



madden

Chartered Quantity Surveyors &
Construction Project Managers

28th September, 2015

Our Ref: SDM/EJC/8483.3
Your Ref: SD2015-012

**Hydro Aluminium Kurri Kurri Pty Ltd,
PO Box 1,
Kurri Kurri,
NSW,
2327.**

For the attention of Stephen Raeburn: Senior Project Engineer

Dear Sir,

Re: Detailed Calculation of the Capital Investment Value (CIV) for the Stage 2 demolition of Smelter Buildings (including the tonnages and salvage value of any scrap metal or redundant equipment to be scrapped) and the remediation of the Smelter Site, including the construction of the proposed Containment Cell for the submission of a Development application (DA) to the Department of Planning for the approval of the State Significant Development, which is comprised of the Stage 2 Demolition Works and the Site Remediation Works, at Hydro Aluminium, Kurri Kurri, Hart Road, Loxford via Kurri Kurri, NSW, 2327.

Further to your instructions, we are pleased to enclose our report on the above project detailing the following:-

- Cost of Demolition for the Stage 2 Works excluding GST and any credit value for scrap.
- Containment Cell Costs.

We trust this CIV report is of assistance, but should you require any further information, please do not hesitate to contact our office.

Yours faithfully,

STEPHEN D MADDEN: MANAGING DIRECTOR

ADiplQS, Dipl(Contract)Law, Dipl(Building)Econ, FCIQB, MRICS, AAIQS, AMAIB, MAIPM.

Project Manager, Chartered Construction Manager, Chartered Building Professional, Chartered Quantity Surveyor, Licensed Builder, Special Counsel (Building Litigation) & Registered Tax Agent (Depreciation)

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1. Executive Summary

Hydro Aluminium Kurri Kurri Pty Ltd (Hydro) have engaged Madden & Associates (Maddens) to provide a detailed calculation of the Capital Investment Value (CIV) for the Stage 2 demolition of all remaining Smelter Buildings (including the tonnages and salvage value of any scrap metal or redundant equipment to be scrapped) and the remediation of the smelter site, including the construction of the proposed containment cell.

1.1 Estimated Cost and Values:-

A summary of the demolition costs and associated CIV work items are shown in Table 1 below:

Table 1:

Item	Estimated Cost (AUD)
Demolition Building Costs. (Excl GST)*	\$8,030,000.00
Containment Cell costs. (Excl GST)	\$22,143,000.00
Concrete Demolition Costs (Excl GST)	\$10,646,580.00

The Demolition estimates are based on rates calculated using historical data from previous projects and the Rawlinsons Construction Handbook Cost Guide 2015.

The demolition costs **do not** make any allowance for scrap value. Should scrap value be taken into account the estimated demolition cost will reduce.

The quantities were measured from drawings supplied by Kurri Hydro, Site Inspection and Satellite imagery.

1.2 Estimated Duration

The duration for the Stage 2 demolition work on site, is estimated at 10 months for the Building and Concrete demolition (subject to inclement weather) inclusive of contractor site establishment and demobilisation.

The duration for the Containment Cell work and maintenance period is extensive and has been analysed in depth under Estimate Details 8486 Stage 2 – Construction and Maintenance of a Containment Cell, contained within the body of this report.

2. Introduction

At the request of Hydro, Madden has produced a Detailed Calculation of the Capital Investment Value (CIV) for the Stage 2 demolition of the remainder of the Smelter Buildings (including the tonnages and salvage value of any scrap metal or redundant equipment to be scrapped) and the remediation of the smelter site, including the construction of the proposed containment cell, for the submission of a Development Application (DA) to the Department of Planning for the approval of the State Significant development, which is comprised of the Stage 2 demolition works and the site remediation works.

2.1 Works Included

The areas for demolition are as shown on the Hydro Coloured Site Plan – Stage 2 Works, in Appendix F.

The works include management, labour, equipment and materials required to:

- Demolish all Stage 2 buildings and Cathode Pile.
- Demolish all reinforced concrete slabs, foundations and services under, to a maximum depth of 1.50m.
- A provisional Sum allowance for the explosive detonation of a number of towers.
- Site clearance
- Construction of a Containment Cell.

2.2 Works Excluded

The following areas have been excluded from the estimate:

- Any works classified as Stage 1 Works
- Switchyard (Although not shown on the Coloured Drawing).
- Building 77A – Pot Rebuild Workshop.
- Any unknown Site Conditions e.g. contaminated areas not previously mentioned etc.
- Removal of all concrete and masonry recovered during the demolition works.
- Works required to de-energise the site for demolition works to commence.
- Fees and charges from Local and other Authorities.
- No allowance for cleaning of contaminated areas.
- No allowance for handling or removal of hazardous materials
- No allowance for removal of equipment for salvage (other than scrap value) Assume all loose plant & equipment has been removed by others.
- Escalation
- Goods and services Tax

2.3 Assumptions

Assumptions are as follows:-

- All concrete and masonry shall be crushed and reused onsite and may be used as landfill. No allowance has been included for the disposal of concrete off site on the basis that all concrete can be reused to fill in voids and holes and create hardstand areas in lieu of importing material.
- All contents of the Cathode pile are to be placed in the Containment Cell.
- A 10% allowance for Project Management fees and charges has been included in the estimate.
- A 5% project contingency has been included in the cost estimate. This allowance is for works or costs that cannot be entirely defined, described or detailed.
- A 10% allowance for Main Contractors Profit and Preliminaries has been allowed in the cost estimate.
- Rates for scrap metal have been taken from the Sydney scrap metal market and compared against previous projects.
- Rates for scrap reo have been taken from the Sydney scrap metal market and compared against previous projects.

3. Basis of Estimate

3.1 Notes and Assumptions

The estimate is prepared based on the following:-

- Estimate base date is September 2015.
- The estimate is prepared using Buildsoft estimating & Excel software.
- Estimating summaries have been produced in Excel and Buildsoft.
- Quantities used for the estimate are based on the scheduled drawings and generally measured in accordance with the Australian Standard Method of Measurement.
- Demolition rates used are from historical cost data and Rawlinsons Construction Handbook Cost Guide.
- Salvage value for demolished steel is based on the Sydney scrap metal market, email response from a company in the Sydney area and Maddens own assessment from previous projects. From this, an average rate has been produced.
- The price offered for scrap is based on current prices, this can naturally vary over time and is subject to demand.
- Demolition rate for concrete and masonry includes pulverizing and removal of steel, plus storing on site, for possible landfill.
- Assume 40 hours roster per week.
- Assume 100% local workforce with no living away from home allowance.
- Project management is calculated as 10% of the estimated demolition cost.
- Contingency is calculated as 5% of the estimated demolition cost.
- Main Contractors Preliminaries and Profit is calculated as 10% of the estimated demolition cost.

4. Summary of Costs

The demolition, scrap costs and close estimate of jobs to be created, were estimated as follows:

Item	Estimated Cost (AUD)
Demolition Costs excluding Scrap value & GST.	\$ 8,030,000.00
Containment Cell Costs	\$ 22,143,000.00
Concrete Demolition Costs	\$ 10,646,580.00
Anticipated jobs created over a 12 month period	85
Anticipated jobs created over an 18 month consolidated period for the Containment Cell	93

5. General Summary

- Madden & Associates certify that the information provided, is accurate at the date of preparation, based on the information in our possession.
- Madden & Associates confirm that the estimate of costs are based on industry recognised prices and,
- The estimated costs have been prepared having regard to the matters set out in Clause 3 of the Environmental Planning and Assessment Regulation 2000.

END OF REPORT.

8483.2/EJC/SDM2 – 28.09.2015

**Appendix A:
Excel Summary of Demolition &
Buildsoft Estimate of Costs**

Estimate Details

Job Name	8483 STAGE2-HYDRO1
Client's Name	Hydro Aluminium Kurri Kurri Pt
Client's Full Address	P.O.Box 1, Kurri Kurri, NSW, 2327
Site Full Address	As above
Contact Name	Andrew Walker
Phone No	02 4837 1555
Fax No	02 4937 4595
Mobile No	N/A
Email Address	Andrew.Walker@hydro.com
Start Date	31/Aug/15
Date of Estimate	28/Sep/15
Job Duration	3 Months
Job Type	Stage 2 General Demo
Sales Person	Stephen D Madden
Description	Smelter Demolition Costs - Buildings down to slab level, including excavation of Cathode Pile & General site clearance
Job Total	8,030,000
Mark Up	%
G.S.T.	%
Locality Index	
Final Total	8,030,000

Full Estimate Summary

Job Name : <u>8483 STAGE2-HYDROI</u>	Job Description
Client's Name: <u>Hydro Aluminium Kurri Kurri Pt</u>	Smelter Demolition Costs - Buildings down to slab level, including excavation of Cathode Pile & General site clearance

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	7A/B/C - Ring Furnace Building	14.61		1,172,930		1,172,930
	19A/B/C - Plumbers, Painters, Carpenters W/Shops & Capital Store	0.53		42,405		42,405
	21A - Administration Building	0.65		52,030		52,030
	25A/B/C - Gatehouse, Medical Centre, Personnel & Bathhouse	0.38		30,855		30,855
	26A/B/C - Eng. Bldg/ Apprentice W/Shop & Maint W/Shop, Boilermakers Shop	0.79		63,406		63,406
	28A - Main Stack & Ductwork					
	30A - Fuel Oil System					
	31A - Dross Storage Building	0.99		79,200		79,200
	32A - Compressor House	0.11		9,020		9,020
	33A - Water Storage and Pumphouse					
	34 Towers					
	35B - Weighbridge	0.14		11,505		11,505
	37A - Sewerage Pumphouse	0.01		1,045		1,045
	38A/B/C - 11kV Switchrooms	0.29		23,650		23,650
	43BS - Stack	0.83		66,770		66,770
	43CN - Stack					
	43CS - Stack					
	50A - Switchyard Upgrade Project Office - Excluded					
	54C - Carbon Plant Amenities & Office Building	0.46		36,685		36,685
	55C - Personnel Training Centre	0.41		32,670		32,670
	56C - Maintenance Office Building & Instrument Fitters Workshop	0.38		30,470		30,470
	62A - Meteorological Tower					
	64C - Mobile Vehicle Workshop	0.47		37,730		37,730
	66C - Natural Gas Meter Station					
	67C - Cathode Disposal Building	2.04		164,010		164,010
	77A - Pot Rebuild - Retained					
	83A - SPL Storage & Process Plant	10.54		846,175		846,175
	92A - Switchyard Storage/ Workshop					
	93A - Switchyard Office Buildings	1.02		81,510		81,510

Full Estimate Summary

Job Name : <u>8483 STAGE2-HYDRO1</u> Client's Name: <u>Hydro Aluminium Kurri Kurri Pt</u>	Job Description Smelter Demolition Costs - Buildings down to slab level, including excavation of Cathode Pile & General site clearance
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Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	Sundries 1 - Cathode Pile	19.61		1,575,000		1,575,000
	Sundries 2 - General site Clearance	20.77		1,667,534		1,667,534
	Subtotal 1					<u>6,024,600</u>
	Provisional Sums	3.74		300,000		300,000
	Subtotal 2					<u>6,324,600</u>
	Builders Preliminaries and Margin	7.88		632,460		632,460
	Subtotal 3					<u>6,957,060</u>
	Contingency Sum	4.27		342,940		342,940
	Subtotal 4					<u>7,300,000</u>
	Project Management Costs	9.09		730,000		730,000
	Subtotal 5					<u>8,030,000</u>
	Schedule of Information Used					
		100.00		8,030,000		8,030,000

Final Total : \$ 8,030,000

Appendix B:
**Excel Summary of Concrete Demolition &
Buildsoft Estimates of Volumes and Costs.**

Estimate Details

Job Name	8483 KURRI HYDRO CON
Client's Name	Hydro Aluminium Kurri Kurri Pt
Client's Full Address	P.O. Box 1, Kurri Kurri, NSW, 2327
Site Full Address	As Above
Contact Name	Andrew Walker
Phone No	02 4837 1555
Fax No	02 4937 4595
Mobile No	N/A
Email Address	andrew.walker@hydro.com
Start Date	31/Aug/15
Date of Estimate	27/Sep/15
Job Duration	8 Months
Job Type	Concrete Demolition
Sales Person	Jordana Dowell
Description	Smelter Concrete Demolition Costs - Ground Slab, Foundations, Footings and services under
Job Total	10,646,580
Mark Up	%
G.S.T.	%
Locality Index	
Final Total	10,646,580

Full Estimate Summary

Job Name : 8483 KURRI HYDRO CON	Job Description
Client's Name: Hydro Aluminium Kurri Kurri Pt	Smelter Concrete Demolition Costs - Ground Slab, Foundations, Footings and services under

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	1 A/B/C - Switchyard					
	2A Chlorine Evaporation Building	0.01		1,290		1,290
	2C Chlorine Storage Building	0.01		1,290		1,290
	3A Potroom Building	5.21		555,090		555,090
	3B Potroom Building	19.59		2,085,780		2,085,780
	3C Potroom Building	19.59		2,085,780		2,085,780
	3AN/BN/CN 3AS/BS/CS/BC/BB Potroom Sub-Stations	0.19		19,800		19,800
	4A Casting Building	1.39		148,260		148,260
	4B Casting Building	1.54		164,100		164,100
	4C Casting Building	0.85		90,060		90,060
	5A Greenmix Building	0.34		35,790		35,790
	5C Greenmix Fire Exit	0.02		2,610		2,610
	6A Vibrator Building	0.23		24,150		24,150
	7A/B/C Ring Furnace Building	1.39		148,335		148,335
	8A Rodding Building	0.78		82,680		82,680
	8B Rodding Building	0.48		50,970		50,970
	8C Baked Anode Storage	0.25		27,045		27,045
	9A Clacined Petroleum Coke Storage	0.03		3,495		3,495
	9C Liquid Pitch System	0.06		6,870		6,870
	10A Potroom Maintenance Workshop Building	0.03		3,405		3,405
	10B PTV Parking					
	10C Potilining Storage Shed					
	11A Pitch Storage Facility	0.04		4,275		4,275
	12A Switchyard Fire System Pump House					
	13A Kooragang Island - Dock & Unload Facility					
	14A Kooragang Island Alumina Storage Silo					
	14B Kooragang Island A-Frame Alumina					
	15A Kooragand Island Coke Storage Silo					
	16A Gas Bottle Storage					
	17AN/BN/AS/BS Alumina Silo	0.17		18,570		18,570
	18A/C Store Building	0.48		51,195		51,195

Full Estimate Summary

Job Name : <u>8483 KURRI HYDRO CON</u>	Job Description
Client's Name: <u>Hydro Aluminium Kurri Kurri Pt</u>	Smelter Concrete Demolition Costs - Ground Slab, Foundations, Footings and services under

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	19A/B/C Plumbers, Painters, Carpenters W/Shops & Capital Store	0.75		80,025		80,025
	21A Administration Building	0.44		46,590		46,590
	23A Casting Plant Office Building & Metlab	0.12		12,765		12,765
	22A Kooragang Amenities Building					
	24A Carbon Plant Offices					
	25A/B/C Gatehouse & Personnel	0.37		39,525		39,525
	26A/B/C Eng. Bldg/Apprentice W/Shop & Maint W/Shop, Boilermakers Shop	0.76		81,255		81,255
	27A Potroom Services Building	0.09		9,855		9,855
	28A Main Stack & Ductwork	0.04		4,455		4,455
	29A/C Control Room Building	0.10		10,515		10,515
	29B Switchroom Building	0.02		2,505		2,505
	30A Fuel Oil System					
	31A Dross Storage Building	0.12		12,285		12,285
	32A Compressor House	0.06		6,165		6,165
	33A Water Storage and Pumphouse	0.23		24,525		24,525
	34A/B/C Cooling Towers and Pumphouse	1.80		192,090		192,090
	35B Weighbridge Pit	0.02		2,220		2,220
	37A Sewage Pumphouse	0.01		930		930
	38A Switchroom Building	0.03		3,060		3,060
	38B Switchroom Building	0.02		2,520		2,520
	38C Substation	0.10		10,365		10,365
	40A Cathode Rodding Building	0.25		26,610		26,610
	41A/B/C Potroom Office Building	0.10		11,040		11,040
	42A/B Rodding Mix Storage Building	0.43		46,170		46,170
	43AN/AS/BN/BS/CN/CS Pot Gas Scrubbing Building	7.04		749,160		749,160
	44C Maintenance Building	0.22		23,730		23,730
	46A Carbon Plant Workshop and Offices	0.17		18,420		18,420
	47B/C Potroom Lunchroom Building 47B/C	0.20		21,180		21,180
	49BN/CN Bath Crushing Plant North	0.12		12,870		12,870

Full Estimate Summary

Job Name : <u>8483 KURRI HYDRO CON</u>	Job Description
Client's Name: <u>Hydro Aluminium Kurri Kurri Pt</u>	Smelter Concrete Demolition Costs - Ground Slab, Foundations, Footings and services under

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	49BS/CS Bath Crushing Plant South	0.35		37,665		37,665
	51B/C Casting Plant Services Building	0.45		47,385		47,385
	53C Pot Rebuild Workshop	0.30		32,055		32,055
	54C Carbon Plant Amenities and Office Building	0.26		27,810		27,810
	55C Personnel Training Centre	0.19		20,265		20,265
	56C Maintenance Office Building and Instrument Fitters Workshop	0.29		31,125		31,125
	57C Compressor House West	0.10		10,185		10,185
	59B Sth Gatehouse and Weighbridge	0.05		5,010		5,010
	60C Ring Furnace Scrubber	0.19		19,710		19,710
	61A Dry Scrubber Lunchroom	0.04		4,335		4,335
	62A Meteorological Tower	0.08		8,835		8,835
	63C EOHS Building	0.41		43,875		43,875
	64C Mobile Workshop	0.34		36,055		36,055
	65C Butt Cleaning Building	0.96		102,644		102,644
	67C Cathode Disposal Building	0.65		68,880		68,880
	68C Green and Baked Storage Building	0.78		83,115		83,115
	70C Truck Loading Shelter	0.14		14,790		14,790
	73C Casting Maintenance Storage Shed	0.02		2,535		2,535
	74C/D Casting Alloy Storage Shed	0.44		46,440		46,440
	75C Slab Repair Shed	0.10		10,590		10,590
	76C Tip Cleaning Station					
	77A Pot Rebuild - Retained					
	78A Computer Centre	0.12		13,050		13,050
	79AN North Equipment Room	0.02		2,325		2,325
	79AS South Equipment Room	0.02		2,325		2,325
	83A SPL Storage and Process Plant	4.71		501,480		501,480
	84A Brochot Ramming Machine Storage Building	0.05		5,715		5,715
	85A Potline Raw Material Storage					
	86A LPG Gas Bottle Fill Station					
	87A Electrolyte Truck Loading Station					
	88A Pot Service Storage Shed					

Full Estimate Summary

Job Name : <u>8483 KURRI HYDRO CON</u>	Job Description
Client's Name: <u>Hydro Aluminium Kurri Kurri Pt</u>	Smelter Concrete Demolition Costs - Ground Slab, Foundations, Footings and services under

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	89C Crucible Cleaning Facility	0.25		26,640		26,640
	90A Bulk Bag Storage Facility	0.21		22,635		22,635
	91A Maintenance Spare Storage Facility	0.01		1,275		1,275
	92A Switchyard Workshop and Storage Bldg	0.05		5,700		5,700
	93A Switchyard Office Buildings	0.32		34,320		34,320
	95A Vehicle Washdown and Parking Storage	0.10		10,215		10,215
	96A Anode Storage Building	0.37		39,180		39,180
	97A Battery Exchange Bay					
	Subtotal 1					<u>8,379,834</u>
	Contingency Sum	3.94		418,992		418,992
	Subtotal 2					<u>8,798,826</u>
	Preliminaries and Profit	8.26		879,883		879,883
	Subtotal 3					<u>9,678,709</u>
	Project Management	9.09		967,871		967,871
	TOTAL of unbulked ground slab and foundation concrete = 42,199m3					
	Schedule of Information used					
		100.00		10,646,580		10,646,580

Final Total : \$ 10,646,580

**Appendix C:
Buildsoft Estimate of Costs for
Containment Cell.**

Estimate Details

Job Name	8483 STAGE 2
Client's Name	Hydro Aluminium Kurri Kurri Pt
Client's Full Address	P.O.Box 1, Kurri Kurri, NSW, 2327
Site Full Address	As above
Contact Name	Andrew Walker
Phone No	02 4837 1555
Fax No	02 4937 4595
Mobile No	N/A
Email Address	Andrew.Walker@hydro.com
Start Date	31/Aug/15
Date of Estimate	27/Sep/15
Job Duration	TBA
Job Type	Containment Cell
Sales Person	Gavin Morton
Description	Construction and Maintenance of a Containment Cell
Job Total	22,143,000
Mark Up	%
G.S.T.	%
Locality Index	
Final Total	22,143,000

Full Estimate Summary

Job Name :	8483 STAGE 2	Job Description
Client's Name:	Hydro Aluminium Kurri Kurri Pt	Construction and Maintenance of a Containment Cell

Trd No.	Trade Description	Trade %	Cost/m2	Sub Total	Mark Up %	Trade Total
	Site Establishment	1.29		286,500		286,500
	Haul Road Construction	2.42		536,485		536,485
	Containment Cell Construction	70.85		15,688,238		15,688,238
	Leechate and Groundwater Management	4.11		910,500		910,500
	Subtotal 1					<u>17,421,723</u>
	Contingency Sum	3.97		878,277		878,277
	Subtotal 2					<u>18,300,000</u>
	Preliminaries and Profit	8.26		1,830,000		1,830,000
	Subtotal 3					<u>20,130,000</u>
	Project Management	9.09		2,013,000		2,013,000
		100.00		22,143,000		22,143,000
Final Total : \$						22,143,000