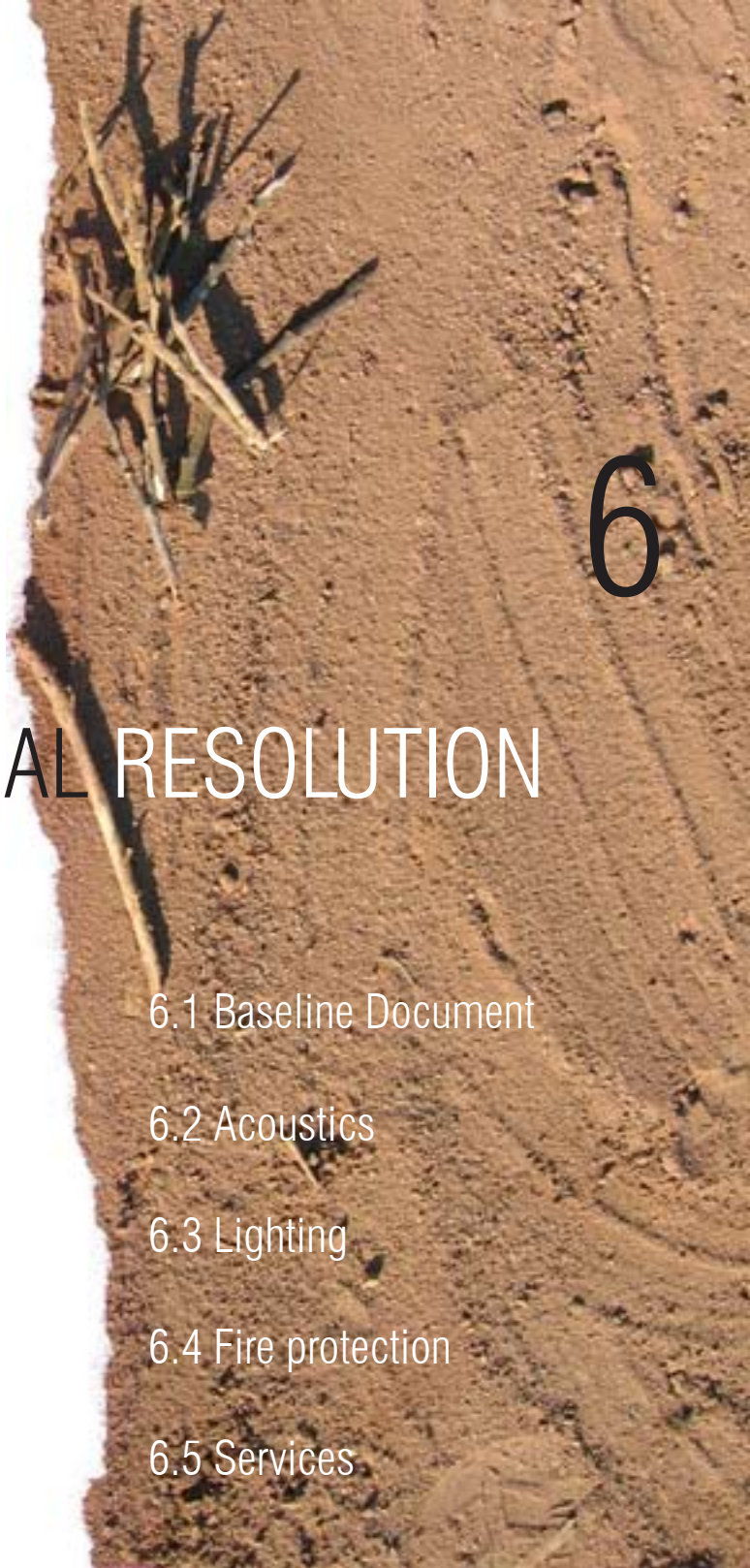

6

TECHNICAL RESOLUTION

6.1 BASELINE DOCUMENT

The Sustainability Building Assessment Tool (SBAT) is used to assess the sustainability of the building in terms of the building's performance. Three main categories; namely, social, environmental and economical; make up the criterion to be investigated. The proposed centre will respond to the SBAT, as well as the National Building Regulations (NBR).

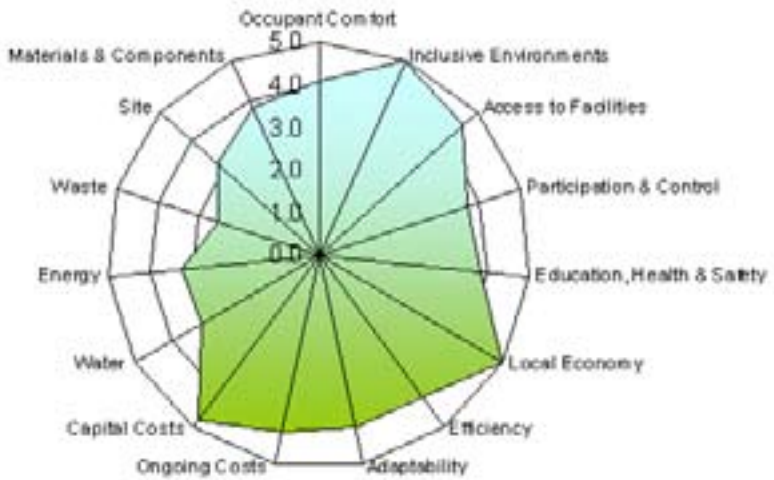

Figure 91: The calculated sustainability of the proposed project. The average building performance is 4, which is fully acceptable as the building is re-used.

6.1.1 Social Performance

Occupant Comfort

The aim is to have as much natural light as possible filling the interior, either through the courtyard, or from the outer sides. By opening up the walls (eastern and southern) and removing the paint from the clerestory windows, sufficient natural light will enter the interior during the day. Dimmable, energy-saving electrical lighting will be used during the evening activities. Not only will the amount of natural daylight be improved, but the efficiency of natural and cross ventilation will be improved as well. The existing clerestory windows will allow hot air to rise and escape. The goal is passive ventilation, whereby little energy is needed to achieve a lot. (Figure 92) The intensity of ventilation and light influx will be controlled by adjustable screens. In other words, each building user will easily be able to mechanically adjust his/her space to suit his/her personal thermal comfort. If possible, mechanical ventilation will be limited to the kitchens, café and toilets.

Inside the building, the audible sounds change from traffic noise in the south of the building to a tranquil, bird-chirping environment in the north. Acoustic panels will ensure ample sound insulation from the noise in the music rooms and from the street side for the rest of the building. The audible sound relates to the percentage of direct openings to the sound. In turn, the openings allow for viewing of the adjacent landscape. Views are created out onto the streetscape and to the east. The views stimulate upliftment, entertainment and education. Nature, peace and harmony will form the main focus.

Inclusive Environment

A variety of transport types are at the Healing Activities Centre's disposal. A taxi rank is situated diagonally opposite the old museum building. The driveway into the centre's premises allows for a pick-up zone straight from the door step. The Belle Ombre train station is situated four blocks to the west from the site and the Pretoria station lies just over 2 km to the south of the site. Busses and taxis pass by the chosen site regularly, allowing for ample transport opportunities. Public parking is allocated directly to the west of the building. The walking distance from the parking site to the building is kept to a minimum.

Clear information regarding the signage itself and the placement thereof will be appropriately provided. Good colour contrast (black, white, yellow and red), the appropriate lettering (Helvettica) and size are important. Comprehensible signage will lead to the one main entrance, where orientation will take place. – The building should stand out like an icon along Boom Street.

Prominent staircases and ramps will indicate a change in level. Tread nose treatment and contrasting colours are essential to avoid confusion and injury. All floor materials, especially on level changes, should be non-slip. Movement or orientation in and around the building will be easily accessible and understandable. All edges should be round and objects shorter than knee height to prevent tripping and falling. For working surfaces to be accessible to all, working tops should not be higher than 750 mm.

Protruding objects inside the bathroom, for example the shower head, should be of contrasting colour. Lever handles should be used throughout, on which hot and cold water are clearly indicated. Handrails along ramps and inside the bathroom are to be provided for wheelchair users. Cupboard doors and inside windows will be of a sliding type to prevent protrusion, and all knobs should be flat and of a colour different to that of the door or drawer surface.

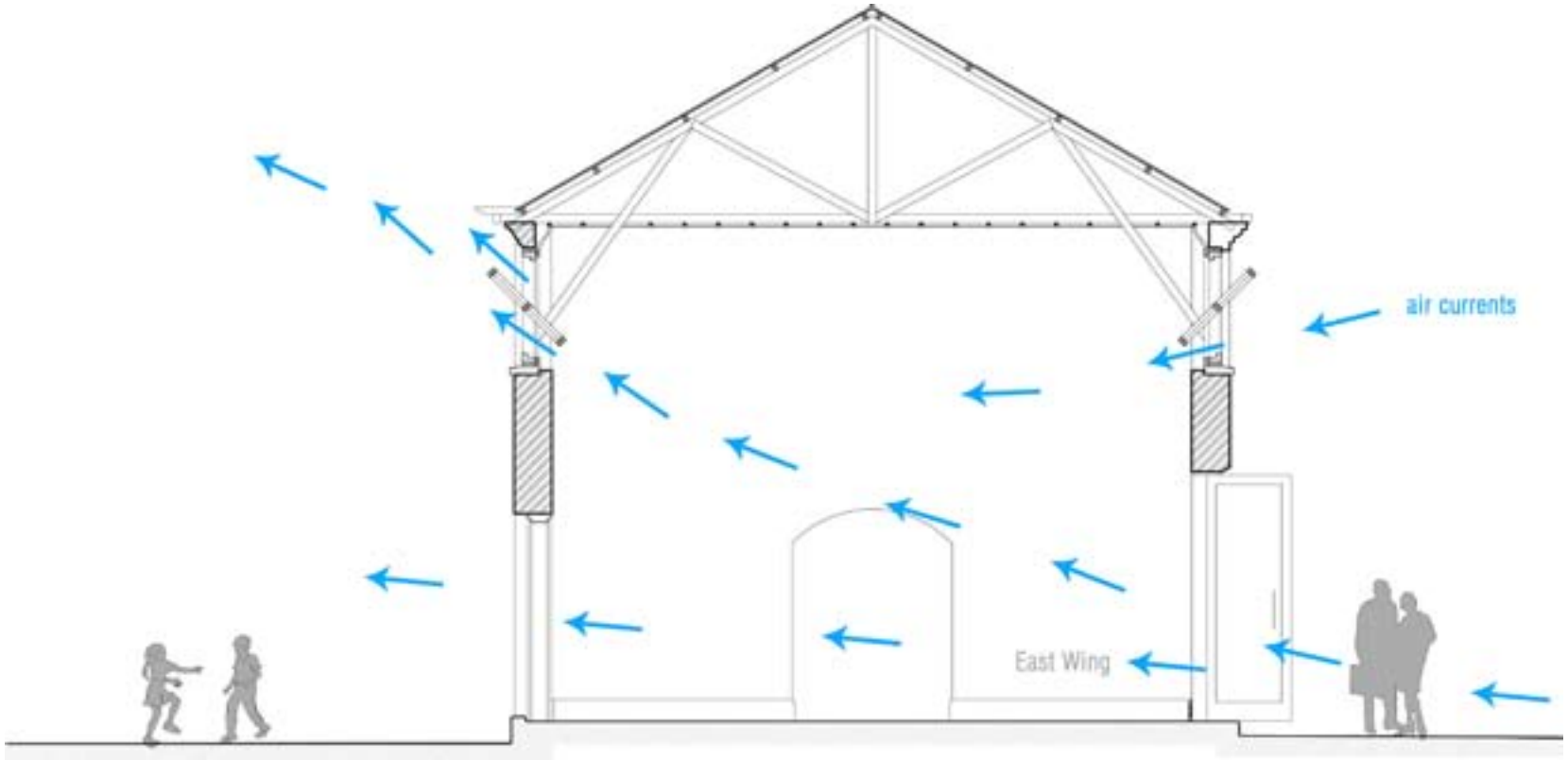

Figure 92: Passive ventilation diagrambe omitted to

Access to Social and Economic Facilities

The Healing Activity Centre is to be kitted with internet facilities and telephone lines to allow communication via fax, phone and e-mail. The centre will also be connected to satellite, as the international meetings will be held in the seminar room.

Due to internet access in the library and at reception, online banking will be possible from within the building. In addition, the receptionist will be able to accept card payments. Outside the building, three ATMs are found along Bloed Street, and the zoo plans to install an ATM on its premises as well.

Informal and formal trading occurs right along Bloed Street and filters through to Boom Street. Vendors also trade inside a stone structure next to the zoo's main entrance. The foyer of the Healing Activity Centre will provide buyers with therapy-related items, such as aromatic essential oils.

Numerous schools are located in the vicinity of the site, making it convenient for children who have problems to come to the proposed centre (see *Chapter 2: Education and Health*). The closest school from the site is the Prinshof School for the Blind and Visually Impaired, which will be within walking distance of the centre. An intimate residential area is embedded between the Prinshof School and the east border of the zoo premises. Two residential flats are also located opposite the centre on either corner of Andries Street and Boom Street.

Opportunities for informal social gatherings inside the courtyard and the Art Café will be possible. A kiosk with benches and lawn areas is situated inside the zoo premises within close walking distance of the Healing Activity Centre.

Health and Safety

All new materials to be used inside the building may not emit any harmful gases or cause skin irritations. Should accidents occur inside or outside of the building, the cause and frequency of such accidents should be investigated immediately. If conditions leading to the accident can be changed, they should be altered in order to prevent future accidents. Staircases or any level changes must be well-lit in order to prevent falling or tripping.

Since Boom Street is currently an unsafe environment, safety from parking to the building is to be addressed by ensuring well-lit routes. Passive surveillance will be carried out from the foyer's range of vision as well. Cameras will also be installed in order to monitor throughout the inside of the building, as well as the outside. Lighting outside and inside the building will be such so as to limit opportunities for crime. Only if necessary, will a security guard be hired to patrol the area.

6.1.2 Environmental Performance

Water and Waste Management

Rainwater will be captured from the roof and stored in a tank, after which it will be filtered to make it fit for drinking purposes. All consumable water will be provided from the collected rainwater until this supply is depleted, after which available municipal water will be used.

The courtyard is drained from all four corners. The runoff occuring inside the courtyard, as well as the grey water fom the buiding will be used to irrigate the courtyard. All newly installed water pipes will need to be certified and approved by a specialist. Taps should be sealed tightly as to avoid leakage.

All waste inside the centre needs to be routed down to the refuse yard outside

the main kitchen. As the centre has its own private access route, waste will be picked up from the site directly, specifically at the delivery platform outside the main kitchen.
Materials impossible to restore will be classified as builder's waste. This would include broken bricks, timber pieces, broken ceilings, etc, and it will be possible to use the waste as a bulk for earth fill or to level out slope problems inside the zoo.

Site

The chosen building is currently deserted, qualifying as a brown field. A 100% energy and space is thus saved, as the site and project revolve around the re-use of and existing building. The building will not be negatively affected by adjacent buildings, regarding the air flow and sunlight penetration.

Half of the courtyard will consist of lawn, whereby the users will sense the reconnection to nature. A certain percentage of plants in the therapeutic garden will be edible and even curing. In order for the courtyard garden to be accessible and presentable at all times, it will need to be managed through gardening servics. This would include pruning, organic insecticides and general up keep.

Energy

The existing building is completely re-used, therefore saving a great amount of capital energy. Renewable and low embodied energy materials are used throughout the design process in order to keep the overall energy usage down. The timber to be employed will be standard SA pine, thereby avoiding unknowingly depleting a special forest.

6.1.3 Economic Performance

Local Economy

All new additions to the building will be contracted out to local companies (not further than 50 km from the site), so as to boost the local economy. Such suppliers, for the completion of the project would have to focus on timber, glass, steel and polycarbonate. The contractors employed will, in addition, have to be able to maintain and repair where and when necessary. Where possible, materials that require little or no maintenance will be used. Local educational and therapeutic manufacturers will be asked to supply the necessary furniture and fittings to the centre.

Efficiency

It is aimed for the building to function at 80% capacity, which is possible due to the variety of activities throughout the day and into the night. Weekend tournaments will further support in using the building to its full capacity.

The therapy-related part of the building will be occupied for 12 hours during the day and for three to four hours in the evening. A total of 15 to 16 hours will be spent in the building per day. However, the accommodation wing will be occupied for longer periods. The accommodation facilitators will live in the building on a permanent basis.

As the building houses different functions, different space provisions will be provided. Some activities will be physical, requiring more space; while other sessions will comprise group forms, which require less space per person.

The design of the new furniture and fittings to be placed inside the building should react to the relationship between the material and component size should be optimal in order to minimise wastage (see Product Design: Mezzanine System).

Adaptability

All spaces inside the building have ceiling heights of 3 m or more, which allowed for efficient spatial changes. Current load-bearing walls separate the rooms into big workable spaces. Partitioning is created through insertion of the mezzanine system, which suggests a different space quality beneath it. It is built on a modular basis, where the required area to be covered can be built to suit individual needs. Also, the usable surface area is increased. The inside room spaces can be connected to the courtyard outside, as the activities stretch out into the courtyard. Inside furthermore becomes outside when performances are held.

The design of the furniture allows for it to be easily configured for different usages. The seating units can accommodate between and three persons per unit, while two units can be joined to seat four people. The seating unit is multifunctional (see Product Design: Seating Unit).

Ongoing Costs

The entire workforce operating inside the building will receive a manual on the efficient operation of the building. Temperature, light and ventilation control are core issues.

The building will have accessible metering- and performance system, through which water and electricity usage, and waste and accident figures can be monitored and compared. By using the building effeicinetly, the ongoing costs are kept to a minimum.

Enduring costs will also be made up of the staff's monthly pays. This however is the centre's cost, not a building cost. Cleaning aids and the general maintenance of the building will contribute to ongoing building costs.

Technological services, namely internet connections, satellite connection, telephone and fax services, projectors, screens, etc which are used throughout the building, will have to be updated and improved regularly.

6.2 ACOUSTICS

A hearing conservation program must be implemented when employees are exposed to 85 dB or more in an 8-hour day. The typical restaurant operates at an 80dB level, but some can reach as much as 110 dB! The sound levels from the kitchen in the Art Café should be kept to a minimum by using quiet machinery. In addition to that, the mezzanine bottom floor layer consists of 32mm plywood sheets. This material reflects the high frequencies that carry information to the audience while absorbing low base sounds that generate noise. By adding glass wool in the cavity between the plywood layers, low frequenciees are absorbed. The existing plastered brick walls (450 mm thick) also contribute to good sound insulation from the adjacent rooms.

It is also important for pavilion roof in the courtyard to have a good acoustical performance. Sufficient sound must be carried from the stage to the listener and not get lost in the courtyard before reaching the listener. This is achieved by the pavilion roof, which slopes up towards the listener. The sound from the stage is thus directed up and away from the performer. The stage screens furthermore concentrate and direct the sound to the listener. In addition to that, a speaker system can be installed, if wished by the audience.

40mm thick, 40kg/m^3 Fibretone sheets will alternatingly clad the seminar room. These sheets absorb all superfluous frequencies, allowing for comfortable acoustics.

The same material will be used in the 'Healing Music' room and Dry Art room. All rooms on the mezzanine floor, where instrument practicing, choire practicing, etc will take place must be cladded with 32mm plywood sheets, sandwiched by glass wool. Fibretone sheets will be behind the plywood layer, ensuring that no sound can escape the practise rooms, causing noise disturbance.

Comfortable conversation and storey-reading will be assured by building a 'play cubicle' from the swinging doors on the west wall in the Dry Art room. The same material as for the Art Café will be used, where the necessary frequencies are reflected allowing comfortable conversation, while the unwanted, noisy frequencies are absorbed.

6.3 LIGHTING

The Healing Activities Centre will mostly be used during the day, where natural light plays an important role. Electrical lighting will be necessary during the evening facilities, the guest accomodation wing and caretaker's accommodation.

For artificial lighting in the centre low voltage dichronic halogen lamps, tungsten halogen lamps, LED lamps and fluorescent lamps are used. LED clusters are used in the spacer box as these give off little heat. This is vital as the display on top of the spacer may not heat up. Also, LED clusters are energy efficient and give off the required amount of lux.

Low voltage and tungsten halogen lamps will be used in the exhibition area as these lamps enhance the spatial light quality and colour rendering. Cool white energy-saver fluorescnet bulbs are placed inside the wall lights. (Figure 117-119).

6.4 FIRE PROTECTION

Little evidence of proper fire fighting equipment is found in the building. Later added sprinklerheads are placed along some pressed ceilings, but it is doubtful wether these are still in working condition. No additional fire extinguishers are to be seen anywhere else in the building.

New preventative measures and fire equipment should be included in the Healing Activities Centre. Fire hose reels and 4.5kg carbon dioxide portable fire extinguishers will be provided at strategic points and will be visible to the user by clear signage. All have to comply with the SABS 543. The existing timber floor in most of the building is a great fire hazard. A new sprinkler system should be installed throughout the entire building. All materials in the centre should have a minimum fire stability of one hour.

6.5 SERVICES

As the existing building is only supplied with very limited wet services, a new sewerage and water system will be installed into the building. The municipal sewer connection is on the western side of the building, to where the off flow will be connected. (Figure 93)

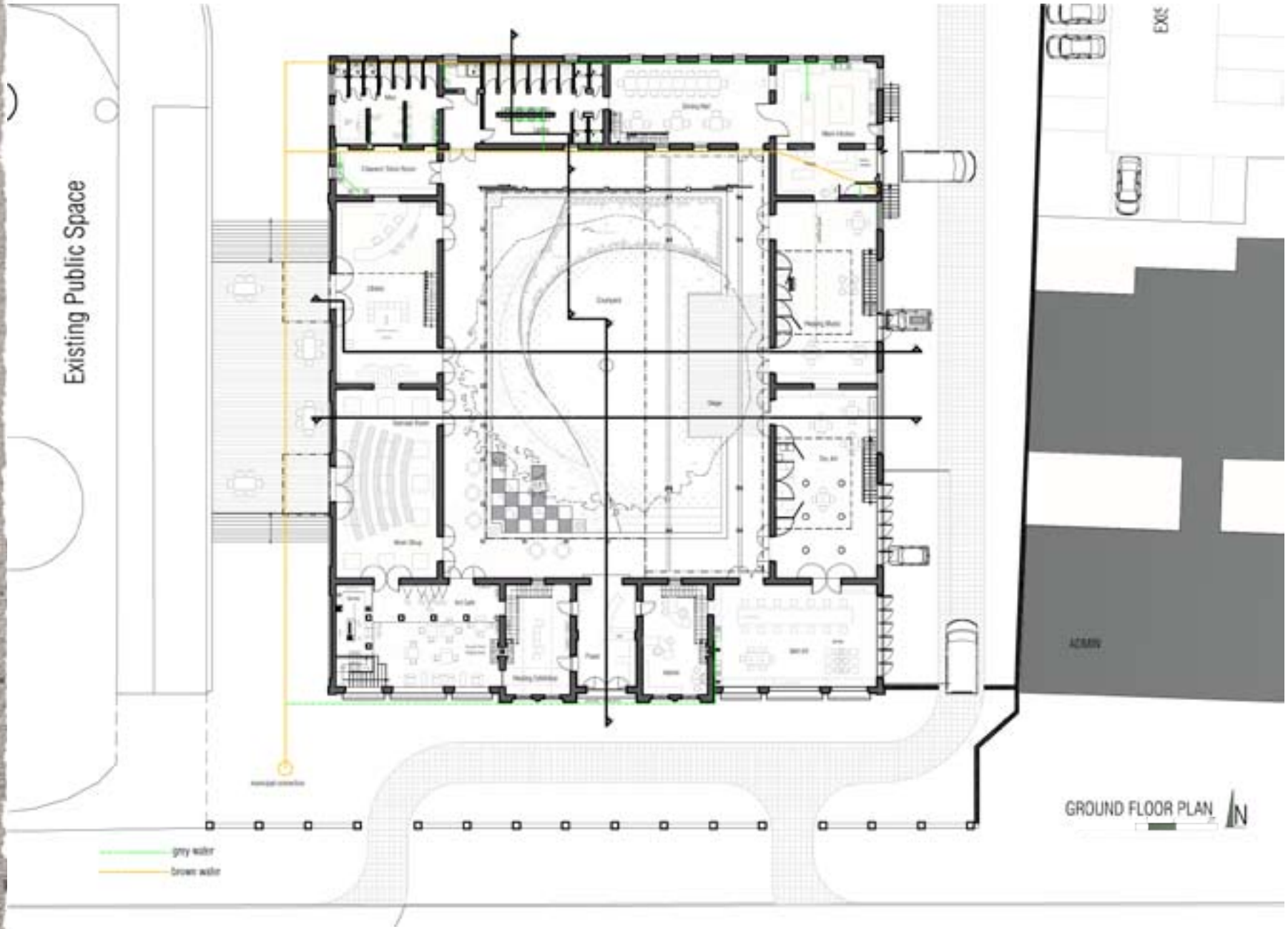

Figure 93: New Sewerage Plan