USE OF DARKER EXTERNAL COLOURS FOR DWELLINGS WITHIN THE HILLSLOPES

Sarah Cook : 8/26/35: 3741576v2

RECOMMENDATION:
That Council notes the report.

EXECUTIVE SUMMARY:

At Council's Ordinary Meeting on 26 September 2012 it was resolved that a report to be provided to Council detailing the scientific justification for the use of darker colours on walls and roofs of dwellings within the hillslopes.

This report details the history of the colour and reflectivity provisions for development on the designated hillslopes within the Cairns region. The report also explores the requirements of the energy equivalence rating of the Queensland Development Code and the Building Code of Australia in the context of the hillslopes colour palette.

It concludes that if Council has a desire to progress hillslope colours as an issue then it is able to be addressed in further detail as part of the preparation of the new planning scheme.

INTRODUCTION:

The hillslopes are a natural attribute of the region that have been recognised by successive Councils through the planning schemes since the 1980’s and in more recent times through Council’s Corporate Plan.

One of the desired outcomes of the planning provisions is for the protection of the visual amenity and landscape character afforded to the region by the hillslopes. A mechanism for protecting the hillslopes and preserving their scenic amenity qualities is through the application of a palette of appropriate colours for new development within the designated hillslopes.

The star rating of energy equivalence has been in place for new residential developments since 2003. In 2010 the energy rating requirement for new houses increased to meet a minimum 6 star energy equivalence.

Amongst the measures used to increase a dwellings ‘star rating’ is the colour selection and reflectivity of the external fabric of the building. A colour and fabric which results in less absorption of solar gain and increased reflectivity has the potential to have a positive effect on the internal environment of a dwelling.
The purpose of this report is to explore the scientific justification for the provisions of the current planning regime for the use of darker colours as the finish for external walls and roofs in new developments within the designated hillslopes of the Cairns region.

**BACKGROUND:**

**Planning Scheme Protection**

The Hillslopes Overlay of the CairnsPlan Planning Scheme area covers the designated hillslopes (of the former Cairns City Council area only) and provides protection to the scenic amenity and landscape values through built form outcomes.

The requirement for development within the hillslopes to be finished in a colour which blends with the surrounding vegetation and landscape is contained within Acceptable Measures A2.17 – A2.19 of the Hillslopes Overlay Code.

The requirement for the built form of development to be finished in a darker colour and to be non-reflective in finish corresponds to Performance Criterion P2 which relates to *the landscape character and visual amenity quality of the Hillslopes are retained and remain the scenic backdrop to the city.*

The areas designated as being within the hillslopes have been refined with each successive planning scheme. It is considered that the hillslopes which are currently designated accurately reflect the extent of the hillslopes requiring protection from incompatible development.

**Scenic amenity study**

The Desired Regional Outcomes of the Far North Queensland Regional Plan require the regional landscape and natural resource values of the region are *identified, protected and managed through an integrated planning approach.* Council has engaged a consultant to undertake a Scenic Amenity Study, which is near completion, to identify the regional landscape and natural resource values of the region. The study will also recommend protection measures for inclusion within the new planning scheme, which will apply across the Region.

The recommendations of preliminary draft documents include those which aim to ensure Council decisions protect the visual dominance of the natural landscape is retained. Built form controls should be implemented to retain vegetation and to ensure sensitive integration of new built form. These recommendations substantiate the current protection mechanisms of current and past planning.

**Energy efficiency**

The Queensland Development Code has required new dwellings and certain renovations and additions to satisfy a minimum rating for energy efficiency since 2003. On 1 May 2010 a 6-star minimum energy equivalence requirement for new housing was introduced. This requirement is contained within the Queensland Development Code MP4.1 – Sustainable buildings and the Building Code of Australia. It applies to all new class 1 buildings (houses & townhouses) and to alterations or additions to existing class 1 buildings.
The objective of the standard is for a range of passive design features to be included into the built form of dwellings so that the overall energy efficiency of a dwelling can be improved.

The requirements for energy efficiency for new dwellings are contained within P2.6.1 of the Building Code of Australia. The objective of this section is to reduce greenhouse gas emissions and is based on the premise that a building should be capable of achieving the reduction through energy efficiency derived from appropriate design. In short this is achieved through an internal environment in which conditions are sufficiently moderate for occupants so as to minimise their use of artificial cooling (or heating).

The overall requirement of P2.6.1 is that a house must have features that provide the required level of thermal performance in order to facilitate the efficient use of energy to reduce greenhouse gas emissions. It is important to note that the term ‘to the degree necessary’ has been included to recognise that there are circumstances where some of the features may not be appropriate or may be unnecessary or impractical to regulate.

P2.6.1 covers those aspects of the building fabric that must be considered for a building to achieve the required thermal performance. The design elements which, when applied to house design in this climatic zone, can have a positive impact on the energy efficiency rating include:

- location and orientation of habitable rooms and non-habitable rooms, positioning non-habitable rooms such as garages or laundries to take the afternoon sun;
- consideration of the direction of the direction of prevailing breezes, especially those in summer;
- minimisation of east and west facing walls;
- wider eaves and awnings to shade walls and windows;
- natural ventilation and good cross ventilation achieved through appropriate alignment and size of openings in both internal and external walls;
- increased insulation in the roof space and walls;
- treated glazing, particularly for windows facing west and north-west;
- lighter coloured roofs and external walls which also reflect solar gain away;
- well designed and located outdoor living areas;
- the ‘thermal mass’ of the materials selected a reduced thermal mass allows for quick release of retained heat once the day starts to cool down;
- the ability for the building to be sealed so that cooling is efficient, when used;
- the use of suspended floors made of light-weight materials
- the height and the pitch of roof;
- the inclusion of ventilation measures within the roof cavity;
- the height of ceilings.

The external colour and reflectivity is one of many possible design features which contribute to increasing the energy efficiency of a dwelling. Lighter colours, in terms of their solar surface absorbance value, have better thermal performance than darker colours.
The relative reflectivity of the surface is also a critical component in ensuring better thermal performance. The more thermal heat which can be reflected away, the less absorption. Reflectivity can be achieved by using insulation underneath the roof which re-reflects heat back up through the roof, reducing its potential to be absorbed into the roof cavity.

A number of roof paints and roof fabrication technologies which aim at reducing thermal absorption are becoming more prevalent. These are not enforceable as individual products but offer improved ways of meeting energy efficiency targets.

**COMMENT:**

The purpose of the colour and reflectivity restrictions of development on hillslopes is to preserve the scenic amenity and landscape character. The restriction of the colour palette is one of the most successful mechanisms in reducing the visual prominence of development.

It is recognised that a lighter colour and increased reflectivity of external materials and roofing products can be a contributing factor to increasing a dwelling’s energy efficiency. However, this is only one of many design elements that can be incorporated into design to increase energy efficiency and reduce greenhouse gas emissions.

The preservation of scenic amenity and the encouragement of a built form which improves energy efficiency and reduces greenhouse gas emissions are both important principles for housing and living comfort. However, the hillslopes are a highly visible portion of the region and community has supported their protection through planning schemes for some time now.

**CONSULTATION:**

Public consultation will be undertaken as part of the preparation of the new Cairns Region Planning Scheme. During this time Council has the ability to canvas the opinion of the broader community on the topic of hillslopes and outcomes for scenic amenity.

**CONCLUSION:**

It is important to note that no single feature alone can maximise a home’s thermal performance and that the energy efficiency of a dwelling cannot be assured by building in appropriate measures as the house also needs to be used and maintained in an appropriate way to realise energy efficiency.

However, the final colour and reflectivity of a development can have a significant impact on the protection of the scenic amenity of the hillslopes.
There is no particular scientific justification for having darker colours in hillslope areas other than to improve outcomes of development in the scenic landscape. The debate is recommended to be left for the review of the new planning scheme where options can be clearly canvassed for broader input through community consultation.

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