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Section 2  
Class 1 Buildings

This section lists the procedures for Class 1 projects to comply with ORS 276.900 to 276.915 and OAR 330-130-0010 to 0080.

## I. PRE-DESIGN OR PROGRAMMING PHASE

| <b>CHECKLIST</b>               |  |
|--------------------------------|--|
| <input type="checkbox"/> _____ | Project Notification Form sent to Department of Energy   |
| <input type="checkbox"/> _____ | <i>Before</i> the Design Team has been selected, SEED program language is included in A&E services RFP |
| <input type="checkbox"/> _____ | After Design Team is established, Project Contact Form sent to Department of Energy                    |
| <input type="checkbox"/> _____ | Interagency Agreement completed and signed (if desired)  |
| <input type="checkbox"/> _____ | Energy Analyst Qualifications Form submitted to ODOE   |
| <input type="checkbox"/> _____ | Energy Analyst hired   |
| <input type="checkbox"/> _____ | Integrated Design Approach discussed   |
| <input type="checkbox"/> _____ | Energy Programming and Design Intent Checklist reviewed  |

### 1. Agency Contact and Project Notification

The Agency needs to appoint the Agency Contact who is responsible for the coordination of all SEED related business with the Department of Energy, i.e. project notifications, interagency agreements, invoice and payment, project coordination, guideline updates, advisory.

When the building class has been determined during the pre-design or programming phase of a building project, complete the *Project Notification Form* and send it to the Department of Energy. Also complete the *Project Contact Form* and send it to the Department of Energy and the Design Team. Both forms can be found in Appendix G.

### 2. Interagency Agreement

The Agency and the Department of Energy may complete and sign an interagency agreement. The interagency agreement identifies the services to be provided by the

Department of Energy under the SEED Program, the responsibilities of the Agency and the related statement of work.

### **3. Hiring A&E: Request for Proposal and Contract**

When selecting a Design Team, the request for proposal (RFP) and the contract's Statement of Work have to include a reference to the SEED process, to the goal of 20% or better than the state building code, and to the "model of energy efficiency." It is expected that this will help make energy efficiency an integral part of the design process from the early phase of pre-design to the time that the building is monitored during occupancy.

The Department of Energy has developed *model language* the Agency may use in the request for proposals and the contract for architectural and engineering services. This model language can be found in Appendix D. Upon request, the Department of Energy will review or comment on the RFP, contract, or energy qualifications of proposals.

### **4. Agency Guidance and Energy Analyst**

The Agency provides energy conservation guidance to the Design Team. Guidance includes these *SEED Program Guidelines* and direction for complying with OAR 330-130.

The Agency hires an Energy Analyst who meets the requirements shown in Appendix C: *Energy Analyst Qualifications*.

The Energy Analyst will be responsible for the preparation of the building energy analysis and the Energy Analysis Report. The analyst will be under the direction of a professional engineer or licensed architect who reports to the project architect or Agency.

### **5. Initial Meeting**

The Agency Contact coordinates, with the Department of Energy, the set-up of the Initial Meeting early in the Pre-design or Programming phase of a building project. During this Initial Meeting, the scope of the project will be discussed and the role of the Department of Energy will be defined. Preliminary discussions regarding the project design, *energy goals of the project (20% or better than code)*, the design criteria, the integrated energy design approach, the modeling approach, the Energy Systems Performance Verification Plan and construction schedule may also take place.

### **6. Programming**

Early design decisions can have a significant impact on building energy use. To address energy opportunities at this early design phase a programming and design intent energy checklist has been developed, which is located in Appendix G. The Programming Team should work through the checklist worksheets and fill in project information as the design

evolves. This information should be documented in preparation for the Energy Planning Session, as discussed under Schematic Design phase requirements.

## II. SCHEMATIC DESIGN PHASE

| <b>CHECKLIST</b>         |  |
|--------------------------|--|
| <input type="checkbox"/> | _____ Energy Planning Session held   |
| <input type="checkbox"/> | _____ Scoping Process Information Checklist submitted two weeks before Scoping Meeting |
| <input type="checkbox"/> | _____ Scoping process completed  |

### 1. Energy Planning Session

The Energy Planning Session builds on the work discussed at the Initial Meeting held during the Pre-design or Programming phase (see step 5 above). Early in the Schematic Design phase, the Agency, Design Team, Department of Energy, and Energy Analyst meet to further define the project design, energy goals of the project, the design criteria, construction schedule, the modeling approach, and the Energy Systems Performance Verification Plan.

To help facilitate making facilities “models of energy efficiency” as required by law, the Agency and its Design Team are encouraged to use the principles of the integrated energy design approach.

### 2. Modeling Approach

The modeling approach needs to be discussed in detail during this phase and may actually include some preliminary “shoebox” modeling. Appendix I shows the energy analysis requirements that include a description of the modeling guidelines.

To eliminate confusion about calculating the impact of the energy conservation measures, it is important to clearly establish the definition of the “Proposed Baseline building,” the “SEED building” and the “Code building.” Appendix I describes these definitions in detail.

### 3. Preliminary Investigation

The Agency, Design Team, and the Energy Analyst conduct a preliminary project investigation during the Schematic Design phase. The team develops a suggested ECM list to capture significant opportunities for building energy savings. The *Scoping Process*

*Information Checklist*, included in Appendix G, must be completed and submitted two weeks before the scoping meeting and should be available before the energy analysis is conducted.

#### **4. Scoping Meeting**

At the Scoping Meeting, the Department of Energy, the Agency, the Design Team, and the Energy Analyst shall select the ECMs for analysis. When identifying ECMs, each major energy-use category shall be considered for analysis. If needed, further refinement of the modeling effort will be discussed and decided upon. The participants will:

- Review administrative rules, statutes, and SEED Program Guidelines. Discuss any questions about the program.
- Discuss project schedules, such as estimated dates for completion of energy analysis, completion of construction documents, bid advertisement, beginning of construction, and completion of construction.
- Review the building program, site conditions, building plans, construction budgets, and other constraints.
- Discuss baseline assumptions and compliance with state energy codes.
- Review the ECM Checklist including ECMs included in the baseline, ECMs not applicable to the project and ECMs slated for further analysis. Discuss the modeling program proposed for use and its ability to model the Baseline Building and proposed ECMs.
- Discuss energy rates and projected energy costs for the facility. Discuss any non-standard energy rates, such as central plant steam or chilled water.

### III. DESIGN DEVELOPMENT PHASE

| <b>CHECKLIST</b>         |  |
|--------------------------|--|
| <input type="checkbox"/> | _____ Baseline and individual ECM analysis completed   |
| <input type="checkbox"/> | _____ Metering Plan included in Energy Analysis Report   |
| <input type="checkbox"/> | _____ Preliminary Energy Analysis Report submitted   |
| <input type="checkbox"/> | _____ Received the Department of Energy's written comments on the Preliminary Energy Analysis Report |
| <input type="checkbox"/> | _____ ECM review meeting held (Optional)   |
| <input type="checkbox"/> | _____ Final Energy Analysis Report submitted   |

#### 1. Proposed SEED Building and ECM Analysis

The Energy Analyst will use the building model for the analysis of the proposed SEED building and the individual ECM analysis. Appendix I describes the energy analysis requirements in detail.

#### 2. Metering Plan

The Agency, in consultation with the Energy Analyst, the Design Team, and the Department of Energy will discuss and specify what types of meters are to be installed and what system is to be used to monitor the building's energy use. The Agency is encouraged to install sub-metering on major energy using equipment or systems. This Metering Plan shall be incorporated in the Energy Analysis Report and the Energy Systems Performance Verification Plan. Guidelines for such a Metering Plan are shown in Appendix F.

#### 3. Submittal of the Preliminary Energy Analysis Report

The Energy Analyst completes the *Preliminary Energy Analysis Report*, which provides adequate material to review each ECM for individual cost effectiveness. It includes draft Sections 2, 3, and 4 of the *Final Energy Analysis Report* (see Appendix H for format).

The *Preliminary Energy Analysis Checklist* (in Appendix G) must be completed and submitted with required information two weeks before the ECM review meeting. If the Department of Energy does not receive all listed items eight business days before the meeting, the meeting will be rescheduled.

The Department of Energy reviews the *Preliminary Energy Analysis Report* and provides written comments to the Agency and the Energy Analyst within 10 working days.

**Note:** The building model input and output and the individual ECM models must be submitted in electronic form on CD-ROM and need not be printed as part of the report.

#### **4. ECM Review Meeting**

The Agency, Design Team, Energy Analyst, and the Department of Energy attend the ECM Review Meeting to discuss the recommended ECM package. The Agency Contact must have authority for ECM selection and knowledge of building maintenance. During the meeting, the participants will:

- Review the building model. Discuss assumptions, code issues, modeling problems, and solutions. Discuss the predicted energy use and cost by category. Discuss the projected energy use index (Btu per square foot per year) and make sure that it meets the 20% below code requirements of the SEED rules. Compare the projected energy use with similar buildings.
- Briefly discuss ECMs eliminated with cost-effective analysis.
- Discuss the ECMs that are individually cost effective.
- Discuss the preliminary ECM cost-effectiveness analysis for each ECM.
- Review Agency comments regarding maintenance, reliability, comfort, operation, and aesthetics.
- Discuss the basis for elimination of any cost-effective ECMs. The Energy Analyst will document these eliminations in the final report.
- Discuss the recommended ECM package. Discuss the packaging and model approach that the Energy Analyst used in finding the optimal ECM package.
- Discuss ECM funding sources for state agencies.
- Discuss the Energy Systems Performance Verification Plan.
- Discuss the Metering Plan.

#### **5. Submittal of the Final Energy Analysis Report**

The Agency and Design Team incorporate the cost-effective *ECM Package* into the final design. The Energy Analyst conducts the final energy analysis. The Energy Analyst completes and submits the *Final Energy Analysis Report* to the Agency and the Department of Energy. The required information to be contained in the *Final Energy*

*Analysis Report* is shown in Appendix G (see checklists for the Final Energy Analysis and the Appendices). The Department of Energy reviews this final report.

## 6. Presentation Meeting (optional)

Only large or complex projects may require a presentation meeting. The Agency, Design Team, Energy Analyst, and the Department of Energy will attend a presentation meeting at which:

- The Energy Analyst:
  - i) Presents a summary building description and energy-use breakdown
  - ii) Describes the recommended ECM Package and economic benefits
  - iii) Identifies other ECMs analyzed or eliminated
- The group discusses any questions regarding ECM implementation

## IV. CONSTRUCTION DOCUMENTS PHASE

| <b>CHECKLIST</b>         |   |
|--------------------------|---|
| <input type="checkbox"/> | _____ Recommended ECM Package included in the final building design                                     |
| <input type="checkbox"/> | _____ Energy Systems Performance Verification Plan and Metering Plan included in Construction Documents |
| <input type="checkbox"/> | _____ Construction Documents in sufficient detail submitted on time                                     |
| <input type="checkbox"/> | _____ Department of Energy written findings and recommendations received                                |

### 1. Implementation of Cost-Effective Measures

To help make sure that the cost-effective measures are implemented, the Agency and the Design Team incorporate the Recommended ECM Package into the final building design.

### 2. Energy Systems Performance Verification Plan

The Energy Systems Performance Verification Plan should be developed. This is a plan that outlines how the building's energy systems are to be tested during the construction phase and how the building's performance is to be verified with long-term monitoring

during occupancy. Appendix E of the Guidelines outlines the minimum required elements for such a plan.

### 3. Metering Plan Implementation

The construction documents should reflect the implementation of the Metering Plan.

### 4. Submittal of Final Construction Documents

The Agency provides the Department of Energy with construction documents in sufficient detail to verify that the ECMs will be included in the final construction documents and specifications *or* no later than at 90% design completion, whichever comes first.

### 5. Review by the Department of Energy

The Department of Energy reviews this submittal and forwards its written findings and recommendations to the Agency within ten working days after receiving the report, if practicable.

## V. CONSTRUCTION PHASE

| <b>CHECKLIST</b>               |  |
|--------------------------------|--|
| <input type="checkbox"/> _____ | Procedure established to make sure that change orders, etc. will adhere to design intent   |
| <input type="checkbox"/> _____ | Energy Systems Performance Verification Plan has been carried out and a copy of the test results has been sent to the Department of Energy |
| <input type="checkbox"/> _____ | Training has been offered to owners and operators of the new facility  |

### 1. Contractor Submittals and Substitutions

The design firm needs to make sure that the contractor's equipment submittals, requests for substitutions and change orders adhere to the design intent. If requested, the Department of Energy will be available to review such documents.

## 2. Site Inspections

To verify that ECMs are installed correctly and operating efficiently, the Department of Energy or its representative may make walk-through site inspections during the installations of ECMs.

## 3. Performance Verification

At this time, the Agency needs to make sure that the Energy Systems Performance Verification Plan is carried out. After completion of this Verification Plan, the Agency will send a copy of the test reports to the Department of Energy.

## 4. Training

It is recommended that instruction on the design intent and operation of *the building as a system* be offered to the owners and operators of the new facility. This may be part of the Energy Systems Performance Verification Plan. It is recommended that the training should parallel the operations manual prepared for the owner.

## VI. OCCUPANCY PHASE

| <b>CHECKLIST</b>               |   |
|--------------------------------|---|
| <input type="checkbox"/> _____ | Monitoring procedures have been established to make sure that data will be continually collected for an 18 month period |
| <input type="checkbox"/> _____ | Procedures have been established to periodically compare modeling results and actual energy use data collected          |
| <input type="checkbox"/> _____ | Procedures have been established to take action if the energy use in the new facility exceeds the modeling results      |

### 1. Monitoring

During the first 18 months into occupancy, energy use by the building systems needs to be monitored and compared with the modeling results. In case significant differences between those two results are discovered during this period, the Agency needs to investigate to find the cause. Depending upon the findings: 1) an adjustment can be made in either the model or the operation of the building, or 2) the difference is acceptable to the Agency and the Department of Energy. The Agency sends its finding to the Department of Energy for inclusion in the Biennial Report to the Legislature.

It is recommended that monitoring of the building's energy use be continued beyond the 18 month period and that the Agency explores ways to improve on the energy performance of the building over time.

## **2. Non-Compliance**

It is possible that after monitoring the building for 18 months, the building's performance does not exceed the energy conservation provisions of the state building code by 20% or more, as required by Statute. If that is the case, the Agency needs to submit an *Energy Conservation Plan* to the Department of Energy within 90 days after reporting the non-compliance. This plan will outline the modifications to be made until monitoring shows that the goal of 20% or better is met, or all reasonable attempts to reduce the energy use have been made. These remedial actions need to be reported and sent to the Department of Energy for inclusion in the Biennial Report to the Legislature.