

2020.04.15

## Design motivation for conversion of the Educational Resources Centre into a new Visitor Centre for the SAAO.

### Preamble and analysis

The old *Engine House* - currently known as the *Educational Resources Centre* - is a Grade 3C heritage building that dates from 1888. Various later alterations and additions have been added. In our study of the building we identified different phases of the building's development, which stems clear from the different building methodologies and detailing employed. Figure 1 below indicates three different phases to the building:

- The building portion that is indicated in white has been identified as clearly being the original building.
- The portions in red indicating later additions that was added later. These two portions also have substantial waterproofing issues that need to be addressed. If possible, these should be altered to not detract from the original building
- The portion indicated in blue is the most recent addition clearly evident in the difference in detailing

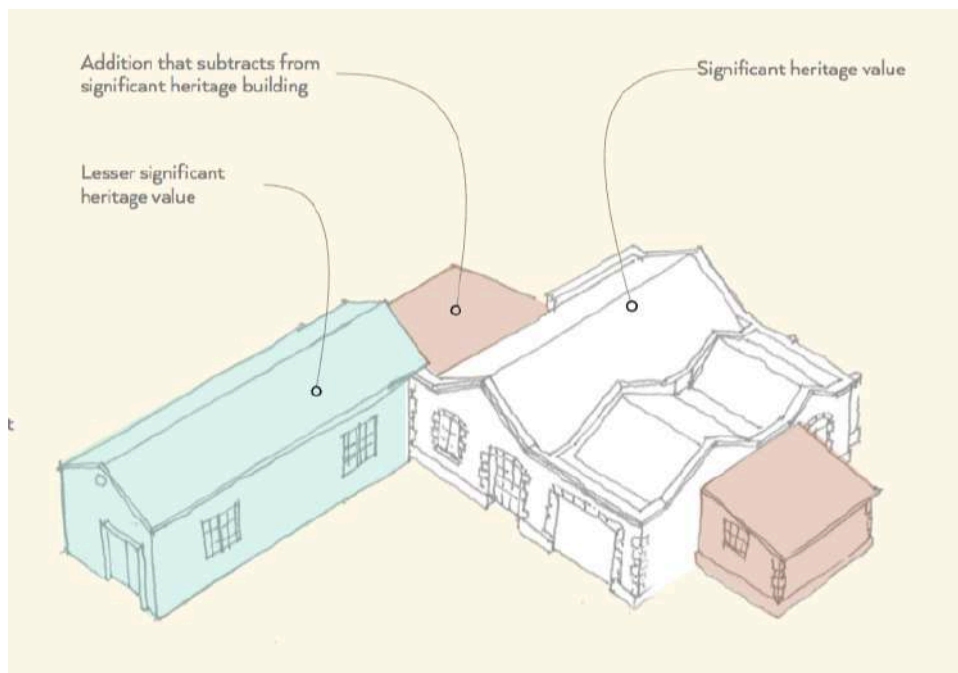


Fig. 1 - Existing building analysis

### Original building analysis:

There are some differences in plaster techniques used as well as roof construction detailing, which suggests that this building was possibly completed in different stages. A further indication of this is the way the rainwater collection of the roofs does not logically connect: currently this portion has three internal gutters, with a fourth that has been abandoned at the approaching facade. However, for the purpose of this document we have included everything indicated in white in *fig. 1* as the original building.

Some alterations have been made to this portion of the building, most prominently being the conversion of the street facing room to a garage – see *fig. 2*



*Fig. 2 - Existing building front façade, with garage alteration*

Some internal walls appear also not to be original, but seems to have been added at a later stage.

The roof sheeting is rusted through and needs complete replacement. All purlins to the roof sheeting also need to be replaced. The main structures of all the roofs are still in fair condition, and will need some cosmetic maintenance.

All doors and windows needs maintenance work, or needs to be replaced. This is indicated in the window and door schedule in *Annexure A*

### Later additions – analysis:

The more recent additions indicated in red in *fig 1* vary from the original building in detailing as well as design approach. Both additions are done in a manner that does not fit in with the original building design. The roofs of both additions are problematic:

- The roof of the eastern addition contains an internal gutter, which has led to considerable damp and water leakage into the room. The roof height is also very low, and is not currently suitable to a number of different habitable functions.

- The roof and general construction of the addition on the western side is problematic. Both the roof and walls are constructed of a timber frame clad with corrugated sheeting. The roof structure seems to be sagging, and may need replacement. This will only become evident upon removal of the ceiling. Refer to *fig 3*.

All doors and windows needs maintenance work, or needs to be replaced. This is indicated in the *window and door schedule* in *Annexure A*



*Fig. 3 - Sagging of roof on corrugate clad addition on north-western corner.*

#### **Most recent addition:**

The most recent addition is indicated in blue. This portion is functionally in the best condition. Some general maintenance is required with gutters and downpipes missing. Roof sheeting needs replacement. It is suspected that the purlins to the roof sheeting are still in fair condition. Gutters and downpipes need to be re-instated and replaced. Refer to *fig 4*.



*Fig. 4 - Most recent addition to the Educational Resources Centre*

Most windows in this portion only needs maintenance and replacement of glass and putty. Details are indicated in the *window and door schedule* in *Annexure A*.

### **Brief by client:**

The client requested proposals that would seek to convert the existing *Educational Resources Centre* into a *Visitor Centre* for the SAAO. Part of the programmatic requirements was to provide sufficient ablution facilities, a reception area, spaces for varying exhibitions, and a room that contains an observation instrument known as a heliostat. This room needs to be able to block out natural light. Furthermore the brief required sufficient general maintenance of the building. All this needs to happen within a limited budget.

### **Approach and design response:**

The analysis discussed earlier serves to inform design decisions. Main principles that have influenced the design decisions are:

- *Heritage implications:* the oldest and more significant portions have been approached in a way that as little as possible is done, but enough to ensure the building can be maintained in the long term. Where there are inherent design problems that will perpetuate maintenance, these are addressed in as sensitive manner as possible. A clear example of this is the intervention with the roofscape, where internal gutters are reduced to what is absolutely necessary, thereby minimising possible leakage points. The current state of the building is testimony to the destruction water has wrought on the building.
- *Functional and daily use as a form of preservation:* the adaptive re-use of this building will ensure that the building is used on a daily basis. This in turn ensures that maintenance items are addressed sooner in future.
- *New additions clearly articulated from the old:* where new items are added, these are expressed in a contemporary manner. This adds to the philosophy of documenting the layers of history. Historical re-representation has been avoided, as this is not honest to current building methods and technologies. Rather, design principles such as scale and proportion are incorporated to make the new additions read well with the historical elements.
- *Limited demolition:* limited demolition has been employed in order to accommodate the new programmatic requirements. Where this has been done it is done in a manner that enhances the spatial experience. Demolished items can be “read” in the building by expressing the old positions of the walls in the floor and wall detailing.
- *Visibility from pedestrian approach:* preference in budget is allocated to those areas that are highly visible from the pedestrian approach. Here for instance, the room housing the heliostat in the later addition on the eastern flank of the building is given more attention than the later addition largely hidden from view in the north-western corner.
- *Budgetary constraints:* The most prominent areas and areas that will be difficult to change in future has been given more focus with regards to changes.
- *Landscaping:* Within the limited budget landscaping is focussed on the main access route. A clear route and axis is established on what we have identified as possibly the original main entrance. This entrance is re-instated as the main-entrance, thereby giving preference of the old over the new. Removal of the tar road is expensive, and this is limited to the portions as indicated in the plans in *Annexure A*.

## **Design layout:**

The approach to the building is emphasised along a newly formed axis that lines up with the original front door. Upon entering the building one immediately experiences the volume and intricacy of the main pitched roof. The impressive roof trusses are kept open, with newly instated ceilings above the trusses. To your right is the reception area and some seating for visitors.

The programmatic requirement of an exhibition space necessitates a more open plan. Consequently some internal walls have been removed, with newly instated steel beams to support the roof. The proposed items that will be removed are indicated in the *diagrams 1 and 2*. An open flow to the newer addition of the building is created by the removal of some walls. Furthermore, the original pump equipment is exhibited to pay homage to the previous workings of the building.

The heliostat room is placed in the later addition room on the eastern side. This is practically the best room as it can be closed off to be a dark room without interfering with the flow of the exhibition area. A minimum floor to ceiling height of 2,7m is required to achieve the correct projection of the image via the heliostat. In order to carry the weight of the new equipment on the roof a supporting structure required. A new flat concrete roof is proposed. This solves the dual purpose of carrying the weight of the heliostat whilst ensuring a waterproof seal to the roof.

The new WC's are placed to the northern side of the building. The bathroom is laid out in such a manner as to accommodate the required toilet facilities, whilst not interfering with the external façade. The original door is refurbished and kept within the new WC, offering some natural light into this space.

A number of interventions are proposed on the exterior of the building. In order to bring in more natural light, two new windows are inserted into the opening where the garage door is currently. These windows are similar in proportion to the original openings in the building, but are expressed in a contemporary manner. These two flush glazed windows have deep, but thin steel frames that forms internal seating in the waiting area. A similar window is proposed as a sidelight to a new door in the existing opening in the southern façade of the newest addition to the building.

An important part of the proposed design is not to only maintain, but improve where a real need is presented. Water drainage from the roofscape is clearly a problem currently. A solution is proposed where the two pitched roofs over the current garage and newly proposed WC's are removed, and replaced with a single pitch roof draining onto a new single internal gutter. This removes three other internal gutters out of the equation, and reduces the risk for water leakage into the building significantly. These two roofs are internally also not of great significance, and currently the roof sheeting is completely exposed from the inside. See *fig 5*.



*Fig. 5 – exposed roof in the existing “garage” area*

The parapet wall over the existing garage door is completed with matching plaster details. This is most probably how the building looked originally before the addition of the garage door. For aesthetic as well as structural reasons two remaining gables on the interior of the building footprint is removed. The gables on the exterior (eastern side) are retained to reflect the original eastern façade of the building.

Existing doors and windows that are retained will be re-instated to their original condition. Paint colours will match the existing. Please refer to *Annexure A’s Window and Door Schedule*

Refer to diagrams 1-4 on the following pages for a brief visual summary of proposed work and changes.

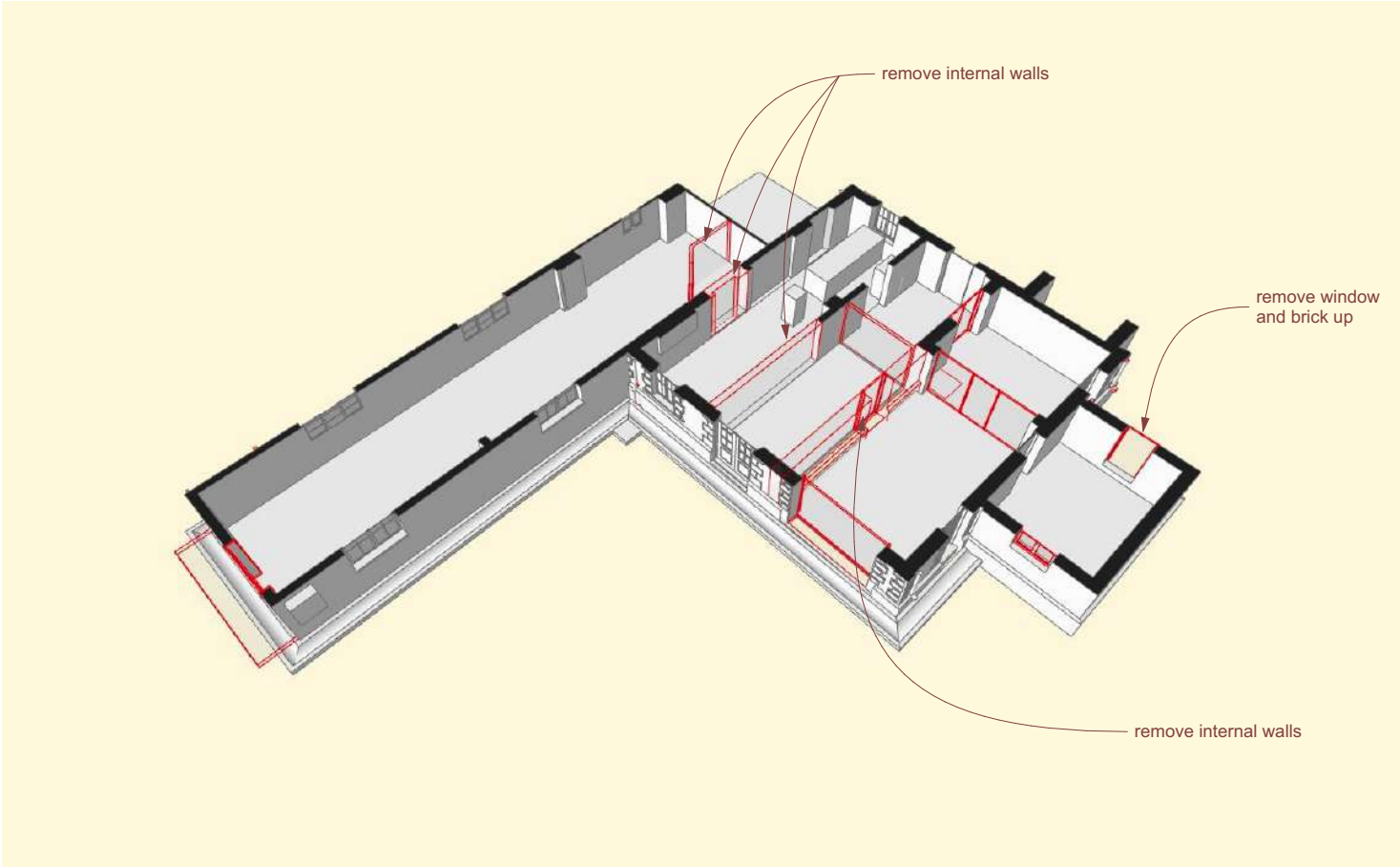


diagram 1: existing plan with proposed demolitions/changes in red, 3D plan view

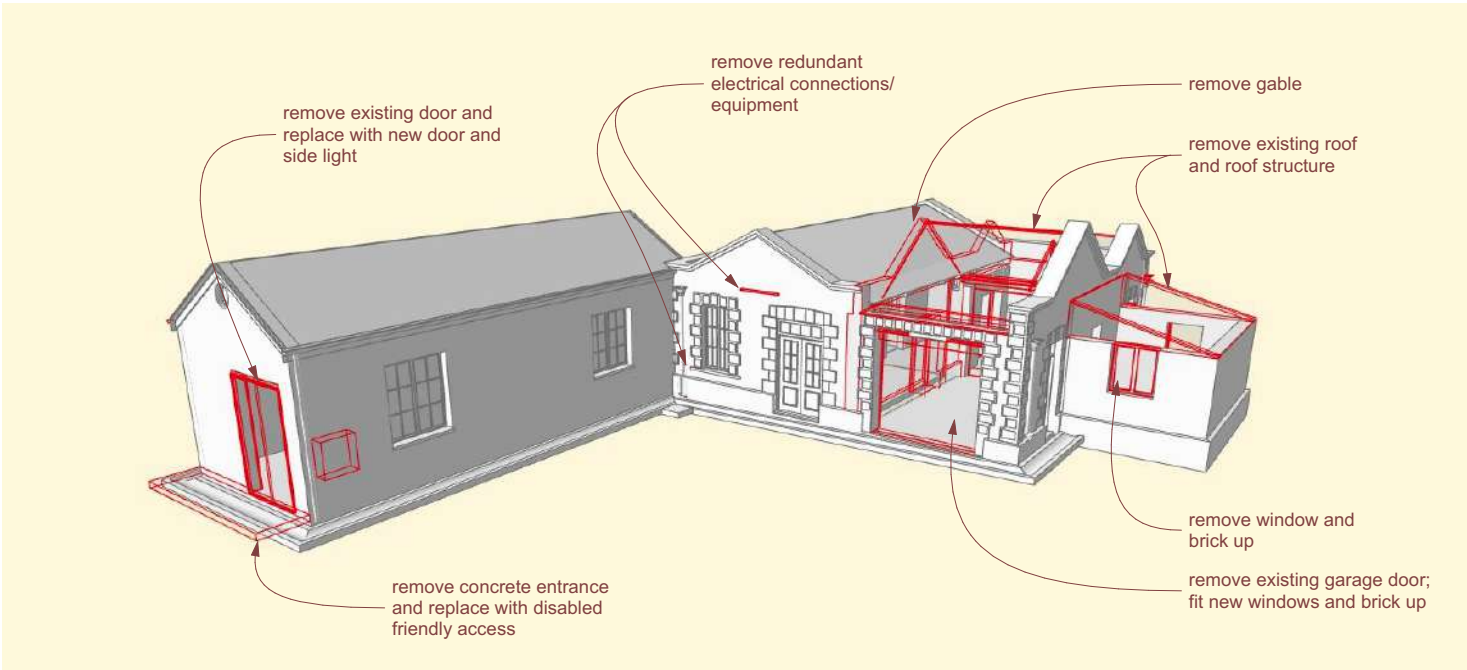


diagram 2: existing building with proposed demolitions/changes in red, 3D perspective view

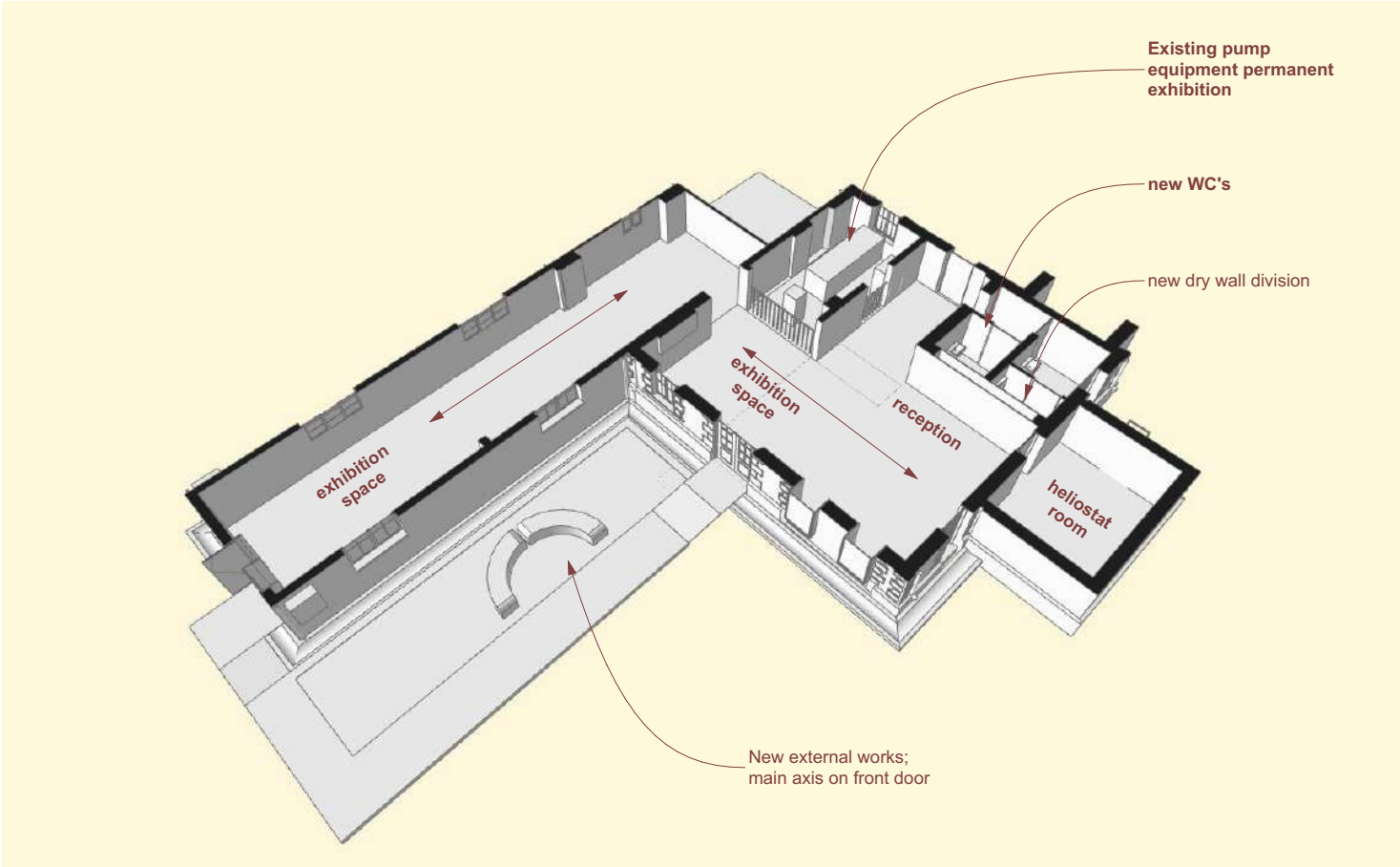


diagram 3: proposed alterations, 3D plan view

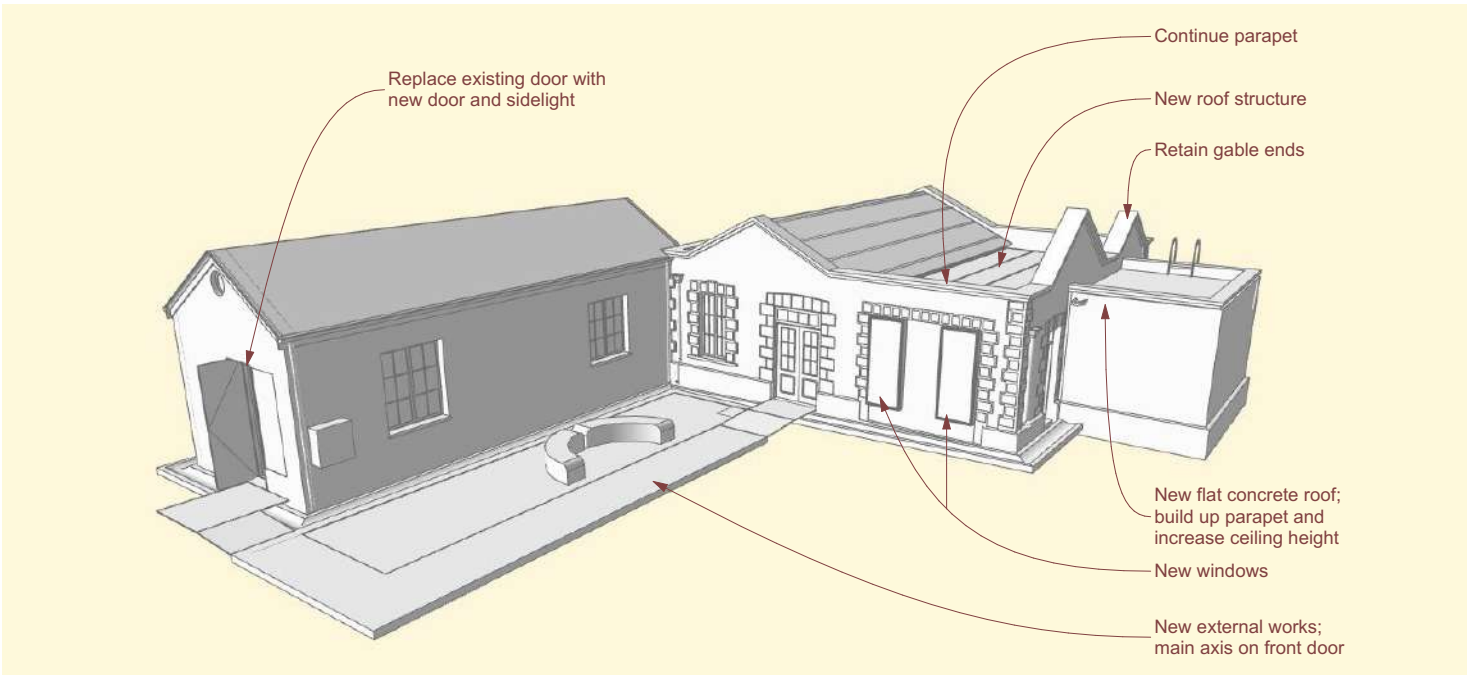


diagram 4: proposed alterations, 3D perspective view



**General specifications:**

All roof sheeting are replaced with matching corrugated profile, and in Colorbond Shale Grey. By pre-coating the sheeting the longevity of the sheets are significantly improved, as well as maintenance costs significantly reduced. Please see figure below for colour sample.



All new portions and existing walls will be painted to match the colour of the existing. Please refer to Annexure B for the general painting specification by Plascon. Clear specification is given for steel, timber, and plaster painting, both internally and externally.

General cracks will be sealed. Where a crack will re-appear, a neat vertical cut-joint will be made. General waterproofing guidelines to be followed as per Annexure C

End.

**Annexures**

- *Annexure A: Technical layout drawings*
- *Annexure B: General paint specifications*
- *Annexure C: General waterproofing products*
- *Annexure D: Heritage Survey Extract*