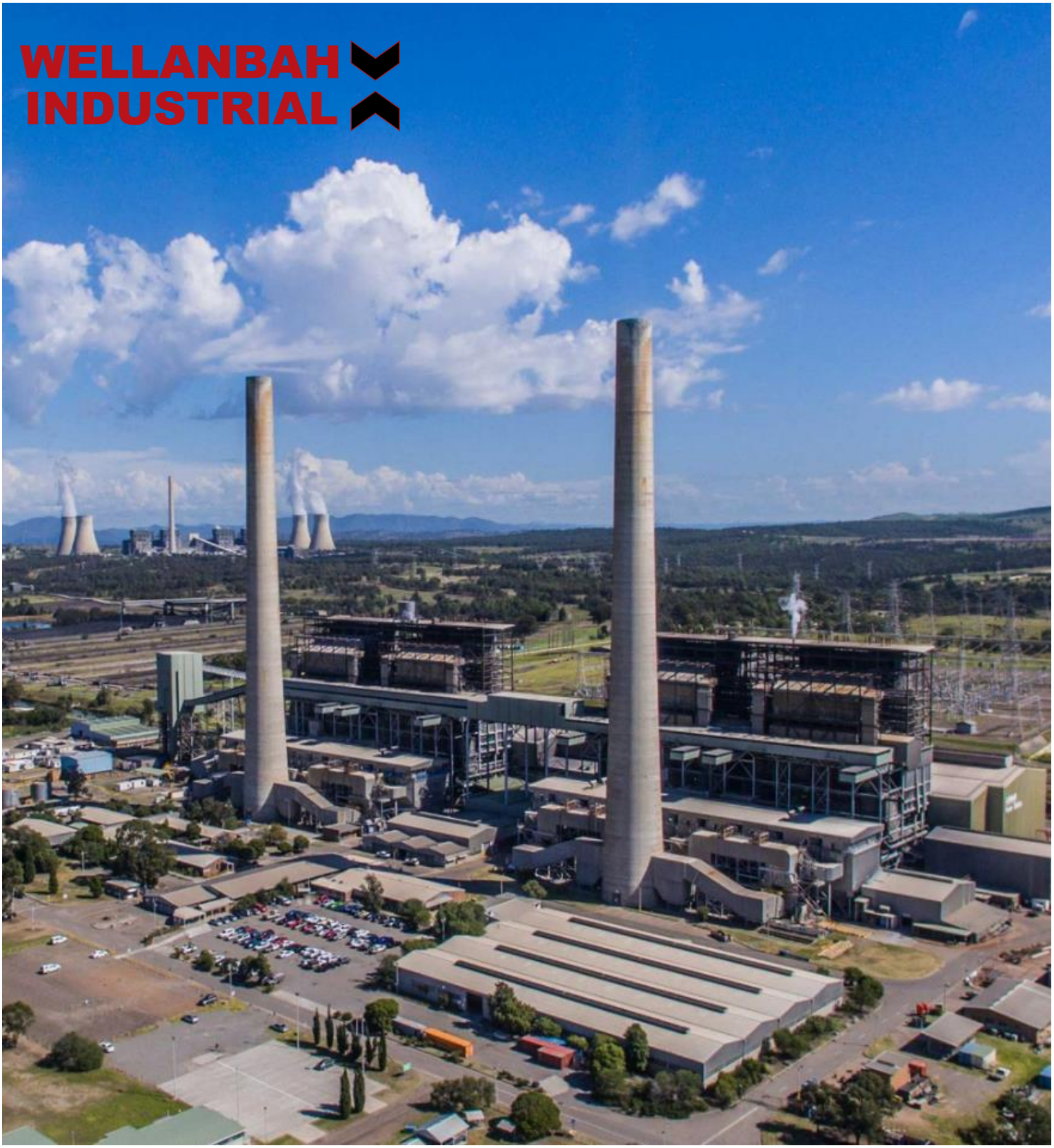
WELLANBAH INDUSTRIAL



BLAST MANAGEMENT SUB-PLAN

LIDDELL POWER STATION CHIMNEY TEST SHOT

WI-BMSP-W057-001a – REV 3

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DOCUMENT REVISION STATUS

REV	DATE	DESCRIPTION OF CHANGE	WRITTEN BY	REVIEWED BY
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2	24/11/25	UPDATED FOLLOWING DPHI AND SAFEWORK NSW REVIEW	D. HEALY	B. HEALY
3	24/11/25	ADDITIONAL OF CONSULTATION RECORD	D. HEALY	B. HEALY

SHOTFIRER SIGNOFF

DATE OF BLAST	SHOTFIRER NAME	SIGNATURE

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1 DOCUMENT PURPOSE

This Blast Management Sub-Plan details the procedures that are to be followed in completing a test shot on the U1/U2 chimney stack, which are currently located at the AGL Liddell Power Station, in the Hunter Region of NSW, Australia.

In accordance consent condition C20 clause a) this blast management plan has been prepared by suitably qualified and experienced person Daniel Healy. Refer to Appendix E for details regarding qualifications and experience for the individual.

It has been specifically developed in accordance with AS2601-2025: The Demolition of Structures and AS2187.2-2006: Explosives – Storage and Use, to ensure that all activities are compliant with legislative requirements and that appropriate risk mitigation strategies are employed throughout the project. The document has been formulated in consultation with suitably qualified and experienced personnel to ensure that industry best practice is also adhered with at all times.

The specific layout provides a step-by-step approach to the project execution; a number of supporting documents are included as appendices for additional pertinent details.

1.1 Compliance with Conditions of Consent

In accordance with the State Significant Development (SSD) planning approval, numerous conditions related to the blast event must be adhered with. These conditions are provided within the conditions of consent – Approval Number: SSD-24937520. The consent conditions relevant to the blast event have been provided in Table 1 below

As per consent condition C20 clause c) (i) a description of the mitigation measures that will be implemented to comply with the conditions of consent is provided herein. This will include having the Blast Management Sub-Plan developed by a suitability qualified and experienced persons to ensure that the plan includes the required mitigation measure listed in the conditions of consent. A summary of all consent conditions and the location where it is addressed is provided within Table 1.

TABLE 1: CONSENT CONDITION COMPLIANCE SUMMARY

#	CONDITION	SUMMARY OF COMPLIANCE	REFERENCE
C20	A blast management sub-plan must be prepared as part of the demolition environmental management plan. The plan must: a) Be prepared by a suitably qualified and experienced person/s. b) Include: (i) an assessment of blasting impacts at	a) Refer to Section 1, Section 7.5 and Appendix E of BMSP for Shotfirers qualifications and relevant experience. b) (i) Refer BMSP Section 7.18 for environmental assessments for airblast overpressure, ground vibration, fly and dust	a) Refer Section 1 and Section 7.5 of BMSP & Appendix E b) (i)BMSP 7.18 Appendix H (ii) BMSP 7.26 (iii) BMSP 7.18, 7.19, 7.20

	sensitive receivers and infrastructure, including the Liddell Ash Dam including the predicted airblast overpressure and ground vibration. (ii) consultation with the relevant private landowners or infrastructure owners if the assessment predicts blasting by the development will impact sensitive receivers. (iii) a strategy to monitor, assess, mitigate or compensate for the effects of blasting at sensitive receivers identified by the assessment required by condition C20(b)(i) of the Consent. c) Describe the mitigation measures that will be implemented to: (i) comply with the conditions of the Consent. (ii) manage the risks identified in the environmental risk assessment required by condition B1 of the Consent. (iii) manage blast generated dust and fumes, protect public safety and manage road closures.	(ii) Refer to section 7.26for details of notification to owners and occupiers of structures, and providers of services adjacent to blast (iii) Based on the magnitude of the explosives being detonated (2.07kg) monitoring is not deemed necessary, however will be completed for the main demolition blast event (not part of the scope of this BMSP). Environmental effect to be managed by minimising explosives quantity, covering charges, distance to receivers, with dust control measures as detailed within the BMSP. Refer BMSP Sections 7.19 and 7.20. c) (i) This will include having the Blast Management Sub-Plan developed by a suitability qualified and experienced persons to ensure that the plan includes the required mitigation measure listed in the conditions of consent. A summary of all consent conditions and the location where it is addressed is provided within Table 1 (ii) In accordance with the environmental risk assessment, control measures to manage this risks as noted in the environmental risk assessment are provided in Section 7.18, 7.19, 7.20, 8, Appendix C and Appendix G which include: Engineering designs, monitoring	c) (i) Section 1.1, (ii) 7.18, 7.19, 7.20, 8, Appendix C and Appendix G of BMSP

		and reporting, SWMS, competent contractors, stakeholder engagement. (iii) Dust is to be managed in accordance with the controls in Section 7.18 and includes pre-wetting, and post-wetting for the event. Fumes are to be managed in accordance with Section 7.35 of this BMSP. No road closures are required for the test shot.	(iii) Section 7.18 and 7.35 of BMSP
	d) Include a monitoring, evaluation and reporting program that uses an approach that is consistent with the environmental management strategy required by condition B1.	d) As per the environmental management strategy required by condition B1, an assessment of environmental effects has been completed for the blast and is provided in Section 7.18. The results of this assessment determined that based on the magnitude of the explosives being detonated (2.07kg) monitoring is not necessary, however it will be completed for the main demolition blast event (not part of the scope of this BMSP).	d) Section 7.18
C22	A dust management sub-plan must be prepared as part of the demolition environmental management plan. The plan must: (a) be prepared by a suitably qualified and experienced person/s; (b) describe the mitigation measures that will be implemented to: i. comply with the conditions of this consent; and ii. (ii) manage the risks identified in the environmental	The dust management sub-plan is a separate document previously submitted and approved (IS501900_DMP_D0v5). This BMSP has been written in accordance with the requirements of Section 7.2 "Management Measures" of this Dust Management Sub-Plan. Refer to Sections 7.19 & 7.20 of BMSP for dust management details.	Section 7.19, 7.20 of BMSP

	risk assessment required by condition B1; Include a monitoring, evaluation and reporting program that uses an approach that is consistent with the environmental management strategy required by condition B1.		
B18	The quantities of dangerous goods stored and handled by the development must be below the threshold quantities listed in the Department's Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 at all times.	Refer SEP33 Table 1, and Figure 5 **Table 1: Screening Method to be Used** **Class** / **Method to Use/Minimum Quantity** 1.1 / Use graph at Figure 5 if greater than 10 Refer 7.11 of BMSP, 2.07kg of explosives to be used in blast event. As this is below 100 kg, there is no risk of reaching the potentially hazardous region.	Sections 7.11 & 7.16 of BMSP
B19	Dangerous goods must be stored and handled strictly in accordance with: (a) all relevant Australian Standards; and (b) for liquids, the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Manual. In the event of inconsistency between the requirements of condition B19(a) and B19(b), the most stringent requirement must prevail to the extent of the inconsistency.	(a) Dangerous goods must be handled and stored in accordance with AS2187 – Explosives- Storage, Transport and Use. BMSP developed to comply with AS2187. Wellanbah Industrial has offsite NSW licensed explosives storage facilities. (b) N/A, Wellanbah Industrial does not require storage or handling of liquids.	AS2187, Section 7 of BMSP.
DM5	Dust management measures will be included in the PEMS, and implemented during demolition.	Dust management measures included in PEMS are to be implemented as detailed in t Sections 7.18 & 7.19 of BMSP	Sections 7.18 & 7.19 of BMSP
DM7	Identify any critical infrastructure that may be damaged by vibration and develop monitoring plan to be included in the PEMS.	Critical infrastructure identified in the PEMS has been assessed in Section 7.18 of BMSP. Based on the quantity of explosives and nature of the blast event, no sensitive receivers will be affected by the event.	Section 7.18 of BMSP
AQ2	Preparation of a Blast Management Plan and Asbestos Control Plan, which would including specific measures for minimising impacts during blasting and handling of ACM, including:	Dust is to be managed in accordance with controls listed in Section 7.18 & 7.19 of BMSP. The blast will not result in any disturbance to asbestos materials.	Section 7.19 of BMSP and Appendix A

	- Soft-strip inside buildings before demolition - Pre-watering - Forecasting Sprinklers Due to the potentially high emissions of dust during blasting events, a monitoring plan is recommended. This would include boundary and receptor monitoring. A report after each blasting event summarising the results of the air quality monitoring during and after the event would be prepared.	Report to be prepared detailing the results the blast as per Appendix A	
HR1	BMP is a risk control plan used to ensure blasts do not harm people in the area and limit damage to the environment. The BMP will describe the design of the blast necessary for the task and what procedures will ensure the charge is prepared and fired safely. This information includes: - Layout of the blast including any drilling pattern and hole depth. - Explosives type/quantity, firing equipment and method. - Detonation sequence/effective charge mass per delay (MIC) 'powder factor.' - Misfire procedures including assessment and actions for any foreseeable misfires. This includes any explosive/detonators found during blasted material pile loading by mobile plant. - Details of reports, drawings and records consulted. - Post blast assessment and inspection procedures. The Blast Management Plan will be prepared.	Wellanbah Industrial has developed a comprehensive BMSP in compliance with worksafe NSW requirements and AS2187. This Blast Management Sub-Plan includes: - Layout of the blast including any drilling pattern and hole depth. - Explosives type/quantity, firing equipment and method. - Detonation sequence/effective charge mass per delay (MIC) 'powder factor.' - Misfire procedures including assessment and actions for any foreseeable misfires. - Details of reports, drawings and records consulted. - Post blast assessment and inspection procedures.	AS2187, BMSP Section 7.9 of BMSP and Appendix B Sections 7.10, 7.11 and 7.12 of BMSP and Appendix B Section 7.10 of BMSP Section 7.34 of BMSP Section 7.8 of BMSP Section 7.35 of BMSP
HR2	Explosives will be stored in a non-ferrous receptacle clearly marked 'Explosives' that is kept closed and locked (except during use by authorised personnel) and stored in the original containers which are securely sealed.	All explosives will be stored as per requirements, in offsite NSW licensed explosive magazine. On arrival to site all explosives to be locked in shotfirers vehicle certified to carry Category 2 explosive quantities ie up to 250kg.	AS2187, AEC3, BMSP Appendix I: NSW Storage Facility License MACS engineering certificate of conformance

	The storage area should be a well-ventilated magazine licenced for Inter-governmental Maritime Consultative Organisation (IMCO) Class 1.1 explosives, which protects the explosives from the weather, contamination, sources of ignition and access from unauthorised individuals. Storage will be isolated from other dangerous good stores and the area free of debris, waste and combustibles. The explosives containers should be protected against physical damage and regularly checked for spills and leaks.		
HR3	Magazines are required to comply with the requirements of AS2187.1 Explosives Storage, transport and use Storage which addresses issues with design and location of the magazine, security, inventory and management of the explosives, and safety concerns.	Wellanbah Industrial Magazines have been built and certified by MAGLOK in compliance with AS2187 Magazine storage license issued by worksafe NSW Note that no magazines are required onsite for these works.	Refer to Appendix I of BMSP: Maglok Certificate of conformance, Worksafe NSW explosives storage license
HR4	Where more than 2.5 kg of Class 1.1 explosives are stored on a site, every perimeter entrance to the site must be labelled with a 'Hazchem' placard in accordance with the Explosives Regulations. Adequate security needs to be provided for the explosive's storage area, and only those who are authorised for unsupervised access to the area may have means to unlock the explosive storage magazine	No explosives are to be stored onsite for the event. Blast will be completed in a single day, with any excess explosives removed from site.	Refer to Section 7.16 of BMSP.
HR5	Explosive storage and use areas will be no smoking and not contain naked light, heat or ignition sources. The explosives stock will be rotated to prevent ageing (use on first in-first out basis).	Refer Section 7.16 of BMSP and AS2187 and Wellanbah Industrial 'Magazine Rules' Product procured for project to be within usable date range (purchased specifically for project, hence old product not a risk).	Section 7.16 of BMSP. Appendix K of BMSP

1.2 Objective and Scope of Test Blast

1.2.1 Objective of the Test Blast

The objective of the test blast is to confirm the powder factor for the chimney felling (main) blast event. The powder factor refers to both the quantity of explosives per charge hole as well as the spacing of the holes. This results in a net explosive quantity per cubic metre of concrete which is to be removed by the initiation of the charges.

As each structure in unique in terms of both concrete strength and reinforcement layout, it is prudent to undertake a test shot on a small portion of the structure to confirm that the concrete is sufficiently removed by the proposed layout of explosives. This is a calibration of the quantity of explosives to be used.

1.2.2 Difference between Test Blast and Main Blast

The significant distinction between the test blast and the main blast is that the test blast is to gather information to confirm the design for the chimney felling design (main blast), whereas the main blast is for the demolition of the chimneys.

As such, the test blast scope is significantly less than that of the main blast. The scope of the test shot is to calibrate the powder factor that is to be adopted for the main blast event by placing and detonating charges in a localised area of the chimney. The positioning of the extent of these charges is such that the integrity of the chimney is in no way compromised by the event. The scope of the main blast is to complete the induced collapse of the chimney structures. This will include placing charges across the front face of the chimney at a specific grid pattern, and upon detonation the chimney will pivot about the base and collapse to ground level.

In terms of scale, the test blast will include the drilling, loading and detonation of a total of 9 charge holes over a localised position of the chimney at ground level (an area of approximately 0.88m by 0.88m). Noting that the circumference of the chimney stack is approximately 58.4m, this represents an arc length of 1.5% of the chimney circumference. The blast event will include the detonation of 2.07kg of explosives total. The main blast event includes the removal of approximately 60% of the chimney circumference, or wholistically an area of 18m x 5m. The quantity of explosives to be used is 331.2 kg of explosives. Hence the test shot represents 0.6% of the explosives to be used in the main blast event.

The test blast will be a single day exercise, whereby the charges are placed and initiated in the same day. The main blast will require approximately 1-2 months of preparation prior to the event.

The outcome for the test shot is the local removal of the 0.88m x 0.88m portion of concrete in the side of the chimney at ground level to confirm an appropriate amount of explosives is proposed for the main event. The outcome for the main blast is the removal of the front face of the chimney, approx. 18m x 5m, which will induce the collapse of the chimneys, bringing them to ground level to allow for subsequent disposal.

In addition, it is noteworthy that due the scale of the test blast event, no stakeholders or sensitive receivers will be affected, and this has been evaluated in section 7.18 of this BMSP. The main blast event will have a minor effect on stakeholders and sensitive receivers and this has also been evaluated in the corresponding Blast Management Sub-Plan for the main blast event.

1.2.3 Specific Parameter or Constraints Unique to the Test Blast

The specific parameter / constraint for the test blast is that it must not compromise the integrity of the chimney structure. To ensure this does not occur, a structural analysis of the blast design has been completed and is provided in Appendix C of this Blast Management Sub-Plan. The engineering assessment confirms that the location of the blast is within a side panel that is to be subsequently removed from the structure prior to the main event. The analysis determined that the removal of this panel will not adversely effect the capacity of the chimney due to the localised nature of the penetration.

As such, this specific constraint is adhered with as detailed within this document.

1.2.4 Tabulated Difference between Test Blast and Main Blast

TABLE 2.2: DIFFERENCES BETWEEN TEST BLAST AND MAIN BLAST PLAN

TABULATION OF DIFFERENCES BETWEEN TEST BLAST AND MAIN BLAST PLAN					
BLAST TYPE	**SCOPE**	**SCALE**	**TIMING**	**EXPECTED OUTCOMES**	**IMPACT TO SENSITIVE RECEIVERS**
TEST BLAST PLAN	Localised test blast to confirm quantity of explosives to be used for main blast	9 charge holes over an area of 0.88m x 0.88m with a total explosives quantity of 2.07kg	Works will be completed within a single day	Local removal of concrete at ground level to allow for calibration of explosives quantities for main event	Nil.
MAIN BLAST PLAN	Removal of front face of chimney to induce collapse of structure	1440 charge holes over an area of 18 x 5m for the chimneys with a total explosives quantity of 331.2kg	Works will take place over a 1 – 2 month period. With the blast still being a single day event.	Removal of front faces of each chimney structure, and the subsequent induced collapse of the structures.	Minor

1.3 Consultation

In finalising this blast management sub-plan, consultation has been completed with both the NSW Department of Planning, Housing and Infrastructure as well as SafeWork NSW.

Records of this consultation are provided within Appendix N of this document.

2 INVESTIGATION OF STRUCTURE

In accordance with Clause 2.2.2 of AS2601, an investigation of the structure has been completed by competent persons with appropriate experience in demolishing structures of a similar type (Refer to Appendix E for qualifications and experience of nominated competent person Daniel Healy). These investigations have determined the following.

2.1 Materials of Construction

The structure which is to have the test shot completed in accordance with this BMSP, consist of a chimney stack with a total height of approximately 169m. The base outside diameter is 18.6m, with a wall thickness of 610mm; the top outside diameter is 9.8m, with a wall thickness of 216mm. The material of construction is reinforced concrete, with the size and layout of the reinforcement varying throughout the height of the structure.

In addition, the chimney includes a number of corbels at regular spacings up the height of the structure, these corbels support the internal brick lining, and an internal concrete slab which is supported also on four columns at approx. 6.7m above ground level.

It is also noteworthy that asbestos has been identified as a material used in the construction of the chimneys based on both details called up in the structural drawings, and subsequently laboratory testing of samples taken from site.

The areas of either identified or assumed asbestos include:

Bitumastic joints to capping at the top of the chimney stack (~169m from ground level):

- Assumed ACM only – not detailed as asbestos on the drawings
- ~12.7mm wide bitumastic between the joints to each capping piece
- There are 48 joints in total at ~1.092m long each joint

Vent pipes at the top of the chimney stack (~168m from ground level):

- Detailed as ACM on drawings
- ~101mm diameter asbestos cement vent pipe running through the chimney stack wall evenly spaced around the circumference of the stack
- There are 10 x pipes at ~101mm diameter x ~228mm long x ~6.4mm wall thickness

Caulking material around each exhaust duct (~6m from ground level to bottom of duct and ~15m from ground level to top of the duct):

- Detailed as ACM on drawings
- ~6.4mm asbestos rope caulking around the perimeter of each duct at the interface with internal brick lining at ~27.9m long around the duct x 2 ducts per stack

Insulation material around each exhaust duct (~6m from ground level to bottom of duct and ~15m from ground level to top of the duct):

- Lab testing complete which confirms material is asbestos

- 80% Magnesia insulation material between duct and concrete wall around the perimeter of each duct at ~609mm deep x ~101mm thick x ~27.9m long around the duct x 2 ducts per stack
- 98% of this insulation has since been removed and sealed to manage this material

Caulking material at the interface of the internal brick lining sitting on top of the concrete slab and the brick wall lining to circumference of the chimney (slab level at ~6m above ground level):

- Detailed as ACM on drawings
- ~25.4mm asbestos rope ~53.9m long

Caulking material across the top of the exhaust duct, between brick lining and concrete wall at the interface of the glass insulation behind the brick wall and the concrete wall at ~RL486 (~RL 148m)

- Detailed as ACM on drawings
- ~6.4mm asbestos rope caulking at ~5.5m long x 2 ducts (across the top)

It is estimated that the asbestos in the above ACMs accounts for ~0.02% of the overall volume of material in each chimney stack.

For the test shot blast event, the asbestos will not be disturbed, and therefore management of ACM materials will only be relevant for the future demolition blast event, which does not form part of the scope of this BMSP.

2.2 Structural System and Sequence of Construction

The structural system of the chimneys is primarily that of a gravity structure, whereby the mass of the chimney is typically sufficient to maintain a net compression in the walls of the structure and to resist overturning. The function of the reinforcement is to provide some additional tensile capacity and crack control.

During typical operation, the structural system resists overturning from wind or earthquakes as a single large cantilevered circular hollow section. Applied loads are transferred from throughout the height of the structure to the base via this section, and the overturning is resisted by the stabilising weight of the structure and base foundations.

The sequence of construction was that of a sliding formwork, starting from the base and progressively working up to the top pours. The formwork was constricted with height, owing to the reduced loading towards the top of the structure.

Figures 1 and 2 are extracts from available existing drawings of the structures.

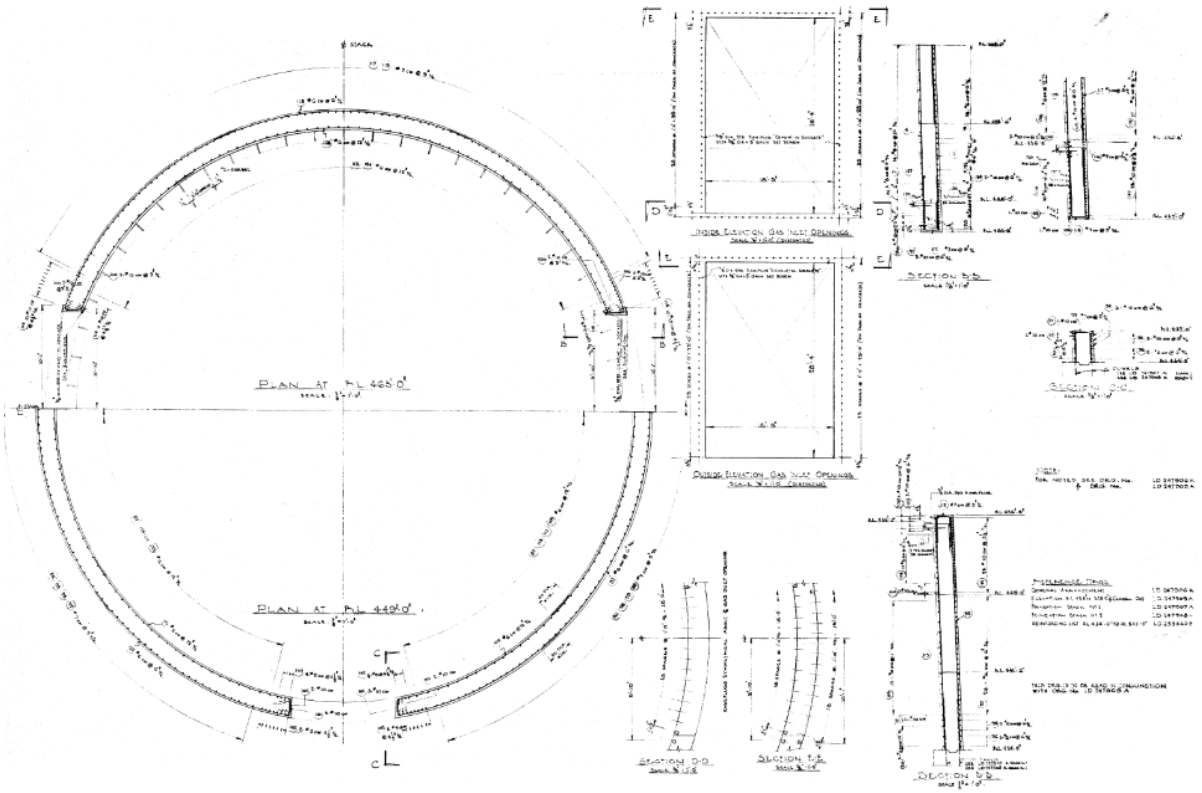


FIGURE 1 – CROSS SECTION OF CHIMNEY

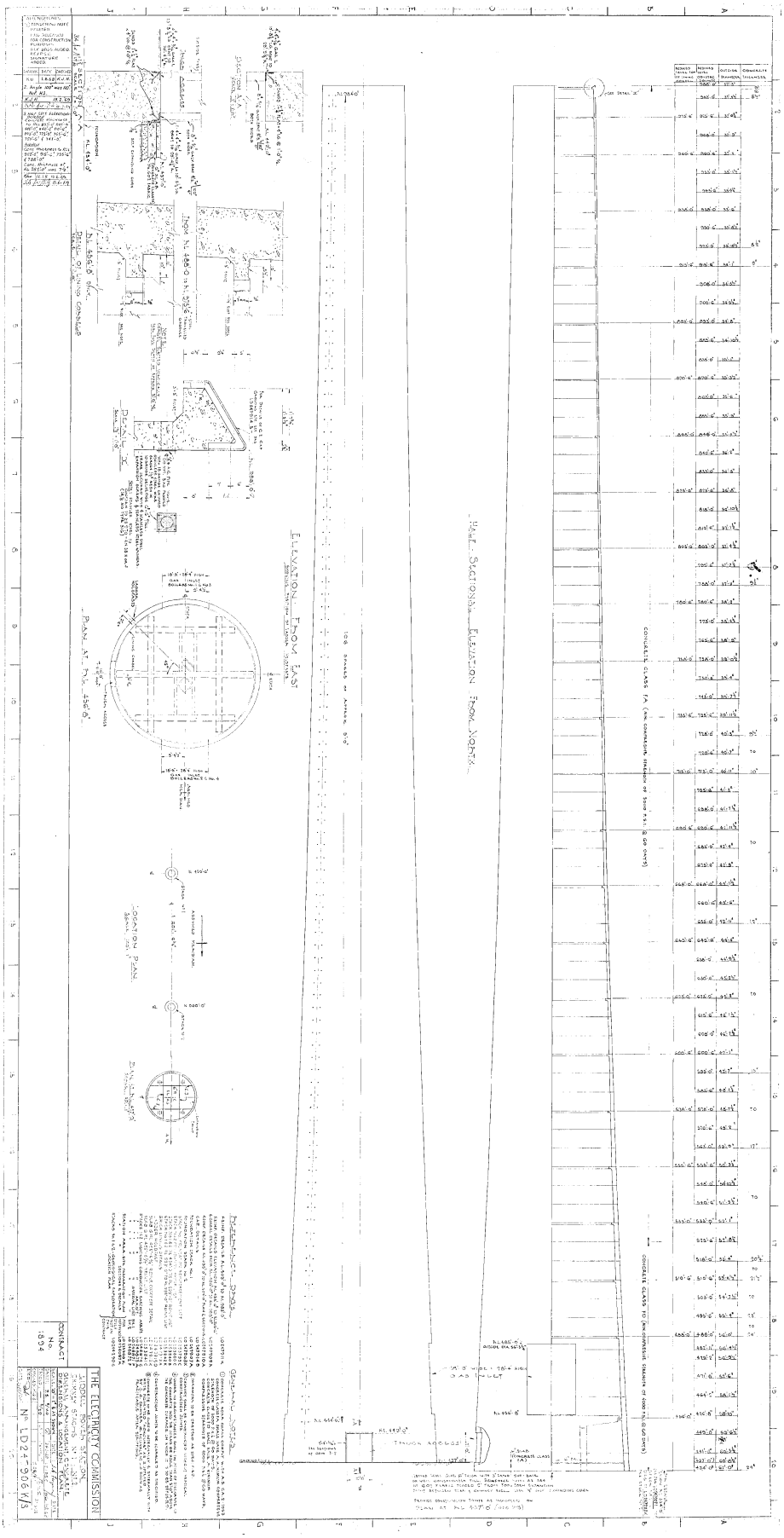


FIGURE 2 – ELEVATION OF CHIMNEY

2.3 Structural Stability

The global stability of the structure is dependent on the following key elements:

- Reinforced Concrete Shell
- Base Foundations

Based on the above, it is evident that these elements must not be compromised to the extent that an instability occurs. The test shot have been nominated in a location of the chimney stack in that the area is to be fully removed prior to the main blast event.

A structural assessment has been undertaken on the chimneys, (Refer to Section 5.2), to ensure the blast plan will not adversely affect the capacity of the chimneys in the lead up to the main blast event.

2.4 Services

There area around the blast location has been review, and no services which will be affected by the test shot have been identified. As such, there is no risk of damage to services.

2.5 General Condition Details

In general, the structure is in sound condition with minimal evidence of significant corrosion / concrete cancer which would lead to concerns regarding the integrity of the structure.

2.6 Confined Spaces

The current work scope does not require access to confined spaces. Note the base of the chimneys was previously considered as a confined space, however a risk assessment has been completed by CMA Contracting, confirming the re-designation of the area for the works.

3 INVESTIGATION OF SITE

The chimney is located at the AGL Liddell Power Station, in the Hunter Region of NSW, Australia. This is a significant site, which presents various constraints which have been considered in the development of the proposed demolition method. These constraints include critical assets that are to be retained, existing services, below ground infrastructure, site geographical features.

Based on the size of the test shot blast event and influence zone, it has been determined that no assets or sensitive receivers will be affected by the blast event.



FIGURE 3 – AERIAL PHOTOGRAPH OF SITE LOCATION

The test shot will be wholly within the power station site boundary, with the nearest sensitive receptor approx. 1.5 km from the blast location.



FIGURE 4 – PHOTO OF U1/2 CHIMNEY

4 LEGAL STATUS REVIEW

In accordance with Appendix A of AS 2601-2001, the following checklist has been completed for the proposed scope of works to confirm the legal status of the project.

TABLE 3: LEGAL REQUIREMENTS CHECKLIST

ITEM	DESCRIPTION	INVESTIGATION RESULTS	STATUS
(a)	Are there any statutory, regulatory, or other legal impediments to the demolition of the building?	Demolition subject Approval for State Significant Planning, which has been granted.	Closed
(b)	Is the owner/principal legally empowered to have the building demolished?	N.A – Test shot only	Closed
(c)	Has the owner/principal identified all hazardous substances located on site including asbestos, PCBs, lead paint, underground storage tanks, chemicals, etc. as per Clause 1.6.1?	Extensive hazardous materials investigations have been completed, and known asbestos in relation to the chimney has been identified and is to be managed in consultation with SafeWork NSW.	Closed
(d)	Has the owner/principal obtained permission to occupy adjoining neighbours' property, including airspace, for the purpose of erecting protective scaffold/screens for the demolition works.	Occupation of neighbouring properties not required for the purpose of erecting protective scaffold/screens for the demolition works.	Closed
(e)	Has the owner/principal provided all existing architectural, services and engineering drawings available for the demolition project?	Details of the power station have been provided by the site owner	Closed
(f)	Are the tender/contract documents sufficient and complete?	Completed.	Closed

5 METHOD ASSESSMENT

5.1 Test Shot Method

The test shot methodology is to be completed in accordance with this document.

This process includes several steps as detailed herein.

- 28mm holes drilled in the side face of the U1/U2 chimney in accordance with blast design;
- Holes packed with explosive charges;
- Install protection over charges (steel panel)
- Undertake test shot
- Review results, and revise demolition blast design accordingly

For detailed blast design, refer to Appendix B of this BMSP.

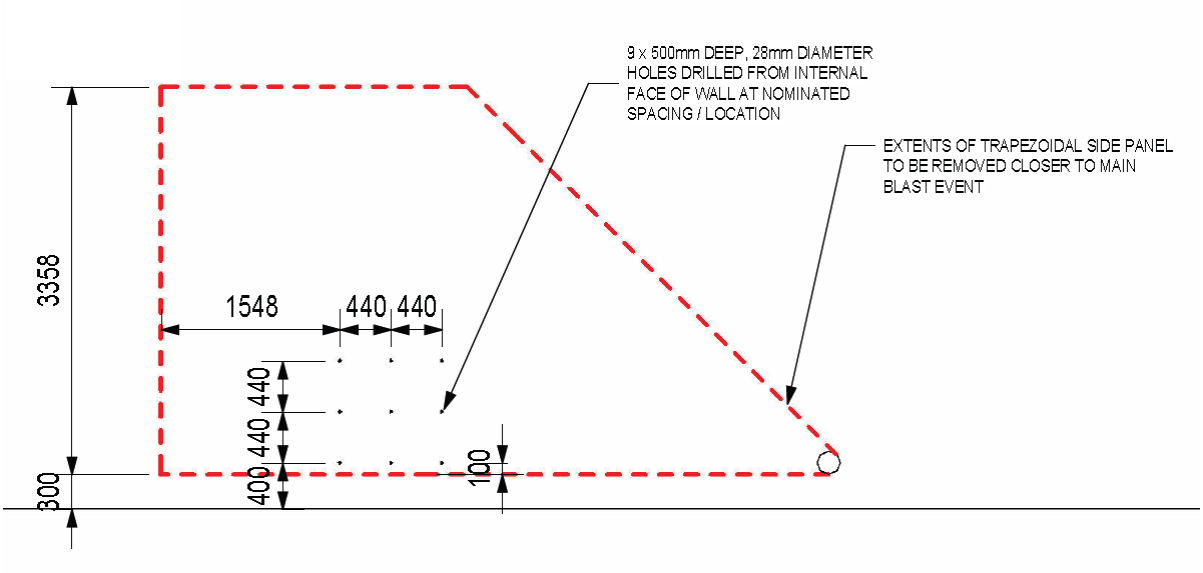


FIGURE 5 – BLAST PLAN EXTRACT

5.2 Structural Assessment

A structural analysis has been undertaken on the future proposed demolition method in order to ensure that the base of the chimney is not overstressed following the detonation of the test shot charges.

The results of the analysis indicate that the panel in which the test shot is to be completed is located such that the integrity of the structure is maintained. In addition, the final blast design for the collapse of the chimney structures includes the removal of this panel in advance, and the structural assessment has evaluated this accordingly.

Refer to Appendix C for Engineering Report for main chimney blast event which confirms that integrity of the chimney will be maintained.

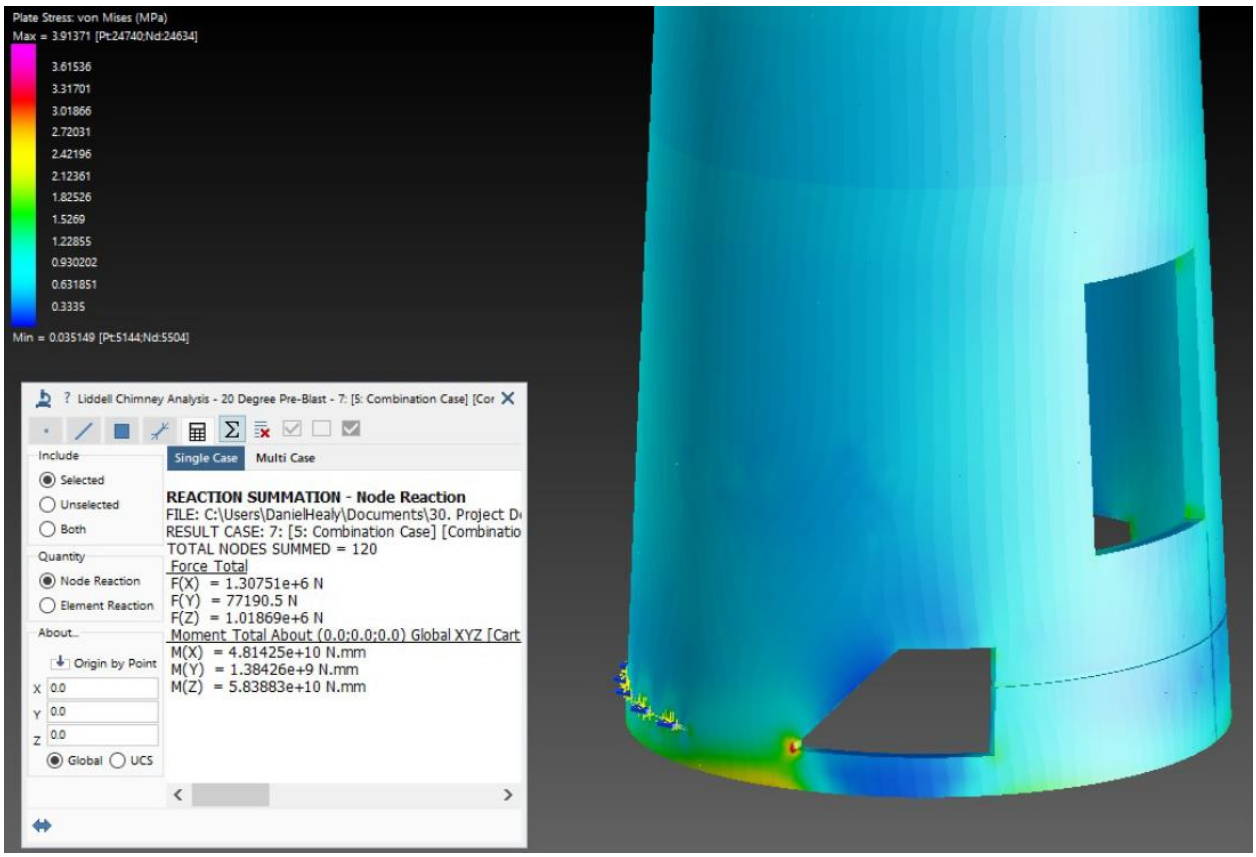


FIGURE 6 – FINITE ELEMENT ANALYSIS OF PRE-CUTS

6 BLAST DESIGN ASSESSMENT

The specific blast design has been developed by the shotfirer to ensure appropriate application of charges for the intended purpose.

The blast design is to include 9 blast holes drilled into the Northern face of the U1/U2 chimney in accordance with the drill pattern provided in Appendix B of this document. The holes are to be filled with packaged emulsion in accordance with the charge schedule, with appropriate delays applied (single delay of 0ms).

7 BLAST PLAN

The following Blast Plan has been developed to satisfy the requirements of AS2601-2025 Demolition of Structures, clause 2.3, and AS2187.2-2006 Explosives Storage and Use – Part 2 Use, clause 5.1. It details the process that must be followed in executing the project scope. Note that a number of supporting documents to the Blast Plan are provided in the Appendices of this document.

7.1 Location of Proposed Blasting

The blasting is to take place within the Liddell Power Station Site, located within the Hunter Valley, NSW. The chimney is positioned on the eastern side of the site, between the boiler houses and Lake Liddell. The specific location of the charges will be in the base of the U1/U2 chimney structures.

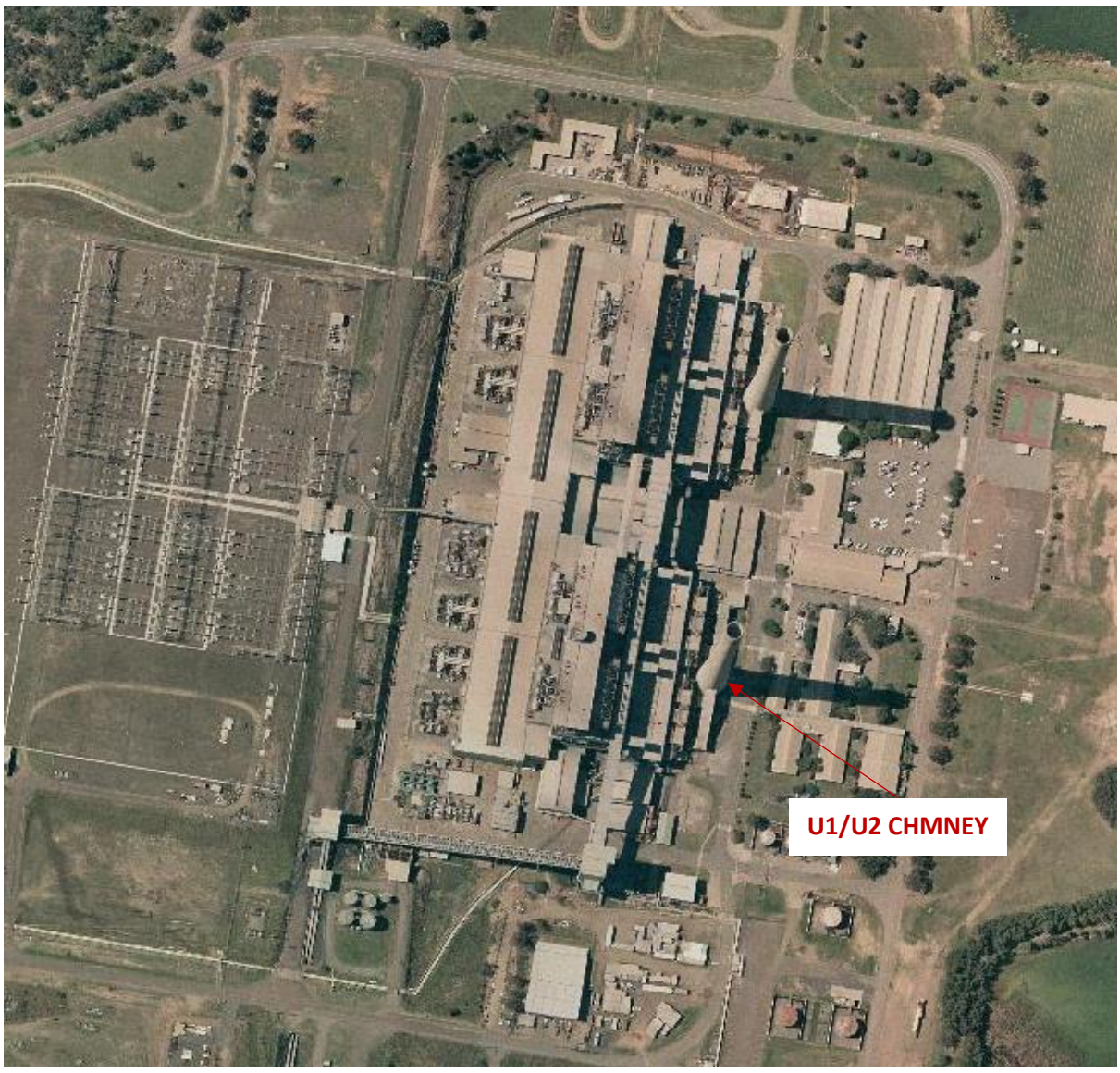


FIGURE 7 – AERIAL PHOTOGRAPH OF LIDDELL POWER STATION – U1/U2 CHIMNEY EAST OF SITE

7.2 Description of Proposed Blasting

The blasting will include the placement of 18 charges into 9 holes which will be pre-drilled into the chimney structures in accordance with the drill pattern / blast plan. The purpose of the blast is to confirm the proposed powder factor for the main chimney demolition blast event. The number of holes has been nominated to achieve a representative response from the structure whilst not risking compromising the structural integrity of the chimney stack. The assumed outcome is that the charges will break out the concrete around the rebar, and therefore confirm an appropriate powder factor has been adopted for the main works.

7.3 Permits / Licenses Required for the Project

Prior to executing these works, the following will be required in addition to the project wide State Significant Development approval:

TABLE 4 – PERMIT AND LICENSE REQUIREMENTS

ITEM	DESCRIPTION
SAFEWORK BLASTING NOTIFICATION	BLASTING NOTIFICATION COMPLETED BY BUEL HOLDER – 7 DAYS BEFORE WORKS
SAFEWORK NSW DEMOLITION NOTIFICATION	DEMOLITION VIA EXPLOSIVES NOTIFICATION – 21 DAYS BEFORE WORKS
SECURITY CLEARANCE	NSW SECURITY CLEARANCE FOR DANGEROUS GOODS
SHOTFIRER LICENSE	SHOTFIRER LICENSE
DEMOLITION SUPERVISOR	SAFEWORK NSW REGISTERED DEMOLITION SUPERVISOR
NOTIFICATION TO STAKEHOLDERS	VARIOUS STAKEHOLDERS TO BE NOTIFIED AS REQUIRED

7.4 Key Appointments and Responsibilities

The below provides a break down of the roles and responsibilities in relation to the blast event only. For details regarding project wide responsibilities and compliance with the conditions of consent, refer to Section 4.1 of Environmental Management Strategy - Liddell Future Land Use and Enabling Works.

TABLE 5 – ROLES AND RESPONSIBILITIES

POSITION	RESPONSIBILITIES
CMA CONTRACTING PROJECT MANAGER	AS REPRESENTING THE PRINCIPAL DEMOLITION CONTRACTOR - OVERARCHING MANAGEMENT OF PROJECT AND RESPONSIBLE FOR LIASON WITH SITE OPERATOR AGL
CMA SITE MANAGER	SITE MANAGEMENT OF PROJECT AND CO-ORDINATION WITH SITE OPERATOR AGL THROUGHOUT PROJECT
CMA DEMOLITION SUPERVISOR	WORKING WITH SHOTFIRING CREW TO ENSURE THAT PREPARATION WORKS ARE COMPLETED. ALSO PROVIDING ASSISTANCE TO SHOTFIRER TO MANAGE WORK EXCLUSION ZONES AND SENTRIES.

WELLANBAH PROJECT MANAGER / DEMOLITION SUPERVISOR	RESPONSIBLE FOR ENSURING PLANNING AND EXECUTION DOCUMENTATION IS COMPLETED, AND TO MANAGE ONSITE EXECUTION OF WORKS INCLUDING INSPECTION TEST PLANS, SIGN OFFS, AND COMPLIANCE WITH BLAST DESIGN.
WELLANBAH SHOTFIRERS	TRANSPORT, PLACEMENT AND DETONATION OF EXPLOSIVES IN ACCORDANCE WITH THIS BLAST MANAGEMENT SUB-PLAN.
WELLANBAH / ROSE STRUCTURAL ENGINEER	ANALYSIS OF DEMOLITION METHODOLOGY
AGL LIDDELL CLOSURE PROJECT MANAGER	ALLOW FOR WORKS TO PROCEED LIASE WITH ALL STAKEHOLDER AFFECTED BY BLASTING EVENTS AND CONFIRM ACCEPTANCE TO PROCEED WITH WORKS

7.5 Shotfirer's Details

In accordance consent condition C20 clause a) this blast management plan has been prepared by suitably qualified and experienced person Daniel Healy. Refer to Appendix E for details regarding qualifications and experience for the individual.

TABLE 6 – SHOTFIRER'S DETAILS

NAME	POSITION	QUALIFICATIONS
DANIEL HEALY*	SHOTFIRER / DEMOLITION SUPERVISOR	SHOTFIRER LICENSE CERTIFICATE IV DEMOLITION BACHELOR CIVIL ENGINEERING (HONS I) CHARTERED PROFESSIONAL ENGINEER – STRUCTURAL MASTER BUSINESS ADMINISTRATION (DIST.)

Refer to Appendix E for evidence of above qualifications.

7.6 Details of the Risk Management Assessment

In evaluating the proposed demolition scope, the following risks have been identified:

- Transport to and from site
- Inclement weather (lightning, high winds)
- Working with explosives – misfires, premature detonation
- Global instability of chimney post blast
- Fly / fragmentation from blast
- Air over blast pressure
- Vibration
- Dust
- Damage to adjacent structures or services
- Maintaining exclusion zones

- Exposure to hazardous materials (asbestos)
- Working in close proximity to a deteriorated structure

In order to manage each of these risks, a specific evaluation of all items will be undertaken, and appropriate control measures put in place prior to execution phase. The results of these evaluations and subsequent controls will be captured within the Safe Work Method Statements or associated project management plans as appropriate.

7.7 Details of Adjacent Structures or Services that Influence the Blast Design

Based on the magnitude of explosives and nature of the blast event, it has been determined that no adjacent structures or services will be affected by the planned activities.

7.8 Details of Reports, Drawings and Records Consulted

In developing this Blast Management Sub-Plan, the following was reviewed:

- Existing Chimney Construction Drawings
- Physical Site Inspections

These formed the basis of the structural analysis and blast design.

7.9 Layout Plan of the Blast

The following details the layout plan for the blast. Due to the size of the structure, the below is only an extract of the layout plan, refer to Appendix B of this document for the blast design drawings in high resolution.

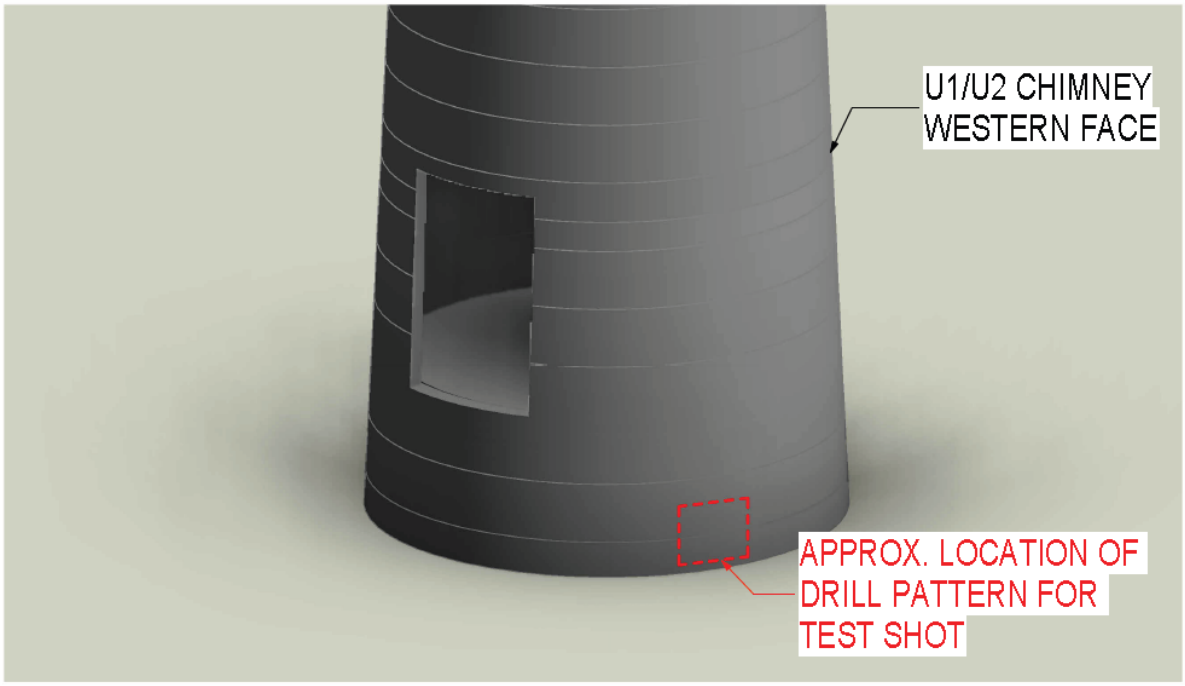


FIGURE 8 – LOCATION OF TEST SHOT

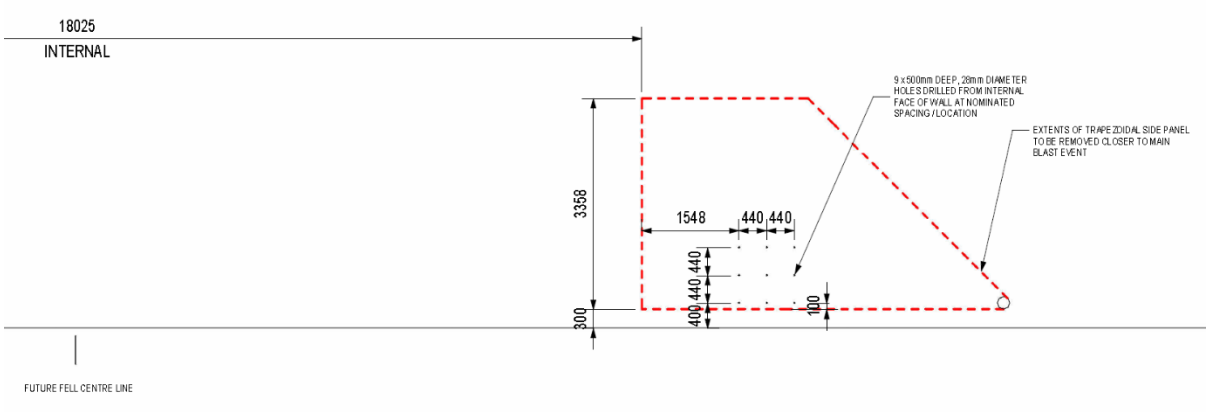


FIGURE 9 – EXTRACT OF BLAST LAYOUT – 1 OF 2



FIGURE 10 – EXTRACT OF BLAST LAYOUT – 2 OF 2



REFER TO APPENDIX M FOR HIGH RESOLUTION DRAWING WITH EXCLUSION ZONE DETAILS

FIGURE 11 – PLAN VIEW EXCLUSION ZONE

The charges are to be detonated from the position indicated herein. An exclusion zone of 300m/170m will be established for all personnel. The exclusion zone will be secured by sentries positioned around the perimeter of the site as indicated in Figure 11.

7.10 Detonation Sequence / Effective Charge Mass per delay (MIC)

Based on the characteristics of the blast, there will only be a single initiation time nominated as 0ms.

As per Table 6 below, this results in an MIC of approximately 2.07 kg and this value has been used in the assessment of Peak Air Over Pressure (refer section 7.18).

TABLE 7 – MAXIMUM INSTANTANEOUS CHARGE

ROW ID#	NUMBER OF HOLES IN ROW	CHARGES PER HOLE	CHARGES FOR ROW	CHARGE WEIGHT OF ROW (KG)	CHARGE TYPE	ROW DELAY TIMING (MS)
U1/2 CHIMNEY TEST SHOT CHARGE SCHEDULE						
1	3	2	6	0.69	SENATEL 25-200	0
2	3	2	6	0.69	SENATEL 25-200	0
3	3	2	6	0.69	SENATEL 25-200	0
TOTALS	**9**		**18**	**2.07**		
MIC				**2.07**		

7.11 Type of Explosive to be Used and Quantity Required

For type of explosives and quantity required, refer to Table 6 above. The explosives utilised will be Senatel packaged emulsions, detonating cord, and electronic detonators. The total quantity of explosives for the event will be 2.07 kg.

Refer to Appendix D for Technical Data Sheets for type of explosives to be used.

7.12 Method of Initiation

The method of initiation is to be electronic detonation of charges.

7.13 Type of Firing Equipment and Procedures

Firing is to be completed with the DaveyTronic Digital Blasting System (Electronic System). The procedure is to be as follows:

1. Tape electronic detonators onto start of detonating cord initiation lines
2. Clip in detonators to harness wire to register with programming unit (PU) and program delays
3. Transfer programming data to Remote Blaster (DRB2)
4. Run pre-blast checks (remote operation)
5. Commence count down / warning procedures and detonate charges



FIGURE 12 – FIRING EQUIPMENT – DAVEYTRONIC DIGITAL BLASTING SYSTEM

7.14 Drilling Procedures

The pre-drilling will be completed in accordance with Standard Operating Procedures and a site specific Safe Work Method Statement (not part of the scope of this BMSP). The drilling is to be in accordance with the drill pattern provided in Appendix B of this document.

7.15 Explosive Loading and Charging Procedures

The following procedure is to be followed for loading and charging:

1. Emulsion charges to be removed from transportable magazine and inspected for damage prior to the packing
2. Charges are to have detonating cord inserted into bottom end, and taped to cartridge.
3. Cartridges to be firmly pushed into charge holes (tamped) in accordance with blast layout plan
4. Charge holes to be stemmed with expanding foam
5. Tie detonating cord tails into horizontal detonating cord lines forming matrix
6. Attach electronic detonators to combined tails at either side of blast patter (detonator to be fixed on either side of pattern for redundancy)
7. Clip in detonators to downline to register with programming unit and program delays
8. Transfer programming data to Remote Blaster (DRB2)
9. Run pre-blast checks (remote operation)
10. Commence count down / warning procedures and detonate charges
11. Following countdown / warning procedures, initiation to take place
12. Post-blast inspection and all clear procedures to then be followed

7.15.1 Quality Control Process

In order to ensure compliance with the blast design, works are to be verified as they progress with a record of compliance maintained within the blast specific Cutting - Drilling - Charge Loading Quality Control Schedule. This schedule is to be completed by the shotfirer, and signed off upon finalising of works.

Refer to Appendix L: Cutting - Drilling - Charge Loading Quality Control Schedule - WI-QC-057-001a

7.16 Explosive Storage and Handling Procedures

As per the requirements of consent condition B18, the quantities of dangerous goods stored and handled by the development are below the threshold quantities listed in the Department's Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 at all times as detailed herein.

In addition, in accordance with consent condition B19 all Dangerous goods are to be stored and handled strictly in accordance with all relevant Australian Standards (AS2187) as detailed herein.

Furthermore, in accordance with consent condition HR2, explosives will be stored in a non-ferrous receptacle clearly marked 'Explosives' that is kept closed and locked (except during use by authorised personnel) and stored in the original containers which are securely sealed.
The storage area should be a well-ventilated magazine licenced for Inter-governmental Maritime Consultative Organisation (IMCO) Class 1.1 explosives, which protects the explosives from the weather, contamination, sources of ignition and access from unauthorised individuals. Storage will be isolated from other dangerous good stores and the area free of debris, waste and combustibles. The explosives containers should be protected against physical damage and regularly checked for spills and leaks.

In accordance with consent condition HR4, where more than 2.5 kg of Class 1.1 explosives are stored on a site, every perimeter entrance to the site must be labelled with a 'Hazchem' placard in accordance with the Explosives Regulations. Adequate security needs to be provided for the explosive's storage area, and only those who are authorised for unsupervised access to the area may have means to unlock the explosive storage magazine.

In accordance with consent condition HR5, Explosive storage and use areas will be no smoking and not contain naked light, heat or ignition sources. The explosives stock will be rotated to prevent ageing (use on first in-first out basis).

The following procedures are to be adhered with in relation to explosive storage and handling. It is noteworthy that due to the short term duration of the works, a storage facility will not be established onsite. Wellanbah Industrial's SafeWork NSW Licensed Facility will be used for storage, with explosives directly transported to site via a Category 2 Explosives Transport Vehicle, and fitted to the chimney structure in accordance with this Blast Management Sub-Plan.

Refer to Appendix I and K for additional supporting documents.

The general process to be implemented is as follows:

1. Explosives storage compound is offsite and registered with SafeWork NSW for the first stage of the project.
2. Explosives register to be maintained for the offsite compound, listing types and quantities of explosives removed/returned to magazine throughout works. Keys to the magazine will be held by the shotfirer nominated on the storage license.
3. Charges to be picked up directly from offsite storage magazine, and transported to site for charge placement.
4. Transport vehicle to be fitted with transportable magazine and magazine to be locked at all times (key to remain in possession of shotfirer)
5. When placing charges, explosives to only be handled by personnel with Security Clearance.
6. Excess explosives to be placed back in transportable magazine which is to remained parked adjacent to the chimney stack and relocated to be outside the exclusion zone for the blast event.
7. Any tooling to be explosive specific, and clothing is to be low static.

In addition to these requirements, compliance with Department's Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 will be achieved at all time.

The requirements of SEPP 33 are provided within the below Figures. Based on the maximum amount of explosive to be utilised < 100 kg, confirmation that the product doesn't fall into the Potentially Hazardous Region has been undertaken.

Table 1: Screening Method to be Used

Class	Method to Use/Minimum Quantity
1.1	Use graph at Figure 5 if greater than 100 kg

FIGURE 13 – SEPP 33 EXTRACT – TABLE 1: SCREENING METHOD TO BE USED

Figure 5: Class 1.1 Explosives

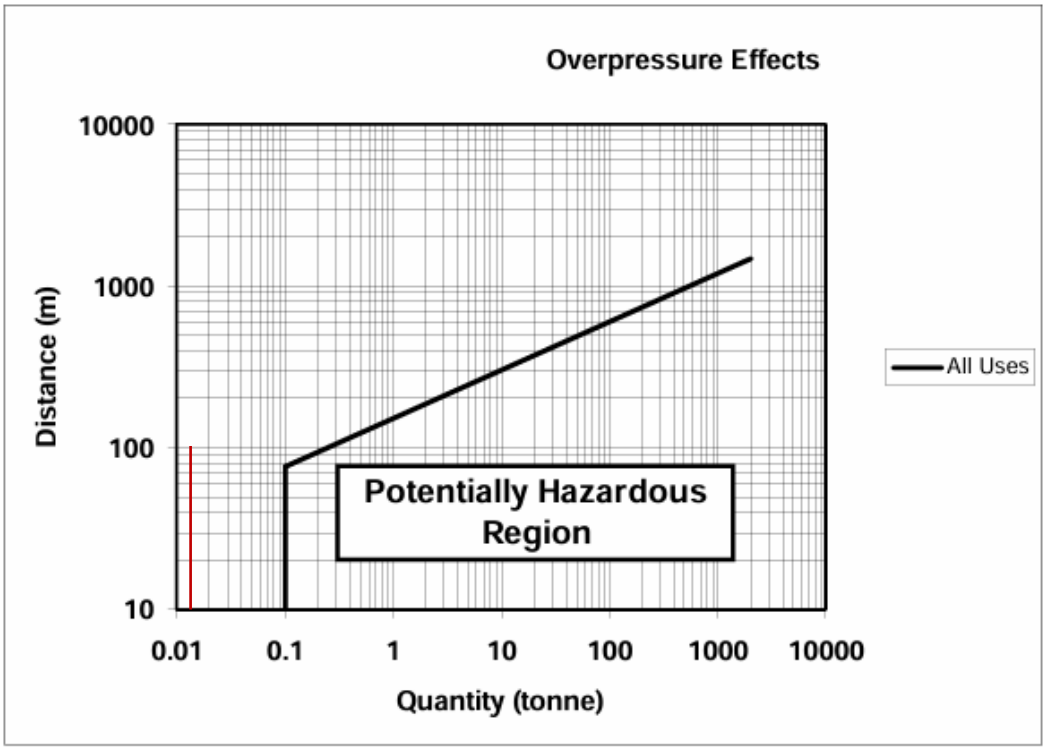


FIGURE 14 – SEPP 33 EXTRACT – HAZARDOUS REGION ASSESSMENT GRAPH FOR EXPLOSIVES

As per the SEPP 33 Hazardous Region Assessment, for 2 kg of explosives cannot fall into the hazardous region.

7.17 Security Procedures for the Site and the Blast, including Explosives

The following security procedures are to be followed onsite

1. All personnel must log onto site in accordance with site procedures
2. Explosives only to be handled by personnel with appropriate NSW Security Clearance
3. Explosives either be locked inside transportable magazine, or under direct supervision of personnel with NSW Security Clearance at all times
4. All explosives to be accounted for in the explosives use register.
5. For blast day, outer exclusion zone to be established in accordance with Blast Day Record Sheet (Refer to Appendix A)
6. Areas to be “swept” to ensure no unauthorised personnel are within the exclusion zone.
7. Sentries to be positioned around perimeter of exclusion zone to restrict any subsequent access
8. Pre-blast sentry checks and countdown procedure to be implemented as per Blast Day Record Sheet (Refer to Appendix A)
9. Exclusion zone to be maintained post blast, until the “all clear” is given by the shotfirer. The exclusion zone will then be handed over to the CMA Site Supervisor.

7.18 Environmental Considerations for Airblast Overpressure, Ground Vibration, Fly and Dust

In accordance with consent condition C20 clause b) (i) an assessment of blasting impacts at sensitive receivers and infrastructure, including the Liddell Ash Dam including the predicted airblast overpressure and ground vibration has been completed as provided herein.

Based on the nature of an explosive demolition blast event, there is minimal potential to cause impact to neighbouring properties or assets due to airblast overpressure, ground vibration, fly and dust. This section outlines the predicted environmental effects that may arise due to the blast event. It is evident from this assessment that the blast will not affect any onsite or offsite stakeholders.

Airblast Overpressure

As noted in Section 7.10, the Maximum Instantaneous Charge for the blast event is 2.07 kg of emulsion.

The estimated peak airblast overpressure has been calculated in accordance with AS2187.2, clause J7.2, with appropriate values for the site exponent and site constant to account for the explosives confinement within the chimney walls.

TABLE 8 – AIR OVER PRESSURE VALUES AT VARIOUS DISTANCES

DISTANCE (m)	ESTIMATE PEAK AOP (DBL)
50	148
100	139
200	130
300	125
400	122
500	119

In addition, as per the requirements of the conditions of consent and AS2187.2, the expected Airblast Overpressure at critical (and sensitive) receivers must be assessed based on the MIC. These receivers are detailed within the consent conditions for SSD-24937520 and provided overleaf in Figure 16.

The closest sensitive receiver is a non-residential receptor HA01. This receptor is approximately 2200m from the nearest chimney. The calculated peak airblast overpressure at this receiver was 100.1 DBL. As per the limits specified in AS2187 Table J5.4(A), this is below the limit for a sensitive site with blasting operations lasting less than 12 months.

Further to the assessment of sensitive receivers, a number of critical assets are to be evaluated, including:

- Liddell Ash Dam
- Lake Liddell Dam Wall
- Transgrid Switchyard
- Battery Storage Facility (BESS)
- Transition 330/33kv Substation

The distance to each of these assets and the corresponding airblast overpressure values are provided in the below table. For locations of the below assets, refer to the site aerial provided in Appendix H.

TABLE 9 – AIR OVER PRESSURE VALUE AT SENSITIVE / CRITICAL RECEIVERS

RECEIVER DETAILS	DISTANCE	ESTIMATE PEAK AOP
Closest Zone NCA1 Receiver – HA01	2200m	100.1 dBL
Closest Zone NCA2 Receiver – R03	4950m	89.89 dBL
Liddell Ash Dam	1800m	102.6 dBL
Lake Liddell Dam Wall	2300m	99.5 dBL
Transgrid Switchyard	230m	128.54 dBL
Battery Storage Facility (BESS)	220m	129.1 dBL
Transition 330/33kv Substation	330m	124.0 dBL

As per AS2187.2, the suggested limits for human discomfort are provided in Table J5.4(A). As per this table, the receivers identified within the consent conditions will not be exposed to peak sound pressure levels above the recommended limit of 120 dBL. As such, no mitigation measures are required for these locations.

Receivers within the Liddell Power Station site will have all personnel vacated for the blast event, with any personnel outside the exclusion zone subject to a peak noise of 132.3 dBL which is well below the legislative limit of 140 dBL.

TABLE J5.4(A)

AIRBLAST LIMITS FOR HUMAN COMFORT CHOSEN BY SOME REGULATORY AUTHORITIES (see Note to Table J5.4(B))

Category	Type of blasting operations	Peak sound pressure level (dBL)
Human comfort limits		
Sensitive site*	Operations lasting longer than 12 months or more than 20 blasts	115 dBL for 95% blasts per year. 120 dBL maximum unless agreement is reached with occupier that a higher limit may apply
Sensitive site*	Operations lasting for less than 12 months or less than 20 blasts	120 dBL mm/s for 95% blasts. 125 dBL maximum unless agreement is reached with occupier that a higher limit may apply
Occupied non-sensitive sites, such as factories and commercial premises	All blasting	125 dBL maximum unless agreement is reached with the occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that can be shown to adversely effect the equipment operation

* A sensitive site includes houses and low rise residential buildings, hospitals, theatres, schools, etc., occupied by people.

FIGURE 15 – EXTRACT FROM AS2187 – AIRBLAST LIMITS FOR HUMAN COMFORT

APPENDIX 3 SENSITIVE RECEIVERS

Figure 3 – Sensitive receivers

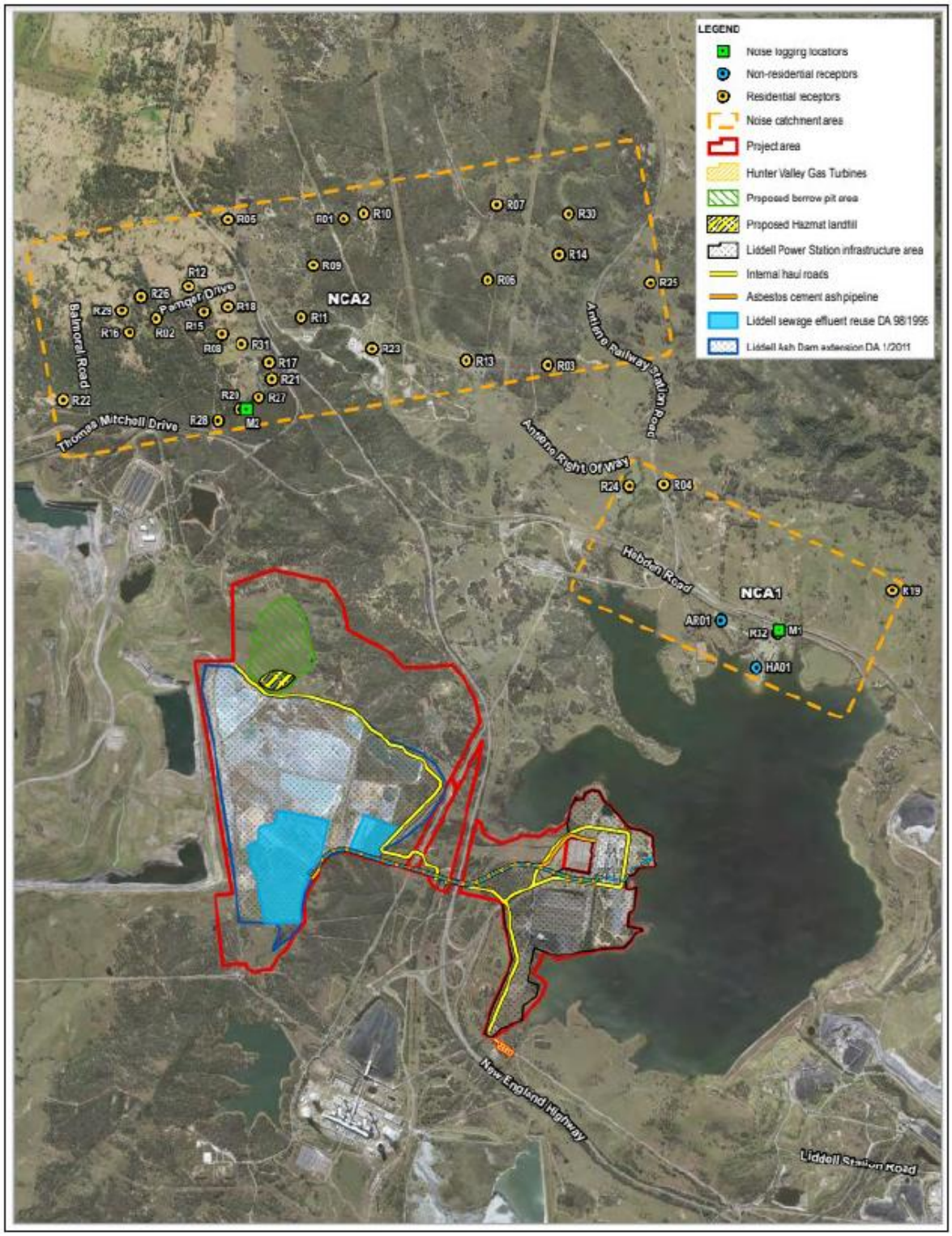


FIGURE 16 – EXTRACT FROM CONDITIONS OF CONSENT - SSD-24937520

In relation to damage to adjacent assets, it is evident that the Transgrid Switchyard, Batter Storage Facility (BESS) and Transition 330/33kv Substation will not be exposed to peak sound pressure levels which exceed the generic recommended limits of AS2187.2 Table J5.4(B).

TABLE J5.4(B)

RECOMMENDED AIRBLAST LIMITS FOR DAMAGE CONTROL (see Note)

Category	Type of blasting operations	Peak sound pressure level (dBL)
Damage control limits		
Structures that include masonry, plaster and plasterboard in their construction and also unoccupied structures of reinforced concrete or steel construction	All blasting	133 dBL maximum unless agreement is reached with the owner that a higher limit may apply
Service structures, such as pipelines, powerlines and cables located above the ground	All blasting	Limit to be determined by structural design methodology

NOTE: Tables J5.4(A) and J5.4(B) are intended to be informative and do not override statutory requirements, particularly with respect to human comfort limits set by various authorities. They should be read in conjunction with any such statutory requirements and with regard to their respective jurisdictions.

FIGURE 17 – EXTRACT FROM AS2187.2 AIRBLAST RECOMMENDED LIMITS FOR DAMAGE CONTROL

Ground Vibration

Due to the nature of the blast event (size & location of charges above ground) explosive induced vibration is not deemed a risk for this blast event.

Fly (projection of material from blast epicentre)

There is a possibility of fly due to the detonation of the charges. In order to manage risk of fly, the following control measures are to be in place:

1. Exclusion zone of 300m/170m to be established
2. Charges to have protection placed over the front by way of steel plate

Note that based on the distances to all critical infrastructure (refer to section7.18), the above listed mitigation measures are sufficient, and no additional mitigation measures are required.

Dust

Dust is to be managed in accordance with the project Dust Management Sub-Plan: Liddell Future Land Use and Enabling Works – DMP D0v5.

Based on the characteristics of the event, dust controls will include a pre-blast wet down of the area, and a post blast wet down.

7.19 Control Measures for Environmental Effects

In accordance with consent condition C20 clause (iii) a strategy to monitor, assess, mitigate or compensate for the effects of blasting at sensitive receivers identified by the assessment required by condition C20(b)(i) of the Consent has been developed as referenced herein. Note this specific section relates to the mitigation strategies.

The following control measures have been implemented for environmental effects

1. Establishment of appropriate exclusion zone
2. Evaluation of airblast overpressure against allowable limits, hence ensuring blast design does not exceed noise limits
3. Placement of protection around charges
4. Communication with all affected stakeholders
5. Dust suppression to be utilised as per the listed controls in Section 7.18
6. Airblast overpressure evaluated as per Section 7.18 of this document

7.20 Monitoring Procedures for Airblast Overpressure, Ground Vibration and Dust

In accordance with consent condition C20 clause (iii) a strategy to monitor, assess, mitigate or compensate for the effects of blasting at sensitive receivers identified by the assessment required by condition C20(b)(i) of the Consent has been developed as referenced herein.

The strategy includes an assessment of the expected effects of blasting as provided in Section 7.18 to evaluate the need to implement monitoring or controls for sensitive receivers. As no sensitive receivers were identified by this process, and based on the magnitude of the charges (2.07 kg) and the characteristics of the blast event (test shot only), it has been determined that monitoring will not be required for the event. Monitoring will be implemented for the subsequent demolition blast event, which does not form part of the scope of this BMSP.

7.21 Details of Communication Systems & Placement of Warning Signs

Communication Systems:

Communication during the establishment of the exclusion zone and the countdown will be completed in consultation with the Principal Contractor via two-way radios issued to all personnel. In addition, all personnel associated with the blast day event will attend a mandatory training session for managing the exclusion zone on the morning of the blast, and the pre-start meeting where the planned activities for the day and specific arrangements for the blast event are broadcast to all personnel. A record of this training will be included within the pre-start meeting minutes. The training is to consist of inducting the sentries into the Senty map (including schedule of events, communication procedures, and personnel contact details).

Warning Signs:

Warning signs “Danger – Blasting Keep Well Clear”, are to be positioned on the four sides of the chimney stack.

7.22 Warning / Signalling Procedures

The following warning / signalling procedure is to be followed for the execution of the planned blast event.

Prior to commencing countdown, an exclusion check over the radios is to be completed to confirm the exclusion zone is clear, the 10-minute countdown will then commence:

@ 10 min. – 5 siren blasts

@ 1 min. – single 10 second-long blast and radio silence

@ 10 seconds – final countdown broadcast over radio from 10 down to 5 seconds

@ 5 seconds – Radio silence maintained

@ 0 second – Shotfirer to broadcast “Firing Now”, and charges will be detonated.

Note - Sentries will monitor this exclusion zone throughout the countdown, and advise any unauthorized entry and if abort is required. This will be completed by broadcasting over the radio abort, abort, abort. If the shotfirer does not respond, repeat the broadcast and await confirmation from the shotfirer prior to providing details of intrusion.

Post blast inspection to be undertaken by the shotfirer following the event, with the exclusion zone to remain in place until the “All Clear” is broadcast over the radio. In the event of a misfire, exclusion zone and sentries to remain in position, until execution of mis-fire treatments.

7.23 Traffic Management Plan

Based on the nature of the blast event, traffic management will not be required. Sentry’s will be responsible for ensuring that access is prevented at all the site roads.

7.24 Proposed Dates and Times of Blasting

TABLE 10 – PROPOSED DATES AND TIMES

DATE RANGE	TIME RANGE	COMMENTS
November 2025 - February 2026	9:00AM TO 5:00PM	Intended blast time to be 4:30pm, subject to weather and site requirements

7.25 Details of Exclusion Zone

The details of the exclusion zone are provided within the below Figure. The exclusion zone on the blast side has been nominated at 300m, reducing to 170m on all other sides.



FIGURE 18 – EXCLUSION ZONE

7.26 Method of Notification / Consultation to Owners and Occupiers of Structures, and Providers of Services Adjacent to Blast

Based on the environmental effects assessment (refer to Section 7.18), the noise and vibration generated by the blast event is below the threshold for sensitive receivers. This is due to the significant buffer zone around the power station.

In accordance with Condition Consent Clause C20 b) ii) AGL will complete consultation with the relevant private landowners or infrastructure owners if the assessment predicts blasting by the development will impact sensitive receivers (Refer to Section 7.18). A record of this consultation is to be included in Appendix R of this BMSP.

7.27 Protection of Services

Based on a review of the location and characteristics of the blast, no services will require protection.

7.28 Influence of Weather

The following weather conditions may result in a pause or cessation of the planned blast:

- Excessive wind – Refer to Section 7.31 for control measures.
- Heavy rain – determined based on site conditions
- Electrical Storms – Refer to Section 7.31 for control measures.

In addition to the above, the weather conditions will be assessed in advance of the anticipated blast day, and postponed if the forecast is deemed unsuitable for the planned activities.

Refer to Appendix J for details regarding the allowable wind conditions.

Refer to Appendix J for Trigger Action Response Plan

7.29 Loading in poor light conditions or reduced visibility

All works are only to be completed during daylight hours. In addition, due to the nature of the charge placement, poor light / reduced visibility is unlikely to become a risk.

In the event that heavy fog, or other meteorological circumstances reduce visibility, works are to be postponed until safe to proceed with works.

7.30 Cessation of Explosive-related Activities During Electrical Storms

Cessation of explosive-related activities during electrical storms is to be completed in accordance with the Trigger Action Response Plan (TARP) as provided in Appendix J.

In the event of an approaching electrical storm, area is to be locally made-safe, and the exclusion zone noted in the TARP is to be set in place until storm has passed. However, works are to be scheduled in consideration of weather forecast to reduce probability of electrical storm occurrence.

7.31 Evacuation Procedures

The evacuation procedure is to be as follows:

1. Requirement for evacuation broadcast on the radio, to notify all personnel within the exclusion zone of the need to immediately evacuate. This notification is to be stated as follows: **“Evacuate, evacuate, evacuate, all personnel to immediately evacuate the chimney blasting area”**
2. All personnel within the exclusion zone are to relocate to the pre-determined muster point for the site.
3. This specific location will be broadcast on the morning of the blast.
4. Roll calls to be completed for all personnel to ensure all are accounted for
5. Depending on the nature of the evacuation, emergency procedures or corrective actions to be developed by shotfirer

The requirement to evacuate is influenced by weather conditions due to potential for lightning or high winds. Appendix J provides the Trigger Action Response Plan (TARP) to be implemented for the project.

7.32 Crowd Control

The location of the blast is within the significant power station site, hence crowd control will be achieved through the positioning of sentries at all potential access locations (Refer to Appendix M) and existing site security fencing.

7.33 Pre-Blast Final Inspection

The following pre-blast final inspection is to be undertaken

1. Following placement of charges and tie in of detonating cord matrix, assess charges and knots for any dislodgement / looseness in the system.
2. Inspect connection between initiation lines and electronic detonators.
3. Inspect protection placed around the base of the chimney for potential cut off to any areas of detonating cord or the detonator wires.
4. Ensure electronic detonator clips are securely fastened to harness wire
5. Run pre-blast checks on initiation system (missing det search, leakage/broken line, det count)
6. Take control of the exclusion zone from the site supervisor following final sentry checks and commence countdown procedure before initiating charges

7.34 Misfire Management System & Contingency Plan

The following procedures are to be followed in the event of a misfire.

7.34.1 Waiting Interval

A waiting interval of 5 min is to be observed prior to approaching an expected misfire (Clause 10.3.2 of AS 2187.2-2006).

7.34.2 Misfire Treatment Procedures

TABLE 11 – MISFIRE PROCEDURES

CAUSE OF MISFIRE	POTENTIAL TREATMENT ACTION
Failure to detonate charges	All sentries to remain in position securing the exclusion zone. Disconnect firing system from harness wire and secure the firing card. After mandatory 5 min waiting interval observed, identify reason for mis-fire. If misfire is due to connectivity issues, identify location of leakage / lack of continuity, rectify and retest circuit prior to attempting to re-shoot in accordance with firing procedure. If misfire is due to failure to initiate charges following detonation of detonator or the failure of a detonator to fire despite the blasting unit completing the firing process, undertake written risk assessment and create a planned response to remove and dispose of the charges / faulty detonator.

Note that prior rectifying a misfire, a written risk assessment and planned response must be developed if the shot holes require excavator (or extraction) or if new charges are required.

7.35 Post Blast Assessment and Inspection Procedures

The following checklist is to be followed when undertaking post blast assessment (note this checklist is included within the Blast Day Record Sheet – Appendix A):

TABLE 12 – POST-BLAST INSPECTION REQUIREMENTS

ITEM	DESCRIPTION
BLAST FUMES – NOXIOUS AND TOXIOUS GASES	BLAST FUMES TO BE VISUALLY ASSESSED PRIOR TO APPROACHING BLAST ZONE
STANDUP OF STRUCTURE	FAILURE OF STRUCTURE TO COLLAPSE, CONFIRM FROM A SAFE DISTANCE CAUSE AND LOCATION OF FAILURE STRUCTURAL ENGINEER TO ASSESS AS REQUIRED
EVIDENCE OF MISFIRE	EVIDENCE OF ANY UNEXPLODED CHARGES
STABILITY OF STRUCTURE	CONFIRM STRUCTURE IN STABLE POSITION / TYPE OF EXCLUSION ZONE WHICH MUST BE MAINTAINED
HAZMAT	ANY UNEXPECTED FINDS IN RELATION TO HAZMAT – ASBESTOS ETC.

Post-blast fumes are to be assessed in accordance with the below colour coding. As per QLD DEEDI advise, the area should not be entered until the adequate dilution of fumes. In emergencies, level of 5 ppm, can be tolerated in short term, however as a general rule, the area should not be approached until there are no visible fumes.

TABLE 13 – RATING PROCEDURE FOR POST-BLAST FUMES

POST-FIRING FUME CONDITIONS						
FUME RATING						
	0	1	2	3	4	5
	☐	☐	☐	☐	☐	☐

Nitrogen dioxide (NO_2) concentrations for odour, visibility and 'immediate danger to life and health' (IDLH)	
Odour threshold	0.12 ppm
Visible	2.5 ppm
Any atmosphere in which nitrogen dioxide (NO2) is noticeable by smell, irritation and colour should be regarded as potentially dangerous.	3 ppm – 5 ppm
Specific symptoms may materialise above this level and can result in immediate danger to life and health (IDLH). IDLH is defined as exposure to airborne contaminants that are likely to cause death or immediate or delayed adverse health effects, or prevent escape from such an environment.	20 ppm+

FIGURE 19 – EXTRACT FROM QLD DEEDI – FACTSHEET ON BLAST FUMES

The below figure provides additional guidance on safe levels of post-blast fumes.

Level	Typical Appearance
Level 0 No NOx gas	
Level 1 Slight NOx gas 1A Localised 1B Medium 1C Extensive	
Level 2 Minor yellow/orange gas 2A Localised 2B Medium 2C Extensive	
Level 3 Orange gas 3A Localised 3B Medium 3C Extensive	
Level 4 Orange/red gas 4A Localised 4B Medium 4C Extensive	
Level 5 Red/purple gas 5A Localised 5B Medium 5C Extensive	

FIGURE 20 – FUME RATING GUIDANCE

7.36 Provision for post-blast comments

Section for post-blast comments is included within the Blast Day Record Sheet. Refer to Appendix A.

7.37 Blast Plan Sign Off

Page 2 of this blast plan is to be signed off prior to executing works.

In addition, the Blast Day Record Sheet and Inspection Test Plan provided in Appendix F, are to be completed by the shotfirer through the duration of the blasting activities and kept as a record post blast.

Copy of this Blast Management Sub-Plan must be retained at the work front at all times.

8 STAKEHOLDER NOTIFICATIONS

Based on the magnitude of the explosives used and characteristics of the blast event, no stakeholder notifications are required.

In accordance with Condition Consent Clause C20 b) ii) AGL will complete consultation with the relevant private landowners or infrastructure owners if the assessment predicts blasting by the development will impact sensitive receivers (Refer to Section 7.18). A record of this consultation is to be included in Appendix R of this BMSP.

APPENDIX A – BLAST DAY RECORD SHEET

BLAST DAY RECORD SHEET

In accordance with AS2187.2-2006 Explosives Storage and Use – Part 2 Use, clause A3, a Blast Day Record Sheet must be completed for all projects which contains the details provided herein.

1. PROJECT AND BLASTING DETAILS

ITEM	DESCRIPTION		
PROJECT NAME	LIDDELL POWER STATION - CHIMNEY TEST SHOT		
SITE LOCATION	LIDDELL POWER STATION, MUSWELLBROOK NSW		
DATE OF BLAST			
TIME OF BLAST			
SHOTFIRER DETAILS	DANIEL HEALY – 0432 164 748		
SHOTFIRER SIGNOFF		**DATE**	
BLASTING METHOD	General blasting method includes drilling 9 blast holes into the side wall of the U1/U2 chimney stack. The holes are to be filled with packaged emulsion in accordance with the charge schedule, with appropriate delays applied. The charge placement includes the following steps: 1. Emulsion charges to be removed from transportable magazine and inspected for damage prior to the packing 2. Charges are to have detonating cord inserted into bottom end, and taped to cartridge. 3. Cartridges to be firmly pushed into charge holes in accordance with blast layout plan 4. Tie detonating cord tails into horizontal detonating cord lines forming matrix 5. Attach electronic detonators to horizontal initiation lines 6. Clip in detonators to downline to register with programming unit and program delays 7. Transfer programming data to Remote Blaster (DRB2) 8. Run pre-blast checks (remote operation) 9. Commence count down / warning procedures and detonate charges 10. Following countdown / warning procedures, initiation to take place 11. Post-blast inspection and all clear procedures to then be followed		

2. KEY PERSONNEL

POSITION	NAME & CONTACT NUMBER	RESPONSIBILITIES
CMA GROUP PROJECT MANAGER		OVERARCHING MANAGEMENT OF PROJECT AND RESPONSIBLE FOR LIASON WITH ASSET OWNER
CMA SITE MANAGER		SITE MANAGEMENT OF PROJECT AND CO-ORDINATION WITH LIDDELL THROUGHOUT PROJECT
CMA DEMOLITION SUPERVISOR		WORKING WITH SHOTFIRING CREW TO ENSURE THAT PREPARATION WORKS ARE COMPLETED. ALSO PROVIDING ASSISTANCE TO SHOTFIRER TO MANAGE WORK EXCLUSION ZONES AND SENTRIES.
WELLANBAH PROJECT MANAGER / DEMOLITION SUPERVISOR		RESPONSIBLE FOR ENSURE PLANNING AND EXECUTION DOCUMENTATION IS COMPLETED, AND TO MANAGE ONSITE EXECUTION OF WORKS INCLUDING INSPECTION TEST PLANS, SIGN OFFS, AND COMPLIANCE WITH BLAST DESIGN.
WELLANBAH SHOTFIRERS		TRANSPORT, PLACEMENT AND DETONATION OF EXPLOSIVES IN ACCORDANCE WITH THIS BLAST MANAGEMENT SUB-PLAN.
WELLANBAH / ROSE STRUCTURAL ENGINEER		ANALYSIS OF DEMOLITION METHODOLOGY
AGL LIDDELL CLOSURE PROJECT MANAGER		ALLOW FOR WORKS TO PROCEED
AGL THIRD PARTIES DECONSULT / BROWN AND MASON		REVIEW BLAST DESIGN

3. PROGRAM OF BLAST WORKS

The program of blast works is to be as provided below.

ITEM	DESCRIPTION	
BLAST EVENT		
INTENDED PROGRAM FOR ACTIVITIES	2:00PM – 2:15PM:	PRE-START MEETING WITH ALL PERSONNEL
	2:15PM – 2:20PM:	SENTRY BRIEFING SESSION
	2:20PM – 2:40PM:	SENTRIES TO MOVE INTO POSITIONS
	2:40PM – 2:45AM:	INITIAL SENTRY CALLS TO CONFIRM EXCLUSION ZONE HAS BEEN ESTABLISHED
	2:45PM – 3:15PM:	CLEARANCE SWEEPS OF ALL POWER STATION AREAS WITHIN THE EXCLUSION ZONE FOR ANY NON-ESSENTIAL PERSONNEL
	2:20PM – 3:15PM:	FIT CHARGES TO STRUCTURE
	3:15PM – 3:30PM	ATTACH DETONATORS AND PROGRAM CHARGES – COMPLETE PRE-CHECKS
	3:30PM – 3:45PM	PLACE PROTECTION
	3:45PM – 3:50PM	COMPLETE PRE-WET DOWN
	3:50PM – 3:55PM	COMPLETE SENTRY CALLS AND ROLL CALL TO ACCOUNT FOR ALL PERSONNEL
	3:55PM – 4:15PM	RE-COMPLETE PRE-CHECKS OF INITIATION SYSTEM AND RUN HARNESS WIRE TO FIRING LOCATION
	4:15PM – 4:20PM	COMPLETE FINAL SENTRY CHECKS HANDOVER CONTROL TO SHOTFIRER FOR FINAL COUNTDOWN
	4:20PM – 4:30PM	10 MINUTE COUNTDOWN
	4:30PM	INITIATE BLAST
	4:30PM – 4:45PM	COMPLETE POST-BLAST INSPECTION
	4:45PM	BROADCAST ALL CLEAR, AND HAND SITE CONTROL BACK TO CMA SUPERVISOR

4. ENVIRONMENTAL CONDITIONS

ITEM	DESCRIPTION
ENVIRONMENTAL CONDITIONS AT TIME OF BLAST	WIND: RAIN: LIGHTNING: CLOUD COVER:

5. SENTRY DETAILS AND EXCLUSION ZONE

Sentries are to be positioned in accordance with the below plan.



REFER TO APPENDIX M FOR HIGH RESOLUTION DRAWING WITH EXCLUSION ZONE DETAILS

300m/170m Exclusion Zone

SENTRY NUMBER	ASSIGNED PERSONNEL	CONTACT NUMBER
1 – CONTROL POINT		
2		
3		
4		
5		
6		
SHOTFIRER CREW (POSITIONED AT BLAST CONTROL POINT)	DANIEL HEALY	0432 164 748
RADIO CHANNEL		

6. WARNING / SIGNALLING PROCEDURE

The following warning / signalling procedure is to be followed for the execution of the planned blast event.

Prior to commencing countdown, an exclusion check over the radios is to be completed to confirm the exclusion zone is clear, the 10-minute countdown will then commence:

@ 10 min. – 5 siren blasts

@ 1 min. – single 10 second-long blast and radio silence

@ 10 seconds – final countdown broadcast over radio from 10 down to 5 seconds

@ 5 seconds – Radio silence maintained to allow for sentries to make abort call due to intrusion to exclusion zone

@ 0 second – Shotfirer to broadcast “Firing Now”, and charges will be detonated.

Note - Sentries will monitor this exclusion zone throughout the countdown, and advise any unauthorized entry and if abort is required. This will be completed by broadcasting over the radio “**abort, abort, abort”**. If the shotfirer does not respond, repeat the broadcast and await confirmation from the shotfirer prior to providing details of intrusion.

Post blast inspection to be undertaken by the shotfirer following the event, with the exclusion zone to remain in place until the “All Clear” is broadcast over the radio. In the event of a misfire, exclusion zone and sentries to remain in position, until execution of mis-fire treatments.

7. PRE-BLAST CHECKLIST

ITEM	DESCRIPTION	STATUS	SIGNED
1	Following placement of charges and tie in of detonating cord matrix, assess charges and knots for any dislodgement / looseness in the system.		
2	Inspect connection between initiation lines and electronic detonators.		
3	Inspect protection placed around the base of the chimney for potential cut off to any areas of detonating cord or the detonator wires.		
4	Ensure electronic detonator clips are securely fastened to harness wire		
5	Run pre-blast checks on initiation system (missing det search, leakage/broken line, det count)		
6	Take control of the exclusion zone from the demolition supervisor following final sentry checks and commence countdown procedure before initiating charges		

8. MISFIRE PROCEDURES

CAUSE OF MISFIRE	POTENTIAL TREATMENT ACTION
Failure to detonate charges	All sentries to remain in position securing the exclusion zone. Disconnect firing system from harness wire and secure the firing card. After mandatory 5 min waiting interval observed, identify reason for mis-fire. If misfire is due to connectivity issues, identify location of leakage / lack of continuity, rectify and retest circuit prior to attempting to re-shoot in accordance with firing procedure. If misfire is due to failure to initiate charges following detonation of detonator or the failure of a detonator to fire despite the blasting unit completing the firing process, undertake written risk assessment and create a planned response to remove and dispose of the charges / faulty detonator.

9. MONITORING EQUIPMENT

N.A

10. POST BLAST CHECKLIST

ITEM	DESCRIPTION	STATUS / RESULTS
BLAST FUMES – NOXIOUS AND TOXIOUS GASES	BLAST FUMES TO BE VISUALLY ASSESSED PRIOR TO APPROACHING BLAST ZONE (COMPLETE BELOW RATING TABLE)	
EVIDENCE OF MISFIRE	EVIDENCE OF ANY UNEXPLODED CHARGES	
STABILITY OF STRUCTURE	CONFIRM STRUCTURE IN STABLE POSITION / TYPE OF EXCLUSION ZONE WHICH MUST BE MAINTAIN	
HAZMAT	ANY UNEXPECTED FINDS IN RELATION TO HAZMAT – ASBESTOS ETC.	
ALL CLEAR ANNOUNCEMENT	BROADCAST “ALL CLEAR” TO SENTRIES	

POST-FIRING FUME CONDITIONS						
FUME RATING	0	1	2	3	4	5
	☐	☐	☐	☐	☐	☐

11. RECORDS BLASTING ACTIVITY

ITEM	DESCRIPTION
MONITORING RECORDS	N.A
DETAILS OF FLYROCK OR FLY	
DETAILS OF DUST	
DETAILS OF INCIDENTS AND COMPLAINTS	

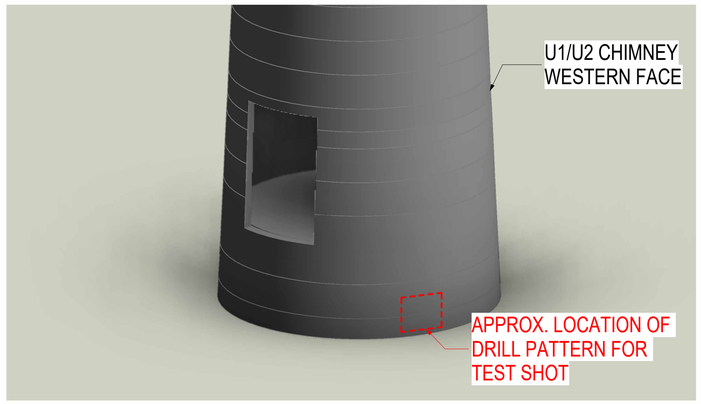
12. ADDITIONAL CLOSEOUT AND COMMENTS

ITEM	DESCRIPTION
COMMENTS ON RESULTS OF BLAST	
PROPOSED MODIFCATION TO THE BLAST PLAN FOR FUTURE SHOTS	

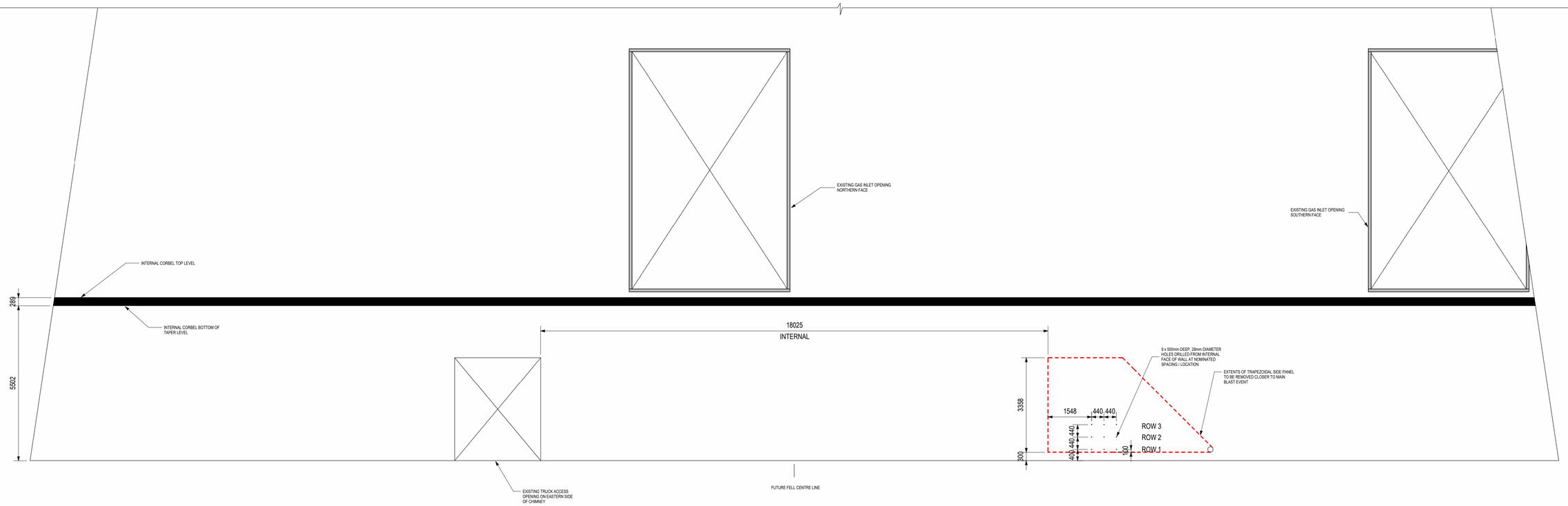
13. FINAL POST-BLAST SIGNOFF

FINAL POST-BLAST SIGNOFF	
SHOTFIRER:	
SIGNATURE:	
TIME:	
DATE:	
CLOSING COMMENTS:	

APPENDIX B – BLAST DESIGN



3D VIEW - U1/U2 CHIMNEY - 20 DEG. ROTATION TEST SHOT LOCATION
SCALE: NTS



NOTES:
1. COMPLETE SITE INVESTIGATIONS PRIOR TO SET OUT, CUTTING OR DRILLING TO ENSURE CHIMNEY GEOMETRY MATCHES DRAWINGS
2. TOLERANCE ON DRILL PATTERN +/- 75mm, TOLERANCE ON HOLE DEPTH +/-25mm.

DRILL PATTERN & CHARGE LAYOUT - U1/U2 TEST SHOT
SCALE 1 : 75

No	Revision	Drawn	Designed	Reviewed	Date
B	UPDATED HOLE NOTATIONS	DH	DH	BH	26.09.25
A	INITIAL ISSUE OF DRAWING	DH	DH	BH	11.09.25

Note: * indicates signatures on original issue of drawing or last revision of drawing

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Drafting Check B. HEALY
Approved D. HEALY
Date 11.09.25
Scale
This Drawing must not be used for Construction unless signed as Approved

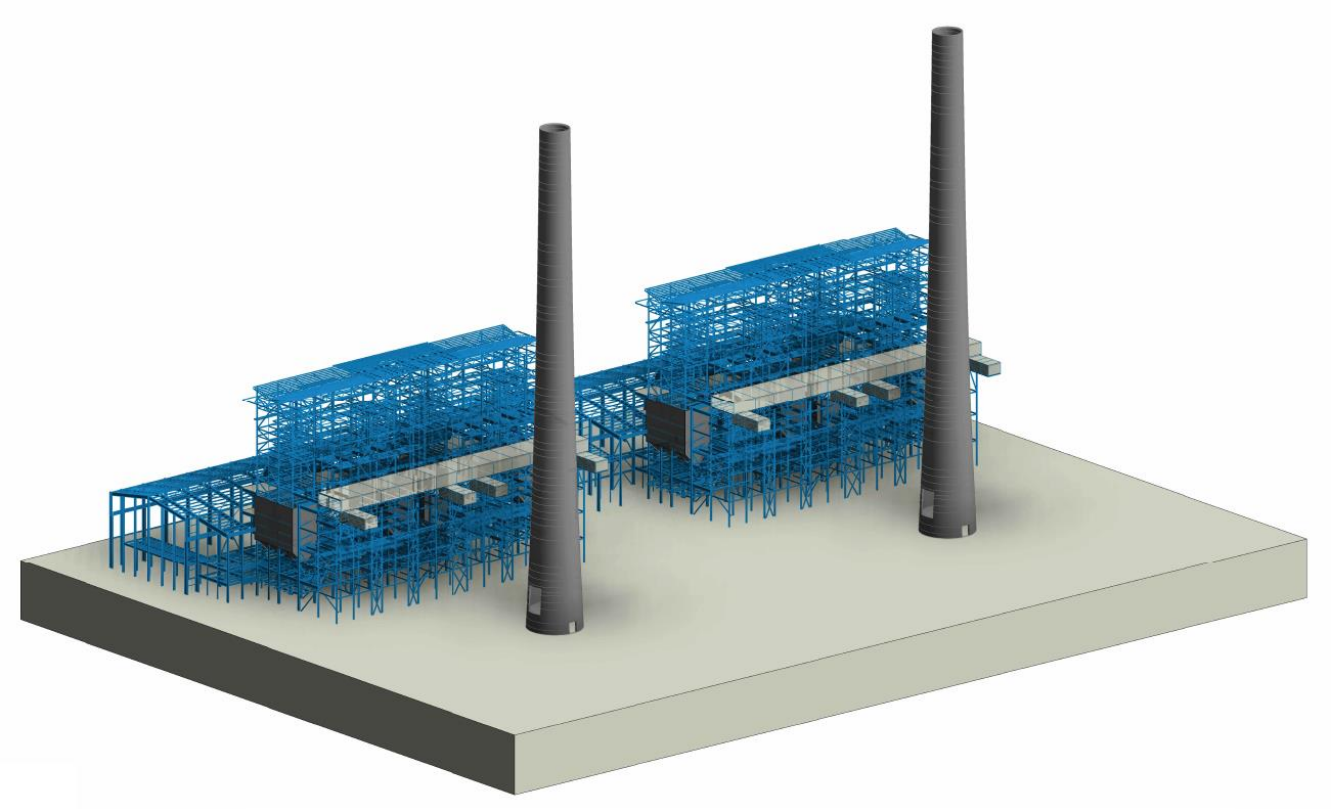
Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **BLAST PLAN - CHIMNEY TEST SHOT**

Original Size **A1**
Drawing No: **WI-24057-06-22-S01**
Rev: B

Plot Date: 26/09/2025 12:05:06 PM

APPENDIX C – ENGINEERING REPORT

WELLANBAH INDUSTRIAL



ENGINEERING ANALYSIS REPORT

LIDDELL POWER STATION CHIMNEY DEMOLITION

WI-ENG-2057-006-REV 2

SEPTEMBER 2025

DOCUMENT CONTROL RECORD

DOCUMENT CONTROL				
REPORT TITLE		LIDDELL POWER STATION CHIMNEY DEMOLITION ENGINEERING ANALYSIS REPORT		
DOCUMENT CODE		WI-ENG-2057-006	**PROJECT NUMBER**	WI-2057
CLIENT		CMA CONTRACTING		
REV	**DATE**	**REVISION DETAILS/STATUS**		**APPROVED BY**
REV 0	14/02/25	ISSUED FOR REVIEW		D. HEALY
REV 1	6/06/25	UPDATES FOLLOWING THIRD PARTY REVIEW		D. HEALY
REV 2	3/09/25	REVISED COLLAPSE DIRECTION / DESIGN		D. HEALY

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EXECUTIVE SUMMARY

CMA Contracting are currently executing the demolition of the Liddell Power Station Site on behalf of asset owner AGL. The redundant site is located within the Hunter Valley, approximately 18 km from the township of Muswellbrook, New South Wales.

A key component of these works is the demolition of the two chimney stack structures which are positioned on the Eastern side of the main power station footprint.

The structures are of height approximately 169m; the base outside diameter is 18.6m, with a wall thickness of 610mm; the top outside diameter is 9.8m, with a wall thickness of 216mm. The material of construction is reinforced concrete, with the size and layout of the reinforcement varying throughout the height of the structure. In addition, the chimneys include a number of corbels at regular spacings, and these corbels support the internal brick lining. There is also an internal concrete slab which is supported on four columns at approx. 6.7m above ground level.

In order to demolish these assets, it has been determined that the safest and most practicable method is that of an industry standard explosive induced collapse. Wellanbah Industrial have been engaged by CMA Contracting to undertake the engineering assessment and subsequent blasting activities onsite.

The method entails completing various pre-cuts to the chimney, followed by the installation and initiation of explosive charges installed in the front face the structure (on the fell side). The detonation of the explosives will result in the removal of the front concrete, causing the structure to pivot about the rear base and fall to grade.

This document summarises the outcomes of the engineering analysis to facilitate onsite works with the demolition blast design drawings related to the assessment provided in Appendix A of this document.

The assessment focused on two critical aspects of structural stability, which included the assessment of the chimney stack following the completion of various cuts in accordance with the blast design, and the analysis of hinge stresses following the initiation of the explosives.

A structural model was developed based on the existing drawings/site invesitgations and a finite element analysis was undertaken to evaluate the global stability of the chimney structures following the completion of enabling / charge placement works. Following the analysis, it was determined that the proposed enabling works can be completed provided that the forecast (and subsequent experienced) gust wind speed stays below 147.6 km/hr. It is noteworthy that the gust wind speeds are determined as a value which is 45% higher than the forecast average wind speeds. Hence if the forecast wind speed is in excess of 101km/hr it is recommended that the planned works be rescheduled, or the structure be vacated with an exclusion zone established until the wind levels reduce to acceptable levels. It should be noted that such a wind speed is based on 1:100 year probability, hence it is not expected that such an event will occur during the minor schedule of works (approx. 1 month).

In addition, it was determined that with the proposed cuts the structure will remain in net compression, even under the design demolition wind loading.

For the blast event, the wind limitation is to be set at a 15 m/s peak gust. Live wind speed monitoring is to be complete onsite, so ensure this is not exceeded at time of initiating the explosives.

A stress analysis was completed to evaluate the rear heel and hinges of the structure following the initiation of the explosives. It was determined that immediately upon blasting, the axial stress for both the hinges and the rear heel increase from 2.28 MPa to 8.12 MPa. This value is still well within the lower bound unconfined capacity of the concrete (24.5 MPa).

The change in eccentricity will then result in an increase stress due to bending in the order of 45.1 MPa at the Eastern toe (compression) and 28.8 MPa at the rear heel (tension). As the tension cannot be developed, this will result in the structure beginning to fail and rotate, with the stress temporarily distributed to the hinges only.

The stresses at this point within the hinges are 99.4 MPa (compression) at the Western toe and 69.8 MPa (tension) at the Eastern heel. As such, failure and subsequent rotation is guaranteed to be achieved based upon the concrete grade of 24.5 MPa.

In conclusion, following the structural analysis of the proposed blast design, it was determined that the structure will remain stable during the pre-cutting works up until a gust wind speed of 147.6 km/hr. In addition, upon detonation, the stresses in the chimney stack are within the range that will encourage rotation of the chimneys prior to crushing of the hinges, and therefore the expected overturning and collapse of the structures will match the design intent. The blast event is to be undertaken under a limiting wind speed of 15 m/s gust, and to be confirmed onsite via live wind monitoring.

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1 INTRODUCTION

AGL are currently undertaking the demolition of redundant infrastructure located within the Liddell Power Station Site. CMA Contracting have been awarded the contract to complete the demolition scope and Wellanbah Industrial have been engaged to undertake the explosive demolition of the two reinforced concrete chimney stacks located on the Eastern site of the main power station assets. In order to finalise the blast design, a structural analysis of the planned demolition method is required to ensure the appropriate response and collapse of the structures following the blast event. This document includes the design basis and calculations for this assessment.

The structural analysis of the demolition method has been completed in consideration of the following Australian Standards and the reference documents listed in Section 1.1 of this report:

- AS 1170.0:2002 Structural design actions Part 0: General Principles
- AS 1170.1:2002 Structural design actions Part 1: Permanent, imposed and other actions
- AS 1170.2:2021 Structural design actions Part 2: Wind Actions
- AS 1170.4:2007 Structural design actions Part 4: Earthquake Actions
- AS 3600:2018 Concrete Structures
- AS 2601:2001 The Demolition of Structures

1.1 Reference Documents

The following reference documents have been relied upon in completing the structural analysis:

- Appendix A – Liddell Power Station – Chimney Blast Design Drawings
- Appendix B – Existing Structural Drawings
- Appendix C – Chimney Weight Takedown

1.2 Limitations and Assumptions

The structural assessment relies upon to the following limitations and assumptions:

- No significant modifications have been made to the structure post initial construction
- Concrete grade is to be confirmed onsite prior to set out and drilling of blast holes

2 SITE DETAILS

The two chimney stacks are positioned within the Liddell Power Station site. The specific location is provided the below FIGURE 1 and FIGURE 2.

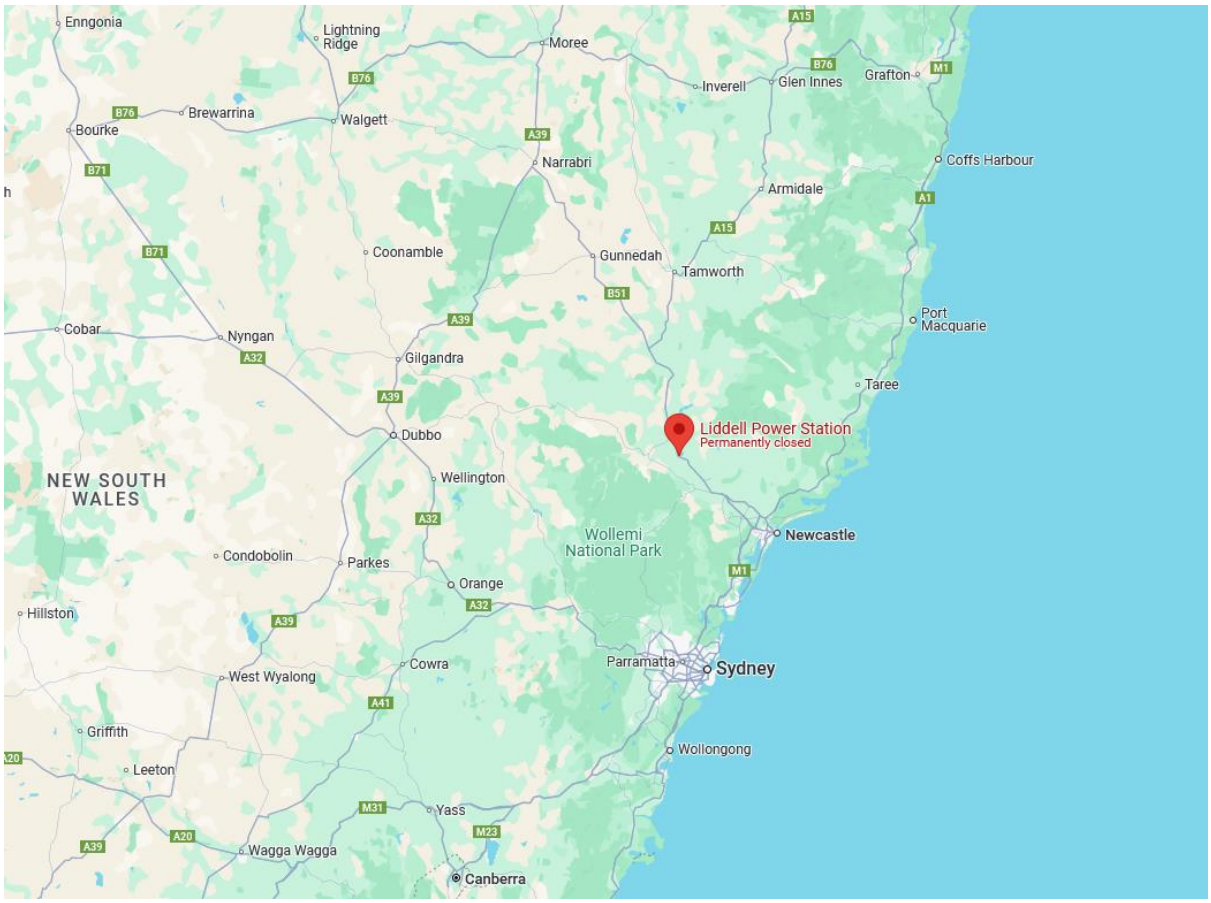


FIGURE 1 – LIDDELL POWER STATION SITE LOCATION

Prior to completing the demolition of the structure, all services are to be disconnected and terminated. Furthermore, any retained assets / services are to be identified and marked onsite.

The demolition area will be wholly within the power station boundary, however additional local fencing and signage may be installed as required based on other site operations. Furthermore, an exclusion zone will be established both during the enabling works and the induced collapse event which will extend into Lake Liddell.

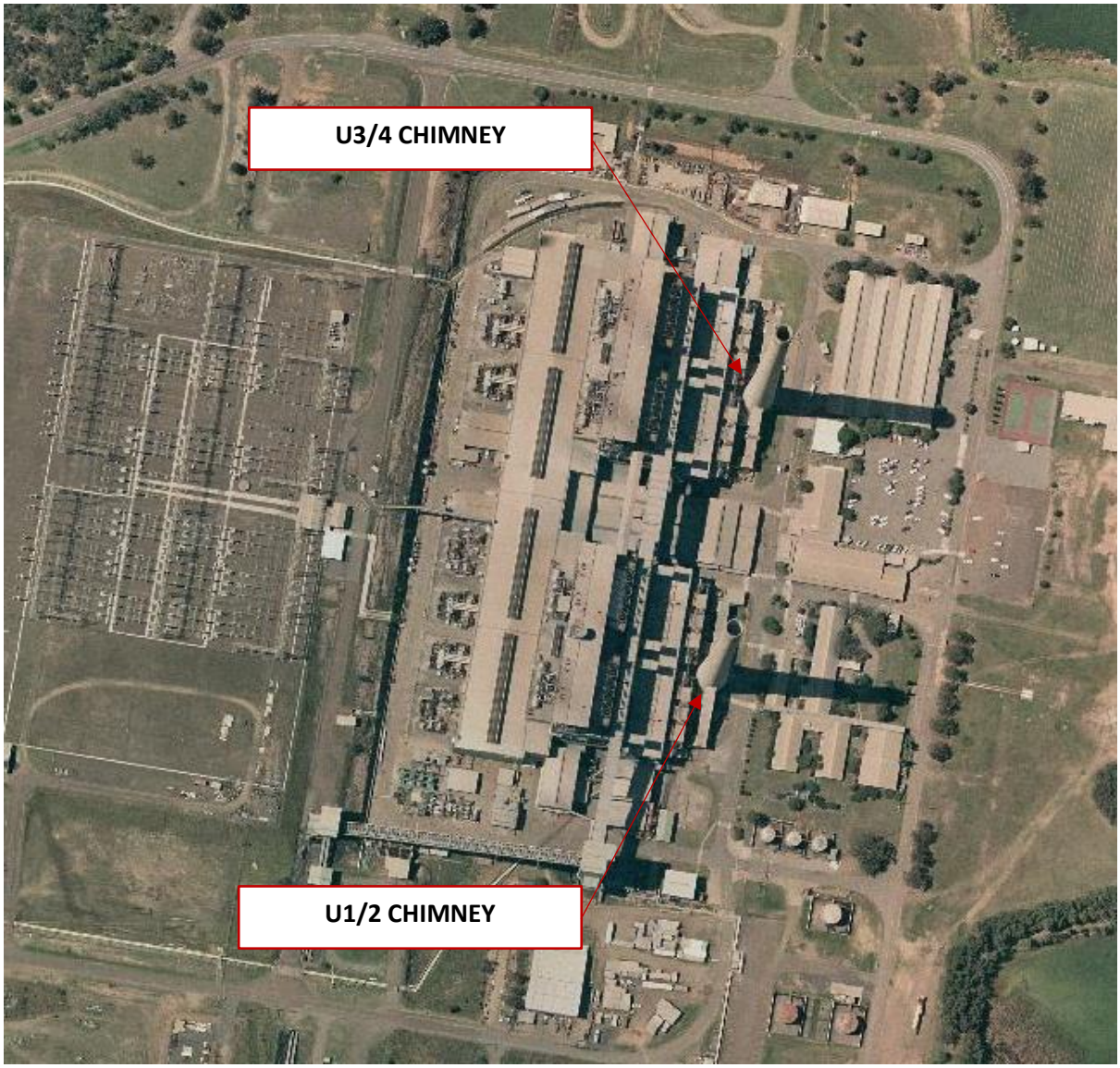


FIGURE 2 – AERIAL PHOTO OF THE LIDDELL CHIMNEY STACKS

3 GEOMETRY / STRUCTURAL SYSTEM

3.1 Geometry

The structures consist of two significant chimneys with a total height of approximately 169m each. The base outside diameter is 18.6m, with a wall thickness of 610mm; the top outside diameter is 9.8m, with a wall thickness of 216mm. The material of construction is reinforced concrete, with the size and layout of the reinforcement varying throughout the height of the structure.

In addition, the chimneys include a number of corbels at regular spacings up the height of the structure, these corbels support the internal brick lining, and an internal concrete slab which is supported on four columns at approx. 6.7m above ground level. FIGURE 3 provides an overview of the structure. The geometry provided within the drawings was confirmed via site investigations, which determined a good correlation between the drawings and the chimney construct (Refer to Appendix E for record of site investigations).



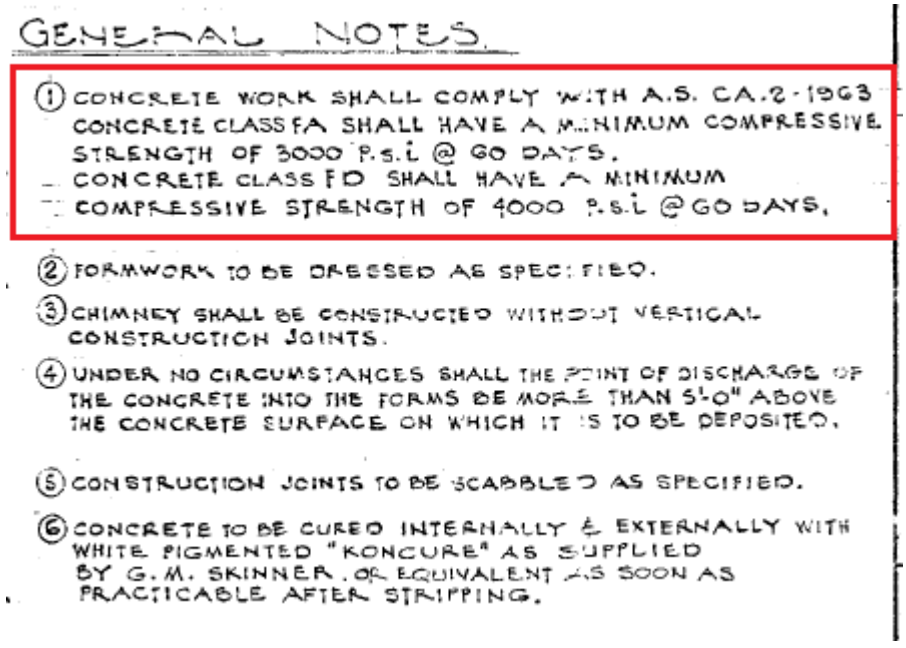
FIGURE 3 – OVERVIEW OF U1/2 CHIMNEY

3.2 Concrete Grade

In order to complete the structural analysis on the chimneys, the concrete grade of the material needs to be assessed. The initial design was based upon the concrete grade specified within the structural drawings.

TABLE 1 – CONCRETE GRADE VS HEIGHT

Relative Level	Description	Concrete Grade at 60 Days	
RL 434' – 0" to RL 525' – 6"	CLASS FD	4000 PSI	27.6 MPa
RL 525' – 6" to RL 988' – 0"	CLASS FA	3000 PSI	20.7 MPa


GENERAL NOTES.

1. CONCRETE WORK SHALL COMPLY WITH A.S. CA.2-1963 CONCRETE CLASS FA SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I @ 60 DAYS. CONCRETE CLASS FD SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 P.S.I @ 60 DAYS.
2. FORMWORK TO BE DRESSED AS SPECIFIED.
3. CHIMNEY SHALL BE CONSTRUCTED WITHOUT VERTICAL CONSTRUCTION JOINTS.
4. UNDER NO CIRCUMSTANCES SHALL THE POINT OF DISCHARGE OF THE CONCRETE INTO THE FORMS BE MORE THAN 5'-0" ABOVE THE CONCRETE SURFACE ON WHICH IT IS TO BE DEPOSITED.
5. CONSTRUCTION JOINTS TO BE SCABBLED AS SPECIFIED.
6. CONCRETE TO BE CURED INTERNALLY & EXTERNALLY WITH WHITE PIGMENTED "KONCURE" AS SUPPLIED BY G.M. SKINNER. OR EQUIVALENT AS SOON AS PRACTICABLE AFTER STRIPPING.

FIGURE 4 – CONCRETE GRADE EXTRACT FROM DRAWING LD247906 K/3

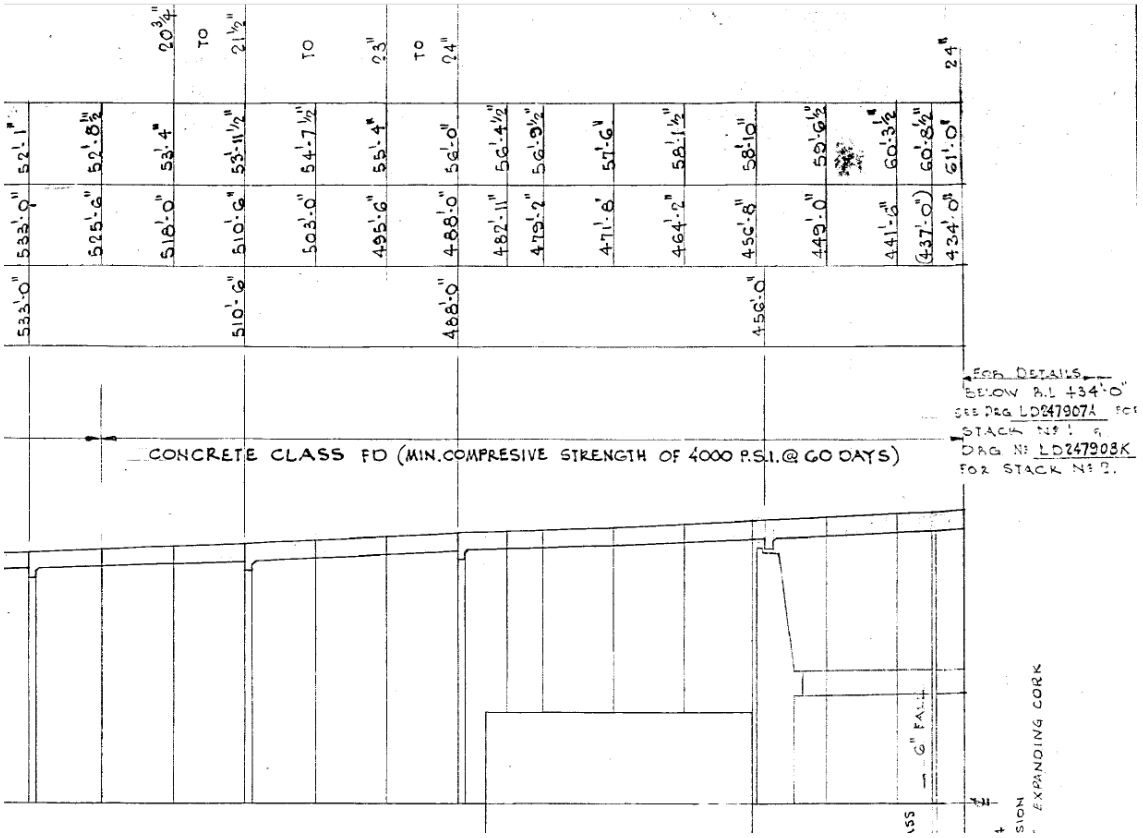


FIGURE 5 – CONCRETE GRADE EXTRACT FROM DRAWING LD247906 K/3 – LOWER LIFTS

In order to verify the concrete grade on the drawings, several core samples were taken from the structure for offsite unconfined compression strength testing. In addition, Schmidt hammer testing was completed in-situ to assess consistency of strength around the circumference of the structure. Appendix E of this document provides a report with the full results of the testing. In general, the results returned with strengths in excess of the specifications of 27.6 MPa, however one of the core samples returned a result of 24.5 MPa. As such, this has been taken as the lower bound value for the analysis of the structure.

TABLE 2 – CONCRETE STRENGTH TEST RESULTS

SPECIMEN ID NO.	CHIMNEY	DATE OF TEST	CORE STRENGTH (MPa)	CORRECTED COMPRESSIVE STRENGTH (MPa)	CORE LOCATION
NEWC5177A	U1/U2	16.06.2025	30.5	30.5	S1C1
NEWC5177B	U1/U2	16.06.2025	30.5	30.5	S1C2
NEWC5177C	U3/U4	16.06.2025	24.5	24.5	S2C3
NEWC5177D	U3/U4	16.06.2025	28.0	28.0	S2C4

3.3 Structural System

The global stability of the chimney is dependent on the capacity of the external concrete shell. As such, the various stages of the works are to be assessed against appropriate dead and live design loads to ensure integrity is maintained in the shell up until the time of initiation.

The demolition stages to be assessed include:

- Initial core holes for concrete testing
- Triangular panels and front charge holes
- Rear heel wire saw cuts

3.4 Analytical Model

In order to analyse the structure, a finite element analysis has been completed to verify the expected stresses at the various stages of works as well as the hinge and heel behaviour post blast. This has also been crossed checked with a first principles stress analysis to confirm the results.

The model was based on the existing structural drawings, which are provided in Appendix B of this document.



FIGURE 6 – FINITE ELEMENT ANALYSIS MODEL OF LIDDELL CHIMNEY STACK

4 DEMOLITION METHOD

The demolition of the two chimney structures is to be achieved via an explosive induced collapse.

This process includes several steps as detailed herein.

- 200mm core holes drilled at termination points of birds mouth;
- Triangular/trapezoidal portion of chimney removed between 200mm core hole and start of charge pattern;
- 28mm holes drilled in the front face of the chimney (fell direction site) in accordance with blast design;
- Rear portion of chimney wire saw cut to extents provided in blast design;
- Holes packed with explosive charges;
- Explosives detonated to remove front portion (bird's mouth) of the chimney base, and induce the collapse of the structure, with the chimneys crossing over at a 20 degree angle from site North-South;
- Establish asbestos management controls in accordance with the asbestos management plan
- Excavators are to be used for processing and loadout of materials.

For detailed design, refer to Appendix A of this document.

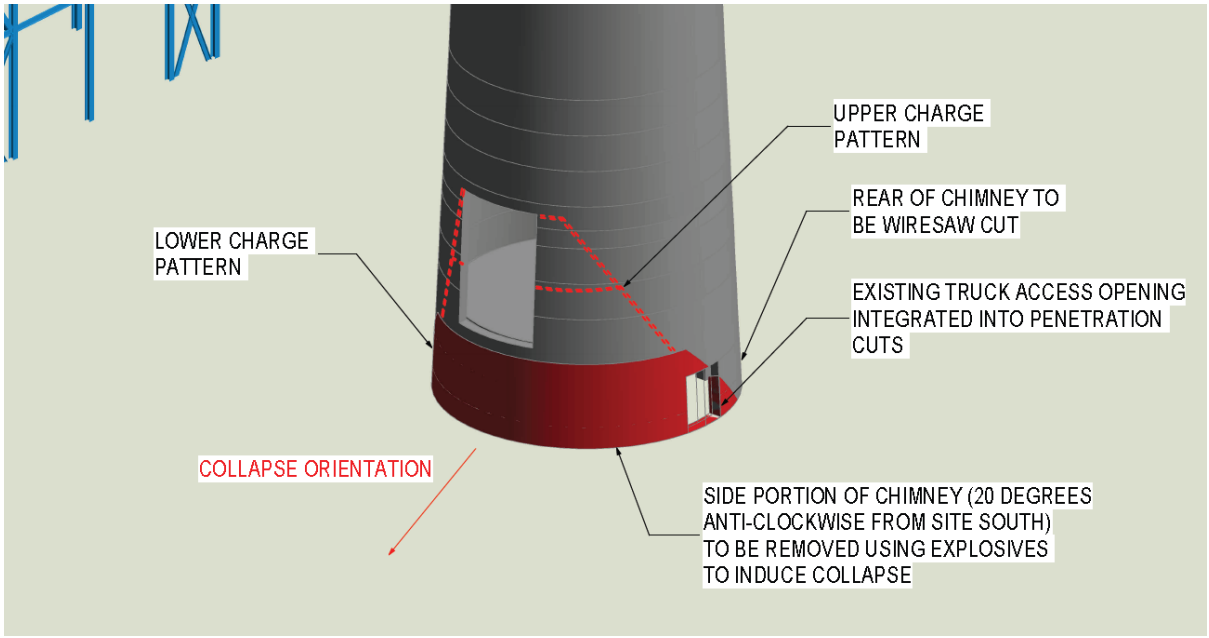
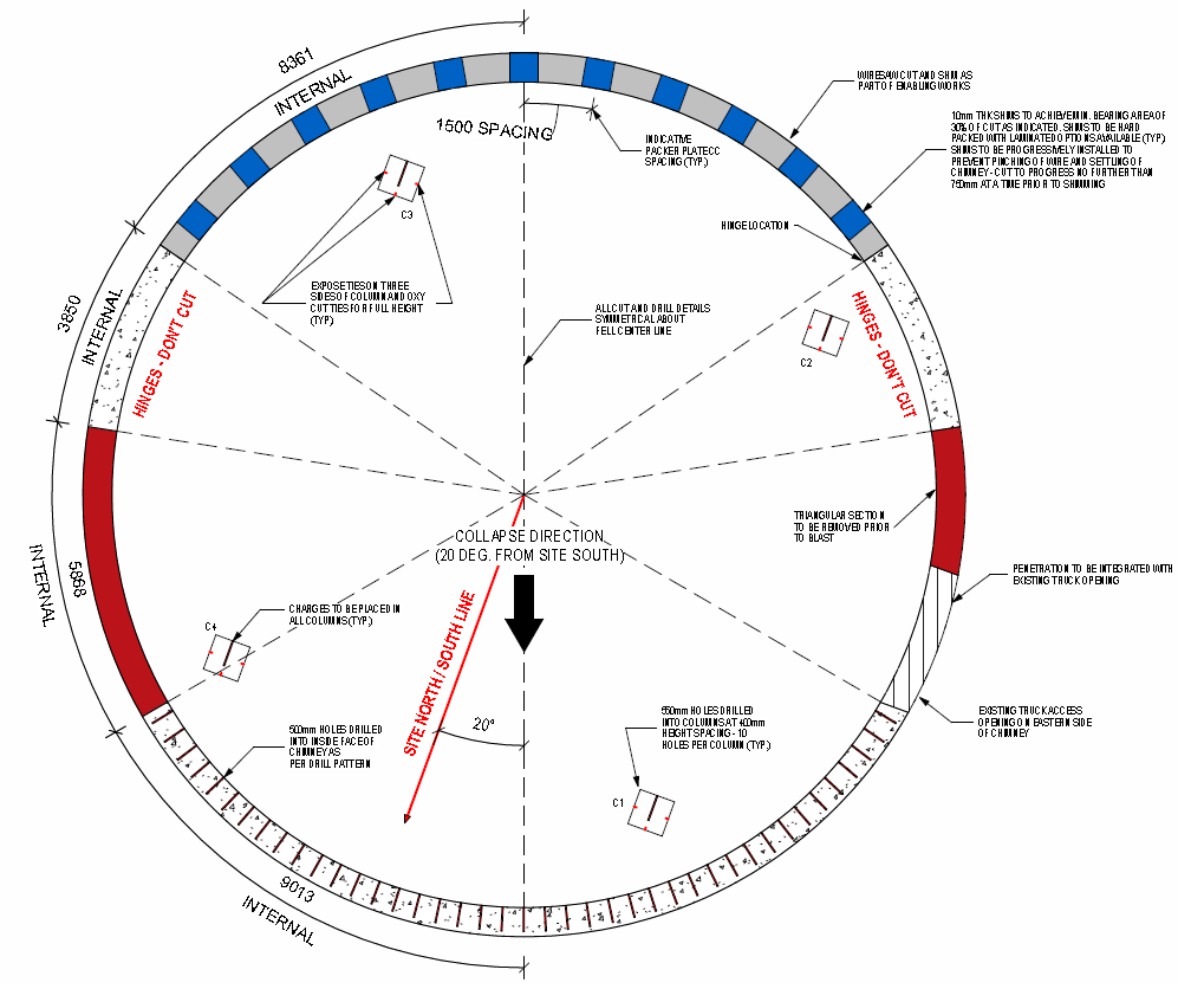


FIGURE 7 – BASIC OVERVIEW OF METHOD

The outcomes of the structural analysis have informed the specific cut details and blast pattern that is to be executed onsite. The design is specified to ensure that failure of the hinges is induced, whilst ensuring that the rear heel of the structure maintains adequate capacity to facilitate rotation as the hinges crush. The below figure provides an overview of the cut details and blast pattern at ground level.



Note: Refer to Appendix A for higher resolution drawing of base set out

FIGURE 8 – CROSS SECTION OF CHIMNEY BASE WITH BLAST AND CUT SETOUT

The intention for the design is to have the chimney collapse via base overturning in a direction which is 20 degrees off site North / South respectively as per the below figure.

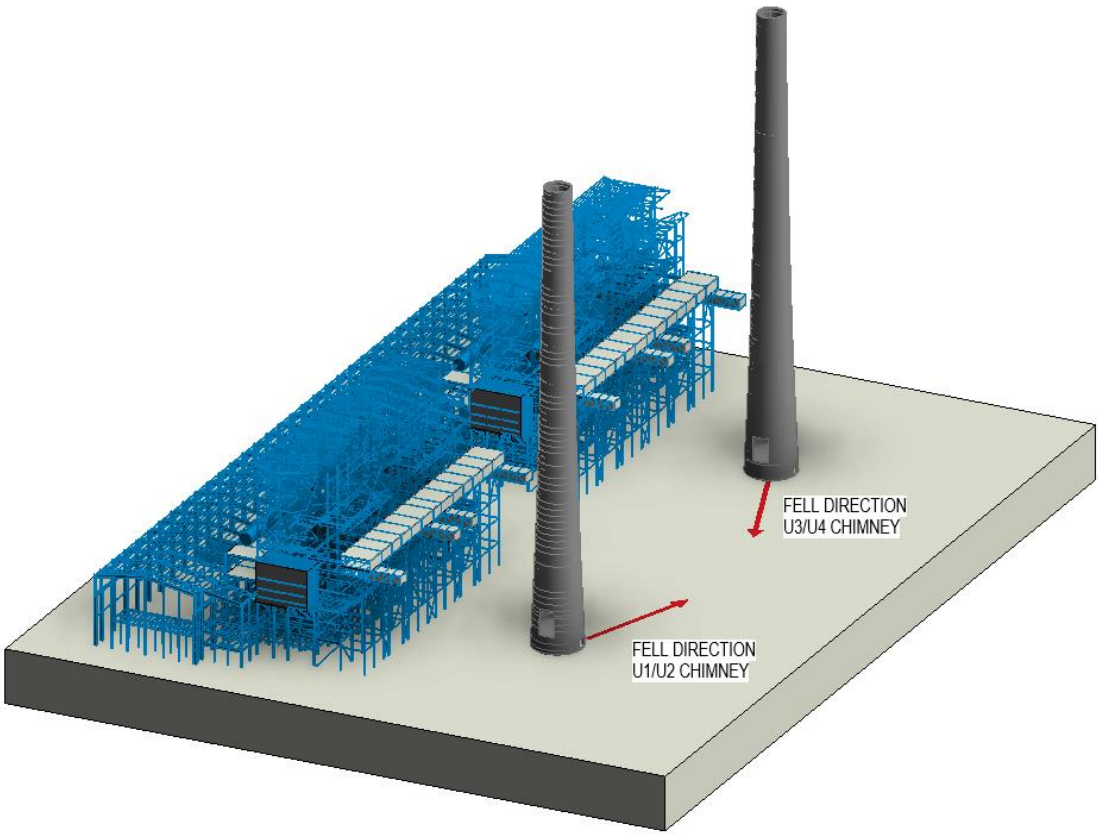


FIGURE 9 – FELL DIRECTION FOR CHIMNEYS

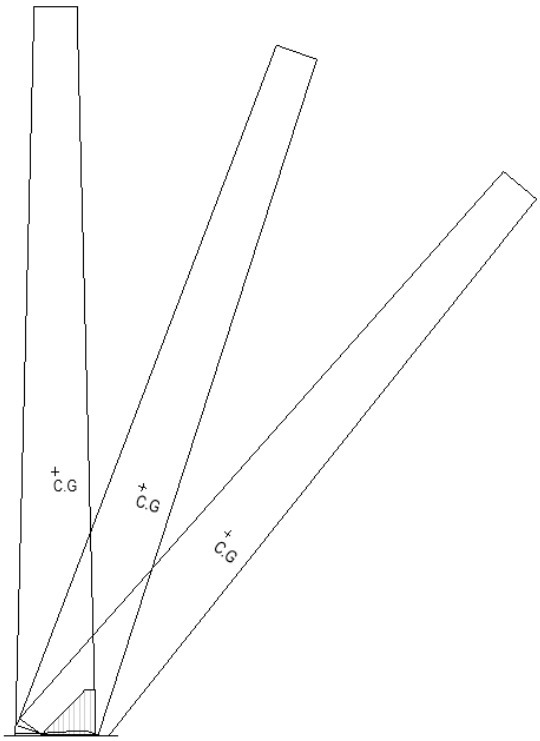


FIGURE 10 – COLLAPSE MECHANISM FOR CHIMNEYS

$kNm := kN \cdot m$

5 LOADING

5.1 Overview

In order to assess both the integrity of the structure during enabling works and the behaviour of the structure post blast, design loads have been evaluated in accordance with AS1170.

5.2 Dead Load

The dead load has been determined based on a model of the structure within Ansys. This analysis returned a self-weight as per below:

$\rho_{conc} := 2.41 \cdot \frac{tonne}{m^3}$

$Volume_{chimney_shell} := 2391433832650.59\ mm^3$

$Mass_{chimney_shell} := Volume_{chimney_shell} \cdot \rho_{conc} = 5763.4\ tonne$

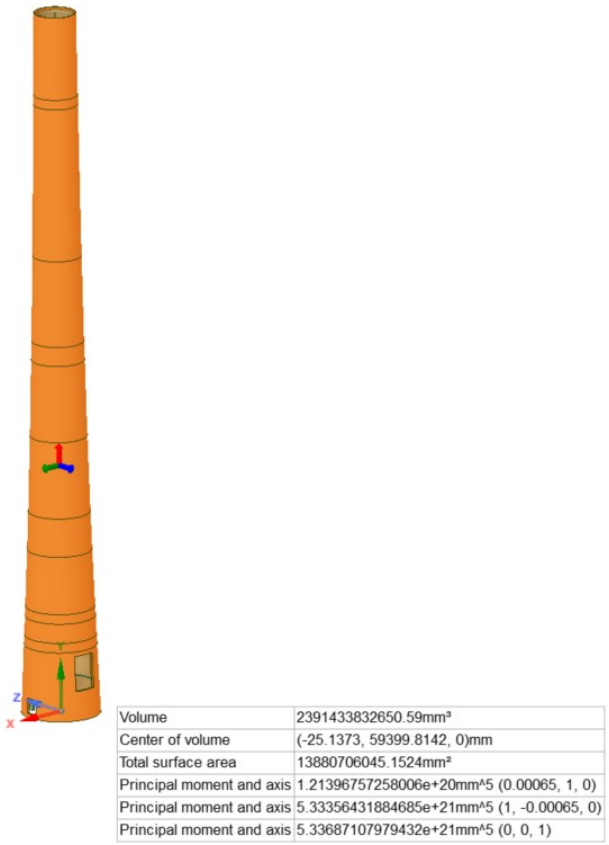


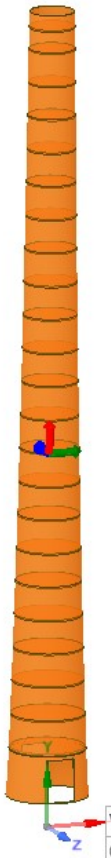
FIGURE 11 - VOLUME OF CONCRETE FROM MODEL

$Volume_{brick_liner} := 749512941230.4\ mm^3$

$\rho_{brick} := 2.3 \cdot \frac{tonne}{m^3}$

Refer to Appendix D for limited brick details. 2.3 density adopted for assessment

$Mass_{brick_liner} := Volume_{brick_liner} \cdot \rho_{brick} = 1723.9\ tonne$



Volume	749512941230.403mm³
Center of volume	(0, 77001.8621, 0)mm
Total surface area	12598095085.9598mm²
Principal moment and axis	2.94179325993436e+19mm^5 (0, 1, 0)
Principal moment and axis	1.70989045706391e+21mm^5 (1, 0, 0)
Principal moment and axis	1.71121307532754e+21mm^5 (0, 0, 1)

FIGURE 12 - VOLUME OF BRICK FROM MODEL

$TOTAL_MASS_{chimney} := Mass_{chimney_shell} + Mass_{brick_liner} = 7487.2\ tonne$

As provided in Appendix C, calculations from first principles were also completed to cross check these weights. These high level calculations returned a total mass of 7409 tonne, hence within 1.1% of the model values. Hence the conservative model value has been adopted.

In order to analyse the stress distribution on the concrete, a finite element analysis model has been developed.

TABLE 3 - SUMMARY DATA FROM FEA MODEL

Bill of Materials | Centre of Mass | Local Inertia | Global Inertia

	Mass t	Volume mm^3	Length mm	Area mm^2	Count	Material	Type	Section
GRAND TOTAL	**5815.67**	**2.4232×10^{12}**		**6.84067×10^{9}**				
PLATE PROPERTIES								
1: Conc 609.6mm	1372.19	5.71746×10^{11}		9.37904×10^{8}	923	Isotropic	Plate/Shell	
2: Conc 584mm	335.751	1.39896×10^{11}		2.39549×10^{8}	263	Isotropic	Plate/Shell	
3: Conc 546mm	154.464	6.43599×10^{10}		1.17875×10^{8}	103	Isotropic	Plate/Shell	
4: Conc 480mm	780.087	3.25036×10^{11}		6.77159×10^{8}	694	Isotropic	Plate/Shell	
5: Conc 405mm	414.287	1.72619×10^{11}		4.26221×10^{8}	423	Isotropic	Plate/Shell	
6: Conc 343mm	659.317	2.74716×10^{11}		8.0092×10^{8}	788	Isotropic	Plate/Shell	
7: Conc 279mm	497.06	2.07108×10^{11}		7.42324×10^{8}	730	Isotropic	Plate/Shell	
8: Conc 248mm	105.662	4.40258×10^{10}		1.77523×10^{8}	195	Isotropic	Plate/Shell	
9: Conc 241mm	443.266	1.84694×10^{11}		7.66365×10^{8}	769	Isotropic	Plate/Shell	
10: Conc 229mm	689.283	2.87201×10^{11}		1.25415×10^{9}	1282	Isotropic	Plate/Shell	
11: Conc 222mm	39.6505	1.65211×10^{10}		7.44192×10^{7}	65	Isotropic	Plate/Shell	
12: Conc 216mm	324.653	1.35272×10^{11}		6.26259×10^{8}	631	Isotropic	Plate/Shell	
TOTAL	**5815.67**	**2.4232×10^{12}**		**6.84067×10^{9}**	**6866**			

The weight determined within the model is approximately 5815.7 tonne, which has shortfall due to missing brick liner & corbels.

As such, a non-structural mass has been added to the model to account for these elements.

$$Mass_{FEA} := 5815.7 \ tonne$$

$$Require_Mass_{FEA} := TOTAL_MASS_{chimney} - Mass_{FEA} = \left(1.672 \cdot 10^{3}\right) \ tonne$$

$$FEA_{surface_area} := 6840670000 \ mm^2$$

$$Add_{mass} := \frac{Require_Mass_{FEA}}{FEA_{surface_area}} = \left(2.444 \cdot 10^{-7}\right) \frac{tonne}{mm^2}$$

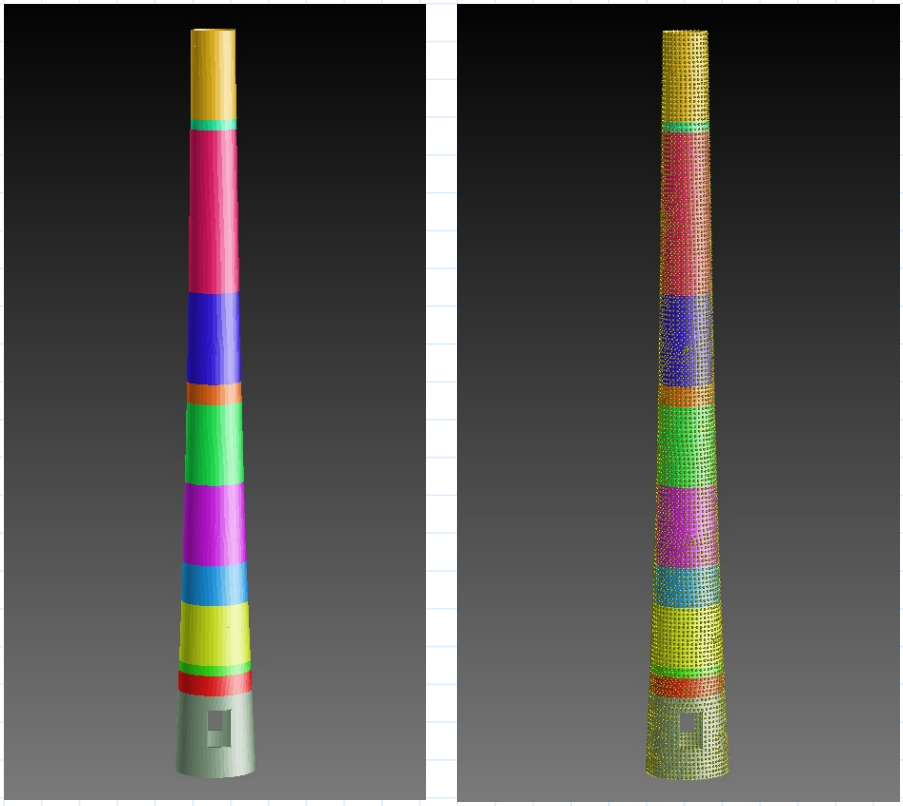


FIGURE 13 - NON-STRUCTURAL MASS ADDED TO FEA MODEL

5.3 Wind Load

The design wind speed for the pre-weakening has been nominated as 41 m/s which is based upon a 6 month design working life for an importance level 2 structure. This results in a 1:100 annual probability of exceedance requirement.

Furthermore, in order to assess an allowable wind speed for the blast event, and potential impacts of wind on the rotation of the chimney during collapse, wind speed of 15 m/s.

In order to complete a comparative analysis, a load case for the ultimate design wind speed is also to be assessed. This is considered for an importance level 3 structure with a 50 year design working life, which equates to a 1:1000 annual probability of exceedance requirement.

The wind loading is determined by the following

$\rho_{air} := 1.2 \ \frac{kg}{m^3}$ $V_{R_demo} := 41 \ \frac{m}{s}$ $V_{R_design} := 46 \ \frac{m}{s}$

$V_{blast_limit} := 15 \ \frac{m}{s}$

$M_d := 1.0$	Wind direction multiplier
Wind Region = A3	Upper Hunter Region - NSW
$M_{z_cat} := 1.37$	Exposed terrain - conservative
$M_s := 1.0$	Assume no shielding
$M_t := 1.0$	Flat approach on all sides
$V_{Des} := V_{R_demo} \cdot M_d \cdot M_{z_cat} \cdot M_s \cdot M_t = 56.17 \ \frac{m}{s}$	Final design wind velocity
$V_{Des_Sens} := V_{R_design} \cdot M_d \cdot M_{z_cat} \cdot M_s \cdot M_t = 63.02 \ \frac{m}{s}$	Original design wind velocity for sensitivity analysis
$V_{Des_Blast_Limit} := V_{blast_limit} \cdot M_d \cdot M_{z_cat} \cdot M_s \cdot M_t = 20.55 \ \frac{m}{s}$	For blast assessment

External Pressure Calculations

Check for compliance with Section A5 of AS1170.2 to assess wind actions as silo

$c_{chimney} := 169\ m$ $b_{chimney} := 18.6\ m$

c/b must be between 0.25 - 4.0

$$A5_{check} := \frac{c_{chimney}}{b_{chimney}} = 9.086$$

As such, adopt aerodynamic shape factors in accordance with Appendix C of AS1170.2

If using Section A5, a Cfig of 0.63 would be adopted.

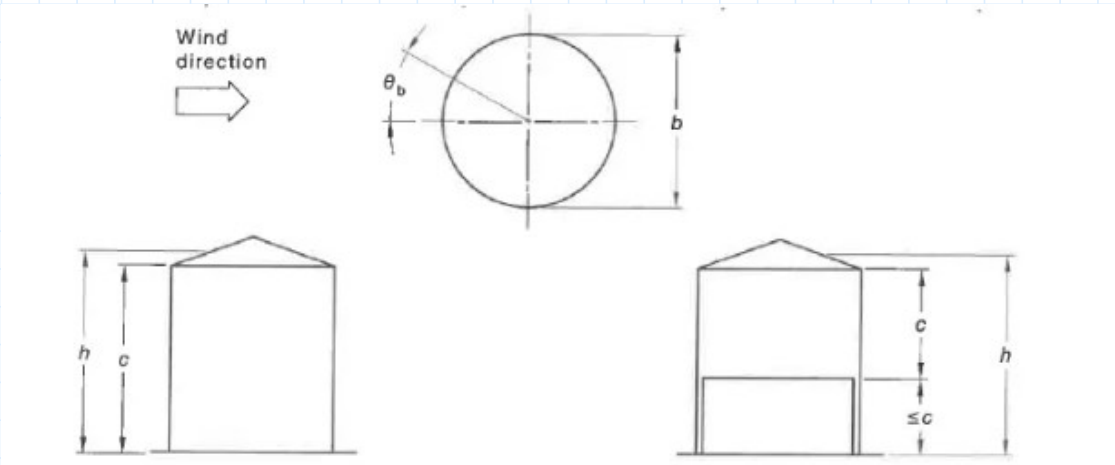


Figure A.5 — External pressure coefficients ($C_{p,b}$) on walls of circular bins, silos and tanks ($0.25 \le c/b \le 4.0$)

FIGURE 14 - EXTRACT FROM AS1170.2

Adopting values from Table C3 of AS1170.2

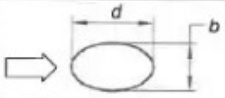
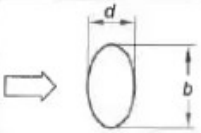
$h_r := 1 \cdot 10^{-3} \cdot \frac{s}{m}$ Rough concrete

$$C_{d_chimney} := 1 + \left(0.033 \cdot \left(\log\left(V_{Des} \cdot h_r\right)\right)\right) - \left(0.025\ \left(\log\left(V_{Des} \cdot h_r\right)\right)^2\right) = 0.92$$

Note that the utilising the American ASCE 7 Figure 6-21, would return a value of approximately 0.8.

Hence the determined value is appropriate

Table C.3 — Drag force coefficients (C_d) for rounded cylindrical shapes

Cross-sectional shape	Description	Drag force coefficient (C_d)	
		$bV_{des,\theta} < 4$ m²/s	$bV_{des,\theta} > 10$ m²/s
	Cylindrical	1.2	See Clause C.3.1
 Ellipse $\frac{b}{d} = \frac{1}{2}$	Ellipse narrow side to wind	0.7	0.3
 Ellipse $\frac{b}{d} = 2$	Ellipse broad side to wind	1.7	1.5
 $\frac{b}{d} = 1$ $\frac{r}{b} = \frac{1}{3}$	Square with rounded corners	1.2	0.6

NOTE Attachments to circular cross-sections (e.g. ladders, pipes, etc.) projecting more than 1 % of the diameter of the cylinder will induce aerodynamic separation and in these cases $C_d = 1.2$.

FIGURE 15 - EXTRACT FROM AS1170.2 - TABLE C3

Based on these values, determine the design wind pressure:

$$C_{fig} := C_{d_chimney} = 0.92$$

Assess structure for dynamic wind response. As per AS1170.2, for chimney structures with a height to width ratio greater than 5, a dynamic

6.3 Other structures

The following requirements apply:

(a) For buildings and free-standing towers, with first mode natural frequencies in the range 0.2 to 1 Hz, C_{dyn} shall be as defined in Clause 6.4 for along-wind response and Clause 6.5 for crosswind response.

(b) For cantilevered roofs with a first mode natural frequency between 0.5 Hz and 1 Hz, C_{dyn} shall be as defined in Clause B.5.

(c) The dynamic response of poles, masts and chimneys of circular cross-section with height to average diameter aspect ratio greater than 5 shall be determined from Clause 6.4.2 and Clause 6.5.3.

(d) The dynamic response factor for horizontal slender structures with a first mode natural frequency between 1 Hz and 0.5 Hz, C_{dyn} shall be as defined in Clause 6.4.3.

NOTE 1 Appendix E provides information on calculating accelerations for serviceability in tall wind-sensitive structures.

NOTE 2 Special studies such as wind-tunnel testing should be undertaken for dynamically-sensitive structures not covered by this Standard.

FIGURE 16 - EXTRACT FROM AS1170.2

Hence the along wind and cross wind dynamic response is to be determined.

Along-Wind Response:

$I_h := 0.088$ — Terrain Category 1

$g_v := 3.4$ — peak factor upwind velocity fluctuations

$h_c := 169$

$L_h := 85 \cdot \left(\frac{h_c}{10}\right)^{0.25} = 172.342$ — Turbulence length scale

$s_{chimney} := 0$ — Base overturning only

$b_{sh} := 12.9$ — Average width

$B_s := \frac{1}{1 + \frac{\sqrt{0.26 \cdot \left(h_c - s_{chimney}\right)^2 + 0.46 \cdot {b_{sh}}^2}}{L_h}} = 0.666$ — Background factor

$H_s := 1 + \left(\frac{s_{chimney}}{h_c}\right)^2 = 1$ — Height factor

$n_a := 0.427$ Fundamental Frequency

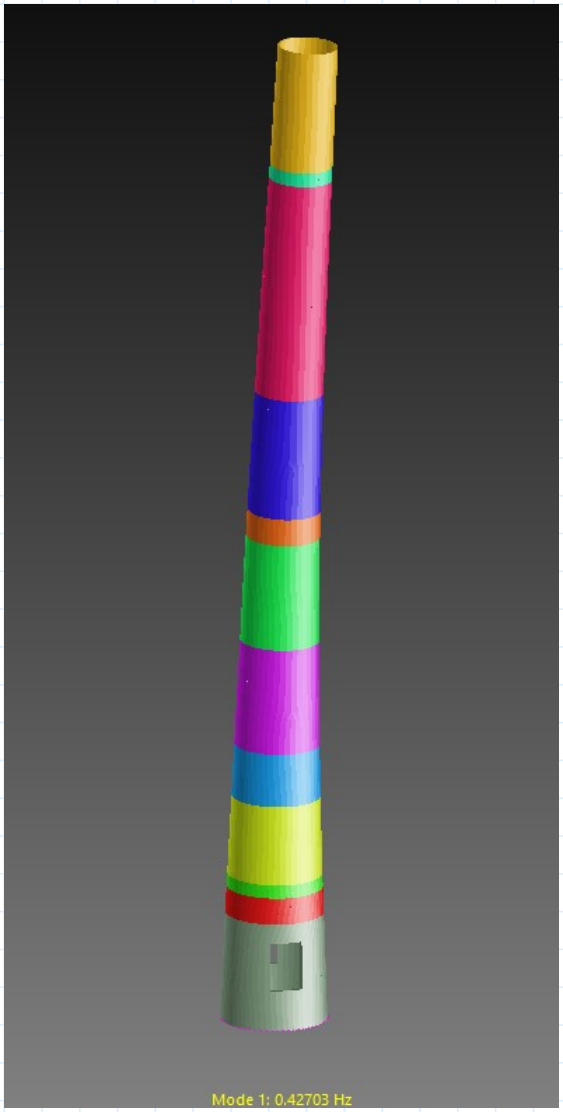


FIGURE 17 - FUNDAMENTAL FREQUENCE FROM FINITE ELEMENT ANALYSIS

$g_R := \sqrt{1.2 + 2\ \ln\left(600 \cdot n_a\right)}$ Peak factor resonant response

$V_{des_unitless} := \frac{V_{Des}}{m} \cdot s = 56.17$

$N := \frac{n_a \cdot L_h \cdot \left(1 + \left(g_v \cdot I_h\right)\right)}{V_{des_unitless}}$ Reduced frequency

$$E_t := \frac{\pi \cdot N}{\left(1 + 70.8 \cdot N^2\right)^{\left(\frac{5}{6}\right)}} = 0.063$$

Spectrum of turbulence

$$\zeta_{chimney} := 0.03$$

ratio of damping - reinforced concrete for ultimate limit state assessment

$$S_{chimney} := \frac{1}{\left(1 + \frac{3.5 \cdot n_a \cdot h_c \cdot \left(1 + g_v \cdot I_h\right)}{V_{des_unitless}}\right) \cdot \left(1 + \frac{4 \cdot n_a \cdot b_{sh} \cdot \left(1 + g_v \cdot I_h\right)}{V_{des_unitless}}\right)}$$

Size reduction factor

$$C_{dyn_chimney} := \frac{1 + 2 \cdot I_h \cdot \sqrt{\left(g_v{}^2 \cdot B_s\right) + \frac{H_s \cdot g_R{}^2 \cdot S_{chimney} \cdot E_t}{\zeta_{chimney}}}}{\left(1 + \left(2 \cdot g_v \cdot I_h\right)\right)} = 0.977$$

Hence modified pressure on stack as per below:

$$p_{stack} := \left(0.5 \cdot \rho_{air}\right) \cdot \left(V_{Des}\right)^2 \cdot C_{fig} \cdot C_{dyn_chimney} = 1.701 \ \textit{kPa}$$

$$p_{stack_sensitivity} := \left(0.5 \cdot \rho_{air}\right) \cdot \left(V_{Des_Sens}\right)^2 \cdot C_{fig} \cdot C_{dyn_chimney} = 2.141 \ \textit{kPa}$$

$$p_{stack_blast} := \left(0.5 \cdot \rho_{air}\right) \cdot \left(V_{Des_Blast_Limit}\right)^2 \cdot C_{fig} \cdot C_{dyn_chimney} = 0.228 \ \textit{kPa}$$

Cross-Wind Response:

As per clause 6.3.3.2, also determine equivalent static crosswind force:

$$n_1 := 0.427 \ \textit{Hz}$$

Fundamental Frequency

$$b_t := 10.569 \ \textit{m}$$

average breadth of top third of structure

$$V_{crit} := 5 \cdot n_1 \cdot b_t = 22.565 \ \frac{\textit{m}}{\textit{s}}$$

$$w_{chimney} := 0.5 \cdot \rho_{air} \cdot \left(V_{crit}\right)^2 \cdot b_t \cdot C_{fig} \cdot C_{dyn_chimney} = 2.902 \ \frac{1}{\textit{m}} \cdot \textit{kN}$$

As noted in AS1170.2 Section 6.6.1, it is confirmed that the critical velocity at the top of the chimney which is the velocity in which the structure is susceptible to vortex shedding, is well below the design velocity, the cross wind response does not need to be further assessed in determining the base overturning moment, which is the focus of this analysis.

For wind loading, apply pressure over projected area of chimney. The area has been generated from the model of the structure.

$Project_Area_{chimney} := 2211623805.9\ mm^2 = 2211.6\ m^2$

$Centre_Area_{chimney} := 75436.45\ mm = 75.436\ m$

$W_{Force_Chimney} := Project_Area_{chimney} \cdot p_{stack} = 3762.5\ kN$

$W_{Force_Chimney_sens} := Project_Area_{chimney} \cdot p_{stack_sensitivity} = 4736.1\ kN$

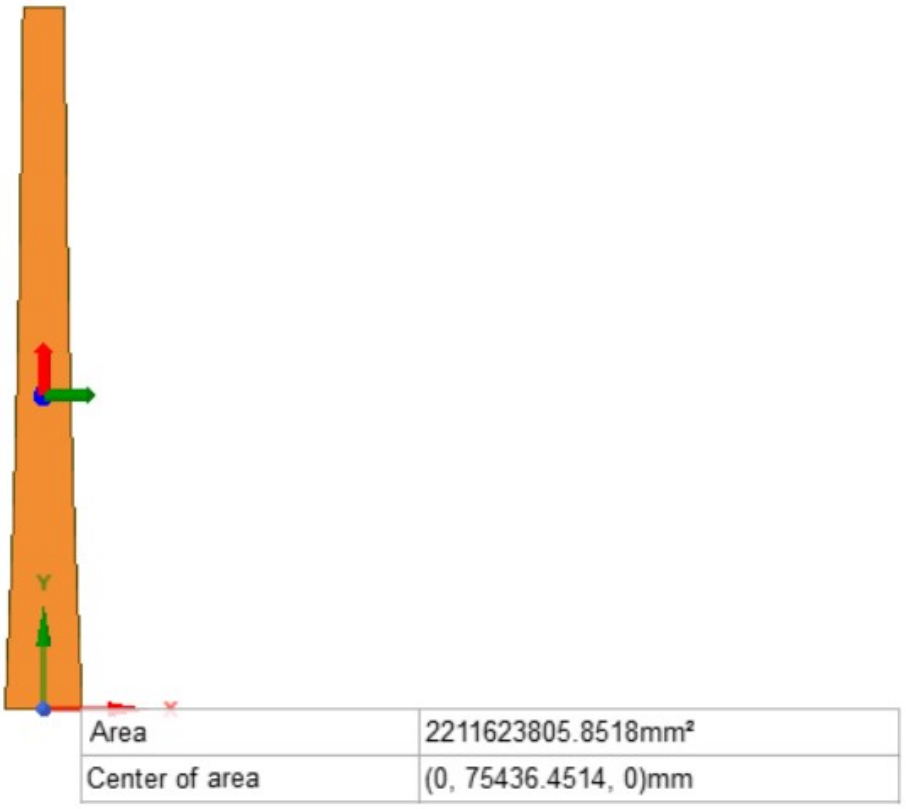


FIGURE 18 - PROJECTED AREA OF CHIMNEY

Applying wind load evenly to a front strip of the structure, noting that this will result in a conservative over estimate of the overturning moment.

$$No_{nodes_strip} := 15571$$

$$Force_{FEA} := \frac{W_{Force_Chimney}}{No_{nodes_strip}} = 241.6\ N$$

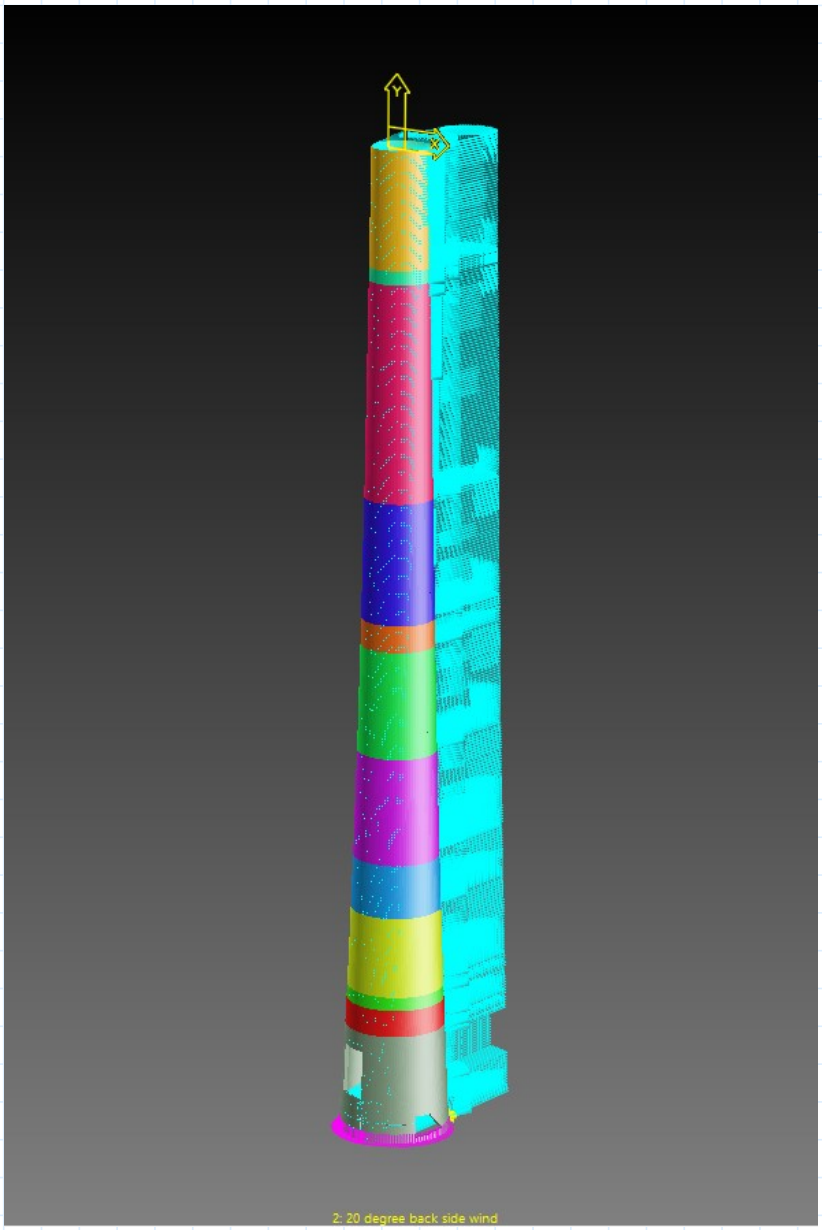


FIGURE 19 - APPLICATION OF DEMO WIND LOAD ONTO FEA MODEL

For comparative assessment, apply the original design load into the uncut FEA model, down a strip of 3882 nodes within the FEA Model.

$$No_{nodes_comparison} := 3882$$

$$Force_{FEA_SENS} := \frac{W_{Force_Chimney_sens}}{No_{nodes_comparison}} = 1220\ N$$

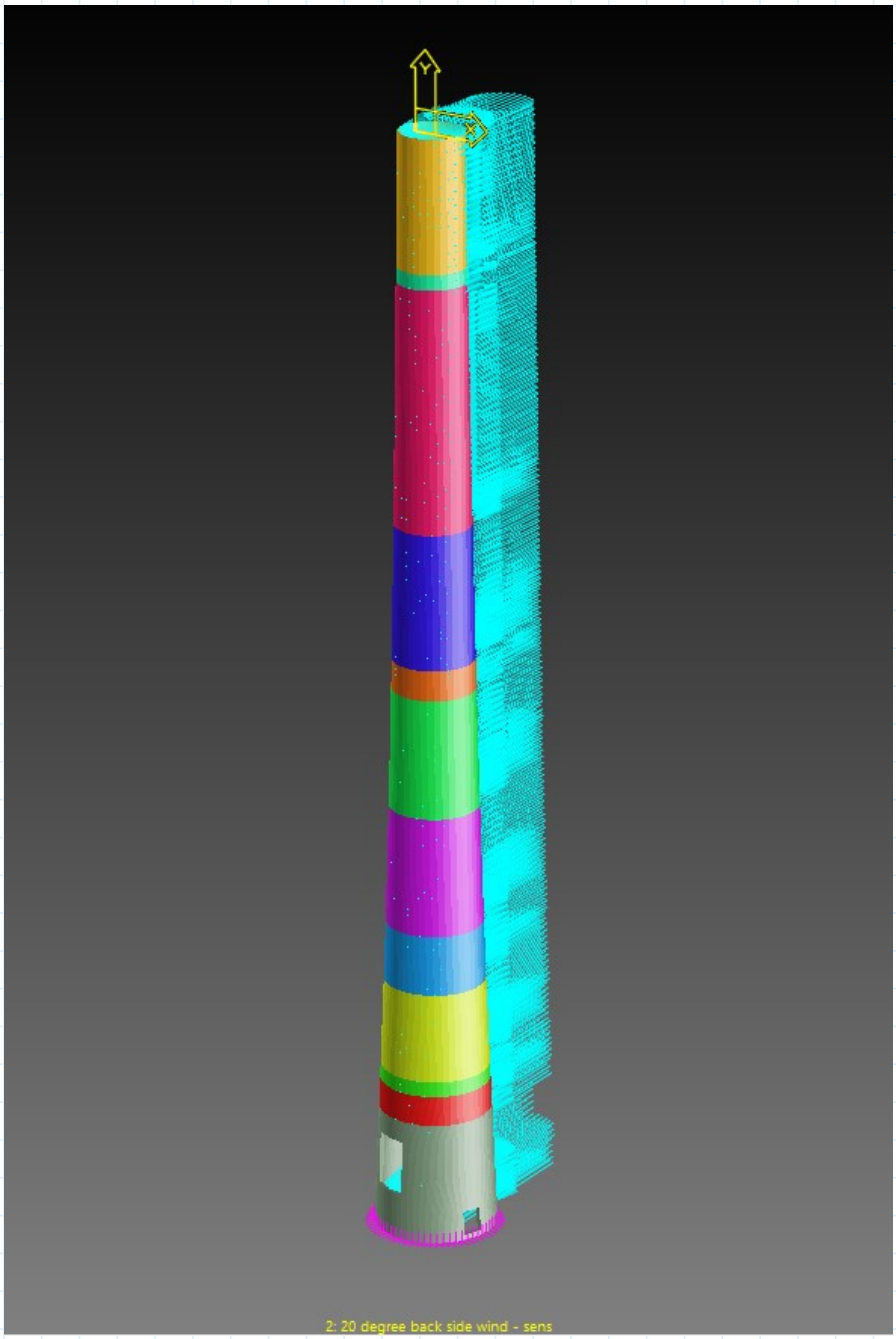


FIGURE 20 - APPLICATION OF ULTIMATE WIND LOAD ONTO FEA MODEL

5.4 Earthquake Load

Based on the height of the structure > 50m, AS1170.4 requires a dynamic analysis of the structure in order to assess the peak earthquake design actions. This was completed via a Spectral Response Solver, and combining the results into a SRSS file.

Adopting 1:100 exceedance probability:

$k_p := 0.5$ — As per Table 3.1 of AS1170.4 for 1:100 probability

$Z := 0.10$ — As per Figure 3.2 of AS1170.4 - Muswellbrook

Soil Class: De — Deep or Soft Soil

$\mu := 3$ — Table B1 - AS1170.4 - Cantilever Structures

$S_p := 1$ — Table B1 - AS1170.4 - Cantilever Structures

Determine number of modes to be evaluated. As per AS1170.2, the number of modes must include those down to a value of 5% of the fundamental period.

$T := 2.342\ s$ — Fundamental Natural Period

$T_5 := 0.05 \cdot T = 0.117\ s$ — 5% of T

This equates to a frequency of 8.55 Hz. Hence need to include adequate modes to this frequency.

As per the FEA, this the first 40 modes to be evaluated.

For input into Strand7, need to evaluate the terms which are not determined intrinsically within the model.

$Base_factor := \frac{k_p \cdot Z \cdot S_p}{\mu} \cdot 9810 = 163.5$ — Multiplying acceleration as 9810mm/s2

$Base_factor_0.3 := 0.3 \cdot \frac{k_p \cdot Z \cdot S_p}{\mu} \cdot 9810 = 49.05$ — Included factor for 30% cardinal direction

For the De soil type, the appropriate normalised response spectra has been adopted:

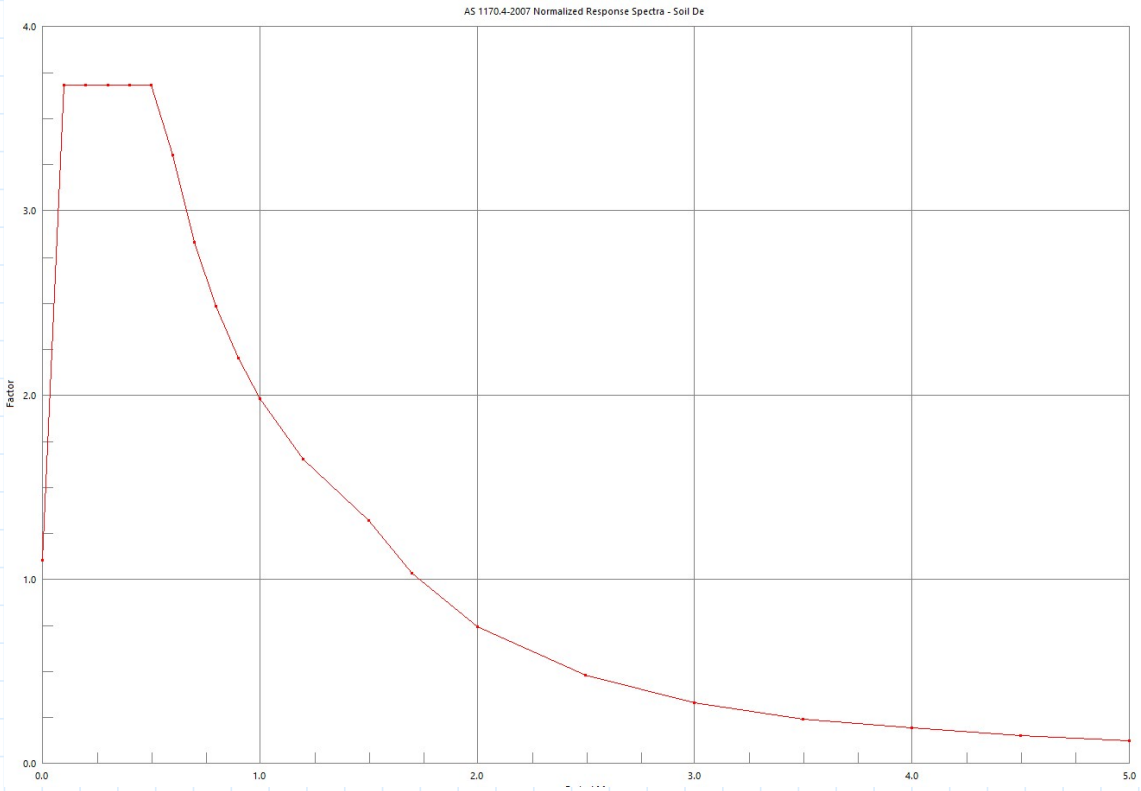


FIGURE 21 - NORMALISED RESPONSE SPECTRA - De Soil

In order to combine the spectral response, eight combinations were developed to account for each direction with the 30% and 100% breakdown of the cardinal directions as required by AS1170.4. This returned the following base reactions and peak stresses.

TABLE 3 - SPECTRAL RESPONSE - RESULTS SUMMARY

Combination Details	FX - N	FZ - N	Resolved - N	kN	tonne	VM - Mpa
1 Combination: 1.0N/S + 0.3E/W	1054660	1187610	1588308.9	1588.3	161.9	3.81
2 Combination: (-1.0N/S) + 0.3E/W	401188	750850	851309.3	851.3	86.8	1.99
3 Combination: (-1.0N/S) + (-0.3E/W)	-1054660	-1187610	1588308.9	1588.3	161.9	3.81
4 Combination: 1.0N/S + (-0.3E/W)	401188	750850	851309.3	851.3	86.8	1.99
5 Combination: 0.3N/S + 1.0E/W	1307510	1018690	1657501.6	1657.5	169.0	3.91
6 Combination: (-0.3N/S)+ 1.0E/W	870750	437158	974326.8	974.3	99.3	2.17
7 Combination: (-0.3N/S + (-1.0E/W)	-1307510	-1018690	1657501.6	1657.5	169.0	3.91
8 Combination: 0.3N/S + (-1.0E/W)	-870750	-437158	974326.8	974.3	99.3	2.17

The critical case was combination 5, which is a 100% value originating from the West, pushing the stack eastward, combined with a 30% Northern component.

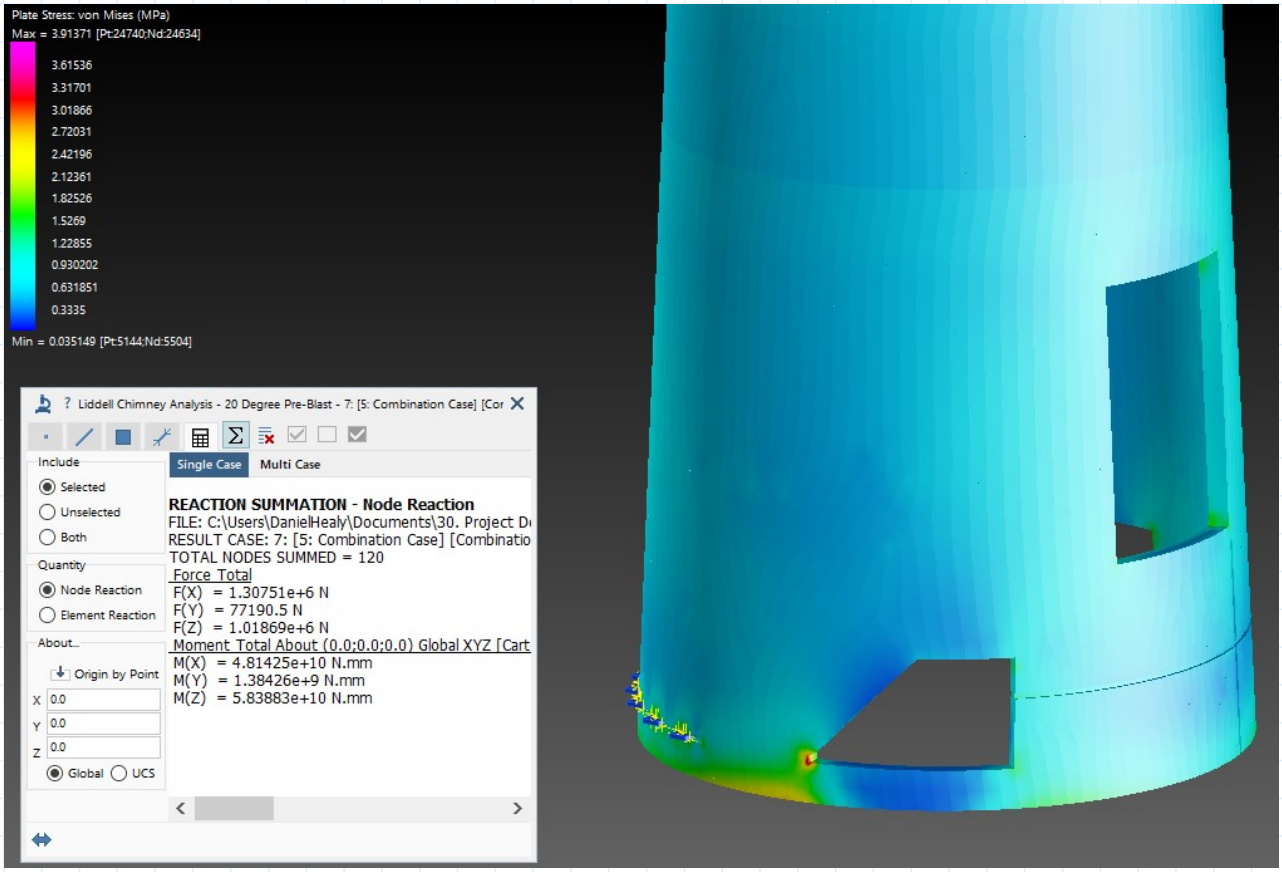


FIGURE 22 - BASE REACTIONS AND STRESS ANALYSIS - COMBINATION 5

As per the analysis, the peak reaction within the SRSS combinations was approximately 169t when resolved into a single force, or 133.3 in the East-West direction and 103.8t in the North-South direction.

This resulted in a peak combined stress of 3.91 MPa, which is well within allowable limits. It is noted that due to the SRSS combination, the negative or positive cannot be assumed for the reaction. This is critical in consideration of the shims at the rear of the cuts, as they have no tensile / uplift resistance.

However, the analysis indicates that the stresses are within limits in a general sense, and it also confirms that the base shear force is well below that caused by the wind design actions (approx. 384t). Hence wind is the governing design and will be assessed further. The wind design actions will also assess the potential for uplift at the heel and ensure the self-weight surcharge is not exceeded at these locations.

In addition, the Equivalent Static Base Shear has been calculated using the provisions of Section 6 of AS1170.4, as a cross check for spectral response results.

$C_h(T) := 0.64$

As per AS1170.4 Spectral Shape Factor Table for Class De soil adopting conservative period of 2.2s

$$V_{base_chimney_factor} := \left(k_p \cdot Z \cdot C_h(T) \cdot \frac{S_p}{\mu}\right) = 0.011$$

$V_{base_chimney_mass} := V_{base_chimney_factor} \cdot TOTAL_MASS_{chimney} = 79.9\ tonne$

Lower than spectral results

Hence the base shear from this analysis is lower than that of the spectral response assessment.

In addition, it is confirmed that the design is governed by wind design actions, and hence earthquake actions are not considered in the remaining sections of this calculation package.

5.5 Load Combinations

The load combinations to be assessed are in accordance with AS1170.0

Case 1 - Permanent action only: 1.35G

Case 2 - Permanent and Wind: 1.2G + Wu

Case 3 - Permanent and wind action reversal: 0.9G + Wu

Note that for the combinations listed, sub cases to account for the cardinal directions have been included within the assessment (I.e. North, South, East, West).

6 DESIGN ACTIONS & ANALYSIS

The demolition method encompasses two stages which have been analysed and detailed within this calculation package. Stage 1 will include the completion of both penetration cuts and rear heel wire saw cut to the chimney stack. Stage 2 includes the post blast response of the structure and associated stress analysis of the hinges / rear of the chimney.

6.1 Base Overturning Moment - Wind (STAGE 1)

The results for the design demolition wind load have been analysed applying a limit of allowable stress to a 0.65 reduction, approximately 15.9 MPa (0.65 x unconfined concrete strength), as per the below, it is clear that there are stress spikes at the toe, and some areas of the duct openings. However, these are likely nodal spikes due to corners and node supports within the FEA model. In general, the model indicates that the stress flow around the openings is within allowable limits. In addition, a stress analysis was completed using first principles, which confirms that stresses around the circumference are within allowable limits.

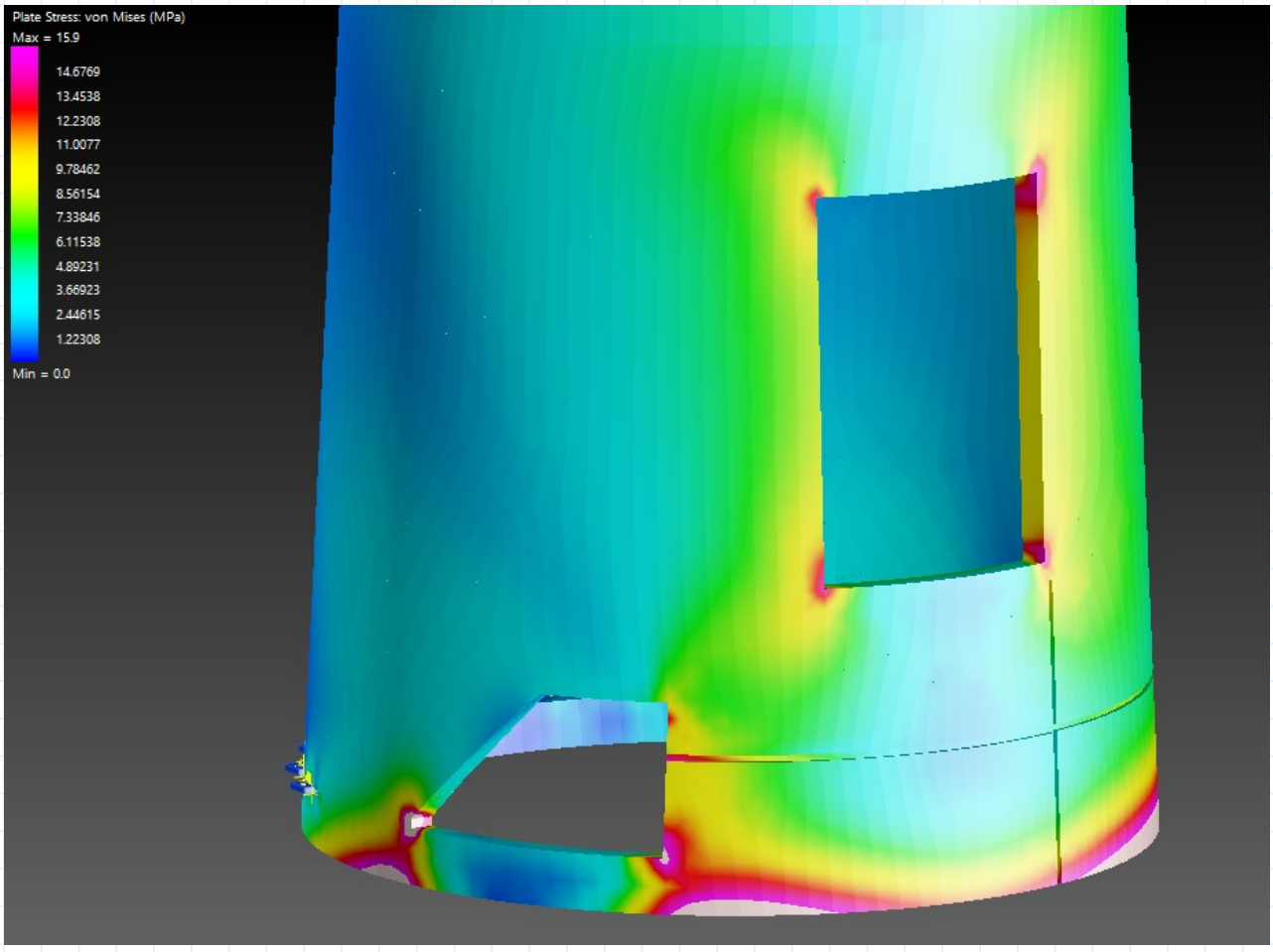


FIGURE 23 - STRESS RESULTS - 1.2G + Wdemo

CROSS CHECK ON UPLIFT USING FIRST PRINCIPLES

As per the previously determined design loads:

$$V_{BASE_WIND} := p_{stack} \cdot Project_Area_{chimney} = 3762.5 \ \boldsymbol{kN}$$

$$M_{BASE_WIND} := p_{stack} \cdot Project_Area_{chimney} \cdot Centre_Area_{chimney} = \left(2.8 \cdot 10^{5}\right) \ \boldsymbol{kNm}$$

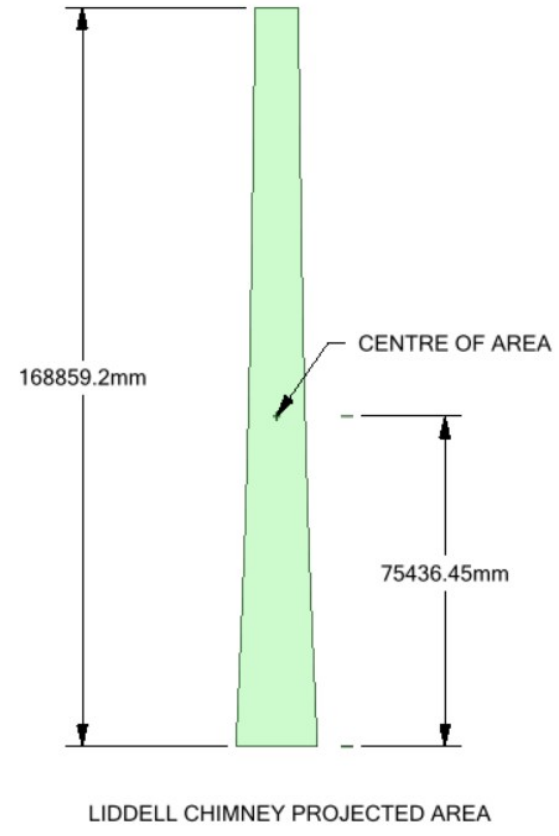


FIGURE 24 - PROJECTED SURFACE OF LIDDELL CHIMNEY STACK

Based on the peak overturning moment, calculate the stress distribution at the base of the stack and confirm net compression has been retained.

The cross section of the chimney base is as provided below, with the Eastern side base fitted with steel packing plates progressively installed as the concrete is wire cut.

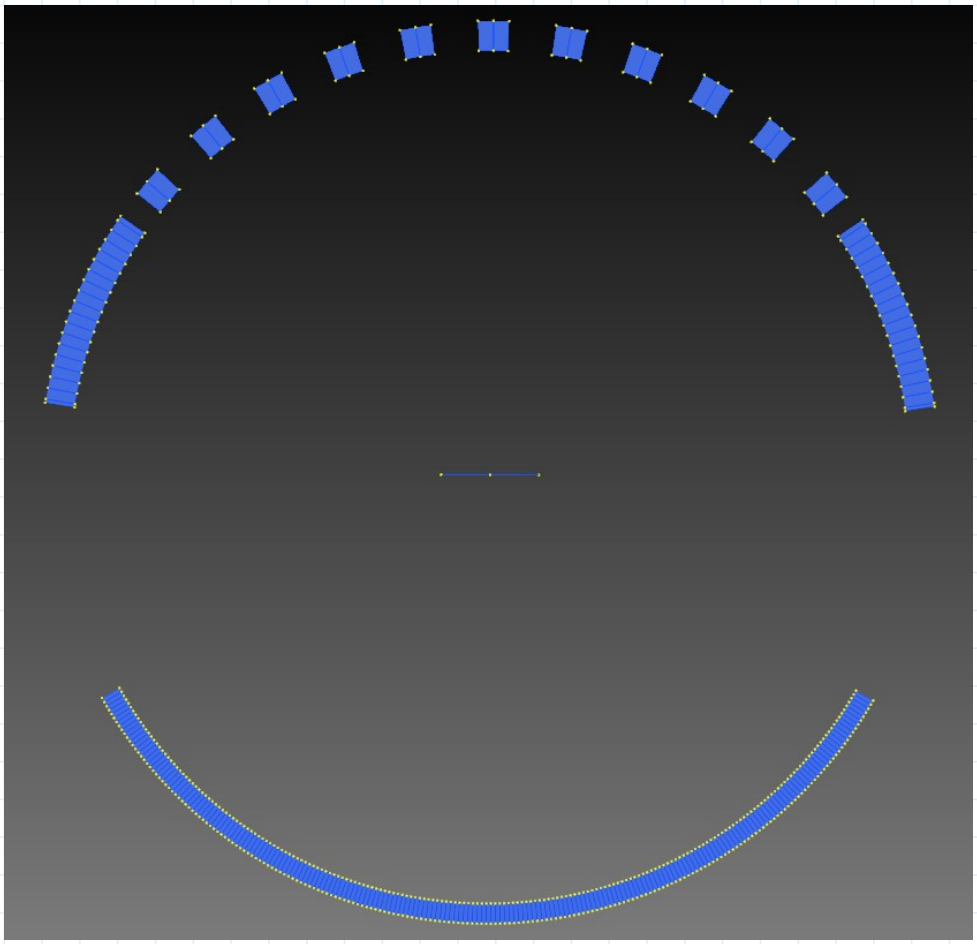


FIGURE 25 - GEOMETRY OF BASE FOLLOWING PREP CUTS

The section properties of the retained cut section have been generated, determining:

$I_{x_chimney_cut} := 7.34 \cdot 10^{14}\ mm^4$

$y_{tens} := 8708.7\ mm$ $y_{comp} := 9659.5\ mm$

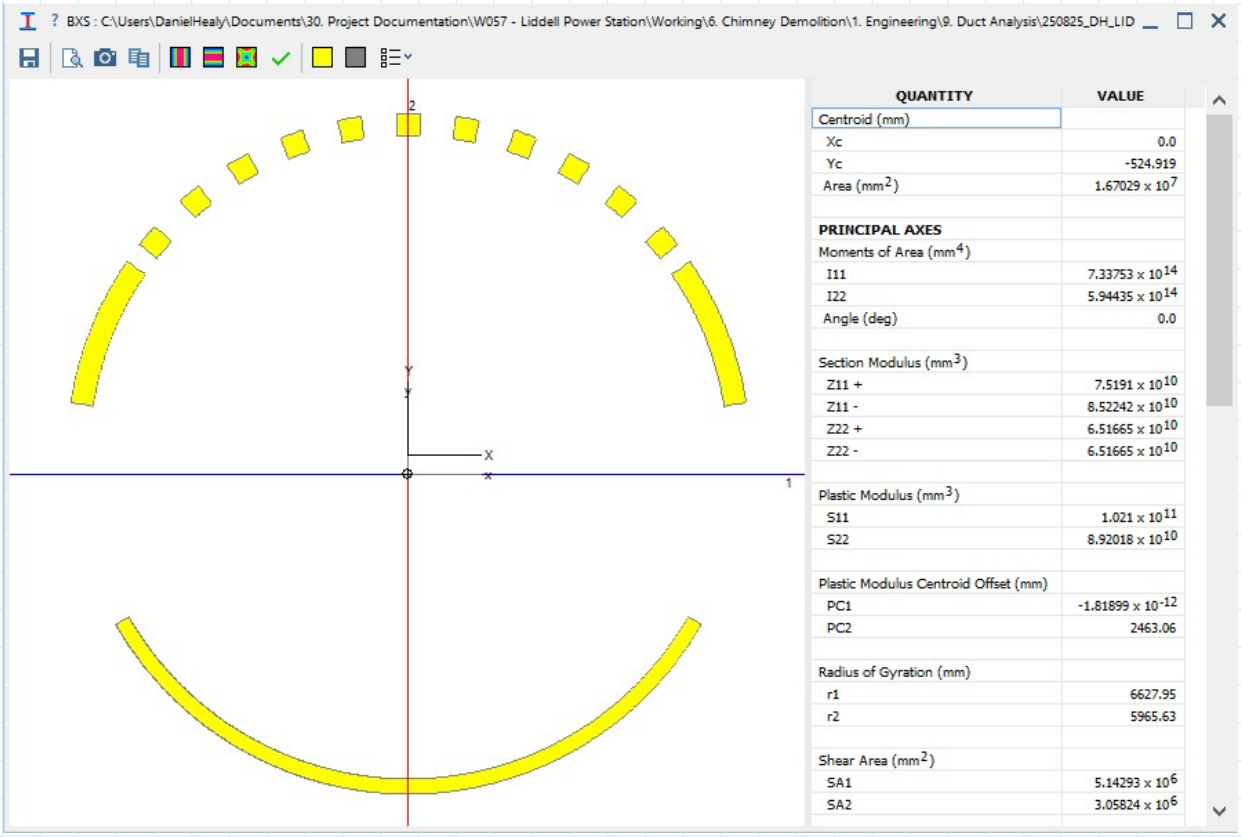


FIGURE 26 - SECTION PROPERTIES FOR CHIMNEY BASE POST CUTS

Determine peak tensile stress due to ultimate wind load:

$$\sigma_{demo_wind} := \frac{M_{BASE_WIND} \cdot y_{tens}}{I_{x_chimney_cut}} = 3.368\ MPa$$

Hence need to confirm stress surcharge due to self-weight stablising moment.

$$Area_{cut_base} := 1.67 \cdot 10^{7}\ mm^{2}$$

$$\sigma_{selfweigth_surcharge} := \frac{0.9 \cdot TOTAL_MASS_{chimney} \cdot g}{Area_{cut_base}} = 3.957\ MPa$$

Also need to add in stablising eccentricity stresses:

$$Lever_{cut_section} := 524.9\ mm$$

Distance between centre of mass and centre of stiffness

$$M_{chimney_sw_eccentricity} := 0.9 \cdot TOTAL_MASS_{chimney} \cdot g \cdot Lever_{cut_section} = \left(3.469 \cdot 10^{4}\right)\ kNm$$

$$\sigma_{sw_bending_surcharge} := \frac{M_{chimney_sw_eccentricity} \cdot y_{tens}}{I_{x_chimney_cut}} = 0.412\ MPa$$

$$\sigma_{total_self_weight_surcharge} := \sigma_{selfweigth_surcharge} + \sigma_{sw_bending_surcharge} = 4.369\ MPa$$

As such, shims are retained in net compression during design demolition wind speeds.

6.2 Post Blast Hinge Stress Analysis (STAGE 2)

Following the blast event, a significant front portion of the chimney stack will be ejected, which will result in the centre of stiffness shifting Westward, inducing a significant overturning moment that will result in failure of the hinges and rotation of the chimney structure. This section analyses the stress distribution post blast, to ensure that the hinges / heel of the chimney base are not instantaneously overstressed, and hence sufficient integrity is maintained to generate initial overturning of the chimney prior to crushing of the hinges.

Based on the stress analysis provided below, it is evident that immediately upon blasting, the axial stress for both the hinges and the rear heel increase from 2.28 MPa to 8.12 MPa. This value is still well within the lower bound unconfined capacity of the concrete (24.5 MPa).

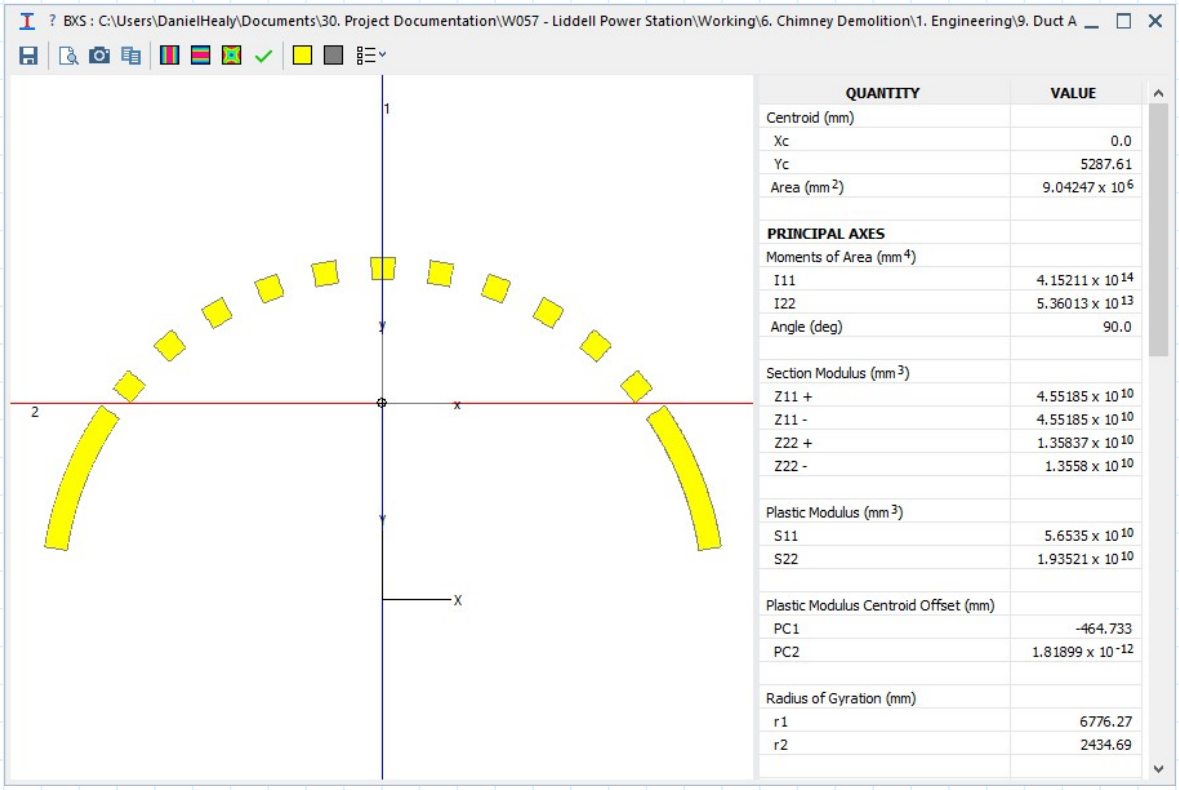
The change in eccentricity will result in an increase due bending of 45.1 MPa at the Eastern toe (compression) and 28.8 MPa at the rear heel (tension). As the tension cannot be developed, this will result in the structure beginning to fail and rotate, with the stress temporarily distributed to the hinges only.

The stresses at this point within the hinges are 99.4MPa (compression) at the Western toe and 69.8MPa (tension) at the Eastern heel. As such, failure and subsequent rotation is guaranteed to be achieved based upon the concrete grade of 24.5 MPa to 30.5 MPa.

Hinge & Rear		
Axial Force	73449.4	kN
Eccentricity	5287.61	mm
Bending at Initial blast	388372.0	kNm
Initial Area	32270675	mm2
Axial Stress	**2.28**	**MPa**
Area Post Blast	**9040000.0**	**mm2**
Axial Stress Post Blast	**8.12**	**MPa**
Ixx	4.152E+13	mm4
y_bar_comp	3953.5	mm
y_bar_tens	3946	mm
Bending Stress - Comp	36.98	Mpa
Bending Stress - Tens.	36.91	MPa
Total Comp.	**45.11**	**Mpa**
Total Ten.	**28.79**	**Mpa**

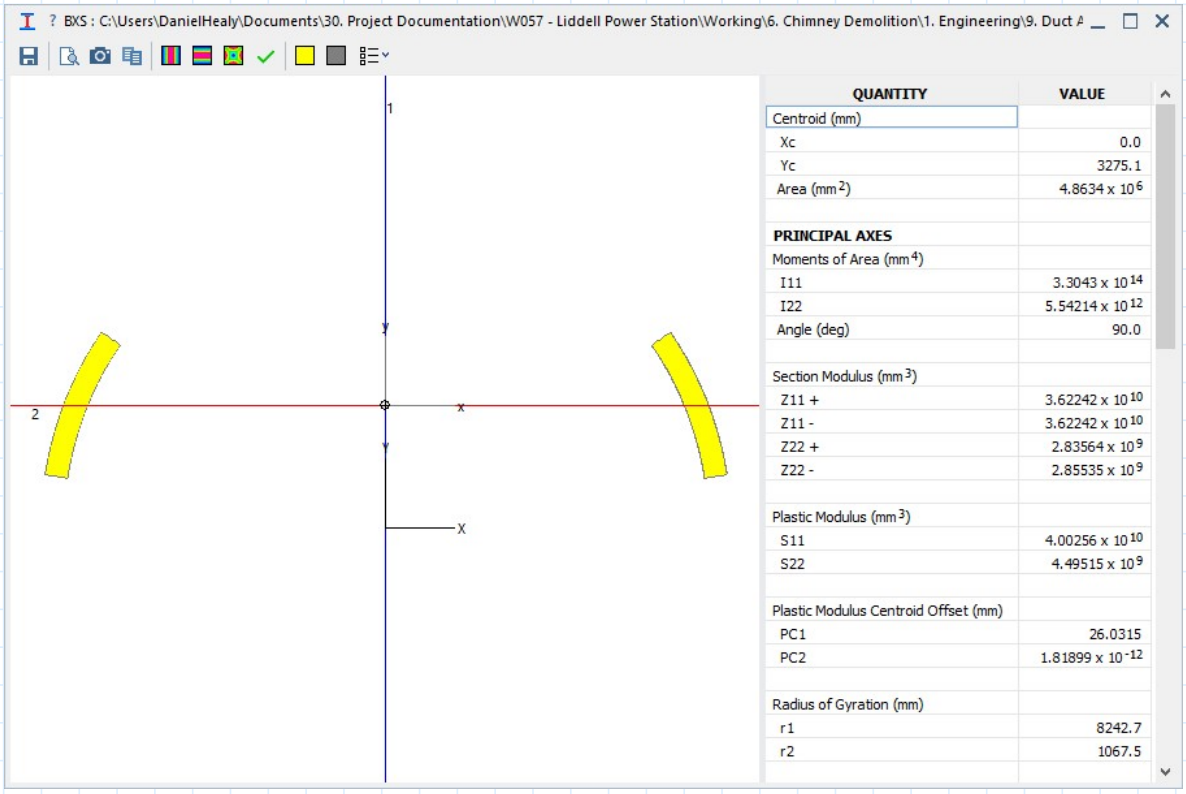
Hinges Only		
Axial Force	73449.4	kN
Eccentricity	3275.1	mm
Bending at rear lift off	240554.2	kNm
Area (Inc. Post Blast)	**4863400**	**mm2**
Axial Stress Post Blast	**15.10**	**MPa**
Area	4863400	mm2
Axial Stress Only	15.10	MPa
Ixx	5.54E+12	mm4
y_bar_comp	1941	mm
y_bar_tens	1954.5	mm
Bending Stress - Comp	84.28	Mpa
Bending Stress - Tens.	84.87	MPa
Total Comp.	**99.38**	**Mpa**
Total Ten.	**69.76**	**Mpa**

FIGURE 27 - STRESS ANALYSIS POST BLAST - HINGES & REAR VS HINGES



QUANTITY	VALUE
Centroid (mm)	
Xc	0.0
Yc	5287.61
Area (mm^2)	9.04247×10^6
PRINCIPAL AXES	
Moments of Area (mm^4)	
I11	4.15211×10^{14}
I22	5.36013×10^{13}
Angle (deg)	90.0
Section Modulus (mm^3)	
Z11 +	4.55185×10^{10}
Z11 -	4.55185×10^{10}
Z22 +	1.35837×10^{10}
Z22 -	1.3558×10^{10}
Plastic Modulus (mm^3)	
S11	5.6535×10^{10}
S22	1.93521×10^{10}
Plastic Modulus Centroid Offset (mm)	
PC1	-464.733
PC2	1.81899×10^{-12}
Radius of Gyration (mm)	
r1	6776.27
r2	2434.69

FIGURE 28 - GEOMETRIC SECTION PROPERTIES FOR HINGES & REAR



QUANTITY	VALUE
Centroid (mm)	
Xc	0.0
Yc	3275.1
Area (mm^2)	4.8634×10^6
PRINCIPAL AXES	
Moments of Area (mm^4)	
I11	3.3043×10^{14}
I22	5.54214×10^{12}
Angle (deg)	90.0
Section Modulus (mm^3)	
Z11 +	3.62242×10^{10}
Z11 -	3.62242×10^{10}
Z22 +	2.83564×10^{9}
Z22 -	2.85535×10^{9}
Plastic Modulus (mm^3)	
S11	4.00256×10^{10}
S22	4.49515×10^{9}
Plastic Modulus Centroid Offset (mm)	
PC1	26.0315
PC2	1.81899×10^{-12}
Radius of Gyration (mm)	
r1	8242.7
r2	1067.5

FIGURE 29 - GEOMETRIC SECTION PROPERTIES FOR HINGES ONLY

Assess Allowable Wind During Blast Event:

Adopting an allowable wind gust of 15 m/s, impact on hinge stresses post blast.

$V_{BASE_WIND_BLAST} := p_{stack_blast} \cdot Project_Area_{chimney} = 503.6\ kN$

$M_{BASE_WIND_BLAST} := p_{stack_blast} \cdot Project_Area_{chimney} \cdot Centre_Area_{chimney} = 37989.8\ kNm$

Taking moments about base 20 degrees from East West Direction:

$Ixx_hinge := 5.542 \cdot 10^{12} \cdot mm^4$

$y_{bar_comp} := 1941\ mm$ $\quad$ $y_{bar_tens} := 1954.5\ mm$

$\sigma_{hinge_EW_comp} := \frac{M_{BASE_WIND_BLAST} \cdot y_{bar_comp}}{Ixx_hinge}$ $\quad$ $\sigma_{hinge_EW_ten} := \frac{M_{BASE_WIND_BLAST} \cdot y_{bar_tens}}{Ixx_hinge}$

$\sigma_{hinge_EW_comp} = 13.305\ MPa$ $\quad$ $\sigma_{hinge_EW_ten} = 13.398\ MPa$

The increase in stresses based on the allowable wind speed are in the order of 13.3 MPa. The orientation of the wind will either temporarily provide resistance to the stack, or it will push the stack over. Based on the hinge stresses, even with a 13.3 MPa reduction, the stresses are sufficient to cause failure of the hinge.

Taking moments about base at 20 degrees from North South Direction:

$Iyy_hinge := 3.16 \cdot 10^{14} \cdot mm^4$

$y_{bar_NS} := 9046\ mm$

$\sigma_{hinge_NS} := \frac{M_{BASE_WIND_BLAST} \cdot y_{bar_NS}}{Iyy_hinge}$

$\sigma_{hinge_NS} = 1.088\ MPa$

Hence, impact of allowable blast wind speed in North - South direction is negligible.

Assess Duct Penetrations for Post Blast Stresses:

A key consideration in the analysis is the response of the duct opening following the blast event. An FEA analysis was completed to review the stresses in this area once the front birdsmouth has been removed via the detonation of explosives. As per the below results, it is evident that the stresses around the duct are in the order of 8 MPa, which is within allowable limits. It is noteworthy that the hinge stresses are exceeding the lower bound unconfined compressive strength of 24.5 MPa, and this is intended as the hinges are designed to fail in order to cause rotation / collapse of the chimey.

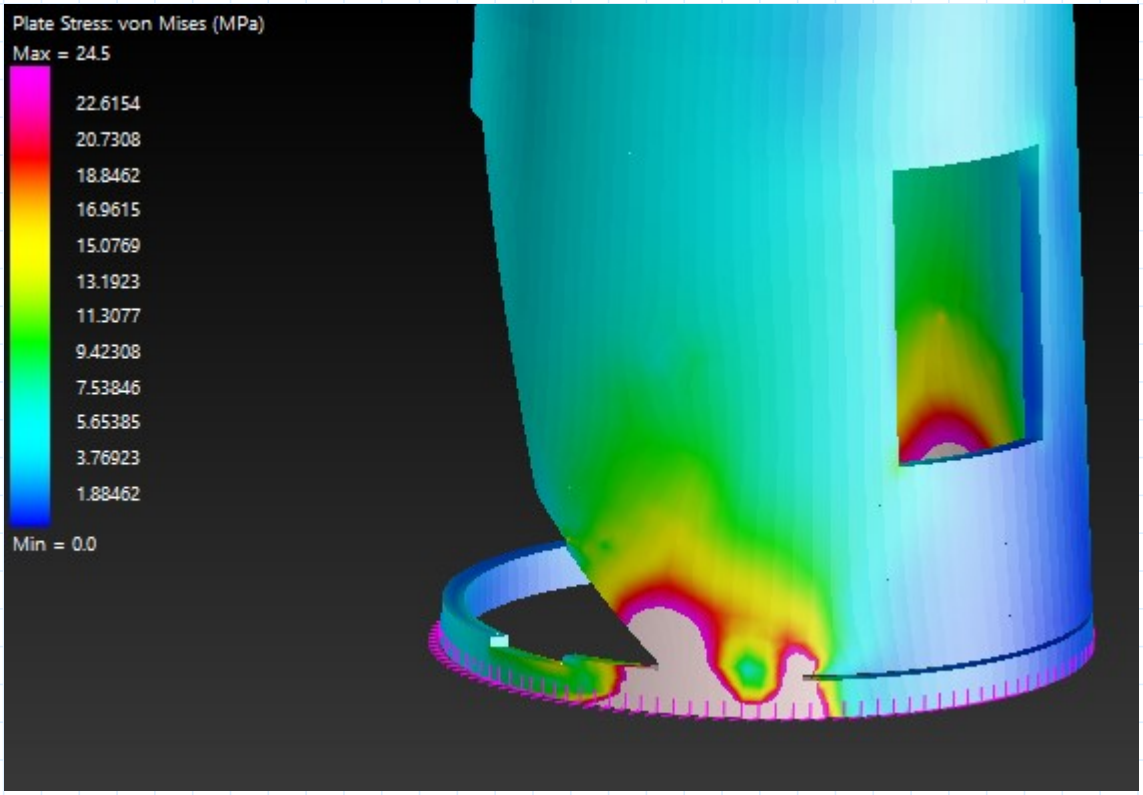


FIGURE 30 - INLET DUCT STRESSES POST BLAST - G

7 CONCLUSION

As part of the Liddell Power Station Demolition Project, Wellanbah Industrial have been engaged to undertake the structural analysis and subsequent onsite execution of the proposed demolition method for the two chimney stacks which are currently onsite.

The method entails completing various pre-cuts to the chimney, followed by the installation and initiation of explosive charges installed in the front face of the structure (on the fell side). The detonation of the explosives will result in the removal of the front concrete, causing the structure to pivot about the rear base and fall to grade.

The assessment focused on two critical aspects of structural stability, which included the assessment of the chimney stack following the completion of various cuts in accordance with the blast design, and the analysis of hinge stresses following the initiation of the explosives.

A structural model was developed based on the existing drawings and a finite element analysis was undertaken to evaluate the global stability of the chimney structures following the completion of enabling / charge placement works. Following the analysis, it was determined that the proposed enabling works can be completed provided that the forecast (and subsequent experienced) gust wind speed stays below 147.6 km/hr. It is noteworthy that the gust wind speeds are determined as a value which is 45% higher than the forecast average wind speeds. Hence if the forecast wind speed is in excess of 101km/hr it is recommended that the planned works be rescheduled, or the structure be vacated with an exclusion zone established until the wind levels reduce to acceptable levels. It should be noted that such a wind speed is based on 1:100 year probability, hence it is not expected that such an event will occur during the minor schedule of works (approx. 1 month). In addition, it was determined that with the proposed cuts the structure will remain in net compression, even under the design demolition wind loading.

A stress analysis was completed to evaluate the rear heel and hinges of the structure following the initiation of the explosives. It was determined that immediately upon blasting, the axial stress for both the hinges and the rear heel increase from 2.28 MPa to 8.12 MPa. This value is still well within the lower bound unconfined capacity of the concrete (24.5 MPa).

The change in eccentricity will then result in an increase stress due to bending in the order of 45.1 MPa at the Eastern toe (compression) and 28.8 MPa at the rear heel (tension). As the tension cannot be developed, this will result in the structure beginning to fail and rotate, with the stress temporarily distributed to the hinges only. The stresses at this point within the hinges are 99.4 MPa (compression) at the Western toe and 69.8 MPa (tension) at the Eastern heel. As such, failure and subsequent rotation is guaranteed to be achieved based upon the concrete grade of 24.5 MPa.

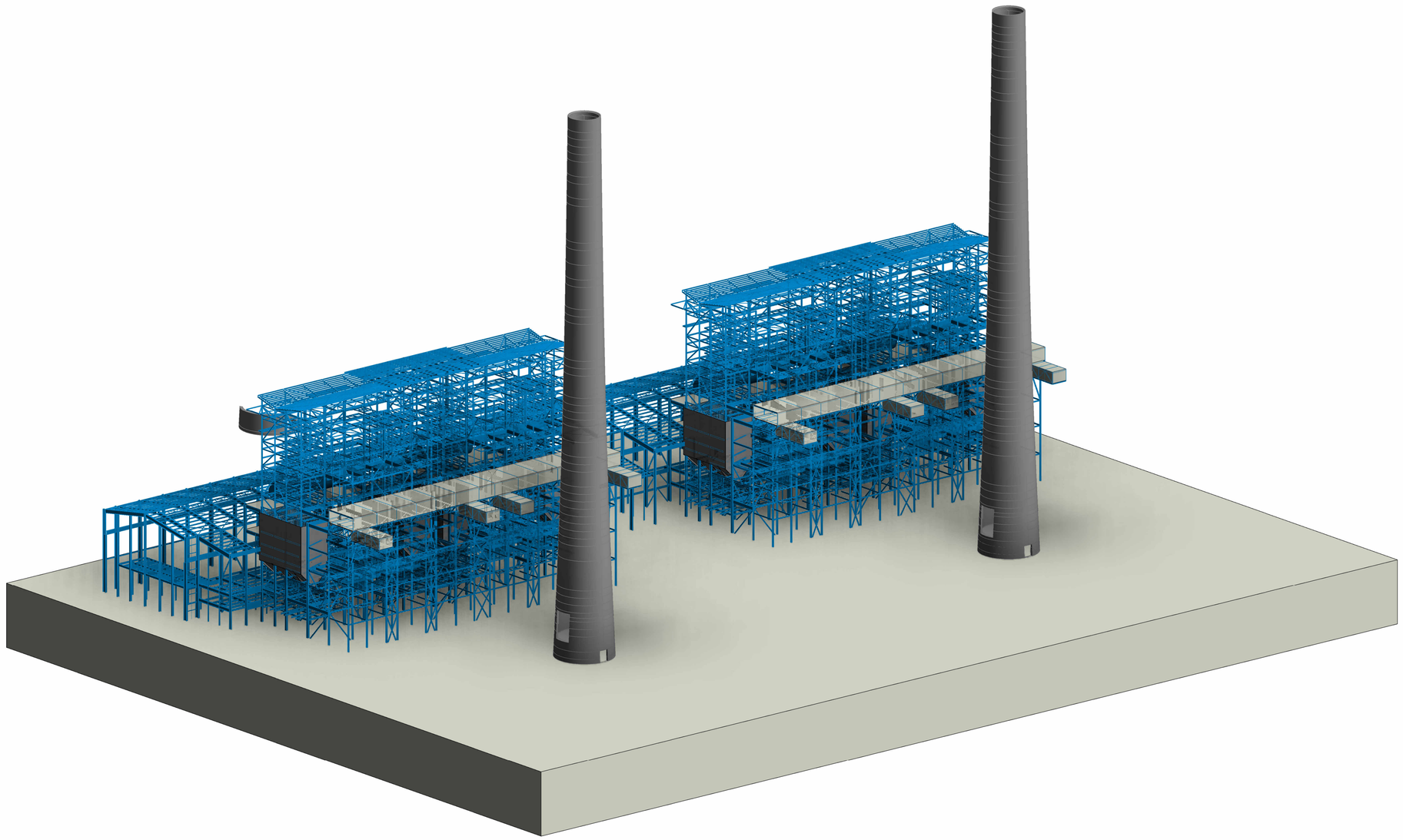
In conclusion, following the structural analysis of the proposed blast design, it was determined that the structure will remain stable during the pre-cutting works up until a gust wind speed up to 147.6 km/hr. In addition, upon detonation, the stresses in the chimney stack are within the range that will encourage rotation of the chimneys prior to crushing of the hinges, and therefore the expected overturning and collapse of the structures will match the design intent. The blast event is to be undertaken under a limiting wind speed of 15 m/s gust, and to be confirmed onsite via live wind monitoring.

APPENDICIES

APPENDIX A – LIDDELL POWER STATION – CHIMNEY DEMOLITION BLAST DESIGN DRAWINGS

LIDDELL POWER STATION

CHIMNEY DEMOLITION - BLAST DESIGN



STRUCTURAL DRAWING INDEX

NUMBER	TITLE
S000	CHIMNEY BLAST - COVER SHEET
S100	CHIMNEY BLAST - OVERVIEW
S110	20 DEG. ROTATION - FELL PATH OVERLAY
S200	20 DEGREE HINGE ROTATION - PREP. DETAILS
S201	U1/U2 CHIMNEY BLAST - CHARGE SCHEDULE
S202	U3/U4 CHIMNEY BLAST - CHARGE SCHEDULE

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	REVISED BLAST DESIGN		DH	DH	BH	3.09.25
B	REVIEW UPDATES		DH	DH	BH	5.06.25
A	PRELIMINARY ISSUE		DH	DH	BH	12.02.25

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DO NOT SCALE

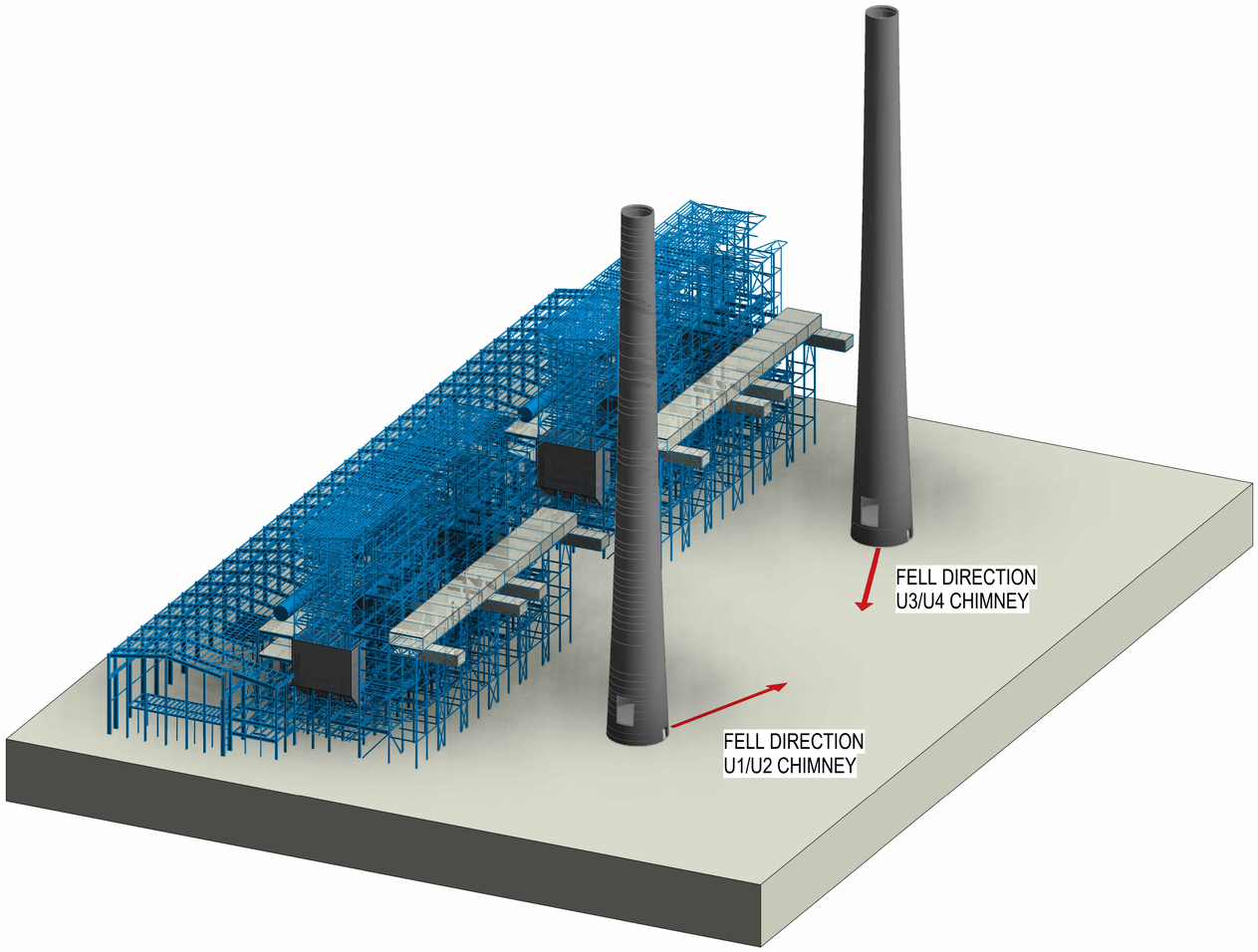
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Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 12.02.25
Scale
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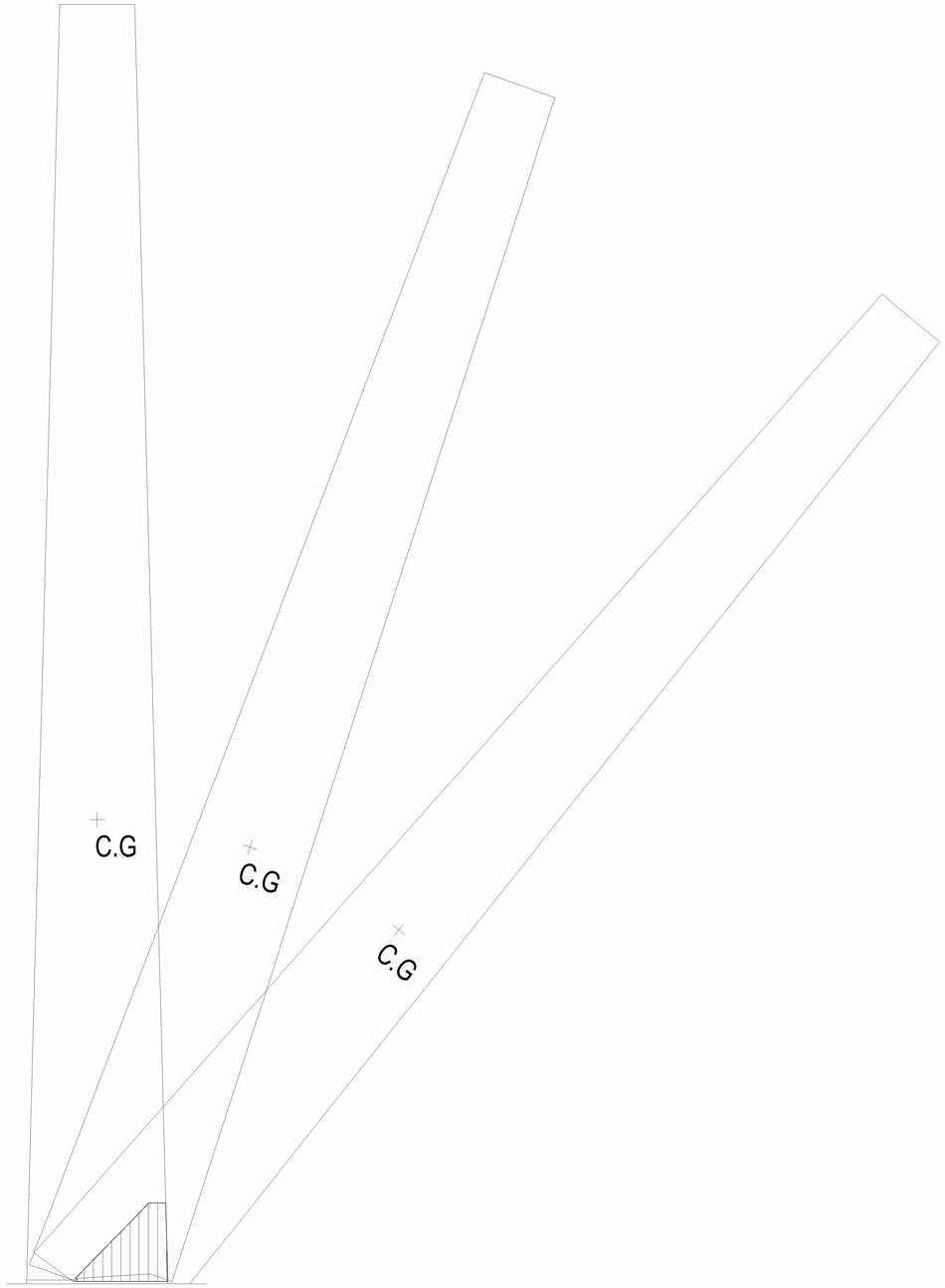
Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY BLAST - COVER SHEET**

Original Size **A1**
Drawing No: **WI-24057-06-S000**
Rev: C

Plot Date: 3/09/2025 5:29:11 PM



SITE OVERVIEW
SCALE : NTS



CHIMNEY COLLAPSE MECHANISM
SCALE 1 : 400

NOTES:
1. THIS DOCUMENT PROVIDES THE BLAST DESIGN FOR THE DEMOLITION OF TWO REINFORCED CONCRETE CHIMNEYS LOCATED AT THE LIDDELL POWER STATION SITE.
2. THE CHIMNEYS ARE APPROXIMATELY 169m IN HEIGHT, AND HAVE AN OUTSIDE BASE DIAMETER OF 18.6m.
3. THE CHIMNEYS ARE TO BE COLLAPSED IN A DIRECTION WHICH IS 20 DEGREES OFF THE SITE NORTH-SOUTH DIRECTION, NOTING THAT THE SITE NORTH ORIENTATION IS 9 DEGREES CLOCKWISE OF TRUE NORTH.
4. ALL STRUCTURES WITHIN THE FELL PATH OF THE CHIMNEYS ARE TO BE DEMOLISHED PRIOR TO THE BLAST.

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	REVISED BLAST DESIGN		DH	DH	BH	3.09.25
B	UPDATED COG POSITION		DH	DH	BH	5.06.25
A	PRELIMINARY ISSUE		DH	DH	BH	12.02.25

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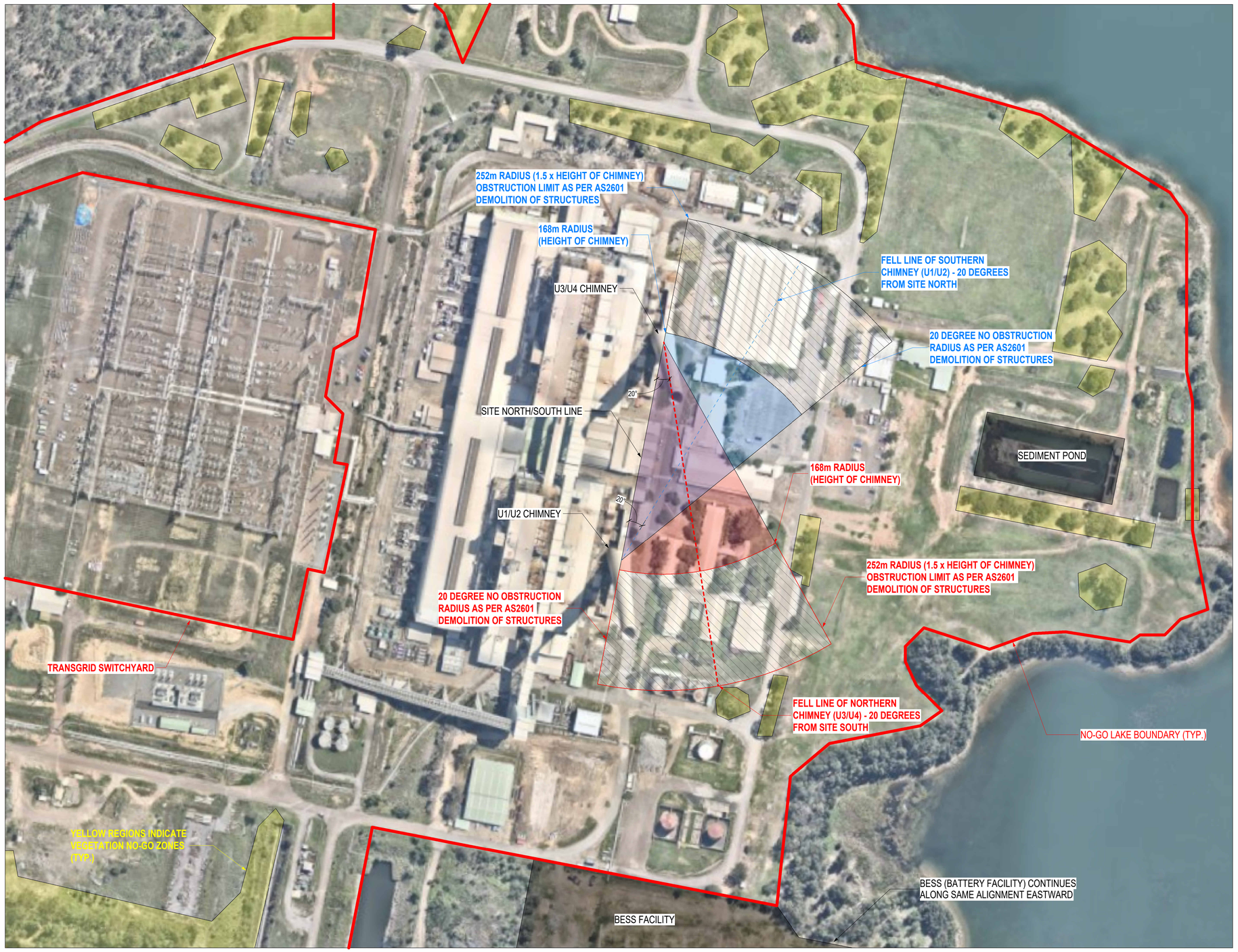
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Drafting Check B. HEALY
Approved D. HEALY
Date 12.02.25
Scale
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Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY BLAST - OVERVIEW**
Original Size **A1**
Drawing No: **WI-24057-06-S100**
Rev: C

Plot Date: 3/09/2025 5:30:03 PM



LIDDELL CHIMNEY COLLAPSE ORIENTATION - 20 DEGREE ROTATION

SCALE 1 : 1500

LIDDELL POWER STATION CHIMNEY DEMOLITION - OPTION 1 COMPLIANCE SCHEDULE

SITE CONSTRAINT	NEAREST DISTANCE FROM BASE OF CHIMNEY WITHIN FELL PATH	COMMENTS
1. BATTERY ENERGY STORAGE SYSTEM (BESS)	376m	NEAREST DISTANCE BASED ON FELL PATH OF NORTHERN CHIMNEY TO EDGE OF COMPOUND FENCE LINE - DISTANCE COMPLIES WITH AS2601 - CLAUSE 7.7.4.3
2. VEGETATION NO - GO ZONES	254m	NEAREST DISTANCE BASED ON FELL PATH OF NORTHERN CHIMNEY TO VEGETATION NO-GO ZONE - DISTANCE COMPLIES WITH AS2601 - CLAUSE 7.7.4.3
3. SITE BOUNDARY AT LAKE	314m	NEAREST DISTANCE BASED ON FELL PATH OF NORTHERN CHIMNEY TO LAKE BOUNDARY LINE - DISTANCE COMPLIES WITH AS2601 - CLAUSE 7.7.4.3
4. SEDIMENT POND (INC. BURIED PIPELINE)	N.A	ASSET OUTSIDE FELL PATH - COMPLIANT WITH AS2601 - CLAUSE 7.7.4.3
5. TRANSGRID SWITCHYARD	N.A	ASSET OUTSIDE FELL PATH - COMPLIANT WITH AS2601 - CLAUSE 7.7.4.3
6. SITE INFRASTRUCTURE YET TO BE DEMOLISHED	N.A	STRUCTURES OUTSIDE FELL PATH - COMPLIANT WITH AS2601 - CLAUSE 7.7.4.3

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	UPDATED TRANSGRID SWITCHYARD REFERENCES	DH	DH	BH	31.10.25
B	FINALISED DESIGN ISSUE	DH	DH	BH	3.09.25
A	PRELIMINARY ISSUE	DH	DH	BH	31.07.25

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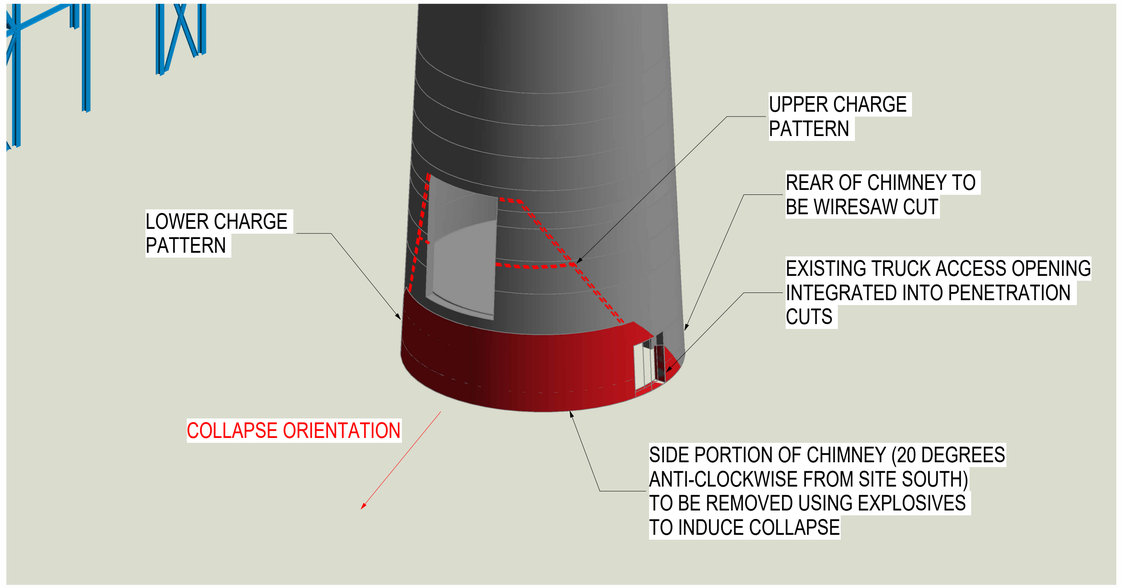
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Date 31.07.25
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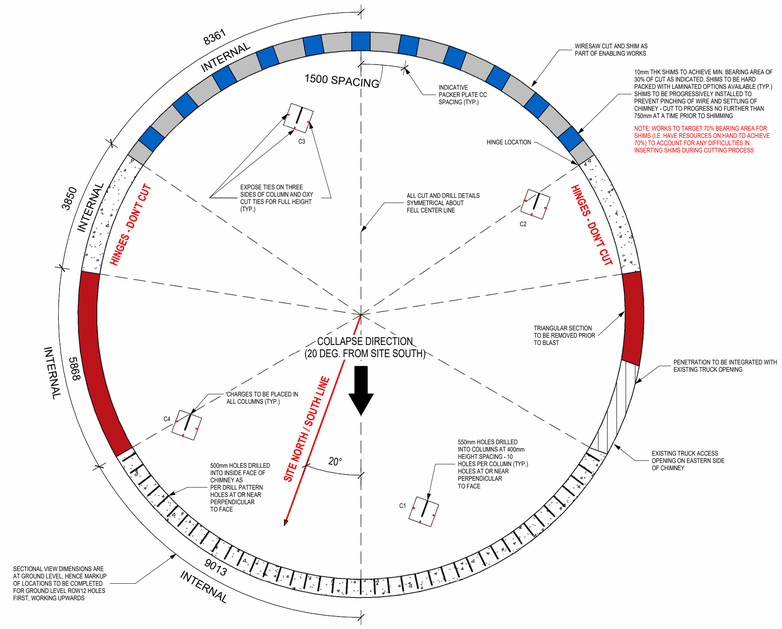
Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **20 DEG. ROTATION - FELL PATH OVERLAY**

Original Size **A1**
Drawing No: **WI-24057-06-S110**
Rev: C

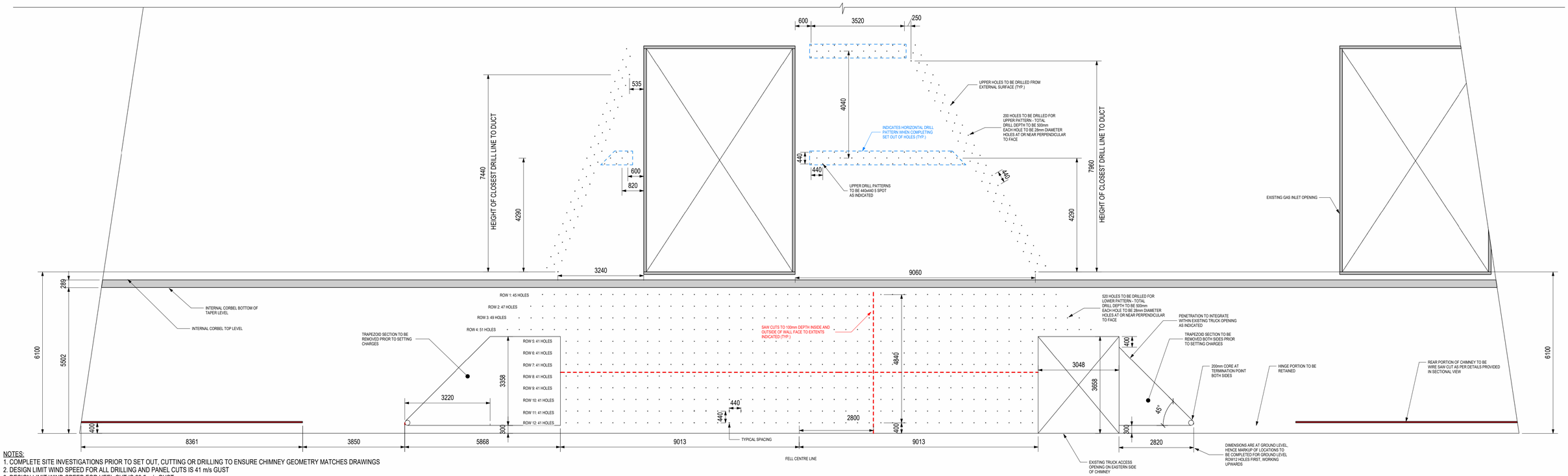
Plot Date: 1/11/2025 12:29:35 PM



3D VIEW - CHIMNEY BASE - 20 DEG. ROTATION
SCALE : NTS



CHIMNEY BASE SECTIONAL VIEW - 20 DEG. ROTATION
SCALE 1 : 100



NOTES:
1. COMPLETE SITE INVESTIGATIONS PRIOR TO SET OUT, CUTTING OR DRILLING TO ENSURE CHIMNEY GEOMETRY MATCHES DRAWINGS
2. DESIGN LIMIT WIND SPEED FOR ALL DRILLING AND PANEL CUTS IS 41 m/s GUST
3. DESIGN LIMIT WIND SPEED FOR HEEL CUT IS 22.5 m/s GUST
4. DESIGN LIMIT WIND SPEED FOR BLAST EVENT IS 15 m/s GUST; LIVE SITE WIND MONITORING TO BE COMPLETED BY MOUNTING UNIT IN VICINITY OF CHIMNEYS AT HEIGHT OF 10m. LOCATION TO BE SELECTED SUCH THAT NO SHIELDING OR VORTEX LOADING WILL INFLUENCE MONITORING.
5. TOLERANCE ON DRILL PATTERN +/- 75mm, TOLERANCE ON HOLE DEPTH +/-25mm.
6. BLAST PATTERN DETAILS HEREIN FOR U3/U4 CHIMNEY - PATTERN IS TO BE MIRRORED FOR U1/U2 CHIMNEY

DRILL PATTERN & CHARGE LAYOUT - 20 DEG. ROTATION
SCALE 1 : 75

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	UPDATED NOTES AND VERTICAL CUT LINE POSITION	DH	DH	BH	1.11.25
B	REVISED BLAST DESIGN	DH	DH	BH	3.09.25
A	PRELIMINARY ISSUE	DH	DH	BH	31.07.25

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Approved	D. HEALY		
Date	31.07.25		
Scale		This Drawing must not be used for Construction unless signed as Approved	

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **20 DEGREE HINGE ROTATION - PREP. DETAILS**
Original Size **A1**
Drawing No: **WI-24057-06-S200**
Rev: C

Plot Date: 1/11/2025 12:26:48 PM

CHARGE SCHEDULE U1/U2 CHIMNEY

ROW ID#	NUMBER OF HOLES	CHARGES PER HOLE	CHARGES FOR ROW	CHARGE WEIGHT OF ROW (KG)	CHARGE TYPE	ROW DELAY TIMING MS
1	45	2	90	10.35	SENATEL 25-200	0
2	47	2	94	10.81	SENATEL 25-200	0
3	49	2	98	11.27	SENATEL 25-200	0
4	51	2	102	11.73	SENATEL 25-200	0
5	41	2	82	9.43	SENATEL 25-200	0
6	41	2	82	9.43	SENATEL 25-200	0
7	41	2	82	9.43	SENATEL 25-200	0
8	41	2	82	9.43	SENATEL 25-200	0
9	41	2	82	9.43	SENATEL 25-200	0
10	41	2	82	9.43	SENATEL 25-200	0
11	41	2	82	9.43	SENATEL 25-200	0
12	41	2	82	9.43	SENATEL 25-200	0
UPPER PATTERN	200	2	400	46	SENATEL 25-200	0
C1	10	2	20	2.3	SENATEL 25-200	0
C2	10	2	20	2.3	SENATEL 25-200	0
C3	10	2	20	2.3	SENATEL 25-200	0
C4	10	2	20	2.3	SENATEL 25-200	0
TOTALS	720		1440	165.6		

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	REVISED BLAST DESIGN	DH	DH	BH	3.09.25
B	REVIEW UPDATES	DH	DH	BH	5.06.25
A	PRELIMINARY ISSUE	DH	DH	BH	12.02.25

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Approved D. HEALY
Date 12.02.25
Scale
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Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **U1/U2 CHIMNEY BLAST - CHARGE SCHEDULE**

Original Size **A1**
Drawing No: **WI-24057-06-S201**
Rev: C

Plot Date: 3/09/2025 5:30:14 PM

CHARGE SCHEDULE U3/4 CHIMNEY

ROW ID#	NUMBER OF HOLES IN ROW	CHARGES PER HOLE	CHARGES FOR ROW	CHARGE WEIGHT OF ROW (KG)	CHARGE TYPE	ROW DELAY TIMING MS
1	45	2	90	10.35	SENATEL 25-200	4000
2	47	2	94	10.81	SENATEL 25-200	4000
3	49	2	98	11.27	SENATEL 25-200	4000
4	51	2	102	11.73	SENATEL 25-200	4000
5	41	2	82	9.43	SENATEL 25-200	4000
6	41	2	82	9.43	SENATEL 25-200	4000
7	41	2	82	9.43	SENATEL 25-200	4000
8	41	2	82	9.43	SENATEL 25-200	4000
9	41	2	82	9.43	SENATEL 25-200	4000
10	41	2	82	9.43	SENATEL 25-200	4000
11	41	2	82	9.43	SENATEL 25-200	4000
12	41	2	82	9.43	SENATEL 25-200	4000
UPPER PATTERN	200	2	400	46	SENATEL 25-200	4000
C1	10	2	20	2.3	SENATEL 25-200	4000
C2	10	2	20	2.3	SENATEL 25-200	4000
C3	10	2	20	2.3	SENATEL 25-200	4000
C4	10	2	20	2.3	SENATEL 25-200	4000
TOTALS	720		1440	165.6		

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
C	REVISED BLAST DESIGN	DH	DH	BH	3.09.25
B	REVIEW UPDATES	DH	DH	BH	5.06.25
A	PRELIMINARY ISSUE	DH	DH	BH	12.02.25

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Drafting Check B. HEALY
Approved D. HEALY
Date 12.02.25
Scale

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Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **U3/U4 CHIMNEY BLAST - CHARGE SCHEDULE**

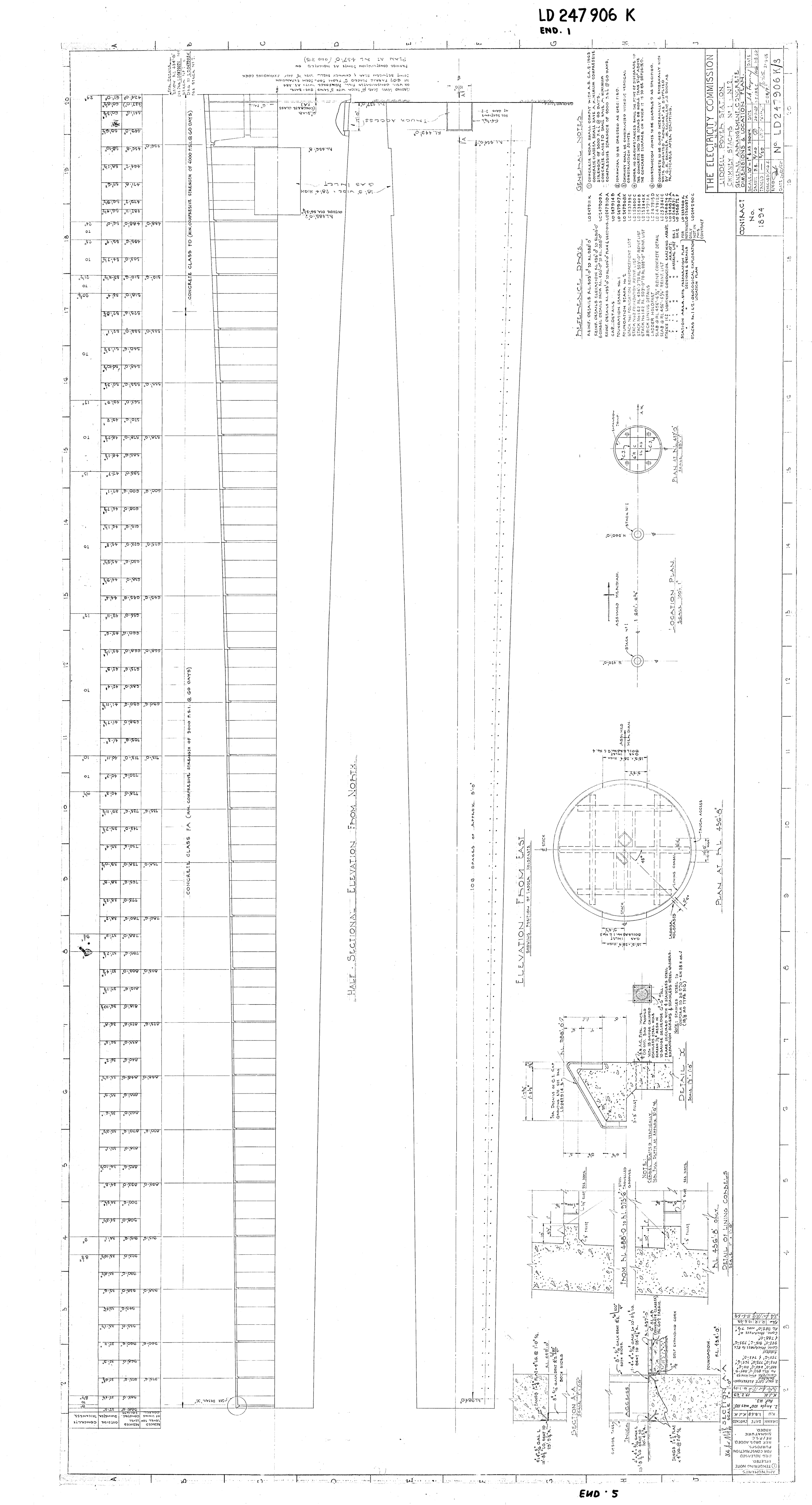
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Rev: C

Plot Date: 3/09/2025 5:30:18 PM

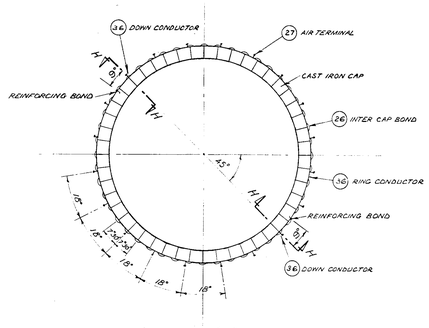
APPENDIX B – EXISTING STRUCTURAL DRAWINGS

LD 247906 K

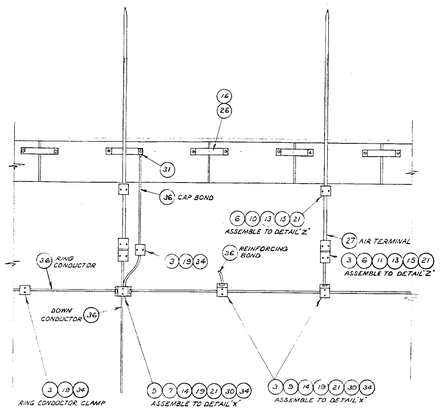
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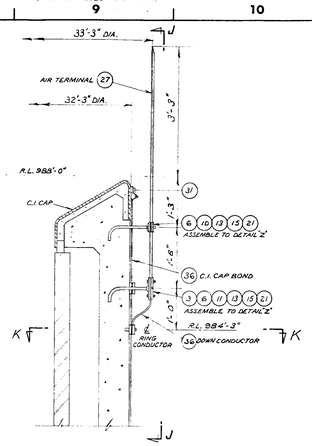
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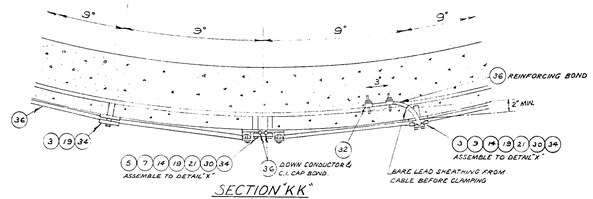
PLAN "AA"
SCALE: 1/8 IN. = 1FT.
R.L. 988'-0"



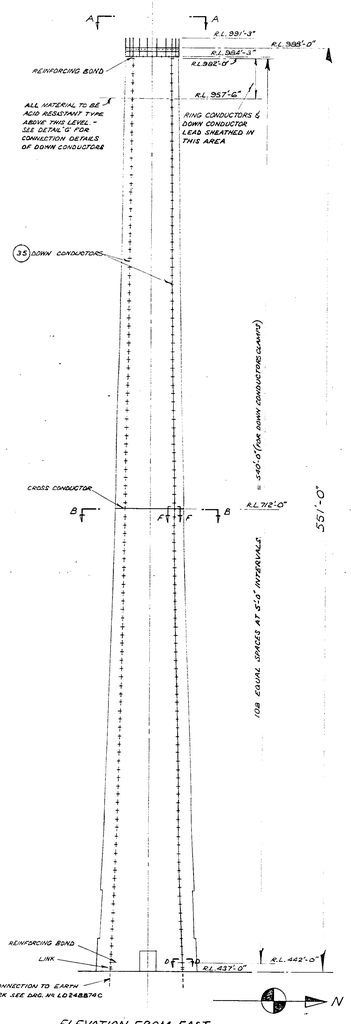
ELEVATION "JJ"
SCALE: 1/8 IN. = 1FT.



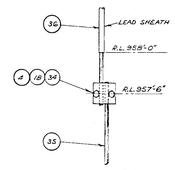
SECTION "HH"
SCALE: 1/8 IN. = 1FT.



SECTION "KK"
SCALE: 1 1/8 IN. = 1FT.
R.L. 984'-6"

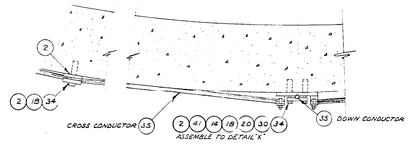


ELEVATION FROM EAST
SCALE: 1/32 IN. = 1FT.

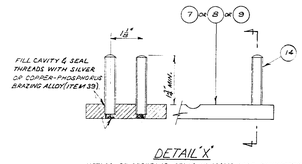


DETAIL "G"
SCALE: 1 1/2 IN. = 1FT.

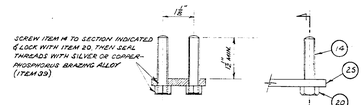
METHOD OF CONNECTING DOWN CONDUCTORS AT COMMENCEMENT OF LEAD SHEATH.



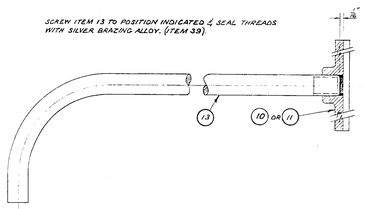
SECTION "FF"
SCALE: 1 1/2 IN. = 1FT.
R.L. 712'-0"



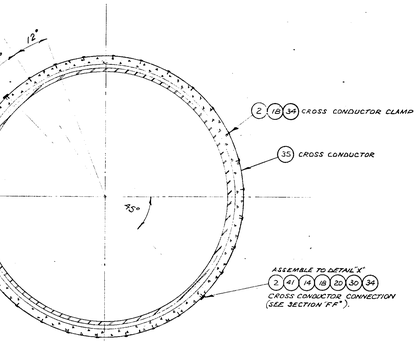
DETAIL "X"
METHOD OF SECURING STUDS IN CLAMP BASE CONNECTORS.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE



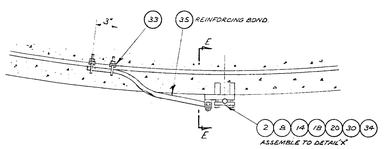
DETAIL "Y"
METHOD OF SECURING STUDS IN TEST LINK CABLE ADAPTOR.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE



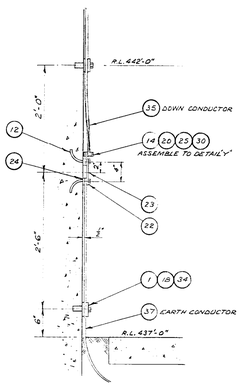
DETAIL "Z"
METHOD OF SECURING HOOK BOLT IN CLAMP BASE.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE



PLAN "BB"
SCALE: 1/16 IN. = 1FT.
R.L. 712'-0"



SECTION "DD"
SCALE: 1 1/2 IN. = 1FT.
R.L. 442'-0"



SECTIONAL ELEVATION "EE"
SCALE: 1/16 = 1FT.

REFERENCE DRAWINGS

LD 248874 C - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - EARTHING ARRANGEMENT.
LD 248871 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - MATERIAL LIST - SHEET 1.
LD 248872 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - MATERIAL LIST - SHEET 2.
LD 247906 K - CHIMNEY STACKS N°1 & N°2 - GENERAL ARRANGEMENT - CONCRETE FOUNDATION & PLAN LAYOUT.
LD 247907 A - CHIMNEY STACK N°1 - FOUNDATION.
LD 247908 K - CHIMNEY STACK N°2 - FOUNDATION.
LD 247914 A - CAP DETAILS.

NOTES

1. ITEM Nos. ENCIRCLED THUS (1) REFER TO ITEM Nos. LISTED ON MATERIAL LIST DRGS. Nos. LD 248871 P & LD 248872 P.
2. LEGS OF BOLTS FOR DOWN CONDUCTOR CLAMPING TO BE IN HORIZONTAL PLANE.
   LEGS OF BOLTS FOR ALL EARTH CLAMPING TO BE IN VERTICAL PLANE.
   LEGS OF HOOK BOLTS FOR TEST LINK & AIR TERMINAL TO BE IN VERTICAL PLANE.
3. EXPANDING PLUG TYPE MASONRY ANCHORS, ITEM 34, ARE TO BE SECURED INTO CHIMNEY IN ACCORDANCE WITH MAKER'S STANDARD INSTRUCTIONS.
4. LOWEST BOLTS AT R.L. 437'-6" MUST NOT BE IN ELECTRICAL CONTACT WITH ANY SURROUNDING REINFORCING METAL, OR NO ACCOUNT MUST LEGS OR HOOK BOLTS (FOR TEST LINK) TOUCH OR FORM ELECTRICAL CONNECTION WITH ONE ANOTHER OR WITH REINFORCING METAL ETC.
5. CONDUCTOR CLAMPS & CONNECTORS TO BE SECURELY TIGHTENED ONTO CONDUCTOR. CLAMPS SHALL BE SUFFICIENTLY TIGHT TO SUPPORT EACH CORRESPONDING LENGTH OF CONDUCTOR. CONNECTIONS SHALL POSSESS A STRENGTH IN TENSION OF AT LEAST 7 TONS / SQ. IN.
6. REINFORCING BONDS TO BE FIRMLY CLAMPED TO REINFORCING BAR. BONDING AT TOP OF CHIMNEY TO BE LEAD SHEATHED.
7. LEGS OF HOOK BOLTS (FOR TEST LINK) TO BE PERPENDICULAR & PROJECTING 1/2 IN. MIN. FROM FACE OF CHIMNEY.
8. CLAMPS SPACED ON 5'-0" CENTRES TO SUIT CONCRETE POUR LIFTS OF 5'-0".
9. THE RADIUS OF ANY BEND IN CONDUCTOR MUST NOT BE LESS THAN 8".
10. DOWN CONDUCTORS ABOVE R.L. 957'-6"; RING CONDUCTOR & BONDS AT R.L. 982'-6" TO BE CAPPED WITH LEAD ON STRIPPED ENDS OF CONDUCTOR. CAPPING TO BE WIPED TO CONDUCTOR SHEATHING TO MINIMUM THICKNESS OF LEAD EQUIVALENT TO RADIAL THICKNESS OF SHEATHING.
11. ALL EXPOSED CLAMPING & CONNECTIONS ABOVE R.L. 957'-6" TO BE OVER LEAD SHEATHING.
12. REINFORCING SHALL BE ELECTRICALLY CONTINUOUS FROM R.L. 984'-3" TO THE BASE OF THE STACK. WIRE TIES SHALL BE SUFFICIENT FOR THIS PURPOSE. LADDER HOLDFASTS TO BE IN ELECTRICAL CONTACT WITH REINFORCING WHERE POSSIBLE.

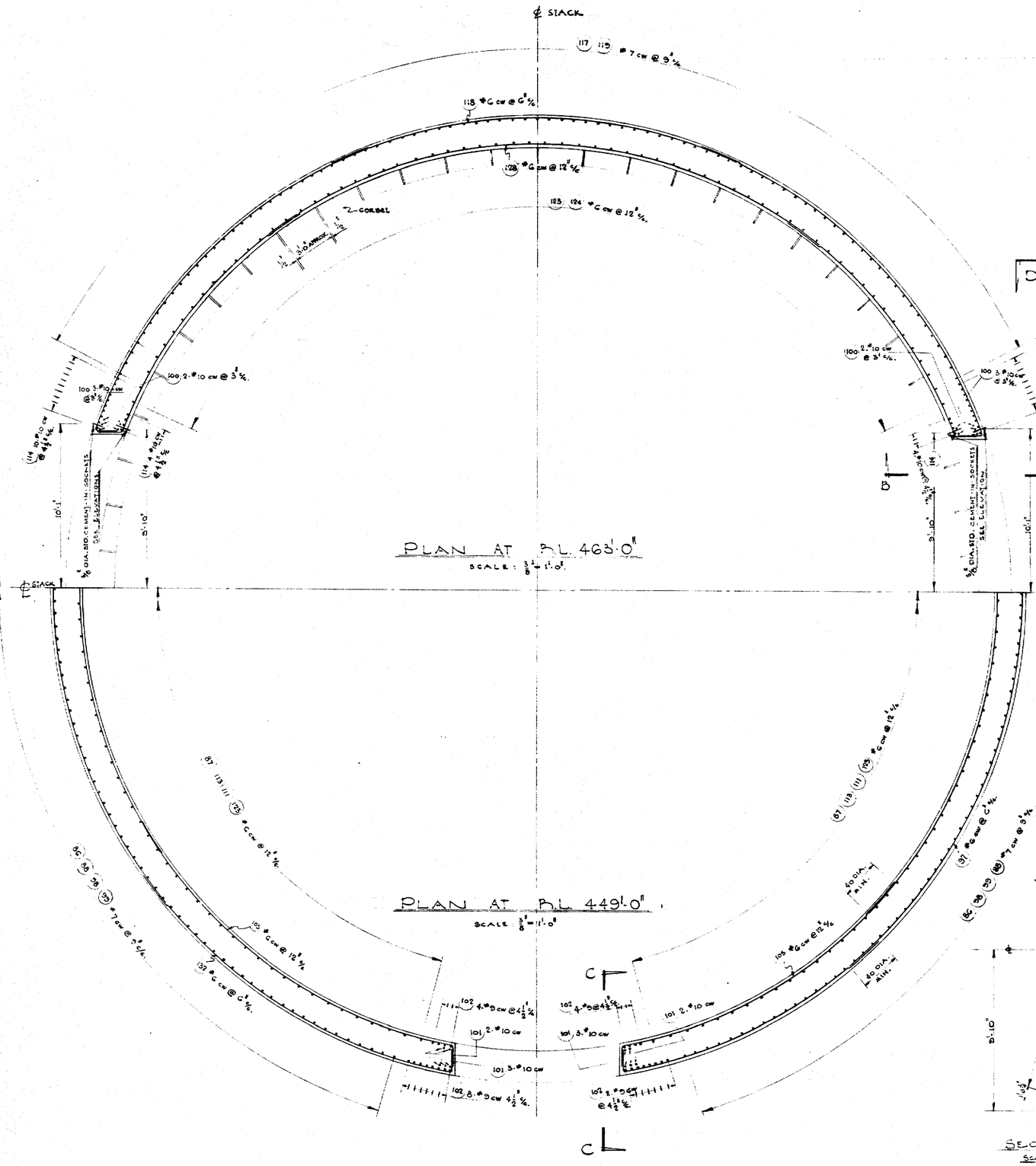
AMENDMENTS		
1. 1ST ISSUE AS REVISED. SHEET 1 OF 2 SHEETS. SHEET 2 TO FOLLOW. ALL MATERIAL ABOVE R.L. 957'-6" TO BE ACID RESISTANT. REINFORCING BONDS TO BE PROVIDED AT TOP OF CHIMNEY. CLAMPS & CONNECTIONS TO BE SPACED ON 5'-0" CENTRES.	ENG. K.K.	7.8.68
2. NOTE RE TENDERING DELETED.	ENG. K.K.	7.8.68
REVD. K.K.W.		7.8.68

CONTRACT Nº 1894

THE ELECTRICITY COMMISSION OF N.S.W.

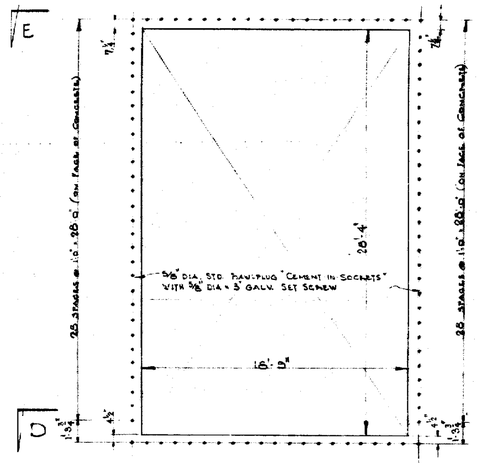
LIDDELL POWER STATION
CHIMNEY STACKS Nº1 & Nº2
LIGHTNING CONDUCTOR ARRANGEMENT

SCALE AS SHOWN				DATE	F.J.A.	DATE
DRAWN	K.R.	E/MP		16/3/68	D.C.E./POWER:	30/5/68
TRACED		L.E.S.A.			A.A. Ferguson	31/5/68
CHECKED	S.G.				P.E./CON.	31/5/68
S.E./E.D.O.:	S.B.C. for W.D.J.					
DATE	13-3-68				LD248873	A 1/2

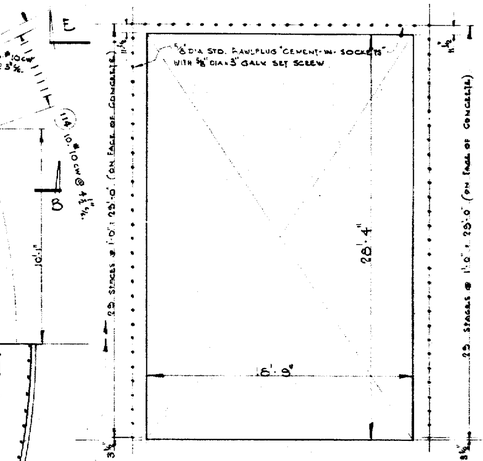


PLAN AT R.L. 463'-0"
SCALE 3/8" = 1'-0"

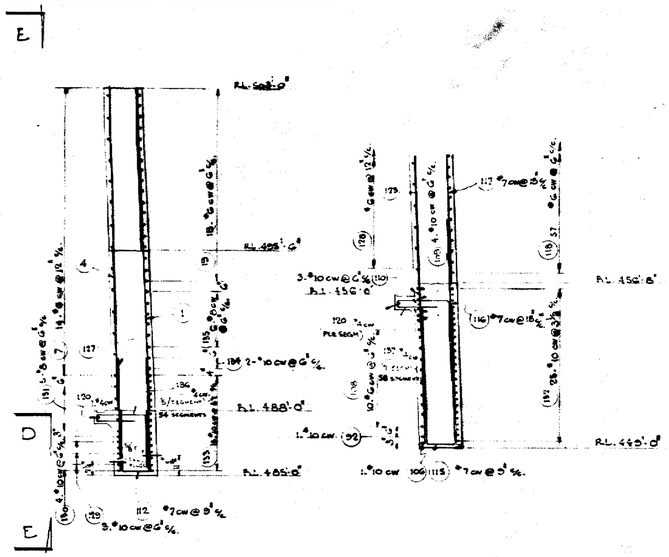
PLAN AT R.L. 449'-0"
SCALE 3/8" = 1'-0"



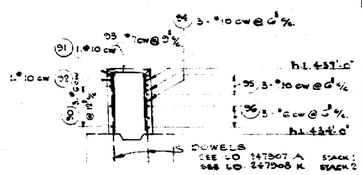
INSIDE ELEVATION GAS INLET OPENINGS.
SCALE ¼" = 1'-0" (DISTORTED)



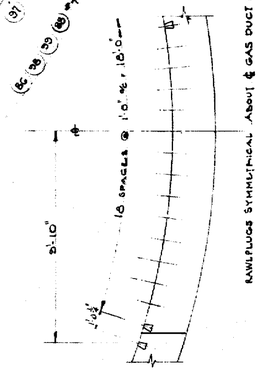
OUTSIDE ELEVATION GAS INLET OPENINGS
SCALE ¼" = 1'-0" (DISTORTED)



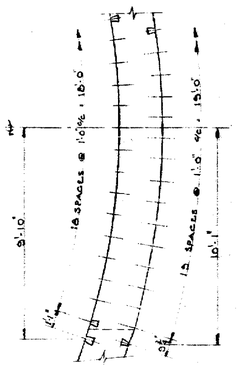
SECTION B-B
SCALE 3/8" = 1'-0"



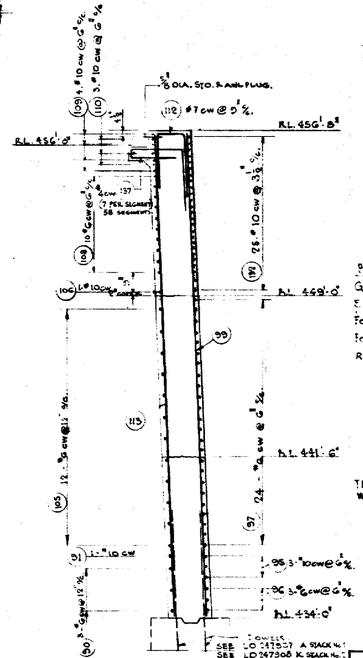
SECTION C-C
SCALE 3/8" = 1'-0"



SECTION D-D
SCALE 3/8" = 1'-0"



SECTION E-E
SCALE 3/8" = 1'-0"



SECTION B-B
SCALE 3/8" = 1'-0"

NOTE:
FOR NOTES SEE DRG. No. LD 247906 K
& DRG. No. LD 247909 A

REFERENCE DRGS.

GENERAL ARRANGEMENT	LD 247906 K
ELEVATION R.L 434'-0" TO 508'-6" & CENBELL DET	LD 247909 A
FOUNDATION STACK N°1	LD 247907 A
FOUNDATION STACK N°2	LD 247908 K
REINFORCING LIST R.L 434'-0" TO R.L 503'-0"	LD 253840 B

THIS DRG. IS TO BE READ IN CONJUNCTION WITH DRG. No. LD 247909 A

DRG. RELEASED FOR CONSTRUCTION
CONTRACT No.
REF. DRGS. ADDED
P.E./PSC. R.E./M.P.
SIGNATURES ADDED.

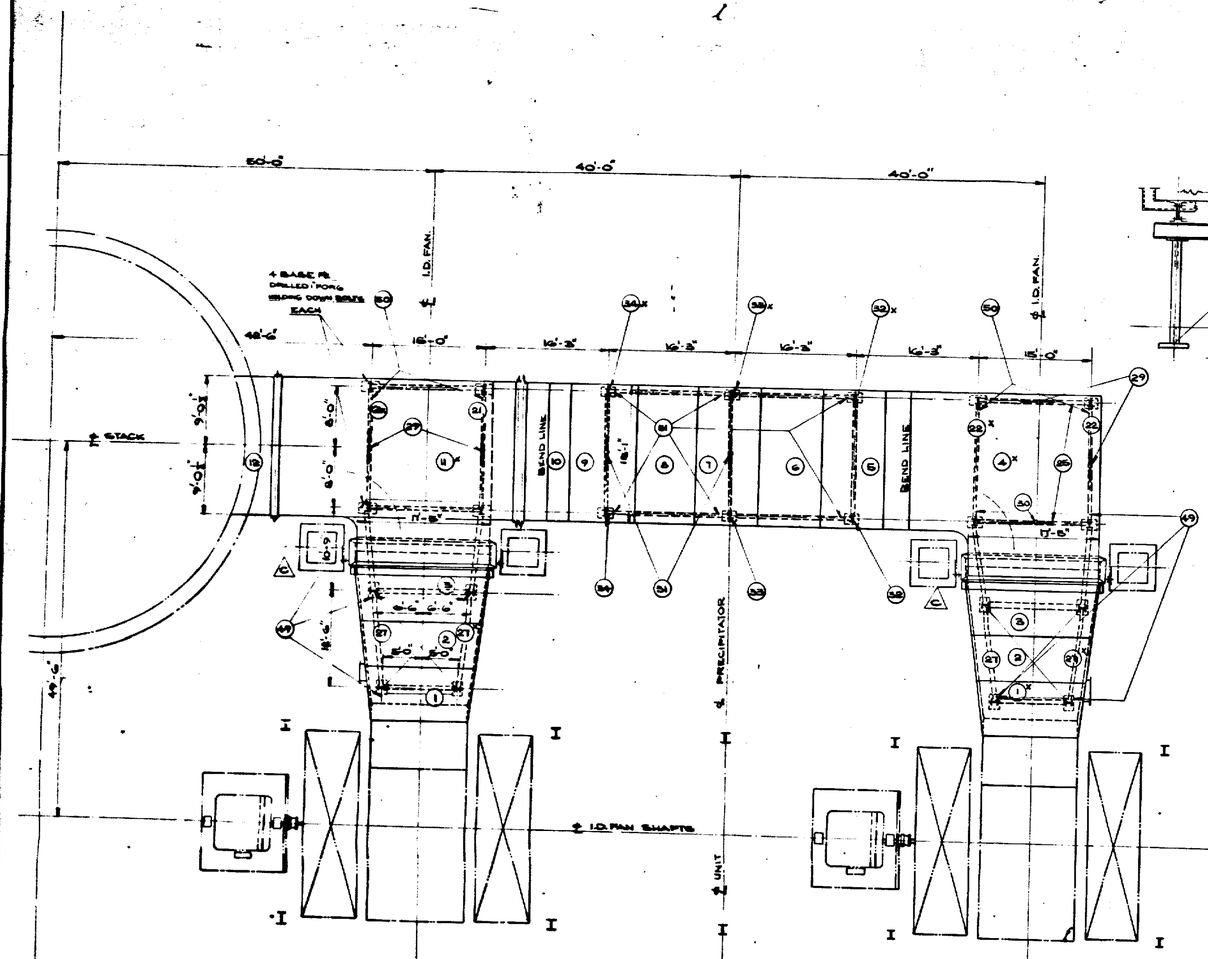
DRAWN	DATE	CHECKED
K.U.	2.8.68	

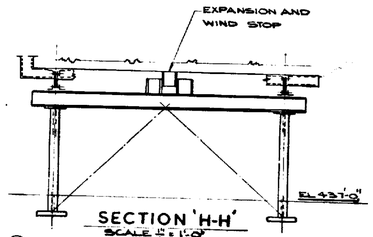
CONTRACT No. 1894

THE ELECTRICITY COMMISSION OF N.S.W.
LIDDELL POWER STATION
CHIMNEY STACKS N°1 & N°2
REINFORCEMENT DETAILS R.L 434'-0" TO R.L 503'-0"
PLAN & SECTIONS

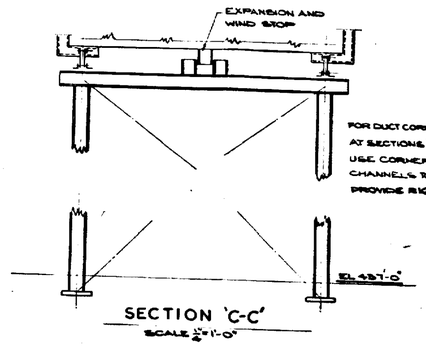
SCALE	AS SHOWN		DATE	DATE
DRAWN	K.U.	R.E./M.P.	8.4.68	5.8.68
TRACED				
CHECKED	G.F.			
DATE	2.8.68			

LD 247910 A/1



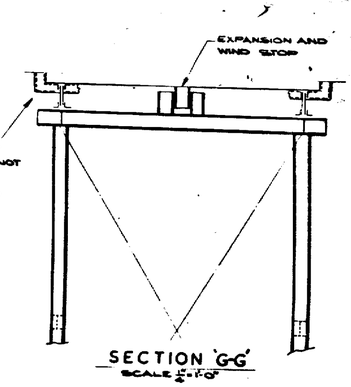


SECTION 'H-H'
SCALE 1" = 1'-0"



FOR DUCT CORNER CONNECTIONS AT SECTIONS 'CC', 'GG' & 'HH' DO NOT USE CORNER PLATES. CHANNELS TO LAP CORNER TO PROVIDE RIGID FRAME.

SECTION 'C-C'
SCALE 1" = 1'-0"



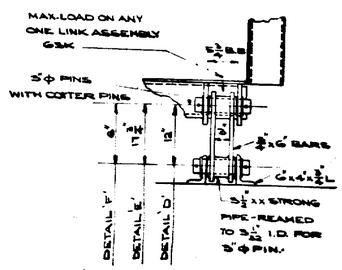
SECTION 'G-G'
SCALE 1" = 1'-0"

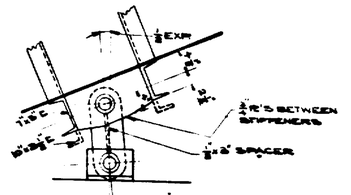
SHACKLE TYPE MOUNTING

MARK N'S	DIMENSION 'V'	N° OFF
49	6"	12
50	17 3/4"	4
51	12"	6

WIND TIE

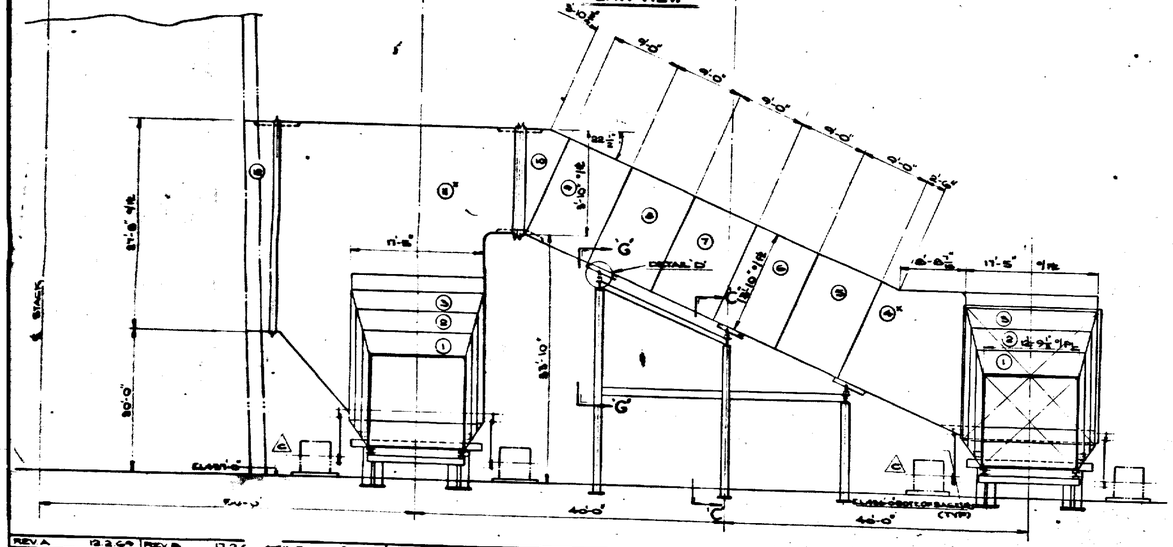
MARK N°	N° OFF
29	4
30	1
31	2



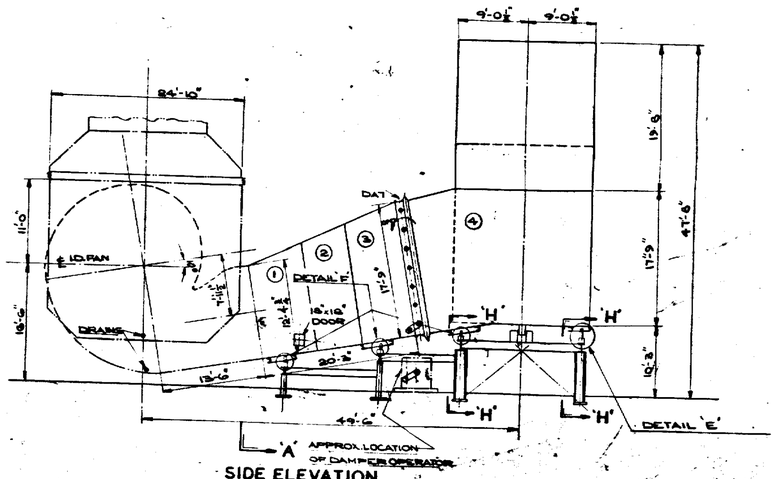


DETAIL 'D'
DETAIL 'E'
DETAIL 'F'
SCALE 1"=1'-0"

PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

NOTES 3RD ANGLE PROJECTION

ONE BOILER SET, AS DRAWN, FOR BOILER N°1
ONE BOILER SET, AS DRAWN, FOR BOILER N°3

MARK N°S TO BE PAINTED ON DUCTING IN BLACK LETTERING ON APPROPRIATE COLOUR PATCH

N°1 BLR	RED	PATCH
N°2 "	WHITE	"
N°3 "	GREEN	"
N°4 BLR	YELLOW	PATCH

REF DRGS

GAS DUCT. I.D. FAN TO STACK. DETAILS SHT1	268/10/5
GAS DUCT. I.D. FAN TO STACK. DETAILS SHT2	268/10/6
GAS DUCT. SUPPORTS.	268/10/7
ARRGT OF I.D. DUCTING FOR BLRS 3 & 4	268/10/4
DETAILS OF DUCTING & SUPPORTS (I.D.)	268/10/1
MATL. LIST (DUCT SCHEDULE 'B')	268/10/3

PAINTING

SURFACE PREPARATION & PAINTING TO BE DONE AT SITE TO N° 21 PAINTING SCHEDULE 29-APR-68. FOR DUCTING ITEM 10 FOR STEELWORK ITEM 1.

REVISED ISSUED	CONTRACT NO.
NOV 570	1600

SUBSTANDARD FOR MICROFILMING

LD257271A/2

THIS DRG WAS REPRODUCED FROM C.E. DRG. N° E732-481-S

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INTERNATIONAL COMBUSTION (AUSTRALIA) LTD.

EC OF N.S.W. - LIDDELL POWER STATION - UNITS 1 & 2

ARRANGEMENT OF GAS DUCTING
I.D. FAN TO STACK.

DRN	C. BROWN	28.11.70
DES	W.K.	27.6.68
PATH	ADS	
SCALE	1/8"=1'-0"	

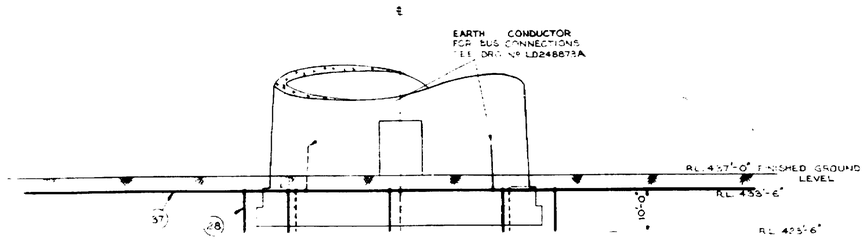
268 10 /2
REV [illegible]

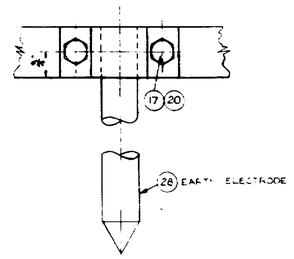
ITEM 11-20

C.E. DRG N° E-935-028-0

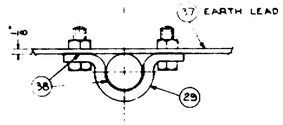
REV	DATE	DESCRIPTION	BY	CHK	APP
A	12.2.69	DIMENSION 249.1" FROM ℄ STACK TO DAMPER ADDED. PT DELETED ALSO DETAIL 'D' REP'ME MODIFIED SEE C.E. TELEX 29/1/69	WK		
B	17.2.69	PAINTING SCHEDULE ADDED	DAB		
C	27.6.69	SECOND CONTROL UNIT ADDED FOR DAMPER D7, SHOWN FOR BLR N° 1 & 2 CESO LETTER 69/27/20, 17.6.69	WK	RHW	
D	22.11.70	DRG TRACED WITHOUT ALTERATION	OB		JS

KODAK 16-11-70

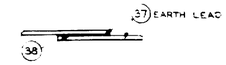




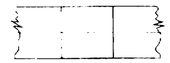
ELEVATION



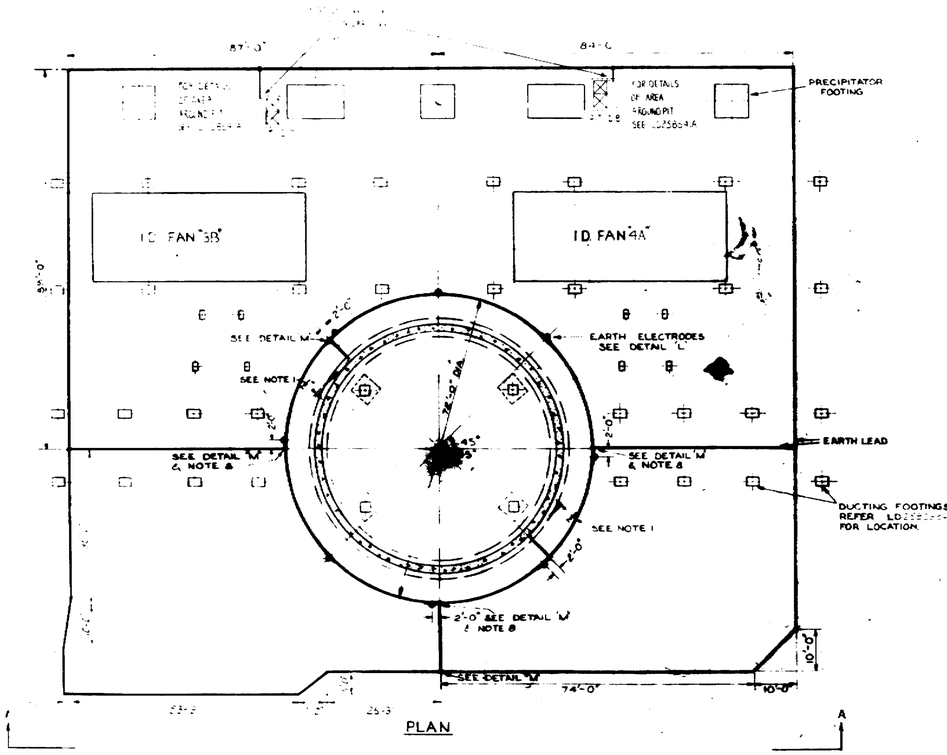
PLAN
DETAIL 'L'



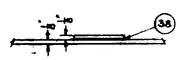
ELEVATION



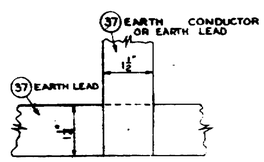
PLAN
DETAIL 'N'



PLAN



ELEVATION



PLAN
DETAIL 'M'

REFERENCE DRAWINGS

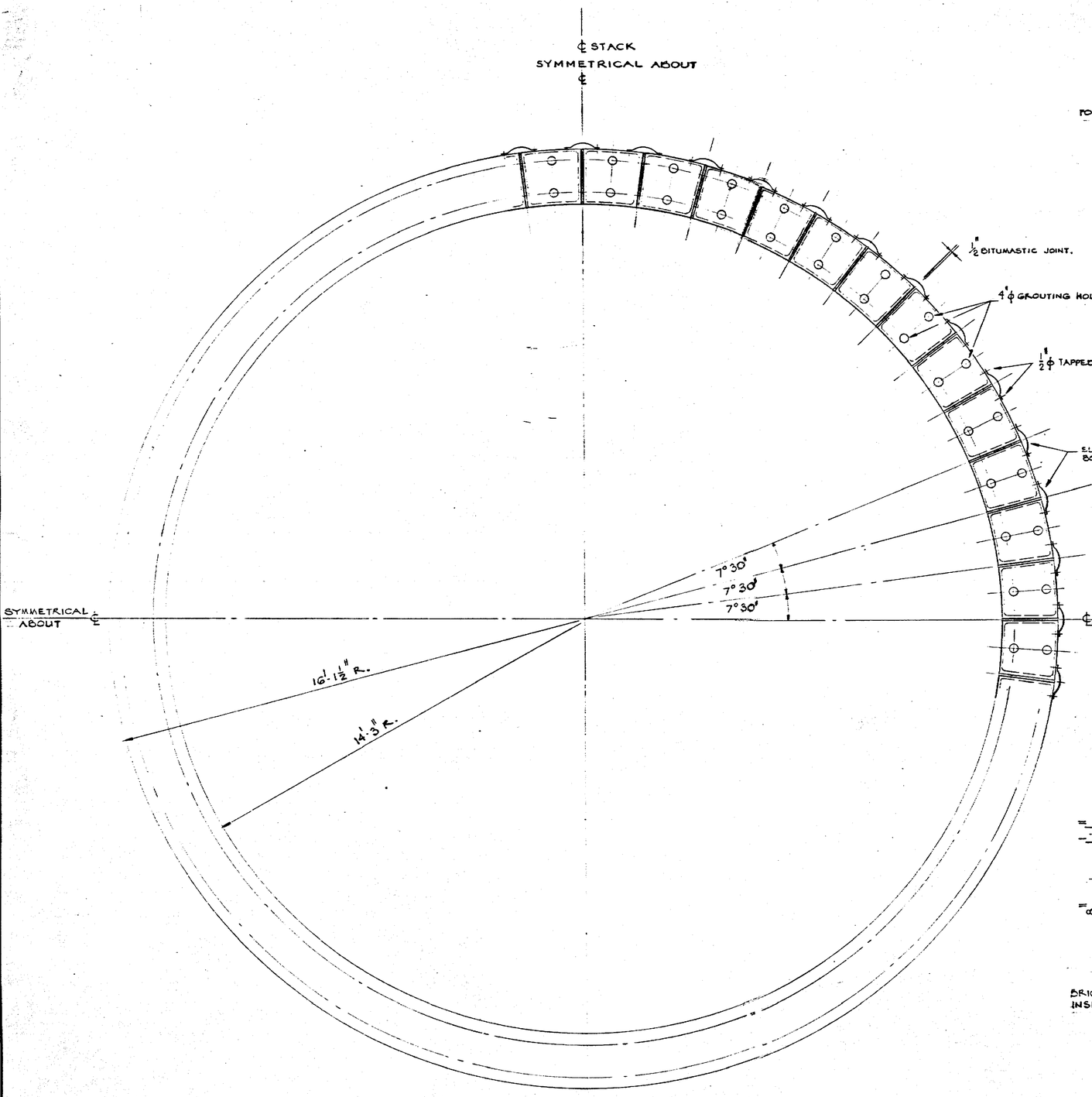
LD247908 K - CHIMNEY STACK N°2 - FOUNDATION
LD248873 A - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - ARRANGEMENT
LD248871 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 1
LD248872 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 2
LD258640A - BOILERS 3A & 4 - PRECIPITATORS & I.D. FANS AREA - CABLE PITS, TUNNEL & CONDUIT LAYOUT.
LD258641A - " " I.D. FANS 4A & 4B AREA - CABLE PITS & CONDUIT DETAILS
LD258642A - " " " 3A & 3B " " " " "
[illegible] - CHIMNEY STACK N°1 - LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

NOTES.

1. EARTH CONDUCTOR TO BE ½" CLEAR OF & PARALLEL TO FINISHED FACE OF STACK AS INDICATED IN PLAN. EARTH CONDUCTOR TO BE EXTENDED UP TO R.L. 441'-0" FOR EARTHING OF SCAFFOLDING (REINFORCEMENT RE-BARS DURING CHIMNEY CONSTRUCTION) ON COMPLETION OF CHIMNEY CONSTRUCTION, EARTH CONDUCTORS ARE TO BE TERMINATED AT TEST LINK IN ACCORDANCE WITH SECTION "L" OF SPECIFICATION.
2. TEMPORARY LEADS FOR EARTHING OF SCAFFOLDING ETC. DURING CHIMNEY CONSTRUCTION SHALL BE FIRMLY BONDED TO EARTH CONDUCTOR AT R.L. 441'-0". THE EARTH LEAD CONDUCTOR CONCENTRIC TO THE STACK OUTSIDE STACK SHALL BE COMPLETELY COVERED & TIGHTLY PACKED WITH [illegible] MIN. R.L. OF 465'-0" PRIOR TO BONDING OF EARTH CONDUCTOR [illegible]
3. ALL MATING SURFACES OF JOINTS IN DETAIL "L" ARE TO BE [illegible] WITH A CONTINUOUS COATING OF ALLOY BY INTERPOSING STRIPS OF SILVER BRAZING ALLOY RIBBON OR COPPER PHOSPHORUS BRAZING ALLOY RIBBON (SHIM) (TYPE SCH OR CDP) BETWEEN MATING SURFACES BEFORE CLAMPING & BRAZING.
4. EARTH LEAD TO BE FORMED UP FROM LONGEST AVAILABLE LENGTHS OF CONDUIT & JOINED WHEREVER NECESSARY IN ACCORDANCE WITH DETAIL "M" NOTE 11.
5. REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
6. DRIVE TOP OF EARTH ELECTRODES TO RE[illegible] OF THE [illegible]
7. BENDS IN EARTH CONDUCTOR TO BE 6" MIN. [illegible]
8. THE THREE LOCATIONS SHOWN SHOULD [illegible] BEEN CARRIED OUT TO DETERMINE THE [illegible] EARTH TERMINATION NETWORK. (CALCULATED [illegible]
9. ITEM Nos ENCIRCLED THUS ⑨ REFER TO ITEMS LISTED ON DRG. Nos LD248871 & 72 P.
10. IF AN ELECTRODE STRIKES ROCK, A 6" DIA. HOLE IS TO BE [illegible] REQUIRED DEPTH & THE ELECTRODE PLACED [illegible] OF BENTONITE & PLASTER OF PARIS SHALL BE [illegible] A SLURRY & POURED INTO THE HOLE [illegible]
11. ALL JOINTS, SHOWN IN DETAIL "M" & N" [illegible] EITHER SILVER-BRAZING ALLOY OR COPPER [illegible]

M.J.C.			
FLT			G.A.G. 22.12.70
A.S.E.E.A.			LD281230

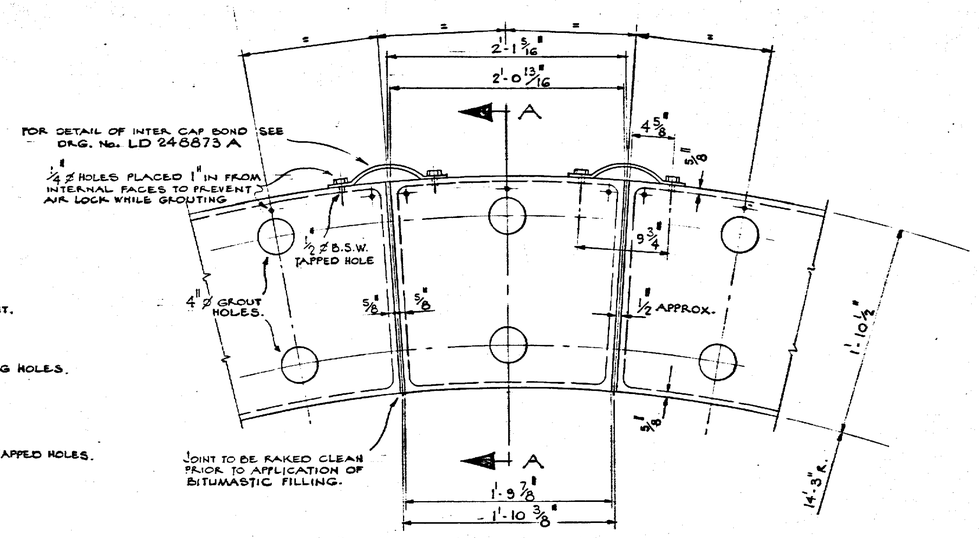
AMENDMENTS



PLAN ON CAP PLATES

COMPOSED OF 48 EQUAL SECTIONS WITH ½" GAP BETWEEN EACH SECTION.

SCALE 1½" = 1'-0"



PART PLAN

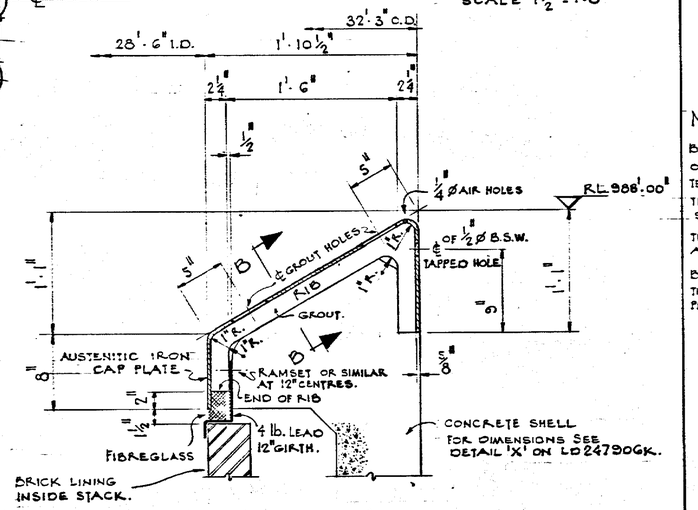
SCALE 1½" = 1'-0"



SECTION B-B

CAP ONLY

SCALE 1½" = 1'-0"



SECTION A-A

SCALE 1½" = 1'-0"

NOTE:
COMPLETE BRICKWORK; PLACE LEAD AND SECURE IN POSITION, PLACE CAP PLATES AND TEMPORARILY HOLD IN POSITION, CAULK JOINT AT BOTTOM OF CAP WITH FIBRE GLASS AND THEN GROUT CAP PLATE USING 1 PART SULPHATE RESISTING CEMENT, 2 PARTS FINE SAND, 5½ GALLONS WATER PER BAG OF CEMENT, TROWEL OFF AT CORE HOLES.

REFERENCE DRG'S:
General Arrg't. & Concrete Dimensions. LD247906K
Lightning conductor arrg't. LD248873A

NOTES.

BEFORE FABRICATION OF THE CAP SECTIONS THE MEASUREMENTS OF THE CHIMNEY STACK SHALL BE TAKEN FROM THE SITE AND TEMPLATES PREPARED FOR THE CASTINGS.

THE AUSTINITIC IRON FOR THE CHIMNEY CAPS CASTINGS SHALL BE AS SPECIFIED.

THE CASTINGS SHALL BE TRUE TO SHAPE AND MEASUREMENTS AND ACCURATE IN CONTOUR.

BEFORE FIXING, THE CAP SECTIONS SHALL BE SET OUT ON THE FLOOR IN ORDER TO CHECK AGAINST THE MEASUREMENTS PREVIOUSLY TAKEN.

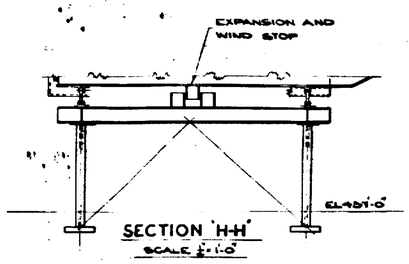
AMENDMENTS	DRAWN	DATE	CHECKED
(1) TENDERING NOTE DELETED. DRG. RELEASED FOR CONSTRUCTION PURPOSES. REF DRGS. ADDED. PE/PSC SIGNATURE ADDED.	K.U.	2-8-68	K.J.H.

CONTRACT No. 1894

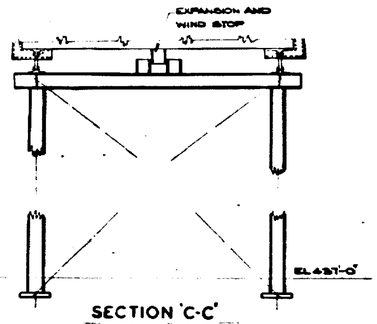
THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No. 1 & No. 2
CAP DETAILS

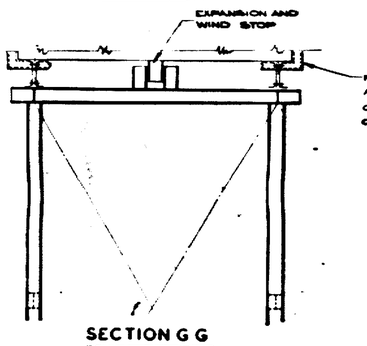
SCALE AS NOTED.				DATE		DATE
DRAWN	K.M.				PE/PSC	2-8-68
TRACED	—					
CHECKED	M.G.S.					
E/GD.						
DATE	20/2/68				LD 247914 B/1	



SECTION 'H-H'
SCALE 1/2"=1'-0"

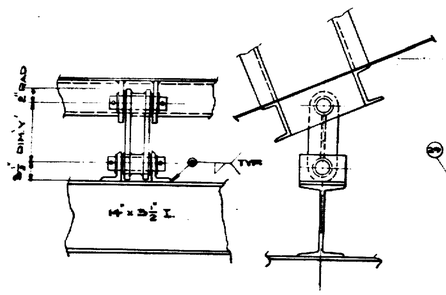


SECTION 'C-C'
SCALE 1/2"=1'-0"



SECTION G G
SCALE 1/2"=1'-0"

FOR DUCT CORNER CONNECTION AT SECTIONS 'CC', 'GG' & 'HH' DO NOT USE CORNER PLATES, CHANNELS TO LAP CORNER TO PROVIDE RIGID FRAME.

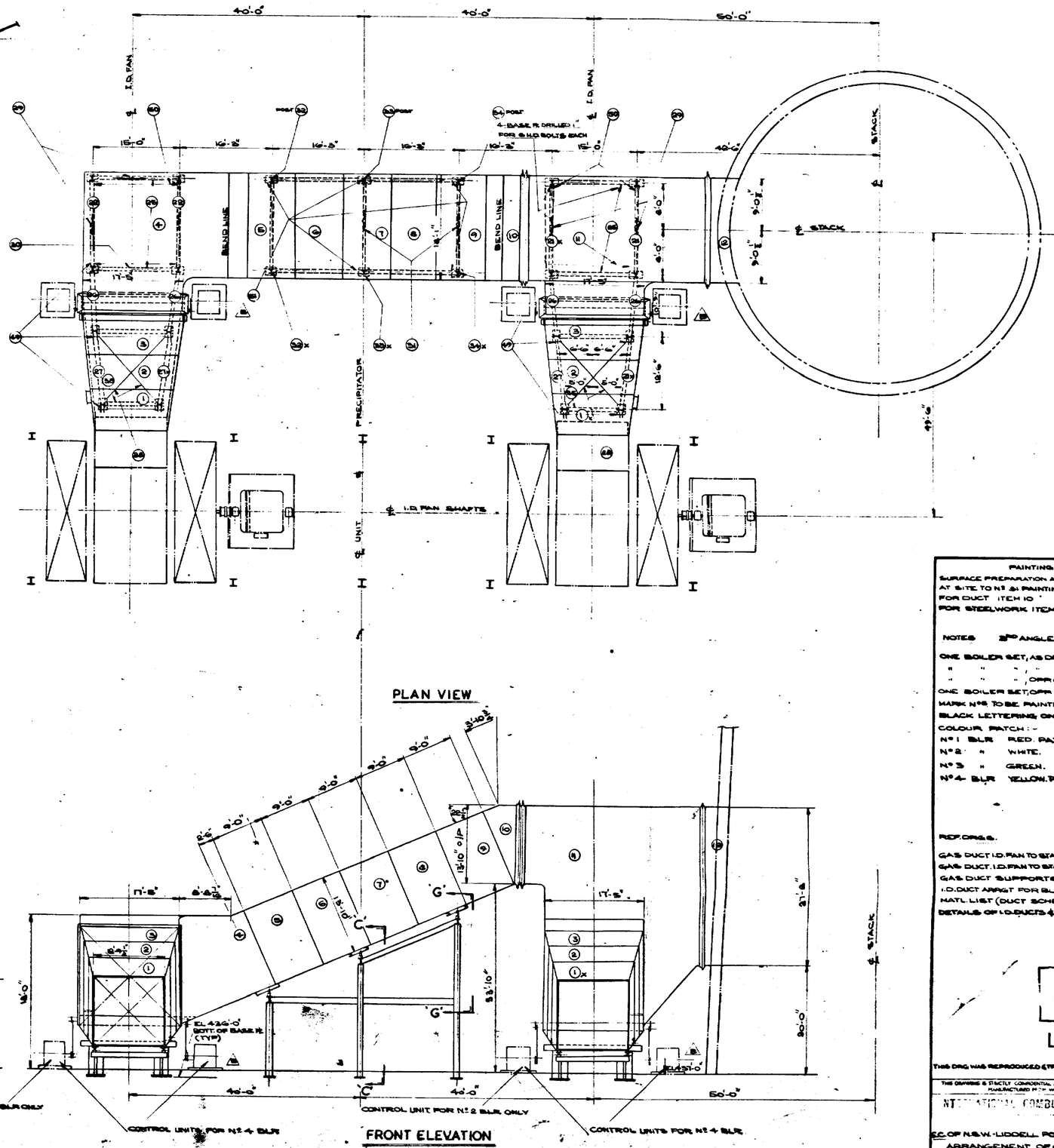


SHACKLE TYPE MOUNTING

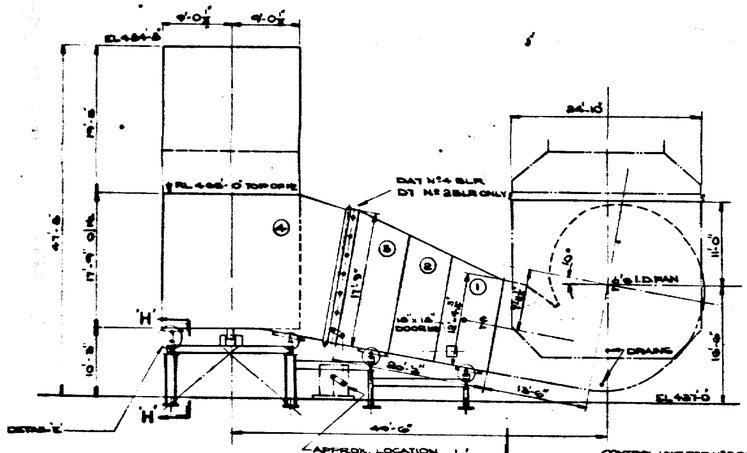
MARK Nº	DIMENSION 'Y'	NO. OFF
49	8"	12
50	17 1/2"	4
51	12"	6

WIND TIE

MARK Nº	Nº OFF
29	4
30	1
31	2



PLAN VIEW



SIDE ELEVATION

FRONT ELEVATION

PAINTING
SURFACE PREPARATION AND PAINTING TO BE DONE AT SITE TO Nº 3a PAINTING SCHEDULE 29-APR-1968
FOR DUCT ITEM 10
FOR STEELWORK ITEM 1

NOTES 3RD ANGLE PROJECTION

ONE BOILER SET, AS DRAWN, FOR BOILER 2
" " " OPP HAND " " 1
ONE BOILER SET, OPP HAND, FOR BOILER 3
MARK Nºs TO BE PAINTED ON DUCTING IN BLACK LETTERING ON APPROPRIATE COLOUR PATCH :-
Nº 1 BLR RED PATCH
Nº 2 " WHITE "
Nº 3 " GREEN "
Nº 4 BLR YELLOW PATCH

REF DRGS.

GAS DUCT I.D. FAN TO STACK DETAILS SHT 1	268/10/13
GAS DUCT I.D. FAN TO STACK DETAILS SHT 2	268/10/14
GAS DUCT SUPPORTS	268/10/7
I.D. DUCT ARRGT FOR BLRS 1 & 3	268/10/2
MATL LIST (DUCT SCHEDULE 5)	268/10/5
DETAILS OF I.D. DUCTS & SUPPORTS	268/10/1

SUBSTANDARD FOR MICROFILMING

LETTER NO.	CONTRACT NO.
NOV 578	1600

LD257273A/3

THIS DRG WAS REPRODUCED & TRACED FROM C.E. DRG Nº E-935-030-0

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INTERNATIONAL COMBUSTION AUSTRALIA LTD.

ELECTRICITY COMMISSION OF N.S.W. - LIDDELL POWER STATION - UNITS 2 & 4
ARRANGEMENT OF GAS DUCTING
- I.D. FAN TO STACK -

DRAWN	C. BROWN	DRG NUMBER
TRACED	23-11-70	268 10/4
CHECKED	WN 27.7.68	
PASSED	ADS	
SCALE	1/2"=1'-0"	A1 S.C.

ITEM 11-20
C.E. DRG Nº E-935-030-0

REV A PAINTING SCHEDULE ADDED DAB
REV B CONTROL UNIT INDICATED FOR Nº 2 BLR ONLY ALSO SECOND ENTRY FOR Nº 4 BLR-CE&D LETTER 6/45/130
REV C DRG TRACED WITHOUT ALTERATION

KODAK 18-11-70

C LD253841

TAG	SIZE	DETAIL	NO.OFF
1	#5CW	14'-6"	22
2	#5CW	ONE OFF: 12'-6" ONE OFF: 18'-3"	2
3	#5CW	ONE OFF: 10'-3" ONE OFF: 9'-4"	2
4	#5CW	ONE OFF: 11'-0" ONE OFF: 15'-0"	2
5	#5CW	10'-0"	2
6	#5CW	ONE OFF: 11'-6" ONE OFF: 12'-6"	2
7	#5CW	11'-9"	2
8	#5CW	ONE OFF: 13'-0" ONE OFF: 14'-2"	2
9	#5CW	11'-3"	1
10	#5CW	ONE OFF: 10'-3" ONE OFF: 9'-4"	2
11	#5CW	10'-9" to 12'-6" — 3 variants	3
12	#5CW	18'-9"	28
13	#5CW	16'-6" to 16'-9" — 4 variants	4
14	#5CW	12'-6"	1
15	#5CW	17'-3"	3
16	#5CW	12'-3" to 13'-4" — 3 variants	3
17	#5CW	11'-0" to 14'-0" — 4 variants	4
18	#4CW	7'-0"	2
19	#4CW	16'-0"	2
20	#4CW	18'-5"	2
21	#4CW	22'-7"	2
22	#4CW	26'-0"	2
23	#4CW	29'-5"	2
24	#4CW	5'-2"	2
25	#4CW	5'-7"	2
26	#4CW	19'-2"	4
27	#7CW	23'-5" to 23'-9" — 4 variants	4
28	#7CW	25'-0" to 25'-3" — 4 variants	4
29	#7CW	25'-8" to 27'-2" — 4 variants	4
30	#7CW	23'-8" to 24'-11" — 4 variants	4
31	#7CW	27'-6"	2
32	#7CW	25'-8"	2
33	#7CW	23'-11" 9"	1
		L	
34	#7CW	L= 23'-11" to 24'-5" 3 variants	3
35	#7CW	L= ONE OFF 25'-5" ONE OFF 26'-5"	2
36	#7CW	L= ONE OFF 24'-2" ONE OFF 24'-11"	2
37	#7CW	L= 23'-8"	1
38	#7CW	L= ONE OFF 24'-5" ONE OFF 25'-2"	2
39	#7CW	L= 25'-8" to 27'-2" 3 variants	3
40	#7CW	28'-8" 6"	2
41	#7CW	26'-2"	1
42	#7CW	27'-2"	1
43	#7CW	24'-5" to 25'-8" 4 variants	4
44	#7CW	25'-2" to 26'-8" 4 variants	4
45	#7CW	21'-1" to 23'-2" 4 variants	4
46	#7CW	22'-8" to 24'-8" 4 variants	4
47	#5CW	13'-6"	50
48	#5CW	17'-0"	30
49	#5CW	6'-3"	2
50	#5CW	15'-10"	2
51	#5CW	21'-0"	2
52	#5CW	25'-5"	2
53	#5CW	28'-5"	2
54	#5CW	31'-1"	2
55	#5CW	14'-8"	2
56	#5CW	30'-2"	12
57	#5CW	8'-11"	2
58	#5CW	12'-5"	10
59	#5CW	7'-0"	2

TAG	SIZE	DETAIL	NO.OFF
60		Not used	
61		Not used	
62	#5CW	13'-3"	2
63	#	Not used	
64	#5CW	9'-8"	2
65	#6CW	18'-8"	8
66	#7CW	31'-3"	2
67	#5CW	11'-8" to 13'-2" 4 variants	4
68	#5CW	13'-8" to 14'-5" 4 variants	8
69	#6CW	28'-5"	2
70	#5CW	ONE OFF 20'-5" ONE OFF 26'-8"	2
71	#5CW	20'-10" to 23'-7" 4 variants	4
72	#6CW	12'-8" to 21'-11" 3 variants	3
73	#5CW	28'-0"	15
74	#5CW	12'-8" to 13'-11" 4 variants	4
75	#5CW	15'-0" to 15'-10" 4 variants	8
76	#5CW	25'-8" to 26'-6" 4 variants	4
77	#6CW	20'-4" to 22'-8" 3 variants	3
78	#5CW	27'-8"	1
79	#5CW	13'-8" to 13'-0" 3 variants	3
80	#5CW	15'-6"	36
81	#5CW	9" L 23'-9" 19"	1
82	#4CW	STOCK LENGTHS — 170 FT.	
83	#7CW	22'-9" 1'-5"	3
84	#7CW	23'-9" 1'-5"	3
85	#5CW	ONE OFF 21'-6" 9" 19" ONE OFF 31'-5"	2
86	#7CW	24'-2" 1'-3"	2
		TAG Nos. 87 to 90 incl. NOT USED	
91	#10CW	28'-6"	11
92	#10CW	14'-7"	30
93	#10CW	18'-6"	12
94	#6CW	23'-6"	4
95	#10CW	28'-5"	6
96	#10CW	18'-6"	4
97	#10CW	28'-9"	4
98	#6CW	15'-5"	6
99		Not used	
100	#10CW	4'-6" 19'-6" 2'-6" 2'-6" c/c	64
101	#10CW	35'-0"	12
102	#10CW	21'-3"	28
103	#10CW	26'-6"	16
104	#8CW	19'-6"	4
105	#8CW	27'-0"	4
106	#10CW	13'-6"	20
107	#10CW	32'-6"	4
108	#10CW	24'-6"	4
109	#8CW	22'-0"	6
110	#6CW	100 1'-7" 13'-6"	6
111	#6CW	15'4" 116 3'-7" 31'-0" 3'-3"	12
112	#10CW	8'-6" 7'-6" 4'-9" 5'-0"	12

TAG	SIZE	DETAIL	NO.OFF
113	#6CW	1'-7" 1'-7"	52
114	#4CW	2'-2" 2'-2"	52
	#5CW	a 1'-9"	
115		a=from 1'-4" to 2'-0" 4 variants	8
116		a=from 2'-0" to 3'-1½" 5 variants	10
117		a=from 3'-5½" to 5'-8½" 6 variants	12
118		a=3'-8½"	168
	#5CW	a 2'-3"	
119		a=1'-1" to 5'-3¾" 4 variants	16
120		a=5'-3¾"	102
121	#10CW	19'-0"	6

501	#7CW	10'-3"	4
502	#7CW	9'-6"	2
503	#7CW	7'-0"	2
504	#7CW	7'-9"	1
505		Not used	
506		Not used	
507	#7CW	11'-9"	4
508	#7CW	8'-0"	3
509	#7CW	7'-9"	1
510	#9CW	16'-3"	4
511	#9CW	10'-6"	2
512	#9CW	17'-0"	4
513	#9CW	11'-6"	2
514	#9CW	24'-1"	1
515	#9CW	15'-6"	1
516	#9CW	10'-0"	5
517		Not used	
516	#9CW	6½"R.H. 21'-0" 21'-6"	2
519	#9CW	6½"R.H. 21'-0" 7'-0"	2
520	#9CW	30'-0"	1
521	#9CW	6½"R.H. 21'-0" 22'-6"	1
522		Not used	
523	#9CW	24'-11"	2
524	#6CW	11" 2'-3½"	94
525	#7CW	10'-3"	2

REFERENCE DRAWINGS:
Slab at R.L 456'-6⅝", Beams & Cols.; R.C. Details... LD 247312 K
Diagram of Bar Bending Shapes..... S 228581 D
Stacks Nos 1&2 General Arrangement..... LD 247906 K

NOTES:
* indicates Cold-Worked Steel deformed bars as per A.S. No. A85. Number indicates dia. in eighths of an inch, e.g. *7 ew indicates 7/8".
Steel Fabric as per A.S. No. A 84. (See Plan)

Reinforcement listed for one Stack only.
Reinforcement Required for TWO Stacks.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH LD 247312 K

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No 1 & No 2
SLAB AT R.L 456'-6⅝", BEAMS AND COLUMNS
REINFORCEMENT LIST

CONTRACT No. 1894

		DATE		DATE
SCALE:				
DRAWN	M.V.S. K.S.		A.T. Ferguson	8/8/68
TRACED	—		P.S./P.S.C.	
CHECKED	J.M.			
ENGD.				
DATE	2.8.68			

Nº LD253841 C/

AMENDMENTS

10 5 4349 21.8.68 5 10

REINFORCEMENT LIST

TAG	SIZE	DETAIL	No OFF	LOCATION	TAG	SIZE	DETAIL	No OFF	LOCATION
1	#8CW	3'-3" 3'-3" 8'-6"	248	SECTIONE-E	13	#8CW	29'-10" 29'-5"	70	SECTIONE-E
2	#8CW	6'-0" 1'-0"	496	"	14	#8CW	7'-9"	510	PART PLAN RL 434'-0"
3	#8CW	4'-0" 1'-0"	496	"	15	#8CW	6'-0"	26	"
4	#8CW	3'-0" 1'-0"	496	"	16	#9CW	1'-7" 1'-7"	64	COLUMN P1 TO P4
5	#8CW	33'-6" 33'-2"	56	"	17	#9CW	2'-2" 2'-2"	64	"
6	#8CW	32'-5" 32'-5"	77	"	18	#10CW	26'-3" 1'-0"	64	"
7	#8CW	31'-5" 31'-3"	63	"					
8	#8CW	32'-4" 27'-8"	54	"					
9	#8CW	31'-0" 26'-5"	68	"					
10	#8CW	29'-10" 25'-6"	48	"					

REFERENCE DRG'S

FOUNDATION STACK No 2.	LD 247908 K
CHIMNEY STACKS No 1 & No 2	LD 247906 K
DIAGRAM OF BAR BENDING SHAPES	S 228581 D

NOTE:

STEEL REINFORCEMENT: #cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A83. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH. e.g. "8 CW = 1"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING, BUNDLED SEPARATELY.

AMENDMENTS

CONTRACT No. 1894

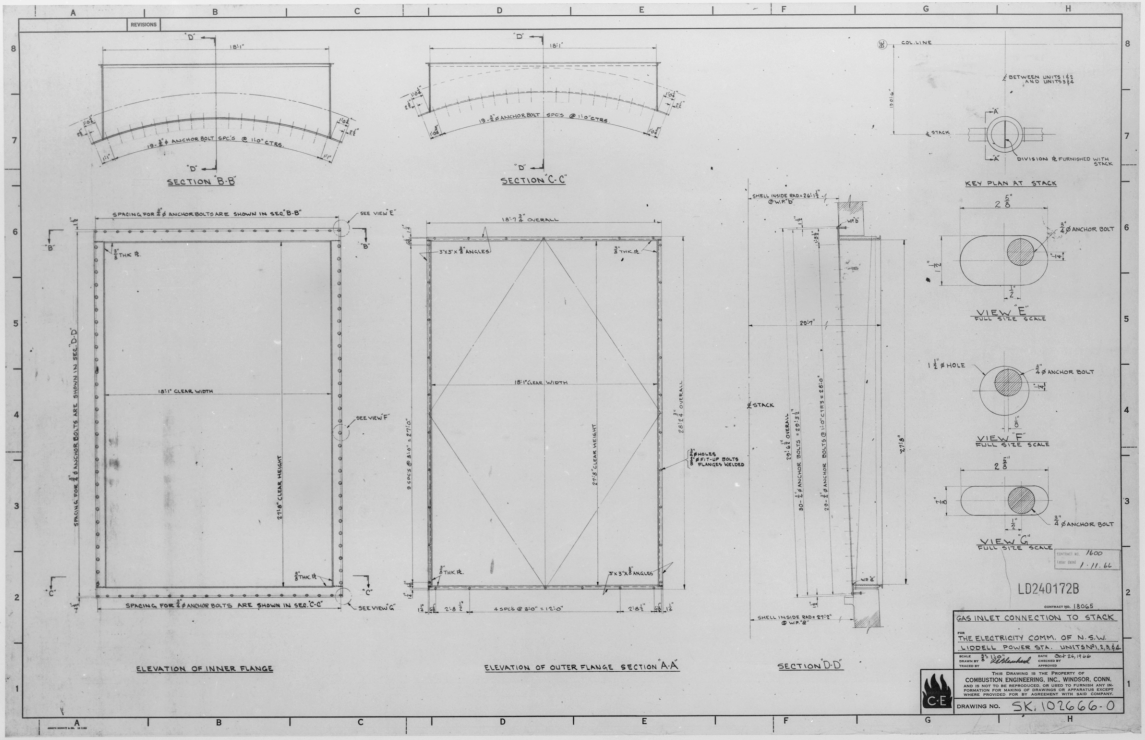
THE ELECTRICITY COMMISSION OF N.S.W.

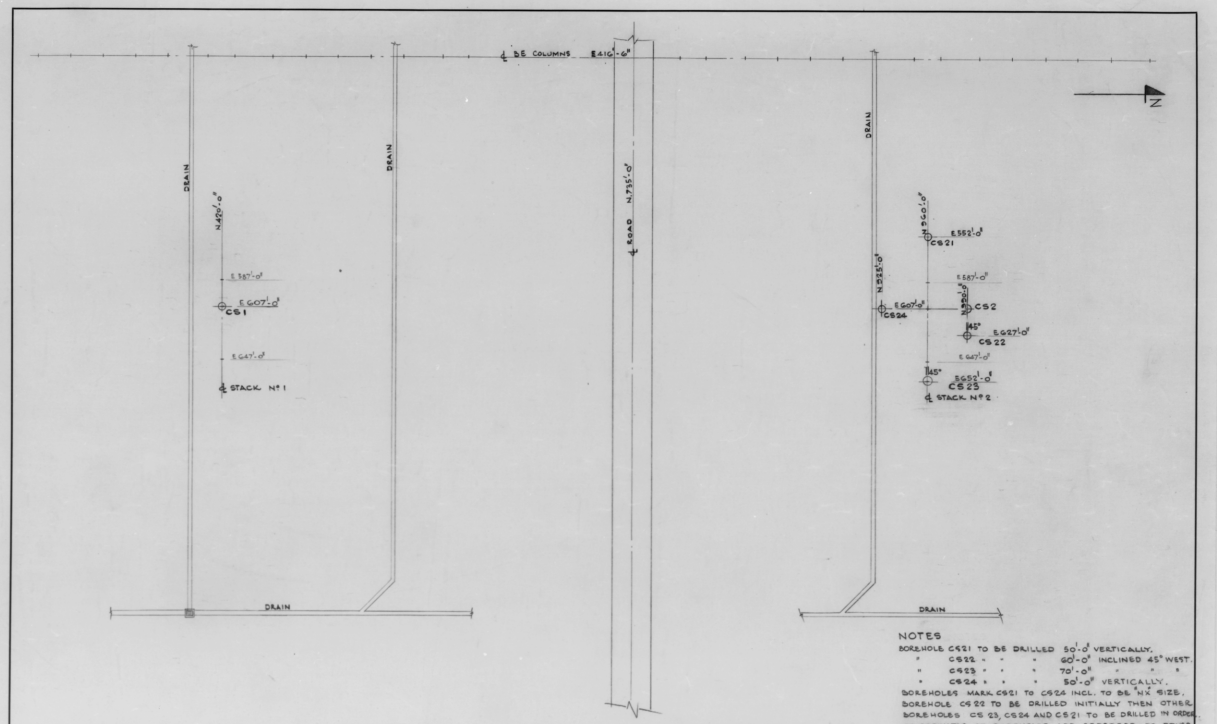
LIDDELL POWER STATION
CHIMNEY STACK No 2
FOUNDATION REINFORCEMENT LIST

			DATE	DATE
SCALE	—			
DRAWN	K.U.		PE/TSC	19/9/68
TRACED	—			
CHECKED	J.C.Q.			
E/TCD				
DATE	2.9.68			

LD 253800 C1

5 436 Z 19.9.68 5


REVISIONS
SECTION 'B-B'
SECTION 'C-C'
KEY PLAN AT STACK
VIEW E
VIEW F
VIEW G
ELEVATION OF INNER FLANGE
ELEVATION OF OUTER FLANGE SECTION A-A
SECTION D-D
LD240172B
GAS INLET CONNECTION TO STACK
THE ELECTRICITY COMM. OF N.S.W.
LIDDELL POWER STA. UNITS 3 & 4
DRAWING NO. SK. 102660-0



AMENDMENTS

INITIAL ISSUED TO TENDERS

BOREHOLE CS23 HAS LOCATED AT E687'-0" AND HAS TO VERTICALLY NOTED ON SITE DRILLING ADDED SHOWN.

K.B.R. 28.FEB.67

2. CS1 (N450 E607) CS2 (N750 E687) E607 ADDED

K.B.R. 13.MAR.67

WORKS ORDER Nº W2596/67

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
STACKS Nos 1 AND 2
GEOLOGICAL EXPLORATION
LOCATION PLAN

SCALE 40 FT. = 1 IN.				DATE	DATE
DRAWN	K.B.R.				
TRACED					
CHECKED	C.F.M.				
S.E. AND A. DATE	K.B.R. 28/2/67				

LD 244290 C/2

5 4279 19.4.68 5

SECTION A-A

NOTE:
FOUNDATION RINGS TO BE PLACED IN QUARTER-SEGMENTS. VERTICAL CONSTRUCTION JOINTS (KEYS) TO BE STAGGERED. NO TWO ADJOINING FOUNDATION SEGMENTS

NOTE:
ROCK TO BE INSPECTED BY THE COMMISSION'S DISTRICT GEOLOGIST PRIOR TO PLACING OF CONCRETE

PART PLAN AT RL. 429'-6"
SHOWING REINFORCEMENT

SECTION B-B
REINFORCEMENT DETAIL

NOTE:
ALL LAPS TO BE STAGGERED

SECTION C-C

SECTION D-D

DETAIL OF CONSTRUCTION JOINTS

FOR ORIENTATION OF BASE SEE PLAN AT RL 434'-0"

ASSUMED MERIDIAN

PLAN AT RL. 434'-0"

NOTE:
6 DAYS TO ELAPSE BETWEEN ADJACENT CONCRETE PLACEMENTS.
FACES OF BASE FOR EACH PLACEMENT OF
CRIBS WITH STRAIGHT FORMS 6'-0" LONG
TOPMOST FOR CLOSING CRIBS TO BE CUT TO SUIT.
FORMWORK IF USED BELOW RL. 429'-0" (SEE NOTES) MAY BE FORMED

PART PLAN AT RL. 434'-0"

DETAILS OF COLUMNS P1 TO P5

REFERENCE DRG'S.
GENERAL ARR'G'T & CONCRETE DIMENSIONS LD 24190 G.A.
DIAGRAM OF BAR BENDING SCHEDULE S 32 6581 D

NOTES.
CONCRETE WORK SHALL COMPLY WITH AS. CA 2 - 1964.
CONCRETE GRADE 25 MPa SHALL HAVE A MINIMUM
STEEL REINFORCEMENT SHALL COMPLY WITH THE FOLLOWING SPECIFICATION: AS. NA 35 COLD WORKED DEFORMED STEEL BARS, EXCEPTED BARS
CONCRETE COVER TO REINFORCEMENT
AND BOTTOM UNLESS NOTED OTHERWISE
CONCRETE TO BE CURED AS PRESCRIBED
CONSTRUCTION JOINTS TO BE TREATED AS SPECIFIED.
CONCRETE BELOW RL 430'-0" TO

THE ELECTRICITY COMMISSION OF N.S.W.
LIDDELL POWER STATION
CHIMNEY STACK No. 1
FOUNDATION
R.C. DETAILS

SCALE	1/4"-1'-0"	DATE	
DRAWN			
TRACED			
CHECKED		DP E/P	
R.C.C. ENGR.			

CONTRACT No. 1825

No. LD 24190 A

AMENDMENTS
15 TENDERING UNDER
14 ISSUED
13 DRG. RELEASED FOR CONSTRUCTION
12 REF. DRG'S ADDED, REF. DRG'S CHANGED, TABLE REVISED.

DRAWN	DATE	CORR.
K.C.	1-6-67	A.M.

TAG	SIZE	DETAIL	No OFF	LOCATION
1	#7CW	17'-11"	114	VERTICAL OUTSIDE FACE FROM RL 503'-0"
2	#6CW	17'-6"	1294	" FROM RL 510'-6"
3	#5CW	17'-1"	1872	" FROM RL 593'-0"
4	#6CW	17'-6"	697	VERT INSIDE FACE FROM RL 503'-0"
5	#4CW	16'-8"	2473	" FROM RL 735'-6"
6	#5CW	17'-1"	840	" FROM RL 570'-6"
7	#6CW	23'-7" 23'-7" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 172'-9" TO 176'-0"	15 RINGS	HORIZ INS. FACE RL 503'-0"
8	#6CW	24'-7" 24'-7" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 169'-6" TO 172'-9"	15 RINGS	" RL 518'-0"
9	#6CW	24'-1" 24'-1" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 166'-6" TO 169'-6"	15 RINGS	" RL 533'-0"
10	#6CW	23'-8" 23'-8" MIN. LAP 2'-6" EACH RING 6BARS TOTAL LENGTH 163'-6" TO 166'-6"	15 RINGS	" RL 548'-0"
11	#6CW	23'-2" 23'-2" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 162'-0" TO 163'-6"	6 RINGS	" RL 563'-0"
12	#5CW	23'-6" 23'-6" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 158'-0" TO 159'-6"	8 RINGS	" RL 570'-6"
13	#5CW	23'-6" 23'-6" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 155'-3" TO 158'-0"	15 RINGS	" RL 578'-0"
14	#5CW	23'-2" 23'-2" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 152'-6" TO 155'-3"	15 RINGS	" RL 593'-0"
15	#5CW	22'-10" 22'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 147'-9" TO 150'-6"	15 RINGS	" RL 608'-0"
16	#5CW	21'-6" 21'-6" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 145'-6" TO 147'-9"	15 RINGS	RL 623'-0"
17	#5CW	20'-7" 20'-7" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 142'-3" TO 145'-6"	15 RINGS	RL 638'-0"
18	#5CW	20'-1" 20'-1" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 140'-0" TO 142'-3"	23 RINGS	RL 653'-0"
19A	#7CW	31'-0" MIN. LAP 2'-11" EACH RING 7 BARS TOTAL LENGTH 190'-0"	10 RINGS	HORIZ. OUTSIDE FACE RL 505'-9"
20	#6CW	21'-6" 21'-6" MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 184'-0" TO 186'-0"	15 RINGS	RL 510'-9"

TAG	SIZE	DETAIL	No OFF	LOCATION
21	#5CW	26'-7" 26'-7" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 177'-0 TO 179'-0"	20 RINGS	HORIZ OUTSIDE FACE RL 517'-3"
22	#6CW	26'-0" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 178'-0"	10 RINGS	" RL 528'-3"
23	#5CW	25'-7" 25'-7" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 171'-0" TO 175'-0"	35 RINGS	" RL 533'-3"
24	#6CW	25'-2" 25'-2" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 173'-6"	10 RINGS	" RL 550'-3"
25	#5CW	24'-9" 24'-9" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 165'-6"TO 169'-6"	35 RINGS	" RL 565'-3"
26	#6CW	24'-3" 24'-3" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 167'-6"	10 RINGS	" RL 573'-3"
27	#5CW	23'-11" 23'-11" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 161'-0 TO 163'-6"	35 RINGS	" RL 578'-3"
28	#6CW	23'-5" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 163'-0"	10 RINGS	" RL 595'-3"
29	#5CW	23'-2" 23'-2" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 158'-0" TO 160'-0"	15 RINGS	" RL 600'-9"
30	#4CW	24'-10" 24'-10" MIN. LAP 1'-8" EACH RING 6 BARS TOTAL LENGTH 153'-9" TO 155'-6"	20 RINGS	" RL 608'-3"
31	#5CW	22'-7" MIN. LAP 2'-1" EACH RING 6BARS TOTAL LENGTH 155'-6"	10 RINGS	" RL 618'-3"
32	#4CW	23'-3" 23'-3" MIN. LAP 1'-8" EACH RING 6 BARS TOTAL LENGTH 150'-0" TO 152'-6"	35 RINGS	" RL 623'-3"
33	#5CW	22'-2" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 150'-0"	10 RINGS	" RL 640'-9"
34	#4CW	21'-7" 21'-10" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 144'-3 TO 146'-9"	35 RINGS	" RL 645'-9"
35	#5CW	21'-5" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 145'-6"	10 RINGS	" RL 663'-3"
36	#4CW	21'-0" 21'-3" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 140'-6" TO 143'-0"	35 RINGS	" RL 668'-3"
37	#5CW	20'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 141'-3"	10 RINGS	" RL 685'-9"
38	#4CW	20'-5" 20'-10" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 137'-0" TO 139'-3"	35 RINGS	" RL 690'-9"
39	#5CW	20'-1" MIN. LAP 2'-1" EACH RING 5BARS TOTAL LENGTH 138'-0"	10 RINGS	" RL 708'-3"
40	#4CW	20'-2" 20'-6" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 134'-0" TO 136'-0"	35 RINGS	" RL 713'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
41	#5CW	19'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTALLENGTH 135'-3"	10 RINGS	HORIZ. OUTSIDE FACE RL 730'-9"
42	#4CW	19'-4" 19'-8" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 131'-0" TO 133'-0"	35 RINGS	" RL 735'-9"
43	#5CW	19'-2" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 132'-3"	10 RINGS	" RL 753'-3"
44	#4CW	19'-0" 19'-3" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 128'-3" TO 130'-3"	35 RINGS	" RL 758'-3"
45	#5CW	18'-11" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 129'-3"	10 RINGS	" RL 775'-9"
46	#4CW	18'-7" 18'-11" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 125'-6 TO 127'-3"	35 RINGS	" RL 780'-9"
47	#5CW	18'-5" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 127'-0"	10 RINGS	" RL 798'-3"
48	#4CW	18'-2" 18'-6" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 123'-0" TO 125'-0"	35 RINGS	" RL 803'-3"
49	#5CW	18'-0" MIN. LAP 2'-1" EACH RING 5BARS TOTAL LENGTH 125'-0"	10 RINGS	" RL 820'-9"
50	#4CW	17'-10" 18'-2" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 121'-0" TO 123'-0"	35 RINGS	" RL 825'-9"
51	#5CW	17'-10" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 120'-6"	10 RINGS	" RL 843'-3"
52	#4CW	17'-7" 17'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 117'-3" TO 119'-0"	35 RINGS	" RL 848'-3"
53	#5CW	17'-6" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 118'-6"	10 RINGS	" RL 865'-9"
54	#4CW	17'-3" 17'-6" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 115'-0" TO 116'-6"	35 RINGS	" RL 870'-9"
55	#5CW	17'-2" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 116'-6"	10 RINGS	" RL 888'-3"
56	#4CW	17'-0" 17'-3" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 113'-3" TO 114'-9"	35 RINGS	" RL 893'-3"
57	#5CW	16'-10" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 114'-6"	10 RINGS	" RL 910'-9"
58	#4CW	16'-8" 16'-11" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 111'-3" TO 112'-9"	35 RINGS	" RL 915'-9"
59	#5CW	16'-7" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 113'-0"	10 RINGS	" RL 933'-3"
60	#4CW	16'-4" 16'-7" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 110'-0" TO 111'-0"	35 RINGS	" RL 938'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
61	#5CW	16'-2" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 110'-6	10 RINGS	HORIZ OUTSIDE FACE RL 955'-9"
62	#4CW	16'-2" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 109'-0"	20 RINGS	" RL 960'-9"
63	#5CW	16'-1" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 110'-6"	10 RINGS	" RL 970'-6"
64	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4BARS TOTAL LENGTH 106'-9"	24 RINGS	" RL 975'-9"
65	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 102'-3"	1 RING	HORIZ. INSIDE FACE AT TOP
66	#4CW	11'-11"O.A. 1'-10" 2" INT. RAD. 60° 11½" O.A.	134	CAP BARS RL 968'-0" AT TOP
67	#4CW	12'-6"	68	VERTICAL INSIDE FACE FROM RL 968'-0"
68	#4CW	2'-6"	996	HORIZ. AT ALL CORBELS
		2'-9" 2½" A O/A X B 3" O/A 1" INT. RAD.		
		X A B		
69	#4CW	93° 2'-2½" 2'-0"	265	RL 510'-6"
70	#4CW	93° 2'-0½" 1'-10"	255	RL 533'-0"
71	#4CW	93° 1'-10½" 1'-8"	250	RL 555'-6"
72	#4CW	93° 1'-9" 1'-6"	240	RL 578'-0"
73	#4CW	92° 1'-7½" 1'-5"	230	RL 600'-6"
74	#4CW	92° 1'-6⅛" 1'-4"	225	RL 623'-0"
76	#4CW	92° 1'-5" 1'-2"	435	RL 645'-6" RL 668'-0"
76	#4CW	92° 1'-4" 1'-1"	210	RL 690'-6"
77	#4CW	92° 1'-3" 1'-0"	205	RL 713'-0"
78	#4CW	92° 1'-2⅛" 1'-0"	200	RL 735'-6"
79	#4CW	92° 1'-2" 11"	195	RL 758'-0"
80	#4CW	91° 1'-1½" 11"	380	RL 780'-6" RL 803'-0"
81	#4CW	91° 1'-1" 10"	185	RL 825'-6"
82	#4CW	91° 1'-0⅛" 10"	360	RL 848'-0" RL 870'-6"
83	#4CW	91° 1'-0½" 10"	175	RL 893'-0"
84	#4CW	91° 1'-0⅛" 10"	340	RL 915'-6" RL 938'-0
85	#4CW	91° 1'-0⅛" 10"	330	RL 960'-6" RL 975'-6"
99	#4CW	20'-2" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 135'-6"	10 RINGS	HORIZ. INS. FACE RL 687'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
113	#4CW	10'-0"	2101	VERTICAL INSIDE FACE FROM RL 686'-9"
140	#4CW	19'-9" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 132'-6"	10 RINGS	HORIZ. INS. FACE RL 699'-9"
141	#4CW	19'-5" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 129'-9"	10 RINGS	" RL 732'-3"
142	#4CW	19'-1" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 127'-3"	10 RINGS	" RL 754'-9"
143	#4CW	18'-9" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 124'-6"	10 RINGS	" RL 777'-3"
144	#4CW	18'-5" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 122'-6"	10 RINGS	" RL 799'-9"
145	#4CW	17'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 119'-0	10 RINGS	" RL 822'-3"
146	#4CW	17'-5" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 116'-6"	10 RINGS	" RL 844'-9"
147	#4CW	17'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 114'-6"	10 RINGS	" RL 867'-3"
148	#4CW	16'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 112'-9"	10 RINGS	" RL 889'-9"
149	#4CW	16'-7" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 110'-0"	10 RINGS	" RL 912'-3"
150	#4CW	16'-3" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 108'-3"	10 RINGS	" RL 934'-9"
151	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 107'-3"	10 RINGS	" RL 957'-3"
152	#4CW	15'-9" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 106'-0"	10 RINGS	" RL 972'-3"
153	#5CW	15'-0"	66	RL 660'-6"
154	#5CW	7'-6"	66	RL 668'-0"
155	#6CW	23'-0" MIN. LAP 2'-6 EACH RING 7 BARS TOTAL LENGTH 187'-0"	5 RINGS	HORIZ. OUTSIDE FACE

REFERENCE DRG'S.

REINFORCEMENT DETAILS RL 503'-0" TO RL 988'-0"	LD 247911 K
SECTIONAL ELEVATION	
CHIMNEY STACK No1 & No2	LD 247906 K
DIAGRAM BAR BENDING SHAPES	S 228581 D

NOTES

STEEL REINFORCEMENT. #CW INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A93. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH e.g. #7CW = 7/8"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY.

REINFORCEMENT LISTED FOR ONE STACK ONLY
REINFORCEMENT REQ'D FOR TWO STACKS

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No1 & 2
RL 503'-0" TO RL 988'-0"
REINFORCEMENT LIST

SCALE			DATE	DATE
DRAWN	K.U.			PE/P.S.C. 1/12 9/6/67
TRACED	—			
CHECKED E/C.D.				
DATE 2.2.68				

CONTRACT No. 1894

N°. LD 253842 K/

REINFORCEMENT LIST

TAG	SIZE	DETAIL	No OFF	LOCATION
1	#8CW	8'-9" / 21'-6"	248	SECTION B-B
2	#8CW	7'-6" / 8'-0"	248	"
3	#8CW	4'-6" / 7'-3"	248	"
4	#8CW	33'-2" / 33'-1" R	35	"
5	#8CW	31'-8" / 31'-7" R	56	"
6	#8CW	30'-4" / 25'-10" R	30	"
7	#8CW	32'-0" / 27'-4" R	48	"
8	#8CW	29'-6" / 29'-6" R	42	"
9	#8CW	7'-9"	540	"
10	#8CW	6'-0"	26	PART PLAN EL 436'-0"
11	#10CW	1'-0" / 12'-9"	64	COLUMNS C1 TO C8
12	#8CW	1'-7" / 1'-7"	28	"
13	#8CW	2'-2" / 2'-2"	28	"

REFERENCE DRG'S

CHIMNEY STACKS No 1 & No 2	LD 247906 H
FOUNDATION STACK No 1	LD 247907 A
DIAGRAM OF BAR BENDING SHAPES	S 228591 D

NOTE

STEEL REINFORCEMENT: #cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A 83. NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH. e.g. "8cw-1"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY.

AMENDMENTS

CONTRACT No. 1896

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACK No 1
FOUNDATION REINFORCEMENT LIST

				DATE
DRAWN	K.J.F			
TRACED	—			
CHECKED	MCS			
DATE	1.8.68			

DATE 1-8-68

LD 253799 C

LD 247912K

PLAN at R.L 456'6½"

Beam reinforcement not shown – See Sections

Note: Minimum lap to be 48 bar diameters unless noted

SECTION C-C (Beam "3")

Slab reinforcement not shown

SECTION A-A (Beam "1N")

SECTION A1-A1 (Beam "1S")

Slab reinforcement not shown

SECTION B-B (Beam "2N")

SECTION B1-B1 (Beam "2S")

Slab reinforcement not shown

SECTION 1-1

SECTION 2-2

SECTION D-D

SECTION 3-3

SECTION E-E

SECTION 4-4

SECTION 5-E

SECTION 6-6

SECTION 7-7

DETAIL "Z"

PART – PLAN

Showing Beams No. 4 & 5

Scale: 1/4" = 1'-0"

REFERENCE DRAWINGS:

Stacks N°1 & General Arrgt & Concrete Dimensions	LD 247906 K
Brick Lining Details	LD 247915 A
Position Cement List	LD 2338416
Stack N°1 Foundation	LD 247907 A
Stack N°2 Foundation	LD 247908 A

NOTES:

Concrete work shall comply with AS CA2 1963

Concrete class "A" shall have a minimum compressive strength of 3000 p.s.i. 30 days

Formwork to be dressed as specified. Formwork to be stripped within fourteen days of placing concrete.

Clear cover to reinforcing bars to be as marked.

Concrete to be cured as specified.

Floor designed for a Live Load of 200 p.s.f.

STEEL REINFORCEMENT 9·7 cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS. No. A 63 · NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH e.g. 9·7 cw = 9/8" DIA. COLD-WORKED.

ALTERATIONS

1) ENTERING NOTE P.G. RELEASED P.G. CONSTRUCTION P.G. RECORDS P.G. CHECKED P.G. ISSUED

DRAWN DATE CHECKED

2. R.L. 456'-6½" ADDED

3. Beam Nos. 1N, 1S, 2N, 2S renumbered Ref. Nos. 101, 102, 103, 104 respectively. Dimensions adjusted to suit. 14" max. 15" and 16" max.

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

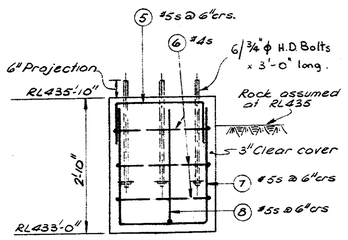
CHIMNEY STACKS N°1 & N°2

STACKS AT R.L 456'-6½", BEAMS AND COLUMNS R.C. DETAILS

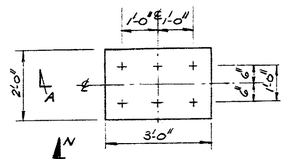
CONTRACT No. 1894

SCALE	1/8" = 1'-0" & as shown	DATE	DATE
DRAWN	WG		
TRACED	–		
CHECKED	M.G.		
P/CO			
DATE			

No LD 247912 K/2

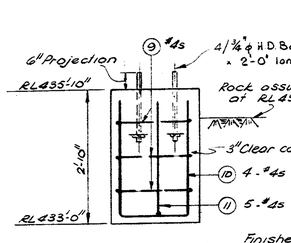


SECTION 'A-A'

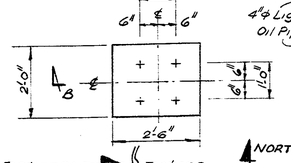


Footings: D103 , D110 , D116 , D117
D203 , D210 , D216 , D217
D303 , D310 , D316 , D317
D403 , D410 , D416 , D417

16 OFF



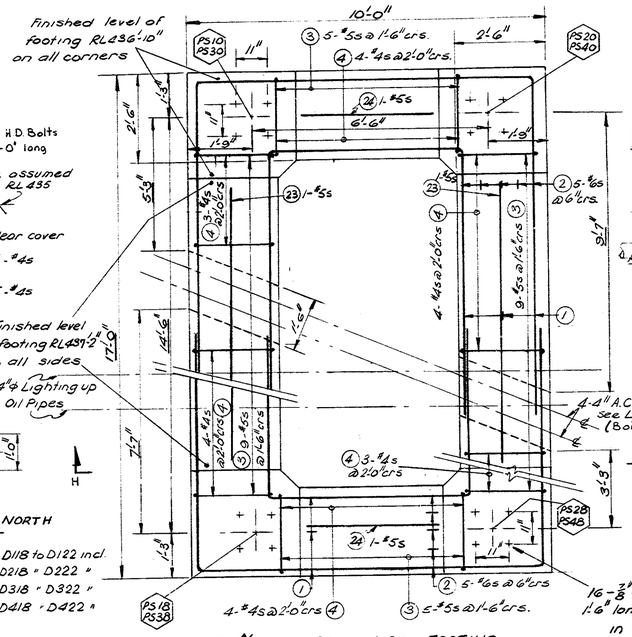
SECTION 'B-B'



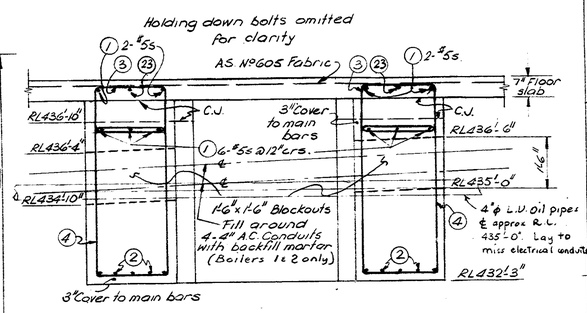
Footings: D101 to D108 incl.
D201 " D208 "
D301 " D308 "
D401 " D408 "

Footings D111 to D115 incl. D118 to D122 incl.
D211 " D215 " D218 " D222 "
D311 " D315 " D318 " D322 "
D411 " D415 " D418 " D422 "

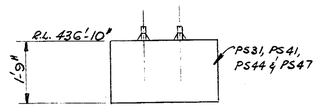
NORTH



ACCESS STAIRS FOOTING
BOILERS 1 & 2 AND 3 & 4 - 20 OFF

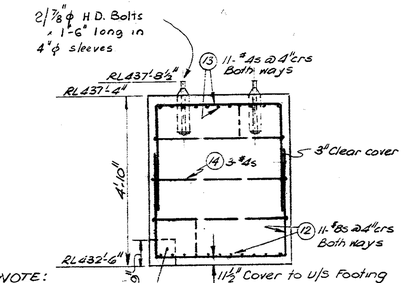


SECTION 'H-H'



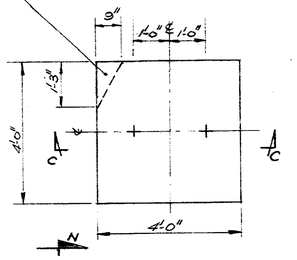
SECTION J-J
WORK AS EXECUTED

72 OFF



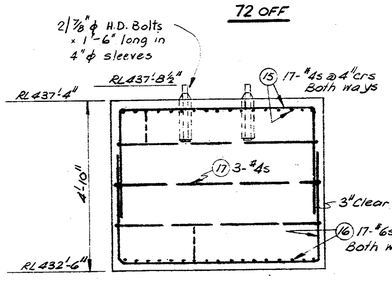
NOTE:
This blockout applicable to PC22 and PC42 ONLY

SECTION 'C-C'

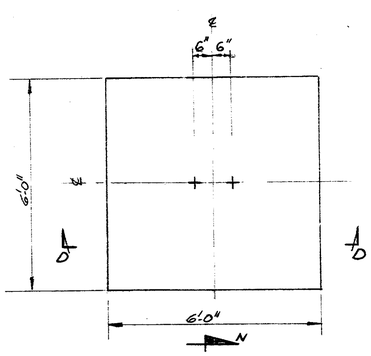


Footings: PC12 , PC13 , PC15, PC16
See above note PC22 PC23 , PC25, PC26
PC32 PC33 , PC35, PC36
PC42 PC43 , PC45, PC46.

16 OFF

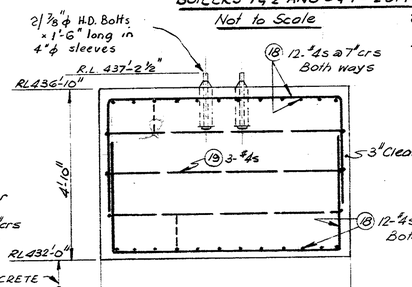


SECTION 'D-D'

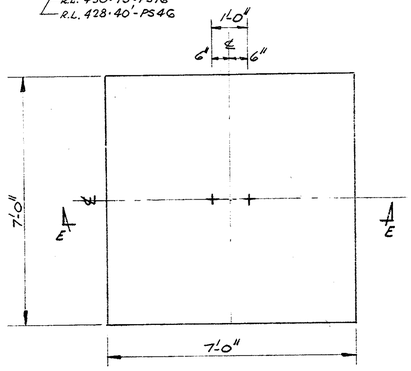


All 'PD' Footings &
PC 11 , PC 14 , PC 17
PC 21 , PC 24 , PC 27
PC 31 , PC 34 , PC 37
PC 41 , PC 44 , PC 47.

40 OFF

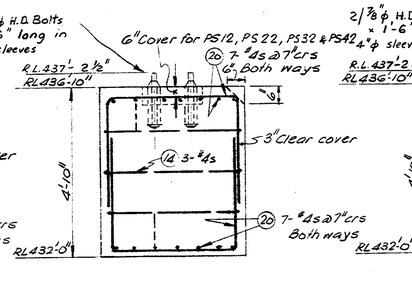


SECTION 'E-E'



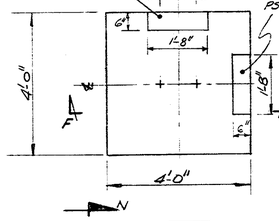
Footings: PS15 , PS16
PS25 , PS26
PS35, PS36
PS45, PS46

8 OFF



SECTION 'F-F'

NOTE
This blockout for PS 42 ONLY

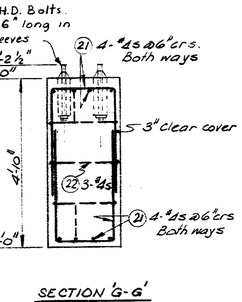


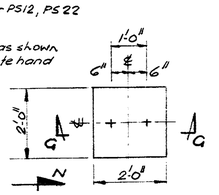
Footings: PS12 , PS18
See above note. PS 22 , PS 23
PS 32 , PS 33
PS 42 , PS 43

8 OFF

NOTE:
This blockout for PS12, PS22 and PS32 only.
PS12 and PS32 - as shown
PS22 - opposite hand

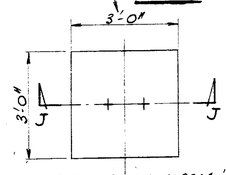
SECTION 'G-G'





Footings: PS11, PS14, PS17
PS21, PS24, PS27
PS31, PS34, PS37
PS41, PS44, PS47

12 OFF



FOOTINGS PS31, PS41, PS44 & PS47 "WORK AS EXECUTED"

REINFORCEMENT LIST

Tag	Size	Detail	No. off.
1	#5s	a, b — 1. 4 off 2. 2 off 3. 4 off. 3 Variants - a = 7'-3" b = 5'-7½" 1. a = 8'-3" b = 7'-6" 2. a = 9'-3" b = 9'-6" 3.	20
2	#6s	a, b — 5 Variants - 2 off each. a = 7'-6" b = 5'-7½" a = 8'-0" b = 6'-6" a = 8'-6" b = 7'-6" a = 9'-0" b = 8'-6" a = 9'-6" b = 9'-6"	20
3	#5s	2'-0" / 4'-3" / 11"	56
4	#4s	4'-3" / 2'-0"	44
5	#5s	2'-0" / 2'-6"	64
6	#4s	2'-6" / 1'-6"	48
7	#5s	2'-6" / 2'-6" / 2'-6"	64
8	#5s	2'-6" / 1'-6" / 2'-6"	96
9	#4s	1'-6" / 2'-0"	216
10	#4s	2'-6" / 2'-0"	288
11	#4s	1'-6" / 2'-6"	360
12	#8s	3'-8" / 3'-4"	352
13	#4s	3'-8" / 3'-1"	352
14	#4s	3'-6" / 3'-6"	72
15	#4s	3'-0" / 3'-5"	1360
16	#6s	3'-0" / 3'-5"	1360
17	#4s	5'-6" / 3'-6"	120
18	#4s	3'-0" / 6'-5"	384
19	#4s	6'-6" / 6'-6"	24
20	#4s	3'-0" / 3'-5"	224
21	#4s	1'-5" / 3'-0"	192
22	#4s	1'-6" / 1'-6"	36
23	#5s	10'-6"	4
24	#5s	3'-8"	4

NOTES: Concrete to be Class "F.A." as specified.
Steel reinforcement shall comply with the following specification: (1) Structural grade deformed bars - A.S. N° A92
Reinforcement List shows TOTAL quantities for Boilers 1 to 4 footings
All H.D. Bolts (& sleeves) to be supplied by Mechanical Plant Contractor & cast in by Civil Contractor.
All Bolts in Sleeves to be worked at cast-in so that they are free to move after concrete has set.

For location of footings see:
Blr. 1 — LD 251112A — LD 248530A — Blr. 2
Blr. 3 — LD 251113A — LD 251114A — Blr. 4

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
BOILERS N° 1 TO 4
FOOTINGS FOR COL. MARKS D, PC, PD AND PS
AND ACCESS STAIRS — R.C. DETAILS

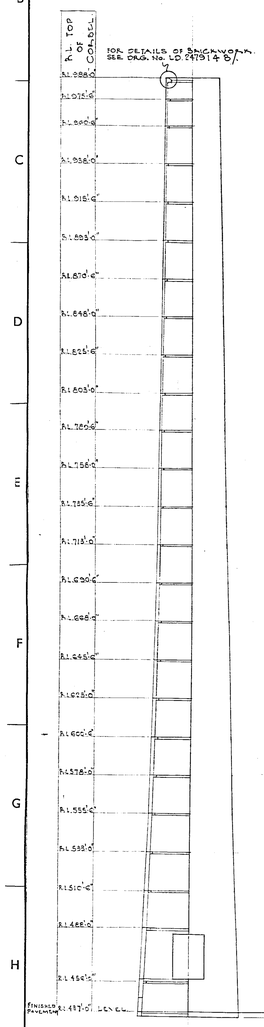
SCALE	½"=1'-0"		DATE		DATE
DRAWN	CKR	E/E.P		S.S.E.A.	24/10/69
TRACED	—	E/M.P	31/3/64		
CHECKED	M.C.J.			D.C.E./POWER.	30/3/64
E/C.D. DATE				LD 251111	B/5

CONTRACT N° 1948

AMENDMENTS

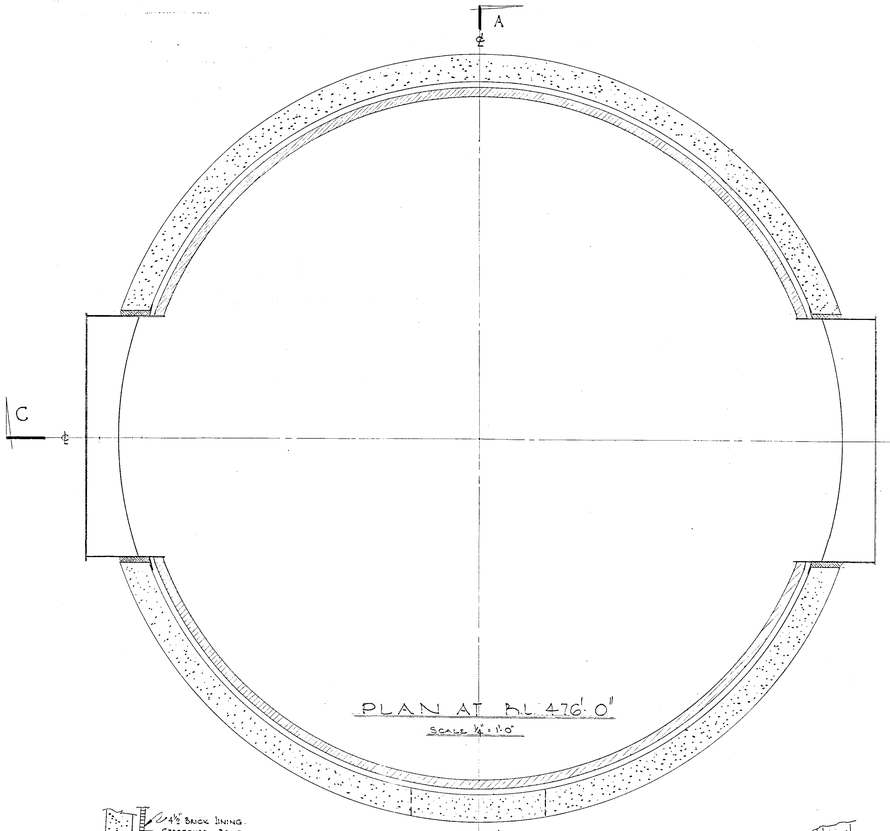
1. Drawing Title and sheet size altered. Tender ing note deleted. Drawing completely revised. Reinforcement List added.	CKR	30.9.68
2. Location of blockouts in Access Stair foot. ing altered. Note re grouting of conduits added Ref. B8. Blockout details for PC 22 and PS12, PS32 added Ref. G-1 and G-7	CKR	17/10/68
	E/ED	18/10/68
3. Bolts shown ont. & 1'-0" centres were shown off centre. F34. at 1'-9 centres. F34. PC footings named B3 Bolt sizes, length & sleeves added to all footings. Note added G10, 11. L.U. oil pipes shown in Sect. H-H. B9. Note added to Elec. Conduits. C7, B8.	M.C.J.	10.3.69
	R.M.	21-1-69
4. Blockouts shown for Footings PC42 PS32 and PS42. Ref. E1, E2, E8.	K.A.F.	6.3.69
5. UNDERSIDE RL. ¼ DIMENSIONS OF CONCRETE BACKFILL ADDED. Ref. E5, C9 & G9 "WORK AS EXECUTED"	P.M.	6.3.69
	C.E.	11-11-70
	H.T.	16.11.70
	A.S.E.	17.11.70
	S/E.C.D.	

KODAK 23·11·70



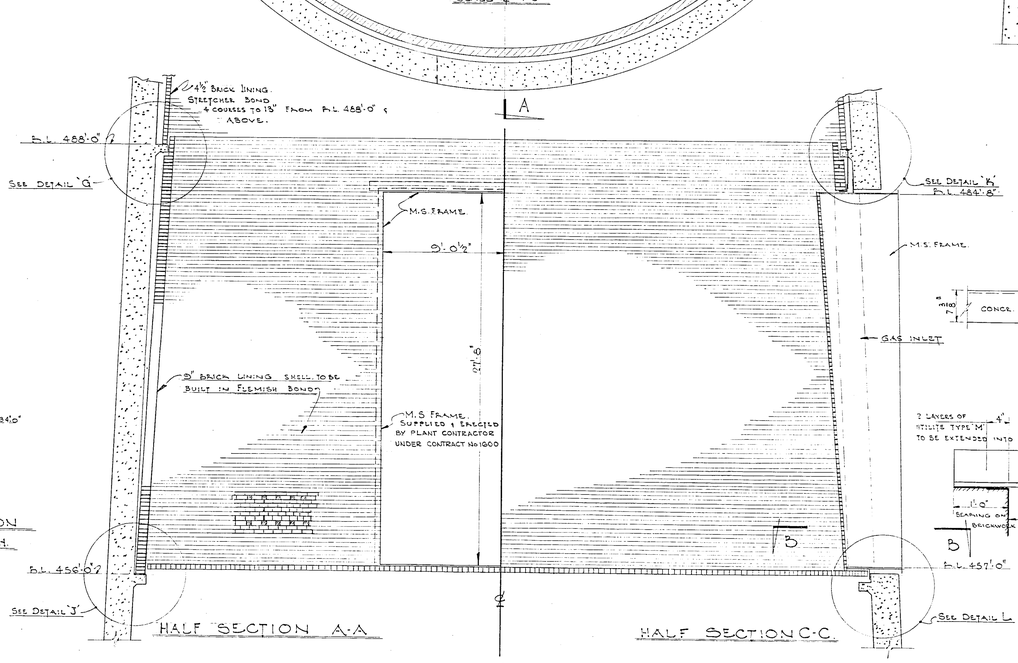
HALF SECTION & HALF ELEVATION OF CHIMNEY FROM NORTH

SCALE 1/32" = 1'-0"

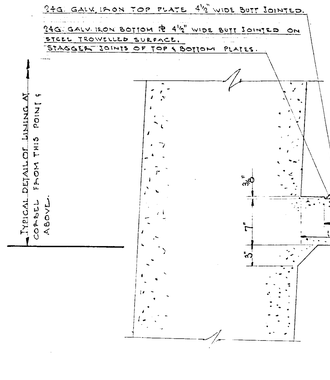


PLAN AT R.L. 476'-0"

SCALE 1/4" = 1'-0"

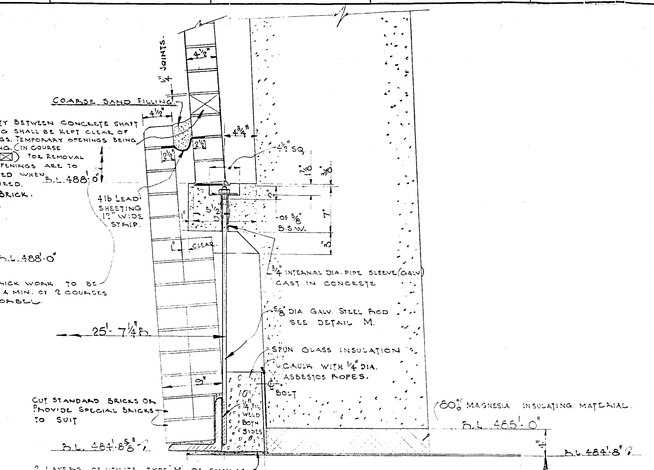


SCALE 1/4" = 1'-0"



DETAIL G

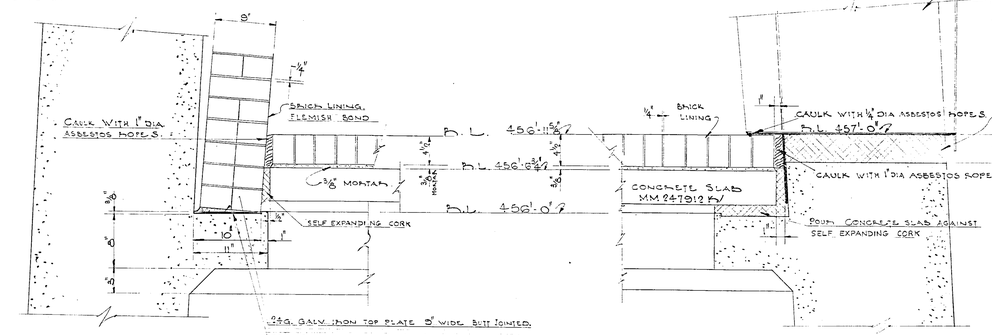
SCALE 1½" = 1'-0"



DETAIL H

SCALE 1½" = 1'-0"

M.S. FRAME SUPPLIED & FIXED BY PLANT CONTRACTOR UNDER CONTRACT No. 1900

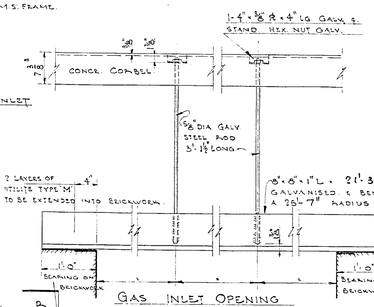


DETAIL J

SCALE 1½" = 1'-0"

DETAIL L

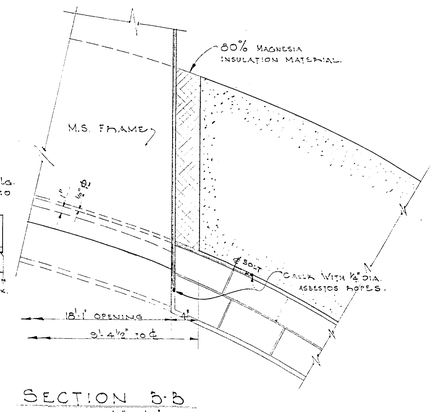
SCALE 1½" = 1'-0"



GAS INLET OPENING INSIDE ELEVATION

DETAIL M.

SCALE 1" = 1'-0"



SECTION B-B

SCALE 1½" = 1'-0"

REFERENCE DRGS.

GENERAL ARRANGEMENT	LD 247906 G/1
SLAB AT R.L. 456'-6⅜" BEAMS COLS. & R.C. DET.	LD 247912 A
CAST IRON CAP DETAILS.	LD 247914 B

NOTES:

1. ALL BRICKS FOR LINING CHIMNEY SHAFT SHALL CONSIST OF GOOD QUALITY ACID & HEAT RESISTING BRICKS OF A SILICEOUS TYPE OF SIZE 9" x 4½" x 3".
2. CAPPING BRICKS SHALL BE BULLNOSED.
3. ALL LINING SHALL BE SET, JOINTED AND POINTED IN ACID & HEAT RESISTING MORTAR.
4. 9" THICK LINING TO BE BUILT IN FLEMISH BOND. 4½" " " SHALL BE BUILT IN STRETCHER BOND 4 COURSES TO 1'8".
5. MANUFACTURER'S RECOMMENDATIONS ARE TO BE FOLLOWED REGARDING PROPORTION OF QUICK-SET ACID AND HEAT RESISTANT CEMENT USED IN MORTARS.
6. STRAIGHT BRICKS TO BE LAID TO REQUIRED RADII OVER ENTIRE HEIGHT OF STACK.
7. PARTICULAR ATTENTION IS TO BE GIVEN TO THE ½" SLOTS IN THE CORBELS. THESE MUST BE KEPT CLEAN FOR THE FULL DEPTH OF SLOTS.
8. ASBESTOS ROPES MUST PROVIDE A COMPLETE SEAL. ROPE SIZES MAY BE VARIED WHERE NECESSARY.
9. FOR DETAILS OF BRICKWORK & CAST IRON CAP SEE DRG. LD 247914 B.

AMENDMENTS			
(1)	TENDERING NOTE CHG. RELEASED	CHKD.	DATE
	CHG. RELEASED FOR CONSTRUCTION	KU	12.8.66
	FIELD ISSUE SIGNATURE ADDED		
		DRAWN	DATE
		KU	12.8.66

CONTRACT No 1894

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

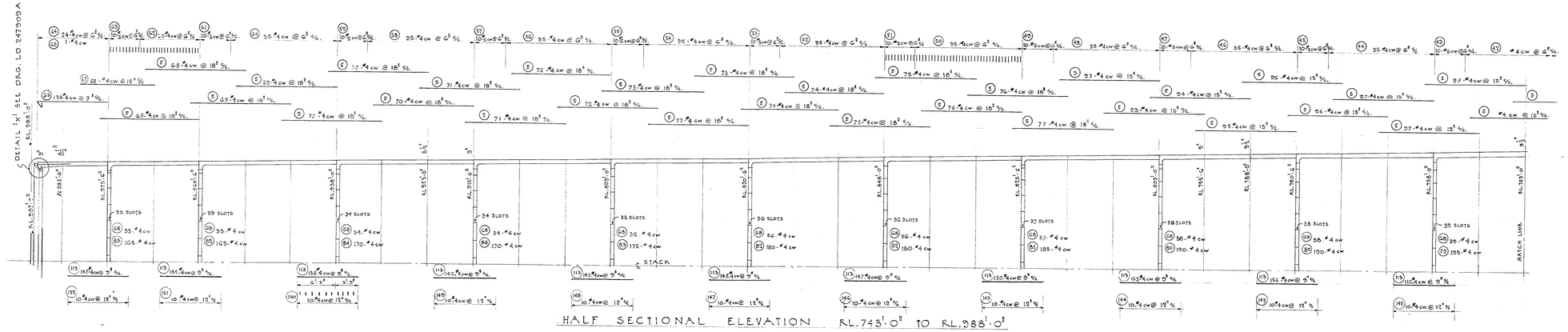
CHIMNEY STACKS No 1 & No 2

BRICK LINING DETAILS

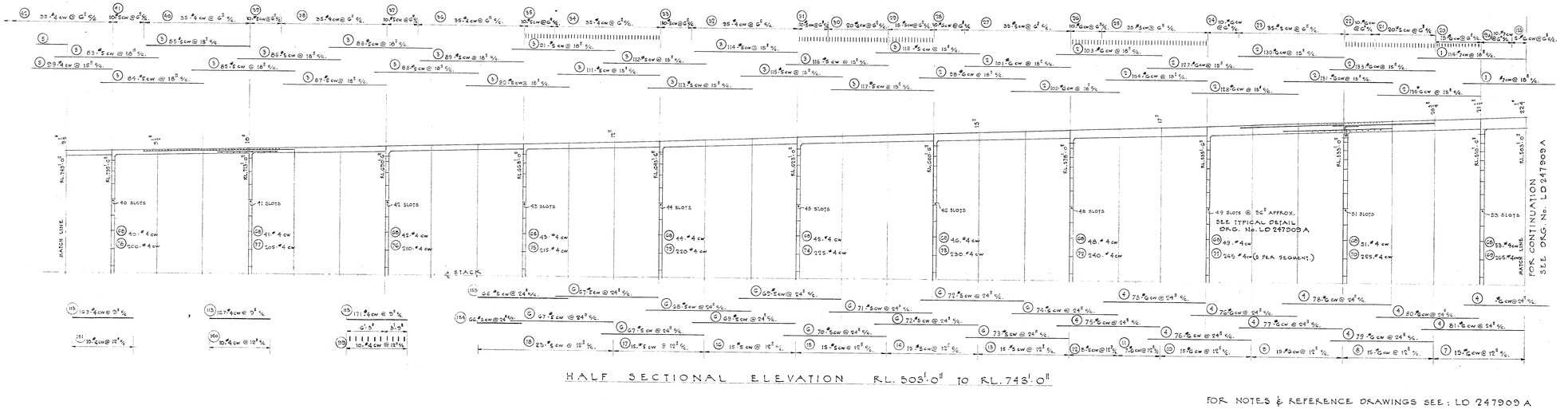
SCALE AS SHOWN.				DATE	A.A. Ferguson / Mgr.	DATE 7/9/68
DRAWN	R.S.	S.M.D.		26.8.68	PE i/sc.	
TRACED	—	152		30.8.68		
CHECKED	A.A.F.					
E.I.C.						
DATE	26/8/68					

LD 247913 A/1

LD 247913



HALF SECTIONAL ELEVATION RL. 743'-0" TO RL. 988'-0"



HALF SECTIONAL ELEVATION RL. 503'-0" TO RL. 743'-0"

FOR NOTES & REFERENCE DRAWINGS SEE: LD 247909 A

FOR REINFORCEMENT LIST SEE DRG: LD 253842 K

AMENDMENTS
OUTSTANDING NOTE DELETED.
SEE DRG. ADDED IN DISTRIBUTION
INSTRUCTIONS.
RELEASE SIGNATURE

ISSUE	DATE	INITIALS
A	12.8.69	K.A.H.
B	11.11.69	K.A.H.

S.I. 1 Corrected R.L.'s
S.I. 2 Vertical Reinf. Changed to 4 Cl-17
Horizontal Reinf. corresponding R.L.'s Changed
Structure Reinf. Changed
Ref. Dwg. Nos. Added
K.A.H. 11.11.69

THE ELECTRICITY COMMISSION OF N.S.W.

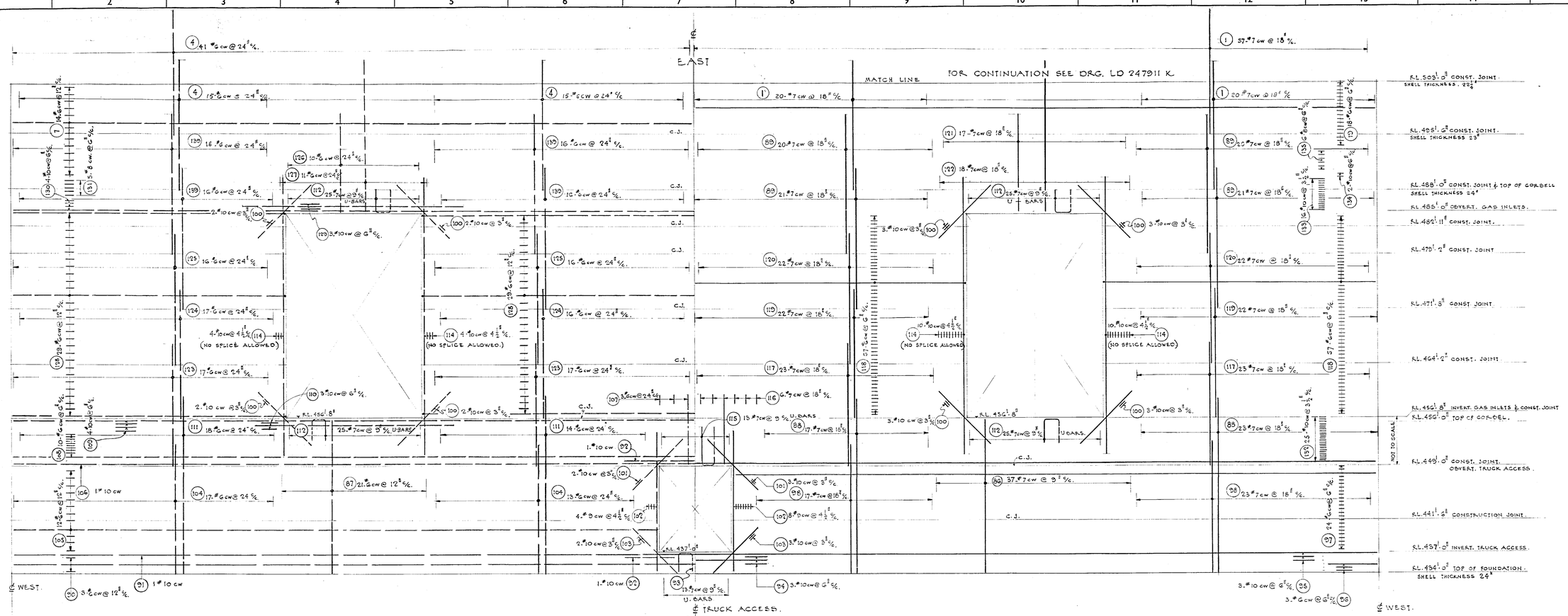
LIDDELL POWER STATION
CHIMNEY STACKS Nº1 & Nº2
REINFORCEMENT DETAILS
RL. 503'-0" TO RL. 988'-0"
SECTIONAL ELEVATION

SCALE: 3/16" = 1'-0"			DATE	DATE
DRAWN R.M.				P.E.P.S.C. 14.11.69
TRACED —				
CHECKED W.G.S.				
E/CO Nº				
DATE 14.11.69				

CONTRACT No. 1894

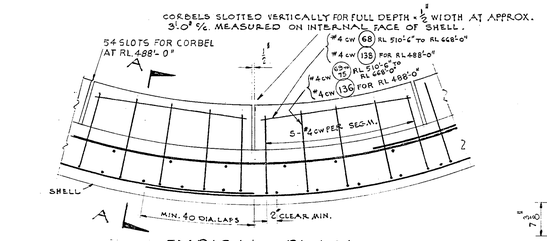
Nº LD 247911 K/2

LD 247911 K
END. 1



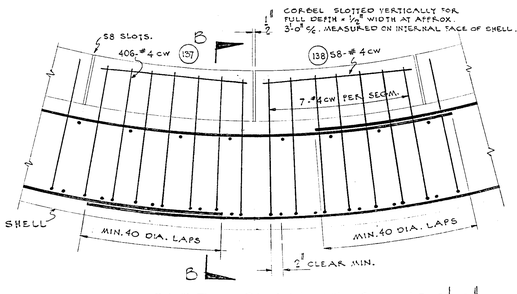
DEVELOPED SURFACE OF SHELL

(DISTORTED SCALE)

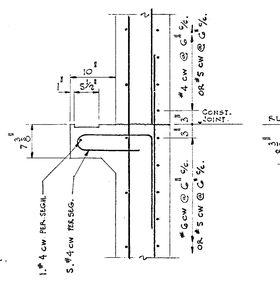


TYPICAL PLAN

CORBELS R.L. 488'-0" TO R.L. 668'-0"

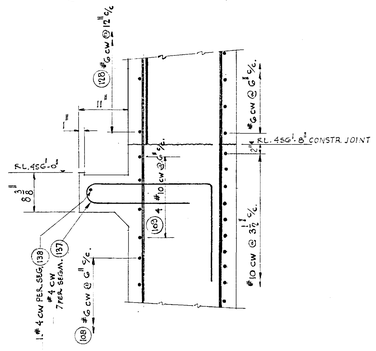


PART PLAN AT R.L. 456'-0"



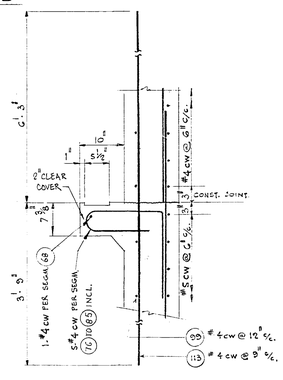
SECTION A·A

(SEE ALSO TYPICAL PLAN)

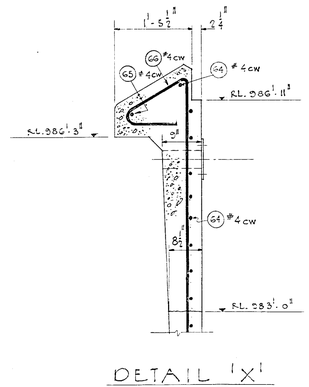


SECTION B·B

(SEE ALSO PART PLAN)



CORBEL DETAILS R.L. 690'-6" & ABOVE



DETAIL 'X'

REFERENCE DRG'S.

GENERAL ARR'T.	LD 247906 K
REINFORCEMENT DETAILS R.L. 503'-0" TO R.L. 988'-0"	LD 247911 K
REINF. DETAILS R.L. 434'-0" TO R.L. 503'-0"	LD 247910 K
FOUNDATION - STACK No. 1	LD 247907 A
FOUNDATION - STACK No. 2	LD 247908 K
CAP DETAILS	LD 247914 B
DIAGRAM OF BAR BENDING SHAPES	S 228581 D
REINFORCEMENT LIST – R.L. 434'-0" TO R.L. 503'-0"	LD 253840 B
REINFORCEMENT LIST – R.L. 503'-0" TO R.L. 988'-0"	LD 253842 K

NOTES.

1. STEEL REINFORCEMENT. #7cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No. A83. NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH e.g. #7cw = 7/8"ø
2. COVER TO REINFORCEMENT TO BE 2" UNLESS OTHERWISE NOTED.
3. MINIMUM LAP TO BE 40 BAR DIAMETERS.
4. ALL LAPS TO BE STAGGERED.
5. SPACING OF VERTICAL BARS GIVEN AT LOWEST POINT OF BAR.

AMENDMENTS

		DRAWN	DATE	CHECKED
(1)	TENDERING NOTE DELETED. DRG. RELEASED FOR CONSTRUCTION PURPOSES. REF DRGS. ADDED RE/INSC. SIGNATURE ADDED.	R.U.	15-6-68	R.J.H.
2.	Detail 'X' Dimension was 7½" 2" clear cover added R.L. 503'-0" to R.L. 456'-0"	R.J.R.	10.6.69	

CONTRACT No. 1894

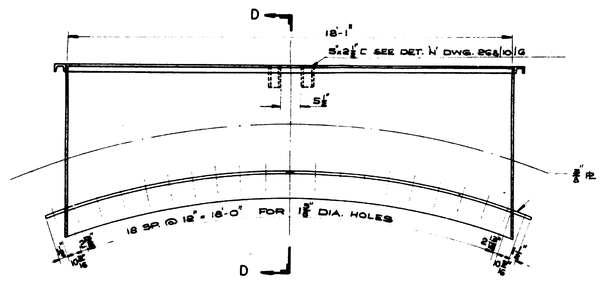
THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

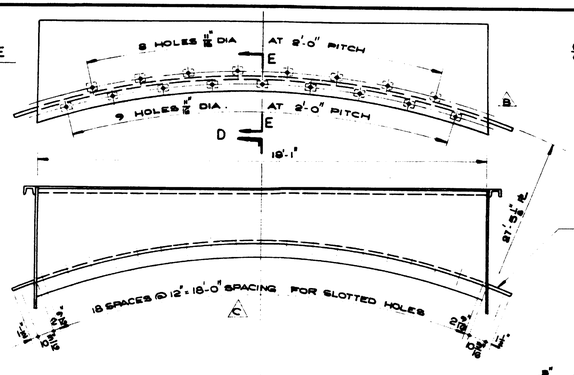
CHIMNEY STACKS No. 1 & 2. REINFORCEMENT DETAILS ELEVATION R.L. 434'-0" TO R.L. 503'-0" & CORBEL DETAILS FROM R.L. 456'-0" TO R.L. 988'-0"

		DATE		DATE
SCALE 3/16" & 1" = 1'-0"			A.A. Ferguson	20/5/68
DRAWN K.M.			P.E./D.S.C.	
TRACED				
CHECKED A.G.S.				
S/CO DATE 20/5/68			LD 247909 A/2	

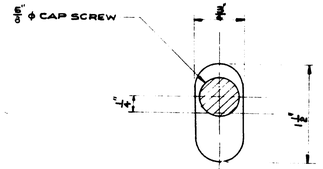
PLAN ON BOTTOM PLATE



SECTION "B-B"

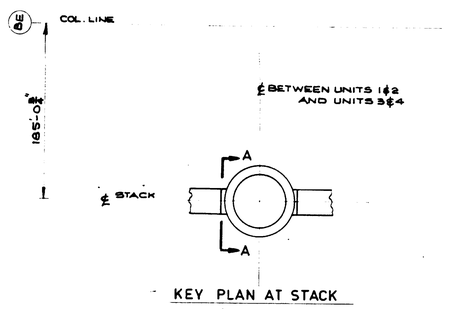


SECTION "C-C"



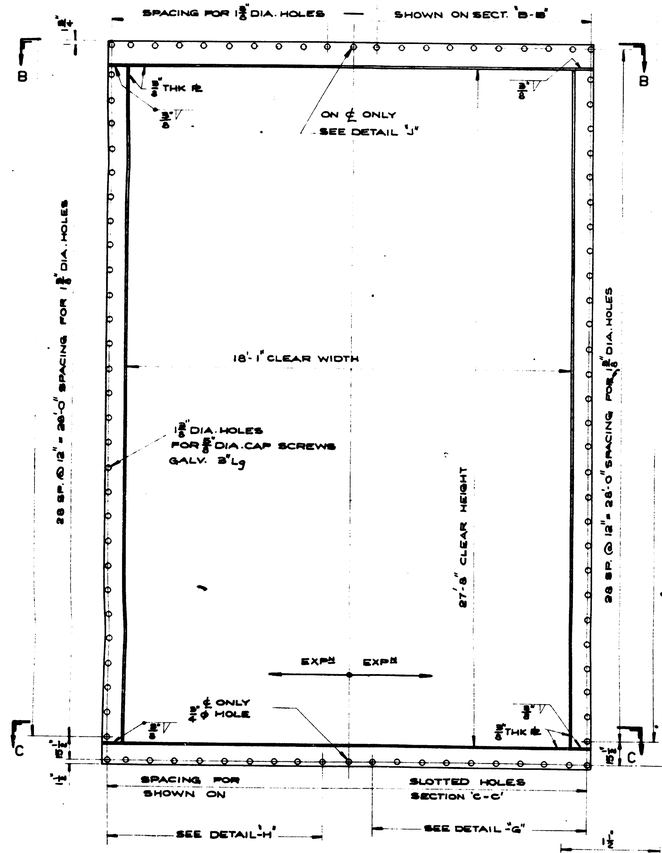
PAINT MARK Nos ON DUCTS IN BLACK LETTERING ON APPROPRIATE BOILER COLOUR PATCH:-

No 1 BOILER	—	RED PATCH
No 2 "	—	WHITE "
No 3 "	—	GREEN "
No 4 "	—	YELLOW "

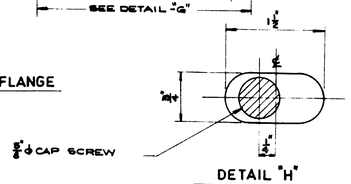


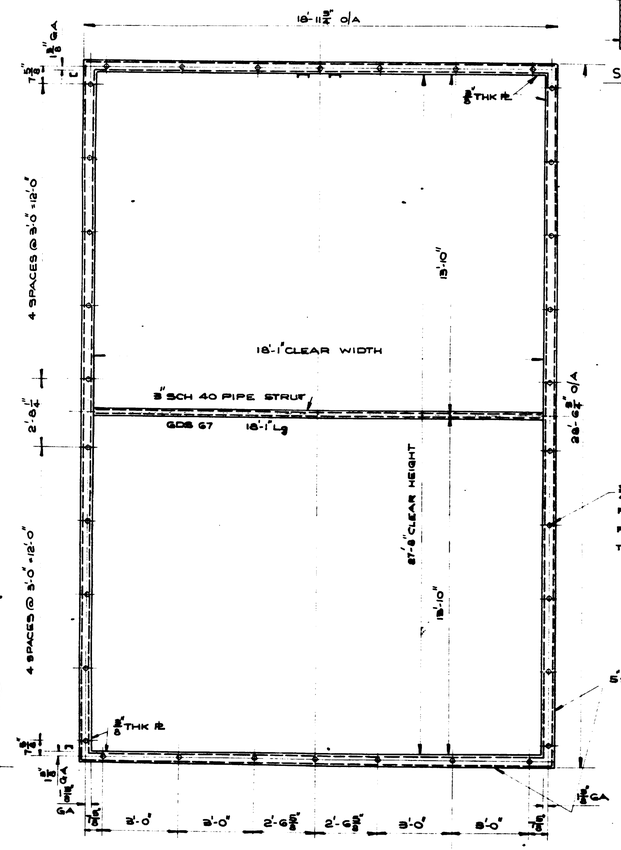
SEE DETAIL-"F"

SEE DETAIL-"E"

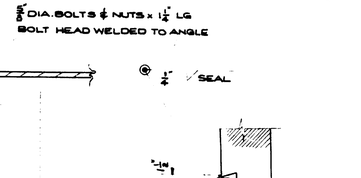


ELEVATION OF INNER FLANGE

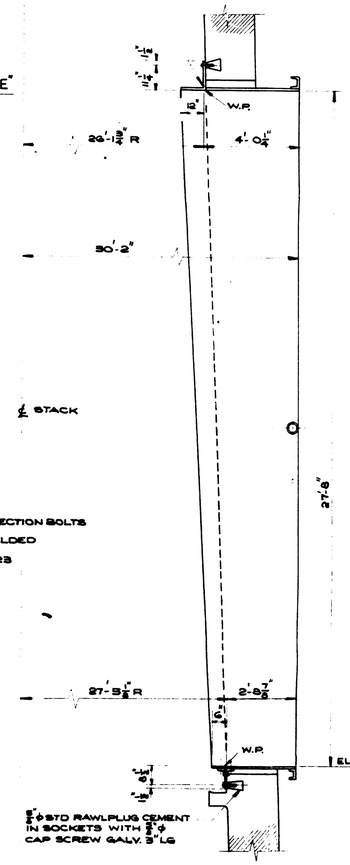




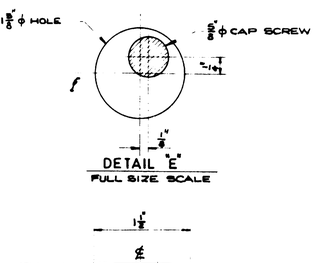
ELEVATION OF OUTER FLANGE SECTION "A-A"
SEE KEY PLAN
MK G.D.S. 12

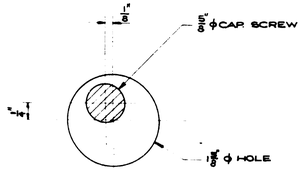


SECTION "E-E"
ENLARGED)



SECTION "D-D"





NOTES

THIS DRG REPRODUCED FROM CE ORG D65-221-442-1

REF. DRGS.	
GAS DUCT I.D. FAN TO STACK (SHEET 1)	268/10/5
ARR'GT OF GAS DUCT, I.D. FAN TO STACK.	SLRS 8&4-226/10/4
ARR'GT " " " " "	SLRS 1&3-268/10/2
DETAILS " " " ℄ SUPPORTS	268/10/1
MATERIAL LIST FOR I.D. DUCT WORK	268/10/3

LD257751B/2

STANDARD FOR MICROFILMING

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SOUTH STREET, RYDALMERE, N.S.W.

GAS INLET CONNECTION TO STACK MK C.D.S. 12
ELECTRICITY COMM. OF N.S.W. (SHT 3 OF 3)
LIDDELL POWER STA. UNITS No 1, 2, 3 & 4

CONTRACT NO.	LETTER DATED
1600	NOV 570

ITEM No 11-80

C-E DRAWING No D-935-368-6

DRAWN TRACED 25.11.70 CHECKED WH 26 NOV 68 PASSED ADB SCALE

DRAWING NUMBER 268/10/68

REV. A B C D E F

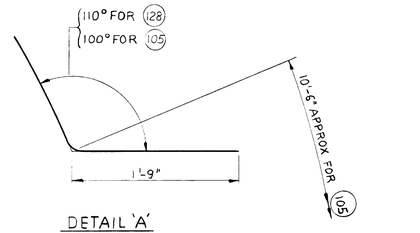
REVISIONS: A/ PIPE STRUT SHOWN IN SECTION D-D SEE CE DRG D65/221/442-1 | B/ PLAN ON BOTTOM PLATE ADDED. SECTION E-E ADDED. SITE LETTER 1.12.69 S.12.69 RSB | C/ DRILLING OF HOLES ON SEC. CC 4 & 5 MODIFIED TO SUIT DRG. D-935-368-5 | D/ DRILLING FOR OUTER FLANGE SEC A-A REMAINS TO SUIT D65-221-1 CE LETTER DEC. 30/69 WH | E/ DRILLING & SPACING FOR 1⅛ DIA HOLES (ORG. D65-221-442-2) 6.2.70 WH | F/ SECT. C-C DIMS ALTERED (ORG. INCORRECTED) 19.2.70 WH | F/ DRG. TRACED WITHOUT ALTERATION. J.S. 11.3.70

KODAK 16-11-70

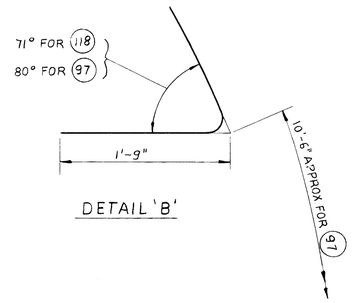
TAG	SIZE	DETAIL	No OFF	LOCATION
1	#7CW	17'-11"	194	VERTICAL EXTERNAL FACE
4	#6CW	17'-6"	142	VERTICAL INTERNAL FACE
7	#6CW	25'-5" / 26'-2" — MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 176'-0" TO 179'-6"	14 RINGS	HORIZ. INTERNAL FACE
19	#6CW	27'-2" / 27'-6" — MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 185'-9" TO 187'-9"	18 RINGS	HORIZ. EXTERNAL FACE
86	#7CW	22'-6"	74	VERT. EXTERNAL FACE
87	#6CW	22'-6"	42	VERT. INTERNAL FACE
88	#7CW	25'-7"	80	VERT. EXTERNAL FACE
69	#7CW	19'-3"	164	〃
90	#6CW	28'-7" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 197'-3"	3 RINGS	HORIZ. INTERNAL FACE
91	#10CW	28'-6" — MIN. LAP 4'-11" RING -7 BARS TOTAL LENGTH 213'-6"	1 RING	〃
92	#10CW	20'-0" / 28'-6" / 27'-11"	2 ARCS	〃 (AT TRUCK OPENING)
93	#7CW	2'-9" / 1'-6"	13	AT TRUCK OPENING
94	#10CW	20'-0" / 30'-2"	3	HORIZ. EXT. FACE
95	#10CW	30'-2" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 224'-0"	3 RINGS	〃
96	#6CW	30'-3" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 207'-6"	3 RINGS	〃
97	#6CW	29'-7" / 30'-2" / 10'-6" APPROX — MIN. LAP 2'-6" EACH ARC 7 BARS TOTAL LENGTH 196'-6" TO 200'-0" SEE DETAIL 'B'	24 ARCS	〃
98	#7CW	17'-11"	80	VERT. EXTERNAL FACE
100	#10CW	10'-0"	40	DIAGONAL TRIMMERS AT GAS INL.
101	#10CW	10'-0"	10	DIAGONAL TRIMMERS

TAG	SIZE	DETAIL	No OFF	LOCATION
102	#9CW	20'-0"	24	VERTICAL AT TRUCK OPENING
103	#10CW	9'-0"	10	DIAGONAL TRIMMERS
104	#6CW	17'-6"	60	VERTICAL INTERNAL FACE
105	#6CW	27'-11" / 28'-6" / 10'-6" APPROX — MIN. LAP 2'-6" EACH ARC 7 BARS TOTAL LENGTH 185'-9" TO 189'-6" SEE DETAIL 'A'	12 ARCS	HORIZ INTERNAL FACE
106	#6CW	27'-11" — MIN. LAP 4'-11" RING 7 BARS TOTAL LENGTH 209'-9"	1 RING	〃
107	#6CW	10'-0"	6	VERTICAL INTERNAL FACE
108	#6CW	27'-9" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 192'-0"	10 RINGS	〃
109	#10CW	27'-7" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 208'-0"	4 RINGS	〃
110	#10CW	30'-0" / 27'-7"	6 ARCS	〃 AT GAS INLETS
111	#6CW	25'-2"	64	VERTICAL INTERNAL FACE
112	#7CW	2'-9" / 1'-6"	100	AT GAS INLET
114	#10CW	38'-4"	56	VERTICAL AT GAS INLETS
115	#7CW	5'-0" / 1'-6"	13	AT TRUCK OPENING
116	#7CW	10'-5"	12	VERTICAL EXTERNAL FACE
117	#7CW	18'-1"	92	〃
118	#6CW	28'-0" / 29'-3" — MIN. LAP 2'-6" EACH ARC 3 BARS TOTAL LENGTH 77'-0" TO 80'-6" SEE DET. 'B' 57 VARIANTS	114 ARCS	HORIZ EXTERNAL FACE
119	#7CW	17'-11"	88	VERTICAL EXTERNAL FACE
120	#7CW	17'-11"	88	〃
121	#7CW	13'-3"	34	〃
122	#7CW	20'-9"	36	〃

TAG	SIZE	DETAIL	No OFF	LOCATION
123	#6CW	17'-8"	68	VERTICAL INTERNAL FACE
124	#6CW	17'-6"	66	〃
125	#6CW	17'-6"	64	〃
126	#6CW	12'-10"	20	〃
127	#6CW	20'-4"	22	〃
128	#6CW	25'-3" / 27'-7" — MIN. LAP 2'-6" EACH ARC 3 BARS TOTAL LENGTH 71'-0" SEE DET 'A' TO 75'-3" 28 VARIANTS	58 ARCS	HORIZ. INTERNAL FACE
129	#10CW	30'-0" / 26'-3"	6 ARCS	〃 AT GAS INLETS
130	#10CW	26'-3" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 199'-6"	4 RINGS	HORIZ INTERNAL FACE
131	#8CW	26'-2" — MIN. LAP 3'-3" EACH RING 7 BARS TOTAL LENGTH 188'-3"	5 RINGS	〃
132	#10CW	29'-3" / 29'-7" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 217'-3" TO 220'-6"	25 RINGS	HORIZ EXTERNAL FACE
133	#10CW	28'-0" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 210'-6"	16 RINGS	〃
134	#10CW	27'-11" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 209'-9"	2 RINGS	〃
135	#8CW	27'-6" — MIN. LAP 3'-3" EACH RING 7 BARS TOTAL LENGTH 194'-6"	6 RINGS	〃
136	#4CW	2'-4½" / 3" INTRAD. / 1" INTERNAL RAD / 2'-2" / 93° / 2'-9"	270	AT CORBEL RL 488'-0"
137	#4CW	2'-4½" / 3" INTRAD. / 1" INTERNAL RAD / 2'-2" / 93° / 2'-9"	406	AT CORBEL RL 456'-0"
138	#4CW	2'-8"	112	AT CORBEL RL 456'-0" & RL 488'-0"
139	#6CW	18'-10"	128	VERTICAL INTERNAL FACE



DETAIL 'A'



DETAIL 'B'

REFERENCE DRG'S.

CHIMNEY STACK 1 & 2 REINFORCEMENT DET. ELEVATION RL 434'-0" TO RL 503'-0"	LD 247909 A
CHIMNEY STACK No1 & 2	LD 247906 K
DIAGRAM BAR BENDING SHAPES	S 228581 D

NOTES

STEEL REINFORCEMENT: #CW INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A 83. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH e.g. #8CW = 1"

DELIVER TO SITE IN TAGGED BUNDLES

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY

TAGS 97, 105, 118, 128 ARE TO BE MADE IN SUCH A WAY, THAT, WHEN PLACED, ALL THE LAPS ARE STAGGERED.

REINFORCEMENT LISTED FOR ONE STACK ONLY
REINFORCEMENT REQUIRED FOR TWO STACKS.

AMENDMENTS
1. Tag 136 No off was 220, tag 138 was 111. — L.N. K.J.H. 27.8.68

KJA for MD 27/9/68

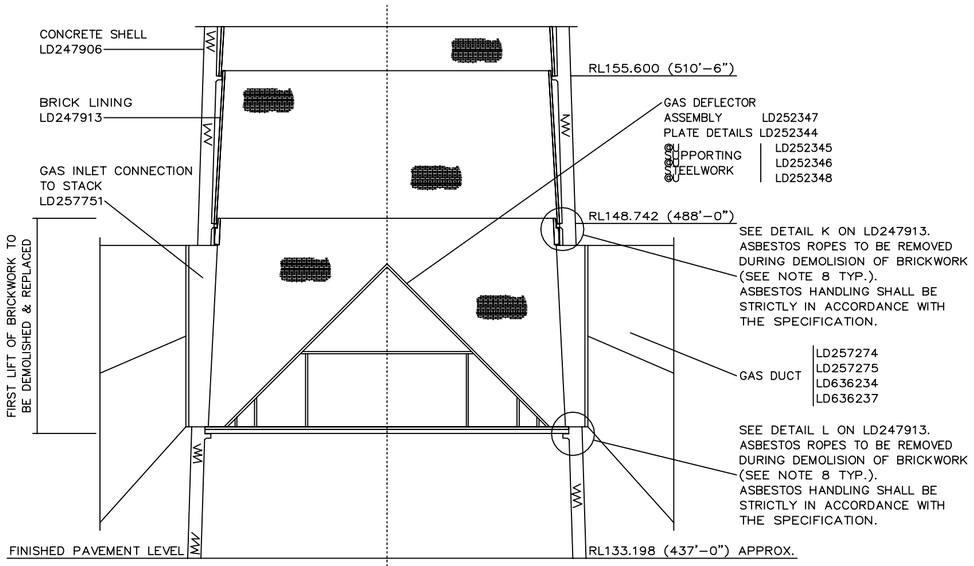
CONTRACT No. 1894

THE ELECTRICITY COMMISSION OF N.S.W.

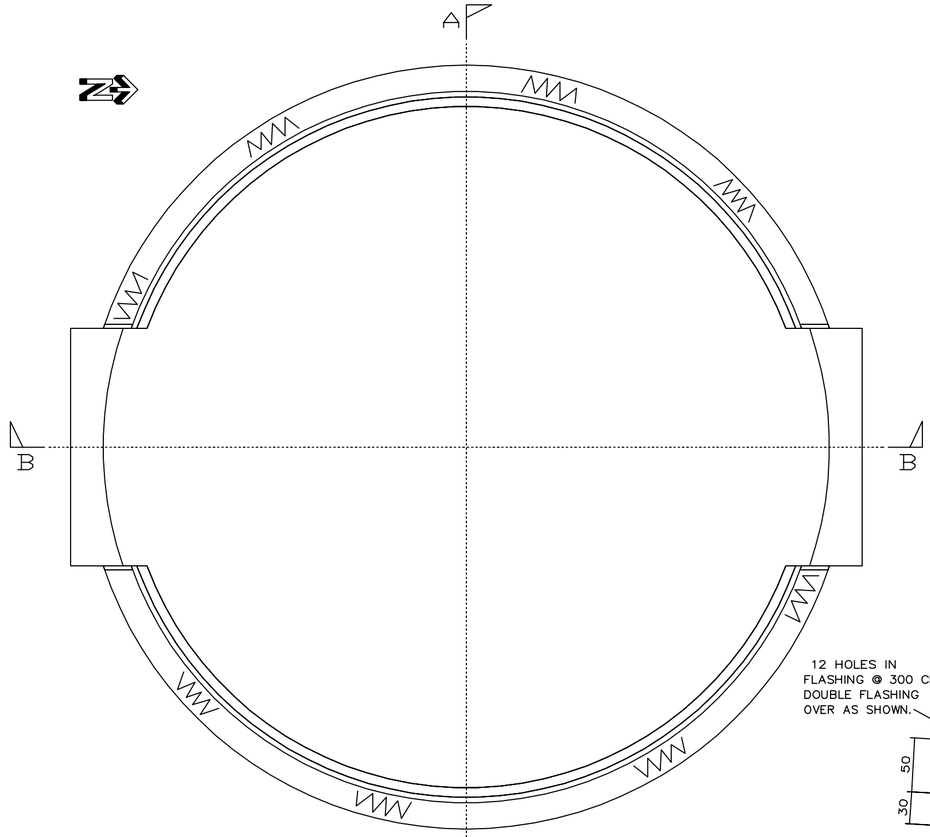
LIDDELL POWER STATION
CHIMNEY STACKS No1 & 2
ELEVATION RL. 434'-0" TO RL. 503'-0"
REINFORCEMENT LIST

SCALE	N.T.S.				DATE	DATE
DRAWN	K.U.				PE/PSC	1-8-68
TRACED	—					
CHECKED	ACG					
E/CD.	KJA for MD					
DATE	1.8.68					

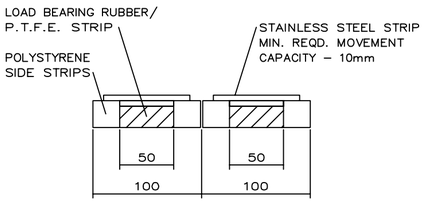
LD 253840 B/1



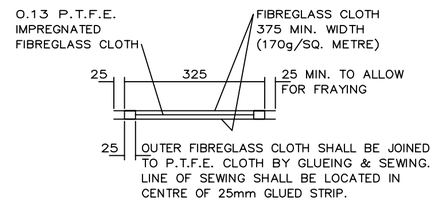
EXISTING CHIMNEY STACK DETAILS
SCALE 1:100



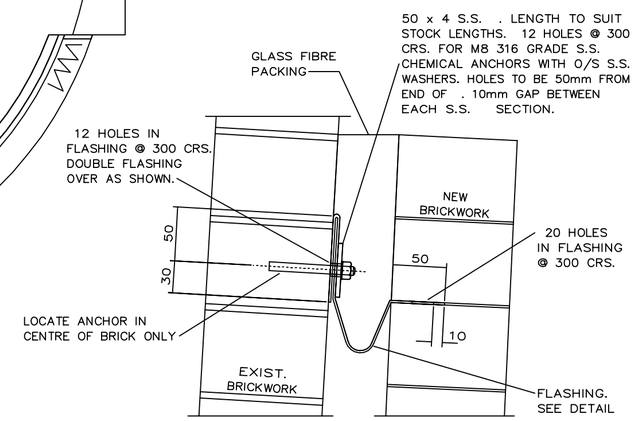
PLAN AT RL145.085
SCALE 1:50
GAS DEFLECTOR NOT SHOWN



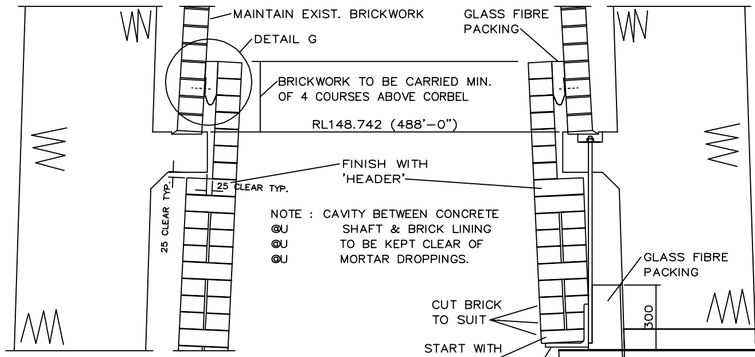
ANTI-FRICTION JOINT
SCALE 1:2



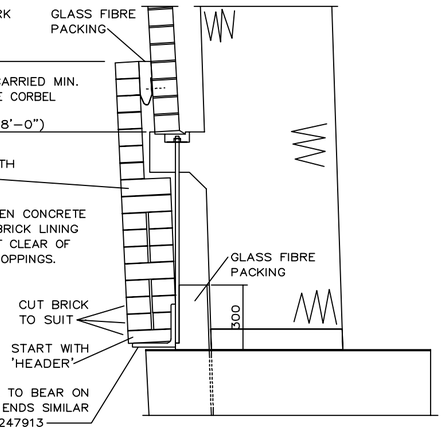
FLASHING DETAIL
N.T.S.



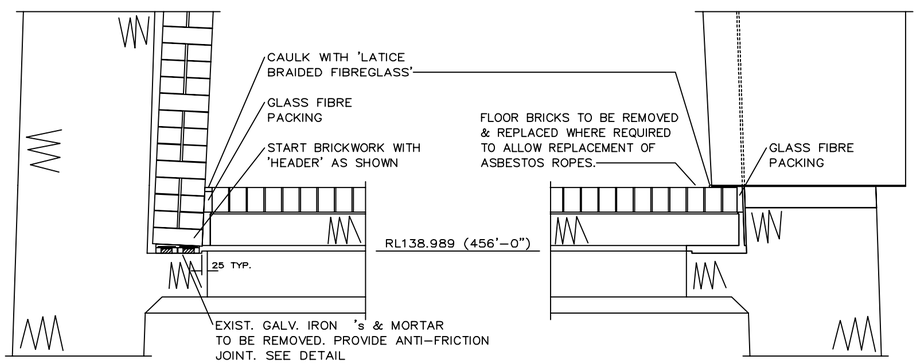
DETAIL G
SCALE 1:2



DETAIL C
SCALE 1:10

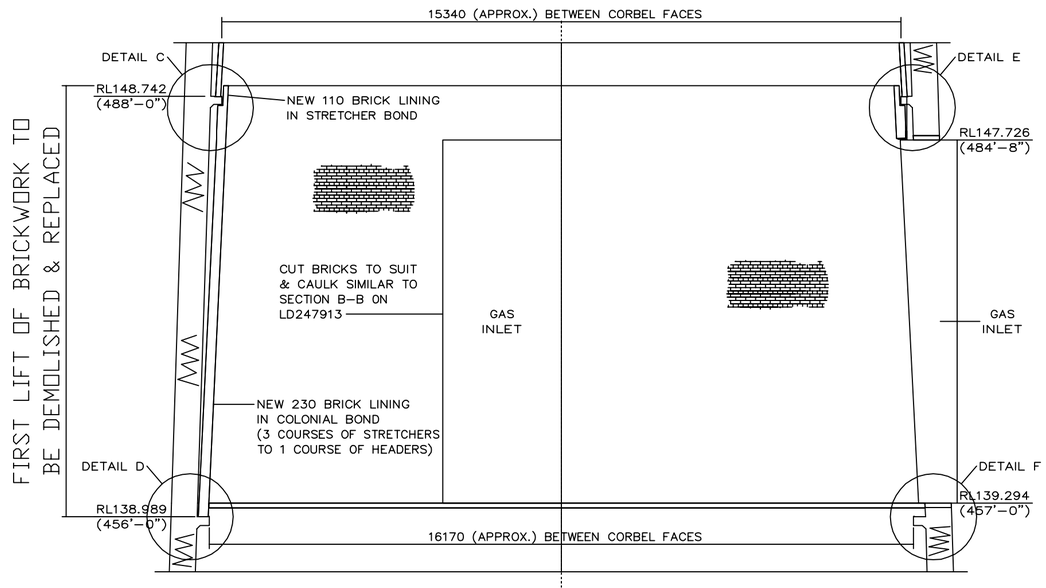


DETAIL E
SCALE 1:10



DETAIL D
SCALE 1:10

DETAIL F
SCALE 1:10



HALF SECTION A-A
HALF SECTION B-B
SCALE 1:50

NOTES

1. THE CONTRACTOR SHALL CONFIRM ALL DIMENSIONS & REDUCED LEVELS ON SITE BEFORE CONSTRUCTION COMMENCES.
2. ASBESTOS HANDLING & REMOVAL SHALL BE STRICTLY IN ACCORDANCE WITH THE SPECIFICATION.
3. EXISTING GLASS INSULATION SHALL BE REPLACED WITH NEW GLASS FIBRE PACKING IN ACCORDANCE WITH THE SPECIFICATION.
4. ALL STAINLESS STEEL PLATE, ANCHORS, NUTS & WASHERS SHALL BE GRADE 316.
5. M8 CHEMICAL ANCHORS SHALL BE INSTALLED IN THE CENTRE OF THE EXISTING BRICKS ONLY.
6. BRICK LINING SHALL BE GAS TIGHT. BRICKS SHALL BE LAID IN COLONIAL BOND (DOUBLE SKIN) & STRETCHER BOND (SINGLE SKIN) WITH 2mm TO 6mm JOINTS ALL AS SPECIFIED.
7. ALL HOLES IN FLASHING MATERIAL SHALL BE PUNCHED ONLY.
8. ASBESTOS ROPE SHALL BE REPLACED WITH 'LATICE BRAIDED FIBREGLASS' OF EQUIVALENT SIZE AS SPECIFIED.

REFERENCE DRAWINGS

LD247906	GENERAL ARRANGEMENT – CONCRETE
LD247913	BRICK LINING DETAILS
LD252344	GAS DEFLECTOR – PLATE DETAILS
LD252345	GAS DEFLECTOR – COLUMN & BRACE DETAILS
LD252346	GAS DEFLECTOR – BEAM & TIE DETAILS
LD252347	GAS DEFLECTOR ASS'Y
LD252348	GAS DEFLECTOR – BEAM & RAFTER DETAIL
LD257274	GAS DUCT I.D. FAN TO STACK – ARRG'T
LD257275	GAS DUCT I.D. FAN TO STACK – DETAILS
LD257751	GAS INLET CONNECTION TO STACK
LD243632	TYP. WELDING & CONSTR. DETS. FOR DUCTING
LD636234	UNIT 3 – I.D. FAN TO STACK DUCTING
@U	ADDITIONAL STIFFENING BEAMS
LD636237	UNIT 4 – I.D. FAN TO STACK DUCTING
@U	ADDITIONAL STIFFENING BEAMS

LINES STRAIGHTENED, BUILDINGS & DRAWINGS LINES SQUARED (DRAWING REALIGNED) ADDITIONAL CORRELATIVES INCORPORATED (CAUSE NOTED) REMOVED FROM AUTOCAD CONVERSION. SYSTEM COLOUR REDEFINED.

01	CKD	PF	06-SEP-93
DATE			

804x1136mm

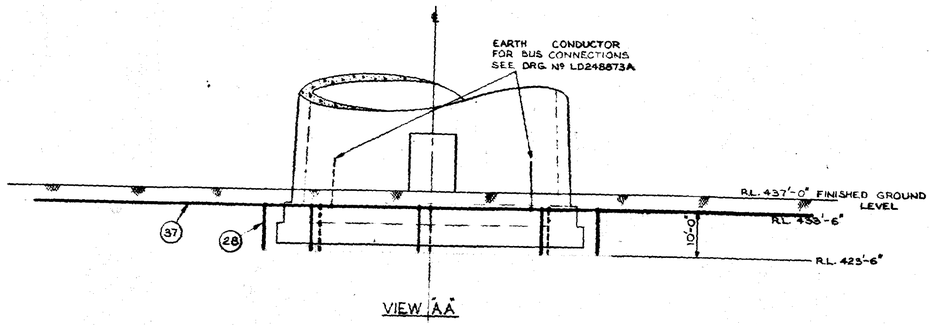
PACIFIC POWER SERVICES

CONTRACT No.	DRAWN	DM	
QUOTE NO. W269/93	DESIGN		
	DSGN'D	DO RT	
	ENG		
	PASSED	PS	
REFERENCE DRAWINGS	MANAGER/PPE	4-JUN-1993	
	APPROVED		
	gad DO NOT AMEND MANUALLY	DRAWING STATUS	SCALE AS SHOWN

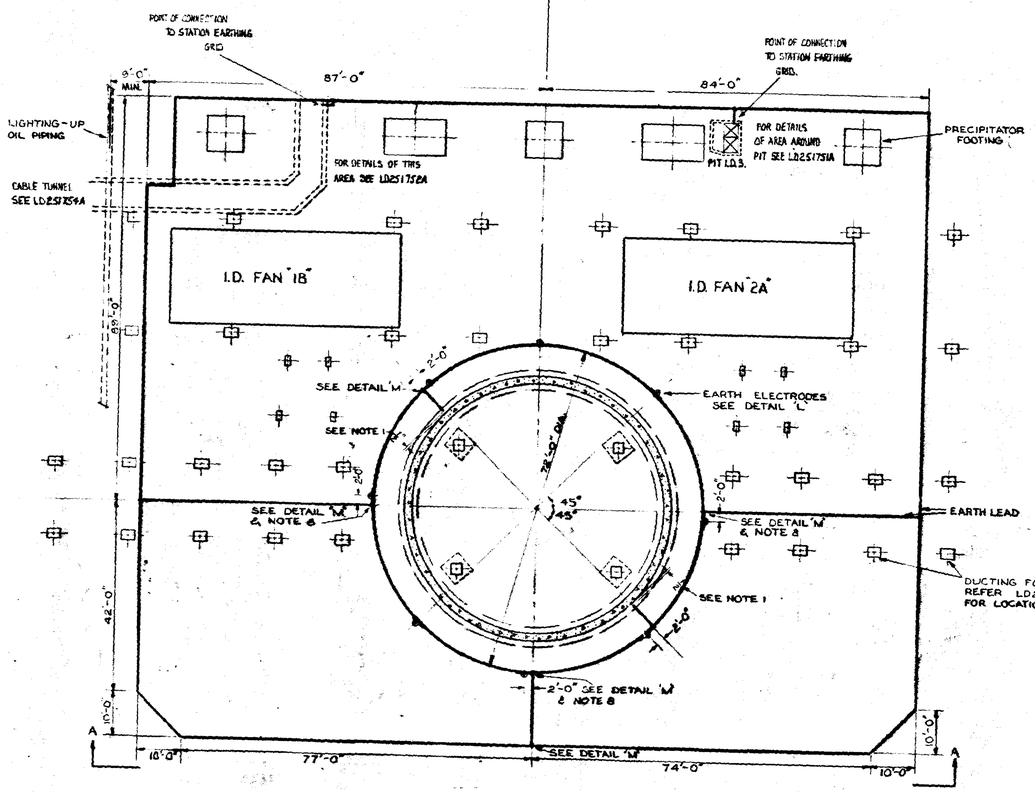
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KKS CODING	UHN
ORIGINAL DRAWING APPROVED BY	C STARK per PS
Macquarie Generation	
LIDDELL POWER STATION UNITS 3 & 4 CHIMNEY STACK REPAIRS TO BRICK LINING DETAILS	
A0	LD637160 01
	PREFIX NUMBER SHEET AMDT

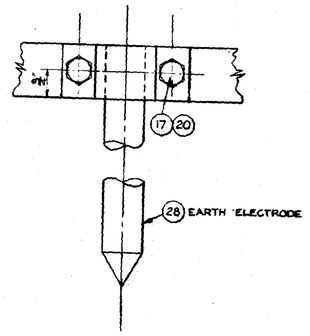
PLOT ISSUE No. 5 | PLOT ISSUE DATE 06SEP93 | COPIED FROM | SUPERSEDES | SUPERSEDED BY | INDEX CLASS'N –



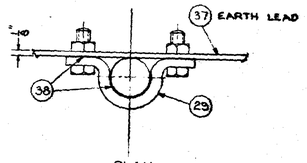
VIEW 'AA'



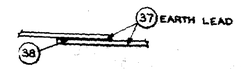
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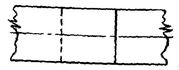
ELEVATION



PLAN
DETAIL 'L'



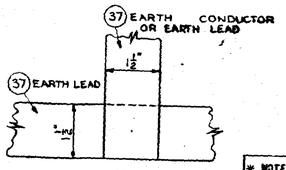
ELEVATION



PLAN
DETAIL 'N'



ELEVATION



PLAN
DETAIL 'M'

REFERENCE DRAWINGS

LD247907A - CHIMNEY STACK Nº1-FOUNDATION

LD248873A - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR - ARRANGEMENT
LD248871P - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 1.
LD248872P - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 2.
LD246715A - BOILERS 1 & 2 - PRECIPITATORS & I.D. FANS AREA - CABLE PITS, TUNNEL & CONDUIT LAYOUT.
LD251751A - I.D FANS 2A & 2B AREA - CABLE PITS & CONDUIT DETAILS
LD251752A - " " " 1A & 1B " " " " " "
LD 28.230 A - CHIMNEY STACK Nº2 - LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

NOTES.

1. EARTH CONDUCTOR TO BE ½" CLEAR OF & PARALLEL TO FINISHED FACE OF STACK AS INDICATED IN PLAN. EARTH CONDUCTOR TO BE EXTENDED UP TO RL 441'-0" FOR EARTHING OF SCAFFOLDING & REINFORCEMENT ETC. DURING CHIMNEY CONSTRUCTION. ON COMPLETION OF CHIMNEY CONSTRUCTION, EARTH CONDUCTORS ARE TO BE TERMINATED AT TEST LINK IN ACCORDANCE WITH SECTION 'EE' ON DRG. Nº LD248873A.
2. TEMPORARY LEADS FOR EARTHING OF SCAFFOLDING ETC. DURING CHIMNEY CONSTRUCTION SHALL BE FIRMLY BONDED TO EARTH CONDUCTOR AT R.L. 441'-0". THE EARTH LEAD CONDUCTOR CONCENTRIC TO THE BASE OF THE STACK SHALL BE COMPLETELY COVERED & TIGHTLY PACKED WITH FINE SOIL TO A MIN. R.L. OF 435'-0" PRIOR TO BONDING OF EARTH CONDUCTOR TO THE TEMPORARY LEADS.
3. ALL MATING SURFACES OF JOINTS IN DETAIL 'L' ARE TO BE COMPLETELY BONDED WITH A CONTINUOUS COATING OF ALLOY & INTERPOSING STRIPS OF SILVER BRAZING ALLOY RIBBON OR COPPER PROSPHORUS BRAZING ALLOY RIBBON (SHIM). (TYPE CP1 OR CP2) BETWEEN MATING SURFACES BEFORE CLAMPING & BRAZING.
4. EARTH LEAD TO BE FORMED UP FROM LONGEST AVAILABLE LENGTHS OF COPPER & JOINED WHEREVER NECESSARY IN ACCORDANCE WITH DETAIL 'N' & NOTE 11.
5. REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
6. DRIVE TOP OF EARTH ELECTRODES TO RL 433'-6" AS INDICATED ON ELEVATION.
7. BENDS IN EARTH CONDUCTOR TO BE 8" MIN. RAD.
8. THE THREE LOCATIONS SHOWN SHOULD NOT BE JOINED UNTIL TESTS HAVE BEEN CARRIED OUT TO DETERMINE THE EARTH RESISTANCE OF THE CONCENTRIC EARTH TERMINATION NETWORK (CALCULATED VALUE 1·6 OHM)
9. ITEM Nºs ENCIRCLED THUS (29) REFER TO ITEMS LISTED ON MATERIAL LIST DRG. Nºs LD248871 & 72P.
10. IF AN ELECTRODE STRIKES ROCK, A 1½" DIA. HOLE IS TO BE DRILLED TO THE REQUIRED DEPTH & THE ELECTRODE PLACED IN HOLE. THEN AN EQUAL MIXTURE OF BENTONITE & PLASTER OF PARIS SHALL BE MIXED WITH WATER TO FORM A SLURRY & POURED INTO THE HOLE AROUND THE ELECTRODE.
11. ALL JOINTS SHOWN IN DETAIL 'M & N' SHALL BE BRAZED JOINTS USING EITHER SILVER-BRAZING ALLOY OR COPPER-PHOSPHORUS BRAZING ALLOY.

* NOTE FOR CONTRACT NO. 2133

This drawing to be used for information only in tendering for Contract No. 2133 in accordance with the requirements of Specification No. 2133 - General-Drawings.

Reference Drawings listed hereon shall only be used for Contract 2133 if specifically supplied and listed in the Specification No. 2133.

AMENDMENTS
NOTES 1 & 3 & 4 MODIFIED. NOTE 11 ADDED. CONTRACT Nº ADDED. DRN: K.R. CHD: W.A.K. APP: A.A.F. 6/6/68
3 NOTE CHANGED. 2133 (WALLSEND AS) ADDED. (G.R.G-81) DRN: C.V. CHD: E.J.A. APP: A.A.F. 11.12.70
4. EARTHING CABLE REROUTED TO SUIT SITE LAYOUT. PIT LD.3 & CABLE TUNNEL ADDED TO SHOW POINTS OF CONNECTION BETWEEN STATION EARTH & STACK GRID. REF DRGS ADDED. TITLE ALTERED. DRN: M.J.K. CHD: E.J.A. APP: [illegible] 12.12.72

* CONTRACT Nº	CONTRACT Nº
2133	1894

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACK Nº1
LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

SCALE ½ IN. = 1 FT. & ½ IN. = 1 IN.				DATE	E.J.A.	DATE
DRAWN	K.R.	E/M.S.				DCE/POWER
TRACED	J.D.W.	S.E.& A.			A.A. Farquhar	
CHECKED	S.G.					PE/CON
SE/E.D.O. DATE	[illegible] 13-3-68				LD248874	B/4

APPENDIX C – LOAD TAKEDOWN FOR CHIMNEY

LIDDELL PS CHIMNEY - CONCRETE SHELL MASS CALCULATIONS

RL Height			Segment Height	Outside Diameter			Outside Area	Inside Area	Wall Area	Wall Volume	Wall Thickness	
Ft	In.	mm	mm	ft	in	mm	mm2	mm2	mm2	mm3	In.	mm
434	0	132283.2	0	61	0	18592.8	271506028.3	237066134.3	34439893.9	0.0	24	609.6
437	0	133197.6	914.4	60	8.5	18503.9	268915866.3	234646226.1	34269640.2	31336159022.9	24	609.6
441	6	134569.2	1371.6	60	3.5	18376.9	265237170	231210749.4	34026420.6	46670638544.8	24	609.6
449	0	136855.2	2286	59	6.5	18148.3	258679361.8	225090736.5	33588625.4	76783597605.9	24	609.6
456	8	139192	2336.8	58	10	17932.4	252561249.1	219386097	33175152.1	77523695360.6	24	609.6
464	2	141478	2286	58	1.5	17716.5	246516355.5	213754676.7	32761678.8	74893197664.9	24	609.6
471	8	143764	2286	57	6	17526	241243430.8	208846581.4	32396849.4	74059197690.9	24	609.6
479	2	146050	2286	56	9.5	17310.1	235336361.7	203352985.6	31983376.1	73113997720.3	24	609.6
482	11	147193	1143	56	4.5	17183.1	231895817.9	200155661.4	31740156.5	36278998868.8	24	609.6
488	0	148742.4	1549.4	56	0	17068.8	228820990.2	197299731.4	31521258.9	48839038477.2	24	609.6
495	6	151028.4	2286	55	4	16865.6	223405300.7	193523747.2	29881553.5	68309231203.5	23	584.2
503	0	153314.4	2286	54	7.5	16649.7	217722196.3	188236888.1	29485308.2	67403414565.1	23	584.2
510	6	155600.4	2286	53	11.5	16446.5	212440277.5	185161173.7	27279103.8	62360031389.0	21.5	546.1
518	0	157886.4	2286	53	4	16256	207547383.4	181503759.1	26043624.3	59535725227.0	20.75	527.05
525	6	160172.4	2286	52	8.5	16065.5	202711493.9	176983295	25728198.9	58814662749.5	20.75	527.05
533	0	162458.4	2286	52	1	15875	197932609	172519835.5	25412773.5	58093600272.0	20.75	527.05
540	6	164744.4	2286	51	5.5	15684.5	193210728.7	168113380.6	25097348.1	57372537794.5	20.75	527.05
548	0	167030.4	2286	50	10.5	15506.7	188855071.2	164052120.1	24802951.1	56699546148.8	20.75	527.05
555	6	169316.4	2286	50	3.5	15328.9	184549071.1	160040517	24508554.0	56026554503.1	20.75	527.05
563	0	171602.4	2286	49	9	15163.8	180595105.9	160610562.9	19984543.0	45684665242.2	17	431.8
570	6	173888.4	2286	49	2	14986	176384873.5	156641523.3	19743350.2	45133298592.8	17	431.8
578	0	176174.4	2286	48	7.5	14820.9	172519835.5	153000450	19519385.5	44621315275.4	17	431.8
585	6	178460.4	2286	48	1.5	14668.5	168990111.2	149677462.3	19312648.9	44148715290.1	17	431.8
593	0	180746.4	2286	47	7	14503.4	165207413.2	148303651.7	16903761.5	38641998795.2	15	381
600	6	183032.4	2286	47	1	14351	161753695	145032348.2	16721346.8	38224998808.2	15	381
608	0	185318.4	2286	46	7.5	14211.3	158619835.9	142065702.6	16554133.3	37842748820.1	15	381
615	6	187604.4	2286	46	1.5	14058.9	155236043.4	138864324.7	16371718.6	37425748833.1	15	381
623	0	189890.4	2286	45	8	13919.2	152166282.8	135961777.6	16204505.2	37043498845.0	15	381
630	6	192176.4	2286	45	2.5	13779.5	149127178	133089886.3	16037291.7	36661248856.9	15	381
638	0	194462.4	2286	44	9.5	13652.5	146390957.6	130505678.2	15885279.5	36313748867.7	15	381
645	6	196748.4	2286	44	4	13512.8	143410377.6	127692311.6	15718066.0	35931498879.7	15	381
653	0	199034.4	2286	43	11	13385.8	140727361.5	128201552.6	12525808.9	28633999107.2	12	304.8
660	6	201320.4	2286	43	6	13258.8	138069680.7	125665481.6	12404199.1	28355999115.9	12	304.8
668	0	203606.4	2286	43	1.5	13144.5	135699429.8	123404679.6	12294750.3	28105799123.7	12	304.8
675	6	205892.4	2286	42	9	13030.2	133349700.6	121164399.1	12185301.5	27855599131.5	12	304.8
683	0	208178.4	2286	42	4	12903.2	130762958.9	118699267.2	12063691.7	27577599140.1	12	304.8
690	6	210464.4	2286	41	11.5	12788.9	128456553.1	116502310.3	11954242.8	27327399147.9	12	304.8
698	0	212750.4	2286	41	7.5	12687.3	126423642.7	114566687.7	11856955.0	27104999154.9	12	304.8
705	6	215036.4	2286	41	3	12573	124156000.1	112408493.9	11747506.2	26854799162.7	12	304.8
713	0	217322.4	2286	40	11	12471.4	122157545.8	112408493.9	9749051.9	22286332638.5	10	254
720	6	219608.4	2286	40	7	12369.8	120175306.1	110507327.4	9667978.7	22100999310.9	10	254
728	0	221894.4	2286	40	3	12268.2	118209281.1	109092093.4	9117187.7	20841891016.8	9.5	241.3
735	6	224180.4	2286	39	11.5	12179.3	116502310.3	107452514.7	9049795.6	20687832688.3	9.5	241.3
743	0	226466.4	2286	39	7.5	12077.7	114566687.7	105593911.7	8972776.0	20511766027.1	9.5	241.3
750	6	228752.4	2286	39	4	11988.8	112886319	103980935.1	8905383.9	20357707698.6	9.5	241.3
758	0	231038.4	2286	39	0.5	11899.9	111218364.7	102380372.8	8837991.9	20203649370.1	9.5	241.3
765	6	233324.4	2286	38	9	11811	109562824.7	100792224.9	8770599.8	20049591041.5	9.5	241.3
773	0	235610.4	2286	38	5.5	11722.1	107919699	99216491.33	8703207.7	19895532713.0	9.5	241.3
780	6	237896.4	2286	38	2	11633.2	106288987.6	97653172.08	8635815.6	19741474384.5	9.5	241.3
788	0	240182.4	2286	37	11	11557	104901115.9	96323064.95	8578050.9	19609424388.6	9.5	241.3

795	6	242468.4	2286	37	7.5	11468.1	103293459.7	95221609.56	8071850.1	18452249424.7	9	228.6
803	0	244754.4	2286	37	4.5	11391.9	101925349.5	93908223.78	8017125.7	18327149428.6	9	228.6
810	6	247040.4	2286	37	1.5	11315.7	100566360.1	92603958.73	7962401.3	18202049432.5	9	228.6
818	0	249326.4	2286	36	10.5	11239.5	99216491.33	91308814.41	7907676.9	18076949436.4	9	228.6
825	6	251612.4	2286	36	8	11176	98098567.95	90236494.71	7862073.2	17972699439.6	9	228.6
833	0	253898.4	2286	36	5	11099.8	96765420.58	88958071.74	7807348.8	17847599443.5	9	228.6
840	6	256184.4	2286	36	2	11023.6	95441393.93	87688769.5	7752624.4	17722499447.4	9	228.6
848	0	258470.4	2286	35	11.5	10960.1	94345005.62	86637984.87	7707020.8	17618249450.7	9	228.6
855	6	260756.4	2286	35	9	10896.6	93254951.16	85593534.08	7661417.1	17513999453.9	9	228.6
863	0	263042.4	2286	35	6	10820.4	91955246.48	84348553.8	7606692.7	17388899457.8	9	228.6
870	6	265328.4	2286	35	3.5	10756.9	90879126.47	83318037.46	7561089.0	17284649461.1	9	228.6
878	0	267614.4	2286	35	1	10693.4	89809340.3	82293854.97	7515485.3	17180399464.3	9	228.6
885	6	269900.4	2286	34	10.5	10629.9	88745887.98	81276006.32	7469881.7	17076149467.6	9	228.6
893	0	272186.4	2286	34	8	10566.4	87688769.5	80264491.52	7424278.0	16971899470.8	9	228.6
900	6	274472.4	2286	34	5.5	10502.9	86637984.87	79259310.56	7378674.3	16867649474.1	9	228.6
908	0	276758.4	2286	34	3.5	10452.1	85801917.53	78459726.16	7342191.4	16784249476.7	9	228.6
915	6	279044.4	2286	34	1	10388.6	84762533.81	77465946.11	7296587.7	16679999479.9	9	228.6
923	0	281330.4	2286	33	10.5	10325.1	83729483.94	76872718.33	6856765.6	15674566177.9	8.5	215.9
930	6	283616.4	2286	33	8.5	10274.3	82907604.41	76085294.91	6822309.5	15595799513.7	8.5	215.9
938	0	285902.4	2286	33	6	10210.8	81885955.45	75106716.09	6779239.4	15497341183.5	8.5	215.9
945	6	288188.4	2286	33	3.5	10147.3	80870640.34	74134471.11	6736169.2	15398882853.2	8.5	215.9
953	0	290474.4	2286	33	1.5	10096.5	80062948.62	73361235.5	6701713.1	15320116189.0	8.5	215.9
960	6	292760.4	2286	32	11	10033	79059034.43	72400391.44	6658643.0	15221657858.7	8.5	215.9
968	0	295046.4	2286	32	9	9982.2	78260463.44	71636276.56	6624186.9	15142891194.5	8.5	215.9
975	6	297332.4	2286	32	6.5	9918.7	77267950.16	70686833.43	6581116.7	15044432864.3	8.5	215.9
983	0	299618.4	2286	32	4.5	9867.9	76478499.91	69931839.28	6546660.6	14965666200.0	8.5	215.9
988	0	301142.4	1524	32	3	9829.8	75889072.44	68993797.06	6895275.4	10508399672.4	9	228.6
Deduct:												
Gas Inlet			8636	18	9	5715				30086649504.0	24	609.6
Gas Inlet			8636	18	9	5715				30086649504.0	24	609.6
Truck Access			3657.6	10	0	3048				6796043182	24	609.6
Totals												
Volume										2389257456503.4	mm3	
Volume										2389.3	m3	
Mass										5758.1	tonne	

LIDDELL PS CHIMNEY - BRICK LINER MASS CALCULATIONS

RL Height			Segment Height	Outside Diameter			Outside Area	Inside Area	Wall Area	Wall Volume	Wall Thickness	
Ft	In.	mm	mm	ft	in	mm	mm2	mm2	mm2	mm3	In.	mm
434	0	132283.2	0	61	-56	17170.4	231553157	231553157	0.0	0.0	0	0
437	0	133197.6	914.4	60	-47.5	17081.5	229161624.3	229161624.3	0.0	0.0	0	0
441	6	134569.2	1371.6	60	-52.5	16954.5	225766684.2	225766684.2	0.0	0.0	0	0
449	0	136855.2	2286	59	-49.5	16725.9	219719637.2	219719637.2	0.0	0.0	0	0
456	8	139192	2336.8	58	-46	16510	214083909.9	214083909.9	0.0	0.0	0	0
464	2	141478	2286	58	-54.5	16294.1	208521401.9	196983672.6	11537729.3	26375249177.6	9	228.6
471	8	143764	2286	57	-50	16103.6	203674111.5	192273193.2	11400918.3	26062499187.4	9	228.6
479	2	146050	2286	56	-46.5	15887.7	198249427.9	187003562.1	11245865.8	25708049198.4	9	228.6
482	11	147193	1143	56	-51.5	15760.7	195092640.3	183937981.8	11154658.4	12749774602.5	9	228.6
488	0	148742.4	1809.4	56	-56	15646.4	192273193.2	181200621.4	11072571.8	17155842798.4	9	228.6
495	6	151028.4	2286	55	-50	15494	188545853	183023248.2	5522604.8	12624674606.4	4.5	114.3
503	0	153314.4	2286	54	-46.5	15278.1	183327906	177882827.5	5445078.6	12447449611.9	4.5	114.3
510	6	155600.4	2286	53	-39.5	15151.1	180292728.2	174893253.3	5399474.9	10939336141.9	4.5	114.3

518	0	157886.4	2286	53	-45.5	14998.7	176683957.6	171339207.1	5344750.5	12218099619.0	4.5	114.3
525	6	160172.4	2286	52	-41	14808.2	172224298.4	166947953.4	5276345.0	12061724623.9	4.5	114.3
533	0	162458.4	2546	52	-48.5	14617.7	167821643.8	162613704.3	5207939.5	11905349628.8	4.5	114.3
540	6	164744.4	2286	51	-44	14427.2	163475993.7	158336459.8	5139534.0	11748974633.7	4.5	114.3
548	0	167030.4	2286	50	-39	14249.4	159471484.5	154395795.7	5075688.8	11603024638.2	4.5	114.3
555	6	169316.4	2546	50	-46	14071.6	155516632.7	150504789	5011843.7	11457074642.8	4.5	114.3
563	0	171602.4	2286	49	-33	14097	156078571.2	151057606.8	5020964.4	11477924642.1	4.5	114.3
570	6	173888.4	2286	49	-40	13919.2	152166282.8	147209163.5	4957119.3	11331974646.7	4.5	114.3
578	0	176174.4	2546	48	-34.5	13754.1	148577907.1	143680072.6	4897834.5	11196449650.9	4.5	114.3
585	6	178460.4	2286	48	-40.5	13601.7	145303563.4	140460453.3	4843110.1	11071349654.8	4.5	114.3
593	0	180746.4	2286	47	-31	13538.2	143950021	139129712.8	4820308.2	11019224656.4	4.5	114.3
600	6	183032.4	2546	47	-37	13385.8	140727361.5	135961777.6	4765583.8	10894124660.3	4.5	114.3
608	0	185318.4	2286	46	-30.5	13246.1	137805306.1	133089886.3	4715419.8	10779449663.9	4.5	114.3
615	6	187604.4	2286	46	-36.5	13093.7	134652572.2	129991876.8	4660695.4	10654349667.8	4.5	114.3
623	0	189890.4	2546	45	-30	12954	131794615.3	127184084	4610531.4	10539674671.4	4.5	114.3
630	6	192176.4	2286	45	-35.5	12814.3	128967314.3	124406946.9	4560367.3	10424999675.0	4.5	114.3
638	0	194462.4	2286	44	-28.5	12687.3	126423642.7	121908879.1	4514763.6	10320749678.2	4.5	114.3
645	6	196748.4	2546	44	-34	12547.6	123654866.4	119190266.8	4464599.6	10206074681.8	4.5	114.3
653	0	199034.4	2286	43	-21	12573	124156000.1	119682279.7	4473720.3	10226924681.1	4.5	114.3
660	6	201320.4	2286	43	-26	12446	121660465.7	117232349.1	4428116.7	10122674684.4	4.5	114.3
668	0	203606.4	2546	43	-30.5	12331.7	119436146.6	115049073.2	4387073.4	10028849687.3	4.5	114.3
675	6	205892.4	2286	42	-23	12217.4	117232349.1	112886319	4346030.0	9935024690.2	4.5	114.3
683	0	208178.4	2286	42	-28	12090.4	114807753.8	110507327.4	4300426.4	9830774693.5	4.5	114.3
690	6	210464.4	2546	41	-20.5	11976.1	112647279.8	108387896.7	4259383.1	9736949696.4	4.5	114.3
698	0	212750.4	2286	41	-24.5	11874.5	110744086.5	106521186.3	4222900.1	9653549699.0	4.5	114.3
705	6	215036.4	2286	41	-29	11760.2	108622375.6	104440518.8	4181856.8	9559724701.9	4.5	114.3
713	0	217322.4	2546	40	-17	11760.2	108622375.6	104440518.8	4181856.8	9559724701.9	4.5	114.3
720	6	219608.4	2286	40	-21	11658.6	106753638.4	102608264.5	4145373.9	9476324704.5	4.5	114.3
728	0	221894.4	2286	40	-24	11582.4	105362726.4	101244714.7	4118011.7	9413774706.5	4.5	114.3
735	6	224180.4	2546	39	-15.5	11493.5	103751523.3	99665434.16	4086089.1	9340799708.8	4.5	114.3
743	0	226466.4	2286	39	-19.5	11391.9	101925349.5	97875743.34	4049606.2	9257399711.4	4.5	114.3
750	6	228752.4	2286	39	-23	11303	100340748.5	96323064.95	4017683.6	9184424713.6	4.5	114.3
758	0	231038.4	2546	39	-26.5	11214.1	98768561.92	94782800.89	3985761.0	9111449715.9	4.5	114.3
765	6	233324.4	2286	38	-18	11125.2	97208789.62	93254951.16	3953838.5	9038474718.2	4.5	114.3
773	0	235610.4	2286	38	-21.5	11036.3	95661431.66	91739515.77	3921915.9	8965499720.5	4.5	114.3
780	6	237896.4	2546	38	-25	10947.4	94126488.02	90236494.71	3889993.3	8892524722.7	4.5	114.3
788	0	240182.4	2286	37	-16	10871.2	92820702.85	88958071.74	3862631.1	8829974724.7	4.5	114.3
795	6	242468.4	2286	37	-18.5	10807.7	91739515.77	87899686.49	3839829.3	8777849726.3	4.5	114.3
803	0	244754.4	2546	37	-21.5	10731.5	90450451.94	86637984.87	3812467.1	8715299728.3	4.5	114.3
810	6	247040.4	2286	37	-24.5	10655.3	89170508.85	85385403.98	3785104.9	8652749730.2	4.5	114.3
818	0	249326.4	2286	36	-15.5	10579.1	87899686.49	84141943.83	3757742.7	8590199732.2	4.5	114.3
825	6	251612.4	2546	36	-18	10515.6	86847635.09	83112694.26	3734940.8	8538074733.8	4.5	114.3
833	0	253898.4	2286	36	-21	10439.4	85593534.08	81885955.45	3707578.6	8475524735.7	4.5	114.3
840	6	256184.4	2286	36	-24	10363.2	84348553.8	80668337.38	3680216.4	8412974737.7	4.5	114.3
848	0	258470.4	2546	35	-14.5	10299.7	83318037.46	79660622.88	3657414.6	8360849739.3	4.5	114.3
855	6	260756.4	2286	35	-17	10236.2	82293854.97	78659242.23	3634612.7	8308724740.9	4.5	114.3
863	0	263042.4	2286	35	-20	10160	81073196.66	77465946.11	3607250.5	8246174742.9	4.5	114.3
870	6	265328.4	2546	35	-22.5	10096.5	80062948.62	76478499.91	3584448.7	8194049744.5	4.5	114.3
878	0	267614.4	2286	35	-25	10033	79059034.43	75497387.56	3561646.9	8141924746.1	4.5	114.3
885	6	269900.4	2286	34	-15.5	9969.5	78061454.08	74522609.04	3538845.0	8089799747.8	4.5	114.3
893	0	272186.4	2546	34	-18	9906	77070207.57	73554164.37	3516043.2	8037674749.4	4.5	114.3
900	6	274472.4	2286	34	-20.5	9842.5	76085294.91	72592053.55	3493241.4	7985549751.0	4.5	114.3
908	0	276758.4	2286	34	-22.5	9791.7	75301925.15	71826925.25	3474999.9	7943849752.3	4.5	114.3
915	6	279044.4	2546	34	-25	9728.2	74328413.4	70876215.35	3452198.1	7891724753.9	4.5	114.3
923	0	281330.4	2286	33	-14.5	9690.1	73747346.6	70308829.65	3438517.0	7860449754.9	4.5	114.3

930	6	283616.4	2286	33	-16.5	9639.3	72976137.82	69555862.33	3420275.5	7818749756.2	4.5	114.3
938	0	285902.4	2546	33	-19	9575.8	72017827.3	68620353.65	3397473.6	7766624757.8	4.5	114.3
945	6	288188.4	2286	33	-21.5	9512.3	71065850.62	67691178.81	3374671.8	7714499759.5	4.5	114.3
953	0	290474.4	2286	33	-23.5	9461.5	70308829.65	66952399.3	3356430.3	7672799760.8	4.5	114.3
960	6	292760.4	2546	32	-14	9398	69368253.89	66034625.38	3333628.5	7620674762.4	4.5	114.3
968	0	295046.4	2286	32	-16	9347.2	68620353.65	65304966.61	3315387.0	7578974763.7	4.5	114.3
975	6	297332.4	2546	32	-18.5	9283.7	67691178.81	64398593.61	3292585.2	7526849765.3	4.5	114.3
983	0	299618.4	2286	32	-20.5	9232.9	66952399.3	63678055.58	3274343.7	7485149766.6	4.5	114.3
988	0	301142.4	1524	32	-23	9169.4	66034625.38	62783083.49	3251541.9	4955349845.5	4.5	114.3
Deduct:												
Gas Inlet			8636	18	9	5715				11282493564.0	9	228.6
Gas Inlet			8636	18	9	5715				11282493564.0	9	228.6
Totals												
Volume										717936444599.7	mm3	
Volume										717.9	m3	
Mass										**1651.3**	**tonne**	

FINAL MASS OF CHIMNEY (CONCRETE SHELL AND BRICK LINER)	**7409.4**	**TONNE**

APPENDIX D – BRICK LINER DENSITY DETAILS

AGL MACQUARIE CHIMNEY STACKS INSPECTION RECORD

(Table updated August 2021)

SUMMARY - CHIMNEY STACKS DETAILS AND DATES AND TYPE OF INSPECTIONS

Power Station	Units	Unit size (MW)	Height (m)	Date comp	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
LIDDELL	1 - 2	2 X 500	168.25	1971							2,3				2		1,2,5								3,5,8
LIDDELL	3 - 4	2 X 500	168.25	1972									3	2	7,2*	1,7									3,5,8
BAYSWATER	1 - 2	2 X 660	250.4	1985										2,3	5		3,5,8		1,7		3,5,8				3,5,8,9
BAYSWATER	3 - 4	2 X 660	250.4	1986											5	1,7	3,5,8				3,5,8	1			3,5,8,9

Power Station	Units	Unit size (MW)	Height (m)	Date comp	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
LIDDELL	1 - 2	2 X 500	168.25	1971							3,5,8					5,8,10		8,10		10	8,10				
LIDDELL	3 - 4	2 X 500	168.25	1972							3,5,8					5,8,10		8,10		10	8,10				
BAYSWATER	1 - 2	2 X 660	250.4	1985							3,5,8					5,8,10		8,10,11		10	8,10				
BAYSWATER	3 - 4	2 X 660	250.4	1986							3,5,8					5,8,10		8,10		10	8,10				

LEGEND

1 Inspection carried out by steeplejack under works order
2 Internal inspection of bottom of the stack
2* Internal inspection of bottom of stack 1st outage after repairs made
3 Helicopter taking photographs of the top of the stack
4 Inspection of the top of the stack
5 External inspection of the concrete shell using high powered telescope
6 Internal inspection by video camera attached to a helium balloon
7 Repairs carried out
8 Thermographic Survey
8# Thermographic Survey and Life Management Study/Update
9 External close-up inspection of the concrete shell using a cherry picker
10 UAV External inspection
11 UAV internal inspection

ALL CHIMNEY STACKS HAVE CONCRETE WINDSHELLS WITH INTERNAL BRICK LININGS

STATION	UNITS	CONSTRUCT BY	BRICK DETAILS			MORTAR	FLASHING (see note 1)
			APPARENT POROSITY	RESISTANCE TO ACIDS	COLD CRUSH STRENGTH		
LIDDELL	1 - 2	TILEMAN	20 - 25 %	-	-	ACID & HEAT RESIST	LEAD
LIDDELL	3 - 4	TILEMAN	20 - 25 %	-	-	ACID & HEAT RESIST	LEAD
BAYSWATER	1 - 2	TILEMAN	NGT 10 %	NLT 99 %	NLT 20 MPa	CERELOX	PTFE
BAYSWATER	3 - 4	TILEMAN	NGT 10 %	NLT 99 %	NLT 20 MPa	CERELOX	PTFE

NGT denotes not greater than. **NLT** denotes not less than **PTFE** denotes fibre glass sandwich material flashing

Note 1: Flashing is material to seal between the overlapping brick lining sections

APPENDIX E – LIDDELL POWER STATION - CHIMNEY GEOMETRY & CONCRETE STRENGTH VERIFICATION MEMORANDUM

WELLANBAH INDUSTRIAL



LIDDELL POWER STATION CHIMNEY GEOMETRY VERIFICATION & CONCRETE STRENGTH TESTING

cma | A DELTA GROUP COMPANY
contracting

25 August 2025 **Document Ref: WI-ENG-2057-006-016-R0**

Ruan Zaayman
CMA Contracting
Project Manager
Mob: 0499 566 496
Email: ruan.zaayman@cmacontracting.com.au

Dear Ruan,

RE: LIDDELL POWER STATION – CHIMNEY GEOMETRY VERIFICATION & CONCRETE STRENGTH TESTING

As part of the Liddell Power Station chimney demolition works, there is a need to confirm the chimney structural geometry and concrete strength in order to ensure the engineering assessment of the demolition methodology is founded upon accurate design input data.

Structural Geometry Verification:

On the 29.07.25 & 8.08.25 Wellanbah Industrial Structural Engineer, Daniel Healy, completed site inspections with the purpose of reviewing the chimney structures geometry against details provided within the drawing set.

As per the drawing set, key features of the structure which were confirmed included:

- Base Diameter of Chimney
- Shell thickness
- Height of internal roof slab
- Geometry of truck access door
- Layout of roof slab support columns and internal beams
- Height to underside of corbel
- Reinforcement layout

Following a review of the structure, it was evident that the layout of key elements matched the details provided within the drawings. In addition, the measurements correlated very well with the values nominated, with measurements typically being within 2-3% of the values nominated on the drawings. It is noteworthy that the discrepancy is attributed to the method of verification, which consisted of a laser distance unit and tape measure. However, based on the nature of the structure, this accuracy is sufficient.

The values measured from site have been collated onto a cross section of each chimney, which is provided in Attachment 1 of this memorandum. Within this drawing, the geometry as noted on the drawings has been included to allow for a cross check of the measured values. The existing drawings have been included as Attachment 2.

It is noteworthy that the geometry / construct of both chimney structures was near identical, with very minor discrepancies in geometry noted, however once again this is likely attributed to the method adopted for taking site measurements.



FIGURE 1 – PHOTO AT BASE OF U1/U2 CHIMNEY



FIGURE 2 – PHOTO AT BASE OF U3/U4 CHIMNEY

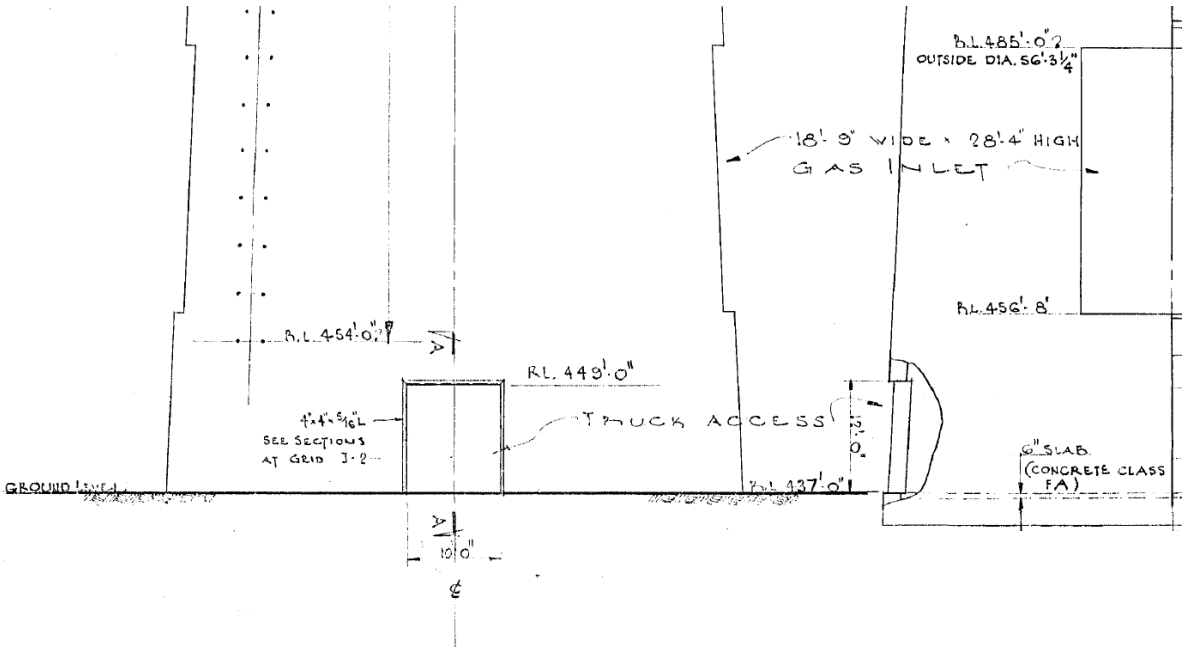


FIGURE 3 – EXTRACT FROM DRAWING LD247906K/3 – TRUCK ACCESS DETAILS



FIGURE 4 – PHOTO OF U1/U2 TRUCK ACCESS DOOR



FIGURE 5 – PHOTO OF U1/U2 EASTERN SIDE ROOF



FIGURE 6 – PHOTO OF U1/U2 INTERNAL ROOF SLAB



FIGURE 7 – PHOTO OF U3/U4 INTERNAL ROOF SLAB

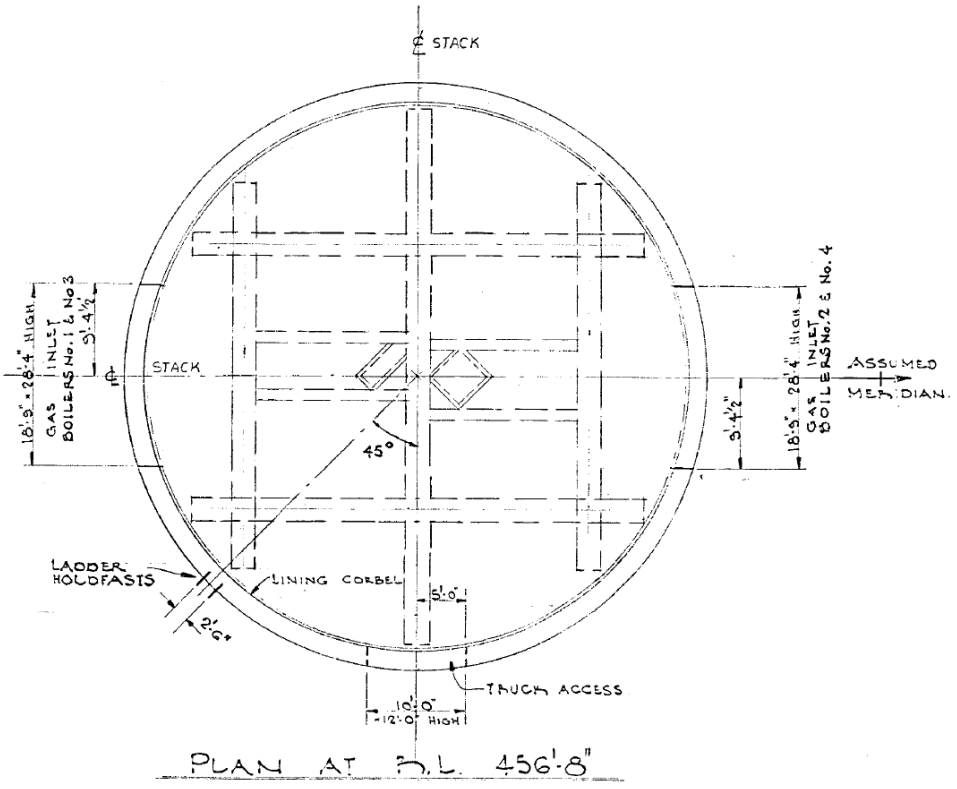


FIGURE 8 – EXTRACT FROM DRAWING LD247906K/3 – ROOF BEAM LAYOUT

Reinforcement Bar Layout:

As per the structural drawings, the reinforcement bar at the base of the chimney consists of the following:

TABLE 1 – LIDDELL POWER STATION CHIMNEYS – REBAR LAYOUT AS PER DRAWINGS

REBAR LOCATION	REBAR ORIENTATION	BAR NOTATION	DIAMETER (mm)	SPACING (mm)
Inside Face	Horizontal Bars	#6 CW @12" c/c	19	304.8
Inside Face	Vertical Bars	#6 CW @12" c/c	19	304.8
Outside Face	Horizontal Bars	#6 CW @ 6" c/c	19	152.4
Outside Face	Vertical Bars	#7 CW @ 9" c/c	22.2	228.6

Note that various areas adjacent to penetrations have reduced spacing, trimmer bars etc., which is not detailed in the above table.

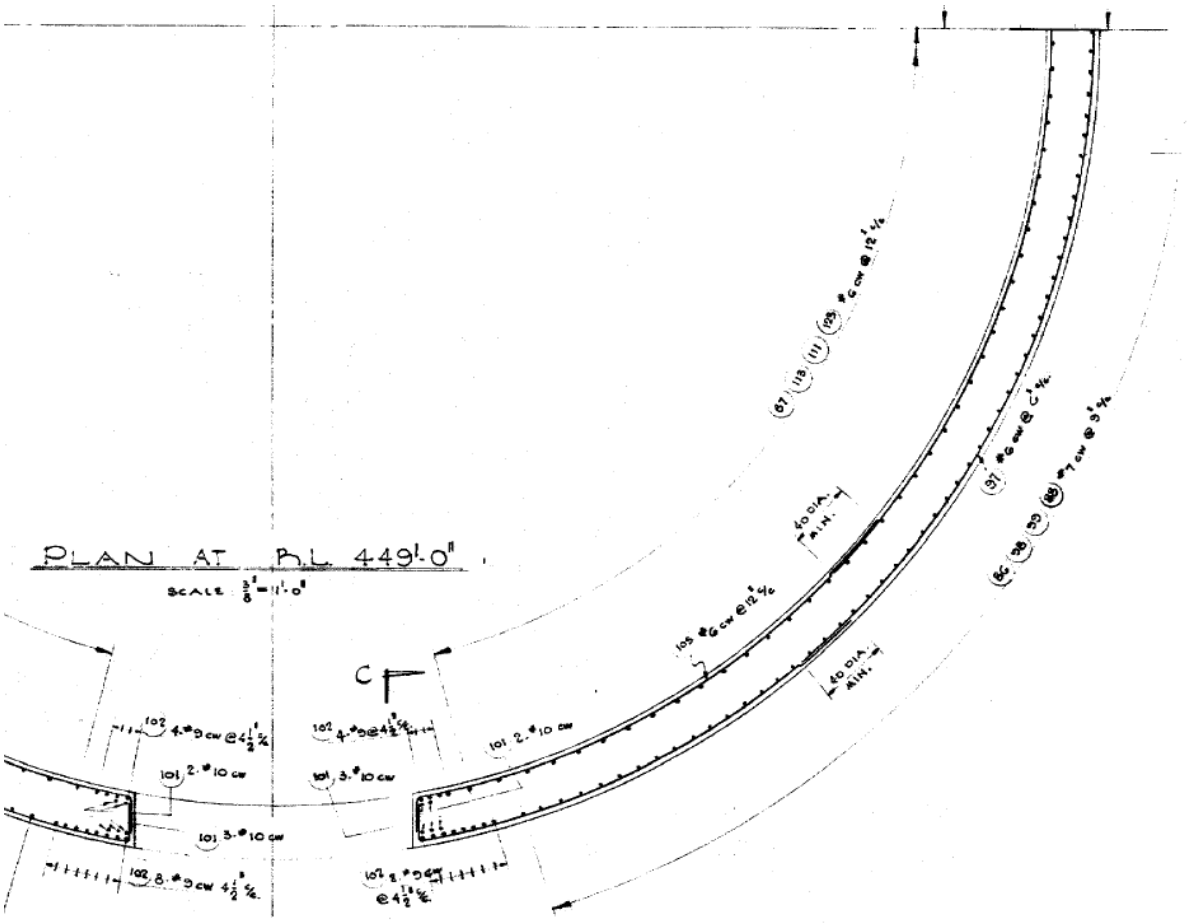


FIGURE 9 – EXTRACT FROM DRAWING LD247910A/1 – REBAR LAYOUT

In order to assess the reinforcement bar layout, concrete scanning was completed at several locations on the external and internal faces of the chimney. The bar diameter is most instances was able to be assessed by measuring bars which passed through core hole locations. However, no cores passed through the external vertical rebar on chimney U1/U2, hence this value was unable to be assessed, and will be confirmed once the break-out panels are removed closer to the blast event.

U1/U2 Chimney Rebar Site Measurements:



FIGURE 10 – U1/U2 EXTERNAL VERTICAL REBAR SPACING ≈ 225mm

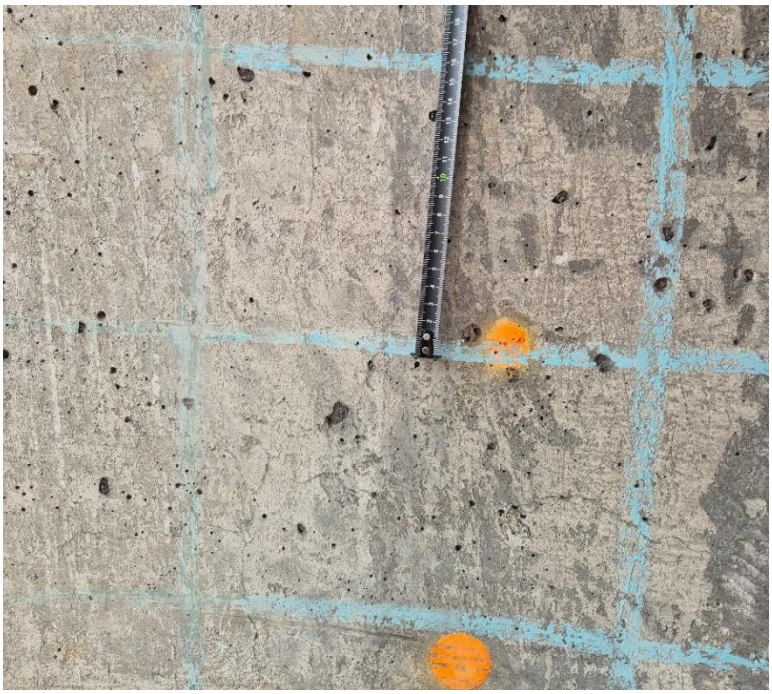


FIGURE 11 – U1/U2 EXTERNAL HORIZONTAL REBAR SPACING ≈ 160mm



FIGURE 12 – U1/U2 EXTERNAL HORIZONTAL REBAR OVERVIEW



FIGURE 13 – U1/U2 EXTERNAL HORIZONTAL REBAR DIAMETER ≈ 19mm



FIGURE 14 – U1/U2 INTERNAL VERTICAL REBAR SPACING ≈ 290mm



FIGURE 15 – U1/U2 INTERNAL HORIZONTAL REBAR SPACING ≈ 295mm



FIGURE 16 – U1/U2 INTERNAL HORIZONTAL REBAR OVERVIEW



FIGURE 17 – U1/U2 INTERNAL HORIZONTAL REBAR DIAMETER ≈ 20mm



FIGURE 18 – U1/U2 INTERNAL VERTICAL REBAR OVERVIEW



FIGURE 19 – U1/U2 INTERNAL VERTICAL REBAR DIAMETER ≈ 18mm

Following the site measurements, it is evident that both the reinforcement diameter and spacing correlate well with the structural drawings, hence we don't anticipate a significant discrepancy between the drawings and the construct of the chimney. Note that the rebar size and spacing will be further verified once the breakout panels are removed from the structure in accordance with the blast design.

TABLE 2 – U1/U2 CHIMNEY REBAR MEASUREMENTS SUMMARY

REBAR LOCATION	REBAR ORIENTATION	MEASURED DIAMETER (mm)	NOTABLE DISCREPENCY	MEASURED SPACING (mm)	NOTABLE DISCREPENCY
Inside Face	Horizontal Bars	20	Nil	295	Nil
Inside Face	Vertical Bars	18	Nil	290	Nil
Outside Face	Horizontal Bars	19	Nil	160	Nil
Outside Face	Vertical Bars	-	N.A	225	Nil

U3/U4 Chimney Rebar Site Measurements:



FIGURE 20 – U3/U4 EXTERNAL VERTICAL REBAR SPACING ≈ 235mm



FIGURE 21 – U3/U4 EXTERNAL HORIZONTAL REBAR SPACING ≈ 150mm



FIGURE 22 – U3/U4 EXTERNAL HORIZONTAL REBAR DIAMETER ≈ 19mm



FIGURE 23 – U3/U4 EXTERNAL VERTICAL REBAR OVERVIEW



FIGURE 24 – U3/U4 EXTERNAL VERTICAL REBAR DIAMETER ≈ 20mm

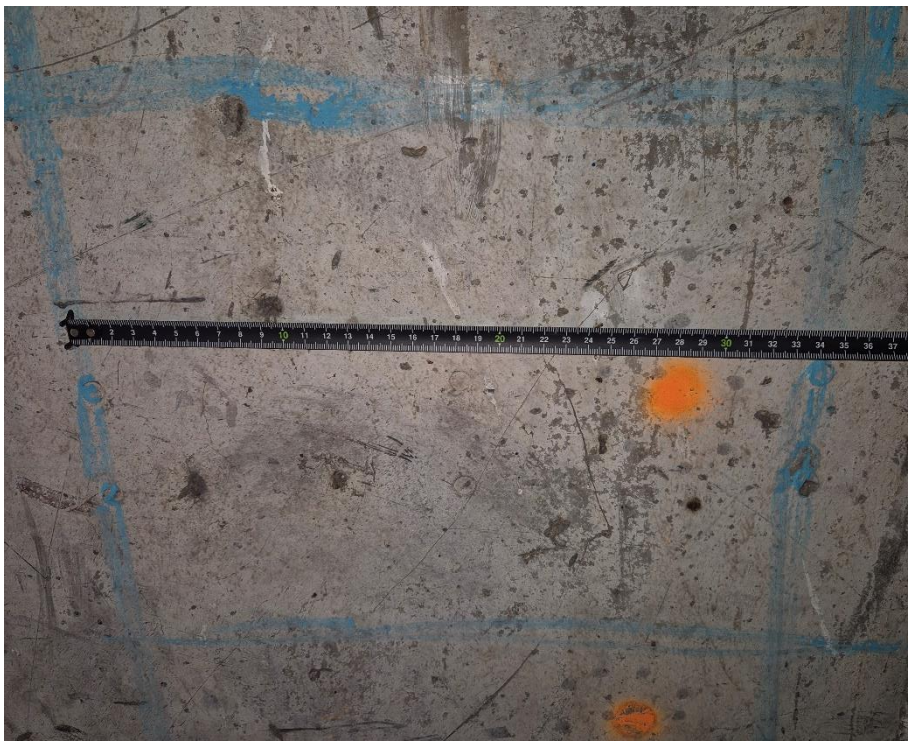


FIGURE 25 – U3/U4 INTERNAL VERTICAL REBAR SPACING ≈ 340mm



FIGURE 26 – U3/U4 INTERNAL HORIZONTAL REBAR SPACING ≈ 280mm



FIGURE 27 – U3/U4 INTERNAL HORIZONTAL REBAR OVERVIEW



FIGURE 28 – U3/U4 INTERNAL HORIZONTAL REBAR DIAMETER ≈ 18mm



FIGURE 29 – U3/U4 INTERNAL VERTICAL REBAR DIAMETER ≈ 18mm

Following the site measurements, it is evident that both the reinforcement diameter and spacing for the U3/U4 chimney also correlate reasonably well with the structural drawings. There were some minor potential discrepancies on the vertical external rebar (20mm measured vs. 22mm on drawings), and internal vertical bar spacing (340mm measured vs. 304.8mm on drawings), however these are not a concern for the blast design. They will also be further verified once the breakout panels are removed from the structure in accordance with the blast design.

TABLE 3 – U3/U4 CHIMNEY REBAR MEASUREMENTS SUMMARY

REBAR LOCATION	REBAR ORIENTATION	MEASURED DIAMETER (mm)	NOTABLE DISCREPENCY	MEASURED SPACING (mm)	NOTABLE DISCREPENCY
Inside Face	Horizontal Bars	18	Nil	280	Nil
Inside Face	Vertical Bars	18	Nil	340	Minor
Outside Face	Horizontal Bars	19	Nil	150	Nil
Outside Face	Vertical Bars	20	Minor	235	Nil

Concrete Strength Testing

In order to determine the strength of the concrete, two types of tests were completed on the Liddell Power Station chimney stacks. This include taking core samples from the chimney for offsite lab unconfined compression tests, as well as in-situ testing via a Schmidt hammer.

The notes on the structural drawings indicate that the concrete specification at the base of the chimneys was for 4000 PSI concrete at 60 days. This is the equivalent of 27.6 MPa concrete. The purpose of the testing was to confirm the minimum concrete grade to inform the structural analysis.

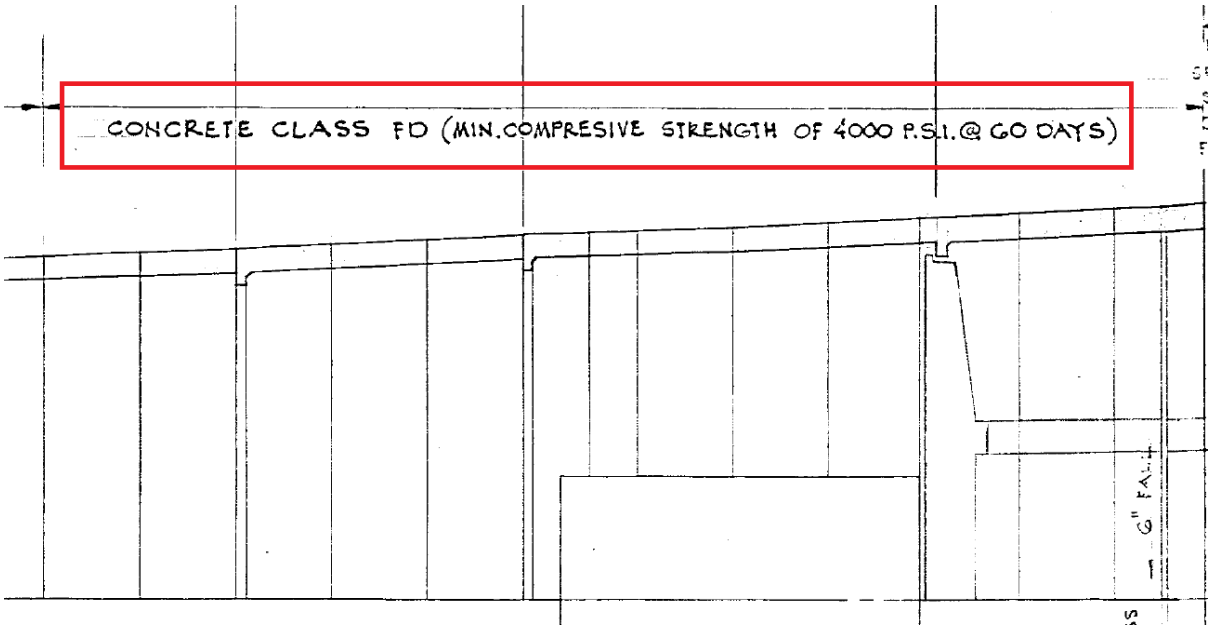


FIGURE 30 – EXTRACT FROM DRAWING LD247906K/3 – CONCRETE GRADE – 4000 PSI

Lab Test Results:

Core samples were taken from two locations per chimney (refer to Attachment 3), and analysed at Coffey Testing NATA certified laboratory (accreditation number 431). A summary of the results of these tests is provided in Table 2 below, with the lab report provided in Attachment 4.

TABLE 4 – COMPRESSION TEST RESULTS SUMMARY

SPECIMEN ID NO.	CHIMNEY	DATE OF TEST	CORE STRENGTH (MPa)	CORRECTED COMPRESSIVE STRENGTH (MPa)	CORE LOCATION
NEWC5177A	U1/U2	16.06.2025	30.5	30.5	S1C1
NEWC5177B	U1/U2	16.06.2025	30.5	30.5	S1C2
NEWC5177C	U3/U4	16.06.2025	24.5	24.5	S2C3
NEWC5177D	U3/U4	16.06.2025	28.0	28.0	S2C4

The results for the compression tests on the samples ranged from a low of 24.5 MPa to a high of 30.5 MPa. The lower bound sample represents a 3.1 MPa reduction to the specified concrete grade on the drawings.

Note that a set of samples were taken prior to this test, however the results were deemed void due to damage identified in the specimens following extraction / transport to the laboratory.

In-situ Test Results:
Due to the magnitude of the surface area of the chimneys, secondary in-situ testing was completed to both verify the results of the laboratory testing, and to evaluate general consistency of strength around the circumference of the chimneys. To achieve this, a regime of Schmidt Hammer Hardness Testing was completed on both chimney structures. The results reports and locations of tests are provided in Attachments 5 – 8, with the results summarised on the below tables.

TABLE 5 – SCHMIDT HAMMER TEST RESULTS SUMMARY – U1/U2 CHIMNEY

CHIMNEY	LOCATION	TEST NUMBER	APPARENT COMPRESSIVE TEST READING (MPa)	LOCATION	TEST NUMBER	APPARENT COMPRESSIVE TEST READING (MPa)
U1/U2	Inside Face	1	52	Outside Face	1	38
		2	54		2	38
		3	52		3	40
		4	55		4	39
		5	45		5	49
		6	46		6	50
		7	47		7	47
		8	47		8	44
		9	47		9	41
		10	38		10	39
		11	44		11	41
		12	52		12	39
		13	47		13	43
		14	44		14	43
		15	55		15	39
		16	49		16	30
		17	51		17	44
		18	43		18	44
					19	45
					20	43
					21	52
					22	54
					23	51
					24	47

TABLE 6 – SCHMIDT HAMMER TEST RESULTS SUMMARY – U3/U4 CHIMNEY

CHIMNEY	LOCATION	TEST NUMBER	APPARENT COMPRESSIVE TEST READING (MPa)	LOCATION	TEST NUMBER	APPARENT COMPRESSIVE TEST READING (MPa)
U3/U4	Inside Face	1	60	Outside Face	1	49
		2	60		2	49
		3	59		3	47
		4	59		4	46
		5	55		5	46
		6	51		6	50
		7	59		7	44
		8	60		8	49
		9	52		9	52
		10	57		10	54
		11	34		11	49
		12	44		12	51
		13	39		13	52
		14	52		14	47
		15	59		15	46
		16	54		16	46
		17	59		17	51
		18	59		18	49
		19	60		19	47
		20	60		20	47
		21	44		21	54
		22	55		22	57

As per the above results, it is evident that the compressive strength of the concrete is reasonably consistent for the structures. In addition, the testing resulted in a lower bound strength of 30 MPa, which as a single test hit on Chimney U1/U2, with the remaining results all exceeding 38 MPa.

In addition, the upper bound strength results reached 60 MPa, at numerous locations. Based on the hammer test results in combination of the laboratory compression test results, it is recommended that the engineering analysis of the blast / collapse design consider the possibility that the concrete strength may be as low as 24.5 MPa, and as high as 60 MPa. This is critical in ensuring that adequate integrity of the structures is maintained during the preparation works, but also that following the blast event, the structures are adequately weakened to cause rotation and subsequent collapse.

Summary:

In summary, the site investigations determined that the geometry of the Liddell Power Station Chimney Stacks matched the details provided within the relevant structural drawings. It was determined that there is potential that the concrete strength of chimney U3/U4 is 3.1 MPa lower than that specified 27.6 MPa strength, and this needs to be considered in finalising the detailed structural analysis of the demolition method.

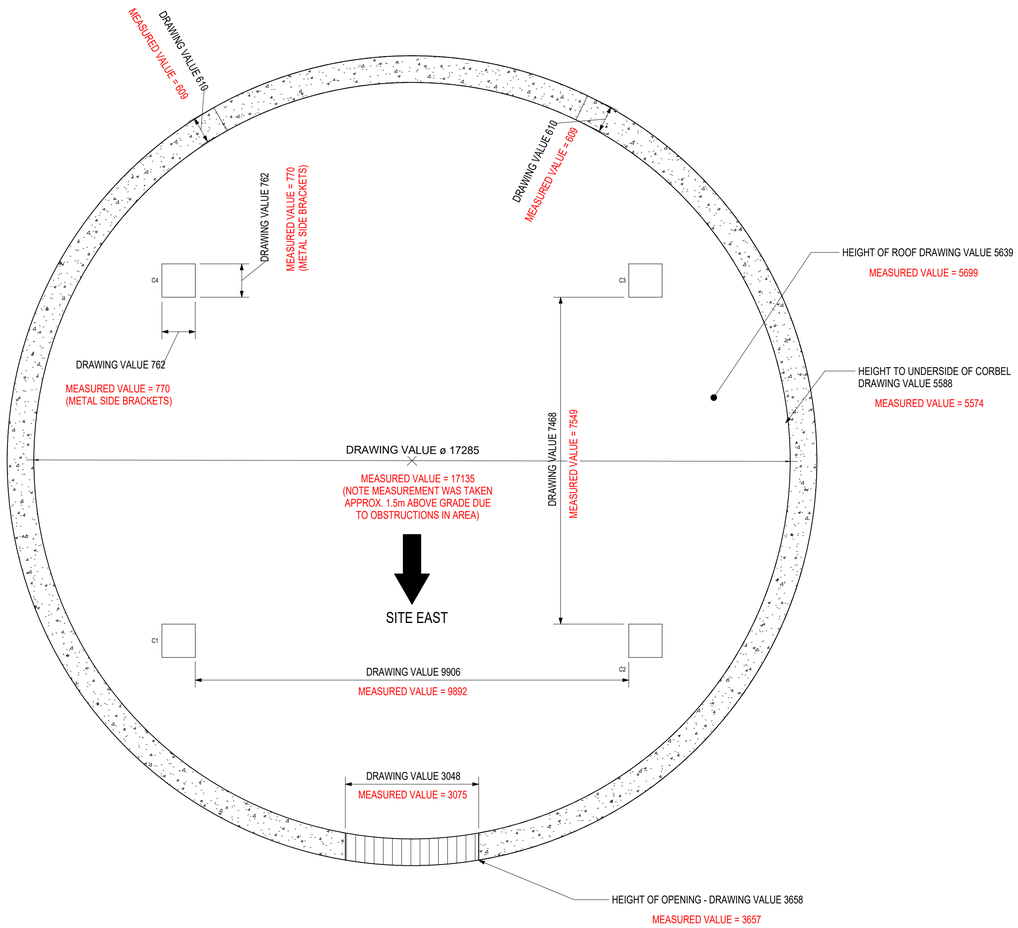
Should you require any further information or clarification regarding this assessment, please feel free to contact the undersigned at your earliest convenience.

Kind regards,

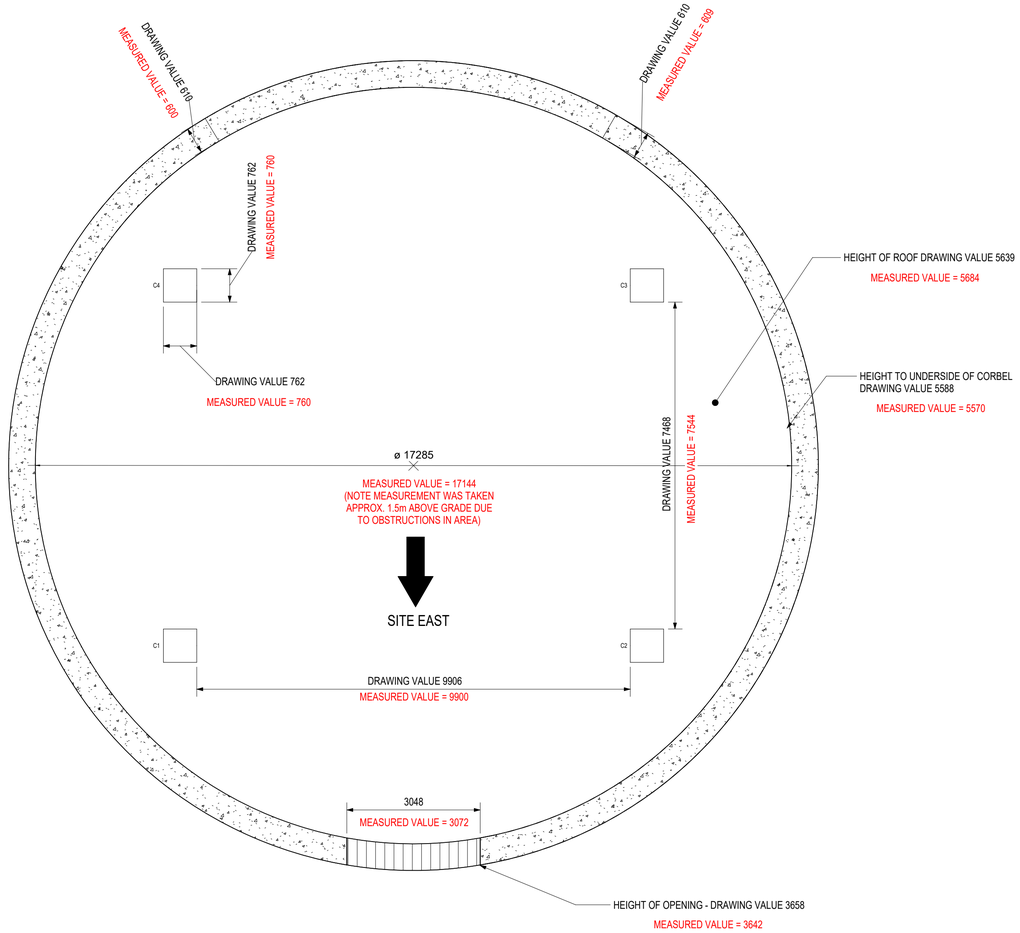


Daniel Healy
DIRECTOR
Wellanbah Industrial
Mob: +61 431 164 748
Email: daniel.healy@wied.com.au

ATTACHMENT 1 – SITE MEASUREMENTS



CHIMNEY BASE SECTION - U1/U2
SCALE 1 : 70



CHIMNEY BASE SECTION - U3/U4
SCALE 1 : 70

NOTES:
1. SITE MEASUREMENTS WERE TAKEN DURING AN INSPECTION COMPLETED ON THE 29.07.2025 BY WELLANBAH STRUCTURAL ENGINEER DANIEL HEALY.
2. ALL DIMENSIONS PROVIDED ARE IN MILLIMETERS

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	ISSUED FOR INFORMATION	DH	DH	-	31.07.25

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Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY - SITE MEASUREMENTS**

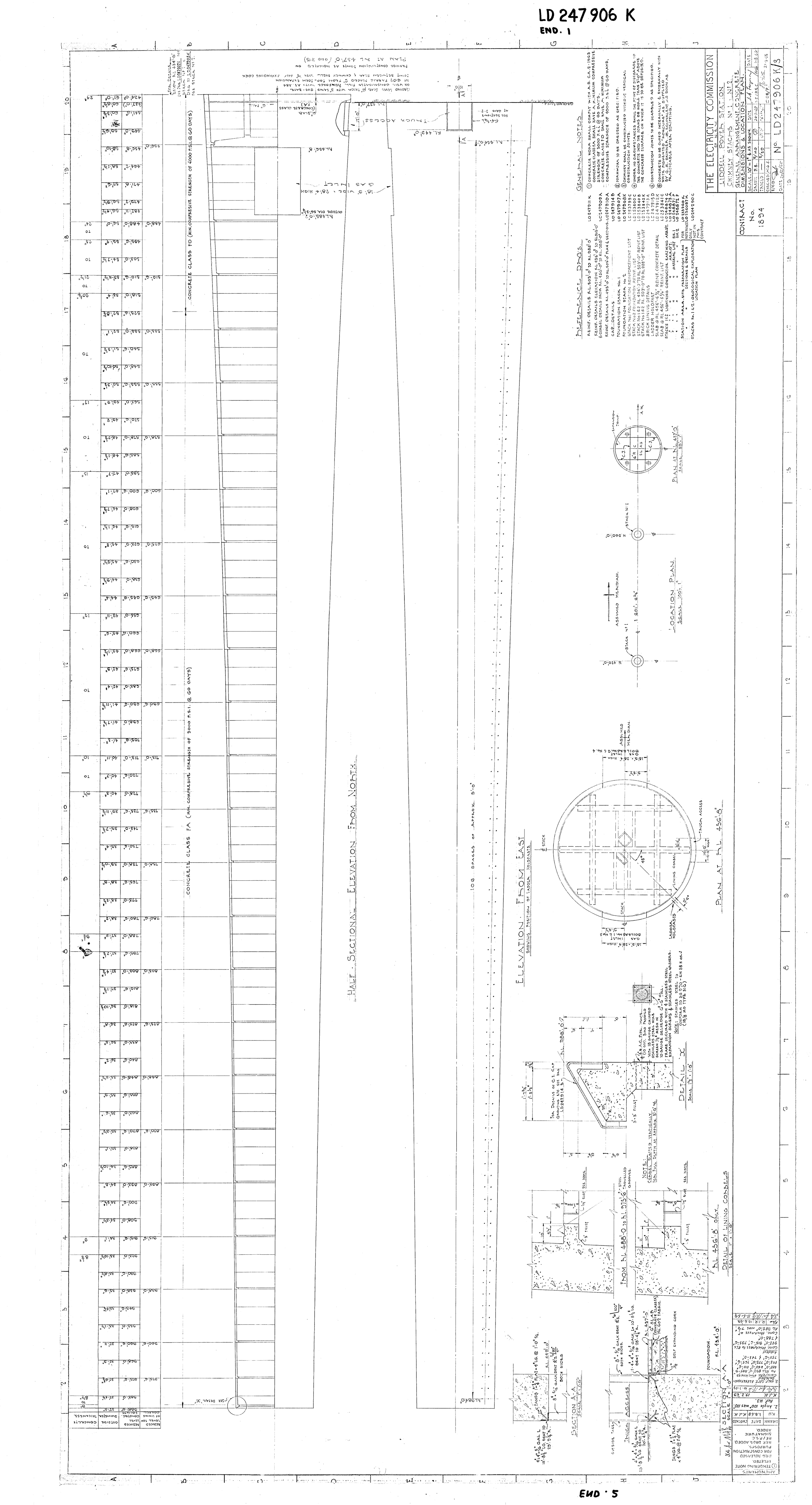
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Rev: A

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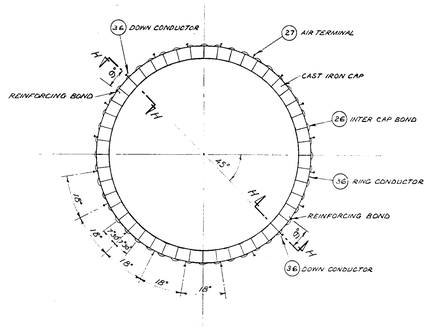
ATTACHMENT 2 – EXISTING STRUCTURAL DRAWINGS

LD 247906 K

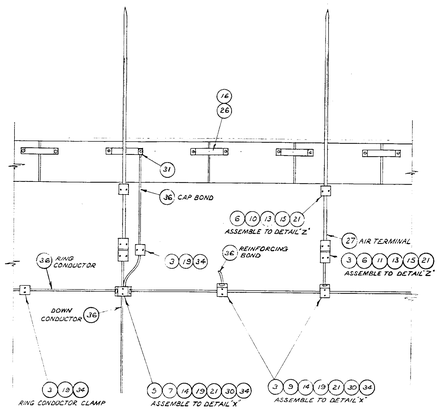
END. 1



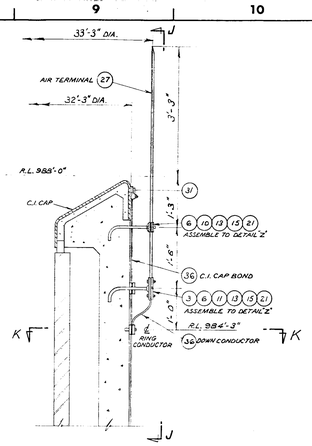
END. 5



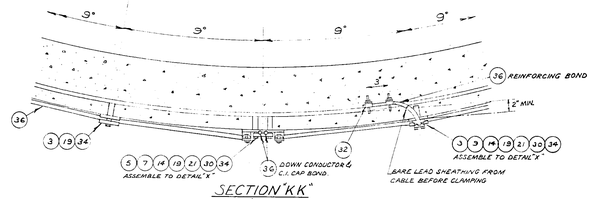
PLAN "AA"
SCALE: 1/8 IN. = 1FT.
R.L. 988'-0"



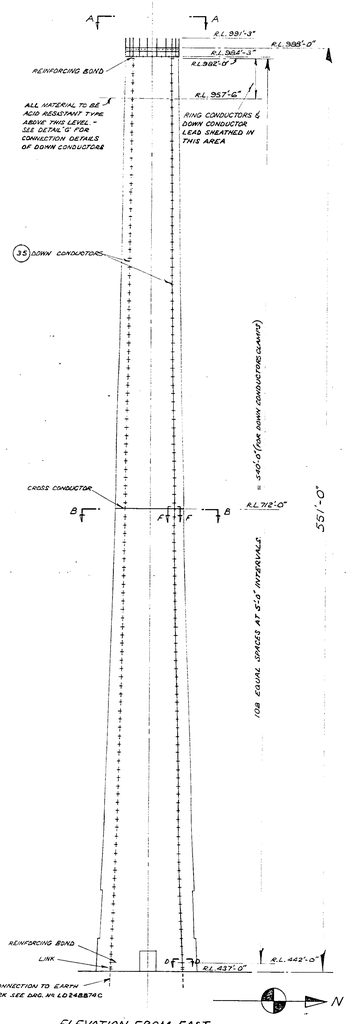
ELEVATION "JJ"
SCALE: 1/8 IN. = 1FT.



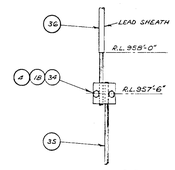
SECTION "HH"
SCALE: 1/8 IN. = 1FT.



SECTION "KK"
SCALE: 1 1/8 IN. = 1FT.
R.L. 984'-6"

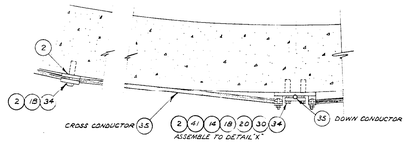


ELEVATION FROM EAST
SCALE: 1/32 IN. = 1FT.

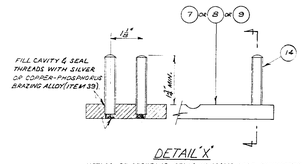


DETAIL "G"
SCALE: 1 1/2 IN. = 1FT.

METHOD OF CONNECTING DOWN CONDUCTORS AT COMMENCEMENT OF LEAD SHEATH.



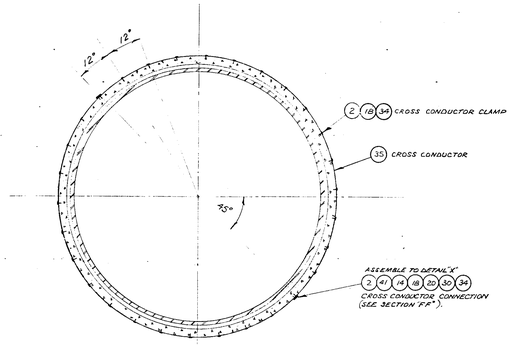
SECTION "FF"
SCALE: 1 1/2 IN. = 1FT.
R.L. 712'-0"



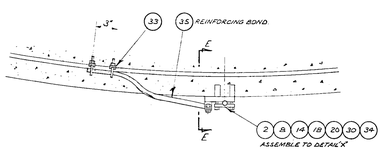
DETAIL "X"

METHOD OF SECURING STUDS IN CLAMP BASE CONNECTORS.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE

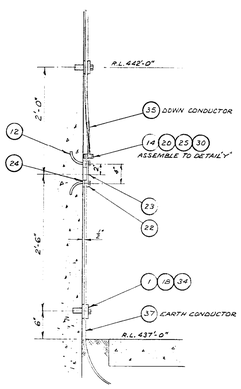
FILL CAVITY & SEAL THREADS WITH SILVER OR COPPER-PHOSPHORUS BRAZING ALLOY (ITEM 39)



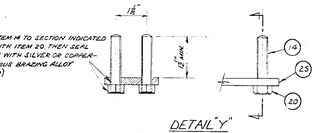
PLAN "BB"
SCALE: 1/16 IN. = 1FT.
R.L. 712'-0"



SECTION "DD"
SCALE: 1 1/2 INCH 1FT.
R.L. 442'-0"

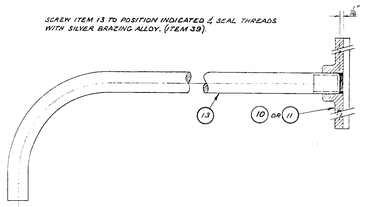


SECTIONAL ELEVATION "EE"
SCALE: 1IN. = 1FT.



DETAIL "Y"

METHOD OF SECURING STUDS IN TEST LINK CABLE ADAPTOR.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE



DETAIL "Z"

METHOD OF SECURING HOOK BOLT IN CLAMP BASE.
NOTE: REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
SCALE: HALF FULL SIZE

REFERENCE DRAWINGS

LD 248874 C - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - EARTHING ARRANGEMENT.
LD 248871 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - MATERIAL LIST - SHEET 1.
LD 248872 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - MATERIAL LIST - SHEET 2.
LD 247906 K - CHIMNEY STACKS N°1 & N°2 - GENERAL ARRANGEMENT - CONCRETE FOUNDATION & PLAN LAYOUT.
LD 247907 A - CHIMNEY STACK N°1 - FOUNDATION.
LD 247908 K - CHIMNEY STACK N°2 - FOUNDATION.
LD 247914 A - CAP DETAILS.

NOTES

1. ITEM Nos. ENCIRCLED THUS (1) REFER TO ITEM Nos. LISTED ON MATERIAL LIST DRGS. Nos. LD 248871 P & LD 248872 P.
2. LEGS OF BOLTS FOR DOWN CONDUCTOR CLAMPING TO BE IN HORIZONTAL PLANE.
   LEGS OF BOLTS FOR ALL EARTH CLAMPING TO BE IN VERTICAL PLANE.
   LEGS OF HOOK BOLTS FOR TEST LINK & AIR TERMINAL TO BE IN VERTICAL PLANE.
3. EXPANDING PLUG TYPE MASONRY ANCHORS, ITEM 34, ARE TO BE SECURED INTO CHIMNEY IN ACCORDANCE WITH MAKER'S STANDARD INSTRUCTIONS.
4. LOWEST BOLTS AT R.L. 437'-6" MUST NOT BE IN ELECTRICAL CONTACT WITH ANY SURROUNDING REINFORCING METAL, ON NO ACCOUNT MUST LEGS OR HOOK BOLTS (FOR TEST LINK) TOUCH OR FORM ELECTRICAL CONNECTION WITH ONE ANOTHER OR WITH REINFORCING METAL ETC.
5. CONDUCTOR CLAMPS & CONNECTORS TO BE SECURELY TIGHTENED ONTO CONDUCTOR. CLAMPS SHALL BE SUFFICIENTLY TIGHT TO SUPPORT EACH CORRESPONDING LENGTH OF CONDUCTOR. CONNECTIONS SHALL POSSESS A STRENGTH IN TENSION OF AT LEAST 7 TONS / SQ. IN.
6. REINFORCING BONDS TO BE FIRMLY CLAMPED TO REINFORCING BAR. BONDING AT TOP OF CHIMNEY TO BE LEAD SHEATHED.
7. LEGS OF HOOK BOLTS (FOR TEST LINK) TO BE PERPENDICULAR & PROJECTING 1/4 IN. MIN. FROM FACE OF CHIMNEY.
8. CLAMPS SPACED ON 5'-0" CENTRES TO SUIT CONCRETE POUR LIFTS OF 5'-0".
9. THE RADIUS OF ANY BEND IN CONDUCTOR MUST NOT BE LESS THAN 8".
10. DOWN CONDUCTORS ABOVE R.L. 957'-6"; RING CONDUCTOR & BONDS AT R.L. 982'-0" TO BE CAPPED WITH LEAD ON STRIPPED ENDS OF CONDUCTOR. CAPPING TO BE WIPED TO CONDUCTOR SHEATHING TO MINIMUM THICKNESS OF LEAD EQUIVALENT TO RADIAL THICKNESS OF SHEATHING.
11. ALL EXPOSED CLAMPING & CONNECTIONS ABOVE R.L. 957'-6" TO BE OVER LEAD SHEATHING.
12. REINFORCING SHALL BE ELECTRICALLY CONTINUOUS FROM R.L. 984'-3" TO THE BASE OF THE STACK. WIRE TIES SHALL BE SUFFICIENT FOR THIS PURPOSE. LADDER HOLDFASTS TO BE IN ELECTRICAL CONTACT WITH REINFORCING WHERE POSSIBLE.

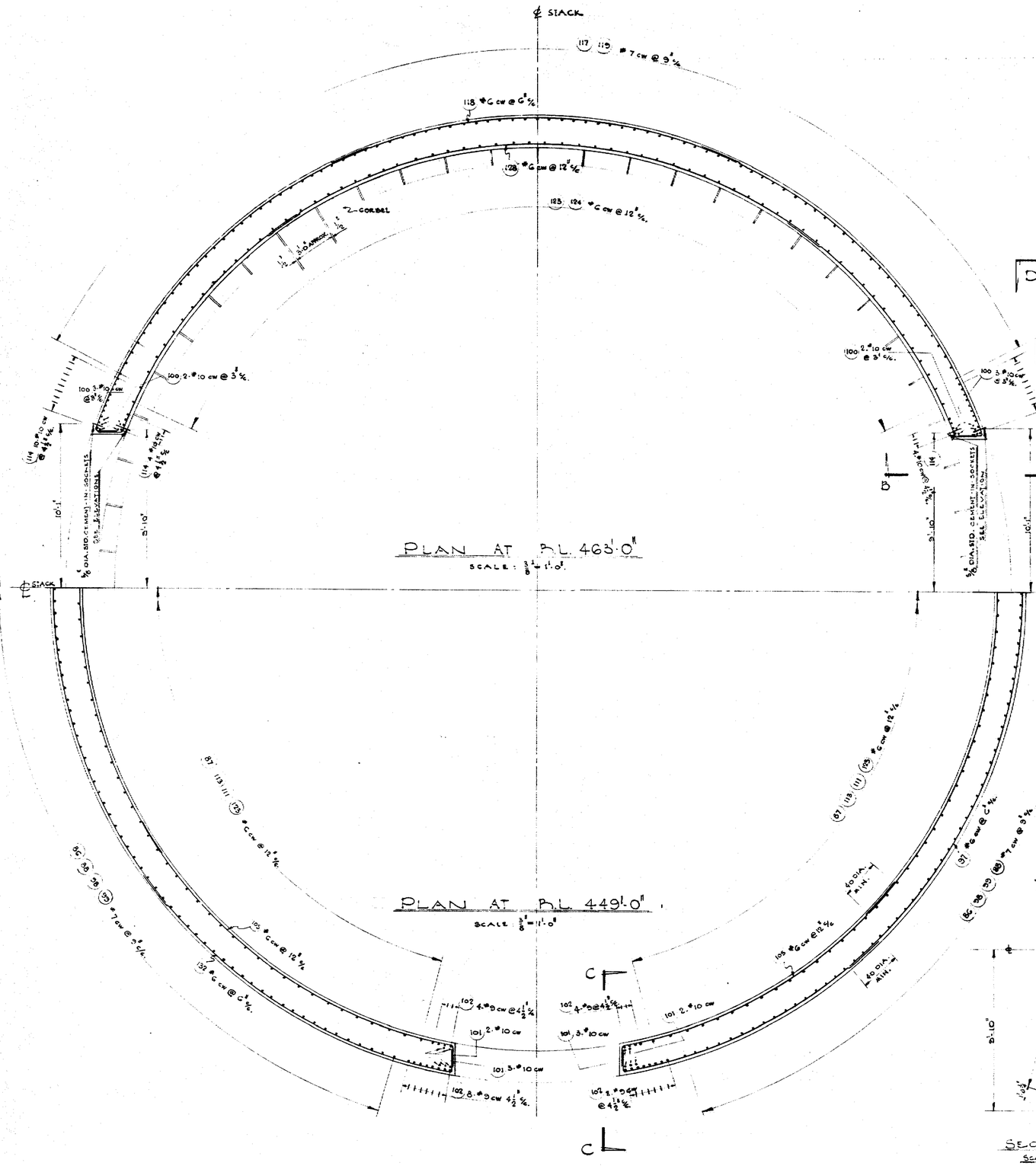
AMENDMENTS		
1. SECTION & DETAILS AMENDED, SHEET SIZE CHANGED, SHEET TITLE SHALL BE, ADDED, DETAIL 'Z' ADDED, REINFORCING BONDS SHOWN, CLAMPS & CONNECTIONS SHOWN, SCALE 0, 16" ADDED, DETAIL 'Y' ADDED, DETAIL 'X' ADDED, REVISED, K.S.W.		
2. NOTE RE TENDERING ADDED		

CONTRACT Nº	
1894	

THE ELECTRICITY COMMISSION OF N.S.W.

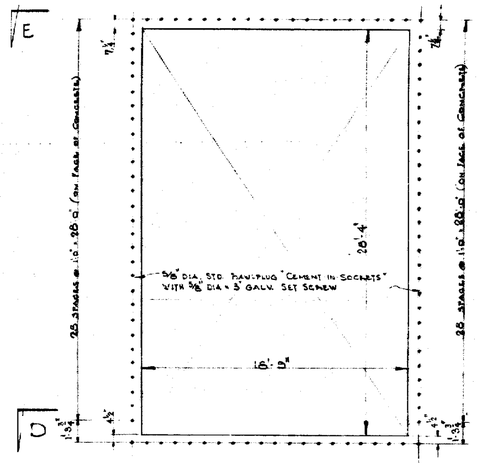
LIDDELL POWER STATION
CHIMNEY STACKS Nº1 & Nº2
LIGHTNING CONDUCTOR ARRANGEMENT

SCALE AS SHOWN				DATE	F.J.A. to H.C.	DATE
DRAWN	K.R.	E/MP		16/3/68	D.C.E./POWER:	1/11/68
TRACED		L.E.S.A.			A.A. Ferguson	21/11/68
CHECKED	S.G.				P.E./CON.	22/11/68
S.E./E.D.O.:						
DATE	13-3-68				LD248873	A/2

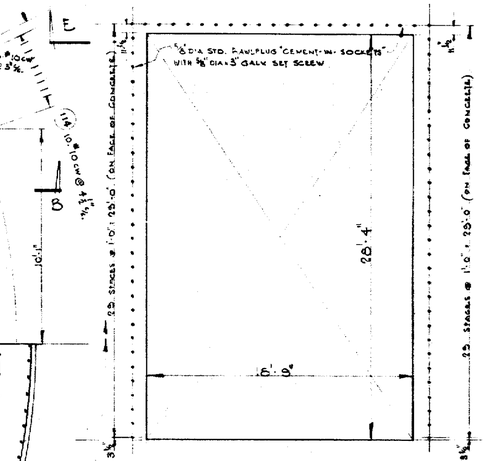


PLAN AT R.L. 463'-0"
SCALE 3/8" = 1'-0"

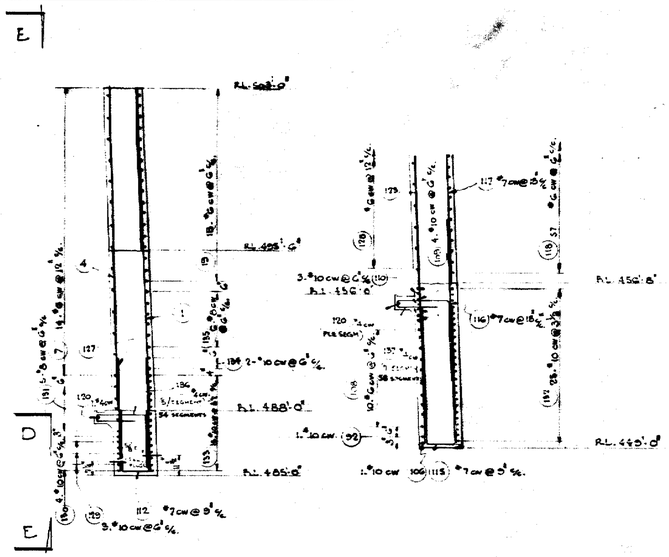
PLAN AT R.L. 449'-0"
SCALE 3/8" = 1'-0"



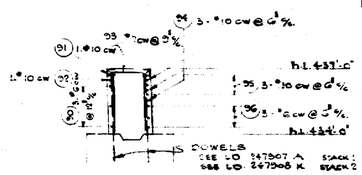
INSIDE ELEVATION GAS INLET OPENINGS.
SCALE ¼" = 1'-0" (DISTORTED)



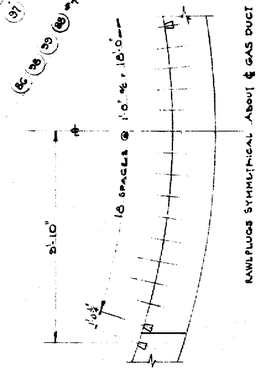
OUTSIDE ELEVATION GAS INLET OPENINGS
SCALE ¼" = 1'-0" (DISTORTED)



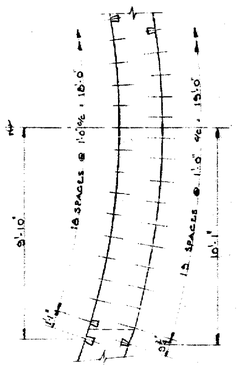
SECTION B-B
SCALE 3/8" = 1'-0"



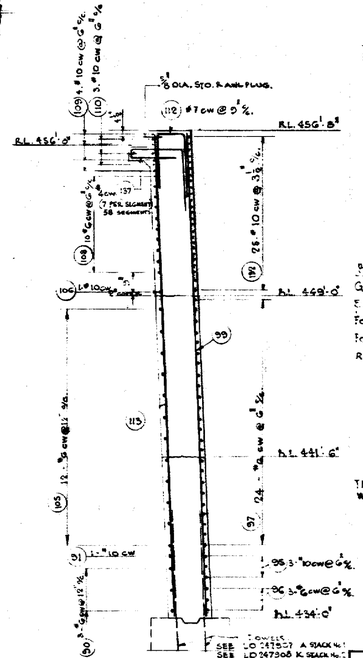
SECTION C-C
SCALE 3/8" = 1'-0"



SECTION D-D
SCALE 3/8" = 1'-0"



SECTION E-E
SCALE 3/8" = 1'-0"



SECTION B-B
SCALE 3/8" = 1'-0"

NOTE:
FOR NOTES SEE DRG. No. LD 247906 K
& DRG. No. LD 247909 A

REFERENCE DRGS.

GENERAL ARRANGEMENT	LD 247906 K
ELEVATION R.L 434'-0" TO 508'-6" & CENBELL DET	LD 247909 A
FOUNDATION STACK N°1	LD 247907 A
FOUNDATION STACK N°2	LD 247908 K
REINFORCING LIST R.L 434'-0" TO R.L 503'-0"	LD 253840 B

THIS DRG. IS TO BE READ IN CONJUNCTION WITH DRG. No. LD 247909 A

DRG. RELEASED FOR CONSTRUCTION
CONTRACT No.
REF. DRGS. ADDED
P.E./PSC. R.E./M.P.
SIGNATURES ADDED.

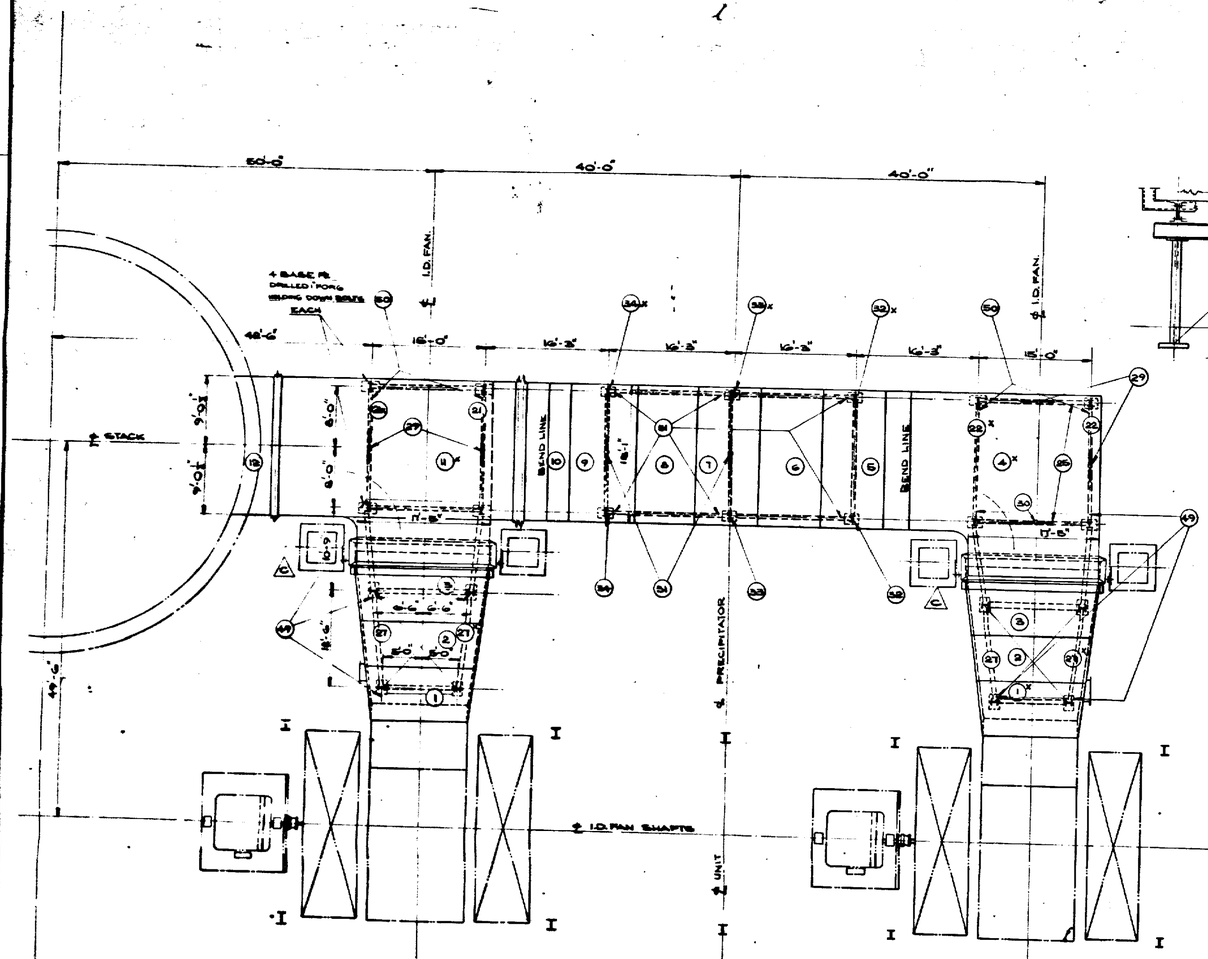
DRAWN	DATE	CHECKED
K.U.	2.8.68	

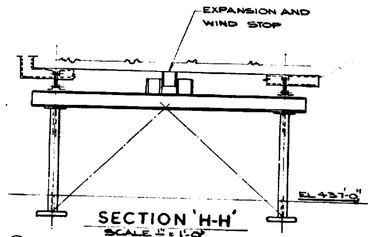
CONTRACT No. 1894

THE ELECTRICITY COMMISSION OF N.S.W.
LIDDELL POWER STATION
CHIMNEY STACKS N°1 & N°2
REINFORCEMENT DETAILS R.L 434'-0" TO R.L 503'-0"
PLAN & SECTIONS

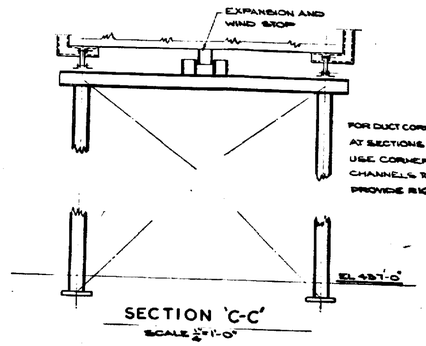
SCALE	AS SHOWN		DATE	DATE
DRAWN	K.U.	R.E./M.P.	8.4.68	5.8.68
TRACED				
CHECKED	G.F.			
DATE	2.8.68			

LD 247910 A/1



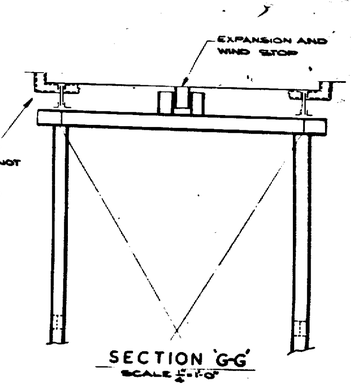


SECTION 'H-H'
SCALE 1" = 1'-0"



FOR DUCT CORNER CONNECTIONS AT SECTIONS 'CC', 'GG' & 'HH' DO NOT USE CORNER PLATES. CHANNELS TO LAP CORNER TO PROVIDE RIGID FRAME.

SECTION 'C-C'
SCALE 1" = 1'-0"



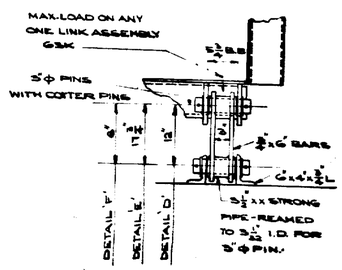
SECTION 'G-G'
SCALE 1" = 1'-0"

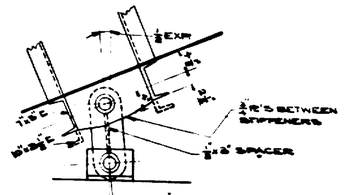
SHACKLE TYPE MOUNTING

MARK N'S	DIMENSION 'V'	N° OFF
49	6"	12
50	17 3/4"	4
51	12"	6

WIND TIE

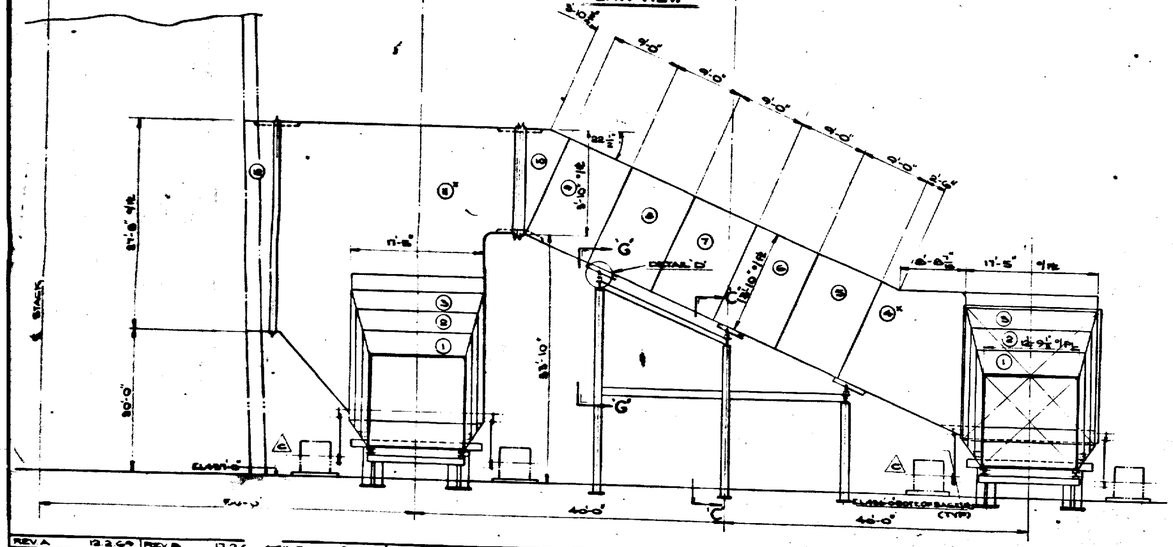
MARK N°	N° OFF
29	4
30	1
31	2



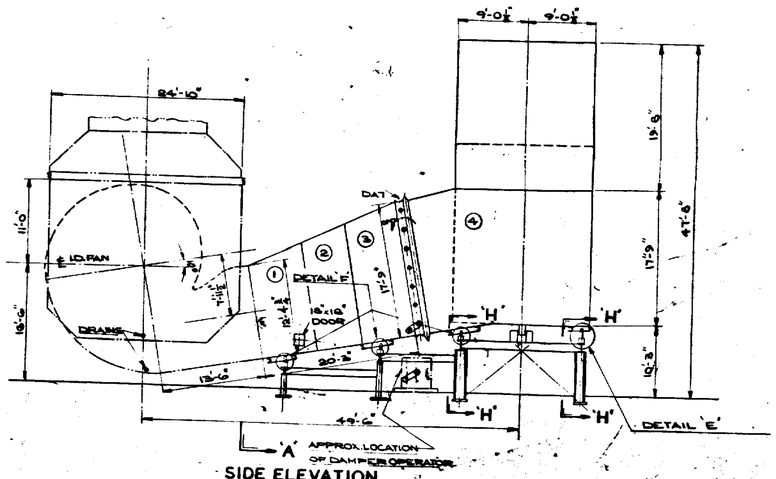


DETAIL 'D'
DETAIL 'E'
DETAIL 'F'
SCALE 1"=1'-0"

PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

NOTES 3RD ANGLE PROJECTION

ONE BOILER SET, AS DRAWN, FOR BOILER N°1
ONE BOILER SET, AS DRAWN, FOR BOILER N°3

MARK N°S TO BE PAINTED ON DUCTING IN BLACK LETTERING ON APPROPRIATE COLOUR PATCH

N°1 BLR	RED	PATCH
N°2 "	WHITE	"
N°3 "	GREEN	"
N°4 BLR	YELLOW	PATCH

REF DRGS

GAS DUCT. I.D. FAN TO STACK. DETAILS SHT1	268/10/5
GAS DUCT. I.D. FAN TO STACK. DETAILS SHT2	268/10/6
GAS DUCT. SUPPORTS.	268/10/7
ARRGT OF I.D. DUCTING FOR BLRS 3 & 4	268/10/4
DETAILS OF DUCTING & SUPPORTS (I.D.)	268/10/1
MATL. LIST (DUCT SCHEDULE 'B')	268/10/3

PAINTING

SURFACE PREPARATION & PAINTING TO BE DONE AT SITE TO N° 21 PAINTING SCHEDULE 29-APR-68. FOR DUCTING ITEM 10 FOR STEELWORK ITEM 1.

REVISED ISSUED	CONTRACT NO.
NOV 570	1600

SUBSTANDARD FOR MICROFILMING

LD257271A/2

THIS DRG WAS REPRODUCED FROM C.E. DRG. N° E732-481-S

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INTERNATIONAL COMBUSTION (AUSTRALIA) LTD.

EC OF N.S.W. - LIDDELL POWER STATION - UNITS 1 & 2

ARRANGEMENT OF GAS DUCTING
I.D. FAN TO STACK.

DRN	C. BROWN	28.11.70
DES	W.K.	27.6.68
PATH	ADS	
SCALE	1/8"=1'-0"	

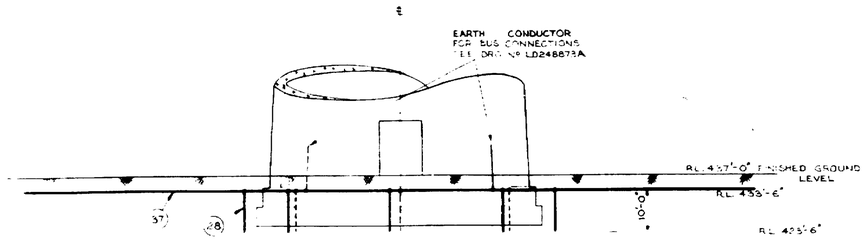
268 10 /2
REV [illegible]

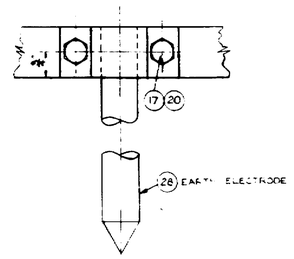
ITEM 11-20

C.E. DRG N° E-935-028-0

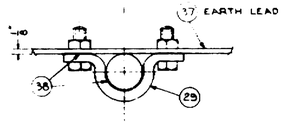
REV	DATE	DESCRIPTION	BY	CHK	APP
A	12.2.69	DIMENSION 249.1" FROM ℄ STACK TO DAMPER ADDED. PT DELETED ALSO DETAIL 'D' REP'ME MODIFIED SEE C.E. TELEX 29/1/69	WK		
B	17.2.69	PAINTING SCHEDULE ADDED	DAB		
C	27.6.69	SECOND CONTROL UNIT ADDED FOR DAMPER D7, SHOWN FOR BLR N° 1 & 2 CESO LETTER 69/27/20, 17.6.69	WK	RHW	
D	22.11.70	DRG TRACED WITHOUT ALTERATION	OB		JS

KODAK 16-11-70

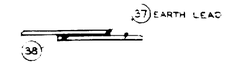




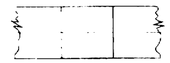
ELEVATION



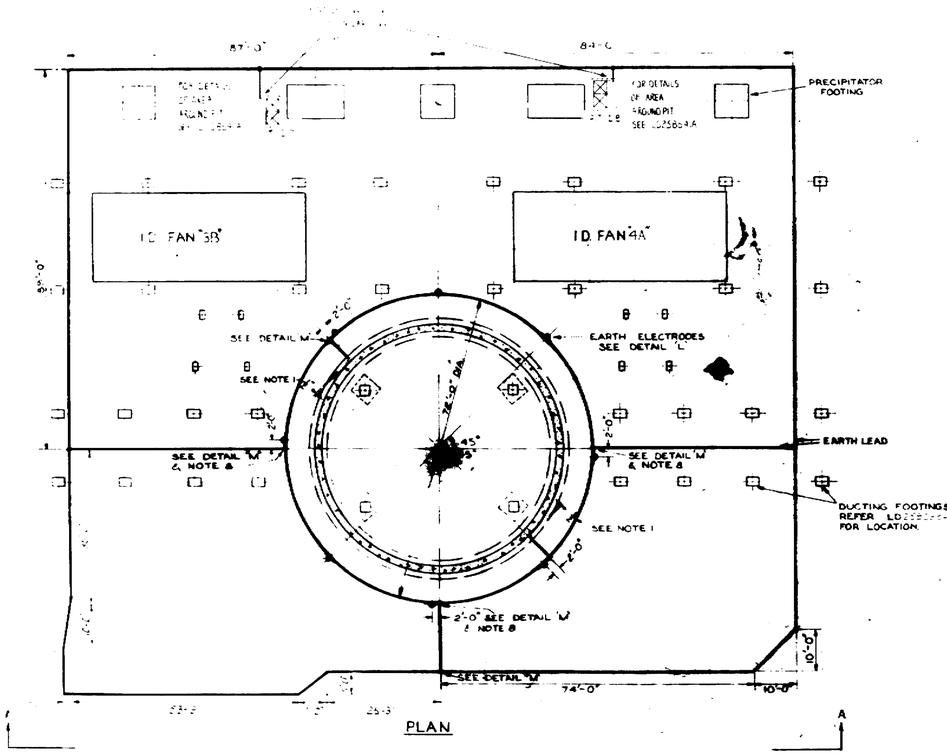
PLAN
DETAIL 'L'



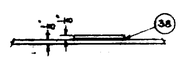
ELEVATION



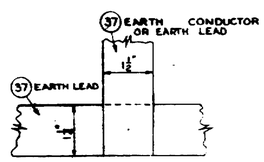
PLAN
DETAIL 'N'



PLAN



ELEVATION



PLAN
DETAIL 'M'

REFERENCE DRAWINGS

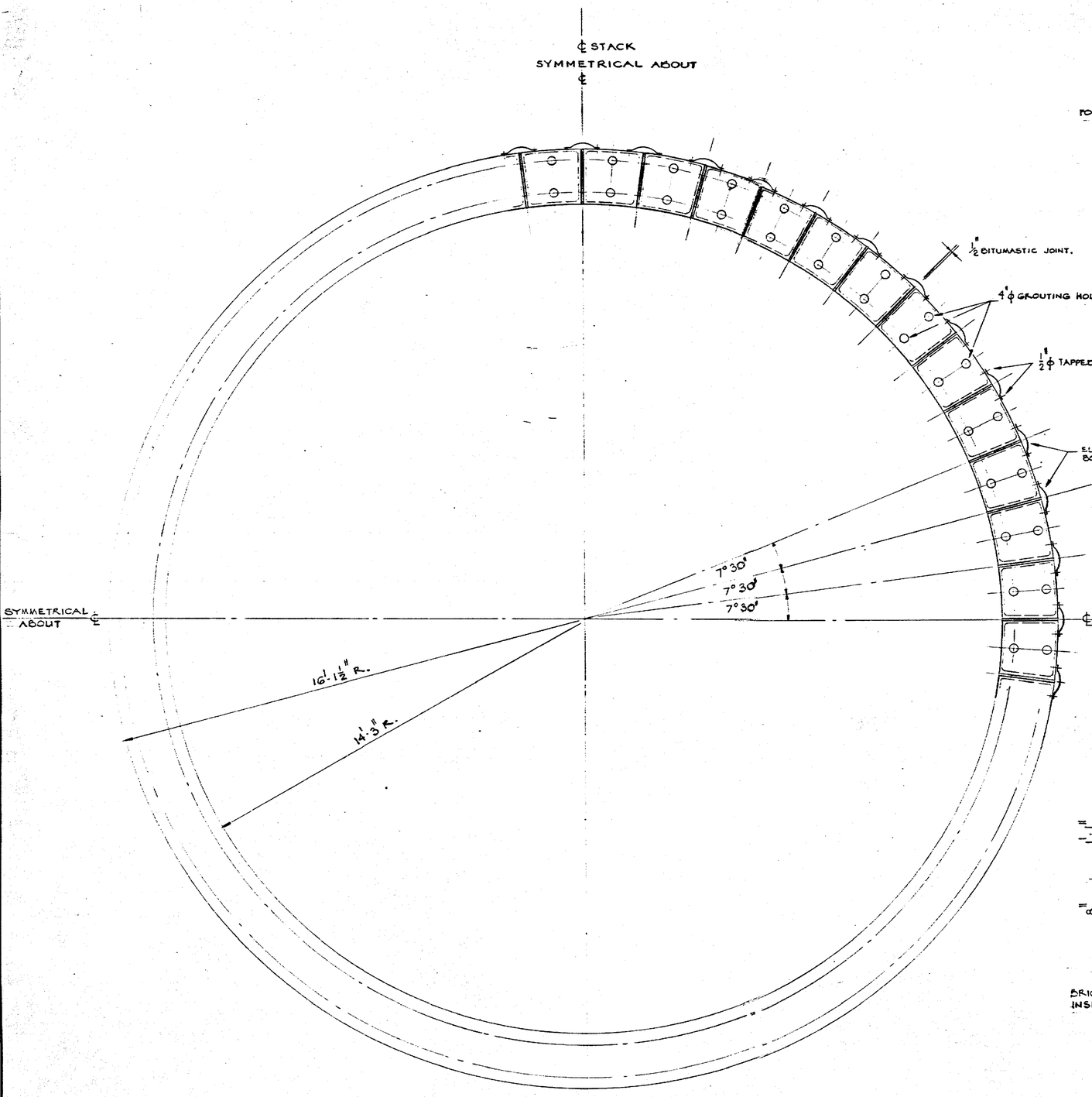
LD247908 K - CHIMNEY STACK N°2 - FOUNDATION
LD248873 A - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR - ARRANGEMENT
LD248871 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 1
LD248872 P - CHIMNEY STACKS N°1 & N°2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 2
LD258640A - BOILERS 3A & 4 - PRECIPITATORS & I.D. FANS AREA - CABLE PITS, TUNNEL & CONDUIT LAYOUT.
LD258641A - " " I.D. FANS 4A & 4B AREA - CABLE PITS & CONDUIT DETAILS
LD258642A - " " " 3A & 3B " " " " "
[illegible] - CHIMNEY STACK N°1 - LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

NOTES.

1. EARTH CONDUCTOR TO BE ½" CLEAR OF & PARALLEL TO FINISHED FACE OF STACK AS INDICATED IN PLAN. EARTH CONDUCTOR TO BE EXTENDED UP TO R.L. 441'-0" FOR EARTHING OF SCAFFOLDING (REINFORCEMENT RE-BARS DURING CHIMNEY CONSTRUCTION) ON COMPLETION OF CHIMNEY CONSTRUCTION, EARTH CONDUCTORS ARE TO BE TERMINATED AT TEST LINK IN ACCORDANCE WITH SECTION "L" OF SPECIFICATION.
2. TEMPORARY LEADS FOR EARTHING OF SCAFFOLDING ETC. DURING CHIMNEY CONSTRUCTION SHALL BE FIRMLY BONDED TO EARTH CONDUCTOR AT R.L. 441'-0". THE EARTH LEAD CONDUCTOR CONCENTRIC TO THE STACK OUTSIDE STACK SHALL BE COMPLETELY COVERED & TIGHTLY PACKED WITH [illegible] MIN. R.L. OF 465'-0" PRIOR TO BONDING OF EARTH CONDUCTOR [illegible]
3. ALL MATING SURFACES OF JOINTS IN DETAIL "L" ARE TO BE [illegible] WITH A CONTINUOUS COATING OF ALLOY BY INTERPOSING STRIPS OF SILVER BRAZING ALLOY RIBBON OR COPPER PHOSPHORUS BRAZING ALLOY RIBBON (SHIM) (TYPE SCH OR CDP) BETWEEN MATING SURFACES BEFORE CLAMPING & BRAZING.
4. EARTH LEAD TO BE FORMED UP FROM LONGEST AVAILABLE LENGTHS OF CONDUIT & JOINED WHEREVER NECESSARY IN ACCORDANCE WITH DETAIL "M" NOTE 11.
5. REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
6. DRIVE TOP OF EARTH ELECTRODES TO RE[illegible] OF THE [illegible]
7. BENDS IN EARTH CONDUCTOR TO BE 6" MIN. [illegible]
8. THE THREE LOCATIONS SHOWN SHOULD [illegible] BEEN CARRIED OUT TO DETERMINE THE [illegible] EARTH TERMINATION NETWORK. (CALCULATED [illegible]
9. ITEM Nos ENCIRCLED THUS ⑨ REFER TO ITEMS LISTED ON DRG. Nos LD248871 & 72 P.
10. IF AN ELECTRODE STRIKES ROCK, A 6" DIA. HOLE IS TO BE [illegible] REQUIRED DEPTH & THE ELECTRODE PLACED [illegible] OF BENTONITE & PLASTER OF PARIS SHALL BE [illegible] A SLURRY & POURED INTO THE HOLE [illegible]
11. ALL JOINTS, SHOWN IN DETAIL "M" & N" [illegible] EITHER SILVER-BRAZING ALLOY OR COPPER [illegible]

M.J.C.			
FLT			G.A.G. 22.12.70
A.S.E.E.A.			LD281230

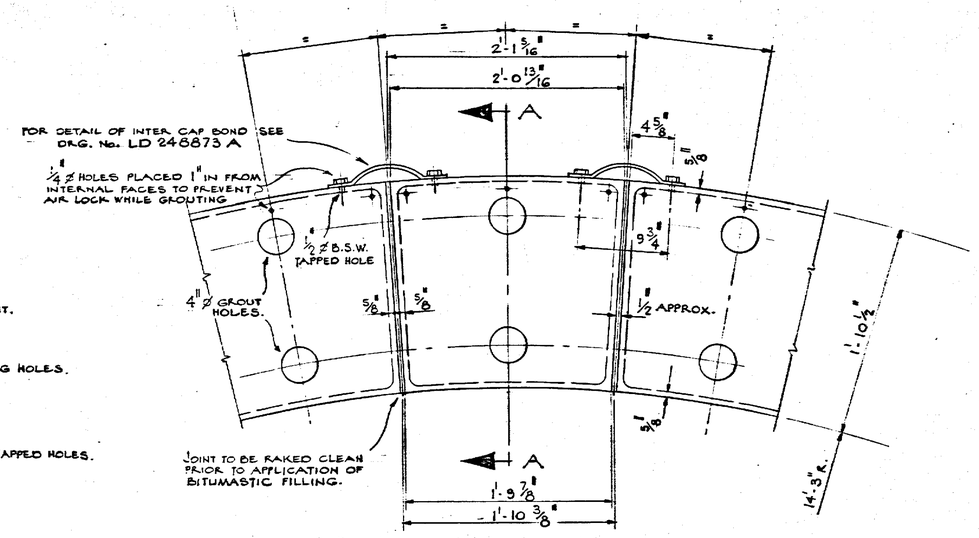
AMENDMENTS



PLAN ON CAP PLATES

COMPOSED OF 48 EQUAL SECTIONS WITH ½" GAP BETWEEN EACH SECTION.

SCALE 1½" = 1'-0"



PART PLAN

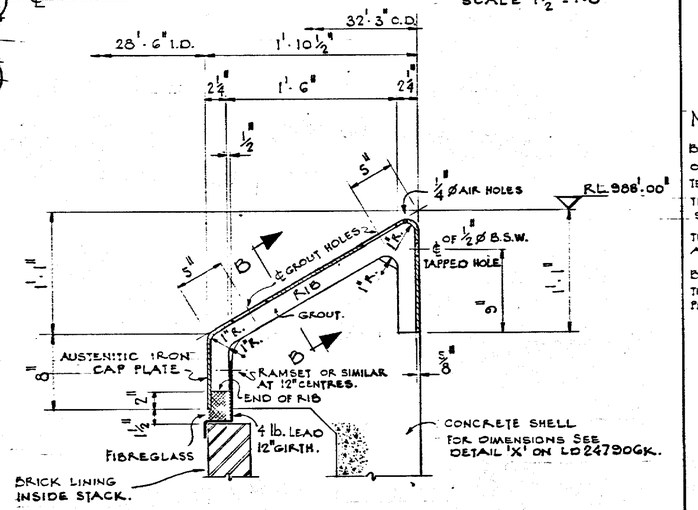
SCALE 1½" = 1'-0"



SECTION B-B

CAP ONLY

SCALE 1½" = 1'-0"



SECTION A-A

SCALE 1½" = 1'-0"

NOTE:
COMPLETE BRICKWORK; PLACE LEAD AND SECURE IN POSITION, PLACE CAP PLATES AND TEMPORARILY HOLD IN POSITION, CAULK JOINT AT BOTTOM OF CAP WITH FIBRE GLASS AND THEN GROUT CAP PLATE USING 1 PART SULPHATE RESISTING CEMENT, 2 PARTS FINE SAND, 5½ GALLONS WATER PER BAG OF CEMENT, TROWEL OFF AT CORE HOLES.

REFERENCE DRG'S:
General Arrg't. & Concrete Dimensions. LD247906K
Lightning conductor arrg't. LD248873A

NOTES.

BEFORE FABRICATION OF THE CAP SECTIONS THE MEASUREMENTS OF THE CHIMNEY STACK SHALL BE TAKEN FROM THE SITE AND TEMPLATES PREPARED FOR THE CASTINGS.

THE AUSTINITIC IRON FOR THE CHIMNEY CAPS CASTINGS SHALL BE AS SPECIFIED.

THE CASTINGS SHALL BE TRUE TO SHAPE AND MEASUREMENTS AND ACCURATE IN CONTOUR.

BEFORE FIXING, THE CAP SECTIONS SHALL BE SET OUT ON THE FLOOR IN ORDER TO CHECK AGAINST THE MEASUREMENTS PREVIOUSLY TAKEN.

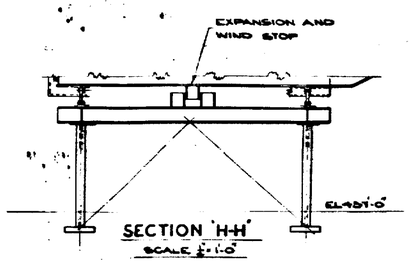
AMENDMENTS	DRAWN	DATE	CHECKED
(1) TENDERING NOTE DELETED. DRG. RELEASED FOR CONSTRUCTION PURPOSES. REF DRGS. ADDED. PE/PSC SIGNATURE ADDED.	K.U.	2-8-68	K.J.H.

CONTRACT No. 1894

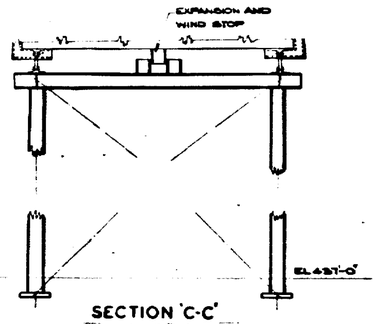
THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No. 1 & No. 2
CAP DETAILS

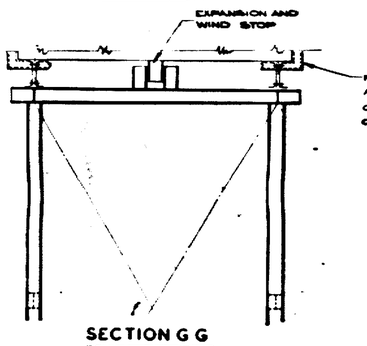
SCALE AS NOTED.				DATE		DATE
DRAWN	K.M.				PE/PSC	2-8-68
TRACED	—					
CHECKED	M.G.S.					
E/GD.						
DATE	20/2/68				LD 247914 B/1	



SECTION 'H-H'
SCALE 1/2"=1'-0"

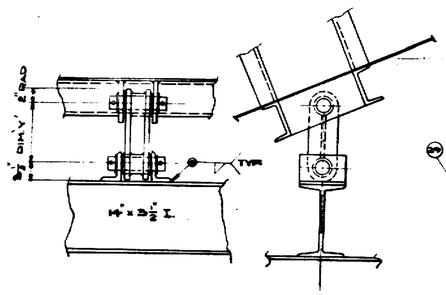


SECTION 'C-C'
SCALE 1/2"=1'-0"



SECTION G G
SCALE 1/2"=1'-0"

FOR DUCT CORNER CONNECTION AT SECTIONS 'CC', 'GG' & 'HH' DO NOT USE CORNER PLATES, CHANNELS TO LAP CORNER TO PROVIDE RIGID FRAME.

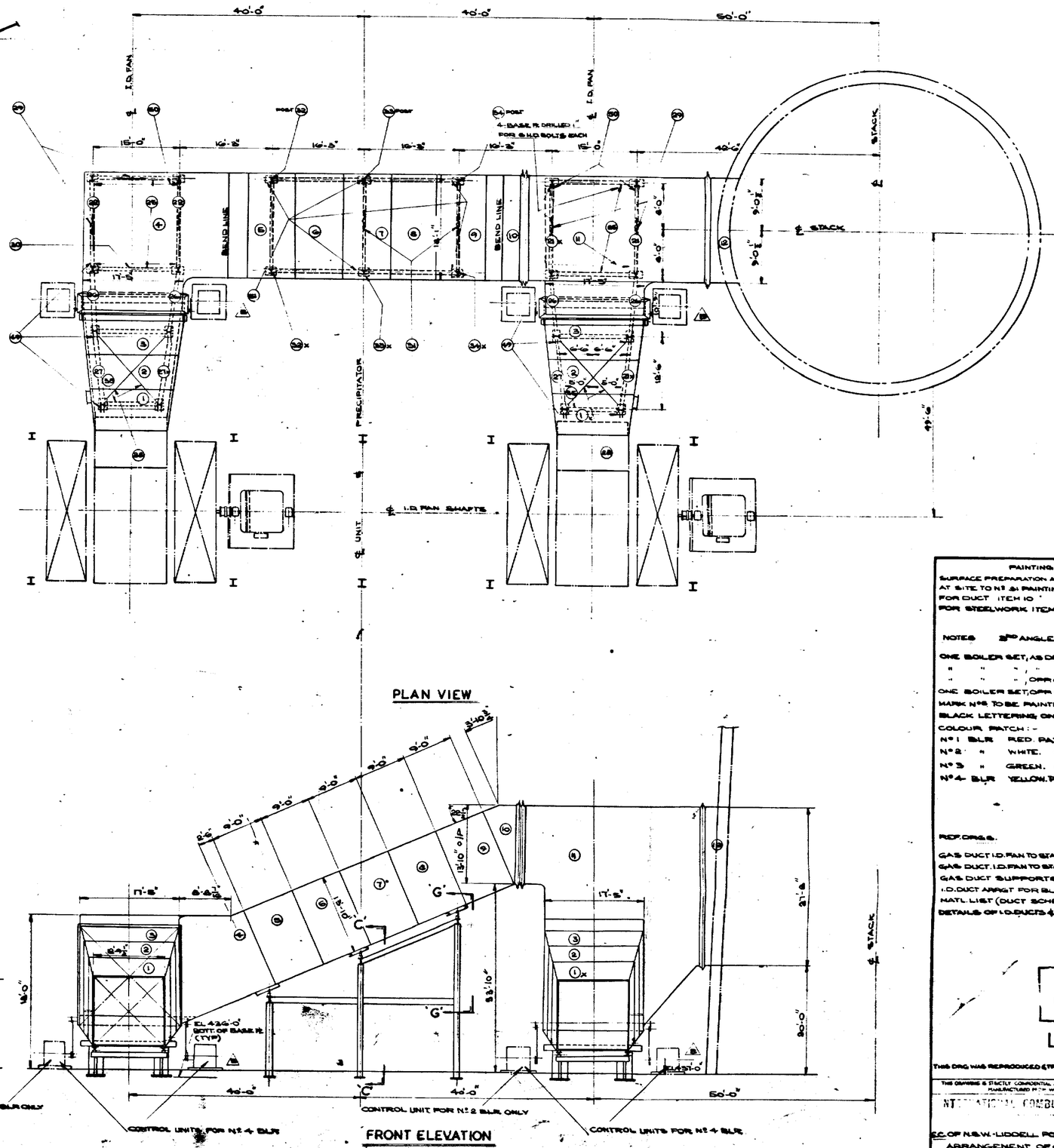


SHACKLE TYPE MOUNTING

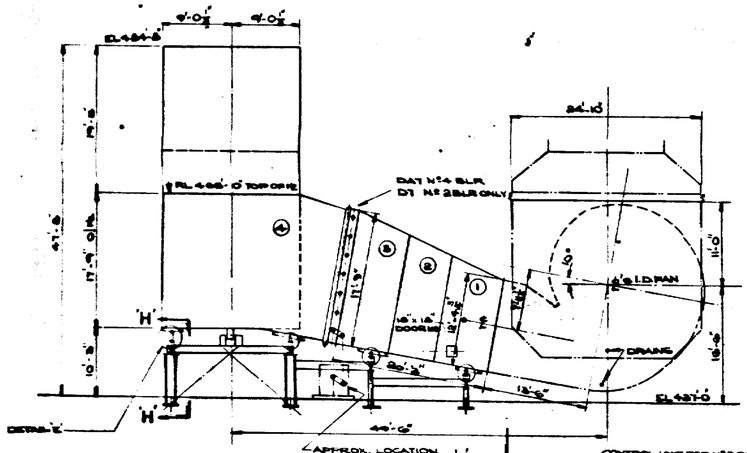
MARK Nº	DIMENSION 'Y'	NO. OFF
49	8"	12
50	17 1/2"	4
51	12"	6

WIND TIE

MARK Nº	Nº OFF
29	4
30	1
31	2



PLAN VIEW



SIDE ELEVATION

FRONT ELEVATION

PAINTING
SURFACE PREPARATION AND PAINTING TO BE DONE AT SITE TO Nº 3a PAINTING SCHEDULE 29-APR-1968
FOR DUCT ITEM 10
FOR STEELWORK ITEM 1

NOTES 3RD ANGLE PROJECTION

ONE BOILER SET, AS DRAWN, FOR BOILER 2
" " " OPP HAND " " 1
ONE BOILER SET, OPP HAND, FOR BOILER 3
MARK Nºs TO BE PAINTED ON DUCTING IN BLACK LETTERING ON APPROPRIATE COLOUR PATCH :-
Nº 1 BLR RED PATCH
Nº 2 " WHITE "
Nº 3 " GREEN "
Nº 4 BLR YELLOW PATCH

REF DRGS.

GAS DUCT I.D. FAN TO STACK DETAILS SHT 1	268/10/13
GAS DUCT I.D. FAN TO STACK DETAILS SHT 2	268/10/14
GAS DUCT SUPPORTS	268/10/7
I.D. DUCT ARRGT FOR BLRS 1 & 3	268/10/2
MATL LIST (DUCT SCHEDULE 5)	268/10/5
DETAILS OF I.D. DUCTS & SUPPORTS	268/10/1

SUBSTANDARD FOR MICROFILMING

LETTER NO.	CONTRACT NO.
NOV 578	1600

LD257273A/3

THIS DRG WAS REPRODUCED & TRACED FROM C.E. DRG Nº E-935-030-0

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INTERNATIONAL COMBUSTION AUSTRALIA LTD.

ELECTRICITY COMMISSION OF N.S.W. - LIDDELL POWER STATION - UNITS 2 & 4
ARRANGEMENT OF GAS DUCTING
- I.D. FAN TO STACK -

DRAWN	C. BROWN	DRG NUMBER
TRACED	23-11-70	268 10/4
CHECKED	WN 27.7.68	
PASSED	ADS	
SCALE	1/2"=1'-0"	A1 S.C.

ITEM 11-20
C.E. DRG Nº E-935-030-0

REV A PAINTING SCHEDULE ADDED DAB
REV B CONTROL UNIT INDICATED FOR Nº 2 BLR ONLY ALSO SECOND ENTRY FOR Nº 4 BLR-CE&D LETTER 6/45/130
REV C DRG TRACED WITHOUT ALTERATION

KODAK 18-11-70

C LD253841

TAG	SIZE	DETAIL	NO.OFF
1	#5CW	14'-6"	22
2	#5CW	ONE OFF: 12'-6" ONE OFF: 18'-3"	2
3	#5CW	ONE OFF: 10'-3" ONE OFF: 9'-4"	2
4	#5CW	ONE OFF: 11'-0" ONE OFF: 15'-0"	2
5	#5CW	10'-0"	2
6	#5CW	ONE OFF: 11'-6" ONE OFF: 12'-6"	2
7	#5CW	11'-9"	2
8	#5CW	ONE OFF: 13'-0" ONE OFF: 14'-2"	2
9	#5CW	11'-3"	1
10	#5CW	ONE OFF: 10'-3" ONE OFF: 9'-4"	2
11	#5CW	10'-9" to 12'-6" — 3 variants	3
12	#5CW	18'-9"	28
13	#5CW	16'-6" to 16'-9" — 4 variants	4
14	#5CW	12'-6"	1
15	#5CW	17'-3"	3
16	#5CW	12'-3" to 13'-4" — 3 variants	3
17	#5CW	11'-0" to 14'-0" — 4 variants	4
18	#4CW	7'-0"	2
19	#4CW	16'-0"	2
20	#4CW	18'-5"	2
21	#4CW	22'-7"	2
22	#4CW	26'-0"	2
23	#4CW	29'-5"	2
24	#4CW	5'-2"	2
25	#4CW	5'-7"	2
26	#4CW	19'-2"	4
27	#7CW	23'-5" to 23'-9" — 4 variants	4
28	#7CW	25'-0" to 25'-3" — 4 variants	4
29	#7CW	25'-8" to 27'-2" — 4 variants	4
30	#7CW	23'-8" to 24'-11" — 4 variants	4
31	#7CW	27'-6"	2
32	#7CW	25'-8"	2
33	#7CW	23'-11" 9"	1
		L	
34	#7CW	L= 23'-11" to 24'-5" 3 variants	3
35	#7CW	L= ONE OFF 25'-5" ONE OFF 26'-5"	2
36	#7CW	L= ONE OFF 24'-2" ONE OFF 24'-11"	2
37	#7CW	L= 23'-8"	1
38	#7CW	L= ONE OFF 24'-5" ONE OFF 25'-2"	2
39	#7CW	L= 25'-8" to 27'-2" 3 variants	3
40	#7CW	28'-8" 6"	2
41	#7CW	26'-2"	1
42	#7CW	27'-2"	1
43	#7CW	24'-5" to 25'-8" 4 variants	4
44	#7CW	25'-2" to 26'-8" 4 variants	4
45	#7CW	21'-1" to 23'-2" 4 variants	4
46	#7CW	22'-8" to 24'-8" 4 variants	4
47	#5CW	13'-6"	50
48	#5CW	17'-0"	30
49	#5CW	6'-3"	2
50	#5CW	15'-10"	2
51	#5CW	21'-0"	2
52	#5CW	25'-5"	2
53	#5CW	28'-5"	2
54	#5CW	31'-1"	2
55	#5CW	14'-8"	2
56	#5CW	30'-2"	12
57	#5CW	8'-11"	2
58	#5CW	12'-5"	10
59	#5CW	7'-0"	2

TAG	SIZE	DETAIL	NO.OFF
60		Not used	
61		Not used	
62	#5CW	13'-3"	2
63	#	Not used	
64	#5CW	9'-8"	2
65	#6CW	18'-8"	8
66	#7CW	31'-3"	2
67	#5CW	11'-8" to 13'-2" 4 variants	4
68	#5CW	13'-8" to 14'-5" 4 variants	8
69	#6CW	28'-5"	2
70	#5CW	ONE OFF 20'-5" ONE OFF 26'-8"	2
71	#5CW	20'-10" to 23'-7" 4 variants	4
72	#6CW	12'-8" to 21'-11" 3 variants	3
73	#5CW	28'-0"	15
74	#5CW	12'-8" to 13'-11" 4 variants	4
75	#5CW	15'-0" to 15'-10" 4 variants	8
76	#5CW	25'-8" to 26'-6" 4 variants	4
77	#6CW	20'-4" to 22'-8" 3 variants	3
78	#5CW	27'-8"	1
79	#5CW	13'-8" to 13'-0" 3 variants	3
80	#5CW	15'-6"	36
81	#5CW	9" L 23'-9" 19"	1
82	#4CW	STOCK LENGTHS — 170 FT.	
83	#7CW	22'-9" 1'-5"	3
84	#7CW	23'-9" 1'-5"	3
85	#5CW	ONE OFF 21'-6" 9" 19" ONE OFF 31'-5"	2
86	#7CW	24'-2" 1'-3"	2
		TAG Nos. 87 to 90 incl. NOT USED	
91	#10CW	28'-6"	11
92	#10CW	14'-7"	30
93	#10CW	18'-6"	12
94	#6CW	23'-6"	4
95	#10CW	28'-5"	6
96	#10CW	18'-6"	4
97	#10CW	28'-9"	4
98	#6CW	15'-5"	6
99		Not used	
100	#10CW	4'-6" 19'-6" 2'-6" 2'-6" c/c	64
101	#10CW	35'-0"	12
102	#10CW	21'-3"	28
103	#10CW	26'-6"	16
104	#8CW	19'-6"	4
105	#8CW	27'-0"	4
106	#10CW	13'-6"	20
107	#10CW	32'-6"	4
108	#10CW	24'-6"	4
109	#8CW	22'-0"	6
110	#6CW	100 1'-7" 13'-6"	6
111	#6CW	15'4" 116 3'-7" 31'-0" 3'-3"	12
112	#10CW	8'-6" 7'-6" 4'-9" 5'-0"	12

TAG	SIZE	DETAIL	NO.OFF
113	#6CW	1'-7" 1'-7"	52
114	#4CW	2'-2" 2'-2"	52
	#5CW	a 1'-9"	
115		a=from 1'-4" to 2'-0" 4 variants	8
116		a=from 2'-0" to 3'-1½" 5 variants	10
117		a=from 3'-5½" to 5'-8½" 6 variants	12
118		a=3'-8½"	168
	#5CW	a 2'-3"	
119		a=1'-1" to 5'-3¾" 4 variants	16
120		a=5'-3¾"	102
121	#10CW	19'-0"	6

501	#7CW	10'-3"	4
502	#7CW	9'-6"	2
503	#7CW	7'-0"	2
504	#7CW	7'-9"	1
505		Not used	
506		Not used	
507	#7CW	11'-9"	4
508	#7CW	8'-0"	3
509	#7CW	7'-9"	1
510	#9CW	16'-3"	4
511	#9CW	10'-6"	2
512	#9CW	17'-0"	4
513	#9CW	11'-6"	2
514	#9CW	24'-1"	1
515	#9CW	15'-6"	1
516	#9CW	10'-0"	5
517		Not used	
516	#9CW	6½"R.H. 21'-0" 21'-6"	2
519	#9CW	6½"R.H. 21'-0" 7'-0"	2
520	#9CW	30'-0"	1
521	#9CW	6½"R.H. 21'-0" 22'-6"	1
522		Not used	
523	#9CW	24'-11"	2
524	#6CW	11" 2'-3½"	94
525	#7CW	10'-3"	2

REFERENCE DRAWINGS:
Slab at R.L 456'-6⅝", Beams & Cols.; R.C. Details... LD 247312 K
Diagram of Bar Bending Shapes..... S 228581 D
Stacks Nos 1&2 General Arrangement..... LD 247906 K

NOTES:
* indicates Cold-Worked Steel deformed bars as per A.S. No. A85. Number indicates dia. in eighths of an inch, e.g. *7 ew indicates 7/8".
Steel Fabric as per A.S. No. A 84. (See Plan)

Reinforcement listed for one Stack only.
Reinforcement Required for TWO Stacks.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH LD 247312 K

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No 1 & No 2
SLAB AT R.L 456'-6⅝", BEAMS AND COLUMNS
REINFORCEMENT LIST

CONTRACT No. 1894

		DATE		DATE
SCALE:				
DRAWN	M.V.S. K.S.		A.T. Ferguson	8/8/68
TRACED	—		P.S./P.S.C.	
CHECKED	J.M.			
ENGD.				
DATE	2.8.68			

Nº LD253841 C/

AMENDMENTS

10 5 4349 21.8.68 5 10

REINFORCEMENT LIST

TAG	SIZE	DETAIL	No OFF	LOCATION	TAG	SIZE	DETAIL	No OFF	LOCATION
1	#8CW	3'-3" 3'-3" 8'-6"	248	SECTIONE-E	13	#8CW	29'-10" 29'-5"	70	SECTIONE-E
2	#8CW	6'-0" 1'-0"	496	"	14	#8CW	7'-9"	510	PART PLAN RL 434'-0"
3	#8CW	4'-0" 1'-0"	496	"	15	#8CW	6'-0"	26	"
4	#8CW	3'-0" 1'-0"	496	"	16	#9CW	1'-7" 1'-7"	64	COLUMN P1 TO P4
5	#8CW	33'-6" 33'-2"	56	"	17	#9CW	2'-2" 2'-2"	64	"
6	#8CW	32'-5" 32'-5"	77	"	18	#10CW	26'-3" 1'-0"	64	"
7	#8CW	31'-5" 31'-3"	63	"					
8	#8CW	32'-4" 27'-8"	54	"					
9	#8CW	31'-0" 26'-5"	68	"					
10	#8CW	29'-10" 25'-6"	48	"					

REFERENCE DRG'S

FOUNDATION STACK No 2.	LD 247908 K
CHIMNEY STACKS No 1 & No 2	LD 247906 K
DIAGRAM OF BAR BENDING SHAPES	S 228581 D

NOTE:

STEEL REINFORCEMENT: #cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A83. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH. e.g. "8 CW = 1"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING, BUNDLED SEPARATELY.

AMENDMENTS

CONTRACT No. 1894

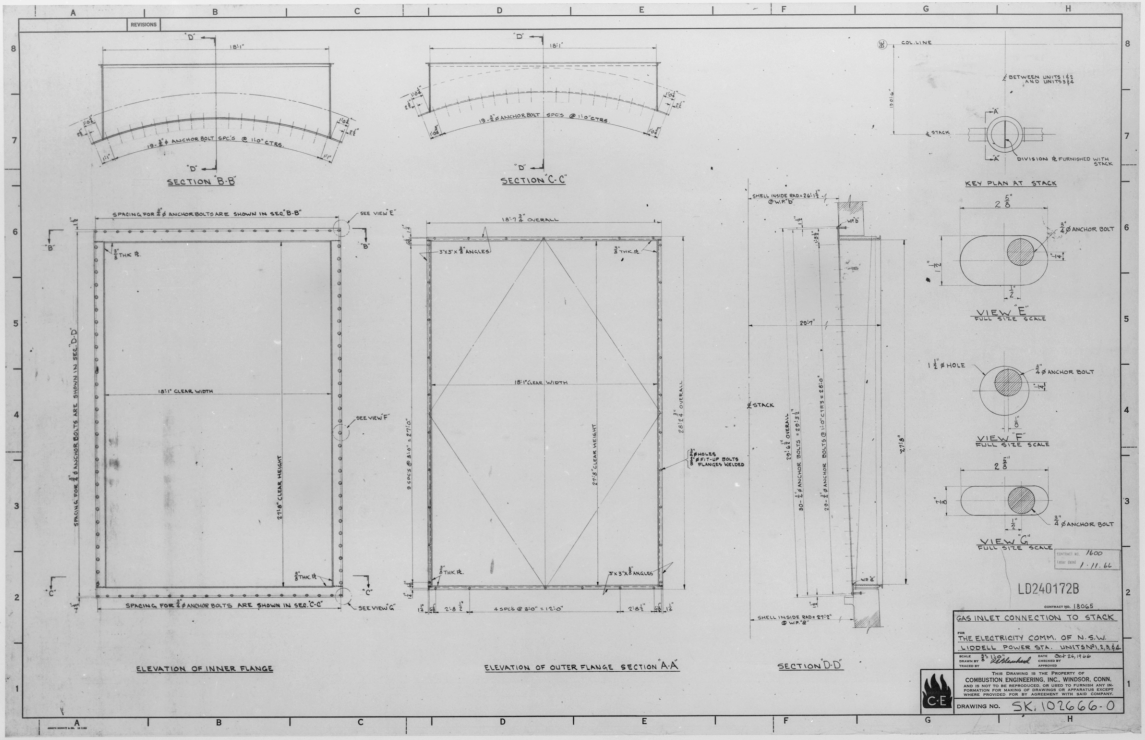
THE ELECTRICITY COMMISSION OF N.S.W.

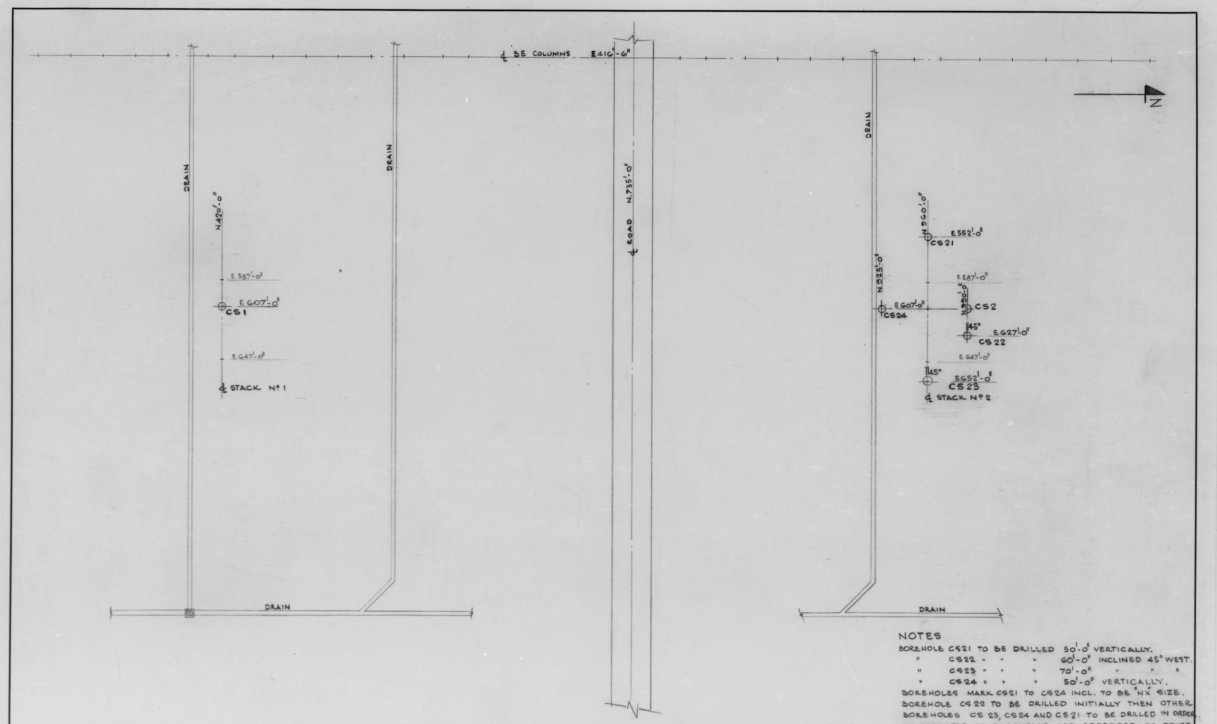
LIDDELL POWER STATION
CHIMNEY STACK No 2
FOUNDATION REINFORCEMENT LIST

			DATE	DATE
SCALE	—			
DRAWN	K.U.		PE/TSC	19/9/68
TRACED	—			
CHECKED	J.C.Q.			
E/TCD				
DATE	2.9.68			

LD 253800 C1

5 436 Z 19.9.68 5


REVISIONS
SECTION 'B-B'
SECTION 'C-C'
KEY PLAN AT STACK
VIEW E
VIEW F
VIEW G
ELEVATION OF INNER FLANGE
ELEVATION OF OUTER FLANGE SECTION A-A
SECTION D-D
LD240172B
GAS INLET CONNECTION TO STACK
THE ELECTRICITY COMM. OF N.S.W.
LIDDELL POWER STA. UNITS 3 & 4
DRAWING NO. SK. 102660-0



AMENDMENTS

INITIAL ISSUED TO TENDERS

BOREHOLE CS23 HAS LOCATED AT E687'-0" AND HAS TO VERTICALLY NOTED ON SITE DRILLING ADDED SHOWN.

K.B.R. 28.FEB.67

2. CS1 (N450 E607) CS2 (N750 E687) E607 ADDED

K.B.R. 13.MAR.67

WORKS ORDER Nº W2596/67

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
STACKS Nos 1 AND 2
GEOLOGICAL EXPLORATION
LOCATION PLAN

SCALE 40 FT. = 1 IN.				DATE	DATE
DRAWN	K.B.R.				
TRACED					
CHECKED	C.F.M.				
S.E. AND A. DATE	K.B.R. 28/2/67				

LD 244290 C/2

5 4279 19.4.68 5

SECTION A-A

NOTE:
FOUNDATION RINGS TO BE PLACED IN QUARTER-SEGMENTS. VERTICAL CONSTRUCTION JOINTS (KEYS) TO BE STAGGERED. NO TWO ADJOINING FOUNDATION SEGMENTS

NOTE:
ROCK TO BE INSPECTED BY THE COMMISSION'S DISTRICT GEOLOGIST PRIOR TO PLACING OF CONCRETE

PART PLAN AT RL. 429'-6"
SHOWING REINFORCEMENT

SECTION B-B
REINFORCEMENT DETAIL

NOTE:
ALL LAPS TO BE STAGGERED

SECTION C-C

SECTION D-D

DETAIL OF CONSTRUCTION JOINTS

FOR ORIENTATION OF BASE SEE PLAN AT RL 434'-0"

ASSUMED MERIDIAN

PLAN AT RL. 434'-0"

NOTE:
6 DAYS TO ELAPSE BETWEEN ADJACENT CONCRETE PLACEMENTS.
FACES OF BASE FOR EACH PLACEMENT OF
CRIBS WITH STRAIGHT FORMS 6'-0" LONG
TOPMOST FOR CLOSING CRIBS TO BE CUT TO SUIT.
FORMWORK IF USED BELOW RL. 429'-0" (SEE NOTES) MAY BE FORMED

PART PLAN AT RL. 434'-0"

DETAILS OF COLUMNS P1 TO P5

REFERENCE DRG'S.
GENERAL ARR'G'T & CONCRETE DIMENSIONS LD 24190 G.A.
DIAGRAM OF BAR BENDING SCHEDULE S 32 6581 D

NOTES.
CONCRETE WORK SHALL COMPLY WITH AS. CA 2 - 1964.
CONCRETE GRADE 25 MPa SHALL HAVE A MINIMUM
STEEL REINFORCEMENT SHALL COMPLY WITH THE FOLLOWING SPECIFICATION: AS. NA 35 COLD WORKED DEFORMED STEEL BARS, EXCEPTED BARS
CONCRETE COVER TO REINFORCEMENT
AND BOTTOM UNLESS NOTED OTHERWISE
CONCRETE TO BE CURED AS PRESCRIBED
CONSTRUCTION JOINTS TO BE TREATED AS SPECIFIED.
CONCRETE BELOW RL 430'-0" TO

THE ELECTRICITY COMMISSION OF N.S.W.
LIDDELL POWER STATION
CHIMNEY STACK No. 1
FOUNDATION
R.C. DETAILS

SCALE	1/4"-1'-0"	DATE	
DRAWN			
TRACED			
CHECKED		DP E/P	
R.C.C. ENGR.			

CONTRACT No. 1825

No. LD 24190 A

AMENDMENTS
15 TENDERING UNDER
14 ISSUED
13 DRG. RELEASED FOR CONSTRUCTION
12 REF. DRG'S ADDED, REF. DRG'S CHANGED, TABLE REVISED.

DRAWN	DATE	CORR.
K.C.	1-6-67	A.M.

TAG	SIZE	DETAIL	No OFF	LOCATION
1	#7CW	17'-11"	114	VERTICAL OUTSIDE FACE FROM RL 503'-0"
2	#6CW	17'-6"	1294	" FROM RL 510'-6"
3	#5CW	17'-1"	1872	" FROM RL 593'-0"
4	#6CW	17'-6"	697	VERT INSIDE FACE FROM RL 503'-0"
5	#4CW	16'-8"	2473	" FROM RL 735'-6"
6	#5CW	17'-1"	840	" FROM RL 570'-6"
7	#6CW	23'-7" 23'-7" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 172'-9" TO 176'-0"	15 RINGS	HORIZ INS. FACE RL 503'-0"
8	#6CW	24'-7" 24'-7" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 169'-6" TO 172'-9"	15 RINGS	" RL 518'-0"
9	#6CW	24'-1" 24'-1" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 166'-6" TO 169'-6"	15 RINGS	" RL 533'-0"
10	#6CW	23'-8" 23'-8" MIN. LAP 2'-6" EACH RING 6BARS TOTAL LENGTH 163'-6" TO 166'-6"	15 RINGS	" RL 548'-0"
11	#6CW	23'-2" 23'-2" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 162'-0" TO 163'-6"	6 RINGS	" RL 563'-0"
12	#5CW	23'-6" 23'-6" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 158'-0" TO 159'-6"	8 RINGS	" RL 570'-6"
13	#5CW	23'-6" 23'-6" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 155'-3" TO 158'-0"	15 RINGS	" RL 578'-0"
14	#5CW	23'-2" 23'-2" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 152'-6" TO 155'-3"	15 RINGS	" RL 593'-0"
15	#5CW	22'-10" 22'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 147'-9" TO 150'-6"	15 RINGS	" RL 608'-0"
16	#5CW	21'-6" 21'-6" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 145'-6" TO 147'-9"	15 RINGS	RL 623'-0"
17	#5CW	20'-7" 20'-7" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 142'-3" TO 145'-6"	15 RINGS	RL 638'-0"
18	#5CW	20'-1" 20'-1" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 140'-0" TO 142'-3"	23 RINGS	RL 653'-0"
19A	#7CW	31'-0" MIN. LAP 2'-11" EACH RING 7 BARS TOTAL LENGTH 190'-0"	10 RINGS	HORIZ. OUTSIDE FACE RL 505'-9"
20	#6CW	21'-6" 21'-6" MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 184'-0" TO 186'-0"	15 RINGS	RL 510'-9"

TAG	SIZE	DETAIL	No OFF	LOCATION
21	#5CW	26'-7" 26'-7" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 177'-0 TO 179'-0"	20 RINGS	HORIZ OUTSIDE FACE RL 517'-3"
22	#6CW	26'-0" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 178'-0"	10 RINGS	" RL 528'-3"
23	#5CW	25'-7" 25'-7" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 171'-0" TO 175'-0"	35 RINGS	" RL 533'-3"
24	#6CW	25'-2" 25'-2" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 173'-6"	10 RINGS	" RL 550'-3"
25	#5CW	24'-9" 24'-9" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 165'-6"TO 169'-6"	35 RINGS	" RL 565'-3"
26	#6CW	24'-3" 24'-3" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 167'-6"	10 RINGS	" RL 573'-3"
27	#5CW	23'-11" 23'-11" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 161'-0 TO 163'-6"	35 RINGS	" RL 578'-3"
28	#6CW	23'-5" MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 163'-0"	10 RINGS	" RL 595'-3"
29	#5CW	23'-2" 23'-2" MIN. LAP 2'-1" EACH RING 6 BARS TOTAL LENGTH 158'-0" TO 160'-0"	15 RINGS	" RL 600'-9"
30	#4CW	24'-10" 24'-10" MIN. LAP 1'-8" EACH RING 6 BARS TOTAL LENGTH 153'-9" TO 155'-6"	20 RINGS	" RL 608'-3"
31	#5CW	22'-7" MIN. LAP 2'-1" EACH RING 6BARS TOTAL LENGTH 155'-6"	10 RINGS	" RL 618'-3"
32	#4CW	23'-3" 23'-3" MIN. LAP 1'-8" EACH RING 6 BARS TOTAL LENGTH 150'-0" TO 152'-6"	35 RINGS	" RL 623'-3"
33	#5CW	22'-2" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 150'-0"	10 RINGS	" RL 640'-9"
34	#4CW	21'-7" 21'-10" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 144'-3 TO 146'-9"	35 RINGS	" RL 645'-9"
35	#5CW	21'-5" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 145'-6"	10 RINGS	" RL 663'-3"
36	#4CW	21'-0" 21'-3" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 140'-6" TO 143'-0"	35 RINGS	" RL 668'-3"
37	#5CW	20'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 141'-3"	10 RINGS	" RL 685'-9"
38	#4CW	20'-5" 20'-10" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 137'-0" TO 139'-3"	35 RINGS	" RL 690'-9"
39	#5CW	20'-1" MIN. LAP 2'-1" EACH RING 5BARS TOTAL LENGTH 138'-0"	10 RINGS	" RL 708'-3"
40	#4CW	20'-2" 20'-6" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 134'-0" TO 136'-0"	35 RINGS	" RL 713'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
41	#5CW	19'-10" MIN. LAP 2'-1" EACH RING 5 BARS TOTALLENGTH 135'-3"	10 RINGS	HORIZ. OUTSIDE FACE RL 730'-9"
42	#4CW	19'-4" 19'-8" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 131'-0" TO 133'-0"	35 RINGS	" RL 735'-9"
43	#5CW	19'-2" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 132'-3"	10 RINGS	" RL 753'-3"
44	#4CW	19'-0" 19'-3" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 128'-3" TO 130'-3"	35 RINGS	" RL 758'-3"
45	#5CW	18'-11" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 129'-3"	10 RINGS	" RL 775'-9"
46	#4CW	18'-7" 18'-11" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 125'-6 TO 127'-3"	35 RINGS	" RL 780'-9"
47	#5CW	18'-5" MIN. LAP 2'-1" EACH RING 5 BARS TOTAL LENGTH 127'-0"	10 RINGS	" RL 798'-3"
48	#4CW	18'-2" 18'-6" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 123'-0" TO 125'-0"	35 RINGS	" RL 803'-3"
49	#5CW	18'-0" MIN. LAP 2'-1" EACH RING 5BARS TOTAL LENGTH 125'-0"	10 RINGS	" RL 820'-9"
50	#4CW	17'-10" 18'-2" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 121'-0" TO 123'-0"	35 RINGS	" RL 825'-9"
51	#5CW	17'-10" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 120'-6"	10 RINGS	" RL 843'-3"
52	#4CW	17'-7" 17'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 117'-3" TO 119'-0"	35 RINGS	" RL 848'-3"
53	#5CW	17'-6" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 118'-6"	10 RINGS	" RL 865'-9"
54	#4CW	17'-3" 17'-6" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 115'-0" TO 116'-6"	35 RINGS	" RL 870'-9"
55	#5CW	17'-2" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 116'-6"	10 RINGS	" RL 888'-3"
56	#4CW	17'-0" 17'-3" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 113'-3" TO 114'-9"	35 RINGS	" RL 893'-3"
57	#5CW	16'-10" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 114'-6"	10 RINGS	" RL 910'-9"
58	#4CW	16'-8" 16'-11" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 111'-3" TO 112'-9"	35 RINGS	" RL 915'-9"
59	#5CW	16'-7" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 113'-0"	10 RINGS	" RL 933'-3"
60	#4CW	16'-4" 16'-7" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 110'-0" TO 111'-0"	35 RINGS	" RL 938'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
61	#5CW	16'-2" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 110'-6	10 RINGS	HORIZ OUTSIDE FACE RL 955'-9"
62	#4CW	16'-2" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 109'-0"	20 RINGS	" RL 960'-9"
63	#5CW	16'-1" MIN. LAP 2'-1" EACH RING 4 BARS TOTAL LENGTH 110'-6"	10 RINGS	" RL 970'-6"
64	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4BARS TOTAL LENGTH 106'-9"	24 RINGS	" RL 975'-9"
65	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 102'-3"	1 RING	HORIZ. INSIDE FACE AT TOP
66	#4CW	11'-11"O.A. 1'-10" 2" INT. RAD. 60° 11½" O.A.	134	CAP BARS RL 968'-0" AT TOP
67	#4CW	12'-6"	68	VERTICAL INSIDE FACE FROM RL 968'-0"
68	#4CW	2'-6"	996	HORIZ. AT ALL CORBELS
		2'-9" 2½" A O/A X B 3" O/A 1" INT. RAD.		
		X A B		
69	#4CW	93° 2'-2½" 2'-0"	265	RL 510'-6"
70	#4CW	93° 2'-0½" 1'-10"	255	RL 533'-0"
71	#4CW	93° 1'-10½" 1'-8"	250	RL 555'-6"
72	#4CW	93° 1'-9" 1'-6"	240	RL 578'-0"
73	#4CW	92° 1'-7½" 1'-5"	230	RL 600'-6"
74	#4CW	92° 1'-6⅛" 1'-4"	225	RL 623'-0"
76	#4CW	92° 1'-5" 1'-2"	435	RL 645'-6" RL 668'-0"
76	#4CW	92° 1'-4" 1'-1"	210	RL 690'-6"
77	#4CW	92° 1'-3" 1'-0"	205	RL 713'-0"
78	#4CW	92° 1'-2⅛" 1'-0"	200	RL 735'-6"
79	#4CW	92° 1'-2" 11"	195	RL 758'-0"
80	#4CW	91° 1'-1½" 11"	380	RL 780'-6" RL 803'-0"
81	#4CW	91° 1'-1" 10"	185	RL 825'-6"
82	#4CW	91° 1'-0⅛" 10"	360	RL 848'-0" RL 870'-6"
83	#4CW	91° 1'-0½" 10"	175	RL 893'-0"
84	#4CW	91° 1'-0⅛" 10"	340	RL 915'-6" RL 938'-0
85	#4CW	91° 1'-0⅛" 10"	330	RL 960'-6" RL 975'-6"
99	#4CW	20'-2" MIN. LAP 1'-8" EACH RING 5BARS TOTAL LENGTH 135'-6"	10 RINGS	HORIZ. INS. FACE RL 687'-3"

TAG	SIZE	DETAIL	No OFF	LOCATION
113	#4CW	10'-0"	2101	VERTICAL INSIDE FACE FROM RL 686'-9"
140	#4CW	19'-9" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 132'-6"	10 RINGS	HORIZ. INS. FACE RL 699'-9"
141	#4CW	19'-5" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 129'-9"	10 RINGS	" RL 732'-3"
142	#4CW	19'-1" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 127'-3"	10 RINGS	" RL 754'-9"
143	#4CW	18'-9" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 124'-6"	10 RINGS	" RL 777'-3"
144	#4CW	18'-5" MIN. LAP 1'-8" EACH RING 5 BARS TOTAL LENGTH 122'-6"	10 RINGS	" RL 799'-9"
145	#4CW	17'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 119'-0	10 RINGS	" RL 822'-3"
146	#4CW	17'-5" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 116'-6"	10 RINGS	" RL 844'-9"
147	#4CW	17'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 114'-6"	10 RINGS	" RL 867'-3"
148	#4CW	16'-10" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 112'-9"	10 RINGS	" RL 889'-9"
149	#4CW	16'-7" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 110'-0"	10 RINGS	" RL 912'-3"
150	#4CW	16'-3" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 108'-3"	10 RINGS	" RL 934'-9"
151	#4CW	16'-0" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 107'-3"	10 RINGS	" RL 957'-3"
152	#4CW	15'-9" MIN. LAP 1'-8" EACH RING 4 BARS TOTAL LENGTH 106'-0"	10 RINGS	" RL 972'-3"
153	#5CW	15'-0"	66	RL 660'-6"
154	#5CW	7'-6"	66	RL 668'-0"
155	#6CW	23'-0" MIN. LAP 2'-6 EACH RING 7 BARS TOTAL LENGTH 187'-0"	5 RINGS	HORIZ. OUTSIDE FACE

REFERENCE DRG'S.

REINFORCEMENT DETAILS RL 503'-0" TO RL 988'-0"	LD 247911 K
SECTIONAL ELEVATION	
CHIMNEY STACK No1 & No2	LD 247906 K
DIAGRAM BAR BENDING SHAPES	S 228581 D

NOTES

STEEL REINFORCEMENT. #CW INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A93. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH e.g. #7CW = 7/8"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY.

REINFORCEMENT LISTED FOR ONE STACK ONLY
REINFORCEMENT REQ'D FOR TWO STACKS

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACKS No1 & 2
RL 503'-0" TO RL 988'-0"
REINFORCEMENT LIST

SCALE			DATE	DATE
DRAWN	K.U.			PE/P.S.C. 1/12 9/6/67
TRACED	—			
CHECKED E/C.D.				
DATE 2.2.68				

CONTRACT No. 1894

N°. LD 253842 K/

REINFORCEMENT LIST

TAG	SIZE	DETAIL	No OFF	LOCATION
1	#8CW	8'-9" / 21'-6"	248	SECTION B-B
2	#8CW	7'-6" / 8'-0"	248	"
3	#8CW	4'-6" / 7'-3"	248	"
4	#8CW	33'-2" / 33'-1" R	35	"
5	#8CW	31'-8" / 31'-7" R	56	"
6	#8CW	30'-4" / 25'-10" R	30	"
7	#8CW	32'-0" / 27'-4" R	48	"
8	#8CW	29'-6" / 29'-6" R	42	"
9	#8CW	7'-9"	540	"
10	#8CW	6'-0"	26	PART PLAN EL 436'-0"
11	#10CW	1'-0" / 12'-9"	64	COLUMNS C1 TO C8
12	#8CW	1'-7" / 1'-7"	28	"
13	#8CW	2'-2" / 2'-2"	28	"

REFERENCE DRG'S

CHIMNEY STACKS No 1 & No 2	LD 247906 H
FOUNDATION STACK No 1	LD 247907 A
DIAGRAM OF BAR BENDING SHAPES	S 228591 D

NOTE

STEEL REINFORCEMENT: #cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A 83. NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH. e.g. "8cw-1"

DELIVER TO SITE IN TAGGED BUNDLES.

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY.

AMENDMENTS

CONTRACT No. 1896

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
CHIMNEY STACK No 1
FOUNDATION REINFORCEMENT LIST

				DATE
DRAWN	K.J.F			
TRACED	—			
CHECKED	MCS			
DATE	1.8.68			

DATE 1-8-68

LD 253799 C

LD 247912K

PLAN at R.L 456'6½"

Beam reinforcement not shown – See Sections

Note: Minimum lap to be 48 bar diameters unless noted

SECTION C-C (Beam "3")

Slab reinforcement not shown

SECTION A-A (Beam "1N")

SECTION A1-A1 (Beam "1S")

Slab reinforcement not shown

SECTION B-B (Beam "2N")

SECTION B1-B1 (Beam "2S")

Slab reinforcement not shown

SECTION 1-1

SECTION 2-2

SECTION D-D

SECTION 3-3

SECTION E-E

SECTION 4-4

SECTION 5-E

SECTION 6-6

SECTION 7-7

DETAIL "Z"

PART – PLAN

Showing Beams No. 4 & 5

Scale: 1/4" = 1'-0"

REFERENCE DRAWINGS:

Stacks N°1 & General Arrgt & Concrete Dimensions	LD 247906 K
Brick Lining Details	LD 247915 A
Position Cement List	LD 2338416
Stack N°1 Foundation	LD 247907 A
Stack N°2 Foundation	LD 247908 A

NOTES:

Concrete work shall comply with AS CA2 1963

Concrete class "A" shall have a minimum compressive strength of 3000 p.s.i. 30 days

Formwork to be dressed as specified. Formwork to be stripped within fourteen days of placing concrete.

Clear cover to reinforcing bars to be as marked.

Concrete to be cured as specified.

Floor designed for a Live Load of 200 p.s.f.

STEEL REINFORCEMENT 9·7 cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS. No. A 63 · NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH e.g. 9·7 cw = 9/8" DIA. COLD-WORKED.

ALTERATIONS

1) ENTERING NOTE P.G. RELEASED P.G. CONSTRUCTION P.G. RECORDS P.G. CHECKED P.G. ISSUED

DRAWN DATE CHECKED

2. R.L. 456'-6½" ADDED

3. Beam Nos. 1N, 1S, 2N, 2S renumbered Ref. Nos. 101, 102, 103, 104 respectively. Dimensions adjusted to suit. 14" max. 15" and 16" max.

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

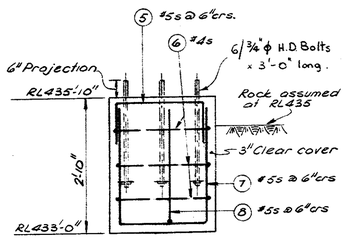
CHIMNEY STACKS N°1 & N°2

STACKS AT R.L 456'-6½", BEAMS AND COLUMNS R.C. DETAILS

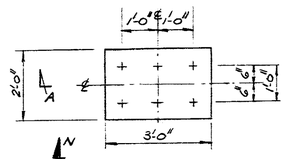
CONTRACT No. 1894

SCALE	1/8" = 1'-0" & as shown	DATE	DATE
DRAWN	WG		
TRACED	–		
CHECKED	M.G.		
P/CO			
DATE			

No LD 247912 K/2

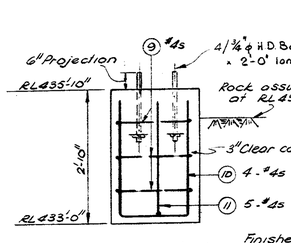


SECTION 'A-A'

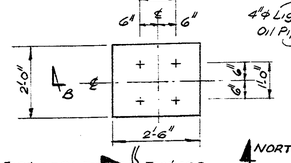


Footings: D103 , D110 , D116 , D117
D203 , D210 , D216 , D217
D303 , D310 , D316 , D317
D403 , D410 , D416 , D417

16 OFF



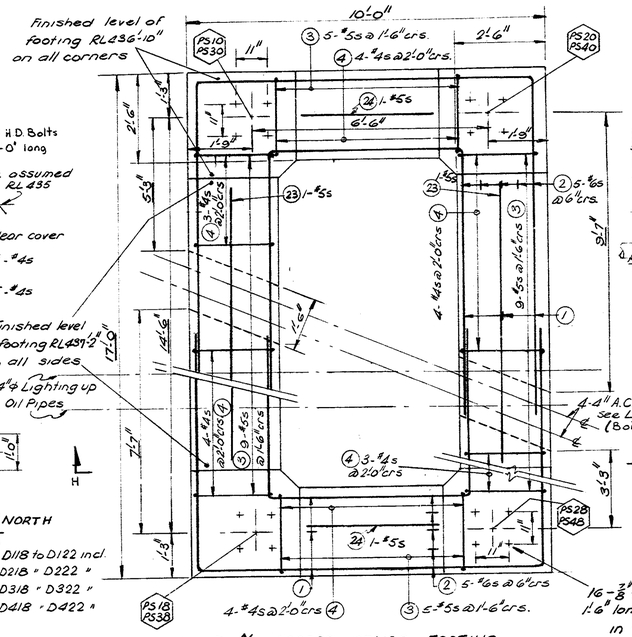
SECTION 'B-B'



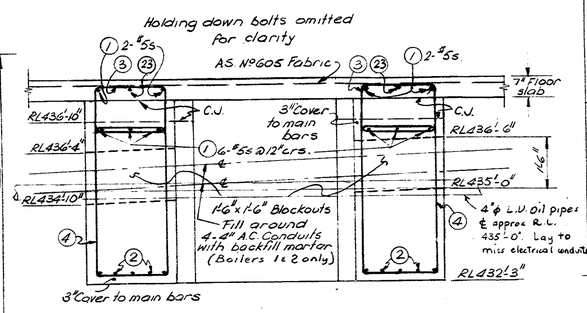
Footings: D101 to D108 incl.
D201 " D208 "
D301 " D308 "
D401 " D408 "

Footings D111 to D115 incl. D118 to D122 incl.
D211 " D215 " D218 " D222 "
D311 " D315 " D318 " D322 "
D411 " D415 " D418 " D422 "

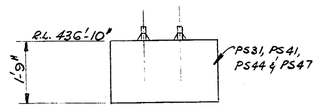
NORTH



ACCESS STAIRS FOOTING
BOILERS 1 & 2 AND 3 & 4 - 20 OFF

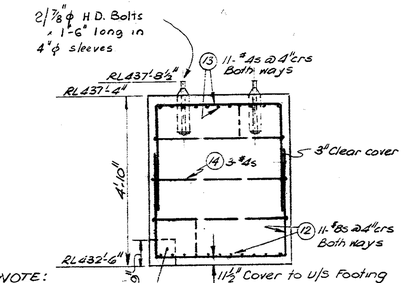


SECTION 'H-H'



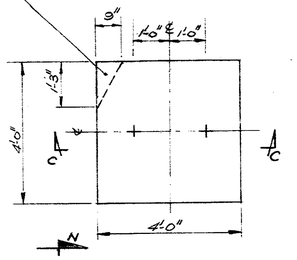
SECTION J-J
WORK AS EXECUTED

72 OFF



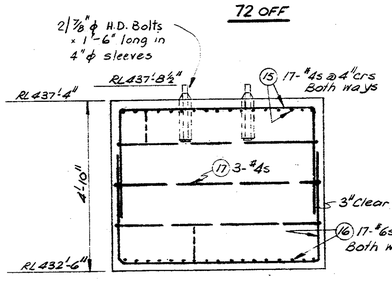
NOTE:
This blockout applicable to PC22 and PC42 ONLY

SECTION 'C-C'

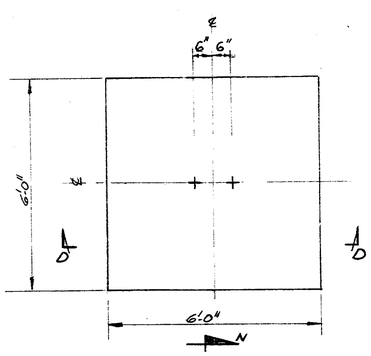


Footings: PC12 , PC13 , PC15, PC16
See above note PC22 PC23 , PC25, PC26
PC32 PC33 , PC35, PC36
PC42 PC43 , PC45, PC46.

16 OFF

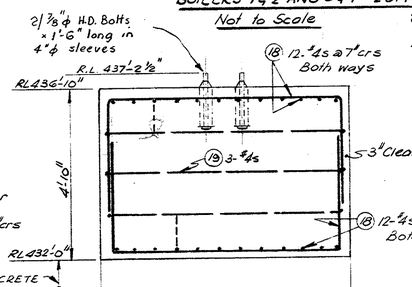


SECTION 'D-D'

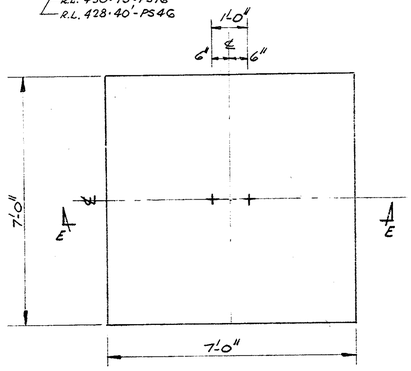


All 'PD' Footings &
PC 11 , PC 14 , PC 17
PC 21 , PC 24 , PC 27
PC 31 , PC 34 , PC 37
PC 41 , PC 44 , PC 47.

40 OFF

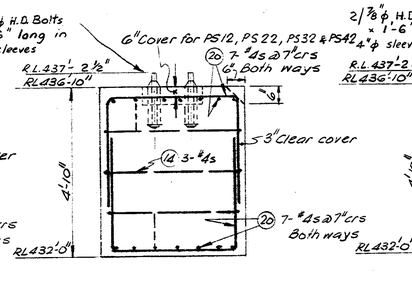


SECTION 'E-E'



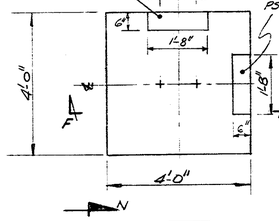
Footings: PS15 , PS16
PS25 , PS26
PS35, PS36
PS45, PS46

8 OFF



SECTION 'F-F'

NOTE
This blockout for PS 42 ONLY

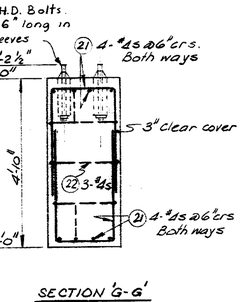


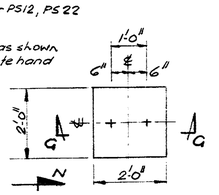
Footings: PS12 , PS18
See above note. PS 22 , PS 23
PS 32 , PS 33
PS 42 , PS 43

8 OFF

NOTE:
This blockout for PS12, PS22 and PS32 only.
PS12 and PS32 - as shown
PS22 - opposite hand

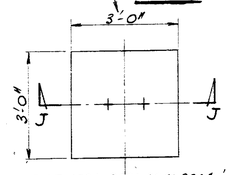
SECTION 'G-G'





Footings: PS11, PS14, PS17
PS21, PS24, PS27
PS31, PS34, PS37
PS41, PS44, PS47

12 OFF



FOOTINGS PS31, PS41, PS44 & PS47 "WORK AS EXECUTED"

REINFORCEMENT LIST

Tag	Size	Detail	No. off.
1	#5s	a, b — 1. 4 off 2. 2 off 3. 4 off. 3 Variants - a = 7'-3" b = 5'-7½" 1. a = 8'-3" b = 7'-6" 2. a = 9'-3" b = 9'-6" 3.	20
2	#6s	a, b — 5 Variants - 2 off each. a = 7'-6" b = 5'-7½" a = 8'-0" b = 6'-6" a = 8'-6" b = 7'-6" a = 9'-0" b = 8'-6" a = 9'-6" b = 9'-6"	20
3	#5s	2'-0" / 4'-3" / 11"	56
4	#4s	4'-3" / 2'-0"	44
5	#5s	2'-0" / 2'-6"	64
6	#4s	2'-6" / 1'-6"	48
7	#5s	2'-6" / 2'-6" / 2'-6"	64
8	#5s	2'-6" / 1'-6" / 2'-6"	96
9	#4s	1'-6" / 2'-0"	216
10	#4s	2'-6" / 2'-0"	288
11	#4s	1'-6" / 2'-6"	360
12	#8s	3'-8" / 3'-4"	352
13	#4s	3'-8" / 3'-1"	352
14	#4s	3'-6" / 3'-6"	72
15	#4s	3'-0" / 3'-5"	1360
16	#6s	3'-0" / 3'-5"	1360
17	#4s	5'-6" / 3'-6"	120
18	#4s	3'-0" / 6'-5"	384
19	#4s	6'-6" / 6'-6"	24
20	#4s	3'-0" / 3'-5"	224
21	#4s	1'-5" / 3'-0"	192
22	#4s	1'-6" / 1'-6"	36
23	#5s	10'-6"	4
24	#5s	3'-8"	4

NOTES: Concrete to be Class "F.A." as specified.
Steel reinforcement shall comply with the following specification: (1) Structural grade deformed bars - A.S. N° A92
Reinforcement List shows TOTAL quantities for Boilers 1 to 4 footings
All H.D. Bolts (& sleeves) to be supplied by Mechanical Plant Contractor & cast in by Civil Contractor.
All Bolts in Sleeves to be worked at cast-in so that they are free to move after concrete has set.

For location of footings see:
Blr. 1 — LD 251112A — LD 248530A — Blr. 2
Blr. 3 — LD 251113A — LD 251114A — Blr. 4

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION
BOILERS N° 1 TO 4
FOOTINGS FOR COL. MARKS D, PC, PD AND PS
AND ACCESS STAIRS — R.C. DETAILS

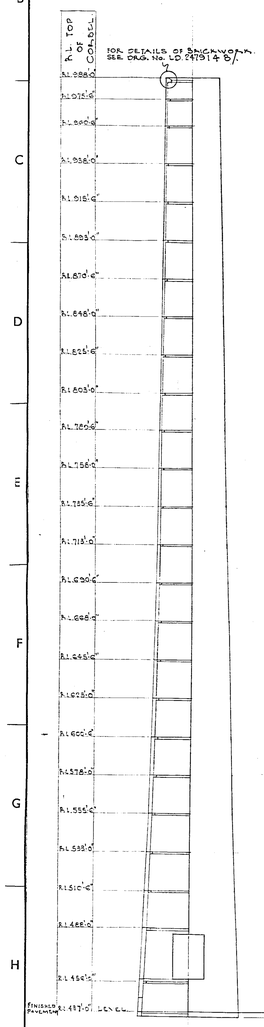
SCALE	½"=1'-0"		DATE		DATE
DRAWN	CKR	E/E.P		S.S.E.A.	24/10/69
TRACED	—	E/M.P	31/3/64		
CHECKED	M.C.J.			D.C.E./POWER.	30/3/64
E/C.D. DATE				LD 251111	B/5

CONTRACT N° 1948

AMENDMENTS

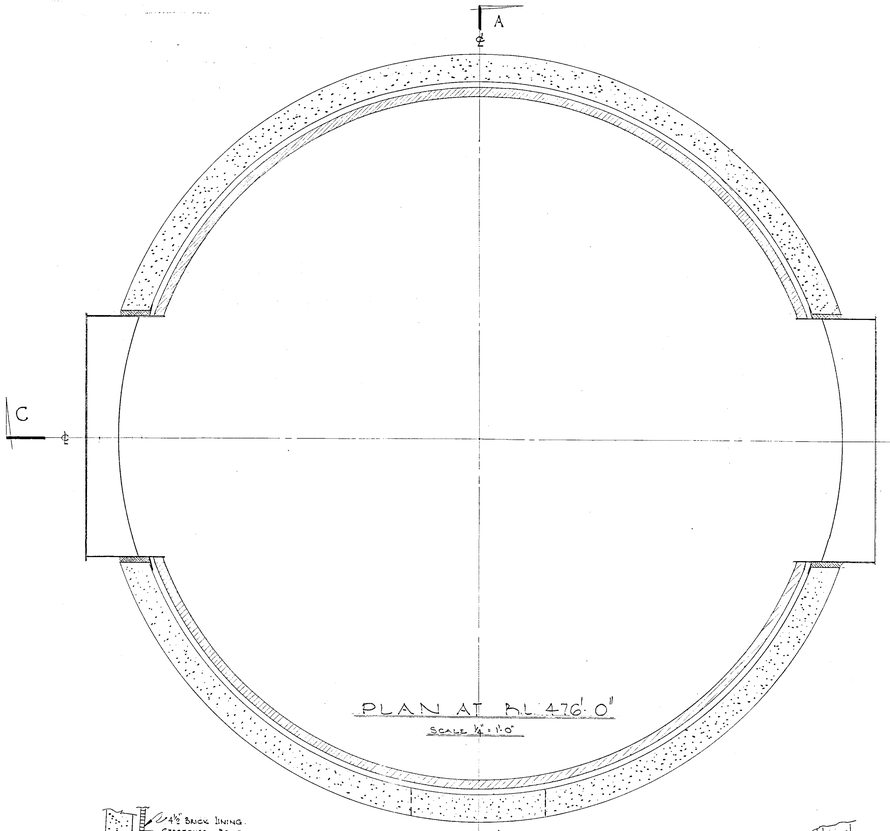
1. Drawing Title and sheet size altered. Tender ing note deleted. Drawing completely revised. Reinforcement List added.	CKR	30.9.68
2. Location of blockouts in Access Stair foot. ing altered. Note re grouting of conduits added Ref. B8. Blockout details for PC 22 and PS12, PS32 added Ref. G-1 and G-7	CKR	17/10/68
	E/ED	18/10/68
3. Bolts shown ont. & 1'-0" centres were shown off centre. F34. at 1'-9 centres. F34. PC footings named B3 Bolt sizes, length & sleeves added to all footings. Note added G10, 11. L.U. oil pipes shown in Sect. H-H. B9. Note added to Elec. Conduits. C7, B8.	M.C.J.	10.3.69
	R.M.	21-1-69
4. Blockouts shown for Footings PC42 PS32 and PS42. Ref. E1, E2, E8.	K.A.F.	6.3.69
5. UNDERSIDE RL. ¼ DIMENSIONS OF CONCRETE BACKFILL ADDED. Ref. E5, C9 & G9 "WORK AS EXECUTED"	P.M.	6.3.69
	C.E.	11-11-70
	H.T.	16.11.70
	A.S.E.	17.11.70
	S/E.C.D.	

KODAK 23·11·70



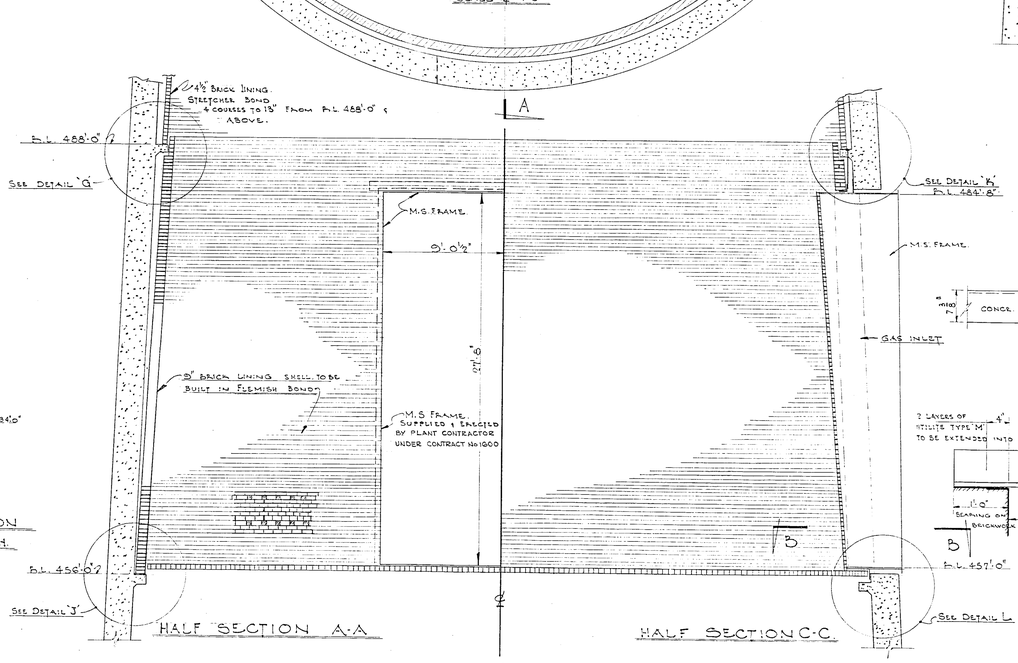
HALF SECTION & HALF ELEVATION OF CHIMNEY FROM NORTH

SCALE 1/32" = 1'-0"

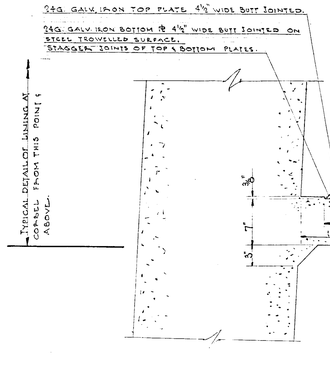


PLAN AT R.L. 476'-0"

SCALE 1/4" = 1'-0"

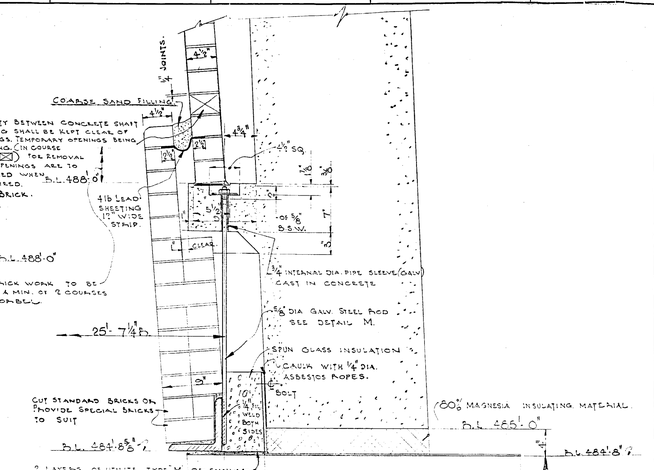


SCALE 1/4" = 1'-0"



DETAIL G

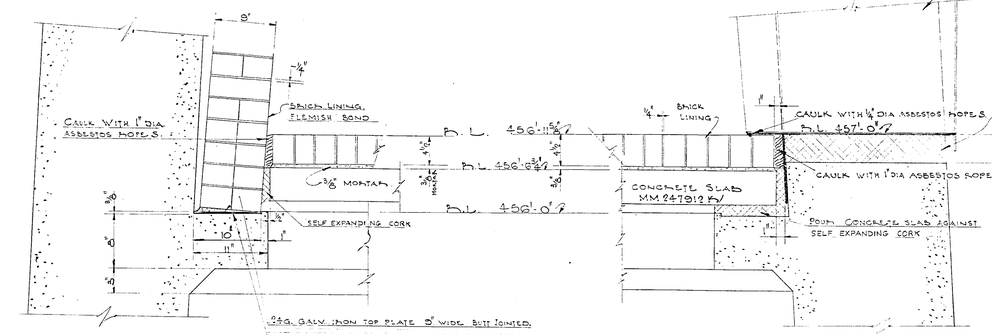
SCALE 1½" = 1'-0"



DETAIL H

SCALE 1½" = 1'-0"

M.S. FRAME SUPPLIED & FIXED BY PLANT CONTRACTOR UNDER CONTRACT No. 1900

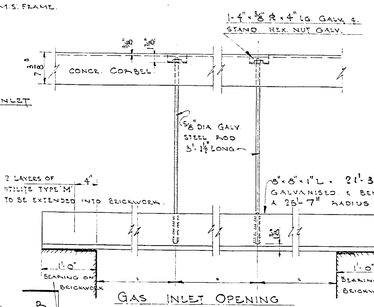


DETAIL J

SCALE 1½" = 1'-0"

DETAIL L

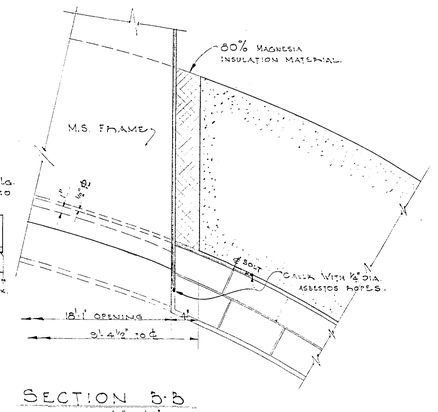
SCALE 1½" = 1'-0"



GAS INLET OPENING INSIDE ELEVATION

DETAIL M.

SCALE 1" = 1'-0"



SECTION B-B

SCALE 1½" = 1'-0"

REFERENCE DRGS.

GENERAL ARRANGEMENT	LD 247906 G/1
SLAB AT R.L. 456'-6⅜" BEAMS COLS. & R.C. DET.	LD 247912 A
CAST IRON CAP DETAILS.	LD 247914 B

NOTES:

1. ALL BRICKS FOR LINING CHIMNEY SHAFT SHALL CONSIST OF GOOD QUALITY ACID & HEAT RESISTING BRICKS OF A SILICEOUS TYPE OF SIZE 9" x 4½" x 3".
2. CAPPING BRICKS SHALL BE BULLNOSED.
3. ALL LINING SHALL BE SET, JOINTED AND POINTED IN ACID & HEAT RESISTING MORTAR.
4. 9" THICK LINING TO BE BUILT IN FLEMISH BOND. 4½" " " SHALL BE BUILT IN STRETCHER BOND 4 COURSES TO 1'8".
5. MANUFACTURER'S RECOMMENDATIONS ARE TO BE FOLLOWED REGARDING PROPORTION OF QUICK-SET ACID AND HEAT RESISTANT CEMENT USED IN MORTARS.
6. STRAIGHT BRICKS TO BE LAID TO REQUIRED RADII OVER ENTIRE HEIGHT OF STACK.
7. PARTICULAR ATTENTION IS TO BE GIVEN TO THE ½" SLOTS IN THE CORBELS. THESE MUST BE KEPT CLEAN FOR THE FULL DEPTH OF SLOTS.
8. ASBESTOS ROPES MUST PROVIDE A COMPLETE SEAL. ROPE SIZES MAY BE VARIED WHERE NECESSARY.
9. FOR DETAILS OF BRICKWORK & CAST IRON CAP SEE DRG. LD 247914 B.

AMENDMENTS			
(1)	TENDERING NOTE CHG. RELEASED	CHKD.	DATE
	CHG. RELEASED FOR CONSTRUCTION	KU	12.8.66
	FIELD ISSUE SIGNATURE ADDED		
		DRAWN	DATE
		KU	12.8.66

CONTRACT No 1894

THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

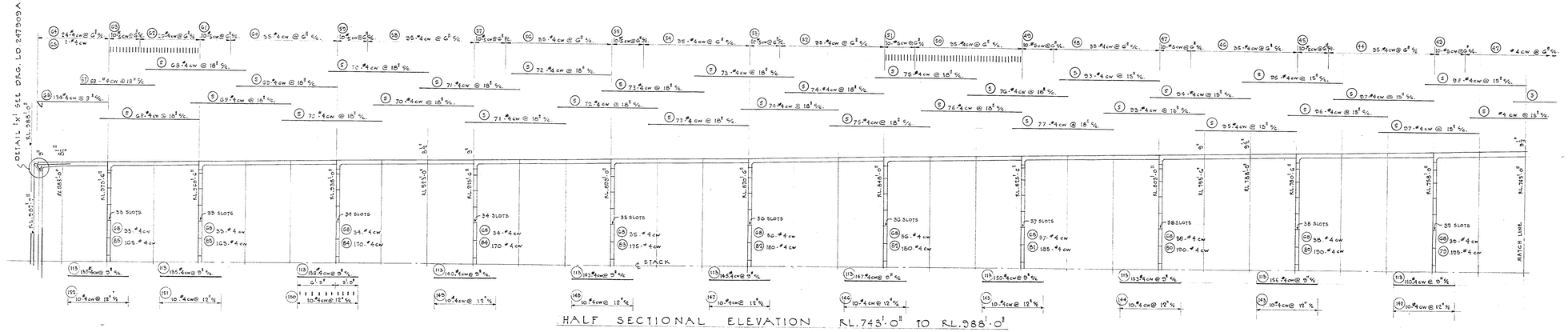
CHIMNEY STACKS No 1 & No 2

BRICK LINING DETAILS

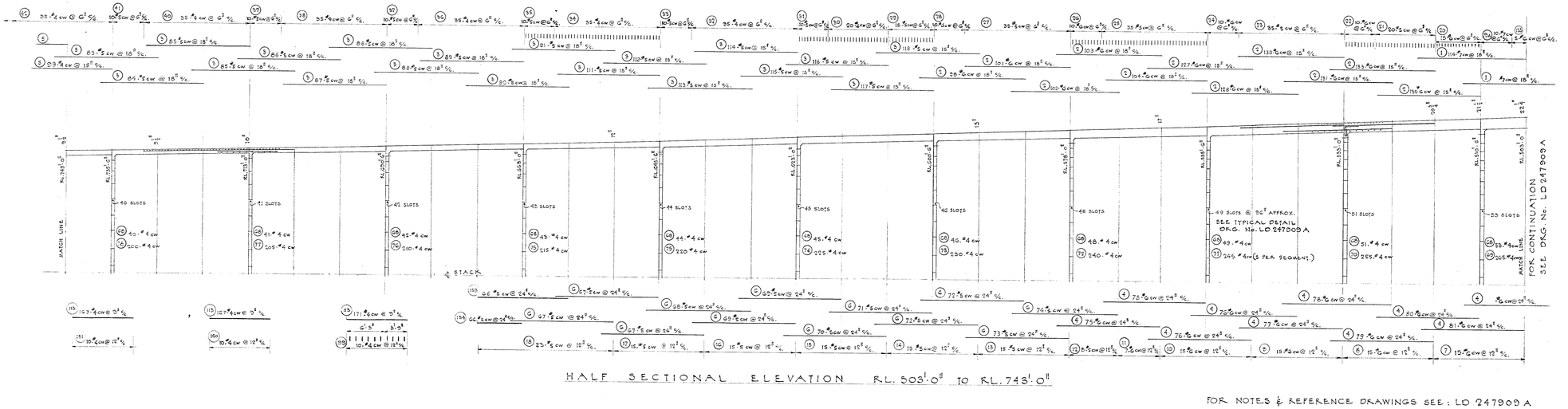
SCALE AS SHOWN.				DATE	A.A. Ferguson / Mgr.	DATE 7/9/68
DRAWN	R.S.	S.M.D.		26.8.68	PE i/sc.	
TRACED	—	152		30.8.68		
CHECKED	A.A.F.					
E.I.C.						
DATE	26/8/68					

LD 247913 A/1

LD 247913



HALF SECTIONAL ELEVATION RL. 743'-0" TO RL. 988'-0"



HALF SECTIONAL ELEVATION RL. 503'-0" TO RL. 743'-0"

FOR NOTES & REFERENCE DRAWINGS SEE: LD 247909 A

FOR REINFORCEMENT LIST SEE DRG: LD 253842 K

AMENDMENTS
OUTSTANDING NOTE DELETED.
SEE DRG. ADDED IN DISTRIBUTION
PLEASE SIGNATURE

ISSUE	DATE	INITIALS
A	12.8.69	K.A.H.
B	11.11.69	K.A.H.

S.A.I. Amendments A-F, 26/1/70 B-F, 27/1/70 Clauses 14.2, 14.3, 14.4 & 14.5 corresponding R.L.C. Drawings Nos. C1-17 Structural Steel Nos. S1-S5 & S7 Mechanical Nos. M1-M2 & M4 Elec. Nos. E1-E3 & E5-E6 K.A.H. 11.1.70

THE ELECTRICITY COMMISSION OF N.S.W.

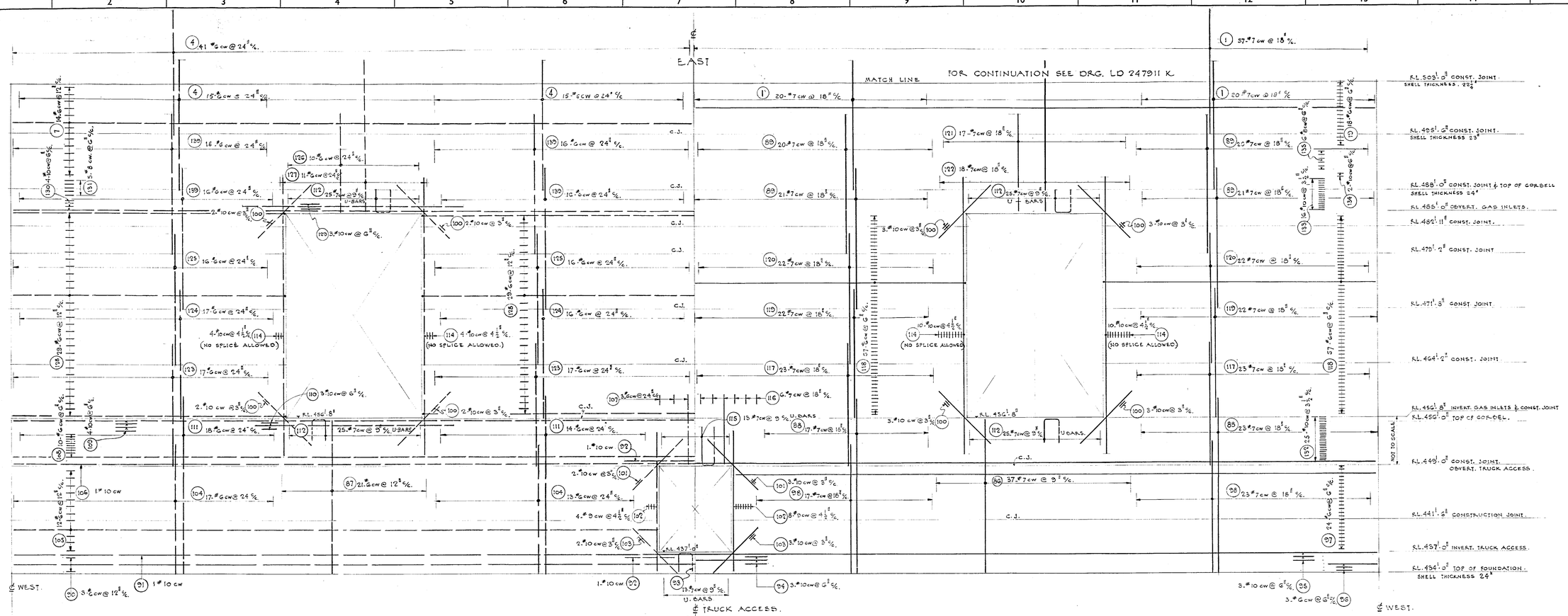
LIDDELL POWER STATION
CHIMNEY STACKS Nº1 & Nº2
REINFORCEMENT DETAILS
RL. 503'-0" TO RL. 988'-0"
SECTIONAL ELEVATION

SCALE: 3/16" = 1'-0"			DATE	DATE
DRAWN R.M.				P.E.P.S.C. 14/11/69
TRACED —				
CHECKED W.G.S.				
E/CO Nº				
DATE 1/12/69				

CONTRACT No. 1894

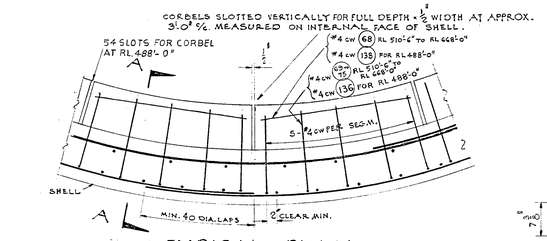
Nº LD 247911 K/2

LD 247911 K
END. 1



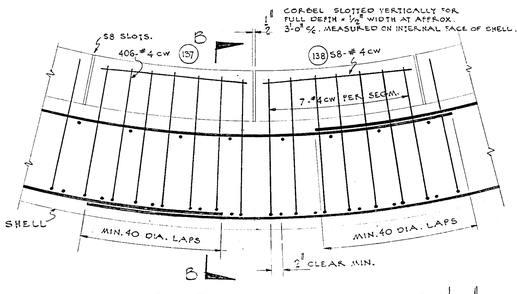
DEVELOPED SURFACE OF SHELL

(DISTORTED SCALE)

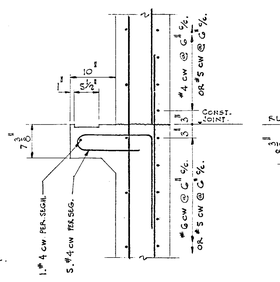


TYPICAL PLAN

CORBELS R.L. 488'-0" TO R.L. 668'-0"

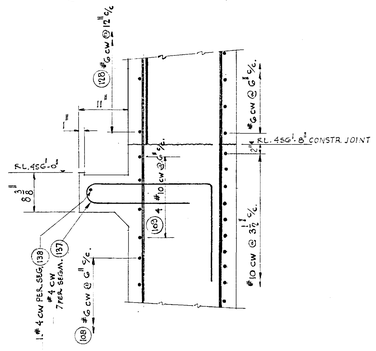


PART PLAN AT R.L. 456'-0"



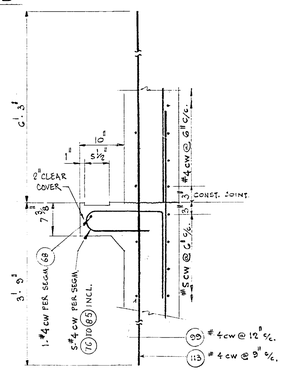
SECTION A·A

(SEE ALSO TYPICAL PLAN)

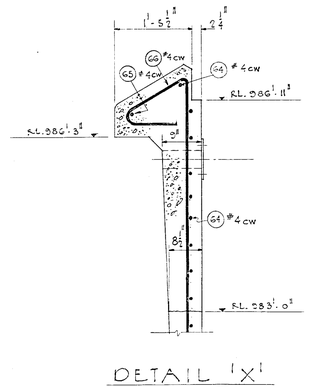


SECTION B·B

(SEE ALSO PART PLAN)



CORBEL DETAILS R.L. 690'-6" & ABOVE



DETAIL 'X'

REFERENCE DRG'S.

GENERAL ARR'T.	LD 247906 K
REINFORCEMENT DETAILS R.L. 503'-0" TO R.L. 988'-0"	LD 247911 K
REINF. DETAILS R.L. 434'-0" TO R.L. 503'-0"	LD 247910 K
FOUNDATION - STACK No. 1	LD 247907 A
FOUNDATION - STACK No. 2	LD 247908 K
CAP DETAILS	LD 247914 B
DIAGRAM OF BAR BENDING SHAPES	S 228581 D
REINFORCEMENT LIST – R.L. 434'-0" TO R.L. 503'-0"	LD 253840 B
REINFORCEMENT LIST – R.L. 503'-0" TO R.L. 988'-0"	LD 253842 K

NOTES.

1. STEEL REINFORCEMENT. #7cw INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No. A83. NUMBER INDICATES DIAMETER IN EIGHTHS OF AN INCH e.g. #7cw = 7/8"ø
2. COVER TO REINFORCEMENT TO BE 2" UNLESS OTHERWISE NOTED.
3. MINIMUM LAP TO BE 40 BAR DIAMETERS.
4. ALL LAPS TO BE STAGGERED.
5. SPACING OF VERTICAL BARS GIVEN AT LOWEST POINT OF BAR.

AMENDMENTS

		DRAWN	DATE	CHECKED
(1)	TENDERING NOTE DELETED. DRG. RELEASED FOR CONSTRUCTION PURPOSES. REF DRGS. ADDED RE/INSC. SIGNATURE ADDED.	R.U.	15-6-68	R.J.H.
2.	Detail 'X' Dimension was 7½" 2" clear cover added R.L. 503'-0" to R.L. 456'-0"	R.J.R.	10.6.69	

CONTRACT No. 1894

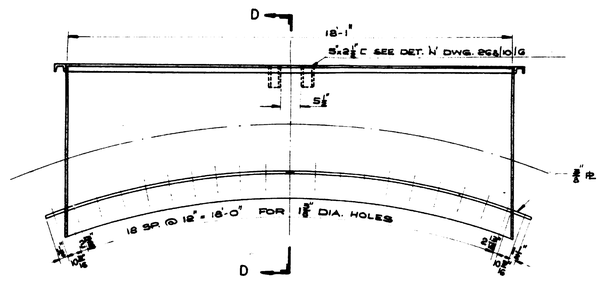
THE ELECTRICITY COMMISSION OF N.S.W.

LIDDELL POWER STATION

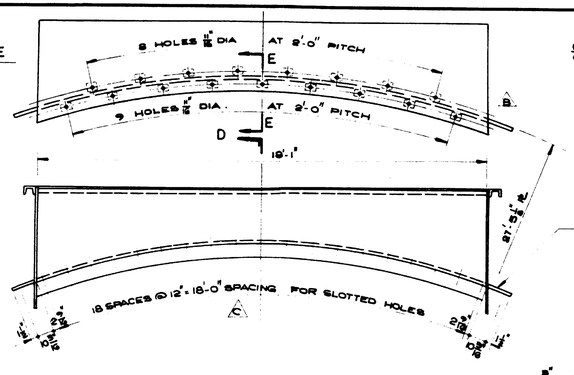
CHIMNEY STACKS No. 1 & 2. REINFORCEMENT DETAILS ELEVATION R.L. 434'-0" TO R.L. 503'-0" & CORBEL DETAILS FROM R.L. 456'-0" TO R.L. 988'-0"

		DATE		DATE
SCALE 3/16" & 1" = 1'-0"			A.A. Ferguson	20/5/68
DRAWN K.M.			P.E./D.S.C.	
TRACED				
CHECKED A.G.S.				
S/CO DATE 20/5/68			LD 247909 A/2	

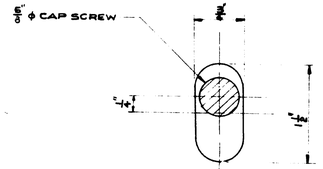
PLAN ON BOTTOM PLATE



SECTION "B-B"

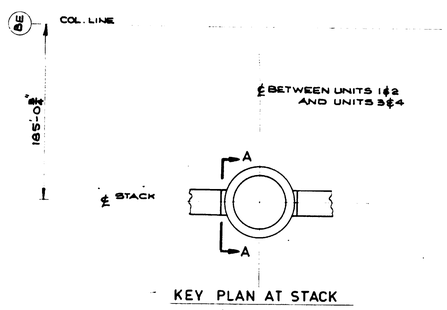


SECTION "C-C"



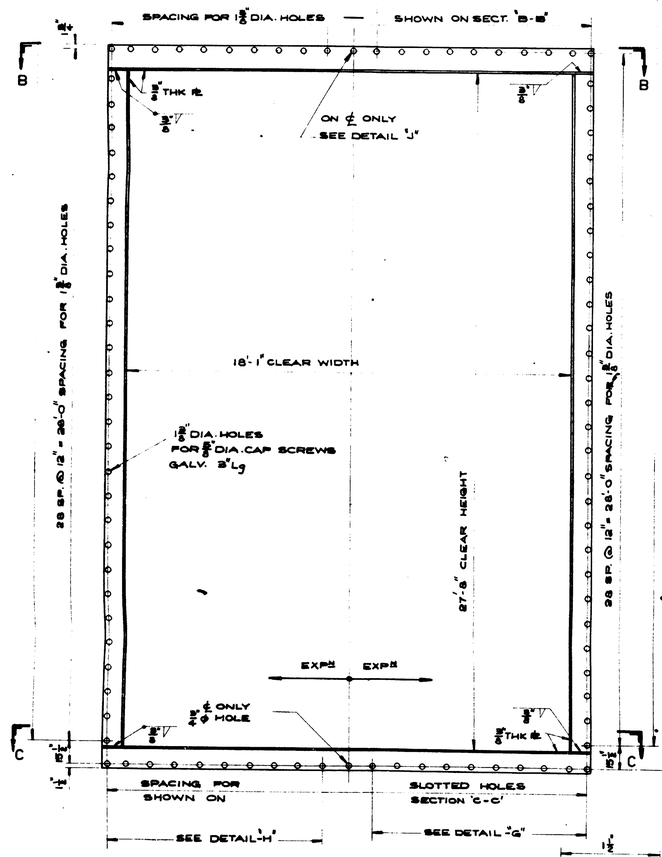
PAINT MARK Nos ON DUCTS IN BLACK LETTERING ON APPROPRIATE BOILER COLOUR PATCH:-

No 1 BOILER	—	RED PATCH
No 2 "	—	WHITE "
No 3 "	—	GREEN "
No 4 "	—	YELLOW "

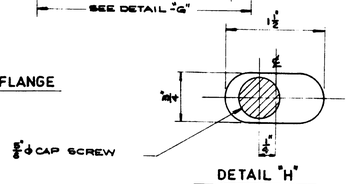


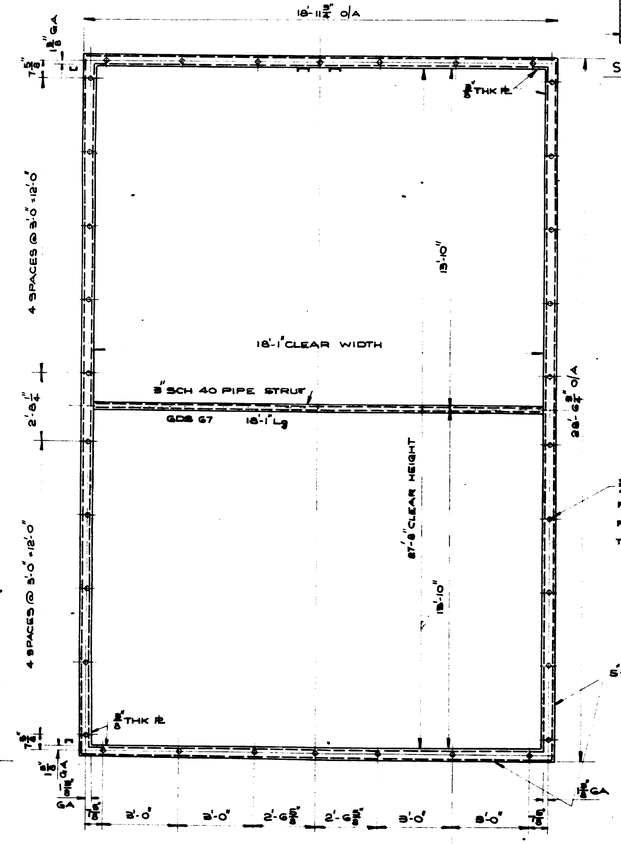
SEE DETAIL-"F"

SEE DETAIL-"E"

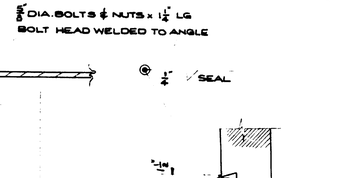


ELEVATION OF INNER FLANGE

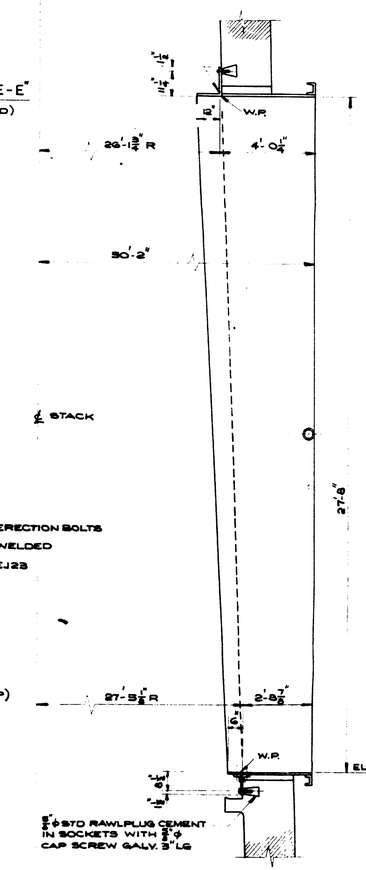




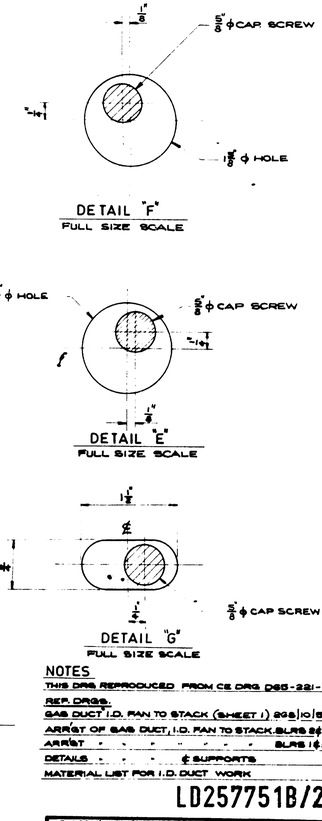
ELEVATION OF OUTER FLANGE SECTION "A-A"
SEE KEY PLAN
MK G.D.S. 12



SECTION "E-E"
ENLARGED)



SECTION "D-D"



NOTES

THIS DRG REPRODUCED FROM CE ORG. D65-221-442-1

REF. DRGS.	
GAS DUCT I.D. FAN TO STACK (SHEET 1)	268/10/5
ARR'GT OF GAS DUCT, I.D. FAN TO STACK.	SLRS 8&4-226/10/4
ARR'GT " " " " "	SLRS 1&3-268/10/2
DETAILS " " " ℄ SUPPORTS	268/10/1
MATERIAL LIST FOR I.D. DUCT WORK	268/10/3

LD257751B/2

SJ3STANDARD FOR MICROFILMING

CONTRACT NO.	LETTER DATED
1600	NOV 570

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INTERNATIONAL COMBUSTION AUSTRALIA LTD.
SOUTH STREET, RYDALMERE, N.S.W.

GAS INLET CONNECTION TO STACK MK C.D.S. 12
ELECTRICITY COMM. OF N.S.W. (SHT 3 OF 3)
LIDDELL POWER STA. UNITS No 1, 2, 3 & 4

ITEM No 11-80

C-E DRAWING No D-935-368-6

DRAWN TRACED 25.11.70 CHECKED WH 26 NOV 68 PASSED ADB SCALE

DRAWING NUMBER 268/10/68

REV. 4 5 6 7 8 E F

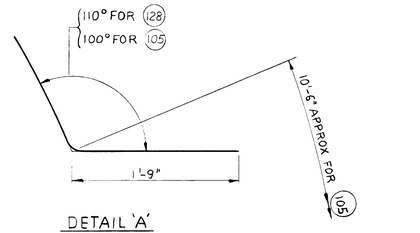
REVISIONS	
4	PIPE STRUT SHOWN IN SECTION D-D SEE CE DRG D65/221/442-1
5	PLAN ON BOTTOM PLATE ADDED. SECTION E-E ADDED. SITE LETTER 1.12.69 S.12.69 RSB
6	DRILLING OF HOLES ON SEC. CC 4.8.70 MODIFIED TO SUIT DRG. D965-221-442-2
7	DRILLING FOR OUTER FLANGE SEC A-A REMAIN TO SUIT D65-221-1 CE LETTER DEC. 30/69 WH
8	DRILLING & SPACING FOR 1⅛" DIA HOLES (ORG. D65-221-442-2) 6.8.70 WAS DRILLING & SPACING FOR ⅞" CAP SCREWS CE30 LETTER 10/146 RHW
9	SECT. C-C DIMS ALTERED (ORG. CORRECTED) 19.2.70 5'/18" WAS 5'/36" & 10 5/18" WAS 11 5/36" RHW
10	ORG. TRACED WITHOUT ALTERATION. T.S. 11.8.70

KODAK 16-11-70

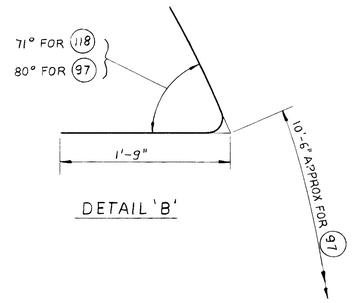
TAG	SIZE	DETAIL	No OFF	LOCATION
1	#7CW	17'-11"	194	VERTICAL EXTERNAL FACE
4	#6CW	17'-6"	142	VERTICAL INTERNAL FACE
7	#6CW	25'-5" / 26'-2" — MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 176'-0" TO 179'-6"	14 RINGS	HORIZ. INTERNAL FACE
19	#6CW	27'-2" / 27'-6" — MIN. LAP 2'-6" EACH RING 6 BARS TOTAL LENGTH 185'-9" TO 187'-9"	18 RINGS	HORIZ. EXTERNAL FACE
86	#7CW	22'-6"	74	VERT. EXTERNAL FACE
87	#6CW	22'-6"	42	VERT. INTERNAL FACE
88	#7CW	25'-7"	80	VERT. EXTERNAL FACE
69	#7CW	19'-3"	164	〃
90	#6CW	28'-7" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 197'-3"	3 RINGS	HORIZ. INTERNAL FACE
91	#10CW	28'-6" — MIN. LAP 4'-11" RING -7 BARS TOTAL LENGTH 213'-6"	1 RING	〃
92	#10CW	20'-0" / 28'-6" / 27'-11"	2 ARCS	〃 (AT TRUCK OPENING)
93	#7CW	2'-9" / 1'-6"	13	AT TRUCK OPENING
94	#10CW	20'-0" / 30'-2"	3	HORIZ. EXT. FACE
95	#10CW	30'-2" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 224'-0"	3 RINGS	〃
96	#6CW	30'-3" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 207'-6"	3 RINGS	〃
97	#6CW	29'-7" / 30'-2" / 10'-6" APPROX — MIN. LAP 2'-6" EACH ARC 7 BARS TOTAL LENGTH 196'-6" TO 200'-0" SEE DETAIL 'B'	24 ARCS	〃
98	#7CW	17'-11"	80	VERT. EXTERNAL FACE
100	#10CW	10'-0"	40	DIAGONAL TRIMMERS AT GAS INL.
101	#10CW	10'-0"	10	DIAGONAL TRIMMERS

TAG	SIZE	DETAIL	No OFF	LOCATION
102	#9CW	20'-0"	24	VERTICAL AT TRUCK OPENING
103	#10CW	9'-0"	10	DIAGONAL TRIMMERS
104	#6CW	17'-6"	60	VERTICAL INTERNAL FACE
105	#6CW	27'-11" / 28'-6" / 10'-6" APPROX — MIN. LAP 2'-6" EACH ARC 7 BARS TOTAL LENGTH 185'-9" TO 189'-6" SEE DETAIL 'A'	12 ARCS	HORIZ INTERNAL FACE
106	#6CW	27'-11" — MIN. LAP 4'-11" RING 7 BARS TOTAL LENGTH 209'-9"	1 RING	〃
107	#6CW	10'-0"	6	VERTICAL INTERNAL FACE
108	#6CW	27'-9" — MIN. LAP 2'-6" EACH RING 7 BARS TOTAL LENGTH 192'-0"	10 RINGS	〃
109	#10CW	27'-7" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 208'-0"	4 RINGS	〃
110	#10CW	30'-0" / 27'-7"	6 ARCS	〃 AT GAS INLETS
111	#6CW	25'-2"	64	VERTICAL INTERNAL FACE
112	#7CW	2'-9" / 1'-6"	100	AT GAS INLET
114	#10CW	38'-4"	56	VERTICAL AT GAS INLETS
115	#7CW	5'-0" / 1'-6"	13	AT TRUCK OPENING
116	#7CW	10'-5"	12	VERTICAL EXTERNAL FACE
117	#7CW	18'-1"	92	〃
118	#6CW	28'-0" / 29'-3" — MIN. LAP 2'-6" EACH ARC 3 BARS TOTAL LENGTH 77'-0" TO 80'-6" SEE DET. 'B' 57 VARIANTS	114 ARCS	HORIZ EXTERNAL FACE
119	#7CW	17'-11"	88	VERTICAL EXTERNAL FACE
120	#7CW	17'-11"	88	〃
121	#7CW	13'-3"	34	〃
122	#7CW	20'-9"	36	〃

TAG	SIZE	DETAIL	No OFF	LOCATION
123	#6CW	17'-8"	68	VERTICAL INTERNAL FACE
124	#6CW	17'-6"	66	〃
125	#6CW	17'-6"	64	〃
126	#6CW	12'-10"	20	〃
127	#6CW	20'-4"	22	〃
128	#6CW	25'-3" / 27'-7" — MIN. LAP 2'-6" EACH ARC 3 BARS TOTAL LENGTH 71'-0" SEE DET 'A' TO 75'-3" 28 VARIANTS	58 ARCS	HORIZ. INTERNAL FACE
129	#10CW	30'-0" / 26'-3"	6 ARCS	〃 AT GAS INLETS
130	#10CW	26'-3" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 199'-6"	4 RINGS	HORIZ INTERNAL FACE
131	#8CW	26'-2" — MIN. LAP 3'-3" EACH RING 7 BARS TOTAL LENGTH 188'-3"	5 RINGS	〃
132	#10CW	29'-3" / 29'-7" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 217'-3" TO 220'-6"	25 RINGS	HORIZ EXTERNAL FACE
133	#10CW	28'-0" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 210'-6"	16 RINGS	〃
134	#10CW	27'-11" — MIN. LAP 4'-11" EACH RING 7 BARS TOTAL LENGTH 209'-9"	2 RINGS	〃
135	#8CW	27'-6" — MIN. LAP 3'-3" EACH RING 7 BARS TOTAL LENGTH 194'-6"	6 RINGS	〃
136	#4CW	2'-4½" / 3" INTRAD. / 1" INTERNAL RAD / 2'-2" / 93° / 2'-9"	270	AT CORBEL RL 488'-0"
137	#4CW	2'-4½" / 3" INTRAD. / 1" INTERNAL RAD / 2'-2" / 93° / 2'-9"	406	AT CORBEL RL 456'-0"
138	#4CW	2'-8"	112	AT CORBEL RL 456'-0" & RL 488'-0"
139	#6CW	18'-10"	128	VERTICAL INTERNAL FACE



DETAIL 'A'



DETAIL 'B'

REFERENCE DRG'S.

CHIMNEY STACK 1 & 2 REINFORCEMENT DET. ELEVATION RL 434'-0" TO RL 503'-0"	LD 247909 A
CHIMNEY STACK No1 & 2	LD 247906 K
DIAGRAM BAR BENDING SHAPES	S 228581 D

NOTES

STEEL REINFORCEMENT: #CW INDICATES COLD-WORKED STEEL DEFORMED BARS AS PER AS No A 83. NUMBER INDICATES DIAMETER IN EIGHTS OF AN INCH e.g. #8CW = 1"

DELIVER TO SITE IN TAGGED BUNDLES

HORIZONTAL REINFORCEMENT, CONSISTING OF TWO OR MORE BARS FORMING A RING, SHALL HAVE THE BARS COMPRISING EACH RING BUNDLED SEPARATELY

TAGS 97, 105, 118, 128 ARE TO BE MADE IN SUCH A WAY, THAT, WHEN PLACED, ALL THE LAPS ARE STAGGERED.

REINFORCEMENT LISTED FOR ONE STACK ONLY
REINFORCEMENT REQUIRED FOR TWO STACKS.

AMENDMENTS
1. Tag 136 No off was 220, tag 138 was 111. — L.N. K.J.H. 27.8.68

KJA for MD 27/9/68

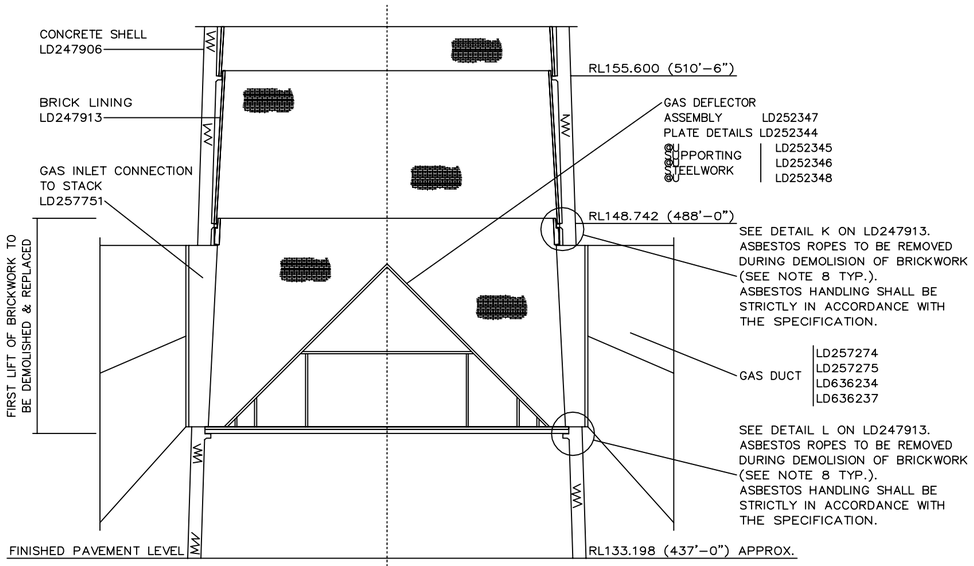
CONTRACT No. 1894

THE ELECTRICITY COMMISSION OF N.S.W.

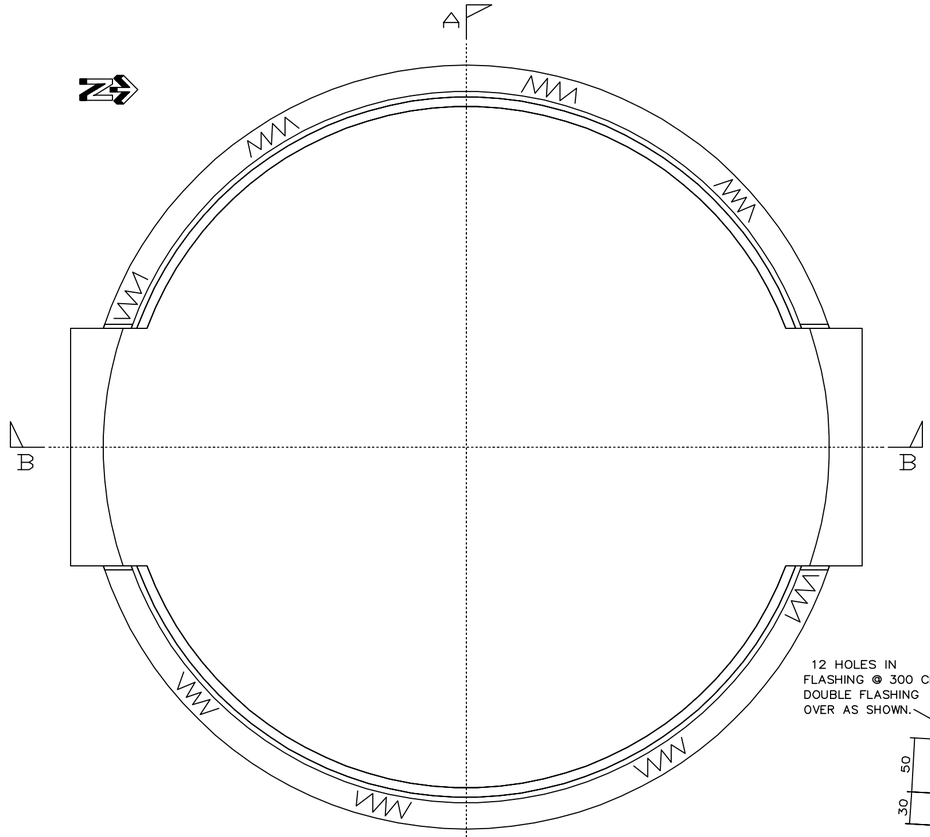
LIDDELL POWER STATION
CHIMNEY STACKS No1 & 2
ELEVATION RL. 434'-0" TO RL. 503'-0"
REINFORCEMENT LIST

SCALE	N.T.S.				DATE	DATE
DRAWN	K.U.				PE/PSC	1-8-68
TRACED	—					
CHECKED	ACG					
E/CD.	KJA for MD					
DATE	1.8.68					

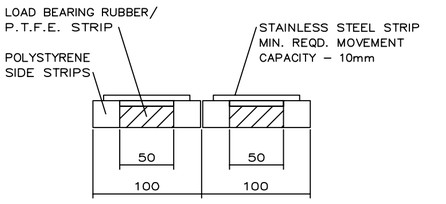
LD 253840 B/1



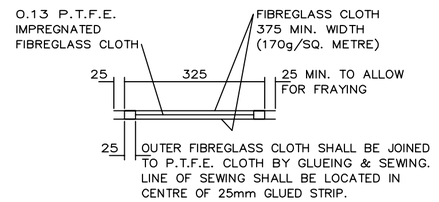
EXISTING CHIMNEY STACK DETAILS
SCALE 1:100



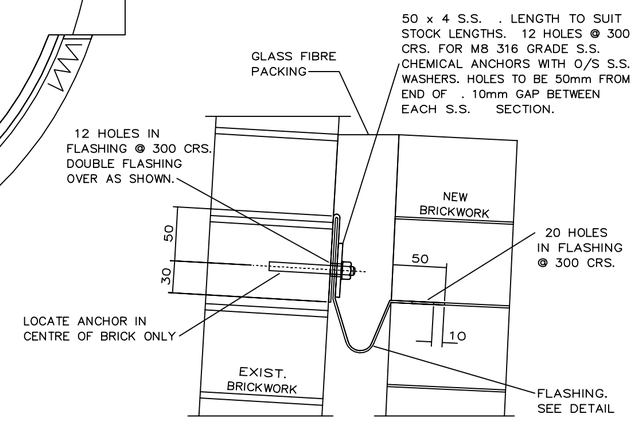
PLAN AT RL145.085
SCALE 1:50
GAS DEFLECTOR NOT SHOWN



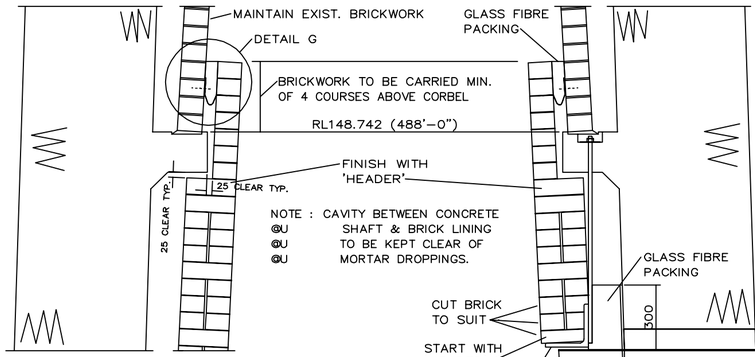
ANTI-FRICTION JOINT
SCALE 1:2



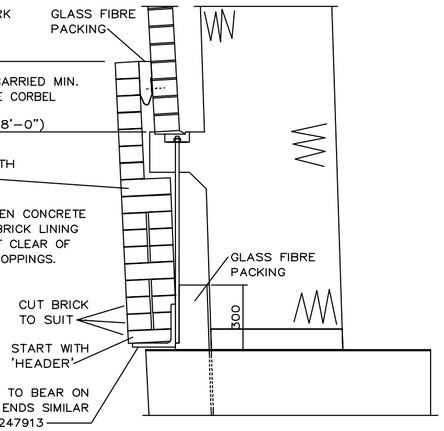
FLASHING DETAIL
N.T.S.



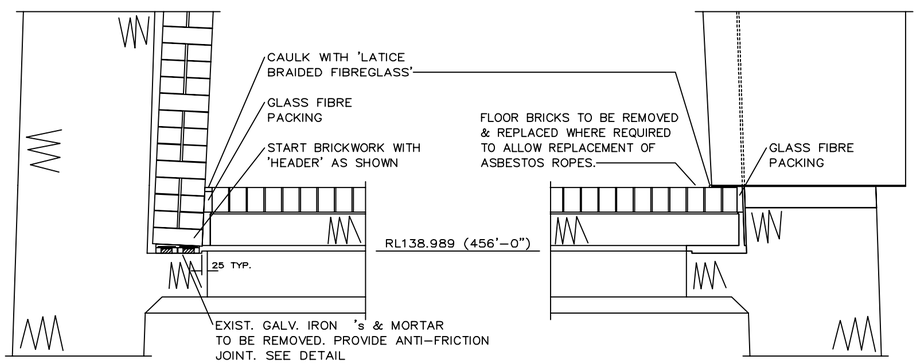
DETAIL G
SCALE 1:2



DETAIL C
SCALE 1:10

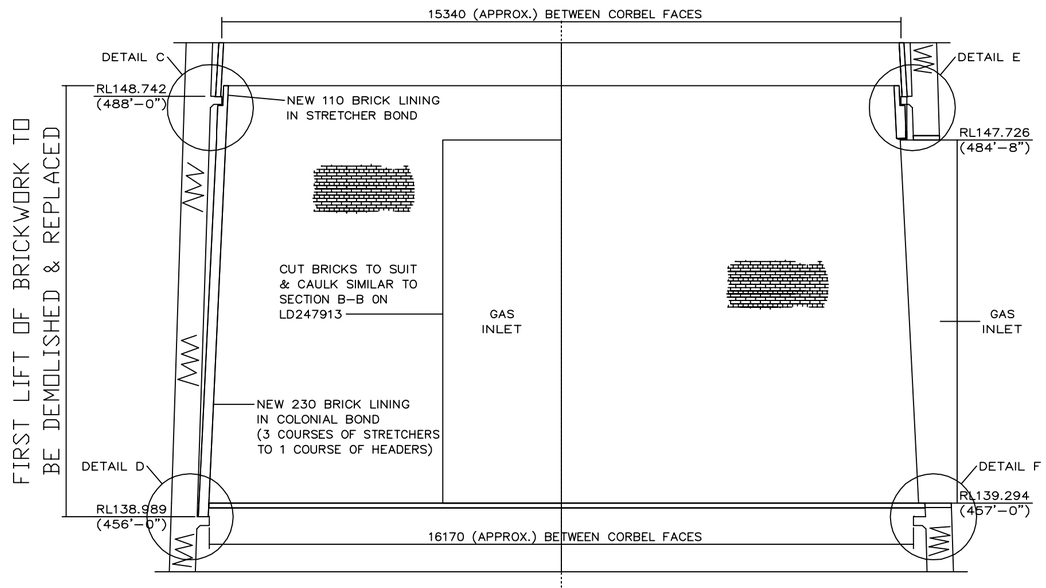


DETAIL E
SCALE 1:10



DETAIL D
SCALE 1:10

DETAIL F
SCALE 1:10



HALF SECTION A-A
HALF SECTION B-B
SCALE 1:50

NOTES

1. THE CONTRACTOR SHALL CONFIRM ALL DIMENSIONS & REDUCED LEVELS ON SITE BEFORE CONSTRUCTION COMMENCES.
2. ASBESTOS HANDLING & REMOVAL SHALL BE STRICTLY IN ACCORDANCE WITH THE SPECIFICATION.
3. EXISTING GLASS INSULATION SHALL BE REPLACED WITH NEW GLASS FIBRE PACKING IN ACCORDANCE WITH THE SPECIFICATION.
4. ALL STAINLESS STEEL PLATE, ANCHORS, NUTS & WASHERS SHALL BE GRADE 316.
5. M8 CHEMICAL ANCHORS SHALL BE INSTALLED IN THE CENTRE OF THE EXISTING BRICKS ONLY.
6. BRICK LINING SHALL BE GAS TIGHT. BRICKS SHALL BE LAID IN COLONIAL BOND (DOUBLE SKIN) & STRETCHER BOND (SINGLE SKIN) WITH 2mm TO 6mm JOINTS ALL AS SPECIFIED.
7. ALL HOLES IN FLASHING MATERIAL SHALL BE PUNCHED ONLY.
8. ASBESTOS ROPE SHALL BE REPLACED WITH 'LATICE BRAIDED FIBREGLASS' OF EQUIVALENT SIZE AS SPECIFIED.

REFERENCE DRAWINGS

LD247906	GENERAL ARRANGEMENT – CONCRETE
LD247913	BRICK LINING DETAILS
LD252344	GAS DEFLECTOR – PLATE DETAILS
LD252345	GAS DEFLECTOR – COLUMN & BRACE DETAILS
LD252346	GAS DEFLECTOR – BEAM & TIE DETAILS
LD252347	GAS DEFLECTOR ASS'Y
LD252348	GAS DEFLECTOR – BEAM & RAFTER DETAIL
LD257274	GAS DUCT I.D. FAN TO STACK – ARRG'T
LD257275	GAS DUCT I.D. FAN TO STACK – DETAILS
LD257751	GAS INLET CONNECTION TO STACK
LD243632	TYP. WELDING & CONSTR. DETS. FOR DUCTING
LD636234	UNIT 3 – I.D. FAN TO STACK DUCTING
@U	ADDITIONAL STIFFENING BEAMS
LD636237	UNIT 4 – I.D. FAN TO STACK DUCTING
@U	ADDITIONAL STIFFENING BEAMS

LINES STRAIGHTENED, BUILDINGS & DRAWINGS LINES SQUARED (DRAWING REALIGNED) ADDITIONAL CORRELATIVES INCORPORATED (CAUSE NOTED) REMOVED FROM AUTOCAD CONVERSION. SYSTEM COLOUR REDEFINED.

01	CKD	PF	06-SEP-93
DATE			

804x1136mm

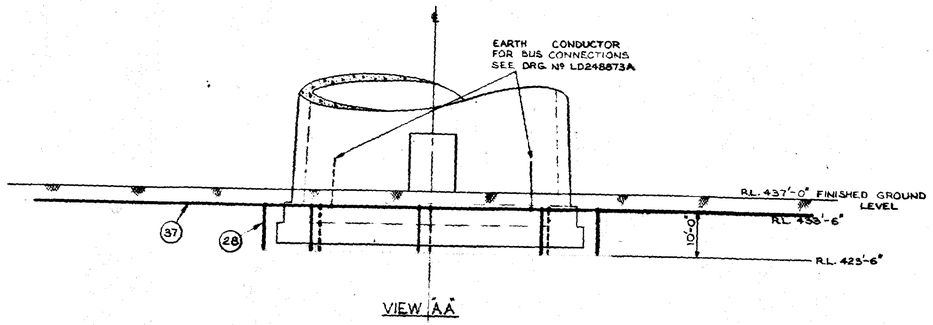
PACIFIC POWER SERVICES

CONTRACT No.	DRAWN	DM	
QUOTE NO. W269/93	DESIGN		
	DSGN'D	DO RT	
	ENG		
	PASSED	PS	
REFERENCE DRAWINGS	MANAGER/PPE	4-JUN-1993	
	APPROVED		
	gad DO NOT AMEND MANUALLY	DRAWING STATUS	SCALE AS SHOWN

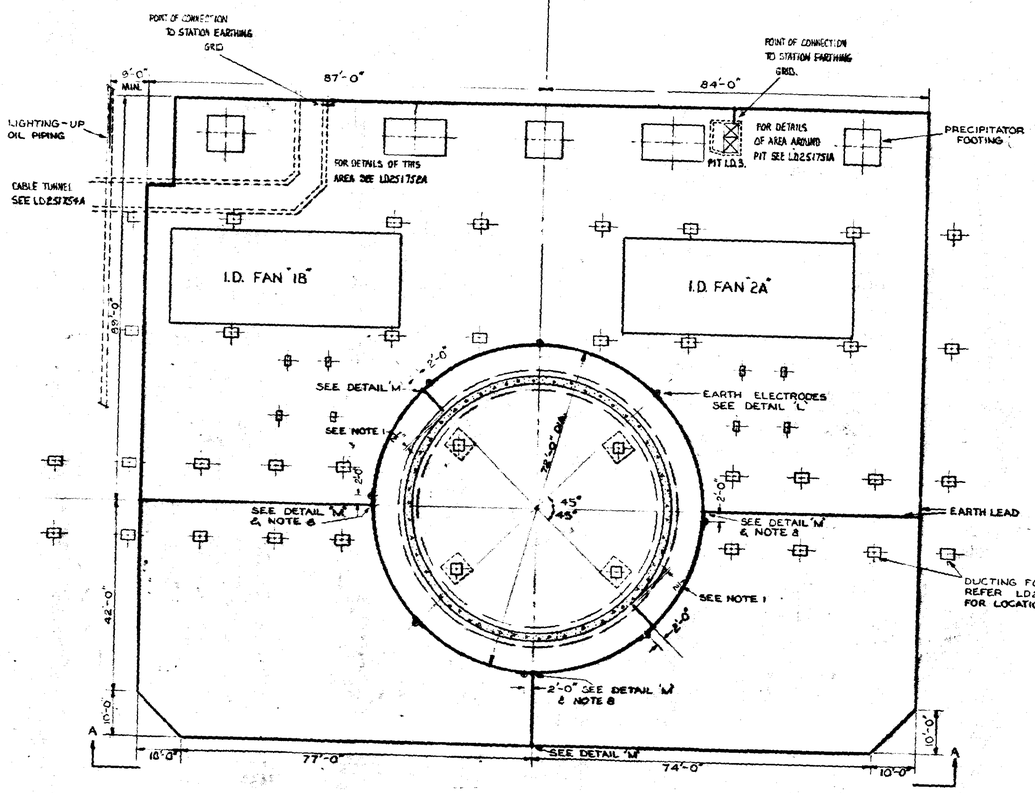
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KKS CODING	UHN
ORIGINAL DRAWING APPROVED BY	C STARK per PS
Macquarie Generation	
LIDDELL POWER STATION UNITS 3 & 4 CHIMNEY STACK REPAIRS TO BRICK LINING DETAILS	
A0	LD637160 01
	PREFIX NUMBER SHEET AMDT

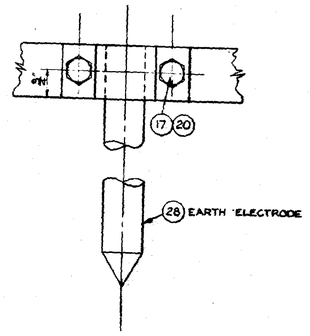
PLOT ISSUE No. 5 | PLOT ISSUE DATE 06SEP93 | COPIED FROM | SUPERSEDES | SUPERSEDED BY | INDEX CLASS'N –



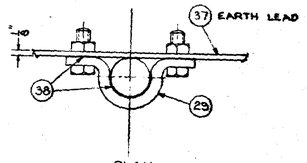
VIEW 'AA'



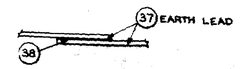
PLAN



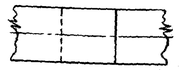
ELEVATION



PLAN
DETAIL 'L'



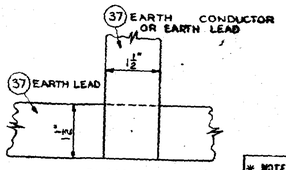
ELEVATION



PLAN
DETAIL 'N'



ELEVATION



PLAN
DETAIL 'M'

REFERENCE DRAWINGS

LD247907A - CHIMNEY STACK Nº1-FOUNDATION

LD248873A - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR - ARRANGEMENT
LD248871P - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 1.
LD248872P - CHIMNEY STACKS Nº1 & Nº2 - LIGHTNING CONDUCTOR MATERIAL LIST - SHEET 2.
LD246715A - BOILERS 1 & 2 - PRECIPITATORS & I.D. FANS AREA - CABLE PITS, TUNNEL & CONDUIT LAYOUT.
LD251751A - I.D FANS 2A & 2B AREA - CABLE PITS & CONDUIT DETAILS
LD251752A - " " " 1A & 1B " " " " " "
LD 28.230 A - CHIMNEY STACK Nº2 - LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

NOTES.

1. EARTH CONDUCTOR TO BE ½" CLEAR OF & PARALLEL TO FINISHED FACE OF STACK AS INDICATED IN PLAN. EARTH CONDUCTOR TO BE EXTENDED UP TO RL 441'-0" FOR EARTHING OF SCAFFOLDING & REINFORCEMENT ETC. DURING CHIMNEY CONSTRUCTION. ON COMPLETION OF CHIMNEY CONSTRUCTION, EARTH CONDUCTORS ARE TO BE TERMINATED AT TEST LINK IN ACCORDANCE WITH SECTION 'EE' ON DRG. Nº LD248873A.
2. TEMPORARY LEADS FOR EARTHING OF SCAFFOLDING ETC. DURING CHIMNEY CONSTRUCTION SHALL BE FIRMLY BONDED TO EARTH CONDUCTOR AT R.L. 441'-0". THE EARTH LEAD CONDUCTOR CONCENTRIC TO THE BASE OF THE STACK SHALL BE COMPLETELY COVERED & TIGHTLY PACKED WITH FINE SOIL TO A MIN. R.L. OF 435'-0" PRIOR TO BONDING OF EARTH CONDUCTOR TO THE TEMPORARY LEADS.
3. ALL MATING SURFACES OF JOINTS IN DETAIL 'L' ARE TO BE COMPLETELY BONDED WITH A CONTINUOUS COATING OF ALLOY & INTERPOSING STRIPS OF SILVER BRAZING ALLOY RIBBON OR COPPER PROSPHORUS BRAZING ALLOY RIBBON (SHIM). (TYPE CP1 OR CP2) BETWEEN MATING SURFACES BEFORE CLAMPING & BRAZING.
4. EARTH LEAD TO BE FORMED UP FROM LONGEST AVAILABLE LENGTHS OF COPPER & JOINED WHEREVER NECESSARY IN ACCORDANCE WITH DETAIL 'N' & NOTE 11.
5. REMOVE ALL SURPLUS FLUX & SCALE AFTER BRAZING.
6. DRIVE TOP OF EARTH ELECTRODES TO RL 433'-6" AS INDICATED ON ELEVATION.
7. BENDS IN EARTH CONDUCTOR TO BE 8" MIN. RAD.
8. THE THREE LOCATIONS SHOWN SHOULD NOT BE JOINED UNTIL TESTS HAVE BEEN CARRIED OUT TO DETERMINE THE EARTH RESISTANCE OF THE CONCENTRIC EARTH TERMINATION NETWORK (CALCULATED VALUE 1·6 OHM)
9. ITEM Nºs ENCIRCLED THUS (29) REFER TO ITEMS LISTED ON MATERIAL LIST DRG. Nºs LD248871 & 72P.
10. IF AN ELECTRODE STRIKES ROCK, A 1½" DIA. HOLE IS TO BE DRILLED TO THE REQUIRED DEPTH & THE ELECTRODE PLACED IN HOLE. THEN AN EQUAL MIXTURE OF BENTONITE & PLASTER OF PARIS SHALL BE MIXED WITH WATER TO FORM A SLURRY & POURED INTO THE HOLE AROUND THE ELECTRODE.
11. ALL JOINTS SHOWN IN DETAIL 'M & N' SHALL BE BRAZED JOINTS USING EITHER SILVER-BRAZING ALLOY OR COPPER-PHOSPHORUS BRAZING ALLOY.

* NOTE FOR CONTRACT NO. 2133

This drawing to be used for information only in tendering for Contract No. 2133 in accordance with the requirements of Specification No. 2133 - General-Drawings.

Reference Drawings listed hereon shall only be used for Contract 2133 if specifically supplied and listed in the Specification No. 2133.

AMENDMENTS
NOTES 1 & 3 & 4 MODIFIED. NOTE 11 ADDED. CONTRACT Nº ADDED. DRN: K.R. CHD: W.A.K. APP: A.A.F. 6/6/68
3 NOTE CHANGED. 2133 (WALLSEND AS) ADDED. (G.R.G-81) DRN: C.V. CHD: E.J.A. APP: A.A.F. 11.12.70
4. EARTHING CABLE REROUTED TO SUIT SITE LAYOUT. PIT LD.3 & CABLE TUNNEL ADDED TO SHOW POINTS OF CONNECTION BETWEEN STATION EARTH & STACK GRID. REF DRGS ADDED. TITLE ALTERED. DRN: M.J.K. CHD: E.J.A. APP: [illegible] 12.12.72

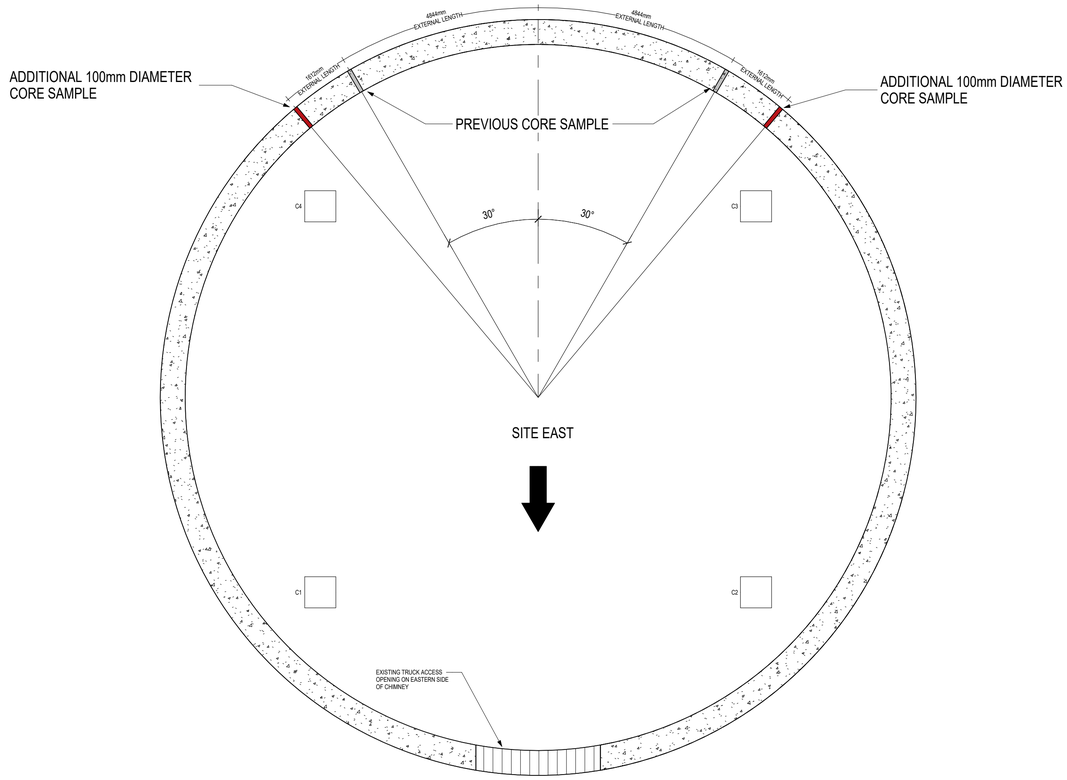
* CONTRACT Nº	CONTRACT Nº
2133	1894

THE ELECTRICITY COMMISSION OF N.S.W.

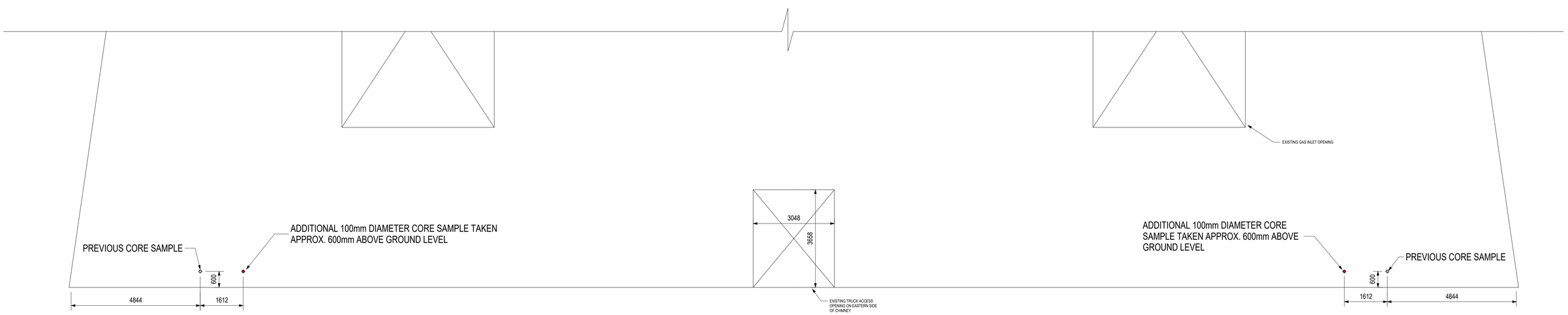
LIDDELL POWER STATION
CHIMNEY STACK Nº1
LIGHTNING CONDUCTOR EARTHING ARRANGEMENT

SCALE ½ IN. = 1 FT. & ½ IN. = 1 IN.				DATE	E.J.A.	DATE
DRAWN	K.R.	E/M.S.				DCE/POWER
TRACED	J.D.W.	S.E.& A.			A.A. Farquhar	
CHECKED	S.G.					PE/CON
SE/E.D.O. DATE	[illegible] 13-3-68				LD248874	B/4

ATTACHMENT 3 – CORE SAMPLE LOCATIONS



CHIMNEY BASE SECTIONAL VIEW
SCALE 1 : 75



CORE SAMPLE LOCATION ELEVATION
SCALE 1 : 75

NOTES:
1. CORE SAMPLES TO BE TAKEN FROM SAME LOCATION FOR BOTH CHIMNEY #1 AND CHIMNEY #2
2. CORE SAMPLES MUST BE MINIMUM 200mm IN LENGTH
3. EXACT LOCATIONS MAY BE ALTERED UP TO 100mm ONSITE TO MISS EXISTING REBAR, BUT ENSURE SAMPLE IS TAKEN FROM FIRST LIFT.

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
1	ADDITIONAL CORE LOCATIONS FOR SECONDARY TESTING	DH	DH	BH	5.06.25
0	INITIAL ISSUE OF DRAWING	DH	DH	BH	27.05.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 27.05.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY BLAST - CORE SAMPLE LOCATIONS**

Original Size **A1**
Drawing No: WI-24057-006
Rev: B

Plot Date: 5/06/2025 5:05:16 PM

ATTACHMENT 4 – LABORATORY TEST RESULT – COMPRESSION TESTING

CONCRETE CORE COMPRESSIVE STRENGTH REPORT

Newcastle Laboratory
16 Callistemon Close Warabrook NSW 2304
Phone: (02) 4016 2300
Email: Newcastle Laboratory

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Jackson Antilla
Laboratory Manager
Laboratory Accreditation Number: 431

Report Number: **NEWC25328-1**
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Core location change*
Date Issued: 12/08/2025
Client: CMA Contracting
Unit 2, 42 Wermol Street, Kurri Kurri NSW 2327
Contact: Marina James
Project: NEWC25328 - Liddell Power Station
Client Reference: C0269
Work Request: 5177
Sampling Method: Sampled by Client
The results apply to the sample as received
Site Selection: Selected by Client
Location: Concrete Cores
Dates Cored: 12/06/2025 - 12/06/2025
Concrete Strength (MPa):
Layer:

Concrete Cores AS 1012 14 & 9 & 12.1												
Specimen Id. No.	Date of Test	Initial Length (mm)	Initial Reinforcement Location (mm)	Trimmed Core Length (mm)	Trimmed Reinforcement Location (mm)	Average Diameter (mm)	Mass/Unit Volume (kg/m^3)	Core Strength (MPa)	Corrected Compressive Strength (MPa)	Cap Type	Age (days)	Core Location / Remarks
NEWC5177A	16/06/2025	**	**	193.7	**	101.1	2380	30.5	30.5	S	**	S1C1
NEWC5177B	16/06/2025	**	**	189.3	**	101.1	2380	31.0	30.5	S	**	S1C2
NEWC5177C	16/06/2025	**	**	191.3	**	101.1	2380	24.5	24.5	S	**	S2C3
NEWC5177D	16/06/2025	**	**	190.7	**	101.1	2340	28.0	28.0	S	**	S2C4

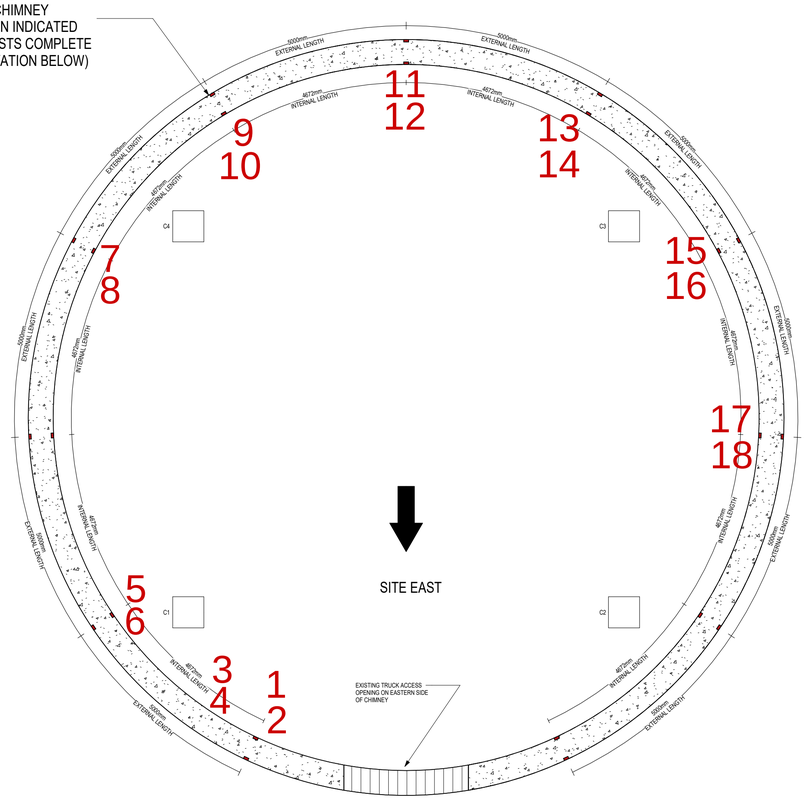
NOTE: Unless otherwise stated to the contrary the following apply:

1. Density in accordance with AS 1012.12.1 with Moisture Condition SSD
2. Compressive Strength in accordance with AS 1012.9
3. Capping: S - Sulphur
4. Preconditioning: Wet-conditioning
5. Curing in accordance with AS 1012.8.1 9.3 Standard Temperate Zone.

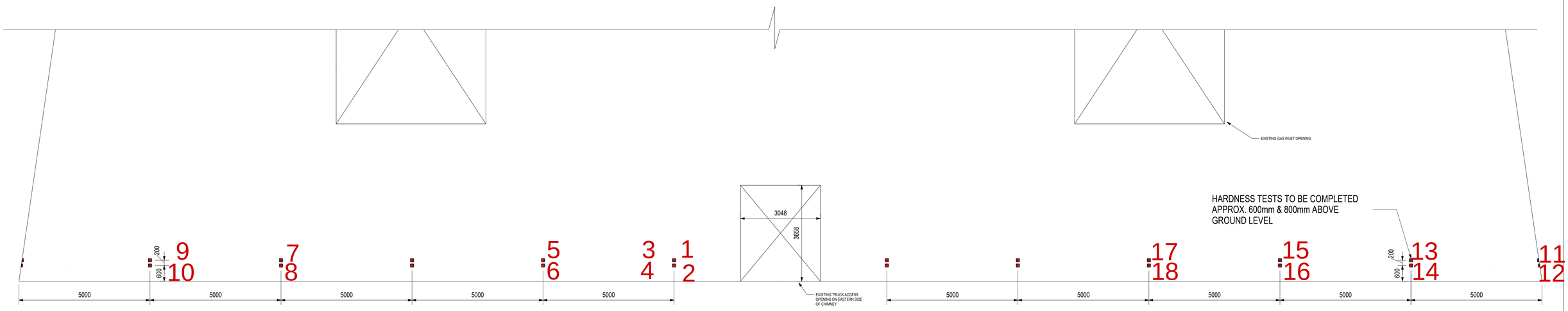
This document shall not be reproduced except in full without the approval of the laboratory.
Results relate only to the items tested/sampled.

ATTACHMENT 5 – SCHMIDT TEST RESULTS CHIMNEY U1/U2 INSIDE FACE

Chimney 1-2 - Inner Rim
HUNT25107
24/06/25



CHIMNEY BASE SECTION
SCALE 1 : 75



HARDNESS TEST LOCATIONS - EXTERNAL
SCALE 1 : 75

NOTES:
1. SCHMIDT HARDNESS TESTS TO BE TAKEN FROM SAME LOCATION FOR BOTH CHIMNEY #1 AND CHIMNEY #2
2. EXACT LOCATIONS MAY BE ALTERED ONSITE TO MISS EXISTING REBAR, BUT ENSURE SAMPLE IS TAKEN FROM FIRST LIFT.
3. TWENTY TWO TESTS TO BE TAKEN ON EXTERNAL SURFACE, AND TWENTY-TWO ON INTERNAL SURFACE, FORTY-FOUR TOTAL PER CHIMNEY

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	-	18.06.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check -
Approved D. HEALY
Date 18.06.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY - HARDNESS TEST LOCATIONS**

Original Size **A1**
Drawing No: **WI-24057-007**
Rev: A

Plot Date: 18/06/2025 9:34:39 PM

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	1	2	3	4	5
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	1	51	52	35	56	46
	2	44	55	55	50	42
	3	53	58	51	50	50
	4	49	52	50	54	46
	5	51	53	53	52	44
	6	52	52	58	53	45
	7	50	50	50	59	53
	8	59	40	50	51	50
	9	49	52	53	55	41
	10	51	53	51	47	51
Average of 10		**50.9**	**51.7**	**50.6**	**52.7**	**46.8**
Average of conforming readings		**51**	**52**	**51**	**53**	**47**
Apparent Compressive Strength (MPA)		**52**	**54**	**52**	**55**	**45**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	6	7	8	9	10
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	43	45	45	51	41
	2	49	46	48	45	34
	3	50	45	49	49	38
	4	49	55	49	39	43
	5	44	40	55	45	45
	6	51	50	41	48	47
	7	48	55	49	50	45
	8	45	50	49	49	38
	9	45	45	49	51	40
	10	47	47	49	48	41
Average of 10		**47.1**	**47.8**	**48.3**	**47.5**	**41.2**
Average of conforming readings		**47**	**48**	**48**	**48**	**41**
Apparent Compressive Strength (MPA)		**46**	**47**	**47**	**47**	**38**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	11	12	13	14	15
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	49	51	50	45	49
	2	50	49	47	21	55
	3	50	59	51	52	55
	4	51	52	41	35	55
	5	50	54	48	50	45
	6	43	51	41	48	51
	7	34	50	49	52	50
	8	39	50	46	52	55
	9	47	52	50	48	55
	10	37	40	52	45	55
Average of 10		**45**	**50.8**	**47.5**	**44.8**	**52.5**
Average of conforming readings		**45**	**51**	**48**	**45**	**53**
Apparent Compressive Strength (MPA)		**44**	**52**	**47**	**44**	**55**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number		16	17	18		
test location details		View attached sketch	View attached sketch	View attached sketch		
element tested		Concrete	Concrete	Concrete		
surface texture		Smooth	Smooth	Smooth		
area form material						
surface moisture condition		Dry	Dry	Dry		
surface ground		No	No	No		
hammer orientation		Horizontal	Horizontal	Horizontal		

Test Results

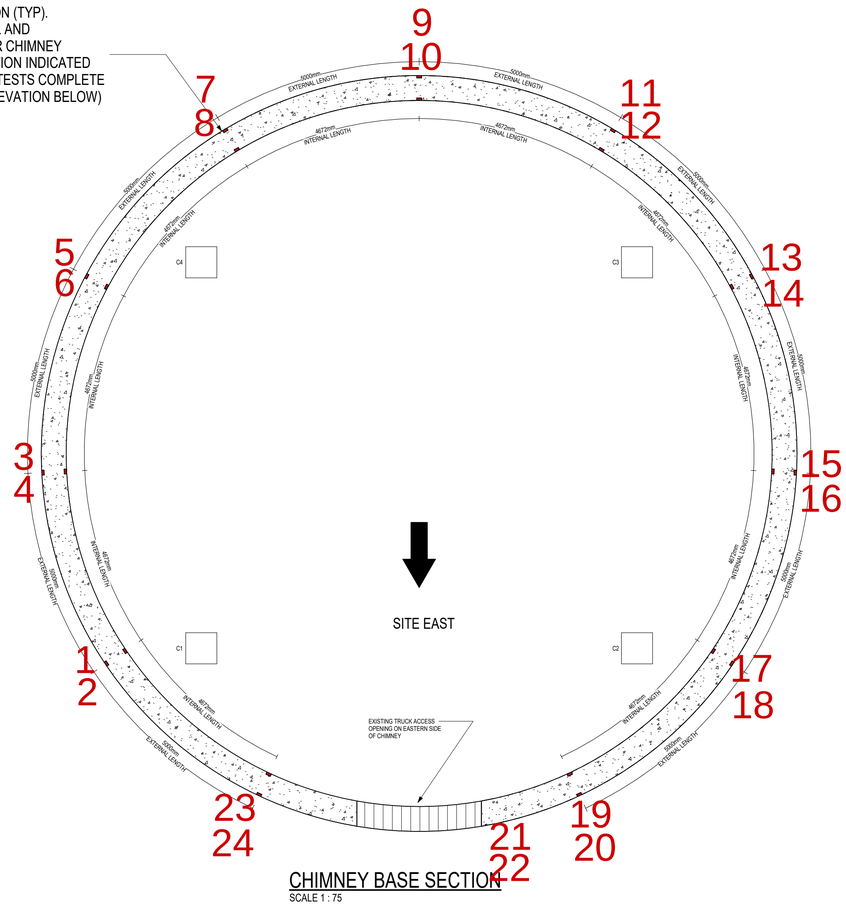
Rebound Readings	**1**	51	45	51		
	2	55	50	41		
	3	51	49	45		
	4	51	45	45		
	5	46	55	40		
	6	52	50	41		
	7	45	51	46		
	8	50	51	40		
	9	44	50	50		
	10	49	49	45		
Average of 10		**49.4**	**49.5**	**44.4**		
Average of conforming readings		**49**	**50**	**44**		
Apparent Compressive Strength (MPA)		**49**	**51**	**43**		
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

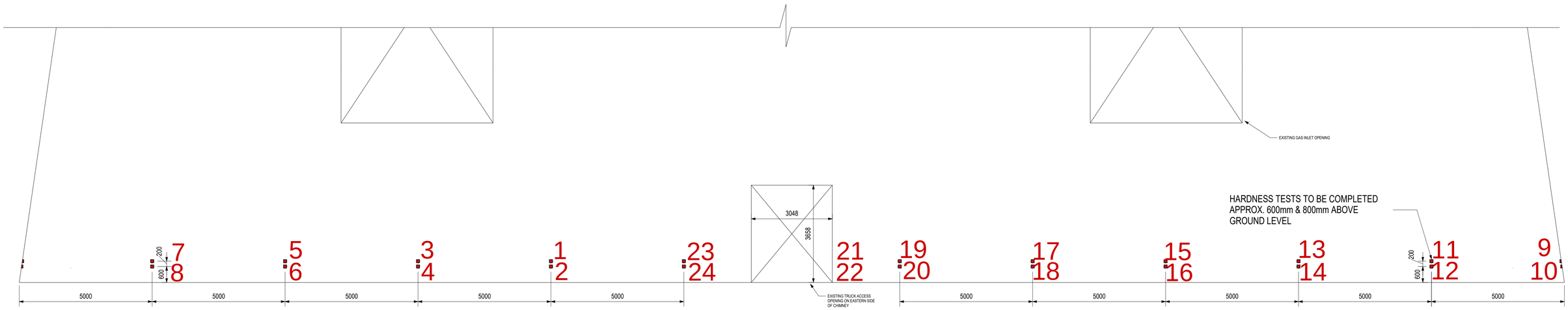
Comments:

ATTACHMENT 6 – SCHMIDT TEST RESULTS CHIMNEY U1/U2 OUTSIDE FACE

Chimney 1-2 - Outer Rim
HUNT25107
24/06/25



CHIMNEY BASE SECTION
SCALE 1 : 75



HARDNESS TEST LOCATIONS - EXTERNAL
SCALE 1 : 75

NOTES:
1. SCHMIDT HARDNESS TESTS TO BE TAKEN FROM SAME LOCATION FOR BOTH CHIMNEY #1 AND CHIMNEY #2
2. EXACT LOCATIONS MAY BE ALTERED ONSITE TO MISS EXISTING REBAR, BUT ENSURE SAMPLE IS TAKEN FROM FIRST LIFT.
3. TWENTY TWO TESTS TO BE TAKEN ON EXTERNAL SURFACE, AND TWENTY-TWO ON INTERNAL SURFACE, FORTY-FOUR TOTAL PER CHIMNEY

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	-	18.06.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check -
Approved D. HEALY
Date 18.06.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY - HARDNESS TEST LOCATIONS**

Original Size **A1**
Drawing No: **WI-24057-007**
Rev: A

Plot Date: 18/06/2025 9:34:39 PM

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-1

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	1	2	3	4	5
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	1	42	41	40	33	51
	2	44	48	45	56	50
	3	40	40	45	45	44
	4	41	48	46	39	51
	5	42	38	45	44	46
	6	46	35	39	32	46
	7	46	46	45	46	46
	8	42	44	50	44	42
	9	41	45	44	42	42
	10	45	44	45	45	54
Average of 10		**42.9**	**42.9**	**44.4**	**42.6**	**47.2**
Average of conforming readings		**43**	**43**	**44**	**43**	**49**
Apparent Compressive Strength (MPA)		**38**	**38**	**40**	**39**	**49**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-2

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**

Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	6	7	8	9	10
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	54	50	47	48	44
	2	51	48	46	46	44
	3	47	49	42	49	40
	4	50	50	50	44	45
	5	52	48	46	38	40
	6	52	47	45	40	41
	7	45	48	44	47	39
	8	51	47	46	38	39
	9	52	50	45	44	45
	10	49	47	47	46	46
Average of 10		**50.3**	**48.4**	**45.8**	**44**	**42.3**
Average of conforming readings		**50**	**48**	**46**	**44**	**42**
Apparent Compressive Strength (MPA)		**50**	**47**	**44**	**41**	**39**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-3

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	11	12	13	14	15
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	43	38	35	43	40
	2	50	45	45	46	40
	3	45	45	45	44	46
	4	46	42	45	46	42
	5	47	40	47	47	40
	6	41	45	48	46	40
	7	38	45	45	46	40
	8	43	40	44	41	42
	9	35	38	46	46	45
	10	52	42	46	46	45
Average of 10		**44**	**42**	**44.6**	**45.1**	**42**
Average of conforming readings		**44**	**42**	**45**	**45**	**42**
Apparent Compressive Strength (MPA)		**41**	**39**	**43**	**43**	**39**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-4

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	16	17	18	19	20
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	35	46	44	43	48
	2	36	49	49	50	45
	3	36	49	49	49	50
	4	37	40	41	41	45
	5	38	49	41	50	40
	6	40	41	45	49	43
	7	32	45	48	49	40
	8	43	49	44	50	46
	9	35	46	50	45	45
	10	36	46	48	40	49
Average of 10		**36.8**	**46**	**45.9**	**46.6**	**45.1**
Average of conforming readings		**37**	**46**	**46**	**47**	**45**
Apparent Compressive Strength (MPA)		**30**	**44**	**44**	**45**	**43**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-5

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 1/2 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	21	22	23	24	
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	
element tested	Concrete	Concrete	Concrete	Concrete	
surface texture	Smooth	Smooth	Smooth	Smooth	
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	
surface ground	No	No	No	No	
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	

Test Results

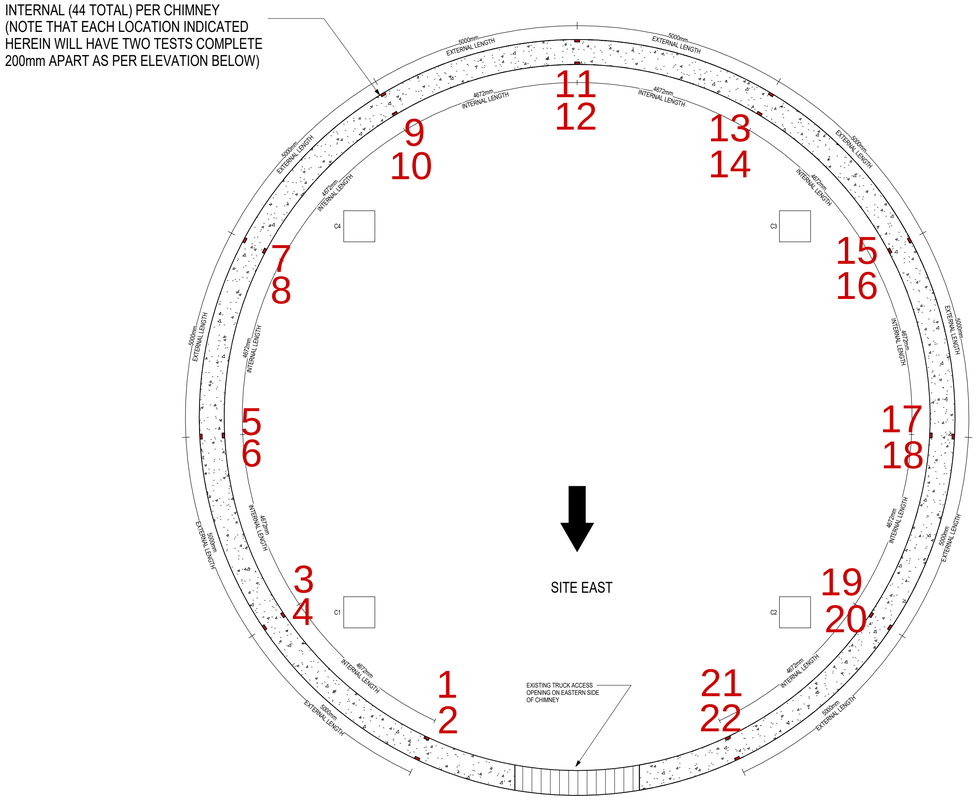
Rebound Readings	**1**	50	52	49	49	
	2	50	54	45	47	
	3	48	53	51	47	
	4	53	51	50	47	
	5	50	48	50	48	
	6	51	53	50	49	
	7	54	53	53	49	
	8	50	53	52	49	
	9	53	52	51	51	
	10	49	53	50	48	
Average of 10		**50.8**	**52.2**	**50.1**	**48.4**	
Average of conforming readings		**51**	**52**	**50**	**48**	
Apparent Compressive Strength (MPA)		**52**	**54**	**51**	**47**	
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

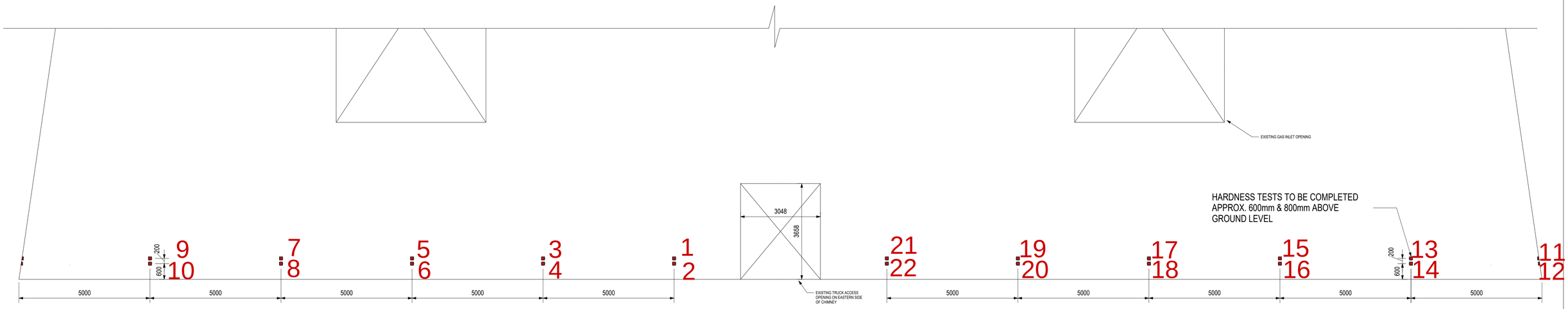
Comments:

ATTACHMENT 7 – SCHMIDT TEST RESULTS CHIMNEY U3/U4 INSIDE FACE

Chimney 3-4 - Inner Rim
HUNT25107
24/06/25



CHIMNEY BASE SECTION
SCALE 1 : 75



HARDNESS TEST LOCATIONS - EXTERNAL
SCALE 1 : 75

NOTES:
1. SCHMIDT HARDNESS TESTS TO BE TAKEN FROM SAME LOCATION FOR BOTH CHIMNEY #1 AND CHIMNEY #2
2. EXACT LOCATIONS MAY BE ALTERED ONSITE TO MISS EXISTING REBAR, BUT ENSURE SAMPLE IS TAKEN FROM FIRST LIFT.
3. TWENTY TWO TESTS TO BE TAKEN ON EXTERNAL SURFACE, AND TWENTY-TWO ON INTERNAL SURFACE, FORTY-FOUR TOTAL PER CHIMNEY

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	-	18.06.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check -
Approved D. HEALY
Date 18.06.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY - HARDNESS TEST LOCATIONS**

Original Size **A1**
Drawing No: **WI-24057-007**
Rev: A

Plot Date: 18/06/2025 9:34:39 PM

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	1	2	3	4	5
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	1	58	57	56	56	64
	2	58	54	58	57	52
	3	54	57	55	55	54
	4	59	57	53	51	56
	5	55	58	59	58	52
	6	55	60	57	59	48
	7	51	60	48	65	55
	8	56	59	54	52	48
	9	58	59	56	55	52
	10	59	56	57	52	48
Average of 10		**56.3**	**57.7**	**55.3**	**56**	**52.9**
Average of conforming readings		**57**	**58**	**55**	**56**	**53**
Apparent Compressive Strength (MPA)		**60**	**60**	**59**	**59**	**55**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	6	7	8	9	10
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	54	52	59	50	61
	2	51	54	61	48	54
	3	41	55	61	42	55
	4	42	60	60	50	55
	5	54	59	59	57	46
	6	49	59	58	57	55
	7	52	56	51	52	55
	8	53	51	60	55	54
	9	54	49	58	45	55
	10	50	50	58	50	50
Average of 10		**50**	**54.5**	**58.5**	**50.6**	**54**
Average of conforming readings		**50**	**55**	**59**	**51**	**54**
Apparent Compressive Strength (MPA)		**51**	**59**	**60**	**52**	**57**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	11	12	13	14	15
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	35	54	40	56	61
	2	42	55	40	50	54
	3	44	49	42	51	50
	4	45	52	43	53	59
	5	44	41	51	50	59
	6	26	46	45	48	60
	7	40	45	39	45	48
	8	47	46	39	53	58
	9	44	45	40	53	60
	10	35	29	45	48	45
Average of 10		**40.2**	**46.2**	**42.4**	**50.7**	**55.4**
Average of conforming readings		**40**	**46**	**42**	**51**	**55**
Apparent Compressive Strength (MPA)		**34**	**44**	**39**	**52**	**59**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	16	17	18	19	20
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	40	60	59	60	60
	2	59	50	58	59	60
	3	49	57	60	58	59
	4	53	58	44	36	59
	5	54	57	60	60	58
	6	55	40	60	59	56
	7	53	55	58	59	56
	8	55	62	41	62	50
	9	55	60	48	61	57
	10	48	58	58	61	52
Average of 10		**52.1**	**55.7**	**54.6**	**57.5**	**56.7**
Average of conforming readings		**52**	**56**	**55**	**58**	**57**
Apparent Compressive Strength (MPA)		**54**	**59**	**59**	**60**	**60**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Inner Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number		21	22			
test location details		View attached sketch	View attached sketch			
element tested		Concrete	Concrete			
surface texture		Smooth	Smooth			
area form material						
surface moisture condition		Dry	Dry			
surface ground		No	No			
hammer orientation		Horizontal	Horizontal			

Test Results

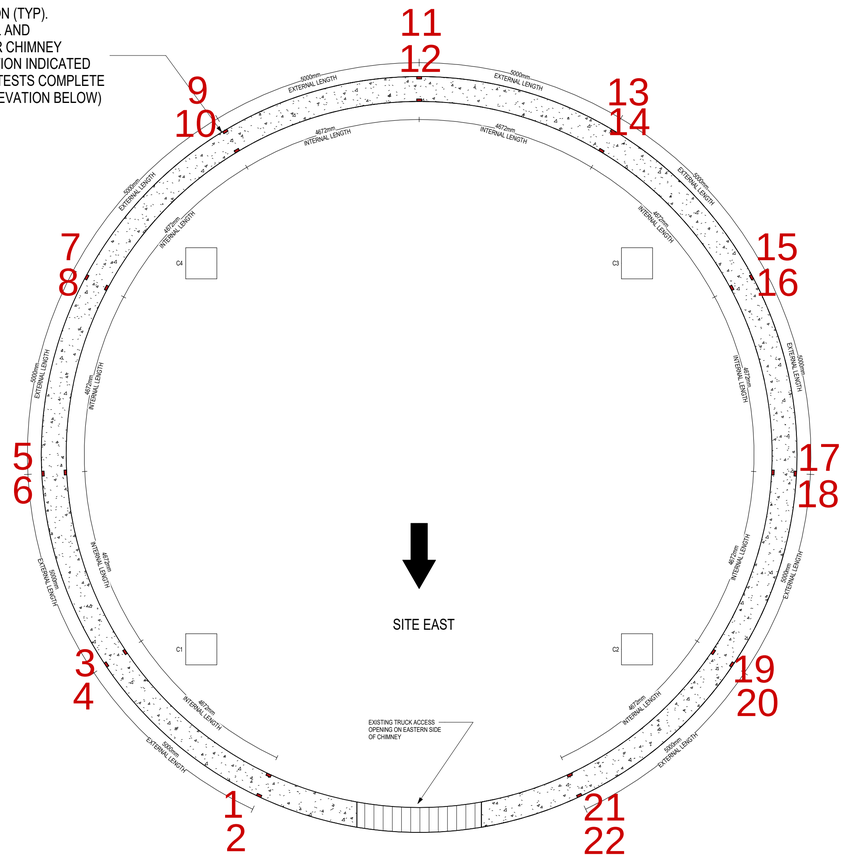
Rebound Readings	**1**	46	54			
	2	42	54			
	3	51	53			
	4	50	52			
	5	50	55			
	6	48	52			
	7	43	52			
	8	43	52			
	9	28	52			
	10	45	49			
Average of 10		**44.6**	**52.5**			
Average of conforming readings		**45**	**53**			
Apparent Compressive Strength (MPA)		**44**	**55**			
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

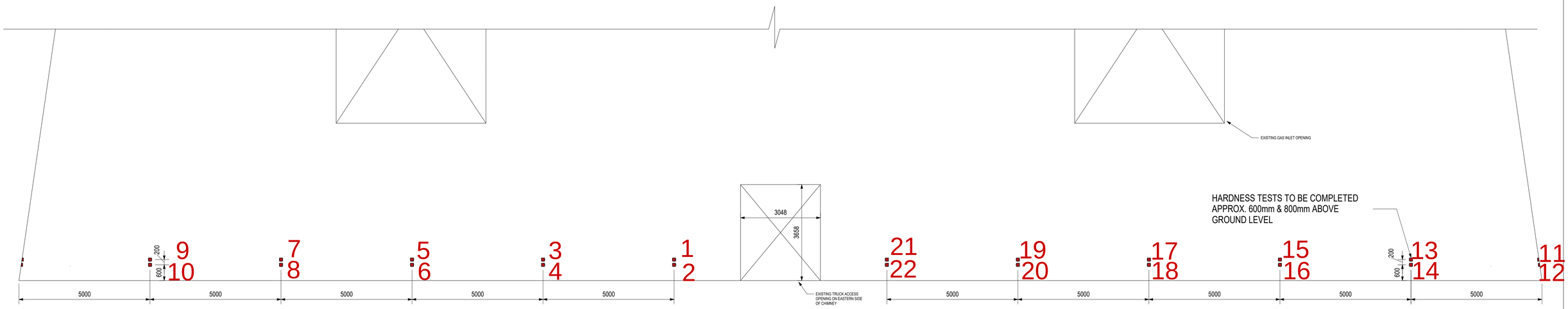
Comments:

ATTACHMENT 8 – SCHMIDT TEST RESULTS CHIMNEY U3/U4 OUTSIDE FACE

Chimney 3-4 - Outer Rim
HUNT25107
24/06/25



CHIMNEY BASE SECTION
SCALE 1 : 75



HARDNESS TEST LOCATIONS - EXTERNAL
SCALE 1 : 75

NOTES:
1. SCHMIDT HARDNESS TESTS TO BE TAKEN FROM SAME LOCATION FOR BOTH CHIMNEY #1 AND CHIMNEY #2
2. EXACT LOCATIONS MAY BE ALTERED ONSITE TO MISS EXISTING REBAR, BUT ENSURE SAMPLE IS TAKEN FROM FIRST LIFT.
3. TWENTY TWO TESTS TO BE TAKEN ON EXTERNAL SURFACE, AND TWENTY-TWO ON INTERNAL SURFACE, FORTY-FOUR TOTAL PER CHIMNEY

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	-	18.06.25

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Drawn D. HEALY	Designer D. HEALY	
Drafting Check -		
Approved D. HEALY		
Date 18.06.25		
Scale	This Drawing must not be used for Construction unless signed as Approved	

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY - HARDNESS TEST LOCATIONS**

Original Size **A1**
Drawing No: **WI-24057-007**
Rev: A

Plot Date: 18/06/2025 9:34:39 PM

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

This report replaces all previous issues of report no. 'MAT:(type number here)'.

Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	1	2	3	4	5
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	1	53	49	51	49	51
	2	48	46	42	42	48
	3	48	51	48	41	49
	4	53	50	43	51	50
	5	55	50	48	46	43
	6	51	50	50	55	51
	7	45	48	45	45	43
	8	43	49	50	39	45
	9	48	47	50	49	49
	10	42	50	50	49	41
Average of 10		**48.6**	**49**	**47.7**	**46.6**	**47**
Average of conforming readings		**49**	**49**	**48**	**47**	**47**
Apparent Compressive Strength (MPA)		**49**	**49**	**47**	**46**	**46**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

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Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	6	7	8	9	10
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	50	45	53	50	46
	2	45	41	49	51	55
	3	51	47	45	48	50
	4	48	47	51	49	45
	5	52	43	48	55	55
	6	50	45	49	42	55
	7	48	50	46	53	49
	8	56	47	50	53	50
	9	50	50	52	50	55
	10	48	41	50	55	56
Average of 10		**49.8**	**45.6**	**49.3**	**50.6**	**51.6**
Average of conforming readings		**50**	**46**	**49**	**51**	**52**
Apparent Compressive Strength (MPA)		**50**	**44**	**49**	**52**	**54**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

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Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	11	12	13	14	15
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	52	47	49	48	51
	2	45	54	52	50	51
	3	54	48	52	49	49
	4	51	45	52	48	50
	5	50	50	50	50	50
	6	50	48	52	41	41
	7	48	52	51	48	50
	8	44	55	48	49	45
	9	51	48	53	55	50
	10	49	52	53	40	30
Average of 10		**49.4**	**49.9**	**51**	**47.8**	**47**
Average of conforming readings		**49**	**50**	**51**	**48**	**47**
Apparent Compressive Strength (MPA)		**49**	**51**	**52**	**47**	**46**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

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Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW

Test area in structure: Chimney 3/4 - Outer Rim

Concrete mix: N/A

Type of aggregate: 20mm

Date Tested: 23/06/2025

Time Tested:

Air Temperature: (°C): 18

Age of Concrete: N/A

Specified Strength (Mpa): 32

Test Conditions

test number	16	17	18	19	20
test location details	View attached sketch	View attached sketch	View attached sketch	View attached sketch	View attached sketch
element tested	Concrete	Concrete	Concrete	Concrete	Concrete
surface texture	Smooth	Smooth	Smooth	Smooth	Smooth
area form material					
surface moisture condition	Dry	Dry	Dry	Dry	Dry
surface ground	No	No	No	No	No
hammer orientation	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

Test Results

Rebound Readings	**1**	49	51	45	36	45
	2	50	48	50	50	50
	3	45	52	45	49	50
	4	39	51	51	52	51
	5	49	50	49	48	48
	6	49	50	42	50	47
	7	51	49	51	50	49
	8	50	50	49	49	53
	9	45	49	56	47	48
	10	47	45	49	49	51
Average of 10		**47.4**	**49.5**	**48.7**	**48**	**49.2**
Average of conforming readings		**47**	**50**	**49**	**48**	**48**
Apparent Compressive Strength (MPA)		**46**	**51**	**49**	**47**	**47**
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

(Type Name) Laboratory
Coffey Testing Pty Ltd
ABN 92 114 364 046
Unit 5, 28-32 Enterprize Crescent
Musswellbrook NSW
Telephone: 02 4016 2300

Schmidt Hammer Test Report

Report No.: 2341-6

Issue No.: 1

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Client: CMA Contracting
Unit 2, 42 Wermol St
Kurri Kurri NSW 2327

Principal:

Project No.: HUNT25107

Project Name: Liddell Chimneys Testing

Lot No.: **TRN:**



Approved Signatory: Matthew Lee
Laboratory Supervisor

Date of Issue: 24/06/2025

Concrete Details

Project Location: Liddell NSW
Test area in structure: Chimney 3/4 - Outer Rim
Concrete mix: N/A
Type of aggregate: 20mm

Date Tested: 23/06/2025
Time Tested:
Air Temperature: (°C): 18
Age of Concrete: N/A
Specified Strength (Mpa): 32

Test Conditions

test number		21	22			
test location details		View attached sketch	View attached sketch			
element tested		Concrete	Concrete			
surface texture		Smooth	Smooth			
area form material						
surface moisture condition		Dry	Dry			
surface ground		No	No			
hammer orientation		Horizontal	Horizontal			

Test Results

Rebound Readings	**1**	50	49			
	2	50	54			
	3	51	53			
	4	50	53			
	5	57	57			
	6	57	57			
	7	45	58			
	8	56	53			
	9	50	50			
	10	52	56			
Average of 10		**51.8**	**54**			
Average of conforming readings		**52**	**54**			
Apparent Compressive Strength (MPA)		**54**	**57**			
Remarks						

Note: Reference against Fig 3b Cylinder Compressive Strength in N/mm^2 plotted against the Rebound number.
In accordance with test procedure ASTM C805/C805M-08

Comments:

APPENDIX D – TECHNICAL DATA SHEETS

TECHNICAL DATA SHEET

Senatel™ Magnum™

Australia



Description

Senatel™ Magnum™ packaged emulsion explosive is a robust, maximum strength, detonator sensitive explosive. The explosive is grey in colour with a firm putty-like consistency.

Application

Senatel™ Magnum™ is a water resistant packaged explosive designed for priming applications, and as a high-energy column explosive, in surface and underground mining and general blasting.

The high detonation velocity and the robust nature of Senatel™ Magnum™ make it an ideal primer for the initiation of ANFO columns.

Senatel™ Magnum™ cartridges readily split during tamping to maximise coupling and bulk strength within a blasthole.

Senatel™ Magnum™ is not suitable for ground containing reactive sulphides.

Key Benefits

- Senatel™ Magnum™ is a maximum energy emulsion formulation with high pre-compression resistance. This gives excellent blast results in the toughest ground even with tight drilling patterns as found in shaft sinking and other extreme blasting environments.
- Specially formulated for underground use, Senatel™ Magnum™ reduces post-blast fumes and improves turnaround time.
- Senatel™ Magnum™ is highly water resistant, which minimises leaching and reduces environmental impact.

Technical Properties

Density[1]	**1.23g/cc**
Relative Effective Energy[2]	
Relative Weight Strength	132%
Relative Bulk Strength • to ANFO @ 0.8g/cc • to ANFO @ 0.95 g/cc	 201% 153%
Minimum Velocity of Detonation[3]	3.4km/s

Recommendations for Use

Blasthole Depth

Senatel™ Magnum™ is suitable for use in blastholes of any practical depth providing contained water does not exceed 20m depth.

Priming and Initiation

Senatel™ Magnum™ at temperatures higher than -20°C can be reliably initiated by an electric No.8*, Exel™ detonator (min. 8* strength) eDev™ detonator, uni tronic™ detonator, or i-kon™ system detonator.

Cordtex™ 10P may also be used to initiate Senatel™ Magnum™ however detonating cords of charge mass lower than 10 g/m are not recommended for initiation of Senatel™ Magnum™.

Charging

In small diameter blastholes maximum energy per metre of blasthole can be achieved by tamping the explosive with a wooden tamping rod appropriate to the hole diameter.

No metal instrument should be used to tamp explosives. The primer cartridge containing a detonator must not be tamped.

Sleep-Time Within Blastholes

In dry blastholes, given the explosives packaging is undamaged, Senatel™ Magnum™ may be charged and fired several months later (provided the product remains within its recommended shelf life).

orica.com

Senatel™ Magnum™

Australia

If the explosives packaging is damaged, the sleep-time in a blasthole is influenced by the extent of damage to the packaging and by the nature of any water present. Even with full length slitting of cartridges, the explosive will give good performance after two weeks immersion.

An Orica Technical Representative should be consulted if special conditions exist.

Reactive Ground and Ground Temperature

Reactive Ground [4] – Senatel™ Magnum™ is not suitable for use in ground containing reactive sulphides.

Elevated Temperature[4] – Senatel™ Magnum™ is suitable for use in ground temperatures from 0°C up to 70ºC.[3]

However, If your application requires you to operate at elevated temperature, above 55ºC please contact your Orica Technical Representative in advance for further information about product compatibility, sleep time and use.

Packaging

Both the Senatel™ Magnum™ packaging cases and film are colour highlighted in red. It is packaged in white plastic film with coloured printing. Each box contains nominally 25kg of product with standard cartridge sizes and counts as follows:

Diameter (mm)	Nominal Length (mm)	Nominal Mass (g)	Cartridges per Box
25	200	115	215
25	700	420	60
32	200	185	135
32	700	650	38

Product Quality

Senatel™ Magnum™ is manufactured using an ISO9001 accredited quality process. Senatel™ Magnum™ has been developed by Orica Australia specifically for the mining industry using ISO9001 accredited research and engineering processes.

Storage and Handling

Product Classification

Authorised Name:	Senatel™ Magnum™
Proper Shipping Name:	Explosive, Blasting, Type E
UN No:	0241
Classification:	1.1D

All regulations pertaining to the handling and use of such explosives apply.

Storage

Store Senatel™ Magnum™ in a suitably licensed magazine for Class 1.1D explosives. The cases should be stacked in the manner designated on the cases.

Senatel™ Magnum™ has a storage life of up to 12 months in an approved magazine; however exposure to hot or cold extremes may cause the product to deteriorate prematurely. Senatel™ Magnum™ is best stored at temperatures above -20°C.

Disposal

Disposal of explosive materials can be hazardous. Methods of safe disposal of explosives may vary depending on the user's situation. Please contact an Orica Technical Representative for information on safe practices.

Safety

The post detonation fume characteristics of Senatel™ Magnum™ make it suitable for both underground and surface blasting applications. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.

Senatel™ Magnum™ can be initiated by extremes of shock, friction or mechanical impact. As with all explosives, Senatel™ Magnum™ should be handled and stored with care. Senatel™ Magnum™ does not burn easily, but it must be kept clear of flame and excessive heat.

Explosives based on Ammonium Nitrate such as Senatel™ Magnum™ may react with sulphides in the ground and create potentially hazardous situations. Orica accepts no responsibility for any loss or liability arising from use of the product in ground containing sulphides or other reactive material.

Senatel™ Magnum™

Australia

Disclaimer

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The word Orica and the Ring device are trademarks of the Orica Group.

Emergency Telephone Numbers

Within Australia: 1800 033 111
Outside Australia: +61 3 9663 2130

Notes:

(1.) Nominal density only.

(2.) REE is the Effective Energy relative to ANFO at a density of 0.8 g/cm^3. ANFO has an effective energy of 2.30 MJ/kg. Energies quoted are based on ideal detonation calculations with a 100MPa cut-off pressure.

(3.) The actual VOD depends on the conditions of use including the diameter of the hole and the degree of confinement. The range quoted refers to unconfined minimum diameter up to calculated ideal VOD.

(4.) Reactive ground and elevated temperature as defined in the Australian Explosives Industry Safety Group (AEISG) Code of Practice for Elevated Temperature and Reactive Ground.

TECHNICAL DATA SHEET

Cordtex™ 10P Detonating Cord

Australia



Technical Properties

Nominal Coreload	10 g/m
Colour	Red
Nominal Tensile Strength	70 kgf
Nominal Velocity of Detonation	6.5 to 7.0 km/s
Nominal Diameter	4.6 mm (Average)

Description

Cordtex™ 10P is a strong, flexible detonating cord with a nominal core charge of 10 g/m PETN.

Cordtex™ 10P consists of a continuous core of PETN powder encased by high strength textiles. This is covered by a seamless plastic jacket. It is designed to maintain stability under all but the most demanding conditions.

Safety

Cordtex™ 10P contains explosive which is relatively insensitive to accidental initiation by shock, friction or mechanical impact under normal conditions of use.

Cordtex™ 10P can detonate if subjected to extremely high temperatures, but remains stable and safe to use below 80ºC. For temperatures between 70ºC and 80ºC, exposure time should not exceed 24 hours.

Cordtex™ 10P is supplied in Class 1.1D packaging and has UN Number 0065.

Application

Cordtex™ 10P is suited for use as a surface trunkline, as it will reliably initiate itself through suitable knots and is compatible with Exel™ Millisecond Connectors (MSCs). Cordtex™ 10P will reliably initiate most Pentex™ boosters. Refer to the relevant Technical Data Sheet for application details.

Cordtex™ 10P will not generally initiate primer-sensitive blasting agents, but in some circumstances desensitisation or side-initiation can occur. Consequently the manufacturer or supplier should be consulted for specific recommendations in each situation.

Cordtex™ 10P has excellent resistance to penetration from water and oil. It has good flexibility and knot holding at normal ambient temperatures.

Recommendations For Use

Cordtex™ 10P should only be cut using a single bladed cutter, or a sharp knife on a non-ferrous block.

Cordtex™ 10P can be reliably initiated by an Exel™ Lead-In-Line, Exel™ Trunkline Delay or #8 Strength Electric Detonator. The detonator should be firmly attached to the cord, with its base at least 150 mm from a dry cut end and pointing in the desired direction of propagation. When using electric detonators, two detonators are recommended for reliability.

Cordtex™ 10P can be reliably initiated by detonating cords of 5 g/m or greater core charge when approved connections are used. For extending surface trunklines, cord should be tied together with a "reef" knot (Figure 1).

The knot should be 150mm from each cut end and pulled tight, with the free ends taped back along the cord to ensure positive contact. For attaching downlines and branchlines to a surface

Cordtex™ 10P Detonating Cord

Australia

trunkline, connections should be made using an approved knot (Figure 1).

All connections should be tight and made at right angles, to minimise the chance of "approach"-type cutoff failures. Cordtex™ 10P surface trunklines should be laid out with no loops, kinks, tight bends or excessive slack.

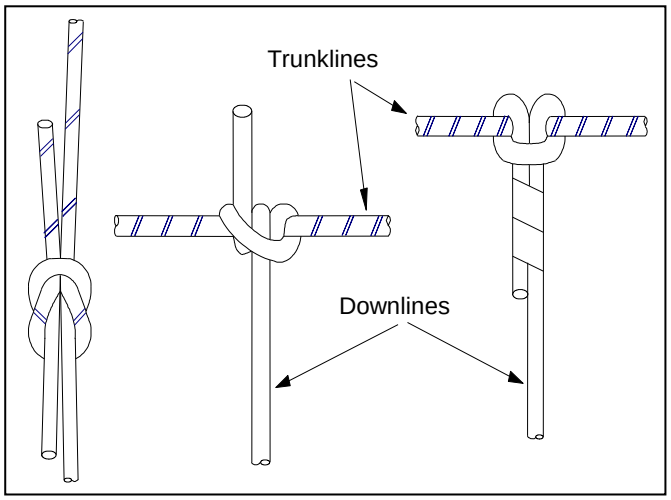


Figure 1.Approved knots, from left to right: Reef knot, Double wrap clove hitch, Double half hitch.

A closed loop of cord is recommended to provide insurance against poor connections. It should never be pulled off the reel over an end flange, as this can cause kinks.

Packaging

Cordtex™ 10P detonating cord is supplied on chipboard spools, which hold 350 metres of cord. A standard cardboard outer case contains 2 of these spools, measures 0.54 x 0.28 x 0.27 m and weighs approximately 18 kg. The weight of contained explosive material is 7.0 kg per case.

Storage and Handling

Cordtex™ 10P should be in a cool, dry, well-ventilated magazine licensed for Class 1.1D explosives.

Cordtex™ 10P has a maximum shelf life of 5 years when stored correctly

Disclaimer

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The word Orica and the Ring device are trademarks of the Orica Group.

Emergency Telephone Numbers

Within Australia: 1800 033 111
Outside Australia: 61 3 9663 2130

DaveyTronic® SP

Davey Bickford Enaex

Surface mining
Digital Blasting System / Electronic Detonators



PRODUCTIVITY

- The high **accuracy** and **reliability** of the **DaveyTronic® SP** detonator significantly **improves blast performance**:
  - Fragmentation and material uniformity
  - Muck pile control (excavation rate and dilution control)
  - Vibration control and repeatability
- The **Synchroblast**™ and **Multiblast** modes enables **larger blasts** to further reduce downtime through less blast windows.

  You can remotely control a network of several blast drivers located at different areas of the mine to fire several blasts simultaneously from a central location.
  - Synchroblast™: up to 4500 detonators for a single location blast
  - Multiblast: up to 5 different blast locations of 1500 detonators each

SAFETY

DaveyTronic® is designed for complete safety throughout the blasting procedure

- **Safer at detonator level**
  - Exclusive double capacitor: one for two-way communication with blasting equipment and one for firing
  - Exclusive Smartshunt, isolating the fuse head until the firing command is received
  - Excellent EMP/ESD protection
- **Safer at system level**
  - Continuous testing procedures up to the firing command
  - Electronic safety lock to authorize the firing procedure
  - Pre-blast equipment coupling ensures immunity to other RF devices





SECURITY

DaveyTronic® SP features a proprietary secure encoded communication protocol for both firing line control and wireless data transmission.

The embedded RFID technology and the unique ID tracking number of each detonator complete the security features.

DESCRIPTION

The **DaveyTronic® SP** digital blasting system includes a set of three rugged types of units:

- 1 hand held remote blaster (DRB), managing testing and firing procedure, communicating remotely with each detonator
- 2 programming units (PU), identifying and diagnostically testing each detonator on the bench and assigning the delay time
- 1 compact blast driver (DBD), communication wirelessly the instructions from the remote blaster and providing designed energy to fire up to 1500 detonators per DBD

Products described herein are potentially hazardous and must be used in accordance with applicable laws or regulatory provisions. Since Davey Bickford cannot anticipate all of the possible applications, and conditions under which this information and its products may be used, it is the responsibility of each user to review the information in the specific context of the intended application. Davey Bickford specifically disclaims all warranties, express or implied, including accuracy, non-infringement and implied warranties of merchantability or fitness for a particular purpose. Davey Bickford specifically disclaims, and will not be responsible for, any liability or damages resulting from the use or reliance of this information.

DaveyTronic® SP

Surface mining
Digital Blasting System

Davey Bickford
Enaex



1 - Remote Blaster (DRB2)
2 - Blast Driver (DBD)
3 - Programming Units (PU)
4 - RFID Tag
5 - Set of Antennas
6 - Spider Charger
7 - 12V Charger
8 - Waterproof Transport Case

OPERATIONAL CHARACTERISTICS	
Detonators	Only to be used with DaveyTronic® SP Detonators
Monoblast Mode	Up to 1500 detonators
Multiblast Mode	Maximum 5 DBD driven by one DRB2 (additional DBD in option)
Synchroblast Mode	Up to 4500 detonators in one blast
Programming	Maximum 6 PU can be associated to one DBD
Connection Modes	4 modes: One by One - Easy One by One - On Line - Easy On Line
Programming Modes	3 modes: Manual - Incremental - Automatic (blast plan on computer)
Connection of DBD to DRB2	Wired or Internal Radio Modem or External Modem*
Accessories / Wires	SP Blasting System shall only be used with authorized bus / harness / bell wire

TECHNICAL CHARACTERISTICS			
	Remote Blaster - DRB2	Blast Driver - DBD	Programming Unit - PU
Weight (kg / lbs)	1.8 / 4.0	1.9 / 4.2	1.2 / 2.7
Size (mm) (inches)	240 x 190 x 32 9.4” x 7.5” x 1.3”	185 x 185 x 55 7.3” x 7.3” x 2.2”	220 x 140 x 32 8.7” x 5.5” x 1.3”
Available Languages	English / French / Spanish / Portuguese**		
Event Recorders	Procedure history file, line data logger		/
Safety Key	Unique RFID security tag	/	/
Second Safety Firing Key	Optional	/	/
GNSS Positioning	Optional Module	/	/
Firmware Upgrade	Through USB com port		
Battery Type	Li-Ion Technology		
Battery Autonomy	4 hours - Battery level indicator	4 hours of stand-by + 1 hour in talk mode	8 hours - Battery level indicator
Charger	Input: 100-240 V AC / 50-60 Hz, 2.0 A - Output: 10-12 V DC - Rated current: 4 A max Charging time: 4 hours up to 4 equipments		
Ingress Protection Rating	IP 65	IP 67	IP 65
Display	5.7” backlit TFT Colour QVGA	4 LED status indicators	3.5” backlit FSTN B&W
Keyboard	14 backlit keys	/	18 backlit keys
Integrated Speaker	Vocal intructions / beeps	/	Beeps
Communication Ports	RS232 / RS 485 - USB - RFID - ETHERNET		USB - RFID - ETHERNET
Device Capacity	1 500 detonators		1 000 detonators
Wireless Range	Up to 3000 meters, expandable with repeaters (optional DBD or other)		
Frequency	868 MHz or 923 MHz (except Europe) or 2.4 GHz		/
Operating Temperature	Operating: -20°C to +50°C / -4°F to +122°F / Battery Charging: 0°C to +40°C / +32°F to +104°F		
Storage Temperature	-40°C to +70°C / -40°F to +158°F		
Waterproof Transport Cases	1 DRB2 + 1 DBD + 2 PU: Pelicase 1520 Orange - Cardboard box: 50 x 40 x 25 cm / 19.7” x 15.7” x 9.8” - 13 kg / 29 lbs 6 PU or 1 DRB2 + 3 DBD: Pelicase 1600 Orange - Cardboard box: 65 x 52 x 25 cm / 25.6” x 20.5” x 9.8” - 17 kg / 37 lbs		
Certificates	Complies with European Standards CEN TS/ 13763-26 & 27 Complies with South African Standards SANS 1717-1 and ARP 1717-1 CE Mark - Certificated FCC - IC - C-Tick Transport Classification UN 3481, Cl9, Gr2		

* External modem compatibility must be checked with Davey Bickford Technical Support
** PU also available in Russian / Finnish / Swedish / Turkish

Products described herein are potentially hazardous and must be used in accordance with applicable laws or regulatory provisions. Since Davey Bickford cannot anticipate all of the possible applications, and conditions under which this information and its products may be used, it is the responsibility of each user to review the information in the specific context of the intended application. Davey Bickford specifically disclaims all warranties, express or implied, including accuracy, non-infringement and implied warranties of merchantability or fitness for a particular purpose. Davey Bickford specifically disclaims, and will not be responsible for, any liability or damages resulting from the use or reliance of this information.

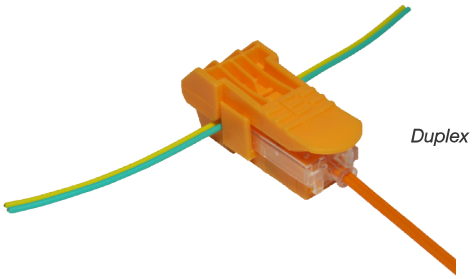
DaveyTronic® SP

Davey Bickford Enaex

Surface mining
Electronic Detonator



Electronic Integrated Delay



Duplex Bus Connection

TECHNICAL CHARACTERISTICS	
Detonator Base Charge	PETN 800mg (#8 cap strength)
Detonator Initiating Charge	Primary explosive 200mg
Detonator Shell Material	Aluminium or Copper alloy (for heavy duty environment)
Lead wire	STD Wire: Ø=0.3 mm galvanized steel - Orange Polyethylene HD Wire: Ø=0.5 mm coppered steel - Red Polypropylene Folded Wire: Ø=0.5 mm galvanized steel - Pink Polyethylene XO wire: Ø=0.5 mm coppered steel - Red Polypropylene with Blue PVC overcoating
Connector	Polypropylene - Silicone waterproof gel - Hydrocarbon compatible
Radio Frequency Resistance	Compliant with EN13763-27 - Up to 30 V/m for 80 MHz to 2 GHz bandwidth
ESD Resistance	Compliant with EN 13763-13 (cl. II) 30kV / 3500pF

PERFORMANCES	
Delay Range	From 0 to 14,000 ms - Programming increments of 1 ms
Blasting System	To be used with DaveyTronic® Blasting System
Communication	Two way communication, fully testable two capacitors concept
Accessories / Bus / Wire	SP Detonators shall only be used with authorized bus / harness / bell wire
Water Resistance	13 bars for 7 days (spooled) / 4 bars for 7 days (folded)
Dynamic Shock Resistance	>1,000 bars - 15,000 PSI (Al shell) / >1,400 bars - 20,000 PSI (Cu shell)
Tensile Strength	STD wire: 328 N - 74 lbs / HD wire: 391 N - 88 lbs / Folded wire: 168 N - 38 lbs / XO wire: 478 N - 107 lbs
Abrasion Resistance	Exceeds EN 13763-4 (class II)
Operating Temperature	-20°C to +45°C / -4°F to +113°F (tested to 70°C - 158°F in hot emulsions)
Storage Temperature	-40°C to +70°C / -40°F to +158°F
Shelf Life	2 years
Certificates 	Compliant with European Standards CEN TS/ 13763-26-27 and with Explosive Directive 2014/28/EU Certified by INERIS : EC Inspection Certificate of Type: 0080.EXP.98.0013 Compliant with European Directive REACH 1907/2006/EC Transport Certification and Packaging UN 0513 - 1.4S

			Aluminium Shell		Copper Shell	
			STD/Spooled Wire	HD Wire	STD/Spooled Wire	HD Wire
Label Colour	Wire Length (m/ft)	Units/Box	Gross weight (kg/lbs)	Gross weight (kg/lbs)	Gross weight (kg/lbs)	Gross weight (kg/lbs)
	4 / 13 (spooled)	144	11.5 / 25.4	-	12.5 / 27.6	-
	6 / 20 (spooled)	112	11.5 / 25.4	-	12.0 / 26.5	-
	8 / 26 (spooled)	96	11.0 / 24.3	-	11.5 / 25.4	-
	10 / 33	80	7.0 / 15.4	8.0 / 17.6	7.0 / 15.4	8.5 / 18.7
	15 / 49	72	8.0 / 17.6	9.5 / 20.9	8.0 / 17.6	10.0 / 22.0
	20 / 66	72	9.5 / 20.9	11.5 / 25.4	9.5 / 20.9	12.0 / 26.5
	25 / 82	72	11.0 / 24.3	14.0 / 30.9	11.5 / 25.4	14.5 / 32.0
	30 / 98	64	11.5 / 25.4	14.5 / 32.0	11.5 / 25.4	15.0 / 33.1
	35 / 115	56	11.5 / 25.4	14.5 / 32.0	11.5 / 25.4	15.0 / 33.1
	40 / 131	56	12.5 / 27.6	16.0 / 35.3	12.5 / 27.6	16.0 / 35.3
	50 / 164	36	10.0 / 22.0	13.5 / 29.8	10.5 / 23.1	13.5 / 29.8
	60 / 197	36	11.5 / 25.4	15.5 / 34.2	12.0 / 26.5	15.5 / 34.2
Packaging Size		Spooled, cardboard box: 445 x 230 x 300 mm (0,031 m^3) / 17.5" x 9.1" x 11.8" (1879 in^3) Folded, cardboard box: 430 x 400 x 320 mm (0,055 m^3) / 16.9" x 15.7" x 12.6" (3343 in^3)				

For other options, please contact your DaveyTronic® SP representative.

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DaveyTronic® SP

Davey Bickford Enaex

Implementation Teams
Enaex Mining Technical Solutions (EMTS)

IMPLEMENTATION TEAMS: Ensuring that our DaveyTronic® system delivers real value

Maximizing productivity is not only about cutting-edge technology. It's also about guided, expert use of that technology with support from engineers and field experts.

Our reputation is built on measurable and tangible improvements that our customers can see and feel. That's the goal of every custom built client solution we design, and our people play the single most important role.

That's why the **DaveyTronic®** system always comes with high added-value implementation services:

- Proving operational advice and support
- Diagnosing customer needs on site
- Training relevant personnel in system usage
- Ensuring fit for purpose functioning equipment
- Providing on bench training and assessment
- Measuring and validating outcomes

The implementation team is made up of industry professionals in client operations, for whom safety, efficiency and the fulfillment of commitments guide their actions.



This includes local small contractors, medium sized mining companies and global mining corporations.

Enaex Mining Technical Solutions ("EMTS") is a global, specialised team of all Enaex business units (Enaex Servicios, Enaex Britanite and Davey Bickford Enaex) expert engineers operating in Australia, the Americas, Africa, Asia and Europe. They range from recent graduates of advanced mining and blasting education programs to PhD holding experts with nearly 30 years in the field of blast research and engineering. All have experience with major international explosives companies and are considered experts in the blast optimization field.



They have the following passions in common:

- Support you in overcoming your blasting challenges
- Unlocking the total value in your production process
- Delivering maximum operational excellence and profitability
- Maintaining world-class Corporate Social Responsibility performance

EMTS TEAMS: bringing significant expertise in optimization of underground (including tunneling) and surface drill and blast operations, covering the production of:

- Gold
- Silver
- Base metals
- Industrial minerals
- Coal
- Aggregates

By technically optimizing the blast designs, our EMTS team empowers customers with the ability to influence the outcome of every blast event. This creates immediate and long-term economic value to mining and tunneling operations throughout the world, with tangible gains in both safety and environmental ethos. The achievement of goals, productivity and business success of our partners is at the core of EMTS.

Do you want to get in touch with one of our experts?

Davey Bickford SAS
Le Moulin Gaspard • Chemin de la Pyrotechnie • 89550 Héry • France
Tel.: +33 (0)3 86 47 30 00

Please visit our website:
www.DaveyBickfordEnaex.com
or mail us directly at
info@DaveyBickfordEnaex.com

SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT IDENTIFICATION: **DAVEYTRONIC® SP (1.4S)**

PRODUCT USE: **Electronic Detonator**

SUPPLIER:

Davey Bickford Enaex Australia Pty Ltd.

Suite 4, 37 Cedric Street, Stirling,
Western Australia, 6021

Tel (08) 9207 1066

admin@daveybickfordenaex.com.au

CONTACTS:

Telephone: +61 8 9207 1066

Emergency: 1800 033 111

Please refer to limitations of this Safety Data Sheet in Section 16 "Other information"

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Classified as Dangerous Goods in accordance with regulation (EC) 1272/2008: without packaging electronic detonators are classified H201 (explosive: mass explosion hazard).

HAZARD PICTOGRAM:



SIGNAL WORD: DANGER

HAZARD STATEMENT: H201: Explosive; mass explosion hazard

PRECAUTIONARY STATEMENT(S):

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P250: Do not subject to grinding, shock, friction.

P372: Explosion risk in case of fire

P401: Store in accordance with local regulations and standards.

P501: Dispose of contents / container in accordance with local regulations and standards.

3. COMPOSITION / INFORMATION ON INGREDIENTS

DESCRIPTION

Metal casing enclosing primary explosive (0.2g) Lead Azide and secondary explosive (0.8g) PETN; and a priming cap coated with pyrotechnic paste.

A plastic plug is crimped on the open end of the casing attached to electrical wires.

The detonator is housed within the plastic spool on which the electrical wire is coiled.

	Identification	Name	Concentration	Classification– Regulation 1272/2008
COMPOSITION:	N. CAS : 78-11-5 N. CE : 201-084-3 N. Index : 603-035-01-2 N. Registrazione : 01-2119557827-23-xxxx	Pentaerithrityl tetranitrate	<20%	Expl. 1.1, H201
	N. CAS : 13424-46-9 N. CE : 236-542-1 N. Index : 082-003-00-7 N. Registrazione : 01-2119475503-38-xxxx	lead diazide	<1%	Unst. Expl. 1.1, H200 – Oral Acute Tox.4, H302 – Inhal Acute Tox 4, H332 – Repr. 1A, H360Df – STOT RE 2, H373 – Aquatic Acute 1, H400 – Aquatic Chronic 1, H410
	N. CAS : 15245-44-0 N. CE : 239-290-0 N. Index : 609-019-00-4	lead 2,4,6-trinitro-*m*-phenylene dioxide	<1%	Unst. Expl , H200 – Acute Tox.4, H302 – Acute Tox. 4, H332 – STOT RE 2, H373 – Aquatic Acute 1, H400 – Aquatic Chronic 1, H410 – Repr. 1A, H360Df

4. FIRST AID MEASURES

DESCRIPTION OF FIRST AID MEASURES: Substances are not directly in contact with users. In case of accidental contact with one of these components, please contact Davey Bickford Enaex Australia immediately for further instructions regarding correct handling procedures.

MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED: Not applicable

CONTACT WITH SKIN: Seek medical advice for any skin irritation.

CONTACT WITH EYES: Not applicable.

INGESTION: Seek urgent medical advice.

OTHER INFORMATION: Detonators are explosive and should be handled with care. Treat symptomatically.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Do NOT fight fires involving explosives.

SPECIFIC HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE: Explosives material. Evacuate immediately. Set up safety perimeter.

Do not attempt to fight fires that involve explosives.

Whenever possible, measures should be taken to prevent the fire from spreading before they reach the explosives.

PRECAUTIONS FOR FIREFIGHTERS:	Explosives material. The risk of explosion may remain latent even after the fire has been extinguished, depending on the condition of the products. In case of fire that has not involved the explosives, use available fire extinguishing sources, if it is safe to do so, to prevent the fire spreading. In case of fire in storage facility or in transit, evacuate all personnel to muster points or to safety perimeter. Notify authorities, secure site of fire, block all access to all non-essential personnel and await emergency services.

6. ACCIDENTAL RELEASE MEASURES

The disposal of damaged or deteriorated electronic detonators must be carried out in accordance with applicable regulations and standards. Do not dispose of these products in waste bins or public waste disposal area. Disposal of pyrotechnic products by blast or incineration must be done by trained and authorised personnel in a safe area.

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES:	Pyrotechnic materials spilled accidentally must be collected by authorised personnel, so that they can be disposed of appropriately (see waste handling, section 13). Avoid any impact, friction, or anything that may lead to a spark or electrostatic discharge. Keep away from incompatible chemicals.
ENVIRONMENTAL PRECAUTIONS:	Advise local authorities if contamination has occurred.
METHODS FOR CONTAINMENT:	Never handle damaged detonators. Undamaged detonators can be repacked in packaging similar to original boxes. Never use damaged products or partially damaged products (that have been shocked or submitted to excessive temperatures, etc.) In case of potentially or visibly damaged products, contact Davey Bickford Enaex Australia immediately to obtain the necessary handling procedures.

7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:	Handle with care, avoiding impacts, friction and exposure to heat, and ignition sources. No smoking. Any use not covered in the technical instructions or by untrained personnel is prohibited. Do not use damaged or partly damaged products (impacted by shock, high temperature). The testing of electronic detonators must be carried out with approved equipment and by authorised and trained personnel.
CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:	Store in approved magazine facilities in accordance with local regulations and standards. Store out of direct sunlight in a well-ventilated facility approved by authorities for the storage of explosives. Do not store with incompatible goods.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONTROL PARAMETERS:	Not Applicable

PERSONAL PROTECTION:	– Appropriate Personal Protective Equipment (PPE) should be considered where engineering controls are not required. – Hand protection: wearing gloves recommended – Eye protection: wearing safety glasses recommended – Hearing protection: close to an explosion, wearing hearing protection appropriate for the distance recommended

9. PHYSICAL AND CHEMICAL PROPERTIES

CHEMICAL COMPOUND:	LMNR, Lead Styphnate, Zinc, Lead Azide, PETN
CHARACTERISTICS:	Detonation hazard at a temperature of 120ºC / 248ºF and above
HAZARDS:	Unpacked – Mass detonation hazard. Packed – Hazard Classification 1.4S Detonator, Electric UN 0513

10. STABILITY AND REACTIVITY

REACTIVITY:	Explosive.
CHEMICAL STABILITY:	Stable within the handling and storage recommendations in section 7 and use by trained and authorised personnel.
HAZARDOUS REACTIONS	Explosion may result due to shock, friction, fire and other sources of ignition, creating the potential for shrapnel.
CONDITIONS TO AVOID:	Avoid any exposure to heat, impact, friction and sources of ignition.
INCOMPATIBLE MATERIALS:	Strong acids or alkalis.
HAZARDOUS DECOMPOSITION PRODUCTS:	Fumes contain lead. Possible release of oxides of lead, carbon and nitrogen.

11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS:	No hazards identified for the item.

12. ECOLOGICAL INFORMATION

TOXICITY:	No hazards identified for the item.
PERSISTENCE AND DEGRADABILITY:	No hazards identified for the item.
BIOACCUMULATIVE POTENTIAL:	No hazards identified for the item.
MOBILITY IN SOIL:	No hazards identified for the item.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS:

Do not place in waste bins, drains, or landfill.

The disposal of damaged or deteriorated electronic detonators must be carried out in accordance with applicable regulations and standards.

Do not dispose of these products in waste bins or public waste disposal area.

Disposal of pyrotechnic products by blast or incineration must be done by trained and authorised personnel in a safe area.

For further information, contact a Davey Bickford Enaex Australia representative.

14. TRANSPORT INFORMATION

UN NO: **0513**

PROPER SHIPPING NAME: **DETONATORS, ELECTRONIC** programmable for blasting

TRANSPORT HAZARD CLASS: **1.4S**

PACKAGING GROUP: Not applicable

ENVIRONMENTAL HAZARDS: No applicable

SPECIAL PRECAUTIONS FOR TRANSPORT:

- ADR specifics (Road) — Australian Code for the Transport of Explosives by Road and Rail.
- IATA specifics (Air) — **Detonators**, **electronic**
- IMDG specifics (Sea) — EMS Fire: F-B EMS Spill: S-X

15. REGULATORY INFORMATION

For all countries, regulations and standards covering the handling, transport, storage, usage, and destruction of explosives must be complied with, and also those regulations and standards governing the safety of workers, their health and the environment.

16. OTHER INFORMATION

This information sheet cannot in any circumstances free the user of the product in question from their obligation to consult applicable legislation.

The information contained here is based on the state of our knowledge of the product concerned at the date of issue. It cannot be considered as exhaustive and deals only with normal use of the product.

This SDS is used in production sites in Australia, United States of America & Europe, and cannot be construed as being a binding injunction; it does not replace the legislation applicable to qualified users of the products in accordance with recognised practices. Standards must be consulted for specific requirements.

DISCLAIMER: We make no warranty of such information; either expressed or implied, and assumes no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.



Duplex Shot Fire F8 Cable

Medium Density Polyethylene Insulated

Conductor: Single Strand Plain copper Conductor to AS/NZS1125

Insulation: PEMD (Medium Density Polyethylene) UV Stabilized , Metal Deactivated and Anti Static

Insulation Color: Green / Yellow

Pack Size: 400mt REELEX Pack

400m Coils





Code	Number of Strands x wire Ø mm	Number of Cores	Nominal Area mm^2	Average Insulation Thickness mm	OFHC Max D.C. Resistance @ 20° C mΩ/m	Nominal O.D. mm	Mass Kg/100mt
	1 /0.60 + - 0.010mm						
EFPP21060		2	0.283	0.43	**66.45**	1.45x3.05	0.774
NOTE: NOT SUITABLE FOR CONNECTION TO MAINS POWER SUPPLY.							

Features:

1. Oxygen Free High Conductivity copper with excellent electric and thermal conductivity properties.

2. Excellent hydrogen enbrittlement resistance, (TPC) Tough pitch copper becomes very brittle when it is heated at higher than 600^0C under a reducing gas atmosphere including hydrogen. Since OFHC contains a very low oxygen content, it does not show any brittleness.
3. Class 1 Conductor.

Please Note!

Austech Wire & Cable Pty. Ltd. takes every precaution to ensure that the information in this publication is correct but accepts no liability of any kind and reserves the right to change any detail in this catalogue without notification.

Austech Wire & Cable 198 Boundary Road, Braeside , Vic. 3195 Tel: (03) 9587 1712 Fax: (03) 9587 7563

APPENDIX E – PERSONNEL QUALIFICATIONS

WELLANBAH INDUSTRIAL

Curriculum Vitae

Daniel Healy

Structural Engineer & Demolition Shotfirer

Qualifications

University of Newcastle, Bachelor of Engineering (Civil), Honours Class I
University of Newcastle, Masters of Business Administration, Distinction
Certificate IV in Demolition
Chartered Professional Engineer (Structural) – Engineers Australia
Member of International Society of Explosive Engineers

Personal Summary

Daniel is a highly regarded subject matter expert with over 18 years' experience across all phases of the demolition process. He has held roles as client engineer and contractor engineer; and he has been instrumental in the successful execution of some of Australia's most significant demolition projects to date, such as Hazelwood Power Station, Energy Brix Power Station and the Hydro Aluminium Smelter.

He specialises in the design and structural analysis of complex demolition methodologies implementing various techniques, such as induced collapse, explosives, craneage, and mechanical top-down approaches. Daniel is also a licensed shotfirer endorsed to execute explosive demolition projects, and has completed numerous explosive induced collapses throughout Australia and overseas. This provides Daniel with the unique insight for the design and practical execution of complex demolition projects.

TRENTON POWER PLANT DEMOLITION – BOILER HOUSE

The Trenton Power Plant Boiler House Demolition included the explosive induced collapse of two redundant boiler structures located within Detroit Michigan. Each of the structures weighed approximately 23,000t. The High-Pressure Unit contained four boilers and associated coal bunkers, and Unit 9 was a significant single boiler structure with Northen coal bunker.

The works were successfully executed within a sensitive environment adjacent to the Detroit River and Trenton residents to the full satisfaction of the asset owner DTE.

TRENTON POWER PLANT DEMOLITION – CHIMNEYS

The DTE Power Plant Demolition was a challenging project located within a densely populated metropolitan area. One of the critical activities was the demolition of dual 170m high reinforced concrete stacks.

The stacks were bordered by river and channel networks on three sides as well as various retained assets which limited the available fell paths. The explosive induced collapse was successfully executed, with both stacks responding in accordance with the results of the detailed analysis complete as part of the planning process and falling directly along the desired fell path without damaging any retained assets onsite.

JAMES DE YOUNG POWER STATION DEMOLITION

The James De Young Power Station Demolition included the explosive induced collapse of the boiler house structure. This significant asset consisted of three top hung boilers, overhead precipitator and three steel stacks.

The structure was approximately 60m in height to the top of the stacks and primarily constructed of heavy steel work. In order to demolish the structure, linear shaped charges were fitted to the nominated columns and extracted to cause rotation of the structure about the pivot columns.

Key challenges included the proximity of the site to adjacent water ways and live operations, as well as the complex column and bracing arrangement. The project was successfully executed without incident, which the collapse mechanism perfectly reflecting the design intent.

WELLANBAH INDUSTRIAL

Curriculum Vitae

OAKY CREEK DRAGLINE DEMOLITION

This project included the explosive induced collapse of the A-frame, mast and boom of a BE 1370 dragline which was located at the Oaky Creek Mine Site in central Queensland.
The project required explosively severing the rear A-frame legs to allow the structure to pivot about front connections to grade. The project was successfully executed and the team received high praise from both the client and the regulator.

COLLINSVILLE DRAGLINE DEMOLITION

The Collinsville dragline demolition project included the severing the main cables in order to trigger the collapse of the mast and boom structures. The project was further complicated due to the intricate explosives tie in required in order to prevent any misfires to adjacent charges as they were initiated.

The results of the blast perfectly matched the design intent, with the structure collapsing within the desired footprint to facilitate subsequent mechanical demolition / processing.

HAZELWOOD POWER STATION DEMOLITION - ENGIE

Australia's largest power station demolition project, the scope included the explosive demolition of eight reinforced concrete chimneys, 140m in height, and four boiler house units 65m in height. Role included structural analysis of demolition methodologies to assess both global behaviour and expected vibration, along with blast design works and onsite execution.

KURRI KURRI ALUMINIUM SMELTER DEMOLITION - HYDRO

The project scope included the demolition of 2.2km of potline structures, overhead cranes, casting building, greenmix structure, steel & concrete chimney stacks, and associated plant & infrastructure. A key component of the project was the explosive demolition of 3 x chimneys and 1 x concrete water tower. Other high rise industrial structures were demolished via specialised induced collapse methods.

ENSHAM DL03 DRAGLINE DEMOLITION

As part of the project team, engaged to execute the explosive demolition component of the Idemitsu 1680t DL03 Dragline Demolition Project.

The dragline was located within the central Queensland, and the demolition was required as part of the overall closure of the mine. Works required the installation of linear shaped charges in order to sever the structural strands and cause the mast and boom elements to fall to grade.

ENERGY BRIX POWER STATION DEMOLITION - EBAC

The Energy Brix Power Station Demolition, in Morwell Victoria comprised of the complete demolition of all major power station assets onsite including the turbine hall, boiler house and coal bunkers.

Role in the project was the comprehensive design of demolition methodologies, structural assessment for expected vibration and subsequent mitigation strategies, and attendance to detailed risk assessment workshops to control various risks inherent with projects of this complexity.

KWINANA POWER STATION DEMOLITION - SYNERGY ENERGY

Scope included the partial demolition of the Kwinana Power Station within a live operating environment. Assets that were demolished included the K3 and L4 boilers along with associated 140 metre high stack.

The stack was demolished utilising a custom made shear suspended from a tower crane (the first of its kind in Australia). The boilers were demolished via an induced collapse, which required significant pre-strengthening to ensure that there was no damage to the live turbine hall during the collapse.

RAVENSWORTH DL301 DRAGLINE DEMOLITION - GLENCORE

The overall project scope included explosive felling of the main boom and mast, induced collapse of A-frame, mechanical demolition of main house and a significant amount of oxy-cutting to down-size heavy steel members. Role in the project was to execute the explosive demolition of the dragline booms, which included detailed blast design, stakeholder consultation, risk assessment and onsite execution.

WELLANBAH INDUSTRIAL

Curriculum Vitae

BAAL BONE COLLIERY DEMOLITION - GLENCORE

The scope of works included the demolition of the coal handling plant, material handling conveyors and stacker, reclaimer tunnels, thickener, and train loadout bin. Role included the design of various demolition methods and onsite execution of induced collapse scope items.

MT ISA HEAVY MINERAL PLANT DEMOLITION - GLENCORE

Project included the demolition of the redundant HMP Building to make way for a new conveyor system to service the sites lead smelter. The structure was approximately 50m in height, and consisted of a heavily braced steel frame which supported ore bins, sizing screens and various other processing infrastructure. The demolition was to take place within a 5 day shutdown, to minimise the impact to site operations, and therefore needed to be meticulously planned and co-ordinated to ensure a successful outcome.

Role in the project was to complete the design and onsite execution of the explosive induced collapse of the main structure. This included blast management plans, method drawings, placement and programming of charges and final initiation of explosives. The project was a great success, and Glencore was highly appreciative of the quality and timely execution of works.

BULGA P&H9020 DRAGLINE DEMOLITION - GLENCORE

The overall project scope included the demolition of the 5,500t dragline located at the Bulga site. This was the largest dragline demolition completed in Australia to date, and required the explosive felling of the main boom and mast, induced collapse of Machinery House and A-frame, and subsequent downsizing of pivot frame, tub and shoe elements.

Role in the project was to complete the explosive demolition of the dragline booms, and the design of machinery house and A-frame induced collapse, along with subsequent onsite execution and monitoring.

ROSEHILL POLYPROPYLENE PLANT DEMOLITION - LYONDELLBASELL

This project included the dismantling and demolition of the Rosehill Polypropylene Plant. The asset had been procured by an overseas company, and the entire plant needed to be dismantled and shipped overseas. Following the removal of all plant, the remaining structures were demolished through a combination of mechanical demolition and induced collapse methods.

WOODLANDS HILL PIT PROGRESSION PROJECT - GLENCORE – BULGA COAL

The scope of works included the dismantling / demolition of the CV701 Overhead Conveyor, BUO Office Buildings and Workshop, Beltana Arch Bridge, Vent Shafts and other minor infrastructure.

A technically challenging portion of the project was the dismantling of the CV701 conveyor. The structure was over 30m in height and had a geometrically complex head end arrange that necessitated significant engineering input to finalise the complex lifting processes.

Additional Areas of Interest

- **Demolition Shotfirer**
  Experienced shotfirer with demolition endorsement, able to execute explosive demolition projects.
- **Dynamic Analysis**
  Conversant with Explicit Dynamic packages to analyse collapse mechanisms and expected vibration as part of the demolition design process.
- **Awards / Scholarships**
  Awarded Newcastle University Industry Scholarship – 2007
  Placed on Deans Merit List – 2009
  Collin Crisp Award for Engineering Excellence – 2012
  Finalist in World Demolition Awards – 2019, 2020, 2022

ENGINEERS AUSTRALIA

National Engineering Register™

CERTIFICATE OF REGISTRATION

Daniel Healy

MIEAust CPEng NER

is registered in the following area(s) of practice

Structural Engineering

valid until 30 June 2026

Bernadette Foley
BE(Hons) FIEAust CPEng EngExec NER
APEC Engineer IntPE(Aus)
Group Executive, Professional Standards and Engineering Practice

Romilly Madew
AO FTSE HonFIEAust
Chief Executive Officer

EA ID
3407199

Date of Issue
01-Aug-2025

ENGINEERS
AUSTRALIA

This is to certify that

Daniel Healy

has been elected

Member

Chartered Professional Engineer

of

The Institution of Engineers Australia

in the

Structural College

on

30 July 2015

Dr David Cruickshanks-Boyd
FIEAust CPEng EngExec
National President

Stephen Durkin
Chief Executive Officer

3407199

THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Daniel Gilbert Healy

Bachelor of Engineering in Civil Engineering with Honours Class I

CHANCELLOR

VICE-CHANCELLOR
AND UNIVERSITY PRESIDENT

DEPUTY-VICE CHANCELLOR (SERVICES)
AND UNIVERSITY SECRETARY

Admitted to the degree by authority of the Council,
on the 12th day of December, 2011

30115002

THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

By the Authority of the Council

Daniel Gilbert Healy

having satisfied the requirements was admitted to the degree of

Master of Business Administration with Distinction

on the 19th day of December 2013

30133641

CHANCELLOR

VICE CHANCELLOR
AND UNIVERSITY PRESIDENT

The University of Newcastle
I LOOK AHEAD
AUSTRALIA

www.safetyadserv.com
admin@safetyadserv.com
02 4739 9748
RTO #91141

Qualification Certificate

Health and Safety Advisory Service Pty Ltd
National Provider Code (RTO#): 91141

This is to certify that

Daniel Healy
(31259)

has fulfilled the requirements for

CERTIFICATE IV in DEMOLITION
(CPC41013)

on

3rd of October 2019

Signed: Robyn E Delander

ROBYN DELANDER (Chief Executive Officer)

Parchment Number: 31259/902

www.safetyadserv.com
admin@safetyadserv.com
02 4739 9748
RTO #91141

Academic Transcript

Health and Safety Advisory Service Pty Ltd
National Provider Code (RTO#): 91141

STUDENT: Daniel Healy

STUDENT ID: 31259

DATE OF AWARD: 3rd of October 2019

DOCUMENT ID: 31259/902

CERTIFICATE IV in DEMOLITION

(CPC41013)

Code	Title	Outcome
BSBWOR402A	Promote team effectiveness	C
CPCCBC4002A	Manage occupational health and safety in the building and construction workplace	CT
CPCCBC4012B	Read and interpret plans and specifications	CT
CPCCBC5018A	Apply structural principles to the construction of medium rise buildings	C
CPCCDE4001A	Plan and prepare for activities on demolition sites	CT
CPCCDE4002A	Plan and supervise demolition work to minimise environmental and public health and safety impact	CT
CPCCDE4003A	Supervise individual activities on demolition sites	CT
CPCCDE4004A	Finalise demolition activities and supervise property handover	CT
CPCCBC4014A	Prepare simple building sketches and drawings	C
CPCCBC4024A	Resolve business disputes	C
CPCCBC4025A	Manage personal work priorities and professional development	C
CPCCBC5001B	Apply building codes and standards to the construction process for medium rise building projects	C
CPCCDE3016A	Identify hazards on demolition sites and apply risk management strategies	CT
CPCCDE3018A	Select and use small plant and equipment for demolition tasks	CT
CPCCWHS1001	Prepare to work safely in the construction industry	RPL

********** End of Record **********
Issued without erasure or alteration

Signed: Robyn E Delander

ROBYN DELANDER (Chief Executive Officer)

NSW GOVERNMENT | SafeWork NSW

EXPLOSIVES LICENCE

NEW SOUTH WALES

DANIEL GILBERT HEALY



D.O.B: 15/07/1988 Expires: 13/05/2030

Description: Blasting Explosives Users Licence Issued under the NSW Explosives Act and the Explosives Regulation

Authorisations:The licence holder is authorised to: Manufacture,Use,Possess,Dispose

Authorisations subject to the licence conditions and class of explosives listed on the reverse

Licence No: XBLS201242

Licence Holder Signature

Category: Agricultural Blasting, Seismic Work, Demolition Work

Licence Conditions: Holders must comply with the SafeWork NSW General Explosives Licence and Security Clearance Conditions and/or the Operational Conditions for Pyrotechnicians and Single Use Fireworks Licences (as applicable)

Licence Restrictions:

Licence Holder Signature

Category: **Agricultural Blasting, Seismic Work, Demolition Work, Above Ground Mining**

Licence Conditions: **Holders must comply with the SafeWork NSW General Explosives Licence and Security Clearance Conditions and/or the Operational Conditions for Pyrotechnicians and Single Use Fireworks Licences (as applicable)**

Licence Restrictions:

NSW GOVERNMENT SafeWork NSW

EXPLOSIVES LICENCE



BENJAMIN JOEL HEALY

D.O.B: 08/01/1986 Expires: 05/04/2028

Description: Blasting Explosives Users Licence Issued under the NSW Explosives Act and the Explosives Regulation

Authorisations:The licence holder is authorised to: Manufacture,Use,Possess,Dispose

Authorisations subject to the licence conditions and class of explosives listed on the reverse

Licence No: XBLS201660

NEW SOUTH WALES

APPENDIX F – INSPECTION TEST PLAN

INSPECTION TEST PLAN	PROJECT NUMBER:	W057	DOCUMENT NUMBER:	W057-ITP-001a	WELLANBAH INDUSTRIAL
	PROJECT TITLE:	Liddell Chimney Stacks	DOCUMENT TITLE:	Chimney Test Shot - ITP	
	DATE:	26/09/25	REVISION STATUS:	REV 0	

PROJECT DETAILS	
CLIENT	CMA Contracting
SITE OWNER	AGL
LOCATION	Liddell
PROJECT DESCRIPTION	DEMOLITION OF CHIMNEY STACKS SPECIFIC SCOPE RELATED TO THIS ITP IS FOR THE TEST SHOT WHICH IS TO BE CARRIED OUT ON THE STRUCTURE TO VERFIY THE PROPOSED POWDER FACTOR.
ITP DEVELOPED BY	B. HEALY
ITP APPROVED BY	D. HEALY

INSPECTION TYPE LEGEND	
INDICATOR	DESCRIPTION
V	VISUAL INSPECTION
T	TEST PROCEDURE (NDT, TRIAXIAL ETC.)
M	MONITORING OR MEASUREMENT (VIBRATION, NOISE)
S	SURVEY
D	DOCUMENTATION

HOLD POINT LEGEND	
INDICATOR	DESCRIPTION
H	HOLD POINT – MANDATORY PRIOR TO PROCEEDING
O	OPTIONAL CLIENT INSPECTION
LA	LOCAL AUTHORITY INSPECTION
E	ENGINEER INSPECTION

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
PRE-CHARGE PLACEMENT						
1.	Blast Management Sub-Plan & Safe Work Method Statements	D	▪ All planning / execution documentation required to complete works developed and submitted for approval process. Noting that some components will be progressively finalised	H		
2.	Engineering assessment of structural pre-weakening Material verification	D T	▪ Structural assessment of proposed demolition method completed. ▪ Core hole samples taken from structures ▪ Laboratory compression test of sample completed	H E		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
			▪ Schmidt test on circumference of chimney completed ▪ Results reviewed by structural engineer and design verified prior to engineering approval to proceed.			
3.	Complete inspection for hazardous materials	D	▪ Confirmation that blast will not disturb any hazardous materials	H		
4.	Sentry Points and Viewing Locations determined in consultation with AGL / CMA	V	▪ Sentry Points / View Points Agreed and Established with Register of persons in attendance held by CMA and AGL	H*		
5.	Blast notifications sent to regulators and site personnel as appropriate	D	▪ SafeWork Blast Notification completed ▪ AGL notified site personnel of planned event.	H*		
6.	Consultation with any affected stakeholders completed	D	▪ Consultation with affected stakeholders (Transgrid, BESS etc.) completed and confirmation from AGL that process has been adequately undertaken and acceptance from stakeholders has been secured (at AGL's discretion).	H		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
7.	Subject to above, amendments made to Blast Management Sub-Plan	D	▪ Updated BMSP with revised execution details.	H		
8.	Blast Management Sub-Plan Accepted by Principal Contractor and Asset Owner	D	▪ BMSP reviewed by CMA/AGL, and permission granted to proceed. Noting that sentry points and notifications may be progressing.	H		
9.	Complete Site Inductions & Print out Work Packs	D	▪ Complete CMA and AGL Site Inductions ▪ All documents printed in hard copy and included in the work pack for site team	H		
10.	Pre-start Meeting (including discussing expected weather for the day)	V	▪ All personnel associated with works to attend pre-start meeting.	H		
11.	Complete Site Establishment	V	▪ Ensure signage, is established to delineate work area ▪ Site Access/Egress Maintained	H		
12.	Drilling & Cutting Works ▪ Complete mark out of drill pattern ▪ Complete drilling of charge holes	V	▪ Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a for Mark Up of works completed ▪ Blast holes are as per BMSP design, correct location, depth, orientation and free from debris.	H		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
			▪ Any damaged or incomplete holes clearly marked with orange paint, checked holes marked with green paint			
BLAST DAY						
13.	Pre-start Meeting (including discussing expected weather for the day)	V	▪ All Wellanbah and CMA Personnel to attend pre-start meeting. ▪ Confirm whether forecast and potential for lightning	H		
14.	Work Authorisation and Permits in place	D	▪ Ensure all required permits are completed and in place (SWMS)	H		
15.	Set Up Exclusion Zone	V	▪ Verify exclusion zone is set up in accordance with the BMSP	H		
16.	Visual inspection of work area for loose material or other hazards	V	▪ Assess area for any hazards that may have developed over night	H		
17.	Continued weather checks	D	▪ Re-assess weather forecast for lightning potential.	H		
18.	Installation of Emulsion explosive charges	V	▪ Verify charges match WI-WI-BMP-W057-001a Blast Management Sub-Plan ▪ Ensure tails are inserted into cartridge end and taped to cartridge	H		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
			▪ Cartridges inserted into charge holes and tamped ▪ Charge holes stemmed post installation/ tamping			
19.	Tie in of horizontal initiation lines	V	▪ Verify that all charges have been installed and stemmed ▪ Confirm that all charges have been tied into horizontal initiation lines ▪ Ensure there is no excessive slack in the system	H		
20.	Installation of charge protection (steel cover plates)	V	▪ Ensure protection has been installed around all charges ▪ Confirm no areas of cut off / pinching of det cord matrix ▪ Ensure detonator connection points are accessible.	H		
21.	Confirm Exclusion Zone for all non-essential personnel	V	▪ All non-essential personnel to vacate site to pre-determined points	H		
22.	Daveytronic Blasting equipment checked	M	▪ Wellanbah Shotfirer to check blasting units prior to tie in of detonators to initiation lines (Note the units will have also been checked on the night before the event and two units will be on hand in case of malfunction of a unit during pre-checks).	H		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
23.	Attachment of detonators to initiation lines and programming delays	V M	▪ Check that detonators have been attached to lead in lines ▪ Ensure all detonators have been programmed	H		
24.	Pre-Blast Inspection	V M	▪ Complete pre-blast checks as per Appendix A – Section 7 of BMSP	H		
25.	Dust Suppression established in accordance with dust management plan	V	▪ Pre-wet of area completed	H		
26.	Run out Harness wire to firing point	V	▪ Harness wire has been run out to firing point	H		
27.	Confirm Exclusion Zone	V	▪ Final exclusion zone to be confirmed ▪ Sentry checks complete, and confirmation that area is secure given to shotfirer	H		
28.	Pre-Blast Inspection Initiation of Blast	V	▪ Remaining pre-blast procedure completed as per Appendix A – Section 7 of BMSP ▪ Countdown procedure completed as per BMSP, and blast to be initiated	H		
29.	Inspection of Blast Area after detonation & give ALL CLEAR	V	▪ Shot firer to undertake Post Blast Inspection completed with All Clear given by Wellanbah Shotfirer to sentries /CMA personnel.	H		

ITEM NUMBER	INSPECTION DESCRIPTION	INSPECTION TYPE	INSPECTION CRITERIA	HOLD POINT	NAMES, DATE AND SIGNATURE	COMMENTS
30.	Wet down of Area	V	▪ Wet down structure / any areas which pose a fire risk. (unlikely for test blast)	H		
31.	Excess explosives removed from site.	V	▪ Wellanbah to remove any excess explosives from site.	H		

FINAL SIGNOFF – COMPLETION OF WORK				
COMPANY	NAME	POSITION	SIGNATURE	DATE
COMMENTS / SUPPORTING DOCUMENTS:				

APPENDIX G – SAFE WORK METHOD STATEMENT

WELLANBAH INDUSTRIAL	Safe Work Method Statement (SWMS) Worksheet

This form should be used in conjunction with the Blast Management Sub-Plan - WI-BMSP-057-001a – LIDDELL CHIMNEY TEST SHOT

Section 1: Details of Safe Work Method Statement

BUSINESS UNIT		
Business Unit: BLASTING	**Date of assessment: 31/10/2025**	**Location: LIDDELL POWER STATION**

ACTIVITY / PROCESS
Describe the work Task (what, why, where, how): Test Blasting Liddell Power Station Chimney Stacks
Relevant documents and evidence used during the SWMS: Codes of Practice, Australian Standards, Blast Management Plan
Trades involved with undertaking this work activity (e.g. construction, electrical, etc): Blasting (Shotfirer)

SWMS TEAM MEMBERS
Team Leader(s): Daniel Healy
Other personnel involved in the SWMS Process: Ben Healy

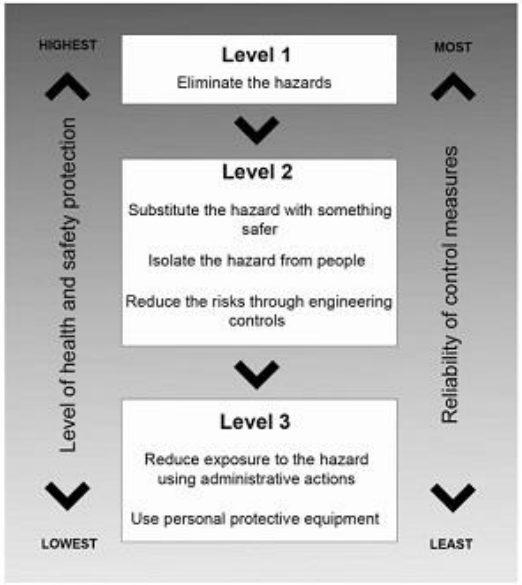
Project Manager - SIGN-OFF AND AUTHORISATION			
Name:	**Position:**	**Signature:**	***Review Date:***

Section 2: Work Activity Steps

You must always aim to eliminate a hazard, which is the most effective control. If this is not reasonably practicable, you must minimise the risk by working through the other alternatives in the hierarchy of Control. See below

Hazard Source	Potential hazards to consider during the hazard identification process
Work Premises	Access/Egress, Layout and condition, structure design, lighting conditions, suitability of equipment and state of deterioration
Physical Working Environment	Electricity, pressure, confined spaces, working at height/depth, confined spaces, fire or explosion, slips/trips/falls, weather conditions, contact with moving or stationary objects, exposure to dust/fumes/ vapour/ noise/ heat/ cold/ vibration/ radiation/static electricity or contaminated atmospheres
Work Practices, Work Systems and Shift Working Arrangements	Hazardous processes, psychological hazards, fatigue-related hazards, training, skills, experience, level of supervision, emergency planning arrangements
Plant and Equipment	Transport, installation, erection, commissioning, use, repair, maintenance, dismantling, storage or disposal of plant, unplanned and uncontrolled energy release, rotating equipment, vehicle movement, plant not used for intended purpose i.e. task specific, tools required for task, plant not maintained to manufacturer and design specifications
Utilising Explosives	Production, handling, use, storage, and transport
Manual Handling	Actions, movements, workplace/workstation layout, posture, duration and frequency of manual handling

Hierarchy of Control
Use this to determine control measures required to minimise the Risks



STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
1.	Set Up Wellanbah Work Area	Lack of personnel awareness for exclusion zones and communication procedures	- All personnel to have completed AGL and CMA Site Inductions - All personnel to attend pre-start meeting and be signed onto required site permits and management plans - Clear signage to be placed at entrance to Wellanbah work area and Muster Location. - Wellanbah evacuation procedures to be adhered with (all site personnel to be trained in this procedure) - Wellanbah Shotfirer to be responsible security of charges within work area	Supervisor / Shotfirer / Demolition Crew / Blast Crew
		Unsafe work area	- Shotfirer and work crew to conduct visual inspection of the work area ensuring all potential hazards are identified and removed (potential debris or loose material) - Work crew to maintain visual awareness for surrounding ground conditions (penetration covers, soft spots). Install visual markers at any such locations. - Ensure the work area is maintained in a clean and tidy state with good house keeping - Authorised workers in area only - Complete weather check to ensure OK to proceed – Winds less than 12.5m/s, no storm activity evident or forecasted.	Supervisor / Shotfirer / Demolition Crew / Blast Crew
2.	Explosives to be placed in nominated charge holes in accordance with WI-BMP-W057-001a Blast Management Sub-Plan	Inadequate quality control resulting in execution errors.	- Prior to commencing any charge placement works, Inspection Test Plan: W057-ITP-001a and Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a to be completed by shotfirer. This is to include: **Charge holes layout and depth matches blast design** **Core hole cleared out with compressed air prior to fitment to ensure all moisture and debris removed** **Checked holes marked in green paint – bar strike holes marked in orange paint** Upon completion of above, approval to load charges will be granted by the shotfirer.	Supervisor / Shotfirer / Blast Crew
		Explosives transport vehicle movements	- Explosives transport vehicle to drive to site along main entrance road - Vehicle to be parked adjacent to chimney, and remain under visual surveillance of the shotfirer / personnel with security clearance at all times - Wheel chocks to be placed to prevent unexpected movement of vehicle. - Driver to hold appropriate transport license	Supervisor / Shotfirer / Driver

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
		Security of explosives	- Transportable storage magazines to be locked at all times, with shotfirer to have key in possession at all times - Secure transport form completed, and explosives use register to be filled out. - Explosives to only ever be under possession of personnel with NSW security clearance - Any unloaded charges to be returned to transport vehicle - Loaded holes are to be under surveillance of shotfirer / personnel with security clearance at all times until time of firing.	Shotfirer / Blast Crew
		Debris in charge holes or incorrect drill depth	- Carry out an inspection of each blast hole prior to installing explosives, ensuring correct drill depth and free from debris (secondary check in addition to Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a) - Any incorrect hole depths, blockages or other defects to be notified to shotfirer, do not load any hole with defects without rectification and approval by Shotfirer/Engineer	Shotfirer / Blast Crew
		Premature explosion whilst installing cartridges	- Check current weather and forecasts are safe to carry out task, no forecast lightning. - Only approved shotfirers, with NSW Shotfirer Permit to handle explosives. - Anti-static PPE to be worn at all times (100% cotton clothing) - All explosives to be inspected, all tooling to be used whilst explosives are installed is to be intrinsically safe. - All tools to be specialised for working with explosives – I.e. Det-cord cutters, timber tamping rod etc. - Emulsion type explosives to be installed in each charge hole by NSW licensed Shotfirers	Supervisor / Shotfirer / Blast Crew
		Misfires due to errors in charge placement	- Works to be completed in accordance with BMSP - Works completed by qualified shotfirer - Inspection Test Plan: W057-ITP-001a and Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a to be completed, to confirm all steps associated with works are adhered with. - Tails to be inserted into each emulsion charge and taped to side of cartridge - Det. cord tails to all be equal length, and marked with coloured electrical tape to indicate insertion length as a cross check for over/under drilled holes. - Charges to be firmly tamped to ensure good coupling in charge hole	Shotfirer / Blast Crew

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
			- Expanding foam stemming to be applied to secure charges in position immediately after tamping	
3.	Tie in det. cord tails to horizontal initiation lines & connect detonators	Misfires/incorrect timing	- Ensure all knots (double half hitch) are tight and all det cord free ends are taped to prevent unravelling. - Work progressively along charge row, ensuring that all charges have been tied into the line - Keep horizontal line tort whilst working along face to eliminate slack in the system - Inspect detonating cord for evident of pinching / damage throughout work - Complete Inspection Test Plan: W057-ITP-001a and Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a. - Detonators to be programmed in accordance with BMSP	Shotfirer / Blast Crew
4.	Installation of protective steel plates to external surface of chimney base to prevent Flyrock Works to include utilising telehandler or excavator to position plates across front of charge pattern	Impact from Flying debris following explosion	- Blast protection (steel panels) to be placed by CMA and checked by shotfirer prior to attaching detonators to initiation lines	Supervisor / Shotfirer / Demolition Crew
		Misfires	- Extreme care taken when working around prepared explosives - Ensure explosives and down lines are not pinched or disturbed during fitment of protection - Any suspected disturbances to be investigated and inspected before final wrapping. - Shotfirer to inspect initiation lines following placement of protection to confirm no areas of concern, and complete Inspection Test Plan: W057-ITP-001 and Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001	Supervisor / Shotfirer / Demolition Crew / Blast Crew
		Crushing injuries	- Maintain awareness of surroundings and plant movements - Wear appropriate PPE for activities (gloves) - Use manual aids where appropriate to assist with lifting objects into position	Supervisor / Shotfirer / Demolition Crew / Blast Crew / Engineer

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
			- Personnel to stand clear of telehandler during placement of steel panels - Engineer to review placement, and confirm stability will be maintained up until time of blast event.	
		Plant movements within work area	- Authorised and trained personnel only to operate plant - Maintain exclusion zones around work areas - Positive communication to be made by personnel that intend on approaching area in which plant is operating - Spotter in position, with direct communication to operators	Supervisor / Shotfirer / Demolition Crew / Blast Crew
5	Establish exclusion zone for all non-essential personnel	Unauthorized access to area prior to blast	- Sentries to be in positioned around perimeter of exclusion zone in accordance with blast management sub-plan - Sentries to have radios, and be in contact with the site supervisor to notify them of any unauthorised access into the exclusion zone - Essential personnel limited to those undertaking physical tasks for the afternoon of the blast ▪ **Shotfirer & blast crew** ▪ **Sentry personnel** ▪ **CMA / AGL Representatives**	Supervisor / Sentries / Essential Personnel
		Lack of personnel awareness for exclusion zones and communication procedures	- All relevant personnel to have completed AGL and CMA Site Inductions - Sentries and essential personnel to attend workshop session for management of exclusion zone and communication procedures. - Personnel to attend pre-start meeting and have sequence of event document supplied along with sentry map, communication protocols, evacuation and abortion procedures on hand at all times	Supervisor / Sentries / Essential Personnel / Blast Crew
6	Complete connection between harness wire and electronic detonators, program detonators in accordance with BMP.	Premature explosion resulting in injury to personnel due to blast, or collapse of chimney stack	- Follow manufacturers procedures for connecting detonators and programming delays. - Complete pre-blast checks using programming unit (PU) - Blasting unit access cards to be in possession of shotfirer at all times - Exclusion zone cleared of all non-essential personnel prior to attaching detonators	Supervisor / Shotfirer / Blast Crew
		Misfires	- Inspect initiation lines prior to final attachment of detonators - Follow manufacturers procedures for connecting detonators and programming delays. - Complete pre-blast checks using programming unit (PU)	Supervisor / Shotfirer / Blast Crew

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
			- Inspection Test Plan: W057-ITP-001a and Cutting - Drilling - Charge Loading Quality Control Schedule: WI-QC-057-001a to be completed by shotfirer.	
7	Run harness wire out to firing location	Misfires	- Area to be cleared of all essential and non-essential personnel with exception of blast crew. Shotfirer to confirm that exclusion zone has been cleared, and all personnel accounted for prior to final run out of harness wire - Care to be taken when running out line to ensure no kinks in line, excessive tension, or potential areas of abrasion - Harness wire **NOT** to be connected to remote blasting unit until final exclusion zone has been established	Supervisor / Shotfirer / Blast Crew / Sentries
8	Establish final exclusion zone	Unauthorized access to area prior to blast	- 10 minutes prior to planned blast, exclusion zone to be established and confirmed by Site Supervisor, Wellanbah Shotfirer and Sentries. - All Wellanbah personnel to be accounted for and vacated site to control point (sentry point 1). - Exclusion zone to be handed over to shotfirer for final warning procedure / count down in accordance with blast management plan.	Supervisor / Shotfirer / Blast Crew / Sentries
		Lack of personnel awareness for exclusion zones and communication procedures	- All involved personnel to have completed AGL and CMA Site Inductions - Sentries and essential personnel to attend workshop session for management of exclusion zone and communication procedures. - Personnel to attend pre-start meeting and have sequence of event document supplied along with sentry map, communication protocols, evacuation and abortion procedures on hand at all times	Supervisor / Sentries / Essential Personnel / Blast Crew
		Detonation of charges prior to establishment of exclusion zone causing injury to personnel	- Harness wire **NOT** to be connected to remote blasting unit until exclusion zone has been established	Supervisor / Shotfirer / Sentries
9	Complete connection between harness wire and remote blasting unit	Premature explosion / Misfires	- Exclusion zones in place prior to establishing connection - Ensure exclusion zone is clear of all personnel following radio checks - Follow manufacturers procedures in relation to connection of harness wire to blasting unit - Pre-blast checks to be completed using unit - Blasting unit access cards to be in possession of shotfirer at all times	Supervisor / Shotfirer / Sentries

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
			Misfire procedure to be carried out as per blast management plan (BMP) section 7.34 if any misfires occur.	
10	Begin warning procedure / countdown	Unauthorized access to blast zone	- Wellanbah shotfirer to manage countdown / warning procedure, as noted in Blast Management Sub-Plan - Sentries to remain in direct radio contact with shotfirer and advise of any unauthorised entry to the exclusion zone via the abort protocols provided within the BMSP, which is to be issue to all sentries.	Supervisor / Shotfirer / Work Crew /
11	Detonate charges	Failure to detonate/misfire	- Shotfirer to advise sentries of misfire. Exclusion zones to be maintained. - Wait a minimum of 5 minutes, shotfirer only to access exclusion zone to investigate and rectify cause of misfire.	Supervisor / Shotfirer / Work Crew /
		Flying debris	- Exclusion zones to be maintained throughout detonation until all clear given by shotfirer and site handed over to demolition supervisor. - Charge protection installed to arrest fly rock debris - PPE to be worn at all times, the following PPE is to be worn as a minimum: a. Safety boots b. High viz c. Gloves d. Safety Glasses e. Safety helmet	Supervisor / Shotfirer / Work Crew /
		Noise	- Calculation of expected Air Over Blast Pressure to be completed, to confirm maximum db is below allowable limits. Refer to Blast management plan (BMSP). - All personnel outside of exclusion zones (with exception of firing crew). Personnel at firing location to have hearing protection	Shotfirer / Blast Crew
		Dust	- Refer dust management controls included in Blast Management Sub-Plan and follow requirements of plans. (wet down area) - Impact areas to be wet down pre-and post blast to minimise dust	Supervisor / Blast Crew / Hygienist / Technicians / Sentries
12	Inspect chimney structure for misfires or area of concern	Obnoxious and toxic dust and gases	- Exclusion zone to be maintained - No personnel (including shotfirer) to approach blast until sufficient time has passed to allow dust to settle and toxic and obnoxious gases to dissipate. Refer BMP 7.35 for Post blast assessment and inspection procedure.	Shotfirer

STEP	Task Step *Break the activity down into steps. List the steps in this column*	Hazard Identification *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	Controls Implemented *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	Responsible Persons *Nominate the persons responsible for implementing the required controls*
		Misfires	- After mandatory wait time (minimum 5 minutes for explosives, longer to allow for dust plume to dissipate), shotfirer to inspect site for misfires and unsafe conditions. Refer BMP section 7.35 for 'Post blast assessment and inspection procedure' - Exclusion zone to be maintained by sentries - Shotfirer to inspect structure from a safe distance prior to approaching - Misfire procedure to be carried out as per blast management plan (BMP) section 7.34 if any misfires are detected. - If misfire identified: 1. Inform sentries and relevant stakeholders (Site Supervisor, AGL, Transgrid, BESS) 2. Confirm the blasting unit has been disconnected from the harness wire (will have been completed immediately after firing, but to be re-confirmed). 3. One-man risk approach, shotfirer to inspect the site and confirm it is safe to enter the warm zone. 4. Shotfirer to investigate and rectify cause of misfire (if safe to do so). Refer to section 7.34 'Misfire management system and contingency plan' in blast management plan (BMSP).	Shotfirer / Structural Engineer
		Unauthorised Access	- Exclusion zone to be maintained by sentries until post blast inspection has been completed.	Supervisor / Shotfirer / Sentries
		Dust	- Allow time for dust plume to dissipate	Shotfirer / Blast Crew
13	Issue all clear from blasting perspective, and hand over site to supervisor	Misfires / unexploded charges	- After mandatory wait times, shotfirer to have inspected site for misfires / unexploded charges and unsafe conditions (as per Step 12).	Shotfirer
		Unstable structure	- Structural Engineer to have reviewed structure for signs of unexpected response. - Structural Engineer to have reviewed adjacent structures for potential damage / created hazards - Identified areas of concern or any locations which an exclusion zone must be maintained discussed with site supervisor	Supervisor / Shotfirer / Structural Engineer
		Unsafe conditions	- Any other identified unsafe conditions following Step 12, to be discussed with site supervisor.	Supervisor / Shotfirer / Structural Engineer
		Shotfirer unused explosives or detonation equipment left unattended	- Shotfirer to ensure all equipment has been turned off / access card removed, accounted for and locked away in shotfirers vehicle prior to 'all clear' given. - Transportable magazines to be locked at all times with key in possession of shotfirer.	Shotfirer

STEP	**Task Step** *Break the activity down into steps. List the steps in this column*	**Hazard Identification** *Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column*	**Controls Implemented** *Decide what controls to use to eliminate or minimise the risks using the Hierarchy of Control. Detail the controls in this column*	**Responsible Persons** *Nominate the persons responsible for implementing the required controls*
			- Any unused explosives to be removed from site following blast event.	

Section 3: Declaration by workers and parties involved in the work activity (e.g. contractors)

I have been **consulted** and have assisted in the development of this SWMS.
I have been given the opportunity to comment on the content of this SWMS.
I have **read** and **understand** how I am to carry out the activities listed in this SWMS.
I have been supplied with **personal protective equipment** identified on this SWMS and I have been given **training** in the safe use of this equipment.
I have read and understand the requirements set out in the **safety data sheets** for any **workplace chemicals** identified in this SWMS.

NAME	SIGNATURE	DATE

APPENDIX H – AIRBLAST OVER PRESSURE CONTOURS AND SENSITIVE RECEIVERS



No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	BH	26.09.25

WELLANBAH INDUSTRIAL

DO NOT SCALE

Conditions of Use.
This document may only be used by intended client for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 26.09.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY TEST SHOT AOP CONTOURS**

Original Size **A1**
Drawing No: **WI-24057-06-22-E02**
Rev: A

Plot Date: 26/09/2025 12:04:55 PM



NOTES:
DISTANCES PROVIDED ARE FROM THE RECEIVER TO THE NEAREST CHIMNEY STRUCTURE

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE	DH	DH	BH	26.09.25

WELLANBAH INDUSTRIAL

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Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 26.09.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY BLAST AOP RECEIVERS**

Original Size **A1**
Drawing No: **WI-24057-06-22-E03**
Rev: A

Plot Date: 26/09/2025 12:04:58 PM

APPENDIX I – LICENCED OFFSITE STORAGE FACILITY DETAILS & TRANSPORT VEHICLE CERTIFICATIONS

SafeWork NSW

Ref: 01042848
30th January 2025

Wellanbah Industrial Pty Ltd
39 BAGENMAR RD
TINTINHULL NSW 2352, AUSTRALIA

Re: XSTR200123 - Amendment

Dear Daniel,

Please find enclosed your Store Explosives Licence issued under the *NSW Explosives Act 2003* and *NSW Explosives Regulation 2024*.

It is important that you are aware of the following conditions regarding the use of your licence:

- It is a condition of a licence to handle explosives and/or explosive precursors that the holder must comply with the requirements of the NSW Explosives Act and Regulation, as well as the *SafeWork NSW General Explosives Licence and Security Clearance Conditions*. To view a copy please visit out website at www.safework.nsw.gov.au.
- You must present your licence to any SafeWork NSW Inspector or NSW Police Officer, if requested. You must have your licence in the possession when you are undertaking work handling explosives or explosive precursors.
- It is also a condition of the licence that you notify SafeWork NSW within 14 days of any change in details.
- If you are listed as a nominated responsible person for a company that has obtained an explosives licence, and you cease to be an employee, the company must notify SafeWork NSW within 14 days.

If the licence is lost, stolen, or destroyed, you are required to apply for a replacement licence. An application to replace an explosives licence is on our website.

For further information or if you have any question, please call our Customer Service Centre on 13 10 50 or visit our website.

Sincerely,

Fiona Hayman
Manager, SafeWork Licensing
SafeWork NSW

NSW GOVERNMENT

SafeWork NSW

Licence Number: XSTR200123

Licence to Store Explosives

Issued under and subject to the provisions of the NSW Explosives Act and the NSW Explosives Regulation

Licence Holder: Wellanbah Industrial Pty Ltd

Business Address: 39 BAGENMAR RD, TINTINHULL NSW 2352, AUSTRALIA

Storage Address: 2381 LIMBRI-WEABONGA RD, WEABONGA, NSW 2340 AUSTRALIA

Date of Issue: 13/09/2021

Date of Expiry: 12/09/2026

Print Date: 30/01/2025

AUTHORISED ACTIVITIES

The licence holder is authorised to: Possess, Store

EXPLOSIVES AND/OR EXPLOSIVES PRECURSORS AUTHORISED FOR STORAGE

UN Number	Proper Shipping Name	Classification Code
UN0030	DETONATORS, ELECTRIC for blasting	1.1B
UN0048	CHARGES, DEMOLITION	1.1D
UN0065	CORD, DETONATING, flexible	1.1D
UN0241	EXPLOSIVE, BLASTING, TYPE E	1.1D
UN0360	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.1B
UN0384	COMPONENTS, EXPLOSIVE TRAIN N.O.S.	1.4S
UN0513	DETONATORS, ELECTRONIC, programmable for blasting	1.4S

AUTHORISED STORES

Storage Facility ID (building name)	Storage Facility Type	Hazard Division	Maximum Storage Quantity
W101	Portable Magazine	1.1D	800 kg
W102	Portable Magazine	1.1B	1100 No

SW08029 0318

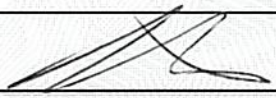
Licence Number: XSTR200123

Licence Conditions:

It is a condition of a licence to handle explosives and/or explosive pre-cursors that the holder must comply with the requirements of the NSW Explosives Act and Regulation, as well as the SafeWork NSW General Explosives Licence and Security Clearance Conditions - September 2013.

Specific Licence Conditions: No specific licence conditions.

Nominated Responsible Person:
Daniel Gilbert Healy, UHL206880 Expiry: 19/03/2025

Signature:	

Name:	DANIEL GILBERT HEALY

MAC-FLEET PTY LTD

Trading as Macs Engineering

4 February 2025

Wellanbah Industrial
39 Bagenmar Road
TINTINHULL NSW 2352

Attn: Mr Ben Healy

Hi Ben,

Re: TOYOTA HILUX DUAL CAB UTE
Registration No. BX-76-JX
Vin No. MROFZ22G601203010

I confirm that the Explosive Boxes fitted to the vehicle described above conform to the "Australian Code for the Transport of Explosives by Road and Rail – Third Edition" – see Engineer's Audit Report below: -

Kind Regards,

Ross Fredrickson
General Manager
Macs Engineering

Mac-Fleet Pty Ltd
1C Victoria Street
Mackay Qld 4740
ABN: 71 167 470 457
Ph: 07 4951 6555
Fax: 07 4951 6542
Web: www.macs.net.au

KEETECH -Mechanical Design for Mines & Manufacturers
Gary Keeton C.Eng, MIMechE, RPEQ
Registered Professional Engineer Queensland
Chartered Engineer, Member of the Institute of Mechanical Engineers (UK)
ABN 92 858 814 278 Ph.02- 49201074 Fax 02-49201074 mob: 0407965872
49 Ironbark Drive, Fern Bay NSW 2295

Design Audit of a CAT 2 Explosives Box For Macs Engineering (Mackay, Qld)

Compiled by: Gary Keeton RPEQ 4455
Report Ref 171110-1
Date: 17.11.2010
Refer attached drawing extract from 01-25-0001-A on page 3, showing the box. Also refer attached photographs on page 2 showing the box. Assessments of suitability and structural integrity are based on design drawings & manufacturing information & the relevant standards.

- The design has been assessed as compliant with the " **Australian Code for the Transport of Explosives by Road & Rail** " - AEC Third Edition section 6.2 (1) (a) through to (h); refer extract on page 4
- The load carried within the box is to be in accordance with Information Explosion Information Bulletin 78; refer page 6 for the extracted bulletin table.
- All MACS explosives carry boxes achieve the minimum CAT2 standards when built to the requirements of this certification.
- All MACS explosives carry boxes built since January 2011 has been done so in accordance with the minimum CAT2 standards when built to the requirements of this certification.

Attach a durable label plate, 3mm letters minimum, on the door of the box stating-

MAC-FLEET PTY LTD

Trading as Macs Engineering

SERIAL NO. :

EXPLOSIVE CARRY BOX IDENTIFICATION PLATE

CATEGORY 2 MIXED LOAD EXPLOSIVES CARRY BOX

UPPER CATEGORY 2 LIMIT 250KG

MAX INCLUDING DETONATORS - 5000 MAX QUANTITY

THIS BOX HAS BEEN BUILT IN ACCORDANCE WITH THE AUSTRALIAN CODE FOR THE TRANSPORT EXPLOSIVES BY ROAD AND RAIL - THIRD EDITION (AEC3). THE DESIGN HAS BEEN ASSESSED, APPROVED & CERTIFIED BY AN INDEPENDENT MECHANICAL ENGINEER.

WARNING - DO NOT REPAIR

1C VICTORIA STREET
MACKAY, QLD-4740
ABN : 71167470457

PH : 4951 6555
FAX : 4951 6542
www.macs.net.au

DATE : J / NO: VIN NO.:

Limitations of this audit as required by the Board of Professional Engineers-Qld.
This document confirms that the mechanical design of the box has been assessed for the conditions specified above. The quality of materials and manufacture are the responsibility of others.

G. Keeton.

Gary Keeton-Mechanical Engineer

17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

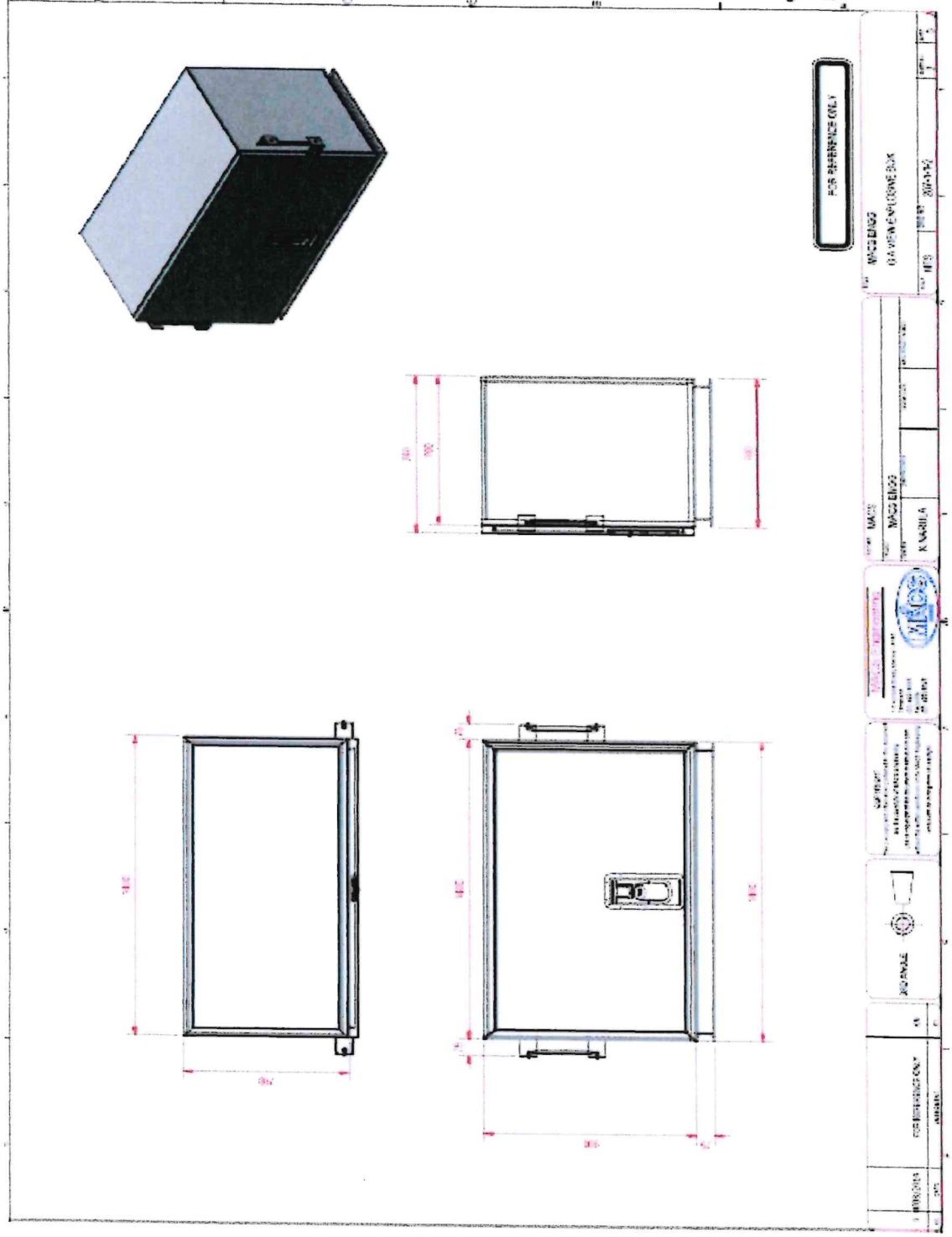


17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

Mac-Fleet Pty Ltd

1C Victoria Street
Mackay Qld 4740
ABN: 71 167 470 457

Ph: 07 4951 6555
Fax: 07 4951 6542
Web: www.macs.net.au



17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

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CHAPTER 6: CARRY BOX, ENCLOSED VEHICLE BODY, FREIGHT CONTAINER AND VEHICLE DESIGN

6.1 Scope of Section

This Chapter sets out requirements for locks, carry boxes, enclosed vehicle bodies, freight containers, bulk vehicles, rail vehicles and special vehicles used in the transport of explosives.

6.1.1 Requirements for Locks

(1) Any receptacle, carry box, tank or closed transport unit used to transport explosives by road or rail must be lockable.

(2) If locks, such as padlocks or locksets, are used to provide locking security for high security risk loads of explosives being conveyed on a vehicle, the locks must be of a type equivalent to or better than SP3, K1 to K4, D1 or D2, C2 as described in AS 4145.2 and AS 4145.4.

(3) Where other types of locking mechanisms, such as security seals, are used to provide security for high security risk loads of explosives being conveyed on a vehicle, they must provide the level of security outlined in Section 6.1.1(2), above.

Note: Australian Standards, AS 4255.1 and AS 4255.2, provide guidance about seals that may provide such security.

6.2 Requirements for Carry Boxes and Enclosed Vehicle Bodies

(1) When an enclosed vehicle body or carry box is used in the transport of explosives (other than of Classification Code 1.4S, excluding detonators), in Category 1 and 2 quantities, the following requirements apply:

(a) a carry box and an enclosed vehicle body must be lockable;

(b) a carry box, when not contained within an enclosed vehicle body, must be securely attached to the vehicle;

(c) the inside surface of an enclosed vehicle body or carry box must be of wood or some other material incapable of producing incendive sparks;

(d) where the explosives are transported in sealed packages and in any enclosed portion of a road vehicle, a carry box is not required but the explosives must be stowed so that they are incapable of movement within the vehicle;

(e) the box or body must be strong enough to maintain its integrity during transport and built in such a manner that it adequately protects and secures the goods:

(f) the box or body must be weatherproof:

(g) the box or body must be closed and have a continuous floor to contain spillage: and

(h) a portable magazine complying with the requirements of AS 2187.1 may be used as a carry box if the magazine also complies with the carry box requirements.

17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

Explosives Information Bulletin 78

Mixed loads of detonators and high explosives in shotfirer vehicles

Mixed loads of detonators and high explosives can be transported on the same vehicle in separate carry boxes under the segregation requirements in section 7.3.2 of the Australian Explosives Code third edition (AEC3). This bulletin addresses the application of section 7.3.2 to mixed loads of detonators and high explosives up to the Category 2 limit only on vehicles with carry boxes on public roads. The AEC3 introduced changes where the amount of class 1.1B detonators that could be transported in these specially constructed vehicles was reduced from 5000 units to 125 units unless the vehicle is fitted with an effective means of segregation demonstrated to prevent sympathetic detonation of incompatible explosives (approved blast barrier).

The AEC3 also provides for means specifically approved by the Chief Inspector (competent authority under section 7.3.2(5)(b) of the AEC3) and a means specifically approved by the Chief Inspector is addressed in this bulletin. The requirements take recognition of the differences between plain detonators and elemented caps of class 1.1B and electric, non-electric or electronic detonators of class 1.1B and that many shotfirer vehicles are using carry boxes to a Category 3 standard for Category 2 quantities.The table below summaries the minimum standards accepted against section 7.3.2 for Category 2 loads in carry boxes on shotfirer vehicles. These quantities apply to public places only, i.e. public roads. Following the table, notes are provided to support different options in the table.

Mac-Fleet Pty Ltd
1C Victoria Street
Mackay Qld 4740
ABN: 71 167 470 457
Ph: 07 4951 6555
Fax: 07 4951 6542
Web: www.macs.net.au

Table 1 Segregation alternatives for mixed loads in shotfirer vehicles

	Detonator Type	Maximum Quantity (mass) of Explosives	Carry Box Standard	Segregation barrier provided	Separation between carry boxes ≥ 2m	AEC3 requirement or Chief Inspector approved means
1	Plain detonators, elemented caps Class 1.1B Quantity 125 max	Upper category 2 limit 250 kg max including detonators	Category 2 or Category 3	No	No	AEC3 requirement
2	Electric, non-electric electronic detonators Class 1.1B Quantity 125	Upper category 2 limit 250 kg max including detonators	Category 2	No	No	AEC3 requirement
3	Plain detonators, Elemented caps Class 1.1B Quantity 5000 max	Upper Category 2 limit 250 kg max including detonators	Category 2 or Category 3	No	Yes	AEC3 requirement
				Yes	No	AEC3 requirement
4	Electric, non electric detonators Class 1.1B Quantity 5000 max	Upper category 2 limit 250 kg max including detonators	Category 2	No	Yes	AEC3 requirement
				Yes	No	AEC3 requirement
5	Electric, non electric detonators Class 1.1B Quantity 5000 max	Upper category 2 limit 250 kg max including detonators	Category 3	No	No	Chief Inspector approved means
6	Detonators of Class 1.4B or Class 1.4S Any Quantity	Upper category 2 limit 250 kg max including detonators	Category 2 or Category 3	No	No	AEC3 requirement

17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

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MAC-FLEET PTY LTD

Trading as Macs Engineering

4 February 2025

Wellanbah Industrial
39 Bagenmar Road
TINTINHULL NSW 2352

Attn: Mr Ben Healy

Hi Ben,

Re: TOYOTA HILUX DUAL CAB UTE
Registration No. NSW: FMI71H
Vin No. MR0KA3CD701262146

I confirm that the Explosive Boxes fitted to the vehicle described above conform to the "Australian Code for the Transport of Explosives by Road and Rail – Third Edition" – see Engineer's Audit Report below: -

Kind Regards,

Ross Fredrickson

General Manager

Macs Engineering

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Design Audit of a CAT 2 Explosives Box For Macs Engineering (Mackay, Qld)

Compiled by: Gary Keeton RPEQ 4455
Report Ref 171110-1
Date: 17.11.2010
Refer attached drawing extract from 01-25-0001-A on page 3, showing the box. Also refer attached photographs on page 2 showing the box. Assessments of suitability and structural integrity are based on design drawings & manufacturing information & the relevant standards.

- The design has been assessed as compliant with the " **Australian Code for the Transport of Explosives by Road & Rail** " - AEC Third Edition section 6.2 (1) (a) through to (h); refer extract on page 4
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MAC-FLEET PTY LTD

Trading as Macs Engineering

SERIAL NO. :

EXPLOSIVE CARRY BOX IDENTIFICATION PLATE

CATEGORY 2 MIXED LOAD EXPLOSIVES CARRY BOX

UPPER CATEGORY 2 LIMIT 250KG

MAX INCLUDING DETONATORS - 5000 MAX QUANTITY

THIS BOX HAS BEEN BUILT IN ACCORDANCE WITH THE AUSTRALIAN CODE FOR THE TRANSPORT EXPLOSIVES BY ROAD AND RAIL - THIRD EDITION (AEC3). THE DESIGN HAS BEEN ASSESSED, APPROVED & CERTIFIED BY AN INDEPENDENT MECHANICAL ENGINEER.

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G. Keeton.

Gary Keeton-Mechanical Engineer

17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

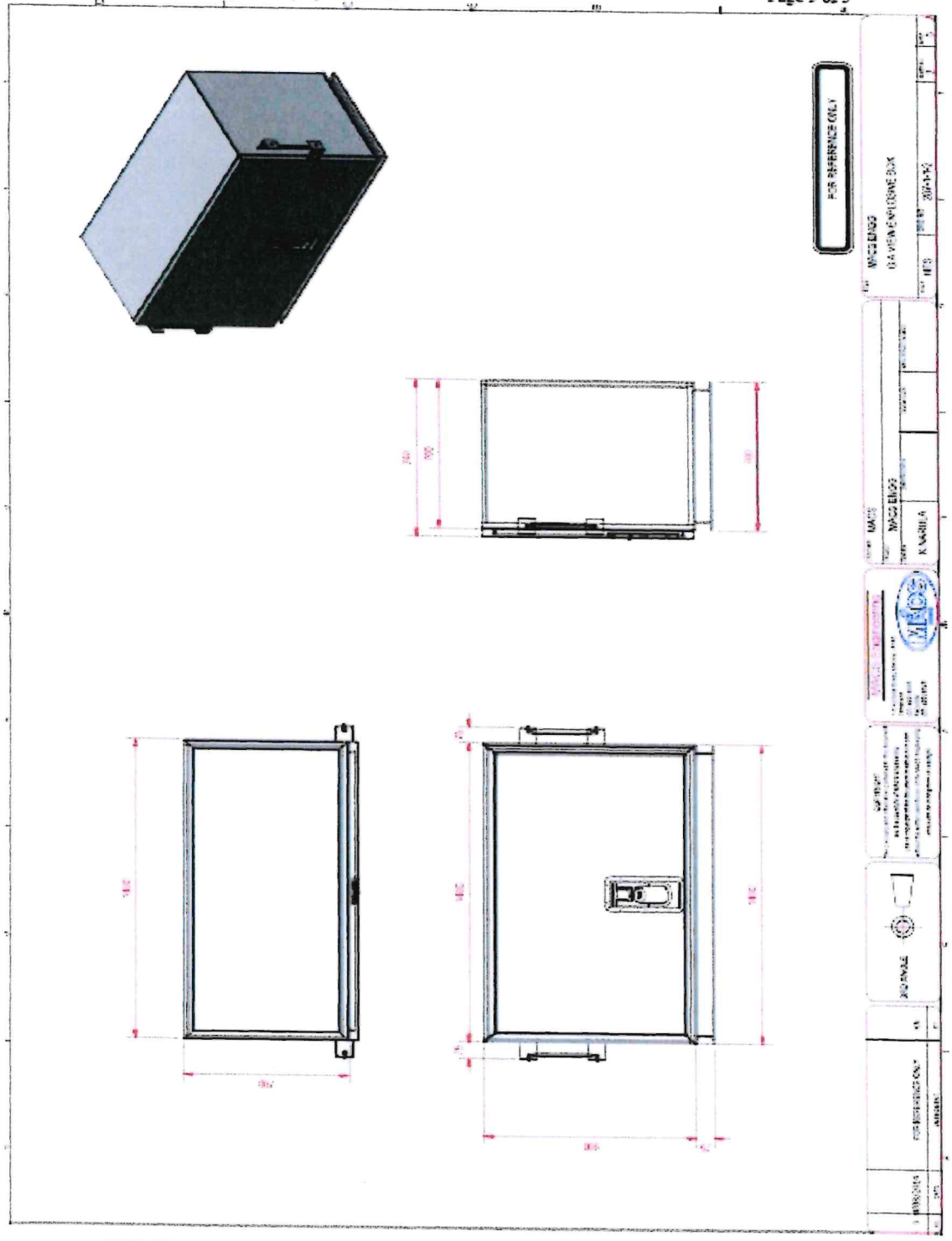


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(d) where the explosives are transported in sealed packages and in any enclosed portion of a road vehicle, a carry box is not required but the explosives must be stowed so that they are incapable of movement within the vehicle;

(e) the box or body must be strong enough to maintain its integrity during transport and built in such a manner that it adequately protects and secures the goods:

(f) the box or body must be weatherproof:

(g) the box or body must be closed and have a continuous floor to contain spillage; and

(h) a portable magazine complying with the requirements of AS 2187.1 may be used as a carry box if the magazine also complies with the carry box requirements.

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Explosives Information Bulletin 78

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The AEC3 also provides for means specifically approved by the Chief Inspector (competent authority under section 7.3.2(5)(b) of the AEC3) and a means specifically approved by the Chief Inspector is addressed in this bulletin. The requirements take recognition of the differences between plain detonators and elemented caps of class 1.1B and electric, non-electric or electronic detonators of class 1.1B and that many shotfirer vehicles are using carry boxes to a Category 3 standard for Category 2 quantities.The table below summaries the minimum standards accepted against section 7.3.2 for Category 2 loads in carry boxes on shotfirer vehicles. These quantities apply to public places only, i.e. public roads. Following the table, notes are provided to support different options in the table.

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MAC-FLEET PTY LTD

Trading as Macs Engineering

Table 1 Segregation alternatives for mixed loads in shotfirer vehicles

	Detonator Type	Maximum Quantity (mass) of Explosives	Carry Box Standard	Segregation barrier provided	Separation between carry boxes ≥ 2m	AEC3 requirement or Chief Inspector approved means
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4	Electric, non electric detonators Class 1.1B Quantity 5000 max	Upper category 2 limit 250 kg max including detonators	Category 2	No	Yes	AEC3 requirement
				Yes	No	AEC3 requirement
5	Electric, non electric detonators Class 1.1B Quantity 5000 max	Upper category 2 limit 250 kg max including detonators	Category 3	No	No	Chief Inspector approved means
6	Detonators of Class 1.4B or Class 1.4S Any Quantity	Upper category 2 limit 250 kg max including detonators	Category 2 or Category 3	No	No	AEC3 requirement

17.11.2010 rev1. 25.5.2016 REV2. 20.6.2016 rev3. 18.11.2016 rev4

Mac-Fleet Pty Ltd
1C Victoria Street
Mackay Qld 4740
ABN: 71 167 470 457
Ph: 07 4951 6555
Fax: 07 4951 6542
Web: www.macs.net.au

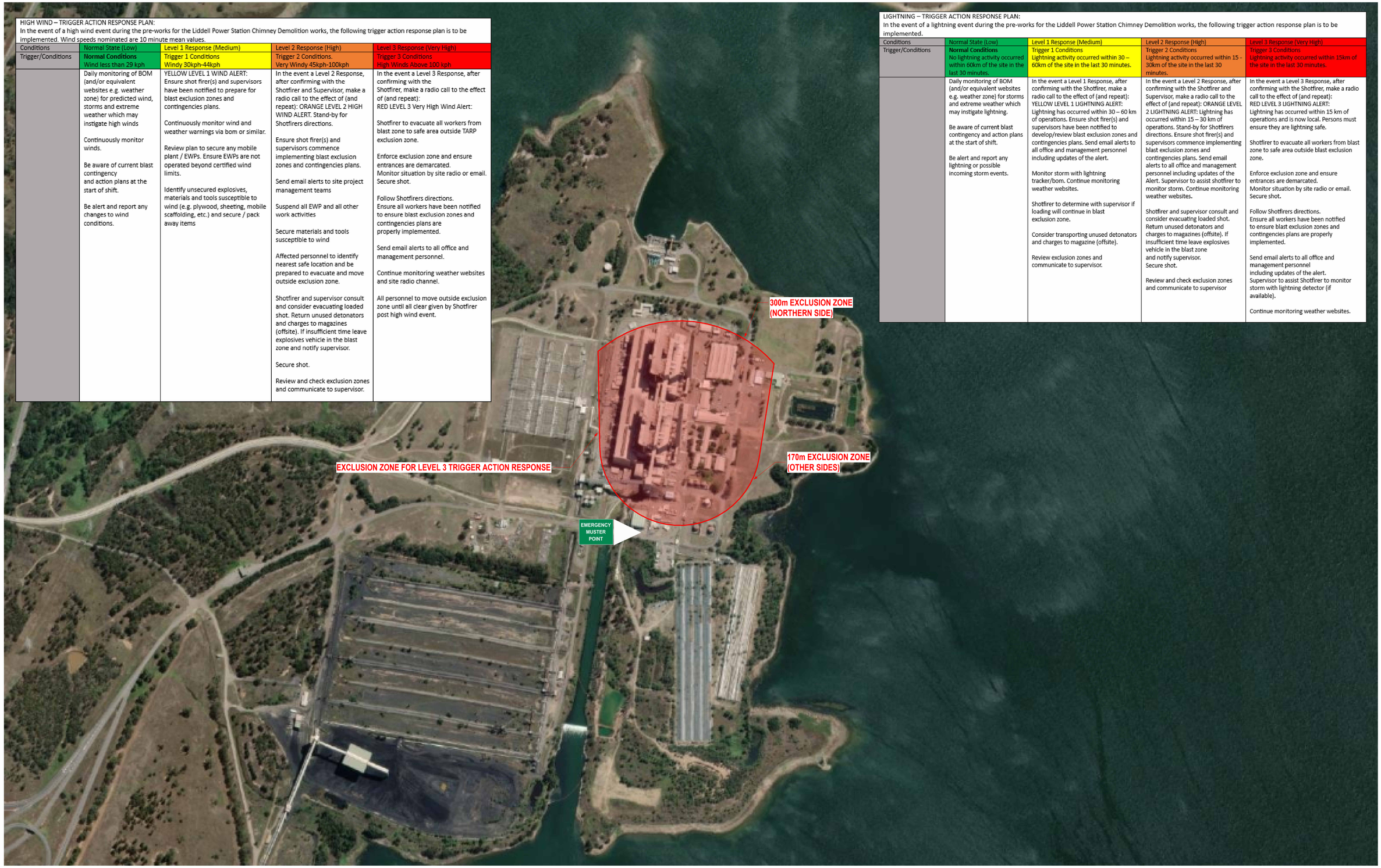
APPENDIX J – TRIGGER ACTION RESPONSE PLAN – LIGHTNING AND HIGH WIND

HIGH WIND – TRIGGER ACTION RESPONSE PLAN:
In the event of a high wind event during the pre-works for the Liddell Power Station Chimney Demolition works, the following trigger action response plan is to be implemented. Wind speeds nominated are 10 minute mean values.

Conditions	Normal State (Low)	Level 1 Response (Medium)	Level 2 Response (High)	Level 3 Response (Very High)
Trigger/Conditions	**Normal Conditions** Wind less than 29 kph	Trigger 1 Conditions Windy 30kph-44kph	Trigger 2 Conditions. Very Windy 45kph-100kph	Trigger 3 Conditions High Winds Above 100 kph
	Daily monitoring of BOM (and/or equivalent websites e.g. weather zone) for predicted wind, storms and extreme weather which may instigate high winds Continuously monitor winds. Be aware of current blast contingency and action plans at the start of shift. Be alert and report any changes to wind conditions.	YELLOW LEVEL 1 WIND ALERT: Ensure shot firer(s) and supervisors have been notified to prepare for blast exclusion zones and contingencies plans. Continuously monitor wind and weather warnings via bom or similar. Review plan to secure any mobile plant / EWPs. Ensure EWPs are not operated beyond certified wind limits. Identify unsecured explosives, materials and tools susceptible to wind (e.g. plywood, sheeting, mobile scaffolding, etc.) and secure / pack away items	In the event a Level 2 Response, after confirming with the Shotfirer and Supervisor, make a radio call to the effect of (and repeat): ORANGE LEVEL 2 HIGH WIND ALERT. Stand-by for Shotfirers directions. Ensure shot firer(s) and supervisors commence implementing blast exclusion zones and contingencies plans. Send email alerts to site project management teams Suspend all EWP and all other work activities Secure materials and tools susceptible to wind Affected personnel to identify nearest safe location and be prepared to evacuate and move outside exclusion zone. Shotfirer and supervisor consult and consider evacuating loaded shot. Return unused detonators and charges to magazines (offsite). If insufficient time leave explosives vehicle in the blast zone and notify supervisor. Secure shot. Review and check exclusion zones and communicate to supervisor.	In the event a Level 3 Response, after confirming with the Shotfirer, make a radio call to the effect of (and repeat): RED LEVEL 3 Very High Wind Alert: Shotfirer to evacuate all workers from blast zone to safe area outside TARP exclusion zone. Enforce exclusion zone and ensure entrances are demarcated. Monitor situation by site radio or email. Secure shot. Follow Shotfirers directions. Ensure all workers have been notified to ensure blast exclusion zones and contingencies plans are properly implemented. Send email alerts to all office and management personnel. Continue monitoring weather websites and site radio channel. All personnel to move outside exclusion zone until all clear given by Shotfirer post high wind event.

LIGHTNING – TRIGGER ACTION RESPONSE PLAN:
In the event of a lightning event during the pre-works for the Liddell Power Station Chimney Demolition works, the following trigger action response plan is to be implemented.

Conditions	Normal State (Low)	Level 1 Response (Medium)	Level 2 Response (High)	Level 3 Response (Very High)
Trigger/Conditions	**Normal Conditions** No lightning activity occurred within 60km of the site in the last 30 minutes.	Trigger 1 Conditions Lightning activity occurred within 30 – 60km of the site in the last 30 minutes.	Trigger 2 Conditions Lightning activity occurred within 15 - 30km of the site in the last 30 minutes.	Trigger 3 Conditions Lightning activity occurred within 15km of the site in the last 30 minutes.
	Daily monitoring of BOM (and/or equivalent websites e.g. weather zone) for storms and extreme weather which may instigate lightning. Be aware of current blast contingency and action plans at the start of shift. Be alert and report any lightning or possible incoming storm events.	In the event a Level 1 Response, after confirming with the Shotfirer, make a radio call to the effect of (and repeat): YELLOW LEVEL 1 LIGHTNING ALERT: Lightning has occurred within 30 – 60 km of operations. Ensure shot firer(s) and supervisors have been notified to develop/review blast exclusion zones and contingencies plans. Send email alerts to all office and management personnel including updates of the alert. Monitor storm with lightning tracker/bom. Continue monitoring weather websites. Shotfirer to determine with supervisor if loading will continue in blast exclusion zone. Consider transporting unused detonators and charges to magazine (offsite). Review exclusion zones and communicate to supervisor.	In the event a Level 2 Response, after confirming with the Shotfirer and Supervisor, make a radio call to the effect of (and repeat): ORANGE LEVEL 2 LIGHTNING ALERT: Lightning has occurred within 15 – 30 km of operations. Stand-by for Shotfirers directions. Ensure shot firer(s) and supervisors commence implementing blast exclusion zones and contingencies plans. Send email alerts to all office and management personnel including updates of the Alert. Supervisor to assist shotfirer to monitor storm. Continue monitoring weather websites. Shotfirer and supervisor consult and consider evacuating loaded shot. Return unused detonators and charges to magazines (offsite). If insufficient time leave explosives vehicle in the blast zone and notify supervisor. Secure shot. Review and check exclusion zones and communicate to supervisor	In the event a Level 3 Response, after confirming with the Shotfirer, make a radio call to the effect of (and repeat): RED LEVEL 3 LIGHTNING ALERT: Lightning has occurred within 15 km of operations and is now local. Persons must ensure they are lightning safe. Shotfirer to evacuate all workers from blast zone to safe area outside blast exclusion zone. Enforce exclusion zone and ensure entrances are demarcated. Monitor situation by site radio or email. Secure shot. Follow Shotfirers directions. Ensure all workers have been notified to ensure blast exclusion zones and contingencies plans are properly implemented. Send email alerts to all office and management personnel including updates of the alert. Supervisor to assist Shotfirer to monitor storm with lightning detector (if available). Continue monitoring weather websites.



No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING		DH	DH	BH	26.09.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 26.09.25
Scale — This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY TEST SHOT LIGHTNING & WIND TARP**

Original Size **A1**
Drawing No: **WI-24057-06-22-E04**
Rev: A

Plot Date: 26/09/2025 12:05:02 PM

APPENDIX K – MAGAZINE RULES

MAGAZINE RULES

MAGAZINE NUMBERS: WI01 & WI02

STORAGE LICENSE NUMBER: XSTR200123

1. The magazine shall be used only for the storage of explosives and not as a working place for any other purpose.
2. High explosives must not be kept in the same magazine as detonators.
3. The magazine shall be kept securely closed and locked when not in use.
4. Maintenance work must not be carried out on this magazine except with the approval of: DANIEL HEALY Tel: 0432 164 748
5. The magazine must be kept clean and free from rubbish such as bags, cartons, rags and other waste.
6. The floor of the magazine must be kept clean. A broom and mat shall be provided.
7. Cases must not be stacked more than 2 meters high and must be clear of wall ventilators.
8. Old stock must be used first. Stock that is not useable due to damage or age must not be allowed to remain in the magazine.
9. Loose explosive cartridges or detonators must not be left exposed in the magazine. Any loose plugs or detonators must be repacked in the carton or placed in a special receptacle and disposed of as soon as possible.
10. Steel tools shall not be used to open packages in magazines.
11. Dry undergrowth or combustible materials must not be allowed on the ground within 8 meters of the magazine.
12. The magazine shall be closed and locked during a thunderstorm.
13. The earthing connections shall be checked for electrical continuity at least every twelve months.
14. No smoking is allowed. No matches or cigarette lighters are to be brought into this magazine.
15. All explosives must be kept in original container or a special receptacle.
16. No person affected by liquor, drugs or under the age of 16 years shall be allowed in the magazine.

APPENDIX L – CUTTING - DRILLING - CHARGE LOADING QUALITY CONTROL SCHEDULE - WI-QC-057-001a

WELLANBAH INDUSTRIAL

Liddell Power Station - Chimney Test Shot: Cutting, Drilling and Charge Loading QC Schedule

Project	Liddell Power Station Closure Project	**Document Number**	WI-QC-057-001a	**Revision Status**	Rev 0	**Reference Documents**
Project Number	W25-057	**Client**	CMA Contracting	**Date**	8/09/2025	Inspection Test Plan - W057-ITP-001a - REV 0
Document Title	Drilling and Charge Schedule	**Asset Details**	Chimney Structure			Blast Management Sub-Plan - WI-BMSP-057-001a - REV 0

Notes:
This is a live document to be utilised for the management of the execution phase of works.
The purpose of this document is to confirm compliance with the blast design and to track the progress of works as they are completed.
This schedule is to be completed based on the details provided within the Blast Management Sub-Plan (inclusive of blast design drawings) as well as the overarching Inspection Test Plan for the works.
All hold points associated with these works are provided within the Inspection Test Plan, and must be reviewed and signed off at each phase of works.

PRE-DRILLING WORKS

CHIMNEY ID	WORK ITEM DESCRIPTION	SHOTFIRER SIGNOFF	CHARGE LOADING DETAILS - LIDDELL POWER STATION CHIMNEYS
U1/U2	MARK OUT OF DRILLING LOCATIONS		2 X SENATEL MAGNUM 115g EMUSION CHARGES PER HOLE CORDTEX 10P DETONATING CORD TO BE INSERTED/TAPED TO FIRST CHARGE DET CORD TAIL LENGTH FROM START OF FIRST CHARGE TO BE MIN. 760mm, ALLOWING FOR 250mm PROTUSION FROM CHARGE HOLE

DRILLING & LOADING WORKS

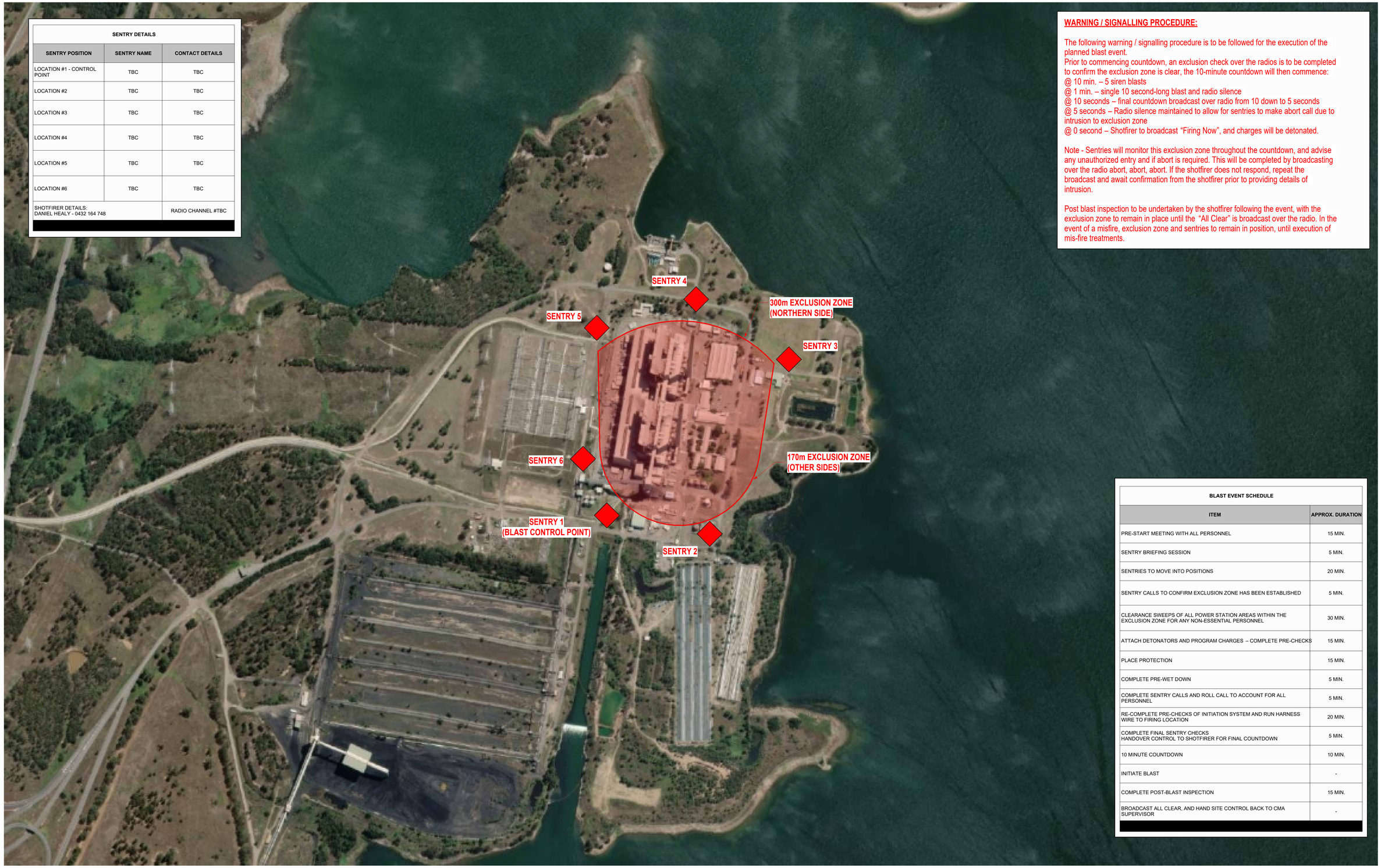
CHIMNEY ID	CHARGE ROW ID	NUMBER OF HOLES	MARK OUT OF DRILL PATTERN COMPLETED AND MATCHES DESIGN DRAWINGS	CHARGE HOLES DRILLED IN CORRECT LOCATION TO CORRECT DEPTH	CHARGE HOLES CLEARED OF DEBRIS	COMPLIANT HOLES MARKED IN GREEN PAINT NON-COMPLIANT HOLES MARKED IN ORANGE PAINT	CARTRIDGES WITH DET CORD TAILS INSERTED INTO CHARGE HOLES	STEMMING APPLIED TO CHARGE HOLES	ALL TAILS TIED INTO HORIZONTAL INITIATION LINE	HORIZONTAL INITIATION LINES CONNECTED TO VERTICAL INITITATION LINES	PROTECTION INSTALLED OVER CHARGES	DETONATORS ATTACHED TO INITIATION LINES	DETONATORS PROGRAMMED WITH DELAYS
U1/U2	ROW 1	3											
	ROW 2	3											
	ROW 3	3											

FINAL SIGN OFF

SHOTFIRER DETAILS:		**COMMENTS:**
SHOTFIRER SIGNATURE:		
DATE:		

APPENDIX M – SENTRY / EXCLUSION ZONE AERIAL MAP

SENTRY DETAILS		
SENTRY POSITION	**SENTRY NAME**	**CONTACT DETAILS**
LOCATION #1 - CONTROL POINT	TBC	TBC
LOCATION #2	TBC	TBC
LOCATION #3	TBC	TBC
LOCATION #4	TBC	TBC
LOCATION #5	TBC	TBC
LOCATION #6	TBC	TBC
SHOTFIRER DETAILS: DANIEL HEALY - 0432 164 748		RADIO CHANNEL #TBC



WARNING / SIGNALLING PROCEDURE:

The following warning / signalling procedure is to be followed for the execution of the planned blast event.
Prior to commencing countdown, an exclusion check over the radios is to be completed to confirm the exclusion zone is clear, the 10-minute countdown will then commence:
@ 10 min. – 5 siren blasts
@ 1 min. – single 10 second-long blast and radio silence
@ 10 seconds – final countdown broadcast over radio from 10 down to 5 seconds
@ 5 seconds – Radio silence maintained to allow for sentries to make abort call due to intrusion to exclusion zone
@ 0 second – Shotfirer to broadcast "Firing Now", and charges will be detonated.

Note - Sentries will monitor this exclusion zone throughout the countdown, and advise any unauthorized entry and if abort is required. This will be completed by broadcasting over the radio abort, abort, abort. If the shotfirer does not respond, repeat the broadcast and await confirmation from the shotfirer prior to providing details of intrusion.

Post blast inspection to be undertaken by the shotfirer following the event, with the exclusion zone to remain in place until the "All Clear" is broadcast over the radio. In the event of a misfire, exclusion zone and sentries to remain in position, until execution of mis-fire treatments.

BLAST EVENT SCHEDULE	
ITEM	**APPROX. DURATION**
PRE-START MEETING WITH ALL PERSONNEL	15 MIN.
SENTRY BRIEFING SESSION	5 MIN.
SENTRIES TO MOVE INTO POSITIONS	20 MIN.
SENTRY CALLS TO CONFIRM EXCLUSION ZONE HAS BEEN ESTABLISHED	5 MIN.
CLEARANCE SWEEPS OF ALL POWER STATION AREAS WITHIN THE EXCLUSION ZONE FOR ANY NON-ESSENTIAL PERSONNEL	30 MIN.
ATTACH DETONATORS AND PROGRAM CHARGES – COMPLETE PRE-CHECKS	15 MIN.
PLACE PROTECTION	15 MIN.
COMPLETE PRE-WET DOWN	5 MIN.
COMPLETE SENTRY CALLS AND ROLL CALL TO ACCOUNT FOR ALL PERSONNEL	5 MIN.
RE-COMPLETE PRE-CHECKS OF INITIATION SYSTEM AND RUN HARNESS WIRE TO FIRING LOCATION	20 MIN.
COMPLETE FINAL SENTRY CHECKS HANDOVER CONTROL TO SHOTFIRER FOR FINAL COUNTDOWN	5 MIN.
10 MINUTE COUNTDOWN	10 MIN.
INITIATE BLAST	-
COMPLETE POST-BLAST INSPECTION	15 MIN.
BROADCAST ALL CLEAR, AND HAND SITE CONTROL BACK TO CMA SUPERVISOR	-

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Designed	Reviewed	Date
A	INITIAL ISSUE OF DRAWING	DH	DH	BH	26.09.25

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Drawn D. HEALY | Designer D. HEALY
Drafting Check B. HEALY
Approved D. HEALY
Date 26.09.25
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **CMA CONTRACTING PTY LTD**
Project **LIDDELL POWER STATION DEMOLITION**
Title **CHIMNEY TEST SHOT EXCLUSION ZONE**

Original Size **A1**
Drawing No: **WI-24057-06-22-E01**
Rev: A

Plot Date: 26/09/2025 12:04:51 PM

APPENDIX N – CONSULTATION

NSW Department of Planning, Housing and Infrastructure Consultation Record

Documents: "Blast Sub-plan Plan"
Revision: Rev 1 Nov 2025
Reviewed: Charissa Pillay in November 2025
Schedule

Schedule	**Sufficient (Yes/No/ Partial)**	**Document reference and comment**	**Action Required**	**Company Response**	**DPHI Response**
Schedule 2					
Dangerous goods B18. The quantities of dangerous goods stored and handled by the development must be below the threshold quantities listed in the Department's Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 at all times.	Yes	Sections 7.11 & 7.16 of BMSP addresses the requirement.	-		
B19. Dangerous goods must be stored and handled strictly in accordance with: (a) all relevant Australian Standards; and	Yes	AS2187, Section 7 of BMSP. Addresses the requirement.	-		
(b) for liquids, the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Manual. In the event of inconsistency between the requirements of condition B19(a) and B19(b), the most stringent requirement must prevail to the extent of the inconsistency	-	(b) N/A, Wellanbah Industrial does not require storage or handling of liquids.	-		
DM5 Dust management measures will be included in the PEMS, and implemented during demolition.	Yes	Sections 7.18 & 7.19 of BMSP addresses the requirement.	-		
DM7 Identify any critical infrastructure that may be damaged by vibration and develop monitoring plan to be included in the PEMS.	Yes	Section 7.18 of BMSP addresses the requirement.	-		
AQ2 Preparation of a Blast Management Plan and Asbestos Control Plan, which would including specific measures for minimising impacts during blasting and handling of ACM, including: - Soft-strip inside buildings before demolition - Pre-watering - Forecasting Sprinklers Due to the potentially high emissions of dust during blasting events, a monitoring plan is recommended. This would include boundary and receptor monitoring. A report after each blasting event summarising the results of the air quality monitoring during and after the event would be prepared		Section 7.19 of BMSP and Appendix A			

Documents: “Blast Sub-plan Plan”
Revision: Rev 1 Nov 2025
Reviewed: Charissa Pillay in November 2025
Schedule

HR 1 BMP is a risk control plan used to ensure blasts do not harm people in the area and limit damage to the environment. The BMP will describe the design of the blast necessary for the task and what procedures will ensure the charge is prepared and fired safely. This information includes: - Layout of the blast including any drilling pattern and hole depth. - Explosives type/quantity, firing equipment and method. - Detonation sequence/effective charge mass per delay (MIC) ‘powder factor.’ - Misfire procedures including assessment and actions for any foreseeable misfires. This includes any explosive/detonators found during blasted material pile loading by mobile plant. - Details of reports, drawings and records consulted. - Post blast assessment and inspection procedures. The Blast Management Plan will be prepared.	Yes	AS2187, BMSP Section 7.9 of BMSP and Appendix B Sections 7.10, 7.11 and 7.12 of BMSP and Appendix B Section 7.10 of BMSP Section 7.34 of BMSP Section 7.8 of BMSP Section 7.35 of BMSP	-		
HR 2 Explosives will be stored in a nonferrous receptacle clearly marked ‘Explosives’ that is kept closed and locked (except during use by authorised personnel) and stored in the original containers which are securely sealed.	Yes	AS2187, AEC3, BMSP Appendix I: NSW Storage Facility License MACS engineering certificate of conformance	-		
General					
The Test Blast subplan does not clearly articulate the purpose and intent of the test blast, nor does it explain how it differs from the main blast.		Include a section that explicitly states: - The objective of the test blast (e.g., calibration, safety verification, equipment performance). - How the test blast differs from the main		Addressed in Section 1.2 – Objective and Scope of Test Blast	

Documents: “Blast Sub-plan Plan”
Revision: Rev 1 Nov 2025
Reviewed: Charissa Pillay in November 2025
Schedule

		blast in terms of scope, scale, timing, and expected outcomes. - Any specific parameters or constraints unique to the test blast. - Tabulate how this test blast plan will differ from the main blast plan			
Other Agency Comments	***Action Required***		***Company Response***	***Company Response (XX/XX/XX)***	

SafeWork NSW Consultation Record

Todd Solomon

From: Daniel Healy <daniel.healy@wied.com.au>
Sent: Monday, 24 November 2025 2:08 PM
To: Daniel Massey
Cc: Todd Solomon; Oliver Easingwood; Toni Mckay
Subject: RE: Liddell Power Station Chimney Test Shot - Blast Management Plan

Hi Daniel,

Thank you for your email and raised queries.

Please see below responses in **Red.**

Also, I have updated the Mis-fire section of the BMP as per your below comments, and this is included in the below link with both a clean and tracked changes version. Note that we also received some minor feedback from the Department of Planning, requesting a summary section at the front of the BMP and this has been added as Section 1.2.

https://www.dropbox.com/scl/fo/1inzdgb9tezapnwify67l/AMj02J0UW5EJoLwHGoKWn7c?rlkey=e4k96sb0zmea8egckulgwpyuo&st=zaiefc9g&dl=0

1. My understanding is that the test shot will only occur in a single chimney. Please advise if this is incorrect. – That is correct, we are only completing the test shot on the U1/U2 chimney. Which is the Southern most chimney
2. Please confirm that Sentries 2 and 3 will be positioned behind buildings and out of sight of any flyrock or ricochet. – The blast pattern is positioned on the Western side of the chimney, hence projection of material is towards the boiler house. As such, there is a significant barrier between the sentries in the potential line of fire (5 & 6) – please also see below screen shot.
3. Please confirm the positions/orientations of steel plate. Will they be positioned to provide protection in the orientations of both Sentries 2 and 3? - The steel plate will be 10mm thickness and consist of a 5m wide by 1.84m high section, oriented length ways to maximise coverage. As the blast pattern is 880mm x 880mm, this will ensure full coverage of the shot. Also, as per above, the blast is oriented into the boiler house area and not towards sentries 2 and 3.
4. What communication and consultation about the test blast has occurred with on-site stakeholders such as Transgrid, BESS and other site occupants. What controls are in place to manage the movements and safety of those occupants on blast day? – This is being undertaken in consultation with AGL. We have a stakeholder meeting with AGL, Transgrid and BESS this Friday 28.11.25 and this forms part of the discussions. The controls will include the notification/consultation with all stakeholders, establishment of the exclusion zone, and clearances of all areas within the exclusion zone prior to the blast event.
5. The misfire information in Section 7.34 of the BMP is quite brief and would benefit from some of the more specific information on Page 9 of the SWMS. We also recommend Section 7.34 require a written risk assessment and planned response if the cause of the misfire is not easily explained or requires anything more than simple measures to resolve (i.e. connection issues). For example, a written risk assessment and planned response should be considered if shot holes require excavation, or if new charges are required. – Noted. Additional details have been added to this section, and are included in the Rev 2 of the blast management plan pages 45 and 59.
6. Please consider contingency plans for safety and security of explosives in the event that a misfire cannot be resolved on blast day and the shot requires sleeping overnight, particularly given the proposed 1630 firing time. – Noted. We will arrange for a shotfirer resource to be available in the event that the charges need to be slept overnight.



Kind regards,
Daniel

Daniel Healy BEng (Hons I) MBA (Dist) MIEAust CPEng
Director | Wellanbah Industrial
PH: 0432 164 748 | E: daniel.healy@wied.com.au

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From: Daniel Massey <daniel.massey@safework.nsw.gov.au>
Sent: Friday, 21 November 2025 4:45 PM
To: Daniel Healy <daniel.healy@wied.com.au>
Cc: Todd Solomon <todd.solomon@cmacontracting.com.au>; Oliver Easingwood <oliver.easingwood@deltagroup.com.au>; Toni Mckay <Toni.McKay@safework.nsw.gov.au>
Subject: RE: Liddell Power Station Chimney Test Shot - Blast Management Plan

Hi Daniel

Please see below for a few questions or recommendations for the test shot. Please point out if the answers are already in the BMP as I may have overlooked something.

1. My understanding is that the test shot will only occur in a single chimney. Please advise if this is incorrect.
2. Please confirm that Sentries 2 and 3 will be positioned behind buildings and out of sight of any flyrock or ricochet.
3. Please confirm the positions/orientations of steel plate. Will they be positioned to provide protection in the orientations of both Sentries 2 and 3?
4. What communication and consultation about the test blast has occurred with on-site stakeholders such as Transgrid, BESS and other site occupants. What controls are in place to manage the movements and safety of those occupants on blast day?
5. The misfire information in Section 7.34 of the BMP is quite brief and would benefit from some of the more specific information on Page 9 of the SWMS. We also recommend Section 7.34 require a written risk assessment and planned response if the cause of the misfire is not easily explained or requires anything more than simple measures to resolve (i.e. connection issues). For example, a written risk assessment and planned response should be considered if shot holes require excavation, or if new charges are required.
6. Please consider contingency plans for safety and security of explosives in the event that a misfire cannot be resolved on blast day and the shot requires sleeping overnight, particularly given the proposed 1630 firing time.

I am on leave next week but will back on 1 December and I'm open to discussing any outstanding items at that point. It is possible we will want to inspect on blast day but will discuss that with you. After the blast we will probably ask to see some of the blast day paperwork mentioned in the BMP.

Thanks

Regards
Daniel Massey
State Inspector Dangerous Goods and Explosives
SafeWork NSW
p 02 8867 2738
4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150

From: Daniel Healy <daniel.healy@wied.com.au>
Sent: Friday, 21 November 2025 10:54 AM
To: Daniel Massey <daniel.massey@safework.nsw.gov.au>
Cc: Todd Solomon <todd.solomon@cmacontracting.com.au>; Oliver Easingwood <oliver.easingwood@deltagroup.com.au>
Subject: RE: Liddell Power Station Chimney Test Shot - Blast Management Plan

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Thank you for your email Daniel,

That would be great.

Kind regards,
Daniel

Daniel Healy BEng (Hons I) MBA (Dist) MIEAust CPEng
Director | Wellanbah Industrial
PH: 0432 164 748 | E: daniel.healy@wied.com.au

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From: Daniel Massey <daniel.massey@safework.nsw.gov.au>
Sent: Friday, 21 November 2025 10:51 AM
To: Daniel Healy <daniel.healy@wied.com.au>
Cc: Todd Solomon <todd.solomon@cmacontracting.com.au>; Oliver Easingwood <oliver.easingwood@deltagroup.com.au>
Subject: RE: Liddell Power Station Chimney Test Shot - Blast Management Plan

Hi Daniel

Sorry I haven't had a chance to get back to you yet, this week has been flat out. I have already reviewed the BMP for the test shot and I will have some comments to you today. I don't believe there is anything major that would cause us to object to the test shot.

Regards
Daniel Massey
State Inspector Dangerous Goods and Explosives
SafeWork NSW
p 02 8867 2738
4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150

From: Daniel Healy <daniel.healy@wied.com.au>
Sent: Friday, 21 November 2025 10:31 AM
To: Daniel Massey <daniel.massey@safework.nsw.gov.au>
Cc: Todd Solomon <todd.solomon@cmacontracting.com.au>; Oliver Easingwood <oliver.easingwood@deltagroup.com.au>
Subject: RE: Liddell Power Station Chimney Test Shot - Blast Management Plan

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[CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.]

Morning Daniel,

I tried to call a couple of time this week to briefly discuss the Liddell chimney stack test blast.

In essence, we are targeting a test shot date for the 15.12.25, and I wanted to confirm whether this is achievable from your end, in that are we likely to receive any review comments that we can close out before this date.

In the interim, I have raised the appropriate notifications in the portal / blasting notification forms in anticipation that we would receive confirmation from your end.

Kind regards,
Daniel

Daniel Healy BEng (Hons I) MBA (Dist) MIEAust CPEng
Director | Wellanbah Industrial
PH: 0432 164 748 | E: daniel.healy@wied.com.au

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From: Daniel Healy
Sent: Monday, 3 November 2025 3:43 PM
To: daniel.massey@safework.nsw.gov.au
Cc: Todd Solomon <todd.solomon@cmacontracting.com.au>; Oliver Easingwood <oliver.easingwood@deltagroup.com.au>
Subject: Liddell Power Station Chimney Test Shot - Blast Management Plan

Afternoon Daniel,

Thank you for your call late last week.

Please find below link the Blast Management Plan for the upcoming test shot for the Liddell Power Station Chimney Stack.

https://www.dropbox.com/scl/fo/snlk6cnz2o33xtob2m6bu/AJJneeyt95YacL8b0AR3p0U?rlkey=aqrd8ownapkfingty52jbezbw&st=39cscv96&dl=0

We are targeting the issue the Blast Management Plan for the main chimney blast event later in the next few days.

Also, as discussed last week, we are looking to complete this test shot in early December, so it would be very much appreciated if you could fit your review into your schedule in the near future.

Please feel free to call me any time if there are any items you would like to discuss, or any background information I can supply that would assist with your review.

Kind regards,
Daniel

Daniel Healy BEng (Hons I) MBA (Dist) MIEAust CPEng
Director | Wellanbah Industrial
PH: 0432 164 748 | E: daniel.healy@wied.com.au

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