AVEVA Everything 3D

A Unified Engineering and Design Approach

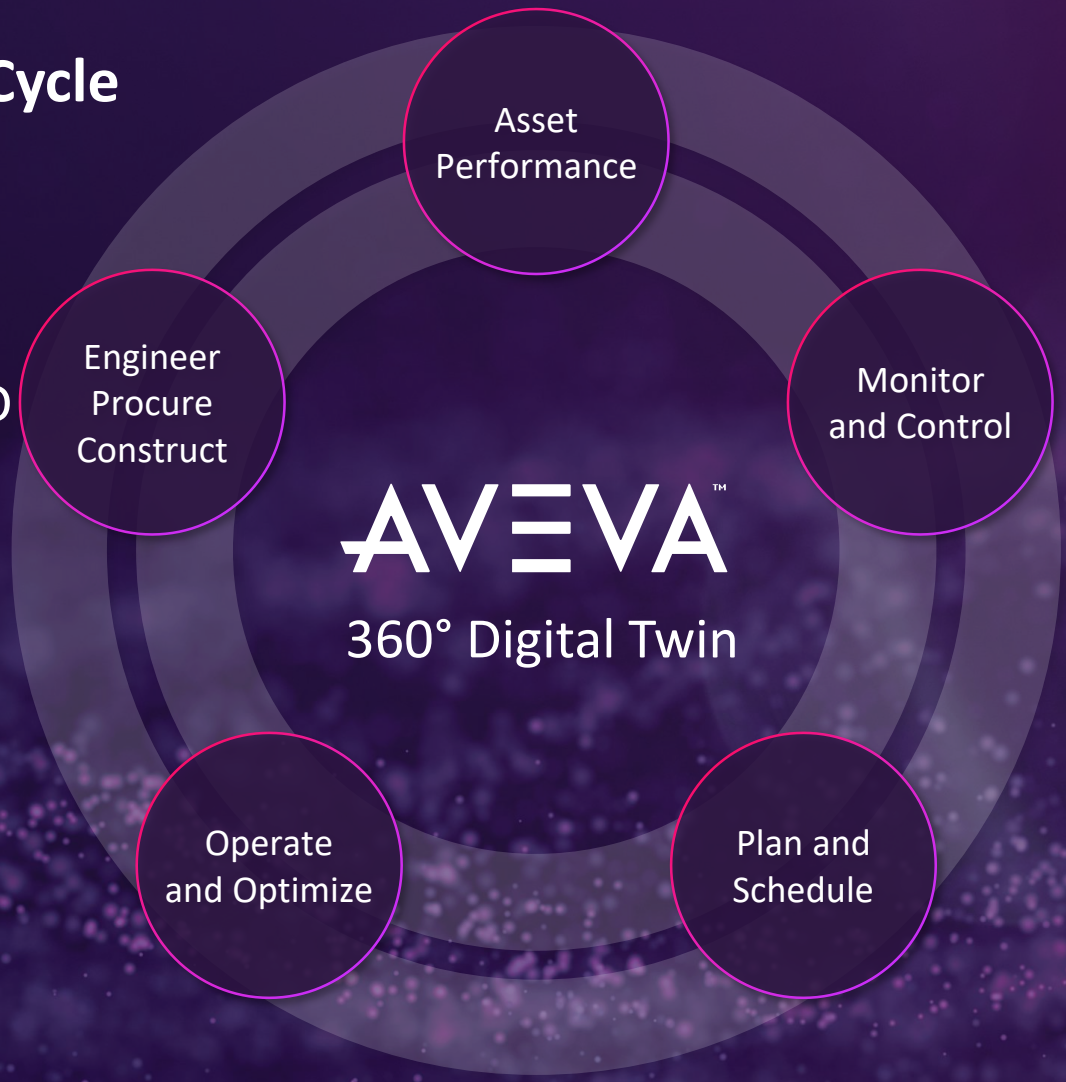
Jen Sargianis—Technical Consultant

September 2020

Asset Life Cycle

Improve Return On Capital

AVEVA E3D



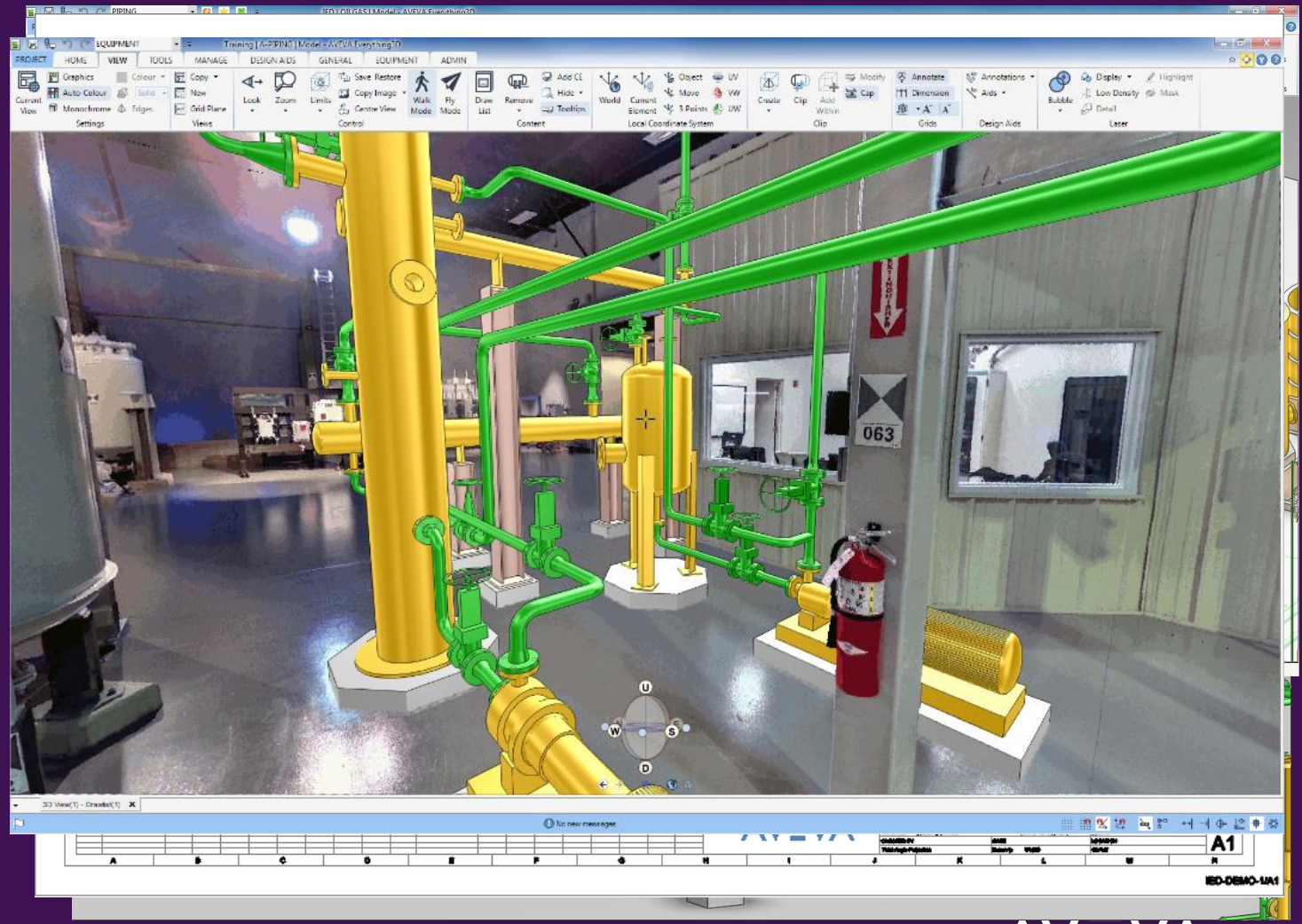
Operations Life Cycle

Improve Profitability

AVEVA™

What is AVEVA Everything 3D?

- Object & Data Based Design
- Multi-user and Multi-discipline Concurrent Design
- Built on a power graphics engine and intuitive user interface
- Ensures consistent, reliable, clash-free design
- Rapid and correct deliverable creation
- Fully integrated Laser Data Capabilities

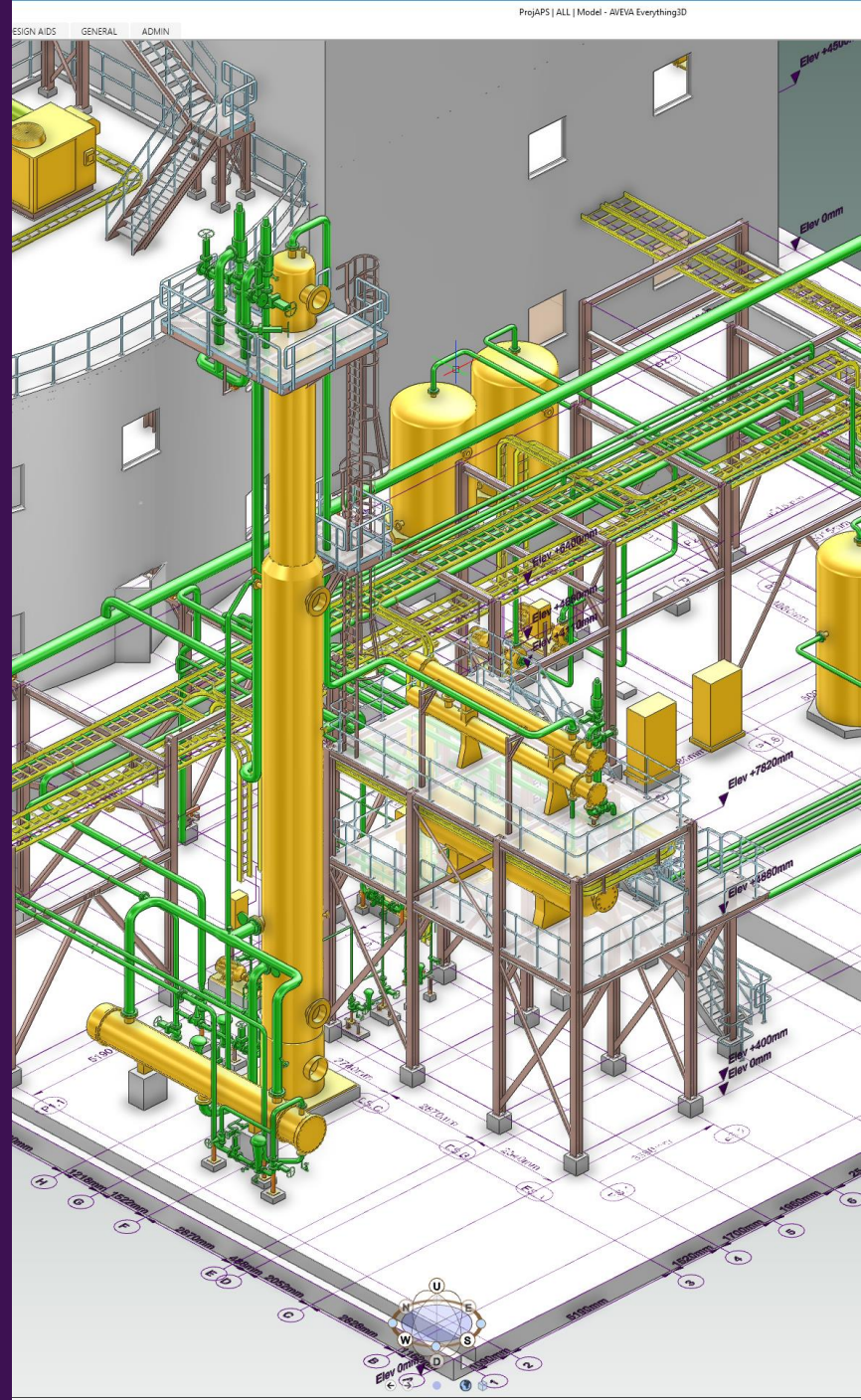


What is included in AVEVA E3D?

What is in AVEVA Everything 3D?

Multi-Discipline Design

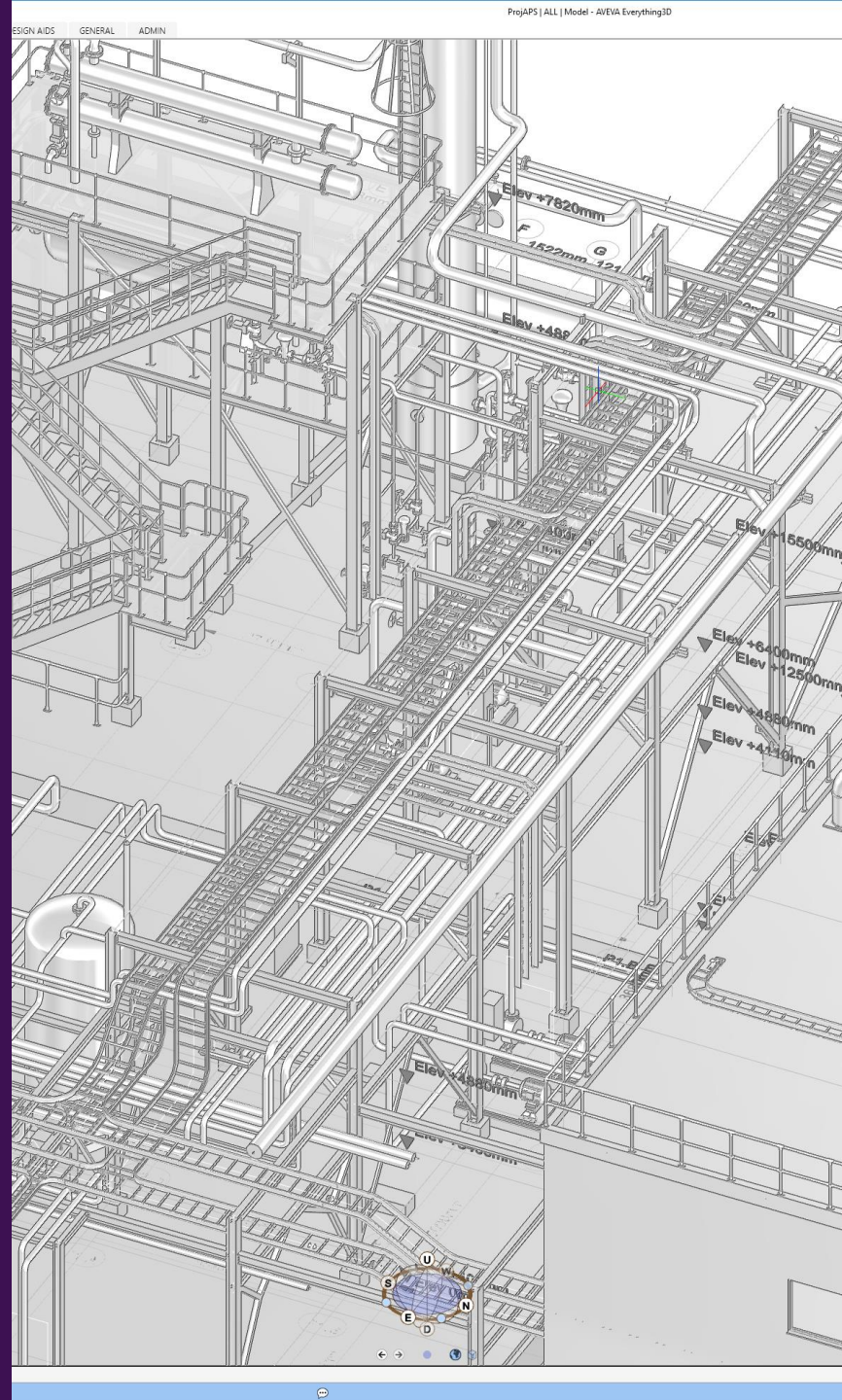
- Piping Catalogues & Specifications
- Structural Layout
  - Catalogues and Specifications
  - LOD 300-350
- Equipment
  - Process, Mechanical and Electrical
- HVAC, Mining & Terrain, Multi-Discipline Supports
- Cableway, Cable Tray, Cable Design
  - Direct Integration with AVEVA Instrumentation & Electrical for automatic cable routing
  - Pass back Cable Design Lengths for complete Cable Schedule



What is in AVEVA Everything 3D?

Deliverable Creation

- Automatic Reporting:
  - Lists
  - Status Reports
  - Progress Reports
- 2D Drawings
  - Plant Layout
  - Piping Isometrics
  - Equipment Layout
  - Automatic Drawing Production
  - Automatic Support Drawing Production



AVEVA E3D

Catalogues & Specifications and Templates

HVAC Catalogs

- 3 User Defined Fitting Specs
- 1 Penetration Spec
- 1 "SPIRO Duct" Spec
- 19 Duct Insulation Specs
- 21 HVAC Detailing Specs
- 758 Components
- 2 Shapes
- 32 Fittings

Piping Catalogs

- 6 Layout Specs
- 12 Design Specs
- 25 Insulation & Tracing
- 3 Bolting Specs
- 2 PSI Specs
- 3 Pipe Fabrication Specs
- 4 Surface Treatment Specs
- 2 Miscellaneous Specs
- 45,947 Components

Steelwork Catalogs

- 11 National Standard Specs
- 76 Components
- 14,7050 Shapes
- 843 Fittings

Equipment Catalogs

- 19 Specs
- 38 Components

Electrical Catalogs

- 285 Specs
- 23,973 Components

Mining Catalogs

- 12 Specs
- 56 Components

Supports Catalogs

- 24 Specs
- 331,407 Components
- 172 Shapes
- 74 Fittings

Drawings

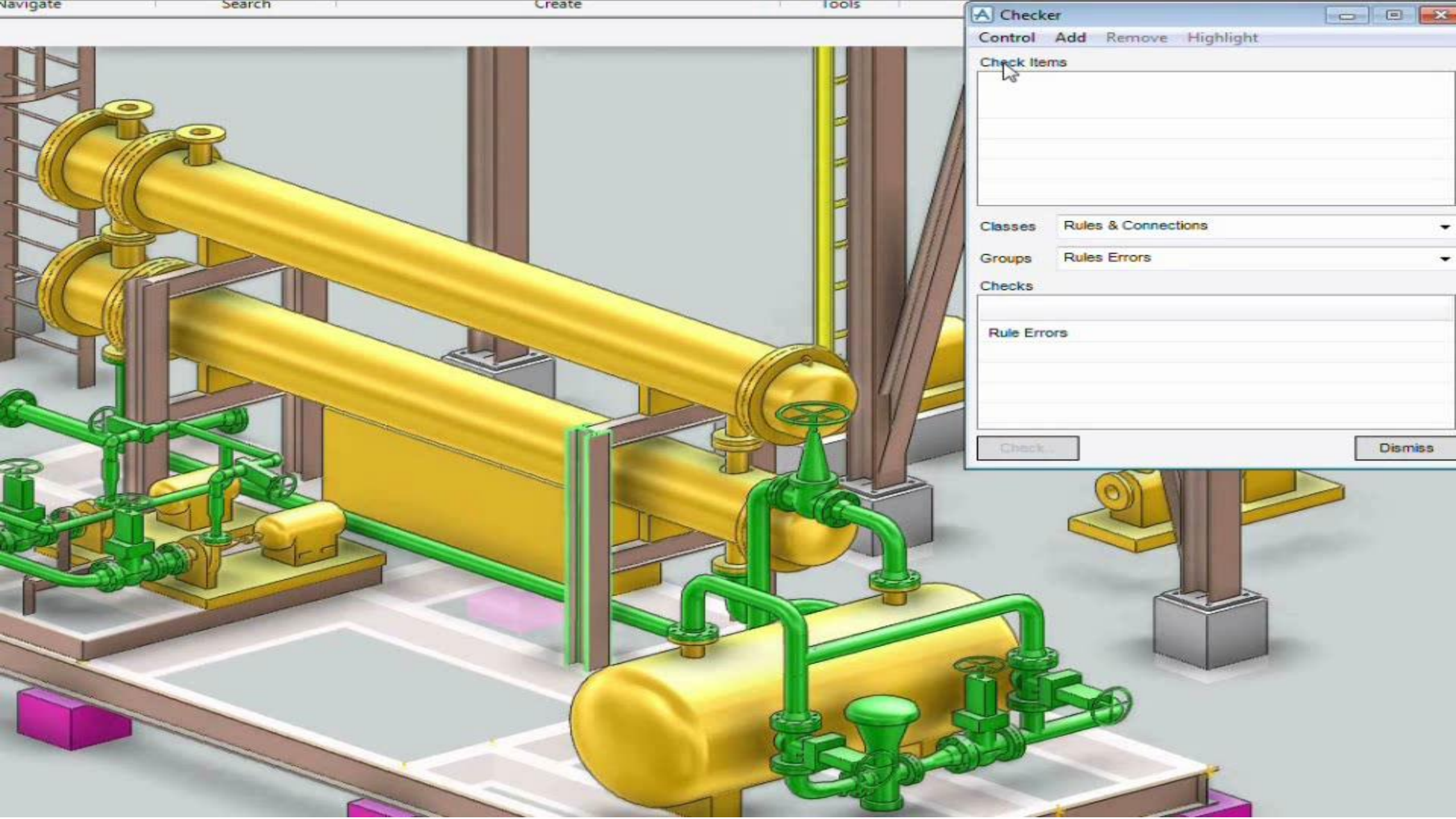
- 15 Report Templates
- 5 Isometric Drawing Configurations
- 45 Drawing Templates (Imperial & Metric sizes, drawing standards-fonts & line styles)
- 29 Backing Sheets
- 170 Label Templates
- 280 Symbol Templates

Data Dictionary

- 5,092 User Defined Attributes
- 300 User Defined Element Types

Modeling

- 25 Mechanical Equipment Templates
- 68 Mining Equipment Templates
- 600 Support Frameworks
- 1,517 Support Hangers

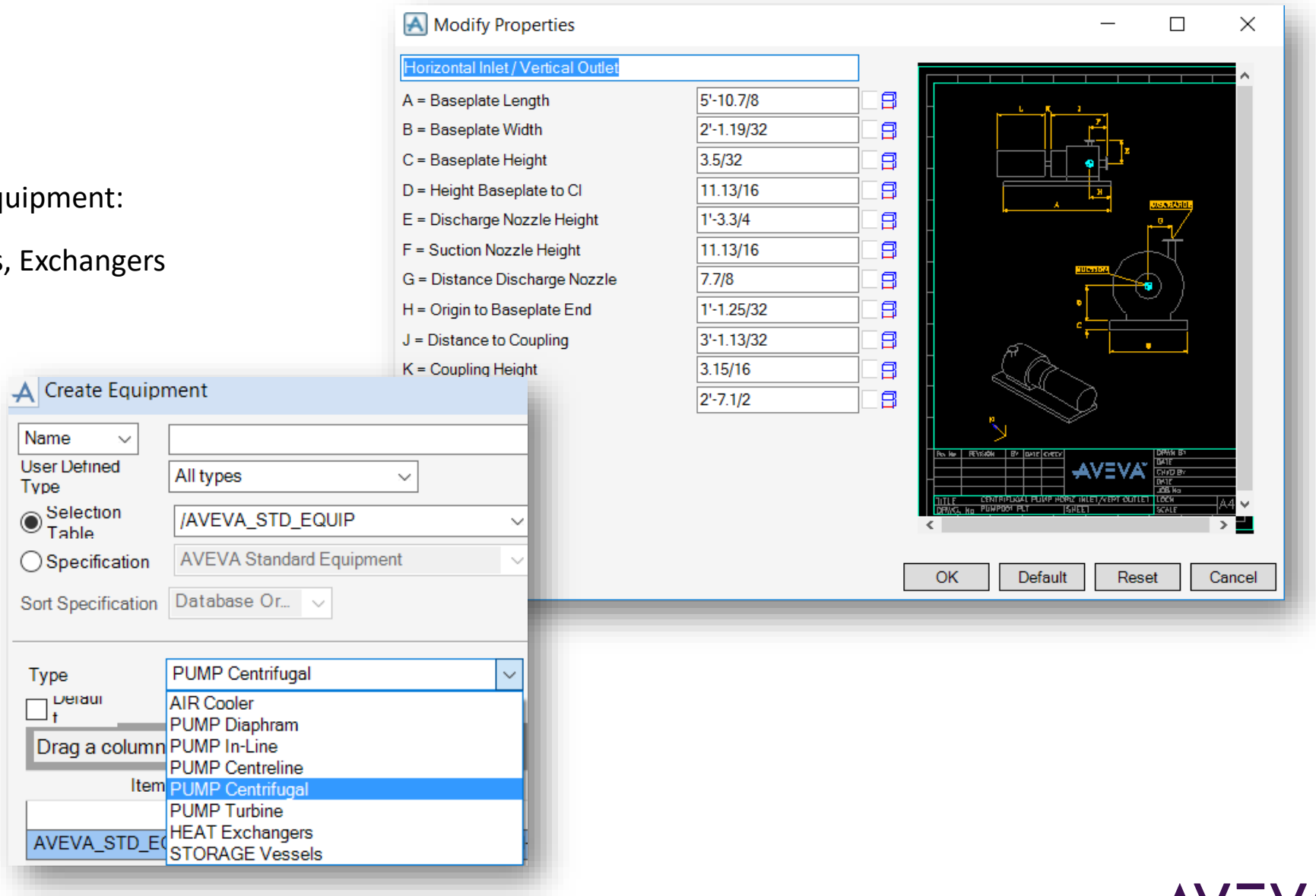

Navigate
Search
Create
Tools
Checker
Control
Add
Remove
Highlight
Check Items
Classes
Rules & Connections
Groups
Rules Errors
Checks
Rule Errors
Check...
Dismiss

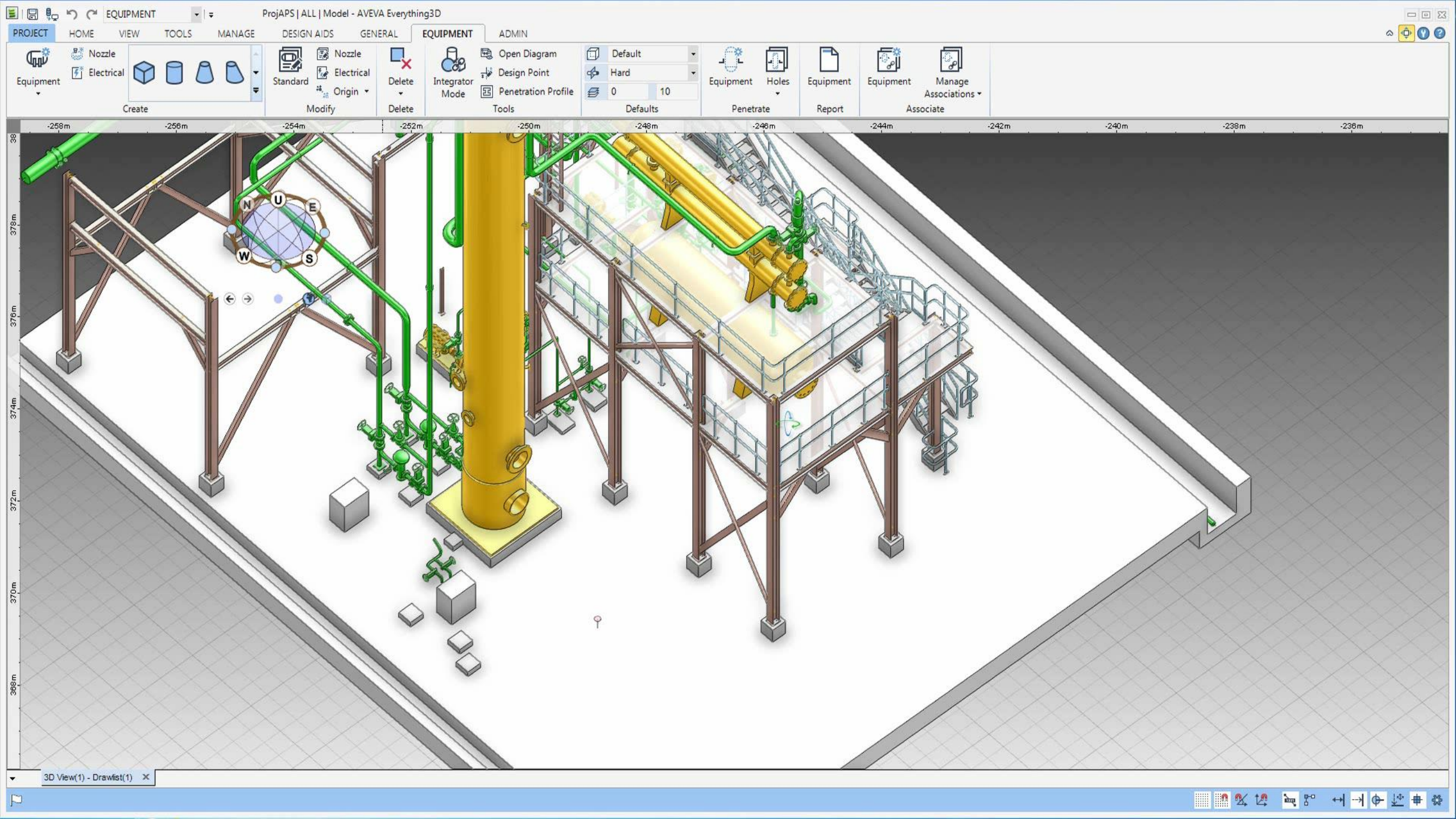
AVEVA E3D

Equipment Standards

AVEVA Standard Parameterized Equipment:

- AVEVA Pumps, Tanks, Columns, Exchangers




EQUIPMENT
ProjAPS | ALL | Model - AVEVA Everything3D
PROJECT
HOME
VIEW
TOOLS
MANAGE
DESIGN AIDS
GENERAL
EQUIPMENT
ADMIN
Equipment
Nozzle
Electrical
Create
Standard
Nozzle
Electrical
Origin
Modify
Delete
Delete
Integrator Mode
Open Diagram
Design Point
Penetration Profile
Tools
Default
Hard
0
10
Defaults
Equipment
Holes
Penetrate
Equipment
Report
Equipment
Manage Associations
Associate
-258m
-256m
-254m
-252m
-250m
-248m
-246m
-244m
-242m
-240m
-238m
-236m
378m
376m
374m
372m
370m
368m
N
U
E
W
S
3D View(1) - Drawlist(1)

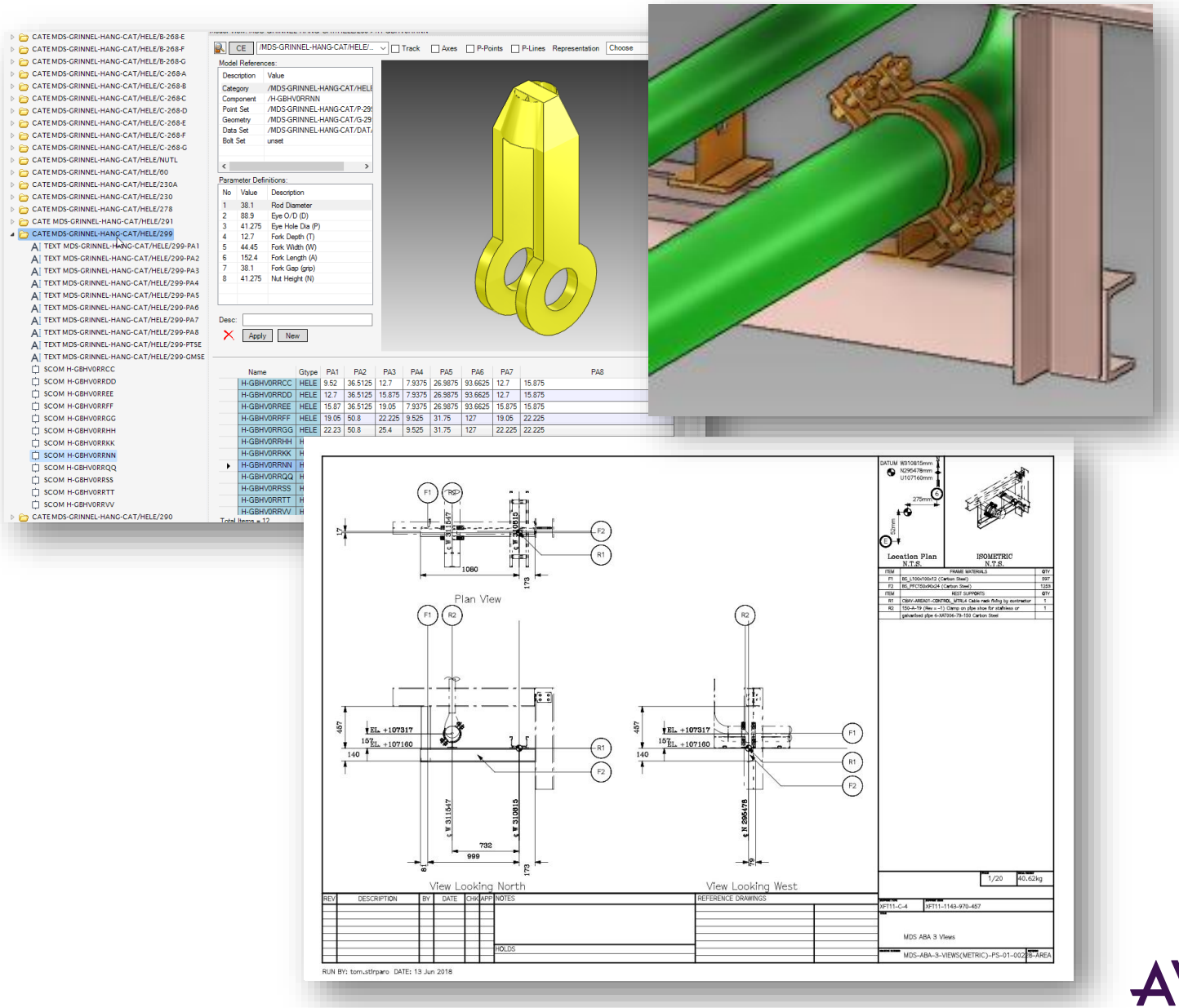
AVEVA E3D

Support Standards

AVEVA Supports

- Lisega
- Pipe Supports Limited
- Carpenter & Patterson
- Anvil (*Grinnell*)

- Automatic Drawing Production for supports and hangers



AVEVA E3D HVAC

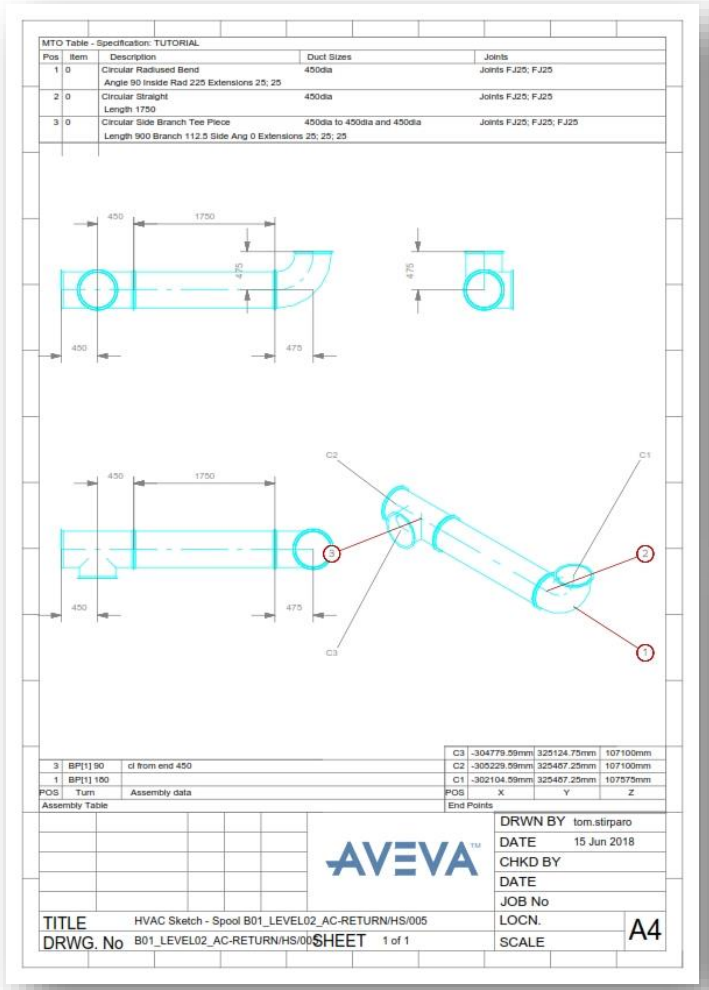
Specs & Catalogs

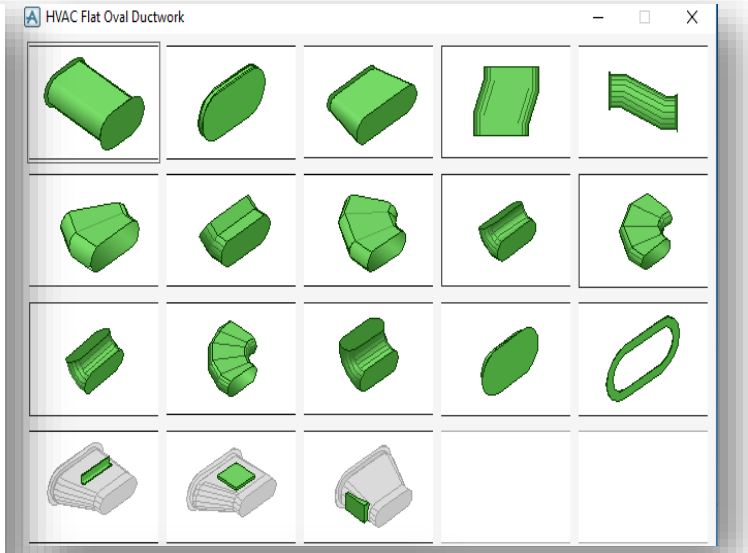
Multi Specs and Catalogs:

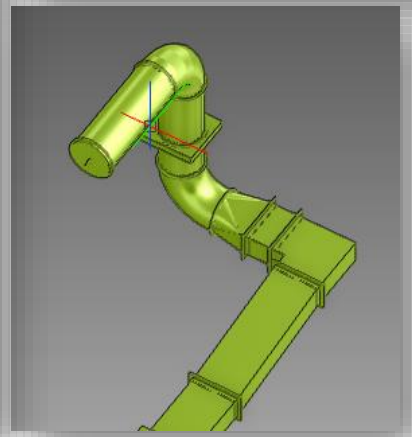
- AVEVA HVAC Spec
- AVEVA HVAC Insulation
- AVEVA HVAC Penetration
- Catalogues include Branches, Rectangular, Circular, Flat Oval, Transformations, Branch Connectors, Joints, Stiffeners, Inline Equipment

HVAC Sketches:

- HVAC Sketches can be generated automatically in the DRAW module







AVEVA E3D

Cable Tray, Conduits & Cabling Standards

Cable Tray Specs and Catalogs

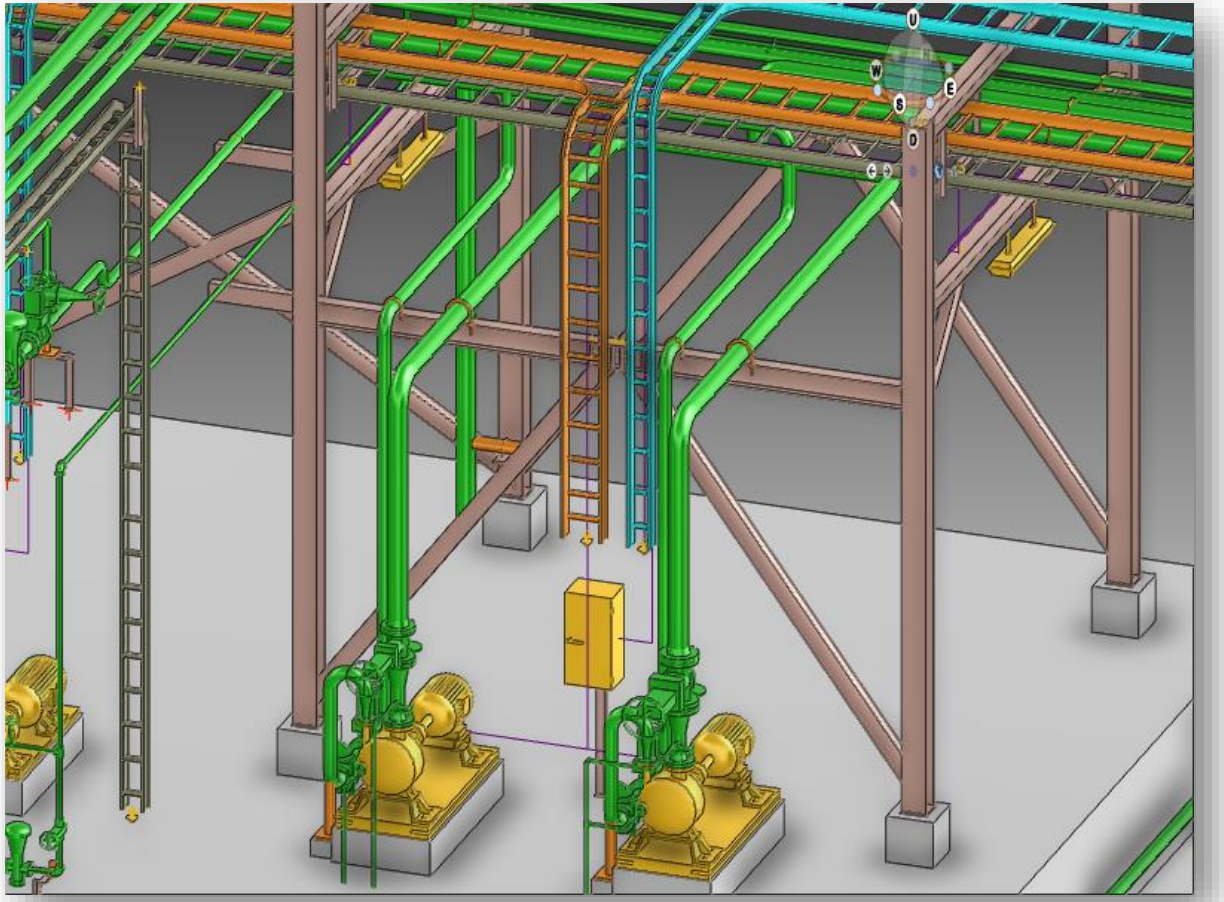
Cable Tray Specs

- Cablofil
- Vantrunk
- Legrand
- Oglaend
- Salamandre
- Comm Cables
- Signal Cables
- Power Cables
- Control Cables
- Wire Cables
- Catalogs include:
  - Straights, Bends, Elbows, Reducers, Tees, Crosses

Conduit Specs

Allied ARC

Allied GRC

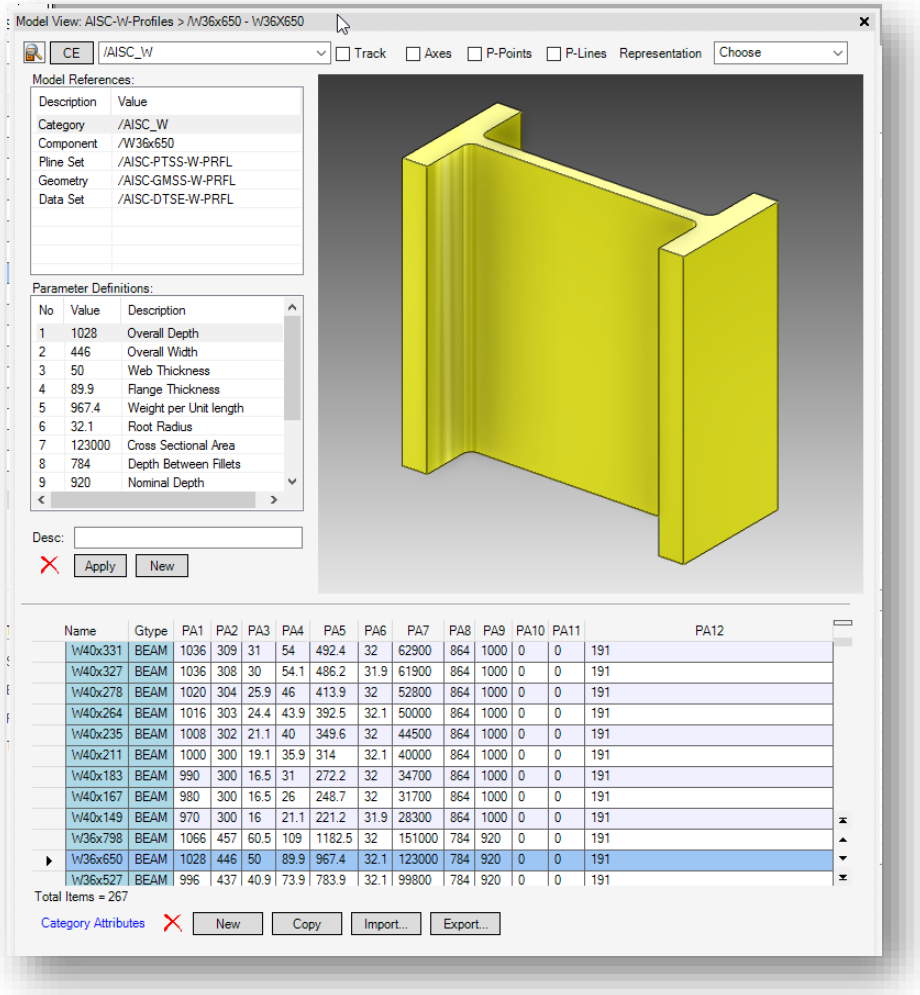


AVEVA E3D

Steelwork Standards

AVEVA Structural specs include

- American Profiles
- Australian & New Zealand STD Profiles
- British Profiles
- Canadian Profiles
- Chilean Profiles
- Chinese Profiles
- European Profiles
- Indian Profiles
- Japanese Profiles
- Russian Profiles
- South African Profiles
- Swedish Profiles

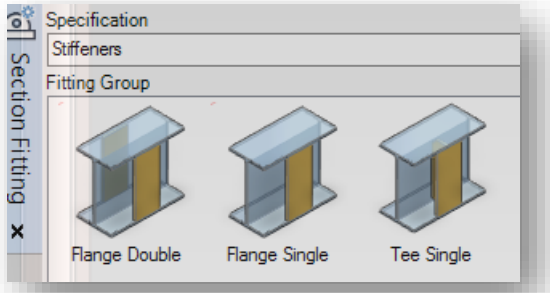


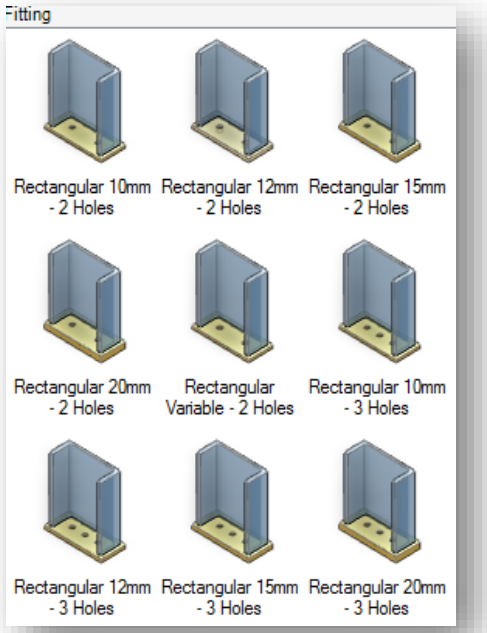
AVEVA E3D

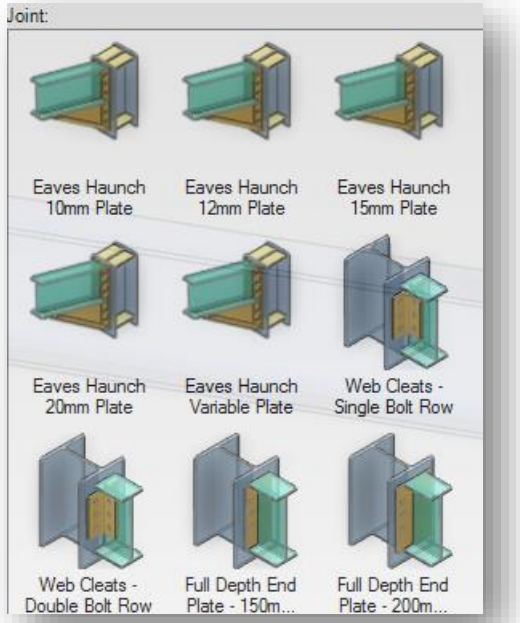
Steelwork Catalog Component

AVEVA Structural specs also include

- Joints
- Architectural Fittings
- Non-Standard (Plate Girders)
- Plate (Grating)
- Walls (Brick, Concrete)



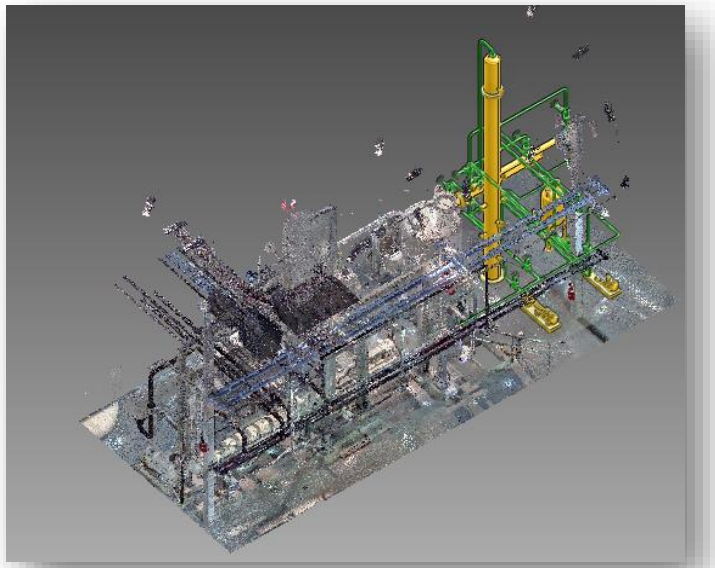




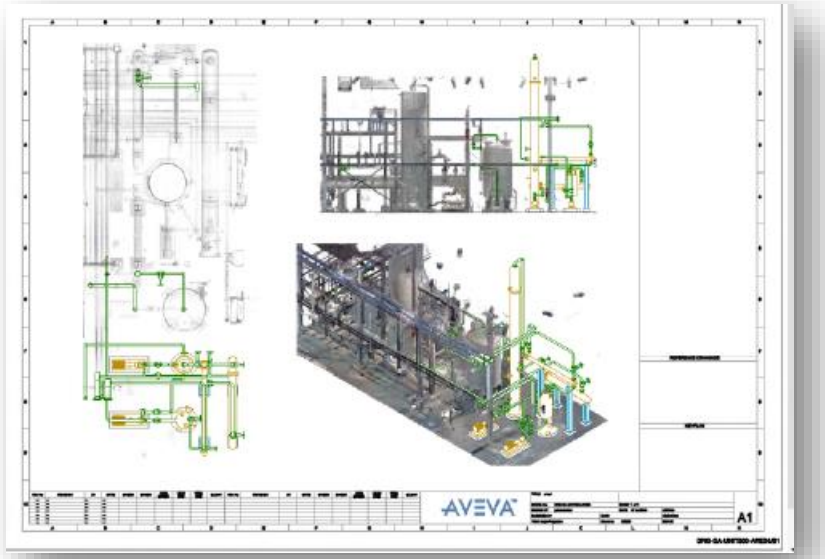
AVEVA E3D

Draw Deliverables

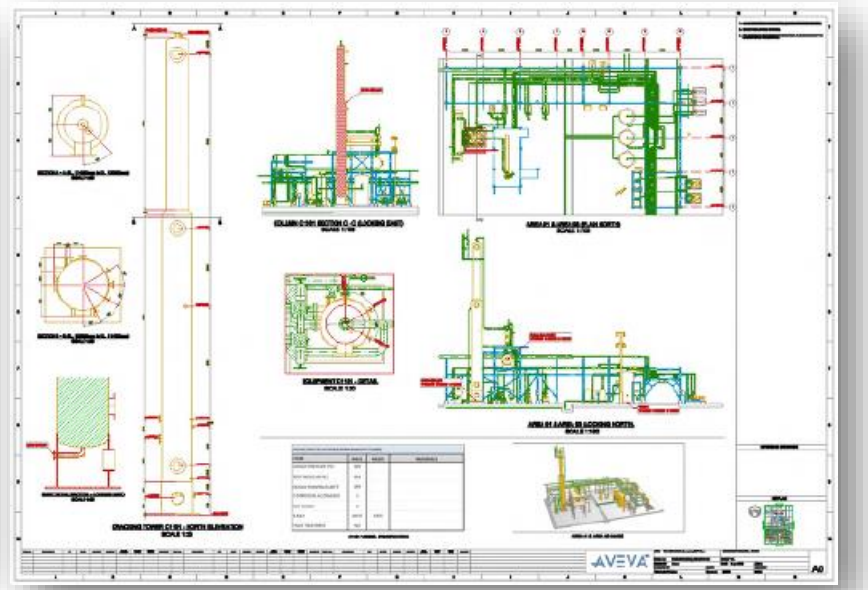
- Discipline arrangement drawings are generated from the intelligent design items.
- Laser Data can be added and annotated on the arrangement drawings.

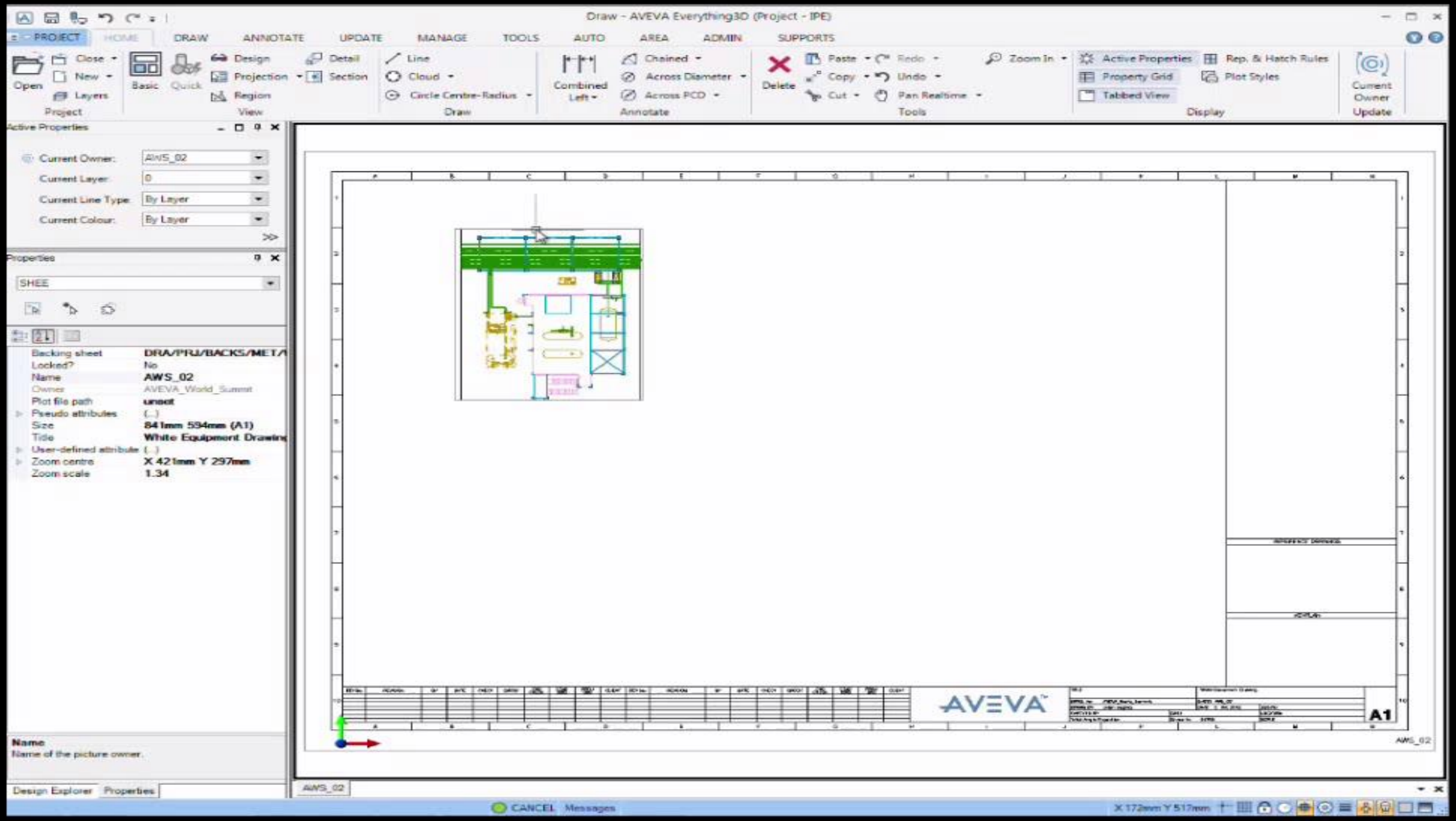


Laser Data and 3D Model shown in the Model Module.



Laser Data and the 2D Design shown on an arrangement drawing

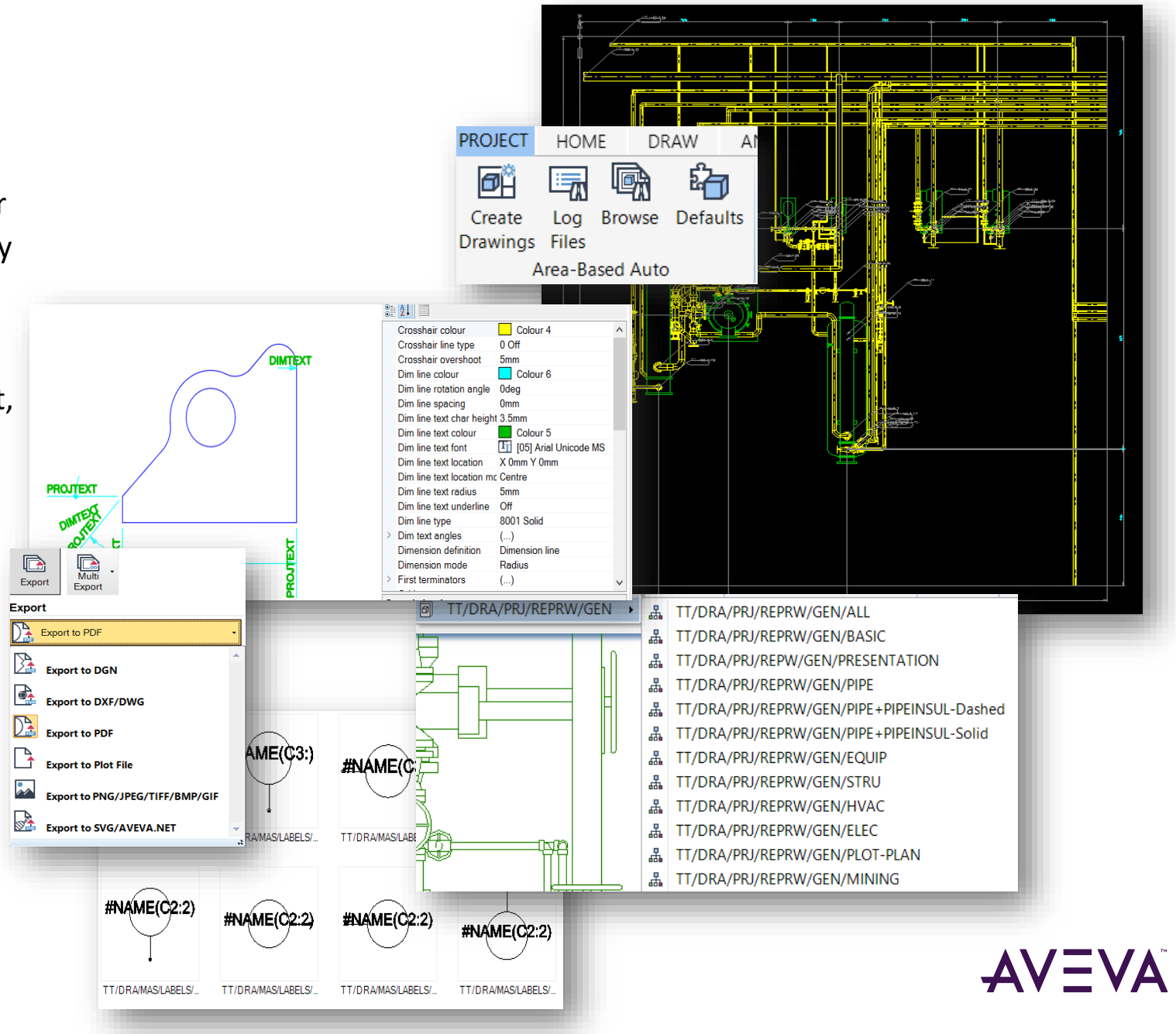



Draw - AVEVA Everything3D (Project - IPE)
PROJECT
HOME
DRAW
ANNOTATE
UPDATE
MANAGE
TOOLS
AUTO
AREA
ADMIN
SUPPORTS
Open
Close
New
Layers
Project
Basic
Quick
Design
Projection
Region
Detail
Section
View
Line
Cloud
Circle Centre-Radius
Draw
Combined
Chained
Across Diameter
Across PCD
Annotate
Delete
Paste
Copy
Cut
Redo
Undo
Pan Realtime
Zoom In
Tools
Active Properties
Property Grid
Tabbed View
Rep. & Hatch Rules
Plot Styles
Display
Current Owner
Update
Active Properties
Current Owner: AWS_02
Current Layer: 0
Current Line Type: By Layer
Current Colour: By Layer
Properties
SHEE
Backing sheet DRA/PRJ/BACKS/MET/
Locked? No
Name AWS_02
Owner AVEVA_World_Summit
Plot file path unset
Pseudo attributes (...)
Size 841mm 594mm (A1)
Title White Equipment Drawing
User-defined attribute (...)
Zoom centre X 421mm Y 297mm
Zoom scale 1.34
Name
Name of the picture owner.
Design Explorer
Properties
AVEVA
A1
AWS_02
CANCEL
Messages
X 172mm Y 517mm

AVEVA E3D

Draw Deliverables

- Area based automatic drawing production for Discipline arrangement drawings functionality is available for companies to configure per their drawing generation requirements.
- Intelligent Label Libraries for Pipe, Equipment, Loops, Columns, Geodetic and Datum Elevations, etc.
- Representation Styles for discipline specific arrangement drawings.
- Visual Styles for Dimensions Labels, etc.
- Drawing Export Formats

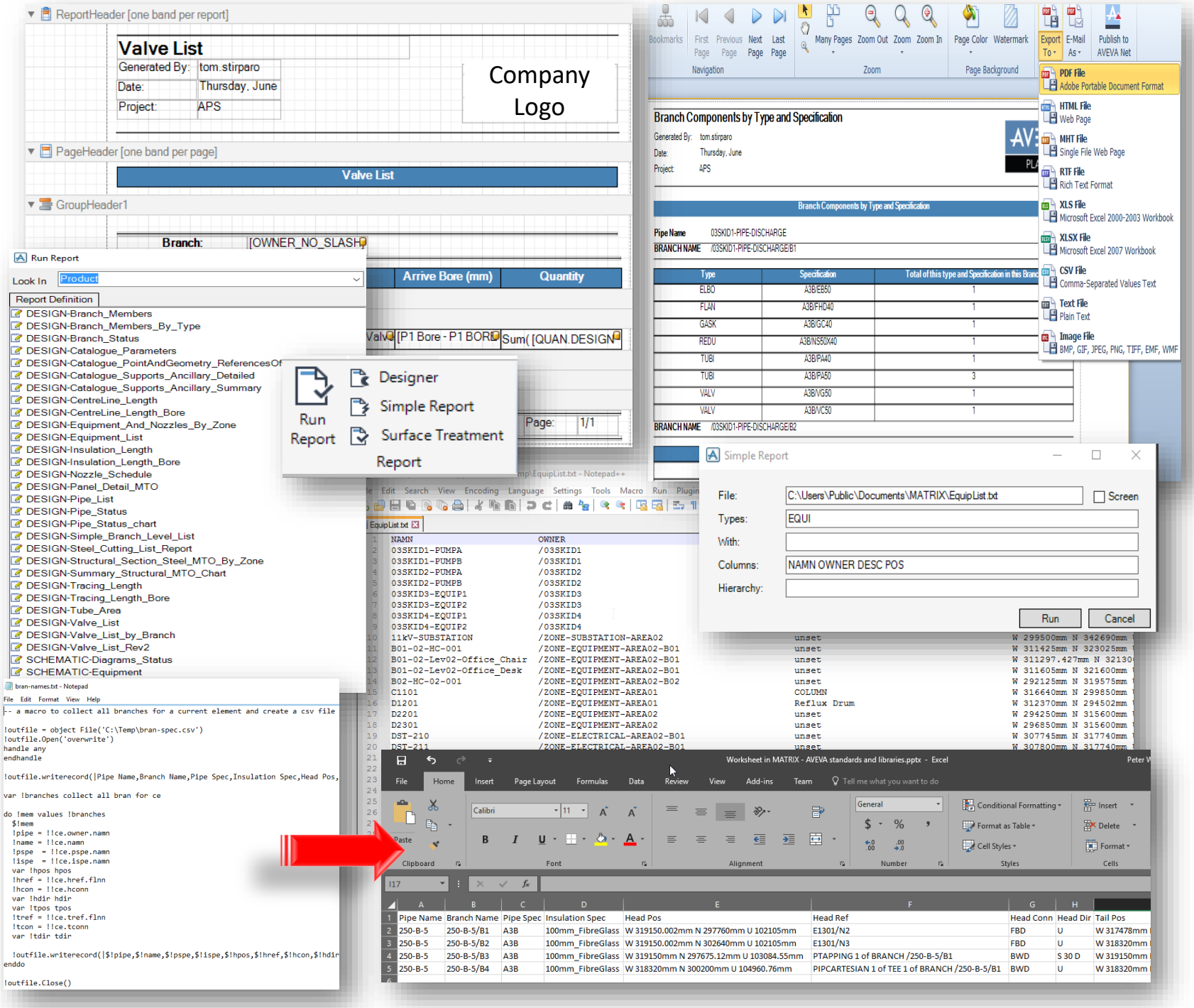


AVEVA E3D

Reports & Templates

Reporting Templates & Options

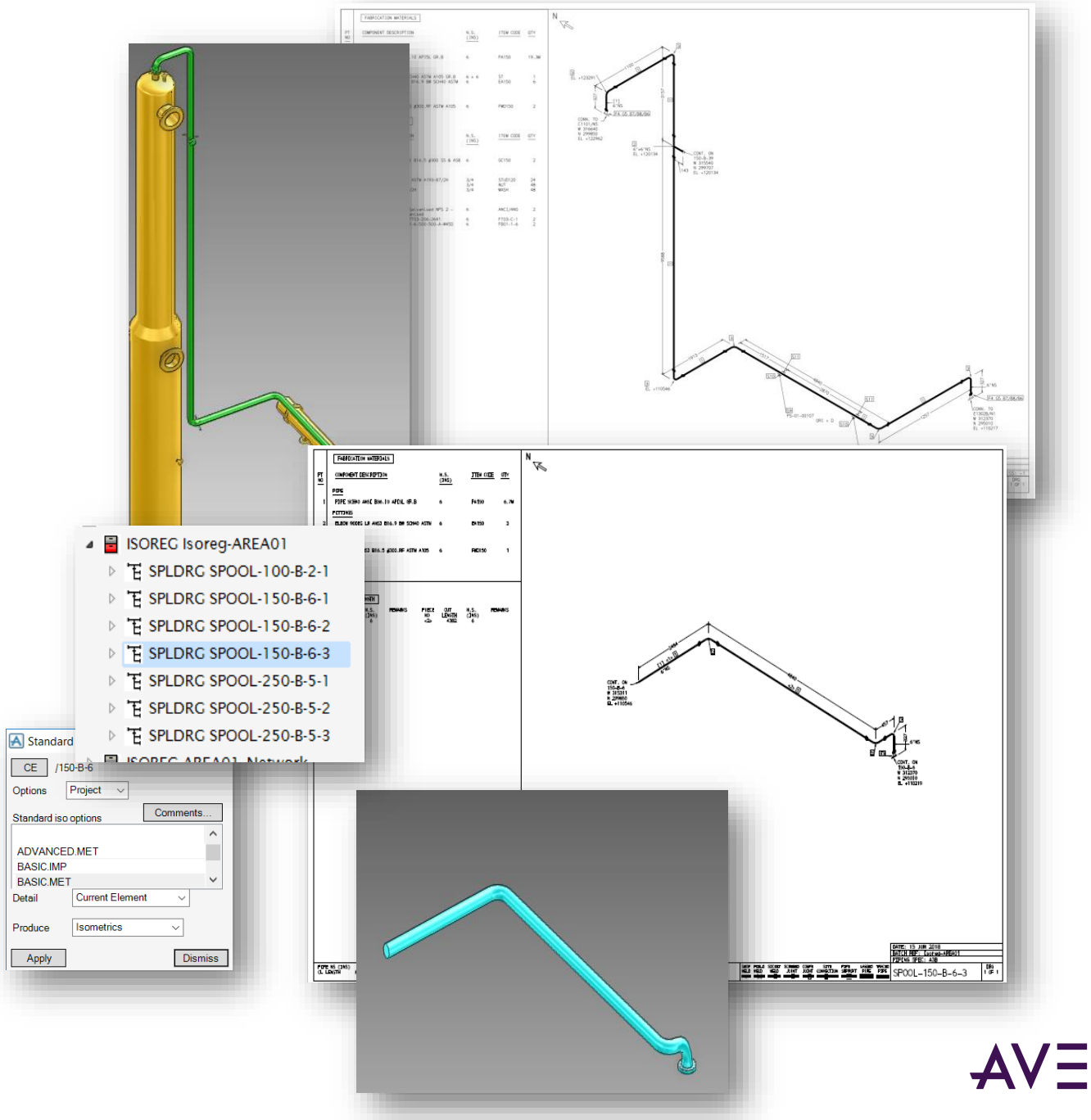
- 28 Report Templates, execute and export to multiple formats.
- Simple Reports
- Search Grids Exported to Excel
- Create Company Corporate or Project Report Templates with Report Designer
- Create a Programable Macro Language (PML) macro to generate a report



AVEVA E3D

Isometrics & Spool Drawings

- Standard and System Isometrics can be automatically generated from company or project specific Isodraft Option Files.
- Options files format the look and content of the isometrics including borders, bill of material, dimensioning, etc.
- Pipe spools can be defined in the SPOOL Module and SPOOL Drawings can then be generated.

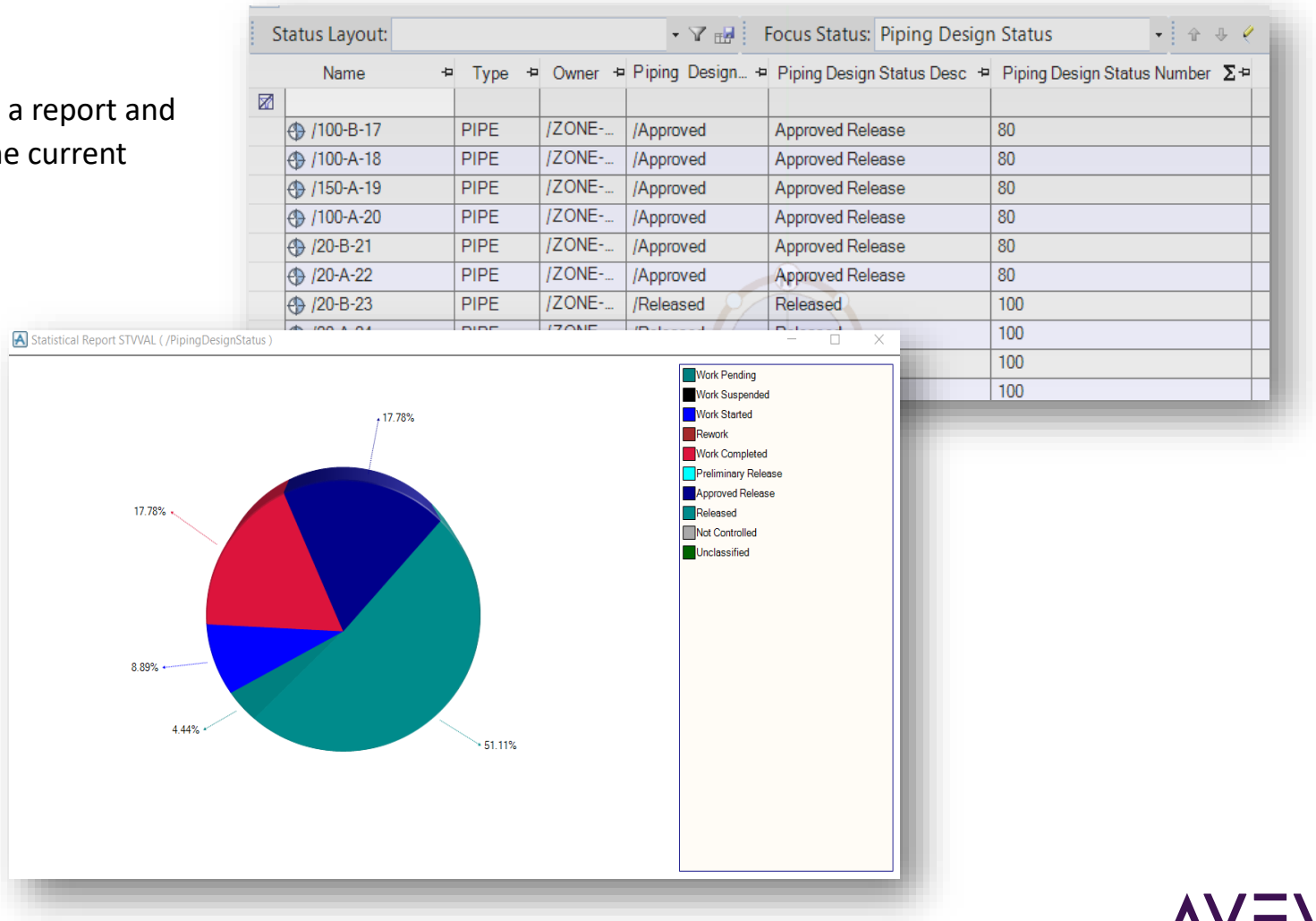


AVEVA E3D

Reports, Status Control

Status Reporting Options

- The Status grid can be exported to Excel to create a report and many types of charts can be produced showing the current status of the design elements.



AVEVA E3D

Import & Export options

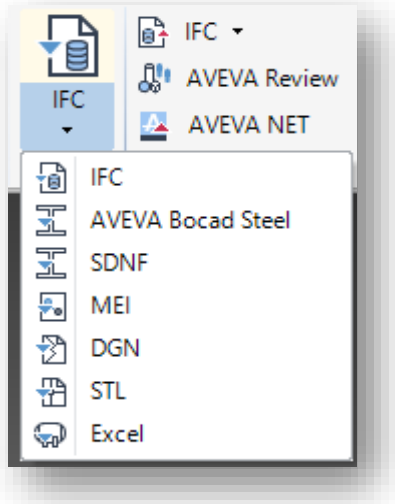
Import:

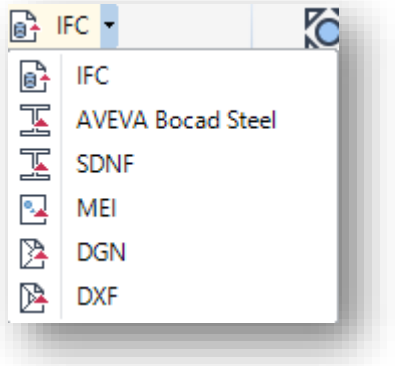
- IFC, AVEVA Bocad Steel, SDNF, MEI, DGN, STL, Excel

Export:

- IFC, AVEVA Bocad Steel, SDNF, MEI, DGN, DXF

Note: STEP AP203 .STP files can be imported and exported via MEI *(Mechanical Equipment Interface)*



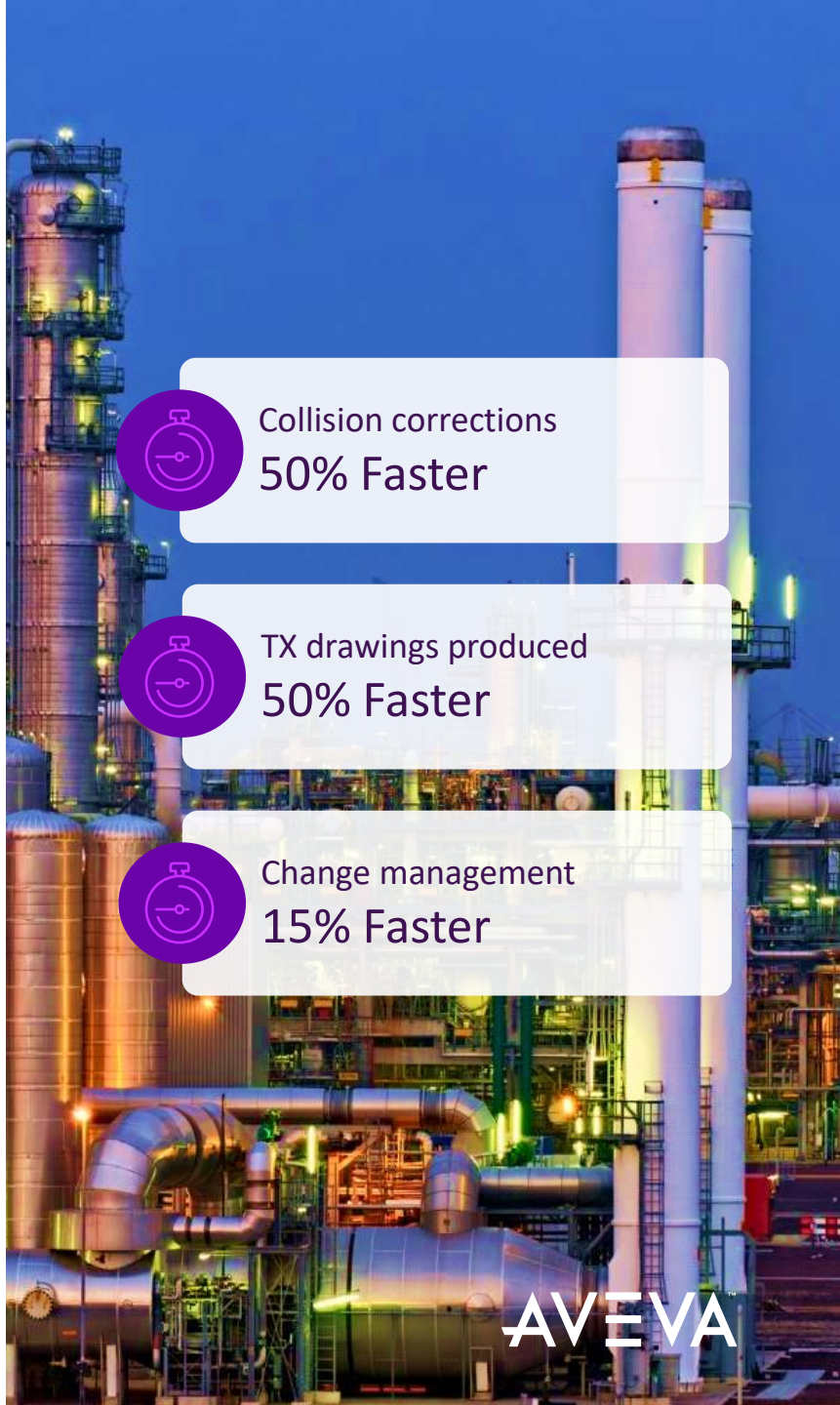


NIIK

Efficient Engineering and Design

- Challenges
  - Information transfer between departments
  - Opaque processes at the design supervision stage
- Solution
  - Improve plant safety for all
  - Instil greater confidence in the operator
  - Unite the company in their approach to implementing change
  - Streamline the procurement process
  - Deployment **of AVEVA Everything 3D (AVEVA E3D), AVEVA Bocad, AVEVA Engineering, AVEVA Diagrams, AVEVA Instrumentation, AVEVA Electrical**
- Results
  - Collision corrections are 50% faster
  - TX drawings are produced 30% faster
  - Changes as a whole are managed 15% faster
  - Working relationships were greatly improved
  - Updates are communicated automatically instead of tracked manually
  - Progress is easily monitored and controlled at all stages of design and construction

View case study



ATKINS

Member of the SNC-Lavalin Group

EPC Contractor in Australia

- Used for the Varanus Island Compression Project for Apache Energy
  - Complex greenfield project with brownfield tie-ins
- Chose AVEVA E3D Specifically for it's tight integration with Laser Scan Data
- 3D Data Capture integration allows for familiarization of hazardous or difficult access sites
- Originally a 14-week schedule with 8,500 estimated man-hours delivered in 13 weeks

Follow Up Availability:

October 12th, 13th or 14th