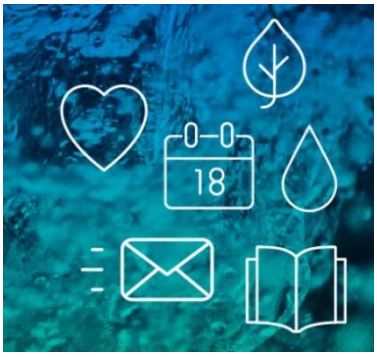
Independent Water Networks

Adoptable Wastewater Pumping Station Design Guide



Document Review – Latest Update

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Contents

1.0 Executive Summary

IWNL Pumping station adoptions should be agreed in the commercial offer with the relevant BUUK sales representative. This is an additional item to the standard agreement and before submission developers should ensure this is part of the agreement. Independent Water Networks Limited (IWNL) do not adopt a pumping station (PS) when the site is serving less than 100 plots.

As part of the S104 agreement process, the designer will submit a detailed design of the pumping station to IWNL for technical review and approval.

All installations should meet the design criteria set out in the Water UK Sewerage Sector Guidance and Design and Construction Guidelines (DCG). The IWNL specific requirements are outlined below:

- Vent pipe to be fitted to the wet well. Vent pipe with an anti-vermin vented cap must be supported by attaching to the fence or use metal pipe for self-support.
- Flowmeter must be provided; it can be located either within the valve chamber or in a separate chamber.
- LED floodlight on a hinged pole must be provided; it must be wired into the mains with a switch within the kiosk.
- Nortech NX12 unit to be installed for telemetry, including a remote start/restart function for the pumps. The telemetry output will be reported using the iHost platform.
- Pumping stations should be fenced off, 1.8m high brick, galvanised palisade or steel mesh fencing.
- Bunded tanker bay with drainage must drain directly into the wet-well. The general fall of the tanker bay must slope towards a centralised gully drain.
- For dual pump stations, compound levels and falls must be designed so that in the event of a failure, cross contamination is prevented.
- Pipe support for the valve chamber must be cast in situ concrete block.
- Maximum wet-well depth should not exceed 8m, if greater then please consult with IWNL as specialised lifting equipment will be required along with the storage kiosk.

IWNL will accept local incumbent addendum specifications, unless they go against the above requirements, or the flow rates and emergency storage requirements detailed in DCG are changed

The following information is required for the pumping station technical review submission:

- Design inflow and proposed discharge.
- Compound layout.
- Pumping station plan and sections
- Hydraulic calculations and profile for sewer network and emergency storage
- Performance curves
- Pump dimensions and details.
- Storage calculations and retention times, please state if chemical dosing is required.
- Telemetry details
- Rising main long sections
- Surge analysis of rising main if over 500m

Technical approval of the design will be issued once IWNL are satisfied with all the above design details and all queries have been answered,

During construction IWNL Asset Surveyors will be on site to witness construction of the main structures and the installation of all mechanical and electrical components.

The asset surveyor will be present for the set up and charging of the rising main during pressure testing. This includes a review of logged test results. IWNL will undertake a detailed onsite inspection, once the building works have been completed at the commissioning stage, IWNL will inspect control levels, build quality, and confirm the design has been followed. If the construction complies with the approved design and all relevant standards, IWNL will undertake a final check of all historic and current operational data, ensure that after 50% upstream occupancy, all worn parts have been replaced and that the wet well is clear of all debris, prior to a final inspection.

The developer's 12-month maintenance period will start once IWNL is satisfied that the pumping station construction is adequate, and its performance is satisfactory. The vesting phase will be undertaken after the completion of the 12-month maintenance period. The pumping station will come under IWNL ownership as per the Section 104 adoption process provided that all remedial works are complete and IWNL has received a full detailed set of maintenance reports, telemetry data and incident reports for the site.

2.0 Introduction

The Design and Construction Guidance (DCG) specifications provides a comprehensive set of guidance for adoptable pumping stations that must be complied with in accordance with Section 104 of the Water Industry Act, 1991. This document details IWNL specific requirements that must also be incorporated within the design and construction of pumping stations.

The scope of the document covers only submersible pumping stations that do not exceed 30kW per pump unit and where the maximum depth of the wet well from ground level to the underside of the pump unit is 8m.

IWNL are unable to adopt pumping stations on a site with less than 100 dwellings.

All pumping stations that are submitted for adoption, must contain a detailed design that contains design information compliant with the IWNL requirements. Details of these requirements can be found in Table 1.0.

Table 1.0 - Design requirements for an adoptable pumping station submission.

Design Requirement	
Specification	Design Inflow and Proposed Discharge
Drainage Strategy	Rising Main & Surge Analysis
Hazardous Area Classification	Emergency Storage
Retention Times and Chemical Dosing	Pump Duty and Selection
Pump Station Layout	Pump and Level Control Cabling
Control Equipment	Telemetry Equipment
Access Covers	Lifting Equipment
Penstock Valve	Baffle Plate
Appendices consisting of hydraulic calculations, storage calculations, hazardous area certification, pump station drawings, wiring diagrams and structural design information	

All adoptable pumping stations will undergo the same procedure from initial submission to vesting. Details of this process can be found in Figure 1.0. Further information on the adoption process can be found in Appendix A.

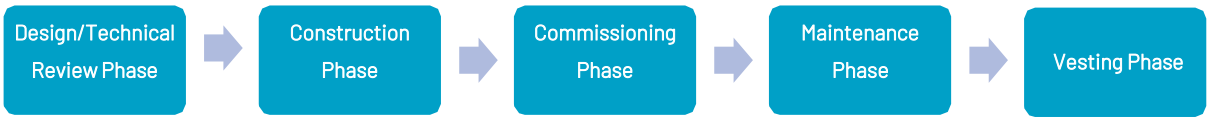

Figure 1.0 - Flow diagram of the pumping station adoption process.

Further details on work the IWNL Asset surveyors undertake during the process and prior to Vesting can be found in Appendix B.

IWNL will accept local incumbent addendum specifications, unless the design of the pumping station deviates from our specified requirements, or the flow rates and emergency storage differ from requirements detailed in DCG.

3.0 Provision of Pumping Stations

3.1 Location

The minimum distance habitable buildings can be located from the wet well can be found in Table 2.1.

Table 2.1 - Minimum Distances of Wet Wells to Habitable Buildings.

Pumping Station Type	Minimum Distance (m)
Type 3	15
Type 4	15

3.2 Site Layout

3.2.1 Hardstanding/Tanker Access and Egress

Impermeable hardstanding adjacent to the wet well must be provided with 125mm kerb upstand surrounding. This hardstanding must support an 18,000L tanker. Access and egress to the compound should be simple, allowing the tanker to manoeuvre safely into and out of the compound. The hardstanding area must be a concrete slab with tamped/ brushed finish and trowelled edging. The tanker bay must be bunded with a single gully at the lowest point connected directly to the wet-well.

3.2.2 Concrete Connection Requirements

Pipes, sleeves, water bars or other items, built into the concrete, must be rigidly secured in position to prevent movement and must be free from external coatings that may adversely impact the bond. Precautionary measures must be taken to prevent the formation of air pockets, voids any other reasonable defaults, whilst the concrete is being poured. Any concrete used shall comply with BS EN 206 BS 8500:2019.

3.2.3 Flood Requirements

The pumping station must not be located where flooding occurs more regularly than 1:30 years. All electrical equipment must be water resistant or situated above 1:200-year flood level.

3.2.4 Levels

The cover level of the wet well and valve chamber must be equal to the ground level. For compounds that contain both a foul and surface water wet well – the foul water cover levels must be set below their surface water counterparts.

3.2.5 Access Points

The last access point for the upstream gravity sewer network must be located within the site compound, adjacent to the wet well and be designed to allow for over pumping. This access point must also have provision for isolating the incoming flow into the pumping station by means of a hand-operated, or penstock valve.

3.2.6 Security

The compound must be entirely secured with 1.8m high brick, galvanised palisade or steel mesh fencing.

Suitably sized gates that allow easy tanker access must be included. The gates must be made from steel with powder coating to suit the development. The gates must be lockable and be 4 meters for Type 3 pumping stations. Gates should open outwards and include padlock holes and gate stay holes.

Once erected, the following warning signs should be permanently fixed to such gates.

68007AU-R2H x 1 - Danger 400 Volts - Portrait
Size: 200 x 300 mm
Material: 2mm Rigid Plastic
Fixings: Wall Mounting Kit

52020AU-R2H x 1 - No Unauthorised Persons - Portrait
Size: 200 x 300 mm
Material: 2mm Rigid Plastic
Fixings: Wall Mounting Kit

65515AU-R2H x 1 - Danger Automatic Machinery May Start - Portrait
Size: 200 x 300 mm
Material: 2mm Rigid Plastic
Fixings: Wall Mounting Kit

A4-R2 x 1 - Custom Sign - 210 x 297 mm (A4) - 2mm Rigid Plastic
Sign Reads: KEEP CLEAR ACCESS REQUIRED AT ALL TIMES
Size: 210 x 297 mm (A4)
Material: 2mm Rigid Plastic
Fixings: None

Figure 2 - Warning signs

3.2.7 Kiosk Positioning

The kiosk must be fixed to a suitable sized concrete plinth with tamped finish and trowelled edging and be located at least 150mm above ground level. The kiosk must be sized to accommodate the control panel, outstation and emergency power connection. The kiosk must be lockable and of a suitable security rating to prevent forced entry and should be painted green in colour; any alteration to suit the surrounding environment should be discussed with IWNL.

3.2.8 Covers

All covers must be minimum 675mm for single access. Wet-well covers must be hinge assisted with fall arrest land lockable via recessed padlocks. Valve chamber covers must be hinged and sized to fit the valve chamber and lockable via recessed padlocks. The area around the covers should be tamped finish concrete.

3.2.9 Bollards

Bollards must be included to protect the wet well, upstream manhole and downstream valve chamber from possible loading from maintenance vehicles and tankers. They should have a minimum height of 900mm and diameter of 100mm.

Temporary bollards must also be included where resident parking may restrict the ability for vehicles to easily access and egress the pumping station compound.

3.3 Emergency Storage

3.3.1 Foul Water Pumping Stations

In order to ensure sewage flooding does not occur at, or upstream of, the pumping station during plant or power failure, emergency storage must be incorporated within the design, to provide containment whilst remedial work is undertaken to repair the plant/power failure.

The base of the storage must be above the high-level wetwell alarm, with the top water level of this storage being below the invert of the lowest lateral drain connection in the upstream network.

The planned area for the wet well must not be increased to facilitate this additional storage below the high-level wetwell alarm. Storage must be provided either:

- In any upstream sewers and lateral drains, up to the invert level of the upstream end of the lowest public lateral drain or,
- Specifically designed adjacent storage structures that are designed to be self-cleansing.

As a minimum, the storage should equate to 160 L/dwelling, and for commercial or industrial developments, one hour of the peak design flow rate. The same storage requirements should be followed when calculating emergency storage for pumping stations serving more than 500 dwellings.

3.3.2 Surface Water Pumping Stations

Surface water pumping stations should only be used when no other practicable solution for the surface water drainage is available, and an acceptable flood exceedance plan is provided in the event of pump/power failure. IWNL must be notified as early as possible when a surface water pumping station is to be included as part of the drainage strategy.

For surface water pumping stations, 125m3 of storage should be provided per hectare of impermeable surface draining to the pumping station. Checks should be made to ensure the system still complies with the local authorities' requirements for flood protection frequencies and to ensure no flooding occurs in properties due to the pump or plant failure.

4.0 Pumping Station Design Criteria

A general schematic of the pumping station chambers can be found in Appendix C.

4.1 Wet Well general considerations

Precast concrete or an in-situ formed concrete base must be used for pumping station wet wells. Adequate benching must be provided for all materials, to prevent the formation of "dead zones". Benching must start no more than 100mm from the pump unit volume, with the slope of the benching never falling below 60° to the horizontal. The area below the pump must be as small as practicable, to ensure effective well cleansing and flat floor areas must be kept to a minimum.

The wet well diameter should be kept to a minimum to reduce the amount of benching necessary. The wet well design and sewer inlet arrangement should ensure satisfactory flow conditions to the pump units and avoid the formation of damaging vortices. This is best achieved by installing the incoming sewer on the centreline between the submersible pump units. An inlet baffle or drop tube terminating above the start level may be included for the sewer inlet to prevent excessive aeration of sewage or interference with ultrasonic beams for level sensing.

The valve chamber must be a separate chamber but can be structurally attached.

Valves must not be installed in the wet well. A penstock valve must be provided upstream of the wet well, to allow for wet well isolation during maintenance.

Pipework situated within the wet well must be ductile iron. Corrosion protection must comply with the Water Industry Mechanical Electrical Specification (WIMES) 4.01 – Paints and Polymeric Coatings for Corrosion Protection, published by ESR Technology, 2005.

The wet well should be designed, as far as practicable, to eliminate the need for manned entry during maintenance. Permanent ladder or step rungs must not be installed within the wet well. A stainless-steel eyebolt must be available to permit manned entry in the small number of cases when this is unavoidable.

IWNL require a vent pipe, regardless of whether upstream venting is provided. Ventilation should be provided through the installation of a stack with a minimum diameter of 75mm and a minimum height of 1.8m, with a galvanised mild steel mesh at the top. The vent pipe must be connected directly to the wet-well and be secured to the fence/wall with an anti-vermin vented cap.

4.2 Hazardous Areas

Foul pumping stations have the potential to become hazardous zones, in accordance with the Dangerous Substances and Explosive Atmospheres Regulations, 2002 (DSEAR).

A detailed risk assessment in accordance with these regulations, must be provided for all adoptable pumping stations.

Due consideration must be taken when installing equipment within hazardous areas, along with any appropriate measures to limit the scope of the hazardous zone.

Wet wells should be assumed to be a Zone 1 atmosphere, unless the risk assessment clearly shows that protection to a less hazardous zone is appropriate for compliance with DSEAR.

4.3 Valve Chamber

Precast concrete or an in-situ formed concrete base can be used for the valve chamber base.

The valve chamber must be provided with a hand-operated penstock that operates a gravity drain into the wet well. This discharge drain must be protected to prevent flows from flammable atmospheres entering the valve chamber from the wet well.

Opening covers must extend across the full valve and have a fall arrest system. Valves should be fitted with extension spindles up to the underside of the cover, and a "T" key for operation, to ensure valve chamber entry is not necessary.

The valve chamber should have a maximum depth of 1.5m from cover level to the base of the chamber.

Steps must be provided along with an extendable handrail.

4.4 Access into Wet Well and Valve Chambers

Chamber openings must be large enough to allow for pump units, valves and flowmeters to be lifted easily and safely out of their relevant chamber for above ground inspection, maintenance or replacement. Openings must be a minimum of 675mm x 675mm.

4.5 Davit Sockets

Davit sockers must be designed and positioned to provide lifting equipment with a vertical pull on the pump unit lifting attachments, to allow pump units to be raised or lowered on their guide rails.

Davit sockets must be capable of lifting twice the weight of each pump unit, subject to a minimum safe working load of 500kg. They must be load tested in-situ, with an IWNL certified test certificate being produced, upon completion of this test.

To prevent water and debris entering the davit sockets, cover plates flush with the top of the surrounding concrete must be provided.

Further details on the lifting system are described in Appendix C

4.6 Flow Meter, pressure monitor and amp meter

A flow meter and an electronic pressure monitor must be installed downstream of the non- return valves on the rising main. Both measuring instruments must be wired to the control panel and telemetry system via a 4-20ma signal. All pump panels regardless of pump size must be fitted with an amp meter that is hardwired to the telemetry unit via a 4-20ma signal.

4.7 Pump Selection

Each pump unit or combination of pumps (when using more than 2 pump arrangement, excluding the standby pump), must be capable of pumping the design flow rate when the sewage level is at the mid-point of the start and stop levels in the wet well.

Protective coatings must be selected with reference to the operating environment, pumped liquid and expected design life.

The noise levels from each pump unit must not exceed 80dB(A) at a distance of 1m from the pump unit centreline (based on the pump unit being mounted in "semi-reverberant" conditions).

Each pump unit must be provided with an auto-coupling system (ACS) to interface with the outlet pipework/rising main.

If possible, pump units shall not be fitted with minimum or maximum sized impellers for selected casing size. Impellers shall be selected to prevent fouling, allow passage of fibrous, stringy and solid materials and to suit the operating conditions in an efficient manner.

Pump motors must:

- Be capable of continuous operation.
- Be suitable for the site electrical supply.
- Be capable of handling a maximum number of 15 starts per hour.

Pump controls should ensure pumps run for a minimum of three minutes, but not on more than 15 occasions per hour. The anticipated wet well inflow, capacity, pump discharge rate and consequential number of pumps starts must be considered, prior to pump choice.

Pumps should be supplied from an established manufacturer, with all calculations provided as part of the design submission.

4.8 Hydraulic Design

IWNL require the design flow rate for pump units within foul pumping stations to be the maximum of half the incoming peak design flow rate and it should also achieve a minimum flow velocity in the rising main as per DCG guidelines.

The stop level for duty pump shall be selected to prevent pump cavitation which can occur when pump draw air. Consideration should be given to the pump manufacturer's recommended net positive suction head when choosing the pump stop level.

A time delay between the stops of pumps should be considered to avoid high immediate flow changes and pressure transients in the discharge pipes.

The invert level of the incoming sewer shall be above the start level of the standby pump.

The pumping station designed static head for the pump unit design flow rate should be based on the mid-point of the duty pump stop and start levels in the wet well. Calculations must be provided to confirm capacities of the pumping station based on hydraulic design.

The pumping station should be provided with an ultrasonic level control system. Four level set points should be set in the wet well. These should be a "snore" level, a "pump unit stop" level, a "duty pump unit start" and a "standby pump unit start" level. The levels must be selected so that:

- The pump units operate safely and effectively in accordance with the pump manufacturer's specifications.
- If the wet well is a hazardous area, the pump units should meet the DSEAR requirements.
- Pump unit starts are limited to 15 per hour.
- Pump unit run time is at least 3 minutes.
- Combined sewage retention time in the wet well and rising main does not exceed 6 hours.
- As a minimum, the duty pump stop level should be selected to allow the pump motor to be half submerged when the pump stops.
- Wet well shall be designed to ensure that the standby pump unit start level is a minimum of 150 mm above the duty pump unit start level and the High-Level Alarm level is a minimum 100 mm above the standby pump start level.
- The high-level back up float switch in the wet well is not routinely activated.

4.9 Kiosk Design

The kiosk should contain the electricity distribution network, operator's supply and metering equipment (housed in a separate section of the kiosk), the electrical assembly, kiosk heating and lighting system, telemetry outstation and an RCD switched 240V socket.

The kiosk must comply with the required security rating in accordance with the Loss Prevention Certification Board Standard 1175.

Fixed to the inside door of the kiosk should be:

- Information on resuscitation following electric shock.
- Pump unit information.
- Ultrasonic level controller setting.
- Diameter and length of the rising main.
- Complete set of wiring diagrams contained within a weatherproof envelope.
- The kiosk must be fitted with an intruder alarm that is wired into the telemetry via a binary input.

An information plate detailing the name of the site and IWNL's contact number should be fixed to the kiosk door exterior. This notice should be made from a durable plastic material and have dimensions no less than 200mm x 150mm. Additionally, a standard "DANGER – electrical apparatus" notice must be fixed on the kiosk exterior, indicating the highest voltage likely to be encountered.

The kiosk should ensure thermal transmittance does not exceed 1.5W m-2 K-1, fire resistance must be Class 2 in accordance with BS 476-7 when tested in accordance with BS 476-20 for a period of over 30mins and the kiosk should have an IP rating of at least IP55.

The bottom flange of the kiosk and plinth must be sealed with a mastic sealant to prevent water ingress.

All wiring should be in accordance with DCG and be labelled correctly.

Cable ducts should be provided to route cables underground with pulling rope left in situ. Lighting should be provided within the kiosk for working in the dark. Any external lighting column must be hinged for maintenance.

Copies of all wiring, ladder logic and wet well diagrams to be laminated and stored within the kiosk for future use.

4.10 Valve Selection

Bauer connection to be provided on the auxiliary suction pipe to facilitate pump maintenance and emergency work.

One check valve per pump unit mounted horizontally in the pump unit outlet pipework upstream of the gate valves and arranged to prevent mass flow reversal under normal operating conditions.

For Type 3 and 4 pumping stations, a gate valve and 100mm diameter female Bauer coupling, mounted vertically in a tee piece in the rising main, downstream of the gate and check valves to be fitted.

Spindles for penstock valves accessible from the surface.

One gate valve per pump unit mounted horizontally in the pump unit outlet pipework and arranged to isolate the pump units from the rising main.

5.0 Rising Main

5.1 General Requirements

Rising mains should be laid in highways, or public open spaces where they are reasonably accessible. Rising mains should not be laid in enclosed private land.

Rising main should be situated no nearer than 3m from any building or structure. Butt fusion jointing is preferred over all other methods.

The line and level of the rising main must comply with the latest S104 drawings.

Non-degradable marker tape should be laid 300mm above the top of the pipe.

For non-metal mains, the marker tape should include a trace wire that protrudes to the surface at a marker post every 1000m where it is connected to terminals on the marker post.

At the pumping station, marker tape should enter through a sealed duct, 300mm below the final paved area, and should terminate with 1m of wire coiled inside the valve chamber.

At the rising mains point of discharge, the marker tape should be terminated by a marker post, or coiled up inside a trench the main has been laid in.

For all instances, rising mains should discharge into a standard chamber, that gravity feeds into another chamber downstream. This connection must not prohibit normal access to the manhole and connect soffit to soffit to avoid any turbulence.

Where the rising main passes through the wall of a structure, the pipe manufacturer's recommendation should be adhered to, to safeguard the integrity of the main from differential settlement/movement.

The rising main should be tested as per Water Industry Specification WIS 4-01-03.

5.2 Hydraulic Design

The diameter of the rising main should ensure the velocity of the discharge lies within the range of 0.75m/s – 1.8m/s when the pump unit is operating.

The rising main should be laid to a minimum gradient of 1:500 when rising, and 1:300 when falling, with air release valves located at high points, and washout chambers at low points. Where possible, IWNL prefer a rising main which continuously rises, with no air valves. Where air valves are required, the use of smart air valves can be considered.

Rising mains should have a nominal bore (NB) of no less than 80mm.

In exceptional circumstances, where it is not possible to satisfy the hydraulic design requirements using an 80mm NB pipe or greater, then the designer must confer with IWNL to agree the best code of practice going forward.

The roughness value (ks) used for the rising main design, should be shown within the calculations provided and should be in accordance with 'Tables for the Hydraulic Design of Pipes, Sewers and Channels, 6th edition – Volume II' published by HR Wallingford.

6.0 Telemetry

6.1 General Points

IWNL use Nortech NX-12 Remote Terminal Units (RTUs) to monitor pumping station performance. This information is relayed to the IHost platform via the NX-12 RTU. The units can be purchased direct from supplier.

Telemetry is to be set up at the developer's cost.

All Nortech equipment will be approved by IWNL to satisfy the requirements of the remote site, including communications of GSM.

Configuration of the RTU will be completed by Nortech and downloaded to the RTU upon initial power up.

All plant I/O identified in Appendix D, shall be connected to the appropriate RTU terminal blocks and pins, as per the requirements stated therein. Plant I/O shall not be connected to any other terminal block or pin other than that stated for specific signals.

IWNL require an analogue 4-20ma signal to measure current from the pumps.

Appendix D displays the standard telemetry setup for an IWNL foul pumping station using a Nortech NX-12 RTU in conjunction with the iHost database. Standard variables, commands and notifications can be seen within Appendix D

6.2 Logic I/O

The RTU provides internally derived logic for GSM signal strength and temperature.

These signals are not identified on the standard telemetry I/O displayed in Appendix D as they are automatically monitored by the RTU.

6.3 Hardwired I/O

All signals shall be hardwired as failsafe, direct from the relevant MCC cubicles (starter and common control sections) to a din rail mounted terminal that is mounted within the cubicle the RTU is to be located in.

A multicore flex shall be used to connect the din rail mounted terminals to the terminations within the RTU.

Multicore flexes used for final connections to the RTU shall incorporate switched pairs for each digital signal. A single common, and multiple switched returns will not be accepted.

A screened twisted pair shall be used for each analogue signal.

Digital and analogue circuits from the din rail mounted terminal to the RTU shall be numbered, at one end, in accordance with the RTU input or output they are connecting to. For example, DI1+, DI1- and, at the other end, matching the wire number entering the din railed mounted terminal.

6.4 High-Level Alarm Float

The high-level alarm float shall not be connected directly to the RTU.

The Nortech RTU does not have a power output to supply the barrier relay. A suitable power supply shall be taken from the common control section to power the barrier relay. The float shall be connected to the barrier only and a volt free connection made to the RTU from the barrier relay.

6.5 RTU Requirements

The RTU shall be connected to a dedicated 230V AC power supply that does not provide power for any other device. Isolate from Mains before removing cover.

AC Powered Models
The AC supply should be isolated prior to opening the enclosure and should not be reconnected until the enclosure lid is secured.
The AC Power Supply should be rated at 230 Volts or 115 Volts, operating at a frequency of 50Hz.
The power supply to the RTU should be:

- Connected via a switch or circuit breaker.
- Close to the RTU and within easy reach of an operator.
- Marked as the disconnection device for the RTU.

6.6 Testing

Testing shall include Nortech web-based iHost platform. Log in and access requirements shall be pre-arranged with IWNL prior to testing.

All hardwired circuits to the RTU shall be tested end to end, from source to RTU, including field devices such as high level or stop/start floats.

6.7 Electrical Schematics

Electrical schematics produced by the panel builder shall incorporate a block diagram to reflect the cable connections between the din rail mounted terminals located within the cubicle housing the RTU and the RTU connection points as detailed in Appendix E.

Appendix A – Pumping Station Adoption Procedure

Design/Technical Review Phase

After the designer has submitted their design for the pumping station, IWNL will review the submission thoroughly to check that the design conforms to IWNL requirements. Once IWNL are satisfied with the design then technical approval will be issued.

Construction Phase

Once the design has been technically approved, the construction can begin. IWNL will endeavour to be onsite to see concrete being poured for the structure and witness the installation of all mechanical and electrical parts.

Commissioning Phase

The commissioning phase involves checking the building works have been finished. IWNL will inspect levels, build quality and if the pumping station has been constructed to the approved design.

Maintenance Phase

12-month period from the point when the development reaches 50% occupancy. During this period, IWNL will assess the performance of the pumping station, to ensure there are no operational issues.

Vesting Phase

This is the final stage of the adoption process - an IWNL Asset Surveyor will conduct a final assessment of the pumping station compound/components. Following issue of all reports to IWNL requirements, the Asset Surveyor will sign off on the pumping station whereby IWNL will officially take ownership of the asset from thereon.

Appendix B – Asset Surveyor Checklist

Rising Main

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Line of main.
- Marker tape.
- Level bedding and surround.
- Jointing (preferred jointing method is butt fusion).
- Gaskets are joined correctly (no bolts missing).
- The air valve is located correctly.
- The flowmeter is located in the correct location and feeds back to iHost.

Valve Chamber

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Galvanised ladder.
- Concrete finish.
- Covers.
- one gate valve per pump unit is mounted horizontally in the unit outlet pipework and arranged to isolate the pump units from the rising main.
- Presence of infiltration.
- Valve chamber has drainage connected to the wet well and a penstock valve is present.
- Gaskets have been joined correctly with all bolts used.
- One check valve per pump unit mounted horizontally in the pump unit outlet pipework upstream of the gate valves and arranged to prevent mass flow reversal under normal operating conditions.
- For Type 3 and Type 4 pumping station, must ensure the presence of a gate valve and 100mm diameter female Bauer coupling, mounted vertically in a tee piece in the rising main, downstream of the gate and check valves.
- Spindles for penstock valves are accessible from the surface.

Wet Well

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Construction/benching complies with the design.
- The wet well is materially self-cleansing in terms of grit, solids, and as far as practicable, positive buoyancy material.
- No steps or ladders present in the wet well.
- Vent pipe connected directly to the wet well and secured to the wall with vermin control.
- Penstock valve on the inlet.
- Dry flow channel for storage and access for both sides.
- The pump delivery pipework is opposite the wet well.
- Baffle plate present.

Pump Unit

Asset Surveyor must take photos to store for future reference.

Each pump unit must be provided with an information plate, that is permanently fixed to the pump unit. The plate and its fixings shall be manufactured from corrosion-resistant metallic materials. As a minimum, the information plate shall include:

- Pump unit manufacturer.
- Pump unit type.
- Pump unit serial number.
- Impeller number or diameter.
- Flow rate at the duty point (litres per second).
- Head at the duty point (m).
- Operating speed (rpm).
- Motor rating (kW).
- Operating voltage (V), number of phases and frequency (Hz).
- Full load current (A).
- Full load power factor.
- Insulation class.
- Enclosure classification (IP rating).
- Hazardous area classification.
- Pump unit weight.

Compound

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- There is space to accommodate an 18000L tanker.
- There is sufficient space to carry out the chosen method of pump maintenance safely.
- Tanker bay should be bunded with a single gully at the lowest point connected directly to the wet well.
- Gates must open outwards with a sliding bolt and padlock. Floor bolts must be located on each side.
- 4m wide opening, to enable easy access for the tanker.
- Any external lighting column must be hinged for maintenance.
- Hinged covers are normally preferred. The hinged cover should incorporate a facility for securing a recessed padlock with a safety grid beneath.
- The cover frame should provide facilities for demountable handrailing which can be erected prior to any maintenance on the pump units being undertaken. Depending on the site conditions, the handrail can be fixed permanently, but with removable sections to allow pump unit removal.

Kiosk

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Minimum of 3m between the kiosk and any vent from the wet well.
- There is a minimum of 1m of hardstanding in front of the kiosk.

- Operators can have an unobstructed view of the top of the wet well whilst attending the electrical assembly.
- The doors of the kiosk open safely and do not open onto any access cover/manhole or cause an obstruction.
- No dangers will arise to operators through working on, or operating the equipment within the kiosk, whilst the opening covers are lifted.
- Type 3 pumping stations have sufficient space to offload and position a mobile generator adjacent to the kiosk.
- The base of the kiosk is above flood level.
- The kiosk is outside any hazardous areas.

Concreting

Initially, take photos and store for future reference. Asset Surveyor must ensure any concreting at ambient temperature (below 15°C), may only be carried out if the following conditions are satisfied:

- The aggregates and water used in the mix shall be free from snow, ice and frost.
- Before placing concrete, the formwork, reinforcement and any surface the fresh concrete will come into contact with, is free from snow, ice and frost, and is above 0°C.
- The initial temperature of the concrete at the time of placing shall be at least 5°C, as stated in BS EN 206-1, Section 5.2.8, Lower Limit.
- The temperature at the surface of the concrete shall be maintained at not less than 5°C at any point, until the concrete reaches a strength of 5 N mm^{-2}, as confirmed by tests on cubes matured under similar conditions.
- Temperatures at the surface of the concrete shall be measured where the lowest temperature is expected.
- Precautions shall be taken to prevent the temperature of any concrete falling to 0°C during the first 5 days after placing.

Network Cleansing

Asset Surveyor must ensure/inspect:

- Jet vac tanker required.
- Bung last downstream chamber within the network or bung the section you are intending to jet (on live sites) to prevent rubble and foreign objects from entering the main network.
- Larger parcels should be split into smaller networks and the same methodology should be applied.
- Always start at the head of the run and jet downstream.
- Clean any material before starting the next chamber.
- Only remove bungs when network has been fully cleaned and material removed.

Appendix C – IWNL Pumping Station General Schematic

Appendix D – Telemetry Signals Table

IWNL Telemetry NX12 input/outputs

Inputs	State Healthy	State Alarm	Signal Type	I/O Allocation	NX12 Pins	NX12 Block	Additional comments
Binary Inputs							
Power failure	Normal	Failed	Pulsed input	Di5	5	TB4	
Power meter Pulsed KWH			Digital input	N/A	N/A	N/A	
Pump 1 Running	Running / Stopped		Digital input	Di/1&7	9 & 3	TB4	
Pump 1 Tripped		Tripped	Digital input	Di8	2	TB4	
Pump 1 Available/ Unavailable	Available/ Unavailable		Digital input	Di6	4	TB4	
Pump 2 Running	Running / Stopped		Digital input	Di2&10	8 & 8	TB2	
Pump 2 Tripped		Tripped	Digital input	Di11	7	TB2	
Pump 2 Available/ Unavailable	Available/ Unavailable		Digital input	Di9	9	TB2	
Back up Float operating	Normal	Activated	Digital input	Di14	4	TB2	
Ultrasonic level controller healthy	Normal	Failed	Digital input	Di13	5	TB2	
Wet Well High-High level	Normal	High	Digital input	Di12	6	TB2	
Maintenance on site	Off / On		Digital input	Di16	2	TB2	
Flowmeter Flow pulse			Pulsed input	Di3	7	TB4	
Flowmeter Health	Normal	Failed	Digital input	Di15	3	TB2	
Intruder Alarm	Healthy	Alarm	Digital input	Di4	6	TB4	
Analogue Inputs							
Wet Well Level			Analog input	AI1	9	TB3	4-20 ma
Rising Main Delivery Flow			Analog input	AI2	8	TB3	4-20 ma
Pump 1 Running Current			Analog input	AI3	7	TB3	
Pump 2 Running Current			Analog input	AI4	6	TB3	
Delivery Pressure signal			Analog input	AI5	5	TB3	4-20 ma
Power Meter			Modbus 485	MODBUS	1 & 2	TB1	
Digital Outputs							
Remote Control Select			Digital output	DO1	9	TB5	
Pump 1 Remote Reset			Pulsed digital output	DO2	8	TB5	
Pump 2 Remote Reset			Pulsed digital output	DO3	7	TB5	
Pump 1 Remote Start/Stop			Digital output (on when contact closed)	DO4	6	TB5	
Pump 2 Remote Start/Stop			Digital output (on when contact closed)	DO5	5	TB5	
Modbus Expansion Card							
(only required if the bellow signals need to be monitored)							
Pump 1 Seal Leak	Healthy	Failed	Digital	Di0			
Pump 2 Seal Leak	Healthy	Failed	Digital	Di1			
Station Inhibited	Healthy	Inhibited	Digital	Di2			
Dosing Pump Fault	Healthy	Failed	Digital	Di3			
Bund High Level	Normal	High	Digital	Di4			
Tank Recorder Level	Normal	Reorder	Digital	Di5			
Tank Low Level	Normal	Low	Digital	Di6			

Appendix E – Electrical Wiring Diagrams

Appendix B – Asset Surveyor Checklist

Rising Main

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Line of main.
- Marker tape.
- Level bedding and surround.
- Jointing (preferred jointing method is butt fusion).
- Gaskets are joined correctly (no bolts missing).
- The air valve is located correctly.
- The flowmeter is located in the correct location and feeds back to iHost.

Valve Chamber

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Galvanised ladder.
- Concrete finish.
- Covers.
- one gate valve per pump unit is mounted horizontally in the unit outlet pipework and arranged to isolate the pump units from the rising main.
- Presence of infiltration.
- Valve chamber has drainage connected to the wet well and a penstock valve is present.
- Gaskets have been joined correctly with all bolts used.
- One check valve per pump unit mounted horizontally in the pump unit outlet pipework upstream of the gate valves and arranged to prevent mass flow reversal under normal operating conditions.
- For Type 3 and Type 4 pumping station, must ensure the presence of a gate valve and 100mm diameter female Bauer coupling, mounted vertically in a tee piece in the rising main, downstream of the gate and check valves.
- Spindles for penstock valves are accessible from the surface.

Wet Well

Initially, take photos and store for future reference. Asset Surveyor must ensure/inspect:

- Construction/benching complies with the design.
- The wet well is materially self-cleansing in terms of grit, solids, and as far as practicable, positive buoyancy material.
- No steps or ladders present in the wet well.
- Vent pipe connected directly to the wet well and secured to the wall with vermin control.
- Penstock valve on the inlet.
- Dry flow channel for storage and access for both sides.
- The pump delivery pipework is opposite the wet well.
- Baffle plate present.

Pump Unit

Asset Surveyor must take photos to store for future reference.

Each pump unit must be provided with an information plate, that is permanently fixed to the pump unit. The plate and its fixings shall be manufactured from corrosion-resistant metallic materials. As a minimum, the information plate shall include:

- Pump unit manufacturer.
- Pump unit type.
- Pump unit serial number.
- Impeller number or diameter.
- Flow rate at the duty point (litres per second).
- Head at the duty point (m).
- Operating speed (rpm).
- Motor rating (kW).
- Operating voltage (V), number of phases and frequency (Hz).
- Full load current (A).
- Full load power factor.
- Insulation class.
- Enclosure classification (IP rating).
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- Pump unit weight.

Compound

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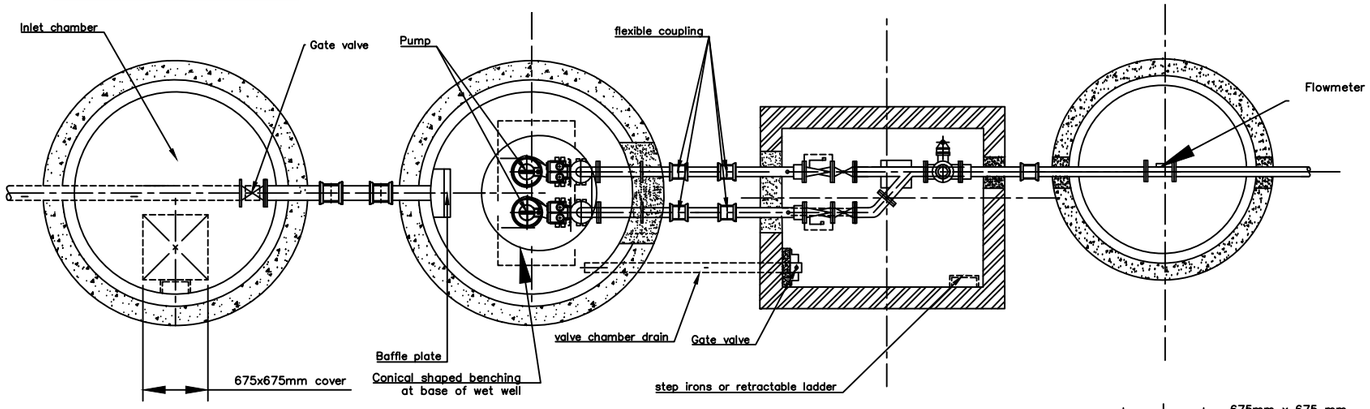
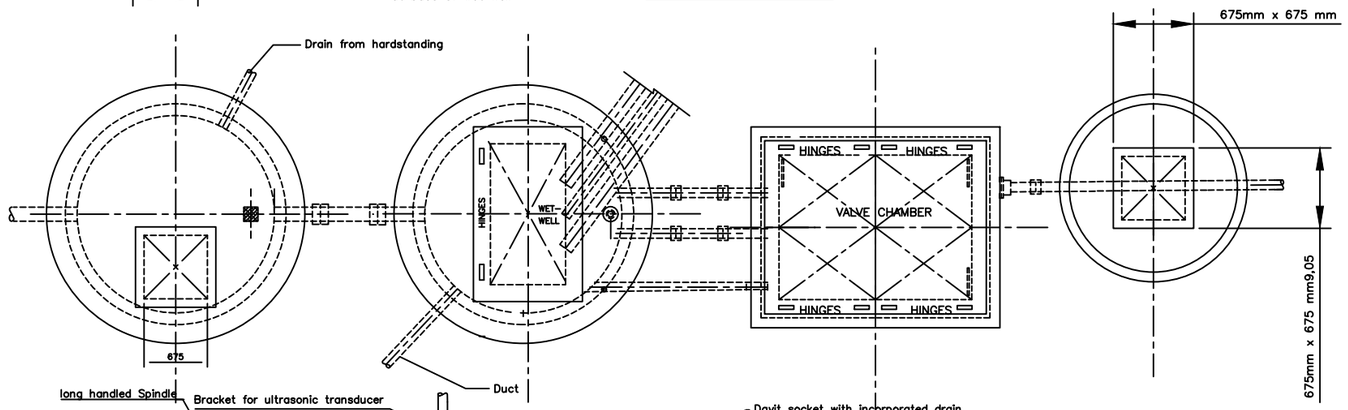
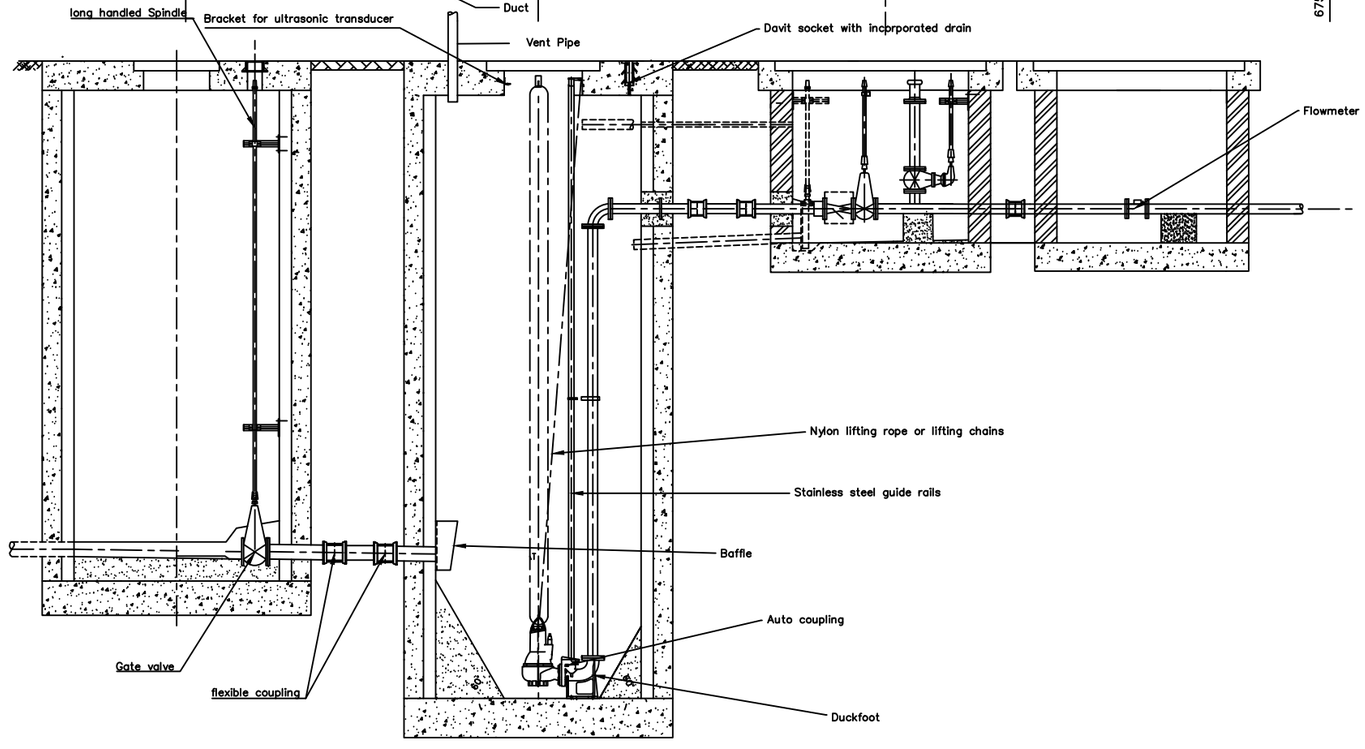
- Always start at the head of the run and jet downstream.
- Clean any material before starting the next chamber.
- Only remove bungs when network has been fully cleaned and material removed.

Appendix C – IWNL Pumping Station General Schematic







General Notes

1. Flowmeter situated in its own chamber but can be included in valve chamber to suit designers needs
2. Access to all chambers to be a minimum of 675mm x 675 mm
3. maximum wet well depth of 8 metres

No.	Revision/Issue	Date
1	DW	2022

Firm Name and Address

Independent Water Networks

Project Name and Address

IWNL Adoptable Pumping Station Schematic

Project	IWNL Adoptable PS
Date	12.07.2022
Scale	DO NOT SCALE
Sheet	1

Appendix C – IWNL Pumping Station General Schematic.dwg

19.07.2022

Appendix D – Telemetry Signals Table

IWNL Telemetry NX12 input/outputs

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Binary Inputs							
Power failure	Normal	Failed	Pulsed input	Di5	5	TB4	
Power meter Pulsed KWH			Digital input	N/A	N/A	N/A	
Pump 1 Running	Running / Stopped		Digital input	Di/1&7	9 & 3	TB4	
Pump 1 Tripped		Tripped	Digital input	Di8	2	TB4	
Pump 1 Available/ Unavailable	Available/ Unavailable		Digital input	Di6	4	TB4	
Pump 2 Running	Running / Stopped		Digital input	Di2&10	8 & 8	TB2	
Pump 2 Tripped		Tripped	Digital input	Di11	7	TB2	
Pump 2 Available/ Unavailable	Available/ Unavailable		Digital input	Di9	9	TB2	
Back up Float operating	Normal	Activated	Digital input	Di14	4	TB2	
Ultrasonic level controller healthy	Normal	Failed	Digital input	Di13	5	TB2	
Wet Well High-High level	Normal	High	Digital input	Di12	6	TB2	
Maintenance on site	Off / On		Digital input	Di16	2	TB2	
Flowmeter Flow pulse			Pulsed input	Di3	7	TB4	
Flowmeter Health	Normal	Failed	Digital input	Di15	3	TB2	
Intruder Alarm	Healthy	Alarm	Digital input	Di4	6	TB4	
Analogue Inputs							
Wet Well Level			Analog input	AI1	9	TB3	4-20 ma
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Pump 2 Running Current			Analog input	AI4	6	TB3	
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Power Meter			Modbus 485	MODBUS	1 & 2	TB1	
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Remote Control Select			Digital output	DO1	9	TB5	
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Pump 2 Remote Reset			Pulsed digital output	DO3	7	TB5	
Pump 1 Remote Start/Stop			Digital output (on when contact closed)	DO4	6	TB5	
Pump 2 Remote Start/Stop			Digital output (on when contact closed)	DO5	5	TB5	
Modbus Expansion Card							
(only required if the bellow signals need to be monitored)							
Pump 1 Seal Leak	Healthy	Failed	Digital	Di0			
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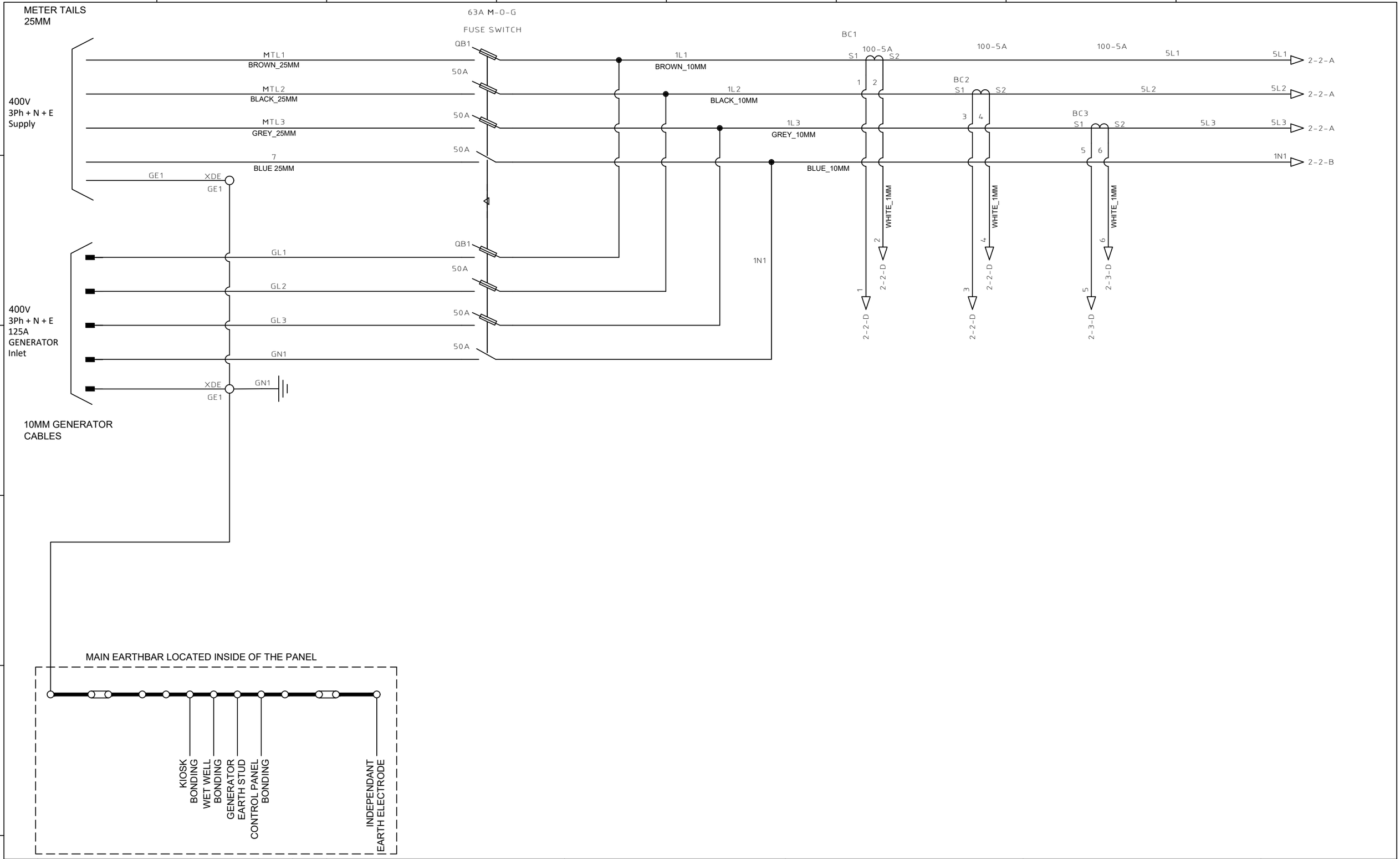
Station Inhibited	Healthy	Inhibited	Digital	Di2			
Dosing Pump Fault	Healthy	Failed	Digital	Di3			
Bund High Level	Normal	High	Digital	Di4			
Tank Recorder Level	Normal	Reorder	Digital	Di5			
Tank Low Level	Normal	Low	Digital	Di6			

Appendix E – Electrical Wiring Diagrams



Rev	Description	Date	Drn	Apprv
A	FIRST ISSUE	15/04/25	JH	JH

Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
INCOMER SECTION

Drawn By
JH

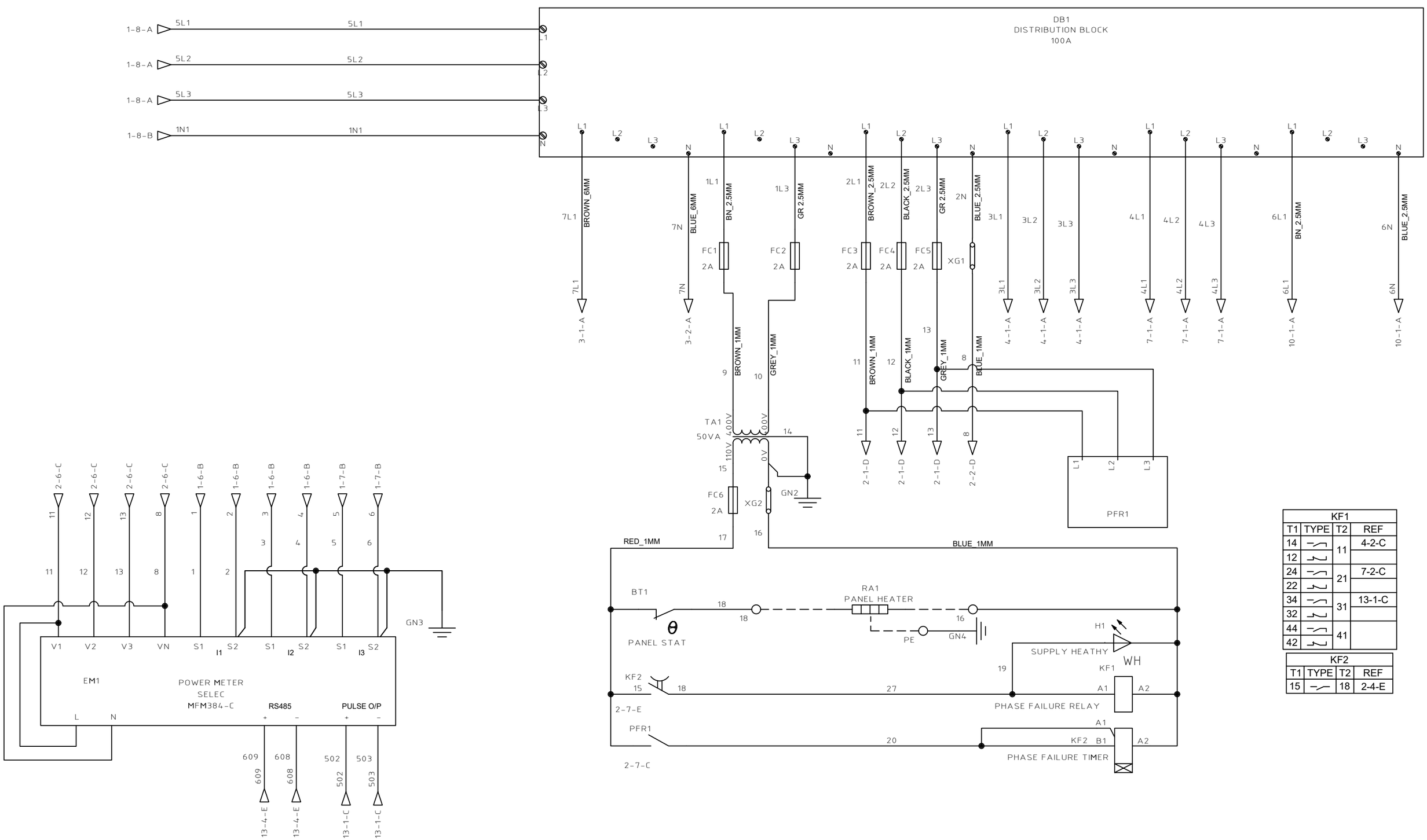
Project Code
GCS0401

Drawing No GCS0401

Site
TEMPLATE DWG'S

Independent Water Networks

Sheet No
1 of 17



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12			
24		21	7-2-C
22			
34		31	13-1-C
32			
44		41	
42			

KF2			
T1	TYPE	T2	REF
15		18	2-4-E

Rev	Description	Date	Drn	Apprv
A	FIRST ISSUE	15/04/25	JH	JH

Client Name: IWNL WATER v3 + DCG

Title: IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
INCOMER SECTION

Drawn By: JH

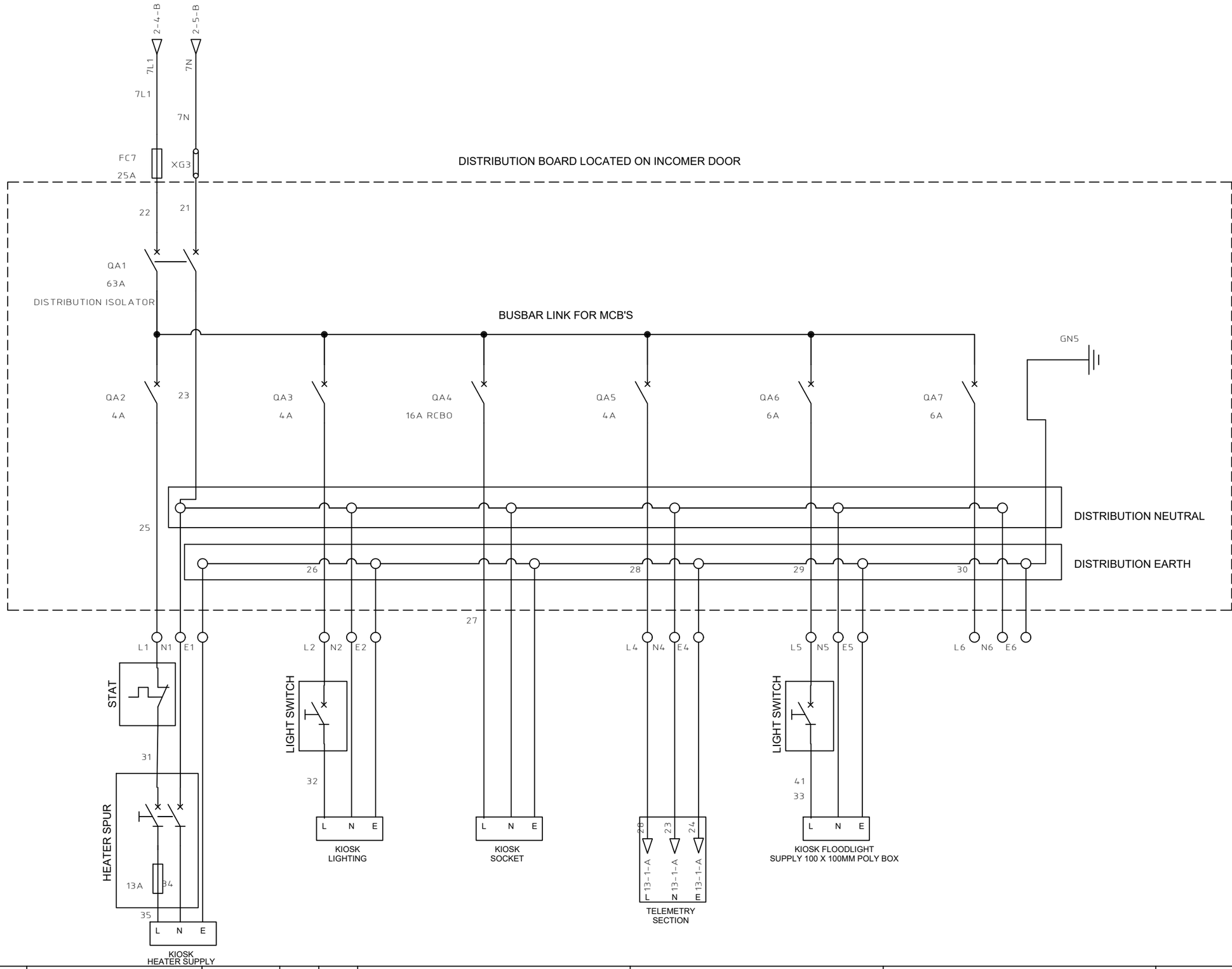
Project Code: GCS0401

Drawing No: GCS0401

Site: TEMPLATE DWG'S

Independent Water Networks

Sheet No 2 of 17



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A	FIRST ISSUE	15/04/25	JH	JH

Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
DISTRIBUTION SECTION

Drawn By: JH

Project Code: GCS0401

Drawing No GCS0401

Site
TEMPLATE DWG'S

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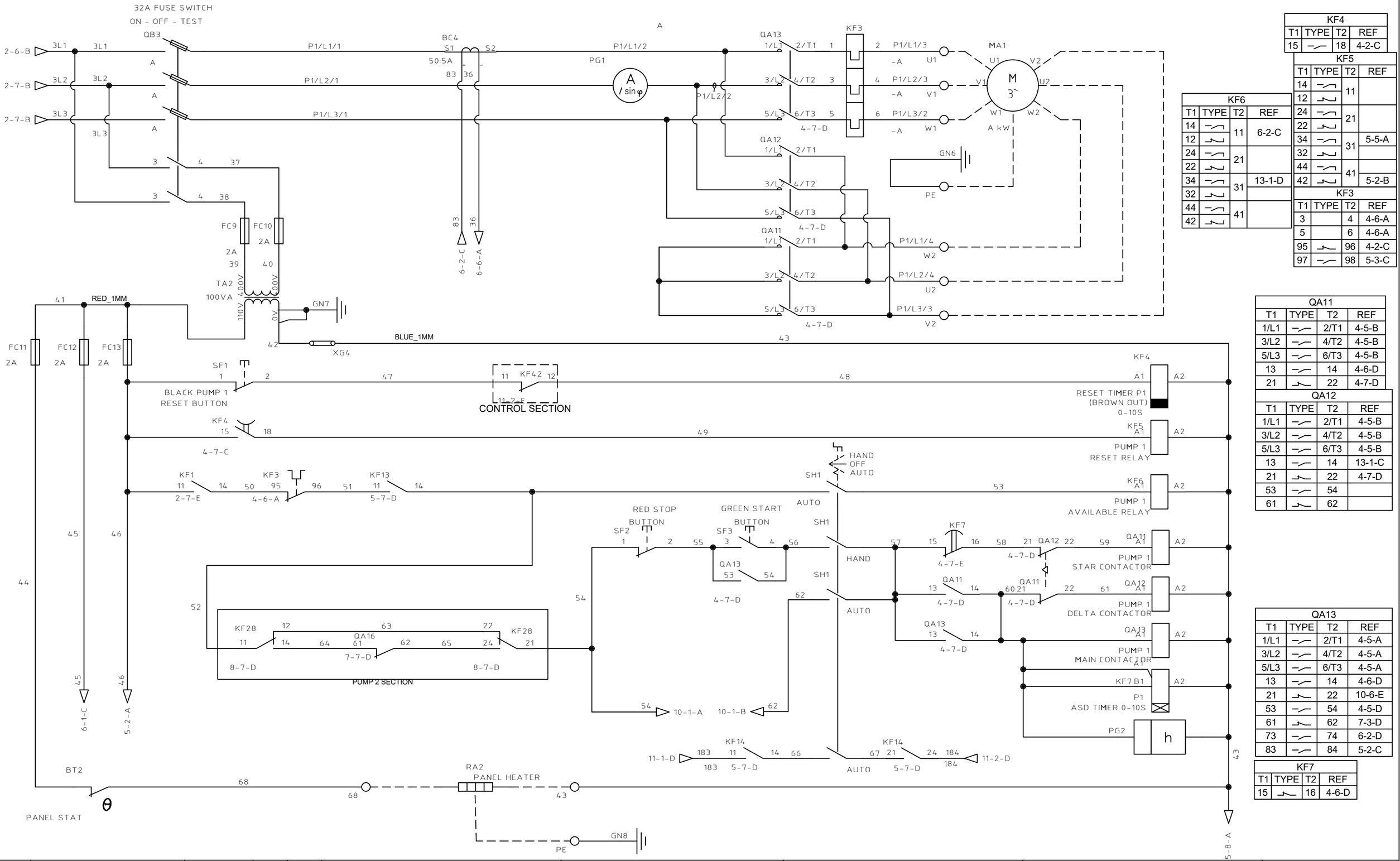
3 of 17

GCD0002/C- 18/10/17



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12	–/–		
24	–/–	21	
22	–/–		
34	–/–	31	5-5-A
32	–/–		
44	–/–	41	
42	–/–		5-2-B

KF6			
T1	TYPE	T2	REF
14	–/–	11	6-2-C
12	–/–		
24	–/–	21	
22	–/–		
34	–/–	31	13-1-D
32	–/–		
44	–/–	41	
42	–/–		

KF3			
T1	TYPE	T2	REF
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5		6	4-6-A
95	–/–	96	4-2-C
97	–/–	98	5-3-C

QA11			
T1	TYPE	T2	REF
1/L1	–/–	2/T1	4-5-B
3/L2	–/–	4/T2	4-5-B
5/L3	–/–	6/T3	4-5-B
13	–/–	14	4-6-D
21	–/–	22	4-7-D

QA12			
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1/L1	–/–	2/T1	4-5-B
3/L2	–/–	4/T2	4-5-B
5/L3	–/–	6/T3	4-5-B
13	–/–	14	13-1-C
21	–/–	22	4-7-D
53	–/–	54	
61	–/–	62	

QA13			
T1	TYPE	T2	REF
1/L1	–/–	2/T1	4-5-A
3/L2	–/–	4/T2	4-5-A
5/L3	–/–	6/T3	4-5-A
13	–/–	14	4-6-D
21	–/–	22	10-6-E
53	–/–	54	4-5-D
61	–/–	62	7-3-D
73	–/–	74	6-2-D
83	–/–	84	5-2-C

KF7			
T1	TYPE	T2	REF
15	–/–	16	4-6-D

Rev	Description	Date	Drn	Apprv
A	FIRST ISSUE	15/04/25	JH	JH

Client Name
IWNL WATER v3 + DCG

Title
IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
PUMP 1 STARTER

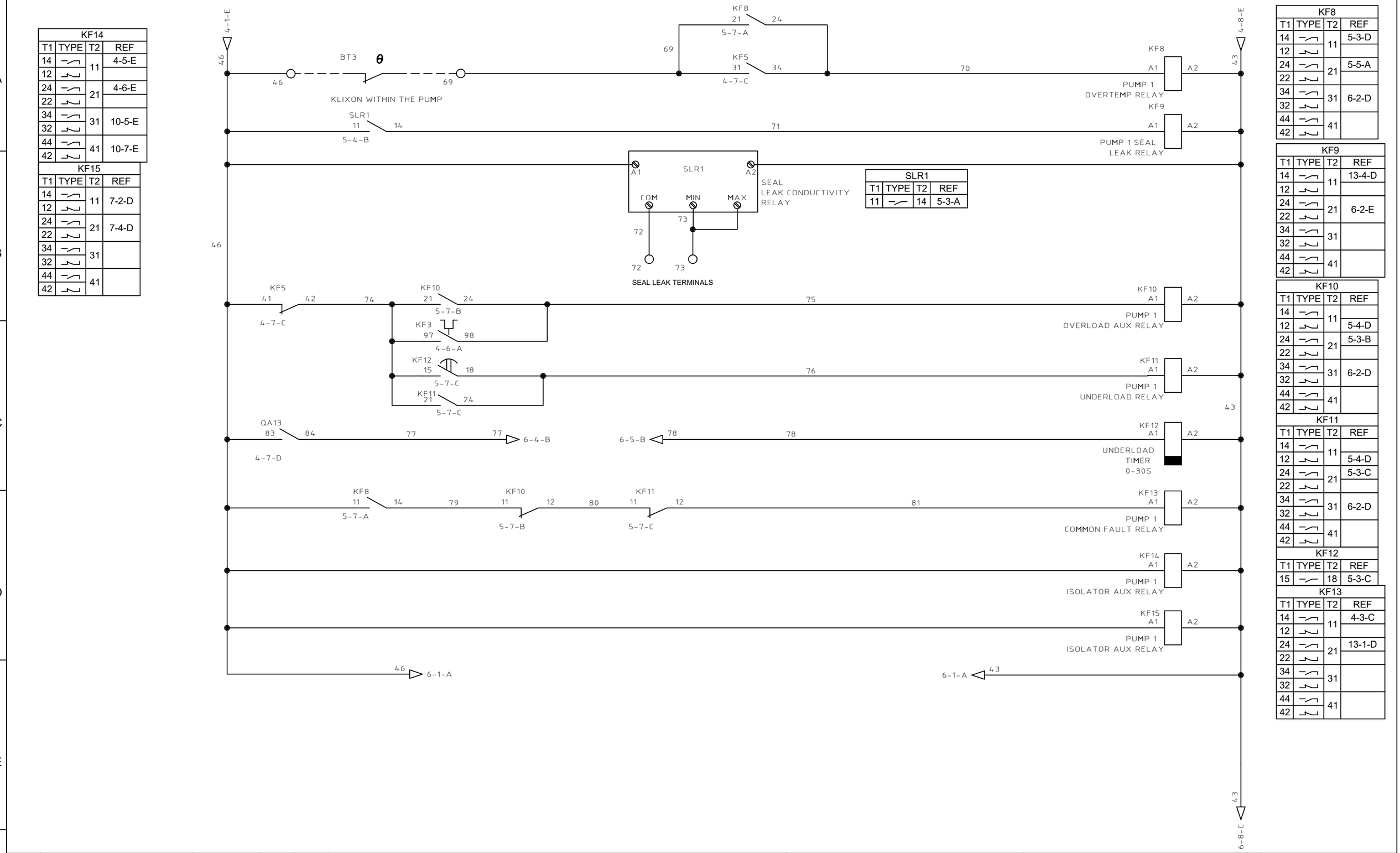
Drawn By: JH
Project Code: GCS0401

Drawing No GCS0401

Site
TEMPLATE DWG'S

Independent Water Networks

Sheet No
4 of 17



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24	—◝	21	4-6-E
22	—◟		
34	—◝	31	10-5-E
32	—◟		
44	—◝	41	10-7-E
42	—◟		

KF15			
T1	TYPE	T2	REF
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24	—◝	21	7-4-D
22	—◟		
34	—◝	31	
32	—◟		
44	—◝	41	
42	—◟		

SLR1			
T1	TYPE	T2	REF
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KF8			
T1	TYPE	T2	REF
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12	—◟		
24	—◝	21	5-5-A
22	—◟		
34	—◝	31	6-2-D
32	—◟		
44	—◝	41	
42	—◟		

KF9			
T1	TYPE	T2	REF
14	—◝	11	13-4-D
12	—◟		
24	—◝	21	6-2-E
22	—◟		
34	—◝	31	
32	—◟		
44	—◝	41	
42	—◟		

KF10			
T1	TYPE	T2	REF
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12	—◟		5-4-D
24	—◝	21	5-3-B
22	—◟		
34	—◝	31	6-2-D
32	—◟		
44	—◝	41	
42	—◟		

KF11			
T1	TYPE	T2	REF
14	—◝	11	
12	—◟		5-4-D
24	—◝	21	5-3-C
22	—◟		
34	—◝	31	6-2-D
32	—◟		
44	—◝	41	
42	—◟		

KF12			
T1	TYPE	T2	REF
15	—◝	18	5-3-C

KF13			
T1	TYPE	T2	REF
14	—◝	11	4-3-C
12	—◟		
24	—◝	21	13-1-D
22	—◟		
34	—◝	31	
32	—◟		
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42	—◟		

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DUAL ASD CONTROL PANEL
PUMP 1 STARTER

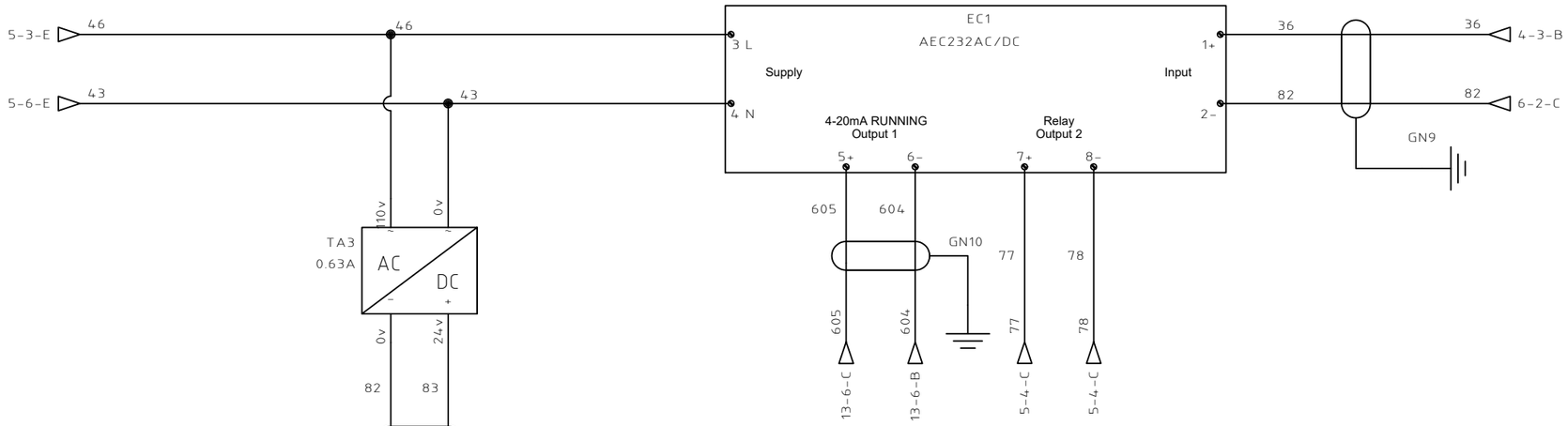
Drawn By: JH
Project Code: GCS0401

Drawing No GCS0401

Site
TEMPLATE DWG'S

Independent Water Networks

Sheet No
5 of 17



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PUMP 1 STARTER

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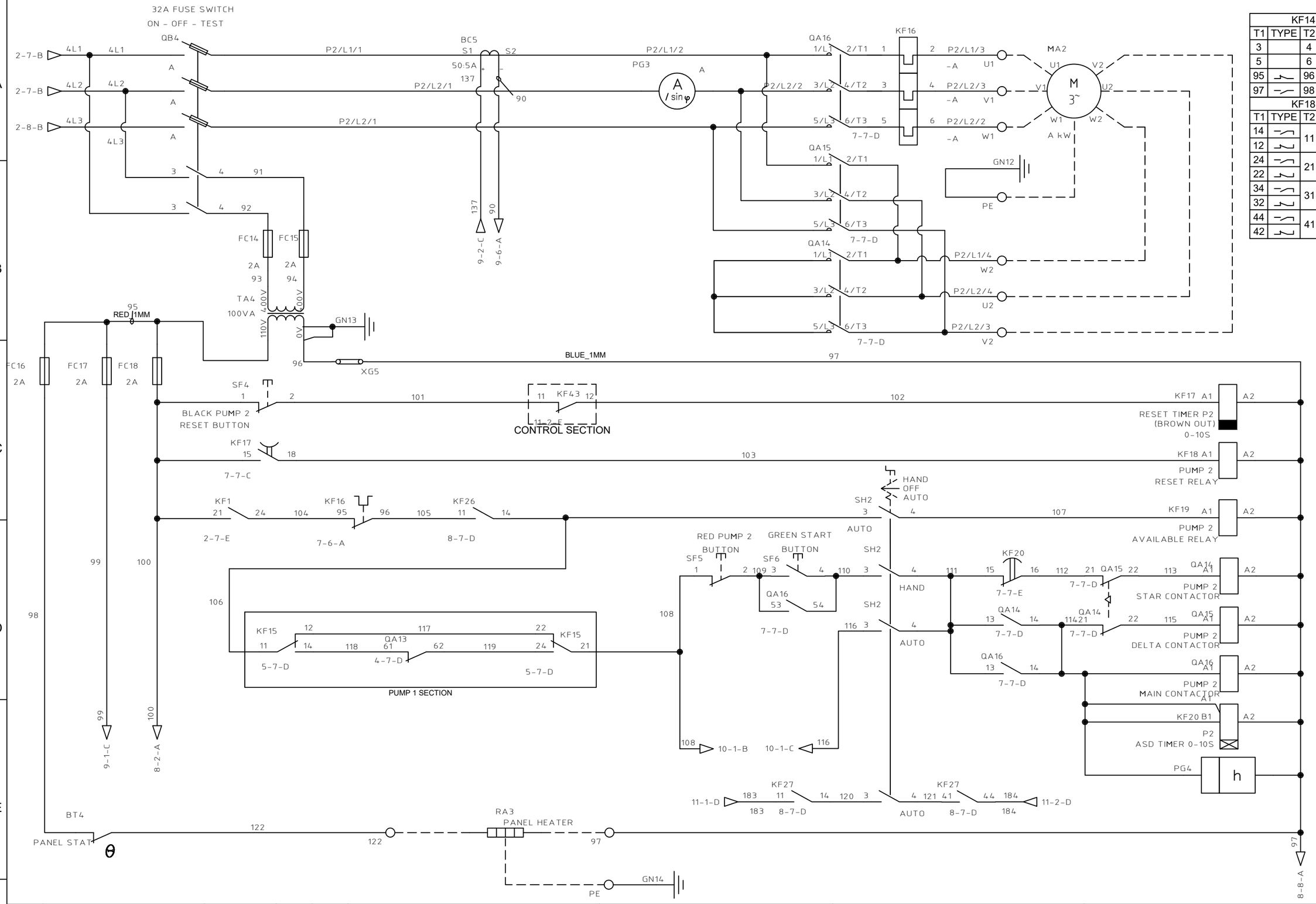
Site: TEMPLATE DWG'S

Independent Water Networks



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5		6	6-6-A	KF19			
95		96	6-4-D	T1	TYPE	T2	REF
97		98	7-3-B	14		11	9-2-D
KF18				12			
T1	TYPE	T2	REF	24		21	
14		11		22			
12				34		31	13-1-E
24		21	8-5-A	32			
22				44		41	
34		31		42			
32			8-2-C				
44		41					
42							

KF16			
T1	TYPE	T2	REF
3		4	7-6-A
5		6	7-6-A
95		96	7-3-C
97		98	8-3-C

QA14			
T1	TYPE	T2	REF
1/L1		2/T1	7-5-B
3/L2		4/T2	7-5-B
5/L3		6/T3	7-5-B
13		14	7-6-D
21		22	7-7-D

QA15			
T1	TYPE	T2	REF
1/L1		2/T1	7-5-B
3/L2		4/T2	7-5-B
5/L3		6/T3	7-5-B
13		14	13-1-E
21		22	7-7-D
53		54	
61		62	

QA16			
T1	TYPE	T2	REF
1/L1		2/T1	7-5-A
3/L2		4/T2	7-5-A
5/L3		6/T3	7-5-A
13		14	7-6-D
21		22	10-6-E
53		54	7-5-D
61		62	4-3-D
73		74	9-2-D
83		84	8-2-C

KF20			
T1	TYPE	T2	REF
15		16	7-6-D

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Client Name
IWNL WATER v3 + DCG

Title
IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
PUMP 2 STARTER

Drawn By: JH
Project Code: GCS0401
Drawing No GCS0401

Site
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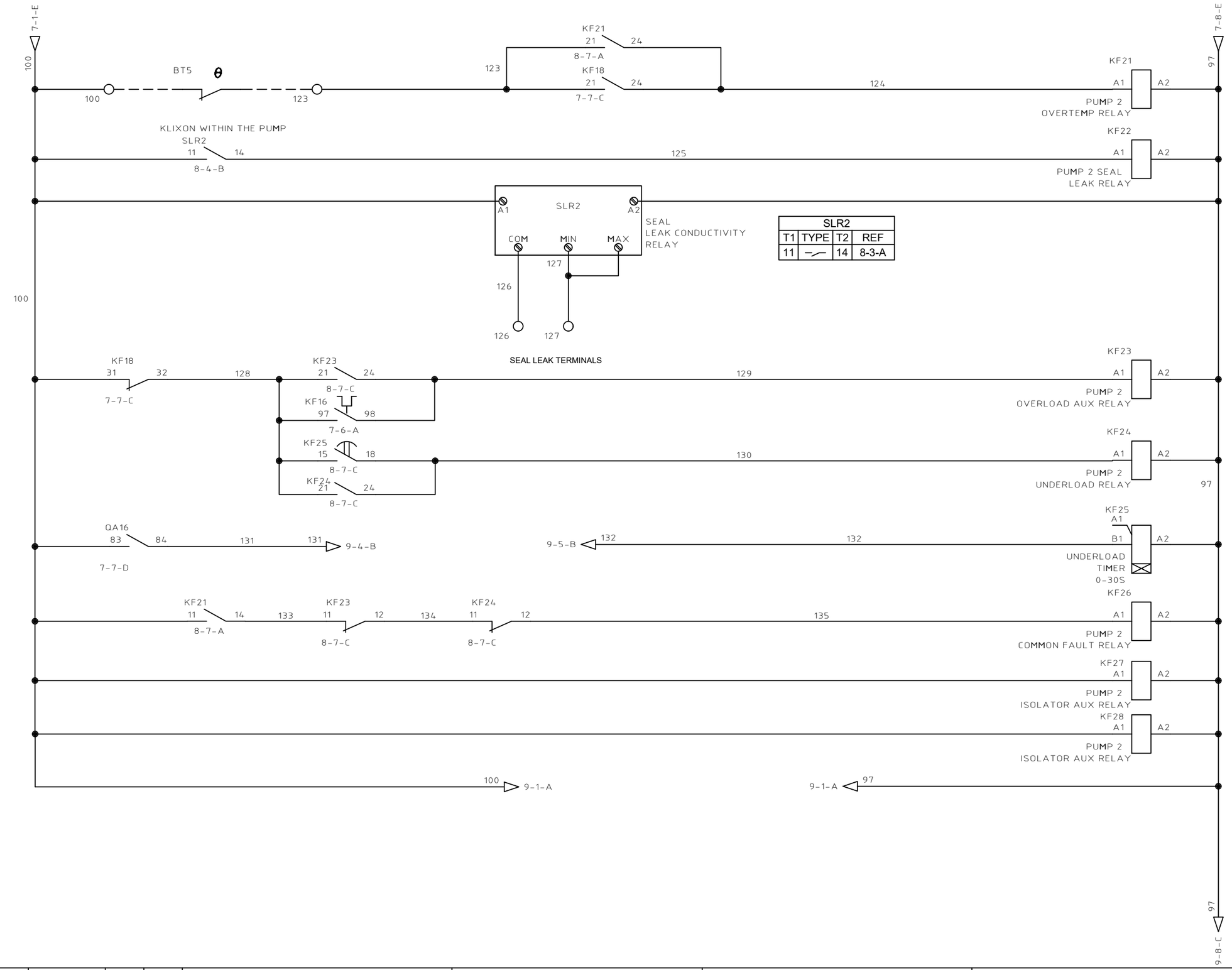

KF27			
T1	TYPE	T2	REF
14		11	7-5-E
12			
24		21	10-5-E
22			
34		31	10-7-E
32			
44		41	7-6-E
42			

KF28			
T1	TYPE	T2	REF
14		11	4-2-D
12			
24		21	4-4-D
22			
34		31	
32			
44		41	
42			

SLR2			
T1	TYPE	T2	REF
11		14	8-3-A

KF21			
T1	TYPE	T2	REF
14		11	8-3-D
12			
24		21	8-5-A
22			
34		31	9-2-D
32			
44		41	
42			

KF22			
T1	TYPE	T2	REF
14		11	13-4-D
12			
24		21	9-2-E
22			
34		31	
32			
44		41	
42			

KF23			
T1	TYPE	T2	REF
14		11	
12			8-3-D
24		21	8-3-C
22			
34		31	9-2-D
32			
44		41	
42			

KF24			
T1	TYPE	T2	REF
14		11	
12			8-4-D
24		21	8-3-C
22			
34		31	9-2-E
32			
44		41	
42			

KF25			
T1	TYPE	T2	REF
15		18	8-3-C

KF26			
T1	TYPE	T2	REF
14		11	7-3-C
12			
24		21	13-1-E
22			
34		31	
32			
44		41	
42			

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Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
PUMP 2 STARTER

Drawn By: JH
Project Code: GCS0401
Drawing No GCS0401

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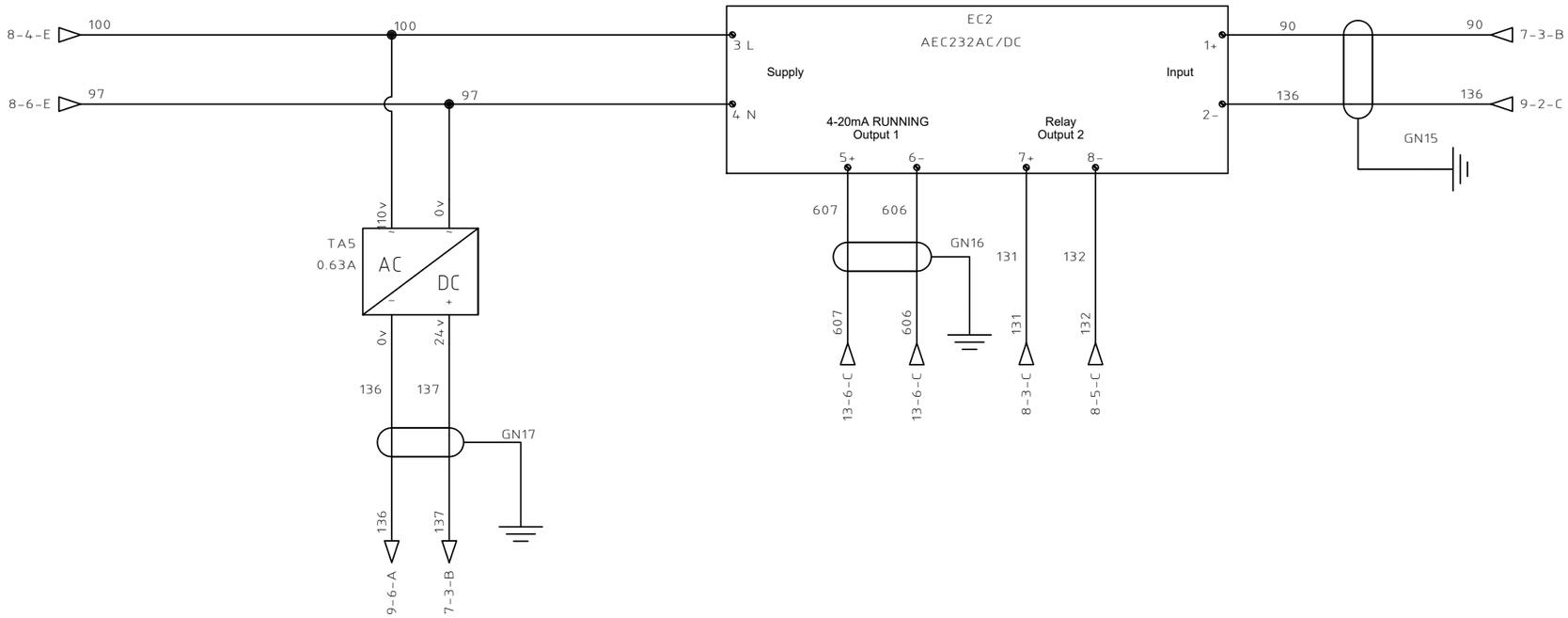

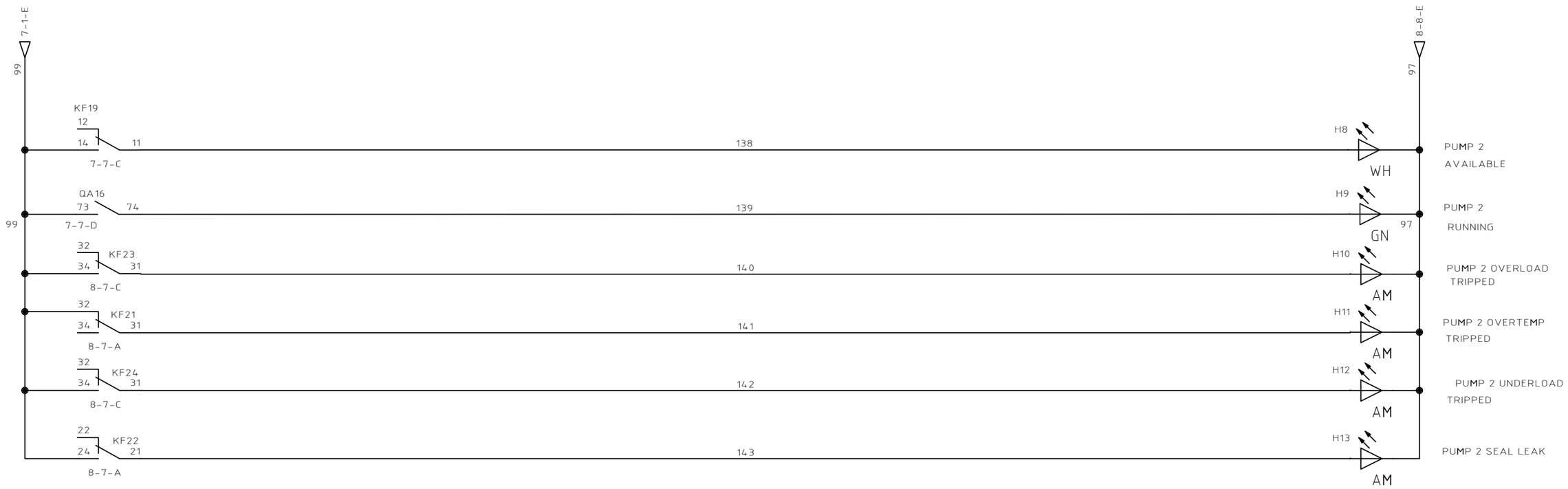

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Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
PUMP 2 STARTER

Drawn By
JH

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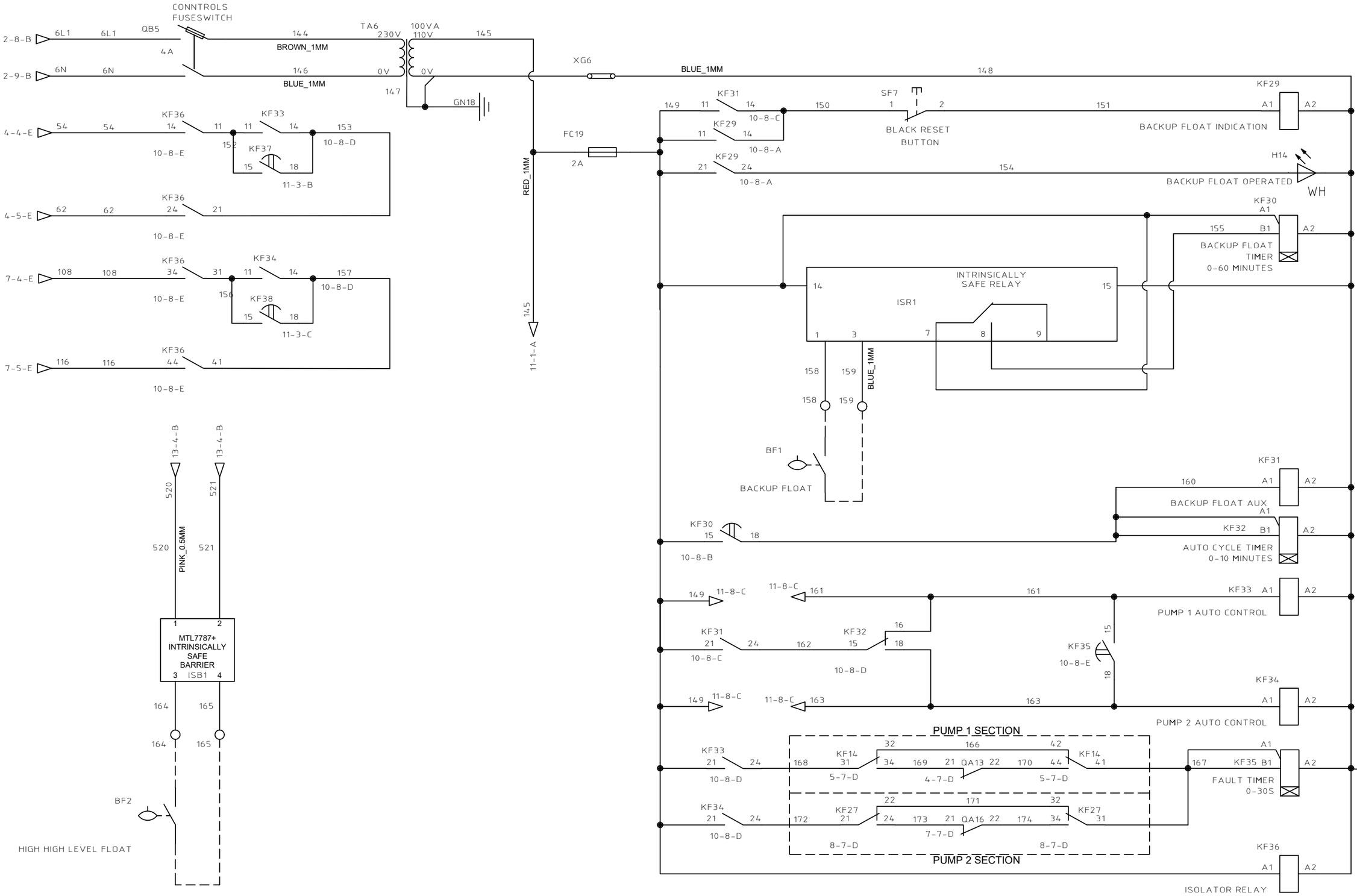

KF29			
T1	TYPE	T2	REF
14		11	10-5-A
12			
24		21	10-5-B
22			

KF30			
T1	TYPE	T2	REF
15		18	10-5-D

KF31			
T1	TYPE	T2	REF
14		11	10-5-A
12			
24		21	10-5-D
22			
34		31	13-4-A
32			
44		41	
42			

KF32			
T1	TYPE	T2	REF
18		15	10-5-D
16			

KF33			
T1	TYPE	T2	REF
14		11	10-2-A
12			
24		21	10-5-E
22			

KF34			
T1	TYPE	T2	REF
14		11	10-2-B
12			
24		21	10-5-E
22			

KF35			
T1	TYPE	T2	REF
15		18	10-7-D

KF36			
T1	TYPE	T2	REF
14		11	10-2-A
12			
24		21	10-2-B
22			
34		31	10-2-B
32			
44		41	10-2-C
42			

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Client Name
IWNL WATER v3 + DCG

Title
IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
COMMON CONTROLS

Drawn By
JH

Project Code
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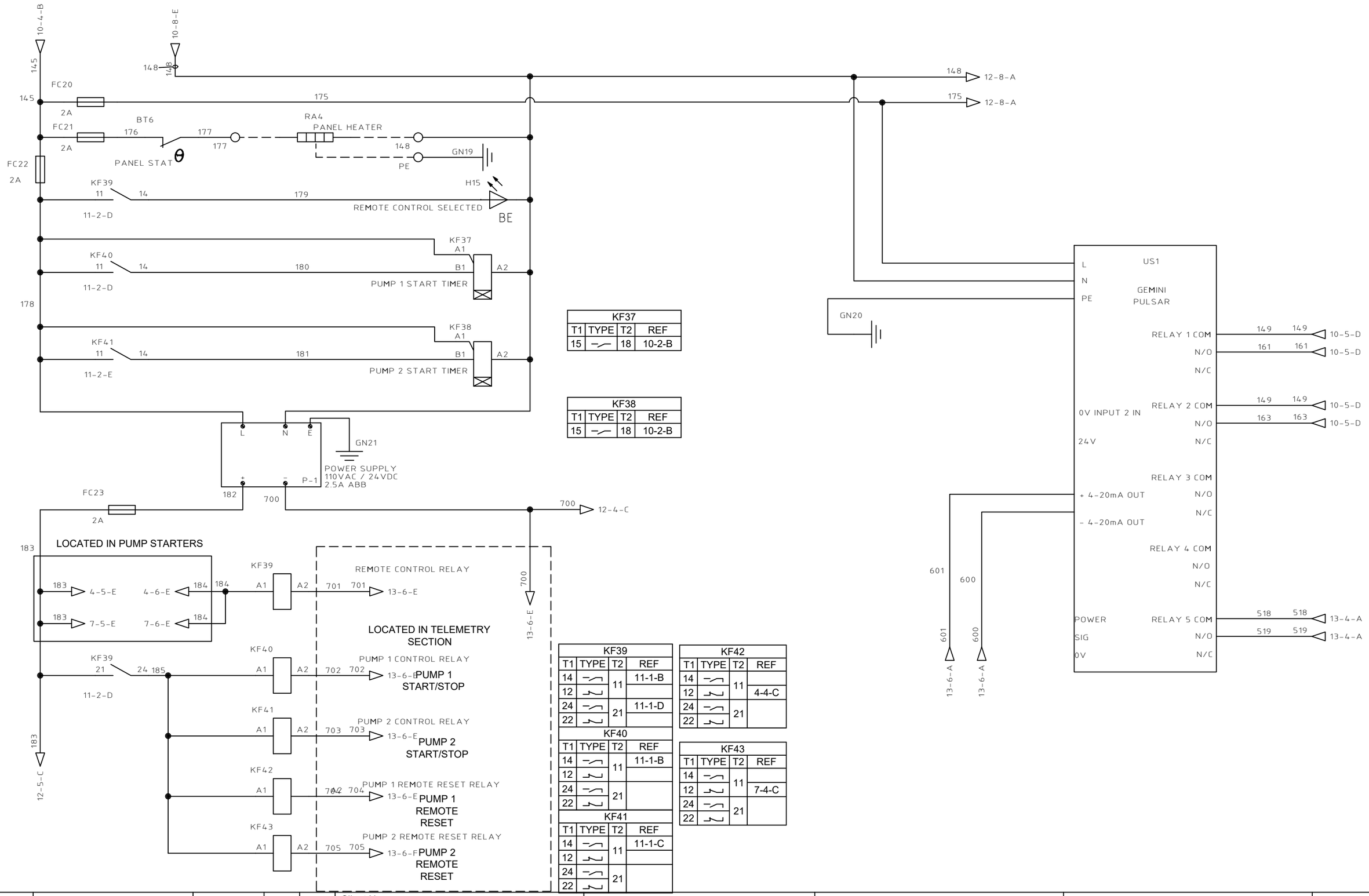

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15	—/—	18	10-2-B

KF38			
T1	TYPE	T2	REF
15	—/—	18	10-2-B

KF39			
T1	TYPE	T2	REF
14	—/—	11	11-1-B
12	—\—		
24	—/—	21	11-1-D
22	—\—		

KF40			
T1	TYPE	T2	REF
14	—/—	11	11-1-B
12	—\—		
24	—/—	21	
22	—\—		

KF41			
T1	TYPE	T2	REF
14	—/—	11	11-1-C
12	—\—		
24	—/—	21	
22	—\—		

KF42			
T1	TYPE	T2	REF
14	—/—	11	
12	—\—		4-4-C
24	—/—	21	
22	—\—		

KF43			
T1	TYPE	T2	REF
14	—/—	11	
12	—\—		7-4-C
24	—/—	21	
22	—\—		

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Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
COMMON CONTROLS

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JH

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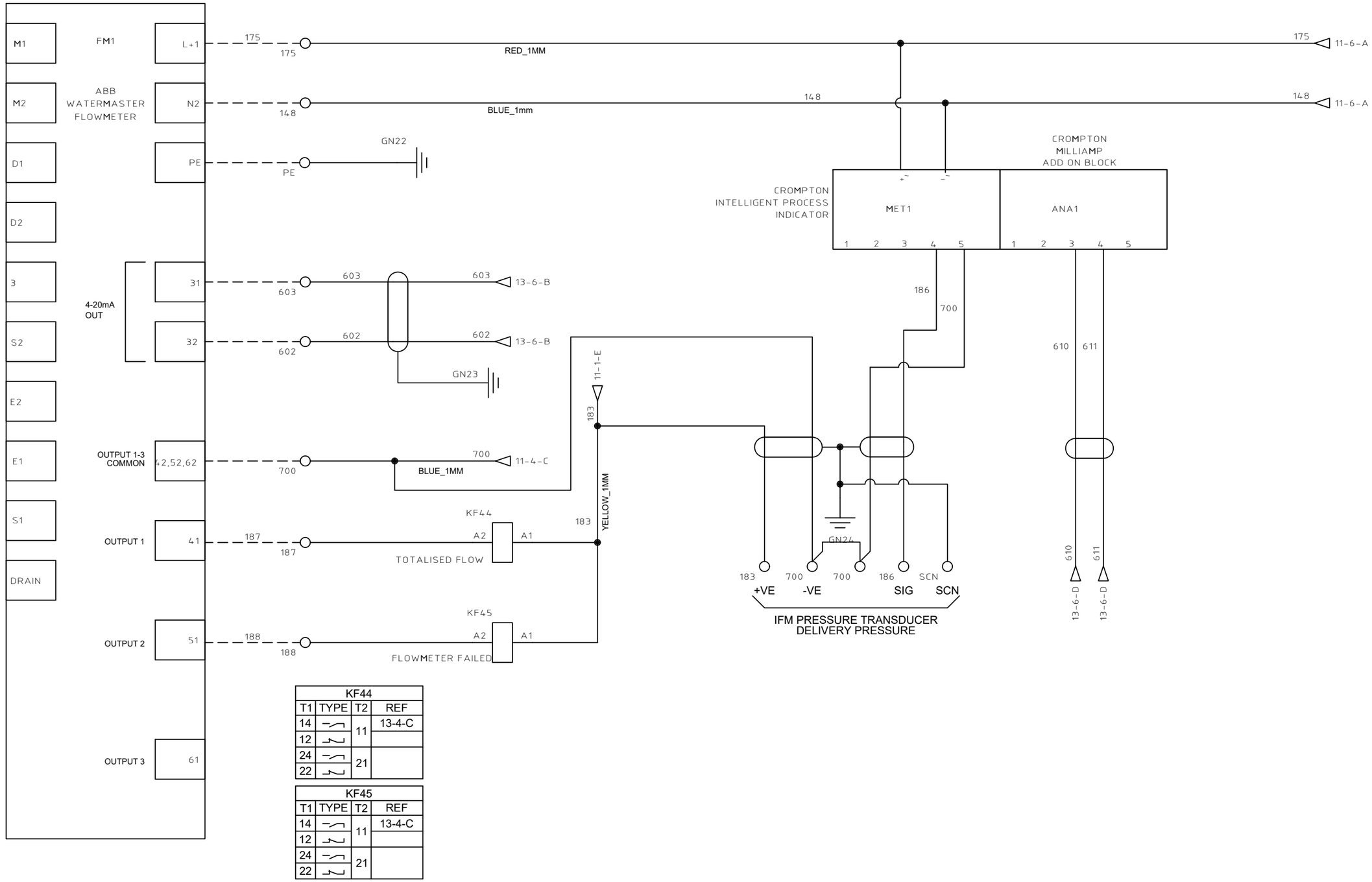

KF44			
T1	TYPE	T2	REF
14		11	13-4-C
12			
24		21	
22			

KF45			
T1	TYPE	T2	REF
14		11	13-4-C
12			
24		21	
22			

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IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
COMMON CONTROLS

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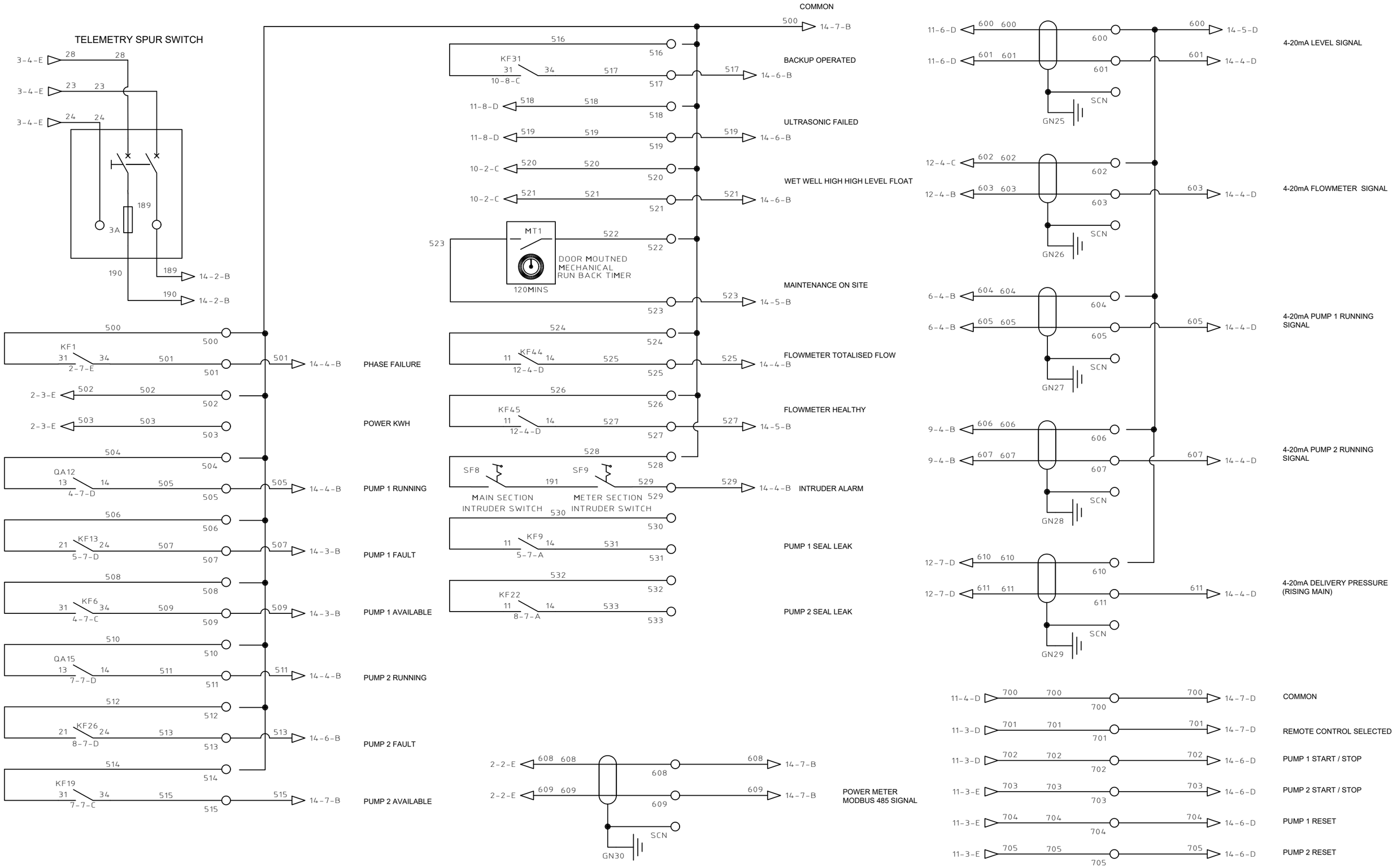

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Client Name
IWNL WATER v3 + DCG

Title
IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
TELEMETRY MARSHALLING

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Project Code: GCS0401

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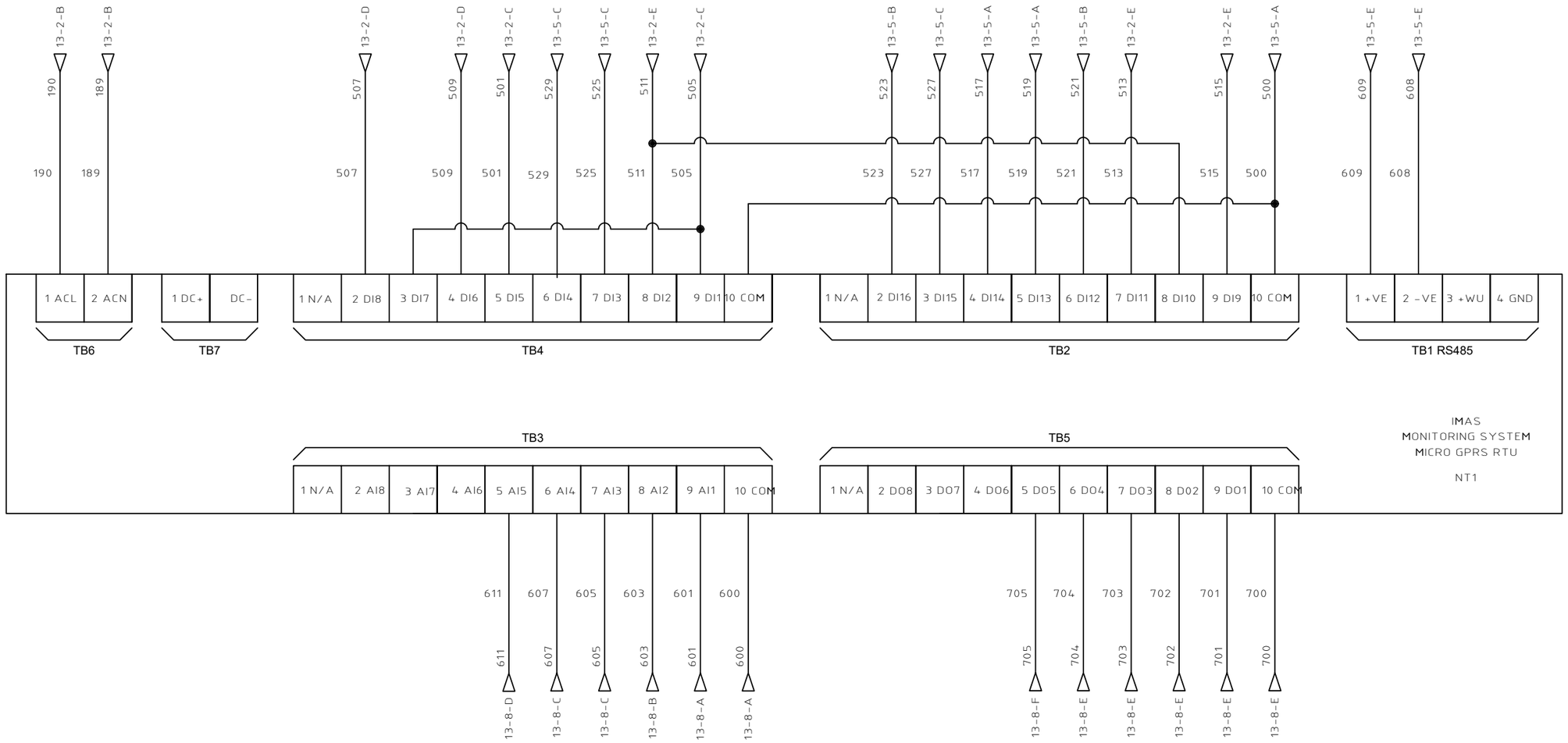

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Client Name
IWNL WATER v3 + DCG

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DUAL ASD CONTROL PANEL
TELEMETRY MARSHALLING

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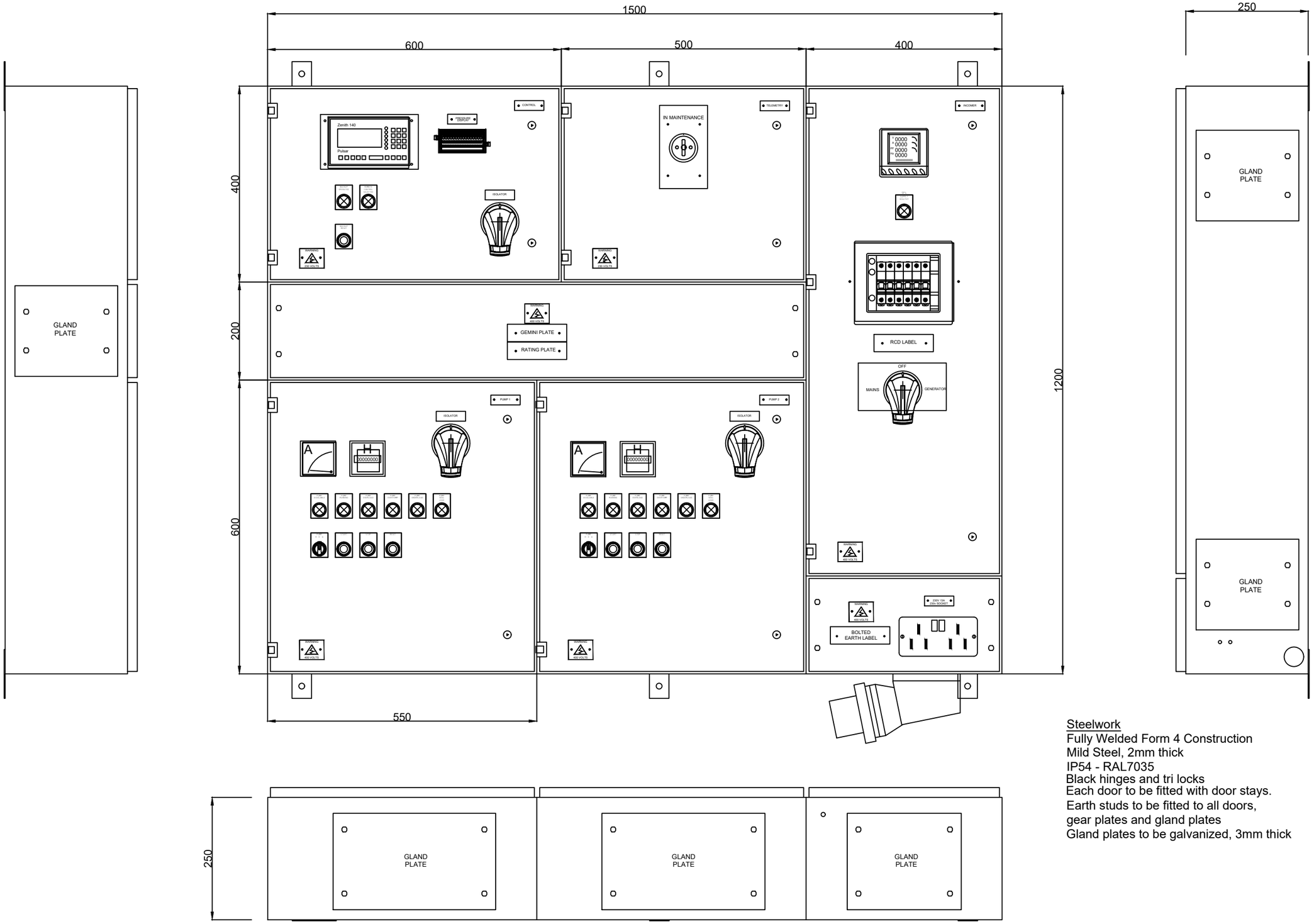

Steelwork
Fully Welded Form 4 Construction
Mild Steel, 2mm thick
IP54 - RAL7035
Black hinges and tri locks
Each door to be fitted with door stays.
Earth studs to be fitted to all doors,
gear plates and gland plates
Gland plates to be galvanized, 3mm thick

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IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
PANEL GA

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CONSTRUCTION NOTES:

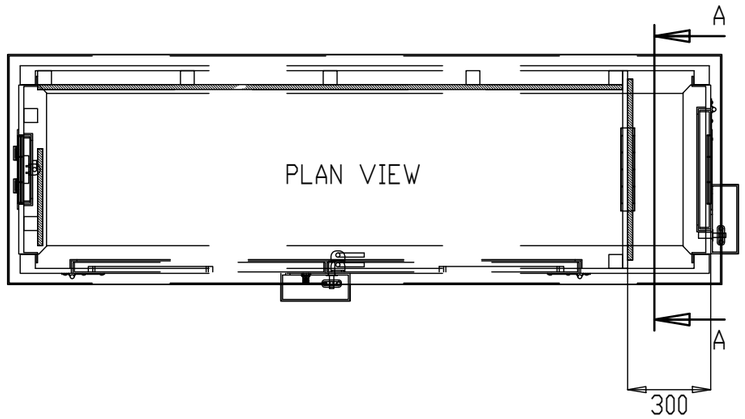
-PARTITION WALL REQUIRED C/W BACKBOARD & UPVC VENTS

- PARTITION WALL TO BE 50mm SHORTER THAN PERIMETER WALLS

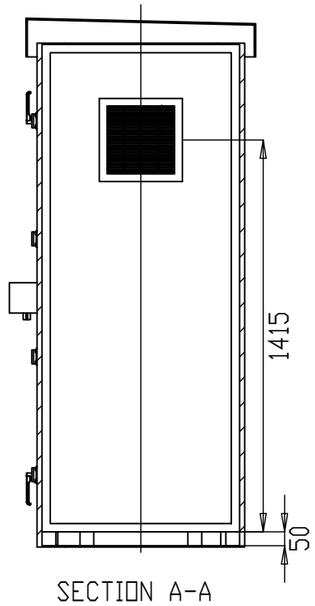
- 3 No. 18mm TREATED MARINE GRADE PLYWOOD BACKBOARDS REQUIRED AS SHOWN

- STAINLESS STEEL VENTS TO HAVE INTERNAL VERMIN PROTECTION

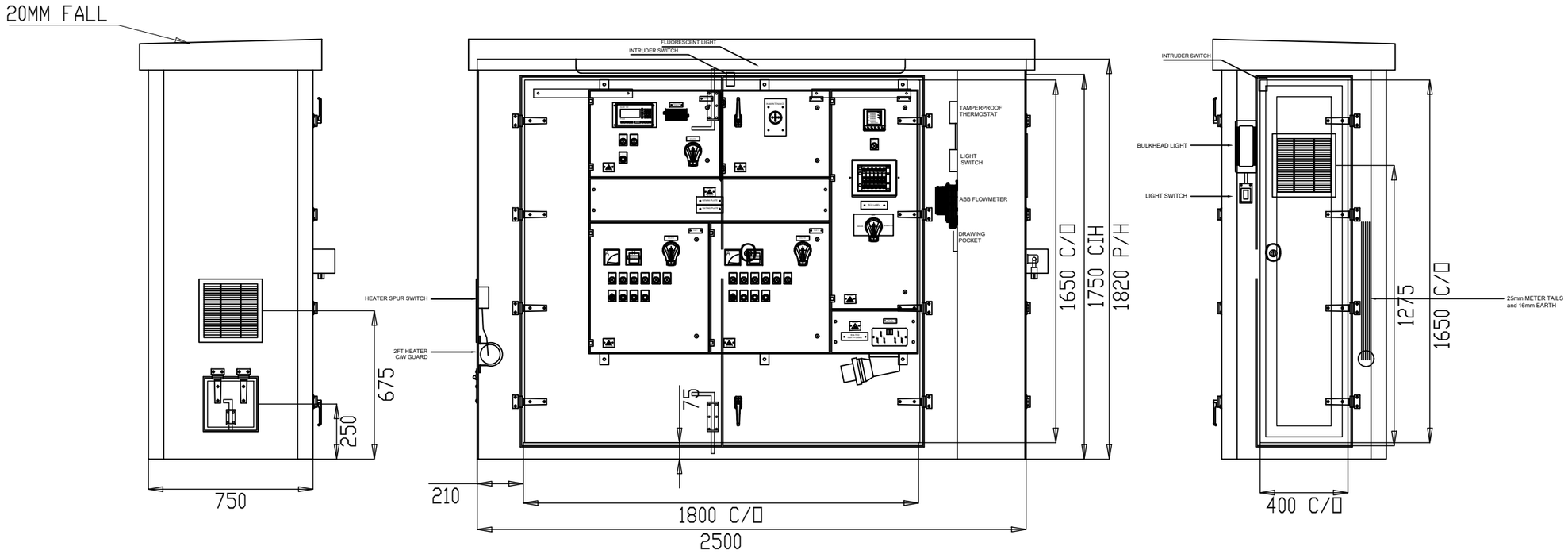
LPCB SR2	CONSTRUCTION
GLOSS	EXT FINISH
14-C-39 HOLLY GREEN	EXT COLOUR
WHITE GRP	INT FINISH
1.5 W/M2/*C	THERMAL VALUE



FULL SIZE C/W UPVC VENTS ON EACH SIDE



SECTION A-A



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Client Name
IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
KIOSK GA

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Project Code: GCS0401

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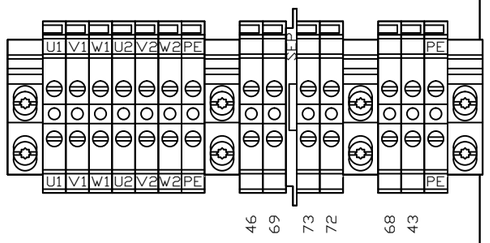
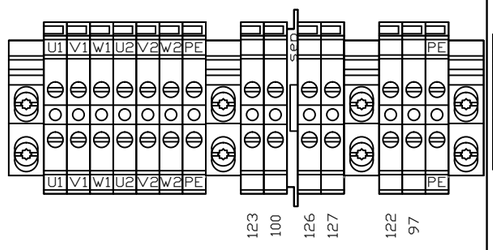
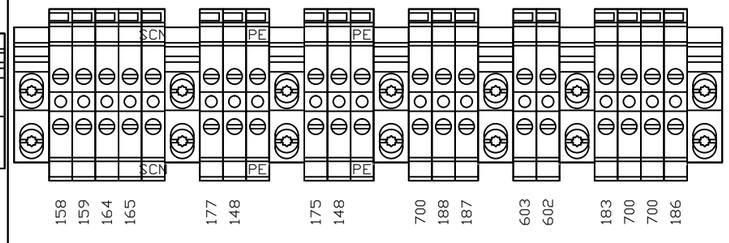
PUMP 1 STARTER



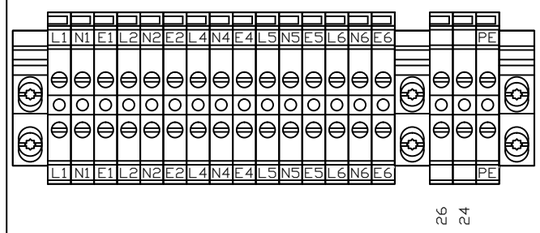
PUMP 1 STARTER



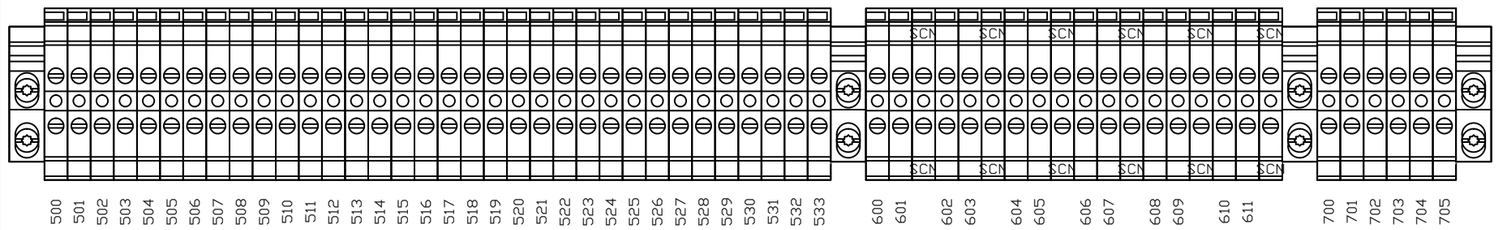
CONTROLS TERMINALS



INCOMER FEEDS FROM DISTRIBUTION BOARD



TELEMETRY + REMOTE CONTROL TERMINALS



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IWNL WATER v3 + DCG

Title IWNL WATER v3 + DCG
DUAL ASD CONTROL PANEL
TERMINAL FOOTPRINTS

Drawn By: JH
Project Code: GCS0401

Drawing No GCS0401

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