The Innovation Hub
for Affordable Heating and Cooling

IDS-12 Illawarra LALC Former Unanderra Police Station Redevelopment – Lessons Learned Report

Project - IDS12

25 May 2022

University of Wollongong

About i-Hub

The Innovation Hub for Affordable Heating and Cooling (i-Hub) is an initiative led by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) in conjunction with CSIRO, Queensland University of Technology (QUT), the University of Melbourne and the University of Wollongong and supported by Australian Renewable Energy Agency (ARENA) to facilitate the heating, ventilation, air conditioning and refrigeration (HVAC&R) industry's transition to a low emissions future, stimulate jobs growth, and showcase HVAC&R innovation in buildings.

The objective of i-Hub is to support the broader HVAC&R industry with knowledge dissemination, skills-development and capacity-building. By facilitating a collaborative approach to innovation, i-Hub brings together leading universities, researchers, consultants, building owners and equipment manufacturers to create a connected research and development community in Australia.
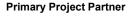
Primary Project Partner

The i-Hub Initiatives

SMART BUILDING DATA CLEARING HOUSE

LIVING LABORATORIES – GREEN PROVING GROUNDS

INTEGRATED DESIGN STUDIOS

Lessons Learnt Report: IDS12 – Illawarra LALC Former Unanderra Police Station Redevelopment

i-Hub Design Studio Lessons Learned Report

The IDS-12 Illawarra Local Aboriginal Land Council (LALC) Former Unanderra Police Station Redevelopment Integrated Design Studio investigates design innovation to reduce net energy consumption of a proposed redevelopment of the former police station located in Unanderra. Over a 13-week period, a group of multidisciplinary students, consultants and academics work collaboratively to develop several proposed designs for the client (the Illawarra Local Aboriginal Land Council).

This report explores the lessons that have been learned through the completion of these Integrated Design Studios, extracting relevant findings from the Studio Report (i-Hub IDS-12 Design Studio Outcomes Report 100%). These lessons learned were developed through evaluating the observations of studio tutors made during (and following) the studios, assessing the feedback from industry consultants through conducting one-on-one interviews, and from evaluating anonymous participant survey responses.

Lead organisation	University of Wollongong		
Sub-Project number	IDS12		
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Report date	25th May 2022		
Contact name	Dr Georgios Kokogiannakis		
Position in organisation	Associate Professor at UOW's Sustainable Buildings Research Centre		
Phone	+61 2 4221 5795	Email	gkg@uow.edu.au

Important Note: The Integrated Design Studio (IDS12) ran in parallel with an additional studio (IDS09), with all studios occurring concurrently, utilising the same consultants and studio tutors, with differing clients. Due to the similarities of these studios and due to them running in concert, it is difficult to differentiate unique findings between the two IDS's, resulting in some similarities in the associated lessons learned relating to IDS12 and IDS09. To improve readability (for those reading multiple IDS reports), any information included within the report which is similar to information outlined within other IDS reports will be highlighted with a greyed-out background (as shown here).

Lessons learnt

Lesson learnt #1	Existing building structures impose limits on design options but significant opportunities for improving energy performance still exist

Category	Technical

Describe what you learnt about this aspect of the Project.

The extent of pre-existing structural development has previously been found to impact integrated design opportunities (IDS11), with existing buildings limiting the impact that both engineers and architects can contribute to the design process. Opposingly, eliminating bounds completely (such as investigating greenfield site opportunities) present many opportunities to designers, though can result in designers becoming overwhelmed at the scale of the project, especially if they are relatively inexperienced (IDS09).

A middle ground approach offers advantages to both extremes, providing emerging designers with flexible design opportunities while limiting scope. While imposed bounds (wither artificial or physical) may restrict some opportunities, a large variety remain for designers to explore. The design studio still remains challenging, given bounds that need to be worked around or overcome, though is not so flexible that participants become overwhelmed by the innumerable opportunities available. By reducing the requirements of the designers at an earlier stage (e.g. providing an existing structural footprint to eliminate investigation of site layout, structural form and function, etc.), focus can be shifted to design improvements, improving building operation, interior function, or design optimisation.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

Ultimately, the criteria for the design will be specified by the client, which restricts the overall flexibility and boundaries of the design studio. While not always possible, selecting a client with flexible project outcomes is beneficial, with some boundaries being imposed specifically by the client, or artificially by the studio facilitator where necessary to achieve an idealised outcome.

For projects where these factors are not feasible to implement, it is important for the studio facilitator to work collaboratively with the client to tailor the brief in some regard to improve final design outcomes and limit the overall complexity of the associated design, so to not overwhelm the student designers, which will ultimately yield improved final design outcomes.

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

Qualitative observations have identified that this type of middle ground approach results in improved outcomes, however it is not well understood how differing design boundaries or restrictions affect the finalised designs. An investigation of different imposed restrictions could reveal how varying design boundaries affect the final design, providing greater insights into how differing limitations inhibit integrated design outcomes.

Please include any other information you feel is relevant or helpful in sharing the knowledge you learnt through this stage of the Project. This may be qualitative or quantitative and may include a graph, chart, infographic or table as appropriate.

Refer to Studio Report (i-Hub IDS-12 Design Studio Outcomes Report 100%) for further exploration of this lesson.

Lesson learnt #2	Importance of defining a concise brief with ongoing client involvement

Category	Social/Technical

Describe what you learnt about this aspect of the Project.

A client's aspirations and desires are always the primary driving factor for any given project, as without the client, the project would not exist. For this reason, it is imperative to ascertain the client brief as a key first step in the design process. While a client may understand the general requirements for the project, it is ultimately the designer who develops the concept into a presentable design. This necessitates an ongoing dialogue between client and designer, to ascertain the details of the project being undertaken (i.e. Who is the intended user? What functions must the building serve? What are the operational requirements? What are the financial limitations? etc.) Without specifying key design criteria, the designers job becomes increasingly difficult.

Given the complexity of the design process (especially for emerging or junior designers), providing a concise client brief is an important first step in design development. If a vague, incomplete or insufficient brief is provided, designers are directionless, using valuable time in the attempt of gaining further clarity of the brief, rather than progressing a design with incorrect assumptions. For integrated design (or any other design process), open communication with a client is integral, with regular feedback promoting successful design outcomes.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

To fully utilise the time allocated to the integrated design studios, the studio facilitators must work with the clients prior to studio commencement to develop a concise brief which may be provided to the participants early on. This should be provided prior to the project introduction, so that students may question the client and query the brief about important details associated with the design. It is also recommended that the client be readily available for short periods of time in earlier weeks to provide feedback to design teams, providing them with regular opportunities to further dissect the client brief.

Outlining these requirements with the client is an important preliminary step for studio facilitators, as without ongoing client involvement, the facilitators or consultants are required to make assumptions regarding the clients' desired outcomes.

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

N/A

Please include any other information you feel is relevant or helpful in sharing the knowledge you learnt through this stage of the Project. This may be qualitative or quantitative and may include a graph, chart, infographic or table as appropriate.

Refer to Studio Report (i-Hub IDS-12 Design Studio Outcomes Report 100%) for further exploration of this lesson.

Lesson learnt #3	Online working environments impede integrated design opportunities

Category	Social

Describe what you learnt about this aspect of the Project.

In the years following the advent of Covid-19, an unprecedented number of workplaces have been required to transition into an online working environment, a position which many employers and employees previously believed to be impractical. Work previously believed to be unachievable in an isolated environment is now achieved on a daily basis by many of the world's available workforce. While some have found this online working environment to be more productive and beneficial, this practice does not hold true for all professions, especially those requiring ongoing creative interdisciplinary collaboration.

Online working environments can for some professions be conducted in an efficient manner while operating in isolation, however for integrated design, this environment has been found to impede in a multitude of differing aspects. Communication was identified as the primary variable impacted by isolation, with conferencing applications and other communication methods being insufficient to replicate a face-to-face design environment. While different tools exist to facilitate some gaps (e.g. Miro), these cannot truly replicate or replace an in-person design studio, particularly in an interdisciplinary setting. Shared workspace tools are capable of achieving desired outputs when a team of individuals of similar backgrounds work in unison, however for a diverse team to work collaboratively, face-to-face communication is of great benefit if not necessary.

To exemplify this, online working environments replicate a traditional style of interaction between different disciplines, with designers working in isolation from one another, sharing designs once they have been developed rather than collaboratively working on a singular design together. While integrated design is achievable in some form in a virtual environment (as evidenced by the IDS's), true integrated design needs to occur where individuals are able to interact and engage with one another.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

Integrated Design Studios should (where possible) be operated completely face-to-face. While this was an impossibility for IDS09 (due to Covid-19 risks and restrictions), it afforded the opportunity to better understand if IDS is possible in a virtual environment. While achievable, opportunities and outputs are greater when participants are able to engage in-person.

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

While it was generally identified that integrated design is better achieved in a face-to-face environment, this may not necessarily be true for all aspects of the design process. For example, it is unknown as to whether developing a finalised design can be conducted in isolation and achieve similar outputs to finalised designs completed in person. Separate aspects of the design process would need to be further investigated to better understand if only some aspects of design yield better outputs when undertaken in person.

Please include any other information you feel is relevant or helpful in sharing the knowledge you learnt through this stage of the Project. This may be qualitative or quantitative and may include a graph, chart, infographic or table as appropriate.

Refer to Studio Report (i-Hub IDS-12 Design Studio Outcomes Report 100%) for further exploration of this lesson.