ATTACHMENT D

MEMORANDUM

DATE: November 4, 2016

TO: Planning Commission and
Open Space and Ecology Committee

FROM: Ken Johnson, Senior Planner

SUBJECT: State Building Code Update and Adoption

The City is in the process of updating its Building Code consistent with the State's triennial update of the California Building Code (CBC) which will take effect January 1, 2017. The Code update will be scheduled for City Council review in December 2016.

As occurs in every code update cycle, the 2017 update has implications on a series of City-adopted "reach codes", which are local ordinances that exceed state mandated requirements in specific topic areas. The City of Brisbane has building/development site related reach codes for indoor and outdoor water conservation, waste recycling and diversion, and green buildings.

The purpose of this memorandum is to address how City reach codes will be impacted by the 2017 CBC and to discuss how City environmental and sustainability-related goals associated with building construction will be addressed. One of the key proposed code amendments is to add a new energy generation/conservation reach code, which is to be included for Council's consideration. This is consistent with the City's Climate Action Plan (CAP) goal of reducing the City's carbon footprint to aid in reducing the future impacts of increased global warming.

Energy Generation/Conservation: As indicated above, consistent with the CAP and as has been expressed multiple times by members of the Planning Commission and OSEC, newly proposed energy generation and conservation ordinance provisions are proposed in conjunction with this CBC adoption.

By way of background, with the current 2013 CBC cycle, the estimated improvements in building energy efficiencies for new construction were to yield energy use reductions of 25 percent for new residential buildings over the previous CBC and 30 percent for non-residential buildings. With this 2016 cycle, it's estimated by the California Energy Commission (CEC) that residential buildings will use 28 percent less energy versus buildings constructed under the 2013 CBC. The state's goal, as expressed in these CBC code trends, is that all new residential construction will be zero net energy (ZNE) by 2020 and that non-residential will be ZNE by 2030. To date, energy use reductions are largely borne out by building envelop, HVAC and lighting efficiencies. Additionally, although solar readiness is required in the 2016 CBC, installation solar on new buildings is not.

It also important to note that any local jurisdiction energy code that goes beyond the state mandated minimums must have a Cost Effectiveness Study completed and approved by the California Energy Commission (CEC) prior to the effective date of the ordinance. Independently undertaking this process can be costly and time consuming. However, jurisdictions may use other jurisdiction's approved Cost Effectiveness Study for the same provisions within the same climate zone. Therefore, where reach code cost effectiveness data is available that is applicable to other jurisdictions and that fits with the Brisbane's own goals, it is prudent to utilize it.

With that in mind, staff has researched other potential energy reach codes that the City might use as a model to require solar energy generation and other companion measures. At the time of this writing, there is one jurisdiction listed with the CEC that is within our climate zone with a Cost Effectiveness study approved for an energy reach code and that is the City of San Mateo. San Francisco has a reach code in process, as does Portola Valley. San Mateo's ordinance includes cool roof requirements for low-pitched roofs and rooftop solar, for both residential and non-residential new construction, consistent with the Brisbane's CAP. These reach code requirements are fairly straightforward and modest. The cost effectiveness study showed that the added costs for the measures would be cost effective over time (see attached excerpts and for a complete cost effectiveness report see CEC's webpage: http://www.energy.ca.gov/title24/2016standards/ordinances/). Given that, San Mateo's ordinance provides a good model for Brisbane. Also, note that additional measures may be added as code amendments at the discretion of City Council and subject to CEC rules at any time.

Staff will be presenting an energy generation and conservation ordinance based on the San Mateo model to City Council, along with the adoption of the 2016 Edition of the CBC, in December. An outline of the key draft provisions are provided as an attachment to this memorandum and excerpts from the Cost Effectiveness Study are also attached.

Green Building Ordinance: The Green Building Ordinance, BMC 15.80, was originally adopted in 2007. In 2012, City Council directed that OSEC and the Planning Commission form a subcommittee, which was comprised of 2 members each, to provide recommendations on potential updates to the Green Building Ordinance (GBO). The subcommittee worked from 2012 to 2013 to provide recommendations for updates to that chapter. However, prior to providing their recommendation to City Council, the State's triennial update, 2013 Edition of the CBC, surpassed what the subcommittee's recommendations for the reach code would have implemented. Ultimately there were unresolved questions as to whether an updated GBO would be materially more effective than the updated state codes and no update to the GBO was recommended at that time. The subcommittee questioned the use of these third party systems and the apparently small incremental advantage over the state's mandatory requirements relative to the cost. This incremental green building advantage versus cost continues to be a moving target and may be immeasurable except on a project specific basis. The 2007 Green Building Ordinance remains in effect in Brisbane.

The Green Building ordinance still requires LEED silver equivalency for non-residential covered projects and Build-It-Green rating equivalency for covered residential projects. To date, no projects have been built that were subject to the ordinance, due to fairly large project size thresholds and construction in Brisbane being comprised of smaller projects since adoption of the ordinance in 2007.

When the 2016 CBC adoption ordinance is brought to Council in December, Council may choose to provide further direction as to whether it would like to revisit the City's Green Building Ordinance. In the meantime, the Green Building Ordinance remains effective and applicable to large residential and non-residential projects in Brisbane.

Water Conservation: In 2010, the City adopted the Water Conservation in Landscaping Ordinance and the Indoor Water Conservation Regulations, consistent with Bay Area Water Supply & Conservation Agency (BAWSCA) model ordinances, as BMC Chapters 15.70 and 15.72. In response to the ongoing drought, Governor Brown issued an executive order in April of 2015 directing state agencies to implement immediate measures to save water. The Dept. of Water Resources then adopted the State's Model Water Efficient Landscape Ordinance (MWELO) which became effective statewide last December. Around that same time, BAWSCA provided an update to the regional model ordinance which surpassed the state's ordinance and the City refined and adopted the regional model in early 2016.

The City's water conservation in landscaping ordinance is more conserving than the state's regulations in several ways. First, it would capture more projects in that it reduces the threshold for covered projects from the state's 2,500 sq ft to 1,000 sq ft on replacement landscapes. New development has a threshold of 500 sq ft of irrigated landscaping under both the City's and the state's regulations. Both the City and state have a prescriptive compliance option, or a water budget calculation option for compliance, with the permit application requirements being less rigorous with the prescriptive option. Under the prescriptive option the state allows for turf, but Brisbane's ordinance does not. It is also more restrictive in that it requires at least 80% of the irrigated landscape areas to be installed with native, low to very low water using plants for residential and 100% for commercial landscapes. The state's regulations require only 75% low water use plants under the residential prescriptive option. Given that the City's ordinance is already more water conserving than the state's regulations no changes are being proposed at this time.

The Indoor Water Conservation ordinance has not been updated since 2010 and now virtually all of the low flow water fixture requirements have been met by the state's minimum requirements, so those provisions are redundant. Amendments are being proposed as appropriate to remove the water use references that have now been surpassed or met by the state's regulations.

Waste Recycling and Diversion: Similar to the indoor water conservation ordinance, the City's waste recycling and diversion ordinance surpasses the state's new mandatory requirements in some areas but not in others and amendments will be presented to Council for consistency, while retaining requirements that will continue to surpass the state's.

The 2016 Edition of the CBC, CalGreen, covers only waste for new construction, whereas the City's ordinance covers demolition of 200 sq ft or more and reroofing of 500 square feet or more. These provisions would be retained. Although the City's ordinance is more conserving in covering more projects, it is still due for an update in this cycle to 1) ensure consistency of terms, 2) to address waste management plans requirements and 3) to increase the minimums amounts for recycling, salvage and reuse for covered projects from 50 to 65 percent, per state requirements.

Conclusion: This report is provided for the Planning Commission's and OSEC's consideration and staff will forward any of the Commission's and OSEC's recommendations to City Council as it considers code adoption in December 2016.

Attachments:

A. Summary of Preliminary Draft of Key Provisions for a New Brisbane Energy Conservation Code
B. ~~Excerpts - City of San Mateo 2016 Building Energy Effieiency Reach Code, Cost Effectiveness Study, May 9, 2016, by TRC~~ – Provided to Council separately
C. California Energy Commission FAQ Sheets

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Attachment A

Summary of Preliminary Draft of Key Provisions for a New Brisbane Energy Conservation Code

The following would be in addition to state energy code requirements:

Cool Roof Draft Provisions:

1. **New Non-residential Buildings:**
   a. Low-sloped roofs shall have:

      i. A minimum aged solar reflectance of 0.70 and a minimum thermal emittance of 0.85; or

      ii. A minimun Solar Reflectance Index (SRI) of 85.

   Exceptions:
      i. Roof constructions that have a thermal mass with a weight of at least 25 pounds per square foot over the roof membrane are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.

      ii. An aged solar reflectance less than 0.70 is allowed provided the maximum roof/ceiling U-factor in Table 140.3-B of the Energy Code is not exceeded.

2. **New High-rise residential buildings, hotels and motels:**
   a. Low-sloped roofs shall have:

      i. A minimum aged solar reflectance of 0.70 and a minimum thermal emittance of 0.85; or

      ii. A minimum Solar Reflectance Index (SRI) of 85.

   Exceptions:
      iii. Roof constructions that have a thermal mass with a weight of at least 25 pounds per square foot over the roof membrane are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.

      iv. Roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels is exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.

3. **New Low-rise residential buildings**
   a. Low-sloped roofs shall have:

      i. A minimum aged solar reflectance of 0.70 and a minimum thermal emittance of 0.85 or a minimum SRI of 85:

Exceptions:

      ii. Roof constructions that have a thermal mass over the roof membrane with a weight of at least 25 pounds per square foot over the roof membrane are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.

iii. Roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels is exempt from the minimum requirements for solar reflectance and thermal emittance or SRI.

Solar Installation Draft Provisions

A. Solar photovoltaic systems shall be installed on both non-residential and residential building types as follows:

1. New Non-residential buildings:

a. Buildings with less than 10,000 square feet of gross floor area shall provide a minimum of a 3 kilowatt photovoltaic system.

b. Buildings with 10,000 square feet or more of gross floor area shall provide a minimum of a 5 kilowatt photovoltaic system.

2. New Residential Buildings:

a. Single-family buildings and duplexes shall provide a minimum of a 1 kilowatt photovoltaic system.

b. Multifamily buildings of 3 to 16 units shall provide a minimum of a 2 kilowatt photovoltaic system.

c. Multifamily buildings of 17 units or more shall provide a minimum of a 3 kilowatt photovoltaic system.

3. Exception: As an alternative to a solar photovoltaic system, all of the building types listed above may provide a solar hot water system (solar thermal) with a minimum collector of 40 square feet.

Infeasibility Exemption
If an applicant believes that circumstances exist that make it infeasible to meet the requirements of this chapter, the applicant may request an exemption via written request to the building official. In applying for the exemption, the burden is on the applicant to demonstrate infeasibility to the satisfaction of the building official.

Attachment C

2016 BUILDING ENERGY EFFICIENCY STANDARDS
FREQUENTLY ASKED QUESTIONS

What are Building Energy Efficiency Standards?

Building Energy Efficiency Standards are designed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. These measures (Title 24, Part 6) are listed in the California Code of Regulations.

The California Energy Commission is responsible for adopting, implementing and updating building energy efficiency. Local city and county enforcement agencies have the authority to verify compliance with applicable building codes, including energy efficiency.

Why are energy standards important?

Since 1978, Energy Efficiency Standards make buildings more comfortable, lower energy costs and reduce greenhouse gas emissions. Standards ensure that builders use the most energy efficient technologies and construction.

Why do the standards need to be updated?

The Energy Commission is required by law to adopt standards every three years that are cost effective for homeowners over the 30-year lifespan of a building. The standards are updated to consider and incorporate new energy efficient technologies and construction methods. The standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants and help preserve the environment.

The effective date of the Standards is January 1, 2017.

How much will these standards add to the cost of a new home?

On average, the 2016 Building Energy Efficiency Standards will increase the cost of constructing a new home by about $2,700, but will save $7,400 in energy and maintenance costs over 30 years. In other words, when factored into a 30-year mortgage with a 5 percent interest rate, the standards will add about $11 per month for the average home, but will save consumers roughly $31 on monthly heating, cooling, and lighting bills.

How much energy will the 2016 standards save?

Single family homes built to the 2016 standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards. In 30 years, California will have saved enough energy to power 2.2 million homes, reducing the need to build 12 additional power plants.

Do the 2016 residential standards get us to zero net energy?

In 2008, California set bold energy-use reduction goals, targeting zero net energy (ZNE) use in all new homes by 2020 and commercial buildings by 2030. The ZNE goal means new buildings must use a combination of improved efficiency and distributed renewable energy generation to meet 100 percent of their annual energy need.

The 2016 standards will not get us to ZNE. However, they do get us very close to our goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve ZNE for newly constructed residential buildings throughout California.

Who supports the standards?

The California Building Industry Association supports the adopted standards as does the Natural Resources Defense Council and other environmental groups, investor owned utilities such as Pacific Gas & Electric and Southern California Edison, and publically owned utilities such as the Sacramento Municipal Utility District.

What buildings are covered by the standards?

All new construction of, and additions and alterations to, residential and nonresidential buildings are covered except hospitals, nursing homes, correctional centers, jails, and prisons.

Why do the standards vary by climate zone?

Measures that are cost effective in more extreme climates may not be cost effective in milder climates. Requiring measures by climate zone ensure that a building will have the most energy efficient features for that area. There are 16 climate zones in the state (www.energy.ca.gov/maps/renewable/building_climate_zones.html).

How can I learn more about the Standards?

Contact the Energy Commission's Energy Standards Hotline toll-free at (800) 772-3300 or (916) 654-5106 or email title24@energy.ca.gov.

Additionally, the Energy Commission's Blueprint newsletter is available at: www.energy.ca.gov/efficiency/blueprint/

Based on CBC Mandatory Provisions

CALIFORNIA'S 2016 — RESIDENTIAL BUILDING ENERGY EFFICIENCY STANDARDS

CALIFORNIA ENERGY COMMISSION

$7,400 SAVINGS OVER A 30 YR. MORTGAGE | INITIAL COST $2,700

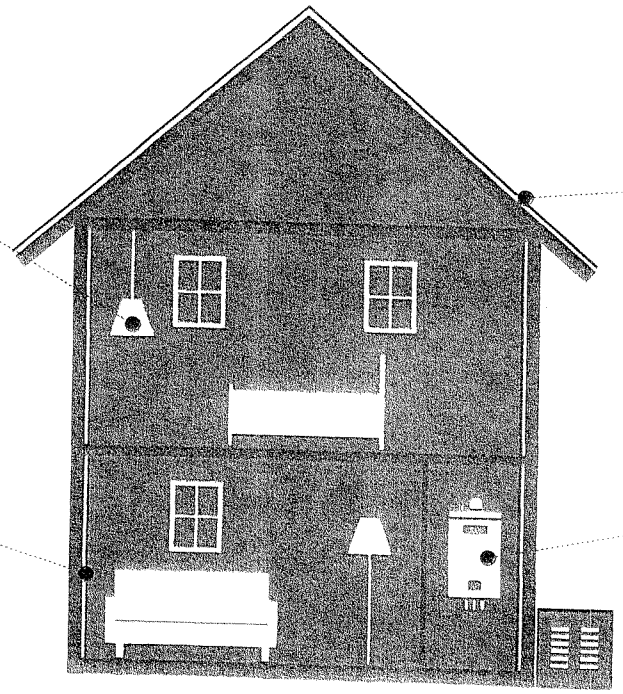
The state's energy efficiency standards for new buildings and appliances have saved consumers billions in reduced electricity and natural gas bills. The building standards include better windows, insulation, lighting, air conditioning systems and other features that reduce energy consumption in homes and businesses. Since 1978 these standards have helped protect the environment by reducing more than 250 million metric tons of greenhouse gas emissions (or the equivalent of removing 37 million cars off California roads).

HIGH EFFICACY LIGHTING

All lighting in new homes must be efficient. Installation of high quality lighting with controls that nearly halve the energy required for lights in new homes.

HIGH PERFORMANCE WALLS

Increased wall insulation keeps the sun's heat out of your home during hot summer months and warm air in during winter months, improving comfort and reducing energy consumption.



HIGH PERFORMANCE ATTICS

Attics with additional insulation at the roof deck keep attic temperatures closer to ambient, improving the home's heating and cooling performance. Extra insulation at the roof deck, in addition to the ceiling insulation, will reduce the attic temperature by 35 degrees or more during hot summer days.

IMPROVED WATER HEATING SYSTEM EFFICIENCY

Installing tankless water heating technology and better distribution systems reduces the energy needed to provide hot water to the home by about 35 percent.

These are cost effective measures that home builders may consider to achieve new levels of efficiency. They can be traded for other efficient technologies such as higher efficiency HVAC units, higher efficiency water heaters, etc.

Based on CBC Mandatory [illegible]

CALIFORNIA'S 2016 — NONRESIDENTIAL
BUILDING ENERGY EFFICIENCY STANDARDS

CALIFORNIA ENERGY COMMISSION

The state's energy efficiency standards for new buildings and appliances have saved consumers billions in reduced electricity and natural gas bills. The building standards include better windows, insulation, lighting, air conditioning systems and other features that reduce energy consumption in homes and businesses. Since 1978 these standards have helped protect the environment by reducing more than 250 million metric tons of greenhouse gas emissions (or the equivalent of removing 37 million cars off California roads).

DOOR AND WINDOW INTERLOCKS

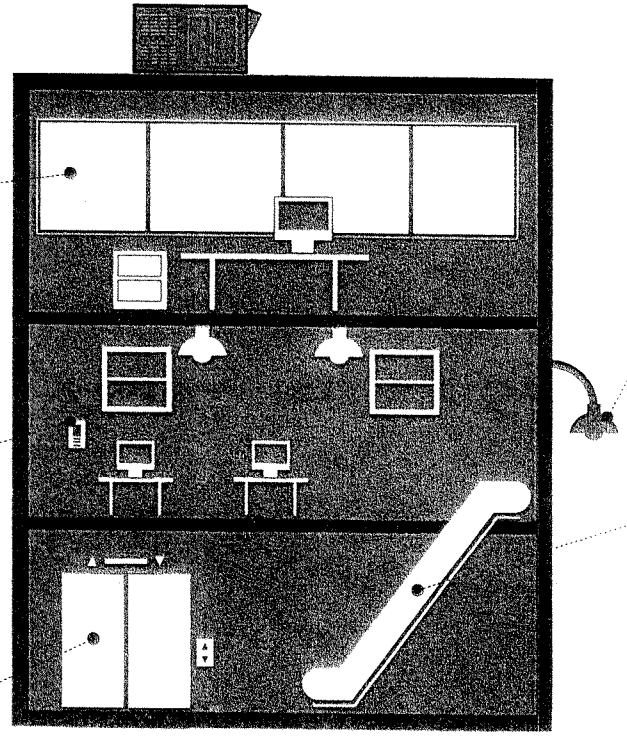
Sensors on doors and windows adjust the thermostat to turn off the heating or cooling if a door or window is left open for more than five minutes. This allows occupants to take advantage of outside temperatures and save on heating and cooling costs.

DIRECT DIGITAL CONTROLS

For larger heating, ventilation and air conditioning systems, installing digital controls enables communication with building energy management systems, allowing managers to tailor the building's heating and cooling demands and prevent waste.

ELEVATORS

Efficient ventilation fans and lighting sources installed within the elevator, along with controls that turn off the cab lighting and fans when the elevator is empty, save energy both when the elevator is in use and when empty.



These are cost effective measures that builders may consider to achieve new levels of efficiency. They can be traded for other efficient technologies such as higher efficiency HVAC units, higher efficiency water heaters, etc.

OUTDOOR LIGHTING

The general power allowance for outdoor lighting has been lowered to include newer, more efficient luminaires which are widely available and commonly used for outdoor lighting applications.

ESCALATORS

Requires escalators and moving walkways in transit areas to run at a lower, less energy-consuming speed when not in use.