

Method Statement and Risk Assessment

Site: Central Gelderland Power Plant
Hollandiaweg 11
6541 BL Nijmegen

Our Ref: C2002/MJW/MSD003a

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Title: Demolition of the remaining sections of the FGD
Ducting, by the Controlled Use of Explosives

Date: 26th February 2021

Document authorisation:

Originator	<div>5.1.2e</div>	<div>5.1.2e</div> <div>5.1.2e</div> Signature	<div>26/02/21</div> Date
Site Manager	<div>5.1.2e</div>	Signature	Date
SHE Manager	<div>5.1.2e</div>	Signature	Date

Brown & Mason Group Limited

Anson House, Schooner Court, Dartford, Kent. DA2 6QQ

Tel: +44 (0)1322 277731 www.brownandmason.co.uk

Fax: +44 (0)1322 284152 5.1.2e@brownandmason.co.uk

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Registered in England No. 1892133

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Revision Record

Rev	Date	By	Comment
-	10/12/20	5.1.2e	Document Issue
a	26/02/21	5.1.2e	Changes after structural design survey, updated SHE Manager

1.0 Introduction

- 1.1 As part of the complete demolition of Central Gelderland Power Station, it is our intention to demolish the remaining sections of the FGD Ducting, by the controlled use of explosives.
- 1.2 Following a detailed site survey carried out by our in-house structural engineer, we propose to demolish the FGD Ducting in the following manner.
- 1.3 The remaining sections of the FGD ducting are situated adjacent to the chimney, one at the north side and the other to the south. Each of these structures has a section supported by steel columns with the other half supported by reinforced concrete columns. The high-level ducting spans from the concrete supported section across to the steel supported section on both the north and south sides.
- 1.4 This document covers the explosive demolition of the FGD on the north side of the chimney only, with the south side section being demolished as a separate event at a later date.
- 1.5 The collapse of both the steel column supported section and the concrete column supported section of the structure covered by this document, will be in a northerly direction away from the chimney.
- 1.6 The horizontal ducting that enters the chimney from the structure being demolished, has an expansion joint immediately to the north side of the chimney. This will be confirmed as a clean separation which will allow the FGD structure to be demolished without disturbing the ducting/flue within the chimney.
- 1.7 As part of the preparation for the explosive demolition, sections of the ducting and the fans between ground level and the first horizontal beam level within each of the support structures, will be removed carefully, by a combination of hot cutting and machine work, to create space between the supporting columns. Care will be taken to ensure that the support columns are not damaged during the works, leaving the columns isolated in readiness for the final preparation works for explosive removal.

The collapse of the structure in the designed direction, will be achieved by a combination of the explosive removal of the columns on the northern side of the structures, hinge cutting of the rear columns and separation of the high-level ducting running into the chimney as described above.


The preparation works will be carried out in a carefully controlled pre-determined work pattern, under the supervision of our site manager and his team, all of whom are experienced personnel, fully trained to undertake work activities of this nature. The final preparation works and the charging and connecting with explosives, will be conducted under the direct supervision of the Explosives Manager, who is experienced and qualified in the use of explosives.

The required preparatory cuts will be quality checked at every stage by the Supervisor or qualified Top Man carrying out the works, with the information recorded on our Quality Control Check Sheets. As soon as a cut level is completed, a further check of that section will be carried out by the Site Manager, who would also sign the check sheets to confirm that all is correct. Until that check had been completed no work will commence on the next level down.

This method statement is to be read in conjunction with Blowdown Manual BDM1 and the relevant preparatory works method statement.

The following method statement describes in more detail, the work required to complete the Explosive Demolition of the north half of the remaining FGD structure.

2.0 Risk Assessment

Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Access Routes	a. Vehicles	BAM	3	2	6	<p>BAM would operate a traffic management plan across the site, which would be relayed to all personnel during site induction and toolbox talks as circumstances change.</p> <p>All demolition site traffic would enter at the main Power Station entrance.</p> <p>No person would drive a vehicle unless they were trained, competent, tested and or licensed to operate that vehicle. The following rules will to be adhered to:</p> <p>No person may drive a vehicle unless they are trained, competent, tested and/or licensed to operate that vehicle. The following rules are to be adhered to.</p> <ol style="list-style-type: none"> 1 A safe demolition site speed limit of 15km/h will be monitored and enforced. 2 Seat belts must be worn at all times. 3 The use of mobile phones is prohibited whilst driving and operating machines. 4 Engines are to be switched off when unattended with keys removed. 5 All premises, including car parks, have a mandatory reverse parking policy. <p>Suitable traffic management signage will be installed at the entrance to site.</p> <p>Vehicular / pedestrian segregation will be implemented across site. Segregation will primarily use the main roads and footpaths around the site. Access to demolition areas will be controlled.</p> <p>Access routes through site will be maintained clear to enable unrestricted access to foot / vehicular traffic, including the Emergency Services' in the event of an emergency.</p> <p>Emergency escape routes will be designated prior to commencement of work.</p> <p>Banksmen will be present during reversing operations, where operator's view is obscured. Flashing beacons would be fitted to all on site vehicles and plant.</p> <p>Plant and machinery will be fitted with traverse alarms to ensure safe manoeuvring.</p> <p>All demolition employees and visiting personnel to the site will be logged in and out at the site office.</p> <p>The Provisional Exclusion Zone drawing for this event, is included in Appendix 2 of this Method Statement.</p> 	2	1	2
	b. Plant	Contractors	3	2	6		2	1	2
	c. Personnel	Others	3	2	6		2	1	2
	d. Emergency								

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

1-2 : Work may proceed in accordance with Brown & Masons policy and procedures	3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)	6-9 : The work cannot commence until alternative method of work or additional control measures implemented
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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Bio-Security	a. COVID 19	B&M Contractors Others	3 3 3	2 2 2	6 6 6	<p>With regard to the risks and control measures required due the COVID 19 pandemic we have created a separate risk assessment, to be found in appendix 13 of the Health and Safety Plan, the main headings of which are:</p> <ol style="list-style-type: none"> 1. Site 2. Deliveries 3. Meetings 4. Inductions, Toolbox Talks, Training, etc. 5. Canteen 6. Toilet & Shower Facilities 7. CDM Demolition Zone 8. Use of Face Coverings <p>Measures for the control of spread of the virus are to be followed by all persons. The guidance on COVID19 / Coronavirus produced and issued by B&M is to be followed as this reiterates the current government guidance on minimising the risks from the virus.</p> <p>Any person exhibiting symptoms of the virus i.e., a dry cough and or a temperature or on the advice of a medical practitioner is to self-isolate for 7 days or 14 days if they share a residence with an infected person. Tissues are to be used and immediately discarded into rubbish bags. If no tissues are available persons are to sneeze and cough into the crook of their arm away from others. If symptoms of Covid 19 / Corona virus come on while at work, the individual is to immediately leave site and go straight home-they must not go back to company provided accommodation to minimise the risk of spreading the pathogen.</p> <p>Additional precautions are to be taken in line with the B&M guidance i.e always maintaining at least a 2m separation from all other persons. The 2m rule applies to <u>all areas</u> of site including welfare facilities, offices, canteen and other such locations.</p> <p>Additional thorough cleaning is to be carried out in all areas of site including welfare, offices, machines and vehicles.</p> <p>All persons are to regularly wash their hands thoroughly with soap and hot water for at least 20 seconds.</p> <p>Social distancing has been considered for each stage of the explosive charging process, with social distancing rules to be adhered to, so far as is reasonably practicable.</p>			



Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
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			S	L	RR		S	L	RR
Bio-Security (Cont'd)						<p>The following key stages have been reviewed and additional precautions developed where required.</p> <ol style="list-style-type: none"> 1. Installing cutting charges will be carried out in accordance with the 2m social distancing by the two-man charging team. 2. Installing kicking charges will necessitate the two-man charging team and two-man labour support team working within the 2m social distance requirement to place explosives and place the sand-bag nests. All personnel will wear a face covering, visor or glasses and gloves at all times. 3. Connecting-up of the explosive charges will also be carried out in accordance with 2m social distancing by the two-man charging team. 			
Asbestos	a. Air Bourne Fibre Release	BAM	3	3	9	<p>Asbestos containing materials were identified in certain structures within the Power Station during the initial surveys.</p> <p>All asbestos materials will be removed from the structures being demolished prior to the preparation works commencing and all necessary clearance documentation obtained.</p> <p>Background fugitive asbestos fibre monitoring and general dust monitoring would be carried out during the explosive demolition and reports produced.</p>	3	1	3
		Contractors	3	3	9		3	1	3
	b. Spread of Contamination	Others	3	3	9		3	1	3
Climatic Conditions	a. Darkness	BAM	2	3	6	<p>If lighting levels are below ambient or acceptable limits, lighting in the form of tower lights, halogen or festoon lighting would be used to allow safe access/egress.</p> <p>If cold weather conditions are encountered, all personnel will be issued with protective clothing as required. Sunscreen cream will be made available on site for use in sunny weather.</p> <p>During hot weather operatives will be provided with fresh cold drinking water and given rest breaks as required.</p> <p>In the event of stormy weather where lightning could be a factor, charging with explosives would be postponed and a safe exclusion zone maintained until the storm had passed.</p> <p>In the event of high winds during the final preparation works, the charging with explosives would be postponed until the wind had dropped to an acceptable level, which would be confirmed by our structural engineer within his calculations.</p> <p>If fog was present on the blowdown day and visibility was restricted enough that we could not guarantee the exclusion zone was clear, the blowdown would be delayed until the fog cleared.</p>	2	1	2
	b. Heat	Contractors	2	3	6		2	1	2
	c. Cold Conditions	Others	2	3	6		1	1	1
	d. Electrical Storms								
	e. High Winds								
	f. Fog								

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

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			S	L	RR		S	L	RR
CoSHH (Control of Substances Hazardous to Health)	a. Diesel Spillages	BAM	2	3	6	<p>The extent and presence of any substances hazardous to health will be established prior to commencement of work in the area. This will form part of the site COSHH assessment.</p> <p>The Ducting's and supporting structures look reasonably clean, but pockets of dust will probably remain in inaccessible areas within the structures when the blowdown is carried out.</p> <p>All deleterious material will be removed and disposed of in accordance with the SWMP, prior to the commencement of the preparatory works.</p> <p>Protective clothing will be provided in accordance with the COSHH assessment.</p> <p>Any suspicious materials will be sampled and analysed.</p> <p>All working areas will be inspected prior to commencement of work to assess any residual chemical contamination.</p> <p>Disposal of hazardous substances will be in accordance with statutory undertakings.</p> <p>When handling NG based explosives, the correct PPE will be worn, such as rubber gloves and standard site PPE.</p> <p>All materials associated with explosives (NG Based Explosives, Linear shaped cutting charges, Detonating Cord, Detonators and connectors) will be under the strict control of the explosive engineers and will be correctly transported and used on site.</p> <p>CoSHH Assessments for the explosive materials will be included in the site CoSHH file.</p>  	2	1	2
	b. Oil Spillages	Contractors	2	3	6		2	1	2
	c. Residual Dusts	Others	1	1	1		1	1	1
	d. Residual liquids								
	e. NG Based explosives								
	f. Detonating cord								
	g. Euronel (Detonators and Connectors)								
Explosives (Detonation of explosives)	a. Air over pressure creating damage to surrounding properties.	BAM	3	3	9	<p>Explosive demolition events will be carried out, in accordance with 5.1.2f</p> <p>5.1.2f</p> <p>Each event will be the subject of extensive planning and stakeholder liaison.</p> <p>Event specific Method statements, risk assessments and 'Blowdown Manuals' will be produced for each blowdown event.</p> <p>All site operations will be under the overall control of our Site Manager.</p>	3	1	3
		Contractors	3	3	9		3	1	3
		Others	3	3	9		3	1	3
	b. Ground Vibration causing damage to surrounding properties.								
	c. Misfire								

Severity			Likelihood		
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			S	L	RR		S	L	RR
(Detonation of explosives) (Cont'd)	d. Unauthorised persons entering the exclusion zone. e. Driver distraction					<p>All explosive works will be under the direct supervision of our qualified, experienced explosives engineer [REDACTED] 5.1.2e in accordance with the current Codes of Practice and HSE guidance notes.</p> <p>Control for the event will be the responsibility of our Safety Health and Environment Director [REDACTED] 5.1.2e with the assistance of our Senior Site Safety Health and Environment [REDACTED] 5.1.2e</p> <p>The minimum amount of explosives will be used, with a designed initiation delay sequence introduced between detonations. This will reduce the amount of air overpressure created by the detonation of explosives as far as is reasonably practicable.</p> <p>Vibrolock Limited will be contracted to provide prediction reports for both vibration and air over pressure, considering the weight of the structure, the type of ground that the structure is to be dropped onto, the proposed charge weights and the delay sequence.</p> <p>Ground Vibration and Air over pressure will be monitored on the day of the blowdown, to provide details of the levels created by the detonation of explosives and the resulting collapse of the structure.</p> <p>Only qualified and experienced explosives engineers will be used to place and connect the explosives.</p> <p>[REDACTED] 5.1.2f system to be used, is designed to incorporate a double line of redundancy throughout, to mitigate the risk of a misfire.</p> <p>The stakeholder management plan will involve all interested parties.</p> <p>The Explosive event will be meticulously pre-planned and implemented in accordance with strict procedures.</p> <p>A full exclusion zone will be in place for the demolition event. This exclusion zone will be designed such that in any event debris from this operation will not reach the boundary of the exclusion zone.</p> <p>All lookouts will have line of site between them and the next, at either side and will be in radio contact with the Controller and firing point at all times.</p> <p>Lookouts will maintain their positions after the blowdown, until the all clear has been given.</p> <p>No traffic will be inside of the exclusion zone at the time of the Blowdown.</p>			

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
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			S	L	RR		S	L	RR
Explosives (Placing and connecting explosive charges)	a. Carrying explosives to the workface	BAM	3	3	9	Only trained and qualified explosives engineers will handle the explosives.	3	1	3
		Contractors	3	3	9	Access ways will be maintained clear.	3	1	3
		Others	3	3	9	Hands will be washed regularly, and protective gloves worn when handling explosives.	3	1	3
	b. Headaches when handling explosives					Explosives will be locked away in the explosives engineer's vehicle, with constant attendance at all times.			
	c. Security of Explosives on site					Explosives will be placed as soon as possible once removed from the vehicle.			
	d. Premature detonation of Explosives					No loose explosives will be stored on site overnight.			
						In addition to normal site security measures, extra security will be provided to guard the explosives when the explosive engineers were not on site or at the working location. The local Police would also be notified of the security measures taken.			
						5.1.2f system will be used.			
						Charging would be postponed if there was any possibility of electric storms and a safe exclusion zone set up around the area.			
						Vehicle movements will be restricted in the immediate area during the charging operation.			
Fire & Explosion	a. Hot work		3	3	9	As a general site ethic to reduce the risk of fire and explosion 'Hot Work' will be minimised, in favour of cold shearing, with hot cutting operations only carried out in clearly defined areas which will have exclusion area barriers in place.	2	2	4
	b. Gas Cylinders		3	3	9		2	2	4
	c. Solid Combustibles (Bitumen/ Timber/Paper)		3	3	9	Remote mechanical techniques for demolition will be adopted where practicable when dismantling the surrounding ducting and pipes etc.	2	1	2
	d. Flammable Liquids (Diesel Fuel Oil & Oil Residues)					Hot cutting operations will be strictly controlled in relation to their proximity to flammable substances/materials and explosives.			
	e. Flammable Liquids (Petrol)					Emergency plans and procedures will be communicated to all personnel at induction and regular drills carried out.			
	f. Dusts					A "Permit to Work" system will be adopted.			
	g. Explosives					Prior to hot work commencing the surrounding area will be stripped of all combustible materials and the area damped down.			



Severity			Likelihood		
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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Fire & Explosion (Cont'd)						<p>Fire extinguishers will be placed in adequate numbers at each hot work area, within office/welfare accommodation and all locations where liquids, gas or solid combustibles were stored.</p> <p>The necessary PPE/RPE will be worn comprising (as a minimum) of overalls, gloves, safety helmets and goggles or "Pro-cap helmets" and pro-flow pack. All PPE will comply with our BAM hot works policy and procedures including associated PPE/RPE specifications.</p> <p>Blind hot cutting into pipe work or vessels will be strictly prohibited on site.</p> <p>Atmosphere monitoring may be required and would be considered as part of a specific assessment.</p> <p>Operatives will be responsible for checking their equipment prior to work each day. A record of this inspection will be maintained on site.</p> <p>Regular checks will be carried out for leaks and serviceability.</p> <p>Consideration will be given to the potential for accumulation of explosive gases in buildings and plant and the provision of adequate ventilation if required.</p> <p>No smoking in areas of potential explosive gas accumulation will be permitted.</p> <p>All gas cylinders will be fitted with flash back arrestors and will not be left on site unsecured.</p> <p>Propane and Oxygen Gas cylinders will be stored in designated separate compounds (full or empty), constructed and located away from external perimeter fences, and equipped with fire extinguishers and signage.</p> <p>Diesel fuel oil and gas bottles will be stored outside buildings in separate designated areas.</p> <p>Petrol will not be stored on site in quantities greater than 20 litres.</p> <p>All spillages of liquid or solvents of any sort will be cleaned up immediately they occur.</p> <p>The primary inspections for fires will be conducted by the burning operatives themselves prior to leaving their work area. Burning operations will cease 1 hour prior to the end of the working shift to carry out a fire check.</p> <p>Fuel oils, hydraulic and lubricating fluids will be stored in purpose designed 110% tanks. Storage facilities will be subject to daily inspection.</p>			



Severity			Likelihood		
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			S	L	RR		S	L	RR
Fire & Explosion (Cont'd)						Combustible dusts may remain in items of plant and structures. Care will be taken to either clean areas thoroughly or manage works ignition sources, to mitigate the risk of dust explosions and fires.			
Flying debris	a. Detonation of Explosives	BAM	3	3	9	<p>Demolition operations will be designed, in accordance with 5.1.2f in such a way that the techniques being adopted will reduce flying debris to the practical minimum.</p> <p>A safe exclusion zone will be established with lookouts and Police placed in specific positions to maintain it clear.</p> <p>The minimum amount of explosives will be used and placed in the correct position.</p> <p>Adequate protection in the form of sand- bags, will be placed around the steel columns to ensure that no explosively driven steel debris is ejected on detonation of the explosives.</p>	3	1	3
		Contractors	3	3	9		3	1	3
		Others	3	2	6		3	1	3
General Public / Third Parties	a. Access roads b. Public roads c. Site boundaries	BAM	3	2	6	<p>The preparation works will be carried out within the secure confines of the site boundary.</p> <p>A safe exclusion zone will be established for the Blowdown event.</p> <p>All visitors will, after induction, be required to wear a safety helmet, boots, glasses, gloves and a high visibility vest, prior to accessing the site working area.</p> <p>During the charging phase of the operation, visitors to site will be restricted to essential personnel only, at the discretion of the Site Manager and the Explosives Engineer.</p> <p>Visitors will be escorted at all times on site.</p>	1	1	1
		Contractors	3	2	6		1	1	1
		Others	3	3	9		3	1	3
Hand Arm Vibration Syndrome	a. Rock Drills	BAM	2	2	4	<p>Operative's exposure to hand arm vibration will be controlled by applying BAM's HAVS policy.</p> <p>All operatives involved in the drilling works will be suitably trained.</p> <p>All equipment will be selected considering the vibration characteristics and regularly maintained.</p> <p>Drill rods/bits will be replaced as soon as there is any sign of excessive wear.</p> <p>Operatives will be rotated regularly to reduce continued exposure.</p> <p>Suitable and sufficient PPE will be issued to all operatives carrying out the drilling works including anti vibration gloves.</p>	2	1	2
		Contractors	2	2	4		2	1	2
		Others	1	1	1		1	1	1

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

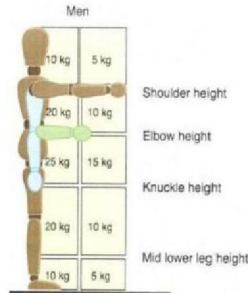
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			S	L	RR		S	L	RR
Hand Arm Vibration Syndrome (Cont'd)						HAVS record sheets will be completed daily for each operative to confirm their personal levels of vibration were not exceeded.			
Inhalation of Dust and Fumes	a. Hot Work (inc. Metal burning /Smoke/Fume/Lead etc)	BAM	3	2	6	General dust & fume	1	2	2
		Contractors	3	2	6	Adequate ventilation of work areas will always be maintained.	1	2	2
		Others	1	1	1	Dust will be damped down at source with water sprays when necessary to prevent high concentrations of airborne dust which could represent both a health risk for operatives and a nuisance or interruption to neighbouring properties.	1	1	1
	b. Diesel Fumes c. General Dust d. MMMF					In localised areas operatives will use appropriate RPE where other measures do not give adequate air quality. To prevent operatives from the associated risks when handling general dusts, suitable respiratory protective equipment will be issued. RPE will be specified according to the results of a risk assessment, however in general a P3 level of protection will be specified. Hot Work All paintwork will be assumed as lead bearing. As a demolition site rule, personnel other than burning operatives wearing RPE will not be permitted to enter the burning areas of the site. Personal hygiene is the most important requirement to ensure that the entry of lead into the operatives' bloodstream is maintained to the absolute minimum. RPE will be provided by the company (FFP3 approved type) and maintained by the operative, with new filters being issued as required. Welfare facilities will be provided to ensure that ingestion of the lead products from the paint and that cross contamination of personnel and clothing is minimised. Statutory control limits for 'lead in blood' will be observed: Action level = 50 µg/dl Suspension level = 60 µg/dl Operatives will wear flame retardant overalls for cutting and burning operations. Overalls will be laundered by our company at regular intervals.			



Severity			Likelihood		
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			S	L	RR		S	L	RR	
Inhalation of Dust and Fumes (Cont'd)						MMMM Man-made mineral fibre, mainly in the form of plant insulation, is widespread on site. All forms of MMMF are classed as irritant. All forms of insulation will be assessed prior to its planned removal to determine the correct safe removal procedures and respiratory protective equipment required. A minimum standard of FFP3 protection would be adopted.				
Manual Handling	a. Carrying/placing explosives	BAM	3	3	9	<p>Explosives will be delivered to site in box's weighing no more than 25kgs. The boxes will be unloaded and placed directly into a designated cabin on site, where the explosive will be prepared in readiness for placing. The explosives when prepared will be placed in the explosives engineer's vehicle and transported to the workplace.</p> <p>The sandbags and conveyor belting required for blast protection around the charged sections of the steel and concrete columns, will be delivered into the area by Telehandler and placed as near as possible to the columns.</p> <p>The bags will then be placed in position one at a time by operatives working at ground level, using safe lifting techniques. The conveyor belting will also be hung in manageable lengths.</p> <p>The placing of the sandbag and conveyor belt protection will be personally supervised by the Explosives Engineers.</p> <p>When installing the sandbag/conveyor belt protection, operatives will work within their personal limits.</p> <p>All personnel will be advised of the danger of incorrect lifting and correct lifting techniques.</p> <p>At no point in time should the weight of the lifted item by manual means exceed 25kg.</p>		2	1	2
		Contractors	3	3	9			2	1	2
	b. Carrying/placing sand-bags and conveyor-belt protection	Others	1	1	1			1	1	1

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
Risk Rating & Control & Monitoring Protocols					
1-2 : Work may proceed in accordance with Brown & Masons policy and procedures			3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)		6-9 : The work cannot commence until alternative method of work or additional control measures implemented

Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Noise	a. Vehicles b. Equipment c. Plant	BAM Contractors Others	3 3 3	3 2 1	9 6 3	<p>Designated hearing protection zones will be established whilst carrying out the drilling works, as dictated by site noise conditions.</p> <p>Where noise levels exceed: 80dB (A) hearing protection will be provided. Where noise levels exceed: 85dB (A) hearing protection will be enforced.</p> <p>During the works personnel will ensure that adjacent occupiers are not unduly disturbed, and compliance is maintained with the EIA Screening Report and Prior Approval Requirements.</p> <p>Control procedures will be introduced as far as practical to limit noise disturbance.</p>  	2 2 1	1 1 1	2 2 1
Plant & vehicular movement	a. Telehandler b. MEWP	BAM Contractors Others	3 3 3	2 2 2	6 6 6	<p>Defined routes for movements will be instigated and warning signs displayed.</p> <p>A safe speed limit of 15km/h will be enforced on the site.</p> <p>All personnel who operate plant and machinery will be trained and hold the appropriate CPCS card, NPORS cards.</p> <p>Banksmen will be deployed as required to marshal traffic movements.</p> <p>Telehandlers will be fitted with a warning beacon and mirrors.</p> <p>All Vehicular access to the site will be controlled by the Site Manager and all operators would be inducted and informed of the speed limit, safe routes, and site rules before entering site.</p> <p>Once the charging had commenced, only the necessary plant will be allowed into the immediate area underneath and around the section of the FGD Ducting to be demolished.</p>	2 2 1	1 1 1	2 2 1
Plant, Tools and Equipment	a. Hand Tools b. Equipment	BAM Contractors Others	2 2 1	2 2 1	4 4 1	<p>All plant, tools and equipment will to be maintained in good working order to the manufacturer's instructions.</p> <p>Regular user inspections will be undertaken to confirm the adequacy of use</p> <p>Guards will be maintained in place and the requisite PPE be worn.</p> <p>Regularly inspections of air hoses will be carried to secure high energy hoses against whiplash. Whip-checks will be installed at all the connections on compressed air lines.</p> <p>Only competent and trained operatives will operate any plant, tools or equipment.</p>	2 2 1	1 1 1	2 2 1

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

1-2 : Work may proceed in accordance with Brown & Masons policy and procedures	3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)	6-9 : The work cannot commence until alternative method of work or additional control measures implemented
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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Plant, Tools and Equipment (Cont'd)						<p>Pre-use inspections will be carried out on all plant and equipment. All faults identified will be reported to management to enable repair or replacement.</p> <p>Any damaged equipment will be reported immediately to site management and the equipment would not be used.</p> <p>All relevant plant e.g., Telehandlers and MEWP's, will have current thorough examination certification which will be retained on site (nb! lifting appliances would be examined every 12 months)</p> <p>All records will be maintained on site for inspection by relevant interested parties</p>			
Premature structural collapse	<p>a. Buildings</p> <p>b. Structures</p>	<p>BAM</p> <p>Contractors</p> <p>Others</p>	<p>3</p> <p>1</p> <p>1</p>	<p>3</p> <p>1</p> <p>1</p>	<p>9</p> <p>1</p> <p>1</p>	<p>Calculations will be provided by our qualified structural engineer, prior to commencing the works, to confirm that the structural integrity of the buildings being demolished, will be maintained throughout the preparatory works.</p> <p>When carrying out the preparation works, the proposed sequence of cutting must be strictly adhered to.</p> <p>The Building structure cuts will be quality checked at every stage, initially by the Supervisor or Top Man carrying out the works, followed by further checks by the Explosive Manager or Site Manager. The information will be recorded on Quality Control Check sheets.</p> <p>All the preparatory cuts will be accurately measured and marked by the Supervisor, Site Manager or the Explosives Manager with French chalk, prior to the work commencing.</p> <p>All operatives engaged in the preparatory works will be experienced, fully trained personnel.</p> <p>5.1.2f initiation system, which will be finally connected on the Blowdown day, will be used to prevent premature initiation by stray electrical currents from items such as mobile phones or two-way radios.</p> <p>The wind speed will be monitored throughout the preparatory works, with weather forecasts checked daily. If the winds approach the limits set by our structural engineer within his calculations, the work will cease, and the area will be evacuated immediately until the wind speeds died down to a safe level.</p> <p>All method statements will be issued in writing and signed for by the relevant foreman/supervisor in charge of the work.</p>	<p>3</p> <p>1</p> <p>1</p>	<p>1</p> <p>1</p> <p>1</p>	<p>3</p> <p>1</p> <p>1</p>

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
Risk Rating & Control & Monitoring Protocols					
1-2 : Work may proceed in accordance with Brown & Masons policy and procedures		3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)		6-9 : The work cannot commence until alternative method of work or additional control measures implemented	

Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Security	a. Trespassers	BAM	1	1	1	<p>The existing Station perimeter security fence (and associated gates and gatehouse) will remain and not be affected by the works.</p> <p>The demolition works will be securely fenced using HERAS type re-locatable fencing with access gates.</p> <p>Work areas will be made safe at the end of each working day.</p> <p>Coordination and cooperation will be maintained with security personnel to ensure that the standard of security on site is maintained.</p> <p>Warning signs will be posted up advising the potential dangers of unauthorised entry.</p> <p>Access gates will be locked out of hours.</p> <p>When explosives are in place overnight, extra security officers will be placed at the structure being charged at all times and when the explosives engineers are not on site.</p> <p>The local Police will be informed of the security measures taken.</p>	1	1	1
	b. Visitors	Contractors	1	1	1		1	1	1
	c. Contractors	Others	3	3	9		1	1	1
Services	a. Identification and Termination of Live Services	BAM	3	3	9	<p>Prior to commencement of demolition works, the main services to the plant, equipment and pipework will have been terminated by the client and the necessary certification confirming the safety of same would be issued. Any retained live services will be clearly identified.</p> <p>It is essential that all live services to each structure to be demolished are isolated / terminated prior to demolition/dismantling works commencing.</p> <p>Prior to commencing work in any area, investigation would be carried out to fully identify all services, this would include CAT scanning etc. as required.</p>	2	1	2
		Contractors	3	3	9		2	1	2
		Others	1	1	1		1	1	1
	b. Electrical Supplies Both Above and Below Ground								
	c. Water and fire mains								
	d. Effluent								
	e. Drains and sewers								
	f. Telecoms								

Severity

Likelihood

1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
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Risk Rating & Control & Monitoring Protocols

1-2 : Work may proceed in accordance with Brown & Masons policy and procedures	3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)	6-9 : The work cannot commence until alternative method of work or additional control measures implemented
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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Tripping / Slipping Hazards	a. Waste materials	BAM	2	3	6	<p>In order to prevent personnel from tripping over debris/materials lying on the floor, all loose materials will be removed from the working area prior to commencing the works.</p> <p>To achieve a safe working area, all items of waste will be relocated appropriately, during and at the end of each working shift.</p> <p>Any redundant protruding steelwork or pipework will be cut flush with the surrounding area.</p> <p>Permanent features, i.e., steps/stairs etc, will be identified and clearly marked. If these items are present in areas of poor light levels, additional lighting will be provided.</p> <p>Uneven ground will be levelled and compacted prior to commencing the works.</p> <p>Any spillage of liquid will be cleaned up immediately.</p>	2	1	2
	b. Protruding steelwork, pipework or reinforcing bars	Contractors	2	3	6		2	1	2
		Others	2	3	6		1	1	1
	c. Hoses								
	d. Uneven ground								
Unstable Ground	a. Voids	BAM	3	3	9	<p>The general area beneath the structures, is mainly existing reinforced concrete slab.</p> <p>Safe and unhindered access will be maintained for plant items to conduct their required activities.</p> <p>Any existing voids will be filled and uneven ground levelled, in order to use a MEWP or mobile telescopic crane with man basket, to gain access to the cuts at some of the higher levels.</p>	2	1	2
	b. Soft Ground	Contractors	3	3	9		2	1	2
		Others	1	1	1		1	1	1
Visibility	a. Darkness	BAM	3	2	6	<p>The works will be planned primarily during periods of natural daylight, however where required artificial lighting in the form of either festoon lighting, self-contained luminaries' or mobile lighting towers will be installed in all work areas as required.</p> <p>Personnel entering areas that did not have adequate natural illumination will always carry torches.</p> <p>High visibility luminous signs, or spray paint, will be fixed/used to indicate egress routes where appropriate.</p> <p>High visibility waist coats or jackets will be worn by all personnel.</p>	2	1	2
	b. Dust	Contractors	3	2	6		1	1	1
	c. Fumes	Others	3	2	6		1	1	1

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Work at Height	a. Floors & Steelwork	BAM	3	3	9	<p>The preparation work will be predominantly carried out from a MEWP situated at ground level, or from the existing floors throughout the structures.</p> <p>Any unstable or uneven ground within the FGD Ducting area, will be levelled and compacted for the MEWP's to work safely. All terrain mobile access platforms will be used to gain access for the preparation works.</p> <p>All operatives working from the MEWP'S, will wear full body safety harnesses attached to a secure anchor point within the basket.</p> <p>All operatives involved with this work will be fully experienced and trained in 'working at height'.</p> <p>As a minimum all Brown and Mason personnel are trained and certificated to work at height (including safety harness instruction). In addition, key individuals are trained in rescue techniques and harness inspection.</p>	2	1	2
	b. MEWP	Contractors	3	3	9		2	1	2
		Others	3	2	6		2	1	2
Zoonoses	a. Legionella	BAM	2	2	4	<p>A zoonosis or zoonose is any infectious disease that can be transmitted (in some instances, by a vector) from other animals, both wild and domestic, to humans.</p> <p>Leptospirosis</p> <p>The main risk from Leptospirosis is exposure to rodent urine in contaminated water, to this end BAM will control rodent population through pest control if required.</p> <p>Ensure that any water storage tanks are covered and protected from infestation.</p> <p>Ensure that any "stagnant" pools of water and voids are regularly drained or pumped clear.</p> <p>Operatives will wear the necessary PPE in the form of gloves and waders when working in polluted areas.</p> <p>If an operative did get a cut or scratch, all reasonable steps will be taken to avoid immersion of same in the polluted water.</p> <p>Legionella</p> <p>Over 90% of legionellosis cases are caused by Legionella pneumophila, an aquatic organism that thrives in warm environments (25 to 45 °C (77 to 113 °F) with an optimum around 35 °C (95 °F))</p> <p>During the contract BAM will maintain welfare facilities used by all personnel.</p> <p>Maintenance will include water sterilising of shower heads, regular discharge of water tanks.</p>	1	1	1
	b. Leptospirosis (Weil's Disease)	Contractors	2	2	4		1	1	1
	c. Psittacosis / (Ornithosis) / Histoplasmosis / Cryptococcosis	Others	2	2	4		1	1	1

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 - Low	2 – Medium	3 – High

Risk Rating & Control & Monitoring Protocols

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Hazard	Hazard Sub-Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Zoonoses (Cont'd)						<p>Any retained water will be sampled and disposed of as necessary in accordance with current legislation. Contaminated water will not be pumped into sewers.</p> <p>Personnel would be provided with PPE & RPE if required.</p> <p>Psittacosis / Ornithosis</p> <p>Pigeons, sparrows, ducks, hens, gulls and many other species of bird can carry several infectious diseases such as Psittacosis, Ornithosis and other respiratory problems. As such all operatives would be required to wear full PPE/RPE.</p>			

Severity			Likelihood		
1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 – Low	2 – Medium	3 – High
Risk Rating & Control & Monitoring Protocols					
1-2 : Work may proceed in accordance with Brown & Masons policy and procedures		3-4: Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)		6-9 : The work cannot commence until alternative method of work or additional control measures implemented	

Aspect	Normal / Abnormal / Emergency	Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	R
Air Quality	N	Dust arising from the felling operation	2	2	4	Dust propagation will be mitigated via a range of control measures including, water suppression of the drop zone and any required localised cleaning. The structures are reasonably clean. A minimal amount of residual dust may remain, which would be mitigated by damping down during the preparation works and immediately prior to the Blowdown.	1	1	1
	A	High wind conditions	2	1	2	Weather conditions will be monitored, and consideration given to the potential for dust propagation during the works. Weather forecasts will be checked daily, with any wind speed restrictions observed.	1	1	1
	E	N/A	-	-	-	-	-	-	-
Ecology	N	Impact to local wildlife	2	2	4	The Explosive Demolition will be scheduled to minimise the disruption to protected species.	1	1	1
	A	Disturbance of wildlife	2	2	4	The structures will be checked at each stage of the demolition process for protected species and recorded on the permit to work. If at any stage signs of protected species were present, work will stop until further investigation by an approved ecologist takes place.	1	1	1
	E	N/A	-	-	-	-	-	-	-
Neighbouring land uses	N	No Impact	1	1	1	In terms of the physical impacts on the neighbouring land uses, the Explosive demolition operations will be carried out wholly within the confines of the existing site boundary.	1	1	1
	A	Slight Impact	1	1	1	The Exclusion zone for this event that will be maintained around the area during the blowdown, will be within the site boundary fence. Lookouts, with assistance from the Police if necessary, will be in place around the perimeter of the zone to prevent unauthorised entry into the area whilst the event took place.	1	1	1
	E	N/A	-	-	-	-	-	-	-

Severity			Likelihood		
1 – Negligible Impact	2 – Transient Impact	3 – Detrimental Impact	1 – Low	2 – Medium	3 – High
Risk Rating & Control & Monitoring Protocols					
1-2 : Work may proceed in accordance with Brown & Masons policy and procedures			3-4 : Work may proceed providing stringent control measures have been implemented (e.g., permit to work, monitoring, etc.)		6-9 : The work cannot commence until alternative method of work or additional control measures implemented

Aspect	Normal / Abnormal / Emergency	Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	R R
Noise & Vibration	N	Potential nuisance to neighbouring residents or businesses	2	3	6	As part of the stakeholder management plan the general public and surrounding businesses will be informed of the event. The event will be planned during the working day and avoid rush hours, school arrival/leaving times, etc. to minimise nuisance or disturbance.	1	1	1
	A	Potential damage by vibration or air over pressure	2	2	4	The explosive demolition initiation sequence will be designed to minimise air over pressure. Vibrock Limited will be contracted to provide a prediction report for both vibration and air over pressure. Ground Vibration and Air over pressure will be monitored on the day of the blowdown, to provide details of the levels created by the detonation of explosives and the resulting collapse of the structures. General noise and vibration caused by the preparation works will be minimal.	1	1	1
	E	Premature collapse	2	1	2	Calculations will be provided by our qualified structural engineer, prior to commencing the works, to confirm that the structural integrity of the buildings will be maintained throughout the preparatory works. When carrying out the preparation works, the proposed sequence of cutting will be strictly adhered to. Wind speeds will be monitored continuously throughout the preparation works. A non-electric initiation system, which will be finally connected on the Blowdown day, will be used to prevent premature initiation by stray electrical currents from items such as mobile phones or two-way radios.	1	1	1
Traffic Management	N	Impact on local traffic	1	1	1	A traffic management plan will be developed to detail the procedures and controls regarding both on and off-site vehicular movements. All reasonable measures will be taken so as not to impede the local community as far as practicable during the blowdown. The Police would decide if traffic calming and other restrictions during the blow down event were required.	1	1	1
	A	Impact on peak times	2	1	2	The time and day of the week for the blowdown will be agreed with all interested parties well in advance of the event.	1	1	1
	E	N/A	-	-	-	-	-	-	-

Severity			Likelihood		
1 – Negligible Impact	2 – Transient Impact	3 – Detrimental Impact	1 – Low	2 – Medium	3 – High
Risk Rating & Control & Monitoring Protocols					
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3.0 Explosive Demolition Design

3.1 As described earlier in the introduction, it is our intention to demolish the north section of the FGD Ducting, by the controlled use of explosives. The works have been designed by our Structural Engineer, 5.1.2e and our Explosives Manager 5.1.2e

3.2 The section of the FGD Ducting structure to be demolished, is approximately 45metres high, 22metres wide north to south and 33metres long east to west. As previously mentioned, the section of the structure being demolished will be separated from the chimney at the expansion joint position, immediately to the north side of the chimney, to totally isolate it in readiness for demolition.

Note: Separate more detailed method statements will be produced, which will cover the general preparation works such as removing sections of the ducting and the fans between ground and the upper ducting support levels and the general safety precautions to be taken during all of the preparatory works.

3.3

5.1.2f

3.4

3.5 Fractional delays of 5.1.2f milliseconds would be introduced between the detonations of explosives on individual columns, to assist in the collapse of the structure and reduce air over pressure created by the detonation of the explosives.

3.6 The explosive kicking and cutting charges placed onto each of the steel columns and the 5.1.2f explosives inserted into the holes that will be drilled into the concrete columns, will be initiated by 5.1.2f gram per metre detonating cord, with each of the linear shaped explosive cutting charges having a small piece of 5.1.2f explosives inserted first as a booster, to ensure that all the explosives within the charges detonate. 5.1.2f detonators will be attached to the ends of the detonating cord at each column position, to ensure that advanced initiation of all the detonators is achieved prior to the initial detonation of the explosives. This will avoid the possibility of cut offs causing a partial misfire.

3.7 Please refer to the drawings included in the design document D001, for the extent of the internal ducting and fan removal at ground level and details of the column preparation for explosive removal, including the kick direction.

4.0 Sequence of Works

4.1 The works to demolish the FGD Ducting, would be carried out in a methodical sequence as detailed below.

Enabling Works

(To be read in conjunction with the relevant enabling works method statements.)

- Clear the area around the structures to be demolished, to leave the area of the drop zone clear, removing all loose items.

- Establish Exclusion zones around areas of the work where necessary.
- Carry out ecological checks.
- Carefully remove the sections of ducting and fans between ground level and the first ducting support level above, to leave the columns which are to be removed by explosives, clear in readiness for preparation.
- Remove the cladding around the expansion joint in the ducting attached to the chimney and ensure it is a clean separation.
- Obtain and fill sufficient sandbags required for protection, to be placed around the steel columns.
- Cut to length, sections of heavy-duty rubber conveyor belting required for protection, to be placed around the concrete columns to prevent debris travelling any significant distance.

Preparation Works

(To be read in conjunction with the relevant preparatory method statements.)

5.1.2f

Explosive Installation

- Explosive delivery daily
- Prepare explosive charges for placement.
- Charge the structures with explosives.
- Place conveyor belt protection.
- Place sand-bag protection.

Explosive Detonation

- Fix detonators.
- Carry out final connections.
- Blowdown event.

Final Clearance of the Structure

- Process arising's and clear area

5.0 Enabling Works

5.1 Clear the area to the north side of the structure to be demolished, leaving a clean area of ground for the collapsing structure to land onto.

5.2 Prior to commencement of the preparatory works, a local exclusion zone will be implemented around the immediate work vicinity. The size and position of the zone will be dependent on what items of work is being carried out on any day and will be controlled by the site manager on a day-to-day basis. The exclusion zone will consist of a secure, physical barrier with appropriate warning signage attached. The daily permit system and residual risk assessments will highlight where and when they are required.

- 5.3** The structure will be checked at each stage of the demolition process for protected species and recorded on the permit to work. If at any stage signs of protected species are present, work will stop until further investigation by an ecologist takes place.
- 5.4** Sections of the ducting between ground level and the first ducting support level will be carefully removed using a combination of hot cutting and mechanical methods to isolate the columns for preparation and make space beneath the structures, to allow the unrestricted collapse at the time of detonation. A separate document will be produced, which will detail how this item of the work will be carried out.
- 5.5** The expansion joint in the horizontal ducting immediately to the north of the chimney will have the cladding removed to ensure that there is a separation at this position. If this is a material spanning the joint, it will be cut to complete the separation.
- 5.6** A sufficient number of sandbags will be filled to place around each of the steel columns charged with explosives, to direct the force of the explosives in the correct direction and prevent any possibility of debris fly on detonation of the explosives.
- 5.7** Heavy duty conveyor belting will be cut to size in readiness to be suspended over the charged sections of the reinforced concrete columns on all 4 sides, to prevent the shattered concrete travelling any significant distance on detonation of the explosives.

6.0 Preparation Works

6.1

6.2

5.1.2f

Access to carry out the drilling work will be carried out by operatives working from a MEWP.

The drills used to place the holes in the columns will be, Atlas Copco air driven, rotary percussive rock drills, which have vibration damped handles.

Operatives carrying out the drilling work will be experienced personnel, who will work strictly in accordance to assessed exposure times, produced for hand arm vibration. Records will be kept in the site office in accordance with BAM procedures. The operatives carrying out the works, will be rotated to ensure that they do not have continued exposure to vibration.

On completion of the drilling works, the vertical reinforcing bars on all 4 faces of the 3 rear columns on Grid line A1, will be exposed using hand-held jack hammers, for flame cutting on the day before the blowdown. The cutting of the reinforcing bars will initially create a pivot but will also allow the columns to lift as the structure rotates in the designed direction.

5.1.2f

6.3

5.1.2f

The explosives removal of all the columns on Grid line 1, 2, 2' and 3 column lines B to D inclusive combined with the hinge cutting of the columns on column line B, just above ground level, will create a predominantly vertical collapse of the structure with a bias in a northerly direction, pulling the rear vertical ducting in a northerly direction away from the chimney.

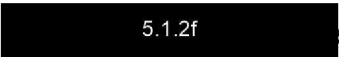
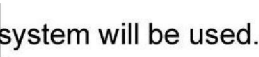

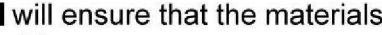



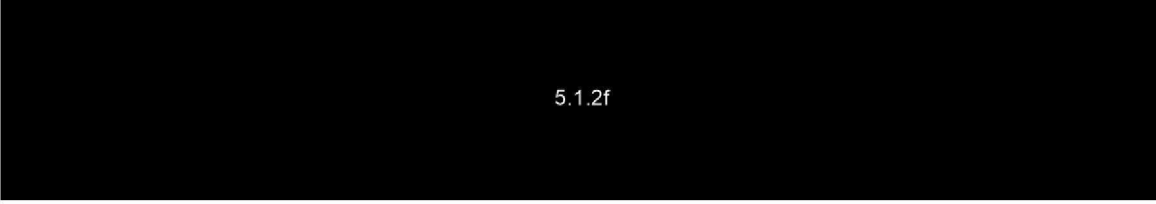
Preparation of the columns

5.1.2f

6.4 Following the completion of the preparatory cutting and drilling works, sand-bags will be built up to the level of the blast cuts on the steel columns, in readiness for the charging with explosives to begin.

6.5 Prior to commencing the charging with explosives, the horizontal beams and sections of bracings shown on the drawings in red will be removed as stated on the drawings.

7.0 Explosives Installation

- 7.1 A local exclusion zone will be established around the immediate charging area to exclude unnecessary personnel. The exclusion zone will be formed using crowd barriers or a similar type fencing.
- 7.2 During the charging and connecting period, access into the area where the explosives are being placed will be restricted to essential personnel only, who must be authorised by the explosives engineer in charge of the works.
- 7.3 All of the hot works required in the immediate area of the charging, will be completed prior to commencing the placement of explosives.
- 7.4 The no smoking rule will be enforced in the immediate area.
- 7.5  5.1.2f  system will be used.
- 7.6 Explosives will be delivered to site daily by the Explosives company, with only the required amount of explosives being delivered to complete that day's charging.
- 7.7 The quantity of explosives and detonators delivered and placed, will be recorded in a logbook which will be kept on site. The logbook will record the amount of explosives brought to site, the amount used/in place and details of any surplus material which will either be returned to the explosives company or destroyed on site. No loose explosives will be left on site overnight.
- 7.8 Once delivered, the explosives engineer  5.1.2e  will ensure that the materials are placed immediately in a designated cabin for assembly.
- 7.9 The explosive  5.1.2f  charges for the steel columns, will be assembled and installed by the Explosives Engineers as follows:
- 7.10  5.1.2f
- 7.11
- 7.12 Sand-bags will be built up and around the sides of each column, to a height of approximately 0.5 metres above the top of the charges leaving the ends of the detonating cord exposed.
- 7.13  5.1.2f
- 7.14 Each of the linear shaped explosive cutting charges placed over the flanges to be cut, will be secured in place using cable ties, which will be threaded through pre-cut holes at either side of each of the cut lines.

7.15

7.16

5.1.2f

7.17

7.18

The explosive charges to be placed into the concrete columns would be cut to size in readiness for placing into the holes at the work face.

7.19

5.1.2f

7.20

The detonating cord tails would be connected to the explosives, which would then be placed into each of the holes and pushed to the bottom using a plastic drain rod. The ends of the detonating cord would protrude from the holes by approximately 5.1.2f mm. Each of the holes would then be filled with 5.1.2f to confine the explosives within the hole.

7.21

7.22

5.1.2f

7.23

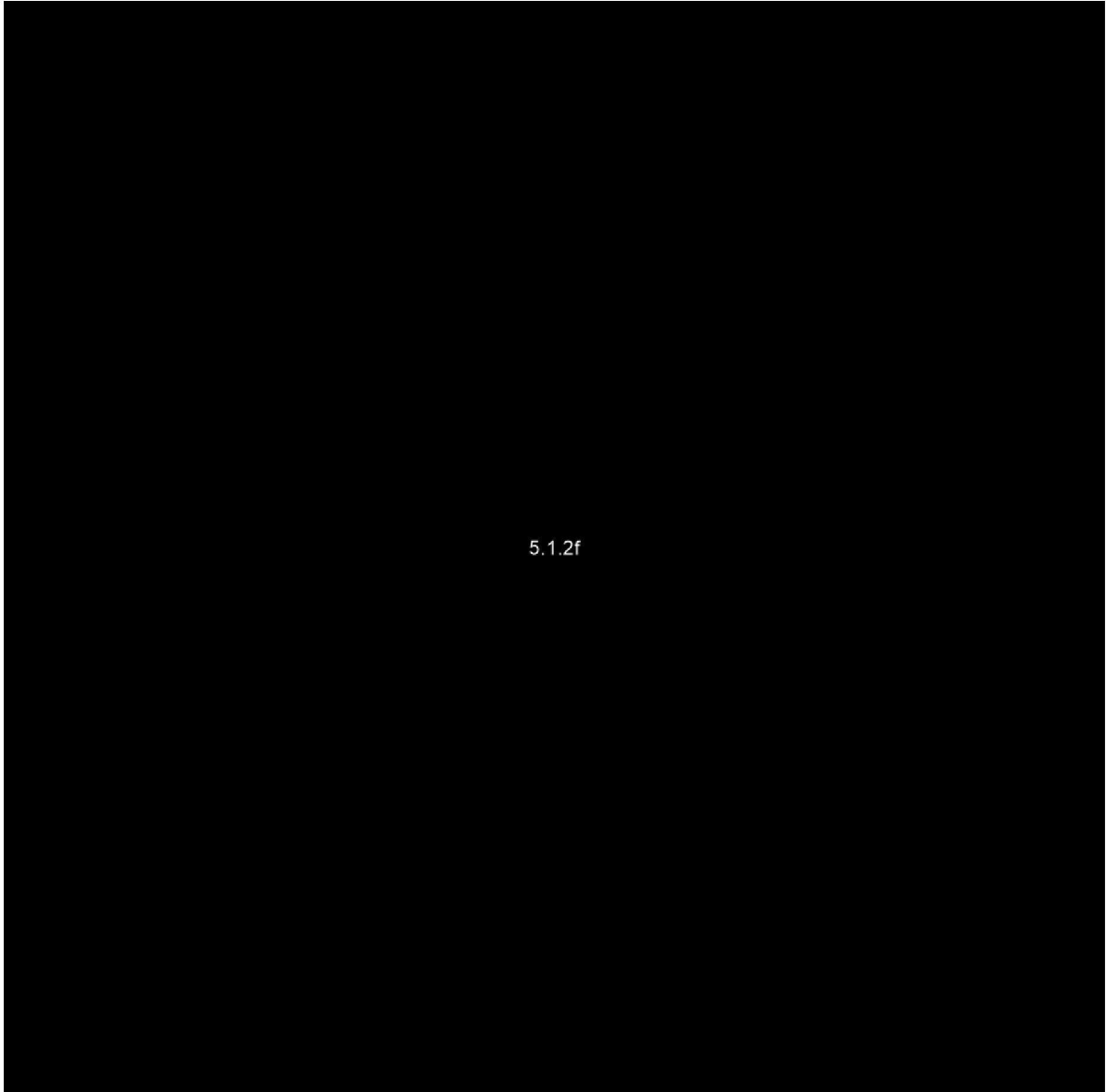
A dedicated Security Officer will be placed inside of the explosive's exclusion zone fenced off area 24 hours per day once the explosives are on site. Further security officers will also patrol the area during the night hours, to ensure the safety of the explosives. Tower lights will be provided to illuminate the area during the night.

A barriered off area will be maintained at all times once the charging has commenced through until the day of the Blowdown, to ensure that there is no unauthorised entry into the area.

The local Police will be notified that explosives will be on site and of our security arrangements.

8.0 Charge Weights of Explosives to be Used

- 8.1** The following table identifies and quantifies the explosive components required for the event.



5.1.2f

- 8.2** Charging up and connecting of the structures should take no longer than 1 day, with the final connections made on the morning of the blowdown. It would be our proposal to carry out the demolition at a time suitable to all the interested parties.

Extra security would be placed on site overnight, whilst explosives were on the site, to ensure the safety of the explosives. The local Police would be notified that explosives were on site and of our security arrangements.

9.0 Protection

- 9.1** Protection in the form of filled hessian sand-bags will be placed around the steel columns to be removed by explosives.

A triple row of sand-bags would be placed directly behind the explosive kicking charges with a double row to the sides, to provide enough resistance to use the energy from the explosives to push out the target columns on detonation of the explosives.

Further sand-bags would be placed between the flanges of the columns on both sides, tight up against the web, to ensure no debris fly on detonation of the explosives.

- 9.2** Protection in the form of heavy duty rubber conveyor belting will also be suspended over the charged sections of the reinforced concrete columns, on all 4 sides, to prevent the shattered concrete travelling any significant distance on detonation of the explosives.

The protection material would be secured in place using 12mm diameter polypropylene rope, which would be tied around the column at approximately 1 metre intervals.

The conveyor belt protection would be cut to size by the operatives carrying out the drilling works at the same time, to allow the operatives a break from the drilling.

The protection would be placed as soon as the columns are charged with explosives, with the work supervised personally by the explosives engineer.

10.0 Explosive Detonation

- 10.1** On the morning of the event, the final connecting and checking of the initiation system will be carried out in readiness for the blowdown.

10.2

5.1.2f

On completion of the connecting, 5.1.2f will be attached in readiness to run out to the firing point.

- 10.3** A safe exclusion zone will be formed as described in section 12.

- 10.4** The sequence of events for the day of the blowdown will be issued at a later stage, following meetings with all parties involved. This item will be included in the Blowdown Manual.

- 10.5** At the prescribed time on the day of the event, the Explosives Engineer will initiate the explosives and demolish the structures following the countdown procedure which will be detailed in the sequence of events.

11.0 Final Clearance of Structures

- 11.1** The final clearance of the structures will be carried out in accordance with the Brown and Mason document: WP12 - Extracting and Processing Explosive Demolition Arising's.

12.0 Exclusion Zone

- 12.1** A safe exclusion zone will be maintained around the structure, to prevent any unauthorised entry into the danger area during the blowdown. Please see the provisional exclusion zone drawing, included in Appendix 2.

- 12.2** The exclusion zone drawing identifies the exclusion zone boundary together with the boundaries of the design drop zone and maximum predicted debris spread area, with a buffer zone outside of the debris area, utilising the available space around the site.

The only debris we would expect to find outside of the drop zone, but within the maximum predicted debris area, would be small pieces of the sand-bags placed around the columns or pieces of the conveyor belting.

- 12.3** The exclusion zone boundary shown will need to be re-visited, to plot the exact positions of sentries with lines of site between them.

- 12.4** The zone will be monitored by trained sentries, positioned around its perimeter within visual contact of each other and equipped with radios linked back to a central control point.

- 12.5** The zone which will be agreed with all interested parties prior to the blowdown, is based on the nature and size of the structures that are to be demolished, the amount of explosives and position of the charges, the protection placed around the explosives and its target and the topography of the surrounding area, as included in **5.1.2f**

5.1.2f

- 12.6** Brown & Mason Ltd will undertake the planning and co-ordination of the zone involving all interested parties including the Police.

- 12.7** The explosives engineer at the firing point will be in direct contact with the control point as they will be in a joint position ensuring that the countdown can be stopped within a matter of seconds at any time up to the time of the Blowdown.

- 12.8** If the zone is breached after the final warning siren has been sounded i.e. within 30 seconds of the intended blowdown time, the event will be delayed until the problem is rectified and the countdown will begin again at an agreed time after consultation with all the relevant parties involved.

- 12.9** Additional information on Exclusion Zone management will be identified in the Blowdown Manual, section 10.

13.0 Contingency Plans

- 13.1** For contingency plans please see the Blowdown Manual BDM 1, section 12.

14.0 Safety, Health & Environment

14.1 Health & Safety

14.1.1 All explosives work will be carried out by our qualified and experienced Explosive Engineer, [REDACTED]

5.1.2f

5.1.2f

14.1.2 Throughout the course of the working day, our Site Manager, or his nominated 'competent person', will patrol the site confines and boundary perimeters on a regular basis to ensure that no breaches of either Company/Site Health & Safety Procedures, deviations from working methods or any undue inconvenience to adjacent occupiers/users occurs.

14.1.3 Operatives will be required to wear all necessary Personal Protective Equipment (PPE) as listed below:

- Safety Helmet
- Safety Boots
- Overalls
- High Visibility Vest / Jacket
- Safety Glasses
- Gloves
- Disposable latex gloves whilst assembling explosive charges.
- Kevlar gloves when cutting detonating cord.

14.1.4 Assembly Points and Emergency Evacuation Plans for the works will have been developed and will be included in the Construction Phase Plan. These plans will be regularly reviewed and updated.

14.1.5 Works associated with this document will be subject to a BAM 'General Permit to Work'.

14.1.6 The permit to work and associated safe systems of work contained within this document would be briefed to all the relevant personnel by the permit receiver prior to the work commencement.

14.1.7 The residual risk assessment which will accompany the permit to work will be completed by the work party, post briefing and prior to work commencement.

14.1.8 All work identified will be carried out under the supervision of our Site Manager, with the authority of the Explosives Manager.

14.1.9 The client will have isolated the services to the buildings and structures located within the area that are subject to demolition.

14.1.10 Movement of pedestrians and vehicles to and from the site will be controlled. We will also ensure our activities did not disrupt works being carried out by others. Segregation of pedestrian and vehicle movement on site will be implemented within the working area during the works.

14.1.11 A two-way radio system will be instigated on the site to facilitate communication between all supervisory personnel on site.

14.1.12 All operatives will be required to use the site hygiene/welfare and toilet facilities.

- 14.1.13 Working at height will be avoided or minimised wherever reasonably practicable, with risks assessed as per the Construction Phase Plan. Operatives working at height will be wearing full body harness and lanyards attached to a secure anchorage point and/or running line as per Construction Phase Plan.
- 14.1.14 All work will be carried out in a safe manner and in accordance with all current, relevant legislation.
- 14.1.15 Fire extinguishers and fully charged fire hose will be in position when hot works were in progress.
- 14.1.16 Control of Substances Hazardous to Health (COSHH) assessments will be carried out by our Resident Site SHE Manager, with a written report held in the Site Office.
- 14.1.17 During any work activity, noise levels will be maintained as low as is reasonably practicable. At 80dB(A) hearing protection will be provided, where noise levels exceeded 85dB (A) hearing protection use would be enforced.
- 14.1.18 The works will be subject to regular auditing both by Brown and Mason and the client.
- 14.1.19 The works will be undertaken by suitably trained and experienced personnel.

14.2 Environmental

- 14.2.1 The key environmental impacts that will be associated with the works will be that of dust propagation, air-over-pressure (noise) and vibration. All impacts have been suitably and sufficiently assessed by Brown and Masons Management team, with mitigation measures developed and implemented as detailed within this document.
- 14.2.2 The drop zone will be damped down prior to the Blowdown to reduce the amount of dust generated as the structures collapse.
- 14.2.3 Ground vibration, air over pressure, fugitive dust air sampling and asbestos fibre air sampling will be carried during the blowdown. Ground Vibration and air over pressure predictions will also be provided prior to the event, which will be compared with the actual event results following the blowdown.

5.1.2e

5.1.2e

MIExpE MEFEE

Explosive Manager

15.0 References

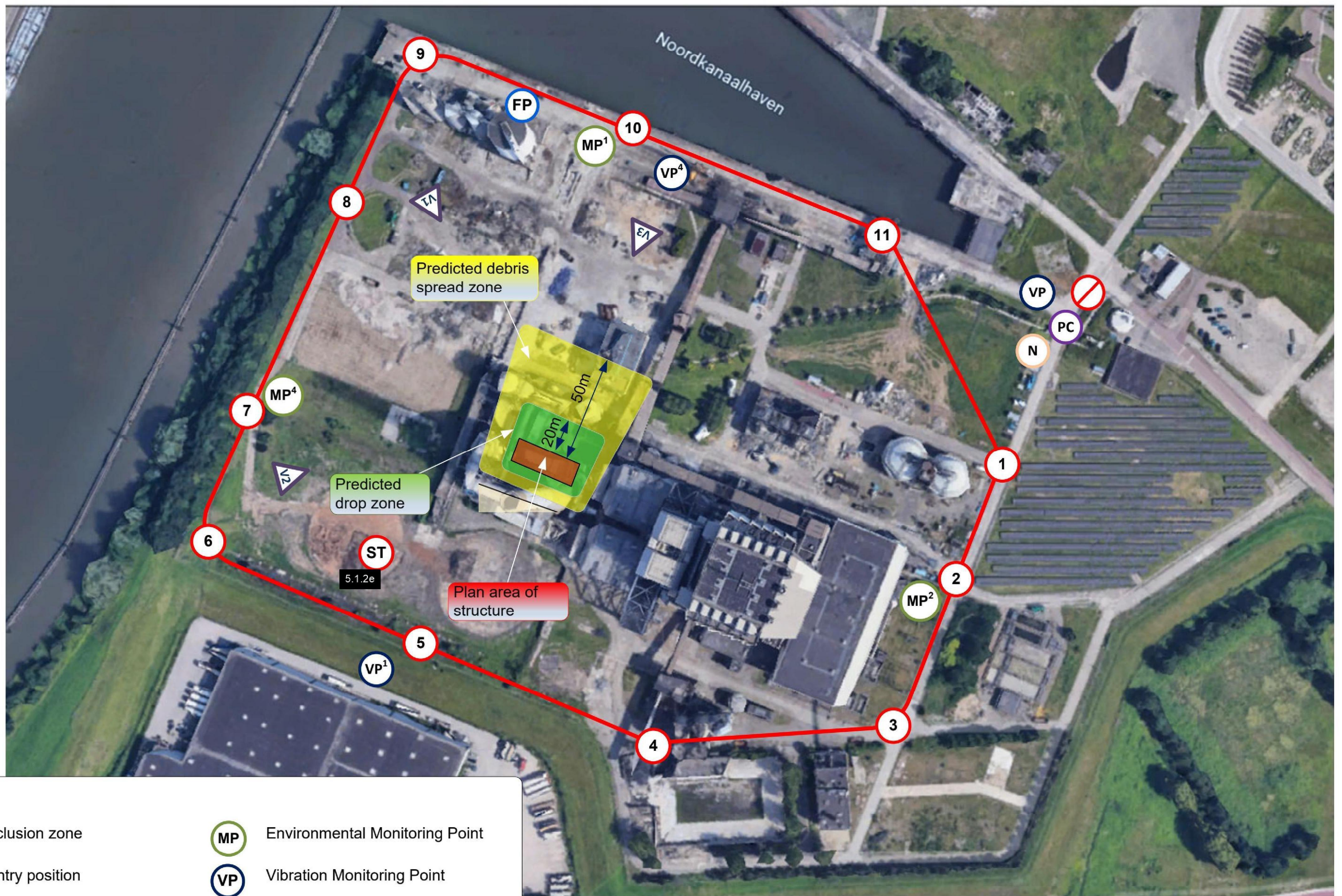
- 15.1 This method statement should be read in conjunction with the following project documents:
- C2002/H&SP/10.20 Demolition Phase Health and Safety Plan
 - C2002/EMP/10.20 Environmental Management Plan
 - C2002/BDM1/BAM Blow Down Manual
 - WP12 Extracting and Processing Explosive Demolition Arisings
- 15.2 This method statement should be read in conjunction with the following Brown and Mason system documents:
- Health, Safety, Environment & Quality Management System Manual
 - Health, Safety, Environment & Quality Policy and Procedures Document
 - Brown and Mason "Asbestos Standard Operating Procedures"
 - Brown and Mason "Drugs and Alcohol Policy"
 - Brown and Mason "Work at Height Policy"
 - Brown and Mason "Hot Work Policy"
 - Brown and Mason "Training Policy"
 - Brown and Mason "HAVS Policy"

16.0 Appendices

- 1) Exclusion Zone Drawing

Appendix 1

Exclusion Zone Drawing



Key	
	Exclusion zone
	Sentry position
	Police position
	Firing Point (inc. Control Point)
	Road Closure
	Environmental Monitoring Point
	Vibration Monitoring Point
	Video Camera Position
	Search Team
	Non essential Personnel

BROWN & MASON Anson House, Schooner Court, Crossways Business Park, Dartford. DA2 6QQ Tel : 01322 277731 Fax : 01322 284152	Site :		Drg No.	
	Centrale Gelderland Power Station		C2002/BDM1/EZP001	
	Title :		Date :	Scale :
	Exclusion Zone Plan		26/02/21	Not to scale
	FGD Structure		DRG by :	Size Rev
		5.1.2e	A3	5