SUS-01
Version 0
7th April 2018

Sustainability- For Office Developments

Contents

Lodha's definition of Sustainability, and immediate action requirements 2
Relationship between 'True Sustainability' and 'Certification' 2
Multitude of Sustainability Certification Agencies 2
Analysis of the selected certifications 4
Correlation matrix between various certifications 5
Review and research areas 8
Recommendations 10
Annexure 1 (Fitwel) 11
Annexure 2 (WELL) 18
Annexure 3 (IGBC) 24
Annexure 4 (GBCI – LEED) 26
Annexure 5 (BREEAM) 32
Annexure 6 (Living Building Challenge) 35

Lodha's definition of Sustainability, and immediate action requirements

As per our policy a sustainable development (office or others) will need to have the following essential characteristics:

- Lower use of resources
- Lower operating costs
- Better health and higher productivity of the occupants (Wellness)

There are many office developments in our portfolio (at varied stages of design and construction), our immediate need is to identify the following:

1. Applicable certifications which should be pursued (wrt need and applicability)
2. Lodha sustainability performance benchmarks
3. Urgent research areas to ensure non disruptive coupling of Sustainability with ongoing projects

Relationship between 'True Sustainability' and 'Certification'

While the certifications are a good tool to align the project with the Sustainability goals, it has been observed that with time the real performance of the certified projects have not been exceptional.

Among others, the main reasons of this are absent or lenient:

- post occupancy evaluations
- performance disclosure norms
- facility management norms

Despite other criticisms, it should be noted that the certification criteria outlined by these agencies are the best quantifiable performance measures which can be adopted by the designer to realize a highly sustainable building.

If we are conscientious enough to track the post occupancy performance against the certified benchmark, on a regular basis, it is highly likely that the project continues to perform exceptionally. This will also let us ensure implementation of O&M best practices.

Further use of technology, occupant engagement and post occupancy surveys can establish adherence to originally selected goals.

It was decided during the design charrette that we will pursue what is best for our occupants, as long as it is context appropriate and cost feasible, while not being too caught up with the certification game.

Multitude of Sustainability Certification Agencies

There are a lot of certification agencies active in the Sustainability space, the most popular and the one currently followed by us is the (US) Green Building Certification Inc. (GBCI) which administers Leadership in Energy and Environmental Design (LEED) ratings. Most rating agencies generally focus on a segment of Sustainability and very few take a holistic view.

The certifications are classified as per project definition like masterplan, new buildings, retrofit buildings, car parks, etc. This document however takes an approach limited to core and shell office buildings.

A summary of some certification bodies and their focus area is given below:

			Focus		
Certification	Est'd	Origin	Energy and Environment	Health and Wellness	Community and Collaboration
Fitwel	2015	United States	None	Strong	Light
WELL	2013	United States	None	Strong	Light
BREEAM	1990	United Kingdom	Strong	Moderate	Moderate
LBC	2006	United States	Strong	Moderate	Strong
GRIHA	2007	India	Strong	Light	None
CASBEE	2003	Japan	Strong	None	None
Green Star	2003	Australia	Strong	Light	None
Green Mark	2009	Singapore	Strong	Light	None
USGBC - LEED	1993	United States	Strong	Light	None
IGBC - Green	2001	India	Strong	Light	None

The popularity of these certifications, with tenants, can be evaluated separately with Commercial Sales.

The certifications which will be discussed in detail in this document are:











They are chosen due to being the most stringent and popular certifications, and all together they cover the Sustainability features in a building/development most holistically.

Note: Living Building Challenge is not an office specific certification

Analysis of the selected certifications

The selected certifications deal broadly in the following domains.

Fitwel
Location
Building Access
Outdoor Spaces
Entrance and ground floor
Indoor Environment
Tenant Spaces
Shared Spaces
Water Supply
Food Services
Vending Machines
Regional Priority

Well
Air
Water
Nourishment
Light
Fitness
Comfort
Mind

IGBC
Sustainable Architecture
Site Selection and Planning
Water Conservation
Energy Efficiency
Building Materials
Indoor Environment Quality
Innovation and Development

BREEAM
Management
Energy
Health and Wellbeing
Transport
Water
Materials
Waste
Land use and Ecology
Pollution

LBC
Site
Water
Energy
Health
Material
Equity
Beauty

LEED (USGBC)
Location and Transportation
Sustainable Sites
Water Efficiency
Material and Resources
Indoor Environment Quality
Innovative Thinking
Regional Priority

Abbreviations:
LBC - Living Building Challenge
LEED - Leadership in Energy and Environmental Design
USGBC - United States Green Building Council
BREEAM - Building Research Establishment Environmental Assessment Method
IGBC - Indian Green Building Council

Please refer annexures for detailed criteria of each certification (classified per domain)

Correlation matrix between various certifications

Tag:
W – Health and Wellness
E – Energy and Environment
C – Community and Collaboration

Domain	Feature	TAG	WELL	IGBC	LBC	BREEAM	USGBC	FITWELL
Water	Domestic Water Quality	W	✓	x	x	✓	x	✓
Water	Water Treatment	S	✓	✓	✓	✓	✓	x
Water	Drinking Water Promotion	W	✓	x	x	x	x	✓
Water	Water Demand Reduction(Efficient Fixtures)	S	x	✓	✓	✓	✓	x
Water	Water Metering	S	x	✓	✓	✓	✓	x
Water	Rain Water Harvesting	S	x	✓	✓	✓	✓	x
Water	Landscape Water Demand Reduction	S	x	✓	✓	✓	✓	x
Water	Cooling Tower Water Quality	S	x	x	x	x	✓	x
Energy	Efficient Use of Energy	S	x	✓	✓	✓	✓	x
Energy	Use of Renewable Energy or Renewable Energy Credits	S	x	✓	✓	✓	✓	x
Energy	Energy Metering	S	x	✓	✓	✓	✓	x
Energy	Enhanced Commisioning	S	x	✓	x	✓	✓	x
Materials	Prohibited Material (Red List)	S	x	x	✓	x	x	x
Materials	Embodied Energy	S	x	x	✓	✓	✓	x
Materials	Pesponsible Industry (Wood, recycle, etc)	S	x	✓	✓	✓	✓	x
Materials	Proximal Sourcing	S	x	✓	✓	✓	✓	x
Materials	Net Positive Waste	S	x	x	✓	x	x	x
Materials	Construction Waste Management	S	x	✓	✓	✓	✓	x
Materials	Operation Waste Management	S	x	x	✓	✓	x	x
Materials	Material Efficiency	S	x	✓	✓	✓	✓	x
Materials	Material Storage Management	S	x	✓	✓	✓	✓	x
Air Quality & Ventilation	Indoor Air Quality Improvement	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	Indoor Air Quality Measurement	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	VOC reduction	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	No smoking (Smoking in designated area, 8m of building)	W	✓	x	✓	✓	✓	✓

Domain	Feature	TAG	WELL	IGBC	LBC	BREEAM	USGBC	FITWELL
Air Quality & Ventilation	Effective ventilation	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	Air Filteration	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	Restrict microbial air contaminants	W	✓	x	x	x	x	✓
Air Quality & Ventilation	Restrict Particulate air contaminants	W	✓	✓	x	x	x	✓
Air Quality & Ventilation	Pest Contol, EPA Compliant Cleaning Products	W	✓	?	?	?	?	✓
Air Quality & Ventilation	Restrict Flue Gases	W	✓	✓	?	?	?	?
Air Quality & Ventilation	Humidity Control	W	✓	✓	✓	✓	✓	✓
Air Quality & Ventilation	Promote Natural Ventilation, Operable Windows	W	✓	x	✓	✓	x	✓
Air Quality & Ventilation	Integrated Pest Management	W	✓	?	?	?	?	✓
Sustainable Site Planning/Design	Community Integration/Neighbourhood Integration	S	x	✓	✓	x	✓	✓
Sustainable Site Planning/Design	Non Ecosensitive Plot Location	S	x	X	✓	✓	✓	x
Sustainable Site Planning/Design	Nearby Ammenities	S	x	✓	x	✓	✓	✓
Sustainable Site Planning/Design	Green Vehicles+Encourage Driving	S	x	✓	x	✓	✓	✓
Sustainable Site Planning/Design	Access to public Transport	S	✓	✓	x	✓	✓	✓
Sustainable Site Planning/Design	Bicycle Encouragement	S	✓	✓	x	✓	✓	✓
Sustainable Site Planning/Design	Disabled Access Friendly	S	✓	✓	✓	✓	✓	✓
Sustainable Site Planning/Design	Heat Island Reduction	S	x	x	x	x	✓	x
Sustainable Site Planning/Design	Light Pollution Reduction	S	x	x	x	✓	✓	x
Sustainable Site Planning/Design	Urban Agriculture	S	✓	✓	✓	✓	x	✓
Sustainable Site Planning/Design	Strom Water Management	S	x	x	✓	✓	✓	x
Sustainable Site Planning/Design	Habitat Restoration	S	x	x	✓	✓	✓	x

Domain	Feature	TAG	WELL	IGBC	LBC	BREEAM	USGBC	FITWELL
Sustainable Site Planning/Design	Adequate Open Spaces	S	✓	✓	✓	✓	✓	✓
Sustainable Site Planning/Design	Climate Change	S	?	?	?	?	?	?
Health	Access to active flexible work place	W	✓	x	x	x	x	✓
Health	Ergonomic Workplace	S	✓	x	x	x	x	✓
Health	Indoor Air Quality	W	✓	✓	✓	✓	✓	✓
Health	Noise Control/Sound Masking	W	✓	x	✓	✓	✓	x
Health	Thermal Comfort	W	✓	✓	✓	✓	✓	✓
Health	Daylighting+Glare Control	S	✓	✓	✓	✓	✓	✓
Health	Acive Design- Stairs	W	✓	x	x	x	x	✓
Health	Active Design- Outdoor Spaces	W	✓	✓	x	✓	✓	✓
Health	Active Design - Gym,etc.	W	✓	x	x	x	x	✓
Health	Hygeine	W	✓	x	x	x	x	✓
Health	Access to Nutritional Food	W	✓	x	✓	x	x	✓
Health	Access to Organic/Local Food	W	✓	x	✓	x	x	✓
Health	Access to Water	W	✓	✓	✓	✓	✓	✓
Health	Access to Vending M/c's	W	✓	x	X	X	X	✓
Health	Biophilia (therapeutic landscape)	S	✓	✓	✓	✓	✓	✓
Health	Healthy Sleep	W	✓	x	x	x	x	x
Health	Health Policy and it's promotion	W	✓	x	?	x	x	✓
Health	Medtaition Room	W	x	x	x	x	x	✓
Collaboration/Community	Post Occupancy Survey	C	✓	✓	✓	x	x	✓
Collaboration/Community	Community Engagement	C	✓	✓	✓	x	x	✓
Collaboration/Community	Equity	C	x	x	✓	x	x	x
Collaboration/Community	Education+Implication	C	x	x	✓	✓	x	x
Collaboration/Community	Safe	C	✓	✓	✓	✓	x	✓
Collaboration/Community	Diverse	C	x	x	✓	x	x	x

Review and research areas

Looking at the above matrix (and annexures) we have identified the following immediate areas of policy update and further research:

1. Occupancy guidelines update – ref policy 25

2. Prepare a list of passive design possibilities in our context (checklist)

3. Prepare an 'Integrated Design Process' flowchart/protocol to achieve the sustainability design goals

4. Prepare a target performance guideline for:
    a. Daylighting
    b. Glare control
    c. Façade heat gain
    d. Window wall ratio
    e. EPI - kWh/sqm/yr or kWh/person/yr
    f. Water demand

5. Prepare a lifecycle costing format to evaluate the feasibility of Sustainability ideas

6. Formulate a new policy on insulation of the building envelop

7. Material redlisting and low VOC guidelines for:
    a. flooring systems,
    b. ceiling systems,
    c. interior wall assemblies or interior surfaces of exterior walls,
    d. paints,
    e. coatings,
    f. adhesives, and
    g. sealants wet-applied on site
    – Ref paint policy 71

8. Wood sourcing policy – Ref door policy 39, 66

9. Updating of staircase policy 38 (to include features promoting staircase use)

10. Updating of signage guidelines 34 (to include wellness related signage)

11. Prepare a policy on desired sound levels and related acoustic measures to be taken in the occupied spaces.

12. Update parking allotment guidelines for commercial developments (giving preferential slots to registered car poolers)

13. Prepare an internal lighting design policy (indicating desired types and intensities as per health and wellbeing requirements)

14. White paper on building integrated agriculture options

15. Prepare a list of active and wellness related Indoor amenities which can be accommodated within the designated shared amenity area (10%).

16. Prepare a list of active and wellness related Outdoor amenities which shall be included in the masterplan program of office developments

17. Prepare landscape maintenance guidelines (to cover outdoors, indoors, and urban agriculture)

18. Policy on embodied energy calculations, and list of impacted materials, procurement strategy (with Structural)

19. Review the height of the stack of the DGs (located near commercial buildings) in power failure prone areas like Thane, Palava, etc

20. White paper on Radiant cooling technologies

21. White paper on High efficiency motors

22. White paper on Regenerative drives in elevators

23. White paper on Air Quality Monitoring system

24. White paper on UFAD

25. White paper on ISEER +5 Airconditioners

26. White paper on Geothermal ground source technology

27. White paper on District cooling

28. White paper on Solar PV (roof top on office and amenity buildings (+possibility on residential), large farms, scalability of design/agreements)

29. White paper on Solar integrated facades (FIPV)

30. White paper on cost effective shading devices which can be employed on the façade.

31. BMS policy update

32. White paper on Smart technologies for community, resident engagement (with Strategy)-update of related policies (expand list)

33. White paper of immediate EV charging provisioning in the upcoming office parking areas

34. Standardize a cleaning protocol for the completed office buildings

35. Standardize an Integrated Pest Management plan for the completed office buildings

36. Standardize a Mechanical Plant Operation and Maintenance plan, protocol for office developments

Recommendations

It is recommended that we should:

1. Develop a Lodha Sustainability Criteria, which is holistic in nature; and which includes all cost appropriate measures from the above database (across certifications).

2. Prioritize the above research ideas depending upon applicable implementation on ongoing and upcoming projects

3. Continue to pursue LEED (Gold/Platinum) ratings as precertification for our developments, while aim at achieving LEED Platinum during the final certification, by adopting better building design and additional features as per research and feasibility of the above identified areas.

4. Decide and check feasibility on pursuing Fitwel certification instead of WELL as it is optimally costed (USD6,000/certification) and covers equal or sometimes better features than WELL.

Annexure 1 (Fitwel)

Domain	ID	Feature	Intent Description
Location	1.1	Walkability	Walk Score® of 50 or above
Location	1.2	Walkability	Walk Score® of 70 or above
Location	1.3	Walkability	Walk Score® of 90 or above
Location	1.4	Proximity to Transit	Public transit stop located within 1/2 mile or 800 meters of the main building entrance
Building Access	2.1	Pedestrian Route to Transit	Provide a direct, accessible pedestrian route between the main building entrance and public transit
Building Access	2.2	Commuter Survey	Conduct an annual occupant commuter survey (healthy commute - help support carpool/vanpool programs, determine bicycle storage demand, and assess potential bicycle use increase if bicycle facilities are improved)
Building Access	2.3	Bicycle Parking	Provide secure and covered bicycle parking within 100 feet or 30 meters of a building entrance for a minimum of 5% of regular occupants or exceed demand as dictated by occupant survey by 1%
Building Access	2.4	Active Commuter Showers	Provide showers with lockers for regular occupants.
Building Access	2.5	Market Value Parking	If parking is provided, charge fair market value for parking utilization
Building Access	2.6	Preferred Parking	If parking is provided, assign a minimum of 5% priority parking spaces or exceed demand by at least 1% as dictated by the occupant commuter survey for carpools and vanpools, whichever is greater
Outdoor Spaces	3.1	Outdoor Space Amenities	Provide an outdoor space amenity accessible from a building entrance to all regular occupants. Including outdoor space amenities such as benches, tables, paths, or small landscaped gardens may improve health by increasing levels of physical activity, exposing occupants to daylight, and reducing overall stress. Providing at least partial shading offers an opportunity to enjoy the benefits of being outdoors, while allowing the outdoor space amenity user to adjust their environment to partially or totally exclude the sun's rays, offering a high degree of control and flexibility for the use of outdoor areas.

Domain	ID	Feature	Intent Description
Outdoor Spaces	3.2	Walking Trail	Provide a walking trail of at least 1/4 mile or 400 meters on the building site/campus accessible to all regular occupants
Outdoor Spaces	3.3	Outdoor Fitness Equipment	Provide permanent fitness equipment in outdoor spaces accessible to all regular occupants
Outdoor Spaces	3.4	Restorative Garden	Provide a restorative garden amenityaccessible to all regular occupants. Providing a therapeutic landscape amenity, such as a restorative garden, improves employee mental health, reduces stress levels, and improves productivity.
Outdoor Spaces	3.5	Farmers Market	Offer on-site weekly sale of produce or establish a farmers market in a location accessible to all regular occupants
Outdoor Spaces	3.6	Fruit and Vegetable Garden	Support an on-site fruit and vegetable garden that is at least 1 square foot or .09 square meters per regular occupant, accessible to all regular occupants, and maintained weekly. Providing on-site gardening opportunities contributes to increased physical activity levels and social capital benefits from working in the gardens. In addition, convenient access to healthy food helps improve diets for employees.
Outdoor Spaces	3.7	Integrated Pest Management	Establish and adopt an Integrated Pest Management (IPM) Plan. Provide an official copy (signed, dated, and on official letterhead) of IPM plan or contract detailing procedures requiring nonchemical approaches to meet all the following: - improved sanitation (e.g., removing food from desks, cleaning) - inspection and monitoring of pest population sites managing waste (e.g., keeping refuse in tight containers, locating waste containers away from building if possible) - maintaining structures (e.g., fixing leaking pipes promptly, sealing cracks) - adding physical barriers to pest entry and movement (e.g., screens for chimneys, doors, and windows; air curtains) - modifying habitats (e.g., removing clutter, relocating outside light fixtures away from doors) - using traps (e.g., light traps, snap traps, and glue boards) - using pesticides judiciously

Domain	ID	Feature	Intent Description
Outdoor Spaces	3.8	Pathway and Parking Lighting	Provide context-appropriate lighting at all pathways and parking areas. CPTED: Crime Prevention through Environmental Design.
Outdoor Spaces	3.9	Tobacco-Free Outdoor Spaces	Adopt a tobacco-free policy for all outdoor spaces
Entrances and Ground Floor	4.1	Tobacco-Free Signage	Provide permanent signage at all building and/or campus entrances publicizing a tobacco-free building and site
Entrances and Ground Floor	4.2	Alternative Pedestrian Entrance	Provide at least one additional building entrance, other than the main entrance, oriented towards an outdoor pedestrian route
Entrances and Ground Floor	4.3	Main Pedestrian Entrance	Locate the main entrance oriented towards an outdoor pedestrian route
Entrances and Ground Floor	4.4	Safe Entry and Exit Lighting	Provide context-appropriate lighting at all building entrances
Entrances and Ground Floor	4.5	Publicly Accessible Use	Provide at least one publicly accessible use on the ground floor. Buildings that include a service that is publicly accessible such as a library, retail store, restaurant, or a coffee shop increase community amenities and neighborhood walkability.
Entrances and Ground Floor	4.6	Local Amenities	Provide a permanent dedicated display in a location accessible to all regular occupants advertising amenities within a 1/2 mile or 800 meter walking distance of the building
Entrances and Ground Floor	4.7	Entryway Systems	Employ entryway systems that are maintained weekly at building entrances. Entryway systems reduce the amount of dirt and particulates that enter the building decreasing the amount of pollutants and potential illness-causing agents.
Stairwells	5.1	Regularly Accessible Stairwell	Provide at least one stairwell accessible to regular occupants that connects relevant building floors
Stairwells	5.2	Stairwell Location	Locate an accessible stairwell equally or more visible than any elevators and/or escalators from the main building entrance
Stairwells	5.3	Stairwell Design	Implement active design strategies in stairwell design
Stairwells	5.4	Stair Signage	Place permanent point-of-decision signs promoting stair use at elevator call areas
Stairwells	5.5	Stairwell Visibility	Make the accessible stairwell clearly visible with code-compliant glass
Indoor Environment	6.1	Tobacco-Free Building	Adopt and implement a tobacco-free building policy

Domain	ID	Feature	Intent Description
Indoor Environment	6.2	Asbestos-Free Building	Certify that all asbestos has been properly abated throughout the building
Indoor Environment	6.3	Indoor Air Quality (IAQ) Policy	Adopt and implement an Indoor Air Quality (IAQ) Policy. For Fitwel credit, non-emitting or low-VOC materials must be tested and deemed compliant with the California Department of Public Health Standard Method V1.1–2010 in the following categories: 1) insulation, thermal, and acoustic 2) flooring systems 3) ceiling systems 4) interior wall assemblies or interior surfaces of exterior walls 5) paints, coatings, adhesives, and sealants wet-applied on site -how a building or workplace will manage the sources of pollutants, dilute pollutants, and remove through ventilation, and use filtration to clean the air -details of a regular ventilation and filtration maintenance plan -how the building or workplace will manage the most common ways to improve the indoor air in an office, such as: ·avoiding blockage of ventilation supply or exhaust or other grilles ·building- or campus-wide tobacco-free policy ·proper maintenance of interior plants (watering, pruning, etc.) ·regular disposal of garbage and other waste ·hygienic storage of foods, including refrigeration where necessary ·rules prohibiting products or other sources of harmful or bothersome odors and contaminants ·indoor air quality notification system to alert building management of potential issues
Indoor Environment	6.4	Green Purchasing Policy	Adopt and implement a Green Purchasing Policy
Indoor Environment	6.5	Chemical Storage Ventilation	Provide separate ventilation in all areas with chemical use or storage

Domain	ID	Feature	Intent Description
Tenant Spaces	7.1	Natural Daylight	Provide natural daylight in a majority of the workplace. Provide an annotated plan(s) and/or diagram(s) showing the total area that receives daylight on all relevant building floors, and provide calculations indicating that a minimum of 51% of regular occupant workspaces, common areas, and other regularly occupied areas receive daylight. If spaces are existing provide a clear photograph(s) of each relevant floor showing the floor layout relative to the windows. The area of daylit workspaces is defined in plan as the area within two feet of exterior windows, with a depth into the space determined by a factor relative to the window head height. At the south and north facades the depth of the daylit area is 1.5x the window head height, and at the east and west facades this factor is 1x the window head height.
Tenant Spaces	7.2	Views of Nature	Provide views of nature from a majority of workspaces. Provide an annotated plan(s) and/or diagram(s) showing the following on all floors: - A calculation including the total number of employee and building staff workstations that demonstrates direct lines of sight to outside nature for a minimum of 51% of the total workspaces. The area of workspaces with views is defined in plan as the area with direct line of sight of the view to a depth into the space 3x the window head height.
Tenant Spaces	7.3	Operable Shading	Provide operable shading in all regularly occupied workplaces
Tenant Spaces	7.4	Active Workstations	Provide access to sufficient active workstations
Shared Spaces	8.1	Bathroom Cleaning Schedule	Adopt a regular cleaning schedule for bathrooms
Shared Spaces	8.2	Hand-Washing Signage	Provide permanent educational signs promoting hand-washing in bathrooms
Shared Spaces	8.3	Common Break Areas	Provide common break areas accessible to all regular occupants that can accommodate lunch-time activity
Shared Spaces	8.4	Refrigerator and Freezer Cleaning	Adopt regular cleaning schedule for the interiors of refrigerators and freezers in break areas

Domain	ID	Feature	Intent Description
Shared Spaces	8.5	Quiet Room	Provide a dedicated quiet room accessible to all regular occupants that can be used in private
Shared Spaces	8.6	Lactation Rooms and Stations	Provide a sufficient number of dedicated lactation rooms or stations accessible to all regular occupants
Shared Spaces	8.7	Multi-purpose Room	Provide a multi-purpose room that can be scheduled for wellness activities or on-site exercise by all regular occupants
Shared Spaces	8.8	Exercise Room	Provide a dedicated exercise room accessible free of charge to all regular occupants - fitness equipment (cardio and strength training equipment) - access to locker rooms - access to showers
Shared Spaces	8.9	Fitness Facility	Provide a dedicated, staffed fitness facility with subsidized or below market rate membership fees for all regular occupants
Water Supply	9.1	Water Supply	Provide at least one ADA compliant water supply on relevant floors
Water Supply	9.2	Water Bottle Refilling Station	Provide water bottle refilling ability at a minimum of one water supply on every floor and at all water outlets within the workplace
Food Services	10.1	Healthy Food Service	Require a healthy food and beverage standard at least as rigorous as the applicable Food Service Guidelines for Federal Facilities in leasing agreements with food service providers
Food Services	10.2	Food Services Choice Architecture	Incentivize healthy food selection with choice architecture practices. At least two of the following are required: - point-of-choice nutritional labeling - packaging design - food and drink portion sizing - increasing healthier food options - altering proximity of food options by changing food area layout
Food Services	10.3	Food Services Pricing Incentives	Encourage healthy food choices through pricing incentives
Food Services	10.4	Food Services Water Access	Provide access to free water in cafeteria and prepared food retail areas
Vending Machines and Snack Bars	11.1	Healthy Vending	Require a healthy food and beverage standard at least as rigorous as the applicable Food Service Guidelines for Federal Facilities in all vending machines and snack bars

Domain	ID	Feature	Intent Description
Vending Machines and Snack Bars	11.2	Vending and Snack Bar Choice Architecture	Incentivize healthy food selection with choice architecture practices. Provide a clear photograph(s) and/or document(s) detailing choice architecture practices employed at vending machines and snack bars, as applicable. At least one of the following is required: - point-of-choice nutritional labeling - packaging design - food and drink portion sizing - altering proximity of food options by changing food area layout
Vending Machines	11.3	Vending and Snack Bar Pricing	Encourage healthy food choices through pricing incentives
Vending Machines	11.4	Water Access	Provide access to free water near vending machines and snack bars
Emergency Procedures	12.1	Emergency Equipment Database	Create and maintain a database of building emergency equipment and supplies. For credit building should include at least 10 of the 12 items off of the FEMA list included below: - water (amounts for portable kits will vary. If it is feasible, store one gallons of water per person per day, for drinking and sanitation) - at least a three-day supply of non-perishable food - battery-powered radio and extra batteries - flashlight and extra batteries - first aid kit - whistle to signal for help - dust or filter masks - moist towelettes for sanitation - wrench or pliers to turn off utilities - can opener for food (if kit contains canned food) - plastic sheeting and duct tape to “seal the room” - garbage bags and plastic ties for personal sanitation
Emergency Procedures	12.2	Automated External Defibrillator (AED)	Install an Automated External Defibrillator (AED) on each floor and adopt a regular testing schedule
Emergency Procedures	12.3	Certified First Responders	Ensure that there is one certified first responder (CFR) per 100 regular occupants present during work hours
Emergency Procedures	12.4	Emergency Address Notification	Provide an emergency address notification system in building

Annexure 2 (WELL)

Domain	Type	Feature	Intent
Air	Precondition	Air quality standards	To ensure a basic level of high indoor air quality.
Air	Precondition	Smoking ban	To deter smoking, minimize occupant exposure to second hand smoke, and reduce smoke pollution.
Air	Precondition	Ventilation effectiveness	To ensure adequate ventilation and high indoor air quality.
Air	Precondition	VOC reduction	To minimize the effect of VOCs in building materials on indoor air quality.
Air	Precondition	Air filtration	To remove indoor and outdoor airborne contaminants through air filtration.
Air	Precondition	Microbe and mold control	To reduce mold and bacteria growth within buildings, particularly from water damage or condensation on cooling coils.
Air	Precondition	Construction pollution management	To minimize the introduction of construction-related pollutants into indoor air and protect building products from degradation.
Air	Precondition	Healthy entrance	To minimize the introduction of pollutants into indoor air at building entrances.
Air	Precondition	Cleaning protocol	To reduce occupant exposure to pathogens, allergens, and harmful cleaning chemicals.
Air	Precondition	Pesticide management	To reduce the presence of pests in buildings and minimizing occupant exposure to harmful chemicals.
Air	Precondition	Fundamental material safety	To reduce or eliminate occupant exposure to lead, asbestos, and polychlorinated biphenyls (PCBs) from building materials.
Air	Precondition	Moisture management	To limit the potential for bacteria and mold growth within buildings from water infiltration and condensation.
Air	Optimization	Air flush	To remediate construction-related indoor air contamination.
Air	Optimization	Air infiltration management	To minimize air quality and thermal comfort issues resulting from the infiltration of untreated air through the building envelope.
Air	Optimization	Increased ventilation	To expel internally-generated pollutants through an increased supply of outdoor air.
Air	Optimization	Humidity control	To limit the growth of pathogens, reduce off-gassing, and maintain thermal comfort by providing the appropriate level of humidity.

Domain	Type	Feature	Intent
Air	Optimization	Direct source ventilation	To preserve air quality in occupied spaces through the isolation and proper ventilation of indoor pollution sources and chemical storage areas.
Air	Optimization	Air quality and monitoring feedback	To monitor and effectively remediate indoor air quality issues and inform building managers and occupants of the quality of the indoor environment.
Air	Optimization	Operable windows	To increase the supply of high quality outdoor air and promote a connection to the outdoor environment by encouraging occupants to open windows when outdoor air quality is acceptable.
Air	Optimization	Outdoor air systems	To allow buildings to control the outdoor air supply independently from the heating/cooling needs of the building.
Air	Optimization	Displacement Ventilation	To improve air quality in the breathing zone of the room and maintain thermal comfort by supplying low velocity outdoor air near the floor and expelling near the ceiling.
Air	Optimization	Pest control	To reduce the presence of pests in buildings and minimize occupant exposure to pest-related allergens.
Air	Optimization	Advanced Air Purification	To improve recirculated indoor air quality through the implementation of advanced air purification strategies.
Air	Optimization	Combustion minimization	To reduce occupant exposure to combustion-related air pollution from heating and transportation sources.
Air	Optimization	Toxic material reduction	To minimize the impact of hazardous building material chemicals on indoor air quality and protect the health of manufacturing and maintenance workers.
Air	Optimization	Enhanced material safety	To minimize the impact of hazardous building material ingredients on indoor air quality and protect the health of manufacturing and maintenance workers.
Air	Optimization	Antimicrobial surfaces	To reduce occupant exposure to both harmful pathogens and hazardous cleaning agents.
Air	Optimization	Cleanable environment	To reduce occupant exposure to pathogens on high-touch surfaces.
Air	Optimization	Cleaning equipment	To reduce occupant exposure to both harmful pathogens and hazardous chemicals through the use of high quality cleaning equipment and the proper storage of cleaning agents.

Domain	Type	Feature	Intent
Water	Precondition	Fundamental water quality	To limit the presence of sediment and water borne pathogens in water designated for human contact
Water	Precondition	Inorganic contaminants	To limit the presence of inorganic contaminants in drinking water
Water	Precondition	Organic contaminants	To limit the presence of organic contaminants in drinking water.
Water	Precondition	Agricultural contaminants	To limit the presence of agricultural contaminants in drinking water.
Water	Precondition	Public water additives	To limit the presence of certain disinfectants, disinfection byproducts and fluoride in drinking water.
Water	Optimization	Periodic water quality testing	To maintain high quality water through regular water quality monitoring and remediation.
Water	Optimization	Water treatment	To improve water quality by requiring the use of water treatment systems.
Water	Optimization	Drinking water promotion	To promote the consumption of water by making high quality drinking water easily accessible to occupants.
Nourishments	Precondition	Fruits and vegetables	To promote the consumption of fruits and vegetables by making fruits and vegetables easily accessible to occupants.
Nourishments	Precondition	Processed foods	To help occupants avoid highly-processed ingredients and foods.
Nourishments	Precondition	Food allergies	To help occupants avoid consumption of or contact with potential food allergens.
Nourishments	Precondition	Handwashing	To reduce pathogen transmission by providing accessible and sanitary hand washing facilities.
Nourishments	Precondition	Food contamination	To minimize occupant exposure to food-borne pathogens by providing safe food storage.
Nourishments	Precondition	Artificial ingredients	To help occupants avoid artificial colors, sweeteners and preservatives in food.
Nourishments	Precondition	Nutrition information	To help occupants make informed food consumption choices.
Nourishments	Precondition	Food advertising	To promote healthy food consumption choices.
Nourishments	Optimization	Safe food preparation materials	To reduce occupant exposure to harmful contaminants that may originate from food preparation materials and eliminate surfaces that harbor pathogens.
Nourishments	Optimization	Serving sizes	To reduce unintended overconsumption and encourage portion control.

Domain	Type	Feature	Intent
Nourishments	Optimization	Special diets	To provide alternative food choices to individuals with food restrictions or allergies.
Nourishments	Optimization	Responsible food production	To reduce occupant exposure to pesticides or hormones, limit environmental degradation and promote humane livestock practices.
Nourishments	Optimization	Food storage	To encourage the consumption of fresh foods by providing sufficient cold food storage to occupants.
Nourishments	Optimization	Food production	To improve access to fresh produce by providing space, infrastructure and tools for on-site food production.
Nourishments	Optimization	Mindful eating	To encourage mindful eating behaviors and socialization by providing communal eating spaces.
Light	Precondition	Visual lighting design	To support visual acuity by setting a threshold for adequate light levels and requiring luminance to be balanced within and across indoor spaces.
Light	Precondition	Circadian lighting design	To support circadian health by setting a minimum threshold for daytime light intensity.
Light	Precondition	Electric light glare control	To minimize direct and overhead glare by setting limits on the luminous intensity of luminaires.
Light	Precondition	Solar glare control	To avoid glare from the sun by blocking or reflecting direct sunlight away from occupants.
Light	Optimization	Low-glare workstation design	To minimize visual discomfort by situating computer monitors in a way that avoids glare and luminance contrast.
Light	Optimization	Color quality	To enhance spatial aesthetics and color differentiation through the use of lamps with quality color rendering abilities.
Light	Optimization	Surface design	To increase overall room brightness through reflected light from room surfaces and avoiding glare.
Light	Optimization	Automated shading and dimming controls	To prevent glare and encourage reliance on natural light through automated shading and dimming.
Light	Optimization	Right to light	To promote exposure to daylight and views of varying distances by limiting the distance workstations can be from a window or atrium.
Light	Optimization	Day light modeling	To support circadian and psychological health by setting thresholds for indoor sunlight exposure.
Light	Optimization	Daylighting fenestration	To optimize occupant exposure to daylight and limit glare through enhanced fenestration parameters.

Domain	Type	Feature	Intent
Fitness	Precondition	Interior fitness circulation	To encourage intermittent bouts of physical activity and reduce sedentary behavior through accessible, safe, and visually appealing stairs, entryways, and corridors.
Fitness	Precondition	Activity incentive programs	To promote active lifestyles through the provision of physical activity incentive programs.
Fitness	Optimization	Structured fitness opportunities	To promote safe and convenient exercise through access to on-site professional fitness training and education.
Fitness	Optimization	Exterior active design	To promote active lifestyles through the integration of active design elements into the building exterior.
Fitness	Optimization	Physical activity spaces	To promote physical activity through complimentary access to on-site indoor and local outdoor physical activity spaces.
Fitness	Optimization	Active transportation support	To promote daily physical activity through the provision of on-site support for active commuting.
Fitness	Optimization	Fitness equipment	To promote both cardiovascular and muscle-strengthening exercise by providing complimentary access to on-site fitness equipment.
Fitness	Optimization	Active furnishings	To reduce sedentary behavior by making active workstations readily available to occupants.
Comfort	Precondition	Accessible design	To promote equity by providing buildings that are accessible and usable by people of all physical abilities.
Comfort	Precondition	Ergonomics: visual and physical	To reduce physical strain and maximize ergonomic comfort and safety.
Comfort	Precondition	Exterior noise intrusion	To reduce acoustic disruptions by limiting external noise intrusion.
Comfort	Precondition	Internally generated noise	To reduce acoustic disruptions from internal noise sources and increase speech privacy.
Comfort	Precondition	Thermal comfort	To promote occupant productivity and ensure a sufficient level of thermal comfort.
Comfort	Optimization	Olfactory comfort	To maximize olfactory comfort by reducing the transmission of strong smells and odors within the building.
Comfort	Optimization	Reverberation time	To help maintain comfortable sound levels by limiting reverberation times.

Domain	Type	Feature	Intent
Comfort	Optimization	Sound masking	To reduce acoustic disruptions and increase speech privacy by implementing sound masking into the building design.
Comfort	Optimization	Sound reducing surfaces	To reduce sound reverberation and maintain comfortable sound levels though absorptive ceiling and wall surfaces.
Comfort	Optimization	Sound barriers	To reduce sound transmission and acoustic disruptions through sound barriers.
Comfort	Optimization	Individual thermal control	To maximize and personalize thermal comfort among all occupants.
Comfort	Optimization	Radiant thermal comfort	To maximize floor space, reduce dust transmission and increase thermal comfort by incorporating radiant heat and cooling systems into the building design.
Mind	Precondition	Health and wellness awareness	To promote a deeper understanding of factors that impact health and wellness.
Mind	Precondition	Integrative design	To facilitate a collaborative development process and ensure adherence to collective wellness goals.
Mind	Precondition	Post-occupancy surveys	To allow occupants to provide feedback to building owners and management, and help further develop the WELL Building Standard.
Mind	Precondition	Beauty and design I	To thoughtfully create unique and culturally-rich spaces.
Mind	Precondition	Biophilia I - qualitative	To nurture the innate human-nature connection within the project.
Mind	Optimization	Adaptable spaces	To reduce distractions, mitigate stress and enable focused work by integrating a stimuli management program within the building.
Mind	Optimization	Healthy sleep policy	To support healthy sleep habits by discouraging occupants from working late at night and providing them with sleep support software.
Mind	Optimization	Business travel	To minimize disruptions to occupants' sleep and fitness regimens, and personal relationships by adopting supportive travel policies.
Mind	Optimization	Building health policy	To protect the overall health and well-being of occupants and their families by adopting comprehensive health policies.
Mind	Optimization	Workplace family support	To ensure occupants are able to properly care for themselves and their families by adopting supportive family care policies.
Mind	Optimization	Self-monitoring	To promote awareness of individual biomarkers associated with health and wellness.

Domain	Type	Feature	Intent
Mind	Optimization	Stress and addiction treatment	To avoid or mitigate substance use and addiction issues by providing access to stress management programs.
Mind	Optimization	Altruism	To enhance community identity and promote social cohesion.
Mind	Optimization	Material transparency	To promote material transparency along the supply chain.
Mind	Optimization	Organizational transparency	To promote economic and social equity by requiring the adherence to and disclosure of fair and equitable business practices.
Mind	Optimization	Beauty and design II	To promote occupant comfort and spatial familiarity by designing spacious, familiar and aesthetically appealing spaces.
Mind	Optimization	Biophilia II - quantitative	To support occupant emotional and psychological well-being by including the natural environment in interior and exterior design.

Annexure 3 (IGBC)

Points	Domain	Feature
	Sustainable Sites	Pre requisite- Construction Pollution Prevention
1	Sustainable Sites	Site Selection
5	Sustainable Sites	Development Density & Community Connectivity
1	Sustainable Sites	Brownfield Redevelopment
6	Sustainable Sites	Alternative Transportation: Public Transportation Access
2	Sustainable Sites	Alternative Transportation: Bicycle Storage and Changing Rooms
3	Sustainable Sites	Alternative Transportation: Low-Emitting and Fuel Efficient Vehicles
2	Sustainable Sites	Alternative Transportation: Parking Capacity
1	Sustainable Sites	Site Development: Protect or Restore Habitat
1	Sustainable Sites	Maximize open space
1	Sustainable Sites	Stormwater Design: Quantity Control
1	Sustainable Sites	Stormwater Design:Quality control
1	Sustainable Sites	Heat Island Effect: Non-roof
1	Sustainable Sites	Heat Island Effect: Roof
1	Sustainable Sites	Light pollution reduction
1	Sustainable Sites	Tenant design Guideline

Points	Domain	Feature
	Water Efficiency	Pre requisite- Water Use Reduction
4	Water Efficiency	Water efficient landscaping, reduce by 50%/ No Potable Water Use
2	Water Efficiency	Innovative Wastewater Treatment and Reuse
4	Water Efficiency	Water Use Reduction (30% - 2, 35% - 3 & 40% - 4)
	Energy & Atmosphere	Pre requisite 1- Fundamental Commissioningof Building Energy Systems
	Energy & Atmosphere	Pre requisite 2- Minimum Energy Performance
	Energy & Atmosphere	Pre requisite 3- Fundamental Refrigerant Management
21	Energy & Atmosphere	Optimise energy performance (3-12%, 4-14%, 5-16%, 6-18%, 10-26%)
4	Energy & Atmosphere	On-site Renewable Energy (1% of Bldg's annual energy cost)-Solar/Wind
2	Energy & Atmosphere	Enhanced Commissioning
2	Energy & Atmosphere	Enhanced Refrigerant Management
6	Energy & Atmosphere	Measurement & Verification - Base Building & Tenant (5.1-5.2)
2	Energy & Atmosphere	Green Power - 2 years
	Materials & Resources	Pre requisite- Storage and collection of recyclables
5	Materials & Resources	Building reuse, maintain 75% of existing Walls, Floors And Roof
2	Materials & Resources	Construction waste management, Divert 50%/75% from disposal
1	Materials & Resources	Materials Reuse - 5% / 10%
2	Materials & Resources	Recycled Content - 10%/20%
2	Materials & Resources	Regional Materials - 10%/20%
1	Materials & Resources	Certified wood: 50% of wood based materials
	Indoor Environmental Quality	Pre requisite 1- Minimum IAQ performance
	Indoor Environmental Quality	Pre requisite 2- Environmental Tobacco Smoke Control
1	Indoor Environmental Quality	Outdoor air delivery monitoring (AFMS / CO2 sensors installation)
1	Indoor Environmental Quality	Increased Ventilation:30% above ASHRAE 62.1 requirements
1	Indoor Environmental Quality	Construction IAQ management plan - construction / occupancy
1	Indoor Environmental Quality	Low emitting materials, adhesives & sealants
1	Indoor Environmental Quality	Low emitting materials, Paints & Coatings
1	Indoor Environmental Quality	Low emitting materials, Carpet

Points	Domain	Feature
1	Indoor Environmental Quality	Low emitting materials, Composite wood & agrifiber products
1	Indoor Environmental Quality	Indoor chemical & pollutant source control
1	Indoor Environmental Quality	Controllability of Systems, Thermal comfort
1	Indoor Environmental Quality	Thermal comfort, Design / Verification
1	Indoor Environmental Quality	Daylight & Views, daylight 75% of spaces
1	Indoor Environmental Quality	Daylight & Views, Views for 90% of spaces
1	Innovation & Design process	Innovation in design - Green Housekeeping Chemicals
1	Innovation & Design process	Exemplary Performance -
1	Innovation & Design process	Exemplary Performance - Heat Island Effect Non-roof
1	Innovation & Design process	Exemplary Performance - Water Use Reduction 45%
1	Innovation & Design process	Innovation in design - Green Education
1	Innovation & Design process	LEED accredited professionals
4	Regional Priority	Regional Priority

110

Annexure 4 (GBCI – LEED)

Domain	Feature	Points	Feature Requirement
Integrative Process	Integrative Process	1	Energy and Water related systems must be analysed before design stage. Energy -Simple box energy modeling analysis: 2 options for each. 1. Programmatic and operational parameters, 2. Site conditions, 3. Massing and orientation, 4. Basic envelope attributes. 5. Lighting levels, 6. Thermal comfort ranges, 7. Plug and process load needs Water -Preliminary water budget analysis 1. Indoor water demand, 2. Outdoor water demand, 3. Process water demand., 4. Supply sources
Location and Transportation	LEED for Neighborhood Development Location		-

Domain	Feature	Points	Feature Requirement
Location and Transportation	Sensitive Land Protection	2	Project should be on a previously developed site (site should not contain any farm land, wetland, forest area, flood hazard area, it may be previouly graded)
Location and Transportation	High Priority Site	3	1. A site listed by the EPA National Priorities List; 2. A Federal Empowerment Zone site; 3. A Federal Enterprise Community site; 4. A Federal Renewal Community site; 5. A Department of Justice Weed and Seed Strategy Community; 6. A Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community (a subset of the New Markets Tax Credit Program); 7. A site in a U.S. Department of Housing and Urban Development's Qualified Census Tract (QCT) or Difficult Development Area (DDA); or 8. A local equivalent for projects outside the United States (SEZ)
Location and Transportation	Surrounding Density and Diverse Use	6	1. Surrounding density (within 400 meter radius) should be 12 units/acre (7) for residential and 0.8 (0.5) FAR for non-residential. 2. Building's main entrance should be within 800 meter walking distance of 8 or more basic services. (Supermarket, Hardware Store, Pharmacy, Bank, Gym, Health Club, Child Care, Post office, Place of Worship, Public Park etc.)
Location and Transportation	Access to Quality Transit	6	Functional entry of the project should be within 400 meter walking distance of bus stop/rideshare. Number of trips: Weekday: 72 , 144, 360; Weekend: 40, 108,216 (1,3,6)
Location and Transportation	Bicycle Facilities	1	Functional entry of the project should be within 180 meter walking distance or bicycling distance from a bicycle network which connects at least 10 basic services/school/bus stop

Domain	Feature	Points	Feature Requirement
Location and Transportation	Reduced Parking Footprint	1	Parking spaces provided should be 40% less than the base ratios recommended by the Parking Consultants Council, as shown the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4. Also, the preferred parking provided for carpool vehicles will be 5% of the total parking spaces.
Location and Transportation	Green Vehicles	1	Approx 21 number of ECU spaces (5% of parking facility) must be reserved for fuel efficient vehicles and electrical charging stations must be provided to cater 2% of parking spaces i.e. approx. 9 number of ECU spaces. Electric charging stations must be on network.
Sustainable Sites	Prerequisite 1- Construction Activity Pollution Prevention		Implement ESC measures as per NBC 2005
Sustainable Sites	Site Assessment	1	A site survey/ assessment required to document the existing conditions of site w.r.t topography,climate, hydrology, soil, vegetation, human use and human health effects.The survey or assessment should demonstrate the relationships between the site features and topics mentioned and how these features influenced the project design.
Sustainable Sites	Site Development- Protect or Restore Habitat	2	Preserve 40% of the greenfield area on the site AND Use native or adaptive vegetation for more than 30% of total site area. Turf area will be not counted.
Sustainable Sites	Open Space	1	Open space 30% of the site area (the entire vegetated area and any additional undeveloped site). 25% of the open space must be vegetated. Turf area will be not counted.
Sustainable Sites	Rainwater Management	3	RWH systems must be designed to cater entire runoff from rooftop as well as the project site.
Sustainable Sites	Heat Island Reduction	2	Non roof area must be covered with SRI material/open grid pavers (more than 50% permeable) with a SRI of 39 or shade from trees. Roof area must be covered with SRI material of 82 SRI.

Domain	Feature	Points	Feature Requirement
Sustainable Sites	Light Pollution Reduction	1	Meet uplight and light tresspass requirements. Exterior lighting simulation for lighting compliance.
Sustainable Sites	Tenant Design and Construction Guidelines	1	-
Water Efficiency	Prerequisite 1- Outdoor Water Use Reduction		Reduction of water consumption for landscape by min 30% over the baseline case by using native and drought tolerant species and efficient irrigation
Water Efficiency	Pre requisite 2 - Indoor Water Use Reduction		Reduction of water consumption over the baseline case by the use of water efficient fixtures.Proposed flow rates: WC: 4/2 LPF; Restroom Faucets: 1.3 LPM; Urinals: 1.5 LPF, Kitchen Faucets: 3.8 LPM.
Water Efficiency	Pre requisite 3- Building-Level Water Metering		Building level water meters are required that track the water consumption of the project at one-month duration.
Water Efficiency	Outdoor Water Use Reduction, 50%, 100%	2	Reduction of water consumption for landscape by 50% over the baseline case. Use of drought tolerant species of plants and STP treated water.
Water Efficiency	Indoor Water Use Reduction, 25%- 50%	6	Reduction of water consumption over the baseline case by the use of water efficient fixtures.
Water Efficiency	Cooling Tower Water Use	2	Reduce the makeup water demand by use of treated water and by increasing the cycle of water circulation.
Water Efficiency	Water Metering	1	Install water sub meters to measure water consumption by any two of following: Irrigation, indoor plumbing fixtures, domestic hot water, process water.
Energy and Atmosphere	Prerequisite 1- Fundamental Commissioning and Verification		-
Energy and Atmosphere	Pre requisite 2 - Minimum Energy Performance		-
Energy and Atmosphere	Pre requisite 3- Building-Level Energy Metering		Building level energy meters and BTU meter required at building level
Energy and Atmosphere	Pre requisite 3- Fundamental Refrigerant Management		CFC free refrigerants must be used.
Energy and Atmosphere	Enhanced Commissioning	6	A third party commissiong authority will perform fundamental and enhanced commissiong. All energy and water consuming systems must be on BMS

Domain	Feature	Points	Feature Requirement
Energy and Atmosphere	Optimize Energy Performance-3%,5%,7%,9%,11%,13%--47%	18	AAC blocks, DGU glass, 75 mm XPS insulation, VFD on AHU's and SCHWP, Solar PV of 85 KW considered.
Energy and Atmosphere	Advanced Energy Metering	1	Install meters for tenant spaces so that tenants will be capable of independently metering energy consumption (electricity, chilled water, etc.) for all systems dedicated to their space. Provide a sufficient number of meters to capture total tenant energy use with a minimum of one meter per energy source per floor.
Energy and Atmosphere	Demand Response	2	Infrastructure should be capable of shedding 10% of peak load
Energy and Atmosphere	Renewable Energy Production-1%, 3%, 5%	3	Solar PV of 85 kW for 1 point.
Energy and Atmosphere	Enhanced Refrigerant Management	1	CFC/ HCFC free refrigerants must be used.
Energy and Atmosphere	Green Power and Carbon Offsets	2	Project needs purchase REC certificates equal to 100% of total energy consumption of the building.
Material and Resources	Pre requisite 1- Storage and Collection of Recyclables (MS)		Separate bins must be provided to collect and store waste materials such as: mixed paper, corrugated cardboard, glass, plastics, metals, batteries and e-waste
Material and Resources	Pre requisite 2- Construction and Demolition Waste Management Planning		-
Material and Resources	Building Life-Cycle Impact Reduction	6	Whole building lifecycle assessment must be performed to measure the project's impact on the environment in three of the following areas: The impact should be 10% less than the basline building. 1. Global warming potential (greenhouse gases), in CO2e; 2. Depletion of the stratospheric ozone layer, in kg CFC-11; 3. Depletion of nonrenewable energy resources, in MJ. 4. Acidification of land and water resources, in moles H+ or kgSO2 5. Eutrophication, in kg nitrogen or kg phosphate 6. Formation of tropospheric ozone, in kg NOx or kg ethene

Domain	Feature	Points	Feature Requirement
Material and Resources	Building Product Disclosure and Optimization - EPD	2	-
Material and Resources	Building Product Disclosure and Optimization - Sourcing of raw materials	2	-
Material and Resources	Building Product Disclosure and Optimization - Material Ingredients	2	-
Material and Resources	Construction and Demolition Waste Management	2	-
Indoor Environmental Qualtiy	Pre requisite 1- Minimum Indoor Air Quality Performance		The project should meet the requiremets of ASHRAE 62.1.2010 standard for fresh air. Install current transducer on the supply fan of TFA units (considering constant volume). Considering two TFA's for building
Indoor Environmental Qualtiy	Pre requisite2 - Environmental Tobacco Smoke Control(MS)		Smoking is prohibitted inside the building and outdoor spaces except in designated smoking areas located at least 25 feet from all entries, outdoor air intakes, and operable windows.
Indoor Environmental Qualtiy	Enhanced Indoor Air Quality Strategies	2	1. Entryway system, Exhaust in battery rooms, chemical rooms /printer/copier room and MERV 13 filters on outdoor air units. 2. 30% extra fresh air
Indoor Environmental Qualtiy	Low-Emitting Materials	3	
Indoor Environmental Qualtiy	Construction Indoor Air Quality Management Plan	1	An efficient construction indoor air quality management plan will be implemented on site.
Indoor Environmental Qualtiy	Daylight (1-75%, 2-90% and 3 incase of Measurement)	3	
Indoor Environmental Qualtiy	Quality Views	1	75% of the regularly occupied area have views that include (1) sky and movement and (2) unobstructed views located within the distance of three times the head height of the vision glazing
Innovation	INNOVATION - Exemplary performance - Indoor Water Reduction	1	Indoor water reduction

Domain	Feature	Points	Feature Requirement
Innovation	INNOVATION - Exemplary performance - Construction Waste Management	1	Construction Waste Management
Innovation	INNOVATION - Innovation in Design - O&M starter kit	1	Site Management Policy, Green Cleaning Policy
Innovation	INNOVATION - Innovation in Design - Sustainable Wastewater Management	1	-
Innovation	INNOVATION - Pilot - EQpc57 - Enhanced acoustical performance - exterior noise control	1	-
Innovation	LEED Accredited Professional	1	Involve atleast one LEED AP professional in the project
Regional Priority	Regional Priority	1	These credit points may be achieved by documentating credit listed in LT, SS, EA, MR and IEQ sections above. UGSBC will award points for having additional regional importance for the project's region. No additional documents are required in this section.
Regional Priority	Regional Priority	1	
Regional Priority	Regional Priority	1	
Regional Priority	Regional Priority	1	
		110	

Annexure 5 (BREEAM)

Domain	ID	Feature	Intent
Management	MAN 01	Project brief and design	To encourage integrated design process, performance targetting, influence early decision making
Management	MAN 02	Life cycle cost and service life planning	To promote business case and enhance understanding of sustainability costing
Management	MAN 03	Responsible contruction practices	Construction to be managed in an environmentally and socially considerate and responsible manner
Management	MAN 04	Commissioning and handover	To encourage a well managed commissioning and handover
Management	MAN 05	Aftercare	To ensure that the building operates in accordance with the design
Energy	ENE 01	Reduction of energy use and carbon emissions	Encourage energy modelling and better energy performance
Energy	ENE 02	Energy monitoring	Measure energy demand to control/reduce high enegy consumption where possible

Domain	ID	Feature	Intent
Energy	ENE 03	External lighting	Encourage energy efficient external lighting
Energy	ENE 04	Low carbon design	Adopt passive design
Energy	ENE 05	Energy efficient cold storage	Reduce carbon footprint by installing energy efficient refrigeration systems
Energy	ENE 06	Energy efficient transport systems	Keep optimal no. of lifts, propose lowest energy consumption in VT and escalator systems
Energy	ENE 08	Energy efficient equipment	Acheive meaningful reduction in energy use at unregulated points by having energy efficient equipment
Energy	ENE 09	Drying Space	Provide low energy means of drying clothes
Water	WAT 01	Water consumption	Reduce the demand of water by efficient fixtures, recycling and rain water harvesting
Water	WAT 02	Water monitoring	Encourage reduction by identifying areas of high usage
Water	WAT 03	Water leak detection	Reduce unintended water consumption by leak detection and flow control devices
Water	WAT 04	Water efficient equipment	Improve design efficiency of any water using system (non domestic or sanitary)
Waste	WST 01	Construction waste management	Pre demolition audit, recovery of demolition material, management of hazardous material
Waste	WST 02	Recycled aggregates	Use recycled or secondary aggregates
Waste	WST 03	Operational waste	Segregation and recycling of operational waste
Waste	WST 04	Speculative floor and ceiling finishes	Reduce wastage by specifying only where agreed by tenant/occupant
Waste	WST 05	Adaptation to climate change	Mitigate the impact of more extreme weather conditions due to climate change during the lifespan of the building
Waste	WST 06	Design for disassembly and adaptability	Adapt for refurbishment such that there is functional adapdability and diassembly possible in the fit out works
Pollution	POL 01	Impact of refrigerants	Reward buildings for reduction in impact of refrigerant gas emissions
Pollution	POL 02	Local air quality	Selection of combustion plant and fuel used on site
Pollution	POL 03	Flood and surface water management	Reward buildings that limit on and off site local flooding
Pollution	POL 04	Reduction of night time light pollution	Avoidance and reduction of the impact of night time light pollution

Domain	ID	Feature	Intent
Pollution	POL 05	Reduction of noise pollution	Avoidance or reduction of the impact of
Health and Well Being	HEA 01	Visual comfort	Daylighting, Glare control, Task appropriate lux levels
Health and Well Being	HEA 02	Indoor air quality	Low VOC material control, IAQ monitoring, appropriate ventilation
Health and Well Being		Safe containment in laboratories	Encourage safety, mitigate health and nuisance effects
Health and Well Being	HEA 03	Thermal comfort	Encourage thermal modelling, user control, thermal zoning
Health and Well Being	HEA 05	Acoustic performance	Ensure best practice acoustic levels for the occupants
Health and Well Being		Security	Consider and take into account occupants security and safety
Health and Well Being	HEA 06	Safe and healthy surroundings	Enhanced with access to an outdoor space, ensure that outdoor areas are safe
Health and Well Being		Accessibility	Encourage disabled accessibility
Health and Well Being	HEA 07	Hazards	Reduce or negate effects of a natural hazard on a building
Health and Well Being	HEA 04	Water quality	Provide clean, fresh drinking water; avoid risk of contamination of water
Transport	TRA 01	Public transport accessibility	Recognition of developments in proximity to good public transport networks
Transport	TRA 02	Proximity to amenities	Recognition of developments in close proximity of, and accessible to, local amenities which are likely to be frequented by the occupant
Transport	TRA 03	Alternative modes of transport	Encourage use of low carbon modes of transport
Transport	TRA 04	Maximum car parking capacity	Recognition of developments that limit car parking capacity
Transport	TRA 05	Travel plan	Site specific travel assessments, Develop travel plans based on specific needs of the particular site
Materials	MAT 01	Life cycle impacts	Conduct life cycle impacts through conducting life cycle analysis and integrate its outcomes in design decision making process
Materials	MAT 02	Hard landscaping and boundary protection	Selection of low environmental impact material for external hardscape and boundary protection
Materials	MAT 03	Responsible sourcing of material	Proximal sourcing of materials, recyclable material use

Domain	ID	Feature	Intent
Materials	MAT 04	Insultation	To recognise and encourage the use of thermal insulation which has a low embodied environmental impact relative to its thermal properties.
Materials	MAT 05	Designing for durability and resilience	Increase the life of the building, by specyfying measures for protection from degradation
Materials	MAT 06	Material efficiency	Optimisation of use of material, low wastage, recyclable.
Land use and ecology	LE 01	Site selection	Recognition of reuse of developed, contaminated land with appropriate measures
Land use and ecology	LE 02	Ecological value of site and protection of ecological features	To encourage development on land that already has limited value to wildlife and to protect existing ecological features from substantial damage during site preparation and completion of construction works.
Land use and ecology	LE 03	Mitigating ecological impact	To minimise the impact of a building development on existing site ecology.
Land use and ecology	LE 04	Enhancing site ecology	Encourage steps to enhance ecology of the site like planting local vegetation, adopting horticulture good practices, install bird and insect boxes at appropriate locations
Land use and ecology	LE 05	Long term impact on biodiversity	To minimise the long term impact of the development on the site and the surrounding area's biodiversity.
Innovation		Innovation	Encourage drive and publicise innovation

Annexure 6 (Living Building Challenge)

Domain	ID	Feature	Intent
Site	I-01	Limits to Growth	Be a brownfield, greyfield development, stay away from ecologically sensitive areas
Site	I-02	Urban Agriculture	Demonstrate implementation of urban agriculture and sustainable community food systems
Site	I-03	Habitat Exchange	Set aside (for perpetuity) an equal amount of land away from site
Site	I-04	Human Powered Living	Prove that project has increased the density from the original condition
Water	I-05	Net Positive Water	Demonstrate demand vs production. Also show harmony with natural water flows based on a minimum of a 10 year storm event.

Domain	ID	Feature	Intent
Energy	I-06	Net Positive Energy	Demonstrate demand vs production
Health	I-07	Civilized Environment	To improve occupant health by providing a direct connection to the outdoor environment.
Health	I-08	Healthy Interior Environment	1. Cleaning products to be EPA compliant 2. HVAC compliance with ASHRAE 62 3. Low VOC material use 4. IAQ testing 5. CO2, Temp, Humidity testing
Health	I-09	Biophilic Environment	Deliberately incorporate nature through design
Materials	I-10	Red Lists	Red lists, Health Product Declarations, MSDS, VOC disclosure, etc.
Materials	I-11	Embodied Carbon Footprint	Carbon calculations and offset receipts
Materials	I-12	Responsible Industry	Certified wood, salvaged, recycled products
Materials	I-13	Living Economy Sourcing	Proximal sourcing
Materials	I-14	Net Positive Waste	Evidence on process, recycle and salvage of waste
Equity	I-15	Human Scale + Humane Places	Promote culture and interaction between people and the community
Equity	I-16	Universal Access to Nature and Place	Disabled access friendly, etc.
Equity	I-17	Equitable Investment	Provide project cost data and offset .5% project cost as donation if I-13 is not met
Equity	I-18	JUST Organizations	Project teams to have participated in JUST
Beauty	I-19	Beauty + Spirit	Occupants survey to inquire whether they think that the project has succeeded to acheive the intent of the imperative
Beauty	I-20	Inspiration + Education	Promote and showcase the project and its benefits