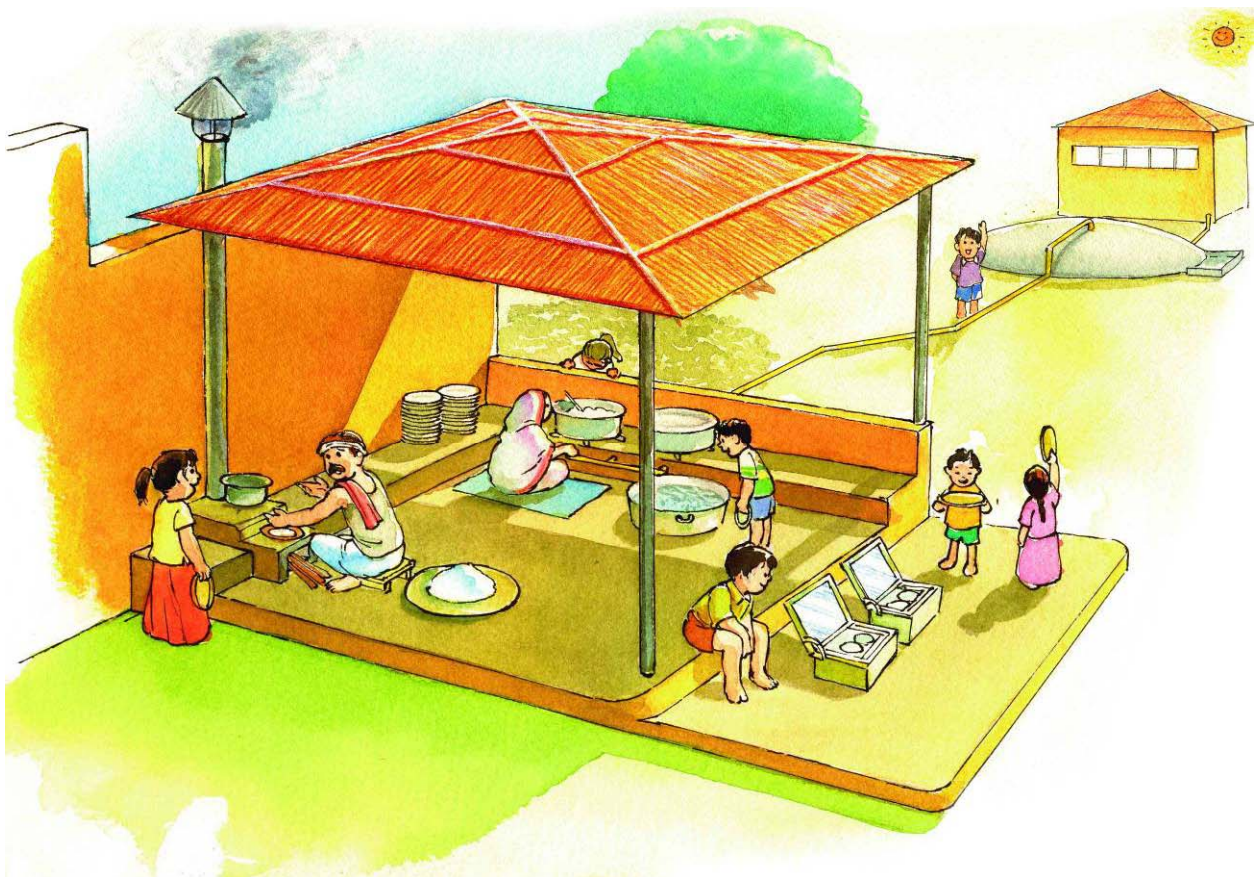


# Developing Ideas for Designing Mid Day Meal Kitchens for Primary and Elementary Schools

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Developed for  
Ministry of Human Resource Development, Government of India



Developed at  
VINYAS, Centre for Architectural Research & Design, New Delhi

April 2013

## Developing Designs for Mid Day Meal Kitchens

Mid day meal kitchens are now integral to primary and elementary schools of our country. Single design may not be suitable to varied and different needs and contexts of the schools, given the diversity in the country. Hence generic conceptual design, with key design guiding principles is more useful. Based on these guiding principles, a range of design variations can be developed in States, Districts, Blocks, or even in Schools, by respective Architects, Engineers and others.

### Design Guiding Principles

1. **The design should be proportionate to the enrolment of children in school.** For 100 children, provision of 20 sq.m of built-up area, and for every additional 100 children provision for additional 4 sq.m is made by the government.

2. **Storing, cooking and serving must happen in safe, secure and hygienic environment.** Design must facilitate it in site-planning, as well as in design provisions.

3. **Overall design and its provision must be child friendly.** Kitchen may not just be place for cooking, but also a place for learning for children. Its activities must be visible and self evident to the children.



4. **Design and activities around must inculcate the values** of healthy eating practices, self-hygiene, optimum resource use, conservation of resources and energy, sharing with others, self discipline, gender sensitivity, inclusiveness, amongst others.

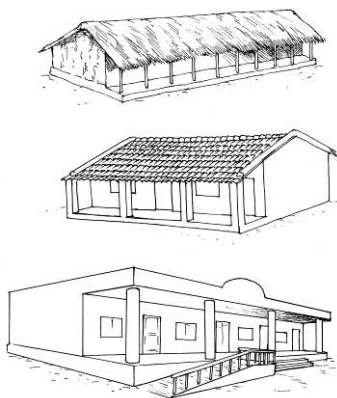


5. **Design must be sensitive to local culture and traditional methods of cooking.** Some prefer floor based cooking. Others may like cooking while standing. The food habits and diets are also diverse. Design must also be sensitive to traditional wisdom of planning and construction.

6. **Design must have integral provision** of store, wash area, preparatory area, cooking area and serving area for kitchen. It must also integrate

hand wash, drinking water as well as utensil wash in it. These can form the 'core'. Their provision must be as per norms and standards.

7. **Design options must allow expansion of key integral components,** as per need, while keeping the basic core intact. E.g. with increase in enrolment of children, the storage, washing, cooking, hand wash, drinking water must also expand, without affecting the core. Design must also allow that once the 'core' structure is built, its 'skin' of finishing materials can be upgraded with resources and time in future.

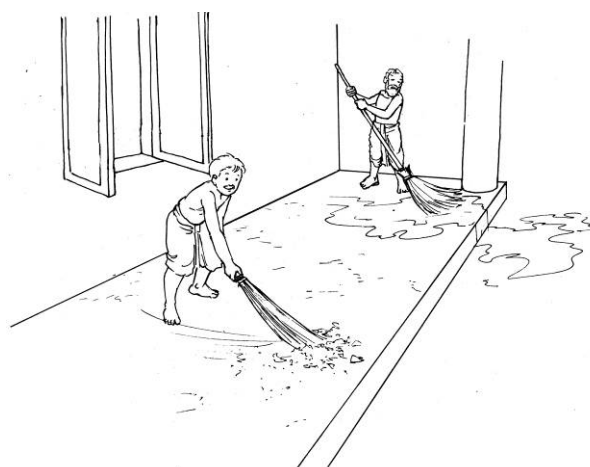


8. **Design must allow diverse and safe building systems of different areas to be used** and allow flexibility. These may pertain to foundation, walling roofing, flooring, paneling, shelving, washing areas, etc. However, all the building systems used must be fire resistant or fire retardant.

9. **Design must allow natural sunlight and ventilation to be used maximally** to keep the place clean, dry and hygienic.

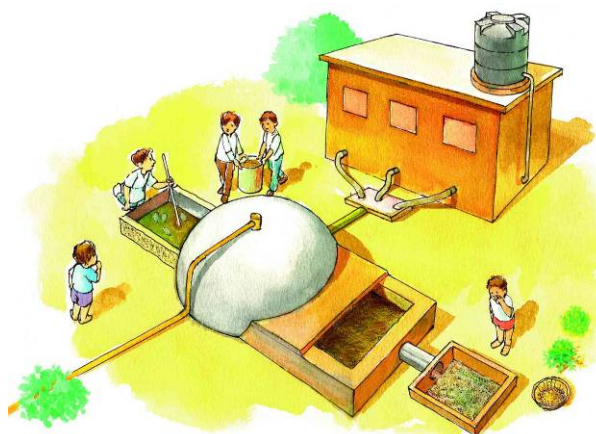
10. **Kitchen fixtures and hardware must be rodent and pest proof** so that storage and cooking is not affected by rodents and pests present in the environment around.

11. **Operation and Maintenance of the construction of the design must be simple and low resource consuming.** Detailing of the design must be such that it does not require high maintenance.



12. **User and environment-friendly energy saving or renewable energy options must be planned along with Kitchen.** There can be use of Smokeless chulha, Solar cooker, Bio-gas, LPG, which can either be the main cooking devices or supplementary devices, as per efficiency, feasibility and requirement.

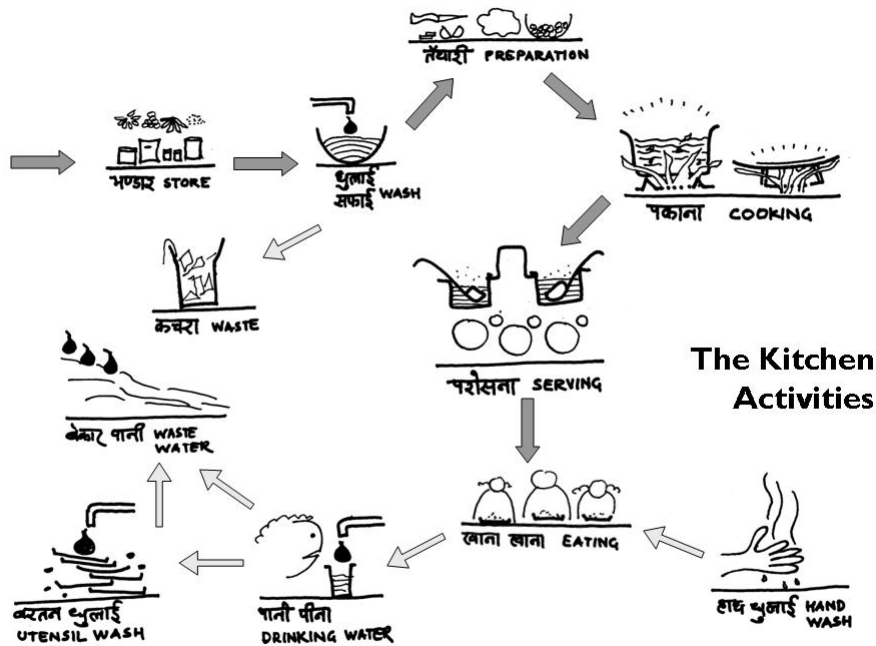
13. **Other components of the schools must be integrally be linked to the mid day meal kitchen.** E.g. Mid day meal eating space (like a courtyard, or a shaded platform); Water supply, storage, distribution and disposal; Kitchen or herbal garden using waste water from the wash and drinking water point; management of school waste and garbage.



## Understanding the key issues in Mid-Day-Meal (MDM) Kitchen.

There are three key issues of a Mid Day Meal (MDM) Kitchen. These are:

1. **Safe Storage**
2. **Hygienic Cooking and comfortable serving**
3. **Hygienic drinking and water hand wash**

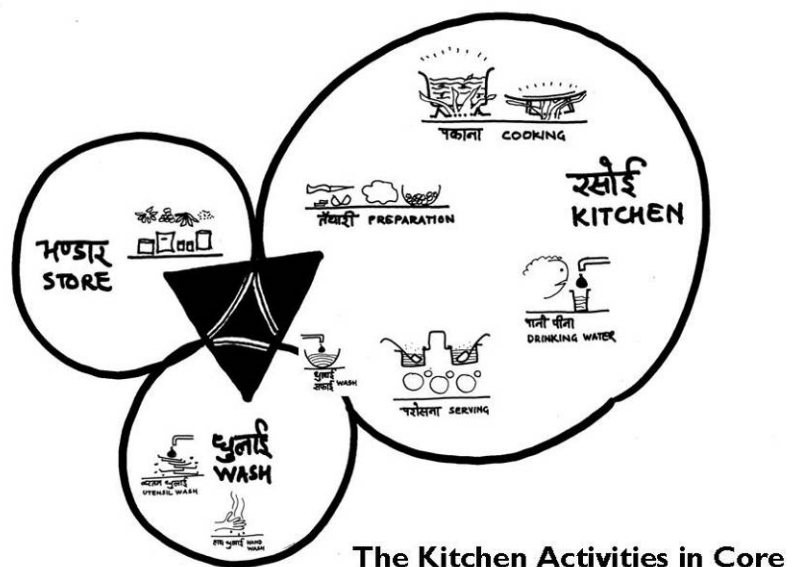


These issues need to be addressed through some essential activities. These are linked to each other in a logical sequence, as shown here. This sequence of operation is essential for efficient functioning of the kitchen. The design has to facilitate this sequence.

It is important to address them in any generic design. Thus, the MDM Kitchen will need to have three major areas, where these activities can be performed:

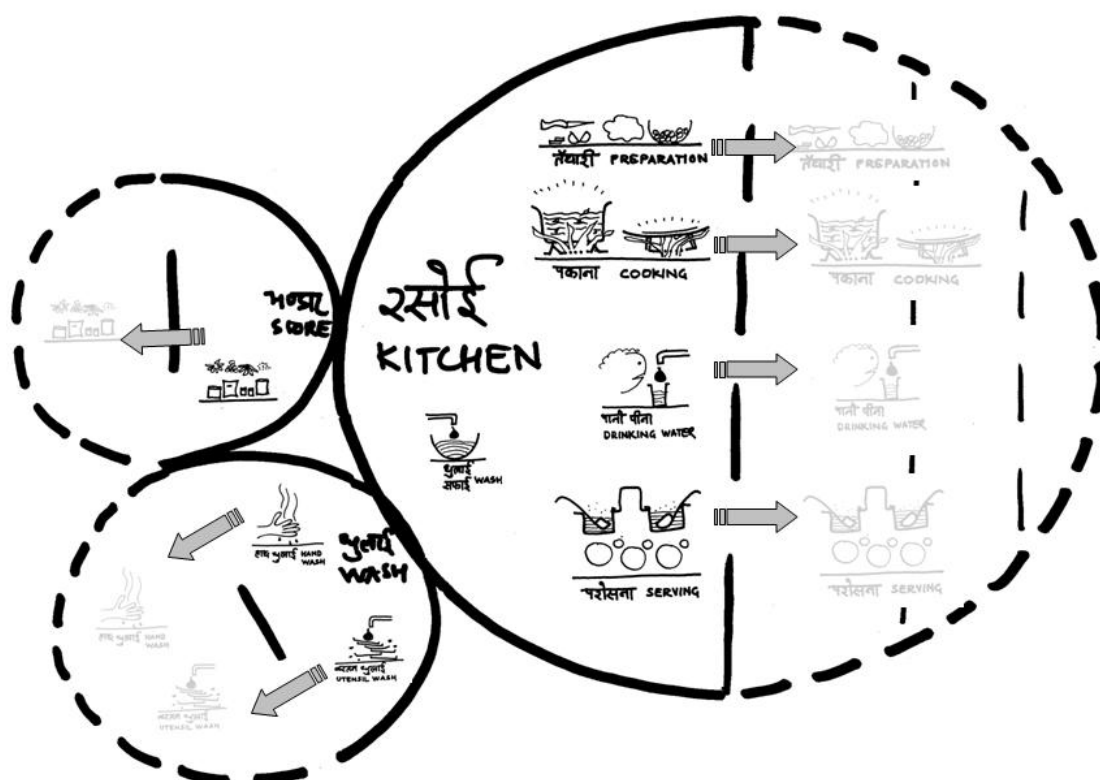
1. **The Store**
2. **The Preparatory, Cooking and Serving Space**
3. **The Wash Space**

The activities that may not be in the core, can be on the periphery or around the core. E.g. MDM Eating space, Waste (Garbage) or Waste Water, etc.



Since the given kitchen space may need to be expanded in future. It is important to address the question that 'what all will need to be expanded, when it is needed in future?'. From design perspective, the above-mentioned three core areas will need augmentation, as follows:

1. The Store >> Expanded storage
2. The Preparatory, Cooking and Serving Space >> Expanded preparatory, cooking and serving space
3. The Wash Space >> Expanded number of hand wash and drinking water points



**The Expanding Kitchen Core, with need**

Thus, the design of the 'core' of the MDM Kitchen, has to be such that the three key components expand, as per increase in enrolment of children. As a result, sufficient space needs to be provided for this expansion to take place.

Two design options have been developed to illustrate the guiding principles as well as key issues of design, as enumerated above.

# Understanding the Design

## Design Option I (A,B,C)

First Design option has three different, fixed variants for 100, 200 and 300 children, respectively. Shown here is the Design Option IA concept for 100 children. The generic form of IA expands to accommodate the requirements of 200 (IB) and 300 (IC) children.

The performance specification for foundation, wall, door and windows, roof, floor, finishing materials are such that diverse building materials and systems can be used to make it.

The technical drawings of all the design variants are given in Annexure-I.

There can be multiple options for filtering, storing and distributing drinking water in child-friendly manner

Rodent proof storage with shutters

Multiple level and depth of ledges for preparation and easy access to raw food material. Cooking working zone can be floor based or raised platform based

Smokeless Chulha

Efficient *Sigri*, or Solar cooker are other options to supplement main cooking to save energy costs

Fire Extinguisher

Utensil Wash area

The waste water from the kitchen can be used to irrigate the kitchen or herbal garden, depending upon quality of water

Segregated garbage and its appropriate reuse/ recycling/ disposal integrated

There can be multiple options of child-friendly hand wash that can be integrated with Kitchen, based on resources available. Use of inclusive fixtures.

**DESIGN OPTION IA. PLAN For 100 Children. Area 20 sq.m.**

## Understanding the Design

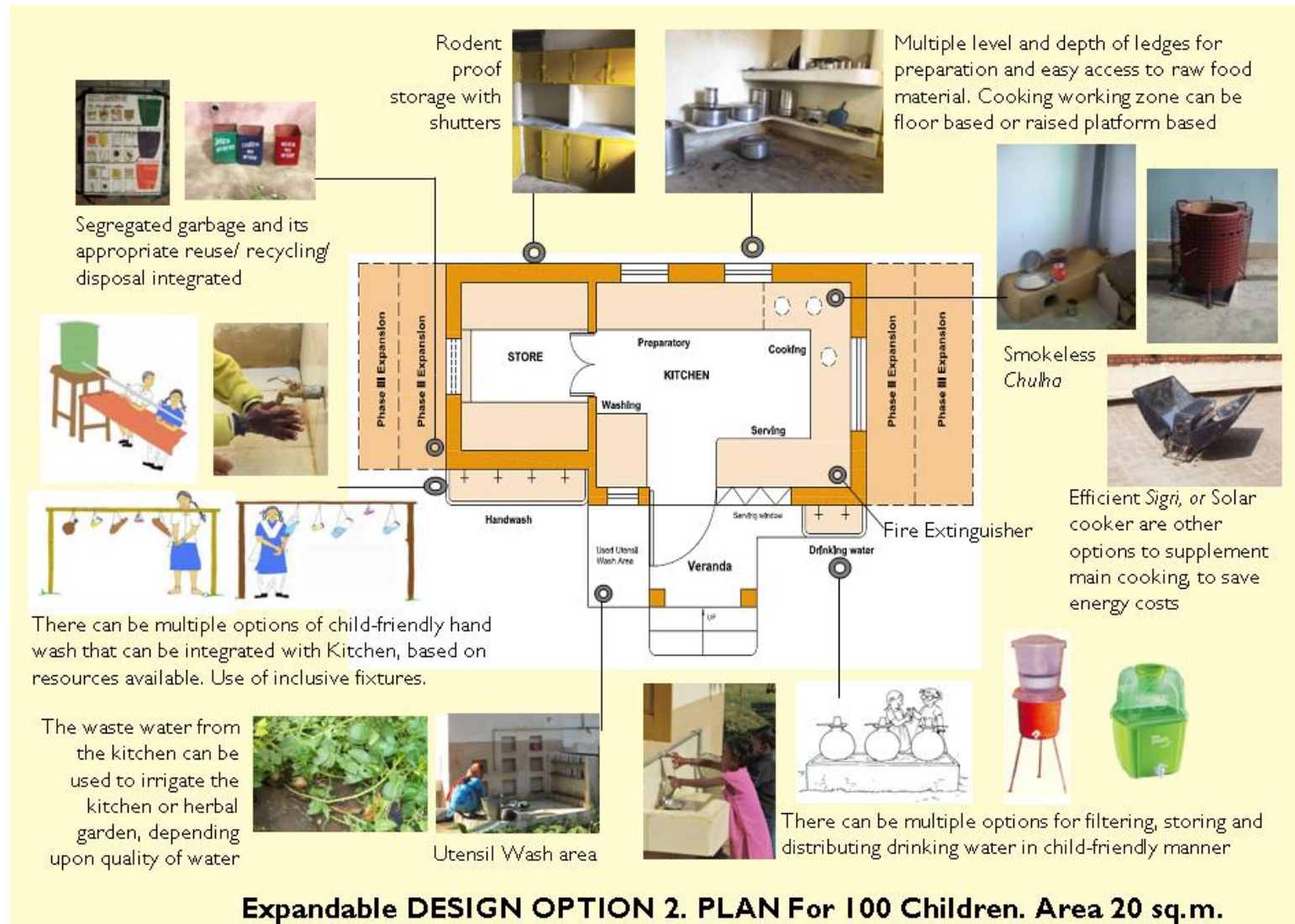
### Design Option 2

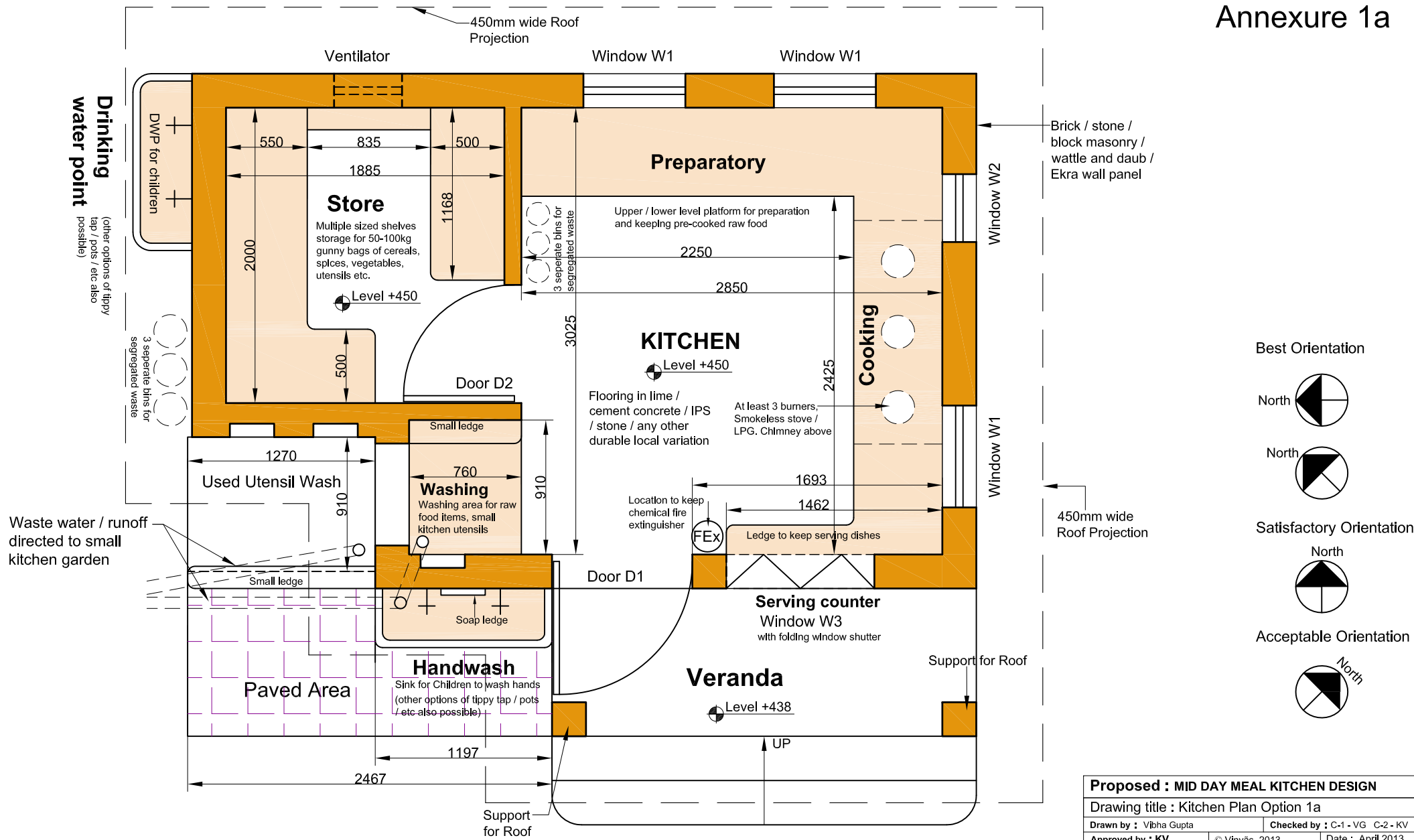
Second design option has a core that can be expanded with increase in enrolment from 100 to 300. Following the Design Option 2 concept, as it is in phase-I for 100 children. As the enrolment in the school increases, the core expands in a linear fashion in both direction to accommodate increased requirement of core kitchen activities.

Like the previous design option, diverse building materials and systems can be used to make it.

The technical drawings of this design are given in Annexure-2.

Annexure 1 & 2 follow.





**MDM Kitchen cum Store CONCEPT DESIGN OPTION 1a  
for 100 Children in a School  
Built-up Area = 20sqm**

**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Plan Option 1a

Drawn by : Vjibha Gupta      Checked by : C-1 - VG C-2 - KV

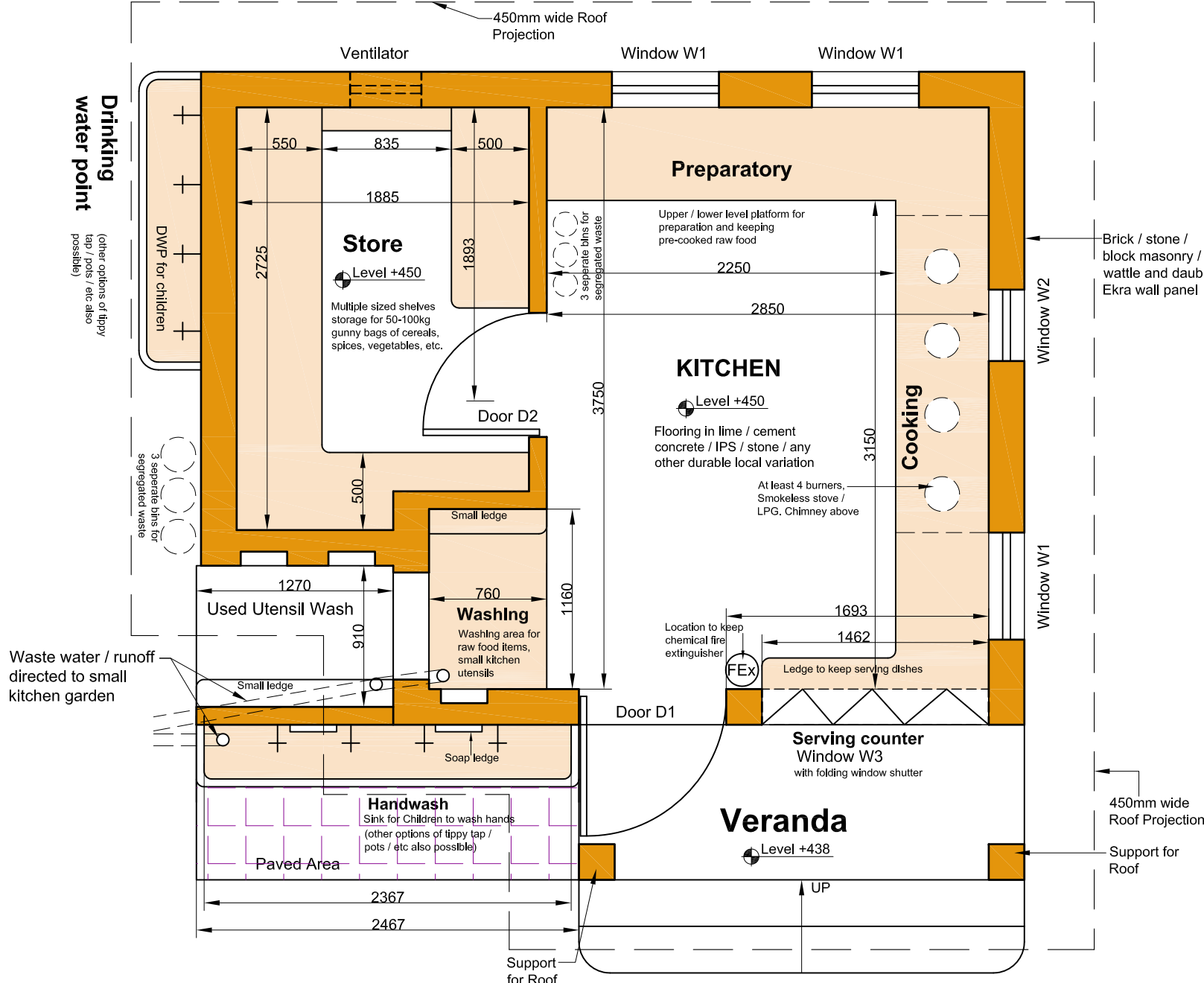
Approved by : KV      © Vinyās, 2013.      Date : April 2013

Scale

All dimensions are in mm.

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Brick / stone / block masonry / wattle and daub / Ekra wall panel

Best Orientation



Satisfactory Orientation



Acceptable Orientation



**MDM Kitchen cum Store CONCEPT DESIGN OPTION 1b**  
**for 200 Children in a School**      **Built-up Area = 24sqm**

**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Plan Option 1b

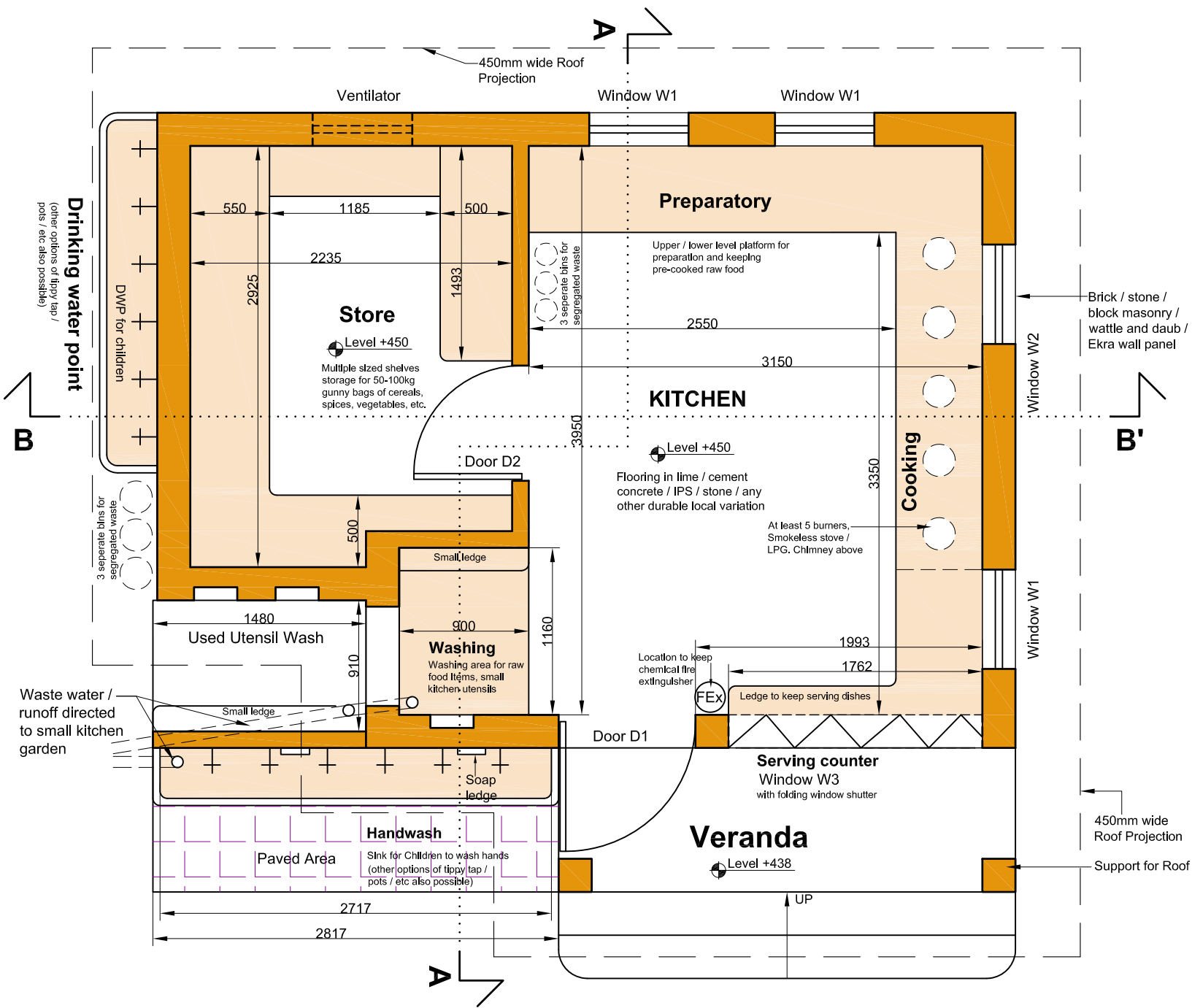
Drawn by : Vjibha Gupta      Checked by : C-1 - VG    C-2 - KV

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Scale

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 Phone 011-22628151, 22625747 (tele-fax), Email : vinyascentre@yahoo.co.uk



Best Orientation



Satisfactory Orientation



Acceptable Orientation



**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Plan Option 1c

Drawn by : Vijbha Gupta      Checked by : C-1 - VG   C-2 - KV

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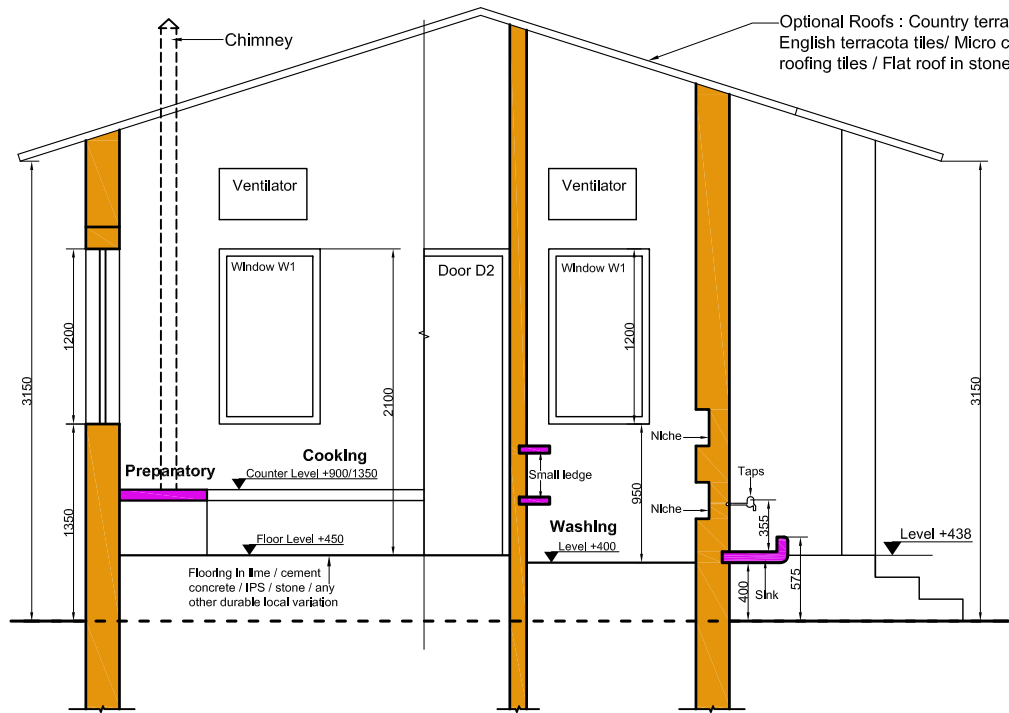
Architects

विन्यास Vinyās

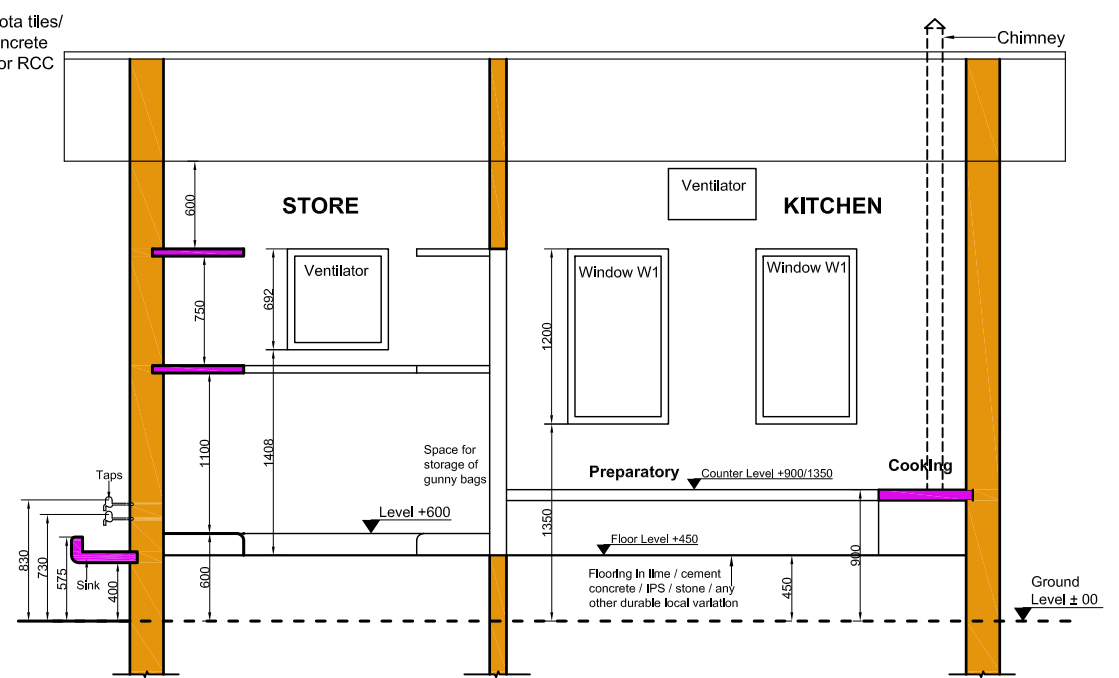
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 Phone 011-22628151, 22625747 (tele-fax), Email : vnyascentre@yahoo.co.uk



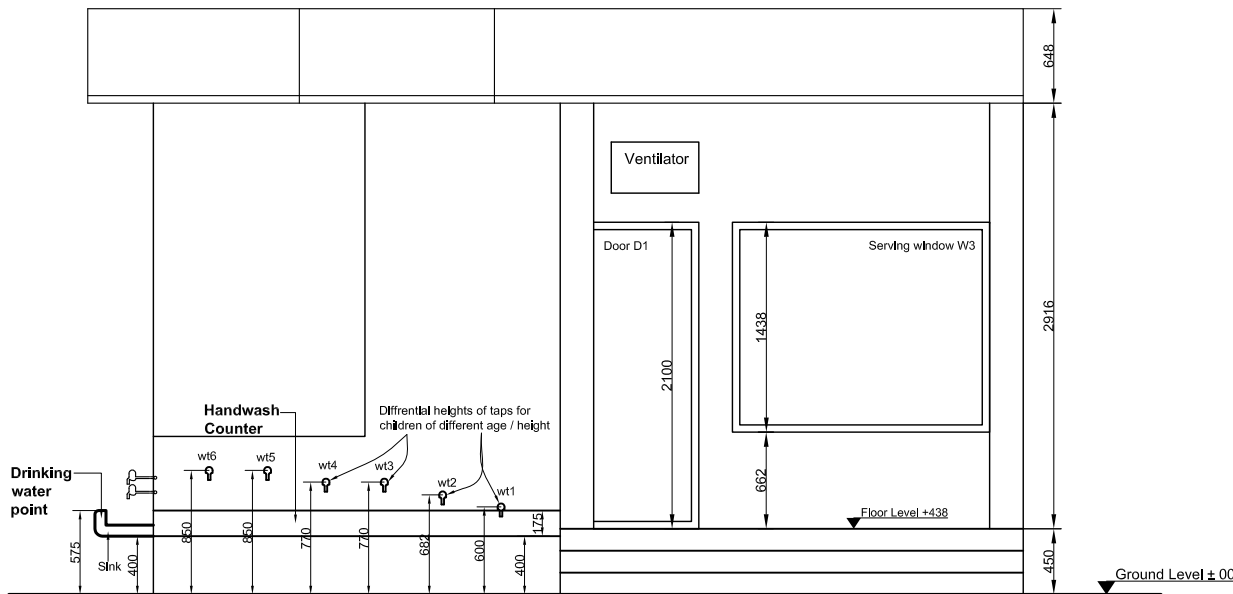
**MDM Kitchen cum Store CONCEPT DESIGN OPTION 1c  
 for 300 Children in a School      Built-up Area = 28sqm**



SECTION A-A'



SECTION B-B'



FRONT ELEVATION of MDM KITCHEN UNIT

## Annexure 1d

**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Elevation & Sections of Option 1

Drawn by : Vjibha Gupta Checked by : C-1 - VG C-2 - KV

Approved by : KV © Vinyās, 2013. Date : April 2013

Scale



All dimensions are in mm.

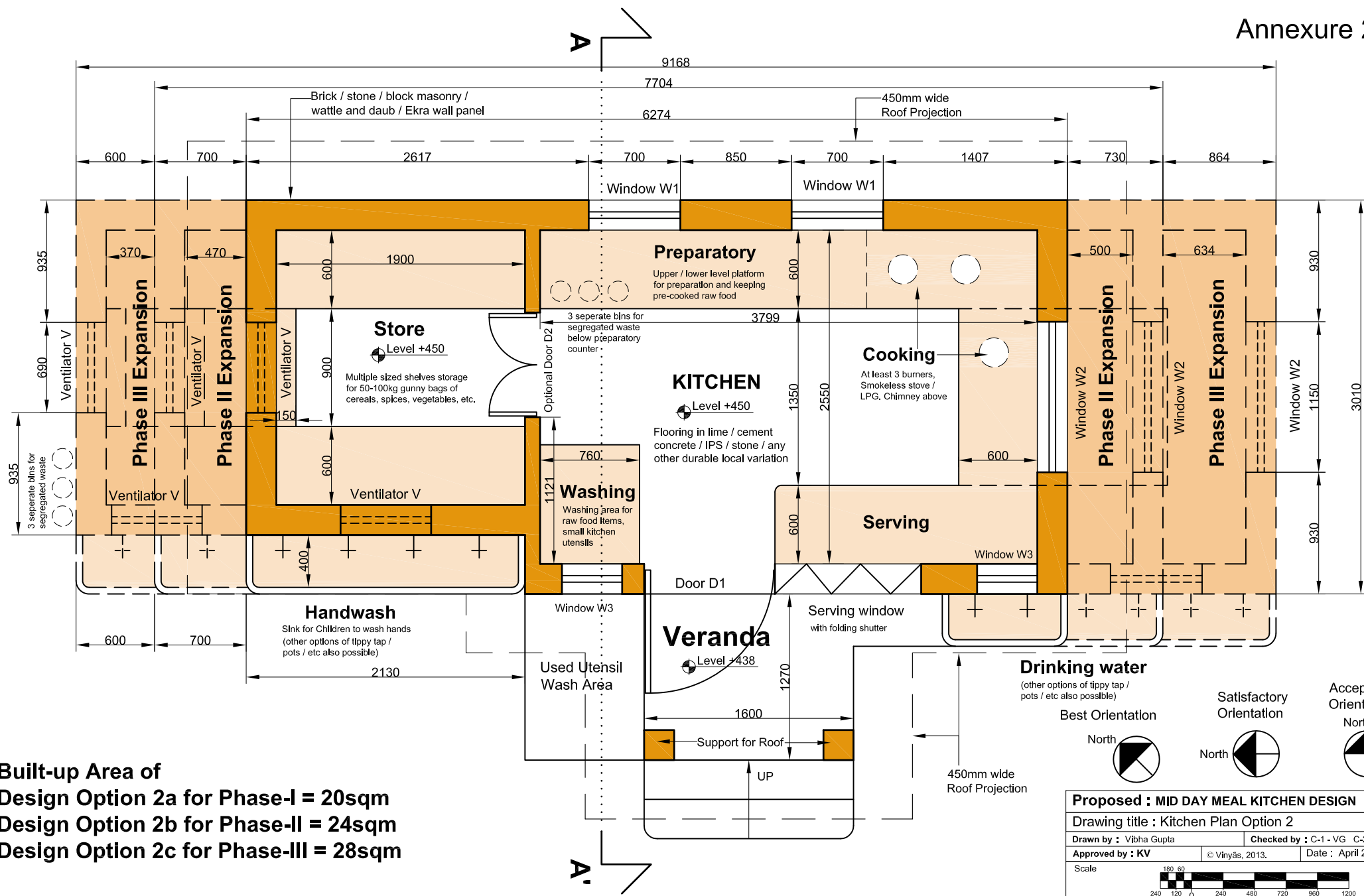
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**Built-up Area of**  
 Design Option 2a for Phase-I = 20sqm  
 Design Option 2b for Phase-II = 24sqm  
 Design Option 2c for Phase-III = 28sqm

## MDM Kitchen cum Store CONCEPT DESIGN OPTION 2 for 100 - 300 Children in a School



**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Plan Option 2

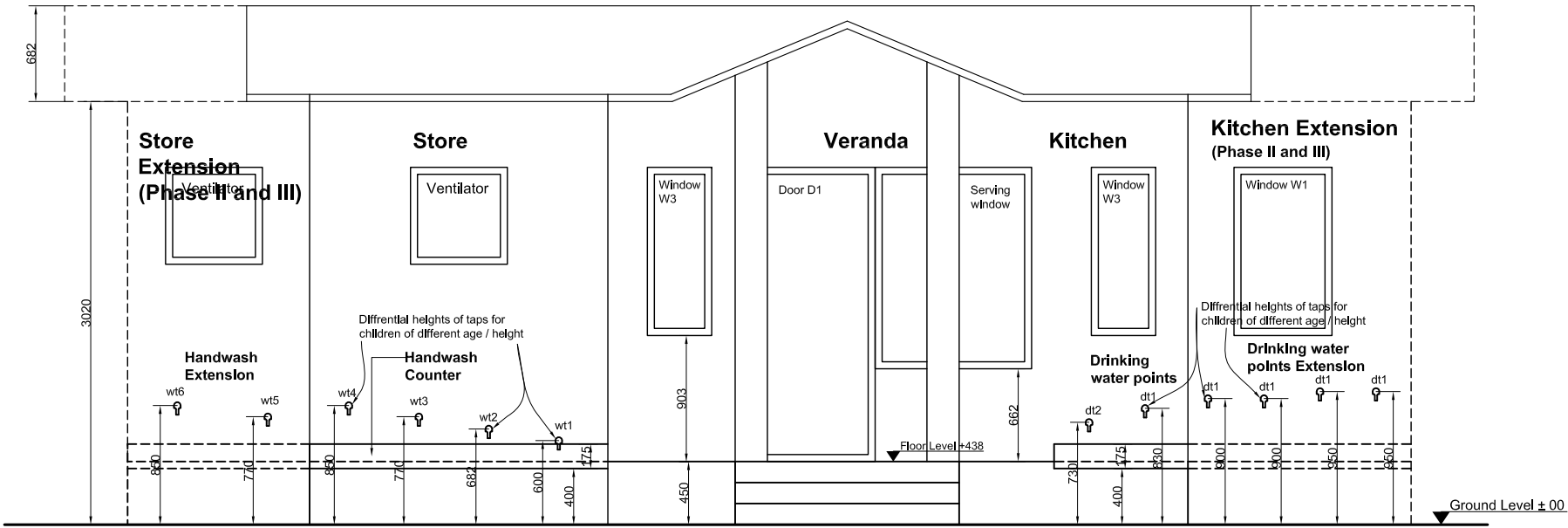
Drawn by : Vijha Gupta      Checked by : C-1 - VG    C-2 - KV

Approved by : KV      © Vinyās, 2013.      Date : April 2013

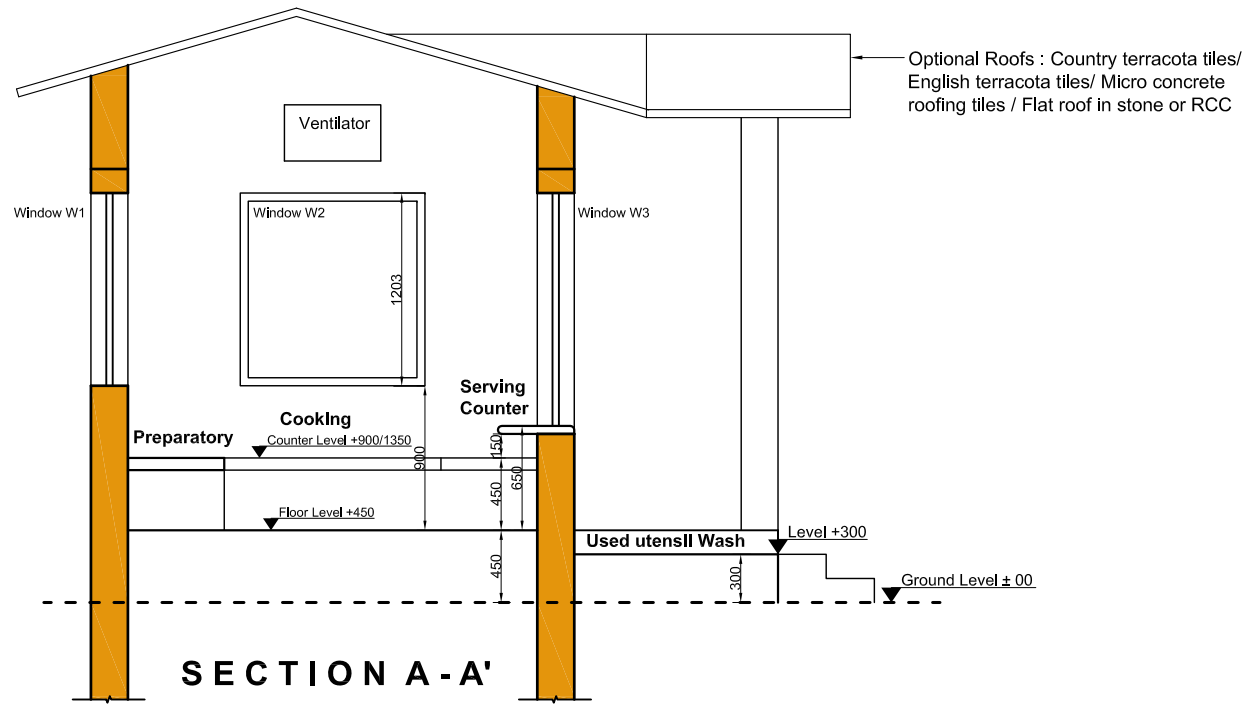
Scale: 1:60

All dimensions are in mm.

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**FRONT ELEVATION of MDM KITCHEN UNIT**



**SECTION A-A'**

**Proposed : MID DAY MEAL KITCHEN DESIGN**

Drawing title : Kitchen Elevation & Section of Option 2

Drawn by : Vjibha Gupta      Checked by : C-1 - VG   C-2 - KV

Approved by : KV      © Vinyās, 2013.      Date : April 2013

Scale

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## Annexure 3

### Performance Specifications for MDM Kitchen Building

The choice of specific building materials and their specifications is to be made locally. However, they should adhere to the respective Performance Specifications given below:

<b>Building Element</b>	<b>Performance Specifications</b>
<b>1. Foundation</b>	<ol style="list-style-type: none"><li>a. Stable and strong enough to<ul style="list-style-type: none"><li>▪ Take dead and live-loads of kitchen building superstructure on the given natural strata, in all weathers</li><li>▪ Resist natural hazards applicable in the area like earthquake, landslide, flood, cyclone, tsunami, etc.</li></ul></li><li>b. It should not allow dampness to rise above into the superstructure.</li><li>c. Designed to take expansion, as per need (horizontal / vertical)</li></ol>
<b>2. Walling</b>	<ol style="list-style-type: none"><li>a. Stable and strong enough to<ul style="list-style-type: none"><li>▪ Take dead and live-load of the roof, and any superstructure above.</li><li>▪ Resist natural hazards applicable in the area, like earthquake, landslide, flood, cyclone, tsunami, etc.</li></ul></li><li>b. Durable enough to take extreme weather conditions in the area</li><li>c. Secure enough to avoid any thefts or vandalism</li><li>d. Material should be<ul style="list-style-type: none"><li>▪ Fire resistant and fire retardant.</li><li>▪ Water proof and all weather proof</li><li>▪ Requires minimal maintenance</li></ul></li><li>e. Detailing should provide enough thermal insulation to keep inside temperature comfortable, in all weathers</li><li>f. Designed to take expansion, as per need (horizontal / vertical)</li><li>g. Can be constructed and maintained locally.</li><li>h. Painted externally or internally with only non-toxic paints</li></ol>
<b>3. Roofing</b>	<ol style="list-style-type: none"><li>a. Stable and strong enough to take self-load and load of<ul style="list-style-type: none"><li>▪ Maintenance personnel working on roof top</li><li>▪ Superstructure / water tank, if any.</li><li>▪ Resist natural hazards applicable in the area, like earthquake, landslide, flood, cyclone, tsunami, etc.</li></ul></li><li>b. Durable enough to take extreme weather conditions in the area</li><li>c. Secure enough to avoid any thefts or vandalism / monkey menace.</li><li>d. Material should be<ul style="list-style-type: none"><li>▪ Fire resistant and fire retardant</li><li>▪ Water-proof and all weather proof</li><li>▪ Breath out smoke and hot air, if needed</li><li>▪ Requires minimal maintenance / replacement</li></ul></li><li>e. Detailing should provide enough thermal insulation to keep inside temperature comfortable, in all weathers</li><li>f. Designed to take expansion, as per need (horizontal / vertical)</li><li>g. Can be constructed and maintained locally.</li></ol>
<b>4. Flooring</b>	<ol style="list-style-type: none"><li>a. Stable and durable enough to take<ul style="list-style-type: none"><li>▪ Day-to-day movement of people, raw food and heavy utensils</li></ul></li><li>b. Material should<ul style="list-style-type: none"><li>▪ Be easily clean-wiped with minimum water</li><li>▪ Be fire resistant and fire retardant</li><li>▪ Require minimal maintenance / replacement</li><li>▪ Be thermally insulative, if seating is on floor</li><li>▪ Not be slippery to move on</li><li>▪ Not be stained easily</li></ul></li></ol>
<b>5. Door / Window / openings</b>	<ol style="list-style-type: none"><li>a. Durable enough to take extreme weather conditions in the area</li><li>b. Require minimal maintenance / replacement</li><li>c. Can be constructed and maintained locally.</li><li>d. Secure enough to avoid any thefts or vandalism / monkey menace.</li><li>e. Allow enough light and ventilation, as per need of the inhabitants</li><li>f. Protected with only non-toxic coating / paints – internally or externally.</li><li>g. Made, if possible out of fire-retardant / fire resistant materials</li></ol>
<b>6. Platforms / shelves</b>	<ol style="list-style-type: none"><li>a. Stable and durable enough to take load of stacked raw food and heavy utensils</li><li>b. Material should<ul style="list-style-type: none"><li>▪ Be easily clean-wiped with minimum water</li><li>▪ Be fire resistant and fire retardant</li><li>▪ Require minimal maintenance / replacement</li><li>▪ Not be stained easily</li></ul></li><li>c. Can be constructed and maintained locally.</li></ol>