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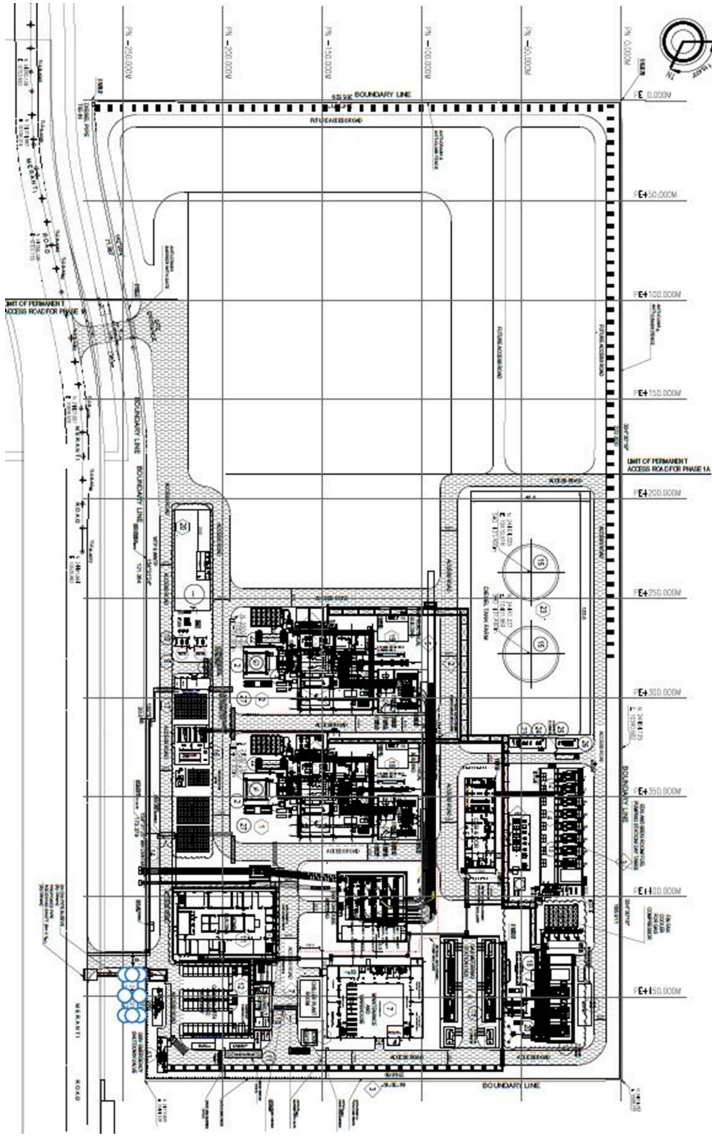
JEL Maintenance Pte Ltd (JML): 500 MW DEVELOPMENT OF OPEN CYCLE GAS TURBINE (OCGT) GENERATING STATION IN SINGAPORE



Client : JEL Maintenance Pte Ltd (JML)
Project : Meranti Power Pte Ltd
Role : Review consultant for complete Engineering

Review of Process and Mechanical engg.,

Review of Electrical system

Review of Civil, structural and architectural works

Review of Control and Instrumentation

Project Background

Singapore Energy Market Authority (EMA) and Meranti Power (MP/ EMA's Special Purpose Vehicle) is constructing a new Generating Station with 500MW of Open Cycle Gas Turbine (OCGT) Generating Unit to ensure that Fast Start Generation Capacity (FSGC) continues to be available in the power system.
The FSGC are generating unit that can be brought online quickly to augment any shortfall in generation capacity, which is necessary for the security and reliability of Singapore electricity system.

The new Generating Station (Project) is located on the western part of Jurong Island of the Republic of Singapore, hereinafter referred to as Stage 1A Development. EMA & MP intend to have an option to further utilize the 12ha land for additional generating units by constructing additional power block(s) of similar 'F' Class OCGT generating unit(s) and the relevant balance of plants within the site which shall be further outlined in the following sections. This shall be referred to as Stage 1B Development. Stage 1B Development (Option) involve up to 3x250MW.

The Project shall consider state of the art, efficient 2 units of 'F' class gas turbines OCGT technologies, with a total minimum of 500MW, with each gas turbine no lesser than 250MW. They shall be designed for at least 25 years, or 200,000 Equivalent Operating Hours (EOH), whichever is later, of reliable and efficient operation. They shall also be capable of using natural gas as primary fuel and diesel oil as alternate fuel for continuous base load operations and able to perform on-load changeover to alternative fuel and vice versa.
Employer: Meranti Power
Fuel Source: Natural Gas (Primary) + Diesel (Back-up)
Location: Beside SLNG Plant, Jurong Island, Singapore

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Site Location

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Package List

MECHANICAL AND PROCESS

Fuel Oil System, Flue Gas System, Compressed Air System (GT IA, BOP IA, BOP SA), Exhaust Gas System, Water Treatment plant, CCCW System, Waste Water System, Lifting Equipment System, Fire Protection System, Air Conditioning Mechanical Ventilation, H2, N2 and CO2 Storage System

ELECTRICAL

SLD, Load List / General, Block diagrams / System Study, 400KV GIS, 19kV Generator Circuit Breaker, GSUT, Unit Transformer, Auxiliary Transformer / Station Transformer, Zig Zag Earthing Transformer, BSDG (6.6kV, 2MVA), Emergency Diesel Generator, 6.6kV Switchgear, 19kV Isolated Phase Busduct, 110V DC System, 230V Station AC UPS, 230V Unit AC UPS, 400V Switchgear, Cable Routing layouts, Grounding System, Lighting System & Small Power, GAS TURBINE PACKAGE, EOT Crane, CCCW, Fire Protection system

CIVIL

Admin Building, Warehouse & Maintenance Building, Central Control Rm & Central Elect. Building,
Guard House, Gas Metering Building, Fire Pump House, Gas Turbine Building, Unit Electrical Building,
Switch House Building, Gas Conditioning Building, EDG & BSDG Room / Fuel Pumping Station / Day Tanks,
Fin Fan Cooler, Water Treatment Plant & Waste Water Treatment Plant, Plant Air Room, Bin Centre (without compactus), Fuel Pumping Station, Fire Pump House, Compressor Building, Detention tank, Pipe Rack, Pipe Sleepers

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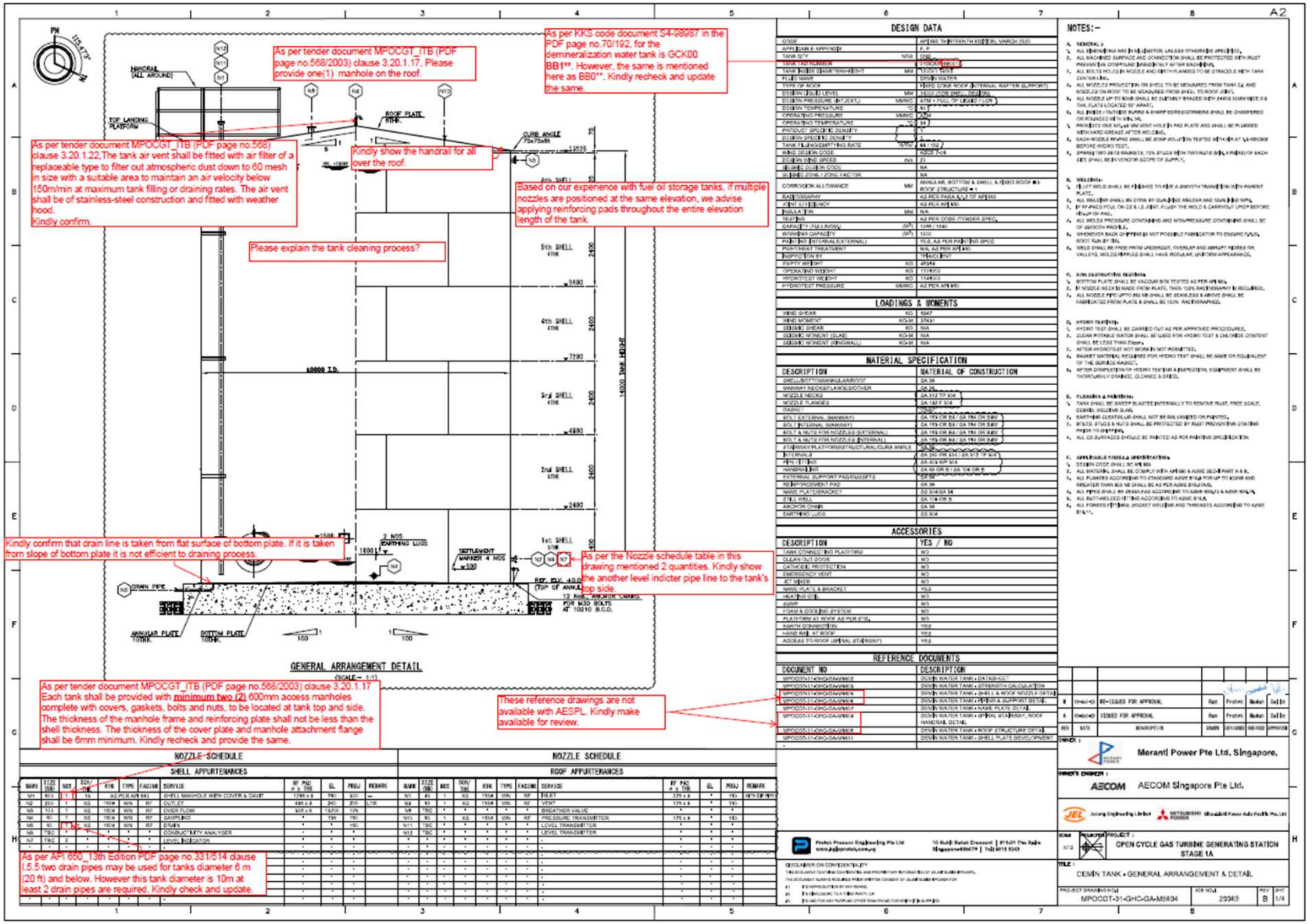
Vendor Document Review



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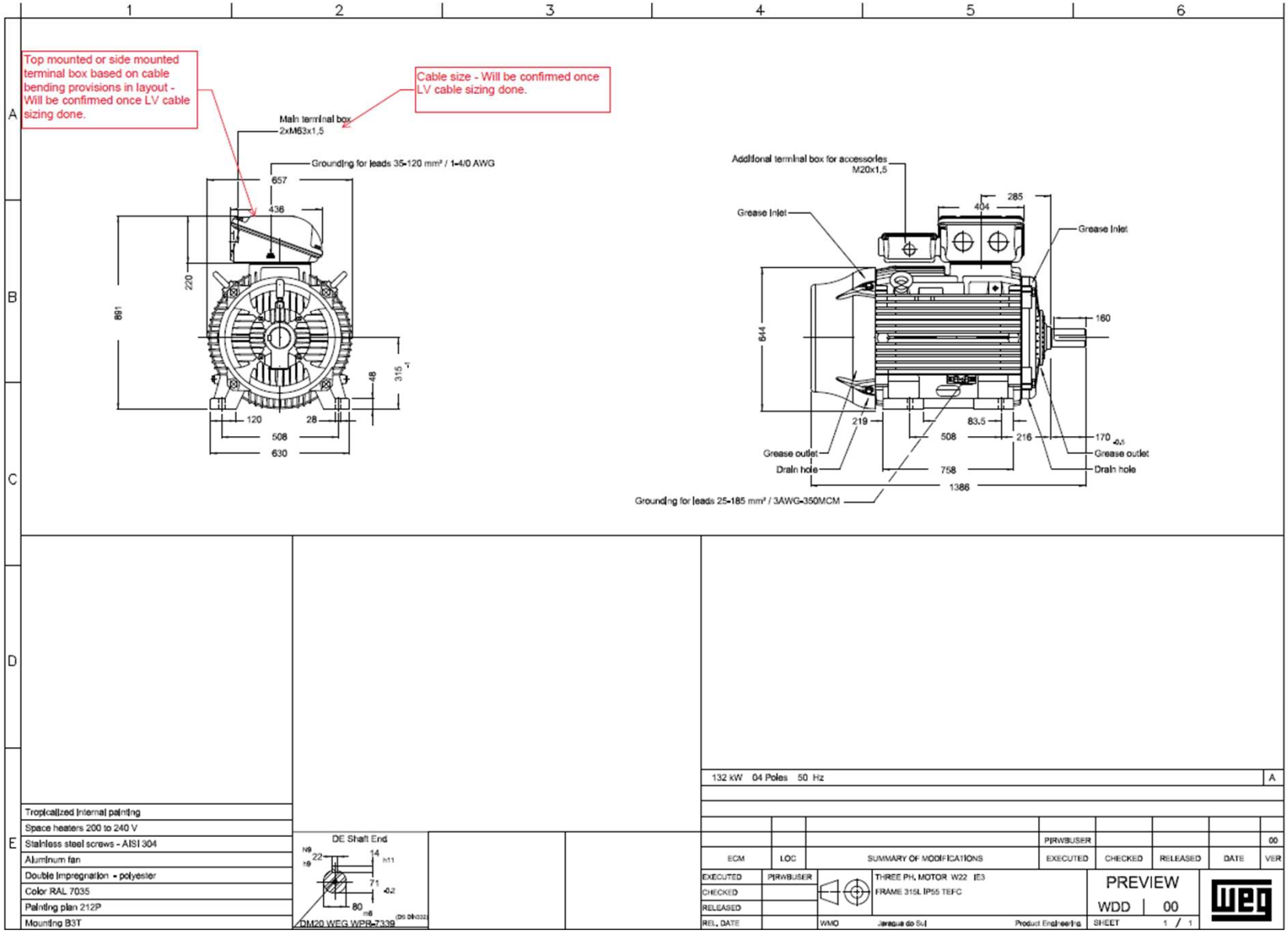
Vendor Document Review



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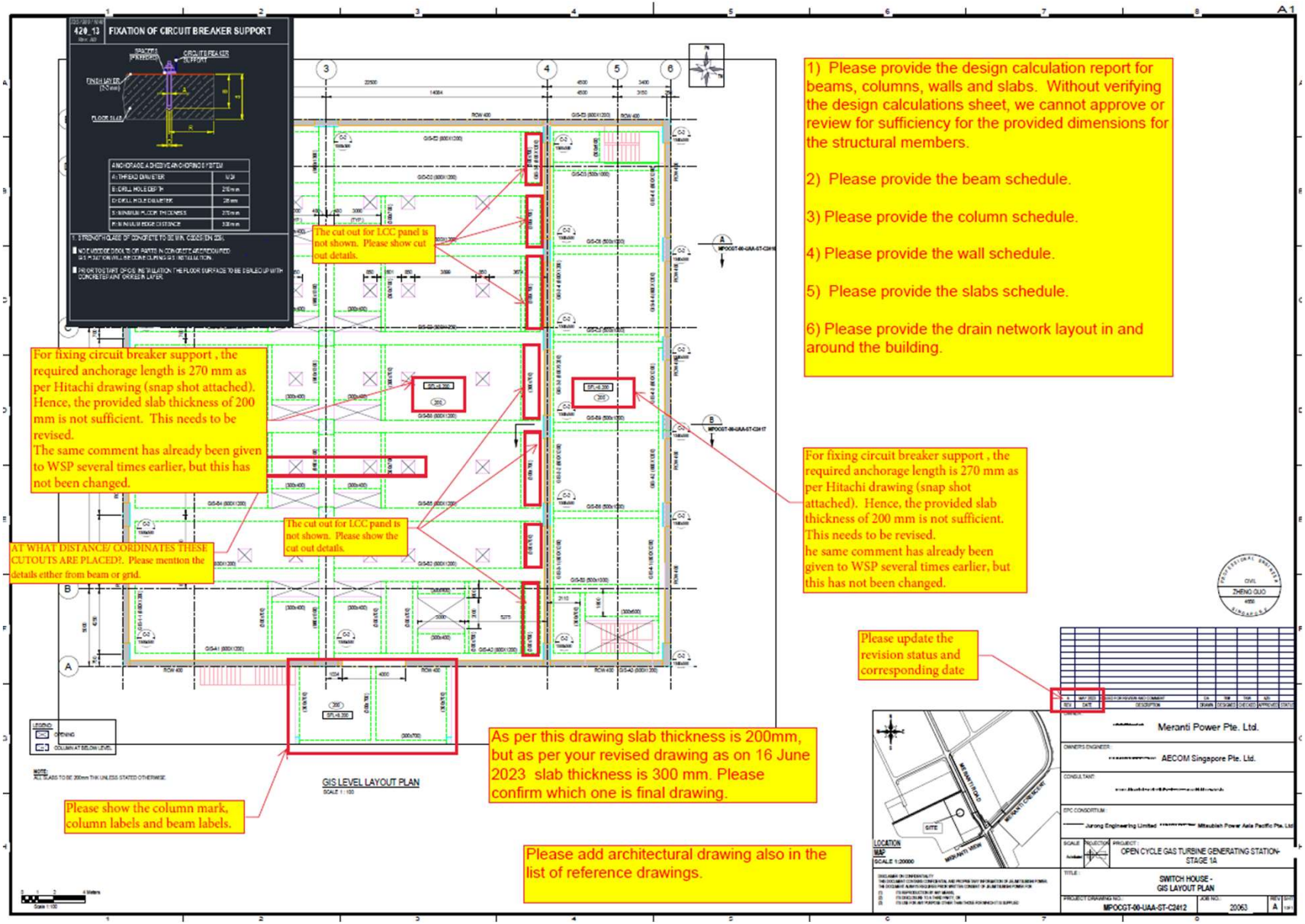

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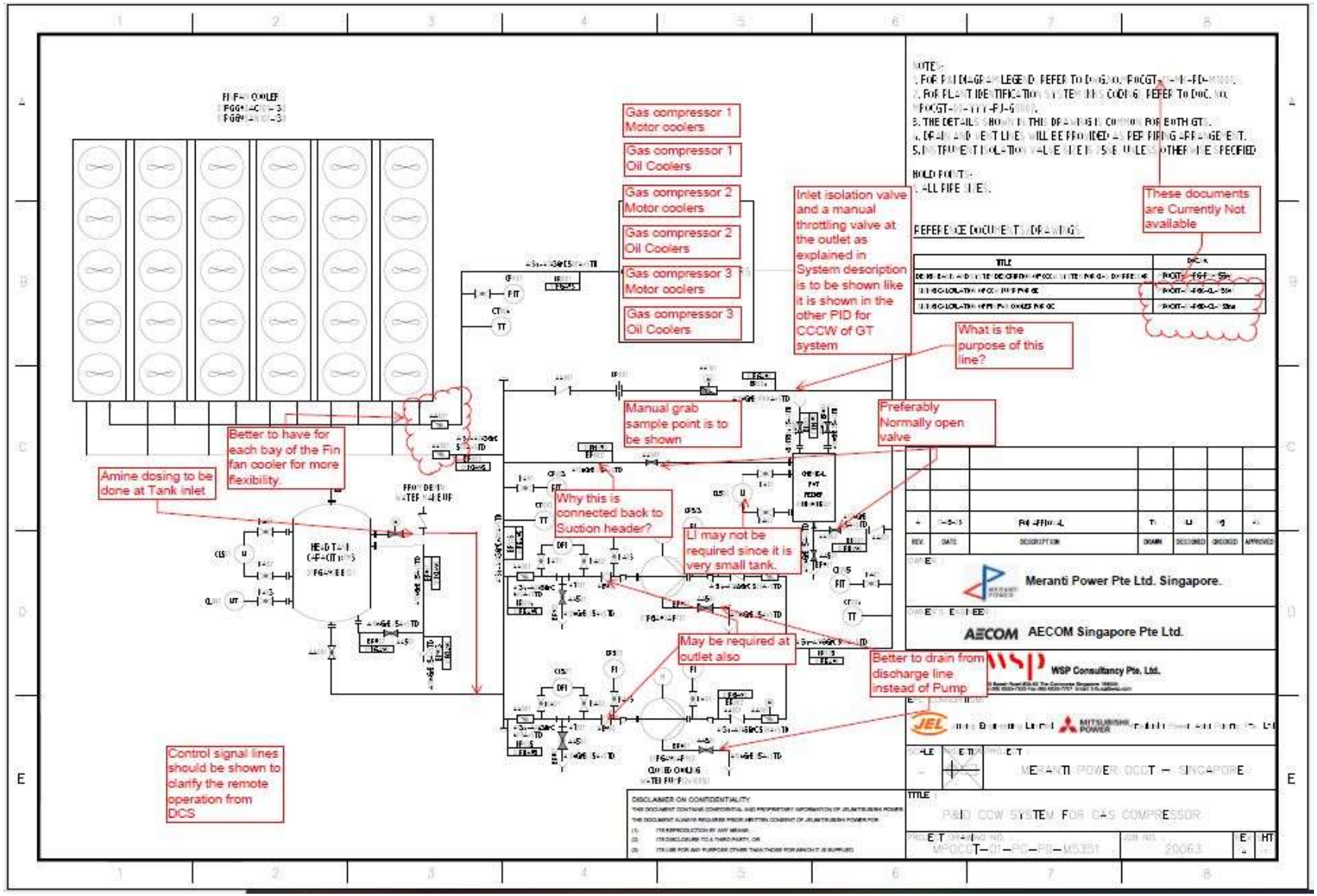

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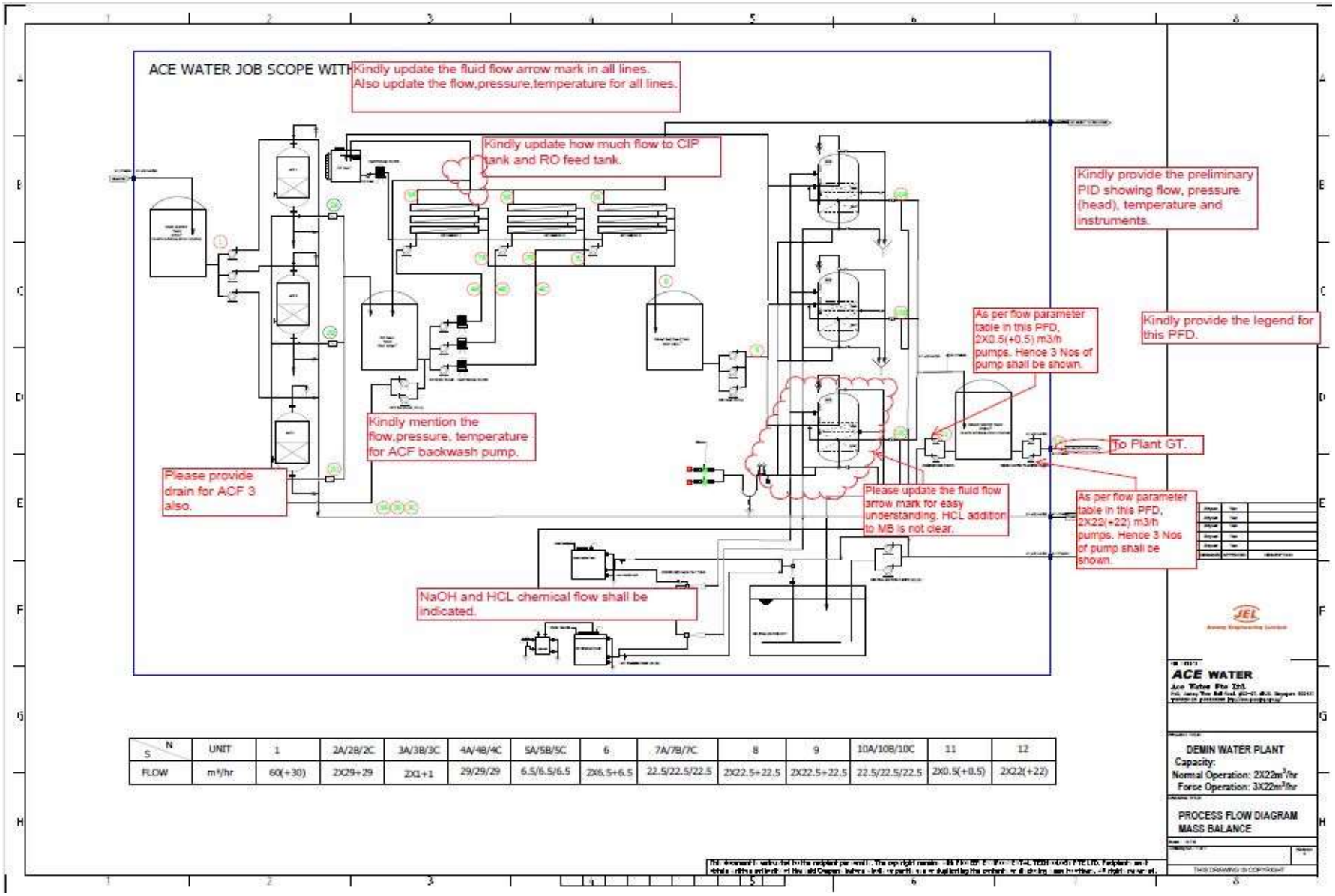

S N	UNIT	1	2A/2B/2C	3A/3B/3C	4A/4B/4C	5A/5B/5C	6	7A/7B/7C	8	9	10A/10B/10C	11	12
FLOW	m³/hr	60(+30)	2X29+29	2X1+1	29/29/29	6.5/6.5/6.5	2X6.5+6.5	22.5/22.5/22.5	2X22.5+22.5	2X22.5+22.5	22.5/22.5/22.5	2X0.5(+0.5)	2X22(+22)

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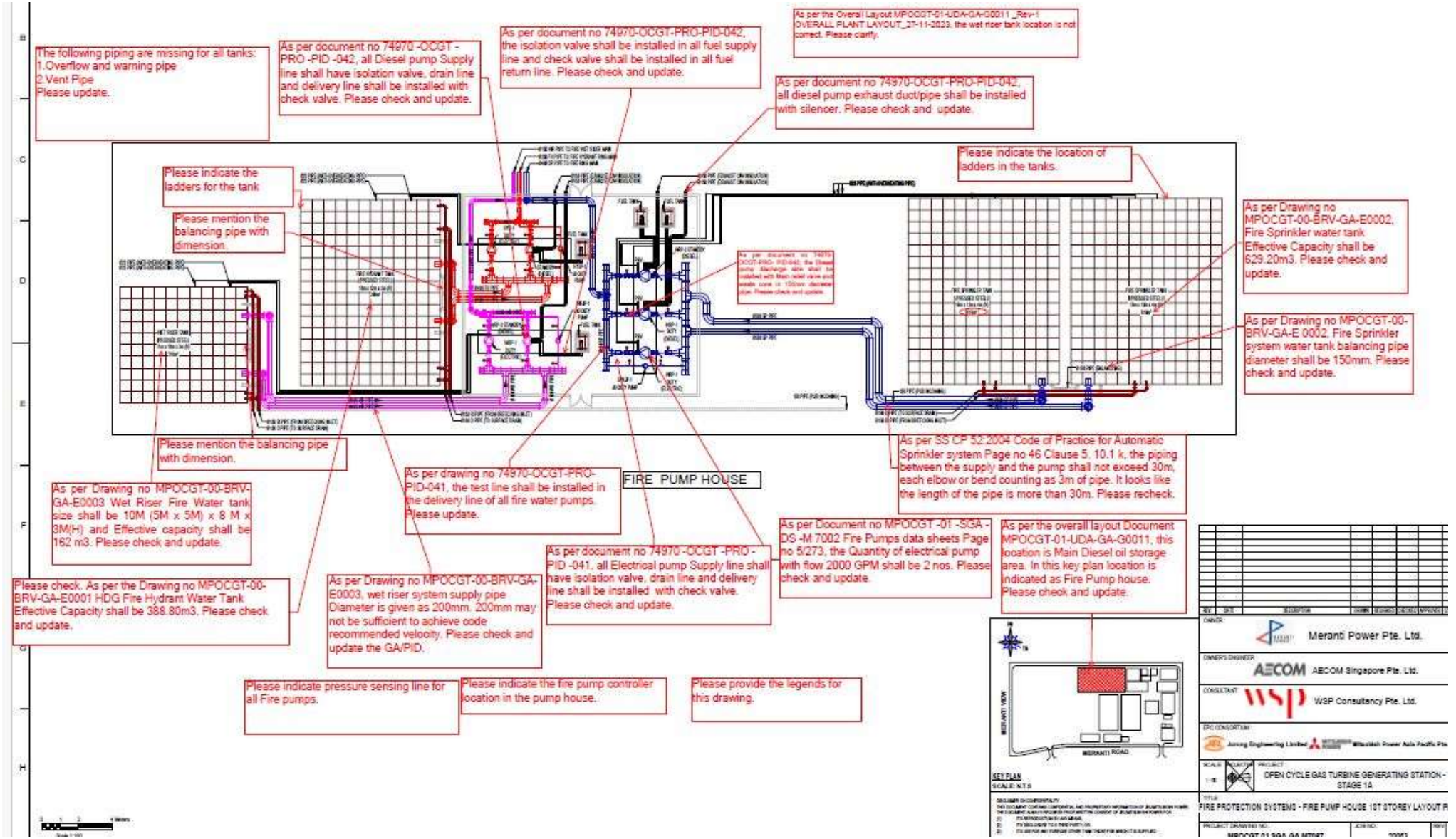
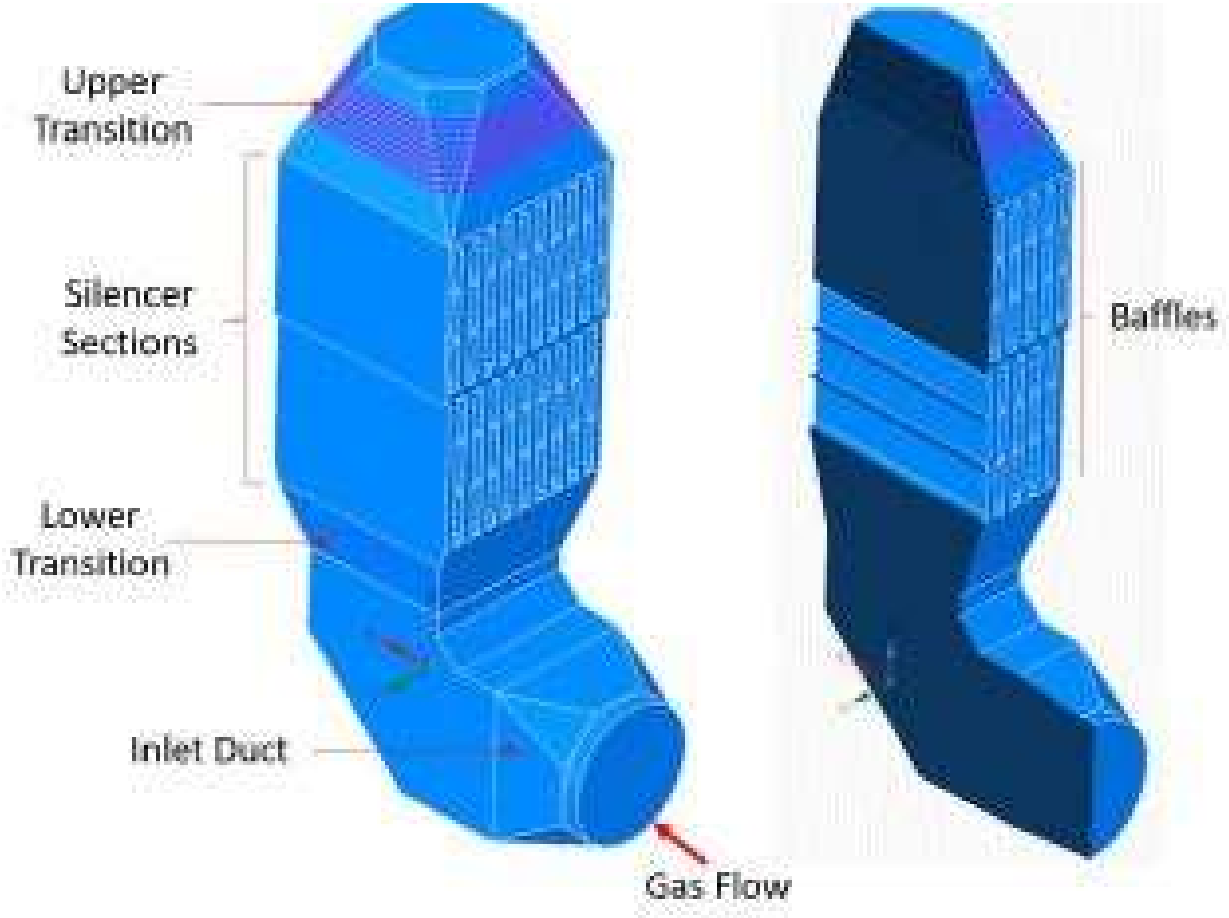
Review Of Fire Protection System Layout



Review Of CFD and CEM report analysis (Exhaust System)



Fluid domain

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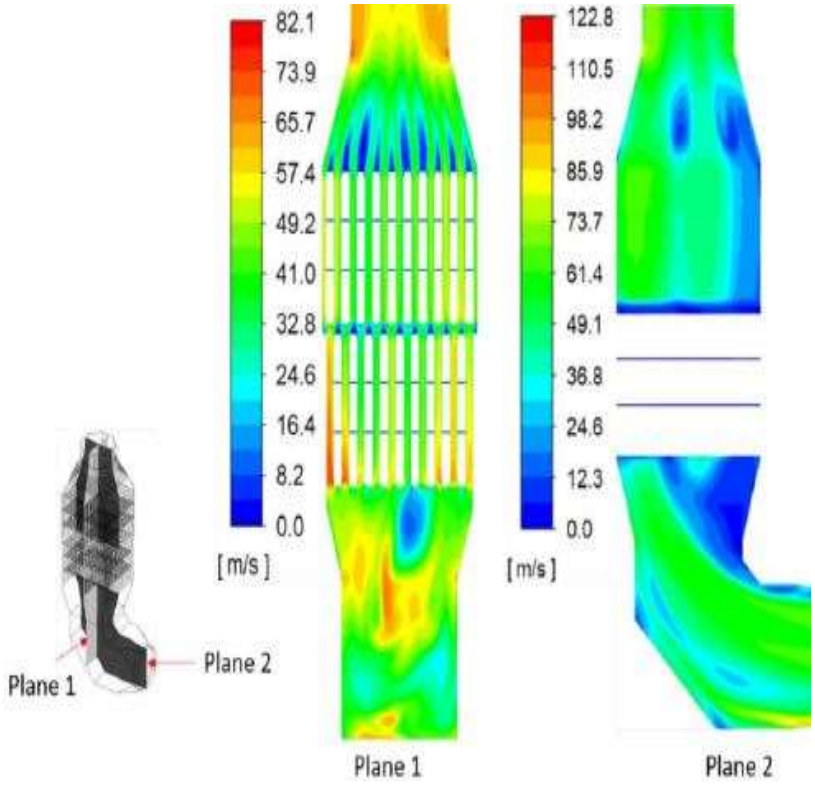
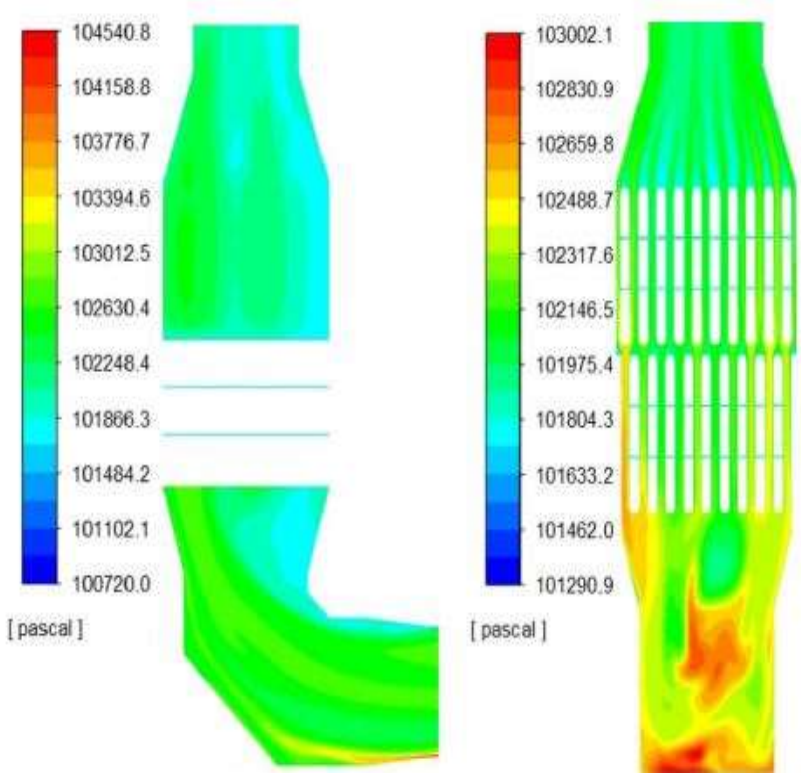
FLOW PROFILE ACROSS EXHAUST FLOW ASSEMBLY



Velocity contour



Pressure contour

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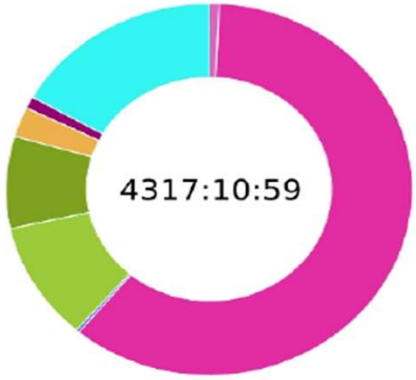
Task



(Without Task)		726:12:00	16,82%
CALCULATION - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		41:30:00	0,96%
CLIENT MEETING - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		113:30:00	2,63%
INTERNAL DISCUSSION - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		345:45:00	8,01%
TENDER STUDY - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		443:20:00	10,27%
VENDOR DISCUSSION - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		11:30:00	0,27%
VENDOR DOCUMENT REVIEW - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		2600:53:59	60,25%
VENDOR MEETING - DEVELOPMENT OF OCGT(OPEN CYCLE GAS TURBINE)GENERATING STATION IN SINGAPORE - JML(JEL)		34:30:00	0,80%

Time sheet report during execution for Process & Mechanical Engineering