MOORE TREES

Consulting Arborist

Root Mapping Assessment
Arborist Report

Australian Institute of
Police Management (AIPM)
North Head, Manly

Prepared by
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1. Introduction:

1.1 This report has been conducted to assess the quantity of root loss from the subject trees that may occur due to a proposed building within the grounds of the Australian Institute of Police Management (AIPM) at North Head, Manly. The subject trees are listed in Table 1. This report has been commissioned by Brewster Hjorth Architects as required for a redevelopment and upgrade of the site buildings including landscaping at the site.

This report concerns potential damage to the structural woody roots of two trees located near a proposed new administration building within the site. The trees concerned have been numbered as Trees 7 and 9 in the Arborist Report by Moore Trees dated September 2008.

Root Mapping was undertaken on 7th October, 2008. The purpose of root mapping is to locate existing tree roots with non-invasive techniques. This may include high pressure water hoses, air jets, hand digging or ground penetrating radar. For the purpose of this report, a trench was dug by hand, with care taken not to damage any existing roots over fifty (50) millimetres in diameter.

The trees concerned are listed as follows;

Tree No.	Botanical name and common name	SULE
7	*Eucalyptus botryoides(* Bangalay)	1a
9	*Angophora costata (*Sydney Red Gum)	1a

Table 1: List of trees.

I have been provided with a plan which includes detailed surveyed distances from the tree trunks to the proposed building extremities. This plan can be seen in Diagram 1, Site survey.

1.2 Scope of works:

The work undertaken included excavation (by hand) of a trench below Trees 7 and 9, so as not to disturb any existing roots (over 50mm diameter) of the subject trees. The excavation varied between 500mm and 800mm in depth or until stone was reached. The location of the trench is marked in Diagram 1. The width of the trench is approximately 300mm wide.

The root map that shows the findings can be seen in Diagram 2.

Assessment of the overall health and structure of Trees 7 and 9 can be found in the Arborist Report by Moore Trees titled *'Arborist development assessment report- Australian Institute of Police Management (AIPM)'* 2008.

2. Methodology:

2.1 Height and distances: The heights and distances within this report have been measured with a Bosch DLE 50 laser measure. The tree locations, heights and spreads were plotted on a Site Ground Floor Plan, A04 dated December 2008 drawn by Brewster Hjorth Architects.

2.2 Trench location: The trench was excavated at a distance of one metre from the proposed building. This distance has been selected so as to allow for drainage and battering of the excavation (Plate 1).

For example the northerly measurement from Tree 7 to the southern most wall of the proposed building is 5185mm. The trench has been excavated at 3800mm from the tree.

Excavation depth was undertaken until stone was encountered. Any boulders were removed as required (no larger than 40 kilograms).

In total three (3) trenches were dug. These have been numbered as Trench 1, Trench 2 and Trench 3. These trenches also have corresponding Section drawings in Diagram 3.

2.3 Tree Protection Zones (TPZ): Tree Protection Zones have been designed for each tree. The TPZs are based on the British Standard for *Trees in relation to construction*, BS5837 (2005). A detailed methodology on the TPZ design can be found in Appendix 4. The Tree Protection Zones are shown in the results section of this report.

2.4 Colour plates: Some of the colour plates have a white ball present. The ball has been included for scale and has a diameter of one hundred (100) millimetres.

3. Observations:

3.1 Diagram 3 shows plan and section drawings of trenches 1, 2 and 3 that correspond to the observations listed below.

3.2 **Trench 1:** Several woody roots were found that are connected to Tree 7. The smallest of these roots is forty (40) millimetres and the largest is one hundred and fifty five (155) millimetres in diameter (Plate 2). These roots were spaced along the distance of the trench (8000mm) and were at depths between 180 and 250mm below ground level.

Trench 1 (Section 1) was excavated until bed rock was reached. This depth varied between 500mm and 800mm at the lowest point.

An old precast concrete drainage pipe was also found just below the surface (Plate 2).

3.3 **Trench 2:** Two (2) woody roots were found that are connected to Tree 7 (Plate 3). These roots measured 130mm and 95mm in diameter. The larger root was shown to be growing in a downward direction.

Trench 2 (Section 2) was excavated until bed rock was reached. Due to the presence of bedrock this trench reached 500mm in depth.

3.4 **Trench 3:** A single woody root was found that is connected to Tree 7 (Plate 4). This root is 165mm in diameter (Plate 3). This root was located just below ground level.

Trench 3 (Section 3) was excavated until bed rock was reached. This depth varied between ground level due to a large boulder at the western end of the trench and 500mm at the lowest point.

3.5 Due to the texture of the roots found it is most likely that all roots exposed are from Tree 7. There is no evidence to suggest that roots from Tree 9 are growing towards the proposed development area.

4. Recommendations:

Although several woody roots have been revealed at the trench locations, it is possible that the proposed design would be acceptable, provided that several tree protection measures are followed to ensure the negative affects of the excavation required are minimised.

Severing woody roots on any tree is not an accepted arboreal practice however due to the size of these roots and the distance from the trunk these trees should not be too severely impacted by the proposed works.

It is highly unlikely, due to the lack of oxygen, moisture and bedrock that tree roots exist below the trench excavated. Most tree roots will grow within the top 900 millimetres of any soil horizon so that they can receive adequate oxygen and moisture.

The following points have been recommended if the proposed development is to be implemented;

1) **Distances:**
   Excavation along the location of trench 1 should be no closer than 4100mm to Tree 7.
   Excavation along the location of trench 2 should be no closer than 3200mm to Tree 7.
   Excavation along the location of trench 3 should be no closer than 4400mm to Tree 9.

2) **Tree Protection Zone (TPZ):** The tree protection zone for Tree 7 is eight (8) metres. The TPZ for Tree 9 is seven (7) metres. The TPZ is a radial measurement taken from the trunk. The following activities shall be avoided within the TPZ of each tree;

   - Erecting site sheds or portable toilets.
   - Trenching, ripping or cultivation of soil (with the exception of approved foundations and underground services).
   - Soil level changes or fill material (pier and beam or suspended slab construction are acceptable).
   - Storage of building materials.
   - Disposal of waste materials, solid or liquid.

3) **Mulch:** The entire TPZ area below Trees 7 (8 metres) and Tree 9 (7 metres) should be mulched to help retain moisture and reduce any compaction that may occur under these trees.

4) **Additional roots:** It is recommended that once excavation commences if any additional roots are found, over one hundred (100) millimetres in diameter, a qualified Arborist (AQF Level 5) should be contacted immediately and have the roots examined so that the structure of the tree is not compromised.

These recommendations will help reduce any negative impacts on the trees health and structure.

Images

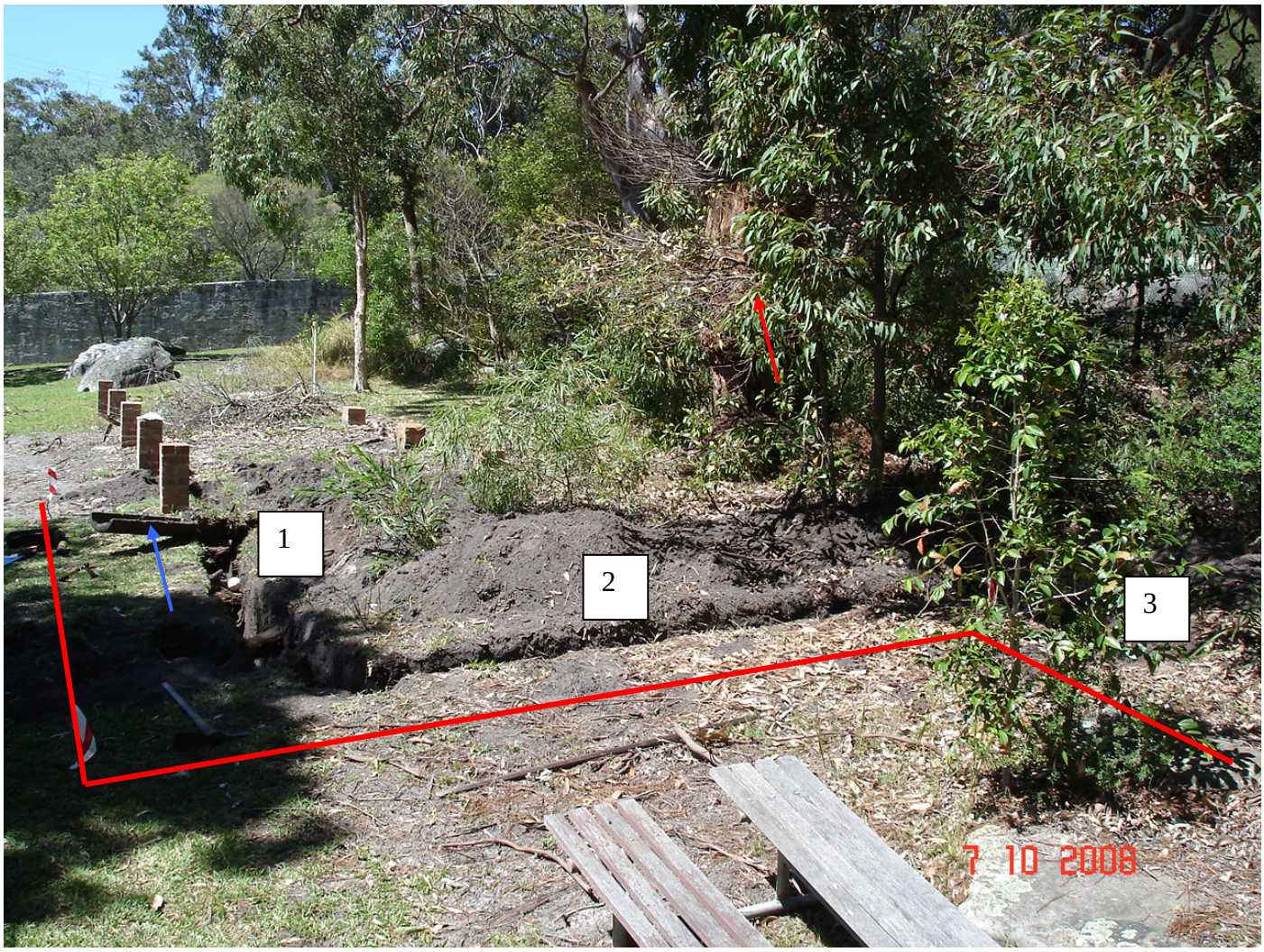


Plate 1. Image shows trenching numbered as trenches 1, 2 and 3. Red line is the proposed location of building. The exposed concrete pipe is to the left of image (blue arrow). Tree 7 is behind shrub (red arrow). P. Vezgoff.

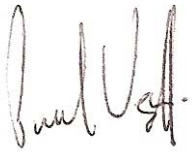
Plate 2: Trench 1. P. Vezgoff.

Plate 3: The two (2) roots located within trench 2. P. Vezgoff.

Plate 4: The root located on the corner of trench 2 and 3. P. Vezgoff.

If you have any questions in relation to this report please do not hesitate to contact me on 02 4268 0425 or 0411 712 887.

Yours sincerely,



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October, 2008

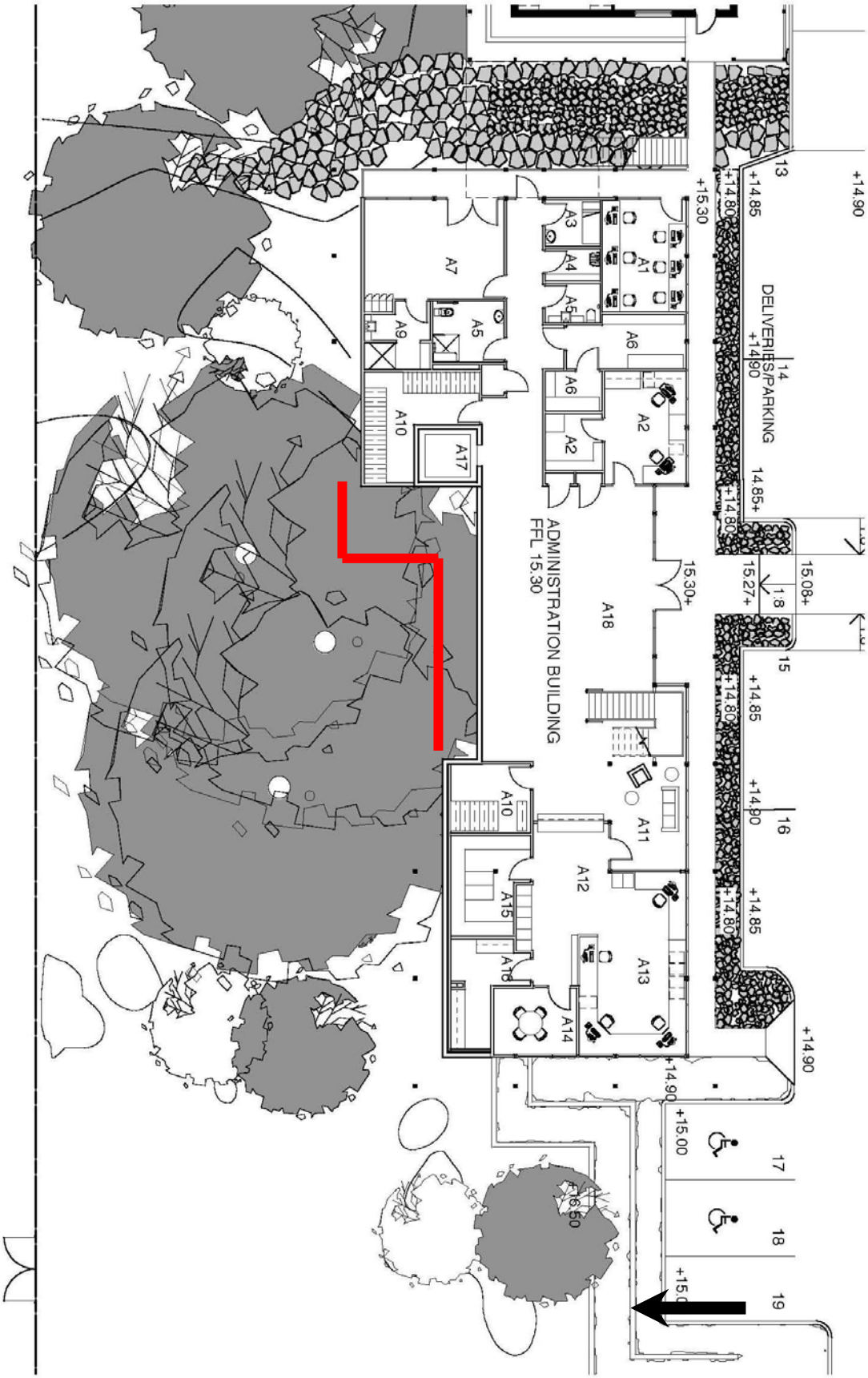

Diagram 1: Location of root mapping (red lines).

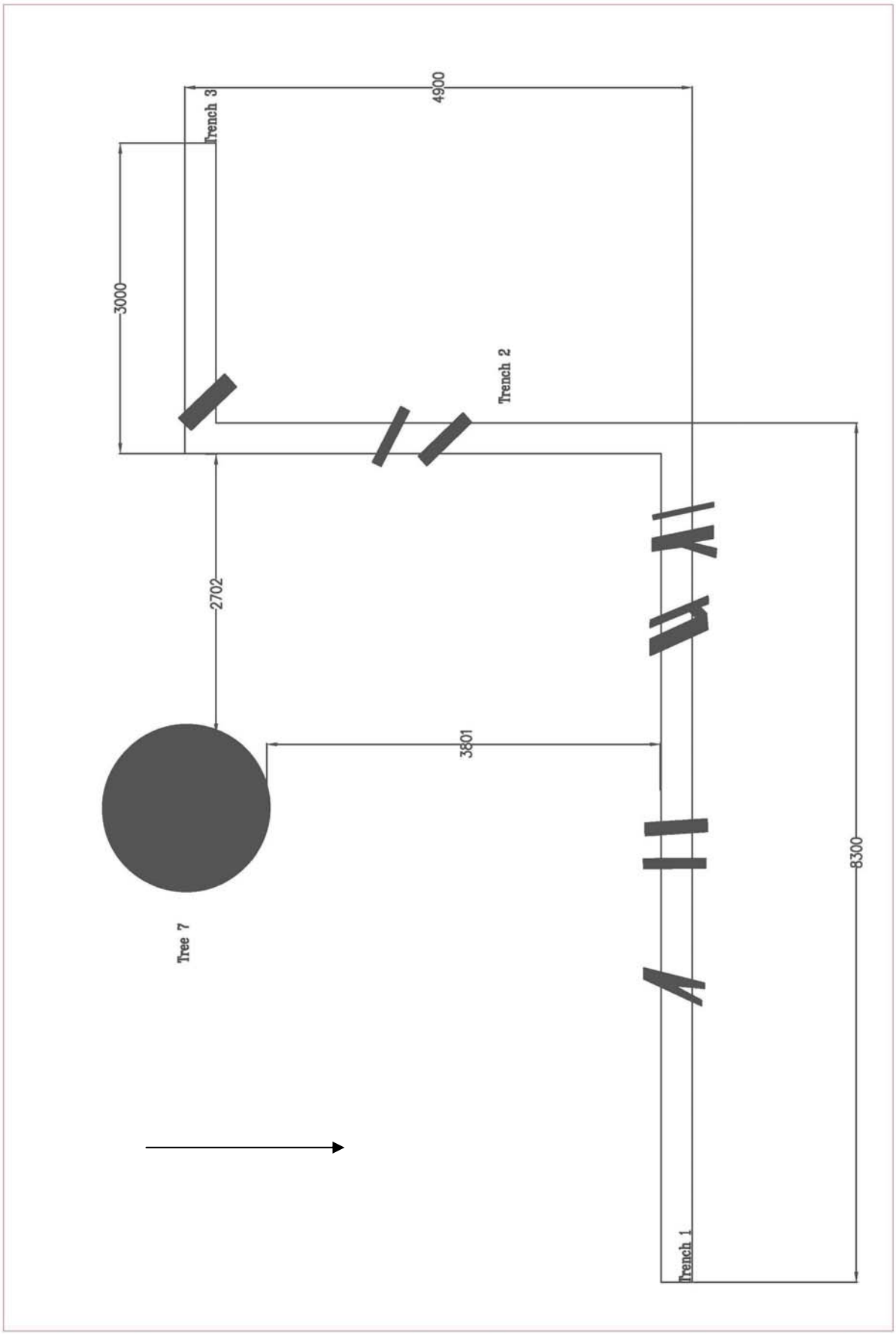

Diagram 2: Root map diagram

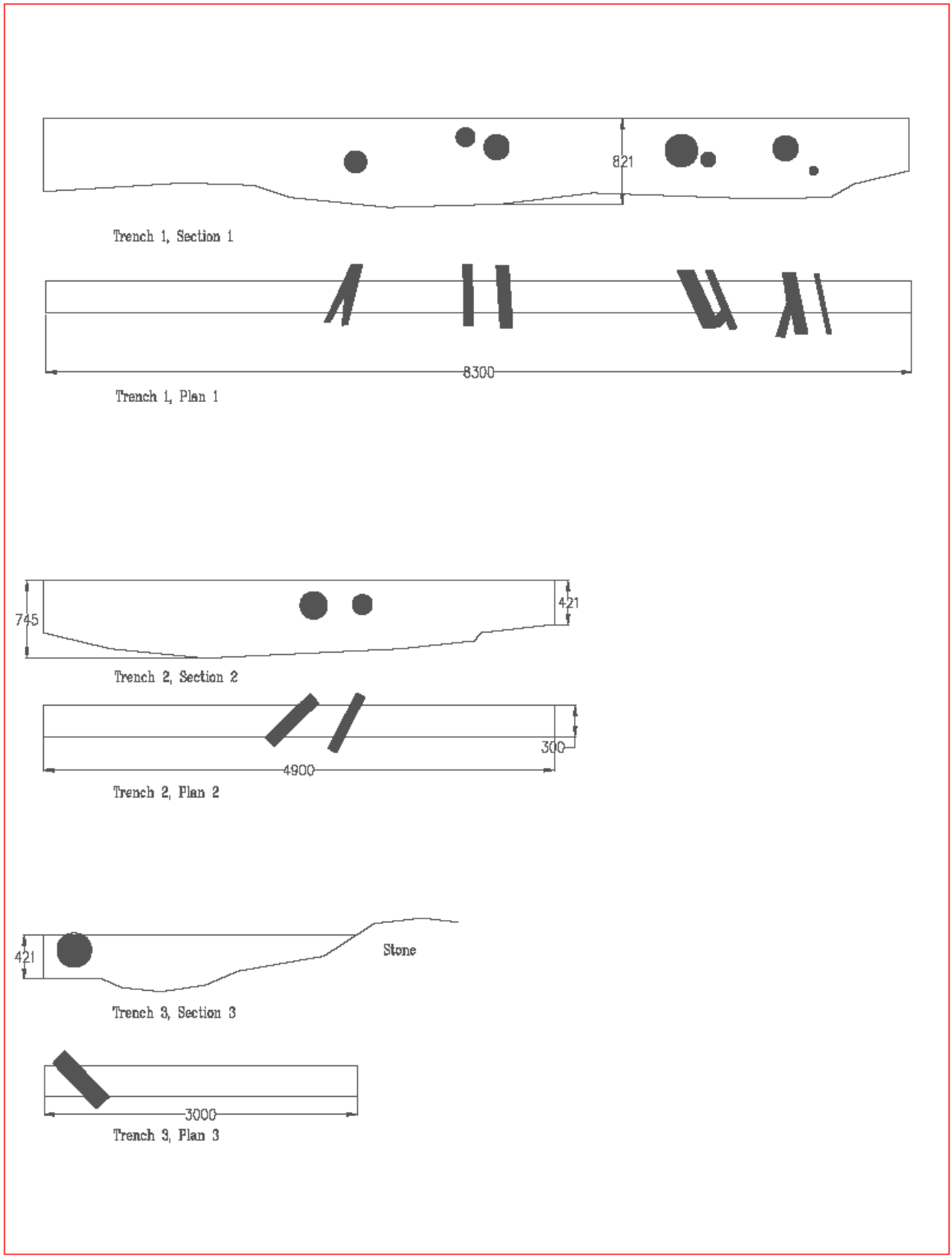

Diagram 3: Plan and section drawings of trenches 1, 2 and 3.