

Sustainability Assessment for the Preservation of The Mutual Orange Distributors Packing House

330 North Third Street
Redlands, CA 92373

Prepared for:

Redlands City Council and Redevelopment Agency
July 5, 2011

Prepared by:

Eric Shamp, AIA, NCARB, LEED AP

Principal

Ecotype Consulting

10 E. Vine Street, Suite 212A

Redlands, CA 92373

T: [909] 307-8987

F: [909] 307-8922

eric@ecotypeconsulting.com



TABLE OF CONTENTS

1	INTRODUCTION	1
2	SUSTAINABILITY AND HISTORIC PRESERVATION	3
	2.1 Definition of sustainability	
	2.2 Sustainability efforts in Redlands	
	2.3 Nexus between sustainability and historic preservation	
	2.4 Types of historic resource reuse and implications for sustainable development	
	2.5 Green Rehabilitation of the MOD	
3	EMBODIED ENERGY COMPARISONS	9
	3.1 Definition of embodied energy	
	3.2 Methodology and assumptions	
	3.3 Summary of results	
4	THE REDLANDS SUSTAINABILITY ACTION PLAN	15
	4.1 Summary of the document	
	4.2 Goals	
	4.3 Indicators	
	APPENDIX A: AUTHOR'S QUALIFICATIONS.....	21

1. INTRODUCTION

Ecotype Consulting has voluntarily and of its own initiative prepared this report to analyze the sustainability of preserving and reusing the historic Mutual Orange Distributors Packing House (MOD), located at 330 North Third Street. We hope that this document can be of some use in understanding all that is at stake when deciding how to proceed with the sale of the property. It is my hope that the City will consider its own sustainability goals when considering how to best transfer this property into private hands.

The concept of sustainability has become politically abused and somewhat diluted through poor marketing. In this study, we attempt to clarify its meaning, so that the reader can better understand its relevance to the MOD. Sustainability (or, more commonly, “greenness”) is not an absolute condition; it can only be assessed in a comparative manner against an alternative. In other words, it is impossible to declare that a project is sustainable or not sustainable; we can only assess a project relative to something else, such as the well-known LEED rating system or another project alternative. In the case of the MOD, the obvious alternative project is a plan that threatens its demolition, such as the Sprouts Market as proposed by Showprop Redlands, LLC.

We understand that the development of a Sprouts Markets does not *necessarily* call for the demolition of the MOD, however, there is no limitation in the proposed sale agreement that expressly forbids demolition if the Sprout Market development proceeds. For the sake of this assessment, we will assume a worst-case scenario in which the Showprop Redlands scheme requires demolition of the historic structure.

Although sustainability is generally considered to be the nexus between ecological, economic, and cultural concerns, it is beyond the scope of this study to compare the economic and cultural aspects of the MOD and its alternative. The cultural relevance of the MOD has been addressed in numerous documents and studies, especially those provided by the Redlands Conservancy. The economic relevance of the MOD has presumably been investigated by Showprop Redlands and the City of Redlands Redevelopment Agency. This document is intended to serve as a counterpart, rather than a counterpoint, to those analyses, in order to provide City decision-makers and private investors with a comprehensive picture of the relative sustainability of the project.

In regards to *ecological* sustainability, this study will clearly demonstrate that preservation of the MOD is the superior choice by the metrics and/or principles of embodied energy conservation and the City’s own established goals for

sustainability. It is my sincere hope that these results will be considered and given the same weight as the economic and cultural considerations for whichever project is ultimately implemented.

Eric R. Shamp, AIA, NCARB, LEED AP
Principal, Ecotype Consulting
June 2011

2. SUSTAINABILITY AND HISTORIC PRESERVATION

2.1 Definition of sustainability

Sustainable development can best be described using a definition developed by the UN World Commission on the Environment in 1987: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"¹. This definition is quite broad in its application, with no specific reference to any category or aspect of conservation. In common practice, however, this definition is generally understood by the progressive business and development community to apply to a continuity of economic, ecological, and cultural conditions that support human society.

These economic, ecological, and cultural conditions are known collectively as the "triple bottom line"² of sustainable development. In order to produce the most sustainable outcome from any development project, all three conditions are to be given equal consideration. The "triple bottom line" concept distinguishes traditional economic development from *sustainable* economic development. The Redlands Mall is an obvious example of economic development that was not, in fact, sustainable.

In this report, we will investigate the impact on the Mutual Orange Distributors Packing House (MOD) site of two proposed development schemes and assess how well each scheme addresses the sustainability "triple bottom line". The first scheme is based on a hypothetical grocery or mixed use retail/museum project, in which the MOD is rehabilitated and preserved (the "Preservation Scheme"). The second scheme is based on the worst-case Showprop Redlands proposal, in which the MOD is demolished to make way for a grocery store (the "Showprop Scheme").

2.2 Sustainability efforts in Redlands

The City of Redlands has demonstrated a commitment towards sustainability by establishing a community-based Sustainability Action Plan Committee, developing and approving a Sustainability Action Plan (March 2011), and signing on to the US Conference of Mayors Climate Protection Agreement.

¹ The World Commission on Environment and Development, *Our Common Future*, (New York: Oxford University Press, 1987), 43.

² Originally coined by John Elkington, *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, (London: New Society Publishers, 1998).

The *Sustainability Action Plan*³ addresses community-wide goals in several relevant areas:

Chapter 2. Energy Efficiency and Conservation

Chapter 4. Green Building

Chapter 5. Waste Reduction and Recycling

Chapter 9. Land Use and Community Design

Later in this report, we will assess how well each of the two schemes aligns with each of the objectives of the *Sustainability Action Plan*.

2.3 Nexus between sustainability and historic preservation

There is a significant alignment between the movement to preserve historic structures and sustainable development. The construction of a new building represents a significant economic investment in material and energy resources, along with ecological impacts associated with raw material extraction, manufacturing, transportation, fossil fuel extraction, and fuel consumption. The demolition of an existing building (whether historic or not) results in a total loss of those economic and ecological resources, and further compounds the ecological impacts of a construction project.

Washington DC architect Carl Elefante, FAIA, LEED AP describes building reuse thus, "The greenest building is the one that's already built." According to one study⁴, 39% of the total energy consumption over the life span of a typical building is embodied in its materials. By retaining an existing building, the embodied energy is amortized over a greater time span, dramatically reducing the size of the building's ecological footprint.

Historic structures tend to be especially good candidates for rehabilitation as "green" buildings. In contrast with the majority of contemporary buildings, historic buildings are usually designed for passive thermal comfort, are built using more durable materials and construction techniques, and are sited in a way that prioritizes pedestrian access over vehicular traffic. With a few discrete improvements to a historic building's exterior envelope (blown-in insulation, thermally-efficient windows, cool roofing), a historic building can be made quite energy efficient.

³ Approved by City Council on March 11, 2011.

⁴ Mike Jackson, "Embodied Energy and Historic Preservation: A Needed Reassessment", *Journal of Preservation Technology* 36:4, (2005).

2.4 Types of historic resource reuse and implications for sustainable development

Although the MOD is not itself a designated historic structure, it sits within a designated historic district. In determining the fate of the MOD, it is instructive to define the different types of historic preservation, and how each type can allow for green building upgrades to the existing structure. The US Department of the Interior recognizes several standard treatments of historic properties⁵:

Preservation. The standard for historic preservation requires the application of measures intended to “stabilize, consolidate, and conserve” historic features. The property must be used for its original historic purpose, or used in a manner that does not require significant change to the defining characteristics of the building. Only deteriorated or missing portions of the building may be built; no new additions are allowed. This approach would allow some energy efficiency upgrades, as long as they did not disrupt the historic character of the building. This approach may not provide the required design flexibility to make the project economically feasible, and may limit the ability to make energy efficiency and sustainability upgrades.

Rehabilitation. In summary, this standard requires that a property be used for its historic purpose, or used in a manner that does not require significant change to the defining characteristics of the building. There shall be no removal or alteration of historic materials, features, or spaces. Deteriorated features are repaired rather than replaced. New additions are allowed, but must be distinguishable from the historic portions of the property. This approach would allow most energy efficiency upgrades, as long as they did not disrupt the historic character of the building. If rehabilitation is performed on a designated historic structure, the owner may be entitled to a 20% rehabilitation tax credit. This approach gives the flexibility to make major repairs, alterations, and/or additions.

Restoration. This is defined as “the act or process of accurately depicting the form, features, and character of a property as it appears at a particular period of time”. This approach is typically selected in cases where a historic structure is intended to be used for the demonstration a significant period of time for educational purposes. It is the most restrictive approach, and would not be appropriate to suit the ongoing economic sustainability of the MOD.

⁵ Kay Weeks and Anne E. Grimmer, *The Secretary of the Interior’s Standards for the Treatment of Historic Properties*, (Washington DC, National Park Service, 1995).

Adaptive Reuse. This approach is not formally recognized by the US Department of the Interior as an official standard for the treatment of historic properties. Adaptive reuse is the process of dramatically changing the historic use of a property, especially after the original use is obsolete. This can often require significant architectural changes, or even the co-opting of a historic structure within a new structure. Depending on the programmatic requirements of the proposed development, this could possibly be an appropriate approach. However, for the purpose of this study, that determination requires more information than is readily available.

Earlier this year, the US Department of the Interior published *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*⁶. This will be a very useful document in guiding a "green" rehabilitation of the MOD.

2.5 Green Rehabilitation of the MOD

The Preservation Scheme is an opportunity for the City to demonstrate the confluence of its goals of historic preservation and sustainability, and in the process establish a ground-breaking case study for other communities to follow. There are several factors that make the MOD an ideal candidate for a green building rehabilitation:

Integrity. We do not have access to the interior of the building, nor have we seen any credible report for a building professional attesting to the condition of the building. We did perform a walk-around of the exterior, and found that despite some neglect and resultant cosmetic damages, the building appears to be in good restorable condition. There is no apparent structural damage that could be observed from the exterior of the building. Some of its historic features have been obscured, but few are lost. Later additions and modifications appear to be easily removable, if desired. A rehabilitation of the building would require some material resources, however, it would require considerably fewer material resources when compared to a new construction.

Simple HVAC upgrades. There do not appear to be any viable heating, ventilating, and air conditioning (HVAC) systems currently installed on

⁶ Anne E. Grimmer, Jo Ellen Hansley, Liz Petrella, and Audrey T. Tepper, *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings*, (Washington DC, National Park Service, 2011).

the building, so a new HVAC system would be in order. Due to the considerable height of the interior space and the availability of ample rooftop area, a new HVAC installation would be simple and straightforward. Without exposed roof structure, the installation of ductwork is simplified.

Passive cooling opportunities. The MOD is constructed of very thick masonry walls. These walls act as a thermal mass, slowing the conduction of heat. As a result, the building will stay cool through much of the day with minimal active cooling input. During periods of diurnal temperature swings, the walls effectively store heat during the day, and release the heat to the interior at night. The thermal envelope of this building will outperform any common envelope construction technique available today. This envelope, coupled with a modern, efficient HVAC system, will provide the owner of this building with dramatically reduced utility bills, when compared to a modern construction.

Passive daylighting opportunities. The distinctive sawtooth roof of the MOD is ideal for the display of goods, food (especially produce), and/or museum exhibits. The north-facing sawtooth windows allow the entrance of ample, full-spectrum, diffuse daylight, and can be easily vented to reduce heat gain. Glare caused by direct sunlight will not occur through these lights. Daytime electric lighting would be unnecessary in most of the interior space. This represents a considerable utility savings due to the fact that lighting accounts for up to 40% of a building's electricity use.

Renewable energy opportunities. The sawtooth roof consists of south-facing, sloped roof areas that could provide optimal orientation and angle for a photovoltaic (solar electricity) array. Photovoltaic panels can be surface mounted, eliminating the cost of mounting racks that are traditionally used to angle the panels towards the sun on a flat roof. Mounting racks can be a significant cost component of a photovoltaic array, and the elimination of them can help the building owner realize a faster return on investment.

High-volume, open plan. The open floor plan and high roof structure make the MOD well suited to a wide variety of uses, including a museum, a retail establishment, and entertainment establishment, or a boutique grocery store. Its history as a produce packing house provides a poetic connection to either the museum or the boutique grocery proposals.

3. EMBODIED ENERGY COMPARISONS

3.1 Definition of embodied energy

Embodied energy is defined as the amount of energy required to extract, manufacture, transport, install, use, decommission, and dispose of a material or an assembly of materials. In 2005, architect Mike Jackson, FAIA, published an article in the *Journal of Preservation Technology*⁷ asserting that the ratio of embodied energy to annual operating energy in an existing building ranges from 5:1 to 30:1. In other words, it takes 5 to 30 years of operation to consume the same amount of energy as is embodied in the materials. Considering that most contemporary buildings are constructed with a 25 year lifespan in mind, many new buildings have more energy invested in the materials than in their operation over the entire lifespan.

Furthermore, when we consider that fossil fuels make up 86.4% of the world's primary energy consumption,⁸ it becomes apparent that the embodied energy of building materials is a significant source of greenhouse gas (GHG) emissions. According to an analysis⁹ of 2009 data from the US Energy Information Administration, buildings consume almost half of all energy produced in the US. Building are by far the biggest single contributor to US GHG emissions.

If we are to seriously address the reduction of GHG emissions, we must prioritize the reduction of energy consumption by the building sector. Using its regulatory powers, the state of California has done an excellent job of reducing GHG emissions related to operational energy consumption in buildings. Embodied energy is as significant a contributor of GHG emissions as operational energy, yet the development industry in California continues to demolish usable and economically feasible buildings with little concern for the ecological and long-term economic impacts.

3.2 Methodology and assumptions

In order to measure and compare the embodied energy between the Preservation Scheme and the Showprop Scheme, we use a method developed

⁷ Jackson, p. 51.

⁸ US Energy Information Administration International Energy Statistics, 2007.

⁹ Analysis by architect Ed Mazria for Architecture 2030, in which traditional energy data reporting classifications are re-allocated to create a single Building Sector (www.architecture2030.org/the_problem/buildings_problem_why)

by the Advisory Council on Historic Preservation¹⁰. Due to the lack of specifics in the Showprop Scheme, we used the simplest analytical approach, known as the Building Concept Model. This allowed us to estimate embodied energy using only basic information about a building. Results are relatively correct but not precise.

We used the following formulas in our calculations:

Embodied Energy Investment in Existing Buildings

$$\text{Embodied energy investment} = \text{Gross floor area of historic building} \times \text{Invested energy per square foot specific to the building type}$$

Demolition Energy for Existing Buildings

$$\text{Demolition energy} = \text{Gross floor area of historic building} \times \text{Demolition energy of materials per square foot of construction for buildings of similar size and construction type}$$

Embodied Energy Investment in Renovated Buildings

$$\text{Embodied energy investment} = \text{Gross floor area of historic building} \times \text{Invested energy per square foot specific to the building type} \times f_1$$

Where f_1 = fraction of materials and construction of the existing historic building that is being replaced or added in the renovation process. This is largely a matter of professional judgment.

Embodied Energy Investment in New Buildings

$$\text{Embodied energy investment} = \text{Gross floor area of new building} \times \text{Invested energy per square foot specific to the building type}$$

Demolition Debris for Existing Buildings

$$\text{Demolition debris} = \text{Gross floor area of existing building} \times \text{Demolition debris rate specific to the building type}$$

¹⁰ Advisory Council on Historic Preservation, "Assessing the Energy Conservation Benefits of Historic Preservation: Methods and Examples", January 1979.

Construction and Demolition Debris for Renovated Buildings

$$\text{C\&D debris} = f_1 \times \left(\begin{array}{l} \text{Gross floor} \\ \text{area of} \\ \text{existing} \\ \text{building} \end{array} \right) \times \left(\begin{array}{l} \text{Demolition} \\ \text{debris rate} \\ \text{specific to the} \\ \text{building type} \end{array} + \begin{array}{l} \text{Construction} \\ \text{debris rate} \\ \text{specific to the} \\ \text{building type} \end{array} \right)$$

Construction Debris for New Buildings

$$\text{Construction debris} = \left(\begin{array}{l} \text{Gross floor area of new} \\ \text{building} \end{array} \right) \times \left(\begin{array}{l} \text{Construction debris rate specific} \\ \text{to the building type} \end{array} \right)$$

We used the following assumptions in our calculations:

Site Study Boundary

The site study boundary is identical for both the Preservation Scheme and the Showprop Scheme. For this analysis, we are only considering the portion of the Showprop scheme that falls inside the site study boundary. The boundary is shown below:



Preservation Scheme Building Assumptions

Characteristic	Assumption	Source
Gross floor area	19,200 sf	Estimated by scaling off aerial photo.
Building type	Industrial Building	Based on predominant historic use.
Invested energy per sf specific to building type	970 MBTU/sf	<i>Energy Use for Building Construction</i> ¹¹
Construction materials	Heavy (masonry)	From observation.
Demolition energy of construction materials for existing buildings	15,500 BTU/sf	<i>Energy Use for Building Construction</i>
Fraction of materials to be replaced or renovated (f_1)	25%	Assuming replacement of all HVAC, lighting, roofing, windows, exterior doors, plus cosmetic repairs, addition of insulation, and accessibility upgrades.
Demolition debris rate	173 lbs/sf	<i>Characterization of Building-Related Construction and Demolition Debris in the United States</i> ¹²
Construction debris rate	4.02 lbs/sf	<i>Characterization of Building-Related Construction and Demolition Debris in the United States</i>

Showprop Scheme Building Assumptions

Characteristic	Assumption	Source
Gross floor area	25,000 sf	<i>Redlands Daily Facts</i> , "Fate of Packing House Rests with Council", 6/28/11.
Building type	Stores/Restaurants	Based on proposed Showprop plan.
Invested energy per sf specific to building type	940 MBTU/sf	<i>Energy Use for Building Construction</i>

¹¹ *Energy Use for Building Construction*, Energy Research Group, Center for Advanced Computation, University of Illinois and Richard G. Stein and Associates, December 1976.

¹² *Characterization of Building-Related Construction and Demolition Debris in the United States*, US Environmental Protection Agency, Franklin Associates, June 1998.

Characteristic	Assumption	Source
Demolition debris rate	173 lbs/sf	<i>Characterization of Building-Related Construction and Demolition Debris in the United States</i>
Construction debris rate	4.02 lbs/sf	<i>Characterization of Building-Related Construction and Demolition Debris in the United States</i>

3.3 Summary of results

Embodied Energy Comparison

	Preservation Scheme	Showprop Scheme
Embodied Energy Investment		
existing	18,624,000 MBTU	18,624,000 MBTU
renovation	9,312,000 MBTU	
new building construction		23,500,000 MBTU
subtotal	27,936,000 MBTU	42,124,000 MBTU
Demolition Energy	69,840 MBTU	297,600 MBTU
Total Embodied Energy	28,005,840 MBTU	42,421,600 MBTU
Difference		+ 14,415,760 MBTU

The Showprop Scheme exhibits an embodied energy investment that is over a third higher than the Preservation Scheme in which 25% of the material in the existing building is removed and replaced. The Preservation Scheme is, conservatively, the equivalent of saving 125,354 gallons of gasoline when compared to the Showprop scheme. This is equivalent to taking more than 5% of the drivers in Redlands off the road for one month.

Construction and Demolition Waste Comparison

	Preservation Scheme	Showprop Scheme
demolition	415.2 tons	1660.8 tons
renovation	9.6 tons	
new construction		50.3 tons
Total C&D Waste	424.8 tons	1711.1 tons

Again, the Showprop Scheme performs poorly in comparison to the Preservation Scheme. A complete teardown and rebuild of the site results in more than four times as much construction and demolition debris when compared to an

extensive rehabilitation of the MOD. It is conceivable that much of the non-hazardous construction and demolition debris can be diverted from the landfill and recycled. However, the City only requires that the developer expend "reasonable efforts" to do so. While the City does require reporting of construction and demolition waste, there is no minimum amount of diversion required. In essence, any construction and demolition waste recycling is the prerogative of the owner, and is performed at the owner's additional expense.

4. THE REDLANDS SUSTAINABILITY ACTION PLAN

4.1 Summary of the document

In March 2011 the Redlands City Council approved the *Redlands Sustainability Action Plan* (the "*Plan*"), which established a triple-bottom line approach to decision-making, and mapped out a course achieving a more sustainable community. The document consists of Goals, Indicators, and Actions within ten key areas of community sustainability. Of the ten key areas of community sustainability, there are four that are relevant to the fate of the MOD:

Chapter 2. Energy Efficiency and Conservation

Chapter 4. Green Building

Chapter 5. Waste Reduction and Recycling

Chapter 9. Land Use and Community Design

We will evaluate the Showprop Scheme against the Preservation Scheme, and determine how well each complies with the *Redlands Sustainability Action Plan* Goals and Indicators described in each of the four relevant key areas.

4.2 Goals

The Goals describe major objectives of the *Plan*. According to the *Plan*, "achieving these goals would require a combination of actions by the public and private sectors." In order that these goals are met, the City must evaluate all decisions in order to determine consistency with the *Plan* described in the document. The following comparison briefly compares each project's compliance with the *Plan's* goals.

Goals		Preservation Scheme	Showprop Scheme
Energy Efficiency and Conservation			
EE1	Promote energy efficiency and conservation technologies and practices that reduce the use of nonrenewable resources by both City government and the community.	Yes. Existing non-renewable cultural, material, and energy resources will be conserved.	Maybe. While a new energy-efficient building is certainly feasible, the exterior envelope will not be capable of the thermal efficiency of the existing masonry.

Goals		Preservation Scheme	Showprop Scheme
EE2	Promote energy awareness community-wide with energy audit information for all and by educating the community regarding incentives (grants, rebates, exchanges, etc.) available for energy conservation.	Maybe. Education could be a fundamental mission of a museum scheme.	Maybe. However, education would not likely be a fundamental mission of a retail establishment.
EE3	Update city plans, resolutions and ordinances to promote greater energy efficiency in both existing and new construction.	Yes. A City action to forbid demolition would conserve embodied energy.	Maybe. The City could “encourage” the developer to build an energy efficient building.
Green Buildings			
GB1	Adopt broadly accepted standards for green building.	Maybe. Green building standards including preservation requirements can be incorporated into a sales agreement.	No. Once the property is sold, the City can no longer place green building requirements on its redevelopment.
GB2	Demonstrate leadership in the development of City-owned and operated facilities.	See above.	See above.
GB3	Re-evaluate City impact fees in light of the reduced impact of green buildings.	Maybe. Impact fees could be reduced to reward preservation, energy efficiency, water efficiency, etc.	Maybe. Impact fee reductions should be considerably smaller considering the amount of demolition waste generated.
GB4	Coordinate development standards with City’s alternative transportation plan.	Yes. Development is within future transit-oriented development zone.	Yes. Development is within future transit-oriented development zone.
GB5	Provide assistance to the development community in adopting economically viable and ecologically responsible green building strategies.	Maybe. The City can include preservation requirements and offer green building assistance through a sales agreement.	No. Green building strategies would be the prerogative of the developer.
GB6	Encourage developers to consider the entire life-cycle of a built project.	Yes. The heavy masonry construction of the MOD could potentially amortize embodied energy over a span of hundreds of years.	No. A typical new construction is designed for a 25-year lifespan.

Waste Reduction and Recycling			
WR1	Improve commercial recycling diversion rates.	Yes. In essence, the entire structure is being diverted from landfill.	Maybe. Demolition and construction waste could be recycled, although the developer is under no obligation to do so.
WR2	Ensure the financial stability of Redlands waste collection and waste diversion programs.	Not applicable.	Not applicable.
WR3	Create opportunities to recycle more materials.	No. Demolition and construction waste would be dramatically reduced, reducing opportunities for recycling.	Yes. Demolition waste would be considerable, providing many opportunities for recycling.
WR4	Invest in new infrastructure and technology that contributes to increased waste diversion.	Not applicable.	Not applicable.
Land Use and Community Design			
LU1	Incorporate mixed land uses.	No.	No.
LU2	Encourage compact building design.	No.	No.
LU3	Create a range of housing opportunities.	No.	No.
LU4	Retain Redlands' strong sense of place.	Yes. Historic buildings are a significant contributor to Redlands' sense of place.	No. New construction that mimics a historic style lacks the unique character that contributes to a sense of place.
LU5	Offer a variety of transportation options.	Yes. Development is within future transit-oriented development zone.	Yes. Development is within future transit-oriented development zone.
LU6	Create pedestrian-friendly neighborhoods.	Yes. Development will be part of a walkable Downtown Specific Plan.	Yes. Development will be part of a walkable Downtown Specific Plan.
LU7	Ensure preservation of open space and agricultural land.	No.	No.
LU8	Solicit and use Federal, State, regional, and local funding mechanisms to encourage smart growth development.	Yes. There are federal tax incentives available for rehabilitation of historic structures.	No. grants and incentives are rarely available for new construction projects.

4.3 Indicators

Indicators are conditions that can be measured and tracked (metrics) to determine compliance with described Targets. The following comparison briefly compares each project with the prescribed Indicators in each of the four relevant key areas. In many cases, objectives will not be directly applicable to either project, and will be marked “not applicable” (“n/a”).

- Legend:
- Makes progress towards target.
 - ◐ May progress towards target.
 - Does not make progress towards target.
 - n/a Not applicable.

Indicator	Preservation Scheme	Showprop Scheme
Energy Efficiency and Conservation		
Increase residents’ awareness of city’s energy efficiency and conservation strategies and goals.	●	○
Increase residents’ awareness of household opportunities for energy conservation strategies and technology.	n/a	n/a
Reduce energy use by city-owned facilities.	n/a	n/a
Reduce energy use by business and residential consumers.	●	◐
Minimize on peak and expand off peak electric usage (shift load where possible).	●	◐
Increase residential access to affordable funding mechanisms for energy and conservation.	n/a	n/a
Green Buildings		
Increase in municipal green buildings.	n/a	n/a
Reduce non-renewable energy use in municipal buildings.	n/a	n/a
Reduce city’s contribution to urban heat island effect.	◐	◐
Increase on-site water retention and groundwater recharge.	○	○
Decrease single occupancy non-commercial vehicle miles travelled.	●	●
Reduce construction waste.	●	○
Increase market demand for residential and commercial green buildings.	◐	◐
Waste Reduction and Recycling		
Reduce mixed solid waste landfill stream from both businesses and households, including multi-housing households.	●	◐

MOD Packing House
Sustainability Assessment

Indicator	Preservation Scheme	Showprop Scheme
Increase commercial and residential recycling, including multi-housing and institutional recycling.	●	●
Increase commercial and residential composting of organic (food) waste.	n/a	n/a
Land Use and Community Design		
Encourage mixed-use planning and construction.	○	○
Encourage preservation of open space.	○	○
Totals		
● Meets objective.	6	1
● May meet objective.	3	6
○ Does not meet objective.	3	5
n/a Not applicable.	6	6

The Preservation Scheme performs considerably better than the Showprop Scheme in working towards meeting *Plan* targets.

APPENDIX A AUTHOR'S QUALIFICATIONS

Eric R. Shamp, AIA, NCARB, LEED® AP

Principal, Ecotype Consulting

Eric Shamp is a licensed architect, and has dedicated his career to the practice of sustainable design and development for the past eight years. He founded Ecotype Consulting in order to respond to the ever-increasing demand for green building consulting in and around the inland communities of southern California. By locating the business in a historic daylight building with operable windows within biking distance of his home, he has reduced his personal carbon emissions by more than 50%.

From 2000 to 2008, Mr. Shamp was responsible for directing and coordinating sustainable design efforts at HMC Architects, a 450-person architecture firm with 10 offices, headquartered in Ontario, California. In that role, he was responsible for research, education, marketing, and consulting in energy and resource efficient design. He provided sustainability master planning, energy analysis and modeling, whole building analysis, materials research, sustainable design and site planning, and "green team" building for a wide variety of projects for HMC project teams and directly to clients. In 2006, he was named corporate-wide Sustainable Design Director and was promoted to Associate Principal. At that time, he also established the HMC Sustainable Design Studio, and oversaw its development as a specialized sustainable design service provider within HMC. The Studio grew to a staff of four before Mr. Shamp left the firm to pursue independent consulting.

Mr. Shamp has been active on the Collaborative for High Performance Schools (CHPS) Technical Committee, the California Department of Water Resources Alluvial Fan Task Force, the AIA Inland California Blueprint for America Task Force, and the City of Redlands Climate Action Task Force. He serves on the City of Redlands Planning Commission, and is the former vice-chair of Redlands' Historic and Scenic Preservation Commission. He is an executive committee member of the Redlands' Climate Action Task Force, charged with leading the development of green building standards for the City.

In keeping with his belief that sustainable design must become mainstream in order to have a positive effect on our quality of life, Mr. Shamp provides LEED training through the US Green Building Council - Inland Empire, and

has served as instructor or guest lecturer at UC Riverside Extension, San Bernardino Community College, and the University of Redlands.

Mr. Shamp holds a Bachelor of Arts with a double major in architecture and art/art history and a Bachelor of Architecture, both from Rice University. He has been a licensed Architect in the state of California since 2003 (license number C29013), and is accredited with the National Council of Architectural Registration Boards (NCARB). He is also a Qualified Commissioning Provider (QCxP), a LEED® Accredited Professional since 2003, and a member of the American Institute of Architects, US Green Building Council, ASHRAE, and the California Association of Building Energy Consultant

