

Project: Sandstone Precinct (23-39 Bridge Street, Sydney) **Project No:** 29212
To: City of Sydney (CoS) **Date:** 28 April 2021
From: Alex Kobler

RE: Sandstone Precinct – NABERS

Introduction

This memorandum has been prepared for the City of Sydney (CoS) on behalf of Pontiac Land Group (PLG) to propose a range of alternate Conditions of Consent in lieu of the current NABERS related DA Conditions for the Sandstone Precinct development, namely Condition B26, F12 and G4.

Stantec, in our role as the Professional Sustainability Engineer, and the project team believe these set of conditions are no longer appropriate due to the changes in hotel arrangement. This includes a significant reduction in hotel rooms compared to the original scheme (300-key reduced to 192-key scheme) and the limitations of how NABERS Energy allowance for Hotels is calculated.

As a result, the development is no longer capable of meeting the 4 Star NABERS Energy benchmark performance to satisfy Condition B26. Stantec note this is not due to a reduction in Building Energy Performance, but the calculation protocol outlined by NABERS for calculating energy in hotels.

While GreenPower can be purchased to meet this NABERS energy objective, it is not permitted as part of the NABERS Commitment Agreement peer review process. This presents an issue to satisfy Condition F12 and G4 and ultimately impacting the ability of the Sandstones precinct to achieve Occupancy Certificate.

Hence, Stantec propose a range of potential alternate Conditions of Consent for consideration in lieu of the current NABERS related DA Conditions for the Sandstone Precinct development. The intent is to achieve an equivalent or better environmental performance than what was originally approved, while maintaining the energy efficiency performance that would be achieved under NABERS.

Background

The below summarises the development's design progression up the current situation:

1. At DA stage, both Education and Lands Building were originally designed to be refurbished into hotel developments, holding up to total 300-keys (original scheme). While not subjected to any formal rating, a 4 Star Green Star equivalency design was proposed to form part of the development's ESD strategy. This was chosen as appropriate as it aligned directly with the site's ESD brief prepared by Arup on behalf of the City of Sydney for the site. The development received a Draft DA Condition of Consent (Condition B27) requesting a *formal Green Star Design and As-Built rating* (minimum 4 Star).
2. Given the type of development and the lack of flexibility in design due to heritage constraints, the project team proposed the *formal Green Star Design and As-Built rating* condition (Condition B27) be amended to a more suitable condition for the hotel development. In response, the Council offered an alternate set of conditions to a NABERS Energy Commitment Agreement of a minimum 4 Star NABERS Energy for Hotels rating (Condition B26, F12, and G4). This was agreed upon as the project was pursuing a high level of energy efficiency and the target appeared attainable through best practice and excellent design/management.
3. Stantec were engaged to undertake the modelling for NABERS Hotel rating based on the original scheme – the hotel development (Education & Lands Building) was estimated to achieve close to a 4 Star NABERS Energy outcome.

4. Due to strategic changes outside of the specific DA conditions, the entire project scheme was amended. This included a major reduction in hotel key count. All hotel rooms within the Lands Building were removed as it was re-designed to solely provide ancillary and supporting functions for the Education Building. The number of keys in the Education building was also reduced, but the functional area remained consistent.

Per the predicted NABERS Hotel Energy Assessment report (Rev. 01) prepared by Stantec, the estimated NABERS Energy outcome dropped to 2.5 Stars as shown in the table below because of the reduced NABERS energy allowance and limited hotel scope to the Education Building alone with 192-keys. **Note this 1.5 Star reduction in NABERS rating does not relate to a reduction in energy efficiency in design, but rather a NABERS accountancy issue with the process for calculating NABERS ratings.**

Description	Electricity (kWh/yr)	Gas (MJ/yr)
Heating (Boiler)	-	8,161,611
Cooling (Chiller+ CT)	399,683	-
Misc. Ventilation Fans	493,415	-
HVAC Pumps	212,659	-
Vertical Transportation	131,707	-
Safety, Emergency, house power	44,481	-
Internal Lighting	974,002	-
External Lighting	47,944	-
Split System AC Units	37,230	-
Kitchen Equipment	756,076	2,154,815
Domestic Hot Water	-	4,726,925
Hydraulic Pumps	74,135	-
Swimming Pool Heating	-	1,007,593
Swimming Pool Pumps	26,280	-
Hotel Room Equipment	186,437	-
TOTAL ENERGY USE	3,384,049	16,050,944
Total Carbon (kgCO₂-e)	4,633,015 kg CO₂-e/year	
NABERS Score	2 Star + 58%	

While GreenPower can be purchased to meet the 4 Star NABERS Energy outcome, it is not permitted in the Independent Design Review (IDR) process as part of the NABERS Commitment Agreement. As a result, the current project design is unable to complete its NABERS Commitment Agreement as no signed-off IDR report can be provided to satisfy the NABERS-related DA Conditions (Condition F12 and G4). This presents an issue for achieving Occupancy Certificate, as the executed IDR report will not be possible.

Project Constraints

There are numerous constraints due to the heritage and unique nature of the project that makes achieving a specific NABERS Hotel Energy Rating significantly challenging in practice, including:

- The majority of the internal layouts are remained fixed due to heritage which leaves very little room for flexibility in design. Several rooms are relatively large volumetrically as well as in height which demands greater energy usage to thermally condition the spaces;
- Preservation of the appearance of the existing heritage windows is a heritage requirement by council. While the team have been able to improve the performance by introducing additional glazing behind, the project is limited to maintaining the size of openings and the colour rendering of the original glazing. Limited improvements are possible, particularly when relative to a new curtainwall glazing system and what would be possible.
- The heritage constraints exist on both the interior and exterior, limiting the architecture and services ability to influence positive environmental design;

Despite the heritage constraints described above, Stantec believes the current design scheme has incorporated a variety of ESD initiatives to demonstrate energy efficiency at a high level in line with best practice and excellent design/management. These include but are not limited to the following:

- Thermally efficient façade system selection to exceed the NCC requirements;
- Preservation of the existing sandstone building structure to retain excellent thermal mass for improved passive thermal performance of the building;
- Re-use of existing buildings allows the development to make use of the low window to wall ratio, high thermal mass and the buildings' inherent building energy performance. Performance glazing and secondary glazing layers will further improve building efficiency;
- New plant to the development includes high efficiency chillers, boilers, fans and pumps throughout. Control systems to the rooms and spaces will further drive energy efficiency;
- Guest room management systems with master switches to reduce energy consumption;

While the incorporation of these design initiatives aligned with the project's pursuit of high levels of energy efficiency, this is not recognised by the NABERS scheme due to the limitations of how NABERS Energy allowance for hotels is calculated.

The current NABERS rating tool for hotel developments establishes the energy benchmark performance based on the following key parameters, being:

- Hotel Star Rating – NABERS recognises that there are fundamental difference between hotels in each quality star band in both design and operation. A 5-star hotel is expected to use more energy than an equivalent size 3-star hotel. This is due to the range of services offered to guests (e.g. reception, room service, food, gym, etc.) and hours of operation of those services.
- Number of Rooms in the Hotel – In addition to the hotel quality star rating, NABERS also adjust for the number of guest rooms available for use in the hotel to determine the size of the hotel development. The energy allowance for hotels is largely proportional to the number of guest rooms within the hotel development.

Given the project is intended to be a "6-star" luxury hotel development with Education Building mainly composed of guest rooms with hotel services offerings provided in the Lands Building, the rating tool has penalised the 192-key scheme design outcome as the drop in hotel rooms to accommodate more services offering has imposed a more stringent NABERS benchmark performance requirement onto the project. This performance requirement is foreseen to be no longer achievable as the energy use of the development would need to be halved to achieve the rating.

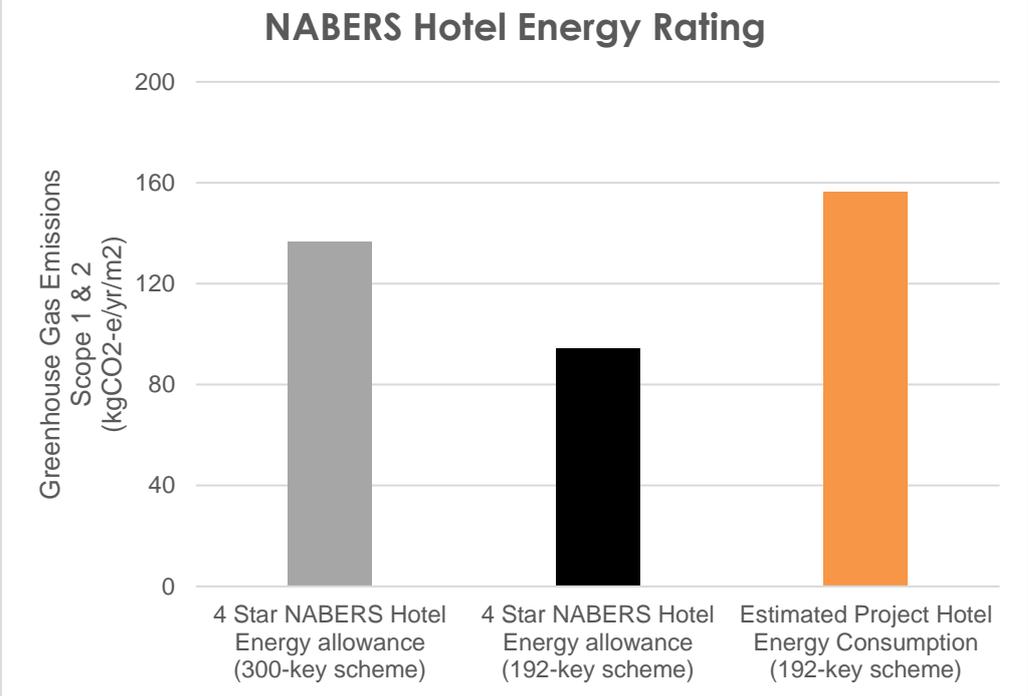
In addition, the rating tool does not integrate the total rated floor area as an input parameter to quantify the energy allowance. This is disadvantageous to not only for this project but to any other hotels of similar quality star rating where it is expected to provide a larger proportion of services offerings than the number of guest rooms, therefore imposing a stricter requirement compared to lower luxury hotels providing a larger proportion of guest rooms than services offerings. If the rating tool had accounted for the total rated floor area in its calculation, the NABERS energy allowance would have been defined more appropriately as it would cater for all quality star hotels irrespective to the proportion between the number of guest rooms and services offerings across the hotel development.

This NABERS accounting issue within the process for calculating NABERS ratings for hotels has been acknowledged by NABERS themselves and is further described in the Consultation Section.

Details of Consultations

A series of consultations has been undertaken to explore possible avenues to address the current NABERS-related Conditions of Consent for the current project scheme (192-key scheme).

Party	Discussion
NABERS	<p>Built and Stantec worked together to explore options with NABERS directly on the issue. Through consultation with NABERS (25th May, 2020), the following was advised on this matter:</p> <p><i>“The main cause of the significant change in the modelling from previously meeting a 4-star NABERS energy objective to becoming 2 stars is due to the drop-in hotels rooms. This is because hotel rooms are a key input in rating tool and keys has almost halved, yet energy usage remains the same. The rating tool does not look at total area which again is why this hotel is disadvantaged since the design changes have occurred. Additionally, the hotel star quality of 6 stars is not currently mapped in the NABERS hotel rating tool as there has not been any 6-star hotels that are not luxury resorts (not a part of hotel tool).</i></p> <p><i>We recommend asking City of Sydney to allow this through as a research style project as it will aid us in mapping to the new ceiling of 6 star quality to ensure future hotels of this manner can be appropriately modelled. We do need to consider the fact that only having one data point makes the modelling to 6 star quality quite limited but we can do our best to work to this parameter” – Sara Rathborne, NABERS Sector Lead</i></p> <p>Below is a visual representation comparing the estimated NABERS Hotel Energy consumption of the current project design (192-key scheme) against the 4 Star NABERS Hotel benchmark performance under the two schemes (i.e. 300-key and 192-key schemes). The 2.5 Star NABERS outcome of the current scheme is due to the inclusion of all energy consumption of all spaces considered as part of the hotel within the Lands Building despite having no keys.</p>

	<p style="text-align: center;">NABERS Hotel Energy Rating</p>  <table border="1"> <caption>NABERS Hotel Energy Rating Data</caption> <thead> <tr> <th>Category</th> <th>Greenhouse Gas Emissions (kgCO₂-e/yr/m²)</th> </tr> </thead> <tbody> <tr> <td>4 Star NABERS Hotel Energy allowance (300-key scheme)</td> <td>~135</td> </tr> <tr> <td>4 Star NABERS Hotel Energy allowance (192-key scheme)</td> <td>~95</td> </tr> <tr> <td>Estimated Project Hotel Energy Consumption (192-key scheme)</td> <td>~155</td> </tr> </tbody> </table> <p>Given the current situation with the 192-key scheme development and the approach with how NABERS Hotel rating defines the performance benchmarks for 6 star quality hotels, NABERS recommends an exemption for the NABERS-related conditions (Condition B26, F12, and G4) in place of assisting themselves to re-define the NABERS Hotel performance benchmarks for 6 star quality hotels.</p>	Category	Greenhouse Gas Emissions (kgCO ₂ -e/yr/m ²)	4 Star NABERS Hotel Energy allowance (300-key scheme)	~135	4 Star NABERS Hotel Energy allowance (192-key scheme)	~95	Estimated Project Hotel Energy Consumption (192-key scheme)	~155
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<p>Pontiac Land Group & Essence PM</p>	<p>Stantec, Pontiac Land Group (PLG) and Essence held a meeting on 27th January 2021 to discuss the possibility for a standalone NABERS rating for each building and any complications that may arise.</p> <p>Stantec has advised that:</p> <ul style="list-style-type: none"> Isolating the NABERS Hotel rating tool to the Education Building alone would achieve a 3.5 Star NABERS Energy outcome. However, this outcome may reduce down to a 3 Star outcome once any Lands Building spaces supporting the Education Building’s hotel function (e.g. “charge-to-room” retail facilities) are accounted for. This has timing implication as the Occupancy Certificate for the Education Building is heavily reliant on the Lands Building to aide in achieving the minimum 4 Star NABERS Hotel Energy outcome. The commercial component of Lands Building (i.e. non-“charge-to-room” retail facilities or public retail areas) can undergo a separate rating under the NABERS Office & Tenancies rating tool. However, there will be metering complications in monitoring the building operational performance for the respective NABERS rated spaces The non-commercial component of Lands Building cannot be rated under the NABERS scheme as it falls outside the available rating tools as shown below. As such, an alternate condition other than a NABERS Commitment Agreement is to be sought. 								

	<p>NABERS Energy ratings for...</p> <ul style="list-style-type: none"> Office Buildings and Tenancies Shopping Centres Apartment Buildings Hospitals (Public) Hotels Data Centres <p>Based on the above discussion and given that both Education and Lands Building have different Occupancy Certificate dates, it is recommended an alternate condition is sought to allow separate assessments to be made for both buildings.</p>
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Proposed Options

Given the current scheme and through the series of consultations detailed above, Stantec propose a range of potential options to Council for consideration as an alternative to address the NABERS-related Conditions of Consent. These include:

1. Adopt City of Sydney’s proposed energy performance standards targets for buildings seeking a DA from 2023, as outlined in the *Planning For Net Zero Energy Buildings Briefing*. This would require demonstration of the development to achieve the energy target of maximum 245kWh/m2/year of GFA.
2. Entering into a Power Purchase Agreement (PPA) for external renewable electricity generation for the ‘gap between actual building performance and 4 Star NABERS benchmark performance’ for a period of 5 years.
3. Retire large-scale generation certificates for the ‘gap between actual building performance and 4 Star NABERS benchmark performance’ for a period of 5 years.

These options are tabled on the following page:

Proposed Options	Explanation						
<p>Option #1: Adopt CoS' 2023 Performance Standards</p>	<p>In March, the City of Sydney outlined their proposed performance standards as part of the transition plan to a Net Zero Carbon city. This is an incremental step process that increases the performance in time.</p> <p>The Proposed Performance standard for the Hotel class is 4 Star NABERS with Commitment Agreement, or as an alternate a maximum consumption of 245kWh/m²/year based on GFA.</p> <p>The table below is an excerpt from the discussion paper for the hotel:</p> <table border="1" data-bbox="379 607 1426 965"> <thead> <tr> <th data-bbox="379 607 533 707">Proposed use</th> <th data-bbox="533 607 956 707">Performance standards - step one Development applications submitted between 1 January 2023 – 31 December 2025</th> <th data-bbox="956 607 1426 707">Performance standards - step two Development applications submitted from 1 January 2026 onwards</th> </tr> </thead> <tbody> <tr> <td data-bbox="379 707 533 965">Hotel (whole building)</td> <td data-bbox="533 707 956 965"> <ul style="list-style-type: none"> - maximum 245.0 kWh/yr/m² of GFA, or - 4 star NABERS Energy CA, or - certified Green Star Buildings rating achieving the "minimum expectation" in Credit 22: Energy Use, or - equivalent </td> <td data-bbox="956 707 1426 965"> <ul style="list-style-type: none"> - maximum 240.0 kWh/yr/m² of GFA, or - 4 star NABERS Energy CA + 10%, or - certified Green Star Buildings rating with a "credit achievement" in Credit 22: Energy Use, or - equivalent <p>AND</p> <ul style="list-style-type: none"> - renewable energy procurement equivalent to "net zero energy" or a maximum of 240.0 kWh/yr/m² of GFA </td> </tr> </tbody> </table> <p>This discussion paper considers 245kWh/m²/year a fair replacement for the target of a 4 Star NABERS Commitment Agreement. Specifically for the Sandstones development, using the /m² metric rather than /key in NABERS allows a fair assessment of the project's sustainability. The project proposed to demonstrate the performance standards outlined in the above performance standards is met under design. Further, the project is committed to achieving this performance in operation.</p> <p>Unlike NABERS, the hotel's change in scheme and room key do not have the same impact. It is proposed the scope of inclusion would include all hotel elements of the development that would be included under NABERS Protocols.</p> <p>The team could have an independent review of the design undertaken by a professional engineer to provide certainty to the City of Sydney, similar to the Commitment Agreement process. Alternately, the clause could require reporting to the satisfaction of the certifying authority.</p>	Proposed use	Performance standards - step one Development applications submitted between 1 January 2023 – 31 December 2025	Performance standards - step two Development applications submitted from 1 January 2026 onwards	Hotel (whole building)	<ul style="list-style-type: none"> - maximum 245.0 kWh/yr/m² of GFA, or - 4 star NABERS Energy CA, or - certified Green Star Buildings rating achieving the "minimum expectation" in Credit 22: Energy Use, or - equivalent 	<ul style="list-style-type: none"> - maximum 240.0 kWh/yr/m² of GFA, or - 4 star NABERS Energy CA + 10%, or - certified Green Star Buildings rating with a "credit achievement" in Credit 22: Energy Use, or - equivalent <p>AND</p> <ul style="list-style-type: none"> - renewable energy procurement equivalent to "net zero energy" or a maximum of 240.0 kWh/yr/m² of GFA
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<p>Option #2:</p> <p>GreenPower Purchase Power Purchase Agreement (PPA) to achieve 4 Star NABERS (with Green Power) at minimum</p>	<p>Amendment to the NABERS-related conditions to include “a minimum 4 Star NABERS with GreenPower”. This involves entering into a Power Purchase Agreement (PPA) for external renewable electricity generation for the ‘gap between actual building performance and 4 Star NABERS benchmark performance’ for a period of 5 years.</p> <p>The inclusion of GreenPower will enable the development to achieve its environmental performance requirements to satisfy all NABERS-related DA Conditions (Condition B26, F12, and G4) as well as allowing the possibility to achieve Occupancy Certificate.</p> <p>Should the above environmental performance requirements not be satisfactory to Council, the project would be willing to pursue a higher NABERS Energy performance targets to demonstrate greater environmental performance over what was originally approved. At most, achieving net zero emission for the building via 100% GreenPower would be demonstrating an equivalent environmental performance standard to the City of Sydney where all electricity purchased is 100% renewable [1]</p> <div data-bbox="371 763 1396 1355" data-label="Figure"> <table border="1"> <caption>NABERS Hotel Energy Rating</caption> <thead> <tr> <th>NABERS Star Rating</th> <th>Greenhouse Gas Emissions (kgCO2-e/yr/m2)</th> </tr> </thead> <tbody> <tr> <td>Project Score</td> <td>~155</td> </tr> <tr> <td>4 Star</td> <td>~95</td> </tr> <tr> <td>4.5 Star</td> <td>~75</td> </tr> <tr> <td>5 Star</td> <td>~55</td> </tr> <tr> <td>5.5 Star</td> <td>~40</td> </tr> <tr> <td>6 Star</td> <td>~25</td> </tr> </tbody> </table> </div> <p>Typically a PPA contract last for a minimum 5 - 10 years and is the desired level of commitment period for this project. Currently as it stands, the City of Sydney’s PPA contract lasts for 10 years to allow price certainty in the volatile electricity market [1].</p> <p>[1]: https://news.cityofsydney.nsw.gov.au/articles/5-things-to-know-about-our-electricity-deal</p>	NABERS Star Rating	Greenhouse Gas Emissions (kgCO2-e/yr/m2)	Project Score	~155	4 Star	~95	4.5 Star	~75	5 Star	~55	5.5 Star	~40	6 Star	~25
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<p>Option #3:</p> <p>Large-scale Generation Certificates (LGC)</p>	<p>Amendment to the NABERS-related conditions to include a commitment to purchase renewable power via LGCs. Similar to Option #2 but rather than entering a Power Purchase Agreement (PPA), this involves the retirement of 5 years’ worth of Large-Scale Generation Certificates (LGC) for the ‘gap between actual building performance and 4 Star NABERS benchmark performance’.</p> <p>From an environmental performance perspective, the outcome would be similar to Option #2 which will enable the development to achieve its environmental performance requirements to satisfy all NABERS-related DA Conditions (Condition B26, F12, and G4) as well as allowing the possibility to achieve Occupancy Certificate.</p> <p>Should the current proposal be not satisfactory to Council, a higher level of NABERS Energy performance targets and commitment period can be pursued to demonstrate environmental performances greater than what was originally approved.</p>														

Conclusion

As outlined in this memorandum, it is the opinion of Stantec and the project team that the current NABERS-related DA Conditions (Condition B27, F12, and G4) is no longer appropriate nor can be met with the current project scheme (192-key scheme) for the Sandstone Precinct development. This is irrespective of the performance and selection of plant and building fabric.

To resolve this matter, a range of alternate Conditions of Consent in lieu of the current NABERS-related DA Conditions is proposed to the City of Sydney for consideration to allow the Sandstone Precinct development to achieve an equivalent or improved environmental performance than what was originally approved as well as relieving any complications in achieving Occupancy Certificate.

Should you have any further queries, please do not hesitate to contact the undersigned.

Yours sincerely,



Alex Kobler
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Stantec Australia Pty Ltd