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Digital Project Delivery for Rio Tinto Projects

Conveyor Design Utility for AVEVA E3D Design

Paul Rushton - Manager, Digital Delivery, Rio Tinto Projects

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RioTinto

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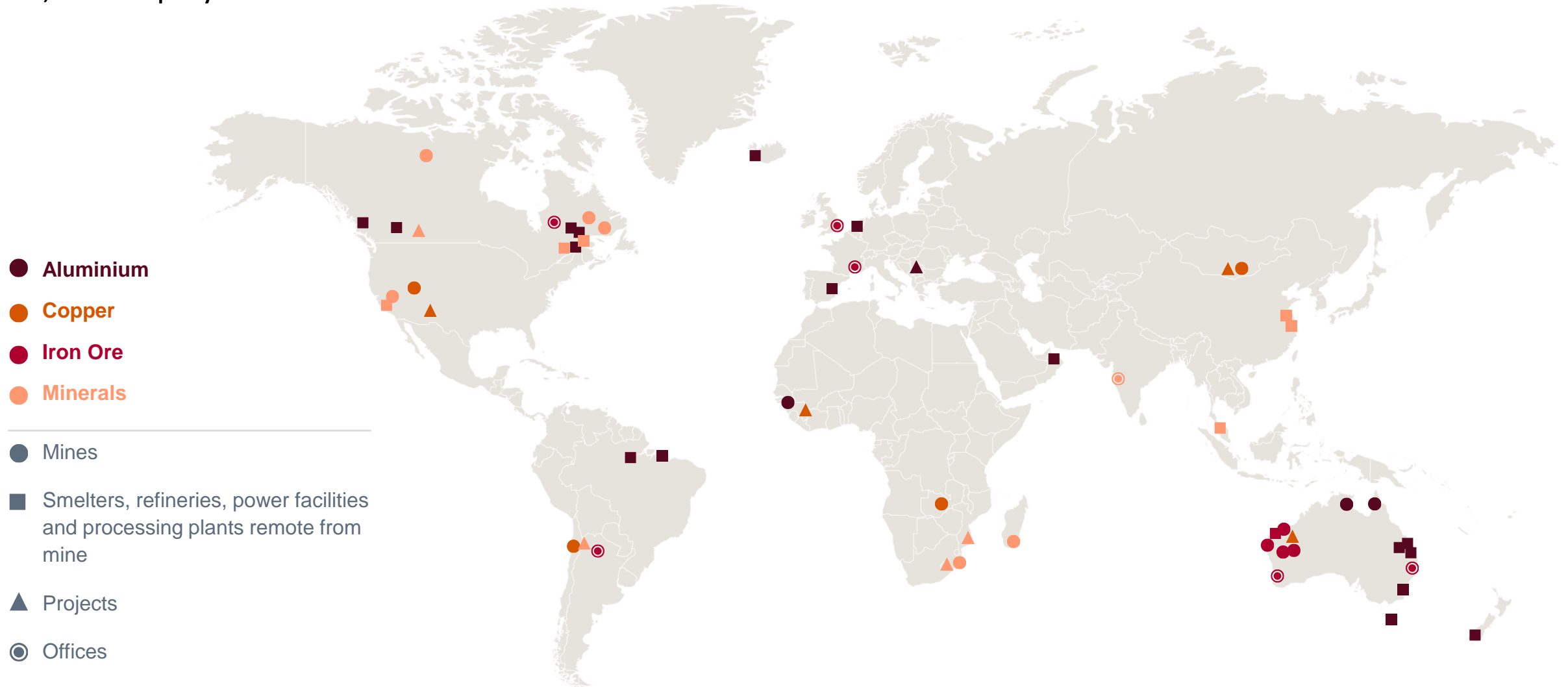
About Rio Tinto

- Rio Tinto is a global mining and metals company. Our purpose is to find better ways to provide the materials the world needs.
- Founded 150 years ago in 1873 when a group of investors bought the Rio Tinto mines in Spain.
- Product Groups: Iron Ore, Bauxite, Alumina, Aluminium, Copper, Minerals (includes Borates, Salt, Molybdenum, Titanium, Lithium and Diamonds).
- Statistics:
 - 52,000 Employees (2022)
 - 35 Countries
 - 20,000 Suppliers
 - 2,000 Customers
 - \$55.55 Billion (USD) Revenue (2022)

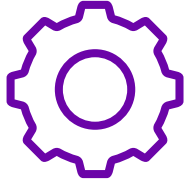


Rio Tinto Global Footprint

52,000 Employees 2023



Reliable and repeatable project delivery success



Challenges

- Custom-made designs for each project, steered and held by EPCMs – limited data/design re-use
- Data & information is fragmented, often manually processed and not easily reusable across the portfolio
- Consistent cost, schedule & quality challenges post contract award
- Path of construction and commissioning not consistently used to steer engineering activities
- Engineering contract environment based on ‘consuming hours’



Solution

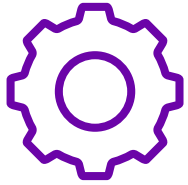
- Leveraging enhanced data management and digital innovation
- A single Rio Tinto ‘preferred’ platform based on the AVEVA suite of engineering and design software
- A single Rio Tinto controlled and hosted project delivery environment
- An Engineering Systems and Data Management (ESDM) platform supported by in-house specialist digital engineering capability



Benefits

- Cost and schedule reduction / certainty for major projects:
 - reduced project set up, configuration utilising common systems & administration
 - automated rules-based design based on Rio Tinto Standards
 - re-use of standard designs & designed assemblies from catalog
 - increased control over project specifications, catalogs & standards - single source of truth
 - minimal duplication of data

Reliable and repeatable project delivery success



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Digital delivery implementation details

Reframing how we define, engineer, deliver and handover projects to 'engineer for value'

ASSET INFORMATION REQUIREMENT SPECS.

The Foundations for Digital Delivery through Consistent Metadata & Handover Standards

- fully defined requirements for the format and content of the digital project handover
- fully defined class library requirements & tagging specs.
- engineering key list requirements
- fully defined requirements for engineering & design systems

ASSET DATA MANAGEMENT

A Common Data Environment to provide access to Engineering & Asset Data for all Stakeholders

- compliance & validation against the class library requirements
- integrating information from various repositories including engineering systems, the DMS and SharePoint.
- finds & reports inconsistencies
- deploy AWP execution methodology

ENGINEERING & DESIGN

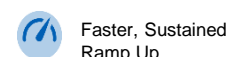
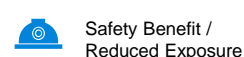
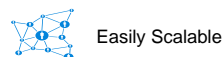
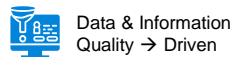
A fully configured Project Delivery Platform based on a preferred set of Engineering & Design Tools

- a fully defined/preferred platform for all design tools - 'What Good Looks Like'
- a fully configured & integrated tool set
- built on the corporate class library & tagging standards
- options open for ESPs to use their own authoring tools (with conversion to Rio Tinto systems prior to handover)

HOSTED PLATFORM

Maximise the benefits of Digital Delivery via Mandated Design Tools in a Hosted Environment

- fully defined & mandated platform for all engineering & design tools
- Rio Tinto controlled & managed project delivery environment
- ESPs must use this environment for project delivery – no handover req'd.
- optimal AWP execution methodology (full access to all potential DD benefits)



Digital delivery implementation details

Reframing how we define, engineer, deliver and handover projects to 'engineer for value'

ASSET INFORMATION REQUIREMENT SPECS.
 The Foundations for Digital Delivery through Consistent Metadata & Handover Standards

- fully defined requirements for project handover
- issued for use & available in PM+
- included in all contracts Schedule N and Specs List

ASSET DATA MANAGEMENT

AVEVA

Asset Portal

- AVEVA AIM (formerly AVEVA Net)

Asset Class Library

- AVEVA ISM for Standards & Compliance Management

ENGINEERING & DESIGN

AVEVA

Engineering Authoring Tools

- AVEVA E3D
- AVEVA Diagrams
- AVEVA E&I
- AVEVA Engineering
- AVEVA ERM

HOSTED PLATFORM

AVEVA

Microsoft Azure

Cloud based AVEVA Platform for ESPs to use.



Data & Information Quality → Driven

Quicker

Easily Scalable

Capital Efficient & Effective

Safety Benefit / Reduced Exposure

Faster, Sustained Ramp Up

Seamless Handover

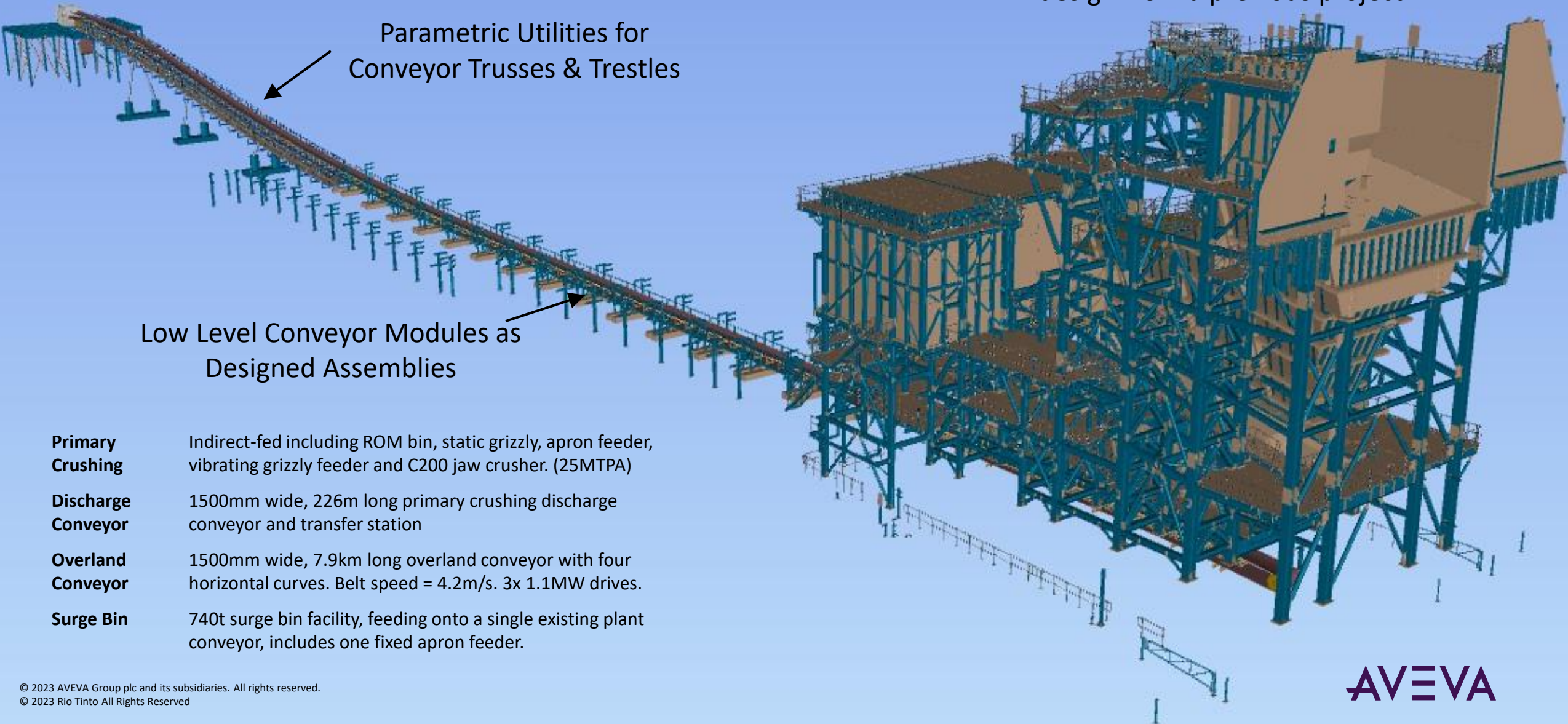
Asset Meets Business Case



Maximising Design Re-Use & Automated Design

RioTinto

Reuse a complete Primary Crushing Building design from a previous project



Parametric Utilities for
Conveyor Trusses & Trestles

Low Level Conveyor Modules as
Designed Assemblies

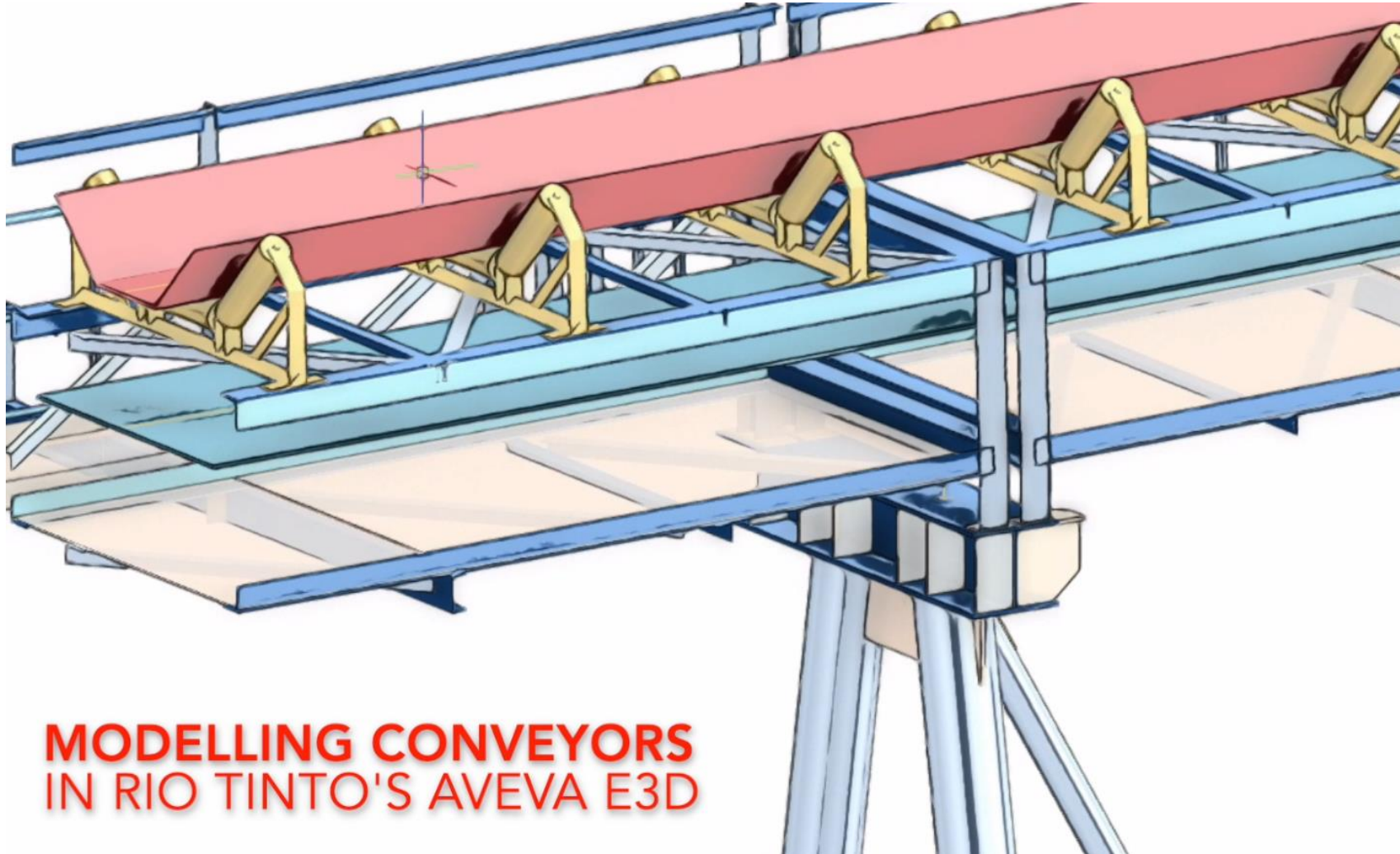
- Primary Crushing** Indirect-fed including ROM bin, static grizzly, apron feeder, vibrating grizzly feeder and C200 jaw crusher. (25MTPA)
- Discharge Conveyor** 1500mm wide, 226m long primary crushing discharge conveyor and transfer station
- Overland Conveyor** 1500mm wide, 7.9km long overland conveyor with four horizontal curves. Belt speed = 4.2m/s. 3x 1.1MW drives.
- Surge Bin** 740t surge bin facility, feeding onto a single existing plant conveyor, includes one fixed apron feeder.

Maximising Design Re-Use & Automated Design

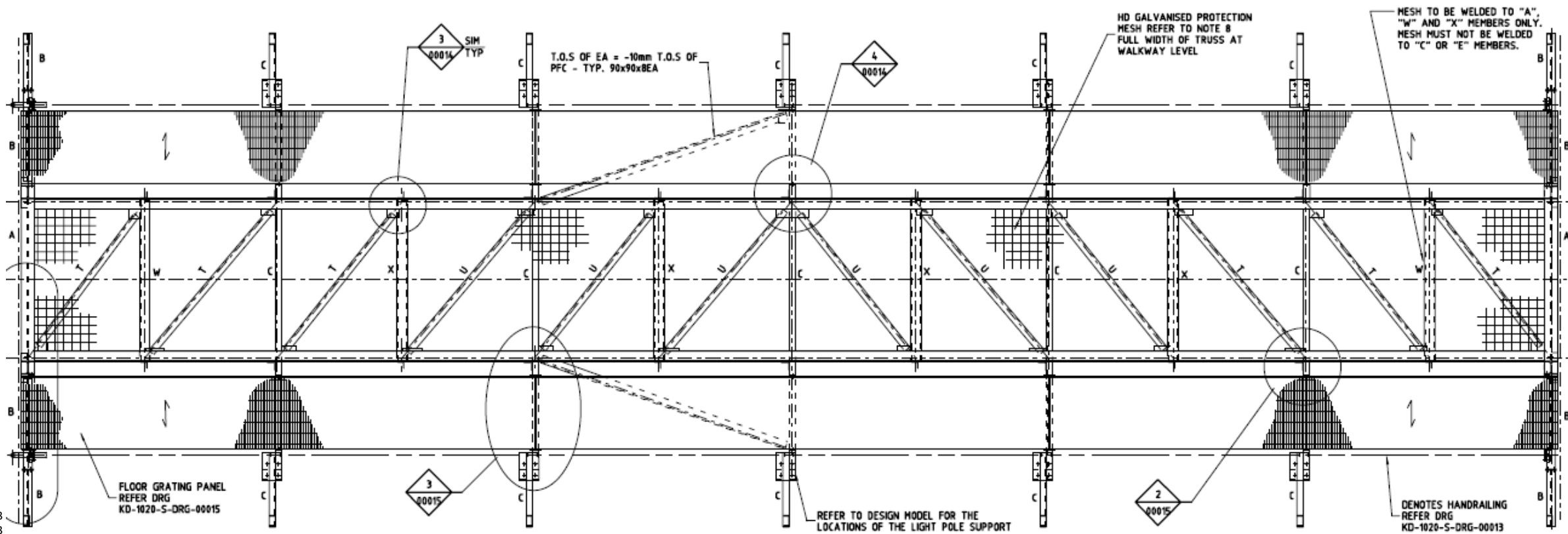
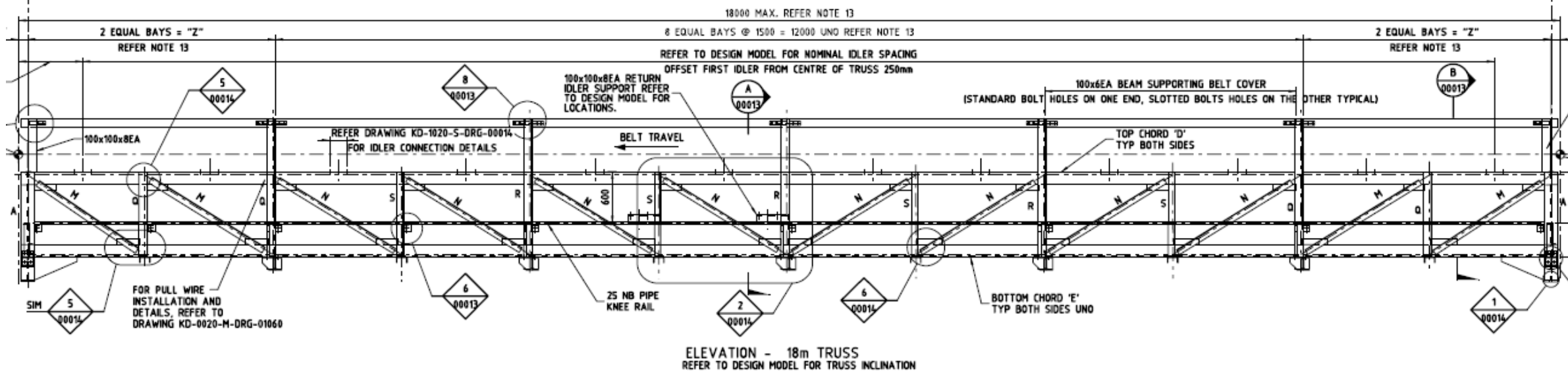
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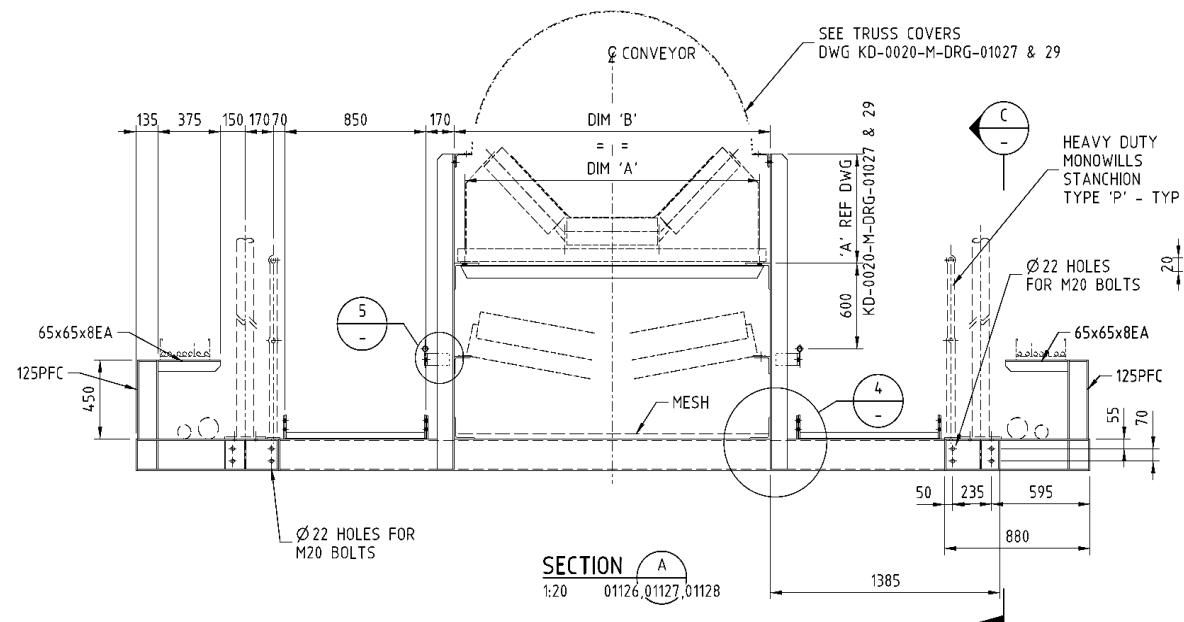
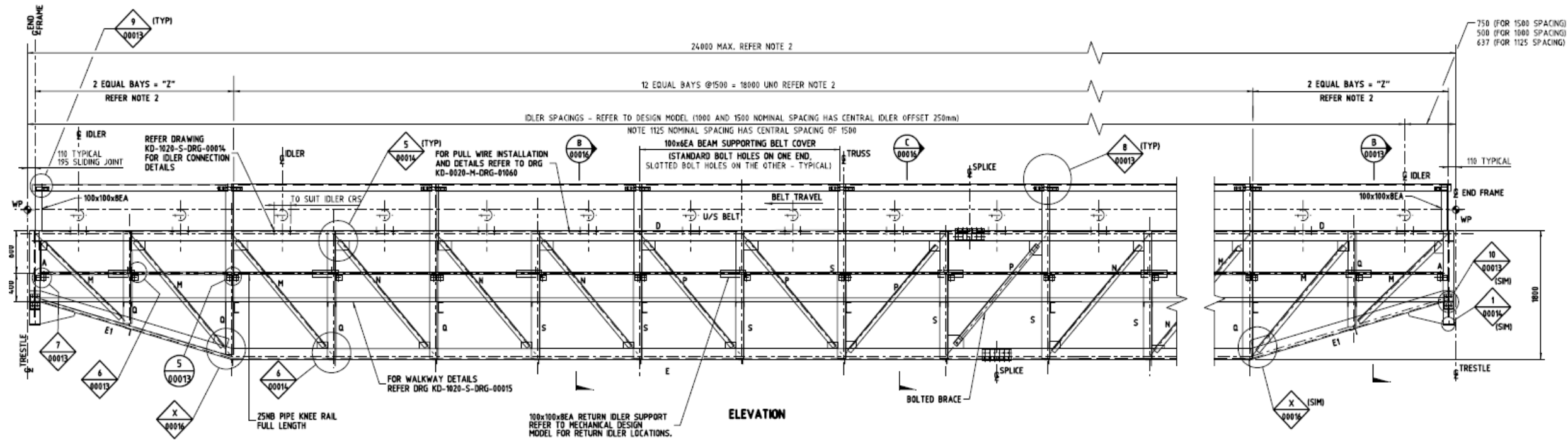


Parametric Utility for Conveyor Design

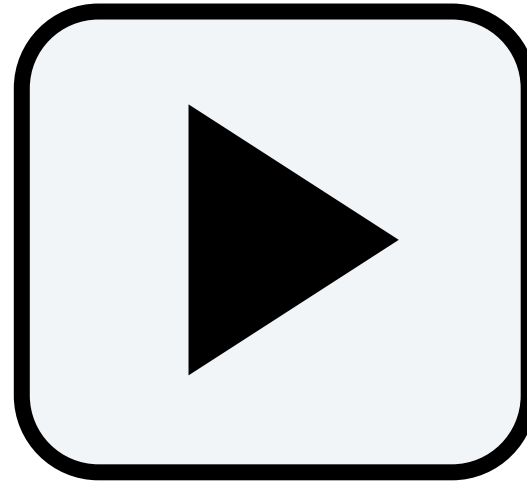


**MODELLING CONVEYORS
IN RIO TINTO'S AVEVA E3D**





Parametric Utility for Conveyor Design



Paul Rushton

Manager – Digital Delivery



Rio Tinto

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State your name and company.



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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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