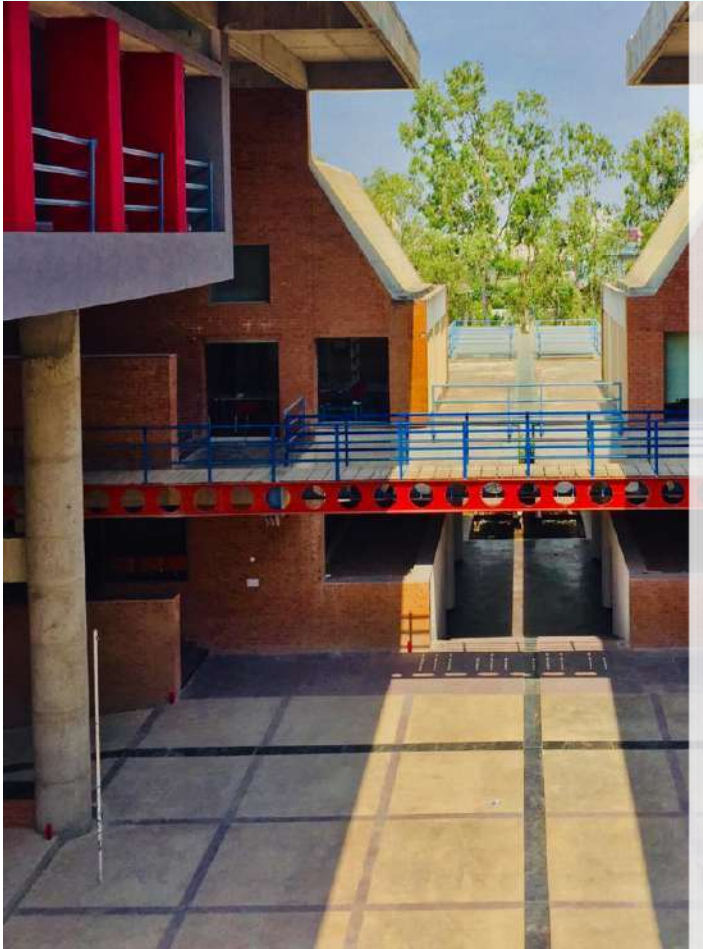




Habitat Collaboration 2020-21



Fourth year

Term 1

Academic year 2020-21

**S.M.E.F'S Brick School of
Architecture, Pune, India**

**Team: Ar.Vishwas Kulkarni,
Ar.Harshal Kavdikar, Ar.Rohit
Podar, Ar.Rohit Gadiya, Ar.Girija
Indulkar, Ar.Ninad Rewatkar**

**Thomas Jefferson University
Philadelphia, United States.**

Team: Ar. Robert Fleming

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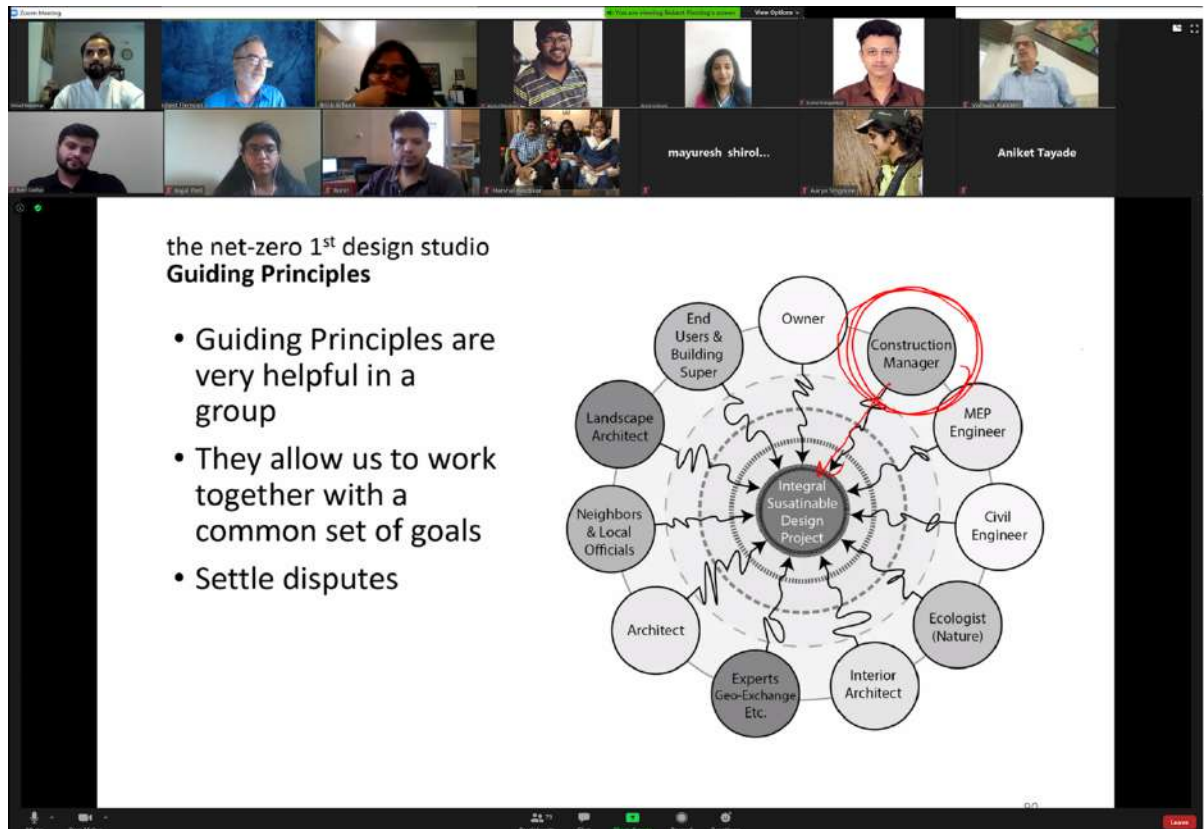
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1. Summary

2020 Fourth year B.Arch Habitat Design Studio from SMEF's Brick School of Architecture collaborated with the M.S. in Sustainable Design Studio from Jefferson University (Philadelphia University + Thomas Jefferson University). This collaboration studio was conducted for a semester starting from August to November 2020. The Evidence based design approach followed during this collaboration led to outstanding student outcomes for a Netzero Affordable Habitat design project.



2. Introduction and objectives



the net-zero 1st design studio
Guiding Principles

- Guiding Principles are very helpful in a group
- They allow us to work together with a common set of goals
- Settle disputes

Welcoming a new era in architecture; an era where new forms of technology and new ideas of design changes the way we communicate with our environments, where sustainability is more crucial than ever before, an era, where creativity beckons and fortune favors the bold - this year our fourth year Habitat studio (2020) from SMEF's Brick school of Architecture collaborated with the award winning MS in Sustainable Design program studio at Jefferson University (Philadelphia University + Thomas Jefferson University). This collaboration has exposed the

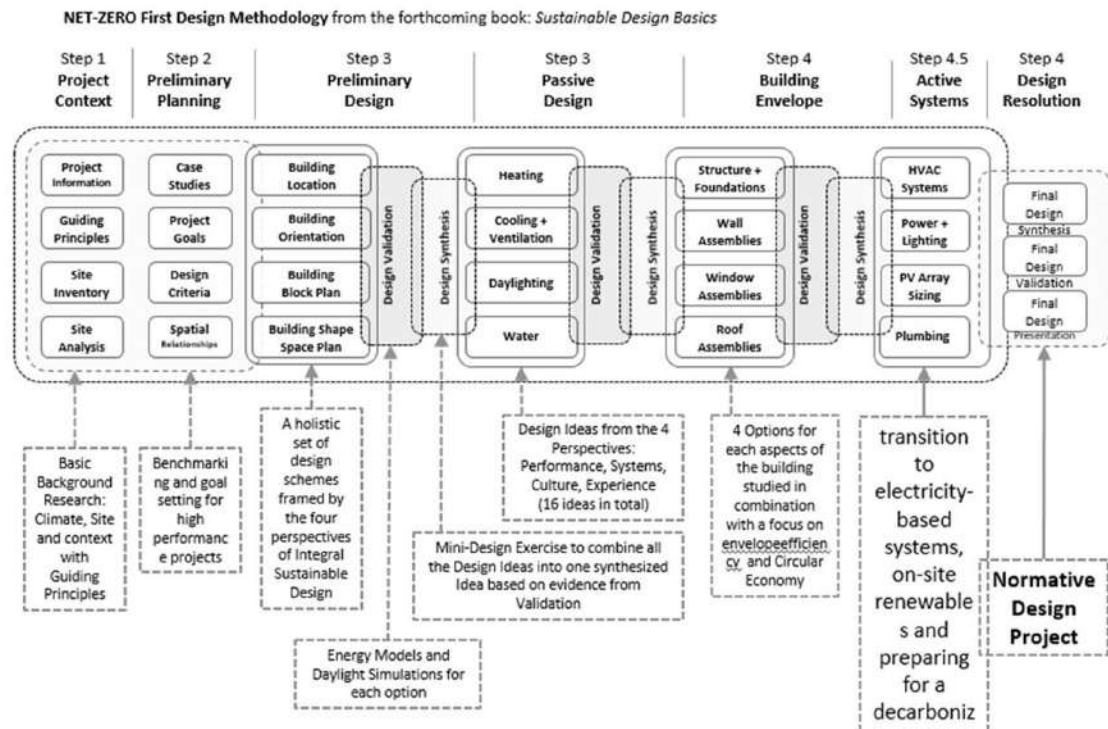
students to an “Evidence based Design” , a different and sensitive approach to housing. Prof. Robert Fleming, Director of MS in Sustainable Design Program at Jefferson University shares with the students his expert insights on the Guiding Principles to Sustainable Design and achieving benchmarks for a “Net zero Building”.

Joint reviews and validations by the studio faculty and students team from both Brick School of Architecture and Jefferson University at all stages encourages the students to a new approach of working towards the trade-off between the net-zero parameters and design strategies in achieving environmentally sustainable housing.

3. Methodology- By Thomas Jefferson University

Professor Fleming began teaching full time at Jefferson in 1996 where he developed the first undergraduate sustainable design studio which ran until 2007. In 2007, He co-founded the Master of Science in Sustainable Design and assumed the position of Program Director. The Program received the United States Green Building Council's Excellence in Education award. In 2012, the program received the National Institute for Building Science's award for "Best High Performance Building Initiative" in the USA. Professor Fleming received the University's President's Award for Teaching Excellence.

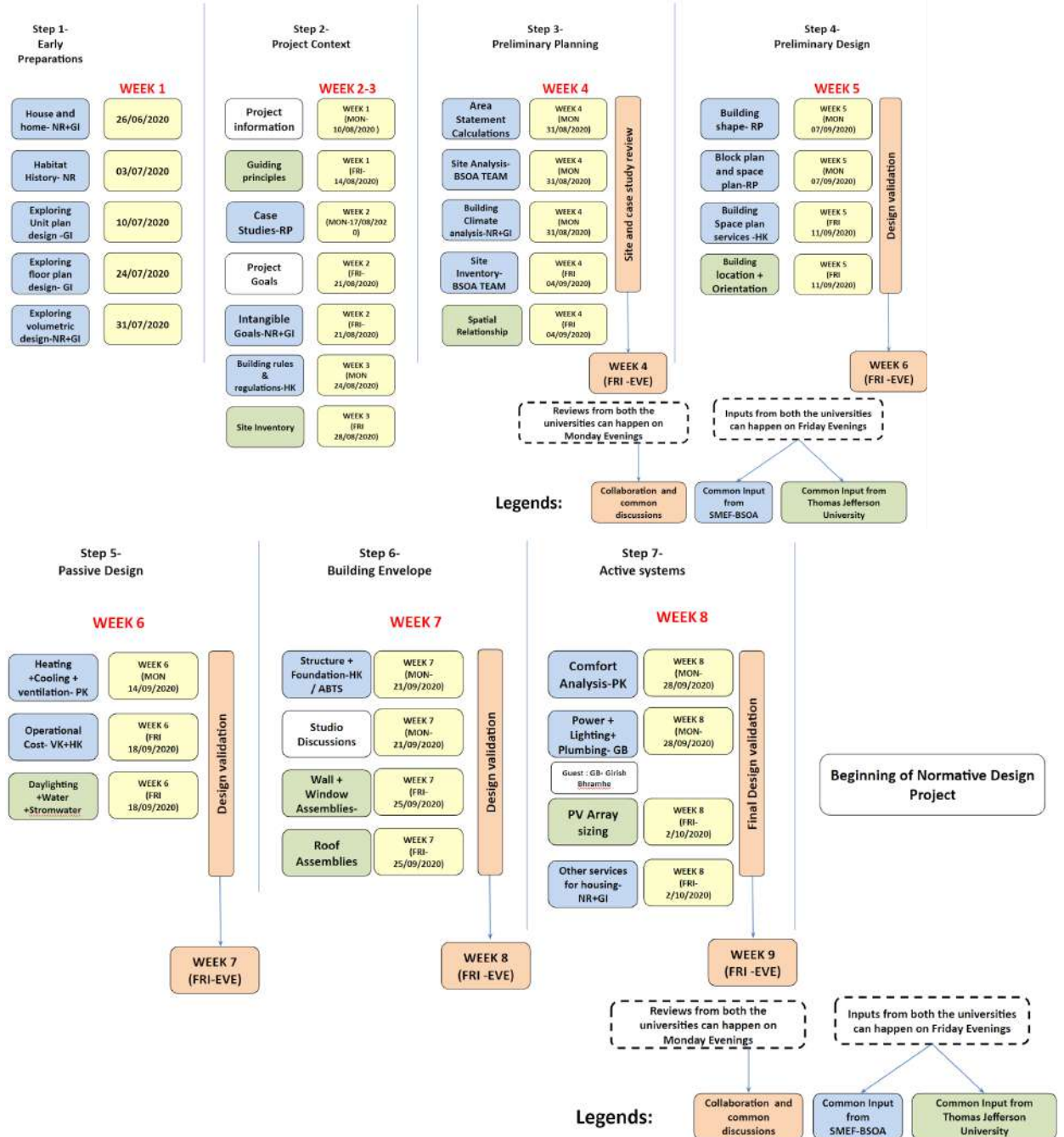
The methods adopted in the collaboration studio was based on his latest book *Sustainable Design Basics* which is published by Wiley.



The above diagram indicates the methods adopted at MS sustainable design studio in Thomas Jefferson University.

4. Methodology for collaboration Studio - By SMEF's Brick school of Architecture

As the Studio was to be conducted for undergraduate students parallelly with Masters Students, our design team adopted a slightly different approach. Students were introduced to a primary induction course about Habitat design and Sustainability as a part of early preparations. There were few additional inputs taken by Ar. Robert Fleming.



The above diagrams indicate the collaborative methods adopted at 4th year B.Arch Habitat Design Studio in SMEF's Brick School of Architecture, Pune.

a. Email Communication with Prof Rob (TJ)

Robert Fleming		Robert.Fleming@jeffers...
<input type="checkbox"/>	★ Robert Fleming	Inbox FW: Announcement of Professor Rob Fleming's Retirement from TJU - Dear Brick friends, This is my last semester at Jefferson. I ... 11/16/21
<input type="checkbox"/>	☆ Robert, me 2	Inbox Update - Robert.Fleming@jefferson.edu wrote: Hi-- we are updating our sefaira accounts Are your students still using sefaira 5/27/21
<input type="checkbox"/>	★ Robert Fleming	Inbox Free Net-Zer0-First Studio at Thomas Jefferson University - Good day everyone, You are receiving this email because you are part... 4/13/21
<input type="checkbox"/>	★ Robert, Manali 2	Inbox how did your semester end up? Robert.Fleming@jefferson.edu wrote: Life got so hectic - I just could not keep up... I hope all e... 12/18/20
<input type="checkbox"/>	☆ me	Collaborative Studio on Friday - Hello Rob, Good Evening to you! We haven't heard from you in the last 2 weeks, hope everything is 11/4/20
<input type="checkbox"/>	☆ Robert, Manali 2	Inbox i can come in from 9:00 - 10:00 am - Robert.Fleming@jefferson.edu wrote: Let me know of this works or if you want me to come... 10/30/20
<input type="checkbox"/>	☆ me	Collaboration studio - Dear Rob, When will be the good time to take our next studio? Should we take any studio today that is 10/23/20
<input type="checkbox"/>	☆ Robert Fleming	Inbox be there is one or two minutes - Robert Fleming, AIA, LEED AP, NOMA Salaman ... 10/16/20
<input type="checkbox"/>	☆ me 2	Zoom meeting invitation - Collaboration studio_16th Oct 2020 - Hello Rob, You can Join in the studio by 8.30 am even though i have sch... 10/16/20
<input type="checkbox"/>	☆ Manali, me 3	Inbox Fwd: I could get on-line tomorrow morning - Robert.Fleming@jefferson.edu Date: Fri, Oct 16, 2020 at 6:57 AM Subject: I could g... 10/16/20
<input type="checkbox"/>	☆ Manali, Robert 4	Inbox tomorrows session to be confirmed : Input on Passive strategies related to Daylighting water and Storm water - Robert.Fleming@... 10/9/20
<input type="checkbox"/>	★ Robert, Steven, me 4	Inbox Habitat 2020 RE: one agenda item - Robert.Fleming@jefferson.edu wrote: >> Hi - >> Can you make Girija a admin person on o... 9/22/20
<input type="checkbox"/>	☆ Robert, Manali 2	Inbox Habitat 2020 I just got the software working for our meeting tomorrow - Robert.Fleming@jefferson.edu wrote: Hi - I will be dem... 9/19/20
<input type="checkbox"/>	☆ Manali, Robert, me 5	Inbox Tomorrows Friday 18th Sept collaborative studio @ 5:30 pm ist. - Robert.Fleming@jefferson.edu wrote: >> >>> >>> >>> >>> >>> 9/19/20
<input type="checkbox"/>	☆ me	Zoom meeting invitation - Collaboration studio 18th Sept 2020 - Hello all, Brick School is inviting you to a scheduled Zoom meeting. Topi... 9/18/20
<input type="checkbox"/>	★ Manali, Robert 4	Inbox Habitat 2020 Confirming tomorrow's session - Robert.Fleming@jefferson.edu Date: Thu, 10 Sep 2020 at 11:44 PM Su... 9/18/20
<input type="checkbox"/>	☆ me	Zoom meeting invitation - Collaboration studio_11/09/20 - Dear all, Brick School is inviting you to a scheduled Zoom meeting. Topic: Co... 9/11/20
<input type="checkbox"/>	☆ me	Zoom meeting invitation - Collaborative studio_08/09/20 - Hello all, Brick School is inviting you to a scheduled Zoom meeting. Topic: Col... 9/8/20
<input type="checkbox"/>	☆ Manali, Robert 6	Inbox Do we confirm tomorrow Tuesday 8th Sept @5:30pm ist - Robert.Fleming@jefferson.edu wrote: Yes we just have to figure out w... 9/8/20
<input type="checkbox"/>	☆ Manali, Ninad 2	Inbox Habitat 2020 Fwd: this might help your students who are using the template - Robert.Fleming@jefferson.edu Date: Sat, Aug 29, ... 9/3/20
<input type="checkbox"/>	☆ Manali Deshmukh	Inbox Could we meet tomorrow Friday 4h Sept 5:30pm ist - Hi Rob To continue with the collaboration, the students this week did work o... 9/3/20
<input type="checkbox"/>	☆ me 2	Zoom meeting invitation - Site inventory - Dear all, Brick School is inviting you to a scheduled Zoom meeting. Topic: Site inventory Time: ... 8/28/20
<input type="checkbox"/>	☆ Manali Deshmukh	Inbox Habitat 2020 Fwd: Session on Site inventory - Robert.Fleming@jefferson.edu Date: Fri, 28 Aug 2020 at 6:10 AM Subject: RE: Ses... 8/29/20
<input type="checkbox"/>	☆ Manali Deshmukh	Inbox Fwd: Meet with Brick Architecture - Robert.Fleming@jefferson.edu Date: Tue, Aug 25, 2020 at 8:26 AM Subject: Meet with Brick ... 8/25/20
<input type="checkbox"/>	☆ Manali Deshmukh 4	Inbox Fwd: Meet with Brick Architecture - Robert.Fleming@jefferson.edu Date: Tue, Aug 25, 2020 at 7:16 AM Subject: Meet with Brick ... 8/25/20
<input type="checkbox"/>	☆ Manali, Robert 5	Inbox Habitat 2020 Re: Discussion of studio collaboration - Robert.Fleming@jefferson.edu wrote: >>> Hey there >>> We just got throug... 8/25/20
<input type="checkbox"/>	☆ Manali Deshmukh	Inbox Fwd: this is what we did last semester - a ecological masterplan - Robert.Fleming@jefferson.edu Date: Wed, Aug 19, 2020 at 9:4... 8/19/20
<input type="checkbox"/>	☆ manalideshmukh 2	Inbox Invitation: Possible Collaboration for the Fall Semester @ Thu Jun 25, 2020 5:30pm - 6pm (IST) - You have been invited to t... 6/25/20
<input type="checkbox"/>	☆ manalideshmukh	Inbox Invitation: Pissoble Collaboration for the Fall Semester @ Thu Jun 25, 2020 5:30pm - 6pm (IST) - You have been invited to L... 6/24/20
<input type="checkbox"/>	☆ Manali Deshmukh 2	Inbox Fwd: Pissoble Collaboration for the Fall Semester - Robert.Fleming@jefferson.edu Date: Tue, Jun 23, 2020 at 9:39 PM Subject: P... 6/24/20
<input type="checkbox"/>	☆ Manali Deshmukh 2	Inbox Fwd: Looking forward to exploring new opportunities for Collaborative learning - Robert.Fleming@jefferson.edu wrote: Hi Manali... 6/24/20
<input type="checkbox"/>	☆ manalideshmukh	Inbox Invitation: Demystifying online teaching by Prof Robert Fleming @ Wed May 20, 2020 5:30pm - 6:30pm (IST) (girijaindulkar@brick... 5/19/20

All the communications done between BSOA and TJ

Following are few crucial correspondence between BSOA and TJ

From: Manali Deshmukh <manalideshmukh@brick.edu.in>
Sent: Wednesday, June 17, 2020 3:32 PM
To: Robert Fleming 2 <Robert.Fleming@jefferson.edu>
Cc: Pooja Misal <poojamisal@brick.edu.in>; Poorva Keskar <poorvakeskar@brick.edu.in>
Subject: Looking forward to exploring new opportunities for Collaborative learning

WARNING: External Email - This email originated outside of Jefferson
DO NOT CLICK links or attachments unless you recognize the sender and are expecting the email

Dear Prof Rob,
Hope everything is well at your end!
Moving forward in our journey of enhancing the quality of education at Brick we would like to collaborate with Jefferson University and explore a new perspective and experience of learning for the students at Brick.

To initiate collaboration between SMEF's Brick School of Architecture (BSOA) Pune and Jefferson University we propose a collaborative Second year Design studio or a Fourth year (housing) studio which could be a design idea for a small urban insert. The faculties of both the universities could jointly initiate a design brief that could be introduced to the students of both the universities. The twinning model can then be adopted as a methodology in teaching and learning. The students could exchange their research and conceptual ideas through interactive digital media and peer learning could be encouraged.

This is just a thought and I am sure you would have more to share.

If the idea of collaborating seems workable, I could schedule a joint online meet with either the fourth year or the second year faculty of both the schools to discuss more and decide on a course of action.

I am also aware that an interaction with our fourth years and final years students proposed by you to introduce the graduate programme at Jefferson is long scheduled. Do share with me a convenient date & time any Wednesday /Friday post 3 pm (IST) for the same.

Looking forward for a collaborative studio this term- beginning from July 2020 for our school.

Warm Regards
Manali Deshmukh
Academic Coordinator
SMEF'S BRICK SCHOOL OF ARCHITECTURE

Invitation to Thomas Jefferson for collaboration with Brick School of architecture

On Thu, Jun 18, 2020 at 1:20 AM Robert Fleming 2 <Robert.Fleming@jefferson.edu> wrote:

Hi Manali - thanks for the kind email.
I do think we should try and do something together...

My fall semester is already planned completely out as I am launching a brand new studio philosophy and curriculum. It is geared toward 2nd year design students and first year graduate students. The goal is to reach net-zero energy performance among other goals through an authentic evidence based process...

I would not mind sharing the curriculum with you and discussing how it might be adoptable in your curriculum - or look for other ways to link up...

Let me send you something on what we have planned but also let me think of other ways to collaborate and get back to you.

Thanks,

Rob

Rob Fleming, AIA, LEED AP, NCMA
Salomon Family Chair in Sustainable Design
Professor and Director, IES in Sustainable Design Program
Director of Education, AIA Philadelphia Chapter
Board Member, Center for Architecture and Design
(he, him, his)

Thomas Jefferson University
T 215-951-2928 | robert.fleming@jefferson.edu
My Website: [Room](#) | [My Website](#) | [My Website](#) | [My new video](#) | [My new book](#)

Acceptance to the invitation by Thomas Jefferson for collaboration with Brick School of architecture

From: Manali Deshmukh <manalideshmukh@brick.edu.in>
Sent: Thursday, June 18, 2020 6:39 AM
To: Robert Fleming 2 <Robert.Fleming@jefferson.edu>
Cc: Pooja Misal <poojamisal@brick.edu.in>; Poorva Keskar <poorvakeskar@brick.edu.in>
Subject: Re: Looking forward to exploring new opportunities for Collaborative learning

Hi Rob
Thank you for the prompt and positive response.
It would be great if you could share your curriculum as mentioned -- a read before we discuss would always be good.
Also do tell me when you would like to schedule this discussion.

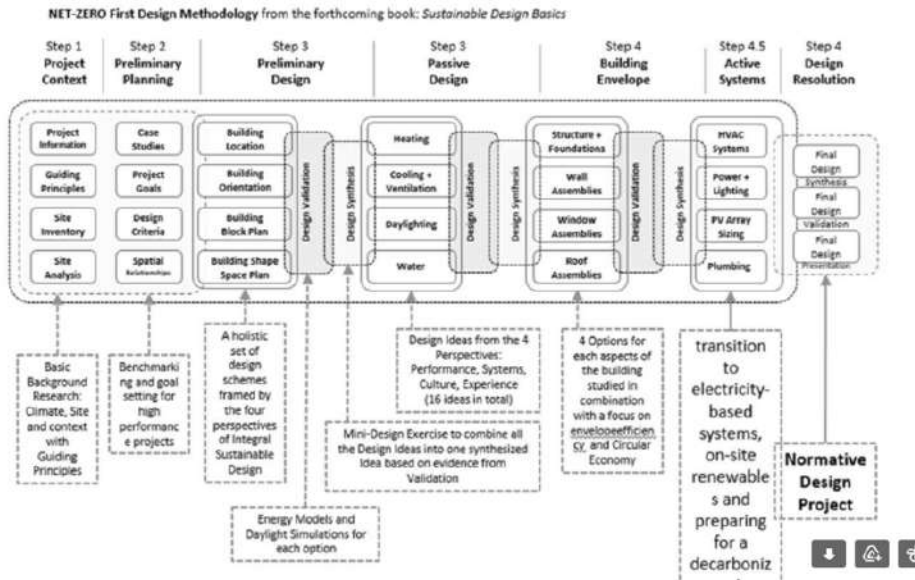
Warm Regards
Manali Deshmukh
Academic Coordinator
SMEF'S BRICK SCHOOL OF ARCHITECTURE

Corresponding email from Brick school of architecture

I will circle back with a meeting request to discuss this process and to see if it might be a fit for you. I can also introduce all of you to some of the other studio professors who do housing ---

Here is a pre-view of the process and here is a link to the studio deliverables <https://drive.google.com/file/d/13Nrgvni34t4OypU5rrhGMm1SA1m5tkNG/view?usp=sharing>
 For undergrads we would try and get the process below in about 8-9 weeks leaving the rest of the semester for normal design activities...

Over the next month, I am building a comprehensive Canvas site with all the materials including "how to" videos so that students can always get help on their studio assignments...



Here is a link to student work – This student was an interior design student completing here first building design – meets net-zero
<https://drive.google.com/file/d/1G7g5062pDAjI0L31pEeBACA1FDZw2PpH/view?usp=sharing>

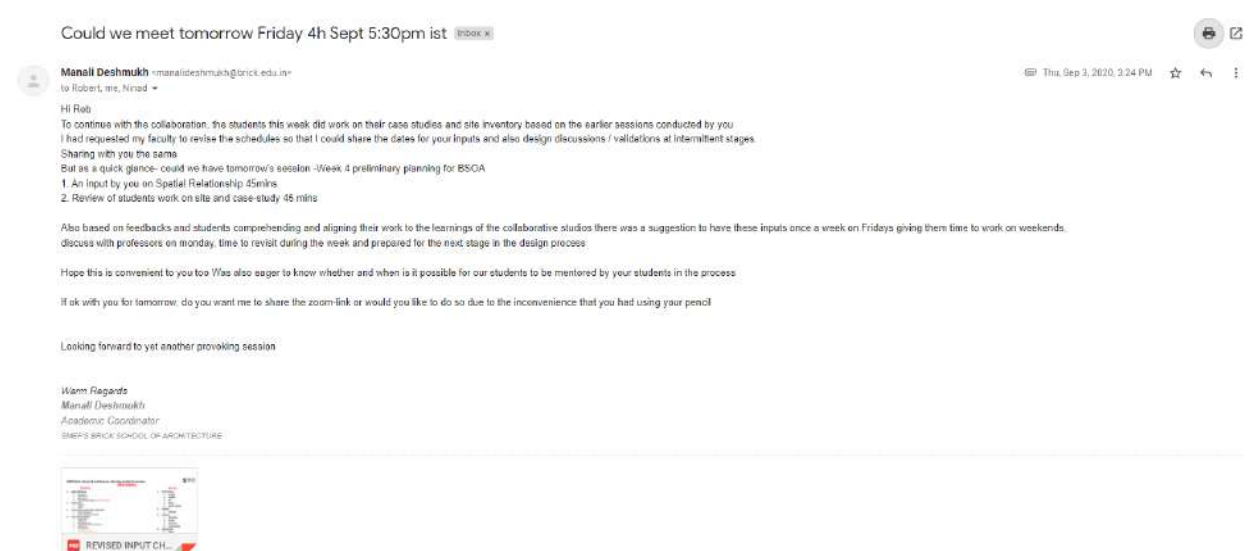
Rob Fleming, AIA, LEED AP, NOMA
 Salaman Family Chair in Sustainable Design
 Professor and Director, MS in Sustainable Design Program
 Director of Education, AIA Philadelphia Chapter
 Board Member, Center for Architecture and Design
 (he, him, his)

Thomas Jefferson University
 T 215-951-2928 | www.eastfalls.jefferson.edu/green
 My [Meetings Room](#) My [LinkedIn](#) My [Website](#) My [free course](#) My new [Video](#) My new [Book!](#)

Sharing of documents and methodology with the links to students work as a reference by TJ.

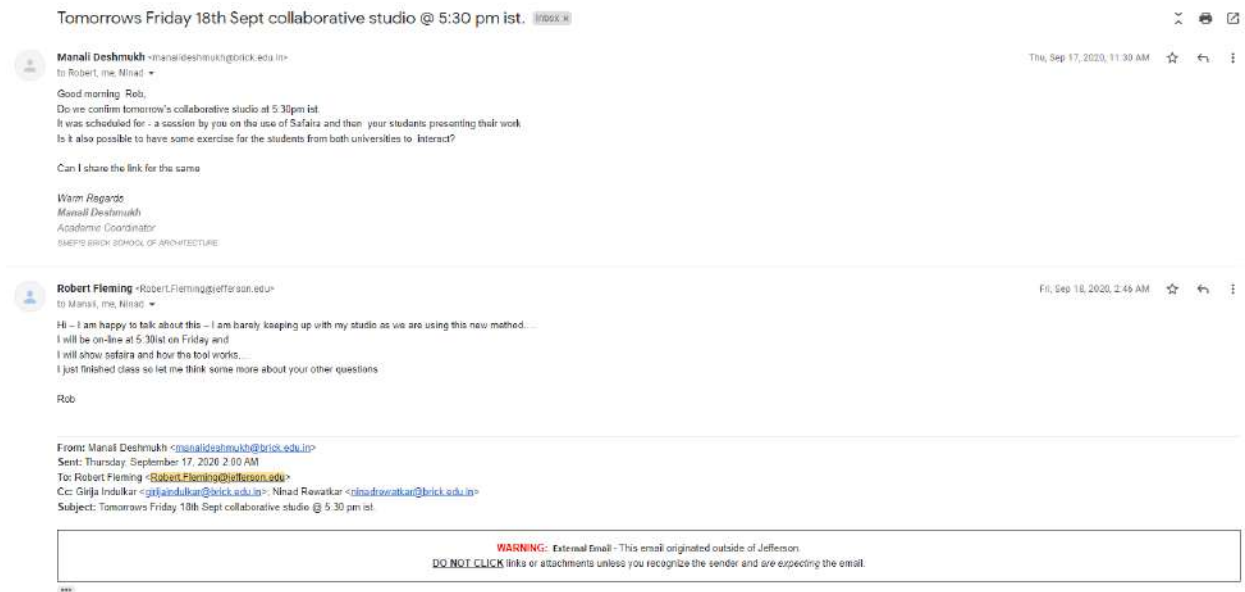


Invitation Zoom meeting to Prof. Rob by BSOA for Input on Site inventory.

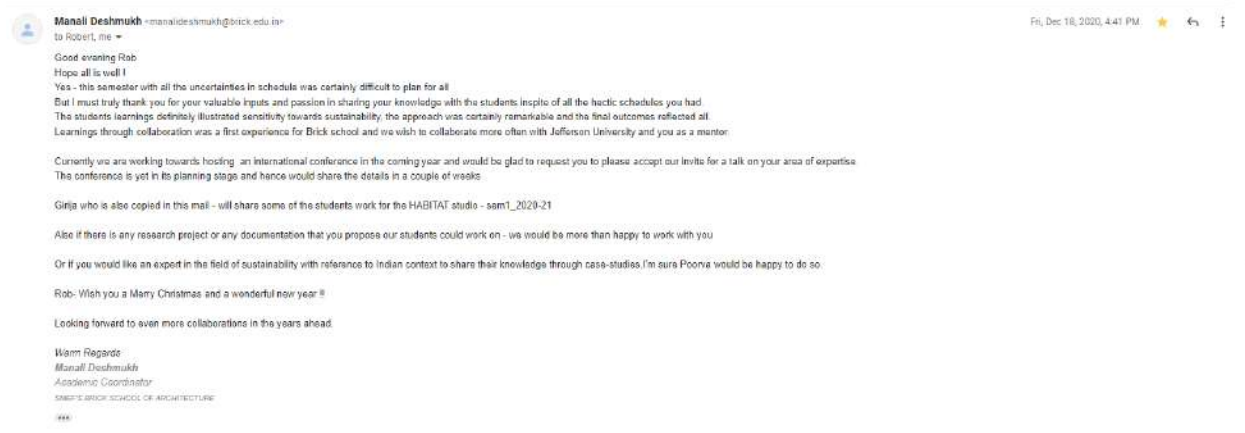


Correspondence for:

1. An input by on Spatial Relationship 45mins
2. Review of students work on site and case-study 45 mins by Prof. Rob



Input on How to use Sefaira by Prof. Rob.



Concluding email thanking Prof. Rob for his valuable contribution in the collaboration with BSOA

b. Week Wise Input schedule as per lesson plan

Week 1- Foundation week :Introduction to Affordable housing and Sustainability.

Monday: **Input:** Medium: Presentation on Introduction to affordable Housing by Girija and Ninad & **Output:** Quiz

Friday: **Preparation :** Movie/ Write up on Sustainability (over week)

Input: Presentation by Divya / Anagha P/ Chitra V Discussion on Economic Sustainability (in class)

Output: A3 preparation over weekend (graphical representation of "sustainability in habitat")

Week 2- : Understanding various examples and its analysis

Monday **Input:** Case study presentation by Vishwas sir and Harshal sir. **Output:** students group presentation not more than 5 slides (to be submitted by Thursday 8AM)

Friday: **Input:** Presentation by selected students on case studies.

Output: Revisiting your individual case studies with suitable alteration (to be submitted by Monday 8 am)

Week 3- : Understanding volumetric analysis

Monday: **Input + Output:** Pre-recorded lecture by Rohit P and Girija followed by **Game on SketchUp:** "volumetric analysis using parameters and understanding of scale using section" in on-going class (to be submitted in ppt by end of day.)

Friday: **Input:** Discussion selected student's presentation.

Week 4- : Introduction to housing plans

Monday: **Input :** Definitions, concepts like FSI, ground coverage, carpet area etc. and bye laws by Harshal sir

Output: Assignment "to Draw and analyze your own home/ apartment". (to be submitted A3)

Friday: **Input :**Demonstration on analyzing efficiency of sample unit plan by Harshal sir

Output: revisiting own plans for efficiency analysis submission on a3 by next Friday 8 am also read the theories or extracts given.)

Week 5- :Efficiency Analysis of Unit plan

Monday: **Input:** Reflection on theories and doubt clearing session on efficiency analysis submission.

Friday: **Input:** Introduction to Site, Program and context

output: Site Analysis

Week 6- :Design of Unit plan

Monday: **Input:** Presentation of selected students for site analysis. **Output:** Reflections on site analysis

Friday: **Input:** discussion on **Typical unit plans** in relation to climate, building technology and services

output: Preparation of Unit plans based on input.

Week 7- :Design of Floor plans

Monday: **Input:** Demonstration floor plan efficiency of selective individual student's project:

Output: Reflections on floor plan A3.

Friday: **Input:** Overview Graphical, spatial and technological aspects in master plan using Case study / Samples

Output: preparation of floor plans and master plans on A1.

5. Summary of Inputs taken during Collaborations with Thomas Jefferson University:

a. Introduction and Guiding Principles

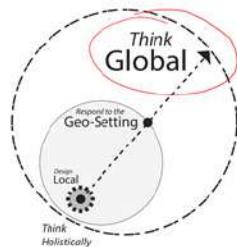
This was the first interaction of the students with Prof. Robert Flemming. Since this input was organised to set the tone for the projects in both studios, the input was aimed to introduce the ideas of sustainable design with respect to the global context of Climate change. We conducted an input of around 45 min. followed by group discussions in groups of 5 students each..

The Guiding principles were introduced and a similar matrix was given to students for group discussion. At the culmination, the students were equipped with basic understanding of how to come up with their own guiding principles for their respective projects.



the net-zero 1st design studio
Guiding Principles

- Guiding Principles help us to think across scale



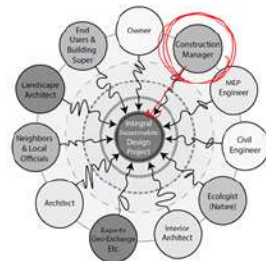
the net-zero 1st design studio
Guiding Principles

- The principles are focused on the long term impacts and benefits of the project



the net-zero 1st design studio
Guiding Principles

- Guiding Principles are very helpful in a group
- They allow us to work together with a common set of goals
- Settle disputes

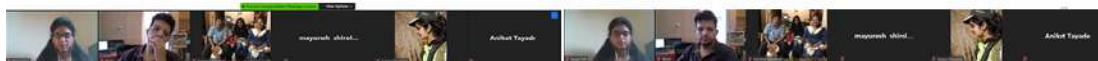


the net-zero 1st design studio
Guiding Principles

Guiding Principles Matrix

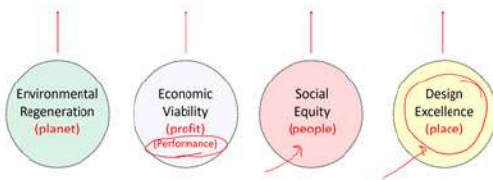
The Four Perspectives	Objective/Tangible Aspects		Subjective/Intangible Aspects		
	PERFORMANCE	SYSTEMS	CULTURE	EXPERIENCE	
Guiding Principles	Fight climate change by creating the highest energy performing project possible	Educate the public about sustainability by showcasing sustainable technologies	Become an integral part of a strong sustainable community	Celebrate Diversity	Infuse a sense of beauty in every design decision
Thoughts	Primary 1	2	4	4	3

Sustainable Design Basics: A methodology for the schematic design of sustainable buildings



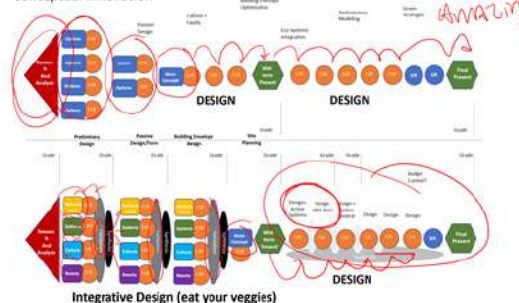
the net-zero 1st design studio
Conceptual Foundation

SUSTAINABLE DESIGN



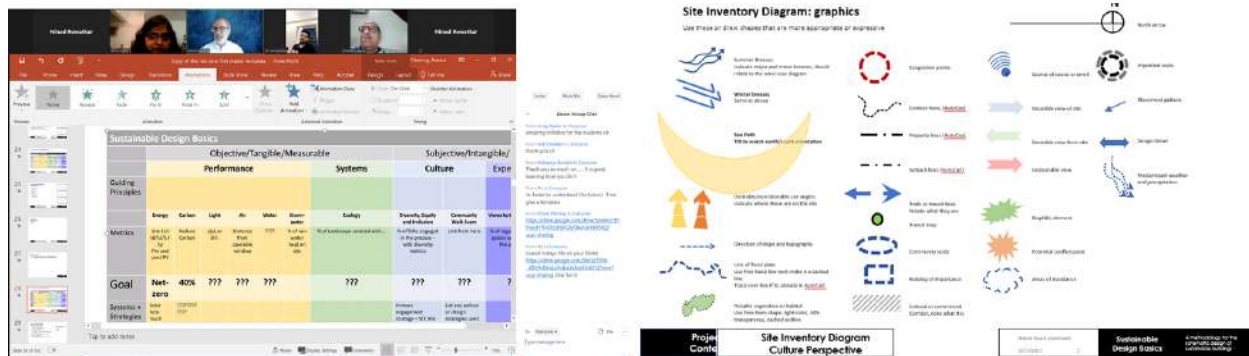
Quadruple Bottom Line Sustainability

the net-zero 1st design studio
Conceptual Innovation

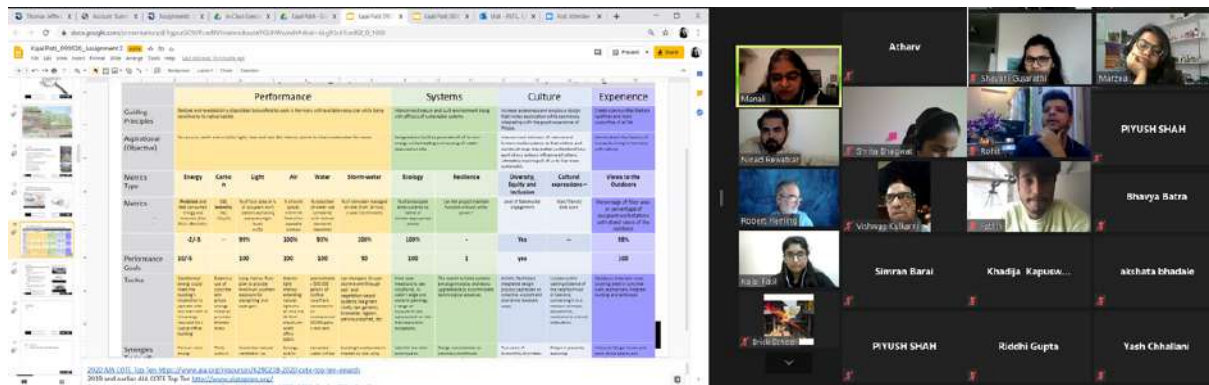


b. Project Context: Site Inventory & Analysis:

This input was taken up by Prof. Rob for all the tutors. Intention of this input was to do a thorough site analysis where one has to discuss the project context at site level and at ward/ district level based on four Perspectives: 1) System, 2) Performance 3) Culture and 4) Experience .Based on this input a separate Site inventory template was generated for the students of Brick school, which would help them to do a site analysis. Since we were giving this presentation to fourth year students, we tried to make the parameters simpler for their own understanding. We also focused on the advanced skill set of Presentation tools. We also shared the common graphics which were used to make their group level presentations for site inventory, to make everyone's presentation standardised so that it's easier to understand and assimilate. Prof. Rob also shared the following pre recorded lecture so that it can be helpful for us to make our input session based on the same. <https://vimeo.com/452699309>



c. Preliminary planning: Setting Up Goals



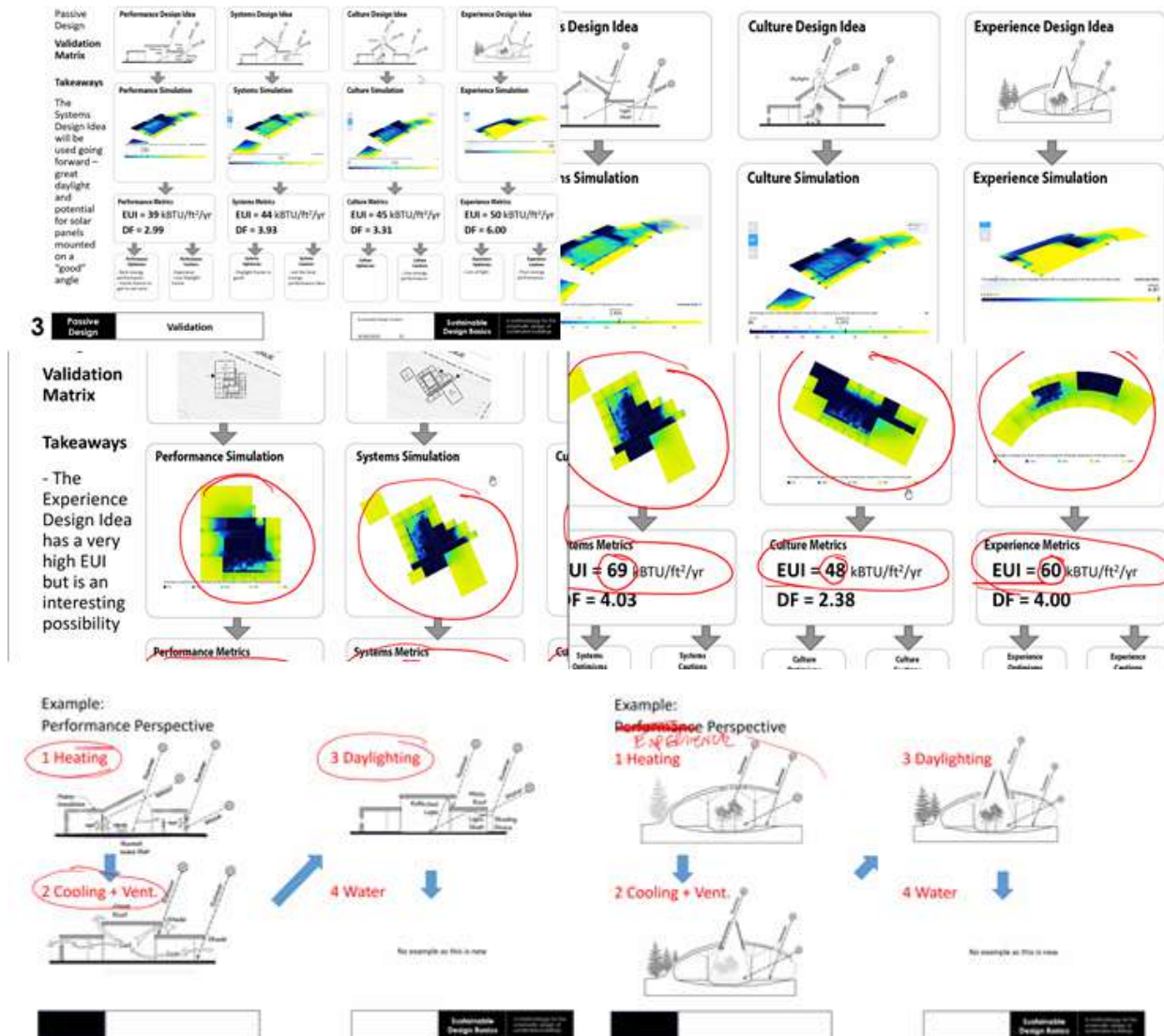
During this Input, one of the M.S. student Ms. Kajal Patil from Thomas Jeferson University tried to explain her project and explained how she was able to set up Goals using various benchmarks.

Since the climatic conditions and construction methods are different for both the sites, we discussed how we can do benchmarking for performances and energy efficiency for Indian Conditions. We also deliberated that for sake of analysing the design capabilities of fourth year students we added a new layer of spatial efficiency. Many real time standards were discussed amongst tutors and certain goals were set for students such that they don't exceed in common built up areas within housing projects.

<https://docs.google.com/spreadsheets/d/1WvVwXW6rJ1tlcRFwkp5-ztqGD-AIAob555qqyMa1mFo/edit#gid=1268238933>

d. Preliminary Design and Passive Design: Building location, Orientation & Daylighting

Prior to this the Thomas Jefferson university arranged or free students subscription for Sketch up plug-in Safaira. This was an eye opener session as the students were asked to create a small 3D of their own individual unit plans and these were then tried to assess using the simulations of Safaira. Professor Robert showed students how different orientation , window sizing and shading arrangements can affect the Daylighting and thermal comfort in the different unit plans.



This session was followed up by a case study of a project done by Prof. Robert which showcases how energy performance of buildings can be made more and more efficient following each step . Since this was constructed with Indian materials and using Indian construction techniques, there was a fruitful session discussing the same aspects.

**Final Validation
 Energy Goals**

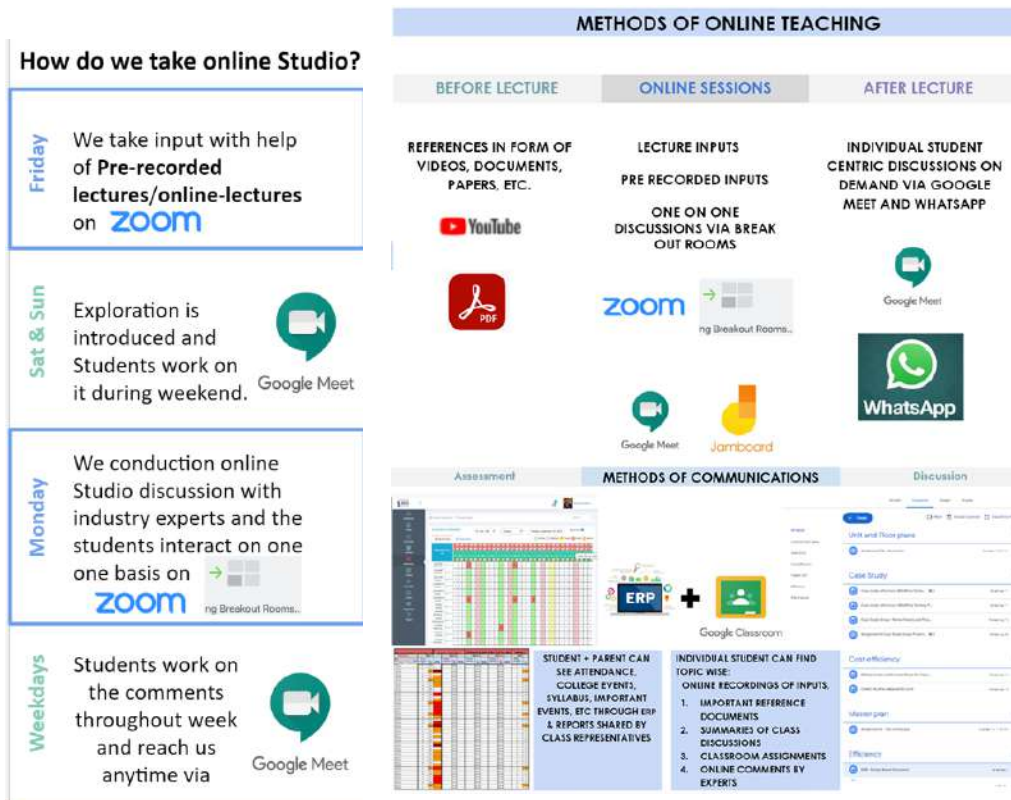


Final Validation Energy Validation

Sustainable Design Goals

6. Tools used:

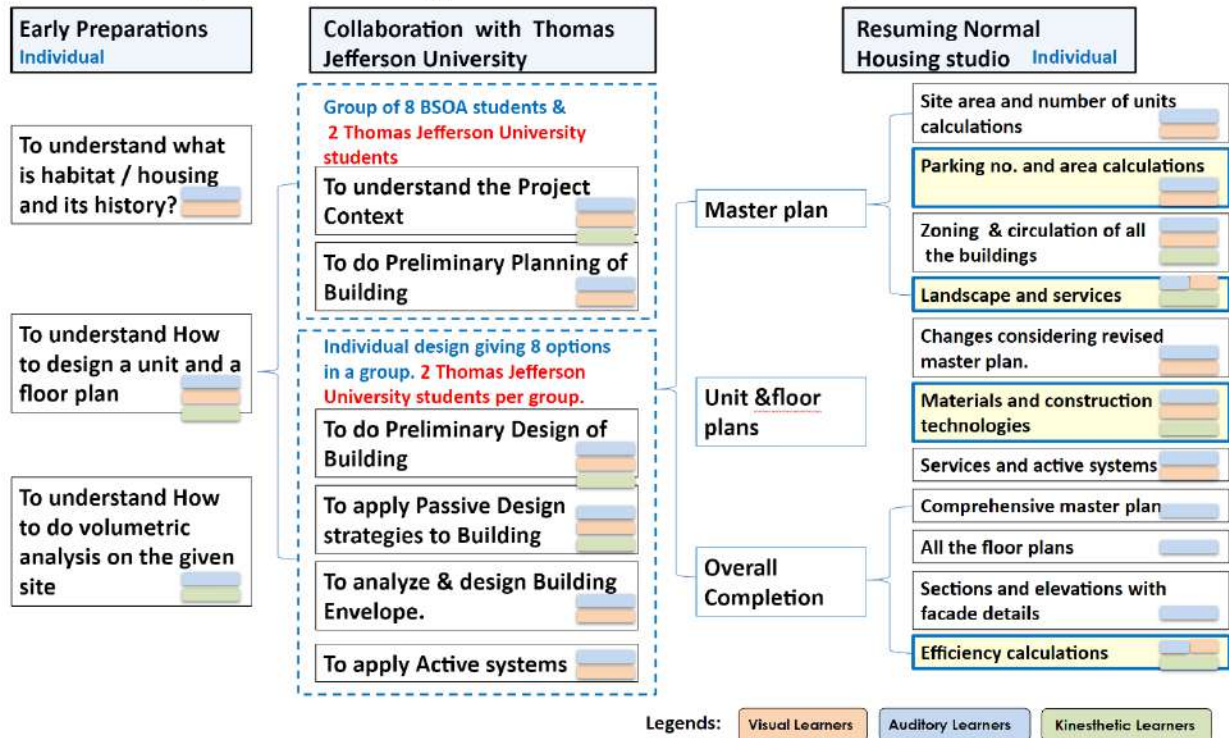
a. Use of ICT (Information and Communication Technology) tools in teaching along with a input video recording by Prof. Robert Fleming



Above diagram shows how we conduct our studios throughout the week and which tools are used for online teaching and communication with students. Following video show a small clip of our collaboration studio. [Please click here for watching online teaching demonstration video](#)

b. Addressing student diversity

Over all Housing studio Methodology with Addressing student diversity



Prior to the semester we identified three types of learners in our students. based on their abilities we created various assignments focussing all types of learners.

7. Documentation of students' work

Exploration 1: Zeroth Week

- Katha- Movie Review
- Know your Habitat
- Exploring Unit plan, floor plans & Volumetric understanding.
 - i. Aim of the exercise: Understanding **tangible and intangibles** in a habitat
 - ii. Method adopted and duration: to select one frame from the movie and express their observations. Total Duration: 3 weeks (Individual assignments :1/2 week (each))
 - iii. Expectations from Students: Write up in 250 words with selected frame (image) + Analysing your own home + Designing 3 options of unit, floor plan & its volumetric understanding.
 - iv. Format for Output: Google doc file + Google slide + Google slide (tools used: AutoCAD & sketch up)
 - v. Summary with basic observations: great work. Some students were observed to