1 Action Plan to Meet HSE Licensing Requirements.

1.1 General Points

1.1.1 The numbers of hard standings on each battery have been calculated to meet the peaks in the current forward programme for each battery. In particular during the construction phase for this project there is the need to keep at least one proof battery operational, hence K and Q batteries are "sized" to take on the major proof work whilst the other is undergoing site works.

1.1.2 All hard standings for Mobile Conditioning Chambers (MCC) and Mobile Ammunition Processing Buildings (MAPB) should be sized to cope with mobile structures based on a standard ISO 40 foot container, unless otherwise stated.

1.1.3 The works have been designed to meet the requirements of HSE, whilst trying to minimise the need to move stressed ammunition on the site roads – and in particular through the Landwick gate, which is public road. Centralization of storage and conditioning would have meant that a much larger fleet of ammunition transport vehicles would have been needed and moving stressed ammunition within strict timelines dictated by keeping the ammunition at the right temperatures for the tests.

1.1.4 This plan has highlighted the full user requirement for meeting the needs of HSE and MSER. In some cases the requirement may be met by investment that is through the DE Capital Works, or through investment in Schedule 26 through the unallocated provision. One example of where the unallocated provision will be used is where the Mobile Chambers require the roof to be hardened. There is currently a plan to refurbish some of the mobile chambers and possibly replace others within the Investments Portfolio, it is this project that will be used to carry out the hardening work during the refurbishment, or – if an interim fix is required the minor investment route will be used to add additional steel plate to the tops of the MCCs.

1.1.5 The second area which will require investment, but not necessarily through the DE Core Works programme is the security aspects associated with CCTV, Intruder & fire detection. Some of the systems that can be used to secure ammunition areas are temporary (in the same way as the MCCs themselves can be moved). "Sentry"™ systems for instance, are a mobile post which can be configured with CCTV camera, PIR detector etc. which would be bought through the Minor investment route or as a result of an overall review of security and fire detection.

1.1.6 Where possible those requirements that may be met through investment through the "equipment" oriented Schedule 26 scheme rather than the Core Works budget are highlighted so.

1.1.7 One general requirement that falls into this category will be the need to procure some manual handling equipment to move the heavy shells (more than 1 man lift" between the storage, processing and firing points. All the new storage and processing positions are further from the gun than those they replace, and some sort of lifting and carrying systems will need to be procured.

1.1.8 Some of the aspects of MSER and HSE have also dictated that we address the need to separate tasks that in the past may have been carried out in single buildings. An example of this is the Charge adjustment process and the crimping process for 4.5" naval ammunition. In these cases it has been important to provide the standing for more than one MAPB, to allow the safest methods of carrying out more than one process, or to allow parallel processing when more than one propellant type will be fired during a trial day – making best use of time on battery (weather and clearance of the range) and to reduce the time actually firing. Just having one MAPB would mean a thorough cleaning process to remove the risk of cross contamination of types of propellant for instance when switching, more than one provides for a much more efficient system of working.

1.2 Q Battery

1.2.1 Problem

Q Battery is the principle gun firing Battery on site. A temporary, interim solution has been agreed with the HSE to permit Q Battery to be used although not fully compliant with the Licence Plans. Existing facilities have been closed and no longer house any explosive or ammunition and limited storage and processing capability has been provided by mobile facilities The overnight storage of ammunition in conditioning chambers will require 'baby sitting' until an alarm system can be installed. The APB does not provide sufficient protection from possible fragment damage, even with increased distance from the gun bed plate. An APB is still required to carry out charge adjustment, and another temporary building is used to carry out crimping – segregation of tasks is part of MSER licensing. Both of these are in temporary areas without traverses and sited on gravel tracks which will be unsuitable (both to provide a long term stable base, and with migration of the gravel through constant use).

For efficiency, a number of different types of ammunition through different calibre guns will be fired in one day on this battery, with all conditioning taking more than 24 hours (Soak time). The different calibres may be under a number of different temperatures. So the number of container hard standings has been sized to cope with the most demanding combinations and complex firing days that can be foreseen using current available forward data.

1.2.2 Actions Required

1. Four new locations are required for the Mobile Conditioning Chambers (MCC15 MCC16 MC44 MCC44A) used in support of battery operations. Each location will require to be located at ½ IBD from any non explosive building and the appropriate internal magazine distance from each other and the appropriate process building distance from the processing buildings (see Layout Plan)
2. Each MCC will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. New locations are required for a mobile Ammunition Process Building and a mobile crimping unit(MCCISO42 , MCCISO42A)
4. Distances and Traversing required as detailed above.
5. Hard standing to be provided for all MCC and APB locations
6. Access roads for vehicles to be provided to all new locations
7. Roofs to be hardened on MCCs and mobile APB.

8. Intruder detection system to be in installed for all over night storage in the mobile conditioning chambers
9. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
10. A suitable lightning protection system must be provided for all explosive buildings/locations.
11. Power supplies to be provided to all MCC and MAPB locations
12. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 16

1.3 K Battery

1.3.1 Problem

Existing battery buildings are located too closely together and could not meet the safety distance requirements of MSER and their safety could not be justified by full technical appraisal. None of the existing explosive storage or processing facilities on K battery could therefore be used in support of a trial.

Whilst K battery is not highly utilised, it is seen as a key facility to allow trials operations to be maintained while Q Battery is undergoing a full upgrade as detailed above. The full Q Battery requirement does not need replication as the trials can be programmed and workarounds used on a temporary basis. The extra work involved to carry out trials at K battery during the works at Q battery would require further investment if the arrangement were to be made permanent.

1.3.2 Actions Required

1. Three new locations are required for the Mobile Conditioning Chambers (MCC7, MCC8, MCC9) used in support of battery operations. Each location will require to be located at ½ IBD from any non explosive building and the appropriate internal magazine distance from each other and the appropriate process building distance from the processing buildings (see Layout Plan).
2. Each MCC will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. New location is required for a mobile Ammunition Process Building or a mobile crimping unit(MCCISO41)
4. Distances and Traversing required as detailed above.
5. Hard standing to be provided for all MCC and APB locations
6. Access roads for vehicles to be provided to all new locations
7. Roofs to be hardened on MCCs and mobile APB.
8. Intruder detection system to be in installed for all over night storage in the mobile conditioning chambers
9. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place

10. A suitable lightning protection system must be provided for all explosive buildings/locations.
11. Power supplies to be provided to all MCC and MAPB locations
12. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 17

1.4 DAT Battery

1.4.1 Problem

There are two problems with DAT Battery. The new operations building FM76 is exposed to fragments from trials and demolitions being undertaken on DAT North Pan to and the Range Arisings Store ISO6 is too close to building FM76 and needs to be relocated.

During some trials, there is a requirement to store a stressed store locally to where it will be destroyed, and at times there is a need to maximise the flexibility of the site when it comes to storage of different compatibility groups.

1.4.2 Actions Required

1. Existing ISO 6 needs to be demolished and a new steel store needs to be erected at the new location (as shown on plan Appendix A Page 18).
2. Intrusion Detection System (IDS) instillation required.
3. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
4. Access road to be built.
5. Hard standings and traverses required to be built.
6. An interceptor traverse needs to be constructed to the north of building FM76 to protect the building and occupants from high velocity low angle fragments from the direction of the North Pan.

See Appendix A Page 18

1.5 Rugwood Battery

1.5.1 Problem

Due to the close proximity of occupied battery buildings , including a rest room facility, the explosive storage in existing buildings FH11, FH12 FH13 has had to be severely restricted and severely compromises the ability of trials to be conducted using HT1 and HT2 (Large) explosives and ammunition. Under the new licensing arrangements, this lack of storage has been addressed by providing licence schedules for erecting a new steel store (FH30A) and a new location for a Mobile Conditioning Chamber (MCC26). Until these new storage locations are complete Shelford mine soak store has to be used, preventing use of Shelford whilst Rugwood is active.

1.5.2 Actions Required

1. Two new locations are required for a new permanent explosive store FH30A and the Mobile Conditioning Chamber (MCC27) used in support of battery operations. Each location will require to be located at ½ IBD from any non explosive building and full IBD from the rest room. The appropriate internal magazine distance from each other and the appropriate process building distance from the processing buildings FH13(see Layout Plan). The permanent building is thought the best option here because the building will be in almost constant use (though some times for small amounts of detonators or storage of projectiles and cartridges used in fragment attack trials), the alternative is to have a further hard standing and purchase an MCC that would be permanently sited at Rugwood (which would not be the best solution under the "sustainability report")
2. Both the new steel store FH30 and MCC27 will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. Hard standing to be provided for all MCC and APB locations
4. Access roads for vehicles to be provided to both new locations
5. Roof to be hardened on MCC27.
6. Intruder detection system to be in installed for all over night storage in both FH30A and MCC27
7. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
8. A suitable lightning protection system must be provided for all explosive buildings/locations.
9. Power supplies to be provided to both locations

See Appendix A Page 19

1.6 Shelford Battery

1.6.1 Problem

Current arrangements and locations for the use of mobile conditioning chambers at Shelford Battery would not be permitted under MSER due to the close proximity of these locations to occupied battery buildings and the spine road

1.6.2 Actions Required

1. Three new locations are required for the Mobile Conditioning Chambers (MCC22, MCC23, MCC23A) used in support of battery operations. Each location will require to be located at ½ IBD from any non explosive building and the appropriate internal magazine distance from each other and the spine road.(see Layout Plan).
2. Each MCC will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. Hard standing to be provided for all MCC locations
4. Access roads for vehicles to be provided to all new locations
5. Roofs to be hardened on MCCs.

6. Intruder detection system to be in installed for all over night storage in the mobile conditioning chambers
7. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
8. A suitable lightning protection system must be provided for all explosive buildings/locations.
9. Power supplies to be provided to all MCC locations
10. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 20

1.7 Shelford Battery – Sappers Area

1.7.1 Problem

Sappers area has a mobile APB MCCISO25 and an explosive storage building FF10 co-located with occupied buildings. The distances are too small to comply with MSER without effective traversing around the APB

1.7.2 Actions Required

1. The Mobile APB (MCCISO25) used in support of battery operations will need to be relocated at ½ IBD from any non explosive building and the appropriate process building distance from other explosives buildings (see Layout Plan)
2. The mobile APB MCCISO25 will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre. As a minimum, the traverse should be on the south and west elevations.
3. Hard standing to be provided for the APB location.
4. Access roads and turning area for vehicles to be provided to all new locations
5. Roof to be hardened on mobile APB.
6. A suitable lightning protection system must be provided for all explosive buildings/locations.
7. Power supplies to be provided to the MAPB locations
8. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 21

1.8 Churchend Battery

1.8.1 Problem

The battery is used for medium calibre firings on a regular basis and has always used conditioning. Due to the close proximity of the occupied battery buildings, especially the three storey Observation Post, the license schedules for the existing process and storage buildings no longer provide a sufficiently large NEQ to permit them to support trials at Churchend Battery. In order to address this problem and increase the HT1 NEQ, three new locations for conditioning chambers have been sited across the spine road (See Appendix A Page 27).

1.8.2 Actions Required

1. Three new locations are required for the Mobile Conditioning Chambers (MCC27, MCC27A and MCC27B) used in support of battery operations. Each location will require to be located at ½ IBD from any non explosive building and the appropriate internal magazine distance from each other and the spine road.(see Layout Plan).
2. Each MCC will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. Hard standing to be provided for all MCC locations
4. Access roads and turning area for vehicles to be provided to all new locations
5. Roofs to be hardened on MCCs.
6. Intruder detection system to be in installed for all over night storage in the mobile conditioning chambers
7. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
8. A suitable lightning protection system must be provided for all explosive buildings/locations.
9. Power supplies to be provided to all MCC locations
10. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 22

1.9 Nasewick Battery

1.9.1 Problem

Most of the buildings in Nasewick 2000 do not maintain ½ IBD between the explosive and occupied non-explosive buildings; And until the building work takes place no storage and/or processing (charge adjust) can take place on battery.

Unlike other batteries, at Nasewick 2000 it is a simpler task to move the non explosive occupied buildings than to relocate the explosive storage buildings. The process building for charge adjust was originally located adjacent to the main storage facility on battery and

therefore has to be relocated at the appropriate Process Building Distance and adequately traversed.

1.9.2 Actions Required

1. Relocation up to six of the occupied battery buildings at Nasewick 2000 to maintain ½ IBD between them and the explosive buildings. (Note The existing buildings are old Portakabins and will probably not survive the move. Costs for new units should be incorporated). The numbers of Portakabins is not important, but there must be enough space for the firing team, instrumentation (and their equipment) and visitor groups to be housed safely – which could be up to 25 people.
2. Process building FM147 needs to be located at an appropriate distance from the storage buildings (FM146, MCCISO36 and MCCISO37) and non-explosive buildings as per the licensed area plan.
3. Both the process building FM147 and the storage buildings (FM146, MCCISO36 and MCCISO37) will require traverses equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building(s) they surround with a minimum width of mound at eaves level being 1 metre.
4. Extra hard standing may need to be provided for all MCC and APB locations
5. Access roads for vehicles already exist in the area, but a vehicle turning area may be required.
6. Roofs to be hardened on all permanent explosives buildings.
7. Roof to be hardened on MCCs and MAPBs
8. Intruder detection system to be in installed in all explosives storage buildings
9. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
10. A suitable lightning protection system must be provided for all explosive buildings/locations.
11. Power supplies to be provided to both the process building location and extended to the relocated occupied battery buildings.

See Appendix A Page 23

1.10 R Battery

1.10.1 Problem

R Battery is programmed to be the principle site for the 40mm grenade work and much of the EMTAP work formerly undertaken at New England. Currently there is only one building on battery P8 which will be occupied by trials personnel. This building is licences for explosives processing up to 100 grammes. The license for R Battery has been changed to show that a processing room P20 has been scheduled but is not yet in existence. In order to maximise the NEQ of building P20 it is necessary to provide adequate traversing at least to the north east and south east elvations. The licence building schedule to P20 could usefully be amended to incorporate Storage an an "In Lieu" basis.

3.9.1. Actions Required

1. P20 requires new steel building, not brick or concrete. (H & G manufacture suitable pre-fabricated units)
2. Process building P20 needs to be located at an appropriate distance from the process building P8 as per the licensed area plan.
3. The process building P20 will require traverses equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building(s) they surround with a minimum width of mound at eaves level being 1 metre.
4. Some additional hard standing may need to be provided for building P20.
5. Access roads for vehicles already exist in the area, but the existing vehicle turning area should be checked for suitability.
6. Roofs to be hardened on all explosives buildings.
7. A suitable lightning protection system must be provided for all explosive buildings/locations.

See Appendix A Page 24

1.11 Eastwick Battery

1.11.1 Problem

The battery is used for rotary engine and rocket motor testing. The conditioning/storage locations for rocket motors and other ancillary ammunition was located in close proximity to other inhabited buildings on the battery

1.11.2 Actions Required

1. Two new locations are required for the Mobile Conditioning Chambers (MCC30 and MCC30A) used in support of battery operations. Each location will require to be located at ½ IBD from any inhabited non explosive building and the appropriate internal magazine distance from each other and the spine road.(see Layout Plan).
2. Each MCC will require a traverse equivalent in safety and effectiveness to an earth mound to the height of the eaves of the building they surround with a minimum width of mound at eaves level being 1 metre.
3. Hard standing to be provided for all MCC locations
4. Access roads and turning area for vehicles to be provided to all new locations
5. Roofs to be hardened on MCCs.
6. Intruder detection system to be in installed for all over night storage in the mobile conditioning chambers
7. CCTV to be installed to cover any area that cannot be seen from existing equipment once new buildings and traverses are in place
8. A suitable lightning protection system must be provided for all explosive buildings/locations.
9. Power supplies to be provided to all MCC locations

10. Building work including the refurbishment of existing battery buildings (Scope to be specified dependant on end use)

See Appendix A Page 25

1.12 Environmental Test Centre (ETC)

1.12.1 Problem

After reviewing all new licences it is clear that some of the new explosive licence limits are more restrictive than the those previously granted under MOD licensing and could result in a less flexible operation of the site and an inability to handle larger stores without having to close down other parts of the site in order to provide adequate levels of safety. This would obviously be detrimental to efficient use of the existing testing facilities and reduce the overall capability of the ETC site in handling extra volume of work. Many of the constraints on the licensed limits are due to the close proximity of explosive building to offices, control rooms and other explosive buildings. Safety of ETC personnel and increase in licence limits of the existing testing and process buildings can be achieved by reinforcing and traversing certain buildings, and by relocating control rooms.

Currently, there is no facility at ETC for staff to take their meal breaks and ETC staff are therefore required to eat their meals at their desks within the hazardous area. The HSE take the view that if workers are on a meal break, they should not be exposed to the same level of risk as they would be expect to be exposed to when carrying out necessary tasks. There are two possible solutions to this problem; provide a rest room facility outside of the danger area for meal and rest breaks to be taken or remote all operations back to building 3 so that personnel in charge of the trials are normally in a place of safety and can therefore eat at their desks.

1.12.2 Actions Required

1.11.2.1 Building 3: Administration

1. Move Dynamic and Climatic personnel from control rooms 43 and 33 into the office space vacated by Demil and provide data link between buildings 3, 6 and 33.
2. Internal walls to be removed to provide sufficient accommodation space (suggest combining rooms 24, 25, 26, 27 and 27A to provide on large open plan office).
3. Refurbish walls and redecorate. Replace carpet.
4. Provide fibre optic network link in underground ducts (and associated connections) in B3 (approx 25) between buildings 3, 6, 25, 30, 33 and 43 to enable remote control and monitoring of test equipment.
5. Provide 16 Cornet connections and 4 additional phone connections.
6. Toilet facilities will be required for 30 staff – refurbishment of existing toilets in B6 probably required to meet this requirement.

7. Provide suitable kitchen area for 30 staff to use for lunch and providing tea, coffee and microwave facilities

1.11.2.2 Building 4A: Electronic Workshop and Store

1. B4a to be converted to workshop area for the engineering team.
2. Remove and replace existing flooring in current area.
3. Fit 32 Amp 3 phase socket.
4. Provide one additional phone point.
5. Assess/remediate current lighting/electrical installation for compliance with legislation if necessary.
6. Build cupboard around switch gear by door to make safe.
7. Redecorate walls ceiling and woodwork.
8. Refurbish existing workshop rest room for use as an office/document storage area.

1.11.2.3 Building 6: Calibration workshop

1. No change but increase in occupancy. Relocate Technical Services from B72 into B6.
2. Remove internal partition wall between lab and rest room.
3. Make good all walls. Replace carpet.
4. Redecorate all walls, ceilings doors and wood work.
5. Provide 7 Cornet connections and 4 phone connections.
6. Connect local control network data link from B3.

1.11.2.4 Building 10: Ammunition inspection building

1. Construct a technically justified traverse to restore the 150kg Hazard Type 1 limit (the buildings' explosive licence).

1.11.2.5 Building 22A: X-Ray and Sectioning control room

1. Replace existing exterior door and frame with 16mm steel construction.
2. Fit air conditioning – justified by now having a fully enclosed office space without windows and an armoured door, the only cooling during hot weather would be to open the door!

1.11.2.6 Building 25: Control Room

1. Remove existing "Critall" type windows (5) and 6mm steel shutters from window openings.
2. Brick up exiting window openings to the same standard as existing (225mm brickwork).
3. Plaster and make good interior walls to match existing decoration.
4. Replace existing exterior door and frame (4ft 8in wide 6ft high) with 16mm steel construction.

1.11.2.7 Building 33: Control Room

1. Remove existing "Critall" type windows (13) and 6mm steel shutters from window openings.
2. Brick up exiting window openings to the same standard as existing (225mm brickwork).
3. Plaster and make good interior walls to match existing decoration.

4. Replace existing exterior door and frame (6ft 4in wide 6ft 8in high) with 16mm steel construction.

1.11.2.8 Building 40: Process building

1. Construct a technically justified traverse to protect B40 from B45?

1.11.2.9 Building 43: Control Room

1. Remove existing "Critall" type windows (5) and 6mm steel shutters from window openings.
2. Brick up exiting window openings to the same standard as existing (225mm brickwork).
3. Plaster and make good interior walls to match existing decoration.
4. Replace existing exterior door and frame (4ft 8in wide 6ft high) with 16mm steel construction.

1.11.2.10 Building 44: Sand and Dust Cell

1. Construct a technically justified traverse in front of the frangible north wall to provide protection from fragments from ether Building 38 or 45.

1.11.2.11 Building 49 and 49a: Climatic building

1 Review and implement measures to restore explosive limit to 900kg Hazard Type 1 based on removal of control room staff from B72 and B43. There are 2 conditioning chambers in this building (although there are 2 building numbers they are joined by a single common wall). With the current limitation, only one chamber can be used at once, restoration of the upper limit will allow both to be used at once - remembering that ETC often process pallets or unit loads of items, so a large limit is required if more than one is to be conditioned.

1.11.2.12 Building 54: Climatic building

1. Construct a technically justified traverse on west aspect to provide protection from fragments from Building 56.

1.11.2.13 Building 56: Ammunition Inspection Building

1. Construct a technically justified traverse on east aspect to provide protection from fragments from Building 54.

1.11.2.14 Building 55A: Disused Building

Building 56A can no longer be used as a control room for building 56. This combination of buildings has been used in the past to conduct electrical testing of rocket components.

Either and alternate control room located at a safe distance from Building 56 has to be found or an alternate location within ETC (ie an appropriate process building and an associated building which can be safely used as a control room) for carrying out this particular test has to be used. Building 29 controlled from building 25 or building 40 controlled from building 33 are combinations that would allow this work to be carried out. However various improvements to these buildings would be required.

Actions:

Carry out a cost benefit analysis to determine optimum combination of test and control building.

Undertake the work identified in the assessment above.

1.11.2.15 Building 67: Control Room

1. Construct a technically justified traverse on east aspect to provide protection from fragments from Building 68.

1.11.2.16 Building 70: Ammunition Storehouse

1. Construct a technically justified traverse on northeast aspect to provide protection from fragments from Building 68.

See Appendix A Page 26

Demilitarisation

Avocet Area

Building FB19 is no longer fit for purpose due to the deterioration of the fabric of the building. The building was originally licensed under MOD rules as a process building for the breakdown of munitions prior to feeding them through the Avocet incinerators. The building has not been used for this purpose for some considerable time and as the MSER licensing has reduced the NEQ of both of the feed rooms this building is required to be employed as an explosive store acting as a buffer stock of ammunition for supplying the incinerators during the day. Without a buffer store the ammunition would have to be brought from elsewhere on the site in a "Just-in-time" delivery process that would require investment in a small fleet of vehicles. A buffer store means that the demilitarisation process can start as soon as the incinerators are up to temperature, rather than having to load/unload vehicles and move the store a number of miles, it also allows for periods where an incinerator fails and stores can be moved back to the buffer during repairs.

Actions Required

1. Replacement of building FB19 is required, preferably with a prefabricated steel magazine (Possibly H & G) but a sustainability report should be commissioned to provide the correct building.
2. An earth traverse is already in place surrounding FB19 with a minimum width of mound of 1 metre at eaves level. Any replacement building should not exceed the height of these earth mounds, or the mounds will need reprofiling to correct any shortfall.

3. Hard standing, access roads and turning area for vehicles are already in existence, but need to be checked for suitability
4. Intruder detection system to be in installed for FB19.
5. A suitable lightning protection system must be provided for all explosive buildings/locations.
6. Power supplies are already provided to all FB19, but require checking for suitability.
7. The change in use of building FB19 is dependant upon the Gas Oil Storage being removed from its current location and being relocated at the entrance to the AVOCET site, outside of the danger area. The opportunity should be taken to change the heavy fuel oil supply for LPG, as this is cleaner to use, and its storage system will be cheaper to install than a fully bunded fuel oil storage system.

See Appendix A Page 27

White City Area

In order to protect occupied buildings, FM30 in particular, from possible fragmentation effects from nearby explosive storage and process buildings, a Pendine block wall needs to be built. Pendine block structures are accepted by the HSE as effective mitigation against high velocity, low angle fragments and therefore can be used in this instance.

Actions Required

1. Pendine block wall to be constructed along the length of FM29 to a height of at least 2.5m. If stability of a Pendine Block structure is deemed to be unsuitable for a long term solution them an alternative R/C structure may be required.
2. Pendine block wall to be constructed between FM117 to FM116 to a height of at least 2.5m. If stability of a Pendine Block structure is deemed to be unsuitable for a long term solution them an alternative R/C structure may be required.

See Appendix A Page 28

X3 Battery

Layout changes are required to X3 battery in order for the battery to meet licence requirements.

Actions Required

1. Layout change required to relocate burning cages further away from battery buildings, together with general clean up and improvement to access.
2. Security fencing required around disposal area.
3. In order to protect the fence from damage due to projected material from Demil activities, an earth traverse is required as shown on the license area plan

See Appendix A Page 29

DAT Battery

Layout change for DAT interceptor traverse required to NW of FM76 to protect from DAT Battery North Pan has already been identified in Section 1.3.

2. Conclusions

- The layout of certain batteries is such that the buildings, both explosive licensed and unlicensed buildings are too close to provide an adequate level of safety to personnel where HD1.1 material is being processed and stored and therefore the HSE have stated that they are unable to licence the operations on battery.
- Various solutions exist for overcoming this problem, but the solution with the greatest chance of success is to move the storage and processing away from the other trials buildings to provide an adequate level of safety.
- Separation distances of 31 metres would allow a maximum HD1.1 explosive content within the explosives buildings of 200 Kg while 48m separation would allow for 500 kg. The work needs to be done anyway to meet the licence; the additional distances make little difference to the costs.
- By utilising Mobile Conditioning Chambers and Mobile Ammunition Process/Crimping Buildings, these distances can be achieved on battery.
- In order to utilise the mobile units concrete plinths will be required to be positioned at that required locations together with access roads and paths to allow the safe location of these units and also to permit the safe transport of ammunition between these units and the firing point.
- Other work including electrical upgrading of some explosive process buildings, maintenance of unused buildings and the fencing of hazardous areas, such as X3 demolition ground and DAT battery will also be required.
- ETC requires significantly more work than had previously been anticipated due to the HSE changing its view regarding the applicability of JSP 482 safety distances.
- HSE will no longer accept un-traversed process buildings without a full technical justification to demonstrate the equivalent level of safety from blast; fragment and thermal effects as compared with the MSER model.
- Any control rooms required to protect personnel from the blast effects outlined above must be subject to a structural assessment to demonstrate that the do provide an adequate level of protection.
- Environmental assessments will be required for these works as well as planning permission for all but the most minor of works
- Under MSER operatives are not permitted to consume food whilst on battery and there is also requirement to ALARP the risk to operatives and evacuate all non essential personnel whilst final disposal is being conducted. At DAT the recovery point has been agreed as either a new build at 1200m Stop Gate or at Churchend. X3 alternative was agreed as being situated at Jerrywood. A5 Mags and APB rest room was agreed as being situated at the Salt Pit just after White City.
- During the requirements capture phase, concluding in this document, it has been decided that most of the control rooms within ETC will be changed to remote laboratories (the exception being X-ray building 22A). People will have temporary access to set up trials, but then retire to Building 3 or 6, outside the controlled explosives area to monitor the conduct of the trial. This has resulted in a reduction in

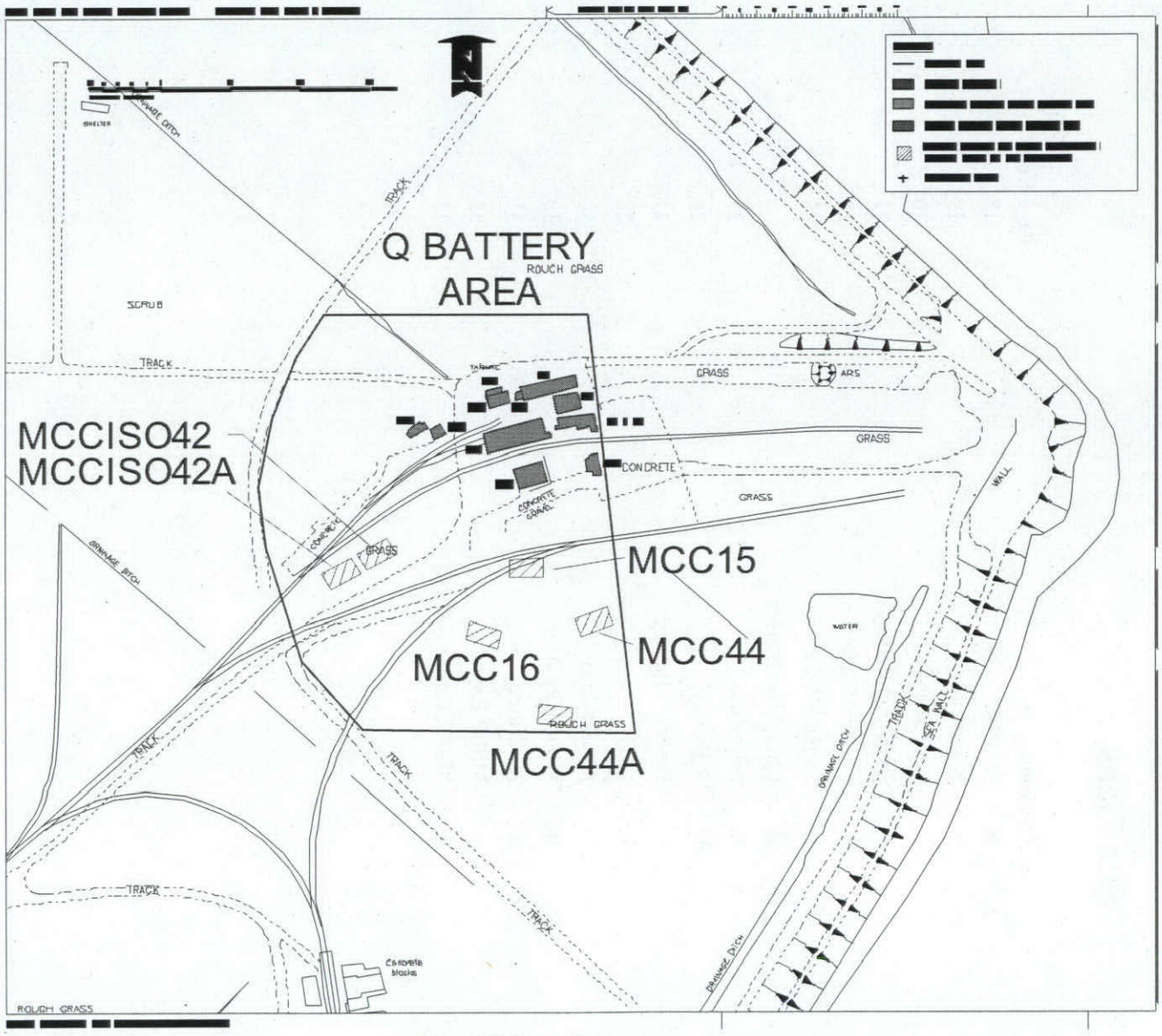
the numbers of traverses necessary to protect Buildings 25, 30, 33, and 45. This reduces the risk to people, cuts down construction costs and reduces the effect of building work interfering with the day-to-day site delivery.

- As most people will now be housed in suitable office accommodation, there is now no longer a need driven by MSER to construct or change use of a building to make a Rest room. A suitable room with kitchen facilities should be made available within building 3.

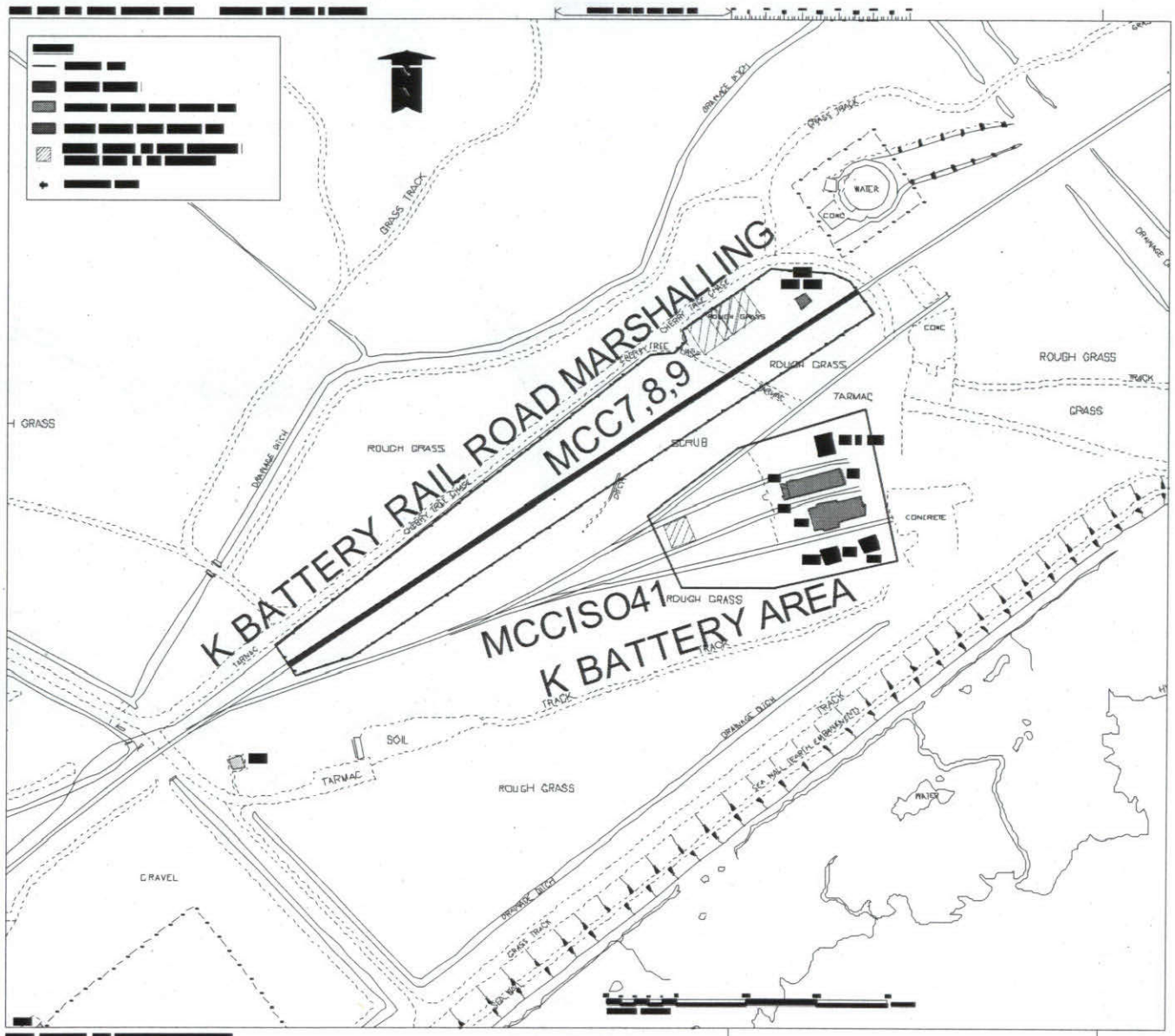
3. Appendix A

Site Plans

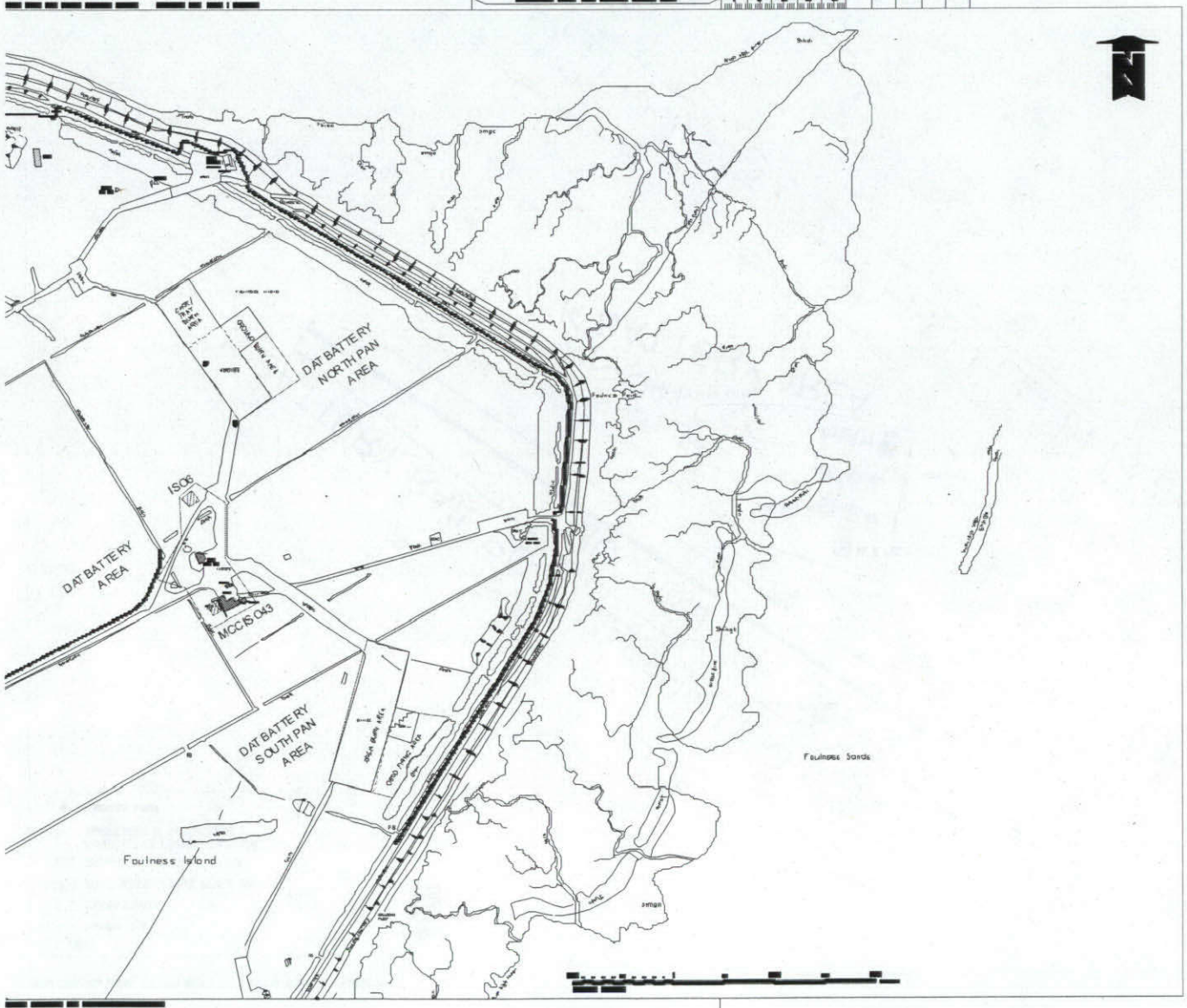
Q Battery


Q BATTERY AREA
MCCISO42
MCCISO42A
MCC15
MCC44
MCC16
MCC44A
ROUGH GRASS
SCRUB
TRACK
GRASS
CONCRETE
WALL
WATER
DRAINAGE DITCH
ROUGH GRASS

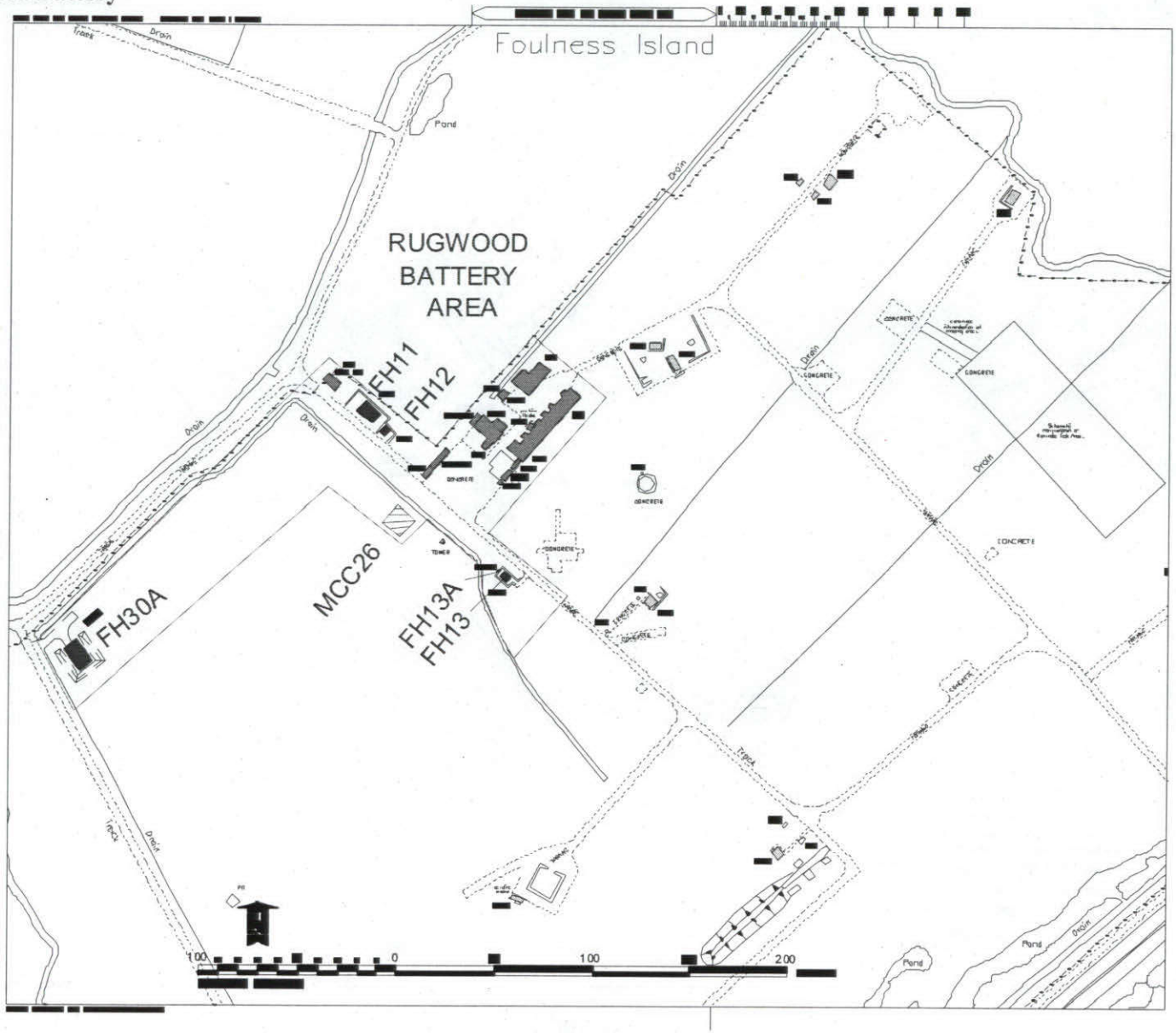
K Battery


K BATTERY RAIL ROAD MARSHALLING
MCC7,8,9
MCCISO41
K BATTERY AREA
ROUGH GRASS
TARMAC
SCRUB
CONCRETE
GRASS TRACK
DRAINAGE DITCH
WATER
CONC
SOIL
GRAVEL
TRACK

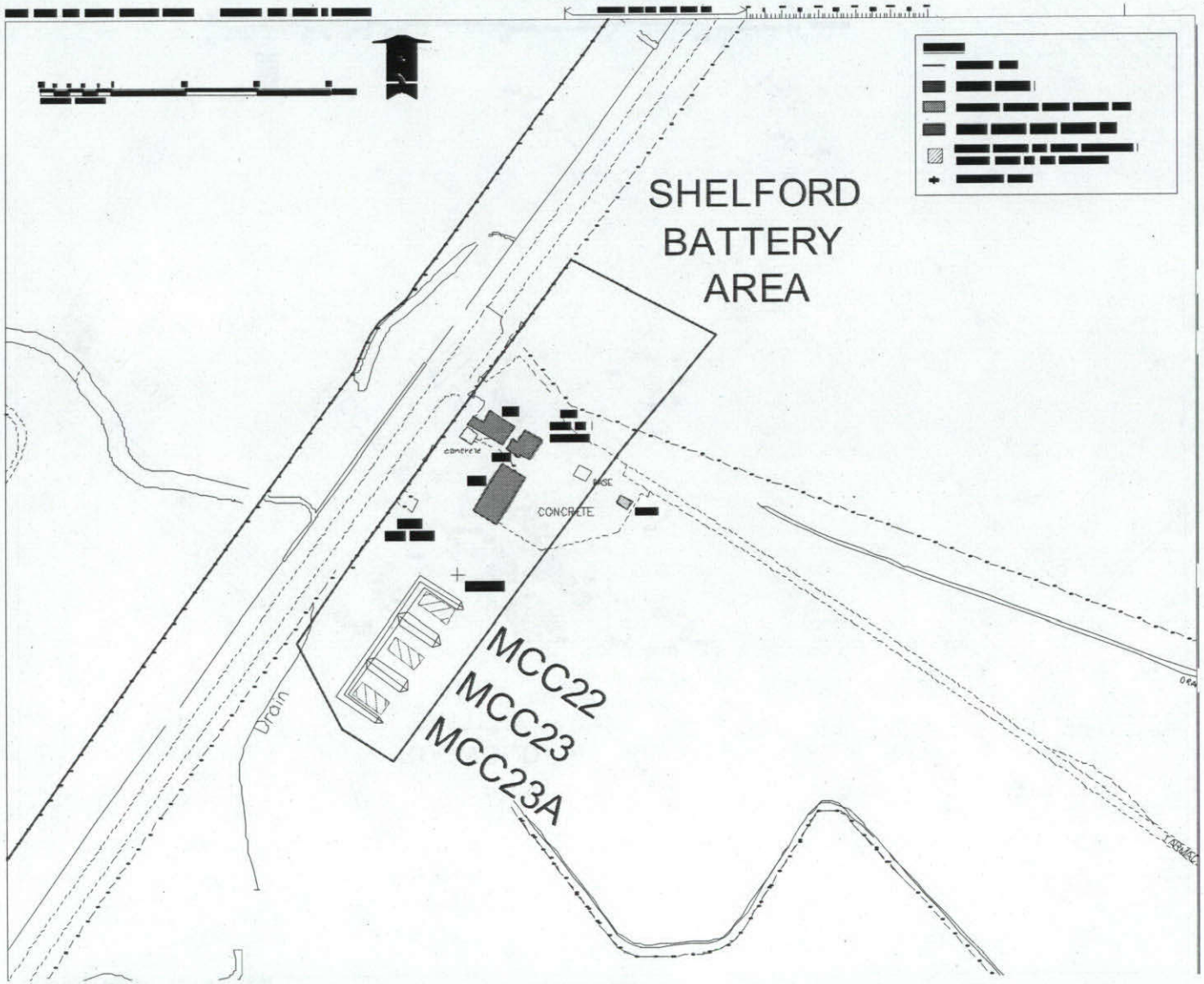
DAT Battery


DAT BATTERY NORTH PAN AREA
DAT BATTERY AREA
ISO6
MCCIS 043
DAT BATTERY SOUTH PAN AREA
Foulness Island
Foulness Sands

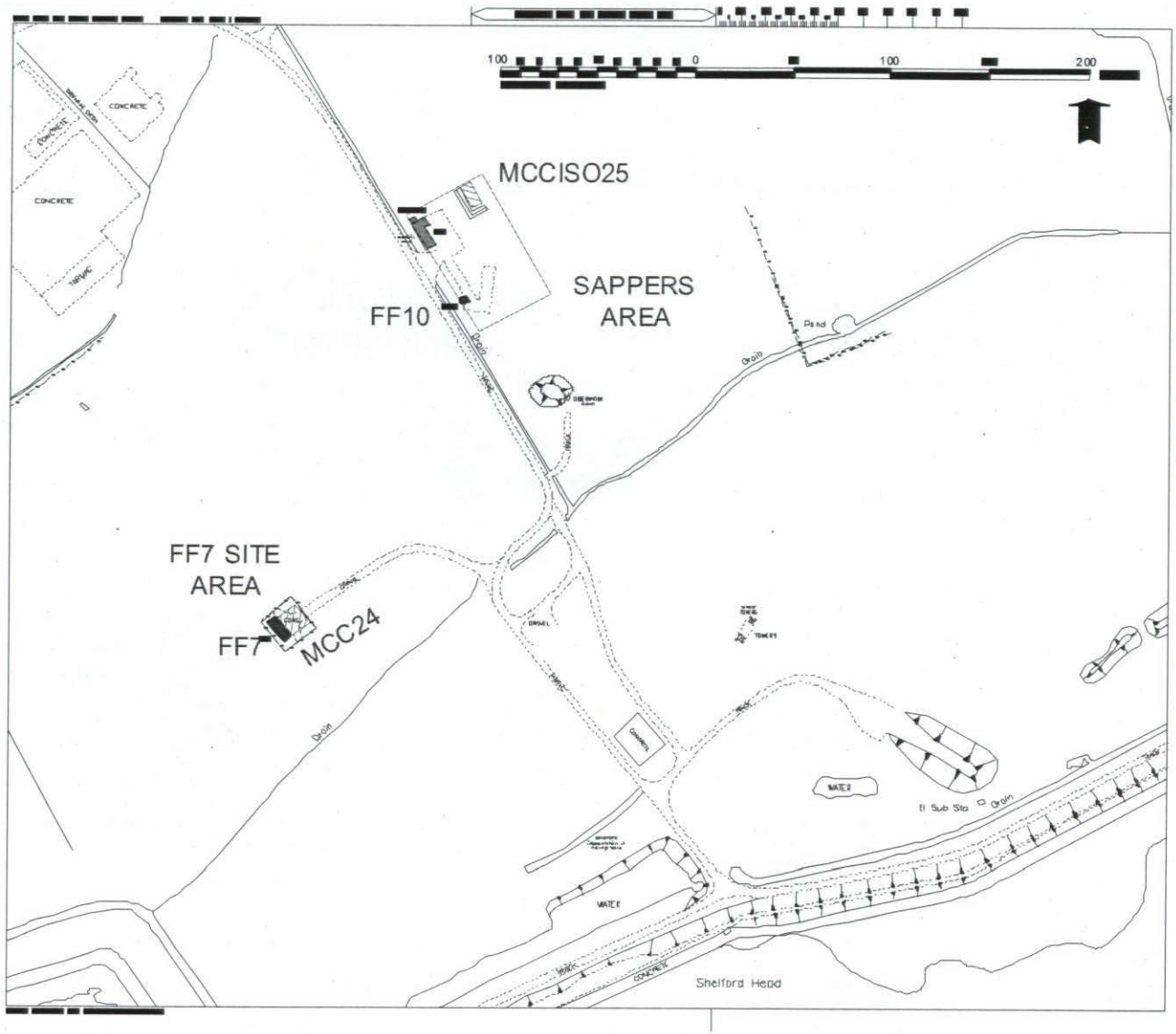
Rugwood Battery



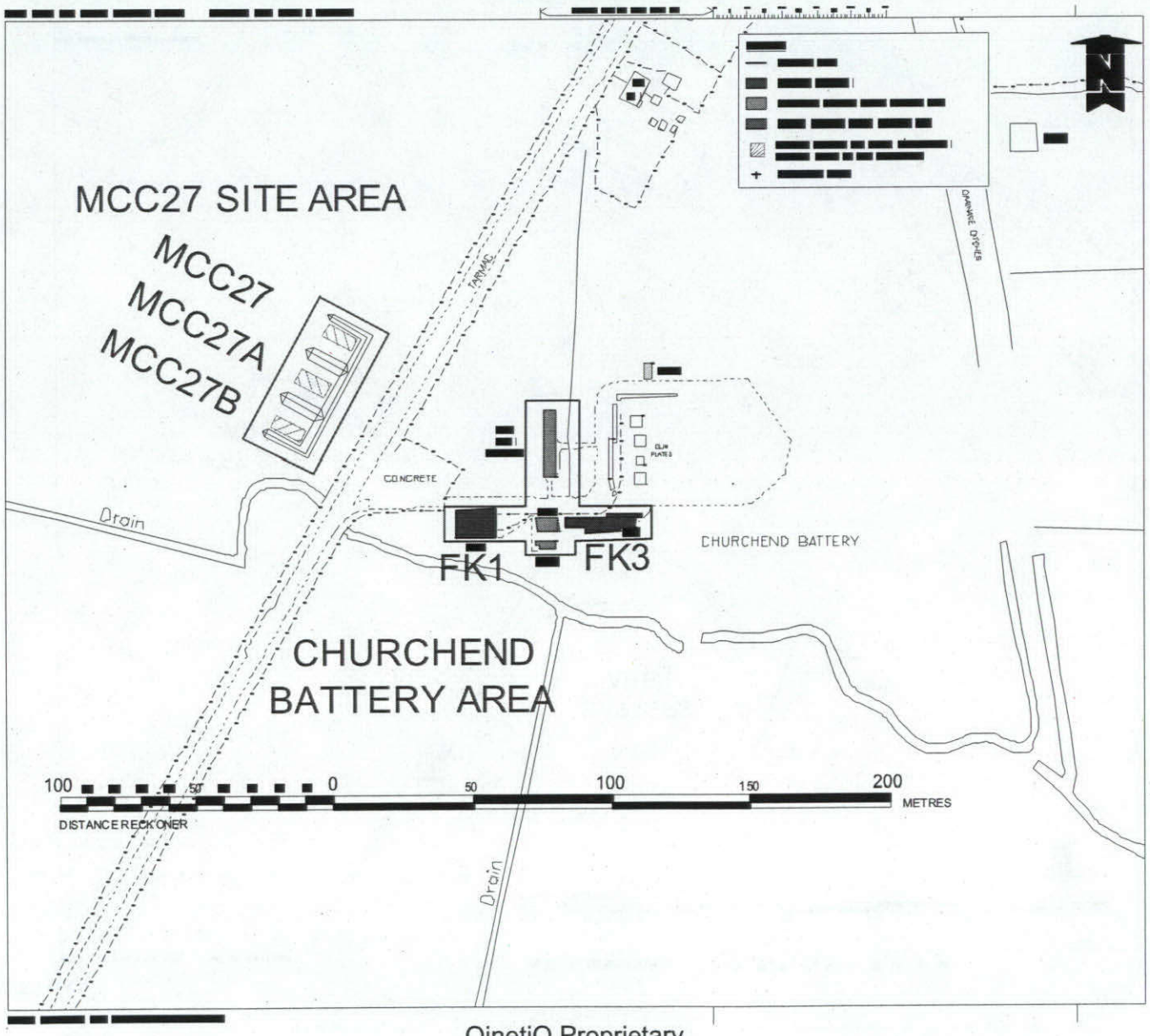
Shelford Battery

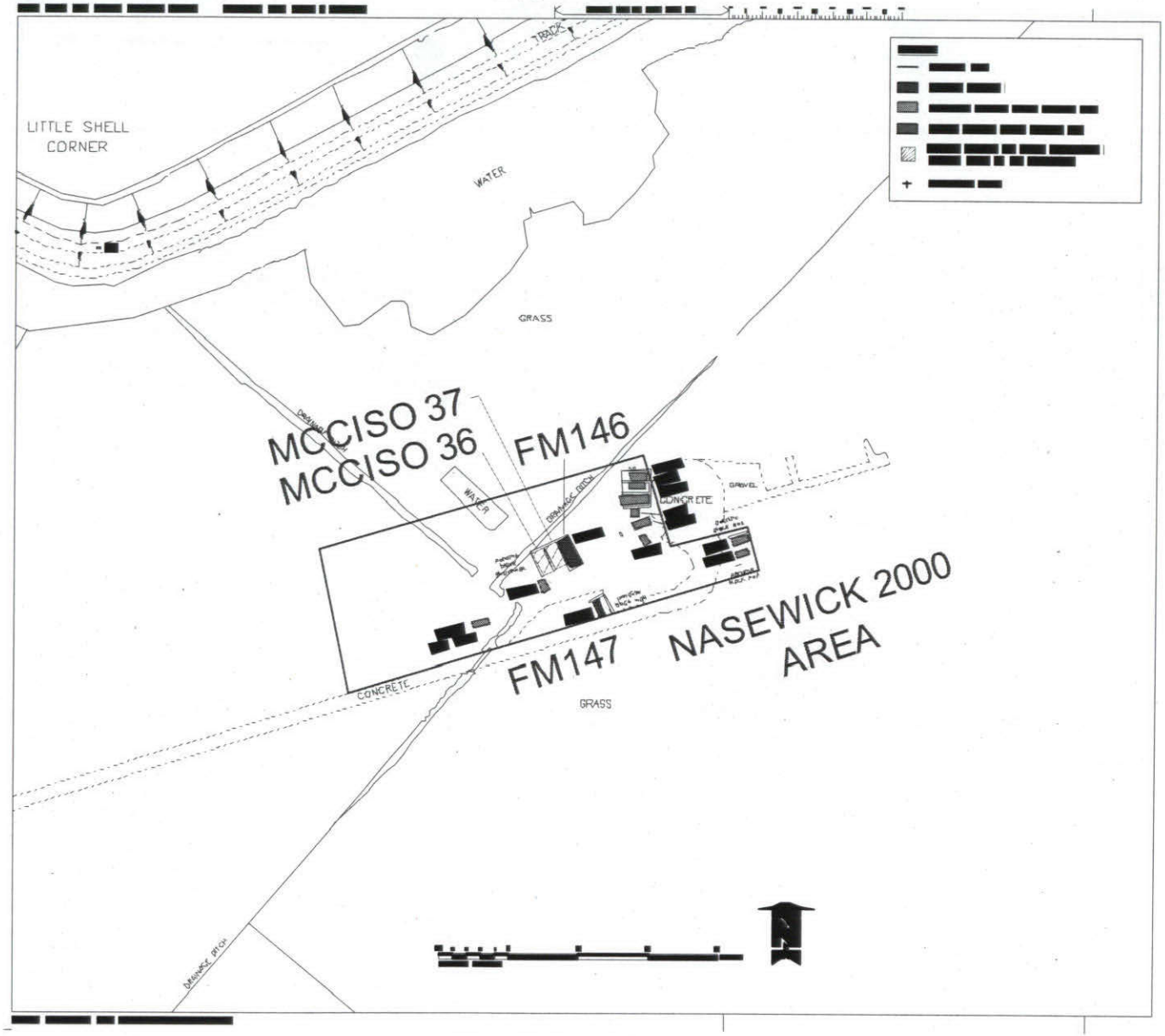


Sappers Area

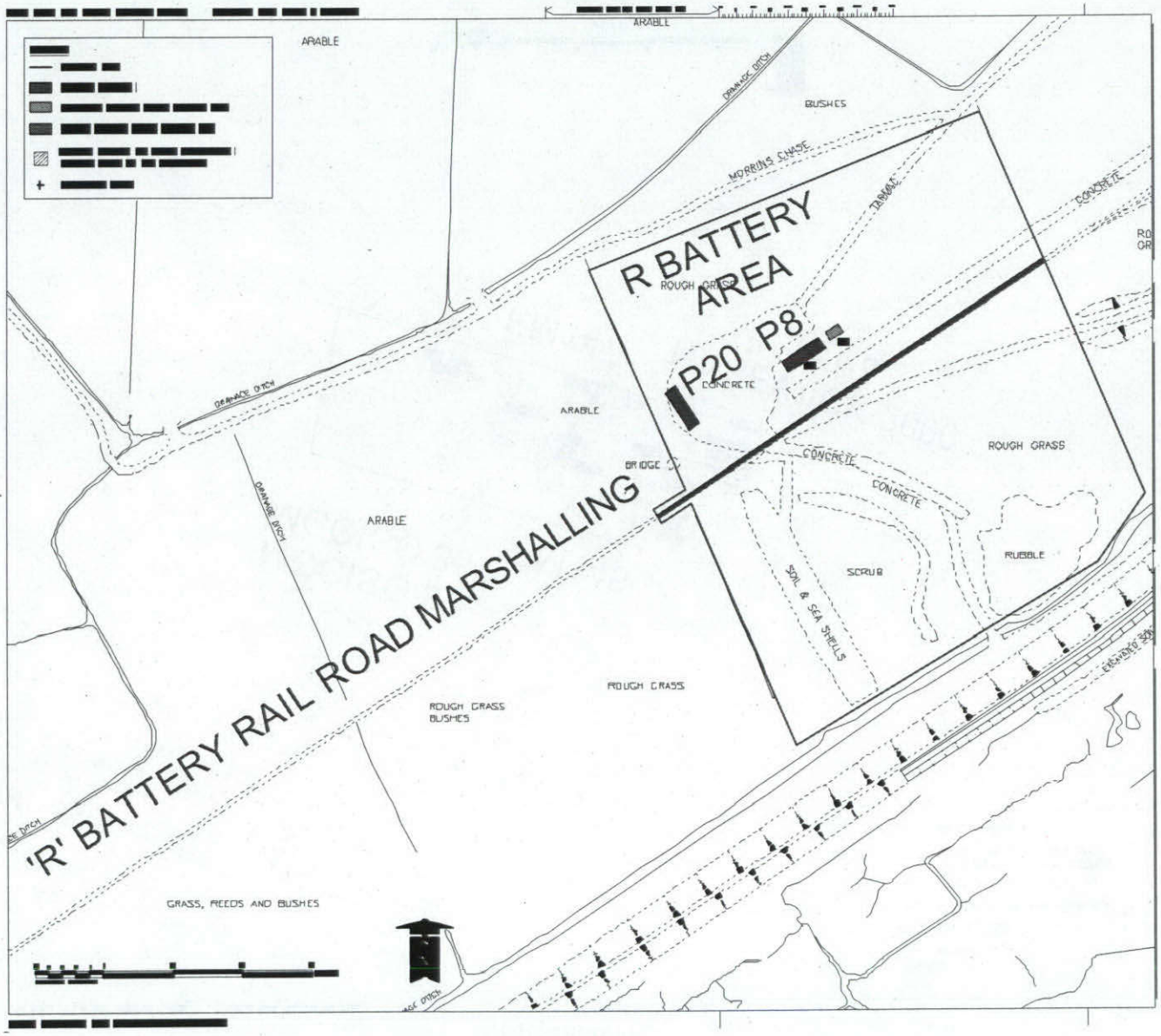


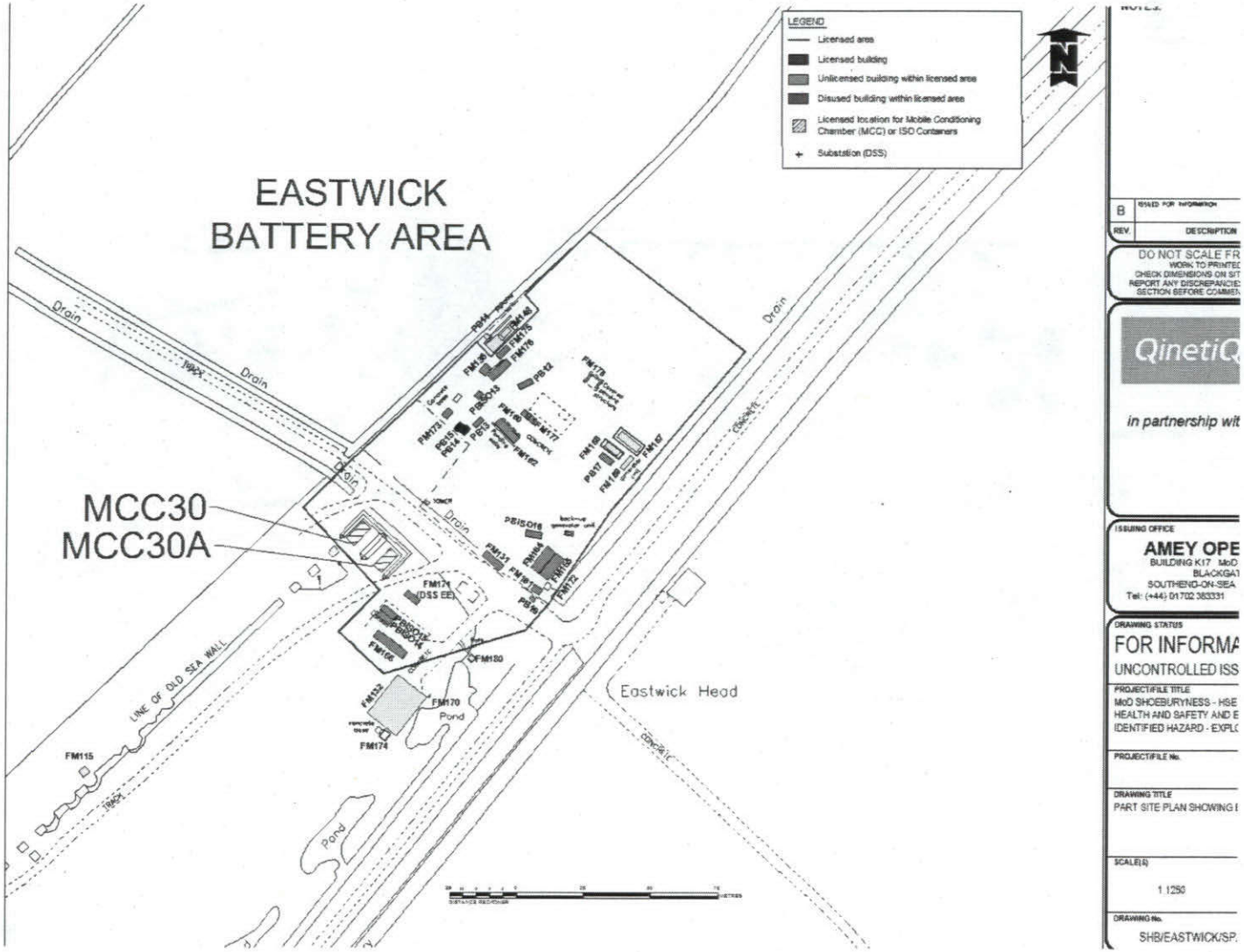
Churchend Battery

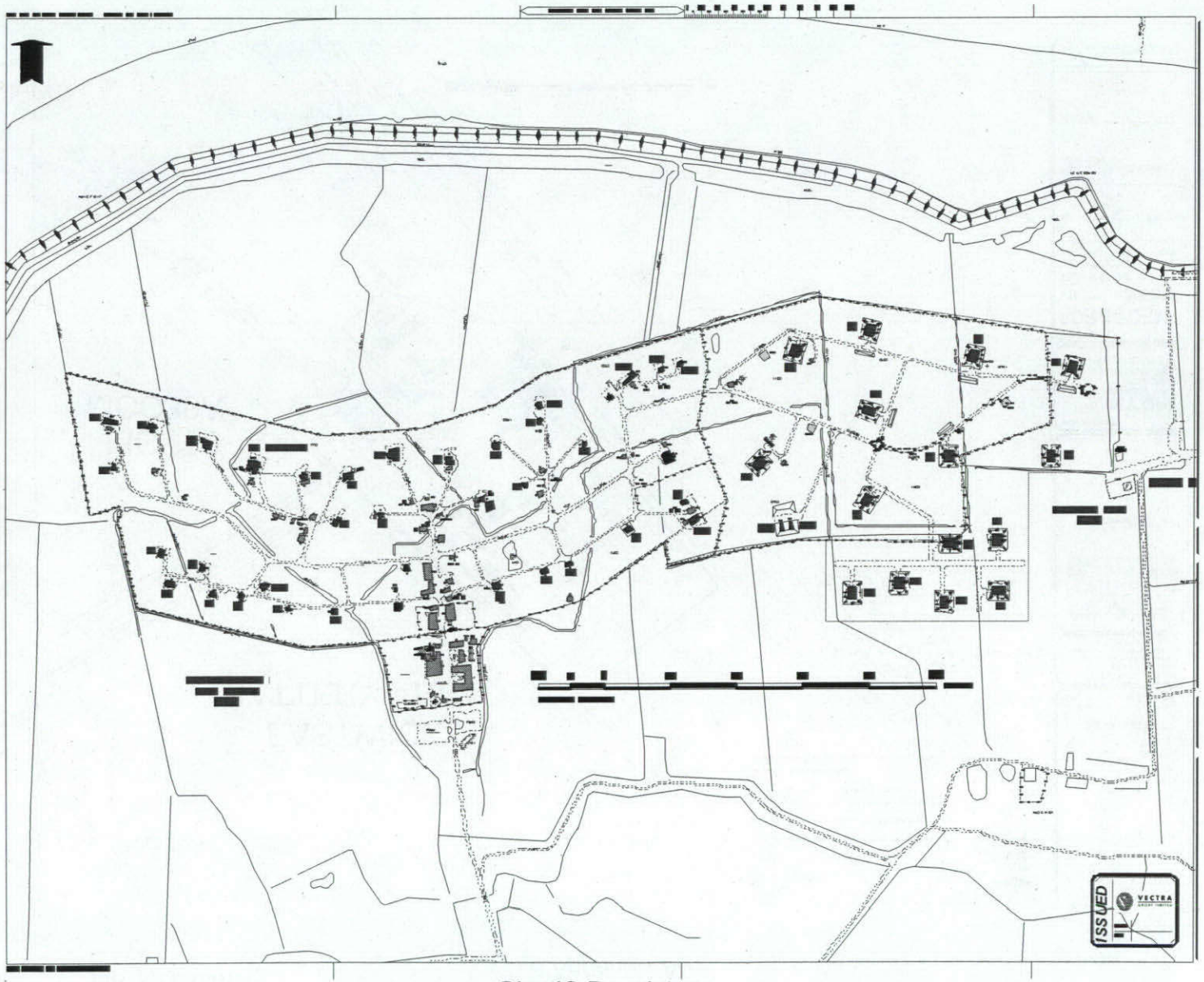



LITTLE SHELL
CORNER
TRACK
WATER
GRASS
MCCISO 37
MCCISO 36
FM146
CONCRETE
GRAVEL
FM147
NASEWICK 2000
AREA
CONCRETE
GRASS

R Battery

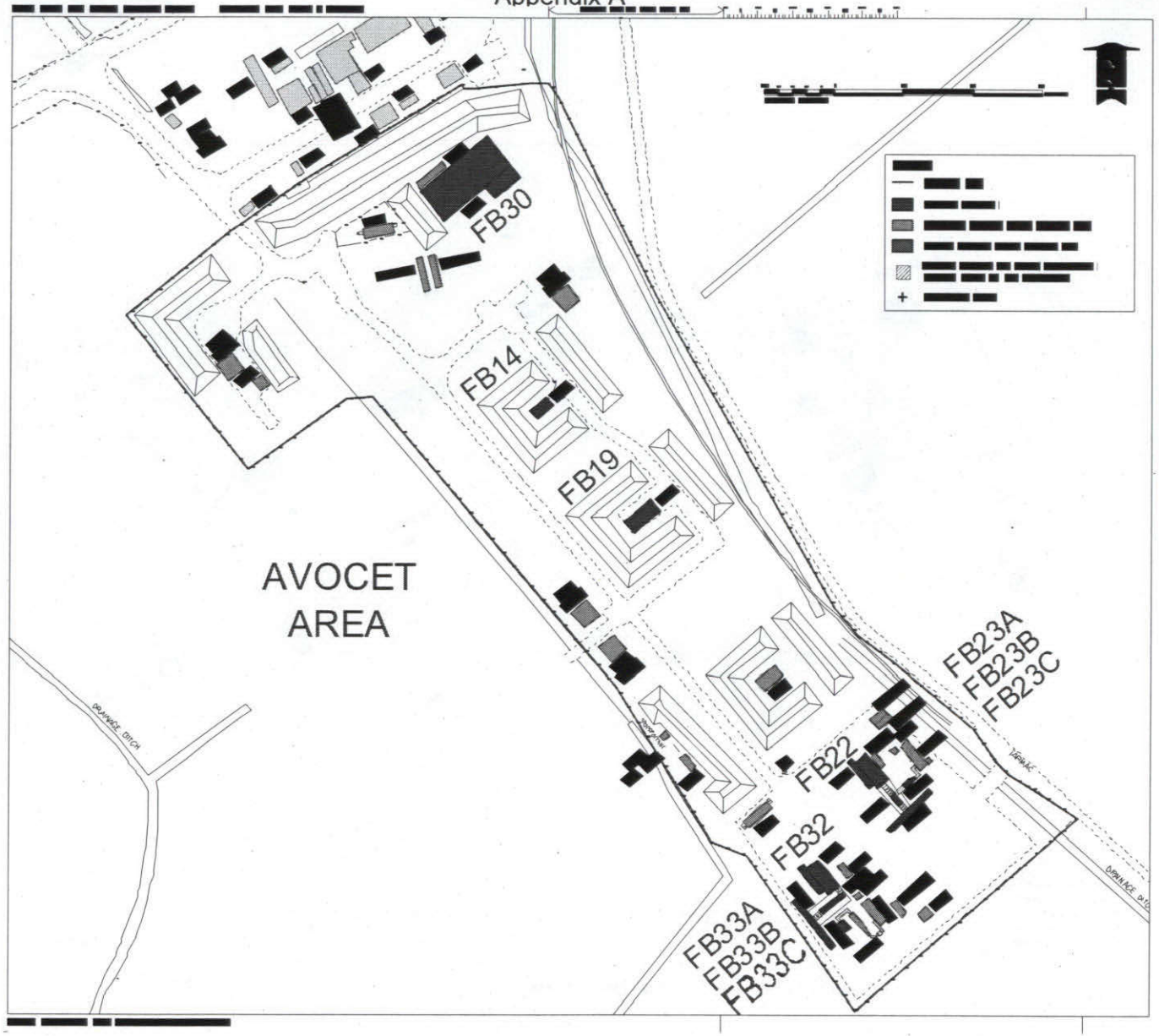

ARABLE
ARABLE
DRAINAGE DITCH
BUSHES
MORRIS'S MASE
TARMAC
CONCRETE
R BATTERY AREA
ROUGH GRASS
P20
P8
CONCRETE
ARABLE
DRAINAGE DITCH
BRIDGE
CONCRETE
CONCRETE
ROUGH GRASS
'R' BATTERY RAIL ROAD MARSHALLING
ARABLE
SCRUB
RUBBLE
SOIL & SEA SHELLS
ROUGH GRASS
ROUGH GRASS
BUSHES
GRASS, REEDS AND BUSHES


EASTWICK
BATTERY AREA
MCC30
MCC30A
Drain
Drain
Drain
Drain
Drain
LINE OF OLD SEA WALL
Eastwick Head
Pond
Pond
FM115
FM170
FM174
FM171
(DSS EE)
LEGEND
Licensed area
Licensed building
Unlicensed building within licensed area
Disused building within licensed area
Licensed location for Mobile Conditioning Chamber (MCC) or ISO Containers
Substation (DSS)
N
B
REV.
DESCRIPTION
DO NOT SCALE FR
WORK TO PRINTED
CHECK DIMENSIONS ON SIT
REPORT ANY DISCREPANCIE
SECTION BEFORE COMMEN
QinetiQ
in partnership wit
ISSUING OFFICE
AMEY OPE
BUILDING K17 MoD
BLACKGA
SOUTHEND-ON-SEA
Tel: (+44) 01702 383331
DRAWING STATUS
FOR INFORMA
UNCONTROLLED ISS
PROJECT/FILE TITLE
MoD SHOEBURYNESS - HSE
HEALTH AND SAFETY AND E
IDENTIFIED HAZARD - EXPL
PROJECT/FILE No.
DRAWING TITLE
PART SITE PLAN SHOWING
SCALE(S)
1:1250
DRAWING No.
SHB/EASTWICK/SP

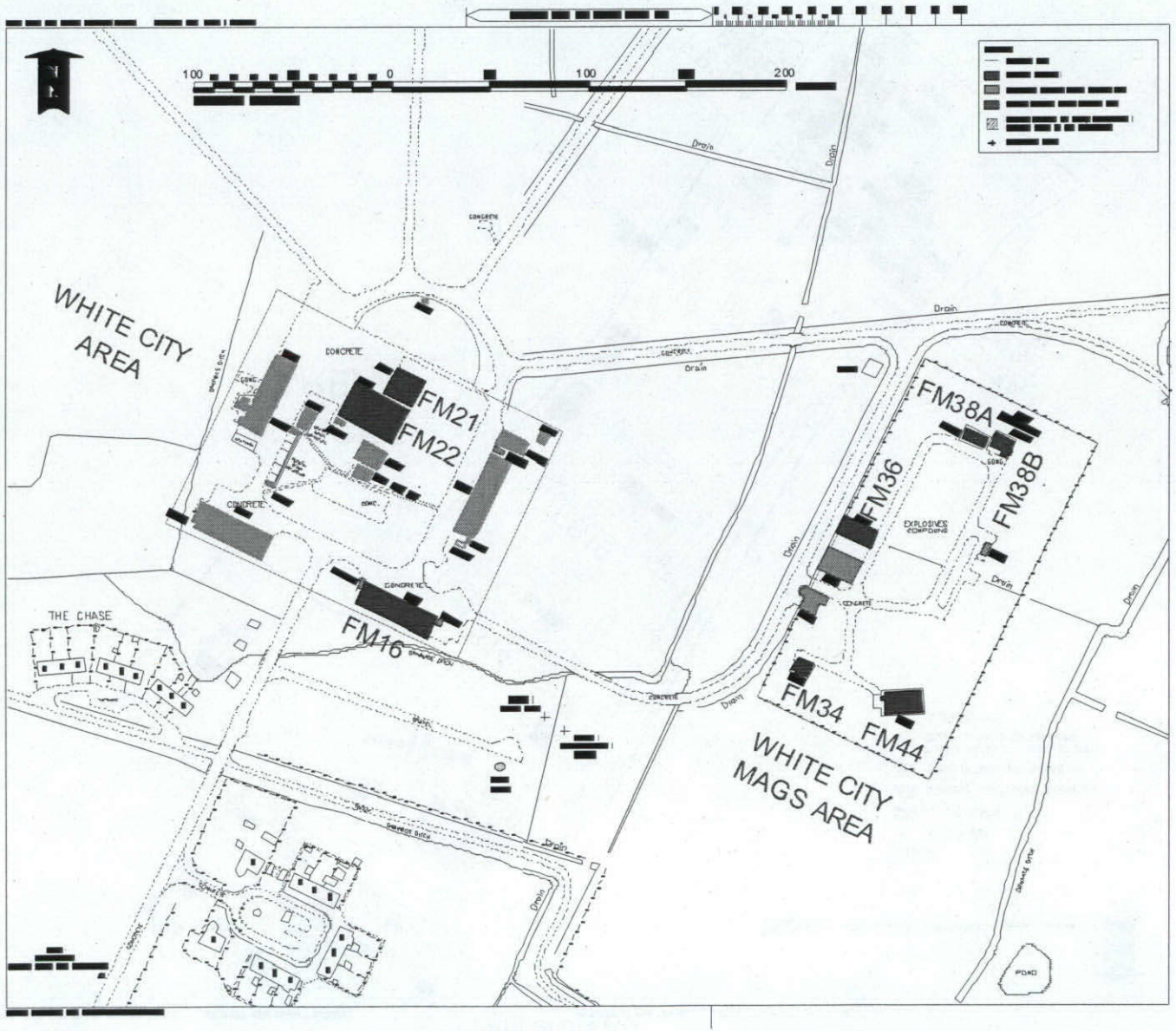

ISSUED
VECTRA

Avocet Area

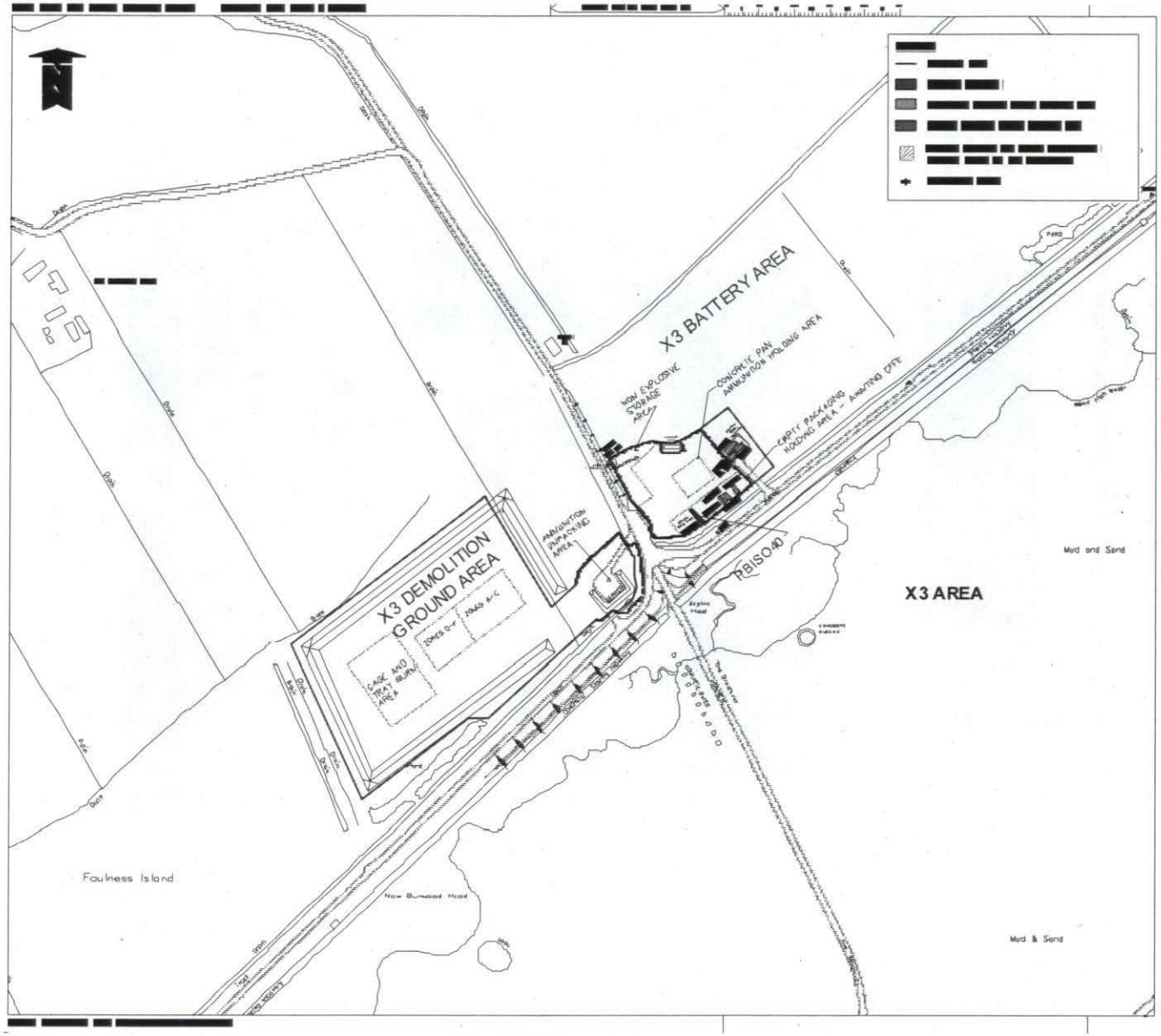
Appendix A



White City Area

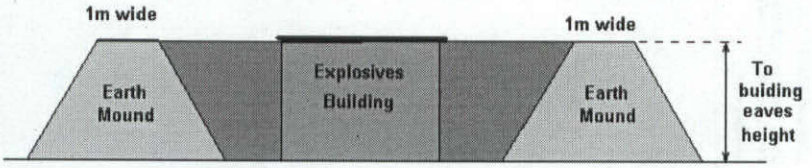


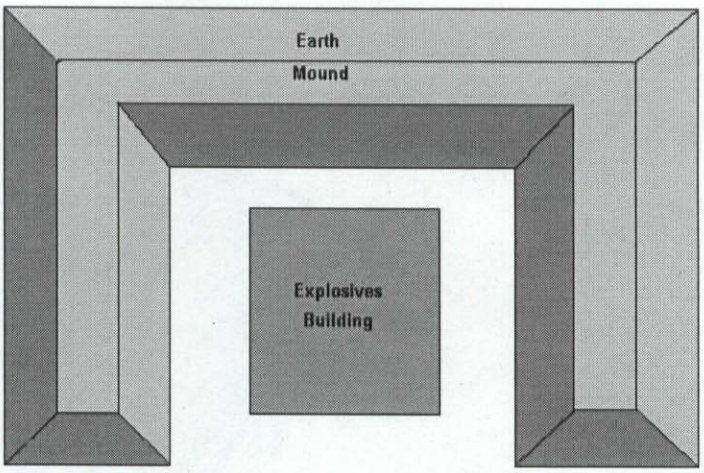
X3 Battery


X3 BATTERY AREA
NEW EXPLOSIVE STORAGE AREA
CONCRETE PAN AMMUNITION HOLDING AREA
EMPTY PACKAGING HOLDING AREA – AWAITING DISPOSAL
X3 DEMOLITION GROUND AREA
CAGE AND TRAY BURN AREA
AMMUNITION UNPACKING AREA
X3 AREA
RBIS040
Mud and Sand
Mud & Sand
Foulness Island
New Burnwood Head
Path
Ditch
Pond

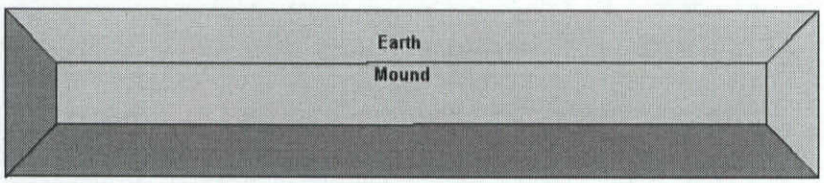
Basic Arrangements for the mounding of explosives building as required by MSER 2005

General arrangement of explosive buildings and mounding as required by MSER

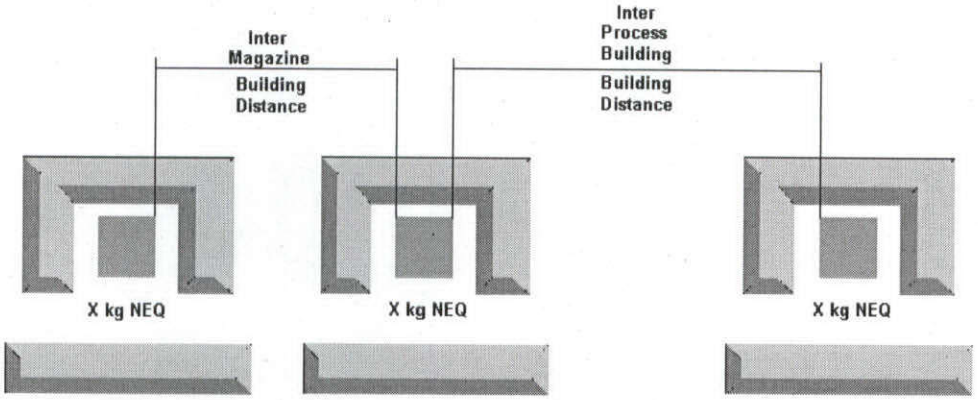




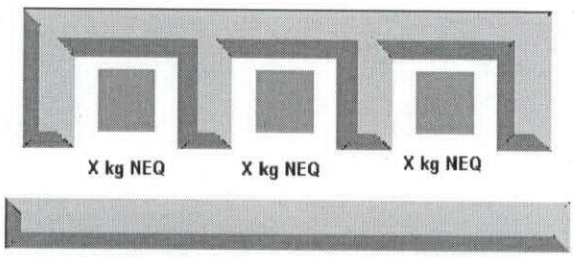
ACCESS ROAD



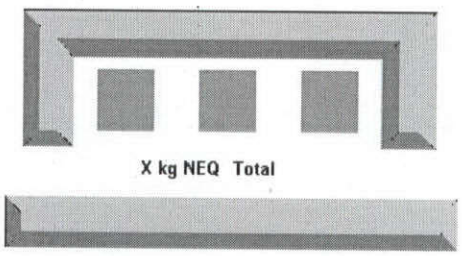
2 Further Variations on Explosives building layouts in line with MSER 2005



Normal Arrangement of Magazines and Process Building under MSER
(Note larger inter process building distance for same NEQ)



Alternative layout for Magazine/Process Buildings
(Internal distances between buildings determine NEQ)



Aggregated Storage

Note:

Other layouts could still comply so long as internal safety distances are adhered to.