KARARA MINING LIMITED

KARARA MINING LIMITED

Scope of Work for Detailed Engineering for an Additional Concentrate Filter

1314-GE-SOW-1002

11 Feb 2026

SYNOPSIS

This document covers the Scope of Work for the detailed engineering of one Concentrate Filter and associated equipment to the existing Concentrate Filtration Building. The filtered concentrate from this new filter will discharge onto the existing discharge conveyor CV-020. The scope encompasses all disciplines.

Note that this SoW is prepared in accordance with the findings from the Tetra Tech Proteus's study report prepared in year 2014 (Ref. report no.: L037-GE-REP-0001_F). The Engineering Consultant is to conduct own assessment to validate all design requirements stipulated in this report and confirm the scope for all the associated upgrade such as the design requirements on the filter feed pump, flushing pump, hopper, conveyor, power supply etc. The Engineering Consultant is to be fully accountable of the design criteria for the detailed engineering work.

Disclaimer

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REV	DESCRIPTION	ORIG	REVIEW	APPROVAL	DATE
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1. GLOSSARY

Wherever the words “Company, Purchaser or Buyer” are used, it shall mean Karara Mining Limited.

Wherever the words “Engineering Consultant, Supplier” are used it shall mean the person so named in the Contract (and its successors and permitted assigns).

Wherever the words “Company’s Representative, Purchaser’s Representative or Buyer’s Representative” are used, it shall mean the person so named in the Contract (and its successors and permitted assigns).

Table 1:1: Glossary

Term	Definition
Authorities	Any statutory, public, municipal, governmental or administrative department, commission, authority, agency or entity with jurisdiction in connection with the WUC
BoD	Basis of Design
CCIWA	Chamber of Commerce and Industry Western Australia
CDRL	Contractor Data Requirements List
CM	Construction Management
Company’s Project Requirements	Has the meaning ascribed to it in the Contract
Company’s Representative’s nominee	Means an individual appointed in writing by the Company’s Representative under the Contract
Contract	The agreement between the Company and the Engineering Consultant to which this Scope of Work pertains
DED	Detailed Engineering Design
DFS	Definitive Feasibility Study
DSO	Direct Shipping Ore
ECM	Engineering and Construction Management
Execution Date	Means the date on which the Formal Instrument of Agreement is signed by the Company
Equipment	Means the goods to be supplied or supplied by the Supplier.
FAT	Factory Acceptance Testing
FEED	Front End Engineering Design
GPA	Geraldton Port Authority
HAZID	Hazard Identification
HAZOP	Hazard and Operability Review
HME	Heavy Mining Equipment
HSEC	Health, Safety, Environment and Community

Term	Definition
HV	High Voltage
IFC	Issued For Construction
ITP	Inspection and Test Plan
KIOP	Karara Iron Ore Project
kW	Kilowatt
LV	Low Voltage
MCC	Motor Control Centre
MDR	Manufacturers' Data Report
Mine site	The location of the KIOP mine at Karara in the Mid-West Region of Western Australia, approximately 225 km East of Geraldton and 320 km North East of Perth
MIS	Management Information Systems
MTOs	Material Take Offs
MV	Medium Voltage
P&IDs	Piping and Instrumentation Diagrams
PCS	Process Control System
PEP	Project Execution Plan
PFDs	Process Flow Diagrams
PLC	Programmable Logic Controller
PMC	Project Management Contracting
Port Site	Geraldton Port
Power Supply	HV from the Base Plant
QA / QC	Quality Assurance / Quality Control
SCADA	System Control and Data Acquisition
SDRL	Supplier Data Requirements List
SDS	Supplier Document Schedule
SoW	Scope of Work
SWIN	South West Interconnected Networks
Tenderer	Means a person who lodges a tender for the Work
Work	Includes the supply of Equipment
WUC	Means the whole of the Work to be carried out under the contract

2. INTRODUCTION AND BACKGROUND

2.1. Background

The Karara Iron Ore Project consists of mine, processing plant (magnetite concentrator), export terminal, rail, water, power, tailings storage facility and other infrastructure required to produce and export mainly magnetite product from Karara site, which is located approximately 320 km north-north-east of Perth.

Due to the reliability issues and process constraints, the 4 current realised concentrate filters availability is approximately 72.42% from year 2021 to 2025. This is lower than the design availability. KML constructed 8 new concentrate dams in year 2024 in addition to the 4 concentrate dams already constructed in 2017. These dams alleviate the filtration availability but increases the operating cost due to the manual handling of the dry concentrate from these dams. KML plans to increase the filter quantity to 5 so that availability will be increased to 75% to consistently achieve the nameplate capacity of >8Mtpa.

This work described herein covers the upgrade of the concentrate filtration facility by adding one additional MetsoOutotec FFP 2512-60/60 Filters similar to the existing's and all associated equipment and infrastructure to meet the demand.

Tetra Tech Proteus has done the feasibility study and the report (ref.no.: L037-GE-REP-0001_F) can be used for reference.

2.2. Introduction

It is expected that, the detailed engineering shall be carried out to ensure all phases of the Filter upgrade works such as the design concept, equipment and material procurement, construction and commissioning will have minimal interference with the normal operation of the Base Plant. Furthermore, as much as practicable, all aspects of the works shall leverage from the existing plant design and operational experience to ensure cost effectiveness of the project.

To the West of the building there is vacant space and CV-020 will not require extending. The equipment impacted by locating the filter at this end of the building may include upgrading the CV-020 drive motor and relocating the weightometer. This minimises the engineering required as it utilises the existing designs. The Engineering Consultant is responsible for reviewing the existing equipment capability to ensure they meet the requirement of a new concentrate filter. The existing Concentrate Filtration Building is shown in the following.

Figure 1: Location of the Existing Concentrate Filtration Facility

3. SCOPE OF WORK

3.1. General

The SoW will encompass the engineering design for the installation of additional concentrate filter. Notably, KML expects that the design of the building and associated infrastructure including the equipment selection will duplicate the existing design as much as possible with very minimal changes unless it is necessary and value adding.

The scope will generally involve:

- Provide project management for the duration of the work.
- Review all Corporate Standards & Specifications, basis of design, past design information and the relevant documents required for the works.
- Conduct engineering design with all drawings and models to KML standards.
- Conduct HAZID and HAZOP analysis and Constructability reviews and prepare the appropriate reports during the design stage for KML.
- Proceed with design and identify all the necessary mechanical, process and electrical tie-in points.
- KML documentation prepared for this project shall be to KML standards as a minimum.
- Prepare Operations readiness document that includes selected engineering deliverables (by discipline) and selected vendor data and this shall be completed at the 90% design review stage and submitted to KML for review. Note that the Operational Readiness document will be updated at end of final commissioning, after which the document will be converted to As-built document.
- Constructability review for potential impact plant operation due to the construction including a submission of the construction work schedule, a commission plan and the capital cost estimate for Procurement, Construction and Commissioning.

Note that most of the pipe work used at KML site is rubber lined carbon steel and were fabricated in Asia (e.g. China). The existing structural steel and plate work, piping etc. were fabricated in China using the Chinese Steel Sections. If the Australian steel sections are selected, the Engineering Consultant is to aware of the Chinese steel profiles for any brownfield connections to the existing. The standard steel connections shall be in accordance with the KML standards. The design shall utilise economic and standard details wherever possible to reduce the cost for shop detailing, fabrication and construction. Connection design shall be to ASI standard. Difficult box in connections or beam to column end plate connection are hard to blast, paint and erect and should be avoided. To facilitate this outcome, the Engineering Consultant shall use 3D modelling complying with the Company's procedures to assist with design reviews, clash detection etc.

3.2. Project Set-up Phase

The Project Set-up, in this context, shall include all items to be completed to facilitate the commencement of the project and shall include all itemised costs for site visits, preparing schedules, key personnel and plans required for the complete execution of the work. The incorporation of the Company's procedures and standards, transfer of data, set up of all necessary software, IT platforms etc. shall form part of the Project Set-up phase.

Prior to the commencement (at Project Set-up stage), the following information for existing relevant processing plant and equipment will be supplied to the Engineering Consultant:

- Process design criteria, PFDs, P&IDs
- Project Basis of Design and all disciplines' design criteria
- Equipment list (mechanical, electrical)
- Electrical load list
- Instrument list
- Line list including tie-in list and the valve list
- Past design calculations (mechanical equipment, civil foundation and structure)
- Structural analysis file (Staadpro file)
- All past relevant disciplines construction drawings
- 3D model (Naviswork & dgn files)

3.3. Engineering Management

The Engineering Consultant shall:

- Provision of the necessary skilled resources, expertise and support services to implement and manage the timely design delivery of the scope.
- Manage all personnel and any sub consultants regarding compliance with statutory requirements and with all relevant Australian standards.
- Ensure that the design considers all safety and environmental issues.
- Ensure that all engineering design and all other works are carried out in a logical sequence and by personnel with the appropriate professional qualifications for the respective areas/disciplines of work in accordance with Mine Safety and Inspection Act 1994.
- Review and provide all deliverables, monitor and report progress of work at weekly meetings and issue minutes of meetings.
- Promptly advise any delays, detailing the reason for each delay and action(s) taken to minimise the delay(s).
- Liaise with KML document control officer to ensure all documents are transmitted in accordance with KML protocols and also all documents are prepared to KML approved standards and procedures.
- Organise a workshop (which will be attended by KML stakeholders) at the end of 30%, 60% and 90% design stage to present overall/final design progress report, outlining specific findings in each design package.
- Facilitate and prepare detailed report for the HAZOP/HAZID studies
- Presentation of the final engineering design report including the construction Drawings and MTOs.

At the end of project, the Engineering Consultant shall provide KML with all design drawings and documentation in native format. The design native drawings shall be intelligent i.e. X-ref bound, capable of being used exclusively by KML.

3.4. Utilisation Requirement of Navis Works

Navis Works has been selected as the Project Status Reporting application and shall be utilised at all stages of the project to provide:

- Visual representation for Design Reviews of the related project.
- Regular updates to KML for internal distribution to be aware of project progress.

4. SCOPE REQUIREMENTS FOR TECHNICAL DISCIPLINE AREAS

4.1. Description of Upgraded Facilities

4.1.1. Layout

The existing concentrate filter building is to be extended to house the additional filter. The internal layout of the extension shall be based upon the existing building. It is expected that the following works are required:

- Design of new foundations independent of the existing footings.
- Design of monorails similar to existing's.
- Extend the overhead crane girders including the modification of the service platform and walkway.
- Strengthen the end bay by adding temporary or additional bracings before a new bay is added.
- Design of field attachment of gusset plates, stiffeners to existing structural members for the connection of new work.

The existing concentrate filtration building including the associated facilities is shown below.

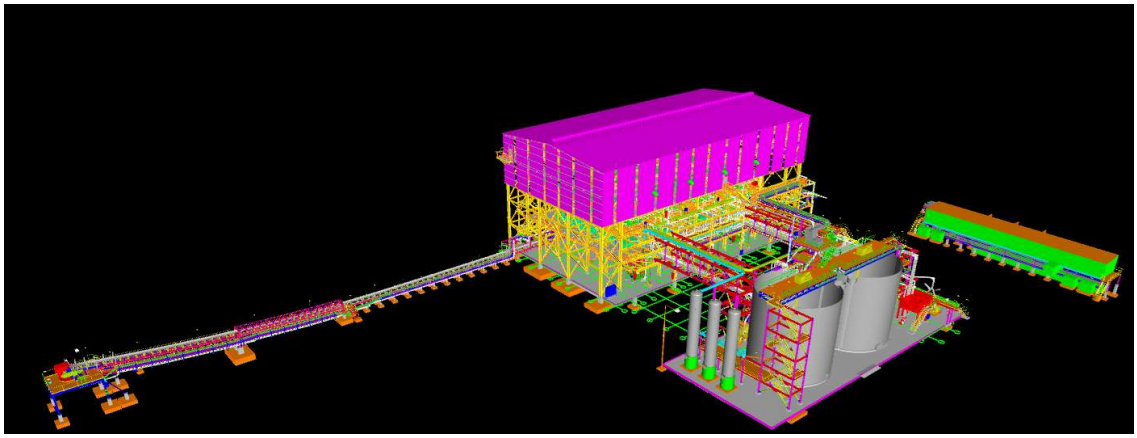

Figure 2: 3D Naviswork model of the Existing Building and its associated Facilities

4.1.2. Slurry Storage

There are two existing filter feed tanks, 1314-TK-042 and 1314-TK-043. The capacity of these tanks was deemed sufficient for the current duty. With the new feed rate of from other base plant improvement projects, there will be 5.35h of storage available.

There are two filter feed pumps per tank and no spare nozzles for the new filter feed pump.

Utilising the existing storage facilities simplifies the distribution as all feed from the thickeners reports to the existing distributor.

4.1.3. Filter Feed Pumps

An additional nozzle will be required for the new filter feed pump. This will require a new pump plinth to be installed. Figure 3 shows the location of the new pump, West of and adjacent to the existing filter feed pumps.

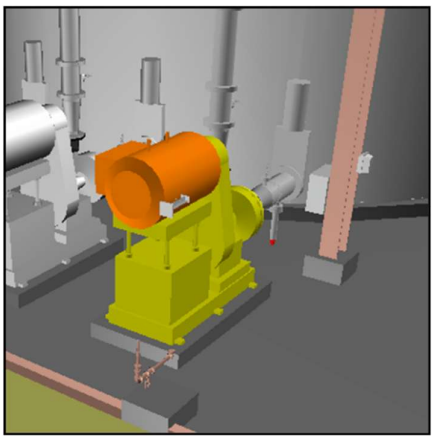

Figure 3: New Filter Feed Pump

4.1.4. Flushing Water

There are four flushing water pumps in the current circuit. Whilst they supply a ring main, there is one installed for each filter. A new flushing water pump will be required for the fifth filter. The process water flow rate to the concentrate flush water tank is 336m3/h which is sufficient for the current circuit and the additional concentrate filter.

One additional flushing pump will be required to supply the flushing water for the new filter. Figure 4 shows the new flushing water pump tied in to the existing header.

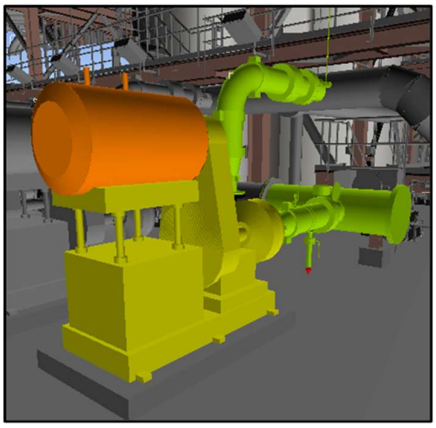

Figure 4: Flushing Water Pump Tie In

4.1.5. Filtrate Transfer Pumps and Hopper

The filtrate return hopper and pumps are suitable only for the current duty. The Filtrate transfer pumps are sufficient but will require a motor upgrade. The existing transfer pump duty is 575m3/h and has a 75 kW motor installed. The new duty requires 720m3/h and a motor upgrade to 90kW. The existing filtrate transfer hopper is not sufficient for the increased duty.

The filtrate transfer pumps require an upgrade to cater for the additional duty. Even though the concentrate production has not increased, the instantaneous capacity required has increased due to the addition of another filter. As such the filtrate hopper requires hungry boards to be installed to increase the capacity. 600mm of extra height is required to maintain the retention time in the hopper. Figure 5 shows the modified Filtrate return hopper with the modified access platform.

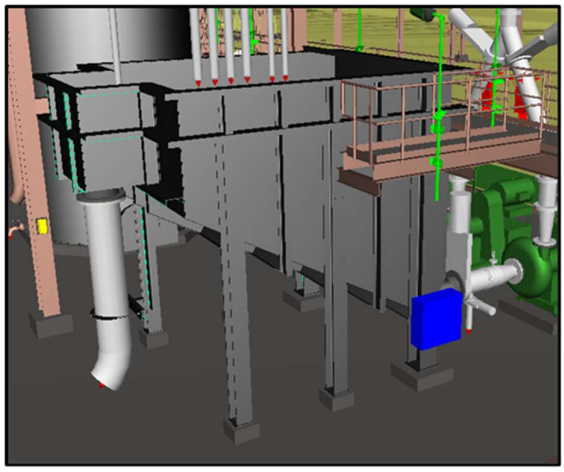

Figure 5: Filtrate Return Hopper

4.1.6. Sump Pump

Ground slab for the building extension shall be graded to fall to a new sump pump to be mounted on a new sump pump frame. This sump pump is to be serviced by a monorail similar to the existing. See Figure 6 for the proposed set up.

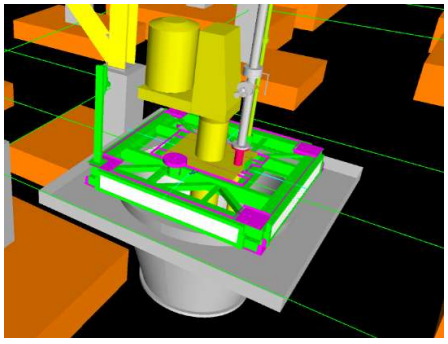

Figure 6: Sump pump in Precast Concrete Sump

4.1.7. Power Supply

Power to the current concentrate filter building is provided from switchroom 1314-SR-108, which incorporates one 33kV switchboard, two 415V Motor Control Centres (MCC's) plus a number of Variable Speed Drives (VSD's) and other associated electrical equipment. Each MCC is fed from a 33/0.433kV transformer. Both the transformers are contained within a blast wall that encompasses three sides of the transformer. Figure 7 shows the existing switchroom and a transformer wall.

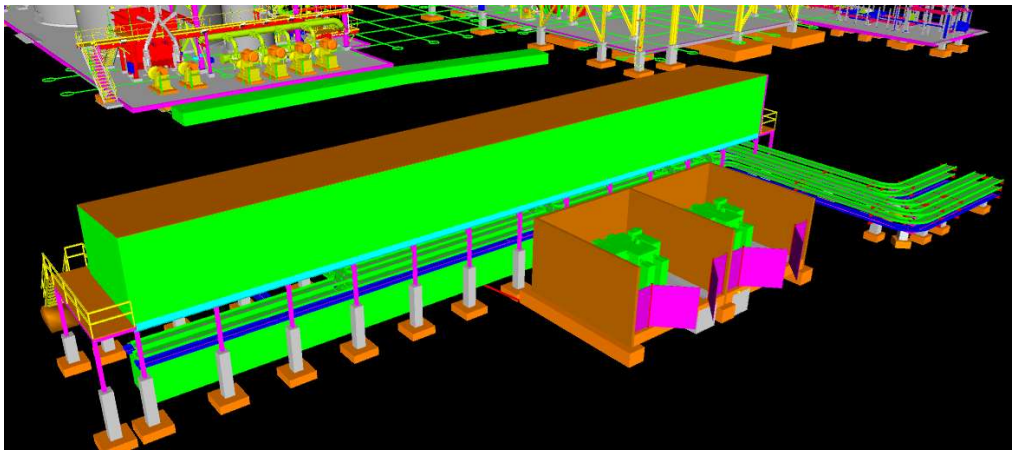

Figure 7: Existing Switch Room SR-108

The existing concentrate filter substation 1314-SR-108 does not have enough available space for the electrical equipment required for an additional filter as is seen in Figure 8. The Engineering Consultant is to evaluate existing electrical, instrumentation and communication design capacity to identify required upgrades/modification to meet the requirement of the new filter.

Figure 8: Existing substation 1314-SR-108

4.1.8. Instrumentation

Basing on the evaluation of the existing electrical, instrumentation and communication; design new electrical, instrumentation and communication equipment and associated infrastructure.

4.1.9. CCTV & Control System

The existing plant control system will be extended to add the new PLC and communications equipment required for the new filter addition.

4.1.10. Compressed Air

A new air receiver is required to provide additional compressed air surge capacity. The new receiver is to be located adjacent to the existing air receivers shown in Figure 9.

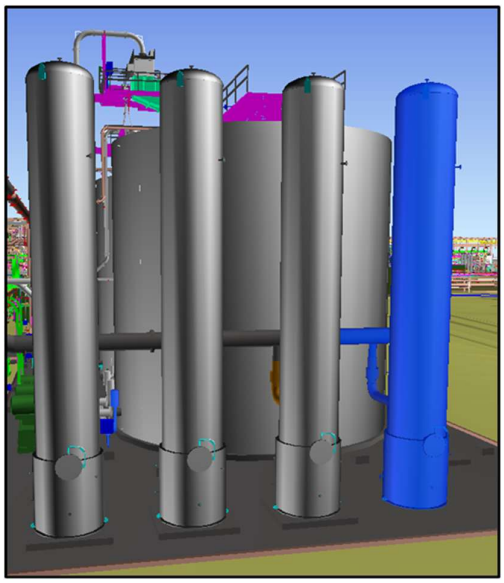

Figure 9: Additional Air Receivals

4.1.11. Conveyors

The filtered concentrate from the new filter is to discharge to the existing 1314-CV-020 conveyor. The drive motor is expected to be upgraded to 132 kW for the increased duty. The existing weightometer is required to be relocated. The existing conveyor belt below the new filter shall be equipped with skirts and guards.

Table 2 and 3 summarises the data for the existing conveyor.

Table 2 Conveyor Data

CONVEYOR	1314-CV-020
Power	75 kW
Belt Designation	ST1000
Belt Width	1200 mm
Conveyor Length	321 m
Conveyor Capacity	1770 wet t/hour
Belt Speed	1.6 m/s

Table 3 Conveyor System Upgrade

CONVEYOR	Existing Drive kW
1314-CV-020	110
1315-CV-021	110
1315-CV-022	110

4.1.12. Gland Water

The increase in gland water required is minimal and the existing system is considered sufficient for the increased duty. This can be tied into existing gland water supply system and will provide high pressure gland water for the filter feed, flushing and filtrate pumps.

4.1.13. Process Water

Process water is required for cloth washing and plant wash down. The existing process water capacity is sufficient for the new filter.

4.1.14. Fire Water

Additional fire hydrants and hose reels are required. Tie in to the existing fire water system is required. Additional fire hydrant and hose reels can be installed similar to the existing configuration.

4.1.15. Plant process philosophy

The new filter will be operated under the same regime as the existing 4 concentrate filters, with the design duplicating elements of the existing design, where possible, to allow an easier transition for operational personnel.

The following process design items shall be completed by the Engineering Consultant at end of engineering design phase as project deliverables:

- Updated Process Design Criteria
- Finalised Process Description
- Updated PFDs
- P&IDs
- Line List
- Valve List
- Special Items List
- Updated Tie-In List
- Instrument List
- HAZOPs and HAZIDs

4.2. Process Scope Requirements

The requirements for the design are:

- Conduct process design to for the upgrade of conveyor, Raw Water, Process Water, Potable Water, Fire Water (Within Buildings and Structures), Gland Water Systems, Plant /Instrument and Filtration Air Systems.
- Prepare datasheet to support equipment procurement.
- Review and update as necessary all PFDs.

4.3. Mechanical Scope Requirements

The requirements for the design are:

- Complete and check calculations for all mechanical equipment including but not limited to pumps, conveyors, pipe work, vessels, duct work etc.
- Prepare and maintain mechanical equipment list, valve list, line list, tie-in list and special items list.
- Prepare and maintain list of service utilities
- Check, revise and create as necessary all data sheets.
- Ensure that vendor data for equipment that is 'identical' to the Base Plant has identical tie-in details to eliminate re-design
- Assist in preparation and update of the Procurement list
- Incorporate 'certified final' vendor data into the design document for long lead time equipment
- Prepare 3D design models with full intelligence, including preliminary pipe routing
- Prepare MTO's
- Revise the design 3D models
- Prepare general arrangements, sections and detail drawings for the new extension
- Incorporate 'certified final' vendor data into the final design

4.4. Structural Scope Requirements

The requirements for the design are:

- Complete the steelwork design for the building extension including platform and walkway to Australian Standards using Australian steel sections as appropriate.
- Develop construction drawings for equipment support, existing platform modification including stair and walkway, new platform, new columns and new pipe supports. Steel connection arrangement to be designed, detailed and carefully selected to allow for easy installation. Drawings shall include general notes and information on existing services shall be included.
- Design check on the existing members, including strengthening if required and updating of existing drawings.
- Prepare 3D models with full intelligence.
- Prepare MTO's.

- Prepare general arrangements, sections and detail drawings.

4.5. Civil Scope Requirements

The requirements for the design are:

- Provide a design that fully complies with the environmental conditions such as process water management.
- Provide a design that minimises the requirement for imported fill.
- Prepare intelligent model (12D or similar).
- Prepare MTO's.
- Prepare earthwork general arrangements, sections and detail drawings.

4.6. Concrete Scope Requirements

The requirements for design are:

- Provide a design for foundation, column/pedestal, sump, ground slab, equipment plinths that utilises the same design basis and the standard details for footings, formwork, holding down bolts, transformer yard etc. to minimise costs.
- Prepare MTO's.
- Prepare general arrangements, sections and detail drawings for concrete works.

4.7. Architectural Scope Requirements

The requirements for the design are:

- Provide design for cladding, roof ridge ventilator and other architectural facilities similar to the existing.
- Prepare 3D models.
- Prepare MTO's.
- Prepare general arrangements, sections and detail drawings for architectural works.

4.8. Electrical Scope Requirements

The requirements for the design are:

- Liaise with Company representative and Electrical switchroom/substation design to ensure all design is consistent with electrical requirements.
- Check, prepare and complete all calculations for all electrical equipment including, but not limited to load flow, fault levels, power factor, harmonics, protection curves,

distribution networks, HV switchgear, LV switchgear, transformers, cable sizing, heat load, earthing, substation earthing, lightning protection, lighting and VSD sizing.

- Prepare E&I equipment list.
- Load flow and fault level study.
- Develop data sheets for main electrical equipment items.
- Prepare electrical load list.
- Prepare cable schedule.
- Liaise with Company representative and Electrical switchroom/substation design to ensure all design is consistent with electrical requirements
- Show on the 3D Models and include on drawings the route for all cable trays and buried cable routes.
- Prepare MTO's.
- Prepare all drawings as required.

4.9. Instrumentation and Controls System

The requirements for the design are:

- Prepare instrument list/index, Control System IO list and an interlock schedule.
- Prepare PLC block diagrams and wirings.
- Calculate new power supply including new lightings to new platforms.
- Prepare I&C cable list.
- Prepare instrumentation equipment layouts.
- Update existing P&IDs.
- Review and revise as necessary all data sheets.
- Utilise existing Control Philosophy and prepare an updated control system functional description document.

4.10. Model Review

The following outlines the stage presentation and the documentation requirement of work completion of the project.

Required Documents Status and Model Content Guide for Design 30% Model Review

Deliverable / Activity	Model / Document Status	Remarks
PFD's	IFA	
P&ID's	Issued for HAZOP	HAZOP to be completed after review
Line List	Issued for HAZOP	
Equipment List	Issued for HAZOP	
Equipment Location Plans	IFD	Based on best supplier's data available
Modelling of Major Equipment	All Modelled	Based on best supplier's data available
Modelling of Minor Equipment	All Modelled	Based on best supplier's data available
Piping	All Modelled	Valves modelled, inline instruments modelled, or envelopes defined
Structural Supports for Piping	All Modelled	Commenced Engineered, first pass model by piping, envelopes defined
Preassembly schemes defined (if required)	Modelled	As agreed between structural/mech/piping/elect.
Primary Steel	All Modelled	To be frozen after review
Secondary & Tertiary Steel	All Modelled	Engineered-detailed design 50%
Floor grating/plating & Penetrations	Modelled	First pass by piping
Access & Egress Routes	Modelled	All in Model (translucent envelopes) Stairways modelled by piping
Maintenance / craneage access zones	Modelled	All in Model (translucent envelopes) Prelim crane studies completed.
Concrete	Modelled	Detailed slabs and footings
Civil	Modelled	Detailed earthworks and drainage
Buried Services (if required)	Modelled	Envelopes modelled for all buried services trenches
Major Electrical Equipment	All Modelled	Based on best data available
Cable Ladders (All sizes)	Modelled	

Required Documents Status and Model Content Guide for Design 60% Model Review

Deliverable / Activity	Model / Document Status	Remarks
P&IDs	IFC	
Line List	IFC	
Equipment List	IFC	
Equipment Location Plans	IFC	

Deliverable / Activity	Model / Document Status	Remarks
Modelling of Major Equipment	All Modelled	Major Equipment Fully Checked to Supplier's Data (final, certified)
Modelling of Minor Equipment	All Modelled	To final supplier's data
DN80 & Above Piping	Final Design	Line by line review required Valves modelled, inline instruments modelled Stress Analysis complete where required. Isometrics IFT
< DN80 Piping & Supports	All Modelled	Modelled or envelopes defined. Line by line review required, Only Minor Utilities Outstanding
Structural Supports for DN80 & Above Piping	All Modelled	Engineered & Included in Structural Model
Structural Supports for < DN80 Pipe	Modelled	First pass by piping
Preassemblies (if required)	All Modelled	Preassemblies identified, modelled and finalised.
Primary Steel	IFC	Modelling Complete
Secondary & Tertiary Steel	All Modelled	To go IFA after review
Floor grating/plating & Penetrations	All Modelled	To go IFA after review
Access & Egress Routes	All Modelled	All in Model (translucent envelopes)
Maintenance / craneage access zones	All Modelled	All in Model (translucent envelopes) Crane studies completed.
Safety Equipment	All Modelled	
Utility Stations	All Modelled	
Concrete	All Modelled	To go IFA after review
Civil	All Modelled	To go IFA after review
Buried Services (if required)	All Modelled	Envelopes modelled for all buried services trenches To go IFA after review
Hazardous Area Drawings	IFD	
Electrical Equipment	Updated	Based On Supplier Data
Cable Ladders & Supports (All sizes)	IFA	Modelling complete envelopes defined
Junction Boxes	All Modelled	
Lighting Fixtures	Modelled	Based On Supplier Data, Lighting studies

Required Documents Status and Model Content Guide for Design 90% Model Review

Deliverable / Activity	Model / Document Status	Remarks
P&IDs	IFC	
Line List	IFC	
Equipment List	IFC	
Equipment Modelling	Frozen	All Equipment Fully Checked to Supplier's Data (final, certified)
Piping (All sizes)	IFC Frozen	Isometrics IFC
Structural Supports for Piping (All sizes)	IFC Frozen	
< DN80 Piping & Supports	Final Design	Line by line review required on outstanding lines
Piping Interfaces	IFC Frozen	Only Minor Utilities remaining
Steel	IFC Frozen	Fully connected shop detail model imported back in to 3D model for final clash check, to be completed prior to 90% review.
Floor grating/plating & Penetrations	IFC Frozen	
Equipment Supports	IFC Frozen	
Access & Egress Routes	IFC Frozen	
Maintenance / craneage access zones	IFC Frozen	
Safety Equipment	IFC Frozen	
Utility Stations	IFC Frozen	
Hazardous Area Drawings	IFC Frozen	
Electrical Equipment	IFC Frozen	
Cable Ladders & Supports (All sizes)	IFC Frozen	To go IFC after review
Junction Boxes	IFC Frozen	
Lighting Fixtures	IFC Frozen	

4.11. Commissioning

The Consultant shall:

- Review the commissioning procedures submitted by the vendors for all equipment.
- Provide assistance to KML and its contractors for commissioning of other related equipment for the overall commissioning and handover of the project

4.12. Constructability Review

The requirements of this review are:

- Prepare constructability report to cover the construction impact analysis including but not limited to downtime to existing operation during construction, mitigation plan to minimize plant's downtime during construction.
- Prepare Construction works schedule and commissioning plan.
- Provide cost estimate for Procurement, Construction and Commissioning in assisting KML for the Capital Expenditure Request.

4.13. Deliverables

All deliverables shall be submitted to KML for approval and shall be submitted in accordance with the requirements of KML's Corporate Standards. Approval by KML shall not relieve the Engineering Consultant from its contractual responsibilities, which include the production of designs that are fit for purpose and technically correct to meet all safety requirements in accordance with the Mine safety and Inspection Act 1994. All documents, drawings and 3D Models shall be supplied in KML format for integration into KML master files.

All drawings shall be supplied as follows:

- One copy in native/intelligent file format, Microstation V8i.
- One copy in pdf format
- All drawings shall be in English.

All 3D models shall be supplied as follows:

- Prepared in Microstation V8i format with full intelligence.
- NAVISWORK (NWD) format for design review.
- Civil 3D Digital Terrain models and 3D Digital Design models, compatible with Terrain Modelling.
- Shall be submitted to KML together with the data source

All engineering documents shall be supplied as follows:

- One copy in native file format in Microsoft Word or Microsoft Excel.
- All documents shall be in English and shall be submitted in both PDF and native formats.

5. BATTERY LIMITS

The Process Battery Limits for Filter Upgrade shall be:

- Tie-in of new filter feed pump suction nozzles to existing filter feed tanks
- Tie-in to existing process water system
- Tie-ins points for flush water
- Tie-in to existing gland water system at the Filter Feed area
- Tie-in's at the gland water supply tank
- Tie-in to existing potable water system
- Tie-in's to existing fire water system
- Tie-in point to existing filtration air header, i.e. new filter air receiver shall tie-in with existing filtration air header
- Tie-in point to existing plant / instrument system
- Filtrate transfer into existing thickener feed tank
- Discharge of concentrate to of CV-020 discharge conveyor

Electrical battery limit is termination on the switch gear in the new Switchroom.

6. COMPANY SUPPLY

The Company will supply:

- Data, documentation, calculation reports, drawings, 3D models and information for the Base Plant relating to the Concentrate Filtration Facility. Not all documents may be in native file format. See the list of drawings in Appendix A.
- Existing Geotechnical report
- Tetra Tech Proteus's study report (ref.no.: L037-GE-REP-0001_F)

7. CORPORATE ENGINEERING STANDARD DRAWINGS AND SPECIFICATIONS FOR MAJOR ITEMS APPLICABLE DOCUMENTS

All work covered by this Scope of Work shall comply with the applicable statutory requirements of Federal, State and Local Authorities of Australia, and shall comply with the nominated Codes, Standards and referenced standards within these.

The Engineering Consultant shall note that if there is any doubt, the hierarchy of the documents are indicated below:

1. All Statutory Authorities having jurisdiction over the works at the mine site;
2. This Scope of Work document;
3. The latest editions of relevant Company / Principal's Standards and Specifications;
4. Standard Association of Australian Standards; and
5. All other relevant publications and regulations.

Where Standards applicable to the work are not published by the Standards Association of Australia, then relevant International Standards shall apply subject to the written approval of the Company.

7.1. Procedures, Standards and Specifications

The work shall be executed in accordance with, but not limited to the documents listed herein. If available, the CORP- Corporate Standard shall be used, however if not available, the other referenced document shall apply. The issue of any new Corporate Standard shall supersede the equivalent referenced document.

Document No.	Title
2000-CDRL-2CG101A	Contractor Data Requirements List
CORP-GE-PLN-1002	Document and Data Management Plan
CORP-GE-LST-1003	Project Glossary
CORP-AD-FRM-1002	Document & Revision Numbering System
CORP-AD-FRM-1005	Work Breakdown Structure Coding
CORP-AD-FRM-1007	Plant Numbering System
CORP-PC-SPC-1002 *1000-PC-SPC-1002*	Contractor Progress Reporting and Planning Specifications
CORP-AD-SPC-1001	Supplier Data Instruction Specification
CORP-AD-SPC-1002	Contractor Data Requirements Specifications

CORP-AD-FRM-1026	Supplier Data Schedule
CORP-CI-SPC-1001	Mine Site Earthwork and Roadwork
CORP-CI-SPC-1011	Spec for Concrete Supply
CORP-CI-SPC-1012	Spec for Grouting under Struc Baseplates and Equipment
CORP-CI-SPC-1013	Spec for Anchor Bolts
CORP-CI-SPC-1014	Spec for Reinforcing Bars and Wore Fabric
CORP-CI-SPC-1015	Spec for Construction of Concrete Works
CORP-GE-SPC-1002	Packing, Marking & Doc. Instruction
CORP-GE-SPC-1004	Spec for Surface Treatment of Structural Steelwork & Pipework
CORP-GE-SPC-1005	Spec for Shop Detailing of Structural and Mechanical items
CORP-QA-SPC-1001	Supplier Quality Requirements
CORP-QA-SPC-1002	Requirements For Compilation of Manufacturer's Data Report (MDR) By Contractors
CORP-QA-SPC-1003	Contractor Quality Requirements
CORP-EN-PLN-1001	Construction Environmental Management Plan
CORP-EN-PRO-1009	Environmental Procedure - Flora, Weeds and Plant Pathogens
CORP-HS-PLN-1001	Occupational Health and Safety Management Plan
CORP-HS-PLN-1003 *1000-HS-PLN-1003*	Emergency Management Plan
CORP-HS-PRO-1007	Crane Management Procedure
CORP-ST-SPC-1001	Specification For Fabrication of Platework
CORP-ST-SPC-1002	Specification For Structural Steelwork Erection
CORP-ST-SPC-1005	Specification For Structural Steelwork Fabrication
CORP-ST-SPC-1007	Specification For Fabrication of Platework - Chinese Supply
CORP-ST-SPC-1008	Specification For Structural Steelwork Fabrication - Chinese Supply

7.2. Design Criteria

The work shall be executed in accordance with the following documents but not limited to:

Document No.	Title
CORP-GE-BOD-1001	Karara Mining Limited Basis of Design
1300-PR-PHL-1007	Process Operating and Control Philosophy
2300-PR-BOD-0001	Process Design Criteria – Base Plant
2300-PR-BOD-0002	Process Design Criteria
CORP-CI-BOD-1001	Civil/Structural Design Criteria
CORP-ME-BOD-1001	Mechanical Design Criteria
CORP-PI-BOD-1001	Piping Design Criteria
CORP-EL-BOD-1001	Electrical Design Criteria
CORP-IN-BOD-1001	Controls and Instrumentation Design Criteria
CORP-IN-PHL-1001	Control System Philosophy
CORP-TE-BOD-1001	Telecommunications Design Criteria
CORP-FG-BOD-1001 *1300-FG-BOD-1001*	Fire Prevention Basis of Design

7.3. Standard Drawings

The Standard Drawings shall be provided by KML and will be issued to the Engineering Consultant at the project Set up stage. Where applicable, project standard drawings shall be used until superseded by Corporate Standards.

Document No.	Title
CORP-EL-DRG-1001	Electrical Symbols - Legends Sheet 1
CORP-EL-DRG-1002	Electrical Symbols - Legends Sheet 2
CORP-EL-DRG-1003	Labels - Typical Arrangement and Details Sheet 1
CORP-EL-DRG-1004	Labels - Typical Arrangement and Details Sheet 2
CORP-EL-DRG-1010	Field Equipment Installation Details - Wiring Connections

CORP-EL-DRG-1011	Field Equipment Installation Details - Cable Ladder Sheet 1
CORP-EL-DRG-1012	Field Equipment Installation Details - Cable Ladder Sheet 2
CORP-EL-DRG-1013	Field Equipment Installation Details - Motors
CORP-EL-DRG-1014	Field Equipment General Arrangements - Junction Box Type 1
CORP-EL-DRG-1015	Field Equipment General Arrangements - Junction Box Type 2
CORP-EL-DRG-1016	Field Equipment Installation Details - Junction Boxes
CORP-EL-DRG-1017	Field Equipment Installation Details - Equipment Panels
CORP-EL-DRG-1018	Field Equipment Installation Details - Distribution Boards
CORP-EL-DRG-1019	Field Equipment Installation Details - Local Control Stations
CORP-EL-DRG-1020	Field Equipment Installation Details - Welding and Socket Outlets
CORP-EL-DRG-1022	Field Equipment Installation Details - Lighting Sheet 1
CORP-EL-DRG-1023	Field Equipment Installation Details - Lighting Sheet 2
CORP-EL-DRG-1024	Field Equipment Installation Details - Lighting Sheet 3
CORP-EL-DRG-1025	Field Equipment Installation Details - Lighting Sheet 4
CORP-EL-DRG-1026	Field Equipment Installation Details - Lighting Sheet 5
CORP-EL-DRG-1035	Earthing Installation - Cable Ladder Details
CORP-IN-DRG-1071	Instrument Supports Standard Details
CORP-IN-DRG-1072	Magnetic Flowmeter (Remote Transmitter) Instrument Installation Detail
CORP-IN-DRG-1073	Flow Transmitter DP Type Annubar and Pilot Tube Instrument Installation Details
CORP-IN-DRG-1074	Flow Transmitter DP Type Dry Air and Gas (Below Tap) Instrument Installation Details
CORP-IN-DRG-1075	Flow Transmitter DP Type Clean Liquids or Steam (Below Tap) Instrument Installation Details
CORP-IN-DRG-1076	Flow Transmitter DP Type - Clean Liquids or Steam (Direct Mounted) Instrument Installation Drawing
CORP-IN-DRG-1077	Flow Transmitter DP Type Dry Air and Gas (Above Tap) Instrument Installation Detail

CORP-IN-DRG-1078	Pressure Gauge/ Transmitter Direct Mount with Bleed Instrument Installation Detail
CORP-IN-DRG-1079	Pressure Gauge/ Transmitter Direct Mount Without Bleed Instrument Installation Detail
CORP-IN-DRG-1080	Pressure Gauge /Transmitter with Diaphragm Seal Instrument Installation Detail
CORP-IN-DRG-1081	Overall Single Block Segment Protection Instrument Junction Box
CORP-IN-DRG-1083	Pressure Transmitter Diaphragm Seal with Capillary Tube Instrument Installation Detail
CORP-IN-DRG-1084	Diff Pressure Gauge and Transmitter Clean Liquids Instrument Installation Detail
CORP-IN-DRG-1085	Diff Pressure Gauge and Transmitter Dry Air /Gasses Instrument Installation Detail
CORP-IN-DRG-1086	Differential Transmitter Diaphragm Seal with Capillary Tube Instrument Installation Detail
CORP-IN-DRG-1087	Level Indicator Non-Pressurised Tank Instrument Installation Detail
CORP-IN-DRG-1088	Level Transmitter Ultrasonic and Radar Instrument Installation Detail
CORP-IN-DRG-1089	Level Transmitter/Switch Nucleonic Instrument Installation Detail
CORP-IN-DRG-1090	Nucleonic Density Transmitter Instrument Installation Detail
CORP-IN-DRG-1091	Temperature Transmitter/Indicator Flange Mounted Instrument Installation Detail
CORP-IN-DRG-1092	On/Off or Modulating Valve Instrument Installation Detail
CORP-IN-DRG-1093	Sonar Flowmeter (Remote Transmitter) Instrument Installation Detail
CORP-IN-DRG-1094	Instrumentation Standards - Weightometer/Load Cells Instrument Installation Detail
CORP-IN-DRG-1095	Tilt/Float Ball Level Switch Instrument Installation Detail
CORP-IN-DRG-1100	Overall One Terminal Strip Instrument Junction Box
CORP-IN-DRG-1102	Bus Powered Profibus Pa Typical Instrument Segment Diagram
CORP-IN-DRG-1103	External Powered 240vac Profibus Pa Typical Loop Diagram
CORP-IN-DRG-1104	External Powered 24vdc 4-20ma Hart Typical Loop Diagram
CORP-IN-DRG-1105	Solenoid Valve I/O Typical Loop Diagram

CORP-IN-DRG-1106	Loop Powered 4-20ma Hart Instrument Typical Loop Diagram
CORP-IN-DRG-1107	4-Wire Digital Input External 24v Dc Powered Typical Loop Diagram
CORP-IN-DRG-1108	3-Wire Digital Input Typical Loop Diagram
CORP-IN-DRG-1109	2-Wire Digital Input Typical Loop Diagram
CORP-IN-DRG-1110	External Powered 240ac 4 Wire 4-20ma Hart Typical Loop Diagram
CORP-IN-DRG-1111	External Powered 240vac 4-20 Ma Hard Typical Loop Diagram
CORP-IN-DRG-1112	External Powered Profibus Pa Magnetic Flowmeter Typical Loop Diagram
CORP-IN-DRG-1113	External Powered 24vdc 4-20ma Hart Sonar Flowmeter Typical Loop Diagram
CORP-IN-DRG-1114	Digital Output 240vac Powered Typical Loop Diagram
CORP-IN-DRG-1115	External Powered 24vdc Profibus Pa Typical Loop Diagram
CORP-IN-DRG-1132	Instrument/Pcs Power Distribution Typical Schematic Diagram
CORP-IN-DRG-1135	Electrical Standards CCTV Camera Mounting Installation Details
CORP-IN-DRG-1136	CCTV Network Standard Schematic
CORP-IN-DRG-1175	Control System Network Overview Data Flow & External Connection Diagram
CORP-IN-DRG-1178	Plc Cabinet Conceptual Layout
CORP-IN-DRG-1179	Communications Cabinet Conceptual Layout
CORP-IN-DRG-1180	Field Marshalling Cabinet - Pair Conceptual Layout
CORP-IN-DRG-1181	PCS Network Architecture Diagram Sheet 1 Of 2
CORP-IN-DRG-1182	PCS Network Architecture Diagram Sheet 2 Of 2
CORP-IN-DRG-2021	General Notes and Legends
CORP-IN-DRG-2051	CCTV System Block Diagram Typical
CORP-IN-DRG-2135	Power Management Network Block Diagram
CORP-IN-DRG-2136	It Data/Voip System Block Diagram

CORP-IN-DRG-2137	Fs System Block Diagram
CORP-ME-DRG-1002	Mechanical General Notes
CORP-ME-DRG-1004	Mechanical Standard – Chinese Sections Mechanical General Notes
CORP-ME-DRG-1039	Mechanical Standards Chinese Sections Miscellaneous Chute Details Sheet ½
CORP-ME-DRG-1040	Mechanical Standards Chinese Sections Packer and Shim Sets
CORP-ME-DRG-1041	Mechanical Standards Chinese Sections Lifting Lug Details
CORP-ME-DRG-1043	Mechanical Standards Chinese Sections Miscellaneous Chute Details Sheet 2/2
CORP-PI-DRG-1034	Standard Pipe Support - Drawing Index Sheet
CORP-PI-DRG-1128	Piping Standard Drawing Piping Special Flanges
CORP-PI-DRG-1129	Special Pipe Support Sps006 Riser for Vertical Pipe
CORP-PI-DRG-1131	Piping Standard Drawing Dn450 & Above Spectacle Blind
CORP-PI-DRG-1133	Piping Standard Drawing Rubber Lined Tee with Hatch
CORP-PI-DRG-1134	Piping Standard Drawing Blind Flange with Drilled Holes
CORP-PI-DRG-1135	Piping Standard Drawing Sump Pump Discharge Spool
CORP-PI-DRG-1136	Piping Standard Drawing 43° & 43.5° Special Bend
CORP-PI-DRG-1142	Piping Standard Drawing Pump Suction Arrangement
CORP-PI-DRG-1161	Piping Standard Drawing Pump Discharge Arrangement
CORP-PI-DRG-1162	Piping Standard Drawing Sump Pump Discharge
CORP-PI-DRG-1163	Piping Standard Drawing 15° Pulled Bend 3d/5d
CORP-PI-DRG-1164	Piping Standard Drawing 22.5°Pulled Bend 3d/5d
CORP-PI-DRG-1165	Piping Standard Drawing 30° Pulled Bend 3d/5d
CORP-PI-DRG-1166	Piping Standard Drawing 45° Pulled Bend 3d/5d
CORP-PI-DRG-1167	Piping Standard Drawing 60° Pulled Bend 3d/5d

CORP-PI-DRG-1168	Piping Standard Drawing 90° Pulled Bend
CORP-PI-DRG-1169	Piping Standard Drawing Lap Joint Flange for Sr1 Piping
CORP-PI-DRG-1170	Piping Standard Drawing Ff So Flange for Sr1 Piping
CORP-PI-DRG-1171	Piping Standard Drawing for Utility Station
CORP-PI-DRG-1172	Piping Standard Drawing for Vents and Drains
CORP-PI-DRG-1173	Piping Standard Drawing Weld Distance
CORP-PI-DRG-1174	Piping Standard Drawing Piping Spacing
CORP-PI-DRG-1175	Piping Standard Drawing Piperack & Trench Clearances
CORP-PI-DRG-1177	Piping Standard Drawing Rubber Lined Fabricated Branch Tees
CORP-PI-DRG-1178	Pipe Standard Drawing Rubber Lined Reducing Spools
CORP-PI-DRG-1179	Piping Standard Drawing Rubber Lined Spools
CORP-PI-DRG-1180	Piping Standard Drawing Rubber Lined Y Piece
CORP-PI-DRG-1181	Standard Pipe Support Drawing Support Index Sheet 1
CORP-PI-DRG-1182	Standard Pipe Support Drawing Support Index Sheet 2
CORP-PI-DRG-1183	Standard Pipe Support Drawing Support Index Sheet 3
CORP-PI-DRG-1184	Standard Pipe Support Drawing Support Index Sheet 4
CORP-PI-DRG-1185	Standard Pipe Support Drawing Support Index Sheet 5
CORP-PR-DRG-1001	Process Drawing Index Sheet
CORP-PR-DRG-1002	Process Standards - Legend and Symbols PID - Sheet 1 Of 4
CORP-PR-DRG-1003	Process Standards - Legend and Symbols PID - Sheet 2 Of 4
CORP-PR-DRG-1004	Process Standards - Legend and Symbols PID - Sheet 3 Of 4
CORP-PR-DRG-1005	Process Standards - Legend and Symbols PID - Sheet 4 Of 4
CORP-ST-DRG-1001	Structural Steel Standards - Australian Sections - Drawing Index
CORP-ST-DRG-1002	Structural Steel Standards - Australian Sections - General Notes

CORP-ST-DRG-1003	Structural Steel Standards - Australian Sections - Base Plate Details
CORP-ST-DRG-1004	Structural Steel Standards - Australian Sections - Shear Keys for Base Plates
CORP-ST-DRG-1005	Structural Steel Standards - Australian Sections - Beam and Bracing Connections Sheet 1 Of 2
CORP-ST-DRG-1006	Structural Steel Standards - Australian Sections - Beam and Bracing Connections Sheet 2 Of 2
CORP-ST-DRG-1007	Structural Steel Standards - Australian Sections - Column Splices - UC & UB Column Sections
CORP-ST-DRG-1008	Structural Steel Standards - Australian Sections - Column Splices - WC Column Sections
CORP-ST-DRG-1010	Structural Steel Standards - Australian Sections - Horizontal Bracing Details
CORP-ST-DRG-1011	Structural Steel Standards - Australian Sections - Pipe Bracing Details Sheet 1 Of 2
CORP-ST-DRG-1012	Structural Steel Standards - Australian Sections - Pipe Bracing Details Sheet 2 Of 2
CORP-ST-DRG-1013	Structural Steel Standards - Australian Sections - Open Section Bracing Details
CORP-ST-DRG-1014	Structural Steel Standards - Australian Sections - Miscellaneous Details
CORP-ST-DRG-1015	Structural Steel Standards - Australian Sections - Knee Bracing Details
CORP-ST-DRG-1016	Structural Steel Standards - Australian Sections - Wc Bracing Details
CORP-ST-DRG-1017	Structural Steel Standards - Australian Sections - Welded Connections
CORP-ST-DRG-1203	Structural Steel Standards - Monorail & Support Details
CORP-ST-DRG-1212	Structural Steel Standards - Handrail - Webforge Monowills System
CORP-ST-DRG-1213	Structural Steel Standards - Handrail Hot Rolled Angle System Details
CORP-ST-DRG-1215	Structural Steel Standards - Standard Floor Plate and Grating Details Sh 1 Of 2
CORP-ST-DRG-1216	Structural Steel Standards - Standard Floor Plate and Grating Details Sh 2 Of 2
CORP-ST-DRG-1218	Structural Steel Standards - Lifting Lug Details

7.4. Reference Drawings

All the existing drawings for the Concentrate Filtration Building will be provided to the Engineering Consultant during the Project Set up Stage. The list of drawings is in Appendix A.

8. HEALTH, SAFETY AND ENVIRONMENT

8.1. Health and Safety Management

All work undertaken for this project shall be carried out with the greatest regard and attention to safety issues.

The Occupational Health and Safety Management Plan document number CORP-HS-PLN-1001 outlines the minimum safety and health requirements to be implemented in delivery of services to KML for the project. The Engineering Consultant shall comply with all safety requirements of the relevant Acts, Regulations, By-Laws, Codes of Practice, Standards and other regulatory requirements.

The safety and health of personnel shall be considered in the design and planning stage, and shall be considered when reviewing the project standards documentation. Hazards considered shall include that which will be encountered during procurement and expediting, construction, commissioning, operations and maintenance. Particular attention shall be paid to providing safe design access and egress of personnel, ergonomic operations and maintenance activities.

9. QUALITY ASSURANCE AND TESTING

The Engineering Consultant shall be responsible for all quality management activities necessary to assure that the Work meets the project requirements.

The Engineering Consultant shall establish and maintain a Quality Program that is based on ISO 9001 and complies with Karara Mining Limited requirements.

The Quality Program shall provide systems that ensure activities associated with carrying out the Work are auditable, including the activities of Sub Engineering Consultant and Vendors.

10. COST PROPOSAL REQUIREMENTS

The Engineering Consultant's pricing proposal shall be a fixed lump sum cost and shall include the following:

- Detailed pricing schedule for the whole SoW delivery.
- Preliminary project schedule.
- Project resourcing plan and key project team's profiles.
- Quality management plan.
- Other document required by the Company's commercial department as and when required during evaluation.
- Explicitly list the deviations to KML's SoW requirement, if any.

Appendix A. 1314 CONC FILTER UPGRADE DOCUMENT LIST