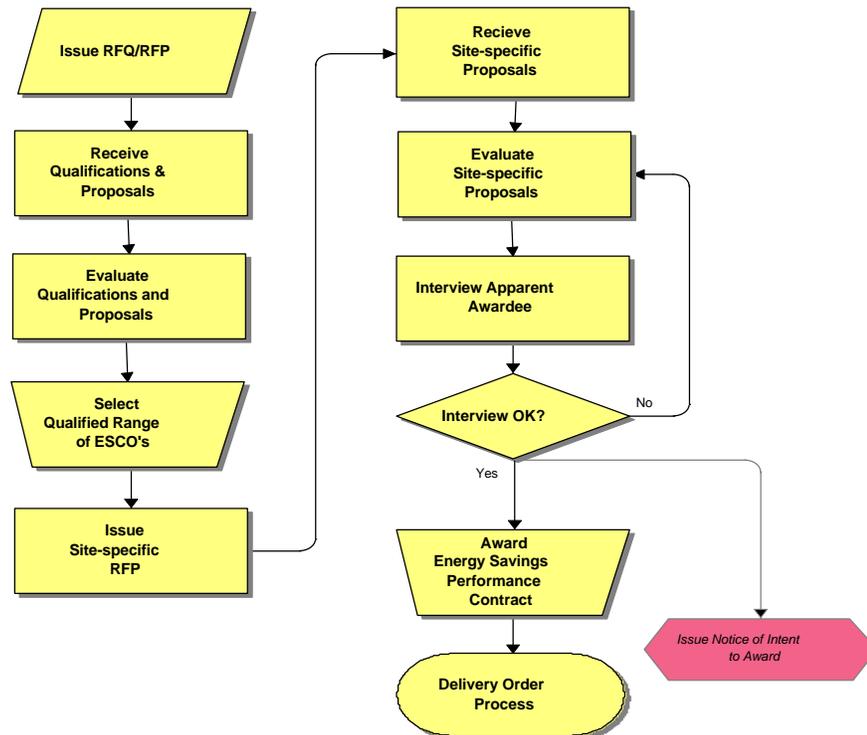


be made available for use in implementing additional energy and related deferred maintenance projects at State buildings.

### Standard Procurement Process

A standard Request for Proposal (RFP) process and language has been established for acquiring, utilizing and guaranteeing multi-disciplined performance from qualified energy service companies (ESCOs). This process is based upon a competitive evaluation of qualifications and proposals from qualified ESCOs. (see chart below)

### Energy Savings Performance Contract (ESPC) RFQ - RFP Process



## Resources

### EPA Energy Star Buildings

The State has signed on as a partner in the U. S. Environmental Protection Agency’s voluntary Energy Star Buildings program. In the program, partners focus on reducing energy consumption and improving building performance by using new high-efficiency energy technologies. EPA asks its partners to prioritize projects based upon profitability by using a five-stage energy upgrade strategy that leads to maximum savings, prevents over-sizing of heating and cooling equipment, and minimizes capital costs. A public commitment from the Administration when we begin implementation can provide the motivation and public support of the program required to make it successful.

EPA offers financing options, software, educational workshops, unbiased technical support, actual case studies on buildings of all sizes and improved opportunities to share information with other partners. The EPA will also publicly recognize the state's environmental leadership and assist in promoting successful projects at State facilities. Following is a summary of the Memorandum of Understanding (MOU) that establishes the partnership with EPA.

### **Buildings MOU in Brief**

ENERGY STAR Buildings participants sign a Memorandum of understanding (MOU) with EPA agreeing to improve the overall energy efficiency of their facilities through the implementation of a comprehensive set of profitable upgrades. EPA assists participants by providing technical and administrative assistance to ensure maximum energy savings while satisfying cost-effective criteria.

### **Partner Responsibilities**

The ENERGY STAR Buildings Partner agrees to:

- Survey and implement all profitable upgrades in one Pilot Building within 2 years
- Complete full-building upgrades where profitable in at least 50% of remaining qualifying space and lighting upgrades in remaining 40% within 7 years (qualifying space is conditioned space that is owned or financially controlled by the Partner)
- Maintain or improve indoor air quality in upgraded ENERGY STAR Buildings
- Partners are encouraged to follow EPA ENERGY STAR Buildings staged approach to upgrades, or at a minimum account for inter-system effects
- Adhere to ENERGY STAR energy-efficiency and profitability criteria when replacing failed or retired equipment during the term of the MOU
- Annually report progress to EPA
- Develop an employee outreach program entailing the ENERGY STAR Buildings program goals and results and your pollution prevention accomplishments
- Allow EPA to use your results to promote EPA pollution prevention programs

### **EPA Responsibilities**

EPA Agrees to:

- Provide technical support, including written materials and guides, and a technical hotline
- Provide software tools to aid in estimating energy savings and environmental benefits from specific upgrades (i.e. variable speed drives, fan systems)
- Advise and assist partners in planning and implementing the upgrades
- Provide marketing resources, such as posters and fact sheets, to help Partners communicate the ENERGY STAR Buildings program within their organizations
- Create an Ally Program of equipment manufacturers and distributors, contractors, utility companies, and building technology experts
- Publicly recognize Partners for their participation and publicize their successes
- Provide special recognition for those buildings that achieve the greatest energy-use reductions
- Allow Partners to use EPA's ENERGY STAR logo to publicize their participation in the program

## **Available Resources**

Current resources available to implement this plan include:

- the State Building Energy Management Program, F&A Capital Projects

- Building Management Staff at participating agencies
- the Facility Revolving Fund (FRF)
- the State Energy Management Fund
- Energy Management Loan Fund
- Rebuild America Partners (Oak Ridge National Labs, MTSU, PECCI, others)
- EPA Energy Star Buildings program
- Agency O & M Budgets (including utilities)
- TVA, Energy Services Group and Power Distributors, utility services
- Private sector Energy Service Companies (ESCO's)

**Future Resources:**

- Savings generated from completed EM retrofit projects
- Enhanced staffing support for the program (data and technical)
- Enhanced staffing support at each participating agency (full-time coordinator)

## **Expected Benefits**

The State will benefit from more efficient buildings, increased productivity of employees due to improved living and working environments, reductions in the number of employees / contracts for operation and maintenance from improved maintenance conditions (saves money). In addition, this can be accomplished with little or no internal capital funds.

**Direct benefits** to State agencies include:

- Reducing energy consumption will reduce rising energy costs and environmental pollution.
- Leveraging current program resources through improved coordination of activities will produce “more bang for the buck”.
- Unaccomplished maintenance needs can be reduced or eliminated
- Improving the monitoring and follow-up of efficiency upgrade projects will ensure program success.
- Improving the operation and maintenance of state buildings will reduce the number of emergency repairs and reduce costs.
- Increasing the environmental awareness of facility managers, tenants and clients will result in a cleaner environment.
- Improving the physical plant will result in fewer “trouble” calls from unhappy tenants.

**Implementation of this plan can also:**

- Establish Tennessee as a leader in accomplishing energy efficiency at government facilities
- Spur economic development in urban areas
- Fuel economic growth by converting energy savings into local jobs and other community investments
- Reduce pollution and demand on existing power plants
- Prepare Tennessee Government for de-regulation of electric utilities
- Provide national recognition to Tennessee by sharing what has been done with others nationally through our partnership with U.S. DOE and EPA (Tennessee is the first state with an action plan for its buildings)

# State Building Energy Management Partnership Agreement

**SBEM Agrees to:**

- Assign a Representative who will aid the Partnership agency in the development and implementation of energy efficient project identification.
- Coordinate program resources among all partnership agencies, US DOE Rebuild America, and EPA Energy Star Buildings.
- Promote exchanges of information and provide guidance, programs, workshops, and training opportunities.
- Support peer exchange conferences to aid in replicating successes throughout the State of Tennessee.

**Partnership agency agrees to:**

- Support and participate in, the State Energy Action Plan.
- Prepare and submit an action plan for your agency including measurable goals and objectives that supports the State plan.
- Identify an energy management coordinator to represent the agency in these efforts with the SBEM.
- Provide routine follow-up information to the State Building Energy Management Program on project status, savings achieved and plan status.

By signing below, this agency accepts the Tennessee Action Plan agreement with the State Building Energy Management Program. This form should be signed by the agency's chief executive officer, or another senior officer who has the authority to commit the organization's resources.

**EXECUTIVE ACCEPTANCE**

SIGNATURE

DATE:

\_\_\_\_\_

\_\_\_\_\_

NAME:

TITLE:

\_\_\_\_\_

\_\_\_\_\_

AGENCY:

PHONE:

\_\_\_\_\_

\_\_\_\_\_

ADDRESS:

FAX:

\_\_\_\_\_

\_\_\_\_\_

**Additional Contact:** *(main point of contact for this program)*

NAME:

TITLE:

\_\_\_\_\_

\_\_\_\_\_

AGENCY:

PHONE:

\_\_\_\_\_

\_\_\_\_\_

ADDRESS:

FAX:

\_\_\_\_\_

\_\_\_\_\_

# Annex A

## Proposed Tennessee Integrated Energy Services Process (TIES)

In this process, building commissioning (Cx) is the foundation from which integrated, multi-disciplined energy programs and services are provided. Combined with “performance contracting”, this may be the only approach that can integrate the various program objectives, maintain a long-term perspective, reduce overall owning and operating costs, and ensure program success.

The State Building Energy Management Program, as a Rebuild America partner is currently working with State officials, as-well-as energy and commissioning consultants, to develop and implement an integrated plan for providing O&M, energy efficiency and related services to State agencies with a minimum impact on capital and operating and maintenance budgets.

Based on the success of the two pilot projects at Citizen’s Plaza and the Chattanooga State Office Building, and much study of “performance contracting” in other states and the Federal government, an effective process for Tennessee would include the following elements:

- 1. Engineering assessment** (energy survey) at existing state owned buildings including:
  - a) Perform site survey and building energy evaluations
  - b) Identify major systems and equipment
  - c) Identify operational requirements and constraints
  - d) Conduct pre-functional tests requirements
  - e) Identify potential O & M fixes / needs
  - f) Establish energy savings performance baselines
  - g) Identify potential energy management retrofit opportunities (order of magnitude costs & savings)
  - h) Prepare strategic energy plan for site
  
- 2. Implementation of Strategic Energy Plan**
  - a) Conduct detailed engineering study
  - b) Establish performance contract as appropriate
  - c) Evaluate and select specific O&M and energy measures
  - d) Prepare commissioning plan
  - e) Commission existing building / systems (complete appropriate O&M fixes)
  - f) Select and perform energy retrofits & commission
  - g) Prepare implementation report (identify costs and savings)
  - h) Monitor and verify results

**3. Partnerships Between DOE, TVA / Local Power Distributors , and Energy Services Companies (ESCO's) so that services can be provided and paid for from existing O & M budgets, including utilities.**

- a) Advanced metering services
- b) Building commissioning services
- c) Detailed energy studies
- d) Energy services agreement
- e) Project design and construction
- f) Commissioning of new systems
- g) Operation and maintenance services
- h) Monitoring and verification

# ANNEX B

## BUILDING ENERGY ASSESSMENT

### WHAT IS A BUILDING ENERGY ASSESSMENT?

An energy assessment is an examination of the energy consumption of a building. The assessment consists of an analysis of each type of energy consumption, cost and demand for at least a twelve month period, and an on-site, walk through examination of the building shell and energy consuming devices in the building. The purpose of the Energy Assessment is to establish baseline energy performance of the building and general condition of the various energy consuming systems within a building.

### PLANNING FOR ENERGY ASSESSMENTS

Energy utilization can be improved in any building. Obviously some buildings are better performers than others. To better utilize available funds and other resources, it is wise to look at which buildings are the worst performers or heavy energy users, such as hospitals or buildings requiring 24 hours/day operation, and prioritize your inventory of buildings based upon energy consumption.

This can be done best by studying records of energy consumption for the past several years (making judgments and allowances for major changes, such as more or less personnel, a major addition or major modification). Energy usage should be collected by someone on the building management staff specifically assigned this responsibility. The energy consumption data is obtained from the utility bills which can be found in the bookkeeping or accounting office of your facility or department, or directly from your utility company. In a large facility or complex of buildings, it may be well worth having a full time energy manager or someone that has part of their work time specifically devoted to energy conservation.

Total annual consumption's of all types of energy may be converted to thousand BTUs (KBTU) using the following conversion factors:

<i>Energy Type</i>	<i>Quantity</i>	<i>Unit</i>	<i>Conversion Factors</i>			<i>10<sup>3</sup> BTU's</i>
Electricity	_____	KWH	X	3.413	=	_____
Natural Gas	_____	CCF	X	100	=	_____
Coal	_____	Tons	X	25,000	=	_____
Oil (#2)	_____	Gallons	X	138	=	_____
LPG (Propane)	_____	Gallons	X	91.6	=	_____
Steam	_____	Pounds	X	1.0	=	_____
Chilled Water	_____	Ton Hrs	X	12	=	_____

## AVERAGE PERFORMANCE FOR STATE OF TENNESSEE BUILDINGS

The following chart shows building energy use averages, in BTU/square foot per year, for Tennessee State Buildings. You can compare your building's energy use to see how it compares to the average situation.

Type of Facility	Tennessee Buildings Energy Consumption	DOE Survey Energy Consumption**
Office, Administration	65,000*	95,500
Elementary School Building	70,000	64,900
Secondary School	60,000	64,900
College Classroom	83,000	64,900
Gyms and Auditoriums	68,000	56,400
Food Preparation, Cafeteria	211,600	231,700
Hi-Rise Dorm	106,000	82,800
Apartment	53,000	82,800
Mobile Units	84,000	N/A
Hospitals	226,000	154,000
Clinic / Long Term Health Care	72,000	82,800

*\*116,000 BTU/sqft/year reflects large computer or process loads not typically found in most state office buildings. A figure of 65,000 BTU/square foot is more representative for office buildings without large computer or other process loads where reasonable conservation measures are implemented.*

*\*\* The data was compiled by DOE in 1989 printed in 1992 for south region commercial buildings categorized by buildings activity. (Ref. 15, Table 16)*

*NOTE: These are average numbers and may not be a realistic goal for a particular building. The hours of use vary from building to building and will affect energy use.*

## CALCULATING THE ENERGY UTILIZATION INDEX ( EUI ) FOR YOUR BUILDING

Following are the steps required to determine the energy utilization index:

- a. Select the appropriate facility-type for your building from the preceding table.
- b. Divide the total annual BTU/sq. ft. from the Energy Use Charts by the corresponding value from the preceding table to get your (EUI) building performance measure. For example, consider a

50,000 square foot office building with typical office equipment, that uses 3,000,000 KBTU of energy per year.

$$\begin{aligned} & 3,000,000 \text{ KBTU/year} / 50,000 \text{ square feet} \\ & = 60 \text{ KBTU/ square foot/year} \end{aligned}$$

$$EUI = 60 / 65 = 0.923$$

Using the recommended 65 KBTU/year/square foot for a simple office building

- c. If your EUI is less than 1, your building energy use is less than the average for a comparable Tennessee building. If your EUI is greater than 1, your building's energy performance is more than the average for a similar type building in Tennessee and a detailed audit is probably needed to find what energy uses can be reduced within budgetary allowances. In the example, under item b above, the building would not be assigned a high priority for an audit. It should be noted that every energy saving idea or device will not pay back in the monetary cost of energy in the lifetime of some buildings while others will payback in a few years. In addition to dollars payback, of course, there is the added environmental benefit of reduced thermal and toxic gaseous emissions due to reduced need for energy production. Those energy conservation savings measures (ECSMs) that have the best paybacks (on the order of 5 years or less) are recommended to be implemented as soon as possible. However, if some improvements (such as lighting or general renovation) are scheduled to be done anyway, or if a combined number of ECSMs provides a good payback and they improve productivity in the workplace, comfort and/or aesthetics, it may be justifiable to proceed with them. In every case, indoor air quality issues must be considered. In particular any modifications to heating, ventilation, and air conditioning systems and their associated controls must not degrade the indoor air quality or violate code requirements for fresh air. Consultation and advice is available from the State Building Energy Management Program.

### **SOURCES OF BUILDING INFORMATION**

Several persons will need to be contacted to obtain the required information. The building manager with several maintenance personnel should fill out the detailed audit forms as completely as possible. Completeness of the data forms will greatly assist the energy management professional team and will reduce data collection costs. Since energy retrofits frequently improve the quality of the workplace and reduce operation and maintenance problems, it is wise to be as thorough as possible. Data collection forms can be found in Annex E.

---

# **ANNEX C**

---

## **Commissioning Guideline**

**State of Tennessee**

by

Portland Energy Conservation, Inc.

Prepared for

The State Building Energy Management Program

**May 1999**

---

# Table of Contents

<b>INTRODUCTION.....</b>	<b>3</b>
<b>COMMISSIONING EXISTING STATE BUILDINGS.....</b>	<b>4</b>
BUILDING SELECTION AND SCREENING PROCESS FOR DETERMINING COMMISSIONING SERVICES.....	4
<i>Building Selection.....</i>	<i>5</i>
<i>Delivering Commissioning Services for Existing State Buildings.....</i>	<i>6</i>
Existing-Building Commissioning.....	6
Commissioning New Equipment or Systems.....	7
Combining New and Existing-Building Commissioning.....	9
<i>Degrees of Commissioning.....</i>	<i>11</i>
THE COMMISSIONING PROCESS FOR EXISTING BUILDINGS.....	11
1. <i>Planning Phase.....</i>	<i>12</i>
1.1. Communicate the Primary Objectives for Commissioning the Building.....	14
1.2. Obtain a General Overview of the Building and Systems.....	14
1.3. Develop the Building-Specific Commissioning Plan.....	15
1.4. Hold a Scoping Meeting.....	15
2. <i>Investigation Phase.....</i>	<i>16</i>
2.1. Perform an Operation and Maintenance (O&M) Site Assessment.....	16
2.2. Develop a Master List of O&M Deficiencies and Opportunities.....	17
2.3. Develop and Implement a Diagnostic Monitoring Plan.....	17
2.4. Functionally Test Systems and Equipment.....	18
2.5. Select Cost Effective O&M Opportunities.....	18
3. <i>Implementation Phase.....</i>	<i>19</i>
3.1. Implement O&M Improvements.....	19
3.2. Retest and Verify.....	19
4. <i>Integration Phase / Project Hand Off.....</i>	<i>20</i>
4.1. Identify Possible Energy-Efficient Capital Improvements.....	20
4.2. Deliver the Commissioning Final Report.....	20
4.3. Recommissioning Procedures and Schedule.....	21
STRATEGIES FOR REDUCING COMMISSIONING COSTS:.....	22
1.2 Obtain a General Overview of the Building and Systems.....	22
2.1 Perform an Operation and Maintenance (O&M) Site Assessment.....	23
2.3. Develop and Implement a Diagnostic Monitoring Plan.....	23
2.4. Functionally Test Systems and Equipment.....	24
3.1. Implement O&M Improvements.....	24
ADDITIONAL COMMISSIONING TASKS FOR CONSIDERATION.....	24
<b>RECOMMENDATIONS FOR HIRING COMMISSIONING SERVICE PROVIDERS</b>	<b>24</b>
PREQUALIFY A GROUP OF COMMISSIONING PROVIDERS.....	25
SELECTING A COMMISSIONING PROVIDER.....	25

---

# Commissioning Guidelines

## State of Tennessee

by

Portland Energy Conservation, Inc.

Prepared for the

State Building Energy Management Program

**May 1999**

---

## Introduction

The Tennessee Department of General Services (DGS), State Buildings Energy Management Program embraces building commissioning as the foundation from which integrated, multi-disciplined energy programs and services are provided. Combined with “performance contracting”, commissioning can integrate the various program objectives, promote a long-term perspective, reduce overall owning and operating costs, and insure program success.

This commissioning guideline is a result of the Department of General Service’s partnership with State officials, TVA, local power distributors, and energy and commissioning consultants to develop and implement an integrated plan for providing O&M, commissioning, and related energy efficiency services with a minimum impact on current operating and maintenance budgets. Based on the success of two demonstrations projects at Citizen’s Plaza and the Chattanooga State Office Building, and based on an on-going investigation of “performance contracting”, DGS is convinced that the best approach for Tennessee should include the following elements:

- I. Appropriate commissioning efforts** at all existing state-owned buildings (including repairs & fixes)
  - A. Testing and monitoring
  - B. O&M tune-up and repairs

- C. Monitoring and verification; establishment of performance baselines
  - D. Identification of energy efficiency opportunities (capital improvements) for future investigation.
- II. Partnerships with Utilities and Local Power Distributors** as well as contractors and consultants (with the option of paying for service through utility bills).
- A. Engineering and Consulting Services
  - B. Advanced Metering Services
  - C. Building Commissioning Services
  - D. Performance Contracting Pilot Projects
- III. Performance Based Contracts** for services when significant energy savings can be identified.
- A. Detailed energy studies
  - B. Energy services agreement
  - C. Project design and construction
  - D. Commissioning of new systems
  - E. Operation and maintenance services (including O&M staff training)
  - F. Monitoring and verification

The following commissioning guideline addresses commissioning for each of the four elements outlined above, with an emphasis on the first element “appropriate commissioning at all existing state owned buildings”. The guide presented below is generic. It provides criteria for selecting commissioning projects, methods for increasing cost effectiveness, guidance in selecting a commissioning service provider along with a checklist for bidding out commissioning work, and discusses when and how much commissioning is beneficial. It also outlines the commissioning process phases for existing buildings.

## **Commissioning Existing State Buildings**

### **Building Selection and Screening Process for Determining Commissioning Services**

Although most state buildings are candidates for building commissioning, their needs regarding the type and degree of commissioning and timing for the service differ. The precommissioning screening process takes these differences into consideration.

## Building Selection

The objective of the precommissioning screening process is to perform *appropriate* commissioning services in each state building starting with the buildings that are most cost effective and yield the greatest gains in energy savings. As part of this preliminary screening process, a database tool has been developed to help prioritize which buildings may be the best candidates for existing-building commissioning as well as help determine the intensity of the commissioning process. The tool organizes information for each building into the following three main categories:

1. General building information
2. Building equipment information
3. Energy data

Each of these three categories contains broad yet critical information that allows for an initial evaluation of each building's potential for commissioning services (see Appendix A for the list of characteristics under each of the categories). The database tool contains formulas to calculate such things as load factor, density (number of sq. ft. per person), energy use index, etc. Also under consideration, is the expansion of this tool to include links to other available building selection tools (such as the energy benchmarking tool developed by Terry Sharp at Oak Ridge National Laboratory.) Combining these elements, provides information on the need for commissioning and the recommended intensity (degree) of the commissioning process.

After the initial selection process using the database tool is complete, the buildings showing the most potential for receiving commissioning services are further screened by conversations with the building's facility administrator and appropriate building staff members. The intention of the conversations are to understand the facility administrator's level of commitment to the process, the expertise of the facility staff to carry out commissioning tasks, and any special needs the building may have that would preclude the success of the project.

As part of the selection process, it may be necessary to do a walk-through of the buildings that show promise as commissioning candidates. A walk-through often reveals problems and/or opportunities that distant database analysis and phone conversations with building staff cannot uncover. Walk-throughs are helpful for making the final decision as to whether performing commissioning on the existing systems adds sufficient value to the building. In some cases the building may be too "broken" to benefit

from existing building commissioning alone. This is discussed in more detail in the section below.

## **Delivering Commissioning Services for Existing State Buildings**

The DGS recognizes three types of commissioning as part of its program

1. Existing-building commissioning (only)
2. Commissioning for new equipment or systems (immediately following the commissioning of existing systems)
3. Combined new and existing systems commissioning (existing-building commissioning as part of a major retrofit project)

The following summarizes the three types of commissioning followed by a more detailed discussion of the existing building commissioning process.

### **Existing-Building Commissioning**

Existing-building commissioning seeks to meet project goals through identifying and implementing *low-cost operation and maintenance improvements* in selected state buildings. The goal of performing commissioning, as a first step in improving existing building performance, is to obtain as much energy savings as possible by implementing *low cost* O&M improvements prior to performing an extensive and detailed energy study. In some state buildings, performing existing-building commissioning may be the only step needed to obtain significant energy savings (5% to 30%) and meet project goals. This is often true for buildings with fairly new major equipment and controls (less than 10 years old).

Commissioning existing systems when carried out in a systematic way, can preclude the need for installing expensive capital improvements. Also, the process may be cost effective enough to be funded entirely by the building's operating budget. The section titled "The Existing-Building Commissioning Process" describes the activities involved in the process.

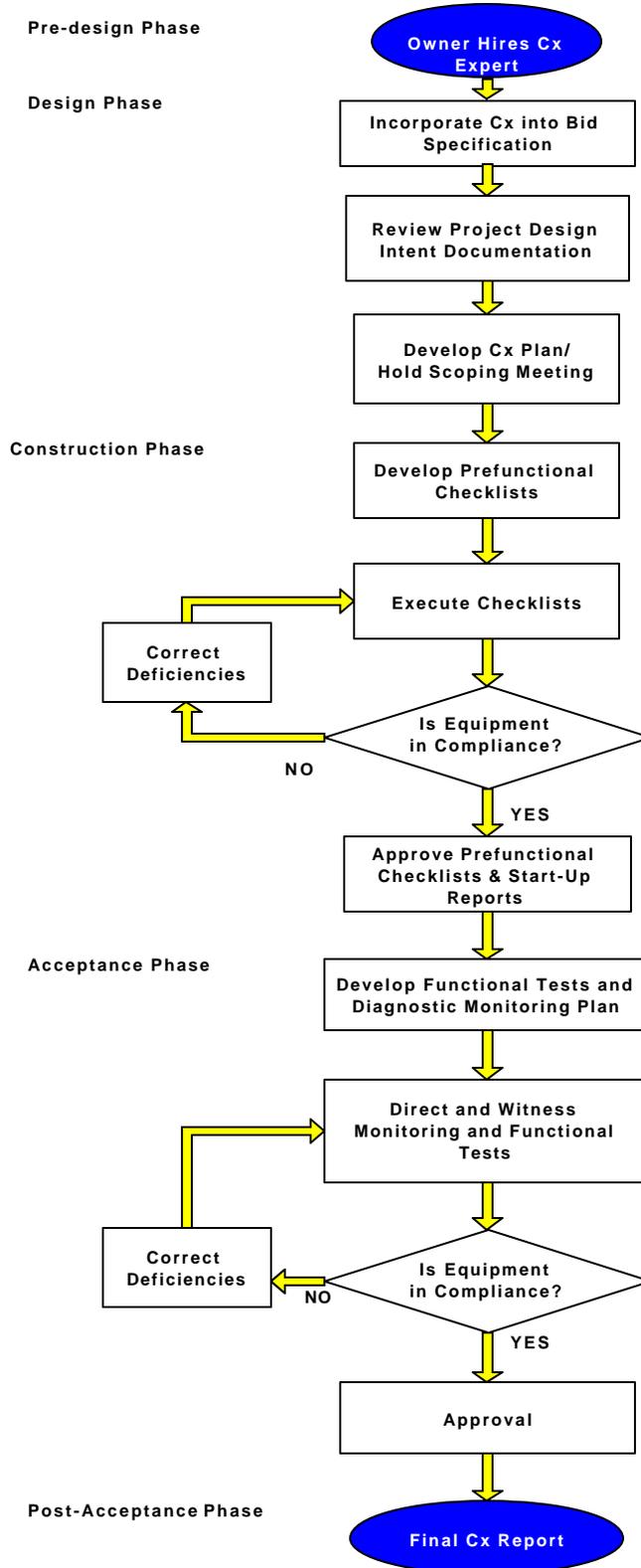
Although for some buildings the commissioning process is sufficient for meeting project goals, in many others it is only the first step in improving the facility's performance and environment. Identifying possible energy-efficient capital improvements is typically part of the existing building commissioning process. Since these improvements may prove to be cost effective to install, it may be beneficial to follow-up the commissioning process with a more thorough energy study of the building. The section below discusses commissioning for new equipment installed following an extensive existing-building commissioning process.

## **Commissioning New Equipment or Systems**

Performing existing-building commissioning as a first step for obtaining energy savings sometimes leads to installing energy-efficient capital improvements. If it is determined that some of the recommended retrofit items identified during the initial commissioning process are cost effective and they are installed reasonably soon after the existing-building commissioning is complete (within 18 months), then only commissioning the new installation (retrofit) may be required. No matter how simple or complex the retrofit is, the facility is more likely to receive the estimated energy savings when commissioning is specified as part of the project. Commissioning assesses whether the new equipment is operating according to design intent and integrates optimally with the existing systems.

Commissioning for new installations follows the typical *new-building* commissioning process in that it incorporates commissioning tasks into the design and bid phase of the project all the way through installation and acceptance. Figure presents a flow chart for commissioning new equipment.

Figure 1 Commissioning New Equipment



## **Combining New and Existing-Building Commissioning**

Performing existing-building commissioning is not always an appropriate first step for improving a buildings performance. Some buildings are too “broken” to reap much benefit from the commissioning process alone. In cases where most of the building’s equipment is beyond its useful life, the equipment or controls are outdated and/or drastically circumvented, and information or expertise for proper repair or operation is costly to obtain, existing-building commissioning is generally not a cost effective first step. In such cases, performing a rigorous O&M site assessment combined with a detailed energy study of the building is the best approach in determining which energy-efficiency measures and O&M strategies are most effective for meeting project goals.

The commissioning of existing equipment may be more appropriately integrated into the energy retrofit project when considering an energy service performance contract (ESPC). An ESPC is often an effective strategy for obtaining financing for major energy retrofit projects. The savings gained from bundling the low cost O&M measures with the capital upgrades, especially if some of the upgrades are marginally cost-effective (good value but long pay backs), helps to increase the overall attractiveness of the project for funding. Both commissioning of the existing equipment and the new equipment should be specified as part of the ESPC.

The process for accomplishing the combined new and existing systems commissioning work is summarized in Table 1. In this case, new and existing commissioning tasks are combined and follow the phases of the typical new-construction or installation process.

**Table 1: Commissioning Tasks Corresponding to Retrofit Project Phases**

<b>Commissioning Tasks</b>	<b>Retrofit Project Phase</b>
<b>Design Phase</b>	
<ul style="list-style-type: none"> <li>◆ Hire the Commissioning Provider</li> <li>◆ Develop commissioning plan combining both new and existing equipment</li> <li>◆ Hold commissioning scoping meeting</li> <li>◆ Review of design Intent for new equipment</li> <li>◆ Develop commissioning specifications for bid documents including responsibilities for both new and existing system commissioning</li> </ul>	<ul style="list-style-type: none"> <li>◆ Design new installation</li> <li>◆ Prepared documents</li> <li>◆ Award job to contractor</li> </ul>
<b>Installation Phase</b>	
<ul style="list-style-type: none"> <li>◆ Review both new and existing equipment/system documentation</li> <li>◆ Develop and execute prefunctional checklists for new and existing equipment as part of startup.</li> <li>◆ Develop a “Master List of Improvements needed for existing equipment</li> <li>◆ Develop a Master List of Deficiencies” for new equipment</li> <li>◆ Develop diagnostic monitoring plan</li> <li>◆ Develop functional test plans</li> </ul>	<ul style="list-style-type: none"> <li>◆ Install equipment</li> <li>◆ Start up equipment</li> </ul>
<b>Acceptance Phase</b>	
<ul style="list-style-type: none"> <li>◆ Execute functional tests and diagnostics for both existing systems and new equipment</li> <li>◆ Implement O&amp;M Improvements and repairs for existing systems</li> <li>◆ Fix new equipment deficiencies found during testing</li> <li>◆ Perform fine tuning and verify new equipment integrates with exiting systems through post testing and monitoring analysis</li> <li>◆ Verify operator training</li> <li>◆ Review and verify O&amp;M manuals are complete</li> <li>◆ Prepare and submit final Commissioning Report</li> </ul>	<ul style="list-style-type: none"> <li>◆ Operator training completed</li> <li>◆ Equipment documentation completed</li> <li>◆ New installation and improvements accepted by owner</li> </ul>
<b>Post-acceptance</b>	
<ul style="list-style-type: none"> <li>◆ Perform deferred tests (if any)</li> <li>◆ Perform periodic recommissioning</li> </ul>	<ul style="list-style-type: none"> <li>◆ Perform ongoing O&amp;M</li> </ul>

## Degrees of Commissioning

Although it is generally true that smaller buildings have simpler systems, the complexity of the building's systems rather than the building's size generally dictates the degree of commissioning. Buildings with primary HVAC and lighting equipment that operates fairly independently of other equipment or systems, such as single-zone packaged air conditioners, do not need the same degree of commissioning as buildings with complicated built-up systems that use computerized energy management controls. The more complex the piece of equipment or system, the higher the risk for problems. Complexity may be gauged from the presence of any one or combination of the following conditions:

- Sophisticated controls and control strategies
- Complex sequences of operation
- A high degree of interaction between a new installation and the existing systems and equipment in the building.

The intensity of commissioning depends on the following:

- Complexity, size, and number of pieces of the plant equipment
- Complexity of the air and water distribution systems
- Complexity and size (number of points) of the control system
- Complexity and number of pieces of special equipment such as fume hoods

For example, equipment that stands alone - such as a photocell for controlling exterior lights - does not present as many possibilities for problems as a more dynamic system - such as a VAV (variable air volume) system—with inlet vanes or a VFD (variable-frequency drive).

Static installations require only inspection to adequately ensure their performance. For example, commissioning beyond inspection would not be appropriate for an energy retrofit of T-8 lamps and electronic ballasts. However, commissioning is appropriate if daylight harvesting and/or sweep controls are also installed as part of the project. Commissioning should be required for dynamic systems and equipment, especially those involving sophisticated controls.

## The Commissioning Process for Existing Buildings

The commissioning process described below assumes that the commissioning scope includes existing systems only and is not interfacing with an energy-efficiency retrofit. It also assumes that a commissioning

provider is hired (Appendix F details the Commissioning Provider’s typical responsibilities) and that the building was selected using the recommended method outlined in the section titled “Building Selection”. The process consists of the four following phases:

1. Planning Phase
2. Investigation Phase
3. Implementation Phase
4. Integration Phase / Project Hand Off

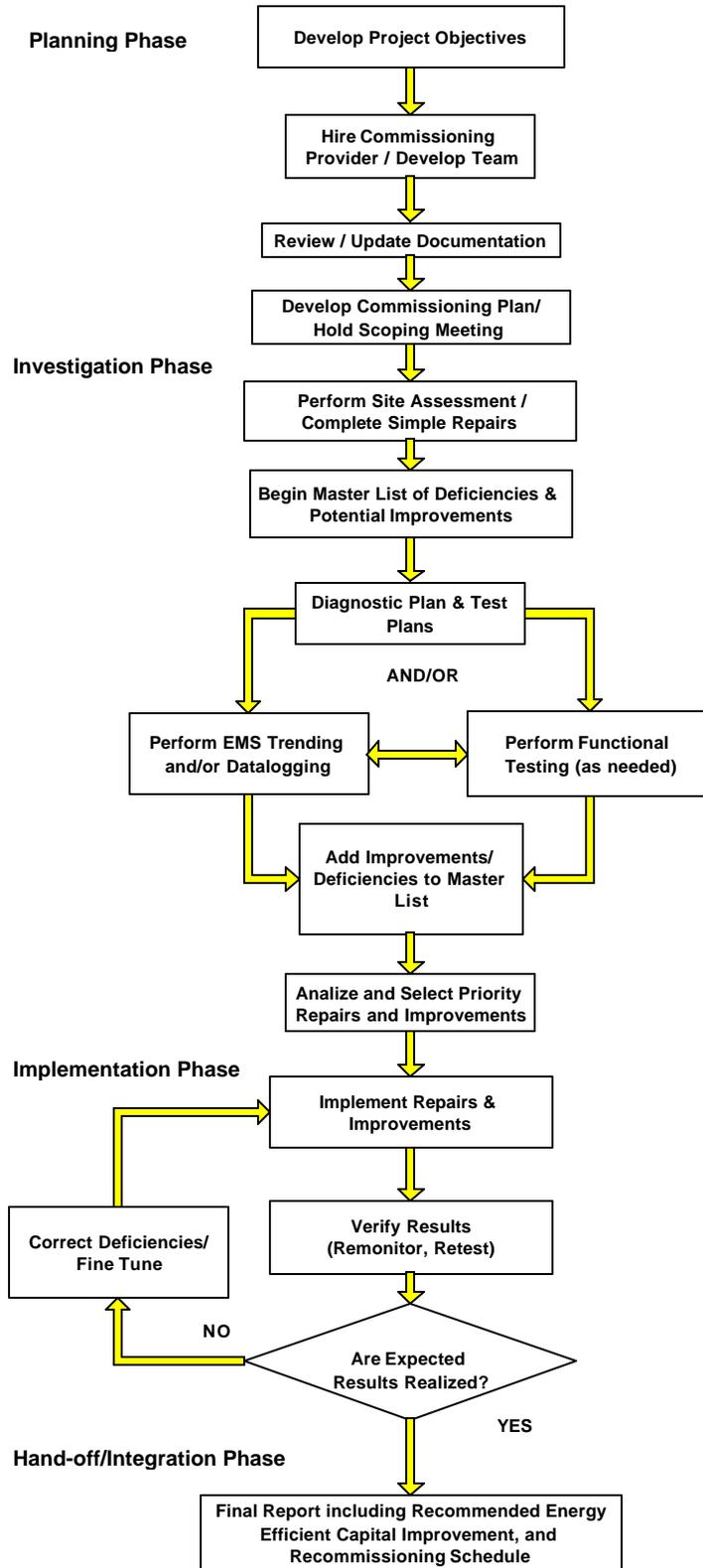
Figure 2 presents a flow chart of the existing building commissioning process.

In reality the phases and many of the steps overlap and may occur simultaneously; some may be eliminated depending on the nature of the project.

The four phases are discussed below along with their respective steps. Cost saving strategies are shown in italics and are discussed in more detail in the section titled “Strategies for Reducing Commissioning Costs”.

Figure 2

### Existing-Building Commissioning



## 1. Planning Phase

Of the four phases discussed below, the planning phase involves the most input from the facility administrator.

### 1.1. Communicate the Primary Objectives for Commissioning the Building

The commissioning process begins by defining *in writing* exactly what the objectives are for putting a building or selected building systems through the commissioning process and clearly communicating those objectives to the commissioning provider and others with primary implementation responsibilities. The commissioning process may focus on one or several of the following major objectives:

- Obtain energy savings through improved operation and maintenance
- Reduce comfort calls
- Reduce the risk of premature equipment failures
- Improve indoor air quality
- Reduce O&M staff time spent on emergencies (“fire fighting”)
- Improve building occupant productivity

At this point it is also important to determine the method for measuring whether the commissioning objectives are met. For example, to determine the before and after energy use for a commissioning project, analyzing energy bills may be sufficient. However, for some projects (demonstration projects or large complex buildings) whole-building metering with end-use monitoring may be needed. Other objectives maybe require simpler methods for measuring results. For example, keeping a written log of comfort calls for several months before the commissioning process and comparing it to the number of calls occurring after the process, is a straight forward way to determine the effect of commissioning on occupant comfort. **1.2. Obtain a General Overview of the Building and Systems**

As part of the initial process, the commissioning provider, along with facility staff, performs a walk-through of the building to obtain a general understanding of what system types exist and how the systems are controlled. It is also important to identify which systems, equipment, and groups of smaller equipment controlled together are the largest energy users.

*To minimize costs and expedite this activity, facility staff should compile a building documentation package for the commissioning provider to study prior to the walk-through or site-assessment. Appendix B contains a comprehensive list of building documentation.*

NOTE: if a bid process was used to secure the commissioning services and a walk-through of the building was part of the bidder meeting, then the walk-through in this phase may be eliminated.

### **1.3. Develop the Building-Specific Commissioning Plan**

Once the commissioning provider and building staff have a clear understanding of the objectives for commissioning and have reviewed the documentation, the commissioning provider with input from the facility administrator develops the commissioning plan. The plan includes the following information:

- Commissioning objectives
- Scope of commissioning
- Commissioning team members and their roles and responsibilities
- Schedule of commissioning events
- Scope of testing
- Description of diagnostic monitoring and use of energy management control system trending

The plan should be viewed as a somewhat flexible document that may include some schedule and team member changes during the course of the project. Appendix C contains a sample commissioning plan. This plan can be modified as needed to fit the intended project.

### **1.4. Hold a Scoping Meeting**

Generally, the Commissioning Provider facilitates the scoping meeting with the plan as the primary focus. The scoping meeting brings all of the team members together to review, discuss, and agree to the retrocommissioning plan. The primary role of the owner representative or facility administrator is to reiterate the objectives for the project and show support for the Commissioning Provider. Each team member's responsibilities are discussed and the schedule is agreed to. The scoping meeting may also include others who are invested in the project success, such as a local utility, but are not directly responsible for performing work on the project.

The facility administrator also conveys the building protocols during the scoping meeting. It is important that the members of the team are well informed about what is expected of them when they enter and perform work in the building. The following lists some examples of building protocol topics:

- Restrictions on photos or videos (building-wide or in certain areas)

- Restrictions on building keys
- Restrictions on special areas in the building (sensitive tenants etc.)
- Sign in and sign out requirements
- Identification
- Parking permits
- Safety requirements
- Need for escort while in the building or in special areas of the building and who that escort is.
- Special protocols when entering tenant spaces, such as acceptable times for performing work in tenant spaces

Notes from the scoping meeting become part of the commissioning documentation.

The following deliverables may be expected as part of this phase:

- Retrocommissioning Project Plan (including objectives and scope)
- Scoping meeting minutes

## **2. Investigation Phase**

Understanding why building systems are operated and maintained the way they are, identifying deficiencies and potential improvements, and selecting the most cost-effective “fixes” to implement are the primary tasks for investigation phase. This phase of the project looks at all aspects of the current O&M program and practices.

### **2.1. Perform an Operation and Maintenance (O&M) Site Assessment**

The goal of the O&M site assessment is to gain an in depth understanding of how and why the building systems and equipment are currently operated and maintained. For large and complex buildings and systems, the commissioning provider generally develops a formal assessment document that includes a detailed building staff interview and an in-depth site survey of equipment condition. The assessment should identify, at minimum, the following issues:

- Annual building energy use and demand
- Highest energy using equipment or groups of equipment
- Current design and operational intent and actual control sequences
- Equipment condition issues (broken dampers, dirty coils, sensor calibration, etc.)
- Current schedules (setpoint, time-of-day, holiday, cleaning, etc.)
- The most severe control and operational problems

- Where the most comfort or trouble spots are in the building

*To reduce costs and expedite the assessment process, assign at least one building operator to work with the commissioning provider. The designated operator should be someone who is most knowledgeable in operating and maintaining the systems designated for commissioning.*

As part of the assessment phase and prior to diagnostic monitoring and functional testing, scheduled preventive maintenance as well as simple repairs and adjustments should be completed. *Attending to these tasks during this phase of the project, reduces the cost of the diagnostic testing and analysis phase of the project.*

## **2.2. Develop a Master List of O&M Deficiencies and Opportunities**

Concurrent with the O&M site assessment, the commissioning provider begins to develop a Master List of O&M Deficiencies and Improvements (“Master List”) for possible implementation. This list ultimately becomes an important decision making tool for the operating staff and is a primary product of the commissioning effort. Appendix D presents a sample Master List. Every finding from the assessment and from the diagnostic monitoring activity (see 2.3 below) is placed on this “Master List” including those adjustments and repairs made during the assessment process. The list includes the name of the system or piece of equipment involved, a description of the deficiency or problem, the suggested solution and status of implementation.

## **2.3. Develop and Implement a Diagnostic Monitoring Plan**

Using the information gained from the O&M site assessment, it may be necessary to obtain more complete and exact data on when and how systems are actually operating, since the assessment may only identify *suspected* areas for improvement. The commissioning provider develops and implements a diagnostic plan for using either the building’s energy management control system trending capability (this is acceptable as long as the system’s sensors have been recently calibrated) and/or portable data loggers. In 1996, the State purchased ten AEC MicroDataLoggers™ specifically for diagnosing and troubleshooting building system problems. These loggers are ideal for commissioning. It is generally recommended that data be gathered for a minimum of two weeks including a typical weekend. Once the data is gathered, the commissioning provider analyzes the findings and checks it against the O&M assessment information for discrepancies. Any additional deficiencies are placed on the “Master List” described above in 2.2.

*It can be cost-effective to have building staff initiate trend logs through the building's EMCS, this can reduce the Commissioning Provider's time spent on this task or eliminate the need to hire the controls contractor to do the trending. Building staff may also assist with the installation and removal of the portable dataloggers used for short-term diagnostics and assist with carrying out the functional test plans (see below). This also reduces costs and gives the building staff exposure to different approaches to troubleshooting problems and investigating and verifying equipment performance.*

#### **2.4 Functionally Test Systems and Equipment**

It may be necessary to manually test the system or equipment in question during the investigation process. Functional testing may be done along with diagnostic monitoring or in lieu of diagnostic monitoring if data loggers are not available for the project. In some cases, diagnostic monitoring may indicate that a problem exists but may not reveal the cause of the problem. In these cases, functional testing may be used in concert with diagnostic monitoring or trending to pinpoint the source of the problem.

When data loggers are not available or the energy management control system is inadequate for trending, manually functionally testing the system is the only option. Manual testing involves putting the system or piece of equipment through a series of tests that check its operation under various modes and conditions. Spot measurements are taken with hand-held instruments to verify correct operation and equipment efficiencies.

*To reduce costs and expedite the process, simple changes or repairs may be implemented during testing. This is especially true for control system modifications. These "field fixes" should be logged on the "Master List" and designated complete in the status column.*

#### **2.5 Select-Cost Effective O&M Opportunities**

Once the investigation process is complete, the master list of O&M opportunities is used to decide which improvements are most important and cost-effective to implement. As part of the selection processes, it may be necessary to do some engineering analysis to determine which opportunities will save the most energy and cost the least to implement. It is not unusual to expect a simple payback of 18 months or less for the selected O&M improvements.

The following deliverables may be expected as part of this phase:

- The draft Master List of Potential Improvements (Master List)
- List of selected improvements for immediate implementation

- Completed diagnostic monitoring plans and functional test plans

### **3. Implementation Phase**

During the implementation phase the more complicated and expensive improvements are completed. This section discusses implementing improvements and verifying the results along with some important issues to consider during these activities.

#### **3.1. Implement O&M Improvements**

A major emphasis for commissioning existing-building systems is to implement cost-effective improvements that meet the project objectives. Unless improvements are actually put in place, the commissioning process remains incomplete.

*Depending on staff time and expertise, it can be very cost effective to have in-house O&M staff carry out as much of the implementation process as possible.*

In some cases, implementation may need to be outsourced. For example, hiring a controls contractor may be necessary if in-house staff lacks the expertise or access required to make control strategy changes at the program level. It is often beneficial to have the commissioning provider supervise those individuals tasked with implementing the improvements, whether implementation is done in-house or outsourced.

#### **3.2. Retest and Verify**

Because fixing a problem often unmask other problems, it may be necessary (and highly recommended) to retest some of the equipment and systems. This is done either manually or through remonitoring and ensures that the improvements are working as expected and that they positively effect other systems and equipment as well as the building occupants.

When the commissioning objectives include obtaining energy savings, a one to two week post-monitoring period is necessary to better inform energy savings estimates. However, only those systems with implemented improvements are remonitored. The post-monitoring data is then analyzed against the initial diagnostic data to more accurately measure the expected annual savings.

The following deliverables may be expected as part of this phase:

- Completed repairs and improvements
- Final estimated energy savings calculations for energy saving improvements

## **4. Integration Phase / Project Hand-Off**

Although this is the final phase for the project, the building staff's effort to maintain the investment continues. They must integrate the products and recommendations from this phase of the project into the building's O&M and energy management program so that the estimated return on the investment may be realized.

### **4.1. Identify Possible Energy-Efficient Capital Improvements.**

During the normal course of commissioning, review current equipment and system efficiencies, condition and age to identify O&M improvements and also to identify possible future energy-efficient capital improvements. Although the existing building commissioning does not involve implementing expensive energy-efficient capital improvements, it is often the first step toward obtaining these improvements. It is therefore important for the commissioning provider to recommend a list of relevant capital improvements for further investigation. The list should be as specific as possible and reference particular pieces of equipment, buildings, and rooms by name, number, or area. Below is a sample list of possible energy-efficient capital improvements:

Recommended energy-efficiency improvements for Building "X":

- Energy-efficient lighting retrofit (all interior lighting including exit lighting)
- Addition of lighting sweep control for all interior lights not in 24-hour use areas
- Addition of occupancy sensors for lighting in offices in restrooms, conference rooms and store rooms building-wide
- Addition of photo cells on exterior lights on south side of the building
- Daylight harvesting in south corridors and all entry lobbies
- Variable frequency drives on air handler fan motors # 3 and # 4
- CO<sub>2</sub>-based ventilation control for conference room 107 and 108

### **4.2. Deliver the Commissioning Final Report**

The final report is one of the primary products resulting from the commissioning process. The commissioning provider prepares a comprehensive final report that generally includes the following information along with an executive summary:

- Project background
- Building / systems description
- Scope of the commissioning project
- The final “Master List” of improvements
- A description of implemented improvements and a cost/savings analysis for each.
- List of recommended capital improvements for future investigation
- The draft and final commissioning plan
- A description of the identified design issues for further investigation
- The EMCS trending plan and logger diagnostic / monitoring plan and results
- All completed tests and results

The Final Report contains valuable information for maintaining continuity about the O&M practices and strategies that are currently implemented. The Master List of Improvements presented in the Final Report contains the implementation status of each of the recommended O&M improvements and can be used as a decision making tool for prioritizing the improvements that were not completed as part of the original project.

The final report is especially useful when a detailed energy study follows existing-building commissioning. The report informs the individuals performing the study about what low-cost O&M improvements are currently in place. Information from the final report is particularly useful when considering an ESPC. Give a copy of the report to the contractor offering the ESPC. If they are not informed and energy bills from prior years are used to help determine the facility’s baseline, the baseline will not accurately reflect the savings from the recent O&M improvements. This may cause the predicted savings upon which the financing is based to be significantly less than expected, leading to arguments and possible legal battles.

#### **4.3. Recommissioning Procedures and Schedule**

Recommissioning helps ensure that the results of existing-building commissioning effort continue to persist through out the life of the building. Recommissioning is a periodic event that reapplies the original commissioning tests in order to keep the building operating according to design or current operating needs. Having a commitment to performing regular recommissioning increases the chances that the O&M improvements will continue to perform according to their original intent. In order to ensure persistence of performance and energy savings incorporate a recommissioning schedule into the overall O&M plan for the

facility. The commissioning provider may be required to develop the schedule as part of the project deliverables.

Depending on the type of improvements and how often the building changes, the recommissioning schedule may vary considerably. If building use remains stable and tenants rarely if ever request major changes (such as moving or constructing walls or installing additional duct work), then recommissioning may be scheduled less frequently than for a building where changes occur often or are significant. In some cases it may be convenient and appropriate to incorporate recommissioning activities into the regular annual or semiannual preventive maintenance requirements. This may be particularly true for the major plant equipment. Recommissioning can be done by any of or a combination of the following parties:

- In-house O&M staff
- Outside O&M service contractor
- Commissioning service provider

The following deliverables may be expected as part of this phase:

- Final Report
- A list of Recommended Capital Improvements
- Recommissioning Plan or Schedule

## **Strategies for Reducing Commissioning Costs:**

The following reviews and expands on the cost-reducing strategies introduced for each of the four existing-building commissioning phases outlined above. These strategies increase the cost effectiveness of commissioning because they are performed by state building personnel, thus either eliminating or reducing the outside commissioning provider's and contractor's time. Also, having facility staff work closely with the commissioning provider can increase their awareness concerning O&M issues as well as increase their troubleshooting skill level. This educational benefit adds value to the commissioning project.

### **1.2 Obtain a General Overview of the Building and Systems**

To minimize costs and expedite this activity, facility staff should compile a building documentation package for the commissioning provider to study prior to the building walk-through. This packet should include as much of the following information as possible:

- Drawings relevant to the systems scheduled for commissioning

- O&M manuals
- Testing, Adjusting, and Balancing (TAB) report
- Equipment list with nameplate information
- Preventive maintenance logs or plans
- Control system documentation, such as sequences of operation, control diagrams, and points lists
- Energy-efficient operating strategies
- Energy bill (electric, gas, steam, chilled water, etc.) or energy accounting information for at least the last 24 months along with a rate schedule
- Load profiles / analysis for each fuel type

See Appendix B for a more comprehensive list of documentation.

### **2.1 Perform an Operation and Maintenance (O&M) Site Assessment**

To reduce costs and expedite the assessment process, assign at least one building operator to work with the commissioning provider. The designated operator should be someone who is most knowledgeable in operating and maintaining the systems designated for commissioning.

Scheduled preventive maintenance along with simple repairs and adjustments should be completed during the site assessment and prior to diagnostic monitoring and testing. Attending to these tasks during this phase of the project, reduces the cost of the diagnostic testing and analysis phase of the project.

### **2.3. Develop and Implement a Diagnostic Monitoring Plan**

It is often appropriate and cost-effective to have the most motivated and interested building staff assist with the short-term diagnostics monitoring and trend logging, that occurs during the investigation phase of the project. This helps reduce project costs and provides the building staff with a learning experience that they can reapply later. If building staff is trained to initiate trend logs through the building's EMCS, this can reduce the Commissioning Provider's time spent on the task or eliminate the need to hire the controls contractor to do the trending. Building staff may also assist with the installation and removal of the portable dataloggers used for short-term diagnostics and assist with carrying out the functional test plans (see below). This also reduces costs and gives the building staff exposure to different approaches to troubleshooting problems and investigating and verifying equipment performance.

## **2.4. Functionally Test Systems and Equipment**

To reduce costs and expedite the testing and implementation phases of the project, simple changes or repairs may be implemented by building personnel during testing. These “field fixes” should be logged on the “Master List” and designated complete in the status column.

### **3.1. Implement O&M Improvements**

Depending on availability and expertise, in-house O&M staff may be enlisted to implement the selected repairs and improvements. Using in-house staff to perform these tasks reduces costs. Having to hire an outside contractor to implement major repairs and improvements may cause the improvement’s payback to increase to the point where it is no longer cost effective. It is important however, that the in-house staff has the training, knowledge, and willingness to carry out the work.

## **Additional Commissioning Tasks for Consideration**

The following optional tasks may be included in the commissioning contract. Some of these tasks may be more relevant and critical for some projects than others.

- Finalize an O&M plan outline, including examining and enhancing the current maintenance service contract procedures.
- Develop a list of required O&M documentation and methods for the building or systems. Include full written sequences of operation for all equipment.
- Develop guidelines for implementing a preventative maintenance plan.
- Develop a comprehensive training plan. Or, develop recommendations for appropriate building staff to attend training in general O&M concepts and for specific equipment and systems. This will include both building operators and facility managers or owners.
- Develop a list of operational strategies for incorporation when considering future control upgrades.
- Develop recommendations for how O&M documentation is managed and stored.

## **Recommendations for Hiring Commissioning Service Providers**

There are several reasons why hiring an outside Commissioning Provider increases the project’s chances of success. A well qualified Commissioning

Provider brings to the project years of troubleshooting and problem solving experience from a variety of similar projects. Even if the building has an expert in-house building staff, an outside expert provides new perspectives and has a low investment in doing things the “old way”, coupled with a broad-range experience. Commissioning Experts also provide the diagnostic monitoring, testing, and analysis expertise needed to uncover the hidden problems and select the most cost effective solutions.

## **Prequalify a Group of Commissioning Providers**

Currently, there is no universally accepted certification process for Commissioning Providers. Even if there were, certifications only indicate that an individual is able to pass a test, they do not guarantee that he or she has the experience needed to provide appropriate retrocommissioning services. Prequalifying a pool of commissioning providers allows the state to have a ready group of experts to choose from when a commissioning project is selected. It is important that the skill-set of the Commissioning Provider match the objectives and scope of the project. For example, if improving indoor air quality is the overall objective for the commissioning effort, then the individual hired for the job must be skilled at investigating and solving IAQ problems. Appendix E recommends a list of required experience for prequalifying Commissioning Providers along with a “Commissioning Firm Experience Form”. When looking for quality Commissioning Providers also ask the following questions:

- Is commissioning your firm’s core business or a primary business component?
- Are final commissioning reports available for review?
- Do you have a list of references for recent commissioning projects?

As the final step in the prequalification process it is highly recommended that the State also require the selected pool of Commissioning Providers attend a commissioning orientation meeting. This meeting imparts the goal and objectives for the State’s program along with information about the expected commissioning process, lines of communication, and required deliverables. Developing and supplying standard commissioning forms and procedures simplifies and reduces the costs for administering and tracking of the program.

## **Selecting a Commissioning Provider**

Once the pool of experts is established, selecting a Commissioning Provider for a project depends on the needs, complexity, and size of the project. If the project is fairly simple or small, the State may select the most appropriate consultant for the project without going through a Request for

Proposal (RFP) process. However, for larger, more complex, and expensive projects, the RFP method may be necessary. Appendix G contains a checklist of things to consider when putting together an RFP.

As part of the RFP the State should provide a list of expected products or deliverables resulting from the project. The number of deliverables depends on the scope of the project. Possible deliverables include:

- All required forms according to an agreed upon time or conditions framework
- Existing-Building Commissioning Plan (Retrocommissioning Plan)
- Progress Reports per schedule
- All major commissioning meeting minutes (scoping meeting, progress meetings, etc.)
- Completed assessment forms
- Diagnostic monitoring, trending, and functional test plans
- Completed Functional Performance Tests
- Master List of Deficiencies and Potential Improvements (decision making tool)
- List of recommended improvements for immediate implementation (based on cost-effectiveness)
- Final energy saving estimates and calculations
- List of Recommendations for Capital Improvements for Further Investigation
- Service Contract Review findings and recommendations
- Recommissioning Schedule
- Updated/revised building documentation
- Final Report (some of the above deliverables may be incorporated into the final report)

If the project is large or complicated, a pre-bid meeting including a site visit may be necessary. This allows the prequalified Commissioning Providers who choose to bid on the project a chance to see the facility and ask critical questions about the project. It also tends to “level the playing field” so that each party has the same information when developing their bids.

## ANNEX D

# ENERGY SAVINGS PERFORMANCE CONTRACTS (ESPC)

### Energy Savings Performance Contracts Overview

With any performance contract, the goal is to meet some performance criteria as specified by the parties involved. For energy savings performance contracts (ESPC), the criteria is usually a level of energy savings and the parties involved are building owner, an energy services company (ESCO), usually a lending institution, and perhaps a utility. In addition, other non-energy criteria, such as indoor air quality and comfort control, are often found in performance contracts.

Because of the nature of performance-based contracts, a certain amount of measurement and verification (M&V) is required to demonstrate whether the performance criteria have been met. Recently, the first standardized protocols for M&V have been developed and will play an increasing role in ESPCs.

Energy savings performance contracts are being mandated for the Federal sector, and use of the M&V protocols is increasing. In May 1997, DOE's FEMP awarded the first of its *Super Energy Savings Performance Contracts*. These contracts reduce the time and effort required to award an ESPC in the Federal sector for ESCOs and building owners alike, thereby providing incentive for implementing a performance-based project. Several federal performance contracts may be awarded for various regions of the country in fiscal year 1998, with up to \$5 billion available for expenditure over the next 5 to 10 years. This represents a significant market shift towards performance contracting in the building construction and retrofit industry.

### What Is Performance Contracting?

Energy savings performance contracting offers the customer an opportunity to receive turnkey services such as engineering analysis; project management; and equipment installation, operation, and maintenance. These services are provided for the purpose of generating energy-related cost savings. The contract will be written to specify a level of performance. The period of a performance contract could be from 5 to 25 years, and the contractor usually promises energy savings of 15 to 30 percent.

Another key element of performance contracts is that the performance contractors are compensated based on results that have been measured and verified. If the energy savings are not realized, the ESCO must pay the difference. By legally guaranteeing savings based on the contractor's performance, this process mitigates much of the risk for the owner. Most of the technical and operational risks are borne by the ESCO. The financial risks, however, can be borne in part by either the owner or the ESCO.

There are several types of performance contracts, and several types of financing.

### Guaranteed Savings Contracts

In a guaranteed savings project, the building owner finances the project, perhaps with its own capital, but usually by borrowing funds from a commercial bank or other lending institution. The financing is typically arranged by the ESCO, although the ESCO has no contractual relationship with the lender. It is the owner who has the duty of repayment on the loan.

In this arrangement, the ESCO still takes the performance risk. It guarantees that energy savings will meet a certain level, usually enough to cover debt service. If that level of minimum savings is not achieved, the ESCO must pay the owner the difference. If minimums are exceeded, the customer may pay the ESCO a specified percentage of the extra savings.

The advantage of the guaranteed savings approach is that the lender bears the customer's credit risk. Banks and other financiers can better handle this risk than most ESCOs. An advantage to the ESCO is that their balance sheet is kept free of project debt.

Guaranteed savings contracts are the most common type of energy savings performance contract available.

### **“Pay From Savings” Contracts**

This is a subcategory of guaranteed savings contracts, but instead of fixed payments for the customer to repay the loan, the payment schedule depends on the level of savings. Thus, the loan can be repaid more rapidly if the savings are higher. Pay from savings contracts are generally less risky than guaranteed savings projects and have been popular in situations where cost-based construction is prominent (such as the public sector).

### **Debt Financing**

Debt financing refers to the practice of the owner obtaining financing directly from a bank or lending institution. This is the most common method available, mostly because of the relatively low associated financing costs. These costs will tend to rise if the financing is shifted to a leasing company or ESCO because the average building owner's cost of capital is lower than that of the average ESCO. The principal disadvantage of this method is that the debt appears on the owner's balance sheet, which affects its debt-to-equity ratio.

There are several specific types of debt financing:

1. *Leases.* Leases are similar to debt financing. ESCOs frequently use guaranteed leases, which are analogous to debt-based guaranteed savings projects.
2. *Capital Lease.* The customer essentially owns the equipment, and at the end of the lease, they have the option of purchasing the equipment.
3. *Operating Lease.* This lease has the advantage of shifting risk from the customer to the leasing firm. However, this makes them more expensive for the customer. The leasing company retains ownership of the equipment. At the end of the lease, the customer has the option to take title to the equipment, based on fair market value of the equipment, rather than at a price stipulated in the lease. The lessor thus risks having to reclaim and dispose of the equipment.
4. *Municipal Lease.* This type of lease is commonly employed to finance projects in schools, hospitals, and other facilities operated by state and local governments. Municipal leases are available only to entities that can take advantage of tax exempt financing. As the most common type of lease, they are used extensively in the growing municipal market. Municipal leases can be either capital or operating leases, but their distinguishing feature is their low cost, a consequence of their favorable tax treatment.

### **Stipulated Savings Contracts**

Stipulated savings contracts specify engineering calculation of savings prior to the implementation of the project. Once the savings are calculated (as the “potential to generate savings”), that amount of savings is

stipulated for the duration of the contract. This amount is agreed upon by the owner and ESCO, and all future payments are made based on that assumed amount. In this case, no long-term measurements are required.

This type of contract is easy to implement and is the least expensive to administer. However, the contract has less basis on the ESCO's performance than any other. Rather, the ESCO is paid its portion of the stipulated savings during the contract regardless of the energy performance. This type of arrangement is most appropriate for projects where there is high confidence in the stipulated savings calculations, such as lighting projects.

### **Indefinite Delivery/Indefinite Quantity (IDIQ) Contracts**

An IDIQ contract is one in which a competitive bidding process yields a pool of qualified ESCOs. This pool is then available over the length of the contract to provide services. When the contract is written, the delivery requirements and quantity of the individual delivery orders are not necessarily known. Thus, this type of contract provides for multiple projects under an umbrella contracting arrangement.

IDIQ contracts reduce the overall procurement expenses by having competition up front, eliminating the bidding process from project to project. Also, ESCOs have more incentive to perform: good performance could secure the opportunity for future projects because the funds are already in place with a large umbrella contract. The Federal Government has issued several "Super ESPCs" that follow the IDIQ format.

### **Shared Savings Contracts**

Many building owners are interested in structuring a performance contract that gives the benefits of an energy savings project but does not cause the owner to incur any debt. This is called a shared savings contract. In this case, the ESCO finances the project, either from its own funds or by borrowing from a third party. Thus, the ESCO takes on not only the performance risk, but also the risk associated with the customer's creditworthiness.

If the ESCO borrows the capital from a third party, the ESCO becomes fully responsible for repayment. The advantage to the customer is that it makes no down payment, keeps debt obligations off its balance sheet, and is free of repayment obligations. The disadvantage is that the customer has to pay the ESCO a large share of energy savings—a larger share than would be expected in a guaranteed savings contract. Shared savings contracts are useful when the customer does not want to, or cannot, use borrowing capacity.

When the ESCO finances the project (called "ESCO financing"), it is risky for the ESCO. If the customer goes out of business, the revenue stream from the project will stop. In addition, an ESCO can only finance a limited number of these types of projects, because every new project causes its debt-to-equity ratio to decline. At some point, financial institutions will cease to lend to the ESCO due to its high debt ratio. Lenders tend to require a variety of credit enhancements for this type of financing, such as bonding or insurance. In some cases, the ESCO will implement "non-recourse project financing" by setting up a single-purpose entity as a stand-alone corporation to own and operate the project. This approach allows the ESCO to keep the loan off its balance sheet.

ESCO financing is expensive and sometimes difficult to sell to the customer. These projects require very high shared savings payments to be justified. This makes the savings less attractive to the customer.

The following table gives a summary of guaranteed savings and shared savings contracts:

<i>Type of ESPC</i>	<i>Financing</i>	<i>Risk</i>	<i>The Bottom Line</i>
Guaranteed Savings	Building owner finances the project; debt appears on owner's balance sheet.	Owner takes financial risk; ESCO takes performance risk.	Because risk is taken by the owner, he/she will receive a higher fraction of the savings. This is the most common form of ESPC.
Shared Savings	ESCO finances the project; debt does not appear on owner's balance sheet.	ESCO takes both financial and performance risk.	The lack of risk for the owner makes this attractive; however, the owner will receive a lower share of the savings than in guaranteed savings contracts.

## Overview of Measurement and Verification

Measurement and verification are extremely important to performance-based projects. Because the ESCO must meet performance to be remunerated, there must be some method to measure the energy savings. These savings should be monitored over the project's life in order for the ESCO to prove to the customer that savings are real and ongoing.

M&V protocols have been written for use in performance contracting. Although use of protocols are not yet standard practice, increased adoption of the DOE's international Performance Measurement and Verification Protocol (IPMVP)—the front-runner among M&V protocols—indicates movement in that direction.

While M&V protocol in general has not decreased financing costs, it may become more important to financiers since it could avoid disputes over verification of savings that lead to delays in debt payments. Measurement and verification can greatly add to risk mitigation for all parties.

## Different Options for M&V

There are several methods that are generally accepted for gathering and analyzing M&V data. The following is an overview of the available methods as outlined in DOE's IPMVP:

- A. *Engineering calculations using spot or short-term measurements.* This approach is designed for projects where the *potential* to generate savings must be verified. Thus, the focus is on a physical assessment of equipment changes to ensure that the installation was completed per specifications. Spot or short-term metering before and after the installation during the first year of operation is all that is required; no long-term measurements are involved. Performance factors and proper operation are measured or checked annually. The cost of this option depends on the number of measurement points and ranges from 1 to 5 percent of the construction cost.
- B. *Engineering calculations using metered data.* This method is designed for projects where not only the potential for savings, but the savings themselves must be measured and verified. For calculation of savings, actual energy use will be measured during the contract period for comparison with a baseline model. Thus, savings are determined after project completion by short-term or continuous measurements taken throughout the term of the contract at the device or system level. Both performance and operational factors are monitored. The cost depends on the number and type of systems measured and the term of analysis and metering. Typical costs range from 3 to 10 percent of the construction cost.
- C. *Utility billing analysis.* This is an alternate method for accomplishing the same objectives as Option B: verify both the potential for savings and the actual energy savings. This option encompasses Option A but

adds a determination of energy savings during the contract term through the use of whole-building metering data. Techniques could range from simple billing comparisons to multivariate regression analysis. After project completion, savings are determined at the “whole-building” or facility level using current year and historical utility submeter data. The cost depends on the number and complexity of parameters in billing analysis and will range from 1 to 10 percent of construction cost.

- D. *Calibrated energy simulation and modeling.* Like Options B and C, this method requires verification of actual savings as well as the potential for savings. With this method, savings are determined through simulation of facility components and/or the whole facility with a computer program such as DOE-2, a spreadsheet analysis, or vendor estimating programs. The cost depends on the number and complexity of systems evaluated and will range from 3 to 10 percent of construction cost.

In summary, all methods verify the potential of savings through collecting nameplate data, taking spot measurements, and commissioning. Options B, C, and D go further to verify actual savings through metering, utility bills, or simulation.

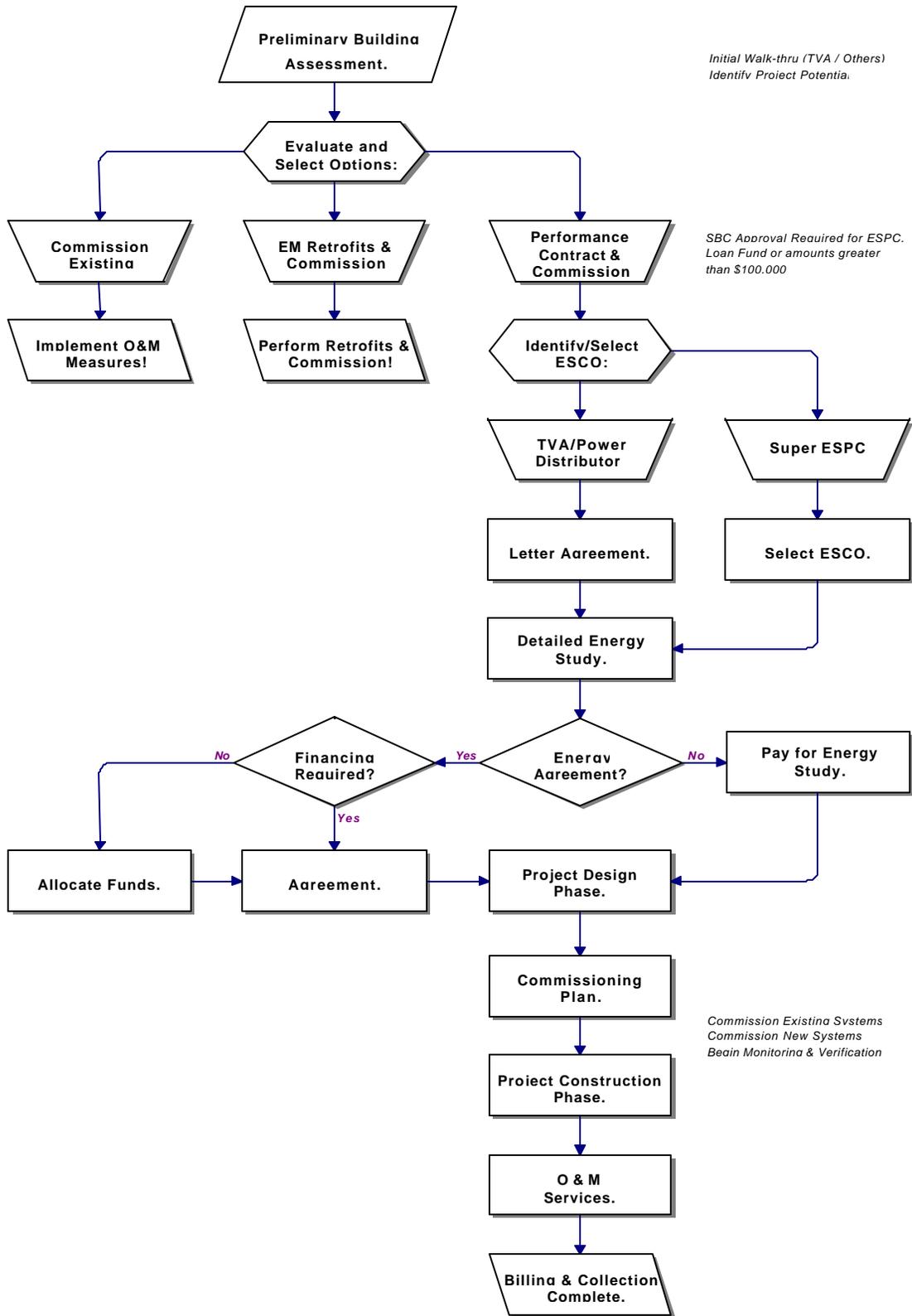
### ***Integration of Commissioning and ESPC***

For ESPC projects to be successful, an appropriate quality assurance and quality control component must be incorporated. *The Measurement and Verification (M&V) Guidelines for Federal Energy Projects* call for commissioning on all projects, generally referencing the ASHRAE commissioning guideline.

However, the most appropriate commissioning process used for ESPC projects is likely to be significantly different than the normal commissioning process used in a typical new construction or major renovation project. In the extreme, ESPC contractors have felt that there is no need for an outside commissioning authority and process, because if they (the contractor) don't “police” their own process, they won't achieve the predicted savings and subsequently will lose payments.

On the other hand, the owner is interested in more than just the energy savings. He/she wants to ensure that all installed equipment and interfaced systems are working as intended in all modes of operation and conditions, whether there is an energy impact or not. In addition, commissioning can ensure that the proper preventative maintenance and operator training programs are put in place.

As a result, it is important to integrate the commissioning process with the Tennessee Integrated Services (TIES) process for performance contracting. By doing so, the owner will satisfy the IPMVP and provide a higher quality project. The following flowchart shows the TIES approach for delivering energy projects.



The following table addresses several of the flowchart steps that require specific integration with commissioning.

<b>PC Process Step</b>	<b>Recommendation for Including Commissioning in PC Process</b>	<b>Responsible Party</b>
Performance Contract and Commission	Hire or designate a commissioning supervisor or consultant to oversee project for State	Owner
Identify ESCO	Incorporate cx requirements in ESCO RFP or SOQ	Owner
Letter of Agreement (TVA or ESCO)	Incorporate State cx requirements for tasks to include both retrocx and new construction (installations) cx.	Owner
Detailed Energy Study (Scope of Service)	Incorporate a rigorous O&M assessment component for obtaining low-cost energy savings including savings estimates	ESCO, per owner requirements
	Provide results of study to all State-designated parties	
Energy Agreement	<p>Bundle cx requirements for both new and existing equipment into agreement. Address:</p> <ul style="list-style-type: none"> <li>• Commissioning costs</li> <li>• Who hires (pays for) the Commissioning Provider (may depend on financing arrangements)</li> <li>• Commissioning Provider qualifications</li> <li>• Lines of communication (stipulate data sharing between performance contractor, cx provider, and State agency's energy manager and State's commissioning consultant as appropriate)</li> </ul>	Owner and ESCO jointly with review by cx supervisor
Project Design Phase	<p>Commissioning Provider review all design documents and design intent for completeness regarding commissioning needs and requirements (sequences of operation, energy efficient control strategies, etc.)</p> <p>Commissioning Provider develop commissioning specifications for installing contractors etc.</p>	Cx provider and ESCO
Final Draft Commissioning Plan	Develop plan and hold a commissioning scoping meeting involving all participating parties (owner, ESCO, and appropriate installing contractors) to introduce plan and obtain agreement (buy in) from the team members.	Cx provider and ESCO
Project Construction Phase	Incorporate typical commissioning activities for both new and existing systems according to State guidelines	Cx provider and others according to cx specifications
Acceptance Phase	Incorporate typical commissioning activities for both new and existing systems according to State guidelines	Cx provider and others according to cx specifications

**ANNEX E**  
**ENERGY AUDIT FORMS**

(24 Pages)

## **Building Information Form**

The information in Sections 1 through 3 should be as complete as possible.

Section 2 enter building codes as followed:

1. Admin. Office
2. General Use
3. Residence
4. Assembly
5. Library
6. Museum
7. Laboratory
8. Public Safety
9. Warehouse
10. Mixed Use
11. Maintenance
12. Health Care

The identification of areas (Section 4) should be considered along with decision to use computer modeling. If a computer model simulation is done, the identified areas should correspond to the zones used in the model.

Sections 5 through 9 are detailed information needed for a computer model or other building calculations. Judgment should be used as to how much time to spend on this effort. Information that is readily available should be filled in.

Sections 10 and 11 should be completed with the best information available.

# State Owned Buildings Report Greater than 10,000 SF

	Sqr/ft	ID Name	zip
001	UT Knoxville - Educational		
	406,500	58 LAUREL APARTMENTS AND GARAGE	37996
	351,000	62 HODGES UNDERGRADUATE LIBRARY	37996
	335,900	90 ANDY HOLT APARTMENTS	37996
	329,800	104 SUTHERLAND VILLAGE APARTMENTS	37919
	316,300	57 HUMANITIES BLDG - MCCLUNG TOWER & GARAGE	37996
	300,200	56 KINGSTON APARTMENTS AND GARAGE	37919
	283,600	9 STOKELY ATHLETIC CENTER	37996
	252,400	98 NEYLAND STADIUM	37996
	239,200	93 CARRICK HALL-NORTH AND SOUTH	37996
	230,300	79 ADMINISTRATION PARKING GARAGE	37996
	230,000	51 SCIENCE/ENGINEERING RESEARCH FACILITY	37996
	227,200	25 CLAXTON EDUCATION BUILDING	37996
	213,400	68 HESS HALL	37996
	212,200	19 CAROLYN P BROWN STUDENT CENTER	37996
	211,000	77 PARKING GARAGE - HOLT & VOLUNTEER	37996
	202,900	21 DABNEY HALL & BUEHLER ADDN	37996
	180,500	7 ART-ARCHITECTURE BUILDING	37996
	176,200	2 CIRCLE PARK ADMINISTRATION BUILDING	37996
	169,900	60 UNIVERSITY CENTER PARKING GARAGE	37996
	169,900	81 PHYSICAL EDUCATION BUILDING-MEN	37996
	168,400	69 MORRILL HALL	37996
	157,200	24 CLEMENT HALL	37996
	150,600	63 LIFE SCIENCES BLDG	37996
	133,800	46 MASSEY HALL	37996
	129,800	112 WOODLAWN APT	37920
	127,600	61 HOSKINS LIBRARY AND KEFAUVER WING	37996
	126,200	59 TAYLOR LAW CENTER AND ADDITION	37996
	123,500	26 DOUGHERTY ENGINEERING BUILDING	37996
	122,300	15 HESLER BIOLOGY BUILDING	37996
	115,100	17 BUSINESS ADMINISTRATION BUILDING	37996
	114,600	92 REESE HALL	37996
	114,600	95 HUMES HALL	37996
	110,000	23 COMMUNICATIONS & EXTENSION BUILDING	37996
	107,600	103 STRONG HALL AND CAFETERIA	37996
	101,400	5 ALUMNI MEMORIAL BUILDING	37996
	101,400	6 ALUMNI MEMORIAL BLDG. RENOVATIONS	37996
	100,800	66 MELROSE HALL	37996
	94,100	45 GREVE HALL	37996
	92,300	16 GLOCKER BUSINESS ADMINISTRATION BUILDING	37996
	91,900	11 AYRES HALL	37996
	85,400	50 HARRIS HOME ECONOMICS BUILDING	37996
	82,700	47 DUNFORD HALL	37996
	76,900	80 PERKINS HALL	37996
	71,700	73 STUDENT AQUATIC CENTER (INCLUDING OUTDOOR	37996
	70,400	82 PHYSICS BUILDING	37996
	70,000	94 FOOD SERVICES BUILDING	37996
	67,400	1 AUSTIN PEAY BUILDING	37996
	63,500	114 GIBBS HALL	37996
	61,700	108 TALIWA COURT ADDN	37920
	60,400	107 TALIWA COURT APARTMENTS	37920
	57,300	27 ESTABROOK HALL	37996
	55,700	29 FERRIS HALL	37996
	55,700	89 CLARENCE BROWN THEATRE	37996
	53,600	72 MUSIC BUILDING	37996
	51,000	78 PANHELLENIC BLDG	37996
	50,200	8 WHITE AVENUE BLDG	37996
	42,900	43 GEOLOGY & GEOGRAPHY BUILDING	37996
	41,400	83 COLLEGE OF NURSING BUILDING	37996

Sqr/ft	ID Name	zip
38,800	64 MCCLUNG MUSEUM	37996
38,100	3 ALUMNI HALL (ACONDA CT)	37996
35,000	44 BURCHFIEL GEOGRAPHY BUILDING	37996
30,500	49 HENSON HALL	37996
30,400	65 MAINTENANCE SHOP & WAREHOUSE	37996
29,100	76 RECREATIONAL-FITNESS FACILITY	37996
27,700	102 STEAM PLANT	37996
27,400	84 NUCLEAR ENGINEERING BLDG	37996
18,300	105 STUDENT COUNSELING CENTER	37996
17,600	28 1609 MELROSE - TYSON HOUSE - ALUMNI AFFAIRS	37996
17,200	109 TEMPLE COURT	37996
16,300	34 LAMBOA CHI ALPHA FRATERNITY HOUSE	37996
15,900	31 ALPHA TAU OMEGA FRATERNITY HOUSE	37996
15,500	87 STORAGE AND MAIL SERVICES BLDG	37996
15,300	41 SIGMA PHI EPSILON FRATERNITY HOUSE	37996
15,300	106 STUDENT HEALTH SERVICES BLDG	37996
15,100	71 MOTOR POOL BLDG	37996
15,000	39 SIGMA CHI FRATERNITY HOUSE	37996
15,000	54 TEXTILES & NONWOVENS DEVELOP. CENTER BLDG.	37996
15,000	97 SOUTH COLLEGE	37996
14,900	35 PHI GAMMA DELTA FRATERNITY HOUSE	37996
14,500	37 PI KAPPA ALPHA FRATERNITY HOUSE	37996
14,200	38 SIGMA ALPHA EPSILON FRATERNITY HOUSE	37996
13,800	36 PHI SIGMA KAPPA FRATERNITY HOUSE	37996
12,400	32 DELTA TAU DELTA FRATERNITY HOUSE	37996
12,400	85 PURCHASING BLDG	37996
11,200	18 CAROUSEL THEATRE	37996
10,900	14 ATHLETICS ACADEMIC BLDG.	37996
10,400	33 KAPPA ALPHA FRATERNITY HOUSE	37996
10,300	30 ALPHA GAMMA RHO FRATERNITY HOUSE	37996
10,100	74 STUDENT INTERNATIONAL HOUSE	37996

Summary for 'Agency' = 001 (89 detail records)  
**9,123,100** Percent of Total 0.145

**005 UT Knoxville - Non-Educational**

411,300	164 THOMPSON-BOLING ASSEMBLY CENTER AND ARENA	37996
243,000	154 PARKING GARAGE - 17TH STREET AT WHITE	37996
199,700	155 WAREHOUSE - 2121 STEPHENSON DRIVE	37996
138,200	153 PARKING GARAGE	37996
95,000	159 OFFICE/WAREHOUSE - 5723 MIDDLEBROOK	37921
80,300	150 FOOTBALL COMPLEX	37996
52,900	149 CITY STORAGE BUILDING	37996
47,000	135 PARKING STRUCTURE - LAKE AVENUE	37996
35,600	166 TENNIS CENTER BUILDING - 2016 CALEDONIA	37996
20,500	146 2704 KINGSTON PIKE FACULTY CLUB	37996
11,400	132 940 CHEROKEE-PRESIDENT HOME	37996

Summary for 'Agency' = 005 (11 detail records)  
**1,334,900** Percent of Total 0.021

**010 UT Knoxville - Farms**

233,000	209 VETERINARY SCHOOL BUILDING	37916
122,800	188 MCLEOD FOOD TECH BLDG & BREHM ANIMAL SCIENCE	37916
79,900	191 PLANT SCIENCES BUILDING INC AUD	37916
68,100	184 MORGAN HALL	37916
49,200	185 NEW AGRICULTURAL ENGINEERING BUILDING	37916
35,800	182 MCCORD HALL	37916
21,100	187 DAIRY PRODUCTS BUILDING	37916
15,300	193 ENT-PL PATH BLDG & GREENHOUSES	37916
14,000	186 AG ENGINEERING BUILDING	37916

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 010 (9 detail records)			
	<b>639,200</b>	Percent of Total	0.010
<b>015</b>	<b>UT Knoxville - Farms</b>		
	53,700	219 CHEROKEE ANIMAL FACILITY	37920
	17,100	221 BARN, MAIN DAIRY	37920
	14,400	222 BARN-FEEDING & RESTING WITH 3 SILOS	37920
	11,700	229 3 LAYING HOUSES	37920
	10,900	220 CHEROKEE FEED CENTER	37920
Summary for 'Agency' = 015 (5 detail records)			
	<b>107,800</b>	Percent of Total	0.002
<b>020</b>	<b>UT Knoxville - Farms</b>		
	46,400	263 CATTLE BARN, MACHINE STORAGE, FEED STGE-ALCOA	37701
	24,000	266 CATTLE FEEDING BARN #4-ALCOA LEASE	37701
	13,000	252 BARN-CATTLE NO. 3	37777
	12,100	253 BARN-CATTLE	37777
Summary for 'Agency' = 020 (4 detail records)			
	<b>95,500</b>	Percent of Total	0.002
<b>025</b>	<b>UT Knoxville - Farms</b>		
	12,100	273 PLANT SCIENCE FARM CENTER	37920
Summary for 'Agency' = 025 (1 detail record)			
	<b>12,100</b>	Percent of Total	0.000
<b>027</b>	<b>UT Knoxville - Farms</b>		
	33,400	291 KNOXVILLE COMMUNITY SERVICE CENTER - DORM	37914
Summary for 'Agency' = 027 (1 detail record)			
	<b>33,400</b>	Percent of Total	0.001
<b>030</b>	<b>UT Memphis - Educational</b>		
	225,000	316 BASIC MEDICAL SCIENCES GENERAL EDUCATION BLDG	38163
	191,200	320 66 PAULINE PARKING GARAGE	38163
	187,800	326 RANDOLF GARAGE	38163
	176,900	313 CHILD DEVELOPMENT CENTER	38163
	158,000	304 COLLEGE OF MEDICINE BUILDING	38163
	154,500	295 ANATOMY-LIBRARY - PHARMACY	38163
	129,500	299 DENTAL CLINIC BUILDING	38163
	116,000	323 BEALE BUILDING	38163
	109,900	306 GAILOR HOSP-MED & SURG BLDG	38163
	104,900	311 RANDOLF STUDENT-ALUMNI CENTER	38163
	103,300	305 JAMES K. DOBBS RESEARCH HOSPITAL	38163
	90,600	308 PATHOLOGY BUILDING	38163
	87,200	318 MEDICAL OFFICE COMPLEX	38163
	86,800	321 LIBRARY-NURSING BUILDING	38163
	85,100	296 T. P. NASH CHEM - PHYSIOLOGY BLDG	38163
	69,500	298 DENTISTRY BLDG	38163
	64,300	312 STUDENT CENTER DORMITORY	38163
	64,000	310 NASH ADDITION	38163
	60,200	328 GOODMAN FAMILY RESIDENCE HALL	38163
	49,000	293 O W HYMAN ADMINISTRATION BUILDING	38163

Sqr/ft	ID Name	zip
48,400	325 LINK BUILDING	38163
41,400	302 MEMPHIS REGIONAL CANCER CENTER	38100
35,000	300 SELDON D FEURT DENTAL - PHARMACY RESEARCH BLDG	38163
34,300	317 CENTRAL PURCHASING & PHYSICAL PLANT BUILDING	38163
28,000	307 LES PASSEES BUILDING	38105
20,900	314 PHI CHI MEDICAL FRATERNITY HOUSE	38104
18,200	315 DENTAL AUX CLINIC BUILDING	38163
16,900	297 KIRBY CHEVROLET BLDG	38163
11,600	322 896 EASTMORELAND-PHYS PLANT BLDG	38163
11,500	309 CHANDLER RADIOLOGY BUILDING-U T PART	38163

Summary for 'Agency' = 030 (30 detail records)  
**2,579,900** Percent of Total 0.041

**043 UT Other Counties**

18,000	363 JACKSON OUTPATIENT FACILITY	38301
--------	---------------------------------	-------

Summary for 'Agency' = 043 (1 detail record)  
**18,000** Percent of Total 0.000

**045 UT Martin - Educational**

145,800	378 PHYSICAL EDUCATION CONVOCATION CTR	38238
129,500	380 MEEK LIBRARY	38238
126,400	386 STUDENT CENTER BUILDING	38238
126,100	395 UNIVERSITY COURTS APTS & ADDN	38238
110,000	371 GOOCH HALL	38238
105,800	389 AUSTIN PEAY RES HALL- UNITS C & D	38238
105,800	390 JIM MCCORD RES HALL- UNITS A & B	38238
105,800	392 ELLINGTON RES HALL- UNITS E & F	38238
105,800	394 BROWNING HALL	38238
100,700	388 CLEMENT HALL	38238
96,900	369 ENG-PHYS SCI BUILDING & ADDITION	38238
82,400	402 AGRICULTURAL PAVILION	38238
79,700	393 COOPER HALL	38238
73,500	375 HUMANITIES BLDG	38238
72,600	377 MENS PHYSICAL EDUCATION BUILDING - FIELDHOUSE	38238
56,800	376 FINE ARTS BLDG	38238
54,000	366 BREHM BUILDING	38238
41,700	364 ADMIN BUILDING	38238
40,800	403 LIVESTOCK PAVILION - STALLING FACILITY	38238
36,700	391 BUS. ADM. BLDG.	38238
28,900	379 FOOTBALL GYM	38238
17,400	370 CRISP HALL	38238
13,400	396 MAINT. BUILDING	38238
12,700	399 MAINTENANCE AND STORAGE WAREHOUSE	38238

Summary for 'Agency' = 045 (24 detail records)  
**1,869,200** Percent of Total 0.030

**065 UT Nashville**

23,300	446 35TH AVE. NORTH & ALAMEDA ST. NASHVILLE	37209
10,800	445 STATE CENTER AND AGR BUILDING	37203

Summary for 'Agency' = 065 (2 detail records)  
**34,100** Percent of Total 0.001

**070 UT Agricultural Extension - Cumberland County**

13,400	459 MIX MILL-STOREAGE BIN & HERD KING BARN	38555
--------	--	-------

Monday, May 14, 2001

Page 4 of 38

	Sqr/ft	ID Name	zip
	12,700	467 BARN-CATTLE WITH SILO & SHEDS NO 2	38555
Summary for 'Agency' = 070 (2 detail records)			
	<b>26,100</b>	Percent of Total	0.000
<b>080</b>	<b>UT Agricultural Extension - Gibson County</b>		
	15,500	481 AGRICULTURAL MUSEUM	38358
Summary for 'Agency' = 080 (1 detail record)			
	<b>15,500</b>	Percent of Total	0.000
<b>090</b>	<b>UT Agricultural Extension - Madison County</b>		
	45,000	531 OFFICE BLDG	38301
Summary for 'Agency' = 090 (1 detail record)			
	<b>45,000</b>	Percent of Total	0.001
<b>100</b>	<b>UT Agricultural Extension - Maury County</b>		
	19,900	583 BULL TESTING BARN	38401
Summary for 'Agency' = 100 (1 detail record)			
	<b>19,900</b>	Percent of Total	0.000
<b>130</b>	<b>UT Agricultural Extension - Gibson County</b>		
	20,100	708 AUDITORIUM-DINING HALL- KITCHEN	38382
Summary for 'Agency' = 130 (1 detail record)			
	<b>20,100</b>	Percent of Total	0.000
<b>135</b>	<b>UT Agricultural Extension - Greene County</b>		
	15,800	711 DORMITORY	37743
Summary for 'Agency' = 135 (1 detail record)			
	<b>15,800</b>	Percent of Total	0.000
<b>140</b>	<b>UT Agricultural Extension - Maury County</b>		
	20,000	719 AUDITORIUM-DINING HALL- KITCHEN	38401
Summary for 'Agency' = 140 (1 detail record)			
	<b>20,000</b>	Percent of Total	0.000
<b>145</b>	<b>UT Memorial Research Center &amp; Hospital</b>		
	63,000	735 PROFESSIONAL OFFICE BUILDING III - DENTISTRY & ORAL	37996
	51,000	734 CLINICAL EDUCATION AND FAMILY PRACTICE/MEDICAL	37920
Summary for 'Agency' = 145 (2 detail records)			
	<b>114,000</b>	Percent of Total	0.002
<b>150</b>	<b>UT Tullahoma Space Institute</b>		
	80,900	737 SPACE INSTITUTE BUILDING	37388

Sqr/ft	ID Name	zip
21,400	739 INDUSTRY STUDENT CENTER	37388
19,400	774 ADVANCED TECHNOLOGY LABORATORY BUILDING	37388
12,700	779 ADVANCE TECHNOLOGY & ANALYTICAL ENGINEERING LAB	37388
10,200	756 AIRCRAFT HANGAR	37388

Summary for 'Agency' = 150 (5 detail records)  
**144,600** Percent of Total 0.002

**155 UT Chattanooga - Educational**

299,500	795 LIBRARY & GARAGE	37403
189,900	793 PARKING GARAGE - E. 5TH STREET	37403
98,700	796 FLETCHER HALL	37403
86,200	804 GROTE SCIENCE-ENGINEERING BUILDING	37403
84,000	781 HOLT HALL	37403
81,000	807 STUDENT CENTER	37403
76,600	797 MACLELLAN GYM	37403
74,000	841 OFFICE COMPLEX - 511 MCCALLIE AVENUE	37403
72,300	787 FINE ARTS BUILDING	37403
65,000	816 PHYSICAL PLANT FACILITY	37403
58,200	794 HUNTER HALL	37403
57,700	810 LOCKMILLER I (2 BUILDINGS)	37403
50,100	808 STAGMIER AND PFEIFFER HALL	37403
47,200	809 NORTH STADIUM AND VINE DORM	37403
42,800	814 NEW VILLAGE II (BUILDINGS D, E, F, G & H)	37403
36,500	813 LOCKMILLER II (DORM C)	37403
35,200	792 RACE AND HOOPER HALL	37403
31,100	782 BROCK HALL	37403
28,500	790 ALEX GUERRY HALL	37403
27,000	805 INDOOR TENNIS & HANDBALL CENTER	37403
26,800	789 FOUNDERS HALL	37403
25,700	815 NEW VILLAGE I	37403
23,100	783 CADEK HALL	37403
21,600	786 DAVENPORT HALL	37403
21,500	785 MEMORIAL FOUNDATION BUILDING	37403
19,200	798 CHALLENGER LEARNING CTR-855 E. FIFTH	37403
18,000	806 SOUTH STADIUM	37403
14,700	811 LOCKMILLER II (DORM A)	37403
14,700	812 LOCKMILLER II (DORM B)	37403
12,400	803 CENTRAL ENERGY FACILITY	37403

Summary for 'Agency' = 155 (30 detail records)  
**1,739,200** Percent of Total 0.028

**160 UT Chattanooga - Other**

212,000	853 SPORTS ARENA PHYSICAL EDUCATION COMPLEX	37400
125,000	856 PARKING GARAGE - 744 MCCALLIE AVE.	37403
46,000	855 DOCTOR'S BUILDING - 744 MCCALLIE AVE	37403
22,000	854 FRIST HALL	37400
11,800	851 605 CHESTNUT STREET	37402
11,100	842 RESIDENCE-PRESIDENT- 605 OAK	37400

Summary for 'Agency' = 160 (6 detail records)  
**427,900** Percent of Total 0.007

**164 UT Hamilton County - Transportation Center**

17,000	865 MOTOR VEHICLE DIAGNOSTIC INSPECTION BLDG	37400
--------	--	-------

Monday, May 14, 2001

Page 6 of 38

Sqr/ft

ID Name

zip

Summary for 'Agency' = 164 (1 detail record)  
17,000 Percent of Total 0.000

**185 UT - Special Coverage**

38,100 937 WAREHOUSE - 1817 GRAND AVENUE, KNOXVILLE 37916  
13,000 912 MAIN DWELLING-DOTSON RD.- RUTLEDGE, TN. 37861

Summary for 'Agency' = 185 (2 detail records)  
51,100 Percent of Total 0.001

**201 Middle Tennessee Mental Health Institute**

211,000 961 HOSPITAL 37214  
33,000 960 FORENSIC SERVICES BLDG 37214  
11,700 957 ADOLESENT CENTER - EDUCATIONAL UNIT "A" 37200

Summary for 'Agency' = 201 (3 detail records)  
255,700 Percent of Total 0.004

**202 Clover Bottom Developmental Center**

50,100 977 INFIRMARY BLDG 37214  
48,700 975 CLEMENT HALL 37214  
46,700 978 DIETARY & CENTRAL SUPPLY BLDG 37214  
39,400 973 VAN BUREN HALL (#23) 37214  
39,400 976 HARRISON HALL(26) 37214  
35,900 971 EDUCATIONAL & TRAINING BLDG (#21) 37214  
34,000 981 HAROLD JORDAN HABILITATION CTR 37214  
28,300 972 RICHARD P STAMPS BUILDING 37214  
25,500 967 MONROE HALL(#13) 37214  
21,500 963 PROGRESS HOUSE (#3) 37214  
17,000 980 FOOD SERVICES RECEPTOR BLDG 37214  
16,200 979 SPECIAL EDUCATION BLDG 37214  
15,500 968 ENGINEERING & MAINTENANCE BLDG 37214

Summary for 'Agency' = 202 (13 detail records)  
418,200 Percent of Total 0.007

**203 Greene Valley Developmental Center**

72,200 1002 CRIB PATIENT BLDG - WILSON HALL 37743  
68,800 1001 MEDICAL & SURGICAL BLDG (INCL PASSAGEWAY) 37743  
62,800 1014 CARDWELL HABILITATION CENTER AND POOL 37743  
57,400 1016 SERVICE BLDG-KITCHEN AND CAFETERIA 37743  
30,500 1013 LIVING UNIT - N 37743  
26,500 1015 SEMI-AMBULATORY PATIENT BLDG. GREENWOOD COTTAGE 37743  
19,900 1010 LIVING UNIT - K 37743  
19,900 1011 LIVING UNIT - L 37743  
19,900 1012 LIVING UNIT - M 37743  
16,200 1003 LIVING UNIT - A 37743  
16,200 1004 LIVING UNIT - B 37743  
16,200 1005 LIVING UNIT - C 37743  
16,200 1006 LIVING UNIT - D 37743  
16,200 1007 LIVING UNIT - I 37743  
16,200 1008 LIVING UNIT - H 37743  
16,200 1009 LIVING UNIT - J 37743

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 203 (16 detail records)			
	<b>491,300</b>	Percent of Total	0.008
<b>204</b>	<b>Mocassin Bend Mental Health Institute</b>		
	116,900	1032 MAIN BUILDING (INCL PASSAGEWAYS)	37400
	70,200	1040 WINSTON BUILDING	37400
	37,900	1037 SMALLWOOD BLDG.	37400
	30,800	1034 BOILER HOUSE-KITCHEN & WAREHOUSE	37400
	21,600	1045 ADOLESCENT CENTER (INCLUDING LIFT STATION)	37400
	19,500	1043 COMMUNITY MENTAL HEALTH CENTER	37400
Summary for 'Agency' = 204 (6 detail records)			
	<b>296,900</b>	Percent of Total	0.005
<b>205</b>	<b>Western Mental Health Institute</b>		
	150,500	1055 POLK BUILDING	38008
	90,300	1056 FRANK G. CLEMENT BUILDING	38008
	65,600	1053 WINSTON HALL (FMLY LINCOLN #1)	38008
	51,000	1054 LUTON HALL (FMLY LINCOLN #2)	38008
	35,500	1048 BAKERY -KITCHEN- DINING ROOM	38008
	33,000	1047 ADMINISTRATION BUILDING	38008
	29,400	1067 WINFIELD DUNN BUILDING	38008
	27,700	1049 UTILITY BLDG & WHSE (INCL REFRIG MCHY AND	38008
	22,600	1051 BOILER HOUSE (INCL BOILERS, EQUIP & STACK) LDRY &	38008
	20,500	1066 HARDEMAN HALL	38008
Summary for 'Agency' = 205 (10 detail records)			
	<b>526,100</b>	Percent of Total	0.008
<b>206</b>	<b>Lakeshore Mental Health Institute</b>		
	109,300	1094 WATERSIDE CENTER	37919
	85,700	1104 CHOTA BUILDING	37919
	66,400	1078 BAKER BUILDING	37919
	60,300	1097 CENTRAL SERVICE BUILDING & DIETARY KITCHEN	37919
	32,000	1080 VILLAGE MALL	37919
	28,000	1077 JANE KELLER BLDG	37919
	21,300	1096 CHILDREN AND YOUTH DINING ROOM	37919
	12,400	1075 ADMN BUILDING	37919
Summary for 'Agency' = 206 (8 detail records)			
	<b>415,400</b>	Percent of Total	0.007
<b>207</b>	<b>Arlington Developmental Center</b>		
	173,900	1106 BAKER ADMN & HOSPITAL BLDG (ABC)	38002
	39,800	1111 EDUCATION & TRAINING BLDG	38002
	38,000	1108 COTTAGE BLDG (E)	38002
	38,000	1109 COTTAGE BLDG (F)	38002
	38,000	1110 COTTAGE BLDG (G)	38002
	30,300	1112 GYMNASIUM	38002
	24,000	1119 MAPLE COTTAGE (64 BEDS)	38002
	22,200	1107 INFIRMARY BLDG (D)	38002
	16,700	1115 WAREHOUSE	38002
Summary for 'Agency' = 207 (9 detail records)			
	<b>420,900</b>	Percent of Total	0.007

	Sqr/ft	ID Name	zip
<b>209</b>		<b>Nolichucky - Holston Mental Health Center</b>	
	10,200	1122 MENTAL HEALTH CENTER	37743
	Summary for 'Agency' = 209 (1 detail record)		
	<b>10,200</b>	Percent of Total	0.000
<b>212</b>		<b>Chattanooga Psychiatric Clinic</b>	
	15,100	1128 OFFICE BLDG #1	37400
	Summary for 'Agency' = 212 (1 detail record)		
	<b>15,100</b>	Percent of Total	0.000
<b>213</b>		<b>Quinco Mental Health Center</b>	
	16,200	1131 OFFICES & CLINIC	38008
	Summary for 'Agency' = 213 (1 detail record)		
	<b>16,200</b>	Percent of Total	0.000
<b>215</b>		<b>Harriet Cohen Mental Health Center</b>	
	19,800	1133 OFFICES & CLINIC	37040
	Summary for 'Agency' = 215 (1 detail record)		
	<b>19,800</b>	Percent of Total	0.000
<b>217</b>		<b>Cheer Mental Health Center</b>	
	10,300	1136 OFFICES & CLINIC	37110
	Summary for 'Agency' = 217 (1 detail record)		
	<b>10,300</b>	Percent of Total	0.000
<b>224</b>		<b>Lakeway Center</b>	
	30,000	1140 LAKEWAY CENTER FOR THE HANDICAPPED	37814
	Summary for 'Agency' = 224 (1 detail record)		
	<b>30,000</b>	Percent of Total	0.000
<b>242</b>		<b>Tennessee Correction Academy</b>	
	23,300	1147 HAMPTON HALL	37388
	21,200	1152 FARRAR HALL	37388
	14,500	1145 HORTON HALL	37388
	13,700	1153 CLEMENT HALL	37388
	12,000	1144 RYE HALL	37388
	11,900	1146 COOPER HALL	37388
	10,100	1143 MCALISTER HALL	37388
	Summary for 'Agency' = 242 (7 detail records)		
	<b>106,700</b>	Percent of Total	0.002
<b>246</b>		<b>Tennessee State Prison</b>	
	48,900	1166 MAIN CELLBLOCK #1 #2 #3 & #4	37200
	47,600	1171 CET WAREHOUSE #1	37200

Sqr/ft	ID Name	zip
41,200	1172 HOSPITAL (#34)	37200
40,600	1169 CENTRAL STORES WAREHOUSE (#8)	37200
35,100	1175 SUPPLY DEPT (#41)	37200
30,800	1165 ADMN BLDG (#1)	37200
16,300	1173 INMATE DORM UNIT #7	37200
10,200	1168 ISOLATION CELL BLDG & DEATH HO (#6A)	37200

Summary for 'Agency' = 246 (8 detail records)  
**270,700** Percent of Total 0.004

**247 Tennessee State Prison - Women**

33,000	1204 NEW HOUSING UNIT	37200
24,300	1200 SCHOOL/INDUSTRY BUILDING	37200
23,000	1197 DORMITORY #5	37200
19,500	1191 DORMITORY (#2)	37200
19,400	1188 TREATMENT BLDG.	37200
19,200	1198 OFFICES & WOMENS DORMITORY	37200
18,700	1189 GYMNASIUM AND AUDITORIUM	37200
12,100	1193 NEW ADMIN BLDG	37200

Summary for 'Agency' = 247 (8 detail records)  
**169,200** Percent of Total 0.003

**248 Turney Center**

75,400	1250 WOOD PLANT - INDUSTRY BLDG (Q)	37033
58,100	1220 METAL/SIGN BLDG (J)	37033
35,900	1218 DINING ROOM, KITCHEN & LDRY (BLDG G)	37033
33,600	1208 SERVICE BLDG (INCL UNDGRD PASSAGEWAY) (B)	37033
31,900	1223 WAREHOUSE (M)	37033
31,000	1219 SCHOOL BLDG. (H)	37033
30,400	1210 MSA 1	37033
30,400	1211 MSA 2	37033
30,400	1212 MSA 3	37033
30,400	1213 MSA 4	37033
29,500	1209 HSA UNIT	37033
23,000	1214 GYMNASIUM & RESOURCE CENTER (F)	37033
18,500	1246 MINIMUM SECURITY ANNEX	37033
13,900	1251 PAINT PLANT - INDUSTRY BLDG (P)	37033
11,600	1245 MINIMUM SECURITY ANNEX	37033

Summary for 'Agency' = 248 (15 detail records)  
**484,000** Percent of Total 0.008

**249 Cold Creek Correctional Facility**

29,600	1272 MINIMUM SECURITY FACILITY	38041
19,200	1295 LOAFING BARN	38041
12,000	1294 GRAIN STORAGE COMPLEX (INCL EQUIPMENT)	38041
10,800	1270 CET INDUSTRY BUILDING	38041

Summary for 'Agency' = 249 (4 detail records)  
**71,600** Percent of Total 0.001

**250 Brushy Mountain Prison**

79,300	1311 MAIN BLDG (#1)	37845
29,700	1344 SEGREGATION UNIT	37845
10,600	1313 LAUNDRY & RECREATION BUILDING (#3)	37845

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 250 (3 detail records)			
	<b>119,600</b>	Percent of Total	0.002
<b>256</b>	<b>Mark Luttrell Reception Center</b>		
	35,800	1352 SERVICES BUILDING "C"	38100
	25,200	1367 DORMITORY (MCSC)	38100
	22,500	1353 LIVING UNIT BUILDING "D"	38100
	22,500	1354 LIVING UNIT BUILDING "E"	38100
	22,500	1355 LIVING UNIT BUILDING F	38100
	14,100	1358 WAREHOUSE BUILDING "I"	38100
	10,500	1356 GYMNASIUM BUILDING G	38100
Summary for 'Agency' = 256 (7 detail records)			
	<b>153,100</b>	Percent of Total	0.002
<b>259</b>	<b>Nashville Community Services Center</b>		
	30,900	1369 ADMIN BLDG (#207) (FMLY STOCKADE)	37200
Summary for 'Agency' = 259 (1 detail record)			
	<b>30,900</b>	Percent of Total	0.000
<b>261</b>	<b>Middle Tennessee Reception Center</b>		
	44,400	1388 ADMINISTRATION & GENERAL SERVICES BUILDING (INCL	37243
	14,100	1411 WAREHOUSE/MAINTENANCE BUILDING	37243
Summary for 'Agency' = 261 (2 detail records)			
	<b>58,500</b>	Percent of Total	0.001
<b>262</b>	<b>Southeast Tennessee Regional Correctional Facility</b>		
	36,800	1415 PROGRAM BLDG & GUARD TOWERS #1 & #5 (OLD ADMIN	37367
	18,400	1453 INDUSTRY BLDG	37367
	18,100	1449 WAREHOUSE/MAINTENANCE BUILDING	37367
	11,600	1452 EDUCATION BLDG	37367
Summary for 'Agency' = 262 (4 detail records)			
	<b>84,900</b>	Percent of Total	0.001
<b>264</b>	<b>Morgan County Regional Correctional Facility</b>		
	44,600	1479 ADMN BLDG	37887
	31,000	1503 INDUSTRY BUILDING	37887
	19,600	1502 MAINTENANCE/WAREHOUSE BUILDING	37887
	19,400	1501 EDUCATION BLDG	37887
Summary for 'Agency' = 264 (4 detail records)			
	<b>114,600</b>	Percent of Total	0.002
<b>265</b>	<b>Lake County Regional Correctional Facility</b>		
	36,800	1529 PROGRAM/SERVICES BLDG (OLD ADMIN)	38257
	14,000	1554 VOCATIONAL SCHOOL BUILDING	38079

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 265 (2 detail records)			
	<b>50,800</b>	Percent of Total	0.001
<b>266</b>	<b>Wayne County Boot Camp</b>		
	45,500	1569 DETENTION HOUSING	38425
	17,400	1567 DORMITORY	38425
Summary for 'Agency' = 266 (2 detail records)			
	<b>62,900</b>	Percent of Total	0.001
<b>267</b>	<b>Carter County Regional Work Camp</b>		
	43,800	1575 ADMINISTRATION BUILDING AND DORMITORY	37643
Summary for 'Agency' = 267 (1 detail record)			
	<b>43,800</b>	Percent of Total	0.001
<b>268</b>	<b>River Bend Maximum Security Inst.</b>		
	30,400	1597 MSA BLDG (#6)	37219
	29,500	1583 HSA BLDG (#1)	37219
	29,500	1584 HSA.1 BLDG (#2)	37219
	29,200	1587 HSB.1 BLDG (#3)	37219
	29,200	1588 HSB.1 BLDG (#4)	37219
	28,000	1596 HSB BLDG (#5)	37219
	23,200	1595 FACILITY MANAGEMENT BLDG (#14)	37219
	20,900	1589 SECURITY, VISITATION, CAPITAL PUNISH. BLDG (#8)	37219
	14,900	1590 FOOD & LAUNDRY SERVICES BLDG (#9)	37219
	14,700	1594 INDUSTRY BUILDING (#13)	37219
	14,000	1582 ADMINISTRATION SERVICES BUILDING	37219
	13,000	1591 MEDICAL SERVICES BLDG (#10)	37219
	10,700	1592 PROGRAM SERVICES BLDG (#11)	37219
	10,100	1593 RECREATION SERVICES BLDG (#12)	37219
Summary for 'Agency' = 268 (14 detail records)			
	<b>297,300</b>	Percent of Total	0.005
<b>269</b>	<b>West Tennessee High Security Facility</b>		
	31,200	1605 INDUSTRY BLDG B	38041
	27,000	1610 LARGE PROGRAMS/LIBRARY - BLDG F	38041
	22,400	1604 FACILITY MANAGEMENT WAREHOUSE-BLDG.A (INCL.	38041
	20,100	1616 UNIT #6 - BLDG K	38041
	20,100	1617 UNIT #5 - BLDG L	38041
	19,300	1611 UNIT #1- BLDG H (EAST)	38041
	19,300	1612 UNIT #2- BLDG H (WEST)	38041
	19,200	1613 UNIT #3- BLDG J (SOUTH)	38041
	19,200	1614 UNIT #4- BLDG J (NORTH)	38041
	15,800	1606 SECURITY & VISITATION SERVICES-BLDG D	38041
	14,600	1608 FOOD SERVICE BUILDING- BLDG C	38041
	14,300	1603 ADMINISTRATION BUILDING	38041
	12,800	1609 MEDICAL SERVICES BUILDING- BLDG E	38041
Summary for 'Agency' = 269 (13 detail records)			
	<b>255,300</b>	Percent of Total	0.004
<b>270</b>	<b>Northeast Correctional Center</b>		
	62,200	1644 MINIMUM SECURITY FACILITY BLDG.16	37683

Sqr/ft	ID Name	zip
57,600	1628 INDUSTRIES BLDG. (#2)	37683
30,400	1636 MSA (BLDG #10A)	37683
30,400	1637 MSA (BLDG #10B)	37683
30,400	1638 MSA (BLDG #10C)	37683
30,400	1639 MSA (BLDG #10D)	37683
30,400	1643 MSA (BUILDING #10E)	37683
30,300	1627 FACILITIES MANAGEMENT BUILDING (#1)	37683
29,500	1634 HSA.1 (BLDG #8)	37683
17,600	1632 PROGRAM SERVICES BUILDING (#6)	37683
16,000	1630 SECURITY/VISITATION BUILDING (#4)	37683
15,100	1629 FOOD SERVICES/LAUNDRY BUILDING (#3)	37683
14,300	1626 ADMIN BUILDING (#12)	37683
12,900	1631 MEDICAL SERVICES BUILDING (#5)	37683
10,300	1633 RECREATION SERVICES BUILDING (#7)	37683

Summary for 'Agency' = 270 (15 detail records)

**417,800** Percent of Total 0.007

### 271 South Central Correctional Center

62,200	1677 MINIMUM SECURITY FACILITY (BLDG #16)	38425
57,600	1662 INDUSTRIES BUILDING (#2)	38425
30,400	1670 MSA (BLDG #10A)	38425
30,400	1671 MSA (BLDG #10B)	38425
30,400	1672 MSA (BLDG #10C)	38425
30,400	1673 MSA (BLDG #10D)	38425
30,400	1679 MSA UNIT	38425
30,300	1661 FACILITY MANAGEMENT BUILDING (#1)	38425
29,500	1668 HSA (BLDG #8)	38425
16,000	1664 SECURITY VISITATION BUILDING (#4)	38425
15,100	1663 FOOD SERVICES/LAUNDRY BUILDING (#3)	38425
14,300	1660 ADMINISTRATION BUILDING (#12)	38425
12,900	1665 MEDICAL SERVICES BUILDING (#5)	38425
11,500	1666 PROGRAM SERVICES BUILDING (#6)	38425
10,300	1667 RECREATION SERVICES BUILDING (#7)	38425

Summary for 'Agency' = 271 (15 detail records)

**411,700** Percent of Total 0.007

### 272 Special Needs Facility

58,400	1687 MENTAL HEALTH HOUSING BLDG (#7)	37219
44,700	1689 MEDICAL BLDG(#9)	37219
41,200	1682 PROGRAM SERVICES BLDG (#2)	37219
31,800	1692 FACILITIES MGT BLDG (#12)	37219
31,700	1696 DETENTION HOUSING	37219
20,300	1685 INTERMEDIATE HOUSING BLDG (#5)	37219
20,300	1686 INTERMEDIATE HOUSING BLDG (#6)	37219
20,200	1684 SEX OFFENDER/CADRE HOUSING BLDG (#4)	37219
20,100	1683 SEX OFFENDER HOUSING BLDG (#3)	37219
19,200	1688 TRANSIENT/INTAKE UNIT BLDG (#8)	37219
12,100	1681 ADMINISTRATION BLDG (#1)	37219
10,300	1691 FOOD SERVICES/LAUNDRY BLDG (#11)	37219

Summary for 'Agency' = 272 (12 detail records)

**330,300** Percent of Total 0.005

### 273 Northwest Correctional Center Medium Security Fac.

62,200	1714 MINIMUM SECURITY FACILITY (BLDG #16)	38079
57,600	1699 INDUSTRIES BLDG (#2)	38079
30,400	1707 MSA (BLDG #10A)	38079
30,400	1708 MSA (BLDG #10B)	38079

Sqr/ft	ID Name	zip
30,400	1709 MSA (BLDG #10C)	38079
30,400	1710 MSA (BLDG #10D)	38079
30,400	1715 MSA (BUILDING #10E)	38079
30,300	1698 FACILITIES MANAGEMENT BLDG (#1)	38079
29,500	1705 HSA (BLDG #8)	38079
16,000	1701 SECURITY/VISITATION BLDG (#4)	38079
15,100	1700 FOOD SERVICES BLDG (#3)	38079
14,200	1697 ADMINISTRATION BLDG. (#12)	38079
12,900	1702 MEDICAL SERVICES BLDG (#5)	38079
11,500	1703 PROGRAM SERVICES BLDG (#6)	38079
10,300	1704 RECREATION SERVICES BLDG (#7)	38079

Summary for 'Agency' = 273 (15 detail records)  
**411,600** Percent of Total 0.007

**280 Joe L. Evins Appalachian Crafts Center**

25,900	1814 COOL WING BLDG	38582
19,500	1815 ADMINISTRATION, CAFETERIA & DISPLAY BLDG	38582
13,400	1817 CLAY STUDIO	38582
12,300	1816 GLASS AND METAL STUDIOS	38582

Summary for 'Agency' = 280 (4 detail records)  
**71,100** Percent of Total 0.001

**283 Historical Commission**

17,800	1849 ROCKY MOUNT, PINEY FLATS, TENN MUSEUM & APT	37686
13,400	1885 HOLST HOUSE AND BOILER HOUSE	37326
11,100	1886 CHESTER INN	37659
10,500	1879 MACHINE SHOP	37326
10,300	1888 CLOVERBOTTOM MANSION	37214

Summary for 'Agency' = 283 (5 detail records)  
**63,100** Percent of Total 0.001

**340 Tennessee Wildlife Resources Agency**

57,300	3336 PREMISES ELLINGTON AGRICULTURAL CTR, NASHVILLE, TN	37200
16,800	3421 NEW REGION IV HEADQUARTERS	37814
14,200	3478 EAGLE BEND FISH HATCHERY -ANDERSON	37716
13,400	3611 REGION II HEADQUARTERS - ELLINGTON AG. CENTER - 5105	37204

Summary for 'Agency' = 340 (4 detail records)  
**101,700** Percent of Total 0.002

**361 Chattanooga State Community College**

204,500	3626 ALBRIGHT COMPLEX	37406
62,900	3627 INSTRUCTIONAL MATERIALS CENTER	37406
46,000	3634 HUMANITIES BLDG	37406
45,900	3649 SHOP BUILDING	37406
40,800	3630 PHYSICAL EDUCATION BLDG	37406
37,000	3652 SEQUATCHIE VALLEY SCHOOL - BLEDSOE CO.	37367
36,000	3629 STUDENT & COMMUNITY SERVICES CENTER	37406
31,900	3648 ADMN BUILDING	37406
17,000	3650 DIESEL AUTOMOTIVE TECHNICAL SHOPS	37406
15,500	3646 OFFICES & CLASSROOMS KIMBALL, TN	37380
15,000	3642 7158 LEE HIGHWAY	37406
15,000	3651 LEASED OFFICE/CLASSROOMS - 200 4TH AVENUE, DAYTON	37321
11,400	3641 DOWNTOWN - 535 CHESTNUT (LEASED)	37406
11,000	3633 WAREHOUSE FACILITY	37406

Sqr/ft	ID Name	zip
10,500	3643 FILLAUER BLDG - (LEASED)	37406
Summary for 'Agency' = 361 (15 detail records)		
<b>600,400</b>	Percent of Total	0.010

**362 Volunteer State Community College**

68,700	3656 STUDENT ACTIVITIES BUILDING "B"	37066
55,300	3664 LIBRARY	37066
51,800	3658 GYMNASIUM AND MUSIC BLDG. D	37066
49,400	3655 ADMIN BLDG "A"	37066
28,300	3657 CLASSROOM BLDG"C"	37066
25,900	3659 CLASSROOMS AND LECTURE HALL "E"	37066
22,000	3661 CAREER TECHNOLOGY BUILDING G	37066
11,300	3667 HEALTH SOUTH COMPLEX - BLDG 300	37066
11,000	3669 HEALTH SOUTH COMPLEX - BLDG 500	37066
Summary for 'Agency' = 362 (9 detail records)		
<b>323,700</b>	Percent of Total	0.005

**363 Walters State Community College**

148,500	3674 CENTRAL ENERGY PLANT, OBSERVATORY & ADMN BLDG -	37814
102,000	3695 AGRIBUSINESS PAVILION - (EXPO)	37890
66,000	3679 CAREER TECHNOLOGY BLDG - (TECH)	37814
50,000	3693 WSCC EXTENSION FACILITY - 215 NORTH COLLEGE ST.,	37743
49,500	3678 LIBRARY - (LIB)	37814
40,200	3708 SEVIER CO. CENTER - 1720 OLD NEWPORT HWY	37876
37,900	3682 HUMANITIES/FINE ARTS BUILDING - (HUM)	37814
36,200	3699 PUBLIC SAFETY CNTR-MAIN BLDG-COLLEGE PK DR,	37814
32,200	3677 NATURAL SCIENCE BUILDING (NSCI)	37814
30,000	3680 MATH/BEHAVIORAL/SOCIAL SCIENCE BUILDING (MBSS)	37814
22,700	3704 HORSE BARN #1 (WHITE PINE)	37890
22,700	3705 HORSE BARN #2 (WHITE PINE)	37890
Summary for 'Agency' = 363 (12 detail records)		
<b>637,900</b>	Percent of Total	0.010

**364 Tennessee Technological University**

128,200	3728 ROADEN UNIVERSITY CENTER	38501
123,500	3776 SMITH QUADRANGLE	38501
122,200	3718 LIBRARY AND MEDIA CENTER	38501
120,300	3724 HOOPER ELBEN CENTER	38501
107,700	3735 PRESCOTT HALL	38501
87,200	3713 MEMORIAL GYM	38501
80,200	3725 WELLNESS/ FITNESS CENTER	38501
77,000	3766 AGRICULTURE PAVILION ARENA	38501
74,100	3726 JOHNSON HALL	38501
73,000	3782 MURPHY AND JOBE HALL	38501
65,700	3727 PENNEBAKER HALL	38501
64,200	3733 BRUNER HALL	38501
64,200	3734 BROWN HALL	38501
63,100	3780 WHITE AND MARSHALL HALLS	38501
61,900	3732 CLEMENT HALL	38501
60,300	3722 STADIUM - WEST BLEACHERS	38501
60,200	3730 FOSTER HALL	38501
60,200	3779 MEADOWS AND EARLY HALLS	38501
59,300	3723 STADIUM - EAST BLEACHERS	38501
58,700	3771 ELLINGTON AND WARF HALL	38501
56,300	3781 PINKERTON & M S COOPER HALLS - (UNITS A & B)	38501
55,300	3709 DERRYBERRY HALL	38501
55,000	3729 BRYAN FINE ART BUILDING	38501

Sqr/ft	ID Name	zip
55,000	3773 MADDUX AND MCCORD HALL	38501
52,500	3716 SOUTH HALL	38501
50,900	3765 AGRICULTURAL PAVILION BARN	38501
49,900	3774 MATTHEWS AND DANIEL HALL	38501
49,800	3767 BROWNING AND EVINS HALL	38501
49,800	3769 COOPER AND DUNN HALL	38501
43,600	3775 CRAWFORD HALL	38501
42,400	3778 DIXIE AND RYE HALLS	38501
35,500	3710 HENDERSON HALL	38501
35,100	3717 JERE WHITSON BLDG.	38501
26,700	3736 LEWIS HALL (FMLY IND TECH SHOP)	38501
26,200	3743 MAINTENANCE WAREHOUSE	38501
25,600	3720 UNIV SERVICES & HEATING PLT (INCL BOILERS EQUIP &	38501
25,300	3711 T J FARR EDUCATION BLDG	38501
21,200	3745 NURSING SCHOOL	38501
19,000	3712 BARTOO HALL	38501
19,000	3719 KITTRELL HALL	38501
19,000	3777 SMITH LODGE	38501
15,200	3860 INDOOR TENNIS COURTS	38505
11,200	3747 SHIPLEY FARM - LOAFING BARN AND CONCRETE SILO	38501
Summary for 'Agency' = 364 (43 detail records)		
<b>2,450,700</b>	Percent of Total	0.039

**365 Motlow State Community College**

77,100	3866 CLASS ROOMS & LIBRARY BLDG	37388
48,200	3873 NURSING AND TECHNOLOGY BLDG	37388
40,200	3867 PHYSICAL EDUCATION BUILDING	37388
23,700	3872 CLASSROOM AND AUDITORIUM BUILDING	37388
16,900	3879 MCMINNVILLE AVTS - CLASSROOM BLDG	37110
16,400	3868 STUDENT CENTER	37388
14,000	3880 FAYETTEVILLE TEACHING SITE - HWY 64 (LEASED)	37334
11,700	3865 ADMN BLDG	37388
10,200	3869 POWER BLDG	37388
Summary for 'Agency' = 365 (9 detail records)		
<b>258,400</b>	Percent of Total	0.004

**366 Middle Tennessee State University**

288,800	3925 FOOTBALL STADIUM	37132
260,300	3978 UNIVERSITY LIBRARY	37132
237,100	3966 MURPHY CENTER	37132
162,600	3976 BUSINESS/AEROSPACE BLDG	37132
145,100	3950 STUDENT RECREATION CENTER	37132
125,400	3920 KEATHLEY UNIVERSITY CENTER	37132
115,700	4030 FARM PROPERTY-MAIN CAMPUS-LIVESTOCK PAVILION (INCL	37132
111,200	3938 PECK HALL	37132
107,500	3892 TODD	37132
104,200	3936 CORLEW HALL	37132
101,300	3891 KIRKSEY OLD MAIN & MIDGETT BLDG	37132
100,300	3893 MONOHAN, REYNOLDS & SCHARDT HALLS	37132
96,400	3937 CUMMINGS HALL	37132
88,200	3915 JOHN BRAGG MASS COMMUNICATIONS BUILDING	37132
73,300	3900 ALUMNI MEMORIAL GYM	37132
71,600	3939 GEORGE DAVIS SCIENCE BUILDING	37132
65,300	3974 NED McWHERTER LEARNING RESOURCES CENTER	37132
63,000	3894 LYON, MARY AND MCHENRY HALLS	37132
59,500	3924 WRIGHT MUSIC & FINE ARTS BLDG	37132
59,400	3895 JAMES UNION BUILDING	37132
57,300	3890 COPE ADMN BLDG	37132
55,900	3898 BOUTWELL DRAMATIC ARTS	37132
51,700	3964 ABERNATHY HALL	37132

Sqr/ft	ID Name	zip
51,700	3965 EZELL HALL	37132
43,600	3903 WOOD AND FELDER HALLS	37132
43,000	3906 WISER-PATTEN SCIENCE HALL	37132
39,300	3905 JONES HALL	37132
38,800	3913 PITTARD CAMPUS SCHOOL	37132
38,000	3907 SMITH HALL	37132
37,100	3927 DEERE HALL	37132
37,000	3899 VOORHIES INDUSTRIAL ARTS COMPLEX	37132
36,300	3928 NICKS HALL	37132
30,000	3949 CASON-KENNEDY NURSING BUILDING	37132
29,500	3941 ART BARN	37132
24,900	3910 CLEMENT HALL	37132
24,900	3911 GORE HALL	37132
24,600	3919 STARK AGRICULTURAL CTR	37132
23,200	3923 SIMS HALL	37132
22,500	3908 GRACY HALL	37132
22,500	3909 JUDD HALL	37132
22,200	3922 BEASLEY HALL	37132
21,600	3896 RUTLEDGE HALL	37132
20,800	4018 WAREHOUSE 880 ESTHER LANE (LEASED)	37130
20,000	4031 PAVILION SHED A	37132
20,000	4032 PAVILION SHED B	37132
18,600	3975 AIRWAY SCIENCE FACILITY	37130
18,400	3945 WAREHOUSE & CENTRAL RECEIVING BUILDING	37132
15,900	4019 SCARLETT COMMONS APT # 9	37132
15,900	4020 SCARLETT COMMONS APT#1	37132
15,900	4021 SCARLETT COMMONS APT # 2	37132
15,900	4022 SCARLETT COMMONS APT # 3	37132
15,900	4023 SCARLETT COMMONS APT # 4	37132
15,900	4024 SCARLETT COMMONS APT #6	37132
15,900	4025 SCARLETT COMMONS APT # 7	37132
15,900	4026 SCARLETT COMMONS APT # 8	37132
14,800	3904 ELLINGTON HUMAN SCIENCE BUILDING	37132
14,500	4007 CENTRAL/COGENERATION PLANT	37132
14,200	3916 FORREST HALL	37132
14,100	3933 WOMACK LANE APTS (E)	37132
14,100	3934 WOMACK LANE APTS (F)	37132
14,000	3955 WOMACK LANE APTS (G)	37132
14,000	3956 WOMACK LANE APTS (H)	37132
14,000	3957 WOMACK LANE APTS. (I)	37132
12,500	3929 WOMACK LANE APTS (A)	37132
12,500	3931 WOMACK LANE APTS (C)	37132
12,000	3940 PHOTOGRAPHY BUILDING	37132
11,500	3946 TURNER HAYES BUILDING	37132
11,500	3985 STEVEN B. SMITH BASEBALL CLUB HOUSE & INDOOR	37132
11,400	3958 WOMACK LANE APTS. (J)	37132
11,400	3959 WOMACK LANE APTS. (K)	37132
11,400	3960 WOMACK LANE APTS. (L)	37132
11,200	3901 NATATORIUM	37132
10,900	3930 WOMACK LANE APTS (B)	37132
10,900	3932 WOMACK LANE APTS (D)	37132
10,600	4027 SCARLETT COMMONS APT #5	37132
10,300	3914 R.O.T.C. ANNEX	37132
10,100	3942 MCFARLAND HEALTH SERVICES BUILDING	37132

Summary for 'Agency' = 366 (77 detail records)  
**3,708,700** Percent of Total 0.059

### 367 University of Memphis

280,100	4276 STUDENT ACTIVITIES COMPLEX - PARKING GARAGE	38152
259,200	4273 NED R. MCWHERTER LIBRARY	38152
251,000	4248 PARKING GARAGE - DELOACH	38100
228,600	4184 RICHARDSON TOWERS	38100
167,200	4123 UNIVERSITY CENTER	38100

Sqr/ft	ID Name	zip
152,800	4066 ADMINISTRATION BUILDING (INCL ADMN ANNEX)	38100
140,600	4091 LIBRARY -UNDERGRADUATE & TOWER	38100
136,000	4102 HEALTH & PHYS. ED BLDG (SPOTTSWOOD & ECHLES)	38100
131,500	4074 FIELD HOUSE, INCLUDING MEMORIAL GYMNASIUM	38100
118,200	4084 J M SMITH HALL	38100
103,000	4067 JONES HALL INCL CAFETERIA	38100
97,500	4093 ENGINEERING SCIENCE BLDG (B)	38100
97,300	4107 FOGELMAN EXECUTIVE CENTER	38152
88,000	4095 PSYCHOLOGY CLASS- ROOM BLDG	38100
87,000	4115 RAWLS HALL (W)	38100
84,500	4087 LAW SCHOOL	38100
84,200	4085 THEATRE & COMMUNICATIONS ARTS BUILDING	38100
83,500	4105 LIFE SCIENCES BUILDING	38100
83,000	4100 ENGINEERING TECHNOLOGY BUILDING	38100
77,200	4088 PATTERSON HALL	38100
74,500	4071 MANNING HALL	38100
73,600	4101 WINFIELD DUNN HALL	38100
73,300	4073 COMMUNICATION AND FINE ARTS BUILDING	38100
71,000	4096 BUSINESS ADMINISTRATION (CLASSROOM)	38100
70,300	4076 SCHOOL OF EDUCATION AND AUDITORIUM	38100
69,600	4086 MUSIC BUILDING	38100
62,300	4078 LIBRARY -BRISTER	38100
61,700	4083 CLEMENT HALL	38100
60,100	4178 ATHLETIC DRESSING FACILITIES (KENNEDY)	38100
52,600	4070 MITCHELL HALL (BUS ADMN BLDG - INCL ADMN HALL)	38100
52,600	4112 MYNDERS HALL (W)	38100
51,500	4075 ELLINGTON HALL	38100
50,800	4097 BUSINESS ADMINISTRATION (OFFICES)	38100
47,700	4117 SOUTH HALL	38100
44,500	4072 CAMPUS SCHOOL	38100
42,000	4116 ROBISON HALL (M)	38100
39,400	4108 SMITH HALL (W)	38100
38,700	4068 JOHNSON HALL	38100
38,400	4113 WEST HALL (W)	38100
37,700	4174 MAINT BLDG	38100
36,700	4098 ENGINEERING SCIENCE BLDG (A)	38100
35,100	4118 ATHLETIC OFFICE BUILDING & ADDITION	38100
34,000	4103 JOURNALISM (MEEMAN) BUILDING	38100
32,700	4114 BROWNING HALL (M)	38100
32,500	4090 SPEECH & HEARING CENTER 807 JEFFERSON ST	38100
32,000	4111 MCCORD HALL (M)	38100
31,000	4277 MICHAEL D. ROSE THEATER LECTURE HALL	38152
30,900	4286 CARRIER CENTER (LEASED)	38017
25,200	4110 SCATES HALL (M)	38100
21,200	4069 ART BUILDING	38100
21,200	4109 HAYDEN HALL (M)	38100
21,000	4188 WKNO- TV STUDIO (#29)	38100
19,100	4121 PANHELLENIC BLDG	38100
18,200	4124 HUDSON HEALTH CTR	38100
17,800	4189 CENTRAL RECEIVING (#34)	38100
17,000	4291 PYRAMID ARENA	38105
16,000	4181 NEWPORT HALL	38100
15,800	4258 APT F (12 FAMILY UNIT) 3860 TIGER PAW SOUTH	38100
15,800	4259 APT E (12 FAMILY UNIT) 3872 TIGER PAW SOUTH	38100
15,800	4261 APT D (12 FAMILY UNIT) 3882 TIGER PAW SOUTH	38100
15,800	4262 APT C (12 FAMILY UNIT) 3896 TIGER PAW SOUTH	38100
15,800	4263 APT B (12 FAMILY UNIT) 3906 TIGER PAW SOUTH	38100
15,800	4265 APT G (12 FAMILY UNIT) 255 TIGER PAW WEST	38100
15,800	4266 APT A (12 FAMILY UNIT) 270 TIGER PAW EAST	38100
14,700	4186 BIOLOGY STORAGE BUILDING #8	38100
14,400	4187 HEATING PLANT #33	38100
13,900	4190 STORAGE (#45)	38100
13,900	4191 STORAGE (#46)	38100
13,900	4192 STORAGE (#47)	38100
13,900	4193 STORAGE (#48)	38100

Sqr/ft	ID Name	zip
13,400	4185 EDUCATIONAL RESEARCH BLDG (#1)	38100
13,100	4080 CHUCALISSA - MUSEUM	38100
12,700	4175 STEAM & POWER PLANT (INCL. STACK)	38100
12,500	4194 BIOLOGY RESEARCH BUILDING (#113)	38100
12,100	4182 BILLY MAC JONES BUILDING	38100
12,100	4183 ALUMNI HOUSE 637 NORMAL	38100
10,700	4099 PSYCHOLOGY AUDITORIUM	38100
10,600	4196 CENTRAL RECEIVING STORAGE (#43)	38100
Summary for 'Agency' = 367 (78 detail records)		
<b>4,596,800</b>	Percent of Total	0.073

**368 Jackson State Community College**

84,200	4301 CLASSROOMS BLDG	38301
66,000	4307 TECHNICAL EDUCATION CENTER	38301
38,200	4304 GYMNASIUM	38301
26,700	4302 LIBRARY	38301
25,000	4303 SCIENCE BLDG	38301
24,400	4300 STUDENT CENTER	38301
18,900	4299 ADMN BLDG	38301
13,600	4305 MAINT BLDG	38301
Summary for 'Agency' = 368 (8 detail records)		
<b>297,000</b>	Percent of Total	0.005

**369 East Tennessee State University**

343,400	4413 VA BLDG 200	37684
343,000	4369 MEMORIAL CENTER	37614
232,100	4371 D P CULP UNIVERSITY CENTER	37614
193,300	4335 NEW CENTRAL LIBRARY	37614
160,400	4310 D. M. BROWN HALL	37614
126,800	4321 LIBRARY	37614
119,700	4412 VA BLDG 77	37684
114,500	4355 LUCILLE CLEMENT HALL	37614
101,800	4325 JOHN P. LAMB HALL	37614
101,600	4334 CENTER FOR PHYSICAL ACTIVITY	37614
93,600	4343 WARF-PICKEL EDUCATION BLDG	37614
93,500	4312 BURGIN E. DOSSETT HALL	37614
92,000	4395 CLASSROOMS & LABS - V A CENTER - BLDG (#119)	37684
91,000	4315 MEMORIAL GYMNASIUM (FMLY PHY ED BLDG)	37614
80,400	4390 KINGSPORT CENTER, KINGSPORT, TENN. SCHOOL	37660
77,700	4323 ROGERS-STOUT HALL	37614
68,000	4367 CLINICAL EDUCATION FACILITY	37614
64,400	4316 WILSON HALL	37614
62,500	4318 WILSON-WALLIS HALL	37614
57,800	4320 COLLEGE OF MEDICINE (FMLY CAFETERIA & UNIVERSITY	37614
56,100	4410 VA BLDG 2	37684
56,000	4394 OFFICE - V A CENTER BLDG (#1)	37684
53,700	4309 ALEXANDER HALL	37614
51,300	4311 GILBREATH HALL	37614
50,800	4380 BONNIE LUNTSFORD HALL (FMLY WOMEN'S APT-DORM)	37614
42,700	4319 BALL HALL	37614
38,100	4398 VA BLDG 3	37684
37,700	4324 CARTER HALL	37614
32,300	4411 VA BLDG 76	37684
32,100	4328 ROSS - PANHELLENIC HALL	37614
30,700	4314 MATHES HALL	37614
29,000	4396 LIBRARY - V A CENTER BLDG (#4)	37684
28,000	4313 BURLESON HALL	37614
27,900	4349 MARRIED STUDENTS APARTMENTS (F)	37614
27,800	4353 MCCORD HALL	37614
27,800	4354 COOPER HALL	37614
27,500	4377 MACK P DAVIS BLDG - UNIT B	37614

Sqr/ft	ID Name	zip
26,500	4378 MACK P DAVIS BLDG - UNIT C	37614
26,100	4326 HUTCHESON HALL	37614
26,000	4333 DOSSETT HALL	37614
25,500	4375 WILBUR BOND BLDG (FMLY PHYS PLT OPERATIONS BLDG)	37614
24,500	4317 CLEMENT HALL	37614
24,400	4332 WEST HALL	37614
23,900	4350 MARRIED STUDENTS APARTMENTS (G)	37614
23,000	4329 POWELL HALL	37614
21,800	4397 PARA MED BLDG-ELIZATION, TENN. SCHOOL	37643
21,000	4330 YOAKLEY HALL	37614
20,100	4336 ELLINGTON HALL	37614
20,000	4402 CENTRAL RECEIVING/PHYSICAL PLANT WAREHOUSE	37614
19,800	4362 STUDENT HOUSING BLDG. 4C & 4D - BUCCANEER RIDGE DR.	37614
19,800	4363 STUDENT HOUSING BLDG. 5E & 5F - BUCCANEER RIDGE DR.	37614
19,800	4364 STUDENT HOUSING BLDG. 6G & 6H - BUCCANEER RIDGE DR.	37614
19,800	4365 STUDENT HOUSING BLDG. 7I & 7J - BUCCANEER RIDGE DR.	37614
19,800	4376 MACK P DAVIS BLDG - UNIT A	37614
19,400	4331 STONE HALL	37614
19,400	4387 BRISTOL FAMILY PRACTICE CENTER - 108 MEDICAL PARK	37621
18,000	4426 BRISTOL - 1200 VOLUNTEER PKWY. (LEASED)	37620
14,700	4322 REECE MEMORIAL MUSEUM	37614
14,300	4360 STUDENT HOUSING BLDG. 2A - BUCCANEER RIDGE DR.	37614
14,300	4361 STUDENT HOUSING BLDG. 3B - BUCCANEER RIDGE DR.	37614
14,000	4393 OFFICE - V.A. CENTER BLDG (#52)	37684
13,600	4384 2101 SIGNAL DRIVE - JOHNSON CITY CHILD CARE	37614
13,200	4370 JOHN CLACK BLDG (FMLY CHILLING PLANT)	37614
12,300	4399 VA BLDG 8	37684
12,100	4383 JOHNSON CITY FAMILY PRACTICE CTR- W WALNUT ST	37614
11,800	4341 POWER PLANT (INCL STACKS)	37614
10,900	4372 SHELBRIDGE DWG #1	37614

Summary for 'Agency' = 369 (67 detail records)  
**3,836,800** Percent of Total 0.061

**370 Dyersburg State Community College**

47,900	4432 CLASSROOM BLDG	38024
35,500	4435 PHYSICAL ED. BLDG	38024
33,500	4442 TIPTON COUNTY FACILITY - COVINGTON, TN	38019
24,500	4431 ADMN BUILDING	38024
15,800	4441 GIBSON COUNTY CENTER-2071 HWY 45 BY-PASS TRENTON,	38382
12,300	4434 STUDENT CENTER	38024
10,600	4433 LIBRARY	38024

Summary for 'Agency' = 370 (7 detail records)  
**180,100** Percent of Total 0.003

**371 Columbia State Community College**

50,500	4457 FRANKLIN SITE - HILLSBORO ROAD FRANKLIN	37064
46,000	4444 WARF SCIENCE BLDG	38401
45,300	4448 GYMNASIUM	38401
32,500	4451 LIBRARY	38401
28,900	4449 HUMANITIES BLDG (CLEMENT HALL)	38401
28,100	4445 STUDENT CENTER	38401
19,000	4467 795 MAIN ST. - CLIFTON, TN (LEASED)	38425
12,400	4447 MAINTENANCE & POWER BLDG - (INCL BOILERS CHILLERS	38401
11,550	4443 ADMN BLDG	38401

Summary for 'Agency' = 371 (9 detail records)  
**274,250** Percent of Total 0.004

	Sqr/ft	ID Name	zip
<b>372</b>	<b>Cleveland State Community College</b>		
	58,800	4474 GYMNASIUM	37311
	52,000	4478 VOCATIONAL BLDG	37311
	41,000	4471 LIBRARY	37311
	40,800	4472 STUDENT CENTER	37311
	40,100	4476 CAREER EDUCATION BLDG	37311
	26,800	4473 HUMANITIES CLASSROOM BLDG	37311
	25,900	4469 ADMN BLDG	37311
	24,900	4470 SCIENCE BLDG	37311
	13,200	4477 CONTINUING EDUCATION & COMMUNITY SERVICE BLDG	37311
	10,100	4475 MAINTENANCE BLDG	37311

Summary for 'Agency' = 372 (10 detail records)  
**333,600** Percent of Total 0.005

	Sqr/ft	ID Name	zip
<b>373</b>	<b>Austin Peay State University</b>		
	217,200	4511 NEW SCIENCE BUILDING	37040
	139,800	4549 WINFIELD DUNN HEALTH & PHY EDUC BLDG &	37040
	87,200	4508 MUSIC BUILDING	37040
	78,400	4492 WOODWARD LIBRARY	37040
	58,300	4502 MEMORIAL HEALTH & PHYSICAL EDUCATION	37040
	57,300	4491 CLEMENT BLDG	37040
	53,600	4489 MCCORD BLDG	37040
	50,400	4548 TRAHERN ART & DRAMA BUILDING	37040
	45,300	4500 SEVIER HALL	37040
	42,600	4493 CLAXTON BLDG	37040
	42,600	4504 ELLINGTON HALL	37040
	40,800	4497 MYRA MCKAY HARNED HALL	37040
	40,500	4540 ATHLETIC STADIUM, OFFICE & DRESSING ROOMS	37044
	35,800	4510 KILLEBREW HALL	37040
	33,300	4509 CROSS HALL	37040
	32,000	4550 KIMBROUGH BUILDING	37040
	29,100	4490 BROWNING BLDG	37040
	24,000	4546 R C SHASTEEN MAINTENANCE & GENERAL SERVICIS	37040
	22,900	4499 BLOUNT HALL	37040
	21,600	4533 MECHAM - BLDG. A	37040
	18,900	4506 RAWLINS HALL	37040
	18,300	4503 MILLER HALL	37040
	18,000	4514 WAREHOUSE (FAIRGROUNDS)	37040
	17,200	4496 HARVILL HALL	37040
	17,000	4547 OFFICES AND CLASSROOMS (FMLY ARMORY)	37040
	16,700	4501 HARVILL CAFETERIA	37040
	16,100	4505 MCREYNOLDS HALL	37040
	11,000	4534 MECHAM BLDG. B	37040
	10,100	4498 MARKS BLDG	37040

Summary for 'Agency' = 373 (29 detail records)  
**1,296,000** Percent of Total 0.021

	Sqr/ft	ID Name	zip
<b>374</b>	<b>Tennessee State University</b>		
	245,700	4645 AVON WILLIAMS CAMPUS 10TH & CHARLOTTE	37203
	229,300	4587 FLOYD - PAYNE CAMPUS CENTER	37200
	164,900	4617 HOWARD C. GENTRY COMPLEX	37200
	114,600	4602 WILSON HALL (FMLY WOMEN'S DORM WRC)	37200
	103,000	4599 WILMA RUDOLPH DORMITORY	37200
	88,200	4579 CHEMISTRY, PHYSICS & MATH BLDG	37200
	81,600	4593 LIBRARY	37200
	77,700	4590 BOYD HALL (FMLY WATSON HALL #2)	37200
	70,400	4581 HALE HALL (FMLY GIRLS HONOR DORMITORY)	37200
	69,600	4615 W.S. DAVIS COMPLEX	37200
	68,000	4588 WATSON HALL	37200

Sqr/ft	ID Name	zip
58,900	4591 EPPSE HALL (FMLY WATSON HALL #3)	37200
55,200	4595 ELLIOTT BUILDING	37200
55,000	4597 UTILITIES TUNNEL	37200
55,000	4618 TORRENCE ENGINEERING BLDG	37200
51,900	4594 LEARNING RESOURCES CENTER	37200
51,400	4613 AGRICULTURE RESEARCH BLDG	37200
51,200	4577 HUMANITIES BLDG.	37200
50,300	4642 STUDENT HOUSING - BUILDING B	37200
50,300	4643 STUDENT HOUSING - BUILDING C	37200
42,200	4610 CLEMENT HALL	37200
41,400	4619 HOLLAND HALL SCHOOL OF BUSINESS	37200
40,000	4600 HANKAL HALL	37200
37,300	4611 C.A.R.P. COMPLEX	37200
36,400	4612 SMALL BUSINESS INCUBATION CENTER BUILDING	37200
35,900	4583 MCCORD ENGR BLDG	37200
35,800	4578 HUBERT B CROUCH GRADUATE SCHOOL	37200
34,400	4586 CLAY SCHOOL OF EDUCATION BUILDING	37200
33,900	4582 STRANGE HALL	37200
30,800	4641 STUDENT HOUSING - BUILDING A	37200
24,500	4584 INDUSTRIAL ARTS BUILDING	37200
24,500	4585 INDUSTRIAL ARTS BUILDING RENOVATION	37200
24,400	4580 MCWHERTER ADMINISTRATION BUILDING	37200
24,400	4614 OPERATIONS BLDG	37200
19,700	4646 RESEARCH LAB/ADMINISTRATION BUILDING - MCMINNVILLE	37110
19,000	4605 HARNED HALL	37200
17,500	4616 VEHICLE MAINTENANCE SHOP & WAREHOUSE	37200
17,400	4657 GENERAL SERVICES	37200
15,400	4598 QUEEN WASHINGTON HEALTH CENTER	37200
14,200	4596 HEATING PLANT & CHILLER PLANT (INCL BOILERS EQUIP &	37200

Summary for 'Agency' = 374 (40 detail records)  
**2,361,300** Percent of Total 0.038

### 375 Roane State Community College

122,900	4674 CLASSROOM BLDG. - OAK RIDGE BRANCH CAMPUS	37830
111,800	4664 SCHOOL-BLDG A&B	37748
73,500	4688 LIVESTOCK PAVILION	37748
70,200	4683 AG BARN	37748
45,200	4667 HUMANITIES BUILDING	37748
42,900	4665 GYMNASIUM-BLDG C	37748
42,100	4682 AG OPEN PAVILLION	37748
40,500	4666 TECHNOLOGY BLDG	37748
32,400	4669 L R C BUILDING	37748
30,300	4673 CUMBERLAND COUNTY HIGHER EDUCATION CENTER	38557
16,900	4670 CENTRAL HEATING PLANT & MAINTENANCE BLDG	37748
16,000	4680 123 HAYFIELD ROAD, KNOXVILLE	37922
14,700	4672 SCOTT COUNTY HIGHER EDUCATION CENTER - HUNTSVILLE,	37756

Summary for 'Agency' = 375 (13 detail records)  
**659,400** Percent of Total 0.010

### 376 Shelby State Community College

71,300	4695 SCHOOL - MIDTOWN CAMPUS 737 UNION AVENUE	38103
68,300	4701 PARRISH BUILDING	38103
67,400	4696 BUILDING A-B	38103
53,500	4698 SAILS BUILDING (INCL COVERED WALKWAYS)	38103
47,800	4700 BUILDING F (INCL BRIDGE & COVERED WALKWAYS)	38103
43,400	4697 BUILDING C	38103
43,000	4708 OFFICE/CLASSROOMS - 5396 MENDENHALL MALL	38115
30,700	4694 MIDTOWN CAMPUS - ALLIED HEALTH TEACHING FACILITY	38103
28,200	4699 BUILDING E (INCL BALCONY & COVERED WALKWAYS)	38103
27,800	4705 PHYSICAL PLANT-CENTRAL RECEIVING & WAREHOUSE	38103

Sqr/ft	ID Name	zip
22,200	4703 OFFICE & CLASSROOMS - 3833 MOUNTAIN TR	38127
12,500	4706 ART DEPARTMENT - BLDG "B" FISCHER SITE	38103
10,800	4704 GYMNASIUM - 3833 MOUNTAIN TR	38127
Summary for 'Agency' = 376 (13 detail records)		
<b>526,900</b>	Percent of Total	0.008

### 377 Pellissippi State Community College

119,700	4713 ACADEMIC #1 - BUILDING B	37933
97,300	4712 ADMINISTRATION - BUILDING A	37933
80,300	4714 ACADEMIC #2 - BUILDING C	37933
64,500	4721 EDUCATIONAL RESOURCES CENTER - LIBRARY	37933
37,700	4733 OFFICE - 1610 E. MAGNOLIA AVE KNOXVILLE LEASED	37917
31,400	4722 1010 MIDDLESETTLEMENT RD., ALCOA- BUILDING #30408	37701
31,300	4717 STUDENT ACTIVITIES CENTER-BLDG 2055P & BUBBLE 2050P	37933
17,600	4715 PHYSICAL PLANT - BUILDING D	37933
13,200	4716 TUNNEL	37933
Summary for 'Agency' = 377 (9 detail records)		
<b>493,000</b>	Percent of Total	0.008

### 391 Vocational Rehabilitation

33,900	4741 ADMINISTRATION BLDG (BLDG A) (INCL ENCLOSED BRIDGE	37167
33,000	4744 DORMITORY BLDG (BLDG D) (INCL ENCLOSED BRIDGE AND	37167
27,100	4742 VOCATIONAL EDUCATION BLDG (BLDG B)	37167
25,400	4745 DORMITORY AND CLINIC BUILDING (BLDG E)	37167
21,700	4734 HERMITAGE LEARNING CTR - 88 HERMITAGE AVE NASHVILLE	37200
21,400	4743 RECREATION BLDG (BLDG F)	37167
21,000	4739 WORK ADJUSTMENT- (BLDG N) - 9TH AVE. N. SMYRNA	37167
19,500	4749 REHAB. ENGINEERING/WAREHOUSE (BLDG M)	37167
16,100	4747 DINING HALL-KITCHEN-BOILER RM-CHILLER RM & COOLING	37167
15,100	4746 INDEPENDENT LIVING FACILITY	37167
12,000	4735 170 N MAIN ST (STATE OFFICE BLDG) MEMPHIS	38100
Summary for 'Agency' = 391 (11 detail records)		
<b>246,200</b>	Percent of Total	0.004

### 400 Alvin C. York Agricultural Institute

75,000	4755 HIGH SCHOOL, GYMNASIUM & AUDITORIUM BLDG	38556
19,600	4769 OLD SCHOOL BLDG	38556
16,000	4760 SCIENCE AND HOME ECON BUILDING	38556
Summary for 'Agency' = 400 (3 detail records)		
<b>110,600</b>	Percent of Total	0.002

### 401 Tennessee Preparatory School

176,000	4790 HIGH SCHOOL - MIDDLE SCHOOL COMPLEX	37210
42,600	4787 WAREHOUSE/MAINTENANCE BUILDING	37210
34,800	4783 COLE- KILVINGTON HALL	37210
28,600	4785 HIGH SCHOOL	37210
20,200	4788 PHYSICAL EDUCATION BLDG	37210
16,800	4777 ELEMENTARY SCHOOL - DEPARTMENT OF EDUCATION	37210
16,300	4782 COLE AUDITORIUM	37210
12,400	4786 SILLS HALL	37210

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 401 (8 detail records)			
	<b>347,700</b>	Percent of Total	0.006
<b>402</b>	<b>Tennessee School For The Deaf</b>		
	54,200	4843 AKIN HEALTH & P E BLDG	37920
	44,800	4824 WARD BUILDING	37920
	32,800	4837 MIDDLE SCHOOL	37920
	32,200	4839 ELEMENTARY DORMITORY	37920
	30,100	4831 JONES BUILDING	37920
	24,600	4836 ETHEL A POORE HALL	37920
	18,200	4834 COTTAGE E	37920
	16,500	4826 OLD GYM	37920
	14,100	4838 EDMUNDS BUILDING	37920
	12,100	4835 CENTRAL DINING HALL	37920
	11,300	4832 HEATING PLANT & STOREROOM	37920
Summary for 'Agency' = 402 (11 detail records)			
	<b>290,900</b>	Percent of Total	0.005
<b>403</b>	<b>Tennessee School For The Blind</b>		
	126,700	4870 SCHOOL BLDG (#1A & #1B)	37214
	22,000	4871 GYMNASIUM & SWIMMING POOL (#15)	37214
	16,600	4874 VOC TRCVI (#11)	37214
Summary for 'Agency' = 403 (3 detail records)			
	<b>165,300</b>	Percent of Total	0.003
<b>404</b>	<b>West Tennessee Center For The Deaf</b>		
	18,000	4891 OFFICES & CLASSROOMS	38301
Summary for 'Agency' = 404 (1 detail record)			
	<b>18,000</b>	Percent of Total	0.000
<b>411</b>	<b>State Technical Intitute at Memphis</b>		
	96,400	4895 FARRIS COMPLEX (10001)	38134
	74,600	4899 FULTON BLDG (10017)	38134
	30,400	4907 WHITEHEAD CENTER (10014)	38134
	29,900	4897 JENNINGS BLDG (10004)	38134
	29,200	4898 FREEMAN/SULCER BUILDING (10005/10006)	38134
	21,700	4901 PHYSICAL PLANT (10008)	38134
	20,900	4917 WHITEHAVEN CAMPUS (12008)	38109
	20,800	4896 PARRISH BLDG (10003)	38134
	17,600	4923 WORKFORCE DEV CENTER (12004)- 3523 LAMAR AVE	38118
	16,800	4910 NABORS CENTER (10015)	38134
	14,500	4924 WORKFORCE TRAINING CENTER (12011) 3545 LAMAR AVE	38118
	13,200	4900 THORNTON BLDG (10007)	38134
	11,000	4902 COVERED WALKWAYS (13001)	38134
Summary for 'Agency' = 411 (13 detail records)			
	<b>397,000</b>	Percent of Total	0.006
<b>412</b>	<b>Nashville State Technical Institute</b>		
	105,000	4928 SCHOOL BLDG	37200
	66,300	4932 LIBRARY/CLASSROOM BUILDING	37200
	61,100	4930 CLASSROOM BLDG	37200

	Sqr/ft	ID Name	zip
	31,100	4929 STUDENT SERVICES & MAINTENANCE SHOP	37200
	Summary for 'Agency' = 412 (4 detail records)		
	<b>263,500</b>	Percent of Total	0.004
<b>413</b>	<b>Pellissippi SCC - Division Street Campus</b>		
	45,500	4945 ACADEMIC BLDG	37919
	Summary for 'Agency' = 413 (1 detail record)		
	<b>45,500</b>	Percent of Total	0.001
<b>414</b>	<b>Northeast State Technical Institute</b>		
	47,900	4946 CLASSROOM BUILDING	37617
	30,000	4952 JAMES M PIERCE BUILDING	37617
	24,900	4955 CLASSROOMS & LABS BUILDING (B)	37617
	23,400	4950 STUDENT SERVICES BUILDING	37617
	22,500	4954 FACULTY OFFICE BUILDING (A)	37617
	15,100	4949 TRUCK SHOP	37617
	Summary for 'Agency' = 414 (6 detail records)		
	<b>163,800</b>	Percent of Total	0.003
<b>421</b>	<b>Future Farmers of America</b>		
	14,600	4973 CLASSROOM-AUDITORIUM & OFFICE BUILDING	38583
	10,400	4972 ACTIVITY BLDG	38583
	Summary for 'Agency' = 421 (2 detail records)		
	<b>25,000</b>	Percent of Total	0.000
<b>422</b>	<b>Tennessee Technology Center at Murfreesboro</b>		
	54,800	4980 OFFICE AND CLASS ROOMS	37130
	Summary for 'Agency' = 422 (1 detail record)		
	<b>54,800</b>	Percent of Total	0.001
<b>423</b>	<b>Tennessee Technology Center at Crump</b>		
	16,200	4983 ADMN BLDG	38327
	11,200	4984 SHOP BUILDING (LEFT WING)	38327
	10,700	4985 SHOP BUILDING (RIGHT WING)	38327
	Summary for 'Agency' = 423 (3 detail records)		
	<b>38,100</b>	Percent of Total	0.001
<b>424</b>	<b>Tennessee Technology Center at Shelbyville</b>		
	64,100	4990 ADMINISTRATION BUILDING-SHOP RIGHT AND LEFT WING	37160
	Summary for 'Agency' = 424 (1 detail record)		
	<b>64,100</b>	Percent of Total	0.001
<b>425</b>	<b>Tennessee Technology Center at McMinnville</b>		
	14,800	4994 ADMIN BLDG	37110

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 425 (1 detail record)			
	<b>14,800</b>	Percent of Total	0.000
<b>426</b>	<b>Tennessee Technology Center at Memphis</b>		
	97,000	5000 SCHOOL	38105
	47,500	5003 AVIATION MECHANICS TRAINING FACILITY	38116
	46,000	5001 SHOP BUILDING - MOSBY ADDITION	38105
Summary for 'Agency' = 426 (3 detail records)			
	<b>190,500</b>	Percent of Total	0.003
<b>427</b>	<b>Tennessee Technology Center at Morristown</b>		
	56,400	5009 CLASSROOMS & SHOP BUILDING-SULPHUR SPRINGS	37814
	26,000	5011 ROGERSVILLE FACILITY - PHIPPS BEND	37857
	15,100	5004 ELECTRONICS BUILDING	37814
	13,900	5007 SHOP BUILDING (RIGHT WING)	37814
	12,900	5006 SHOP BUILDING (LEFT WING)	37814
Summary for 'Agency' = 427 (5 detail records)			
	<b>124,300</b>	Percent of Total	0.002
<b>428</b>	<b>Tennessee Technology Center at Nashville</b>		
	36,100	5015 SHOP BUILDING	37209
	35,900	5012 ADMN BUILDING	37209
	14,000	5016 AUTO TECHNOLOGY BUILDING	37209
	10,800	5013 CLASSROOM BUILDING #5	37209
	10,800	5014 CLASSROOM BUILDING #6	37209
Summary for 'Agency' = 428 (5 detail records)			
	<b>107,600</b>	Percent of Total	0.002
<b>429</b>	<b>Tennessee Technology Center at Newbern</b>		
	46,700	5018 SCHOOL	38059
Summary for 'Agency' = 429 (1 detail record)			
	<b>46,700</b>	Percent of Total	0.001
<b>430</b>	<b>Tennessee Technology Center at Pulaski</b>		
	36,700	5021 MAIN BLDG - (INCL ADMIN, CLASSROOMS, SHOPS - BLDGS #1,	38478
	11,000	5022 CLASSROOM BUILDING #7	38478
Summary for 'Agency' = 430 (2 detail records)			
	<b>47,700</b>	Percent of Total	0.001
<b>431</b>	<b>Tennessee Technology Center at Jacksboro</b>		
	30,600	5028 ADMINISTRATION BUILDING (INCLUDING LEFT WING SHOP)	37757
	10,400	5029 SHOP BUILDING (RIGHT WING)	37757
Summary for 'Agency' = 431 (2 detail records)			
	<b>41,000</b>	Percent of Total	0.001

	Sqr/ft	ID Name	zip
<b>432</b>	<b>Tennessee Technology Center at Jackson</b>		
	30,900	5039 CLASSROOM, HEALTH BLDG., AND SHOP (RIGHT WING)	38301
	11,200	5032 ADMN BUILDING	38301
	Summary for 'Agency' = 432 (2 detail records)		
	<b>42,100</b>	Percent of Total	0.001
<b>433</b>	<b>Tennessee Technology Center at Knoxville</b>		
	38,900	5040 ADMN BUILDING	37919
	34,700	5041 SHOP BUILDING	37919
	17,500	5042 AUTO TECH BLDG - 901 LIBERTY STREET KNOXVILLE (LEASE)	37919
	Summary for 'Agency' = 433 (3 detail records)		
	<b>91,100</b>	Percent of Total	0.001
<b>434</b>	<b>Tennessee Technology Center at Livingston</b>		
	23,600	5050 CLASSROOM AND SHOP BLDG	38570
	14,500	5045 ADMN BUILDING	38570
	Summary for 'Agency' = 434 (2 detail records)		
	<b>38,100</b>	Percent of Total	0.001
<b>435</b>	<b>Tennessee Technology Center at McKenzie</b>		
	13,700	5052 ADMN BUILDING	38201
	11,400	5053 SHOP BUILDING (LEFT WING)	38201
	10,900	5054 SHOP BUILDING (RIGHT WING)	38201
	Summary for 'Agency' = 435 (3 detail records)		
	<b>36,000</b>	Percent of Total	0.001
<b>436</b>	<b>Tennessee Technology Center at Dickson</b>		
	50,600	5058 ADMIN BLDG, SHOPS RT & LEFT WINGS, HEALTH OCC BLDG	37055
	11,200	5062 SHOP/CLASSROOM BUILDING B-CLARKSVILLE	37040
	10,800	5061 SHOP/CLASSROOM BUILDING A-CLARKSVILLE	37040
	Summary for 'Agency' = 436 (3 detail records)		
	<b>72,600</b>	Percent of Total	0.001
<b>437</b>	<b>Tennessee Technology Center at Elizabethton</b>		
	17,200	5067 CLASSROOM BUILDING (HWY 91)	37643
	11,500	5063 SCHOOL BLDG #1	37643
	10,500	5064 SHOP BLDG #2	37643
	Summary for 'Agency' = 437 (3 detail records)		
	<b>39,200</b>	Percent of Total	0.001
<b>438</b>	<b>Tennessee Technology Center at Harriman</b>		
	23,900	5073 COMP. SHOP BUILDING - BLDG 4	37748
	11,100	5070 SHOP BUILDING - BLDG 2	37748
	11,100	5071 SHOP BUILDING - BLDG 3	37748
	10,200	5069 ADMN BUILDING - BLDG 1	37748

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 438 (4 detail records)			
	<b>56,300</b>	Percent of Total	0.001
<b>439</b>	<b>Tennessee Technology Center at Hartsville</b>		
	11,800	5075 SHOP BUILDING (LEFT WING) (BLDG 3)	37074
Summary for 'Agency' = 439 (1 detail record)			
	<b>11,800</b>	Percent of Total	0.000
<b>440</b>	<b>Tennessee Technology Center at Hohenwald</b>		
	39,900	5079 ADMINISTRATION BLDG - SHOP RIGHT WING AND LEFT WING	38462
Summary for 'Agency' = 440 (1 detail record)			
	<b>39,900</b>	Percent of Total	0.001
<b>441</b>	<b>Tennessee Technology Center at Athens</b>		
	45,100	5084 ADMINISTRATION BUILDING (INCLUDING RIGHT AND LEFT	37303
Summary for 'Agency' = 441 (1 detail record)			
	<b>45,100</b>	Percent of Total	0.001
<b>444</b>	<b>Tennessee Technology Center at Covington</b>		
	26,200	5087 MAIN BUILDING (INCL LEFT WING)	38019
	14,100	5088 SHOP BUILDING (RIGHT WING)	38019
Summary for 'Agency' = 444 (2 detail records)			
	<b>40,300</b>	Percent of Total	0.001
<b>445</b>	<b>Tennessee Technology Center at Crossville</b>		
	22,200	5098 CLASSROOM SHOP BUILDING #1	38555
	12,600	5092 SHOP BUILDING (LEFT WING) (3B)	38555
	12,600	5093 SHOP BUILDING (RIGHT WING) (3A)	38555
	11,200	5097 SHOP BUILDING #3 (5)	38555
	10,100	5091 ADMN BUILDING (2)	38555
Summary for 'Agency' = 445 (5 detail records)			
	<b>68,700</b>	Percent of Total	0.001
<b>446</b>	<b>Tennessee Technology Center at Ripley</b>		
	37,000	5099 CLASSROOM & SHOP BUILDING	38063
Summary for 'Agency' = 446 (1 detail record)			
	<b>37,000</b>	Percent of Total	0.001
<b>447</b>	<b>Tennessee Technology Center at Oneida</b>		
	34,300	5103 CLASSROOM BUILDING - 355 SCOTT HIGH DR	37841
	14,200	5101 SHOP BUILDING	37841
	12,800	5100 SCHOOL	37841

	Sqr/ft	ID Name	zip
	Summary for 'Agency' = 447 (3 detail records)		
	<b>61,300</b>	Percent of Total	0.001
<b>448</b>	<b>Tennessee Technology Center at Whiteville</b>		
	36,400	5104 SCHOOL	38075
	Summary for 'Agency' = 448 (1 detail record)		
	<b>36,400</b>	Percent of Total	0.001
<b>449</b>	<b>Tennessee Technology Center at Paris</b>		
	49,000	5107 ADMINISTRATION & CLASSROOMS	38242
	Summary for 'Agency' = 449 (1 detail record)		
	<b>49,000</b>	Percent of Total	0.001
<b>460</b>	<b>Non-Owned</b>		
	50,000	5109 TRI-COUNTY VOCATIONAL CTR- RT #1 RED BOILING SPGS	37150
	Summary for 'Agency' = 460 (1 detail record)		
	<b>50,000</b>	Percent of Total	0.001
<b>464</b>	<b>Henderson - Decatur County Vo - Tech Center</b>		
	38,100	5111 SCHOOL-LEXINGTON	38351
	Summary for 'Agency' = 464 (1 detail record)		
	<b>38,100</b>	Percent of Total	0.001
<b>468</b>	<b>Wilson County Vocational - Technical Center</b>		
	45,700	5112 SCHOOL-LEBANON	37087
	Summary for 'Agency' = 468 (1 detail record)		
	<b>45,700</b>	Percent of Total	0.001
<b>473</b>	<b>Fentress County Vocational - Technical Center</b>		
	33,800	5113 SCHOOL-JAMESTOWN	38556
	Summary for 'Agency' = 473 (1 detail record)		
	<b>33,800</b>	Percent of Total	0.001
<b>483</b>	<b>Morgan County Vocational - Technical Center</b>		
	45,400	5114 SCHOOL-WARTBURG	37887
	Summary for 'Agency' = 483 (1 detail record)		
	<b>45,400</b>	Percent of Total	0.001
<b>497</b>	<b>Obion - Lake Counties Vocational Tech Center</b>		
	42,200	5115 SCHOOL-UNION CITY	38261

Sqr/ft	ID Name	zip
Summary for 'Agency' = 497 (1 detail record)		
42,200	Percent of Total	0.001

**500 McMinn - Meigs Vocational - Technical Center**

46,800	5116 SCHOOL-ATHENS	37303
Summary for 'Agency' = 500 (1 detail record)		
46,800	Percent of Total	0.001

**521 Facility Revolving Fund**

831,400	5127 TENNESSEE TOWER - 312 8TH AVE. N. NASHVILLE	37200
765,900	5132 NASHVILLE, TENN - JAMES K POLK STATE OFFICE BLDG	37200
537,900	5120 STATE OFFICE BLDG-CENTRAL SERVICES & CORDELL HULL	37200
437,800	5125 ANDREW JACKSON OFFICE BUILDING	37200
277,000	5134 CITIZENS PLAZA BUILDING - 400 DEADERICK ST NASHVILLE	37219
249,000	5131 MEMORIAL PLAZA	37200
245,100	5129 ANDREW JOHNSON TOWER-710 JAMES ROBERTSON PKWY	37200
245,100	5157 DAVY CROCKETT BUILDING - 500 JAMES ROBERTSON PKWY -	37200
194,900	5151 MEMPHIS, TN - DONNELLY J. HILL OFFICE BUILDING	38100
170,800	5153 INTERSTATE LIFE BLDG - 540 MCCALLIE AVE CHATTANOOGA	37402
146,000	5168 TBI CONSOLIDATED FACILITY	37200
134,900	5170 R S GASS BUILDING	37200
121,300	5126 RACHAEL JACKSON OFFICE BUILDING	37200
113,400	5118 CAPITOL BLDG	37200
113,400	5124 WAR MEMORIAL BUILDING	37200
110,200	5156 KNOXVILLE STATE OFFICE BLDG - 531 HENLEY ST	37902
103,200	5121 LIBRARY AND ARCHIVES BLDG	37200
98,900	5143 NASHVILLE - EDUCATIONAL SURPLUS PROP WHSE (6500	37200
83,200	5152 CHATTANOOGA CLIENT SERVICES BUILDING	37402
79,800	5148 JACKSON, TENN - STATE OFFICE BLDG	38301
77,500	5135 DATA CENTER AND WAREHOUSE	37219
70,500	5146 KNOXVILLE, TN.- STATE PLAZA BLDG. 2700 MIDDLEBROOK	37900
66,200	5204 PORTER BUILDING - COTTON IVY LABORATORY	37200
57,400	5123 SUPREME COURT BLDG	37200
57,300	5186 ELLINGTON AGRICULTURAL CTR, OFFICE BUILDING (TWRA)	37200
51,700	5145 KNOXVILLE, TENN - SUPREME COURT & STATE OFF BLDG	37900
51,200	5161 WARF-HARDISON-BROWNING BUILDING	37200
47,900	5158 T.E.A. OFFICE BLDG & GARAGE-598 J.R. PKWY NASHVILLE	37200
47,600	5271 CET WAREHOUSE #1	37200
46,200	5160 STOCKYARDS BUSINESS CENTER - 1000 2ND AVE NORTH	37200
45,900	5154 OFFICE BLDING - 460 JAMES ROBERTSON PKWY	37200
41,200	5244 NASHVILLE, TN-225 EZELL RD-MULTI-PURPOSE SERVICE	37200
39,500	5181 EAST TN. REGIONAL HEALTH OFFICE & CLINIC	37900
39,000	5138 2200 CHARLOTTE AVE- OLD GARAGE	37200
39,000	5184 SW REG. PUB. HEALTH OFFICE BUILDING	38301
38,100	5159 STOCKYARDS BUSINESS CENTER - 900 2ND AVENUE NORTH	37200
35,000	5199 SHOW & STOCK BARN	37200
34,600	5174 MID-CUMBERLAND REGIONAL HEALTH ADMINISTRATION	37200
33,800	5169 ENVIRONMENTAL ASSISTANCE CENTER - 711 R.S. GASS BLVD	37200
33,100	5227 SAFETY-LAW ENFORCEMENT TRAINING ACADEMY	37214
32,800	5270 RECYCLING PLANT	37200
32,500	5147 JACKSON, TENN - SUPREME COURT BUILDING	38301
30,900	5230 GYMNASIUM & AUDITORIUM	37214
30,300	5269 TN STATE PRISON - DINING ROOM & AUDM-UNIT 5	37200
29,600	5133 OFFICES - 450 JAMES ROBERTSON PARKWAY NASHVILLE	37200
27,700	5175 OPERATOR TRAINING CENTER	37130
26,000	5177 FIRST TN. REG. PUBLIC HEALTH OFFICE BUILDING	37601
23,300	5179 UPPER CUMBERLAND REG. PUB. HEALTH OFFICE & CLINIC	38501
23,000	5208 EMPLOYMENT SECURITY- MEMPHIS, TN OFF-1295 POPLAR S	38100

Sqr/ft	ID Name	zip
21,700	5197 HOLEMAN BLDG	37200
19,900	5137 2200 CHARLOTTE AVE- ANNEX BUILDING	37200
19,300	5268 DONELSON, TN-LEBANON RD CRIME LABORATORY	37200
19,200	5173 MID CUMBERLAND REGIONAL OFFICE (FMLY APTS)	37200
18,000	5188 W F MOSS OFFICE BLDG (MANSION) #2	37200
17,700	5162 COOPER HALL	37200
16,000	5198 SHOW RING BLEACHERS (#22)	37200
15,500	5163 MENZLER HALL	37200
15,100	5200 BRUER BUILDING	37200
15,000	5286 STORAGE	37200
14,600	5176 SO. CENTRAL TN. PUBLIC HEALTH OFFICES & CLINIC	38401
14,200	5164 MCCORD HALL	37200
14,000	5272 EDUCATIONAL BLDG	37200
12,000	5180 NW REG. HEALTH FACILITY - OFFICES & CLINIC	38261
10,300	5142 STANFORD MANSION (CLOVERBOTTOM)	37214

Summary for 'Agency' = 521 (64 detail records)  
**6,510,500** Percent of Total 0.104

**522 Agriculture - DELETE !!!!!!!!!!!!!????????????**

66,200	5316 PORTER BUILDING - COTTON IVY LABORATORY	37200
21,700	5312 HOLEMAN BLDG	37200
18,000	5305 W F MOSS OFFICE BLDG (MANSION) #2	37200
15,100	5313 BRUER BUILDING	37200

Summary for 'Agency' = 522 (4 detail records)  
**121,000** Percent of Total 0.002

**551 Military Department**

90,900	5532 USPFO BLDG #110	37200
62,000	5528 ARMORY & DRILL HALL BLDG #100	37200
60,800	5403 JACKSON - HWY. 70 BYPASS (IND PARK) ARMORY	38301
45,800	5446 MEMPHIS, TN - HOLMES ROAD ARMORY	38118
42,500	5416 KINGSPORT, TENN. - U.S. HWY 11-W ARMORY	37660
42,200	5422 ARMORY (INCL BOILER ROOM BLDGS #6 & #7	37900
40,900	5409 JOHNSON CITY, TENN. - U.S. HWY 11E ARMORY	37601
38,800	5517 DET. 3 TROOP B	37900
36,900	5531 CIVIL DEFENSE E.O.C. BLDG #100	37200
33,800	5484 SMYRNA ARMORY BLDG. 510	37167
33,000	5394 HUMBOLDT, TN - HWY 45 BYPASS ARMORY	38343
32,500	5533 COMBINED FIELD MAINT. SHOP BUILDING #130	37200
31,400	5499 TRENTON, TENN. - HWY 45W ARMORY	38382
30,500	5360 COLUMBIA, TENN. - INDUSTRIAL BY-PASS ARMORY	38401
28,000	5513 KNOXVILLE, TN - 711 CONCORD ST. - SQDN HEADQUARTERS	37900
27,400	5324 ATHENS, TENN. - S. R. #30 ARMORY	37303
26,000	5339 CENTERVILLE, TENN.-S.R. 50W & UNIVERSAL DR. ARMORY	37033
26,000	5375 DYERSBURG, TENN. - COUNTY FARM RD ARMORY	38024
25,500	5358 CLINTON, TN - YARNEL INDUSTRIAL PKWY-ARMORY	37716
25,500	5511 WINCHESTER, TN - MINGO RD. ARMORY	37398
25,000	5396 HUNTINGDON, TN - HADLEY DRIVE ARMORY	38243
25,000	5436 LIVINGSTON, TN - HWY 111 ARMORY	38570
24,700	5527 NASHVILLE, TN - SIDCO DR ARMORY ADMN BLDG #100	37200
23,800	5366 COVINGTON, TN - MUELLER BRASS ROAD ARMORY	38019
23,800	5371 DRESDEN, TENN. - HWY 22 ARMORY	38225
23,300	5429 LENOIR CITY, TN - OLD HIGHWAY 95 & HINES VALLEY ROAD	37771
23,200	5504 UNION CITY, TENN -E. REELFOOT AVE ARMORY	38261
22,900	5363 COOKEVILLE TENN - BURGESS FALLS ROAD ARMORY	38501
22,800	5458 MURFREESBORO, TENN. - I-24 AND HWY 96 ARMORY	37130
22,000	5428 LEBANON, TENN. - LEEVILLE PIKE ARMORY	37087
21,700	5546 NASHVILLE-BERRY FIELD- ARMY AVIATION MAINT SUPPLY	37200
21,600	5470 PIGEON FORGE ARMORY	37862
21,300	5493 SPRINGFIELD, TN - HIGHWAY 76 ARMORY	37172
21,100	5327 BOLIVAR, TENN.- HWY 64 ARMORY	38008
21,100	5381 ERWIN, TENNESSEE - SOUTH MAIN - ARMORY	37650

Sqr/ft	ID Name	zip
21,000	5392 HOHENWALD, TENN. - AIRPORT ROAD ARMORY	38462
20,800	5333 CAMDEN, TENN. - PARK DRIVE, HWY 70 - ARMORY	38320
20,600	5376 ELIZABETHTON, TENN-STATE HWY #91 ARMORY	37643
20,600	5466 ONEIDA TN - AIRPORT RD ARMORY	37841
20,100	5435 LINDEN ARMORY, HWY. 13, RT. 1, LOEBELVILLE	37096
19,800	5344 DRILL HALL	37400
19,800	5472 PULASKI, TENN.- U.S.HWY 31 BYPASS ARMORY	38478
19,800	5482 SHELBYVILLE, TENN.- FAYETTEVILLE HWY ARMORY	37160
19,700	5384 GREENEVILLE, TENN - VOCATIONAL SCHOOL RD ARMORY	37743
19,600	5491 SPARTA, TENN.-DOYLE HWY ARMORY	38583
19,500	5336 CARTHAGE, TN - INDUSTRIAL PARK ARMORY	37030
19,400	5479 ROGERSVILLE ARMORY	37857
19,300	5425 LAWRENCEBURG, TENN.-HELTON DR-INDUSTRIAL PK	38464
19,300	5457 MOUNTAIN CITY ARMORY	37683
19,200	5442 MCKENZIE, TENN.-COMD RD ARMORY	38201
19,000	5357 CLEVELAND, TENN. - DALTON PIKE ARMORY	37311
18,900	5433 LEXINGTON, TN - AIRWAYS ROAD ARMORY	38351
18,900	5461 NEWPORT, TENN. - COSBY HIGHWAY ARMORY	38237
18,800	5467 PARIS, TENN. - HENRY CO. INDUSTRIAL PARK ARMORY	38242
18,800	5498 TIPTONVILLE, TN - HWY 22E ARMORY	38079
18,800	5506 WAVERLY, TENN. - U.S. HWY 70 ARMORY	37185
18,700	5323 ASHLAND CITY ARMORY	37015
18,700	5382 FAYETTEVILLE, TN - 1805 WILSON PARKWAY ARMORY	37334
18,400	5407 JACKSBORO, TN - J. WALES SMITH INDUSTRIAL DRIVE	37757
18,300	5332 BROWNSVILLE, TN ARMORY	38012
18,300	5343 CHATTANOOGA, TENN. - 1801 HOLTZCLAW AVE - ADMN BLDG	37400
18,000	5481 SELMER, TN - HWY 45 ARMORY	38375
17,900	5408 JAMESTOWN, TENN.-OWENS RD ARMORY	38556
17,900	5474 RIPLEY, TENN - U.S. HWY 51 ARMORY	38063
17,500	5424 LAFAYETTE, TENN. - HWY 52 ARMORY	37083
17,300	5459 NEWBERN, TN - U.S. HWY 51 BY-PASS ARMORY	38059
17,200	5379 ERIN, TN - HIGHWAY #49 ARMORY	37061
17,200	5398 AMSA BLD. - GRAY	37614
17,200	5496 SWEETWATER, TENN.-STATE RT 68 ARMORY	37874
17,100	5373 DUNLAP, TN - HWY #28 ARMORY	37327
17,100	5441 MARYVILLE, TENN - S R #95 ARMORY	37801
17,000	5321 ALAMO, TENN - S R #54 ARMORY	38001
16,800	5455 MONTEAGLE, TN - HWY #56 ARMORY	37356
16,800	5480 SAVANNAH, TENN. - STATE ROUTE #69 ARMORY	38372
16,600	5329 BRISTOL, TENN. - BLUFF CITY HWY ARMORY	37620
16,600	5432 NEW ARMORY	37091
16,500	5383 GALLATIN, TENN. - HWY 25 ARMORY	37066
16,400	5413 JEFFERS ON CITY - OLD ANDREW JOHNSON HIGHWAY	37760
16,300	5369 DICKSON, TENN.-U.S. HWY 70 ARMORY	37055
15,900	5368 DAYTON, TN - WALNUT GROVE RD ARMORY	37303
15,800	5508 WAYNESBORO ARMORY	38485
15,500	5501 TULLAHOOMA, TENN.-MANCHESTER HWY ARMORY	37388
15,000	5552 NASHVILLE - ARMORY DR - CONTINGENCY STORAGE BLDG	37200
14,100	5437 MARTIN, TENN. - CARLTON ST ARMORY	38237
14,100	5453 MORRISTOWN, TENN. - HWY 11-E ARMORY	37814
13,900	5355 CLARKSVILLE, TENN. - U.S. HWY 41A, ARMORY	37040
13,500	5341 CHATTANOOGA TENNESSEE ARMORY BUILDING A	37400
13,500	5388 ARMORY	38340
13,300	5485 SMYRNA - 425 8TH ST. OFFICE	37165
13,100	5487 SOMERVILLE, TENN. - OLD SOMERVILLE HWY W/S ARMORY	38068
13,000	5342 ARMORY BUILDING B	37400
12,600	5397 OMS BLD. GRAY PURITAN RD - GRAY	37614
12,500	5419 KNOXVILLE, TENN. - SUTHERLAND AVE - GARAGE &	37900
12,300	5367 CROSSVILLE, TENN. - N. WEST AVE (U.S. 70) ARMORY	38555
12,300	5539 CLASS RMS - OFF & WHSE BLDG #121	37200
12,100	5451 MILAN, TENN.-WAHL ST ARMORY	38358
12,000	5353 ARMORY	37400
12,000	5514 CO. "C" MEDICAL	37900
11,900	5475 ROCKWOOD, TENN. - S. HEWITT ST ARMORY	37854
11,800	5386 HARRIMAN, TENN. - HIGHWAY 61 ARMORY	37748

	<b>Sqr/ft</b>	<b>ID Name</b>	<b>zip</b>
	11,800	5488 SO PITTSBURG, TENN-10TH ST(LINCOLN DR) ARMORY	37380
	11,700	5469 PARSONS, TENN. - W 9TH ST ARMORY	38363
	11,000	5500 TRENTON ORGANIZATIONAL MAINTENANCE SHOP	38382
	11,000	5516 SQDN STORAGE	37900
	10,900	5462 OAK RIDGE, TENN.-1880 OAK RIDGE TURNPIKE ARMORY	37830
	10,800	5542 3000 ARMORY DR - ENGINEERS OFFICE BLDG #160	37200
	10,500	5417 AREA MAINTENANCE SUPPORT ACTIVITY BUILDING	37660
	Summary for 'Agency' = 551 (107 detail records)		
	<b>2,293,100</b>	Percent of Total	0.036
<b>559</b>	<b>Tennessee Veterans Nursing Home</b>		
	58,500	5564 NURSING HOME - 2865 E MAIN ST-HUMBOLDT	38343
	54,400	5562 NURSING HOME - 345 COMPTON RD. MURFREESBORO	37130
	Summary for 'Agency' = 559 (2 detail records)		
	<b>112,900</b>	Percent of Total	0.002
<b>561</b>	<b>Human Services - Blind Services</b>		
	59,500	5577 CLOVERNOOK CENTER AT BLIND INC. - BROOM & MOP FAC.	38100
	42,400	5578 ED LINDSEY INDUSTRIES INCORP - BROOM & MOP FCTY	37200
	Summary for 'Agency' = 561 (2 detail records)		
	<b>101,900</b>	Percent of Total	0.002
<b>592</b>	<b>National Civil Rights Museum</b>		
	45,400	5926 MUSEUM	38100
	Summary for 'Agency' = 592 (1 detail record)		
	<b>45,400</b>	Percent of Total	0.001
<b>613</b>	<b>Shelby County Welcome Station (I-40)</b>		
	11,600	5995 WELCOME STATION	38103
	Summary for 'Agency' = 613 (1 detail record)		
	<b>11,600</b>	Percent of Total	0.000
<b>621</b>	<b>DOT Bureau of Aeronautics</b>		
	21,800	6000 METRO AIRPORT - NASHVILLE STATE HANGAR	37217
	Summary for 'Agency' = 621 (1 detail record)		
	<b>21,800</b>	Percent of Total	0.000
<b>622</b>	<b>Arlington DOT - District 45</b>		
	13,000	6001 OFFICE AND REPAIR SHOP (ST #1)	38002
	Summary for 'Agency' = 622 (1 detail record)		
	<b>13,000</b>	Percent of Total	0.000
<b>623</b>	<b>Bethel Springs DOT - District 43</b>		
	12,000	6010 OFFICE AND REPAIR SHOP (STATE #1)	38315

	Sqr/ft	ID Name	zip
	Summary for 'Agency' = 623 (1 detail record)		
	12,000	Percent of Total	0.000
<b>624</b>	<b>Chattanooga DOT - Division 2</b>		
	48,300	6022 GARAGE (ST#2)	37400
	23,300	6021 ADMINISTRATION BUILDING (STATE #1)	37400
	Summary for 'Agency' = 624 (2 detail records)		
	71,600	Percent of Total	0.001
<b>625</b>	<b>Clarksville DOT - District 33</b>		
	12,000	6049 OFFICE AND REPAIR SHOP (STATE #1)	37040
	Summary for 'Agency' = 625 (1 detail record)		
	12,000	Percent of Total	0.000
<b>626</b>	<b>Columbia DOT</b>		
	13,000	6055 OFFICE & REPAIR SHOP (STATE #1)	38401
	Summary for 'Agency' = 626 (1 detail record)		
	13,000	Percent of Total	0.000
<b>627</b>	<b>Cookeville DOT - District 24</b>		
	13,900	6069 TRUCK & EQUIPMENT STORAGE	38502
	12,000	6059 OFFICE & REPAIR SHOP (STATE #1)	38501
	Summary for 'Agency' = 627 (2 detail records)		
	25,900	Percent of Total	0.000
<b>628</b>	<b>Crossville DOT - District 23</b>		
	12,000	6070 OFFICE AND REPAIR SHOP (STATE #1)	38555
	Summary for 'Agency' = 628 (1 detail record)		
	12,000	Percent of Total	0.000
<b>629</b>	<b>Dunlap DOT - District 22</b>		
	12,000	6080 OFFICE AND REPAIR SHOP (STATE #1)	37327
	Summary for 'Agency' = 629 (1 detail record)		
	12,000	Percent of Total	0.000
<b>630</b>	<b>Gallatin DOT - District 32</b>		
	12,000	6088 OFFICE AND REPAIR SHOP (STATE #1)	37066
	Summary for 'Agency' = 630 (1 detail record)		
	12,000	Percent of Total	0.000
<b>631</b>	<b>Harriman DOT - District 16</b>		
	12,000	6092 OFFICE AND REPAIR SHOP (STATE #1)	37748

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 631 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>632</b>	<b>Jackson DOT - Division 4</b>		
	33,800	6099 GARAGE & EQUIPMENT SHED (STATE # 2, 3, 4, 5 AND 10)	38301
	22,300	6098 DIVISION OFFICE (STATE #1)	38301
Summary for 'Agency' = 632 (2 detail records)			
	<b>56,100</b>	Percent of Total	0.001
<b>633</b>	<b>Johnson City DOT - District 11</b>		
	12,000	6121 OFFICE AND REPAIR SHOP (STATE #1)	37601
Summary for 'Agency' = 633 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>635</b>	<b>Lafollette DOT - District 14</b>		
	12,000	6132 OFFICE AND REPAIR SHOP (STATE #1)	37766
Summary for 'Agency' = 635 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>636</b>	<b>Lawrenceburg DOT - District 36</b>		
	13,000	6139 OFFICE AND REPAIR SHOP (STATE #1)	38464
Summary for 'Agency' = 636 (1 detail record)			
	<b>13,000</b>	Percent of Total	0.000
<b>637</b>	<b>Lewisburg DOT - District 34</b>		
	13,000	6144 OFFICE AND REPAIR SHOP (STATE #1)	37091
Summary for 'Agency' = 637 (1 detail record)			
	<b>13,000</b>	Percent of Total	0.000
<b>638</b>	<b>McEwen DOT - District 35</b>		
	13,000	6148 OFFICE AND REPAIR SHOP (STATE #1)	37101
Summary for 'Agency' = 638 (1 detail record)			
	<b>13,000</b>	Percent of Total	0.000
<b>639</b>	<b>McKenzie DOT - District 41</b>		
	14,200	6152 OFFICE AND REPAIR SHOP (STATE #1)	38201
Summary for 'Agency' = 639 (1 detail record)			
	<b>14,200</b>	Percent of Total	0.000
<b>641</b>	<b>Morristown DOT - District 12</b>		
	12,000	6171 OFFICE AND GARAGE (STATE #1)	37814

	Sqr/ft	ID Name	zip
Summary for 'Agency' = 641 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>643</b>	<b>Jackson DOT - Division 4</b>		
	53,900	6185 ADMIN/MATERIAL TEST LAB - (BLDG A/B)	38301
	49,300	6190 GARAGE (BLDG E)	38301
	19,100	6191 HIGHWAY MARKING DIV. (BLDG F)	38301
	11,200	6186 FIELD OFFICE-(BLDG C)	38301
Summary for 'Agency' = 643 (4 detail records)			
	<b>133,500</b>	Percent of Total	0.002
<b>644</b>	<b>Newbern DOT - District 42</b>		
	12,800	6198 OFFICE AND REPAIR SHOP (STATE #1)	38059
Summary for 'Agency' = 644 (1 detail record)			
	<b>12,800</b>	Percent of Total	0.000
<b>645</b>	<b>Newport DOT - District 13</b>		
	12,000	6204 OFFICE AND REPAIR SHOP (STATE #1)	37821
Summary for 'Agency' = 645 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>646</b>	<b>Tullahoma DOT - District 25</b>		
	12,000	6208 OFFICE AND REPAIR SHOP (STATE #1)	37388
Summary for 'Agency' = 646 (1 detail record)			
	<b>12,000</b>	Percent of Total	0.000
<b>647</b>	<b>Nashville DOT - Division 3</b>		
	94,600	6215 ADMIN BLDG & LAB (BLDG A/B)	37200
	47,800	6218 REGION GARAGE (BLDG E)	37200
	30,100	6217 STORAGE/MATERIAL & TEST SHOP (BLDG D/G)	37200
	18,700	6219 SIGN MANUFACTURING SHOP (BLDG F)	37200
	14,000	6222 SALT BIN (BLDG J)	37200
	10,300	6216 ENGINEERING FIELD OFFICE (BLDG C)	37200
	10,200	6229 EQUIPMENT SHED, 6630 CENTENNIAL BLVD., NASHVILLE	37243
Summary for 'Agency' = 647 (7 detail records)			
	<b>225,700</b>	Percent of Total	0.004
<b>648</b>	<b>Knoxville DOT - Division 1</b>		
	47,300	6235 GARAGE (BUILDING E)	37900
	44,700	6231 ADMINISTRATION (BUILDING A)	37900
	17,200	6233 FIELD OFFICE (BUILDING C)	37900
	14,800	6236 HIGHWAY MARKING (BUILDING F)	37900
Summary for 'Agency' = 648 (4 detail records)			
	<b>124,000</b>	Percent of Total	0.002

	Sqr/ft	ID Name	zip
<b>710</b>	<b>East Tennessee Nursery</b>		
	14,300	6921 SEEDLING PACKING AND STORAGE BUILDING	37325
	Summary for 'Agency' = 710 (1 detail record)		
	<b>14,300</b>	Percent of Total	0.000
<b>725</b>	<b>Woodland Hills Youth Development Center</b>		
	35,300	6927 CORE BUILDING (#1)	37218
	17,600	6929 MENS DORMITORY (#3)	37218
	17,600	6930 MENS DORMITORY (#4)	37218
	12,300	6928 MENS DORMITORY (#2)	37218
	12,300	6932 WOMENS DORMITORY (#6)	37218
	10,700	6931 GYMNASIUM (#5)	37218
	Summary for 'Agency' = 725 (6 detail records)		
	<b>105,800</b>	Percent of Total	0.002
<b>726</b>	<b>Taft Youth Center</b>		
	43,000	6934 DORM (BLDG A)	37367
	19,300	6952 DORM BLDG B	37367
	16,500	6935 GRAMMAR SCHOOL	37367
	15,400	6946 GYMNASIUM	37367
	11,100	6944 UPPER VOC. BLDG	37367
	10,100	6936 SUPPLY WAREHOUSE (INCL REFRIG EQUIP)	37367
	Summary for 'Agency' = 726 (6 detail records)		
	<b>115,400</b>	Percent of Total	0.002
<b>728</b>	<b>Spencer Youth Center</b>		
	44,500	6973 CLEMENT HALL (#2)	37200
	17,900	6975 EDUCATIONAL BLDG	37200
	14,000	6976 DORMITORY	37200
	Summary for 'Agency' = 728 (3 detail records)		
	<b>76,400</b>	Percent of Total	0.001
<b>729</b>	<b>Johns S. Wilder Youth Development Center</b>		
	23,000	6986 SCHOOL BLDG (D)	38068
	18,100	6987 GYMNASIUM (E)	38068
	11,200	6983 ADMN BLDG (A)	38068
	10,900	6985 FOOD SERVICE & SUPPLY BUILDING (C)	38068
	Summary for 'Agency' = 729 (4 detail records)		
	<b>63,200</b>	Percent of Total	0.001
<b>733</b>	<b>Mountain View Youth Development Center</b>		
	35,300	7009 CORE BLDG (E)	37725
	17,600	7005 MENS DORMITORY (BLDG A)	37725
	17,600	7006 MENS DORMITORY (BLDG B)	37725
	12,300	7007 MENS DORMITORY (BLDG C)	37725
	12,300	7008 MENS DORMITORY (BLDG D)	37725
	10,700	7010 GYMNASIUM (BLDG F)	37725

Sqr/ft	ID Name	zip
Summary for 'Agency' = 733 (6 detail records)		
105,800	Percent of Total	0.002

**Grand Total 62,875,550 Square Feet**