CONCEPT

To create a set of spaces which will promote the brilliance of the minds of the students.

UNDERSTANDING THE CONSTRAINTS

Mongolia during the winter can become incredibly cold, with temperatures as low as 45 degrees across (seven) months of the year.

And for the project to realise itself, we need to create a building that is cheap to build and economical to run even in the coldest of winters...

Whilst giving each space the best quality of light for studying...

We’ve considered all of these factors and have produced a scheme which balances all of these needs in a simple integrated, realistic architecture.

We have taken a sensitive approach to our material choice as we try to answer our demanding criteria. The school is designed with local material sources in mind which the local labour will be familiar with. Bricks are used to give our small structure a thermal mass which will help contain the heat produced within the building. We also have chosen to play with the transparency of the building. We wanted to make clear views something of note and in doing so reduce the overall heat loss from the building.

We want to extend the life of the school through in a cost efficient and community driven manner. We unite the new and the old so that all students within the school may benefit from the investments made into the structure instead of segregating and forgetting the past.
CONSTRUCTION STAGES

Stage 1
The ground will be excavated in order to prepare for the construction of the foundations. An opening will be formed at the western end of the existing school's corridor for later connection.

Stage 2
Pads footings will be placed at the proposed locations of the timber columns, whereas strip footings will be built to support the external brick walls. These shallow foundations will be constructed with in situ concrete sourced from local stone mines and cement plants. The process is quick, simple and has minimum effects to the environment. A layer of hardcore will then be placed to stabilize the footings.

Stage 3
The main frame structures, which are made with locally sourced timber, will be erected after the foundations are set in place. A total of 10 portal frames, spanning approximately 3 m from each other, will be connected by beams. We believe using timber is very sustainable, easy to construct, and also encourages local craftsmanship.

Stage 4
The roof, along with the roof lights, will be placed on top of the main structures. Slate roof tiles would be used as they could be extracted and manufactured locally. The hollow box shaped roof lights would be locked in place and connected to the timber beams.

Stage 5
The brick walls, with wool insulation and damp proof membrane being sandwiched between the external and internal faces, will be constructed and wrapped around the structure. It provides sufficient thermal mass and additional stiffness to the overall building. The use of local bricks minimizes transportation of materials and encouages local trades.

Stage 6
The final stage will involve the installation of windows, lightings, doors, internal walls, timber floorings etc. after the internal space is being sheltered. Photovoltaic panels will also be installed on the roof.

PERSPECTIVE OF THE INTERNAL CORRIDOR

The form of the building is derived from the surrounding contexts in order to provide the best design solution to the brief. The classrooms are placed at the southern end, where the students can enjoy the view of the backyard and the rooms can take advantages of their southern orientation. The sports hall is placed at the northern end. Its entrance is deliberately placed in front of the proposed new opening towards the corridor of the main school building, thus creating a strong axis and a significant relationship with the existing building.

With the introduction of the new 2m brick wall on the southern boundary, this creates a new courtyard space where the current rundown toilets are. The school could then decide whether to keep the toilets or to develop that enclosed space for other functions.

CIRCULATION

The new extension will provide better accessibility to the whole site: the corridor of the existing school would lead into the newly built corridor, thus allowing the students to walk to the toilets sheltered from wind and rain. The extension also has step-free access for children with disabilities. The new building also provides entrance to the backyard, therefore students will not have to walk all the way from the front entrance to the backyard.

FORM AND FUNCTIONS

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A new set of additional doors are provided for more accessibility into the school. It also provides more fire escape routes.

The design of the extension is meant to integrate with the surroundings, therefore similar but not entirely the same architectural languages with the existing school are implemented. The building therefore is very humble and down to earth, making it welcoming rather than imposing.

We believe the current wooden wall of the school is a safety hazard and visually unattractive. By replacing it with a 2m high brick wall, it improves the backyard significantly whilst providing more privacy and security.

A new entrance is also provided, which would only open at the start and end of the school day. This allows some students to travel quicker to the sheltered school during cold days.
CROSS VENTILATION

As most wind come from the north (13%) and the south (10%) in Mongolia, this provides the perfect opportunity for cross ventilation in the corridor. Openings on both ends would allow natural ventilation during summer time, thus providing a comfortable environment for students to learn.

SUNLIGHT

Roof lights and solar panels are installed to take advantage of the fact that Mongolia is almost sunny all around the year. The classrooms and the sports hall all have a box shaped roof light located at the centre of the room, providing more solar gain during winter but not losing too much heat. They also resemble a tradition Mongolian yurt, where the concealed tent is penetrated by a small translucent canvas located at the very top. Students could feel safe but not entrapped in this environment.

In addition, polycarbonate sheets are installed at the top part of the sports hall, thus allowing more sunlight to come in. In addition, the translucent material helps to express the aesthetics of the structural elements of the building.

RAINWATER COLLECTION

As the roof is designed in a V shaped where both the classroom and sports hall roofs are slanting inwards, rainwater or melted snow could be collected at the centre of the building. With the toilets located at the middle area, this allows the collected rainwater to be used for flushing.