GREEN ENERGY CREATIVE SOLUTIONS

2-274, II Floor, Saibaba Colony, Thatithopu, Tirupati-517505
www.hetarthi.com, Email: roopa@hetarthi.com

GREEN BUILDING / GREEN ENERGY AUDIT

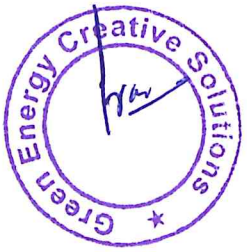
Name of the organization	: Siddartha Educational Academy Group of Institutions
Address	: Chinthagunta Village, Near C Gollapalli, Tirupati (Rural)-517505, Andhra Pradesh
Geographical Coordinates	: 13.580831° N, 79.375853° E

ASSESSMENT REPORT

S. No.	Principal Requirement	Recommendations
1	Government Approved Plans	Satisfactory
2	Fire and Life Safety in Sustainable Buildings	Satisfactory
3	Construction Management Best Practices	Satisfactory
4	Parking for Building Occupants	Satisfactory
5	Preserve and Plant Trees Onsite	Satisfactory
6	Rainwater Harvesting – Recharge and/ or Reuse	Satisfactory.
		Use the stored rain water for landscape/ flushing/ domestic applications as applicable.
		Quality of rain water must be tested to meet the standards of landscape/ flushing/ domestic use as applicable.
7	Installation of Low Flow Water Fixtures	Must install low flow water fixtures to reduce the demand of potable as well as non-potable water.
8	On-site Treatment of Grey and Black Water and Reuse for Flushing	Implement strategies for onsite treatment of Grey and Black water and reduce the potable water demand for flushing.

S. No.	Principal Requirement	Recommendations
9	Measurement of Energy and Water Consumption	Install meters to measure Energy and Water consumptions of the project on daily/monthly basis.
		Must provide water meters at water end usage
10	Post-occupancy Waste Management	Implement a strategy for post-occupancy waste collection, segregation and disposal.
		Install biodegradable waste bins
		Install non-biodegradable waste bins
11	Onsite Conversion of Organic Waste	Implement a strategy for conversion of organic waste into a nutrient-rich, usable material to encourage zero waste from project.
12	Amenities for fundamental needs and daily commute	Provide swimming pool towards amenities for fundamental needs and daily commute (For proposed Hostel if any)
13	Best Practices for Universal Building Design	Provide hand rails, Audio and Braille facility in the lift in view of differently abled.
		Facilitate atleast 2 toilets per block in the common area of the facility designed for differently abled.
14	Sustainable Development of Construction Engineering (for new construction if any)	Use Portland Pozzolana Cement (PPC) cement for masonry and plaster work.
		Use fly ash bricks or AAC blocks or similar products for brick work.
15	Local Sourcing of Construction Materials	Satisfactory
16	Judicious use of hard wood and soft wood	Satisfactory
17	Energy Management Best Practices	Must undergo detailed Energy Audit / Energy performance need to be improved by reducing EPI value
18	Efficient Electric Equipment and Systems	Review for the motors that can be replaced with energy efficient motors
19	Use of Imperishable Energy Resources	Possibly install/enhance the capacity of onsite and offsite imperishable energy systems

S. No.	Principal Requirement	Recommendations
20	Optimal Use of Natural Light	Provide Daylight/ occupancy sensors/ Timers in common areas such as corridors, lift lobbies, reception, parking and exterior lighting etc as applicable and integrate it with the artificial lighting.
21	Healthy Indoor Air Quality	Install outside fresh air filtering media with at least MERV 8
		Install CO2 monitoring and alarm systems
		Ventilation must be improved
22	Propagating Passive Design Strategies	Consider alternative ways of ventilation, cooling, underground air tunnel systems, water bodies, fountains, landscaped mounds, variety of plantations for creating green buildings to the extent possible.
23	Landscape Best Practices	Good
24	High Albedo Materials - Roof and Non-roof	Try to use high albedo materials on exposed roof and non-roof hardscape areas
		Necessary to implant open grid grass pavers and / or shade giving trees
		Try to cover the exposed roof areas by roof vegetation or high albedo materials
25	Irrigation Best Practices	Must create a facility to use treated water/rain water to meet landscape water demand
		Provide sprinklers for lawn and turf areas
		Drip irrigation system is used for water efficient irrigation system
		Provide Time base controller on irrigation system
		Provide Moisture sensor controller on irrigation system



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GREEN BUILDING/GREEN AUDIT

GEA- ASSESSMENT FORM

Name of the applicant organization : **Siddartha Educational Academy Group of Institutions**

Address : Chinthagunta Village, Near C Gollapalli, Tirupati (Rural)-517505, Andhra Pradesh

Geographical Coordinates (Lat., : 13.580831° N, 79.375853° E

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
A	**Government Approved Plans**						
1	1		Land allotment letter	Yes			Satisfactory
2	2		Government approved site plan with Site area, Built-up/FAR area and Parking details	Yes			
3			In case, the government approval is not available at the time of Certification of Intent (Provisional/Pre Certification) rating, following details can be submitted:				
4		a	Site plan with all the details and an acknowledgement letter from a competent government authority regarding the submission of site plans for approval	Yes			
5			OR				
6		b	Site plan with all the details and a letter from the project owner confirming the project details. Government approved site plan with all the details can be submitted as soon as it is received by the project team prior to occupancy.	Yes			
7	3		Approved building plans/ clearance from Chief Fire Officer or local competent authority as applicable	Yes			

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
B	**Fire and Life Safety in Sustainable Buildings**						
8			Follow National Building Codes 2016 (Part 4) and requirements prescribed by local competent for the authority and obtain Fire No Objection Certificate from the competent authority for the facility.	Yes			Satisfactory
C	**Construction Management Best Practices**						
9	1		Conduct site survey to show existing vegetation including shrubs, grass covers, trees –preserved, transplanted and/ or removed	Yes			Satisfactory
10	2		Prepare and implement soil erosion and sedimentation control plan at site during construction (For new construction)	Yes			
11	3		Provide the following including but not limited to –				
12		a	Site boundary around the project site	Yes			
13		b	Gravel road at the main entrance and exit of the site	Yes			
14		c	If the top soil is fertile and suitable for landscape use, stockpile the Top soil of the site with temporary vegetation and/or cover.	Yes			
15		d	Sediment basin(s) at the lowermost level of the site from where the site storm water will run-off	Yes			
16	4		Prepare and implement spill prevention and control plans at site during construction.	Yes			
D	**Parking for Building Occupants**						
17	1		Provide the parking as per local parking by-laws and Government approved site/ parking plans	Yes			Satisfactory
18	2		Project can meet or exceed the parking requirements as per local parking by-laws	Yes			
19	3		In places where local parking by-laws do not exist, follow National Building Code (NBC) of India, 2016	Yes			
E	**Preserve and Plant Trees Onsite**						

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
20	1		Do not cut any existing developed tree onsite. Transplant developed trees within the site. Ensure the survival of all transplanted trees. In case it becomes necessary to cut trees, plant 3 trees for every 1 tree cut of the similar species. This point is not applicable if there is no developed tree onsite. (essential)	Yes			Satisfactory
21	2		Plant tree saplings onsite as per following criteria that can develop into grown up trees:	Yes			
22		a	At least 5 for site area up to 500 m2.	Yes	Site area (m2)	67177.82	
23					Actual no. of trees	1200	
24		b	At least 5 for every additional 500 m2 site area or part thereof	Yes	Desired no. of trees	671.78	
25					T/S Ratio	0.018	
F	**Rainwater Harvesting – Recharge and/ or Reuse**						
26	1		Install a suitably designed rain water storage system and/ or recharge pit to cater to roof and non-roof rain water.	Yes	Total No. of Building sides	4	Satisfactory
27	2		Store and/ or recharge at least 30% of daily rain water collected from all surfaces (Essential)		Total No. of rain water drains per building side	1	
28	3		Store and/ or recharge more than 60% of daily rain water collected from all surfaces.		Total No. of rain water recharge pits per building side	1	
29	4		Store and/ or recharge more than 90% of daily rain water collected from all surfaces.	Yes	Total No. of rain waterstorage systems per building side	1	
30	5		Use the stored rain water for landscape/ flushing/ domestic applications as applicable.	Yes			Satisfactory

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
31	6		If any competent government authority says that the ground water table is high and ground water recharging is not required, then the project shall provide a storage system to cater to rain water from roof surfaces only and reuse it for landscape/ flushing/ domestic applications as applicable. (essential + 4 points)				
32	7		Quality of rain water should meet the standards of landscape/ flushing/ domestic use as applicable.	Yes			Satisfactory
G	**Installation of Low Flow Water Fixtures**						
33	1		Install efficient water fixtures with flow rates not more than the values listed below:(1 point for each product)				Must install low flow water fixtures to reduce the demand of potable as well as non-potable water.
34		a	Water Closets should be dual flush type with flush rates 4.6 LPF and 2.6 LPF	Yes			
35		b	Health Faucets = 6.5 LPM at a design pressure of 3 bar	Yes			
36		c	Kitchen Sink Faucets = 4.5 LPM at a design pressure of 3 bar	No			
37		d	Wash Basin Faucets = 4.5 LPM at a design pressure of 3 bar	Yes			
38		e	Showers (all types) = 6.5 LPM at a design pressure of 3 bar	No			
39		f	Urinals = 1.5 LPF	Yes			
40	2		Install sensor based water fixtures (sink/ basin faucets/ urinals) with above flow rates in the common area applications.	No			
41			All other water fixtures that are intended to fill the bucket and/ or bath tub can be excluded from above requirements.	Yes			
H	**On-site Treatment of Grey and Black Water and Reuse for Flushing**						
42	1		Install on-site waste water treatment system and treat entire grey and black water from the project. Quality of treated water must meet the norms of Central/ State Pollution Control Board (CPCB/ SPCB) as applicable. (2 points)				Implement strategies for onsite treatment of Grey and Black water and reduce the potable water demand for flushing.
43	2		Provide dual plumbing in all toilets for flushing in all tenant spaces, residential units and common area toilets as applicable.	Yes			
44	3	a	Use treated water for flushing such that at least 75% of total flushing water demand is fulfilled by the treated water.	Yes	Flushing water demand quantity	3150	
45			OR		Treated water demand quantity	2500	

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
46		b	If more than 95% of total flushing water demand shall be fulfilled by the treated water				
I	**Measurement of Energy and Water Consumption**						
47	1		Provide following energy meters:		No. of energy meters	1	Install meters to measure Energy and Water consumptions of the project on daily/monthly basis.
48		a	Each tenant level/ residential unit level/ department level in case of industrial projects as applicable	No			
49		b	Interior common area lighting including stilt and basement parking	No			
50		c	Interior common area air-conditioning (reception, club house, gymnasium, games rooms etc.)	No			
51		d	Separate meters for Interior lighting and HVAC applications for industrial projects	No			
52		e	Exterior area lighting (landscape, surface parking, driveways)	No			
53		f	Onsite renewable energy system	No			
54		g	Onsite waste water treatment system	No			
55		h	Water pumping (both domestic and flushing water)	No			
56		i	Lifts and elevators	No			
57	2		Provide water meters on following water end usages:		No. of water meters	0	Must provide water meters at water end usage
58		a	Domestic water	No			
59		b	Flushing water	No			
60		c	Irrigation water	No			
61		d	Main municipal water	No			
62		e	Bore well water	No			
63		f	Solar hot water system	No			
J	**Post-occupancy Waste Management**						
64	1		Provide separate waste bins for biodegradable and non biodegradable wastes at each residential unit level/ tenant level or floor level as applicable (2 points)		Total no. of floors	3	Implement a strategy for post-occupancy waste collection, segregation and disposal.
65					Total no. of biodegradable waste bins	0	Install additional no. of biodegradable waste bins

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
66					Total no. of non biodegradable waste	0	Install additional no. of non-biodegradable waste bins
67	2		Provide central waste collection yard(s) for collection of biodegradable and non biodegradable wastes from the entire project. (2 points)	Yes			Satisfactory
K	**Onsite Conversion of Organic Waste**						
68	1		Implement strategies for onsite treatment of entire organic waste	Yes			Satisfactory
L	**Amenities for fundamental needs and daily commute**						
69	1		Provide following facilities within the project site before the occupancy				
70		a	Common hall/ Break out room	Yes			Satisfactory
71		b	Games room	Yes			Satisfactory
72		c	Gymnasium	Yes			Satisfactory
73		d	Swimming pool	No			Provide swimming pool towards amenities for fundamental needs and daily commute
74		e	Play ground for activity	Yes			Satisfactory
75		f	Canteen	Yes			Satisfactory
76		g	First aid facility	Yes			Satisfactory

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
77	2		Develop the site near to the following facilities (within the site or 1 km pedestrian distance from the main entrance of the site)				
78		a	Pharmacy shop	No	Distance(kM)	2	
79		b	Grocery store	No	Distance	2	
80		c	Bakery	No	Distance	6	
81		d	ATM/ Bank	No	Distance	6	
82		e	Restaurant/ hotel	No	Distance	6	
83		f	Barbershop/ beauty parlour	No	Distance	6	
84		g	Public park/ Garden	No	Distance	6	
85		h	Hardware and sanitary shop	No	Distance	6	
86	3		Develop the site near to the following facilities (within 1.5 km distance from the main entrance of the site) - (2 points for any two facilities)				
87		a	School	No	Distance	2	
88		b	College/ University	No	Distance	8	
89		c	Hospital/ Clinic	No	Distance	2	
90		d	Bus stop/ Auto stand	No	Distance	2	
91		e	Metro station		Distance		
92		f	Super Market/ Shopping Mall	No	Distance	6	
93		g	Car/ Van pool/ Bus shuttle services provided for at least 20% of regular occupants by the project owner/ developer		Distance		
M	**Best Practices for Universal Building Design**						
94	1		Include but not limited to following features for differently abled. All features must be designed as per National Building Code (NBC) of India 2016.				
95		a	Ramps with handrails at the main entrance and exit of each building. (essential)	Yes			Satisfactory
96		b	Handrails, Audio and Braille facilities in the lifts (1 point)	No			Provide hand rails, Audio and Braille facility in the lift in view of differently abled

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
97		c	Preferred parking nearest to the main entrance of the building. Provide at least one designated accessible parking space for every 50 equivalent car units (ECUs) provided in the project as per local parking bylaws and part thereof.	Yes			
98		d	For commercial, industrial and other buildings – at least one toilet per floor designed for differently abled	Yes			Satisfactory
99	2		For residential/Hostel buildings – provide at least two toilets designed for differently abled in the common area of the facility up to two towers/ blocks. Add one toilet per tower/ block further for more than two blocks/ towers.				Facilitate atleast 2 toilets per block in the common area of the facility designed for differently abled
N	**No Use of Halogenated Hydrocarbons**						
100	1		Use Chlorofluorocarbon (CFC) free HVAC and refrigeration systems in the project (essential)	No			
101	2		Fire extinguishers and suppression systems installed in the project must be free from halons (essential)	Yes			
102	3		Use Hydro chlorofluorocarbon (HCFC) free HVAC and refrigeration systems in the project				
O	**Sustainable Development of Construction Engineering**						

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
103	1		Use façade glass, door and window glass with recycled content of more than 15%	Yes			Satisfactory
104	2		Use Portland Pozzolana Cement (PPC) cement for masonry and plaster work.				Use Portland Pozzolana Cement (PPC) cement for masonry and plaster work.
105		a	50% of masonry and plaster work				
106		b	75% of masonry and plaster work	Yes			
107	3		Use fly ash bricks or AAC blocks or similar products for brick work.				Use fly ash bricks or AAC blocks or similar products for brick work.
108		a	40% of brick work – 1 point				
109		b	80% of brick work – 2 points	Yes			
110	4		Use fly ash in concrete mix/ ready mix concrete	Yes			Satisfactory
111	5		Use TMT steel bars with recycled content of more than 25%	Yes			Satisfactory
112	6		Use at least 50% of tiles with recycled content of more than 25%	Yes			Satisfactory
P	**Local Sourcing of Construction Materials**						
113	1		Use locally sourced (excavated and/ or manufactured) sand, stones, aggregates, bricks, paver blocks and concrete as applicable. Source distance from project site should not be more than 250 km.	Yes	Distance of Places from where construction material was sourced	0.2	Satisfactory

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
114	2		Use locally sourced (excavated and/ or manufactured) cement, glass, wood products and tiles as applicable. Source distance from project site should not be more than 550 km.	Yes	Distance of Places from where construction material was sourced	6	Satisfactory
115	3		Use locally sourced (excavated and/ or manufactured) steel (all types) as applicable. Source distance from project site should not be more than 850 km.	Yes	Distance of Places from where construction material was sourced	6	Satisfactory
116			Note – Distance mentioned above is not the radial distance. It can be pedestrian, rail or road distance.				
Q	**Judicious use of hard wood and soft wood**						
117	1		Do not use hardwood and softwood in the project in door frames, doors and furniture applications.	Yes			Satisfactory
118	2		Use engineered wood products such as Medium density fiberboard (MDF), Low density fiberboard (LDF) and Plywood for making door frames, doors and furniture as applicable.	Yes			Satisfactory
119	3		Engineered wood products should be free from urea formaldehyde resin (1 point)	Yes			Satisfactory

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
120	4		Use rapidly renewable materials in the project that constitute at least 10% of total cost of wood or wood products used in the project. The rapidly renewable materials include but not limited to linseed, straw, cotton, wheat, natural rubber, bamboo and cork.	Yes			Satisfactory
R	**Energy Management Best Practices**						
121	1		All projects other than residential -				
122		a	Energy Performance Index (EPI) ratio is equal to 1 (mandatory)		EPI of the Building	NA	Must undergo detailed Energy Audit / Energy performance need to be improved by reducing EPI value
123		b	Energy Performance Index (EPI) ratio is equal to 0.95 (6 points)				
124		c	Energy Performance Index (EPI) ratio is equal to 0.9 (8 points)				
125		d	Energy Performance Index (EPI) ratio is equal to 0.85 (10 points)				
126		e	Energy Performance Index (EPI) ratio is equal to 0.8 (12 points)				
S	**Efficient Electric Equipment and Systems**						
127	1		Install Energy Conservation Building Code (ECBC) compliant power transformers of suitable rating and design in the project. Permissible total loss values for power transformers shall not exceed the ECBC minimum acceptable efficiency at 50% and full load rating.		Total BEE 3 star rated Motors		
128	2		Install energy efficient motors in the project as per details listed below: (3 points)		Total BEE 4 star rated Motors	0	
129		a	Motors of International Efficiency IE2 (high efficiency)/ EFF1 class/ BEE 3 star rated		Total BEE 5 star rated Motors	0	
130			OR		Total No. of Motors installed	1	Review for the motors that can be replaced with energy efficient motors
131		b	Motors of IE3 (premium efficiency)/ BEE 4 star rated				

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
132			OR				
133		c	Motors of IE4 (super premium efficiency)/ BEE 5 star rated				
134			Note – For industrial projects, consider the motors installed for non-process applications only				
T	**Use of Imperishable Energy Resources**						
135	1		Install onsite imperishable energy systems to offset a part of electric contract demand of the project.		Contract demand	141.82	Possibly install/enhance the capacity of onsite imperishable energy systems
136			% contract demand of the project		Demand met by Onsite Imperishable Energy Resources	0	
137			5		% contract demand met	0.00	
138			10				
139			15				
140			20				
141			25				
142	2		Install offsite imperishable energy systems to offset a part of electric contract demand of the project.		Contract demand	141.82	Possibly install/enhance the capacity of offsite imperishable energy systems
143			% contract demand of the project		Demand met by offsite Imperishable Energy Resources	0	
144			10		% contract demand met	0	
145			20				
146			30				
U	**Optimal Use of Natural Light**						
147	2		Daylight/ occupancy sensors/ Timers on exterior lighting:				

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
148		I	For residential and institutional units - common areas such as corridors, lift lobbies, reception, parking and exterior lighting etc as applicable and integrate it with the artificial lighting.	No			Provide Daylight/ occupancy sensors/ Timers in common areas such as corridors, lift lobbies, reception, parking and exterior lighting etc as applicable and integrate it with the artificial lighting.
V	**Healthy Indoor Air Quality**						
149			Mechanical Ventilation System and Residential projects where centralized chilled water system is installed:	Yes			
150	2		Install outside fresh air filtering media with at least MERV 8 (Minimum Efficiency Reporting Value) or higher rating, in the fresh air unit supplying outside air to air handling units (AHUs) or fan coil units (FCUs). MERV 8 or equivalent filters can also be installed at the fresh air intake points of AHUs or FCUs as applicable.				Install outside fresh air filtering media with at least MERV 8
151	5		Install permanent carbon dioxide (CO2) monitoring and alarm systems to ensure the adequate supply of outside fresh air at all times. CO2 sensor can be installed at the return air duct/ path. CO2 level should not exceed 900 ppm.	No			Install CO2 monitoring and alarm systems
152	6		Natural Ventilation and when Mechanical Ventilation is not operational during occupied time, Residential projects where split/ window AC/ VRF system is installed:	Yes			
153		1	The openable area of operable wall openings must be at least 8% of the net occupiable floor area. For kitchen, this can be 4%. (essential)	Yes	Area of wall opening (Sqm)	37.37	Poor ventilation
154		2	Additional points:		Net Occupiable floor area (sqm)	19710.69	
155		a	If the openable area of operable wall openings shall be at least 9% of the net occupiable floor area. For kitchen, this shall be at least 4.5%.		Percentage of operable wall area wrt floor area	0.190	

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
156		b	If the openable area of operable wall openings shall be at least 10% of the net occupiable floor area. For kitchen, this shall be at least 5%.				
157		3	The occupiable spaces must be permanently open to operable wall openings directly to the outdoors and within 28 feet of operable wall openings to the outdoors.	Yes			
158		4	Where interior occupiable spaces without direct openings to the outdoors are ventilated through adjoining rooms, the opening between occupiable spaces shall be permanently unobstructed (operable wall openings such as sliding/ openable doors/ windows are not acceptable) and have an opening of at least 10% of the area of the interior occupiable space not less than 21 sft.		No. of rooms without direct openings	0	NA
159		5	The operable openings must be readily accessible to building occupants		Interior occupiable space (sft)		
160		6	Occupiable space does not include the spaces that are occupied upon occasion and for very limited periods of time such as toilet, inactive storage, stairs, electrical and mechanical rooms.		Opening area (sft)		
161		7	If openings are covered with louvers or other obstructions, the openable area shall be the net free unobstructed area through the opening.		Ratio of pening to occupiable space (%)		
W	**Propagating Passive Design Strategies**						
162	1		Consider our great heritage, ethnic values, culture and social bondage with advanced era of civilizations dedicated to the natural resources, solar oscillations, wind movement, topography or terrain,of the land. (Pre-construction phase)		Open to sky (Sqm) : natural lighting, fresh air in, local utilization of direct rain water		Consider alternative ways of ventilation, cooling,underground air tunnel systems, water bodies, fountains, landscaped mounds, variety of plantations for creating green buildings

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
163		a	Implement Passive Design Strategies to reduce the consumption of energy (allowing natural day light, fresh air, etc to meet the needs of occupants against artificial lighting, fans, etc)		Specify the passive design strategies pacticed		
164		b	Implement Passive Design Strategies to reduce the consumption of water (Use of step wells, baoris and kunds)		Specify the passive design strategies pacticed		
165		c	Implement Passive Design Strategies to reduce the consumption of natural resources.		Specify the passive design strategies pacticed		
X	**Landscape Best Practices**						
166	1		Maximize natural landscape area and plant native/ adaptive/ drought tolerant flora onsite.	Yes	Quantity/List of native plants, adaptive or drought tolerant flora		Good practice
167		a	Minimum landscape area requirements for institutions		Site area (sqm)	67177.82	
168			At least 12% of site area (on earth only) OR At least 16% of site area (on earth only)	Yes	Landscape area covered for plant native/ adaptive/ drought tolerant flora onsite (sqm)	47417.82	
169					Percentage area	70.59	
Y	**High Albedo Materials - Roof and Non-roof**						
170	1		Use high albedo materials on exposed roof and non-roof hardscape areas to reduce the heat island effect as well as cooling energy consumption.	Yes			Try to use high albedo materials on exposed roof and non-roof hardscape areas

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
171		a	At least 40% of parking in the basement or stilt floor or covered with high albedo material		Area of parking in the basement or slit floor (sqm)		
172			OR		Area covered by albedo material (sqm)		
173			More than 60% of parking in the basement or stilt floor or covered with high albedo material for an additional point		Percentage of area covered		
174	2		Open grid grass pavers and/ or shade giving trees to cover at least 40% area of open surface parking, driveways and walkways	Yes	Total area of open surface parking, driveways and walkways (sqm)		Necessary to implant open grid grass pavers and / or shade giving trees
175					Area covered by grass pavers and/or shade giving trees (sqm)		
176					Percentage of area covered by grass pavers and/or shade giving trees		
177	3		Roof vegetation or high albedo materials or combination of both for more than 70% of exposed roof areas. Exposed roof does not include the areas covered by services provided on the roof.		Total exposed roof area (sqm)		Must cover the exposed roof areas by roof vegetation or high albedo materials
178					Area of roof covered by vegetation (sqm)		

S.No	Sc.No		Requirements	Yes / No	Notch Points	Remarks	Recommendations
179					Area of roof covered by high albedo materials (sqm)		
180					Percentage roof area covered		
Z	**Irrigation Best Practices**						
181	1		Use of treated water/ rain water for landscape to reduce at least 50% of total landscape water demand		Total landscape water demand (Ltrs/annum)		Must create a facility to use treated water/rain water to meet landscape water demand
182			OR				
183	2		Use of treated water/ rain water for landscape to reduce at least 75% of total landscape water demand	Yes	Total treated water/ rain water stored (Ltrs)		
184					Percentage of treated/rain water w.r.t. landscape water demand		
185	3		Use of water efficient irrigation systems such as:				
186		a	Sprinklers for lawn and turf areas	No			Provide sprinklers for lawn and turf areas
187		b	Drip irrigation system for plants and trees	Yes			Drip irrigation system is used for water efficient irrigation system
188		c	Time base controller on irrigation system	No			Provide Time base controller on irrigation system
189		d	Moisture sensor controller on irrigation system	No			Provide Moisture sensor controller on irrigation system

PRINCIPAL
Siddartha Educational Academy
Group of Institutions
TIRUPATI - 517 505

Green Energy Creative Solutions

GREEN ENERGY CREATIVE SOLUTIONS

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GREEN BUILDING/GREEN AUDIT
GEA- DATA FORM

Name of the applicant organization : Siddartha Educational Academy Group of Institutions

Address : Chinthagunta Village, Near C Gollapalli, Tirupati (Rural)-517505, AP

Geographical Coordinates (Lat., :13.580831° N, 79.375853° E

DATA FORM

Preserve and Plant Trees Onsite		
S.No (As Per IF)	**Description**	**Value**
22	Site area (m2)	67177.82
23	Actual no. of trees	1200
24	Desired no. of trees	1500
25	T/S Ratio	0.45

Rainwater Harvesting – Recharge and/ or Reuse		
26	Total No. of Building sides	4
27	Total No. of rain water drains per building side	1
28	Total No. of rain water recharge pits per building side	1
29	Total No. of rain waterstorage systems per building side	1

On-site Treatment of Grey and Black Water and Reuse for Flushing		
44	Flushing water demand quantity (Ltrs)	3150
45	Treated water demand quantity (Ltrs)	2500

Measurement of Energy and Water Consumption		
47	No. of energy meters	1
57	No. of water meters	0

Post-occupancy Waste Management		
64	Total no. of floors	3
65	Total no. of biodegradable waste bins	
66	Total no. of non biodegradable waste bins	

Amenities for fundamental needs and daily commute		
S.No (As per IF)	**Name of the nearby facility**	**Distance in km**
78	Pharmacy shop	2

79	Grocery store	2
80	Bakery	6
81	ATM/ Bank	6
82	Restaurant/ hotel	6
83	Barbershop/ beauty parlour	6
84	Public park/ Garden	6
85	Hardware and sanitary shop	6

S.No (As per IF)	Name of the nearby facility from Institution/hostel/faculty accommodation/etc	Distance in km
87	School	2
88	College/ University	8
89	Hospital/ Clinic	2
90	Bus stop/ Auto stand	2
91	Metro station	
92	Super Market/ Shopping Mall	6
93	Car/ Van pool/ Bus shuttle services provided for at least 20% of regular occupants by the project owner/ developer	

Local Sourcing of Construction Materials			
S.No (As per IF)	**Name of the Material**	**Major places from where construction material was sourced**	**Distance (kM)**
113	Sand, stones, aggregates, bricks, paver blocks and concrete as applicable	River Bed (Quarry)	0.2 (0.5)
114	Cement, glass, wood products and tiles as applicable.	Yes	6
115	Steel (all types) as applicable	Yes	6

Energy Management Best Practices		
S.No (As per IF)	**Building Ref**	**EPI** (Ref Energy Audit Report)
122		

Efficient Electric Equipment and Systems		
S.No (As per IF)	**Motor Type**	**Qty**
127	Total BEE 3 star rated Motors	
128	Total BEE 4 star rated Motors	
129	Total BEE 5 star rated Motors	
130	Total No. of Motors installed	1

Use of Imperishable Energy Resources

S.No (As per IF)	Quantity	Value
135	Contract demand (kVA)	141.82
136	Demand met by Imperishable Energy Resources-onsite (kVA)	
137	% Contract demand met by on-site IER	
142	Contract demand (kVA)	141.82
143	Demand met by offsite Imperishable Energy Resources (kVA)	
144	% contract demand met by off-site IER	

Healthy Indoor Air Quality		
S.No (As per IF)	**Description**	**Value**
153	Area of wall opening (sqm)	37.37
154	Net Occupiable floor area (sqm)	19710.69
155	Percentage of operable wall area wrt floor area	1971.69
158	No. of rooms without direct openings	0
159	Interior occupiable space (sft)	
160	Opening area (sft)	
161	Ratio of pening to occupiable space (%)	

Propagating Passive Design Strategies		
S.No (As per IF)	**Passive Design Strategies**	**Specify the details**
163	To reduce the consumption of energy (allowing natural day light, fresh air, etc to meet the needs of occupants against artificial lighting, fans, etc)	
164	To reduce the consumption of water (Use of step wells, baoris and kunds)	
165	To reduce the consumption of natural resources.	

Landscape Best Practices		
S.No (As per IF)	**Description**	**Specify the details**
166	List of native plants, adaptive or drought tolerant flora	
167	Site area (sqm)	67177.82
168	Landscape area covered for plant native/ adaptive/ drought tolerant flora onsite (sqm)	47417.82
169	Percentage area	70.5

High Albedo Materials - Roof and Non-roof		
S.No (As per IF)	**Description**	**Specify the details**
171	Area of parking in the basement or slit floor (sqm)	

172	Area covered by albedo material (sqm)	
173	Percentage of area covered	
174	Total area of open surface parking, driveways and walkways (sqm)	
175	Area covered by grass pavers and/or shade giving trees (sqm)	
176	Percentage of area covered by grass pavers and/or shade giving trees	
177	Total exposed roof area (sqm)	
178	Area of roof covered by vegetation (sqm)	
179	Area of roof covered by high albedo materials (sqm)	
180	Percentage roof area covered	

Irrigation Best Practices		
S.No (As per IF)	**Description**	**Specify the details**
181	Total landscape water demand (Ltrs/annum)	
183	Total treated water/ rain water stored (Ltrs)	
184	Percentage of treated/rain water w.r.t. landscape water demand	

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GREEN BUILDING/GREEN AUDIT

GEA- INPUT FORM

Name of the applicant organization : **Siddartha Educational Academy Group of Institutions**

Address : Chinthagunta Village, Near C Gollapalli, Tirupati (Rural)-517505, Andhra Pradesh

Geographical Coordinates (Lat., :13.580831° N, 79.375853° E

S.No	Sc.No		Requirements	Yes/No
A	**Government Approved Plans**			
1	1		Land allotment letter	Yes
2	2		Government approved site plan with Site area, Built-up/FAR area and Parking details	Yes
3			In case, the government approval is not available at the time of Certification of Intent (Provisional/Pre Certification) rating, following details can be submitted:	
4		a	Site plan with all the details and an acknowledgement letter from a competent government authority regarding the submission of site plans for approval	Yes
5			OR	
6		b	Site plan with all the details and a letter from the project owner confirming the project details. Government approved site plan with all the details can be submitted as soon as it is received by the project team prior to occupancy.	Yes
7	3		Approved building plans/ clearance from Chief Fire Officer or local competent authority as applicable	Yes
B	**Fire and Life Safety in Sustainable Buildings**			
8			Follow National Building Codes 2016 (Part 4) and requirements prescribed by local competent for the authority and obtain Fire No Objection Certificate from the competent authority for the facility.	Yes
C	**Construction Management Best Practices**			
9	1		Conduct site survey to show existing vegetation including shrubs, grass covers, trees –preserved, transplanted and/ or removed	Yes
10	2		Prepare and implement soil erosion and sedimentation control plan at site during construction (For new construction)	Yes
11	3		Provide the following including but not limited to –	
12		a	Site boundary around the project site	Yes
13		b	Gravel road at the main entrance and exit of the site	Yes

S.No	Sc.No		Requirements	Yes/No
14		c	If the top soil is fertile and suitable for landscape use, stockpile the Top soil of the site with temporary vegetation and/or cover.	Yes
15		d	Sediment basin(s) at the lowermost level of the site from where the site storm water will run-off	Yes
16	4		Prepare and implement spill prevention and control plans at site during construction.	Yes
D	**Parking for Building Occupants**			
17	1		Provide the parking as per local parking by-laws and Government approved site/ parking plans	Yes
18	2		Project can meet or exceed the parking requirements as per local parking by-laws	Yes
19	3		In places where local parking by-laws do not exist, follow National Building Code (NBC) of India, 2016	Yes
E	**Preserve and Plant Trees Onsite**			
20	1		Do not cut any existing developed tree onsite. Transplant developed trees within the site. Ensure the survival of all transplanted trees. In case it becomes necessary to cut trees, plant 3 trees for every 1 tree cut of the similar species. This point is not applicable if there is no developed tree onsite. (essential)	Yes
21	2		Plant tree saplings onsite as per following criteria that can develop into grown up trees:	Yes
22		a	At least 5 for site area up to 500 m2.	Yes
23				
24		b	At least 5 for every additional 500 m2 site area or part thereof	Yes
25				
F	**Rainwater Harvesting – Recharge and/ or Reuse**			
26	1		Install a suitably designed rain water storage system and/ or recharge pit to cater to roof and non-roof rain water.	Yes
27	2		Store and/ or recharge at least 30% of daily rain water collected from all surfaces (Essential)	
28	3		Store and/ or recharge more than 60% of daily rain water collected from all surfaces.	
29	4		Store and/ or recharge more than 90% of daily rain water collected from all surfaces.	Yes
30	5		Use the stored rain water for landscape/ flushing/ domestic applications as applicable.	Yes
31	6		If any competent government authority says that the ground water table is high and ground water recharging is not required, then the project shall provide a storage system to cater to rain water from roof surfaces only and reuse it for landscape/ flushing/ domestic applications as applicable.	
32	7		Quality of rain water should meet the standards of landscape/ flushing/ domestic use as applicable.	Yes
G	**Installation of Low Flow Water Fixtures**			

S.No	Sc.No		Requirements	Yes/No
33	1		Install efficient water fixtures with flow rates not more than the values listed below:	
34		a	Water Closets should be dual flush type with flush rates 4.6 LPF and 2.6 LPF	Yes
35		b	Health Faucets = 6.5 LPM at a design pressure of 3 bar	Yes
36		c	Kitchen Sink Faucets = 4.5 LPM at a design pressure of 3 bar	No
37		d	Wash Basin Faucets = 4.5 LPM at a design pressure of 3 bar	Yes
38		e	Showers (all types) = 6.5 LPM at a design pressure of 3 bar	No
39		f	Urinals = 1.5 LPF	Yes
40	2		Install sensor based water fixtures (sink/ basin faucets/ urinals) with above flow rates in the common area applications.	No
41			All other water fixtures that are intended to fill the bucket and/ or bath tub can be excluded from above requirements.	Yes
H	**On-site Treatment of Grey and Black Water and Reuse for Flushing**			
42	1		Install on-site waste water treatment system and treat entire grey and black water from the project. Quality of treated water must meet the norms of Central/ State Pollution Control Board (CPCB/ SPCB) as applicable. (2 points)	
43	2		Provide dual plumbing in all toilets for flushing in all tenant spaces, residential units and common area toilets as applicable.	Yes
44	3	a	Use treated water for flushing such that at least 75% of total flushing water demand is fulfilled by the treated water.	Yes
45			OR	
46		b	If more than 95% of total flushing water demand shall be fulfilled by the treated water	
I	**Measurement of Energy and Water Consumption**			
47	1		Provide following energy meters:	
48		a	Each tenant level/ residential unit level/ department level in case of industrial projects as applicable	No
49		b	Interior common area lighting including stilt and basement parking	No
50		c	Interior common area air-conditioning (reception, club house, gymnasium, games rooms etc.)	No
51		d	Separate meters for Interior lighting and HVAC applications for industrial projects	No
52		e	Exterior area lighting (landscape, surface parking, driveways)	No
53		f	Onsite renewable energy system	No
54		g	Onsite waste water treatment system	No
55		h	Water pumping (both domestic and flushing water)	No
56		i	Lifts and elevators	No
57	2		Provide water meters on following water end usages:	

S.No	Sc.No		Requirements	Yes/No
58		a	Domestic water	No
59		b	Flushing water	No
60		c	Irrigation water	No
61		d	Main municipal water	No
62		e	Bore well water	No
63		f	Solar hot water system	No
J	**Post-occupancy Waste Management**			
64	1		Provide separate waste bins for biodegradable and non biodegradable wastes at each residential unit level/ tenant level or floor level as applicable (2 points)	
65				
66				
67	2		Provide central waste collection yard(s) for collection of biodegradable and non biodegradable wastes from the entire project. (2 points)	Yes
K	**Onsite Conversion of Organic Waste**			
68	1		Implement strategies for onsite treatment of entire organic waste	Yes
L	**Amenities for fundamental needs and daily commute**			
69	1		Provide following facilities within the project site before the occupancy	
70		a	Common hall/ Break out room	Yes
71		b	Games room	Yes
72		c	Gymnasium	Yes
73		d	Swimming pool	No
74		e	Play ground for activity	Yes
75		f	Canteen	Yes
76		g	First aid facility	Yes
77	2		Develop the site near to the following facilities (within the site or 1 km pedestrian distance from the main entrance of the site)	
78		a	Pharmacy shop	No
79		b	Grocery store	No
80		c	Bakery	No
81		d	ATM/ Bank	No
82		e	Restaurant/ hotel	No
83		f	Barbershop/ beauty parlour	No
84		g	Public park/ Garden	No
85		h	Hardware and sanitary shop	No
86	3		Develop the site near to the following facilities (within 1.5 km distance from the main entrance of the site) - (2 points for any two facilities)	
87		a	School	No
88		b	College/ University	No
89		c	Hospital/ Clinic	No
90		d	Bus stop/ Auto stand	No

S.No	Sc.No		Requirements	Yes/No
91		e	Metro station	
92		f	Super Market/ Shopping Mall	No
93		g	Car/ Van pool/ Bus shuttle services provided for at least 20% of regular occupants by the project owner/ developer	
M	**Best Practices for Universal Building Design**			
94	1		Include but not limited to following features for differently abled. All features must be designed as per National Building Code (NBC) of India 2016.	
95		a	Ramps with handrails at the main entrance and exit of each building. (essential)	Yes
96		b	Handrails, Audio and Braille facilities in the lifts (1 point)	No
97		c	Preferred parking nearest to the main entrance of the building. Provide at least one designated accessible parking space for every 50 equivalent car units (ECUs) provided in the project as per local parking bylaws and part thereof.	Yes
98		d	For commercial, industrial and other buildings – at least one toilet per floor designed for differently abled	Yes
99	2		For residential buildings – provide at least two toilets designed for differently abled in the common area of the facility up to two towers/ blocks. Add one toilet per tower/ block further for more than two blocks/ towers.	
N	**No Use of Halogenated Hydrocarbons**			
100	1		Use Chlorofluorocarbon (CFC) free HVAC and refrigeration systems in the project (essential)	No
101	2		Fire extinguishers and suppression systems installed in the project must be free from halons (essential)	Yes
102	3		Use Hydro chlorofluorocarbon (HCFC) free HVAC and refrigeration systems in the project	
O	**Sustainable Development of Construction Engineering**			
103	1		Use façade glass, door and window glass with recycled content of more than 15%	Yes
104	2		Use Portland Pozzolana Cement (PPC) cement for masonry and plaster work.	
105		a	50% of masonry and plaster work	
106		b	75% of masonry and plaster work	Yes
107	3		Use fly ash bricks or AAC blocks or similar products for brick work.	
108		a	40% of brick work – 1 point	
109		b	80% of brick work – 2 points	Yes
110	4		Use fly ash in concrete mix/ ready mix concrete	Yes

S.No	Sc.No		Requirements	Yes/No
111	5		Use TMT steel bars with recycled content of more than 25%	Yes
112	6		Use at least 50% of tiles with recycled content of more than 25%	Yes
P	**Local Sourcing of Construction Materials**			
113	1		Use locally sourced (excavated and/ or manufactured) sand, stones, aggregates, bricks, paver blocks and concrete as applicable. Source distance from project site should not be more than 250 km.	Yes
114	2		Use locally sourced (excavated and/ or manufactured) cement, glass, wood products and tiles as applicable. Source distance from project site should not be more than 550 km.	Yes
115	3		Use locally sourced (excavated and/ or manufactured) steel (all types) as applicable. Source distance from project site should not be more than 850 km.	Yes
116			Note – Distance mentioned above is not the radial distance. It can be pedestrian, rail or road distance.	
Q	**Judicious use of hard wood and soft wood**			
117	1		Do not use hardwood and softwood in the project in door frames, doors and furniture applications.	Yes
118	2		Use engineered wood products such as Medium density fiberboard (MDF), Low density fiberboard (LDF) and Plywood for making door frames, doors and furniture as applicable.	Yes
119	3		Engineered wood products should be free from urea formaldehyde resin	Yes
120	4		Use rapidly renewable materials in the project that constitute at least 10% of total cost of wood or wood products used in the project. The rapidly renewable materials include but not limited to linseed, straw, cotton, wheat, natural rubber, bamboo and cork.	Yes
R	**Energy Management Best Practices**			
121	1		All projects other than residential -	
122		a	Energy Performance Index (EPI) ratio is equal to 1 (mandatory)	
123		b	Energy Performance Index (EPI) ratio is equal to 0.95	
124		c	Energy Performance Index (EPI) ratio is equal to 0.9	
125		d	Energy Performance Index (EPI) ratio is equal to 0.85	
126		e	Energy Performance Index (EPI) ratio is equal to 0.8	
S	**Efficient Electric Equipment and Systems**			

S.No	Sc.No		Requirements	Yes/No
127	1		Install Energy Conservation Building Code (ECBC) compliant power transformers of suitable rating and design in the project. Permissible total loss values for power transformers shall not exceed the ECBC minimum acceptable efficiency at 50% and full load rating.	
128	2		Install energy efficient motors in the project as per details listed below: (3 points)	
129		a	Motors of International Efficiency IE2 (high efficiency)/ EFF1 class/ BEE 3 star rated	
130			OR	
131		b	Motors of IE3 (premium efficiency)/ BEE 4 star rated	
132			OR	
133		c	Motors of IE4 (super premium efficiency)/ BEE 5 star rated	
134			Note – For industrial projects, consider the motors installed for non-process applications only	
T	**Use of Imperishable Energy Resources**			
135	1		Install onsite imperishable energy systems to offset a part of electric contract demand of the project.	
136			% contract demand of the project	
137			5	
138			10	
139			15	
140			20	
141			25	
142	2		Install offsite imperishable energy systems to offset a part of electric contract demand of the project.	
143			% contract demand of the project	
144			10	
145			20	
146			30	
U	**Optimal Use of Natural Light**			
147	2		Daylight/ occupancy sensors/ Timers on exterior lighting:	
148		I	For residential and institutional units - common areas such as corridors, lift lobbies, reception, parking and exterior lighting etc as applicable and integrate it with the artificial lighting.	No
V	**Healthy Indoor Air Quality**			
149			Mechanical Ventilation System and Residential projects where centralized chilled water system is installed:	Yes

S.No	Sc.No		Requirements	Yes/No
150	2		Install outside fresh air filtering media with at least MERV 8 (Minimum Efficiency Reporting Value) or higher rating, in the fresh air unit supplying outside air to air handling units (AHUs) or fan coil units (FCUs). MERV 8 or equivalent filters can also be installed at the fresh air intake points of AHUs or FCUs as applicable.	
151	5		Install permanent carbon dioxide (CO2) monitoring and alarm systems to ensure the adequate supply of outside fresh air at all times. CO2 sensor can be installed at the return air duct/ path. CO2 level should not exceed 900 ppm.	No
152	6		Natural Ventilation and when Mechanical Ventilation is not operational during occupied time, Residential projects where split/ window AC/ VRF system is installed:	Yes
153		1	The openable area of operable wall openings must be at least 8% of the net occupiable floor area. For kitchen, this can be 4%.	Yes
154		2	Additional points:	
155		a	If the openable area of operable wall openings shall be at least 9% of the net occupiable floor area. For kitchen, this shall be at least 4.5%.	
156		b	If the openable area of operable wall openings shall be at least 10% of the net occupiable floor area. For kitchen, this shall be at least 5%.	
157		3	The occupiable spaces must be permanently open to operable wall openings directly to the outdoors and within 28 feet of operable wall openings to the outdoors.	Yes
158		4	Where interior occupiable spaces without direct openings to the outdoors are ventilated through adjoining rooms, the opening between occupiable spaces shall be permanently unobstructed (operable wall openings such as sliding/ openable doors/ windows are not acceptable) and have an opening of at least 10% of the area of the interior occupiable space not less than 21 sft.	
159		5	The operable openings must be readily accessible to building occupants	
160		6	Occupiable space does not include the spaces that are occupied upon occasion and for very limited periods of time such as toilet, inactive storage, stairs, electrical and mechanical rooms.	
161		7	If openings are covered with louvers or other obstructions, the openable area shall be the net free unobstructed area through the opening.	
W	**Propagating Passive Design Strategies**			
162	1		Consider our great heritage, ethnic values, culture and social bondage with advanced era of civilizations dedicated to the natural resources, solar oscillations, wind movement, topography or terrain,of the land. (Pre-construction phase)	

S.No	Sc.No		Requirements	Yes/No
163		a	Implement Passive Design Strategies to reduce the consumption of energy (allowing natural day light, fresh air, etc to meet the needs of occupants against artificial lighting, fans, etc)	
164		b	Implement Passive Design Strategies to reduce the consumption of water (Use of step wells, baoris and kunds)	
165		c	Implement Passive Design Strategies to reduce the consumption of natural resources.	
X	**Landscape Best Practices**			
166	1		Maximize natural landscape area and plant native/ adaptive/ drought tolerant flora onsite.	Yes
167		a	Minimum landscape area requirements for institutions	
168			At least 12% of site area (on earth only) OR At least 16% of site area (on earth only)	Yes
169				
Y	**High Albedo Materials - Roof and Non-roof**			
170	1		Use high albedo materials on exposed roof and non-roof hardscape areas to reduce the heat island effect as well as cooling energy consumption.	Yes
171		a	At least 40% of parking in the basement or stilt floor or covered with high albedo material	
172			OR	
173			More than 60% of parking in the basement or stilt floor or covered with high albedo material for an additional point	
174	2		Open grid grass pavers and/ or shade giving trees to cover at least 40% area of open surface parking, driveways and walkways	Yes
175				
176				
177	3		Roof vegetation or high albedo materials or combination of both for more than 70% of exposed roof areas. Exposed roof does not include the areas covered by services provided on the roof.	
178				
179				
180				
Z	**Irrigation Best Practices**			
181	1		Use of treated water/ rain water for landscape to reduce at least 50% of total landscape water demand	
182			OR	
183	2		Use of treated water/ rain water for landscape to reduce at least 75% of total landscape water demand	Yes
184				
185	3		Use of water efficient irrigation systems such as:	
186		a	Sprinklers for lawn and turf areas	No
187		b	Drip irrigation system for plants and trees	Yes

S.No	Sc.No		Requirements	Yes/No
188		c	Time base controller on irrigation system	No
189		d	Moisture sensor controller on irrigation system	No

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