

Schedule 1 Interim Narara Ecovillage Building Standards & Guidelines

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Schedule 1 Interim Narara Ecovillage Building Standards & Guidelines



- Our **Vision** is for an environmentally, socially and economically sustainable world.
- Our **Mission** is to create a sustainable ecovillage as a demonstration of this vision.
- Our **Aim** is to research, design and build a stylish, inter-generational, friendly demonstration ecovillage at Narara, blending the principles of ecological and social sustainability, good health, business, caring and other options that may evolve for our wellbeing.

1. Introduction

The Interim Narara Ecovillage Building Standards & Guidelines (the Building Standards) have been developed in support of the community's vision, mission and aims.

The NEV Building Standards have been developed and implemented by the NEV Community to further our aims to research, design and build a thriving Ecovillage which demonstrates our commitment to ecological and social sustainability

The standards seek an outcome based on inclusive decision making, good design, good health and the wellbeing of all community members. They encourage small and inexpensive houses knowingly designed to provide thermal comfort, low water use and low energy consumption. The standards also seek innovation from community members in the design of their homes and the use of recycled and locally sourced materials wherever possible. We are all seeking homes with a significantly reduced impact on the environment when compared to the "average" house currently built in NSW and in Australia as a whole.

We aim for standards equal to the current best practice, and which incorporate higher sustainability and performance outcomes than those set by other commonly used rating tools. In addition, we seek cost-effective outcomes for all sustainability elements incorporated into the homes of community lot owners.

The Building Standards will be reviewed regularly by the Building Review Panel, who will report to the Community Association. The Building Review Panel is focused on improving the standards with reference to our community aims, affordability and building performance.

Please contact Grant Rickey (glickey@gmail.com) from the Building Standards Working Group if you have any question regarding these Standards.

Background to the Building Standards

Our Building Standards are based on:

- i) Conserving potable water and managing stormwater, greywater & blackwater. (Greywater is waste water from showers and basins and blackwater is water from toilets.)
- ii) Reducing greenhouse gas emissions generated by a building's thermal performance and other energy use in a building.
- iii) Supporting increased use of renewable energy.
- iv) Managing peak power demand.
- v) Lowering the environmental impacts of building materials by reducing their embodied energy and toxicity.
- vi) Minimising construction and domestic waste.
- vii) Managing the indoor environmental quality of building, including air quality, lighting, thermal conditions, pollutants and ergonomics, and the effects of these elements on building occupants.

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- viii) Encouraging innovation.
- ix) Placing livability, adaptability and resilience at the core of good building design.

The NEV Building Standards:

- i) Extend the sustainability targets for energy and water set by the Building Sustainability Index (BASIX), which is the sustainable planning measure implemented under the Environmental Planning and Assessment Act. BASIX applies to all residential dwellings and is part of the development application process in NSW. <https://www.basix.nsw.gov.au/>
- ii) Incorporate lessons learned from other assessment tools in common use, and from the building standards of other ecovillages, community associations and green developments including Lochiel Park, South Australia; Aldinga Arts Eco Village; The Bend Neighbourhood Association BEND; The Ecovillage at Currumbin; Green Star; BASIX; STEPS & BESS.
- iii) Have been independently reviewed by external reviewers, including experienced sustainability Architects and Builders

Like BASIX, the NEV Building Standards establish mandatory minimum standards for some sustainability elements¹

Building Performance Targets

BASIX requires a 40% reduction of greenhouse gas emissions and town water usage for a standard NSW house. This standard was set in 2004, and NSW has fallen behind other states in energy efficiency standards that were adopted in 2011.

The NEV Building Standards have benchmarked reductions like those used in the state of Victoria's Built Environment Sustainability Scorecard (BESS) and we have set an initial reduction level compared to the BASIX standard 2004 house, at:

- i) 70% for greenhouse gas emissions,
- ii) 70% for potable water usage, and
- iii) a similar reduction for other Categories.

2. Smart Grid Compatible Equipment

Narara Ecovillage infrastructure incorporates advanced smart grid technology which uses a variety of operational and energy measures including smart meters, smart appliances, and renewable energy resources to control the production and distribution of electricity within the NEV mini-grid

A schedule of smart grid compatible equipment, including smart meters and inverters is located on the wiki at:

<https://wiki.nararaecovillage.com/display/BIMIT/Smart+Grid+Compatible+Equipment>.

The page is maintained and updated by NEV so that Lot Owners can be informed on the correct equipment to choose for installation in their home to achieve the maximum benefit from the smart grid.

¹ Refer [Table 1 - NEV Building Ratings Scheme Summary - The Initial Minimum Reduction Levels](#) for more information on mandatory elements.

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3. Landscape Standards and Guidelines

NEV's Landscape Standards and Guidelines are also located on the NEV Wiki at:

<https://wiki.nararaecovillage.com/display/CDT/Landscape+standards+CMS+Schedule+2>

This document and should be read in conjunction with these Building Standards & Guidelines.

4. Design Assessment Scoresheet

The home designs of Lot Owners are assessed against the Building Standards using the Design Assessment Scoresheet.

The Scoresheet is located on the wiki at:

<https://wiki.nararaecovillage.com/display/BIMIT/Building+Standards+-+Design+Assessment+Scoresheet>

The Scoresheet measures the resources that a NEV dwelling uses, and considers the house energy emissions and water consumption in a similar manner to the 2004 BASIX benchmark, but seeks an initial reduction of estimated consumption that is less than 70% of the BASIX 2004 benchmark for both. Goals for each category in the Scoresheet are provided in the following table.

Scoresheets may be filled out by either the lot owners, the lot owner's design consultants or by a Nev Registered Assessor. The Lot Owner is responsible for any cost incurred in completing the NEV Scoresheet.

Table 1 – NEV Building Ratings Scheme Summary - Initial Minimum Reduction Levels

CATEGORY	SUB-CATEGORY	GOAL	MEASUREMENT CRITERIA	INITIAL VILLAGE MINIMUM*
Water	Potable Water Usage	Conserve drinking water from NEV dam	Water efficient devices; Water effective landscaping & gardens; Use of recycled water in house; Strategies for high water demand features e.g. irrigation	70% reduction
	Stormwater Greywater & Black-Water Management	Conserve drinking water; reduce stormwater, greywater, blackwater; consume recyclable surplus	Water Sensitive Urban Design (WSUD); how stormwater is harvested; ponds; rain gardens; infiltration systems; buffers incl. water tanks; swales; waterless toilets	70% reduction
Energy	Thermal Performance	Decrease Energy usage	Passive solar house design considering orientation, windows, insulation, thermal mass, shading and ventilation	7 stars' minimum**

CATEGORY	SUB-CATEGORY	GOAL	MEASUREMENT CRITERIA	INITIAL VILLAGE MINIMUM*
Energy	Other Energy Usage	Decrease Other Energy usage	Heating & cooling methods; Hot water units; Appliances; Lighting (type, flexibility & optimizing); Standby power usage; Clothes drying	70% reduction
	Renewable Energy	To at least meet annual demand	Photovoltaic panels	At least meet annual demand
	Peak Power Demand	Reduce summer and winter peak loading	Standby switches/ power boards; Energy monitoring system; Basic control system e.g. timer; Remote control system (app?); Separate circuits for non-essential appliances; load shifting by Electricity Provider; have PV plus battery system; surplus renewable energy above that required to meet the energy demand over the year	(Points are awarded for these items)
Materials	Materials	Lower the health & environmental impact of materials for sourcing, production and disposal	Having a minimum amount of materials; being durable; designing for ease of deconstruction at end of building life; low embodied energy; high recycled content; natural and renewable resource materials; low human health impact materials; locally sourced materials	(Points are awarded for these items)
Waste	Waste	Domestic and construction	Recycle waste streams; reuse and recycling of construction wastes; design to minimise offcuts & waste with prefabrication, using standard sizes etc.	(Points are awarded for these items)
Indoor	Indoor Environmental Quality (IEQ)	Optimum ventilation & acoustics; low pollutant level	Daylighting; type of walling, flooring and design for the acoustic consideration of neighbours; low emission materials, control of mould and condensation	(Points are awarded for these items)
Innovation	Innovation	Foster new ideas	Owners to demonstrate how elements exceed Category minimums NB: Any innovative proposals need preliminary assessment from the BRP at the early design stage.	(Points can be awarded if the requirements of other Categories are exceeded)
Other	Other	Adaptability; Resilience; Noise; Livability	The ease of adapting house for future uses; ability to withstand severe external forces including fires; noise control measures e.g. pump locations (including heat pumps); Ability to improve access for occupants over time	Meet bushfire requirements; design for low noise

Notes

* Initial Minimum reduction in the BASIX benchmark of average NSW household usage per person (in 2004).

** Owners should aim to have their dwellings achieve more than 7 stars where costs are not prohibitive. This will help to provide a higher average Narara Ecovillage Standard across all Categories.

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5. Average Standard

Narara Ecovillage will also calculate the average score of all dwellings in the community by using the scores provided for individual lots by Lot Owners.

The Ecovillage may also be assessed against additional criteria; including::

- i) Food (where the ecovillage will grow some of its food) and
- ii) Transport (e.g. sharing vehicles).

6. Building Design and Approval

A 5-Steps Approval

- a) The Narara Ecovillage Building Approval Process is shown in Figure 1 below and is also included in Annexure 01 on of this document.

- b) Step 1 – Site & Neighbourhood Analysis:

A significant test in building sustainable communities is how Lot Owners deal with their neighbours when placing and sizing their homes. The approval pathway sets down a requirement for Lot Owners to participate in a neighbourhood exchange at early stage of their home design and we recommend the exchange is facilitated by a design professional.

The aim of the exchange is to optimise the location of houses on lots to achieve equity across the neighbourhood in respect of solar access and overshadowing, and to consolidate at an early stage of the design the use of Hill Thalys metrics and common garden easements.

The Building Review Panel's recommendation with respect of access to sunlight is set out in Appendix 3 – Solar Access of these Building Standards. While the criteria set are guidelines only and not mandatory they should inform each neighbourhood exchange.

Which lots are included in a specific neighbourhood exchange will be agreed between the Building Review Panel and Lot Owners, and decided with reference to a lot's potential impact on an adjacent property. Lots impacting each other constitute a neighbourhood for the Facilitated Exchange. As an example, Lots 2 – 6 and Lots 7 – 9 in Stage 1 suggest themselves as natural neighbourhoods.

Outcomes from the Facilitated Exchange are to be documented in a Neighbourhood Agreement, which states the placement and size of Lot Owners' homes and associated structures across the entire neighbourhood.

A Lot Owner's detailed design can now be developed with confidence.

- c) Step 2 – Design Development & Assessment.

The objective of this step is to prepare all documents needed for the Lot Owner to tender their building works and to gain NEV's building approval and Council's development consent.

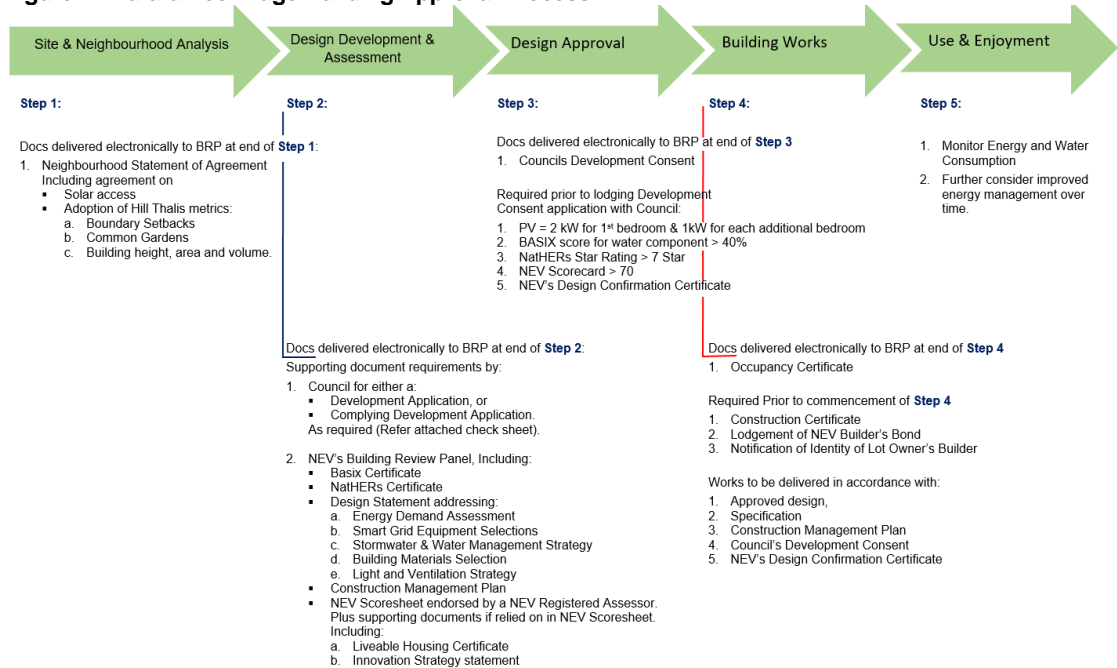
NaTHERS and BASIX certificates are to be obtained by the Lot Owner at their cost as part of their design development.

Lot Owners also complete the Design Assessment Scoresheet and provide any documentation needed to support the information provided in the scoresheet.

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At the end of Stage 2, the NEV Registered Assessor assigned to a Lot Owner will review and endorse the Lot Owner's scoresheet. If the requisite score is achieved, the design will automatically be accepted by the Building Review Panel, and a Design Confirmation Certificate issued.

Figure 1 - Narara Ecovillage Building Approval Process



d) Step 3 - Design Approval:

Once NEV's Design Confirmation Certificate is issued, the Lot Owner can proceed to lodge their plans with Council.

e) Step 4 - Building Works:

The Lot Owner proceeds with their building works.

f) Step 5 – On Completion of Building Works:

Once the building works are completed and an Occupancy Certificate is issued, the Lot Owner's home can be occupied and enjoyed.

Energy use will be monitored by NEV Power. In a situation where energy use significantly varies from design expectations, the Community Association may review energy consumption with the Lot Owner to determine where the variance from design occurs, and to establish strategies for reducing the demand for power.

Differential charges for power may also be applied, with higher rates charged when consumption is more than an agreed limit.

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7. The Construction Stage

Lot Owners are to lodge a refundable bond of \$500 with the Community Association. This is to manage potential damage to Community Association and Co-operative owned property within the ecovillage site caused by a Lot Owner's building works.

Where damage to Common property or Co-operative Property has occurred because of building activity, the Lot Owner shall ensure such damage is rectified in full before the bond is refunded.

Lot Owners may also wish to engage a building inspector to independently check that their work proceeds in accordance with approved construction drawings and specifications, and with the Construction Management Plan.

8. Supporting Documentation

- a) The Lot Owner is to arrange for supporting documents required for the building approval to be made available to the Building Review Panel in electronic pdf format. Documents can be either:
 - i) transferred by the Lot Owner to a dedicated Drop Box folder created for each lot by Community Association, or by
 - ii) providing to the NRA assigned to the lot a memory stick with the required documentation saved to it.
- b) Documents may be provided together or progressively in accordance with the NEV approval process

Step 1: Site & Neighbourhood Analysis

- iii) The Neighbourhood Agreement

Step 2: Design Development & Assessment

- iv) Supporting document requirements by Council for either a:
 - Development Application, or
 - Complying Development Application.
 - As applicable - Refer Annexure B
- v) Basix Certificate
- vi) NatHERs Certificate
- vii) Design Statement addressing:
 - Energy Demand Assessment
 - Smart Grid Equipment Selections
 - Stormwater & Water Management Strategy
 - Building Materials Selection
 - Light and Ventilation Strategy
- viii) Construction Management Plan
- ix) NEV Scoresheet endorsed by a NEV Registered Assessor.

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- x) Supporting documents if relied on in NEV Scoresheet. Including:
 - Liveable Housing Certificate
 - Innovation Strategy statement

Step 3: Design Approval

- xi) A statutory approval certificate:
 - Council's Development Consent, or
 - A statutory certifier's statement of a Complying Development
- xii) NEV's Design Confirmation Certificate

Step 4: Building Works

- xiii) Their Construction Certificate
- xiv) Builders details, or in the case of Owner Builder's their subcontractor details, including:
 - Contact details:
 - ✓ Company name,
 - ✓ Primary contacts name,
 - ✓ mobile number,
 - ✓ email address.
 - Statement of Currency for insurance including: Public & Product Liability; Vehicle insurance; Workers Compensation.
- xv) The construction management plan signed in agreement by the Lot Owner's Builder.
- xvi) Bond lodgment to address damage to the Community Property.

Step 5: Finished Building

- xvii) An occupancy certificate.

9. Roles and Responsibilities

NEV's Community Management Statement establishes several roles to oversee the design approval process within the ecovillage and assigns to those roles some key responsibilities. A summary of those roles and responsibilities follow..

Building Review Panel

The Building Review Panel (the Panel) is appointed by the Community Association at its 1st Annual General Meeting. When constituted, the Panel comprises between 3 and 5 members and is empowered by the Community Association to review Lot Owners' designs prior to submission of those designs to Council for development consent. The Panel's approval or disapproval of designs is made solely on the matters set out in the Community Association's By-laws, its Rules and Building and Landscape Standards referenced in the Community Management Statement

A Lot Owner can make a submission to the Panel concerning their design for the Panel's consideration.

The Panel must provide its decision in writing to the Lot Owner within 40 days of receiving all documentation required in support of an approval application.

Designs are deemed approved unless the Panel provides a written disapproval or requests additional information for the Lot Owner.

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The Panel can impose conditions on its approval.

NEV Registered Assessors

The Building Review Panel maintains a list of accredited NEV Registered Assessors (NRAs) who represent the Building Review Panel in the review of Lot Owners designs described above.

Building Appeals Committee

The Building Appeals Committee is also appointed by the Community Association at its 1st Annual General Meeting and also comprises of between 3 and 5 members.

The Committee hears Lot Owners appeals against decisions made by the Building Review Panel.

An appeal application fee of \$300 applies to any appeal raised by a Lot Owner, of which 50% is refundable if the appeal is successful.

On determining an appeal, the Committee will notify the Lot Owner, the Building Review Panel and the Executive Committee of the outcome, and in regards to the appeal may make recommendation to the Community Association regarding exemptions from or changes to the Building Standards.

Community Association

A Lot Owner may make application to the Building Review Panel or Building Appeals Committee requesting changes to the Building Standards applying to the standards generally or to their own lot. On receiving such a request, the Building Review Panel must refer the request to the Executive Committee for determination by the members in a General Meeting by Special Resolution.

10. NEV Registered Assessors & NEV Building Approvals

In practical terms, NEV Registered Assessors are at the forefront of the Ecovillage's building approval process.

They are to assess the wide variety of building techniques it is hoped Lot Owners will present for approval, and they are asked by the Building Review Panel to welcome innovation in building design and to assist with its implementation. They are required to understand the background to a Lot Owner's design approach, and to support the reasonable requirements of a Lot Owner.

While Lot Owners are expected to make all reasonable endeavours to achieve the outcomes of the Building Standards, if the situation denies them the ability to do so, they should discuss the issue with the NRA and the Building Review Panel as soon as possible, so that alternative arrangements can be discussed and wherever possible implemented.

A single NRA will assess and approve not more than 3 separate Lot Owners designs. A list of 15 NRAs is maintained by the Building Review Panel. The Panel itself is a subset of [3] drawn from the NRA List. The list is displayed on the Building Review Panel's Wiki page located at [link required].

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The assignment of an NRA to a lot is decided by the Building Review Panel by drawing lot numbers from a hat and recording those lot numbers against NRA names listed on the Building Review Panel's Wiki page.

The NRA's role is a voluntary one.

Beyond the minimum requirements set out in the NEV's building approval pathway, the extent of engagement between Lot Owners and NRAs is solely at the discretion of lot owners. It is expected, however, that NRAs will assist each other in their dealings with Lot Owners. At the discretion of lot owners, several NRAs can engage with a lot owner when discussing Building Standard matters - accessing the wisdom of the many.

NRAs are recruited through an Expression of Interest process. For selection, a candidate demonstrates technical skill in the interpretation of domestic building plans and specification and a working understanding of NatHERS, BASIX and the statutory approval process in NSW for residential dwellings. Once recruited, the NRA is further trained through workshops and worked assessments commissioned by NEV to achieve a standardised approach to the assessment of building designs.

Once trained, the NRA demonstrate their ongoing competency through their knowledge of the NEV building approval process and their ability to engage with lot owners in an efficient and productive way, supporting lot owners throughout their project, from the time of the initial site assessment to the day of occupation.

The primary role of the NRA is to champion the NEV Building Standards within the NEV community by providing ongoing advice and guidance to lot owners on how the objectives of NEV building standards can be achieved.

The core responsibility of the NRA is to demonstrate veracity in reviewing and endorsing completed NEV Scoresheets.

11. Building Approval Appeals

NEV's building standards and building approval processes are addressed in Part 4 of our Community Management Statement, the following by-laws being relevant:

- By-Law 41 - Building & Landscape Standards and Guidelines
- By-Law 42 - Building Review Panel
- By-Law 43 - Alterations to Building & Landscape Standards
- By-Law 44 - Current Copy of Building & Landscape Standards and Guidelines
- By-Law 45 - Building Appeals Committee
- By-Law 46 - Conflict Of Interest Committee

Informal and formal approval appeals mechanism are available to Lot Owners and the following key points are noted:

- xviii) Both Lot Owners and NEV Registered Assessor (NRAs) can seek the opinion of the Building Review Panel on any design and approval matter arising during the Lot Owner's engagement with NRAs throughout the entire design and construction of their project.
- xix) The Building Review Panel at its discretion can make Interim Arrangements with Lot Owner on design matter prior to the formal submission of a design subject to the Interim Arrangement:
 - Not contravening either the Building Standards and Guidelines nor the Landscape Standards and Guidelines; and

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- Being made available to the whole NEV Community via publication on the Building Review Panels wiki page.
- xx) A Lot Owner may also make application to the Building Review Panel requesting additions or alterations to the Building Standards and Guidelines or the Landscape Standards and Guidelines applying either generally or to Lot Owners design. In response the Building Review Panel will refer the application to the Executive Committee of the Community Association for determination by members in a General Meeting by Special Resolution.
- xxi) If the matter cannot be resolved by the Building Review Panel than the Lot Owner can make a written application to the Building Appeals Committee.

12. Conflict of interest

The Conflict of Interest provisions of the Community Management Statement apply to NEV building Approval pathways. Building Review Panel, Building Appeals Committee and NRA members must remove themselves from any approval process in which they have a material interest.

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Appendix 2 – Development Guidelines Checklist

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Appendix 3 – Solar Access

- a) Hill Thalys and Central Coast Council vary in reference to their definition solar access and both in turn vary from the Building Review Panel's preferred definition.
- b) The Building Review Panel recommends that Lot's Owners aim for the following solar access when considering the placement and orientation of their homes and also in the facilitated exchange with their neighbours leading to the preparation and signing of a Neighbourhood Agreement:
 - i) At the winter solstice, glazing, irrespective of its size and location, should receive:
 - When North facing, at least 5 hours of sunlight to 80% of the glazing.
 - When North East or North West facing, at least 3 hours of sunlight to 80% of the glazing.
 - When West or East facing, at least 2 hours of sunlight to 80% of the glazing.
 - ii) North facing is defined as between 22.5° East of North and 22.5° West of North.
 - iii) North East facing is defined as between 22.5° East of North and 67.5° East of North.
 - iv) North West facing is defined as between 22.5° West of North and 67.5° West of North

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Appendix 4 – Design Assessment Scoresheet

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