

Exhaust Control Industries

Protecting our urban environment for over 30 years



ECI Corporate Presentation



M e l b o u r n e • S y d n e y • B r i s b a n e • A s i a P a c i f i c

About ECI Australia



- Over 30 years of experience in design and manufacture of control solutions that reduce unwanted exhaust and noise emissions.
- Design catalysts for the Mining, Construction, Power Generation, Oil and Gas, Road Transport, Industry, Rail, Marine and Passenger Car markets.
- Full Service offering : Select, Size, Supply and Service.
- Exhaust test facility, capable of testing off-road, on-road and stationary engines up to 900HP with '5-gas' emission testing capability.



Geography

- ECI's geographical market extends to a wider definition of Australasia.
- Includes Indonesia, PNG, the Pacific Islands and New Zealand.



ECI Facilities



- Mordialloc, Victoria –
 - Manufacturing facility and head office: 2200m²
 - Engine Test Facilities: 750m²
- Huntingdale, Victoria –
 - Heavy Engineering and Acoustic Enclosure manufacturing facility: 3420m²
- Brisbane, Queensland –
 - Factory and office: 750m²
- Total: 7120m²
- In addition, we have technical and sales representation in WA and Jakarta.
- Total employee count: 44

ECI Technology & Products



- ECI design, manufacture and supply a range of emission and noise control products:
 - Selective catalytic reduction for NO_x reduction
 - Catalyst systems for CO, HC, PM and NO_x reduction (lean burn and rich burn engines)
 - Passive and active diesel particulate filtration systems for stationary and off-road equipment
 - 2-stage diesel particulate catalyst systems
 - Exhaust waste heat recovery – hot water/steam service
 - Acoustic enclosures, modular panel systems and/or plant room acoustic treatment
 - Ventilation systems for air handling
 - Fuel systems including tanks, pipework and control technology
 - Full mechanical installation service available
 - Silencers – exhaust and air handling silencers
 - Emission and noise testing service is also available

Capabilities



- Design
- Project Management
- Installation
- Handover and Training
- Servicing

TURN KEY SOLUTIONS

- Recent projects
- Products to support these projects

Design

- Acoustic assessment - room and exhaust
- Room layouts / sizing
- Backpressure assessment
- Thermal growth and appropriate support structures
- Fuel Systems to meet AS1940, including ECI's own range of PLC fuel controllers
- Emissions control solutions

Project Management

- Project management staff base
 - Melbourne
 - Brisbane
 - Perth

- Happy to travel - local or remote
 - Australia wide
 - PNG
 - Pacific Islands
 - South East Asia and Indonesia

Installations

- Installation teams staff base
 - Melbourne
 - Brisbane
 - Perth (in development)

- Happy to travel - local or remote
 - Australia wide
 - PNG
 - Pacific Islands
 - South East Asia and Indonesia

Exhaust Emission Control Technologies

■ Diesel Engines

- Selective Catalytic Reduction (SCR) Systems for control of NOx
- Diesel Particulate Filters (DPF) for diesel particulate removal (Armourtech™)
- Diesel Particulate 2 Stage Catalyst system for partial Diesel particulate reduction (Predator™)
- Diesel Oxidation Catalyst for carbon monoxide and hydrocarbon reduction



Exhaust Emission Control Technologies



- Gas Engines
 - Stoichiometric/Rich Burn Engines
 - Three way catalyst system for simultaneous reduction of NO_x, CO + non-Methane Hydrocarbons (NMHC) reduction Lean Burn Engines
 - Lean Burn Engines
 - SCR Systems for control of NO_x
 - Oxidation Catalyst for CO and NMHC
 - Methane Oxidation Catalyst for Methane reduction

Comparison Emissions: % Reductions by ECI Product



Emission	DOC	POC	DPF	CDPF	SCR
HC (Hydrocarbons)	80%	85-95%	N/A	70-95%	N/A
CO (Carbon Monoxide)	90%	95%	60%	95%	N/A
NOx (Nitrogen Oxide)	N/A	Up to 10%	N/A	Up to 15%	80-100%
PM (Particulate Matter)	Up to 20%	Up to 70%	Up to 99%	Up to 99%	N/A

Where:

- DOC = Diesel Oxidation Catalyst
- POC = Particulate Oxidation Catalyst (Predator)
- DPF = Diesel Particulate Filter (Armour Tech without DOC)
- CDPF = Catalytic Diesel Oxidation Filter (Armour Tech with DOC)
- SCR = Selective Catalytic Reduction

Note: Actual unit performance will vary, generally within the ranges noted above, depending on actual operating conditions e.g. engine tune, exhaust oxygen content and exhaust temperatures

Southern Projects Operations

- 31-33 Fonceca St Mordialloc
- Paul Earley –Manager Southern Operations – 0412 436 465
- James Millward – Engineering Manager – 0432 550 239
- Manufacturing facility and head office: 2200m²
- Engine Test Facilities: 750m²
- Sales, service, installations, design, manufacture
- ECI Centre of Excellence for product design and emissions control solutions



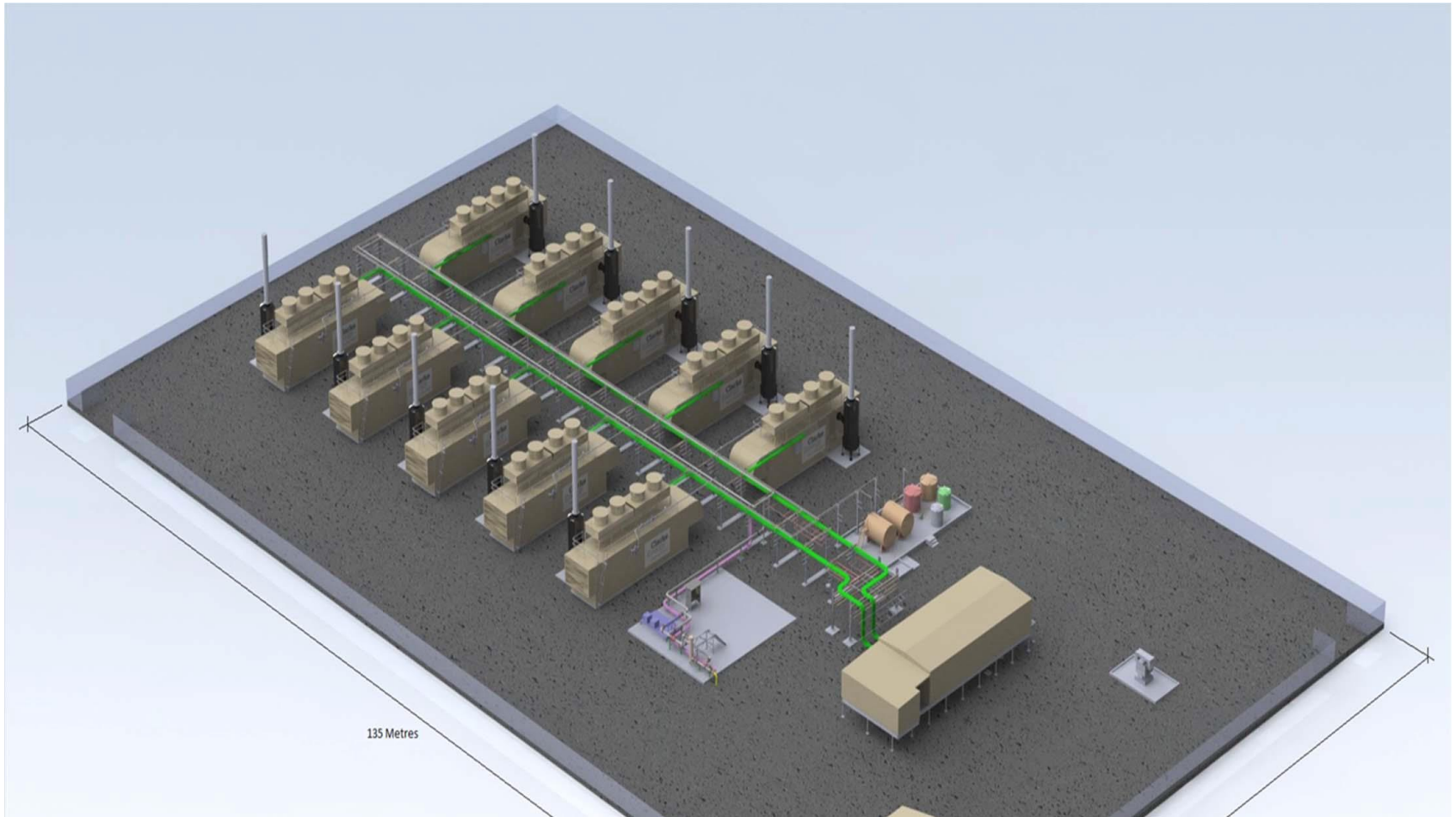
Projects - Acoustic Enclosures & Panels

Clarke Energy Project – REEDY CREEK 2

- Drop Over Enclosure 80 dB(A) @ 1m for JGS 620 Gas Engine with removable end wall
- Size 4m Wide X 3.95m High X 17.9m Long Weight 17 Tonnes
- Construction: 3mm Outer Galvanised Skin with 32Kg/m³ Glass Fibre Acoustic Infill & Galvanised Perforated sheet internal
- Internal structural RHS Frame



Design 30 MW Power Station



EDL – Moranbah Power Station 45MW



Mt Isa Power Station 43 MW



Kenya WTP QLD 21 MW



Roc Oil Power Station – Flare Gas

- 5.5 MW, WA



Dyno Nobel – Moranbah – 21 MW



Projects – PEQ Melbourne

Post Entry Quarantine Facility – Melbourne

Completed designs, drawings Supply and Installation of 3 off acoustic enclosures and equipment as per below to suit Cummins C1675 Gensets.

■ **Enclosures**

- Design, Supply and installation 3 off acoustic enclosures to meet 75db(A) at 1m from walls.

■ **Fuel System**

- Design, Supply and installation of 3 off 10,000lt bulk tank and fuel reticulation system within generator compound.

■ **Exhaust System**

- Enclosures were fitted with Roof mounted, critical grade silencers .

Projects – PEQ Melbourne



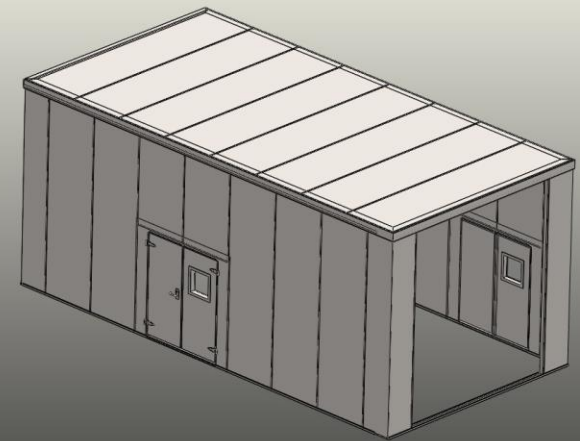
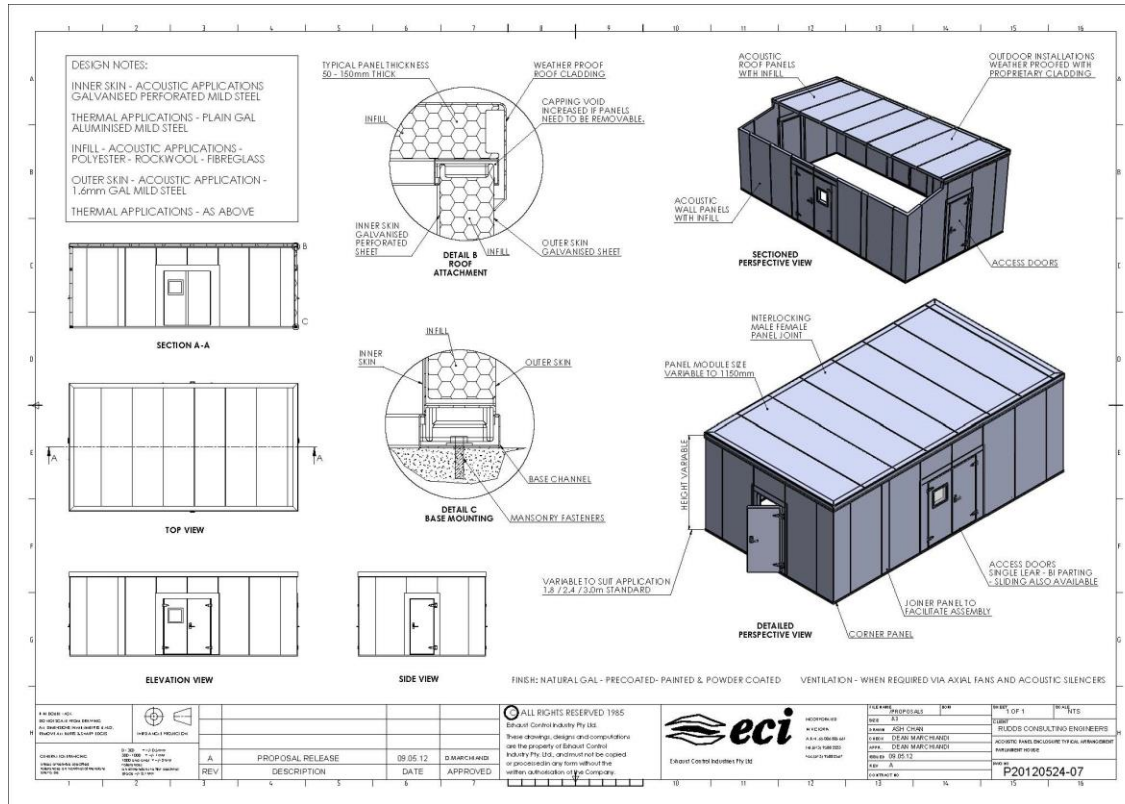
Acoustic Enclosures & Panels



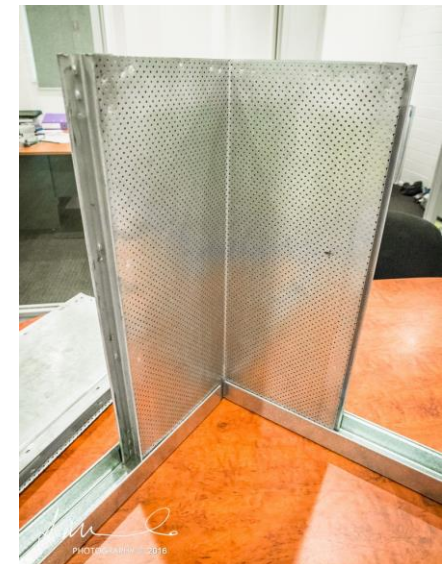
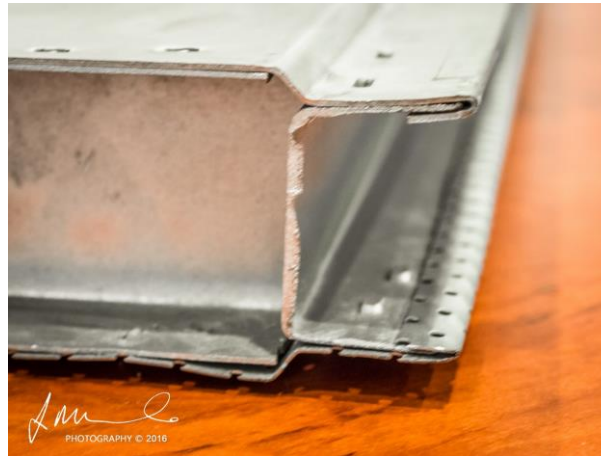
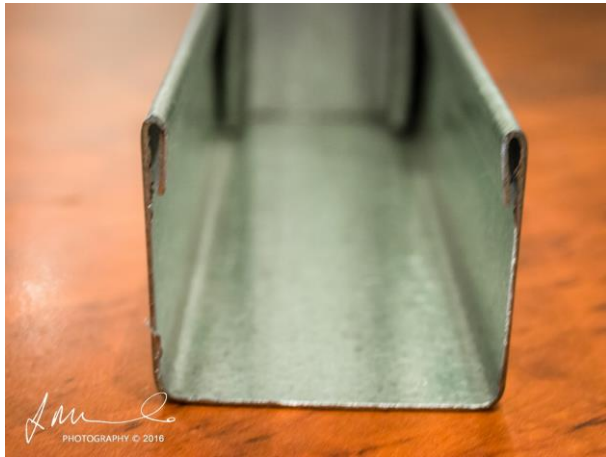
Modular Acoustic Panel System

- Flexible manufacturing system
- Panel thickness from 50mm to 100mm and Custom Lengths up to 4 Metres
- Interlocking Acoustic panels
- 1.6mm Galvanised outer skin
- 32kg/m³ Glass Fibre Acoustic Infill
- Perforated inner skin
- Delivered to site flat packed
- Variety of Surface finishes available, ie plain Gal Finish, Powder coated or Colorbond cladding
- Structural Steel required for load bearing applications
- Plasterboard installed internally for higher performance transmission loss

Acoustic Enclosures & Panels



Acoustic Enclosures & Panels



Victorian Comprehensive Cancer Centre - 2015

Completed designs, drawings Supply and Installation of equipment as per below to suit 3 x Cummins C 2500 D5 Gensets, all operating at full load.

■ Fuel System

- Design, Supply and installation of Bulk Tank, day tanks, fuel reticulation system with pipe run of over 450 metres.

■ Ventilation system

- Design, Supply and installation of Intake and discharge attenuators, Supply Air Fans and Duct work.
- The ventilation system was designed for a 10 ° C temp rise across the plant room for the C 2500 D5 Heat Exchange Cooled sets, running at full load.

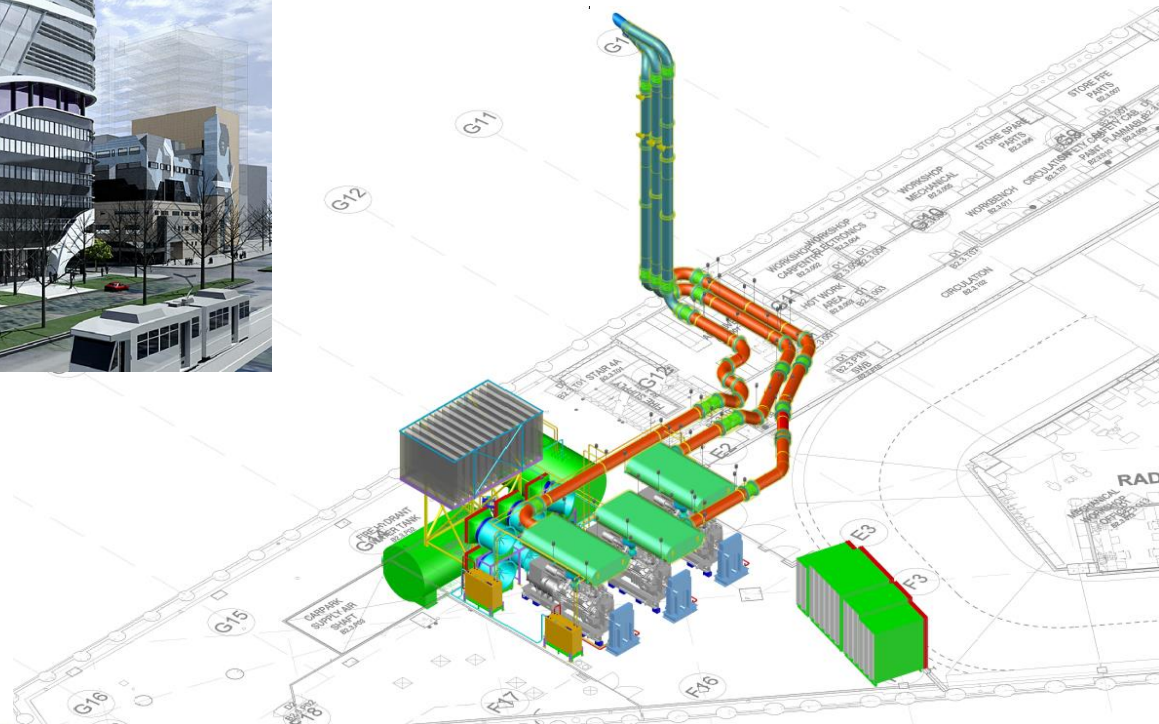
■ Exhaust System

- Design, Supply and installation of exhaust system to including 3 off 450mm diameter stainless steel flues, Hospital Grade Super Critical Silencers, oval in shape to suit available space above Genset and purposed built to house Predator 2 Stage Particulate Catalyst System to reduce CO, HC and PM.

■ Cooling system

- Design, Supply and installation of 3 of Heat Exchangers including piping to genset and building header piping tied to Cooling towers.

Projects – VCCC



Projects – Bendigo Hospital

Completed designs, drawings Supply and Installation of equipment as per below to suit 2 x Cummins C 1700 D5 Gensets, and 2 x 1300kva Mitsubishi DRUPS units all operating at full load.

■ Fuel System

- Design, Supply and installation of day tanks, fuel reticulation system within plant room.

■ Ventilation system

- Design, Supply and installation of Intake and discharge attenuators and support stands.
- The ventilation system was designed for a 10 ° C temp rise across the plant room for the 4 engines running at full load.

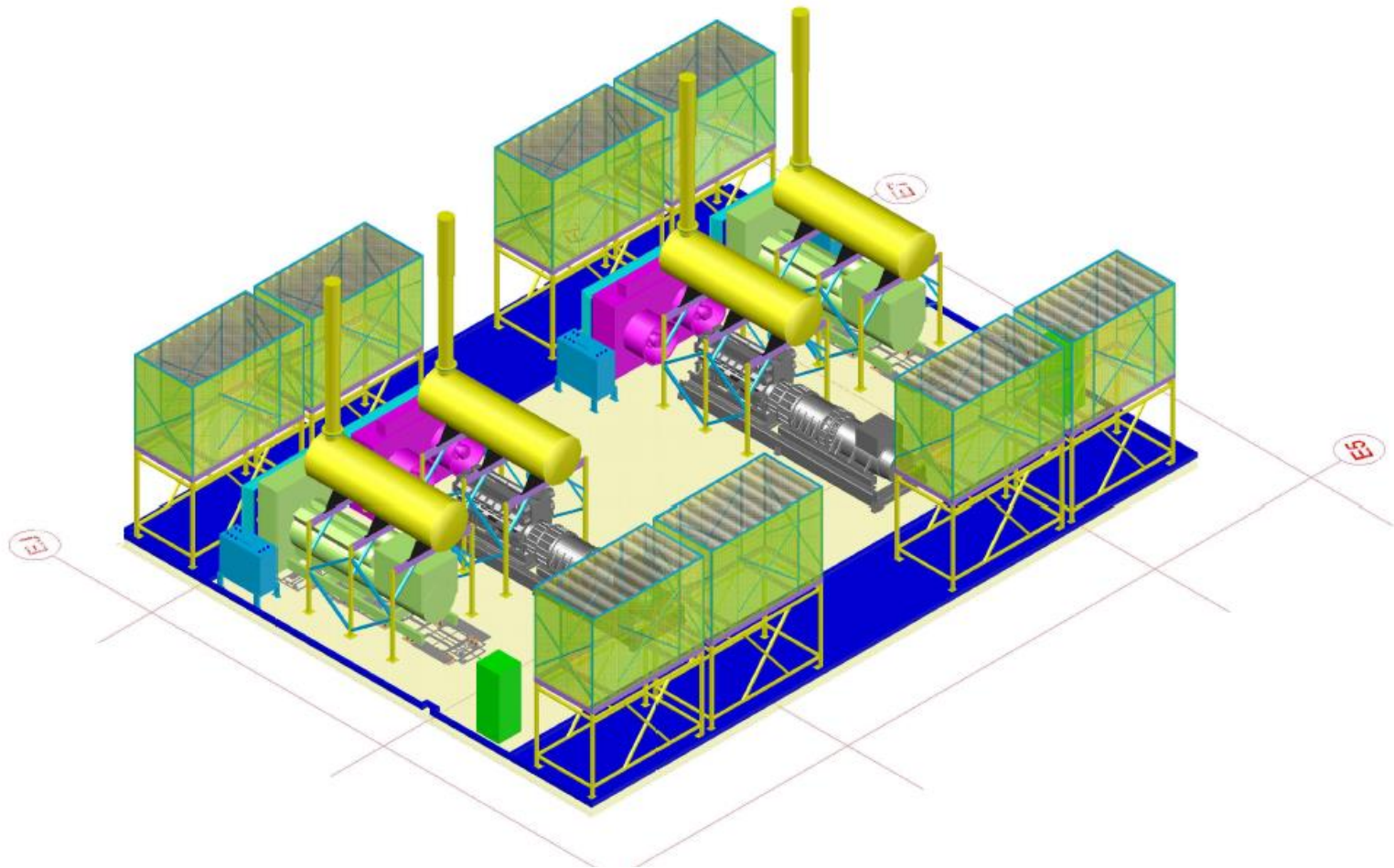
■ Exhaust System

- Design, Supply and installation of exhaust system to including 4 off 450mm diameter stainless steel flues, Hospital Grade Super Critical Silencers and installation onto prefabricated support frame which allowed a complex post-roof installation possible.

■ Cooling system

- Design, Supply and installation of piping for DRUPS system.

Projects – Bendigo Hospital



Digital Realty Data Centre – Deer Park Victoria

Completed designs, drawings Supply and Installation of 6 off acoustic enclosures and equipment as per below to suit Cummins C2250 Gensets.

■ **Enclosures**

- Design, Supply and installation 6 off acoustic enclosures to meet 75db(A) at 1m from walls.

■ **Fuel System**

- Design, Supply and installation of 20,000lt Base frame fuel tank and fuel reticulation system within enclosure room.

■ **Exhaust System**

- Enclosures were fitted with Critical grade silencers and in built predator catalyst systems.

Projects – Digital Realty



Projects – 567 Collins Street

567 Collins St. Commercial Tower & Leighton HQ Victoria

Completed designs, drawings Supply and Installation of 2 off MTU 1400kva Diesel and 1 off 800kva Gas co-gen system equipment as below

■ **Exhaust System**

- Design, Supply and installation of exhaust systems to including stainless steel flues, Hospital Grade Super Critical Silencers and installation suspended from ceiling.

■ **Fuel System**

- Design, Supply and installation of 1 off 20,000lt bulk tank and fuel reticulation system from Basement level to generators on level 4.

■ **Cooling system**

- Design, Supply and installation of **exhaust waste heat recovery system** piping for gas generator system.

Projects – 567 Collins Street

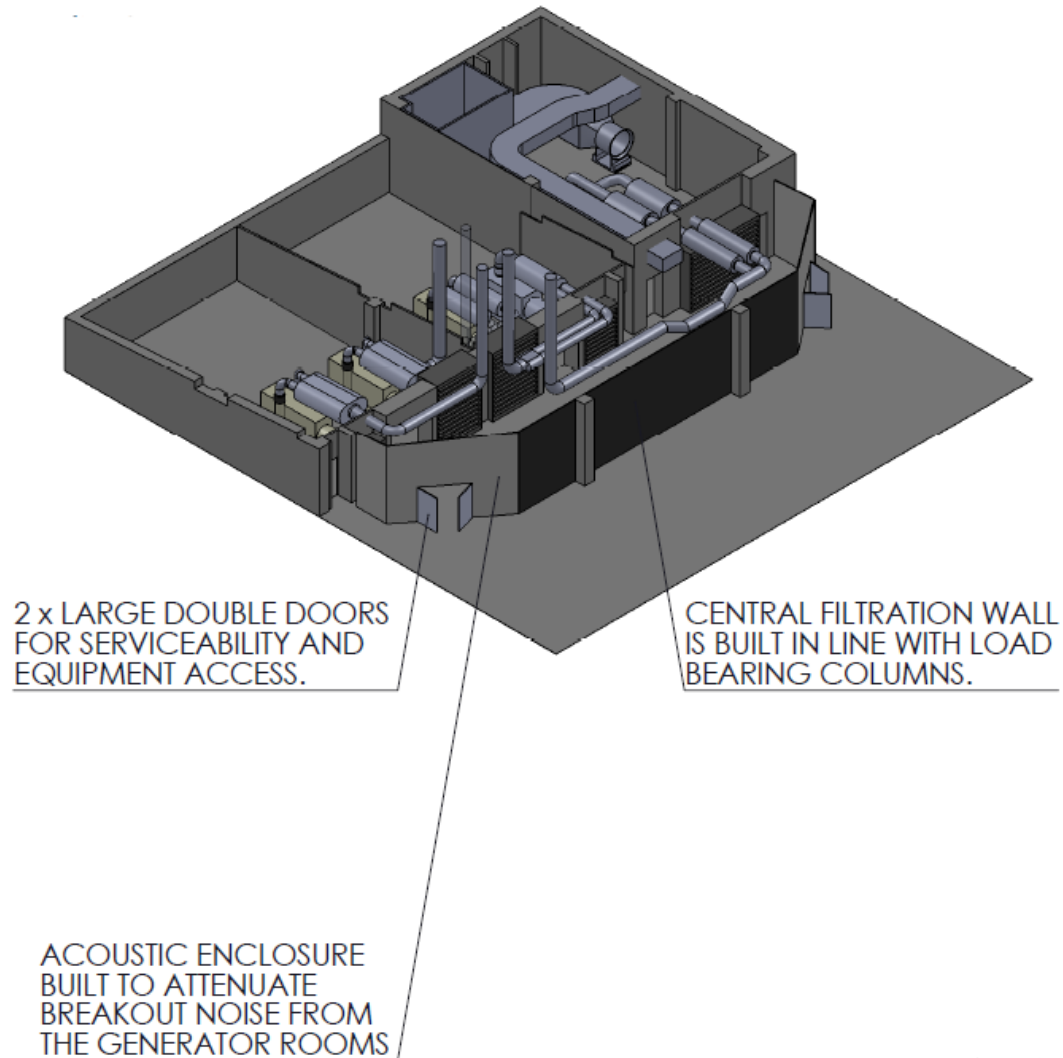


Projects – Telstra Exhibition St

Telstra Exhibition St Exchange (2011/2012)

- ECI worked with Telstra and Transfield Services to achieve reductions in noise and exhaust pollution at their flagship exchange building in Melbourne's CBD. ECI designed, manufactured, and installed a complex range of product solutions and provided auditing and project management expertise.
- Due to nearby residents complaints over noise and pollution ECI were contracted to retro-fit existing installation in Victoria's largest telephone exchange including:
 - Acoustic enclosures/treatment
 - Silencers and exhaust systems
 - Plant room installation
 - Emissions control (oxidation catalyst)

Projects - Telstra Exhibition St



Projects - Telstra Exhibition St



Northern Operations

- 31 Flanders Street,
Salisbury QLD 4107
- Lee Gunn –Manager
Northern Operations –
0422 016 566
- Factory, office & workshop:
750m²
- Sales, service, installations
- ECI Centre of Excellence for
SCR and fuel control
systems



Projects – PNG

Bank of South Pacific - three new banking facilities in Port Moresby

■ Each having:

- Acoustic design, manufacture and installation
- Turn key fuel systems including proprietary fuel polishing integration and ECI fuel controllers
- Container tank farms – 2x 30,000L ISO bulk tanks
- Underground bulk tank storage 2x 20,000L
Underground Glassteel bulk tanks



Projects - PNG



Projects – Manus Island

Manus Island Processing Facility

- **4 x No. 2MW containerised gensets – 40' ISO's**
- **550,000L diesel tank farm:**
 - Full fuel system design to AS1940
 - Wharf pumping and metering system
 - Fuel laundering by coalescence and dedicated particulate filtering
 - Fuel transfer and interlocked overflow control of four enclosure day tanks, site boiler skid day tanks and a vehicle refilling bowser
 - Site mobilization and installation
 - Supply and commissioning of ECI integrated PLC fuel controller
 - Training and Handover

Projects – Manus Island



Sunshine Coast University Hospital (SCUH) - Central Energy Plant Emergency Standby Power

■ 200,000L underground diesel tank farm

- Full fuel system design to AS1940
- Full civil contract for the tank excavation and trenching including sheet piling a 15m x 15m x 5.5m deep tank pit, dewatering, water and spoil treatment, etc...
- Fuel laundering by coalescence and dedicated particulate filtering
- Fuel transfer and interlocked overflow control of four enclosure day tanks
- Site mobilization and installation
- Supply and commissioning of ECI integrated PLC fuel controller
- Training and Handover

Projects - SCUH



Projects – Freeport Grasberg Mine



Freeport Diesel SCR NOx Abatement Installation for new 5MW Caterpillar

- **Integration of SCR plant into existing Power Station, including:**
 - New 900NB exhaust system
 - Rebuild of service platforms and stairs – External and internal
 - New SCR plant – mixing duct, reactor, vertical exhaust/stack
 - Reconfigure urea storage and transfer
 - Electrical and wiring supply and design – installation by site electrical staff
 - Supply, installation and commissioning of SCR controller including remote local and remote HMI.
- **Site mobilization and installation**
- **Shipping and Freight coordination**

Projects – Freeport Grasberg Mine



Projects – Freeport Grasberg Mine



Projects – Coolangatta Airport

Coolangatta Airport Control Tower

- Acoustic design and installation of new generator room including;
 - Primary secondary exhaust silencers
 - Air flow and attenuation
 - Acoustically line room
 - Room bunding, including fuel line bunding of all transfer lines
- Full fuel system design to AS1940
- Custom built diesel tank farm with built in pump end for fuel laundering and process measurement
- Fuel laundering by coalescence and dedicated particulate filtering
- Fuel transfer and pumped return tank overflow control of two new day tanks
- Site mobilization and installation
- Supply and commissioning of ECI integrated PLC fuel controllers (x2)
- Training and Handover

Projects – Coolangatta Airport



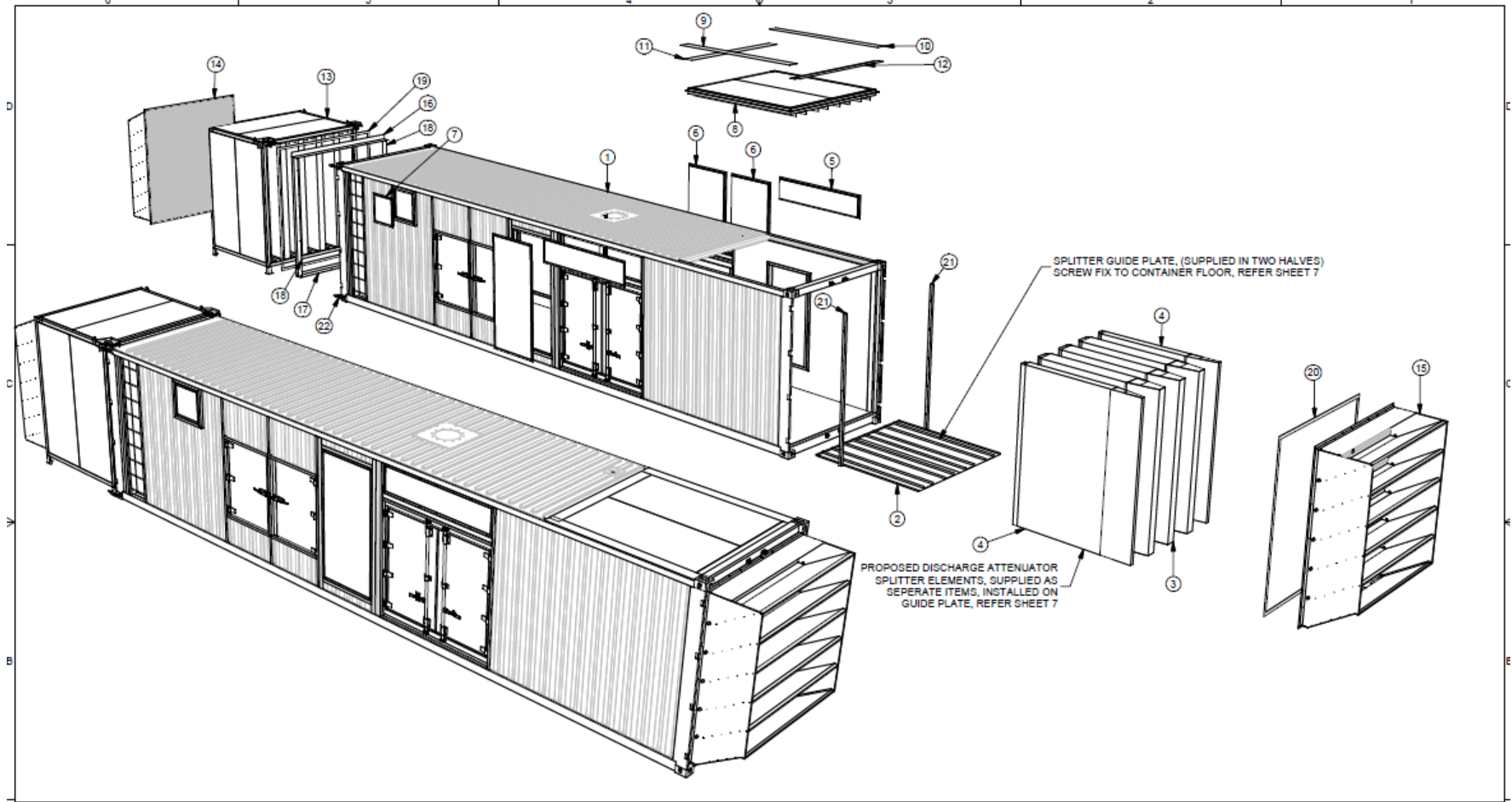
Projects – Noumea

Noumea Mont-Dore Power Station Site assessment and rebuild of new acoustic enclosures

- Acoustic assessment and design.
- Supply only modifications to existing Chinese built enclosures. Stage 1:
 - New supply air attenuators
 - New discharge attenuators
 - All existing openings (10 per enclosure) blanked off
- Shipping and Freight coordination



Projects - Noumea



Lady Cilento Children's Hospital, Brisbane

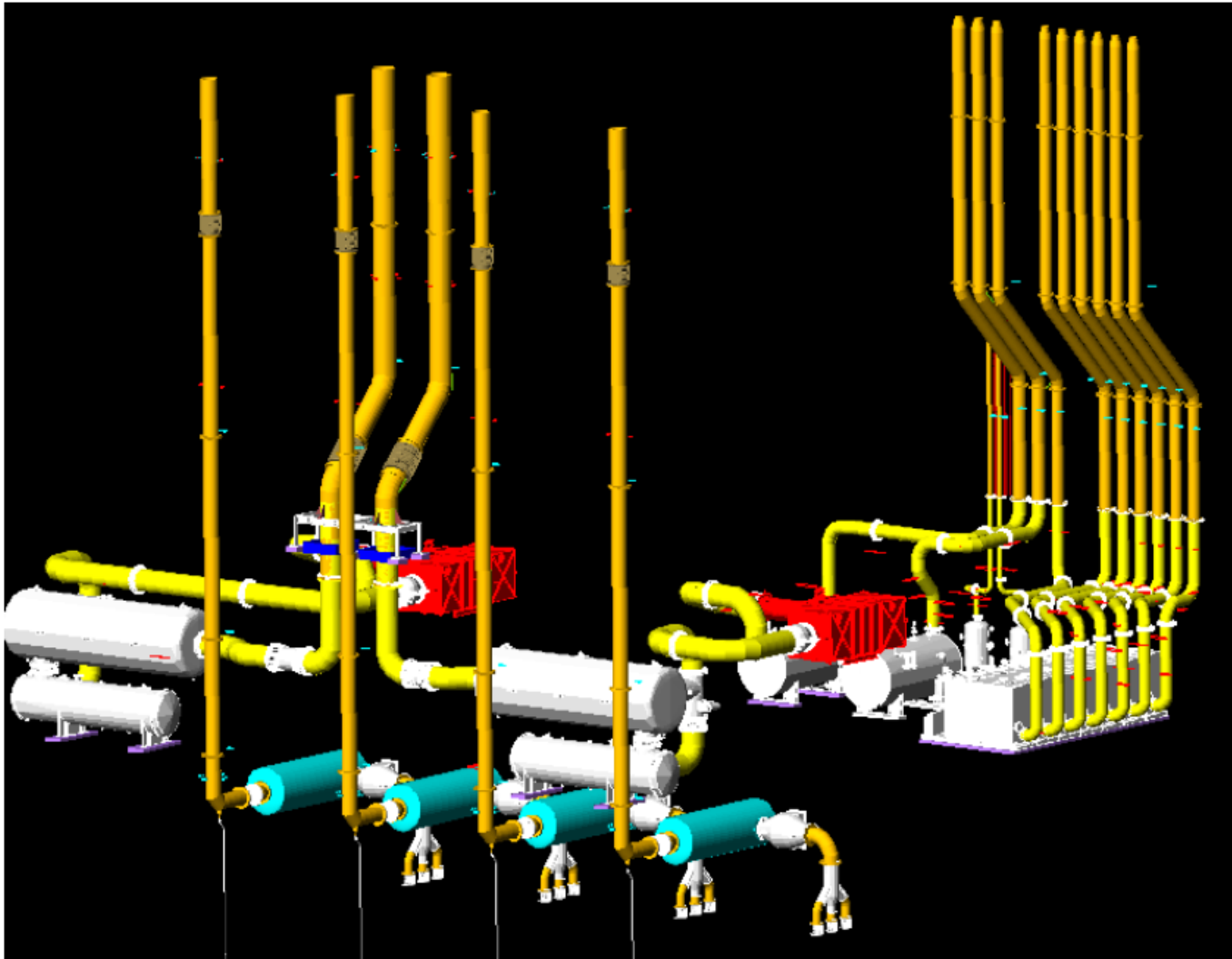
- Scope:
 - 2 x JMS 616 2.4MW Gas Engines
 - 4 x MTU 20V-4000 3000 kVA Diesel Engines
 - 11 x Gas Hot Water Boilers
- Complete turnkey of exhaust for above , including design, fabrication, installation and commissioning.
- Gas Engines - includes:
 - SCR NOx Reduction System
 - Oxidation Catalyst for CO + NMHC reduction
 - Exhaust Waste Heat Recovery Silencer for hot water service
 - Exhaust Bypass Diverter Valve with Electric Actuator
 - Exhaust Silencer
 - Exhaust Pipework in Bellows & Support
 - Thermal Insulation

Projects - QCHEP

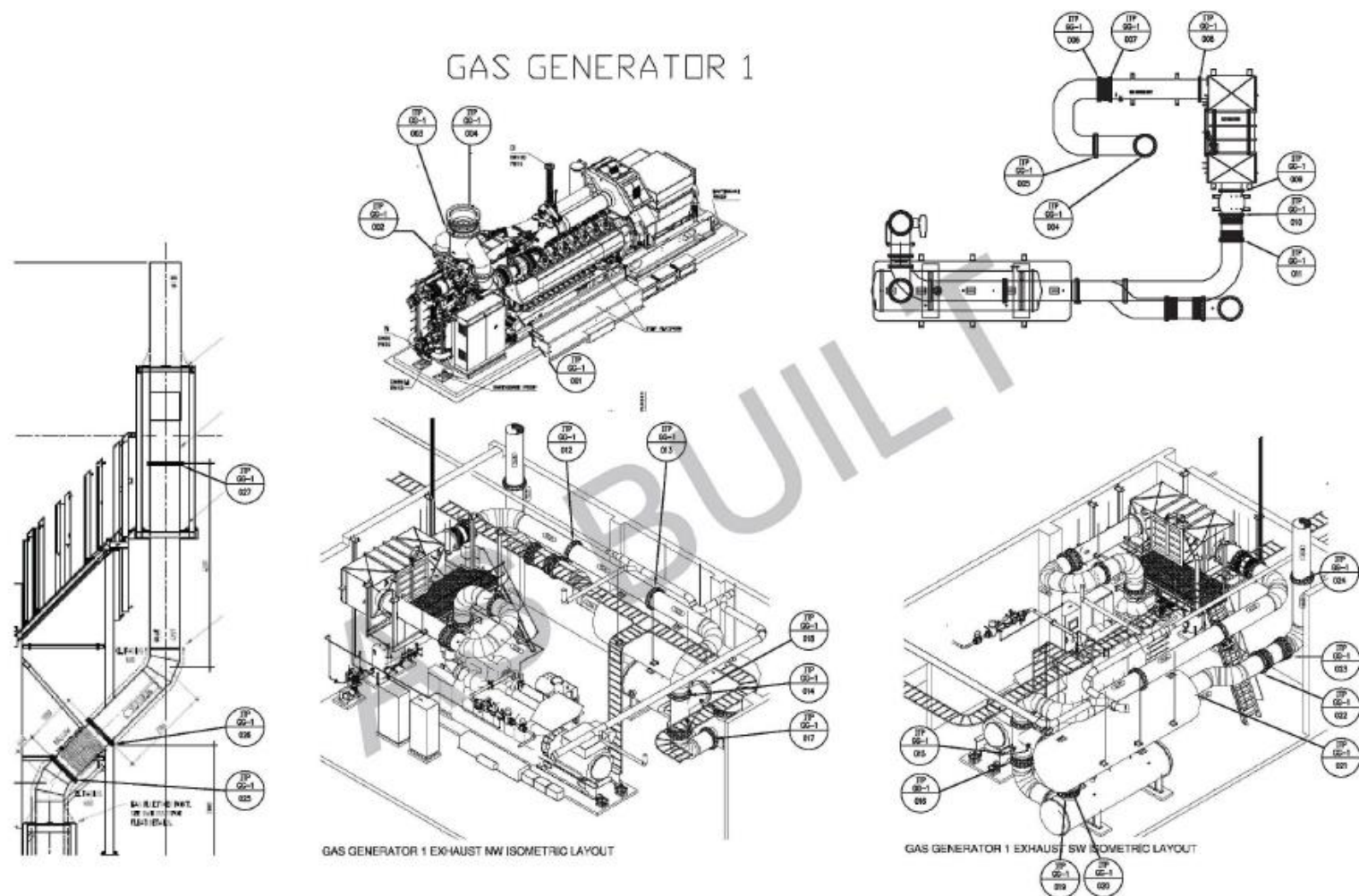


- Diesel Engines - includes:
 - Diesel Particulate 2-stage Catalytic system for DPM, CO + HC reduction
 - Exhaust Silencers
 - Exhaust Pipework, Bellows & Supports
 - Thermal Insulation
- Hot Water Boilers
- Exhaust Pipework and Support

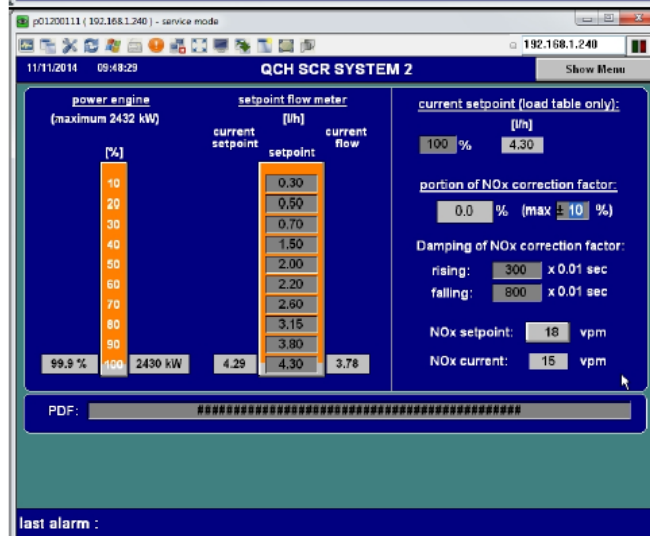
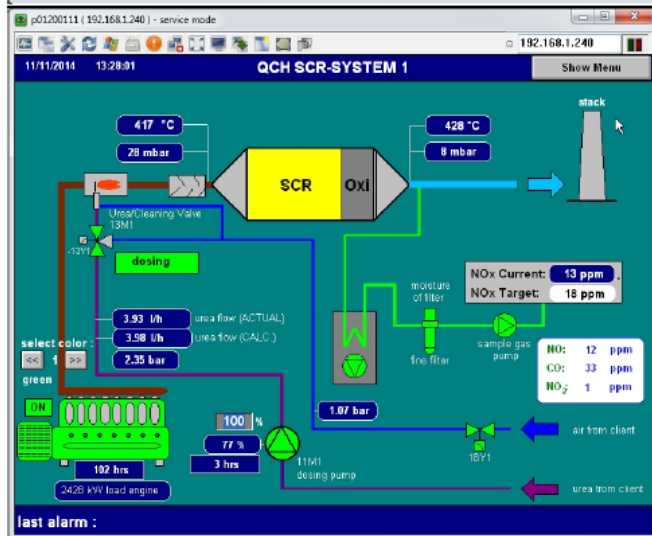
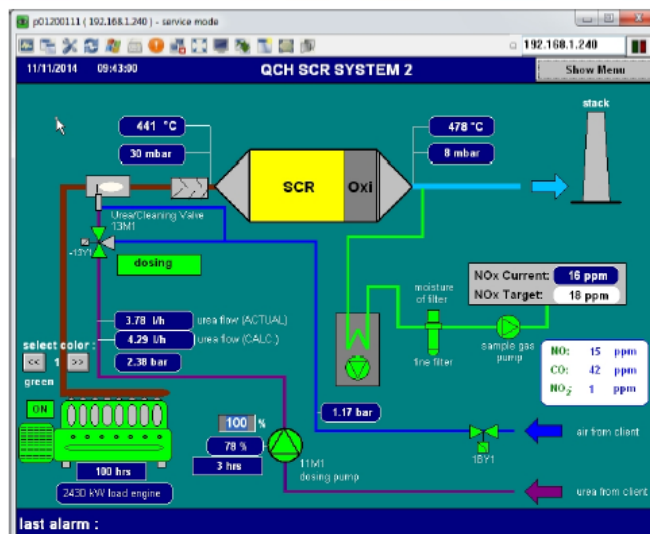
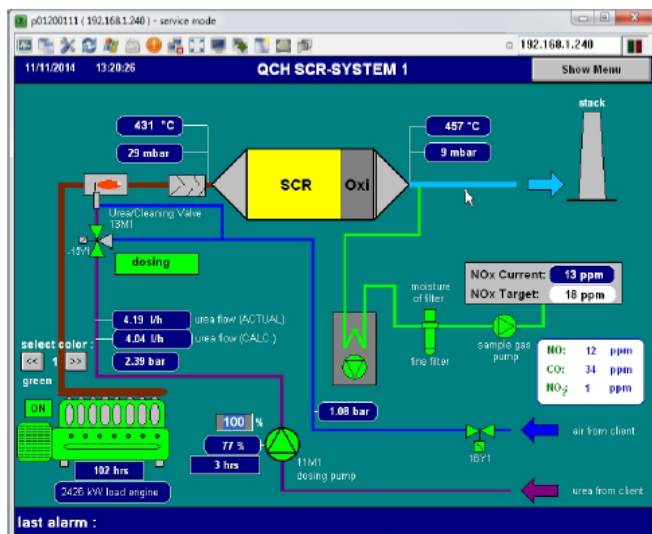
Projects - QCHEP



Projects - QCHEP



Projects - QCHEP



PLC Fuel Controllers – standard or customer built

- Powder coated mild steel control panel. Stainless Steel grade on request
- Beckhoff PLC embedded controller complete with IEC 61131 programming
- Networking and bus options available (many available)
- Modular design where I/O is configured to match the task – thus limited cost for spare I/O
- LED indication and alarming (standard)
- Auto/Manual/Off selector switches for pump control
- Segregated Low Voltage[LV] and Extra Low Voltage[ELV] wiring
- Volt free outputs for remote monitoring , via interposing relays -25 points
- Designated field wiring terminals for all field equipment
- Colour coded wiring
- Quality components
- Full set of AutoCAD drawings
- Operation and Maintenance manuals
- ITP commissioning documentation.
- On-site commissioning offered

PLC Fuel Controllers

- Fuel Controller Options: 7",10",12",15" Touch Screen HMI complete with three display pages:
 - Mechanical single line (plant view page)
 - System Status (status page)
 - Alarms (alarms page)
 - Stainless Steel Enclosure
 - Custom Builds



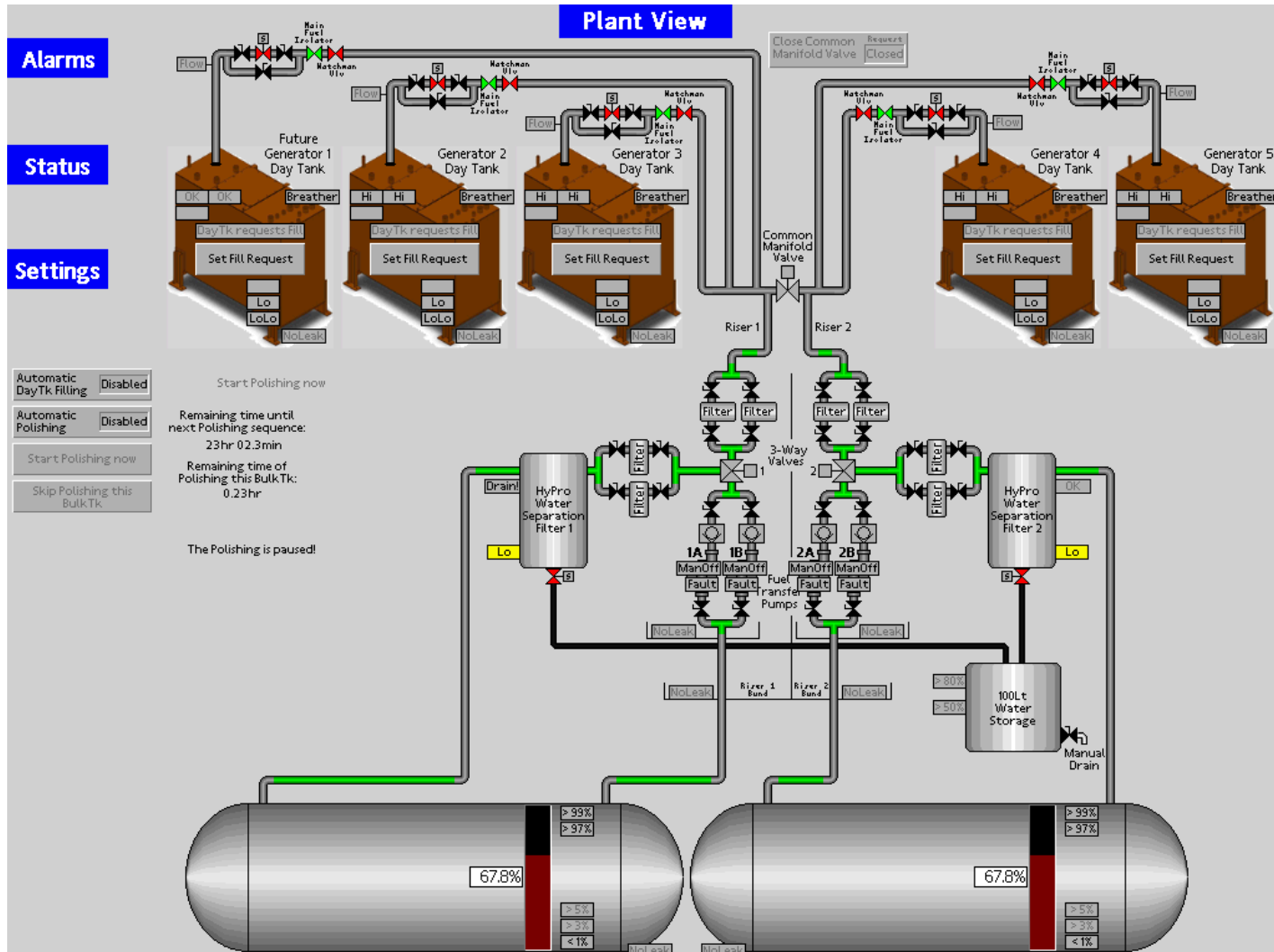
PLC Fuel Controllers



■ Market differentiation:

- **PLC.** Not 'black box' microprocessor, nor programmable relay or relay logic
- **Standard controllers, also custom designed**
- **Modular design** means limited wasted I/O
- **Talks to most high level typologies** – if required.
- **On site commissioning.** Pricing on Application
- **Technical Support**

HMI Graphics Examples



ECI Contacts



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