

21614

8<sup>th</sup> August 2017

IPG Corporation Limited

Emailed to: design.club@xtra.co.nz

Attention: Stephen White

Dear Stephen

**Re: Construction methodology confirmation and existing building condition**

Silvester Clark have been engaged by IPG Corporation Limited to check the overall structural condition at 114 Adelaide Rd, Newtown, Wellington. Silvester Clark will provide a report on our findings of the current condition of the building and provide possible construction requirements and strengthening of the structure.

**Summary of Findings and comments on remedial options:**

1. The building façade is in an acceptable condition given the age of the building and does not require significant remedial works.
2. Timber structure (floors, roof and walls) are in varying condition with some elements in very poor condition with significant timber decay.
3. To reinstate timber elements that have undergone significant decay remedial works will be required with the complete replacement of a number of timber elements.
4. Pile could not be comprehensively inspected however it appears that a number of piles may be suffering from timber decay and require replacement. To complete an audit the condition of timber piles a significant portion of floor boards would need to be lifted and a number of piles will likely require replacement.
5. **Reinstatement works will not address the inadequate seismic capacity of this building as well as the unsecured facade.**
6. To secure the façade to a capacity greater than 33%NBS significant works would be required that would include strengthening the connection between the floors and roof and the facades as well as strengthening the structure of the floors and roof. Works would also be required to secure the parapet.
7. To increase the overall capacity of the existing structure to greater than 33%NBS we are of the opinion that new structural elements, include anchor foundations to resist overturning, will be required.
8. Even if the above works are carried out these will only reduce the risk of collapse but will be unlikely to prevent significant damage to the façade in a significant seismic event.
9. In our experience we have not seen the remedial and strengthening works described above carried out on a building of this size as the expense of the works cannot be justified based on financial return.
10. We are of the opinion that constructing new structure behind the façade, and securing the façade to this structure, will achieve a far safer result of securing the façade and reduce the risk of significant damage in an earthquake event.

**Principals:** Silvester Clark Limited  
J.E Silvester, NZCE, AIPENZ  
P.F Clark, BE, CPEng, MIPENZ  
S.M Miller, BE, CPEng, MIPENZ, MISTRUCTE  
**Consultant:** K.C.F Spring, CPEng, MISTRUCTE, MIE(AUST), FIPENZ

**Principals:** C.A Jack, NZCE  
I.P Black, BE, CPEng, MIPENZ.  
A.S Blain, BE, CPEng, MIPENZ.  
**Associate:** A.M Carr, BCA



**Building Construction and General Information:**

The original building was built in 1899 (Adelaide Hotel) and is on the Wellington City Council heritage building list. The building is a double storey building with a single storey addition on the southern end of the building. The exterior of the building is unreinforced masonry with a lightweight roof, timber internal ground and first floors. The building has shallow concrete strip foundations for the external walls and pads supporting the internal ground floor. Based on the findings on site no strengthening has been done to the existing building.

A geotechnical report has been produced by Coffey Geotechnical. The report indicates that the site has fill material 0 to 2metres and varied materials between 0 and 10metres. Graywacke is expected to be found at a depth of 5 to 10metres below ground level. All levels are dependent on the site. The site has a site soil class C.

**Inspection and Findings:**

Silvester Clark have attended the site on 26 July 2017 to evaluate the current condition of the exterior and interior condition of the structure. For ease of the report the double storey (Adelaide Hotel) and single storey (Addition to the South) have been separated.

**Double Storey Structure (Adelaide Hotel):**

The exterior façade of the building is unreinforced masonry which is in good condition given the age of the building. There are minor cracks around the window arches that is a typical failure mode for unreinforced masonry buildings with arch window construction. It was noted that there is vegetation growth on the higher levels of the building face between the bricks.

The foundation system consist of shallow footing for the perimeter walls and internal timber piles.

The internal floors on the ground floor has undergone timber decay in certain areas due to the occupancy use as a bar at some stage. The ground floor to the western side of the building has either failed due timber decay of floor joists and bearers. The floor is uneven and is lacking stiffness.

The roof is a lightweight system with timber rafters and metal roof sheeting. The roof for the double storey is still in a fair condition in the areas that was available to see on site.

#### Single Storey Structure:

The roof over the single storey has failed and is both unstable and unsafe in its current condition. We recommend action be taken to either remove or repair the damaged roof as soon as possible.

The external walls are unreinforced masonry. The walls have been weakened due to the partial failure of the roof in the area.

The timber floor in the single storey area has also experienced timber decay due to leaks in the roof and is deemed unsafe to walk on in its current condition.

#### **Remedial works:**

The following remedial works are only to repair the existing structure close to or as near as possible to its original condition. The remedial work excludes any strengthening and of the current building and the façade and will not remove the building from the earthquake prone building and façade strengthening lists. All of the remedial works should be carried out to current building standards.

#### Double Storey:

- a) Foundations: The existing internal foundations will require re-piling in many areas due to settled or decayed timber piles. This would require parts of the floor structure to be lifted to be able to perform the drilling of the piles and then the floor be reinstated.
- b) Ground and first floor: Due to timber decay a significant portion of the ground floor structure will need to be replaced. The full extent would not become clear until the floor boards are lifted and the full extent of bearers and joist can be inspected.
- c) Roof structure: The entire roof structure has to be reinspected to confirm the condition of the roof as there was no access to the roof on the day of inspection.
- d) Internal timber wall: All of the timber framed wall on the ground floor has to be reinstated due to water damage or timber decay. The timber framed wall on the first floor looked to be in a fair condition with damage due to previous occupants.
- e) Façade Remedial: The façade will require cleaning, removal of vegetation and some repointing.

#### Single Storey:

- a) All of the foundations and the flooring in this area has to be redrilled and reconstructed. All members that have timber decay is to be demolished and replaced.
- b) The roof over the single storey area has failed and is both unstable and unsafe in its current condition and should be replaced with a similar roof or demolished as soon as possible. The ceiling has also been damaged and should be demolished and replaced.
- c) All of the timber framed walls in this area has also suffered timber decay and should be demolished and replaced.

- d) Once the roof in this area has been replaced or removed a detailed inspection of the unreinforced masonry wall from the external and internal can be performed.

### **Seismic Strengthening and Façade Securing – Double Storey Structure (Adelaide Hotel)**

The façade of the building is not adequately secured and under current regulations will require seismic securing and strengthened under the new regulations. Due to the building being a heritage building all of the façade strengthening should occur on the internal of the building.

We note that this building is clearly earthquake prone (has less than 33%NBS) and would require significant seismic strengthening works to increase the capacity to above 33%NBS or above 67%NBS. These works would likely require new structural elements with significant foundations, probably anchor piles to resist seismic uplift.

Seismic Strengthening:

Significant seismic strengthening of the ceiling diaphragm, 1<sup>st</sup> floor diaphragm, Out-of-plane loading of walls (façade remedial), possible in plane capacity of walls will be required. This includes possible new shear walls, additional steel frames and new diaphragms to assist in lateral load resistance

For the first floor and roof diaphragms the ceiling and floors will have to be opened up or replaced to allow for the additional bracing. The out of plane loads for the façade will be included in the façade remedial work. Possible additional shear walls will be placed against the existing walls but will require new foundations which could be possibly be a new strip foundation with additional piles. If steel frames are introduced this will also require new foundations with a possibility of being piles.

Possible Groundworks Associated With Strengthening:

- a) Grout injection of fill
- b) Removal of fill and importing suitable hard fill that requires compaction to meet minimum required compressive strength
- c) Removal of fill and replace with possible basement

Possible Foundation Works Required:

- a) Underpinning of façade foundations
- b) Screw piles
- c) Anchor piles
- d) Continuous flight auger

All of the above options for the possible ground works and foundations will require full access to the ground floor area for machinery. Due to the ground floor structure being timber the entire floor has to be removed to ensure a solid base for any machinery. Equipment will require site access and temporary supports/foundation for the machines. Access would be proposed through the single storey building on the assumptions that it will be demolished. Depending on the type of machinery that will be used it might affect the first floor structure which in turn might have to be removed. If this is the case then the walls and the roof has to be propped to ensure no collapse occurs. The first floor can also be systematically removed and replaced as ground works are taking place to ensure that the majority of the first floor stays intact to assist with lateral support of the building.

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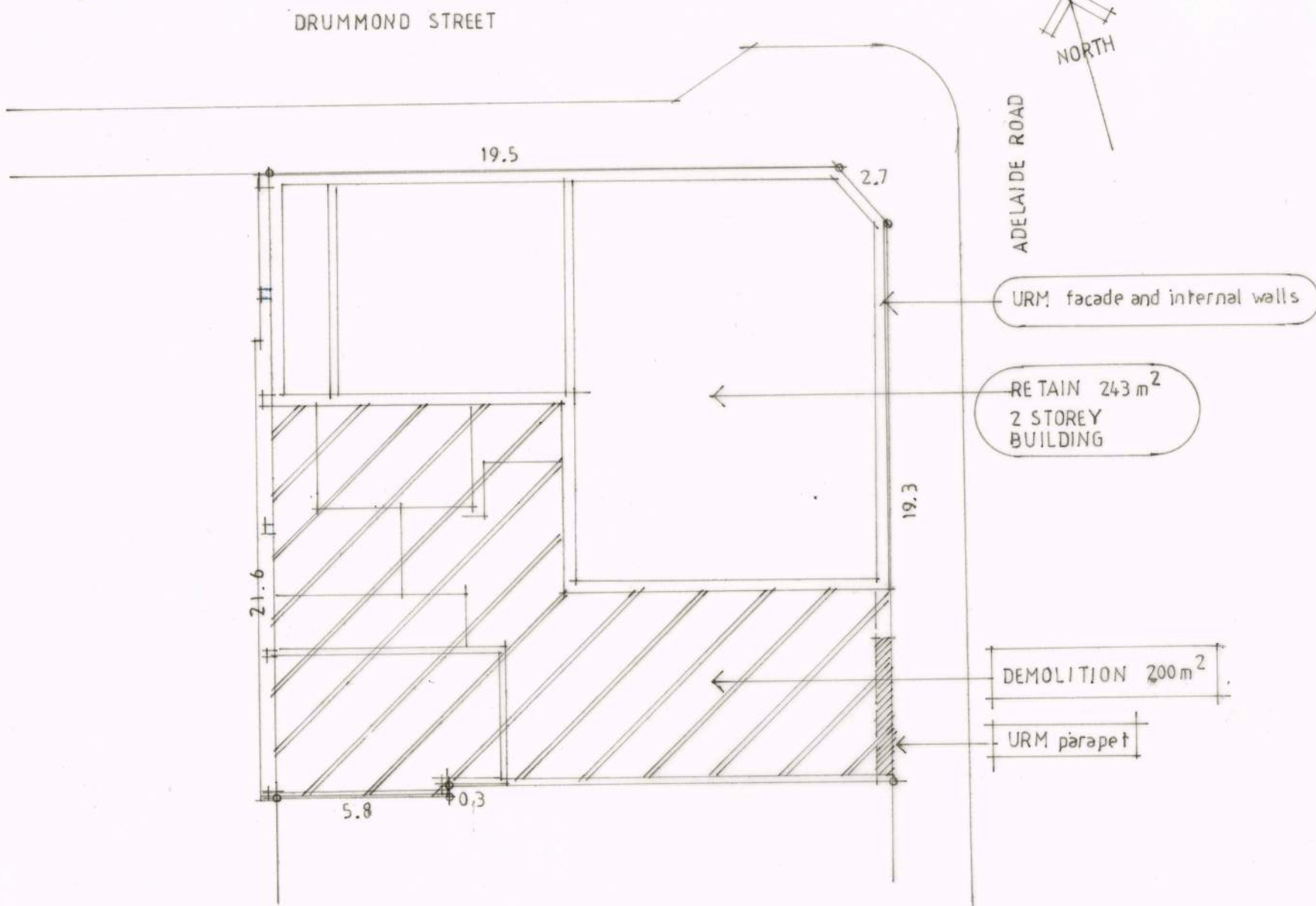
Please call if you have any queries.

Yours faithfully



**Barend Geldenhuys (Reviewed by Ignatius Black)**  
**Structural Engineer**  
**SILVESTER CLARK LTD**



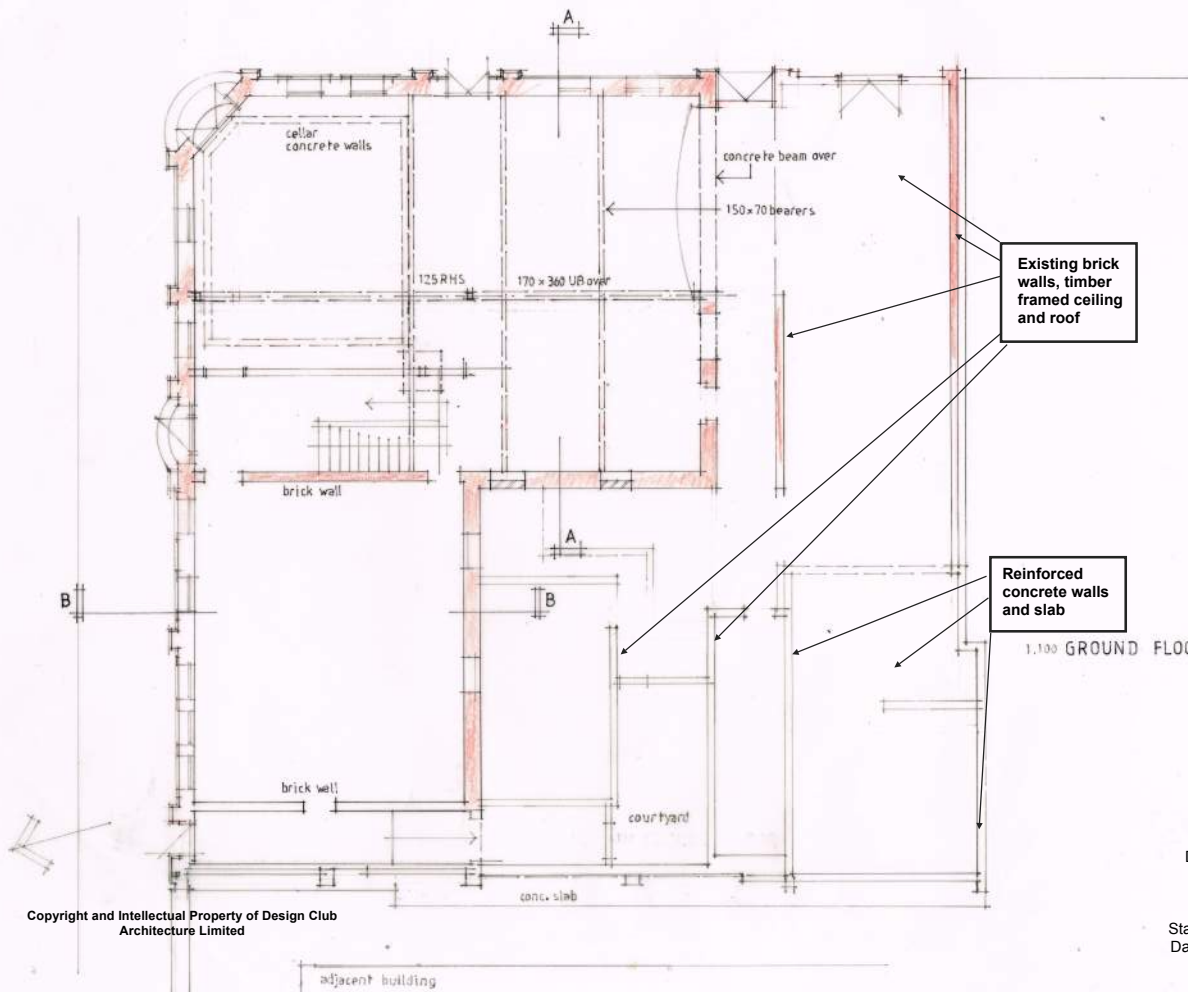


1.200 SITE PLAN LOT 1-2  
 DP 21496  
 455 m<sup>2</sup>



LOCATION PLAN

ADELAIDE ROAD



Existing brick walls, timber framed ceiling and roof

Reinforced concrete walls and slab

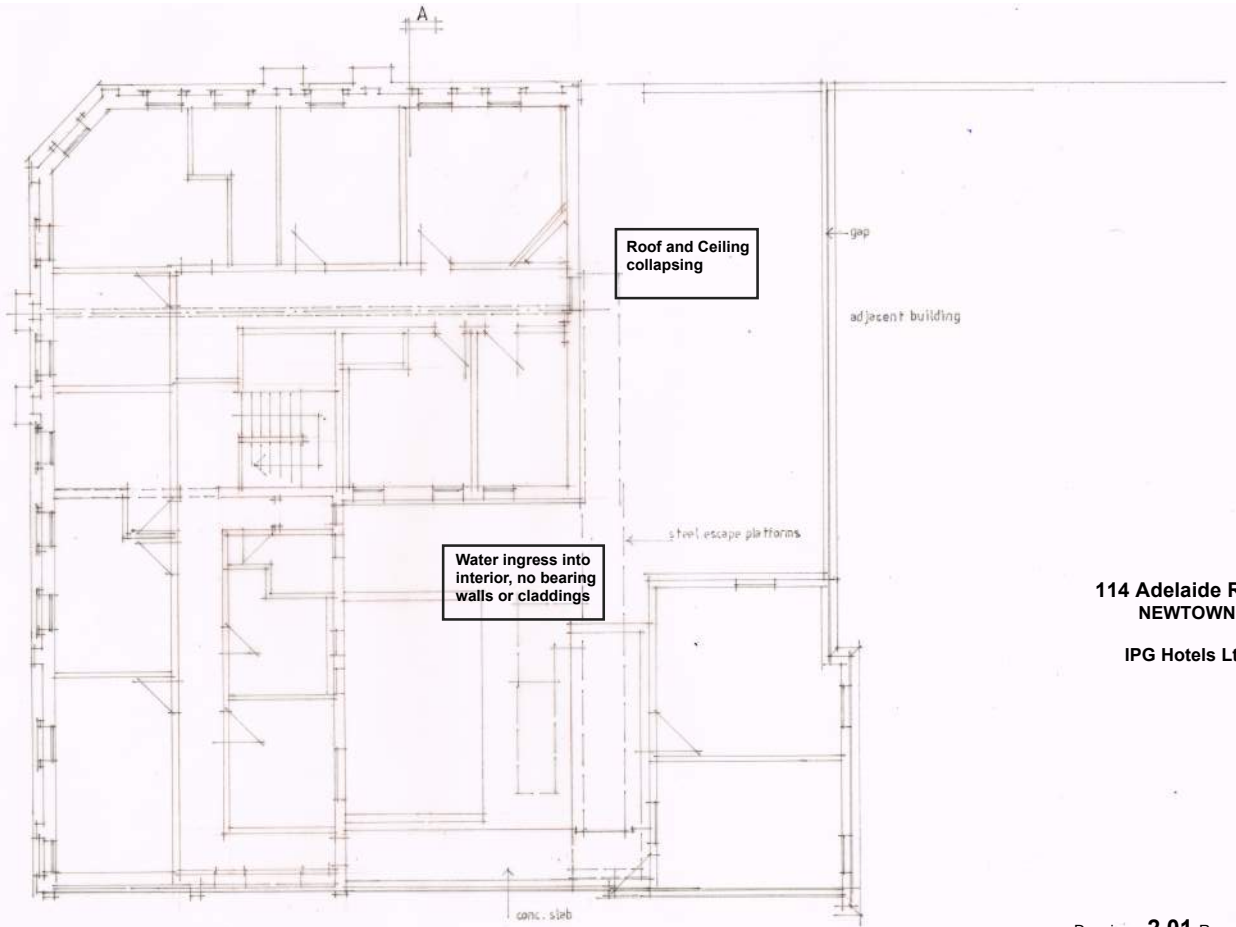
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1:100 GROUND FLOOR PLAN

Drawing 2.00 Rev

Stage Resource Consent  
Date 11 September 2017

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1.100 FIRST FLOOR PLAN

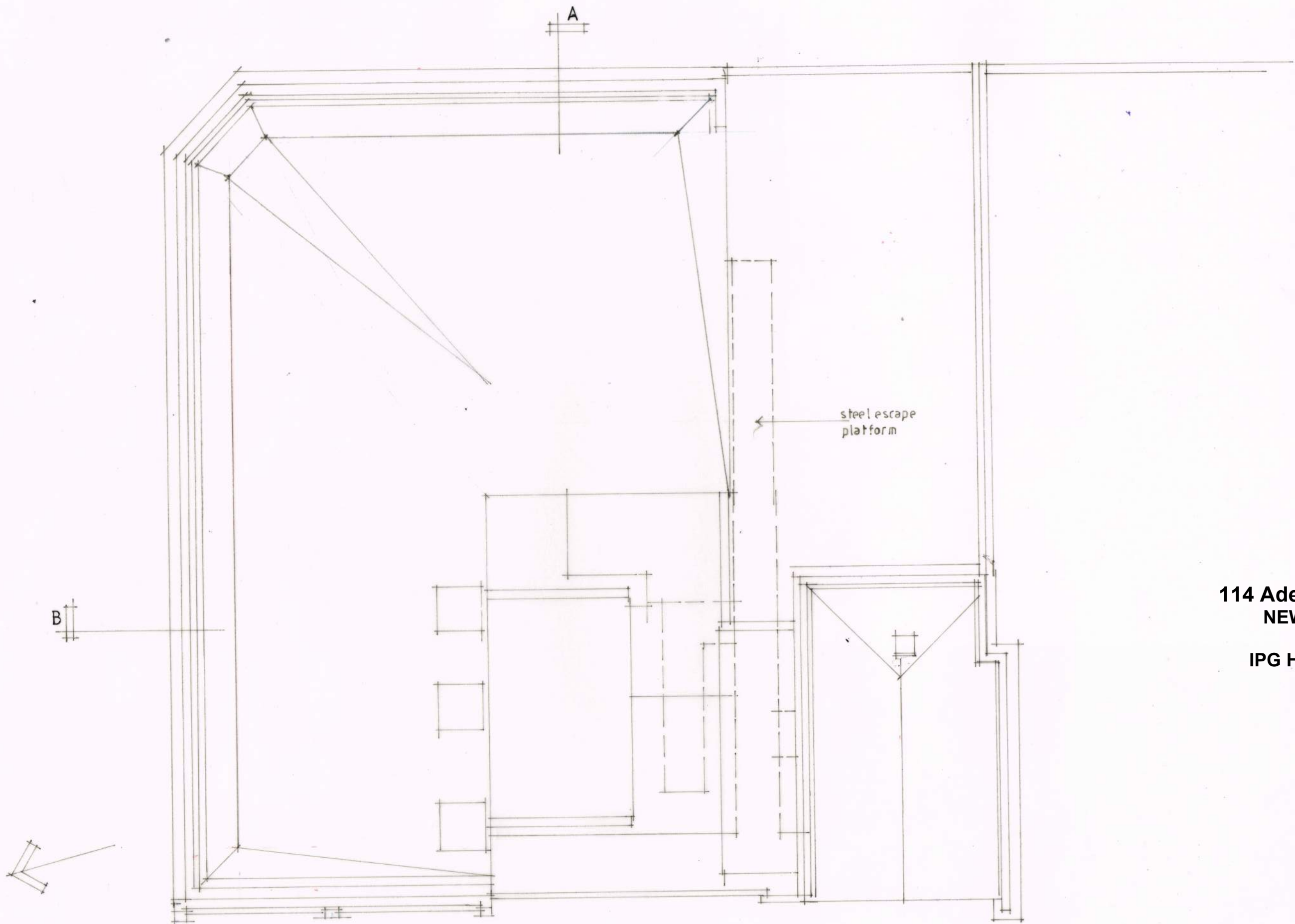
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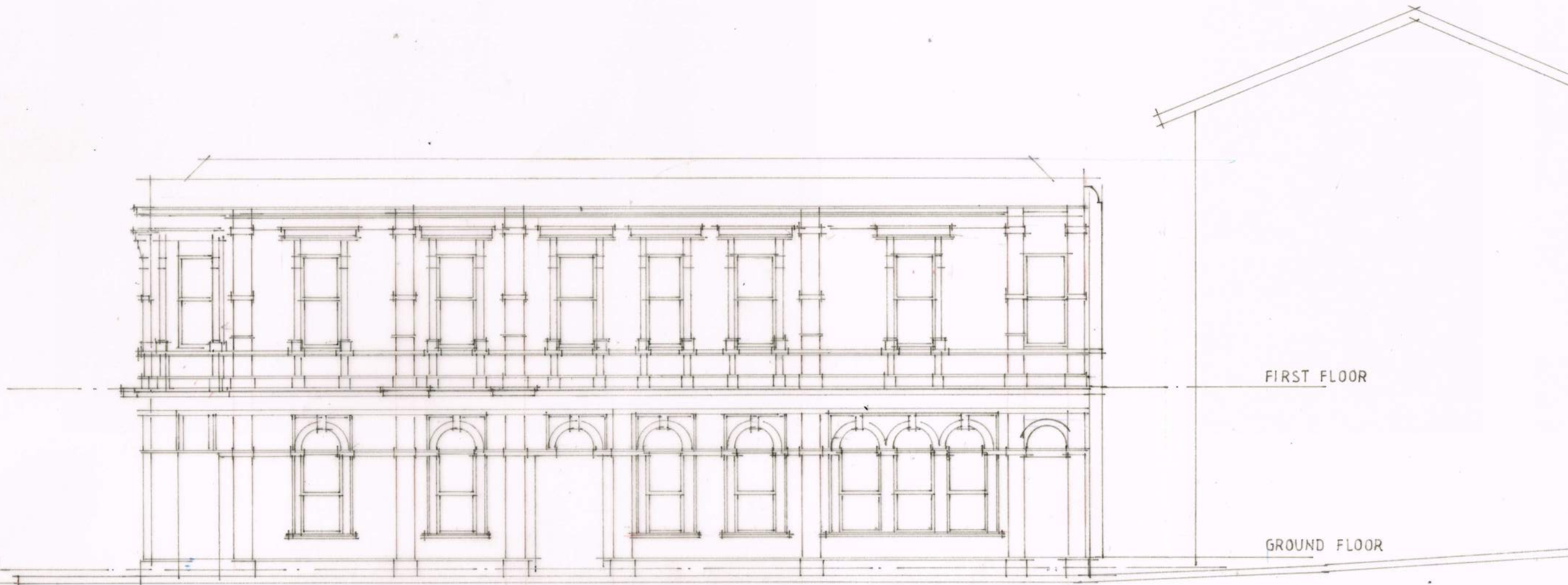


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1:100 ROOF PLAN

Drawing **2.02** Rev

ADELAIDE ROAD



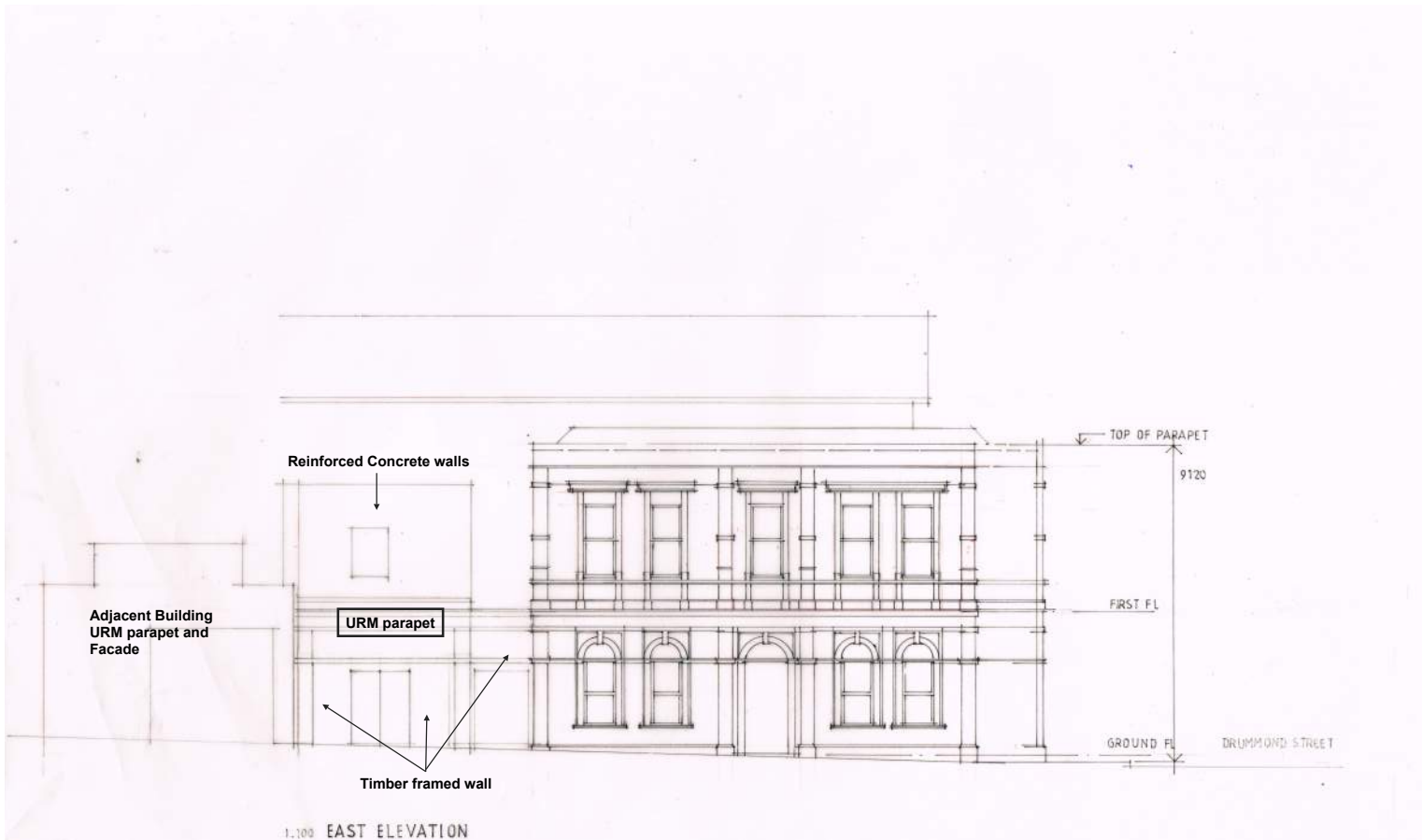
FIRST FLOOR

GROUND FLOOR

1.100 NORTH ELEVATION

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Drawing **2.03** Rev



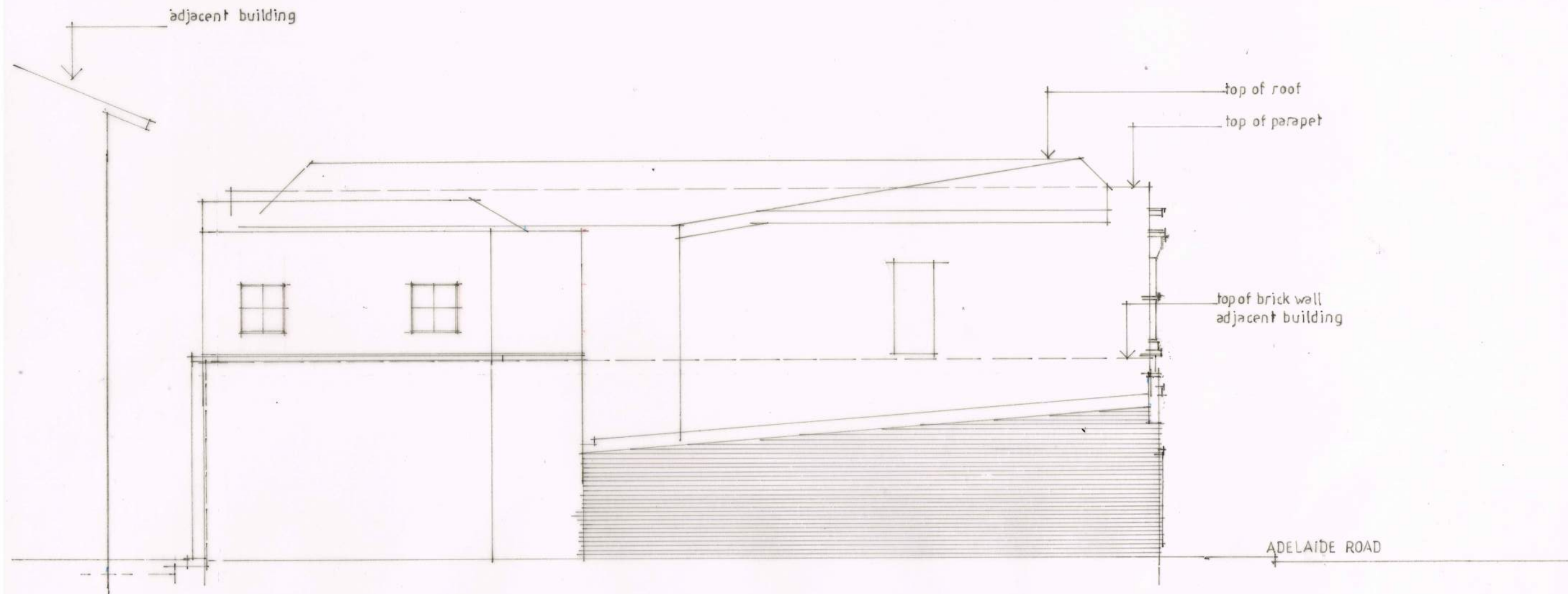
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1.100 SOUTH ELEVATION

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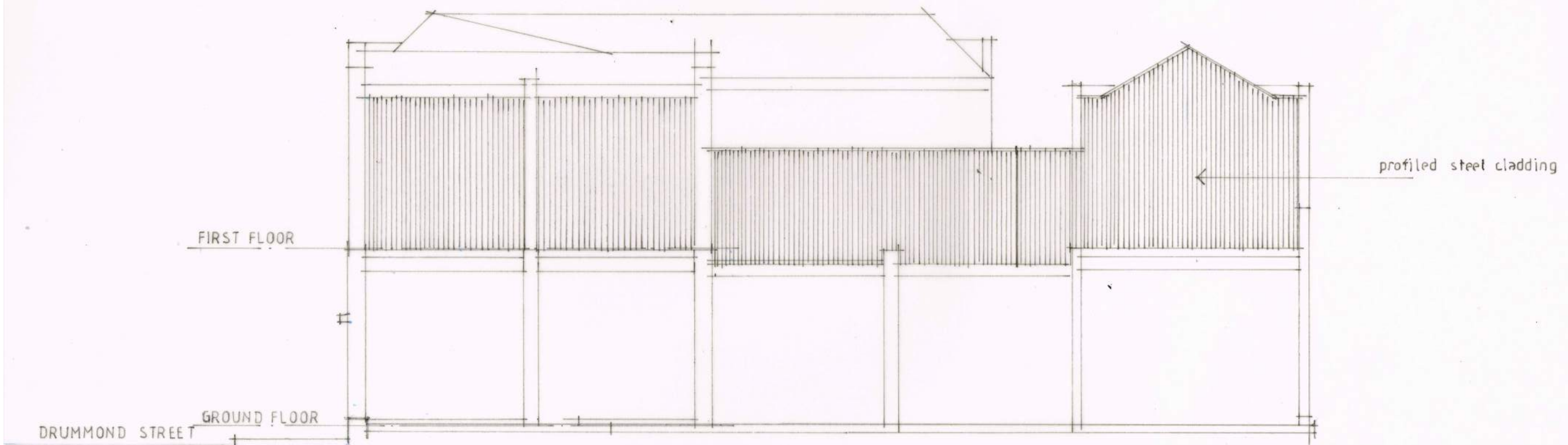
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Drawing **2.05** Rev

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1.100 WEST ELEVATION

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