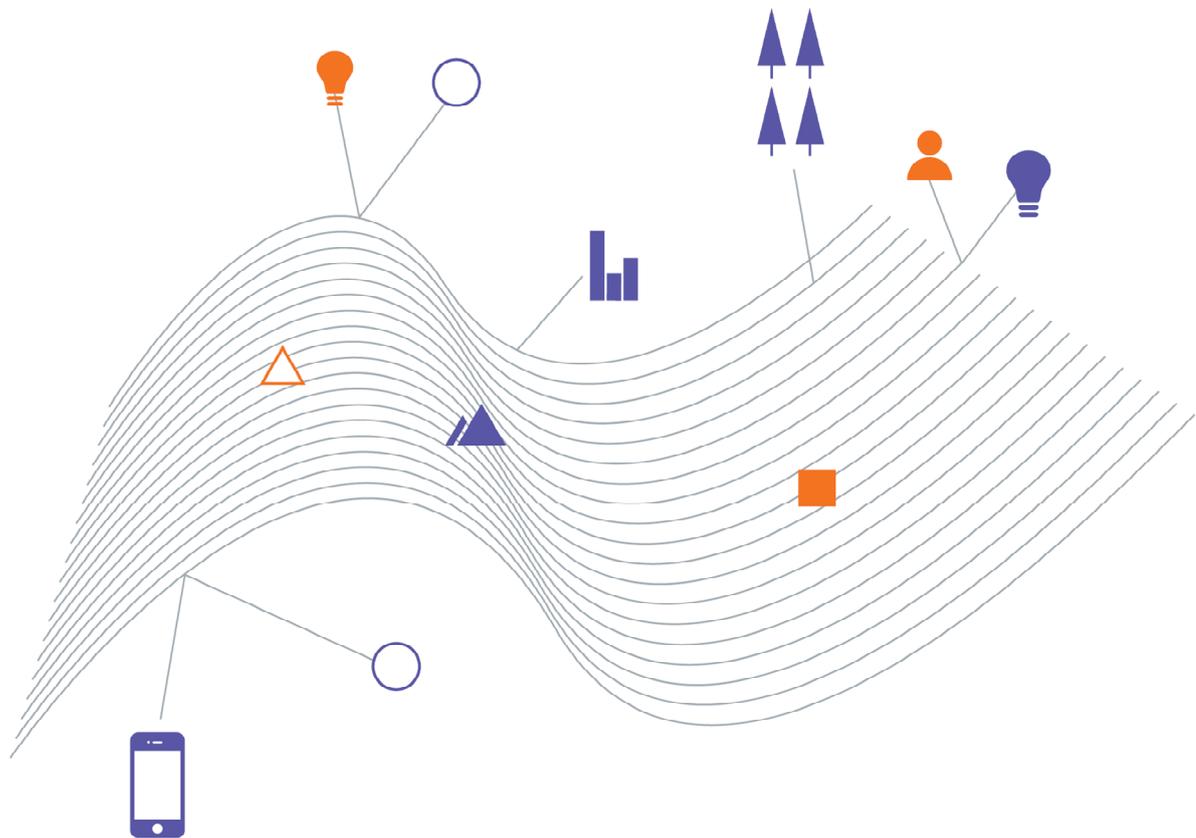


Richard Crookes Constructions – Jesse Moss

Unexpected Finds Procedure

Sydney Modern Gallery
Art Gallery Road, Sydney, NSW

15 October 2019



In a
turbulent
world
we provide
clear thinking

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Unexpected Finds Procedure

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Table of contents

1. Identification of potential unexpected finds	1
1.1. Background	1
1.2. Responsibility	2
1.3. Expected subsurface conditions	2
1.4. Unexpected finds	3
1.4.1. Non-specific unexpected finds	3
1.4.2. Specific unexpected finds.....	6
1.5. Management of unexpected finds of contamination	6
1.5.1. Training and induction of personnel and limitations.....	6
1.5.2. Procedure in the event of an unexpected find	6

Tables

Table 1: Expected Subsurface Conditions.....	2
Table 2: Summary of Non-specific Unexpected Finds.....	4

Figures

Figure 1 Locality Map for SMG Site

Figure 2 Area of Identified Contamination on the SMG Site

1.2. Responsibility

RCC, as Principal Contractor, is responsible for implementing this Unexpected Finds Procedure (UFP) and requiring its subcontractors engaged in excavation to adopt this UFP, so that unexpected contamination finds can be appropriately managed.

The UFP is to be implemented by contractors during any construction works where the ground surface may be disturbed (earthworks). The UFP provides a procedure to be followed in the event of an unexpected find of contamination during earthworks.

This UFP applies for the period of earthworks being carried out at the SMG site, including remediation works described in the Remedial Action Plan (RAP). A copy of the UFP is included in Appendix A to the RAP.

After earthworks are completed, this UFP does not provide procedures for on-going management of residual contamination. On-going management will be addressed as part of site validation under the RAP.

1.3. Expected subsurface conditions

Subsurface conditions encountered in previous investigations included fill material overlying sandstone rock. The fill material and its constituents did not vary significantly throughout the site. Table 1 provides a high level summary of these materials likely to be encountered.

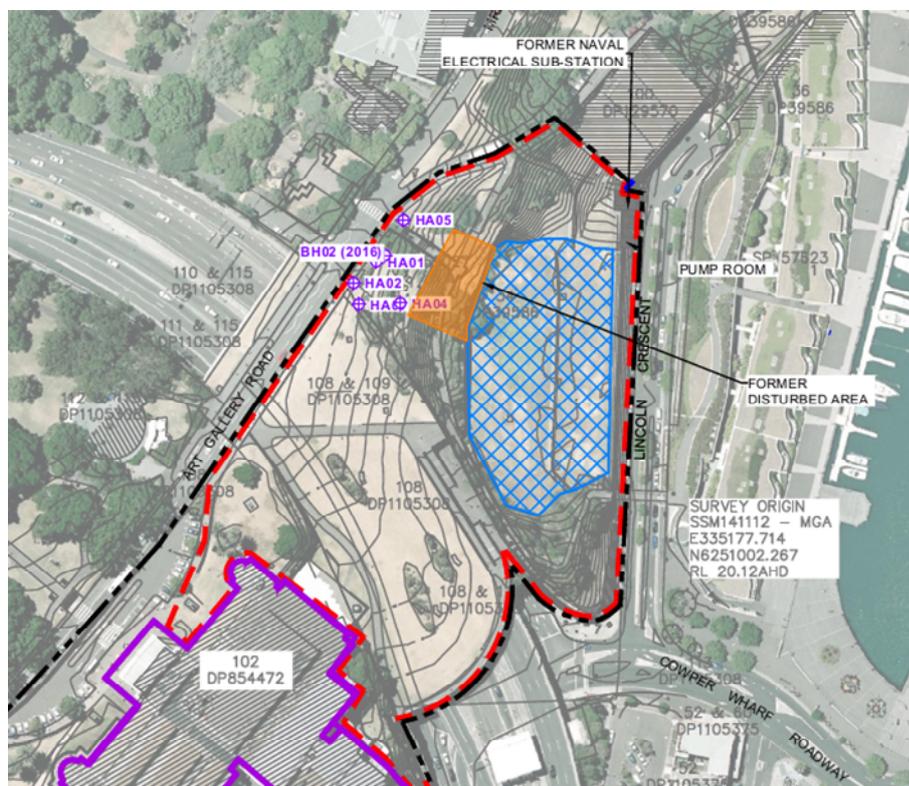
Table 1: Expected Subsurface Conditions

Material / Origin	Description
Topsoil	Sandy silt, fine grained sands, dark brown, to depths of approximately 0.1m.
Fill	<p>Silty Sand / Sand, fine to medium grained, brown to dark brown, grey, orange, coal gravel, to depths between 0.8m and 3.2m bgs.</p> <p>Foreign materials: tile and brick fragments at locations BH6 and BH7. Concrete and glass fragments at BH03 and BH02a, respectively. Coal and / or bitumen like material at locations BH2, BH4, BH6 and BH7 at depths of between 0.5m and 1.5m.</p> <p>Evidence of contamination included:</p> <ul style="list-style-type: none">• BH2: Very strong hydrocarbon odours from 1.1m• BH3: Hydrocarbon odours from 1m• BH4: Strong hydrocarbon odours between 1m and 1.5m
Sandstone	Weathered sandstone.

The location of identified contamination on the site is indicated in Figure 2.

Subsurface conditions departing substantially from those described above may constitute an unexpected find and can be managed through the implementation of the actions outlined in Section 1.5.

Figure 2 Area of Identified Contamination on the SMG Site



1.4. Unexpected finds

Unexpected finds of potential contamination on site may be identified by visual (appearance) and/or olfactory (odour) observations during earthworks.

Based on previous investigation results, unexpected finds are likely to be in two categories, non-specific and specific. Non-specific unexpected finds refers to any possible occurrence within any area of the site not investigated. The second category refers to areas of the site where, for example, contamination was identified yet the source or the extent was not confirmed.

1.4.1. Non-specific unexpected finds

Based on information from previous investigations and site history, potential 'unexpected finds' which could reasonably be possible within the site (although unexpected) are discussed in Table 2.

It is not practical to cover all types of possible unexpected finds. In cases not described in Table 2, when the ground condition or consistency appears impacted, then the precautionary principle is followed and the unexpected finds procedure described in the following section should be activated.

Table 2: Summary of Non-specific Unexpected Finds

Potential Unexpected Find	Observed Characteristic	Typical Key Contaminant of Concern	Example of an unexpected find where applicable
Asbestos containing materials and/or buried asbestos pipes	<p>It is often very difficult to identify the presence of asbestos by sight. The only way to be certain is to have a sample of the material analysed by a laboratory. Cement bound asbestos (fibro cement sheet) may be present in building materials such as wall sheeting, pipes and roofing, backing of electrical switch boards, linoleum floor tiles etc and may be found as fragments of broken building materials (often found close to the building) and building wastes.</p> <p>Friable forms of asbestos including lagging and insulation may occur as fibrous material which flakes and powders easily. Textured coatings used to improve fire-resistance may also contain asbestos.</p>	Asbestos	
Buried waste materials	<p>May include a variety of waste materials, inclusive of waste oil drums, wood, plastic, metal fragments, building rubble (e.g. concrete, brick, asphalt, asbestos containing materials), lead paint. We do not consider that a trivial piece or fragment of foreign material constitutes as an unexpected find (e.g. a single brick).</p>	<p>Total Recoverable Hydrocarbons (TRH) Benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN) Polycyclic Aromatic Hydrocarbons (PAHs)</p> <p>Volatile Halogenated Compounds (VHCs) Asbestos Heavy metals – usually arsenic, cadmium, chromium, copper lead, mercury, nickel and zinc</p>	
Underground storage tanks (USTs)	<p>Though unlikely but can be identified as follows:</p> <ul style="list-style-type: none"> • A buried steel underground tank; • Deeper sand fill is sometimes observed and / or hydrocarbon odours or staining. • Encountering relatively small concrete footings or steel pipelines, sometimes with observed hydrocarbon odours or staining. 	TRH, BTEXN, PAHs, VHCs, phenols, lead	 23/10/2006

Potential Unexpected Find	Observed Characteristic	Typical Key Contaminant of Concern	Example of an unexpected find where applicable
Ash or slag deposits	<p>Ash materials typically light weight, grey and white gravel and sand sized (1mm to 10mm) particles (see photograph example).</p> <p>Slag materials can be varied in consistency and colour. Typically slags from steelmaking are pale grey to grey, however can be blue/green/grey, loose or cemented. Slag gravels can be very angular and appear to have a vesicular (i.e. 'honeycomb') shape.</p>	PAHs, heavy metals	
Hydrocarbon Compounds	<p>May be identified by a hydrocarbon (e.g. petrol, diesel or oil) odour which may vary in strength from possible (just detectable) to very strong (easily detectable at a distance from the source).</p> <p>The odour may or may not be accompanied by specific areas of dark staining (black-grey) or larger scale discolouration of strata from a previously identified 'natural colour' e.g. staining of orange and brown clay to dark grey and green.</p>	TRH, BTEXN, PAHs, lead	
Other unusual odours	<ul style="list-style-type: none"> • Solvent odour – sweet • Acetone odour – nail polish remover • Alcohol odour - sweet • Sulphur (rotten egg) odour (possibly associated with Acid Sulfate Soils) • Acidic (Acetic/Formic/Citric) odour – sharp or burning. • Ammonia odour - pungent • Caustic odour 	Variable	

1.4.2. Specific unexpected finds

Previous investigations identified TRH and PAH contamination and strong hydrocarbon odours in the part of the SMG site indicated in orange on Figure 2. The extent of the odorous contaminated soils is estimated to be 12m by 25m in area and is estimated to extend to the top of sandstone, which varies between 1.1m and 2.2m bgs.

The unexpected finds procedure for specific areas of the site will be required to manage the following possible circumstances:

- The impacted material extends beyond the estimated extent.
- Additional contaminants are discovered during remediation works (that is, the type of contamination has changed).

1.5. Management of unexpected finds of contamination

1.5.1. Training and induction of personnel and limitations

All personnel involved in earthworks on site are to be inducted for awareness of potential unexpected finds. The induction can be undertaken at the time of general site induction and refreshed during toolbox meetings.

Personnel involved in earthworks are required to implement the initial parts of this Procedure during earthworks.

It is not practical to cover all types of possible unexpected finds. If the ground condition or consistency appears impacted, then the unexpected finds procedure should be implemented as a precaution.

Additionally, it is noted that some forms of potential contamination may not be evident visually or through odour. The unexpected finds procedure does not provide protection against potential health risks from such contaminants.

1.5.2. Procedure in the event of an unexpected find

If an unexpected find of potential contamination is encountered during earthworks, then the following procedure should be followed:

1. Stop work in the area as soon as it is safe to do so and move to a meeting point, preferably upwind of the find.
2. Contact the Safety Supervisor for the site and advise of the hazard and request assistance to assess the hazard.
3. Have a suitably qualified person, or the Safety Supervisor, assess the potential risk to human health posed by the unexpected find and assess if evacuation or emergency services need to be called.
4. Establish an exclusion zone around the affected area using fencing and/or appropriate barriers and signage. Additional control measures are required for:
 - a. Odours and/or volatile compounds: odours suppression and no smoking signage.
 - b. Potential asbestos containing materials: if area is small cover with weighted plastic sheeting or geofabric. For larger areas, ensure material remains damp to prevent dust generation.

5. Contact the appointed environmental consultant for advice and request a site visit to undertake an assessment of the unexpected find.
6. The environmental consultant will assess the unexpected find and provide advice as follows:
 - a. Preliminary assessment of the contamination and need for immediate management controls (if any);
 - b. What further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines;
 - c. Notify the Site Auditor of the unexpected find of contamination;
 - d. In the case of asbestos, adopt appropriate management protocols and identify requirements for controlled removal;
 - e. Prepare an addendum to the Remedial Action Plan (RAP) (if necessary) or provide clean up advice;
 - f. Remediation works required (where applicable);
 - g. Validation works required following remediation works (if applicable).
7. Works are not to recommence in the affected area until appropriate advice has been obtained from the environmental consultant, the site auditor has been made aware of the changed conditions and the environmental consultant has recommended that works resume.
8. If it is deemed safe to do so, the environmental consultant will provide clearance for works to resume in the affected area. We note that following removal of asbestos impacted materials, WHS regulations require issue of a Clearance Certificate by a Licensed Asbestos Assessor if asbestos is friable or is more than 10m² of bonded asbestos cement material. The environmental consultant may seek an opinion from the site auditor before providing clearance. If it is not considered to be safe, earthworks in the area must remain on hold until appropriate assessment, remediation and/or validation measures have been actioned.

A simple one-page summary of the sequence of actions recommended in the UFP.

Below is a summary version of the **Unexpected Finds Procedure** and can be used as a handout:



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