

3_04_2020

Shelley Bolser

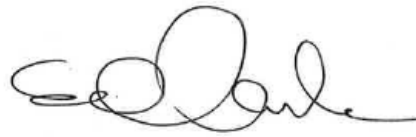
Seattle Department of Construction and Inspections

700 5th Ave Suite 2000, PO Box 34019

RE: 3019699 Response to EIS Addenda, Public Comments

Dear Shelley,

Please find my responses to the *ADDENDUM to the Final Environmental Impact Statement for the Downtown Height and Density Changes EIS* and responses to public comment from Perkins and Will dated 2_18_2020.

A handwritten signature in black ink, appearing to read 'E. Clark', with a stylized, cursive script.

Edward Clark

Director

Dr. Brainard is an outlier in the application of circadian lighting in the public sector. Trusted, validated tools for assessing circadian light are available; have not been used; and should be used.

Although Dr. Brainard is one of the leading experts in the research and innovation of circadian impactful lighting, he is an outlier who is uniquely conservative and resistant to the application of these concepts to the public realm.

New tools have been developed to assess circadian light impacts and those tools are being used now. The science has evolved and industry is rapidly adopting these tools as documented below.

Academia's Development of New Tools to Assess Circadian Light Impacts

Dr. Brainard's contemporaries, fellow innovators, and collaborators, including four of the most prominent circadian science researchers (Dr. Rob Lucas from the University of Manchester, Dr. Stephen Lockley from Harvard Medical School, Dr. Mark Rea and Dr. Mariana Figueiro from Rensselaer Polytechnic) have created tools for practitioners that allow for the thoughtful and rigorous application of circadian impactful lighting strategies within the built environment.

Professor Lockley, as well as Professors Rea and Figueiro, played instrumental roles and provided scientific guidance for the creation of validated modeling tools (Alfa and Lark Spectral Lighting respectively) specifically used to assess circadian light through computer simulation. These tools are for use within the design and construction industry and are being used by those industries now.

Drs. Lockley, Rea and Figueiro routinely advocate for the application of circadian impactful lighting strategies in the built environment, as evidenced by a multitude of lectures, articles in peer reviewed journals, newspapers and magazines, as well as workshops given at conferences and academic institutions focused towards the design and construction practitioner. While Brainard's work provides a solid scientific foundation and he continues to add to understanding through his research, it is their work, not Dr. Brainard's, that represents the mainstream application of academic work in this area.

Industry regulators are providing application guidance.

Industry regulators also are developing respected methods for assessing circadian light impacts.

The Illumination Engineering Society of North America, IESNA has developed the *BSR/IES RP-4x-201x, Recommended Practice for Interior Lighting Installations in Consideration of the Circadian, Neuroendocrine, and Neurobehavioral Effects of Ocular Light Exposure*. This standard is currently in the review and approval process by the IESNA membership.

The same organization adopted IESNA TM-18-18 *Light and Human Health: An Overview of the Impact of Optical Radiation on Visual, Circadian, Neuroendocrine, and Neurobehavioral Responses* initially published in 2008 and reaffirmed in 2018.

Another organization, Underwriters' Laboratory, has drafted UL RP 24480, *Recommended Practice and Design Guideline for Promoting Circadian Entrainment with Light for Day-Active People*. These standards are currently under review.

Circadian Health Considerations are being utilized and supported by building industry leaders.

The General Services Administration, which owns and operates all US government buildings, is actively applying circadian impactful concepts across its portfolio of buildings. Google and TD Ameritrade are doing so, as well. The American Institute of Interior Designers incorporated circadian impactful lighting strategies at its headquarters. Pacific Northwest National Laboratory, under the direction the US Department of Energy is actively validating built examples and promoting the deployment of circadian impactful lighting strategies. Circadian lighting design is also being applied in health care institutions like the Children’s Hospital of Philadelphia and the Swedish Medical Center’s Ballard Behavioral Health Unit. Sacramento Municipal Utilities District has funded retrofits in multiple retirement facilities to improve circadian health. There are many other completed projects not mentioned and many more currently in design.

The Loveland analysis is valid.

The applicant’s “correction response” asserts that Joel Loveland’s work should be ignored because he only reported results (not the underlying data) and because the project design has evolved subsequent to Mr. Loveland’s analysis. While the 5th and Virginia project has evolved, the changes are not significant enough to invalidate Joel Loveland’s analysis effort. Additionally, the detailed information provided within Joel Loveland’s report is enough information for any professional modeler to replicate those results. The applicant’s complaints about Mr. Loveland’s work are not valid.

The WELL Building Standard is not the best available science, but a simplified commercial application, developed as a for profit, commercial venture.

The WELL Building Standard is a for profit rating system. It is not the best available science. It is a compromise between scientific rigor and mass market adoption.

Furthermore, the current version, v2, is aggregated from different sets of criteria specifically designed to address the disparate and varied needs of non-office uses, such as multi-family residential. As such the nuances specific to multifamily application of the circadian lighting credit has been modified to be more aligned with the office credit, rendering the credit much easier to achieve. The threshold criteria of 150 EML was also reduced from 250 EML in previous versions. The change was not driven by new scientific breakthroughs, but a desire to increase market uptake through less strenuous criteria.

Furthermore, the WELL Building Standard recommends, and the Stantec modelers employed, a D65 sky definition for circadian daylighting analysis. The D65 sky defines a clear sky condition. Using this sky definition over-predicts the circadian light resource due to a higher quantity of blue light than if overcast or partly overcast skies are modeled. The latter are much less effective at stimulating the circadian system. When considering the climate of Seattle, the lack of climate specific sky definitions results in a substantial overprediction of available circadian impactful light.

As with other rating systems such as LEED, following the credit protocol will not necessarily result in the best outcome or the absence of adverse impacts, but in an outcome good enough to garner a point in the system. In this case, choosing the current WELL Building v2 criteria as the standard to be measured against is taking the least rigorous path to application. The previous versions are more rigorous, still available and were updated as recently as the fourth quarter of 2019. *Despite the Stantec modeling team's choice to use the least strenuous evaluation criteria, the credit was not achieved.*

The Escala building is not pursuing the WELL Building Standard Certification. The assessment of the circadian resource and impacts should not be performed using the limited criteria and procedures outlined within the WELL Building Standard. Far more robust analytic processes and tools are available, as described in the prior sections of this memorandum.

The modeling protocol within the *ADDENDUM to the Final Environmental Impact Statement for the Downtown Height and Density Changes EIS* is flawed.

While use of the WELL model to assess the significance of the adverse impacts is inappropriate for the reasons stated above, even if the WELL model were used as an additional source of information, it should be used the right way, but that has not happened here. Errors in the application of the model are noted.

The Stantec modelers failed to follow guidelines in WELL v2 specific to multifamily application. WELL credits must be field verified and the WELL program provides procedural guidance to do so. The Stantec modelers chose different sensors location than recommended for field verification, potentially rendering the simulation outputs useless when compared to the stated measurement criteria.

The scheduling used by the modelers to assess daylight availability is based upon office schedules and fails to account for hours in which residents may experience daylight outside of the office schedule: mornings, evenings weekends, and holidays. The metric chosen compares the number of hours within a schedule that meet a specific illumination threshold. By choosing only the brightest hours of the day, 8:00 am to 5:00 pm and eliminating weekends and holidays, the percentage of hours that meet the illumination criteria is overstated by reducing the total number of hours that need to meet that criteria.