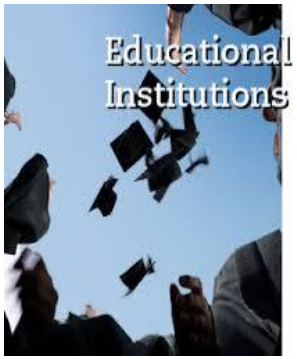
Towards Sustainable Institutions

High-performance?

Design Elements Conformity?

Due care in O & M?



Need for sustainable development?

Readiness and Mitigation

Lifecycle Patterns Assessment

Assessment form

- **Form Serial No:** **Date:**

- **Name of the institution or project:**
- **Assessment carried out by:**
- **Form filled by:**
- **Current status (Tick as applicable):**

❑ Being planned/designed [ ] Ready
❑ Being implemented [ ] Under-rectification or Under-repair
❑ Being integrated/tested [ ] Under-surveillance
❑ Being disassembled [ ] Rejected due to costs, risks or problems

- **Assessment criteria (Tick as applicable):**

❑ Quality assurance for distinctive business model and services
❑ Quality assurance for Location
❑ Quality assurance for Layout
❑ Quality assurance for Natural systems interface utilization
❑ Quality assurance for Sustainability

Assessment form

- **Quality assurance for distinctive nature of business model or services**
- **Nature of customer (student) base (Tick as applicable):**

❑ Small
❑ Medium
❑ Large
❑ Part of a larger cluster

Nature of problems (if any):

Are there issues related to the following (like Issues) (Tick as applicable):

❑ In scope
❑ In pricing for services
❑ In planning for & understanding student's experience
❑ In marketing promotions for presence and services
❑ In improving credibility and customer loyalty
❑ With sustainable facility management

Nature of problems (if any):

Assessment form

- **Quality assurance for Location**
- **Nature of project site (Tick as applicable):**

❑ Small
❑ Medium
❑ Large
❑ Part of a larger cluster

Nature of problems (if any):

Are there issues related to location of project site (like) (Tick as applicable):

❑ In a crowded neighborhood
❑ In an industrial region
❑ In a polluted region
❑ In an isolated place
❑ In a generally unsafe area
❑ With other inherited vulnerabilities due to geographical conditions

Nature of problems (if any):

Assessment form

- **Quality assurance for Layout**
- **Layout includes (Tick as applicable):**

❑ Single building	[ ] Multiple buildings
❑ Laboratories	[ ] Cafeterias, Canteens, Kitchens
❑ Office infrastructure	[ ] Security infrastructure
❑ Play areas	[ ] Other recreational amenities
❑ Compound area	[ ] Basement areas
❑ Basement Parking areas	[ ] Multi-level Parking areas
❑ Sheds or temporary structures	[ ] Storerooms

Nature of problems (if any):

Assessment form

Electricity supply arrangements (Tick as applicable):

- ❑ Overhead lines
- ❑ Transformers Number:
- ❑ Substations Number:
- ❑ Alternate energy systems Number:

Nature of problems (if any):

Assessment form

Electrical systems on site (Tick as applicable):

- ❑ General purpose lighting (in-doors)
- ❑ General purpose lighting (out-doors)
- ❑ Lifts Number:
- ❑ Pumps Number:
- ❑ Motors Number:
- ❑ Generators / Diesel sets Number:
- ❑ UPS Number:
- ❑ Computers Number:
- ❑ Appliances Number:
- ❑ Advanced equipment Number:
- ❑ Critical for life saving, healthcare or nursing equipment Number:
- ❑ Solar heaters Number:
- ❑ Cooling plants Number:
- ❑ HVAC systems Number:
- ❑ Air-conditioning systems Number:
- ❑ Chimneys Number:
- ❑ Incinerators Number:
- ❑ Alternate Energy (electricity supply) systems

Assessment form

Nature of problems with electrical systems (if any):

Assessment form

Type of circuit arrangements for the site (Tick as applicable):

[ ] According to regulations

[ ] Concealed (where ever possible) [ ] Open

[ ] Temporary [ ] Emergency

Nature of problems (if any):

Norms considered at the site (Tick as applicable):

- ❑ Protection against lightning
- ❑ Protection against faulty earthing leakages
- ❑ Protection against short circuit current surges, low voltage, fluctuating voltage, spikes
- ❑ Increasing wiring sizes according to regulation codes or opting for better insulation to prevent energy loss
- ❑ Policy driving replacement of obsolete or power intensive equipments and systems with ones that are capable of more energy savings
- ❑ Regular inspection and remedial action

Assessment form

Water supply arrangements for the site:(Tick as applicable)

- ❑ Public distribution system Capacity: Timings:
- ❑ Wells Number:
- ❑ Bore-wells Number:
- ❑ Tanks Number:

Nature of problems (if any):

Assessment form

Water supply systems at the site(Tick as applicable):

- ❑ Well-planned distribution network
- ❑ Outlet points — Number of flats:
- ❑ Drainage systems — Number:
- ❑ Emergency Drainage systems — Number:
- ❑ Rain-water harvesting systems — Number:
- ❑ Treatment plants — Number:
- ❑ Alternate water supply systems

Nature of problems (if any):

Assessment form

Type of distribution network for water supply (Tick as applicable):

- ❑ Pipes (metallic)
- ❑ Pipes (non-metallic)
- ❑ Hoses
- ❑ Temporary arrangements
- ❑ Emergency arrangements

Nature of problems (if any):

Assessment form

Norms considered (Tick as applicable):

- ❑ Piping that is protected from corrosion, or contamination
- ❑ Efficient plumbing controls and low flow/ better control fixtures for reducing water consumption
- ❑ Controlled pressure levels to maintain uniform or reduced pressure (as is required all throughout site)
- ❑ Periodic assessment of futuristic capability of bore wells
- ❑ Possible strategies for reclaiming or recycling of water
- ❑ Strict discipline for conditional use of potable water
- ❑ Regular inspection and remedial action

Assessment form

- **(continued) Norms considered:**

- ❑ Drainage solutions (for storm water/other incidental reasons)? Yes/No
- ❑ Non- biodegradable (inorganic) Waste management solution? Yes/No
- ❑ Bio-degradable (organic) Waste management solution? Yes/No
- ❑ Alternate Waste management systems? Yes/No
- ❑ Waste-to-Energy systems? Yes/No
- ❑ Drip irrigation systems for garden/lawn etc? Yes/No
- ❑ Green or High-performance garden implements utilization? Yes/No
- ❑ Well-planned (House-keeping and gardening) schedule? Yes/No
- ❑ Well-planned (House-keeping and gardening specific) materials storage? Yes/No

Assessment form

NOTE: Sustainable construction and occupancy is a subject where assessments are done and possible actions plans drawn to preserve the environment, mitigate disasters, damage, risks or threats. The subject deals with equipping the construction company, third party site management company or occupant with information so one can develop a “Natural systems interface” to take advantage of the natural assets at the location like the following:

a. Use of natural slope or designing man-made sloping to mitigate issues like water shortage, low pressure in water supply, water logging, landslides and mudslides etc

b. Optimum use of sunlight, shade to provide natural lighting, and/or generate energy via solar photo voltaic panels

c. Best use of the prevailing winds to provide ventilation, and/or generate energy via micro-windmills

d. Effective use of the prevailing rainfall patterns and the microclimate at the location to plan hazard control construction, water management systems and landscaping

Assessment form

e. Implementing (i) rain water harvesting, or (ii) storm water harvesting

f. Opting for eco-scaping which includes xeriscaping and gardening, where the plants that are grown in-house, or on terraces or in gardens are medicinal plants, aromatic plants and other varieties that need less water and minimal maintenance

g. Facilitating sustainable building techniques by promoting more awareness, adherence and mitigation where occupants show collective responsibility or come up with complementary go- green measures

h. Developing of a disaster mitigation plan to help sensitize the third party management company and occupants to disasters, risks or threats or to at least opt for measures that increase chances of loss reduction or survival.

Part 2 of this Reckoner provides more details on how one can develop a disaster mitigation plan.

Assessment form

Are there any issues related to the (Tick as applicable)

- ❑ Natural systems interface (to take advantage of the natural resources at the location, use of light, shade, the prevailing winds, the prevailing rainfall patterns, the microclimate at the site)? Yes/No

  Related details about design, layout and natural systems utilization:

- ❑ Proximity to disaster prone areas? Yes/No — Vulnerable: Yes/No

  Related details about risks or threats:

- ❑ Seasonal climate patterns in region/state? Yes/No — Vulnerable: Yes/No
- ❑ Recent climate patterns in region/state? Yes/No — Vulnerable: Yes/No
- ❑ Electricity (Energy) supply systems? Yes/No — Insufficient: Yes/No
- ❑ Alternate Energy supply systems? Yes/No — Not planned: Yes/No
- ❑ Water supply systems? Yes/No — Insufficient: Yes/No
- ❑ Alternate Water supply systems? Yes/No — Not planned: Yes/No
- ❑ Irrigation system for garden/lawn etc? Yes/No — Not conservative: Yes/No
- ❑ Waste management systems? Yes/No — Insufficient: Yes/No

Assessment form

- **Are there any issues related to the (Tick as applicable)**

❑ 24/7 Availability model for occupancy or business practices (via standby diesel sets/alternate systems/alternate resources)? Yes/No

(If yes) Nature of problems:

❑ Human health influencers (air quality/water quality/land degradation/waste generated/ house-keeping chemicals utilization etc)? Yes/No

(If yes) Nature of problems:

❑ Neighboring site/facility/building influencers? Yes/No

(If yes) Nature of problems:

❑ Other costs related influencers and risks affecting occupants or business practices? Yes/No

(If yes) Nature of problems:

Assessment form

- **Identification of trends seen for costs related influencers (Tick as applicable)**

❑ Increasing operating costs and maintenance costs? Yes/No

❑ High electric power or electric systems costs? Yes/No

❑ Worsening power grid problems such as power quality and unavailability? Yes/No

❑ Possible water shortages, and waste water disposal issues? Yes/No

❑ Escalating need to control waste generated via proper eco-friendly and conservative approaches? Yes/No

❑ Pressure and responsibility to control utilization and reduce causative effect of harmful chemicals, and criteria pollutants (VOCs)? Yes/No

❑ Growing concern about the aspect of Global warming and unprecedented climate change affecting similar sites/facilities/buildings? Yes/No

Note: This issue may need investment in additional solutions that help mitigate risks and threats.

Assessment form

- **Identification of influencers causing risks (Tick as applicable)**

- ❑ Issues due to unplanned tall/weak structures at location? Yes/No
- ❑ Issues due to old and defunct infrastructure at location? Yes/No
- ❑ Issues with design and/or location of electrical systems? Yes/No
- ❑ Issues with design and/or location of waste water treatment plants? Yes/No
- ❑ Issues with design and/or location of waste treatment plants? Yes/No
- ❑ Issues with how house-keeping chemicals, fertilizers, manure, or other hazardous material is being utilized and/or stocked? Yes/No
- ❑ Issues with availability of transport for occupants, visitors or materials? Yes/No
- ❑ Does the site/building have plans and provisions for early detection, abatement and containment of fire? Yes/No

Assessment form

- **Identification of influencers causing risks (Tick as applicable)**

- ❑ Issues with fire extinguisher systems? Yes/No
- ❑ Issues with planning for inflow, exit or evacuation areas? Yes/No

- ❑ Issues due to non-fire or sudden climate change emergencies? Yes/No

Does the site/building have plans and provisions for preparedness, abatement and containment of damages due to earthquakes? Yes/No

Does the site/building have plans and provisions for preparedness, abatement and containment of damages due to landslides and mudslides? Yes/No

Does the site/building have plans and provisions for preparedness, abatement and containment of damages due to cyclones? Yes/No

Does the site/building have plans and provisions for preparedness, abatement and containment of damages due to water logging or flooding? Yes/No

Does the site/building have plans and provisions for preparedness, abatement and containment of damages due to sudden hailstorms/windstorms/frost? Yes/No

Assessment form

- **Identification of influencers causing risks (Tick as applicable)**

  Does the site/building have plans and provisions for early remedial action, abatement and containment of damages & health hazards due to garbage dumps, sewer problems or open drain problems? Yes/No

  Does the site/building have plans and provisions for early remedial action, abatement and containment of damages & health hazards due to nearby contaminated water bodies? Yes/No

  Does the site/building have plans and provisions for early detection, abatement and containment of damages & health hazards due to pests/termites/virulent insects? Yes/No

Assessment form

- **Risks to life and property due to Earthquakes (Tick as applicable)**

- ❑ Does the building or facility adhere to Building codes for structural and non-structural design measures? Yes/No
- ❑ Do the structures have high energy absorption capability? Yes/No
- ❑ Is seismic resistant steel used? Yes/No
- ❑ Has sway resistance been designed in steel used in the building or facility? Yes/No
- ❑ Has the ductility of steel frames of the building or facility been improved? Yes/No
- ❑ Have norms or guidelines been followed for Building configuration? Yes/No
- ❑ Have norms or guidelines been followed for the Building Foundation? Yes/No
- ❑ Have norms or guidelines been followed for the control on openings in walls? Yes/No

Assessment form

- **Risks to life and property due to Earthquakes (Tick as applicable)**

- ❑ Have norms or guidelines been followed for the control on wall length and building height? Yes/No

- ❑ Have norms or guidelines been followed for providing vertical reinforcement? Yes/No

- ❑ Have norms or guidelines been followed for water-proofing of building? Yes/No

Assessment form

- **Risks to life and property due to Cyclones (Tick as applicable)**

- ❑ Is the building protected from high-velocity winds? Yes/No
- ❑ Has the whole structure been designed in such a way that it can withstand lateral movement and uplift forces? Yes/No
- ❑ Are the frames and gables braced? Yes/No
- ❑ Have the connections between the roofs and the walls been strengthened? Yes/No
- ❑ Have norms or guidelines been followed in planning orientation of the building? Yes/No
- ❑ Have norms or guidelines been followed for certain parameters of the Building Foundation? Yes/No
- ❑ Have norms or guidelines been followed for the control on openings in walls? Yes/No

Assessment form

- **Risks to life and property due to Cyclones (Tick as applicable)**

- ❑ Have norms or guidelines been followed for the control of paneling? Yes/No

- ❑ Have norms or guidelines been followed while deciding upon roof and rooftop structures for the building? Yes/No

- ❑ Have norms or guidelines been followed by the installing of wind-break fences and planting of shelter belts in the direction of the wind, if building is in the country-side, or out in the open? Yes/No

Assessment form

- **Risks to life and property due to Floods (Tick as applicable)**

- ❑ Have norms or guidelines been followed in selecting site of the building (away from flood plains or away from large water bodies that can flood)? Yes/No

- ❑ If not, have norms or guidelines been followed for mitigation of certain risks (like being swept away by strong currents, sudden collapse, water logging)? Yes/No

- ❑ Have norms or guidelines been followed to elevate the building so as to keep the lowest floor above flood level? Yes/No

- ❑ Have norms or guidelines been followed in making the building water tight to restrict entry of water (blocking of doors, windows and air vents with boards, use of coal fly-ash in construction of embankments or dykes)? Yes/No

- ❑ Have norms or guidelines been followed in making the exposed parts of the building resistant to water damage (use of coal fly-ash as it has self-cementing properties)? Yes/No

- ❑ Have norms or guidelines been followed in designing sloping rooftops, basements, driveways and suitable storm water drains to help prevent water logging in manageable circumstances? Yes/No

Assessment form

- **Risks to life and property due to Landslides and Mudslides (Tick as applicable)**

- ❑ Have norms or guidelines been followed in selecting site of the building (away from the foot of hills, not on open or unconsolidated slopes of hilly areas)? Yes/No

- ❑ Have norms or guidelines been followed for mitigation of certain risks (like being swept away by land slides or mud slides, sudden collapse, water stagnation)? Yes/No

- ❑ Have norms or guidelines been followed by constructing wide ditches around building? Yes/No

- ❑ Have norms or guidelines been followed by constructing retention structures? Yes/No

- ❑ Have norms or guidelines been followed by constructing deflection structures or protection walls for building? Yes/No

- ❑ Have norms or guidelines been followed in constructing channels or drainage systems on slopes? Yes/No

- ❑ Have norms or guidelines been followed by planting trees on open or unconsolidated slopes of nearby hilly areas? Yes/No

Readiness, repair and restoration strategy

- **Inspection category:** Assessment of solution, product or service

- **Form Serial No:** **Date:**

- **Name of the institution or project:**

- **Scenarios of issues**
- 1. If there are issues with the scope, lifecycle costs, on-site experience, promotions or customer loyalty, the institution will need to conduct gap analysis using the “Making your services and projects sustainable” handbook/guide (in version 2 of the toolkit). Incorporation of satisfaction surveys at different levels like the Customer Satisfaction Survey, the Manufacturer Satisfaction Survey, and the Supplier Satisfaction Survey can help.

- 2. If there are issues with the project management methodologies, then the institution will need to refer to the ZED Proverbial on Project Management, and compliment this understanding by reading more about sustainable project management in the “Making your services and projects sustainable” handbook/guide (in version 2 of the toolkit).

Readiness, repair and restoration strategy

- **Inspection category:** Assessment of the site
- **Form Serial No:** **Date:**
- **Name of the site or building:**
- **Scenarios of issues**
- 1. If there are issues with the Natural systems interface, these need to be analyzed to understand what the construction company, third party management company or occupants can do to better the design for sustainability. It is found that in most cases a third party management company or occupant cannot change the inherent design of the site/building/flat, or occupants cannot invest in all possible renewable energy solutions due to cost factors, then conformance to certain basic expectations like DEC and HPE can mitigate risks and threats.
- 2. If the site is near disaster prone areas, then it is necessary for the third party management company or occupants to have a disaster mitigation plan.
- 3. If there are issues with the geographical location or seasonal climate patterns in the region/state, then the occupants must analyze the risk probability and mitigate risks via a suitable plan or even procure insurance.

Readiness, repair and restoration strategy

- 4. If there are issues with sudden seasonal climate patterns in region/state, then the occupants must assess the **risk probability,** pursue **or** devise a contingency plan to control or repair damage to the extent possible. It may be necessary to plan for contingency funds.

- 5. If there are issues with the irrigation systems**,** then the third party company or occupants must get this addressed immediately.

- 6. If there are issues with the Electricity (Energy) or Water supply systems, then the third party company or occupants must evaluate DEC & HPE adherence, and get this addressed immediately.

- 7. If there are issues with the Alternate Energy (Electricity supply) systems, then one must evaluate the impact on sustainability and address the same keeping in mind the priority and triple bottom line profitability.

- 8. If there are issues with the Alternate Water supply systems, then one must evaluate the impact on sustainability and address the same keeping in mind the priority and triple bottom line profitability.

Readiness, repair and restoration strategy

- 9. If there are issues with the Drainage arrangements (regular/excess/incidental), then one must evaluate the potential of a better Natural systems interface, and according to what is possible control the damage keeping in mind the priority and sustainability.

- 10. If there are issues with the Non- biodegradable (inorganic) Waste management, then one must carefully look at the nature of the problem and address the same with the help of better segregation, packing and disposal techniques. Any neglect could lead to contamination or pollution of the environment.

- 11. If there are issues with the Biodegradable (organic) Waste management, then one must either opt for a relevant Waste-to-energy solution or address the same with the help of better segregation, packing and disposal techniques. Any neglect could lead to the waste of useful resources or could lead to lost opportunities to convert waste into a valuable entity.

- 12. If there are issues with the Waste-to-Energy systems, then one must evaluate the impact on sustainability and address the same keeping in mind the priority and triple bottom line profitability.

Readiness, repair and restoration strategy

- 13. In scenarios where there is a large garden or lawn, if there are issues with the conventional garden implements, then one must evaluate the need to invest in Green or High-performance farm implements, or must get this addressed immediately.

- 14. If there are issues with the Green or High-performance garden implements, then one must evaluate the impact on sustainability and address the same keeping in mind the priority and triple bottom line profitability.

- 15. If there are issues with the house-keeping chemicals, fertilizers, manure etc, then one must identify the nature of the problem i.e. whether the issues are related to the hazards or benefits of the product, the EPD or EBD declarations of the product, its sourcing, its inventorying, its stocking, its 24/7 or as needed availability, its reordering etc.

  NOTE: EPD stands for Environment Product Declarations, EBD stands for Environment Building Declarations that identify whether a product is safe for the environment and green in its complete lifecycle i.e. sourcing, manufacturing, utilization, disposal and/or reuse practices.

Readiness, repair and restoration strategy

16. If there are issues with the 24/7 Availability model for occupancy or business practices (via standby diesel sets/alternate systems/alternate resources), then these problems need to be cross-examined and addressed to prevent any lack of planning or unavailability (like lack of minimal lighting, water supply, non-functional lifts etc) from adding to the risks faced by the occupants. Preparedness and agility to act are factors that are important to control damage today.

17. If there are issues with Human health influencers (air quality/water quality/chemicals utilization etc), then these need to be taken up seriously and remedial steps taken to address the same.

18. If there are issues with Neighboring plot/site/building/facility influencers, then it needs to be understood that this may affect environment conservation practices and also could in the long term lead to climate change issues and environment deterioration.

19. If there are other costs related influencers affecting occupancy or business practices, then it is important for one to get some assistance in understanding the influencers and alternatives available today. If there is a growing concern about costs, shortage, climate change, then one must assess the **risk probability** for the site.

Readiness, repair and restoration strategy

A note on the risk probability for the site

(a) One must assess and examine what best can be done in case of fire-emergencies. An associated body providing consultation advice can help understand the options available to control damages.

For preparedness, abatement and containment of damages due to earthquakes, cyclones, flooding, landslides and mudslides, one needs to practice hazards control construction and also devise a disaster mitigation plan to act in the event of a disaster, risk or threat.

Certain details have been shared via Part 1 and Part 2 of this Reckoner, it is advised that one consult with an associated body to understand the solutions available to control damages.

(b) One must assess and examine what best can be done in case of climate change emergencies like hailstorms/snow fall/frost. An associated body providing consultation advice can help understand the options available to control damages.

(c) One must assess and examine what best can be done in case of other emergencies like attack due to pests/termites/virulent insects. An associated body providing consultation advice can help understand the options available to control damages.

Readiness, repair and restoration strategy

(Continued) **A note on the risk probability for the site**

(d) One must assess and examine what best can be done in case of another emergency like issues caused due to hazardous practices of a neighboring plot/site/building/facility. An associated body providing consultation advice can help understand the options available to control damages.

(e) If there are issues like health hazards due to garbage dumps, sewer problems or open drain problems, or nearby contaminated water bodies, then must mobilize support from the neighborhood and raise the issue with the area-wise municipal body to initiate necessary remedial action.

Some of these areas need all concerned to have the interests of the community in mind and for people to show collective responsibility for environment conservation and sustainability.

Sensitization and preparedness are the first steps.