CITY OF OAKLAND
AGENDA REPORT

TO: Office of the City Administrator
ATTN: Dan Lindheim
FROM: Community and Economic Development Agency
DATE: June 8, 2010

RE: **Public Hearing, Report And Ordinance Recommended By The Planning Commission, Adopting Oakland Municipal Code Title 18 - Sustainability, Chapter 18.02 Sustainable Green Building Requirements For Private Development To Establish Environmentally Sustainable Regulations For Building Construction, Remodeling, Landscaping And Demolition**

SUMMARY

This ordinance creates a new title and chapter in the Oakland Municipal Code prescribing minimum green building requirements for private development (non City of Oakland) projects in Oakland. Green building is generally defined as a holistic, whole systems approach, to the life-cycle of a building which includes choosing an appropriate building location, orientation, construction, operations, and demolition. Green buildings reduce energy use, conserve water and other natural resources, limit solid waste during construction and operation, and promote healthy indoor air quality.

On April 21, 2010, the City Planning Commission approved the proposed ordinance for forwarding to the City Council. The regulations apply to new construction, additions or alterations of a certain size, mixed-use, affordable housing, and large landscape projects, as well as the demolition of historic resources. The ordinance will become fully effective starting January 1, 2011, after which the project applicant will generally be required to submit a completed green building checklist, meet minimum green building requirements, and certify the project through a specific third-party green building rating system.

The ordinance supports one of the City Council's adopted goals to "Develop a Sustainable City," by "maximizing socially and environmentally sustainable growth, including conserving natural resources." The proposal also implements policies and actions in the Land Use and Transportation Element (LUTE), the Open Space Conservation and Recreation Element (OSCAR), the Historic Preservation Element (HPE) and the Housing Element of the General Plan. Furthermore, the ordinance is a key action item in the draft Energy and Climate Action Plan (ECAP) that is currently being prepared by the Environmental Services Division.

FISCAL IMPACT

Staff has determined that there are no direct impacts to the City's Development Services Fund as a result of this ordinance. In terms of staff costs, the ordinance requires that a project applicant

hire a third-party rater to attest that the construction is in compliance with the ordinance. The Planning and Zoning Division and Building Services Division staff will implement the ordinance and verify the documents submitted by the third-party rater. For the largest affected projects, the ordinance will require two to five days of increased staff time for this review resulting in a minimal indirect impact on the Planning and Zoning Division and Building Services Division. However, since the Planning and Building Departments are cost recovering, all costs associated with review and compliance with the ordinance would be covered by permit application fees which are typically increased every year, in part to cover new City and state requirements.

The long-term fiscal impacts of the ordinance on City revenues are unclear. However, several recent events encourage an optimistic long-term fiscal outcome to the City with the adoption of the ordinance. Jurisdictions throughout the State are adopting Green Building Codes. Therefore, this proposal will not place Oakland at a competitive disadvantage in terms of new construction costs. For instance, the State has adopted a Green Building Code and over 37 cities[1] including the Bay Area jurisdictions of Alameda County, Richmond, Hayward, Pleasanton, Livermore, San Jose, Sunnyvale, Palo Alto, San Mateo, Brisbane, San Francisco, and Marin have adopted similar green building ordinances to the one Oakland is proposing.

Further, the green building industry has been identified by the City Economic Development Division as a target growth industry for Oakland. A local Green Building Ordinance should encourage more local green businesses and jobs necessary to support the ordinance and, therefore, result in an increase in business taxes.

BACKGROUND

Conceptual Framework for the Ordinance

Staff presented a conceptual framework for the ordinance which was approved by the Planning Commission on October 1, 2008 and the CED Committee on October 14, 2008. This framework outlined important considerations which staff relied upon in developing the proposed ordinance. The following is a summary of the framework.

- One ordinance which would include all typical project types (new construction, renovations, additions, historic buildings, etc).
- Existing Planning, CEQA, and building permit square footage requirements as break points between threshold triggers for consistency and ease in implementation for staff and the public.
- Implementation of the ordinance over a three-year period.

[1] Office of the Attorney General: http://www.ag.ca.gov/globalwarming/pdf/green_building.pdf

- A baseline level for compliance and a continuation of the same minimum level in the future to achieve certification.
- Compliance with the ordinance at each stage of the approval process to ensure that the project meets the green building requirements at the end of project construction.
- Third-party green building certification.

In addition to the considerations above, the Planning Commission and the CED Committee agreed that the ordinance should be based on existing green building rating systems and these are described below.

Leadership in Energy and Environmental Design (LEED) Rating System

The Leadership in Energy and Environmental Design (LEED) Rating System was developed by the United States Green Building Council (USGBC). This system is the internationally accepted benchmark for green buildings and is typically applied to commercial, civic, and high-rise residential buildings; however the USGBC has expanded the number of project specific rating systems to include schools, retail, homes, hospitals and neighborhoods. The LEED system is point based. Projects must pre-qualify for LEED by meeting several pre-requisites. The project team then designs the project to include green features and systems which would qualify for green building points. These green building points are tallied to achieve a rating. A LEED Certified rating is achieved with 40-49 points, LEED Silver is 50-59 points, LEED Gold is 60-79 points, and LEED Platinum is 80+ points. A LEED Accredited Professional (AP) is a person certified through the USGBC to assist the project team in meeting the green building goals during conceptual and design development. The LEED AP also compiles and submits the documentation to the USGBC. The USGBC reviews the documentation and certifies the project as a LEED project based on the earned level of performance.

GreenPoint Rating System

Build It Green developed the GreenPoint Rated rating system which has become the standard for evaluating the green performance of single-family and multi-family projects in California. There are fewer pre-requisites and no certification tiers in GreenPoint Rated program. The minimum point level is 50 (for new construction) and the possible number of points increases from there. The project team must retain a GreenPoint Rater to verify compliance with the GreenPoint Rated program. A GreenPoint Rater is a person certified through Build It Green to verify compliance with the rating system and submit the necessary documentation to Build It Green. Without a certified GreenPoint Rater, submittal of the documentation, and verification of the earned level of performance, a project can not be approved as a GreenPoint Rated project.

Small Commercial and Bay Friendly Basic Landscape Checklist

The Small Commercial Checklist is for those commercial projects where LEED is infeasible or inappropriate while the Bay Friendly Basic Landscape Checklist addresses only green landscape techniques. These checklists were developed by Stopwaste.Org of the Alameda County Waste Management Authority. Neither checklist is point based. The project either includes this type of construction and, therefore, the measure that addresses that construction is applicable or the project does not includes it and the measure is not applicable. In general both lists contain best management practices and include "low hanging fruit" measures.

Other Public Hearings and Planning Commission Recommendation

The ordinance was also discussed at three community meetings and several public hearings before the Planning Commission, Special Projects Committee, and Landmarks Preservation Advisory Board (LPAB). On April 21, 2010, the Planning Commission heard the item (***Attachment A***) and unanimously recommended that the City Council adopt the proposal with a few minor changes. These changes included clarification of the definition of a historic resource, ensuring staff ultimately decide on the appropriate rating system and checklist, clarification on which checklist is required and which are optional, and inclusion of a two year timeframe for re-review of the ordinance (***Attachment B***).

KEY ISSUES AND IMPACTS

CalGreen Tiers or Other Potential Rating Systems

Staff recommended and utilized the existing rating systems (LEED, GreenPoint Rated) because they have credibility in the marketplace, are being used regionally as the basis for other jurisdiction's ordinances, and because staff did not have the time or expertise to develop an Oakland-specific rating system. However, since the conceptual framework was approved by Planning Commission and the CED Committee, the state Building Standards Commission has approved amendments to the Green Building Standards Code initiating the "Calgreen" label. Calgreen comprises two voluntary tiers (prescriptive and performance approaches) and describes how a project can achieve the Calgreen label by exceeding the mandatory standards. In staff's opinion the measures are not stringent enough to be considered as part of the ordinance or used as an acceptable rating system. Staff has similar concerns regarding other systems such as the Home Energy Rating System (HERS) or the Building Performance Institute's (BPI) systems as these are focused on energy efficiency and do not address material conservation, water resources, sustainable sites, etc. Should a credible system develop, either through the private sector or through the state, staff will review the rating system for possible inclusion in the ordinance.

Deviations from the Conceptual Framework

Staff deviated from the conceptual framework presented to the CED Committee in one major area by no longer recommending a three-year phase-in period. During internal review of the ordinance, the Building Services Division had several issues with a phased approach and would not recommend approval of the ordinance for forwarding to the Planning Commission. While well intentioned, it believes that this process would be difficult to implement within the Division and would actually create more confusion for the development community. Staff has not heard any comments regarding this change from the development community and most jurisdictions with mandatory green building ordinances have not included a phase-in period.

Verification

This is an important part of existing rating systems and helps these programs maintain their integrity, market value, and uniformity. As such neither system will permit a project applicant to market their building as LEED or GreenPoint Rated without the submission of documentation for review and approval. Staff does not recommend that the City undertake the role of LEED AP or GreenPoint Rater for the project as this would be too time intensive and costly for staff.

Increased Threshold for Demolition of a Historic Resource and New Construction

During the development of the proposed ordinance, staff reviewed permits submitted over six years to determine the type of development typically generated in Oakland. Applications involving historic structures were common given that about half of Oakland's buildings date prior to 1946. Although other jurisdictions specifically exempted or did not mention historic resources in their green building ordinances, staff believed that acting similarly would exempt a majority of Oakland's building stock from the ordinance and would dilute the thoroughness of the proposed ordinance. Furthermore, it would eliminate the potential to further "green" these structures. Staff conducted a thorough analysis of the issue and several key points are noted below.

- Rehabilitating buildings saves more energy than current new construction
- Renovation of existing buildings will play a major part in meeting the state's and Oakland's greenhouse gas (GHG) reduction strategies.
- It is too onerous to require a disincentive for the demolition of any building.
- Historic buildings can attain LEED and GreenPoint Rated certification
- The State Office of Historic Preservation believes that historic buildings can meet green building standards without compromising the historic features.
- Historic resources must already undergo more stringent entitlement review due to CEQA and Historic Element policies.

- There is a proven regional market for green commercial buildings that are historic resources. However, these buildings will remain empty unless green building renovations are required. Unoccupied buildings will fall into disrepair and an applicant will request demolition.
- Since WWII Oakland has a lost a significant number of historic buildings.
- The inclusion of a disincentive is necessary to close a loophole, i.e. need to demolish the building to meet the ordinance or that the existing building is inefficient.
- Inclusion of a disincentive is consistent with the General Plan Elements including the LUTE and the Historic Element.

For these reasons staff included increased green building requirements for demolition of a Historic Resource and new construction. However, we limited the requirement only to those properties that are consistent with the CEQA definition of a historic resource. This specific requirement is potentially a key issue for the development community.

Legal Requirements

The state allows local jurisdictions to exceed and modify the adopted building codes on the basis of climactic, topographical, and geological findings. Because the City's green building ordinance involves amendments to the California Building Code, staff has made these findings and will submit them to the Building Standards Commission (BSC). Currently, the BSC only files the findings. It does not review the findings, and unlike the California Energy Commission (CEC), it has no authority to deny them. Staff has completed the findings based on StopWaste.Org's model document (Exhibit- A1).

The State Building Efficiency Standards allow local jurisdictions to adopt more stringent energy requirements than state standards with approval from the CEC. Because the City's green building ordinance includes rating systems with prerequisites and points, staff will need to prove that these measures will increase energy efficiency above the adopted standards. StopWaste.Org has completed a Cost Effectiveness Analysis which Oakland can use to comply with the CEC requirements. Although the CEC has the authority to approve or deny the submitted documentation, several other jurisdictions have submitted the same Cost Effectiveness Study and been approved. Staff must submit the Cost Effectiveness Study (Exhibit-A2) to the CEC for review and approval between the City Council's 1st and 2nd reading of the ordinance.

Environmental Determination

The ordinance has undergone review to assess its potential environmental impacts. Staff has made the determination (***Attachment C***), based on this analysis, that the proposed ordinance is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection

of Natural Resources), 15308 (Actions by Regulatory Agencies for Protection of the Environment), and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning), each of which constitutes a separate and independent basis for the exemption.

PROJECT DESCRIPTION

The ordinance (see Section 4 of the ordinance) is divided into two phases, the Entitlement Phase and the Construction Phase and covers the following project types.

1. Residential
    a) New construction
    b) Additions and Alterations
2. Non-Residential
    a) New Construction
    b) Additions and Alterations
3. Historic
    a) Demolition of a Historic Resource and new construction
    b) Residential Additions and Alterations
    c) Non-Residential Additions and Alterations
4. Affordable Housing Construction receiving City/Redevelopment Agency Funds
5. Mixed Use
6. Landscapes

General Process

Entitlement Phase

As part of the initial permit application process, the project applicant must submit a completed green building checklist appropriate to the project. This checklist outlines all of the potential green building points or measures of a green building rating system. The checklist is flexible in that project applicants can choose which green building points best apply to the project as it is designed and constructed. However, the project must meet all the prerequisites and meet a certain number of points within each rating system's environmental categories. This process prohibits a project applicant from choosing only points in one or two categories and results in a more holistic project. In addition to the checklist, the applicant must submit permit plans, general notes and/or a project description demonstrating the project is in compliance with the minimum point requirements in the ordinance. The applicant can appeal the checklist determination or the need to comply with the ordinance under unreasonable hardship in the Entitlement Phase. At the end of the permit phase, a qualified GreenPoint Rater or LEED AP must submit a signed

statement attesting that the project is in compliance with the ordinance before planning approval is issued. This requirement will be added as a Condition of Approval.

Construction Phase

As part of the building permit submittal, the project applicant must submit the completed checklist approved in the entitlement phase, a newly completed checklist if modified, permit general notes, detailed design drawings, and construction specifications demonstrating that the project is in compliance with the minimum point requirements in the ordinance. In addition the project applicant must submit a copy of the signed statement from the Entitlement Phase and a new signed statement by a qualified GreenPoint Rater or LEED AP, attesting that the project is in compliance with the ordinance before a building permit is issued.

As part of the inspections process, the project applicant must submit a completed copy of the checklist submitted during the plan check process, a signed statement or statements during all relevant phases of construction by the qualified GreenPoint Rater or LEED AP that the project complies with the minimum requirements of the ordinance. A Stopwork Order may be issued if the project is not in compliance with the ordinance. Before the Building Official finalizes the building permit and issues a Temporary Certificate of Occupancy, the project applicant must also submit a signed statement by the qualified GreenPoint Rater or LEED AP that the project meets the minimum requirements of the ordinance.

The project applicant can substitute green building points during either the plan check or the inspection process provided that the project still meets the minimum requirements and the required number of points in each environmental category. However, the project must be re-reviewed by the Planning and Zoning Division which is standard practice.

General Requirements

Residential

The minimum green building point requirement for residential construction, including single family, multi-family, affordable housing, and mixed use projects containing new residential is 50 points per the GreenPoint Rated rating system. However, there are exceptions. These are summarized below.

- Residential additions and alterations to one and two family homes, including historic properties and affordable housing projects shall be certified through the GreenPoint Rated Element Label (currently 25 points).
- Residential additions and alterations to multi-family, including historic properties and affordable housing projects currently are not available. However, staff has included this

as placeholder until the end of the year when it is anticipated that the rating system will become available.

Non-Residential

The minimum green building point requirement for non-residential new construction, additions and alterations, and mixed use projects over 25,000 square feet is Silver (50-59 points) per the LEED rating system. However, for non-residential addition and alteration projects of historic properties over 25,000 square feet, the requirement is Certified (40-49 points) per the LEED rating system. The reduction in the requirement, from LEED Silver for new construction to LEED Certified for additions or alterations, is meant to encourage project applicants to save and rehabilitate the building instead of requesting demolition.

The following non-residential projects must meet all applicable points on the Small Commercial Checklist:

- New construction projects between 5,000-25,000 square feet
- Additions and alterations, including historic properties, between 5,000-25,000 square feet
- Additions and alterations including historic properties over 25,000 square feet but not involving major upgrades to electrical, mechanical, or plumbing systems.

Demolition or Removal of a Historic Resource and New Construction

In addition to submittal of a green building checklist, applicants proposing the demolition or removal of a historic resource and new construction must meet with a Historic Preservation Planner and achieve an increased number of green building points. The point requirement for residential new construction would increase from 50 to 75 points and the commercial new construction would increase from LEED Silver to LEED Gold. The applicant must also utilize deconstruction techniques on the historic building. Deconstruction is the systematic dismantling of a building to preserve the useful value of its component materials. Unlike demolition, which landfills potential reusable building materials, deconstruction disassembles buildings in a manner that conserves and sorts materials that can be used again or remanufactured into higher-value goods.

Mixed-Use Projects

The specific rating program for mixed-use projects will be evaluated by Planning and Zoning Division staff and based on which use exceeds the noted thresholds. As a general rule, the use with more square footage would determine the rating program. However, staff may choose the stricter threshold if applicable. For example, in a new construction project with 7,000 square feet of commercial space and three units, staff would choose the Build It Green Multi-Family threshold for compliance. In this case, the square footage of the units would likely be less than

the commercial square footage, but the commercial space would only require certification of best management practices per the Small Commercial Checklist. In contrast the residential units would require a more thorough and holistic review through the GreenPoint Rated certification process. As an alternative compliance method, a project applicant could choose to certify both uses separately.

Construction Requiring a Landscape Plan

Construction projects that require a landscape plan, Design Review permit, and are between 500 and 25,000 square feet of floor area need only submit a completed Bay Friendly Basic Landscape Checklist. Projects that require a landscape plan, Design Review permit, and are greater than 25,000 square feet of floor area must submit a completed Bay Friendly Basic Landscape Checklist and achieve all applicable measures on the checklist. This threshold is in addition to the other green building thresholds noted above but points may overlap between the building and landscapes checklists. The stricter requirement shall apply if the rating systems are inconsistent.

Compliance with the Ordinance / Certification / Verification

The project applicant will need to hire a third-party rater such as a GreenPoint Rater or LEED AP. This person will work closely with staff, during the entitlement and construction phase to demonstrate and certify that the project is in compliance with the ordinance. The project applicant will also need to submit documentation to Build It Green or LEED for projects using those rating systems and have the project certified as a green building project. The project applicant must submit this certification to staff to demonstrate final compliance with the ordinance. For projects only requiring the Small Commercial or Bay Friendly Basic Checklist, staff will act both as the third-party rater and certification body. This process (need for approvals during all phases of construction, attestation of compliance from green building professionals during the process, certification by Build It Green or LEED, and final enforcement of the ordinance by the City) assures that the project will be in compliance with the ordinance at the end of project construction. This is an important part of implementing the ordinance that will alleviate staff needing to become experts in green building and devoting a large time compiling green building documentation and verifying compliance.

SUSTAINABLE OPPORTUNITIES

Economic: According to the USGBC Green Jobs Study, green buildings will support or create 7.9 million jobs in the U.S. between 2009 and 2013. The ordinance has the potential to create jobs in green construction and energy efficiency as well as for green building raters.

Environmental: According to the Environmental Protection Agency approximately 39% of total energy use and 72% of electrical consumption is due to buildings. Buildings also generate 39% of carbon dioxide emissions and 30% of GHG, a known contributor to global warming.

Construction and demolition debris from buildings generate 26% of the waste stream. Furthermore, 13% of potable water consumption is from buildings and of this amount the largest use of urban water is for landscape watering. Therefore, improving energy efficiency, using renewable energy sources, and conserving water in buildings are effective ways to improve the environment and reduce the impacts of climate change disruption. Rehabilitating and reusing buildings or alternatively using recycled or sustainable products also reduces waste, decreases pollution and preserves non-renewable natural resources.

Social Equity: The U.S. Environmental Protection Agency reports that the air in buildings can be two to five times more polluted than outdoor air. Formaldehyde, commonly used in shelving and insulation, is one of the most common indoor pollutants. Many paints, floor finishes, and adhesives contain unhealthy volatile organic compounds (VOCs). The use of green building practices promotes the use of alternatives to these unhealthy materials thereby promoting resident and worker health.

DISABILITY AND SENIOR CITIZEN ACCESS

All new development accommodated by this ordinance will be required to comply with the Americans with Disabilities Act.

RECOMMENDATION(S) AND RATIONALE

Staff and the City Planning Commission recommend requiring minimum green building standards for private development projects, because the conventional construction of building and landscapes has an impact on the environment, the economy, and public health. Green buildings have been found to reduce, reverse or eliminate these impacts. Furthermore, the green building ordinance implements existing General Plan policies and will assist the City and the state in meeting its GHG goals.

ACTION REQUESTED OF THE CITY COUNCIL

Staff recommends that the City Council adopt an ordinance that:

1. Adds a new title, Title 18 –Sustainability to the Oakland Municipal Code; and
2. Adds Chapter 18.02 Sustainable Green Building Requirements For Private Development that requires minimum green building standards to private development projects.

Respectfully submitted,

Walter S. Cohen, Director
Community and Economic Development Agency

Reviewed by:
Eric Angstadt, Deputy Director

Prepared by:
Heather Klein, Planner III
Planning and Zoning Division

APPROVED AND FORWARDED TO THE
COMMUNITY AND ECONOMIC DEVELOPMENT COMMITTEE:

Office of the City Administrator

Attachments:
A. Staff report for the April 21, 2010 Planning Commission Meeting (without Attachments)
B. Changes made to proposal at or since the April 21, 2010 Planning Commission Meeting
C. Environmental Determination

Item: _____
CED Committee
June 8, 2010

Oakland City Planning Commission STAFF REPORT

Case File Number ZT09-157 **April 21, 2010**

Project Name:	**Citywide**
Proposal:	Add Title 18, Sustainability, Chapter 18.02 Sustainable Green Building Requirements for Private Development Buildings to the Oakland Municipal Code which will require green building improvements for private development projects.
Applicant:	City Planning Commission
Contact Person/Phone Number:	Heather Klein / (510) 238-3659
Case File Number:	**ZT09-157**
General Plan:	Various Citywide
Zoning:	Various Citywide
Environmental Determination	CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection of Natural Resources), 15308 (Actions by Regulatory Agencies for Protection of the Environment), and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan or Zoning)
Historic Status:	Various Citywide
Service Delivery District:	All
City Council District:	All
Status	The Special Projects Committee and the Landmarks Preservation Advisory Committee recommended that the item be heard before the full Planning Commission.
Action to be taken	Recommendation to City Council contained within staff report
For further information:	Contact case planner Heather Klein at (510) 238-3659 or hklein@oaklandnet.com.

SUMMARY

This report and discussion of the Green Building Ordinance (Item #5) was Continued from the April 7, 2010 Oakland City Planning Commission to the April 21, 2010 agenda. The previous report from April 7th is still applicable. However, staff would like to amend the report with the following paragraph and recommendation.

MINOR MODIFICATIONS

Staff requests that the Planning Commission authorize staff to make minor changes, clarifications and refinements to the proposal prior to submittal to the City Council. This may be required to clean up language, correct typing errors, or make other minor changes consistent with the Commission's recommendations. Although not anticipated, staff proposes to bring any staff initiated significant or controversial changes back to the Planning Commission for further recommendation prior to submittal to the City Council.

ATTACHMENT A

Project Name:	**Citywide**
Proposal:	Add a new title, Title 18 Sustainability, Chapter 18.02 Sustainable Green Building Requirements for Private Development Buildings to the Oakland Municipal Code which will require green building improvements for private development projects.
Applicant:	City Planning Commission
Environmental Determination	CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection of Natural Resources), 15308 (Actions by Regulatory Agencies for Protection of the Environment), and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning)
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Action to be taken	Recommendation to City Council contained within staff report
For further information:	Contact case planner Heather Klein at (510) 238-3659 or hklein@oaklandnet.com.

SUMMARY

The conventional construction of buildings and landscapes has an impact on the environment, the economy, and our health. Green building is generally defined as a holistic, whole systems approach, to the life-cycle of a building. Green buildings reduce energy use, conserve water, limit solid waste during construction, and promote healthy indoor air quality All of these benefits have also been found to reduce emissions of carbon dioxide, a green house gas (GHG) and contributor to global warming.

While buildings can be constructed using "green" techniques, the preservation and rehabilitation of existing building stock (including historic properties) plays an even bigger part in achieving significant reductions in waste, energy and water use, and green house gas emissions since most of these buildings were built prior to 1980 and the adoption of the California Title 24 energy code.

Finally, a holistic approach to green building includes landscapes. Green landscapes nurture healthy soils while reducing fertilizer and pesticide use, prevent erosion and runoff; reduce waste through use of recycled content materials; conserve water and energy; and enhance wildlife habitat.

Based on this information and specific direction from the Planning Commission and CED Committee, staff included each project type (new construction, renovations, remodeling, historic buildings, new neighborhoods, and landscapes) in one proposed ordinance.

The purpose of this report is to discuss the proposed mandatory green building requirements for private development projects. Staff requests that the Planning Commission review the staff report and receive public comments. Staff further recommends that the Planning Commission recommend approval of the proposal and forward it to City Council for adoption.

WHAT IS GREEN BUILDING

Green building is generally defined a holistic, whole systems, approach to the life-cycle of a building

which includes location, siting, design, construction and renovation, operation and, finally, demolition of a building. In practical terms, green buildings reduce energy use, conserve water indoors and out, limit waste during construction and operation, and promote healthy indoor air quality. Green Building techniques include choosing an appropriate location away from habitats and greenfields near infill development or on an already developed lot and near transit; siting a building to take advantage of passive heating and cooling methods; and reusing buildings or, alternatively, using recycled or sustainable products that preserve non-renewable natural resources. These buildings also include installation of high efficiency systems to reduce energy and water consumption. Green buildings benefit occupant's health through the use of healthy building materials, including zero to low Volatile Organic Compound (VOC) and formaldehyde free products.

WHY GREEN BUILDING IS IMPORTANT

The demolition, construction, and operation of buildings have an impact on the environment, the economy, and our health. Nationwide, buildings are the largest contributor to green house gases.[1] According to the U. S. Environmental Protection Agency, buildings in the United States, account for:

- 39% of total energy use
- 72% of electricity consumption
- 39% of carbon dioxide emissions
- 30% of greenhouse gas emissions (known contributor to Global Warming)
- 26% of waste stream/ Construction and Demolition debris
- 13% of potable water consumption

The state of California has recently passed legislation to address these impacts including:

- Executive Order (S-20-04) signed by Governor Schwarzenegger requiring all new and renovated state-owned facilities to meet LEED Silver standards.

- Executive Order (EO) S-3-05 signed by Governor Schwarzenegger establishing statewide GHG emissions reduction targets (by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels).

- California Assembly Bill 32 (AB 32) which commits California to reduce GHG emissions to 1990 levels and establishes a multi-year regulatory process under the jurisdiction of the California Air Resources Board (CARB) to establish regulations to achieve these goals.

- Adoption of a state-wide green building code by the California Building Standards Commission, for all new construction which sets targets for site design, energy efficiency, water consumption, framing techniques, diversion of construction waste, material resource conservation, and indoor air quality.

- *California Assembly Bill 375 (SB 375)* which implements AB 32 by linking regional transportation plans with state greenhouse gas reduction goals.

In the City of Oakland, the 1996 Open Space Conservation and Recreation Element (OSCAR) includes policies related to energy efficient site planning, construction, and consumption. The 2004 Housing Element outlines policies and actions related to sustainable development, green building design, and energy conservation. These policies and actions are being updated and expanded upon as part of the

[1] American Institute of Architects, Sustainability 2030

Housing Element update. In addition, the Oakland City Council recently directed staff to develop the draft Oakland Energy and Climate Action Plan using a preliminary planning GHG reduction target equivalent to 36% below 2005 GHG emissions by 2020, and annual benchmarks for meeting the target. Green building actions were included in the draft report as ways to achieve this ambitious goal.

In addition to building impacts, the design, construction and maintenance of landscapes within the City can also have a significant impact on the City's environmental sustainability, use of resources, and the health of the watershed and San Francisco Bay. Based on the Alameda County Waste Characterization Study of 2000, 7% of the materials disposed of in Alameda County landfills are from landscape construction, renovation and maintenance, and plant debris is now banned from Alameda County landfills. In addition to waste issues, the largest use of urban water is for landscape watering[2]. While there is an increasing demand, the water supply is limited and California may face its fourth year of serious drought conditions. To begin to address these issues, the City of Oakland has adopted Ordinance 12950 C.M.S. requiring the Bay Friendly Landscape guidelines be used in all City projects and Oakland is currently subject to the states model Water Efficient Landscaping Ordinance.

In summary a green building ordinance would implement both the state and City's goals and policies.

BACKGROUND

Work to Date

On September 19, 2007 staff presented an informational Director's Report on sustainable and green building practices in Oakland to the Planning Commission. The report contained several possible recommendations for consideration. The direction from the Planning Commission was to explore the possibilities with the help of a group of stakeholders.

In March 2008, staff held four stakeholders meetings, on an invitation only basis, separately with architects; commercial developers, bankers, and real estate agents; multi-family developers and smaller contractors that work on single family homes, additions, and renovations. These meetings were well attended and staff received valuable input on a wide range of topic questions.

Staff presented the minutes and findings to the Special Projects Committee on March 20, 2008. The Committee reviewed the report, the meeting minutes, and took public testimony. They requested that staff hold another stakeholder meeting that was open to all members of the public.

In July of 2008 former Council President Ignacio De La Fuente announced his intention to pursue green building requirements for private development. This announcement changed staff's direction and we began analyzing mandatory thresholds.

Staff held a wider community meeting in August of 2008 with approximately 45 people attending. Staff again received feedback on possible mandatory green building requirements.

In October of 2008 staff presented a conceptual framework for an ordinance to the Planning Commission and the Community and Economic Development (CED) Committee which was forwarded to the City Council (Attachment A). The conceptual workplan, described in further detail below, outlined key components that would be used as the basis for developing the mandatory thresholds. At the City Council meeting Councilmember Quan requested that the Bay Friendly Landscape Guidelines be included in the proposal.

[2] Department of Water Resources

In February of 2009 staff presented initial threshold requirements based on the input received from the community to the Special Projects Committee. The Special Projects Committee generally agreed with the thresholds but had concerns regarding the proposed requirements for high-rise residential, historic buildings, and neighborhoods. The Special Projects Committee asked that staff further evaluate these thresholds and forward the thresholds related to historic properties to Landmarks Preservation Advisory Committee (LPAB) for their review and recommendation.

Staff also held another community meeting on April 20, 2009 to solicit more comments and additional involvement. Approximately 23 persons attended. Staff also developed a brief website to inform the public of our efforts on this proposal.

In March, April, and May of 2009 staff presented the thresholds to the LPAB. The LPAB passed a motion to forward the proposal as written to the Planning Commission with the following recommendations:

- Require that a meeting with a historic preservation planner be added to each threshold related to historic properties. *Staff included this in the Ordinance.*
- The reasons for the meeting should include but not be limited to, a discussion of the hardship of achieving certain green building points and points that would conflict with character defining features. *Staff will develop this further as part of the implementation process.*
- Definition of what constitutes hardship. *Staff included this in the Ordinance.*
- Clarification of what the check lists are (i.e., what are the implications of not having everything checked on the check list, what's required/not required, and some subjectivity on that process). *Staff will develop this further as part of the implementation process.*
- Change and adaptive management of this ordinance when these standards change and as we get more experience. Mandatory review of the ordinance in five years after adoption. *Staff did not include this for legal reasons.*
- A very clear and explicit statement that green building does not trump historic preservation. *This is being reviewed as part of the Ordinance.*
- Including language for a time frame for revisiting the incentive issue. *Once the Ordinance has been implemented staff will revisit the issue of incentives.*

Conceptual Framework Approved as the Basis for the Ordinance and Subsequent Changes to the Framework by Staff

As noted above staff presented a conceptual framework for the Ordinance to both the Planning Commission and the CED Committee. Both the Planning Commission and CED Committee generally agreed with the conceptual plan. This framework outlined important considerations which staff relied upon in developing the proposed Ordinance. These are detailed below.

Threshold of Applicable Projects

Staff recommended that the City address each project type (new construction, renovations, remodeling, historic buildings, etc) in one ordinance. In addition, staff chose existing Planning, CEQA, and Building Permit square footage requirements as break points between thresholds for consistency and ease in implementation.

Green Building Rating Programs

Both the Planning Commission and the CED Committee agreed that the Ordinance should be based on existing green building rating programs since it would be time consuming and difficult to develop our own program when there are recognized programs with credibility and market value. Staff recommended that, in general, the City of Oakland use the Leadership in Energy and Environmental Design (LEED) for

commercial buildings and/or the GreenPoint Rated program for residential buildings as the basis for the Ordinance.

LEED was developed by the US Green Building Council (USGBC) for the design, construction, and operation of high performance buildings. This system is the internationally accepted benchmark for green buildings and is typically applied to commercial, civic, and high-rise residential buildings; however the USGBC has expanded the number of project specific rating systems to include schools, retail, homes, and neighborhoods, just to name a few. The LEED system is a point based program with third party verification. Projects must pre-qualify for LEED by meeting several pre-requisites. The project team then designs features into the project to qualify for points, which are tallied to achieve a rating. In the LEED for New Construction Version 3.0 rating system, the LEED Certified rating is achieved with 40-49 points, LEED Silver is 50-59 points, LEED Gold is 60-79 points, and LEED Platinum is 80+ points. At the end of the project, the applicant team must submit documents to verify compliance with the points to the USGBC. The USGBC reviews the documentation and certifies the project as a LEED project based on the earned level of performance.

Build It Green developed the GreenPoint Rated rating system which has become the standard for evaluating the green performance of new single-family and multi-family projects. Build It Green has also developed an existing (single-family) home rating program and is working on an existing multi-family version. This system is solely based in California and includes practices that exceed California building codes. There are fewer pre-requisites and no certification tiers in GreenPoint Rated. The minimum point level is 50 and the possible number of points goes up from there. The project team must retain a GreenPoint Rater to verify compliance with the GreenPoint Rated program. Without documentation, a certified GreenPoint Rater and submittal of the documentation, a project is not considered to be a GreenPoint Rated project.

In addition to LEED and GreenPoint Rated, staff is also using the Small Commercial Checklist and the Bay Friendly Basic Landscape Checklist (Attachment B). These checklists were developed by Stopwaste.Org of Alameda County Waste Management Authority. The Small Commercial Checklist is for those commercial projects where LEED is infeasible or inappropriate while the Bay Friendly Landscape Checklist addresses only green landscape techniques. These rating programs were added to address the expanded project types outlined in the section above. Neither checklist is point based. The project either is including this type of construction and, therefore, the measure that addresses that construction is applicable or the project is not including it and the measure is not applicable. An example, per the Small Commercial Checklist, would be a project including new water faucets. The project would then need to include low flow, water saving faucets. If the project is only for electrical work than this water saving measure is not applicable and is not required. In general both lists contain best management practices and include "low hanging fruit" measures.

Phasing

Staff recommended a three-year phase in period. Staff reasoned that this timeframe would allow the public to become familiar with the green building requirements and try out certain construction methods and products. At the same time staff would be trained in the requirements, have time to work out any conflicts and to provide the public with information.

The Building Services Department had several issues with this and would not recommend approval of this phased approach. While well intentioned, they believe that this process will be difficult to implement within their Division and would actually create more confusion for the development community.

Furthermore, the state recently adopted the CalGreen Building Code which would require certain green building measures by January 1, 2011. For these reasons staff is no longer recommending a phased

approach to the Ordinance. These issues are discussed later in the Key Issues section along with several options for the Planning Commission to consider.

Ratcheting of the Requirements in Future Years

Staff recommended that the City choose a baseline level for the Ordinance and maintain the same minimum level of points over time in order to achieve certification. Staff reasoned that the rating programs are reviewed periodically by stakeholders and points available now might be removed from the checklists and replaced with more difficult requirements or based on new information. (An example of this is the mandatory requirements in the new state Green Building Code.) This constant review maintains the programs' credibility and value in the marketplace. It also means that a building built under future requirements will be considered "greener" than a building built today. This internal ratcheting of the requirements ensures that buildings will employ the latest technologies and will become even more efficient. Therefore, staff believed that there was no need to require point or level increases in the Ordinance because it will be more difficult for the development community to achieve the baseline requirements in future years. Because of this constant program review, staff also recommended using the most current program guidelines and checklists. Staff believed that the construction market will dictate a higher level of green without additional City requirements. The exception to this approach is staff's non-residential green building requirement level. Staff chose LEED Silver over LEED Certified as the baseline as this is the level required for City buildings.

Compliance

Staff recommended that City personnel track the project from planning through plancheck and construction to ensure that the project meets the green building requirements. The project would not be approved, a building permit issued or inspection milestones granted if the initial City review showed that the project would not meet the requirements. Staff did not recommend withholding a certificate of occupancy until the project was certified.

Verification

Staff recommended verification through the LEED and GreenPoint Rated certification process. This is an important part of both rating systems and helps these programs maintain their integrity, market value, and uniformity. As such neither system will permit an applicant to market their building as LEED or GreenPoint Rated without the submission of documentation for review and approval. In essence this is the "teeth" of the programs. Staff did not recommend that the City undertake the role of LEED certifier or GreenPoint Rater for the project as this would be too time intensive and costly for staff.

SUMMARY OF THE PROPOSAL

The proposed requirements cover the following project types.

1. Residential
2. Non-Residential
3. Historic
4. Projects with Notice of Funding Availability (NOFA)
5. Mixed Use
6. Landscapes

The Ordinance (Attachment C) will generally be voluntary, except for submittal of the specific checklists until December 31, 2010. Beginning January 1, 2011 the Ordinance will become fully effective. The project applicant must meet any pre-requisites and the minimum level. The project will be required to comply with the Ordinance in each construction phase: entitlements (Planning), plan check and building permit issuance, and inspections. The project must be certified by the specific third-party rating program unless otherwise stated. The size thresholds for compliance are directly related to existing Planning and Building Code permit thresholds. Below are the proposed thresholds and further discussion.

1. Residential New Construction	
A. One and Two Family Dwellings (Group R Occupancy)	
Checklists	***Minimum Requirements***
• Build It Green: Single Family GPR • LEED for Homes	• Completed checklist • Minimum point requirement for certification • Certification
B. Multi-Family Dwellings (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
• Build It Green: Single Family GPR • Build It Green: Multi-Family GPR • LEED New Construction	• Completed checklist • Minimum point requirement for certification • Certification

In the first section, any new single-family or duplex construction project would follow the Build It Green: New Home Green Point Rated (GPR) checklist. Secondary units would not be required to follow these requirements even if detached. The project applicant would need to submit the checklist, meet the minimum requirements (currently 50 points) to be considered a GreenPoint Rated (GPR) project and have the project certified by Build It Green.

The next section is similar to the single-family construction threshold in phasing; however, new construction of 3 + units would use the Build it Green Multi-Family GPR Checklist.

The LEED rating system (as appropriate) can also be used as an alternative compliance path for all residential new construction.

2. Residential Additions and Alterations	
A. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)	
Checklists	***Minimum Requirements***
Build It Green: Existing Home GPR	• Completed checklist • Minimum point requirement for certification (Elements Label) • Certification (Elements Label)
B. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Minimum point requirement for certification • Certification

Additions, alterations, and remodeling projects that exceed 1000 sq. ft. of total floor area would need to comply with Build It Green: Existing Home Green Points Checklist. Staff chose this threshold as these projects currently need to go through the more stringent Tract III Design Review process. Under the Existing Home Green Points Checklist, Build It Green offers two certifications: Elements and Whole House. The Elements certification is for smaller remodels such as a kitchen or bathroom remodel or addition. The Whole House certification is for larger remodels that effect the building's mechanical, plumbing, and electrical system. Staff chose the Elements certification as the basis for this threshold as it is less onerous and yet would still apply to the majority of these projects. The Whole House certification is an acceptable compliance path where appropriate.

Build It Green currently uses the Green Rehabilitation of Multifamily Rental Properties and the Build It Green Multifamily Guidelines for Existing Multi-Family additions, alterations, and retrofits. However, Build It Green is currently developing a rating system for existing multi-family projects and the pilot program was expected to begin in January with the intent to finalize the system by mid-year. The manual and checklist are expected to be available for use by mid to late this year. Staff has included multi-family projects in the Ordinance as a placeholder and will re-review the Ordinance thresholds when the checklist and manual are available. However, it is expected the multi-family process will follow the same approach as the Existing Home program and therefore staff would follow the same approach as the other thresholds in the Ordinance regarding number of points, certification, etc.

3. Non-Residential New Construction	
A. Non-Residential projects between 5,000 to 10,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial Checklist • Certification
B. Non-Residential projects between 10,000 to 25,000 sq. ft. of total floor area	
Checklists	***Minimum Requirements***
• LEED New Construction • Other LEED checklist • Small Commercial Checklist	• Completed LEED checklist and Small Commercial Checklist • All applicable measures on the Small Commercial Checklist • Certification
C. Non-Residential projects over 25,000 sq. ft. of total floor area	
Checklists	***Minimum Requirements***
• LEED New Construction • Other LEED checklist	• Completed checklist • LEED Silver point requirement • Certification

In the first section, any new non-residential construction project between 5,000 and 10,000 sq. ft. would submit the Small Commercial Checklist. The applicant must attain all applicable measures points on the Small Commercial Checklist only. City staff would verify that the project has attained all applicable measures.

In the second section, any new non-residential construction project between 10,000 and 25,000 sq. ft. would submit a LEED checklist. The applicant and staff would choose which specific rating system would be most appropriate for the project. In addition, the applicant would need to submit the Small Commercial Checklist. In requiring two checklists, staff is hoping to encourage applicants to go beyond the Small Commercial Checklist and submit for LEED certification which would be appropriate for this level of construction. The applicant must attain all applicable measures points on the Small Commercial Checklist only. City staff would verify that the project has attained all applicable measures.

The third section requires LEED as the rating system. The applicant and staff would choose which specific rating system would be most appropriate for the project. The applicant must submit the LEED appropriate checklist, meet the minimum amount of points to achieve LEED Silver and certification by the USGBC would be required.

4. Non-Residential Additions and Alterations	
A. Non-Residential Additions and Alterations between 5,000 - 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial checklist
B. Non-Residential Additions and Alterations (see Major Alteration definition) over 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
• LEED New Construction • LEED Commercial Interiors • Other LEED checklist	• Completed checklist • LEED Silver point requirement • Certification
C. Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
• LEED New Construction • LEED Commercial Interiors • Other LEED checklist • Small Commercial Checklist	• Completed LEED checklist and Small Commercial checklist • All applicable measures on the Small Commercial checklist • Certification

In the first section, additions, alterations, or remodeling projects between 5,000 and 25,000 sq. ft. would need to submit the Small Commercial Checklist and achieve all applicable measures on the small checklist.

Addition and alteration projects that are over 25,000 sq. ft. would need to comply with LEED for Commercial Interiors or other appropriate LEED program. The applicant must submit the checklist, attain a LEED Silver rating and certification through the USGBC.

However, if the project is over 25,000 sq. ft. of floor area and does not include the removal of interior finishes and/or major upgrades to mechanical, electrical and/or plumbing systems, it is unlikely that the project could meet the requirements for LEED certification. In this case, the project would go through an alternative compliance process. The project applicant would submit both the LEED checklist and the Small Commercial Checklist and attain all applicable measures on the Small Commercial Checklist. The City would certify that the measures have been met.

5. Removal of a Historic Resource and New Construction	
A. New Construction projects resulting in removal of a Historic Resource	
Checklists	***Minimum Requirements***
• Build It Green: Single Family GPR • Build It Green: Multi-Family GPR • LEED Homes • LEED New Construction • Other LEED checklist	• Completed checklist • Consultation with a Historic Preservation Planner • LEED Gold for non-residential construction or 75 GPR points for residential construction • Certification • Deconstruction of the Historic Resource

For applicants proposing the demolition of a historic resource and new construction, they must submit the appropriate LEED or GreenPoint Rated checklist, meet with a Historic Preservation Planner, and achieve an increased number of green building points and attain certification. The point requirement for residential new construction would increase from 50 to 75 points and the commercial new construction would increase from LEED Silver to LEED Gold. This requirement would ensure that the City of Oakland is getting a new building that is comparable in terms of design quality, construction, and importance to that which was demolished.

The applicant must also utilize deconstruction techniques of the historic building. Deconstruction is the systematic dismantling of a building to preserve the useful value of its component materials. Unlike demolition, which landfills potential reusable building materials, deconstruction disassembles buildings in a manner that conserves and sorts materials that can be used again or remanufactured into higher-value goods.

6. Historic Residential Additions and Alterations	
A. Single-Family Additions and Alterations of Potentially Designated Historic Resources rated C or higher that exceed 1,000 sq. ft of floor area	
Checklists	***Minimum Requirements***
Build It Green: Existing Home GPR	• Completed Checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification (Elements Label) • Certification
B. Multi-Family Additions and Alterations of Potentially Designated Historic Resources rated C or higher	
Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification • Certification

These requirements are the same as for additions or alterations to non-historic residential properties except that the applicant must meet with a Historic Preservation Planner.

7. Historic Non-Residential Additions and Alterations	
A. Non-Residential Additions and Alterations of a Historic Resource between 5,000 - 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Small Commercial Checklist	• Completed checklist • Consultation with a Historic Preservation Planner • All applicable measures on the Small Commercial checklist • Certification
B. Non-Residential Additions and Alterations of a Historic Resource over 25,000 sq. ft. of floor area (see Major Alteration definition)	
Checklists	***Minimum Requirements***
• LEED New Construction • LEED Commercial Interiors • Other LEED checklist	• Completed checklist • Consultation with a Historic Preservation Planner • LEED "Certified" point requirement • Certification
C. Alternate compliance: Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
• LEED New Construction • LEED Commercial Interiors • Other LEED checklist • Small Commercial Checklist	• Completed LEED checklist and Small Commercial checklist • All applicable measures on the Small Commercial checklist • Certification

In this section, additions, alterations, or remodeling projects between 5,000 and 25,000 sq. ft. would need to submit the Small Commercial Checklist, meet with a Preservation Planner and achieve all applicable measures on the small checklist. These are the same thresholds for non-historic, non-residential additions and alterations.

Addition and alteration projects that are over 25,000 sq. ft. would need to comply with the Commercial Interiors or other appropriate LEED program. The applicant must submit the checklist, attain a LEED Certified rating and certification through the USGBC. The reduction in the requirement, from LEED Silver for new construction to LEED Certified for renovations, is meant to encourage project applicants to save and rehabilitate the building instead of demolishing it.

However, if the project is over 25,000 sq. ft. of floor area and does not include the removal of interior finishes and/or major upgrades to mechanical, electrical and/or plumbing systems, it is unlikely that the project could meet the requirements for LEED certification. In this case, the project would go through an alternative compliance process. The project applicant would submit both the LEED checklist and the Small Commercial Checklist and attain all applicable measures on the Small Commercial Checklist. The City would certify that the measures have been met.

8. Affordable Housing Construction receiving City/Redevelopment Agency Funds	
A. One, Two, and Multi-Family New Construction	
Checklists	***Minimum Requirements***
• Build It Green: Single Family GPR • Build It Green: Multi-Family GPR • LEED for Homes • LEED for New Construction	• Completed checklist • Minimum point requirement for certification • Certification
B. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)	
Checklists	***Minimum Requirements***
Build It Green: Existing Home GPR	• Completed checklist • Minimum point requirement for certification (Elements Label) • Certification
B. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Minimum point requirement for certification • Certification

This threshold addresses projects that receive Notice of Funding Application (NOFA) funds from the City for affordable housing projects. The requirement timeframes for this type of project are different from other project types because these requirements are currently part of the NOFA process. To qualify for NOFA funds the applicant must complete the checklist and achieve at least 50 GreenPoint Rated points. Staff is recommending continuing and codifying this proposal as part of the green building Ordinance.

9. Mixed-Use Construction	
A. Portion of project exceeding thresholds as defined above will determine the rating system and checklist for whole project	
Checklists	***Minimum Requirements***
• Build It Green • LEED Checklist • Small Commercial Checklist	• Completed checklist • Minimum point requirement for certification • Certification
B. Alternate compliance path: Certify each portion of the building separately per the appropriate GreenPoint Rated, LEED or Stopwaste.Org checklist)	
Checklists	***Minimum Requirements***
• Build It Green • LEED Checklist • Small Commercial Checklist	• Completed checklist • Minimum point requirement for certification • Certification

This section addresses mixed-use projects that contain both residential and commercial uses. The rating program for mixed-use projects will be evaluated by the Planning staff and based on which use exceeds the above thresholds. As a general rule, the use with more square footage would determine the rating program. However, staff would generally choose a stricter threshold if applicable. For example, in a new construction project with 7,000 square feet of commercial and 2 units, staff would choose the Build It Green Multi-Family threshold for compliance. In this case the square footage of the units would likely be less than the commercial square footage, but the commercial space would only require verification of best management practices per the Small Commercial Checklist while the residential units would require GreenPoint Rated certification.

10. Construction Requiring a Landscape Plan	
A. Construction projects between 500 - 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Bay Friendly Basic Landscape Checklist	Completed checklist
B. Construction projects greater than 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Bay Friendly Basic Landscape Checklist	• Completed checklist • All applicable measures on the Bay Friendly Basic Landscape Checklist • Certification

This section addresses landscaping within development projects. Applicable projects would need to comply with the Bay Friendly Basic Landscape Checklist. In the first section, projects between 500 and 25,000 sq. ft. of floor area need to only submit the checklist

In the second section, the project applicant must submit the checklist if the project is greater than 25,000 sq. ft. and achieve all applicable measures on the checklist. This threshold is in addition to the other green building thresholds above but points may overlap between the building and landscapes checklists. The stricter requirement shall apply if the rating systems are inconsistent.

GENERAL PLAN POLICIES

Several of the City's General Plan Elements describe policies and actions related to sustainability and that address energy efficiency, water conservation, reuse of materials to reduce waste and conserve natural resources and healthy air quality, which are the hallmarks of a green building. Below is an abbreviated list of the specific policies and actions that directly relate to the individual measures in the green building checklists.

Land Use and Transportation Element of the General Plan

The following General Plan Land Use and Transportation Policies apply to the proposed Ordinance:

Policy: W3.3- Protecting and Preserving Wetland Plant and Animal Habitats
Policy I/C2.1- Pursuing Environmental Cleanup
Policy T3.6 - Encouraging Transit
Policy T.4.1 - Incorporating Design Features for Alternate Travel
Policy D6.2 - Reusing Vacant or Underutilized Buildings
Policy N8.1 - Developing of Transit Villages

Historic Preservation Element of the General Plan (HPE)

The following HPE Goals and Policies apply to the proposed project:

Goal 2: To preserve, protect, enhance, perpetuate, use, and prevent the unnecessary destruction or impairment of properties or physical features of special character or special historic, cultural, educational, architectural, or aesthetic interest or value.
Policy 2.1 - Preservation Incentives and Regulations for Designated Historic Properties
Policy 3.1 - Avoid or Minimize Adverse Historic Preservation Impacts Related to Discretionary City Actions

Safety Element

The following Safety Element Policies apply to the proposed project:

Policy GE-2: Continue to enforce ordinances and implement programs that seek specifically to reduce the landslide and erosion hazards.
Policy HM-2: Reduce the public's exposure to toxic air contaminants through appropriate land use and transportation strategies.

Open Space Conservation and Recreation Element (OSCAR)

The following OSCAR Element Objectives, Policies, and Actions apply to the proposed project:

Objective CO-1: To protect and preserve soil as a resource for healthy plant, animal, and human life.
Objective CO-2: Encourage practices to minimize the risk of landsliding
Objective CO-4: To maintain a water supply sufficient to meet local needs while minimizing the need to develop new water supply facilities.
Objective CO-5: To minimize the adverse effects of urbanization on Oakland's groundwater, creeks, lakes, and near shore waters.
Objective CO-7: To minimize the loss of native plant communities and restore these communities where they have been damaged or lost and to preserve Oakland's trees unless there is a compelling safety, ecological, public safety, or aesthetic reasons for their removal

Objective CO-12: To improve air quality in Oakland and the surrounding Bay Region.
Objective CO-13: To manage Oakland's energy resources as efficiently as possible, reduce consumption of non-renewable resources, and develop energy resources which reduce dependency on fossil fuels.
Objective OS-8: To conserve wetlands so that they will continue to provide habitat for fish and animals
Objective OS-9: To protect rare, endangered and threatened species from the effects of urbanization
Action CO-13.3.3: Consider developing additional measures to promote energy efficient building design and construction and energy efficient site planning.

Housing Element

The following Housing Element Policies and Actions apply to the proposed Ordinance:

Policy 7.1 - Sustainable Residential Development Programs
Policy 7.2 - Energy Conservation
Action 1.3.4 – Transit Oriented Development
Action 7.1.1 – Green Building for Private Development
Action 7.1.3 – Re-use of Building Materials
Action 7.4.1 – Compact Building Design

Scenic Highway Element

The following Scenic Highway Element Policy applies to the proposed Ordinance: Urban development should be related sensitively to the natural setting.

ENVIRONMENTAL DETERMINATION

The project has undergone review to assess its potential environmental impacts. Staff has made the determination (see Attachment D for a detailed explanation), based on this analysis, that the proposed Ordinance is exempt from the California Environmental Quality Act pursuant to CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection of Natural Resources), 15308 (Actions by Regulatory Agencies for Protection of the Environment), and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning), each of which constitutes a separate and independent basis for the exemption.

OTHER LEGAL REQUIREMENTS AND CONSISTENCY WITH STATE POLICY

Staff has been advised that adoption of mandatory Green Building requirements does trigger certain State law procedural requirements, as discussed below.

California Energy Commission (CEC)

According to the State Building Efficiency Standards (2005), Section 10-106 allows local jurisdictions to adopt energy standards more stringent than state standards. Local governments must apply to the CEC for approval of mandatory requirements. The application must include documents supporting the jurisdiction's analysis for how the proposed standards will save more energy than the current statewide standards. The CEC then verifies that local standards will require buildings to use less energy than the current standards. StopWaste.Org has completed a Cost Effectiveness Analysis for climate zones 3 and 12 for cities within Alameda County. Since Oakland is located in climate zone 3, staff can use this cost effectiveness study to comply with the CEC requirements. Several other jurisdictions within Alameda County have successfully submitted the same Cost Effectiveness Study to the CEC. Staff will submit the Cost Effectiveness Study to the CEC for review and approval between the City Council's 1st and 2nd reading of the Ordinance. The Cost Effectiveness Study is included as Attachment E.

California Green Building Standards Code / State of California Building Standards Commission

The California Building Standards Commission adopted the Green Building Standards Code, Title 24 Part 11 in 2008. The purpose of this code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental air quality. The code covers both residential and non-residential buildings. Most measures are voluntary were several mandatory measures.

Recently, the state approved amendments to the Green Building Standards Code. The measures are only applicable to new construction and include basic stormwater measures, water efficient fixtures, construction management plans, VOC limits, bike parking requirements, and indoor air quality measures.

Other measures are now divided into two tiers (prescriptive and performance approaches) and these tiers are voluntary measures. The tiers describe how a project can achieve a "Calgreen" label by exceeding the mandatory standards. Within the tiers there are different requirements related to water and energy consumption; waste diversion; low-pollutant paints, and carpets, and flooring, to name a few. However, staff believes the new voluntary measures are really just best practices and the Calgreen label is not stringent enough to be considered as part of the Ordinance. It is not a holistic approach to green building and instead it is staff's opinion that it focuses more on products rather green building systems. Furthermore, Calgreen tiers do not require verification of these measures by a third party in order to be called a Calgreen project.

The state still allows local jurisdictions to exceed and modify the adopted building codes on the basis of climactic, topographical, and geological findings. Because the City's Green Building Ordinance involves amendments to the California Building Code, staff has made these findings and will submit them to the Building Standards Commission (BSC). Currently the BSC only files the findings. They do not review and approve and they currently have no authority to deny the submitted findings. The BSC has adopted StopWaste.Org's Model Findings into the appendix of the Green Building Standards Code as an example of how to prepare Model Findings. Staff has completed the Findings based on StopWaste.Org's model document and these are included as Attachment F.

KEY ISSUES

As stated above, staff presented the proposed thresholds to the Special Projects Committee who had concerns regarding the thresholds for high-rise residential, historic buildings, and neighborhood projects. In subsequent meetings with the development community these specific thresholds continued to be of significant concern. Below is a summary of these and other key issues (see also Attachment G).

Residential High-rise Projects

Staff originally required that high-rise residential projects (those projects requiring a Conditional Use Permit for a Large-Scale Development) to attain LEED Silver certification. Staff's reasoning was that this would be the same threshold as for large scale, high-rise commercial buildings. Based on further conversations with StopWaste.Org, Build It Green, and architects, a developer can choose whether to install a residential system or commercial system. Since the applicant can choose and is not required to install a commercial-type mechanical system staff believes that the Build It Green threshold of 50 points is appropriate. If an applicant wanted to certify under the LEED rating system that would be considered an acceptable alternative compliance option, as it would for all projects. Staff believes that these changes address the development community's concerns.

Demolition of a Historic Resource and New Construction

Staff originally proposed that new construction projects that demolish a historic structure automatically start out with a 50% negative point value and must achieve LEED Silver (without the negative start it would be a LEED Gold project). The purpose of the negative points was to require a penalty for not incorporating the historic structure or adaptive reuse of the building into the project. The Special Projects Committee thought that the negative point requirement was confusing. Staff eliminated this language to just require a LEED Gold building with certification for commercial projects. Commenter's at the hearing were also concerned that LEED certification was being required for new residential construction with demolition of a historic resource. Staff clarified the language for residential projects. The applicant must submit the appropriate GreenPoint Rated checklist, meet with a Historic Preservation Planner and achieve 75 green building points and attain certification. The applicant must also "deconstruct" the historic resource to preserve and recycle the existing building materials.

Staff has received many comments regarding this premium for demolition of a historic resource and new construction. Staff believes that the threshold is still appropriate for reasons detailed below.

Embodied Energy and Waste Regarding Demolition of Existing Buildings

The biggest issue within the green building community has become how to address existing buildings. According to the California Energy Commission approximately 72% of California's existing residential stock and approximately 46% of its non-residential buildings were built the adoption of the California Title 24 energy code. According to Oakland's Historic Element of about half of the City's buildings date from before 1946.

However, when analyzing the energy efficiency of a building most people only refer to the operating energy or how much energy it takes to heat, cool, and light a building. Embodied energy or the amount of energy bound up in the existing building or how much energy it took to build the building is not considered. According to a recent article in Preservation Magazine, a new energy-efficient office building doesn't start saving energy for about 40 years. If a new building replaces (demolishes) an older building it takes 65 years to recoup the energy lost because the demolition and disposal of construction materials consumes a significant amount of energy. For a residential building, it takes 13 years to recoup the lost energy but given the current size of new homes the time period would increase to 28 years.

As also shown previously in the report, the construction of buildings generate 30% of waste output/136 million tons annually in the US. Statewide, California landfills are heavily impacted by over 4 million tons of construction and demolition (C&D) debris each year. According to the US EPA, building demolition accounted for 48% of the national C&D waste stream per year, while renovations accounted for 44%.

In summary, the renovation of existing buildings will be major factor in achieving the state's goal of a reduction in GHG emissions reduction by 80 percent of 1990 levels in 2050 or the City's preliminary goal of 36% by 2020. However, it is not the state's intention to promote demolition of existing buildings and new construction to completely achieve this goal. Based on the Greenhouse Gas Reduction Strategies [3] developed by the state's Climate Action Team, zero waste and high-recycling programs would account for 10 million tons of CO2 saved by 2020. This is the third highest strategy after vehicle standards and a renewable energy portfolio.

Economic Reasons to include Historic Commercial Buildings in the Ordinance

[3] Climate Action Team; http://www.climatechange.ca.gov/publications/factsheets/2005-06_GHG_STRATEGIES_FS.PDF

The retention and remodel of existing buildings makes sense not only from a waste and energy standpoint but from an economic one. Staff had several discussions with the Economic Development Division about whether to include a threshold related to historic commercial buildings. Recently commercial developers have begun to voluntarily certify new Class A buildings through the LEED rating program. Class A spaces are typically the highest quality office space locally available, including modern construction with state-of-the-art functionality and architectural design, infrastructure, life safety and mechanical systems. Potential tenants see the benefit of LEED certification because that ensures a healthier working environment, locations close to transit, with natural lighting and other sustainable features.

However, many tenants see an existing commercial building, typically Class B or C, as inferior to a newly built commercial building. The Economic Development Division confirmed that they have a harder job finding tenants for these spaces because they are not LEED certified. It is one of the first questions posed to the Division when discussing available office space. The fact is that the Class B and C buildings will not be able to compete for tenants unless the City addresses existing alterations or remodels of these buildings. As unoccupied, these buildings will fall into disrepair and eventually an applicant will request demolition. However, there is a proven market for Class B and C buildings with lower lease costs than Class A buildings but with LEED certification. The Uptown Arts Building is a recent example of an existing historic building that achieved LEED certification for a renovation.

Staff's Approach to Existing Buildings including Historic Resources

While buildings can be constructed using "green" techniques, based on the statistics above, the preservation and rehabilitation of existing building stock (including historic properties) plays an even bigger part in achieving significant reductions in waste, energy and water use, green house gas emissions and regional competiveness. Many jurisdictions addressed building renovations but exempted historic buildings from their green building ordinances. It seems part of their reasoning stemmed from the assumptions that 1) historic buildings are already green based on material consumption savings in these buildings and 2) that green renovations would harm the historic status of the building. The exception to this thinking is San Francisco's green building ordinance which addresses demolition of any building.

It has been well-documented that historic buildings can attain green building certification. As of 2005 approximately 131 historic building applications have been registered as a LEED projects through the USGBC and 4.2% of those were National Register resources. Furthermore, the State Office of Historic Preservation "promotes energy and resource conservation in historic buildings and believes this can be accomplished responsibly without compromising the qualities that define their intrinsic historic character." So while historic buildings are intrinsically "green", there is an opportunity to improve upon the sustainable features in these buildings without compromising the historic components. Historic Residential Buildings can also achieve a Build It Green's Existing Home certification.

Lastly, staff believes that a comprehensive green building ordinance must address the entire lifecycle of a building including demolition. Staff believed that it was too onerous a requirement to address the demolition of any building in Oakland within the green building Ordinance. However, projects that currently demolish a Potentially Designated Historic Property (PDHP) rated C or higher on the Local Register must already meet more stringent entitlement (findings for demolition, CEQA review, and design review) requirements than a proposal on vacant land. Basically these properties are already singled out for additional and stricter consideration based on the historic nature of the property. The Green Building Ordinance proposal for additional green building requirements for projects that involve demolition of a PDHP parallels this policy direction of more stringent review and requirements. By accommodating an existing historic building into the proposed project, less energy is consumed, construction waste is diverted, and material resources are saved. In sum, new construction requirements alone cannot achieve Oakland and the state's sustainable goals.

Premium for Demolition of a Historic Resource

Based on the information above, staff believed that it would be a glaring omission to exclude renovations and demolition of historic properties from a green building ordinance. Staff increased the required number of green measures/points as a disincentive to demolish a historic resource. This premium to demolish a historic building is also largely based on discussion that occurred during the public hearing to adopt San Francisco's green building policy. The San Francisco Board of Supervisors required an applicant go beyond the base green building thresholds if demolition occurs as part of the project in order to close, what they believed was a loophole actually encouraging demolition of historic resources. The thought was that an applicant would claim that they *needed* to demolish a historic structure in order to meet the stringent green building ordinance. Staff believes the same risk to historic structures applies in here Oakland as well. Oakland's Historic Element states that since World War II, Oakland has lost a significant number of historic properties due to demolition, insensitive alteration or neglect. This trend is still continuing. Therefore, staff included a 25 point increase for residential buildings and an increase from LEED Silver to LEED Gold for non-residential buildings if demolition of a resource is included in the project. Staff believes that this type of disincentive for demolition will preserve more historic projects especially where there is already a disincentive (public comment, expensive CEQA review, consistency with City policy, etc) for demolition.

Consistency with the General Plan

Staff also included the disincentive to demolish a historic resource for consistency with and to implement the General Plan. As detailed above in the *General Plan* section several objectives, policies, and actions promote the reuse of vacant or underutilized buildings and enacting of policies to discourage demolition. In fact one of the major goals of the Historic Preservation Element is to "preserve, protect, enhance, perpetuate, use, and prevent the unnecessary destruction or impairment of properties or physical features of special character or special historic, cultural, educational, architectural, or aesthetic interest or value." Policy 2.1 states that the City shall use a combination of incentives and regulation to encourage preservation of significant historic properties... Staff believes that the green building Ordinance is one of many ways in which this policy can be implemented. The work on demolition and alteration findings that will be considered by the Planning Commission is another such area.

The green building Ordinance will complement the proposed demolition findings, as well as other existing policies. Staff consistently uses ordinances to implement General Plan policies and actions. Since the Green Building Ordinance addresses construction waste and reuse of materials and the Historic Preservation Element addresses demolition (i.e. waste), staff believes that is appropriate to include stricter demolition thresholds for historic resources in a green building ordinance. The proposed demolition threshold is not intended to circumvent or eliminate but complement existing and proposed policies encouraging preservation of existing buildings and historic resources.

Finally, staff is also offering an incentive for applicants to rehabilitate and renovate a historic commercial building. In the proposed Ordinance the applicant must only attain LEED Certified for a non-residential building. The reduction in the requirement, from LEED Silver for new construction to LEED Certified for renovations, is meant to encourage project applicants to save and rehabilitate the building instead of demolishing. There is no such incentive for residential projects since staff is using the minimum level for certification as the baseline threshold and we would not want to eliminate certification completely for residential projects.

Possible Options for Consideration

Staff believes that the development community still has concerns with a premium threshold for demolition of a historic resource. Below are several options for the Planning Commission's consideration in order of staff's support.

- The Planning Commission could consider a reduction in the point requirement from 75 points to a lesser number.

  Staff would not recommend lowering the residential threshold to less than 60 points. Staff choose based on what we believed was an adequate disincentive since a GreenPoint Rated project automatically receives 30 points just for meeting the pre-requisite of 15% above Title 24. Furthermore many other cities ordinances already go above the 50 point baseline including, but not limited to:
  - Sunnyvale 70 points > 1,500 sf
  - Palo Alto – 70 points for projects >1,250 sf
  - San Francisco 75 points in 2012
  - San Raphael 60 points

- The Planning Commission could reduce the threshold to only include historic resources that are Landmarked, in a Preservation District, or have a historic rating through the Oakland Cultural Heritage Survey of an A or B.

  Staff believes that decreasing the threshold for green building requirements would be a mistake. It would exempt a majority of the historic building stock from the requirement and could result in significant demolition of C rated buildings in Areas of Primary Importance. Furthermore, the resources listed above already are more difficult to demolish due to CEQA. Therefore, reducing the requirement would not impart as significant a disincentive.

- The Planning Commission could eliminate the disincentive threshold for demolition.

  Staff would not recommend this option. However, if the Planning Commission chose to pursue this option staff would recommend that the Planning Commission include in the Ordinance a policy statement that preservation of historic resources is an important factor in achieving the city's green building goals and that demolition of these resources is contrary to the City's green building and climate goals, as well as the HPE's goals.

LEED for Neighborhood Development

Staff eliminated this threshold for consideration.

Costs

Developer Costs

Sustainable buildings generally incur a premium above the costs of standard construction in order to implement green features and systems. However, they also provide an array of financial and environmental benefits that conventional buildings do not. Benefits, such as energy and water savings, should be looked at through the life cycle of a building, not just evaluated in terms of upfront costs. The life cycle costs include initial costs (design and construction); operating costs (energy, water/sewage, waste, recycling, and other utilities); maintenance, repair, and replacement costs; and other environmental or social costs/benefits (impacts on transportation, solid waste, water, energy, infrastructure, worker productivity, outdoor air emissions, etc). Although some of the benefits (indoor air quality and health) are difficult to quantify, if the costs are viewed from an overall building life cycle standpoint, the savings resulting from an initial investment in sustainable design and construction techniques will exceed any additional upfront costs.

The proposed Green Building Ordinance will require upfront costs to an applicant. According to a 2003 report to the California Sustainable Building Task Force the upfront costs for a LEED building are estimated at about 2% with additional costs for a LEED platinum building.4 This percentage was based on LEED certified buildings and so includes the third party certification through the USGBC. StopWaste.Org concurs that a green building will cost about 2-5% more than a conventional building.

Staff Costs

Similarly to San Jose's green building ordinance, the proposed Ordinance has been designed to limit the impact on existing staff resources and avoid new development fees by having a third-party verify project compliance with the applicable green building standard. Staff believes that having a project be reviewed for compliance through each stage in the development process, i.e. planning entitlements, plan check review, and inspections, will result in a project meeting the Ordinance without additional fees or deposits. Staff believes that this checks and balance approach will be successful. However, the City may choose to include a fee or deposit if necessary to recoup unintended staff costs.

Implementation of the policy will still require increased staff time but due to the involvement of the third party rater is not expected to increase costs. Staff has already drafted public information materials and development application materials. Staff will need to train staff on implementation of the proposed policy as well as assist the public with implementation.

Incentives

The Planning Commission reviewed the issue of incentives at the October 2008 hearing. They were not inclined to pursue any incentives at that time. However, this is still an issue within the development community and staff anticipates holding additional community meetings to discuss this further.

CONCLUSION

As stated earlier in the report, building construction renovations, and demolition have serious effects on the environment in terms of energy consumption, material resources, overall waste, and air quality. Oakland is at the forefront of these issues with the adoption of the Sustainable Development Initiative, the Urban Accords, and preparation of an Energy and Climate Action Plan. As shown in the discussion above, the proposed green building Ordinance takes into account the specific development conditions in Oakland including Oakland's sustainable and General Plan goals and policies. The Ordinance is progressive and comprehensive, addressing all types of construction through the building's complete lifecycle.

RECOMMENDATIONS:

Staff asks that the Planning Commission:

1. Review the staff report,
2. Receive public comments,
3. Affirm staff's environmental determination based on the findings contained in the report, and

4 The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force; October 2003

4. Recommend approval of the proposal to the City Council for adoption.

Respectfully submitted:

ERIC ANGSTADT
Deputy Director
Community and Economic Development Agency

Prepared by:

Heather Klein
Planner III, Major Development Projects

Attachments:
A: CED Report dated, October 14, 2008
B: Green Building Checklists
C: Draft Oakland Municipal Chapter 18.02
D: Categorical Exemption CEQA Document
E. Cost Effectiveness Study for the CEC and the Model Findings for the BSC
F: LEED for Neighborhood Development and General Plan Consistency
G: Public Comments

Changes to ordinance from the April 21, 2010 City Planning Commission Hearing

Modifications to the ordinance as directed by the City Planning Commission at the **April 21, 2010** meeting are indicted in underlined type for additions and ~~cross out type~~ for deletions.

1. Modification to definition of a Historic Resource

Section 18.02.030 Definitions

HISTORIC RESOURCE for the purposes of this Chapter only means a Historic Resource, including any Designated Historic Property, any Potentially Designated Historic Property that have an rating~~ed~~ of A or B ~~by the Oakland Cultural Heritage Survey, not including the contingency rating,~~ or ~~and any Potentially Designated Historic Property that is~~ are located within an Area of Primary Importance as these capitalized terms are defined in Oakland's Historic Preservation Element.

2. Modifications to the Compliance Standards Tables to address the required and optional checklist, definition of a Historic Resource

Article III - Green Building Compliance Standards

Section 18.02.090 Compliance Standards Table Effective until December 31, 2010

The criteria in the Compliance Standards Table, below, applies 30 days after adoption of this Chapter and ends December 31, 2010.

1. Residential New Construction	
A. One and Two Family Dwellings (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Single Family GPR *Alternate* • LEED for Homes	Completed checklist
B. Multi-Family Dwellings (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Multi-Family GPR *Alternates* • Build It Green: Single Family GPR, or • LEED New Construction	Completed checklist

Attachment B

2. Residential Additions and Alterations

A. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

3. Non-Residential New Construction

A. Non-Residential projects between 5,000 to 10,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	Completed checklist

B. Non-Residential projects between 10,000 to 25,000 sq. ft. of total floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial Checklist)

C. Non-Residential projects over 25,000 sq. ft. of total floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	Completed checklist

4. Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations between 5,000 - 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	Completed checklist

B. Non-Residential Additions and Alterations (see Major Alteration definition) over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist	Completed checklist

C. Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial Checklist)

5. Removal of a Historic Resource and New Construction

A. New Construction projects resulting in removal of a Historic Resource

Checklists	***Minimum Requirements***
Required for Residential Construction -One and Two ~~Single-Family~~ (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction -Multi-Family (3+ units) (Group R Occupancy)* • Build It Green: Multi-Family GPR *Alternate for Residential Construction* • LEED Homes *Required for Non-Residential Construction(any square footage)* • LEED New Construction *Alternate for Residential Construction* • LEED Homes *Alternate for Non-Residential Construction (any square footage)* • Other applicable LEED checklist	Completed checklist

6. Historic Residential Additions and Alterations

A. ~~Single-Family~~ One and Two-Family Additions and Alterations of ~~Potentially Designated~~ Historic Resources ~~rated C or higher~~ that exceed 1,000 sq. ft of floor area

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

7. Historic Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations of a Historic Resources between 5,000 - 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	Completed checklist

B. Non-Residential Additions and Alterations of a Historic Resources over 25,000 sq. ft. of floor area (see Major Alteration definition)

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist	Completed checklist

***C.* Alternate compliance: Non-Residential Additions and Alterations of a Historic Resources not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area**

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial

8. Affordable Housing Construction receiving City/Redevelopment Agency Funds

A. One, Two, and Multi-Family New Construction

Checklists	***Minimum Requirements***
Required for Residential Construction - One and Two Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy* • Build It Green: Multi-Family GPR *Alternates* • LEED Homes, or • LEED New Construction	• Completed checklist • The minimum point requirement for certification • Green Building Certification

B. One and Two Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

9. Mixed-Use Construction

A. ~~Portion of project exceeding thresholds as defined above will determine the rating system and checklist for whole project~~ Both residential and non-residential uses

Checklists	***Minimum Requirements***
As determined by Planning Staff based on square footage of each use and which rating system and checklist is more appropriate • ~~Build It Green~~ • ~~LEED Checklist~~ • ~~Small Commercial Checklist~~	Completed checklist

B. Alternate compliance path: Certify each portion of the building separately per the appropriate GreenPoint Rated, LEED or Stopwaste.Org checklist)

Checklists	***Minimum Requirements***
As Determined by Planning Staff • ~~Build It Green~~ • ~~LEED Checklist~~ • ~~Small Commercial Checklist~~	Completed checklist

10. Construction Requiring a Landscape Plan	
A. Construction projects over ~~between~~ 500 ~~- 25,000~~ sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternates* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	Completed checklist
~~**B. Construction projects greater than 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan**~~	
~~***Checklists***~~	~~***Minimum Requirements***~~
~~*Required*~~ ~~• Bay Friendly Basic Landscape Checklist~~	~~Completed checklist~~

Section 18.02.100 Compliance Standards Table Effective January 1, 2011

The following green building requirements shall **be effective January 1, 2011 and thereafter** as follows:

1. Residential New Construction	
A. One and Two Family Dwellings (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Single Family GPR *Alternate* • LEED for Homes	• Completed checklist • Minimum point requirement for certification • Green Building Certification
B. Multi-Family Dwellings (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Multi-Family GPR *Alternates* • Build It Green: Single Family GPR, or • LEED New Construction	• Completed checklist • Minimum point requirement for certification • Green Building Certification

2. Residential Additions and Alterations

A. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist • Minimum point requirement for certification (Elements Label) • Green Building Certification (Elements Label) *Alternate* • Completed checklist • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

B. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)

Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Minimum point requirement for certification • Green Building Certification

3. Non-Residential New Construction

A. Non-Residential projects between 5,000 to 10,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential projects between 10,000 to 25,000 sq. ft. of total floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and Small Commercial Checklist	• Completed checklist (LEED and Small Commercial Checklist • All applicable measures on the Small Commercial Checklist • Green Building Certification

C. Non-Residential projects over 25,000 sq. ft. of total floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	• Completed checklist • LEED Silver point requirement • Green Building Certification

4. Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations between 5,000 - 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential Additions and Alterations (see Major Alteration definition) over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternates* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist	• Completed checklist • LEED Silver point requirement • Green Building Certification

C. Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • ~~LEED for Commercial Interiors~~ • Other appropriate LEED checklist, and Small Commercial Checklist	• Completed checklist (LEED and Small Commercial Checklist) • All applicable measures on the Small Commercial Checklist • Green Building Certification

5. Removal of a Historic Resource and New Construction

A. New Construction projects resulting in removal of a Historic Resource

Checklists	***Minimum Requirements***
Required for Residential Construction - One and Two ~~Single~~ Family(Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy)* • Build It Green: Multi-Family GPR *Alternate for Residential Construction* • LEED Homes *Required for Non-Residential Construction (any square footage)* • LEED New Construction *Alternate for Non-Residential Construction (any square footage)* • Other applicable LEED checklist	*Required* • Completed checklist • Consultation with a Historic Preservation Planner • LEED Gold for non-residential construction or 75 GPR points for residential construction • Green Building Certification • Deconstruction of the Historic Resource *Alternate LEED for Homes* • Same as required above, except certification threshold is LEED Silver

6. Historic Residential Additions and Alterations

A. One and Two-Family ~~Single-Family~~ Additions and Alterations of ~~Potentially Designated~~ Historic Resources ~~rated C or higher~~ that exceed 1,000 sq. ft of floor area

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed Checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification (Elements Label) *Green Building Certification* *Alternate* • Completed checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

B. Multi-Family Additions and Alterations of ~~Potentially Designated~~ Historic Resources ~~rated C or higher~~

Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification • Green Building Certification

7. Historic Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations of a Historic Resources between 5,000 - 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	• Completed checklist • Consultation with a Historic Preservation Planner • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential Additions and Alterations of a Historic Resources over 25,000 sq. ft. of floor area (see Major Alteration definition)

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • ~~LEED Commercial Interiors~~ • Other appropriate LEED checklist	• Completed checklist • Consultation with a Historic Preservation Planner • LEED "Certified" point requirement • Green Building Certification
Checklists	***Minimum Requirements***

8. Affordable Housing Construction receiving City/Redevelopment Agency Funds

A. One, Two, and Multi-Family New Construction

Checklists	*Minimum Requirements*
Required for Residential Construction - One and Two ~~Single~~-Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy* • Build It Green: Multi-Family GPR *Alternates* • LEED Homes, or • LEED New Construction	• Completed checklist • Minimum point requirement for certification • Green Building Certification

B. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	*Minimum Requirements*
Required • Build It Green: Existing Home GPR	*Required* • Completed Checklist • Minimum point requirement for certification (Elements Label) • Green Building Certification *Alternate* • Completed checklist • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

C. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)

Checklists	*Minimum Requirements*
Not available	When available: • Completed checklist • Minimum point requirement for certification • Green Building Certification

9. Mixed-Use Construction

A. Both residential and non-residential uses ~~Portion of project exceeding thresholds as defined above will determine the rating system and checklist for whole project~~

Checklists	*Minimum Requirements*
As determined by Planning Staff based on square footage of each use and which rating system and checklist is more appropriate • ~~Build it Green~~ • ~~LEED Checklist~~ • ~~Small Commercial Checklist~~	• Completed checklist • Minimum point requirement for certification • Green Building Certification

B. Alternate compliance path: Certify each portion of the building separately per the appropriate GreenPoint Rated, LEED or Stopwaste.Org checklist)

Checklists	*Minimum Requirements*
As Determined by Planning Staff • ~~Build-It-Green~~ • ~~LEED Checklist~~ • ~~Small Commercial Checklist~~	• Completed checklist • Minimum point requirement for certification • Green Building Certification

10. Construction Requiring a Landscape Plan	
A. Construction projects between 500 - 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternates* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	Completed checklist
B. Construction projects greater than 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternate* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	• Completed checklist • All applicable measures on the Bay Friendly Basic Landscape Checklist • Green Building Certification

3. Modifications to the Address Determination of appropriate Checklist

Section 18.02.110 Green Building Documentation Requirements

A. Green Building Documentation

Application submittals during the Entitlement Phase shall include:

a) A completed copy of the applicable Checklist(s), as determined by Planning and Zoning Division staff.

4. Modifications to the Address Re-Review of Ordinance

SECTION 7. Annual Review

The Community and Economic Development Agency shall review this ordinance biannually and provide a report to the Planning Commission to determine whether it needs to be updated because of, but not limited to, new legislation enacted by the State or new standards developed by applicable organizations, such as StopWaste.Org, Build It Green, and LEED or the development of another effective rating system.

CEQA DETERMINATION FOR
THE GREEN BUILDING FOR PRIVATE DEVELOPMENT PROJECTS ORDINANCE
CASE FILE NUMBER ZT09157

I. INTRODUCTION

This document provides a description of the proposed Sustainable Green Building Requirements for Private Development Ordinance (proposed project), and evaluates the applicability of Categorical Exemptions for this proposed project, in accordance with the California Environmental Quality Act (CEQA).

II. PROJECT DESCRIPTION

The following provides a brief description of the project location, objectives and scope.

Project Location

The proposed Ordinance applies citywide and would, therefore, involve various land uses and settings (downtown, residential neighborhoods, commercial areas, and private open spaces, etc.)

Project Objectives

The demolition, construction, and operation of buildings have an impact on the environment, the economy, and our health. Nationwide, buildings are the largest contributor to green house gases.[1] According to the U. S. Environmental Protection Agency, buildings in the United States, account for:

- 39% of total energy use
- 72% of electricity consumption
- 39% of carbon dioxide emissions
- 30% of greenhouse gas emissions (known contributor to Global Warming)
- 26% of waste stream/ Construction and Demolition debris
- 13% of potable water consumption

In California, which has a cleaner mix of energy than national averages, buildings are the second largest contributor (about one-quarter) to California's green house gas (GHG) emissions.[2] Given these statistics, improving energy efficiency and indoor air quality in buildings and reducing water consumption, waste, and material resources is fundamental to reducing the impacts of conventional building. Green building is a holistic approach to the life-cycle of a building including location, siting, design, construction, operation and demolition. This approach has been proven to greatly reduce the impacts of conventional building. Green Building techniques include choosing an appropriate location away from habitats, greenfields, and near infill development or an already developed site; siting a building to take advantage of passive heating cooling methods; improving energy efficiency; reducing water consumption, and reusing buildings or alternatively using recycled or sustainable products that preserve non-renewable natural resources. Green buildings benefit occupants through the use of healthy building materials, including zero to low Volatile Organic Compound (VOC) and formaldehyde-free products. Furthermore, the Attorney General has identified green building measures to address CEQA and global warming impacts at a local level.

[1] American Institute of Architects, Sustainability 2030

[2] This estimate accounts only for electricity, natural gas, and water use in homes and commercial buildings; if the estimate include emissions savings from recycling waste or fuel savings from transit oriented developments, the number would be far higher.

While the City already has a Green Building Ordinance for City projects, the adoption of a Green Building Ordinance for private development projects would further the City's General Plan, Sustainable Development Initiative, Waste, and Urban Accord's goals and policies, as well as directives from the state such as AB 32.

In addition to building impacts, the design, construction and maintenance of landscapes within the City can also have a significant impact on the City's environmental sustainability, use of resources, and the health of the watershed and San Francisco Bay. Based on the Alameda County Waste Characterization Study of 2000, 7% of the materials disposed of in Alameda County landfills are from landscape construction, renovation and maintenance and beginning in 2009 plant debris will be banned from Alameda County landfills. In addition to waste issues, the largest use of urban water is for landscape watering[3]. The water supply is limited, there is an increasing demand, and California could be entering its fourth consecutive year of serious drought conditions. While the majority of water to Oakland flows by gravity from the Sierras, energy is also used to deliver, pump and treat water to residents.

Therefore, a holistic approach to green building would include landscapes that are part of construction projects. Implementation of a green building proposal that includes landscapes nurtures healthy soils while reducing fertilizer and pesticide use, prevents erosion and runoff; reduces waste through use of recycled content materials; conserves water and energy; and enhances wildlife habitat. In addition, green landscaping features would reduce greenhouse gas emissions, improve air quality, and enhance urban sustainability.

Proposed Ordinance

The proposed Ordinance references three green building rating programs, recognized nationally, statewide, and countywide. These rating programs are Build It Green's GreenPoint Rated for residential projects, the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) for non-residential projects, and StopWaste.Org's Small Commercial Project Checklist and the Bay-Friendly Landscape Checklist. LEED and GreenPoint Rated are point based systems with third party certification. Projects must pre-qualify by meeting pre-requisites. The project team then designs features into the project to qualify for additional points. The rating system is flexible in that the applicant can choose points or design for points based on the project. However, a certain amount of points must be achieved in each environmental category. The points are tallied to achieve a rating. At the end of the project, the applicant team must submit documents to verify compliance with the rating system. The rating program reviews the documentation and certifies the project as a green building project. Stopwaste.Org's Small Commercial Project Checklist and the Bay Friendly Basic Landscape Checklist were not designed to be point based systems. Instead, this system is implemented like "best management practices" and the applicant is required to do all that apply to the scope of the project. The proposed requirements are split into six main parts:

1. Residential
2. Non-Residential
3. Historic
4. Projects with receiving City/Redevelopment Agency Funds
5. Mixed Use
6. Landscapes

Generally, the Ordinance is implemented over a six month period. Thirty-days after adoption of the Ordinance and until January 1, 2011 the Ordinance will be voluntary except for submittal of the appropriate checklist. Starting January 1, 2011 the Ordinance would be fully operative and the project applicant must meet any pre-requisites, a minimum point level, and be certified by the appropriate rating program. The size thresholds for compliance are directly related to existing Planning and Building Code permit thresholds.

[3] Department of Water Resources

III. CEQA ANALYSIS

The Zoning Administrator independently finds and determines that the project is exempt from CEQA pursuant to CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection of Natural Resources), 15308 (Actions by Regulatory Agencies for Protection of the Environment), and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning), each of which constitutes a separate and independent basis for the exemption. The following is an analysis discussing the reasons why this project is exempt from CEQA, and reasons why any CEQA Guidelines Section 15300.2 exceptions do not apply to the categorical exemptions. The discussion of environmental topics, below, utilizes the City of Oakland's CEQA Thresholds/Criteria of Significance Guidelines and Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval, which are applied to projects on a Citywide basis

Section 15060(c)(2), 15061(b)(3) - General Rule, Section 15307 (Class 7) - Actions by Regulatory Agencies for Protection of Natural Resources and Section 15308 (Class 8) Actions by Regulatory Agencies for Protection of the Environment

The proposed Ordinance is not subject to CEQA pursuant to CEQA Guidelines Section 15060(c)(2). This section states:

> (c) Once an application is deemed complete, a lead agency must first determine whether an activity is subject to CEQA before conducting an initial study. An activity is not subject to CEQA if:
>
> (2) The activity will not result in a direct or reasonably foreseeable indirect physical change in the environment;

The Ordinance also is exempt pursuant to CEQA Guidelines Section 15061(b)(3). This Section states:

> (b)A project is exempt from CEQA if:
>
> (3) The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

In addition, the proposed project qualifies for a Categorical Exemption under CEQA Guidelines Section 15307, Actions by Regulatory Agencies for Protection of Natural Resources. Section 15307 states:

> Class 7 consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment. Examples include but are not limited to wildlife preservation activities of the State Department of Fish and Game. Construction activities are not included in this exemption.

Furthermore, the proposed project qualifies for a Categorical Exemption under CEQA Guidelines Section 15308, Actions by Regulatory Agencies for Protection of the Environment. Section 15308 states:

> Class 8 consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption.

As shown in the Determination section below, the Ordinance will not result in a direct or reasonably foreseeable indirect adverse physical change in the environment or a significant adverse effect on the environment. The Ordinance will also not have a significant adverse impact on natural resources or the environment. The Ordinance would minimize the negative impacts of conventional building and landscaping techniques to the environment, occupant health, and the economy. Specifically, the Ordinance would improve aesthetics by promoting longer lasting, higher quality building materials; improve air quality both indoor and out; protect and restore biological and cultural resources; reduce the use of hazardous materials; reduce water consumption and improve water quality; reduce traffic due to the use of transit and alternative transportation; and minimize the strain on utilities and local services. Any impacts associated with potential construction would be less likely due to implementation of the Ordinance. Therefore, staff finds that the proposed Ordinance is exempt from CEQA review.

Section 15300.2 - Exceptions:

CEQA Guidelines Section 15300.2 lists the following project types for which Categorical Exemptions may not apply. The following section discusses whether the project would be subject to any of these exceptions. The exceptions are presented in **bold**, followed by a discussion about how the project is not subject to each exception.

(a) **Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located – a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply in all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.**

Exception (a), as described above, only applies to Classes 3, 4, 5, 6, and 11. Since the proposed project qualifies for a Categorical Exemption under Class 7 and 8 in the *CEQA Guidelines* (Actions by Regulatory Agencies for Protection of Natural Resources, Section 15307 and Actions by Regulatory Agencies for Protection of the Environment, Section 15308), this exception does not apply.

Nonetheless, there is no evidence to suggest that the Ordinance would have a significant impact due to its application in a particularly sensitive environment. The rating systems contains points that include the avoidance of prime farmland, parkland, five feet lower than the 100-year floodplain as mapped by FEMA, land specifically identified as habitat for species on a Federal or State threatened or endangered lists, and undeveloped land near a water body consistent with the Clean Water Act. These points encourage appropriate site selection and design of structures with minimal footprints to minimize site disturbance in sensitive areas. Therefore, the Ordinance will not adversely affect an environmental resource of hazardous or critical concern.

(b) **Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.**

The proposed green building ordinance will not have a significant, adverse cumulative impact on the environment. To the contrary, the Green Building Ordinance will reduce many cumulative impacts that have occurred or would occur using conventional building techniques. Green building techniques will reduce energy and water consumption and the strain on infrastructure and utilities. Examples of specific measures include optimizing energy performance, providing on-site renewable energy, purchasing of green power, use of passive heating and cooling, installation of energy efficient appliances, limitations or elimination of potable water for landscaping, and water use reduction through efficient fixtures. The Ordinance will improve air quality and traffic circulation as well as protecting biological and cultural resources. Specific examples include indoor air quality management, use of low emitting materials, HVAC filters, access to public transportation, inclusion of bike and pedestrian facilities, a reduction of parking, and measures to protect biological and cultural resources as discussed throughout this document.

(d) **Scenic Highways. A categorical exemption shall not be used for a project which may result in *damage to scenic resources, including but not limited to, trees, historic buildings,* rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.**

As shown in the Determination section below, the proposed Ordinance will not have significant adverse effect on scenic highways. While the rating systems do not specifically mention scenic highways, the proposed rating systems contain points related minimizing site disturbance. Examples include protection of greenfields, maximizing open space, preservation of tree canopy and native vegetation, reuse of existing buildings, Historic Resource preservation and adaptive reuse, and redevelopment of existing buildings. Implementation of these green building measures into a project would protect scenic highways by encouraging appropriate site selection and development on infill parcels to specifically avoid damage to scenic character and natural resources. Existing policies in the OSCAR Element provide general mitigation of visual impacts. Policy OS-10.1, Policy OS-9.1, Policy OS-9.2, Policy OS-9.3, and Policy OS-10.2 in the adopted OSCAR Element and Policy T6.5 in the Land Use and Transportation Element

provide mitigation for future visual impacts. Adoption of the Ordinance alone would not increase the potential for impacts.

(e) **Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list complied pursuant to Section 65962.5 of the Government Code.**

As shown in the Determination section below, the proposed Ordinance would not create a hazard or hazardous material impact. The proposed rating systems contain points that discourage the use of hazardous materials during construction and operation of buildings. Examples include use of low VOC paints, sealants, and adhesives; green flooring; low formaldehyde cabinets and wood products; low emitting materials; construction and indoor air quality management plans. The landscape rating program encourages the use of natural (not chemical) fertilizers and pesticides. However, the rating programs do encourage redevelopment of brownfield sites. A brownfield is real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. These sites are often stigmatized due to high cost to clean the contamination and redevelop the site. In this regard, the Ordinance augments existing, complementary actions and policies that encourage clean up and redevelopment of contaminated properties, including Action 3.7.1 in the Housing Element, Action HM-1.6 in the Safety Element, Policy CO-1.2 in the OSCAR Element, and Policy I/C2.1 in the Land Use and Transportation Element (LUTE). These sites could be located on the Cortese List. However, this impact is associated with any potential construction on such sites and neither would be more likely, nor less likely, due to the Ordinance. Given that there are a relatively small number of these sites in Oakland, the extent to which those impacts could occur is too speculative currently to be evaluated; however, implementation of the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval (which have been approved by the City Council and are uniformly incorporated into development projects on a Citywide basis per O.M.C. Section 17.130.070), related to hazardous materials would reduce any impact related to hazards or hazardous materials.

(f) **Historical Resource. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.**

As shown in the Determination section below, the proposed Ordinance would not result in an adverse impact to a historic resource. To the contrary, the rating program contains points that encourage the retention and adaptive reuse of historic structures by reusing and maintaining 75% to 95% of the building structure. The Ordinance also provides disincentives for the demolition of these buildings by increasing the level of green features in the building and requiring deconstruction and recycling of all applicable building materials. In this way the proposed Ordinance cannot be used to encourage demolition of historic buildings. The other thresholds for alterations and remodeling projects are not anticipated to change the historic character and significance of the building as these are interior projects. A meeting with a Historic Preservation Planner is required to help navigate any conflicts between features that contribute to a historic rating and green building features. The California State Historic Office of Preservation has stated that historic buildings should not be exempt from Green Building Ordinances. Any construction project will be required to comply with the use of the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to demolition, grading and site disturbance in order minimize adverse effects on these resources. The Ordinance augments and complements existing policies that encourage preservation and discourage demolition of existing housing and historic buildings including Housing Element (HE) Policy 4.4; Goal 2, Objective 2, Policy 2.1, Objective 3, Policy 3.1, Policy 3.5, Policy 3.7, and Policy 3.12 in the Historic Preservation Element; Policy I/C2.2, Policy D6.2, Policy N3.6, and N9.9 in the Land Use and Transportation Element (LUTE), and Action JL-4.1 and Policy JL6 in the Estuary Policy Plan.

Section 15183 - Projects Consistent with a Community Plan, General Plan, or Zoning:

As a separate and independent basis from the other CEQA findings, pursuant to Public Resources Code Section 21083.3 and CEQA Guidelines Section 15183, the City finds and determines that: (a) the project is consistent

with the Land Use and Transportation Element (LUTE), for which an EIR was certified in March 1998; (b) feasible mitigation measures identified in the LUTE EIR were adopted and have been, or will be, undertaken; (c) the EIR evaluated impacts peculiar to the project and/or project site, as well as off-site and cumulative impacts; (d) uniformly applied development policies and/or standards (City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval)) have been adopted and found, when applied to future projects, to substantially mitigate impacts. To the extent that no such findings were previously made, the City hereby finds and determines that the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval imposed on the Project substantially mitigate environmental impacts; and (e) substantial new information does not exist to show that the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval will not substantially mitigate the project and cumulative impacts. The Ordinance implements existing policies in the Housing Element (HE) that encourage sustainable development including HE Policy 7.1 and Action 7.1.1 that specifically calls for all new private development projects and major retrofits be encouraged to use to green building features in the design and construction; Action 7.1.3 and Policy 7.2 regarding energy efficiency; Actions 7.2.1-7.2.2 which enforce energy conservation standards and encourage passive heating and cooling; and Action 7.4.1 which encourages compact building design. The Ordinance also implements OSCAR Element Policy CO-12.4 requires the design of development projects to reduce air quality impacts through vegetation, energy conservation or increased transit. Objective CO-13, which includes Policies CO-13.1 through Co-13.4.2 specifically encourage energy conservation and efficiency. Additional policies include:

Open Space Conservation and Recreation Element (OSCAR) for which an EIR was certified in June of 1996
Objectives: CO-4, CO-5, CO-6, OS-8, OS-9, CO-1, CO-2, CO-7, CO-8, CO-10, CO-12, CO-13
Policies: CO-1.1, CO-1.1.1, CO-1.1.3, CO-1.2, CO-2.1, CO-2.4, CO-4.1, CO-4.3, CO-4.4, CO-5.1, CO-5.2, CO-5.3, CO-5.3.1, CO-5.4.2, CO-6.1, CO-6.2, CO-7.1, CO-7.2, CO-7.4, CO-9.1, CO-11, CO-11.1, CO-11.2, CO-12.1, CO-12.2, CO-12.6, OS-1.3, OS-4.3, OS-8.2, OS-9.1, OS-9.2, OS-9.3, OS-10.1, OS-10.2, OS-12.3, CO-13.1 through Co-13.4.2
Actions: CO-4.1.1, CO-4.2, CO-4.2.1, CO-4.3.2, CO-5.1.1, CO-5.1.2, CO-5.3.2, CO-5.3.11, CO-7.1.4, CO-7.2.1, CO-7.2.2, CO-11.2.2, CO-12.2.3, CO-12.3.1

Safety Element for which a Negative Declaration was certified in November of 2004
Policies: GE-2, HM-2, FL-1
Actions: GE2.1-2.5, GE2.2, GE2.3, HM-2.1 through 2.5, FL-1.1, FL-1.2, FL-1.3, FL-1.4, FL-1.5, FI-3.1

Noise Element for which a Negative Declaration was certified in June of 2005
Action 3.1

Land Use and Transportation Element (LUTE) for which an EIR was certified in March of 1998 and amended in June of 2005
Objectives:
Policies: W3.4, I/C2.2, I/C3.3, T2.1, T2.2, T2.3, T2.5, T3.6, T.4.1, D6.2, N3.6, N8.1, N9.9

Historic Element for which an EIR was certified in March of 1994 and amended in July of 1998
Goals: 2
Objectives: 2-3, 4
Policies 2.1, 3.1, 3.5, 3.7, 3.12, 4.4

Housing Element for which a Mitigated Negative Declaration was certified in June of 2004
Policies: 7.1, 7.2
Actions: 1.3.4, 3.2.3, 7.1.1, 7.1.3, 7.4.1

Estuary Policy Plan for which an EIR was certified in June of 1999 and amended in June of 2006
Policies: JL6, JL-14, JL-15,
Action JL-4.1

Scenic Highway Element for which an EIR was certified in September of 1974
Policies: 3, 4, 5

Pedestrian Master Plan for which a Mitigated Negative Declaration was certified in November 2002
Policies: 2.1, 2.3,
Actions: 2.1.1, 3.2.2

DETERMINATION THAT THE GREEN BUILDING ORDINANCE IS NOT APPLICABLE TO AND EXEMPT FROM CEQA

Aesthetics

Scenic Vistas, Scenic Highways, Visual Character

The Green Building Ordinance would not affect scenic vistas, scenic resources, or visual character. None of the proposed points in the rating systems address scenic vistas specifically. However, there are points related to the water body conservation, protection and restoration of habitats or wetlands, and minimizing site disturbance through site design and construction. Furthermore, the proposed rating systems and the Ordinance encourage appropriate site selection and development on infill parcels to specifically avoid damage to scenic character and natural resources. Existing policies in the OSCAR Element provide general mitigation of visual impacts including Policy OS-10.1, Policy OS-9.1, Policy OS-9.2, Policy OS-9.3, and Policy OS-10.2. Other policies include OS-13 and Objective OS-9 in the OSCAR Element and Policy W3.4 of the LUTE encourage preservation of views and visual character, Adoption of the Ordinance alone would not increase the potential for impacts. This impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. Therefore, impacts associated with the Ordinance would be less than significant.

Potential Glare

The Green Building Ordinance alone will not cause a new source of substantial light or glare which would substantially and adversely affect day or nighttime views in the area. However, the proposed rating programs in the Ordinance do contain points for natural daylighting, and, therefore, it is possible that the amount of window glazing of some buildings and glare could increase. In addition, the Ordinance alone would not cause an increase in bird strikes due to the increase in daylighting. Since building glare is dependant on many factors such as building orientation, location near other buildings or vegetation, time of year, time of day, or glazing materials, the potential for a substantial impact is too speculative to be evaluated. Furthermore, this impact is associated with any new construction and will neither be more likely, nor less likely, due to the Ordinance. There are points for cool roofs and paving materials which include light colored materials. These materials will not create a substantial glare. Thus, this impact is less than significant. The issue of bird strikes is discussed further in the biological section below.

Shadows

The Green Building Ordinance alone would not introduce landscape that would cast shadows on existing solar collectors or cast shadows that substantially impairs the function of a building using passive solar heat collection, solar collectors for hot water heating, or photovoltaic solar collectors. However, the rating systems contain possible points that would introduce landscaping for passive design, wildlife habitat, to reduce urban heat island effect, and/or open space. In some instances, the actual building construction could cast a shadow on another building using passive solar heat collection, solar collectors, and solar panels. In addition, the adoption of the Ordinance alone will not cast a shadow on any public park, lawn, garden, or a historic resource. However, in some instances, it is possible that construction might generate a shadow that would impact these resources. This impact is associated with any potential construction near such facilities and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. Therefore, impacts associated with the Ordinance would be less than significant.

Conflicts with General Plan, Planning Code, UBC

The Green Building Ordinance will not conflict with applicable provisions related to adequate light. Each project will need to comply with the Zoning Ordinance and City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval including regulations and requirements related to the Building Code which address adequate light. Thus, there is no impact.

Wind

Adoption of the Green Building Ordinance alone will not create winds exceeding 36 mph and none of the rating systems contain points that would address wind hazards. While it is possible that future construction might generate a wind impact this impact is associated with any potential construction and would be neither more likely,

nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. The impacts associated with the Ordinance would be less than significant.

Agriculture

The Green Building Ordinance will not affect agricultural land or use. The City of Oakland is an urban community, without any substantial agricultural land or uses. The City of Oakland General Plan does not contain areas zoned for exclusively for agriculture use. Furthermore, the proposed rating systems contain pre-requisites for farmland conservation and encourage development on infill sites within urban growth boundaries, in areas with existing utilities and transit, and access within ½ to ¼ mile of neighborhood services. Thus, there is no impact.

Air Quality

Air Quality Plan
The Green Building Ordinance will not conflict with or obstruct any applicable air quality plan. The Green Building Ordinance will not conflict with or obstruct any applicable air quality plan. Any future construction would need to comply with the General Plan designations for the sites. Therefore, no significant impact will result from the Ordinance.

Construction Air Quality
The Green Building Ordinance will not violate any air quality standard, contribute to an existing or protected air quality standard violation, have a cumulative considerable net increase in pollutants, subject sensitive receptors to pollutants, result in odors, or contribute to CO concentrations. Building construction would generate short-term emissions of criteria pollutants, including particulate matter and exhaust emissions. Project related activities include demolition, site preparation, grading, and construction. Emissions generated from these activities include dust primarily from construction equipment, vehicles, and emissions from paving and coatings. Construction-related dust emissions vary from day to day depending on several factors. The Bay Area Air Quality Management District (BAAQMD)'s approach to dust emissions had been to emphasize dust controls rather than detailed quantification of emissions. However, BAAQMD's Draft CEQA Air Quality Thresholds and Guidelines released in November 2009 do establish thresholds. Any construction would be required to comply with existing policies and requirements related to air quality, including Action GE2.2 in the Safety Element (require continued enforcement of the grading, erosion, and sedimentation ordinance), Action 7.4.1 in the Housing Element (encourages compact building design), and Objective CO-1, Policy CO-1.1, Policy CO-1.1.1, CO-2.4, Objective CO-12, and Policy CO-12.6 in the OSCAR Element. The projects will need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to dust control and airborne asbestos, which reduce potential impacts to a less than significant level. The proposed rating systems in the Ordinance augment these existing requirements, by requiring erosion and sediment control and construction activity pollution prevention as prerequisites (for projects required to meet LEED standards). There are other available points for site disturbance, slope protection, and compact development. However, in some instances, it is possible that construction might result in an air quality impact. However, this impact is associated with any potential construction and neither would be less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. To the extent that new construction would have impacts, however, the Ordinance would have a beneficial, rather than adverse, impact on air quality. As a result, impacts associated with the Ordinance would be less than significant.

Operational Air Quality
As noted above, under existing conditions, buildings are the second largest contributor to green house gases (39%) within the City of Oakland. Buildings produce these gases through consumption of energy, heating and air conditioning, and waste. The Green Building Ordinance will not result in an increase of emissions of criteria pollutants. The proposed rating systems contain points for energy efficiency; energy performance and commissioning; renewable energy; indoor air quality; low VOC paints, coatings, and adhesives; environmentally friendly materials, flooring, carpets, and cabinets; and material waste. In addition, there are points related to alternative transportation to reduce pollution and land use impacts on traffic congestion. Although it is possible that new construction might generate emissions, this impact is associated with any potential construction and

would be less likely due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. To the extent that new construction would have impacts, however, the Ordinance would have a beneficial, rather than adverse, impact on air quality. As a result, impacts associated with the Ordinance would be less than significant.

As indicated above the Green Building Ordinance would not result in total emissions of ROG, NOx, or PM10 of 15 tons per year or greater, or 80 pounds (36 kilograms) per day or greater, result in potential to expose persons to substantial levels of Toxic Air Contaminants (TAC), or in ground level concentrations of non-carcinogenic TACs such that the Hazard Index would be greater than 1 for the MEI. Compliance with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to *indoor air quality and the installation, operation and on-going maintenance of a MERV 13 filtration sytem as well* as a transportation demand management program would reduce the potential exposure to residential units to substantial concentrations to a level of less than significant. Furthermore, project compliance with Policy HM-2 and Actions HM-2.1 through 2.5 of the Safety Element regarding the public's exposure to toxic air contaminants will also reduce this to a level of less than significant.

Cumulative

No air quality impacts associated with the proposed Ordinance have been identified as significant or potentially significant. The Ordinance would not have a cumulatively considerable (nor a significant cumulative) impact on air quality.

Conflict with General Plan

The proposed Ordinance would not result in any fundamental conflict with the City's General Plan, and the City's General Plan does not fundamentally conflict with the regional air quality plan. As discussed above, the Ordinance is consistent with, and implements a number of policies and provisions of the General Plan. An Oakland Energy and Climate Action Plan (ECAP) is being developed to identify, evaluate and recommend prioritized actions to reduce energy consumption and GHG emissions in Oakland. The ECAP will identify energy and climate goals, clarify policy direction, and identify priority actions for reducing energy use and GHG emissions. On July 7, 2009, the Oakland City Council directed staff to develop the draft Oakland ECAP using a preliminary planning GHG reduction target equivalent of 36 percent below 2005 GHG emissions by 2020 (City of Oakland, 2009). The current proposal includes actions related to adoption of a Green Building Ordinance. There is no significant impact.

Conflict with CAP

The Bay Area Air Quality Management District (BAAQMD) uses the Clean Air Plan to evaluate a project's potential cumulative air quality impacts. The BAAQMD CEQA Guidelines state that "for any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impacts should be based on an evaluation of the consistency of the project with the local general plan and the general plan with the regional air quality plan." The Clean Air Plan projections are based on analysis and forecasts of air pollutant emissions throughout the entire region. The forecasts rely on projections of population and employment made by the Association of Bay Area Governments (ABAG), which are based on land use projections made by local jurisdictions (e.g., General Plan process).The proposed rating systems contain points that encourage alternative transportation to reduce pollution and land use impacts on traffic congestion. The points include access to transit and bikeways, adequate and secure bike parking, alternative fuel vehicles, carpool and vanpools, and reduced parking. Existing actions and policies encourage reduced parking standards and construction of transit oriented developments including Housing Element Action 1.3.4 and Action 3.2.3; Safety Element Action HM2.4; Policies CO-12.1, CO-12.2 and Action CO-12.2.3, CO-12.3.1 in the OSCAR Element; Policies I/C3.3, T2.1, T2.2, *T2.3, T2.5, T3.6, T.4.1, and N8.1 in the Land Use and Transportation Element (LUTE); and Policies JL-14 and JL-*15 in the Estuary Policy Plan. Furthermore, the individual construction projects would need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to transportation demand management. There will be no significant impact

Green House Gases

Buildings contribute ¼ of all California's green house gas emissions (GHG) and the building sector accounts for more than a quarter of all GHG's in the U.S. annually.[4] Homes generate this amount mainly through consumption of energy, heating and cooling, and waste. California Assembly Bill 32 requires the state to reduce GHG emissions to 1990 levels by 2020. A subsequent executive order extended that mandate to an 80 percent reduction by 2050. According to CARB documentation, facilitating the construction, renovation, and operation of green buildings is one initiative by which the state can meet this goal and result in a GHG reduction of 26 annual metric tons. The Green Building Ordinance addresses both energy conservation in existing buildings and the design and construction of new buildings. It also focuses on best management landscape practices. Implementation of the Green Building Ordinance would reduce Oakland's green house gas emissions and in fact several of the 2009 BAAQMD measures to reduce green house gases are similar to points contained within the rating systems such as cool roofs, solar water heaters, and type of duct sealing. Although any additional construction that is not zero net energy or carbon neutral would generate GHG emissions, and it is possible that these projects could increase GHG's, the City of Oakland's ongoing implementation of its Sustainability Community Development Initiative (which includes an array of programs and measures, discussed previously under Regulatory Context for GHG Emissions and Climate Change) will collectively reduce the levels of GHG emissions and contributions to global climate change throughout Oakland. Furthermore, this impact is associated with any potential construction and would actually be less likely due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. Therefore, this impact is less than significant.

Biological Resources:

Habitat Modifications, Riparian Habitat, Other Sensitive Natural Communities, Wetlands

Although new development generally could not affect habitat modifications, riparian habitat, other sensitive natural community, or wetlands, the Ordinance itself would not cause, and likely would reduce, the potential for any such significant impacts to occur. The Ordinance proposes rating systems that include points related to water body conservation, protection and restoration of habitats or wetlands, and minimizing site disturbance through site design and construction. Furthermore, the proposed rating systems and the Ordinance encourage appropriate site selection and development on infill parcels specifically to avoid damage to these natural communities and resources. The proposed points augment and complement existing policies related to protection and preservation of natural resources including OSCAR Policies OS-1.3, OS-4.3, CO-7.1, CO-7.2, CO-9.1; Objectives CO-7, CO-8, CO-9, and Actions CO-7.1.4, CO-7.2.1, CO-7.2.2; Action GE2.2 in the Safety Element (require continued enforcement of the grading, erosion, and sedimentation ordinance), and Action 7.4.1 in the Housing Element (encourages compact building design). Although it is possible that the actual buildings or proposed neighborhoods could degrade or destroy these habitats, wetland or riparian areas, this impact is associated with any potential construction and would actually be less likely due to the Ordinance. The extent to which impacts of specific future development could occur is too speculative currently to be evaluated, but the impacts of the Ordinance will not be significant.

Wildlife and Migratory Corridors and Bird Strikes

The Green Building Ordinance would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The Ordinance is proposing rating systems that avoid development on inappropriate sites. The rating systems contain specific points related to site design for habitat conversation, and minimizing site disturbance through site design and construction. The proposed rating systems and the Ordinance encourage appropriate site selection and development on infill parcels to specifically avoid damage to these natural communities and resources. Furthermore, there are existing policies that encourage the protection of wildlife including Objective OS-8, CO-11, Policies CO-11.1, CO-11.2, OS-8.2, OS-12.3, and CO-7.4, and Action CO-11.2.2 in the OSCAR Element; Action GE2.3, FL-1.3, and FL-1.5 in the Safety Element. Although it is possible that actual buildings or proposed neighborhoods could interfere with the movement of these species, this impact is associated with any potential construction in sensitive areas, would actually be less likely, due to the Ordinance. As discussed earlier in this document the Ordinance is not expected to increase bird strikes from buildings due to glare and window glazing. Compliance with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to bird strikes would reduce

[4] Building Design Leaders Collaborating on Carbon-Neutral Buildings by 2030, Taryn Holowka, USGBC, 05/7/2007

the potential impacts to less than significant. The extent to which impacts of specific future development could occur is too speculative currently to be evaluated but the impacts of the Ordinance will not be significant.

Habitat Plans
The City of Oakland does not have a habitat or conservation plan. Thus, the proposed Ordinance would not conflict with any plan and there is no potential for an impact.

Trees and Creeks
The Green Building Ordinance would not fundamentally conflict with Oakland's Tree Preservation Ordinance or Creek Protection Ordinance. The proposed rating systems in the Green Building Ordinance encourage the retention and conservation of habitat, limited site disturbance, compact development, and require wetland and water body conservation. Any construction project will be required to comply with the Standard Condition of Approvals related to tree preservation and removal and construction near creeks. The Ordinance augments and complements existing policies that require continued enforcement of the creek ordinance, stormwater management and discharge control including Actions GE2.3, FL-1.3, and FL-1.5 in the Safety Element and Objective OS-8, and Policies OS-8.2, OS-12.3, and CO-7.4 in the OSCAR Element. Although it is possible that development applications could conflict with the Tree or Creek Protection Ordinance, such development would be required to comply with provisions of these ordinances. The extent to which impacts of specific future development could occur is too speculative currently to be evaluated, but the impacts of the Ordinance will not be significant.

Cultural Resources

Historic Resources
The Green Building Ordinance would not cause a substantial adverse change in the significance of a historic resource as defined in CEQA Guidelines §15064.5. The Ordinance will not encourage the demolition of historic resources and construction of newer more energy and water efficient buildings. To the contrary, the Ordinance provides disincentives for the demolition of these buildings by increasing the level of green features in the building and requiring deconstruction and recycling of all applicable building materials. The other thresholds for alterations and remodeling projects are not anticipated to change the historic character and significance of the building as these are interior projects. A meeting with a Historic Preservation Planner is required to help navigate any conflicts between features that contribute to a historic rating and green building features. Many construction projects have successfully completed LEED certification and have not damaged their inclusion on National, state, and Local Registers. In fact, the California State Historic Office of Preservation has stated that historic buildings should not be exempt from Green Building Ordinances. The proposed rating systems in the Green Building Ordinance also encourage adaptive reuse of buildings and historic building reuse. The Ordinance augments and complements the General Plan contains policies and programs to protect historic resources, including Housing Element (HE), Goal 2, Objective 2-3, Policies 2.1, 3.1, 3.5, 3.7, 3.12, and 4.4 in the Historic Preservation Element; Policies I/C2.2, D6.2, N3.6, and N9.9 in the LUTE; and Action JL-4.1 and Policy JL6 in the Estuary Policy Plan. These policies address demolition, and design elements. Furthermore, these construction projects will be required to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to demolition, grading and site disturbance in order minimize adverse effects on these resources. The impact of the Ordinance will not be significant.

Paleontological and Archeological Resources and Human Remains
The Green Building Ordinance would not directly or indirectly destroy a unique paleontological or archeological resource or disturb any human remains. The proposed rating systems in the Ordinance encourage limited site disturbance and compact development. In addition, these construction projects will be required to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to grading and site disturbance in order minimize adverse effects on these resources. The Ordinance augments and complements existing policies that require protection of these resources including Historic Element Objective 4. Therefore, this is a less significant impact.

Geology and Soils

Seismic Activity

The City is located in a seismically active region and the principal faults in the vicinity include the Hayward Fault, San Andreas Fault, and the Calaveras Fault. Construction within a liquefaction and landslide hazard zone areas are required to conduct a seismic investigation which would recommend construction methods to address and mitigate potential seismic hazards. The Ordinance proposes rating systems that include points related to material conservation during construction including value engineering framing, engineered lumber, use of structural insulated panels, and raised heel roof trusses. None of these construction methods reduce or limit the applicability of the California Building Code to address seismic issues. The project would still need to be designed and constructed to meet the Building Code standards which require seismic evaluation and particular seismic design criteria to reduce ground shaking effects in structures. The new California Building Code addresses these seismic and green building issues in the Efficient Framing Section of Title 24. Furthermore, there are existing policies in the OSCAR Element regarding land stability including Objective CO-2 and Policy CO-2.1. Although the potential for injury or damage cannot be eliminated, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. Adherence to the recommendations in the geotechnical investigation, the Building Code and other applicable codes along with compliance with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to submittal of geotechnical report and possible inclusion in the Geological Hazard Abatement District would reduce the potential impacts to less than significant. Verification by the City of Oakland that the conditions have been met would result in a less than significant impact related to ground shaking, unstable soils and liquefaction potential.

Erosion and Loss of Topsoil

The Green Building Ordinance would not result in substantial soil erosion or the loss of topsoil, creating substantial risks to life, property, or creek/waterways. The proposed rating systems contain pre-requisites and available points related to erosion and sedimentation control and construction activity pollution prevention. These points are similar to the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to erosion. Individual project compliance with the Standard Conditions of Approval would reduce this impact to less than significant. Furthermore, there are existing policies in the Safety Element that require continued enforcement of the grading, erosion, and sedimentation ordinance including Action GE2.2. No significant impact will occur.

Expansive Soils

The Green Building Ordinance does not specify building site location or selection on expansive soils. Potential impacts are associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. Compliance with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval that require adherence to the Building Code would require an analysis of soil expansion potential and identification of appropriate remediation prior to any expansive soils for foundation support. Furthermore, there are existing policies in the OSCAR Element that require consideration of soil constraints including Action CO-1.1.3. The Ordinance will not result in a significant impact.

Wells, Pits, Swamp, etc

The Green Building Ordinance and proposed rating systems do not specify a building site location or avoidance of a well, pit, swamp, mound, tank vault, or unmarked sewer line. Potential impacts are associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. As required by the City Council adopted Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval, individual projects would need to submit a Phase I Site Assessment Report. The report would identify if any of these features were located on the site and what the recommendations would be address them. The Ordinance will not result in a significant impact.

Landfills or Fill Soils

The Green Building Ordinance and the proposed rating systems do not specify a building site location or avoidance of a landfill or unknown fill soils. Potential impacts are associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. As required by the City Council adopted Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval, the individual project would need to submit a Phase I Site Assessment Report. The report would identify if any of these features were located on the site and what the recommendations would be address them. The Ordinance will not result in a significant impact.

Soils Incapable of Supporting Septic Tanks or Alternative Wastewater Systems

The Green Building Ordinance and the proposed rating systems do not specify a building site location or avoidance of soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. Although the proposed rating systems do address alternative wastewater disposal, the City of Oakland Municipal Code prohibits construction of septic tanks or systems that are not connected to the wastewater disposal systems. The Ordinance will not result in a significant impact.

Hazards and Hazardous Materials

Transport and Disposal

The Green Building Ordinance would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The proposed rating systems address contaminant reduction and brownfield redevelopment which might require the transport of hazardous materials but not the routine transport, use, or disposal of hazardous materials. The Ordinance augments and complements existing policies in the OSCAR Element to minimize hazards with contamination including Policy CO-1.2. Potential impacts are associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. Individual future projects would need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to Phase I Site Assessment Report, Remediation, and Best Practices for soil and groundwater hazards. The Ordinance will not result in a significant impact.

Emission of Hazardous Materials

The Green Building Ordinance would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment or emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. The proposed rating systems contain points that discourage the use of hazardous materials during construction and operation of buildings including, use of low VOC paints, sealants, and adhesives, green flooring, low formaldehyde cabinets and wood products, low emitting materials, construction and indoor air quality management plans. The landscape rating program encourages the use of natural (not chemical) fertilizers and pesticides. Although it is possible that the construction of buildings or proposed neighborhoods could result in the emission of hazardous materials these potential impacts are associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. The individual projects would need to comply with Conditions of Approval related to hazardous materials. The Ordinance will not result in a significant impact.

Location near an Airstrip or Airport Landuse Plan

The Green Building Ordinance does not specify building location within or avoidance of an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and would result in a safety hazard for people residing or working in the project area. Although, it is possible that the construction of buildings or proposed neighborhoods could result in this impact, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. The Ordinance will not result in a significant impact

Evacuation Plan

The Green Building Ordinance would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Although, it is possible that the construction of buildings or proposed neighborhoods could result in this impact, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. The Ordinance will not result in a significant impact.

Wildland Fires

The Green Building Ordinance would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The Bay Friendly Landscape Checklist has points available for appropriate fire suppression landscaping. These points augment and complement existing policies related to fire prevention including Action FI-3.1 in the Safety Element and Objective CO-10, Policy CO-10.1, and Policy CO-10.2 in the OSCAR Element. In addition, the individual projects would need to comply with Conditions of Approval related to wildland fires. Potential impacts are associated with any potential construction and are equally or less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. The Ordinance will not result in a significant impact.

Hydrology and Water Quality

Water Quality

The Green Building Ordinance would not violate any water quality standards or waste discharge requirements. The proposed rating systems contain pre-requisites and points related to sedimentation control and stormwater management. Furthermore, the individual projects would need to comply with Conditions of Approval related to stormwater management and water quality. Furthermore, there are existing policies related to water quality including Action GE2.2, GE2.3, FL-1.4 in the Safety Element, and Objectives CO-5, CO-6, Policies CO-5.2, CO-5.3, CO-5.3.1, CO-5.4.2 and Action CO-5.1.2 in the OSCAR. Potential impacts are associated with any potential construction and are equally or less likely, due to the Ordinance. The extent to which impacts of specific development could occur is too speculative currently to be evaluated. The Ordinance will not result in a significant impact.

Groundwater Depletion

The Green Building Ordinance would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level violate any water quality standards or waste discharge requirements. The proposed rating systems contain points related to reduction in water use, increased water efficiency, elimination of impervious surfaces so that more water percolates through the soil, rainwater collection, recycled water, and irrigation audits. The Ordinance augments and complements existing policies related to water conservation including OSCAR Objective CO-4, Policy CO-4.1, Action CO-4.1.1 (to implement a city water use reduction plan by 20%), CO-4.2 (Drought tolerant landscaping), Action CO-4.2.1 (development of a water efficient landscape ordinance), Policy CO-4.3 and Action CO-4.3.2 (use of reclaimed water and wastewater) as well as Policies CO-4.4, CO-5.1 and Action CO-5.1.1 Furthermore, the rating systems encourage development on infill sites that can be served by the East Bay Municipal Utility District. The extent to which impacts of specific development could occur is too speculative currently to be evaluated to the extent that future development would result in impacts, the Ordinance will reduce these impacts. The Ordinance will not result in significant impacts.

Flooding

The Green Building Ordinance would not result in substantial flooding on- or off-site or location of housing in a floodplain. The proposed rating systems contain pre-requisites and points related to site location and the avoidance of floodplains. In addition, individual projects would need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to floodplains. The Ordinance augments and complements existing policies related to flooding including Policy FL-1 and Actions FL-1.1 through FL1.5 in the Safety Element as well as Action CO-5.1.2, CO-5.3.2 and Policy CO-5.3 in the OSCAR. . The Ordinance will not result in significant impacts.

Capacity of Stormdrain Systems
The Green Building Ordinance would not create or contribute substantial runoff which would exceed the capacity of existing or planned stormwater drainage systems. The proposed rating systems include points for stormwater management plans, limited site disturbance, and onsite retention of water for later dates. The intent of these points is to minimize water use, storm water runoff and increase on-site filtration. In addition, individual projects would need to comply with the City's *Conditions of Approval & Uniformly Applied Development Standards imposed* as Standard Conditions of Approval related to stormwater management and capacity of stormdrains. Compliance with these conditions would result in a less than significant impact. The Ordinance augments and complements existing policies related to storm drain capacity including Action GE2.5 and FL-1.2 in the Safety Element. The Ordinance will not result in significant impacts.

Seiche, Tsunami, or Mudflow
The Green Building Ordinance would not result in inundation by seiche, tsunami, or mudflow. The likelihood of flooding from tsunamis, seiches, or mudflows in Oakland is negligible due to the island of Alameda, so the likelihood of large scale devastation from seiche, tsunami, or mudflow is not significant. The Ordinance would not have a significant impact.

Creek Ordinance
As noted above, the Green Building Ordinance would not fundamentally conflict with Oakland's Creek Protection Ordinance. The proposed rating systems in the Ordinance encourage the retention and conservation of habitat, limited site disturbance, compact development, and require wetland and water body conservation. These construction projects will be required to comply with the Standard Condition of Approvals related to construction near creeks and therefore, this is a less significant impact. The Ordinance augments and complements existing policies in the Safety Element that require continued enforcement of the creek ordinance, stormwater management and discharge control including Action GE2.3, FL-1.3, and FL-1.5. Creek policies are also outlined in the OSCAR Element including Objective CO-6, Policy CO-6.1, and Policy CO-6.2. The Ordinance will not have a significant impact.

Land Use and Planning

Divide an Existing Community
The proposed Green Building Ordinance will not divide an existing community, result in a conflict between adjacent or nearby land uses, or conflict with applicable land use plan. The proposed rating systems contain points that encourage development near neighborhood services. Furthermore, each construction project would need to comply with the General Plan Elements. Although the buildings could result in these impacts, this impact is associated with any potential construction and neither would actually be less likely, due to the Ordinance. The extent to which specific development projects could cause such impacts is too speculative currently to be evaluated; however, the Ordinance will not result in a significant impact.

Conflict with Applicable Land Use Plan
The proposed Green Building Ordinance will not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance. The General Plan is comprehensive in nature and contains a number of competing policies. The City decision makers must determine whether the project is consistent with the General Plan. Each construction project must be consistent with the General Plan, Specific Plan or Zoning Ordinance, even if the City determines that it may not be fully consistent with all specific policies. However, the Ordinance is consistent with applicable land use plans and will not have a significant impact. See a list of applicable General Plan objective and policies on pages 7-8.

Noise

Construction Noise
The Green Building Ordinance would not result in an operational, construction noise impact or a noise impact in excess of the General Plan and the proposed rating systems do not address noise. The individual construction projects would need to comply with all City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to noise impacts. Impacts associated with

individual projects are neither more nor less likely to occur as a result of the Ordinance. Compliance with the Standard Conditions of Approval generally reduces individual project impacts to less than significant. Thus, the Ordinance would not result in a significant impact.

Vibration

The Green Building Ordinance would not create a vibration not associated with motor vehicles, trains, and temporary construction or demolition work, which is perceptible without instruments by the average person at or beyond any lot line containing vibration-causing activities, except vibration causing activities located within the (a) M-40 zone or (b) M-30 zone more than 400 feet from any legally occupied residential property or expose person to or generate rail-related groundbourne vibration in excess of standards established by the Federal Transit Administration. The proposed rating systems do not address vibration, and impacts of specific projects are neither more nor less likely to occur as a result of the Ordinance. Compliance with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval typically would reduce individual project impacts to less than significant. Thus, the Ordinance would not result in a significant impact.

Interior Noise

The Green Building Ordinance would not generate interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities (and may be extended by local legislative action to include single family dwellings) per California Noise Insulation Standards (CCR Part 2, Title 24. The proposed rating systems don't contain points specifically related to noise insulation; these points address thermal comfort and energy efficiency more than noise. However, inclusion of insulation would result in an overall decrease in interior noise. The proposed construction projects would also need to comply with all City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to indoor noise impacts. Compliance with the Standard Conditions of Approval typically would reduce individual project impacts to less than significant. The Ordinance would not result in a significant impact.

Ambient Noise

The Green Building Ordinance would not result in a 5dBA permanent increase in ambient noise levels as the proposed rating systems do not address noise. Although the construction of buildings and neighborhoods could result in a noise related impact, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance would not result in a significant impact.

Land Use Compatibility

The Green Building Ordinance would not conflict with state land use compatibility guidelines for all specified land uses for determination of acceptability of noise as the proposed rating systems do not address noise. However, the rating systems do address building location on infill sites and near transit options, such as BART or Amtrak. Although this could result in the siting of buildings that do not meet the land use guidelines for noise compatibility, such impacts are neither more nor less likely to occur with the adoption of the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. Future construction projects would need to meet Title 24 requirements and comply with all City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to indoor noise impacts. Compliance with the Standard Conditions of Approval for individual projects typically would result in a less than significant impact. In any event, the Ordinance would not result in a significant impact.

Airstrip or Airport Landuse Plan

The Green Building Ordinance does not address whether projects would be located within or avoid an airport land use plan or in the vicinity of a private airstrip, and would expose people residing or working in the project area to excessive noise levels. The proposed rating systems do not address noise but do address building location on infill sites. Although this could result in the siting of buildings that are within an airport land use plan, such impacts are neither more nor less likely to occur as a result of the Ordinance. The extent to which those noise impacts could result from future development projects is too speculative currently to be evaluated. Future construction projects would need to meet Title 24 requirements and comply with all City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to indoor noise impacts, which typically would reduce impacts to a less than significant level. In any event, the Ordinance would not result in a significant impact.

Population and Housing

The Green Building Ordinance would not induce substantial population growth in a manner not contemplated in the General Plan. The Ordinance would not encourage or discourage more building. The Ordinance just addresses the way buildings are constructed. The proposed rating systems contain points that would reduce the loads on the existing infrastructure. These points include reduced water use, innovative wastewater technologies, energy efficiency in buildings, on-site renewable energy, solar orientation, and waste management. Points also are available for infill development where existing roads and infrastructure are already available. Therefore, the Ordinance would not require additional infrastructure that was not previously planned for or analyzed. The future construction projects will comply with all City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to stormwater and sanitary sewer capacity impacts, which typically reduces impacts to a less than significant level. In any event, the Ordinance would not result in a significant impact.

The Green Building Ordinance would not result in substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element induce substantial population growth in a manner not contemplated in the General Plan. The Ordinance would not encourage or discourage more building or the displacement of existing people or housing. The Ordinance just addresses the way buildings are constructed. The Ordinance will not result in a significant impact.

Public Services

The Green Building Ordinance would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services. The proposed rating systems in the Ordinance do encourage construction on infill sites that are adequately served by fire services, police stations, schools, parks, and post offices. As a result, to the extent such impacts would occur from future development, the Ordinance likely would reduce such impacts. Furthermore, individual projects would need to comply with the City's City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to Fire Services Review. In addition, construction projects are required to pay school impact fees. According to SB 50, this fee would be deemed full and complete mitigation for project related school impact fees. The Community Services Analysis prepared for the Land Use and Transportation Element of the General Plan stated that future infill development through 2015 would not likely pose a burden on existing public services. The Ordinance will not result in a significant impact.

Recreation

The proposed rating systems in the Ordinance encourage access to active public spaces and increased open space on site, so proposed construction of buildings or neighborhoods could result in an impact to these parks. However, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance will not result in a significant impact.

The Green Building Ordinance does encourage active public spaces and increased open space on site and could result in new recreational facilities that could have an effect on the environment. However, the Zoning Ordinance requires a certain amount of open space per residential unit. Therefore, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance will not result in a significant impact

Traffic

Level of Service (LOS)

The Green Building Ordinance would not cause a project to be constructed that would result in a degradation of LOS. The proposed rating systems in the Ordinance encourage alternative transportation to reduce pollution and land impacts from auto use. The points include access to transit and bikeways, adequate and secure bike parking,

alternative fuel vehicles, carpool and vanpools, and reduced parking. Existing actions and policies encourage reduced parking standards and construction of transit oriented developments including Housing Element (HE) Action 1.3.4 and Action 3.2.3 and Pedestrian Master Plan Policy 2.1, Action 2.1.1, Policy 2.3, Action 3.2.2 as well as others. Although future construction of buildings or neighborhoods could still result in an impact to LOS, this impact is associated with any potential construction would not be more likely, and would, in fact, be less likely, due to the Ordinance. The extent to which impacts of future projects could occur is too speculative currently to be evaluated. In addition, construction projects will need to meet the Bike Ordinance and the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to Transportation Demand Management. In any event, the Ordinance will not result in a significant impact.

Air Traffic

The Green Building Ordinance would not cause a project to be constructed that would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks. Although future construction of buildings or neighborhoods could result in an impact, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance will not result in a significant impact.

Hazards to Bicycles, or Pedestrians

The Green Building Ordinance would not substantially increase traffic hazards due to motor vehicles, bicycles, or pedestrians due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). The rating systems include points related to bicycle networks, pedestrian access to services, walkable and safe streets, and design of streets. Although future construction of buildings or neighborhoods could result in an impact, this impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance would not result in a significant impact.

Emergency Vehicle Access

The Green Building Ordinance would not cause a project to be constructed that would result in less than two emergency access routes as the proposed rating systems do not address emergency access. This impact is associated with any potential construction and neither would be more likely, nor less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance would not result in a significant impact

Cumulative

The Green Building Ordinance would not cause a project to be constructed that would result in a cumulative impact. The proposed rating systems in the Ordinance encourage alternative transportation to reduce pollution and land impacts from auto use. The points include access to transit and bikeways, adequate and secure bike parking, alternative fuel vehicles, carpool and vanpools, and reduced parking. Although, the proposed construction of buildings or neighborhoods could result in a cumulative impact, this impact is associated with any potential construction and neither would actually be less likely, due to the Ordinance since all construction projects would be encouraged to promote alternative transportation means. The extent to which those cumulative traffic impacts could occur is too speculative currently to be evaluated. Individual construction projects will need to meet the Bike Ordinance and the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to Transportation Demand Management. Furthermore, the Ordinance would not encourage or discourage more building. The Ordinance just addresses the way buildings are constructed. Therefore, the Ordinance is not expected to result in a significant cumulative traffic impact because the Green Building Ordinance would not induce substantial population growth in a manner not contemplated in the General Plan. No cumulative impact will result.

Utilities

Wastewater

The Green Building Ordinance would not exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board. The proposed rating systems in the Ordinance encourage water efficiency to reduce the amount of water needed and the municipal burden to the water supply. In addition, the rating systems

promote alternative innovative wastewater technologies to further reduce this impact. Specific development projects would need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to stormwater and sewer capacity, which typically reduce impacts to a less than significant level. Furthermore, there are existing policies related to stormdrain capacity including Action GE2.5 in the Safety Element and Action CO-5.3.11 in the OSCAR Element. The Ordinance will not result in a significant impact.

Landfills and Solid Waste

The Green Building Ordinance would not exceed landfills with insufficient permitted capacity to accommodate the project's solid waste disposal needs and require or result in construction of landfill facilities or expansion of existing facilities, construction of which could cause significant environmental effects. The proposed rating systems in the Ordinance do encourage recycling and composting to reduce waste. In addition, other points encourage building and material reuse and recycled content in construction materials to further divert material from landfills and direct materials back to the supply stream. In addition, the landscape guidelines further reduce the amount of green waste going to the landfills. Specific development projects would need to comply with the City's Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to stormwater and sewer capacity, which typically reduce impacts to a less than significant level. In any event, the Ordinance will not result in a significant effect.

Energy

The Green Building Ordinance would not violate applicable federal, state and local statutes and regulations relating to energy standards. The projects are required to meet Title 24 regarding energy efficiency. Furthermore, one of the programs requires as a pre-requisite that the project exceeds Title 24 by 15% and the other requires building commissioning and minimum energy efficiency. In addition, points are available for energy performance, renewable energy sources, purchasing of green power, and energy efficient appliances. The Ordinance augments and complements existing policies in the Housing Element that encourage sustainable development including Policy 7.1, Action 7.1.1 (calls for all new private development projects and major retrofits be encouraged to use to green building features in the design and construction), Action 7.1.3, and Policy 7.2 regarding energy efficiency. Objective CO-13 in the OSCAR Element, which includes Policies CO-13.1 through CO-13.4.2 specifically encourage energy conservation and efficiency. Although it is possible that any additional construction that is not zero net energy or carbon neutral would result in an increase in energy consumption, this impact is associated with any potential construction and would actually be less likely, due to the Ordinance. The extent to which those impacts could occur is too speculative currently to be evaluated. In any event, the Ordinance will not result in a significant impact.

In sum, for the reasons stated above, the City finds and determines that the project is exempt from CEQA pursuant to CEQA Guidelines Sections 15060(c)(2), 15061(b)(3) (General Rule), 15307 (Actions by Regulatory Agencies for Protection of Natural Resources), and 15308 (Actions by Regulatory Agencies for Protection of the Environment), each of which constitutes a separate and independent basis for the exemption, and there are no exceptions that would defeat the use of any categorical exemptions. As a further separate and independent basis, the project is exempt from CEQA pursuant to CEQA Guidelines Section 15183(Projects Consistent with a Community Plan, General Plan, or Zoning).

FILED
OFFICE OF THE CITY CLERK
OAKLAND

INTRODUCED BY

2010 MAY 27 AM 10: 24

COUNCILMEMBER

APPROVED FOR FORM AND LEGALITY

DEPUTY CITY ATTORNEY

OAKLAND CITY COUNCIL

Ordinance No. _____ C.M.S.

ORDINANCE ADOPTING OAKLAND MUNICIPAL CODE TITLE 18 - SUSTAINABILITY, CHAPTER 18.02 SUSTAINABLE GREEN BUILDING REQUIREMENTS FOR PRIVATE DEVELOPMENT TO ESTABLISH ENVIRONMENTALLY SUSTAINABLE REGULATIONS FOR BUILDING CONSTRUCTION, REMODELING, LANDSCAPING AND DEMOLITION

WHEREAS, the Oakland City Council adopted the Sustainable Community Development Initiative (SCDI) through Resolution No. 74678 on December 1, 1998; and

WHEREAS, one of the adopted goals of the Oakland City Council is to "Develop a Sustainable City" and to "maximize socially and environmentally sustainable economic growth, including conserving natural resources;" and

WHEREAS, in May 2005, the Oakland City Council unanimously adopted a Civic Green Building Ordinance, joining numerous other cities in requiring that City owned or occupied buildings to meet specific green building standards set by the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system; and,

WHEREAS, in May 2006, the Oakland City Council adopted a Resolution establishing the Alameda County Residential Green Building Guidelines (for new home construction, home remodeling and multifamily residential development), U.S. Green Building Council's LEED™ rating systems (for new commercial construction and remodeling), and Bay- Friendly Landscape Guidelines as official city reference documents for private development projects; and

WHEREAS, the demolition, design, construction, and maintenance of buildings and structures has a significant impact on the City's environmental sustainability, resource usage and efficiency, greenhouse gas emissions, waste management, and the health and productivity of residents, workers, and visitors; and

WHEREAS, green building is a whole systems approach to the location, siting, design, construction, operation, demolition, and landscaping of buildings and structures that reduces or eliminates the environmental, economic, and social impacts of associated with conventional building practices; and

WHEREAS, green building can have significant positive effect on energy, water, and resource efficiency, waste and pollution generation, wildlife habitat and the health and productivity of a property's occupants over the life of the building and landscape; and

WHEREAS, in recent years, green building construction and landscaping design have become increasingly widespread in California and in Oakland, with many homeowners, businesses, and building professionals voluntarily seeking to incorporate these techniques and operations into their projects; and

WHEREAS, at the national level, the U.S. Green Building Council has taken the lead in promoting and guiding green building by developing the Leadership in Energy and Environmental Design (LEED) Rating System and Reference Guide; and

WHEREAS, at the state level, Build It Green's GreenPoint Rated program has become the industry standard for residential new construction and remodels; and

WHEREAS, at the county level, Stopwaste.Org has developed the Small Commercial Building Checklist and the Bay Friendly Basic Landscape Checklist as a list of best management practices to promote green building and landscaping practices where other rating programs are not applicable; and

WHEREAS, many cities within California have adopted mandatory green building ordinances for both public and private development using the Build It Green, LEED, and StopWaste.Org rating systems; and

WHEREAS, as outlined in the Oakland City Council's approval of a draft Greenhouse Gas reduction target in July of 2009 which would include green building actions, it is critical to both the economic and environmental health of the City of Oakland that the City provide leadership to the public and private sectors in the area of green building and sustainable landscapes; and

WHEREAS, the most immediate and meaningful way to do so is to include green building and landscape requirements for both the public and private sectors that are stricter than current building standards, based on local climatic, geological, and topographical conditions and are shown to be cost effective over the life of the building and landscape; and

WHEREAS, the proposed ordinance is categorically exempt from the requirements of the California Environmental Quality Act (CEQA) each as a separate and independent basis pursuant to, without limitation,: (1) CEQA Guidelines pursuant to, without limitation,: (1) CEQA Guidelines Section 15307 (actions by regulatory agencies for the protection of natural resources; (2) CEQA Guidelines Section 15308 (actions by regulatory agencies for the projection of the environment); (3) CEQA Guidelines Sections 15060(c)(2) and15061 (b)(3), (it can be seen with certainty that there is no possibility that the activity in question may have a significant (negative) effect on the environment), and , which exempt changes in Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning); and

WHEREAS, the proposed ordinance, which requires changes and amendments to the Oakland Building Code, is necessary because of "local climatic, geological, and topographical conditions" per the California Health & Safety Code Sections 17958, 17958.5 and 17958.7 and the California Building Standards Code.

WHEREAS, the proposed standards in the Ordinance are cost effective and will require the diminution of energy consumption levels permitted by the 2008 Statewide energy efficiency standards.

WHEREAS, the City Planning Commission held several publicly noticed meetings to take public testimony and discuss the regulations, including a meeting on April 7, 2010 where they voted to recommend the proposal to the City Council; now, therefore,

THE COUNCIL OF THE CITY OF THE OAKLAND DOES ORDAIN AS FOLLOWS:

SECTION 1. The City Council finds and determines the forgoing recitals to be true and correct and are an integral part of the Council's decision, and hereby adopts and incorporates them into this Ordinance.

SECTION 2. The City Council hereby finds that the City is proposing to adopt various enumerated changes and modifications to the Oakland Building Code (Code). California Health and Safety Code Sections 17958, 17958.5 and 17958.7 and the California Building Standards Code permit cities to make such changes or modifications in the Code as they determine are reasonably necessary because of "local climatic, geological, and topographical conditions" provided that such modified standards and findings are filed with the California Building Standards Commission. Such findings detailed in Exhibit A-1 attached hereto are adopted by the Council and shall be filed with the California Building Standards Commission.

SECTION 3. The City Council hereby finds that the proposed building standards are cost effective and will require the diminution of energy consumption levels permitted by the 2008 Statewide energy efficiency standards, based on the findings in the January 21, 2009 study entitled "Energy Cost Effectiveness Case Studies using the 2008 Title 24 Building Energy Efficiency Standards," adopted by the StopWaste.Org Board on April 22, 2009 and made a part hereof by this reference and detailed in Exhibit A-2.

SECTION 4. A new title, Title 18, Sustainability, Chapter 18.02 Sustainable Green Building Requirements for Private Development is hereby added to the Oakland Municipal Code as follows:

Title 18 – Sustainability
Chapter 18.02 Sustainable Green Building Requirements for Private Development

Sections:

Article I - Intent

Section 18.02.010 Title

This Chapter shall be known as the "Sustainable Green Building Requirements for Private Development" and is referred to herein as this Chapter.

Section 18.02.020 Purpose and Intent

This Chapter is intended to promote economic development and enhance the health, safety, and welfare of its residents, workers, and visitors through the integration of environmentally sustainable strategies in building construction and landscapes in the City. The minimum

standards, set forth herein, are intended to minimize the use of natural resources and the production of waste and maximize the healthfulness of enclosed environments.

Article II - Administrative

Section 18.02.030 Definitions

As used in this Chapter, the following terms shall have the meanings set forth hereto or as otherwise specified in the regulations referenced herein. Where terms are not defined, they shall have their ordinary accepted meanings within the context with which they are used.

ADDITION/ ALTERATION for the purposes of this Chapter only means any change, addition, or modification to an existing building or structure, including, but not limited to, remodeling, renovations, tenant improvements, and expansion in floor area.

ADDITION/ ALTERATION - MAJOR for the purposes of this Chapter only means Addition/Alteration of non-residential buildings where (a) interior finishes are removed, (b) major upgrades to mechanical, electrical and/or plumbing systems are proposed, and (c) where such Addition/Alteration is 25,000 square feet or more.

APPLICANT means any individual, firm, limited liability company, association, partnership, political subdivision, government agency, municipality (other than the City of Oakland),, industry, public or private corporation, or any other entity that applies to the City for permits to undertake any construction within the City subject to this Chapter.

BUILDING is defined under Chapter 15.35.030.

CHECKLIST means the most recent green building methodology and rating system suitable for the type of construction proposed in evaluating the conformance with provisions of this Chapter, as determined by the City's Planning and Zoning Division.

CHECKLIST - BAY-FRIENDLY BASIC LANDSCAPE means the most recent version of the Checklist developed by StopWaste.Org for use in the professional design, construction and alterations of landscapes, and any subsequent Checklists associated with the green building methodology.

CHECKLIST - GREENPOINT RATED AND GREENPOINTS (GPR) means the most recent versions of the Checklists, associated with the green building rating system and certification methodology developed by Build It Green, including but not limited to, the Single-Family GreenPoint Rated Checklist, the Multifamily GreenPoint Rated Checklist, the GreenPoint Rated Checklist Existing Home (Elements Label), and any subsequent Checklists.

CHECKLIST - LEED™ means the most recent versions of the Checklists, associated with the green building rating system and certification methodology developed by the United States Green Building Council (USGBC), including but not limited to, LEED for New Construction, LEED for Existing Buildings, LEED for Commercial Interior, LEED for

Homes, LEED for Schools, LEED for Retail, LEED for Neighborhood Development and any subsequent Checklists.

CHECKLIST - SMALL COMMERCIAL means the most recent version of the Checklist, associated with the green building methodology developed by StopWaste.Org, for use in the professional design, construction, and additions and/or alterations of small commercial (non-residential) buildings and any subsequent Checklists.

COMPLIANCE STANDARDS TABLE means the tables located in Section 18.02.090 and Section 18.02.100of this Chapter which outlines the applicable size thresholds, checklist(s), and minimum compliance requirements for each construction type.

CONSTRUCTION means work which is subject to the Oakland Building Construction Code.

CONSTRUCTION PHASE - PERMITTING means the engineering approval process for a permit, including but not limited to a demolition, grading, and building permit, issued pursuant to the Oakland Building Construction Code.

CONSTRUCTION PHASE - INSPECTIONS means the site inspection process for a permit including but not limited to a demolition, grading, and building permit, issued pursuant to the Oakland Building Construction Code.

DECONSTRUCTION for the purposes of this Chapter means the systematic dismantling of a Building to preserve the useful value of its component materials.

DEMOLITION for the purposes of this Chapter only means the full or partial razing, ruining, tearing down or wrecking of any Building's exterior structure not withstanding the provisions of Chapter 15.36 of the Oakland Municipal Code.

ENTITLEMENT PHASE means the land use approval process per the Oakland Planning Code for a planning permit such as, but not limited to, a conditional use permit, design review or variance permit , and the continued compliance with the Conditions of Approval under which such permit was approved.

GREEN BUILDING CERTIFICATION means the certification that the construction complies with the provisions of this Chapter by (a) Build It Green for GreenPoint Rated projects, (b) the Green Building Certification Institution (GBCI) or U.S. Green Building Council for LEED projects, (c) the City's Building Services Division for the Checklist - Small Commercial, the Checklist - Bay-Friendly Basic Landscape, or (d) the City's Environmental Services Division for deconstruction.

GREEN BUILDING CERTIFIER means an individual who (1) can certify that the Applicant is in compliance with this Chapter; (2) does not have financial interest in the project for which Green Building Certification is being sought; provided however, that compensation for providing such certification only shall not be deemed a financial interest, and (3) is (a) currently certified by the United States Green Building Council as a LEED™ Accredited Professional, or (b) currently certified by Build It Green as a GreenPoint Rater. However, if

the Green Building Compliance Officer is the Green Building Certifier than conditions 3(a) and 3(b) in this paragraph is not applicable. The Green Building Certifier must comply with the conflict of interest or code of conduct policies of the rating system, as may be applicable. The Green Building Compliance Officer acts as the Green Building Certifier for projects subject, but not limited to, LEED for Neighborhood Development, Checklist - Small Commercial, Checklist - Bay-Friendly Basic Landscape, and Deconstruction.

GREEN BUILDING COMPLIANCE OFFICER means the City Administrator or designee(s) who is/are responsible for enforcement of this Chapter during the entitlement phase and all phases of construction.

GREEN BUILDING DOCUMENTATION means the information required by the Green Building Compliance Officer sufficient to confirm compliance with the provisions of this Chapter.

HISTORIC PRESERVATION PLANNER for the purposes of this Chapter means a City of Oakland Planning and Zoning Division staff person or designee assigned to review the application submitted pursuant to this Chapter to ensure that the historic integrity of a Historic Resources is not adversely altered by implementation of this Chapter.

HISTORIC RESOURCE for the purposes of this Chapter only means a Historic Resource, including any Designated Historic Property, any Potentially Designated Historic Property that have an rating of A or B or are located within an Area of Primary Importance as these capitalized terms are defined in Oakland's Historic Preservation Element.

LEED™ means Leadership in Energy and Environmental Design.

MIXED-USE for the purposes of this Chapter means a Building or group of Buildings located on a single tract of land, or on two or more tracts of land which may be separated only by a street or other right-of-way, or in a single building and which contain both residential and non-residential occupancies.

OAKLAND BUILDING CONSTRUCTION CODE means Chapter 15.04 of the Oakland Municipal Code.

OAKLAND PLANNING CODE means Title 17 of the Oakland Municipal Code.

OCCUPANCY for the purposes of this Chapter only means the assigned use of a Building or a portion a Building unless otherwise indicated.

RATING SYSTEM means the green building methodology determined by the City Planning and Zoning Division for evaluating compliance with the provisions of this Chapter for the Entitlement Phase and Construction Phases – Permitting and Inspections.

RECORD TITLE HOLDER means the current owner(s) of the fee simple interest of a real property.

REMOVAL for the purposes of this Chapter only shall mean either demolition or deconstruction of a Building, but does not include relocation of a Building.

REQUEST FOR REVISION PLANCHECK PROCESS for the purposes of this Chapter is the process by which a project Applicant may formally request a revision to the Entitlement Phase and/or Construction Phase-Permitting or Construction Phase-Inspection permits.

RESIDENTIAL for the purposes of this Chapter only means a Building or group of Buildings containing a residential Group R occupancy and not do not contain a non-residential occupancy, which is used or designed or intended to be used for human habitation including living, sleeping, cooking or eating or any combination thereof, including residentially oriented live/work units and HBX live/work units as such classifications are defined under Section 17.09.040 of the Oakland Planning Code.

SHALL/ WILL means a determinative directive which includes the common meaning of the word *must*.

UNREASONABLE HARDSHIP for the purposes of this Chapter shall mean practical infeasibilities, difficulties, or results inconsistent with the general purposes of this Chapter that are only applicable during the Entitlement Phase.

Section 18.02.040 Scope and Applicability

This Chapter establishes the scope and applicability of construction, related to siting, designing, constructing, remodeling, demolishing, and landscaping that reduces the environmental and economic impacts of conventional construction practices.

A. Inclusions

This Chapter shall apply to the following:

- Residential New Construction
- One and Two-Family Additions /Alterations of more than 1,000 square feet of contiguous or non-contiguous gross floor area
- Multi-Family (3+units) Additions/Alterations
- Non-Residential New Construction of more than 5,000 square feet of contiguous or non-contiguous gross floor area
- Non-Residential Additions/Alterations of more than 5,000 square feet of contiguous or non-contiguous gross floor area
- Removal of a Historic Resource and construction of a new building
- Historic Residential Additions/Alterations
  a) One and Two-Family Additions/Alterations of more than 1,000 square feet of contiguous or non-contiguous gross floor area

b) Multi-Family (3+ units) Additions/Alterations

- Historic Non-Residential Additions/Alterations of more than 5,000 square feet of contiguous or non-contiguous gross floor area
- Affordable housing new construction and rehabilitation which receives City/ Redevelopment Agency funding and has restrictions on income and rent/sales price.
- Mixed-use construction
- Construction of more than 500 square feet of contiguous or non-contiguous gross floor area requiring a Design Review Permit and a landscape plan subject to the Bay Friendly Landscape Basic Landscape Guidelines.

B. Exclusions

This Chapter shall not apply to the following:

- Fences, decks, arbors, pergolas, retaining walls, and signs.
- Secondary dwelling units, as defined in the Oakland Planning Code Section 17.102.360.
- Repair or replacement of roof covering, fenestration, and façade materials.
- Group U detached accessory buildings which do not exceed 1,000 square feet of floor area.
- Construction, additions, and alterations which are exempted from the permitting requirements both of the Oakland Building Construction Code and the Oakland Planning Code.
- Factory-built buildings approved by the State of California and manufactured housing approved by the United States Department of Housing and Urban Development.
- City and Redevelopment Agency capital improvement construction, alterations, and additions which are subject to Chapter 15.68 of the Oakland Municipal Code or the Bay-Friendly Landscaping Guidelines.
- Seismic retrofits only.
- Fire repairs to buildings that are damaged less than 75% of the current replacement cost per Section 17.114.120 of the Oakland Planning Code.

Section 18.02.050 Authority

A. General

The Green Building Compliance Officer is hereby authorized to enforce the provisions of this Chapter. The Green Building Compliance Officer may also adopt rules and regulations to implement this Chapter.

B. Abatement of Violations

It shall be unlawful for any person, firm, or corporation to maintain any Building or portion thereof or real property or cause or allow the same to be done in violation of this Chapter. In addition to the civil penalties provided by pursuant to Oakland Municipal Code Chapter 1.08, a violator shall be liable for such costs, expenses, accruing interest, and disbursements paid or incurred by the City or any of its contractors in correcting, abating, and/or prosecuting such violation pursuant to Oakland Municipal Code Section 15.08.110.

C. Notification of Violations

A notice of violation under this Chapter shall be served in accordance with Oakland Municipal Code Section 15.08.110(B).

D. Fees, Costs, Penalties and Interest

The fees and costs incurred and the civil penalties assessed and the interest accrued in ascertaining violations or affecting abatement thereof and in collecting such fees, costs, penalties, accruing interest, and attorneys' fees shall be a charge against the real property and record title holder. Such fees, costs, penalties, and accruing interest shall be as established in the Master Fee Schedule and may be recovered by all appropriate legal means, including nuisance abatement liens, prospective and priority liens, special assessments of the general tax levy, and civil and small claims court action brought by the City, and combinations of such actions.

E. Service and Collection

The methods of service for collection actions and the types and contents of the instruments of collection shall be as set forth in Chapter 15.08 of the Oakland Municipal Code, as may be amended.

Section 18.02.060 Conflict

Wherever the provisions of this Chapter conflict with each other or with the provisions of other associated codes, regulations, or ordinances, the more restrictive provision or standard shall control.

Section 18.02.070 Amendments

Where any section, subsection, sentence, clause, phrase, or other part of this Chapter and the referenced law recited herein are amended subsequently, all provisions of the original recitation not so specifically amended shall remain in full force and effect and all amended provisions shall be considered as added thereto.

Section 18.02.080 Payments

The Record Title Holder shall pay all fees as established in the Master Fee Schedule associated with this Chapter, including but not limited to, the submittal of Green Building Documentation, requests for determinations, unreasonable hardship, alternative methods, appeals, and administrative hearings to the City.

Article III - Green Building Compliance Standards

Section 18.02.090 Compliance Standards Table Effective until December 31, 2010

The criteria in the Compliance Standards Table, below, applies 30 days after adoption of this Chapter and ends December 31, 2010.

1. Residential New Construction	
A. One and Two Family Dwellings (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Single Family GPR *Alternate* • LEED for Homes	Completed checklist
B. Multi-Family Dwellings (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Multi-Family GPR *Alternates* • Build It Green: Single Family GPR, or • LEED New Construction	Completed checklist

2. Residential Additions and Alterations	
A. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

3. Non-Residential New Construction	
A. Non-Residential projects between 5,000 to 10,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	Completed checklist
B. Non-Residential projects between 10,000 to 25,000 sq. ft. of total floor area	
Checklists	***Minimum Requirements***
Required • LEED New Construction, and • *Small Commercial Checklist* *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial Checklist)
C. Non-Residential projects over 25;000 sq. ft. of total floor area	
Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	*Completed checklist*

4. Non-Residential Additions and Alterations	
A. Non-Residential Additions and Alterations between 5,000 - 25;000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	Completed checklist
B. Non-Residential Additions and Alterations (see Major Alteration definition) over 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	Completed checklist
C. Non-Residential Additions and Alterations <u>not</u> meeting the Major Alteration definition and over 25,000 sq. ft. of floor area	
Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial Checklist)

5. Removal of a Historic Resource and New Construction

A. New Construction projects resulting in removal of a Historic Resource

Checklists	***Minimum Requirements***
Required for Residential Construction - One and Two Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy)* • Build It Green: Multi-Family GPR *Alternate for Residential Construction* • LEED Homes *Required for Non-Residential Construction- (any square footage)* • LEED New Construction *Alternate for Non-Residential Construction (any square footage)* • Other applicable LEED checklist	Completed checklist

6. Historic Residential Additions and Alterations

A. One and Two-Family Additions and Alterations of Historic Resources that exceed 1,000 sq. ft of floor area

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

7. Historic Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations of Historic Resources between 5,000 - 25,000 sq. ft. of floor area

Checklists	*Minimum Requirements*
Required • Small Commercial Checklist	Completed checklist

B. Non-Residential Additions and Alterations of Historic Resources over 25,000 sq. ft. of floor area (see Major Alteration definition)

Checklists	*Minimum Requirements*
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	Completed checklist

C. Alternate compliance: Non-Residential Additions and Alterations of Historic Resources not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area

Checklists	*Minimum Requirements*
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	Completed checklist (LEED and Small Commercial Checklist)

8. Affordable Housing Construction receiving City/Redevelopment Agency Funds

A. One, Two, and Multi-Family New Construction

Checklists	*Minimum Requirements*
Required for Residential Construction - One and Two Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy* • Build It Green: Multi-Family GPR *Alternates* • LEED Homes, or • LEED New Construction	• Completed checklist • The minimum point requirement for certification • Green Building Certification

B. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	*Minimum Requirements*
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist (Elements Label) *Alternate* • Completed checklist (Whole House Label)

9. Mixed-Use Construction	
A. Both residential and non-residential uses	
Checklists	***Minimum Requirements***
As determined by Planning Staff based on square footage of each use and which rating system and checklist is more appropriate	Completed checklist
B. Alternate compliance path: Certify each portion of the building separately per the appropriate GreenPoint Rated, LEED or Stopwaste.Org checklist)	
Checklists	***Minimum Requirements***
As Determined by Planning Staff	Completed checklist

10. Construction Requiring a Landscape Plan	
A. Construction projects over 500 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternates* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	Completed checklist

Section 18.02.100 Compliance Standards Table Effective January 1, 2011

The following green building requirements shall **be effective January 1, 2011 and thereafter** as follows:

1. Residential New Construction	
A. One and Two Family Dwellings (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Single Family GPR *Alternate* • LEED for Homes	• Completed checklist • Minimum point requirement for certification • Green Building Certification
B. Multi-Family Dwellings (3+ units) (Group R Occupancy)	
Checklists	***Minimum Requirements***
Required • Build It Green: Multi-Family GPR *Alternates* • Build It Green: Single Family GPR, or • LEED New Construction	• Completed checklist • Minimum point requirement for certification • Green Building Certification

2. Residential Additions and Alterations

A. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	*Minimum Requirements*
Required • Build It Green: Existing Home GPR	*Required* • Completed checklist • Minimum point requirement for certification (Elements Label) • Green Building Certification (Elements Label) *Alternate* • Completed checklist • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

B. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)

Checklists	*Minimum Requirements*
Not available	When available: • Completed checklist • Minimum point requirement for certification • Green Building Certification

3. Non-Residential New Construction

A. Non-Residential projects between 5,000 to 10,000 sq. ft. of floor area

Checklists	*Minimum Requirements*
Required • Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential projects between 10,000 to 25,000 sq. ft. of total floor area

Checklists	*Minimum Requirements*
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	• Completed checklist (LEED and Small Commercial Checklist) • All applicable measures on the Small Commercial Checklist • Green Building Certification

C. Non-Residential projects over 25,000 sq. ft. of total floor area

Checklists	*Minimum Requirements*
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	• Completed checklist • LEED Silver point requirement • Green Building Certification

4. Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations between 5,000 - 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • Small Commercial Checklist	• Completed checklist • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential Additions and Alterations (see Major Alteration definition) over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction *Alternates* • Other appropriate LEED checklist	• Completed checklist • LEED Silver point requirement • Green Building Certification

C. Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area

Checklists	***Minimum Requirements***
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	• Completed checklist (LEED and Small Commercial Checklist) • All applicable measures on the Small Commercial Checklist • Green Building Certification

5. Removal of a Historic Resource and New Construction

A. New Construction projects resulting in removal of a Historic Resource

Checklists	***Minimum Requirements***
Required for Residential Construction - One and Two Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy)* • Build It Green: Multi-Family GPR *Alternate for Residential Construction* • LEED Homes *Required for Non-Residential Construction- (any square footage)* • LEED New Construction *Alternate for Non-Residential Construction (any square footage)* • Other applicable LEED checklist	*Required* • Completed checklist • Consultation with a Historic Preservation Planner • LEED Gold for non-residential construction or 75 GPR points for residential construction • Green Building Certification • Deconstruction of the Historic Resource *Alternate LEED for Homes* • Same as required above, except certification threshold is LEED Silver

6. Historic Residential Additions and Alterations

A. One and Two-Family Additions and Alterations of Historic Resources that exceed 1,000 sq. ft of floor area

Checklists	*Minimum Requirements*
Required • Build It Green: Existing Home GPR	*Required* • Completed Checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification (Elements Label) • Green Building Certification *Alternate* • Completed checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

B. Multi-Family Additions and Alterations of Historic Resources

Checklists	*Minimum Requirements*
Not available	When available: • Completed checklist • Consultation with a Historic Preservation Planner • Minimum point requirement for certification • Green Building Certification

7. Historic Non-Residential Additions and Alterations

A. Non-Residential Additions and Alterations of Historic Resources between 5,000 - 25,000 sq. ft. of floor area

Checklists	*Minimum Requirements*
Required • Small Commercial Checklist	• Completed checklist • Consultation with a Historic Preservation Planner • All applicable measures on the Small Commercial Checklist • Green Building Certification

B. Non-Residential Additions and Alterations of a Historic Resource over 25,000 sq. ft. of floor area (see Major Alteration definition)

Checklists	*Minimum Requirements*
Required • LEED New Construction *Alternate* • Other appropriate LEED checklist	• Completed checklist • Consultation with a Historic Preservation Planner • LEED "Certified" point requirement • Green Building Certification

C. Alternate compliance: Non-Residential Additions and Alterations not meeting the Major Alteration definition and over 25,000 sq. ft. of floor area

Checklists	*Minimum Requirements*
Required • LEED New Construction, and • Small Commercial Checklist *Alternate* • Other appropriate LEED checklist, and • Small Commercial Checklist	• Completed checklist • Consultation with a Historic Preservation Planner • All applicable measures on the Small Commercial Checklist • Green Building Certification

8. Affordable Housing Construction receiving City/Redevelopment Agency Funds

A. One, Two, and Multi-Family New Construction

Checklists	***Minimum Requirements***
Required for Residential Construction - One and Two Family (Group R Occupancy) • Build It Green: Single Family GPR *Required for Residential Construction – Multi-Family (3+ units) (Group R Occupancy* • Build It Green: Multi-Family GPR *Alternates* • LEED Homes, or • LEED New Construction	• Completed checklist • Minimum point requirement for certification • Green Building Certification

B. One and Two-Family Additions and Alterations that exceed 1,000 sq. ft. of floor area (Group R Occupancy)

Checklists	***Minimum Requirements***
Required • Build It Green: Existing Home GPR	*Required* • Completed Checklist • Minimum point requirement for certification (Elements Label) • Green Building Certification *Alternate* • Completed checklist • Minimum point requirement for certification (Whole House Label) • Green Building Certification (Whole House Label)

C. Multi-Family Additions and Alterations (3+ units) (Group R Occupancy)

Checklists	***Minimum Requirements***
Not available	When available: • Completed checklist • Minimum point requirement for certification • Green Building Certification

9. Mixed-Use Construction

A. Both residential and non-residential uses

Checklists	***Minimum Requirements***
As determined by Planning Staff based on square footage of each use and which rating system and checklist is more appropriate	• Completed checklist • Minimum point requirement for certification • Green Building Certification

B. Alternate compliance path: Certify each portion of the building separately per the appropriate GreenPoint Rated, LEED or Stopwaste.Org checklist)

Checklists	***Minimum Requirements***
As Determined by Planning Staff	• Completed checklist • Minimum point requirement for certification • Green Building Certification

10. Construction Requiring a Landscape Plan	
A. Construction projects between 500 - 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternates* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	Completed checklist
B. Construction projects greater than 25,000 sq. ft. of total floor area requiring a Design Review permit and a Landscape Plan	
Checklists	***Minimum Requirements***
Required • Bay Friendly Basic Landscape Checklist *Alternate* • Bay Friendly Scorecard for Home Landscapes, or • Bay Friendly Scorecard for Commercial and Civic Landscapes	• Completed checklist • All applicable measures on the Bay Friendly Basic Landscape Checklist • Green Building Certification

Article IV- Entitlement Phase

Section 18.02.110 Green Building Documentation Requirements

A. Green Building Documentation

Application submittals during the Entitlement Phase shall include:

a) A completed copy of the applicable Checklist(s) as determined by Planning and Zoning Division staff.
b) Permit plans shall indicate, in general notes or individual drawings where appropriate, the green building measures used to achieve the minimum requirements. The Green Building Documentation shall indicate how many points the project will achieve in each category pursuant to the appropriate rating system.
c) A signed statement by the Green Building Certifier that the project complies with the minimum requirements upon approval of the Entitlement Phase permit subject.
d) Any other Green Building Documentation the Green Building Compliance Officer determines, in his/her discretion, to be necessary to determine compliance with this Chapter.

B. Peer Review of Green Building Documentation.

The Green Building Compliance Officer reserves the right to retain an independent, green building qualified peer review of the Green Building Documentation at the sole expense of the Applicant.

C. Completion

An application shall not be deemed complete until all required Green Building Documentation has been submitted by the Applicant and reviewed and approved by the Green Building Compliance Officer.

Section 18.02.120 Review and Consideration of Green Building Documentation

The Applicant is responsible for verifying with the Green Building Compliance Officer that the minimum requirements of this Chapter have been met based on the Green Building Documentation. The Green Building Compliance Officer shall approve or disapprove the Green Building Documentation subject to the conditions of approval based on conformance to this Chapter's minimum green building requirements, as applicable.

If during the Entitlement Phase, the Green Building Compliance Officer determines that the Green Building Documentation fails to achieve the minimum requirements of this Chapter, the Green Building Compliance Officer shall reject and return the Green Building Documentation to the Applicant. The Applicant may resubmit the Green Building Documentation to the Green Building Compliance Officer with such modifications and additions, as may be required for permit applications submitted during the Entitlement Phase.

Section 18.02.130 Compliance

A. Green Building Certification as a Condition of Approval

Compliance with the provisions of this Chapter shall be listed as a condition of approval on the Entitlement Phase permit application approvals for construction. Failure to comply with any of the terms of this Chapter shall subject the Applicant to the full range of enforcement mechanisms set forth in Section 18.02.050 and the Oakland Planning Code.

B. Noncompliance with Post Certificate of Occupancy Condition of Approval

If the Green Building Compliance Officer determines that the project is not in compliance with the minimum requirements of this Chapter, as verified by the Green Building Certification, the project shall be referred to the City's Code Enforcement Division for further action. The Green Building Compliance Officer shall also require green building measures to mitigate the project's noncompliance or pursue other remedies available under this Chapter.

Section 18.02.0140 Appeal Procedures

A. Unreasonable Hardship Exemption

a) If compliance with this Chapter presents an Unreasonable Hardship, the Applicant may apply for an exemption as set forth in this section. In applying for an exemption, the burden is on the applicant to demonstrate the Unreasonable Hardship. The City Planning and Zoning Division shall maintain the Unreasonable Hardship Exemption Application.

b) Acceptance or denial of an Unreasonable Hardship exemption is at the discretion of the Director of City Planning. Unreasonable hardship exemptions will only be granted in unusual circumstances based upon a showing of good cause and a determination that the public interest is not served by compliance or other compelling circumstances.

c) Notice of application for an exemption shall be given by posting an enlarged notice on the premises of the subject property; notice shall also be given by mail or delivery to all persons shown on the last available equalized assessment roll as owning real property in the city within three hundred (300) feet of the property involved; provided, however, that failure to send notice to any such owner where his or her address is not shown in said records shall not invalidate the affected proceedings. All such notices shall be given not less than seventeen (17) days prior to the date of the decision on the application by the Director of City Planning.

d) The determination of the Director of City Planning shall become final ten calendar days after the date of decision unless appealed to the City Planning Commission in accordance with this Chapter and Section 17.134.060 of the Oakland Planning Code. For construction involving Historic Resources, the Director of City Planning may, at his or her discretion, refer the request for an unreasonable hardship exemption to the Landmarks Preservation Advisory Board for advisory decision to the Director of City Planning.

e) The Director of City Planning or designee shall determine the maximum feasible number of credits reasonably achievable for the project and shall confirm the number of credits on the green building documentation, which shall be marked "Approved with Exemption". The construction shall be subject to the green building approval and compliance process in this Chapter, based on the confirmed number of credits.

B. Appeal

Any aggrieved individual may appeal the Green Building Compliance Officer's determination of the applicable rating system, checklist, or the Director of City Planning's unreasonable hardship determination under this Chapter to the City Planning Commission pursuant to Section 17.132 of the Oakland Planning Code during the Entitlement Phase only.

Article V - Construction Phase

Section 18.02.150 Green Building Documentation Requirements

A. Green Building Documentation

Construction Phase -Permitting and Inspection submittals shall include:

a) Construction Phase –Permitting.
   i. A completed copy of the applicable Checklist(s) approved during the Entitlement Phase, unless modified under 18.02.150, Section C.
   ii. Permit plans shall indicate in general notes, detailed design drawings and construction specifications as necessary, the green building measures used to achieve the required minimum requirements. The Green Building Documentation shall indicate how many points the project will achieve in each category pursuant to the appropriate rating system.
   iii. A copy of the signed statement by the Green Building Certifier submitted during the Entitlement Phase and a new signed statement by the Green Building Certifier that the project complies with the minimum requirements of this Chapter.
   iv. Any other Green Building Documentation required by the Green Building Compliance Officer to determine compliance with this Chapter.

b) Construction Phase - Inspections.
   i. A completed copy of the applicable Checklist(s) submitted in subsection a) above, unless modified under 18.02.150, Section C.
   ii. Any other Green Building Documentation required by the Green Building Compliance Officer to determine compliance with this Chapter.
   iii. Signed statement or statements by the Green Building Certifier during all relevant phases of construction, as determined by the Green Building Compliance Officer, that the project complies with the minimum requirements of this Chapter.

B. Peer Review of Green Building Documentation

The Green Building Compliance Officer reserves the right during the Construction Phase, to retain an independent, green building qualified peer review of the Green Building Documentation at the sole expense of the Applicant.

C. Substitution of Credits

During the Construction Phases for Permitting and/or Inspections, flexibility may be exercised by the Applicant to substitute or eliminate points approved during the Entitlement Phase as applicable. Substitution and/or omission shall occur only at the request of the applicant. The applicant shall submit, per the Request for Revision Plancheck process, additional Green Building Documentation indicating the points to be substituted or omitted for review and approval. Substitution and/or omission of points shall only be permitted if it does not result in lowering the required minimum point threshold or eliminate points needed in each category pursuant to the appropriate rating system and as verified by the Green Building Certifier. In the case of construction involving Historic Resources, the new substituted points will require re-review and approval by the Historic Preservation Planner.

Section 18.02.160 Review and Consideration of Green Building of Documentation

A. Approval of Documents

The Green Building Compliance Officer, or designees shall be responsible for verifying compliance with the minimum requirements for this Chapter based on the Green Building Documentation submitted during the following construction phases:

a) Construction Phase - Permitting. The Green Building Documentation, provided under Section 18.02.150, unless modified by the Section 18.02.150(D), shall be reviewed during the permit review process and a permit shall be issued based on conformance to the applicable minimum requirements.

b) Construction Phase - Inspections. The Green Building Compliance Officer or a designee shall verify that the green building measures and provisions indicated in the Green Building Documentation submitted during the Entitlement and Construction Phase - Permitting are implemented through inspections during the construction of the project. In lieu of or in addition to visual inspections by the Green Building Compliance Officer, the Applicant, through the Green Building Certifier, may submit Green Building Documentation verifying that green building measures have been implemented in compliance with the minimum requirements of this Chapter.

B. Non-approval of Documents

a) Construction Phase - Permitting. If during the Permitting stages, the Green Building Compliance Officer determines that the Green Building Documentation fails to achieve the minimum requirements, the Green Building Compliance Officer shall reject and return the Green Building Documentation to the Applicant, including a detailed explanation for rejection and measures required to conform to this Chapter. The Applicant may resubmit the Green Building Documentation with such modifications and additions as may be required for Permitting issuance.

b) Construction Phase - Inspections. If the Green Building Compliance Officer determines that the project under construction does not comply with any portion of the approved Green Building Documentation showing compliance with the minimum requirements, a Stop Work order may be issued. At the discretion of the Green Building Compliance Officer, the Stop Work order may apply to the portion of the project that is not in compliance or to the entire project. The Stop Work order shall remain in effect until the Green Building Compliance Officer determines that the project is in compliance with the requirements and the provisions of this Chapter as shown on the approved Green Building Documentation.

Section 18.02.170 Compliance

A. Final Determination of Compliance and Building Occupancy

Prior to signing a building permit by the Building Official and issuing of a Temporary Certificate of Occupancy, the Applicant must also submit a signed statement by the Green Building Certifier that the project meets the minimum requirements of this Chapter. The Green Building Compliance Officer may also review the verification documentation submitted by the Green Building Certifier and determine whether the Applicant has achieved the minimum requirements as set forth in this Chapter.

Section 18.02.180 Appeal Procedures

A. General

In order to hear and decide appeals of orders, decisions or determinations made by the Green Building Compliance Officer during the Construction Phase Permitting and Inspections process, relative to the application and interpretation of the non-administrative sections of this Chapter, the Record Title Holder may request an administrative hearing with a Hearing Officer. The request shall be filed in writing with the Green Building Compliance Officer within twenty-one (21) calendar days following said rendering. The request for an administrative hearing shall contain a brief statement in ordinary and concise language of the relief sought and the reasons why it is claimed that the protested order, decision, or determination should be modified or reversed or otherwise set aside.

B. Hearing

After receiving a written request and the required fee for an administrative hearing, the Green Building Compliance Officer shall fix a date, time and place for adjudication by a Hearing Officer during the Construction Phase Permitting and Inspections process. Only those technical matters or issues specifically raised by the appellant in the request shall be considered in the administrative hearing.

C. Hearing Officer

In cases of a Construction Phase Permitting and Inspections process appeal, the Hearing Officer shall not be an employee of the City and shall be qualified by experience and training to adjudicate matters pertaining to the provisions of this Chapter. The Hearing Officer shall have no authority relative to interpretations of the administrative (non-technical) provisions of this Chapter and shall not be empowered to waive or otherwise set aside the non-administrative (technical) provisions of this Chapter.

D. Effect of Hearing

Decisions of either the City Planning Commission or the Hearing Officer in all instances shall be final and conclusive. The limitation period provided pursuant to California Code of Civil Procedure Section 1094.6 shall apply to all petitions filed seeking judicial review of decisions by either the City Planning Commission or the Hearing Officer.

SECTION 5. Severability

The provisions of this Ordinance are severable, and if any clause, sentence, paragraph, provision, or part of this Ordinance, or the application of this Ordinance to any person, is held to be invalid or preempted by state or federal law, such holding shall not impair or invalidate the remainder of this Ordinance. If any provision of this Ordinance is held to be inapplicable, the provisions of this Ordinance shall nonetheless continue to apply with respect to all other covered development projects and applicants. It is hereby declared to be the legislative intent of the City Council that this Ordinance would have been adopted had such provisions not been included or such persons or circumstances been expressly excluded from its coverage.

SECTION 6. California Environmental Quality Act

Prior to adopting this Ordinance, the City Council independently finds and determines that this action is exempt from CEQA (California Environmental Quality Act), pursuant to CEQA Guidelines Section 15060(C)(2),15061(B)(3) (General Rule; Section 150307 (Actions by Regulatory Agencies for Protection of Natural Resources); Section 150308 (Actions by Regulatory Agencies for Protection of the Environment); and Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning), each of which provides a separate and independent basis for an exemption.

SECTION 7. Annual Review

The Community and Economic Development Agency shall review this ordinance biannually and provide a report to the Planning Commission to determine whether it needs to be updated because of, but not limited to, new legislation enacted by the State or new standards developed by applicable organizations, such as StopWaste.Org, Build It Green, and LEED or the development of another effective rating system.

SECTION 8. Effective Date

This Ordinance shall be effective on and after its adoption by sufficient affirmative votes of the Council of the City of Oakland, as provided in the Charter of the City of Oakland, Section 216. This Ordinance shall be implemented in phases. The first phase criteria applies to 30 days from the date of final passage by the City Council until December 31, 2010. The Ordinance becomes fully effective January 1, 2011 and thereafter, as amended from time to time. The Ordinance shall not apply to (a) building/construction related permits already issued and not yet expired, or (b) to zoning applications approved by the City and not yet expired, or to (c) zoning applications deemed complete by the City as of the date of final passage. However, zoning applications deemed complete by the City prior to the date of final passage of this Ordinance may be processed under provisions of these Planning Code amendments if the applicant chooses to do so.

IN COUNCIL, OAKLAND, CALIFORNIA, _____, 2010

PASSED BY THE FOLLOWING VOTE:

AYES - BROOKS, DE LA FUENTE, KAPLAN, KERNIGHAN, NADEL, QUAN, REID, AND PRESIDENT BRUNNER

NOES -

ABSENT -

ABSTENTION -

ATTEST: _____
LATONDA SIMMONS
City Clerk and Clerk of the Council
of the City of Oakland, California

DATE OF ATTESTATION _____

a. The City of Oakland is located in Climate Zone 3 which is characterized by periods of extremely hot, dry weather during the summer and fall months. During these months, emissions generated within or transported to the Bay Area can combine with abundant sunshine to create conditions conducive to the formation of pollutants, such as ozone and secondary particulates, such as nitrates and sulfates. In addition, during the winter, the City of Oakland frequently experiences cold days with temperature inversions that trap certain air pollutants near the ground and exacerbate conditions leading to respiratory disease and other health risks. These local features contribute to the Bay Area's status as a "nonattainment area" under the federal Clean Air Act for ozone and particulate matter.

   The City of Oakland is located on the east side of San Francisco Bay. About two-thirds of Oakland is within a flat alluvial plain while the other third is located in the foothills of the East Bay Hill range. It is also a major port City and the regional transportation hub for the East Bay.

   Most Oakland residents have experienced the effects of poor air quality at one time or another. While the meteorology is generally favorable due to marine air traveling through the Golden Gate, the Oakland area is often considered a source for regional pollutants that contribute to elevated concentration in downward communities. This is especially the case in mobile or transportation sources. Resident populations in West and East Oakland have been the subject of many recent public health studies related to industry, multiple freeways, diesel trucks and port operations. Most of these studies have concluded that there is a serious health risk due to poor air quality including respiratory problems such as asthma, heart ailments, suppressed resistance to disease, infant mortality and finally reduced life span. Therefore, Oakland's geographic location and infrastructure makes it especially vulnerable to the climatic affects.

b. In June 2006, ICLEI – Local Governments for Sustainability in partnership with the Alameda County Waste Management Authority & Recycling Board (StopWaste.Org) and the Alameda County Conference of Mayors launched the Alameda County Protection Project. The City of Oakland committed to the project and embarked on an ongoing, coordinated effort to reduce the emissions that cause global warming, improve air quality, reduce waste, cut energy use and save money. On July 6, 2009, the Oakland City Council set a preliminary target to reduce community-wide greenhouse gas emissions by 36% below 2005 levels by 2020, and recommended a path to reduce GHG emissions by 83% below 2005 levels by 2050, to be analyzed as part of the preparation of a City-wide Energy and Climate Action Plan. While climate change is a global problem influenced by an array of interrelated factors, climate change is also a local problem with serious impacts foreseen for California, the Bay Area and City of Oakland. Local impacts include:

   i. **Sea level rise:** According to the Union of Concerned Scientists, the sea level in the State of California is expected to rise up to 12 inches of the next hundred years. The California Energy Commission's Public Interest Energy

Research (PIER) Climate Change Program predicts that a medium to high greenhouse gas emissions scenario is expected to result in sea level rises in San Francisco Bay of 16 inches by 2050 and 55 inches by 2100 if no actions are taken to protect the coast1. The Pew Center on Climate Change has reported that this would result in the erosion of beaches, bay shores and river deltas, marshes and wetlands and increased salinity of estuaries, marshes, rivers and aquifers. In addition, sea level rise will damage coastal roads and other infrastructure (port, bridges, and roads), and low-lying property.

Modeling by the San Francisco Bay Conservation and Development Commission (SFBCDC) show that under medium to medium-high greenhouse gas emissions scenarios, sections of Interstate 880, much of the Oakland International Airport (72-93%), portions of West Oakland, EBMUD's water treatment plant, areas around Lake Merritt, much of Oakland's shoreline, and areas near the coliseum would be underwater. The modeling also shows a drastic impact to the movement of goods from the Port of Oakland, the third largest port in California. Further modeling by Researcher Matt Heberger of The Pacific Institute estimates that with a 55-inch sea level rise, the area in Oakland flooded by the unimpeded 100-year tide would be 8.6 square miles – over 15% of Oakland's land area.[2]

ii. **Impacts on water**: Water quality and quantity in Oakland are at risk as a result of changing temperatures. With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season in the Sierra's and accelerating the rate at which the snowpack melts in the spring. Not only does such snow melt increase the threat for spring flooding, it will decrease the Sierras' capacity as a natural water tower, resulting in decreased water availability for agricultural irrigation, hydro-electric generation and the general needs of a growing population.

The Sierra snow-pack is the origin of the Mokelumne River, the primary source of water for the jurisdictions within Alameda County including the City of Oakland. The East Bay Municipal Utility District (EBMUD) provides water and sewage treatment for Alameda County customers. In 2008, EBMUD staff conducted a study on climate change impacts on water quality and water supply for the EBMUD service area, with many of its findings relevant to the City of Oakland. That study found the Sacramento/San Joaquin River Delta and its aging levee system exceptionally susceptible to storm damage. Although EBMUD does not divert its water supply from the delta, failure of the delta's levees could result in catastrophic damage to EBMUD's nearby water supply aqueducts, interrupting water deliveries to EBMUD's service area, including Oakland.[3]

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[1] Heberger *et. al.* Pacific Institute, 2009. "The Impacts of Sea-Level Rise on the California Coast." Pp. xi.
[2] Heberger, Matt. 2009. <http://www.pacinst.org/reports/sea_level_rise/files/Ca_coast_yr2100_flood.html.>
[3] Wallis *et. al.*, EBMUD, 2008. Pp. 74.

Rising water temperatures may affect water quality by promoting algae growth in Lake Merritt, the Estuary, and Oakland's many above ground creeks and marshes, resulting in increased algal by-products such as taste-and-odor compounds[4] and hypoxia.[5]

iii. **Natural disasters:** Climate models predict a 4°F temperature increase in the next 20 to 40 years, with an increase in the number of long dry spells, as well as a 20-30% increase in precipitation in the spring and fall. More frequent and heavier precipitation causes flooding, mudslides and landslides, incurring considerable costs in damages to property, infrastructure and even human life.

As mentioned above, a large portion of Oakland is located in the foothills of the East Bay Hills range and many properties are located on extremely steep slopes. During winters with an extreme storm event or a series of storm events with heavy rainfall, Oakland typically experiences landslides in these areas due to saturated ground-water conditions. Approximately 43 landslides occurred in a single El Niño (extreme wet weather) season.[6]

An increasing number of wildfires, due to continued dry periods and high temperatures, are another expected impact of continued climate change. As indicated in Oakland's Safety Element, wildfires are the most severe fire hazard in Oakland, especially in the hills above the Warren Freeway. Because the Oakland Hills are a fire-dependent ecosystem, there is a severe wildfire every 10 to 20 years when the area's natural vegetation is dry and extremely flammable. Urbanization of Oakland's fire hazard areas has increased the potential for more frequent and severe wildfires with an additional likelihood of severe damage and loss of life. The 1991 fire is notorious for being the most destructive wildfire in California history.

iv. **Public health impact:** Warming temperatures and increased precipitation can also encourage mosquito-breeding, thus engendering diseases that come with mosquitoes, such as the West Nile Virus, a disease of growing concern in Oakland and the surrounding region.

Heat waves are also expected to have a major impact on public health and be a determinant factor of mortality. Increased temperatures also pose a risk to human health when coupled with high concentrations of ground-level ozone and other air pollutants, potentially leading to increased rates of asthma and other pulmonary diseases. The incidence of bad air days in California's urban areas has increased, mostly in hot summer days. In the summer of 2006, the

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[4] Wallis *et. al.*, EBMUD, 2008. Pp. 75.
[5] SFBCDC, 2009. Pp. 78.
[6] Coe, Jeffrey, Jonathan W. Godt, Dianne Brien, and Nicolas Houdre, 1999. "Map Showing Locations of Damaging Landslides in Alameda County, California, resulting from 1997-98 El Niño Rainstorm."

Bay Area Air Quality Management District (BAAQMD) registered 11 Spare the Air days for the region and exceeded the California 1-hour standard for ozone (set at 90 ppb) 18 times. As noted above, parts of Oakland are already impacted by poor air quality due to the adjacent port, major highway system, and industry within the city borders.

Impacts on plants and vegetation: Native plants and animals are at risk as temperatures rise and scientists are reporting more species moving to higher elevations or more northerly latitudes in response to climate change. This could affect the 31 plant and 20 animal species that are either in danger of extinction or present in very limited numbers and make Oakland their home. On the list of special status animals, there are two mammals, one reptile, fifteen birds, one fish, and one insect. Of these, 14 are federal special status and 19 are state special status creatures. Six threatened plant species in Oakland are state status and 14 plant species are federal status threatened, endangered, or rare plants.
The absence of these native species would allow invasive species of weeds and insects to gain a foothold in these areas and to threaten other native species and their habitat. This change would be particularly devastating to Oakland as wildlife actually composes nearly 20% of Oakland's total land area. Furthermore, these special species and their habitats as they are already struggling to survive in an infill, urban area.

c. The City of Oakland's local climatic, topographic, and geological conditions exacerbate the impacts of global climate change in several ways to make the adoption of green building requirements reasonably necessary:

i. Increasing summer temperatures increase the need for air conditioning, thereby increasing average load demand and peak load demand for energy within the City of Oakland. This heightened demand increases the risk of power outages and power shortages, with associated adverse public safety and economic impacts. Increased energy demand and usage also increases local and regional air pollution impacts. Decreasing energy consumption through energy efficiency and other green building techniques reduces each of these impacts.

ii. Increasing summer and year-round temperatures also adversely affect the City of Oakland's water supply, which is already subject to periodic drought conditions and potential water cutback. Decreasing water usage through conservation, sustainable landscaping (such as Bay-Friendly Landscaping), use of drought-tolerant and native plants, and other green building techniques reduces these adverse impacts.

d. The City of Oakland finds that the design, construction, and maintenance of buildings and landscapes within the City of Oakland can have a significant impact on the City of Oakland's environmental sustainability, resource usage and efficiency, waste management, and the health and productivity of residents, workers, and visitors to the

City of Oakland. In 2005, Oakland enacted Chapter 15 of the Oakland Municipal Code, which requires all new City construction and major renovation projects to achieve a LEED Silver certification. In 2006, Oakland adopted as the Alameda County Residential Green Building Guidelines, the U.S. Green Building Council's LEED Rating Systems and the Bay-Friendly Landscape Guidelines as official City reference documents.

e. Green buildings play a significant role in reducing the amount of waste sent to landfills. Construction and demolition debris comprise up to 30% of all materials disposed of in California's landfills and over 21% of materials disposed of in Alameda County. Many of these materials have greenhouse gas implications once landfilled. The breakdown of organic materials in landfills produces methane and other greenhouse gases, as does the process of making new building materials from raw materials.

f. This green building ordinance furthers the City of Oakland's efforts to enhance the community's social, economic, and environmental well-being and to mitigate the efforts of global warming on the City of Oakland's weather, water supply, physical infrastructure, ecological diversity, human health and economy.

GREEN BUILDING in Alameda County

Energy Cost-effectiveness Study*

Executive Summary

Purpose of the Study:

Stopwaste.Org's Green Building in Alameda County program commissioned this Energy Cost-effectiveness study on behalf of their member agencies. This report can be used by Alameda County jurisdictions wishing to adopt mandatory energy policy(ies) that exceed the State's Building Energy Efficiency Standards 2008 Title 24 part 6 (T-24 2008) scheduled to be effective on August 1st, 2009. In order to adopt policies requiring energy efficiency beyond T-24 2008, a cost effectiveness study and findings must be approved by the California Energy Commission (CEC) and filed with the California Building Standards Commission (BSC).

It's important to note that separate local climatic, geological, or topographical findings must be filed with the BSC for adopted local policies that require building standards that are different and *more restrictive than the California Green Building Standards Code.*

This report can be referenced in the CEC/BSC filing process and should eliminate the need for each individual City in Alameda County to replicate this analysis. The report includes energy cost-effectiveness analysis using case studies of several building designs that meet and exceed T-24 in the two California climate zones within Alameda County: 3 & 12. Gabel Associates, LLC was contracted to conduct the energy analysis and summary report, and Building Advisory, LLC was contracted to conduct cost research referenced in the report.

Summary of Methodology:

The data in this cost-effectiveness study has been developed and compiled to consider code change cost implications to new construction projects in Climate Zones 3 and 12 for single family residential, multifamily low-rise residential, multifamily high-rise residential and non-residential office buildings. For each prototype new construction building the measures and associated incremental cost necessary to reach 10%, 15%, 20%, and 35% above code are itemized, and the cost-effectiveness for each scenario is presented in graph format.

The percent better than code compliance is per the T-24 performance approach in the T-24 2008 *code beta versions of the MICROPAS and EnergyPro compliance alternative calculations* method (ACM) software programs. These ACM software programs report energy savings in the metric of time dependent valuation (TDV) kBtu/sf-year. TDV kBtu/sf-year is the energy savings metric from which site energy in KWh and Therms is calculated for each performance scenario to establish the annual energy savings, energy cost savings and CO2-equivalent reductions in greenhouse gases.

* This document summarizes a more comprehensive document authored by Gabel and Associates, LLC.

Exhibit A-2

Starting with a 2008 Standards minimally compliant set of measures, various items are changed to just reach the next increment of energy performance (e.g., 10% better than Title 24). The energy measures chosen are not all the prescriptive measures, but are a combination of measures, which reflect how designers, builders and developers are likely to achieve a specified level of performance. A minimum and maximum range of incremental costs of added energy measures is established by a variety of research and surveys to obtain accurate and current measure cost.

Results of the Study:

The case study analysis provides a limited set of data representing the impact that the T-24 2008 code update will have on the cost for projects to go beyond minimum code compliance. Figures 1-5 on the following pages summarize the cost/square foot and the average cost for projects to meet these thresholds above the new code.

The goal of these case studies is to provide relatively real-world order-of-magnitude results for local jurisdictions attempting to understand and calibrate energy and cost impacts of local energy ordinances or local green building ordinances. In this limited study, no attempt has been made to gather statistically significant data that can be applied to all new construction projects.

Single Family Home Cost Effectiveness Summary

Two Homes at 10%, 15%, 20% & 35% above the T-24 2008 Standards in Climate Zones 3 & 12

Home # 1 = 1,582 square feet
Home # 2 = 2,025 square feet

Climate Zone 3										
Home Size (square feet)		#1 =	1,582				#2 =	2,025		
% > T-24	**Meet Code**	**10%**	**15%**	**20%**	**35%**	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.****	$0.15	$0.64	$1.19	$1.33	$2.14	$0.69	$0.69	$0.77	$0.87	$2.03
Ave. $/home	$237.30	$1,012.48	$1,882.58	$2,104.06	$3,385.48	$1,397.25	$1,397.25	$1,559.25	$1,761.75	$4,110.75
CZ 3 Average of Home #1 & #2										
%> T-24	Meet Code	10%	15%	20%	35%					
Ave. of Both Homes	$817.28	$1,204.87	$1,720.92	$1,932.91	$3,748.12					

Climate Zone 12										
Home Size (square feet)		#1 =	1,582				#2 =	2,025		
% > T-24	**Meet Code**	**10%**	**15%**	**20%**	**35%**	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.****	$0.52	$0.60	$1.10	$1.94	$5.38	$0.48	$0.60	$1.18	$1.69	$4.92
Ave. $/home	$822.64	$949.20	$1,740.20	$3,069.08	$8,511.16	$972.00	$1,215.00	$2,389.50	$3,422.25	$9,963.00
CZ 12 Average of Home #1 & #2										
%> T-24	**Meet Code**	**10%**	**15%**	**20%**	**35%**					
Ave. of Both Homes	$897.32	$1,082.10	$2,064.85	$3,245.67	$9,237.08					

Average of Climate Zones 3 & 12					
%> T-24	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. of Both Climate Zones	**$857.30**	**$1,143.48**	**$1,892.88**	**$2,589.29**	**$6,492.60**
	~$850	~$1,150	**~$1,900**	~$2,600	~$6,500

On Average, the incremental cost per single family home to exceed T-24 2008 by 15% is $1,900.

The "Meet Code" columns show the incremental cost per single family home to go from minimally compliant T-24 2005 to minimally compliant T-24 2008. On average, the incremental cost to meet the new code is $850.

Figure 1

Low-rise Multifamily Cost Effectiveness Summary

One prototype multifamily building at 10%, 15%, 20% & 35% above the T-24 2008 Standards in Climate Zones 3 & 12

2 story, 8 units, 8,442 s.f.

Climate Zone 3					
Building Size (square feet)	8,442				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.	$0.14	$0.54	$1.42	$1.58	$1.86
Ave. $/unit (8 units/building)	$147.74	$569.84	$1,498.46	$1,667.30	$1,962.77

Climate Zone 12					
Building Size (square feet)	8,442				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.	$0.37	$1.07	$1.80	$2.37	$4.20
Ave. $/unit (8 units/building)	$390.44	$1,129.12	$1,899.45	$2,500.94	$4,432.05

Average of Climate Zones 3 & 12					
Building Size (square feet)	8,442				
%> T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f. both climate zones	$0.26	$0.81	$1.61	$1.98	$3.03
Ave. $/unit (8 units/building)	**$269.09**	**$849.48**	**$1,698.95**	**$2,084.12**	**$3,197.41**
	~$270	~$850	**~$1,700**	~$2,000	~$3,000

On Average, the incremental cost per multifamily unit to exceed T-24 2008 by 15% is $1,700.

The "Meet Code" columns show the incremental cost per multifamily building to go from minimally compliant T-24 2005 to minimally compliant T-24 2008. On average, the incremental cost per multifamily dwelling unit to meet the new code is $300.

Figure 2

High-rise Multifamily Cost Effectiveness Summary

One prototype High-rise Residential building at 10%, 15%, 20% & 35% above the T-24 2008 Standards in Climate Zones 3 & 12

5 story, 40 units, 26,800 s.f.

Climate Zone 3					
Building Size (square feet)	26,800				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.	$0.00	$0.86	$1.18	$2.66	$5.40
Ave. $/unit (40 units/building)	$0.00	$907.52	$1,245.20	$2,806.97	$5,698.35

Climate Zone 12					
Building Size (square feet)	26,800				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f.	$0.00	$0.58	$0.76	$2.66	$4.69
Ave. $/unit (40 units/building)	$0.00	$612.05	$801.99	$2,806.97	$4,949.12

Average of Climate Zones 3 & 12					
Building Size (square feet)	26,800				
%> T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**35%**
Ave. $/s.f. both climate zones	$0.00	$0.72	$0.97	$2.66	$5.05
Ave. $/unit (40 units/building)	**$0.00**	**$759.78**	**$1,023.59**	**$2,806.97**	**$5,323.74**
	~$0*	~$760	**~$1,000**	~$2,800	~$5,300

On Average, the incremental cost per high-rise residential unit to exceed T-24 2008 by 15% is $1,000.

* The "Meet Code" columns show the incremental cost per multifamily building to go from minimally compliant T-24 2005 to minimally compliant T-24 2008. On average, the incremental cost per multifamily dwelling unit to meet the new code is $0. In the Beta version of EnergyPro available at the time this analysis was conducted, the 2005 code Highrise Multifamily project also complied with the 2008 code and therefore showed no incremental cost. In the final version of EnergyPro with the residential (waterheating) code changes incorporated, we anticipate that there will be some incremental cost to meet the new code.

Figure 3

Non-Residential Cost Effectiveness Summary

One prototype low-rise office building at 10%, 15%, 20% & 25% above the T-24 2008 Standards in Climate Zones 3 & 12

2 story, 21,160 s.f.

Climate Zone 3					
Building Size (square feet)	21,160				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**25%**
Ave. $/s.f.	$0.73	$0.91	$2.35	$3.98	$4.34
Ave. $/building	$770.33	$960.28	$2,479.84	$4,199.90	$4,579.79

Climate Zone 12					
Building Size (square feet)	21,160				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**25%**
Ave. $/s.f.	$1.46	$0.95	$2.11	$2.61	$3.89
Ave. $/building	$1,540.67	$1,002.49	$2,226.58	$2,754.20	$4,104.92

Average of Climate Zones 3 & 12					
Building Size (square feet)	21,160				
%> T-24 2008	**Meet Code**	**10%**	**15%**	**20%**	**25%**
Ave. $/s.f. both climate zones	$1.10	$0.93	$2.23	$3.30	$4.12
Ave. $/building both climate zones	**$1,155.50**	**$981.38**	**$2,353.21**	**$3,477.05**	**$4,342.35**
	~$1,150	**~$1,000**	~$2,300	~$3,500	~$4,300

The "Meet Code" columns show the incremental cost per non-residential office building to go from minimally compliant T-24 2005 to minimally compliant T-24 2008.

Figure 4

Non-Residential Cost Effectiveness Summary

One prototype high-rise office building at 10%, 15% & 20% above the T-24 2008 Standards in Climate Zones 3 & 12

5 story, 52,900 s.f.

Climate Zone 3				
Building Size (square feet)				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**
Ave. $/s.f.	$0.36	$0.79	$1.74	$2.25
Ave. $/building	$379.89	$833.65	$1,836.14	$2,374.31

Climate Zone 12				
Home Size (square feet)				
% > T-24 2008	**Meet Code**	**10%**	**15%**	**20%**
Ave. $/s.f.	$1.01	$0.95	$1.01	$1.89
Ave. $/building	$1,065.80	$1,002.49	$1,065.80	$1,994.42

Average of Climate Zones 3 & 12				
%> T-24 2008	**Meet Code**	**10%**	**15%**	**20%**
Ave. $/s.f. both climate zones	**$0.69**	**$0.87**	**$1.38**	**$2.07**
Ave. of Both Climate Zones	**$722.85**	**$918.07**	**$1,450.97**	**$2,184.37**
	~$700	**~$900**	~$1,500	~$2,100

The "Meet Code" columns show the incremental cost per highrise non-residential office building to go from minimally compliant T-24 2005 to minimally compliant T-24 2008.

Figure 5

Policy Recommendations:

When developing and implementing an energy efficiency or green building ordinance, we recommend the following:

- Performance vs. Prescriptive Approach

The performance approach to energy compliance should be implemented in all local ordinances for residential and nonresidential. There are two approaches to meet the energy code: the performance approach and the prescriptive approach. In order to show a project exceeds the energy code, California State requires a performance approach to meet a threshold percentage better than T-24. While the prescriptive approach is essentially a list of measures and can appear to be easier to implement, it doesn't provide a mechanism to determine the most cost-effective set of energy efficiency measures for each unique project. For these reasons, the performance approach showing a percentage of performance better than T-24 is used in a large variety of applications such as:

- Utility incentive programs
- State tax credits for solar PV systems (NSHP program)
- GreenPoint Rated program
- LEED rating system
- Local energy ordinances
- Low Income Housing Tax Credits
- ENERGY STAR New Homes
- Federal energy efficiency tax credits
- HERS Phase 2 for Existing and New Homes (2010)

Conversely, we strongly recommend against a local ordinance requiring prescriptive measures that can be modeled in the performance method because it does not allow building designers flexibility in deciding which energy measures, in combination and for the lowest cost, meet the overall energy budget for the building. The prescriptive approach's limitation on project decisions, and perceived preference towards specific energy saving products, could cause legal disputes with constituents and product manufacturers.

- Title 24 Analysis, Metric and Forms

Use Title 24 methods, rules, software and reports wherever possible, augmented only when necessary to comply with or document a special energy credit.

- LEED Energy Performance

Any local ordinance which references LEED should provide an administrative mechanism whereby a permit applicant can meet the minimum energy LEED requirement with a designated Title 24 energy equivalent performance.

- Energy Efficiency before On-site Generation

Only award solar PV credit after a building has already achieved the minimum energy efficiency performance. Energy efficiency is a more cost-effective investment to achieve green house gas reductions than on-site generation as documented in numerous studies, including the California

Public Utility Commission's (CPUC) 2020 Strategic Plan and the California Air Resources Board's (CARB) AB32 draft scoping plan.

We also recommend that, to ensure consistency with State programs and maximum benefit to applicants seeking to apply for available incentives, a local energy ordinance that includes provisions for PV meet all installation criteria in the "Guidelines for California's Solar Electric Incentive Programs Pursuant to Senate Bill 1." The methodology used to calculate the energy equivalent to the solar PV credit shall be the CECPV Calculator using the most recent version prior to the permit application date, which may be found at: http://www.gosolarcalifornia.ca.gov/nshpcalculator/.

- Certified Energy Plans Examiners (CEPEs)

The California Association of Building Energy Consultants (CABEC) sponsors and administers the Certified Energy Plans Examiner (CEPE) program for the Residential and Nonresidential Standards. CEPE candidates must pass an examination to demonstrate knowledge of the applicable standards.

Local ordinances can include a requirement, or create a permit incentive, for the energy analysis and documentation to be prepared by an individual with the current applicable CEPE credential.

State Review of Local Adopted Energy Standards

This cost effectiveness study and findings can be submitted by Cities in Alameda County to the California Energy Commission (CEC) and filed with the California Building Standards Commission (BSC) in the process described below. The following summarizes the steps of creating and implementing a local energy ordinance, or a green building ordinance which includes energy requirements, that exceed the California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part6):

1. Establish Ordinance (city/county staff)
2. Conduct Cost Effectiveness Study (city/county staff or consultant)
3. First Reading of Ordinance (City Council or Board of Supervisors)
4. Application to the California Energy Commission (CEC)
5. Second Reading of Ordinance (City Council or Board of Supervisors)
6. File with the California Building Standards Commission (BSC)
7. Implementation and Enforcement (city/county staff)

1. Establish Ordinance

Include the following findings in the ordinance:

- A clear policy statement outlining the green building or energy goals for each building type covered
- A general understanding of the relative impact on increased construction costs of the proposed ordinance

- A plan including the adoption timeline and approach for enforcement by the local building department

Specify thresholds for the more stringent energy requirements as defined by the following building permit scenarios:

- New construction vs. Additions vs. Alterations
- Occupancy type
- Number of stories and/or building height
- Total conditioned floor area

Note that the cost effectiveness study in this report only applies to *new construction*, a separate analysis would be required for existing buildings.

2. Cost Effectiveness Study

The jurisdiction makes an independent judgment as to the levels of energy efficiency appropriate for their permit applicants, usually requiring projects to be between 10% to 20% more energy efficient than Title 24, Part 6 depending on occupancy type and costs. A jurisdiction may choose for the ordinance to refer to one or more green building rating systems, such as LEED and GreenPoint Rated, which have standard minimum energy efficiency requirements for new construction and those requirements then become the basis for the local ordinance.

The energy cost-effectiveness study is a consideration of the incremental first cost to achieve the required percentage above code as compared to the annual energy cost savings for the various building types. The cost-effectiveness study should inform the energy efficiency thresholds as part of the supporting documentation provided to members of the City Council or Board of Supervisors prior to the vote on the ordinance. The Energy Cost-effectiveness study satisfies this requirement.

3. First Reading of Ordinance

An ordinance must have preliminary local approval *before* the application to the CEC can be submitted for state review. In most cases, that means a "first reading" or "introduction" of an ordinance, and its initial approval by the City Council or Board of Supervisors prior to its final adoption at a later date.

4. Application to the California Energy Commission (CEC)

Public Resources Code section 25402.1(h)(2) and the California Code of Regulations, Title 24, Part 1, Article 1, Section 10-106 establish that no local energy ordinance can be legally enforced unless the CEC first reviews the ordinance and finds that it "will require the diminution of energy consumption levels permitted by [Title 24].". The following is the full text of section 10-106:

SECTION 10-106 – LOCALLY ADOPTED ENERGY STANDARDS

(a) Requirements. Local governmental agencies may adopt and enforce energy standards for newly constructed buildings, additions, alterations, and repairs provided the Commission finds that the standards will require buildings to be designed to consume no more energy than

permitted by Part 6. Such local standards include, but are not limited to, adopting the requirements of Part 6 before their effective date, requiring additional energy conservation measures, or setting more stringent energy budgets. Local adoption of the requirements of Part 6 before their effective date is a sufficient showing that the local standards meet the requirements of this section and Section 25402.1(f)(2) of the Public Resources Code; in such a case only the documentation listed in Section 10-106(b), and a statement that the standards are those in Part 6, need be submitted.
(b) Documentation Application. Local governmental agencies wishing to enforce locally adopted energy conservation standards shall submit four copies of an application with the following materials to the executive director:
1. The proposed local energy standards.
2. A study with supporting analysis showing how the local agency determined energy savings.
3. A statement that the local standards will require buildings to be designed to consume no more energy than permitted by Part 6.
4. The basis of the agency's determination that the standards are cost effective.
NOTE: Authority cited: Section 25402.1, Public Resources Code. Reference: Section 25402.1, Public Resources Code.

The findings in the ordinance and scope of the cost-effectiveness study are at the discretion of the local jurisdiction. See example approved ordinances at:
http://www.energy.ca.gov/title24/2005standards/ordinances_exceeding_2005_building_standards.html

CEC staff will review the ordinance, and may have comments or request clarification of language that they interpret as unclear or potentially in conflict with Title 24 Standards. From the date that the CEC receives an application expect a minimum of two to three months until formal review by the Commission. CEC's required findings generally do not require the presence of local jurisdiction staff to be present in Sacramento to respond to questions or comments by the Commissioners although they are welcome to be present if they wish. They may also listen in to Energy Commission Business Meetings via the weblink at:
http://www.energy.ca.gov/calendar/events/index.php?com=detail&eID=30

5. Second Reading by City Council or Board of Supervisors

Final adoption of the ordinance by the local jurisdiction can occur any time after the date of CEC review of findings.

6. File with the California Building Standards Commission (BSC)

After the local energy ordinance has been adopted, it must be filed with the California Building Standards Commission (BSC). The BSC is responsible for administering California's building codes, including adopting, approving, publishing, and implementing codes and standards. However, the BSC does not review the energy ordinance or formally vote on it. The BSC clerk simply receives it and files it and nothing further.

NOTE: S*eparate* local climatic, geological, or topographical findings have to be filed with BSC for mandatory green building polices and ordinances that are more restrictive than the California *Green Building Standards Code. This process is different than the one outlined in this document.*

StopWaste.Org is developing Model Findings for its member agencies that will be available in March 2009.

7. Implementation and Enforcement

The effective date of the ordinance is generally 30 days (or some other specified number of days) after final ordinance adoption. Implementation of the ordinance requires building department staff training and resources such as:

- A concise summary of the local energy ordinance requirements for the building department to provide to permit applicants
- Provision for a clear methodology to meet green building program (e.g. LEED, GreenPoint Rated) energy requirements based on Title 24 calculations and documentation
- Clarification of how to calculate the extent to which a building exceeds Title 24 for specific building types
- Additional forms to supplement the standard Title 24 energy compliance report
- A commitment to improve enforcement of the Title 24 Standards as well as the requirements of the local ordinance

Energy Cost-Effectiveness Case Studies Using the 2008 Title 24 Building Energy Efficiency Standards

January 21, 2009

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Table of Contents

1.0 Purpose of Study

Gabel Associates, LLC conducted an energy cost-effectiveness analysis using case studies of several building designs that meet and exceed the 2008 Title 24 Building Energy Efficiency Standards in the two California climate zones within Alameda County: Zones 3 and 12. The goal was to answer the following questions for each building type in in each climate zone;

- What set of energy measures are needed to just meet the 2008 Standards? And what sets of additional measures are needed to reduce the standard Time Dependent Valuation (TDV) energy in KBtu/sf-yr by 10%, 15%, 20% and 35%?
- What is the incremental (added) construction cost of the various sets of energy measures? And what are those costs per square foot?
- What is the annual energy saving for each scenario? And using current utility rates, what is the annual energy cost saving for each scenario?
- What is the Simple Payback for the added energy measures?
- What is the CO2-equivalent reduction in emissions from each scenario (lb./sf-yr)? *And what is the added cost of CO2-equivalent reduction ($/sf-lb.-yr)?*
- What level or levels of energy efficiency that exceed the 2008 Standard appear cost-effective in these climate zones?

The following data has been developed and compiled to consider these and related questions for single family residential, multifamily low-rise and multifamily high-rise residential and non-reisdential office buildings. This report can be used by Alameda County jurisdictions wishing to adopt mandatory energy policy(ies) that exceed T-24 part 6. The goal of these case studies is to provide relatively real-world order-of-magnitude results for local jurisdictions attempting to understand and calibrate energy and cost impacts of local energy ordinances or local green building ordinances. In this limited study, no attempt has been made to gather statistically significant data that can be applied to all new construction projects and thereby determine the macro-effects of specific policy decisions.

2.0 Methodology

2.1 Performance Approach

One important basis of this study is that the performance approach is used almost exclusively as the method which permit applicants use to demonstrate compliance with the Title 24 Building Energy Efficiency Standards. California Energy Commission studies have shown that well over 95% of new low-rise residential buildings are submitted with a performance Title 24 report. In addition, utility incentive programs use the performance

approach metric to establish eligibility for energy incentives; and the state uses the performance approach (e.g., exceeding the 2005 standards by 15%) to establish eligibility for the New Solar Homes Partnership (NSHP) program.

Some important reasons for the pre-dominant use of the performance approach are:

1. It allows the building designers the greatest flexibility in deciding which energy measures, in combination, meet the overall energy budget for the building;

2. It provide the best way to find the lowest first cost or the most cost-effective ways to meet or exceed the standards; and,

3. It allows building designers and developers an excellent means to assess the energy performance of specific energy measures or combinations of measures.

2.2 Title 24 Time Dependent Valuation (TDV) Energy and Other Possible Energy Metrics

Building energy efficiency programs and the GreenPoint Rated system use the Title 24 metric of TDV energy (KBtuh/sq.ft.-year) in measuring building energy performance. This metric weights the value of mostly electricity according to the day of the year and time of year (similar to Time-of-Use utility rates). Because the Title 24 rules, calculations, compliance rules and forms are familiar to the building industry, energy consultants and building departments, it makes sense to use the same procedures and the same metric to require higher energy efficiency. However, this may change in the future as the California Energy Commission may, by 2011, require that several other metrics of building energy performance be listed on the Certificate of Compliance which must be on the drawings. Other metrics in the future may include:

- The Home Energy Rating System (HERS) Phase 2 score for existing and new buildings which is a much better indication of how well specific building is performing with respect to a Zero Net Energy version of that building.

- The site energy use of the building in total KWh and Therms, or KBtuh/sf.

- The overall or per square foot CO2-equivalent reduction in greenhouse gases.

Until one or more of the above metrics is an automatic part of the Title 24 analysis and documentation, building energy performance will generally focus on TDV energy as the basis of improved energy performance.

2.3 Case Study Method

The methodology used in the case studies is based on the way that real buildings are designed and evaluated to meet or exceed the energy standards.

(a) Each prototype building design is tested for compliance with the 2008 Standards, and all energy measures are adjusted with common construction options to just barely meet the 2005 and 2008 Standards. The energy measures chosen are not all the prescriptive measures, but are a combination of measures which reflects how designers, builders and developers are likely to achieve a specified level of performance. It is worth noting that almost no new construction ever uses the prescriptive approach to demonstrate compliance, but instead uses a mix of features which are evaluated by an energy analyst using the performance approach.

(b) Starting with a 2008 Standards minimally compliant set of measures, various items are changed to just reach the next increment of energy performance (e.g, 10% better than Title 24). In this study, the design choices are based on years of work experience with architects, mechanical engineers and builders and general knowledge of the relative incremental costs of most measures. The intent of this approach is for the study to reflect how building energy performance is actually studied and used to select final energy measures in real life situations.

(c) A minimum and maximum range of incremental costs of added energy measures is established by a variety of research means. A construction cost estimator, Building Advisory LLC, was contracted to conduct research and surveys to obtain accurate and current measure cost information. Site energy in KWh and Therms, is calculated for each run to establish the annual energy savings, energy cost savings and CO2-equivalent reductions in greenhouse gases.

(d) A variety of charts are generated to illustrate and consider different aspects of cost-effectiveness by building type and climate zone.

2.4 Cost Effectiveness

The tables in section 4.0 are based upon the following:

- Incremental site electricity (kWh) and natural gas (therms) saved per year as calculated using the state-approved energy compliance;
- Average utility rates of $0.16/kWh for electricity and $1.30/therm for natural gas in constant dollars
- The assumption of no change (i.e., no inflation or deflation) of utility rates in constant dollars over time

- The assumption of no increase in summer temperatures, even though recent scientific studies suggest that global climate change will increase temperatures in the Western U.S. which in turn will increase air conditioning energy use

The tables illustrating Simply Payback include a cost-effectiveness analysis assuming:

- No external cost of global climate change -- and the corresponding value of additional investment in energy efficiency and CO2 reduction – is included

- The cost of money invested in the incremental cost of energy measures is not included.

3.0 Impacts of the 2008 Standards

This study focuses on incremental impacts of exceeding the 2008 energy standards by specific percentages in different climate zones for each building design. We have also included the incremental measures and costs associated with upgrading a building that just meets the 2005 standards to the same building which meets the 2008 standards. This data is included in Section 4 with the various charts which illustrate additional first cost per dwelling unit, and additional first cost per square foot.

3.1 Single Family House Case Studies

House Designs. A typical single family home design is modeled to just meet the overall TDV energy performance requirements of 2008 Title 24 standards using a 2008 Standards research version of Micropas. Incremental improvements to building energy efficiency measures then are made to reduce TDV energy to:

(a) from 2005 standards, meet the 2008 standards;
(b) 10% less than the 2008 standards;
(c) 15% less than the 2008 standards;
(d) 20% less than the 2008 standards; and,
(e) 35% less than the 2008 standards.

The following measures were first evaluated so that the house design just meets the 2008 standards in each climate zone as follows:

Climate Zone #3: 2,025 SF 2-story home 2008 Title 24 Base Case, **20.2% total glazing** area:

- R-38 roof w/ radiant barrier
- R-13 exterior walls
- R-19 raised floor
- Dual vinyl windows, U=0.40, SHGC=0.40 w/ no overhangs
- Furnace: 80% AFUE; No Cooling
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.62; no extra pipe insulation

Climate Zone #12: 2,025 SF 2-story home 2008 Title 24 Base Case, **20.2% total glazing** area:

- R-38 roof w/ radiant barrier
- R-19 exterior walls
- Covered slab-on-grade floor
- Dual vinyl windows, U=0.37, SHGC=0.25 w/ no overhangs
- Furnace, 80% AFUE; Air Conditioner, 15.0 SEER/12.0 EER
- Reduced duct leakage/testing (HERS)
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.62; no extra pipe insulation

Climate Zone #3: 1,582 SF 1-story home 2008 Title 24 Base Case, **14.3% total glazing** area:

- R-38 roof w/ radiant barrier
- R-13 exterior walls
- R-19 raised floor
- Dual vinyl windows, U=0.36, SHGC=0.30 w/ no overhangs
- Furnace: 80% AFUE; No Cooling
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.58; no extra pipe insulation

Climate Zone #12: 1,582 SF 1-story home 2008 Title 24 Base Case, **14.3% total glazing** area:

- R-38 roof w/ radiant barrier
- R-13 exterior walls
- Covered slab-on-grade floor
- Dual vinyl windows, U=0.36, SHGC=0.30 w/ no overhangs
- Furnace, 80% AFUE; Air Conditioner, 15.0 SEER/12.0 EER (HERS)
- Reduced duct leakage/testing (HERS)
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.62; no extra pipe insulation

Energy Measures Needed to Meet the 2008 Standards

The following energy features were modified from the 2005 Title 24 set of measures so that the building just meets the 2008 standards. The added first cost of that measure compared with the equivalent 2005 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

CLIMATE ZONE #3

2,025 sq.ft. (from 2005 Stds to 2008 Stds)

• Low-E glazing: 409 sf @ $1.35 - $1.50/sf	$ 550 - 615
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
Total incremental cost of Ordinance energy measure:	**$ 650 - 815**
Incremental cost in $/sq.ft.:	**$ 0.32 to 0.40 /sq.ft.**
	Avg = $0.69 /sf

1,582 sq.ft. (from 2005 Stds to 2008 Stds)

• Radiant Barrier: 1,582 sf @ $0.12 - $0.18/sf	$ 190 - 285
Total incremental cost of Ordinance energy measure:	**$ 190 - 285**
Incremental cost in $/sq.ft.:	**$ 0.12 to 0.18 /sq.ft.**
	Avg = $0.15 /sf

CLIMATE ZONE #12

2,025 sq.ft. (from 2005 Stds to 2008 Stds)

• 15 SEER/12 EER air conditioner	$ 300 - 1350
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
Total incremental cost of Ordinance energy measure:	**$ 400 - 1550**
Incremental cost in $/sq.ft.:	**$ 0.20 to 0.77 /sq.ft.**
	Avg = $0.48 /sf

1,582 sq.ft. (from 2005 Stds to 2008 Stds)

• Walls: from R-13 + R4 to R-19, 1116 sf -$0.45 to -$0.60	$ -500 - -400
• 15 SEER/12 EER air conditioner	$ 300 - 1350
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
Total incremental cost of Ordinance energy measure:	**$ 100 - 1550**
Incremental cost in $/sq.ft.:	**$ 0.06 to 0.98 /sq.ft.**
	Avg = $0.52 /sf

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

CLIMATE ZONE #3

(A-10%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• 92% AFUE furnace	$ 500 - 1,200
• R-49 roof insulation: 1,443 sf @$0.19 to $0.22/sf	$ 275 - 320
• House wrap: 2,550 sf @ $0.08 to $0.12/sf	$ 205 - 305
Total incremental cost of Ordinance energy measure:	**$ 980 - 1,825**
Incremental cost in $/sq.ft.:	**$ 0.48 to 0.90 /sq.ft.**
	Avg = $0.69 /sf

(A-15%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• House wrap: 2,550 sf @ $0.08 to $0.12/sf	$ 205 - 305
Total incremental cost of Ordinance energy measure:	**$ 1,005 - 2,105**
Incremental cost in $/sq.ft.:	**$ 0.50 to 1.04 /sq.ft.**
	Avg = $0.77 /sf

(A-20%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• House wrap: 2,550 sf @ $0.08 to $0.12/sf	$ 205 - 305
Total incremental cost of Ordinance energy measure:	**$ 1,180 - 2,355**
Incremental cost in $/sq.ft.:	**$ 0.58 to 1.16 /sq.ft.**
	Avg = $0.87 /sf

(A-35%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• R-19 walls: 2,550 sf @$0.27 to $0.39/sf	$ 690 - 995
• R-49 roof insulation: 1,443 sf @$0.19 to $0.22/sf	$ 275 - 320
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• Tankless gas DHW, 0.80 EF (5 to 10 gpm)	$ 900 - 1,500
• House wrap: 2,550 sf @ $0.08 to $0.12/sf	$ 205 - 305
Total incremental cost of Ordinance energy measure:	**$ 3,045 - 5,170**
Incremental cost in $/sq.ft.:	**$ 1.50 to 2.55 /sq.ft.**
	Avg = $2.03 /sf

(A-10%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 790 - 1,225**
Incremental cost in $/sq.ft.:	**$ 0.50 to 0.77 /sq.ft.**
	Avg = $0.64 /sf

(A-15%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 1,290 - 2,485**
Incremental cost in $/sq.ft.:	**$ 0.82 to 1.57 /sq.ft.**
	Avg = $1.19 /sf

(A-20%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• 92% AFUE furnace	$ 500 - 1,200
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 1,465 - 2,735**
Incremental cost in $/sq.ft.:	**$ 0.93 to 1.73 /sq.ft.**
	Avg = $1.33 /sf

(A-35%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• 92% AFUE furnace	$ 500 - 1,200
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• Tankless gas DHW, 0.80 EF (5 to 10 gpm)	$ 900 - 1,500
• R-15 wall insulation: 1,116 sf @ $0.06 to $0.08/sf	$ 70 - 90
• Reduced duct leakage (installation testing & HERS inspection)	$ 300 - 600
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 2,435 - 4,325**
Incremental cost in $/sq.ft.:	**$ 1.54 to 2.73 /sq.ft.**
	Avg = $2.14 /sf

CLIMATE ZONE #12

(A-10%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• R-19 walls: 2,550 sf @$0.27 to $0.39/sf	$ 690 - 995
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• TXV/EER (HERS inspection)	$ 25 - 50
• Verified air flow (HERS inspection)	$ 100 - 150
Total incremental cost of Ordinance energy measure:	**$ 990 - 1,445**
Incremental cost in $/sq.ft.:	**$ 0.49 to 0.71 /sq.ft.**
	Avg = $0.60 /sf

(A-15%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced building leakage SLA=3.0 (testing & HERS inspection)	$ 250 - 400
• R-19 walls: 2,550 sf @$0.27 to $0.39/sf	$ 690 - 995
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• TXV/EER (HERS inspection)	$ 25 - 50
• Verified air flow (HERS inspection)	$ 100 - 150
Total incremental cost of Ordinance energy measure:	**$ 1,740 - 3,045**
Incremental cost in $/sq.ft.:	**$ 0.86 to 1.50 /sq.ft.**
	Avg = $1.18 /sf

(A-20%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced building leakage SLA=3.0 (testing & HERS inspection)	$ 250 - 400
• R-19 walls: 2,550 sf @$0.27 to $0.39/sf	$ 690 - 995
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• TXV/EER (HERS inspection)	$ 25 - 50
• Super Low-E glazing: 409 sf @ $1.35 - $1.50/sf	$ 550 - 615
• R-49 roof insulation: 1,443 sf @$0.19 to $0.22/sf	$ 275 - 320
• Verified air flow (HERS inspection)	$ 100 - 150
Total incremental cost of Ordinance energy measure:	**$ 2,565 - 4,280**
Incremental cost in $/sq.ft.:	**$ 1.27 to 2.11 /sq.ft.**
	Avg = $1.69 /sf

(A-35%) 2,025 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• 92% AFUE furnace	$ 500 - 1,200
• Reduced building leakage SLA=3.0 (testing & HERS inspection)	$ 250 - 400
• R-19 walls: 2,550 sf @$0.27 to $0.39/sf	$ 690 - 995
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• TXV/EER (HERS inspection)	$ 25 - 50
• Super Low-E glazing: 409 sf @ $1.35 - $1.50/sf	$ 550 - 615
• R-49 roof insulation: 1,443 sf @$0.19 to $0.22/sf	$ 275 - 320
• 70% NSF solar hot water system	$ 5,000 - 6,000
• Tankless gas DHW, 0.80 EF (5 to 10 gpm)	$ 900 - 1,500
• Verified air flow (HERS inspection)	$ 100 - 150
Total incremental cost of Ordinance energy measure:	**$ 8,465- 11,480**
Incremental cost in $/sq.ft.:	**$ 4.18 to 5.67 /sq.ft.**
	Avg = $4.92 /sf

(A-10%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• R-21 walls: 1,116 sf @$0.37 to $0.52/sf	$ 415 - 580
• Refrig. Charge & Adequate Airflow (HERS inspection)	$ 100 - 150
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 780 - 1,115**
Incremental cost in $/sq.ft.:	**$ 0.49 to 0.70 /sq.ft.**
	Avg = $0.60 /sf

(A-15%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• 92% AFUE furnace	$ 500 - 1,200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• R-19 walls: 1,116 sf @$0.27 to $0.39/sf	$ 300 - 435
• Refrig. Charge (HERS inspection)	$ 75 - 125
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 1,265 - 2,245**
Incremental cost in $/sq.ft.:	***$ 0.80 to 1.42 /sq.ft.***
	Avg = $1.11 /sf

(A-20%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• Low-E3 windows: U-factor=0.36, SHGC=0.23 226 sf @ $1.35 - $1.50/sf	$ 305 - 340
• Refrig. Charge & Adequate Airflow (HERS inspection)	$ 100 - 150
• Hot water pipe insulation (from minimum to all)	$ 250 - 300
• R-21 walls: 1,116 sf @$0.37 to $0.52/sf	$ 415 - 580
• 94% AFUE furnace	$ 800 - 1,300
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• Water heater EF=0.62 (from EF=0.58)	$ 100 - 200
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
Total incremental cost of Ordinance energy measure:	**$ 2,535 - 3,605**
Incremental cost in $/sq.ft.:	**$ 1.60 to 2.28 /sq.ft.**
	Avg = $1.94 /sf

(A-35%) 1,582 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• 92% AFUE furnace	$ 500 - 1,200
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• Tankless gas DHW, 0.80 EF (5 to 10 gpm)	$ 900 - 1,500
• Low-E3 windows: U-factor=0.36, SHGC=0.30 226 sf @ $1.35 - $1.50/sf	$ 305 - 340
• Hot water pipe insulation (from minimum to all)	$ 250 - 300
• R-21 walls: 1,116 sf @$0.37 to $0.52/sf	$ 415 - 580
• Quality insulation installation (includes HERS inspection)	$ 175 - 250
• R-49 roof insulation: 1,582 sf @$0.19 to $0.22/sf	$ 300 - 350
• House wrap: 1,116 sf @ $0.08 to $0.12/sf	$ 90 - 135
• 60% Net Solar Fraction solar hot water collector system	$ 4,000 - 5,000
Total incremental cost of Ordinance energy measure:	**$ 7,110 - 9,905**
Incremental cost in $/sq.ft.:	**$ 4.49 to 6.26 /sq.ft.**
	Avg = $5.38 /sf

3.2 Low-rise Multi-family Building Case Study

Building Design. A typical 8-unit, 2-story low-rise multi-family building is modeled to just meet the overall TDV energy performance requirements of 2008 Title 24 standards using a 2008 Standards research version of Micropas. Incremental improvements to building energy efficiency measures then are made to reduce TDV energy to:

(f) *10% less than the 2008 standards;*
(g) 15% less than the 2008 standards;
(h) 20% less than the 2008 standards; and,
(i) 35% less than the 2008 standards.

The following measures were first evaluated so that the house design just meets the 2008 standards in each climate zone as follows:

Climate Zone #3: 8,442 SF 2-story building 2008 Title 24 Base Case, **12.5% total glazing** area:

- R-38 roof w/ radiant barrier, R-13 exterior walls, slab-on-grade 1st floor
- Dual vinyl windows, U=0.39, SHGC=0.33 w/ no overhangs
- Furnace: 80% AFUE; No Cooling
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.575; no extra pipe insulation

Climate Zone #12: 8,442 SF 2-story building 2008 Title 24 Base Case, **12.5% total glazing** area:

- R-38 roof w/ radiant barrier, R-19 exterior walls, slab-on-grade 1st floor
- House wrap
- Dual vinyl windows, U=0.35, SHGC=0.31 w/ no overhangs
- Furnace: 80% AFUE
- Air conditioner: 13.0 SEER, 11.0 EER
- R-6 ducts in the attic
- DHW: 50 gallon gas water heater, EF=0.62; no extra pipe insulation

Energy Measures Needed to Meet the 2008 Standards

The following energy features were modified from the 2005 Title 24 set of measures so that the building just meets the 2008 standards. The added first cost of that measure compared with the equivalent 2005 Title 24 design measure is listed to the right.

CLIMATE ZONE #3

• (8) Water heaters EF=0.62 (from EF=0.58)	$ 800 - 1,600
Total incremental cost of Ordinance energy measure:	**$ 800 - 1,600**
Incremental cost in $/sq.ft.:	**$ 0.09 to 0.19 /sq.ft.**
	Avg = $0.14 /sf

CLIMATE ZONE #12

• R-19 from R-13 walls, 9,266 sf @$0.27 - $0.39/sf	$ 2,505 - 3,615
Total incremental cost of Ordinance energy measure:	**$ 2,505 - 3,615**
Incremental cost in $/sq.ft.:	**$ 0.30 to 0.43 /sq.ft.**
	Avg = $0.37 /sf

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

CLIMATE ZONE #3

(A-10%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• Reduced duct leakage (installation testing & HERS inspection)	$ 2000 - 4000
• R-15 wall insulation: 9,266 sf @ $0.06 to $0.08/ sf	$ 560 - 745
• House wrap: 9,266 sf @ $0.08 to $0.12/sf	$ 745 - 1,115
Total incremental cost of Ordinance energy measure:	**$ 3,305 - 5,860**
Incremental cost in $/sq.ft.:	**$ 0.39 to 0.69 /sq.ft.**
	Avg = $0.54 /sf

(A-15%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• Reduced duct leakage (installation testing & HERS inspection)	$ 2000 - 4000
• R-15 wall insulation: 9,266 sf @ $0.06 to $0.08/ sf	$ 560 - 745
• House wrap: 9,266 sf @ $0.08 to $0.12/sf	$ 745 - 1,115
• (8) 92% AFUE furnaces	$ 4,000 - 9,600
• R-49 roof/ceiling insulation, 2,880 sf @$0.19 - $0.22/sf	$ 550 - 635
Total incremental cost of Ordinance energy measure:	**$ 7,855- 16,095**
Incremental cost in $/sq.ft.:	**$ 0.93 to 1.91 /sq.ft.**
	Avg = $1.42 /sf

(A-20%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• Reduced duct leakage (installation testing & HERS inspection)	$ 2,000 - 4,000
• R-19 wall insulation: 9,266 sf @ $0.27 to $0.39/ sf	$ 2,505 - 3,615
• House wrap: 9,266 sf @ $0.08 to $0.12/sf	$ 745 - 1,115
• (8) 92% AFUE furnaces	$ 4,000 - 9,600
• No roof radiant barrier 2,880sf @-$0.12 to -$0.18/sf	$ -520 - -345
Total incremental cost of Ordinance energy measure:	**$ 8,730 - 17,985**
Incremental cost in $/sq.ft.:	**$ 1.03 to 2.13 /sq.ft.**
	Avg = $1.58 /sf

(A-35%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• Reduced duct leakage (installation testing & HERS inspection)	$ 2,000 - 4,000
• R-19 wall insulation: 9,266 sf @ $0.27 to $0.39/ sf	$ 2,505 - 3,615
• (8) Tankless water heaters EF=0.805 @$900 - $1,500 each	$ 7,200 - 12,000
Total incremental cost of Ordinance energy measure:	**$ 11,705 - 19,615**
Incremental cost in $/sq.ft.:	**$ 1.39 to 2.32 /sq.ft.**
	Avg = $1.86 /sf

CLIMATE ZONE #12

(A-10%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• Quality insulation installation (includes HERS inspection)	$ 1,100 - 1,600
• R-21 walls: 9,266 sf @$0.10 to $0.13/sf	$ 930 - 1,205
• (8) 15 SEER/12 EER air conditioner	$ 2,400 -10,800
Total incremental cost of Ordinance energy measure:	**$ 4,430 -13,605**
Incremental cost in $/sq.ft.:	**$ 0.52 to 1.61 /sq.ft.**
	Avg = $1.07 /sf

(A-15%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• Quality insulation installation (includes HERS inspection)	$ 1,100 - 1,600
• R-21 walls: 9,266 sf @$0.10 to $0.13/sf	$ 930 - 1,205
• (8) 15 SEER/12 EER air conditioners	$ 2,400 -10,800
• (8) 92% AFUE furnaces	$ 4,000 - 9,600
• Refrigerant charge tests	$ 300 - 1,600
Total incremental cost of Ordinance energy measure:	**$ 8,730 -21,605**
Incremental cost in $/sq.ft.:	**$ 1.03 to 2.56 /sq.ft.**
	Avg = $1.80 /sf

(A-20%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• Quality insulation installation (includes HERS inspection)	$ 1,100 - 1,600
• R-21 walls: 9,266 sf @$0.10 to $0.13/sf	$ 930 - 1,205
• (8) 15 SEER/12 EER air conditioners @$300 - $1,350 each	$ 2,400 -10,800
• (8) 92% AFUE furnaces @$500 - $800 each	$ 4,000 - 6,400
• Refrigerant charge tests	$ 300 - 1,600
• Low-E3 windows: U-factor=0.36, SHGC=0.23 1,055 sf @ $1.35 - $1.50/sf	$ 1,425 - 1,585
• Verified Air Flow	$ 300 - 1.600
• R-49 roof/ceiling insulation, 2,880 sf @$0.19 - $0.22/sf	$ 550 - 635
• Pipe insulation @$150 - $300/unit	$ 1,200 - 2,400
Total incremental cost of Ordinance energy measure:	**$12,205- 27,825**
Incremental cost in $/sq.ft.:	**$ 1.45 to 3.30 /sq.ft.**
	Avg = $2.37/sf

(A-35%) 8,442 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• Quality insulation installation (includes HERS inspection)	$ 1,100 - 1,600
• R-21 walls: 9,266 sf @$0.10 to $0.13/sf	$ 930 - 1,205
• (8) 15 SEER/12 EER air conditioners @$300 - $1,350 each	$ 2,400 -10,800
• (8) 92% AFUE furnaces @$800 - $1200 each	$ 6,400 - 9,600
• Refrigerant charge tests	$ 300 - 1,600
• Low-E3 windows: U-factor=0.36, SHGC=0.23 w/ argon gas 1,055 sf @ $2.35 - $2.50/sf	$ 2,480 - 2,640
• Verified Air Flow	$ 300 - 1.600
• R-49 roof/ceiling insulation, 2,880 sf @$0.19 - $0.22/sf	$ 550 - 635
• Pipe insulation @$150 - $300/unit	$ 1,200 - 2,400
• (8) Tankless water heaters EF=0.80 @$900 - $1,500 each	$ 7,200- 12,000
• R-8 ducts	$ 1,600 - 2,400
•	
Total incremental cost of Ordinance energy measure:	**$24,460- 46,480**
Incremental cost in $/sq.ft.:	**$ 2.90 to 5.51 /sq.ft.**
	Avg = $4.20 /sf

3.3 High-rise Residential Building Case Study

High-rise Residential Building Design. A typical high-rise residential buildings has been modeled according to the same criteria as in Section 2.1, except that a research version of EnergyPro has been used to evaluate compliance with the 2008 Nonresidential, Hotel/Motel and High-rise Residential standards.

The following measures were first evaluated so that the building just meets the 2008 standards in each climate zone as follows:

Climate Zone #3: 36,800 SF 5-story building 2008 Title 24 Base Case, **35.2% Window Wall Ratio glazing** area, 40 dwelling units:

(A) 36,800 SF 5-story apartment building which just meet Title 24:

- R-30 attic insulation w/ cool roof Reflectance=0.30, Emittance=0.75
- R-19 in metal frame exterior walls
- Un-insulated (R-0) raised slab floor over parking garage;
- Dual vinyl NFRC-rated Low-E windows: U-factor=0.33, SHGC=0.30, (SHGC includes minimal exterior shading)
- Split heat pump for each dwelling unit: HSPF=7.2, EER=10.2
- Central domestic hot water boiler, 82.7% AFUE; re-circulating system w/ timer and temperature controls; variable speed drive hot water pump

Energy Measures Needed to Meet the 2008 Standards

The same building designs that just meet the 2005 standards also must meet the 2008 standards, for both climate zones. Therefore, in this case study, there was no additional cost associated with meeting the 2008 standards.

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

CLIMATE ZONE #3

(A-10%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• R-3.5 (1") K-13 spray-on insulation under raised floor	
9,200 sf @ $1.20 - $1.50/sf	$ 11,040 - 13,800
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• Heat pumps: HSPF=7.84 / EER=11.2	
80 units @$150 - $250 each	$ 12,000 - 20,000
Total incremental cost of Ordinance energy measure:	**$ 25,440 - 37,800**
Incremental cost in $/sq.ft.:	**$ 0.69 to 1.03 /sq.ft.**
	Avg = $0.86 /sf

(A-15%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• Super Low-E glazing: U=0.33, SHGC=0.23,	
6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-3.5 (1") K-13 spray-on insulation under raised floor	
9,200 sf @ $1.20 - $1.50/sf	$ 11,040 - 13,800
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• Heat pumps: HSPF=7.84 / EER=11.2	
80 units @$150 - $250 each	$ 12,000 - 20,000
Total incremental cost of Ordinance energy measure:	**$ 33,865 - 47,160**
Incremental cost in $/sq.ft.:	**$ 0.92 to 1.28 /sq.ft.**
	Avg = $1.18 /sf

(A-20%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• Super Low-E glazing: U=0.33, SHGC=0.23,	
6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-3.5 (1") K-13 spray-on insulation under raised floor	
9,200 sf @ $1.20 - $1.50/sf	$ 11,040 - 13,800
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• 30% Net Solar Fraction solar DHW system	$ 48,000 - 60,000
• Heat pumps: HSPF=8.8 / EER=11.3	
80 units @$180 - $300 each	$ 14,400 - 24,000
Total incremental cost of Ordinance energy measure:	**$ 84,265 - 111,160**
Incremental cost in $/sq.ft.:	**$ 2.29 to 3.02 /sq.ft.**
	Avg = $2.66 /sf

(A-35%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 36%)

• Super Low-E glazing: U=0.33, SHGC=0.23, 6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-3.5 (1") K-13 spray-on insulation under raised floor 9,200 sf @ $1.20 - $1.50/sf	$ 11,040 - 13,800
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• 72% Net Solar Fraction solar DHW system	$140,000 - 168,000
• R-38 Roof: 9,200 sf @ $0.10 - $0.15/sf	$ 920 - 1,380
• Heat pumps: HSPF=8.8 / EER=11.3 80 units @$180 - $300 each	$ 14,400 - 24,000
Total incremental cost of Ordinance energy measure:	**$177,185 - 220,540**
Incremental cost in $/sq.ft.:	**$ 4.81 to 5.99 /sq.ft. Avg = $5.40 /sf**

CLIMATE ZONE #12

(A-10%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• Super Low-E glazing: U=0.33, SHGC=0.23, 6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-3.5 (1") K-13 spray-on insulation under raised floor 9,200 sf @ $1.20 - $1.50/sf	$ 11,040 - 13,800
Total incremental cost of Ordinance energy measure:	**$ 19,465 - 23,160**
Incremental cost in $/sq.ft.:	**$ 0.53 to 0.63 /sq.ft. Avg = $0.58 /sf**

(A-15%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• Super Low-E glazing: U=0.33, SHGC=0.23, 6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• Heat pumps: HSPF=7.84 / EER=11.2 80 units @$150 - $250 each	$ 12,000 - 20,000
Total incremental cost of Ordinance energy measure:	**$ 22,825 - 33,360**
Incremental cost in $/sq.ft.:	**$ 0.62 to 0.91 /sq.ft. Avg = $0.76 /sf**

(A-20%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• Super Low-E glazing: U=0.33, SHGC=0.23, 6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-7.0 (2") K-13 spray-on insulation under raised floor 9,200 sf @ $1.80 - $2.00/sf	$ 16,560 - 18,400
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• Heat pumps: HSPF=8.8 / EER=11.3 80 units @$180 - $300 each	$ 14,400 - 24,000
Total incremental cost of Ordinance energy measure:	**$ 41,785 - 55,760**
Incremental cost in $/sq.ft.:	**$ 1.14 to 1.52 /sq.ft. Avg = $2.66 /sf**

(A-35%) 36,800 sq.ft. (Reduction in 2008 T24 TDV Energy by 35%)

• Super Low-E glazing: U=0.33, SHGC=0.23, 6,240 sf @ $1.35 - $1.50/sf	$ 8,425 - 9,360
• R-8.75 (2.5") K-13 spray-on insulation under raised floor 9,200 sf @ $2.10 - $2.35/sf	$ 19,320 - 21,620
• (2) Munchkin boilers @ $1200 - $2,000 additional each	$ 2,400 - 4,000
• 55% Net Solar Fraction solar DHW system	$110,000 - 132,000
• Heat pumps: HSPF=8.8 / EER=11.3 80 units @$180 - $300 each	$ 14,400 - 24,000
Total incremental cost of Ordinance energy measure:	**$154,545 - 190,980**
Incremental cost in $/sq.ft.:	***$ 4.20 to 5.19 /sq.ft.*** **Avg = $4.69 /sf**

3.4 Nonresidential Building Case Studies

Nonresidential 5-Story Office Building Design. A typical 5-story office building has been modeled according to the same criteria as in Section 2.1, except that a research version of EnergyPro has been used to evaluate compliance with the 2008 Nonresidential, Hotel/Motel and High-rise Residential standards.

CLIMATE ZONE #3 CASE STUDY

The following measures were first evaluated so that the building just meets the 2008 standards in climate zone #3 as follows:

Climate Zone #3: 52,900 SF 5-story building 2008 Title 24 Base Case, **32.5% Window Wall Ratio glazing** area:

(A) 52,900 SF 5-story office building which just meet Title 24:

- R-30 attic insulation, R-19 in metal frame exterior walls, slab-on-grade 1st floor
- NFRC-rated Low-E windows: U-factor=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) w/ no exterior shading
- Lighting = 0.887 w/sf: 720 2-lamp 4' T8 fixtures @ 62w each and 260 26w CFLs @ 26 w each; no lighting controls
- 4 identical Packaged VAV units: Aaron 25 ton, EER=10.4, 10,000 CFM, standard efficiency fan motors, 30% VAV boxes w/ reheat
- Ducts in conditioned space, R-4.2 duct insulation
- Hot water assumed to be standard gas water heater

Energy Measures Needed to Meet the 2008 Standards

The same building with the 2005 standards measures fails to meet the 2008 standards by a margin of 6%. To bring the building up to the 2008 standards, the following measures were added.

52,900 sq.ft. (from 2005 Stds to 2008 Stds)

- U=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M)

9,496 sf @$1.50 - 2.50/sq.ft.	$ 14,250 - 23,750
Total incremental cost of Ordinance energy measure:	**$ 14,250 - 23,750 Avg = $19,000**
Incremental cost in $/sq.ft.:	**$ 0.27 to 0.45 /sq.ft. Avg = $0.36 /sf**

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

(A-10%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)	
• R-38 w/ Cool Roof 10,580 sf @ $0.30 - $0.40/sf	$ 3,175 - 4,230
• 10 NEMA Premium fan motors on supply & return fans	$ 750 - 1,250
• 720 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.803	$ 18,000 - 21,600
• 120 occupant sensors controlling (2) 2-lamp T8 fixtures @$65.00 - $85.00 each	$ 7,800 - 10,200
• 40 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 7,000 - 10,000
Total incremental cost of Ordinance energy measure:	**$ 36,725 - 47,280 Avg = $42,003**
Incremental cost in $/sq.ft.:	**$ 0.69 to $0.89/sq.ft. Avg = $0.79 /sf**

(A-15%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)	
• 720 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.803	$ 18,000 - 21,600
• 120 occupant sensors controlling (2) 2-lamp T8 fixtures @$65.00 - $85.00 each	$ 7,800 - 10,200
• 40 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 7,000 - 10,000
• (5) Trane 25 ton units, EER=11.0 @ $9,000 to $13,000 each w/ premium fan motors	$ 45,000 - 65,000
Total incremental cost of Ordinance energy measure:	**$ 77,800 - 106,800 Avg = $92,300**
Incremental cost in $/sq.ft.:	**$ 1.47 to $2.02/sq.ft. Avg = $1.74 /sf**

(A-20%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• 720 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.803	$ 18,000 - 21,600
• R-38 w/ Cool Roof 10,580 sf @ $0.25 - $0.35/sf	$ 2,645 - 3,700
• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 9,496 sf @$2.00 - 3.00/sq.ft.	$ 18,990 - 28,490
• 120 occupant sensors controlling (2) 2-lamp T8 fixtures; @$65.00 - $85.00 each	$ 7,800 - 10,200
• 40 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 7,000 - 10,000
• (5) Trane 25 ton units, EER=11.0 @ $9,000 to $13,000 each w/ premium fan motors	$ 45,000 - 65,000
Total incremental cost of Ordinance energy measure:	**$ 99,435 - 138,990 Avg = $119,213**
Incremental cost in $/sq.ft.:	**$ 1.88 to $2.63/sq.ft. Avg = $2.25 /sf**

CLIMATE ZONE #12 CASE STUDY

The following measures were first evaluated so that the building just meets the 2008 standards in climate zone #12 as follows:

Climate Zone #12: 52,900 SF 5-story building 2008 Title 24 Base Case, **29.1% Window Wall Ratio glazing** area:

(A) 52,900 SF 5-story office building which just meet Title 24:

- R-30 attic insulation, w/ cool roof solar reflectance=0.55 and emttance=0.75, R-19 in metal frame exterior walls, slab-on-grade 1st floor;
- NFRC-rated Low-E windows: U-factor=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) w/ exterior shading on front 1st floor glazing
- Lighting = 0.783 w/sf: 720 2-lamp 4' T8 fixtures (high efficiency lamps and ballasts) @ 50w each and 300 18w CFLs @ 18w each; no lighting controls
- 4 identical Packaged VAV units: Aaron 30 ton, EER=10.4, 12,000 CFM, standard efficiency fan motors, 30% VAV boxes w/ reheat
- Ducts in conditioned space, R-4.2 duct insulation
- Hot water assumed to be standard gas water heater

Energy Measures Needed to Meet the 2008 Standards

The same building with the 2005 standards measures fails to meet the 2008 standards by a margin of 23%. To bring the building up to the 2008 standards, the following measures were added.

52,900 sq.ft. (from 2005 Stds to 2008 Stds)

• U=0.50, SHGCc=0.31 (e.g., Viracon VE 1-2M) 8,500 sf @$2.50 - 3.50/sq.ft.	$ 21,250 - 29,750
• R-19 metal frame walls (from R-13 in 2x6 metal studs) 20,730 sf @ $0.08 – 0.10/sq.ft.	$ 1,660 - 2,075
• R-38 roof w/ cool roof, 10,580 sf @ $0.50 – 0.70/sq.ft.	$ 5,290 - 7,405
• 720 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.803	$ 18,000 - 21,600
Total incremental cost of Ordinance energy measure:	**$ 46,200 - 60,830 Avg = $53,515**
Incremental cost in $/sq.ft.:	**$ 0.87 to 1.15 /sq.ft. Avg = $1.01 /sf**

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

(A-10%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• R-38 w/ no cool roof, 10,580 sf @$0.35 – 0.50	($ 3,705 - 5,290)
• (5) Trane 30 ton units, EER=11.0 @ $9,000 to $13,000 each w/ premium fan motors	$ 45,000 - 65,000
Total incremental cost of Ordinance energy measure:	**$ 41,295 - 59,710 Avg = $50,503**
Incremental cost in $/sq.ft.:	**$ 0.78 to $1.13/sq.ft. Avg = $0.95 /sf**

(A-15%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• R-38 w/ Cool Roof 10,580 sf @ $0.25 - $0.35/sf	$ 2,645 - 3,700
• 120 occupant sensors controlling (2) 2-lamp T8 fixtures; @$65.00 - $85.00 each	$ 7,800 - 10,200
• ¾" R-4.88 rigid insulation + R-19 metal frame walls 20,730 sf @ $1.75 – 2.25/sq.ft.	$ 36,280 - 46,645
Total incremental cost of Ordinance energy measure:	**$ 46,725 - 60,545 Avg = $53,635**
Incremental cost in $/sq.ft.:	**$ 0.88 to $1.14/sq.ft. Avg = $1.01 /sf**

(A-20%) 52,900 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• R-30 w/ no cool roof, 10,580 sf @$0.43 – 0.60	($ 4,550 - 6,350)
• 120 occupant sensors controlling (2) 2-lamp T8 fixtures; @$65.00 - $85.00 each	$ 7,800 - 10,200
• ¾" R-4.88 rigid insulation + R-19 metal frame walls 20,730 sf @ $1.75 – 2.25/sq.ft.	$ 36,280 - 46,645
• (5) Trane 25 ton units, EER=11.0 @ $9,000 to $13,000 each w/ premium fan motors	$ 45,000 - 65,000
Total incremental cost of Ordinance energy measure:	**$ 84,530 - 115,495 Avg = $100,013**
Incremental cost in $/sq.ft.:	**$ 1.60 to $2.18/sq.ft. Avg = $1.89 /sf**

CLIMATE ZONE #3 CASE STUDY

The following measures were first evaluated so that the building just meets the 2008 standards in climate zone #12 as follows:

Climate Zone #3: 21,160 SF 2-story building 2008 Title 24 Base Case, **37.1% Window Wall Ratio glazing** area:

(A) 21,160 SF 2-story office building which just meets Title 24:

- R-38 attic insulation, R-19 in metal frame exterior walls, slab-on-grade 1st floor;
- NFRC-rated Low-E windows: U-factor=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) w/ no exterior shading
- Lighting = 0.867 w/sf: 248 2-lamp 4' T8 fixtures @ 62w each and 104 26w CFLs @ 26 w each; no lighting controls
- (4) 10-ton Packaged DX units: Carrier EER=11.0, 4,000 CFM; (4) 7.5-ton Packaged DX units: Carrier EER=11.0, 3,000 CFM; all standard efficiency fan motors
- Ducts in conditioned space, R-4.2 duct insulation
- Domestic hot water assumed to be standard gas water heater

Energy Measures Needed to Meet the 2008 Standards

The same building with the 2005 standards measures fails to meet the 2008 standards by a margin of 9%. To bring the building up to the 2008 standards, the following measures were changed.

21,160 sq.ft. (from 2005 Stds to 2008 Stds)

• U=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) from SHGCc=0.54; 5,160 sf @$2.50 - 3.50/sq.ft.	$ 12,900 - 18,060
Total incremental cost of Ordinance energy measure:	**$ 12,900 - 18,060**
	Avg = $15,480
Incremental cost in $/sq.ft.:	***$ 0.61 to 0.85 /sq.ft.***
	Avg = $0.73 /sf

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

(A-10%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)

• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 248 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.727	$ 5,800 - 6,960
Total incremental cost of Ordinance energy measure:	**$ 16,120 - 22,440**
	Avg = $19,280
Incremental cost in $/sq.ft.:	**$ 0.76 to $1.06/sq.ft.**
	Avg = $0.91 /sf

(A-15%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)

• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 248 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 5,800 - 6,960
• 64 (26% of) T8 fixtures on 32 occupant sensors, small offices: @$65.00 - $85.00 each	$ 2,080 - 2,720
• 24 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 4,200 - 6,000
• (8) Premium Efficiency supply fans, @$100 - $200 each	$ 800 - 1,600
• R-38 w/ Cool Roof 10,580 sf @ $1.75 - $2.35/sf includes R-10 (2") rigid insulation	$ 18,515 - 24,865
Total incremental cost of Ordinance energy measure:	**$ 41,715 - 57,625**
	Avg = $49,670
Incremental cost in $/sq.ft.:	**$ 1.97 to $2.72/sq.ft.**
	Avg = $2.35 /sf

(A-20%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)

• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 248 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 5,800 - 6,960
• 64 (26% of) T8 fixtures on 32 occupant sensors, small offices: @$65.00 - $85.00 each	$ 2,080 - 2,720
• 24 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 4,200 - 6,000
• (8) Premium Efficiency supply fans, @$100 - $200 each	$ 800 - 1,600
• (4) Global Energy Group 1400 Series 10-ton Packaged DX, EER = 13.4 @$2300 - $2900 each	$ 9,200 - 11,600
• (4) Global Energy Group 1400 Series 7.5-ton Packaged DX, EER = 13.0 @$1950 - $2450 each	$ 7,800 - 9,800
• R-6.5 rigid insulation + R-19 in metal stud walls, 8,752 sf @$1.50 - $2.00/sf	$ 13,130 - 17,505
• R-38 w/ Cool Roof 10,580 sf @ $1.75 - $2.35/sf includes R-10 (2") rigid insulation	$ 18,515 - 24,865
Total incremental cost of Ordinance energy measure:	**$ 71,845 - 96,530 Avg = $84,188**
Incremental cost in $/sq.ft.:	**$ 3.40 to $4.56/sq.ft. Avg = $3.98 /sf**

(A-25%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 25%)

• U=0.50, SHGCc=0.22 (e.g., Viracon VE 1-42M **) 5,160 sf @$3.50 - 4.50/sq.ft.	$ 18,060 - 23,220
• 248 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 5,800 - 6,960
• 64 (26% of) T8 fixtures on 32 occupant sensors, small offices: @$65.00 - $85.00 each	$ 2,080 - 2,720
• 24 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 4,200 - 6,000
• (8) Premium Efficiency supply fans, @$100 - $200 each	$ 800 - 1,600
• (4) Global Energy Group 1400 Series 10-ton Packaged DX, EER = 13.4 @$2300 - $2900 each	$ 9,200 - 11,600
• (4) Global Energy Group 1400 Series 7.5-ton Packaged DX, EER = 13.0 @$1950 - $2450 each	$ 7,800 - 9,800
• R-6.5 rigid insulation + R-19 in metal stud walls, 8,752 sf @$1.50 - $2.00/sf	$ 13,130 - 17,505
• R-38 w/ Cool Roof 10,580 sf @ $1.75 - $2.35/sf includes R-10 (2") rigid insulation	$ 18,515 - 24,865

Total incremental cost of Ordinance energy measure:	**$ 79,585 - 104,270**
	Avg = $91,938
Incremental cost in $/sq.ft.:	**$ 3.76 to $4.93/sq.ft.**
	Avg = $4.34 /sf

** *Note: This glass type has a low visible light transmittance (31%) which reduces the opportunity for manual control of lighting in response to daylight not accounted for in the Title 24 calculation.*

CLIMATE ZONE #12 CASE STUDY

The following measures were first evaluated so that the building just meets the 2008 standards in climate zone #12 as follows:

Climate Zone #12: 21,160 SF 2-story building 2008 Title 24 Base Case, **37.1% Window Wall Ratio glazing** area:

(A) 21,160 SF 2-story office building which just meets Title 24:

- R-38 roof w/ cool roof, R-19 in metal frame exterior walls, slab-on-grade 1st floor;
- NFRC-rated Low-E windows: U-factor=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) w/ exterior shading on front 1st floor glazing
- Lighting = 0.839 w/sf: 240 2-lamp 4' T8 fixtures @ 62w each and 100 26w CFLs @ 26 w each; no lighting controls
- (4) 10-ton Packaged DX units: Carrier EER=11.0, 4,000 CFM; (4) 7.5-ton Packaged DX units: Carrier EER=11.0, 3,000 CFM; all standard efficiency fan motors
- Ducts in conditioned space, R-4.2 duct insulation
- Domestic hot water assumed to be standard gas water heater

Energy Measures Needed to Meet the 2008 Standards

The same building with the 2005 standards measures fails to meet the 2008 standards by a margin of 22%. To bring the building up to the 2008 standards, the following measures were changed.

21,160 sq.ft. (from 2005 Stds to 2008 Stds)

- U=0.50, SHGCc=0.38 (e.g., Viracon VE 1-2M) from generic dual Low-E glazing; 5,160 sf @$5.00 - 7.00/sq.ft. — $ 25,800 - 36,120

Total incremental cost of Ordinance energy measure:	**$ 25,800 - 36,120**
	Avg = $30,960
Incremental cost in $/sq.ft.:	**$ 1.22 to 1.71 /sq.ft.**
	Avg = $1.46 /sf

Energy Measures Needed to Exceed the 2008 Standards

The following energy features have been modified from the above Title 24 set of measures so that the proposed design uses less TDV energy than the 2008 standards. The added first cost of that measure compared with the equivalent 2008 Title 24 design measure is listed to the right, and the sum of all incremental costs is listed.

(A-10%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 10%)	
• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 8 NEMA Premium fan motors on supply fans	$ 600 - 1,000
• 240 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.703	$ 6,000 - 7,200
Total incremental cost of Ordinance energy measure:	**$ 16,920 - 23,440 Avg = $20,180**
Incremental cost in $/sq.ft.:	**$ 0.80 to $1.11/sq.ft. Avg = $0.95 /sf**
(A-15%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 15%)	
• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 240 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 6,000 - 7,200
• 72 (30% of) T8 fixtures on 36 occupant sensors, small offices: @$65.00 - $85.00 each	$ 2,340 - 3,060
• 20 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 3,500 - 5,000
• 8 NEMA Premium fan motors on supply fans	$ 600 - 1,000
• ¾" R-4.88 rigid insulation + R-19 in metal stud walls, 8,752 sf @$1.75 - $2.25/sf	$ 15,315 - 19,690
Total incremental cost of Ordinance energy measure:	**$ 38,075 - 51,430 Avg = $44,753**
Incremental cost in $/sq.ft.:	**$ 1.80 to $2.43/sq.ft. Avg = $2.11/sf**
(A-20%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 20%)	
• R-30 w/ no cool roof, 10,580 sf @$0.43 – 0.60	($ 4,550 - 6,350)
• U=0.50, SHGCc=0.31 (e.g., Viracon VE 2-2M) 5,160 sf @$2.00 - 3.00/sq.ft.	$ 10,320 - 15,480
• 240 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 6,000 - 7,200
• 72 (30% of) T8 fixtures on 36 occupant sensors, small offices: @$65.00 - $85.00 each	$ 2,340 - 3,060

• 20 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 3,500 - 5,000
• (4) Global Energy Group 1400 Series 10-ton Packaged DX, EER = 13.4 @$2300 - $2900 each	$ 9,200 - 11,600
• (4) Global Energy Group 1400 Series 7.5-ton Packaged DX, EER = 13.0 @$1950 - $2450 each	$ 7,800 - 9,800
• ¾" R-4.88 rigid insulation + R-19 in metal stud walls, 8,752 sf @$1.75 - $2.25/sf	$ 15,315 - 19,690
Total incremental cost of Ordinance energy measure:	**$ 49,925 - 60,480 Avg = $55,203**
Incremental cost in $/sq.ft.:	**$ 2.36 to $2.86/sq.ft. Avg = $2.61 /sf**

(A-25%) 21,160 sq.ft. (Reduction in 2008 T24 TDV Energy by 25%)

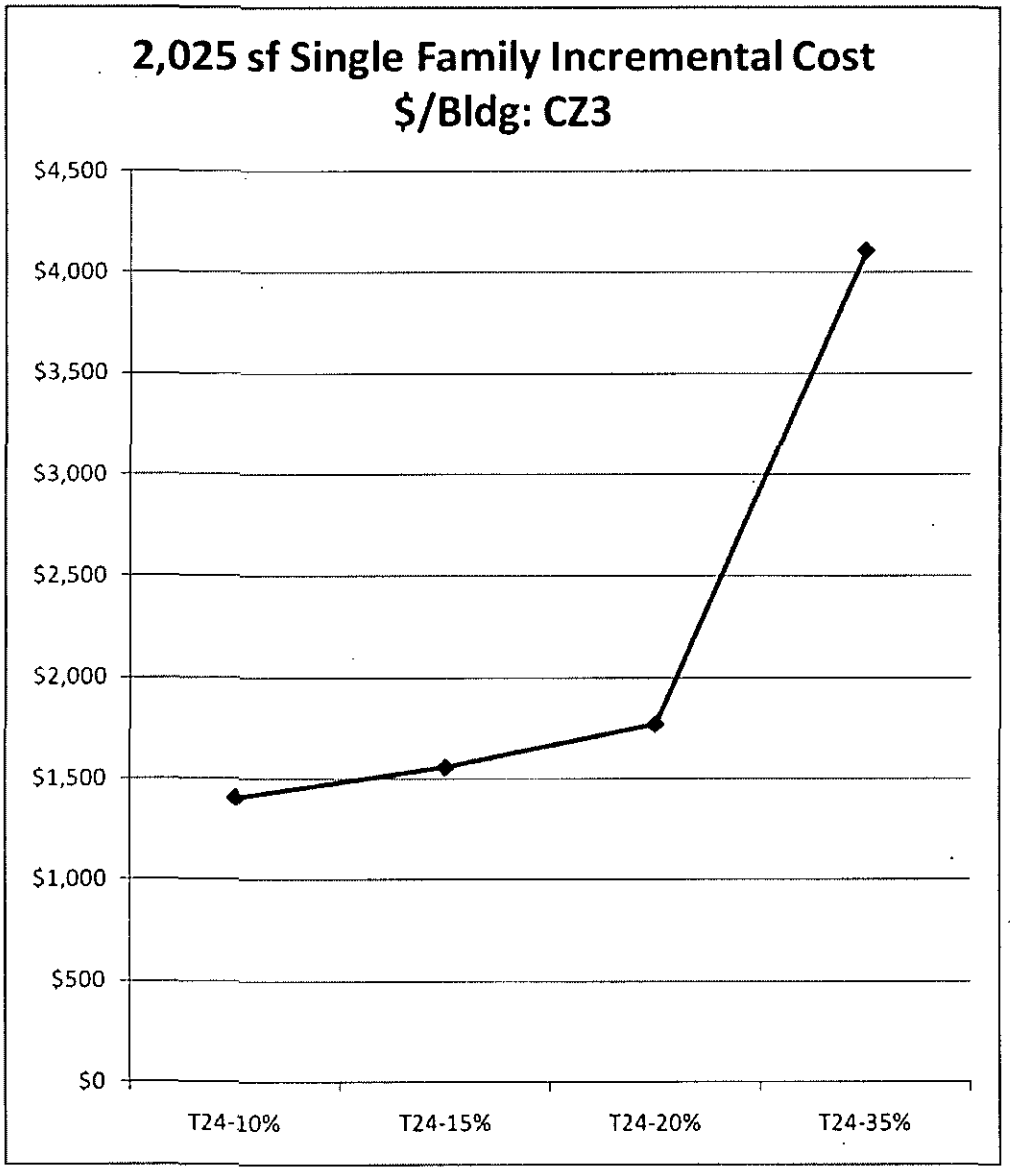
• U=0.50, SHGCc=0.22 (e.g., Viracon VE 1-42M **) 5,160 sf @$3.50 - 4.50/sq.ft.	$ 18,060 - 23,220
• 240 2-lamp 4' T8 fixtures with high efficiency instant start ballasts and premium T8 lamps, 50 input watts @$25.00 - $30.00/fixture; Installed LPD=0.676	$ 6,000 - 7,200
• 72 (30% of) T8 fixtures on 36 occupant sensors, small offices @$65.00 - $85.00 each	$ 2,340 - 3,060
• 20 more recessed CFL fixtures, all CFL fixtures w/ 18w lamps @$175 - $250 each	$ 3,500 - 5,000
• (4) Global Energy Group 1400 Series 10-ton Packaged DX, EER = 13.4 @$2300 - $2900 each	$ 9,200 - 11,600
• (4) Global Energy Group 1400 Series 7.5-ton Packaged DX, EER = 13.0 @$1950 - $2450 each	$ 7,800 - 9,800
• 1 ½" R-4.88 rigid insulation + R-19 in metal stud walls, 8,752 sf @$3.00 - $3.50/sf	$ 26,255 - 30,630
Total incremental cost of Ordinance energy measure:	**$ 73,155 - 90,510 Avg = $82,333**
Incremental cost in $/sq.ft.:	**$ 3.46 to $4.28/sq.ft. Avg = $3.89 /sf**

** *Note: This glass type has a low visible light transmittance (31%) which reduces the opportunity for manual control of lighting in response to daylight not accounted for in the Title 24 calculation.*

4.0 Cost Effectiveness Graphs

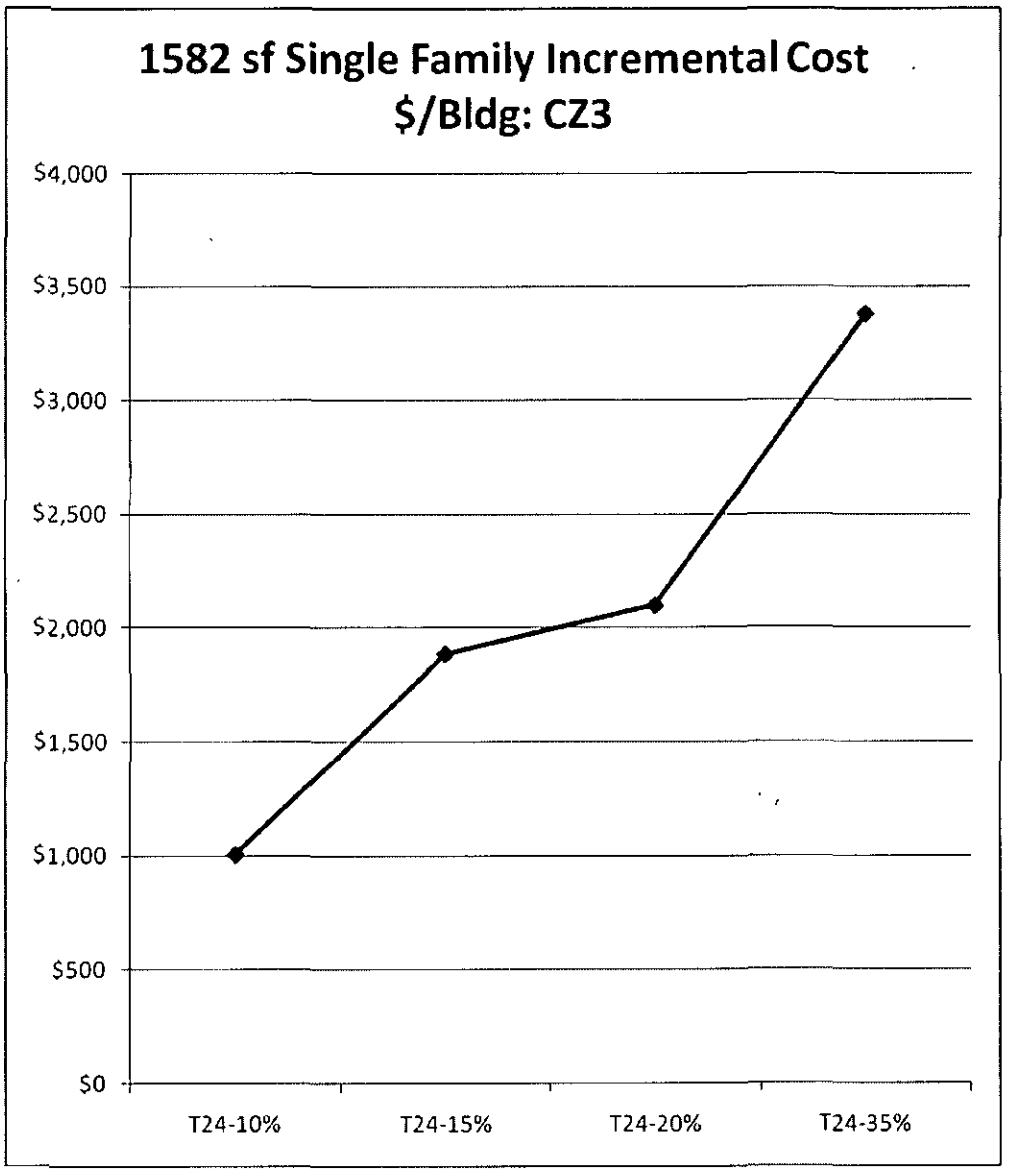
4.1 CLIMATE ZONE #3 CHARTS ILLUSTRATING RESULTS

Figure 4-CZ3a-1: Added First Cost – 2,025 sf 2-Story Single Family Home



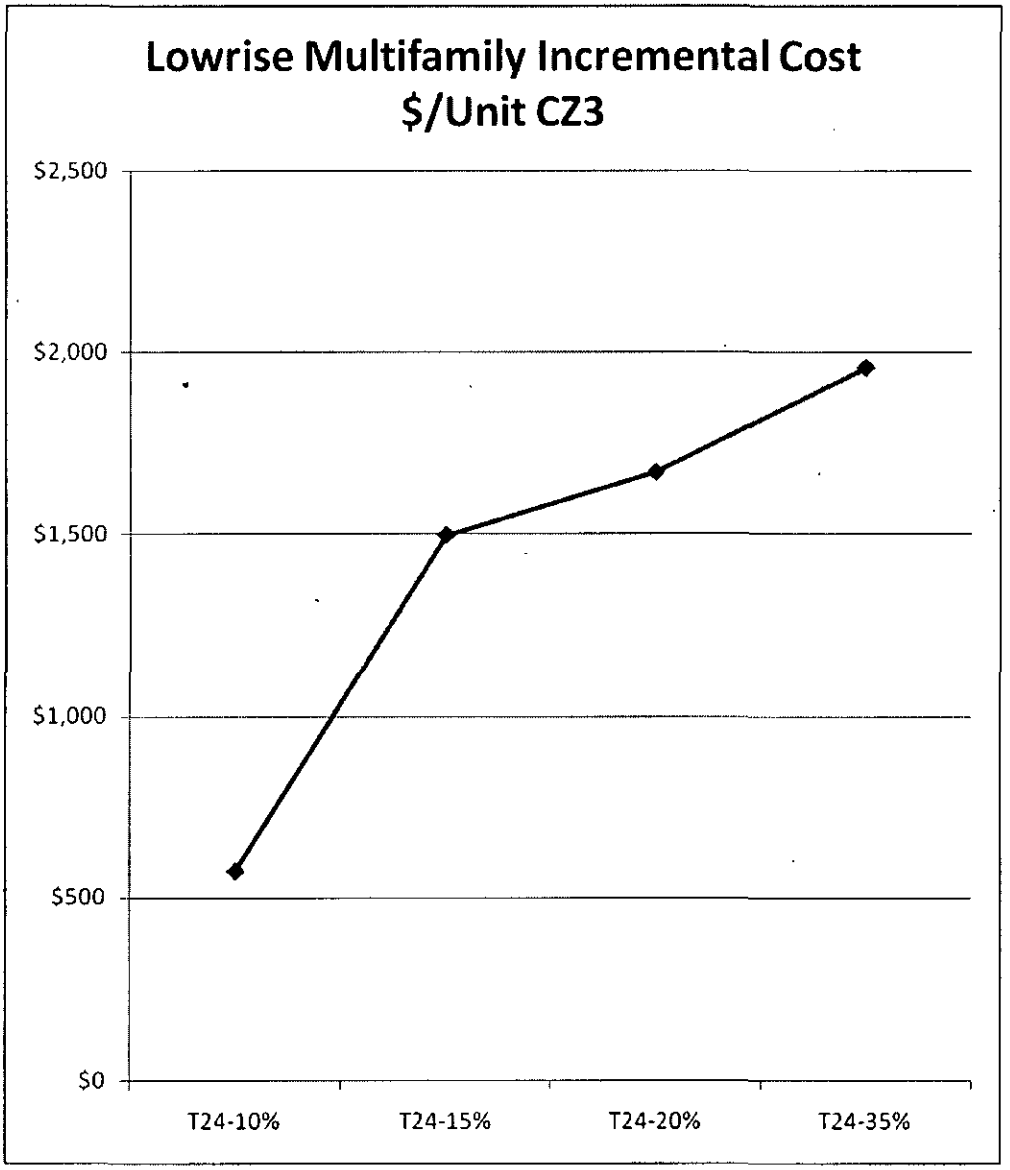
The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $733 in this single family house design.

Figure 4-CZ3a-2: Added First Cost – 1,582 sf 1-Story Single Family Home



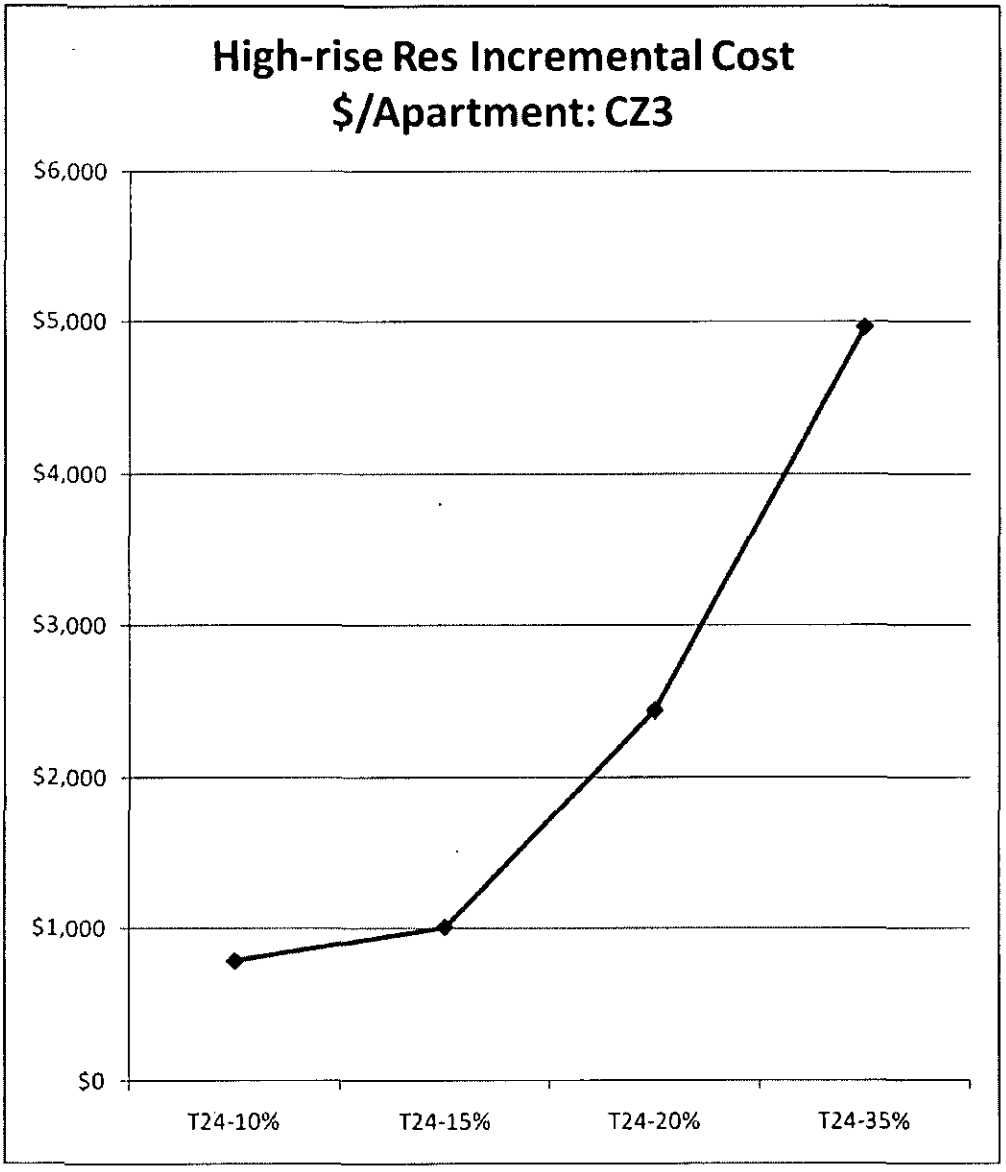
The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $238 in this single family house design.

Figure 4-CZ3a-3: Added First Cost/Dwelling Unit, 2-Story Multifamily Building



The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $150 per dwelling unit in this multifamily building design.

Figure 4-CZ3a-4: Added First Cost – 40 Unit, 5-Story High-rise Residential Building



The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $0 per dwelling unit in this high-rise residential building design. (No changes in the building design were required to meet the 2008 standards.)

Figure 4-CZ3a-5: Added First Cost – 21,160 sf 2-Story Nonresidential Building

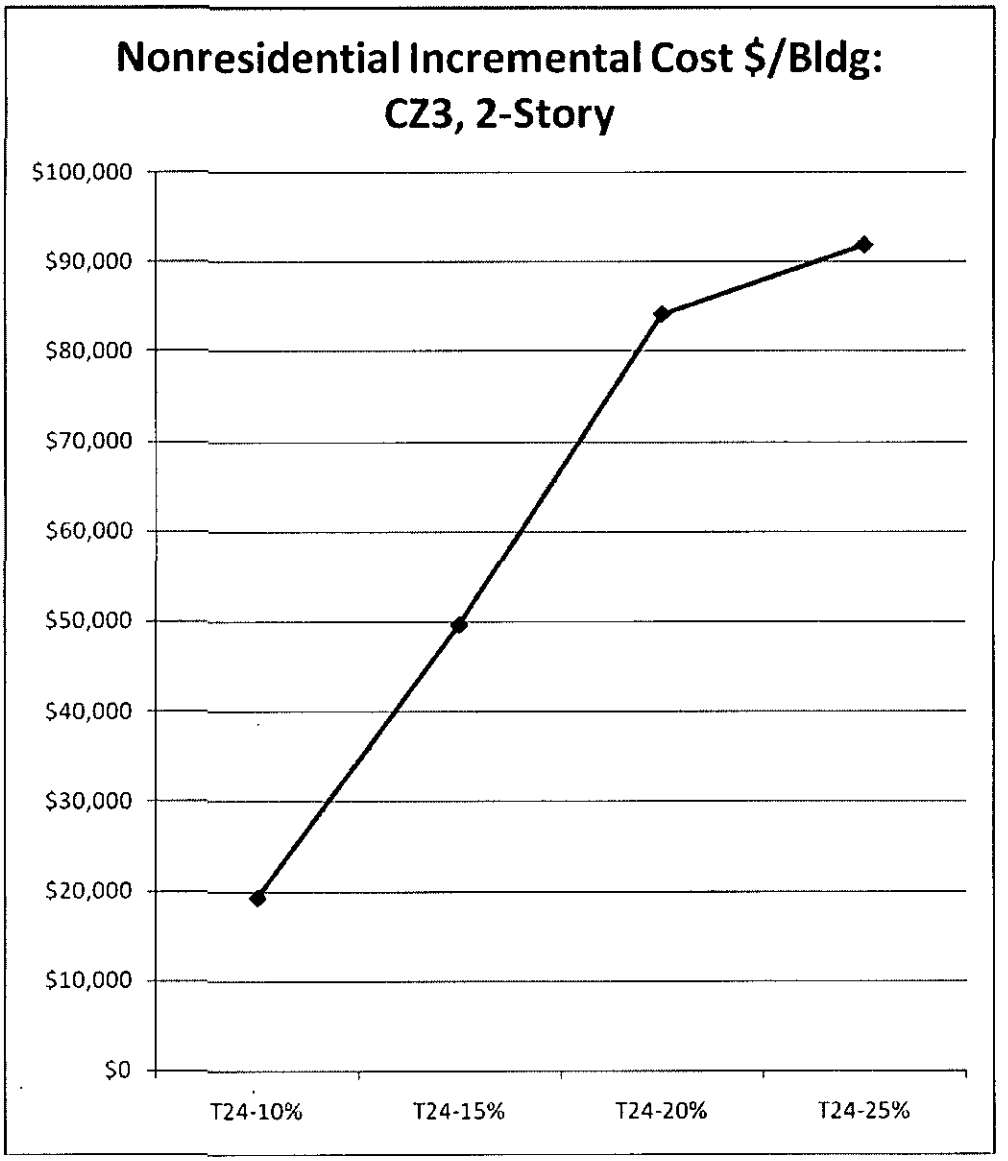


Figure 4-CZ3a-6: Added First Cost – 52,900 sf 5-Story Nonresidential Building

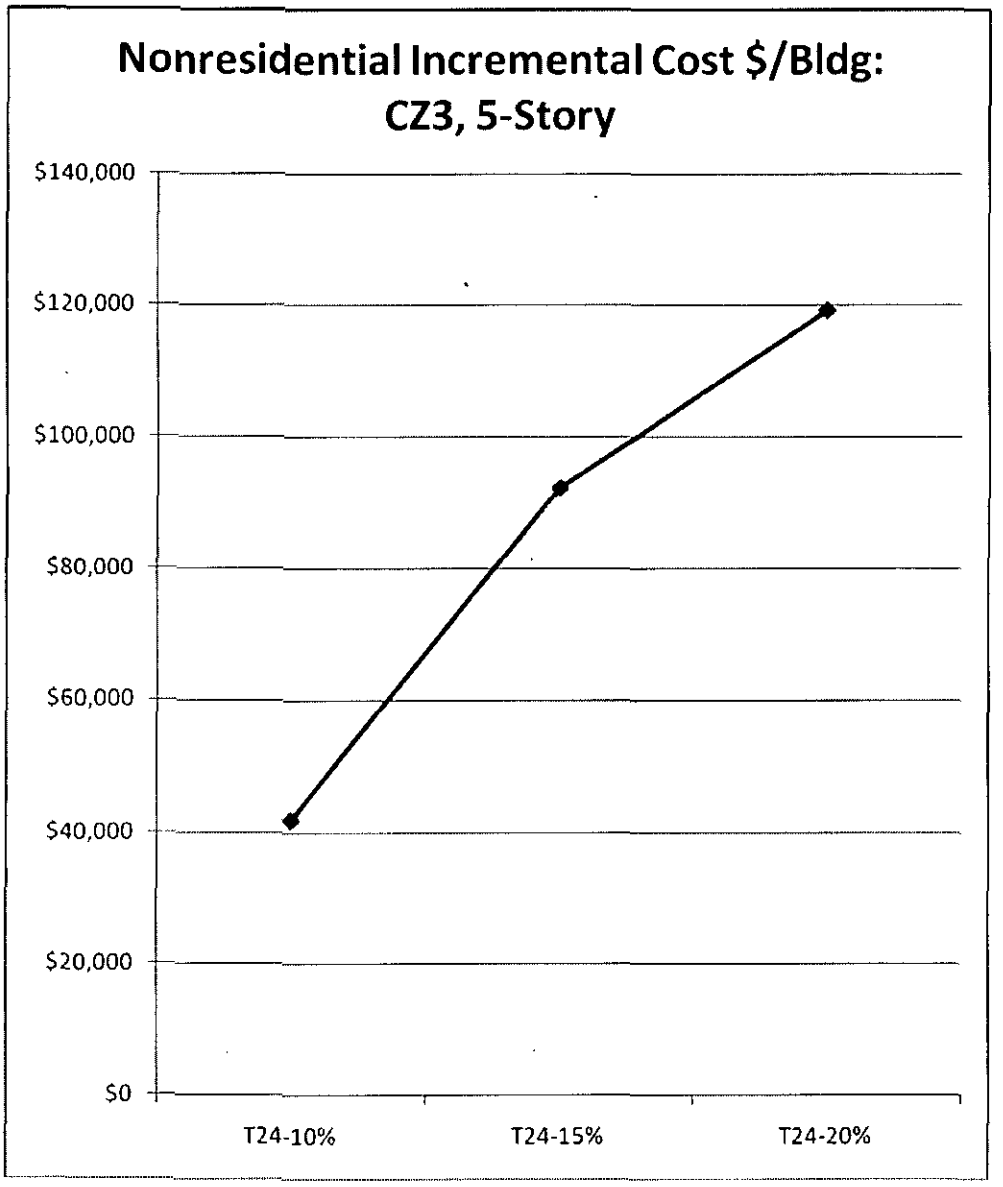


Figure 4-CZ3b-1: Added First Cost/Sq.Ft., – 2,025 sf 2-Story Single Family Home

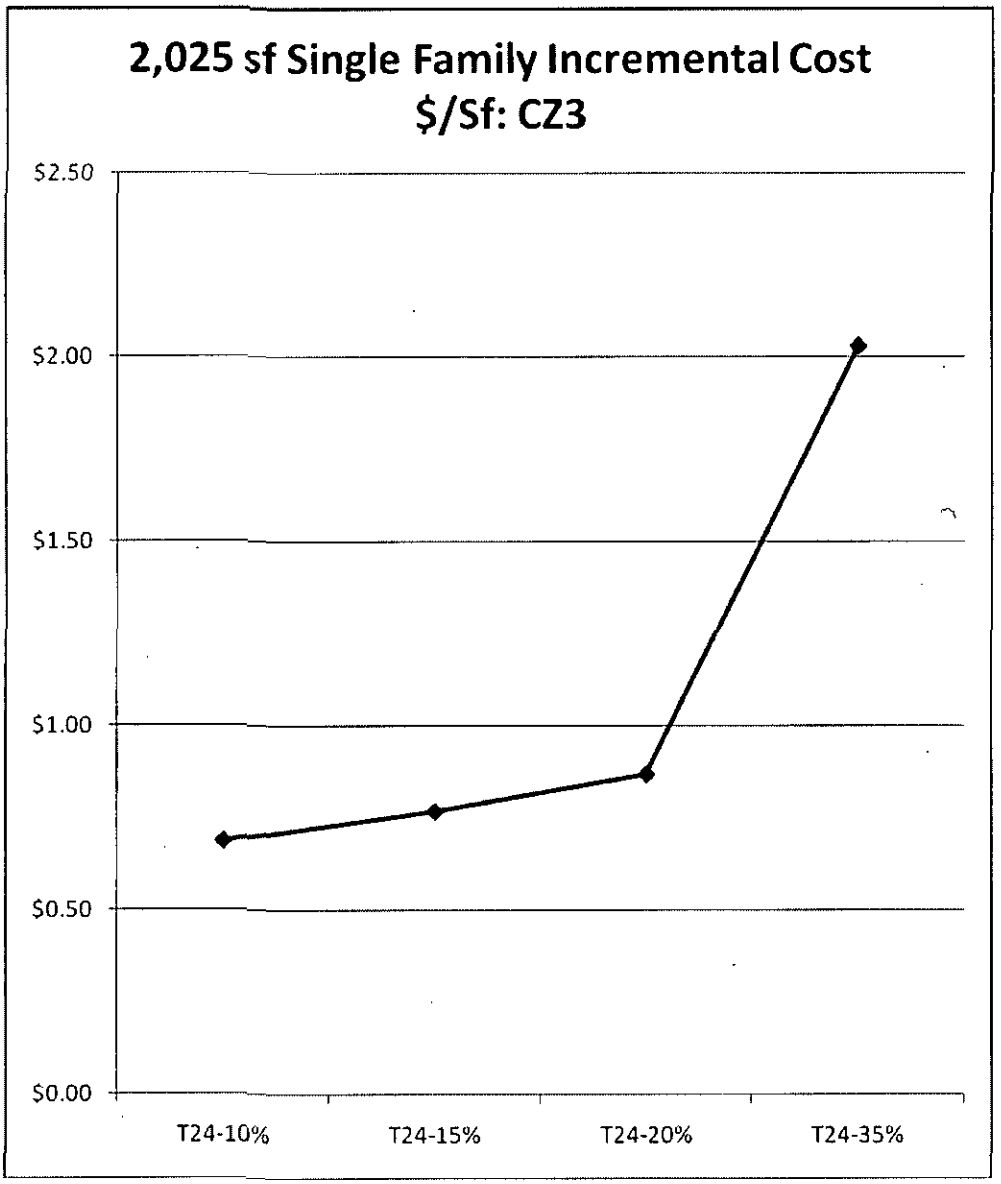


Figure 4-CZ3b-2: Added First Cost/Sq.Ft., – 1,582 sf 1-Story Single Family Home

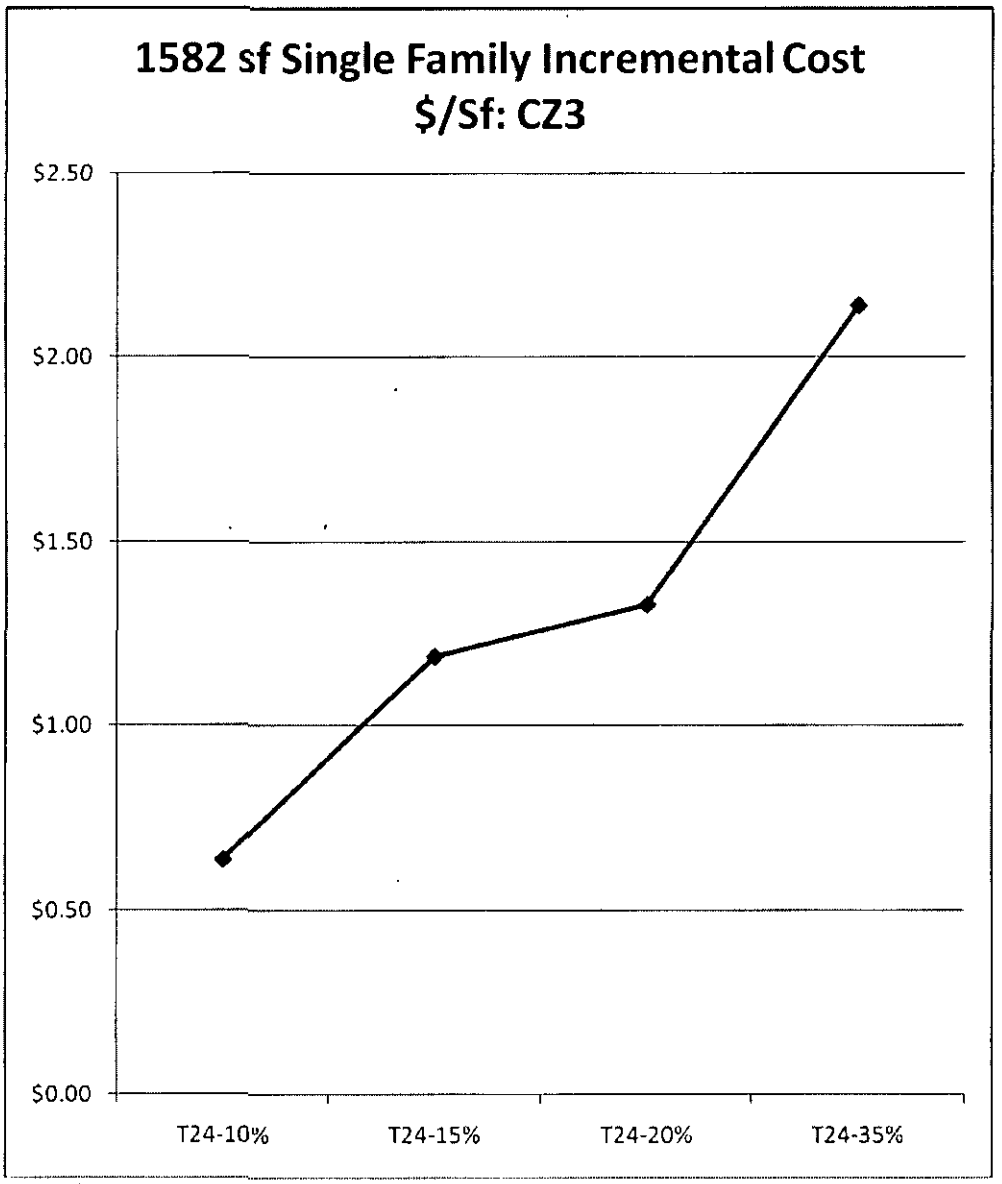


Figure 4-CZ3b-3: Added First Cost/Sq.Ft, 2-Story Multifamily Building

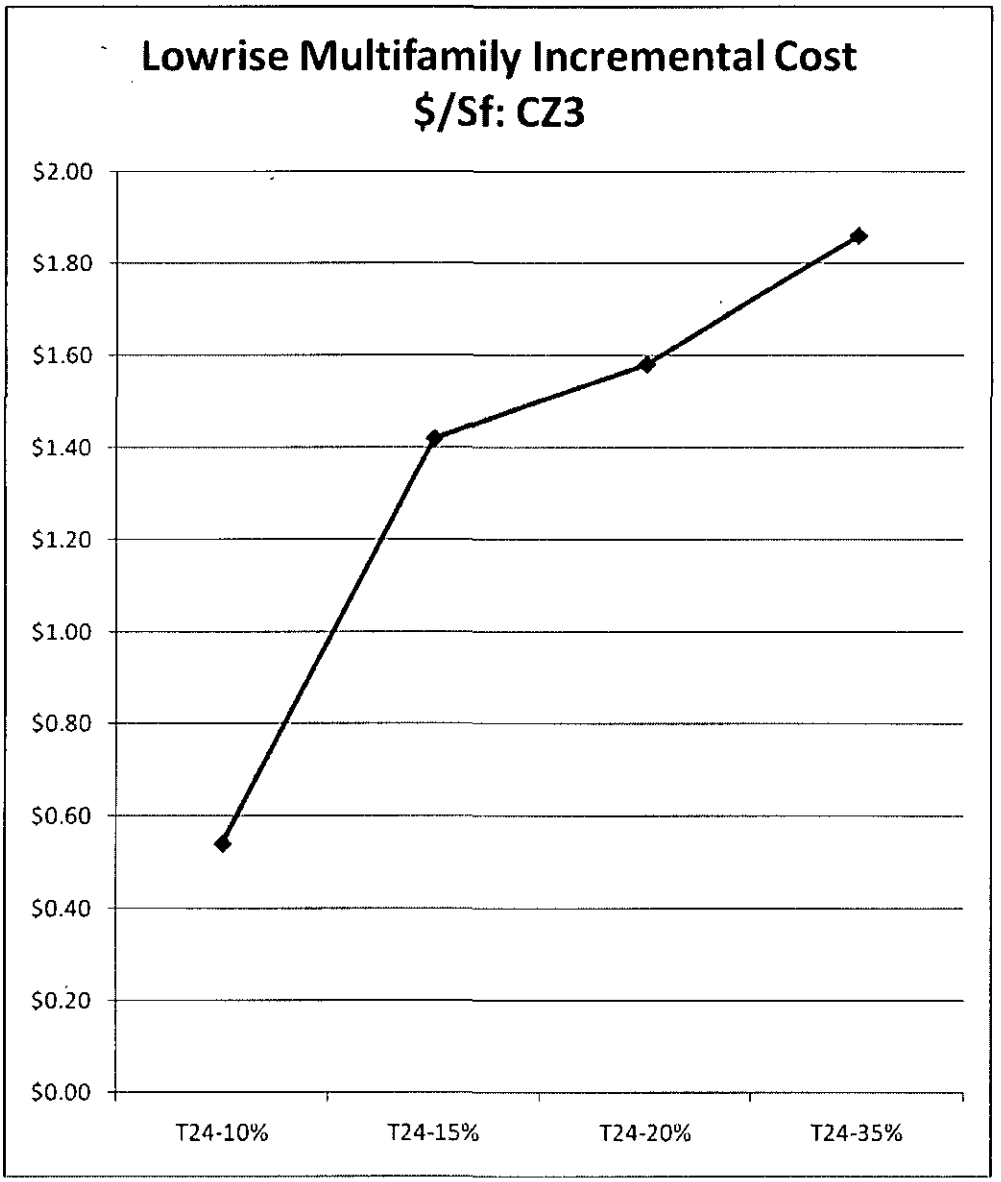
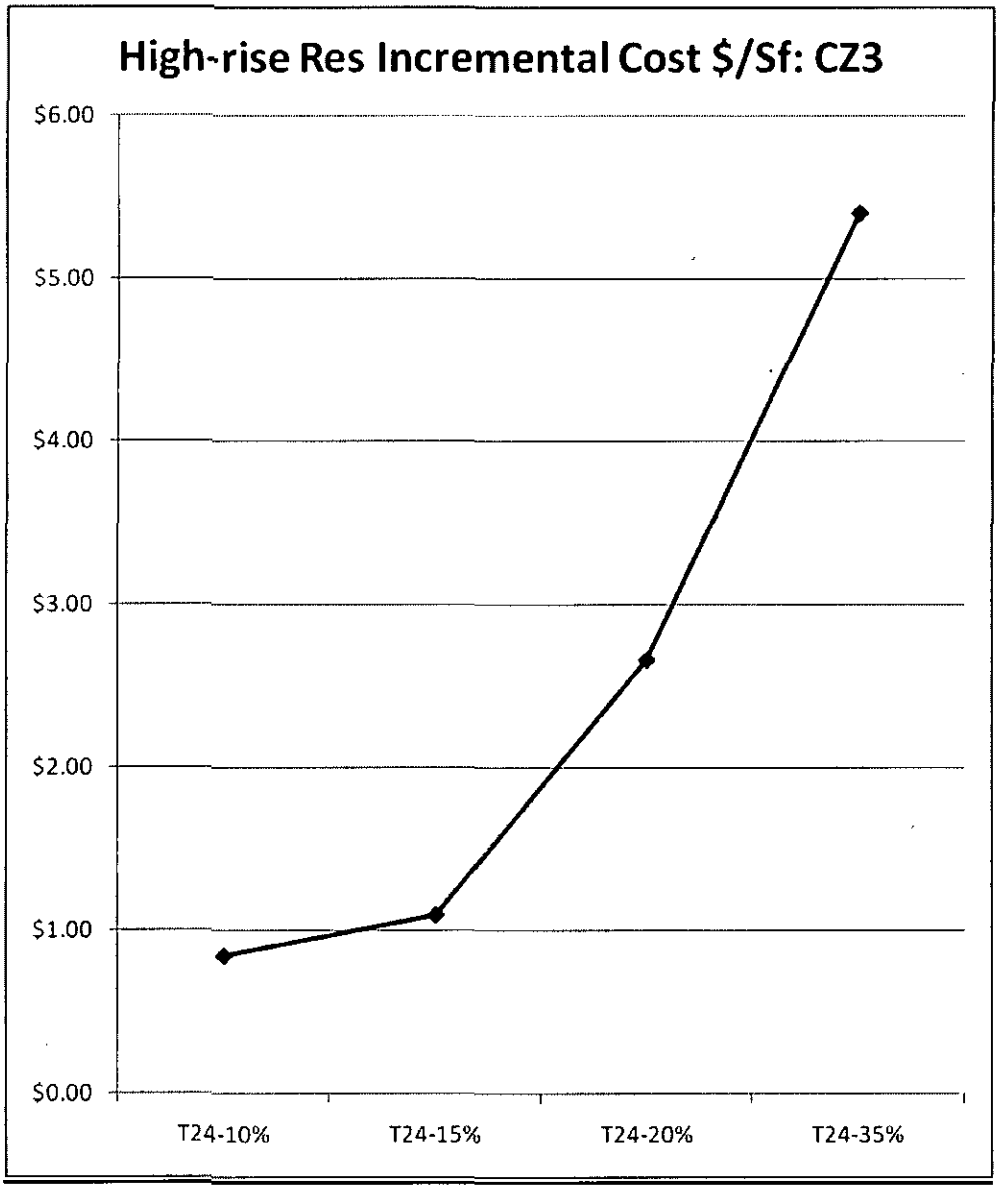


Figure 4-CZ3b-4: Added First Cost/Sq.Ft
– 40 Unit, 5-Story High-rise Residential Building



The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $0 per square foot in this high-rise residential building design. (No changes in the building design were required to meet the 2008 standards.)

Figure 4-CZ3b-5: Added First Cost/Sq.Ft., 21,160 sf 2-Story Nonresidential Building

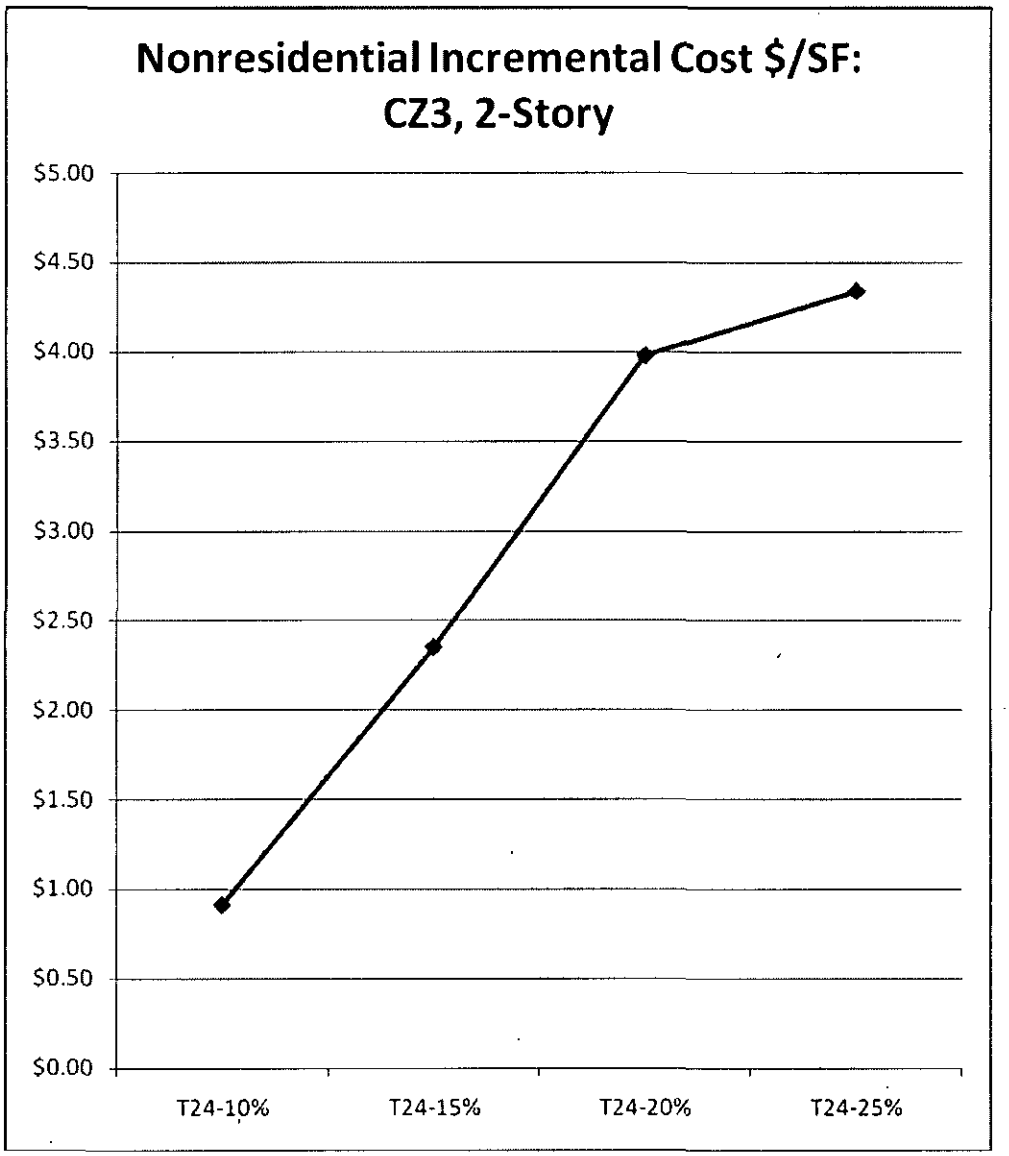


Figure 4-CZ3b-6: Added First Cost/Sq.Ft., 52,900 sf 5-Story Nonresidential Building

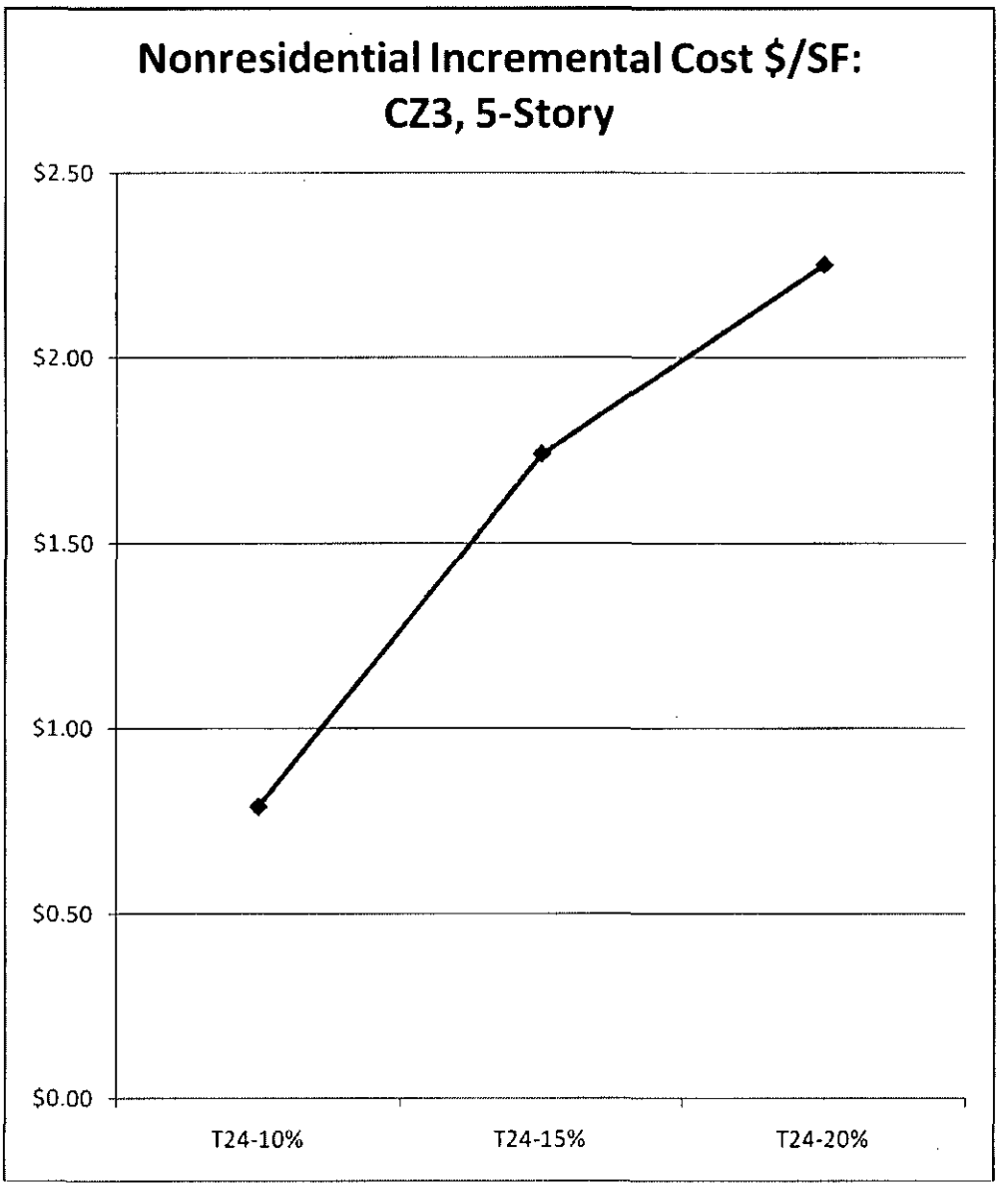


Figure 4-CZ3c-1: Simple Payback of Different Tiers of Energy Measures – 2,025 sf 2-Story Single Family Home

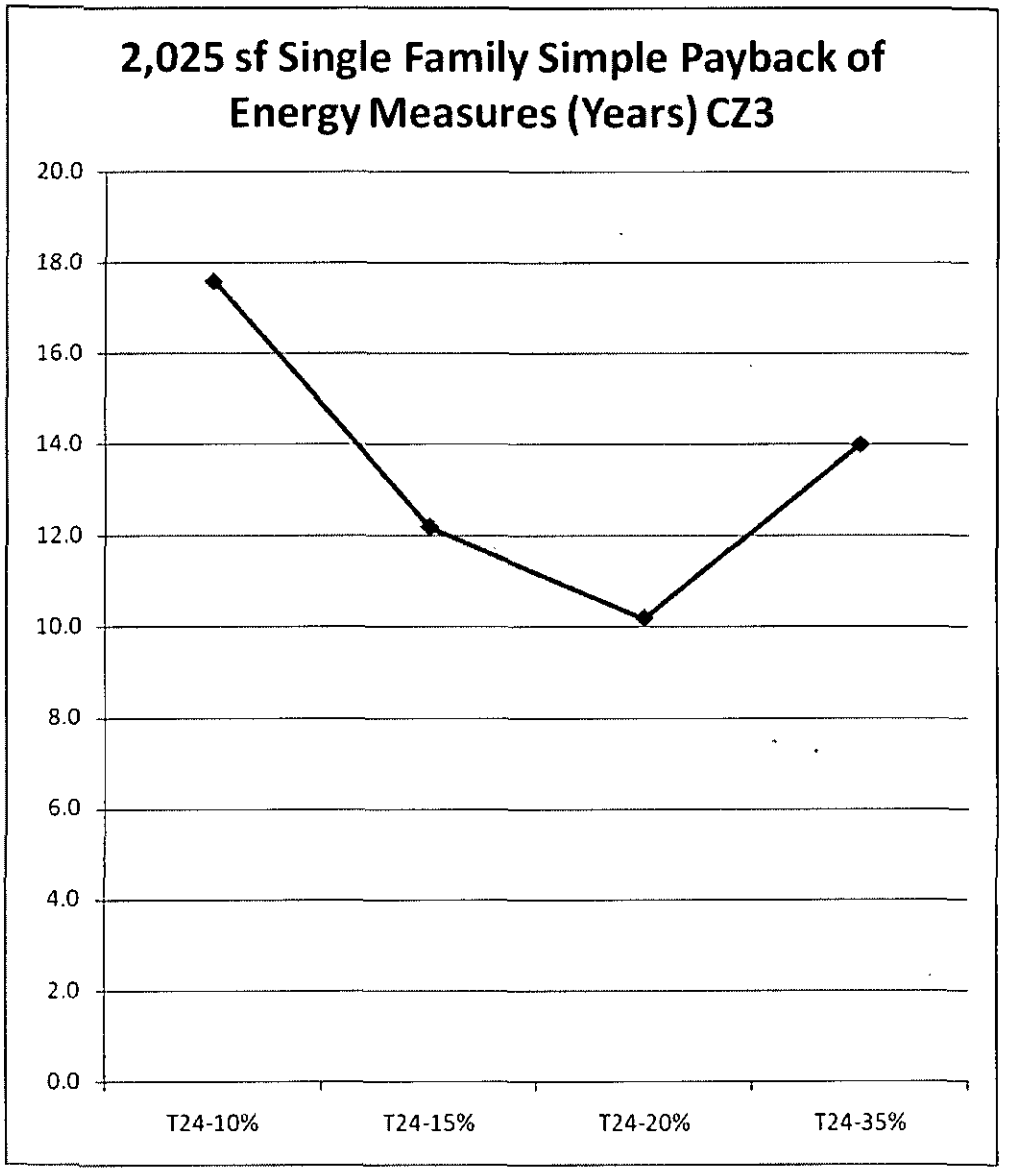


Figure 4-CZ3c-2: Simple Payback of Different Tiers of Energy Measures – 1,582 sf 1-Story Single Family Home

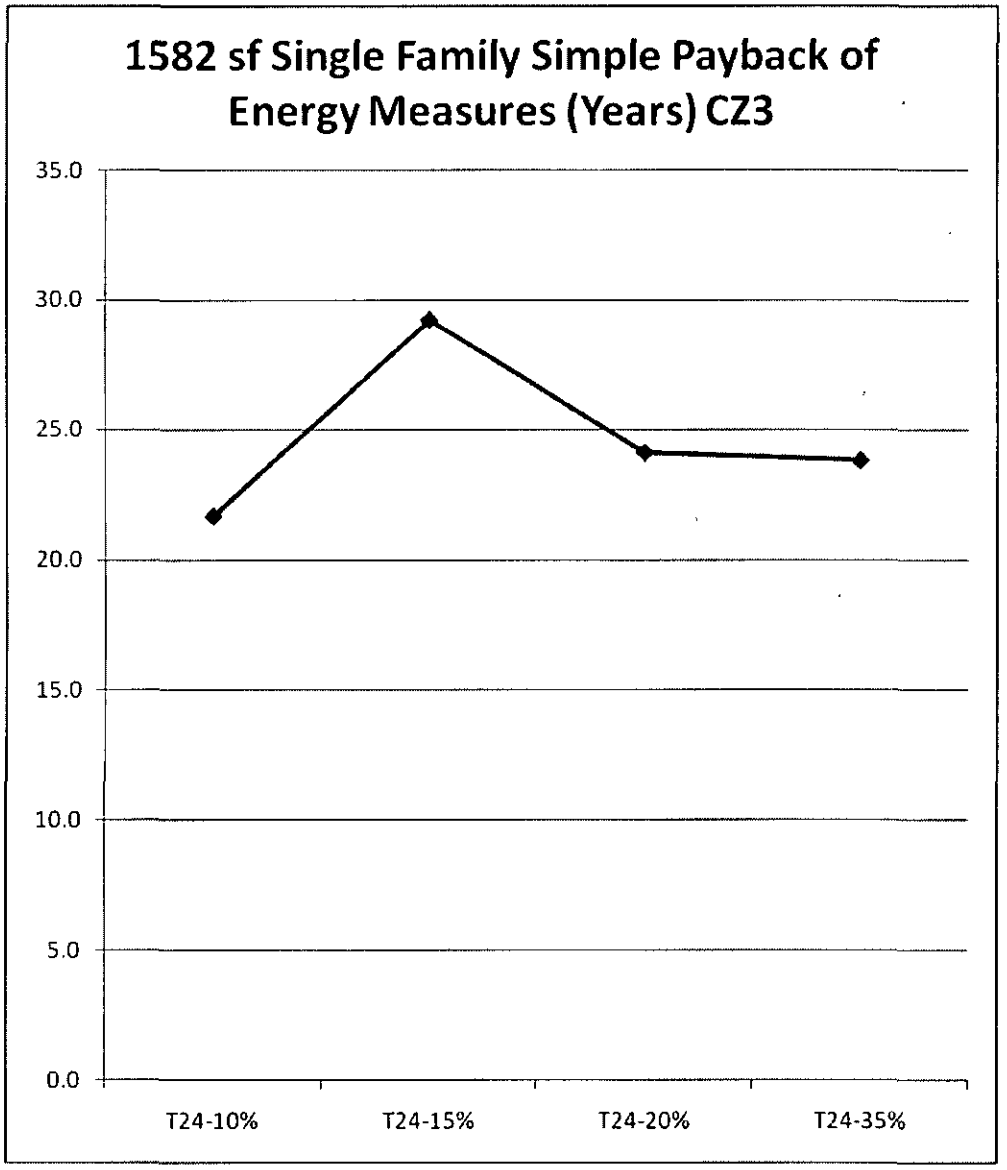


Figure 4-CZ3c-3: Simple Payback of Different Tiers of Energy Measures, 2-Story Multifamily Building

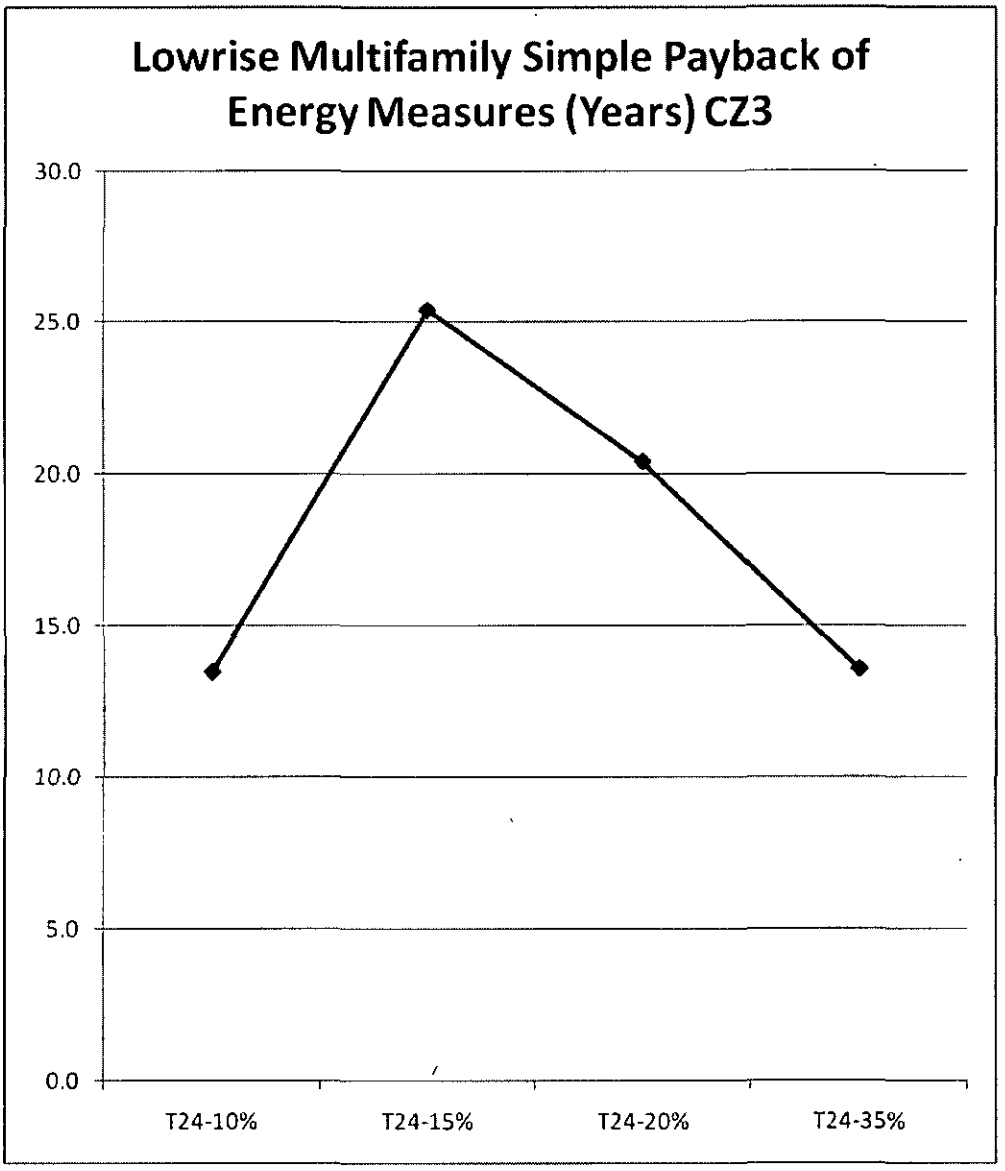


Figure 4-CZ3c-4: Simple Payback of Different Tiers of Energy Measures – 40 Unit, 5-Story High-rise Residential Building

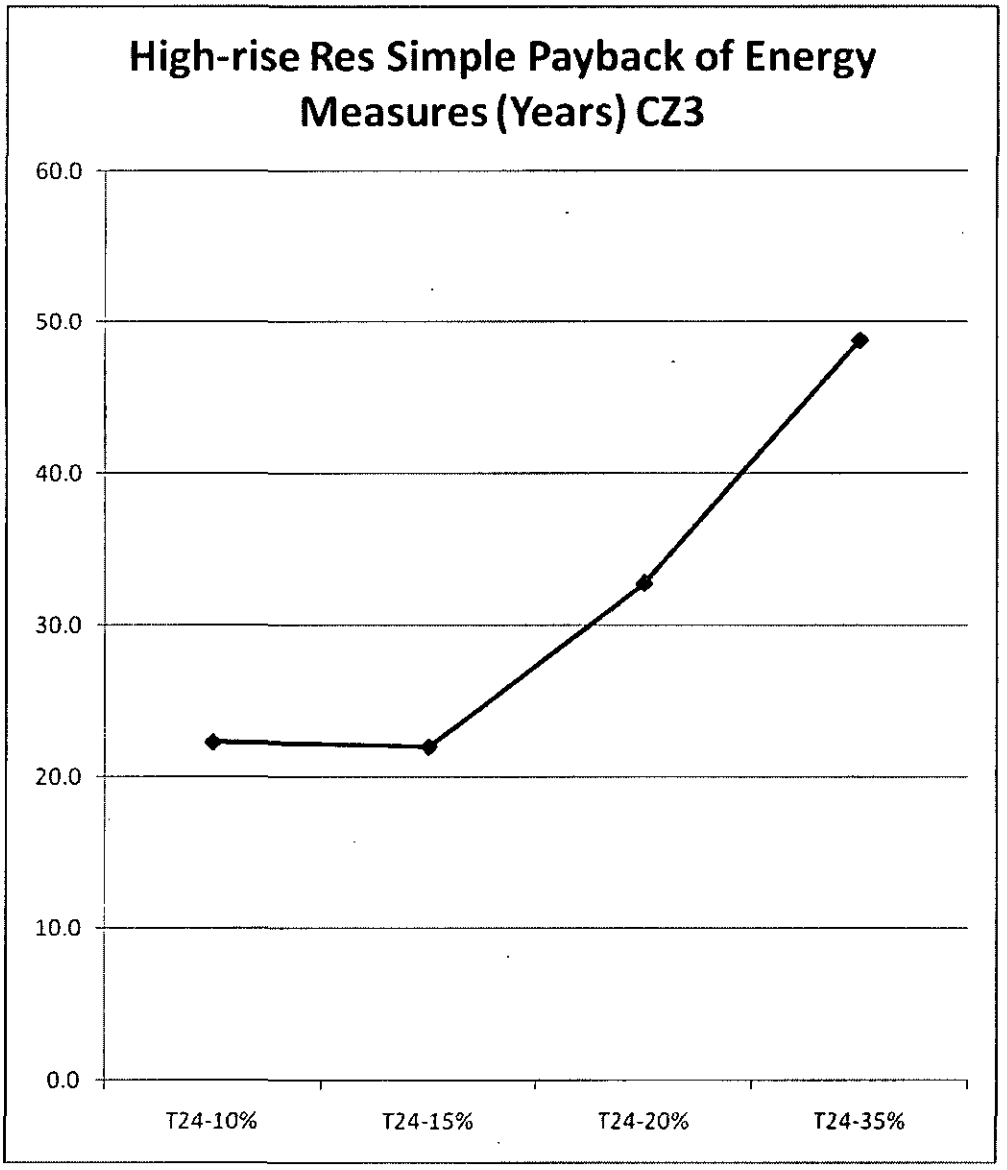


Figure 4-CZ3c-5: Simple Payback of Different Tiers of Energy Measures – 21,160 sf 2-Story Nonresidential Building

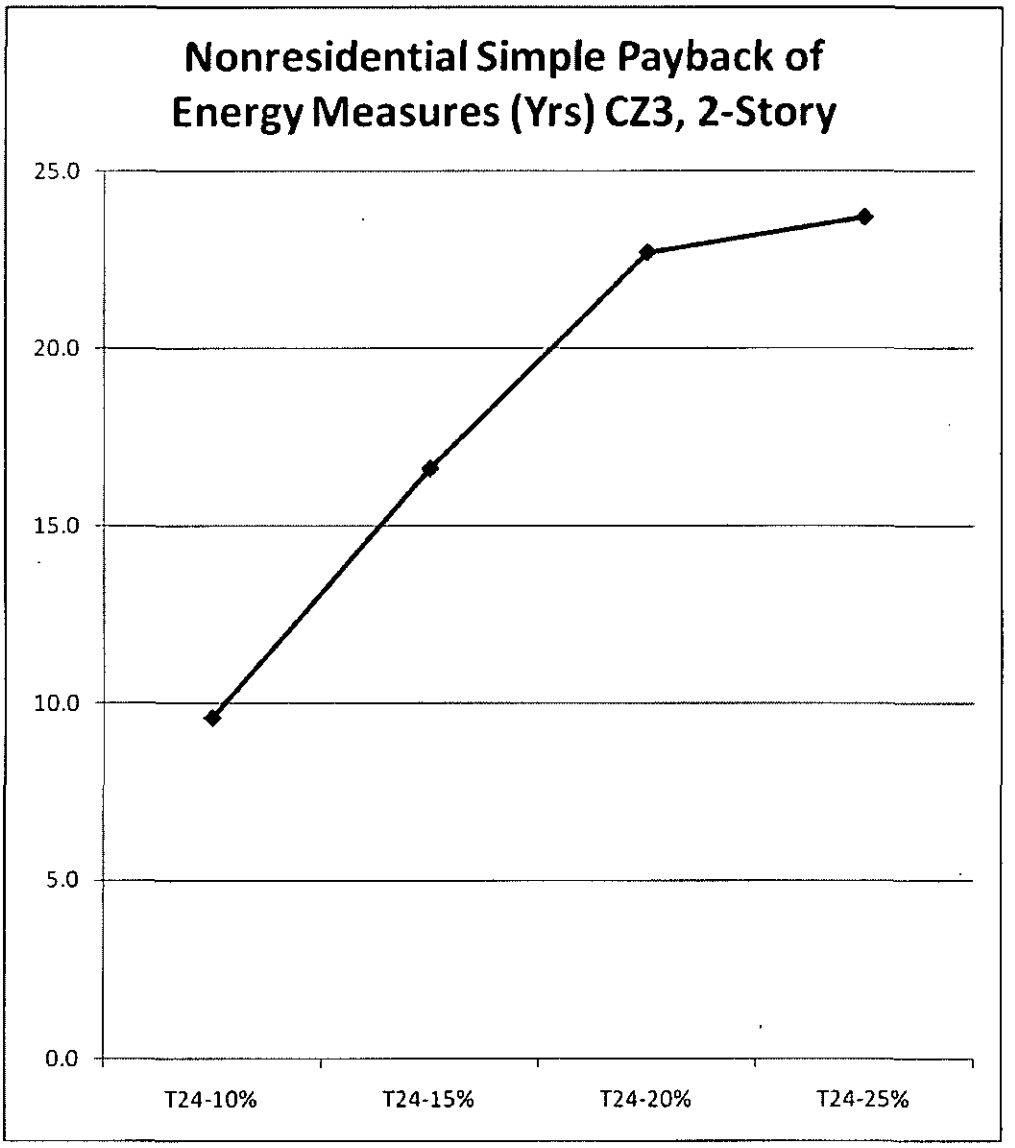


Figure 4-CZ3c-6: Simple Payback of Different Tiers of Energy Measures – 52,900 sf 5-Story Nonresidential Building

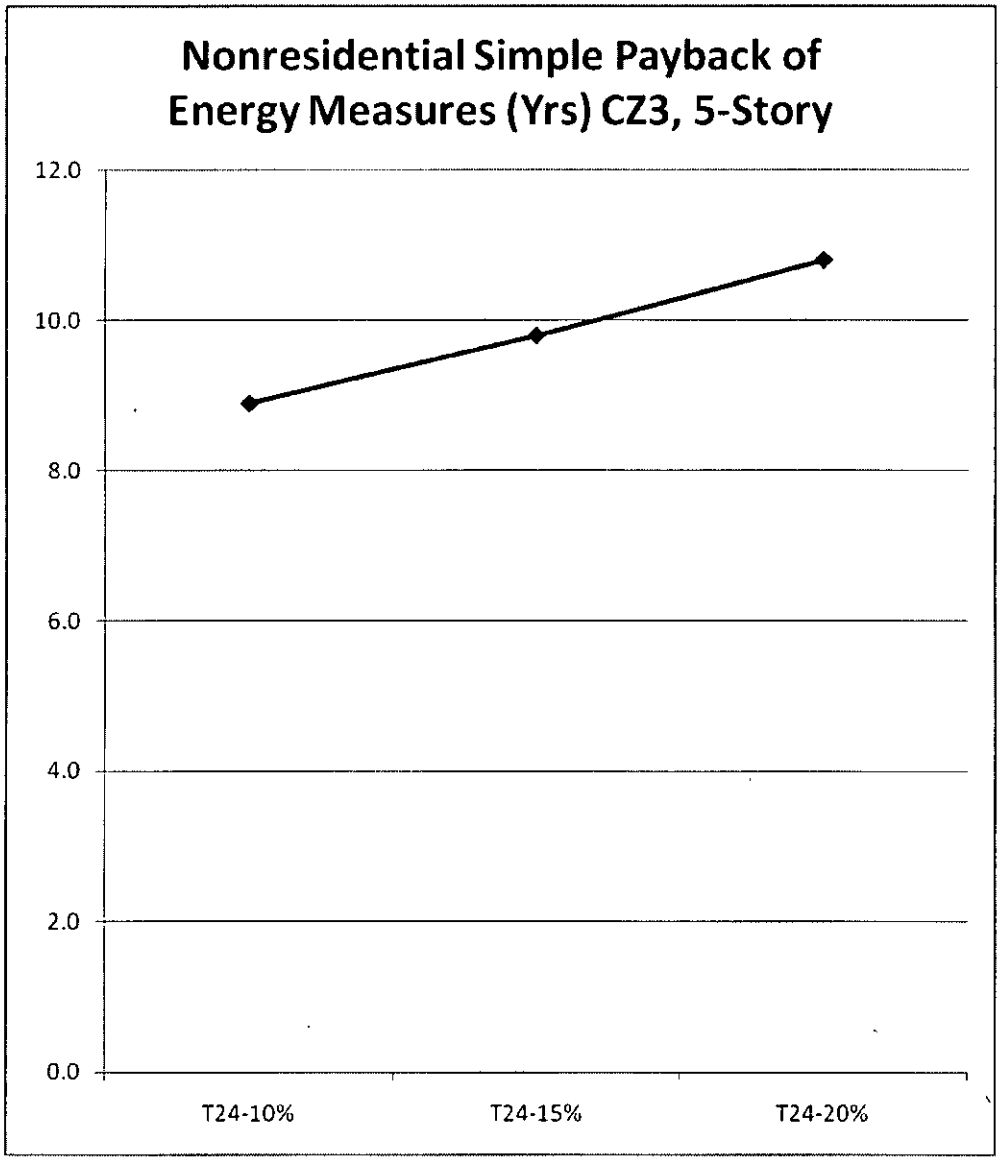


Figure 4-CZ3d-1: Added Cost/Sq.ft. per Lb. of CO2 Reduction – 2,025 sf 2-Story Single Family Home

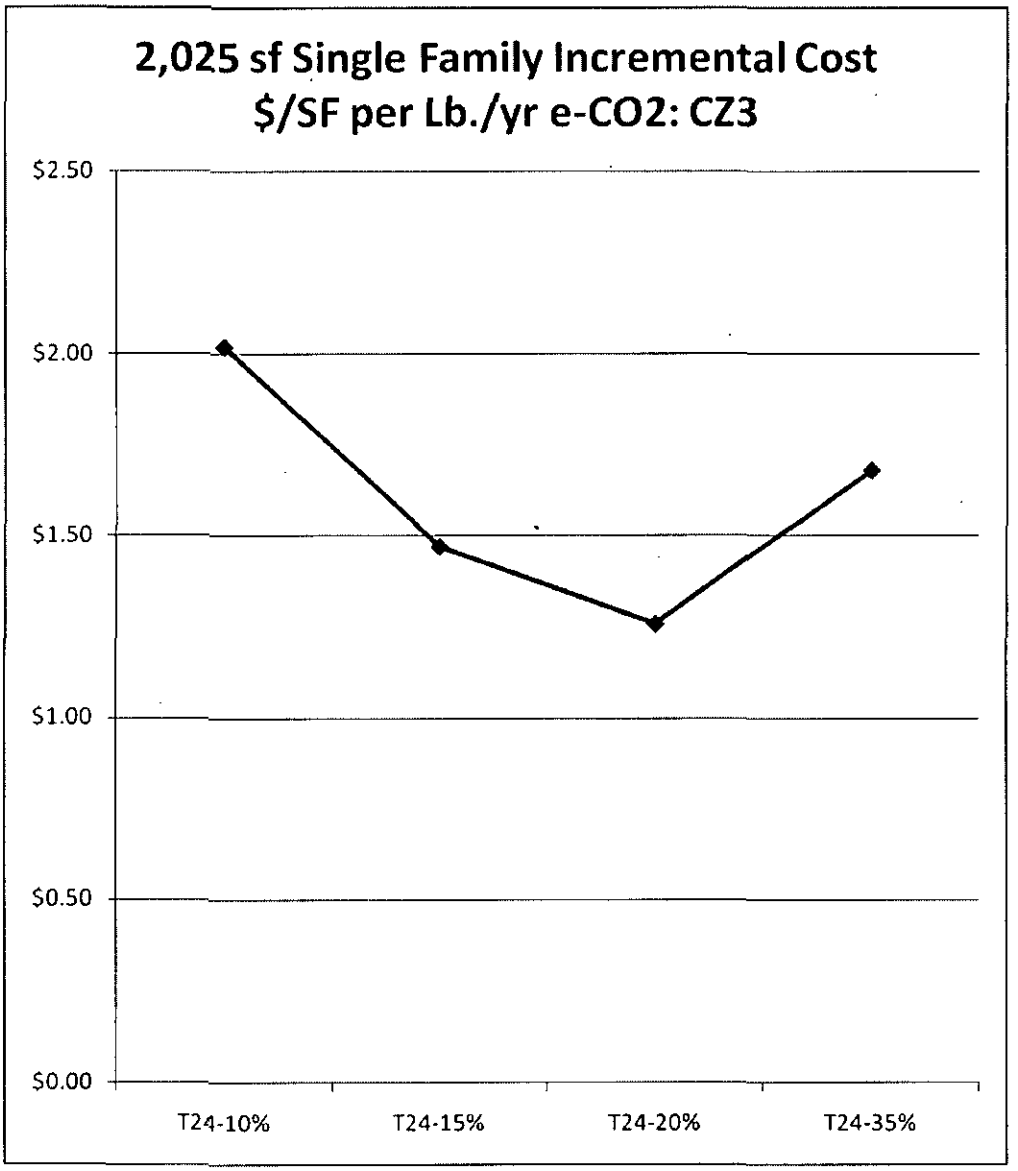


Figure 4-CZ3d-2: Added Cost/Sq.ft. per Lb. of CO2 Reduction – 1,582 sf 1-Story Single Family Home

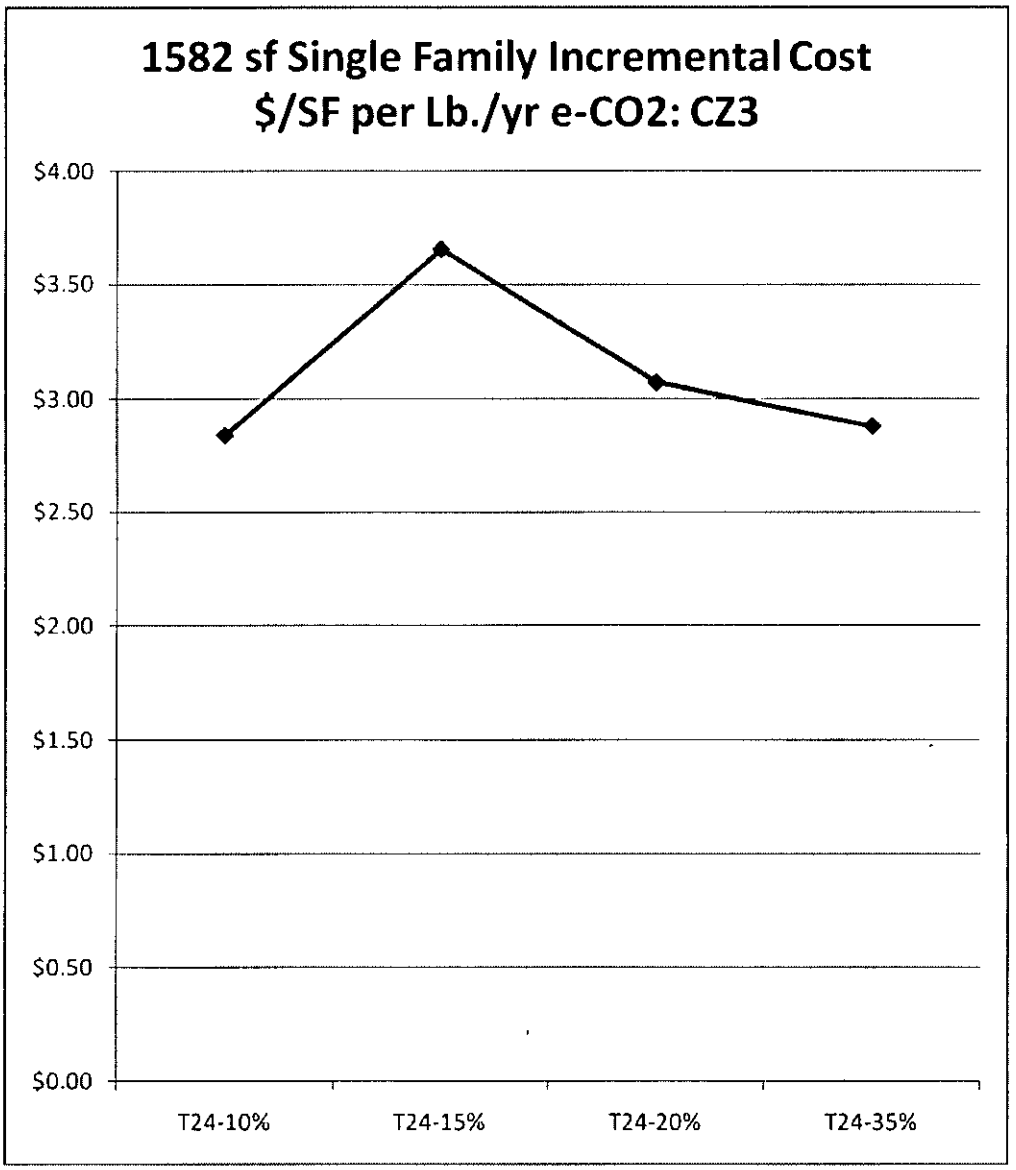


Figure 4-CZ3d-3: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 2-Story Multifamily Building

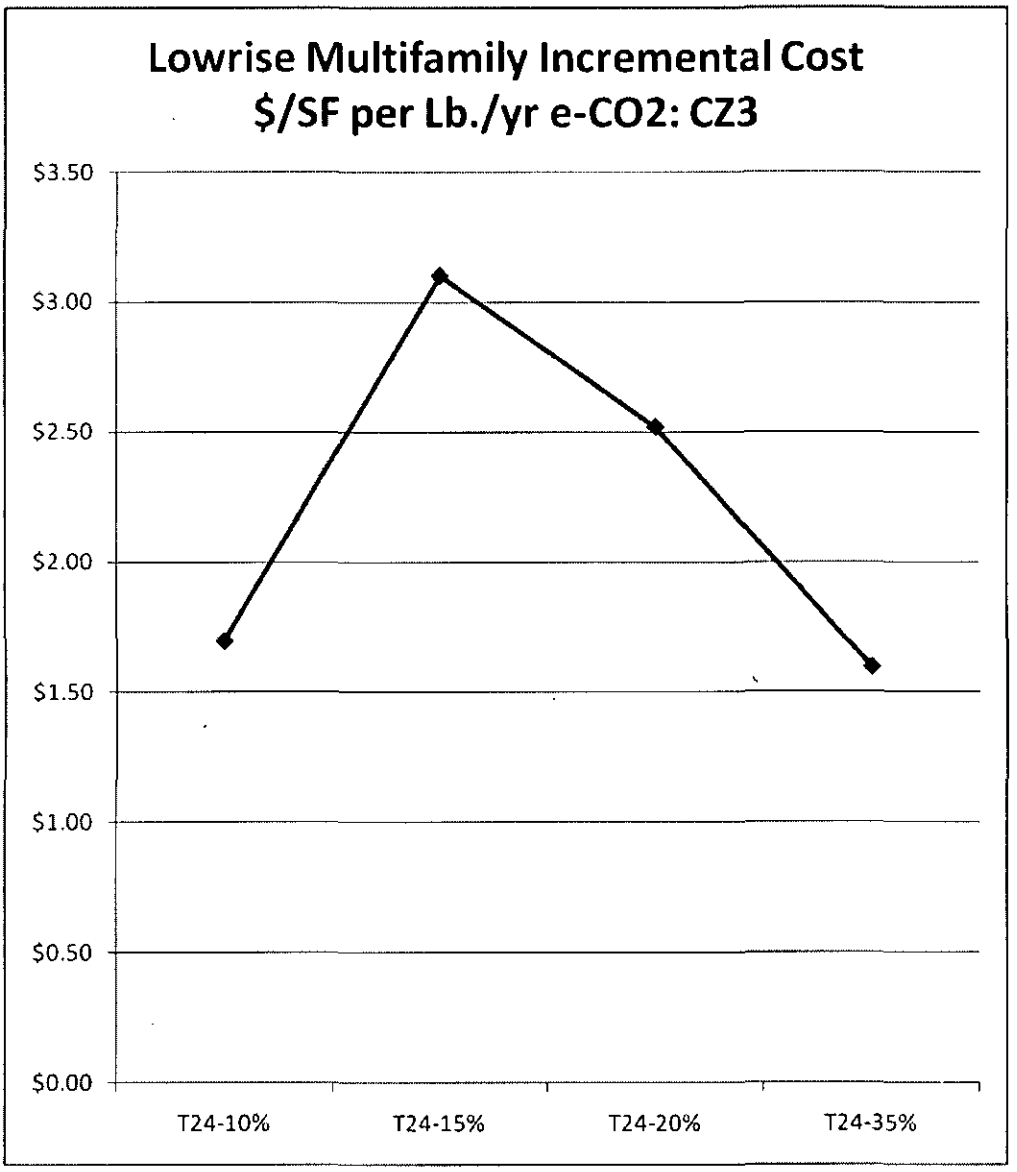


Figure 4-CZ3d-4: Added Cost/Sq.ft. per Lb. of CO2 Reduction – 40 Unit, 5-Story High-rise Residential Building

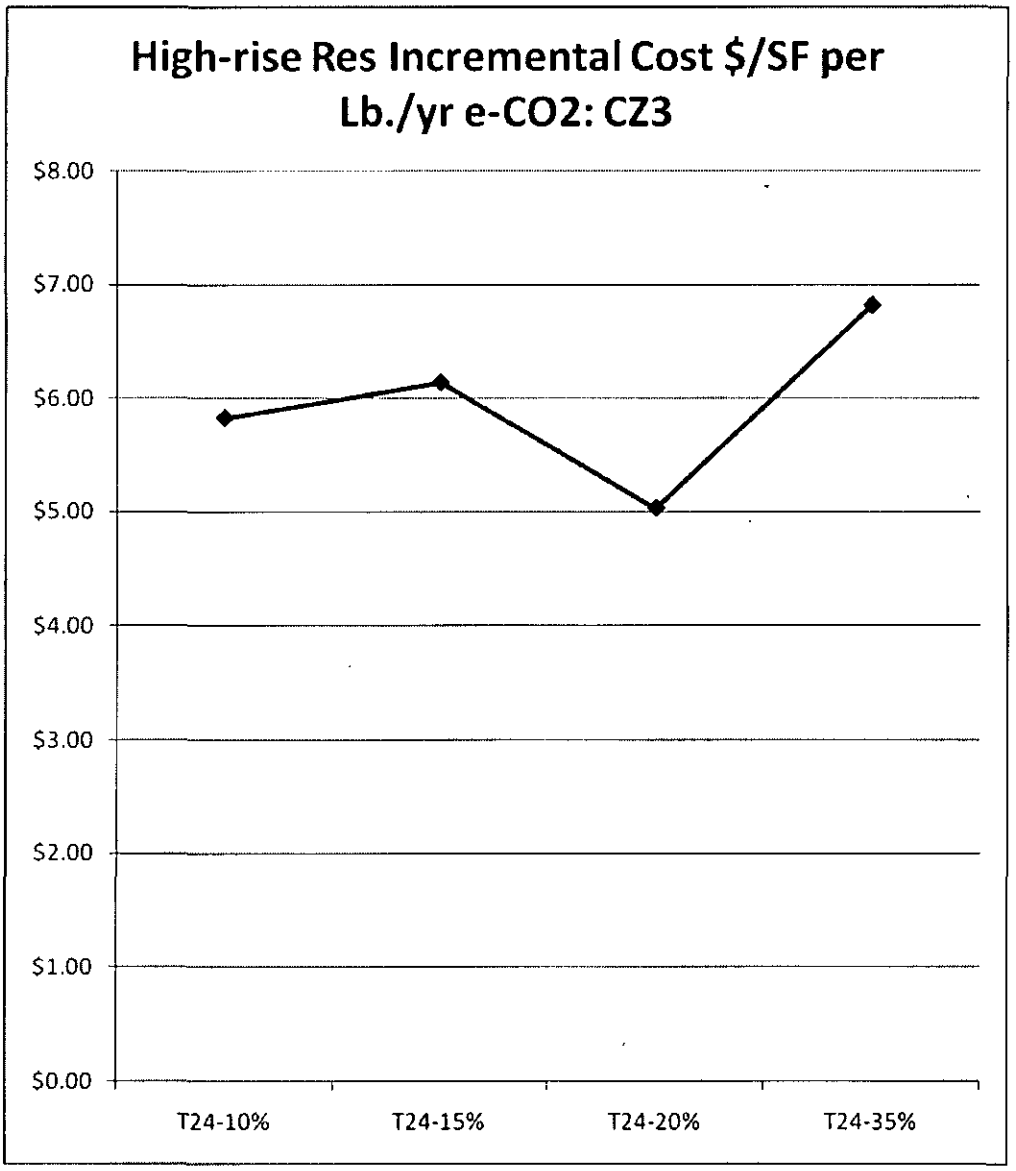


Figure 4-CZ3d-5: Added Cost/Sq.ft. per Lb. of CO2 Reduction – 21,160 sf 2-Story Nonresidential Building

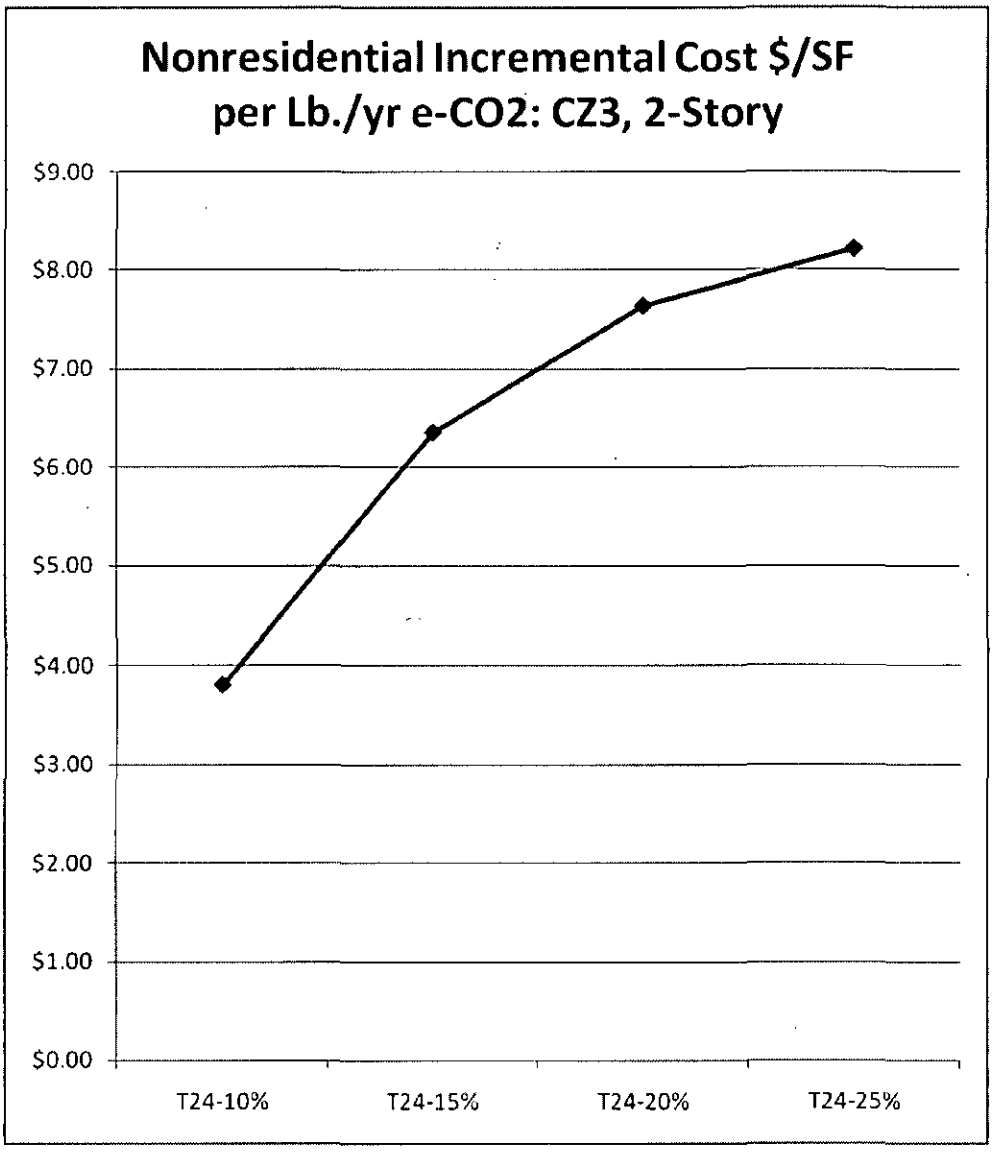


Figure 4-CZ3d-6: Added Cost/Sq.ft. per Lb. of CO2 Reduction – 52,900 sf 5-Story Nonresidential Building

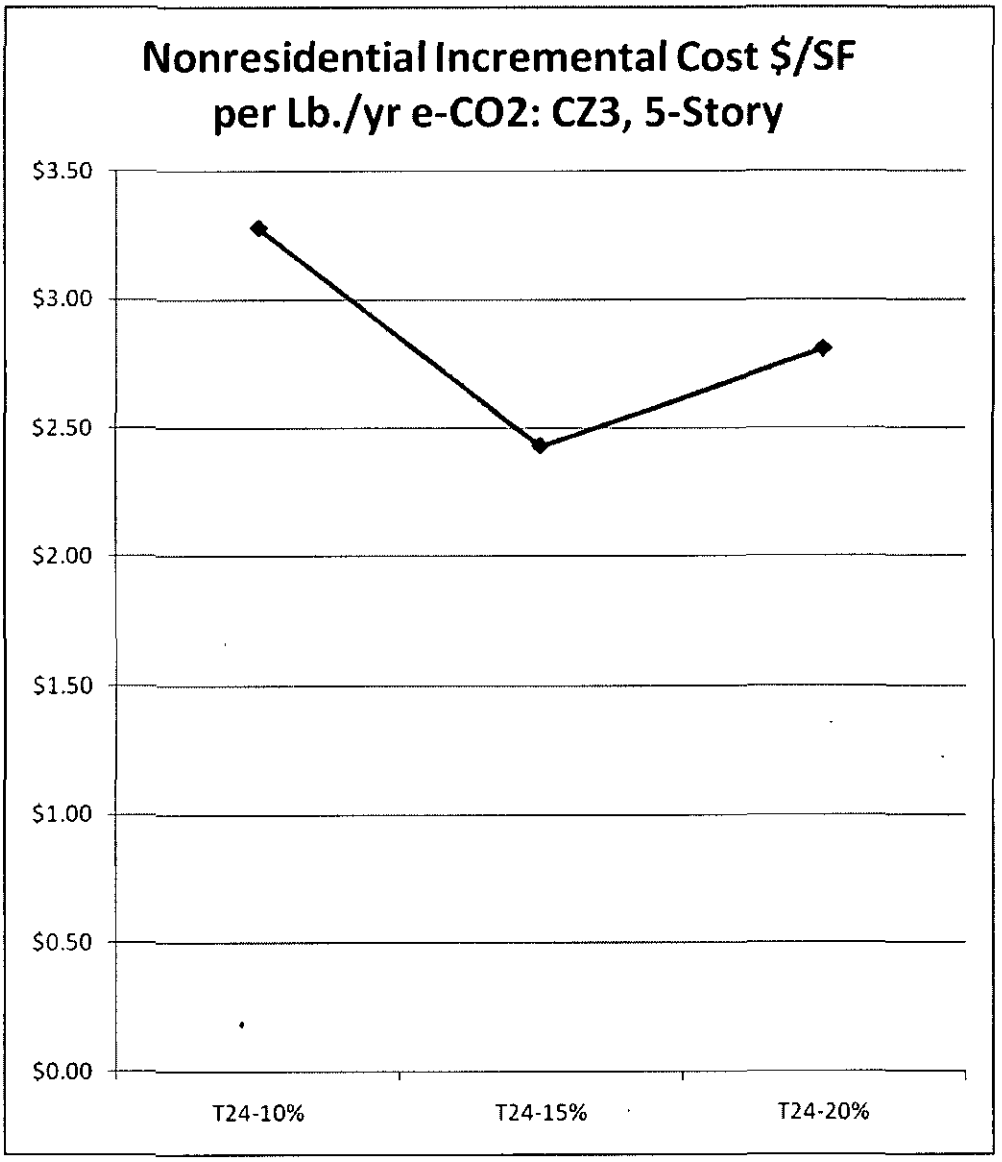


Figure 4-CZ3e-1: Annual Reduction in CO2 in Lbs./Sq.Ft. in Single Family – 2,025 sf 2-Story Single Family Home

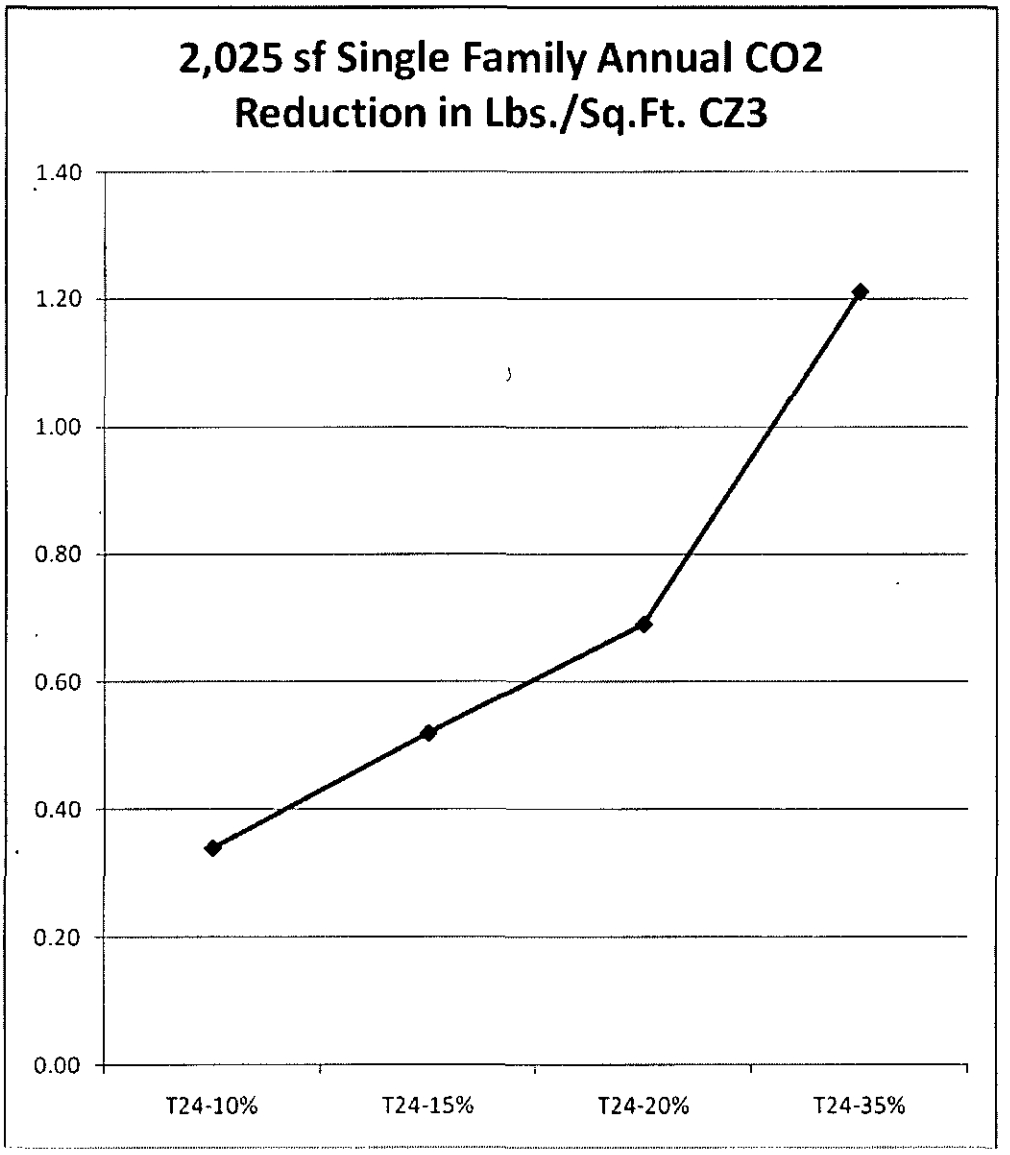


Figure 4-CZ3e-2: Annual Reduction in CO2 in Lbs./Sq.Ft. in Single Family – 1,582 sf 1-Story Single Family Home

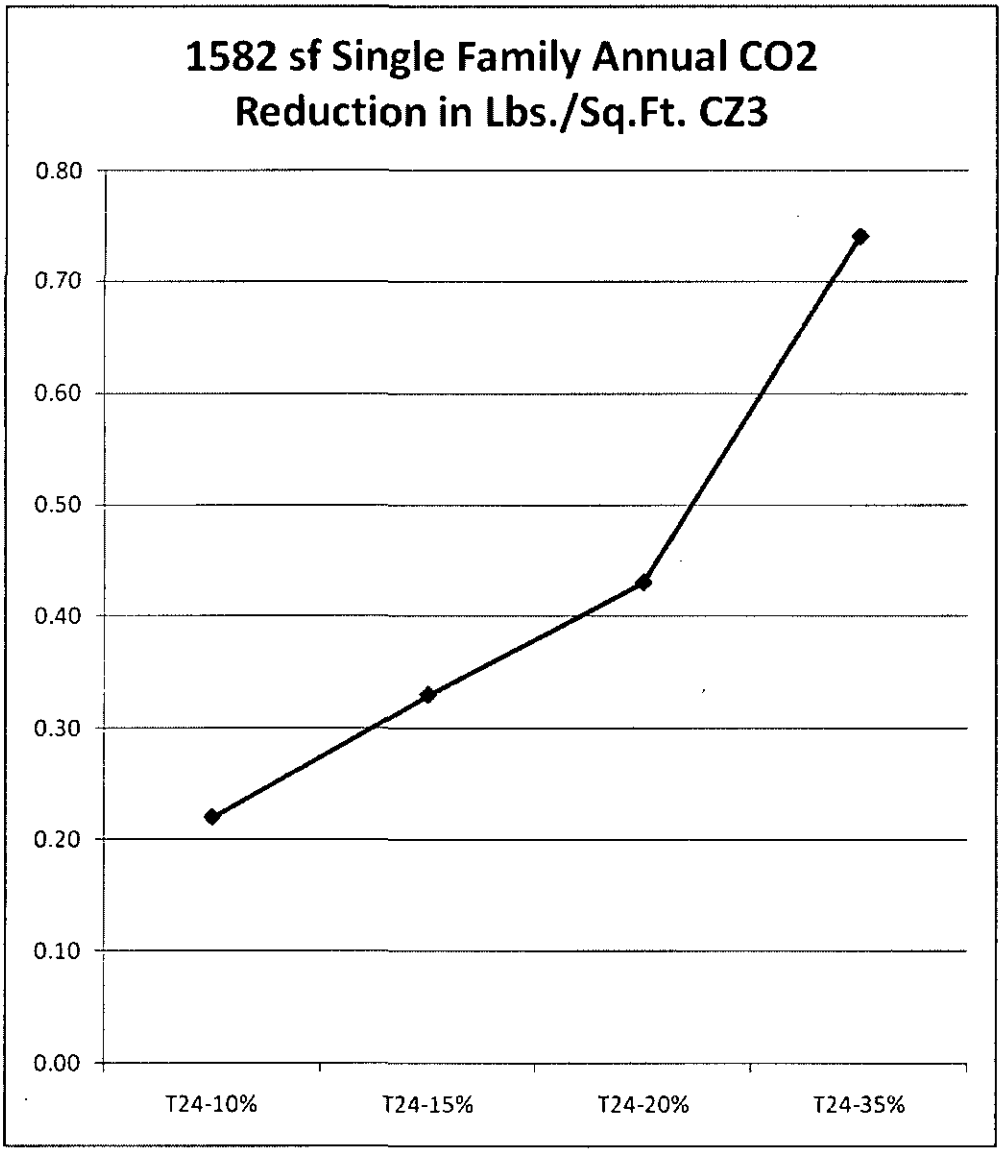


Figure 4-CZ3e-3: Annual Reduction in CO2 in Lbs./Sq.Ft., 2-Story Multifamily Building

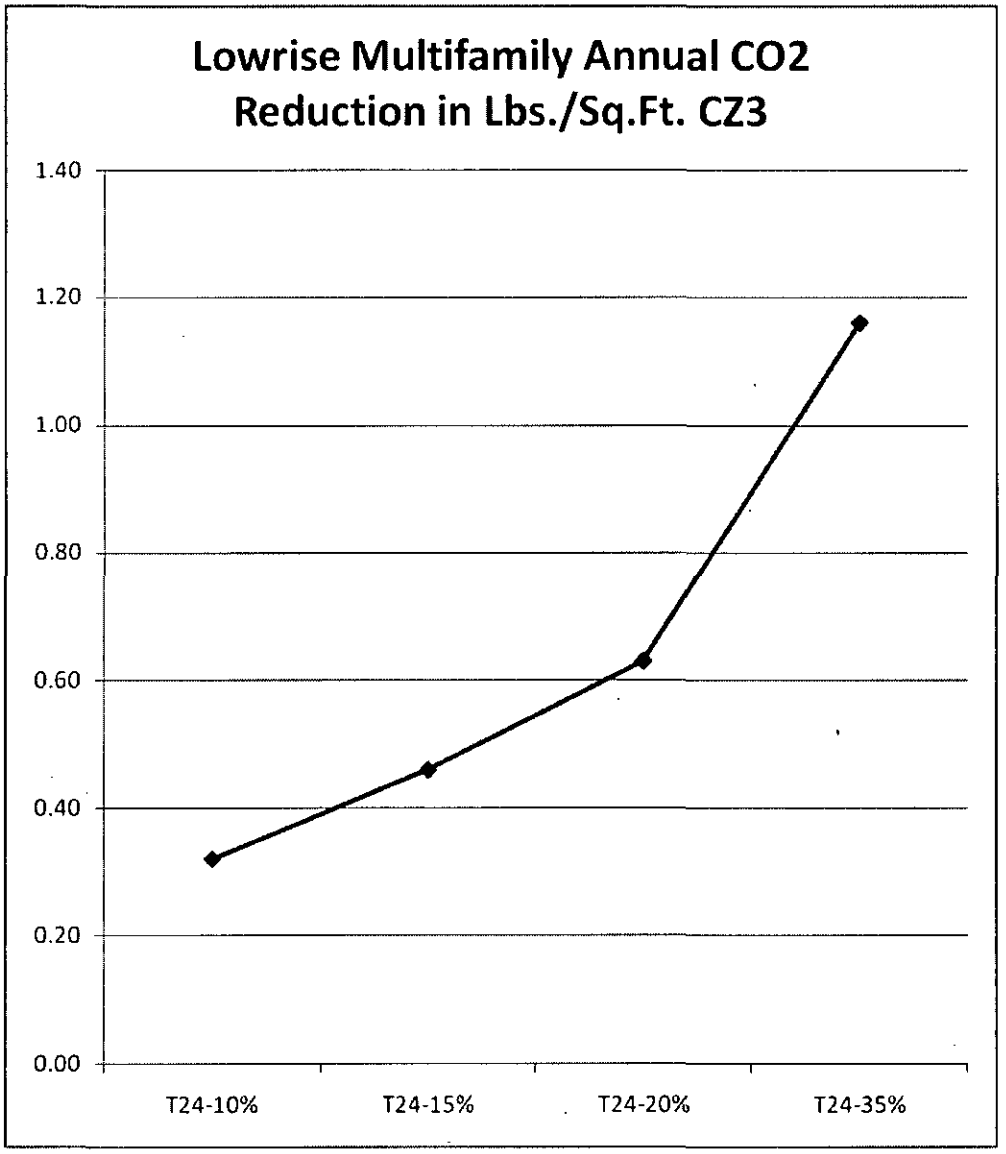


Figure 4-CZ3e-4: Annual Reduction in CO2 in Lbs./Sq.Ft., 40 Unit, 5-Story High-rise Residential Building

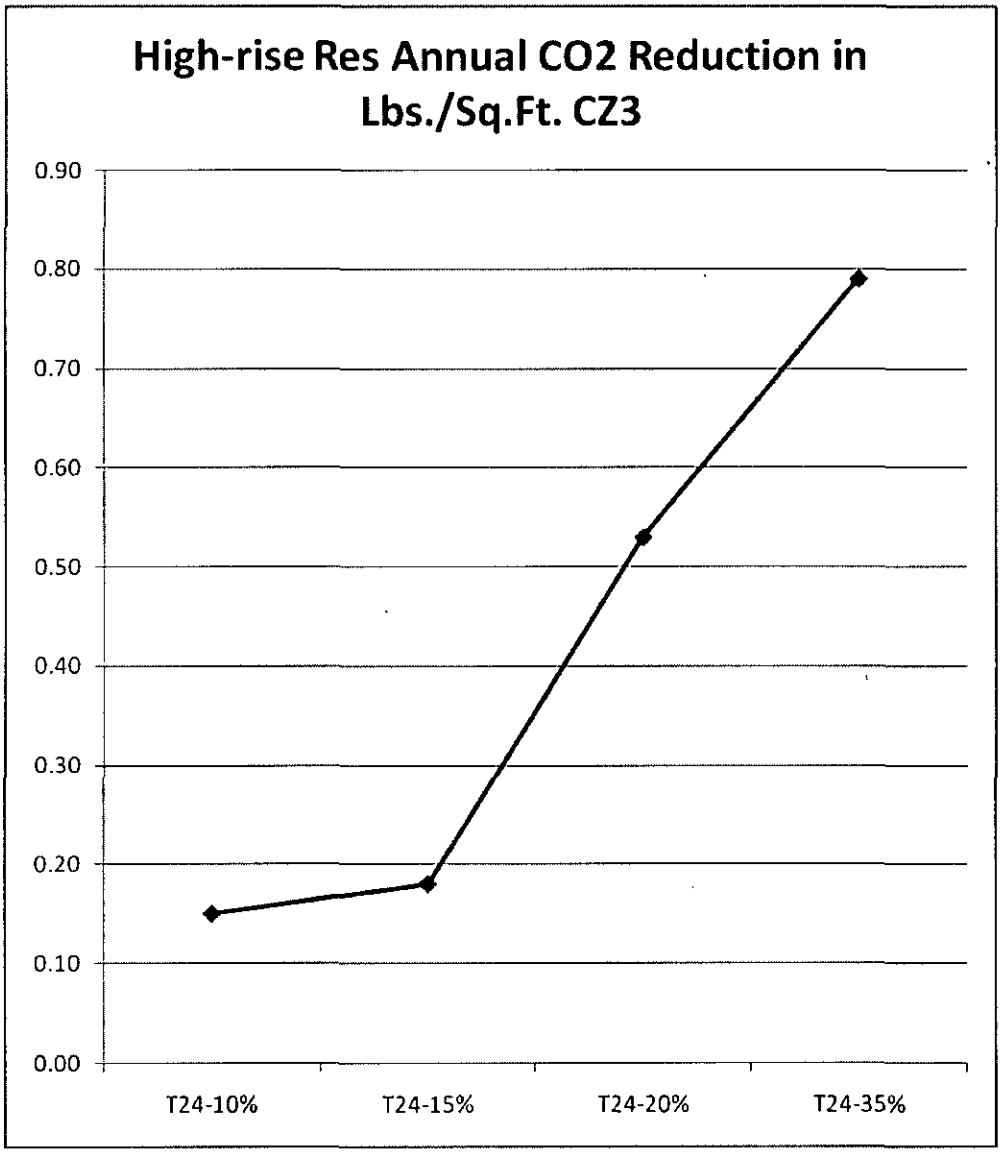


Figure 4-CZ3e-5: Annual Reduction in CO2 in Lbs./Sq.Ft., 21,160 sf 2-Story Nonresidential Building

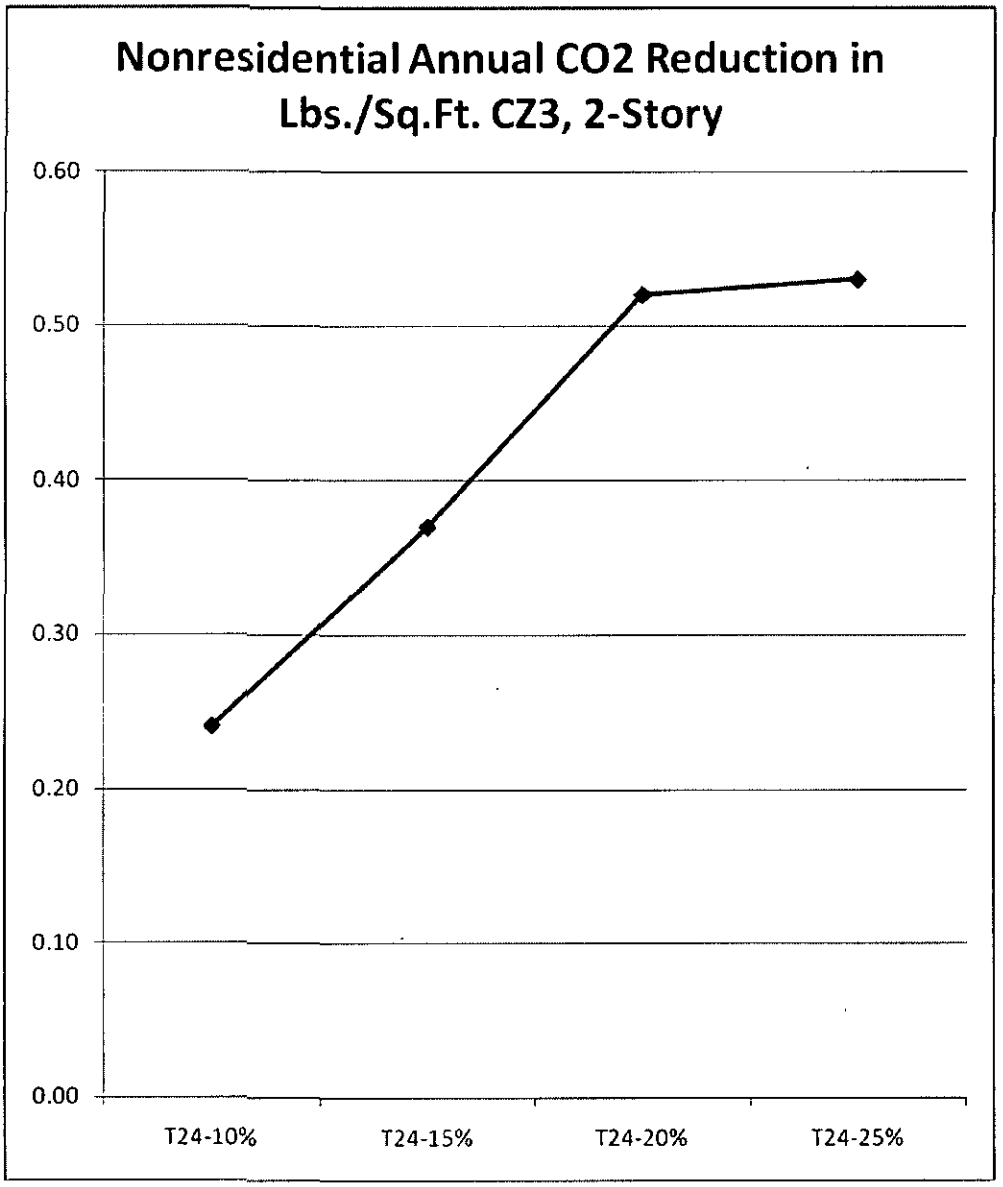
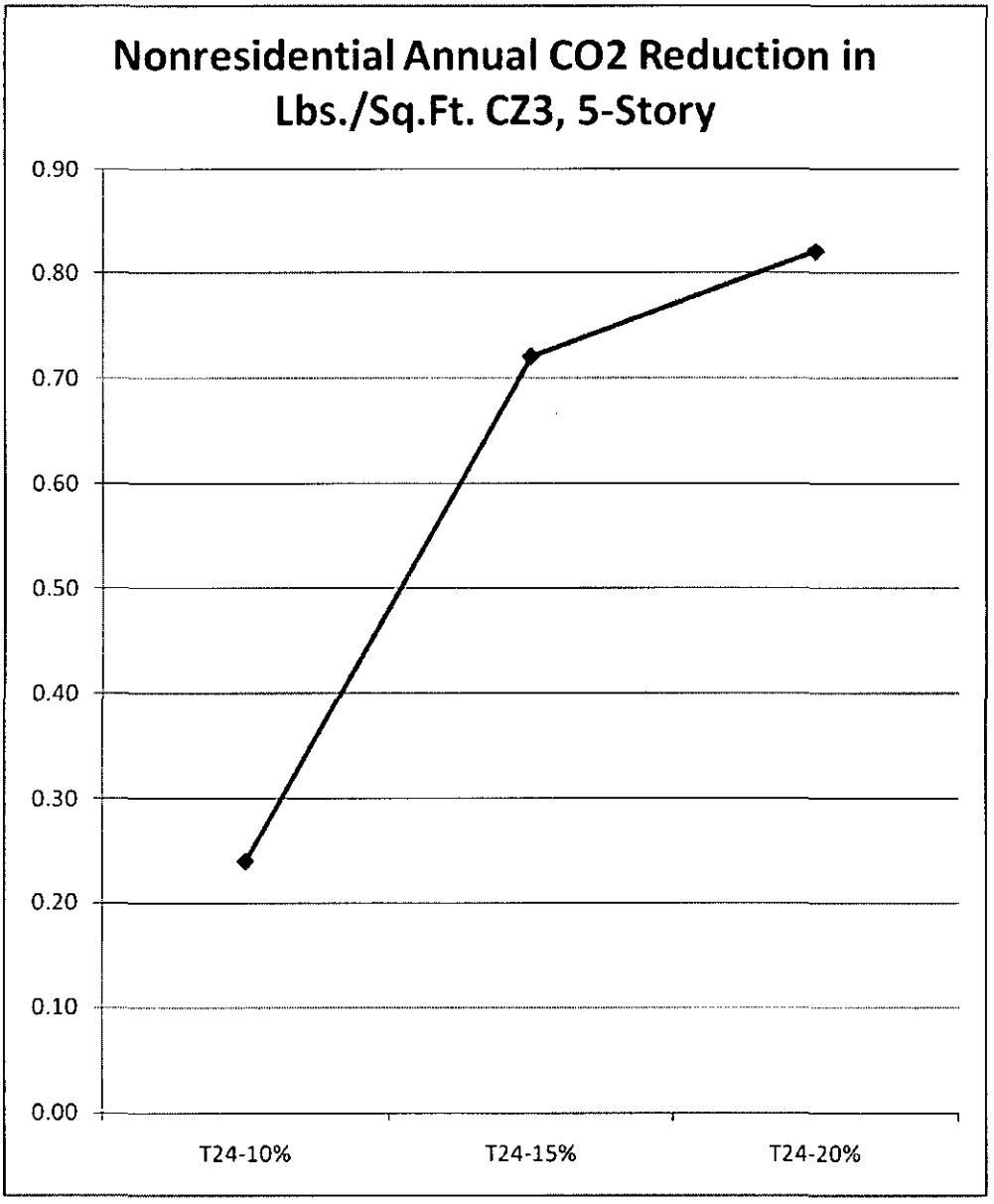
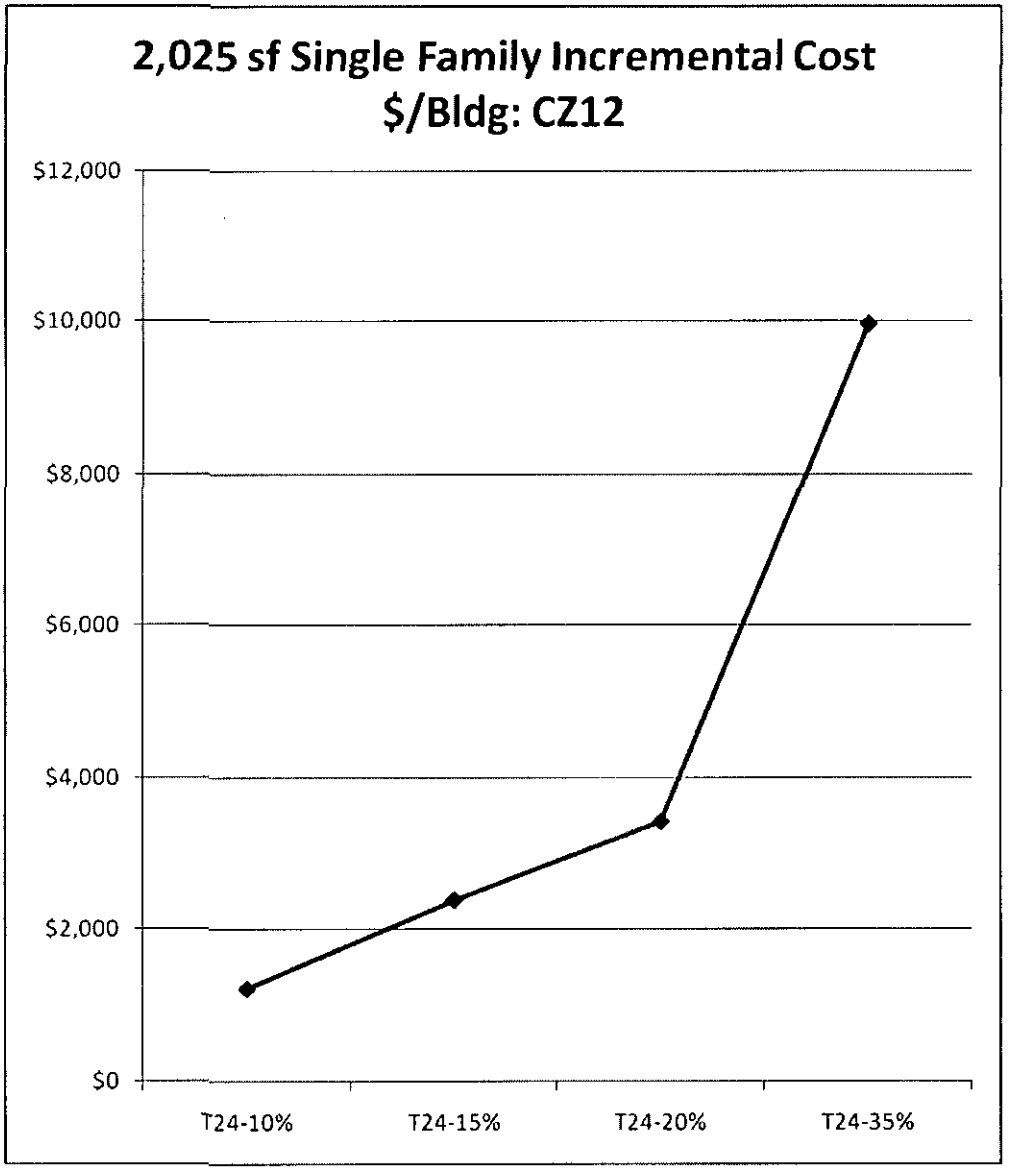


Figure 4-CZ3e-6: Annual Reduction in CO2 in Lbs./Sq.Ft., 52,900 sf 5-Story Nonresidential Building



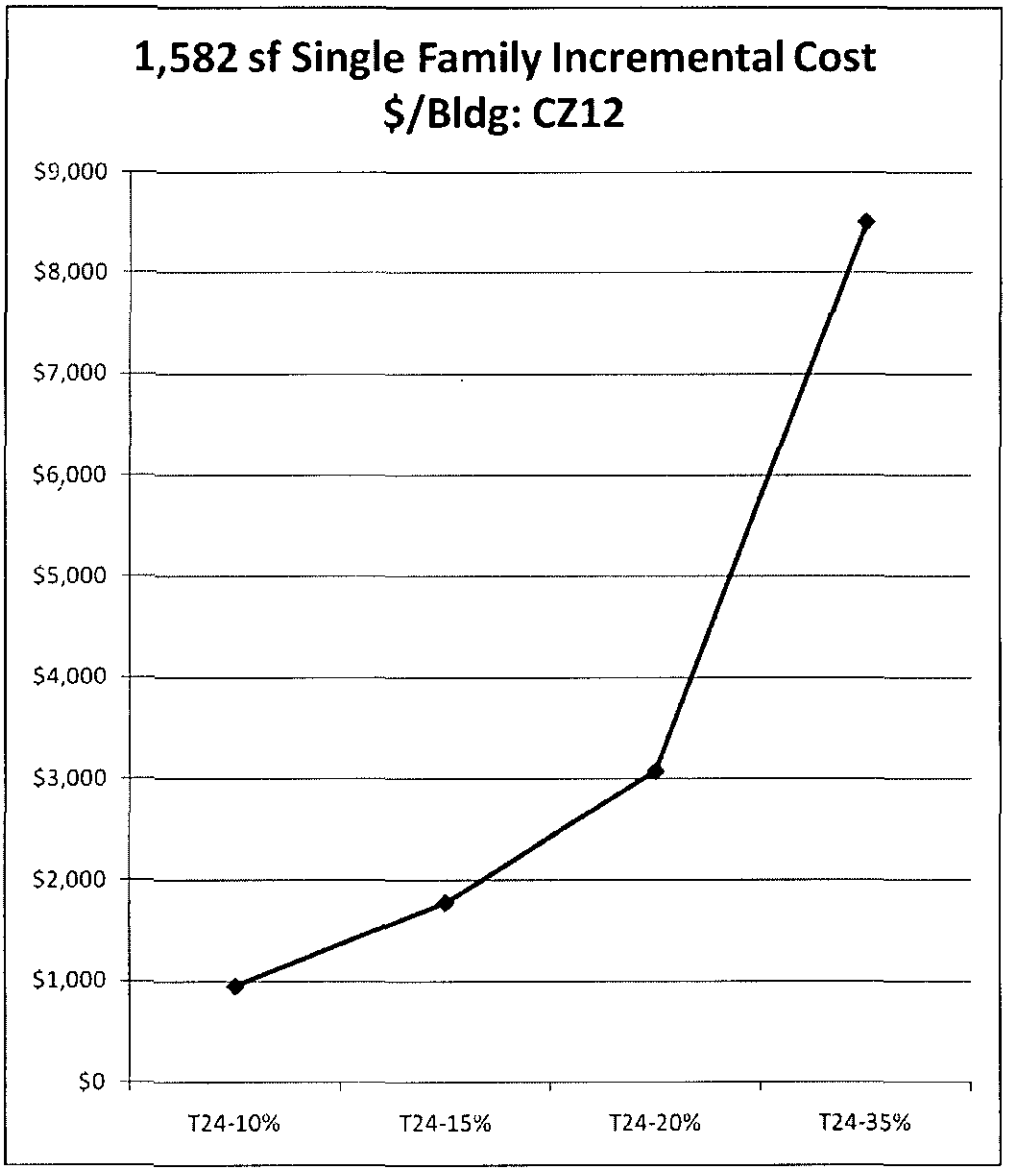
4.2 CLIMATE ZONE #12 CHARTS ILLUSTRATING RESULTS

Figure 4-CZ12a-1: Added First Cost – 2,025 sf 2-Story Single Family Home



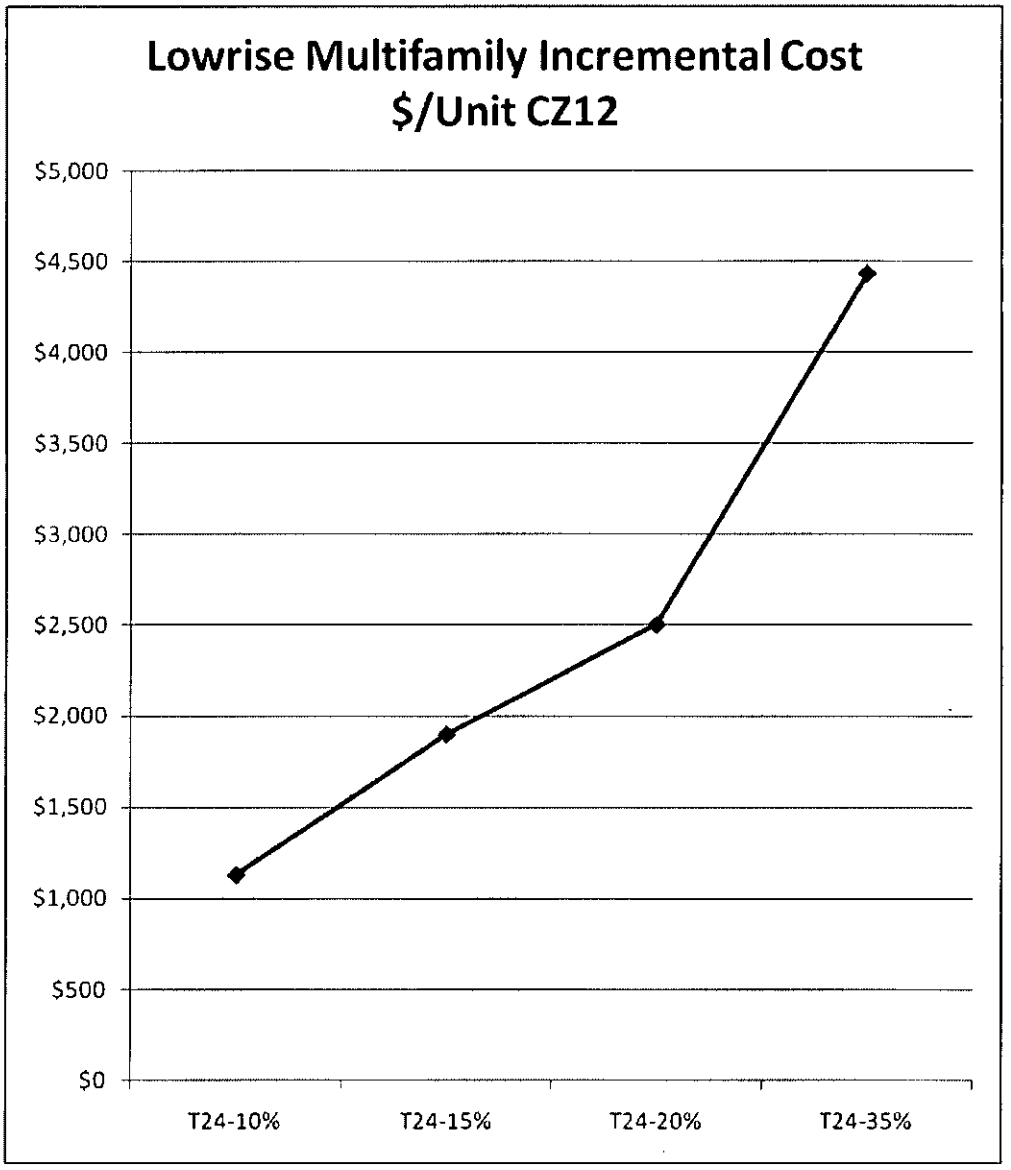
The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $975 per square foot in this single family house design.

Figure 4-CZ12a-2: Added First Cost – 1,582 sf 1-Story Single Family Home



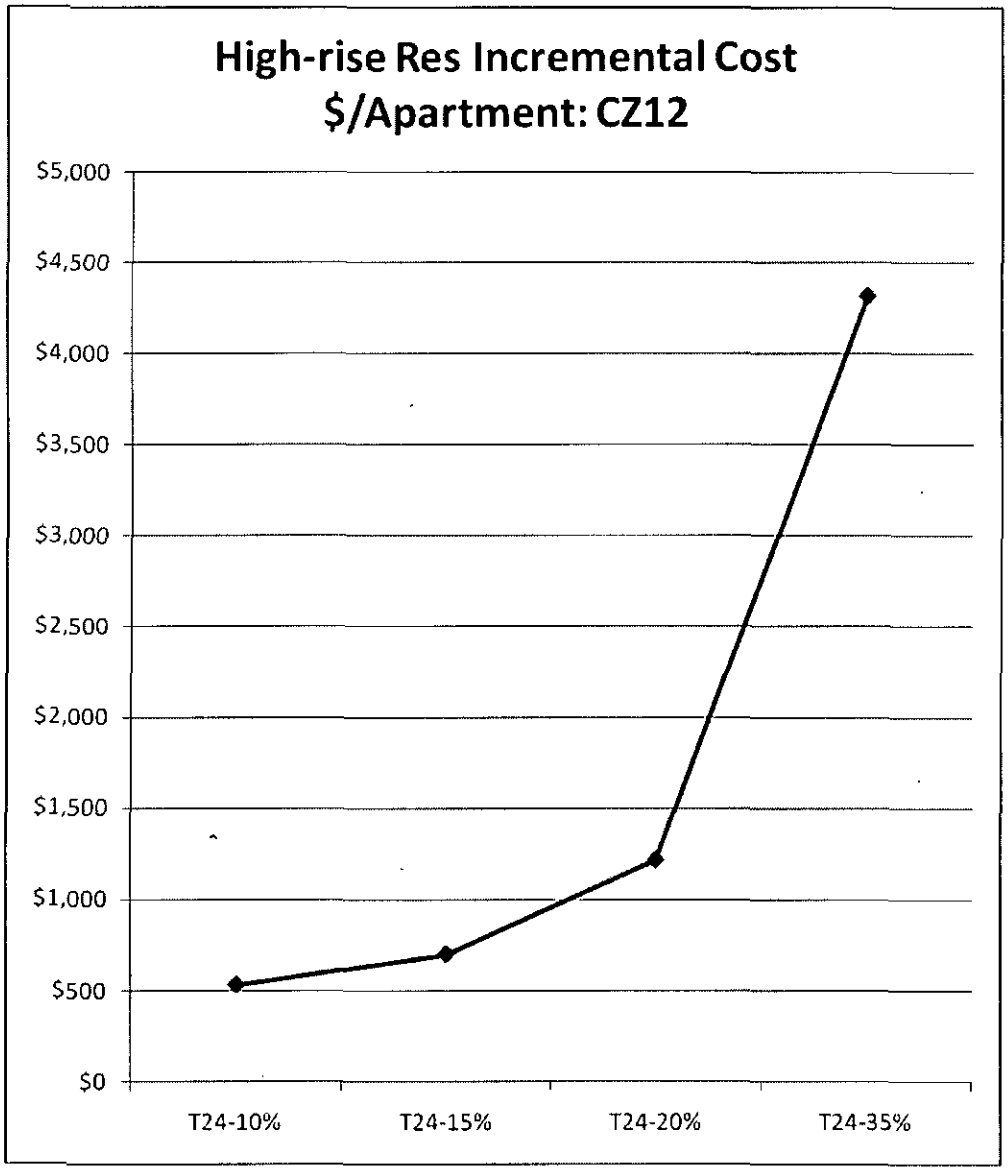
The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $825 per square foot in this single family house design.

Figure 4-CZ12a-3: Added First Cost/Dwelling Unit, 2-Story Multifamily Building



The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $383 per dwelling unit in this multifamily building design.

Figure 4-CZ12a-4: Added First Cost, 40 Unit, 5-Story High-rise Residential Building



The average incremental energy measures to go from the 2005 standards to the 2008 standards cost $0 per dwelling unit in this high-rise residential building design. (No changes in the building design were required to meet the 2008 standards.)

Figure 4-CZ12a-5: Added First Cost -- 21,160 sf 2-Story Nonresidential Building

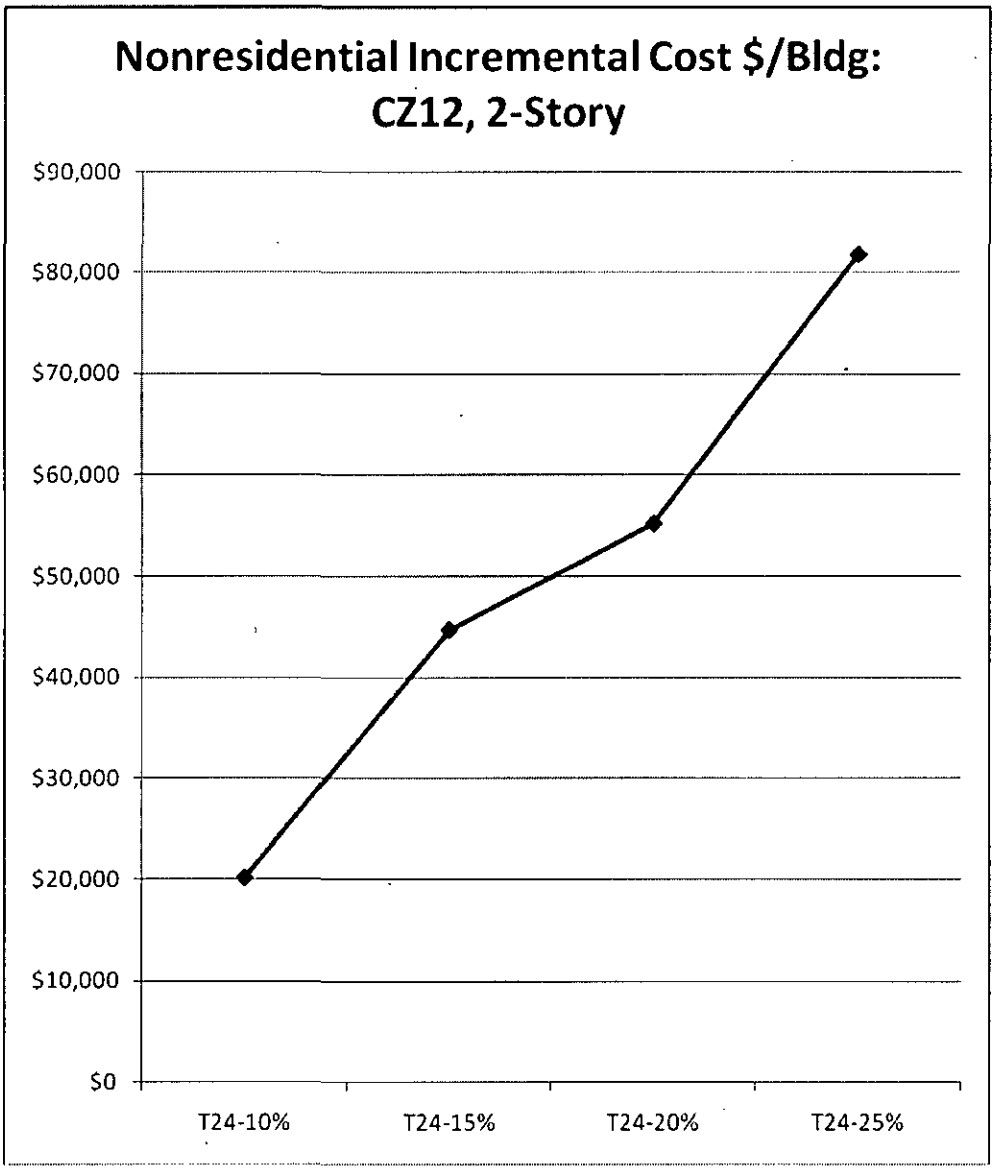


Figure 4-CZ12a-6: Added First Cost -- 52,900 sf 5-Story Nonresidential Building

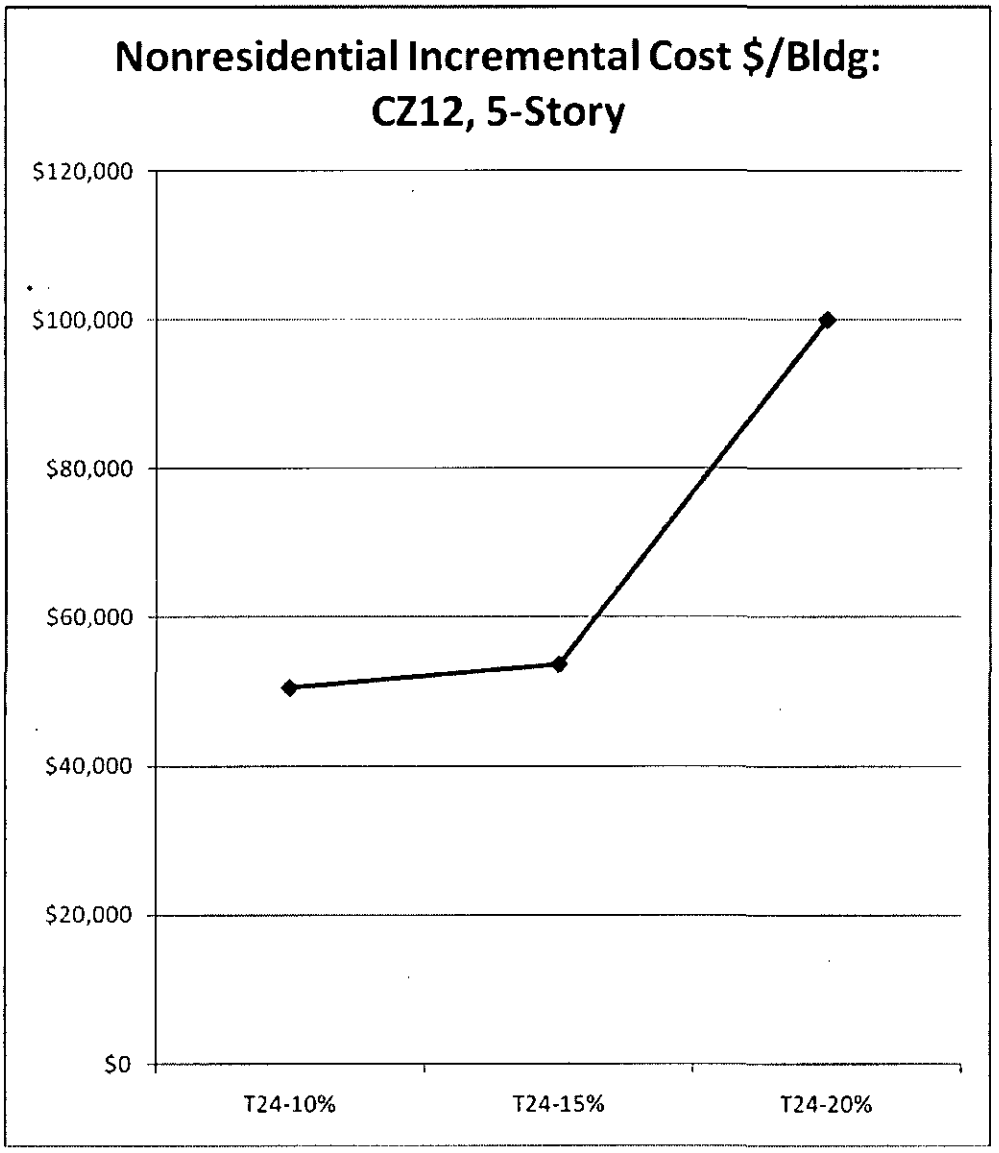


Figure 4-CZ12b-1: Added First Cost/Sq.Ft. – 2,025 sf 2-Story Single Family Home

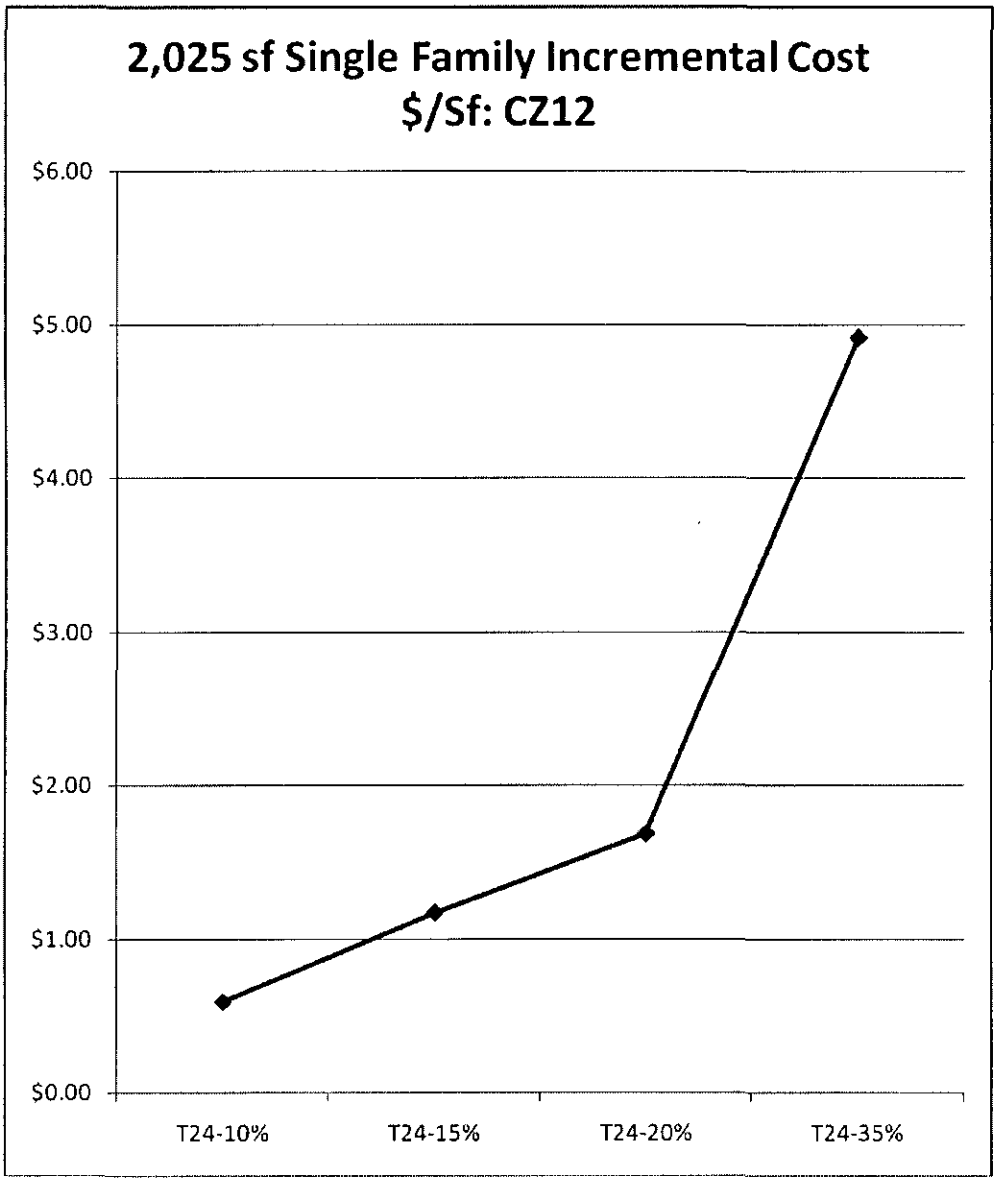


Figure 4-CZ12b-2: Added First Cost/Sq.Ft., – 1,582 sf 1-Story Single Family Home

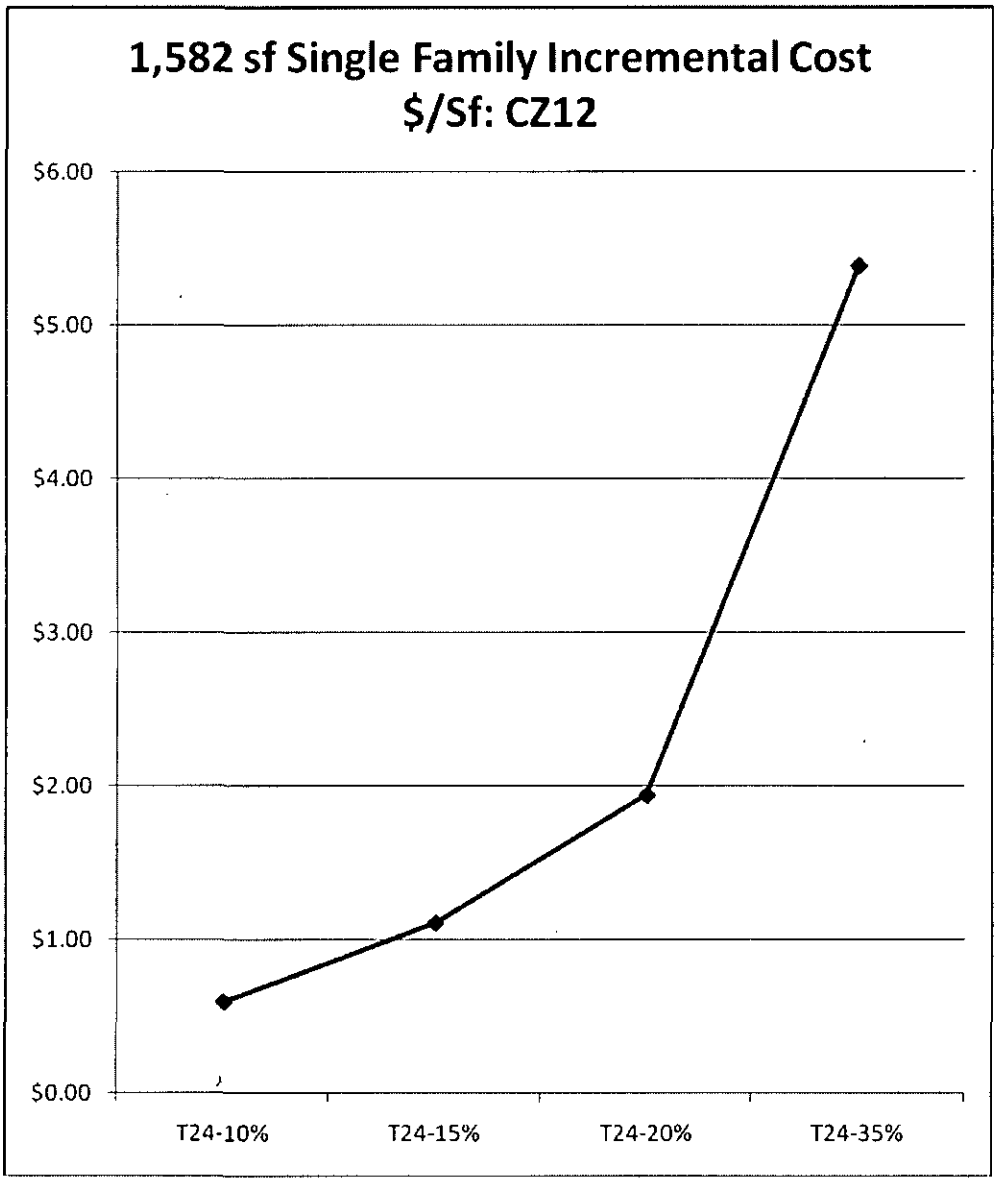


Figure 4-CZ12b-3: Added First Cost/Sq.Ft., 2-Story Multifamily Building

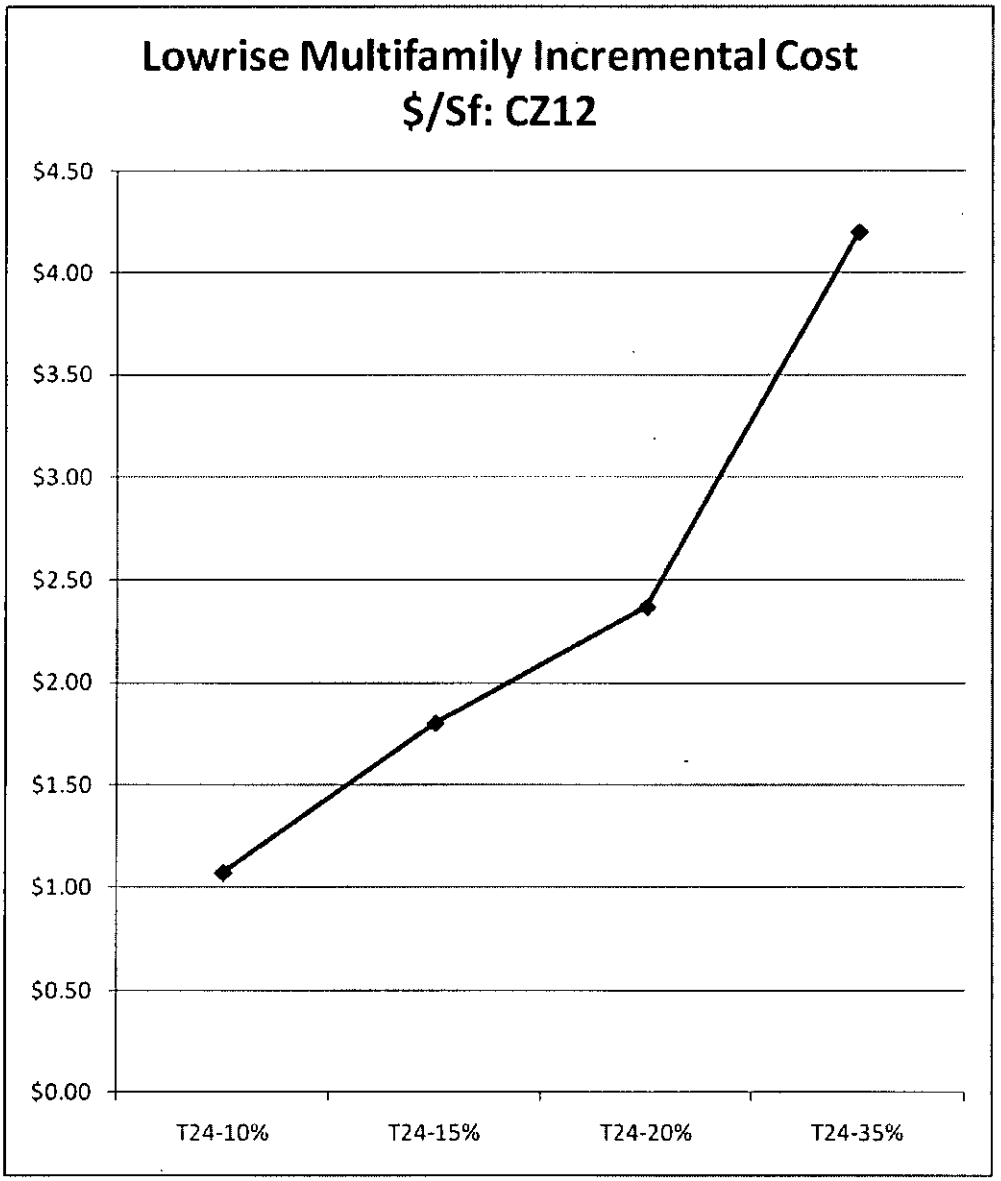


Figure 4-CZ12b-4: Added First Cost/Sq.Ft.
40 Unit, 5-Story High-rise Residential Building

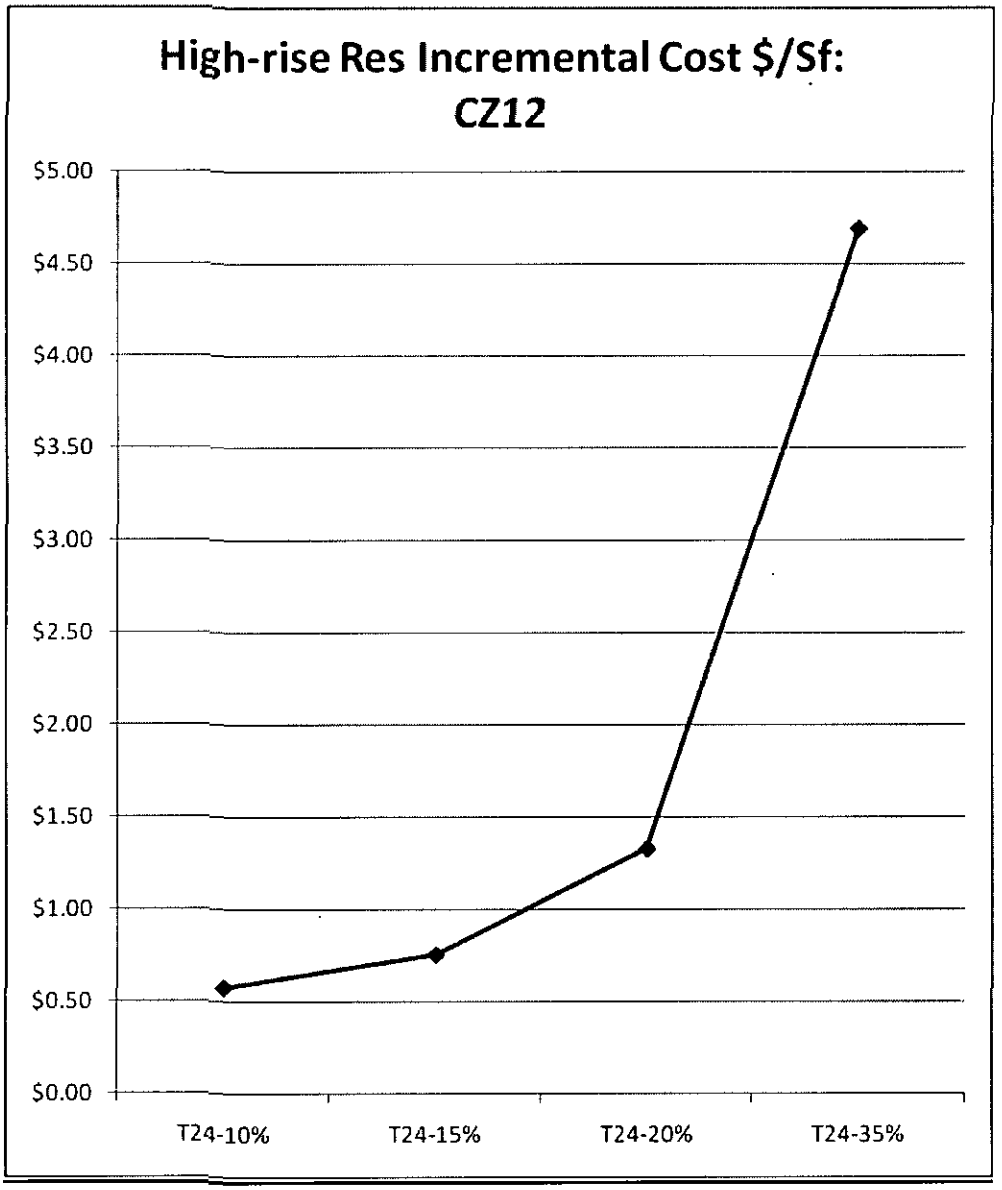


Figure 4-CZ12-b5: Added First Cost/Sq.Ft. -- 21,160 sf 2-Story Nonresidential Bldg

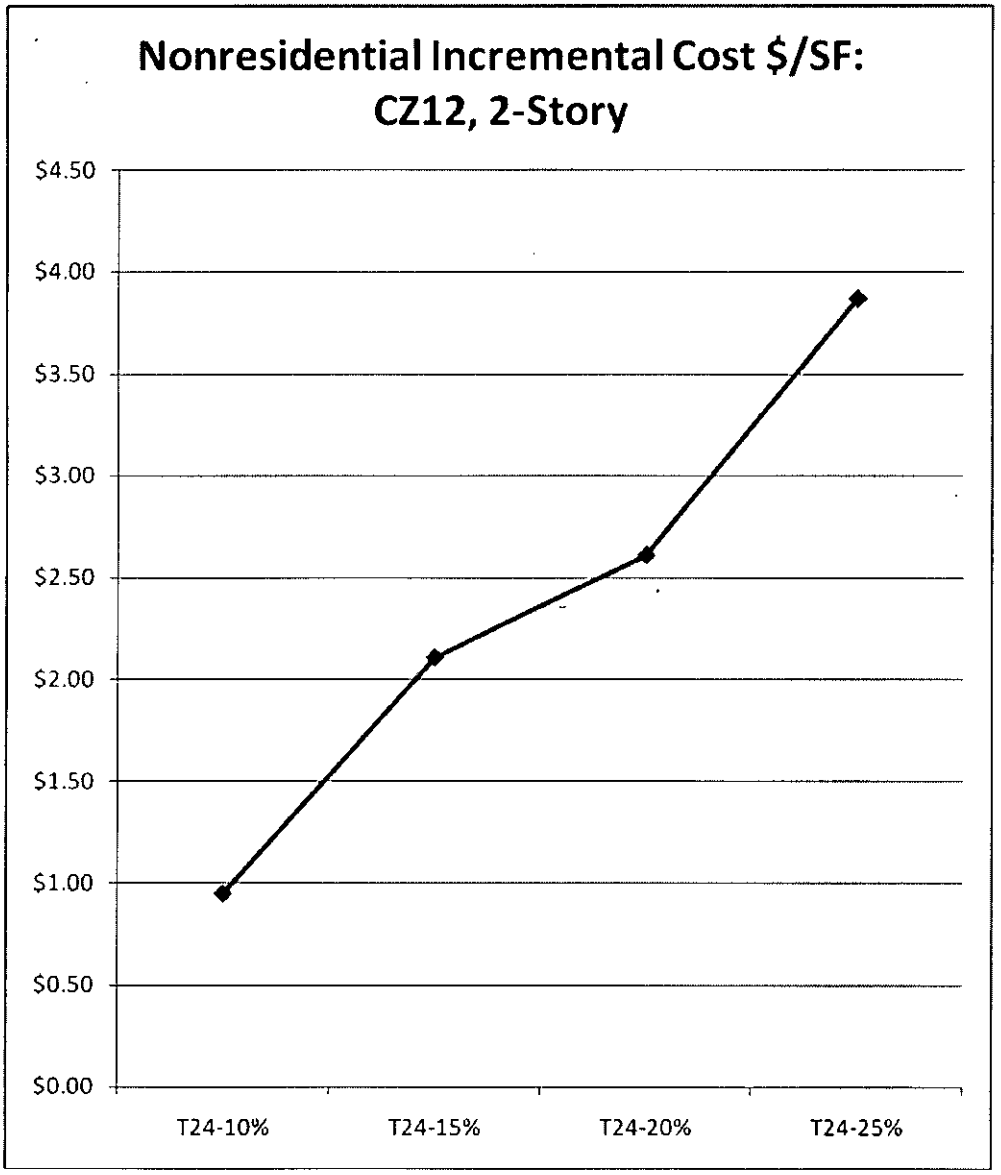


Figure 4-CZ12-b6: Added First Cost/Sq.Ft. -- 52,900 sf 5-Story Nonresidential Bldg

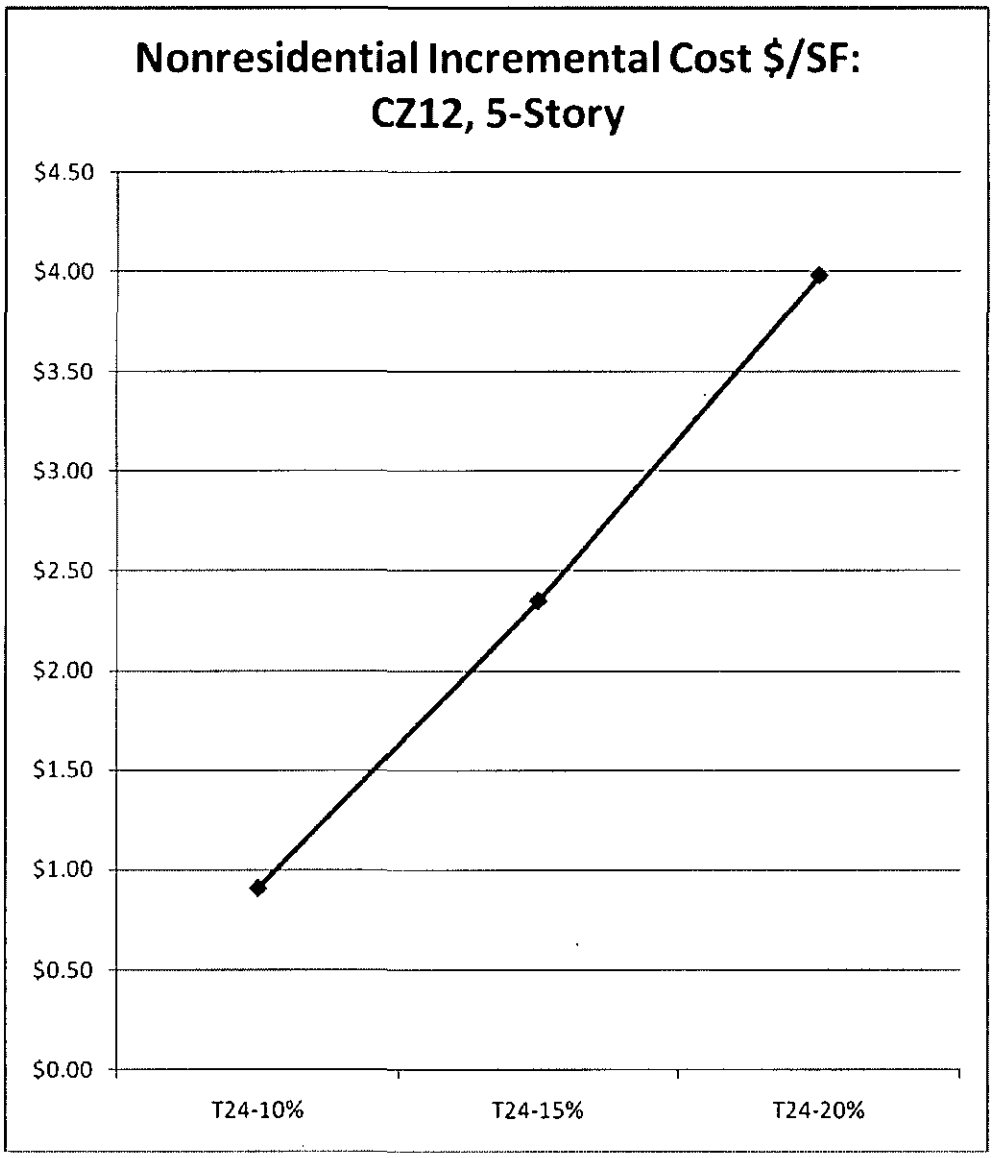


Figure 4-CZ12c-1: Simple Payback of Different Tiers of Energy Measures – 2,025 sf 2-Story Single Family Home

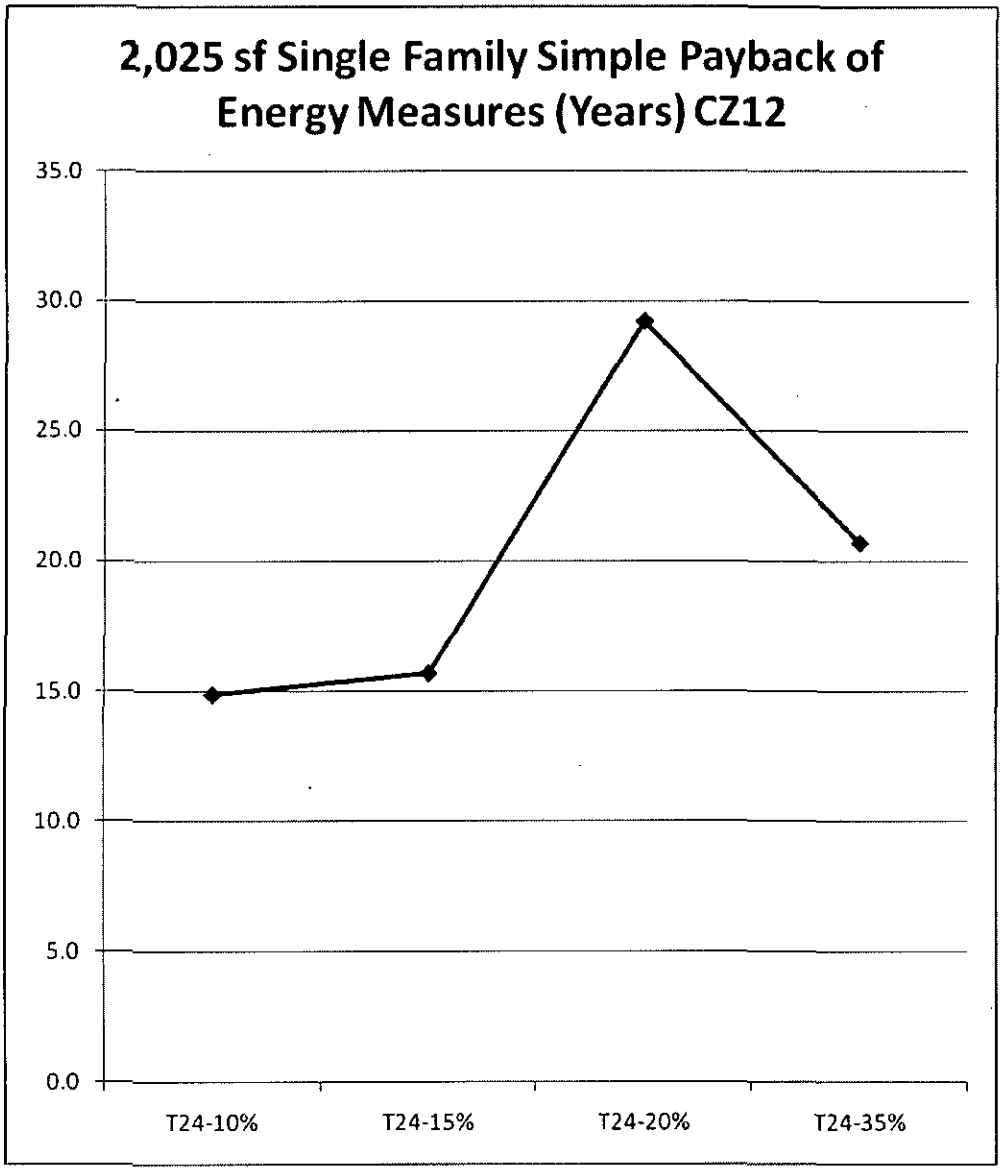


Figure 4-CZ12c-2: Simple Payback of Different Tiers of Energy Measures – 1,582 sf 1-Story Single Family Home

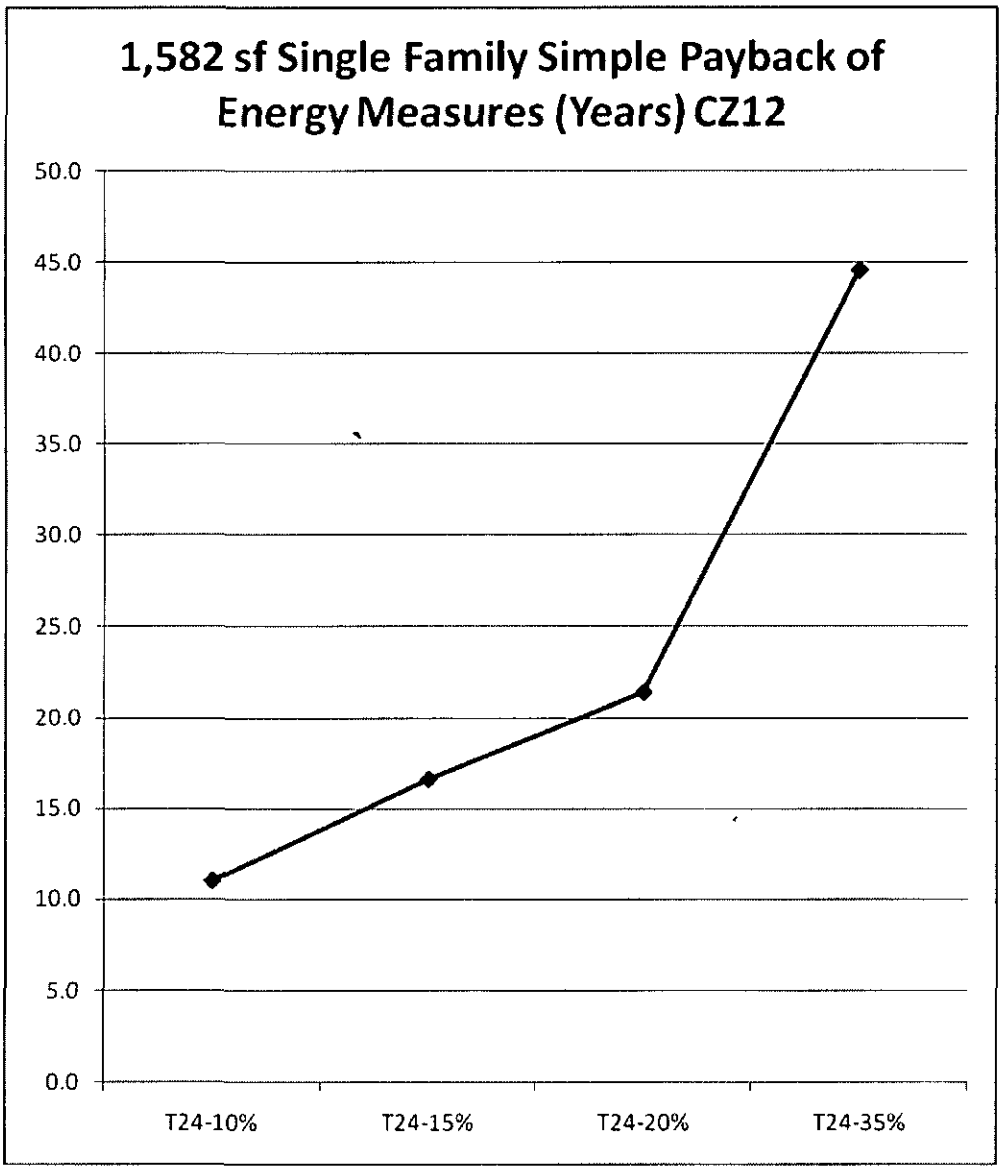


Figure 4-CZ12c-3: Simple Payback of Different Tiers of Energy Measures, 2-Story Multifamily Building

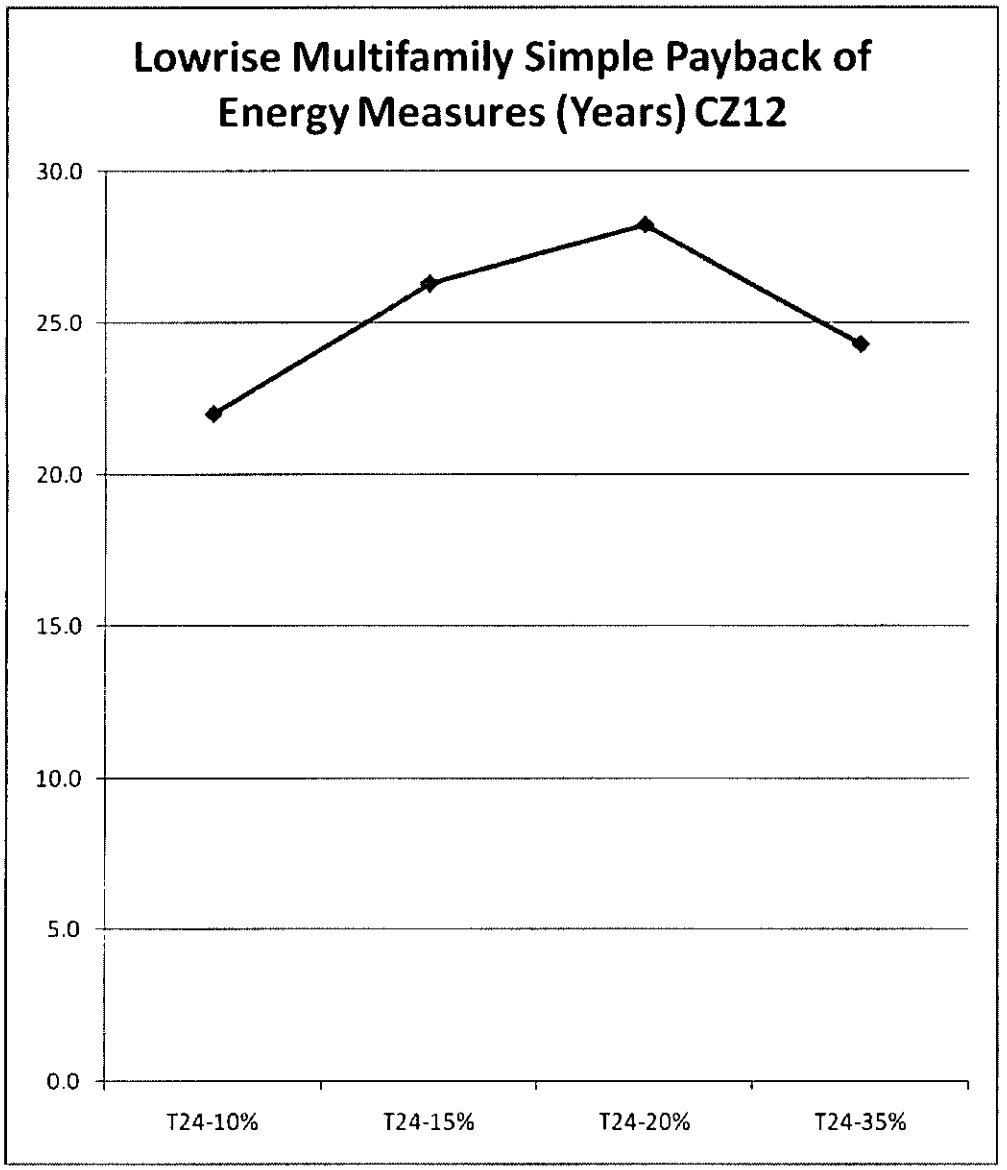


Figure 4-CZ12c-4: Simple Payback of Different Tiers of Energy Measures, 40 Unit, 5-Story High-rise Residential Building

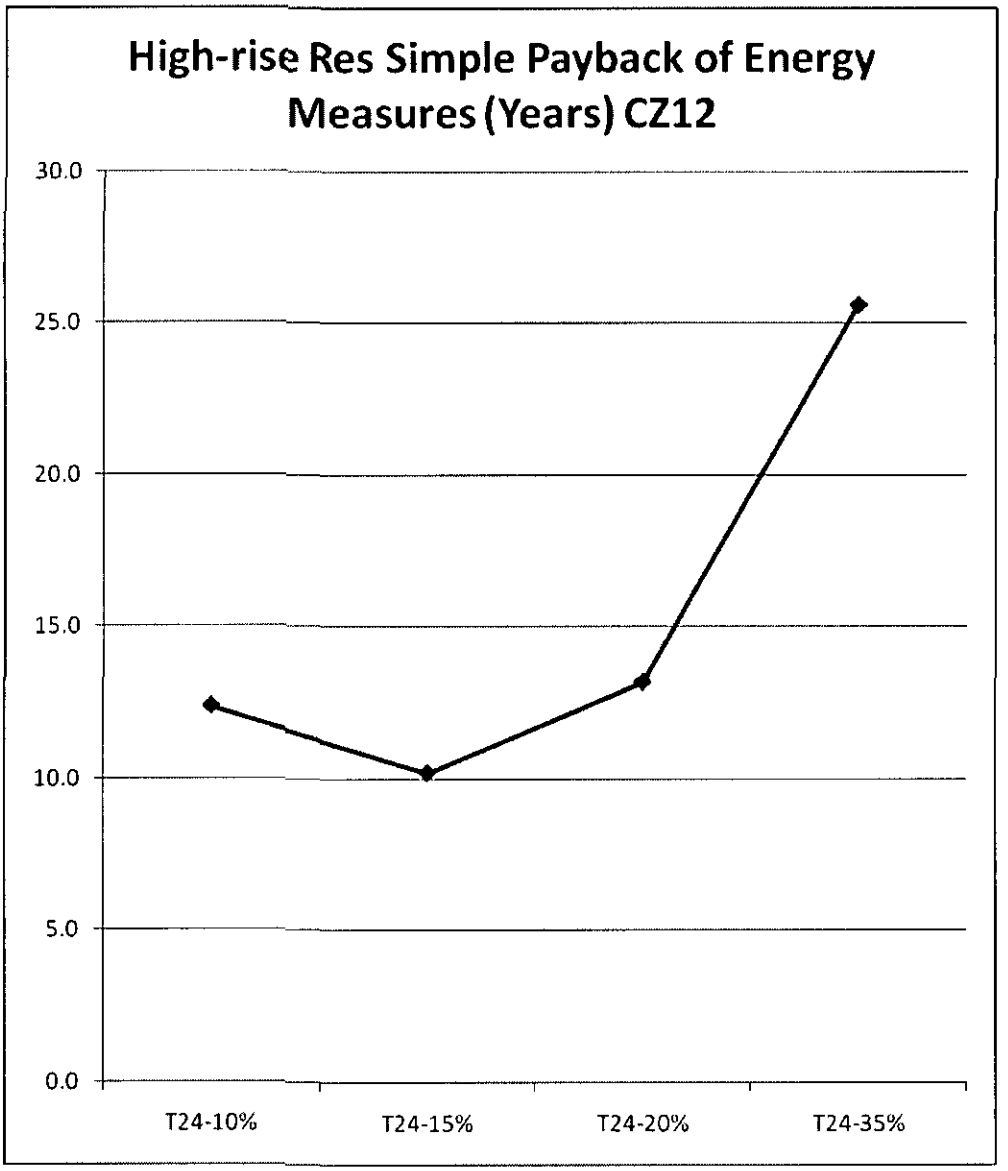


Figure 4-CZ12c-5: Simple Payback of Different Tiers of Energy Measures, 21,160 sf 2-Story Nonresidential Building

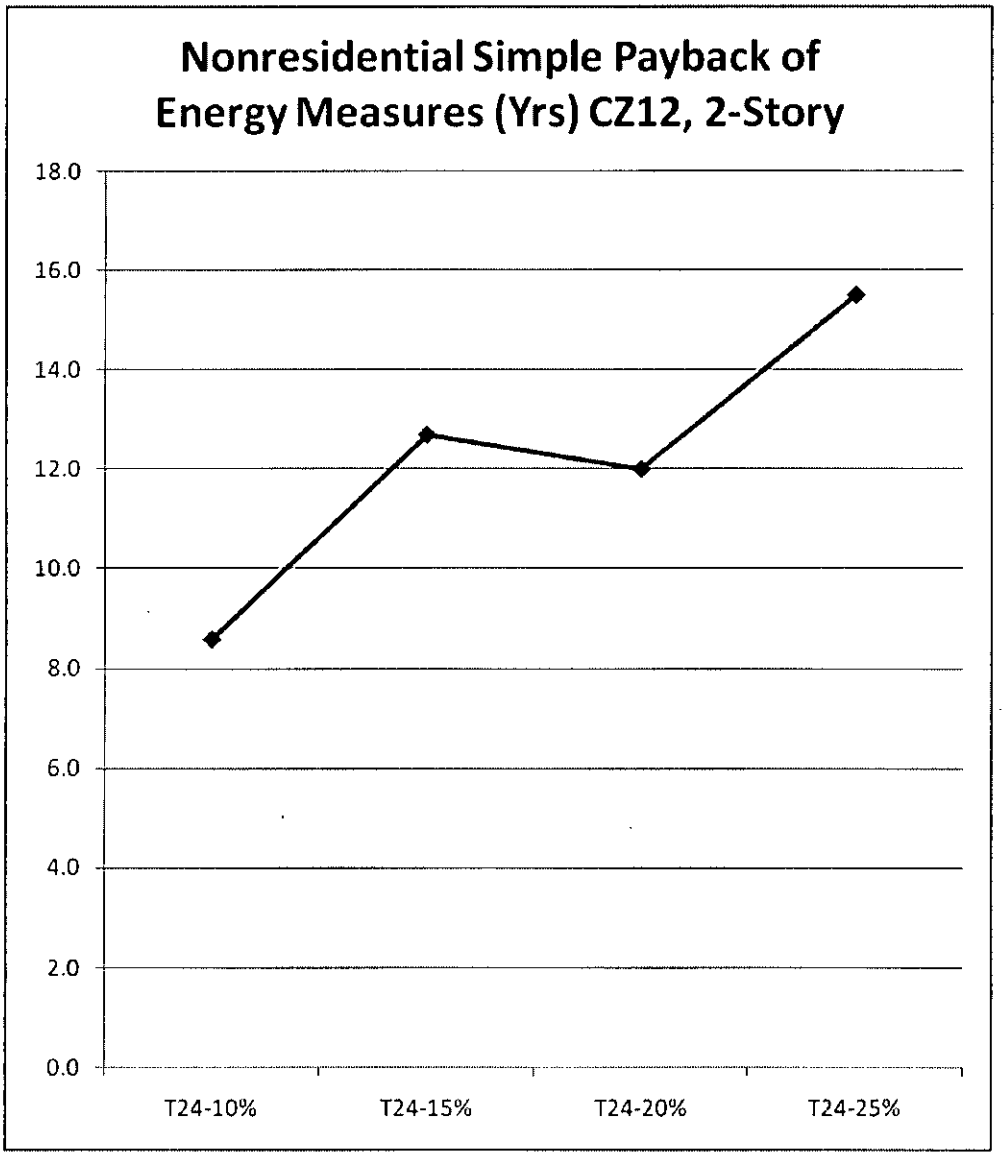


Figure 4-CZ12c-6: Simple Payback of Different Tiers of Energy Measures, 52,900 sf 5-Story Nonresidential Building

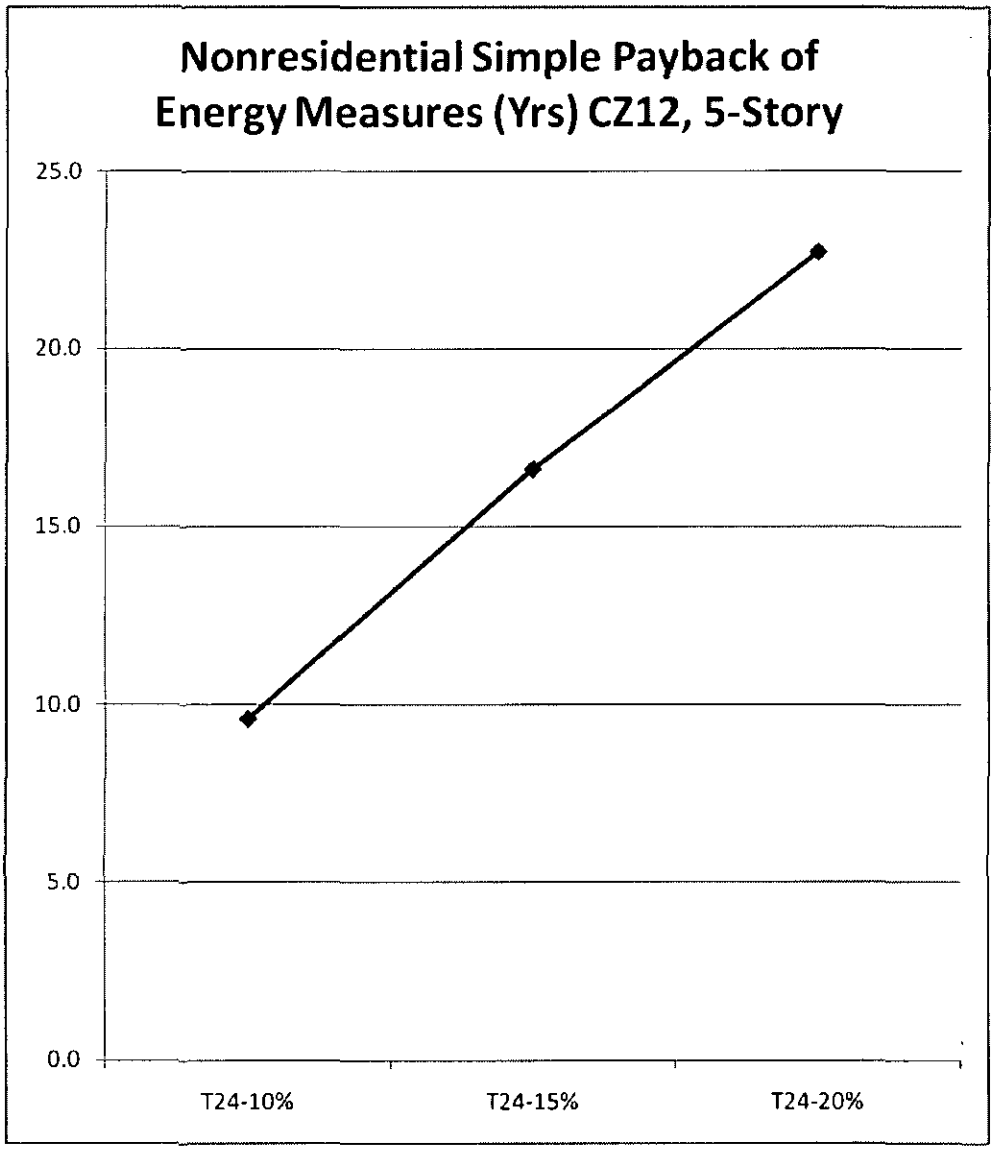


Figure 4-CZ12d-1: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 2,025 sf 2-Story Single Family Home

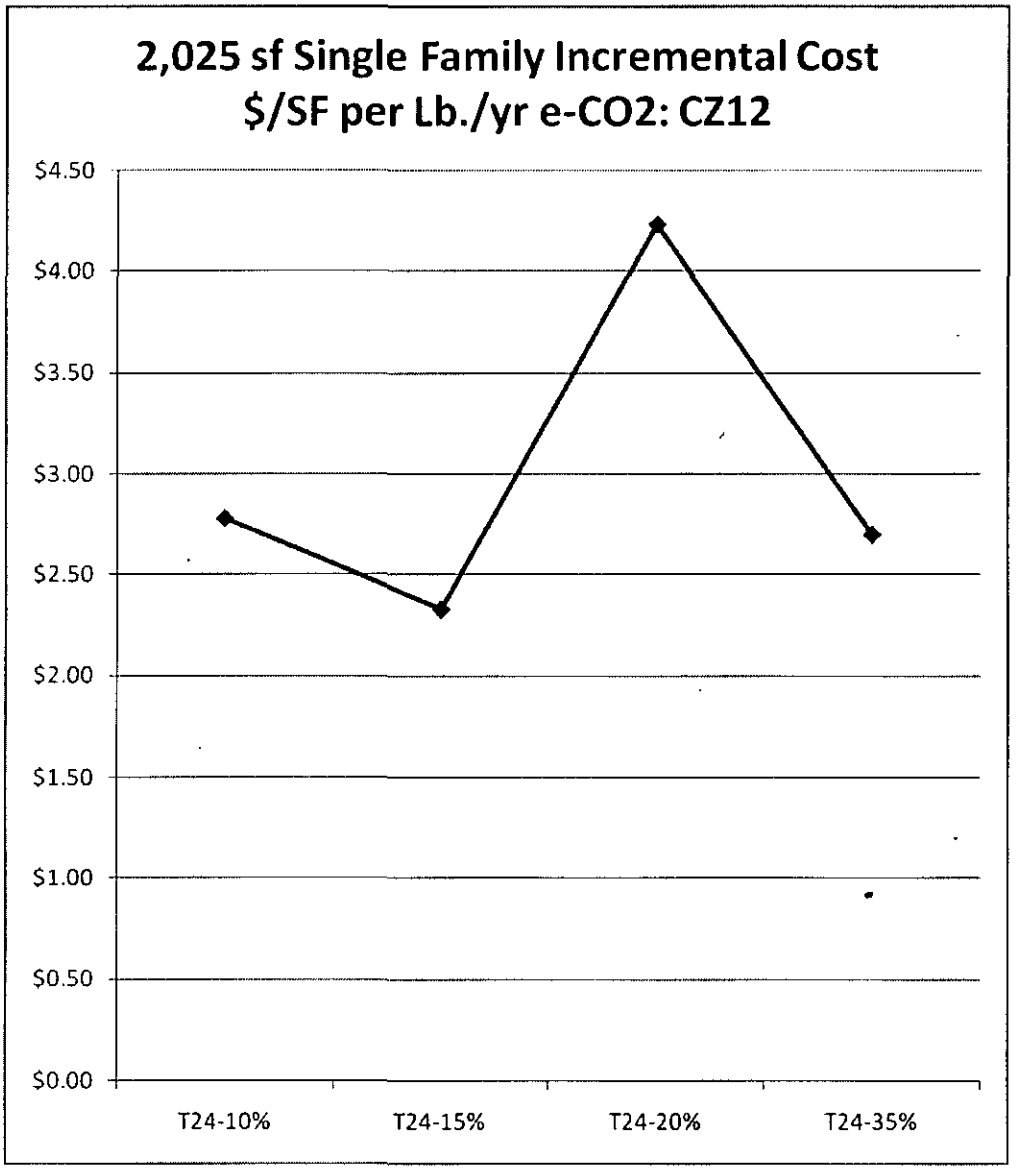


Figure 4-CZ12d-2: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 1,582 sf 1-Story Single Family Home

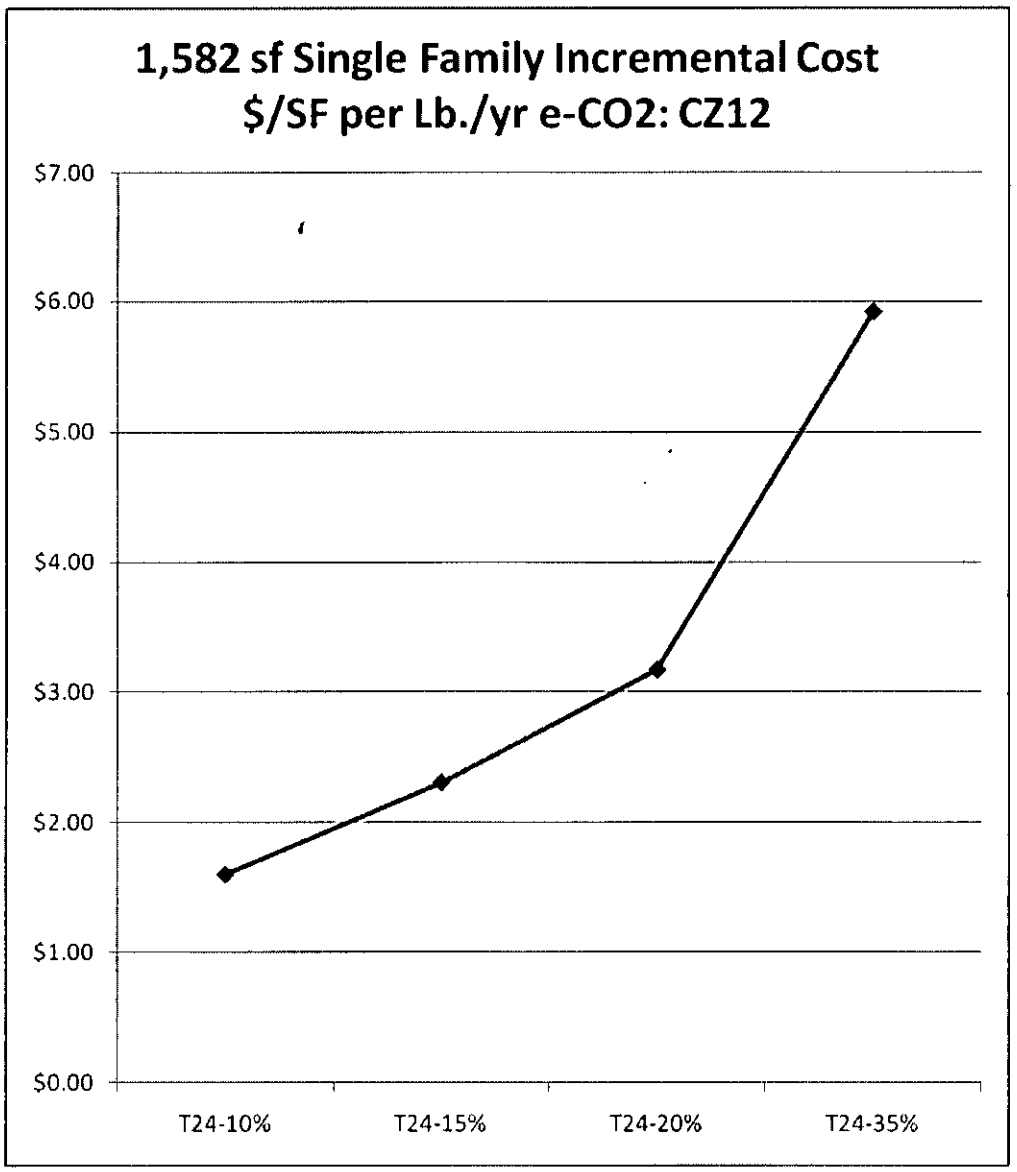


Figure 4-CZ12d-4: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 2-Story Multifamily Building

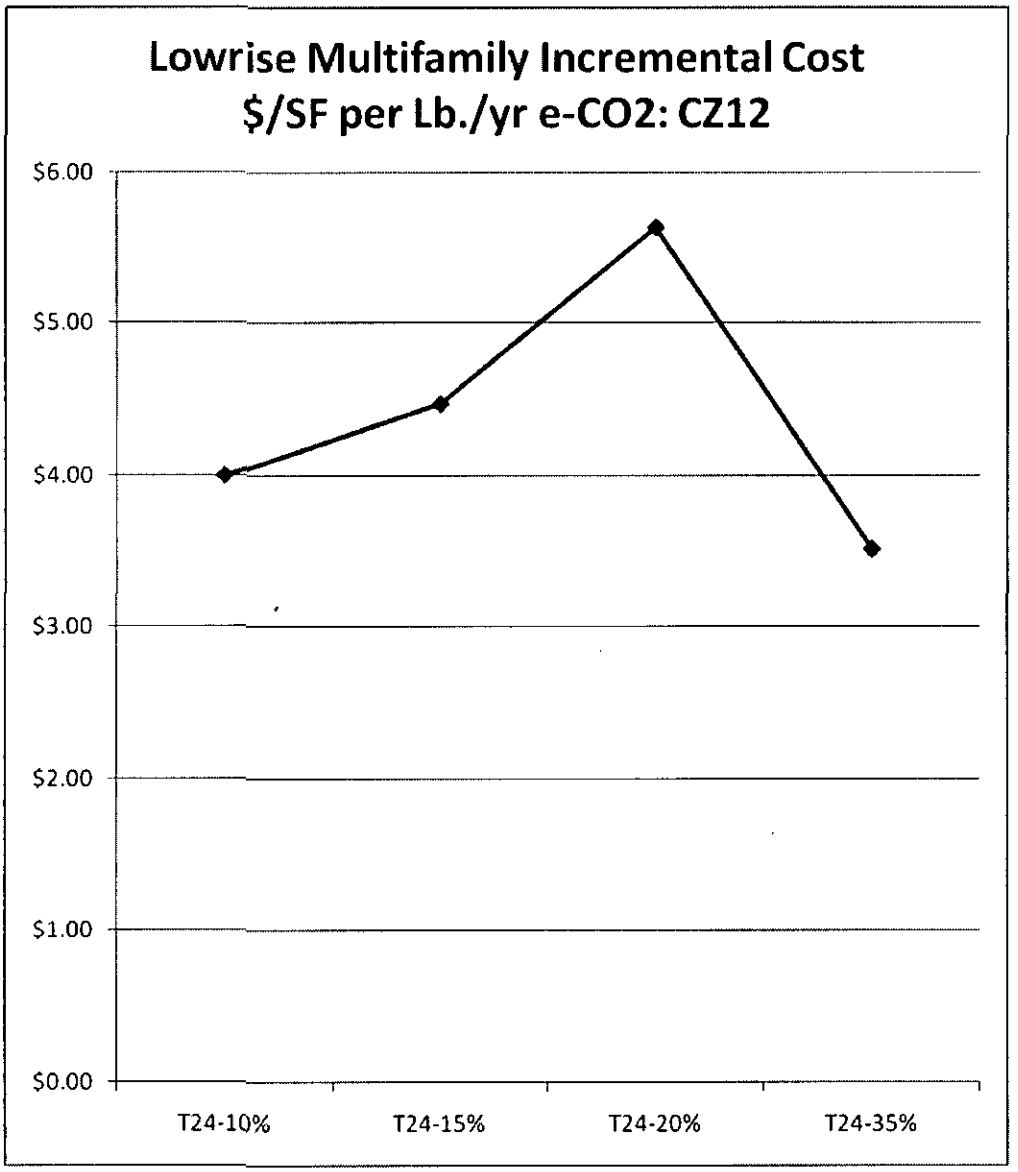


Figure 4-CZ12d-4: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 40 Unit, 5-Story High-rise Residential Building

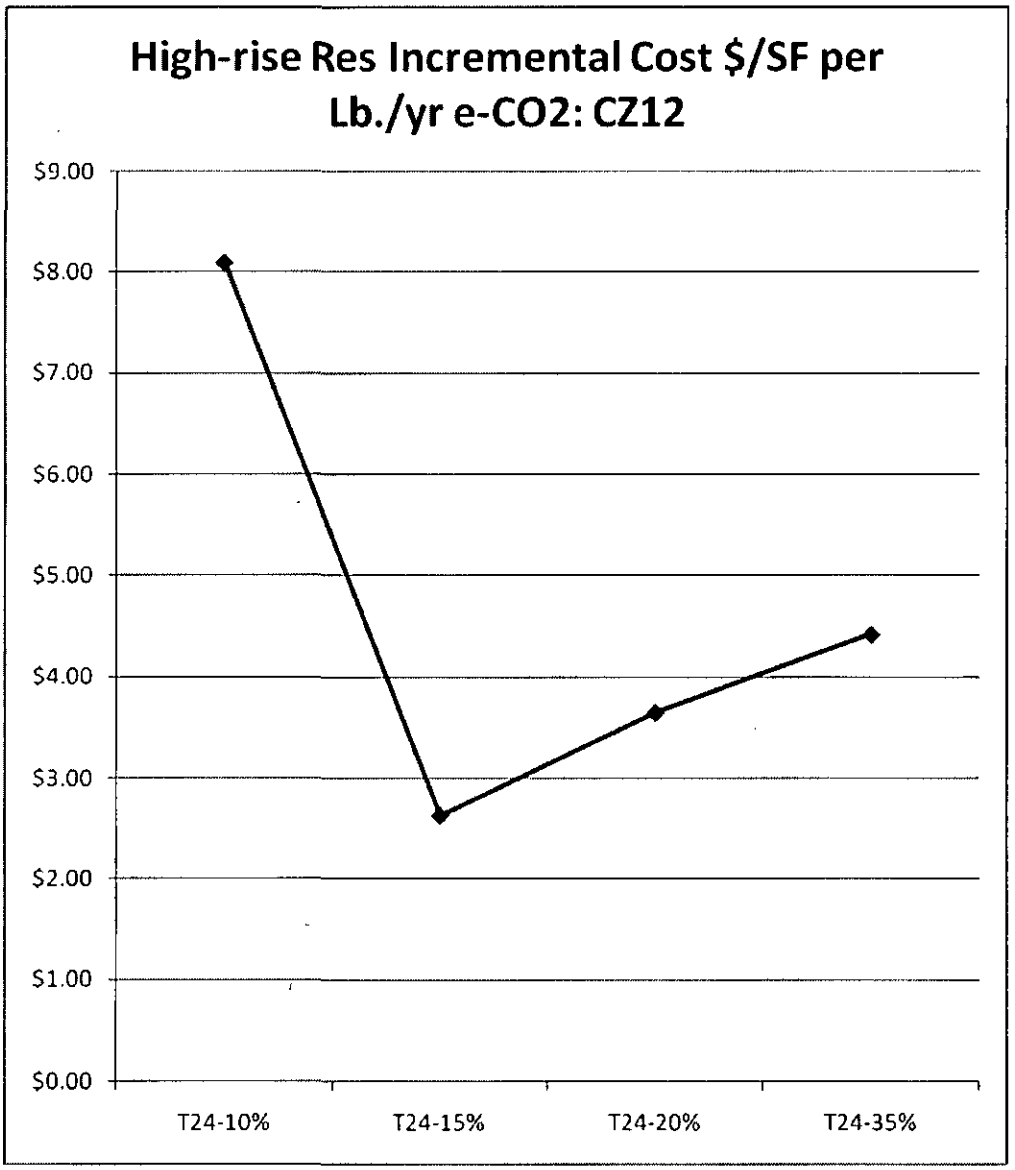


Figure 4-CZ12d-5: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 21,160 sf 2-Story Nonresidential Building

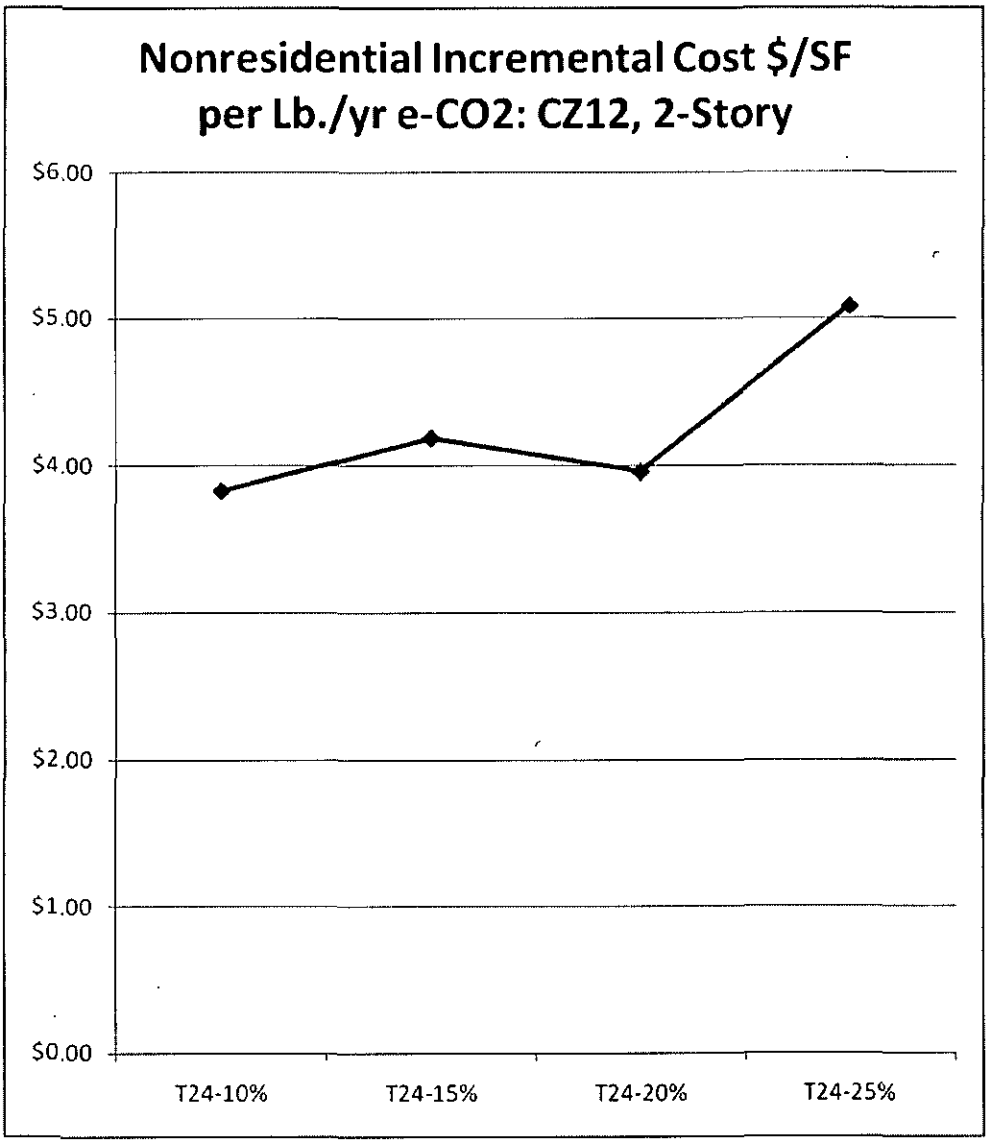


Figure 4-CZ12d-6: Added Cost/Sq.ft. per Lb. of CO2 Reduction, 52,900 sf 5-Story Nonresidential Building

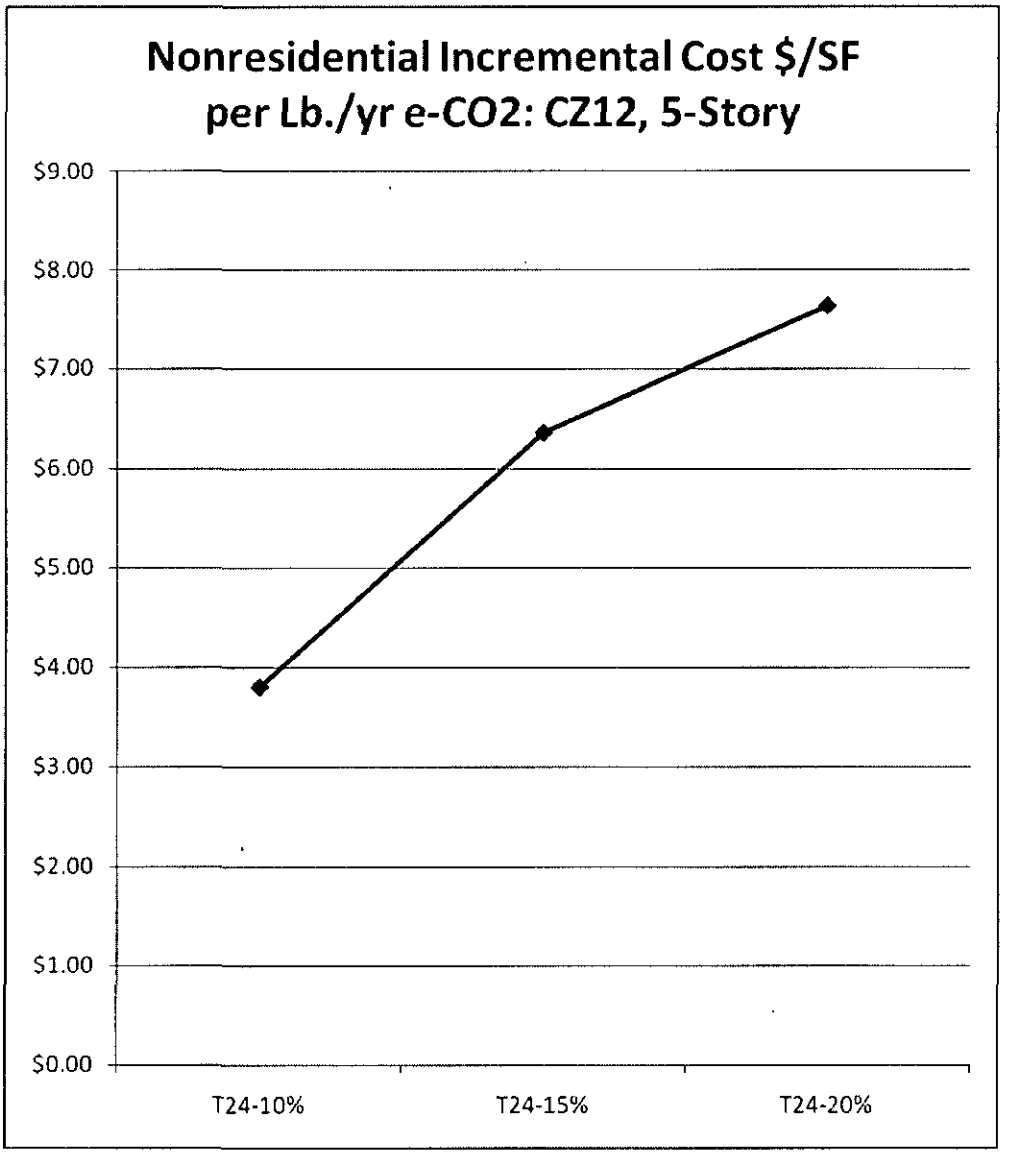


Figure 4-CZ12e-1: Annual Reduction in CO2 in Lbs./Sq.Ft. in Single Family, 2,025 sf 2-Story Single Family Home

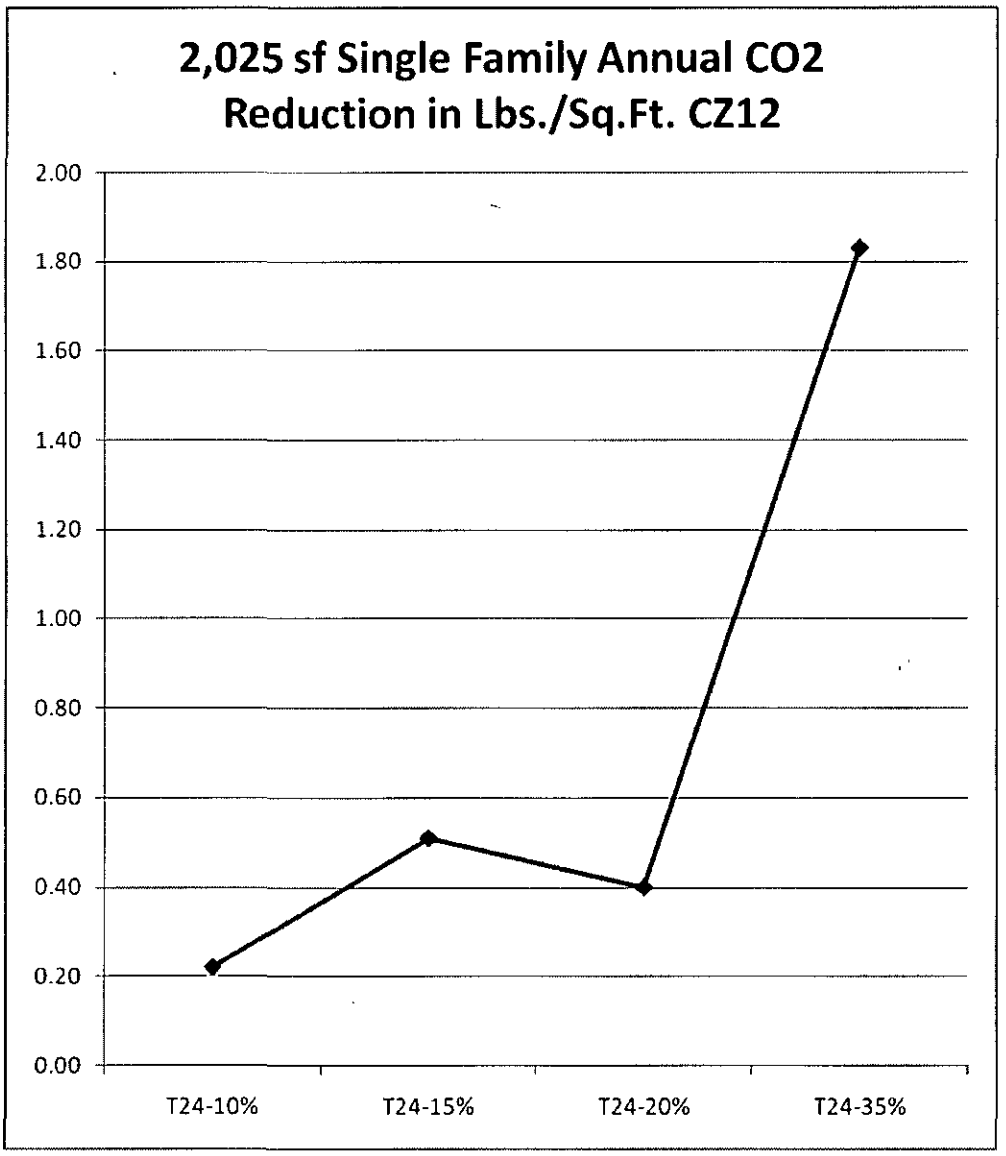


Figure 4-CZ12e-2: Annual Reduction in CO2 in Lbs./Sq.Ft. in Single Family, 1,582 sf 1-Story Single Family Home

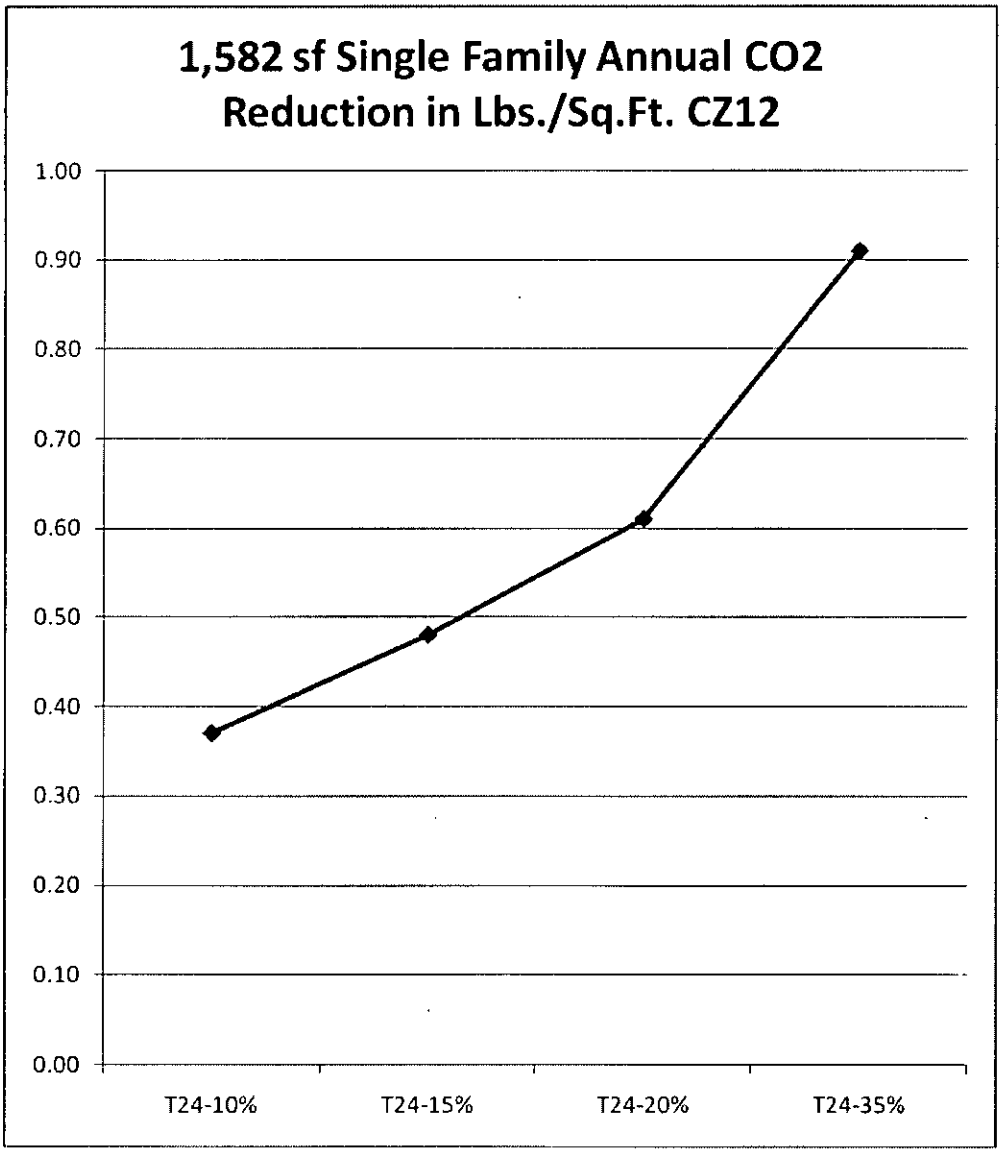


Figure 4-CZ12e-3: Annual Reduction in CO2 in Lbs./Sq.Ft., 2-Story Multifamily Building

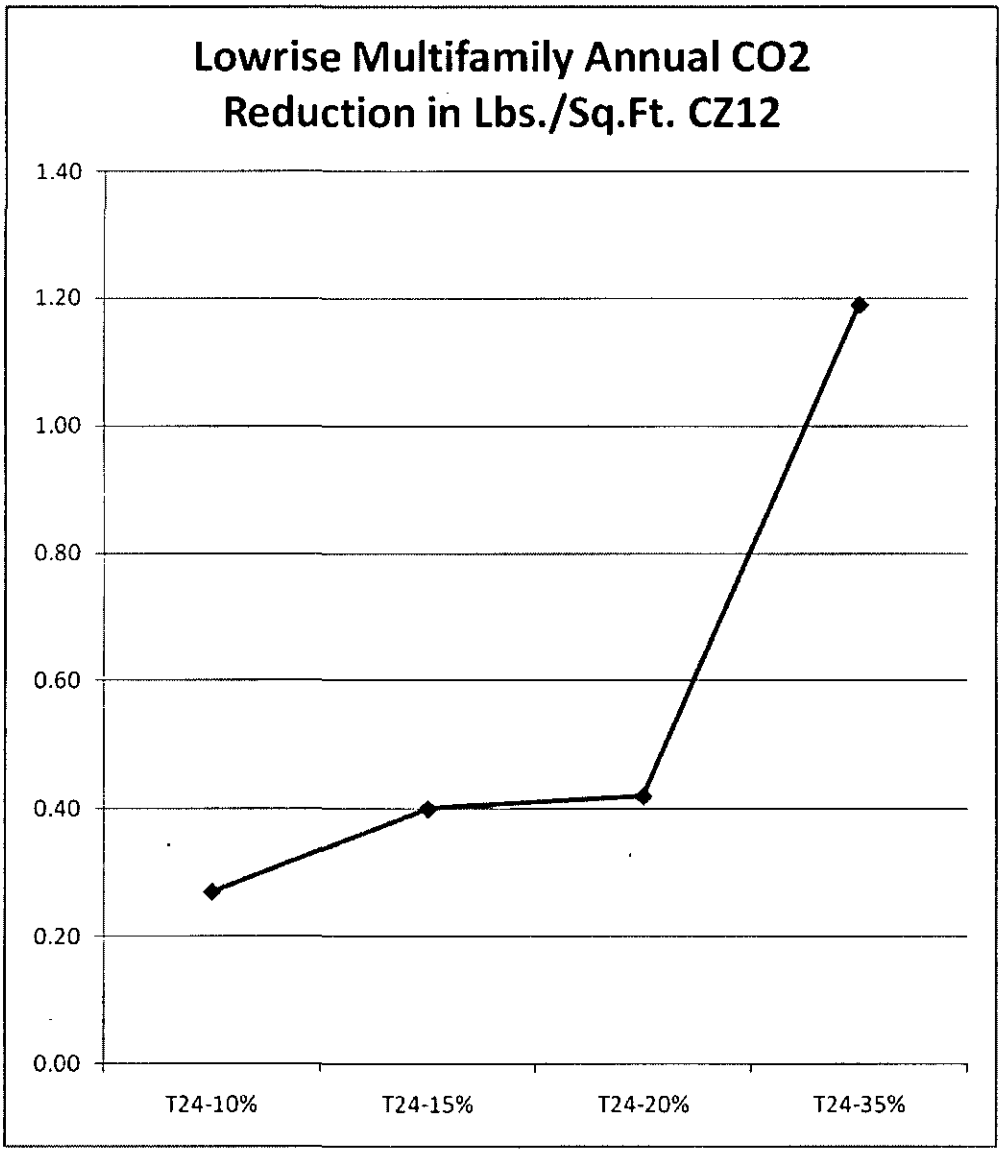


Figure 4-CZ12e-4: Annual Reduction in CO2 in Lbs./Sq.Ft., 40 Unit, 5-Story High-rise Residential Building

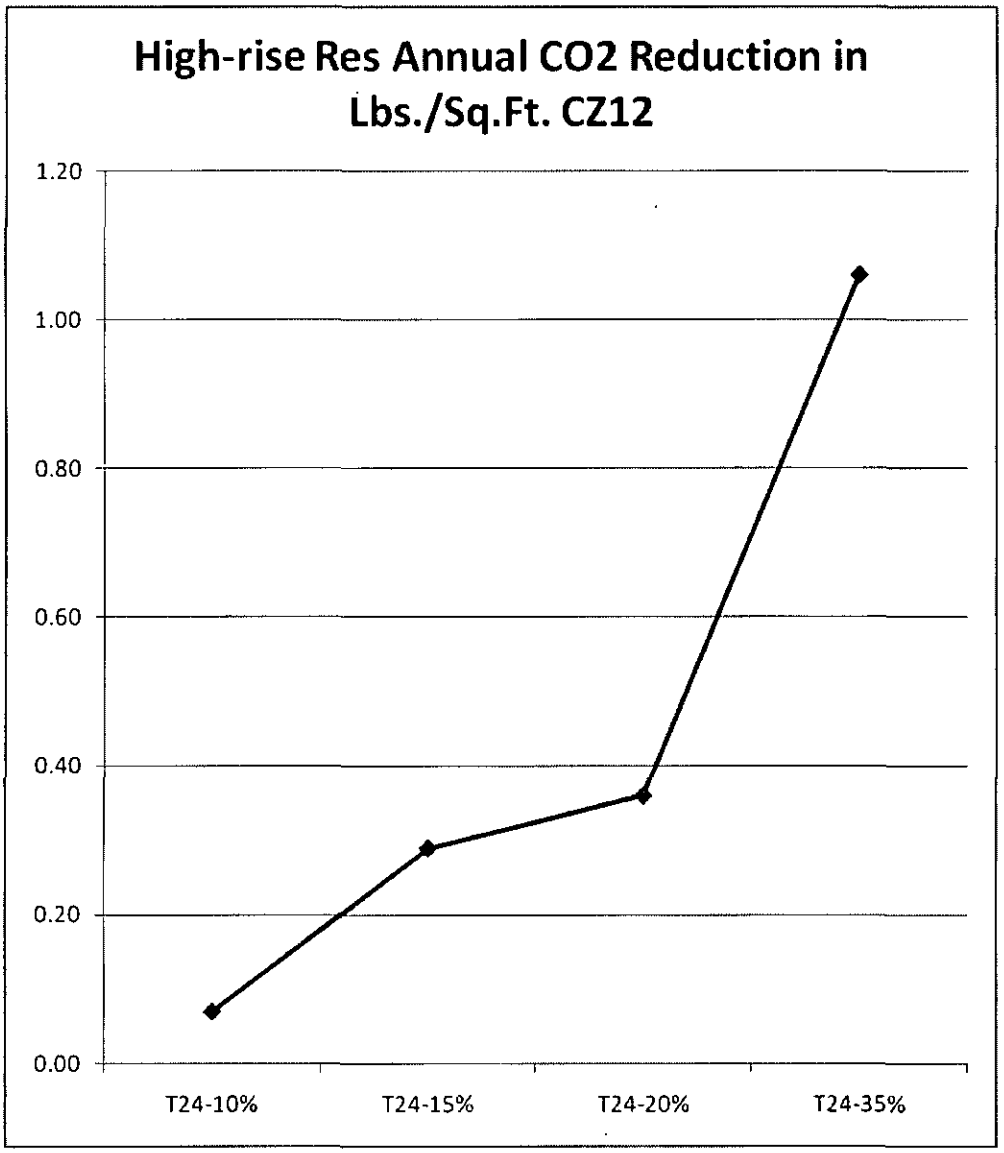


Figure 4-CZ12e-5: Annual Reduction in CO2 in Lbs./Sq.Ft., 21,160 sf 2-Story Nonresidential Building

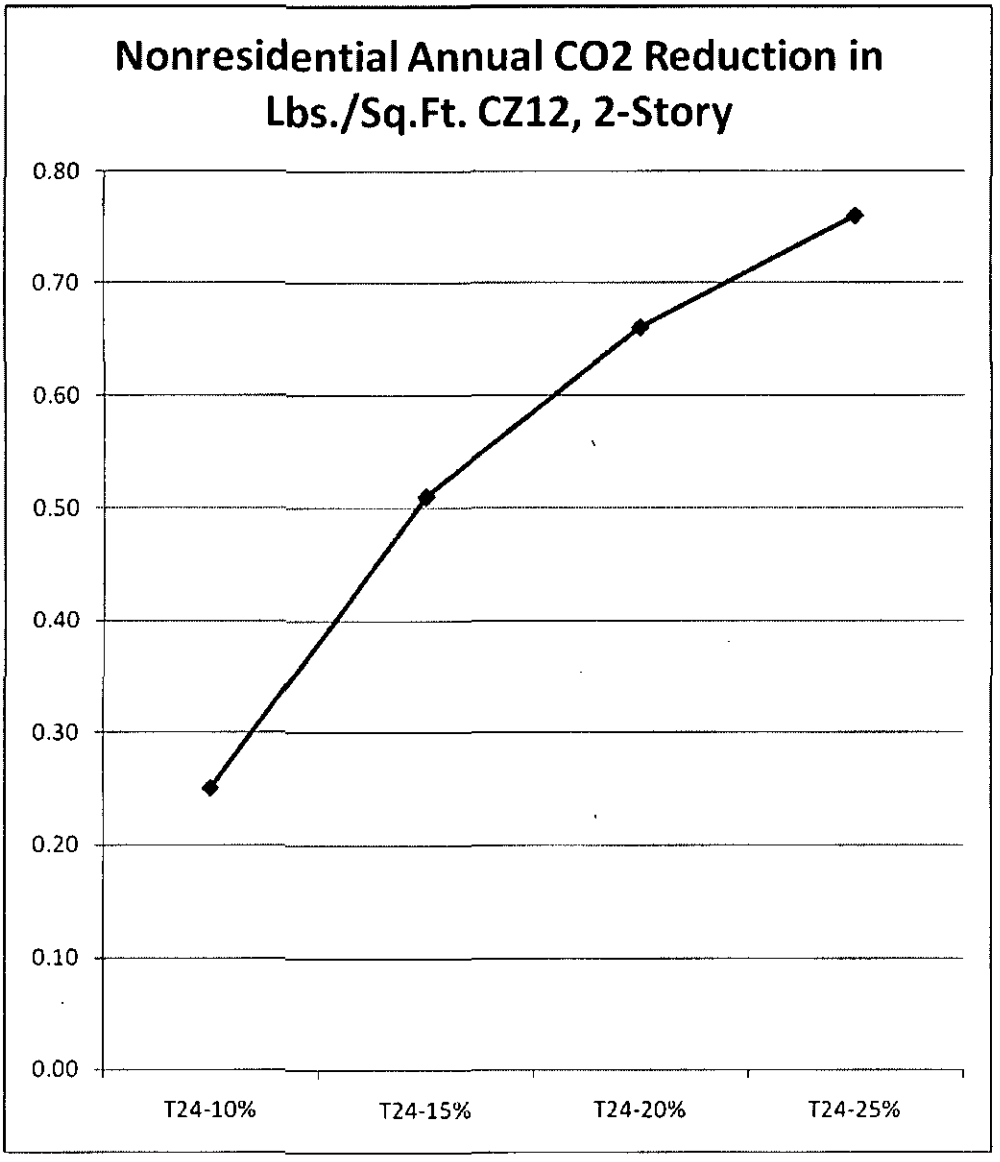
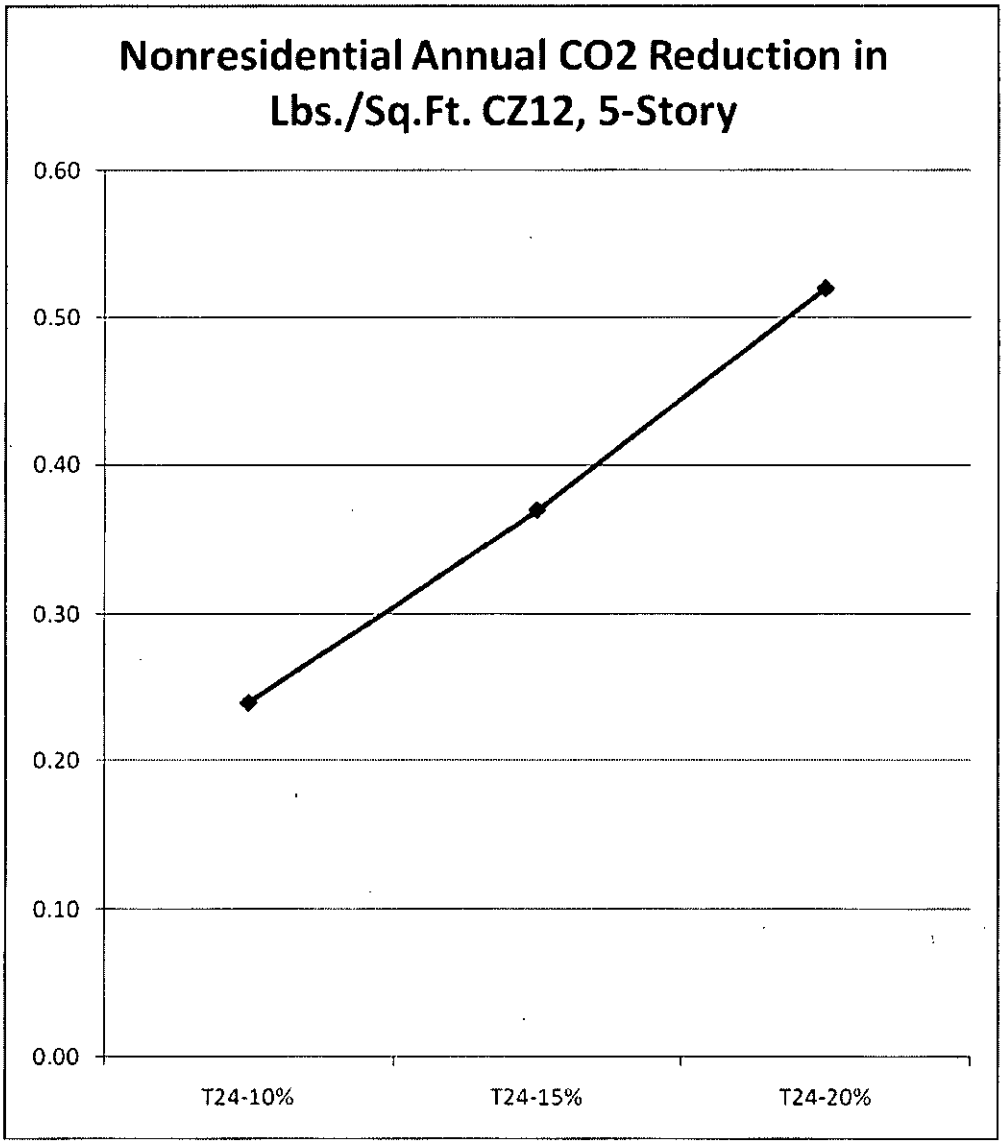


Figure 4-CZ12e-6: Annual Reduction in CO2 in Lbs./Sq.Ft., 52,900 sf 5-Story Nonresidential Building



5.0 Conclusions and Recommendations

5.1 Performance vs. Prescriptive Approach

While some local energy ordinances have in rare instances provided prescriptive options for local nonresidential envelope and lighting energy requirements, the performance approach has been implemented in all local ordinances for residential and nonresidential buildings as the most effective and cost-effective way to achieve higher levels of building energy efficiency. Rather than selecting specific energy measures as required, it is better to have the building industry determine how to reach energy-equivalence with the required efficiency level using the performance method. This is the approach used in a large variety of applications such as:

- Utility incentive programs
- State tax credits for solar PV systems (NSHP program)
- GreenPoint Rated green building system
- LEED green building system
- Local energy ordinances
- Low Income Housing Tax Credits
- ENERGY STAR New Homes
- Federal energy efficiency tax credits
- HERS Phase 2 for Existing and New Homes (2010)

Conversely, we strongly recommend against a local ordinance requiring prescriptive measures that can be modeled in the performance method. The reason is that, on a case-by-case basis, and because of many different variables, a specific energy measure (e.g., high performance Low-E windows with a U=0.33 and SHGC=0.23) may or may not be the most cost-effective solution in reducing energy use for a particular project.

5.2 Title 24 Analysis, Metric and Forms

Because of the familiarity of the building industry and building departments with Title 24 standards, it is best, as a minimum, to use the approved Title 24 software and modeling guidelines, the TDV energy in KBtu/sf-yr for Standard and Proposed designs, and the Title 24 compliance and installation/acceptance forms to document building energy performance measures. Special credits for solar PV systems and other options can be documented separately by the permit applicant, especially if a simple local compliance form is provided by the building department which augments the Title 24 report.

We recommend that all local ordinances use Title 24 methods, rules, software and reports wherever possible; and that those be augmented only when necessary to comply with or document a special energy credit.

5.3 LEED Energy Performance

Because there is a minimum energy requirement for LEED, and nonresidential buildings must meet LEED requirements in many local green building ordinances, it is worthwhile noting that:

(1) LEED 2009 (the next LEED program after v2 which is scheduled to be released sometime in 2009) is based on the ASHRAE 90.1-2007 energy performance standards, which uses the Energy Cost Budget (ECB) method to determine compliance. The minimum energy requirement for LEED 2009 is reducing annual energy cost by at least 10% below the 90.1-2007 baseline annual energy cost.

(2) The 90.1-2007 calculation and ECB metric is very different from the 2008 Title 24 calculation and TDV energy. The building industry in California does not generally understand how to meet and document the LEED requirement.

(3) Some local jurisdictions (e.g., San Francisco and Palo Alto) have adopted ordinances which give the chief building official or other designated City official the option to allow a Title 24 calculation and report to document LEED energy equivalence whether or not the project will be registered and reviewed by USGBC.

We recommend that any local ordinance which references LEED provide an administrative mechanism whereby a permit applicant can meet the minimum energy LEED requirement with a designated Title 24 energy equivalent performance.

5.4 Energy Efficiency before On-site Generation

To ensure consistency with State programs and maximum benefit to applicants seeking to apply for available incentives, a local energy ordinance that includes provisions for PV must meet all installation criteria in the "Guidelines for California's Solar Electric Incentive Programs Pursuant to Senate Bill 1." The methodology used to calculate the energy equivalent to the solar PV credit shall be the CECPV Calculator using the most recent version prior to the permit application date, which may be found at: http://www.gosolarcalifornia.ca.gov/nshpcalculator/. Because energy-efficiency is a more cost-effective investment than generation, programs such as State and Utility incentives, LEED and GreenPoint Rated award solar PV credit only after a building has already achieved the minimum energy efficiency performance.

5.5 Certified Energy Plans Examiners (CEPEs)

The California Association of Building Energy Consultants (CABEC) sponsors and administers the Certified Energy Plans Examiner (CEPE) program for the Residential and Nonresidential Standards. CEPE candidates must pass an examination to demonstrate knowledge of the applicable standards. We recommend that local ordinances include a requirement, or create a permit incentive, for the energy analysis and documentation to be prepared by an individual with the current applicable CEPE credential.

NOTICE AND DIGEST

PUBLIC HEARING, REPORT AND ORDINANCE RECOMMENDED BY THE PLANNING COMMISSION, ADOPTING OAKLAND MUNICIPAL CODE TITLE 18 - SUSTAINABILITY, CHAPTER 18.02 SUSTAINABLE GREEN BUILDING REQUIREMENTS FOR PRIVATE DEVELOPMENT TO ESTABLISH ENVIRONMENTALLY SUSTAINABLE REGULATIONS FOR BUILDING CONSTRUCTION, REMODELING, LANDSCAPING AND DEMOLITION

The proposed ordinance provides green building standards for certain types of private development projects and will be applied citywide to reduce energy use, conserve water and other natural resources, limit solid waste during construction and operation, and promote healthy indoor air quality.