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TAUNG SKULL HERITAGE SITE

PROTECTION OF THE CORE AREA
DESIGN AND ANALYSIS

05 DECEMBER 2013

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TAUNG SKULL HERITAGE SITE

1. Protection of the core area:

The Taung skull heritage site perimeters will be protected by a fence to restrain access of human and large animal traffic. Many sensitive site are currently being damaged by uncontrolled access .
Currently a plastic fence protects a small protection of the site. The client has urged the consultant to find a solution to protect the remaining perimeter.

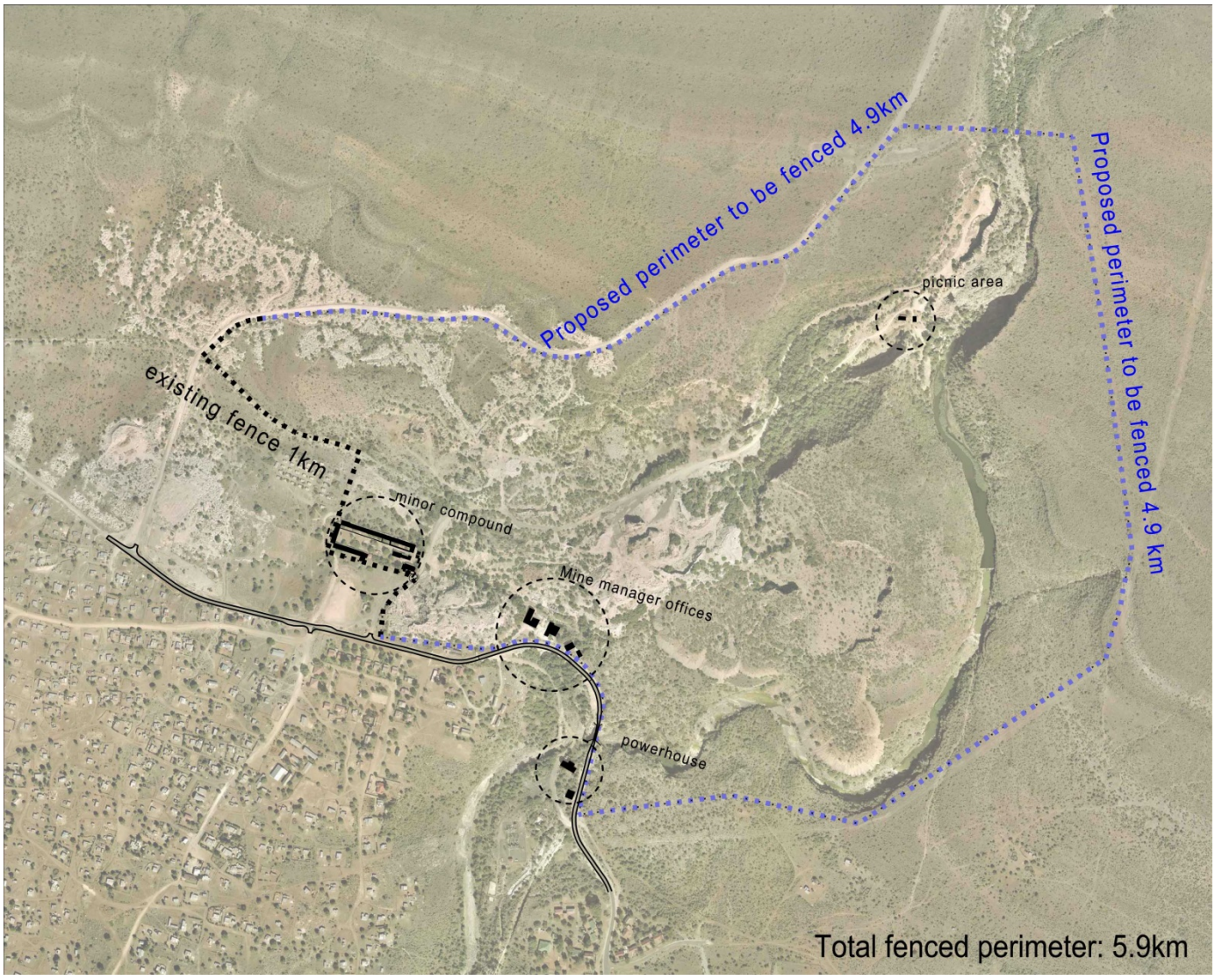

Fig 01: fence perimeter

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2. Existing fence:

The existing fence is composed of tubular plastic poles. The plastic pole were used as shutter to create concrete poles. A plastic connector connects the poles to each other.
A site assessment was conducted on the 12th November 2013 with the client representatives and the professional consultant team.
The following was observed:

1. Fence constructed on a small portion of the entire site: +/- 1 km on 5km
2. Extensive damages of the existing fence
3. Misalignment of poles
4. Poor execution of foundation work
5. Poor execution on assembling the components
6. Very weak connection between poles
7. Instability
8. No concrete poured in most of the poles
9. Bad concrete mixture
10. No steel reinforcement leading to breakage.

The images below illustrates the extent of the damages:

Fig 02 : damages and poles missing on long sections of fencing

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Fig 3 : weak connector between fence

Fig 5: poor execution of concrete mixture **– no reinforcement**

Fig 4: urgent fix due to instability

Fig 6: surface damage

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3. Proposed fence

It was suggested that a similar design aspect be kept. The new fence has to resemble to the existing but offer strength and durability.

The fence proposal takes into consideration the following conditions:

- Provide adequate security
- Not require regular maintenance
- Be easily repairable
- Not have inherent value if pilfered (timber, steel)
- Be aesthetically pleasing, compatible with landscape
- Be adaptable to variable topographic and founding conditions
- Be transportable by hand to installation site
- Provide local employment and skills development

4. Alternative solutions

Other alternative solutions were explored and they showed the following weaknesses:

Steel fence solution

- Easily pilfered
- High scrap value

Timber fence solution

- Easily broken through
- Value as fuel
- High maintenance

Brickwork fence solution

- Relatively easy to break through (may be strengthened with a reinforced core)
- In-compatible with local environment
- Labour intensive and time consuming

The concrete pole solution:

- Provides effective security
- Does not require maintenance
- Has little to no scrap value
- Can be coloured to integrate with local environment. Is a hard material, as is the landscape whilst having a smooth finish providing contrast
- Can be installed on slopes in soft or hard material
- Can be installed by hand in-situ
- Has the potential to provide local employment and skills development

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5. Construction methodology

The construction methodology assumes that aggregate will be sourced locally and used in an on-site casting yard. Local people would run the casting yard and carry out the in-situ concreting and installation. This process has the potential to be developed as a business and similar installations carried out elsewhere post-project.
Construction process:

1. A number of re-useable steel shutter forms are fabricated, the number required a function of the expected construction rate.
2. Reinforcement cages incorporating a base plate are fabricated
3. The shutters are prepared and held vertically inverted in a gig
4. The reinforcing cages are installed
5. Concrete is prepared , coloured appropriately
6. Concrete is introduced into the open end and compacted by means of a vibrator inserted through the base plate.
7. Once the concrete is sufficiently strong the shutters are removed for re-use and the concrete allowed to develop full strength before the poles are transported to site
8. The foundations are prepared either by excavating or, in the case of rock, shuttering
9. In both cases a level layer of blinding concrete is placed
10. The Foundation reinforcement cage is introduced.
11. Poles are placed in position and levelled by shimming. Poles are stabilised and aligned at the top by means of a secured alignment rod
12. Concrete is placed.
13. When sufficient strength is developed the alignment rods are removed

The fence concept design was presented to SAHRA representative on the 25th November 2013
At the Taung Skull Heritage Site.

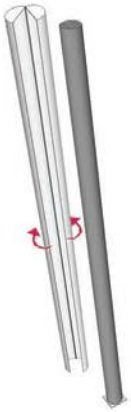
1: Column construction

Step 1
Steel re-bar and base plate construction

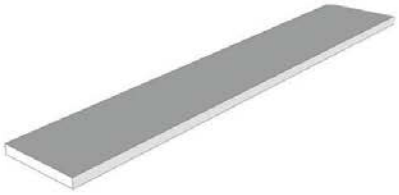
Step 2
column mould wrapped around steel

Step 3 The shutters are prepared and held vertically inverted and left to cure

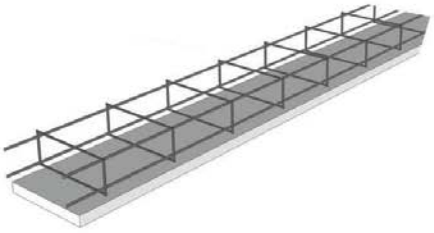
2: Preparation of Foundation



Step 4
mould removed from concrete



Step 5
Level of blinding



Step 6
Reinfocing placed for foundation

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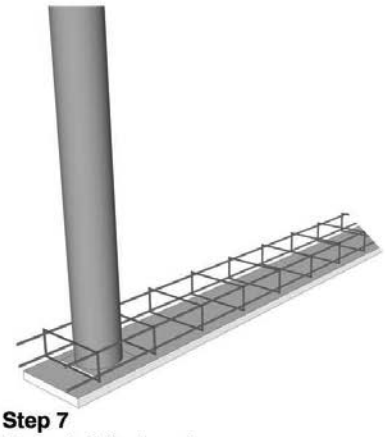
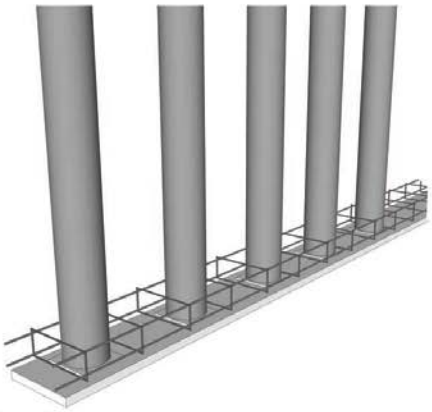
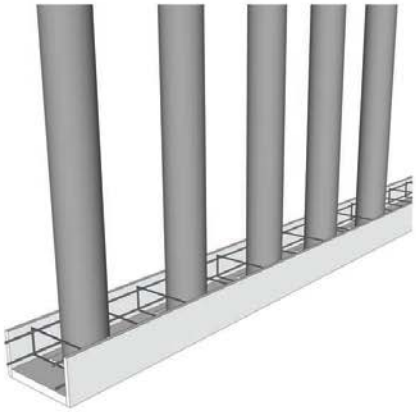


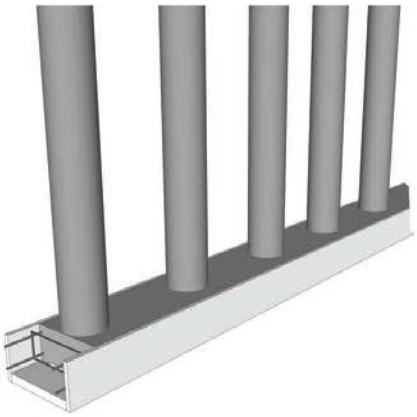
Step 7
Precast slab placed



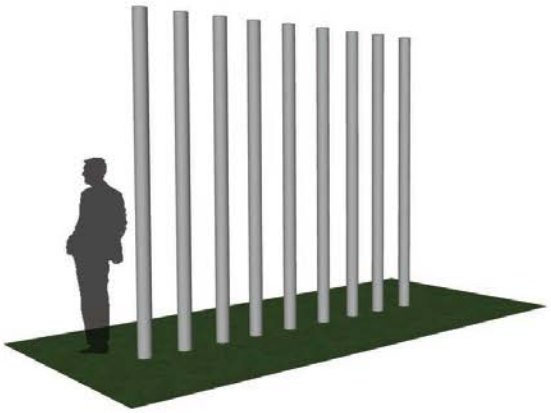
Step 7
Spaced at 150mm centres



Step 8
Shuttering for foundation



Step 9
Foundation poured



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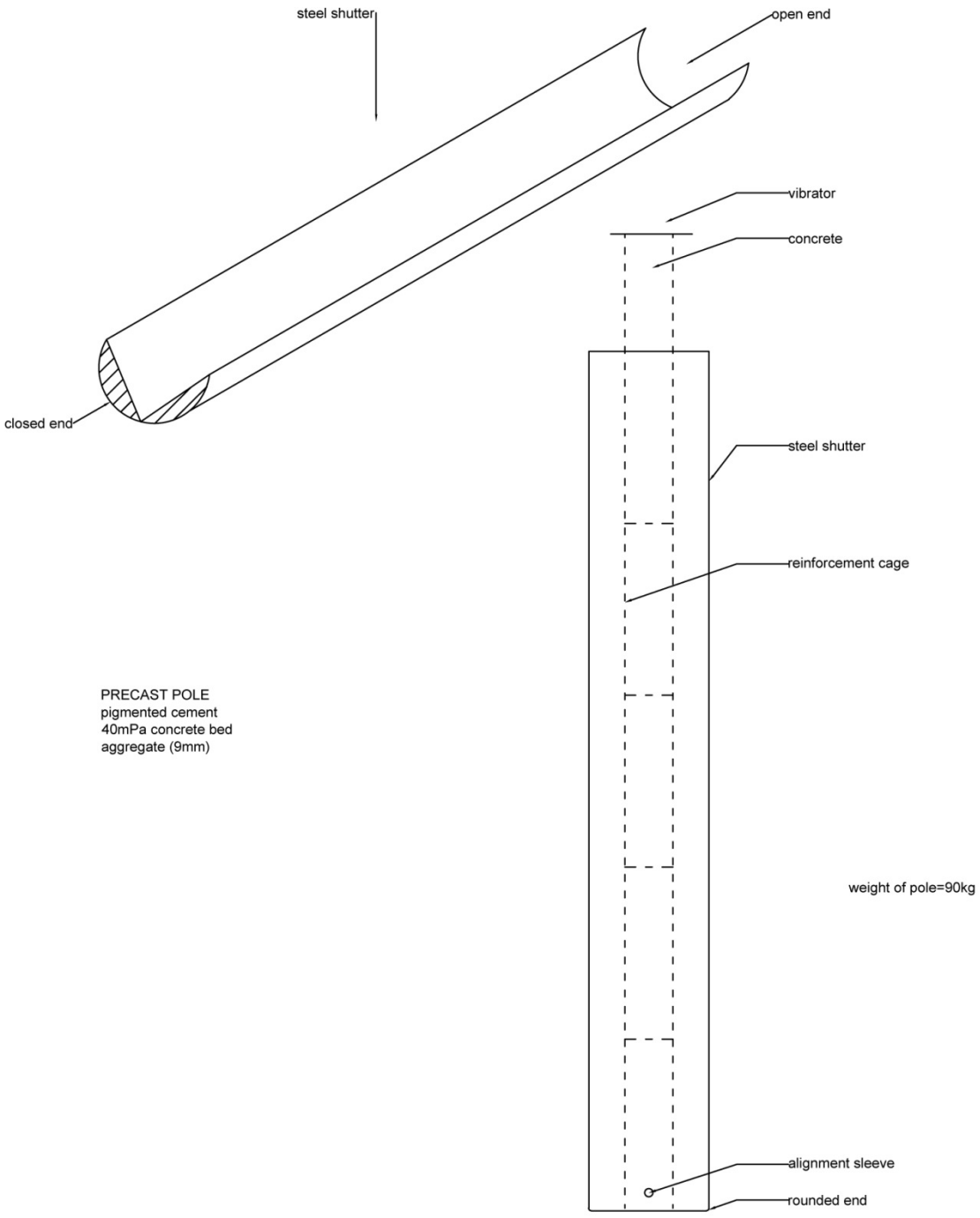
Shutter concept drawings



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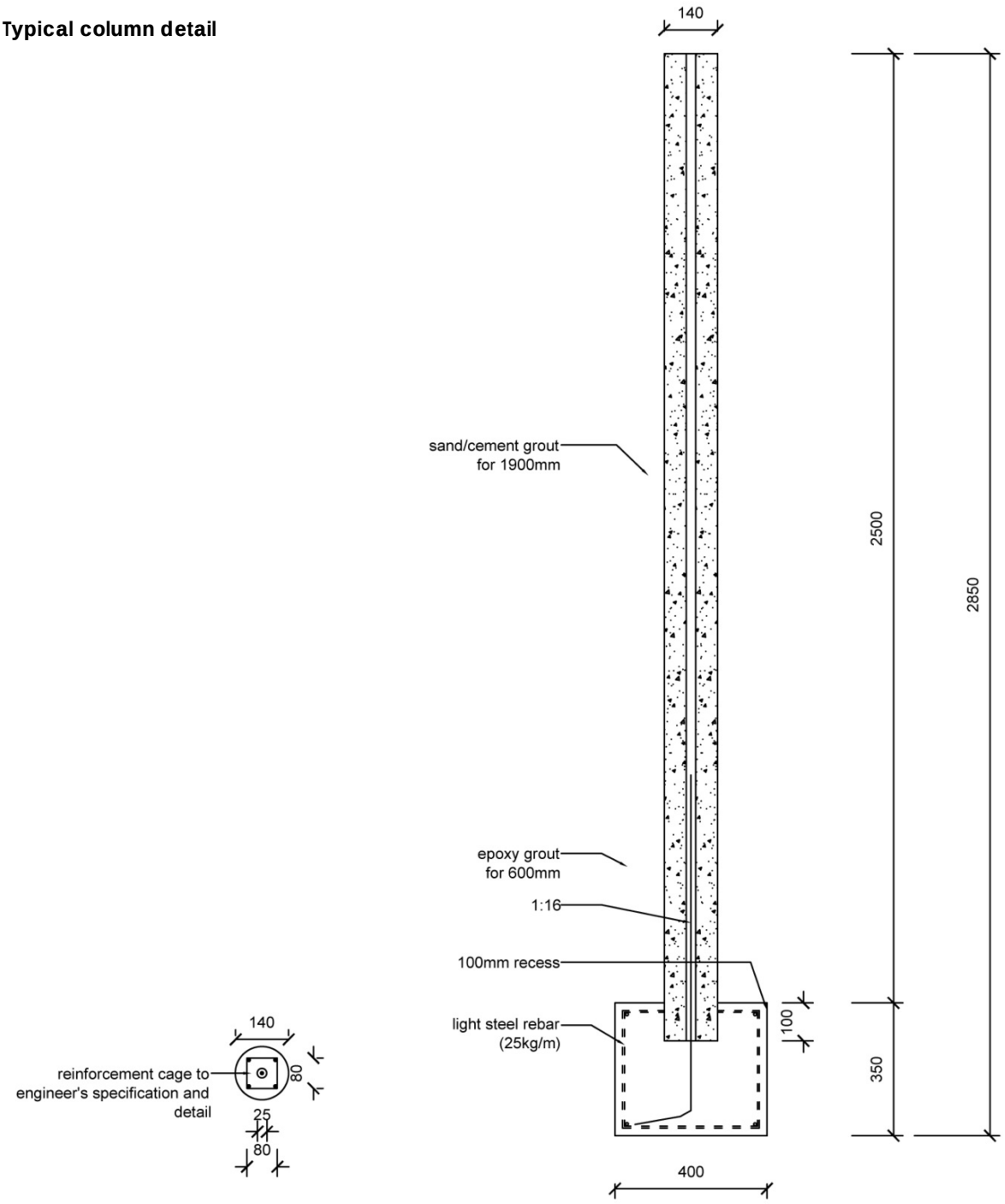
Typical column detail



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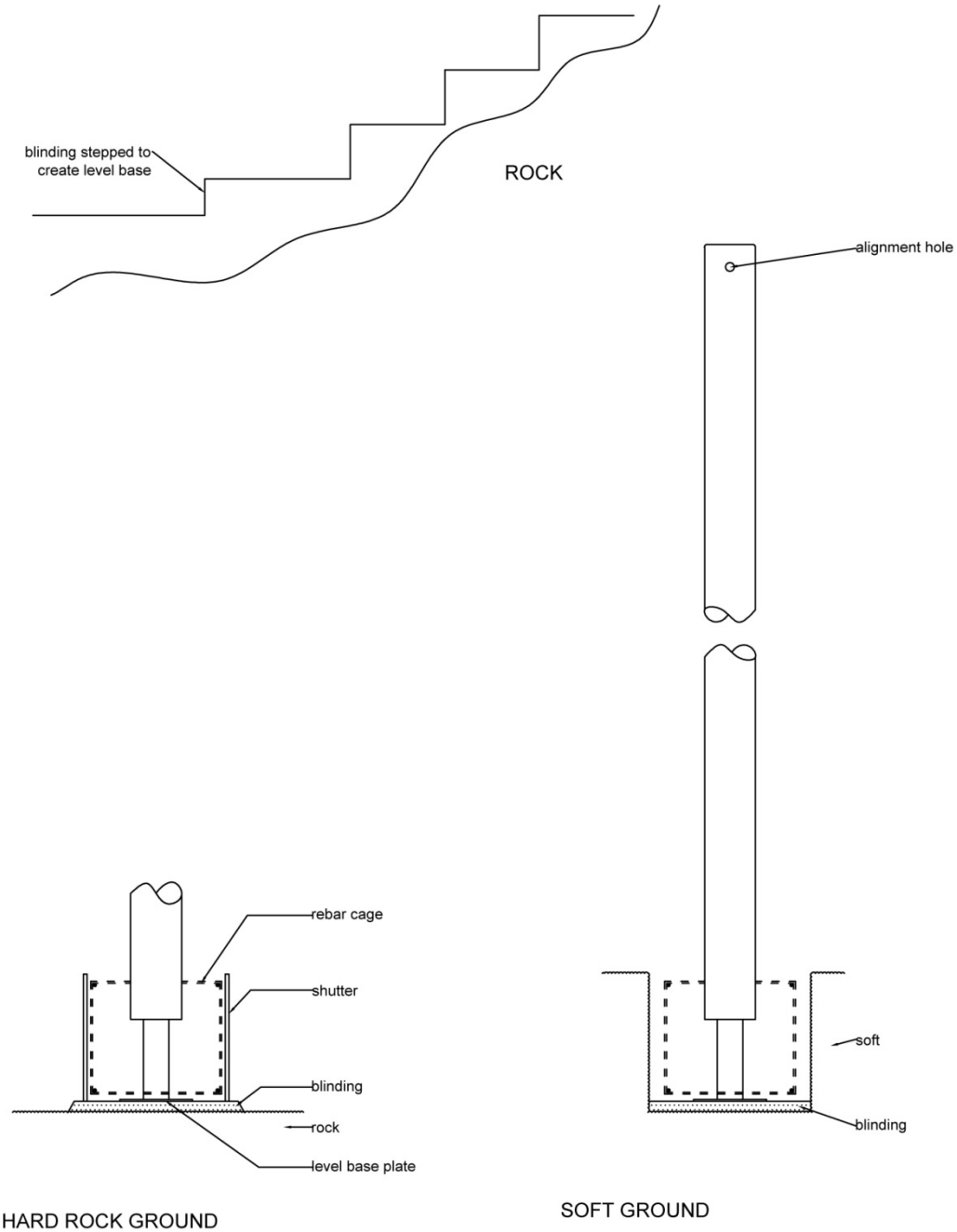
Connection to ground detail



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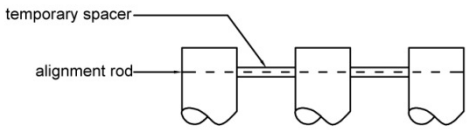
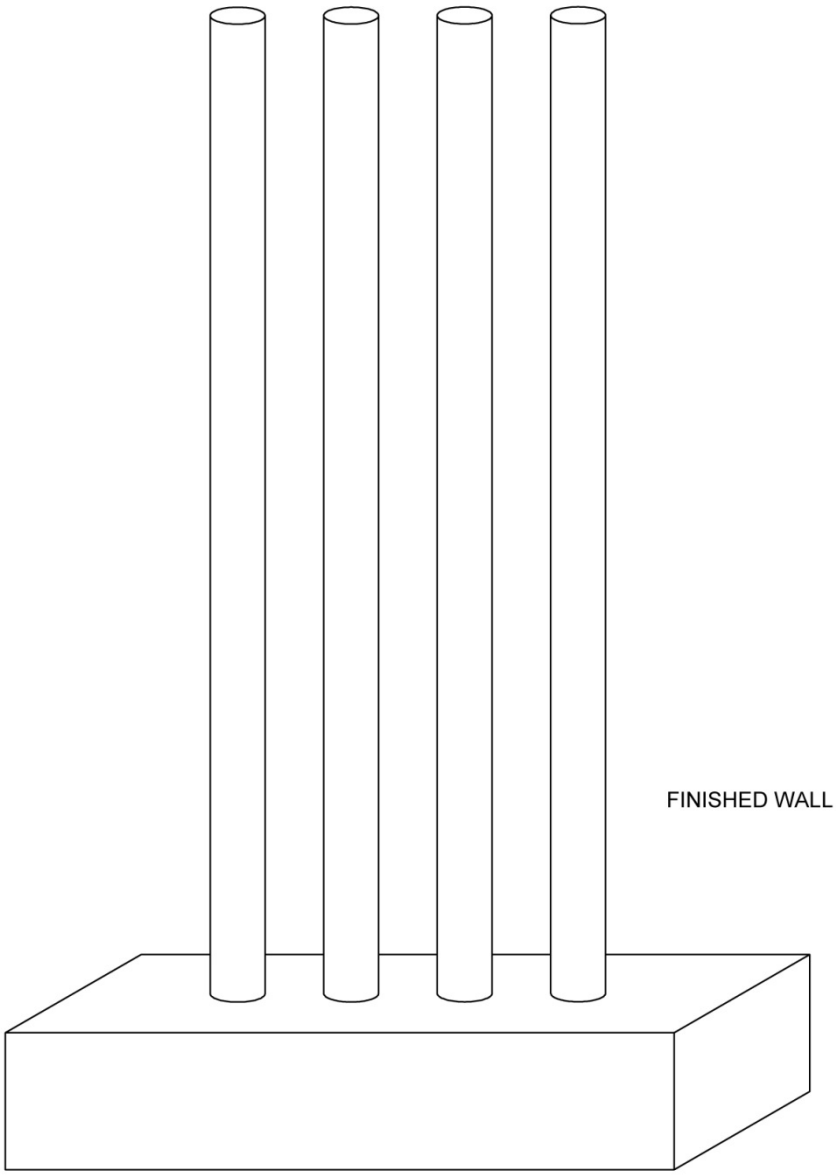
Final assembling





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6. Visualizations

With the use of local aggregate and colouring agent , the concrete columns offers a various range of colours to blend in the landscape.

Fig 7: light grey option

Fig 8: charcoal option

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Fig 9: rusty brown option

Fig 10: dark grey option

Fig 11: charcoal option

Fig 11: medium grey option

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