Johannesburg Water (SOC) Ltd

Johannesburg Water

CONTRACT JW13897

NORTHERN WASTEWATER TREATMENT WORKS

EXPANSION OF CAPACITY UNIT 5 - INSTALLATION OF MECHANICAL AND ELECTRICAL EQUIPMENT

VOLUME 4
TENDER DRAWINGS

Issued by Investment Delivery

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NORTHERN WASTEWATER TREATMENT WORKS

MECHANICAL AND ELECTRICAL WORKS

DRAWING NUMBER	TITTLE
GENERAL – MECHANICAL DRAWINGS	
EE-LIST	MECHANICAL LIST OF TENDER DRAWINGS
303-00141/12-006	SITE PLAN
303-00141/12-007	PROJECT NOTICE BOARD
303-00141/12-021	LEGEND – ALL DISCIPLINES
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303-00141/12-022	PRIMARY SEDIMENTATION TANKS
303-00141/12-023	SLUDGE FERMENTATION PLANT
303-00141/12-024	WASTE SLUDGE THICKENERS
303-00141/12-025	BALANCING TANK
303-00141/12-026	REACTOR 2
303-00141/12-027	FERROUS AND FERRIC DOSING PLANT
303-00141/12-028	DISINFECTION DOSING PLANT
303-00141/12-029	ONLINE MONITORING OF FINAL AND REACTOR EFFLUENT
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303-00141/12-030	NEW HEAD OF WORKS – UNIT 4 – SCREENING
303-00141/12-031	NEW HEAD OF WORKS – UNIT 4 – DEGRITTING
303-00141/12-032	EXISTING HEAD OF WORKS – UNIT 3 (REFURBISHMENT) – SCREENING
303-00141/12-033	EXISTING HEAD OF WORKS – UNIT 3 (REFURBISHMENT) – DEGRITTING
303-00141/12-034	EXISTING HEAD OF WORKS – UNIT 5 (REFURBISHMENT) – SCREENING
303-00141/12-035	EXISTING HEAD OF WORKS – UNIT 5 (REFURBISHMENT) – DEGRITTING
303-00141/12-036	NEW HEAD OF WORKS – UNIT 4 – HYDRO-CONVEYANCE AND SCREENINGS WASHING PUMP STATION
303-00141/12-037	NEW HEAD OF WORKS – UNIT 4 – SECONDARY SCREENS WASHING PUMP STATION
303-00141/12-038	SLUDGE FERMENTATION – ODOUR CONTROL PLANT
GENERAL ARRANGEMENTS	
303-00141/12-041	SITE PLAN
303-00141/12-700	HEAD OF WORKS AND SEPTAGE RECEIVING –PROPOSED ARRANGEMENT
303-00141/12-706	WASHWATER PUMPSTATION
UNIT 4 LAYOUT DRAWINGS	
303-00141/12-701	INLET CHANNEL LAYOUT TO SCREENING AND DEGRITTING
303-00141/12-702	SCREENING LAYOUT – PLAN, SECTIONS AND DETAILS
303-00141/12-703	DEGRITTING LAYOUT – PLAN AND SECTIONS
303-00141/12-704	SCREENING AND DEGRITTING PLANT – SECTIONS AND CHANNEL LINK TO EXISTING
303-00141/12-705	SCREEN PRESS AND BLOWER BUILDING – PLAN, SECTIONS AND DETAILS
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ING0645D-5E2-CR01	SITE PLAN – CABLE ROUTE AND MANHOLE LAYOUT
ING0645D-5E2-CR04	OVERALL SITE PLAN – CABLE ROUTE – NEW, EXISTING AND RE-ROUTED
BIOREACTOR 2	
ING0645D-5E2-CR02	REACTOR – CABLE ROUTING
ING0645D-5E2-CR02	CLARIFIERS – CABLE ROUTING
ING0645D-5E2-CR03	CLARIFIERS – CABLE ROUTING
ING0645D-5E2-SM02	MCC AND MV SUBSTATION – SMALL POWER AND LIGHTING LAYOUT
ING0645D-5E2-SM03	SMALL POWER AND LIGHTING DB –SP&L-DB – SINGLE LINE DIAGRAM
ING0645D-5E2-SM04	HIGHMAST LIGHT 1, HIGHMAST LIGHT 2 AND HIGHMAST LIGHT 3 DBs – SINGLE LINE DIAGRAM
ING0645D-5E2-TYP DOL SUMP	TYPICAL DOL SUMP PUMP – SCHEMATIC DIAGRAM
ING0645D-5E2-TYP DOL	TYPICAL DOL – SCHEMATIC DIAGRAM
ING0645D-5E2-FWD-REV. SCR	TYPICAL FORWARD/REVERSE SCREEN – SCHEMATIC DIAGRAM
ING0645D-5E2-TYP F_R	TYPICAL FORWARD REVERSE – SCHEMATIC DIAGRAM
ING0645D-5E2-TYP INCOMER	TYPICAL INCOMER – SCHEMATIC DIAGRAM
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ING0645D-5E5-CR01	HYPOCHLORITE – CABLE ROUTE
ING0645D-5E5-CR02	FINAL EFFLUENT – CABLE ROUTE
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ING0645D-5E5-SM01	5E5-MCC-01 SINGLE LINE DIAGRAM
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ING0645D-5E5-CR02	FINAL EFFLUENT – CABLE ROUTE
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ING0645D-5E7-GA01	5E7-MCC-01 – GENERAL ARRANGEMENT
ING0645D-5E7-SM01	5E7-MCC-01 SINGLE LINE DIAGRAM
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ING0645D-5E8-CR01	ELUTRITION EFFLUENT AND THICKENED SLUDGE PIPES – CABLE ROUTE AND EQUIPMENT LAYOUT
ING0645D-5E8-GA03	ELUTRIATION PUMP STATION – CABLE ROUTE AND EQUIPMENT LAYOUT

DRAWING NUMBER	TITTLE
ELUTRIATION PUMP STATION	
ING0645D-5E8-GA1	5E8-MCC-01 GENERAL ARRANGEMENT
ING0645D-5E8-GA2	NEW ELUTRIATION 5E8-MCC-02 GENERAL ARRANGEMENT
ING0645D-5E8-SM01	5E8-MCC-01 SINGLE LINE DIAGRAM
ING0645D-5E8-SM02	NEW ELUTRIATION MCC-02-5E8-MCC-02 SINGLE LINE DIAGRAM
ING0645D-5E8-SM03	5E8-IDB-002 – ELUTRIATION INSTRUMENT DB – SINGLE LINE DIAGRAM
ING0645D-5E8-SM04	558-SDB-002 – ELUTRIATION SDB02 – SINGLE LINE DIAGRAM
WASTE ACTIVATED SLUDGE TREATMENT	
ING0645D-5E9-CR01	SITE LAYOUT – CABLE ROUTE
WAS PUMP STATION	
ING0645D-5E9-GA01	5E9-MCC-01 GENERAL ARRANGEMENT
ING0645D-5E9-SM01	5E9-MCC-01 SINGLE LINE DIAGRAM
WAS TERRACE	
ING0645D-5E9-GA02	5E9-MCC-02 GENERAL ARRANGEMENT
ING0645D-5E9-SM02	5E9-MCC-02 SINGLE LINE DIAGRAM
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ING0645D-NET-CR02	CABLE ROUTE
ING0645D-NET-CBD	FIBRE NETWORK DRAWING
U5 PST AND BALANCING TANK (01)	
ING0645D-01-P&ID-LEGEND	REACTOR – CABLE ROUTING
ING0645D-01-022	PST P&ID
ING0645D-01-025	Balancing Tank P&ID
ING0645D-01-SLD	PLC Panel Schematic
ING0645D-01-ROS2A-DI	DI Rack0 Slot2 Wiring Diagram A
ING0645D-01-ROS2B-DI	DI Rack0 Slot2 Wiring Diagram B
ING0645D-01-ROS2C-DI	DI Rack0 Slot2 Wiring Diagram C
ING0645D-01-ROS2D-DI	DI Rack0 Slot2 Wiring Diagram D
ING0645D-01-ROS3A-DI	DI Rack0 Slot3 Wiring Diagram A
ING0645D-01-ROS4-DO	DO Rack0 Slot4 Wiring Diagram
ING0645D-01-ROS5-AI	AI Rack0 Slot5 Wiring Diagram
ING0645D-01-ROS6-AI	AI Rack0 Slot6 Wiring Diagram
ING0645D-01-ROS7-AO	AO Rack0 Slot7 Wiring Diagram
ING0645D-01-CLV001	PST5 Underflow Valve Loop Drawing
ING0645D-01-CLV002	PST6 Underflow Valve Loop Drawing
ING0645D-01-FCV001	Balancing Tank 2 Outlet Sluice Gate Loop Drawing
ING0645D-01-FCV002	Balancing Tank 2 Inlet Sluice Gate Loop Drawing
ING0645D-01-FIT002	Balancing Tank 2 Outflow Loop Drawing
ING0645D-01-FIT005	BTK Flow Devider To Reactor 2 Flow Loop Drawing
ING0645D-01-LIT003	Balancing Tank 2 Inlet Chamber Level Loop Drawing
ING0645D-01-LIT004	Balancing Tank 2 Level Loop Drawing
ING0645D-01-LIT005	Balancing Tank 2 Level 2 Loop Drawing
U5 WST (04)	
ING0645D-04-SLD	WST Schematic Diagram
ING0645D-04-024	WST P&ID
ING0645D-04-ROS4A-DO	DO Rack0 Slot10 Wiring Diagram
ING0645D-04-ROS2A-DI	DI Rack0 Slot5 Wiring Diagram
ING0645D-04-CLV002	WST2 Underflow Valve Loop Drawing
U5 FINAL EFFLUENT PS (05)	
JW13898-05-P&ID-LEGEND	Final Effluent P&ID Legend
ING0645D-05-028	Disinfection P&ID
ING0645D-05-029	Final Effluent P&ID
ING0645D-CBD-05	Cable Block Diagram
ING0645D-05-SLD	PLC Panel Schematic
ING0645D-05-ROS2A-DI	DI Rack0 Slot2A Wiring Diagram
ING0645D-05-ROS2B-DI	DI Rack0 Slot2B Wiring Diagram
ING0645D-05-ROS4A-DO	DO Rack0 Slot4 Wiring Diagram
ING0645D-05-ROS5-AI	AI Rack0 Slot5 Wiring Diagram
ING0645D-05-ROS6-AI	AI Rack0 Slot6 Wiring Diagram
ING0645D-05-AIT008	Orthophosphate Analyser Loop Drawing
ING0645D-05-AIT009	Ammonia Loop Drawing
ING0645D-05-AIT010	Chemical Oxygen Demand Loop Drawing
ING0645D-05-AIT011	Suspended Solids Loop Drawing
ING0645D-05-AIT012	pH Probe Loop Drawing
ING0645D-05-AIT013	Nitrate Probe Loop Drawing
ING0645D-05-AIT014	Conductivity Probe Loop Drawing
ING0645D-05-AIT015	Chlorine Analysers Loop Drawing
ING0645D-05-CLV003	Penstock 3 Loop Drawing
ING0645D-05-CLV004	Penstock 4 Loop Drawing
U5 HYPOCHLORITE (06)	
ING0645D-06-LIT003	CHEMICAL DOSING TANK 3 LEVEL LOOP DRAWINGS
U5 MAIN INTAKE SUBSTATION (07)	
ING0645D-07-SLD	Main Intake Sub Schematic Diagram
ING0645D-07-CBD	Main Intake Sub Cable Block Diagram
ING0645D-07-ROS2A-DI	DI Rack0 Slot2A Wiring Diagram
ING0645D-07-ROS2B-DI	DI Rack0 Slot2A Wiring Diagram
ING0645D-07-ROS2C-DI	DI Rack0 Slot2A Wiring Diagram

DRAWING NUMBER	TITTLE
U5 ELUTRIATION (08)	
ING0645D-08-P&ID-LEGEND	Sludge Fermentation Plant P&ID Legend
ING0645D-08-023	Sludge Fermentation Plant P&ID
ING0645D-08-038	Elutriation Odour Control
ING0645D-08-CBD	Sludge Fermentation Plant Cable Block Diagram
ING0645D-08-SLD	Sludge Fermentation Plant Schematic Diagram
ING0645D-08-D1ROS2-AI	AI Drop 1 Rack0 Slot2 Wiring Diagram
ING0645D-08-D1ROS3-AI	AI Drop 1 Rack0 Slot3 Wiring Diagram
ING0645D-08-D1ROS5-AO	AO Drop 1 Rack0 Slot5 Wiring Diagram
ING0645D-08-D1ROS6-DI	DI Drop 1 Rack0 Slot6 Wiring Diagram
ING0645D-08-D1ROS7-DI	DI Drop 1 Rack0 Slot7 Wiring Diagram
ING0645D-08-D1ROS8-DI	DI Drop 1 Rack0 Slot8 Wiring Diagram
ING0645D-08-D1ROS9-DI	DI Drop 1 Rack0 Slot9 Wiring Diagram
ING0645D-08-D1ROS10-DI	DI Drop 1 Rack0 Slot10 Wiring Diagram
ING0645D-08-D1R1S1-DI	DI Drop 1 Rack1 Slot1 Wiring Diagram
ING0645D-08-D1R1S2-DI	DI Drop 1 Rack1 Slot2 Wiring Diagram
ING0645D-08-D1R1S6-DO	DO Drop 1 Rack1 Slot6 Wiring Diagram
ING0645D-08-D1R1S7-DO	DO Drop 1 Rack1 Slot7 Wiring Diagram
ING0645D-08-D1R1S8-DO	DO Drop 1 Rack1 Slot8 Wiring Diagram
ING0645D-08-CLV001	Recirculation Sump1 Valve Loop Drawing
ING0645D-08-FIT005	Recycle Sump 1 Pump Flow Loop Drawing
ING0645D-08-FIT006	Recycle Sump 2 Pump Flow Loop Drawing
ING0645D-08-FIT007	Rec Sump1 Transfer Pumps Flow
ING0645D-08-LIT005	Recirculation Sump1 Level Loop Drawing
ING0645D-08-ROS2A-DI	DI Rack0 Slot2A Wiring Diagram
ING0645D-08-ROS2B-DI	DI Rack0 Slot2B Wiring Diagram
ING0645D-08-ROS2C-DI	DI Rack0 Slot2C Wiring Diagram
ING0645D-08-ROS2D-DI	DI Rack0 Slot2D Wiring Diagram
ING0645D-08-ROS3A-DI	DI Rack0 Slot3A Wiring Diagram
ING0645D-08-ROS3B-DI	DI Rack0 Slot3B Wiring Diagram
ING0645D-08-ROS3C-DI	DI Rack0 Slot3C Wiring Diagram
ING0645D-08-ROS6A-DO	DO Rack0 Slot6A Wiring Diagram
ING0645D-08-ROS6B-DO	DO Rack0 Slot6B Wiring Diagram
ING0645D-08-ROS7-AI	AI Rack0 Slot7 Wiring Diagram
ING0645D-08-ROS8-AI	AI Rack0 Slot8 Wiring Diagram
ING0645D-08-ROS9-AI	AI Rack0 Slot9 Wiring Diagram
ING0645D-08-ROS10-AO	AO Rack0 Slot10 Wiring Diagram
ING0645D-08-CLV002	Recirculation Sump2 Valve Loop Drawing
ING0645D-08-FIT001	Sludge from PSTs Flow Loop Drawing
ING0645D-08-FIT002	Elutriant Sump 1 Pump Flow Loop Drawing
ING0645D-08-FIT008	Transfer Pumps Flow Loop Drawing
ING0645D-08-FIT009	Elutriant Pump Flow Loop Drawing
ING0645D-08-FIT010	O Control Recirculation Flow Loop Drawing
ING0645D-08-FIT011	O Control Effluent Flow Loop Drawing
ING0645D-08-FIT012	O Control Drain Flow Loop Drawing
ING0645D-08-FIT013	Recirculation Sump2 Pump1 Flow
ING0645D-08-FIT014	Recirculation Sump2 Pump2 Flow
ING0645D-08-FIT015	Wasting Pump1 Flow
ING0645D-08-FIT016	Wasting Pump2 Flow
ING0645D-08-FIT017	Wasting Pump3 Flow
ING0645D-08-FIT018	Odour Control Gas Flow
ING0645D-08-LIT006	Mixing Tank 2 Level Loop Drawing
ING0645D-08-LIT007	Recirculation Sump2 Level Loop Drawing
ING0645D-08-LIT008	Sludge Holding Tank Level Loop Drawing
ING0645D-08-LIT009	Odour Control Effluent Tank Level Loop Drawing
U5 MODULE 2 (80)	
ING0645D-80-P&ID-LEGEND	Bioreactor 2 P&ID Legend
ING0645D-80-026	Bioreactor 2 P&ID
ING0645D-80-027	Ferrous and Ferric Dosing P&ID
ING0645D-80-028	On-Line Monitoring fo Bioreactors 1&2 Effluent
ING0645D-CBD-80	Bioreactor 2 Cable Block Diagram
ING0645D-80-SLD	Bioreactor 2 PLC Panel Schematic
ING0645D-80-ROS2A-DI	DI Rack0 Slot2 Wiring Diagram A
ING0645D-80-ROS2B-DI	DI Rack0 Slot2 Wiring Diagram B
ING0645D-80-ROS2C-DI	DI Rack0 Slot2 Wiring Diagram C
ING0645D-80-ROS2D-DI	DI Rack0 Slot2 Wiring Diagram D
ING0645D-80-ROS3A-DI	DI Rack0 Slot3 Wiring Diagram A
ING0645D-80-ROS3B-DI	DI Rack0 Slot3 Wiring Diagram B
ING0645D-80-ROS3C-DI	DI Rack0 Slot3 Wiring Diagram C
ING0645D-80-ROS3D-DI	DI Rack0 Slot3 Wiring Diagram D
ING0645D-80-ROS4A-DI	DI Rack0 Slot4 Wiring Diagram A
ING0645D-80-ROS4B-DI	DI Rack0 Slot4 Wiring Diagram B
ING0645D-80-ROS4C-DI	DI Rack0 Slot4 Wiring Diagram C
ING0645D-80-ROS4D-DI	DI Rack0 Slot4 Wiring Diagram D
ING0645D-80-ROS5A-DI	DI Rack0 Slot5 Wiring Diagram A
ING0645D-80-ROS5B-DI	DI Rack0 Slot5 Wiring Diagram B
ING0645D-80-R1S0A-DO	DO Rack1Slot0 Wiring Diagram A
ING0645D-80-R1S0B-DO	DO Rack1Slot0 Wiring Diagram B
ING0645D-80-R1S1A-DO	DO Rack1Slot1 Wiring Diagram A
ING0645D-80-R1S2-AI	AI Rack1 Slot3 Wiring Diagram
ING0645D-80-R1S3-AI	AI Rack1 Slot4 Wiring Diagram
ING0645D-80-R1S3-AI	AI Rack1 Slot5 Wiring Diagram
ING0645D-80-R1S5-AO	AO Rack1 Slot6 Wiring Diagram
ING0645D-80-AIT001	Mixed Liquor Suspended Solids Loop Drawing
ING0645D-80-AIT002	Dissolved Oxygen 1 Loop Drawing
ING0645D-80-AIT003	Dissolved Oxygen 2 Loop Drawing
ING0645D-80-AIT004	Dissolved Oxygen 3 Loop Drawing
ING0645D-80-AIT005/009	Bio 1 and 2 Phosphate Loop Drawing
ING0645D-80-AIT005/010	Bio 1 and 2 Ammonia Loop Drawing
ING0645D-80-AIT007	Bio 1 SS Loop Drawing
ING0645D-80-AIT008	Bio 1 COD Loop Drawing
ING0645D-80-AIT011	Bio 2 SS Loop Drawing
ING0645D-80-AIT012	Bio 2 COD Loop Drawing
ING0645D-80-FCV001	WAS Flow Control Valve Loop Drawing
ING0645D-80-FIT001	RAS Flow Loop Drawing
ING0645D-80-FIT002	WAS Flow Loop Drawing
ING0645D-80-FIT003	Dosing Flow Loop Drawing
ING0645D-80-LIT002	Chemical Dosing Tank Level Loop Drawing

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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Industrial Division
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SURVEYED		
DESIGNED		
DRAWN	A M	
CHECKED		
SERVICES CHECKED		
GEOTECHNICAL INVESTIGATION		
SERVITUDES		
APPROVED		
Pr. Eng. No.		
DATE		

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

MECHANICAL AND ELECTRICAL WORKS

LIST OF TENDER DRAWINGS

DESIGN MANAGER	SCALE	AMENDMENTS	APPROVED	DATE
DATE	AS SHOWN			

DRAWING No.

JW NUMBER
JW13986-EE-LIST

CONSULTANT'S NUMBER
303-HOW-EE-LIST

FILE No

P1 P2

D:\Knight Piesold Documents\Projects\JHB North\JW13897 Tender Document\LIST OF DRAWINGS.dwg Jul 17, 2025 - 7:16am

DEPARTMENT	APPROVED	DESIGNATION	DATE

LEGEND:

NWWTW FENCE LINE

EXTENT OF SITE (SITE BOUNDARY)

CONSULTING ENGINEERS

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FAX 011-806 7100
EMAIL enquiries@kprsa.co.za

WSP Group Africa (Pty) Ltd
Industrial Division
Building C, Knightsbridge
33 Sloane Street, Bryanston, 2191
Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

SURVEYED	
DESIGNED	K M
DRAWN	J VD W
CHECKED	K M
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

SITE PLAN

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS	APPROVED	DATE
0 APPROVED FOR CONSTRUCTION	K M	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-006

CONSULTANT'S NUMBER
303 00141-12-006

FILE No

0

P:\303-00141\12\A\DRAWINGS\KP\BWW1500 NW Unit 5 Mod 2\6 Construction\02 Civil Drawings\303000141-12-006 Rev0.dwg Jun 23, 2022 - 1:04pm

Johannesburg Water

Northern Wastewater Treatment Works: Expansion of Capacity – Unit 5 - Phase 2

ANOTHER JOHANNESBURG WATER SANITATION SERVICE DELIVERY PROJECT

HELPDESK 011 688-1500

WORKING IN PARTNERSHIP WITH OUR COMMUNITIES

PROJECT DETAILS:

CONTRACT: JW 13896

DESCRIPTION:
CONSTRUCTION OF EXTENDED WASTE WATER TREATMENT WORKS

CONTRACTOR:
Xxx.
Tel:

Contractor's logo. 250X250

HELVETICA MEDIUM 75mm BLACK UPPER AND LOWER CASE TO BE USED FOR NAME OF SITE

HELVETICA MEDIUM 50mm BLACK UPPER CASE ONLY

CONSULTANT

KW JOINT VENTURE
Tel: 011 806-7111

Knight Piésold CONSULTING

WSP Group Africa (Pty) Ltd
Industrial Division

CONSULTING CIVIL ENGINEERS

KNIGHT PIESOLD CONSULTING. Tel: 011 806-7111

CONSULTING MECHANICAL ENGINEERS

KNIGHT PIESOLD CONSULTING. Tel: 011 806-7111

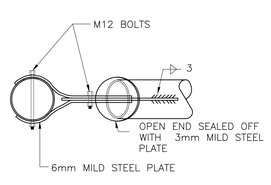
CONSULTING ELECTRICAL AND C&I ENGINEERS

WSP CONSULTING. Tel: 011 361-1300

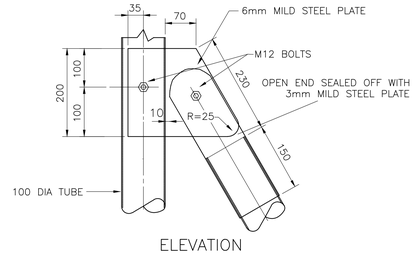
2940

3300

PROFESSIONAL BOARD
N.T.S

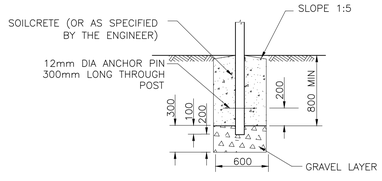


PLAN



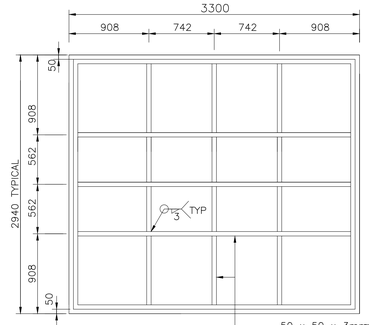
ELEVATION

DETAIL Z
1:5

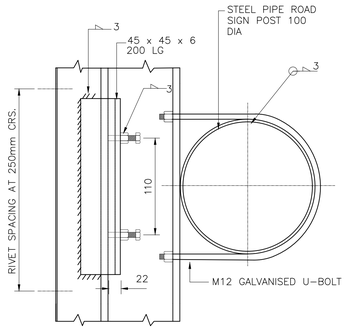


FOUNDATION DETAIL
1:25

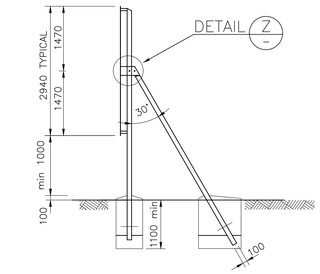
DEPARTMENT	APPROVED	DESIGNATION	DATE



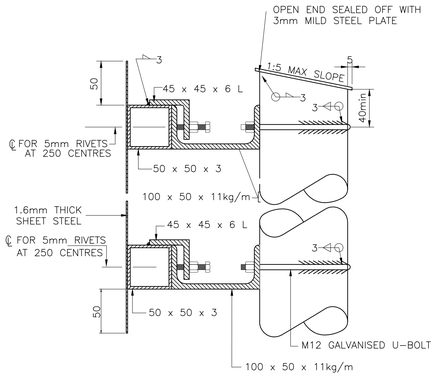
BRACING FOR NAME BOARD
1:25



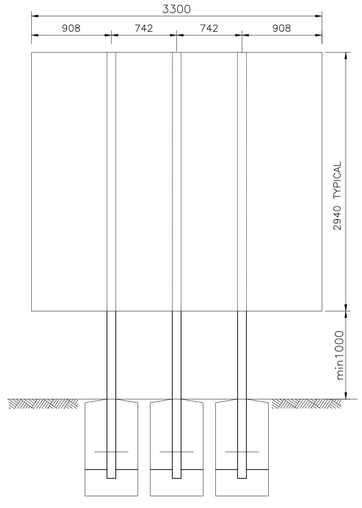
PLAN



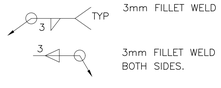
END ELEVATION OF NAME BOARD
1:50



SIDE ELEVATION
ATTACHMENT DETAIL FOR NAME BOARD
1:2.5



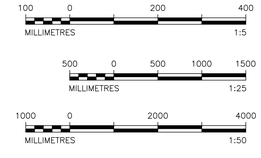
SPACING OF FRAME SUPPORTS
1:25



WELDING LEGEND

NOTES:

1. TYPE FACE TO BE USED SHALL BE HELVETICA MEDIUM. IT IS RECOMMENDED THAT THE STANDARD HELVETICA MEDIUM LETTERS NEEDED BE OBTAINED FROM RECOGNISED DEALERS.
2. SIZES OF LETTERING AND DIMENSIONS SHALL BE STRICTLY ADHERED TO.
3. PROFESSIONAL SEALS SHALL BE IN BLACK AND BE PLACED CENTRAL IN SPACE PROVIDED AS SHOWN ON THE DRAWING.
4. PROFESSIONAL SEALS ON THE BOARD ARE OF REDUCED SIZE (APPROX. 200mm DIAMETER) AND ARE OBTAINABLE FROM THE VARIOUS SOCIETIES CONCERNED.
5. BOARDS MUST BE IN ACCORDANCE WITH A MULTI – PROFESSIONAL BOARD AS RECOMMENDED BY THE SOUTH AFRICAN CONSULTING ENGINEERS.
6. THE SIGNWRITER SHALL REFER TO PAGES 1,2 AND 3 OF THE NOTICE BOARD AS PRODUCED BY THE INSTITUTE OF SOUTH AFRICAN ARCHITECTS – PRACTICE MANUAL A1: 1984
7. BORDER ACCORDING TO SPECIFICATION 05 OF BS 381(C) OF 1964.
8. ALL DIMENSIONS ARE IN MILLIMETRES.
9. THE CONTRACTOR SHALL AGREE WITH THE ENGINEER DETAILS TO BE INCLUDED IN THE SPACE LEFT FOR THE CONTRACTOR ETC PRIOR TO FABRICATION OF THE NAME BOARDS.
10. ALL TEXT ON NAME BOARD TO BE IN CAPITAL LETTERS.
11. TIMES ROMAN LETTER STYLE TO BE USED ON THE NAME BOARD WHERE SHOWN ON THE DRAWING.
12. NAME BOARD TO BE MADE OF 1.6mm THICK CHROMADEK SHEET STEEL UNLESS OTHERWISE AGREED BY THE ENGINEER.
13. NAMES OF THE INDIVIDUAL COMPANIES FORMING THE CONTRACTOR'S JOINT VENTURE ARE NOT TO BE SHOWN ON THE NAME BOARD.



CONSULTING ENGINEERS		JOHANNESBURG WATER (SOC) LTD	CITY OF JOHANNESBURG	DESIGN MANAGER	SCALE	AMENDMENTS	APPROVED	DATE	DRAWING No.
Knight Piésold CONSULTING P.O. BOX 221 RIVONIA 2128 TEL. 011-806 7111 FAX. 011-806 7100 EMAIL enquiries@kprsa.co.za	WSP Group Africa (Pty) Ltd Industrial Division Building C, Knightsbridge, 33 Sloane Street, Bryanston, 2191 Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com	DRAWING OFFICE DESIGNED K.M. DRAWN JvdW CHECKED K. M. SERVICES CHECKED GEOTECHNICAL INVESTIGATION SERVITUDES APPROVED SR JASSRDSE Pr. Eng. No. 800295/79 DATE 30-06-2022	Johannesburg Water 17 HARRISON STREET MARSHALLTOWN 2107 TEL: (011) 688-1400 FAX: (011) 688-1529	NORTHERN WASTEWATER TREATMENT WORKS UNIT 5 – PHASE 2 PROJECT NOTICE BOARD	DATE	AS SHOWN	0 APPROVED FOR CONSTRUCTION	S.J.	01/07/22	JW NUMBER JW 13896-CE-007 CONSULTANT'S NUMBER 30300141-12-007 FILE No 0

NINE CHARACTER EQUIPMENT REFERENCE

DESCRIPTION	TYPICAL CHARACTERS 1	2	3	4	5	6	7	8	9
FIRST CHARACTER THE FIRST CHARACTER REFERS TO THE UNIT OF THE WORKS TO WHICH THE UNIT 5 OF THE JOHANNESBURG NORTHERN SEWAGE PURIFICATION WORKS AND ONLY BY EXCEPTION WILL AN ITEM APPLY TO AN OTHER PART.	5								
SECOND CHARACTER THE LETTERS C,M,E OR I REFERS TO THE TYPE OF EQUIPMENT TO BE USED BY CIVIL, MECHANICAL, ELECTRICAL OR INSTRUMENTATION.		C M E I							
THIRD CHARACTER THE FIGURE REFERS TO THE PLANT AREA.			0 TO 9						
FOURTH AND FIFTH AND/OR SIXTH CHARACTERS THE LETTERS DESCRIBE THE FUNCTION OF EQUIPMENT AND IS EXPLAINED IN THE LEGEND FOR ELECTRICAL EQUIPMENT. THESE CHARACTERS COMPLY WITH THE IDENTIFICATION LETTERS OF THE INSTRUMENT SOCIETY OF AMERICA.				S F M P S	V E S V	T I S L Y			
SIXTH AND SEVENTH OR SEVENTH AND EIGHT CHARACTERS THE FIGURES DESIGNATE THE NUMBER OF THE FUNCTION IN A PARTICULAR PROCESS AND INSTRUMENTATION DIAGRAM EACH FUNCTION COMMENCES WITH NO 01 ALL ELECTRIC PRIME MOVERS ARE GIVEN SEQUENTIAL NUMBERS.							0 TO 9	0 TO 9	
EIGHT OR NINTH CHARACTERS THESE LETTERS ARE OPTIONAL, AND ARE ONLY USED WHEN THE TAG NO IS DUPLICATED ie. THE SAME PIECE OF EQUIPMENT WITH MORE THAN ONE PART.									A TO Z

VALVES AND IDENTIFICATION

WATERWORKS GATE VALVE	(WGV)
RESILIENT SEAL GATE VALVE	(RSGV)
FULL BORE DIAPHRAM VALVE	(FBDV)
WEIR DIAPHRAM VALVE	(WDV)
KNIFE GATE VALVE	(KGV)
BRASS GATE VALVE	(BGV)
THREE WAY SLUDGE VALVE	(TWSV)
REFLUX VALVE	(RV)
PRESSURE REDUCING VALVE	(PRV)
NEEDLE VALVE	(NV)
POLY PLASTIC BALL VALVE	(PPBV)
POLY PLASTIC NON RETURN VALVE	(PPNRV)

PROCESS FLOW INDICATORS

DESCRIPTION	SYMBOL
PROCESS LINE REFERENCE TO AND FROM PLANT AREAS OUTSIDE THE SCOPE OF A PARTICULAR DRAWING.	SLUDGE TO SLUDGE TREATMENT PLANT
PROCESS LINE REFERENCE	S
AIR AND WATER PURGE	P
DIRECTION OF FLOW	
DIRECTION OF ROTATION (CLOCKWISE ON PLAN)	
DIRECTION OF ROTATION (ANTI-CLOCKWISE ON PLAN)	

IDENTIFICATION OF MECHANICAL ENGINEERING ITEMS

DESCRIPTION	DESIGNATION	SYMBOL
BELT CONVEYER UNIT 5, AREA 5, No. 3.	5M5BC03	
ELECTRIC MOTOR UNIT 5, MODULE 1, No. 16.	5M1ME16	M
ELECTRIC ACTUATED VALVE UNIT 5, MODULE 3, No. 1.	5M3EV01	M
BELT PRESS		
FLOW RATE SENSOR (VENTURI) UNIT 5, MODULE 2, No. 1.	5M2FE01	
FLOW RATE SENSOR (FLUME) UNIT 5, AREA 0, No. 2.	5M0FE02	
FLOW METER SENSOR (MAGNETIC) UNIT 5, AREA 5, No. 2.	5M5FE02	FE
SCREENINGS UNIT 5, AREA 5, No. 1.	5M5PB01	M
MOTOR DRIVEN MIXER UNIT 5, AREA 7, No. 12.	5M7MX12	M
PENSTOCK HANDSTOP UNIT 5, AREA 5, No. 3.	5M6PS03	
PENSTOCK HAND WHEEL OPERATED UNIT 5, MODULE 1, No. 2.	5M1PS02	
PENSTOCK ELECTRIC MOTOR ACTUATED UNIT 5, AREA 5 , No. 3.	5M5PS03	M
SLUDGE PUMP (CENTRIFUGAL) (ELECTRIC MOTOR DRIVEN) UNIT 5, AREA 6 , No. 3.	5M6PS03	M
SLUDGE PUMP (CENTRIFUGAL) (ELECTRIC MOTOR DRIVEN)		M
PURGE POINT	P	
BLANK FLANGE	BF	
QUICK COUPLING		
ORIFICE PLATE		

DESCRIPTION	DESIGNATION	SYMBOL
ARCHIMEDIAN SCREW RETURN ACTIVATED SLUDGE PUMP UNIT 5, MODULE 3, No. 2.	5M3RP02	M
SLUDGE AND SCUM SCRAPER MECHANISM WITH MECHANICALLY ACTIVATED DESCUMMING VALVE		M
SURFACE AERATOR UNIT 5, MODULE 3, No. 1. ELECTRIC MOTOR DRIVEN	5M3SA01	M
VALVE UNIT 5, AREA 0, No. 17. ELECTRIC MOTOR ACTUATED	5M0EV17	M
VALVE UNIT 5, MODULE 4, No. 2. HAND OPERATED	5M4HV02	
SLUDGE PINCH VALVE UNIT 5, AREA 6, No. 17. SOLENOID CONTROLLED PNEUMATICALLY ACTUATED	5M6SV07	S
VALVE UNIT 5, AREA 0, No. 2. REFLUX	5M0RV02	
AIR LIFT PUMP SOLENOID CONTROLLED WITH HIGH AND LOW PRESSURE AIR SUPPLY	5M0AP02	S S
MANUAL SAMPLING POINT	MS	
AUTOMATIC SAMPLING POINT	AS	
AIR RELEASE VALVE	5C9LV01	

PUMP DUTY CYCLES

D/D 2 PUMPS NORMALLY CAN RUN
D/S 1 DUTY/1STANDBY IN BANKS OF 2
D/D/S 2 DUTY/1STANDBY IN BANKS OF 3
D/D/D ALL 3 PUMPS NORMALLY CAN RUN

TORQUE LIMITATION DEVICE
ELECTRONIC SHEAR LINE
BY ELECTRICAL CONTRACTOR — TL

IDENTIFICATION OF CIVIL ENGINEERING ITEMS

DESCRIPTION	DESIGNATION	SYMBOL
BIOREACTOR UNIT 5, MODULE 1, No. 1.	5C1BP01	
BALANCING TANK UNIT 5, AREA 7, No. 1.	5C7BT01	
FLOW DIVIDER UNIT 5, AREA 7, No. 1.	5C7FD01	
FLOW DIVIDER UNIT 5, AREA 5, No. 1.	5C5FD01	M M
PRIMARY SEDIMENTATION TANK UNIT 5, AREA 6, No. 6.	5C6PS06	
SLUDGE THICKENER TANK UNIT 5, MODULE 1, No. 2.	5C1ST02	
CLARIFYING TANK UNIT 5, AREA 7, No. 1.	5C7CT01	
STILLING CHAMBER UNIT 5, MODULE 3, No. 1.	5C3ED01	
SUMPS/COLLECTION BOXES		
MOTORISED BAR SCREEN UNIT 5, AREA 5, No. 2.	5M5BS02	M
MOTORISED FINE SCREEN UNIT 5, AREA 7, No. 1.	5M7FS01	
HAND CLEANED BARSCREEN UNIT 5, AREA 5, No. 5.	5M5BS05	
MOTORISED LINEAR SCREEN UNIT 5, AREA 9, No. 1.	5M9LS01	M

IDENTIFICATION OF ELECTRICAL, INSTRUMENTATION AND CONTROL ITEMS (INSTRUMENTATION SYMBOLS AND IDENTIFICATION ISA-S5.1)

IDENTIFICATION LINE SYMBOLS

- INSTRUMENT CONNECTION TO PROCESS
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- HYDRAULIC SIGNAL
- CAPILLARY TUBE
- ULTRASONIC SIGNAL
- SOFTWARE OR DATA LINK
- MECHANICAL LINK
- HARDWARE INTERLOCK

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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P.O. BOX 221
RIVONIA
2128
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FAX 011-806 7100
EMAIL enquiries@kprsa.co.za

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SURVEYED	
DESIGNED	GK
DRAWN	MKM
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT Pr. Eng. No. 202001279	
DATE 30-06-2022	

JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET
MARSHALLTOWN
2107
TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
LEGEND – ALL DISCIPLINES

DESIGN MANAGER
DATE

SCALE

AMENDMENTS	APPROVED	DATE
0 APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-021
CONSULTANT'S NUMBER
30300141/12-021
FILE No
0

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CIVIL AND MECHANICAL

PRIMARY SEDIMENTATION TANKS (PT)

TAG No	ADWF (l/s)	I.DIA. (m)	SIDE WALL DEPTH (m)	FLOOR SLOPE
5C6PT01	290	35.0	4.0	1.6
5C6PT02	290	35.0	4.0	1.6
5C6PT03	**290**	**35.0**	**4.0**	**1.6**
5C6PT04	**290**	**35.0**	**4.0**	**1.6**

HAND STOPS (HS)

TAG No	SIZE (mmxmm)	ACTUATOR DETAILS
5C6HS01	300x1000	HAND STOP
5C6HS02	300x1000	HAND STOP
5C6HS03	300x1000	HAND STOP
5C6HS04	300x1000	HAND STOP
5C6HS05	300x1000	HAND STOP
5C6HS06	300x1000	HAND STOP

DRAIN VALVES (DV)

TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5M6DV01	16	PPBV	SOLENOID
5M6DV02	16	PPBV	BALL

PST MECHANISM (PM)

TAG No.	SCRAPER DRIVE	PERIPHERAL SPEED (m/min)
5M6PM01	PERIPHERAL	3.0
5M6PM02	PERIPHERAL	3.0
5M6PM03	**PERIPHERAL**	**3.0**
5M6PM04	**PERIPHERAL**	**3.0**

FLOW RATE SENSOR (FE)

TAG No.	DIM	TYPE
5C6FE01	–	FLUME

SCUM VALVES (SC)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M6SC01	200	PIPE	BRIDGE
5M6SC02	200	PIPE	BRIDGE
5M6SC03	**200**	**PIPE**	**BRIDGE**
5M6SC04	**200**	**PIPE**	**BRIDGE**

SLUDGE VALVES (SV)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5C6SV01	200	KGV	HAND WHEEL
5C6SV02	200	KGV	HAND WHEEL
5M6SV03	200	KGV	ELECTRICAL
5M6SV04	200	KGV	ELECTRICAL
5C6SV05	50	BV	HAND WHEEL
5C6SV06	50	BV	HAND WHEEL
5C6SV07	**200**	**KGV**	**HAND WHEEL**
5C6SV08	**200**	**KGV**	**HAND WHEEL**
5M6SV09	**200**	**KGV**	**ELECTRICAL**
5M6SV10	**200**	**KGV**	**ELECTRICAL**
5C6SV11	**50**	**BV**	**HAND WHEEL**
5C6SV12	**50**	**BV**	**HAND WHEEL**

FLOW DIVIDER (FD)

TAG No	DIA. (m)
5C6FD01	SEGMENTED FD
5C6FD02	5.0

PENSTOCKS (PS)

TAG No	SIZE (mmxmm)	TYPE	ACTUATOR DETAILS
5C6PS01	413x1600	CHANNEL	HAND WHEEL
5C6PS02	413x1600	CHANNEL	HAND WHEEL
5C6PS03	413x1600	CHANNEL	HAND WHEEL
5C6PS04	413x1600	CHANNEL	HAND WHEEL
5C6PS05	413x1600	CHANNEL	HAND WHEEL
5C6PS06	413x1600	CHANNEL	HAND WHEEL
5C6PS07	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS08	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS09	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS10	EXISTING	SLUICE GATE	ELECTRIC
5C6PS11	EXISTING	SLUICE GATE	ELECTRIC

ELECTRIC MOTORS (ME)

TAG No	KW	rpm	VOLTAGE	ENCLOSURE	APPLICATION
5M6ME01 A/B	0.55	1450	380	TEFC-IP55	SLUDGE AND SCUM SCRAPER DRIVE
5M6ME02 A/B	0.55	1450	380	TEFC-IP55	SLUDGE AND SCUM SCRAPER DRIVE
5M6ME03	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR
5M6ME04	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR
5M6ME13	4	1450	380	TEFC IP65	GAS BLOWER
5M6HEAT01	5	–	380	–	HEATER
5M6ME05	0,37	1450	380	TEFC-IP55	SLUICE GATE ACTUATOR
5M6ME06	0,37	1450	380	TEFC-IP55	SLUICE GATE ACTUATOR
5M6ME07	**0,55**	**1450**	**380**	**TEFC-IP55**	**SLUICE AND SCUM SCRAPER DRIVE**
5M6ME08	**0,55**	**1450**	**380**	**TEFC-IP55**	**SLUICE AND SCUM SCRAPER DRIVE**
5M6ME09	**0,37**	**1450**	**380**	**TEFC-IP55**	**VALVE ACTUATOR**
5M6ME10	**0,37**	**1450**	**380**	**TEFC-IP55**	**VALVE ACTUATOR**

SETTLED SEWAGE VALVES (SS)

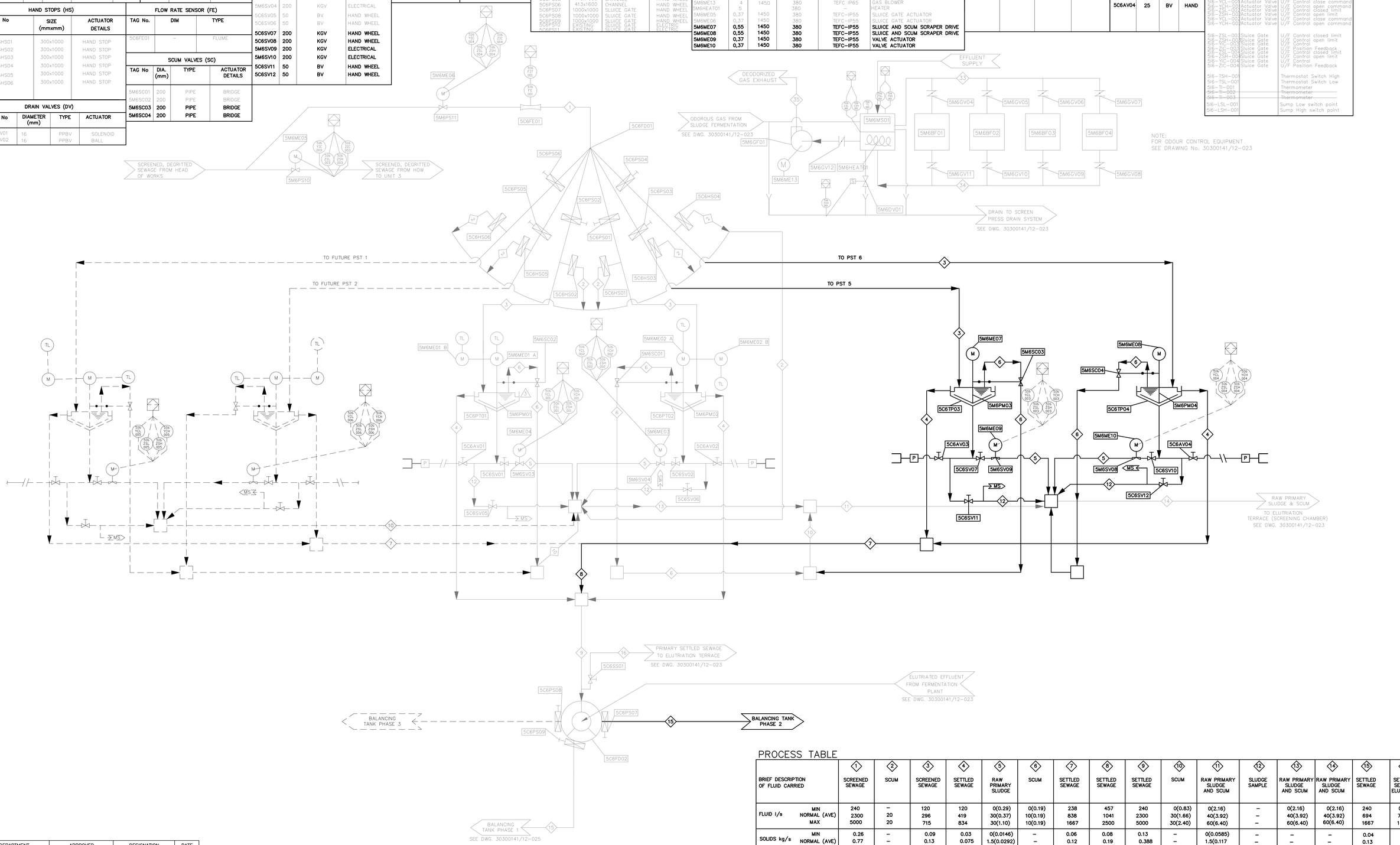
TAG No	DIA (mm)	TYPE	ACTUATOR DETAILS
5C6SS01	300	KGV	HAND

AIR VALVES (AV)

TAG No	DIA (mm)	TYPE	ACTUATOR DETAILS
5C6AV01	25	BV	HAND
5C6AV02	25	BV	HAND
5C6AV03	**25**	**BV**	**HAND**
5C6AV04	**25**	**BV**	**HAND**

INSTRUMENTATION

Transducer TAG No.	Sensor TAG No.	Description
~~5I6-LIT-001~~	~~5I6-LE-001~~	~~U/sonic level transmitter~~
5I6-FIT-001	5I6-FE-001	U/sonic channel flow transmitter
5I6-ZSL-001	Actuator Valve	U/F Control closed limit
5I6-ZSH-001	Actuator Valve	U/F Control open limit
5I6-YCL-001	Actuator Valve	U/F Control close command
5I6-YCH-001	Actuator Valve	U/F Control open command
5I6-ZSL-002	Actuator Valve	U/F Control closed limit
5I6-ZSH-002	Actuator Valve	U/F Control open limit
5I6-YCH-002	Actuator Valve	U/F Control close command
5I6-YCH-002	Actuator Valve	U/F Control open command
5I6-ZSL-003	Sluice Gate	U/F Control closed limit
5I6-ZSH-003	Sluice Gate	U/F Control open limit
5I6-YIC-003	Sluice Gate	U/F Control
5I6-ZIC-003	Sluice Gate	U/F Position Feedback
5I6-ZSL-004	Sluice Gate	U/F Control closed limit
5I6-ZSH-004	Sluice Gate	U/F Control open limit
5I6-YIC-004	Sluice Gate	U/F Control
5I6-ZIC-004	Sluice Gate	U/F Position Feedback
5I6-TSH-001		Thermostat Switch High
5I6-TSL-001		Thermostat Switch Low
5I6-TI-001		Thermometer
5I6-TI-002		Thermometer
5I6-TI-003		Thermometer
5I6-LSL-001		Sump Low switch point
5I6-LSH-001		Sump High switch point



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 SCREENED SEWAGE	2 SCUM	3 SCREENED SEWAGE	4 SETTLED SEWAGE	5 RAW PRIMARY SLUDGE	6 SCUM	7 SETTLED SEWAGE	8 SETTLED SEWAGE	9 SETTLED SEWAGE	10 SCUM	11 RAW PRIMARY SLUDGE AND SCUM	12 SLUDGE SAMPLE	13 RAW PRIMARY SLUDGE AND SCUM	14 RAW PRIMARY SLUDGE AND SCUM	15 SETTLED SEWAGE	16 SETTLED SEWAGE ELUTRIANT
FLUID l/s	MIN	240	–	120	120	0(0.29)	0(0.19)	238	457	240	0(0.83)	0(2.16)	–	0(2.16)	0(2.16)	240	0
	NORMAL (AVE)	2300	20	296	419	30(0.37)	10(0.19)	838	1041	2300	30(1.66)	40(3.92)	–	40(3.92)	40(3.92)	694	70
	MAX	5000	20	715	834	30(1.10)	10(0.19)	1667	2500	5000	30(2.40)	60(6.40)	–	60(6.40)	60(6.40)	1667	140
SOLIDS kg/s	MIN	0.26	–	0.09	0.03	0(0.0146)	–	0.06	0.08	0.13	–	0(0.0585)	–	–	–	0.04	–
	NORMAL (AVE)	0.77	–	0.13	0.075	1.5(0.0292)	–	0.12	0.19	0.388	–	1.5(0.117	–	–	–	0.13	–
	MAX	1.85	–	0.31	0.15	3.0(0.0434)	–	0.30	0.45	0.93	–	3.0(0.174)	–	–	–	0.30	–
CONDUIT SIZE (mm)		VARIES	250ND	750ø	900ø	200ø	200ø	1050ø	1500ø	1800ø	300/200ND	400ND	50ø	400ND	450ND	1050ø	300ND
CONDUIT MATERIAL		CONCRETE	MS	MS	MS	MS	M.S & uPVC	MS	MS	MS	uPVC	uPVC	GMS	uPVC	uPVC	MS	MS/uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
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FAX. 011-806 7100
EMAIL enquiries@kpsa.co.za

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33 Sloane Street, Bryanston, 2191
Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

SURVEYED	
DESIGNED	GK
DRAWN	MKM
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

PROCESS AND INSTRUMENTATION DIAGRAM
PRIMARY SEDIMENTATION TANKS

DESIGN MANAGER

DATE

SCALE

AMENDMENTS		APPROVED	DATE
0	APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-022

CONSULTANT'S NUMBER
30300141/12-022

FILE No

0

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THICKENER (ST)			
TAG No	INTERNAL DIA. (m)	SIDE WATER DEPTH (m)	FLOOR SLOPE
5C8ST01	25	25	1:6
5C8ST02	25	25	1:6

THICKENER MECHANISM (ST)		
TAG No	DRIVE	PERIPHERAL SPEED (m/min.)
5M8TM01	CENTRE	
5M8TM02	CENTRE	3

MIXING TANK (MT)		
TAG No	DEPTH (m)	SIZE (mxm)
5C8MT01	4.1	7.5x7.5
5C8MT02	4.1	7.5x7.5

FLOW DIVIDER (FD)	
TAG No	DESCRIPTION
5C8FD01	PRIMARY SETTLED SEWAGE
5C8FD02	DILUTE SLUDGE
5C8FD03	SLUDGE BYPASS

ELECTRIC MOTORS (EM)					
TAG No	kW	RPM	VOLTAGE	ENCLOSURE	APPLICATION
5M8ME01	0.55	1450	380	TEFC IP55	THICKENER SCRAPER DRIVE
5M8ME02	7.5	1450	380	TEFC IP55	MIXER DRIVE
5M8ME03	11	1450	380	TEFC IP55	RECIRC. SLUDGE PUMP DRIVE
5M8ME04	11	1450	380	TEFC IP55	RECIRC. SLUDGE PUMP DRIVE
5M8ME05	11	1450	380	TEFC IP55	RECIRC. SLUDGE PUMP DRIVE
5M8ME06	11	1450	380	TEFC IP55	RECIRC. SLUDGE PUMP DRIVE
5M8ME07	5.5	1450	380	TEFC IP55	TRANSFER SLUDGE PUMP DRIVE
5M8ME08	5.5	1450	380	TEFC IP55	TRANSFER SLUDGE PUMP DRIVE
5M8ME09	18.5	1450	380	TEFC IP55	ELUTRIANT EFFLUENT PUMP DRIVE
5M8ME10	18.5	1450	380	TEFC IP55	ELUTRIANT EFFLUENT PUMP DRIVE
5M8ME11	18.5	1450	380	TEFC IP55	ELUTRIANT EFFLUENT PUMP DRIVE
5M8ME12	0.37	1450	380	TEFC IP55	VENTILATION FAN
5M8ME13	0.37	1450	380	TEFC IP55	CONTROL VALVE ACTUATOR
5M8ME14	0.37	1450	380	TEFC IP55	VENTILATION FAN
5M8ME15	0.37	1450	380	TEFC IP55	DEWATERING PUMP
5M8ME16	0.37	1450	380	TEFC IP55	DEWATERING PUMP
5M8ME17	0.55	1450	380	TEFC IP55	THICKENER SCRAPER DRIVE
5M8ME18	7.5	1450	380	TEFC IP55	MIXER DRIVE
5M8ME19	–	–	–	–	UNALLOCATED
5M8ME20	0.37	1450	380	TEFC IP55	CONTROL VALVE ACTUATOR

ELECTRIC MOTORS (EM)					
TAG No	kW	RPM	VOLTAGE	ENCLOSURE	APPLICATION
5M8ME21	0.37	1450	380	TEFC IP55	CONTROL VALVE ACTUATOR
5M8ME22	5.5	1450	380	TEFC IP55	TRANSFER SLUDGE PUMP DRIVE
5M8ME23	5.5	1450	380	TEFC IP55	TRANSFER SLUDGE PUMP DRIVE
5M8ME24	5.5	1450	380	TEFC IP55	SLUDGE TO DIG PUMP DRIVE
5M8ME25	5.5	1450	380	TEFC IP55	SLUDGE TO DIG PUMP DRIVE
5M8ME26	5.5	1450	380	TEFC IP55	SLUDGE TO DIG PUMP DRIVE

DEWATERING PUMP (DP)		
TAG No	TYPE	DUTY (l/s@m)
5M8DP01	SUBMERSIBLE	40@5
5M8DP02	SUBMERSIBLE	40@5

EFFLUENT RETURN PUMP (EP)		
TAG No	TYPE	DUTY (l/s@m)
5M8EP01	CENTIFUGAL	105@13
5M8EP02	CENTIFUGAL	105@13
5M8EP03	CENTIFUGAL	105@13

SLUDGE PUMPS (SP)		
TAG No	TYPE	DUTY (l/s@m)
5M8SP01	CENTIFUGAL	60@10
5M8SP02	CENTIFUGAL	60@10
5M8SP03	CENTIFUGAL	20@10
5M8SP04	CENTIFUGAL	20@10
5M8SP05	CENTIFUGAL	60@10
5M8SP06	CENTIFUGAL	60@10
5M8SP07	CENTIFUGAL	20@10
5M8SP08	CENTIFUGAL	20@10
5M8SP09	CENTIFUGAL	20@14
5M8SP10	CENTIFUGAL	20@14
5M8SP11	CENTIFUGAL	20@14

SLUDGE VALVES (SV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5C8SV01	250	KGV	HAND WHEEL
5M8SV02	300	KGV	HAND WHEEL
5M8SV03	250	KGV	HAND WHEEL
5M8SV04	250	RV	
5M8SV05	300	KGV	HAND WHEEL
5M8SV06	250	KGV	HAND WHEEL
5M8SV07	250	RV	
5C8SV08	250	KGV	HAND WHEEL
5M8SV09	300	KGV	HAND WHEEL
5M8SV10	250	KGV	HAND WHEEL
5M8SV11	250	RV	
5M8SV12	300	KGV	HAND WHEEL
5M8SV13	250	KGV	HAND WHEEL
5M8SV14	250	RV	
5M8SV15	200	KGV	HAND WHEEL
5M8SV16	200	KGV	HAND WHEEL
5M8SV17	150	RV	
5M8SV18	150	KGV	HAND WHEEL
5M8SV19	150	KGV	HAND WHEEL
5M8SV20	150	KGV	HAND WHEEL

SLUDGE VALVES (SV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5M8SV21	150	KGV	HAND WHEEL
5M8SV22	150	KGV	HAND WHEEL
5M8SV23	200	KGV	HAND WHEEL
5M8SV24	200	KGV	HAND WHEEL
5M8SV25	150	RV	
5M8SV26	150	KGV	HAND WHEEL
5M8SV27	150	KGV	HAND WHEEL
5M8SV28	150	KGV	HAND WHEEL
5M8SV29	150	KGV	HAND WHEEL
5M8SV30	150	KGV	HAND WHEEL
5M8SV31	150	KGV	HAND WHEEL
5M8SV32	150	KGV	HAND WHEEL
5M8SV33	150	KGV	HAND WHEEL
5M8SV34	150	KGV	HAND WHEEL
5M8SV35	150	RV	
5M8SV36	150	RV	
5M8SV37	200	KGV	HAND WHEEL
5M8SV38	200	KGV	HAND WHEEL
5M8SV39	200	KGV	HAND WHEEL
5C8SV40	150	KGV	HAND WHEEL

SLUDGE VALVES (SV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5C8SV41	300	KGV	HAND WHEEL
5C8SV42	300	KGV	HAND WHEEL
5C8SV43	300	KGV	HAND WHEEL
5C8SV44	300	KGV	HAND WHEEL
5C8SV45	300	KGV	HAND WHEEL
5C8SV46	300	KGV	HAND WHEEL
5C8SV47	350	KGV	HAND WHEEL
5C8SV48	250	KGV	HAND WHEEL
5C8SV49	250	KGV	HAND WHEEL
5C8SV50	250	KGV	HAND WHEEL

EFFLUENT VALVES (EV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5M8EV01	300	KGV	HAND WHEEL
5M8EV02	300	KGV	HAND WHEEL
5M8EV03	250	KGV	HAND WHEEL
5M8EV04	250	KGV	HAND WHEEL
5M8EV05	250	RV	–
5M8EV06	250	RV	–
5M8EV07	250	KGV	HAND WHEEL
5M8EV08	250	KGV	HAND WHEEL
5M8EV09	250	KGV	HAND WHEEL
5M8EV10	250	KGV	HAND WHEEL
5M8EV11	300	KGV	HAND WHEEL
5M8EV12	250	RV	–
5C8EV13			
5C8EV18			
5C8EV19			

PRESSURE GUAGES (PI)		
TAG No	RANGE (kPa)	TYPE
5M8PI01	0–150	LIQUID SEAL
5M8PI02	0–150	LIQUID SEAL
5M8PI03	0–150	LIQUID SEAL
5M8PI04	0–150	BOURBON TUBE
5M8PI05	0–150	BOURBON TUBE
5M8PI06	0–150	BOURBON TUBE
5M8PI07	0–150	LIQUID SEAL
5M8PI08	0–150	LIQUID SEAL
5M8PI09	0–150	LIQUID SEAL
5M8PI10	0–150	LIQUID SEAL
5M8PI11	0–150	LIQUID SEAL
5M8PI12	0–150	LIQUID SEAL
5M8PI13	0–150	LIQUID SEAL
5M8PI14	0–150	LIQUID SEAL

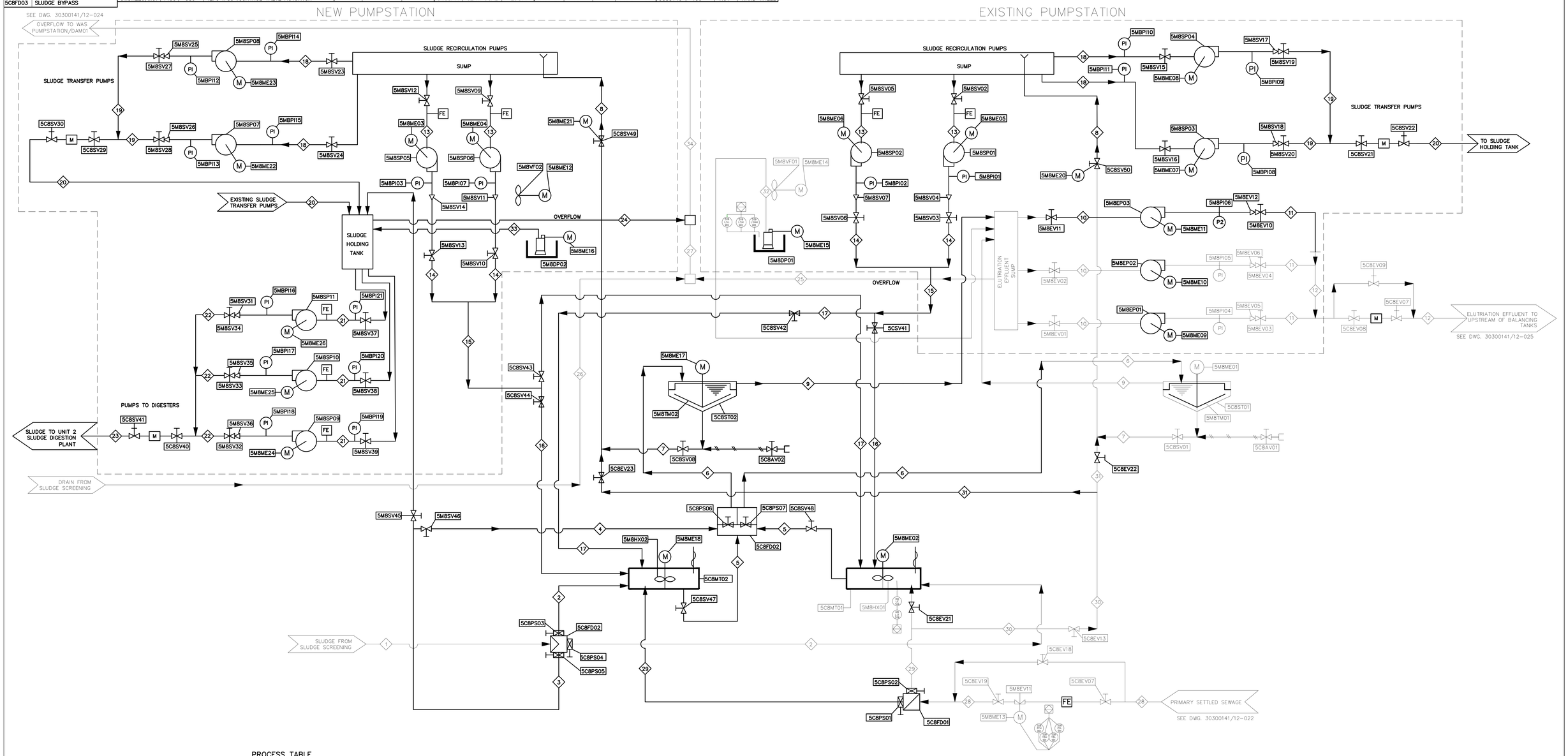
PRESSURE GUAGES (PI)		
TAG No	RANGE (kPa)	TYPE
5M8PI15	0–150	LIQUID SEAL
5M8PI16	0–150	LIQUID SEAL
5M8PI17	0–150	LIQUID SEAL
5M8PI18	0–150	LIQUID SEAL
5M8PI19	0–150	LIQUID SEAL
5M8PI20	0–150	LIQUID SEAL
5M8PI21	0–150	LIQUID SEAL

MIXERS (HX)				
TAG No	kW	SPEED (rpm)	TYPE	
5M8HX01	7.5	25	AXIAL	
5M8HX02	7.5	25	AXIAL	

PENSTOCKS (PS)			
TAG No	SIZE (mmxmm)	TYPE	ACTUATOR
5C8PS01	500x500	SLUICE GATE	HAND
5C8PS02	500x500	SLUICE GATE	HAND
5C8PS03	500x500	SLUICE GATE	HAND
5C8PS04	500x500	SLUICE GATE	HAND
5C8PS05	500x500	SLUICE GATE	HAND
5C8PS06	500x500	SLUICE GATE	HAND
5C8PS07	500x500	SLUICE GATE	HAND

AIR VALVES (AV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5C8AV01	25	BV	HAND
5C8AV02	25	BV	HAND

VENT FAN (VF)	
TAG No	DUTY (m^3/h)
5M8VF01	1.5
5M8VF02	1.5



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED	1 SCREENED PRIMARY SLUDGE	2 SCREENED PRIMARY SLUDGE	3 SCREENED PRIMARY SLUDGE OVERFLOW	4 SCREENED PRIMARY SLUDGE OVERFLOW	5 DILUTE SLUDGE	6 DILUTE SLUDGE	7 THICKENED SLUDGE	8 THICKENED SLUDGE	9 ELUTRIATION EFFLUENT	10 ELUTRIATION EFFLUENT	11 ELUTRIATION EFFLUENT	12 ELUTRIATION EFFLUENT	13 THICKENED SLUDGE	14 THICKENED SLUDGE	15 THICKENED SLUDGE	16 THICKENED SLUDGE	17 THICKENED SLUDGE	18 THICKENED SLUDGE	19 THICKENED SLUDGE	20 THICKENED SLUDGE	21 SLUDGE TO TREATMENT	22 SLUDGE TO TREATMENT	23 SLUDGE TO TREATMENT	24 SLUDGE OVERFLOW	25 ELUTRIANT OVERFLOW	26 SCREEN AREA DRAIN	27 COMBINED OVERFLOW	28 PRIMARY SETTLED SEWAGE	29 PRIMARY SETTLED SEWAGE	30 ELUTRIATION WATER UNDERFLOW DILUTION	31 ELUTRIATION WATER UNDERFLOW DILUTION	32 DRAIN	33 DRAIN	34 COMBINED OVERFLOW
FLUID l/s MIN (AVE)	0(0)	0(0)	0(0)	0(0)	15	15	15	15	76	–	–	–	0	0	0	0	0	–	0	–	–	–	–	0	0	–	0	–	–	0	–	–	0
NORMAL (AVE)	35(5,80)	18(2,9)		18(2,9)	140	140	15	15	82	80	80	160	60	60	120	120	120	20	20	20	20	20	20	40	0	0	–	0	70	70	30	–	–	0
MAX (AVE)	70(17,4)	70(17,4)	70	70(17,4)	140	140	45	45	105	105	105	160	60	60	120	120	120	20	20	20	20	20	20	40	70	120	–	120	140	140	30	30	–	–	120
SOLIDS kg/s MIN (AVE)	–	–			1.4	1,4	1,4	1,4	–	–	–	–	–	–	–			–	–	1,4	–	–	–	–	–		–	–	–	–	–	–	–	–
NORMAL (AVE)	–	–			1,4	1,4	1,4	1,4	–	–	–	–	–	–	–			–	–	1,4	–	–	–	–	–		–	–	–	–	–	–	–	–
MAX (AVE)	–	–			2.1	2,1	2,1	2,1	–	–	–	–	–	–	–			–	–	2,1	–	–	–	–	–		–	–	–	–	–	–	–	–
CONDUIT SIZE (mm)	250ø	250ø	250ø	250ø	350ø	350ø	250ø	250ø	300ø	300ø	250ø	300ø	300ø	200ø	300ø	300ø	300ø	200ø	150ø	150ø	200ø	150ø	160ø	300ø	300ø	150ø	300ø	300ø	300ø	150ø	150ø	80ø	80ø	300ø
CONDUIT MATERIAL	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS/HDPE CLASS 12	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	MS/uPVC	304SS	304SS	304SS	GMS	GMS	uPVC CLASS 12

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 20200127 9	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM
SLUDGE FERMENTATION PLANT
SHEET 1 OF 2

DESIGN MANAGER
DATE

SCALE

AMENDMENTS			
	APPROVED FOR CONSTRUCTION	R G	01/07/22

DRAWING No.
JW NUMBER
JW 13896-CE-023
CONSULTANT'S NUMBER
30300141-12-023
FILE No
0

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WASTE SLUDGE THICKENERS (ST)					
TAG No	DIA m	SIDE WALL DEPTH m	FLOOR SLOPE	RISE RATE (MAX) m/h	SOLIDS FLUX (MAX) kg/m². h
5C9ST01	28	4	1:6	0,60	3,50
5C9ST02	28	4	1:6	0,60	3,50

PENSTOCKS (PS)	
TAG No	SIZE mmxmm
5C9PS01	1000x400
5C9PS02	1000x400

FLOW DIVIDER (FD)	
TAG No	DIM (m)
5C9FD01	1.08x1.08

SLUDGE VALVES (SV)				
TAG No	DIA mm	TYPE	ACTUATOR	
5C9SV01	200	KGV	HAND WHEEL	
5M9SV02	200	KGV	ELECTRICAL	
5M9SV03	200	KGV	SPARE VALVE	
5C9SV04	200	KGV	HAND WHEEL	
5M9SV05	200	KGV	ELECTRICAL	
5C9SV06	200	KGV	HAND WHEEL	

SCUM VALVES (SC)			
TAG No	DIA mm	TYPE	ACTUATOR
5M9SC01	200	PIPE	BRIDGE
5M9SC02	200	PIPE	BRIDGE

WASTE LIQUOR & EFFLUENT VALVES (LV)			
TAG No	DIA mm	TYPE	ACTUATOR
5M9LV01	250	RSGV	HAND WHEEL
5M9LV02	250	RSGV	HAND WHEEL
5M9LV03	200	RV	
5M9LV04	200	RV	
5M9LV05	200	RSGV	HAND WHEEL
5M9LV06	200	RSGV	HAND WHEEL
5M9LV07	200	RSGV	HAND WHEEL
5C9LV08	UNALLOCATED		
5C9LV09	300	KGV	HAND WHEEL
5C9LV10	300	KGV	HAND WHEEL
5C9LV11	300	KGV	HAND WHEEL
5C9LV12	300	KGV	HAND WHEEL
5M9LV13	200	RV	–
5C9LV14	300	KGV	HAND WHEEL
5C9LV15	300	KGV	HAND WHEEL
5C9LV16	150	KGV	HAND WHEEL
5M9LV17	250	RSGV	HAND WHEEL

ELECTRIC MOTORS (ME)						
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN ITEM	
5M9ME01	22	1450	380	TEFC IP55	WAS PUMP	
5M9ME02	22	1450	380	TEFC IP55	WAS PUMP	
5M9ME03	0.55	1450	380	TEFC IP55	THICKENER MECH	
5M9ME04	1.3	1450	380	TEFC IP65	SUMP PUMP	
5E9EE05	?	1450	380	TEFC IP55	VENTILATION FAN	
5M9ME06	0.37	1450	380	TEFC IP55	VALVE ACTUATOR	
5M9ME07	0.55	1450	380	TEFC IP55	MIXER	
5M9ME08	0.55	1450	380	TEFC IP55	MIXER	
5M9ME09	22	1450	380	TEFC IP55	WAS PUMP	
5M9ME10	0.37	1450	380	TEFC IP55	VALVE ACTUATOR	

PRESSURE GAUGES		
TAG No.	RANGE (KPa)	TYPE
5M9PI01	0–150	BOURDON TUBE
5M9ME02	0–150	BOURDON TUBE

VENTILATION FAN (VF)	
TAG No	DUTY m3 /hr
5M9VF01	1250

THICKENER MECHANISM (TM)		
TAG No	DRIVE	PERIPHIRAL SPEED m/min
5M9TM01	PERIPHERAL	3
5M9TM02	PERIPHERAL	3

WASTE LIQUOR PUMPS (LP)		
TAG No	TYPE	DUTY l/s @ m
5M9LP01	CENTRIFUGAL	43 l/s @ 29m
5M9LP02	CENTRIFUGAL	43 l/s @ 29m
5M9LP03	CENTRIFUGAL	43 l/s @ 29m

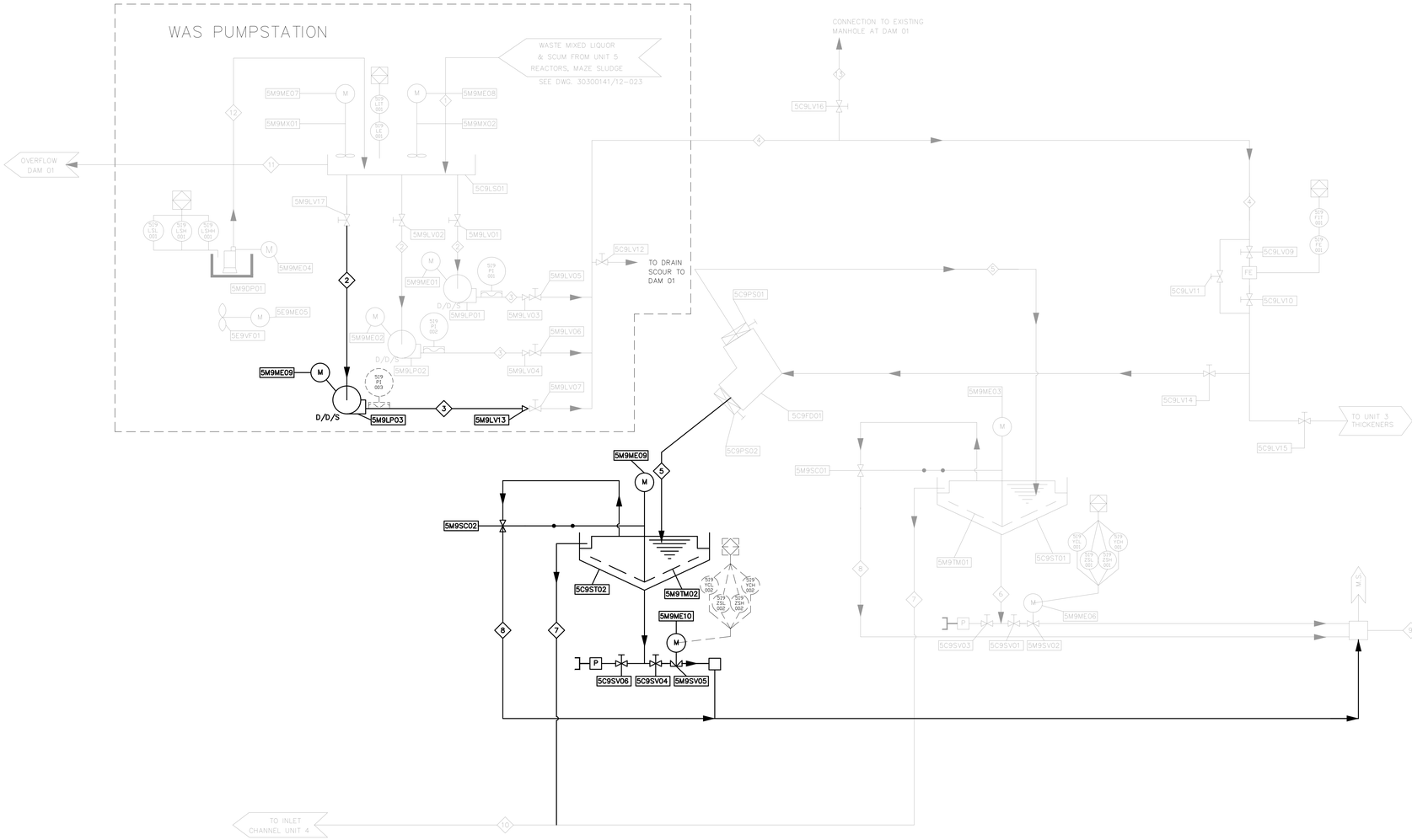
DEWATERING PUMP (DP)		
TAG No	TYPE	DUTY l/s @ m
5M9DP01	SUBMERSIBLE	4 l/s @ 5m

WASTE A.S SUMP (LS)	
TAG No	VOLUME m3
5C9LS01	50

MIXERS (MX)		
TAG No	TYPE	INPUT (kw)
5M9MX01	AXIAL	0.5
5M9MX02	AXIAL	0.5

FLOW SENSORS (FE)		
TAG No	SIZE (mm)	TYPE
5I9FE01	300	Clamp-on Flow
~~5I9FE02~~	~~300~~	~~Clamp-on Flow~~

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
5I9-FIT-001	5I9-FE-001	Clamp-on flowmeter at WST
~~5I9-FIT-002~~	~~5I9-FE-002~~	~~Clamp-on flowmeter~~
5I9-LSHH-001		Float switch-sump high alarm
5I9-LSL-001		Float switch-sump low point
5I9-LSH-001		Float switch-sump high point
5I9-LIT-001	5I9-LE-001	U/sonic level transmitter
~~5I9-LIT-002~~	~~5I9-LE-002~~	~~U/sonic level transmitter~~
5I9-ZSL-001		Actuator Valve Control closed limit
5I9-ZSH-001		Actuator Valve Control open limit
5I9-YCL-001		Actuator Valve Control close command
5I9-YCH-001		Actuator Valve Control open command



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 WASTE MIXED LIQUOR & SCUM	2 WASTE MIXED LIQUOR & SCUM	3 WASTE MIXED LIQUOR & SCUM	4 WASTE MIXED LIQUOR & SCUM	5 WASTE MIXED LIQUOR & SCUM	6 THICKENED SLUDGE	7 EFFLUENT	8 SCUM	9 THICKENED SLUDGE AND SCUM	10 EFFLUENT	11 OVERFLOW DAM 01	12 DRAIN	13 SCOUR
FLUID l/s	MIN	16	16	16	16	16	0	16	0	0	16	–		
	NORMAL (AVE)	34 (92)	23	23 (46)	68 (92)	34	30	34 (35,6)	10 (10)	45 (21,50)	68	–		
	MAX	127	64	64	127	64	30	64	10	60	127	–		
SOLIDS kg/s	MIN	(0,170)	(0,170)	(0,170)	(0,170)	(0,180)	(0)	–	–	(0)		–		
	NORMAL (AVE)	(0,210)	(0,140)	(0,140)	(0,420)	(0,416)	(0,90)	–	–	(1,35)		–		
	MAX	(0,260)	(0,130)	(0,130)	(0,260)	(0,250)	(0,90)	–	–	(1,80)		–		
CONDUIT SIZE (mm)		375ø	250ø	200ø	300/350ND	350ø	200ø	350ø	150ND	300ND	350ø	300ø	50ø	150/400
CONDUIT MATERIAL		uPVC	M.S.	M.S.	MS/HDPE CLASS	M.S.	M.S	M.S	uPVC CLASS12	uPVC CLASS12	M.S	M.S	M.S	uPVC/M.S

DEPARTMENT	APPROVED	DESIGNATION	DATE

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Pr. Eng. No. 202001279	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

PROCESS AND INSTRUMENTATION DIAGRAM

WASTE SLUDGE THICKENERS

DESIGN MANAGER

DATE

SCALE

AMENDMENTS

		APPROVED	DATE
0	APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-024

CONSULTANT'S NUMBER
30300141/12-024

FILE No

0

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CIVIL AND MECHANICAL

SEWAGE VALVES (SV)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M7SV01	**800**	**KGV**	**HAND WHEEL**
5C7SV02	800	KGV	HAND WHEEL
5M7SV03	800	KGV	ELECTRICAL
5C7SV04	**800**	**KGV**	**ELECTRICAL**
5C7SV05	1000	KGV	HAND WHEEL
5C7SV06	800	KGV	HAND WHEEL
5M7SV07	1000	KGV	ELECTRICAL
5C7SV08	**800**	**KGV**	**HAND WHEEL**

REACTOR FLOW DIVIDER (FD)		
TAG No	DIA (m)	
5C7FD01	5.0	

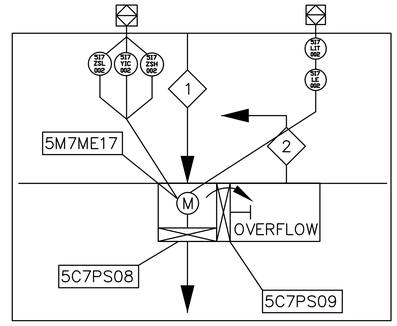
MIXERS (MX)			
TAG No	SPEED (rpm)	TYPE	DEMAND (kW)
5M7MX01	25	AXIAL FLOW	11
5M7MX02	25	AXIAL FLOW	11
5M7MX03	25	AXIAL FLOW	11
5M7MX04	25	AXIAL FLOW	11
5M7MX05	25	AXIAL FLOW	11
5M7MX06	25	AXIAL FLOW	11
5M7MX07	**25**	**AXIAL FLOW**	**11**
5M7MX08	**25**	**AXIAL FLOW**	**11**
5M7MX09	**25**	**AXIAL FLOW**	**11**
5M7MX10	**25**	**AXIAL FLOW**	**11**
5M7MX11	**25**	**AXIAL FLOW**	**11**
5M7MX12	**25**	**AXIAL FLOW**	**11**

BALANCING TANK (BT)		
TAG No	DIA (m)	HEIGHT (m)
5C7BT01	77x40	3.0
5C7BT02	**77x40**	**3.0**

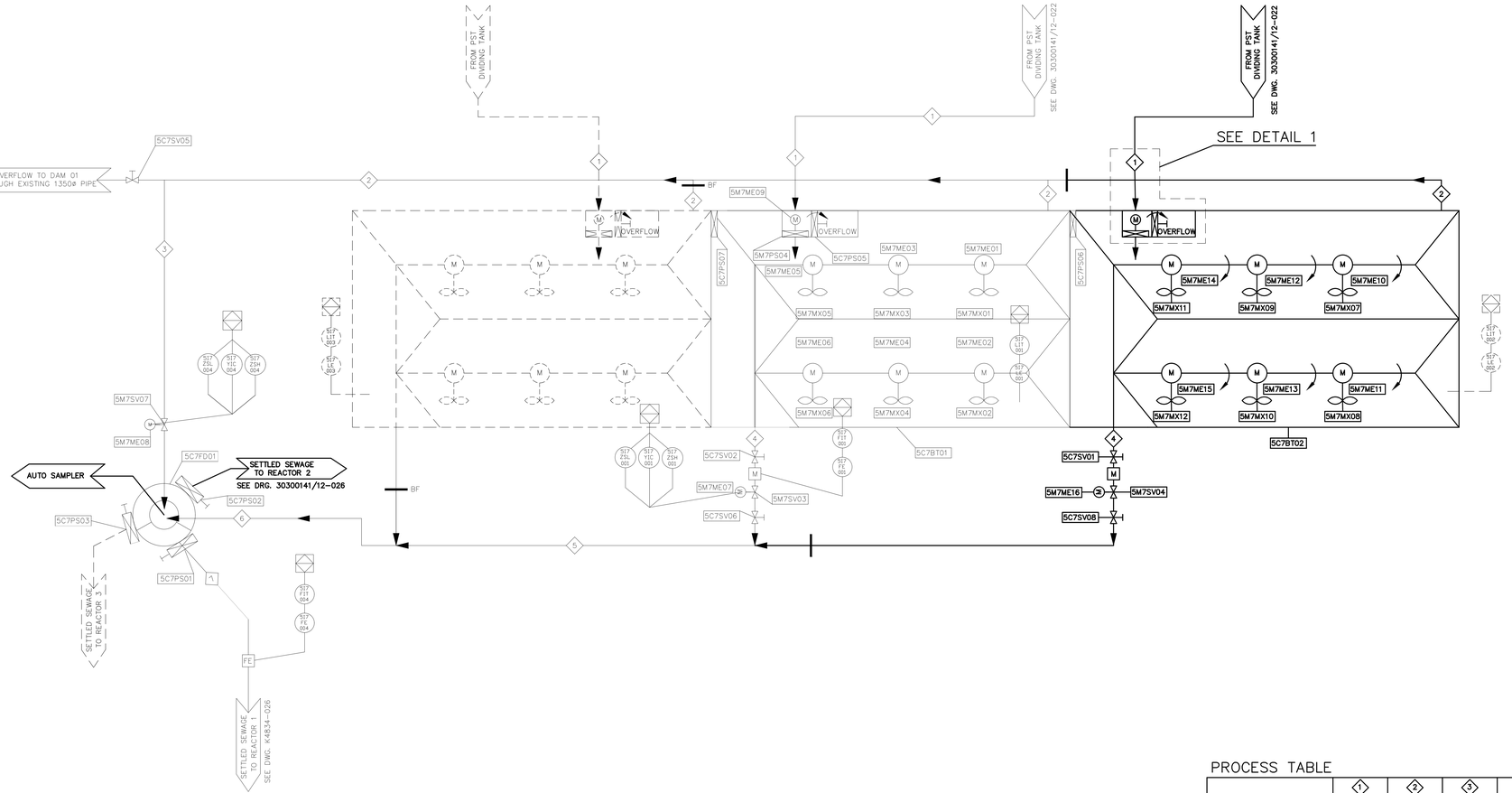
ELECTRIC MOTORS (ME)					
TAG No	KW	SPEED (rpm)	VOLTAGE	ENCLOSURE	APPLICATION
5M7ME01	11	1450	380	TEFC-IP55	MIXER
5M7ME02	11	1450	380	TEFC-IP55	MIXER
5M7ME03	11	1450	380	TEFC-IP55	MIXER
5M7ME04	11	1450	380	TEFC-IP55	MIXER
5M7ME05	11	1450	380	TEFC-IP55	MIXER
5M7ME06	11	1450	380	TEFC-IP55	MIXER
5M7ME07	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME08	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME09	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME10	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME11	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME12	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME13	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME14	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME15	**11**	**1450**	**380**	**TEFC-IP55**	**MIXER**
5M7ME16	**0.37**	**1450**	**380**	**TEFC-IP55**	**ELECTRIC ACTUATOR**
5M7ME17	**0.37**	**1450**	**380**	**TEFC-IP55**	**ELECTRIC ACTUATOR**

PENSTOCKS (PS)			
TAG No	SIZE (mm x mm)	TYPE	ACTUATOR DETAILS
5C7PS01	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS02	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS03	1000x1000	SLUICE GATE	HAND WHEEL
5M7PS04	2000x1000	SLUICE GATE	ELECTRICAL
5C7PS05	1500x1000	WEIR GATE	HAND WHEEL
5C7PS06	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS07	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS08	**2000x1000**	**SLUICE GATE**	**ELECTRICAL**
5C7PS09	**1500x1000**	**WEIR GATE**	**HAND WHEEL**

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
5I7-FIT-001	5I7-FE-001	Magflow flowmeter
5I7-FIT-004	5I7-FE-004	Clamp-on flowmeter
5I7-ZSL-002	Sluice gates	Control closed limit
5I7-ZSH-002	Sluice gates	Control open limit
5I7-YIC-002	Sluice gates	Control of flow
5I7-LIT-001	5I7-LE-001	U/sonic level transmitter
5I7-LIT-002	5I7-LE-002	U/sonic level transmitter
5I7-LIT-004	5I7-LE-004	U/sonic level transmitter
5I7-ZSL-004	Actuator Valve	Control closed limit
5I7-ZSH-004	Actuator Valve	Control open limit
5I7-YIC-004	Actuator valve	Control of flow
5I7-ZSL-001	Actuator valve	Control closed limit
5I7-ZSH-001	Actuator valve	Control open limit
5I7-YIC-001	Actuator valve	Control of flow



DETAIL 1



KEY:

FE = FLOW ELEMENT

AS = AUTOMATIC SAMPLER

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		① SETTLED SEWAGE	② SETTLED SEWAGE OVERFLOW	③ SETTLED SEWAGE BYPASS	④ SETTLED SEWAGE	⑤ SETTLED SEWAGE	⑥ SETTLED SEWAGE	⑦ SETTLED SEWAGE
FLUID l/s	MIN	230		230	0	580	580	0
	NORMAL (AVE)	580	1670	580	690	1160	1740	580
	MAX	1670		1670	690	1400	2082	694
SOLIDS kg/s	MIN	0.04	–	0.04	0	0.10	0.10	0
	NORMAL (AVE)	0.10	–	0.10	0.12	0.20	0.30	0.10
	MAX	0.30	0.30	0.30	0.12	0.24	0.36	0.12
CONDUIT SIZE (mm)		1050ø	1050ø	1050ø	800ø	1200ø	1350ø	700ø
CONDUIT MATERIAL		MS	MS	MS	MS	MS	MS	MS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	GK
DRAWN	MKM
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

PROCESS AND INSTRUMENTATION DIAGRAM

BALANCING TANK

DESIGN MANAGER

DATE

SCALE

AMENDMENTS	APPROVED	DATE
0 APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-025

CONSULTANT'S NUMBER
30300141/12-025

FILE No

0

CIVIL AND MECHANICAL

BIOREACTOR TANK (BR)

TAG No	LENGTH (m)	WIDTH (m)	DEPTH (m)
5C2BR01	176.265	35.51	5.300

FINAL CLARIFYING TANK (CT)

TAG No	I.DIA. (m)	SIDE WATER DEPTH (m)	FLOOR SLOPE
5C2CT01	35	4	1:6
5C2CT02	35	4	1:6
5C2CT03	35	4	1:6

CLARIFIER MECHANISMS (CM)

TAG No	DRIVE	PERIPHERAL SPEED (m/min)
5M2CM01	PERIPHERAL	3
5M2CM02	PERIPHERAL	3
5M2CM03	PERIPHERAL	3

BIOREACTOR MIXERS (MX)

TAG No	TYPE	INPUT (kw)	ROTATION
5M2MX01	RADIAL FLOW	7,5	CLOCKWISE
5M2MX02	RADIAL FLOW	7,5	CLOCKWISE
5M2MX03	RADIAL FLOW	7,5	CLOCKWISE
5M2MX04	RADIAL FLOW	7,5	CLOCKWISE
5M2MX05	RADIAL FLOW	7,5	CLOCKWISE
5M2MX06	RADIAL FLOW	11	CLOCKWISE
5M2MX07	RADIAL FLOW	11	CLOCKWISE
5M2MX08	RADIAL FLOW	11	CLOCKWISE
5M2MX09	RADIAL FLOW	11	CLOCKWISE
5M2MX10	RADIAL FLOW	15	CLOCKWISE

SURFACE AERATORS (SA)

TAG No	ROTATION	O.T.R. (kg/hr)	DEMAND (kw)
5M2SA01	CLOCKWISE		110
5M2SA02	CLOCKWISE		110
5M2SA03	CLOCKWISE		110
5M2SA04	CLOCKWISE		90
5M2SA05	CLOCKWISE		90
5M2SA06	CLOCKWISE		90
5M2SA07	CLOCKWISE		90
5M2SA08	CLOCKWISE		75
5M2SA09	CLOCKWISE		75
5M2SA10	CLOCKWISE		55
5M2SA11	CLOCKWISE		22
5M2SA12	CLOCKWISE		22
5M2SA13	CLOCKWISE		22

PENSTOCKS (PS)

TAG No	SIZE (mm x mm)	TYPE	ACTUATOR DETAILS
5C2PS01	UNALLOCATED		
5C2PS02	UNALLOCATED		
5C2PS03	500 x 1300	CHANNEL	HAND WHEEL
5C2PS04	500 x 1300	CHANNEL	HAND WHEEL
5C2PS05	500 x 1300	CHANNEL	HAND WHEEL
5C2PS06	1200 x 1200	CHANNEL	HAND WHEEL
5C2PS07	1200 x 1200	CHANNEL	HAND WHEEL
5C2PS08	1000 x 1000	SLUICE	HAND WHEEL
5C2PS09	1000 x 1000	SLUICE	HAND WHEEL
5C2PS10	1000 x 1000	SLUICE	HAND WHEEL
5C2PS11			NOT USED
5C2PS12			NOT USED
5C2PS13			NOT USED
5M2PS14	2500 x 700	FLAP GATE	
5M2PS15	2500 x 700	FLAP GATE	
5M2PS16	2500 x 700	FLAP GATE	
5M2PS17	2350 x 700	FLAP GATE	
5C2PS18	800 x 800	SLUICE	HAND WHEEL

LIQUOR RECYCLE PUMPS (LP)

TAG No	TYPE	DUTY l/s @ m
5M2LP01	PROPELLER	290 l/s @ 0,375m
5M2LP02	PROPELLER	290 l/s @ 0,375m
5M2LP03	PROPELLER	MAX 1160 l/s @ 0,455m
5M2LP04	PROPELLER	MAX 1160 l/s @ 0,455m

SAMPLING PUMP (DP)

TAG No	TYPE	DUTY l/s @ m
5M2DP01	SELF PRIMING CENTRIFUGAL	0,79 l/s @ 20m

SLUDGE VALVES (SV)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5C2SV01	250	KGV	HAND
5C2SV02	200	KGV	HAND
5C2SV03	250	KGV	HAND
5M2SV04	250	WDV	ELECTRIC MOTOR

ELECTRIC MOTORS (ME)

TAG No	KW	rpm	VOLTAGE	ENCLOSURE	APPLICATION
5M2ME01	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME02	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME03	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME04	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME05	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME06	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME07	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME08	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME09	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME10	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME11	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME12	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME13	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME14	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME15	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME16	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME17	75	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME18	75	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME19	15	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME20	55	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME21	22	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME22	22	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME23	22	1450	380	TEFC-IP55	SURFACE AERATOR

TAG No	kW	rpm	VOLTAGE	ENCLOSURE	APPLICATION
5M2ME24	3	180	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME25	3	180	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME26	30	750	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME27	30	750	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME28	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME29	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME30	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME31	37	1450	380	TEFC-IP55	ARC. SCREW PUMP
5M2ME32	37	1450	380	TEFC-IP55	ARC. SCREW PUMP
5M2ME33	1,1	1450	380	TEFC-IP55	LIQUOR CONTROL VALVE
5M2ME34	1,5	1450	380	TEFC-IP55	SAMPLING PUMP
5M2ME35	4 Va	–	220	TEFC-IP55	GREASE PUMP
5M2ME36	4 Va	–	220	TEFC-IP55	GREASE PUMP
5M2ME37	1,1		380	TEFC-IP55	MCC ROOM FAN

RETURN ACTIVATED SLUDGE PUMPS (RP)

TAG No	TYPE	DUTY (l/s @ m)
5M2RP01	ARCHIMEDES SCREW	600 @ 4,000
5M2RP02	ARCHIMEDES SCREW	600 @ 4,000

CLARIFIED FLOW DIVIDER (FD)

TAG No	TYPE	DIM (m)
5C2FD01	CIRCULAR WEIR	5,0

GREASE PUMPS (GP)

TAG No	
5M2GP01	
5M2GP02	

EFFLUENT VALVES (EV)

TAG No.	SIZE (mm)	TYPE	ACTUATION
5M2EV01	15	PRV	–
5M2EV02	15	3-WAY	HAND

SCUM VALVES (SC)

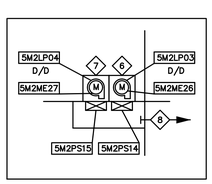
TAG No.	SIZE (mm)	TYPE	ACTUATOR
5M2SC01	200	PIPE	BRIDGE
5M2SC02	200	PIPE	BRIDGE
5M2SC03	200	PIPE	BRIDGE

SEWAGE VALVES (SS)

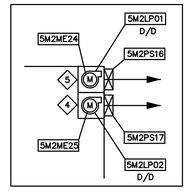
TAG No.	SIZE (mm)	TYPE	ACTUATOR DETAILS
5C2SS01	350	KGV	HAND WHEEL
5C2SS02	700	KGV	HAND WHEEL

FLOW SENSORS (FE)

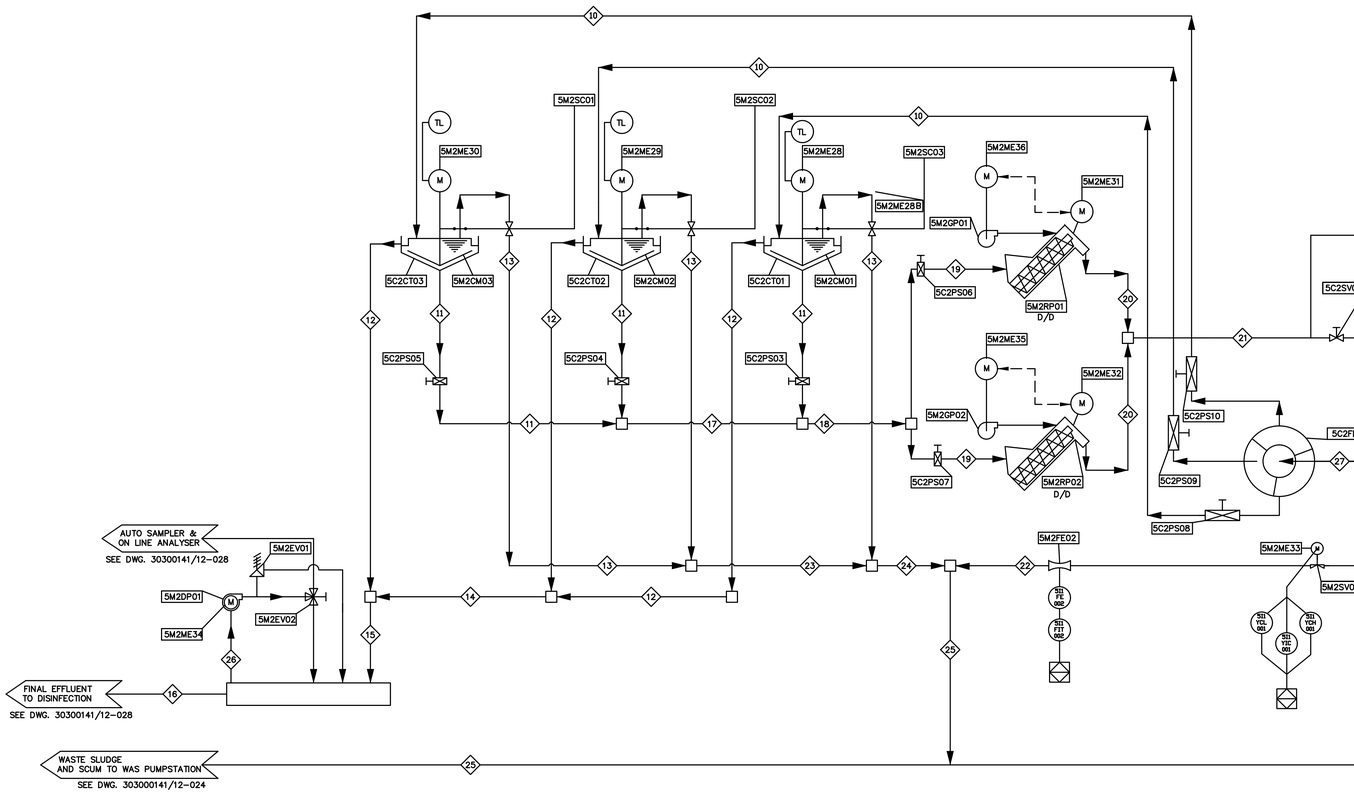
TAG No.	SIZE (mm)	TYPE
5M2FE01	–	–
5M2FE02	–	FLUME



DETAIL 1



DETAIL 2



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 SETTLED SEWAGE	2 SETTLED SEWAGE	3 SETTLED SEWAGE	4 ANAEROBIC ANOXIC RECYCLE	5 ANAEROBIC ANOXIC RECYCLE	6 AEROBIC ANOXIC RECYCLE	7 AEROBIC ANOXIC RECYCLE	8 AEROBIC ANOXIC RECYCLE	9 MIXED LIQUOR TO AERATION	10 MIXED LIQUOR	11 RETURN ACTIVATED SLUDGE	12 FINAL EFFLUENT	13 SCUM	14 FINAL EFFLUENT	15 FINAL EFFLUENT	16 FINAL EFFLUENT	17 RETURN ACTIVATED SLUDGE	18 RETURN ACTIVATED SLUDGE	19 RETURN ACTIVATED SLUDGE	20 RETURN ACTIVATED SLUDGE	21 RETURN ACTIVATED SLUDGE	22 WASTE ACTIVATED SLUDGE	23 SCUM	24 SCUM	25 WASTE AND SCUM	26 FINAL EFFLUENT SAMPLING	27 MIXER LIQUOR TO DIVIDER	28 DRAIN
FLUID l/s	MIN	300	270	0	0	0	0	0	0	590	190	97	95	15(0,017)	190	283	283	193	290	0	0	290	17	15(0,017)	30(15.051)	30(15.051)	–	570	–
	NORMAL (AVE)	590	530	59	290	290	1160	1160	1160	2390	383	193	189	15(0,017)	378	566	566	387	580	580	580	580	24	15(0,017)	30(15.051)	30(15.051)	0,28	1150	–
	MAX				290	290	1160	1160	2380	4960	848	387	462	15(0,017)	924	1398	1398	773	1160	580		580	1160	42	15(0,017)	30(15.051)	30(15.051)	–	2545	–
SOLIDS kg/s	MIN	0,036	0,036		0	0	0	0	0	5,3	0,57	0,57	–	–	–	–	–	1,14	1,71	0,86	0,86	1,71	0,045	–		–	–	1,71	–
	NORMAL (AVE)	0,083	0,083		1,74	1,74	6,96	6,96	13,9	20,9	2,30	2,30	–	–	–	–	–	4,6	6,90	3,45	3,45	6,90	0,104	–		–	–	6,90	–
	MAX	0,200	0,200		1,74	1,74	6,96	6,96	20,9	36,6	5,1	5,1	–	–	–	–	–	10,2	15,30	7,65	7,65	15,36	0,125	–		–	–	15,30	–
CONDUIT SIZE (mm)		700	350	700					CHANNEL		800/825 ø	600ø	600ø	150 ND	900ø	1050/1200ø	900	900ø	1050ø	CHANNEL	CHANNEL	CHANNEL	250 ND	300 ND	300/375	375/525	15 ND	1500ø	300ø
CONDUIT MATERIAL		MS	MS	MS					CONCRETE		MS/ CONCRETE	MS/ CONCRETE	MS/ CONCRETE	uPVC	CONCRETE	CONCRETE	MS	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	MS	uPVC	uPVC	uPVC/CONC	HDPE CLASS12	MS/CONCRETE	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
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SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM
REACTOR 2

DESIGN MANAGER
DATE
SCALE

AMENDMENTS

	APPROVED	DATE
0 APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896-CE-026
CONSULTANT'S NUMBER
30300141/12-026
FILE No
0

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CIVIL AND MECHANICAL

EQUIPMENT TABLES

CHEMICAL STORAGE TANKS (CT)

TAG No	VOLUME (m3)	MATERIAL
5M1CT01	30	GRP
5M1CT02	**30**	**GRP**

CHEMICAL COUPLINGS (CC)

TAG No	DIA. (mm)	TYPE
5M1CC01	80	SCHEDULE 40 TABLE D
5M1CC02	50	SCHEDULE 20 TABLE E

CHEMICAL DOSING PUMPS (CP)

TAG No	TYPE	DUTY l/s @ m
5M1CP01	DIAPHRAGM	0,15 @ 20
5M1CP02	DIAPHRAGM	0,15 @ 20
5M1CP03	**DIAPHRAGM**	**0,15 @ 20**

SPILLAGE PUMP (SP)

TAG No	TYPE	DUTY l/s @ m
5M1SP01	FLOAT PUMP	1.4@5

ELECTRIC MOTORS (ME)

TAG No	kW	rpm	VOLTAGE	ENCLOSURE	DRIVEN ITEM
5M1ME39	0,35	AC VSD	380	TEFC–IP55	CHEMICAL DOSING PUMP No.1
5M1ME37	0,35	AC VSD	380	TEFC–IP55	CHEMICAL DOSING PUMP No.2
5M1ME38	1,50	2950	380	IP55	SPILLAGE PUMP
5M1ME40	**0,35**	**AC VSD**	**380**	**TEFC–IP55**	**CHEMICAL DOSING PUMP No.3**

CHEMICAL STRAINERS (CS)

TAG No	DIA (mm)
5M1CS01	20
5M1CS02	**20**

SPILLAGE TRAYS (ST)

TAG No	VOLUME (m^3)
5C1ST01	30
5C1ST02	3
5C1ST03	1
5C1ST04	–

PRESS & VAC. RELIEF COVER (RC)

TAG No	DIA (mm)
5M1RC01	100

SHOWER AND EYEBATH (SE)

TAG No	TYPE
5M1SE01	FOOT OPERATED
5M1SE02	FOOT OPERATED

PRESSURE RELIEF VALVE (PV)

TAG No	DIA (mm)	RELIEF PRESSURE (kPa)
5M1PV01	20	250
5M1PV02	20	250
5M1PV03	**20**	**250**

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV01	25	PPBV	HAND LEVER
5M1CV04		PPBV	HAND LEVER
5M1CV05		PPBV	HAND LEVER
5M1CV07	25	PPBV	HAND LEVER
5M1CV09	25	PPBV	HAND LEVER
5M1CV10		PPBV	HAND LEVER
5M1CV11	UNALLOCATED		
5M1CV12	50	PPBV	HAND LEVER
5M1CV13	20	PPBV	HAND LEVER
5M1CV14	20	PPBV	HAND LEVER
5M1CV15	20	PPBV	HAND LEVER
5M1CV16	20	PPBV	HAND LEVER
5M1CV18	80	PPBV	HAND LEVER
5M1CV19	50	PPBV	HAND LEVER
5M1CV21	25	PPBV	HAND LEVER

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV24	80	PPBV	HAND
5M1CV25	25	PPBV	HAND
5M1CV26	25	PPBV	HAND
5M1CV28	25	PPBV	HAND
5M1CV29	25	PV	HAND
5M1CV30	80	PPBV	HAND
5M1CV31	50	PPBV	HAND
5M1CV32	20	PPBV	HAND
5M1CV33	20	PPBV	HAND
5M1CV34	20	PPBV	HAND
5C1CV35	50	PPBV	HAND
5C1CV36	20	PPBV	HAND
5M1CV37	50	PPBV	HAND
5M1CV38	110	PPBV	HAND WHEEL
5M1CV39	80	PPBV	HAND
5M1CV40	20	PPBV	HAND LEVER
5C1CV41	20	PPBV	HAND LEVER
5C1CV42	20	PPBV	HAND LEVER

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV43	**25**	**PPBV**	**HAND LEVER**
5M1CV44	**20**	**PPBV**	**HAND LEVER**
5M1CV45	**25**	**PPBV**	**HAND LEVER**
5M1CV46	**20**	**PPBV**	**HAND**
5M1CV47	**20**	**PPBV**	**HAND**
5M1CV48	**20**	**PPBV**	**HAND**
5M1CV49	**25**	**PV**	**–**
5M1CV50	**25**	**PPBV**	**HAND LEVER**

PULSATION DAMPERS (PD)

TAG No	DIA (mm)	
5M1PD01	20	
5M1PD02	20	
5M1PD03	**20**	

CHEMICAL DRAIN VALVES (DV)

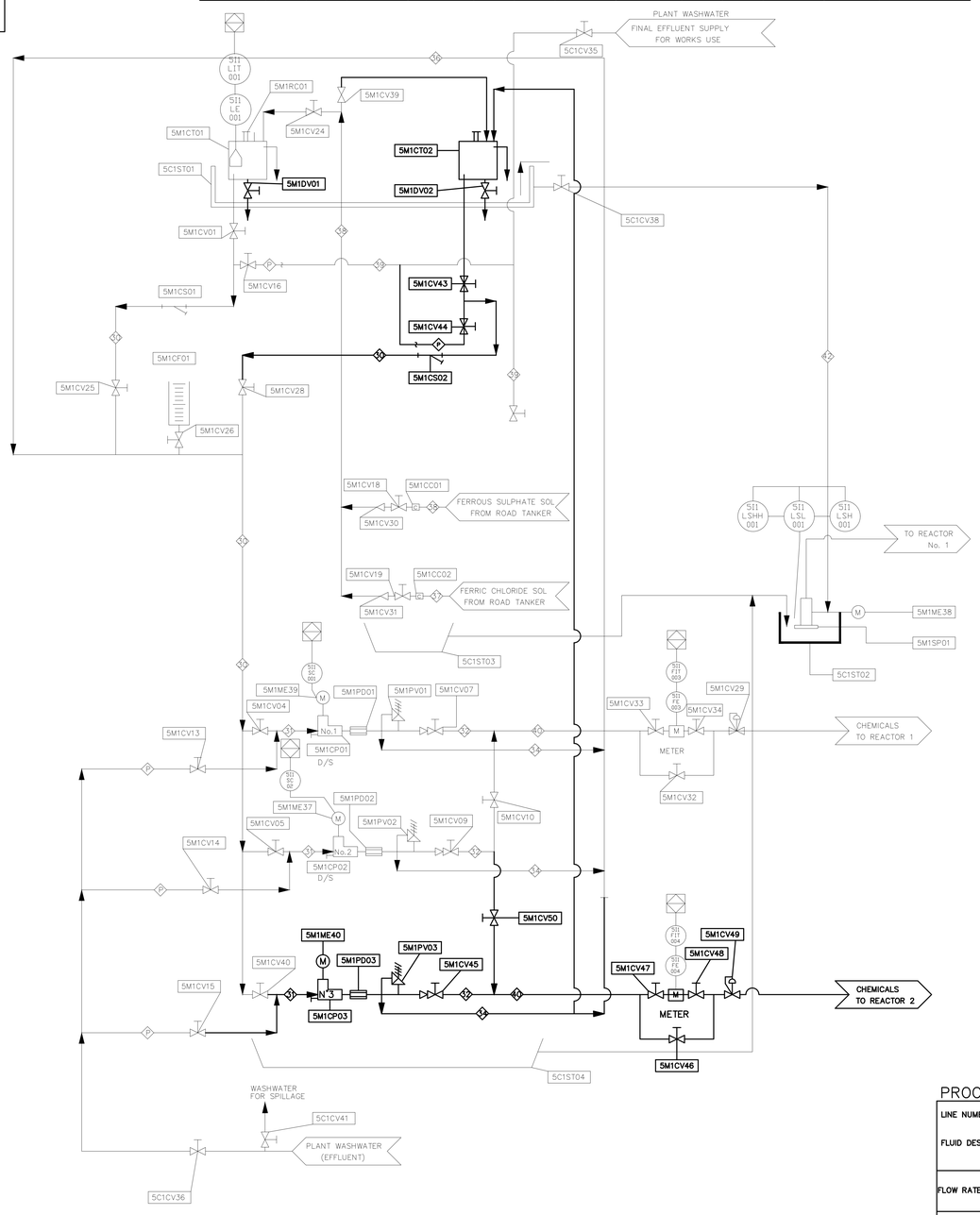
TAG No	DIA (mm)	TYPE	ACTUATOR
5M1DV01	50	–	–
5M1DV02	**50**	**–**	**–**

CALIBRATION FLASK (CF)

TAG No	CAPACITY (l)
5M1CF01	3

INSTRUMENTATION

Transducer TAG No.	Sensor TAG No.	Description
511–FIT–003	511–FE–003	Ultra–low inline magflow
511–LIT–001	511–LE–001	U/sonic level indicator
511–SC–001		VSD speed control
511–SC–002		VSD speed control
511–LSH–001		Float ball level high switch
511–LSHH–001		Float ball high high switch
511–LSL–001		Float ball level low switch



* LIQUID FLOW RATES BASED ON $Fe(SO_4)$ SOLUTION OF 6,5% Fe

PROCESS TABLE

LINE NUMBER / FLUID DESCRIPTION	30 $FeSO_4$ or $FeCl_3$	37 $FeSO_4$ or $FeCl_3$	32 $FeSO_4$ or $FeCl_3$		14 $FeSO_4$ or $FeCl_3$	35 $FeSO_4$ or $FeCl_3$	36 $FeSO_4$ or $FeCl_3$	17 $FeSO_4$ or $FeCl_3$	38 $FeSO_4$ or $FeCl_3$	39 EFFLUENT	40 $FeSO_4$	P EFFLUENT	42 DRAIN	43 EFFLUENT
MIN	0,022	0,011	0,011		0	0	0	0	0	0	0,011	0	0	
FLOW RATE (l/s) NORMAL (AVE)	0,150	0,074	0,074		0	0	0	0	0	0	0,074	0	0	
MAX	0,300	0,150	0,150		0,150	0,150	0,150	10	10	5	0,150	5	5	
CONDUIT SIZE (mm)	25ND	25ND	25ND		25ND	25ND	25ND	50ND	80ND	50ND	20ND	25ND	110	25
CONDUIT MATERIAL	PP CLASS 16	PP CLASS 16	PP CLASS 16		PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	uPVC	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	MKM
CHECKED	RG
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SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 20200127 9	
DATE 30–06–2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM
FERROUS AND FERRIC DOSING PLANT

DESIGN MANAGER
DATE

SCALE

AMENDMENTS

	APPROVED FOR CONSTRUCTION	APPROVED	DATE
0		RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896–CE–027
CONSULTANT'S NUMBER
30300141/12–027
FILE No
0

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CIVIL AND MECHANICAL

EQUIPMENT TABLES

ELECTRIC MOTORS (ME) & HEATERS (HE)

TAG No	KW	rpm	VOLTAGE	ENCLOSURE	DRIVEN ITEM
5M5ME01	0.75	VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP
5M5ME02	0.75	VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP
5M5ME03	**0.75**	**VSD**	**380**	**TEFC-IP55**	**CHEMICAL DOSING PUMP**
5M5ME04	**0.24**	**1450**	**380**	**TEFC-IP55**	**PENSTOCK ACTUATOR**
5M5ME05	**0.24**	**1450**	**380**	**TEFC-IP55**	**PENSTOCK ACTUATOR**
5M5ME06	**0.57**	**1450**	**380**	**TEFC-IP55**	**PENSTOCK ACTUATOR**
5M5ME07	**0.24**	**1450**	**380**	**TEFC-IP55**	**PENSTOCK ACTUATOR**
5M5ME08	UNALLOCATED				
5M5ME09	3	1450	380	IP 67	SUBMERSIBLE SLUDGE PUMP1
5M5ME10	5.5	1450	380	IP 67	SUBMERSIBLE SLUDGE PUMP2
5M5ME11	UNALLOCATED				
5M5ME12	**1,5**	**1450**	**380**	**TEFC-IP55**	**SAMPLING PUMP**
5M5ME15	UNALLOCATED				
5M5ME16					
5M5ME17	22	1450	380	TEFC-IP55	EFFLUENT PUMP
5M5ME18	22	1450	380	TEFC-IP55	EFFLUENT PUMP

CHEMICAL STORAGE TANKS (CT)

TAG No	VOLUME m^3	TYPE
5M5CT01	30	POLYETHYL
5M5CT02	30	POLYETHYL
5M5CT03	**30**	**POLYETHYL**
5M5CT04	**30**	**GLASS REINF. PLASTIC**

CHEMICAL DOSING PUMPS (CP)

TAG No	TYPE	DUTY l/s @ m
5M5CP01	HOSE	0.02–0.23
	PERISTALTIC	l/s @ 20m
5M5CP02	HOSE	0.02–0.23
	PERISTALTIC	l/s @ 20m
5M5CP03	**HOSE**	**0.02–0.23**
	PERISTALTIC	**l/s @ 20m**

CHEMICAL STRAINERS (CS)

TAG No	DIA mm
5M5CS01	20

PRESS & VAC.RELIEF COVER (RC)

TAG No	DIA mm
5M5RC01	100
5M5RC02	100
5M5RC03	**100**
5M5RC04	**100**

EFFLUENT PUMPS (EP)

TAG No	TYPE	DUTY l/s @ m
5M5EP01	SELF PRIMING CENTRIFUGAL	15 @ 60
5M5EP02	SELF PRIMING CENTRIFUGAL	15 @ 60

SPILLAGE TRAYS (ST)

TAG No	VOLUME m^3
5C5ST01	114
5C5ST02	
5C5ST03	
5C5ST04	**38**

LEVEL INDICATOR (LI)

TAG No	TYPE
5M5LI01	FLOAT/EXTERNAL CALIBRATION FLASK/ROTAMETER
5M5CF01	

SLUDGE VALVES (SV)

TAG No	SIZE mm	TYPE	ACTUATOR
5M5SV01	UNALLOCATED		
5M5SV02	150	REFLUX	
5M5SV03	150	REFLUX	
5M5SV04	150	KGV	HAND WHEEL
5M5SV05	150	KGV	HAND WHEEL

CHEMICAL DRAIN VALVES (DV)

TAG No	DIA mm	TYPE	ACTUATOR
5M5DV01	80	PPBV	HAND
5M5DV02	80	PPBV	HAND
5M5DV03	**80**	**PPBV**	**HAND**
5M5DV04	**80**	**PPBV**	**HAND**

CHLORINE MAZE (DC)

TAG No	CAPACITY
5C5DC01	45MIN
5C5DC02	**45MIN**
5C5DC03	**45MIN**

CHEMICAL VALVES (CV)

TAG No	DIA mm	TYPE	ACTUATOR	No. REQ.	NOTES
5M5CV01	80	PPBV	HAND	1	
5M5CV02	80	NRV	–	1	
5M5CV03	80	PPBV	HAND	1	
5M5CV04	80	PPBV	HAND	1	
5M5CV05	50	PPBV	HAND	1	
5M5CV06	50	PPBV	HAND	1	
5M5CV07	40	PPBV	HAND	1	
5M5CV08	40	PPBV	HAND	1	
5M5CV09	40	PPBV	HAND	1	
5M5CV10	40	PPBV	HAND	1	
5M5CV11	20	NRV	–	1	
5M5CV12	20	NRV	–	1	
5M5CV13	20	PPBV	HAND	1	
5M5CV14	20	PPBV	HAND	1	
5M5CV15	40	LV	–	1	
5M5CV16	40	PPBV	HAND	1	
5M5CV17	40	PPBV	HAND	1	
5M5CV18	40	PPBV	HAND	1	
5M5CV19	80	PPBV	HAND	1	
5M5CV20	80	PPBV	HAND	1	
5M5CV21	80	PPBV	HAND	1	
5C5CV22	20	PPBV	HAND LEVER	1	
5C5CV23	40	PPBV	HAND	1	
5M5CV24	40	PPBV	HAND	1	
5C5CV25	40	PPBV	HAND	1	
5M5CV26	40	PPBV	HAND	1	
5M5CV27	75	PPBV	HAND	1	
5M5CV28	40	PPBV	HAND	1	
5M5CV29	40	PPBV	HAND	1	
5M5CV30	40	PPBV	HAND	1	
5M5CV31	40	DIAPH	HAND	1	
5M5CV32	40	PPBV	HAND	1	
5M5CV33	40	PPBV	HAND	1	
5M5CV34	40	PPBV	HAND	1	
5M5CV35	40	PPBV	HAND	1	
5M5CV36	40	NRV	–	1	
5M5CV37	40	PD	–	1	
5C5CV38	20	PPBV	HAND	1	
5M5CV39	**80**	**PPBV**	**HAND**	**1**	
5M5CV40	**80**	**PPBV**	**HAND**	**1**	
5M5CV41	**80**	**PPBV**	**HAND**	**1**	
5M5CV42	**40**	**PPBV**	**HAND**	**1**	
5M5CV43	**40**	**PPBV**	**HAND**	**1**	
5M5CV44	**20**	**NRV**	**–**	**1**	
5C5CV45	**20**	**PPBV**	**HAND**	**1**	
5C5CV46	**80**	**PPBV**	**HAND**	**1**	
5C5CV47	**80**	**PPBV**	**HAND**	**1**	
5C5CV48	**80**	**PPBV**	**HAND**	**1**	

SHOWER AND EYEBATH (SE)

TAG No	TYPE
5M5SE01	FOOT OPERATED
5M5SE02	FOOT OPERATED

PENSTOCKS (PS)

TAG No	SIZE (mm)	TYPE	ACTUATOR
5M5PS06	2000x2250	CHANNEL	ELECTRICAL
5M5PS07	2800x1000	SLUICE	ELECTRICAL
5C5PS08	300x300	SLUICE	HAND
5C5PS09	2800x1000	SLUICE	HAND/ELEC
5C5PS10	2800x1000	SLUICE	HAND/ELEC
5C5PS11	300x300	SLUICE	HAND WHEEL
5C5PS12	**300x300**	**SLUICE**	**HAND**
5C5PS13	**300x300**	**SLUICE**	**HAND**

SLUDGE PUMP (SP)

TAG No	TYPE	DUTY l/s @ m
5M5SP01	SUBMERSIBLE	15.2 l/s@5.55m
5M5SP02	SUBMERSIBLE	15.2 l/s@5.55m

SAMPLING PUMP (DP)

TAG No	TYPE	DUTY l/s @ m
5M5DP01	**SELF PRIMING CENTRIFUGAL**	**0.75@10**

SAMPLING POINTS

MANUAL SAMPLING	MS
AUTOMATIC SAMPLING (220vac REQUIRED)	AS

EFFLUENT VALVES (EV)

TAG No.	SIZE (mm)	TYPE	ACTUATION
5C5EV07	**50**	**BGV**	**HAND WHEEL**
5C5EV08	**50**	**BGV**	**HAND WHEEL**
5M5EV11	**50**	**BGV**	**HAND WHEEL**
5M5EV12	**50**	**BGV**	**HAND WHEEL**
5M5EV13	**50**	**BGV**	**HAND WHEEL**
5M5EV14	**50**	**BGV**	**HAND WHEEL**

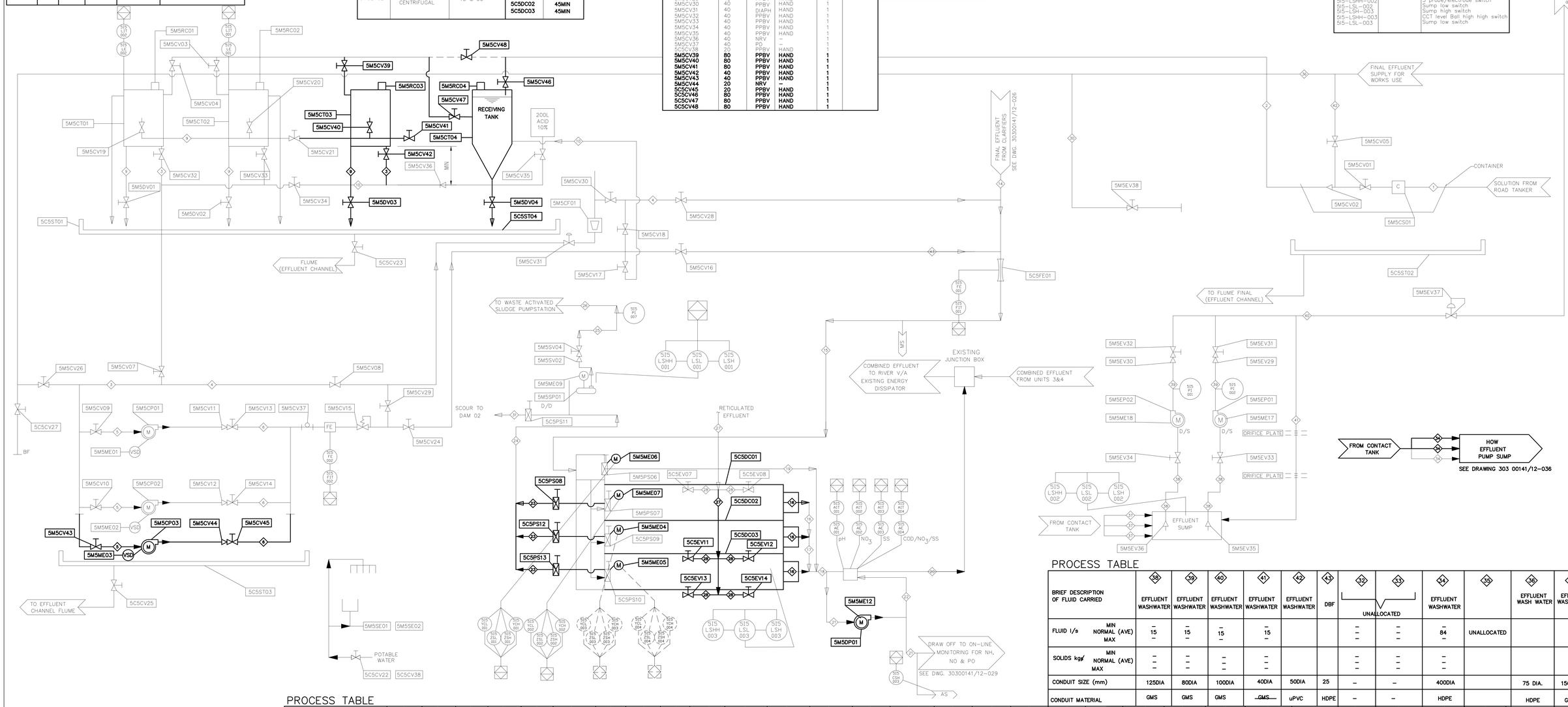
TAG No.	SIZE (mm)	TYPE	ACTUATION
5M5EV19	UNALLOCATED		
5M5EV20			
5M5EV21			
5M5EV22			
5M5EV23			
5M5EV24	UNALLOCATED		–
5M5EV26			–
5M5EV27	UNALLOCATED		
5M5EV28			
5M5EV29	80	RV	–
5M5EV30	80	RV	–
5M5EV31	80	RSV	HAND WHEEL
5M5EV32	80	RSV	HAND WHEEL
5M5EV33	125	RSV	HAND WHEEL
5M5EV34	125	RSV	HAND WHEEL
5M5EV35	125	FV	–
5M5EV36	125	FV	–
5M5EV37	40	PRV	–
5M5EV38	20	BGV	HAND

FLOW SENSORS (FE)

TAG No	SIZE	TYPE
5C5FE01	–	FLUME
5M5FE02	20	FLOW METER

INSTRUMENTATION

Transducer TAG No.	Sensor TAG No.	Description
5I5–CSH–003		Solenoid Valve switch
5I5–AIT–001	5I5–AE–001	pH analyser
5I5–AIT–002	5I5–AE–002	Nitrate analyser
5I5–AIT–003	5I5–AE–003	Suspended Solids
5I5–FSL–004		Flow Switch
5I5–LSH–001		Sump high switch
5I5–LSHH–001		3–probe/electrode switch
5I5–LSL–001		Sump low switch
5I5–FIT–001	5I5–FE–001	Open channel u/s flowmeter
5I5–FIT–002	5I5–FE–002	Ultra low flowmeter
5I5–LIT–001	5I5–LE–001	Ultrasonic Level transmitter
5I5–ZSL–001	Penstock	actuator closed limit
5I5–ZSH–001	Penstock	actuator open limit
5I5–YCH–001	Penstock	actuator close command
5I5–YCH–001	Penstock	actuator open command
5I5–LIT–002	5I5–LE–002	Ultrasonic Level transmitter
5I5–ZSL–002	Penstock	actuator closed limit
5I5–ZSH–002	Penstock	actuator open limit
5I5–YCL–002	Penstock	actuator close command
5I5–YCH–002	Penstock	actuator open command
5I5–AIT–004	5I5–AE–004	$COD/NO_3/SS$
5I5–LSH–002		Sump high switch
5I5–LSHH–002		3 probe/electrode switch
5I5–LSL–002		Sump low switch
5I5–LSH–003		Sump high switch
5I5–LSHH–003		CCT level Ball high high switch
5I5–LSL–003		Sump low switch



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 DBF	2 DBF	3 DBF	4 DBF	5 DBF	6 DBF	7 DBF	8 DBF	9 DBF	10 HCC	11 UNALLOCATED	12	13	14 FINAL EFFLUENT FROM BIOREACTORS	15 CHLORINATED FINAL EFFLUENT	16 CHLORINATED FINAL EFFLUENT	17 CHLORINATED FINAL EFFLUENT	18 CHLORINATED FINAL EFFLUENT	19 CHLORINATED FINAL EFFLUENT BYPASS	20 CHLORINATED FINAL EFFLUENT	21 CHLORINATED FINAL EFFLUENT	22 CHLORINATED FINAL EFFLUENT	23 SLUDGE	24 SLUDGE	25 SLUDGE	26 SLUDGE	27 RETICULATED EFFLUENT	28 RETICULATED EFFLUENT	29 EFFLUENT	30 RETICULATED EFFLUENT	31 DRAIN SCOUR
FLUID l/s	MIN	–	–	0.02	0.02	0.02	0.02	0.02	0.02	0.02					578	578	0	578	578	0	578	0	0	0	0	0	0	0	0	2.5	0	
	NORMAL (AVE)	–	–	0.04	0.16	0.08	0.08	0.16	0.16	0.04					1734	1734	578	1156	1734	0	1734	0	0	0	0	0	0	5	5	5	0	
	MAX	80	80	0.23	0.43	0.22	0.22	0.43	0.43	0.23					2081	2081	694	1387	2081	2081	2081	0,28	0,28	25	50	15	20	10	5	7.5	0.2	
SOLIDS kg/s	MIN	0	0	0	0	0	0	0	0	0	0				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	NORMAL (AVE)	0	0	0	0	0	–	0	0	0	1				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	MAX	0	0	0	0	0	–	0	0	0	0				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CONDUIT SIZE (mm)		80	80	40	40	40	20	20	20	80	20				1200 DIA	900 DIA.	–	–	?	1050	900 DIA	20 ID	20 OD	200 DIA.	200 DIA.	150 DIA.	150 DIA.	80 DIA.	50 DIA.	200 DIA.	20 DIA.	200 DIA.
CONDUIT MATERIAL		uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	HDPE CLASS 9	uPVC CLASS 9	uPVC CLASS 9				CONCRETE	MS	CONCRETE	CONCRETE	CONCRETE	MS	MS	HDPE CLASS 9	HDPE CLASS 9	MS	MS	GMS	MS	UPVC	GMS	VC	GMS	uPVC

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		38 EFFLUENT WASHWATER	39 EFFLUENT WASHWATER	40 EFFLUENT WASHWATER	41 EFFLUENT WASHWATER	42 EFFLUENT WASHWATER	43 DBF	32 UNALLOCATED	33 UNALLOCATED	34 EFFLUENT WASHWATER	35	36 EFFLUENT WASH WATER	37 EFFLUENT WASH WATER
FLUID l/s	MIN	–	–	–	–			–	–	–	UNALLOCATED		–
	NORMAL (AVE)	15	15	15	15			–	–	84			15
	MAX	–	–	–	–			–	–	–			–
SOLIDS kg/	MIN	–	–	–	–			–	–	–			–
	NORMAL (AVE)	–	–	–	–			–	–	–			–
	MAX	–	–	–	–			–	–	–			–
CONDUIT SIZE (mm)		125DIA	80DIA	100DIA	40DIA	50DIA	25	–	–	400DIA		75 DIA.	150 DIA.
CONDUIT MATERIAL		GMS	GMS	GMS	GMS	uPVC	HDPE	–	–	HDPE		HDPE	GMS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM
DISINFECTION DOSING PLANT

DESIGN MANAGER
DATE

SCALE

AMENDMENTS

		APPROVED	DATE
0	APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.

JW NUMBER
JW 13896–CE–028
CONSULTANT'S NUMBER
30300141/12–028
FILE No
0

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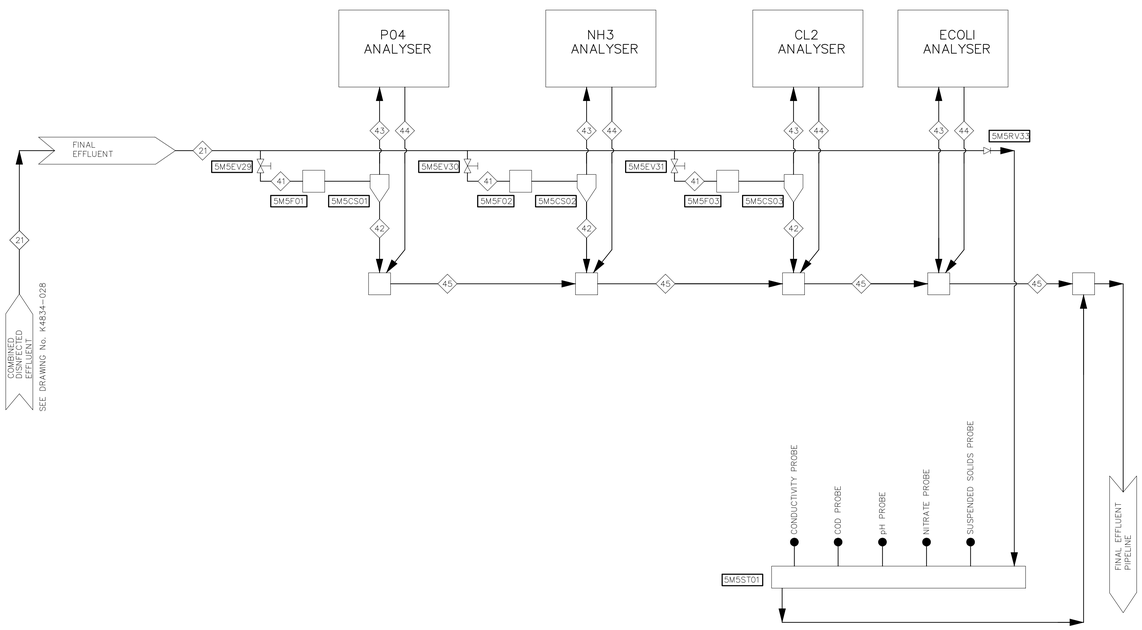
INSTRUMENTATION		
		DESCRIPTION
		ORTHOPHOSPHATE ANALYZER AMMONIA ANALYZER FREE CHLORINE ANALYZER ECOLI ANALIZER CONDUCTIVITY PROBE PH PROBE NITRATE PROBE SUSPENDED SOLIDS PROBE COD PROBE PROBE

CIVIL AND MECHANICAL EQUIPMENT TABLE

CYCLONE SEPARATORS (CS)			INLINE FILTER (F)			EFFLUENT VALVE (EV)			
TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	SIZE (mm)	TYPE	ACTUATOR
5M5CS01	0.75	300	5M5F01	0.75	300	5M5EV29	15	PPBV	HAND
5M5CS02	0.75	300	5M5F02	0.75	300	5M5EV30	15	PPBV	HAND
5M5CS03	0.75	300	5M5F03	0.75	300	5M5EV31	15	PPBV	HAND
			5M5ST01	SAMPLING TROUGH		5M5EV32	15	PPBV	HAND
						5M5RV33	20	RV	HAND



ON LINE MONITORING OF FINAL EFFLUENT

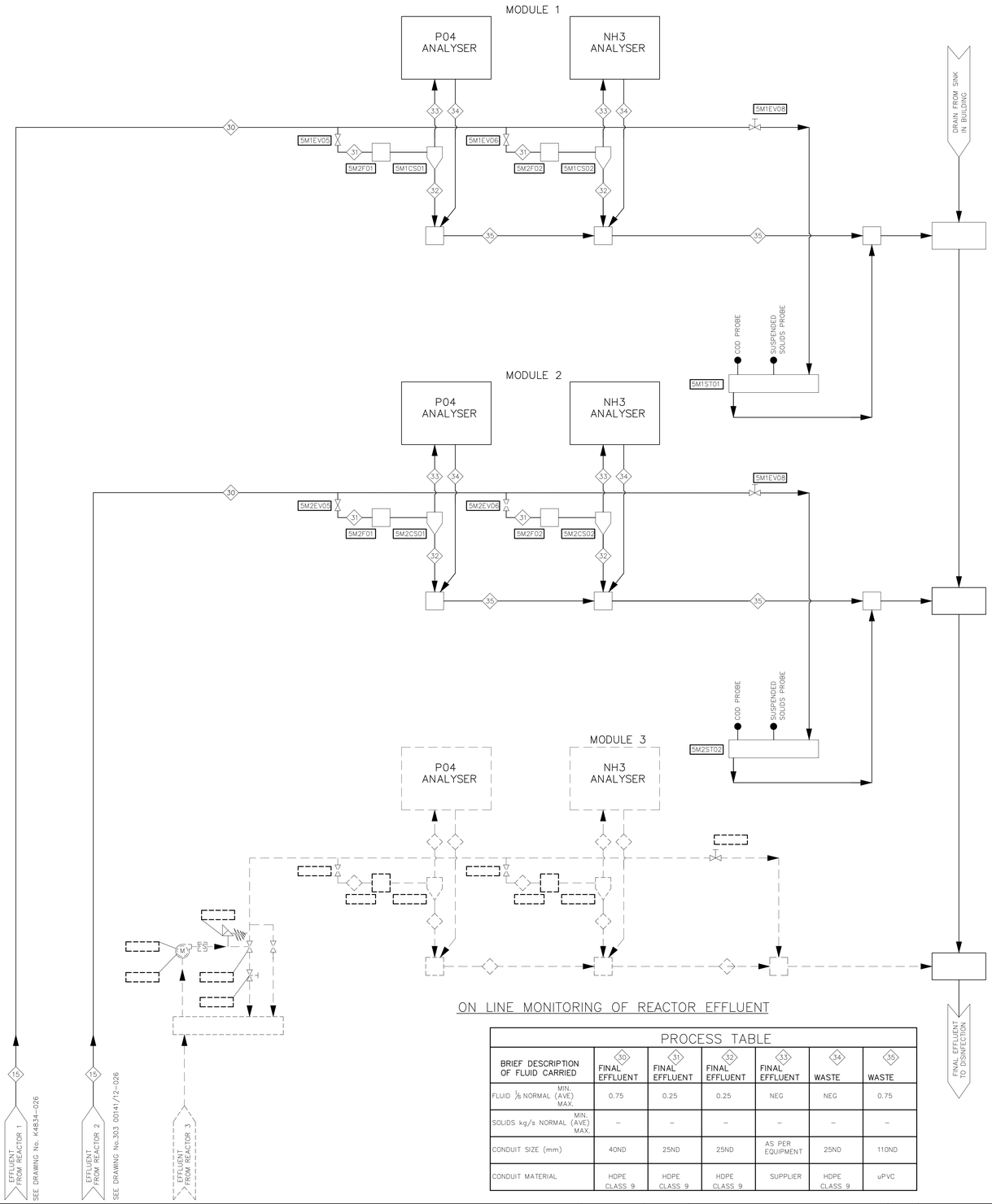
PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED	21 CHORINATED FINAL EFFLUENT	41 CHORINATED FINAL EFFLUENT	42 CHORINATED FINAL EFFLUENT	43 CHORINATED FINAL EFFLUENT	44 WASTE	45 WASTE
FLUID ⅛ NORMAL (AVE) MIN. MAX.	0.75	0.25	0.25	NEG	NEG	0.75
SOLIDS kg/s NORMAL (AVE) MIN. MAX.	–	–	–	–	–	–
CONDUIT SIZE (mm)	40ND	25ND	25ND	AS PER EQUIPMENT	25ND	110ND
CONDUIT MATERIAL	HDPE CLASS 9	HDPE CLASS 9	HDPE CLASS 9	SUPPLIER	HDPE CLASS 9	uPVC

INSTRUMENTATION		
		DESCRIPTION
		ORTHOPHOSPHATE ANALYZER AMMONIA ANALYZER COD PROBE SUSPENDED SOLIDS PROBE

CIVIL AND MECHANICAL EQUIPMENT TABLE

CYCLONE SEPARATORS (CS)			INLINE FILTER (F)			EFFLUENT VALVE (EV)			
TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	SIZE (mm)	TYPE	ACTUATOR
5M1CS01	0.75	300	5M1F01	0.75	300	5M1EV05	15	PPBV	HAND
5M1CS02	0.75	300	5M1F02	0.75	300	5M1EV06	15	PPBV	HAND
5M2CS01	0.75	300	5M2F01	0.75	300	5M1RV08	20	PPBV	HAND
5M2CS02	0.75	300	5M2F02	0.75	300	5M2EV05	15	PPBV	HAND
			5M2ST01	SAMPLING TROUGH		5M2EV06	15	PPBV	HAND
			5M2ST02	SAMPLING TROUGH		5M2RV08	20	PPBV	HAND



ON LINE MONITORING OF REACTOR EFFLUENT

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED	30 FINAL EFFLUENT	31 FINAL EFFLUENT	32 FINAL EFFLUENT	33 FINAL EFFLUENT	34 WASTE	35 WASTE
FLUID ⅛ NORMAL (AVE) MIN. MAX.	0.75	0.25	0.25	NEG	NEG	0.75
SOLIDS kg/s NORMAL (AVE) MIN. MAX.	–	–	–	–	–	–
CONDUIT SIZE (mm)	40ND	25ND	25ND	AS PER EQUIPMENT	25ND	110ND
CONDUIT MATERIAL	HDPE CLASS 9	HDPE CLASS 9	HDPE CLASS 9	SUPPLIER	HDPE CLASS 9	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	GK
DRAWN	MKM
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS AND INSTRUMENTATION DIAGRAM
ONLINE MONITORING OF FINAL AND REACTOR EFFLUENT

DESIGN MANAGER
DATE

SCALE

AMENDMENTS	APPROVED	DATE
0 APPROVED FOR CONSTRUCTION	RG	01/07/22

DRAWING No.
JW NUMBER
JW 13896-CE-029
CONSULTANT'S NUMBER
30300141/12-029
FILE No
0

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CIVIL AND MECHANICAL

PENSTOCKS (PS)

TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION
4MOPS14	2450x2200	CHANNEL	ELECTRIC MOTOR	MAIN INCOMER TO NEW UNIT 4 HOW
4MOPS15	1600x2200	CHANNEL	ELECTRIC MOTOR	TRASH RACK U/S
4MOPS16	1600x2200	CHANNEL	ELECTRIC MOTOR	TRASH RACK U/S
4MOPS17	1600x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
4MOPS18	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
4MOPS19	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
4MOPS20	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
4MOPS21	800x2200	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
4MOPS22	800x2200	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
4MOPS23	800x2200	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
4MOPS24	800x2200	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
4MOPS34	1500x2200	CHANNEL	ELECTRIC MOTOR	STONE TRAP U/S
4MOPS35	1500x2200	CHANNEL	ELECTRIC MOTOR	STONE TRAP D/S
4MOPS36	1500x2200	CHANNEL	ELECTRIC MOTOR	STONE TRAP U/S
4MOPS37	1500x2200	CHANNEL	ELECTRIC MOTOR	STONE TRAP D/S

TRASH RAKE (TR)

TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
4MOTR01	1600x2200	MOTORISED
4MOTR02	1600x2200	MOTORISED

ELECTRIC MOTORS (ME)

TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4MOME26	1.1	1450	380		CHANNEL PENSTOCK
4MOME27	1.1	1450	380		CHANNEL PENSTOCK
4MOME28	1.1	1450	380		CHANNEL PENSTOCK
4MOME29	4	1450	380		TRASH RACK HOIST
4MOME30	4	1450	380		TRASH RACK HOIST
4MOME31	1.1	1450	380		CHANNEL PENSTOCK
4MOME32	1.1	1450	380		CHANNEL PENSTOCK
4MOME33	1.1	1450	380		CHANNEL PENSTOCK
4MOME34	1.1	1450	380		CHANNEL PENSTOCK
4MOME36	1.5	1450	380		BAR SCREEN (PRIMARY)
4MOME37	1.5	1450	380		BAR SCREEN (PRIMARY)
4MOME38	1.5	1450	380		BAR SCREEN (PRIMARY)
4MOME39	1.5	1450	380		BAR SCREEN (PRIMARY)
4MOME40	2.2	1450	380		PERFORATED SCREEN (SECONDARY) SCREEN DRIVE
4MOME41	2.2	1450	380		PERFORATED SCREEN (SECONDARY) SCREEN DRIVE
4MOME42	2.2	1450	380		PERFORATED SCREEN (SECONDARY) SCREEN DRIVE
4MOME43	2.2	1450	380		PERFORATED SCREEN (SECONDARY) SCREEN DRIVE
4MOME44	1.1	1450	380		CHANNEL PENSTOCK
4MOME45	1.1	1450	380		CHANNEL PENSTOCK
4MOME46	1.1	1450	380		CHANNEL PENSTOCK
4MOME47	1.1	1450	380		CHANNEL PENSTOCK
4MOME48	2.2	1450	380		PERFORATED SCREEN (SECONDARY) BRUSH DRIVE
4MOME49	2.2	1450	380		PERFORATED SCREEN (SECONDARY) BRUSH DRIVE
4MOME50	2.2	1450	380		PERFORATED SCREEN (SECONDARY) BRUSH DRIVE
4MOME51	2.2	1450	380		PERFORATED SCREEN (SECONDARY) BRUSH DRIVE

ELECTRIC MOTORS (ME)

TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4MOME68		1450	380		SCREENING COMPACTOR
4MOME69		1450	380		SCREENING COMPACTOR
4MOME70	5.5	1450	380		SCREENING WASHER
4MOME71	5.5	1450	380		SCREENING WASHER
4MOME72		1450	380		SCREENING COMPACTOR
4MOME73		1450	380		SCREENING COMPACTOR
4MOME74	5.5	1450	380		SCREENING WASHER
4MOME87	1.1	1450	380		STONE TRAP CHANNEL PENSTOCK
4MOME88	1.1	1450	380		STONE TRAP CHANNEL PENSTOCK
4MOME89	1.1	1450	380		STONE TRAP CHANNEL PENSTOCK
4MOME90	1.1	1450	380		STONE TRAP CHANNEL PENSTOCK
4MOME91	1.1	1450	380		SKIP TROLLEY
4MOME92	1.1	1450	380		SKIP TROLLEY
4MOME93	1.1	1450	380		SKIP TROLLEY
4MOME94	1.1	1450	380		SKIP TROLLEY
4MOME95	1.1	1450	380		SKIP TROLLEY
4MOME96	1.1	1450	380		SKIP TROLLEY
4MOME97	1.1	1450	380		SKIP TROLLEY
4MOME98	1.1	1450	380		SKIP TROLLEY
4MOME99	1.1	1450	380		SKIP TROLLEY
4MOME100	0.37	1450	380		TRASH RACK HYDRAULIC
4MOME101	1.5	1450	380		TRASH RACK TROLLEY
4MOME102	0.37	1450	380		TRASH RACK HYDRAULIC
4MOME103	0.37	1450	380		TRASH RACK TROLLEY
4MOME104	0.37	1450	380		SCREENINGS DEFLECTOR
					SCREENINGS DEFLECTOR

EFFLUENT VALVES (EV)

TAG No	DIA.	TYPE	ACTUATOR
4MOEV17		KGV	HAND
4MOEV18		KGV	HAND
4MOEV46		KGV	HAND
4MOEV47		KGV	HAND
4MOEV48		KGV	HAND
4MOEV49		KGV	HAND
4MOEV50		KGV	HAND
4MOEV51		KGV	HAND
4MOEV52		KGV	HAND
4MOEV53		KGV	HAND
4MOEV54		UNALLOCATED	
4MOEV55		UNALLOCATED	
4MOEV56		UNALLOCATED	
4MOEV57		UNALLOCATED	
4MOEV94		KGV	HAND
4MOEV95		KGV	HAND
4MOEV96		KGV	HAND
4MOEV97		KGV	HAND
4MOEV98		KGV	ELECTRIC
4MOEV99		KGV	ELECTRIC
4MOEV100		KGV	ELECTRIC
4MOEV101		KGV	ELECTRIC

BAR SCREENS (BS)

TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
4MOBS10	2500x750	FRONT RAKE MANUAL
4MOBS11	1600x1700	FRONT RAKE MOTORISED
4MOBS12	1600x1700	FRONT RAKE MOTORISED
4MOBS13	1600x1700	FRONT RAKE MOTORISED
4MOBS14	1600x1700	FRONT RAKE MOTORISED
4MOBS15	1600x1700	FRONT RAKE PERFORATED MOTORISED
4MOBS16	1600x1700	FRONT RAKE PERFORATED MOTORISED
4MOBS17	1600x1700	FRONT RAKE PERFORATED MOTORISED
4MOBS18	1600x1700	FRONT RAKE PERFORATED MOTORISED
4MOBS19	1600x2200	FRONT RAKE MOTORISED
4MOBS20	1600x2200	FRONT RAKE MOTORISED

HYDRO-CONVEYANCE (HC)

TAG No	WIDTH (mm) BOTTOM
4MOHC11	450 CURVED
4MOHC12	450 CURVED

SCREENINGS COMPACTOR (SC)

TAG No	CAPACITY (m^3/hour)
4MOSC03	2
4MOSC04	2
4MOSC05	2
4MOSC06	2

SCREENINGS DEFLECTOR (SD)

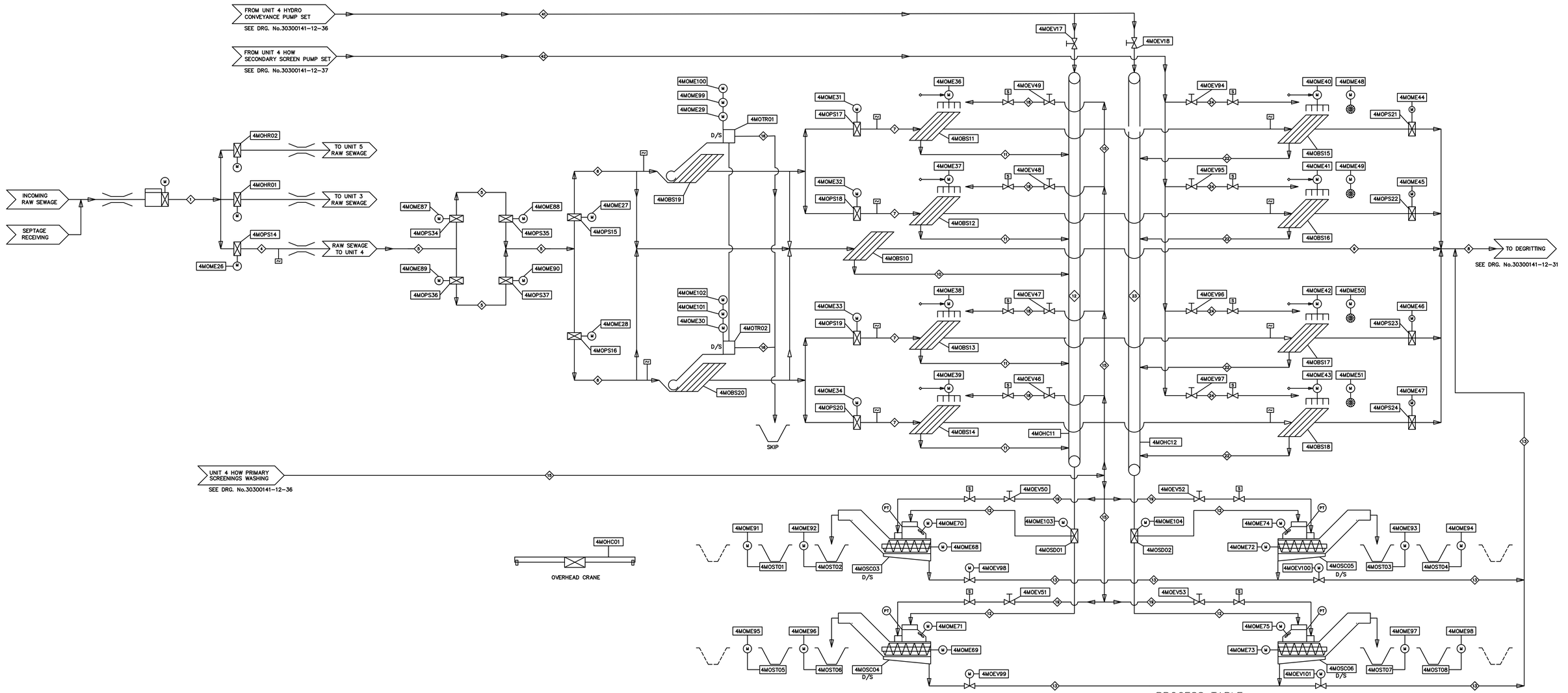
TAG No	CAPACITY (m^3/hour)
4MOSD01	2

OVERHEAD CRANE (OHC)

TAG No	CAPACITY (Kg)
4MOHC01	5000

SKIP TROLLEY (ST)

TAG No	CAPACITY (Kg)
4MOST01	7500
4MOST02	7500
4MOST03	7500
4MOST04	7500
4MOST05	7500
4MOST06	7500
4MOST07	7500
4MOST08	7500



PROCESS TABLE

IDENTIFICATION NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	22	23	24	25	41	42
BRIEF DESCRIPTION OF CARRIER FLUID		RAW SEWAGE	RAW SEWAGE		RAW SEWAGE	RAW SEWAGE	RAW SEWAGE	TRASH SCREENED SEWAGE	SCREENED SEWAGE	RAW SEWAGE BYPASS	SCREENINGS (BYPASS)	SCREENINGS (SCREENS)	SCREENINGS (HYDRO CONVEYOR)	DRAINAGE FROM SCREENINGS	FINAL EFFLUENT WASHWATER (UNIT 4)	TRASH SCREENINGS		FINAL EFFLUENT WASHWATER (PRIMARY SCREENS)	FINAL EFFLUENT WASHWATER (COMPACTOR)	SCREENINGS (SCREENS)	SCREENINGS (HYDRO-CONVEYOR)	FINAL EFFLUENT WASHWATER	FINAL EFFLUENT WASHWATER (SECONDARY SCREENS)	FINAL EFFLUENT	FINAL EFFLUENT
FLUID (l/s)	MINIMUM		–		–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–		
	NORMAL	6944	–		2550	2550	1275	638	2550	1416	–	–	–	–	23	–		4	3	–	–	4	3	8	12
	MAXIMUM	12500	1800		4590	4590	2295	1148	4590	2550	–	–	10	–	38	–		–	–	–	10	–	–		
SOLIDS (kg/s)	MINIMUM	–	–		–	–	–	–	–	–	–			–	–	–		–	–			–	–	–	–
	NORMAL	–	–		–	–	–	–	–	–	–			–	–	–		–	–			–	–	–	–
	MAXIMUM	–	–		–	–	–	–	–	–	0.3	0.14	0.6	–	–	0.04		–	–	0.09	0.4	–	–	–	–
CONDUIT SIZE (mm)		4200w	1500w		2400w	2400w	1600w	1600w	3880w	3800w 2500w	–	–	450 (CURVED)	200 DIA.	HDPE PE80	200 DIA.	–	50 DIA.	50 DIA.	–	450 (CURVED)	50 DIA.	50 DIA.	150 DIA.	150 DIA.
CONDUIT MATERIAL		EXISTING CONCRETE	EXISTING CONCRETE		EXISTING CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	–	–	STAINLESS STEEL	HDPE PE80	HDPE PE100	–		GMS	GMS	–	STAINLESS STEEL	GMS	GMS	GMS	GMS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	SJ/RG
DRAWN	JvdW
CHECKED	JR
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
NEW HEAD OF WORKS – UNIT 4
SCREENING

DESIGN MANAGER
DATE

SCALE

AMENDMENTS

		APPROVED	DATE
T	APPROVED FOR TENDER	JR	30/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.

JW NUMBER
JW 13903-CE-030

CONSULTANT'S NUMBER
30300141/12-030

FILE No

T T1 T2

P:\303-00141\12\A\DRAWINGS\KP\BWW1500 NW Unit 5 Mod 2\4 Design\1 Civil\Head of Works\Tender\30300141-12-030 Rev12.dwg Jul 31, 2019 - 1:12pm

CIVIL AND MECHANICAL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4MOME105	1.1	1450	380		CHANNEL PENSTOCK
4MOME106	1.1	1450	380		CHANNEL PENSTOCK
4MOME107	1.1	1450	380		CHANNEL PENSTOCK
4MOME108	1.1	1450	380		CHANNEL PENSTOCK
4MOME52	1.1	1450	380		CHANNEL PENSTOCK
4MOME53	1.1	1450	380		CHANNEL PENSTOCK
4MOME54	1.1	1450	380		CHANNEL PENSTOCK
4MOME55	1.1	1450	380		CHANNEL PENSTOCK
4MOME62	5.5	1450	380		FLUIDIZATION PUMP
4MOME63	5.5	1450	380		FLUIDIZATION PUMP
4MOME64	5.5	1450	380		FLUIDIZATION PUMP
4MOME65	5.5	1450	380		FLUIDIZATION PUMP
4MOME76	5.5	1450	380		BLOWERS
4MOME77	5.5	1450	380		BLOWERS
4MOME78	5.5	1450	380		BLOWERS
4MOME79	5.5	1450	380		BLOWERS

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4MOME80	5.5	1450	380		BLOWERS
4MOME81	5.5	1450	380		BLOWERS
4MOME82	5.5	1450	380		BLOWERS
4MOME83	5.5	1450	380		BLOWERS
4MOME84	1.5	1450	380		GRIT CLASSIFIER
4MOME85	1.5	1450	380		GRIT CLASSIFIER
4MOME109	1.1	1450	380		SKIP TROLLEYS
4MOME110	1.1	1450	380		SKIP TROLLEYS
4MOME111	1.1	1450	380		SKIP TROLLEYS
4MOME112	1.1	1450	380		SKIP TROLLEYS
4MOME90	1.1	1450	380		GRIT CLASSIFIER FEED
4MOME116	1.1	1450	380		GRIT CLASSIFIER FEED
4MOME117	2.2	1450	380		DRAINAGE PUMP
4MOME113	1.5	1450	380		DEGRITTER COMPRESSOR
4MOME114	1.5	1450	380		DEGRITTER COMPRESSOR
4MOME95	1.1	1450	380		OUTLET CHANNEL PENSTOCK

PENSTOCKS (PS)					
TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION	
4MOPS25	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
4MOPS26	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
4MOPS27	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
4MOPS28	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
4MOPS29	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
4MOPS30	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
4MOPS31	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
4MOPS32	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
4MOPS33	2520X2200	CHANNEL	ELECTRIC MOTOR	OUTLET CHANNEL	

EFFLUENT VALVES (EV)				
TAG No	DIA.	TYPE	ACTUATOR	
4MOEV22		NRV	.	
4MOEV23		NRV	.	
4MOEV45		KGV	HAND	
4MOEV66		KGV	HAND	
4MOEV67		KGV	HAND	
4MOEV68		KGV	HAND	
4MOEV69		KGV	HAND	
4MOEV70		KGV	HAND	
4MOEV71		KGV	HAND	
4MOEV72		KGV	HAND	
4MOEV73		KGV	HAND	
4MOEV74		KGV	HAND	
4MOEV75		KGV	HAND	
4MOEV76		KGV	HAND	
4MOEV77		KGV	HAND	
4MOEV78		KGV	HAND	

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
4MOEV79		KGV	HAND
4MOEV80		KGV	HAND
4MOEV81		KGV	HAND
4MOEV82		KGV	HAND
4MOEV83		KGV	HAND
4MOEV84		KGV	ACTUATED
4MOEV85		KGV	ACTUATED
4MOEV86		NRV	HAND
4MOEV87		NRV	HAND
4MOEV88		NRV	HAND
4MOEV89		NRV	HAND
4MOEV90		NRV	HAND
4MOEV91		NRV	HAND
4MOEV92		NRV	HAND
4MOEV93		NRV	HAND
4MOEV94		NRV	
4MOEV95		KGV	HAND

AIR BLOWER (AB)	
TAG No	DUTY (l/s)
4MOAB01	45
4MOAB02	45
4MOAB03	45
4MOAB04	45
4MOAB05	45
4MOAB06	45
4MOAB07	45
4MOAB08	45

GRIT CLASSIFIER (GC)		
TAG No	CAPACITY (m^3/hour)	
4MOGC03	123	Duty
4MOGC04	123	Stand by

VORTEX DEGRITTERS (VD)		
TAG No	DIAMETER (m)	WATER DEPTH (m)
4COVD05	8	5.3
4COVD06	8	5.3
4COVD07	8	5.3
4COVD08	8	5.3

AIR-COMPRESSOR (AC)	
TAG No	DUTY (l/s)
4MOAC01	150
4MOAC02	150

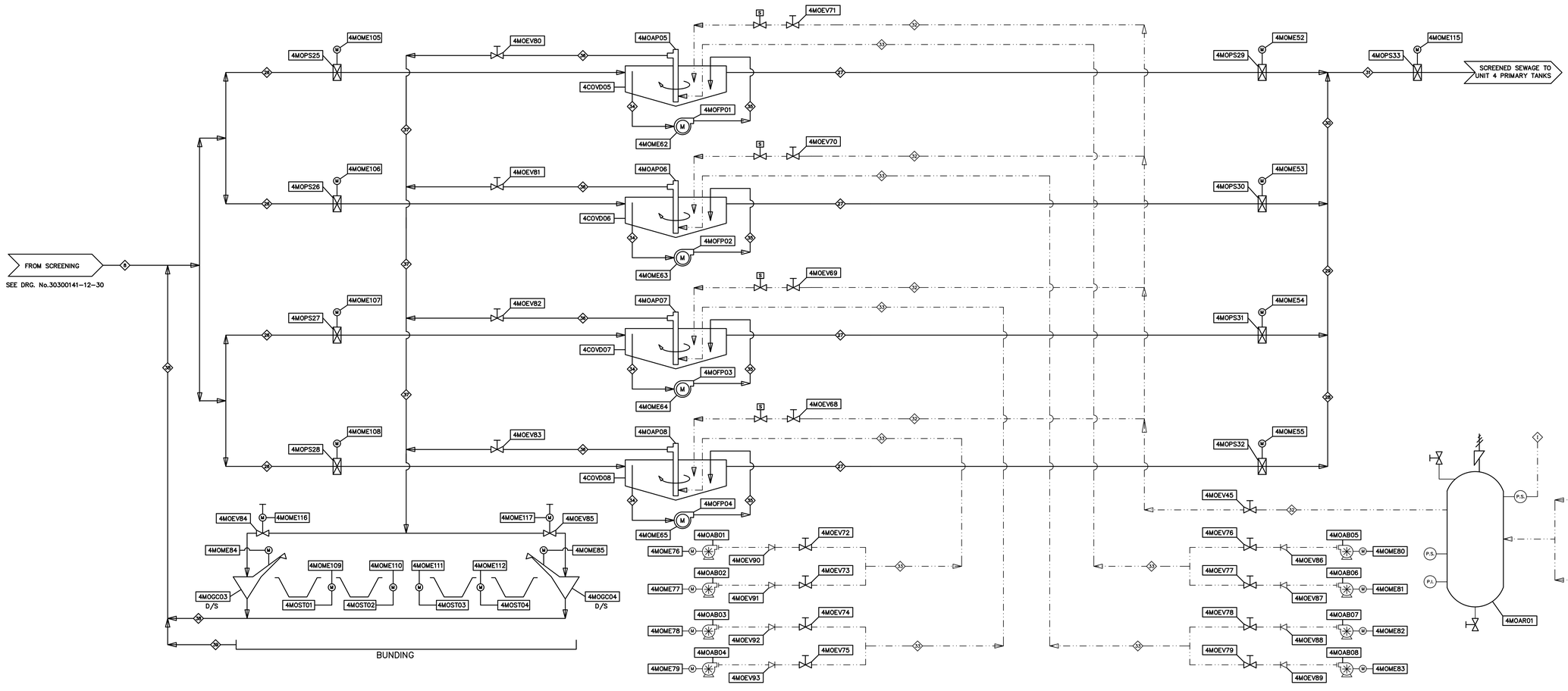
AIR-RECEIVER (AR)	
TAG No	CAPACITY (m^3)
4MOAR01	1

SKIP TROLLEYS (ST)	
TAG No	CAPACITY (kg)
4MOST01	7500
4MOST02	7500
4MOST03	7500
4MOST04	7500

AIR LIFT PUMPS (AP)				
TAG No	DUTY (l/s@m)	SUMP Floor level	Centerline Outlet level	Design Water level
4MOAP05	45 AT 5,5			
4MOAP06	45 AT 5,5			
4MOAP07	45 AT 5,5			
4MOAP08	45 AT 5,5			

FLUIDIZATION PUMPS (FP)		
TAG No	TYPE	DUTY(l/s@m)
4MOFP01	SELF PRIMING	8 AT 6
4MOFP02	SELF PRIMING	8 AT 6
4MOFP03	SELF PRIMING	8 AT 6
4MOFP04	SELF PRIMING	8 AT 6

DRAINAGE PUMPS (DP)		
TAG No	TYPE	DUTY(l/s@m)
4MODP01	SUBMERSIBLE	5 AT 6



PROCESS TABLE

IDENTIFICATION NUMBER		8	26	27	28	29	30	31	32	33	34	35	36	37	38	39
BRIEF DESCRIPTION OF CARRIER FLUID		SCREENED SEWAGE	SCREENED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	AIR SPARGE	AIR BLOWER	SCREENED SEWAGE (FLUIDIZATION)	SCREENED SEWAGE (FLUIDIZATION)	GRIT SLURRY	GRIT SLURRY	DRAINAGE FROM GRIT CLASSIFIER	DRAINAGE FROM GRIT BUND
FLUID (l/s)	MINIMUM												0	0	0	0
	NORMAL	2550	638	638	638	1275	1913	2550	–	–	–	–	17	17	16	8
	MAXIMUM	4590	1148	1148	1148	2295	3443	4590	45	45	8	8	17	17	16	8
SOLIDS (kg/s)	MINIMUM	–	–		–	–	–	–	–	–	–	–	0	0	–	–
	NORMAL	–	–		–	–	–	–	–	–	–	–	1.1	1.1	–	–
	MAXIMUM	–	–		–	–	–	–	–	–	–	–	1.6	1.6	–	–
CONDUIT SIZE (mm)		3880w	800w	800w	800w	1350w	1900w	2500w	50 DIA.	50 DIA.	100 DIA.	100 DIA.	150 DIA.	250 DIA.	250 DIA.	250 DIA.
CONDUIT MATERIAL		CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	GMS	GMS	304 SS	304 SS	304 SS	304 SS	HDPE PE80	HDPE PE80

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	SJ/RG
DRAWN	JvdW
CHECKED	JR
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
NEW HEAD OF WORKS – UNIT 4
DEGRITTING

DESIGN MANAGER

DATE

SCALE

AMENDMENTS			
	APPROVED	DATE	
T	APPROVED FOR TENDER	JR	30/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.

JW NUMBER
JW 13903-CE-031

CONSULTANT'S NUMBER
30300141/12-031

FILE No

T T1 T2

P:\303-001411\12\A\DRAWINGS\KP\DWW1500 NW Unit 5 Mod 2\4 Design\1 Civil\Head of Works\Tender\30300141-12-031 Rev12.dwg Jul 31, 2019 - 1:15pm

CIVIL AND MECHANICAL

PENSTOCKS (PS)				
TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION
3MOPS01	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
3MOPS02	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
3MOPS03	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
3MOPS04	800x2200	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S

TRASH RAKE (TR)		
TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
3MOTR01	1600x1700	MOTORISED
3MOTR02	1600x1700	MOTORISED

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
3MOME01	1.1	1450	380		CHANNEL PENSTOCK
3MOME02	1.1	1450	380		CHANNEL PENSTOCK
3MOME03	1.1	1450	380		CHANNEL PENSTOCK
3MOME04	1.1	1450	380		CHANNEL PENSTOCK
3MOME05					UNALLOCATED
3MOME06	1.5	1450	380		BAR SCREEN (PRIMARY)
3MOME07	1.5	1450	380		BAR SCREEN (PRIMARY)
3MOME08	1.5	1450	380		BAR SCREEN (PRIMARY)
3MOME09	1.5	1450	380		BAR SCREEN (PRIMARY)
3MOME10	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
3MOME11	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
3MOME12	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
3MOME13	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
3MOME14	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
3MOME15	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
3MOME16	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
3MOME17	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
3MOME18	3	1450	380		SCREENING COMPACTOR
3MOME19	3	1450	380		SCREENING COMPACTOR
3MOME20	5.5	1450	380		SCREENING WASHER
3MOME21	5.5	1450	380		SCREENING WASHER

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
3MOME22	1.1	1450	380		SKIP TROLLEY
3MOME23	1.1	1450	380		SKIP TROLLEY
3MOME24	1.1	1450	380		SKIP TROLLEY
3MOME25	1.1	1450	380		SKIP TROLLEY
3MOME26	4	1450	380		TRASH RACK HOIST
3MOME27	1.5	1450	380		TRASH RACK HYDRAULIC
3MOME28	0.37	1450	380		TRASH RACK TROLLEY
3MOME29	4	1450	380		TRASH RACK HOIST
3MOME30	1.5	1450	380		TRASH RACK HYDRAULIC
3MOME31	0.37	1450	380		TRASH RACK TROLLEY
3MOME32	0.37	1450	380		SCREENINGS DEFLECTOR
3MOME33	0.37	1450	380		SCREENINGS DEFLECTOR
3MOME34	3	1450	380		SCREENING COMPACTOR
3MOME35	3	1450	380		SCREENING COMPACTOR
3MOME36	5.5	1450	380		SCREENING WASHER
3MOME37	5.5	1450	380		SCREENING WASHER

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
3MOEV01		KGV	HAND
3MOEV02		KGV	HAND
3MOEV03		KGV	HAND
3MOEV04		KGV	HAND
3MOEV05		KGV	HAND
3MOEV06		KGV	HAND
3MOEV07		KGV	HAND
3MOEV08		KGV	HAND
3MOEV09		KGV	HAND
3MOEV10		KGV	HAND
3MOEV11		KGV	HAND
3MOEV12		KGV	HAND
3MOEV13		KGV	HAND
3MOEV14		KGV	HAND
3MOEV15		KGV	ELECTRIC
3MOEV16		KGV	ELECTRIC
3MOEV17		KGV	ELECTRIC
3MOEV18		KGV	ELECTRIC

BAR SCREENS (BS)		
TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
3MOBS01	2500x750	FRONT RAKE MANUAL
3MOBS02	1600x1700	FRONT RAKE MOTORISED
3MOBS03	1600x1700	FRONT RAKE MOTORISED
3MOBS04	1600x1700	FRONT RAKE MOTORISED
3MOBS05	1600x1700	FRONT RAKE MOTORISED
3MOBS06	1600x1700	PERFORATED MOTORISED
3MOBS07	1600x1700	PERFORATED MOTORISED
3MOBS08	1600x1700	PERFORATED MOTORISED
3MOBS09	1600x1700	PERFORATED MOTORISED
3MOBS10	1600x1700	FRONT RACK TRASH
3MOBS11	1600x1700	FRONT RACK TRASH

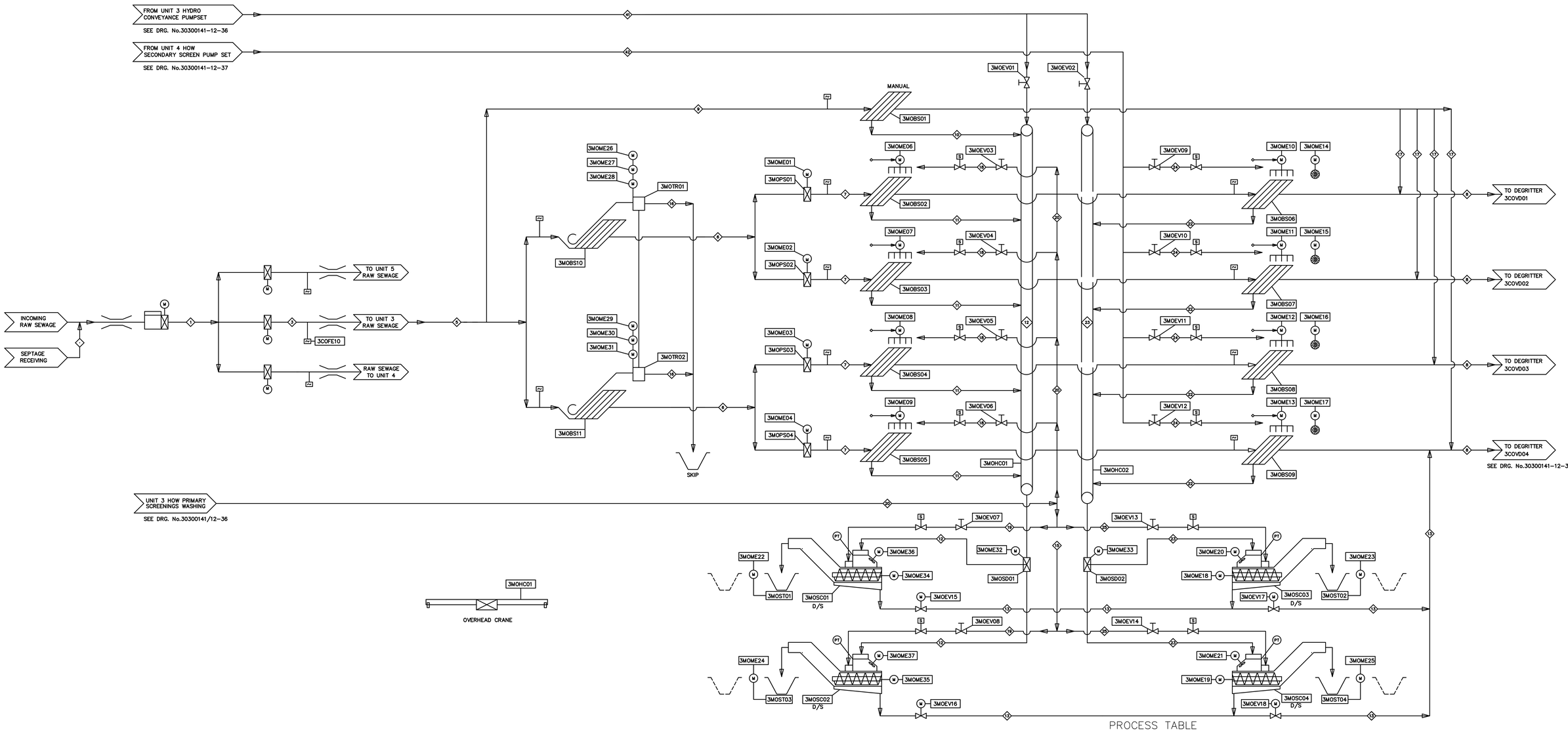
HYDRO–CONVEYANCE (HC)	
TAG No	WIDTH (mm) BOTTOM
3MOHC01	400 CURVED
3MOHC02	400 CURVED

SKIP TROLLEYS (ST)	
TAG No	CAPACITY (kg)
3MOST01	7500
3MOST02	7500
3MOST03	7500
3MOST04	7500

OVERHEAD CRANE (OHC)	
TAG No	CAPACITY (Kg)
3MOHC01	5000

SCREENINGS COMPACTOR (SC)	
TAG No	CAPACITY (m^3/hour)
3MOSC01	2
3MOSC02	2
3MOSC03	2
3MOSC04	2

SCREENINGS DEFLECTOR (SD)	
TAG No	CAPACITY (m^3/hour)
3MOSD01	2
3MOSD02	2



PROCESS TABLE

IDENTIFICATION NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	41	42
BRIEF DESCRIPTION OF CARRIER FLUID		RAW SEWAGE	RAW SEWAGE	RAW SEWAGE		RAW SEWAGE	RAW SEWAGE	RAW SEWAGE	SCREENED SEWAGE	RAW SEWAGE BYPASS	SCREENINGS (BYPASS)	SCREENINGS (SCREENS)	SCREENINGS (HYDRO CONVEYOR)	DRAINAGE FROM SCREENINGS			TRASH SCREENINGS	SCREENED SEWAGE (BYPASS)	FINAL EFFLUENT WASHWATER (SCREENS)	FINAL EFFLUENT WASHWATER (COMPACTOR)	FINAL EFFLUENT WASHWATER (UNIT 3)		SCREENINGS (SCREENS)	SCREENINGS (HYDRO–CONVEYOR)	FINAL EFFLUENT WASHWATER	FINAL EFFLUENT WASHWATER (FUTURE)	FINAL EFFLUENT	FINAL EFFLUENT
FLUID (l/s)	MINIMUM		–	–		–	–	–	–	–	–	–	–	–			–		–	–	–		–	–	–	–		
	NORMAL	6944	–	2315		2315	1158	579	579	1273	–	–	–	–			–	322	4	3	23		–	–	4	3	8	12
	MAXIMUM	12500	1800	4167		4167	2084	1042	1042	2292	–	–	10	–			–	580	–	–	38		–	10	–	–		
SOLIDS (kg/s)	MINIMUM	–	–	–		–	–	–	–	–	–			–			–	–	–	–	–				–	–	–	–
	NORMAL	–	–	–		–	–	–	–	–	–			–			–	–	–	–	–				–	–	–	–
	MAXIMUM	–	–	–		–	–	–	–	–	0.3	0.13	0.6	–			0.04	–	–	–	–		0.09	0.4	–	–	–	–
CONDUIT SIZE (mm)		4200ø	1500ø	2400ø		2400ø	1600ø	1600ø	3880ø	3800ø 2500ø	–	–	450 (CURVED)	200 DIA.			–	600ø	50 DIA.	50 DIA.	200 DIA.		–	450 (CURVED)	50 DIA.	50 DIA.	150 DIA.	150 DIA.
CONDUIT MATERIAL		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	–	–	STAINLESS STEEL	HDPE PE80			–	EXISTING CONCRETE	GMS	GMS	HDPE PE100		–	STAINLESS STEEL	GMS	GMS	GMS	GMS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
EXISTING HEAD OF WORKS – UNIT 3 (REFURBISHMENT)
SCREENING

DESIGN MANAGER
DATE

SCALE

AMENDMENTS			
		APPROVED	DATE
T	APPROVED FOR TENDER	JR	30/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.
JW NUMBER
JW 13903–CE–032
CONSULTANT'S NUMBER
30300141/12–032
FILE No
T T1 T2

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CIVIL AND MECHANICAL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
3MOME60	1.1	1450	380		CHANNEL PENSTOCK
3MOME61	1.1	1450	380		CHANNEL PENSTOCK
3MOME62	1.1	1450	380		CHANNEL PENSTOCK
3MOME63	1.1	1450	380		CHANNEL PENSTOCK
3MOME56	5.5	1450	380		FLUIDIZATION PUMP
3MOME57	5.5	1450	380		FLUIDIZATION PUMP
3MOME58	5.5	1450	380		FLUIDIZATION PUMP
3MOME59	5.5	1450	380		FLUIDIZATION PUMP
3MOME65	5.5	1450	380		BLOWERS
3MOME66	5.5	1450	380		BLOWERS
3MOME67	5.5	1450	380		BLOWERS
3MOME68	5.5	1450	380		BLOWERS
3MOME69	5.5	1450	380		BLOWERS
3MOME70	5.5	1450	380		BLOWERS
3MOME71	5.5	1450	380		BLOWERS
3MOME72	5.5	1450	380		BLOWERS
3MOME45	1.5	1450	380		GRIT CLASSIFIER
3MOME46	1.5	1450	380		GRIT CLASSIFIER

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
3MOME47	1.1	1450	380		SKIP TROLLEY
3MOME48	1.1	1450	380		SKIP TROLLEY
3MOME49	1.1	1450	380		SKIP TROLLEY
3MOME50	1.1	1450	380		SKIP TROLLEY
3MOME51	1.1	1450	380		GRIT CLASSIFIER FEED
3MOME52	1.1	1450	380		GRIT CLASSIFIER FEED
3MOME53	2.2	1450	380		DRAINAGE PUMP
3MOME54	1.5	1450	380		
3MOME55	1.5	1450	380		
3MOME56	1.1	1450	380		OUTLET CHANNEL
3MOME57	1.1	1450	380		
3MOME58	1.1	1450	380		
3MOME59	1.1	1450	380		
3MOME60	1.1	1450	380		
3MOME61	1.1	1450	380		
3MOME62	1.1	1450	380		
3MOME63	1.1	1450	380		
3MOME64	1.1	1450	380		

PENSTOCKS (PS)					
TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION	
3MOPS13	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
3MOPS14	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
3MOPS15	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
3MOPS16	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S	
3MOPS17	–	CHANNEL	ELECTRIC MOTOR	OUTLET CHANNEL	
3MOPS18	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS19	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS20	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS21	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS22	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS23	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS24	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	
3MOPS25	800x2200	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S	

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
3MOEV15		KGV	HAND
3MOEV16		KGV	HAND
3MOEV17		KGV	HAND
3MOEV18		KGV	HAND
3MOEV21		KGV	HAND
3MOEV22		KGV	ACTUATED
3MOEV23		KGV	ACTUATED
3MOEV27		KGV	HAND
3MOEV28		KGV	HAND
3MOEV29		KGV	HAND
3MOEV30		KGV	HAND
3MOEV34		KGV	HAND
3MOEV35		KGV	HAND
3MOEV36		KGV	HAND
3MOEV37		KGV	HAND
3MOEV38		KGV	HAND
3MOEV39		KGV	HAND
3MOEV40		KGV	HAND

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
3MOEV41		KGV	HAND
3MOEV42		NRV	
3MOEV43		NRV	
3MOEV44		NRV	
3MOEV45		NRV	
3MOEV46		NRV	
3MOEV47		NRV	
3MOEV48		NRV	
3MOEV49		NRV	
3MOEV50		KGV	HAND
3MOEV51		KGV	HAND
3MOEV52		NRV	
3MOEV53		NRV	
3MOEV54		NRV	
3MOEV55		KGV	HAND

AIR BLOWER (AB)	
TAG No	DUTY (l/s)
3MOAB01	45
3MOAB02	45
3MOAB03	45
3MOAB04	45
3MOAB05	45
3MOAB06	45
3MOAB07	45
3MOAB08	45

GRIT CLASSIFIER (GC)		
TAG No	CAPACITY (m^3/hour)	
3MOGC01	123	Duty
3MOGC02	123	Stand by

VORTEX DEGRITTERS (VD)		
TAG No	DIAMETER (m)	WATER DEPTH (m)
3COVD01	8	5.3
3COVD02	8	5.3
3COVD03	8	5.3
3COVD04	8	5.3

AIR-COMPRESSOR (AC)	
TAG No	DUTY (l/s)
3MOAC01	3MOAC01
3MOAC02	3MOAC02

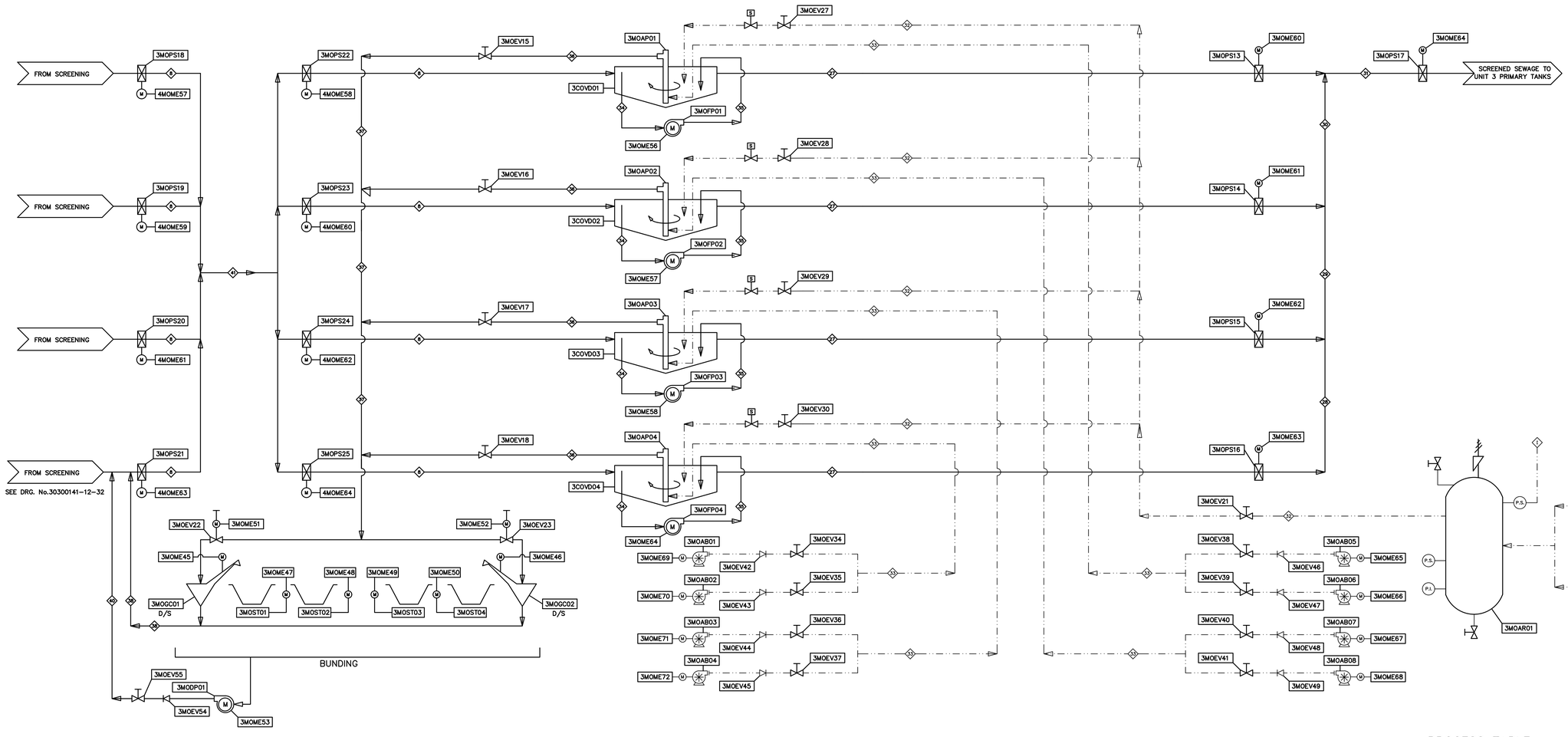
AIR-RECEIVER (AR)	
TAG No	CAPACITY (m^3)
3MOAR01	1

SKIP TROLLEYS (ST)	
TAG No	CAPACITY (kg)
3MOST01	7500
3MOST02	7500
3MOST03	7500
3MOST04	7500

AIR LIFT PUMPS (AP)				
TAG No	DUTY (l/s@m)	SUMP Floor level	Centerline Outlet level	Design Water level
3MOAP01	45 AT 5,5			
3MOAP02	45 AT 5,5			
3MOAP03	45 AT 5,5			
3MOAP04	45 AT 5,5			

FLUIDIZATION PUMPS (FP)		
TAG No	TYPE	DUTY(l/s@m)
3MOFP01	SELF PRIMING	8 AT 6
3MOFP02	SELF PRIMING	8 AT 6
3MOFP03	SELF PRIMING	8 AT 6
3MOFP04	SELF PRIMING	8 AT 6

DRAINAGE PUMPS (DP)		
TAG No	TYPE	DUTY(l/s@m)
3MODP01	SUBMERSIBLE	5 AT 6



PROCESS TABLE

IDENTIFICATION NUMBER		8	26	27	28	29	30	31	32	33	34	35	36	37	38	40	41
BRIEF DESCRIPTION OF CARRIER FLUID		SCREENED SEWAGE		SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	AIR SPARGE	AIR BLOWER	SCREENED SEWAGE (FLUIDIZATION)	SCREENED SEWAGE (FLUIDIZATION)	GRIT SLURRY	GRIT SLURRY	DRAINAGE FROM GRIT CLASSIFIER	DRAINAGE FROM GRIT BUND SUMP	SCREENED SEWAGE
FLUID (l/s)	MINIMUM												0	0	0	0	
	NORMAL	579		579	579	1158	1737	1737	–	–	–	–	17	17	16	8	
	MAXIMUM	1042		1042	1042	2084	5627	5627	45	45	8	8	17	17	16	8	
SOLIDS (kg/s)	MINIMUM	–			–	–	–	–	–	–	–	–	0	0	–	–	
	NORMAL	–			–	–	–	–	–	–	–	–	1.1	1.1	–	–	
	MAXIMUM	–			–	–	–	–	–	–	–	–	1.6	1.6	–	–	
CONDUIT SIZE (mm)		800ø		800ø	800ø	1350ø	1900ø	2500ø	50 DIA.	50 DIA.	100 DIA.	100 DIA.	150 DIA.	250 DIA.	250 DIA.	80 DIA.	
CONDUIT MATERIAL		EXISTING CONCRETE		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	GMS	GMS	304 SS	304 SS	304 SS	304 SS	HDPE PE80	HDPE PE80	EXISTING CONCRETE

DEPARTMENT	APPROVED	DESIGNATION	DATE

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UNIT 5 – PHASE 2
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P:\303-001411\12\A\DRAWINGS\KP\DWW1500 NW Unit 5 Mod 2\4 Design\1 Civil\Head of Works\Tender\30300141-12-033 Rev12.dwg Jul 31, 2019 - 1:19pm

CIVIL AND MECHANICAL

PENSTOCKS (PS)

TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION
5MOPS01	2400x1900	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
5MOPS02	2400x1900	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
5MOPS03	2400x1900	CHANNEL	ELECTRIC MOTOR	PRIMARY SCREENS U/S
5MOPS04	1350x2100	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
5MOPS05	1350x2100	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S
5MOPS06	1350x2100	CHANNEL	ELECTRIC MOTOR	SECONDARY SCREENS D/S

TRASH RAKE (TR)

TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
5MOTR01	1600x1700	MOTORISED
5MOTR02	1600x1700	MOTORISED

ELECTRIC MOTORS (ME)

TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
5MOME01	1.1	1450	380		CHANNEL PENSTOCK
5MOME02	1.1	1450	380		CHANNEL PENSTOCK
5MOME03	1.1	1450	380		CHANNEL PENSTOCK
5MOME04	1.1	1450	380		CHANNEL PENSTOCK
5MOME05	1.1	1450	380		CHANNEL PENSTOCK
5MOME06	1.1	1450	380		CHANNEL PENSTOCK
5MOME08	1.5	1450	380		BAR SCREEN (PRIMARY)
5MOME09	1.5	1450	380		BAR SCREEN (PRIMARY)
5MOME10	1.5	1450	380		BAR SCREEN (PRIMARY)
5MOME11	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
5MOME12	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
5MOME13	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–SCREEN DRIVE
5MOME14	3	1450	380		SCREENING COMPACTOR
5MOME15	3	1450	380		SCREENING COMPACTOR
5MOME16	5.5	1450	380		SCREENING WASHER
5MOME17	5.5	1450	380		SCREENING WASHER
5MOME18	3	1450	380		SCREENING COMPACTOR
5MOME19	3	1450	380		SCREENING COMPACTOR
5MOME20	5.5	1450	380		SCREENING WASHER
5MOME21	5.5	1450	380		SCREENING WASHER

ELECTRIC MOTORS (ME)

TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
5MOME22	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
5MOME23	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
5MOME24	2.2	1450	380		PERFORATED SCREEN (SECONDARY)–BRUSH DRIVE
5MOME25	1.1	1450	380		SKIP TROLLEY
5MOME26	1.1	1450	380		SKIP TROLLEY
5MOME27	1.1	1450	380		SKIP TROLLEY
5MOME28	1.1	1450	380		SKIP TROLLEY
5MOME29	4	1450	380		TRASH RACK HOIST
5MOME30	1.5	1450	380		TRASH RACK HYDRAULIC
5MOME31	0.37	1450	380		TRASH RACK TROLLEY
5MOME32	4	1450	380		TRASH RACK HOIST
5MOME33	1.5	1450	380		TRASH RACK HYDRAULIC
5MOME34	0.37	1450	380		TRASH RACK TROLLEY
5MOME35	0.37	1450	380		SCREENINGS DEFLECTOR
5MOME36	0.37	1450	380		SCREENINGS DEFLECTOR

EFFLUENT VALVES (EV)

TAG No	DIA.	TYPE	ACTUATOR
5MOEV01		KGV	HAND
5MOEV02		KGV	HAND
5MOEV03		KGV	HAND
5MOEV04		KGV	HAND
5MOEV05		KGV	HAND
5MOEV06		KGV	HAND
5MOEV07		KGV	HAND
5MOEV08		KGV	HAND
5MOEV09		KGV	HAND
5MOEV10		KGV	HAND
5MOEV11		KGV	HAND
5MOEV12		KGV	HAND
5MOEV13		KGV	ELECTRIC
5MOEV14		KGV	ELECTRIC

SCREENINGS COMPACTOR (SC)

TAG No	CAPACITY (m^3/hour)
5MOSC01	2
5MOSC02	2
5MOSC03	2
5MOSC04	2

BAR SCREENS (BS)

TAG No	CHANNEL SIZE (mm)	CLEANING MECHANISM
5MOBS02	1600x1700	FRONT RAKE MOTORISED
5MOBS03	1600x1700	FRONT RAKE MOTORISED
5MOBS04	1600x1700	FRONT RAKE MOTORISED
5MOBS05	1600x1700	FRONT RAKE MOTORISED PERFORATED
5MOBS06	1600x1700	FRONT RAKE MOTORISED PERFORATED
5MOBS07	1600x1700	FRONT RAKE MOTORISED PERFORATED
5MOBS08	?	MANUAL
5MOBS09	?	MANUAL
5MOBS10	1600x1700	FRONT RACK TRASH
5MOBS11	1600x1700	FRONT RACK TRASH
5MOBS12	1600x1700	FRONT RACK TRASH

SCREENINGS DEFLECTOR (SD)

TAG No	CAPACITY (m^3/hour)
5MOSD01	2
5MOSD02	2

HYDRO–CONVEYANCE (HC)

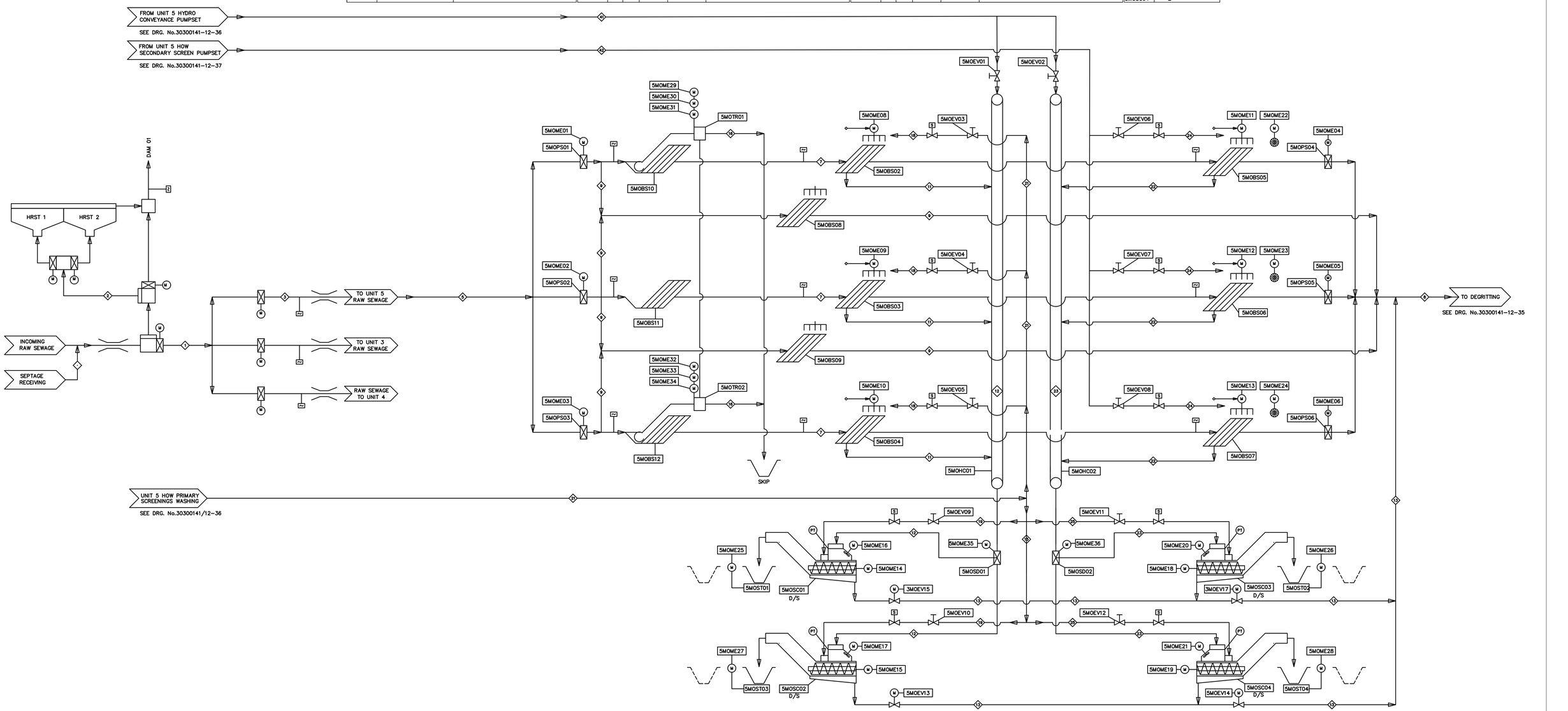
TAG No	WIDTH (mm) BOTTOM
5MOHC01	400 CURVED
5MOHC02	400 CURVED

SKIP TROLLEYS (ST)

TAG No	CAPACITY (kg)
5MOST01	7500
5MOST02	7500
5MOST03	7500
5MOST04	7500

OVERHEAD CRANE (OHC)

TAG No	CAPACITY (Kg)
5MOHC01	5000



PROCESS TABLE

IDENTIFICATION NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	41	42
BRIEF DESCRIPTION OF CARRIER FLUID		RAW SEWAGE	RAW SEWAGE	RAW SEWAGE		RAW SEWAGE		RAW SEWAGE	SCREENED SEWAGE	RAW SEWAGE BYPASS		SCREENINGS (SCREENS)	SCREENINGS (HYDRO CONVEYOR)	DRAINAGE FROM SCREENINGS			TRASH SCREENINGS		FINAL EFFLUENT WASHWATER (SCREENS)	FINAL EFFLUENT WASHWATER COMPACTOR)		FINAL EFFLUENT WASHWATER (UNIT 5)	SCREENINGS (SCREENS)	SCREENINGS (HYDRO–CONVEYOR)	FINAL EFFLUENT WASHWATER	FINAL EFFLUENT WASHWATER	FINAL EFFLUENT	FINAL EFFLUENT
FLUID (l/s)	MINIMUM	–	–	–		–		–	–	–		–	–	–			–		–	–		–	–	–	–	–		
	NORMAL	6944	–	2083		2083		694	2083	1157		–	–	–			–		4	3		23	–	4	3	8	12	
	MAXIMUM	12500	1800	37500		3750		1250	3750	2082		–	10	–			–		–	–		38	–	10	–	–		
SOLIDS (kg/s)	MINIMUM	–	–	–		–		–	–	–				–			–		–	–		–			–	–	–	–
	NORMAL	–	–	–		–		–	–	–				–			–		–	–		–			–	–	–	–
	MAXIMUM	–	–	–		–		–	–	–		0.16	0.6	–			0.04		–	–		–	0.08	0.4	–	–	–	–
CONDUIT SIZE (mm)		4200w	1500w	2400w		2400w		2400w	12000w	–		–	450 (CURVED)	200 DIA.			–		50 DIA.	50 DIA.		200 DIA.	–	450 (CURVED)	50 DIA.	50 DIA.	150 DIA.	150 DIA.
CONDUIT MATERIAL		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE		EXISTING CONCRETE		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE		–	STAINLESS STEEL	HDPE PE80			–		GMS	GMS		HDPE PE100	–	STAINLESS STEEL	GMS	GMS	GMS	GMS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	SJ/RG
DRAWN	JvdW
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
EXISTING HEAD OF WORKS – UNIT 5 (REFURBISHMENT)
SCREENING

DESIGN MANAGER

DATE

SCALE

	AMENDMENTS	APPROVED	DATE
T	APPROVED FOR TENDER	JR	30/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.

JW NUMBER
JW 13903–CE–034
CONSULTANT'S NUMBER
30300141/12–034
FILE No

T | T1 | T2

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CIVIL AND MECHANICAL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
5MOME58	1.1	1450	380		CHANNEL PENSTOCK
5MOME59	1.1	1450	380		CHANNEL PENSTOCK
5MOME60	1.1	1450	380		CHANNEL PENSTOCK
5MOME61	1.1	1450	380		CHANNEL PENSTOCK
5MOME62	1.1	1450	380		CHANNEL PENSTOCK
5MOME63	1.1	1450	380		CHANNEL PENSTOCK
5MOME64	5.5	1450	380		FLUIDIZATION PUMP
5MOME65	5.5	1450	380		FLUIDIZATION PUMP
5MOME66	5.5	1450	380		FLUIDIZATION PUMP
5MOME52	5.5	1450	380		BLOWERS
5MOME53	5.5	1450	380		BLOWERS
5MOME54	5.5	1450	380		BLOWERS
5MOME55	5.5	1450	380		BLOWERS
5MOME56	5.5	1450	380		BLOWERS
5MOME57	5.5	1450	380		BLOWERS
5MOME40	1.5	1450	380		GRIT CLASSIFIER
5MOME41	1.1	1450	380		GRIT CLASSIFIER
5MOME42	1.1	1450	380		SKIP TROLLEYS
5MOME43	1.1	1450	380		SKIP TROLLEYS
5MOME44	1.1	1450	380		SKIP TROLLEYS

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
5MOME45	1.1	1450	380		SKIP TROLLEYS
5MOME46	1.1	1450	380		GRIT CLASSIFIER FEED
5MOME47	1.1	1450	380		GRIT CLASSIFIER FEED
5MOME48	2.2	1450	380		DRAINAGE PUMP
5MOME49	1.5	1450	380		
5MOME50	1.5	1450	380		
5MOME51	1.1	1450	380		OUTLET CHANNEL
5MOME52	1.1	1450	380		OUTLET CHANNEL

PENSTOCKS (PS)				
TAG No	SIZE (mm)	TYPE	ACTUATOR DETAILS	DESCRIPTIVE LOCATION
5MOPS07	2050 x 1500	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S
5MOPS08	2050 x 1500	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S
5MOPS09	2050 x 1500	CHANNEL	ELECTRIC MOTOR	DEGRITTERS U/S
5MOPS10	2050 x 1350	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S
5MOPS11	2050 x 1350	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S
5MOPS12	2050 x 1350	CHANNEL	ELECTRIC MOTOR	DEGRITTERS D/S
5MOPS13	–	CHANNEL	ELECTRIC MOTOR	OUTLET CHANNEL
5MOPS14	–	CHANNEL	ELECTRIC MOTOR	OUTLET CHANNEL

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
5MOEV13		KGV	HAND
5MOEV14		KGV	HAND
5MOEV15		KGV	HAND
5MOEV16		KGV	HAND
5MOEV17		KGV	HAND
5MOEV18		KGV	HAND
5MOEV19		KGV	ACTUATED
5MOEV20		KGV	ACTUATED
5MOEV21		KGV	HAND
5MOEV28		KGV	HAND
5MOEV29		KGV	HAND
5MOEV30		KGV	HAND
5MOEV31		KGV	HAND
5MOEV32		KGV	HAND
5MOEV33		KGV	HAND
5MOEV34		KGV	HAND
5MOEV35		KGV	HAND

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
5MOEV36		NRV	
5MOEV37		NRV	
5MOEV38		NRV	
5MOEV39		NRV	
5MOEV40		NRV	
5MOEV41		NRV	
5MOEV48		NRV	
5MOEV49		NRV	
5MOEV50		NRV	
5MOEV51		KGV	HAND

AIR BLOWER (AB)	
TAG No	DUTY (l/s)
5MOAB01	45
5MOAB02	45
5MOAB03	45
5MOAB04	45
5MOAB05	45
5MOAB06	45

GRIT CLASSIFIER (GC)	
TAG No	CAPACITY (m³/hour)
5MOGC01	123 Duty
5MOGC02	123 Stand by

VORTEX DEGRITTERS (VD)		
TAG No	DIAMETER (m)	WATER DEPTH (m)
5COVD01	8	5.3
5COVD02	8	5.3
5COVD03	8	5.3

AIR-COMPRESSOR (AC)	
TAG No	DUTY (l/s)
5MOAC01	150
5MOAC02	150

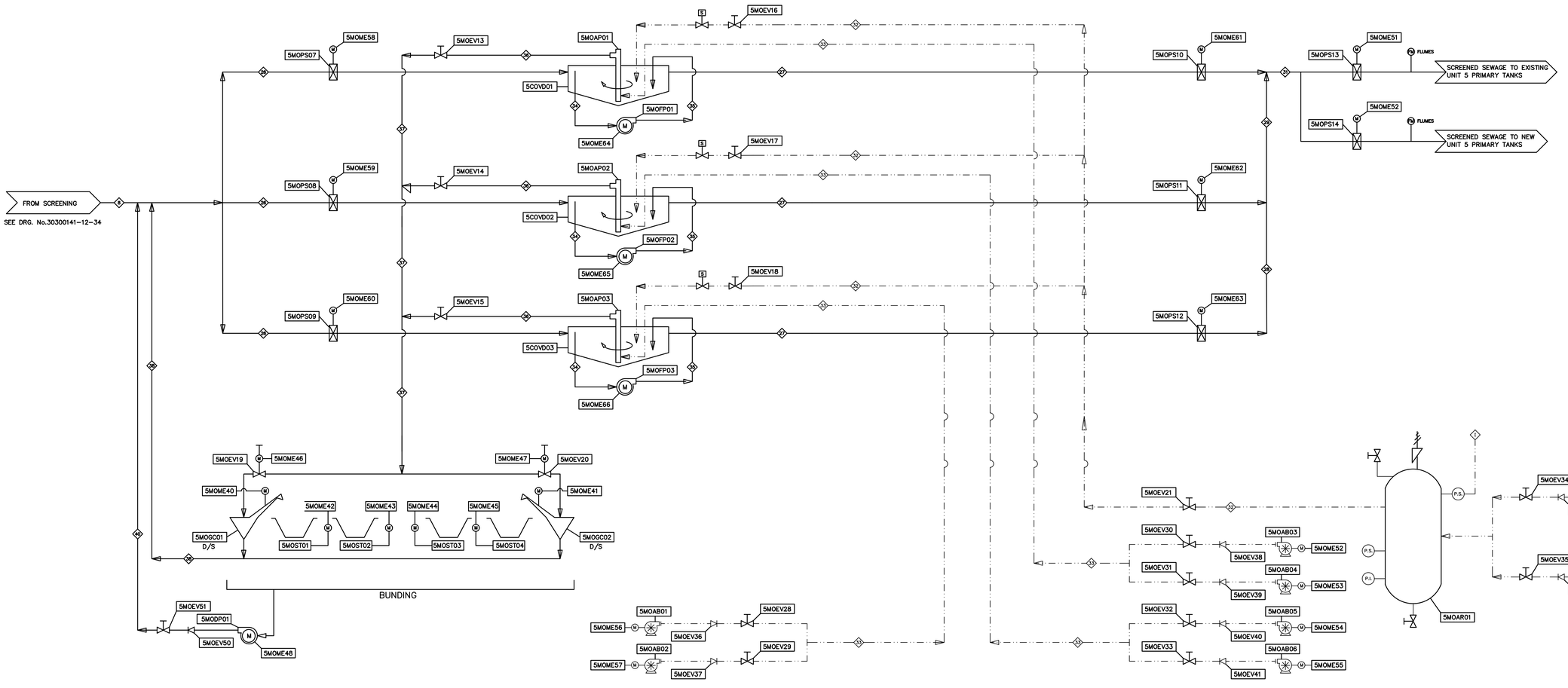
AIR-RECEIVER (AR)	
TAG No	CAPACITY (m³)
5MOAR01	1

SKIP TROLLEYS (ST)	
TAG No	CAPACITY (kg)
5MOST01	7500
5MOST02	7500
5MOST03	7500
5MOST04	7500

AIR LIFT PUMPS (AP)				
TAG No	DUTY (l/s@m)	SUMP Floor level	Centerline Outlet level	Design Water level
5MOAP01	45 AT 5,5			
5MOAP02	45 AT 5,5			
5MOAP03	45 AT 5,5			

FLUIDIZATION PUMPS (FP)		
TAG No	TYPE	DUTY (l/s@m)
5MOFP01	SELF PRIMING	8 AT 6
5MOFP02	SELF PRIMING	8 AT 6
5MOFP03	SELF PRIMING	8 AT 6

DRAINAGE PUMPS (DP)		
TAG No	TYPE	DUTY (l/s@m)
5MODP01	SUBMERSIBLE	5 AT 6



PROCESS TABLE

IDENTIFICATION NUMBER		8	26	27	28	29	30	31	32	33	34	35	36	37	38	40
BRIEF DESCRIPTION OF CARRIER FLUID		SCREENED SEWAGE	SCREENED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE	SCREENED DEGRITTED SEWAGE		SCREENED DEGRITTED SEWAGE	AIR SPARGE	AIR BLOWER	SCREENED SEWAGE (FLUIDIZATION)	SCREENED SEWAGE (FLUIDIZATION)	GRIT SLURRY	GRIT SLURRY	DRAINAGE FROM GRIT CLASSIFIER	DRAINAGE FROM GRIT BUND SUMP
FLUID (l/s)	MINIMUM	–											0	0	0	0
	NORMAL	2083	694	694	694	1388		1737	–	–	–	–	17	17	16	8
	MAXIMUM	3750	1250	1250	1250	2084		5627	45	45	8	8	17	17	16	8
SOLIDS (kg/s)	MINIMUM	–	–	–	–	–		–	–	–	–	–	0	0	–	–
	NORMAL	–	–	–	–	–		–	–	–	–	–	1.1	1.1	–	–
	MAXIMUM	–	–	–	–	–		–	–	–	–	–	1.6	1.6	–	–
CONDUIT SIZE (mm)		12000w	1450w	800w	800w	1350w		5200w	50 DIA.	50 DIA.	100 DIA.	100 DIA.	150 DIA.	250 DIA.	250 DIA.	80 DIA.
CONDUIT MATERIAL		EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE	EXISTING CONCRETE		EXISTING CONCRETE	GMS	GMS	304 SS	304 SS	304 SS	304 SS	HDPE PE80	HDPE PE80

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	JvdW
CHECKED	RG
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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
EXISTING HEAD OF WORKS – UNIT 5 (REFURBISHMENT)
DEGRITTING

DESIGN MANAGER

DATE

SCALE	AMENDMENTS		APPROVED	DATE
	T	APPROVED FOR TENDER	JR	30/11/18
	T1	FIRST UPDATE	SJ	25/02/19
	T2	SECOND UPDATE	RG	31/07/19

DRAWING No.

JW NUMBER
JW 13903-CE-035

CONSULTANT'S NUMBER
30300141/12-035

FILE No

T | T1 | T2

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CIVIL AND MECHANICAL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4MOME01	11	1450	380		SCREENINGS WASHING PUMP
4MOME02	11	1450	380		SCREENINGS WASHING PUMP
4MOME03	11	1450	380		SCREENINGS WASHING PUMP
4MOME04	11	1450	380		SCREENINGS WASHING PUMP
4MOME05	11	1450	380		SCREENINGS WASHING PUMP
4MOME06	11	1450	380		SCREENINGS WASHING PUMP
4MOME07	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME08	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME09	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME10	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME11	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME12	5.5	1450	380		HYDRO–CONVEYANCE PUMP
4MOME13	22	1450	380		EFFLUENT RETICULATION PUMP
4MOME14	22	1450	380		EFFLUENT RETICULATION PUMP
4M5ME13	75	2030	380		EFFLUENT WASHWATER PUMP
4M5ME14	75	2030	380		EFFLUENT WASHWATER PUMP
4M5ME15	75	2030	380		EFFLUENT WASHWATER PUMP
4MOME22					SUBMERSIBLE SUMP PUMP

EFFLUENT VALVES (EV)				
TAG No	DIA.	TYPE	ACTUATOR	
4MOEV01		KGV	HAND	
4MOEV02		KGV	HAND	
4MOEV03		KGV	HAND	
4MOEV04		KGV	HAND	
4MOEV05		KGV	HAND	
4MOEV06		KGV	HAND	
4MOEV07		KGV	HAND	
4MOEV08		KGV	HAND	
4MOEV09		KGV	HAND	
4MOEV10		KGV	HAND	
4MOEV11		KGV	HAND	
4MOEV12		KGV	HAND	
4MOEV13		KGV	HAND	
4MOEV14		KGV	HAND	
4MOEV15		KGV	HAND	
4MOEV16		KGV	HAND	
4MOEV17		KGV	HAND	
4MOEV18		KGV	HAND	
4MOEV19		KGV	HAND	
4MOEV20		KGV	HAND	
4MOEV21		KGV	HAND	
4MOEV22		KGV	HAND	
4MOEV23		KGV	HAND	

EFFLUENT VALVES (EV)				
TAG No	DIA.	TYPE	ACTUATOR	
4MOEV24		KGV	HAND	
4MOEV25		KGV	HAND	
4MOEV26		KGV	HAND	
4MOEV27		KGV	HAND	
4MOEV28		KGV	HAND	
4MOEV29		KGV	HAND	
4MOEV30		KGV	HAND	
4MOEV31		KGV	HAND	
4MOEV32		KGV	HAND	
4MOEV33		KGV	HAND	
4MOEV34		KGV	HAND	
4MOEV35		KGV	HAND	
4MOEV36		KGV	HAND	
4MOEV37		KGV	HAND	
4MOEV38		KGV	HAND	
4MOEV39		KGV	HAND	
4MOEV40		KGV	HAND	
4MOEV41		KGV	HAND	
4MOEV42		KGV	HAND	
4MOEV43		NRV		
4MOEV44		NRV		
4MOEV45		NRV		
4MOEV46		NRV		

EFFLUENT VALVES (EV)				
TAG No	DIA.	TYPE	ACTUATOR	
4MOEV47		NRV		
4MOEV48		NRV		
4MOEV49		NRV		
4MOEV50		NRV		
4MOEV51		NRV		
4MOEV52		NRV		
4MOEV53		NRV		
4MOEV54		NRV		
4MOEV57		KGV	HAND	
4MOEV58		KGV	HAND	
4MOEV59		KGV	HAND	
4MOEV60		KGV	HAND	
4MOEV61		KGV	HAND	
4MOEV62		KGV	HAND	
4MOEV63		KGV	HAND	
4MOEV64		KGV	HAND	
4MOEV65		KGV	HAND	
4MOEV66		KGV	HAND	
4MOEV67		KGV	HAND	
4MOEV68		KGV	HAND	
4MOEV69		KGV	HAND	
4MOEV70		KGV	HAND	
4MOEV71		KGV	HAND	

EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
4MOEV72		KGV	HAND
4MOEV73		KGV	HAND
4MOEV74		KGV	HAND
4MOEV75		KGV	HAND
4MOEV76		KGV	HAND
4MOEV77		KGV	HAND
4MOEV78		KGV	HAND
4MOEV79		KGV	HAND
4MOEV80		NRV	
4MOEV81		NRV	
4MOEV82		KGV	HAND
4MOEV83		KGV	HAND
4MOEV84		PRV	
5M5EV01		KGV	HAND
5M5EV02		KGV	HAND
5M5EV03		KGV	HAND
5M5EV04		KGV	HAND
5M5EV05		KGV	HAND
5M5EV06		KGV	HAND
4MOEV85		NRV	
4MOEV86		NRV	
5M5EV07		NRV	
5M5EV08		NRV	
5M5EV09		NRV	

EFFLUENT RETICULATION PUMPS (ERP)		
TAG No	TYPE	DUTY (l/s @ m)
4MOERP01	SELF PRIMING	20 AT 60
4MOERP02	SELF PRIMING	20 AT 60

UNIT 5 EFFLUENT WASHWATER PUMPS (EWP)		
TAG No	TYPE	DUTY (l/s @ m)
5M5EWP01	SELF PRIMING	84 AT 45
5M5EWP02	SELF PRIMING	84 AT 45
5M5EWP03	SELF PRIMING	84 AT 45

SUBMERSIBLE SUMP PUMP (SSP)		
TAG No	TYPE	DUTY (l/s @ m)
4MOSSP01	SUBMERSIBLE	.

SCREENINGS WASHING PUMPS (EP)		
TAG No	TYPE	DUTY(l/s @ m)
4MOEP01	END SUCTION	40 AT 55
4MOEP02	END SUCTION	40 AT 55
4MOEP03	END SUCTION	40 AT 55
4MOEP04	END SUCTION	40 AT 55
4MOEP05	END SUCTION	40 AT 55
4MOEP06	END SUCTION	40 AT 55

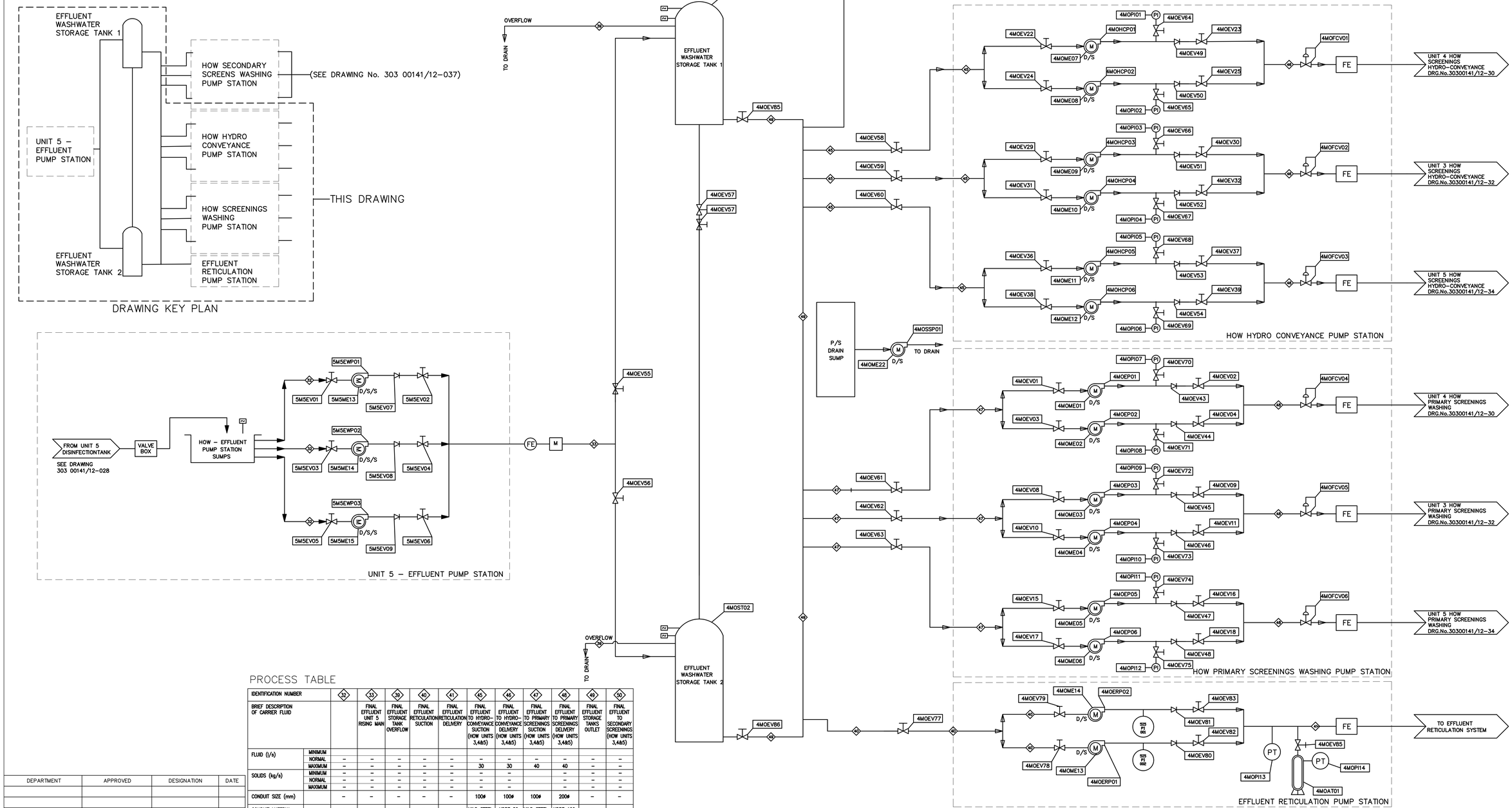
FLOW CONTROL VALVES (FCV)		
TAG No	DIA.	TYPE
4MOFCV01	100	–
4MOFCV02	100	–
4MOFCV03	100	–
4MOFCV04	200	–
4MOFCV05	200	–
4MOFCV06	200	–

HYDRO–CONVEYANCE PUMPS (HCP)		
TAG No	TYPE	DUTY (l/s @ m)
4MOHCP01	SELF PRIMING	8 AT 6
4MOHCP02	SELF PRIMING	8 AT 6
4MOHCP03	SELF PRIMING	8 AT 6
4MOHCP04	SELF PRIMING	8 AT 6
4MOHCP05	SELF PRIMING	8 AT 6
4MOHCP06	SELF PRIMING	8 AT 6

PRESSURE INDICATOR (PI)	
TAG No	PRESSURE (Kilopascal)
4MOPI01	–
4MOPI02	–
4MOPI03	–
4MOPI04	–
4MOPI05	–
4MOPI06	–
4MOPI07	–
4MOPI08	–
4MOPI09	–
4MOPI10	–
4MOPI11	–
4MOPI12	–

EFFLUENT STORAGE TANK	
TAG No	CAPACITY (m^3)
4MOST01	4000
4MOST02	4000

ACCUMULATOR TANK		
TAG No	TYPE	CAPACITY (m3)
4MOAT01	BLADDER	3



PROCESS TABLE

IDENTIFICATION NUMBER		32	33	39	40	41	45	46	47	48	49	50
BRIEF DESCRIPTION OF CARRIER FLUID			FINAL EFFLUENT UNIT 5 RISING MAIN	FINAL EFFLUENT STORAGE TANK OVERFLOW	FINAL EFFLUENT RETICULATION SUCTION	FINAL EFFLUENT RETICULATION DELIVERY	FINAL EFFLUENT TO HYDRO–CONVEYANCE SUCTION (HOW UNITS 3,4&5)	FINAL EFFLUENT TO HYDRO–CONVEYANCE DELIVERY (HOW UNITS 3,4&5)	FINAL EFFLUENT TO PRIMARY SCREENINGS SUCTION (HOW UNITS 3,4&5)	FINAL EFFLUENT TO PRIMARY SCREENINGS DELIVERY (HOW UNITS 3,4&5)	FINAL EFFLUENT STORAGE TANKS OUTLET	FINAL EFFLUENT TO SECONDARY SCREENINGS (HOW UNITS 3,4&5)
FLUID (l/s)	MINIMUM											
	NORMAL	–	–	–	–	–	–	–	–	–	–	–
	MAXIMUM	–	–	–	–	–	30	30	40	40	–	–
SOLIDS (kg/s)	MINIMUM	–	–	–	–	–	–	–		–	–	–
	NORMAL	–	–	–	–	–	–	–		–	–	–
	MAXIMUM	–	–	–	–	–	–	–		–	–	–
CONDUIT SIZE (mm)		–	–	–	–	–	100ø	100ø	100ø	200ø	–	–
CONDUIT MATERIAL		–	–	–	–	–	MILD STEEL	HDPE 80	MILD STEEL	HDPE 100	–	–

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	SJ/RG
DRAWN	JvdW
CHECKED	RG
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

PROCESS FLOW DIAGRAM

NEW HEAD OF WORKS – UNIT 4

HYDRO–CONVEYANCE AND SCREENINGS WASHING PUMP STATION

DESIGN MANAGER

DATE

SCALE

AMENDMENTS			
		APPROVED	DATE
T	APPROVED FOR TENDER	JR	02/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.

JW NUMBER
JW 13903–CE–036

CONSULTANT'S NUMBER
30300141/12–036

FILE No

T T1 T2

P:\303-00141\12\A\DRAWINGS\KP\DWW1500 NW Unit 5 Mod 2\4 Design\1 Civil\Head of Works\Tender\30300141-12-036 Rev12.dwg Jul 31, 2019 - 1:25pm

CIVIL AND MECHANICAL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN TAG
4M5ME16	22	1450	380		EFFLUENT WASHWATER PUMP
4M5ME17	22	1450	380		EFFLUENT WASHWATER PUMP
4M5ME18	22	1450	380		EFFLUENT WASHWATER PUMP
4M5ME19	22	1450	380		EFFLUENT WASHWATER PUMP
4M5ME20	22	1450	380		EFFLUENT WASHWATER PUMP
4M5ME21	22	1450	380		EFFLUENT WASHWATER PUMP

EFFLUENT VALVES (EV)				
TAG No	DIA.	TYPE	ACTUATOR
4MOEV85		KGV	HAND
4MOEV86		KGV	HAND
4MOEV87		KGV	HAND
4MOEV88		KGV	HAND
4MOEV89		KGV	HAND
4MOEV90		KGV	HAND
4MOEV91		KGV	HAND
4MOEV92		KGV	HAND
4MOEV93		KGV	HAND
4MOEV94		KGV	HAND
4MOEV95		KGV	HAND
4MOEV96		KGV	HAND
4MOEV97		KGV	HAND
4MOEV98		KGV	HAND
4MOEV99		KGV	HAND

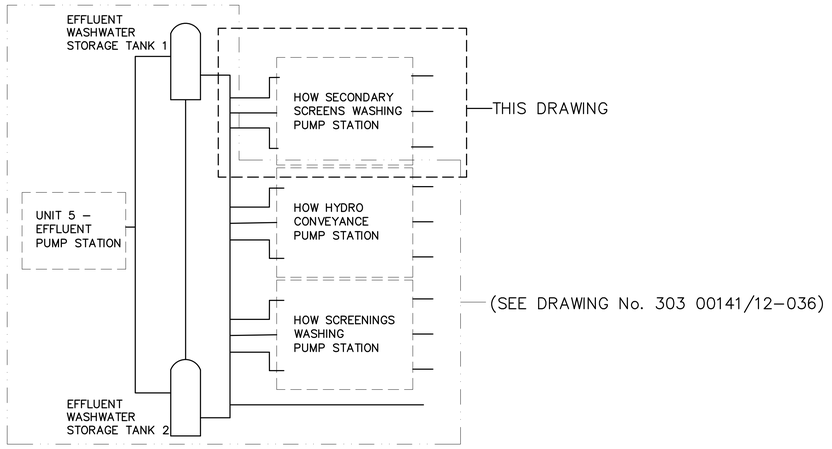
EFFLUENT VALVES (EV)			
TAG No	DIA.	TYPE	ACTUATOR
4MOEV100		NRV	
4MOEV101		NRV	
4MOEV102		NRV	
4MOEV103		NRV	
4MOEV104		KGV	HAND
4MOEV105		KGV	HAND
4MOEV106		KGV	HAND
4MOEV107		KGV	HAND
4MOEV108		KGV	HAND
4MOEV109		KGV	HAND
4MOEV110		KGV	HAND
4MOEV111		KGV	HAND

SECONDARY SCREEN WASH WATER PUMPS (EP)		
TAG No	TYPE	DUTY(l/s @ m)
4MOMEP16	END SUCTION	30 AT 55
4MOMEP17	END SUCTION	30 AT 55
4MOMEP18	END SUCTION	30 AT 55
4MOMEP19	END SUCTION	30 AT 55
4MOMEP20	END SUCTION	30 AT 55
4MOMEP21	END SUCTION	30 AT 55

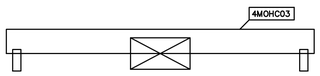
PRESSURE INDICATOR (PI)	
TAG No	PRESSURE (Kilopascal)
4MOPI13	–
4MOPI14	–
4MOPI15	–
4MOPI16	–
4MOPI17	–
4MOPI18	–

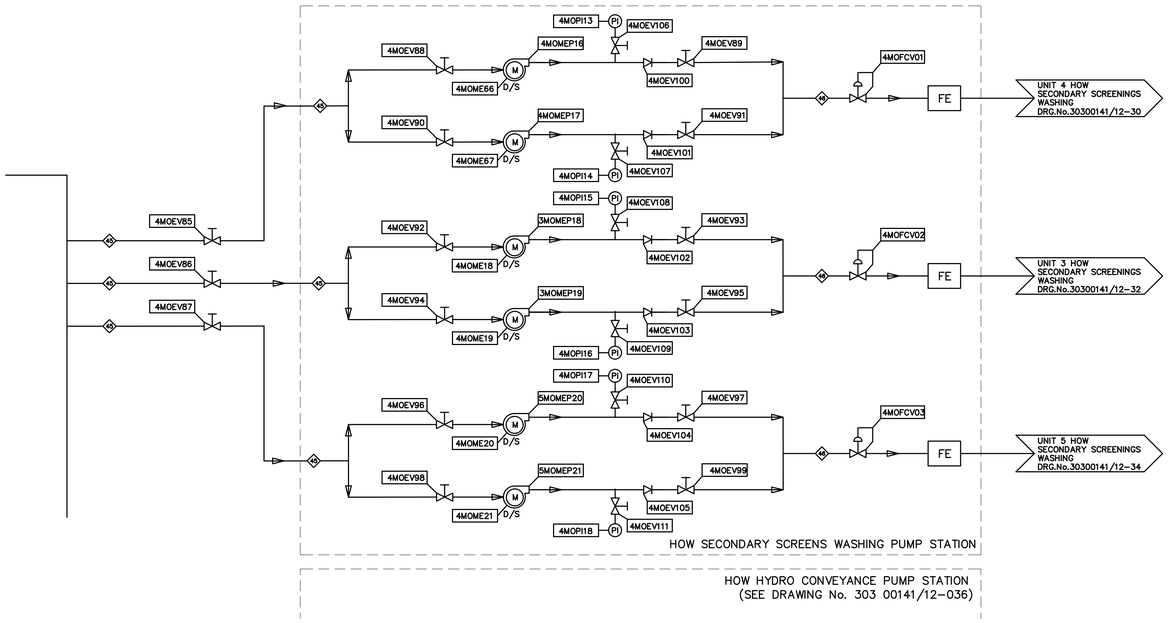
OVERHEAD CRANE (OHC)	
TAG No	CAPACITY (Kg)
4MOHC03	2000

FLOW CONTROL VALVES (FCV)		
TAG No	DIA.	TYPE
4MOFCV01	100	–
4MOFCV02	100	–
4MOFCV03	100	–



DRAWING KEY PLAN





PROCESS TABLE

IDENTIFICATION NUMBER		45	46
BRIEF DESCRIPTION OF CARRIER FLUID		FINAL EFFLUENT	FINAL EFFLUENT
FLUID (l/s)	MINIMUM		
	NORMAL	–	–
	MAXIMUM	30	30
SOLIDS (kg/s)	MINIMUM	–	–
	NORMAL	–	–
	MAXIMUM	–	–
CONDUIT SIZE (mm)		200ø	100ø
CONDUIT MATERIAL		MILD STEEL	HDPE 80

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	SJ/RG
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
NEW HEAD OF WORKS – UNIT 4
SECONDARY SCREENS WASHING PUMP STATION

DESIGN MANAGER
DATE

SCALE

AMENDMENTS		APPROVED	DATE
T	APPROVED FOR TENDER	JR	02/11/18
T1	FIRST UPDATE	SJ	25/02/19
T2	SECOND UPDATE	RG	31/07/19

DRAWING No.
JW NUMBER
JW 13903-CE-037
CONSULTANT'S NUMBER
303001141/12-037
FILE No
T T1 T2

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CIVIL AND MECHANICAL

HAND OPERATED VALVES (HOV)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M8HOV01	40	GV	HAND WHEEL
5M8HOV02	25	GV	HAND WHEEL
5M8HOV03	40	GV	HAND WHEEL
5M8HOV04	25	GV	HAND WHEEL
5M8HOV05	25	GV	HAND WHEEL
5M8HOV06	15	GV	HAND WHEEL
5M8HOV07	40	GV	HAND WHEEL
5M8HOV08	25	GV	HAND WHEEL
5M8HOV09	40	GV	HAND WHEEL
5M8HOV10	40	GV	HAND WHEEL

NON-RETURN VALVES (NRV)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M8NRV01	15	NRV	–
5M8NRV02	40	NRV	–
5M8NRV03	40	NRV	–
5M8NRV04	40	NRV	–

LEVER BALL VALVES (LBV)			
TAG No	DIA. (mm)	TYPE	–
5M8LBV01	40	–	–
5M8LBV02	15		
5M8LBV03	15		
5M8LBV04	40		
5M8LBV05	40		
5M8LBV06	40		
5M8LBV07	40		
5M8LBV08	15		
5M8LBV09	40		
5M8LBV10	40		
5M8LBV11	15		

FLOAT VALVES (FV)			
TAG No	DIA. (mm)	TYPE	–
5M8FV01	40	–	–
5M8FV02	25		

BUTTERFLY VALVES (BV)			
TAG No	DIA. (mm)	TYPE	–
5M8BV01	100	MANUAL	–
5M8BV02	100	MANUAL	
5M8BV03	100	MANUAL	
5M8BV04	100	MANUAL	
5M8BV05	100	MANUAL	
5M8BV06	100	MANUAL	
5M8BV07	100	MANUAL	
5M8BV08	100	MANUAL	
5M8BV09	100	MANUAL	
5M8BV10	100	MANUAL	
5M8BV11	100	MANUAL	
5M8BV12	100	MANUAL	
5M8BV13	100	MANUAL	
5M8BV14	100	MANUAL	
5M8BV15	100	MANUAL	
5M8BV16	100	MANUAL	
5M8BV17	100	MANUAL	
5M8BV18	100	MANUAL	

SOLENOID VALVES (SLV)			
TAG No	DIA. (mm)	TYPE	–
5M8SLV01	40	–	–

DIAPHRAGM VALVES (DV)			
TAG No	DIA. (mm)	TYPE	–
5M8DV01	15	–	–
5M8DV02	40	–	–

PUMPS (P)		
TAG No	TYPE	CAPACITY
5M8P01	RECIRCULATING PUMP	180 L/m
5M8P02	EFFLUENT PUMP	20 L/m

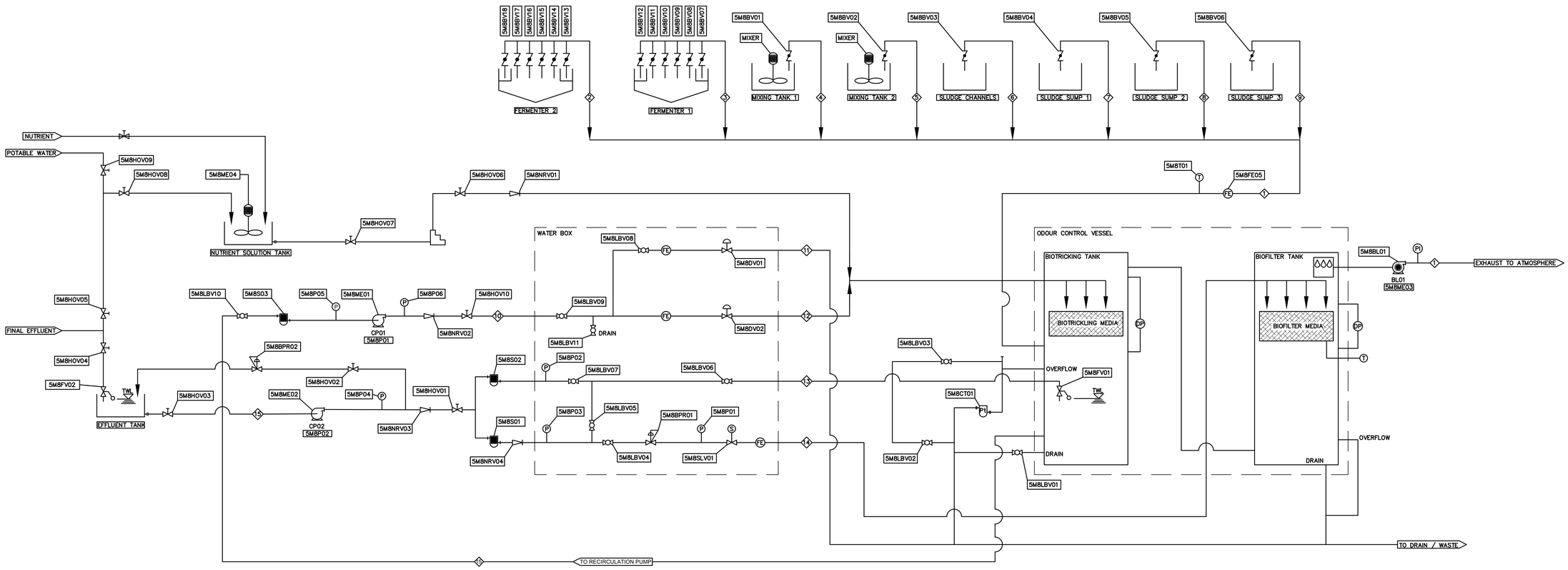
ELECTRIC MOTORS (ME)					
TAG No	KW	SPEED (rpm)	VOLTAGE	ENCLOSURE	APPLICATION
5M8ME01	1.50	1450	380	TEFC-IP55	RECIRCULATING PUMP
5M8ME02	1.50	1450	380	TEFC-IP55	EFFLUENT PUMP
5M8ME03	5.50	1450	380	TEFC-IP55	RECIRCULATING PUMP
5M8ME04	0.37	1450	380	TEFC-IP55	MIXER

STRAINERS (S)		
TAG No	DIA.	–
5M8S01	40	–
5M8S02	40	–
5M8S03	40	–

BACK PRESSURE REGULATORS (BPR)		
TAG No	DIA.	–
5M8BPR01	40	–
5M8BPR02	25	–

CONDENSATE TRAP (CT)		
TAG No	DIA.	–
5MBCT01	40	–

BLOWER (BL)		
TAG No	FLOW m^3/Hr	–
5M8BL01	2067	–



INSTRUMENTATION, VALVES AND EQUIPMENT

- PI PRESS GAUGE
- FE FLOW METER
- DP PRESSURE DIFFERENTIAL INDICATOR
- T THERMOMETER
- LEVER BALL VALVE
- NON RETURN VALVE
- BUTTERFLY VALVE
- HAND OPERATED VALVE
- SOLENOID VALVE
- BACK PRESSURE REGULATOR
- DIAPHRAGM VALVE
- FLOAT VALVE
- PUMP
- EXHAUST FAN
- STRAINER
- CONDENSATE TRAP

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14
STRUCTURE		FERMENTER 1	FERMENTER 2	MIXING TANK 1	MIXING TANK 2	TRANSFER CHANNEL	PUMP STATION SUMP 1	PUMP STATION SUMP 2	PUMP STATION SUMP 3					
DESCRIPTION	TREATED AIR INLET	PROCESS EXTRACTED AIR 1	PROCESS EXTRACTED AIR 2	PROCESS EXTRACTED AIR 3	PROCESS EXTRACTED AIR 4	PROCESS EXTRACTED AIR 5	PROCESS EXTRACTED AIR 6	PROCESS EXTRACTED AIR 7	PROCESS EXTRACTED AIR 8	RECIRCULATION WATER AND BLOWDOWN	BLOWDOWN	RECIRCULATION LINE TO IRRIGATION	SUMP MAKE-UP WATER	BIOFILTER MEDIA IRRIGATION	TOTAL MAKE-UP WATER
EXTRACTION VOLUME															
FLOW RATE	2067 m^3/hr	495.62 m^3/hr	495.62 m^3/hr	124.88 m^3/hr	124.88 m^3/hr	108.00 m^3/hr	240.00 m^3/hr	240.00 m^3/hr	240.00 m^3/hr	150L/min	2.5m^3/DAY	148L/min	2.74m^3/DAY	135L/DAY	2.87m^3/DAY
LINE SIZE	Ø400	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø40	Ø15	Ø40	Ø40	Ø40	Ø40
TEMPERATURE	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C
HUMIDITY	30 - 80%	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH										5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0
H_2S	50 - 300 ppm									--	--	--	--	--	--

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	R G
DRAWN	JvdW
CHECKED	K M
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 202001279	
DATE 30-06-2022	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2
PROCESS FLOW DIAGRAM
SLUDGE FERMENTATION
ODOUR CONTROL PLANT

DESIGN MANAGER

DATE

SCALE

AMENDMENTS		APPROVED	DATE
0	APPROVED FOR CONSTRUCTION	K M	01/07/22

DRAWING No.

JW NUMBER
JW 13897-ME-038
CONSULTANT'S NUMBER
30300141-12-038
FILE No
0

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PLEASE NOTE:–

1. SOL 1,2&3 ARE PARALLEL AND PERPENDICULAR TO SOL A, WHICH IS 6,303° WEST OF NORTH
2. SOL C AND D ARE PARALLEL AND ARE 6,5° WEST OF NORTH SOL C AND D ARE NOT PERPENDICULAR TO SOL 1, 2 &3
3. SOL B IS 6,514° WEST OF NORTH SOL B IS NOT PERPENDICULAR TO SOL 1, 2 &3

SETTING OUT CO–ORDINATES

System = WGS 29°

Name	Y	X	Z	Description
BA	100823.803	2871076.765	1376.570	Cylindrical Pillar with 5/8" bolt
AA	100777.183	2871068.356	1379.735	Cylindrical Pillar with 5/8" bolt
1A	100991.842	2871158.091	1363.283	Cylindrical Pillar with 5/8" bolt
1B	100675.170	2871123.363	1384.930	Cylindrical Pillar with 5/8" bolt
2A	100987.865	2871267.318	1363.043	Cylindrical Pillar with 5/8" bolt
2B	100674.882	2871232.815	1382.534	Cylindrical Pillar with 5/8" bolt
3A	100996.007	2871377.294	1361.095	12mm Iron Peg in Concrete
3B	100692.014	2871344.022	1378.744	Cylindrical Pillar with 5/8" bolt
DA	101024.621	2871038.563	1364.014	Cylindrical Pillar with 5/8" bolt
DB	100968.814	2871528.809	1363.685	Cylindrical Pillar with 5/8" bolt
EB	100893.543	2871434.772	1368.004	12mm Iron Peg in Concrete
AE	100736.784	2871434.534	1375.070	Cylindrical Pillar with 5/8" bolt
BB	100776.659	2871489.985	1370.984	12mm Iron Peg in Concrete
EA	100936.589	2871056.591	1367.184	12mm Iron Peg in Concrete
JW1	100912.341	2871086.471	1366.307	12mm Iron Peg in Concrete
JW2	100876.200	2871293.492	1366.565	12mm Iron Peg in Paving
JW3	101017.671	2871461.798	1361.505	12mm Iron Peg in Concrete
JW4	100835.043	2871442.499	1371.114	12mm Iron Peg in Concrete

TABLE OF BENCH MARKS

NAME	CO–ORDINATES Y	CO–ORDINATES X	HEIGHT	DESCRIPTION
BM1	100 768,723	2 871 457,051	1372,706	20mm IRON PEG
BM2	100 638,962	2 871 200,650	1382,898	20mm IRON PEG
BM3	100 816,803	2 871 082,845	1378,270	20mm IRON PEG

WASTE SLUDGE THICKENER TERRACE

INSERT B

WAS THICKENER 1

WAS THICKENER PHASE 2

300mø STEEL PLATE WITH 15mm OF 5/8" THREAD

300mm ø CONCRETE PIPE

1200m

300

1000m SQ

SURVEY BEACON

1:20

INSERT A

DISINFECTION TERRACE

CHLORINE CONTACT TANK

EFFLUENT RETICULATION PUMP STATION

EFFLUENT MONITORING LABORATORY

EFFLUENT RETICULATION PUMP STATION (PHASE 2)

SEE INSERT A

DAM 01
TWL 1356,5

800ø AC PIPE FROM DAM 01 REPOSITIONED

OVERFLOW TO DAM 01

PUMPING MAIN TO WAS THICKENER

WAS PUMP STATION

EXISTING DIGESTER SUB STATION

EXISTING 500ø AC PIPE FROM DAM 01

CLARIFER EFFLUENT MONITORING LABORATORY

DIESEL BUND

BOILER ROOM

GAS HOLDER

ELUTRIATION PUMP STATIONS

HYPOCHLORITE PUMP STATION

DIGESTERS' TERRACE LEVEL 1366.00

EXISTING POTABLE WATER PIPES

EXISTING ROAD

FIBRE OPTIC CABLE

EXISTING ELECTRIC CABLE

REACTOR SUBSTR PHASE 2

SUBSTATION 3 FUTURE

REACTOR 1

REACTOR 2 PHASE 2

REACTOR 3 FUTURE

RECYCLE PUMPSTATION

REACTOR FLOW DIVIDER

BALANCING TANK OVERFLOW BYPASS PIPELINE (ø1050 STEEL)

BALANCING TANK OVERFLOW TO EXISTING ø1350 PIPE

INLET CHANNEL TIE–IN TO UNIT 5

BALANCING TANK 1 FUTURE

BALANCING TANK 2

BALANCING TANK FLOW DIVIDER

BALANCING TANK 3 PHASE 2

PST 1 FUTURE

PST 2 FUTURE

PST 3

PST 4

PST 5 PHASE 2

PST 6 PHASE 2

PST FLOW DIVIDER

INLET CHANNEL

MAIN INTAKE SWITCHROOM UNIT 5

DIESEL

PST SUBSTATION

CLARIFIER 1/1

CLARIFIER 1/2

CLARIFIER 1/3

CLARIFIER 2/1 PHASE 2

CLARIFIER 2/2 PHASE 2

CLARIFIER 2/3 PHASE 2

CLARIFIER 3/1 FUTURE

CLARIFIER 3/2 FUTURE

CLARIFIER 3/3 FUTURE

CLARIFIER FLOW DIVIDER

FERMENTATION THICKENER 1 PHASE 2

FERMENTATION THICKENER 2

ODOUR CONTROL PLANT

FERMENTATION MIXING TANKS

MINI–SUB

SCREEN STRUCTURE

REPOSITIONED 800 ø RISING MAIN FROM DAM 01

APPROXIMATE POSITION OF EXISTING 500ø RISING MAIN

NEW ELECTRIC ACTUATED PENSTOCK TO BE INSTALLED FOR NEW H.O.W.

1350ø OVERFLOW PIPE

HEAD OF WORKS

HOW NETWORK BUILDING

SOL 1

SOL 2

SOL 3

SOL A

SOL B

SOL C

SOL D

BM1

BM2

BM3

1A

1B

2A

2B

3A

3B

AA

AE

BB

CB

DA

DB

EA

EB

NSRE1

EJB1

EJB2

EJB3

FLUME

14.15m

50.45m

LEGEND:

- PHASE 1 (EXISTING)
- PHASE 2 – (THIS CONTRACT)
- PHASE 3 – FUTURE
- EXISTING BUILDINGS
- EXISTING BUILDINGS TO BE DEMOLISHED
- NEW PAVING
- NEW ROADS
- EXISTING POTABLE WATER PIPES
- FIBRE OPTIC CABLE

SITE PLAN

PRETORIA KRUGERSDORP HIGHWAY

N14

TO KRUGERSDORP

TO KNOPPIESLAAGTE

WORKS

PIPE BRIDGE

DAINFERN

TO RIVERSANDS FARM STORE

INDABA HOTEL

R511

R55 TO PRETORIA

R564

FOURWAYS

WESTERN BYPASS N1

RANDBURG

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL 011-806 7111
FAX 011-806 7100
EMAIL enquiries@kprsa.co.za

WSP Group Africa (Pty) Ltd
Industrial Division
Building C, Knightsbridge,
33 Sloane Street, Bryanston, 2191
Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

SURVEYED	
DESIGNED	G K
DRAWN	J VD W
CHECKED	K M
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED S. JASSAT	
Pr. Eng. No. 20200127	
DATE 30–06–2022	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

SITE PLAN

GENERAL ARRANGEMENT

DESIGN MANAGER

DATE

SCALE 1:750

	AMENDMENTS	APPROVED	DATE
0	APPROVED FOR CONSTRUCTION	K M	01/07/22

DRAWING No.
JW NUMBER
JW 13896–CE–041
CONSULTANT'S NUMBER
303 00141/12–041
FILE No
0

P:\303-00141\12\A\DRAWINGS\KP\BW1500 NW Unit 5 Mod 2\6 Construction\02 Civil Drawings\30300141-12-041 Rev0.dwg Jun 23, 2022 – 1:35pm

LEGEND:

- NEW ROADS
- NEW CONCRETE PAVING
- NEW STRUCTURES
- EXISTING ROADS

HL GANTRY — HIGH LEVEL PIPE AND CABLE GANTRIES — 1,5m WIDE UNLESS OTHERWISE NOTED

SITE BOUNDARY
NEW SEPTAGE RECEIVING AREA FENCE
NEW SEWER FROM SEPTAGE RECEIVING TO MAIN INLET
MULTIPLE DISCHARGING BAYS FOR DIFF. TRUCKS SIZES
HIGH PRESSURE WASHDOWN POINT
NEW FINAL EFFLUENT SCREENINGS WASHING PS
EXISTING BUILDING BETWEEN TANKS TO BE DEMOLISHED
SEPARATE ENTRANCE FOR SEPTAGE DELIVERY TRUCKS & DEDICATED LANE TO DISCHARGE POINT
GATE
EXISTING DIGESTERS TO BE CONVERTED TO FINAL EFFLUENT STORAGE TANKS
ACCESS STAIRS TO TOP OF BOTH DIGESTERS
EXISTING STEEL GAS HOLDER TO BE DEMOLISHED AND SALVAGED
MAIN ENTANCE GATE
NEW RETAINING WALL
EXISTING HT CABLES TO BE RE-ROUTED
DIESEL TANK & BUND
WASHWATER PIPEWORK
CONCRETE
CHANNEL TIE-IN TO UNIT 4
DEMOLISH
NEW HOW COMBINED MCC/PLC BUILDING
TERRACE ACCESS STAIRS
SCREENINGS COMPACTORS
CONCRETE
NEW DEGRITTER
HL GANTRY
WALKWAY
CONCRETE
NEW HOW (UNIT 4)
HL GANTRY (3m)
STONE TRAP
TEMPORARY ROAD
CONCRETE
UNIT 4 GRIT CLASSIFIERS
NEW COMBINED BLOWER BUILDING ABOVE SCREEN PRESS
HL GANTRY
HOW (NORTH)
HL GANTRY
HL GANTRY ABOVE WALKWAY
UNIT 3
UNIT 5
FILL BEHIND NEW RETAINING WALL
CHANNEL TIE-INTO UNIT 3
HL GANTRY
HL GANTRY
EXISTING OFFICE
GRIT CLASSIFIERS
WASHWATER PIPEWORK
HOW (SOUTH)
WALKWAY
EXISTING ROAD TO BE WIDENED
CONCRETE
HOW NETWORK BUILDING
EXISTING CONCRETE GRIT CLASSIFIER TO BE DEMOLISHED
CHANNEL TIE-IN TO UNIT 5
SCREENINGS COMPACTORS
CONCRETE
WIDENING OF INLET CHANNEL TO UNIT 5
EXISTING BLOWER AND GENSET ROOM TO BE DEMOLISHED
EXISTING OPERATOR'S ROOM TO BE DEMOLISHED

FOR INFORMATION ONLY

CONSULTING ENGINEERS

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2128
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SURVEYED	
DESIGNED	S. J.
DRAWN	J VD W
CHECKED	R G
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERWITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

HEAD OF WORKS AND SEPTAGE RECEIVING

PROPOSED ARRANGEMENT

DESIGN MANAGER

DATE

SCALE 1:250

	AMENDMENTS	APPROVED	DATE
P1	FOR INFORMATION ONLY	S J	04/07/17
P2	LAYOUT REVISED	S J	30/11/18
P3	RETAINING WALL REVISED	S J	04/04/19
P4	TEMPORARY ROAD ADDED, ETC.	S J	17/07/19

DRAWING No.

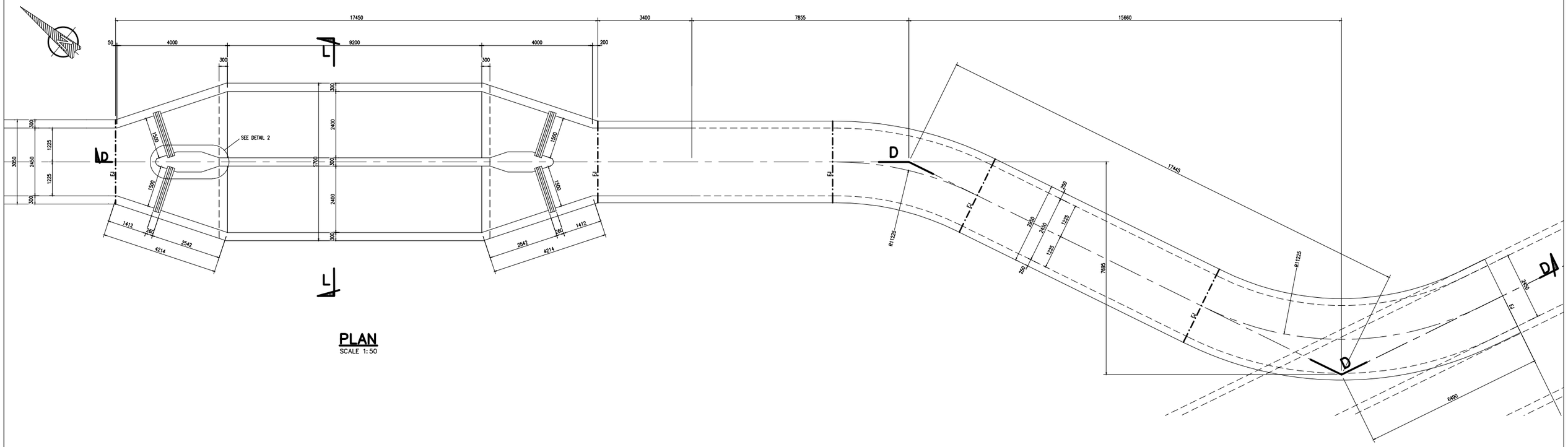
JW NUMBER
JW 13896-CE-699

CONSULTANT'S NUMBER
303 00141-12-699

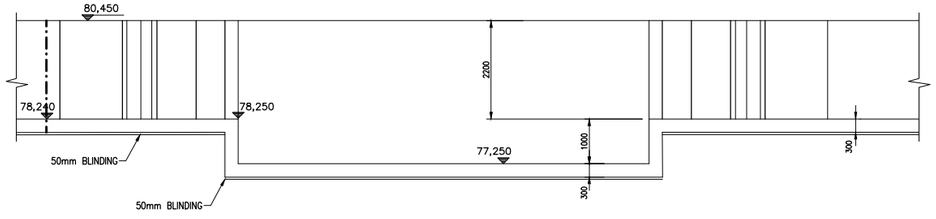
FILE No

P1 P2 P3 P4

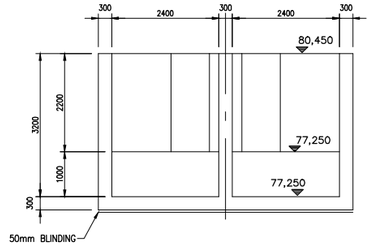
P:\303-00141\12\A\DRAWINGS\KP\BWW1500 NW Unit 5 Mod 2\4 Design\1 Civil\HEAD OF WORKS\303001141-12-700 RevP4.dwg Aug 05, 2019 - 10:22am



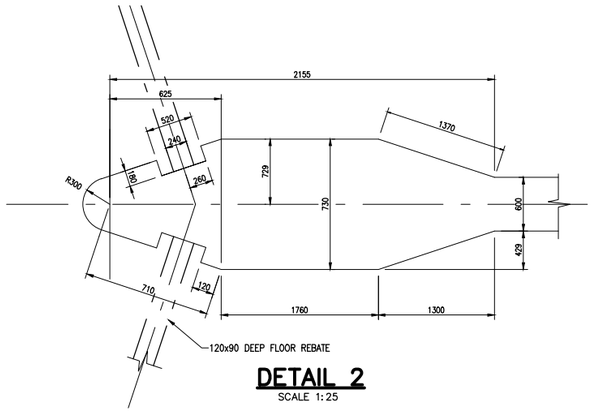
PLAN
SCALE 1:50



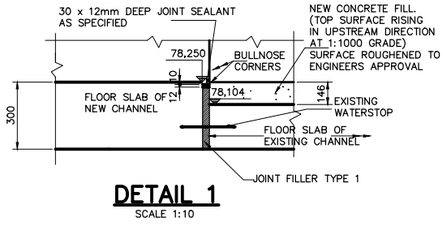
SECTION G–G
SCALE 1:50



SECTION L–L
SCALE 1:50



DETAIL 2
SCALE 1:25



DETAIL 1
SCALE 1:10

NOTES

1. ALL CONCRETE TO BE CLASS 35/26,5 EXCEPT MASS CONCRETE WHICH SHALL BE CLASS 15/38.
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3. EXPANSION JOINTS IN FLOOR SLABS AND WALLS OF CHANNELS TO BE PROVIDED WHERE MARKED 'EJ' ON PLAN. FOR DETAILS OF EXPANSION JOINTS SEE DRG. 30300141–12–632.
4. ALL BOLTS REQUIRED FOR FIXING PLANT TO BE PROVIDED AND DRILLED BY PLANT CONTRACTORS.
5. T.O.W. = TOP OF WALL
   I.L. = INVERT LEVEL
6. FOR REINFORCEMENT DETAILS SEE DRGS. 30300141–12–7..

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	S J
DRAWN	J vd W
CHECKED	S J
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 4 INLET CHANNEL LAYOUT TO SREENING AND DEGRITTING

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS	APPROVED	DATE
P1 FOR INFORMATION ONLY		14/08/17
P2 RE-DESIGNED		14/02/19

DRAWING No.

JW NUMBER
JW13986–CE–701

CONSULTANT'S NUMBER
303 00141–12–701

FILE No

P1 P2

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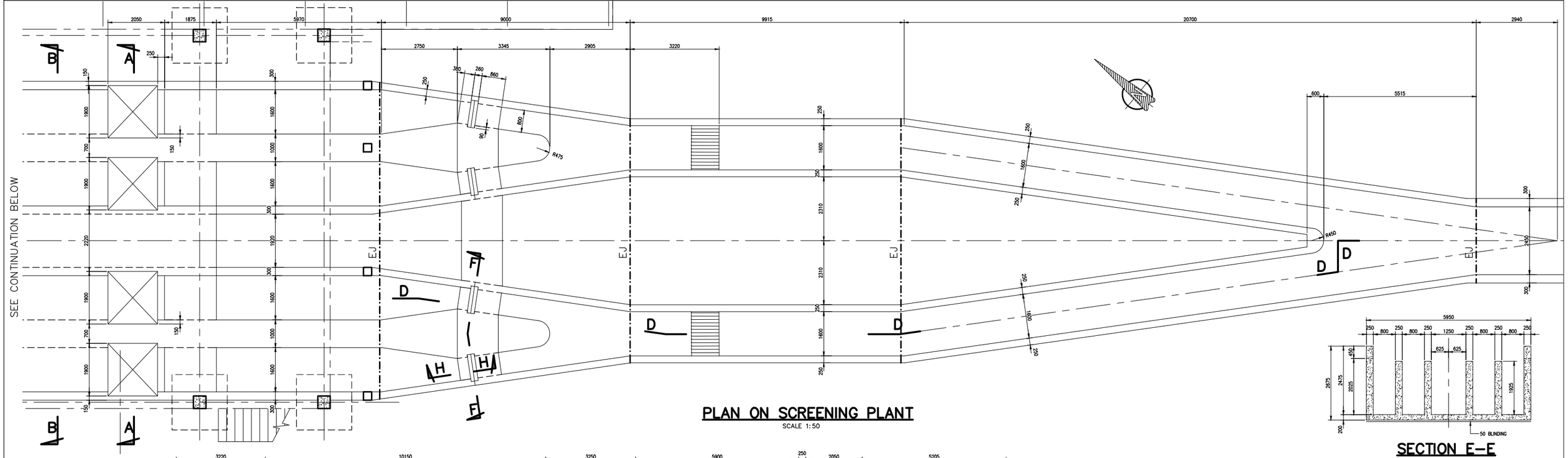
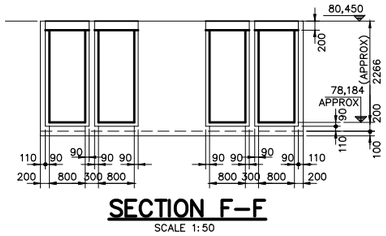


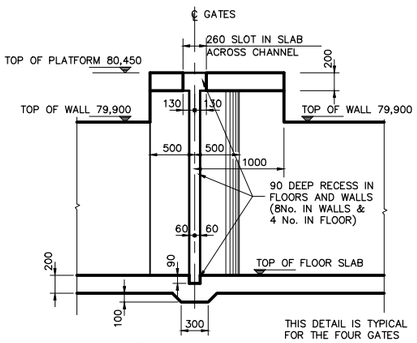
PLAN ON SCREENING PLANT
SCALE 1:50

SECTION E–E
SCALE 1:50

PLAN CONTINUED
SCALE 1:50

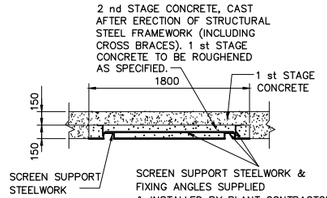


SECTION F–F
SCALE 1:50

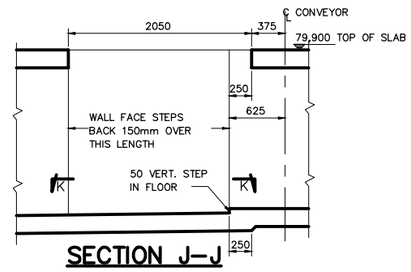


THIS DETAIL IS TYPICAL FOR THE FOUR GATES

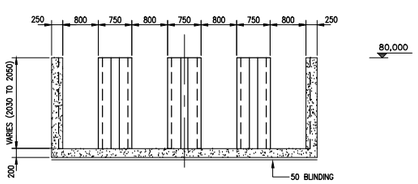
SECTION H–H
SCALE 1:25



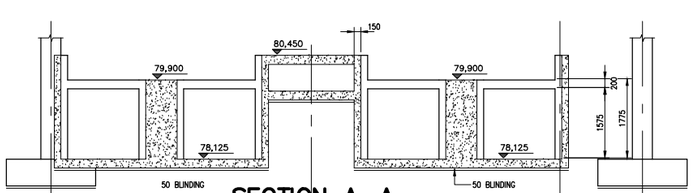
SECTION K–K
SCALE 1:25



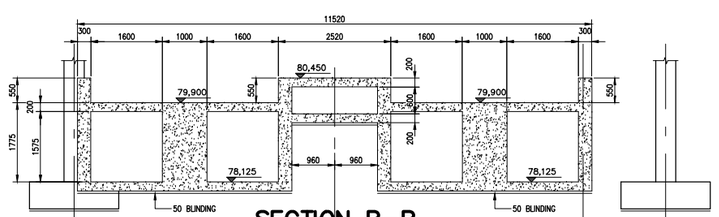
SECTION J–J
SCALE 1:25
(SECTION J1 – J1 SIMILAR BUT TO OPPOSITE HAND)



SECTION C–C
SCALE 1:50



SECTION A–A
SCALE 1:50



SECTION B–B
SCALE 1:50

NOTES

1. ALL CONCRETE TO BE CLASS 35/26,5 EXCEPT MASS CONCRETE WHICH SHALL BE CLASS 15/38.
2. 50mm THICK BLINDING LAYER IN CLASS 15/26,5 CONCRETE TO BE CAST UNDER ALL STRUCTURES.
3. EXPANSION JOINTS IN FLOOR SLABS AND WALLS OF CHANNELS TO BE PROVIDED WHERE MARKED 'EJ' ON PLAN. FOR DETAILS OF EXPANSION JOINTS SEE DRG. 30300141–12–632.
4. ALL BOLTS REQUIRED FOR FIXING PLANT TO BE PROVIDED AND DRILLED BY PLANT CONTRACTORS.
5. T.O.W. = TOP OF WALL
   I.L. = INVERT LEVEL
6. FOR REINFORCEMENT DETAILS SEE DRGS. 30300141–12–7..

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Plésold CONSULTING
P.O. BOX 221
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TEL. 011-806 7111
FAX. 011-806 7100
EMAIL. enquiries@kpsa.co.za

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SURVEYED	
DESIGNED	S. J
DRAWN	J. vd. W
CHECKED	S. J
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET
MARSHALLTOWN
2107
TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 4 SCREENING LAYOUT

PLAN, SECTIONS AND DETAILS

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS		APPROVED	DATE
P1	FOR INFORMATION ONLY		15/08/17
P2	RE-DESIGNED		14/02/19

DRAWING No.
JW NUMBER
JW 13896–CE–702
CONSULTANT'S NUMBER
303 00141–12–702
FILE No
P1 P2

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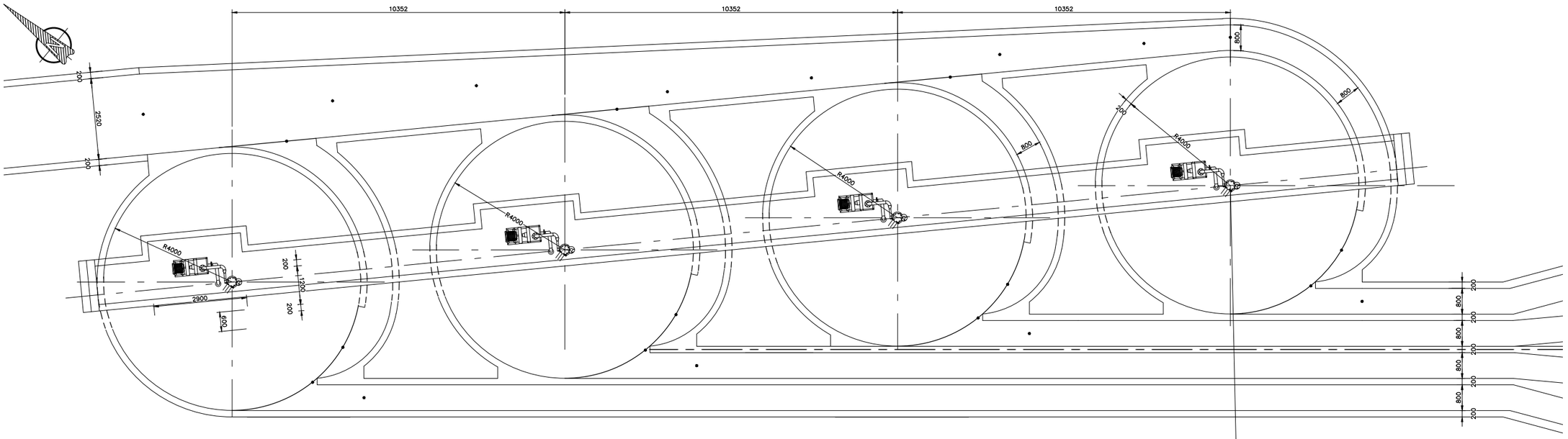
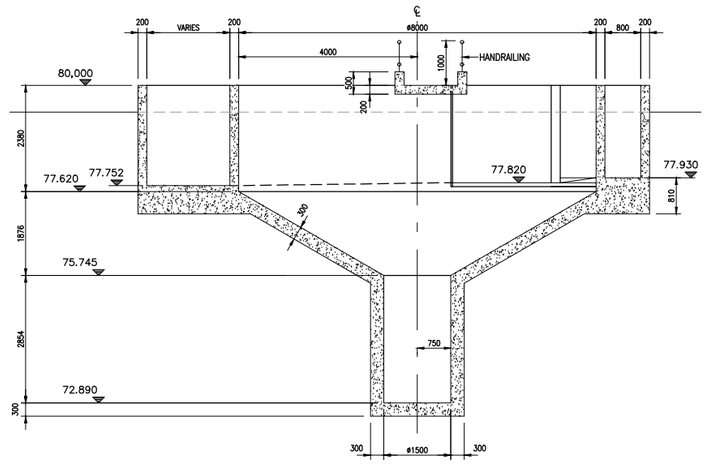


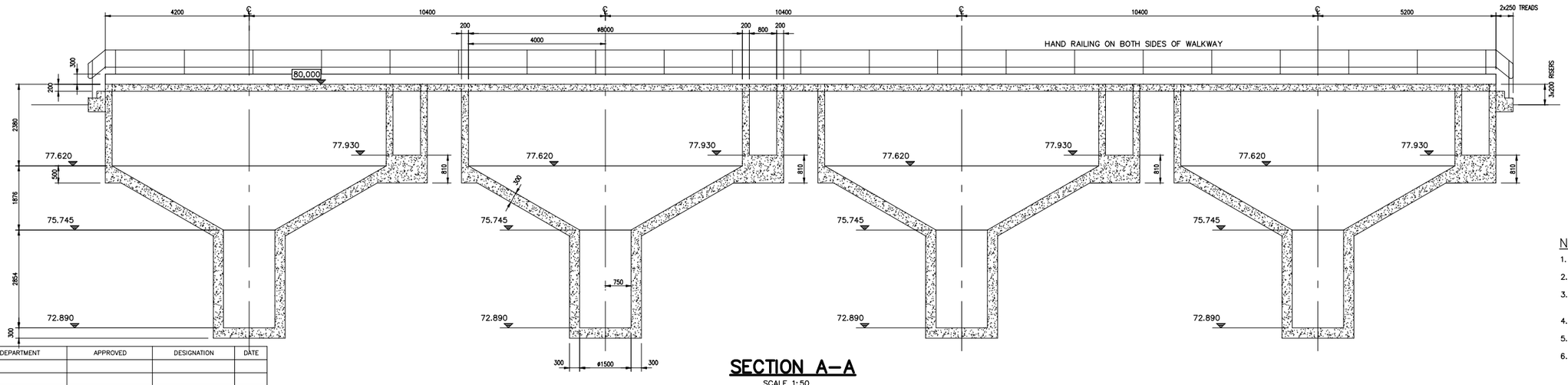
PLAN ON DEGRITTING PLANT

SCALE 1:50



SECTION B–B

SCALE 1:50



SECTION A–A

SCALE 1:50

NOTES

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DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	S J
DRAWN	J vd W
CHECKED	S J
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 4 DEGRITTING LAYOUT
PLAN AND SECTIONS

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS	APPROVED	DATE
P1 FOR INFORMATION ONLY		15/08/17

DRAWING No.

JW NUMBER
*– 703

CONSULTANT'S NUMBER
303 00141–12–703

FILE No

P1

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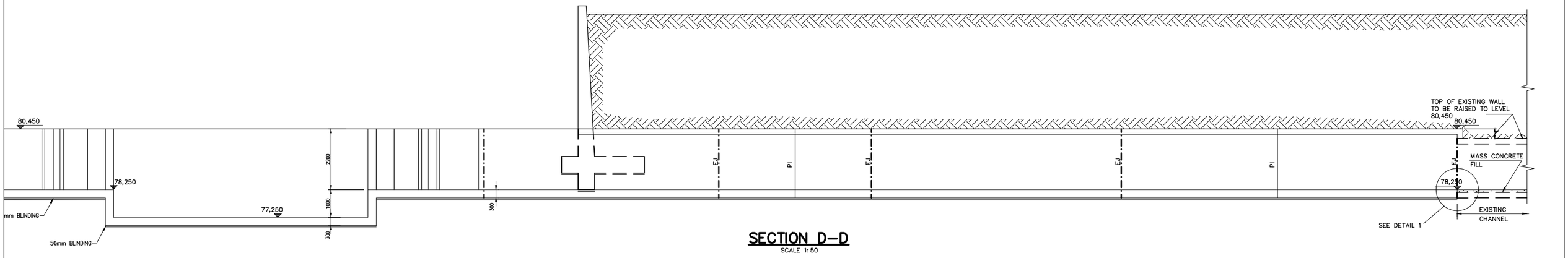
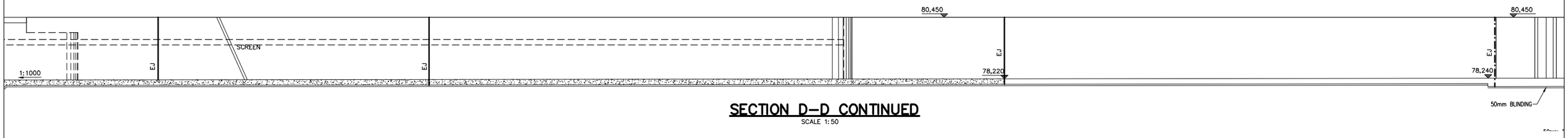
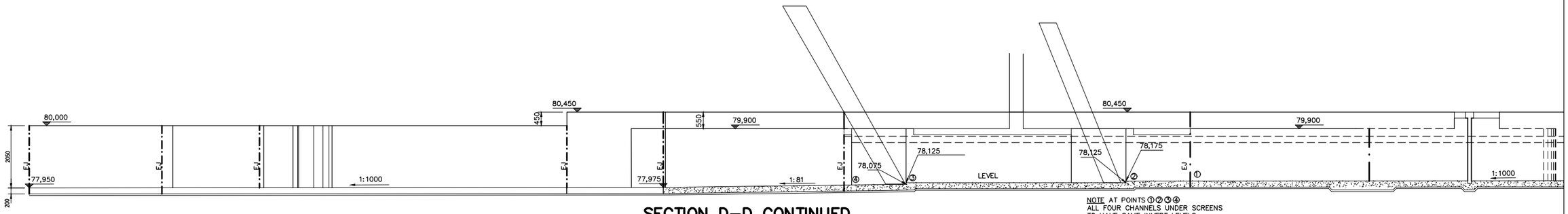


SECTION D–D
SCALE 1:50

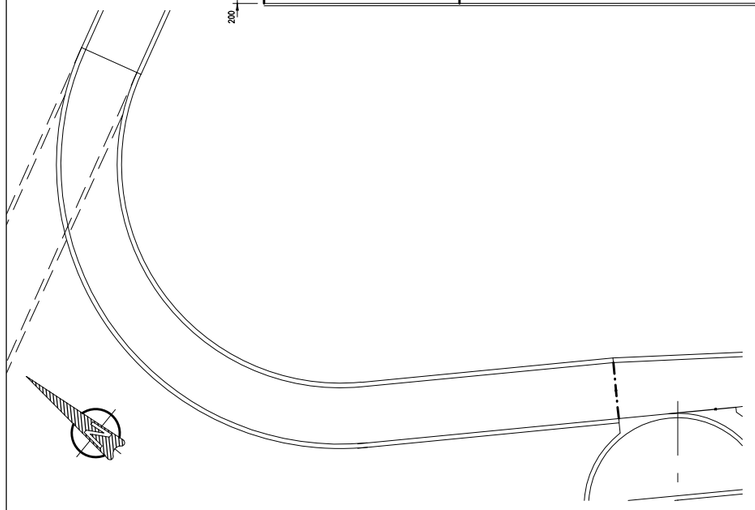


SECTION D–D CONTINUED
SCALE 1:50



SECTION D–D CONTINUED
SCALE 1:50

NOTE AT POINTS ①②③④
ALL FOUR CHANNELS UNDER SCREENS
TO HAVE SAME INVERT LEVELS



PLAN ON CHANNEL TO UNIT 4
SCALE 1:100

NOTES

1. ALL CONCRETE TO BE CLASS 35/26,5 EXCEPT MASS CONCRETE WHICH SHALL BE CLASS 15/38.
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DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DESIGNED	S J
DRAWN	J vd W
CHECKED	S J
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 4 SCREENING AND DEGRITTING PLANT
SECTIONS AND CHANNEL LINK TO EXISTING

DESIGN MANAGER
DATE

SCALE: AS SHOWN

AMENDMENTS	APPROVED	DATE
P1 FOR INFORMATION ONLY		15/08/17

DRAWING No.
JW NUMBER
*– 704
CONSULTANT'S NUMBER
303 00141–12–704
FILE No
P1

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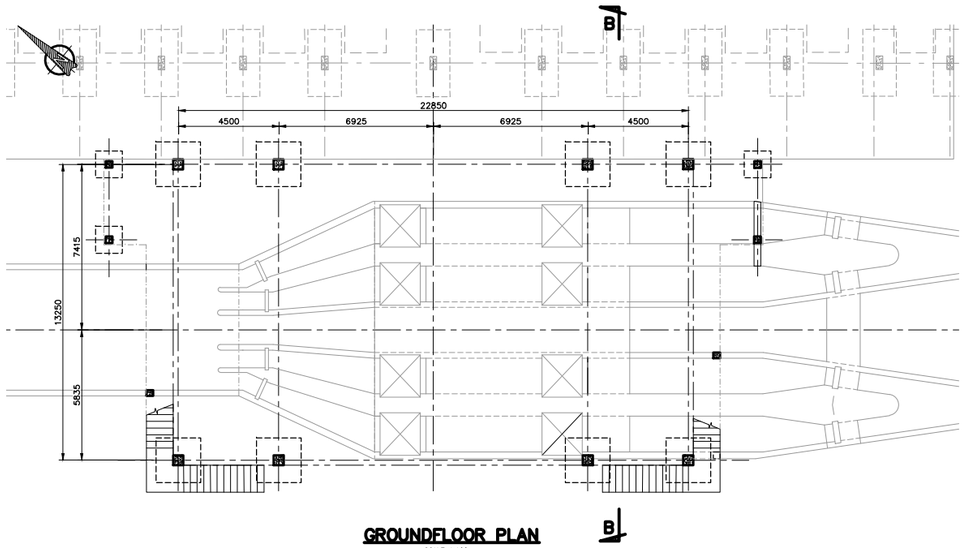
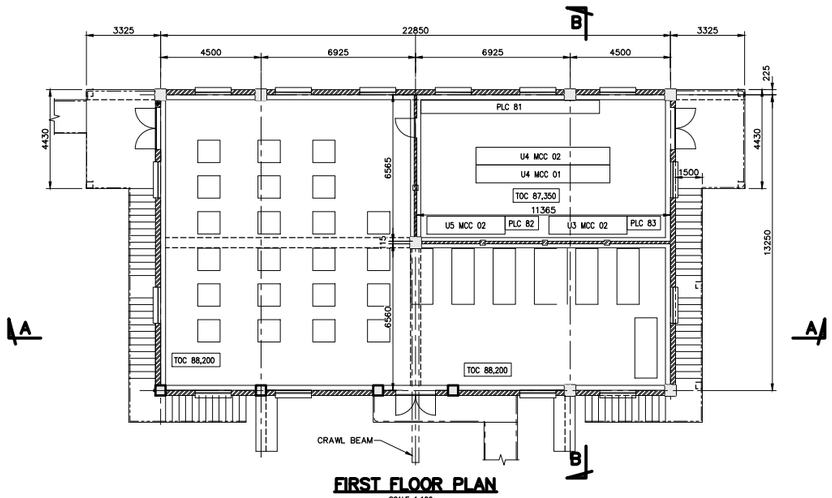
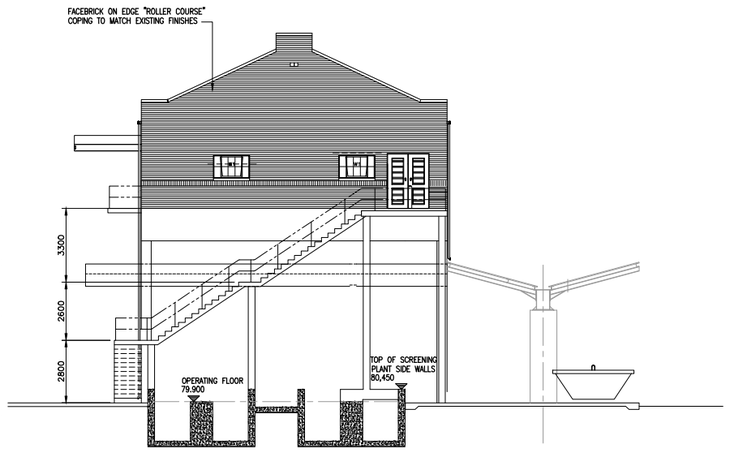


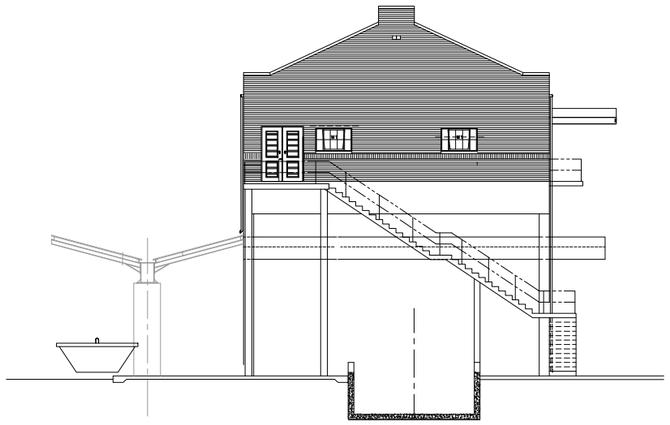
GROUNDFLOOR PLAN
SCALE 1:100

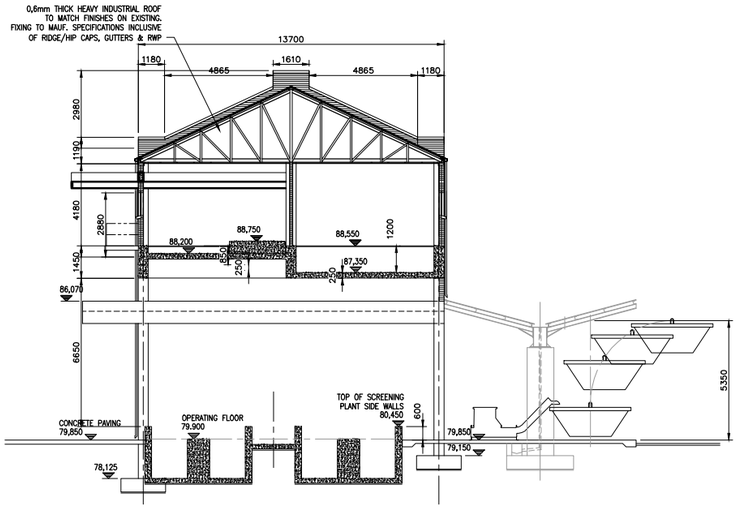


FIRST FLOOR PLAN
SCALE 1:100

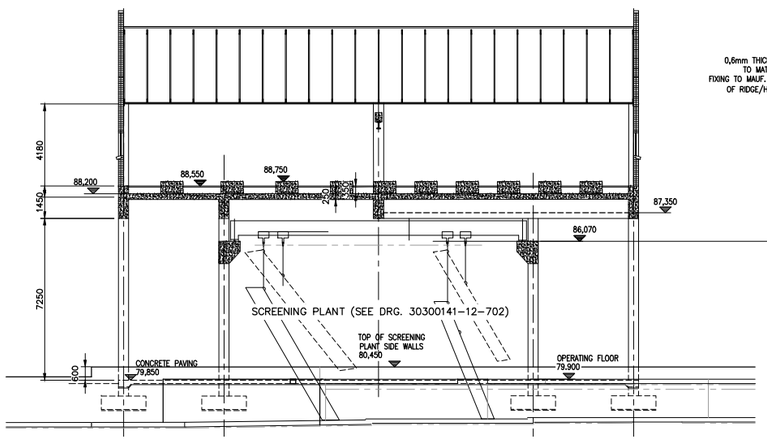


SOUTH-EAST ELEVATION
SCALE 1:100





SECTION B-B
SCALE 1:100



SECTION A-A
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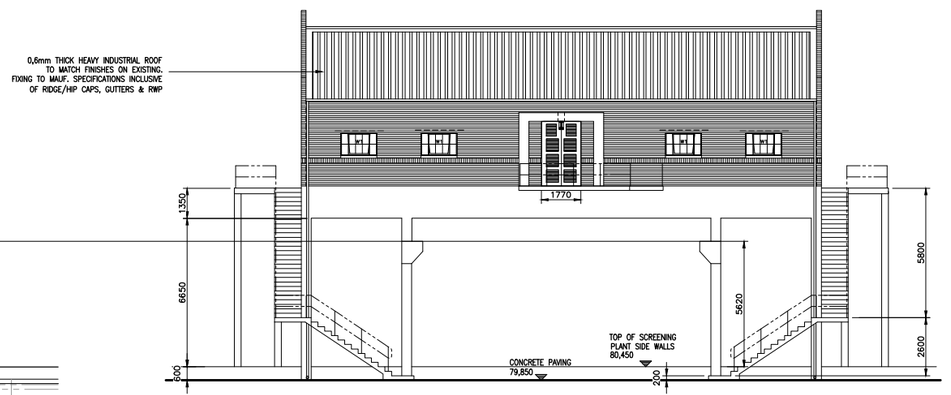

SOUTH-WEST ELEVATION
SCALE 1:100

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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SURVEYED		
DESIGNED	S J	
DRAWN	J vd W	
CHECKED	S J	
SERVICES CHECKED		
GEOTECHNICAL INVESTIGATION		
SERVITUDES		
APPROVED		
Pr. Eng. No.		
DATE		

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 4 SCREEN PRESS AND BLOWER BUILDING

PLAN, SECTIONS AND DETAILS

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS	APPROVED	DATE
P1 FOR INFORMATION ONLY		16/08/17

DRAWING No.

JW NUMBER
JW 13896-CE-705

CONSULTANT'S NUMBER
303 00141-12-705

FILE No

P1

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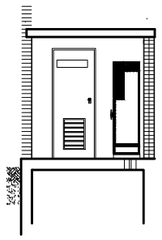

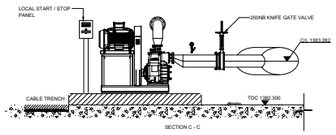

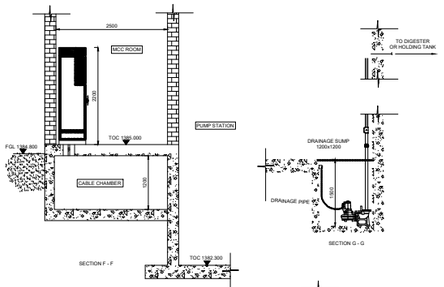

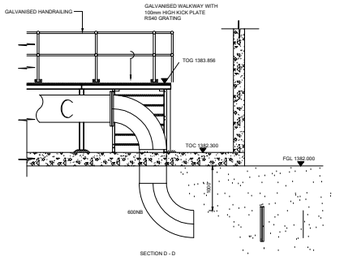

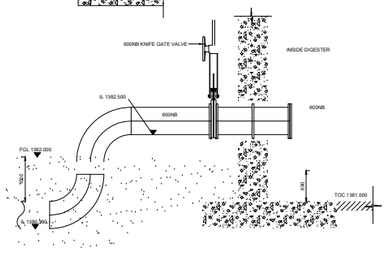

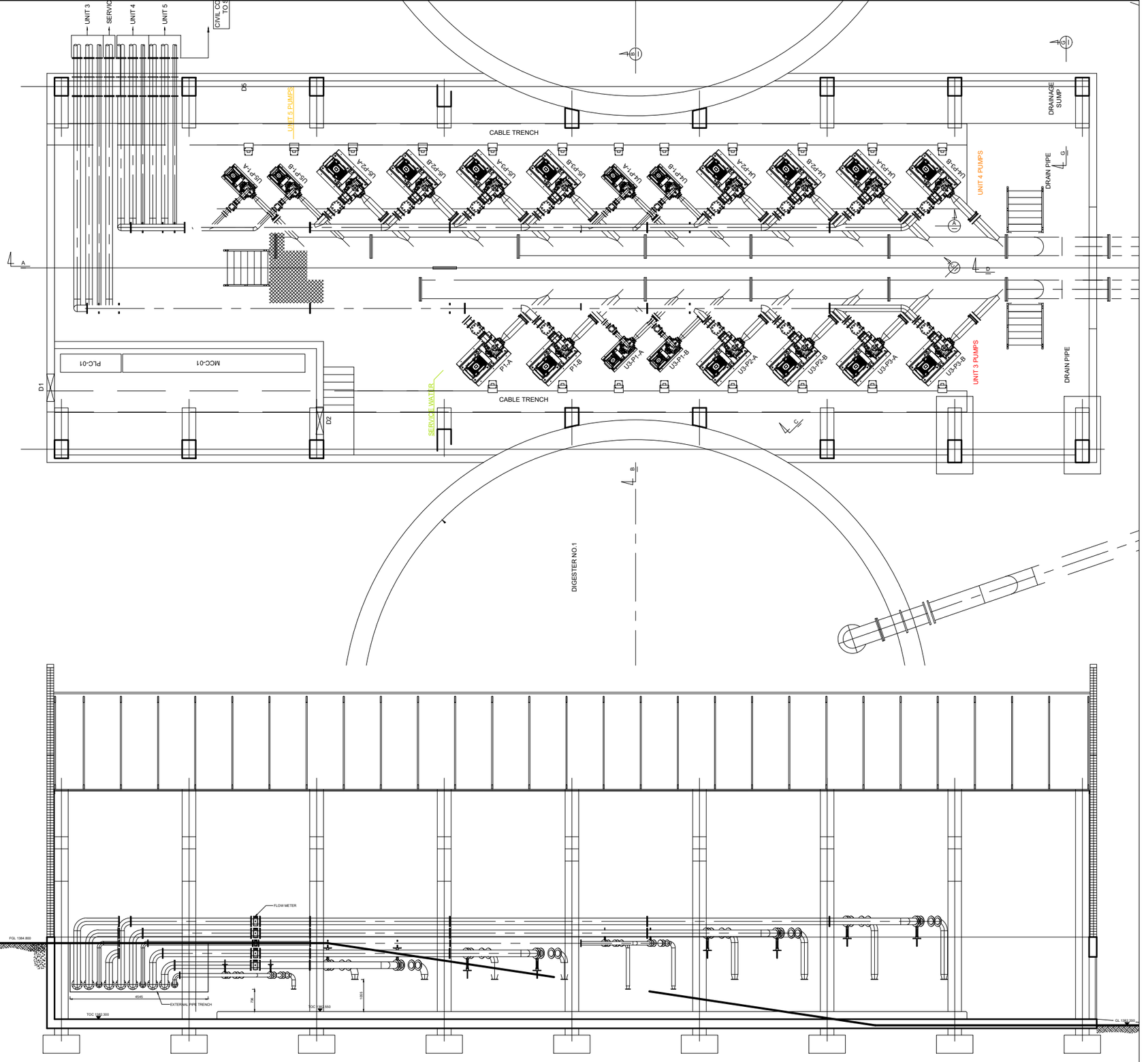

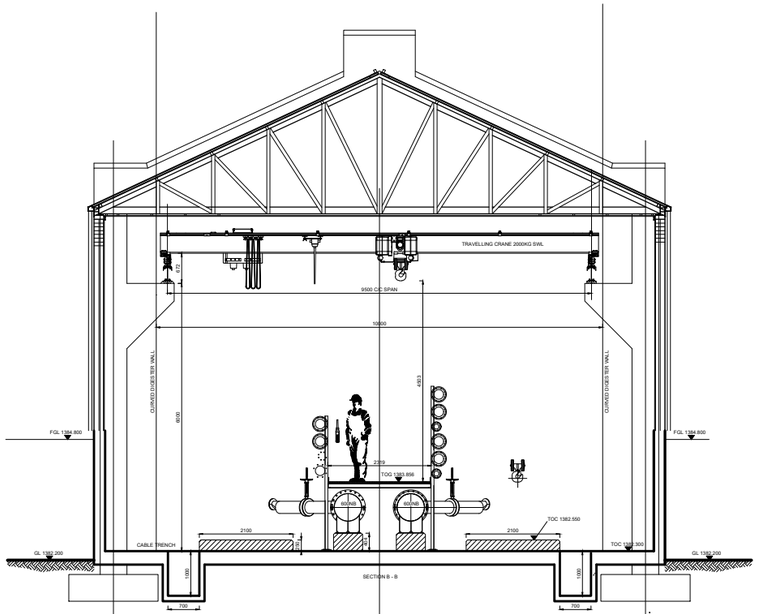

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
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DRAWN	J VD W
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

HEAD OF WORKS
WASHWATER PUMPSTATION
GENERAL ARRANGEMENT

DESIGN MANAGER

DATE

SCALE 1:50

AMENDMENTS			
T	APPROVED FOR TENDER	J R	30/04/19

DRAWING No.

JW NUMBER
JW 13896-CE-706
CONSULTANT'S NUMBER
30300141-12-706
FILE No
T

D:\Knight Piesold Documents\Projects\JHB North\JW13897 Tender Document\30300141-12-706 RevP1.dwg Jul 16, 2025 - 11:14am

PLEASE NOTE:-
1. SOL 1,2&3 ARE PARALLEL AND PERPENDICULAR TO SOL A, WHICH IS 6,303° WEST OF NORTH
2. SOL C AND D ARE PARALLEL AND ARE 6,5° WEST OF NORTH SOL C AND D ARE NOT PERPENDICULAR TO SOL 1, 2 &3
3. SOL B IS 6,514° WEST OF NORTH SOL B IS NOT PERPENDICULAR TO SOL 1, 2 &3

SETTING OUT CO-ORDINATES

POINT NAME	Y CO-ORDINATE	X CO-ORDINATE	Z VALUE
AA	100777,22	2871068.305	1379,708
BA	100823,803	2871076,765	1376,570
CA	100886,380	2871050,871	1372,217
DA	101024,642	2871038.584	1364,007
EA	100936,588	2871056,591	
AB	100736,764	2871434,556	1375,051
BB	100776,756	2871489,158	1372,179
CB	100837,556	2871481,853	1371,315
DB	100968,784	2871528,846	1363,655
EB	100893,750	2871432,570	
1A	100991,845	2871158,091	1363,274
1B	100675,082	2871123,39	1384,850
2A	100987,884	2871267,355	1363,028
2B	100674,888	2871232,805	1382,514
3A	100995,997	2871377,309	1361,621
3B	100692,011	2871344,025	1378,722

TABLE OF BENCH MARKS

NAME	CO-ORDINATES Y	CO-ORDINATES X	HEIGHT	DESCRIPTION
BM1	100 768,723	2 871 457,051	1372,706	20mm IRON PEG
BM2	100 638,962	2 871 200,650	1382,898	20mm IRON PEG
BM3	100 816,803	2 871 082,845	1378,270	20mm IRON PEG

LEGEND:

- TRENCH
- DUCT
- SLEEVES
- MANHOLE
- EXISTING MV CABLE ROUTE

EXISTING MV CABLE ROUTE TO FST 1 MINI SUB

EXISTING MV CABLE ROUTE TO US MV MINI SUB

WAS THICKENER 1

WAS THICKENER PHASE 2

WASTE SLUDGE THICKENER TERRACE

INSERT B

300mØ STEEL PLATE WITH 15mm OF 5/8" THREAD

1200m

300mm Ø CONCRETE PIPE

300

1000m SQ

SURVEY BEACON

1:20

DAM 01
TWL 1356,5

800Ø AC PIPE FROM DAM 01 REPOSITIONED

OVERFLOW TO DAM 01

PUMPING MAIN TO WAS THICKENER

INSERT A

DISINFECTION TERRACE

CHLORINE CONTACT TANK

EFFLUENT RETICULATION PUMP STATION

EFFLUENT MONITORING LABORATORY

SEE INSERT A

EXISTING ELECTRIC CABLE

FIBRE OPTIC CABLE

EXISTING BUILDINGS

SUBSTATION3 FUTURE

REACTOR SUBSTN PHASE2

REACTOR FLOW DIVIDER

BALANCING TANK 1 FUTURE

BALANCING TANK 2

BALANCING TANK FLOW DIVIDER

REACTOR 1

REACTOR 3 FUTURE

CLARIFIER 3/1 FUTURE

CLARIFIER 3/2 FUTURE

CLARIFIER 3/3 FUTURE

CLARIFIER 1/1

CLARIFIER FLOW DIVIDER

CLARIFIER 1/2

CLARIFIER 1/3

BALANCING TANK FLOW DIVIDER

BALANCING TANK FLOW TO EXISTING Ø1350

INLET CHANNEL TIE-IN TO UNIT 5

PST 1 FUTURE

INLET CHANNEL PHASE 1&2

FLUME

PST 2 FUTURE

PST 3

PST 4

INLET CHANNEL

PST FLOW DIVIDER

MAIN INTAKE SWITCHROOM UNIT 5

1350Ø OVERFLOW PIPE

NEW ELECTRIC ACTUATED PENSTOCK TO BE INSTALLED FOR NEW H.O.W.

NEW GRIT DRYING BEDS

APPROXIMATE POSITION OF EXISTING 500Ø RISING MAIN

PST SUBSTATION

ODOUR CONTROL PLANT

FERMENTATION MIXING TANK

FERMENTATION THICKENER 3

SCREEN STRUCTURE

REPOSITIONED 800 Ø RISING MAIN FROM DAM 01

WAS PUMP STATION

EXISTING DIGESTER SUB STATION

EXISTING 500Ø AC PIPE FROM DAM 01

CLARIFER EFFLUENT MONITORING LABORATORY

DIESEL BUND

BOILER ROOM

GAS HOLDER

ELUTRIATION PUMP STATION

HYPOCHLORITE PUMP STATION

DIGESTERS' TERRACE LEVEL 1366.00

DIGESTER No. 1

DIGESTER No. 2

DIGESTER No. 3

DIGESTER No. 4

DIGESTER No. 5

DIGESTER No. 6

EXIST ROAD

SOL 1

SOL 2

SOL 3

SOL A

SOL B

SOL C

SOL D

BM1

BM2

BM3

2871100 X

2871200 X

2871300 X

2871400 X

2871500 X

101100 Y

101000 Y

100900 Y

100800 Y

100700 Y

100600 Y

100500 Y

LEGEND:

- PHASE 1 (EXISTING)
- PHASE 2 – (THIS CONTRACT)
- PHASE 3 – FUTURE
- EXISTING BUILDINGS
- NEW PAVING
- NEW ROADS
- NEW CONCRETE ROAD
- EXISTING ROADS
- EXISTING POTABLE WATER PIPES
- FIBRE OPTIC CABLE

SITE PLAN

PRETORIA KRUGERSDORP HIGHWAY

N14

KRUGERSDORP

WORKS

TO KNOPPIESLAAGTE

PIPE BRIDGE DAINFERN

TO RIVERSANDS FARM STORE

INDABA HOTEL

R511

R55 TO PRETORIA

R564

FOURWAYS

WESTERN BYPASS N1

RANDBURG

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	BM
DRAWN	MD
CHECKED	BM
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
SITE PLAN
CABLE ROUTE AND MANHOLE LAYOUT

DESIGN MANAGER

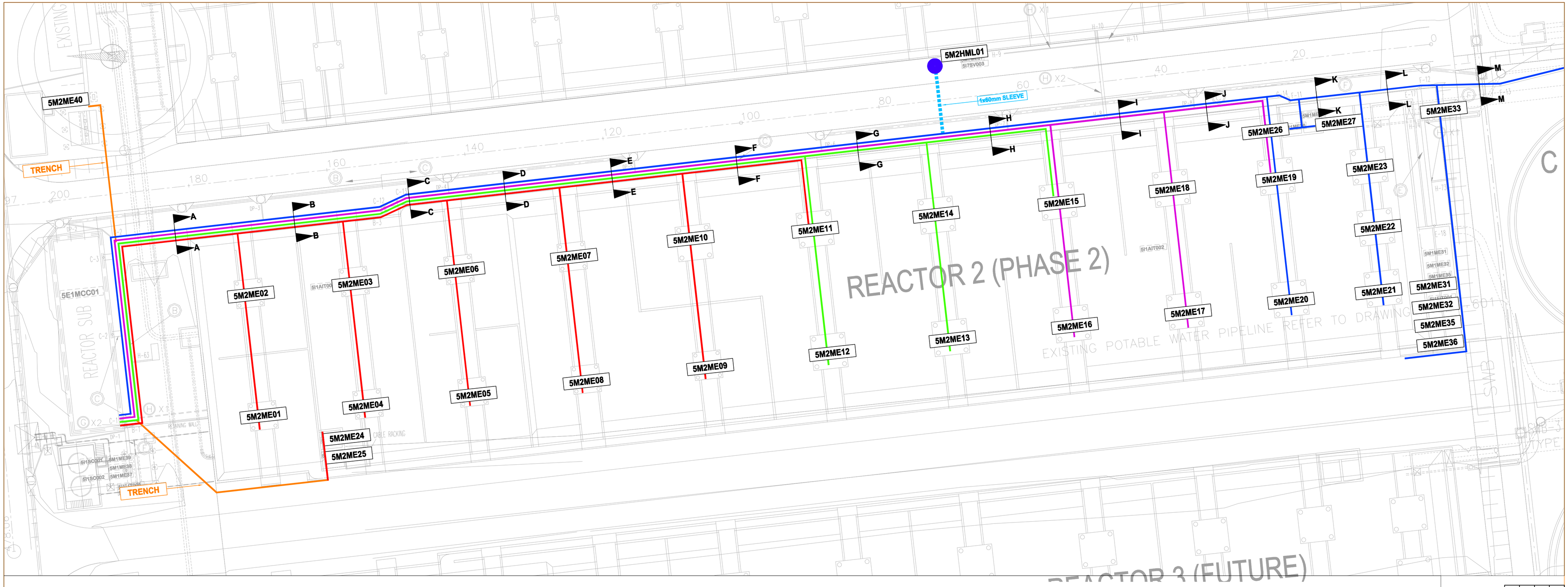
DATE

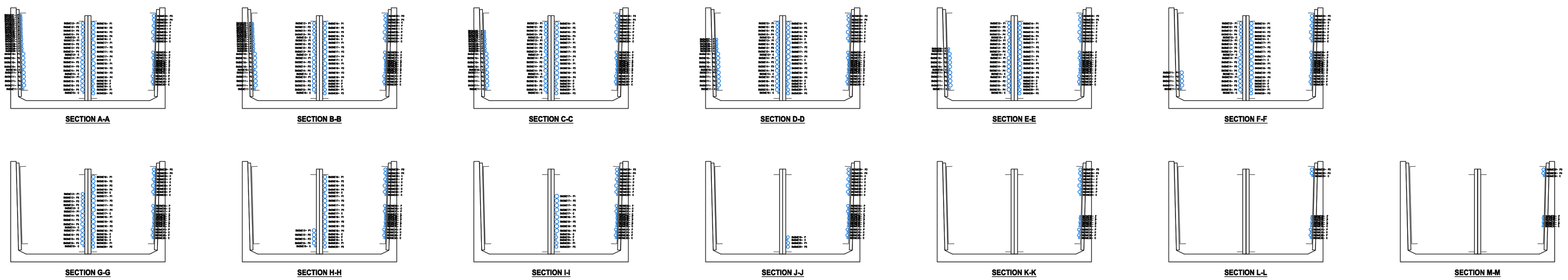
SCALE 1:750

AMENDMENTS		APPROVED	DATE
TO	FOR TENDER	BM	15.11.18

DRAWING No.
JW NUMBER
JW13021R-5E2-CR01
CONSULTANT'S NUMBER
ING0645D-5E2-CR01
FILE No
BWW
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E2-MCC-01 (US MOD 2)\Cable Routes\ING0645D-5E2-CR01 rev10.dwg May 31, 2019 – 2:09pm





CABLE DUCT SECTIONS
N.T.S

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DESIGNED	BM
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SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
REACTOR
CABLE ROUTING

DESIGN MANAGER
DATE

SCALE: 1:750

AMENDMENTS	APPROVED	DATE
TO FOR TENDER	BM	15.11.18

DRAWING No.

JW NUMBER: JW13021R-5E2-GA02
CONSULTANT'S NUMBER: ING0645D-5E2-GA02
FILE No: BWW
TO

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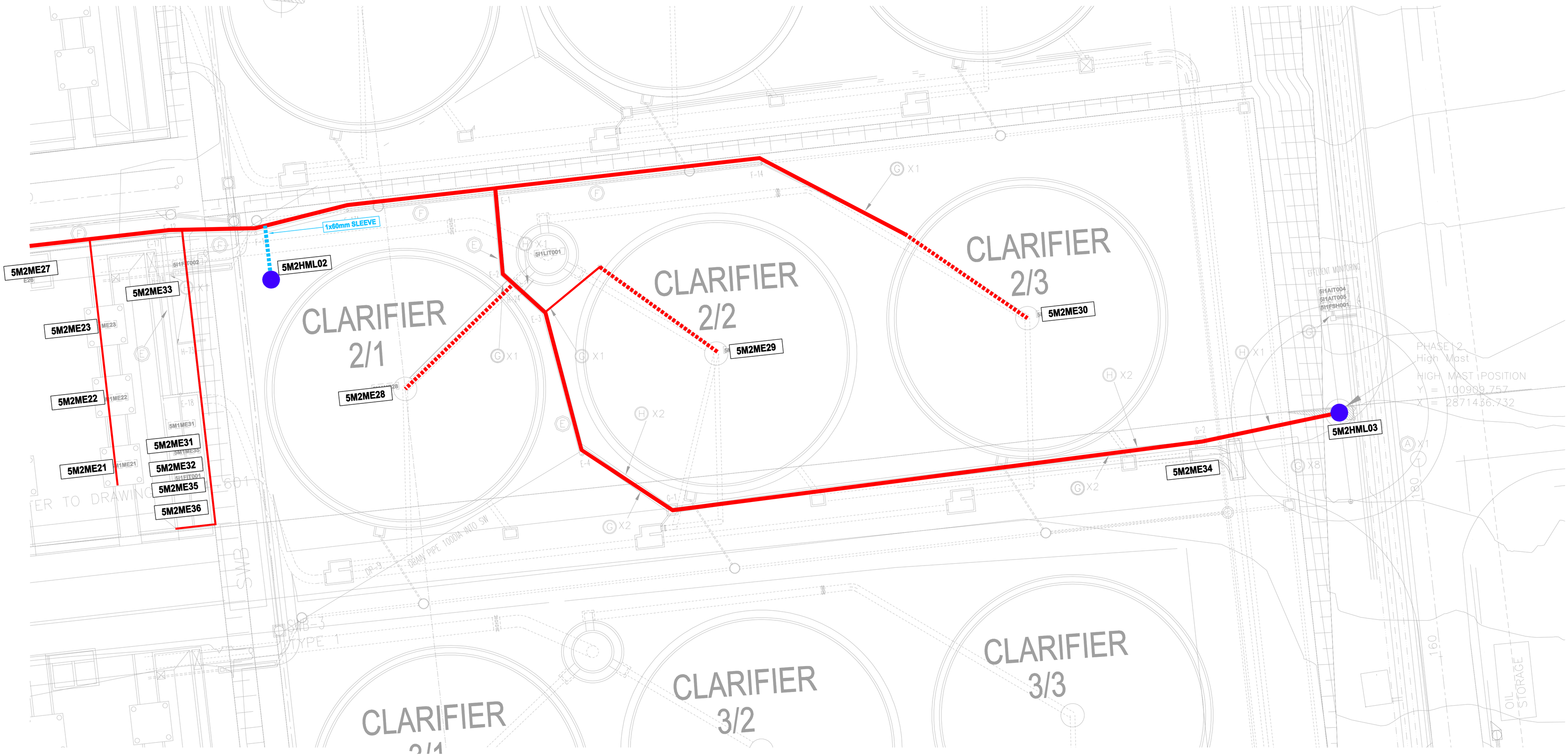

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
CLARIFIERS
CABLE ROUTING

DESIGN MANAGER

DATE

SCALE 1:750

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	15.11.18

DRAWING No.

JW NUMBER
JW13021R-5E2-GA03
CONSULTANT'S NUMBER
ING0645D-5E2-GA03
FILE No
BWW
T0

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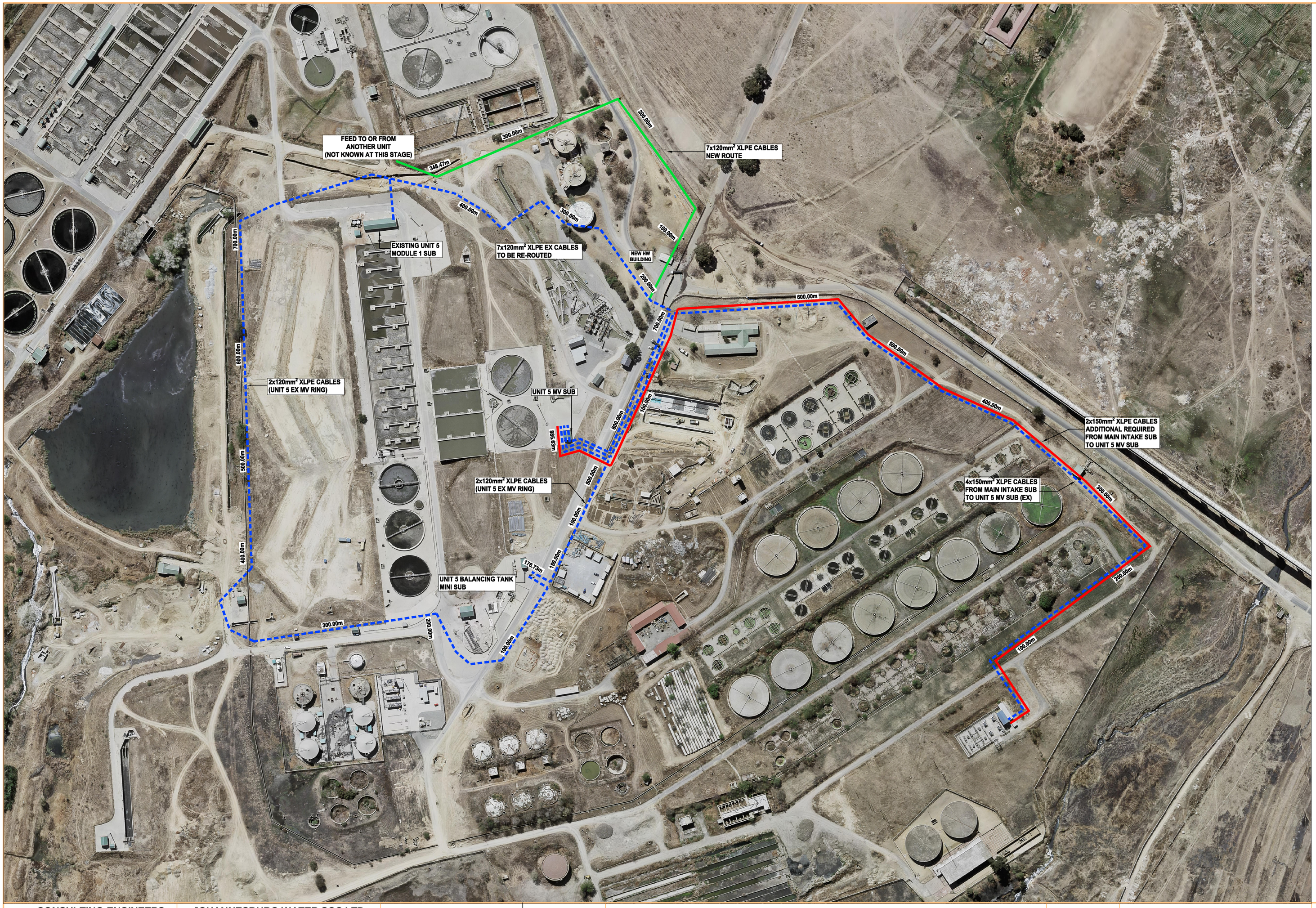

EXISTING CABLES

RE-ROUTED CABLES

ADDITIONAL CABLES

DEPARTMENT | APPROVED | DESIGNATION | DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING

P.O. BOX 221
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SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

OVERALL SITE PLAN

CABLE ROUTE

NEW, EXISTING AND RE-ROUTED

DESIGN MANAGER

DATE

SCALE

AMENDMENTS

		APPROVED	DATE
TO	FOR TENDER	D GABASHE	17.01.19

DRAWING No.

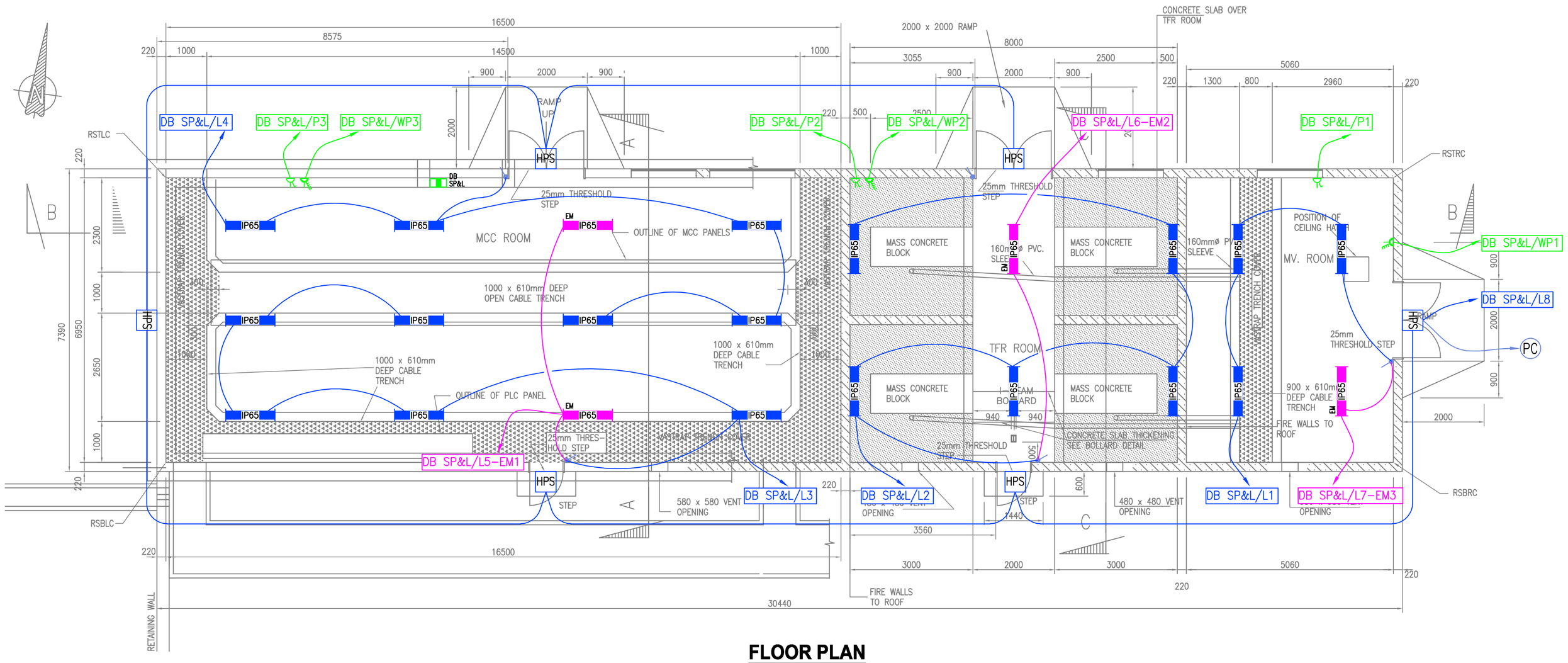
JW NUMBER

CONSULTANT'S NUMBER
ING0645D-5E2-CR04

FILE No
1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E2-MCC-01 (U5 MOD 2)\Cable Routes\ING0645D-5E2-CR04 revT0.dwg May 31, 2019 – 2:13pm



FLOOR PLAN
SCALE 1:100

LEGEND:

- IP65 — 2x58W INDUSTRIAL CORROSION RESISTANT FLUORESCENT (IP65 INGRESS PROTECTION) c/w MOUNTING ACCESSORIES
- EM IP65 — 2x58W INDUSTRIAL CORROSION RESISTANT FLUORESCENT (IP65 INGRESS PROTECTION) WITH BUILT IN EMERGENCY BACK-UP 1 HOUR 50% LIGHT OUTPUT c/w MOUNTING ACCESSORIES
- HPS — 80W HPS BULKHEAD MOUNTED 150mm ABOVE THE DOOR LEVEL
- 1-WAY INDUSTRIAL LIGHT SWITCH MOUNTED AT 1200mm AFFL
- PC — PHOTO-ELECTRIC CELL (DAYLIGHT SWITCH)
- 16A SINGLE PHASE SOCKET OUTLET
- 16A 3 PHASE WELDING SOCKET OUTLET

DEPARTMENT	APPROVED	DESIGNATION	DATE

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APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

MCC AND MV SUBSTATION

SMALL POWER AND LIGHTING LAYOUT

DESIGN MANAGER

DATE

SCALE 1:750

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	DG	15.11.18

DRAWING No.

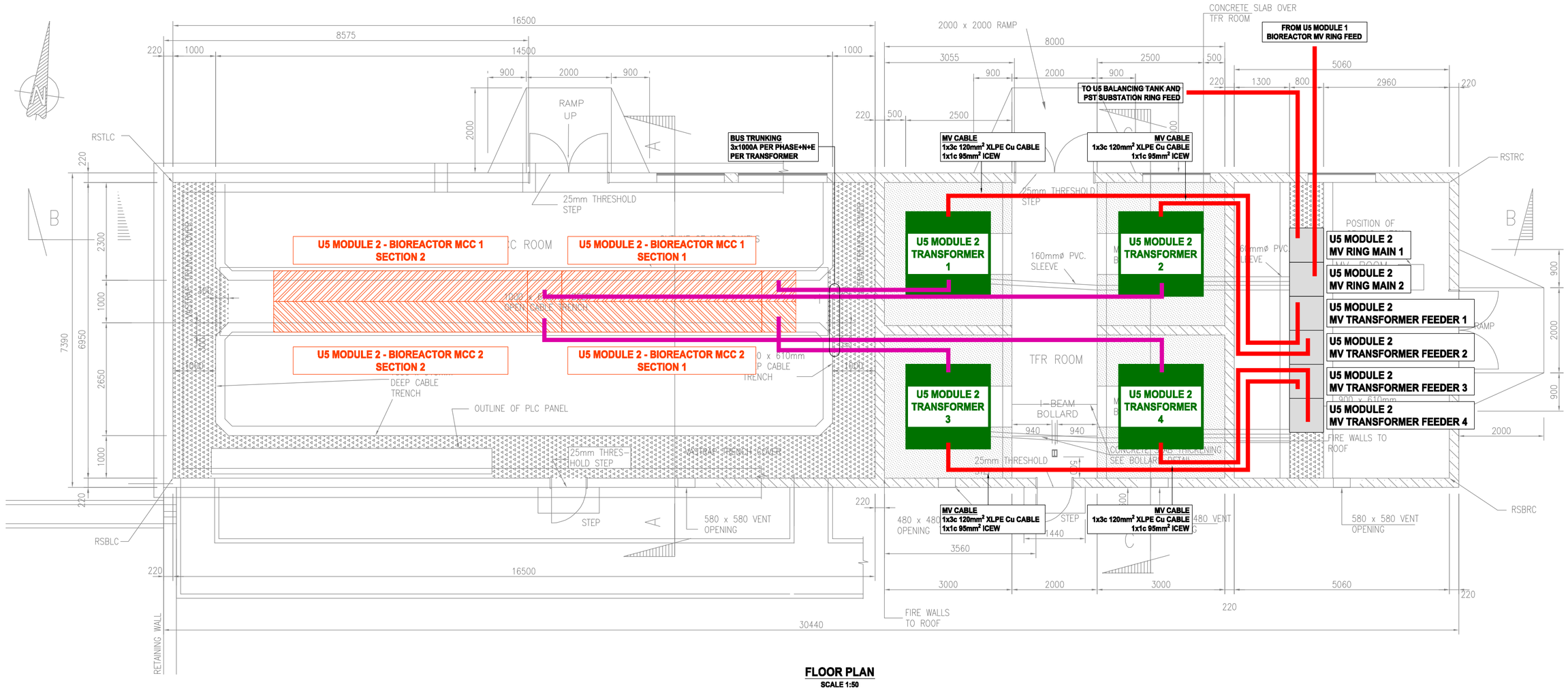
JW NUMBER JW13021R-5E2-GA02

CONSULTANT'S NUMBER ING0645D-5E2-GA02

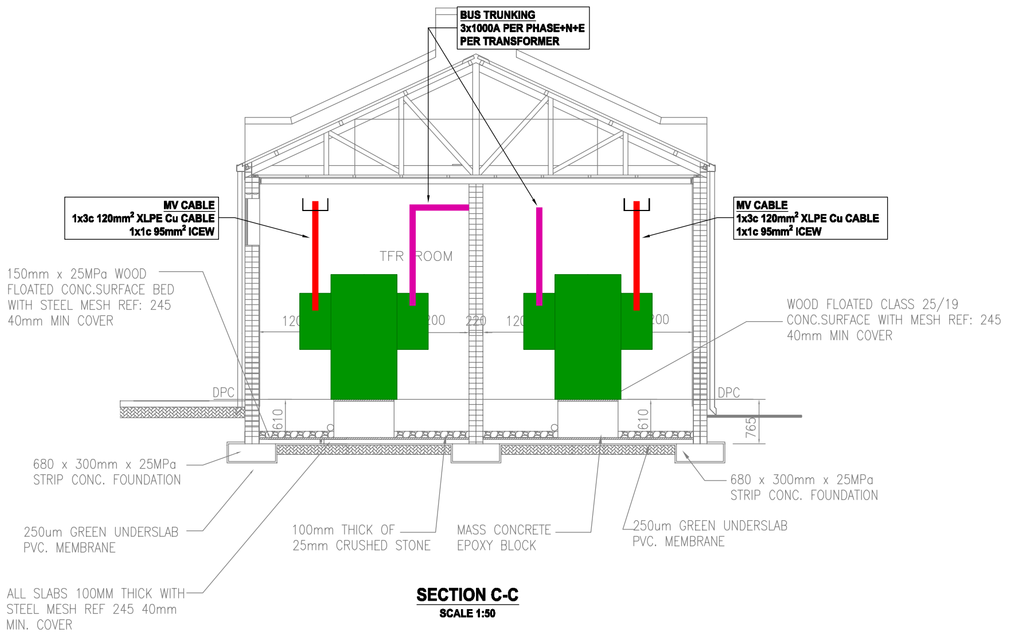
FILE No BWW

T0

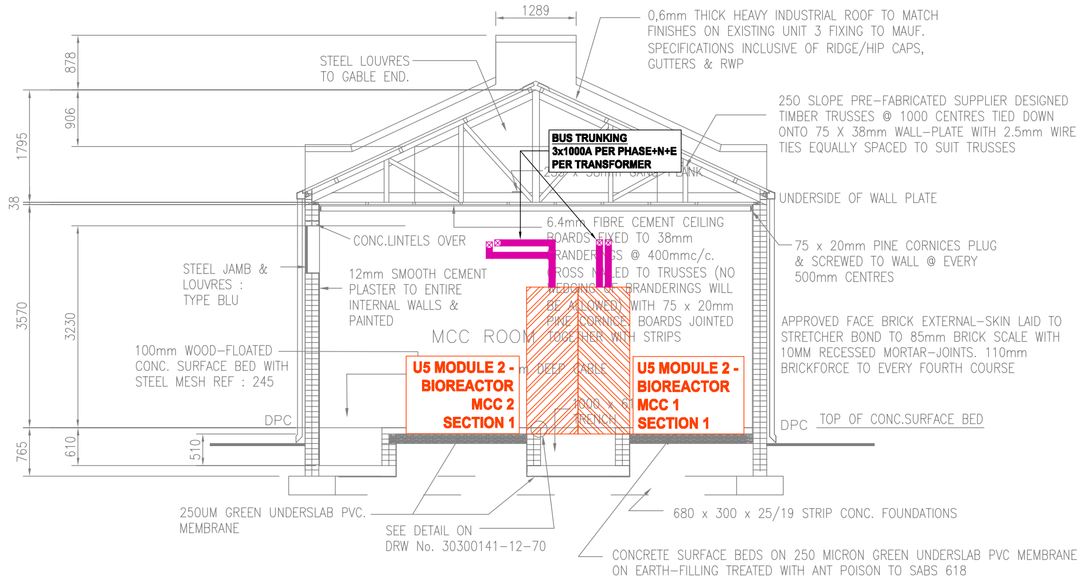
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E2-MCC-01 (U5 MOD 2)\General Arrangements\ING0645D-5E2-GA02 revT0.dwg May 31, 2019 – 2:23pm



FLOOR PLAN
SCALE 1:50



SECTION C-C
SCALE 1:50



SECTION A-A
SCALE 1:50

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
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Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

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DESIGNED	BM
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CHECKED	BM
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SERVITUDES	
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Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET
MARSHALLTOWN
2107
TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
MCC AND MV SUBSTATION
EQUIPMENT AND CABLE ROUTING LAYOUT

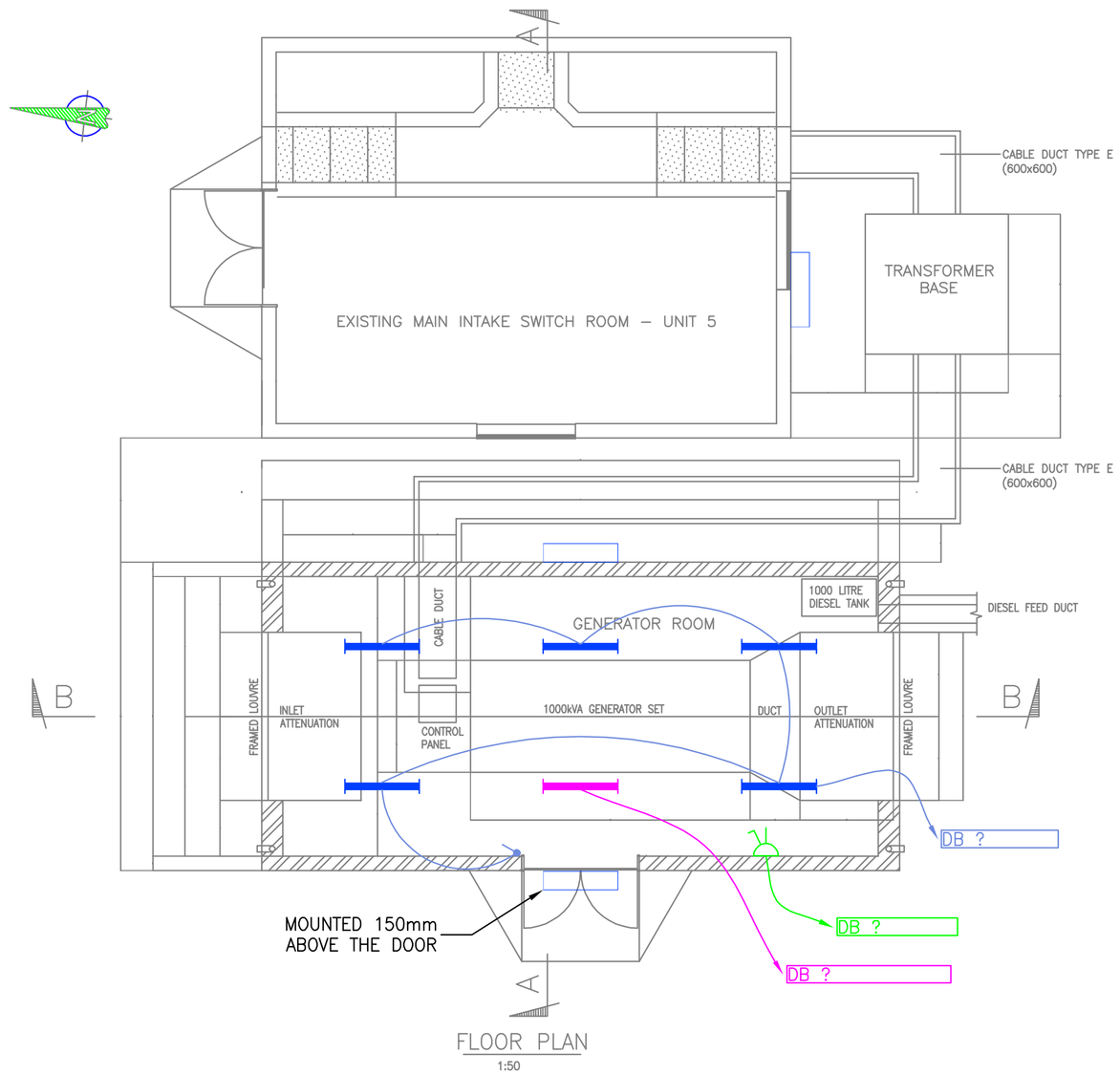
DESIGN MANAGER
DATE

SCALE 1:750

AMENDMENTS	APPROVED	DATE
TO FOR TENDER	BM	15.11.18

DRAWING No.
JW NUMBER
JW13021R-5E2-GA03
CONSULTANT'S NUMBER
ING0645D-5E2-GA03
FILE No
BWW
TO

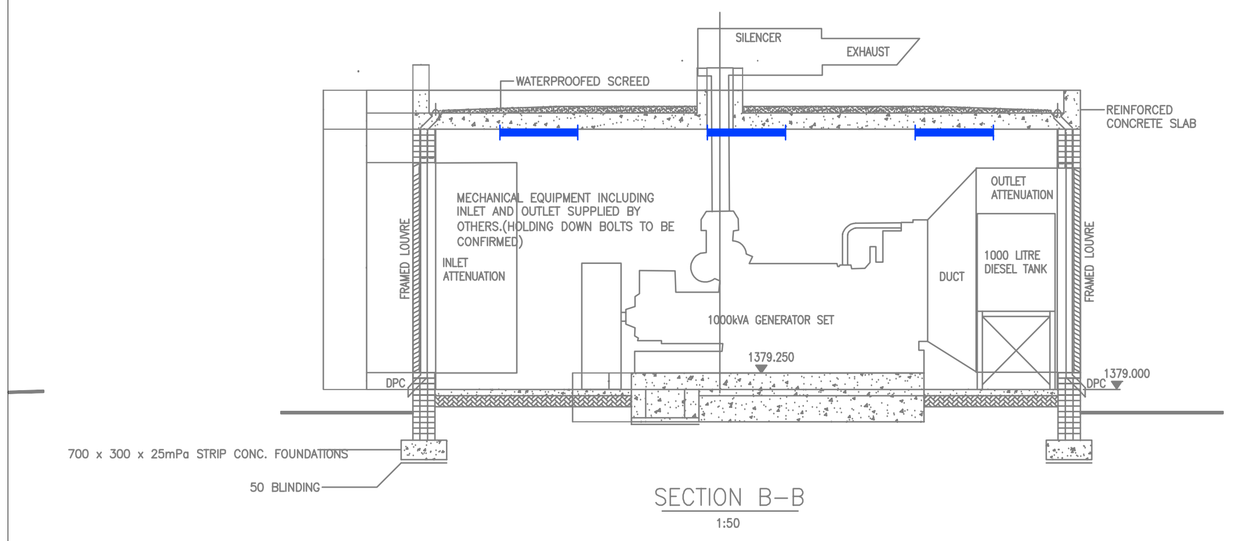
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E2-MCC-01 (U5 MOD 2)\General Arrangements\ING0645D-5E2-GA03 revT0.dwg May 31, 2019 – 2:16pm



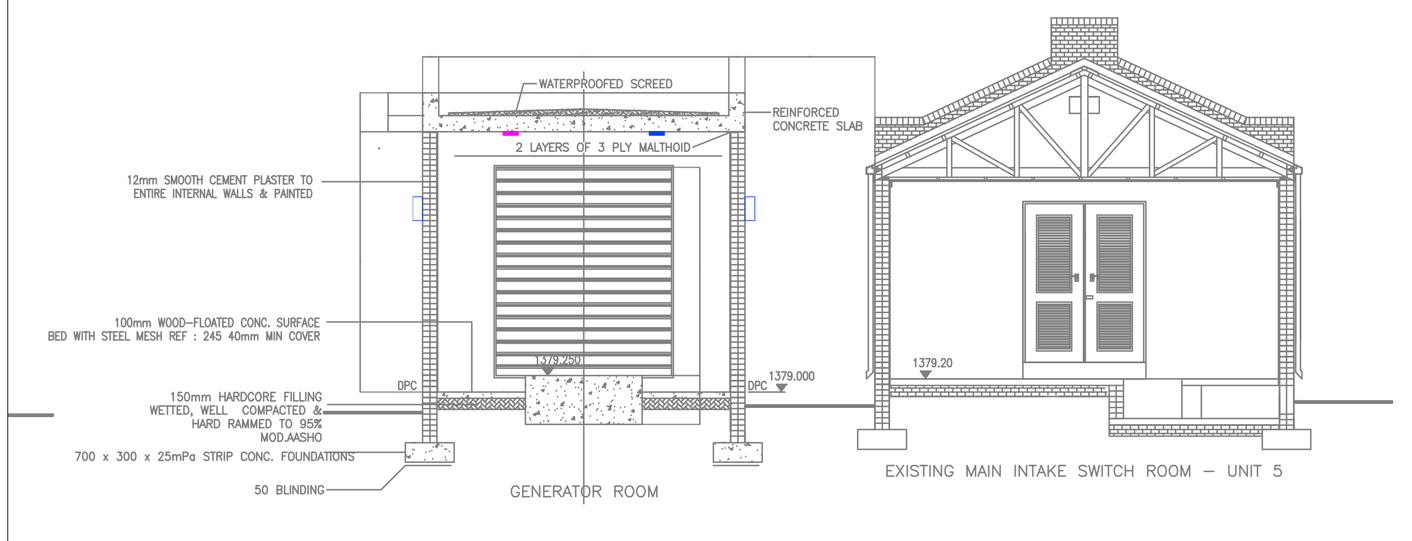
FLOOR PLAN
1:50

LEGEND:

- LED VAPOUR PROOF, DOUBLE 4ft 60W INDUSTRIAL CORROSION RESISTANT FLUORESCENT (IP65 INGRESS PROTECTION) c/w MOUNTING ACCESSORIES
- EM — LED VAPOUR PROOF, DOUBLE 4ft 60W INDUSTRIAL CORROSION RESISTANT FLUORESCENT (IP65 INGRESS PROTECTION) WITH BUILT IN EMERGENCY BACK-UP 1 HOUR 50% LIGHT OUTPUT c/w MOUNTING ACCESSORIES
- 60W LED BULKHEAD IP65 INGRESS PROTECTION
- 1-WAY INDUSTRIAL LIGHT SWITCH MOUNTED AT 1200mm AFFL
- 16A SINGLE PHASE SOCKET OUTLET



SECTION B–B
1:50



SECTION A–A
1:50

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
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Johannesburg Water
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APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – MODULE 2

GENERATOR ROOM

SMALL POWER AND LIGHTING LAYOUT

DESIGN MANAGER

DATE

SCALE 1:750

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	15.11.18

DRAWING No.

JW NUMBER JW13021R–5E2–GA05

CONSULTANT'S NUMBER ING0645D–5E2–GA05

FILE No BWW

T0

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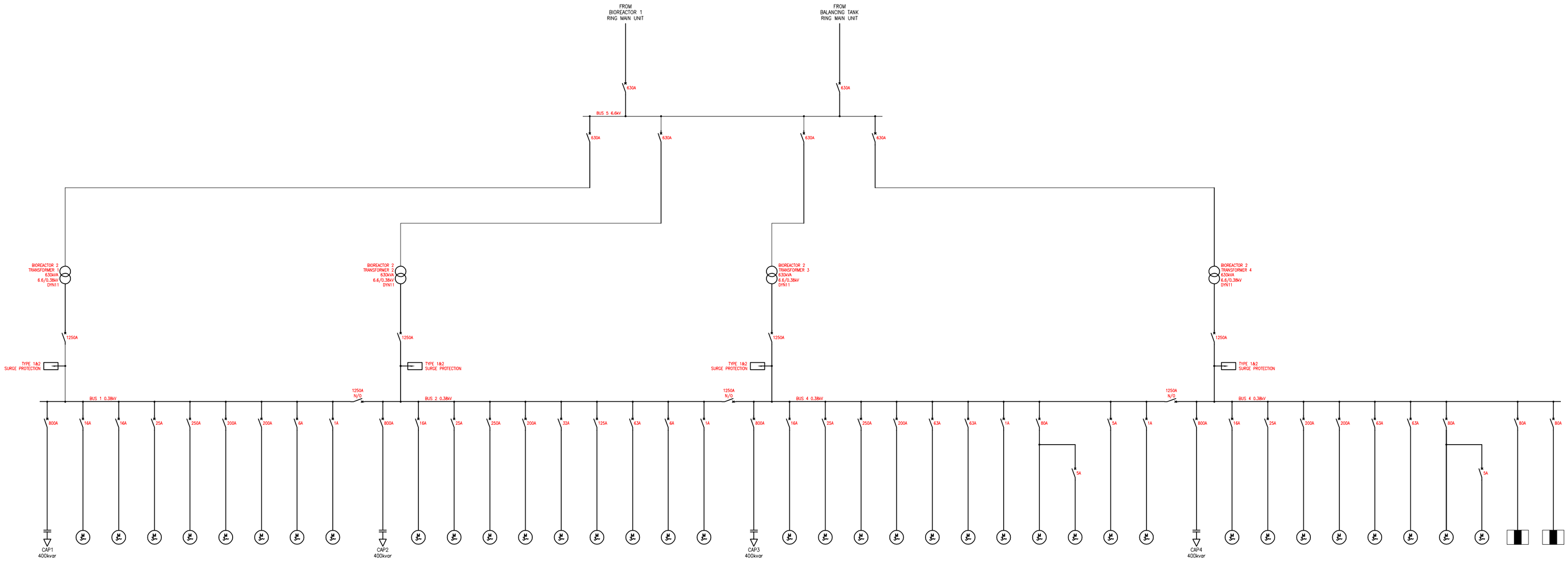

DRIVE NAME	MIXER 1	MIXER 5	MIXER 9	AERATOR 1	AERATOR 5	AERATOR 9	MIXED LIQUOR PUMP 1	CLARIFIER 1 BRIDGE DRIVE
EQUIP No.	5M2ME01	5M2ME05	5M2ME09	5M2ME10	5M2ME14	5M2ME18	5M2ME24	5M2ME28
CB RATING (A)	16A	16A	25A	250A	200A	200A	6A	1A
LOAD (kW)	7.50	7.50	11.00	110.00	90.00	90.00	3.00	0.18
TYPE	DOL	DOL	DOL	STAR-DELTA	STAR-DELTA	STAR-DELTA	DOL	DOL
STANDBY/EMERGENCY	N	N	N	N	N	N	Y	Y
P&ID	JW13021R-80-026							

DRIVE NAME	MIXER 2	MIXER 6	AERATOR 2	AERATOR 6	MIXER 10	AERATOR 10	AERATOR 13	MIXED LIQUOR PUMP 2	CLARIFIER 2 BRIDGE DRIVE
EQUIP No.	5M2ME02	5M2ME06	5M2ME11	5M2ME15	5M2ME19	5M2ME20	5M2ME23	5M2ME25	5M2ME29
CB RATING (A)	16A	25A	250A	200A	32A	125A	63A	6A	1A
LOAD (kW)	7.50	11.00	110.00	90.00	15.00	55.00	30.00	3.00	0.18
TYPE	DOL	DOL	STAR-DELTA	STAR-DELTA	DOL	DOL	DOL	DOL	DOL
STANDBY/EMERGENCY	N	N	N	N	N	N	N	Y	Y
P&ID	JW13021R-80-026								

DRIVE NAME	MIXER 3	MIXER 7	AERATOR 3	AERATOR 7	AERATOR 11	MIXED LIQUOR PUMP 3	CLARIFIER 3 BRIDGE DRIVE	SCREW PUMP 1	SCREW 1 GREASE PUMP	EFFLUENT SAMPLE PUMP 1	CHEMICAL DOSING PUMP 3
EQUIP No.	5M2ME03	5M2ME07	5M2ME12	5M2ME16	5M2ME21	5M2ME26	5M2ME30	5M2ME31	5M2ME35	5M2ME34	5M1ME40
CB RATING (A)	16A	25A	250A	200A	63A	63A	1A	80A	5A	5A	1A
LOAD (kW)	7.50	11.00	110.00	90.00	30.00	30.00	0.18	37.00	1.00	1.50	0.35
TYPE	DOL	DOL	STAR-DELTA	STAR-DELTA	DOL	DOL	DOL	DOL	DOL	DOL	VSD
STANDBY/EMERGENCY	N	N	N	N	N	Y	Y	Y	Y	N	Y
P&ID	JW13021R-80-026										JW13021R-80-027

DRIVE NAME	MIXER 4	MIXER 8	AERATOR 4	AERATOR 8	AERATOR 12	MIXED LIQUOR PUMP 4	SCREW PUMP 2	SCREW 2 GREASE PUMP	INSTRUMENT DB	SMALL POWER AND LIGHTING DB
EQUIP No.	5M2ME04	5M2ME08	5M2ME13	5M2ME17	5M2ME22	5M2ME27	5M2ME32	5M2ME36		
CB RATING (A)	16A	25A	200A	200A	63A	63A	80A	5A	80A	80A
LOAD (kW)	7.50	11.00	90.00	90.00	30.00	30.00	37.00	1.00	50.00	50.00
TYPE	DOL	STAR-DELTA	STAR-DELTA	STAR-DELTA	DOL	DOL	DOL	DOL	FEEDER	FEEDER
STANDBY/EMERGENCY	N	N	N	N	N	Y	Y	Y	Y	N
P&ID	JW13021R-80-026									

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	BM
DRAWN	MD
CHECKED	BM
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

5E2-MCC-01 AND 5E2-MCC02

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS		APPROVED	DATE
TO	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER
JW13021R-5E2-SM01

CONSULTANT'S NUMBER
INC06645D-5E2-SM01

FILE No
BWW

TO

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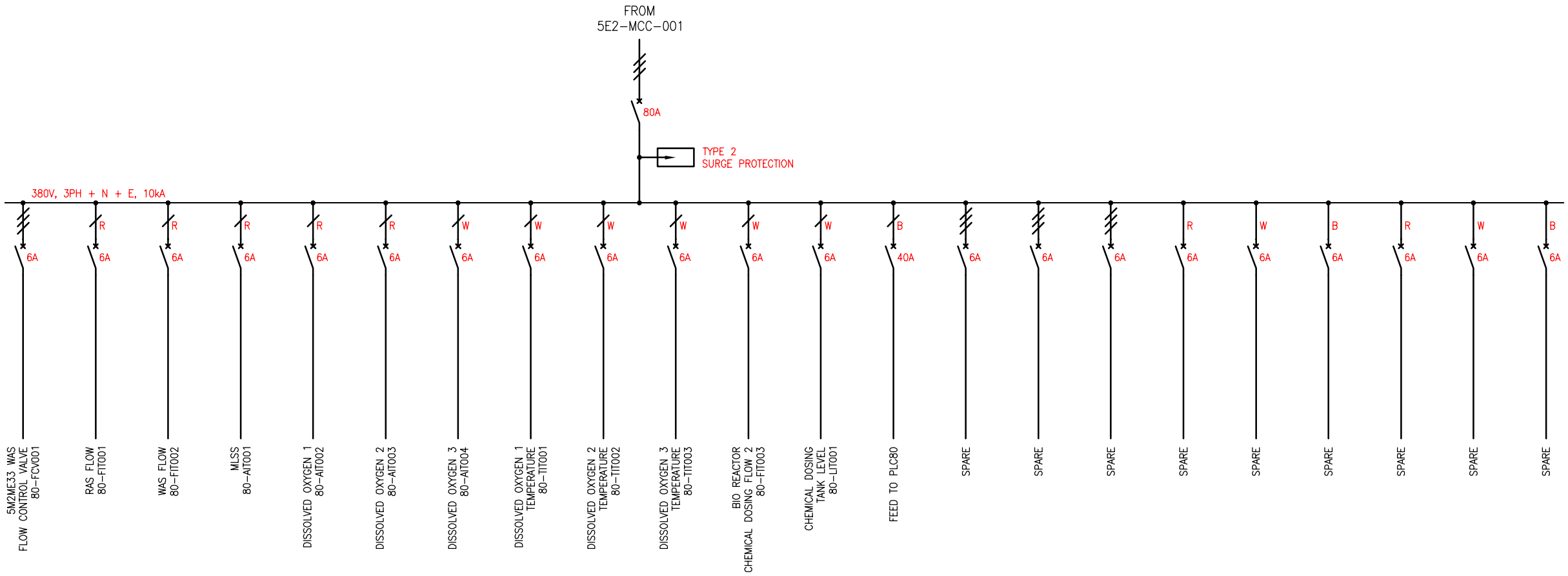

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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P.O. BOX 221
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SERVITUDES	
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Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

INSTRUMENT DB – IDB001

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER JW13021R-5E2-SM02

CONSULTANT'S NUMBER ING0645D-5E2-SM02

FILE No BWW

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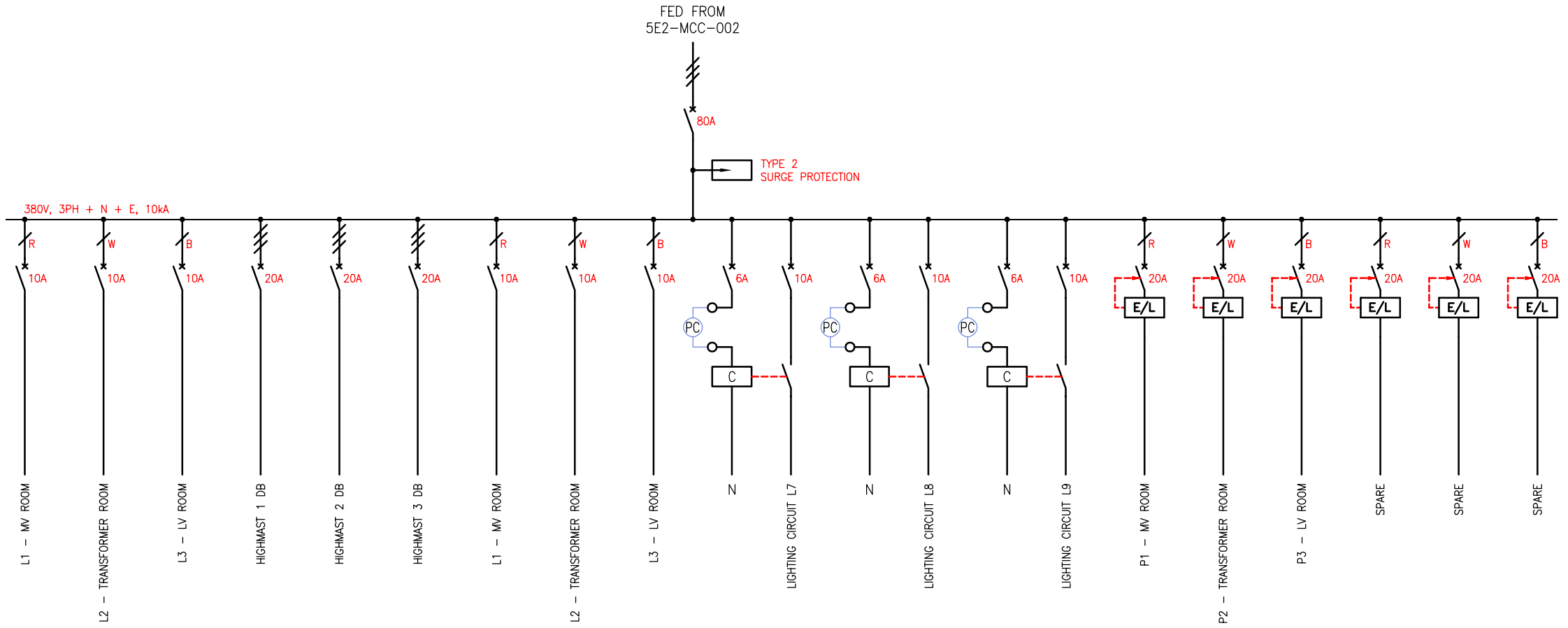

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
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DESIGNED	BM
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GEOTECHNICAL INVESTIG.	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

SMALL POWER AND LIGHTING DB – SP&L-DB

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER
JW13021R-5E2-SM03

CONSULTANT'S NUMBER
ING0645D-5E2-SM03

FILE No
BWW

T0

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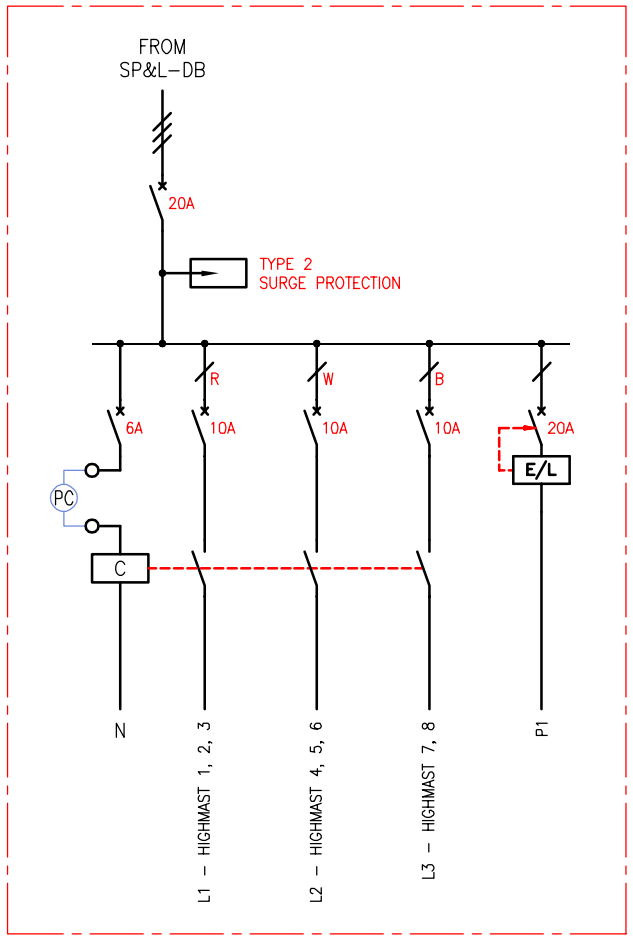
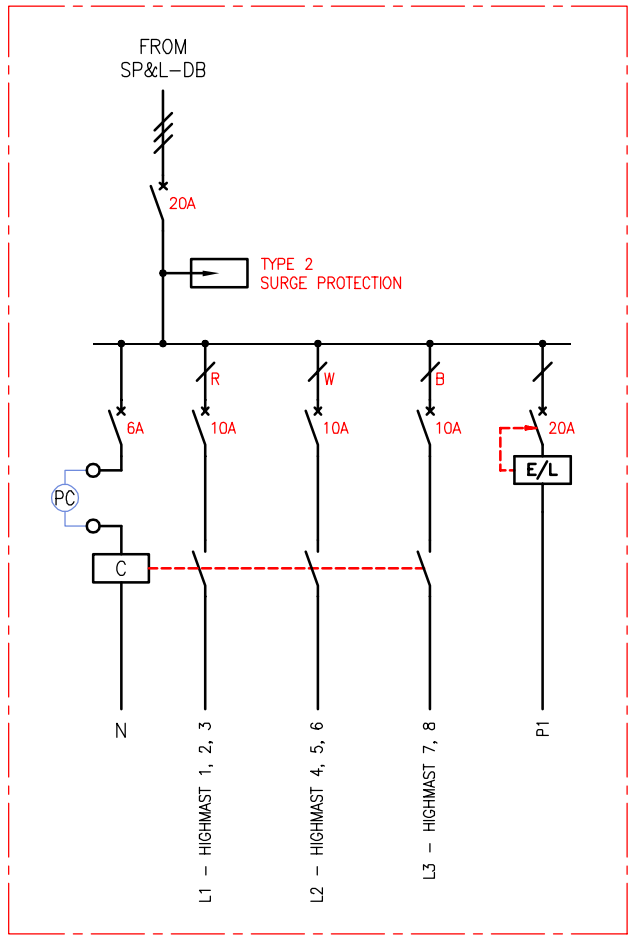
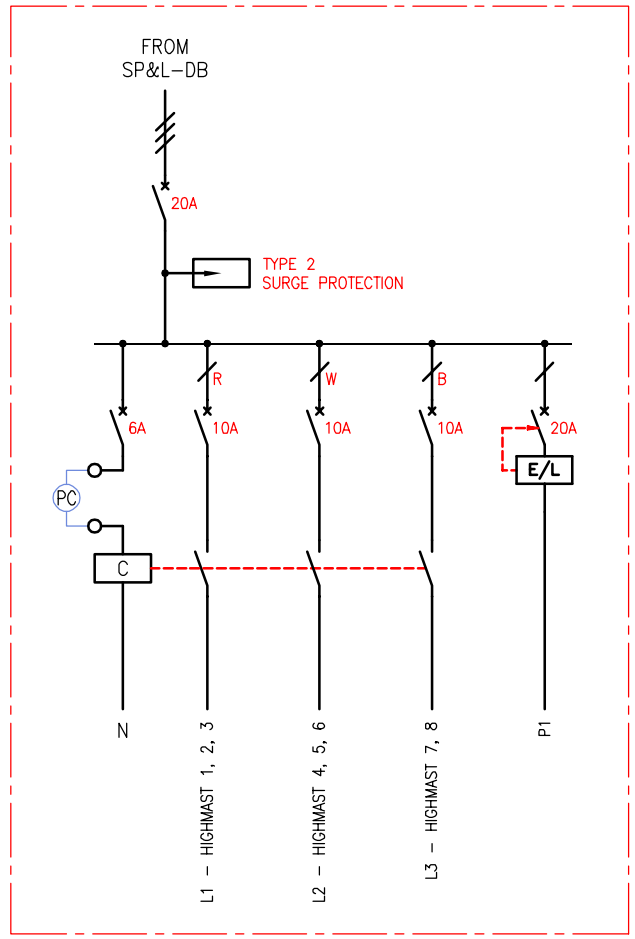


HIGHMAST LIGHT 1–DB



HIGHMAST LIGHT 2–DB



HIGHMAST LIGHT 3–DB

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING

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RIVONIA
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TEL: (011) 688-1400
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SERVITUDES	
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Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

HIGHMAST LIGHT 1 , HIGHMAST LIGHT 2 AND HIGHMAST LIGHT 3 DBs

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER
JW13021R–5E2–SM04

CONSULTANT'S NUMBER
ING0645D–5E2–SM04

FILE No
BWW

T0

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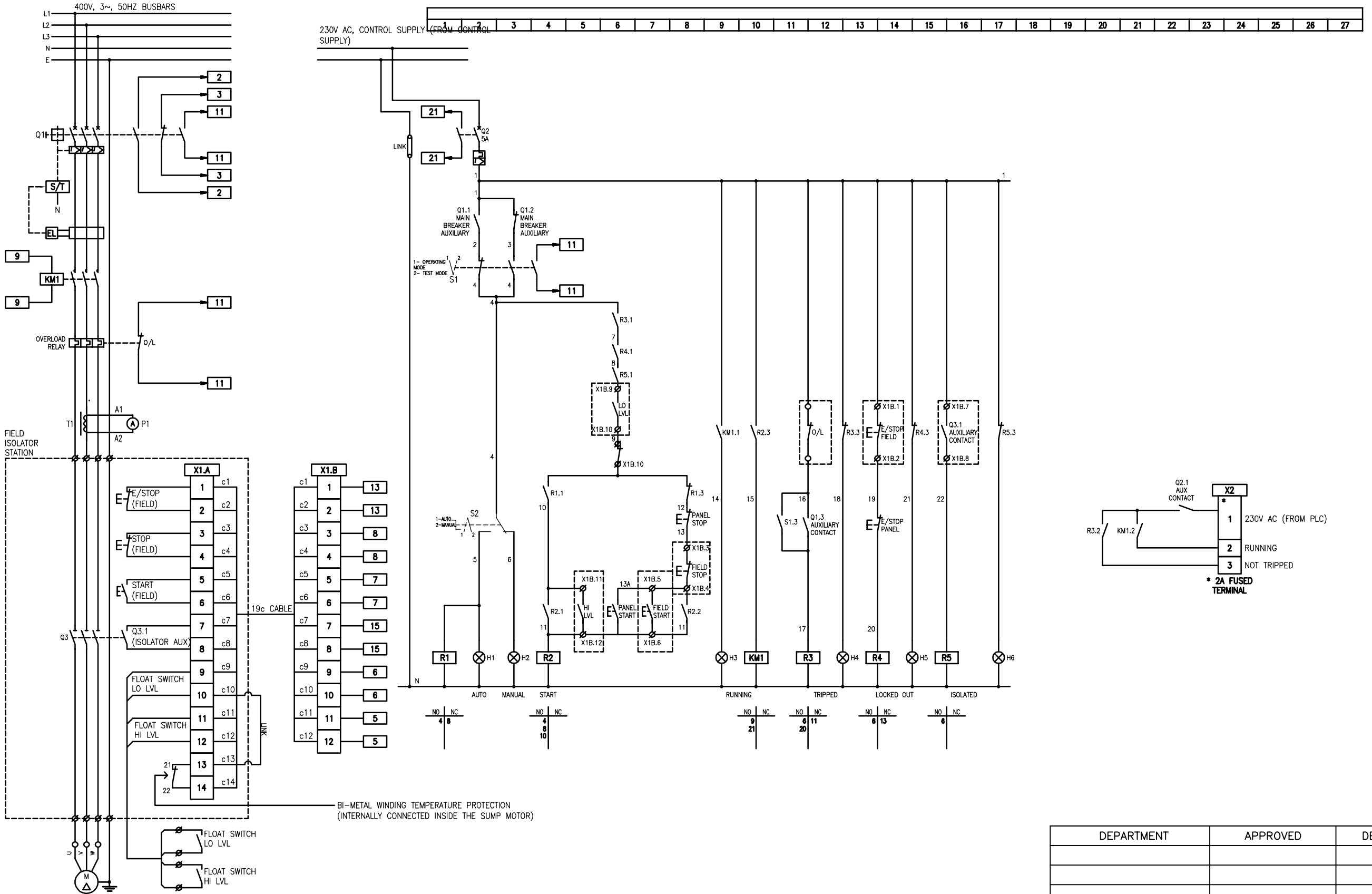

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	

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Pr. Eng. No.
DATE

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

TYPICAL DOL SUMP PUMP

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

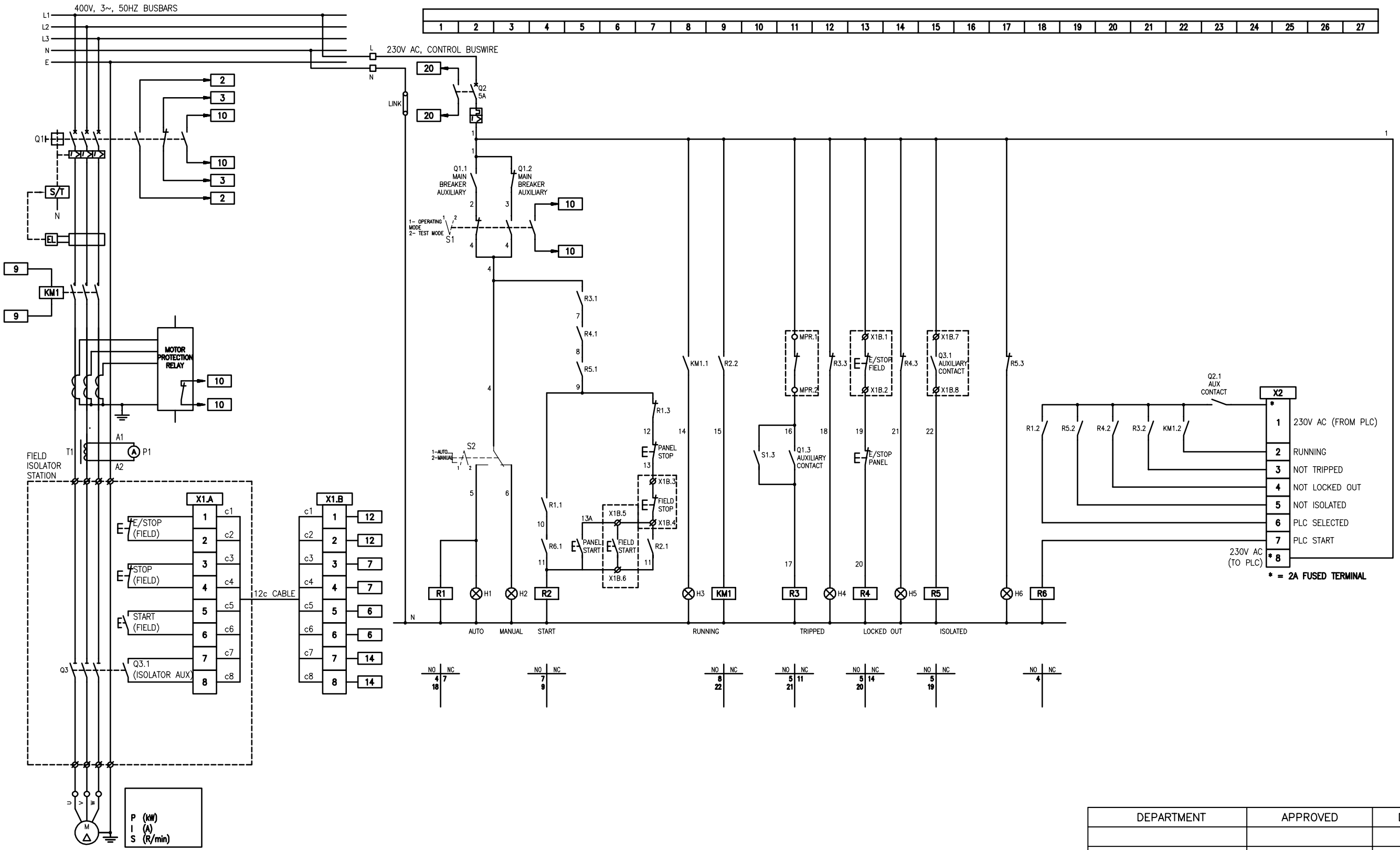
JW NUMBER
JW13021R-5E2-TYP DOL SUMP

CONSULTANT'S NUMBER
ING0645D-5E2-TYP DOL SUMP

FILE No
BWW

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\Common\Typical Schematics\ING0645D-5E2-TYP DOL SUMP revT0.dwg May 31, 2019 – 3:15pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

TYPICAL DOL

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

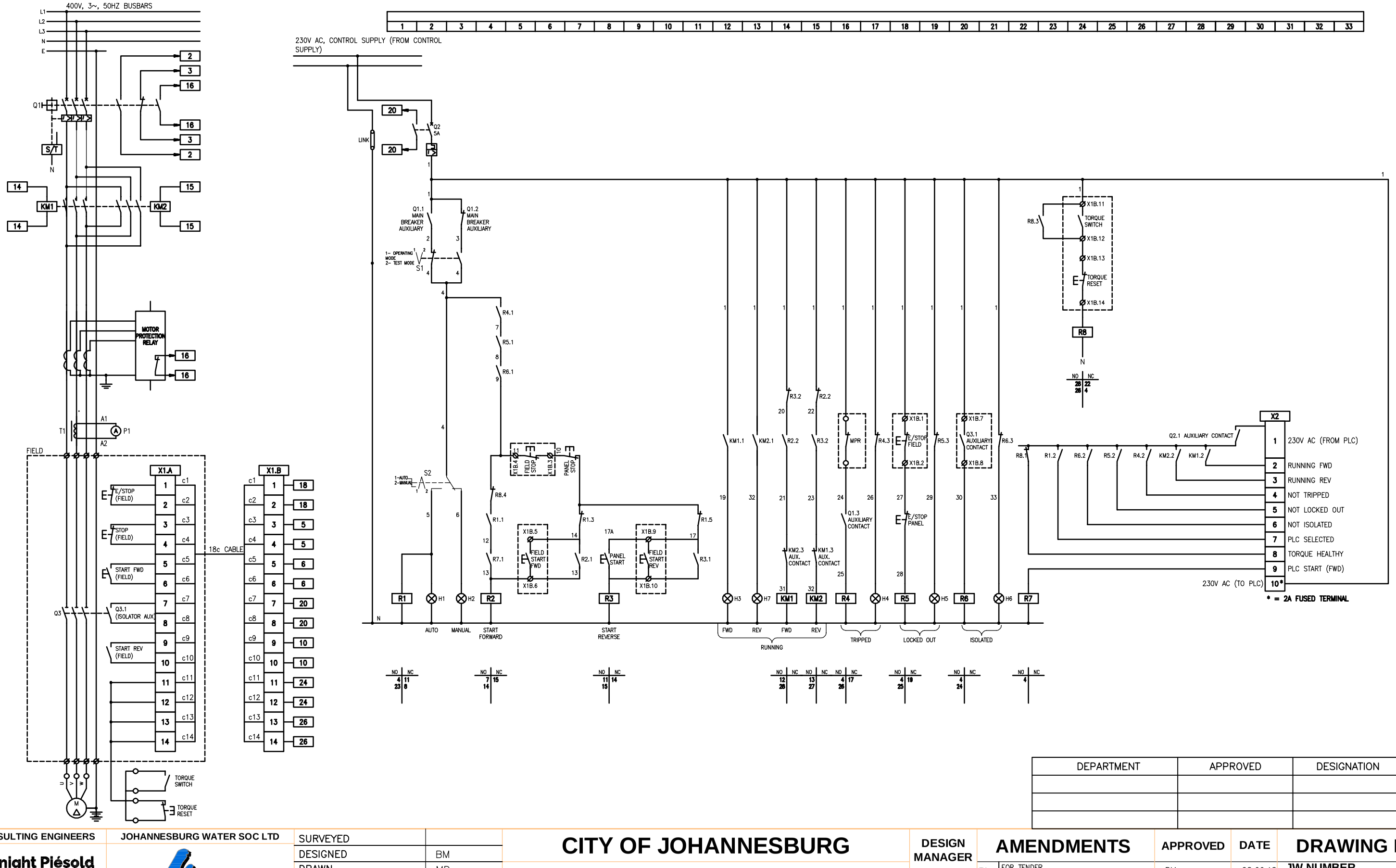
JW NUMBER
JW13021R-5E2-TYP DOL

CONSULTANT'S NUMBER
ING0645D-5E2-TYP DOL

FILE No
BWW

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\Common\Typical Schematics\ING0645D-5E2-TYP DOL rev T0.dwg May 31, 2019 – 3:16pm



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WSP Group Africa (Pty) Ltd
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JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET MARSHALLTOWN - 2107
TEL: (011) 688-1400 FAX: (011) 688-1529

SURVEYED	
DESIGNED	BM
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SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

TYPICAL FORWARD/REVERSE SCREEN

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER JW13021R-5E2-FWD REV SCR

CONSULTANT'S NUMBER ING0645D-5E2-FWD REV SCR

FILE No BWW

T0

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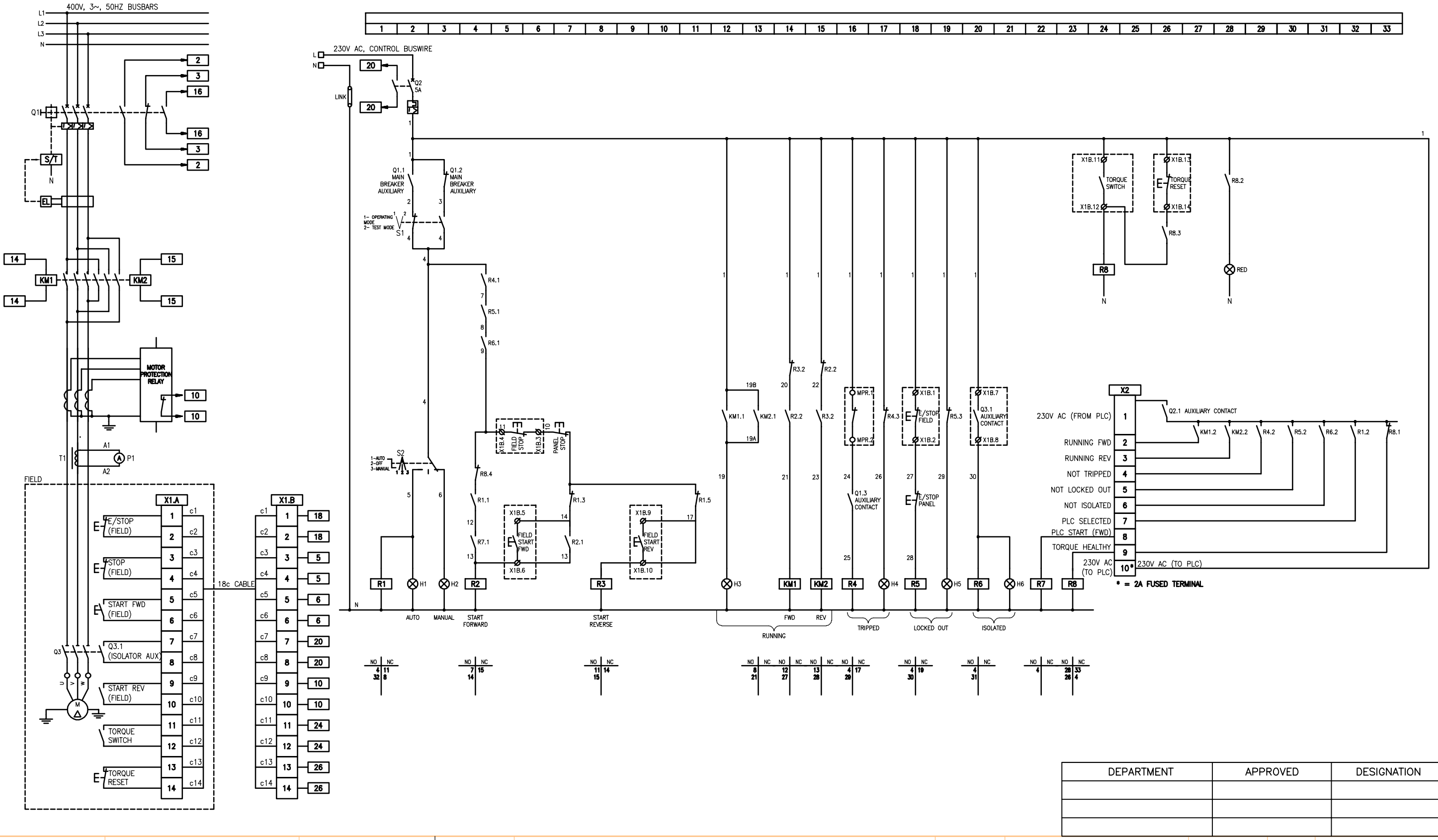

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL. 011-806 7111
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SERVITUDES	
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Pr. Eng. No.	
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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

TYPICAL FORWARD REVERSE

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER JW13021R-5E2-TYP F_R

CONSULTANT'S NUMBER ING0645D-5E2-TYP F_R

FILE No BWW

T0

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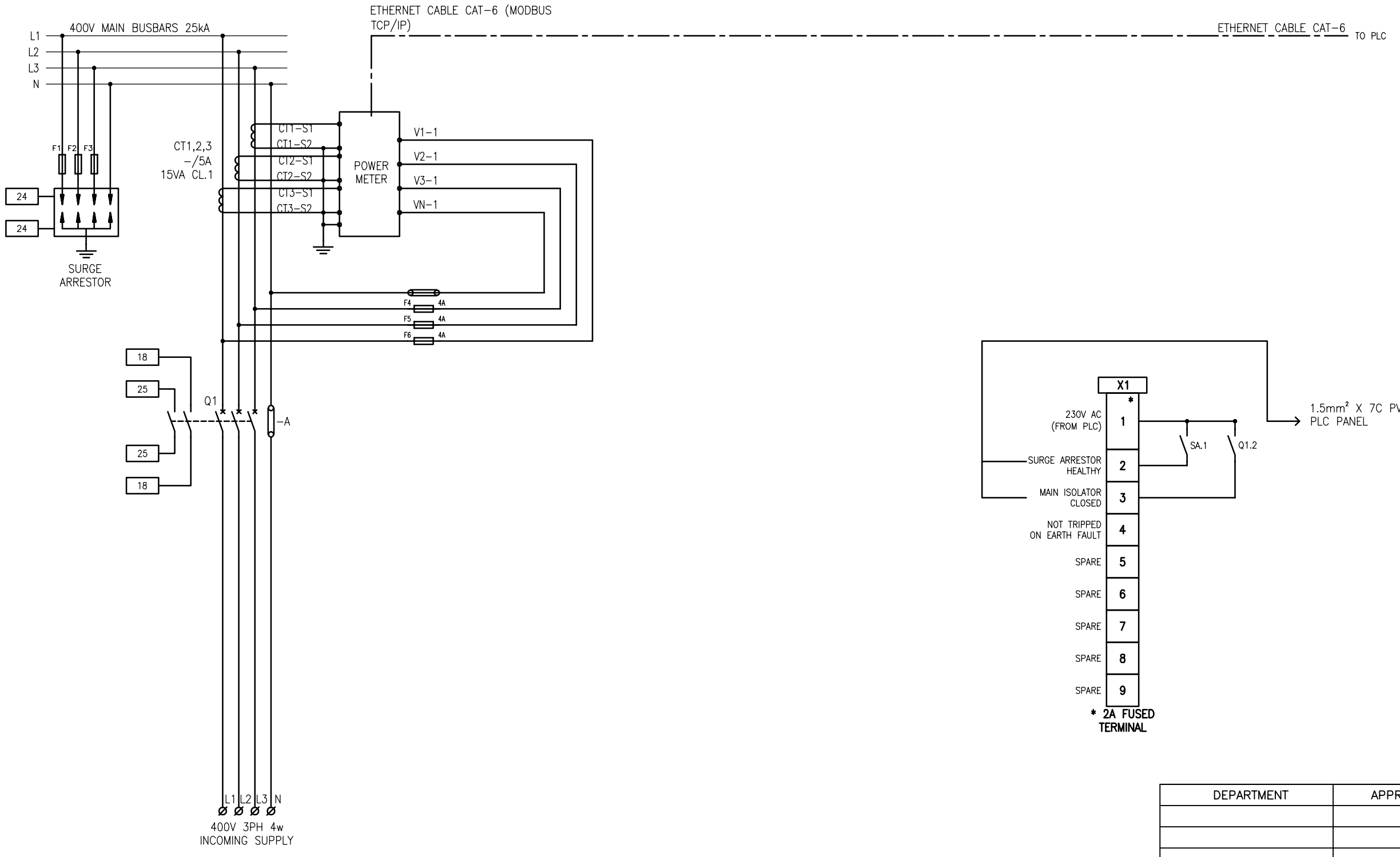

DEPARTMENT	APPROVED	DESIGNATION	DATE

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Pr. Eng. No.	
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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2

TYPICAL INCOMER

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER
JW13021R-5E2-TYP INCOMER

CONSULTANT'S NUMBER
ING0645D-5E2-TYP INCOMER

FILE No
BWW

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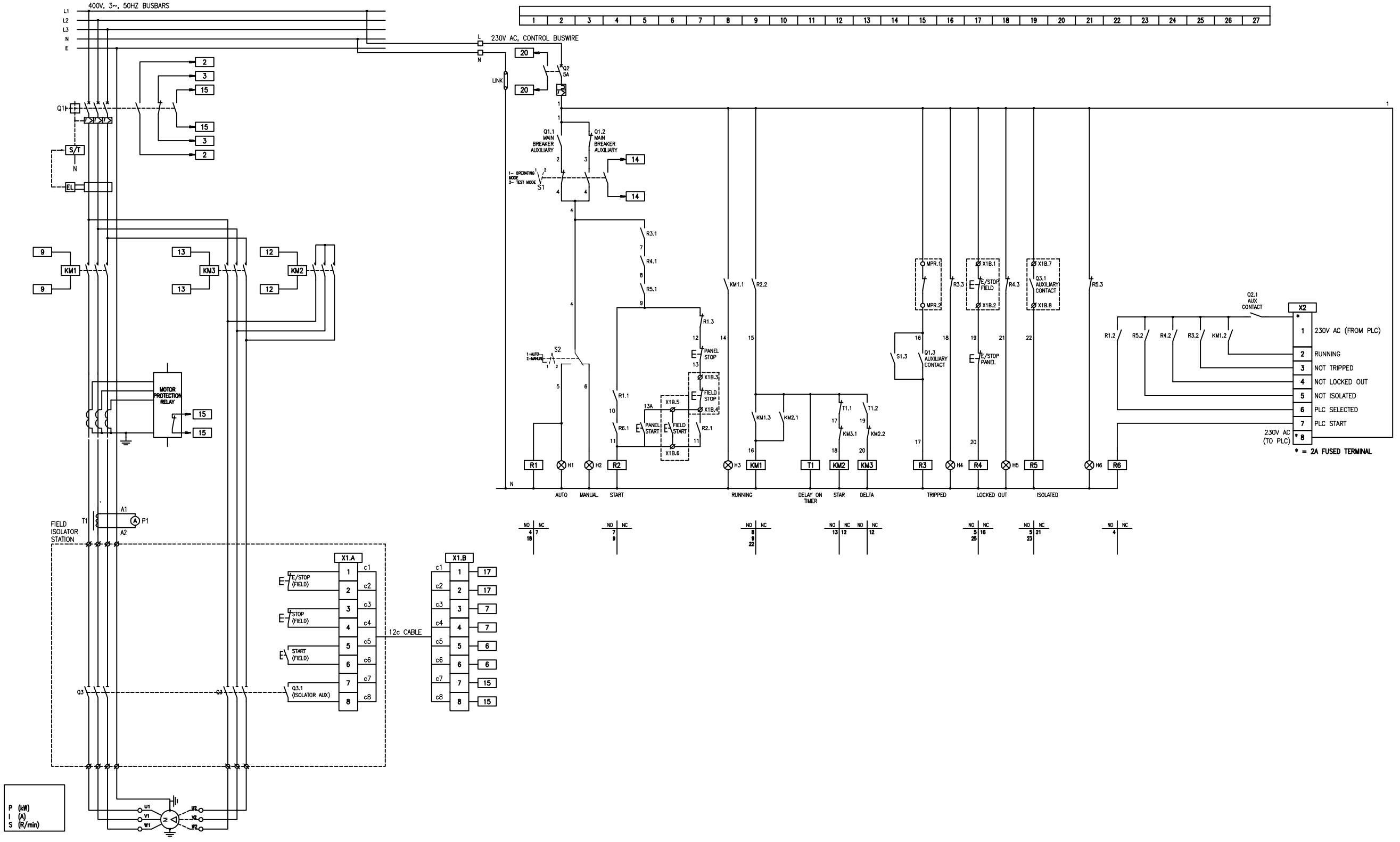
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\Common\Typical Schematics\ING0645D-5E2-TYP INCOMER revT0.dwg May 31, 2019 – 3:14pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
TYPICAL STAR DELTA
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS	APPROVED	DATE
TO FOR TENDER	BM	28.09.18

DRAWING No.

JW NUMBER: JW13021R-5E2-TYP S_D
CONSULTANT'S NUMBER: ING0645D-5E2-TYP S_D
FILE No: BWW
TO

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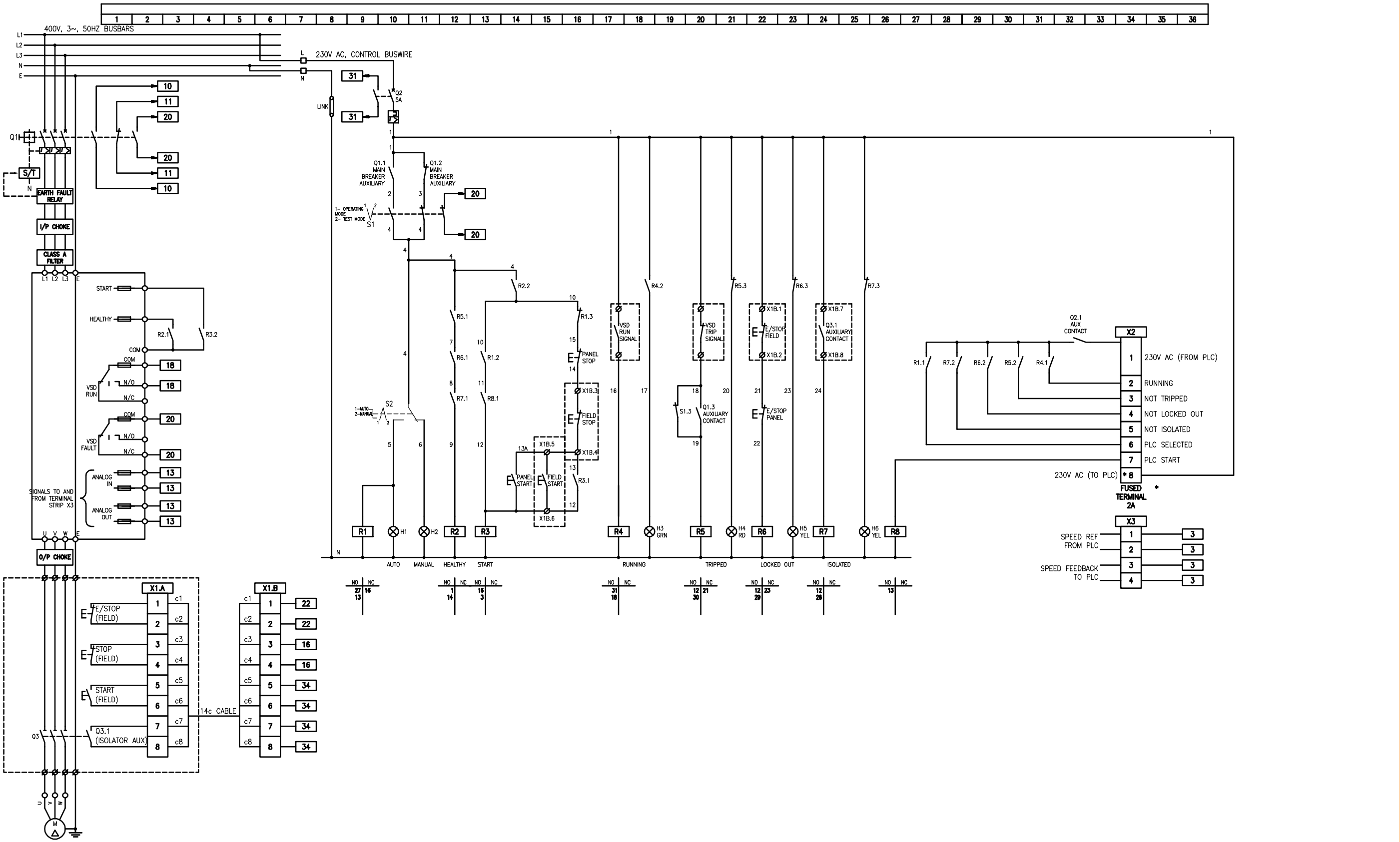

DATE

DESIGNATION

APPROVED

DEPARTMENT

CONSULTING ENGINEERS	JOHANNESBURG WATER SOC LTD			
Knight Piésold CONSULTING P.O. BOX 221 RIVONIA 2128 TEL. 011-806 7111 FAX. 011-806 7100 EMAIL enquiries@kprsa.co.za	Johannesburg Water 17 HARRISON STREET MARSHALLTOWN - 2107 TEL: (011) 688-1400 FAX: (011) 688-1529	SURVEYED		**CITY OF JOHANNESBURG**
WSP Group Africa (Pty) Ltd Industrial Division Building C, Knightsbridge, 33 Sloane Street, Bryanston, 2191 Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com		DESIGNED	BM	NORTHERN WASTE WATER TREATMENT PLANT
		DRAWN	MD	UNIT 5 – PHASE 2
		CHECKED		UNIT 5 – BIOREACTOR 2
		SERVICES CHECKED		TYPICAL VSD
		GEOTECHNICAL INVESTIG.		SCHEMATIC DIAGRAM
		SERVITUDES		
		APPROVED Pr. Eng. No. DATE		

DESIGN MANAGER	AMENDMENTS	APPROVED	DATE
	T0 FOR TENDER	BM	28.09.18
DATE			
SCALE NTS			

DRAWING No.

JW NUMBER: JW13021R–5E2–TYP VSD

CONSULTANT'S NUMBER: ING0645D–5E2–TYP VSD

FILE No: BWW

T0

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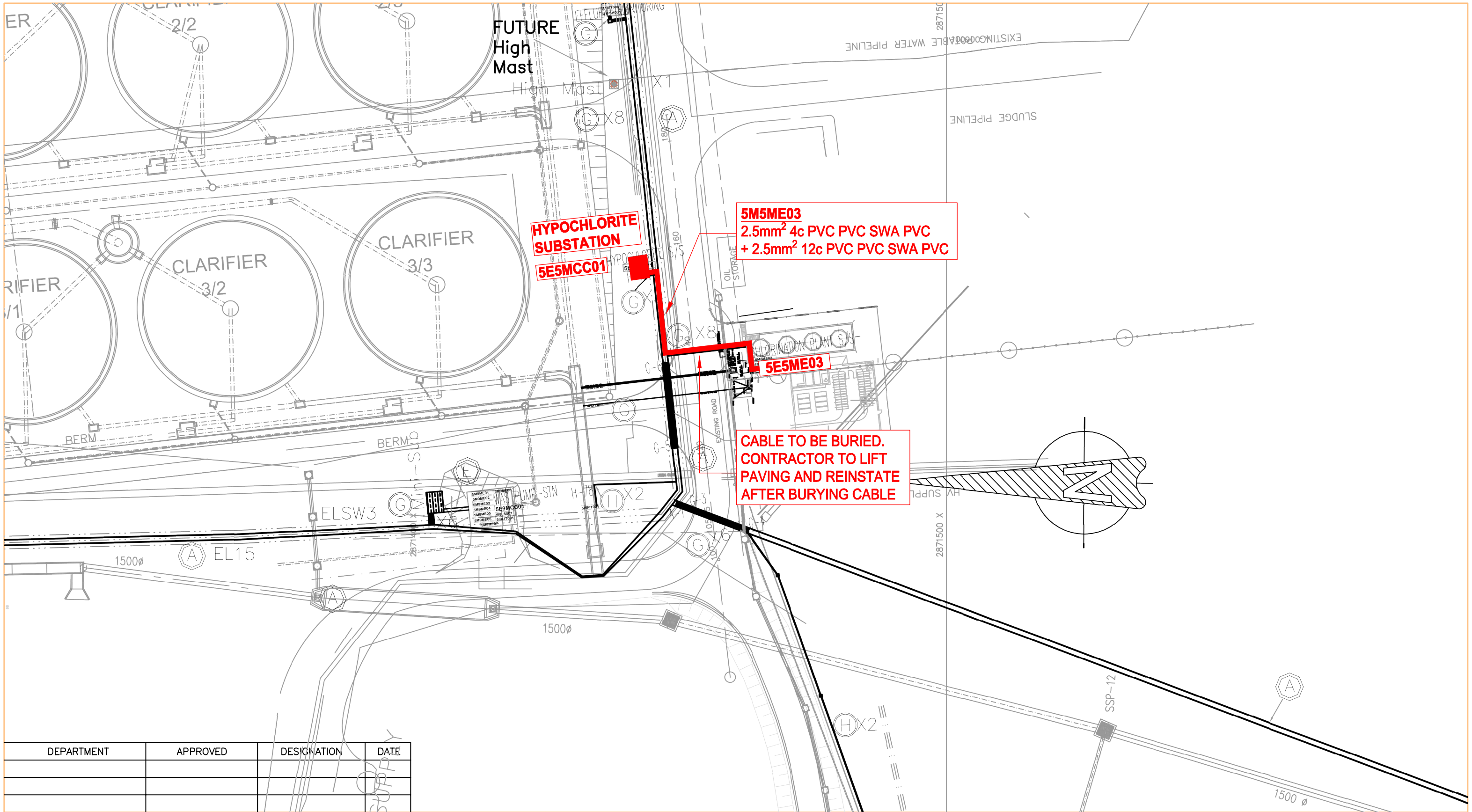

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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P.O. BOX 221
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2128
TEL. 011-806 7111
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CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

HYPOCHLORITE SUB STATION

CABLE ROUTE

DESIGN MANAGER

DATE

SCALE
1:500

AMENDMENTS

		APPROVED	DATE
T0	FOR INFORMATION	BM	15.11.18

DRAWING No.

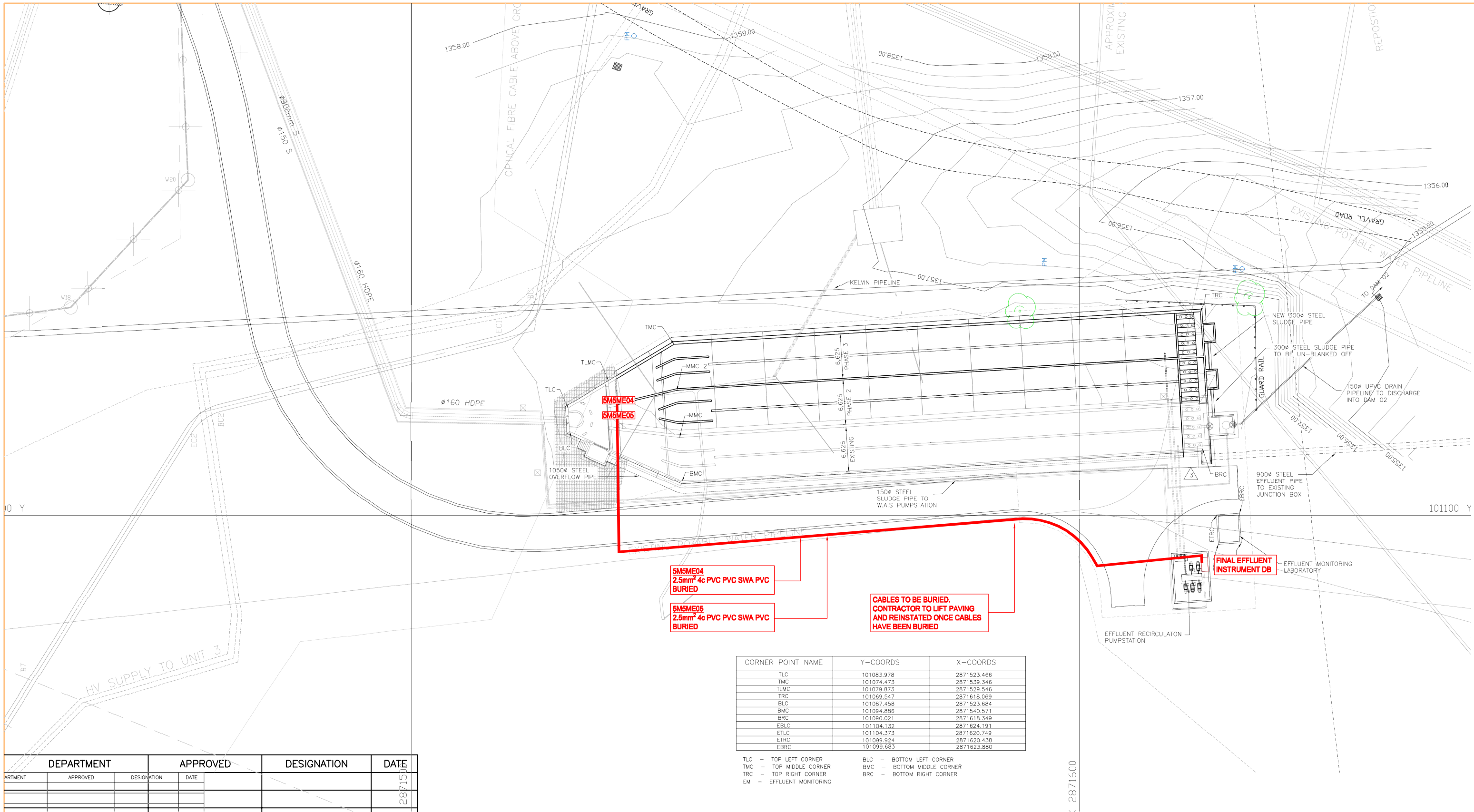
JW NUMBER
JW13021R-5E5-CR01

CONSULTANT'S NUMBER
ING0645D-5E5-CR01

FILE No

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E5-MCC-01 (HYPOCHLORITE)\Cable Routes\ING0645D-5E5-CR01 revT0.dwg May 31, 2019 – 2:36pm



5M5ME04
2.5mm² 4c PVC PVC SWA PVC
BURIED

5M5ME05
2.5mm² 4c PVC PVC SWA PVC
BURIED

CABLES TO BE BURIED.
CONTRACTOR TO LIFT PAVING
AND REINSTATED ONCE CABLES
HAVE BEEN BURIED

CORNER POINT NAME	Y-COORDS	X-COORDS
TLC	101083.978	2871523.466
TMC	101074.473	2871539.346
TLMC	101079.873	2871529.546
TRC	101069.547	2871618.069
BLC	101087.458	2871523.684
BMC	101094.886	2871540.571
BRC	101090.021	2871618.349
EBLC	101104.132	2871624.191
ETLC	101104.373	2871620.749
ETRC	101099.924	2871620.438
EBRC	101099.683	2871623.880

TLC – TOP LEFT CORNER
TMC – TOP MIDDLE CORNER
TRC – TOP RIGHT CORNER
EM – EFFLUENT MONITORING
BLC – BOTTOM LEFT CORNER
BMC – BOTTOM MIDDLE CORNER
BRC – BOTTOM RIGHT CORNER

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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2128
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JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET
MARSHALLTOWN - 2107
TEL: (011) 688-1400
FAX: (011) 688-1529

SURVEYED	
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DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

FINAL EFFLUENT

CABLE ROUTE

DESIGN MANAGER

DATE

SCALE
1:500

AMENDMENTS		APPROVED	DATE
T0	FOR INFORMATION	BM	15.11.18

DRAWING No.

JW NUMBER
JW13021R-5E5-CR02

CONSULTANT'S NUMBER
ING0645D-5E5-CR02

FILE No

T0

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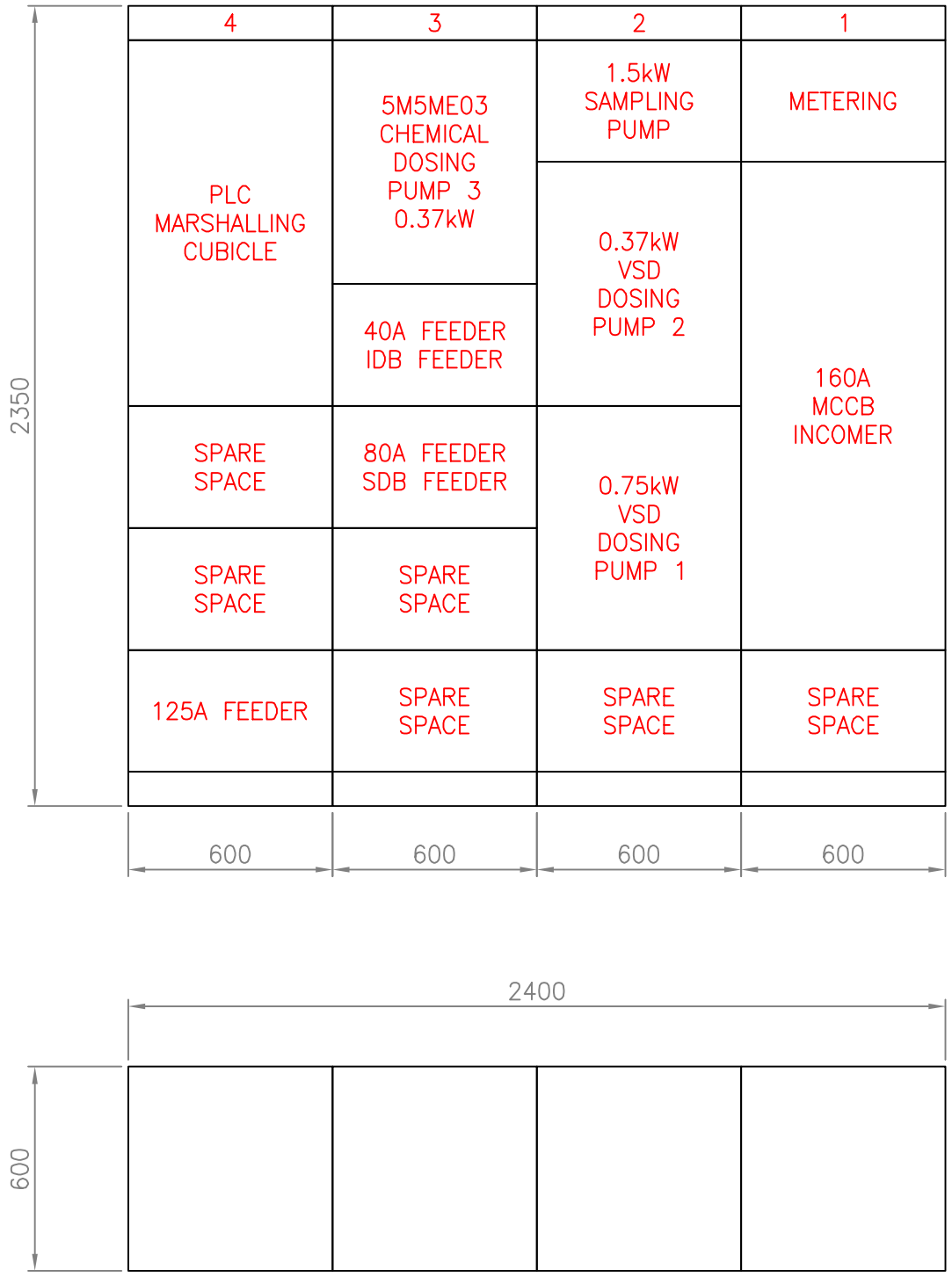


AMMENDEMENTS

TO FOR INFORMATION

BM 03.10.18

A3

CONSULTING ENGINEERS	JOHANNESBURG WATER SOC LTD			
Knight Piésold CONSULTING P.O. BOX 221 RIVONIA 2128 TEL. 011-806 7111 FAX. 011-806 7100 EMAIL enquiries@kprsa.co.za	Johannesburg Water 17 HARRISON STREET MARSHALLTOWN - 2107 TEL: (011) 688-1400 FAX: (011) 688-1529	SURVEYED		**CITY OF JOHANNESBURG**
WSP Group Africa (Pty) Ltd Industrial Division Building C, Knightsbridge, 33 Sloane Street, Bryanston, 2191 Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com		DESIGNED		NORTHERN WASTE WATER TREATMENT PLANT
		DRAWN	M DYKE	UNIT 5 – PHASE 2
		CHECKED	B MARRIOTT	HYPOCHLORIDE
		SERVICES CHECKED		5E5–MCC–01
		GEOTECHNICAL INVESTIGATION		GENERAL ARRANGEMENT
		SERVITUDES		
		APPROVED Pr. Eng. No. DATE		
		DESIGN MANAGER	DATE	
		SCALE	NTS	

DRAWING No.

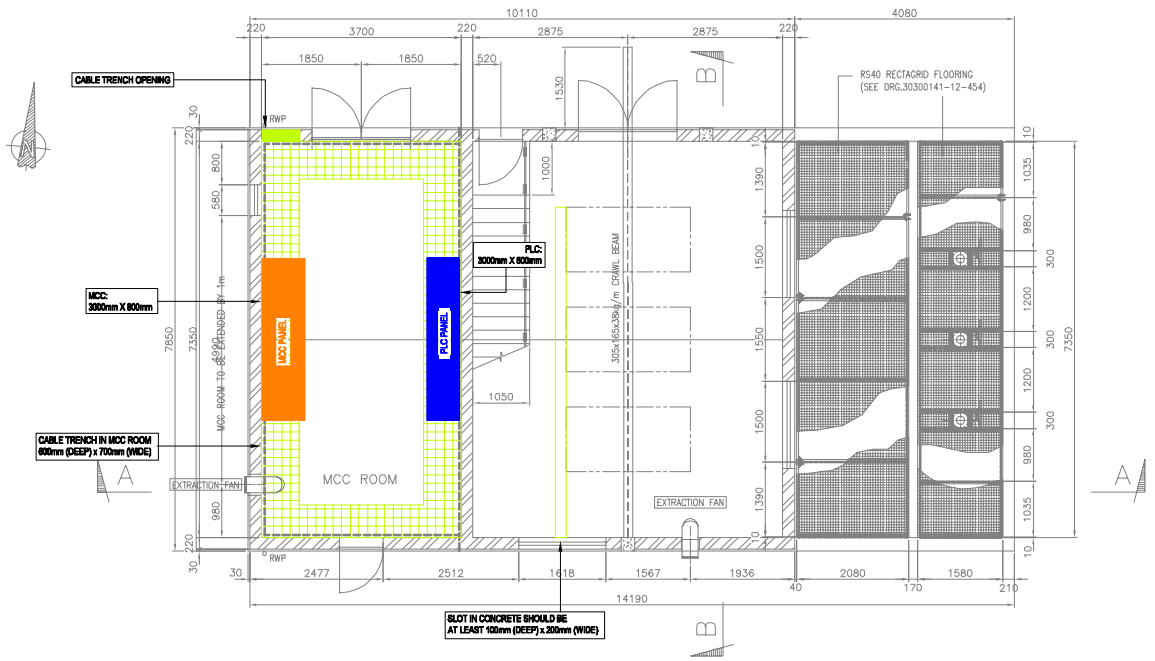
JW NUMBER
JW13021R–5E5–GA01

CONSULTANT'S NUMBER
ING645D–5E5–GA01

FILE No

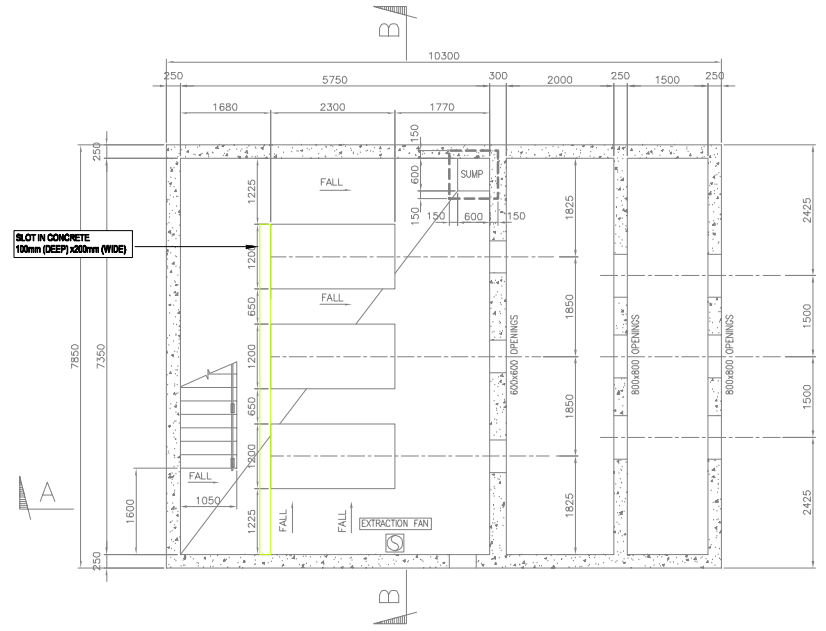
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E5–MCC–01 (HYPOCHLORITE)\General Arrangements\ING0645D–5E5–GA01 revT0.dwg May 31, 2019 – 2:38pm



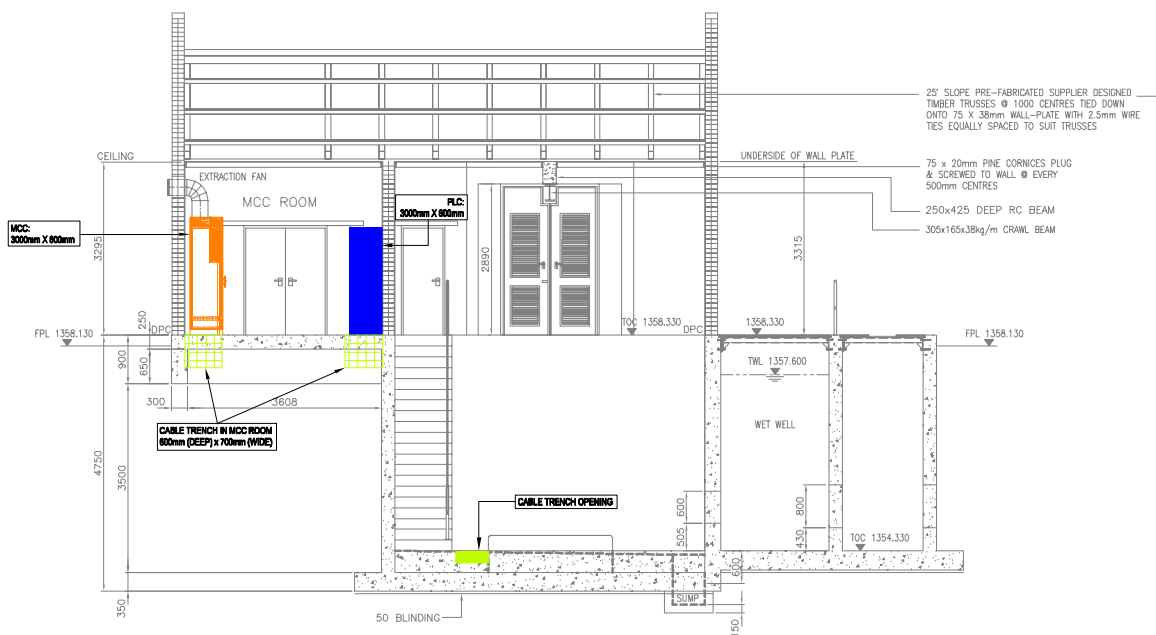
GROUND FLOOR PLAN

1:50



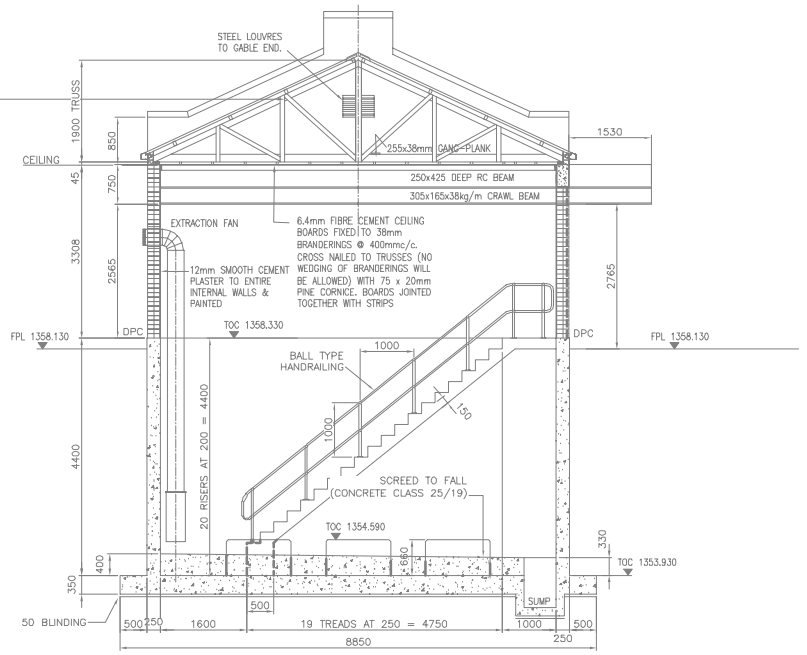
BASEMENT PLAN

1:50



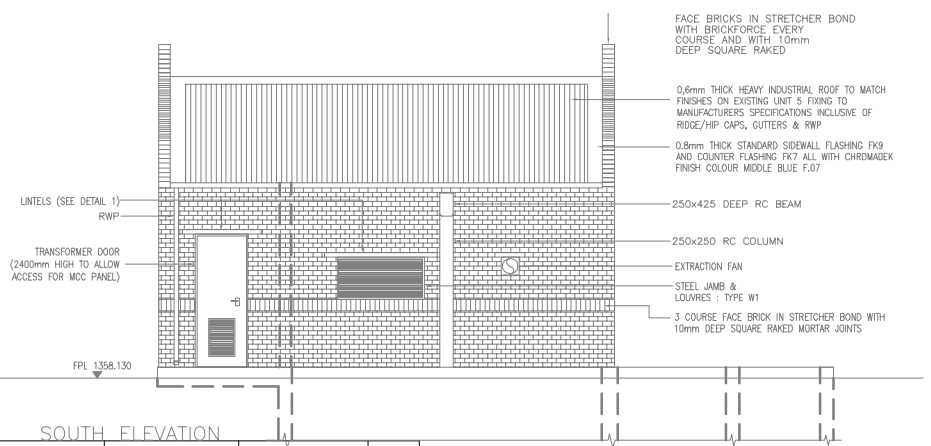
SECTION A–A

1:50

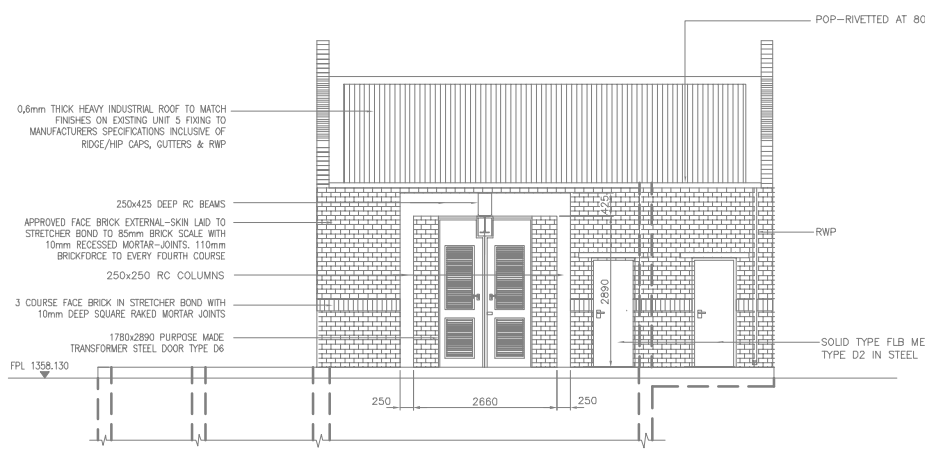


SECTION B–B

1:50

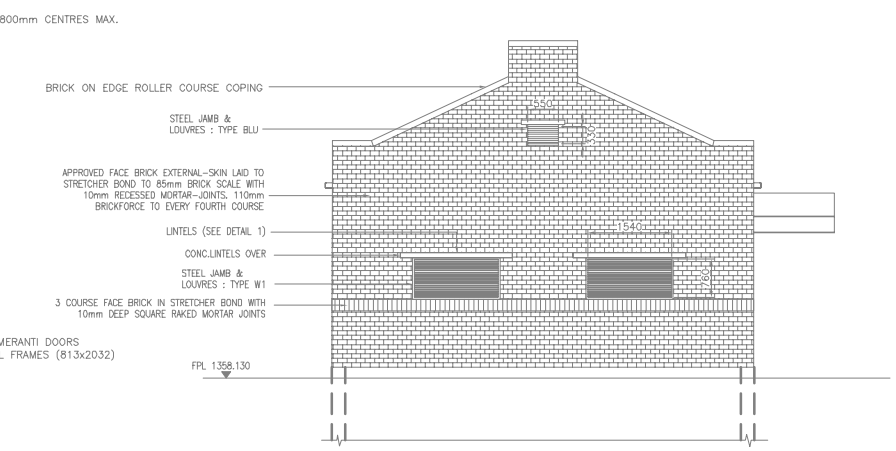


SOUTH ELEVATION



NORTH ELEVATION

1:50



EAST ELEVATION

1:50

DEPARTMENT	APPROVED	DESIGNATION	DATE
	1:50		

CONSULTING ENGINEERS

Knight Piésold CONSULTING

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2128
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Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

EFFLUENT PUMP STATION

MCC AND TRENCH

DETAILS

DESIGN MANAGER

DATE

SCALE: AS SHOWN

AMENDMENTS		APPROVED	DATE
TO	FOR TENDER	MD	23.04.19

DRAWING No.

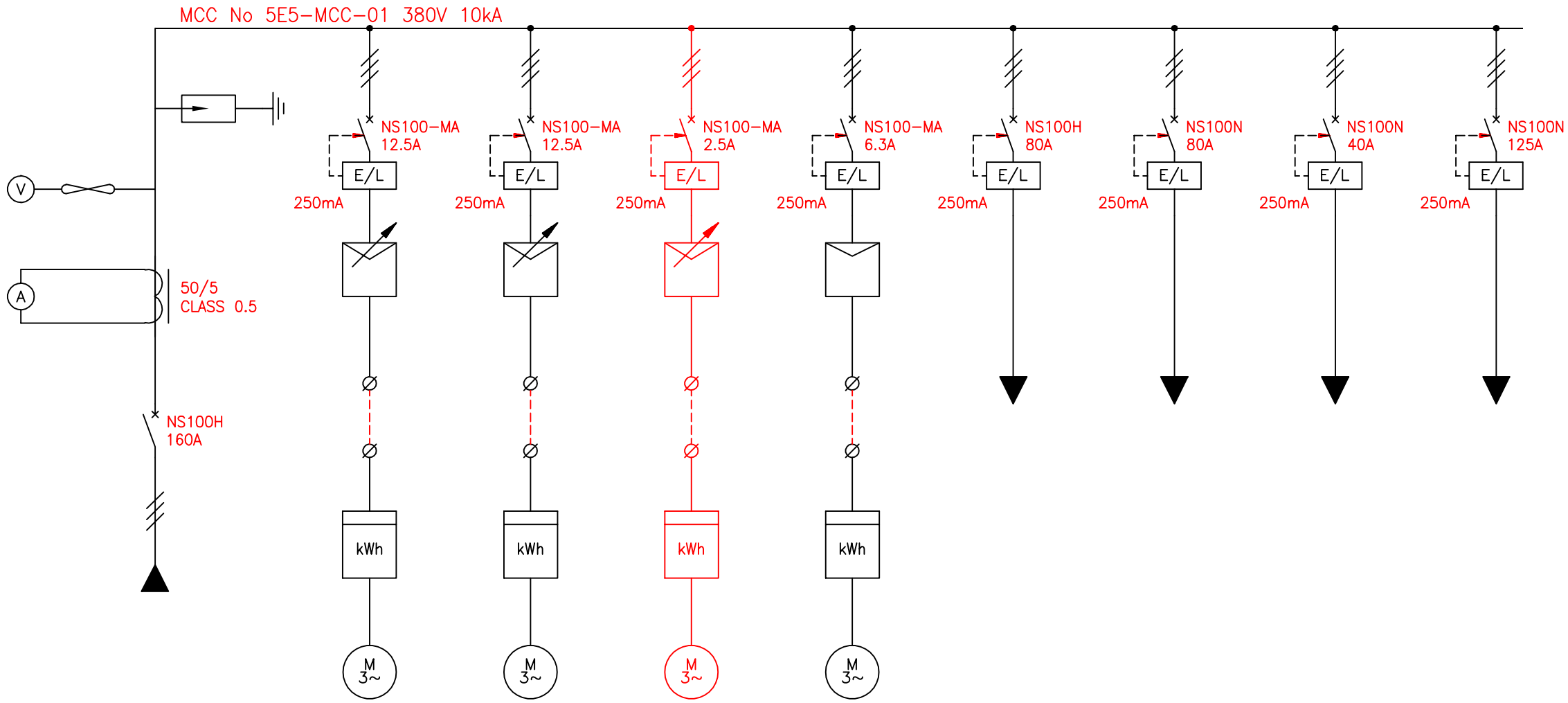
JW NUMBER
JW13896-5E5-GA02

CONSULTANT'S NUMBER
ING0645D-5E5-GA02

FILE No

TO

I:\ING – Projects – Drawings\ING06450 – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E5-MCC-01 (HYPOCHLORITE)\General Arrangements\ING06450-5E5-GA02 revTO.dwg May 31, 2019 – 2:39pm



DRIVE NAME	INCOMER	CHEMICAL DOSING PUMP 1	CHEMICAL DOSING PUMP 2	CHEMICAL DOSING PUMP 3	SAMPLING PUMP	SPARE	LIGHTING & SMALL POWER DB	INSTRUMENT DB	LIGHTING & SMALL POWER DB
EQUIP No.		5M5CP01	5M5CP02	5M5ME03	5M1SP01	–	5E5DB01	5E5IDB01	5E1DB02
LOAD (kW)		0.75	0.37	0.37	1.5	–	–	–	–
EQUIPPED		YES	YES	YES	YES	YES	YES	YES	YES

03.10.18 BM

TO FOR INFORMATION

AMMENDEMENTS

A3

CONSULTING ENGINEERS

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DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

DESIGN MANAGER DATE

SCALE NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

HYPOCHLORIDE

5E5-MCC-01

SINGLE LINE DIAGRAM

DRAWING No.

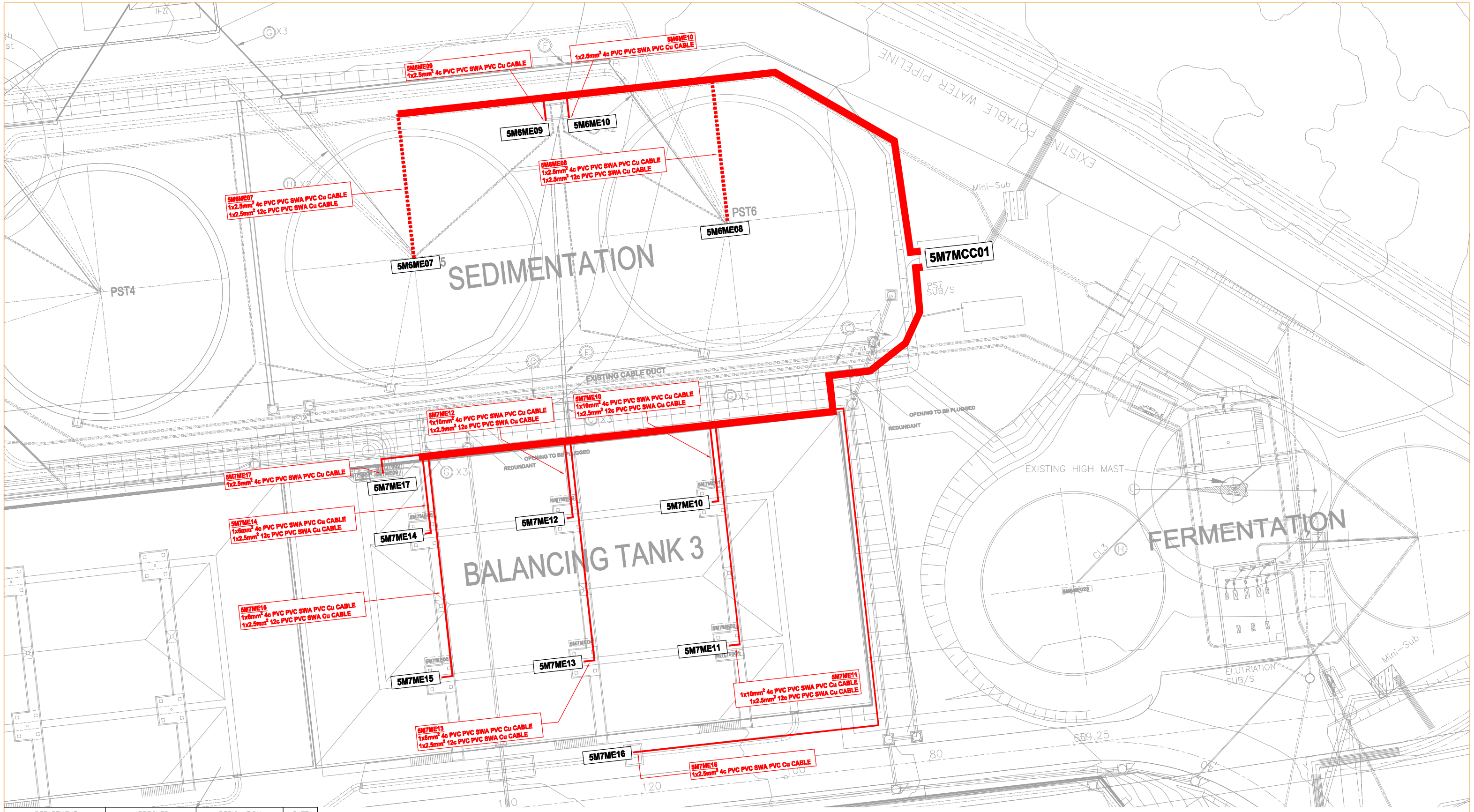
JW NUMBER
JW13021R-5E5-SM01

CONSULTANT'S NUMBER
ING645D-5E5-SM01

FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E5-MCC-01 (HYPOCHLORITE)\Schematics\ING0645D-5E5-SM01 revTO.dwg May 31, 2019 – 2:41pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

SURVEYED	
DESIGNED	BM
DRAWN	MD
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
SEDIMENTATION AND BALANCING TANKS
CABLE ROUTING

DESIGN MANAGER

DATE

SCALE 1:750

AMENDMENTS

		APPROVED	DATE
TO	FOR TENDER	BM	15.11.18

DRAWING No.

JW NUMBER
JW13021R-5E7-CR01
CONSULTANT'S NUMBER
ING0645D-5E7-CR01
FILE No
BWW
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E7-MCC-01 (PST & BAL)\Cable Routes\ING0645D-5E7-CR01 revTO.dwg May 31, 2019 – 2:42pm

9	8	7	6	5	4	3	2	1
PLC MARSHALLING CUBICLE	8A SPARE	ODOUR CONT. HEATER	11kW MIXER 1	11kW MIXER 2	11kW MIXER 3	11kW MIXER 4	0.37kW PST3 SCRAPER	METERING
	SPARE SPACE	ODOUR CONT FAN	11kW MIXER 5	11kW MIXER 6	5M7ME10 BAL TANK 2 MIX 1 11kW USE EX EQUIPPED SPARE	5M7ME11 BAL TANK 2 MIX 2 11kW (USE EX EQUIPPED SPARE)	0.37kW PST4 SCRAPER	630A MAIN INCOMER
	80A FEEDER SPARE	5M7ME15 BAL TANK 2 MIX 6 11kW USE EX EQUIPPED SPARE	N5 INLET PENSTOCK	5M7ME12 BAL TANK 2 MIX 3 11kW USE EX EQUIPPED SPARE	5M7ME13 BAL TANK 2 MIX 4 11kW USE EX EQUIPPED SPARE	5M7ME14 BAL TANK 2 MIX 5 11kW USE EX EQUIPPED SPARE	5M7ME07 PST 5 BRIDGE DRIVE 0.55kW (EX 0.37kW TO BE UPGRADED TO 0.55kW	
	80A FEEDER SPARE	BT1 OUTLET VALVE	BT1 BYPASS VALVE	SPARE SPACE	SPARE SPACE	SPARE SPACE	5M7ME08 PST 6 BRIDGE DRIVE 0.55kW (EX 0.37kW TO BE UPGRADED TO 0.55kW	
	SPARE SPACE	BT1 INLET PENSTOCK	PST3 SLUDGE VALVE	SPARE SPACE	SPARE SPACE	SPARE SPACE	40A FEEDER SDB MAIN SUB	
	SPARE SPACE	N3 INLET PENSTOCK	PST4 SLUDGE VALVE	16A FEEDER IDB FEEDER	WELDING PLUG BT WEST WALL	16A FEEDER SDB FEEDER	SPARE SPACE	CONTROL CUBICLE

2350

800 600 600 600 600 600 600 600 600

5600

600

03.10.18 BM

TO FOR INFORMATION

AMMENDEMENTS

A3

CONSULTING ENGINEERS

Knight Piésold CONSULTING

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DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

DESIGN MANAGER DATE

SCALE NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

PST AND BALANCING TANK

5E7-MCC-01

GENERAL ARRANGEMENT

DRAWING No.

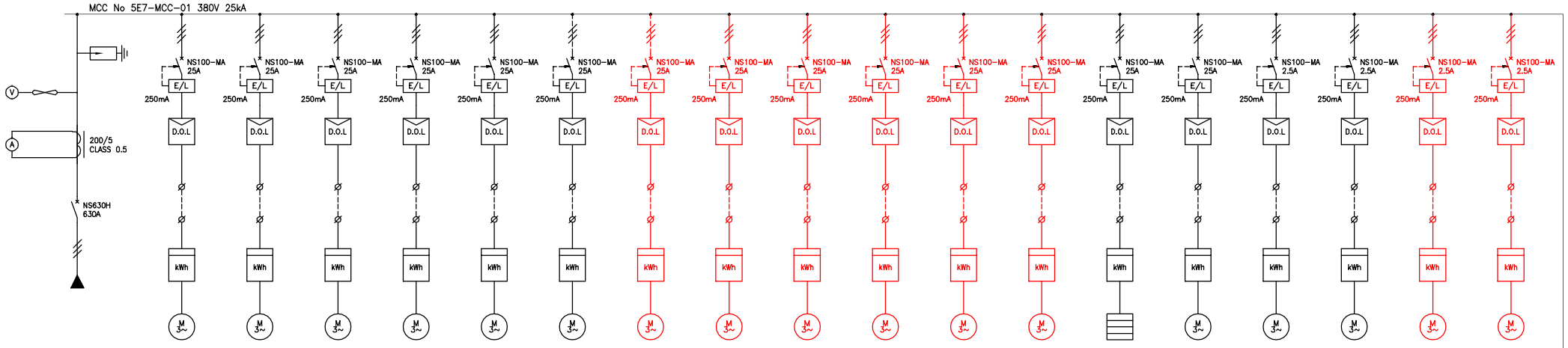
JW NUMBER
JW13021R-5E7-GA01

CONSULTANT'S NUMBER
ING645D-5E7-GA01

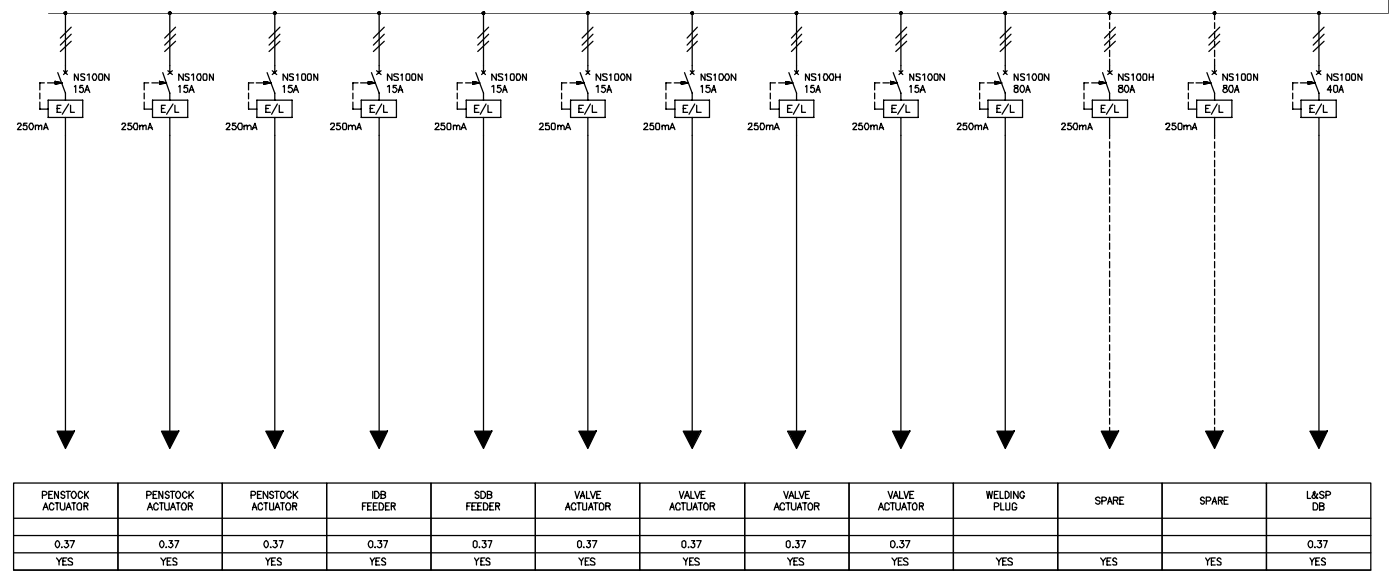
FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E7-MCC-01 (PST & BAL)\General Arrangements\ING0645D-5E7-GA01 revT0.dwg May 31, 2019 – 2:43pm



DRIVE NAME	INCOMER	MIXER 1 DRIVE	MIXER 2 DRIVE	MIXER 3 DRIVE	MIXER 4 DRIVE	MIXER 5 DRIVE	MIXER 6 DRIVE	BALANCING TANK 2 MIXER 1	BALANCING TANK 2 MIXER 2	BALANCING TANK 2 MIXER 3	BALANCING TANK 2 MIXER 4	BALANCING TANK 2 MIXER 5	BALANCING TANK 2 MIXER 6	ODOUR CONTROL HEATER	ODOUR CONTROL FAN	SCRAPER DRIVE	SCRAPER DRIVE	PST5 BRIDGE DRIVE	PST6 BRIDGE DRIVE
EQUIP No.								5M7ME10	5M7ME11	5M7ME12	5M7ME13	5M7ME14	5M7ME15					5M7ME07	5M7ME08
LOAD (kW)		11	11	11	11	11	11	11	11	11	11	11	11	12	4	0.37	0.37	0.55	0.55
EQUIPPED		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES



PENSTOCK ACTUATOR	PENSTOCK ACTUATOR	PENSTOCK ACTUATOR	IDB FEEDER	SDB FEEDER	VALVE ACTUATOR	VALVE ACTUATOR	VALVE ACTUATOR	VALVE ACTUATOR	WELDING PLUG	SPARE	SPARE	L&SP DB
0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37				0.37
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DESIGNED	
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
PST AND BALANCING TANK
5E7-MCC-01
SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
		B MARRIOTT	

DRAWING No.

JW NUMBER
JW13021R-5E7-SM01
CONSULTANT'S NUMBER
ING645D-5E7-SM01
FILE No
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E7-MCC-01 (PST & BAL)\Schematics\ING0645D-5E7-SM01 revT0.dwg May 31, 2019 – 2:45pm

EXISTING PST SUBSTATION

NEW ODOUR CONTROL

5M8ME01 BIO-TRICKLING FILTER

5M8ME02 TANK

5M8ME03

5M8ME04 EXISTING ODOUR TREATMENT PLANT

EXISTING SCREEN STRUCTURE

℄ SCREENS

TOP OF EMBANKMENT

BOTTOM OF EMBANKMENT

ROAD ACCESS TO SCREENS

ARMCO GUARD RAIL

ROAD VERGE AT TOP OF EMBANKMENT

TOE OF EMBANKMENT

ø90 UPVC PIPE

BIN SLAB 14000X9000

BIN

SPILLAGE DRAIN 150ø uPVC CLASS T3

ARMCOR BARRIER ON STEEL STANCHION SUPPORT BOLTED TO SLAB

HEAVY DUTY PAVING

ROAD

1373.500

1375

1372.500

ARMCO BARRIER GUARD RAILS

RETAINING WALL

ø300

SOP23

1371.650

SOP22

TERRACE LEVEL 1371.600

EXISTING MIXING TANK

TWL1372.400

PHASE 2 MIXING TANK

5M8ME16

TWL1372.400

ø350

ø300 uPVC DRAIN

CABLES

EXISTING ROAD

1370

PAVING TO ROAD ED

5000

EXISTING FERMENTATION THICKENER 2 TWL 1371,60

ø250

8,600

2,700

NEW SLUDGE RECIRCULATION PUMP

NEW ELUTRIATION MCC-01

NEW ELUTRIATION MCC-02

5M8ME30

5M8ME17

NEW FERMENTATION THICKENER 1 TWL 1371,60

S.O.P

5M8ME23

5M8ME22

5M8ME21

5M8ME20

5M8ME39

5M8ME37

5M8ME36

5M8ME35

PHASE 2 ELUTRIATION PUMP STATION

EXISTING ELUTRIATION PUMP STATION

5M8ME19

5M8ME10

5M8ME09

5M8ME26

5M8ME25

5M8ME24

5M8ME28

ELUTRIATION EFFLUENT SUMP

SLUDGE HOLDING TANK

TERRACE LEVEL 1371.345

SOP18

TIE INTO EXISTINGPIPE STUB

ø300 uPVC OVERFLOW

ø150

TERRACE LEVEL 1371.345

TOP OF EMBANKMENT 1:2 SLOPE

BOTTOM OF EMBANKMENT

1372

TL 1371,300

ø300 uPVC OVERFLOW

OVERFLOW TO WAS P/S

ø300 uPVC PIPE

TO UNIT B DIGESTERS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	BM
DRAWN	MD
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

FERMENTATION TERRACE

ELUTRIATION EFFLUENT AND THICKENED SLUDGE PIPES

CABLE ROUTE AND EQUIPMENT LAYOUT

DESIGN MANAGER

DATE

SCALE 1:1000

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	10.05.19

JW NUMBER
JW13896-5E8-CR01

CONSULTANT'S NUMBER
ING0645D-5E8-CR01

FILE No

DRAWING No.
T0

t:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\Cable Route\ING0645D-5E8-CR01 rev10.dwg May 31, 2019 – 2:47pm

8	7	6	5	4	3	2	1
PLC MARSHALLING CUBICLE	16A FEEDER WASTE PUMP 1	0.75kW FINE SCREEN 2	1.8kW CONVEYOR 1	18.5kW DOL EFFLUENT PUMP1 5M8ME09 (REPLACE EX. CUBICLE EQUIP)	18.5kW DOL EFFLUENT PUMP2 5M8ME10 (REPLACE EX. CUBICLE EQUIP)	18.5kW DOL EFFLUENT PUMP3 5M8ME19 (REPLACE EX. CUBICLE EQUIP)	METERING
	16A FEEDER WASTE PUMP 2	0.75kW FINE SCREEN 1	1.5kW SUMP PUMP				400A MCCB INCOMER
	16A FEEDER SPARE	16A FEEDER VENT FAN	1.5kW SCREENING PRESS	5.5kW MIXER 1	11kW DOL TRANSFER PUMP1 5M8ME07	11kW DOL TRANSFER PUMP1 5M8ME08	
	16A FEEDER WELDING PLUG	16A FEEDER SET SEWAGE VALVE	1.5kW SPARE	0.55kW ET THICKNER	5.5kW DOL RECYCLE PUMP1 5M8ME05	5.5kW DOL RECYCLE PUMP2 5M8ME06	
	SPARE SPACE	16A FEEDER RECYCLE VALVE	0.75kW RAW SLUDGE INLET VALVE	2.2kW SPARE	SPARE SPACE	SPARE SPACE	
	SPARE SPACE	16A FEEDER WASTE TO U2 VALVE	16A FEEDER SPARE	80A FEEDER SDB FEEDER	80A FEEDER IDB FEEDER	80A FEEDER	CONTROL CUBICLE
800	600	600	600	600	600	600	600

2350

5000

600

03.10.18 BM TO FOR INFORMATION

AMMENDEMENTS

A3

CONSULTING ENGINEERS

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MARSHALLTOWN - 2107
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FAX: (011) 688-1529

SURVEYED	
DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	
DESIGN MANAGER	DATE
SCALE	NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

ELUTRIATION PUMP STATION

5E8–MCC–01

GENERAL ARRANGEMENT

DRAWING No.

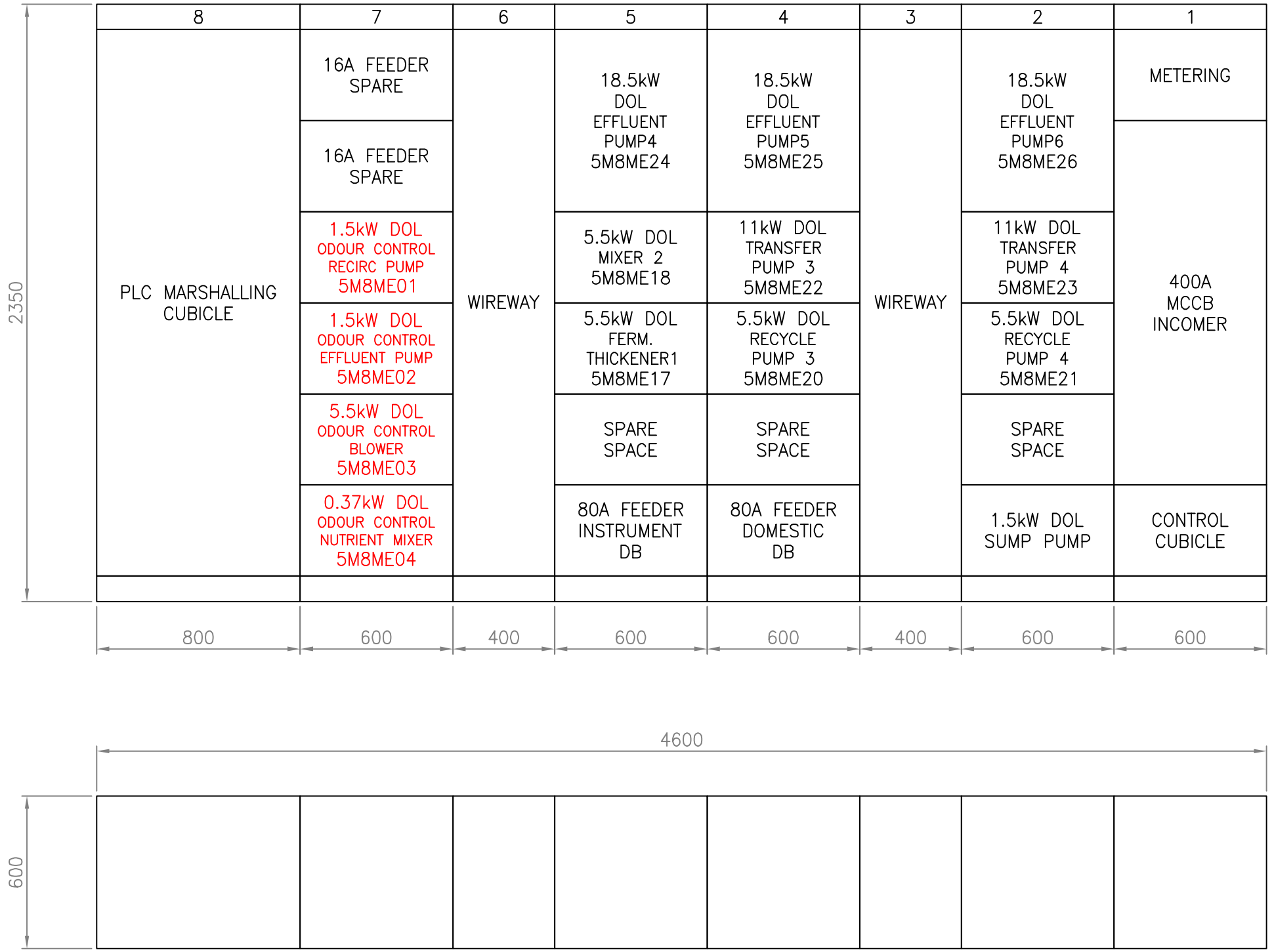
JW NUMBER
JW13021R–5E8–GA1

CONSULTANT'S NUMBER
ING645D–5E8–GA1

FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8–MCC–01 (ELT)\General Arrangements\ING0645D–5E8–GA01 revT0.dwg May 31, 2019 – 2:51pm



03.10.18 BM TO FOR INFORMATION

AMMENDEMENTS

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CONSULTING ENGINEERS

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DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	
DESIGN MANAGER	DATE
SCALE	NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

ELUTRIATION PUMP STATION

NEW ELUTRIATION MCC–02 5E8–MCC–02

GENERAL ARRANGEMENT

DRAWING No.

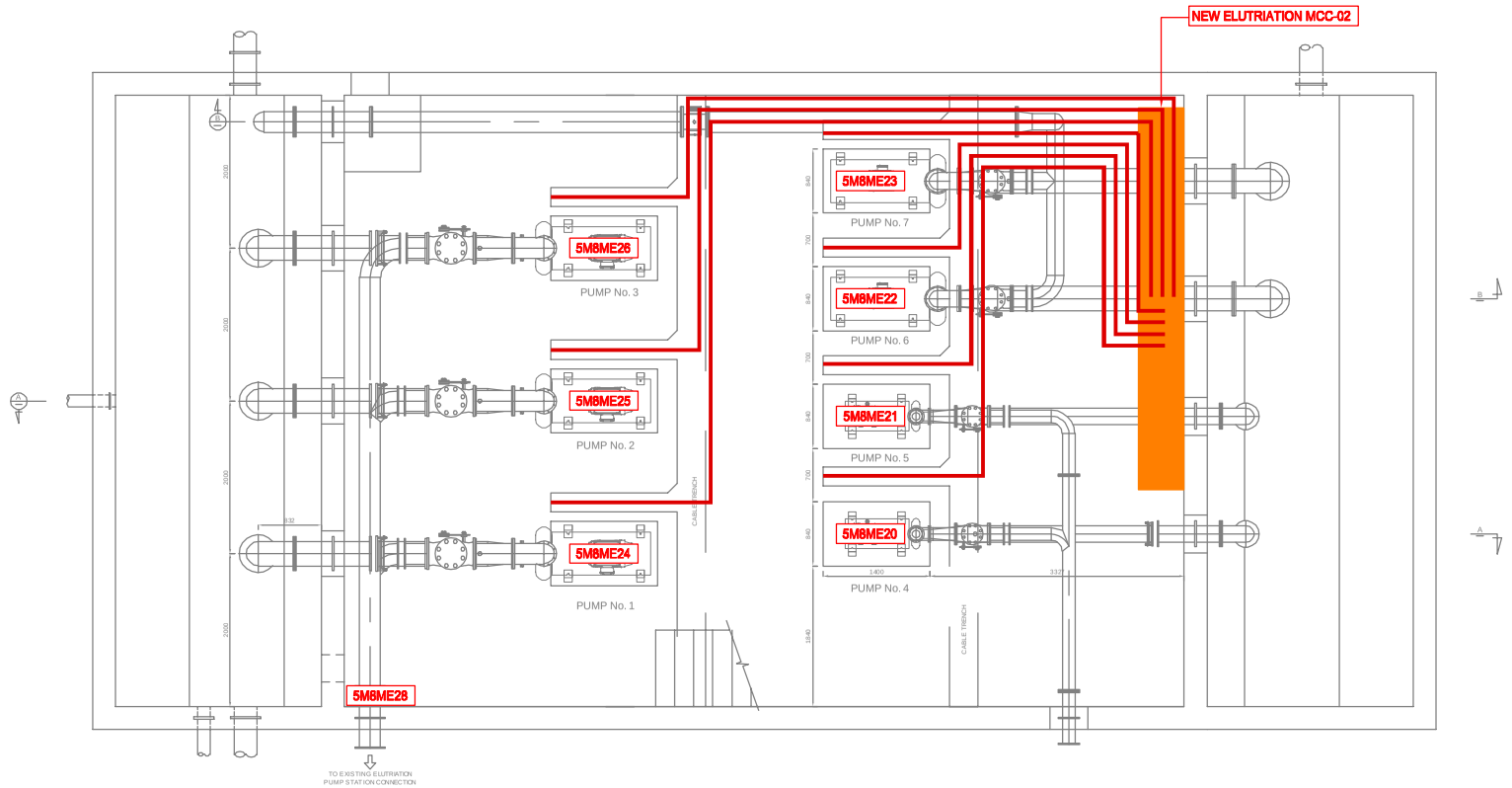
JW NUMBER
JW13898–5E8–GA2

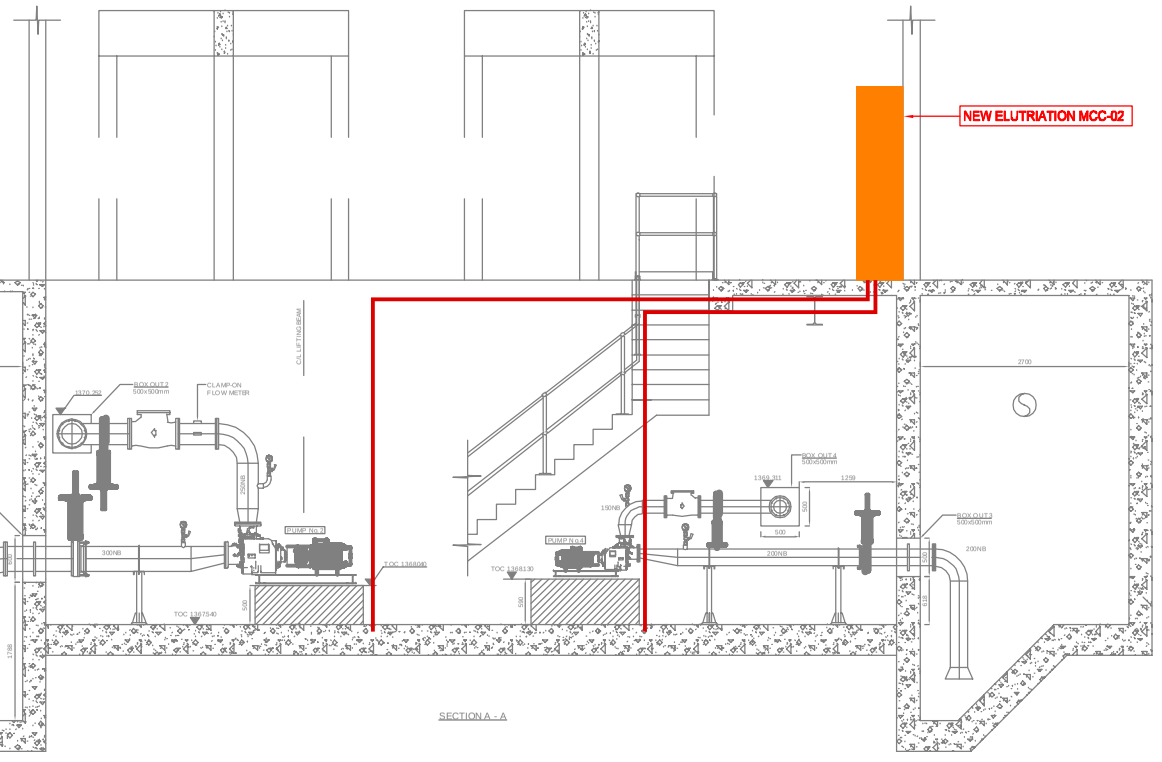
CONSULTANT'S NUMBER
ING645D–5E8–GA2

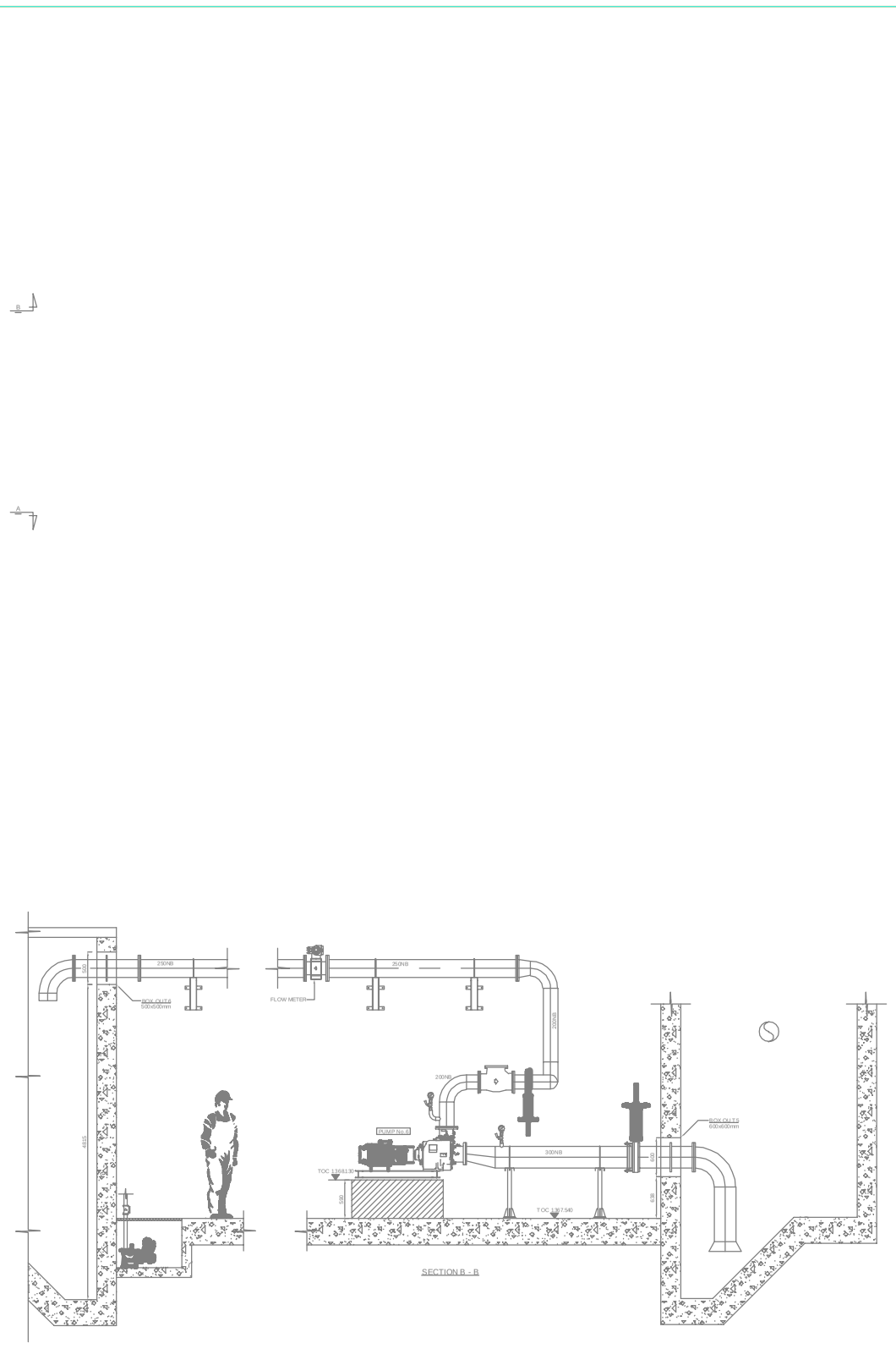
FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8–MCC–01 (ELT)\General Arrangements\ING0645D–5E8–GA02 revT0.dwg May 31, 2019 – 2:50pm







DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DRAWN	MD
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SERVITUDES	
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Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
FERMENTATION TERRACE
ELUTRIATION PUMP STATION
CABLE ROUTE AND EQUIPMENT LAYOUT

DESIGN MANAGER

DATE

SCALE
1:50

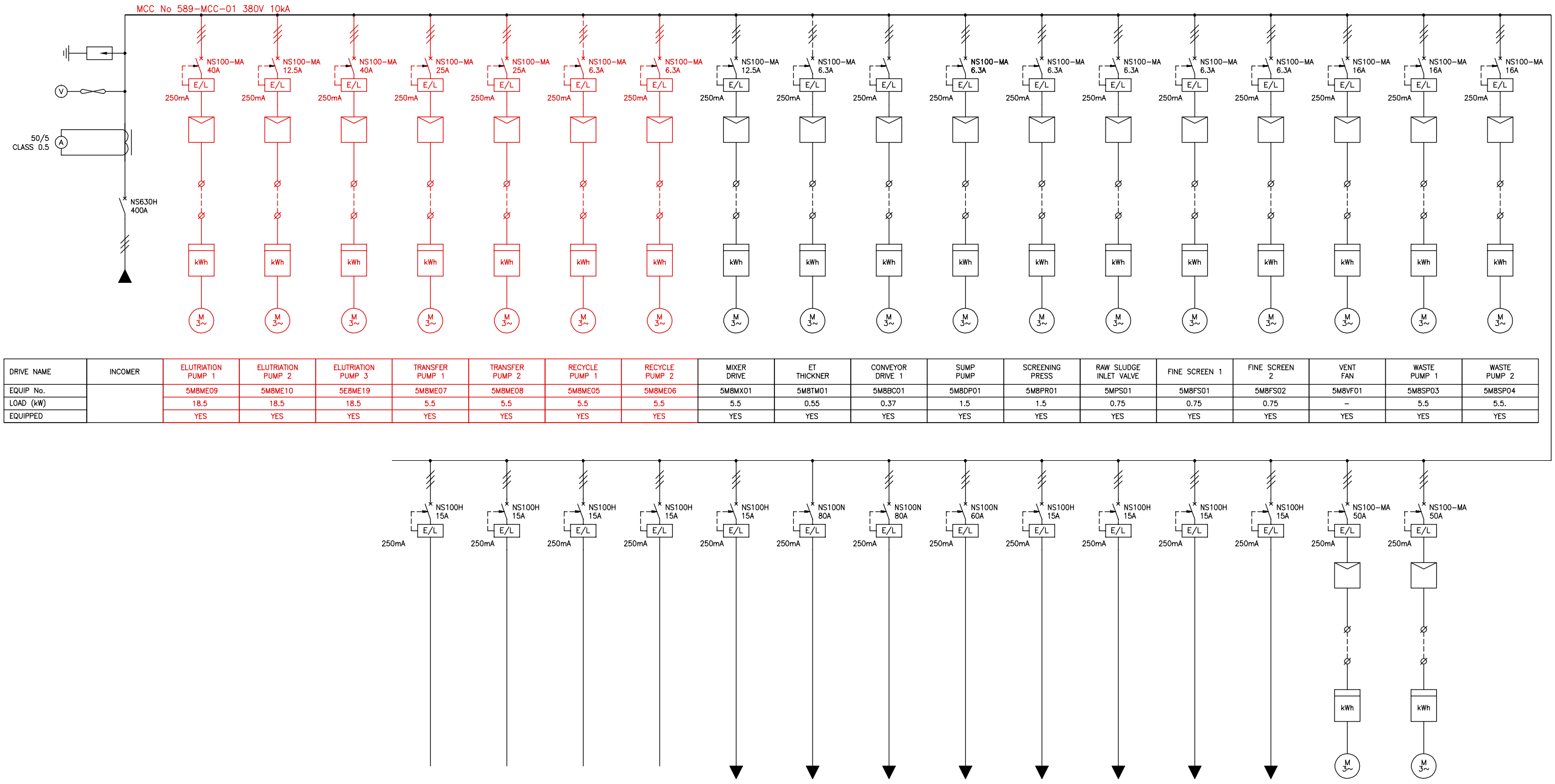
AMENDMENTS

	AMENDMENTS	APPROVED	DATE
T0	FOR TENDER	BM	10.05.19

DRAWING No.

JW NUMBER
JW13896-5E8-GA03
CONSULTANT'S NUMBER
ING0645D-5E8-GA03
FILE No
T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\General Arrangements\ING0645D-5E8-GA03 revT0.dwg May 31, 2019 – 2:51pm



DRIVE NAME	INCOMER	ELUTRIATION PUMP 1	ELUTRIATION PUMP 2	ELUTRIATION PUMP 3	TRANSFER PUMP 1	TRANSFER PUMP 2	RECYCLE PUMP 1	RECYCLE PUMP 2	MIXER DRIVE	ET THICKNER	CONVEYOR DRIVE 1	SUMP PUMP	SCREENING PRESS	RAW SLUDGE INLET VALVE	FINE SCREEN 1	FINE SCREEN 2	VENT FAN	WASTE PUMP 1	WASTE PUMP 2
EQUIP No.		5M8ME09	5M8ME10	5E8ME19	5M8ME07	5M8ME08	5M8ME05	5M8ME06	5M8MX01	5M8TM01	5M8BC01	5M8DP01	5M8PR01	5MPS01	5M8FS01	5M8FS02	5M8VF01	5M8SP03	5M8SP04
LOAD (kW)		18.5	18.5	18.5	5.5	5.5	5.5	5.5	5.5	0.55	0.37	1.5	1.5	0.75	0.75	0.75	–	5.5	5.5.
EQUIPPED		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

SPARE SPACE	SPARE SPACE	SPARE SPACE	SPARE SPACE	16A FEEDER SPARE	80A FEEDER SPARE	80A FEEDER SDB FEEDER	80A FEEDER IDB FEEDER	16A FEEDER WELDING PLUG	WASTE TO U2 VALVE	SETTLING SEWAGE VALVE	RECYCLE VALVE	2.2 kWSPARE	1.5kW SPARE
–	–	–	–	–	–	–	5MEIDB01	–	5M8EV12	5M8EV11	5M8SV01	–	–
–	–	–	–	–	–	–	–	–	–	–	–	2.2	1.5
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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FAX: (011) 688-1529

SURVEYED	
DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

ELUTRIATION PUMP STATION

5E8-MCC-01

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
TO	FOR INFORMATION	BM	03.10.18

DRAWING No.

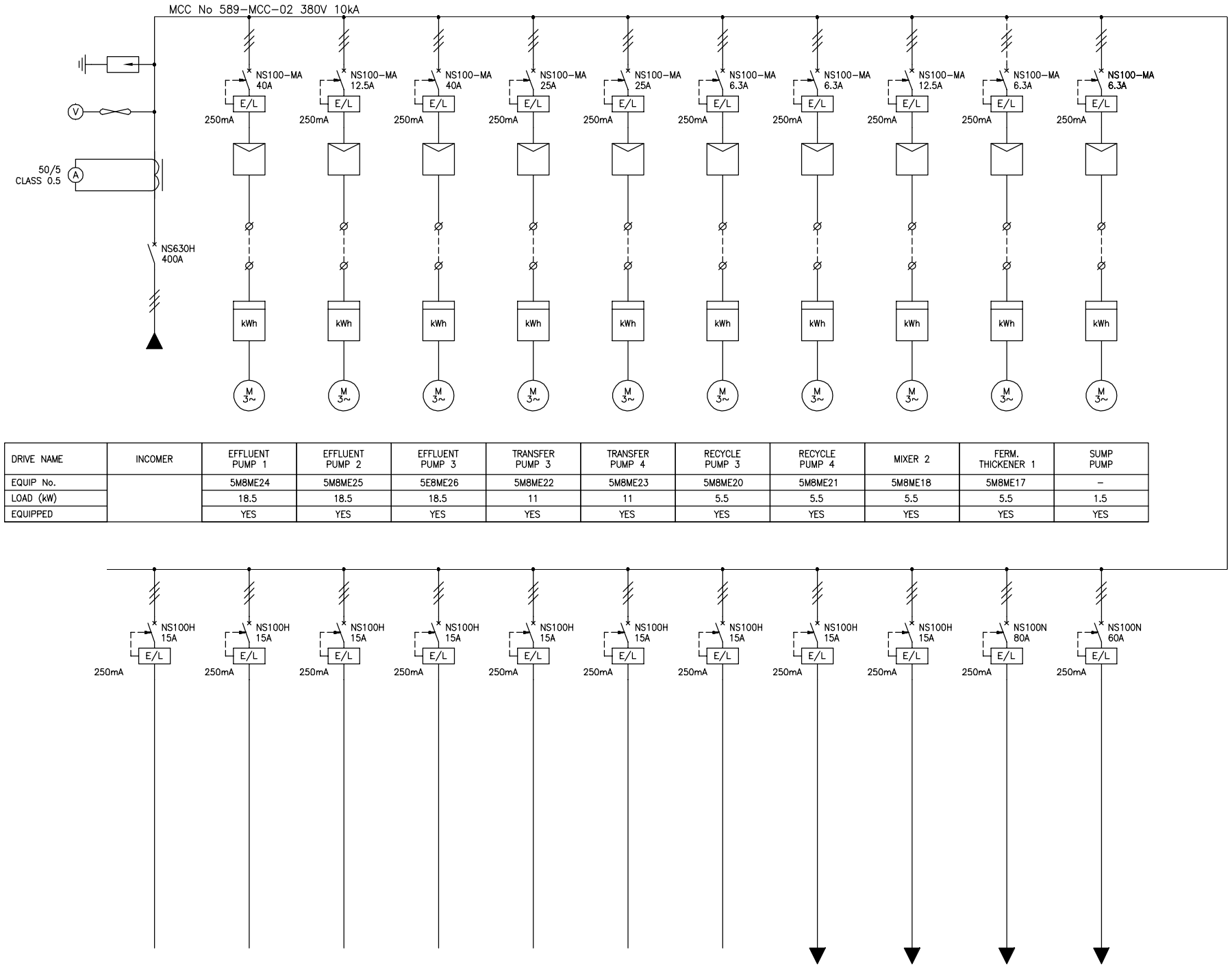
JW NUMBER
JW13021R-5E8-SM01

CONSULTANT'S NUMBER
ING0645D-5E8-SM01

FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\Schematics\ING0645D-5E8-SM01 revT0.dwg May 31, 2019 – 3:01pm



DRIVE NAME	INCOMER	EFFLUENT PUMP 1	EFFLUENT PUMP 2	EFFLUENT PUMP 3	TRANSFER PUMP 3	TRANSFER PUMP 4	RECYCLE PUMP 3	RECYCLE PUMP 4	MIXER 2	FERM. THICKENER 1	SUMP PUMP
EQUIP No.		5M8ME24	5M8ME25	5E8ME26	5M8ME22	5M8ME23	5M8ME20	5M8ME21	5M8ME18	5M8ME17	–
LOAD (kW)		18.5	18.5	18.5	11	11	5.5	5.5	5.5	5.5	1.5
EQUIPPED		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

SPARE SPACE	SPARE SPACE	SPARE SPACE	SPARE SPACE	SPARE SPACE	SPARE SPACE	SPARE SPACE	16A FEEDER SPARE	16A FEEDER SPARE	80A FEEDER DOMESTIC DB	80A FEEDER INSTRUMENT DB
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

ELUTRIATION PUMP STATION

NEW ELUTRIATION MCC-02 5E8-MCC-02

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS		APPROVED	DATE
T0	FOR INFORMATION	BM	03.10.18

DRAWING No.

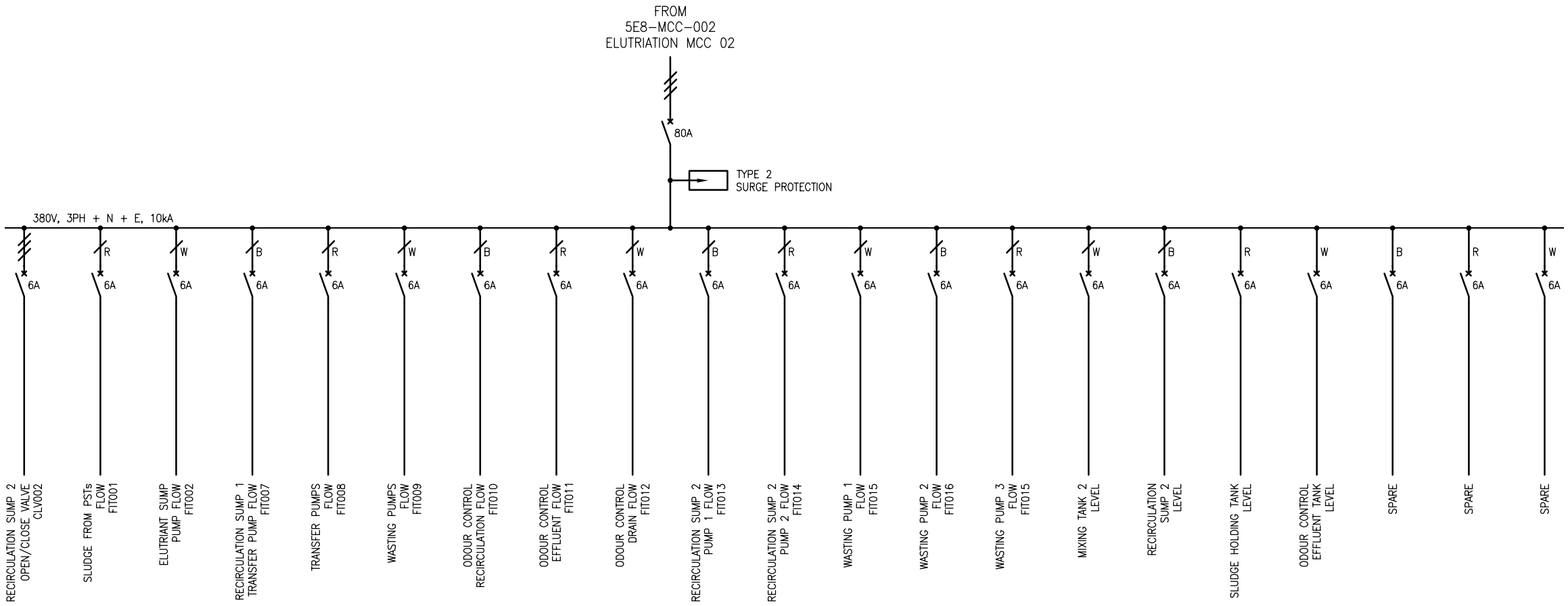
JW NUMBER JW13898-5E8-SM02

CONSULTANT'S NUMBER ING0645D-5E8-SM02

FILE No

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\Schematics\ING0645D-5E8-SM02 revT0.dwg May 31, 2019 – 3:01pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	BM
DRAWN	MD
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SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION

5E8-IDB-002 – ELUTRIATION INSTRUMENT DB

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.05.19

DRAWING No.

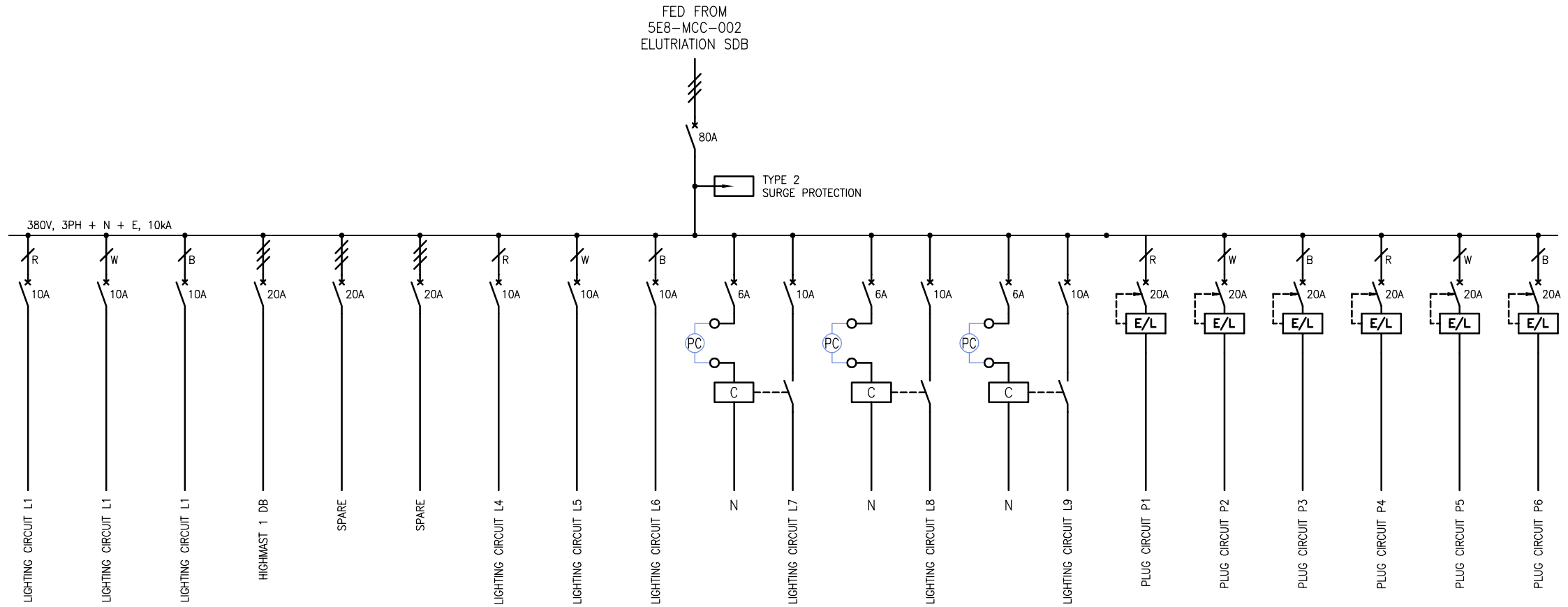
JW NUMBER JW13021R-5E8-SM03

CONSULTANT'S NUMBER ING0645D-5E8-SM03

FILE No BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\Schematics\ING0645D-5E8-SM03 revT0.dwg May 31, 2019 – 2:54pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

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FAX: (011) 688-1529

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DESIGNED	BM
DRAWN	MD
CHECKED	
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION

558-SDB-002 – ELUTRIATION SDB02

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	BM	28.05.19

JW NUMBER
JW13021R-5E8-SM04

CONSULTANT'S NUMBER
ING0645D-5E8-SM04

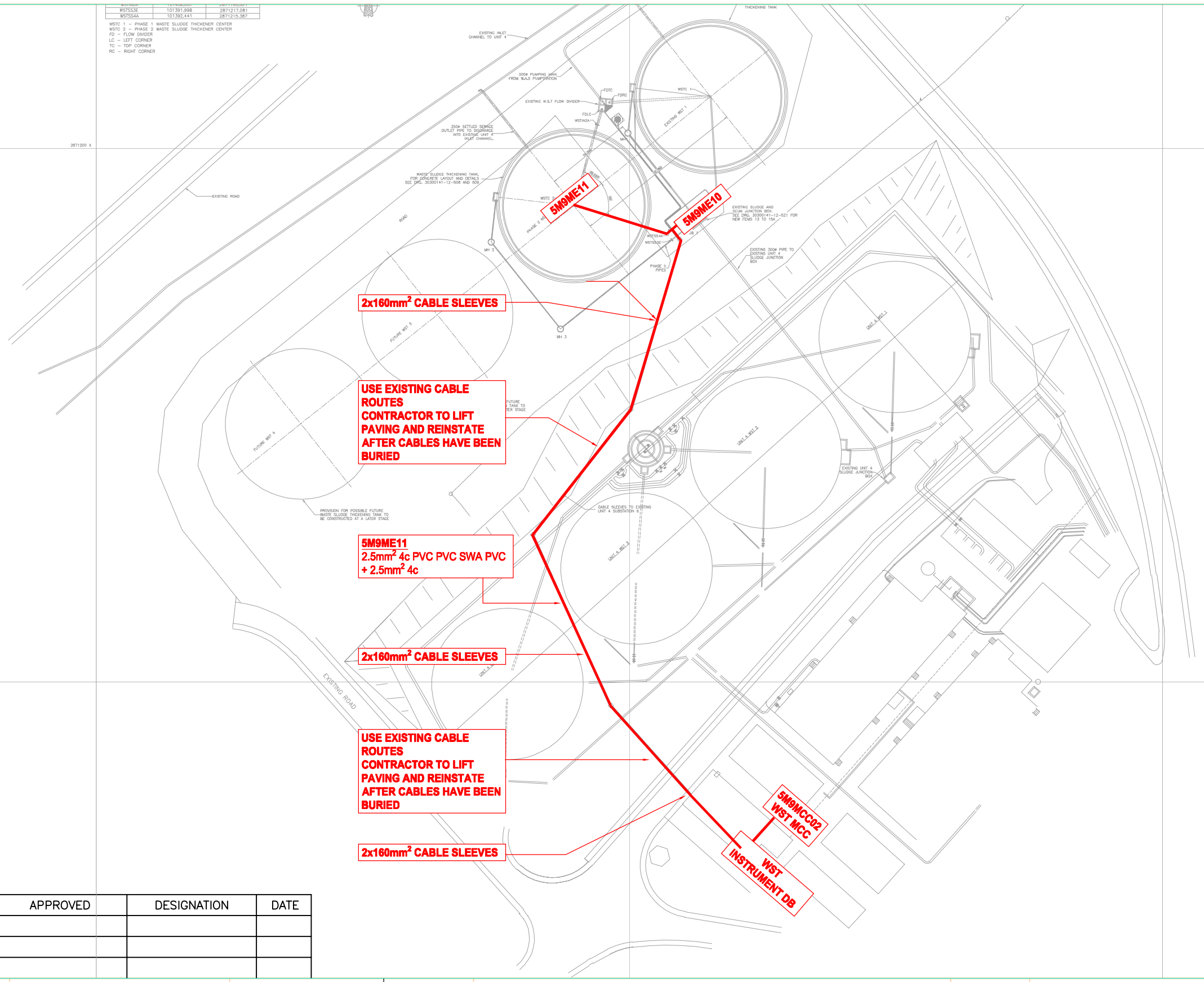
FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E8-MCC-01 (ELT)\Schematics\ING0645D-5E8-SM04 revT0.dwg May 31, 2019 – 3:02pm

WST553E	101.391.998	2871217.081
WST554A	101382.441	2871215.387

WSTC 1 – PHASE 1 WASTE SLUDGE THICKENER CENTER
WSTC 2 – PHASE 2 WASTE SLUDGE THICKENER CENTER
FD – FLOW DIVIDER
LC – LEFT CORNER
TC – TOP CORNER
RC – RIGHT CORNER



DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

WASTE ACTIVATED SLUDGE TREATMENT

SITE LAYOUT

CABLE ROUTE

DESIGN MANAGER

DATE

SCALE 1:500

AMENDMENTS

		APPROVED	DATE
T0	FOR INFORMATION	BM	15.11.18

DRAWING No.

JW NUMBER
JW13021R-5E9-CR01

CONSULTANT'S NUMBER
ING0645D-5E9-CR01

FILE No

T0

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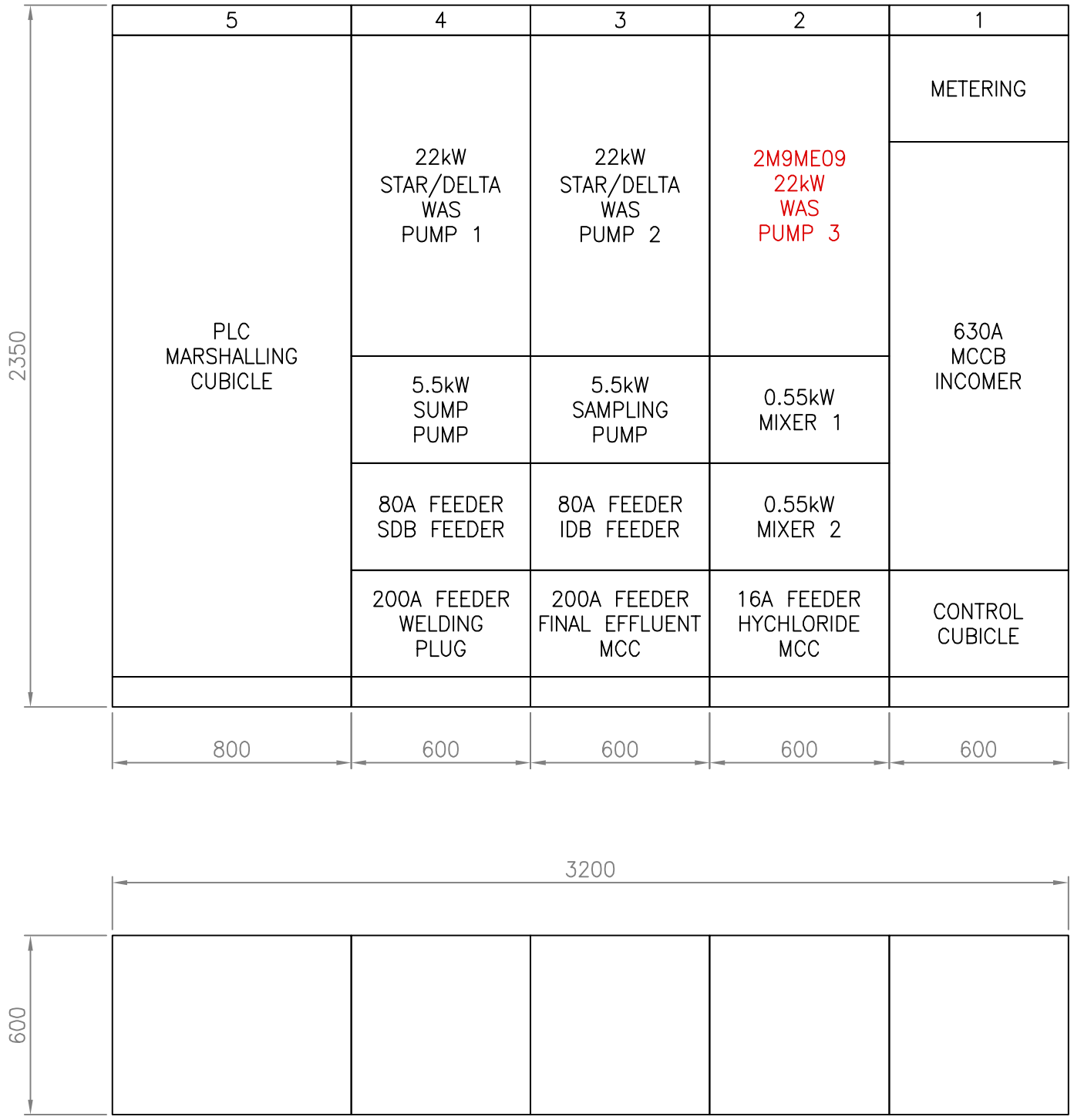

AMMENDEMENTS		
TO	FOR INFORMATION	03.10.18
	BM	

A3

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DESIGNED	
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CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	
DESIGN MANAGER	DATE
SCALE	NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

WAS PUMP STATION

5E9–MCC–01

GENERAL ARRANGEMENT

DRAWING No.

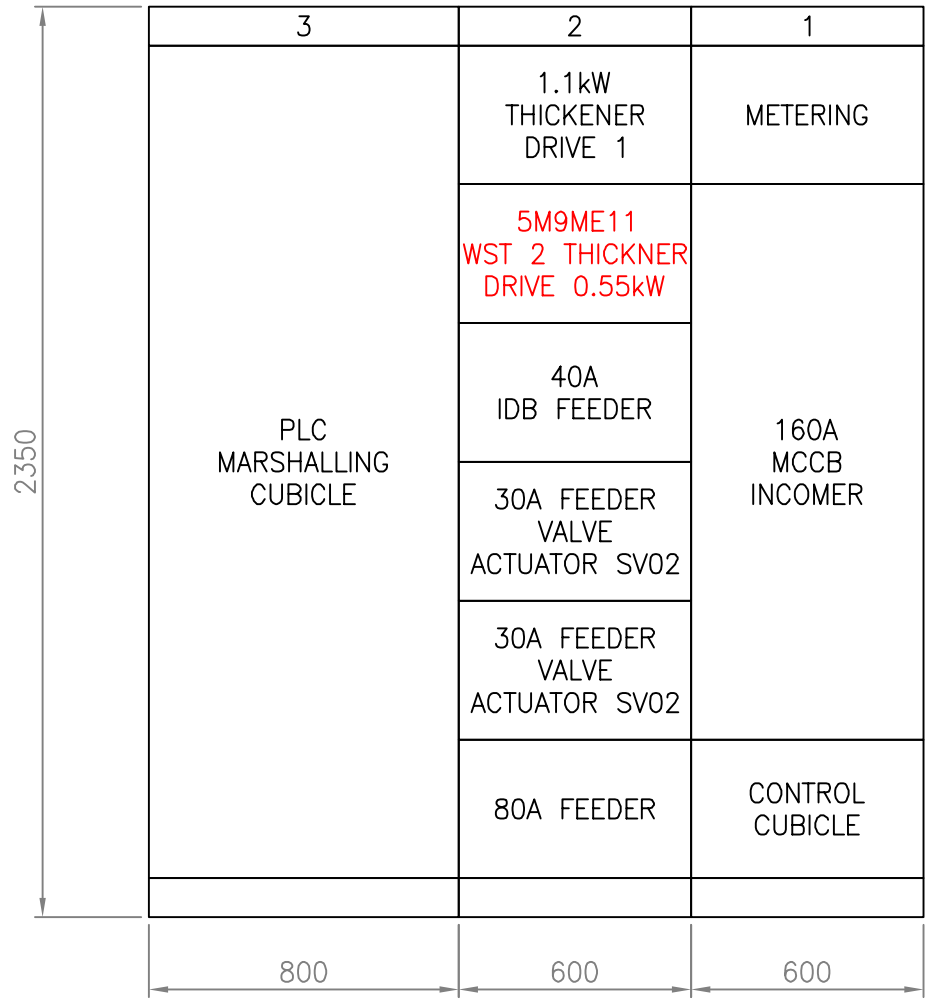
JW NUMBER
JW13021R–5E9–GA01

CONSULTANT'S NUMBER
ING645D–5E9–GA01

FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E9–MCC–01 (WAS)\General Arrangements\ING0645D–5E9–GA01 revTO.dwg May 31, 2019 – 3:03pm



AMMENDEMENTS		
TO	FOR INFORMATION	03.10.18
	BM	

A3

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SURVEYED	
DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

DESIGN MANAGER DATE

SCALE NTS

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

WAS TERRACE

5E9–MCC–02

GENERAL ARRANGEMENT

DRAWING No.

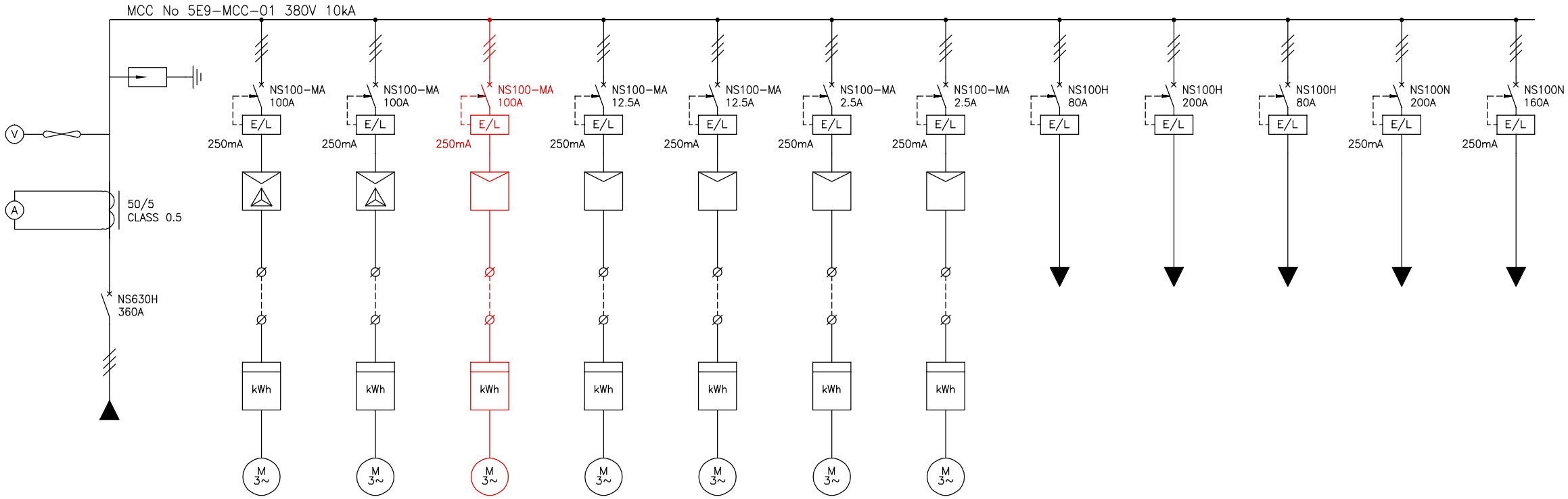
JW NUMBER
JW13021R–5E9–GA02

CONSULTANT'S NUMBER
ING645D–5E9–GA02

FILE No

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E9–MCC–02 (WST)\General Arrangements\ING0645D–5E9–GA02 revT0.dwg May 31, 2019 – 3:06pm



DRIVE NAME	INCOMER	WAS PUMP 1	WAS PUMP 2	WAS PUMP 3	SUMP PUMP	VENT FAN	MIXER DRIVE 1	MIXER DRIVE 2	LIGHTING & SMALL POWER DB	FEED TO 5E5MCC01	WELDING SOCKET	FEED TO 5E5MCC02	INSTRUMENT DB
EQUIP No.		5M09LP01	5M9LP02	5M5ME09	5M9DP01	5M8FV01	5M8MX01	5M8MX01	–	–	–	5M9SV04	5E9IDB01
LOAD (kW)		22	22	22	5.5	5.5	0.55	0.55	–	160A	–	200A	–
EQUIPPED		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

DEPARTMENT	APPROVED	DESIGNATION	DATE

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FAX: (011) 688-1529

SURVEYED	
DESIGNED	
DRAWN	M DYKE
CHECKED	B MARRIOTT
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

WAS PUMP STATION

5E9-MCC-01

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR INFORMATION	BM	03.10.18

DRAWING No.

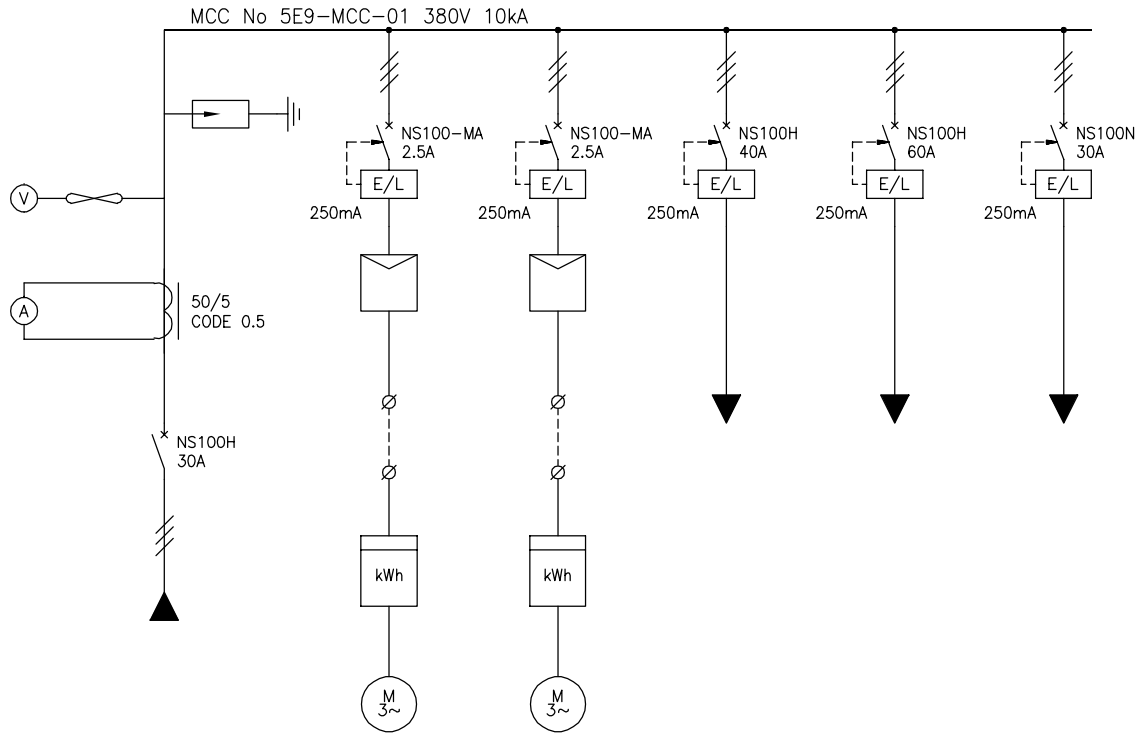
JW NUMBER
JW13021R-5E9-SM01

CONSULTANT'S NUMBER
ING0645D-5E9-SM01

FILE No

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E9-MCC-01 (WAS)\Schematics\ING0645D-5E9-SM01 revT0.dwg May 31, 2019 – 3:04pm



DRIVE NAME	INCOMER	THICKNER DRIVE	WST 2 THICKNER DRIVE	IDB FEEDER	VALVE ACTUATOR	VALVE ACTUATOR
EQUIP No.		5E9TM01	5E9ME11	–	5M9SV02	5M9SV04
LOAD (kW)		1.1	0.55	–	0.37	0.37
EQUIPPED		YES	YES	YES	YES	YES

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

WAS TERRACE

5E9-MCC-02

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS		APPROVED	DATE
T0	FOR INFORMATION	BM	03.10.18

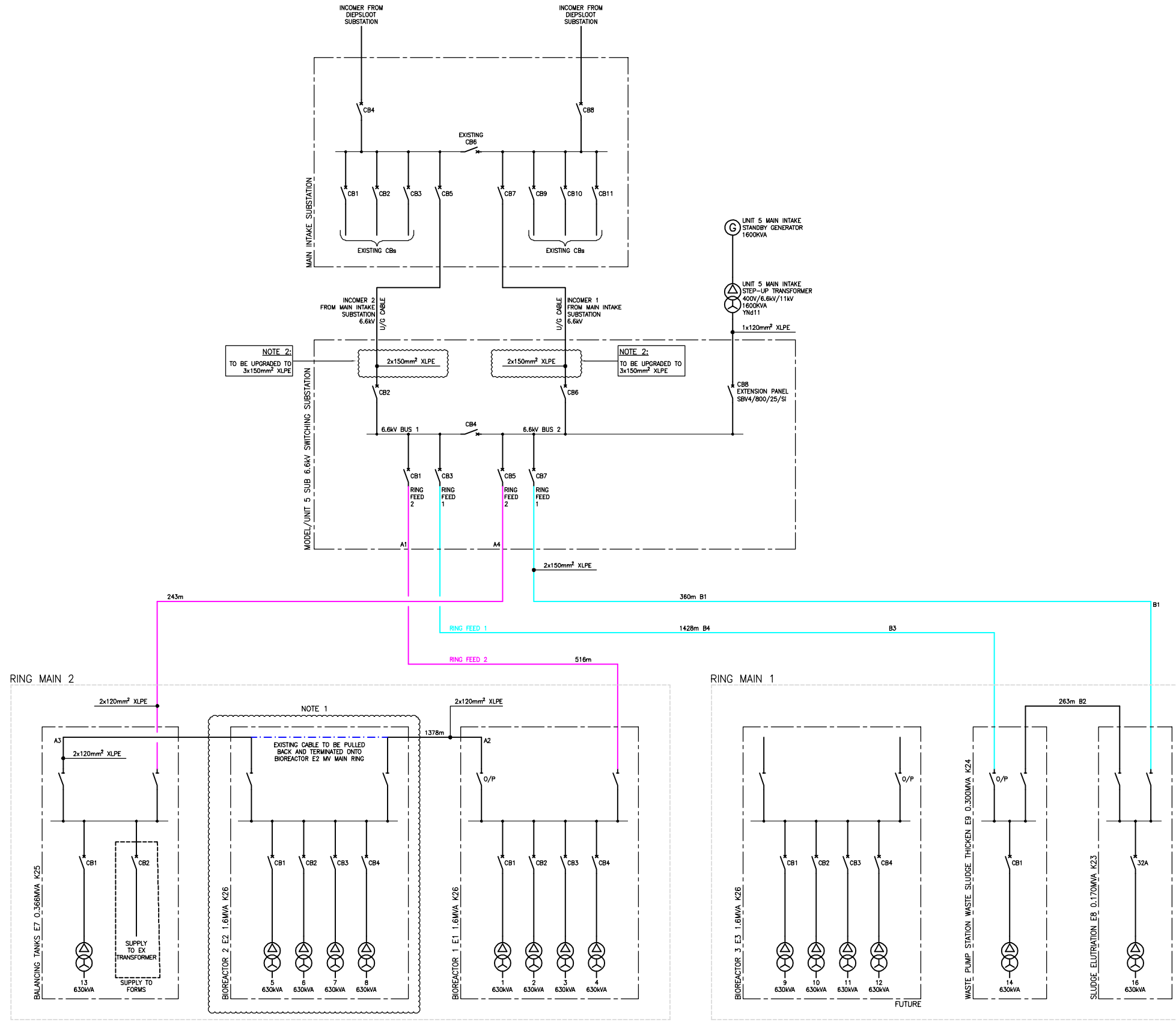
JW NUMBER
JW13021R-5E9-SM02

CONSULTANT'S NUMBER
ING0645D-5E9-SM02

FILE No

DRAWING No.
T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\5E9-MCC-02 (WST)\Schematics\ING0645D-5E9-SM02 revT0.dwg May 31, 2019 – 3:08pm



NOTES:

1. TIE-IN TO BIOREACTOR E2 REQUIRES THAT THE EXISTING MV CABLES FROM BIOREACTOR 1 TO THE BALANCING TANK BE REROUTED AND TERMINATED INTO THE NEW BIOREACTOR E2 SUBSTATION.
   A NEW CABLE FROM BIOREACTOR E2 TO BIOREACTOR E1 WILL ALSO BE INSTALLED TO COMPLETE THE RING.
2. AN ADDITIONAL 1x150mm XLPE CABLE TO BE INSTALLED IN PARALLEL WITH BOTH EXISTING RING FEEDS FROM THE MAIN INTAKE SUBSTATION TO THE UNIT 5 MAIN INTAKE SUBSTATION.

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	BM
DRAWN	MD
CHECKED	
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – MODULE 2
MAIN SINGLE LINE DIAGRAM

DESIGN MANAGER
DATE

SCALE
1:750

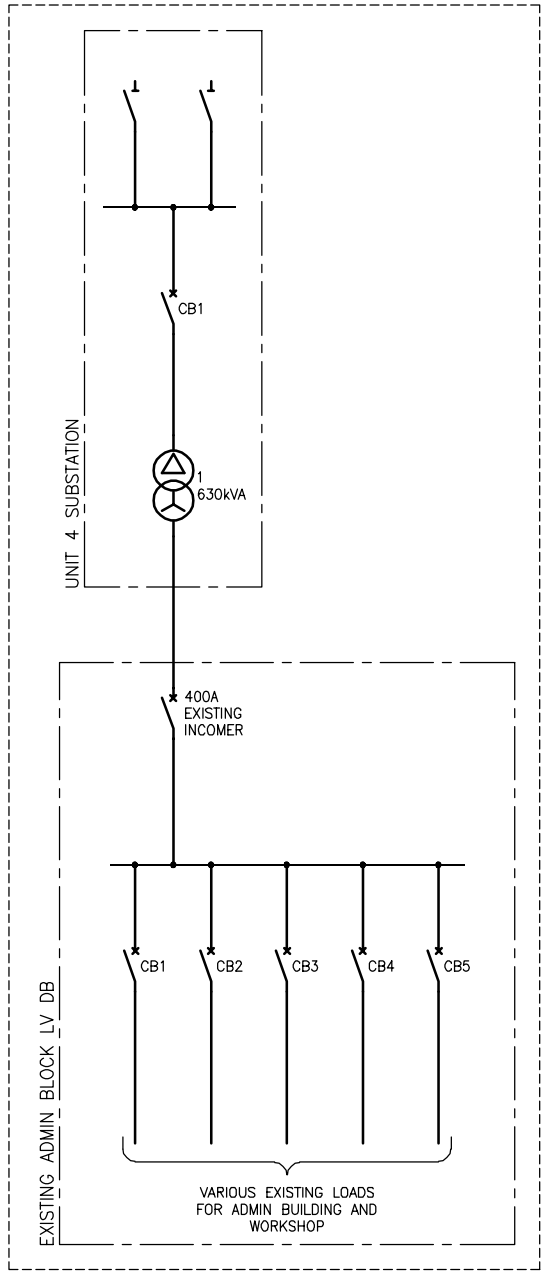
AMENDMENTS

		APPROVED	DATE
TO	FOR TENDER	BM	15.11.18

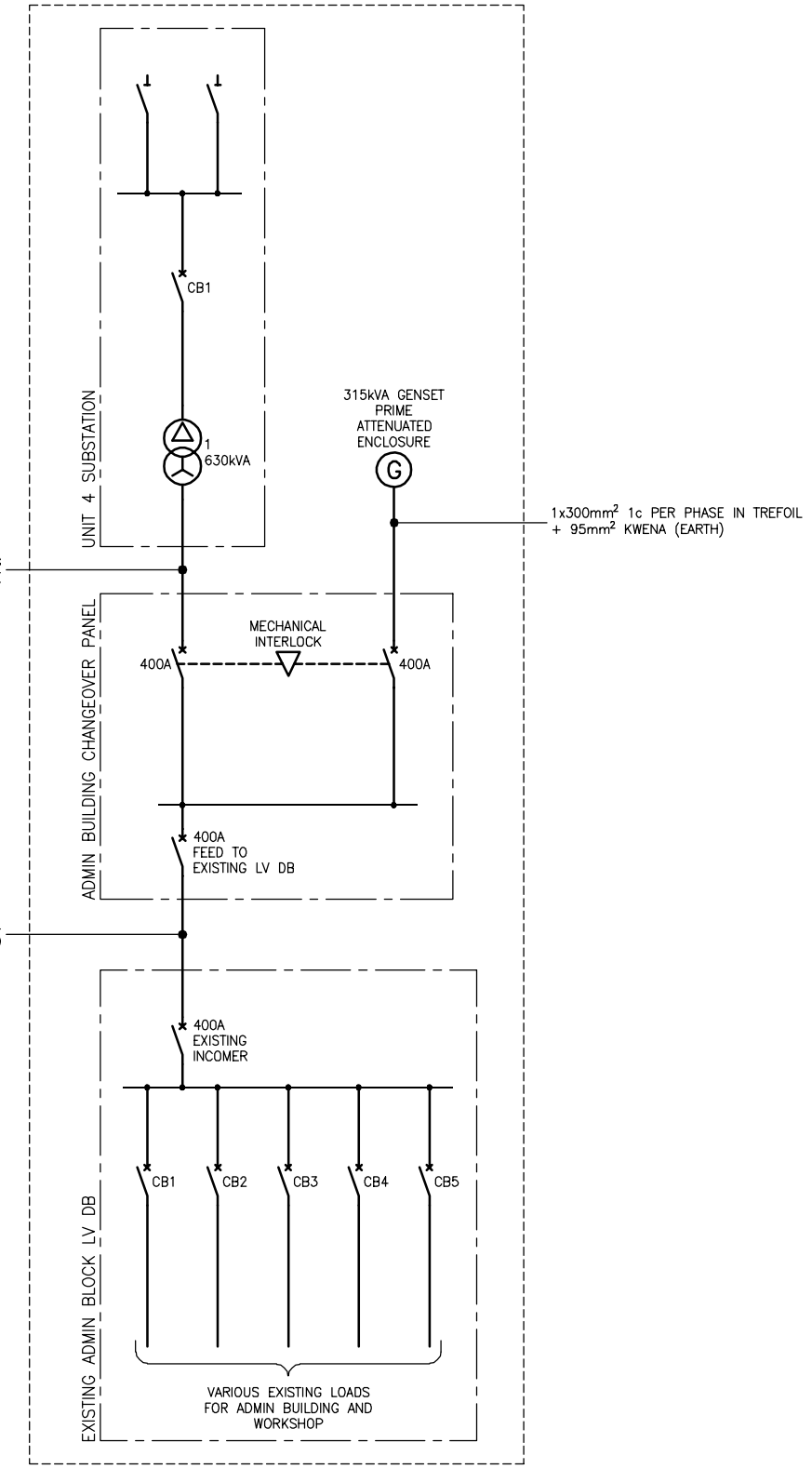
DRAWING No.

JW NUMBER
JW13021R-EE-SM01
CONSULTANT'S NUMBER
ING0645D-EE-SM01
FILE No
BWW
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\Common\Single Line Diagrams\ING0645D-EE-SM01 revT0.dwg May 31, 2019 – 3:12pm



EXISTING INSTALLATION



NEW INSTALLATION WITH GENERATOR AND CHANGE-OVER

DESIGNATION	DATE
APPROVED	
DEPARTMENT	

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DESIGNED	BM
DRAWN	MD
CHECKED	
SERVICES CHECKED	
GEOTECHNICAL INVESTIG.	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 – MODULE 2

ADMIN BUILDING

SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE
1:750

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	15.11.18

DRAWING No.

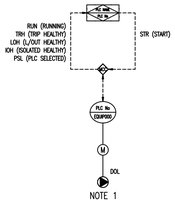
JW NUMBER
JW13021R-EE-SM02

CONSULTANT'S NUMBER
ING0645D-EE-SM02

FILE No
BWW

T0

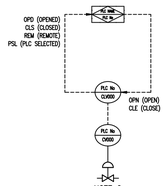
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\1. Electrical\Common\Single Line Diagrams\ING0645D-EE-SM02 revT0.dwg May 31, 2019 – 3:11pm



NOTE 1

DOL DRIVE	
SIGNALS	
DI	DO
RUN (RUNNING) TRH (TRIP HEALTHY) LOH (L/OUT HEALTHY) IOH (ISOLATED HEALTHY) PSL (PLC SELECTED)	STR (START)

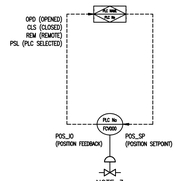
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 2

ON/OFF MOTORISED VALVE		
SIGNALS		
DI		DO
OPD (OPENED) CLS (CLOSED) REM (REMOTE) PSL (PLC SELECTED)		OPN (OPEN) CLE (CLOSE)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 3

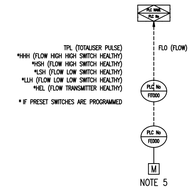
MODULATING MOTORISED VALVE (FLOW CONTROL)		
SIGNALS		
DI	AI	AO
OPD (OPENED) CLS (CLOSED) REM (REMOTE) PSL (PLC SELECTED)	POS_IO (POSITION FEEDBACK)	POS_SP (POSITION SETPOINT)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER

NOTE 4

ULTRASONIC LEVEL SENSOR	
SIGNALS	
DI	AI
HHH (LEVEL HIGH HIGH SWITCH HEALTHY) HSH (LEVEL HIGH SWITCH HEALTHY) LSH (LEVEL LOW SWITCH HEALTHY) LLH (LEVEL LOW LOW SWITCH HEALTHY) HEL (LEVEL TRANSMITTER HEALTHY)	LVL (LEVEL)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 5

FLOW SENSOR							
M MAG FLOW	ULTRASONIC (eg CLAMP-ON)	VENTURI	WEIR	ORIFICE PLATE	FLUME		
P PITOT TUBE	SIGNALS						
DI				AI			
TPL (TOTALISER PULSE) HHH (FLOW HIGH HIGH SWITCH HEALTHY) HSH (FLOW HIGH SWITCH HEALTHY) LSH (FLOW LOW SWITCH HEALTHY) LLH (FLOW LOW LOW SWITCH HEALTHY) HEL (FLOW TRANSMITTER HEALTHY)				FLO (FLOW)			

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W. BRITZ
DRAWN	M. DYKE
CHECKED	C. DU TOIT
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SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
U5 PST AND BALANCING TANK PLC-01
CONTROL AND INSTRUMENTATION DIAGRAM
LEGEND SHEET

DESIGN MANAGER

DATE

SCALE

NTS

		AMENDMENTS	APPROVED	DATE
T0		FOR TENDER	W BRITZ	23.04.19
T1		JW NUMBER UPDATED	W BRITZ	25.04.19

DRAWING No.

JW NUMBER
JW13898-01-P&ID-LEGEND

CONSULTANT'S NUMBER
ING0645D-01-P&ID-LEGEND

FILE No
BWW1500

T0 T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\L2. C&I and Software\P&ID\ING0645D-01-P&ID-LEGEND revT1.dwg May 30, 2019 – 10:18am

CIVIL AND MECHANICAL

PRIMARY SEDIMENTATION TANKS (PT)				
TAG No	ADWF (l/s)	I.DIA. (m)	SIDE WALL DEPTH (m)	FLOOR SLOPE
5C6PT01	290	35.0	4.0	1.6
5C6PT02	290	35.0	4.0	1.6
5C6PT03	290	35.0	4.0	1.6
5C6PT04	290	35.0	4.0	1.6

PST MECHANISM (PM)		
TAG No.	SCRAPER DRIVE	PERIPHERAL SPEED (m/min)
5M6PM01	PERIPHERAL	3.0
5M6PM02	PERIPHERAL	3.0
5M6PM03	PERIPHERAL	3.0
5M6PM04	PERIPHERAL	3.0

SLUDGE VALVES (SV)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5C6SV01	200	KGV	HAND WHEEL
5C6SV02	200	KGV	HAND WHEEL
5C6SV03	200	KGV	ELECTRICAL
5M6SV04	200	KGV	ELECTRICAL
5C6SV05	50	BV	HAND WHEEL
5C6SV06	50	BV	HAND WHEEL
5C6SV07	200	KGV	HAND WHEEL
5M6SV08	200	KGV	HAND WHEEL
5M6SV09	200	KGV	ELECTRICAL
5M6SV10	200	KGV	ELECTRICAL
5C6SV11	50	BV	HAND WHEEL
5C6SV12	50	BV	HAND WHEEL

FLOW DIVIDER (FD)	
TAG No	DIA. (m)
5C6FD01	SEGMENTED FD
5C6FD02	5.0

PENSTOCKS (PS)			
TAG No	SIZE (mmxmm)	TYPE	ACTUATOR DETAILS
5C6PS01	413x1600	CHANNEL	HAND WHEEL
5C6PS02	413x1600	CHANNEL	HAND WHEEL
5C6PS03	413x1600	CHANNEL	HAND WHEEL
5C6PS04	413x1600	CHANNEL	HAND WHEEL
5C6PS05	413x1600	CHANNEL	HAND WHEEL
5C6PS06	413x1600	CHANNEL	HAND WHEEL
5C6PS07	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS08	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS09	1000x1000	SLUICE GATE	HAND WHEEL
5C6PS10	EXISTING	SLUICE GATE	ELECTRIC
5C6PS11	EXISTING	SLUICE GATE	ELECTRIC

ELECTRIC MOTORS (ME)					
TAG No	KW	rpm	VOLTAGE	ENCLOSURE	APPLICATION
5M6ME01 A/B	0.55	1450	380	TEFC-IP55	SLUDGE AND SCUM SCRAPER DRIVE
5M6ME02 A/B	0.55	1450	380	TEFC-IP55	SLUDGE AND SCUM SCRAPER DRIVE
5M6ME03	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR
5M6ME04	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR
5M6ME13	4	1450	380	TEFC IP65	GAS BLOWER
5M6HEAT01	5		380	–	HEATER
5M6ME05	0,37	1450	380	TEFC-IP55	SLUICE GATE ACTUATOR
5M6ME06	0,37	1450	380	TEFC-IP55	SLUICE GATE ACTUATOR
5M6ME07	0,55	1450	380	TEFC-IP55	SLUICE AND SCUM SCRAPER DRIVE
5M6ME08	0,55	1450	380	TEFC-IP55	SLUICE AND SCUM SCRAPER DRIVE
5M6ME09	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR
5M6ME10	0,37	1450	380	TEFC-IP55	VALVE ACTUATOR

SETTLED SEWAGE VALVES (SS)			
TAG No	DIA (mm)	TYPE	ACTUATOR DETAILS
5C6SS01	300	KGV	HAND

AIR VALVES (AV)			
TAG No	DIA (mm)	TYPE	ACTUATOR DETAILS
5C6AV01	25	BV	HAND
5C6AV02	25	BV	HAND
5C6AV03	25	BV	HAND
5C6AV04	25	BV	HAND

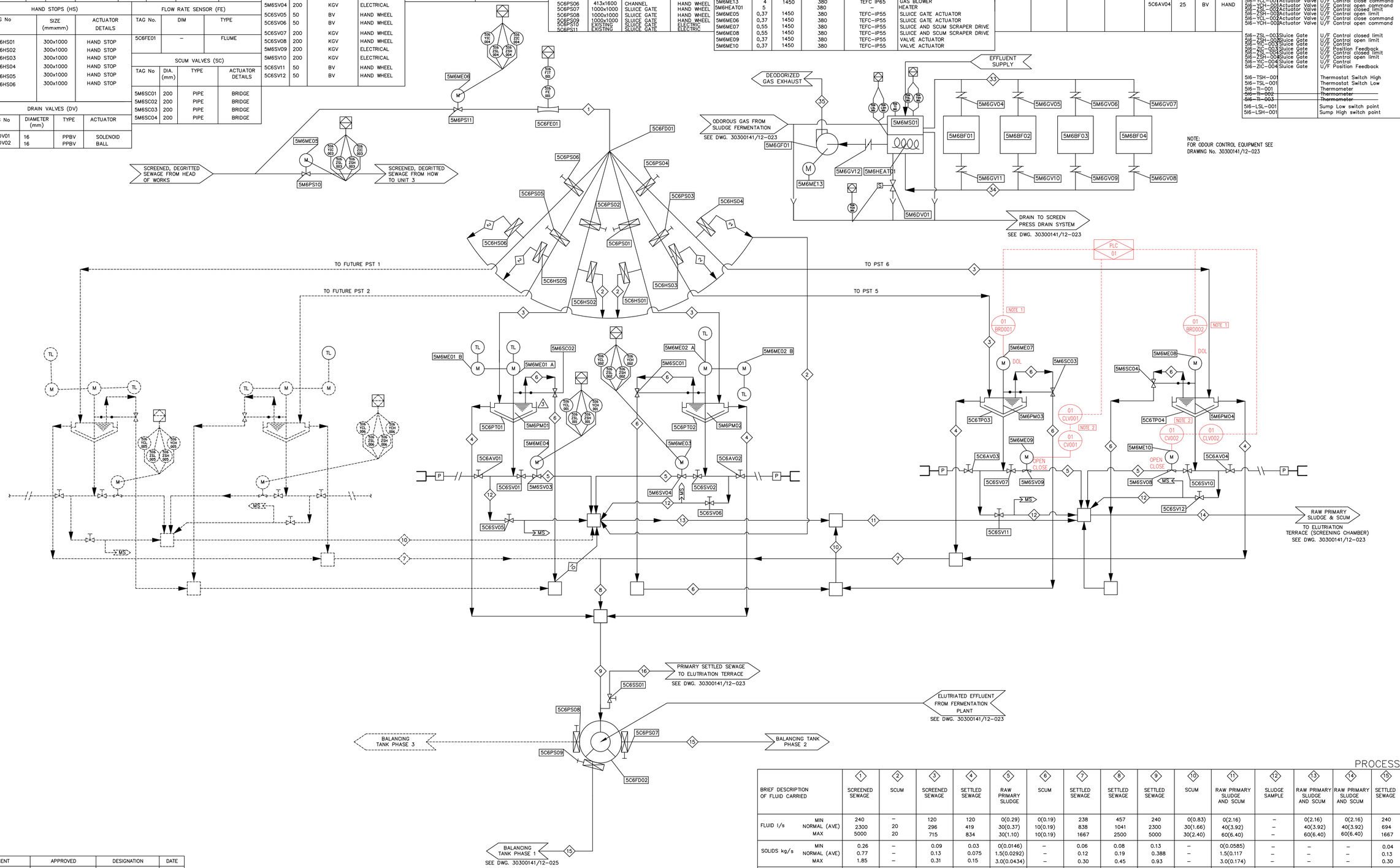
HAND STOPS (HS)		
TAG No	SIZE (mmxmm)	ACTUATOR DETAILS
5C6HS01	300x1000	HAND STOP
5C6HS02	300x1000	HAND STOP
5C6HS03	300x1000	HAND STOP
5C6HS04	300x1000	HAND STOP
5C6HS05	300x1000	HAND STOP
5C6HS06	300x1000	HAND STOP

FLOW RATE SENSOR (FE)		
TAG No.	DIM	TYPE
5C6FE01	–	FLUME

SCUM VALVES (SC)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M6SC01	200	PIPE	BRIDGE
5M6SC02	200	PIPE	BRIDGE
5M6SC03	200	PIPE	BRIDGE
5M6SC04	200	PIPE	BRIDGE

DRAIN VALVES (DV)			
TAG No	DIAMETER (mm)	TYPE	ACTUATOR
5M6DV01	16	PPBV	SOLENOID
5M6DV02	16	PPBV	BALL

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
~~5I6-LIT-001~~	~~5I6-LE-001~~	~~U/sonic level transmitter~~
5I6-FIT-001	5I6-FE-001	U/sonic channel flow transmitter
5I6-ZSL-001	Actuator Valve	U/F Control closed limit
5I6-ZSH-001	Actuator Valve	U/F Control open limit
5I6-YCL-001	Actuator Valve	U/F Control close command
5I6-YCH-001	Actuator Valve	U/F Control open command
5I6-ZSL-002	Actuator Valve	U/F Control closed limit
5I6-ZSH-002	Actuator Valve	U/F Control open limit
5I6-YCL-002	Actuator Valve	U/F Control close command
5I6-YCH-002	Actuator Valve	U/F Control open command
5I6-ZSL-003	Sluice Gate	U/F Control closed limit
5I6-ZSH-003	Sluice Gate	U/F Control open limit
5I6-YIC-003	Sluice Gate	U/F Control
5I6-ZIC-003	Sluice Gate	U/F Position Feedback
5I6-ZSL-004	Sluice Gate	U/F Control closed limit
5I6-ZSH-004	Sluice Gate	U/F Control open limit
5I6-YIC-004	Sluice Gate	U/F Control
5I6-ZIC-004	Sluice Gate	U/F Position Feedback
5I6-TSH-001		Thermostat Switch High
5I6-TSL-001		Thermostat Switch Low
5I6-TI-001		Thermometer
~~5I6-TI-002~~		~~Thermometer~~
~~5I6-TI-003~~		~~Thermometer~~
5I6-LSL-001		Sump Low switch point
5I6-LSH-001		Sump High switch point



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 SCREENED SEWAGE	2 SCUM	3 SCREENED SEWAGE	4 SETTLED SEWAGE	5 RAW PRIMARY SLUDGE	6 SCUM	7 SETTLED SEWAGE	8 SETTLED SEWAGE	9 SETTLED SEWAGE	10 SCUM	11 RAW PRIMARY SLUDGE AND SCUM	12 SLUDGE SAMPLE	13 RAW PRIMARY SLUDGE AND SCUM	14 RAW PRIMARY SLUDGE AND SCUM	15 SETTLED SEWAGE	16 SETTLED SEWAGE ELUTRIANT
FLUID l/s	MIN	240	–	120	120	0(0.29)	0(0.19)	238	457	240	0(0.83)	0(2.16)	–	0(2.16)	0(2.16)	240	0
	NORMAL (AVE)	2300	20	296	419	30(0.37)	10(0.19)	838	1041	2300	30(1.66)	40(3.92)	–	40(3.92)	40(3.92)	694	70
	MAX	5000	20	715	834	30(1.10)	10(0.19)	1667	2500	5000	30(2.40)	60(6.40)	–	60(6.40)	60(6.40)	1667	140
SOLIDS kg/s	MIN	0.26	–	0.09	0.03	0(0.0146)	–	0.06	0.08	0.13	–	0(0.0585)	–	–	–	0.04	–
	NORMAL (AVE)	0.77	–	0.13	0.075	1.5(0.0292)	–	0.12	0.19	0.388	–	1.5(0.117	–	–	–	0.13	–
	MAX	1.85	–	0.31	0.15	3.0(0.0434)	–	0.30	0.45	0.93	–	3.0(0.174)	–	–	–	0.30	–
CONDUIT SIZE (mm)		VARIES	250ND	750ø	900ø	200ø	200ø	1050ø	1500ø	1800ø	300/200ND	400ND	50ø	400ND	450ND	1050ø	300ND
CONDUIT MATERIAL		CONCRETE	MS	MS	MS	MS	M.S & uPVC	MS	MS	MS	uPVC	uPVC	GMS	uPVC	uPVC	MS	MS/uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
PRIMARY SEDIMENTATION TANKS
PLC-01
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE: NTS

AMENDMENTS			
T0	FOR TENDER	W BRITZ	25.01.19
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.
JW NUMBER JW13898-01-022
CONSULTANT'S NUMBER ING0645D-01-022
FILE No BWW1500
T0 T1

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CIVIL AND MECHANICAL

SEWAGE VALVES (SV)			
TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M7SV01	800	KGV	HAND WHEEL
5C7SV02	800	KGV	HAND WHEEL
5M7SV03	800	KGV	ELECTRICAL
5C7SV04	800	KGV	ELECTRICAL
5C7SV05	1000	KGV	HAND WHEEL
5C7SV06	800	KGV	HAND WHEEL
5M7SV07	1000	KGV	ELECTRICAL
5C7SV08	800	KGV	HAND WHEEL

REACTOR FLOW DIVIDER (FD)		
TAG No	DIA (m)	
5C7FD01	5.0	

MIXERS (MX)			
TAG No	SPEED (rpm)	TYPE	DEMAND (kW)
5M7MX01	25	AXIAL FLOW	11
5M7MX02	25	AXIAL FLOW	11
5M7MX03	25	AXIAL FLOW	11
5M7MX04	25	AXIAL FLOW	11
5M7MX05	25	AXIAL FLOW	11
5M7MX06	25	AXIAL FLOW	11
5M7MX07	25	AXIAL FLOW	11
5M7MX08	25	AXIAL FLOW	11
5M7MX09	25	AXIAL FLOW	11
5M7MX10	25	AXIAL FLOW	11
5M7MX11	25	AXIAL FLOW	11
5M7MX12	25	AXIAL FLOW	11

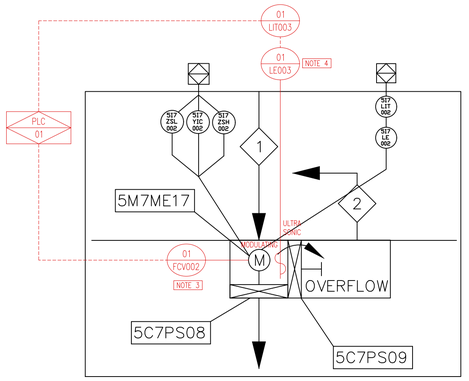
BALANCING TANK (BT)		
TAG No	DIA (m)	HEIGHT (m)
5C7BT01	77x40	3.0
5C7BT02	77x40	3.0

ELECTRIC MOTORS (ME)					
TAG No	KW	SPEED (rpm)	VOLTAGE	ENCLOSURE	APPLICATION
5M7ME01	11	1450	380	TEFC-IP55	MIXER
5M7ME02	11	1450	380	TEFC-IP55	MIXER
5M7ME03	11	1450	380	TEFC-IP55	MIXER
5M7ME04	11	1450	380	TEFC-IP55	MIXER
5M7ME05	11	1450	380	TEFC-IP55	MIXER
5M7ME06	11	1450	380	TEFC-IP55	MIXER
5M7ME07	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME08	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME09	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME10	11	1450	380	TEFC-IP55	MIXER
5M7ME11	11	1450	380	TEFC-IP55	MIXER
5M7ME12	11	1450	380	TEFC-IP55	MIXER
5M7ME13	11	1450	380	TEFC-IP55	MIXER
5M7ME14	11	1450	380	TEFC-IP55	MIXER
5M7ME15	11	1450	380	TEFC-IP55	MIXER
5M7ME16	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR
5M7ME17	0.37	1450	380	TEFC-IP55	ELECTRIC ACTUATOR

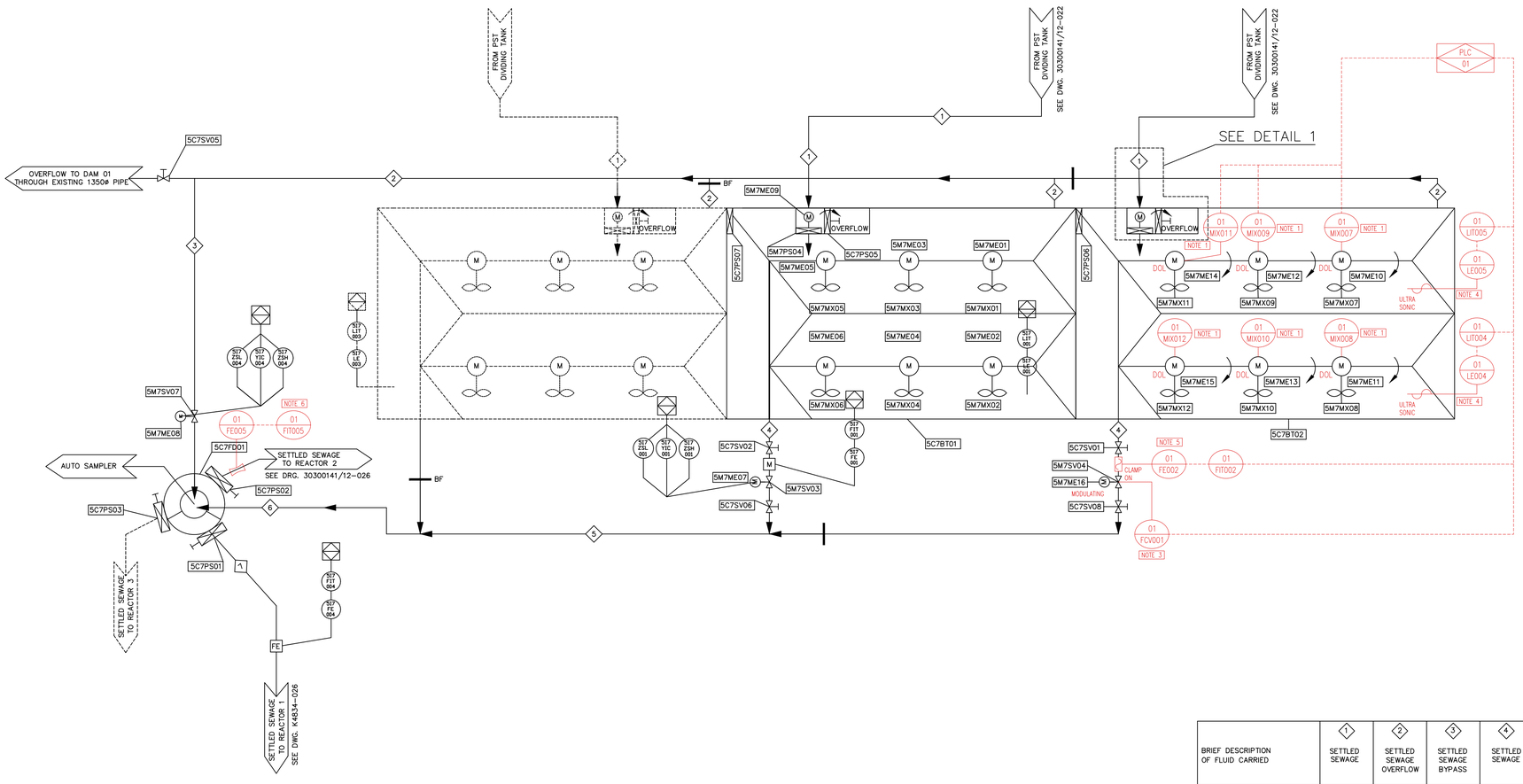
PENSTOCKS (PS)			
TAG No	SIZE (mm x mm)	TYPE	ACTUATOR DETAILS
5C7PS01	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS02	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS03	1000x1000	SLUICE GATE	HAND WHEEL
5M7PS04	2000x1000	SLUICE GATE	ELECTRICAL
5C7PS05	1500x1000	WEIR GATE	HAND WHEEL
5C7PS06	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS07	1000x1000	SLUICE GATE	HAND WHEEL
5C7PS08	2000x1000	SLUICE GATE	ELECTRICAL
5C7PS09	1500x1000	WEIR GATE	HAND WHEEL

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
5I7-FIT-001	5I7-FE-001	Magflow flowmeter
5I7-FIT-004	5I7-FE-004	Clamp-on flowmeter
5I7-ZSL-002	Sluice gates	Control closed limit
5I7-ZSH-002	Sluice gates	Control open limit
5I7-YIC-002	Sluice gates	Control of flow
5I7-LIT-001	5I7-LE-001	U/sonic level transmitter
5I7-LIT-002	5I7-LE-002	U/sonic level transmitter
~~5I7-LIT-004~~	~~5I7-LE-004~~	~~U/sonic level transmitter~~
5I7-ZSL-004	Actuator Valve	Control closed limit
5I7-ZSH-004	Actuator Valve	Control open limit
5I7-YIC-004	Actuator valve	Control of flow
5I7-ZSL-001	Actuator valve	Control closed limit
5I7-ZSH-001	Actuator valve	Control open limit
5I7-YIC-001	Actuator valve	Control of flow

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
01-LIT003	01-LE003	ULTRA SONIC
01-LIT004	01-LE004	ULTRA SONIC
01-LIT005	01-LE005	ULTRA SONIC
01-FIT002	01-FE002	CLAMP-ON
01-FIT005	01-FE005	FLUME



DETAIL 1



KEY:

FE = FLOW ELEMENT

AS = AUTOMATIC SAMPLER

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 SETTLED SEWAGE	2 SETTLED SEWAGE OVERFLOW	3 SETTLED SEWAGE BYPASS	4 SETTLED SEWAGE	5 SETTLED SEWAGE	6 SETTLED SEWAGE	7 SETTLED SEWAGE
FLUID l/s	MIN	230		230	0	580	580	0
	NORMAL (AVE)	580	1670	580	690	1160	1740	580
	MAX	1670		1670	690	1400	2082	694
SOLIDS kg/s	MIN	0.04	–	0.04	0	0.10	0.10	0
	NORMAL (AVE)	0.10	–	0.10	0.12	0.20	0.30	0.10
	MAX	0.30	0.30	0.30	0.12	0.24	0.36	0.12
CONDUIT SIZE (mm)		1050ø	1050ø	1050ø	800ø	1200ø	1350ø	700ø
CONDUIT MATERIAL		MS	MS	MS	MS	MS	MS	MS

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS

UNIT 5 – PHASE 2

BALANCING TANK

PLC-01

CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	W BRITZ	25.01.19
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.

JW NUMBER
JW13898-01-025

CONSULTANT'S NUMBER
ING0645D-01-025

FILE No
BWW1500

T0 T1

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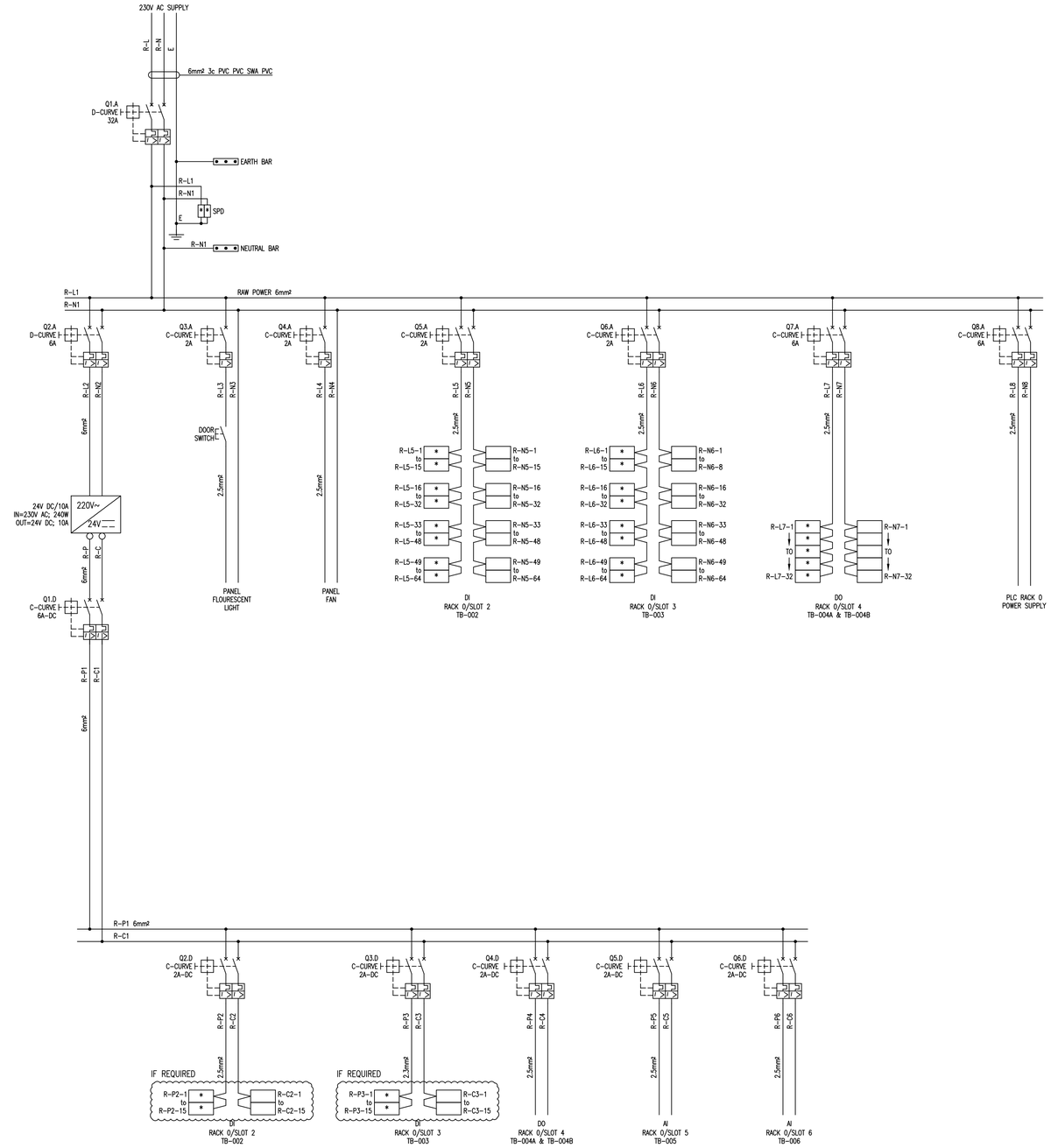

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC
PLC-01
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	C du TOIT	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-SLD

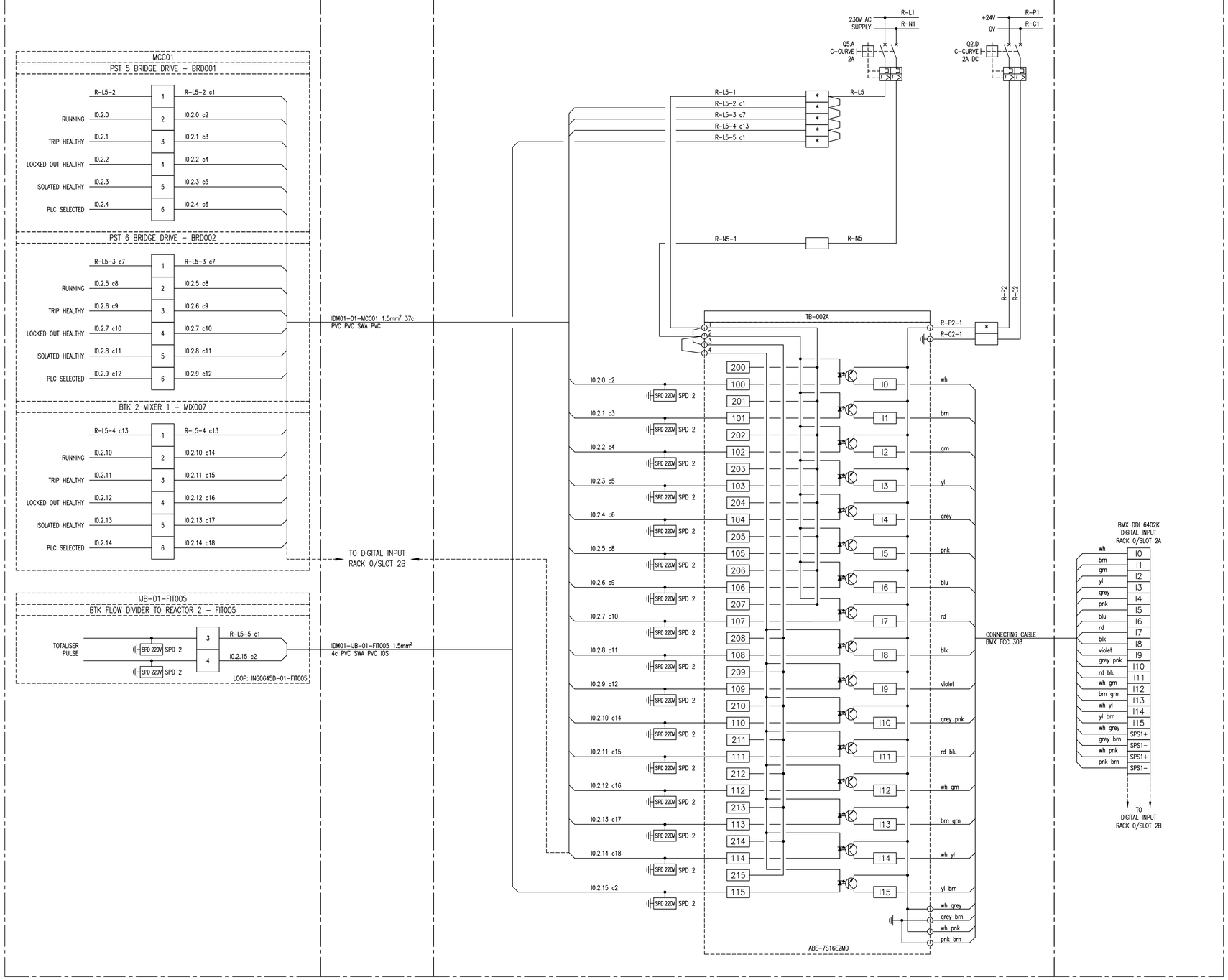
CONSULTANT'S NUMBER
ING0645D-01-SLD

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\PLC Schematic\ING0645D-01-SLD rev70.dwg May 30, 2019 – 10:06am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DATE | DESIGNATION | APPROVED | DEPARTMENT

CONSULTING ENGINEERS

Knight Piésold CONSULTING
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
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TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - PST AND BALANCING TANK PLC-01
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS	APPROVED	DATE
TO ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-R0S2A-DI

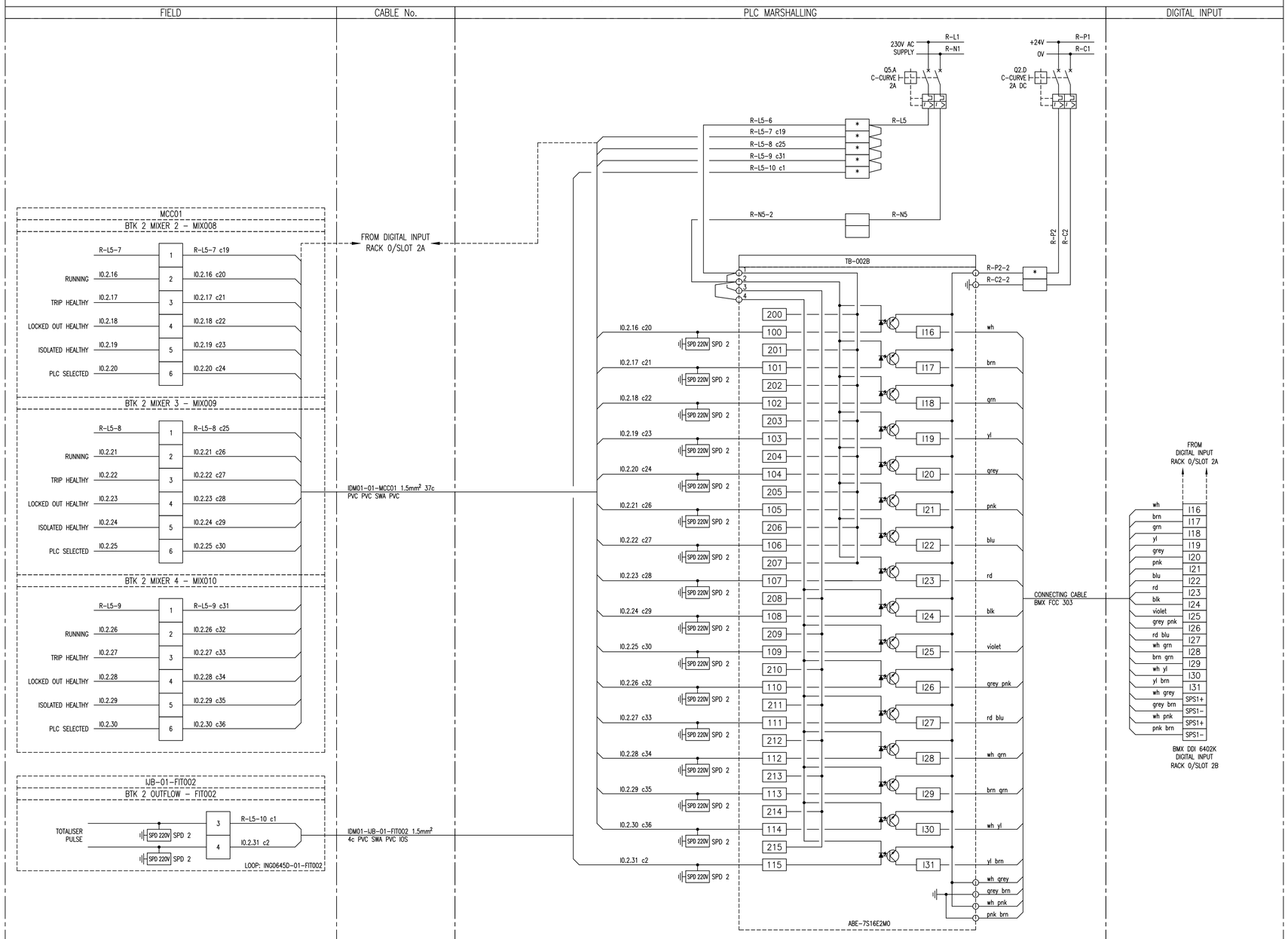
CONSULTANT'S NUMBER
ING0645D-01-R0S2A-DI

FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Wiring Diagrams\ING0645D-01-R0S2A-DI revT0.dwg May 30, 2019 - 10:06am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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GEOTECHNICAL INVESTIGATION	
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NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 2B

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW1300-01-R0S2B-DI

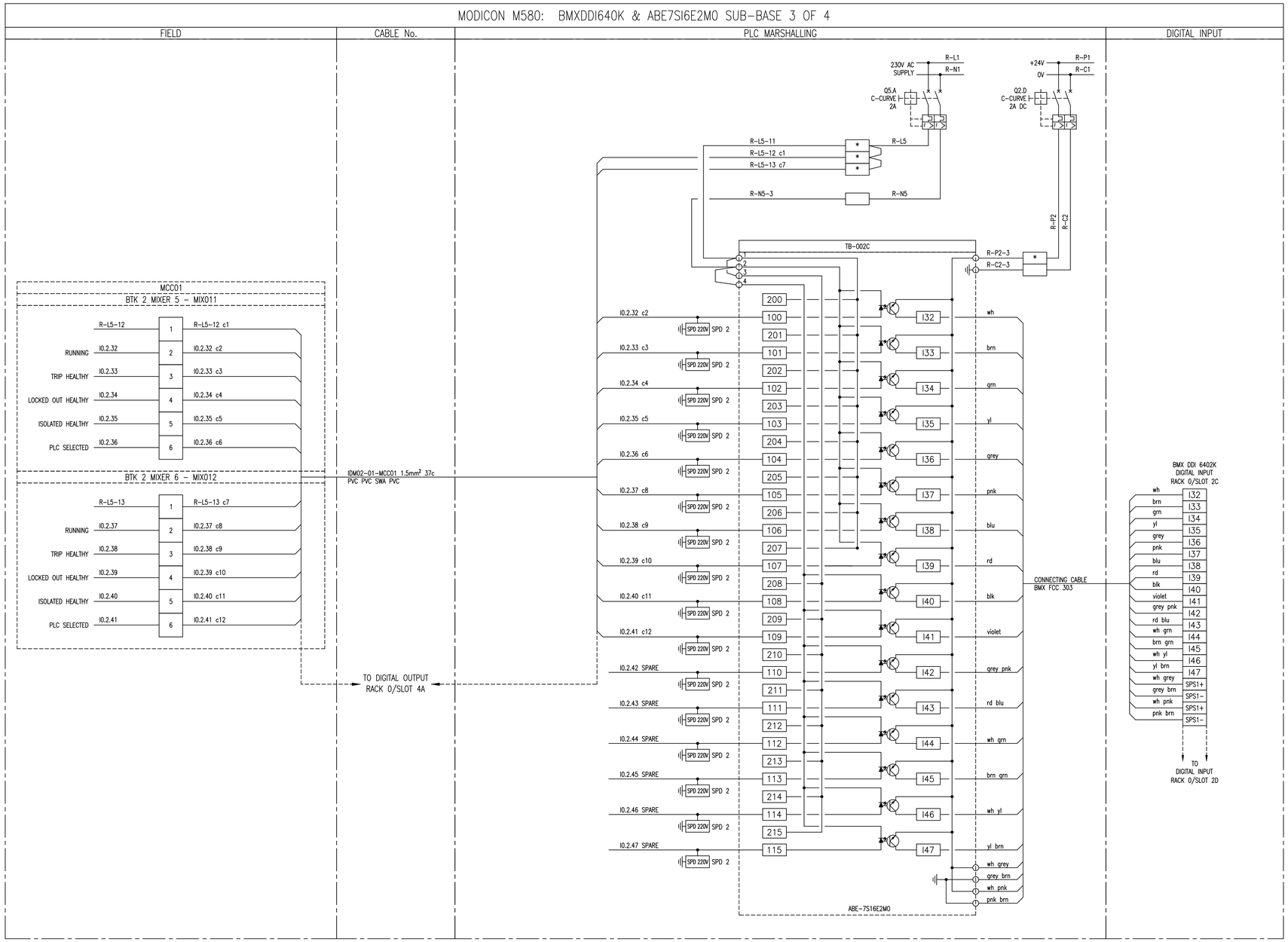
CONSULTANT'S NUMBER
ING0645D-01-R0S2B-DI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Wiring Diagrams\ING0645D-01-R0S2B-DI revT0.dwg May 30, 2019 – 10:06am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



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* FUSED TERMINAL (500mA)

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SURVEYED	
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
DIGITAL INPUT MODULE: SUB-BASE 3 OF 4
RACK 0 / SLOT 2C

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	22.05.19

DRAWING No.

JW NUMBER JW13898-01-R0S2C-DI
CONSULTANT'S NUMBER ING0645D-01-R0S2C-DI
FILE No BWW 1500
TO

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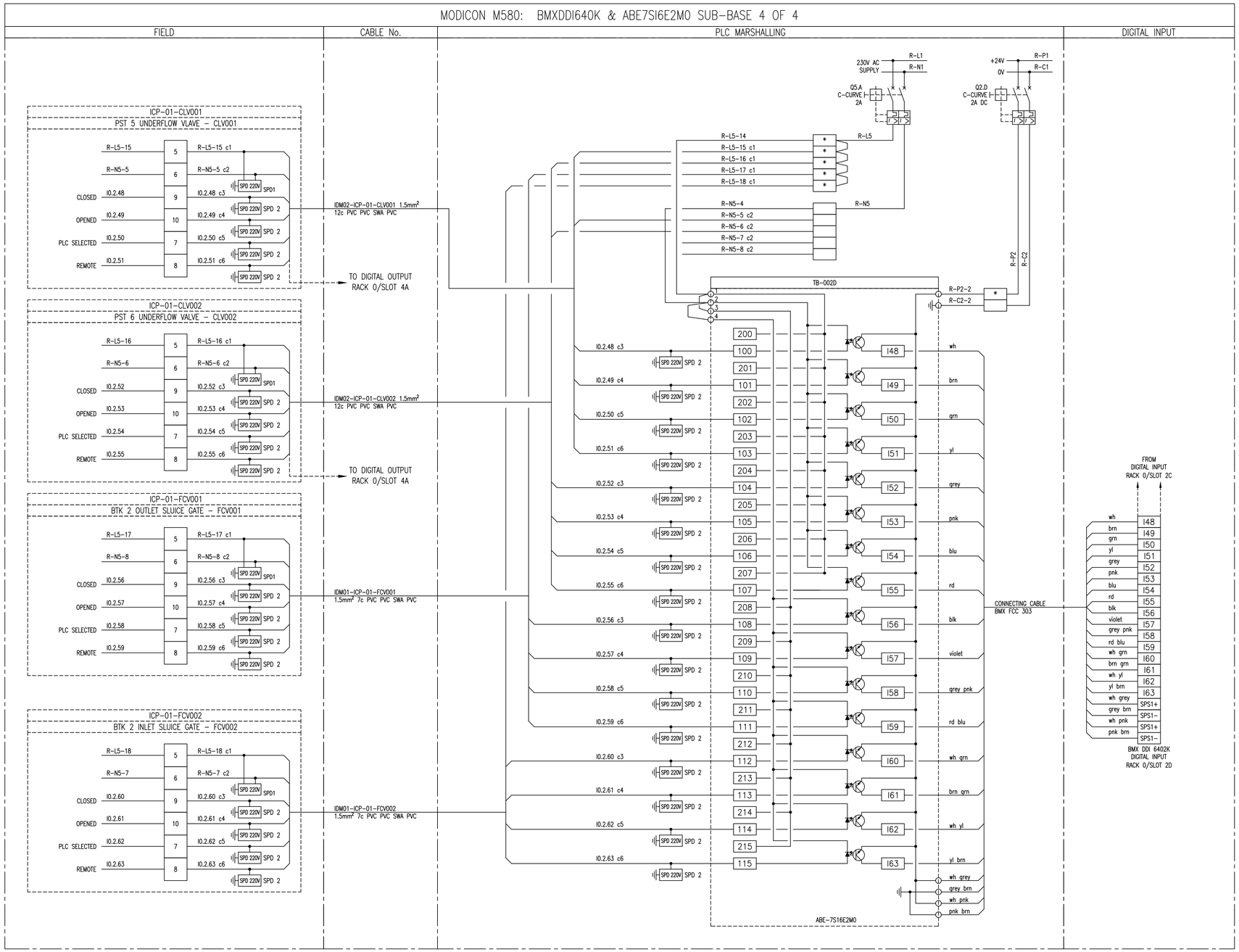
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 4 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - PST AND BALANCING TANK PLC-01

DIGITAL INPUT MODULE: SUB-BASE 4 OF 4

RACK 0 / SLOT 2D

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-R0S2D-DI

CONSULTANT'S NUMBER
ING0645D-01-R0S2D-DI

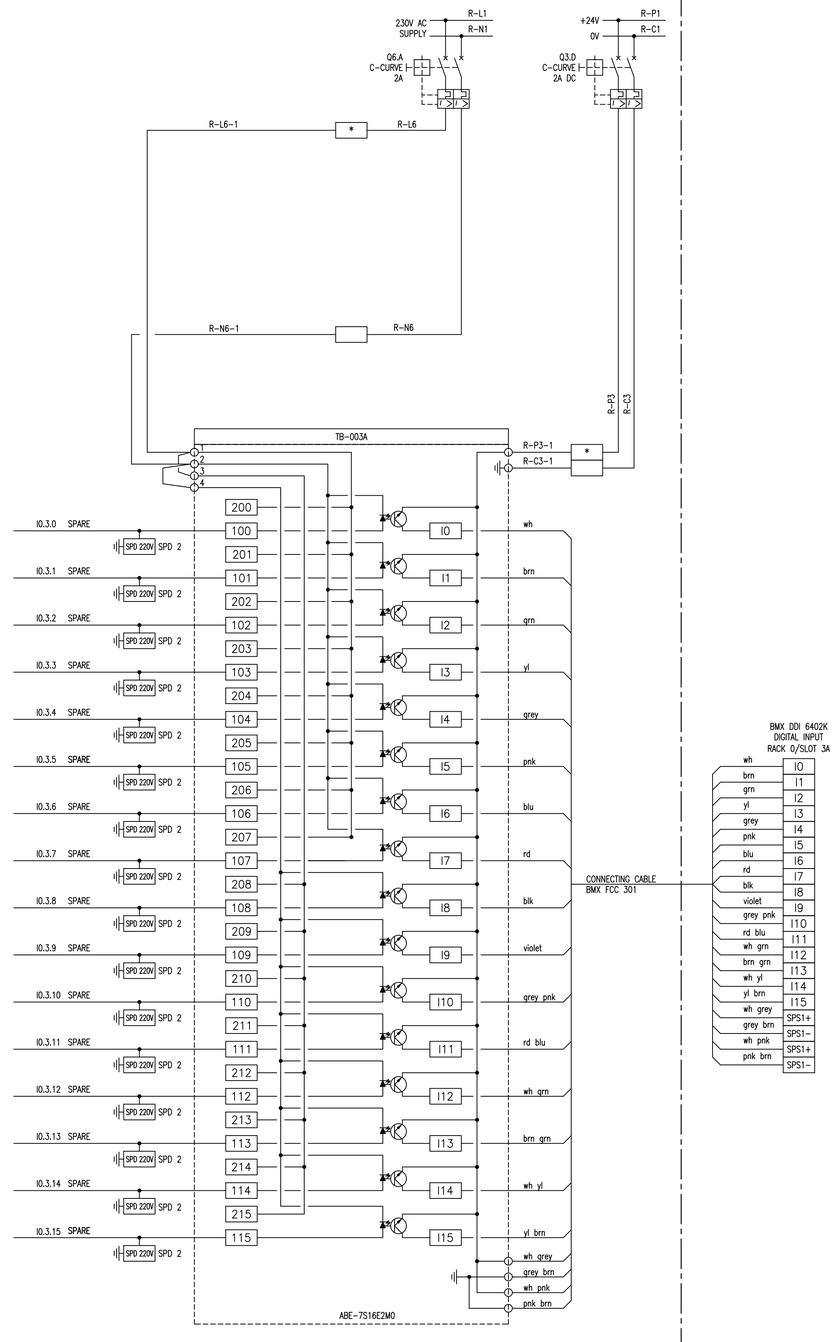
FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Wiring Diagrams\ING0645D-01-R0S2D-DI revT0.dwg May 30, 2019 - 10:06am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4

FIELD	CABLE No.	PLC MARSHALLING	DIGITAL INPUT



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* FUSED TERMINAL (500mA)

LINK TERMINAL

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – PST AND BALANCING TANK PLC-01

DIGITAL INPUT MODULE: SUB-BASE 1 OF 4

RACK 0 / SLOT 3A

DESIGN MANAGER

DATE

SCALE: NTS

	AMENDMENTS	APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER: JW13898-01-R0S3A-DI

CONSULTANT'S NUMBER: ING0645D-01-R0S3A-DI

FILE No: BWW 1500

T0

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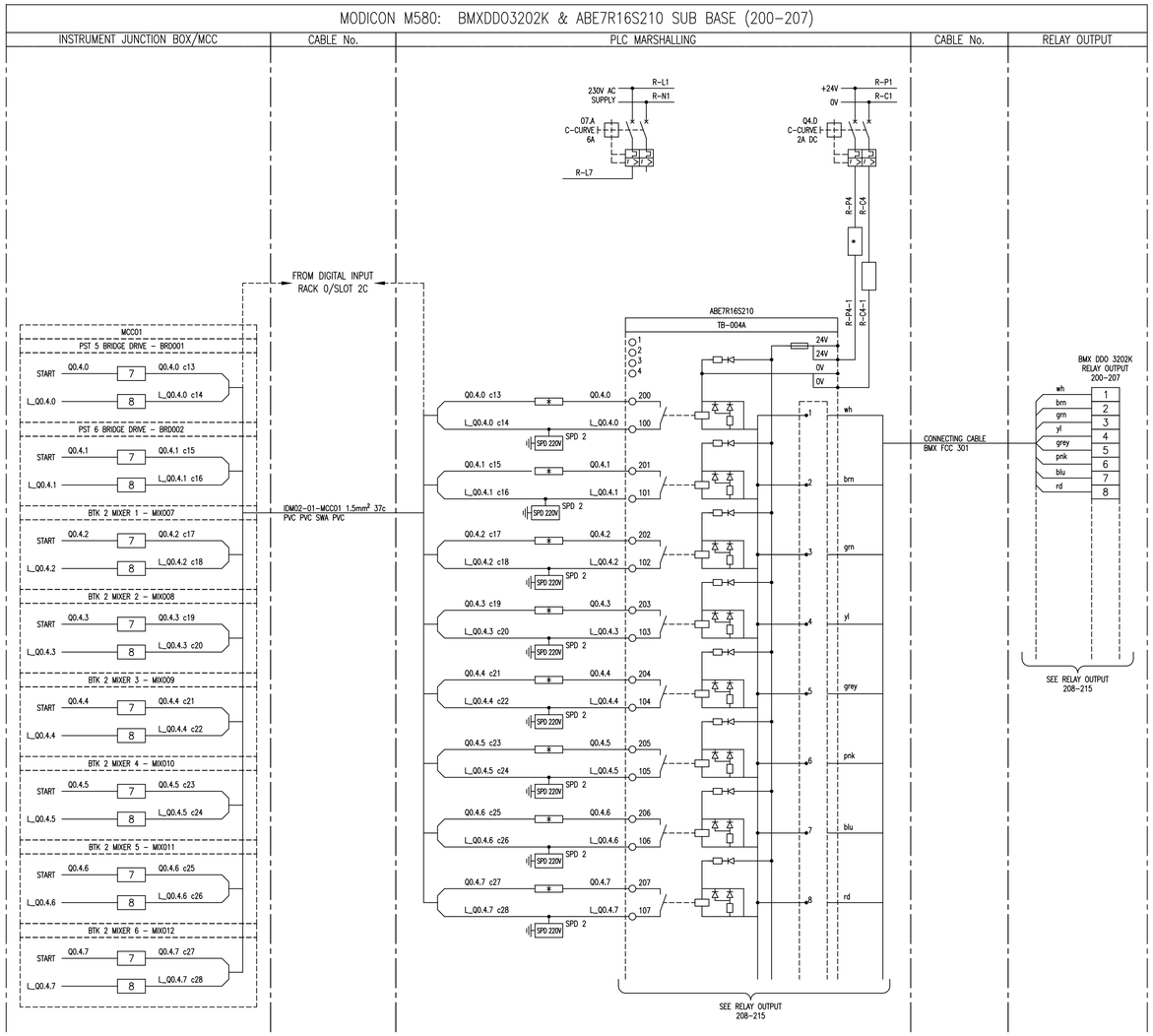

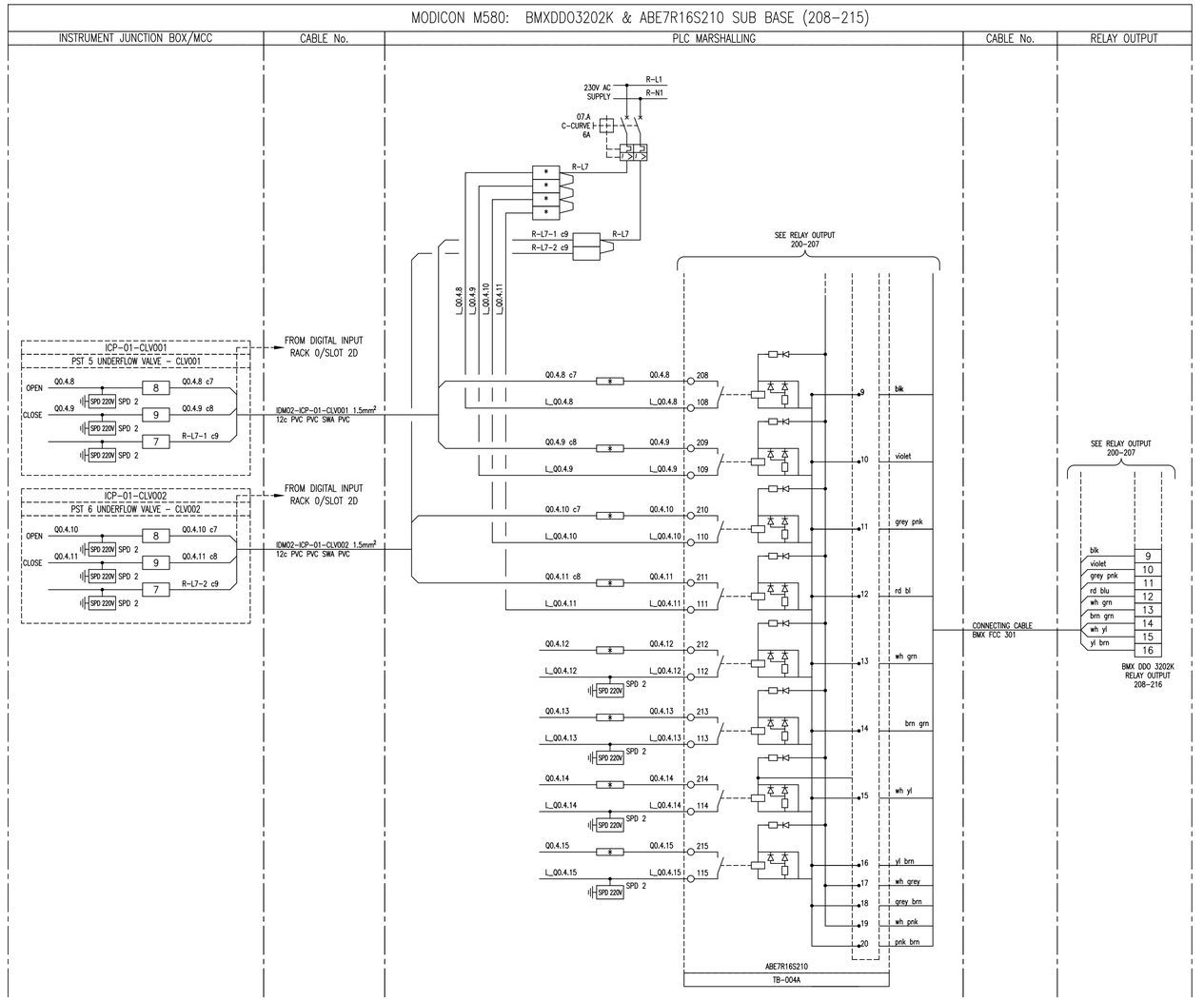

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DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
DIGITAL OUTPUT MODULE: SUB-BASE 1 OF 2
RACK 1 / SLOT 4A (200-215)

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-R0S4A-DO

CONSULTANT'S NUMBER
ING0645D-01-R0S4A-DO

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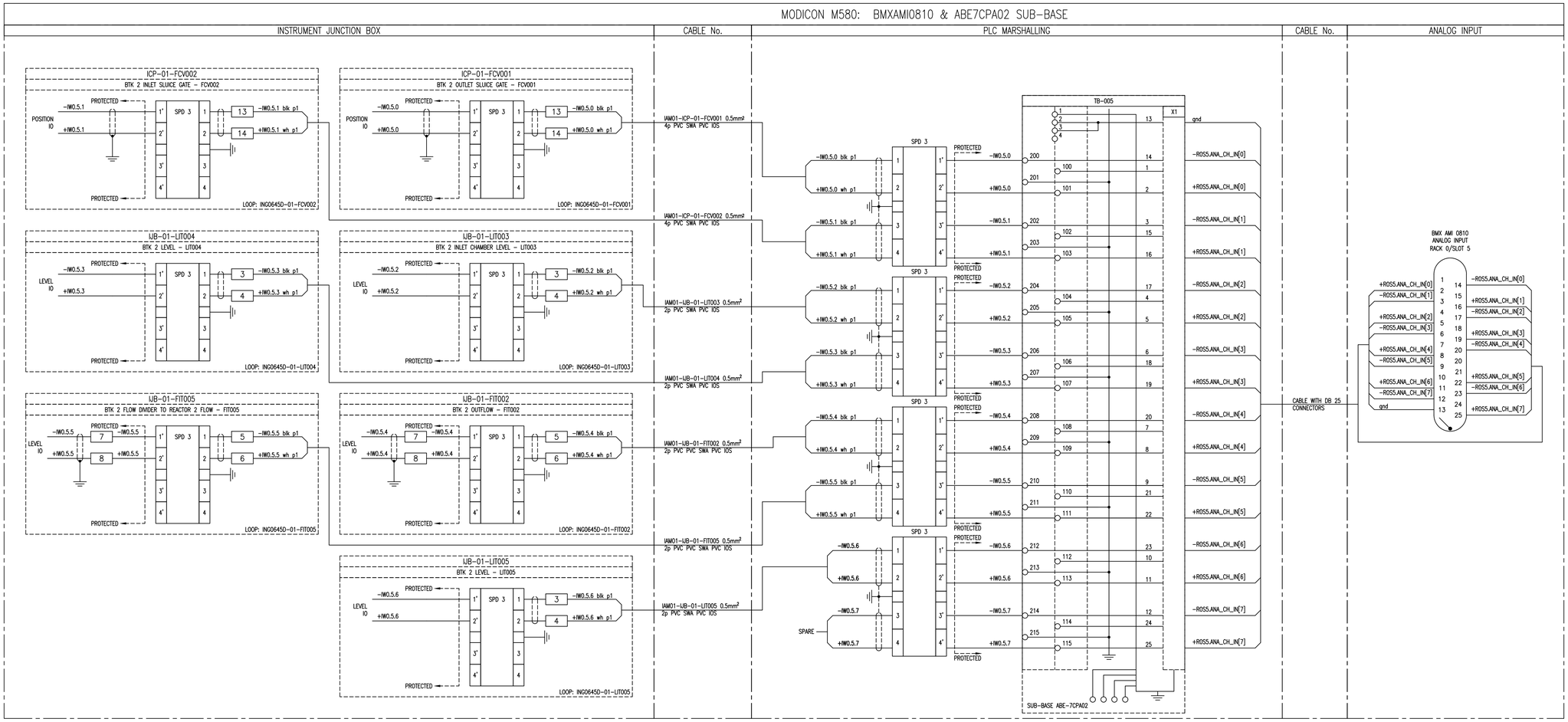

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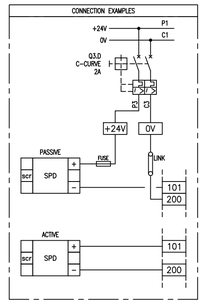

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - PST AND BALANCING TANK PLC-01
ANALOG INPUT MODULE
RACK 0 / SLOT 5

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-R0S5-AI

CONSULTANT'S NUMBER
ING0645D-01-R0S5-AI

FILE No
BWW 1500

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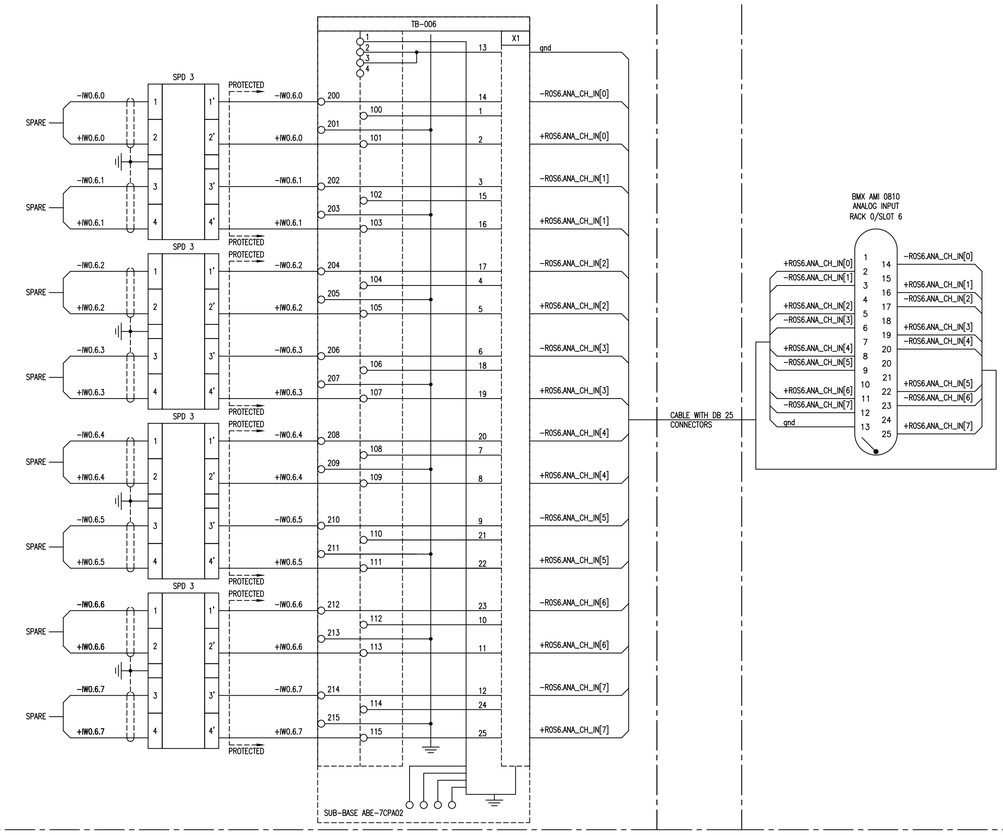
MODICON M580: BMXAMI0810 & ABE7CPA02 SUB-BASE

INSTRUMENT JUNCTION BOX	CABLE No.	PLC MARSHALLING	CABLE No.	ANALOG INPUT



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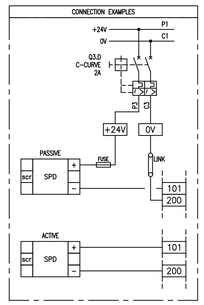

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
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2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
ANALOG INPUT MODULE
RACK 0 / SLOT 6

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

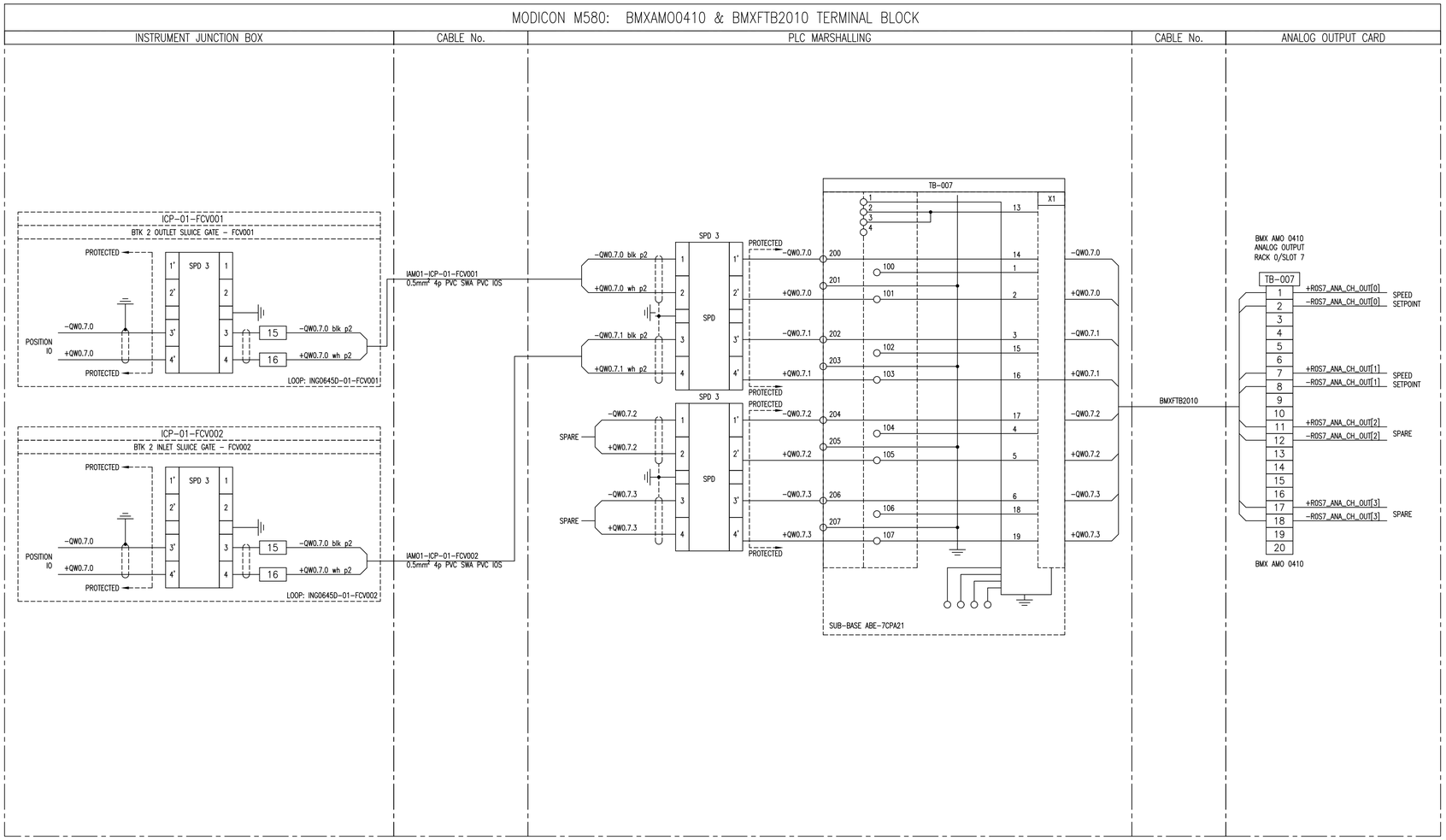
JW NUMBER
JW13898-01-R0S6-AI

CONSULTANT'S NUMBER
ING0645D-01-R0S6-AI

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Wiring Diagrams\ING0645D-01-R0S6-AI rev T0.dwg May 30, 2019 – 10:06am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
3. SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT
4. SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT
5. SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT
6. SPD 1: DEHNguard DG M TN 275
7. SPD 2: DEHNguard DG S 275 VA
8. SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS
9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
ANALOG OUTPUT MODULE
RACK 0 / SLOT 7

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

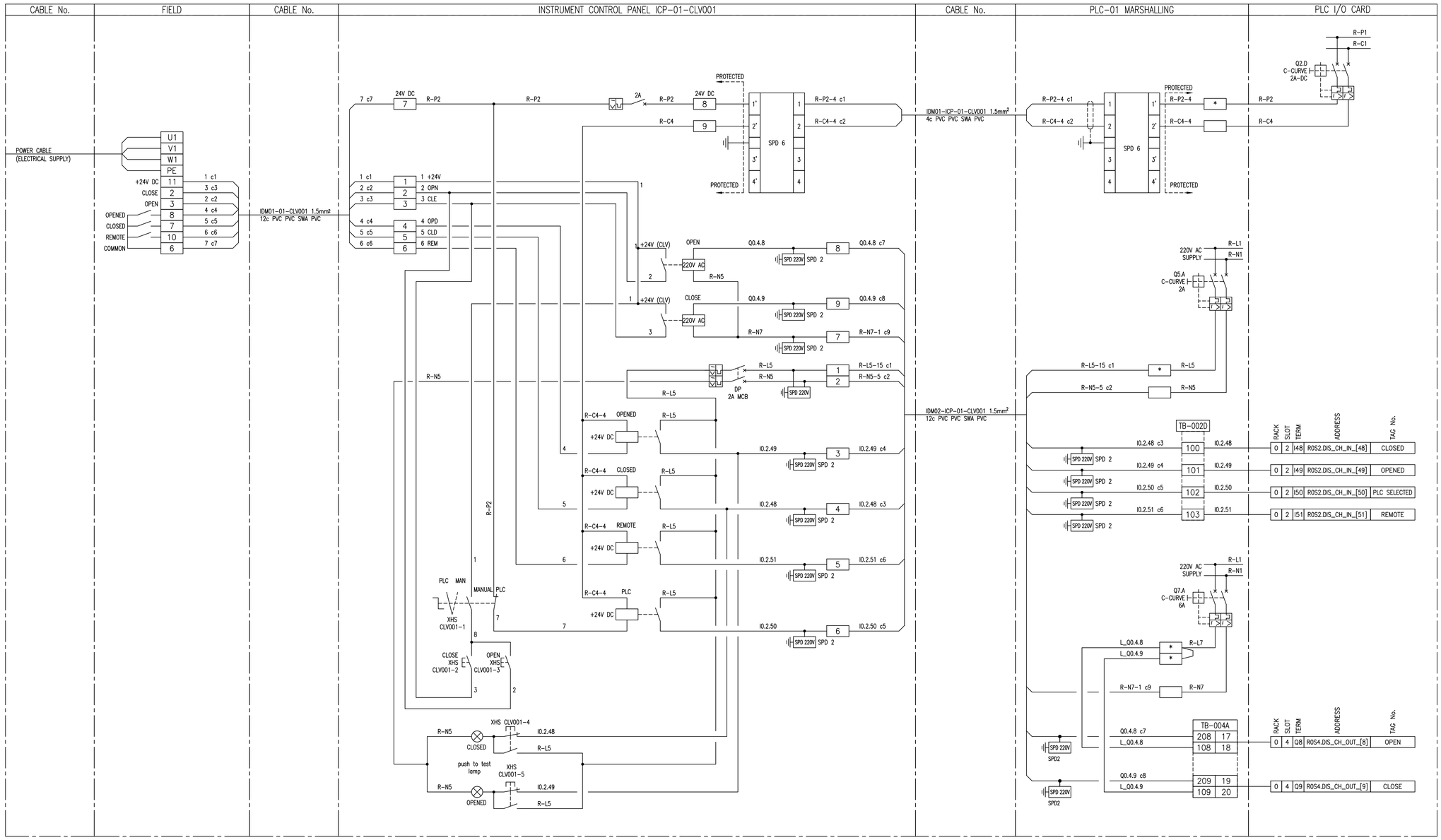
JW NUMBER
JW13898-01-R0S7-A0

CONSULTANT'S NUMBER
ING0645D-01-R0S7-A0

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Wiring Diagrams\ING0645D-01-R0S7-A0 revTO.dwg May 30, 2019 – 10:06am



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SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
PST 5 UNDERFLOW VALVE – CLV001
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-CLV001

CONSULTANT'S NUMBER
ING0645D-01-CLV001

FILE No
BWW 1500

T0

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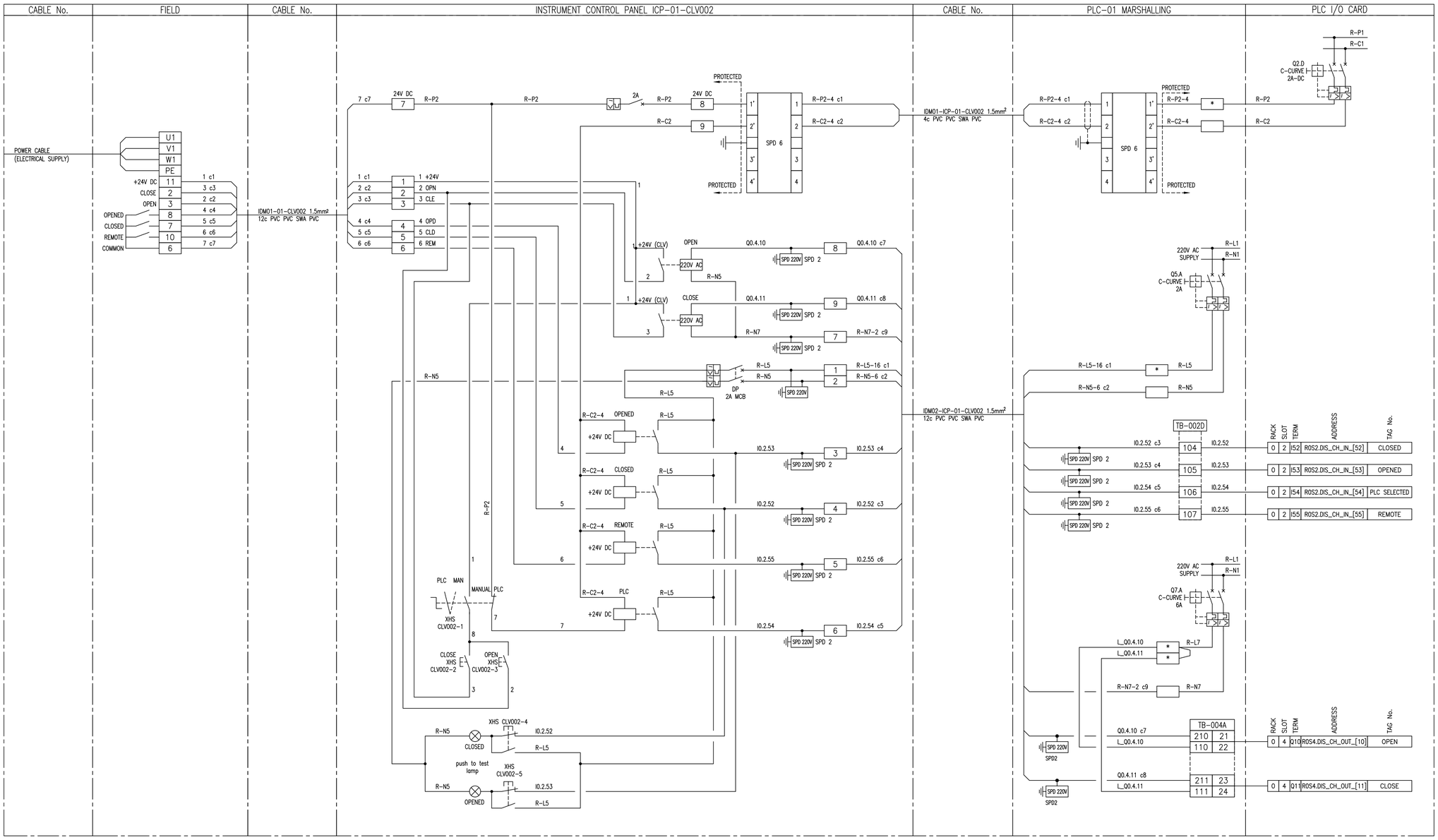

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SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
PST 6 UNDERFLOW VALVE – CLV002
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-CLV002
CONSULTANT'S NUMBER
ING0645D-01-CLV002
FILE No
BWW 1500
T0

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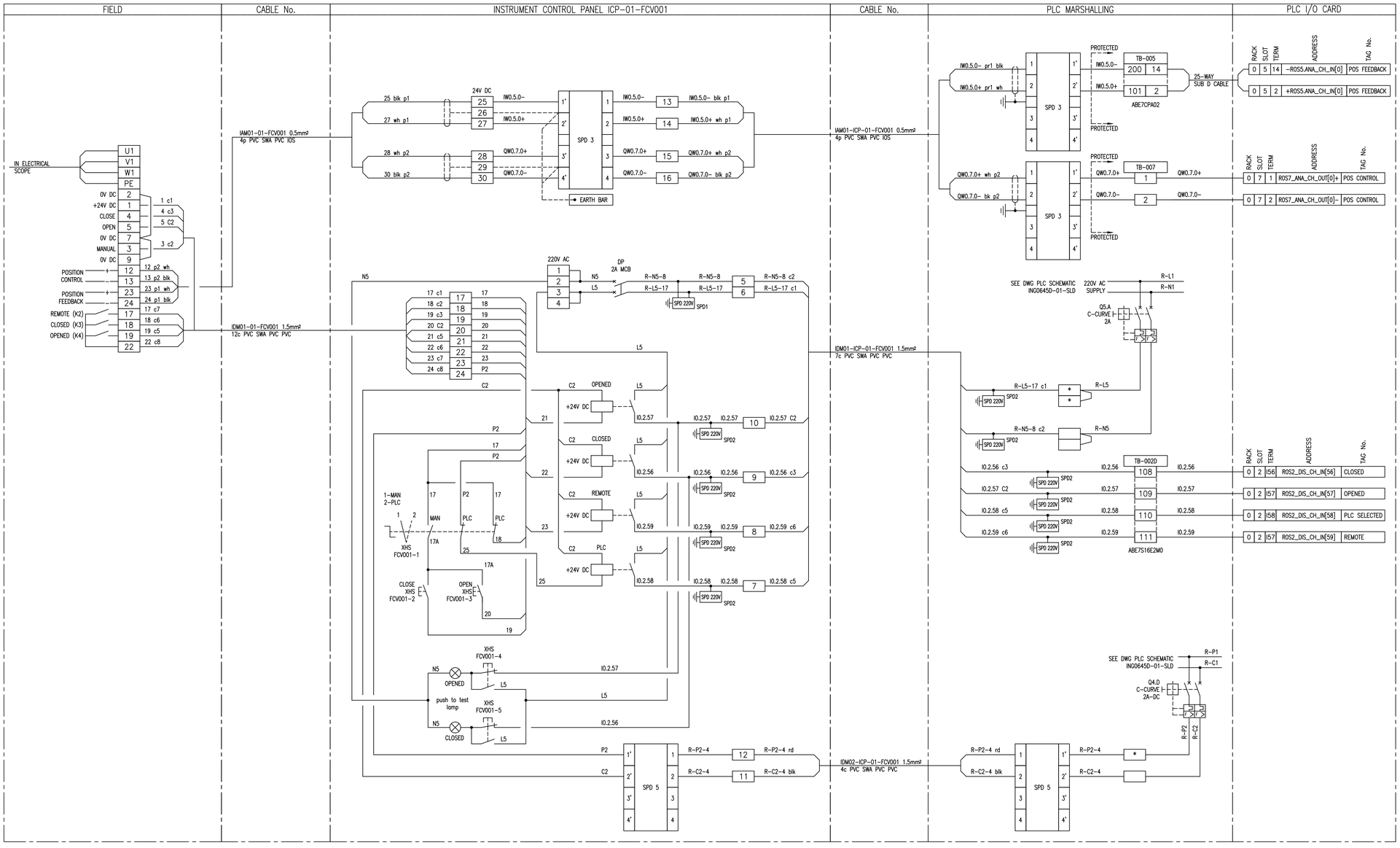

NOTES:

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – PST AND BALANCING TANK PLC-01

BTK 2 OUTLET SLUICE GATE FCV001

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-FCV001

CONSULTANT'S NUMBER
ING0645D-01-FCV001

FILE No
BWW 1500

T0

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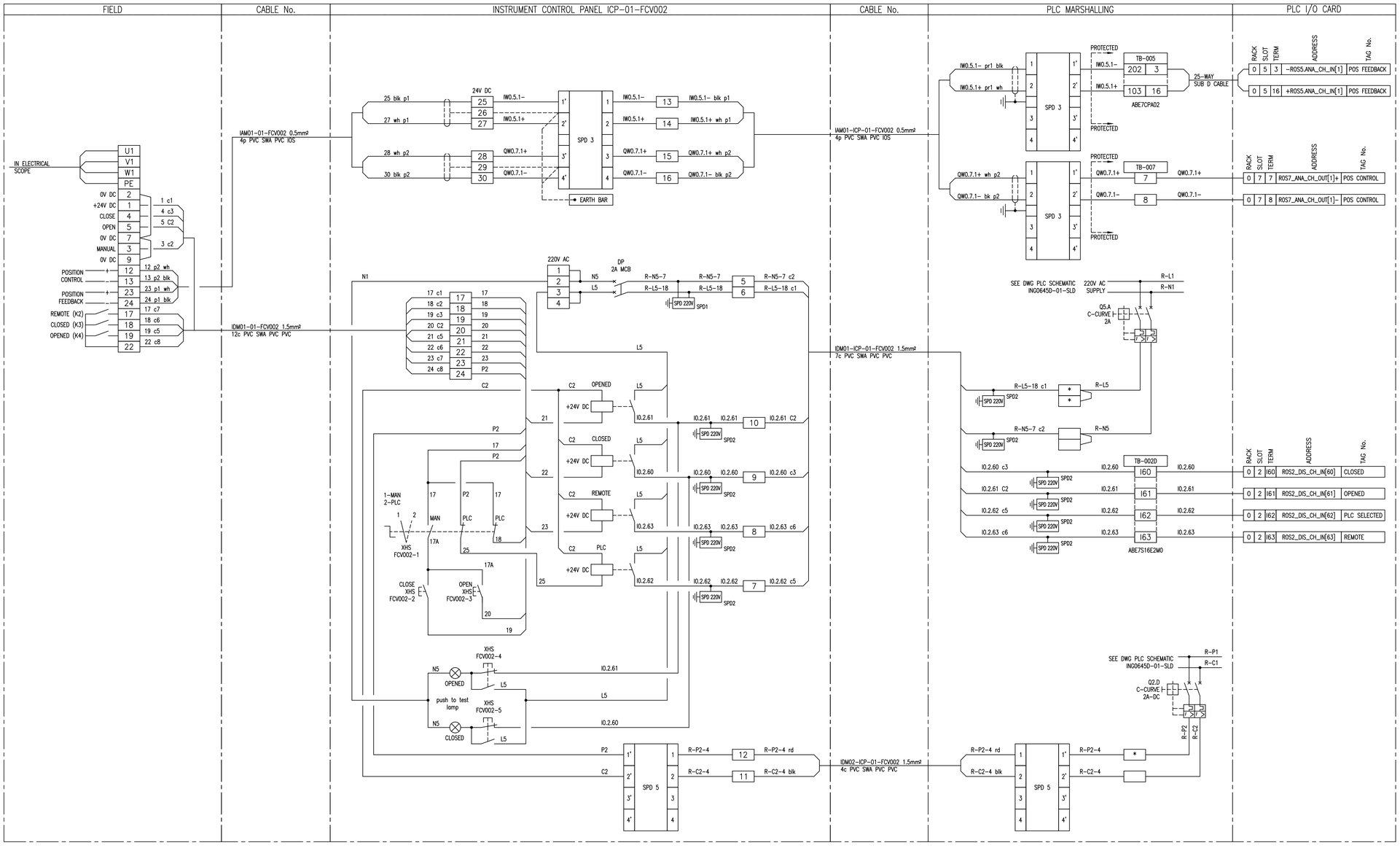

NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

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SPD 1: DEHNguard DG M TN 275

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SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

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SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
BTK 2 INLET SLUICE GATE FCV002
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

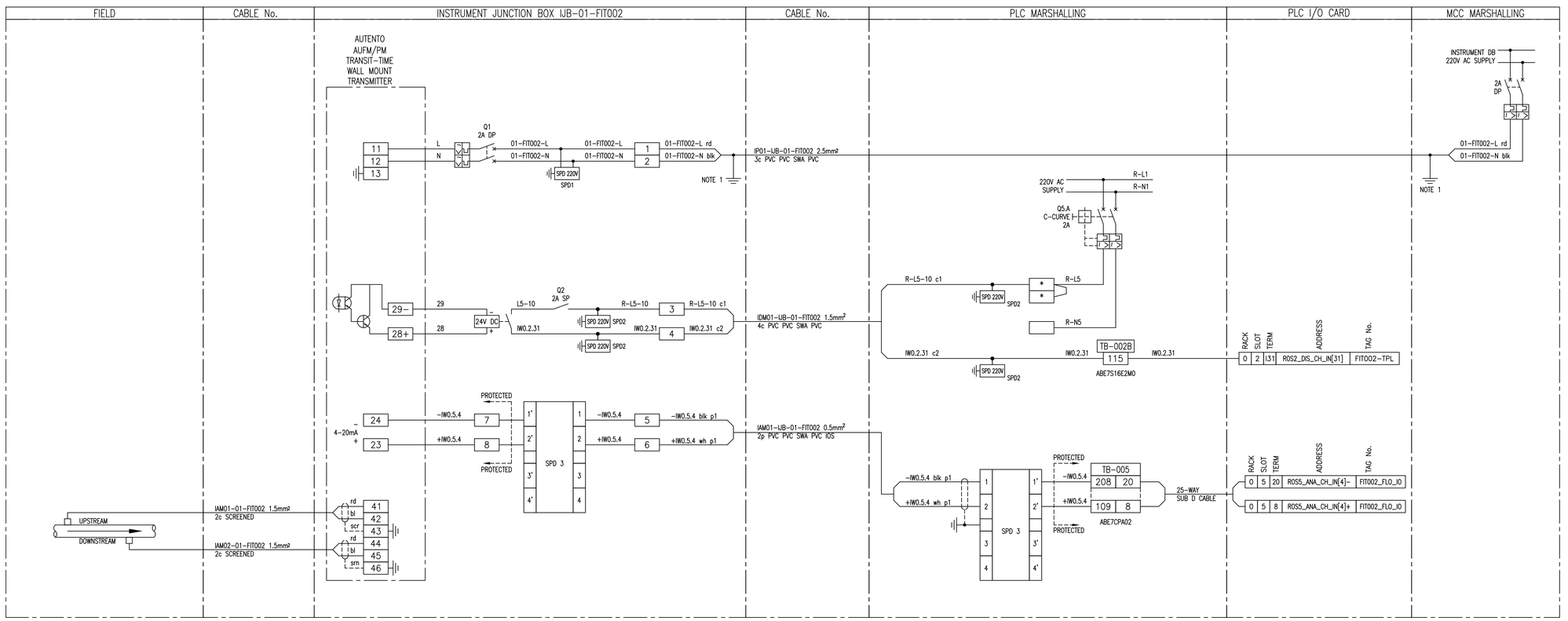
JW NUMBER
JW13898-01-FCV002

CONSULTANT'S NUMBER
ING0645D-01-FCV002

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Loop Diagrams\ING0645D-01-FCV002 revT0.dwg May 30, 2019 – 10:07am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
BTK 2 OUTFLOW – FIT002
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-FIT002

CONSULTANT'S NUMBER
ING0645D-01-FIT002

FILE No
BWW 1500

TO

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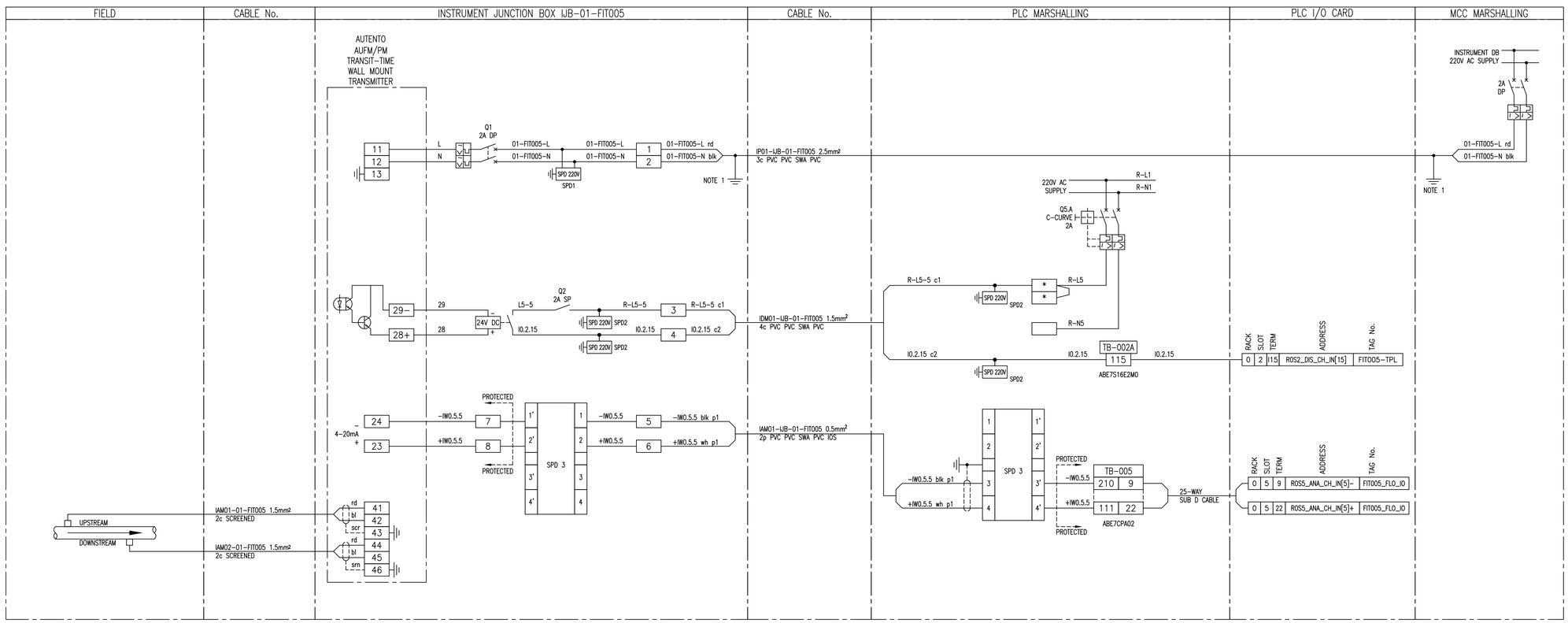

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – PST AND BALANCING TANK PLC-01
BTK FLOW DIVIDER TO REACTOR 2 FLOW – FIT005
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-FIT005

CONSULTANT'S NUMBER
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FILE No
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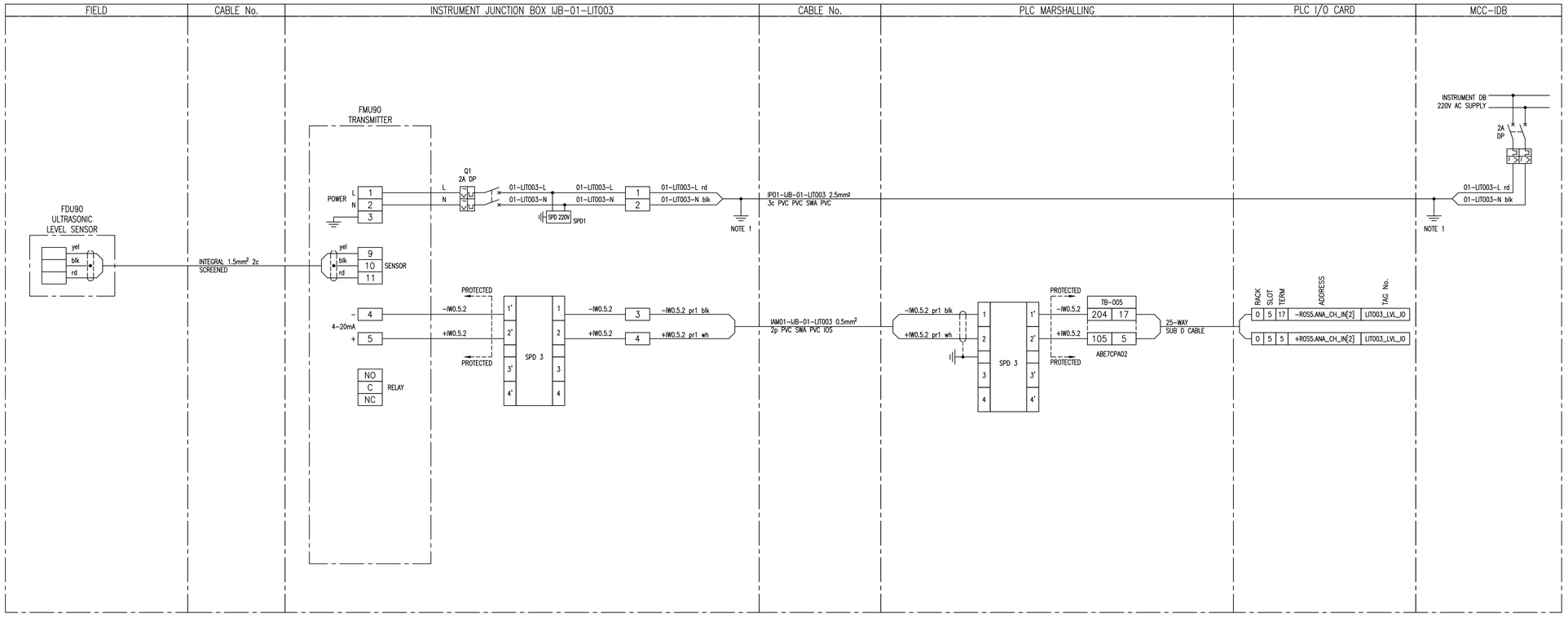

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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – PST AND BALANCING TANK PLC-01

BTK 2 INLET CHAMBER LEVEL – LIT003

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

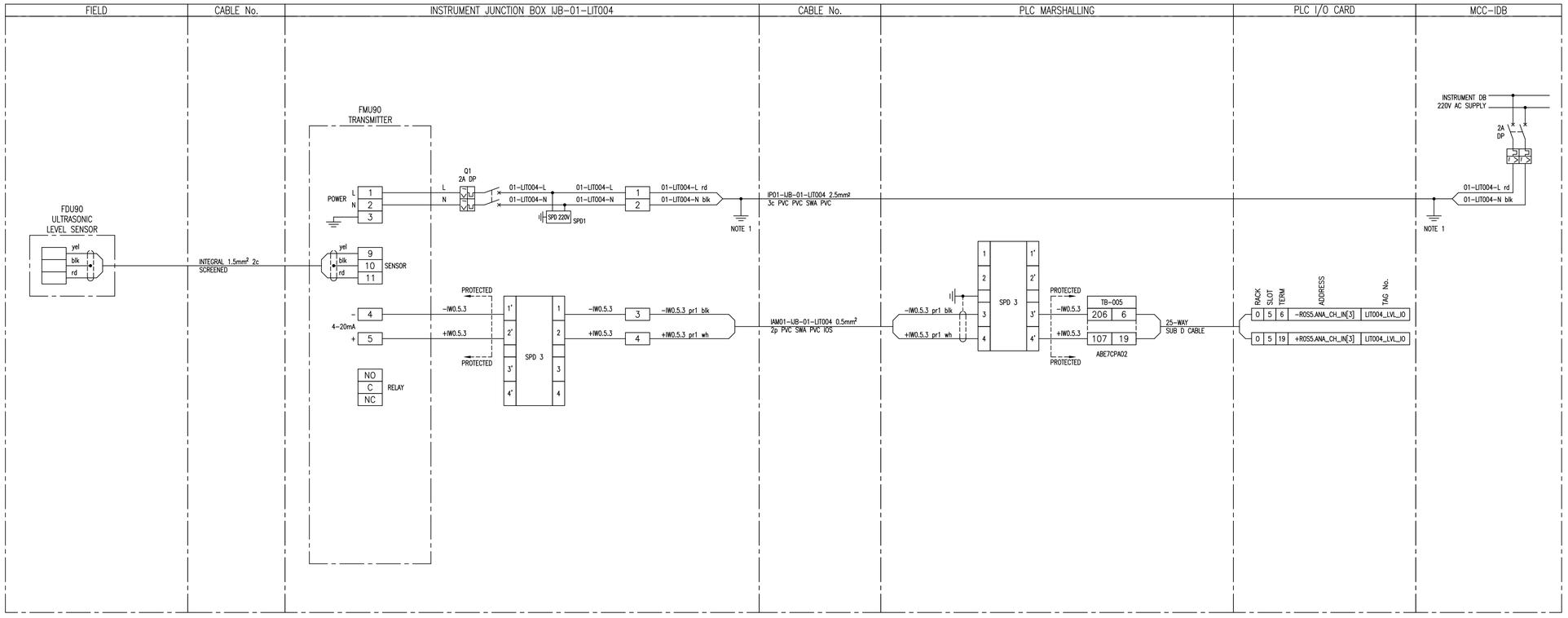
JW NUMBER JW13898-01-LIT003

CONSULTANT'S NUMBER ING0645D-01-LIT003

FILE No BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-01 (PSTs & BAL)\Loop Diagrams\ING0645D-01-LIT003 revT0.dwg May 30, 2019 – 10:07am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

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SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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17 HARRISON STREET
MARSHALLTOWN
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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – PST AND BALANCING TANK PLC-01

BTK 2 LEVEL – LIT004

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-LIT004

CONSULTANT'S NUMBER
ING0645D-01-LIT004

FILE No
BWW 1500

T0

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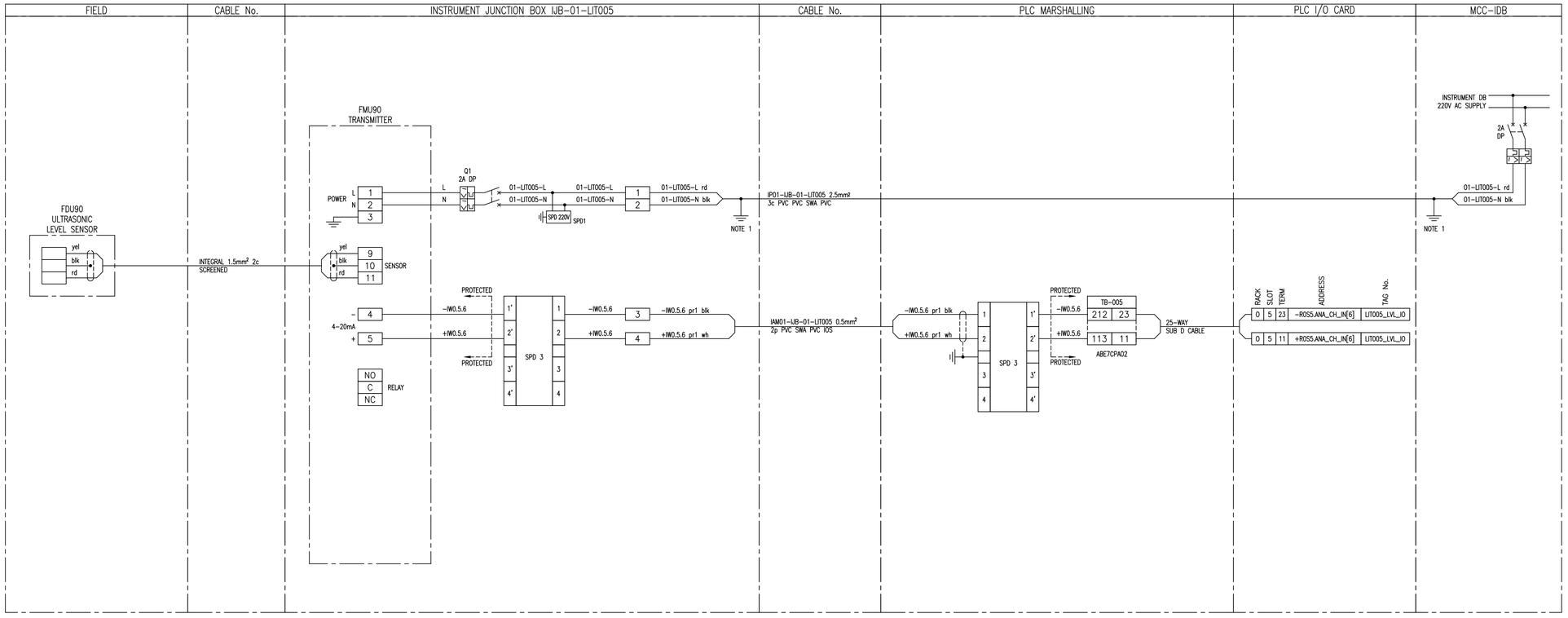

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – PST AND BALANCING TANK PLC-01

BTK 2 LEVEL 2 – LIT005

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-01-LIT005

CONSULTANT'S NUMBER
ING0645D-01-LIT005

FILE No
BWW 1500

T0

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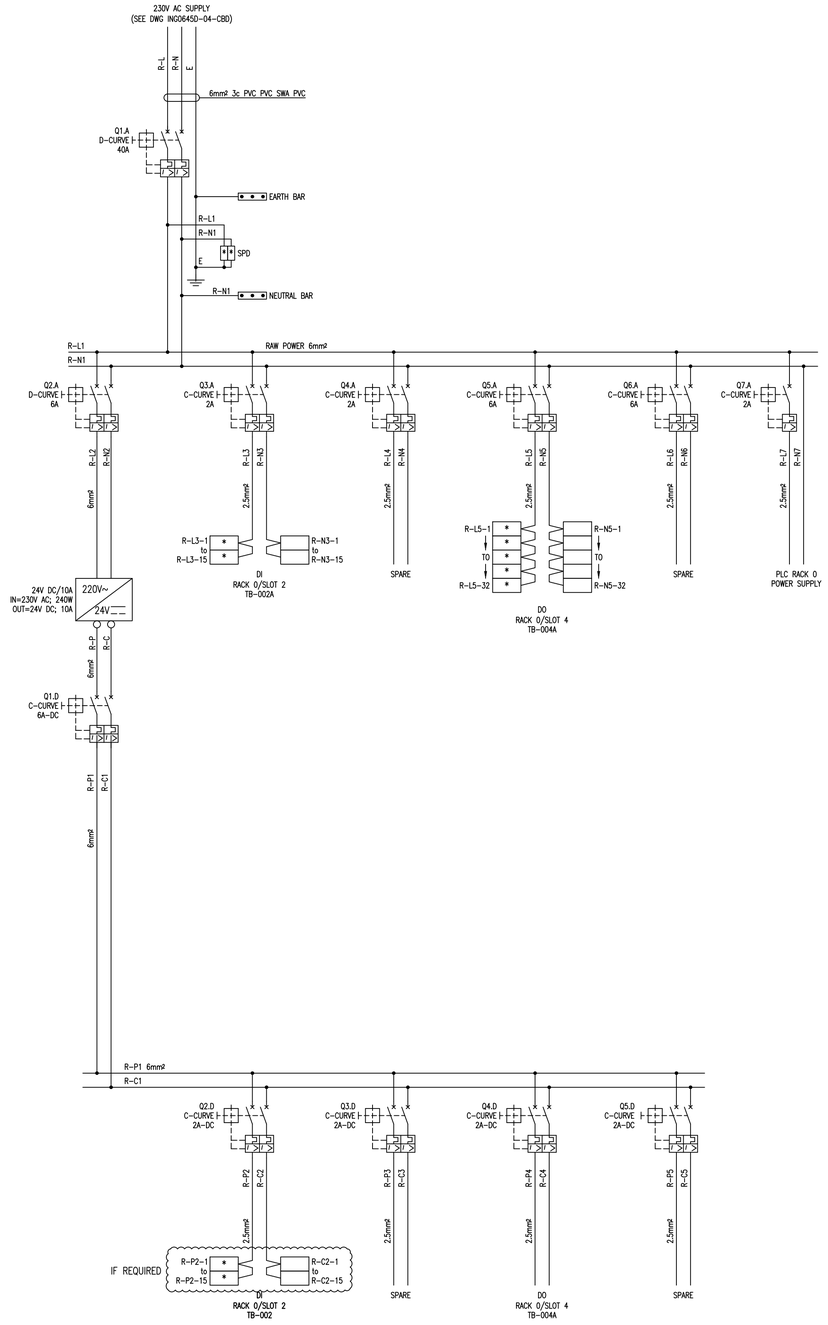

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – WST PLC
PLC-04
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0	ISSUED FOR TENDER	C du TOIT	22.05.19

DRAWING No.

JW NUMBER
JW13898-04-SLD
CONSULTANT'S NUMBER
ING0645D-04-SLD
FILE No
BWW 1500
T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-04 (U5 WST)\PLC Schematic\ING0645D-04-SLD revT0.dwg May 30, 2019 – 10:21am

WASTE SLUDGE THICKENERS (ST)					
TAG No	DIA m	SIDE WALL DEPTH m	FLOOR SLOPE	RISE RATE (MAX) m/h	SOLIDS FLUX (MAX) kg/m². h
5C9ST01	28	4	1:6	0,60	3,50
5C9ST02	28	4	1:6	0,60	3,50

PENSTOCKS (PS)	
TAG No	SIZE mmxmm
5C9PS01	1000x400
5C9PS02	1000x400

SLUDGE VALVES (SV)			
TAG No	DIA mm	TYPE	ACTUATOR
5C9SV01	200	KGV	HAND WHEEL
5M9SV02	200	KGV	ELECTRICAL
5C9SV03	200	KGV	HAND WHEEL
5C9SV04	200	KGV	HAND WHEEL
5M9SV05	200	KGV	ELECTRICAL
5C9SV06	200	KGV	HAND WHEEL

FLOW DIVIDER (FD)	
TAG No	DIM (m)
5C9FD01	1.08x1.08

SCUM VALVES (SC)			
TAG No	DIA mm	TYPE	ACTUATOR
5M9SC01	200	PIPE	BRIDGE
5M9SC02	200	PIPE	BRIDGE

WASTE LIQUOR & EFFLUENT VALVES (LV)			
TAG No	DIA mm	TYPE	ACTUATOR
5M9LV01	250	RSGV	HAND WHEEL
5M9LV02	250	RSGV	HAND WHEEL
5M9LV03	200	RV	
5M9LV04	200	RV	
5M9LV05	200	RSGV	HAND WHEEL
5M9LV06	200	RSGV	HAND WHEEL
5M9LV07	200	RSGV	HAND WHEEL
5C9LV08	UNALLOCATED		
5C9LV09	300	KGV	HAND WHEEL
5C9LV10	300	KGV	HAND WHEEL
5C9LV11	300	KGV	HAND WHEEL
5C9LV12	300	KGV	HAND WHEEL
5M9LV13	200	RV	–
5C9LV14	300	KGV	HAND WHEEL
5C9LV15	300	KGV	HAND WHEEL
5C9LV16	150	KGV	HAND WHEEL
5M9LV17	250	RSGV	HAND WHEEL

ELECTRIC MOTORS (ME)					
TAG No	KW	RPM	VOLTAGE	ENCLOSURE	DRIVEN ITEM
5M9ME01	22	1450	380	TEFC IP55	WAS PUMP
5M9ME02	22	1450	380	TEFC IP55	WAS PUMP
5M9ME03	0.55	1450	380	TEFC IP55	THICKENER MECH
5M9ME04	1.3	1450	380	TEFC IP65	SUMP PUMP
5E9EE05	?	1450	380	TEFC IP55	VENTILATION FAN
5M9ME06	0.37	1450	380	TEFC IP55	VALVE ACTUATOR
5M9ME07	0.55	1450	380	TEFC IP55	MIXER
5M9ME08	0.55	1450	380	TEFC IP55	MIXER
5M9ME09	22	1450	380	TEFC IP55	WAS PUMP
5M9ME10	0.37	1450	380	TEFC IP55	VALVE ACTUATOR

PRESSURE GAUGES		
TAG No.	RANGE (KPa)	TYPE
5M9PI01	0–150	BOURDON TUBE
5M9ME02	0–150	BOURDON TUBE

VENTILATION FAN (VF)	
TAG No	DUTY m3 /hr
5M9VF01	1250

THICKENER MECHANISM (TM)		
TAG No	DRIVE	PERIPHIRAL SPEED m/min
5M9TM01	PERIPHERAL	3
5M9TM02	PERIPHERAL	3

WASTE LIQUOR PUMPS (LP)		
TAG No	TYPE	DUTY l/s @ m
5M9LP01	CENTRIFUGAL	43 l/s @ 29m
5M9LP02	CENTRIFUGAL	43 l/s @ 29m
5M9LP03	CENTRIFUGAL	43 l/s @ 29m

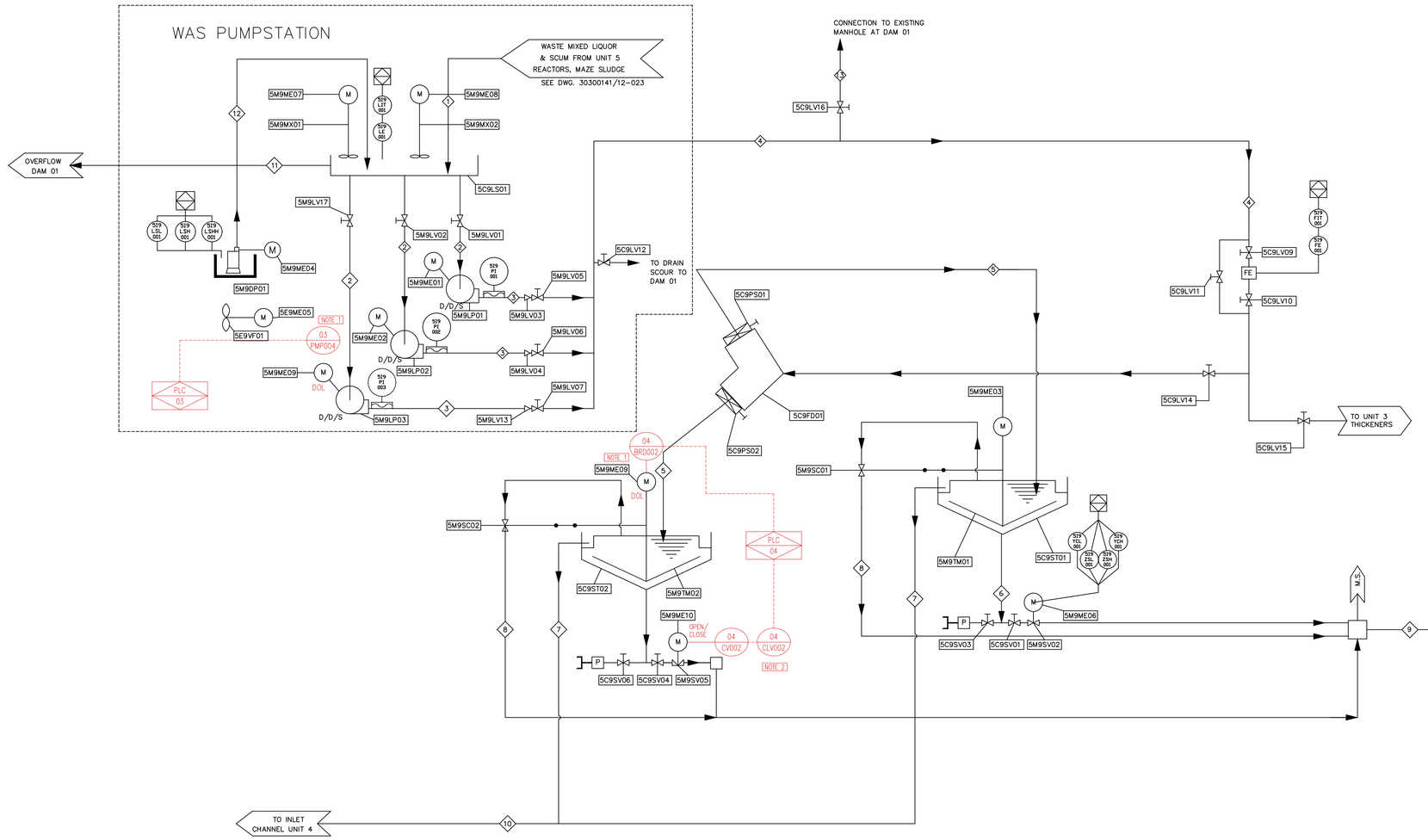
DEWATERING PUMP (DP)		
TAG No	TYPE	DUTY l/s @ m
5M9DP01	SUBMERSIBLE	4 l/s @ 5m

WASTE A.S SUMP (LS)	
TAG No	VOLUME m3
5C9LS01	50

MIXERS (MX)		
TAG No	TYPE	INPUT (kw)
5M9MX01	AXIAL	0.5
5M9MX02	AXIAL	0.5

FLOW SENSORS (FE)		
TAG No	SIZE (mm)	TYPE
5I9FE01	300	Clamp-on Flow
~~5I9FE02~~	~~300~~	~~Clamp-on Flow~~

INSTRUMENTATION		
Transducer TAG No.	Sensor TAG No.	Description
5I9-FIT-001	5I9-FE-001	Clamp-on flowmeter at WST
~~5I9-FIT-002~~	~~5I9-FE-002~~	~~Clamp-on flowmeter~~
5I9-LSHH-001	.	Float switch-sump high alarm
5I9-LSL-001	.	Float switch-sump low point
5I9-LSH-001	.	Float switch-sump high point
5I9-LIT-001	5I9-LE-001	U/sonic level transmitter
~~5I9-LIT-002~~	~~5I9-LE-002~~	~~U/sonic level transmitter~~
5I9-ZSL-001	Actuator Valve	Control closed limit
5I9-ZSH-001	Actuator Valve	Control open limit
5I9-YCL-001	Actuator Valve	Control close command
5I9-YCH-001	Actuator Valve	Control open command



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 WASTE MIXED LIQUOR & SCUM	2 WASTE MIXED LIQUOR & SCUM	3 WASTE MIXED LIQUOR & SCUM	4 WASTE MIXED LIQUOR & SCUM	5 WASTE MIXED LIQUOR & SCUM	6 THICKENED SLUDGE	7 EFFLUENT	8 SCUM	9 THICKENED SLUDGE AND SCUM	10 EFFLUENT	11 OVERFLOW DAM 01	12 DRAIN	13 SCOUR
FLUID l/s	MIN	16	16	16	16	16	0	16	0	0	16	–		
	NORMAL (AVE)	34 (92)	23	23 (46)	68 (92)	34	30	34 (35,6)	10 (10)	45 (21,50)	68	–		
	MAX	127	64	64	127	64	30	64	10	60	127	–		
SOLIDS kg/s	MIN	(0,170)	(0,170)	(0,170)	(0,170)	(0,180)	(0)	–	–	(0)		–		
	NORMAL (AVE)	(0,210)	(0,140)	(0,140)	(0,420)	(0,416)	(0,90)	–	–	(1,35)		–		
	MAX	(0,260)	(0,130)	(0,130)	(0,260)	(0,250)	(0,90)	–	–	(1,80)		–		
CONDUIT SIZE (mm)		375ø	250ø	200ø	300/350ND	350ø	200ø	350ø	150ND	300ND	350ø	300ø	50ø	150/400
CONDUIT MATERIAL		uPVC	M.S.	M.S.	MS/HDPE CLASS	M.S.	M.S	M.S	uPVC CLASS12	uPVC CLASS12	M.S	M.S	M.S	uPVC/M.S

DEPARTMENT	APPROVED	DESIGNATION	DATE

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS

UNIT 5 – PHASE 2
WASTE SLUDGE THICKENERS
PLC–04
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE: NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	W BRITZ	25.01.19
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.
JW NUMBER: JW13898–04–024
CONSULTANT'S NUMBER: ING0645D–04–024
FILE No: BWW1500
T0 T1

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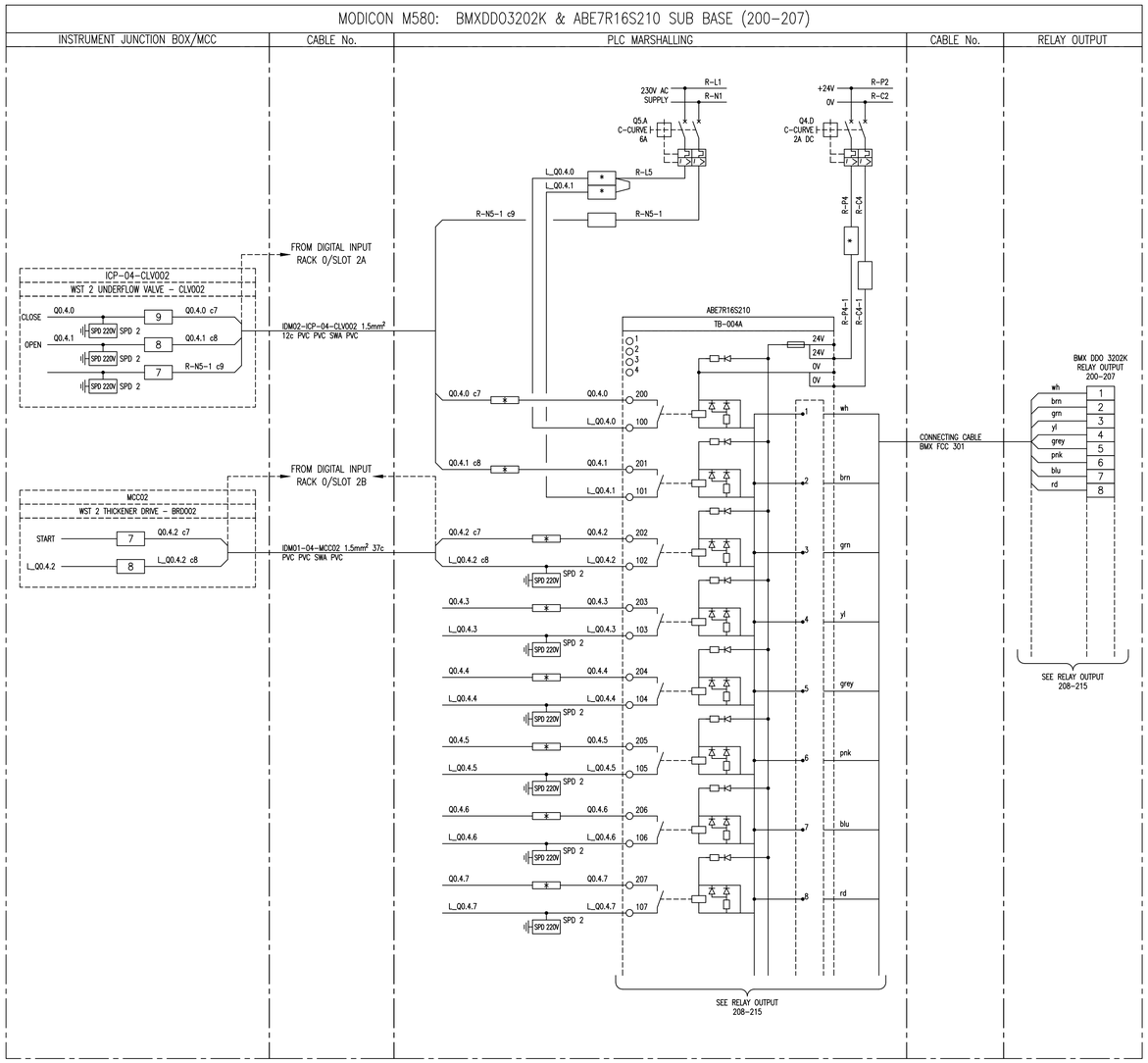

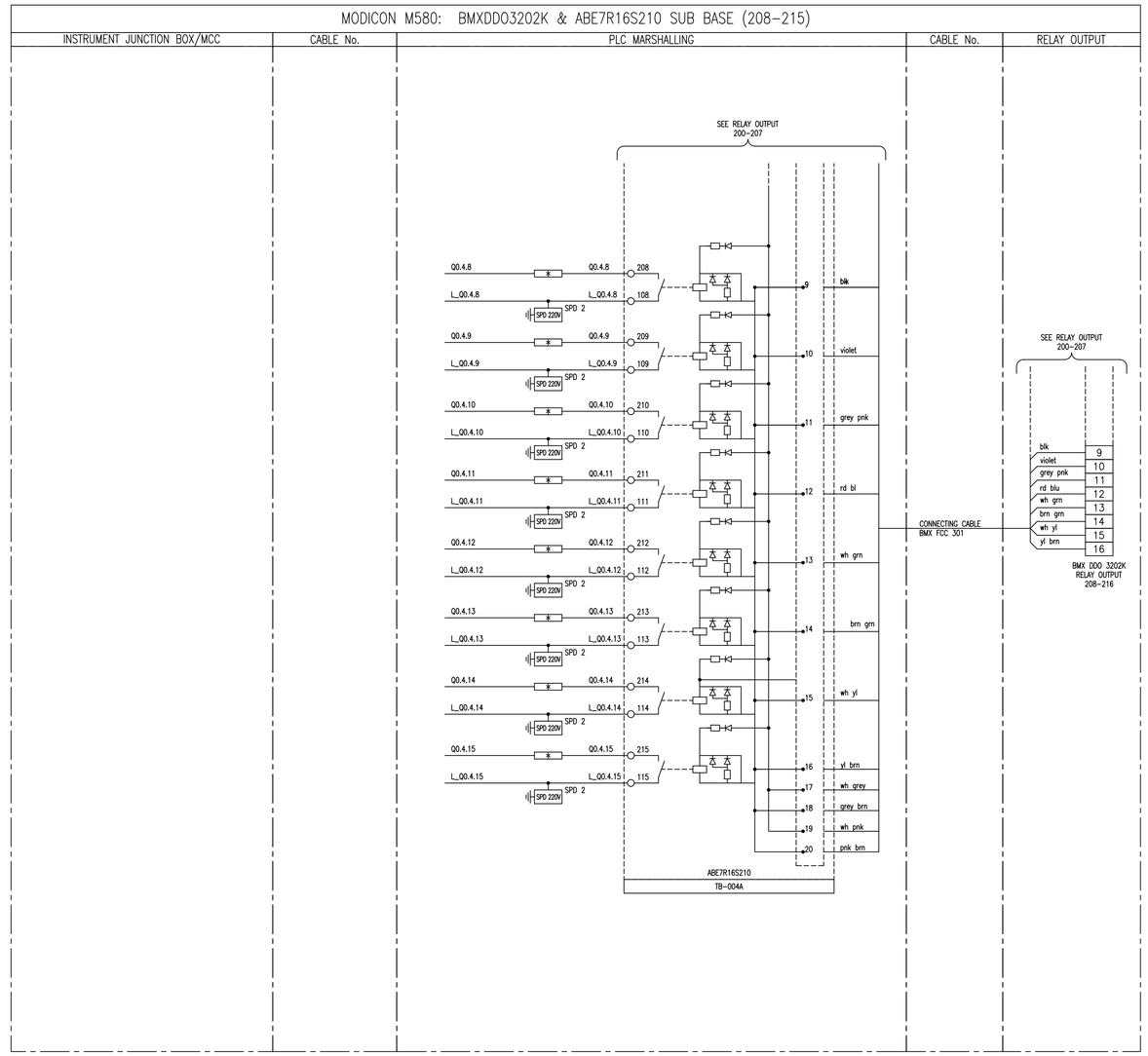

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LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 WST PLC–04
DIGITAL OUTPUT MODULE: SUB–BASE 1 OF 2
RACK 1 / SLOT 0A (200–215)

DESIGN MANAGER
DATE

SCALE: NTS

AMENDMENTS

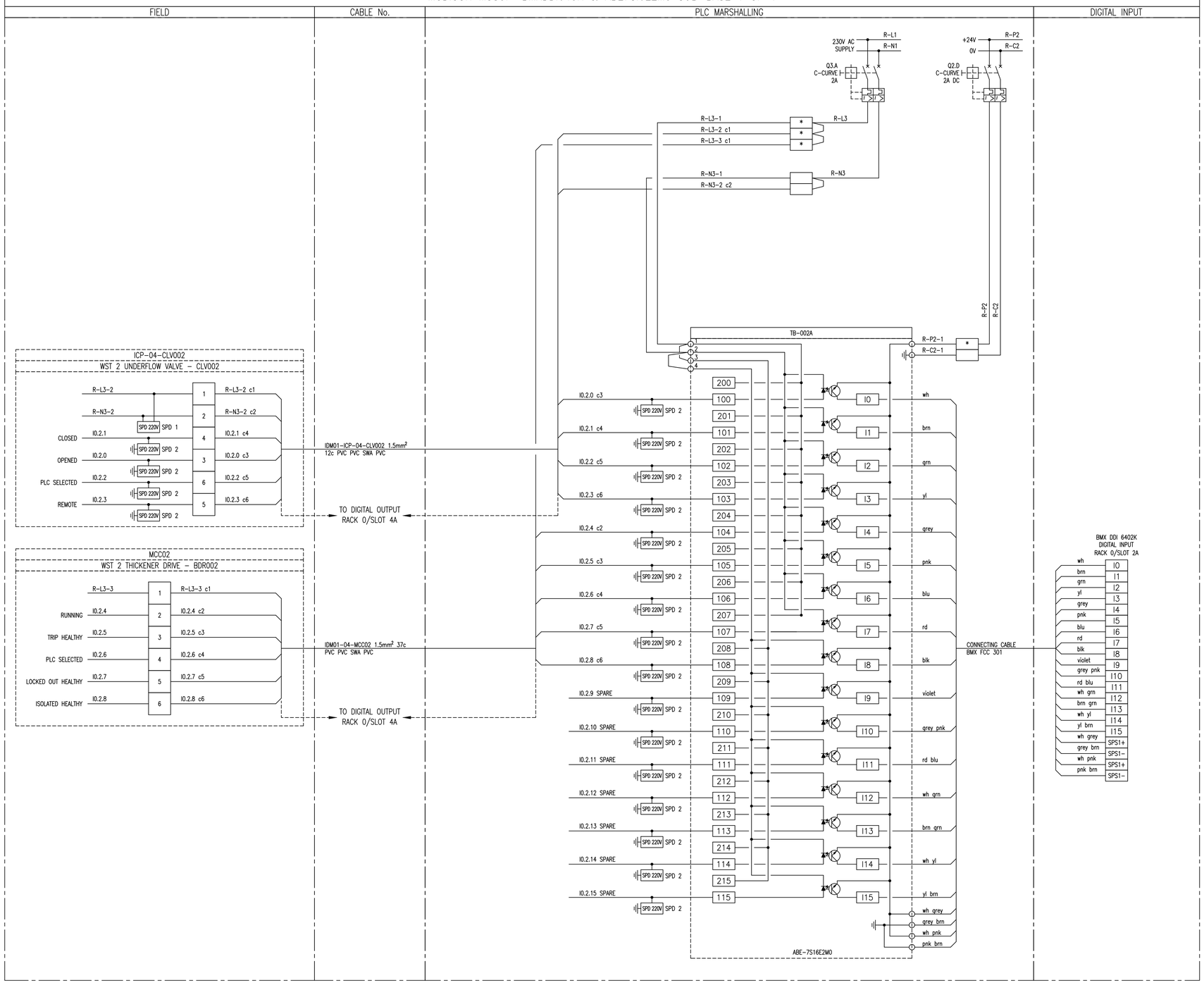
	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	22.05.19

DRAWING No.

JW NUMBER: JW13898–04–R0S4A–DO
CONSULTANT'S NUMBER: ING0645D–04–R0S4A–DO
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–04 (U5 WST)\Wiring Diagrams\ING0645D–04–R0S4A–DO revT0.dwg May 30, 2019 – 10:21am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DATE	DESIGNATION	APPROVED	DEPARTMENT

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - WST PLC-04
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

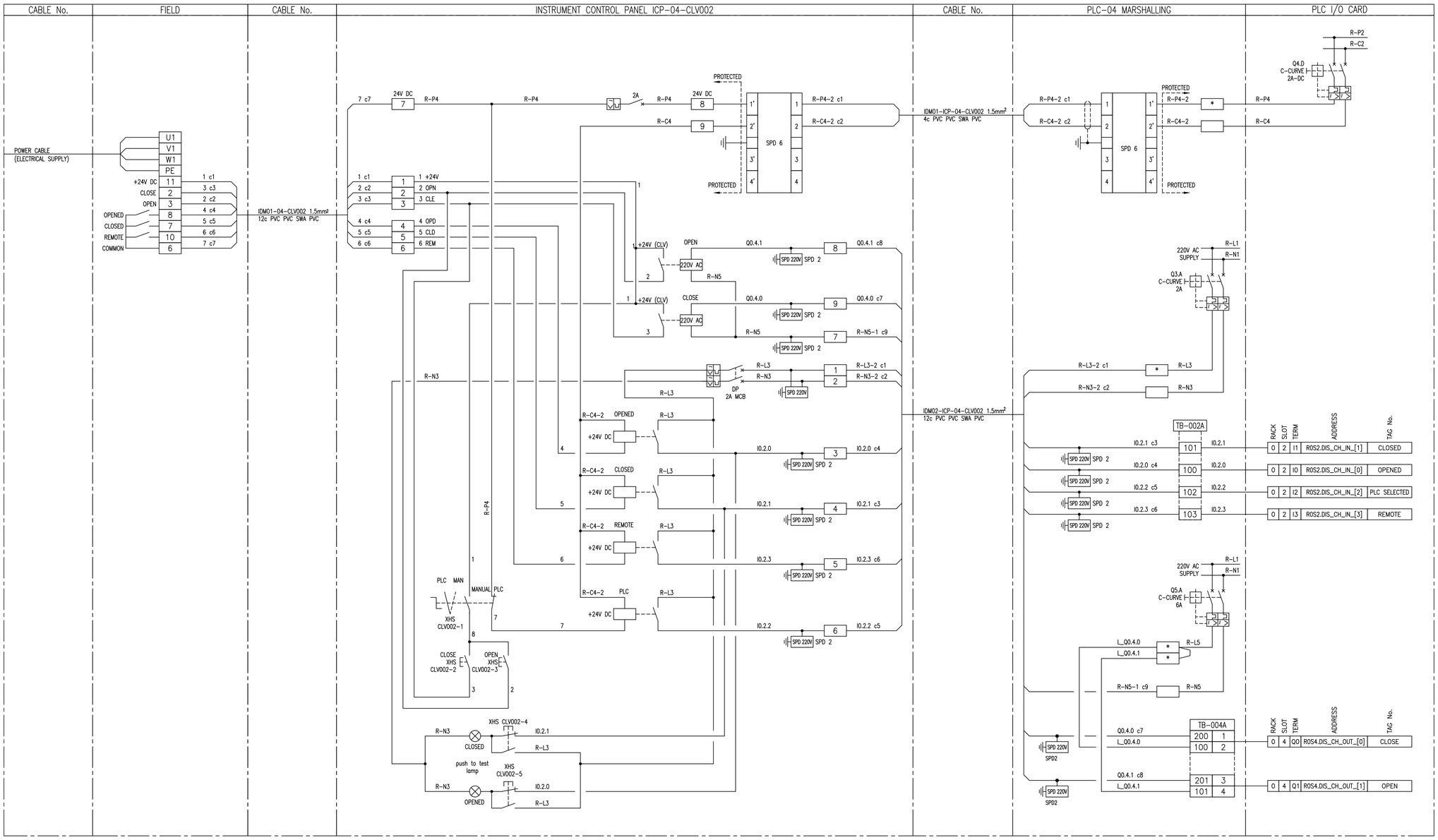
JW NUMBER
JW13898-04-R0S2A-DI

CONSULTANT'S NUMBER
ING0645D-04-R0S2A-DI

FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-04 (U5 WST)\Wiring Diagrams\ING0645D-04-R0S2A-DI revT0.dwg May 30, 2019 - 10:22am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – WST PLC-04
WST 2 UNDERFLOW VALVE – CLV002
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

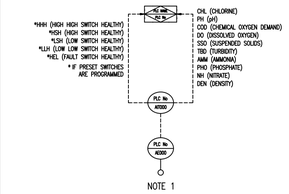
AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-04-CLV002
CONSULTANT'S NUMBER
ING0645D-04-CLV002
FILE No
BWW 1500
T0

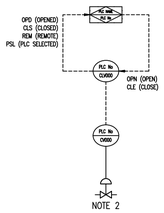
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-04 (U5 WST)\Loop Diagrams\ING0645D-04-CLV002 revT0.dwg May 30, 2019 – 10:22am



NOTE 1

ANALYTICAL	
SIGNALS	
DI	AI
HHH (HIGH HIGH SWITCH HEALTHY) HSH (HIGH SWITCH HEALTHY) LSH (LOW SWITCH HEALTHY) LLH (LOW LOW SWITCH HEALTHY) HEL (FAULT SWITCH HEALTHY)	CHL (CHLORINE) PH (pH) COD (CHEMICAL OXYGEN DEMAND) DO (DISSOLVED OXYGEN) SSO (SUSPENDED SOLIDS) TBD (TURBIDITY) AMM (AMMONIA) PHO (PHOSPHATE) NH (NITRATE) DEN (DENSITY)

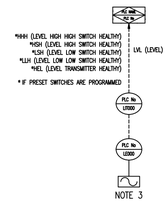
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 2

ON/OFF MOTORISED VALVE	
SIGNALS	
DI	DO
OPD (OPENED) CLS (CLOSED) REM (REMOTE) PSL (PLC SELECTED)	OPN (OPEN) CLE (CLOSE)

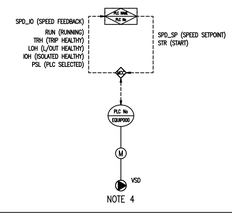
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 3

ULTRASONIC LEVEL SENSOR	
SIGNALS	
DI	AI
HHH (LEVEL HIGH HIGH SWITCH HEALTHY) HSH (LEVEL HIGH SWITCH HEALTHY) LSH (LEVEL LOW SWITCH HEALTHY) LLH (LEVEL LOW LOW SWITCH HEALTHY) HEL (LEVEL TRANSMITTER HEALTHY)	LVL (LEVEL)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 4

VSD DRIVE			
SIGNALS			
DI	DO	AI	AO
RUN (RUNNING) TRH (TRIP HEALTHY) LOH (L/OUT HEALTHY) IOH (ISOLATED HEALTHY) PSL (PLC SELECTED)	STR (START)	SPD_IO (SPEED FEEDBACK)	SPD_SP (SPEED SETPOINT)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
ELUTRIATION PLC-05
CONTROL AND INSTRUMENTATION
LEGEND SHEET

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	W BRITZ	23.04.19
T1	JW NUMBER UPDATED	W BRITZ	25.04.19

DRAWING No.

JW NUMBER
JW13898-05-P&ID-LEGEND

CONSULTANT'S NUMBER
ING0645D-05-P&ID-LEGEND

FILE No
BWW 1500

T0 T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-05-P&ID-LEGEND revT1.dwg May 28, 2019 – 11:50am

ELECTRIC, CONTROL & INSTRUMENTATION CIVIL AND MECHANICAL

EQUIPMENT TABLES

FLOW SENSORS (FE)

TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
FE002	FIT002	MAGFLOW	EFFLUENT WASH WATER PUMP FLOW

LEVEL SENSORS (LE)

TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
LE001 (PLC-06)	LIT001 (PLC-06)	ULTRASONIC	EFFLUENT WASH WATER STORAGE TANK1 LEVEL1

ELECTRIC MOTORS (ME) & HEATERS (HE)

TAG No	KW	rpm	VOLTAGE	ENCLOSURE	DRIVEN ITEM
5M5ME01	0.75	VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP
5M5ME02	0.75	VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP
5M5ME03	0.75	VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP
5M5ME04	0.24	1450	380	TEFC-IP55	PENSTOCK ACTUATOR
5M5ME05	0.24	1450	380	TEFC-IP55	PENSTOCK ACTUATOR
5M5ME06	0.57	1450	380	TEFC-IP55	PENSTOCK ACTUATOR
5M5ME07	0.24	1450	380	TEFC-IP55	PENSTOCK ACTUATOR
5M5ME08	UNALLOCATED				
5M5ME09	3	1450	380	IP 67	SUBMERSIBLE SLUDGE PUMP1
~~5M5ME10~~	~~5.5~~	~~1450~~	~~380~~	~~IP 67~~	~~SUBMERSIBLE SLUDGE PUMP2~~
5M5ME11	UNALLOCATED				
5M5ME12	1,5	1450	380	TEFC-IP55	SAMPLING PUMP
5M5ME15	UNALLOCATED				
5M5ME16					
5M5ME17	22	1450	380	TEFC-IP55	EFFLUENT PUMP
5M5ME18	22	1450	380	TEFC-IP55	EFFLUENT PUMP

CHEMICAL STORAGE TANKS (CT)

TAG No	VOLUME m^3	TYPE
5M5CT01	30	POLYETHYL
5M5CT02	30	POLYETHYL
5M5CT03	30	POLYETHYL
5M5CT04	30	GLASS REINF. PLASTIC

CHEMICAL DOSING PUMPS (CP)

TAG No	TYPE	DUTY l/s @ m
5M5CP01	HOSE PERISTALTIC	0.02–0.23 l/s @ 20m
5M5CP02	HOSE PERISTALTIC	0.02–0.23 l/s @ 20m
5M5CP03	HOSE PERISTALTIC	0.02–0.23 l/s @ 20m

CHEMICAL STRAINERS (CS)

TAG No	DIA mm
5M5CS01	20

PRESS & VAC.RELIEF COVER (RC)

TAG No	DIA mm
5M5RC01	100
5M5RC02	100
5M5RC03	100
5M5RC04	100

EFFLUENT PUMPS (EP)

TAG No	TYPE	DUTY l/s @ m
5M5EP01	SELF PRIMING CENTRIFUGAL	15 @ 60
5M5EP02	SELF PRIMING CENTRIFUGAL	15 @ 60

SPILLAGE TRAYS (ST)

TAG No	VOLUME m^3
5C5ST01	
5C5ST02	114
5C5ST03	
5C5ST04	38

LEVEL INDICATOR (LI)

TAG No	TAG No	TYPE
5M5LI01	5M5CF01	FLOAT/EXTERNAL CALIBRATION FLASK/ROTAMETER

SLUDGE VALVES (SV)

TAG No	SIZE mm	TYPE	ACTUATOR
5M5SV01	UNALLOCATED		
5M5SV02	150	REFLUX	
~~5M5SV03~~	~~150~~	~~REFLUX~~	
5M5SV04	150	KGV	HAND WHEEL
~~5M5SV05~~	~~150~~	~~KGV~~	~~HAND WHEEL~~

CHEMICAL DRAIN VALVES (DV)

TAG No	DIA mm	TYPE	ACTUATOR
5M5DV01	80	PPBV	HAND
5M5DV02	80	PPBV	HAND
5M5DV03	80	PPBV	HAND
5M5DV04	80	PPBV	HAND

CHLORINE MAZE (DC)

TAG No	CAPACITY
5C5DC01	45MIN
5C5DC02	45MIN
5C5DC03	45MIN

CHEMICAL VALVES (CV)

TAG No	DIA mm	TYPE	ACTUATOR	No. REQ.	NOTES
5M5CV01	80	PPBV	HAND	1	
5M5CV02	80	NRV	–	1	
5M5CV03	80	PPBV	HAND	1	
5M5CV04	80	PPBV	HAND	1	
5M5CV05	50	PPBV	HAND	1	
5M5CV06	50	PPBV	HAND	1	
5M5CV07	40	PPBV	HAND	1	
5M5CV08	40	PPBV	HAND	1	
5M5CV09	40	PPBV	HAND	1	
5M5CV10	40	PPBV	HAND	1	
5M5CV11	20	NRV	–	1	
5M5CV12	20	NRV	–	1	
5M5CV13	20	PPBV	HAND	1	
5M5CV14	20	PPBV	HAND	1	
5M5CV15	40	LV	–	1	
5M5CV16	40	PPBV	HAND	1	
5M5CV17	40	PPBV	HAND	1	
5M5CV18	40	PPBV	HAND	1	
5M5CV19	80	PPBV	HAND	1	
5M5CV20	80	PPBV	HAND	1	
5M5CV21	80	PPBV	HAND	1	
5C5CV22	20	PPBV	HAND LEVER	1	
5C5CV23	40	PPBV	HAND	1	
5C5CV24	40	PPBV	HAND	1	
5C5CV25	40	PPBV	HAND	1	
5C5CV26	40	PPBV	HAND	1	
5C5CV27	75	PPBV	HAND	1	
5M5CV28	40	PPBV	HAND	1	
5M5CV29	40	PPBV	HAND	1	
5M5CV30	40	PPBV	HAND	1	
5M5CV31	40	DIAPH	HAND	1	
5M5CV32	40	PPBV	HAND	1	
5M5CV33	40	PPBV	HAND	1	
5M5CV34	40	PPBV	HAND	1	
5M5CV35	40	PPBV	HAND	1	
5M5CV36	40	NRV	–	1	
5M5CV37	40	PD	–	1	
5C5CV38	20	PPBV	HAND	1	
5M5CV39	80	PPBV	HAND	1	
5M5CV40	80	PPBV	HAND	1	
5M5CV41	80	PPBV	HAND	1	
5M5CV42	40	PPBV	HAND	1	
5M5CV43	40	PPBV	HAND	1	
5M5CV44	20	NRV	–	1	
5C5CV45	20	PPBV	HAND	1	
5C5CV46	80	PPBV	HAND	1	
5C5CV47	80	PPBV	HAND	1	
5C5CV48	80	PPBV	HAND	1	

SHOWER AND EYEBATH (SE)

TAG No	TYPE
5M5SE01	FOOT OPERATED
5M5SE02	FOOT OPERATED

SAMPLING POINTS

MANUAL SAMPLING	MS
AUTOMATIC SAMPLING (220vac REQUIRED)	AS

PENSTOCKS (PS)

TAG No	SIZE (mm)	TYPE	ACTUATOR
5M5PS05	2000x2250	CHANNEL	ELECTRICAL
5M5PS07	2800x1000	SLUICE	ELECTRICAL
5C5PS08	300x300	SLUICE	HAND
5C5PS09	2800x1000	SLUICE	HAND/ELEC
5C5PS11	300x300	SLUICE	HAND/ELEC
5C5PS12	300x300	SLUICE	HAND WHEEL
5C5PS13	300x300	SLUICE	HAND
		SLUICE	HAND

SLUDGE PUMP (SP)

TAG No	TYPE	DUTY l/s @ m
5M5SP01	SUBMERSIBLE	15.2 l/s@15.5m
~~5M5SP02~~	~~SUBMERSIBLE~~	~~15.2 l/s@15.5m~~

SAMPLING PUMP (DP)

TAG No	TYPE	DUTY l/s @ m
5M5DP01	SELF PRIMING CENTRIFUGAL	0.75@10

EFFLUENT VALVES (EV)

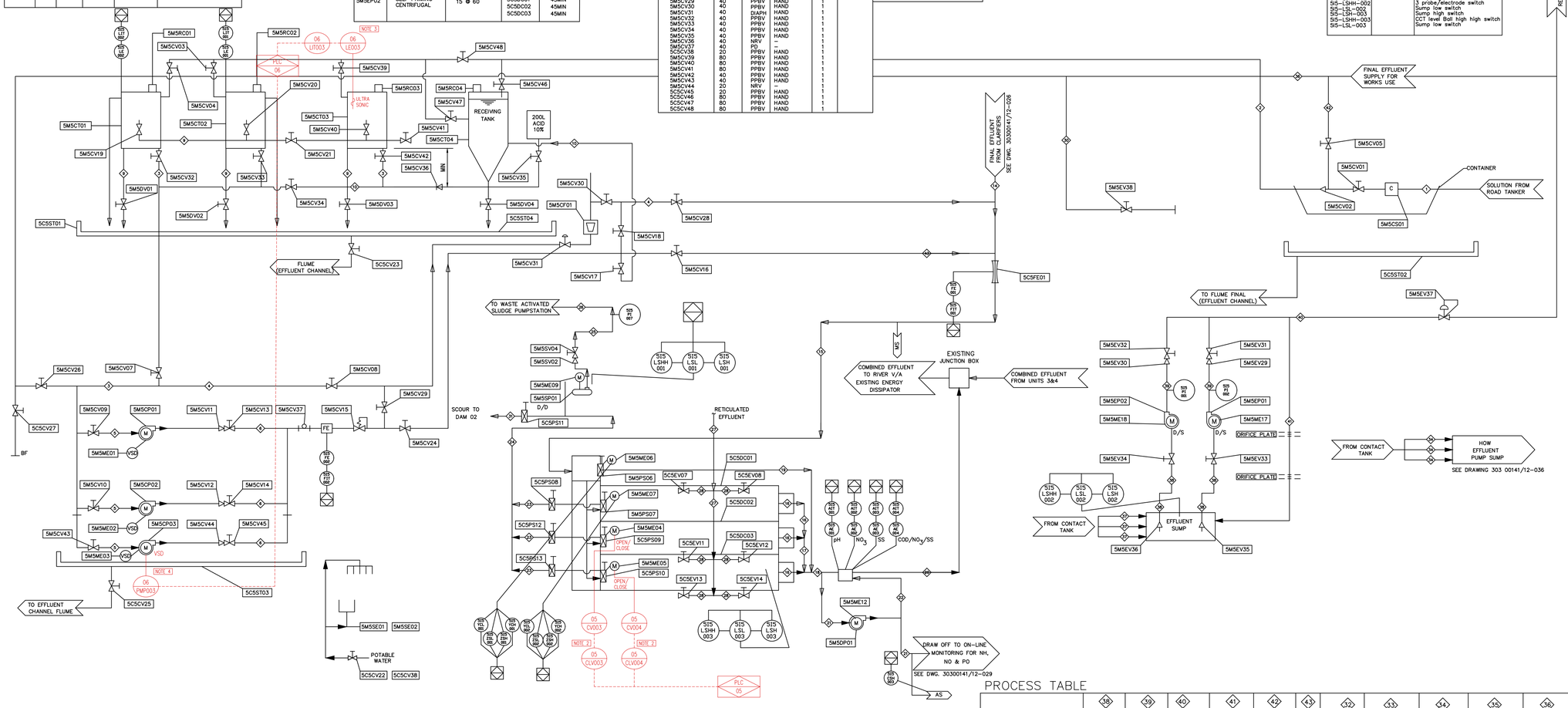
TAG No.	SIZE (mm)	TYPE	ACTUATION	TAG No.	SIZE (mm)	TYPE	ACTUATION
5C5EV07	50	BGV	HAND WHEEL	5M5EV19	UNALLOCATED		
5C5EV08	50	BGV	HAND WHEEL	5M5EV20			
5M5EV11	50	BGV	HAND WHEEL	5M5EV21			
5M5EV12	50	BGV	HAND WHEEL	5M5EV22			
5M5EV13	50	BGV	HAND WHEEL	5M5EV23			
5M5EV14	50	BGV	HAND WHEEL	5M5EV24	UNALLOCATED		–
				5M5EV26	UNALLOCATED		
				5M5EV27			
				5M5EV28			
				5M5EV29	80	RV	–
				5M5EV30	80	RV	–
				5M5EV31	80	RSV	HAND WHEEL
				5M5EV32	80	RSV	HAND WHEEL
				5M5EV33	125	RSV	HAND WHEEL
				5M5EV34	125	RSV	HAND WHEEL
				5M5EV35	125	FV	–
				5M5EV36	125	FV	–
				5M5EV37	40	PRV	–
				5M5EV38	20	BGV	HAND

FLOW SENSORS (FE)

TAG No	SIZE	TYPE
5C5FE01	–	FLUME
5M5FE02	20	FLOW METER

INSTRUMENTATION

Transducer TAG No.	Sensor TAG No.	Description
5I5–CSH–003		Solenoid Valve switch
5I5–AIT–001	5I5–AE–001	pH analyser
5I5–AIT–002	5I5–AE–002	Nitrate analyser
5I5–AIT–003	5I5–AE–003	Suspended Solids
5I5–FSL–004		Flow Switch
5I5–LSH–001		Sump high switch
5I5–LSHH–001		3–probe/electrode switch
5I5–LSL–001		Sump low switch
5I5–FIT–001	5I5–FE–001	Open channel w/s flowmeter
5I5–FIT–002	5I5–FE–002	Ultra low flowmeter
5I5–LIT–001	5I5–LE–001	Ultrasonic Level transmitter
5I5–ZSL–001	Penstock	actuator closed limit
5I5–ZSH–001	Penstock	actuator open limit
5I5–YCL–001	Penstock	actuator close command
5I5–YCH–001	Penstock	actuator open command
5I5–LIT–002	5I5–LE–002	Ultrasonic Level transmitter
5I5–ZSL–002	Penstock	actuator closed limit
5I5–ZSH–002	Penstock	actuator open limit
5I5–YCL–002	Penstock	actuator close command
5I5–YCH–002	Penstock	actuator open command
5I5–AIT–004	5I5–AE–004	COD/NO_3/SS
5I5–LSH–002		Sump high switch
5I5–LSHH–002		3 probe/electrode switch
5I5–LSL–002		Sump low switch
5I5–LSH–003		Sump high switch
5I5–LSHH–003		CCT level Ball high high switch
5I5–LSL–003		Sump low switch



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		36 EFFLUENT WASHWATER	39 EFFLUENT WASHWATER	40 EFFLUENT WASHWATER	41 EFFLUENT WASHWATER	42 EFFLUENT WASHWATER	43 DBF	32 UNALLOCATED	33 UNALLOCATED	34 EFFLUENT WASHWATER	35	36 EFFLUENT WASH WATER	37 EFFLUENT WASH WATER
FLUID l/s	MIN	–	–	–	–			–	–	–			–
	NORMAL (AVE)	15	15	15	15			–	–	84	UNALLOCATED		15
	MAX	–	–	–	–			–	–	–			–
SOLIDS kg/	MIN	–	–	–	–			–	–	–			–
	NORMAL (AVE)	–	–	–	–			–	–	–			–
	MAX	–	–	–	–			–	–	–			–
CONDUIT SIZE (mm)		125DIA	80DIA	100DIA	40DIA	50DIA	25	–	–	400DIA		75 DIA.	150 DIA.
CONDUIT MATERIAL		GMS	GMS	GMS	~~GMS~~	uPVC	HDPE	–	–	HDPE		HDPE	GMS

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 DBF	2 DBF	3 DBF	4 DBF	5 DBF	6 DBF	7 DBF	8 DBF	9 DBF	10 HCC	11 UNALLOCATED	12	13	14 FINAL EFFLUENT FROM BIOREACTORS	15 CHLORINATED FINAL EFFLUENT	16 CHLORINATED FINAL EFFLUENT	17 CHLORINATED FINAL EFFLUENT	18 CHLORINATED FINAL EFFLUENT	19 CHLORINATED FINAL EFFLUENT BYPASS	20 CHLORINATED FINAL EFFLUENT	21 CHLORINATED FINAL EFFLUENT	22 CHLORINATED FINAL EFFLUENT	23 SLUDGE	24 SLUDGE	25 SLUDGE	26 SLUDGE	27 RETICULATED EFFLUENT	28 RETICULATED EFFLUENT	29 EFFLUENT	30 RETICULATED EFFLUENT	31 DRAIN SCOUR
FLUID l/s	MIN	–	–	0.02	0.02	0.02	0.02	0.02	0.02	0.02					578	578	0	578	578	0	578	0	0	0	0	0	0	0	0	2.5	0	
	NORMAL (AVE)	–	–	0.04	0.16	0.08	0.08	0.16	0.16	0.04					1734	1734	578	1156	1734	0	1734	0	0	0	0	0	0	0	5	5	0	
	MAX	80	80	0.23	0.43	0.22	0.22	0.43	0.43	0.23					2081	2081	694	1387	2081	2081	2081	0,28	0,28	25	50	15	20	10	5	7,5	0.2	
SOLIDS kg/s	MIN	0	0	0	0	0	0	0	0	0	0				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	NORMAL (AVE)	0	0	0	0	0	–	0	0	0	1				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
	MAX	0	0	0	0	0	–	0	0	0	0				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CONDUIT SIZE (mm)		80	80	40	40	40	20	20	20	80	20				1200 DIA	900 DIA.	–	–	?	1050	900 DIA	20 ID	20 OD	200 DIA.	200 DIA.	150 DIA.	150 DIA.	80 DIA.	50 DIA.	200 DIA.	20 DIA.	200 DIA.
CONDUIT MATERIAL		uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	uPVC CLASS 9	HDPE CLASS 9	uPVC CLASS 9	uPVC CLASS 9				CONCRETE	MS	CONCRETE	CONCRETE	CONCRETE	MS	MS	HDPE CLASS 9	HDPE CLASS 9	MS	MS	GMS	MS	UPVC	GMS	VC	GMS	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS

UNIT 5 – PHASE 2
DISINFECTION DOSING PLANT
PLC–05
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T1		W BRITZ	25.04.19

DRAWING No.

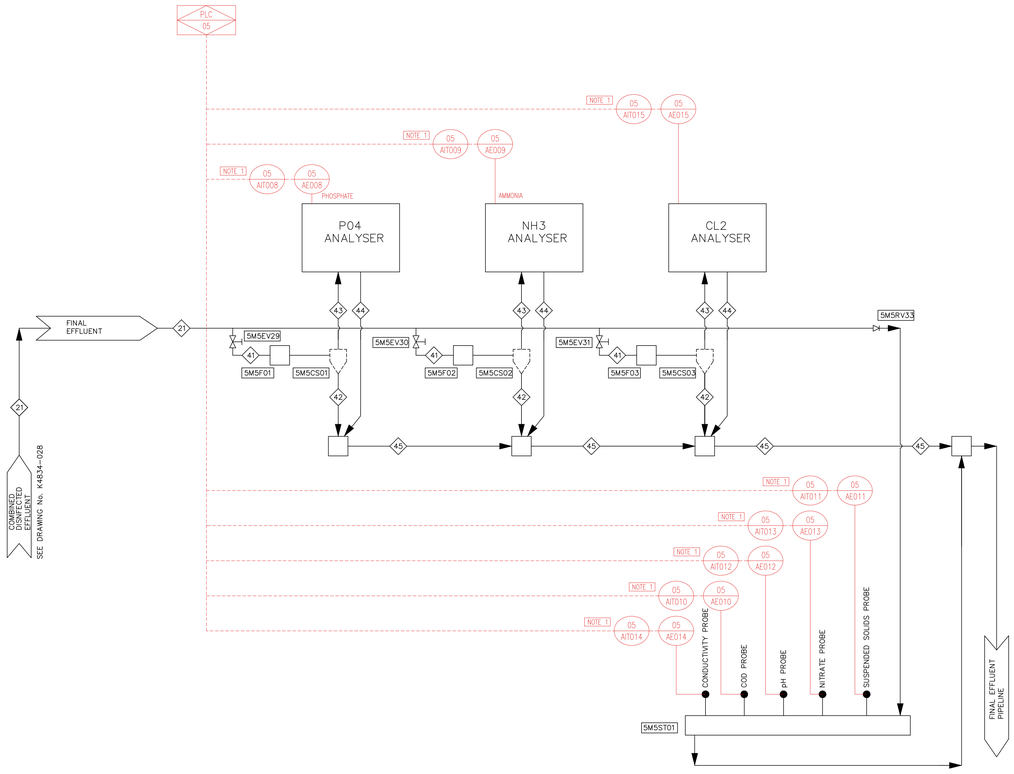
JW NUMBER: JW13898–05–028
CONSULTANT'S NUMBER: ING0645D–05–028
FILE No: BWW1300
T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D–05–028(DISINFECT) rev1.dwg May 28, 2019 – 11:51am

INSTRUMENTATION		
		DESCRIPTION
		ORTHOPHOSPHATE ANALYZER
		AMMONIA ANALYZER
		FREE CHLORINE ANALYZER
		ECOLI ANALIZER
		CONDUCTIVITY PROBE
		PH PROBE
		NITRATE PROBE
		SUSPENDED SOLIDS PROBE
		COD PROBE
		PROBE

CIVIL AND MECHANICAL EQUIPMENT TABLE

CYCLONE SEPARATORS (CS)			INLINE FILTER (F)			EFFLUENT VALVE (EV)			
TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	SIZE (mm)	TYPE	ACTUATOR
5M5CS01	0.75	300	5M5F01	0.75	300	5M5EV29	15	PPBV	HAND
5M5CS02	0.75	300	5M5F02	0.75	300	5M5EV30	15	PPBV	HAND
5M5CS03	0.75	300	5M5F03	0.75	300	5M5EV31	15	PPBV	HAND
			5M5ST01	SAMPLING TROUGH		5M5EV32	15	PPBV	HAND
						5M5RV33	20	RV	HAND



ON LINE MONITORING OF FINAL EFFLUENT

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED	21 CHORINATED FINAL EFFLUENT	41 CHORINATED FINAL EFFLUENT	42 CHORINATED FINAL EFFLUENT	43 CHORINATED FINAL EFFLUENT	44 WASTE	45 WASTE
FLUID ⅛ NORMAL (AVE) MIN. MAX.	0.75	0.25	0.25	NEG	NEG	0.75
SOLIDS kg/s NORMAL (AVE) MIN. MAX.	–	–	–	–	–	–
CONDUIT SIZE (mm)	40ND	25ND	25ND	AS PER EQUIPMENT	25ND	110ND
CONDUIT MATERIAL	HDPE CLASS 9	HDPE CLASS 9	HDPE CLASS 9	SUPPLIER	HDPE CLASS 9	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	C DU TOIT
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
ON-LINE MONITORING OF FINAL EFFLUENT
PLC-05
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE: NTS

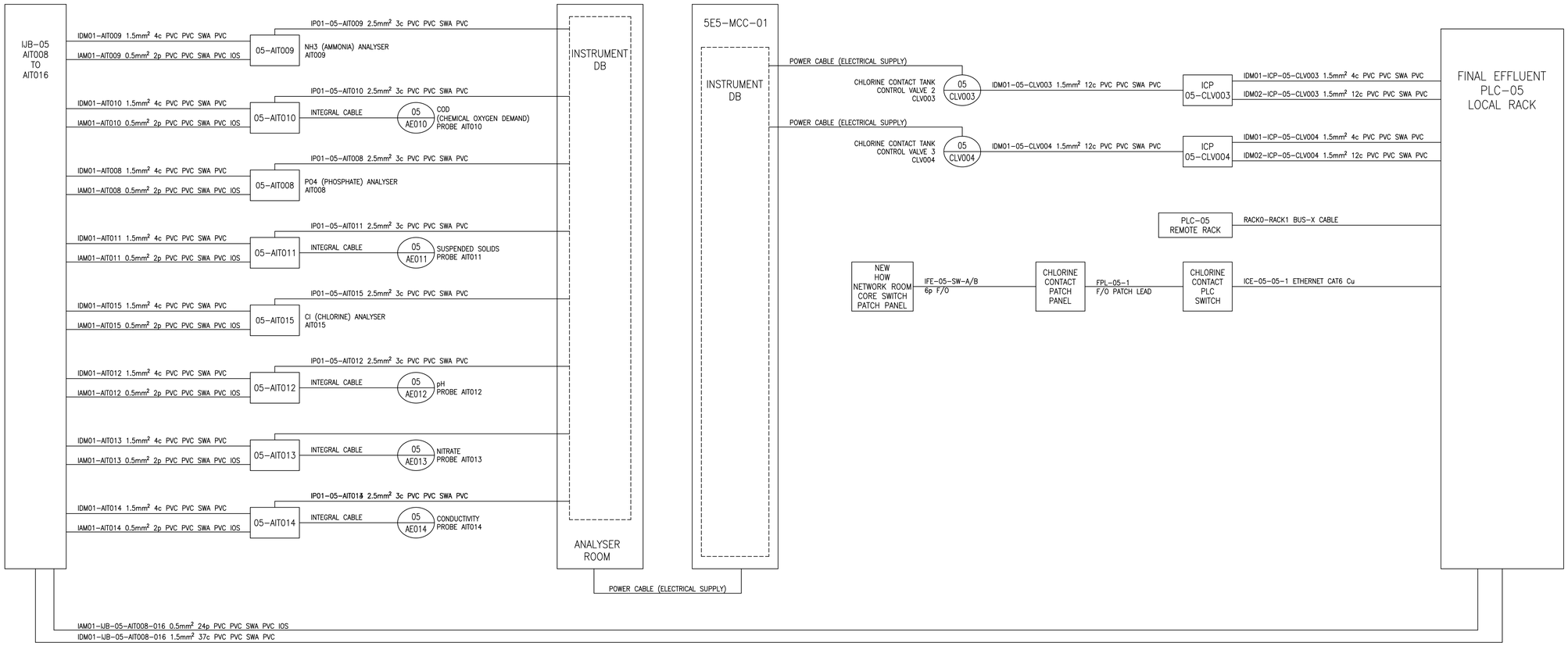
	AMENDMENTS	APPROVED	DATE
T1	FOR TENDER	W BRITZ	25.04.19
T2	RE-ISSUED FOR TENDER	C du TOIT	30.09.24

DRAWING No.

JW NUMBER: JW13898-05-029
CONSULTANT'S NUMBER: ING0645D-05-029
FILE No: BWW1500

T1 T2

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-05-029(FINAL EFFLUENT) rev12.dwg Oct 17, 2024 – 2:24pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 BIOREACTOR 2
FINAL EFFLUENT PLC–05 LOCAL RACK
CABLE BLOCK DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

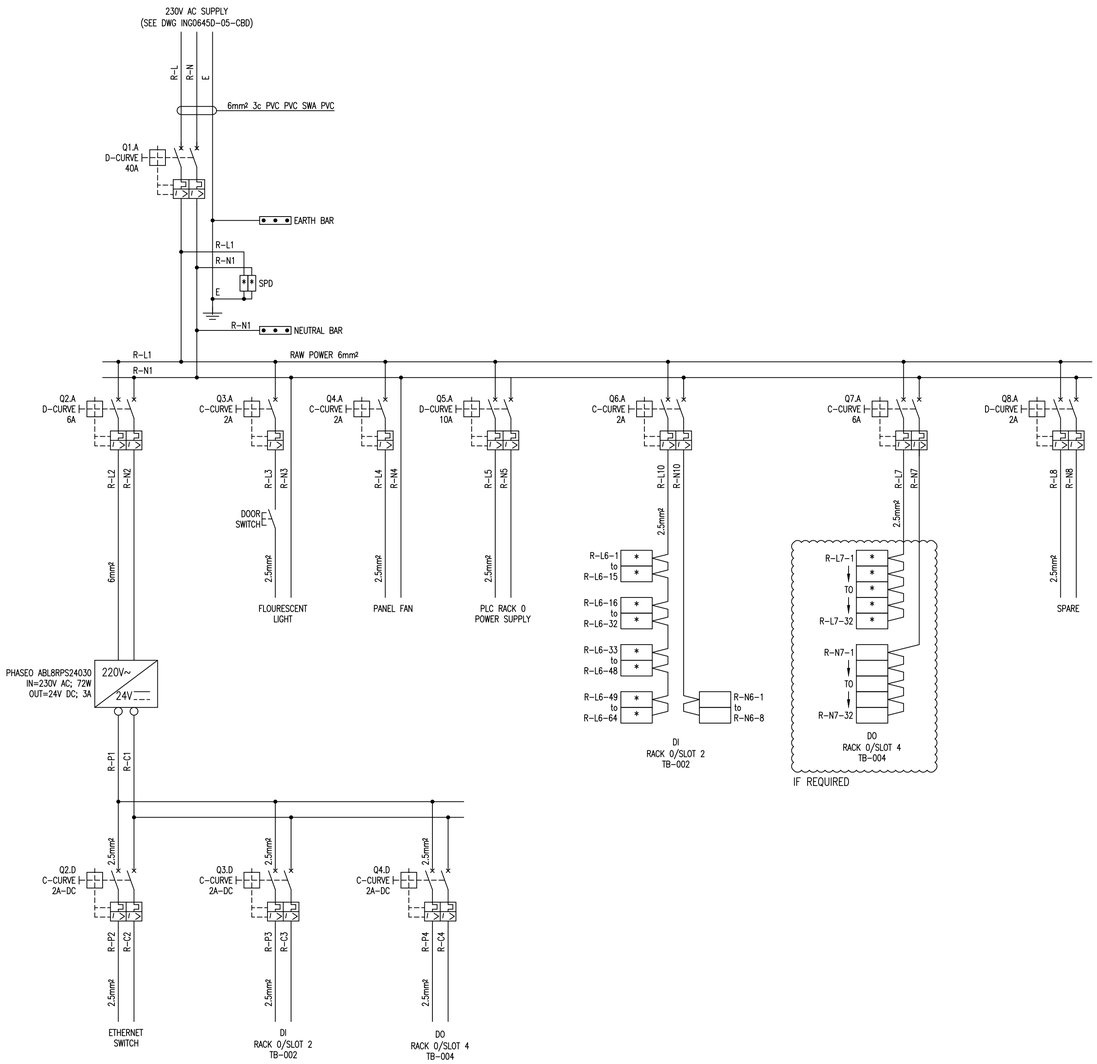
AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	30.11.18
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.

JW NUMBER
JW13898–05–CBD
CONSULTANT'S NUMBER
ING645D–05–CBD
FILE No
BWW1500
T0 T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–05 (EFF)\Cable Block Diagrams\ING0645D–05–CBD revT1.dwg May 28, 2019 – 10:56am



DATE			
DESIGNATION			
APPROVED			
DEPARTMENT			

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DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK

PLC-05

SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	C du TOIT	25.11.18

DRAWING No.

JW NUMBER

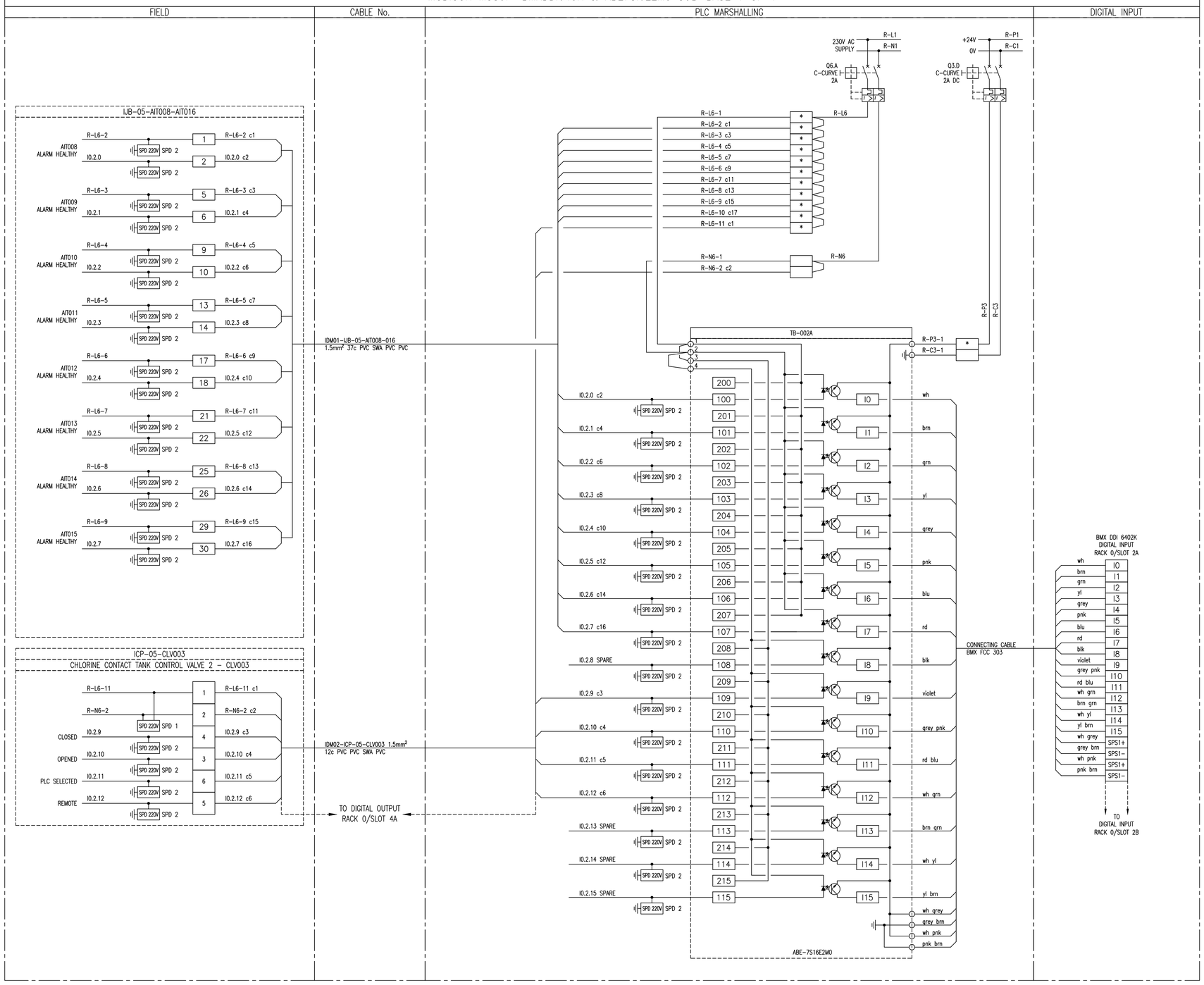
CONSULTANT'S NUMBER
ING0645D-05-SLD

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\PLC Schematic\ING0645D-05-SLD rev T0.dwg May 28, 2019 – 10:56am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
3. SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT
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5. SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT
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7. SPD 2: DEHNguard DG S 275 VA
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9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DATE | DESIGNATION | APPROVED | DEPARTMENT

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - FINAL EFFLUENT PLC-05 LOCAL RACK
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE: NTS

TO	AMENDMENTS	APPROVED	DATE
	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-R0S2A-DI

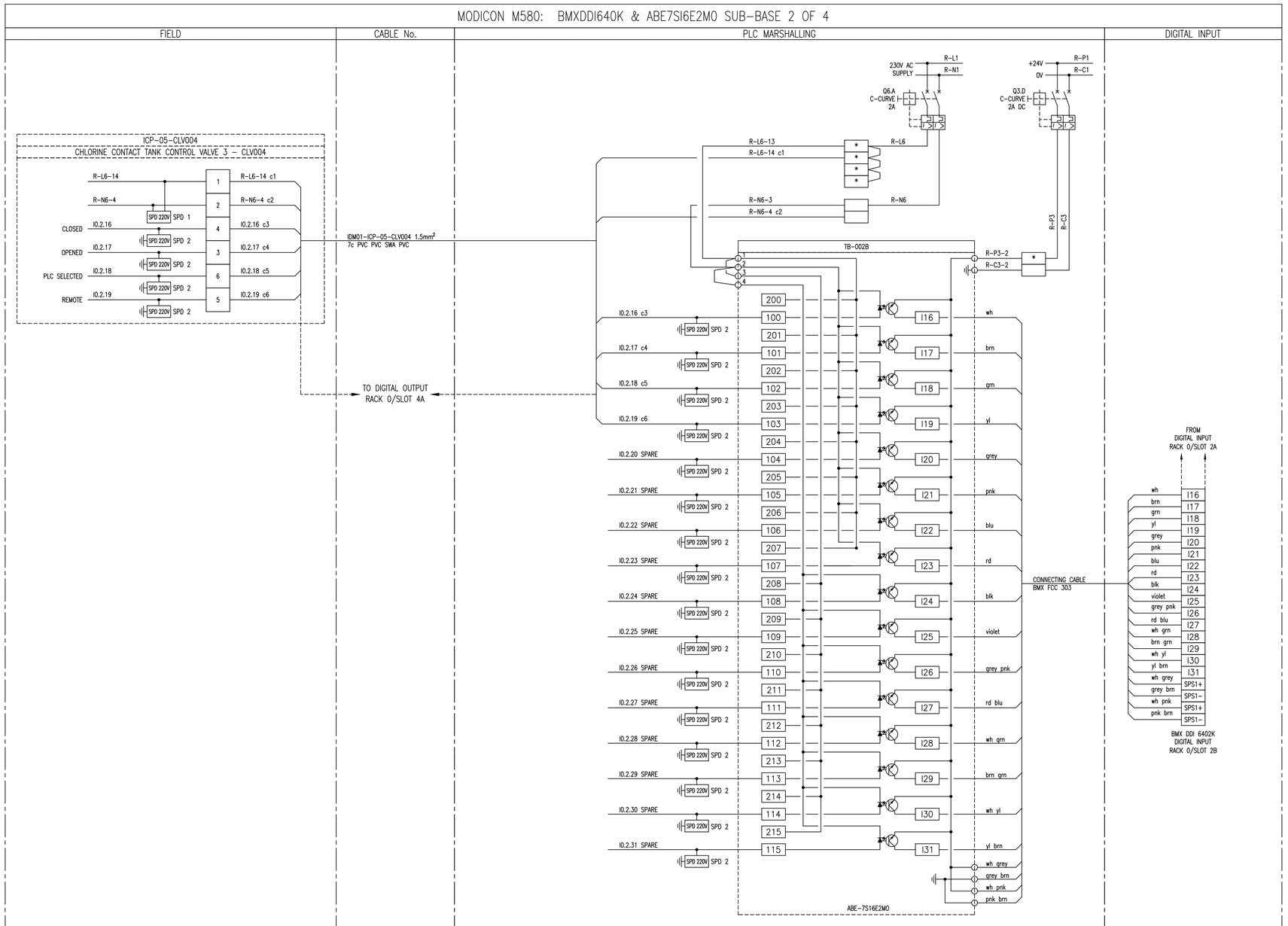
CONSULTANT'S NUMBER
ING0645D-05-R0S2A-DI

FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Wiring Diagrams\ING0645D-05-R0S2A-DI rev70.dwg May 28, 2019 - 11:34am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
3. SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT
4. SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT
5. SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT
6. SPD 1: DEHNguard DG M TN 275
7. SPD 2: DEHNguard DG S 275 VA
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9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 2: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK

DIGITAL INPUT MODULE: SUB-BASE 2 OF 4

RACK 0 / SLOT 2B

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-R0S2B-DI

CONSULTANT'S NUMBER
ING0645D-05-R0S2B-DI

FILE No
BWW 1500

T0

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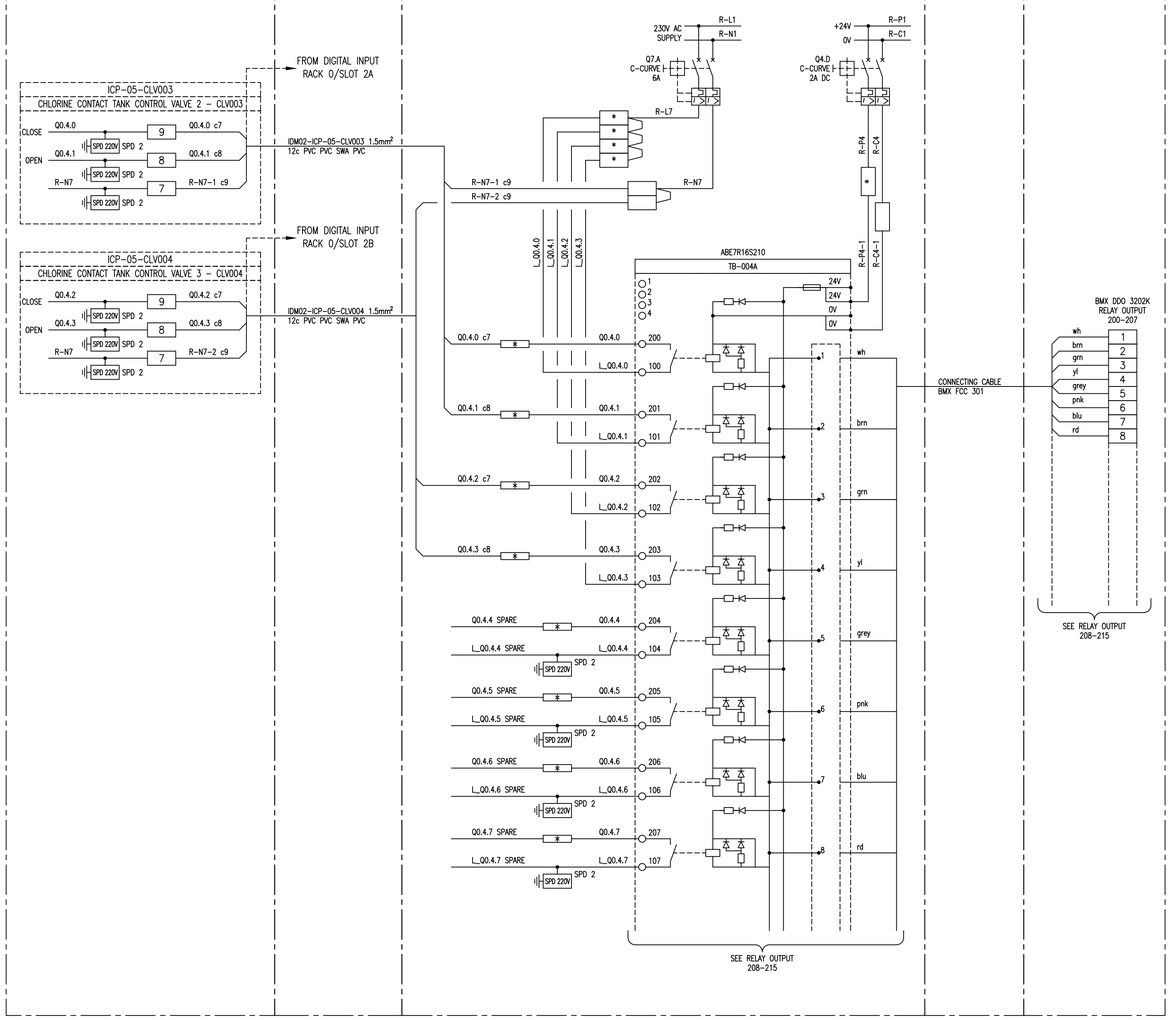
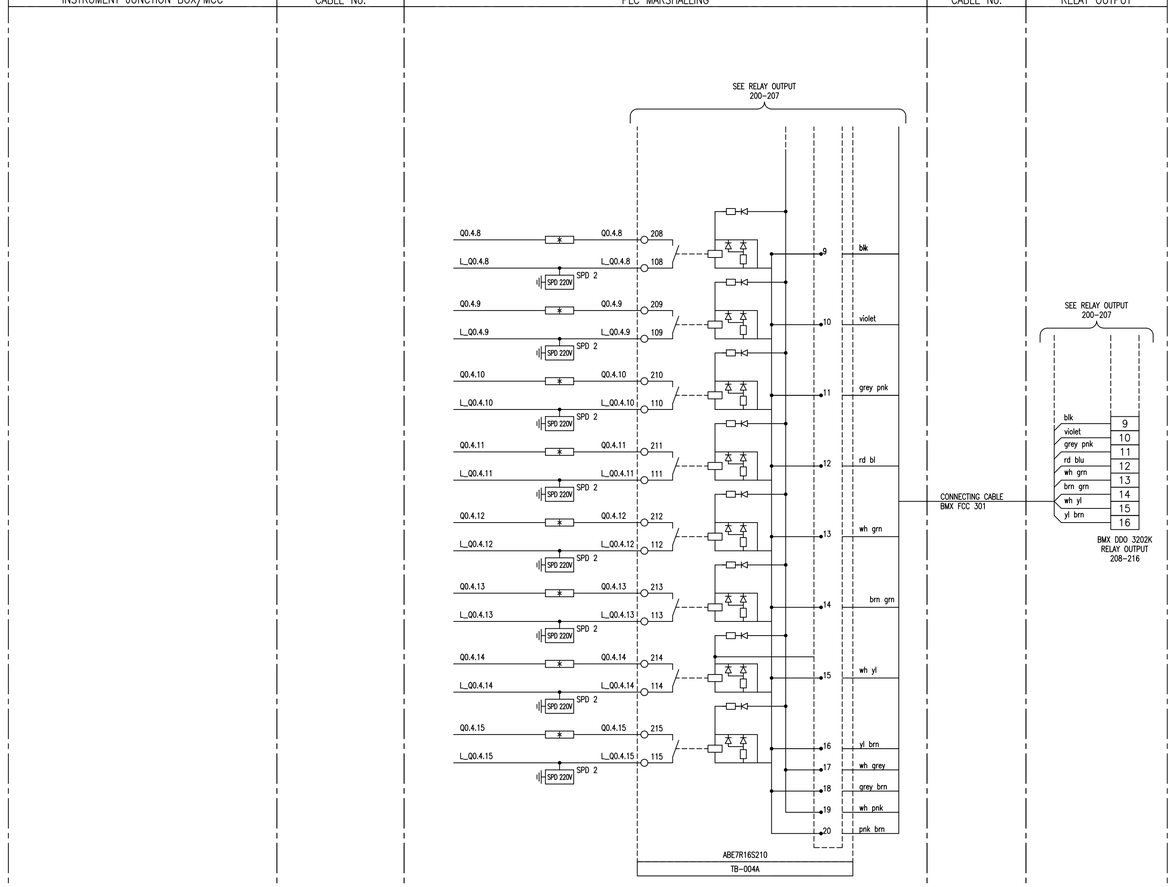
MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (200–207)



MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (208–215)



NOTES:

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9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)
LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
DIGITAL OUTPUT MODULE: SUB-BASE 1 OF 2
RACK 0 / SLOT 4A (200–215)

DESIGN MANAGER
DATE

SCALE: NTS

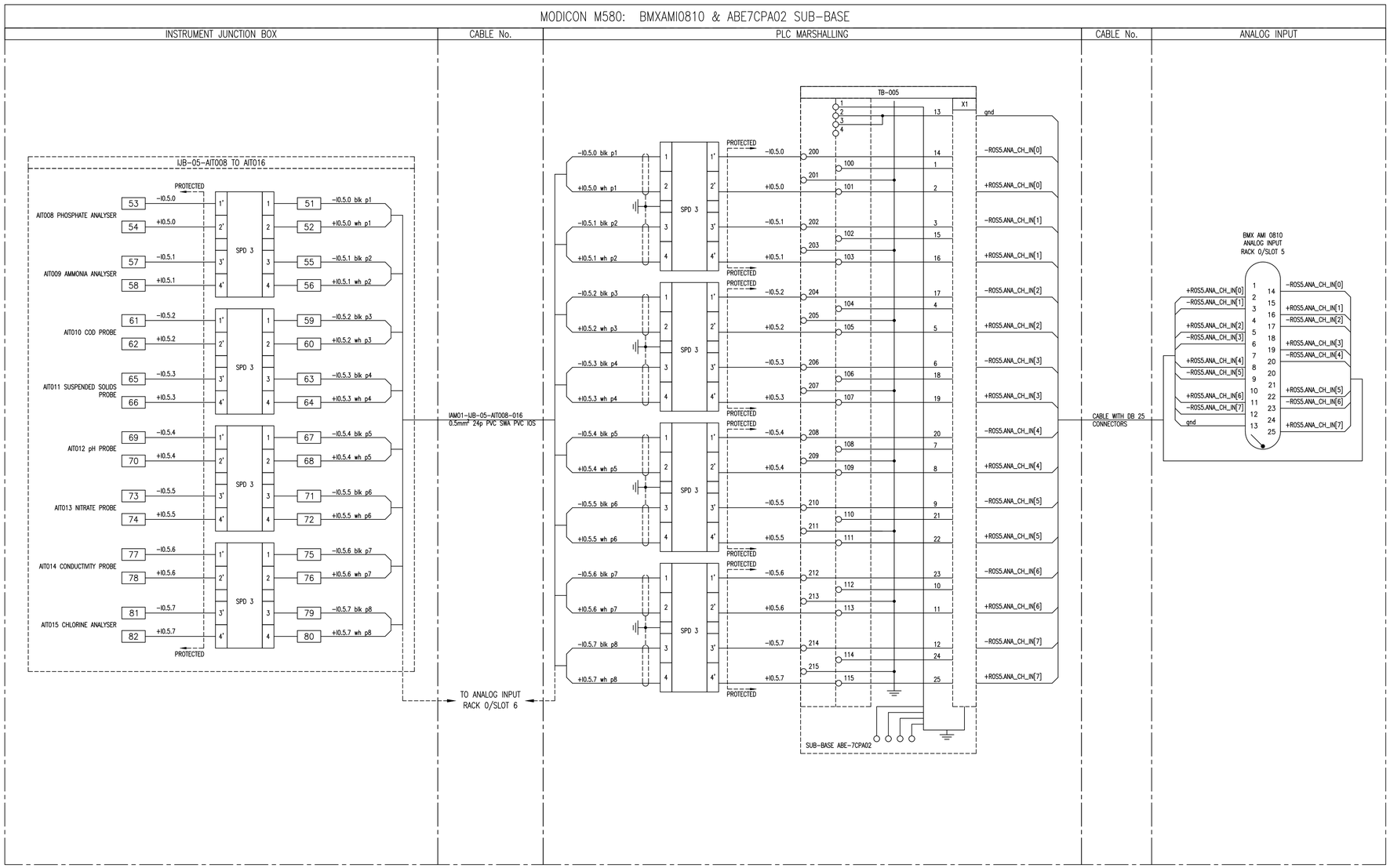
AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	22.05.19

DRAWING No.

JW NUMBER: JW13898-05-R0S4A-DO
CONSULTANT'S NUMBER: ING0645D-05-R0S4A-DO
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Wiring Diagrams\ING0645D-05-R0S4A-DO revT0.dwg May 28, 2019 – 11:35am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
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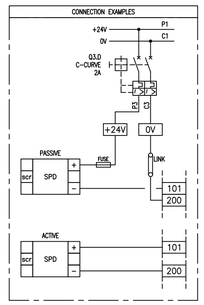
* FUSED TERMINAL (500mA)

LINK TERMINAL



DEPARTMENT	APPROVED	DESIGNATION	DATE

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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Pr. Eng. No.	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
ANALOG INPUT MODULE
RACK 0 / SLOT 5

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-R0S5-AI

CONSULTANT'S NUMBER
ING0645D-05-R0S5-AI

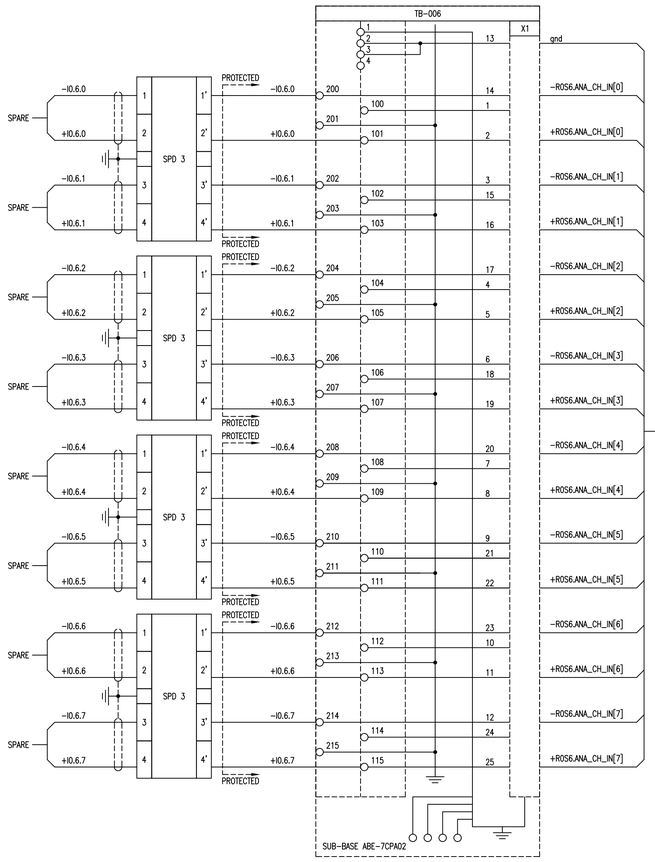
FILE No
BWW 1500

TO

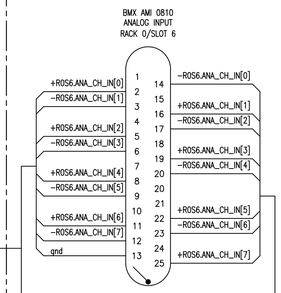
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Wiring Diagrams\ING0645D-05-R0S5-AI revT0.dwg May 28, 2019 – 11:35am

MODICON M580: BMXAMI0810 & ABE7CPA02 SUB-BASE

INSTRUMENT JUNCTION BOX	CABLE No.	PLC MARSHALLING	CABLE No.	ANALOG INPUT



CABLE WITH DB 25 CONNECTORS



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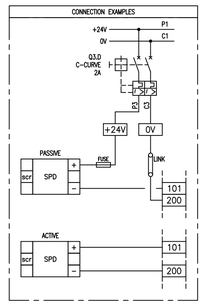
* FUSED TERMINAL (500mA)

LINK TERMINAL



DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
ANALOG INPUT MODULE
RACK 0 / SLOT 6

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

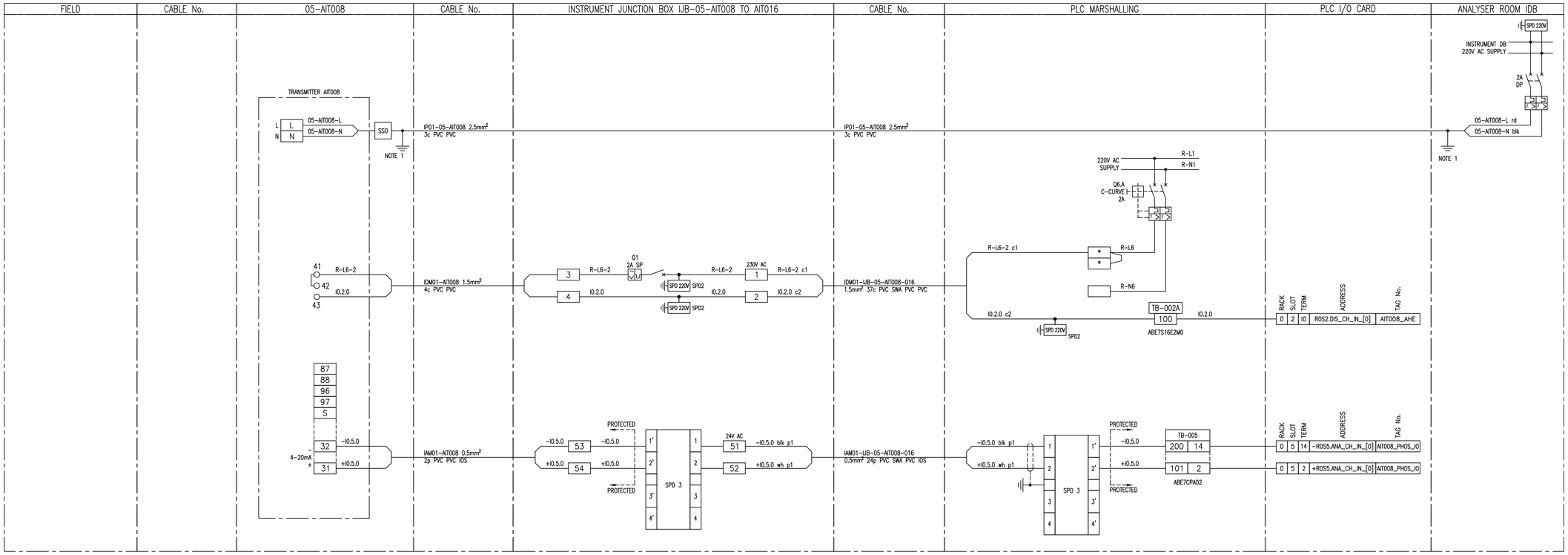
JW NUMBER
JW13898-05-R0S6-AI

CONSULTANT'S NUMBER
ING0645D-05-R0S6-AI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Wiring Diagrams\ING0645D-05-R0S6-AI rev10.dwg May 28, 2019 – 11:35am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
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JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
PHOSPATE ANALYSER – AIT008
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT008

CONSULTANT'S NUMBER
ING0645D-05-AIT008

FILE No
BWW 1500

T0

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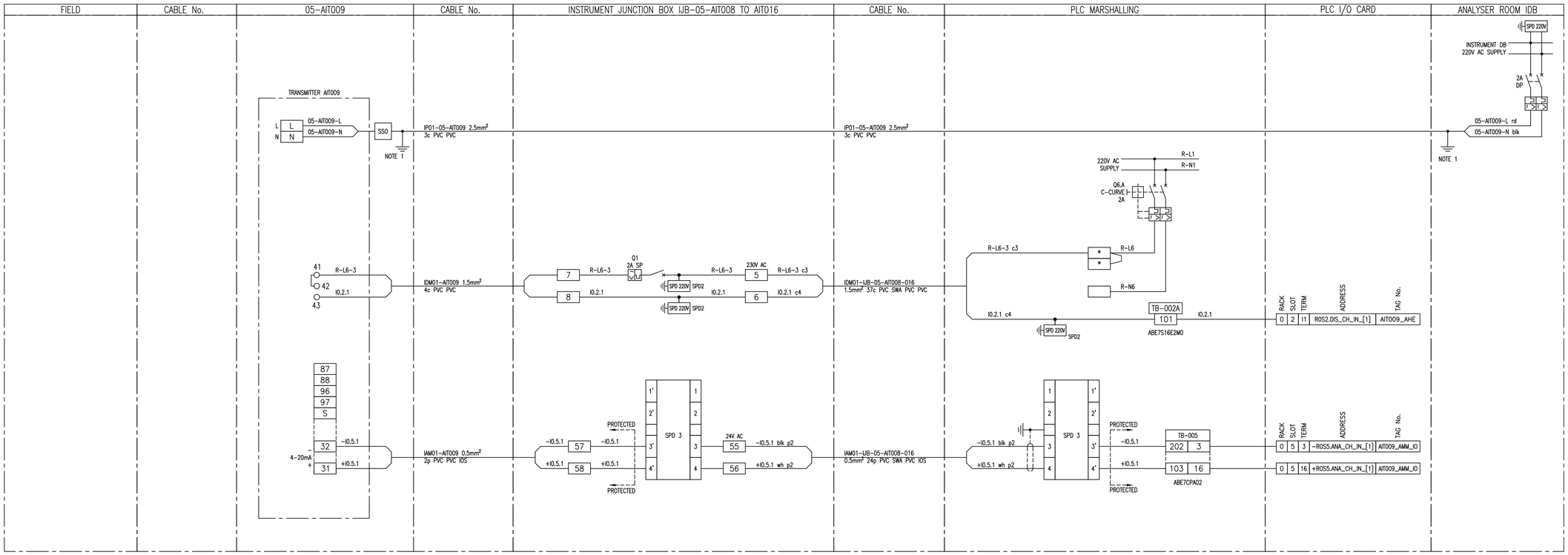

NOTES:

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SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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DRAWN	M DYKE
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
AMMONIA ANALYSER – AIT009
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT009

CONSULTANT'S NUMBER
ING0645D-05-AIT009

FILE No
BWW 1500

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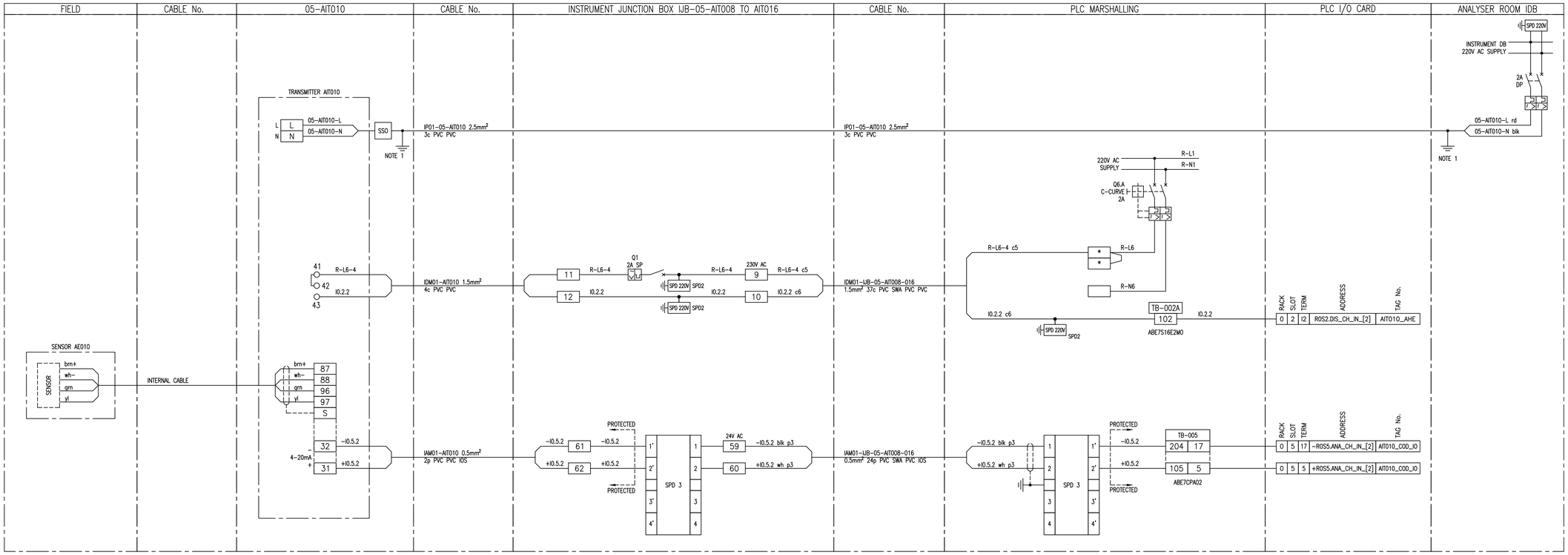

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK

COD PROBE – AIT010

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT010

CONSULTANT'S NUMBER
ING0645D-05-AIT010

FILE No
BWW 1500

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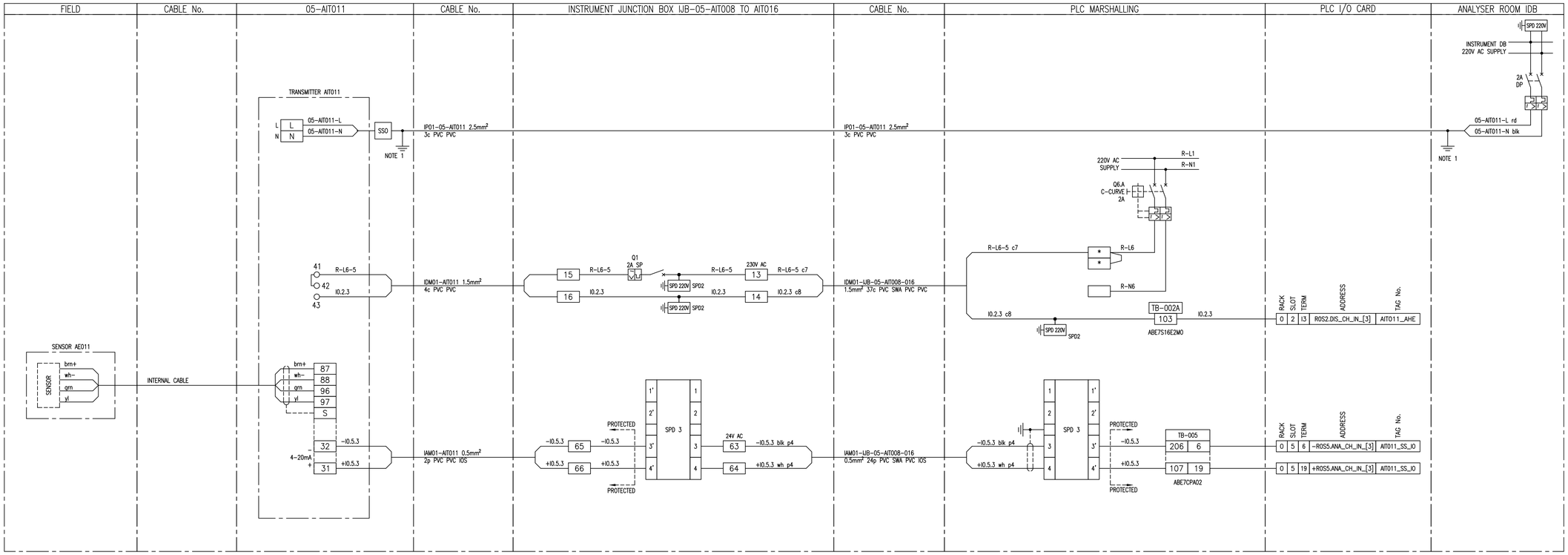

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*	FUSED TERMINAL (500mA)
	LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
SUSPENDED SOLIDS PROBE – AIT011
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT011

CONSULTANT'S NUMBER
ING0645D-05-AIT011

FILE No
BWW 1500

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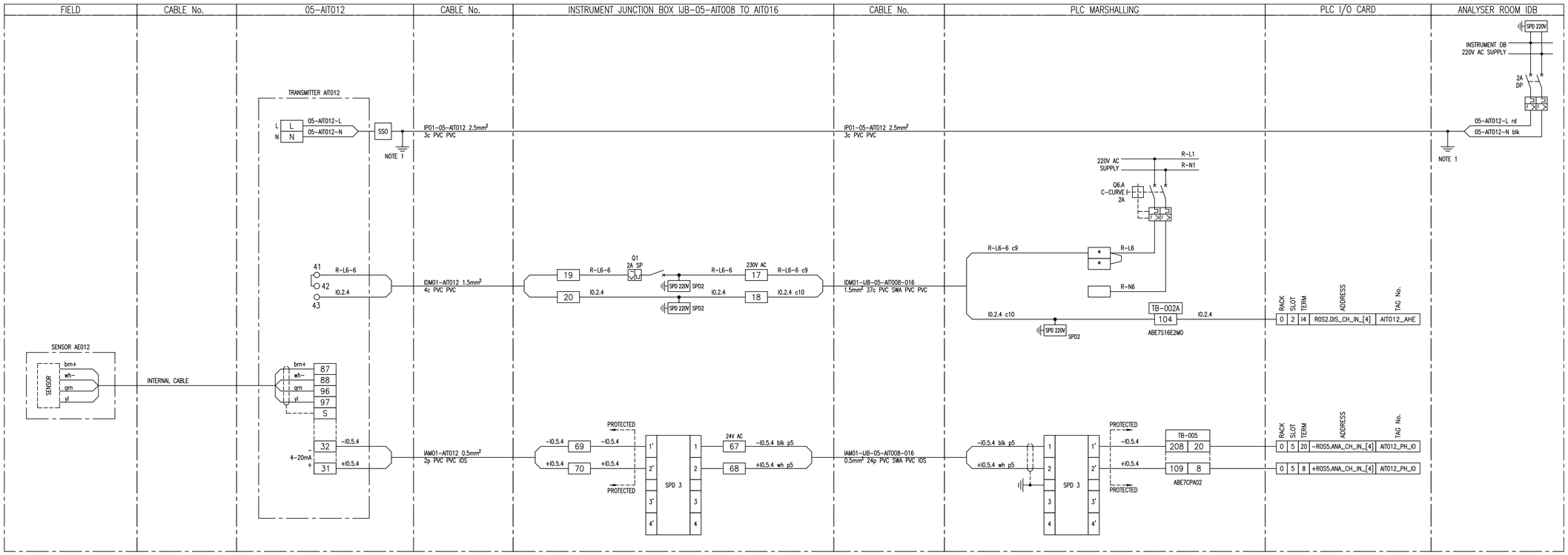

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* FUSED TERMINAL (500mA)

LINK TERMINAL

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2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
pH PROBE – AIT012
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT012

CONSULTANT'S NUMBER
ING0645D-05-AIT012

FILE No
BWW 1500

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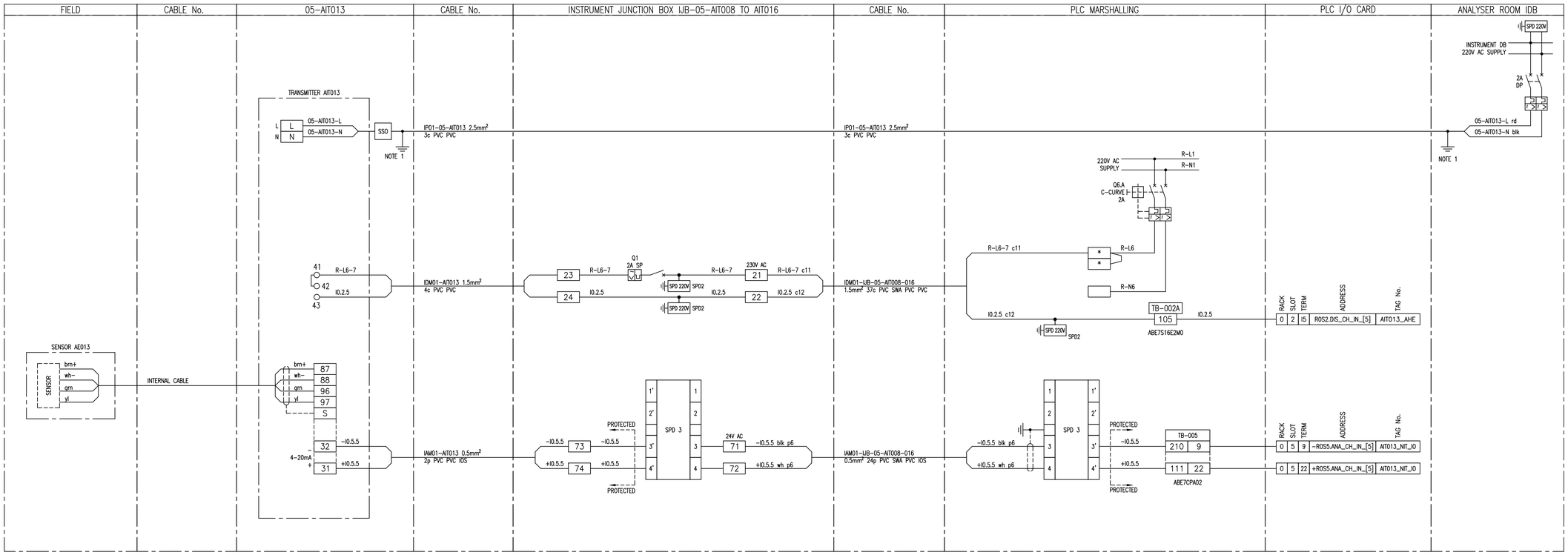

NOTES:

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SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

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SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

*	FUSED TERMINAL (500mA)
	LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
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DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
NITRATE PROBE – AIT013
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT013

CONSULTANT'S NUMBER
ING0645D-05-AIT013

FILE No
BWW 1500

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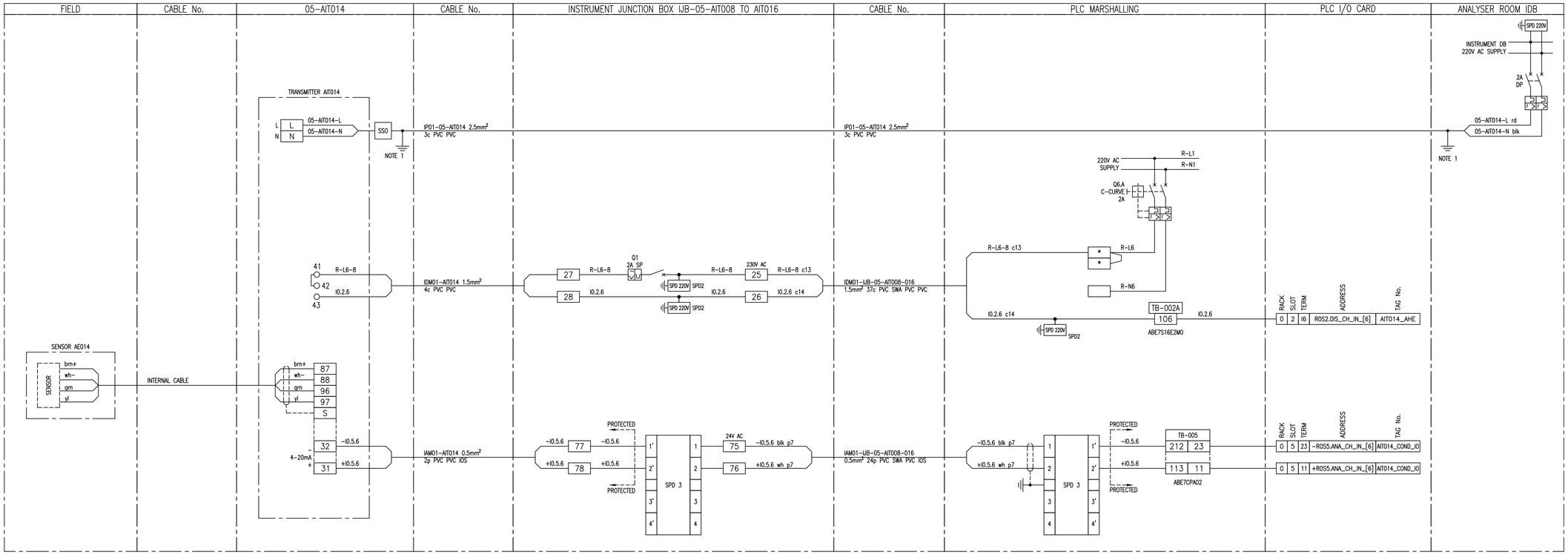

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*	FUSED TERMINAL (500mA)
	LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
CONDUCTIVITY PROBE – AIT014
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER: JW13898-05-AIT014
CONSULTANT'S NUMBER: ING0645D-05-AIT014
FILE No: BWW 1500
T0

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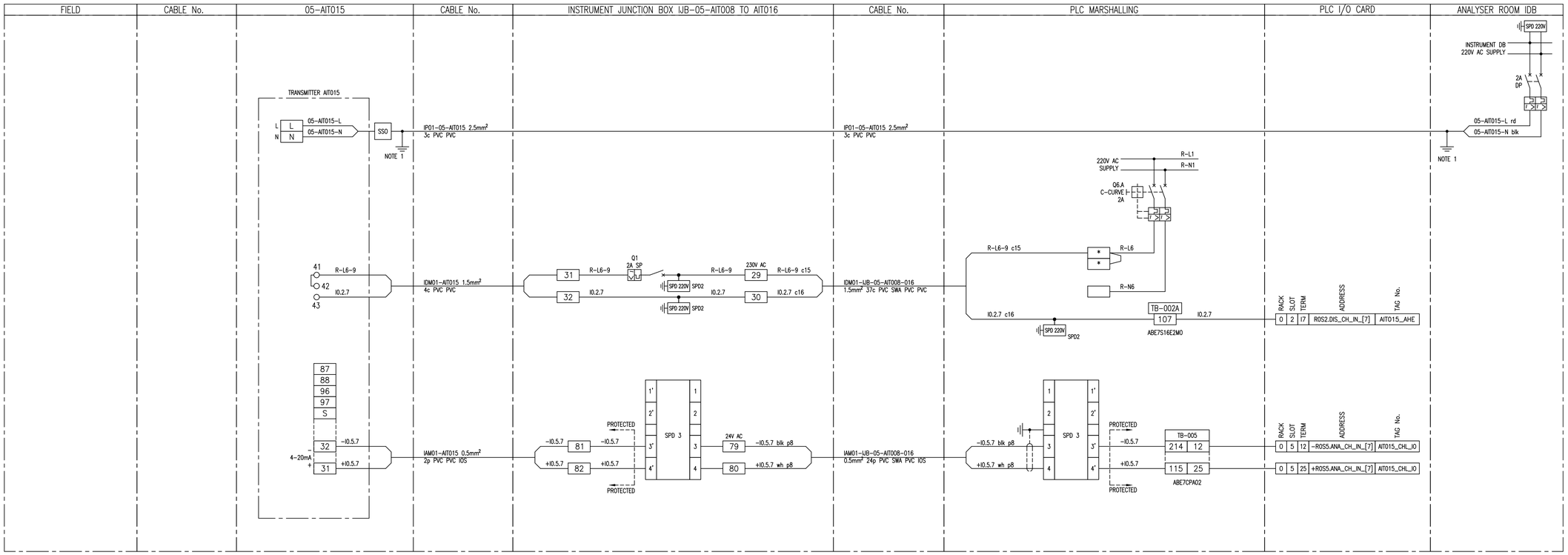

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
CHLORINE ANALYSER – AIT015
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

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T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-05-AIT015

CONSULTANT'S NUMBER
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FILE No
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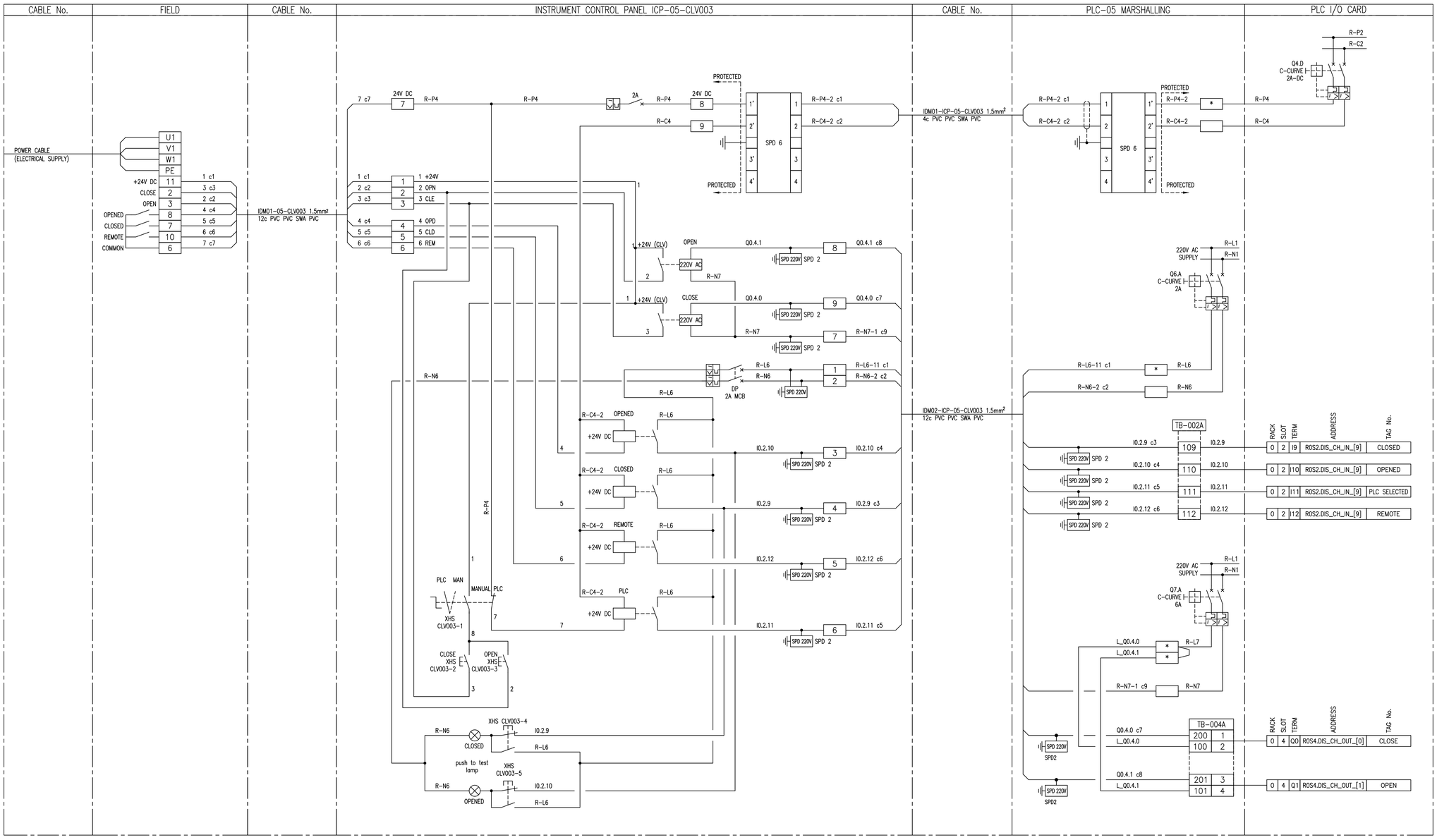

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
CHLORINE CONTACT TANK ON/OFF VALVE 2 – CLV003
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

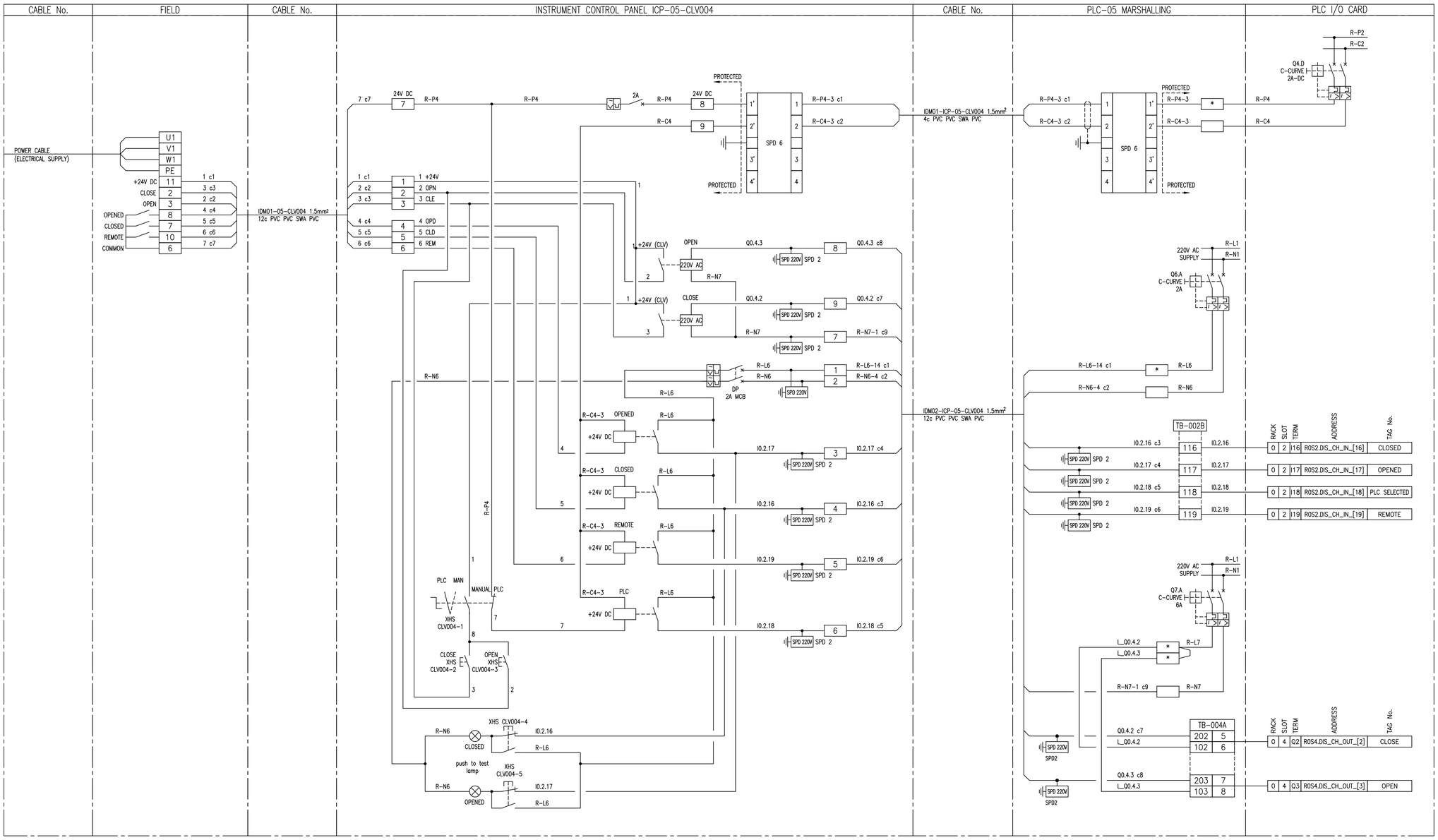
JW NUMBER
JW13898-05-CLV003

CONSULTANT'S NUMBER
ING0645D-05-CLV003

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Loops Diagrams\ING0645D-05-CLV003 revT0.dwg May 28, 2019 – 11:01am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – FINAL EFFLUENT PLC-05 LOCAL RACK
CHLORINE CONTACT TANK ON/OFF VALVE 3 – CLV004
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	APPROVED	DATE
TO ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

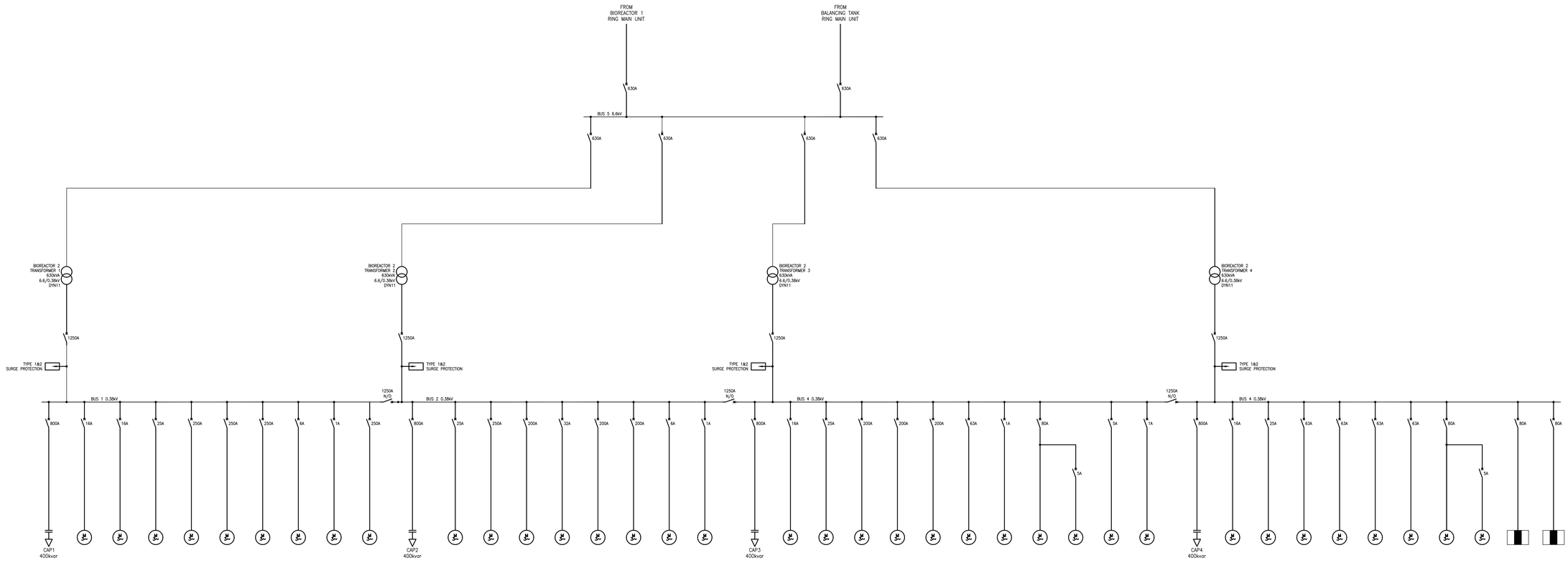
JW NUMBER
JW13898-05-CLV004

CONSULTANT'S NUMBER
ING0645D-05-CLV004

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-05 (EFF)\Loops Diagrams\ING0645D-05-CLV004 revT0.dwg May 28, 2019 – 11:02am



DRIVE NAME	MIXER 1	MIXER 5	MIXER 9	AERATOR 1	AERATOR 5	AERATOR 9	MIXED LIQUOR PUMP 1	CLARIFIER 1 BRIDGE DRIVE	AERATOR 2
EQUIP No.	5M2ME01	5M2ME05	5M2ME09	5M2ME10	5M2ME14	5M2ME18	5M2ME24	5M2ME28	5M2ME11
CB RATING (A)	16A	16A	25A	250A	250A	250A	6A	1A	250A
LOAD (kW)	7.50	7.50	11.00	110.00	110.00	110.00	3.00	0.18	110.00
TYPE	DOL	DOL	DOL	STAR-DELTA	STAR-DELTA	STAR-DELTA	DOL	DOL	STAR-DELTA
STANDBY/EMERGENCY	N	N	N	N	N	N	Y	Y	N
P&ID	JW13021R-80-026								

DRIVE NAME	MIXER 2	MIXER 6	AERATOR 6	MIXER 10	AERATOR 10	AERATOR 13	MIXED LIQUOR PUMP 2	CLARIFIER 2 BRIDGE DRIVE
EQUIP No.	5M2ME02	5M2ME06	5M2ME15	5M2ME19	5M2ME20	5M2ME23	5M2ME25	5M2ME29
CB RATING (A)	16A	25A	200A	32A	200A	200A	6A	1A
LOAD (kW)	7.50	11.00	90.00	15.00	90.00	90.00	3.00	0.18
TYPE	DOL	DOL	STAR-DELTA	DOL	STAR-DELTA	STAR-DELTA	DOL	DOL
STANDBY/EMERGENCY	N	N	N	N	N	N	Y	Y
P&ID	JW13021R-80-026							

DRIVE NAME	MIXER 3	MIXER 7	AERATOR 3	AERATOR 7	AERATOR 11	MIXED LIQUOR PUMP 3	CLARIFIER 3 BRIDGE DRIVE	SCREW PUMP 1	SCREW 1 GREASE PUMP	EFFLUENT SAMPLE PUMP 1	CHEMICAL DOSING PUMP 3
EQUIP No.	5M2ME03	5M2ME07	5M2ME12	5M2ME16	5M2ME21	5M2ME26	5M2ME30	5M3ME31	5M2ME35	5M2ME34	5M1ME40
CB RATING (A)	16A	25A	200A	200A	200A	63A	1A	80A	5A	5A	1A
LOAD (kW)	7.50	11.00	90.00	90.00	90.00	30.00	0.18	37.00	1.00	1.50	0.35
TYPE	DOL	DOL	STAR-DELTA	STAR-DELTA	STAR-DELTA	DOL	DOL	DOL	DOL	DOL	VSD
STANDBY/EMERGENCY	N	N	N	N	N	Y	Y	Y	Y	N	Y
P&ID	JW13021R-80-026										JW13021R-80-027

DRIVE NAME	MIXER 4	MIXER 8	AERATOR 4	AERATOR 8	AERATOR 12	MIXED LIQUOR PUMP 4	SCREW PUMP 2	SCREW 2 GREASE PUMP	INSTRUMENT DB	SMALL POWER AND LIGHTING DB
EQUIP No.	5M2ME04	5M2ME08	5M2ME13	5M2ME17	5M2ME22	5M2ME27	5M2ME32	5M2ME36		
CB RATING (A)	16A	25A	63A	63A	63A	63A	80A	5A	80A	80A
LOAD (kW)	7.50	11.00	30.00	30.00	30.00	30.00	37.00	1.00	50.00	50.00
TYPE	DOL	STAR-DELTA	DOL	DOL	DOL	DOL	DOL	DOL	FEEDER	FEEDER
STANDBY/EMERGENCY	N	N	N	N	N	Y	Y	Y	Y	N
P&ID	JW13021R-80-026									

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	BM
DRAWN	MD
CHECKED	BM
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
5E2-MCC-01 AND 5E2-MCC02
SINGLE LINE DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	BM	28.09.18
T1	FOR TENDER	SN	05.02.25

DRAWING No.

JW NUMBER
JW13021R-5E2-SM01
CONSULTANT'S NUMBER
INC0645D-5E2-SM01
FILE No
BWW
T0

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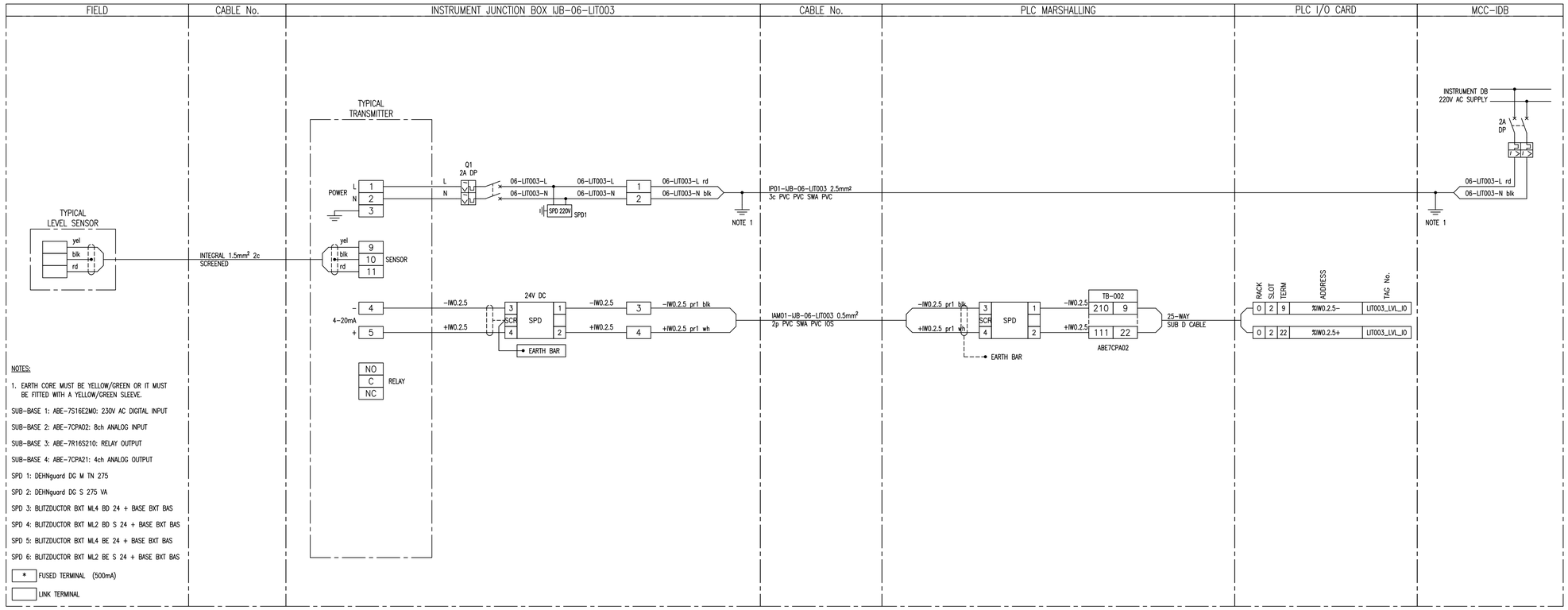

NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – HYPOCHLORITE PLC-06

CHEMICAL DOSING TANK LEVEL

LIT003

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-06-LIT003

CONSULTANT'S NUMBER
ING0645D-06-LIT003

FILE No
BWW 1300

T0

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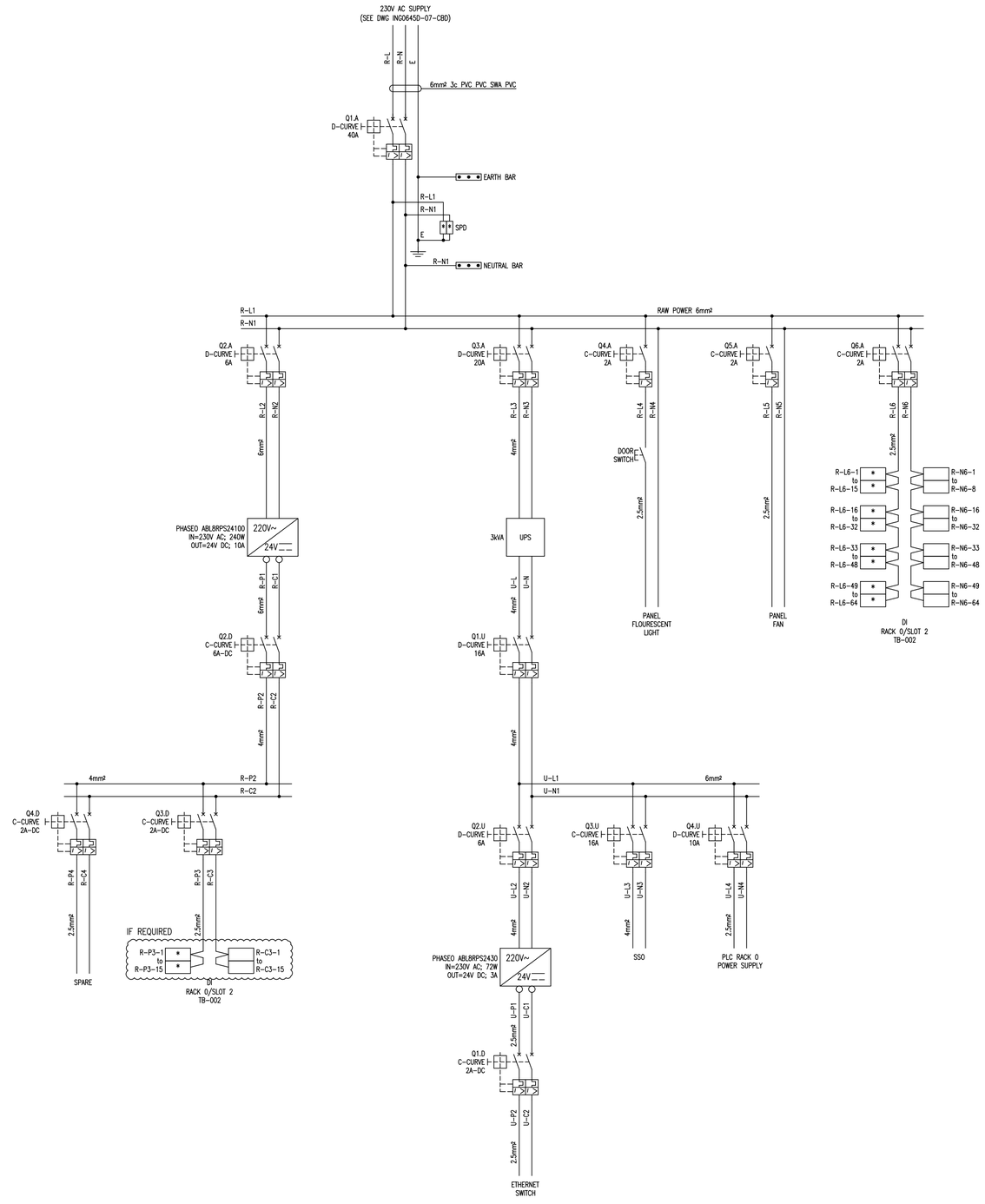

DEPARTMENT			
APPROVED			
DESIGNATION			
DATE			

CONSULTING ENGINEERS

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DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – MAIN INTAKE SUB
PLC-07
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	C du TOIT	10.01.19

DRAWING No.

JW NUMBER
JW13898-07-SLD

CONSULTANT'S NUMBER
ING0645D-07-SLD

FILE No
BWW 1500

T0

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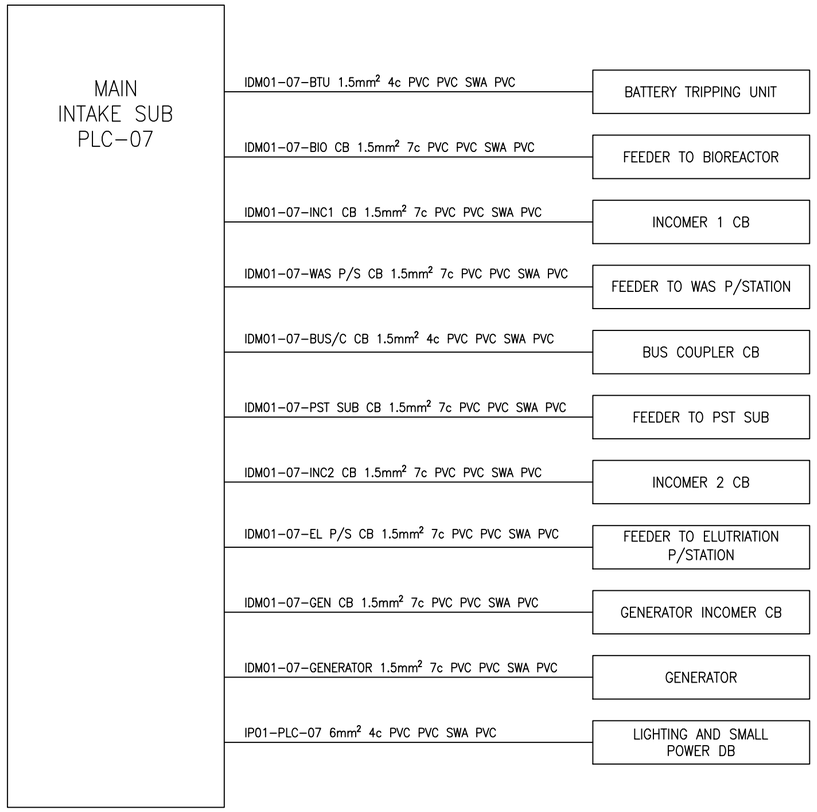

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVITUDES	
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Pr. Eng. No.	
DATE	

CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT PLANT

UNIT 5 – PHASE 2

UNIT 5 MAIN INTAKE SUB

PLC-07

CABLE BLOCK DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

	AMENDMENTS	APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	30.11.18

DRAWING No.

JW NUMBER
JW13898-07-CBD

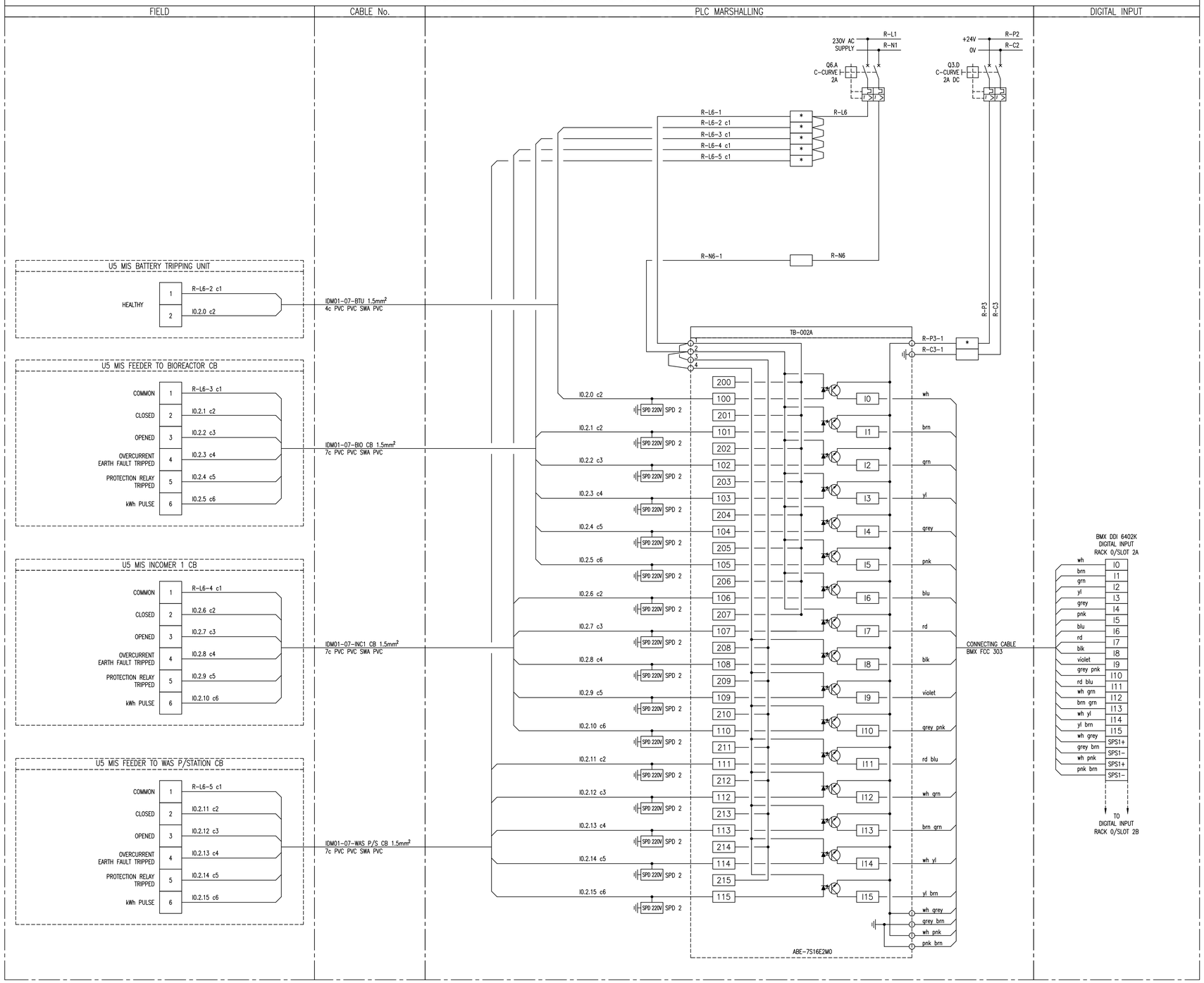
CONSULTANT'S NUMBER
ING645D-07-CBD

FILE No
BWW1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-07 (MAIN INTAKE SUB)\Cable Block Diagram\ING0645D-07-CBD revT0.dwg May 30, 2019 – 2:08pm

MODICON M580: BMXDDI6402K & ABE7SI6E2M0 SUB-BASE 1 OF 4



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
3. SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT
4. SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT
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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DATE			
DESIGNATION			
APPROVED			
DEPARTMENT			

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DRAWN	M DYKE
CHECKED	W BRITZ
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – MAIN INTAKE SUB PLC-07
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

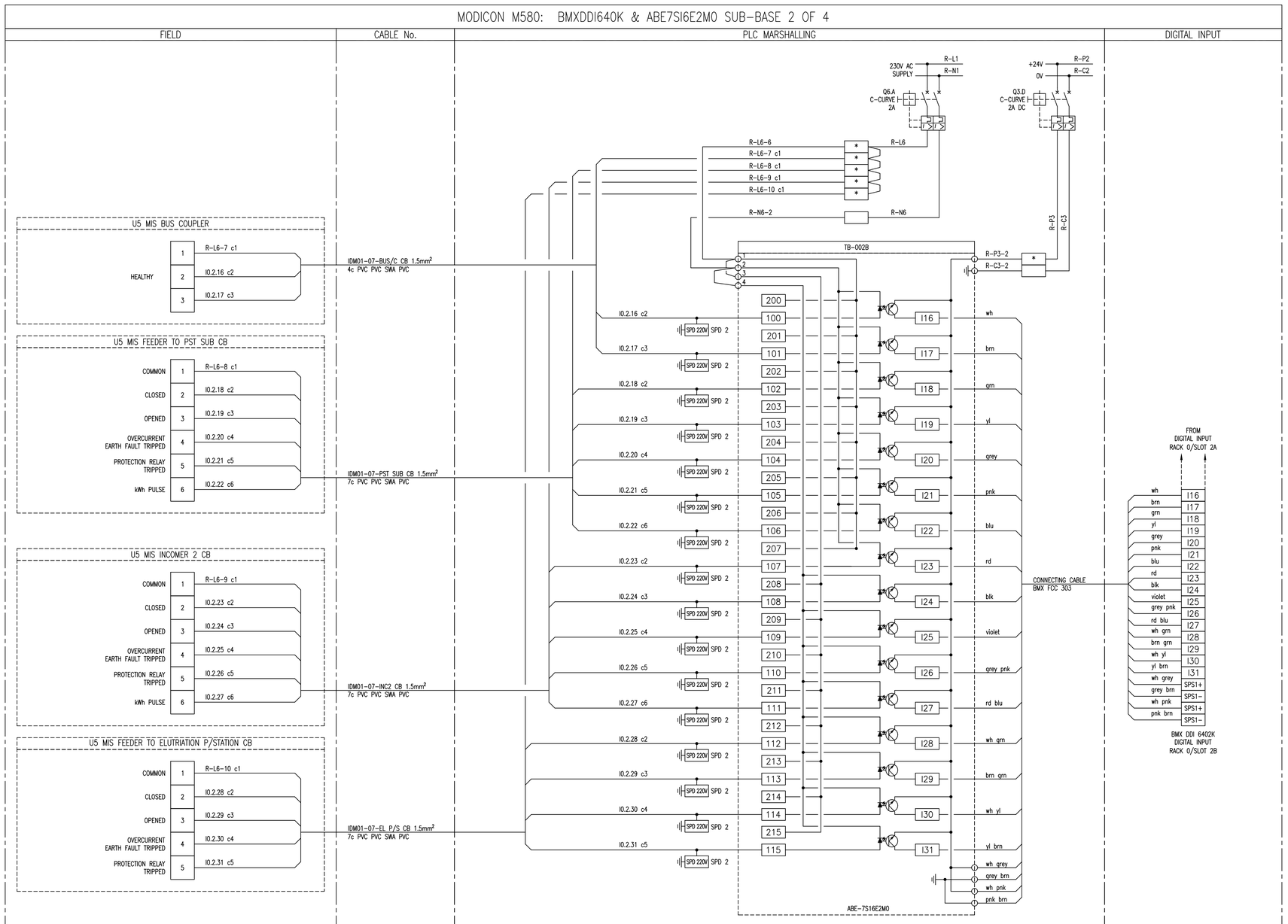
	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	30.11.18

DRAWING No.

JW NUMBER: JW13898-07-R0S2A-DI
CONSULTANT'S NUMBER: ING0645D-07-R0S2A-DI
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-07 (MAIN INTAKE SUB)\Wiring Diagrams\ING0645D-07-R0S2A-DI revTO.dwg May 30, 2019 – 1:38pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
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11. SPD 2: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – MAIN INTAKE SUB PLC-07

DIGITAL INPUT MODULE: SUB-BASE 2 OF 4

RACK 0 / SLOT 2B

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	30.11.18

DRAWING No.

JW NUMBER
JW13898-07-R0S2B-DI

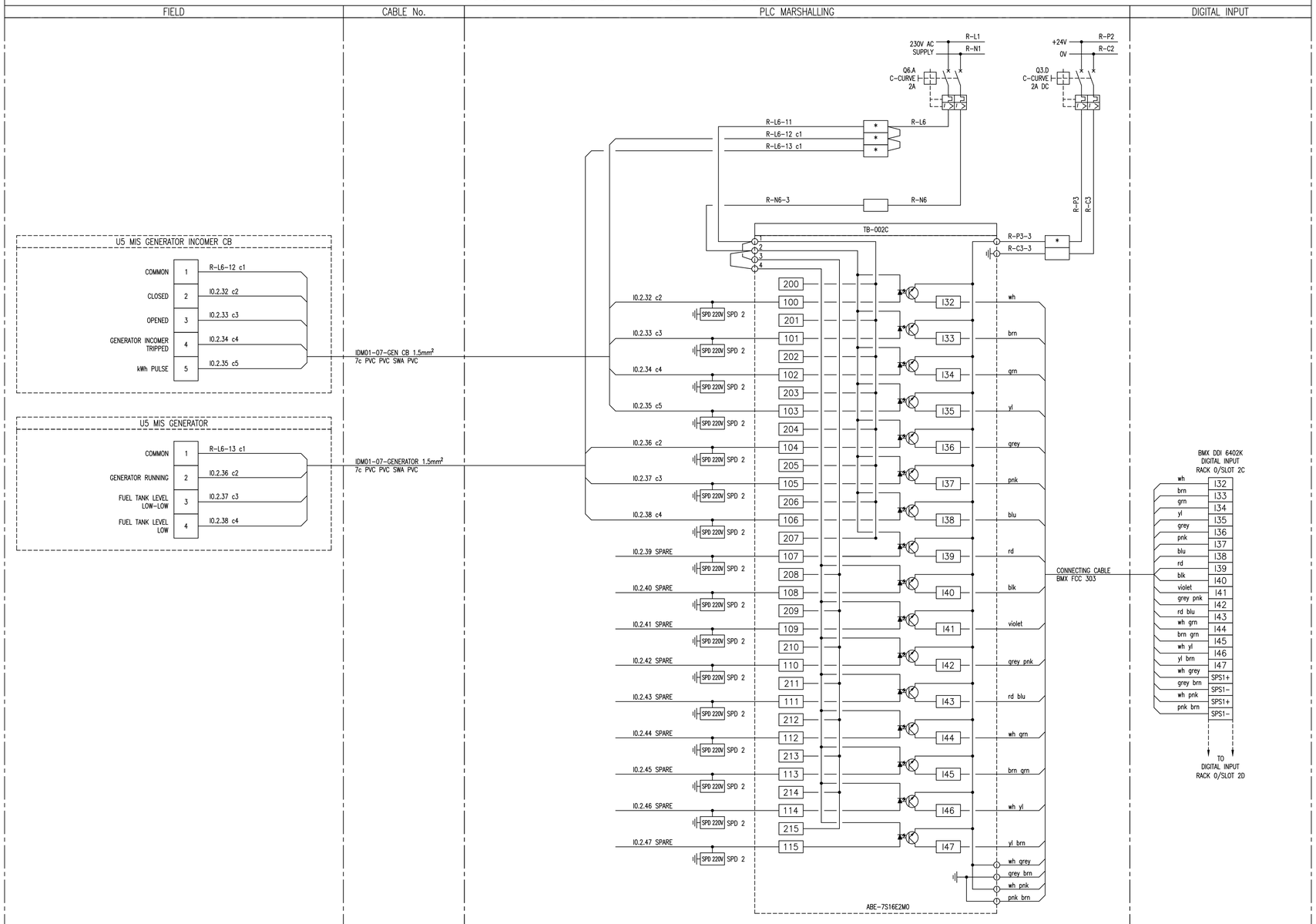
CONSULTANT'S NUMBER
ING0645D-07-R0S2B-DI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-07 (MAIN INTAKE SUB)\Wiring Diagrams\ING0645D-07-R0S2B-DI rev T0.dwg May 30, 2019 – 1:38pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



NOTES:

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5. SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT
6. SPD 1: DEHNguard DG M TN 275
7. SPD 2: DEHNguard DG S 275 VA
8. SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS
9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 2: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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P.O. BOX 221
RIVONIA
2128
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EMAIL enquiries@kprsa.co.za

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33 Sloane Street, Bryanston, 2191
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – MAIN INTAKE SUB PLC-07
DIGITAL INPUT MODULE: SUB-BASE 3 OF 4
RACK 0 / SLOT 2C

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	30.11.18

DRAWING No.

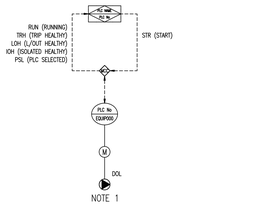
JW NUMBER
JW13898-07-R0S2C-DI

CONSULTANT'S NUMBER
ING0645D-07-R0S2C-DI

FILE No
BWW 1500

T0

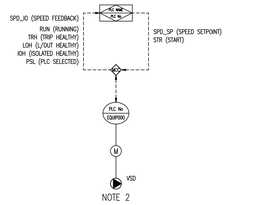
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-07 (MAIN INTAKE SUB)\Wiring Diagrams\ING0645D-07-R0S2C-DI rev T0.dwg May 30, 2019 – 1:38pm



NOTE 1

DOL DRIVE	
SIGNALS	
DI	DO
RUN (RUNNING) TRH (TRIP HEALTHY) LOH (L/OUT HEALTHY) IOH (ISOLATED HEALTHY) PSL (PLC SELECTED)	STR (START)

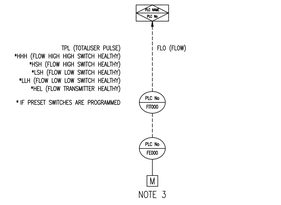
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 2

VSD DRIVE			
SIGNALS			
DI	DO	AI	AO
RUN (RUNNING) TRH (TRIP HEALTHY) LOH (L/OUT HEALTHY) IOH (ISOLATED HEALTHY) PSL (PLC SELECTED)	STR (START)	SPD_IO (SPEED FEEDBACK)	SPD_SP (SPEED SETPOINT)

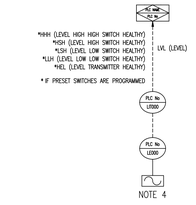
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 3

FLOW SENSOR						
M MAG FLOW	ULTRASONIC (eg CLAMP-ON)	VENTURI	WEIR	ORIFICE PLATE	FLUME	
E PITOT TUBE	SIGNALS					
DI				AI		
TPL (TOTALISER PULSE) HHH (FLOW HIGH HIGH SWITCH HEALTHY) HSH (FLOW HIGH SWITCH HEALTHY) LSH (FLOW LOW SWITCH HEALTHY) LLH (FLOW LOW LOW SWITCH HEALTHY) HEL (FLOW TRANSMITTER HEALTHY)				FLO (FLOW)		

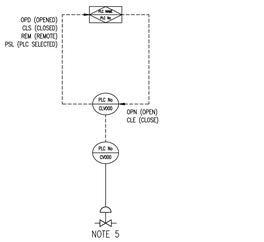
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 4

ULTRASONIC LEVEL SENSOR	
SIGNALS	
DI	AI
HHH (LEVEL HIGH HIGH SWITCH HEALTHY) HSH (LEVEL HIGH SWITCH HEALTHY) LSH (LEVEL LOW SWITCH HEALTHY) LLH (LEVEL LOW LOW SWITCH HEALTHY) HEL (LEVEL TRANSMITTER HEALTHY)	LVL (LEVEL)

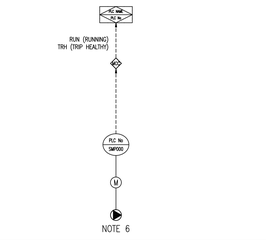
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 5

ON/OFF MOTORISED VALVE	
SIGNALS	
DI	DO
OPD (OPENED) CLS (CLOSED) REM (REMOTE) PSL (PLC SELECTED)	OPN (OPEN) CLE (CLOSE)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 6

SUMP PUMPS AND VENTILATION FANS
SIGNALS
DI
RUN (RUNNING) TRH (TRIP HEALTHY)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
CONTROL AND INSTRUMENTATION
LEGEND SHEET

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	W BRITZ	20.05.19

DRAWING No.

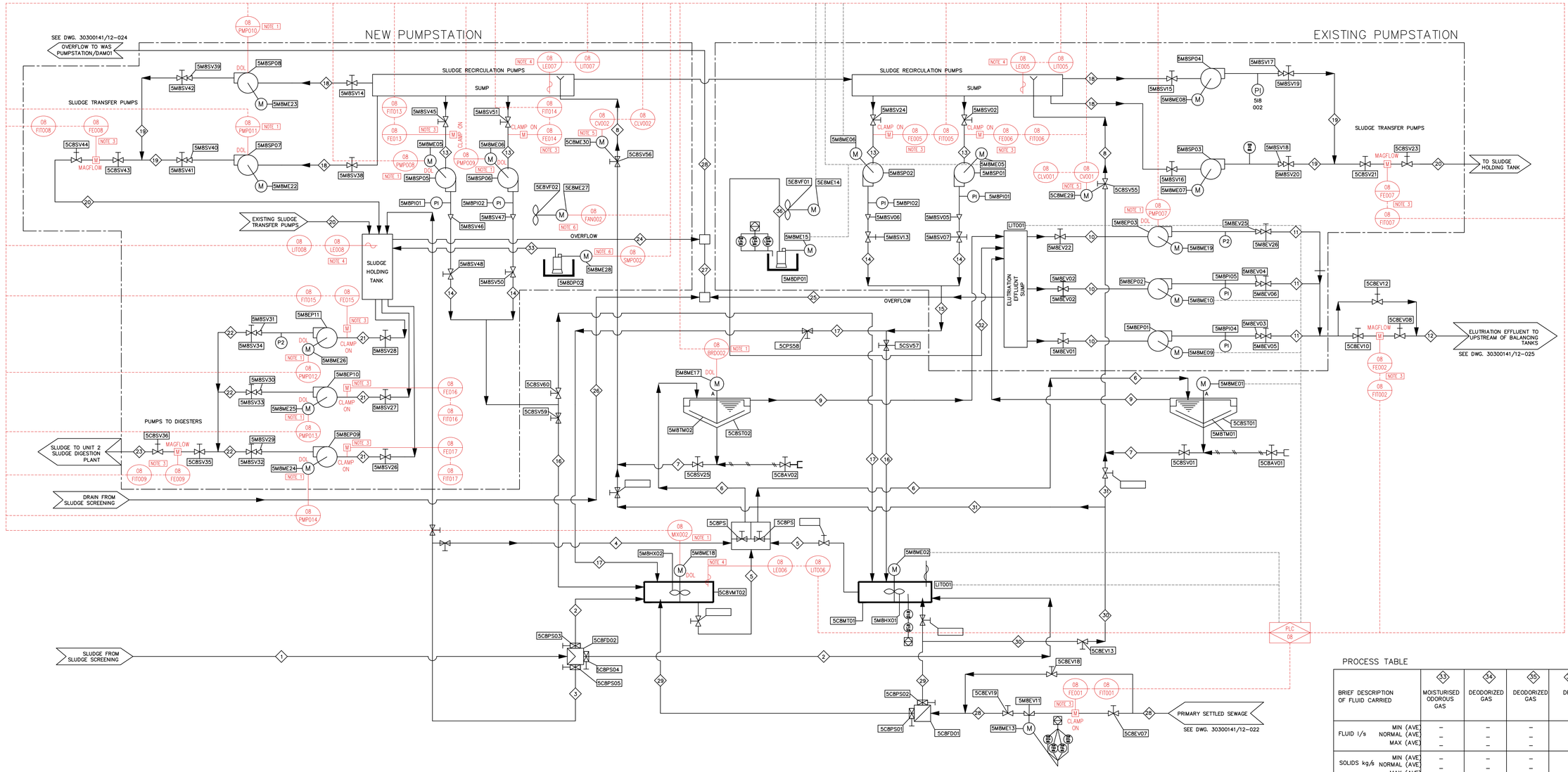
JW NUMBER
JW13898-08-P&ID-LEGEND
CONSULTANT'S NUMBER
ING0645D-08-P&ID-LEGEND
FILE No
BWW1500
T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-08-P&ID-LEGEND rev11.dwg Oct 17, 2024 – 2:26pm

ELECTRIC, CONTROL & INSTRUMENTATION

FLOW SENSORS (FE)			
TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
FE001	FIT001	CLAMP ON	SLUDGE FROM PSTS FLOW
FE002	FIT002	CLAMP ON	ELUTRIANT SUMP 1 PUMP FLOW
FE005	FIT005	CLAMP ON	RECYCLE SUMP 1 PUMP1 FLOW
FE006	FIT006	CLAMP ON	RECYCLE SUMP 1 PUMP2 FLOW
FE007	FIT007	CLAMP ON	REC SUMP1 TRANSFER PUMPS FLOW
FE008	FIT008	CLAMP ON	TRANSFER PUMPS FLOW
FE009	FIT009	CLAMP ON	WASTING PUMPS FLOW
FE010	FIT010	CLAMP ON	ODOUR CONTROL RECIRCULATION FLOW
FE011	FIT011	CLAMP ON	ODOUR CONTROL EFFLUENT FLOW
FE012	FIT012	CLAMP ON	ODOUR CONTROL DRAIN FLOW
FE013	FIT013	CLAMP ON	RECIRCULATION SUMP2 PUMP1 FLOW
FE014	FIT014	CLAMP ON	RECIRCULATION SUMP2 PUMP2 FLOW
FE015	FIT015	CLAMP ON	WASTING PUMP1 FLOW
FE016	FIT016	CLAMP ON	WASTING PUMP2 FLOW
FE017	FIT017	CLAMP ON	WASTING PUMP3 FLOW

LEVEL SENSORS (LE)			
TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
LE005	LIT005	ULTRASONIC	RECIRCULATION SUMP1 LEVEL
LE006	LIT006		MIXING TANK 2 LEVEL
LE007	LIT007		RECIRCULATION SUMP2 LEVEL
LE008	LIT008		SLUDGE HOLDING TANK LEVEL
LE009	LIT009		ODOUR CONTROL EFFLUENT TANK LEVEL



PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		1 PRIMARY SLUDGE	2 PRIMARY SLUDGE	3 EFFLUENT FROM PRESS	4 SCREENED PRIMARY SLUDGE	5 SCREENINGS	6 SCREENED SLUDGE	7 SCREENED PRIMARY SLUDGE	8 ELUTRIATION WATER	9 DILUTE SLUDGE	10 THICKENED SLUDGE	11 ELUTRIATION EFFLUENT	12 THICKENED SLUDGE	13 THICKENED SLUDGE	14 THICKENED SLUDGE	15 ELUTRIATION EFFLUENT	16 ELUTRIATION EFFLUENT	17 ELUTRIATION EFFLUENT	18 PRIMARY SETTLED SEWAGE	19 ELUTRIATION WATER UNDERFLOW DILUTION	20 THICKENED SLUDGE	21 ELUTRIATION SLUDGE DISCHARGE	22 SLUDGE TO TREATMENT	23 SLUDGE TO TREATMENT	24 SCREENINGS	25 DEWATERED SCREENINGS	26 COMBINED OVERFLOW	27 SCREEN AREA DRAIN	28 OVER FLOW	29 ODOROUS GAS	30 ODOROUS GAS	31 ODOROUS GAS
FLUID l/s	MIN (AVE.)	0(0)	0(0)	–	–	–	0	0	0	15	15	76	0	0	0	–	–	–	–	0	–	–	–	–	–	0	–	–	–	–	–
	NORMAL (AVE.)	35(5,80)	18(2,9)	–	18	–	35	35	70	140	15	82	60	60	120	80	80	160	70	30	60	20	20	–	–	–	0	–	–	–	–	–
	MAX (AVE.)	70(17,4)	35(8,7)	1,0	35	–	70	70	140	140	45	105	60	60	120	80	80	160	140	30	120	20	20	–	–	–	120	–	–	–	–	–
SOLIDS kg/s	MIN (AVE.)	0(0)	0(0)	–	0	0,02(0,04)l/s	–	–	–	1,4	1,4	–	–	–	1,4	–	–	–	–	–	1,4	0,029	–	–	0,06(0,012)/s	(0,005)l/s	–	–	–	–	–	–
	NORMAL (AVE.)	0,35(0,05)	0,2(0,3)	–	0,2(0,03)	0,04(0,08)l/s	–	–	–	1,4	1,4	–	–	–	1,4	–	–	–	–	–	1,4	0(0,029)	–	–	0,12(0,023)l/s	(0,009)l/s	–	–	–	–	–	–
	MAX (AVE.)	0,7(0,174)	0,4(0,08)	–	1,0(008)	0,06(0,011)l/s	–	–	–	2,1	2,1	–	–	–	2,1	–	–	–	–	–	2,1	1(0,029)	–	–	0,18(0,035)l/s	(0,013)l/s	–	–	–	–	–	–
CONDUIT SIZE (mm)		450ø	–	150ø	–	–	–	250ø	300ø	350ø	250ø	300ø	250ø	200ø	300ø	300ø	250ø	300	300ø	150ø	250ø	200ø	150ø	160ND	–	–	300ø	150ø	300ø			
CONDUIT MATERIAL		uPVC CLASS 12	CONCRETE CHANNEL	SS	CONCRETE CHANNEL	CONVEYOR	CONCRETE CHANNEL	304SS	uPVC CLASS 12	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS	304SS/HDPE CLASS 12	MS/uPVC	304SS	304SS	304SS	304SS	uPVC CLASS 12	–	–	MS	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		33 MOISTURISED ODOROUS GAS	34 DEODORIZED GAS	35 DEODORIZED GAS	36 DRAIN	37 WORKS EFFLUENT	32 ODOROUS GAS
FLUID l/s	MIN (AVE.)	–	–	–	–	–	–
	NORMAL (AVE.)	–	–	–	–	–	–
	MAX (AVE.)	–	–	–	–	–	–
SOLIDS kg/s	MIN (AVE.)	–	–	–	–	–	–
	NORMAL (AVE.)	–	–	–	–	–	–
	MAX (AVE.)	–	–	–	–	–	–
CONDUIT SIZE (mm)		200ND	160ND	150ND	80ø	12ø	200ND
CONDUIT MATERIAL		uPVC CLASS 12	uPVC CLASS 12	uPVC CLASS 12	MS	HDPE CLASS 12	uPVC CLASS 12

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED		W BRITZ
DESIGNED		W BRITZ
DRAWN		M DYKE
CHECKED		C DU TOIT
SERVICES CHECKED		
GEOTECHNICAL INVESTIGATION		
SERVITUDES		
APPROVED		
Pr. Eng. No.		
DATE		

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

SLUDGE FERMENTATION PLANT

PLC–08

CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER	SCALE	AMENDMENTS		APPROVED	DATE	DRAWING No.
		TO	FOR TENDER	W BRITZ	20.05.19	JW NUMBER
						JW13898–08–023
						CONSULTANT'S NUMBER
	NTS					ING0645D–08–023
						FILE No
						BWW1500
DATE						TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D–08–023(LIT) rev10.dwg May 30, 2019 – 9:01am

CIVIL AND MECHANICAL

HAND OPERATED VALVES (HOV)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M8HOV01	40	GV	HAND WHEEL
5M8HOV02	25	GV	HAND WHEEL
5M8HOV03	40	GV	HAND WHEEL
5M8HOV04	25	GV	HAND WHEEL
5M8HOV05	25	GV	HAND WHEEL
5M8HOV06	15	GV	HAND WHEEL
5M8HOV07	40	GV	HAND WHEEL
5M8HOV08	25	GV	HAND WHEEL
5M8HOV09	40	GV	HAND WHEEL
5M8HOV10	40	GV	HAND WHEEL

NON-RETURN VALVES (NRV)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5M8NRV01	15	NRV	–
5M8NRV02	40	NRV	–
5M8NRV03	40	NRV	–
5M8NRV04	40	NRV	–

LEVER BALL VALVES (LBV)

TAG No	DIA. (mm)	TYPE	–
5M8LBV01	40	–	–
5M8LBV02	15		
5M8LBV03	15		
5M8LBV04	40		
5M8LBV05	40		
5M8LBV06	40		
5M8LBV07	40		
5M8LBV08	15		
5M8LBV09	40		
5M8LBV10	40		
5M8LBV11	15		

FLOAT VALVES (FV)

TAG No	DIA. (mm)	TYPE	–
5M8FV01	40	–	–
5M8FV02	25		

BUTTERFLY VALVES (BV)

TAG No	DIA. (mm)	TYPE	–
5M8BV01	100	MANUAL	–
5M8BV02	100	MANUAL	
5M8BV03	100	MANUAL	
5M8BV04	100	MANUAL	
5M8BV05	100	MANUAL	
5M8BV06	100	MANUAL	
5M8BV07	100	MANUAL	
5M8BV08	100	MANUAL	
5M8BV09	100	MANUAL	
5M8BV10	100	MANUAL	
5M8BV11	100	MANUAL	
5M8BV12	100	MANUAL	
5M8BV13	100	MANUAL	
5M8BV14	100	MANUAL	
5M8BV15	100	MANUAL	
5M8BV16	100	MANUAL	
5M8BV17	100	MANUAL	
5M8BV18	100	MANUAL	

SOLENOID VALVES (SLV)

TAG No	DIA. (mm)	TYPE	–
5M8SLV01	40	–	–

DIAPHRAGM VALVES (DV)

TAG No	DIA. (mm)	TYPE	–
5M8DV01	15	–	–
5M8DV02	40	–	–

PUMPS (P)

TAG No	TYPE	CAPACITY
5M8P01	RECIRCULATING PUMP	180 L/m
5M8P02	EFFLUENT PUMP	20 L/m

ELECTRIC MOTORS (ME)

TAG No	KW	SPEED (rpm)	VOLTAGE	ENCLOSURE	APPLICATION
5M8ME01	1.50	1450	380	TEFC-IP55	RECIRCULATING PUMP
5M8ME02	1.50	1450	380	TEFC-IP55	EFFLUENT PUMP
5M8ME03	5.50	1450	380	TEFC-IP55	RECIRCULATING PUMP
5M8ME04	0.37	1450	380	TEFC-IP55	MIXER

STRAINERS (S)

TAG No	DIA.	–
5M8S01	40	–
5M8S02	40	–
5M8S03	40	–

BACK PRESSURE REGULATORS (BPR)

TAG No	DIA.	–
5M8BPR01	40	–
5M8BPR02	25	–

CONDENSATE TRAP (CT)

TAG No	DIA.	–
5M8CT01	40	–

BLOWER (BL)

TAG No	FLOW m^3/Hr	–
5M8BL01	2067	–

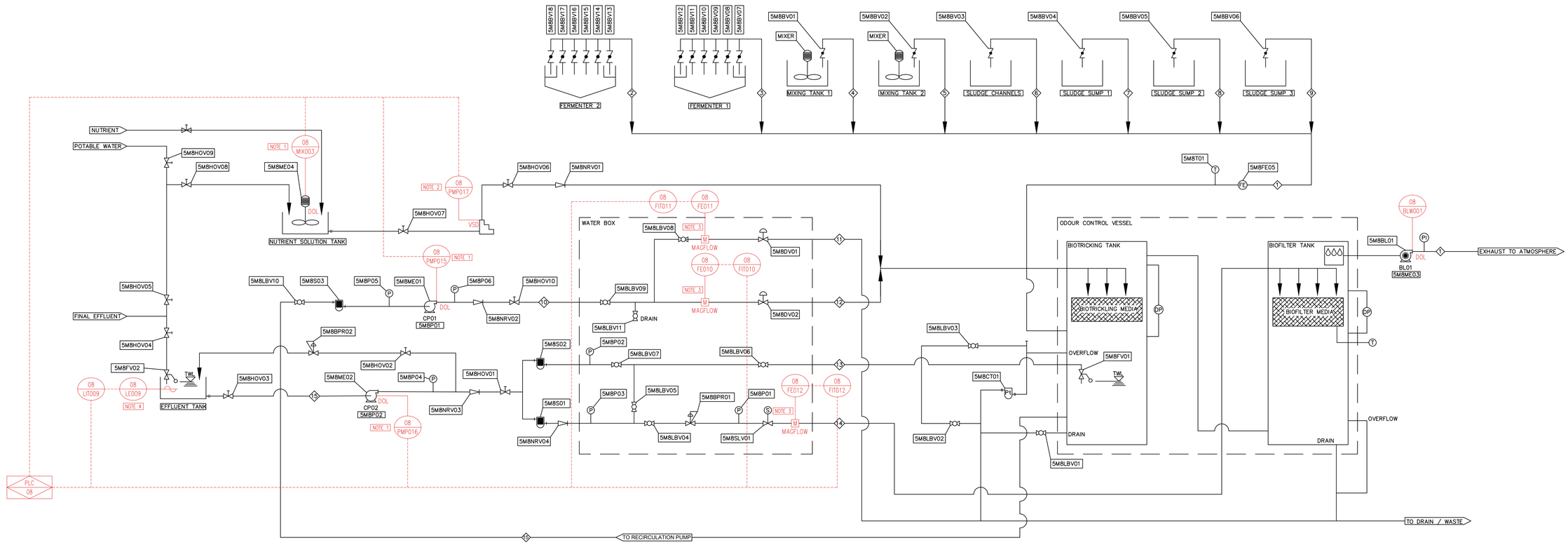
ELECTRIC, CONTROL & INSTRUMENTATION

FLOW SENSORS (FE)

TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
FE010	FIT010	MAGFLOW	ODOUR CONTROL RECIRCULATION FLOW
FE011	FIT011	MAGFLOW	ODOUR CONTROL EFFLUENT FLOW
FE012	FIT012	MAGFLOW	ODOUR CONTROL DRAIN FLOW

LEVEL SENSORS (LE)

TRANSDUCER TAG No	SENSOR TAG No	TYPE	LOCATION
LE009	LIT009	ULTRASONIC	ODOUR CONTROL EFFLUENT TANK LEVEL



INSTRUMENTATION, VALVES AND EQUIPMENT

- PI PRESS GAUGE
- FE FLOW METER
- DP PRESSURE DIFFERENTIAL INDICATOR
- T THERMOMETER
- LEVER BALL VALVE
- NON RETURN VALVE
- BUTTERFLY VALVE
- HAND OPERATED VALVE
- S SOLENOID VALVE
- BACK PRESSURE REGULATOR
- DIAPHRAGM VALVE
- FLOAT VALVE
- PUMP
- EXHAUST FAN
- STRAINER
- CT CONDENSATE TRAP

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STRUCTURE		FERMENTER 1	FERMENTER 2	MIXING TANK 1	MIXING TANK 2	TRANSFER CHANNEL	PUMP STATION SUMP 1	PUMP STATION SUMP 2	PUMP STATION SUMP 3						
DESCRIPTION	TREATED AIR INLET	PROCESS EXTRACTED AIR 1	PROCESS EXTRACTED AIR 2	PROCESS EXTRACTED AIR 3	PROCESS EXTRACTED AIR 4	PROCESS EXTRACTED AIR 5	PROCESS EXTRACTED AIR 6	PROCESS EXTRACTED AIR 7	PROCESS EXTRACTED AIR 8	RECIRCULATION WATER AND BLOWDOWN	BLOWDOWN	RECIRCULATION LINE TO IRRIGATION	SUMP MAKE-UP WATER	BIOFILTER MEDIA IRRIGATION	TOTAL MAKE-UP WATER
EXTRACTION VOLUME		495.62 m^3/hr	495.62 m^3/hr	124.88 m^3/hr	124.88 m^3/hr	108.00 m^3/hr	240.00 m^3/hr	240.00 m^3/hr	240.00 m^3/hr						
FLOW RATE	2067 m^3/hr									150L/min	2.5m^3/DAY	148L/min	2.74m^3/DAY	135L/DAY	2.87m^3/DAY
LINE SIZE	Ø400	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø40	Ø15	Ø40	Ø40	Ø40	Ø40
TEMPERATURE	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C
HUMIDITY	30 - 80%									--	--	--	--	--	--
pH										5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0	5.0 - 8.0
H_2S	50 - 300 ppm									--	--	--	--	--	--

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	R G
DRAWN	JvdW
CHECKED	K M
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
SLUDGE FERMENTATION ODOUR CONTROL PLANT
PLC-08
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

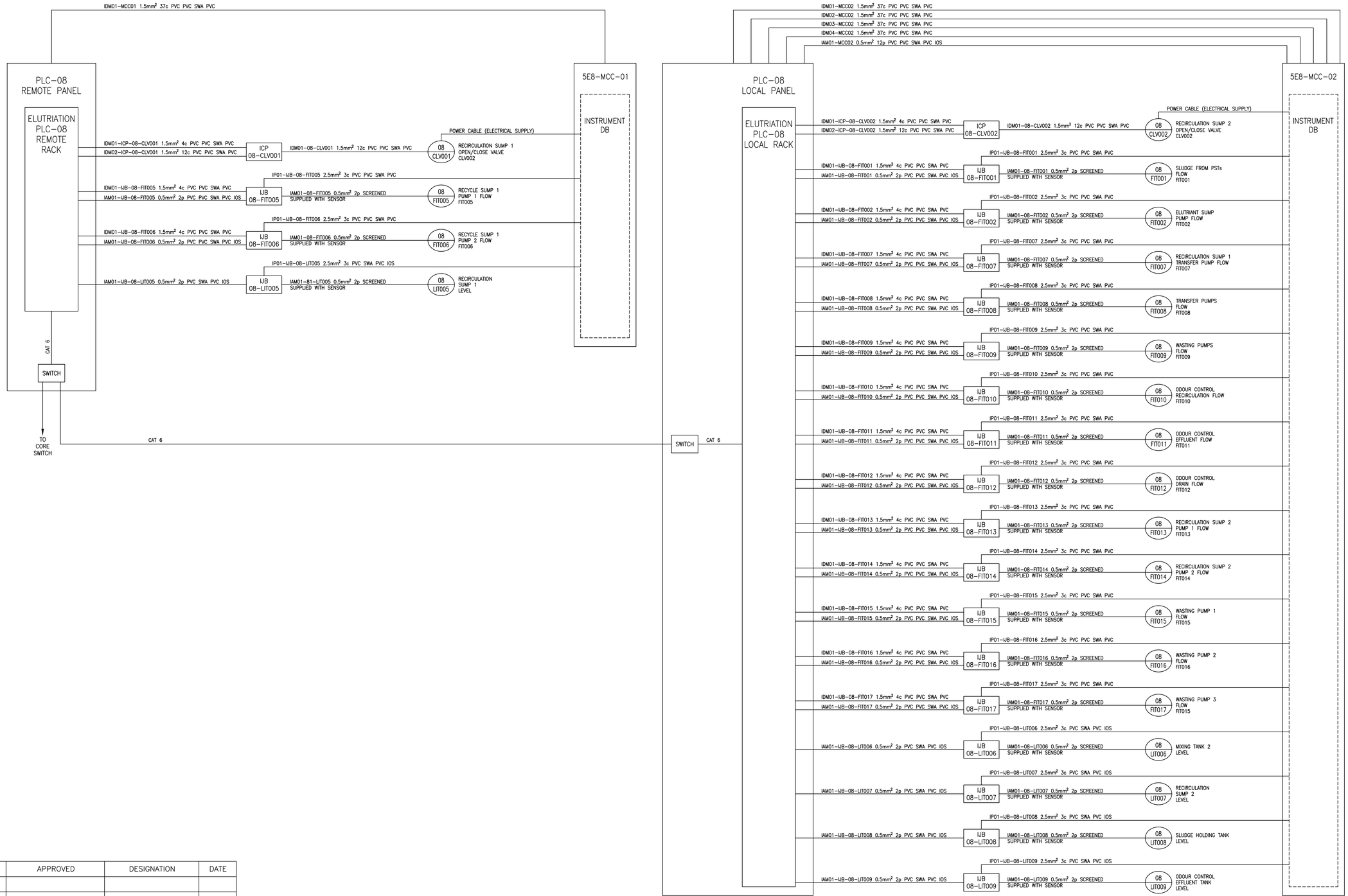
SCALE

AMENDMENTS	APPROVED	DATE
TO FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER: JW13897-08-038
CONSULTANT'S NUMBER: ING0645D-08-038
FILE No: BWW1500
TO

J:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-08-038(ELT) rev10.dwg May 30, 2019 – 9:01am



DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL. 011-806 7111
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Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com

SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 BIOREACTOR 2
ELUTRIATION PLC-08 LOCAL RACK
CABLE BLOCK DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.05.19
T1	RE ISSUED FOR TENDER	C du TOIT	16.10.24

DRAWING No.

JW NUMBER JW13898-08-CBD
CONSULTANT'S NUMBER ING645D-08-CBD
FILE No BWW1500
T0 T1

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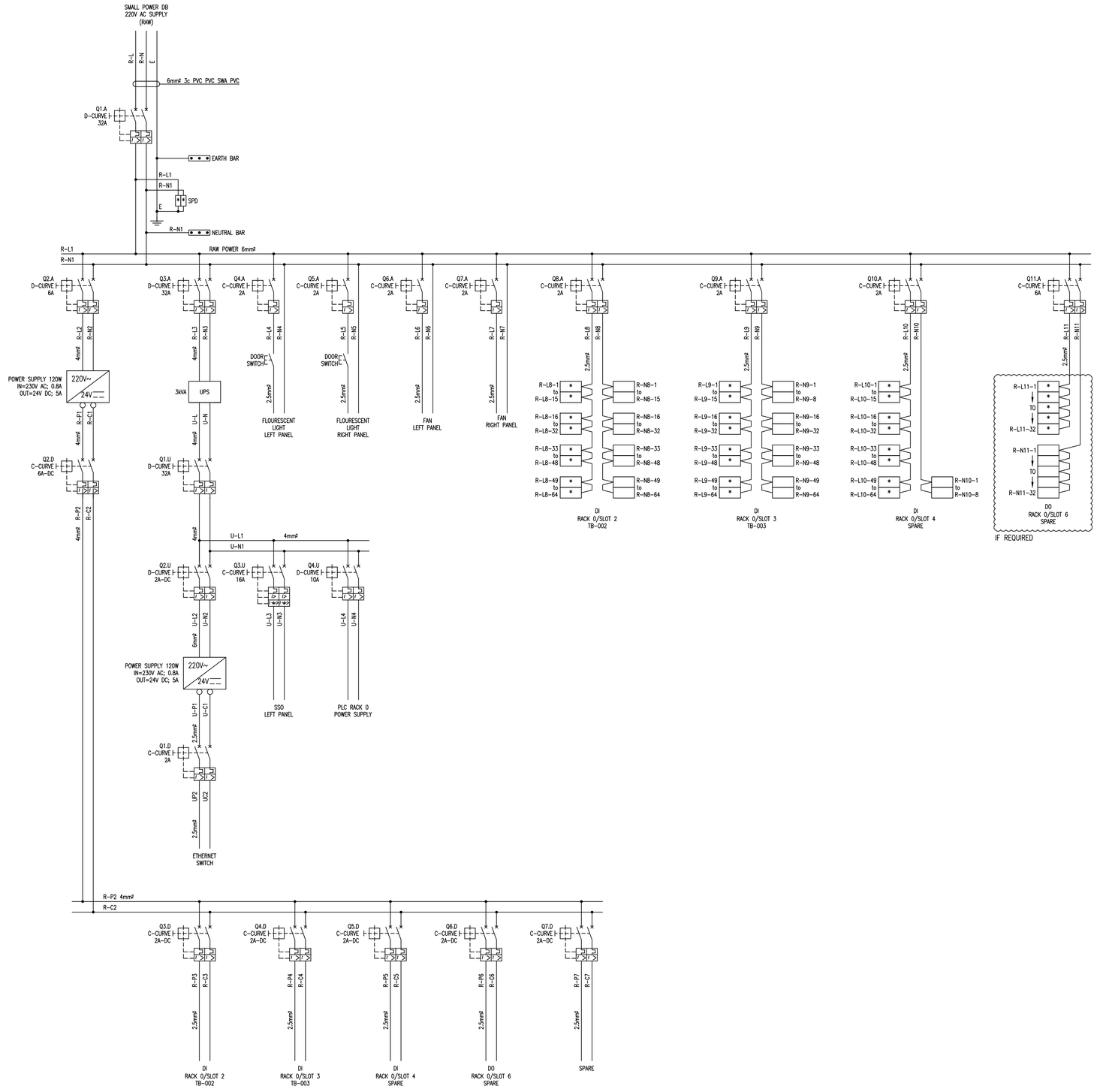

* FUSE TERMINALS

LINK TERMINALS

DATE			
DESIGNATION			
APPROVED			
DEPARTMENT			

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION
PLC-08
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	C du TOIT	15.09.18

DRAWING No.

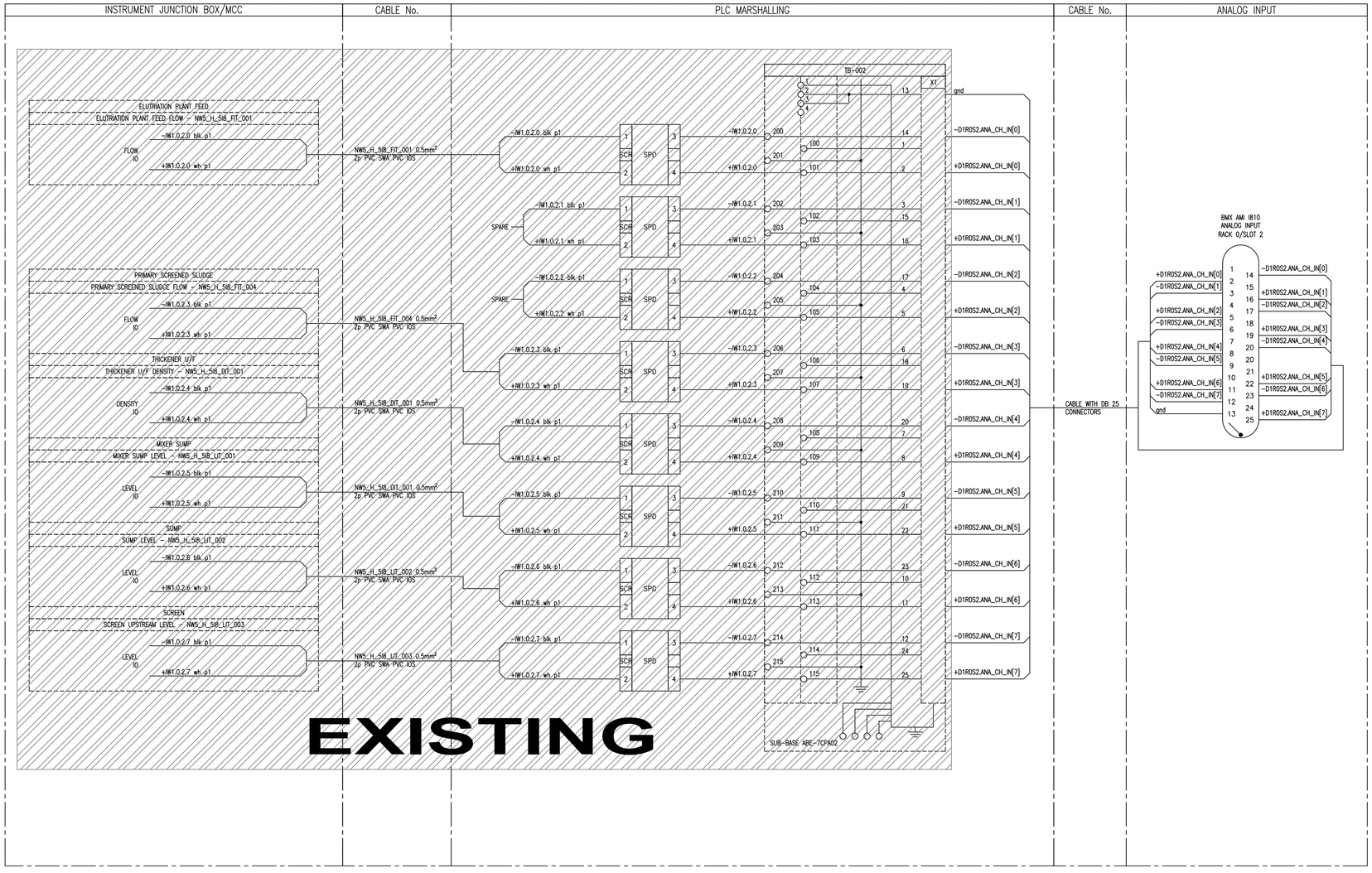
JW NUMBER
JW13898-08-SLD

CONSULTANT'S NUMBER
ING0645D-08-SLD

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Schematic Diagram\ING0645D-08-SLD revT0.dwg May 30, 2019 – 9:36am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
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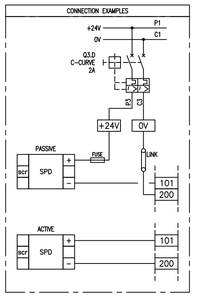
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL



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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
ANALOG INPUT MODULE
REMOTE RACK 0 / SLOT 2

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

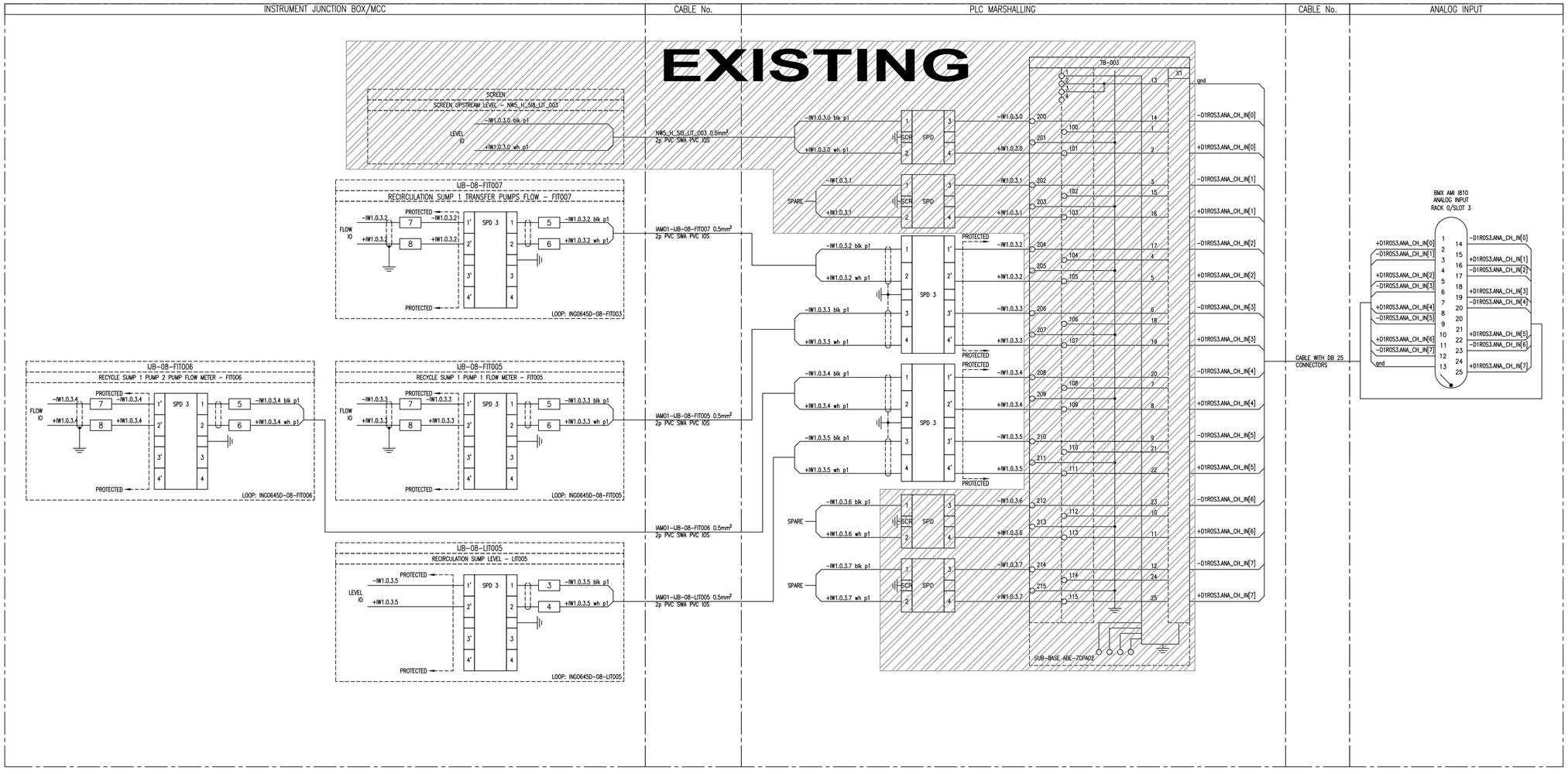
DRAWING No.

JW NUMBER
JW13898-08-D1R0S2-AI

CONSULTANT'S NUMBER
ING0645D-08-D1R0S2-AI

FILE No
BWW 1500

T0



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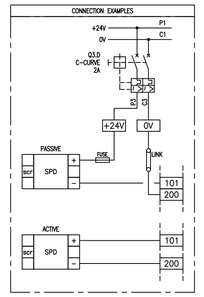
* FUSED TERMINAL (500mA)

LINK TERMINAL



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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
ANALOG INPUT MODULE
REMOTE RACK 0 / SLOT 2

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-08-D1R0S3-AI

CONSULTANT'S NUMBER
ING0645D-08-D1R0S3-AI

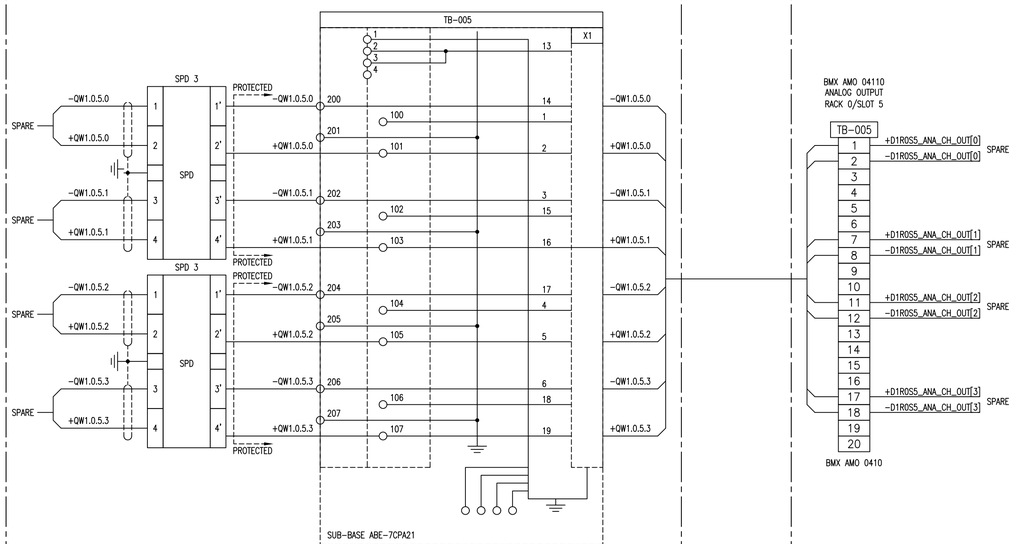
FILE No
BWW 1500

T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R0S3-AI revT0.dwg May 30, 2019 - 1:42pm

MODICON M580: BMXAMO0410 & BMXFTB2010 TERMINAL BLOCK

INSTRUMENT JUNCTION BOX	CABLE No.	PLC MARSHALLING	CABLE No.	ANALOG OUTPUT CARD



NOTES:

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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

ANALOG OUTPUT MODULE

REMOTE RACK 0 / SLOT 5

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

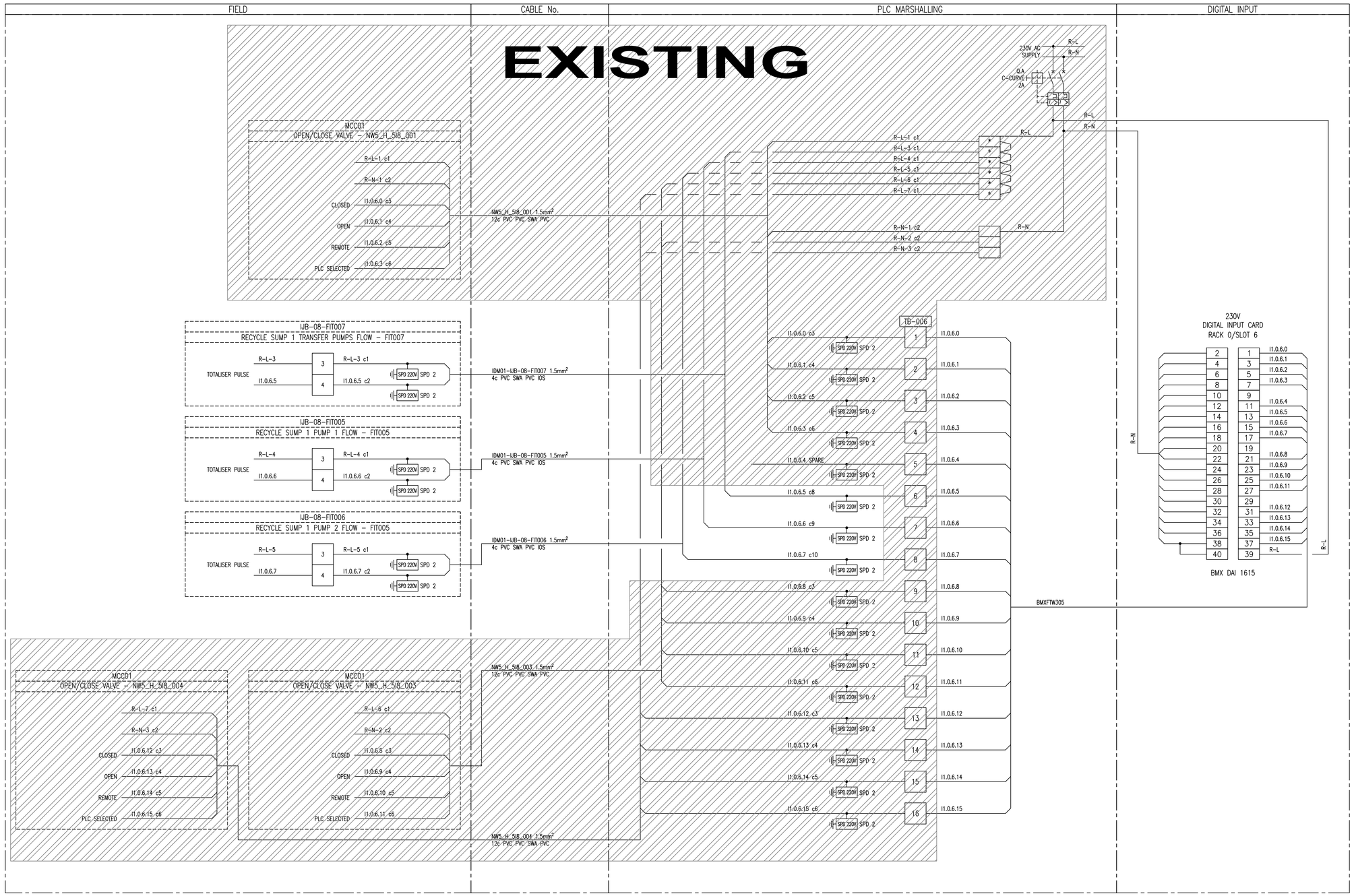
JW NUMBER
JW13898-08-D1R0S5-A0

CONSULTANT'S NUMBER
ING0645D-08-D1R0S5-A0

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R0S5-A0 revT0.dwg May 30, 2019 – 9:47am



NOTES:

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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
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DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - ELUTRIATION PLC-08

DIGITAL INPUT MODULE

REMOTE RACK 0 / SLOT 6

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.05.19

DRAWING No.

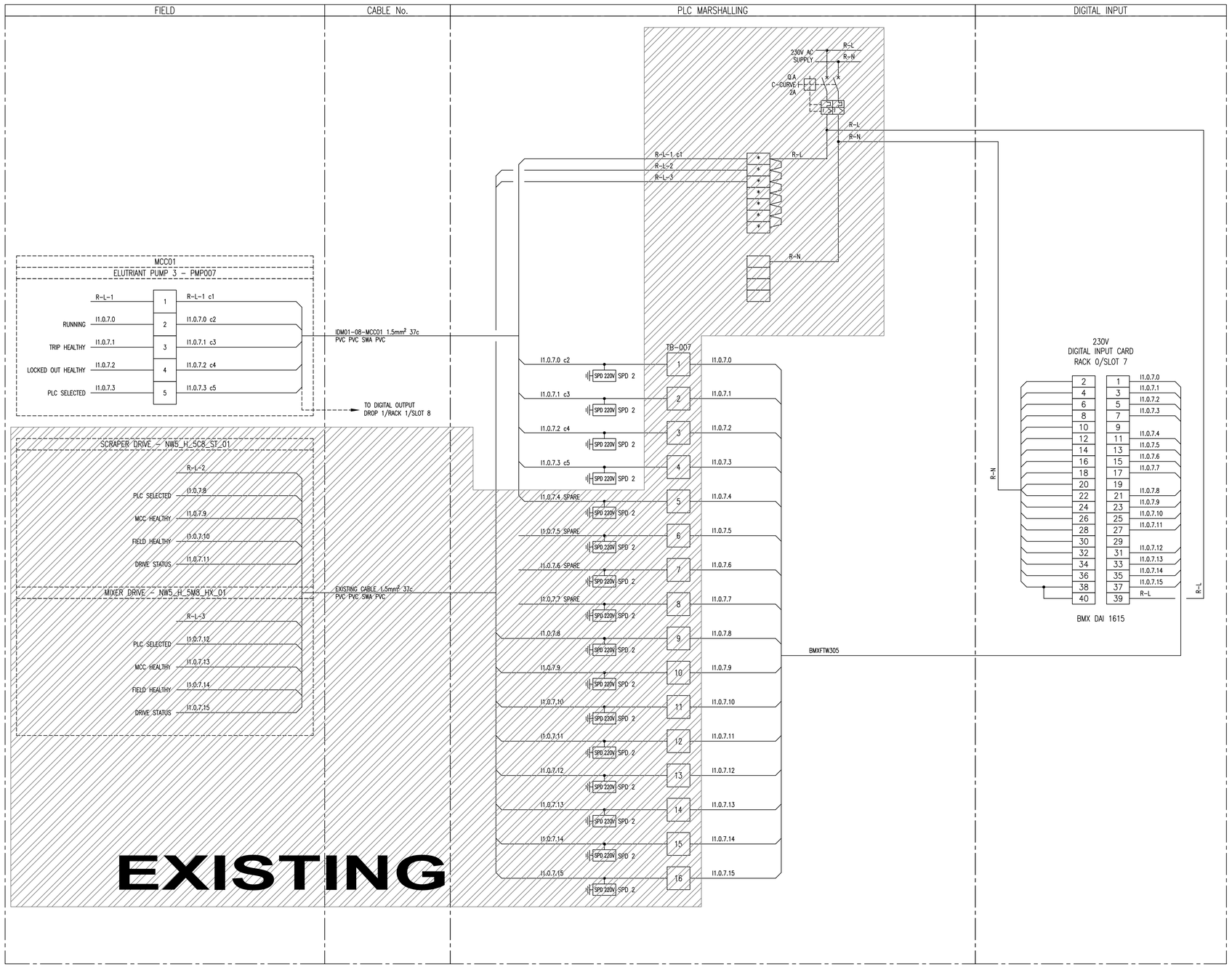
JW NUMBER: JW13898-08-D1ROS6-DI

CONSULTANT'S NUMBER: ING0645D-08-D1ROS6-DI

FILE No: BWW 1300

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1ROS6-DI rev70.dwg May 30, 2019 - 9:47am



NOTES:

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2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL INPUT MODULE
REMOTE RACK 0 / SLOT 7

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	15.05.19

DRAWING No.

JW NUMBER
JW13898-08-D1R0S7-DI

CONSULTANT'S NUMBER
ING0645D-08-D1R0S7-DI

FILE No
BWW 1300

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R0S7-DI revT0.dwg May 30, 2019 - 9:47am

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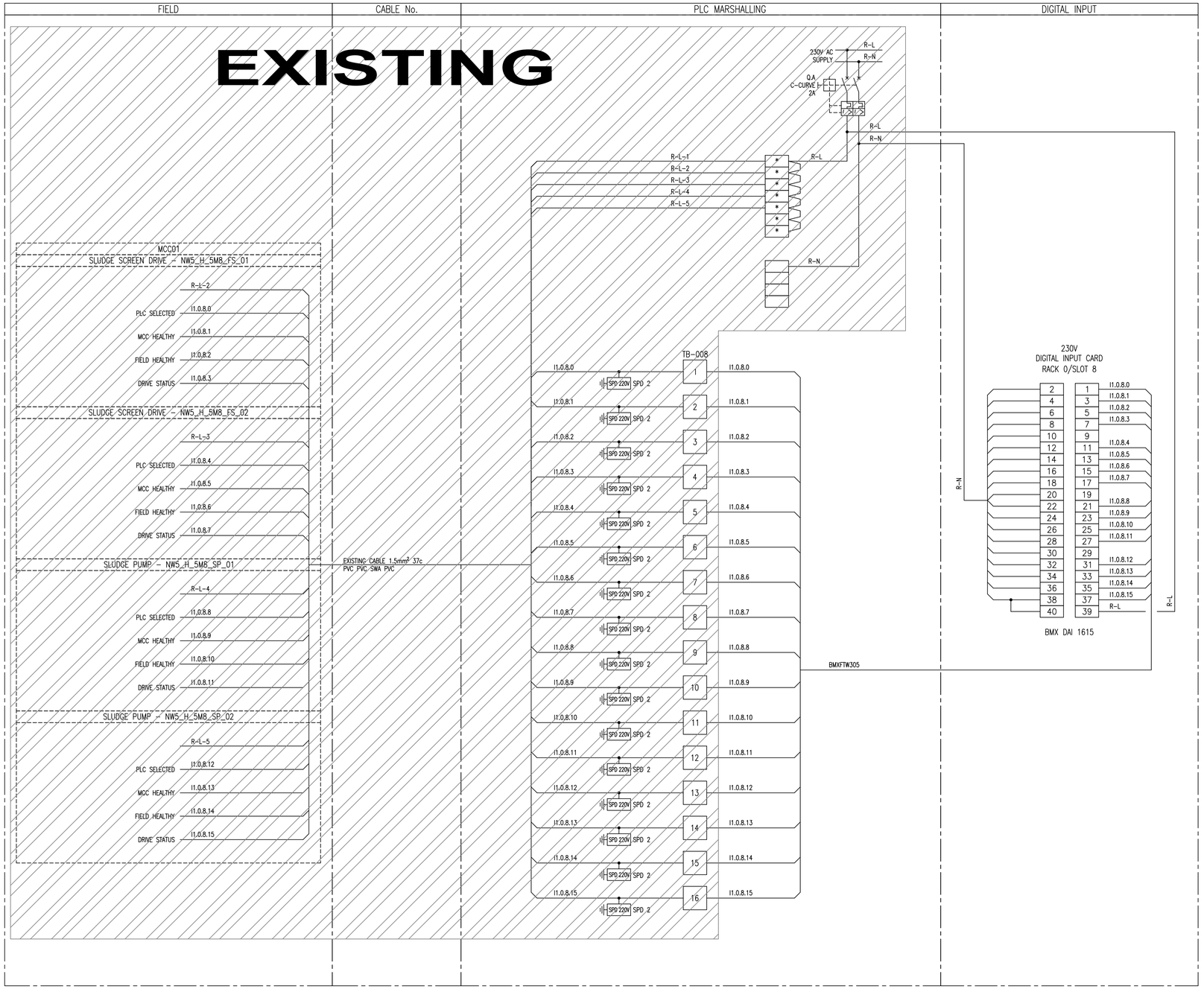

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* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL INPUT MODULE
REMOTE RACK 0 / SLOT 8

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	15.05.19

DRAWING No.

JW NUMBER
JW13898-08-D1R0S8-DI

CONSULTANT'S NUMBER
ING0645D-08-D1R0S8-DI

FILE No
BWW 1300

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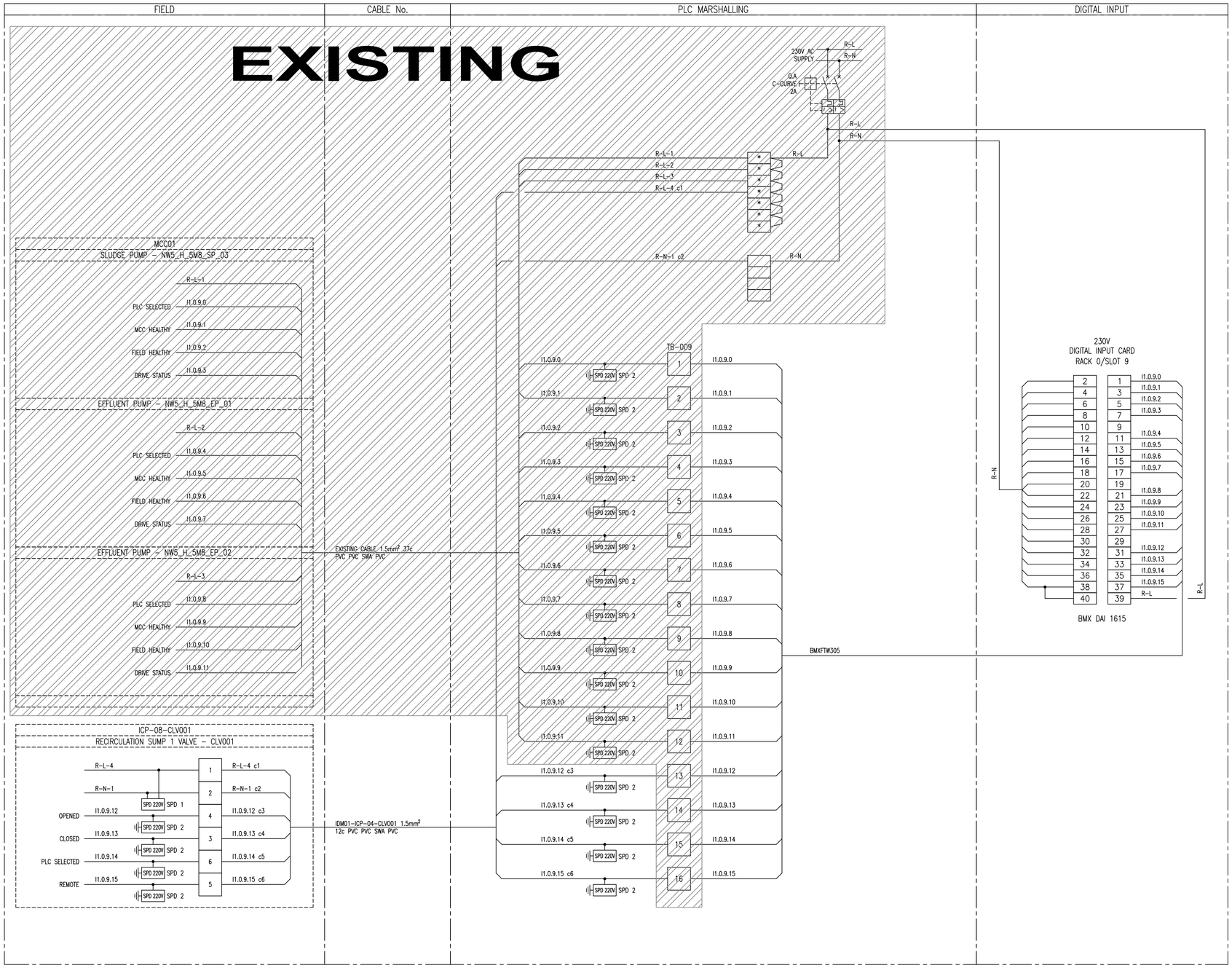

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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL INPUT MODULE
REMOTE RACK 0 / SLOT 9

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	AMENDMENTS	APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.05.19

DRAWING No.

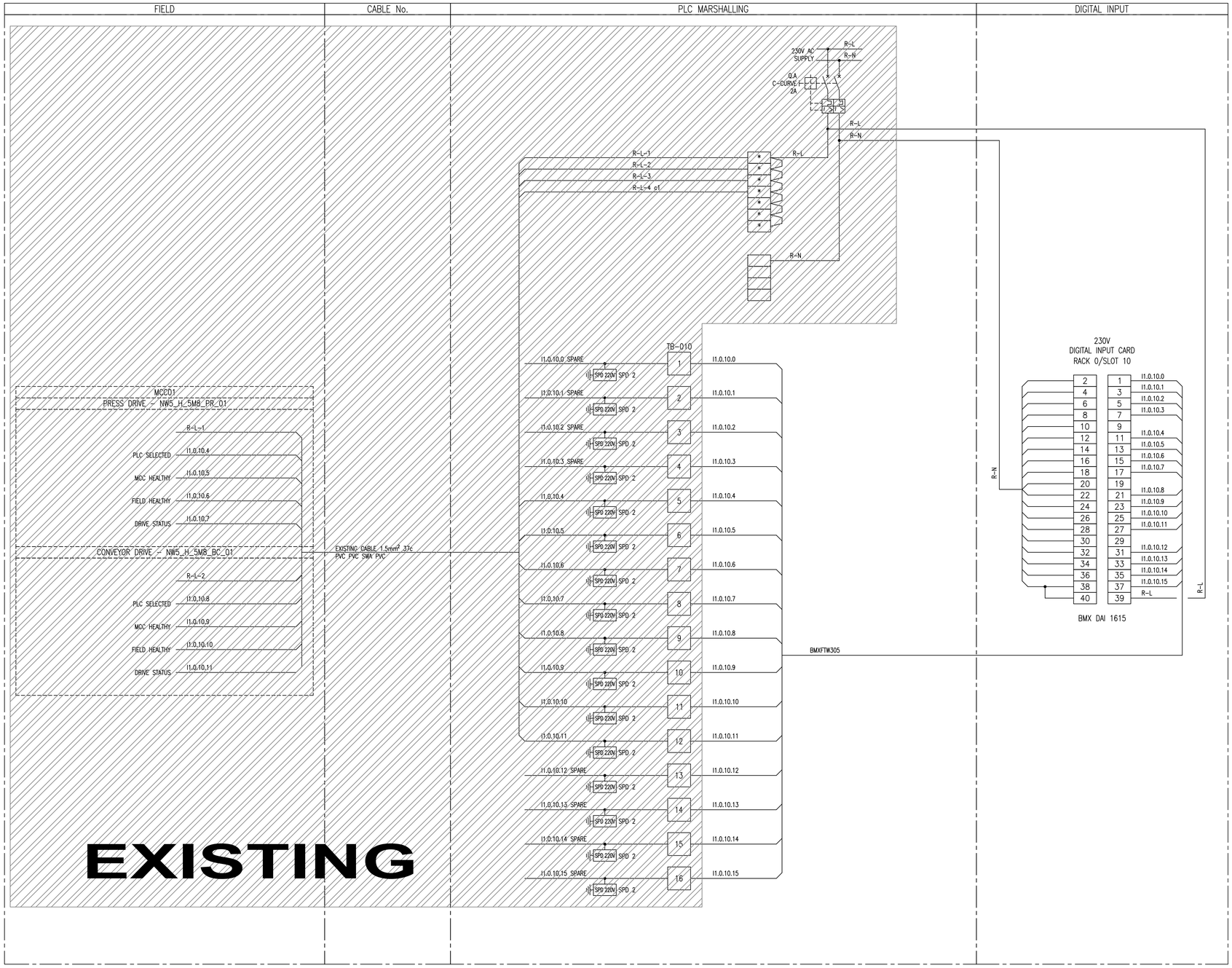
JW NUMBER
JW13898-08-D1R0S9-DI

CONSULTANT'S NUMBER
ING0645D-08-D1R0S9-DI

FILE No
BWW 1300

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R0S9-DI revT0.dwg May 30, 2019 - 9:47am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL INPUT MODULE
REMOTE RACK 0 / SLOT 10

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.05.19

DRAWING No.

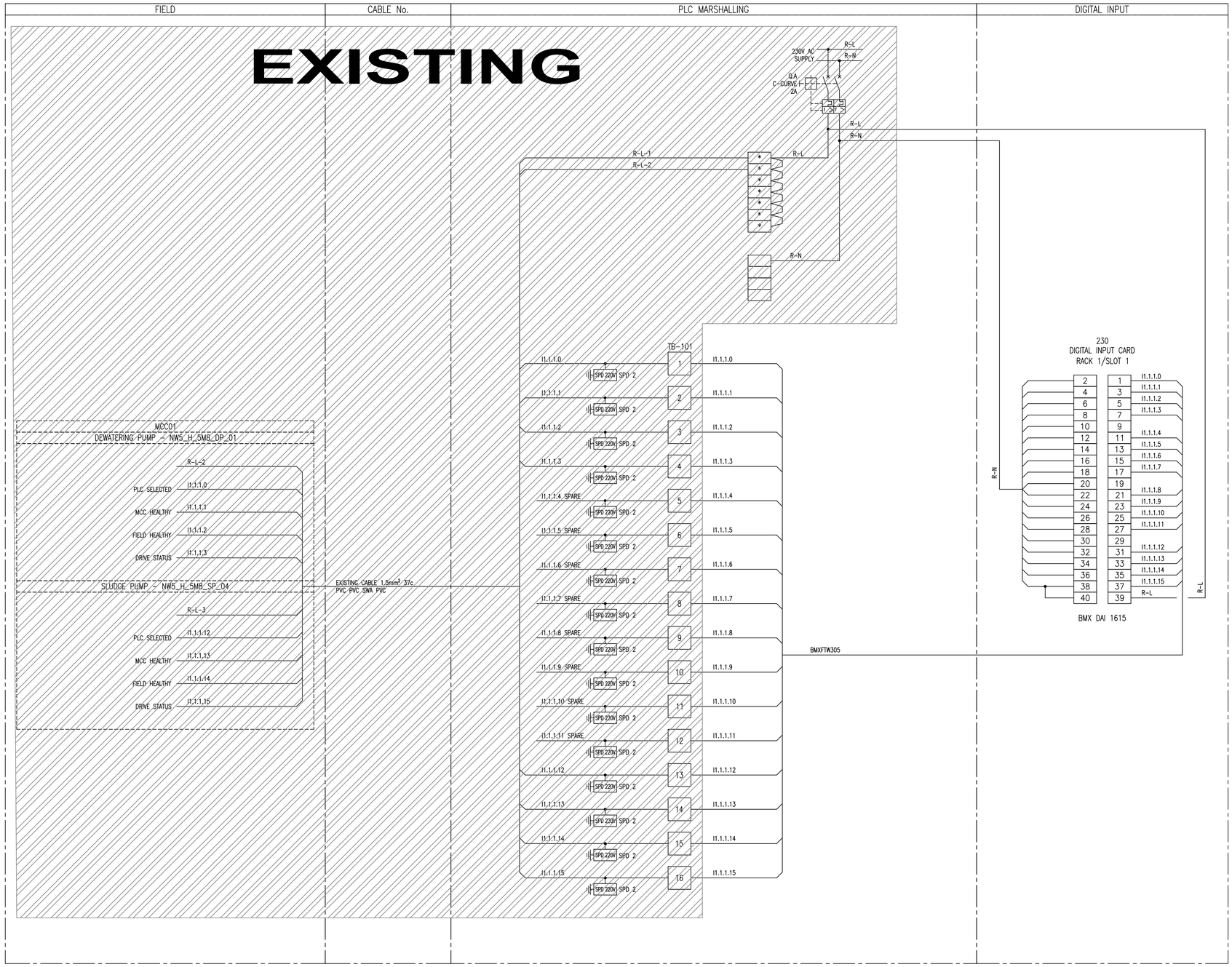
JW NUMBER
JW13898-08-D1R0S10-DI

CONSULTANT'S NUMBER
INC0645D-08-D1R0S10-DI

FILE No
BWW 1300

TO

I:\INC – Projects – Drawings\INC0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\INC0645D-08-D1R0S10-DI revT0.dwg May 30, 2019 – 9:47am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL INPUT MODULE
REMOTE RACK 1 / SLOT 1

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.05.19

DRAWING No.

JW NUMBER
JW13898-08-D1R1S1-DI

CONSULTANT'S NUMBER
ING0645D-08-D1R1S1-DI

FILE No
BWW 1300

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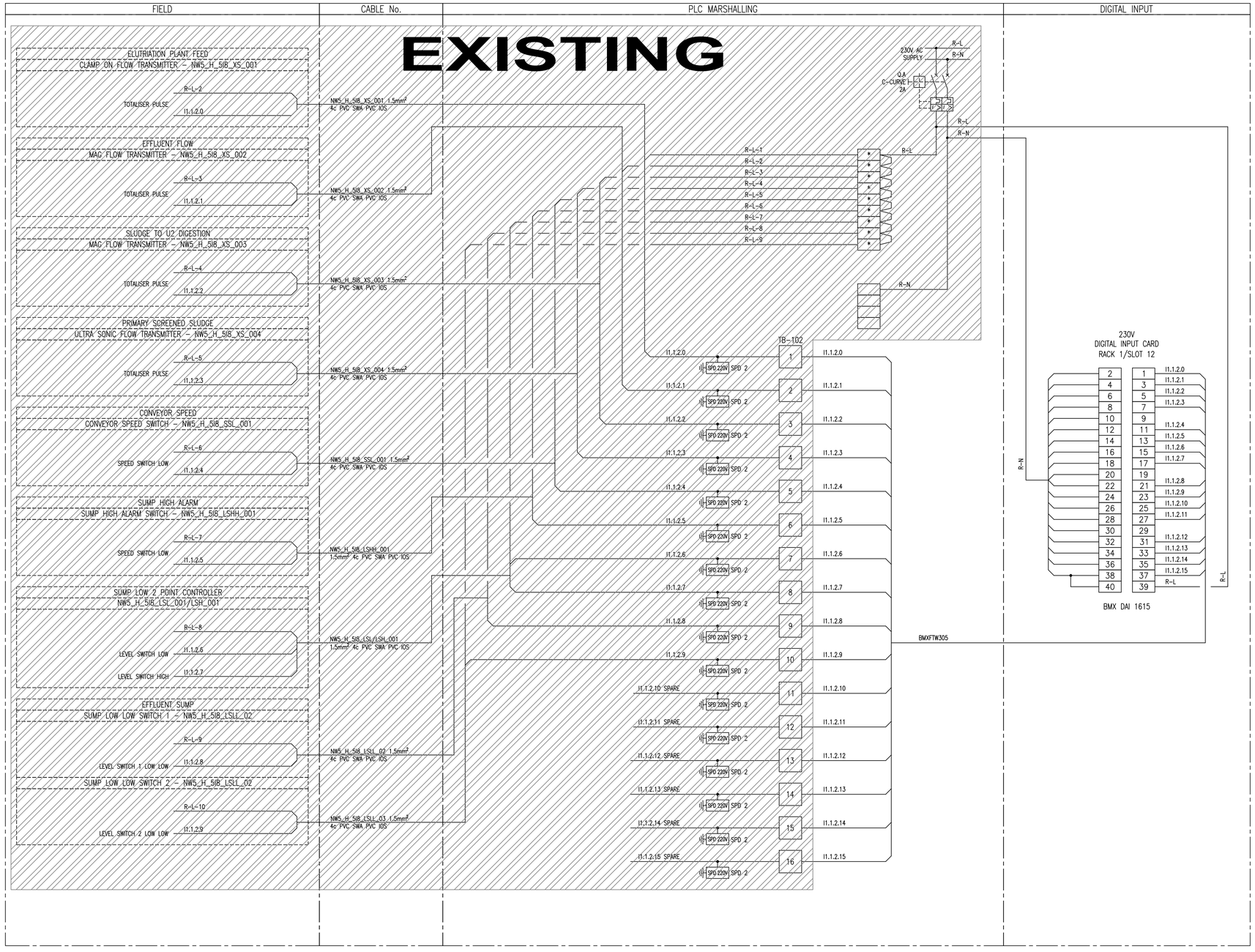
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R1S1-DI revT0.dwg May 30, 2019 – 9:47am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

DIGITAL INPUT MODULE

REMOTE RACK 1 / SLOT 2

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.05.19

DRAWING No.

JW NUMBER
JW13898-08-D1R1S2-DI

CONSULTANT'S NUMBER
ING0645D-08-D1R1S2-DI

FILE No
BWW 1300

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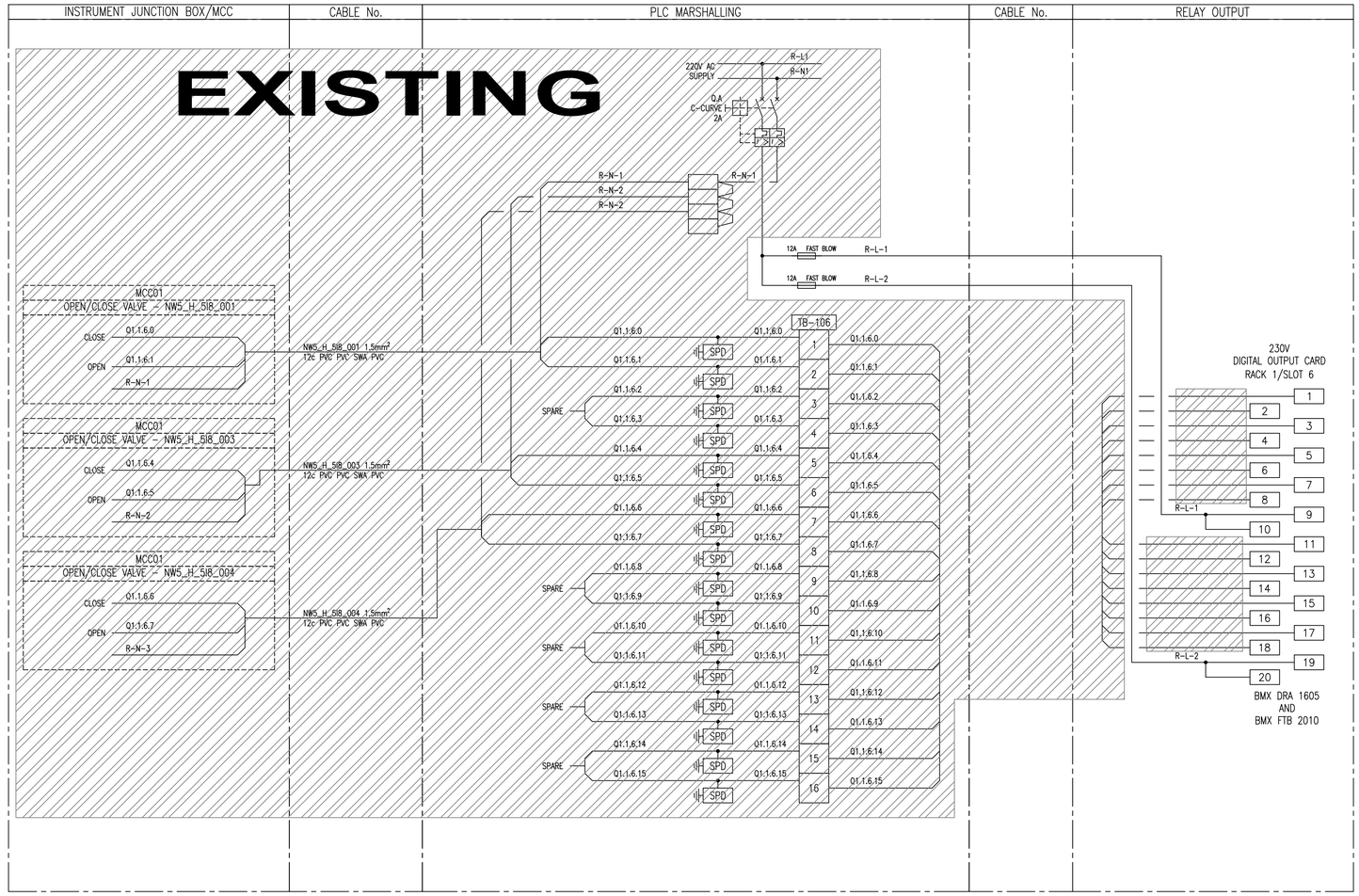

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* FUSED TERMINAL (500mA)
LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL SOLID STATE RELAY OUTPUT MODULE
REMOTE RACK 1 / SLOT 6

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

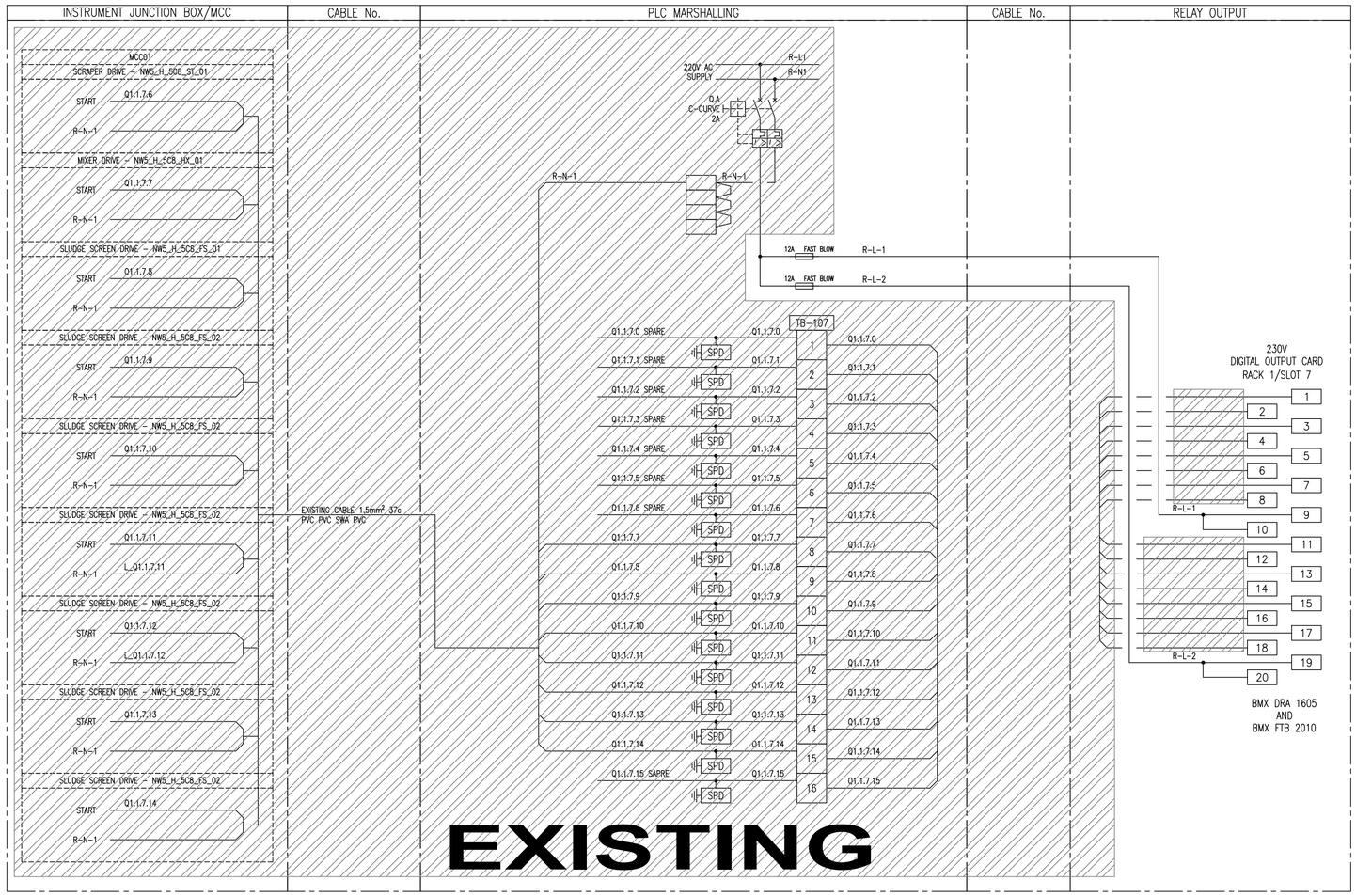
JW NUMBER
JW13898-08-D1R1S6-D0

CONSULTANT'S NUMBER
ING0645D-08-D1R1S6-D0

FILE No
BWW 1300

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R1S6-D0 revT0.dwg May 30, 2019 - 9:47am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
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GEOTECHNICAL INVESTIGATION	
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APPROVED	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

DIGITAL SOLID STATE RELAY OUTPUT MODULE

REMOTE RACK 1 / SLOT 7

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

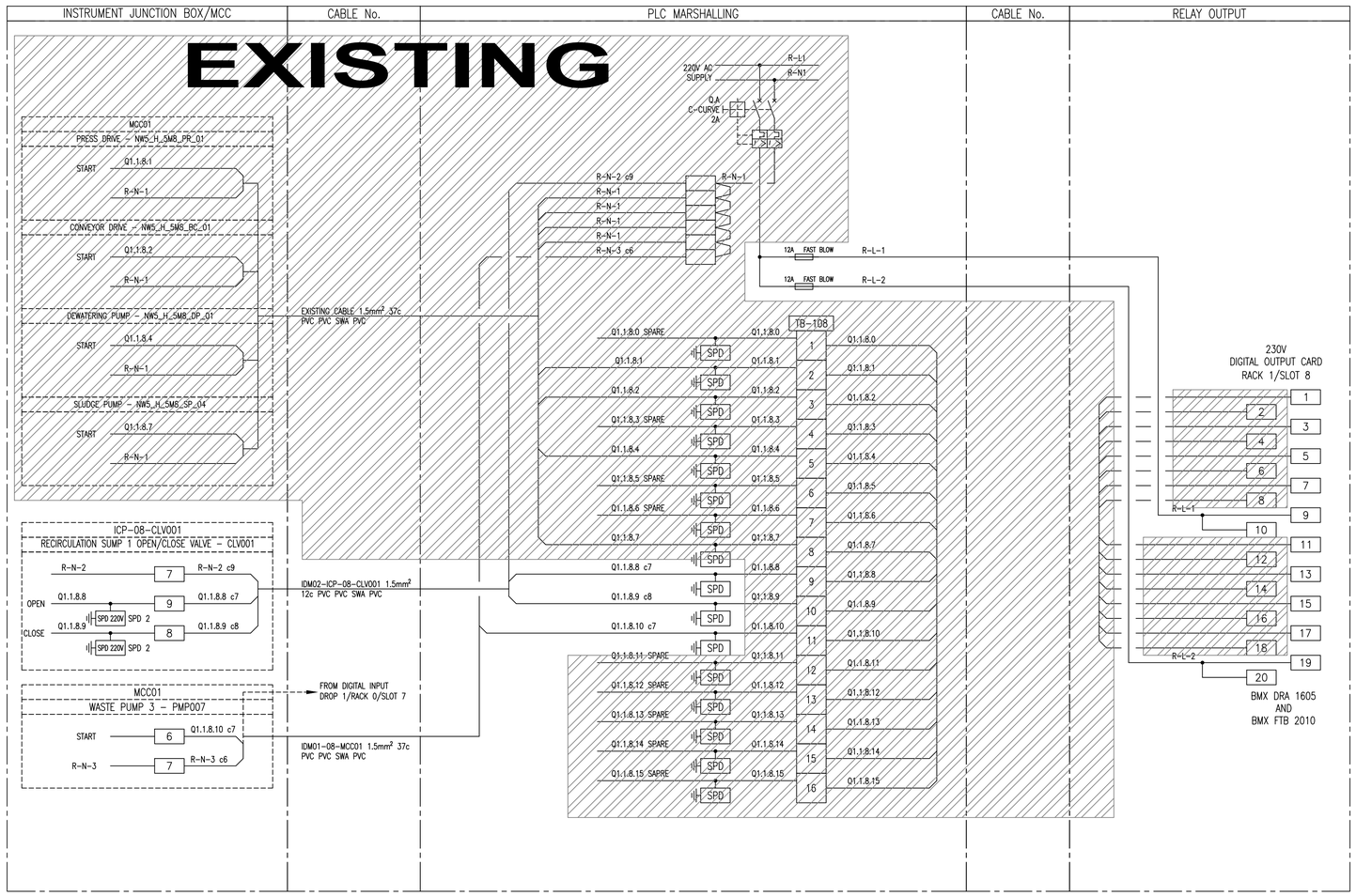
JW NUMBER
JW13898-08-D1R1S7-D0

CONSULTANT'S NUMBER
ING0645D-08-D1R1S7-D0

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R1S7-D0 revT0.dwg May 30, 2019 – 9:48am



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

DIGITAL SOLID STATE RELAY OUTPUT MODULE

REMOTE RACK 1 / SLOT 8

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-08-D1R1S8-D0

CONSULTANT'S NUMBER
ING0645D-08-D1R1S8-D0

FILE No
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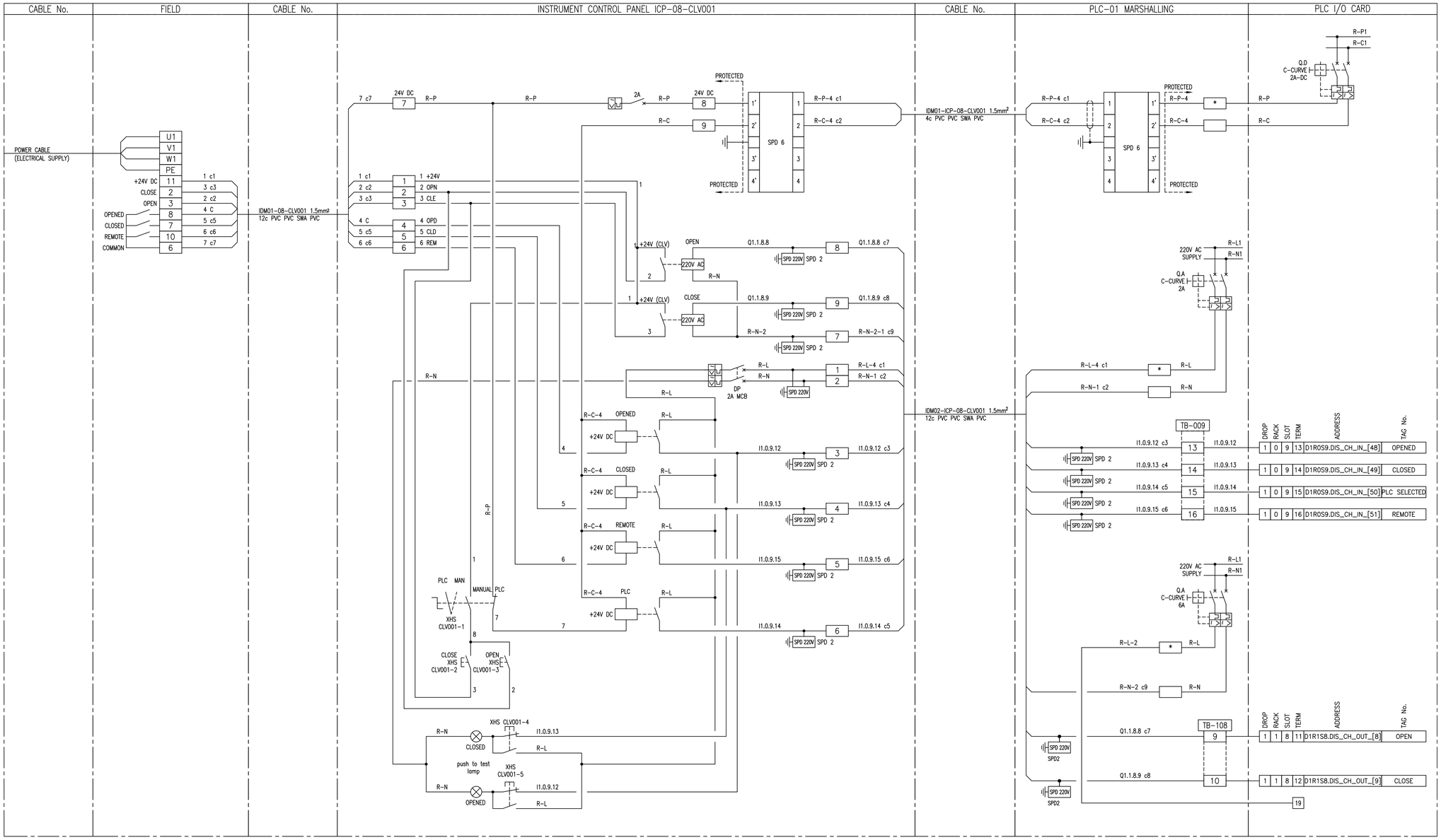
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\Remote\ING0645D-08-D1R1S8-D0 revT0.dwg May 30, 2019 – 9:48am



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RETICULATION SUMP 1 OPEN/CLOSE VALVE – CLV001

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.08.19

DRAWING No.

JW NUMBER
JW13898-08-CLV001

CONSULTANT'S NUMBER
ING0645D-08-CLV001

FILE No
BWW 1300

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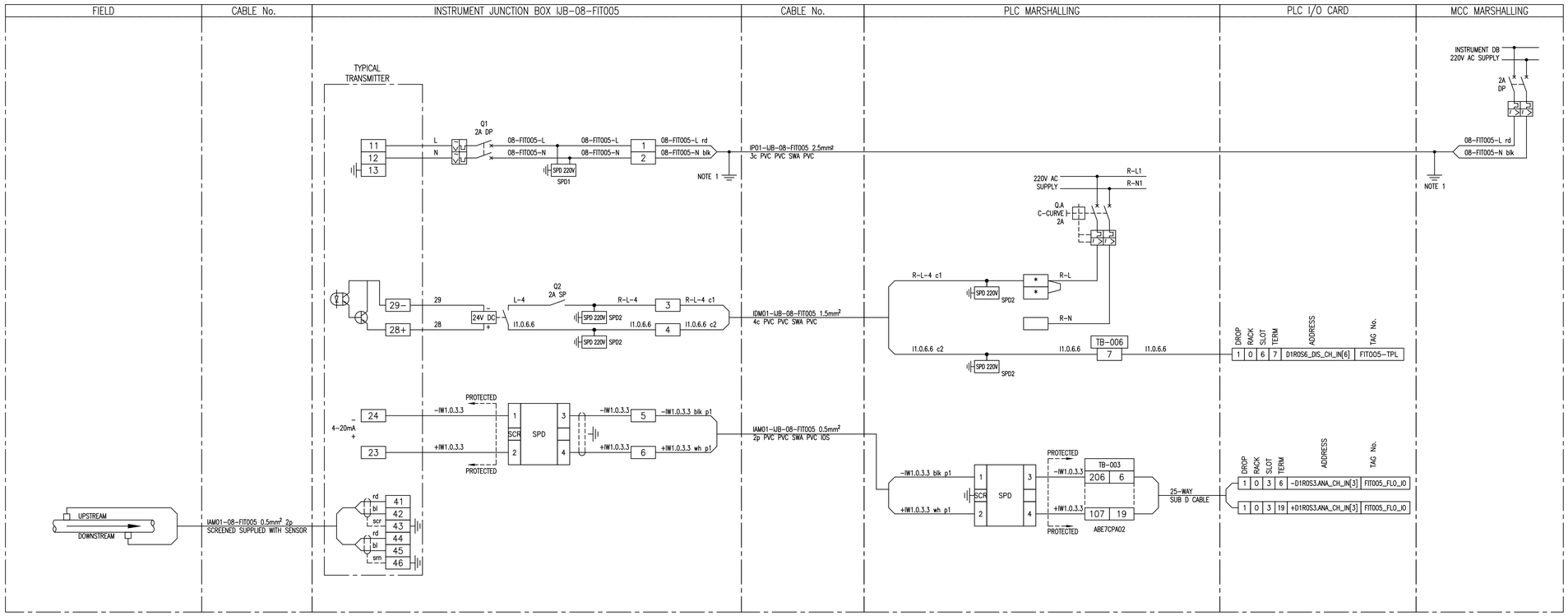
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\Remote\ING0645D-08-CLV001 revT0.dwg May 30, 2019 – 9:48am



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LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
RECYCLE SUMP 1 PUMP 1 FLOW CLAMP-ON FLOW METER
FIT005

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

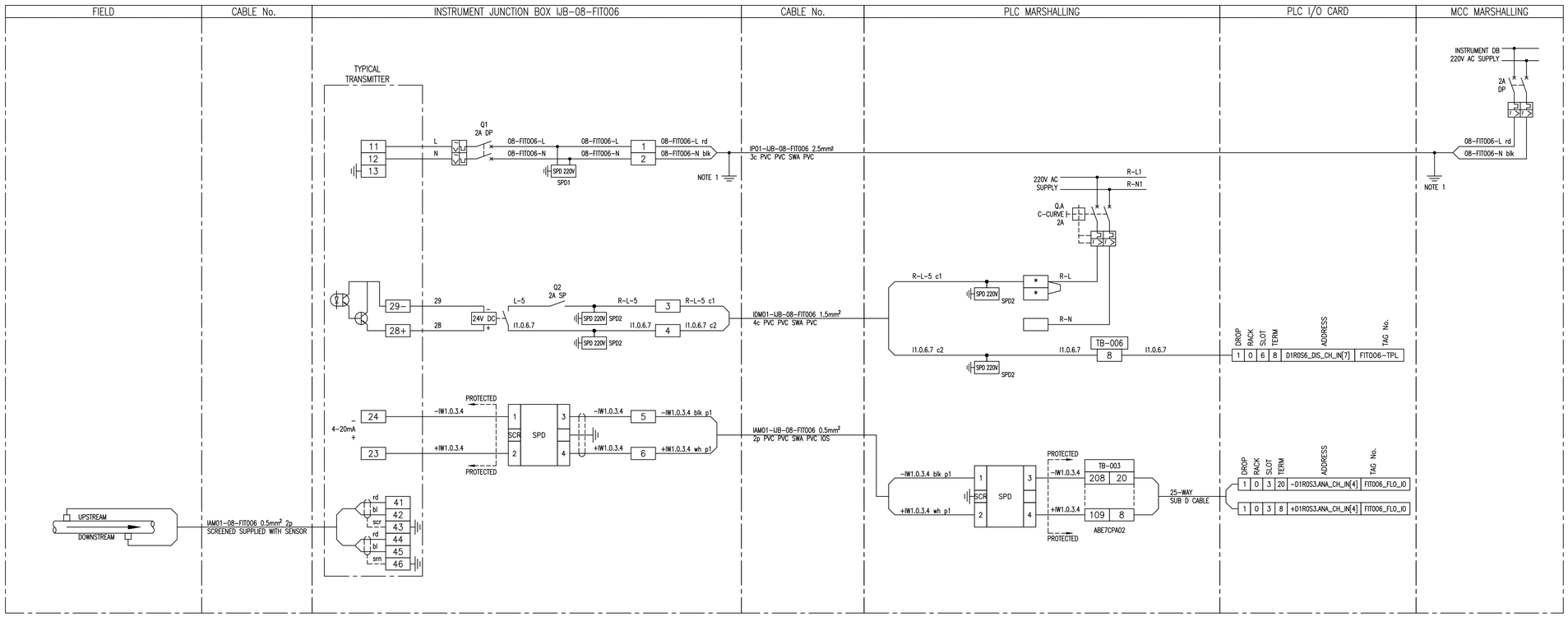
JW NUMBER
JW13898-08-FIT005

CONSULTANT'S NUMBER
ING0645D-08-FIT005

FILE No
BWW 1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\Remote\ING0645D-08-FIT005 revT0.dwg May 30, 2019 – 9:48am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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2128
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
RECYCLE SUMP 1 PUMP 2 FLOW CLAMP-ON FLOW METER
FIT006

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER
JW13898-08-FIT006

CONSULTANT'S NUMBER
ING0645D-08-FIT006

FILE No
BWW 1300

T0

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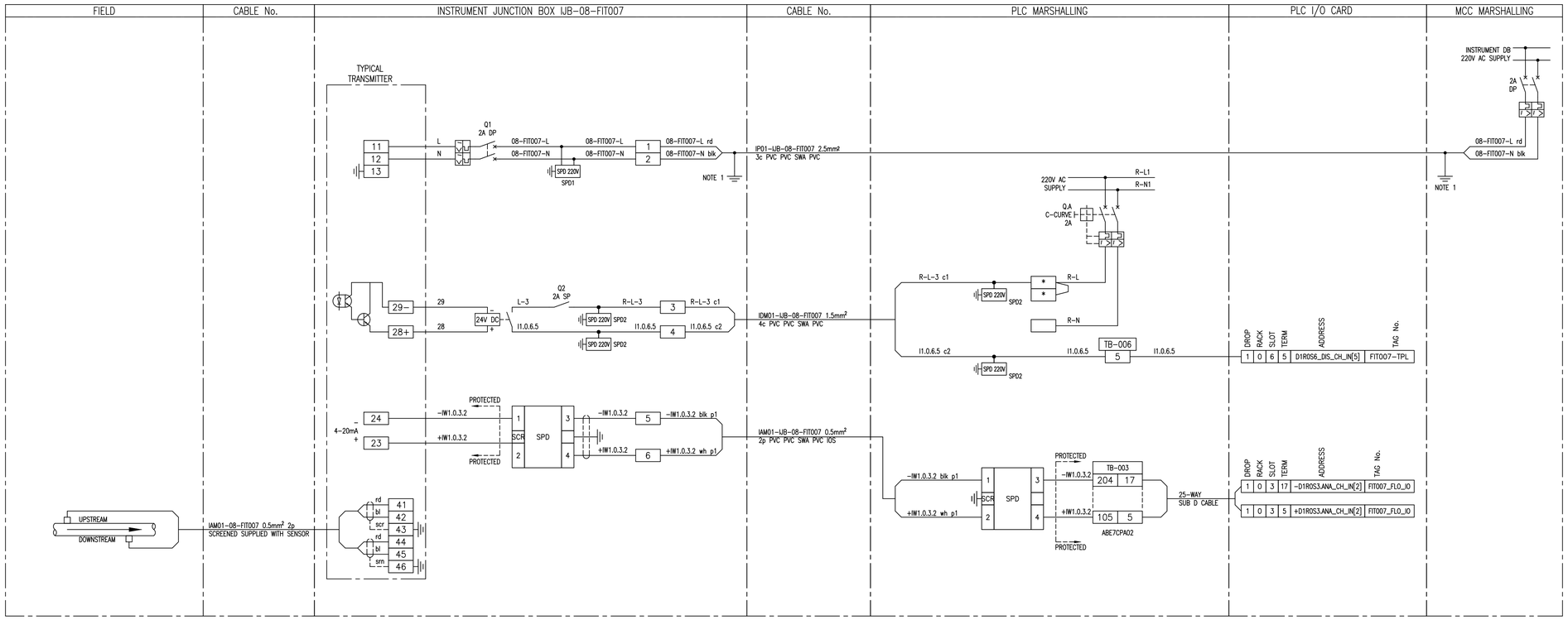

NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RECYCLE SUMP 1 TRANSFER PUMPS FLOW CLAMP-ON FLOW METER

FIT007

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

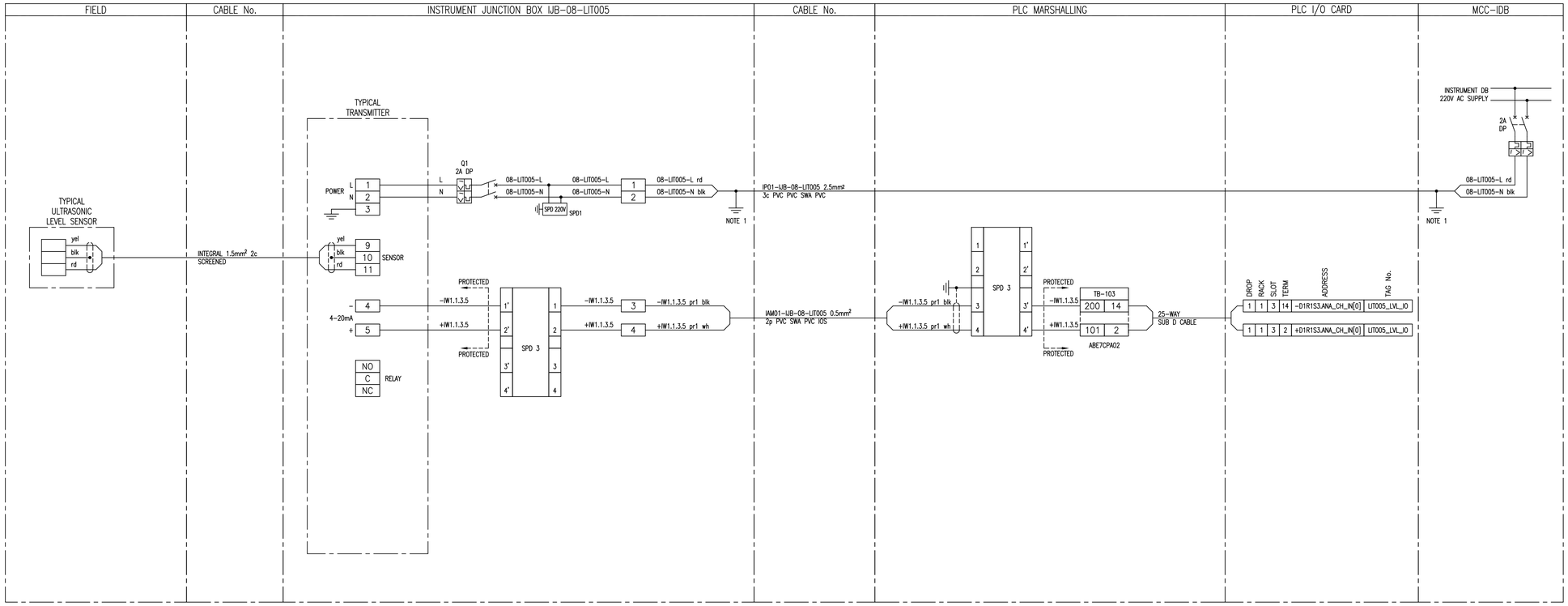
JW NUMBER
JW13898-08-FIT007

CONSULTANT'S NUMBER
ING0645D-08-FIT007

FILE No
BWW 1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\Remote\ING0645D-08-FIT007 revT0.dwg May 30, 2019 – 9:48am



NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

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SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

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DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RECIRCULATION SUMP 1 ULTRASONIC LEVEL

LIT005

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	AMENDMENTS	APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER JW13898-08-LIT005

CONSULTANT'S NUMBER ING0645D-08-LIT005

FILE No BWW 1300

T0

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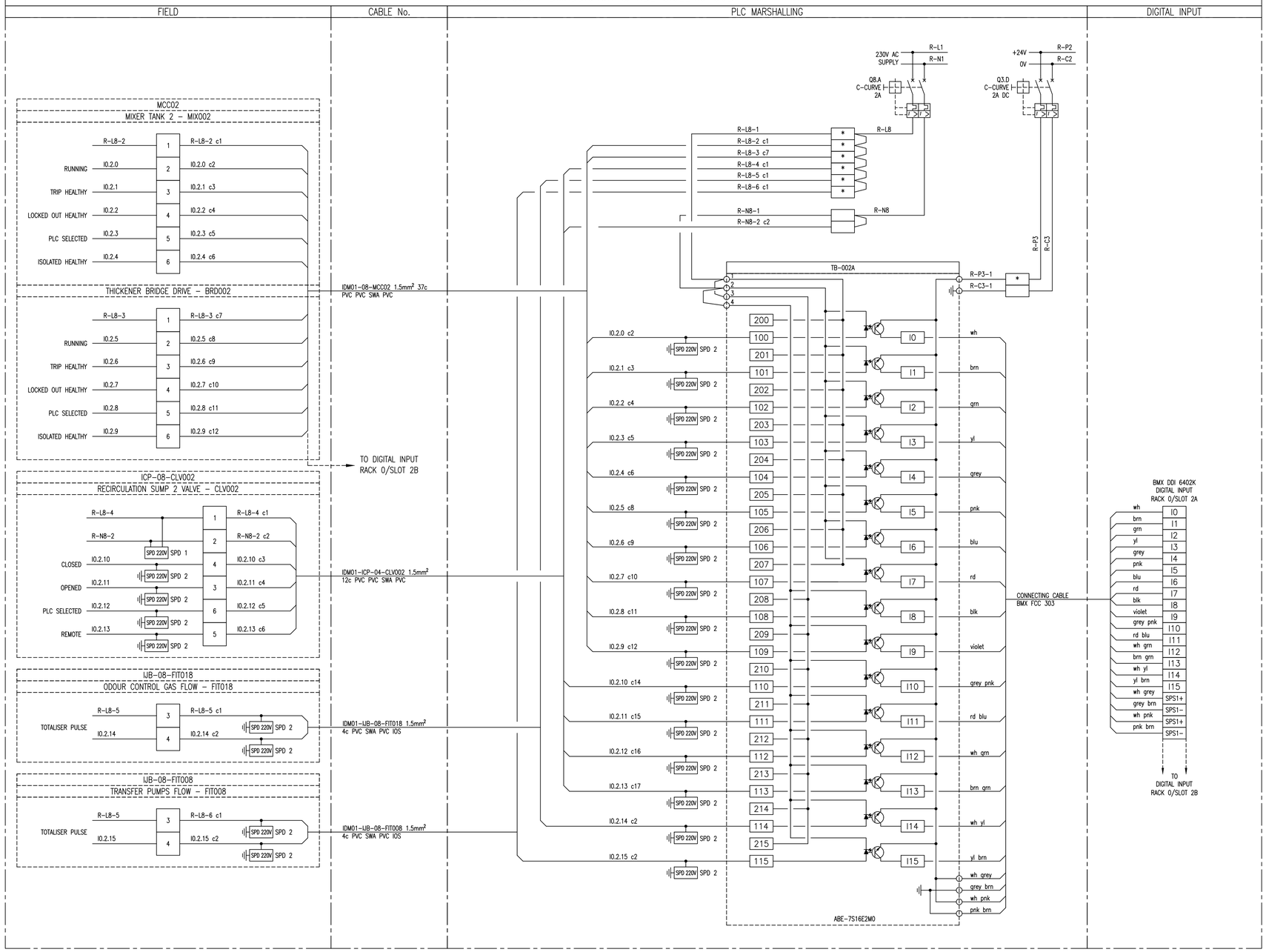
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT
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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S2A-DI

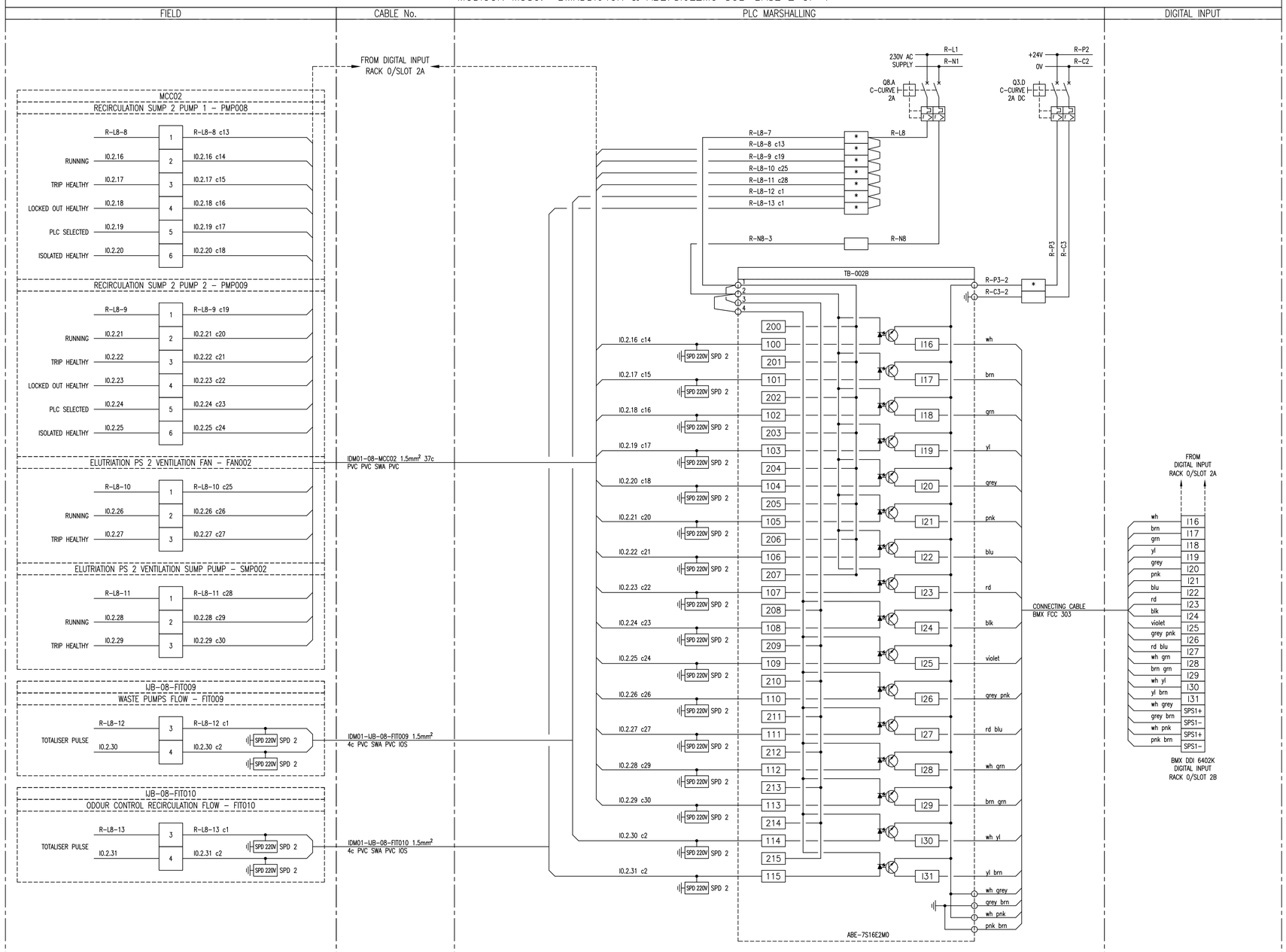
CONSULTANT'S NUMBER
ING0645D-08-R0S2A-DI

FILE No
BWW 1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S2A-DI revT0.dwg May 30, 2019 – 9:36am

MODICON M580: BMXDDI640K & ABE7SI6E2MO SUB-BASE 2 OF 4



NOTES:

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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 2B

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S2B-DI

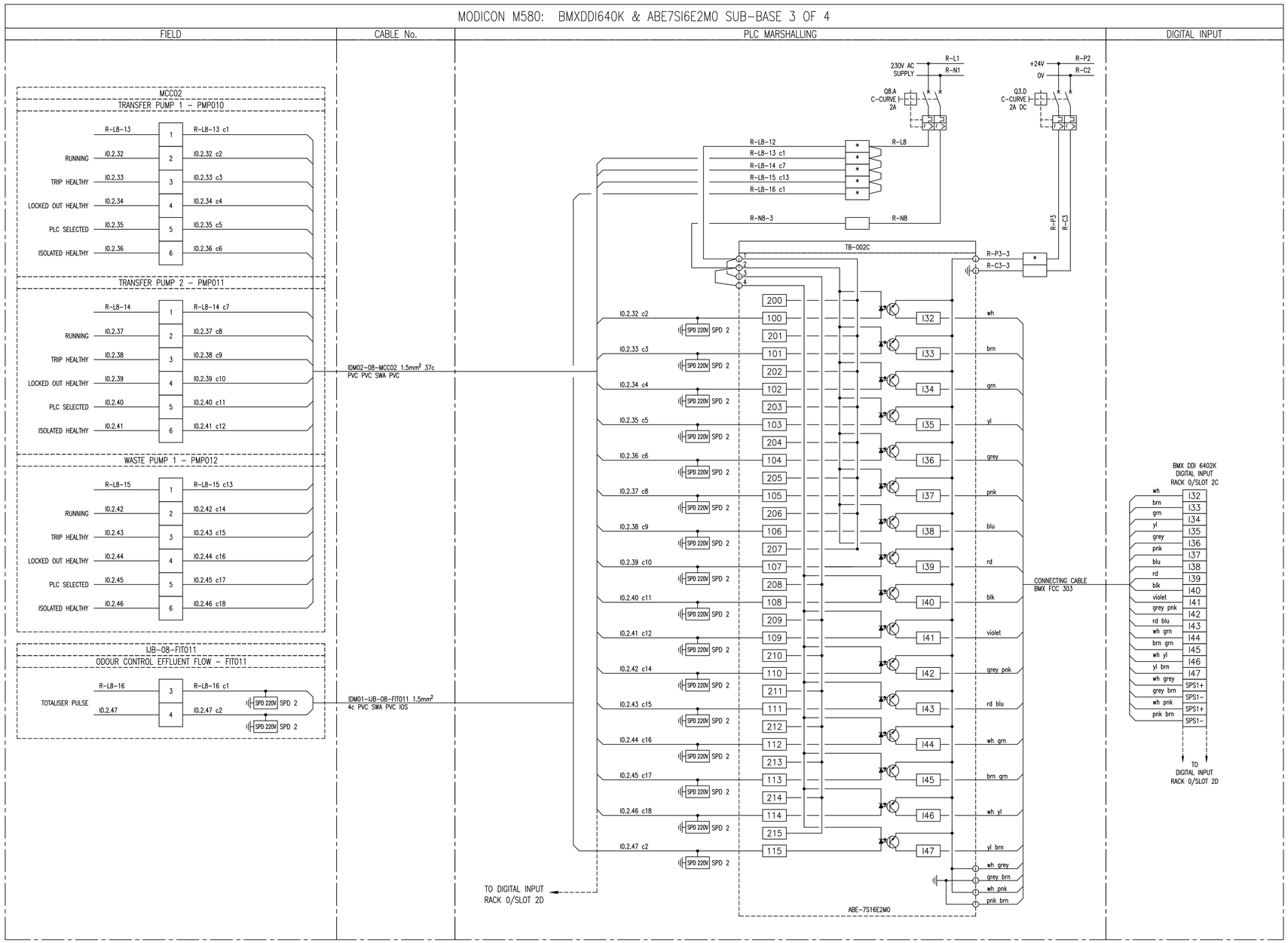
CONSULTANT'S NUMBER
ING0645D-08-R0S2B-DI

FILE No
BWW 1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. Cad and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S2B-DI revT0.dwg May 30, 2019 – 9:36am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



NOTES:

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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

DIGITAL INPUT MODULE: SUB-BASE 3 OF 4

RACK 0 / SLOT 2C

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S2C-DI

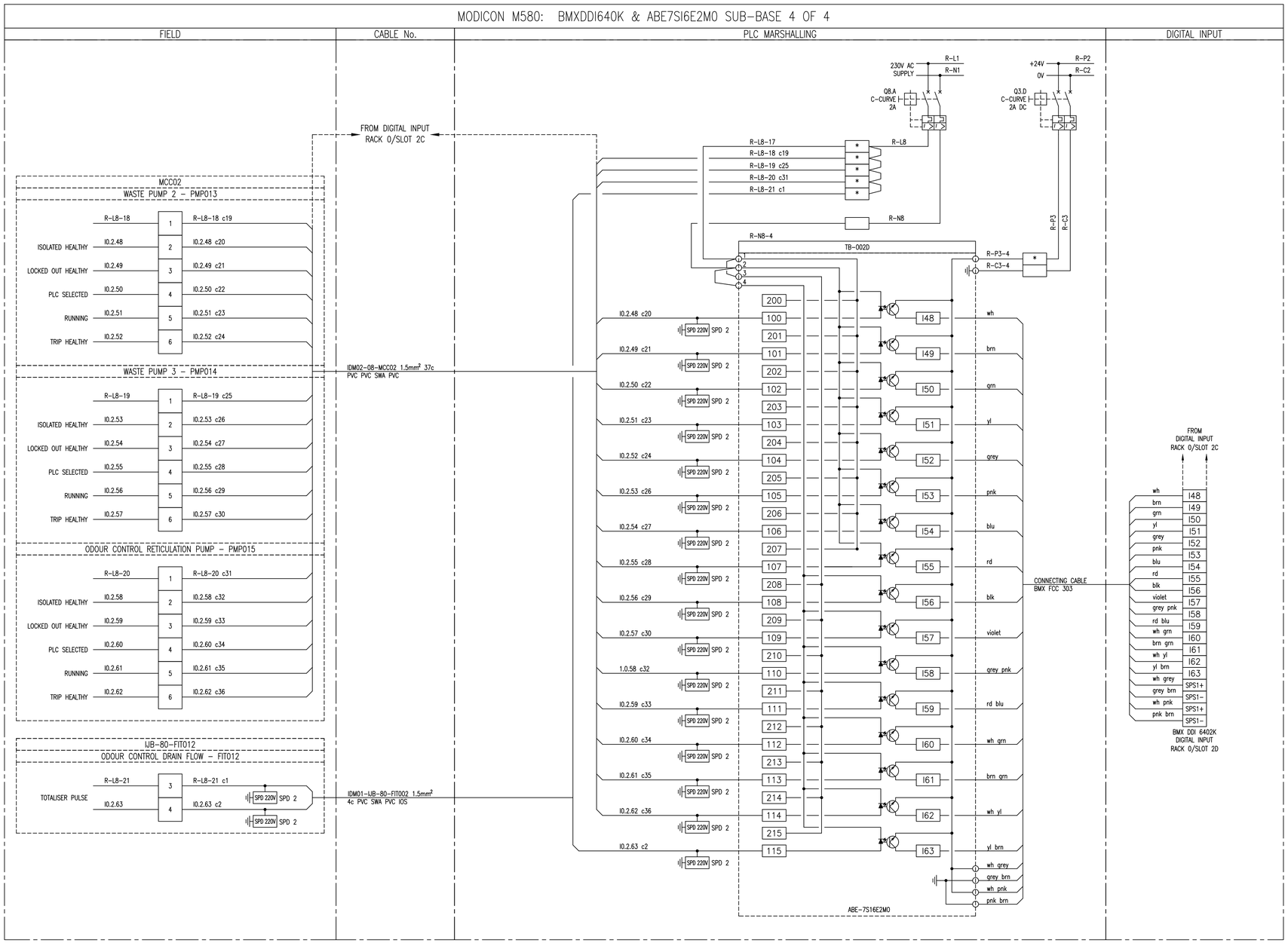
CONSULTANT'S NUMBER
ING0645D-08-R0S2C-DI

FILE No
BWW 1300

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S2C-DI rev70.dwg May 30, 2019 – 9:36am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 4 OF 4



NOTES:

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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL INPUT MODULE: SUB-BASE 4 OF 4
RACK 0 / SLOT 2D

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S2D-DI

CONSULTANT'S NUMBER
ING0645D-08-R0S2D-DI

FILE No
BWW 1300

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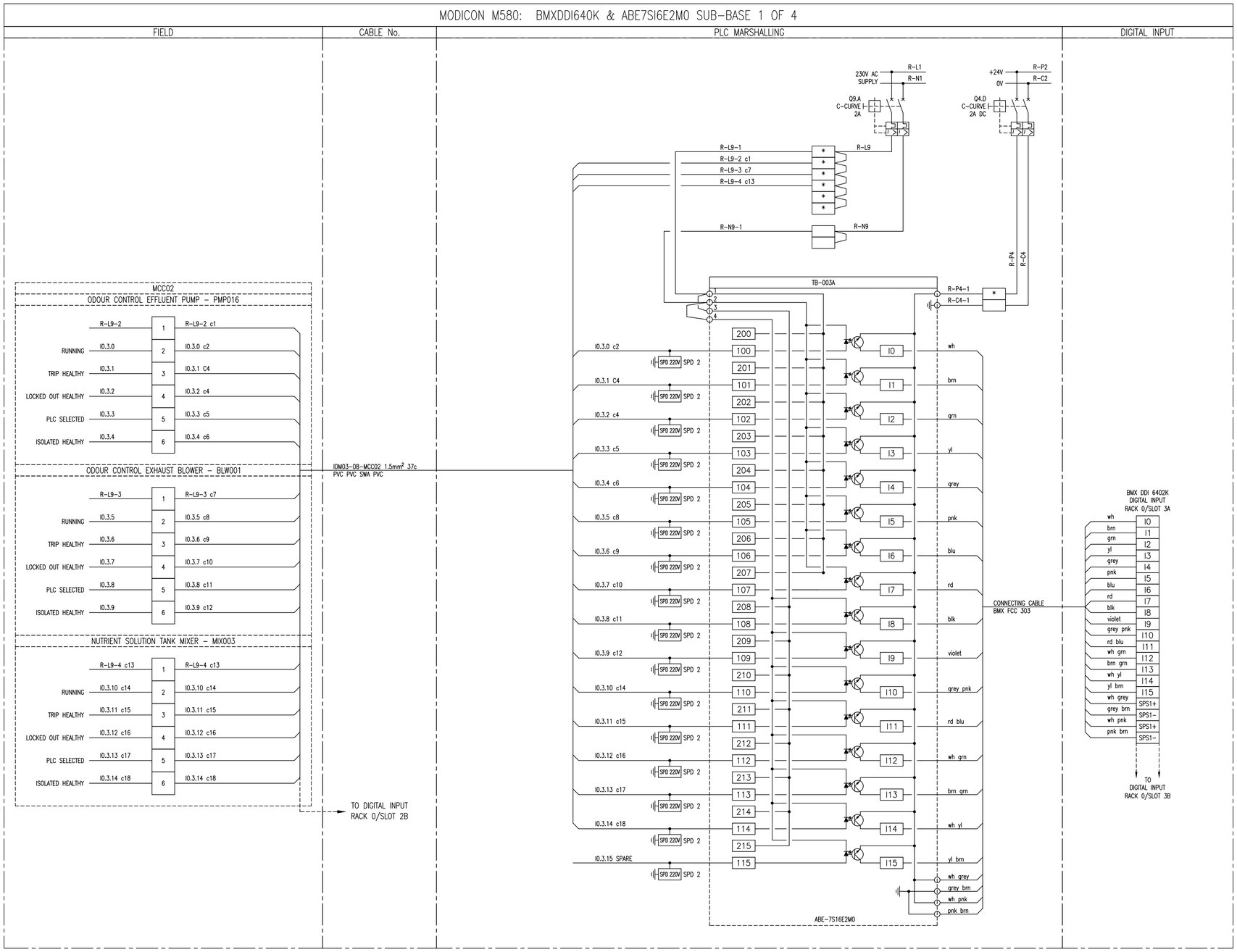
I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S2D-DI revT0.dwg May 30, 2019 - 9:36am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 3A

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S3A-DI

CONSULTANT'S NUMBER
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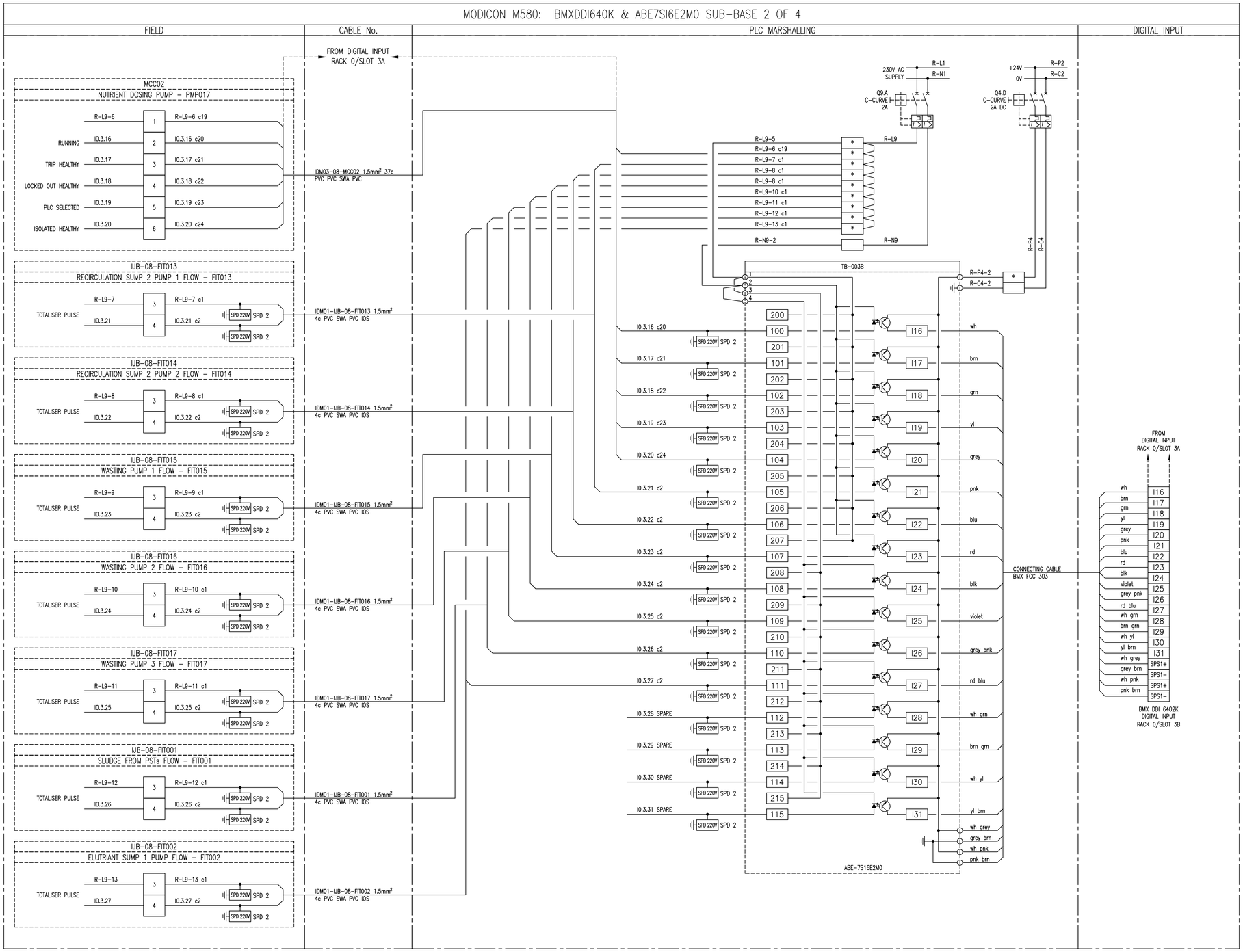
FILE No
BWW 1300

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S3A-DI revT0.dwg May 30, 2019 - 9:36am

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



NOTES:

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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DATE	DESIGNATION	APPROVED	DEPARTMENT

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	

APPROVED
Pr. Eng. No.
DATE

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 3B

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S3B-DI

CONSULTANT'S NUMBER
ING0645D-08-R0S3B-DI

FILE No
BWW 1300

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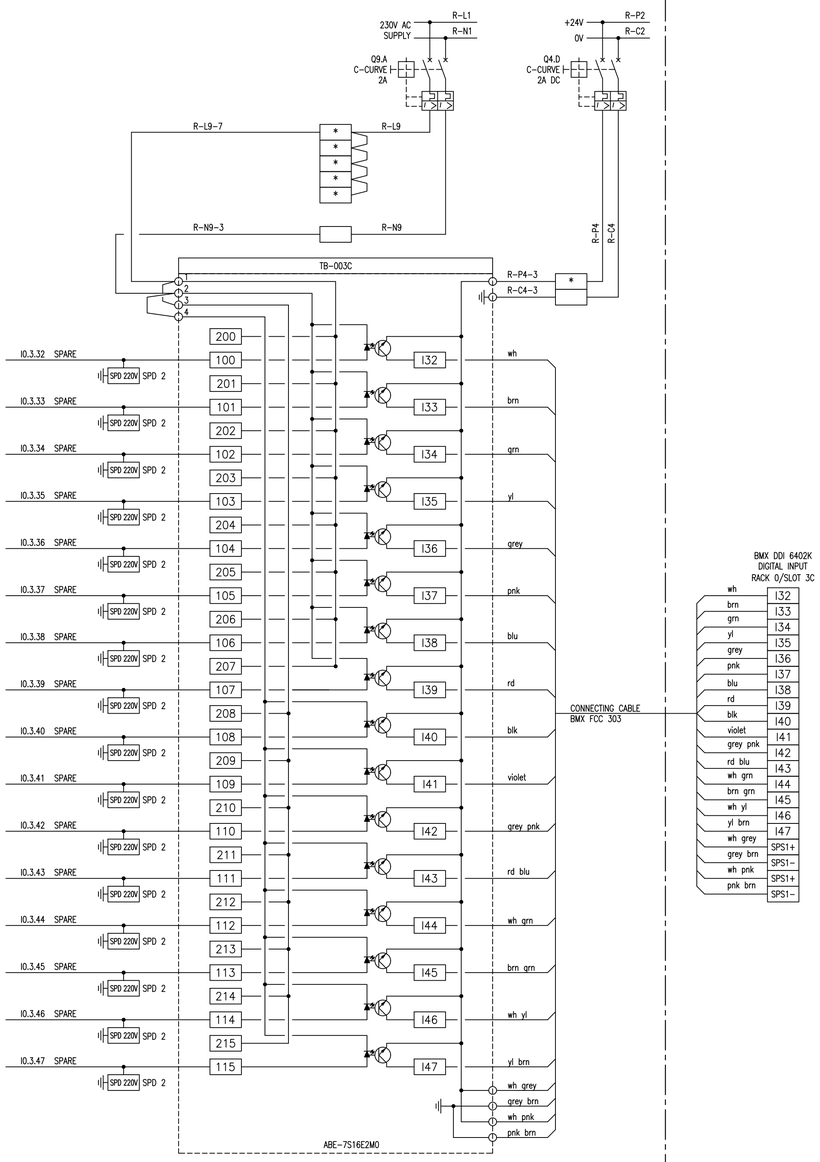
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4

FIELD	CABLE No.	PLC MARSHALLING	DIGITAL INPUT



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11. SPD 2: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

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SERVITUDES	
APPROVED	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

DIGITAL INPUT MODULE: SUB-BASE 3 OF 4

RACK 0 / SLOT 3C

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S3C-DI

CONSULTANT'S NUMBER
ING0645D-08-R0S3C-DI

FILE No
BWW 1300

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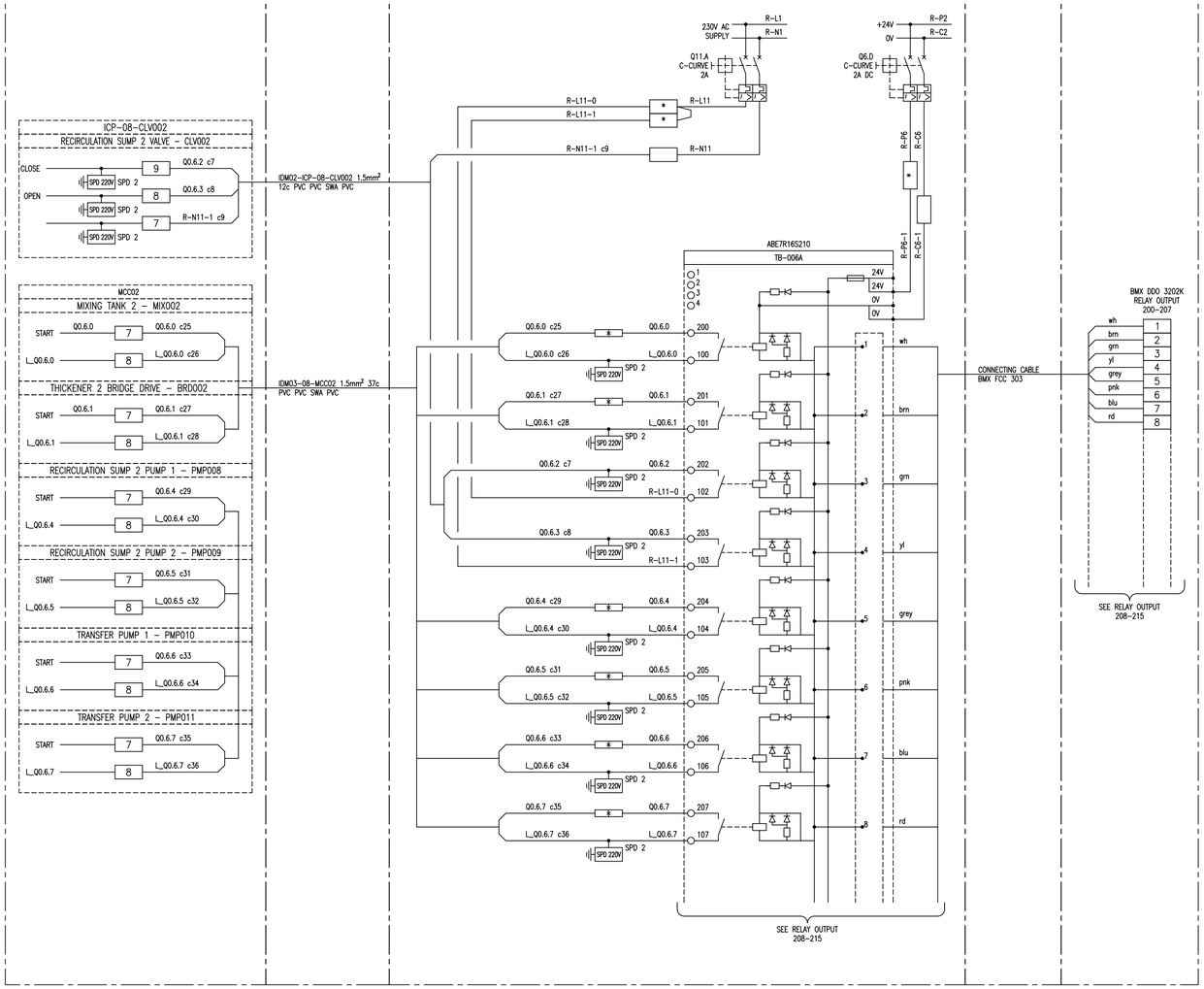
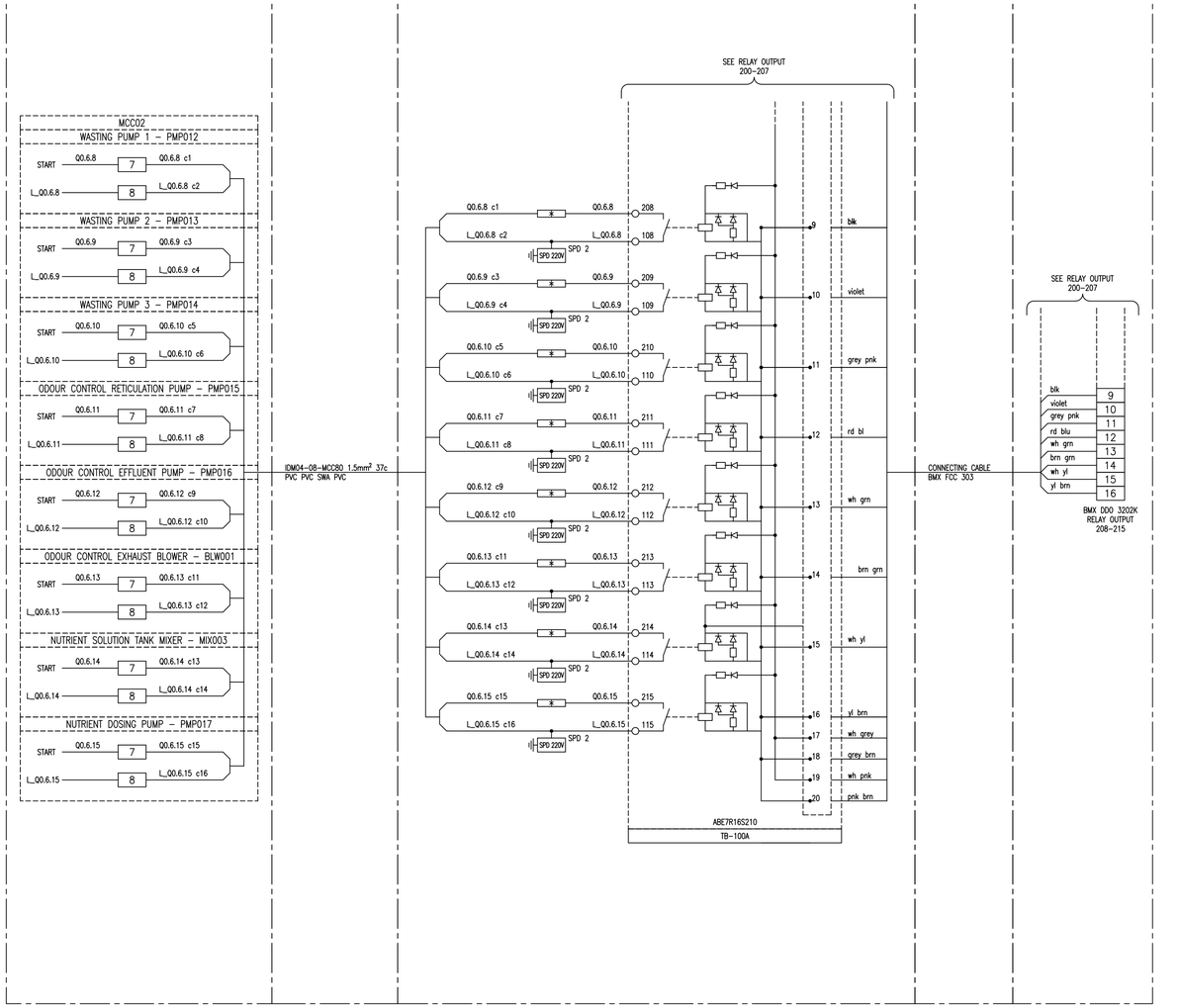
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S3C-DI rev T0.dwg May 30, 2019 – 9:37am

MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (200-207)



MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (208-215)



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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)
LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
DIGITAL OUTPUT MODULE: SUB-BASE 1 OF 2
RACK 0 / SLOT 6A (200-215)

DESIGN MANAGER

DATE

SCALE: NTS

TO	AMENDMENTS	APPROVED	DATE
	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER: JW13898-08-R0R6A-DO
CONSULTANT'S NUMBER: ING0645D-08-R0S6A-DO
FILE No: BWW 1300
TO

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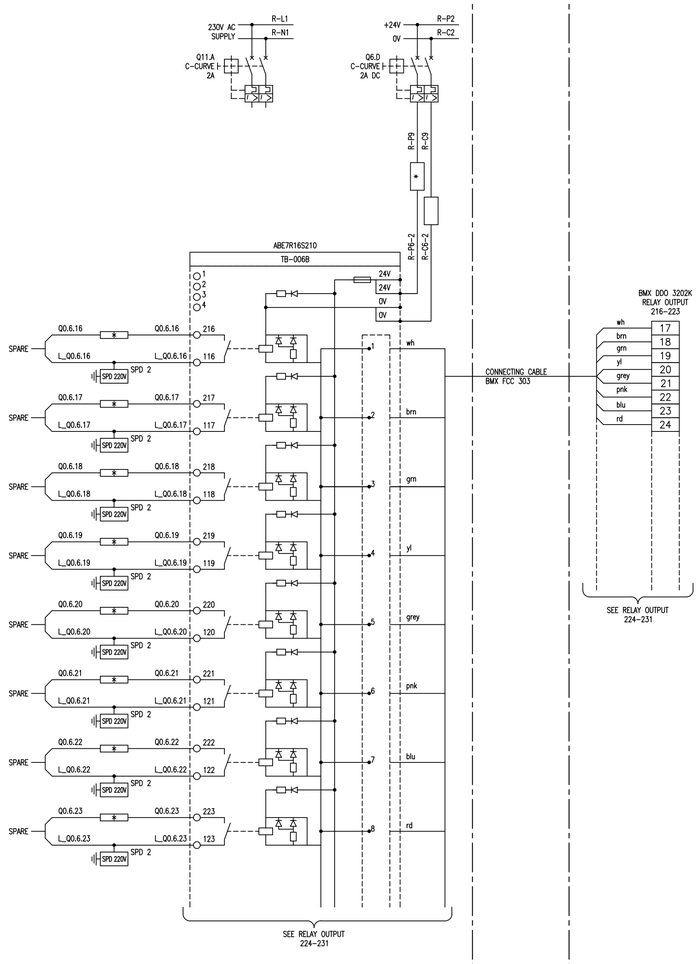
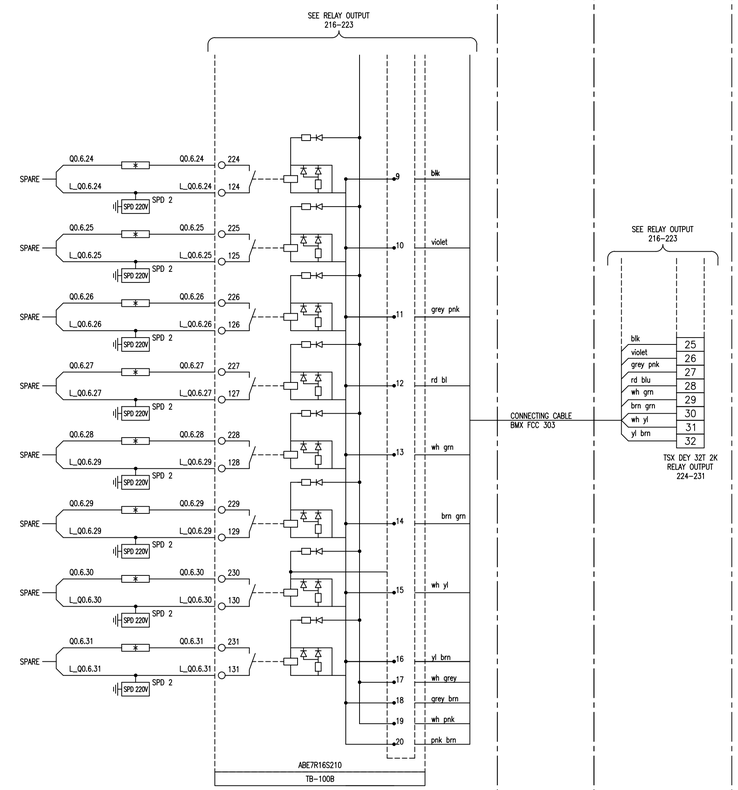
MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (216–223)

INSTRUMENT JUNCTION BOX/MCC	CABLE No.	PLC MARSHALLING	CABLE No.	RELAY OUTPUT



MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (224–231)

INSTRUMENT JUNCTION BOX/MCC	CABLE No.	PLC MARSHALLING	CABLE No.	RELAY OUTPUT



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* FUSED TERMINAL (500mA)
LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
DIGITAL OUTPUT MODULE: SUB-BASE 2 OF 2
RACK 0 / SLOT 6A (216–231)

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE

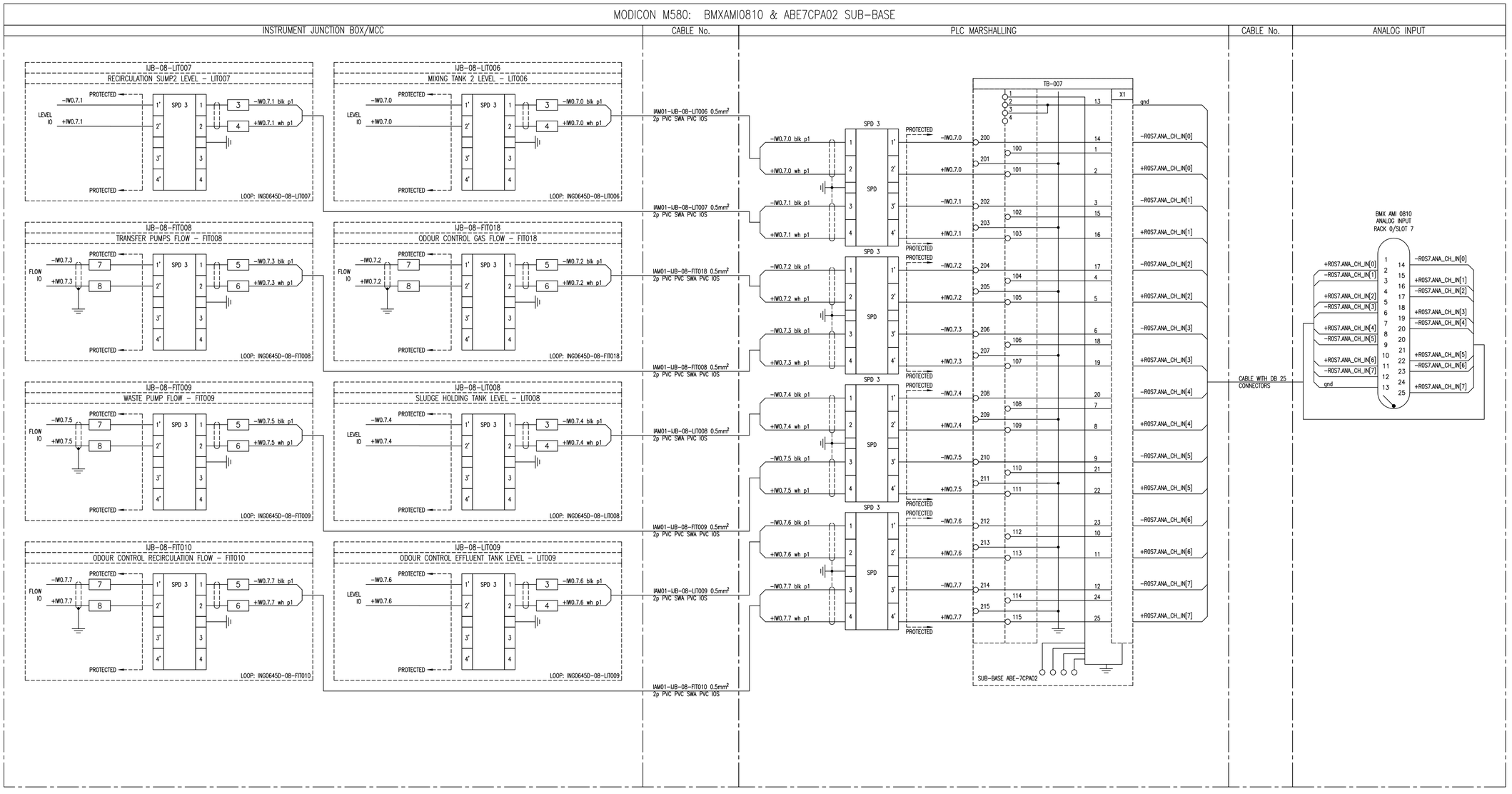
DRAWING No.

JW NUMBER
JW13898-08-R0R6B-D0

CONSULTANT'S NUMBER
ING0645D-08-R0S6B-D0

FILE No
BWW 1500

TO



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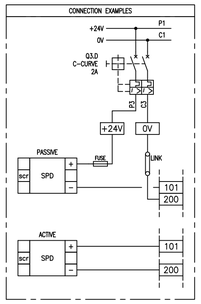
LINK TERMINAL



DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
ANALOG INPUT MODULE
LOCAL RACK 0 / SLOT 7

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

JW NUMBER
JW13898-08-R0S7-AI

CONSULTANT'S NUMBER
ING0645D-08-R0S7-AI

FILE No
BWW 1300

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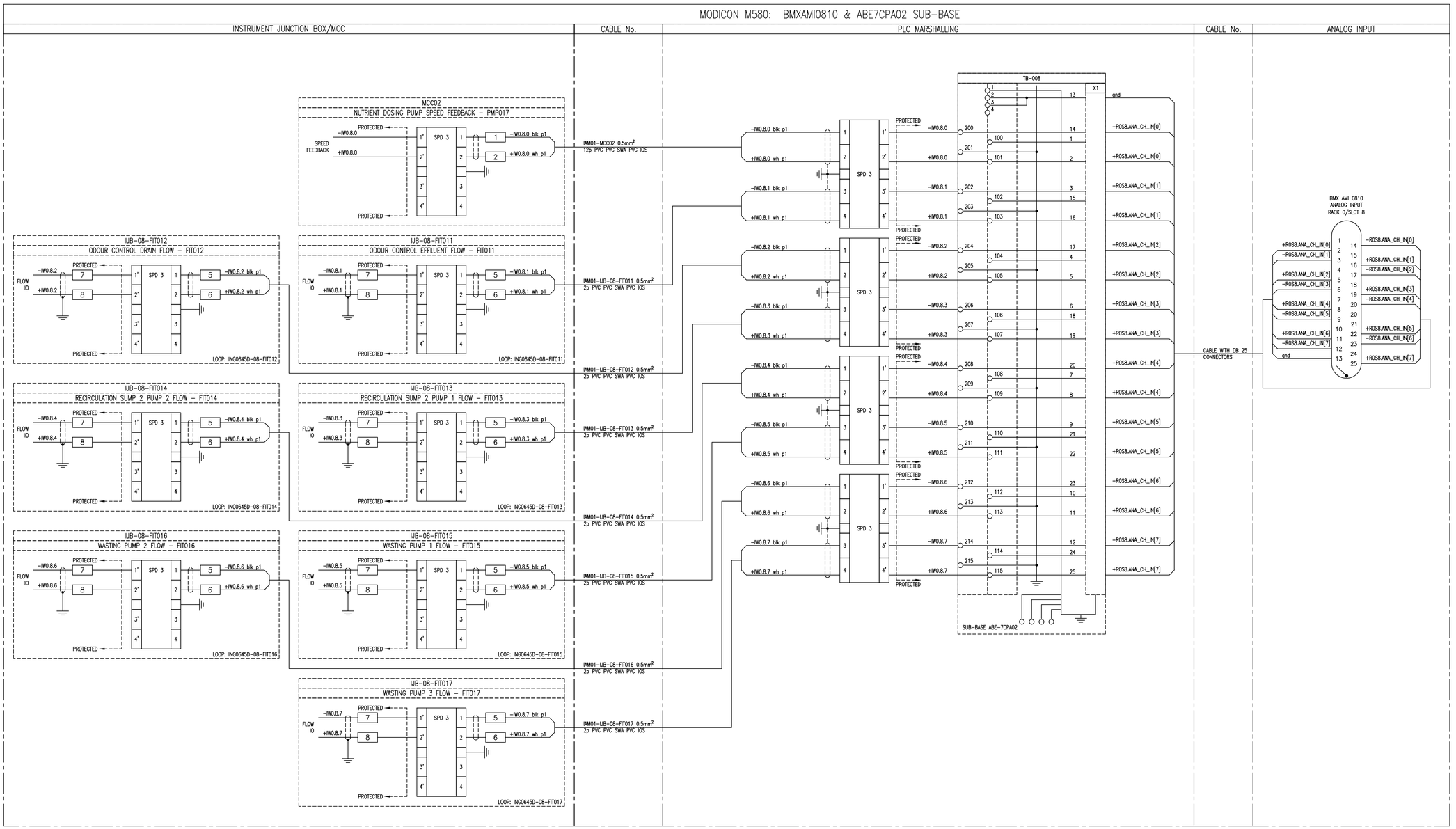

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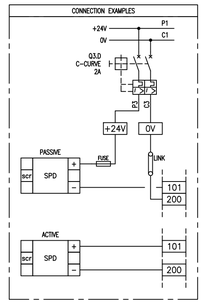

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
ANALOG INPUT MODULE
LOCAL RACK 0 / SLOT 8

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-08-ROS8-AI

CONSULTANT'S NUMBER
ING0645D-08-ROS8-AI

FILE No
BWW 1300

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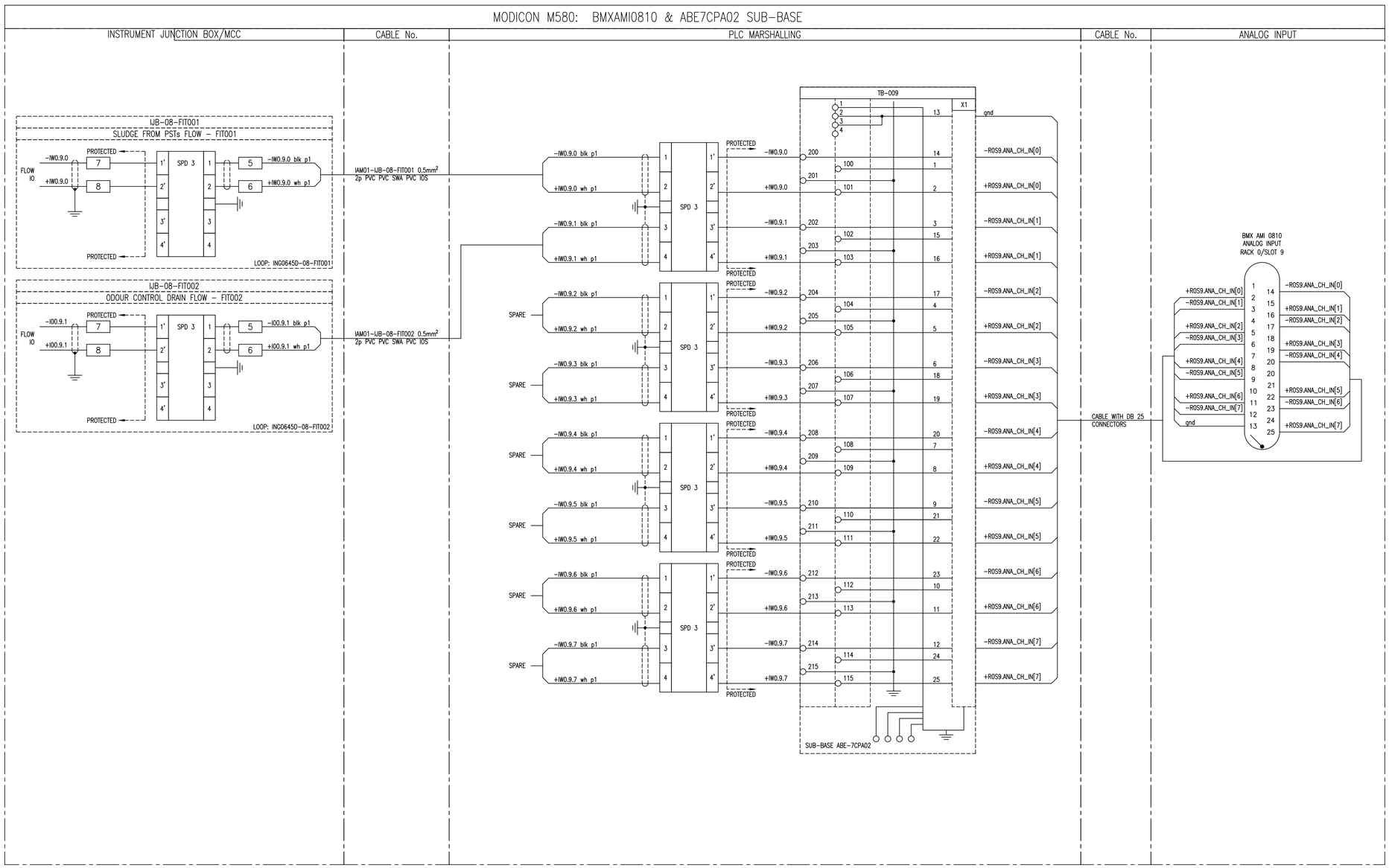

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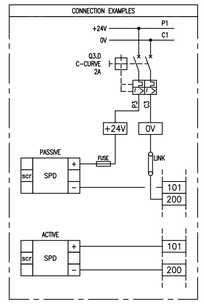

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
ANALOG INPUT MODULE
LOCAL RACK 0 / SLOT 9

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

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T0	ISSUED FOR TENDER	W BRITZ	22.05.19

DRAWING No.

JW NUMBER
JW13898-08-ROS9-AI

CONSULTANT'S NUMBER
ING0645D-80-ROS9-AI

FILE No
BWW 1300

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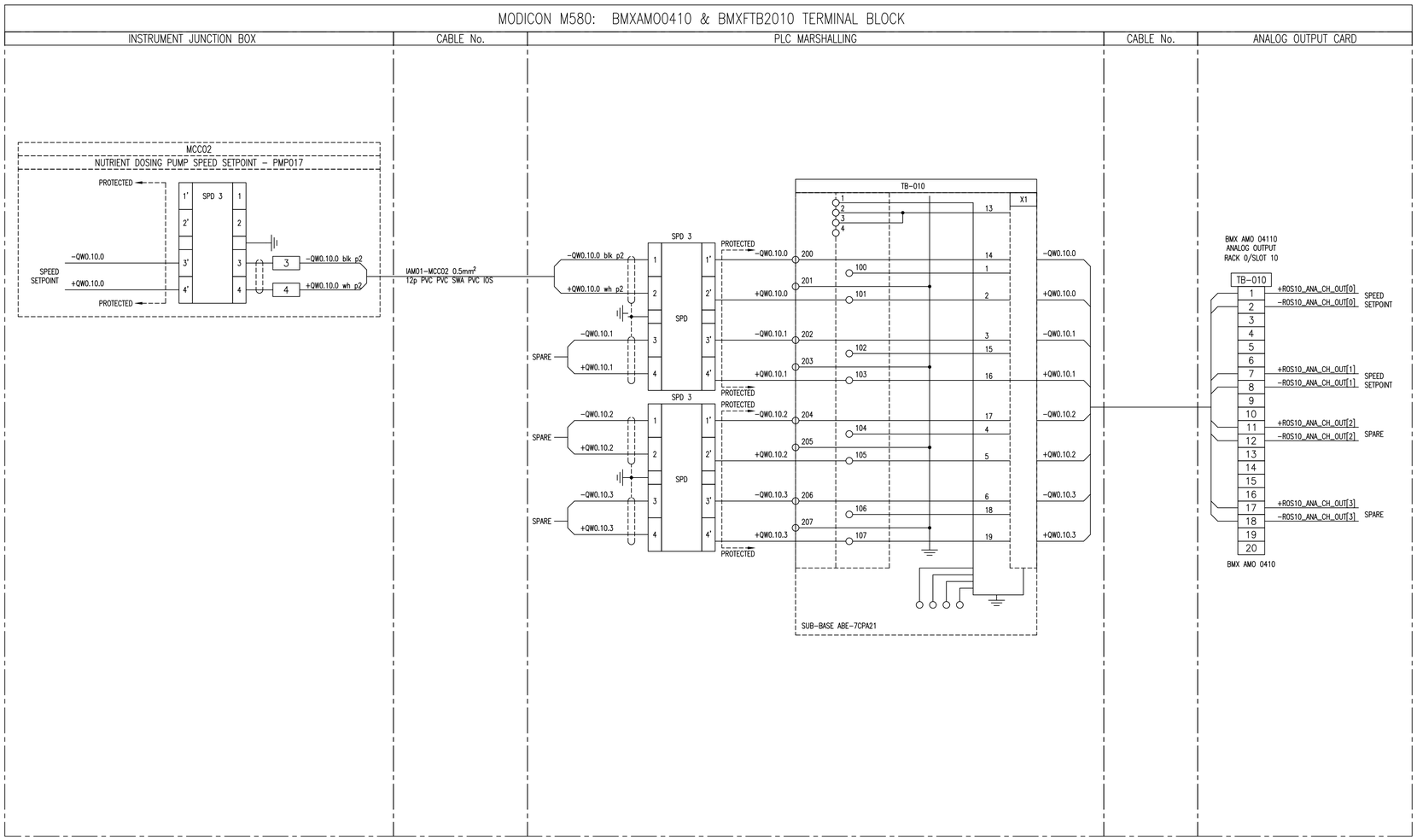
MODICON M580: BMXAMO0410 & BMXFTB2010 TERMINAL BLOCK



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5. SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT
6. SPD 1: DEHNguard DG M TN 275
7. SPD 2: DEHNguard DG S 275 VA
8. SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS
9. SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS
10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL. 011-806 7111
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WSP Group Africa (Pty) Ltd
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Building C, Knightsbridge,
33 Sloane Street, Bryanston, 2191
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - ELUTRIATION PLC-08
ANALOG OUTPUT MODULE
LOCAL RACK 0 / SLOT 10

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.05.19

DRAWING No.

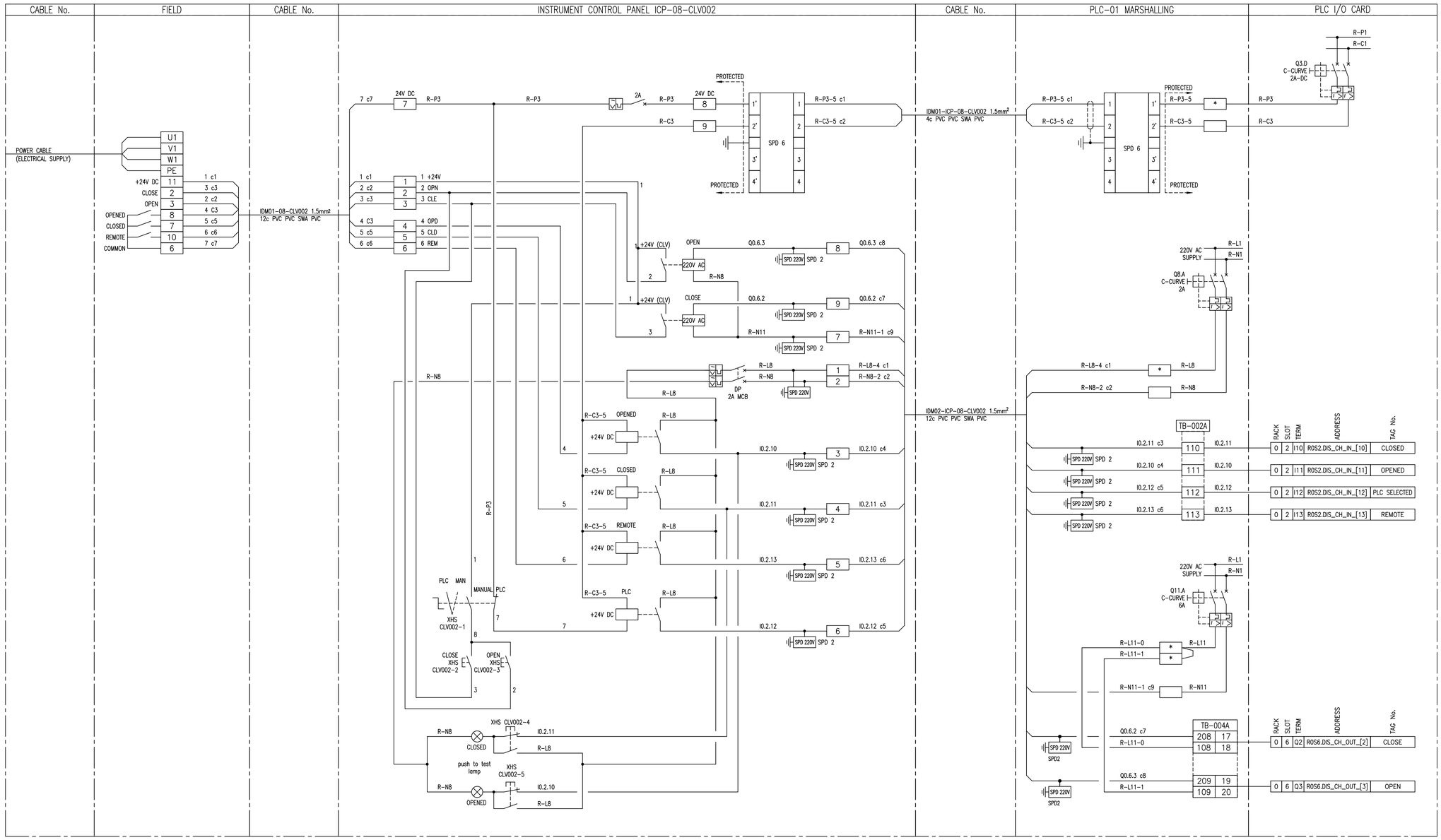
JW NUMBER
JW13898-08-R0S10-A0

CONSULTANT'S NUMBER
ING0645D-08-R0S10-A0

FILE No
BWW 1300

T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Wiring Diagrams\ING0645D-08-R0S10-A0 rev T0.dwg May 30, 2019 - 9:37am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RETICULATION SUMP 2 OPEN/CLOSE VALVE – CLV002

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.08.19

DRAWING No.

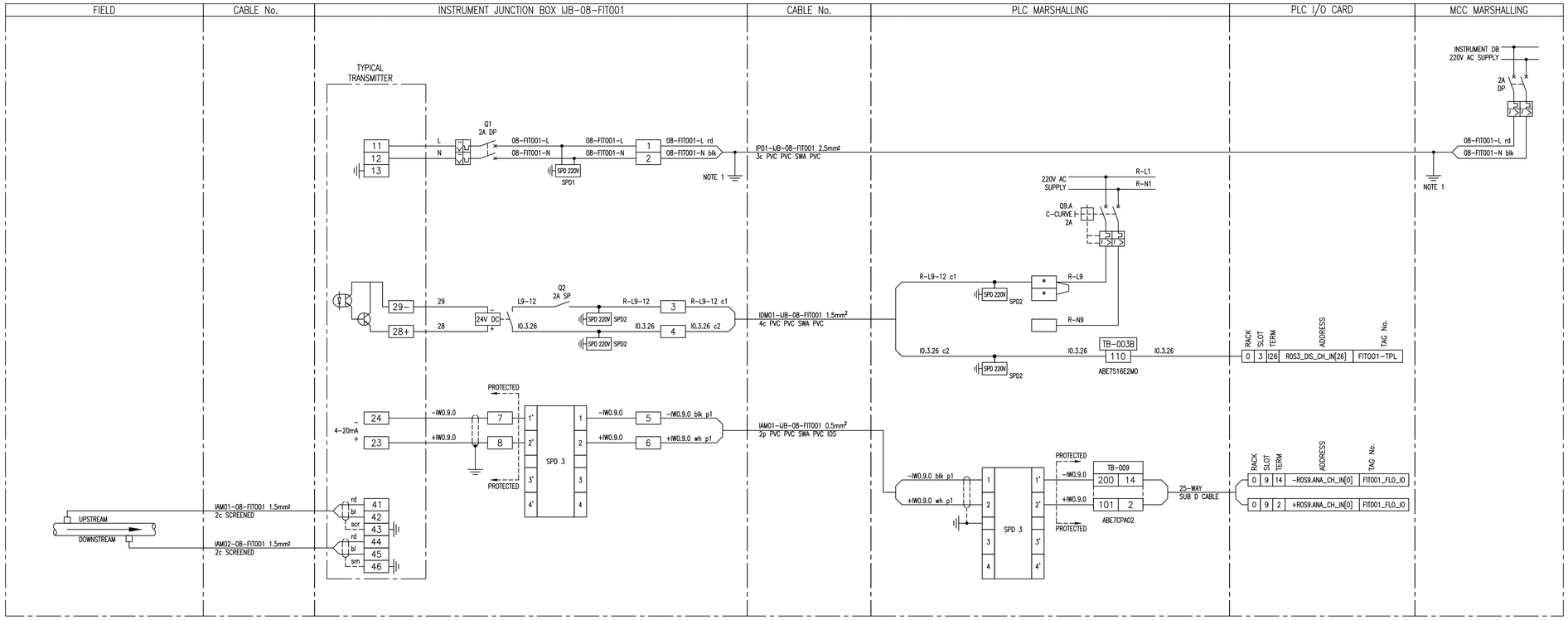
JW NUMBER
JW03898-08-CLV002

CONSULTANT'S NUMBER
ING0645D-08-CLV002

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-CLV002 revT0.dwg May 30, 2019 – 9:37am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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SERVITUDES	
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Pr. Eng. No.	
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JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
SLUDGE FROM PSTs FLOW CLAMP-ON FLOW METER
FIT001

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	13.05.19

DRAWING No.

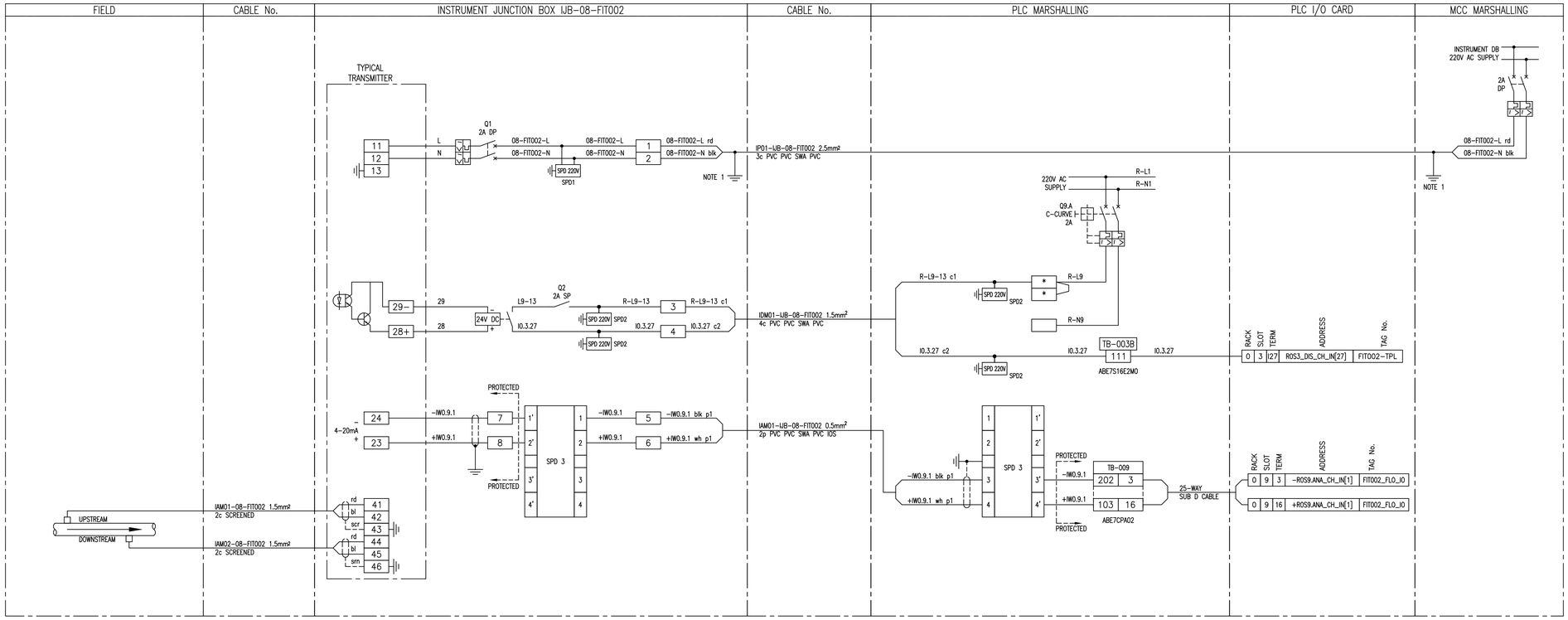
JW NUMBER
JW13898-08-FIT001

CONSULTANT'S NUMBER
ING0645D-08-FIT001

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT001 revT0.dwg May 30, 2019 – 9:37am



NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

ELUTRIANT SUMP 1 PUMP FLOW CLAMP-ON FLOW METER

FIT002

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER
JW13898-08-FIT002

CONSULTANT'S NUMBER
ING0645D-08-FIT002

FILE No
BWW 1300

T0

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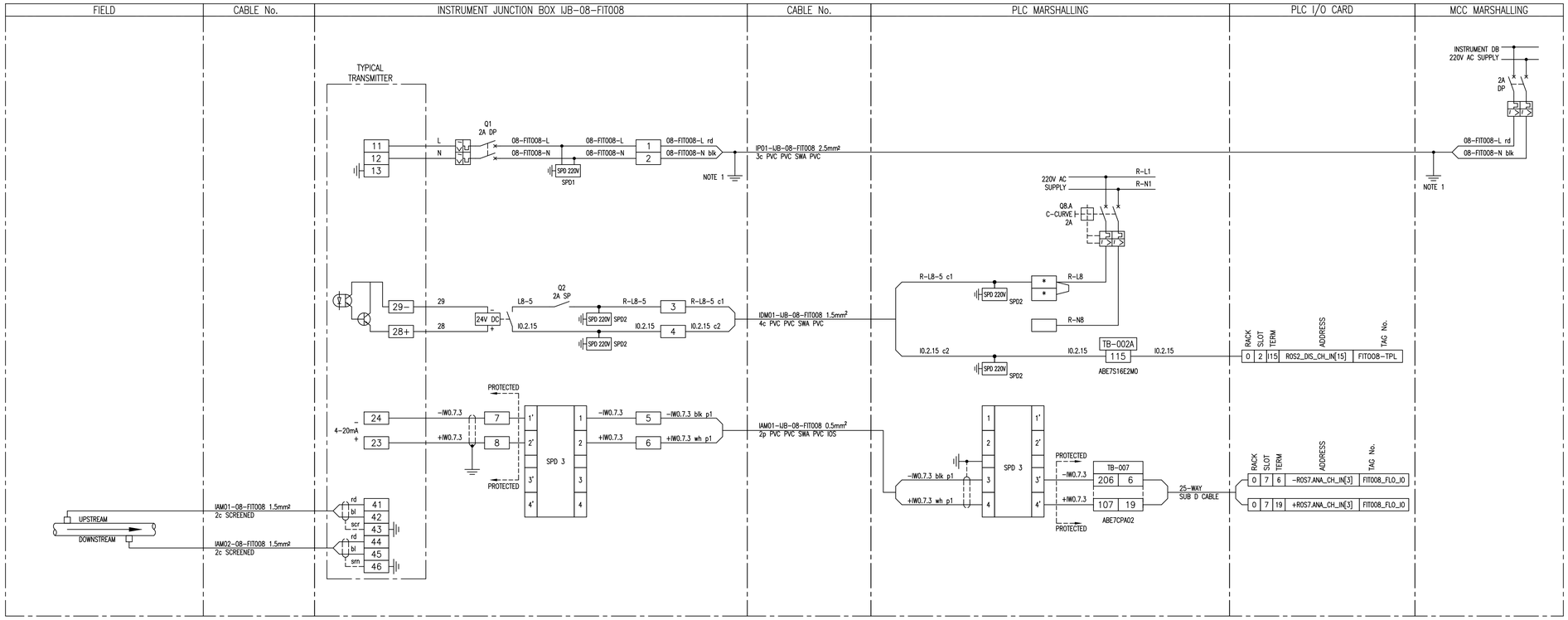

NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

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FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

TRANSFER PUMPS FLOW CLAMP-ON FLOW METER

FIT008

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

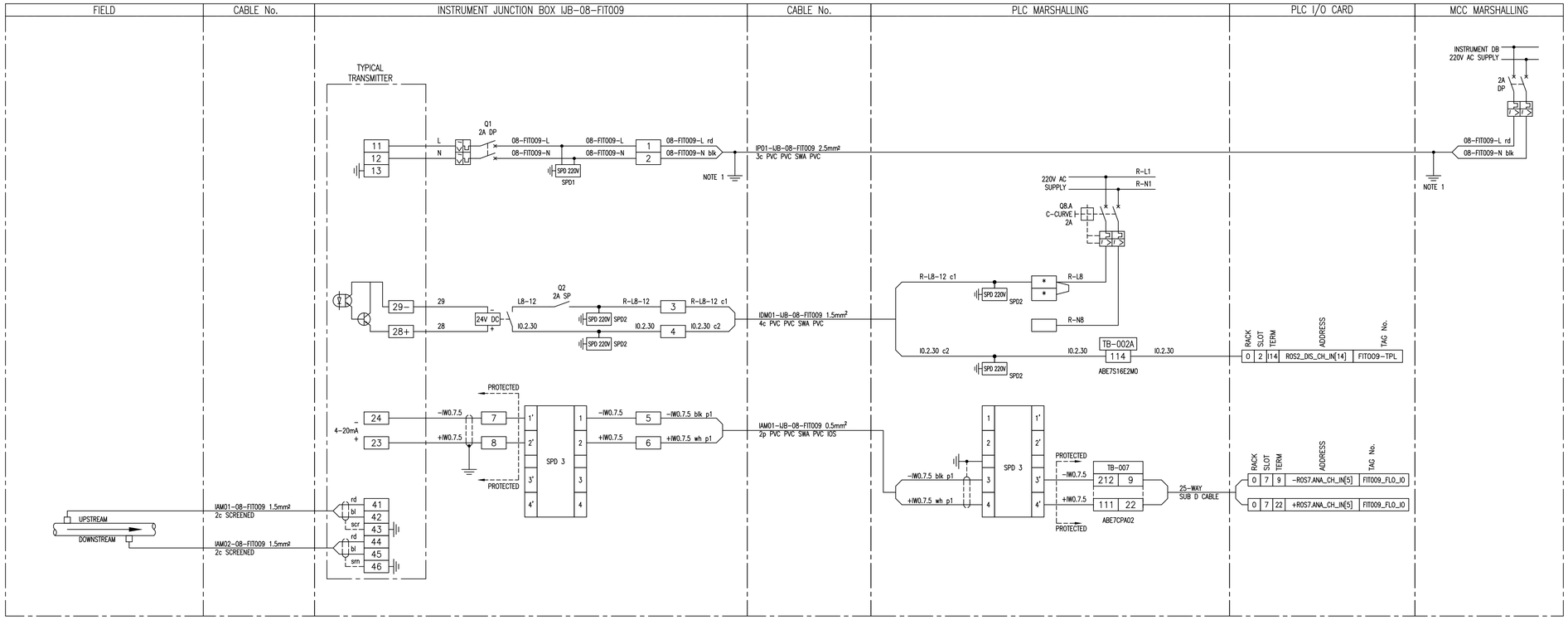
JW NUMBER
JW13898-08-FIT008

CONSULTANT'S NUMBER
ING0645D-08-FIT008

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT008 revT0.dwg May 30, 2019 – 9:37am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RECIRCULATION SUMP 2 PUMP FLOW CLAMP-ON FLOW METER

FIT009

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

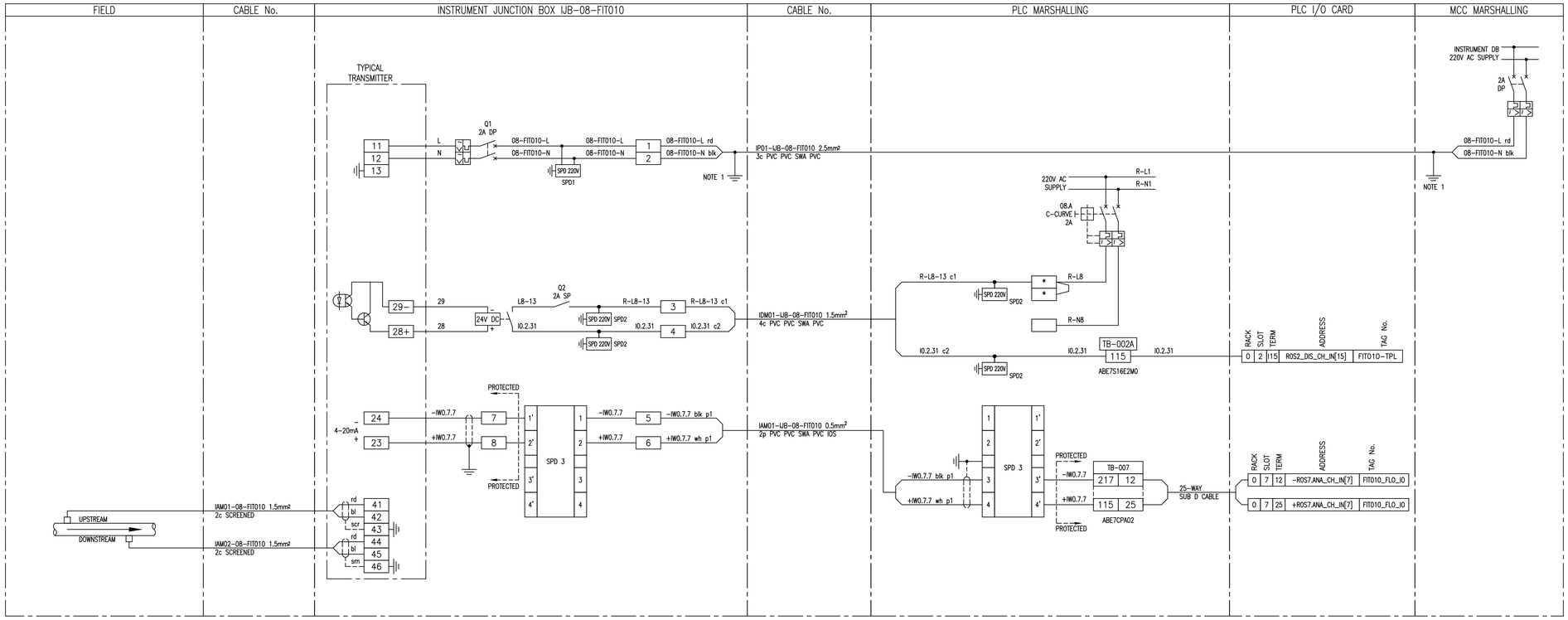
JW NUMBER
JW13898-08-FIT009

CONSULTANT'S NUMBER
ING0645D-08-FIT009

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT009 revT0.dwg May 30, 2019 – 9:37am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
CHECKED	W BRITZ
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

ODOUR CONTROL RECIRCULATION FLOW CLAMP-ON FLOW METER

FIT010

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

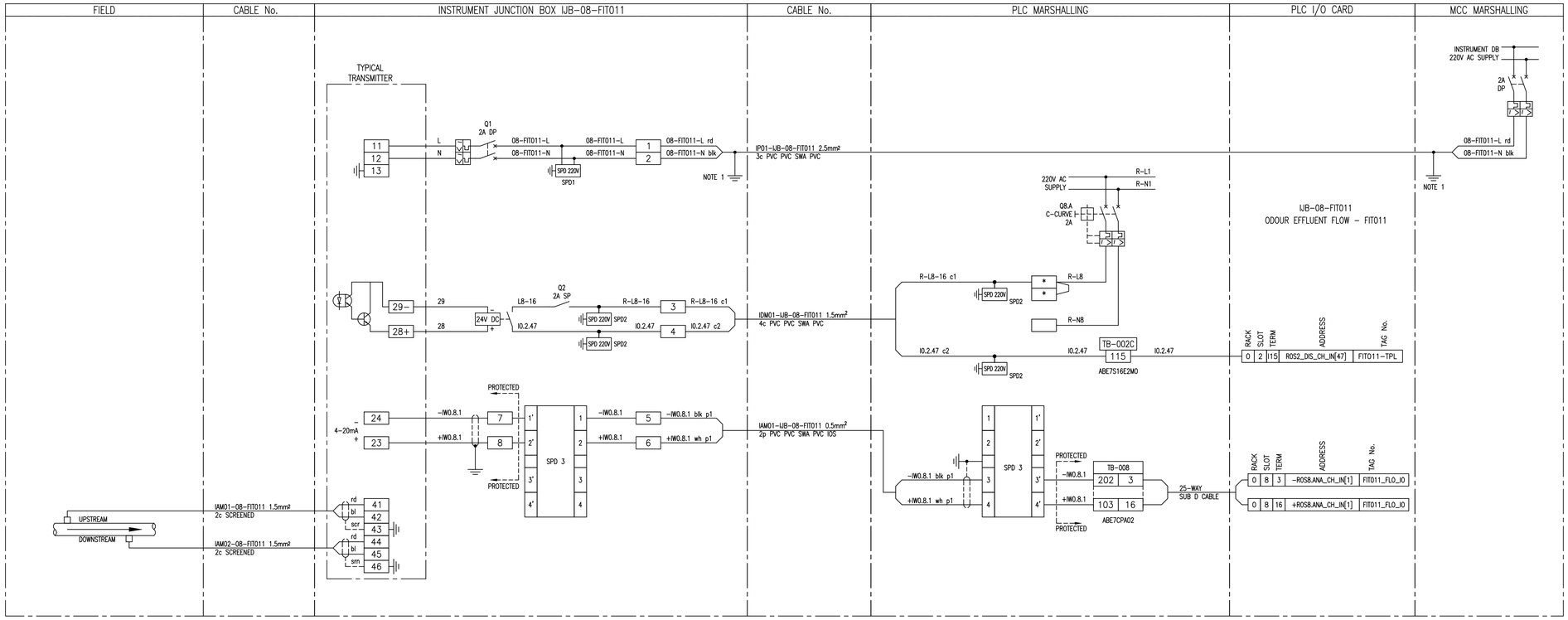
JW NUMBER JW13898-08-FIT010

CONSULTANT'S NUMBER ING0645D-08-FIT010

FILE No BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT010 revT0.dwg May 30, 2019 – 9:37am



NOTES:

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* FUSED TERMINAL (500mA)

LINK TERMINAL

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - ELUTRIATION PLC-08

ODOUR CONTROL EFFLUENT FLOW CLAMP-ON FLOW METER

FIT011

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER JW13898-08-FIT011

CONSULTANT'S NUMBER ING0645D-08-FIT011

FILE No BWW 1300

T0

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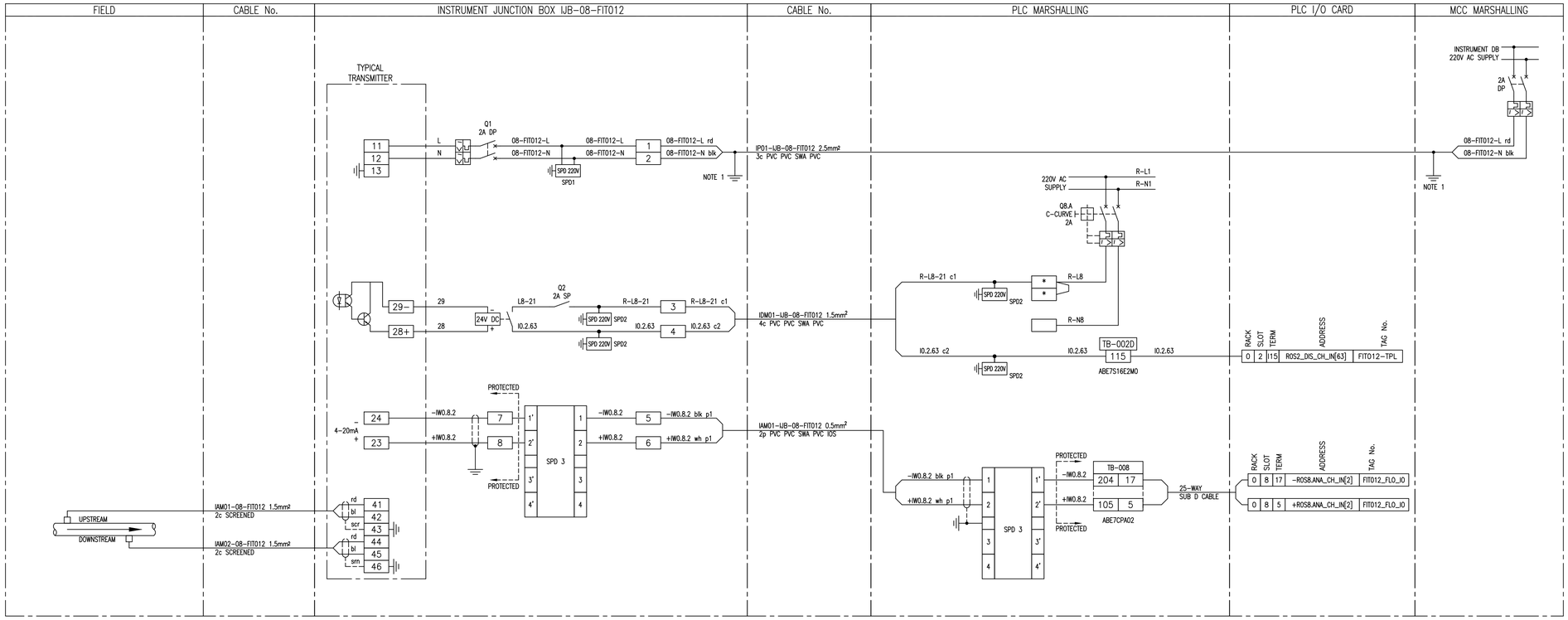

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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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Johannesburg Water

17 HARRISON STREET
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2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
ODOUR CONTROL DRAIN FLOW CLAMP-ON FLOW METER
FIT012

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

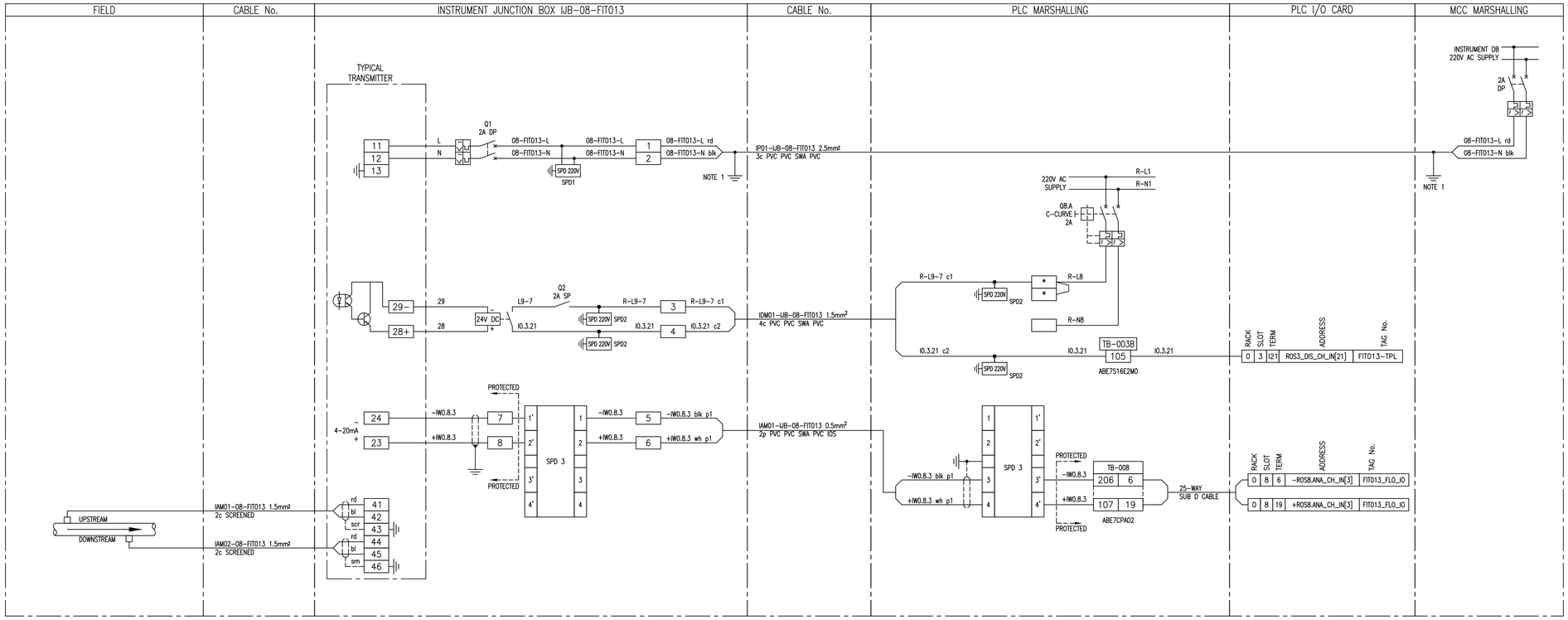
JW NUMBER
JW13898-08-FIT012

CONSULTANT'S NUMBER
ING0645D-08-FIT012

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT012 revT0.dwg May 30, 2019 – 9:38am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
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TEL. 011-806 7111
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RECIRCULATIONN SUMP 2 PUMP 1 FLOW CLAMP-ON FLOW METER

FIT013

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

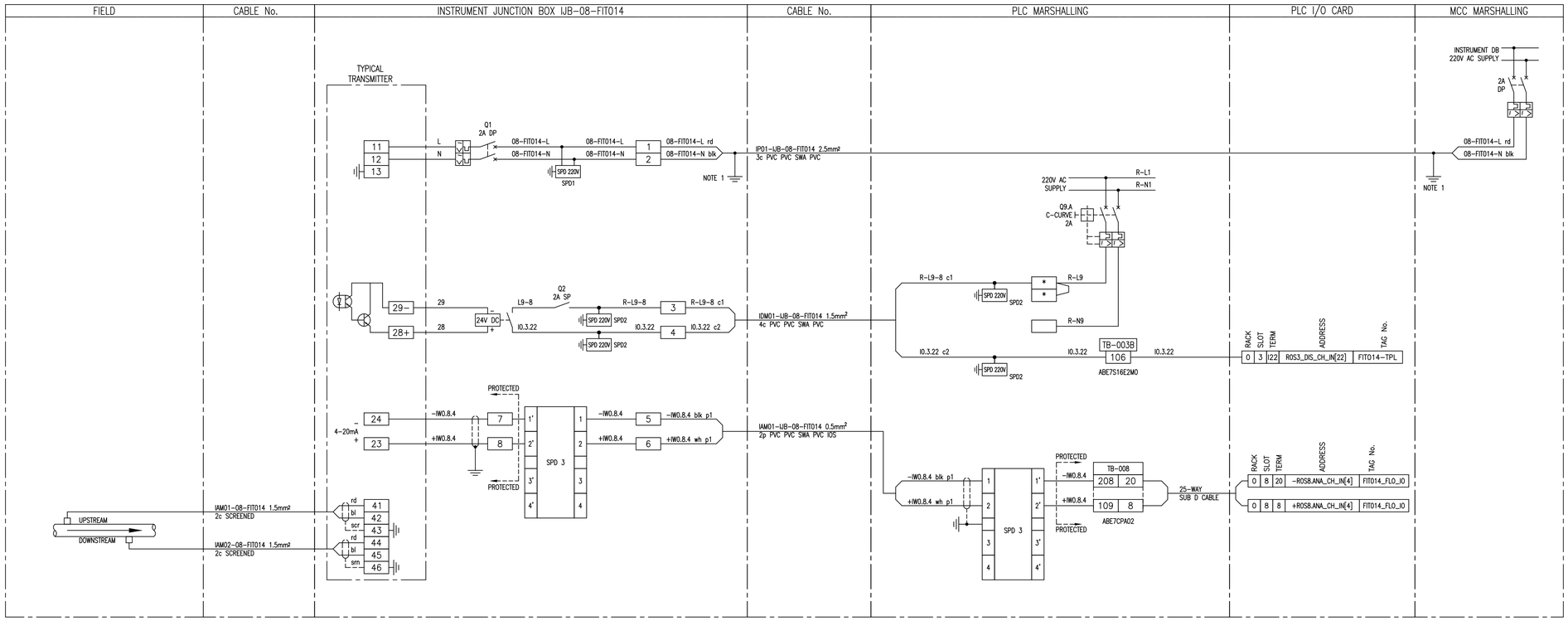
JW NUMBER JW13898-08-FIT013

CONSULTANT'S NUMBER ING0645D-08-FIT013

FILE No BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT013 revT0.dwg May 30, 2019 – 9:38am



NOTES:

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SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SERVITUDES	
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JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
RECIRCULATIONN SUMP 2 PUMP 2 FLOW CLAMP-ON FLOW METER
FIT014

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

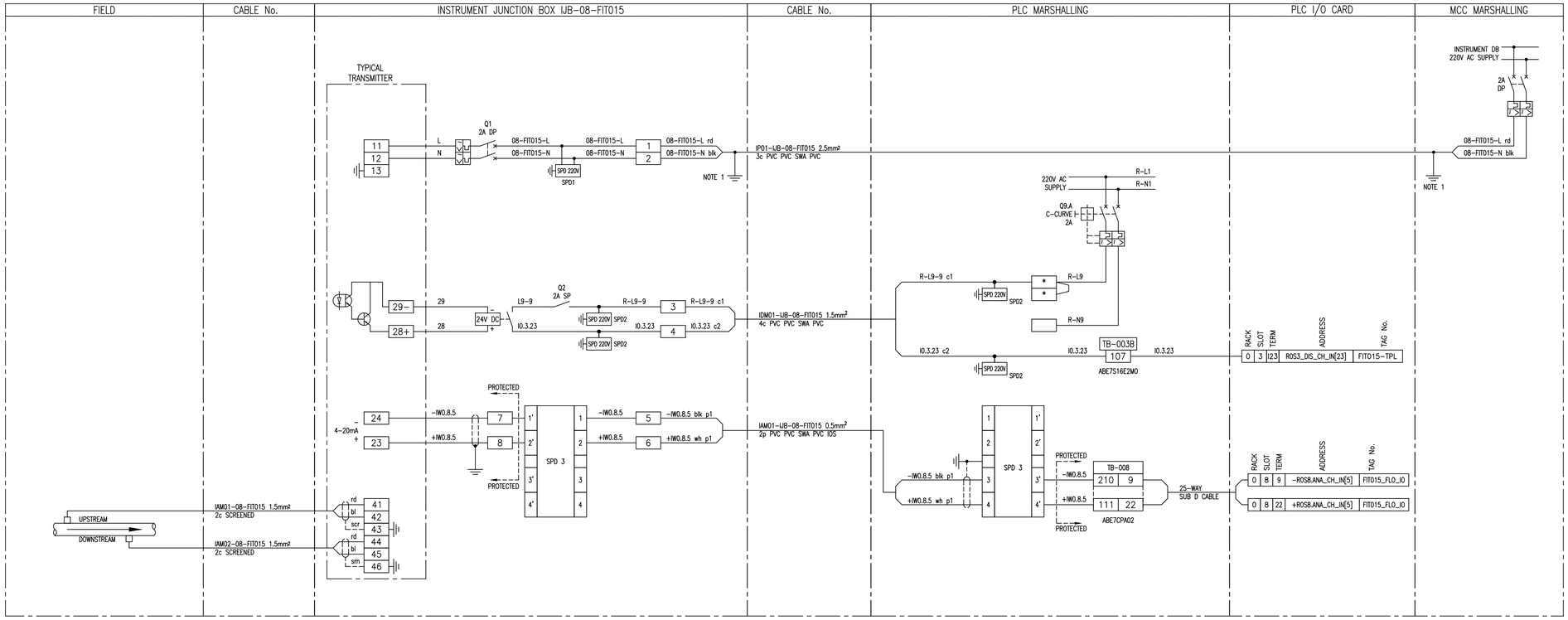
JW NUMBER
JW13898-08-FIT014

CONSULTANT'S NUMBER
ING0645D-08-FIT014

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT014 revT0.dwg May 30, 2019 – 9:38am



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

WASTING PUMP 1 FLOW CLAMP-ON FLOW METER

FIT015

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER JW13898-08-FIT015

CONSULTANT'S NUMBER ING0645D-08-FIT015

FILE No BWW 1300

T0

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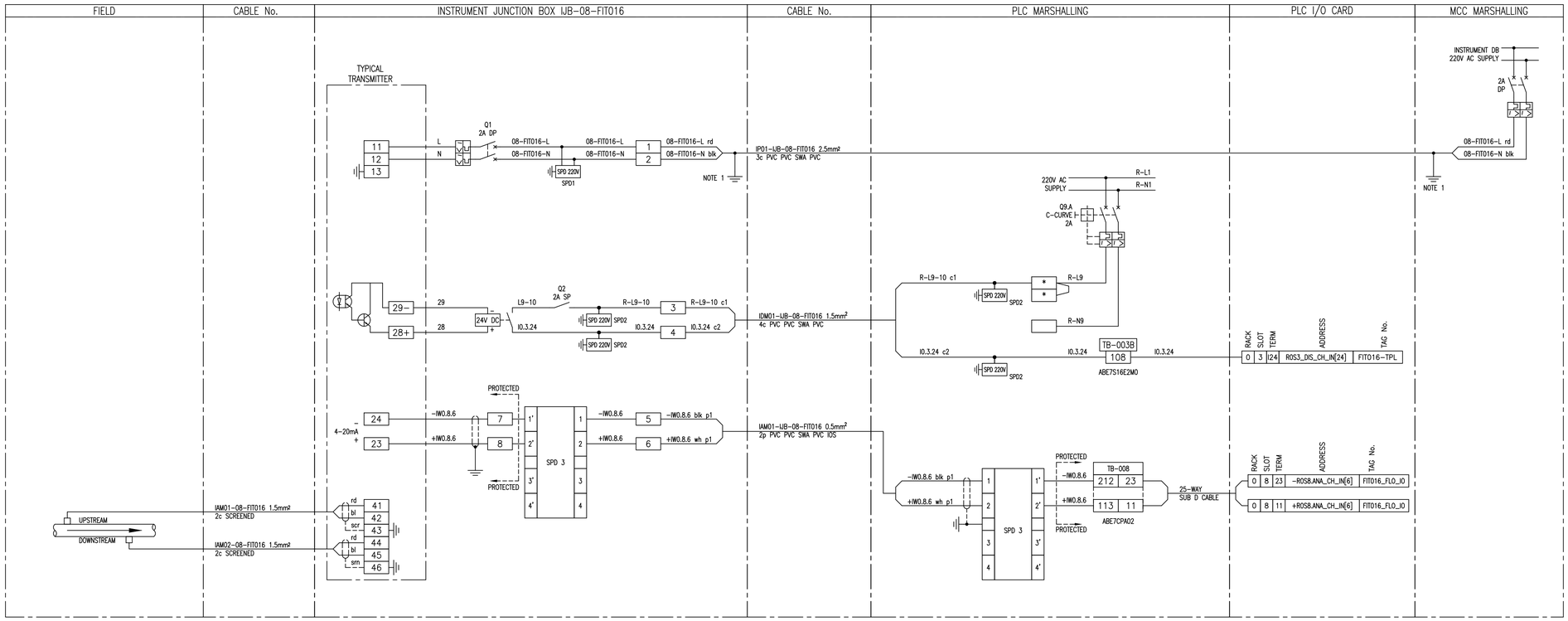

NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
WASTING PUMP 2 FLOW CLAMP-ON FLOW METER
FIT016

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	13.05.19

DRAWING No.

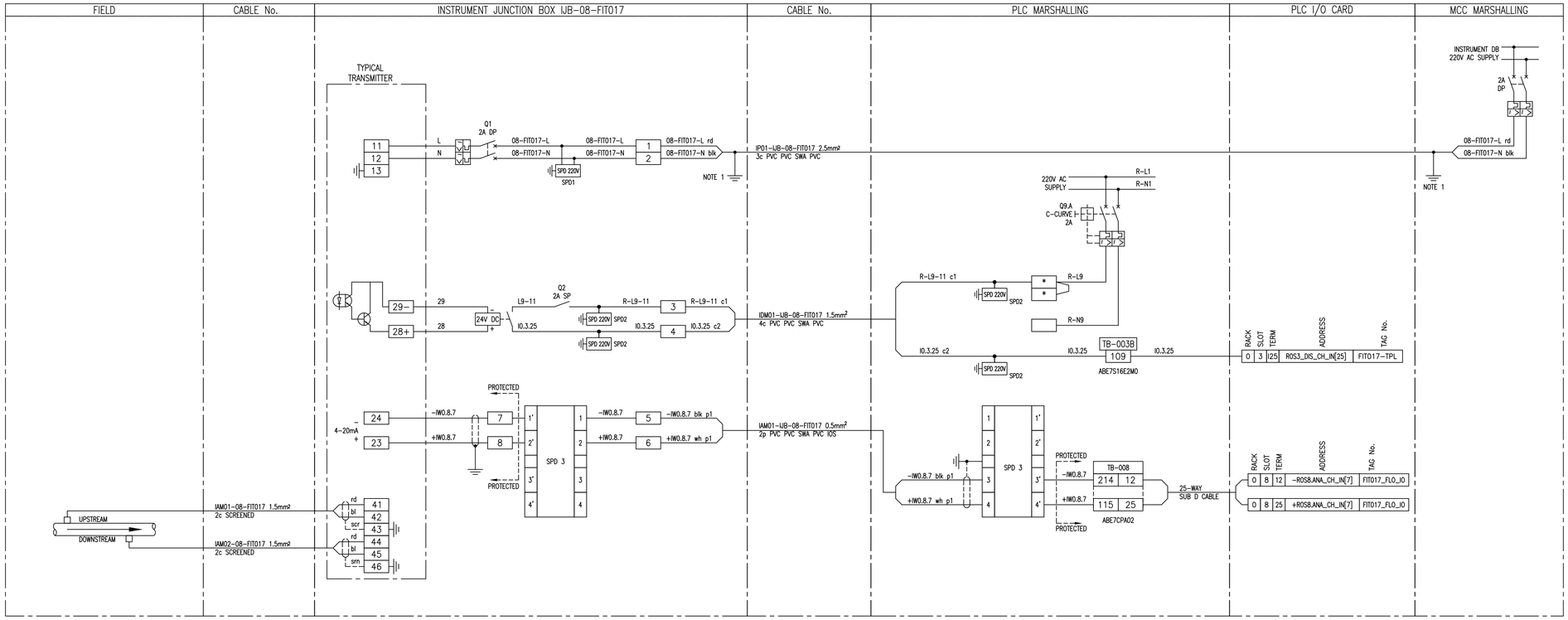
JW NUMBER
JW13898-08-FIT016

CONSULTANT'S NUMBER
ING0645D-08-FIT016

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT016 revT0.dwg May 30, 2019 – 9:38am



NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

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SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
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JOHANNESBURG WATER SOC LTD

Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – ELUTRIATION PLC-08
WASTING PUMP 3 FLOW CLAMP-ON FLOW METER
FIT017

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

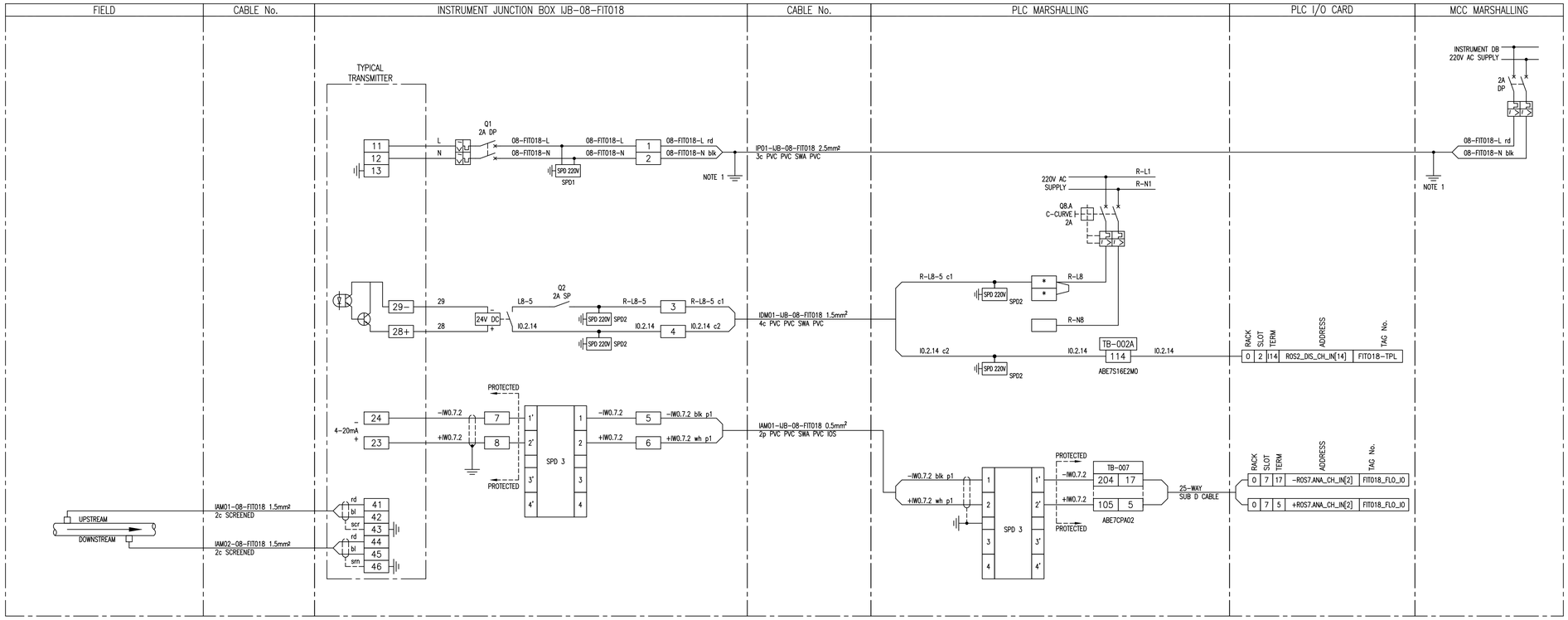
JW NUMBER
JW13898-08-FIT017

CONSULTANT'S NUMBER
ING0645D-08-FIT017

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT017 revT0.dwg May 30, 2019 – 9:38am



NOTES:

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SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

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SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

ODOUR CONTROL GAS FLOW CLAMP-ON FLOW METER

FIT018

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	13.05.19

DRAWING No.

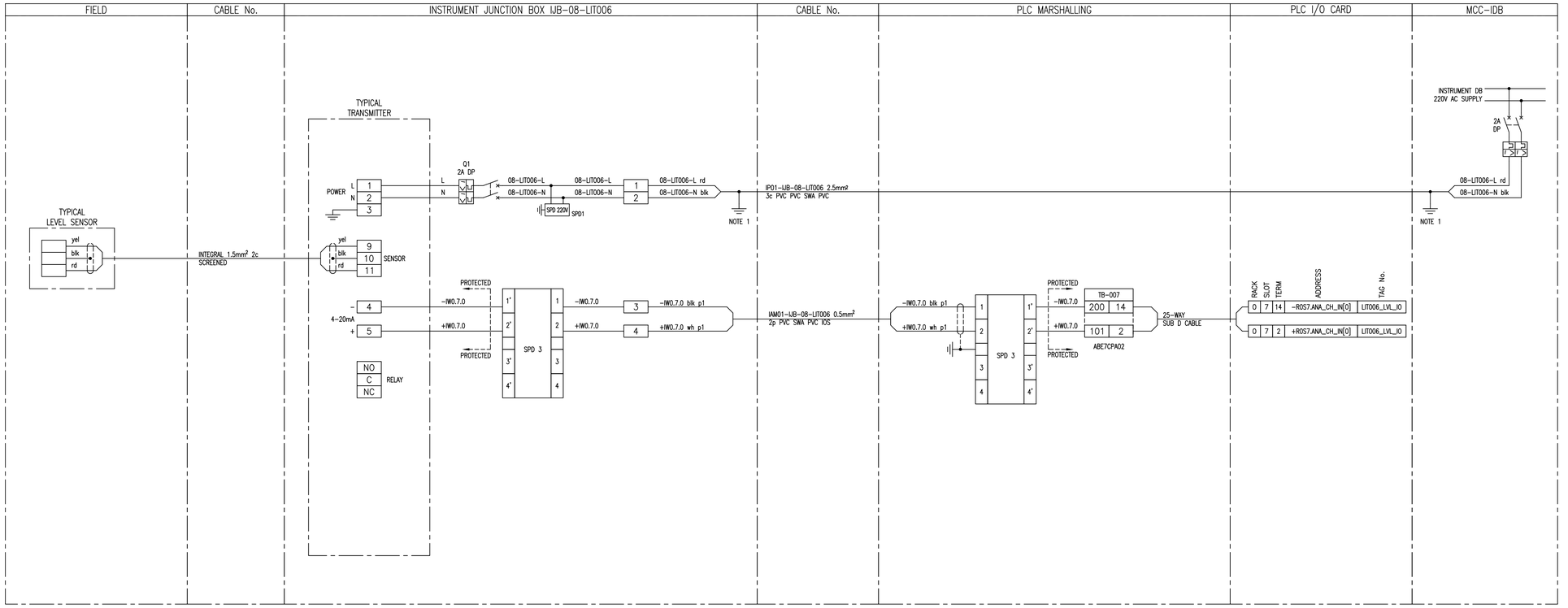
JW NUMBER
JW13898-08-FIT018

CONSULTANT'S NUMBER
ING0645D-08-FIT018

FILE No
BWW 1300

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-FIT018 revT0.dwg May 30, 2019 – 9:38am



NOTES:

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* FUSED TERMINAL (500mA)

LINK TERMINAL

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SERVITUDES	
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Johannesburg Water

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - ELUTRIATION PLC-08

MIXING TANK 2 ULTRASONIC LEVEL

LIT006

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER
JW13898-08-LIT006

CONSULTANT'S NUMBER
ING0645D-08-LIT006

FILE No
BWW 1300

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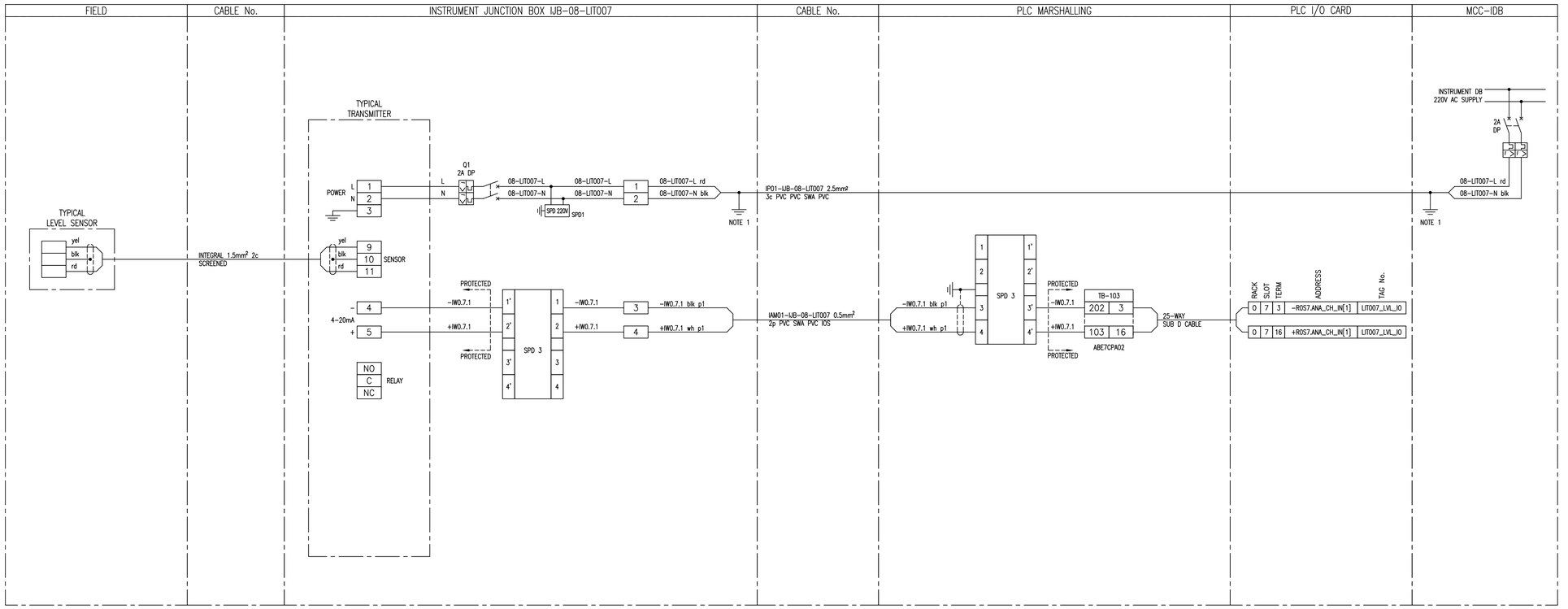

NOTES:

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SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

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SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

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[ ] LINK TERMINAL

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC-08

RECIRCULATION SUMP 2 ULTRASONIC LEVEL

LIT007

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

JW NUMBER
JW13898-08-LIT007

CONSULTANT'S NUMBER
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FILE No
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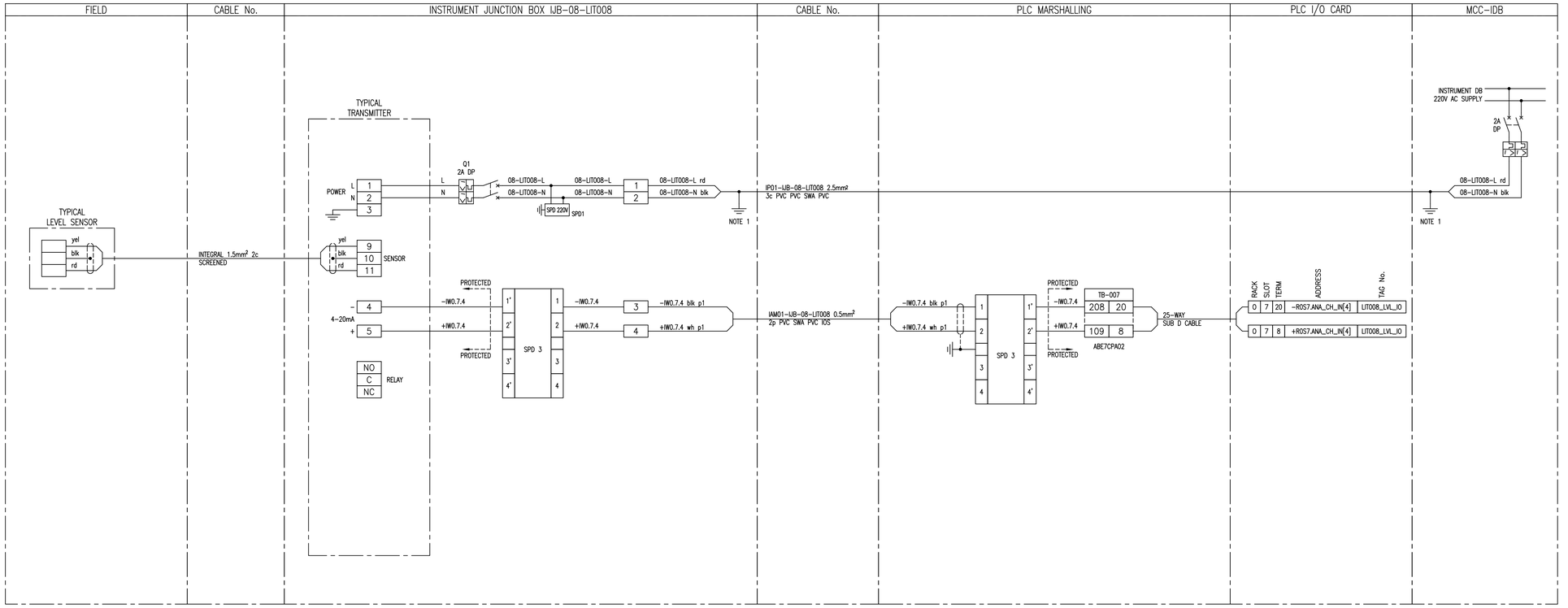

NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - ELUTRIATION PLC-08

SLUDGE HOLDING TANK ULTRASONIC LEVEL

LIT008

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

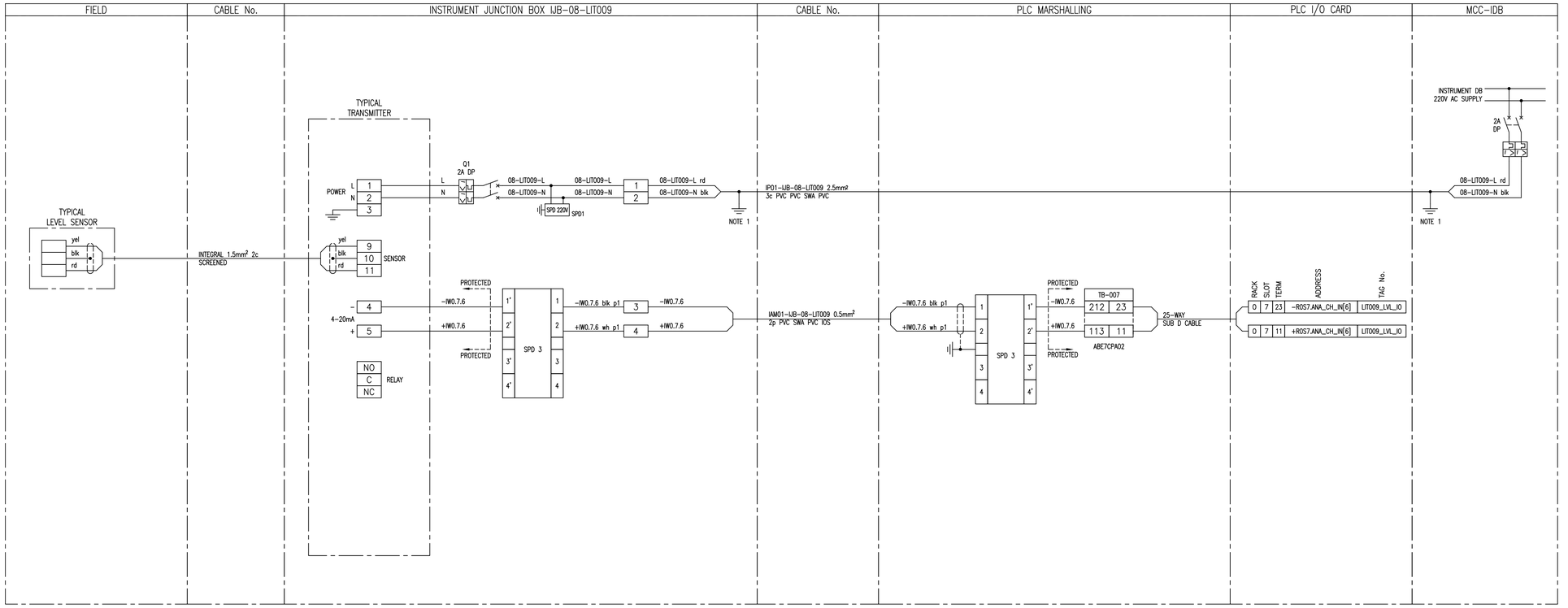
JW NUMBER
JW13898-08-LIT008

CONSULTANT'S NUMBER
ING0645D-08-LIT008

FILE No
BWW 1300

T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-08 (U5 ELUT)\Loop Diagrams\ING0645D-08-LIT008 revT0.dwg May 30, 2019 - 9:38am



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SPD 1: DEHNguard DG M TN 275

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SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M DYKE
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – ELUTRIATION PLC–08

ODOUR CONTROL EFFLUENT TANK ULTRASONIC LEVEL

LIT009

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	13.05.19

DRAWING No.

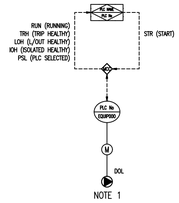
JW NUMBER
JW13898–08–LIT009

CONSULTANT'S NUMBER
ING0645D–08–LIT009

FILE No
BWW 1300

T0

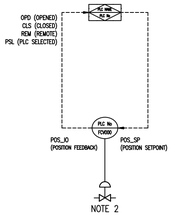
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–08 (U5 ELUT)\Loop Diagrams\ING0645D–08–LIT009 revT0.dwg May 30, 2019 – 9:38am



NOTE 1

DOL DRIVE	
SIGNALS	
DI	DO
RUN (RUNNING) TRH (TRIP HEALTHY) LOH (L/OUT HEALTHY) IOH (ISOLATED HEALTHY) PSL (PLC SELECTED)	STR (START)

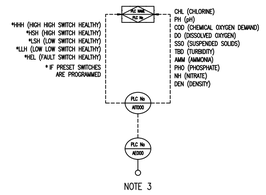
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 2

MODULATING MOTORISED VALVE (FLOW CONTROL)		
SIGNALS		
DI	AI	AO
OPD (OPENED) CLS (CLOSED) REM (REMOTE) PSL (PLC SELECTED)	POS_IO (POSITION FEEDBACK)	POS_SP (POSITION SETPOINT)

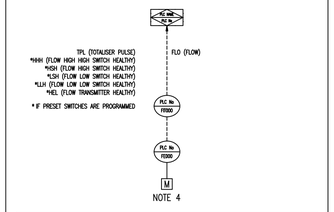
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 3

ANALYTICAL	
SIGNALS	
DI	AI
HHH (HIGH HIGH SWITCH HEALTHY) HSH (HIGH SWITCH HEALTHY) LSH (LOW SWITCH HEALTHY) LLH (LOW LOW SWITCH HEALTHY) HEL (FAULT SWITCH HEALTHY)	CHL (CHLORINE) PH (pH) COD (CHEMICAL OXYGEN DEMAND) DO (DISSOLVED OXYGEN) SSO (SUSPENDED SOLIDS) TBD (TURBIDITY) AMM (AMMONIA) PHO (PHOSPHATE) NH (NITRATE) DEN (DENSITY)

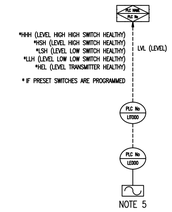
000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 4

FLOW SENSOR						
M MAG FLOW	ULTRASONIC (eg CLAMP-ON)	VENTURI	WEIR	ORIFICE PLATE	FLUME	PITOT TUBE
SIGNALS						
DI				AI		
TPL (TOTALISER PULSE) HHH (FLOW HIGH HIGH SWITCH HEALTHY) HSH (FLOW HIGH SWITCH HEALTHY) LSH (FLOW LOW SWITCH HEALTHY) LLH (FLOW LOW LOW SWITCH HEALTHY) HEL (FLOW TRANSMITTER HEALTHY)				FLO (FLOW)		

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER



NOTE 5

ULTRASONIC LEVEL SENSOR	
SIGNALS	
DI	AI
HHH (LEVEL HIGH HIGH SWITCH HEALTHY) HSH (LEVEL HIGH SWITCH HEALTHY) LSH (LEVEL LOW SWITCH HEALTHY) LLH (LEVEL LOW LOW SWITCH HEALTHY) HEL (LEVEL TRANSMITTER HEALTHY)	LVL (LEVEL)

000 – DENOTES 3 DIGIT EQUIPMENT NUMBER

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DRAWN	M. DYKE
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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
BIOREACTOR 2 FERROUS AND FERRIC DOSING
CONTROL AND INSTRUMENTATION DIAGRAM
LEGEND SHEET

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS		APPROVED	DATE
T0	FOR TENDER	W BRITZ	23.04.19
T1	JW NUMBER UPDATED	W BRITZ	25.04.19

DRAWING No.

JW NUMBER
JW13898-80-P&ID-LEGEND

CONSULTANT'S NUMBER
ING06645D-80-P&ID-LEGEND

FILE No
BWW1500

T0 T1

I:\ING – Projects – Drawings\ING06645D – BWW1407 NSW Unit 5 Module 2\L2. C&I and Software\P&ID\ING06450-80-P&ID-LEGEND revT1.dwg May 30, 2019 – 1:50pm

CIVIL AND MECHANICAL

BIOREACTOR TANK (BR)

TAG No	LENGTH (m)	WIDTH (m)	DEPTH (m)
5C2BR01	176.265	35.51	5.300

FINAL CLARIFYING TANK (CT)

TAG No	I.DIA. (m)	SIDE WATER DEPTH (m)	FLOOR SLOPE
5C2CT01	35	4	1:6
5C2CT02	35	4	1:6
5C2CT03	35	4	1:6

CLARIFIER MECHANISMS (CM)

TAG No	DRIVE	PERIPHERAL SPEED (m/min)
5M2CM01	PERIPHERAL	3
5M2CM02	PERIPHERAL	3
5M2CM03	PERIPHERAL	3

BIOREACTOR MIXERS (MX)

TAG No	TYPE	INPUT (kw)	ROTATION
5M2MX01	RADIAL FLOW	7,5	CLOCKWISE
5M2MX02	RADIAL FLOW	7,5	CLOCKWISE
5M2MX03	RADIAL FLOW	7,5	CLOCKWISE
5M2MX04	RADIAL FLOW	7,5	CLOCKWISE
5M2MX05	RADIAL FLOW	7,5	CLOCKWISE
5M2MX06	RADIAL FLOW	11	CLOCKWISE
5M2MX07	RADIAL FLOW	11	CLOCKWISE
5M2MX08	RADIAL FLOW	11	CLOCKWISE
5M2MX09	RADIAL FLOW	11	CLOCKWISE
5M2MX10	RADIAL FLOW	15	CLOCKWISE

SURFACE AERATORS (SA)

TAG No	ROTATION	O.T.R. (kg/hr)	DEMAND (kw)
5M2SA01	CLOCKWISE		110
5M2SA02	CLOCKWISE		110
5M2SA03	CLOCKWISE		110
5M2SA04	CLOCKWISE		90
5M2SA05	CLOCKWISE		90
5M2SA06	CLOCKWISE		90
5M2SA07	CLOCKWISE		90
5M2SA08	CLOCKWISE		75
5M2SA09	CLOCKWISE		75
5M2SA10	CLOCKWISE		55
5M2SA11	CLOCKWISE		22
5M2SA12	CLOCKWISE		22
5M2SA13	CLOCKWISE		22

PENSTOCKS (PS)

TAG No	SIZE (mm x mm)	TYPE	ACTUATOR DETAILS
5C2PS01	UNALLOCATED		
5C2PS02	UNALLOCATED		
5C2PS03	500 x 1300	CHANNEL	HAND WHEEL
5C2PS04	500 x 1300	CHANNEL	HAND WHEEL
5C2PS05	500 x 1300	CHANNEL	HAND WHEEL
5C2PS06	1200 x 1200	CHANNEL	HAND WHEEL
5C2PS07	1200 x 1200	CHANNEL	HAND WHEEL
5C2PS08	1000 x 1000	SLUICE	HAND WHEEL
5C2PS09	1000 x 1000	SLUICE	HAND WHEEL
5C2PS10	1000 x 1000	SLUICE	HAND WHEEL
5C2PS11			NOT USED
5C2PS12			NOT USED
5C2PS13			NOT USED
5M2PS14	2500 x 700	FLAP GATE	
5M2PS15	2500 x 700	FLAP GATE	
5M2PS16	2500 x 700	FLAP GATE	
5M2PS17	2350 x 700	FLAP GATE	
5C2PS18	800 x 800	SLUICE	HAND WHEEL

LIQUOR RECYCLE PUMPS (LP)

TAG No	TYPE	DUTY l/s @ m
5M2LP01	PROPELLER	290 l/s @ 0,375m
5M2LP02	PROPELLER	290 l/s @ 0,375m
5M2LP03	PROPELLER	MAX 1160 l/s @ 0,455m
5M2LP04	PROPELLER	MAX 1160 l/s @ 0,455m

SAMPLING PUMP (DP)

TAG No	TYPE	DUTY l/s @ m
5M2DP01	SELF PRIMING CENTRIFUGAL	0,79 l/s @ 20m

SLUDGE VALVES (SV)

TAG No	DIA. (mm)	TYPE	ACTUATOR DETAILS
5C2SV01	250	KGV	HAND
5C2SV02	200	KGV	HAND
5C2SV03	250	KGV	HAND
5M2SV04	250	WDV	ELECTRIC MOTOR

ELECTRIC MOTORS (ME)

TAG No	KW	rpm	VOLTAGE	ENCLOSURE	APPLICATION
5M2ME01	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME02	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME03	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME04	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME05	7,5	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME06	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME07	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME08	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME09	11	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME10	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME11	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME12	110	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME13	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME14	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME15	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME16	90	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME17	75	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME18	75	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME19	15	1450	380	TEFC-IP55	BIOREACTOR MIXER
5M2ME20	55	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME21	22	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME22	22	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME23	22	1450	380	TEFC-IP55	SURFACE AERATOR
5M2ME24	3	180	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME25	3	180	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME26	30	750	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME27	30	750	380	TEFC-IP55	MIXED LIQUOR PUMP
5M2ME28	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME29	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME30	0,18	1450	380	TEFC-IP55	SLUDGE & SCUM SCRAPER
5M2ME31	37	1450	380	TEFC-IP55	ARC. SCREW PUMP
5M2ME32	37	1450	380	TEFC-IP55	ARC. SCREW PUMP
5M2ME33	1,1	1450	380	TEFC-IP55	LIQUOR CONTROL VALVE
5M2ME34	1,5	1450	380	TEFC-IP55	SAMPLING PUMP
5M2ME35	4 Va	–	220	TEFC-IP55	GREASE PUMP
5M2ME36	4 Va	–	220	TEFC-IP55	GREASE PUMP
5M2ME37	1,1		380	TEFC-IP55	MCC ROOM FAN

RETURN ACTIVATED SLUDGE PUMPS (RP)

TAG No	TYPE	DUTY (l/s @ m)
5M2RP01	ARCHIMEDES SCREW	600 @ 4,000
5M2RP02	ARCHIMEDES SCREW	600 @ 4,000

CLARIFIED FLOW DIVIDER (FD)

TAG No	TYPE	DIM (m)
5C2FD01	CIRCULAR WEIR	5,0

GREASE PUMPS (GP)

TAG No	
5M2GP01	
5M2GP02	

INSTRUMENTS

Transducer TAG No.	Sensor TAG No.	Description
80-FIT001	80-FE001	ULTRA SONIC FLOW METER
80-FIT002	80-FE002	CLAMP-ON FLOW METER
80-FIT004	80-FE004	MAGFLOW FLOW METER
80-AIT001	80-AE001	MLSS MIXED LIQUOR METER
80-AIT002	80-AE002	DISSOLVED OXYGEN ANALYSER 1
80-AIT003	80-AE003	DISSOLVED OXYGEN ANALYSER 2
80-AIT004	80-AE004	DISSOLVED OXYGEN ANALYSER 2

EFFLUENT VALVES (EV)

TAG No.	SIZE (mm)	TYPE	ACTUATION
5M2EV01	15	PRV	–
5M2EV02	15	3-WAY	HAND

SCUM VALVES (SC)

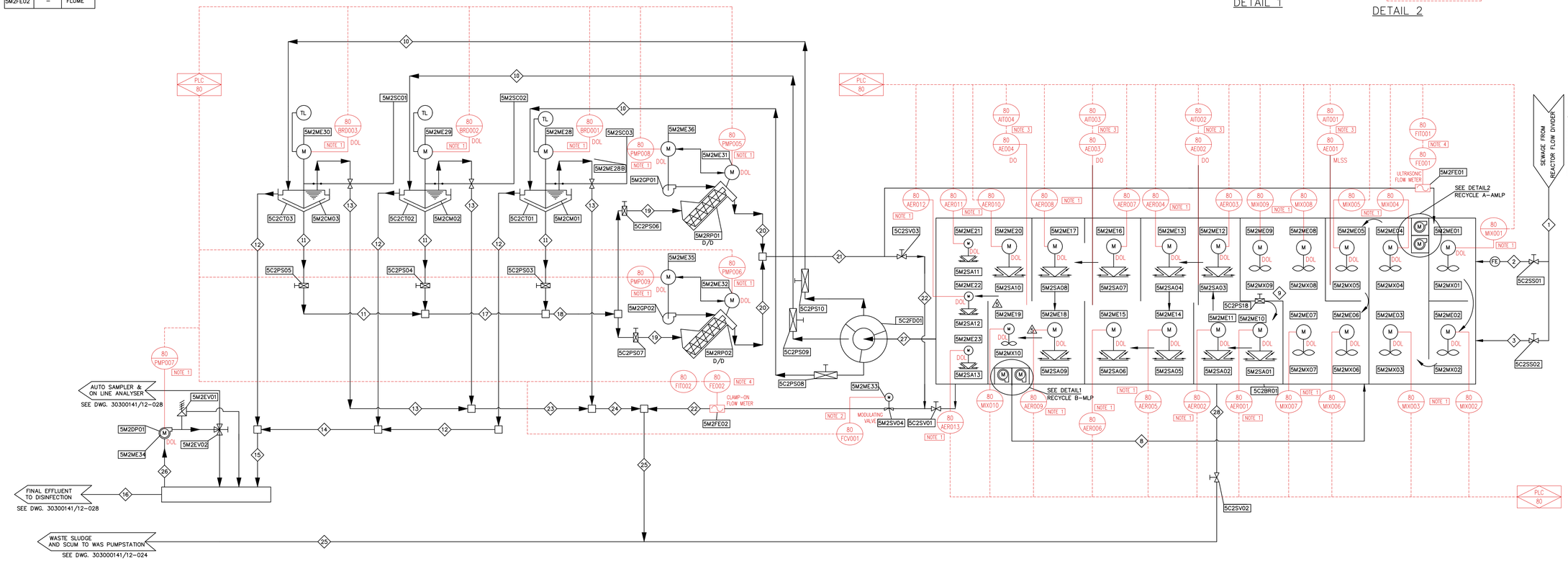
TAG No.	SIZE (mm)	TYPE	ACTUATOR
5M2SC01	200	PIPE	BRIDGE
5M2SC02	200	PIPE	BRIDGE
5M2SC03	200	PIPE	BRIDGE

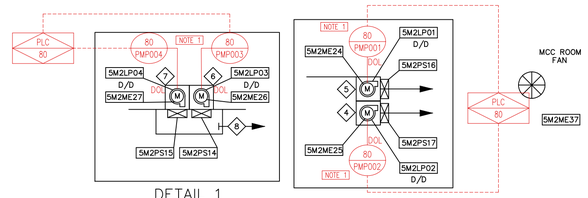
SEWAGE VALVES (SS)

TAG No.	SIZE (mm)	TYPE	ACTUATOR DETAILS
5C2SS01	350	KGV	HAND WHEEL
5C2SS02	700	KGV	HAND WHEEL

FLOW SENSORS (FE)

TAG No.	SIZE (mm)	TYPE
5M2FE01	–	–
5M2FE02	–	FLUME





DETAIL 1

DETAIL 2

PROCESS TABLE

BRIEF DESCRIPTION OF FLUID CARRIED		◇1 SETTLED SEWAGE	◇2 SETTLED SEWAGE	◇3 SETTLED SEWAGE	◇4 ANAEROBIC ANOXIC RECYCLE	◇5 ANAEROBIC ANOXIC RECYCLE	◇6 AEROBIC ANOXIC RECYCLE	◇7 AEROBIC ANOXIC RECYCLE	◇8 AEROBIC ANOXIC RECYCLE	◇9 MIXED LIQUOR TO AERATION	◇10 MIXED LIQUOR	◇11 RETURN ACTIVATED SLUDGE	◇12 FINAL EFFLUENT	◇13 SCUM	◇14 FINAL EFFLUENT	◇15 FINAL EFFLUENT	◇16 FINAL EFFLUENT	◇17 RETURN ACTIVATED SLUDGE	◇18 RETURN ACTIVATED SLUDGE	◇19 RETURN ACTIVATED SLUDGE	◇20 RETURN ACTIVATED SLUDGE	◇21 RETURN ACTIVATED SLUDGE	◇22 WASTE ACTIVATED SLUDGE	◇23 SCUM	◇24 SCUM	◇25 WASTE AND SCUM	◇26 FINAL EFFLUENT SAMPLING	◇27 MIXER LIQUOR TO DIVIDER	◇28 DRAIN
FLUID l/s	MIN	300	270	0	0	0	0	0	0	590	190	97	95	15(0,017)	190	283	283	193	290	0	0	290	17	15(0,017)	30(15.051)	30(15.051)	–	570	–
	NORMAL (AVE)	590	530	59	290	290	1160	1160	1160	2390	383	193	189	15(0,017)	378	566	566	387	580	580	580	580	24	15(0,017)	30(15.051)	30(15.051)	0,28	1150	–
	MAX				290	290	1160	1160	2380	4960	848	387	462	15(0,017)	924	1398	1398	773	1160	580	580	1160	42	15(0,017)	30(15.051)	30(15.051)	–	2545	–
SOLIDS kg/s	MIN	0,036	0,036		0	0	0	0	0	5,3	0,57	0,57	–	–	–	–	–	1,14	1,71	0,86	0,86	1,71	0,045	–		–	–	1,71	–
	NORMAL (AVE)	0,083	0,083		1,74	1,74	6,96	6,96	13,9	20,9	2,30	2,30	–	–	–	–	–	4,6	6,90	3,45	3,45	6,90	0,104	–		–	–	6,90	–
	MAX	0,200	0,200		1,74	1,74	6,96	6,96	20,9	36,6	5,1	5,1	–	–	–	–	–	10,2	15,30	7,65	7,65	15,36	0,125	–		–	–	15,30	–
CONDUIT SIZE (mm)		700	350	700					CHANNEL		800/825 ø	600ø	600ø	150 ND	900ø	1050/1200ø	900	900ø	1050ø	CHANNEL	CHANNEL	CHANNEL	250 ND	300 ND	300/375	375/525	15 ND	1500ø	300ø
CONDUIT MATERIAL		MS	MS	MS					CONCRETE		MS/ CONCRETE	MS/ CONCRETE	MS/ CONCRETE	uPVC	CONCRETE	CONCRETE	MS	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE	MS	uPVC	uPVC	uPVC/CONC	HDPE CLASS12	MS/CONCRETE	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
BIOREACTOR 2
PLC-80
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE: NTS

	AMENDMENTS	APPROVED	DATE
T0	FOR TENDER	W BRITZ	25.01.19
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.

JW NUMBER: JW13898-80-026
CONSULTANT'S NUMBER: ING0645D-80-026
FILE No: BWW1300
T0 T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-80-026(B02) rev11.dwg May 30, 2019 – 1:50pm

CIVIL AND MECHANICAL

EQUIPMENT TABLES

CHEMICAL STORAGE TANKS (CT)

TAG No	VOLUME (m3)	MATERIAL
5M1CT01	30	GRP
5M1CT02	30	GRP

CHEMICAL COUPLINGS (CC)

TAG No	DIA. (mm)	TYPE
5M1CC01	80	SCHEDULE 40 TABLE D
5M1CC02	50	SCHEDULE 20 TABLE E

CHEMICAL DOSING PUMPS (CP)

TAG No	TYPE	DUTY l/s @ m
5M1CP01	DIAPHRAGM	0,15 @ 20
5M1CP02	DIAPHRAGM	0,15 @ 20
5M1CP03	DIAPHRAGM	0,15 @ 20

SPILLAGE PUMP (SP)

TAG No	TYPE	DUTY l/s @ m
5M1SP01	FLOAT PUMP	1.4@5

ELECTRIC MOTORS (ME)

TAG No	kW	rpm	VOLTAGE	ENCLOSURE	DRIVEN ITEM
5M1ME39	0,35	AC VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP No.1
5M1ME37	0,35	AC VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP No.2
5M1ME38	1,50	2950	380	IP55	SPILLAGE PUMP
5M1ME40	0,35	AC VSD	380	TEFC-IP55	CHEMICAL DOSING PUMP No.3

CHEMICAL STRAINERS (CS)

TAG No	DIA (mm)
5M1CS01	20
5M1CS02	20

SPILLAGE TRAYS (ST)

TAG No	VOLUME (m3)
5C1ST01	30
5C1ST02	3
5C1ST03	1
5C1ST04	–

PRESS & VAC. RELIEF COVER (RC)

TAG No	DIA (mm)
5M1RC01	100

SHOWER AND EYEBATH (SE)

TAG No	TYPE
5M1SE01	FOOT OPERATED
5M1SE02	FOOT OPERATED

PRESSURE RELIEF VALVE (PV)

TAG No	DIA (mm)	RELIEF PRESSURE (kPa)
5M1PV01	20	250
5M1PV02	20	250
5M1PV03	20	250

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV01	25	PPBV	HAND LEVER
5M1CV04		PPBV	HAND LEVER
5M1CV05		PPBV	HAND LEVER
5M1CV07	25	PPBV	HAND LEVER
5M1CV09	25	PPBV	HAND LEVER
5M1CV10		PPBV	HAND LEVER
5M1CV11	UNALLOCATED		
5M1CV12	50	PPBV	HAND LEVER
5M1CV13	20	PPBV	HAND LEVER
5M1CV14	20	PPBV	HAND LEVER
5M1CV15	20	PPBV	HAND LEVER
5M1CV16	20	PPBV	HAND LEVER
5M1CV18	80	PPBV	HAND LEVER
5M1CV19	50	PPBV	HAND LEVER
5M1CV21	25	PPBV	HAND LEVER

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV24	25	PPBV	HAND
5M1CV25	80	PPBV	HAND
5M1CV26	25	PPBV	HAND
5M1CV28	25	PPBV	HAND
5M1CV29	25	PV	HAND
5M1CV30	80	PPBV	HAND
5M1CV31	50	PPBV	HAND
5M1CV32	20	PPBV	HAND
5M1CV33	20	PPBV	HAND
5M1CV34	20	PPBV	HAND
5C1CV35	50	PPBV	HAND
5C1CV36	20	PPBV	HAND
5M1CV37	50	PPBV	HAND
5M1CV38	110	PPBV	HAND WHEEL
5M1CV39	80	PPBV	HAND
5M1CV40	20	PPBV	HAND LEVER
5C1CV41	20	PPBV	HAND LEVER
5C1CV42	20	PPBV	HAND LEVER

CHEMICAL VALVES (CV)

TAG No	DIA (mm)	TYPE	ACTUATOR
5M1CV43	25	PPBV	HAND LEVER
5M1CV44	20	PPBV	HAND LEVER
5M1CV45	25	PPBV	HAND LEVER
5M1CV46	20	PPBV	HAND
5M1CV47	20	PPBV	HAND
5M1CV48	20	PPBV	HAND
5M1CV49	25	PV	–
5M1CV50	25	PPBV	HAND LEVER

PULSATION DAMPERS (PD)

TAG No	DIA (mm)
5M1PD01	20
5M1PD02	20
5M1PD03	20

CHEMICAL DRAIN VALVES (DV)

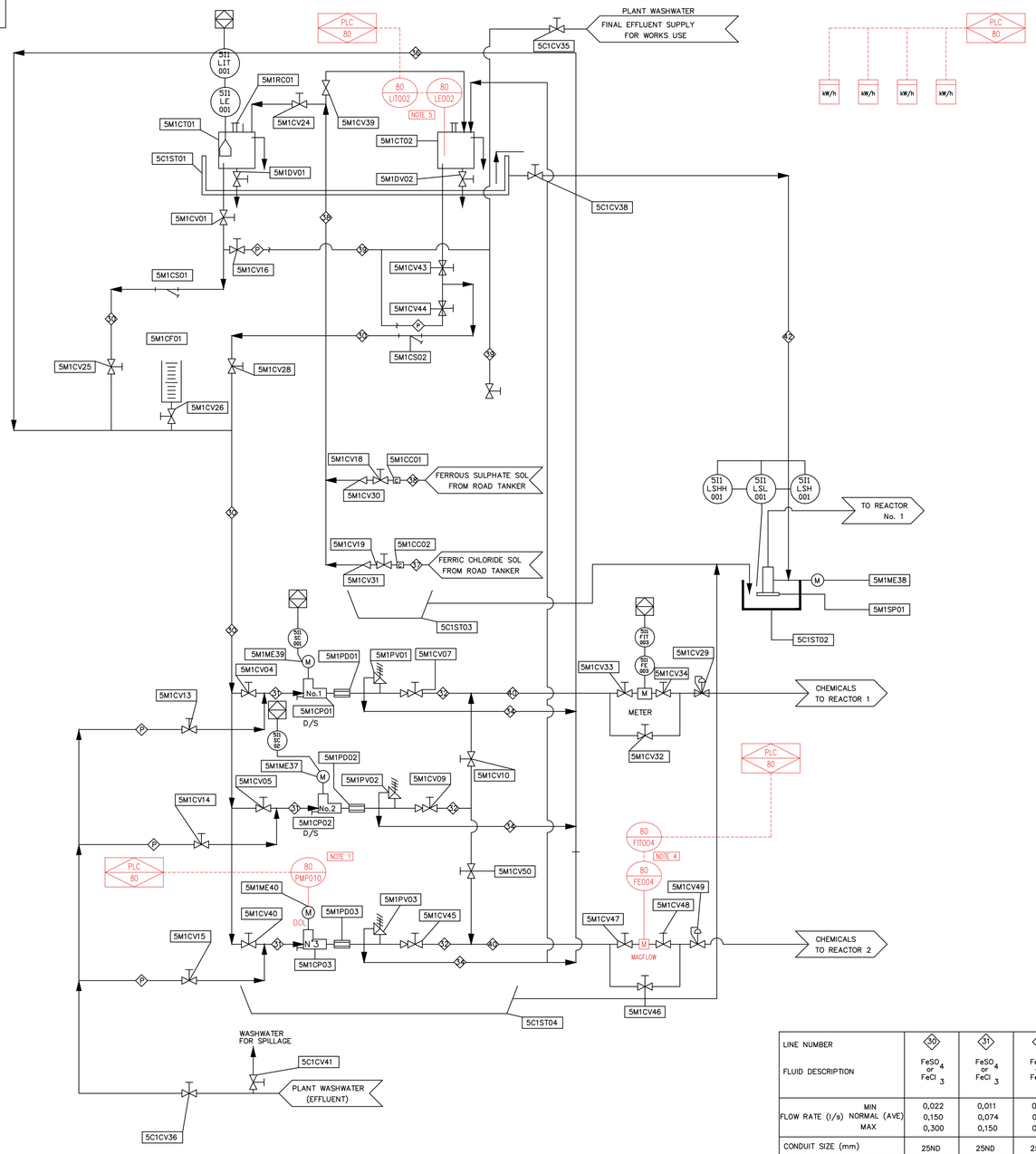
TAG No	DIA (mm)	TYPE	ACTUATOR
5M1DV01	50	–	–
5M1DV02	50	–	–

CALIBRATION FLASK (CF)

TAG No	CAPACITY (l)
5M1CF01	3

INSTRUMENTATION

Transducer TAG No.	Sensor TAG No.	Description
5I1–FIT–003	5I1–FE–003	Ultra–low inline magflow
5I1–LIT–001	5I1–LE–001	U/sonic level indicator
5I1–SC–001		VSD speed control
5I1–SC–002		VSD speed control
5I1–LSH–001		Float ball level high switch
5I1–LSHH–001		Float ball high high switch
5I1–LSL–001		Float ball level low switch
80–FIT004	80–FE004	MAGFLOW FLOW METER
80–LIT002	80–LE002	ULTRASONIC LEVEL METER



* LIQUID FLOW RATES BASED ON $Fe(SO_4)$ SOLUTION OF 6,5% Fe

PROCESS TABLE

LINE NUMBER	30	31	32		34	35	36	37	38	39	40	P	42	43
FLUID DESCRIPTION	$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$		$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$	$FeSO_4$ or $FeCl_3$	EFFLUENT	$FeSO_4$	EFFLUENT	DRAIN	EFFLUENT
FLOW RATE (l/s) MIN	0,022	0,011	0,011		0	0	0	0	0	0	0,011	0	0	
FLOW RATE (l/s) NORMAL (AVE)	0,150	0,074	0,074		0	0	0	0	0	0	0,074	0	0	
FLOW RATE (l/s) MAX	0,300	0,150	0,150		0,150	0,150	0,150	10	10	5	0,150	5	5	
CONDUIT SIZE (mm)	25ND	25ND	25ND		25ND	25ND	25ND	50ND	80ND	50ND	20ND	25ND	110	25
CONDUIT MATERIAL	PP CLASS 16	PP CLASS 16	PP CLASS 16		PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	PP CLASS 16	uPVC	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
FERROUS AND FERRIC DOSING PLANT
PLC–80
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER
DATE

SCALE: NTS

		AMENDMENTS	APPROVED	DATE
	T0	FOR TENDER	W BRITZ	25.01.19
	T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.
JW NUMBER: JW13898–80–027
CONSULTANT'S NUMBER: ING0645D–80–027
FILE No: BWW1300
T0 T1

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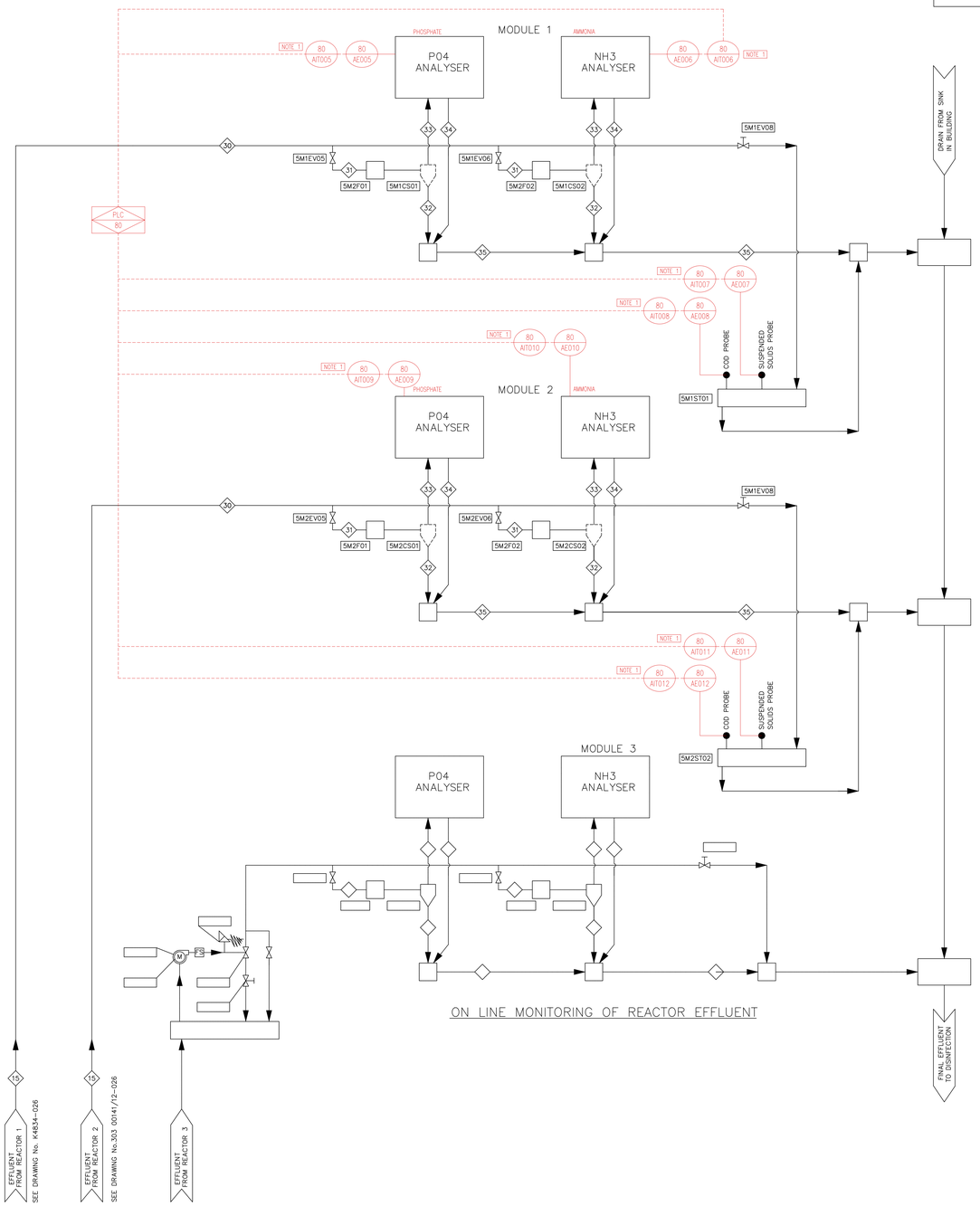
INSTRUMENTATION			CIVIL AND MECHANICAL EQUIPMENT TABLE									
		DESCRIPTION	CYCLONE SEPARATORS (CS)			INLINE FILTER (F)			EFFLUENT VALVE (EV)			
		ORTHOPHOSPHATE ANALYZER AMMONIA ANALYZER COD PROBE SUSPENDED SOLIDS PROBE	TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	FLOW e/s	PRESSURE (kPa)	TAG No.	SIZE (mm)	TYPE	ACTUATOR
			5M1CS01	0.75	300	5M1F01	0.75	300	5M1EV05	15	PPBV	HAND
			5M1CS02	0.75	300	5M1F02	0.75	300	5M1EV06	15	PPBV	HAND
			5M2CS01	0.75	300	5M2F01	0.75	300	5M1RV08	20	PPBV	HAND
			5M2CS02	0.75	300	5M2F02	0.75	300	5M2EV05	15	PPBV	HAND
						5M2ST01	SAMPLING TROUGH		5M2EV06	15	PPBV	HAND
						5M2ST02	SAMPLING TROUGH		5M2RV08	20	PPBV	HAND



ON LINE MONITORING OF REACTOR EFFLUENT

PROCESS TABLE						
BRIEF DESCRIPTION OF FLUID CARRIED	30 FINAL EFFLUENT	31 FINAL EFFLUENT	32 FINAL EFFLUENT	33 FINAL EFFLUENT	34 WASTE	35 WASTE
FLUID ℓ/s NORMAL MIN. (AVE) MAX.	0.75	0.25	0.25	NEG	NEG	0.75
SOLIDS kg/s NORMAL MIN. (AVE) MAX.	–	–	–	–	–	–
CONDUIT SIZE (mm)	40ND	25ND	25ND	AS PER EQUIPMENT	25ND	110ND
CONDUIT MATERIAL	HDPE CLASS 9	HDPE CLASS 9	HDPE CLASS 9	SUPPLIER	HDPE CLASS 9	uPVC

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTE WATER TREATMENT WORKS
UNIT 5 – PHASE 2
ON-LINE MONITORING OF BIOREACTORS 1 & 2 EFFLUENT
PLC-80
CONTROL AND INSTRUMENTATION DIAGRAM

DESIGN MANAGER

DATE

SCALE NTS

AMENDMENTS			
T1	FOR TENDER	C du TOIT	16.10.24

DRAWING No.

JW NUMBER: JW13898-80-028
CONSULTANT'S NUMBER: ING0645D-80-028
FILE No: BWW1500
T1

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\P&ID\ING0645D-80-028(ANALY) rev11.dwg Oct 17, 2024 - 2:32pm

BIOREACTOR 2
PLC PANEL

BIOREACTOR 2
PLC
PLC 80

IDM01–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM02–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM03–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM04–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM05–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM06–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM07–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM08–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM09–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IDM10–80–MCC80 1.5mm² 37c PVC PVC SWA PVC
IAM01–80–MCC80 0.5mm² 4p PVC PVC SWA PVC IOS

MCC–80

INSTRUMENT DB

IAM01–IJB–80–LIT001 0.5mm² 2p PVC PVC SWA PVC IOS → IJB 80–LIT001
IIP01–IJB–80–LIT001 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–LIT001 0.5mm² 2p SCREENED SUPPLIED WITH SENSOR → 80 LIT001 — CHEMICAL DOSING TANK LEVEL METER

IDM01–IJB–80–FIT001 1.5mm² 4c PVC PVC SWA PVC
IAM01–IJB–80–FIT001 0.5mm² 2p PVC PVC SWA PVC IOS → IJB 80–FIT001
IIP01–IJB–80–FIT001 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–FIT001 0.5mm² 2p SCREENED SUPPLIED WITH SENSOR → 80 FIT001 — RAS FLOW

IDM01–IJB–80–FIT002 1.5mm² 4c PVC PVC SWA PVC
IAM01–IJB–80–FIT002 0.5mm² 2p PVC PVC SWA PVC IOS → IJB 80–FIT002
IIP01–IJB–80–FIT002 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–FIT002 0.5mm² 2p SCREENED SUPPLIED WITH SENSOR → 80 FIT002 — WAS FLOW

IDM01–IJB–80–FIT004 1.5mm² 4c PVC PVC SWA PVC
IAM01–IJB–80–FIT004 0.5mm² 2p PVC PVC SWA PVC IOS → IJB 80–FIT004
IIP01–IJB–80–FIT004 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–FIT004 0.5mm² 2p SCREENED SUPPLIED WITH SENSOR → 80 FIT004 — CHEMICAL DOSING FLOW 2

IAM01–IJB–80–AIT001 0.5mm² 2p PVC PVC SWA PVC IOS → IJB 80–AIT001
IIP01–IJB–80–AIT001 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–AIT001 0.5mm² 2p PVC PVC SWA PVC IOS → 80 AIT001 — MLSS

IAM01–IJB–80–AIT002 0.5mm² 4p PVC PVC SWA PVC IOS → IJB 80–AIT002
IIP01–IJB–80–AIT002 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–AIT002 0.5mm² 4p PVC PVC SWA PVC IOS → 80 AIT002 — DISSOLVED OXYGEN 1

IAM01–IJB–80–AIT003 0.5mm² 4p PVC PVC SWA PVC IOS → IJB 80–AIT003
IIP01–IJB–80–AIT003 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–AIT003 0.5mm² 4p PVC PVC SWA PVC IOS → 80 AIT003 — DISSOLVED OXYGEN 2

IAM01–IJB–80–AIT004 0.5mm² 4p PVC PVC SWA PVC IOS → IJB 80–AIT004
IIP01–IJB–80–AIT004 2.5mm² 3c PVC PVC SWA PVC
IAM01–80–AIT004 0.5mm² 4p PVC PVC SWA PVC IOS → 80 AIT004 — DISSOLVED OXYGEN 3

IDM01–ICP–80–FCV001 1.5mm² 7c PVC PVC SWA PVC
IDM02–ICP–80–FCV001 1.5mm² 4c PVC PVC SWA PVC
IAM01–ICP–80–FCV001 0.5mm² 4p PVC PVC SWA PVC IOS → ICP 80–FCV001
IDM01–80–FCV001 1.5mm² 12c PVC PVC SWA PVC
IAM01–80–FCV001 0.5mm² 4p PVC PVC SWA PVC IOS → 80 FCV001 — WAS FLOW CONTROL VALVE
3–PHASE POWER – IN ELECTRICAL SCOPE

ANALYSER ROOM
INSTRUMENT DB

IAM01–IJB–80–AIT005–012 0.5mm² 12p PVC PVC SWA PVC IOS → IJB–80 AIT005 TO AIT012
IIP01–IJB–80–AIT005–AIT012 10mm² 3c PVC PVC SWA PVC

IAM01–80–AIT005 & AIT009 0.5mm² 4p PVC PVC SWA PVC IOS → 80–AIT005 / 80–AIT009
SSO
IIP01–08–AIT005 & AIT009 2.5mm² 3c PVC PVC SWA PVC
BIO1 PHOSPHATE AIT005
BIO2 PHOSPHATE AIT009

IAM01–80–AIT006 & AIT010 0.5mm² 4p PVC PVC SWA PVC IOS → 80–AIT006 / 80–AIT010
SSO
IIP01–08–AIT006 & AIT010 2.5mm² 3c PVC PVC SWA PVC
BIO1 AMMONIA AIT006
BIO2 AMMONIA AIT010

IAM01–80–AIT007 0.5mm² 2p PVC PVC SWA PVC IOS → 80–AIT007
SSO
IIP01–08–AIT007 2.5mm² 3c PVC PVC SWA PVC
INTEGRAL CABLE → 80 AIT007 — BIO1 SUSPENDED SOLIDS AIT007

IAM01–80–AIT008 0.5mm² 2p PVC PVC SWA PVC IOS → 80–AIT008
SSO
IIP01–08–AIT008 2.5mm² 3c PVC PVC SWA PVC
INTEGRAL CABLE → 80 AIT008 — BIO1 COD AIT008

IAM01–80–AIT011 0.5mm² 2p PVC PVC SWA PVC IOS → 80–AIT011
SSO
IIP01–08–AIT011 2.5mm² 3c PVC PVC SWA PVC
INTEGRAL CABLE → 80 AIT011 — BIO2 SUSPENDED SOLIDS AIT011

IAM01–80–AIT012 0.5mm² 2p PVC PVC SWA PVC IOS → 80–AIT012
SSO
IIP01–08–AIT012 2.5mm² 3c PVC PVC SWA PVC
INTEGRAL CABLE → 80 AIT012 — BIO2 COD AIT012

INCOMER 1 POWER METER → 80 KWH001
INCOMER 2 POWER METER → 80 KWH002

ICE–80–KWH001 CAT6 SHIELDED TCP
ICE–80–KWH002 CAT6 SHIELDED TCP

BIO 2 SWITCH
RJ45 — RJ45
RJ45
RJ45

PATCH BOX L35
IFE–80–SWA — LC — FPL–80–SWA MM FIBRE OPTIC — LC
IFE–80–SWB — LC — FPL–80–SWB MM FIBRE OPTIC — LC
TDC43 — 2MD–80–TDC43

TO CORE SWITCH <

DATE
DESIGNATION
APPROVED
DEPARTMENT

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 BIOREACTOR 2
PLC–80
CABLE BLOCK DIAGRAM

JW13898-80-CBD

DESIGN MANAGER

DATE

SCALE: NTS

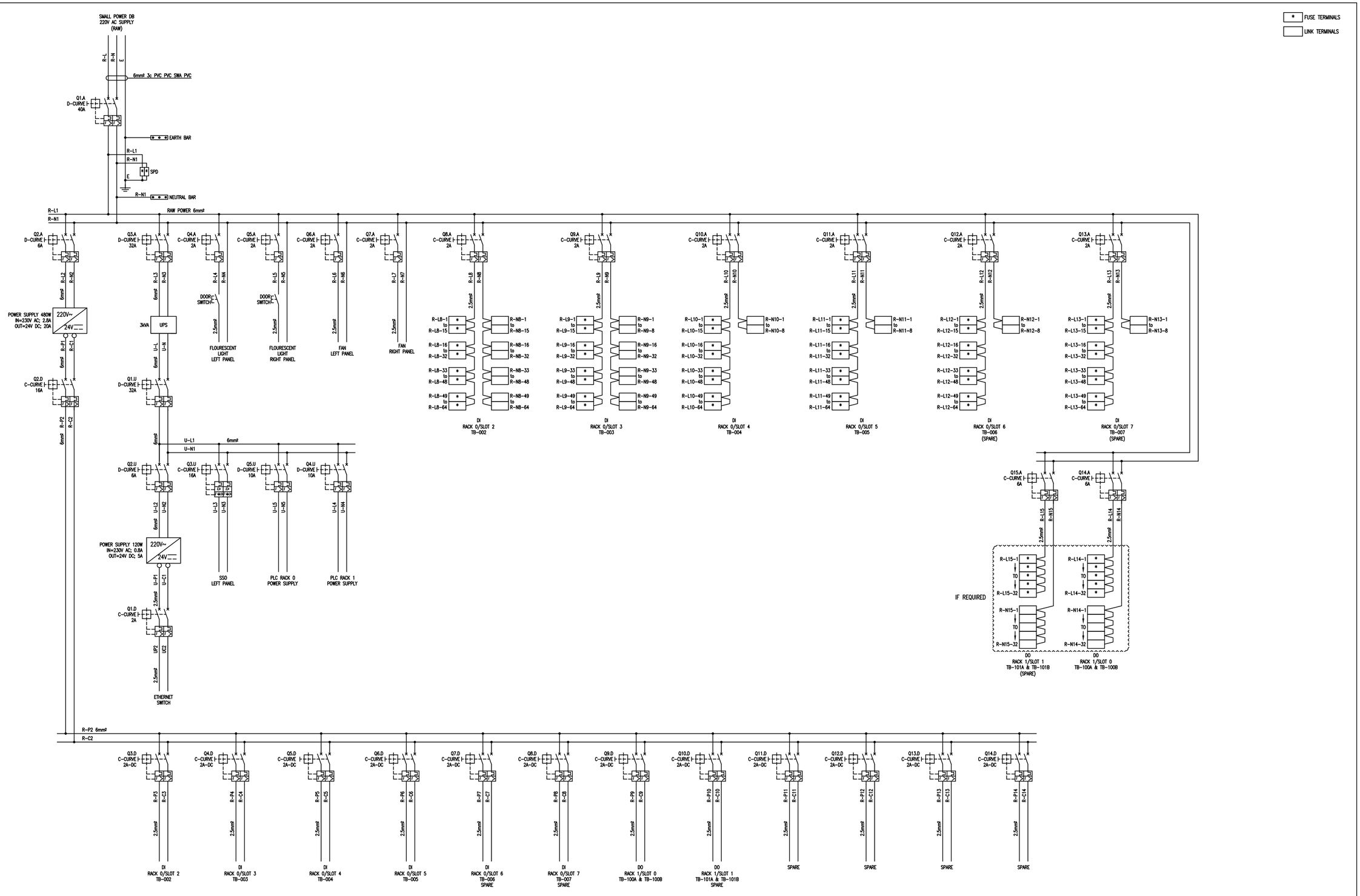
AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.11.18
T1	JW NUMBER UPDATED	W BRITZ	18.04.19

DRAWING No.

JW NUMBER
JW13898–80–CBD
CONSULTANT'S NUMBER
ING645D–80–CBD
FILE No
BWW1500
T0 T1

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–80 (U5 MOD 2)\Cable Block Diagrams\ING0645D–80–CBD revT1.dwg Oct 17, 2024 – 2:42pm



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2
PLC-80
SCHEMATIC DIAGRAM

DESIGN MANAGER

DATE

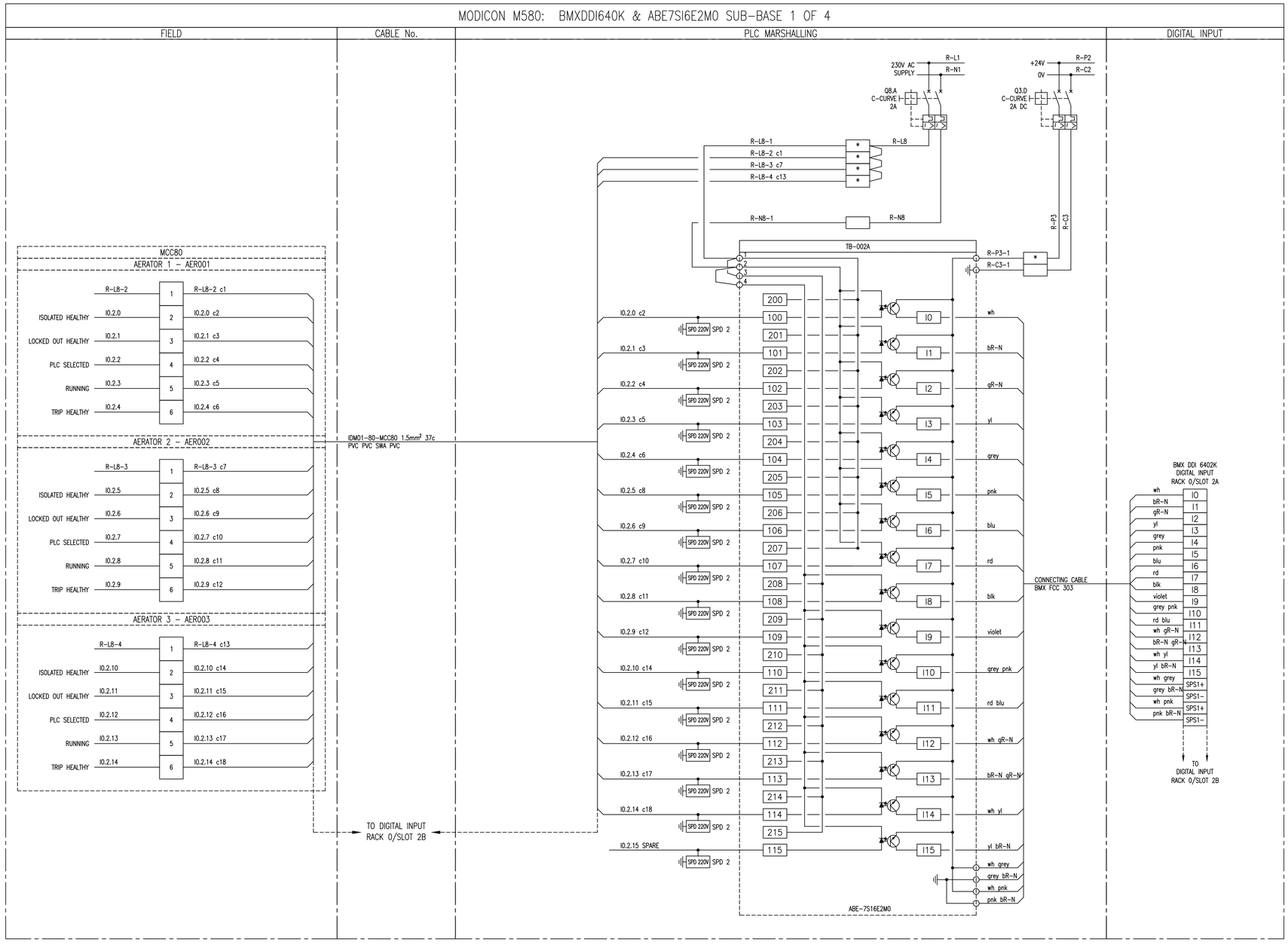
SCALE: NTS

AMENDMENTS		APPROVED	DATE
TO	ISSUED FOR TENDER	C du TOIT	15.09.18

DRAWING No.

JW NUMBER: JW13898-80-SLD
CONSULTANT'S NUMBER: ING0645D-80-SLD
FILE No: BWW 1500
TO

t:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&d and Software\PLC-80 (U5 MOD 2)\PLC Schematic\ING0645D-80-SLD revT0.dwg Jan 23, 2019 – 9:06am



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11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL. 011-806 7111
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 2A

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
13898-80-R0S2A-DI

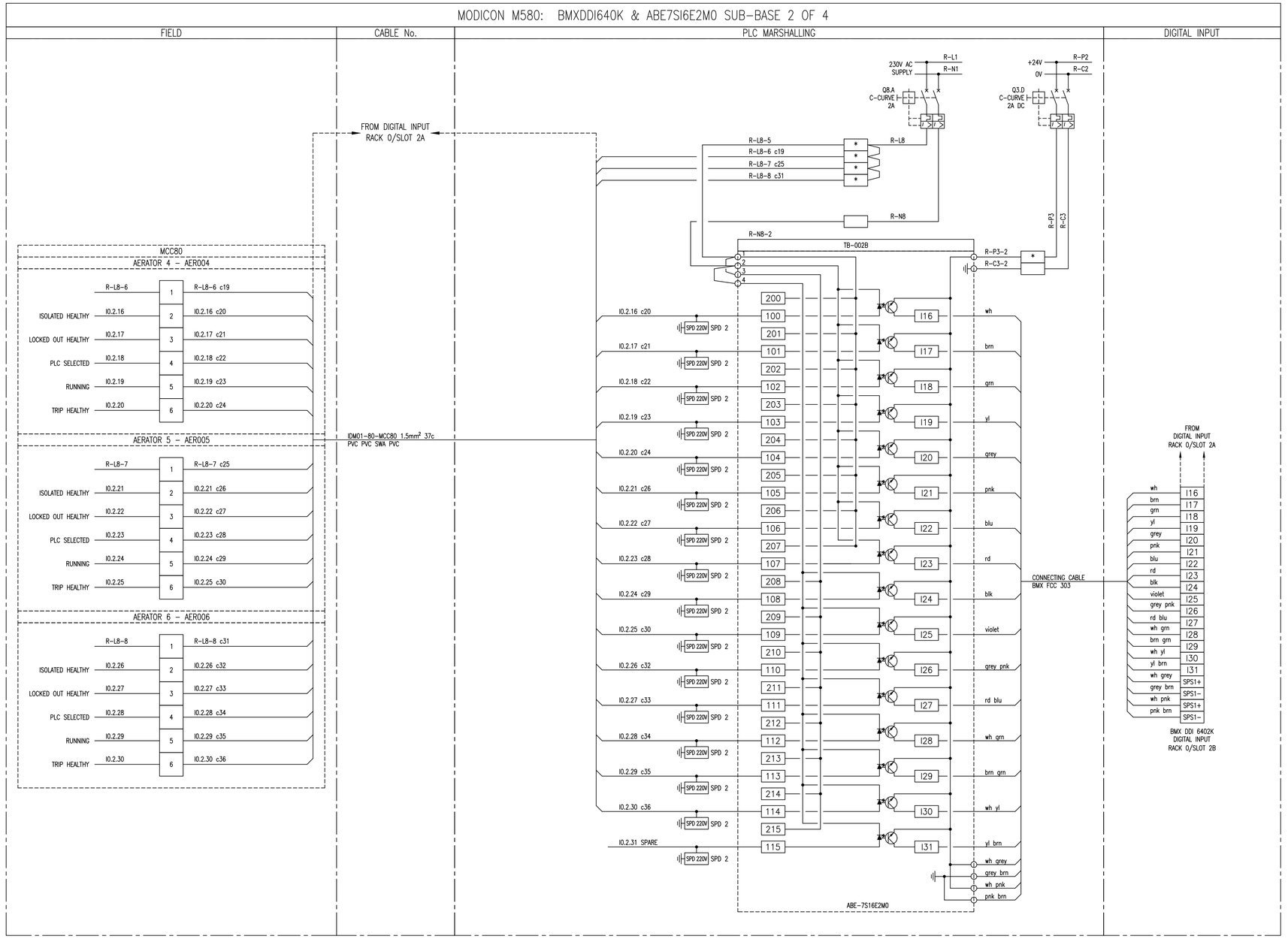
CONSULTANT'S NUMBER
ING0645D-80-R0S2A-DI

FILE No
BWW 1500

T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S2A-DI rev T0.dwg May 30, 2019 - 2:15pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



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* FUSED TERMINAL (500mA)

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 2B

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	AMENDMENTS	APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S2B-DI

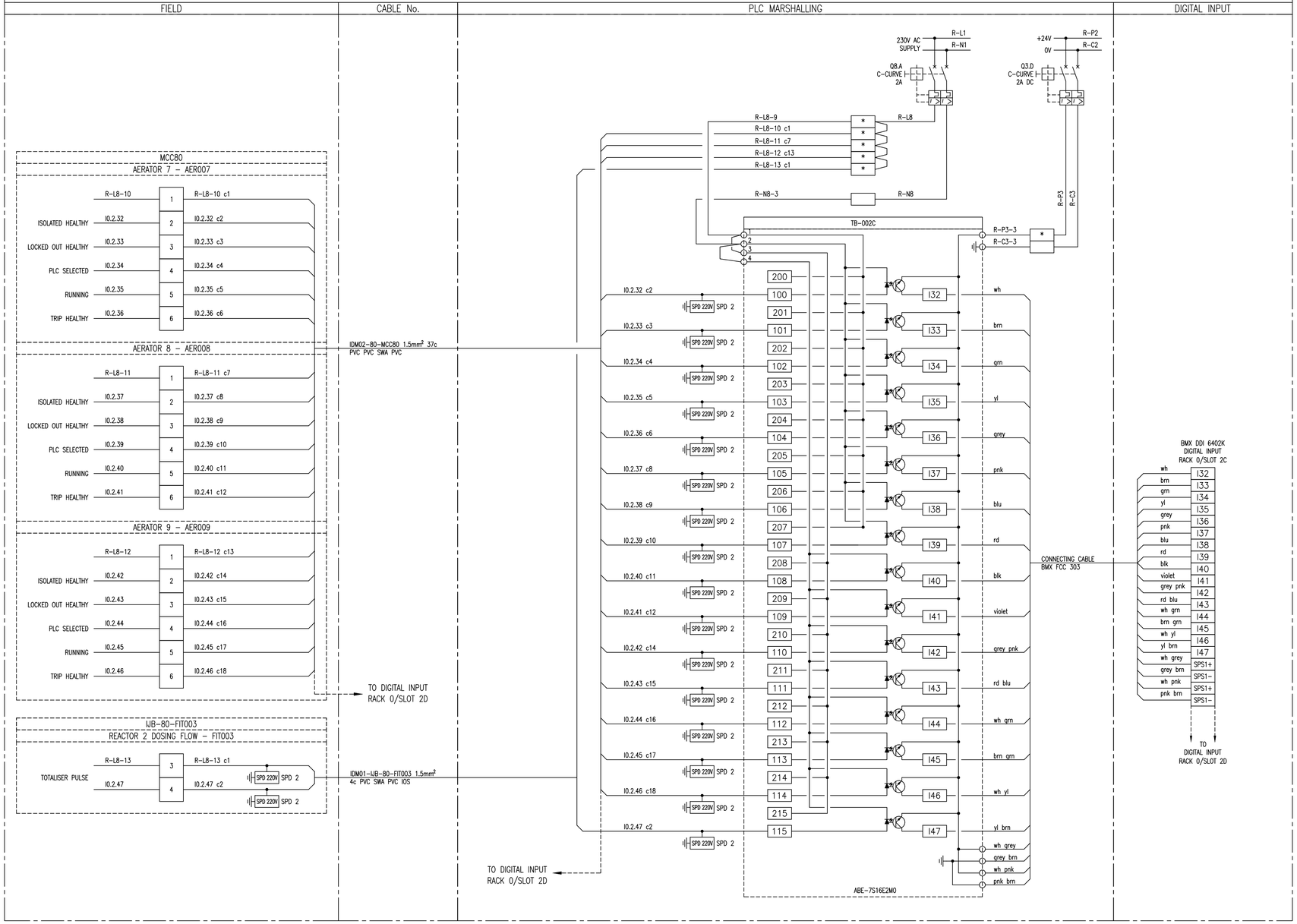
CONSULTANT'S NUMBER
ING0645D-80-R0S2B-DI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S2B-DI revT0.dwg May 30, 2019 – 2:15pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

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SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 3 OF 4
RACK 0 / SLOT 2C

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

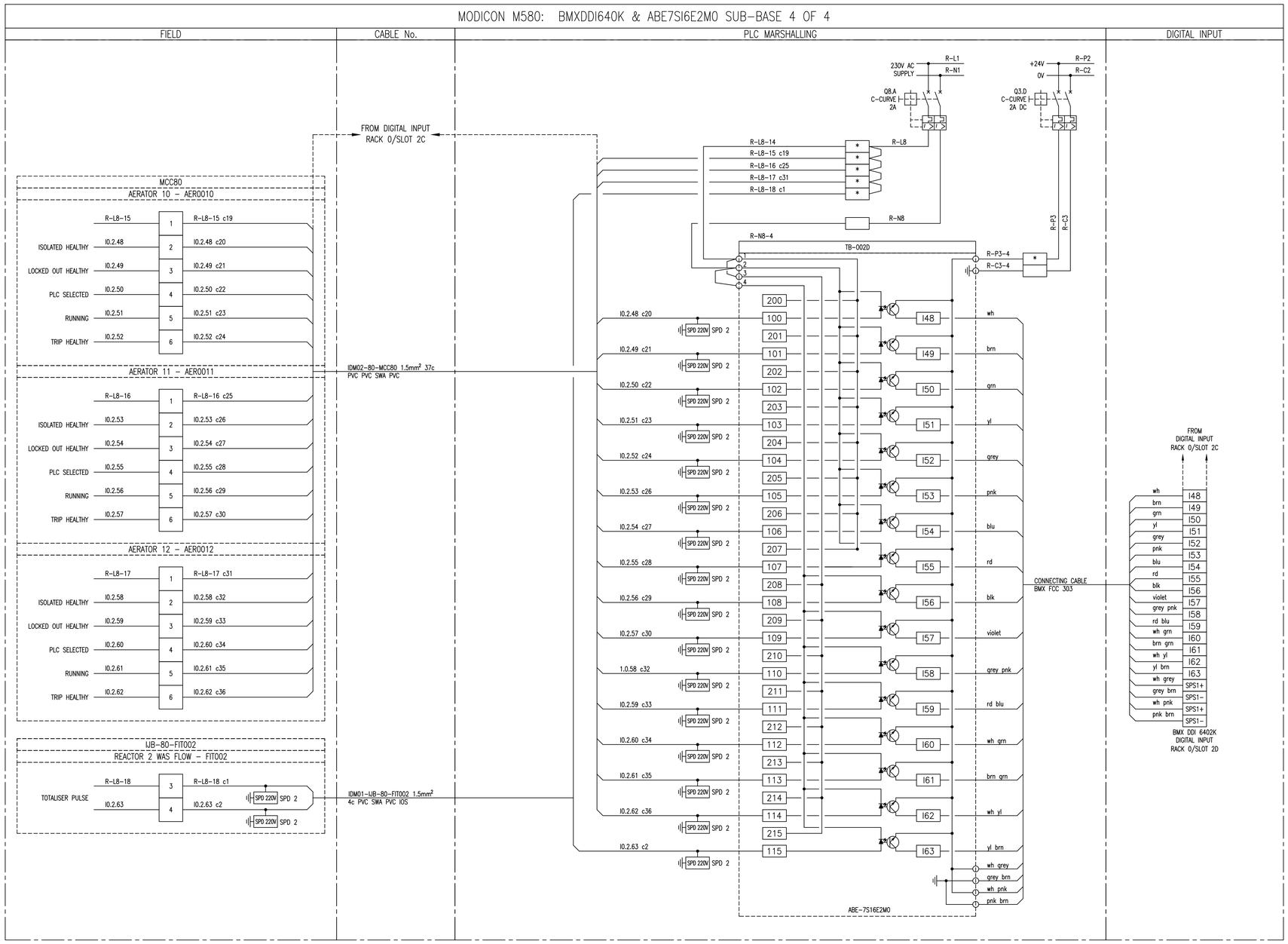
TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	15.09.18

DRAWING No.

JW NUMBER: JW13898-80-R0S2C-DI
CONSULTANT'S NUMBER: ING0645D-80-R0S2C-DI
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S2C-DI revT0.dwg May 30, 2019 – 2:15pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 4 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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DESIGNED	W BRITZ
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 4 OF 4
RACK 0 / SLOT 2D

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

	TO	ISSUED FOR TENDER	APPROVED	DATE
			W BRITZ	15.09.18

DRAWING No.

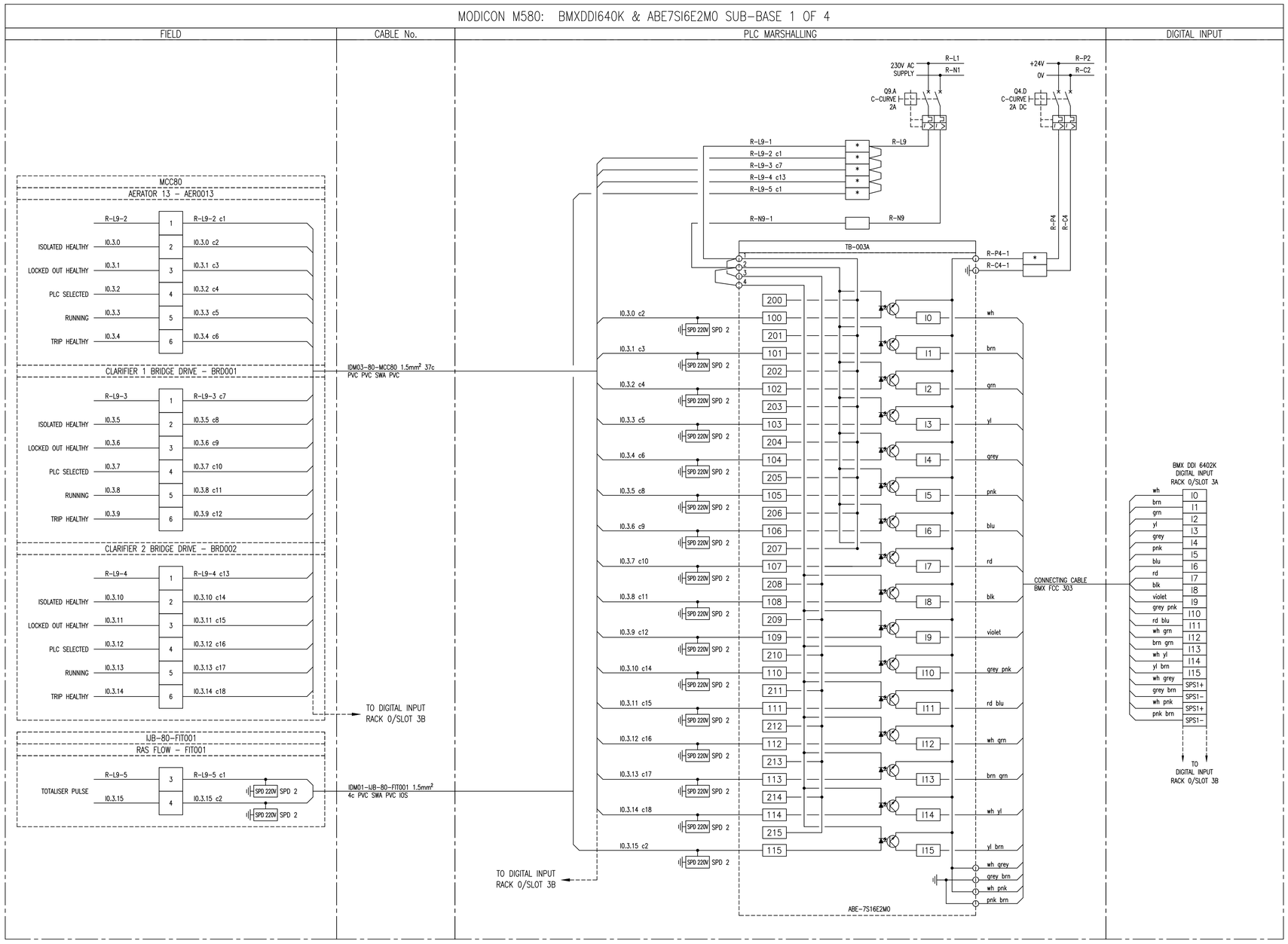
JW NUMBER
JW13898-80-R0S2D-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S2D-DI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S2D-DI revT0.dwg May 30, 2019 – 2:15pm



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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - BIOREACTOR 2 PLC-80

DIGITAL INPUT MODULE: SUB-BASE 1 OF 4

RACK 0 / SLOT 3A

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	15.09.18

DRAWING No.

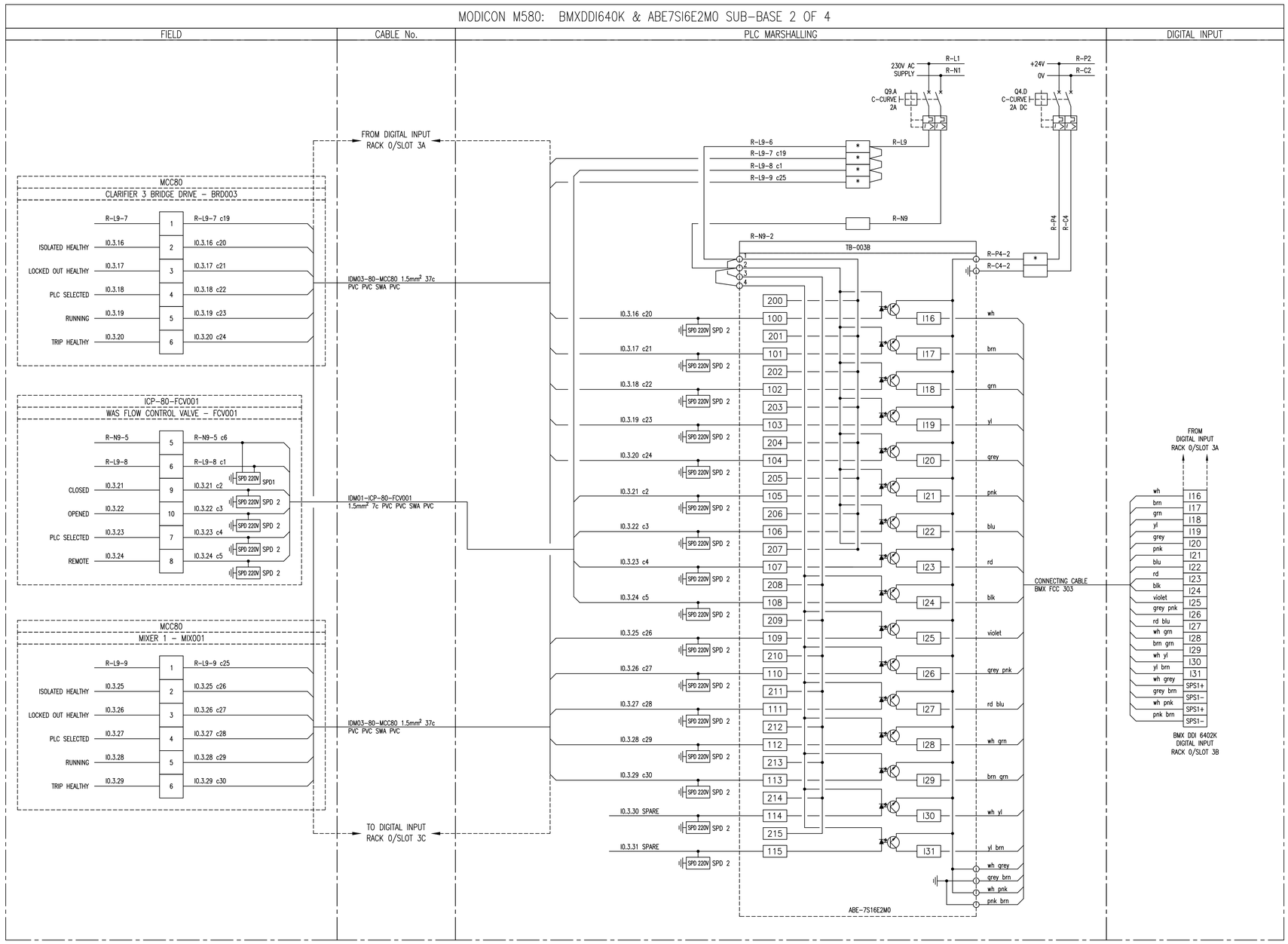
JW NUMBER
JW13898-80-R0S3A-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S3A-DI

FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S3A-DI revT0.dwg May 30, 2019 - 2:16pm



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LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - BIOREACTOR 2 PLC-80

DIGITAL INPUT MODULE: SUB-BASE 2 OF 4

RACK 0 / SLOT 3B

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	15.09.18

DRAWING No.

JW NUMBER JW13898-80-R0S3B-DI

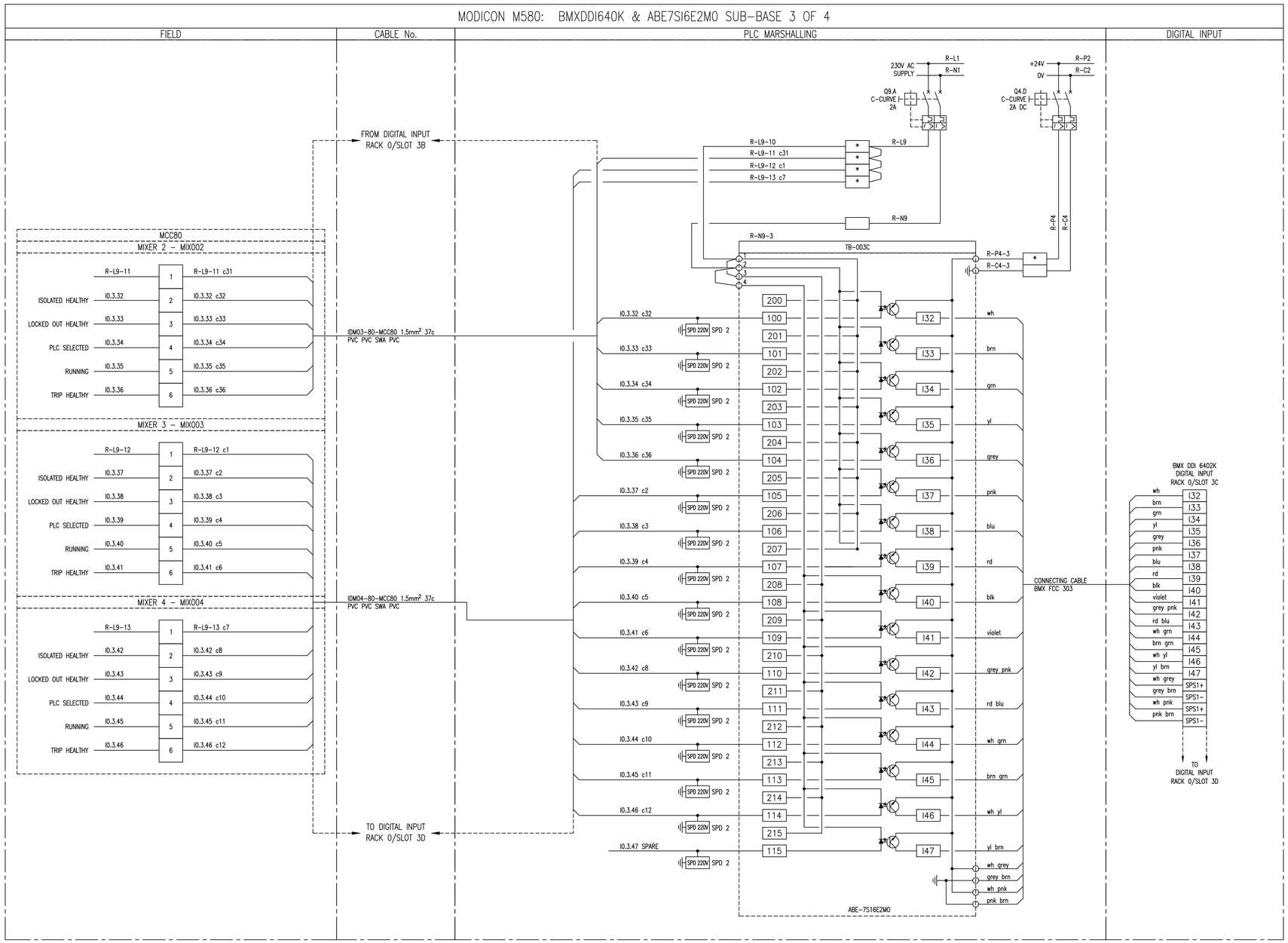
CONSULTANT'S NUMBER ING0645D-80-R0S3B-DI

FILE No BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S3B-DI revT0.dwg May 30, 2019 - 2:16pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 3 OF 4
RACK 0 / SLOT 3C

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S3C-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S3C-DI

FILE No
BWW 1500

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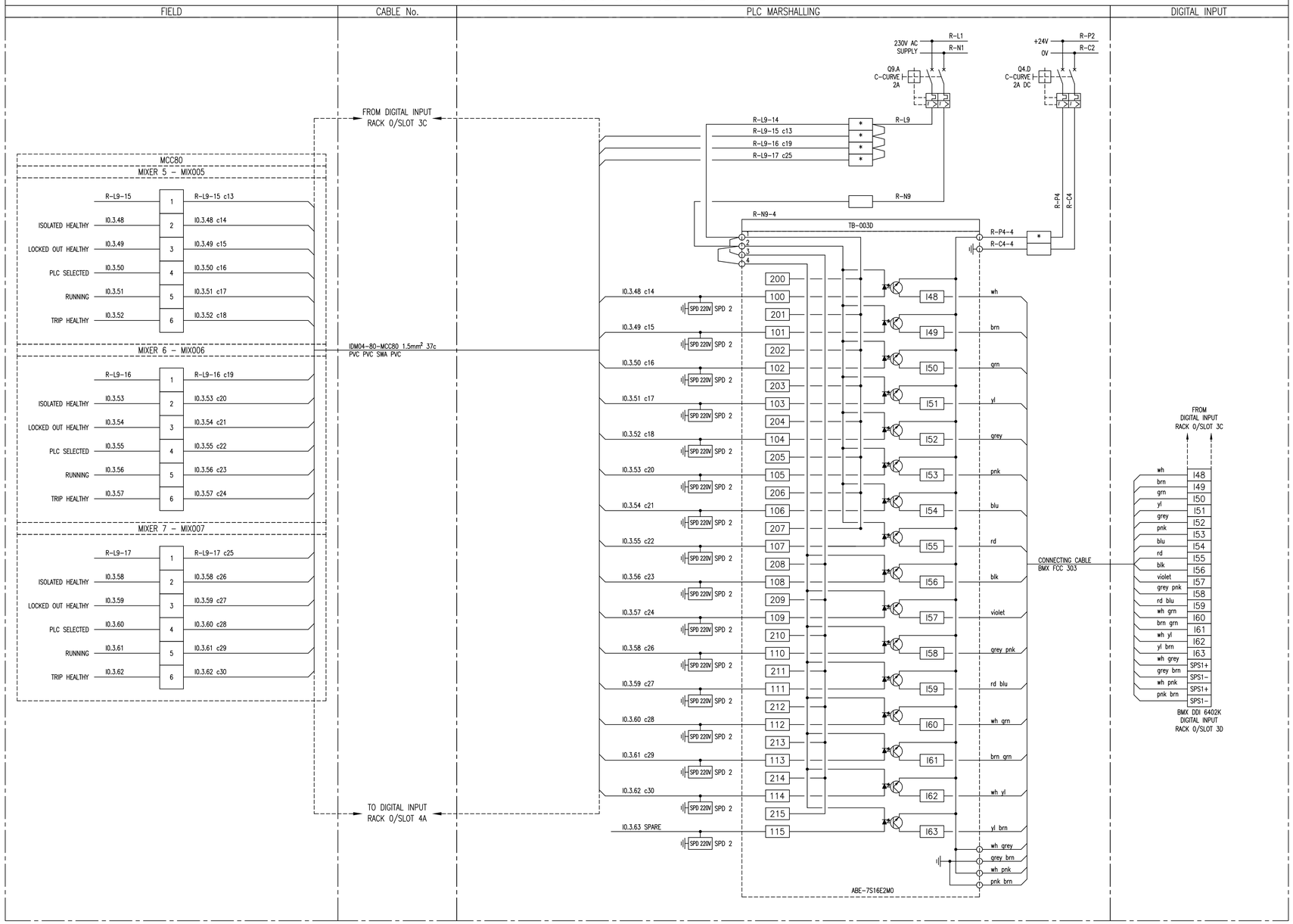
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 4 OF 4



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 - PHASE 2

UNIT 5 - BIOREACTOR 2 PLC-80

DIGITAL INPUT MODULE: SUB-BASE 4 OF 4

RACK 0 / SLOT 3D

DESIGN MANAGER

DATE

SCALE

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T0		W BRITZ	15.09.18

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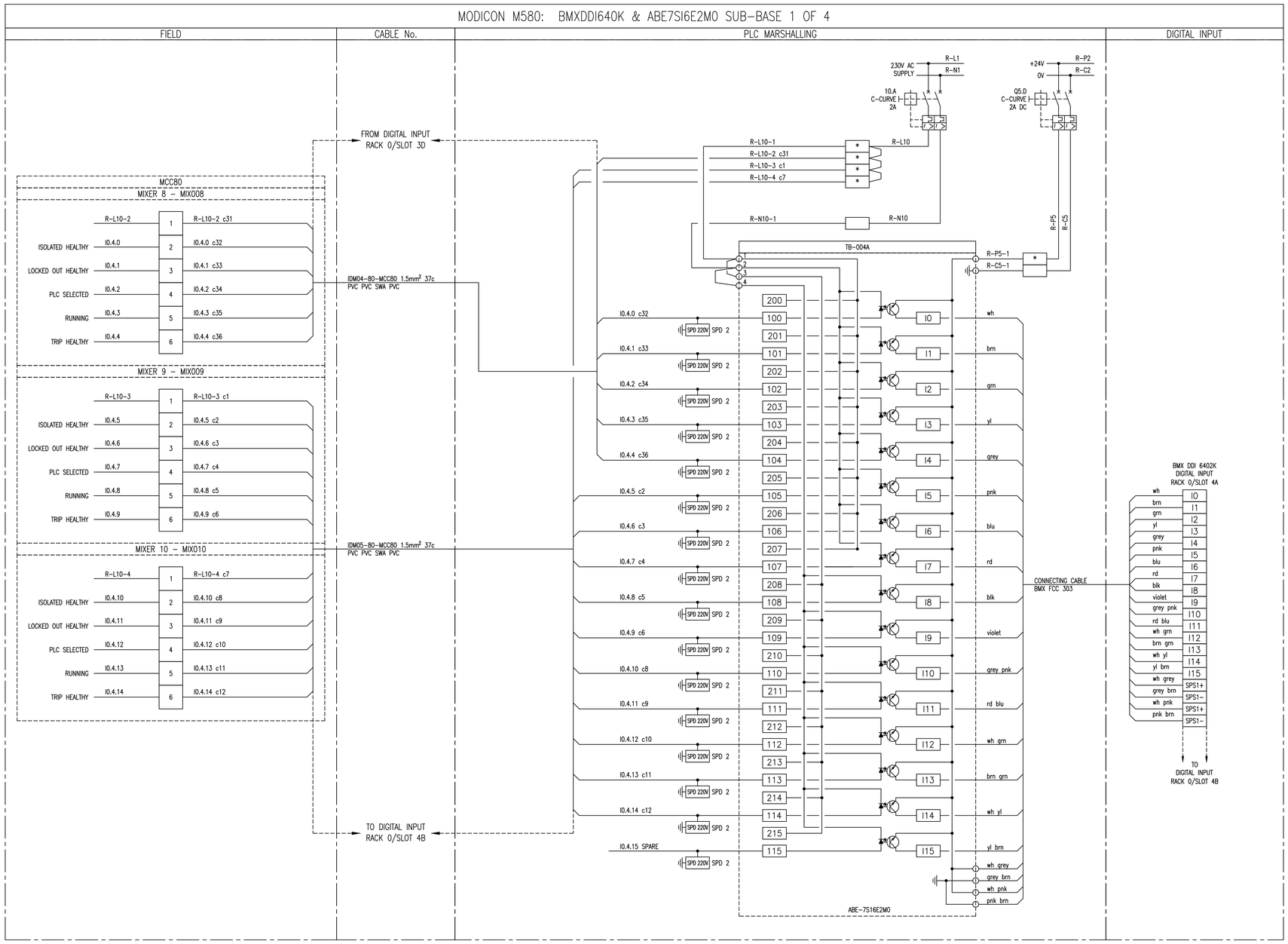
T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S3D-DI rev T0.dwg May 30, 2019 - 2:16pm



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11. SPD 2: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
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TEL. 011-806 7111
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water
17 HARRISON STREET
MARSHALLTOWN
2107
TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 4A

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	15.09.18

DRAWING No.

JW NUMBER
13898-80-R0S4A-DI

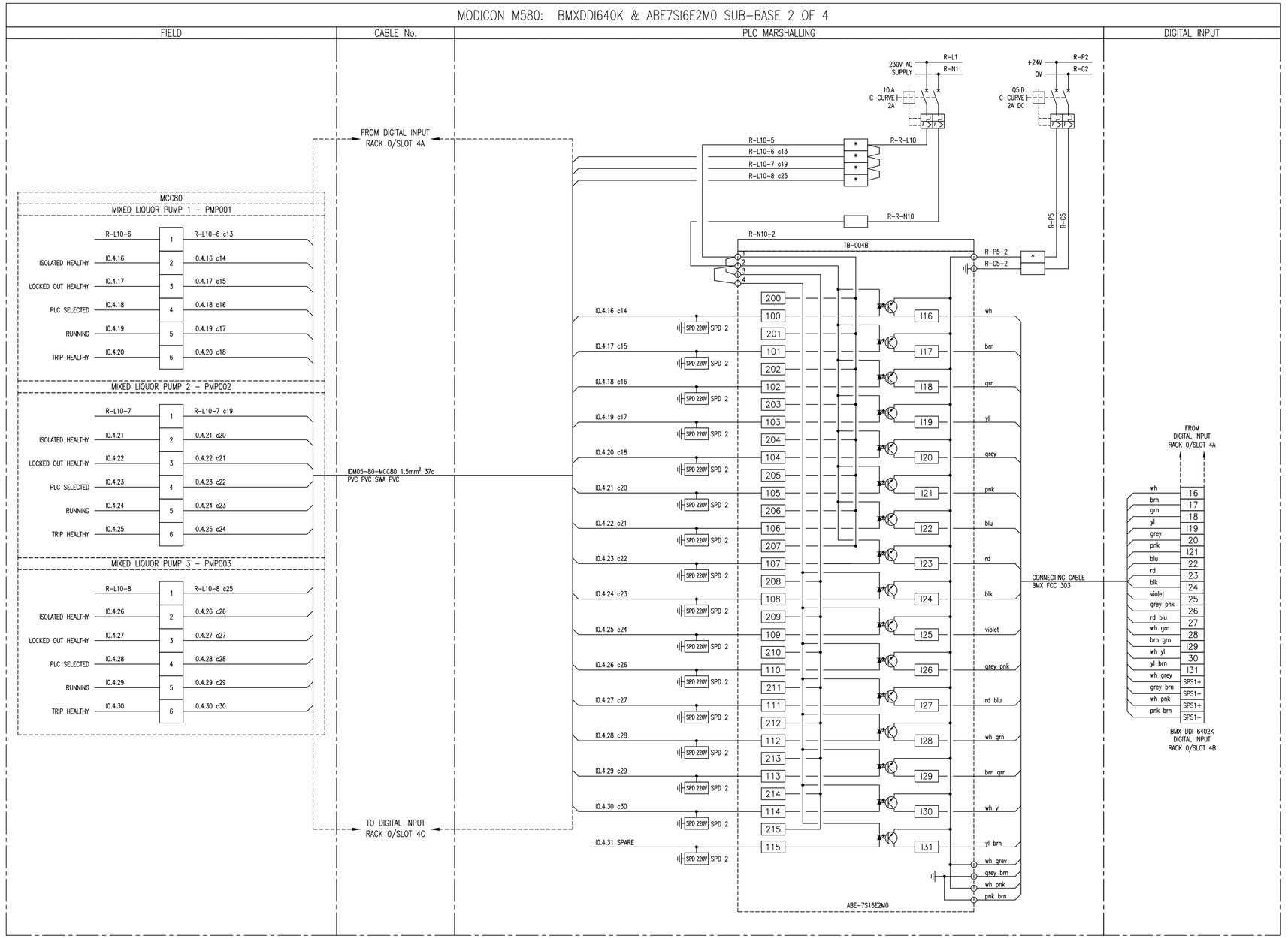
CONSULTANT'S NUMBER
ING0645D-80-R0S4A-DI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S4A-DI revT0.dwg May 30, 2019 – 2:16pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4



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* FUSED TERMINAL (500mA)

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 4B

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	AMENDMENTS	APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S4B-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S4B-DI

FILE No
BWW 1500

TO

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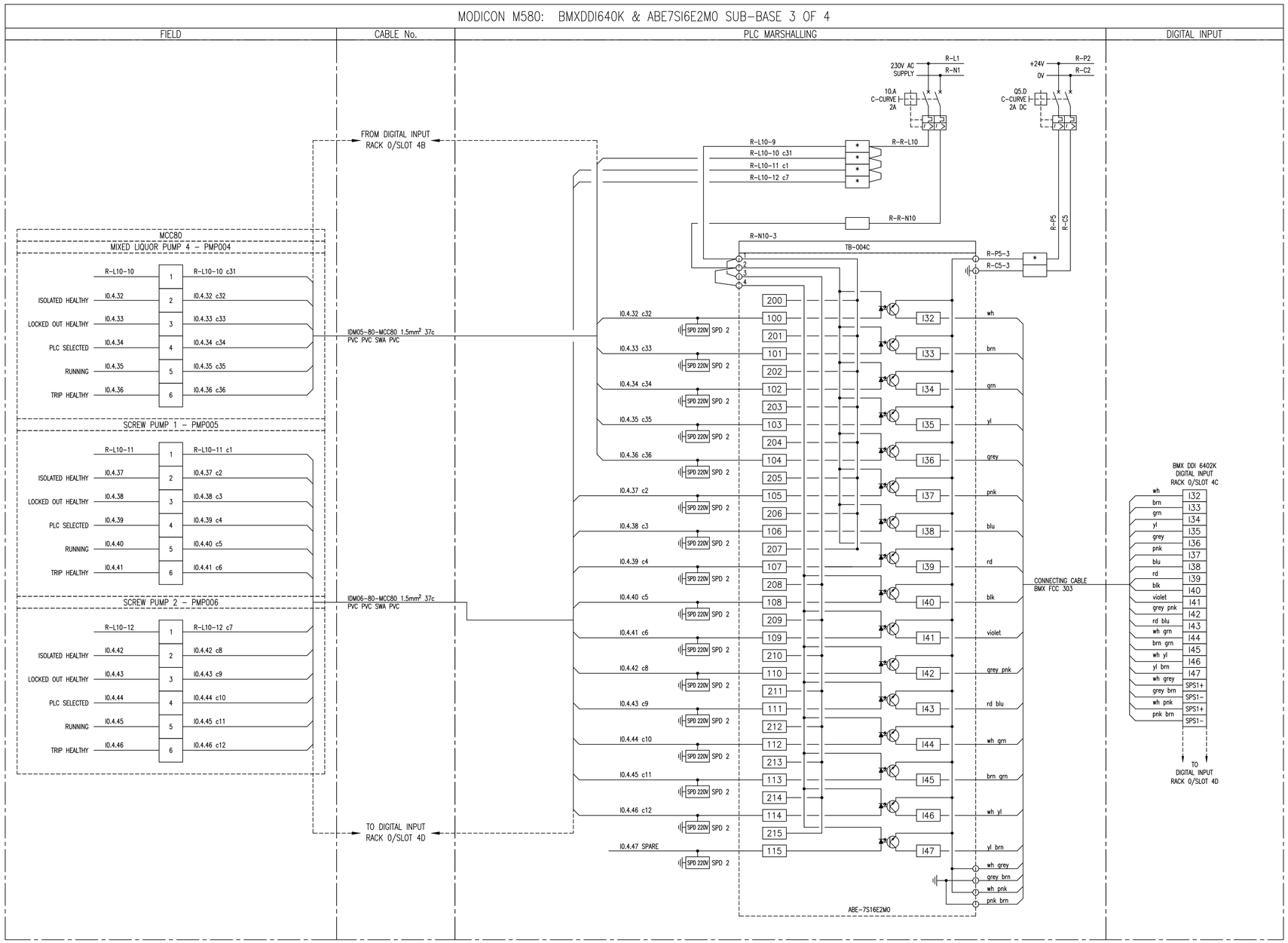
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 3 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 3 OF 4
RACK 0 / SLOT 4C

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S4C-DI

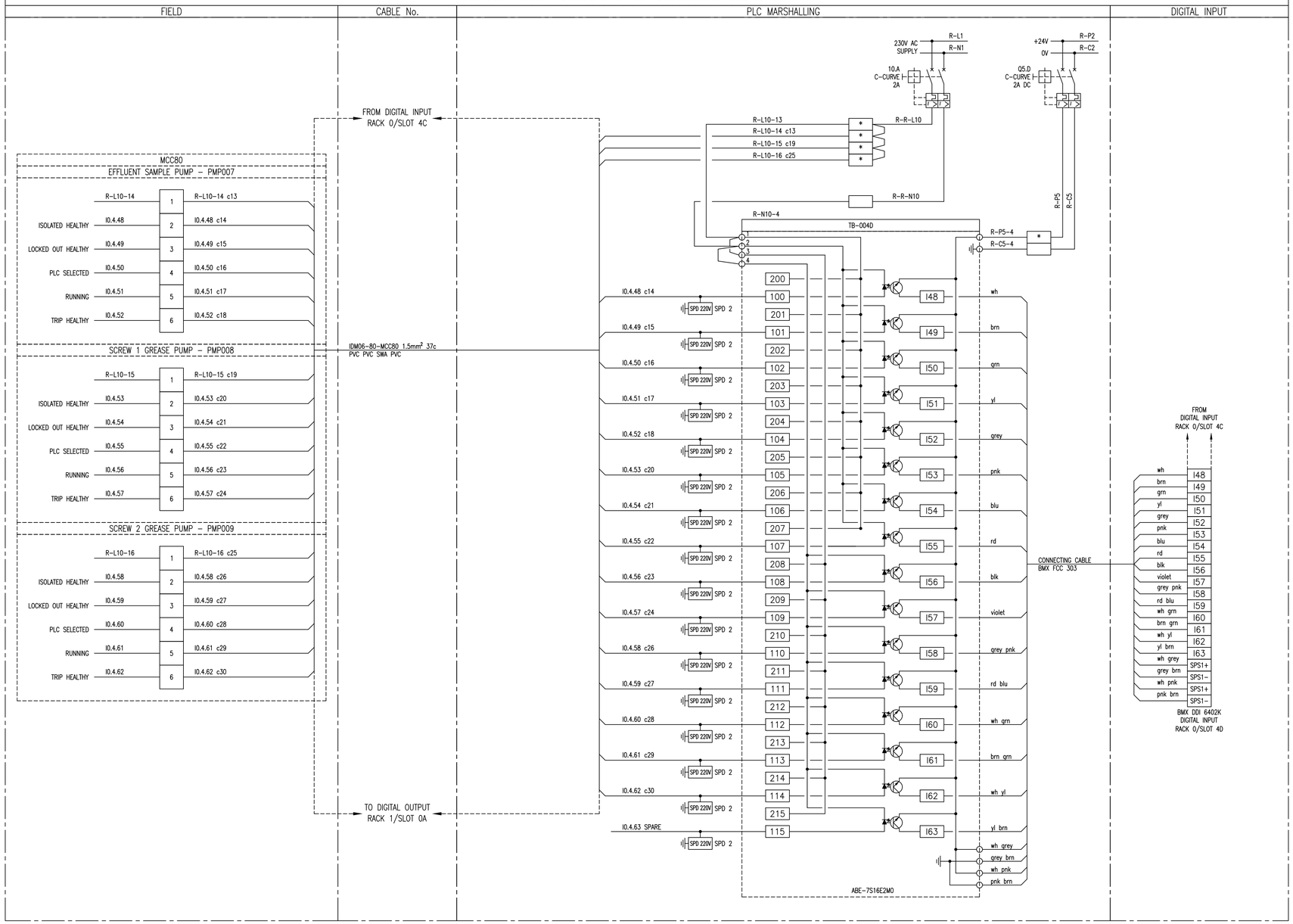
CONSULTANT'S NUMBER
ING0645D-80-R0S4C-DI

FILE No
BWW 1500

TO

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S4C-DI revT0.dwg May 30, 2019 - 2:16pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 4 OF 4



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 4 OF 4
RACK 0 / SLOT 4D

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S4D-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S4D-DI

FILE No
BWW 1500

T0

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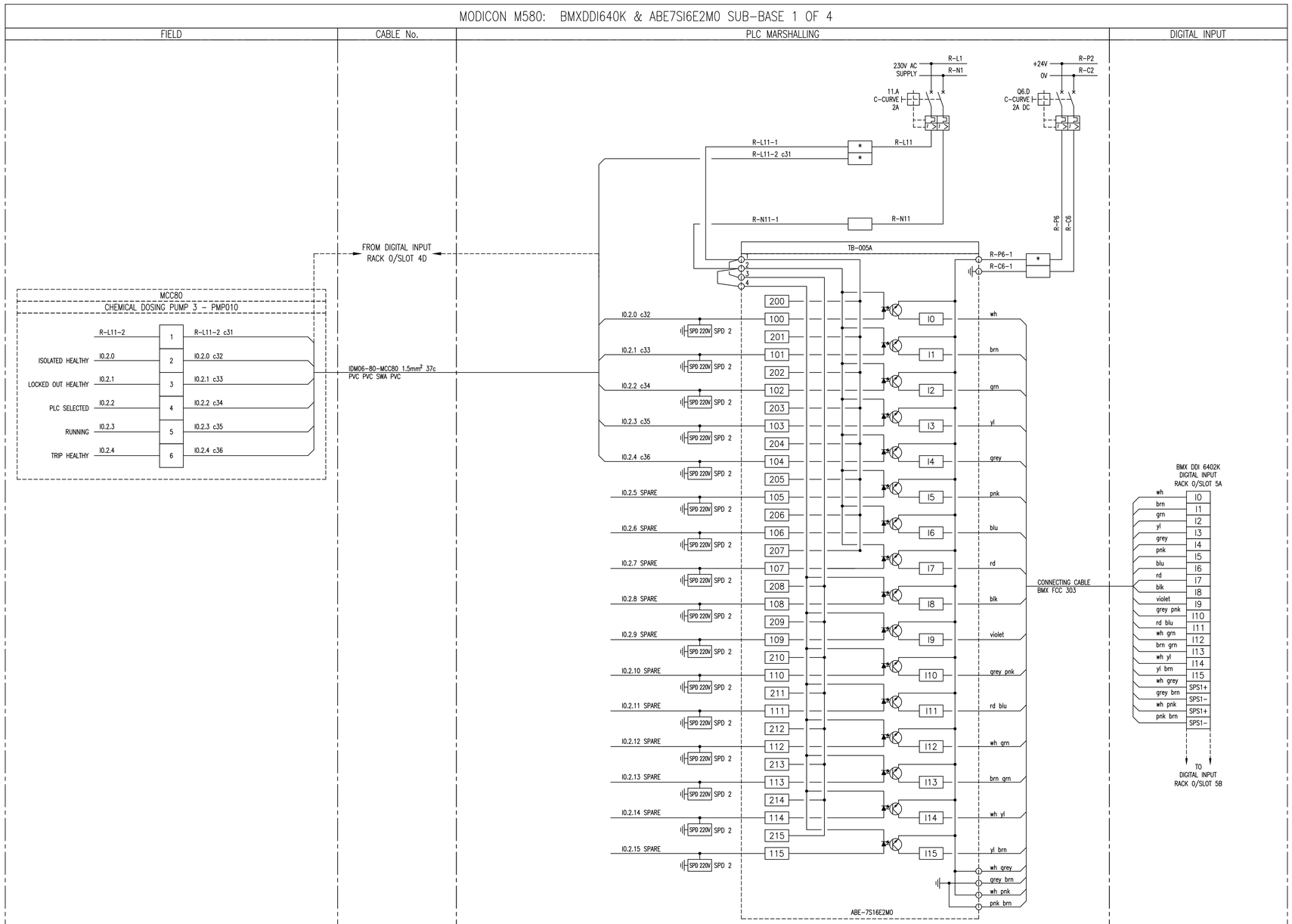
MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 1 OF 4



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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 1 OF 4
RACK 0 / SLOT 5A

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R0S5A-DI

CONSULTANT'S NUMBER
ING0645D-80-R0S5A-DI

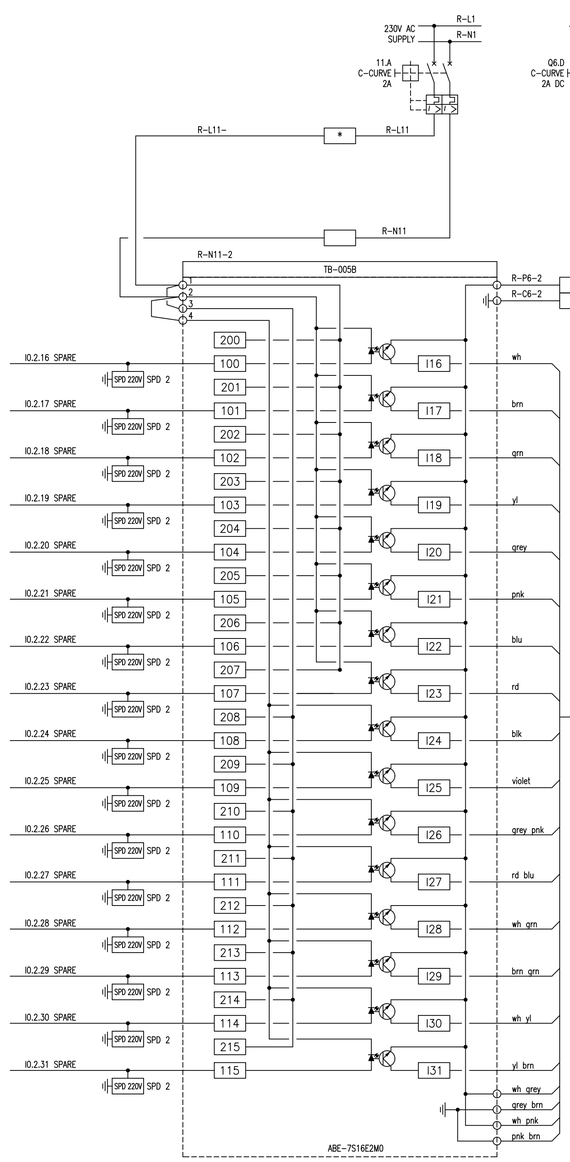
FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S5A-DI revT0.dwg May 30, 2019 – 2:16pm

MODICON M580: BMXDDI640K & ABE7SI6E2M0 SUB-BASE 2 OF 4

FIELD	CABLE No.	PLC MARSHALLING	DIGITAL INPUT



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* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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DATE	

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
DIGITAL INPUT MODULE: SUB-BASE 2 OF 4
RACK 0 / SLOT 5B

DESIGN MANAGER

DATE

SCALE: NTS

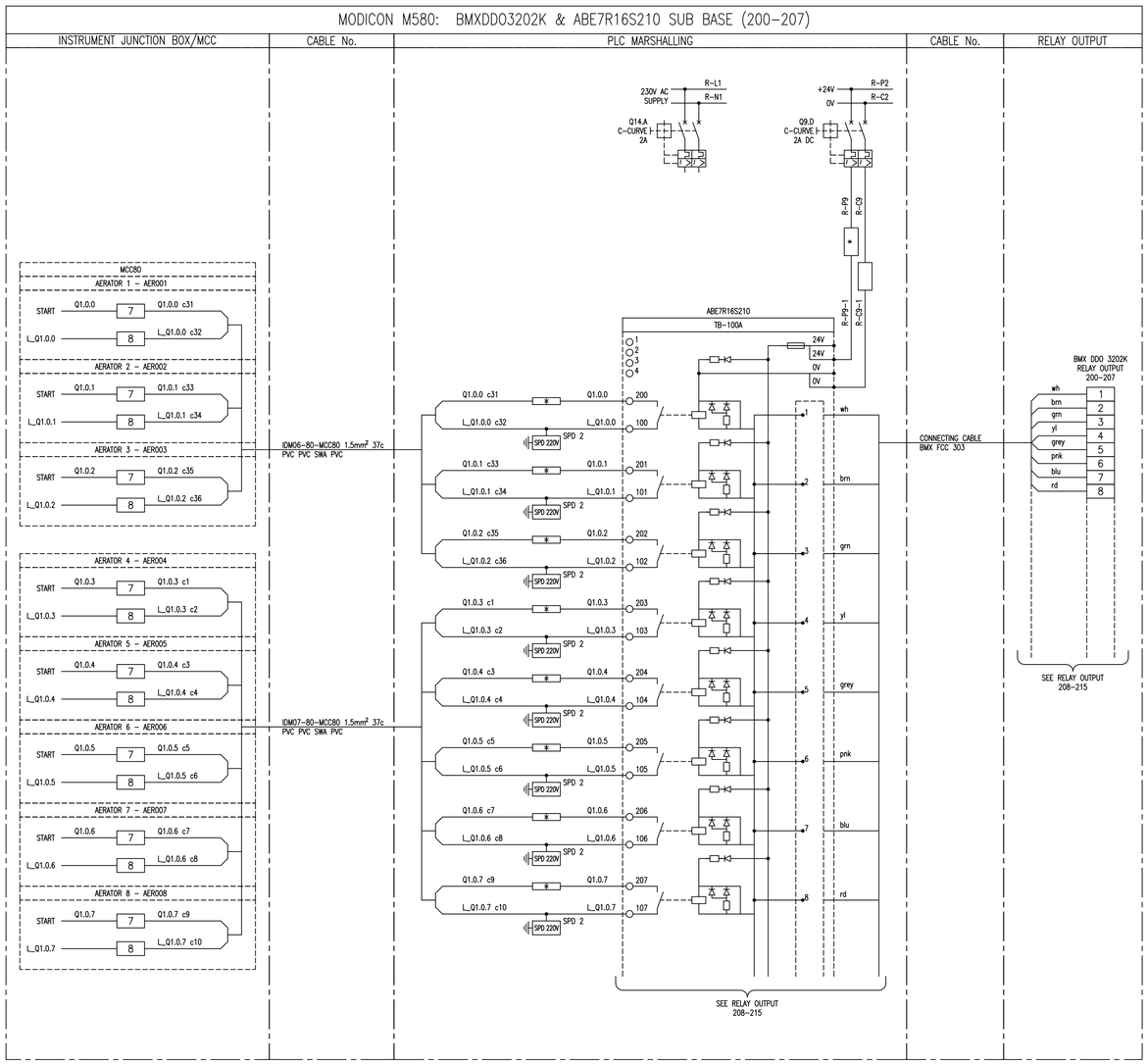
AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER: JW13898-80-R0S5B-DI
CONSULTANT'S NUMBER: ING0645D-80-R0S5B-DI
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R0S5B-DI revTO.dwg May 30, 2019 – 2:16pm



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LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC–80
DIGITAL OUTPUT MODULE: SUB–BASE 1 OF 2
RACK 1 / SLOT 0A (200–215)

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
TO		W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898–80–R1S0A–D0

CONSULTANT'S NUMBER
ING0645D–80–R1S0A–D0

FILE No
BWW 1500

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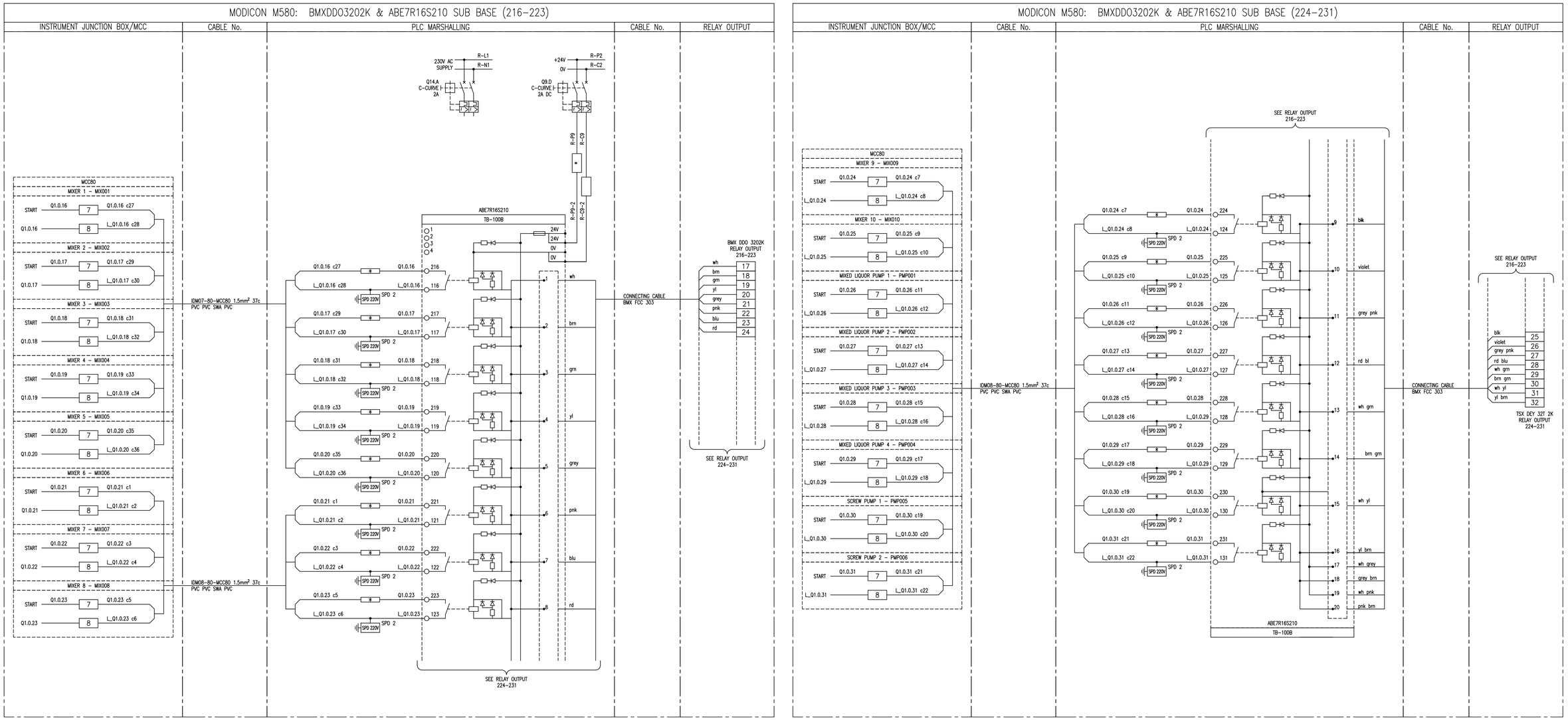

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 2 – BIOREACTOR 2 PLC–80
DIGITAL OUTPUT MODULE: SUB–BASE 2 OF 2
RACK 1 / SLOT 0B (216–231)

DESIGN MANAGER

DATE

SCALE: NTS

AMENDMENTS

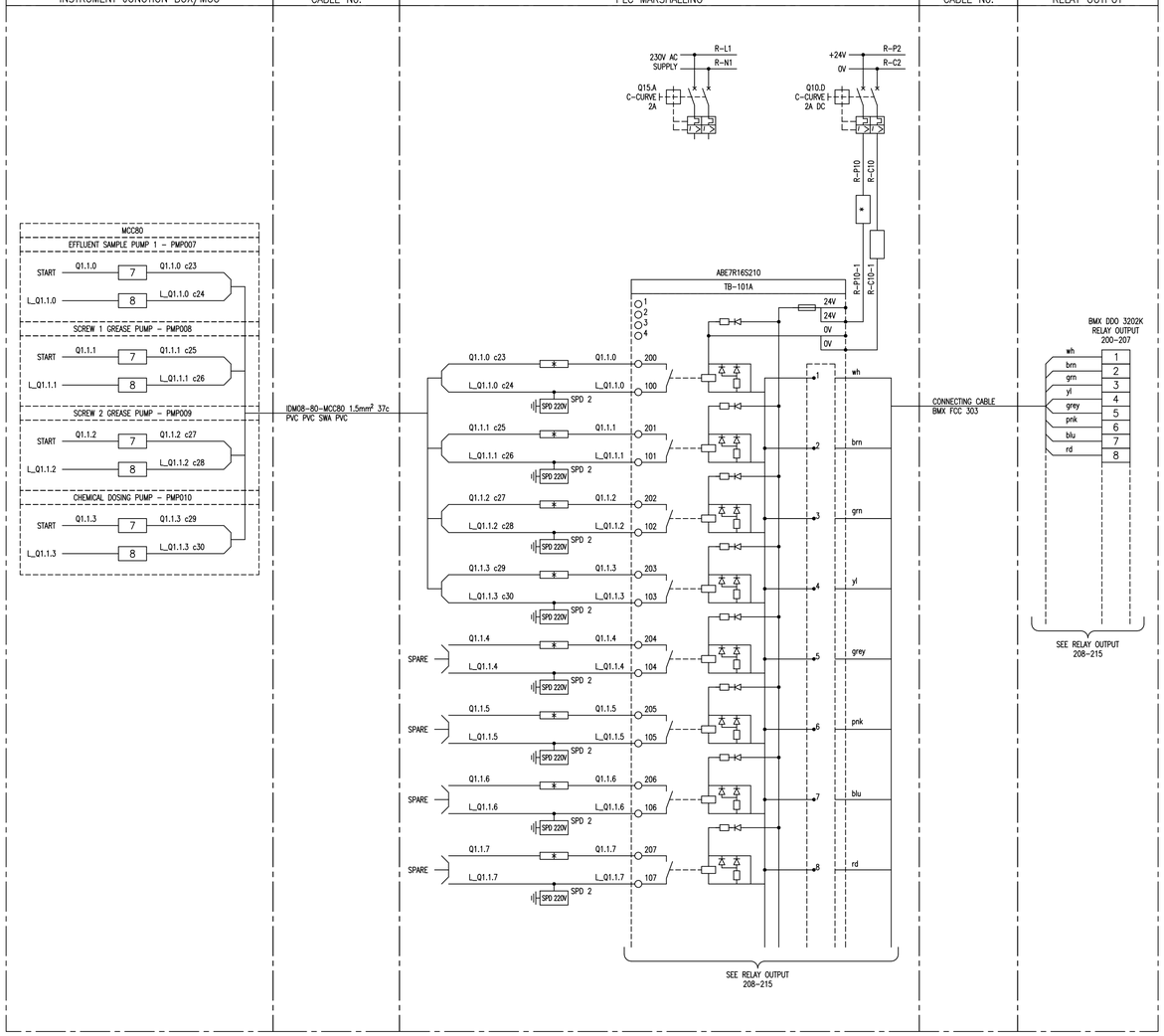
		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	15.09.18

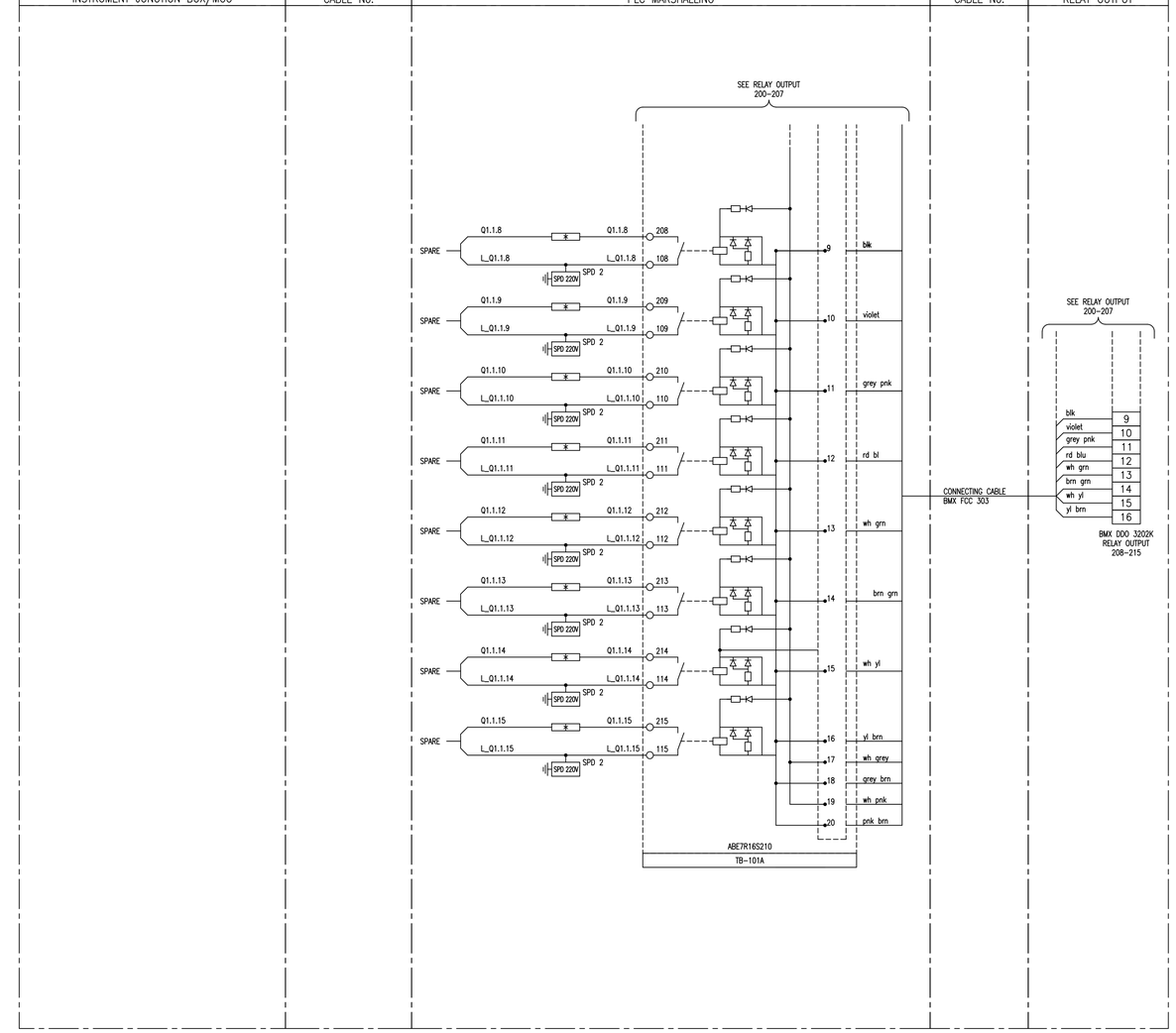
DRAWING No.

JW NUMBER: JW13898–80–R1S0B–DO
CONSULTANT'S NUMBER: ING0645D–80–R1S0B–DO
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–80 (U5 MOD 2)\Wiring Diagrams\ING0645D–80–R1S0B–DO revT0.dwg May 30, 2019 – 2:16pm

MODICON M580: BMXDDO3202K & ABE7R16S210 SUB BASE (200–207)





NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.
2. SUB–BASE 1: ABE–7S16E2M0: 230V AC DIGITAL OUTPUT
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7. SPD 2: DEHNguard DG S 275 VA
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10. SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS
11. SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)
LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC–80
DIGITAL OUTPUT MODULE: SUB–BASE 1 OF 2
RACK 1 / SLOT 1A (200–215)

DESIGN MANAGER

DATE

SCALE: NTS

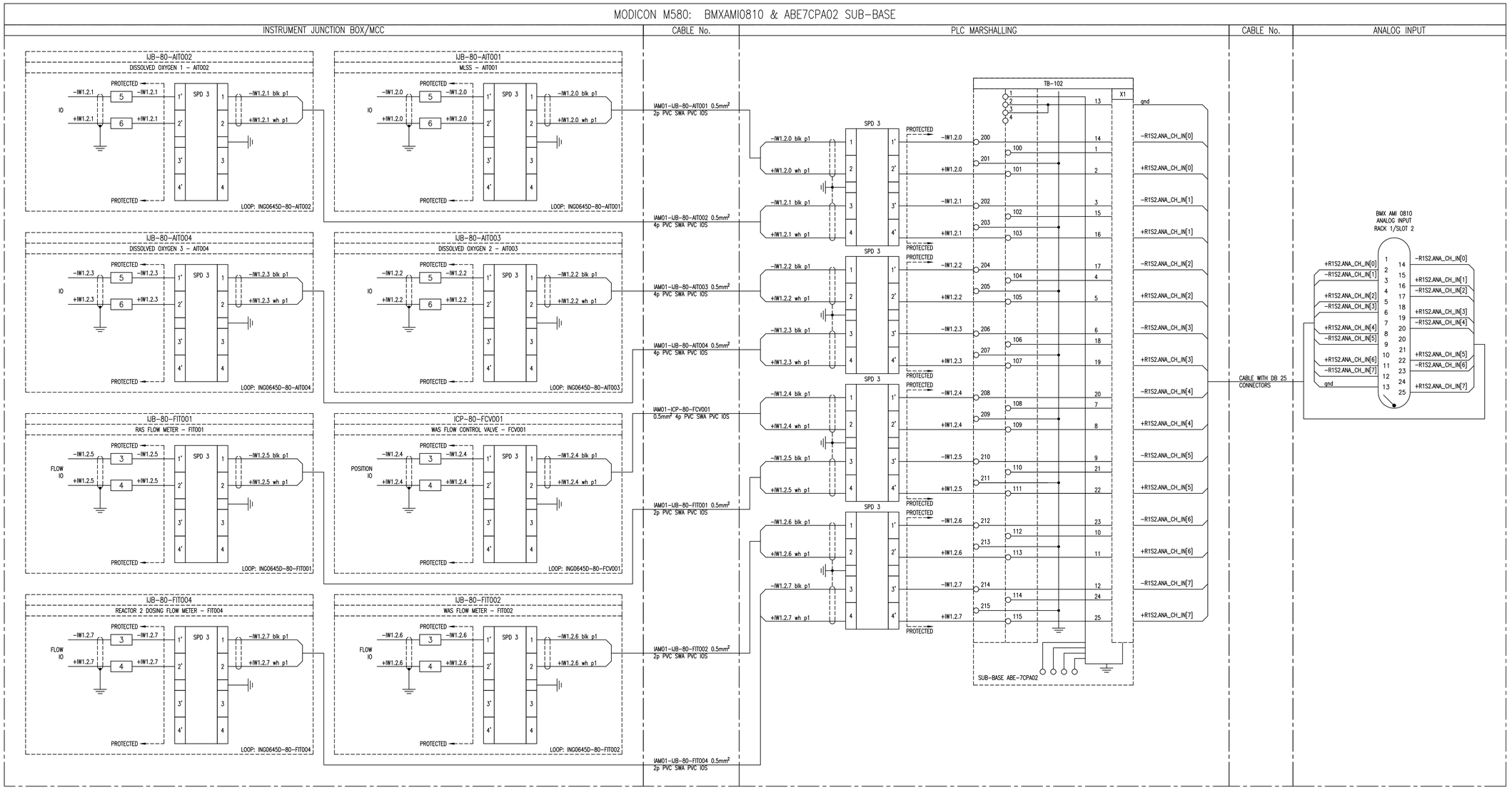
AMENDMENTS

TO	ISSUED FOR TENDER	APPROVED	DATE
		W BRITZ	15.09.18

DRAWING No.

JW NUMBER: JW13898–80–R1S1A–DO
CONSULTANT'S NUMBER: ING0645D–80–R1S1A–DO
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC–80 (U5 MOD 2)\Wiring Diagrams\ING0645D–80–R1S1A–DO revT0.dwg May 30, 2019 – 2:17pm



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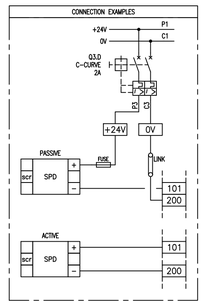
* FUSED TERMINAL (500mA)

LINK TERMINAL



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
ANALOG INPUT MODULE
RACK 1 / SLOT 2

DESIGN MANAGER

DATE

SCALE: NTS

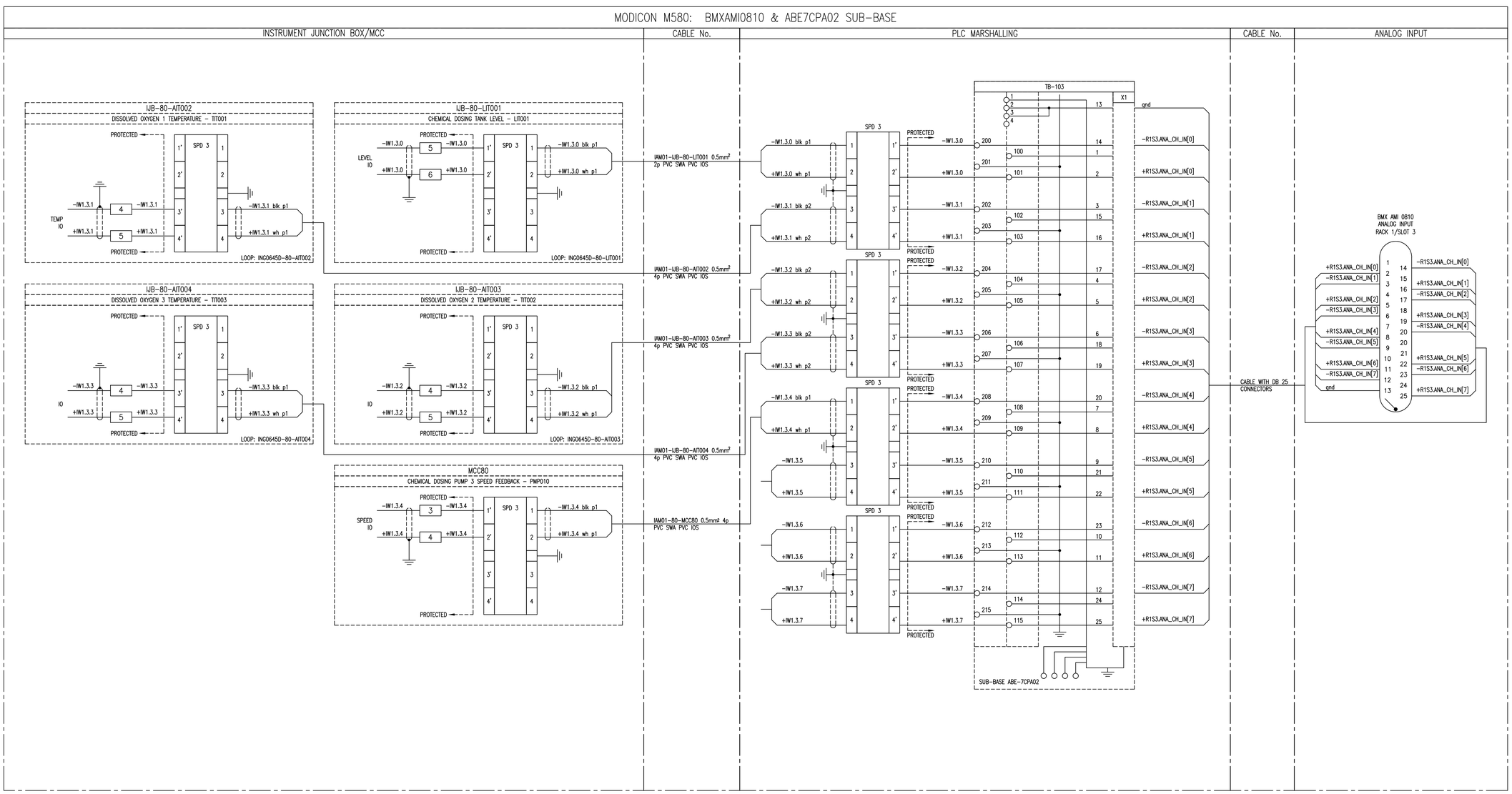
AMENDMENTS

	TO	ISSUED FOR TENDER	APPROVED	DATE
			W BRITZ	15.09.18

DRAWING No.

JW NUMBER: JW13898-80-R1S2-AI
CONSULTANT'S NUMBER: ING0645D-80-R1S2-AI
FILE No: BWW 1500
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R1S2-AI rev70.dwg May 30, 2019 – 2:17pm



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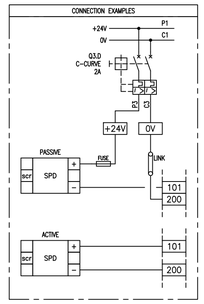

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
ANALOG INPUT MODULE
RACK 1 / SLOT 3

DESIGN MANAGER

DATE

SCALE

NTS

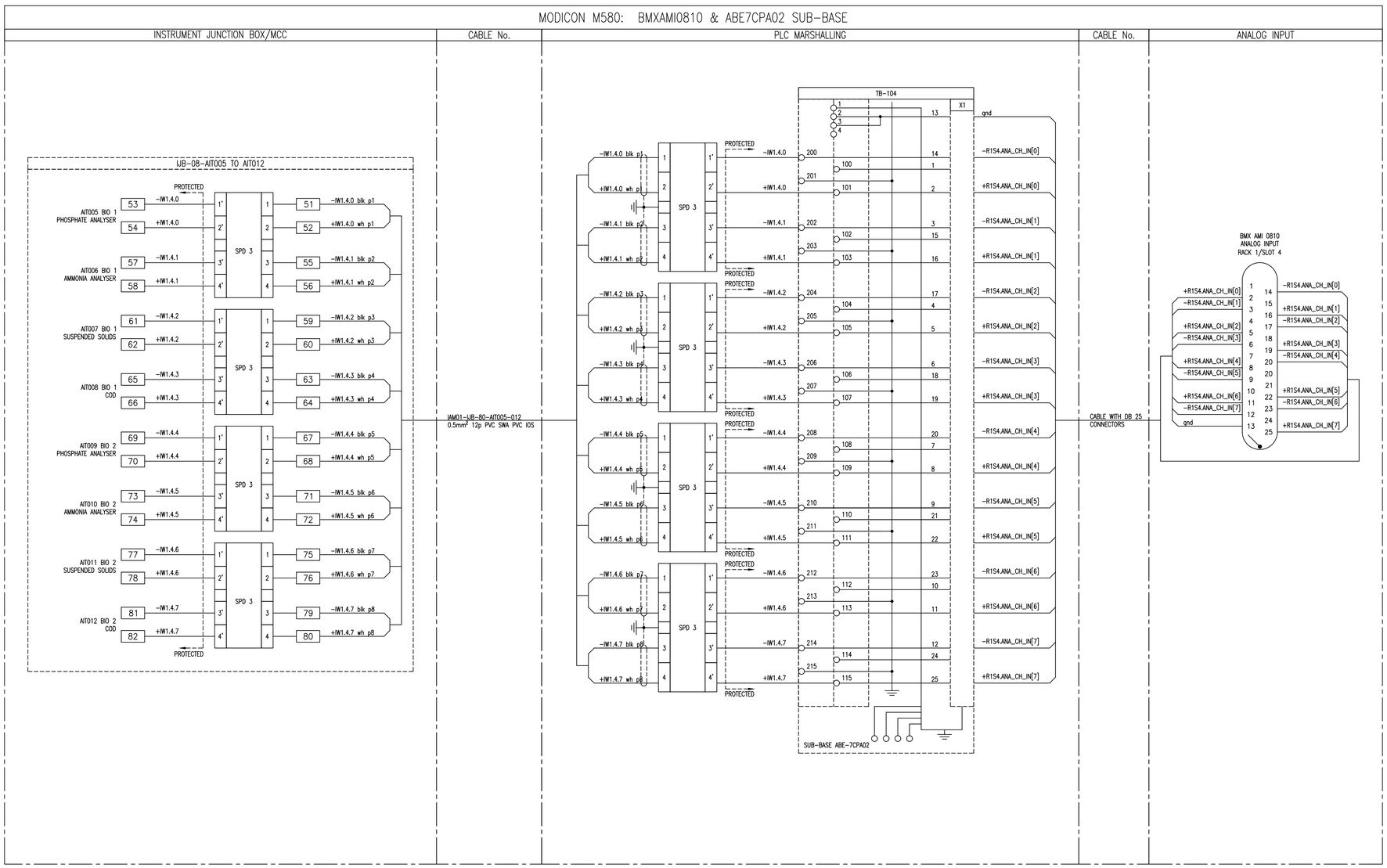
AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R1S3-AI
CONSULTANT'S NUMBER
ING0645D-80-R1S3-AI
FILE No
BWW 1500
T0

I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R1S3-AI rev T0.dwg May 30, 2019 - 2:17pm



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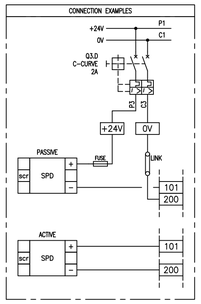

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SURVEYED	
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
ANALOG INPUT MODULE
RACK 1 / SLOT 4

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	ISSUED FOR TENDER	APPROVED	DATE
T0		W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R1S4-AI

CONSULTANT'S NUMBER
ING0645D-80-R1S4-AI

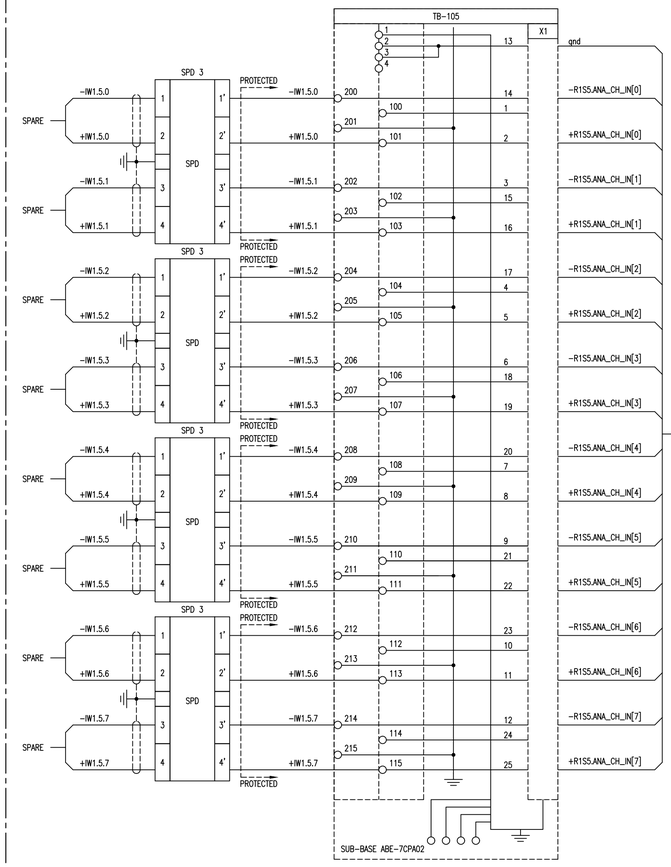
FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. Cad and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R1S4-AI rev10.dwg May 30, 2019 – 2:17pm

MODICON M580: BMXAMI0810 & ABE7CPA02 SUB-BASE

INSTRUMENT JUNCTION BOX/MCC	CABLE No.	PLC MARSHALLING	CABLE No.	ANALOG INPUT



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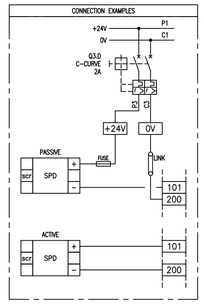

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DESIGNED	W BRITZ
DRAWN	M DYKE
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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
ANALOG INPUT MODULE
RACK 1 / SLOT 5

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	TO	ISSUED FOR TENDER	APPROVED	DATE
			W BRITZ	15.09.18

DRAWING No.

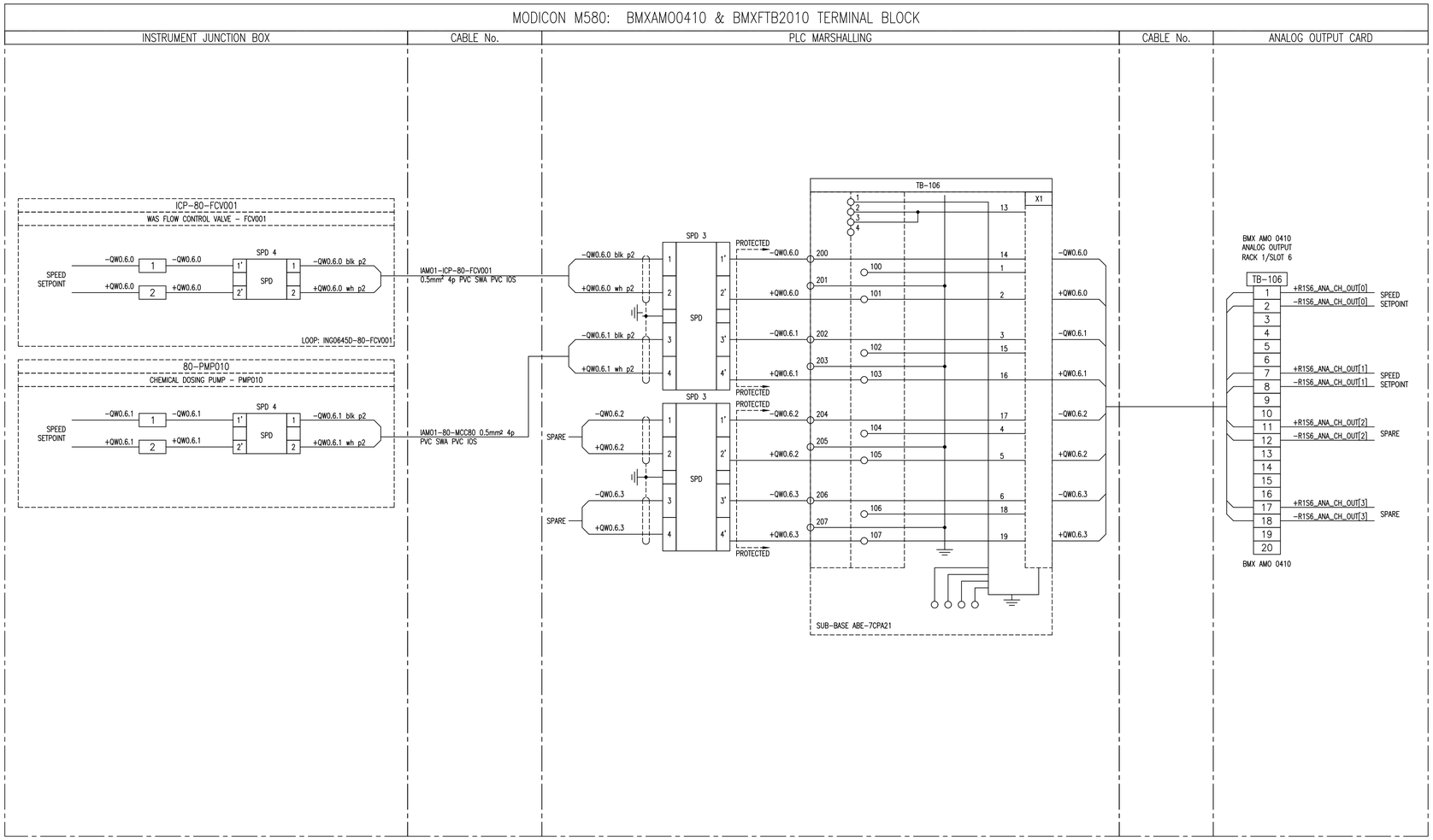
JW NUMBER
JW13898-80-R1S5-AI

CONSULTANT'S NUMBER
ING0645D-80-R1S5-AI

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R1S5-AI rev70.dwg May 30, 2019 – 2:17pm



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LINK TERMINAL

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GEOTECHNICAL INVESTIGATION	
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 - PHASE 2
UNIT 5 - BIOREACTOR 2 PLC-80
ANALOG OUTPUT MODULE
RACK 1 / SLOT 6

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	15.09.18

DRAWING No.

JW NUMBER
JW13898-80-R1S6-AO

CONSULTANT'S NUMBER
ING0645D-80-R1S6-AO

FILE No
BWW 1500

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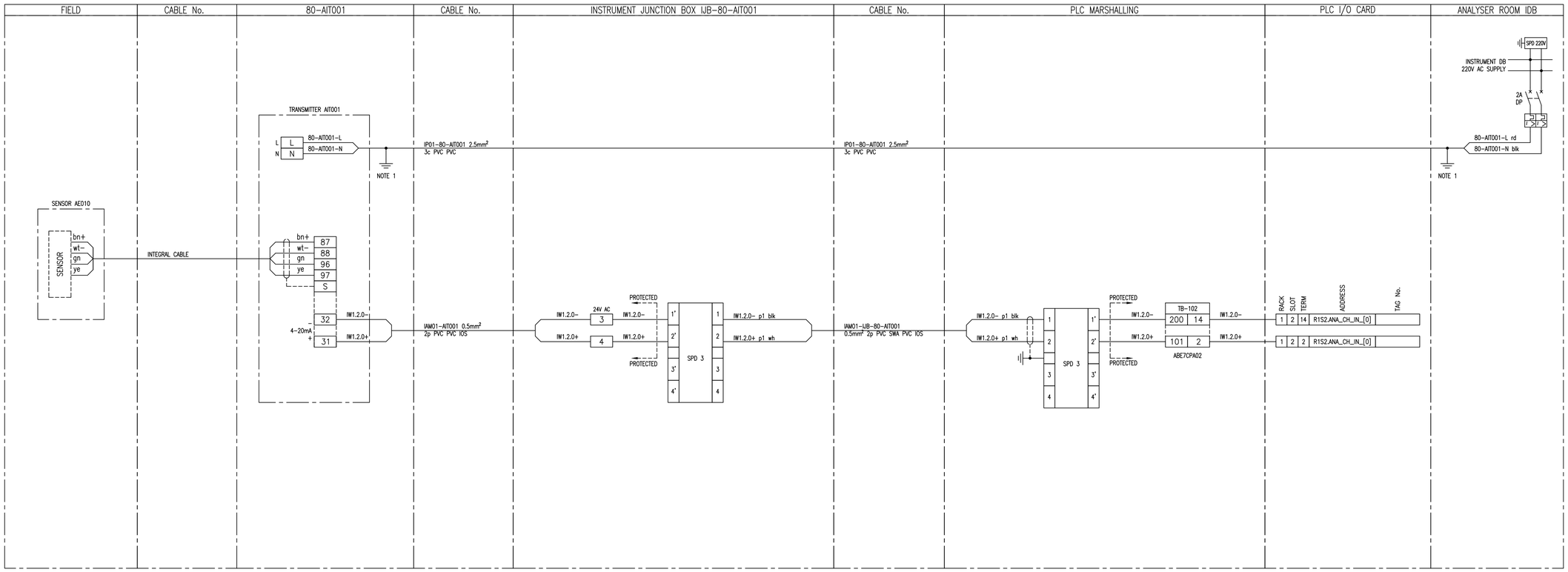
I:\ING - Projects - Drawings\ING0645D - BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Wiring Diagrams\ING0645D-80-R1S6-AO revT0.dwg May 30, 2019 - 2:17pm



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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

MIXED LIQUOR SUSPENDED SOLIDS – AIT001

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	20.11.18

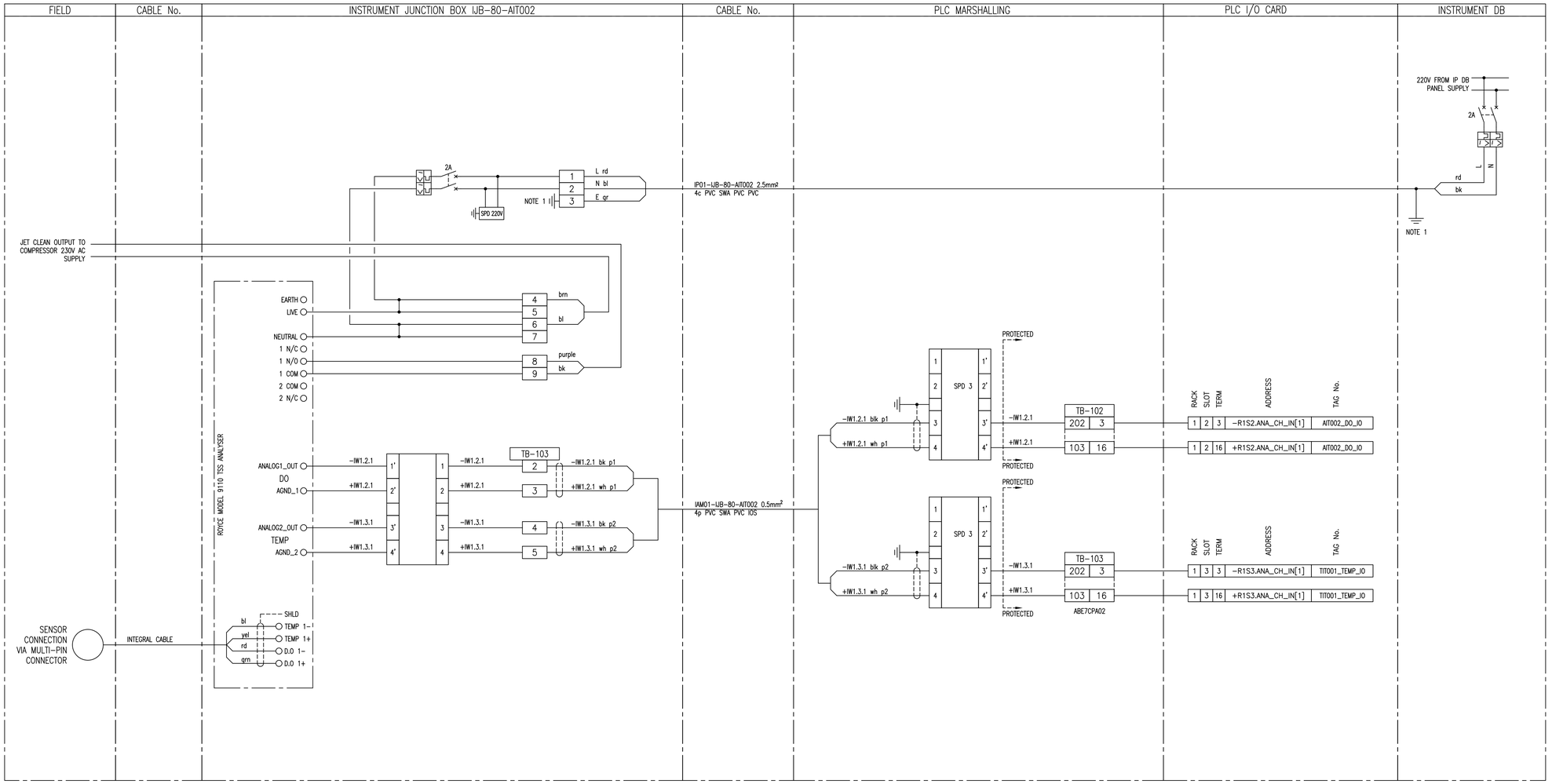
JW NUMBER
JW13898-80-AIT001

CONSULTANT'S NUMBER
ING0645D-80-AIT001

FILE No
BWW 1500

DRAWING No.
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT001 revTO.dwg May 30, 2019 – 2:17pm



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CONSULTING ENGINEERS

Knight Piésold CONSULTING

P.O. BOX 221
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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

DISSOLVED OXYGEN – AIT002

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	TO	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

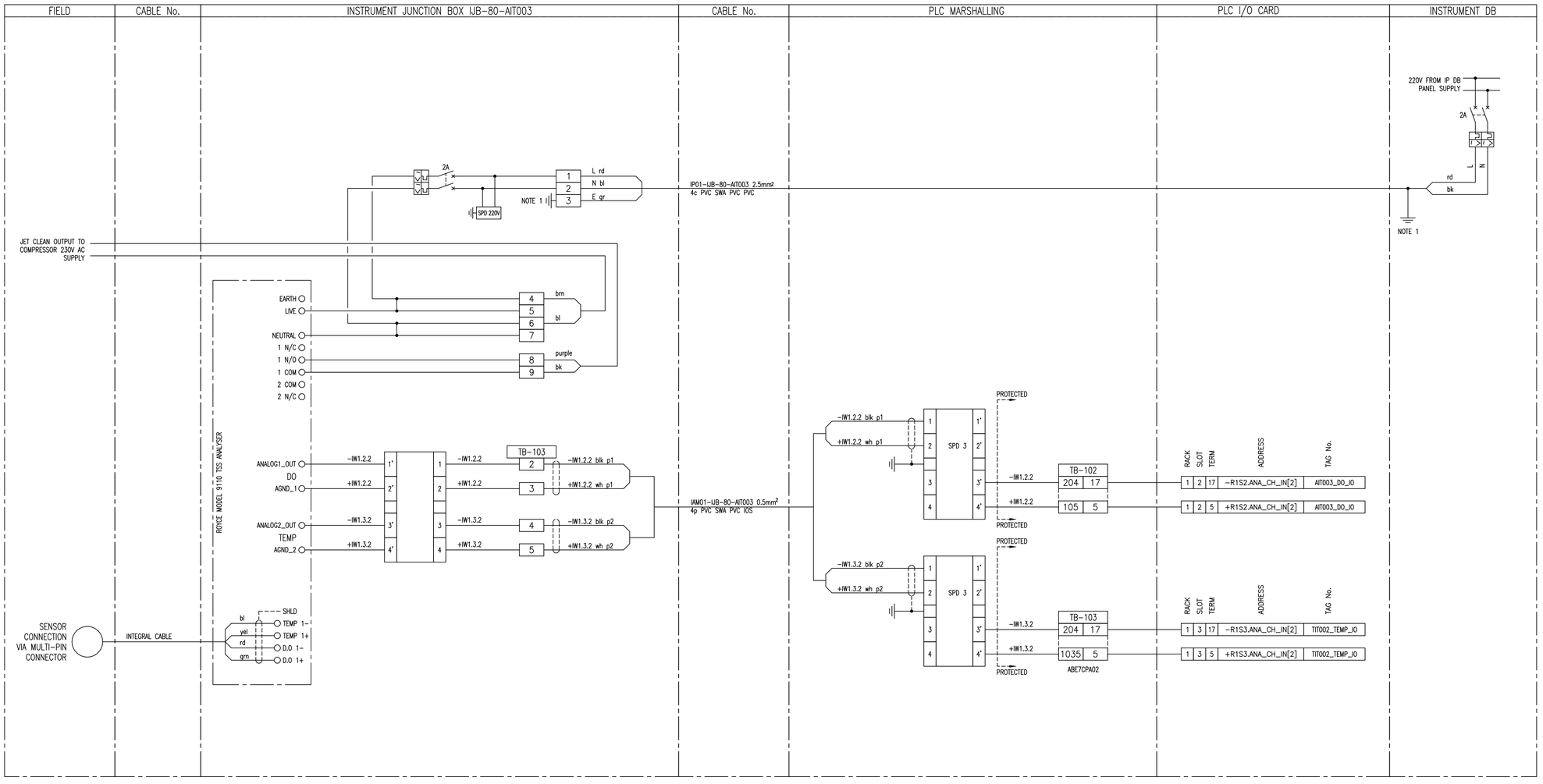
JW NUMBER
JW13898-80-AIT002

CONSULTANT'S NUMBER
ING0645D-80-AIT002

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT002 revTO.dwg May 30, 2019 – 2:17pm



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

DISSOLVED OXYGEN – AIT003

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-AIT003

CONSULTANT'S NUMBER
ING0645D-80-AIT003

FILE No
BWW 1500

T0

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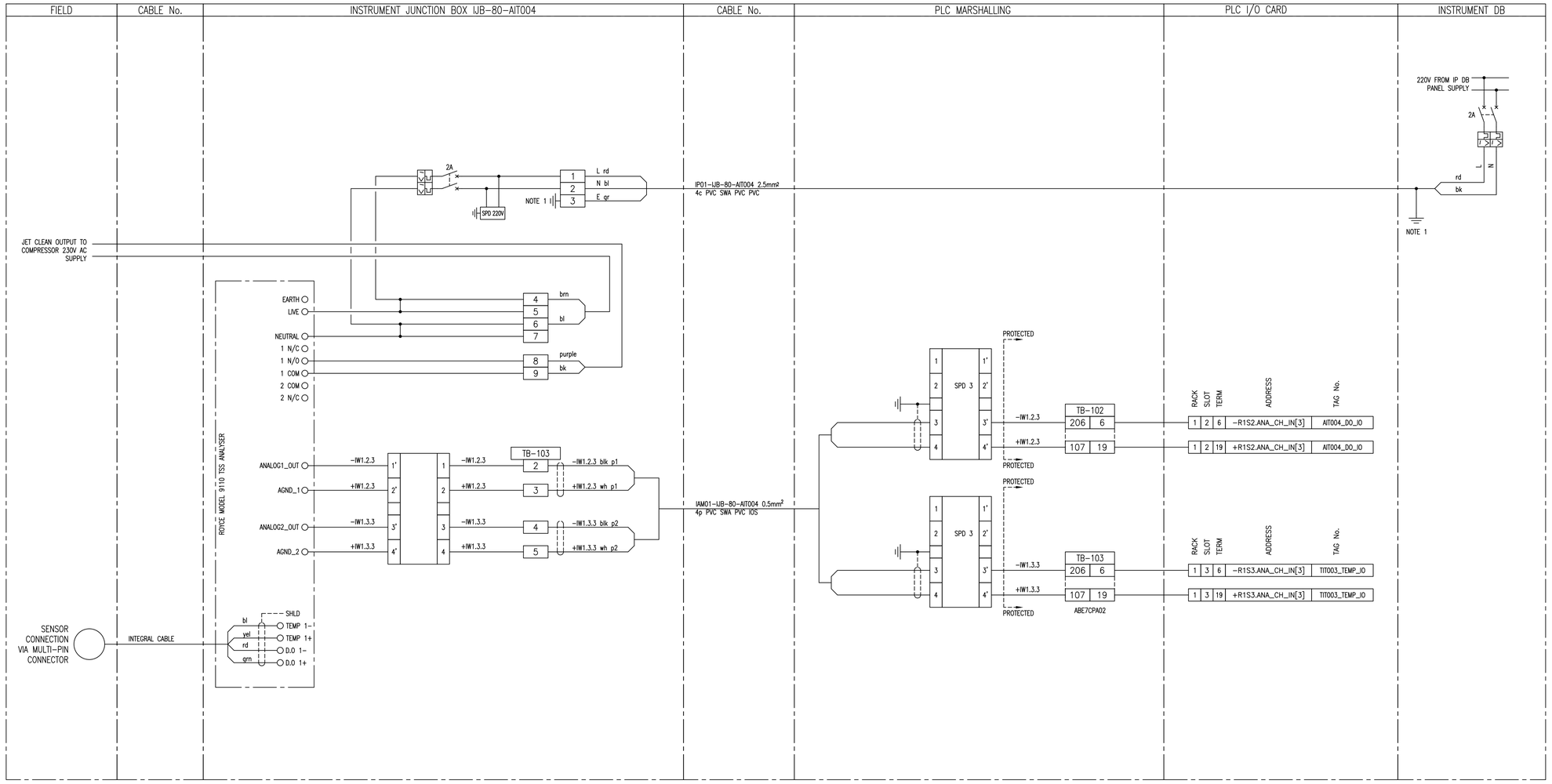

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SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

DISSOLVED OXYGEN – AIT004

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

	TO	ISSUED FOR TENDER	APPROVED	DATE
			W BRITZ	20.11.18

DRAWING No.

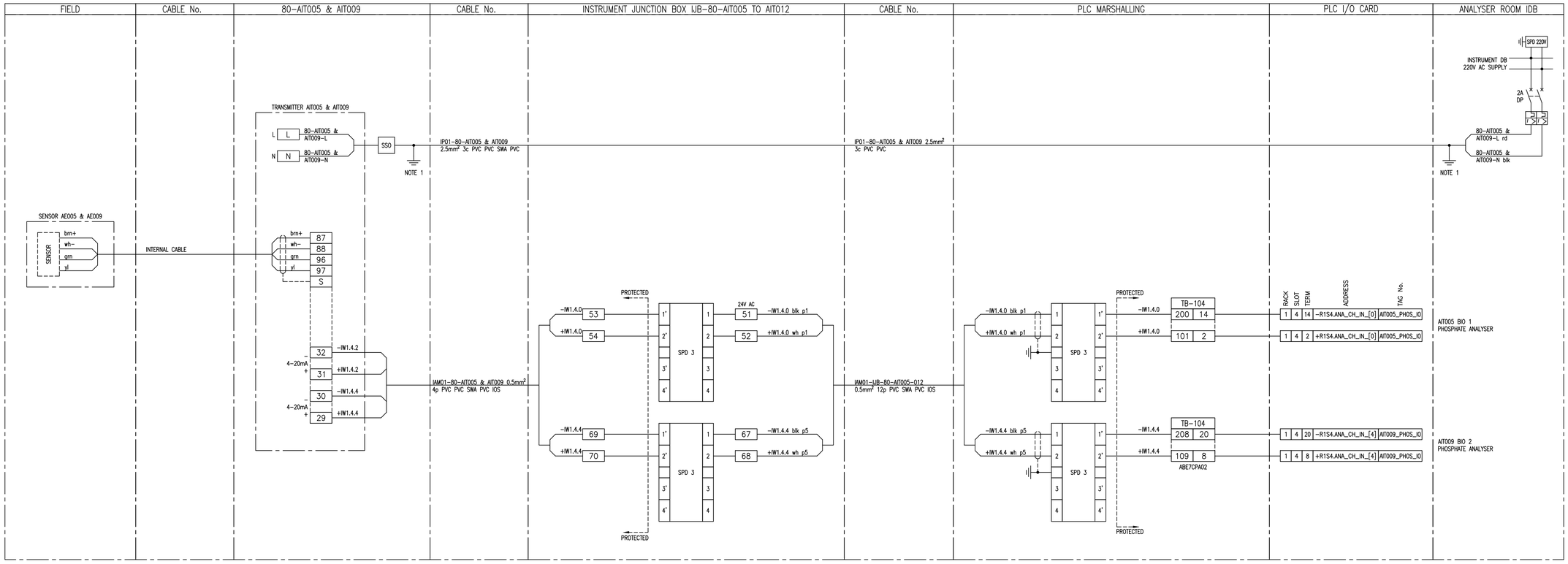
JW NUMBER
JW13898-80-AIT004

CONSULTANT'S NUMBER
ING0645D-80-AIT004

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT004 revTO.dwg May 30, 2019 – 2:17pm



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SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 1 AND 2 PHOSPHATE ANALYSERS – AIT005 & AIT009

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-AIT005&AIT009

CONSULTANT'S NUMBER
ING0645D-80-AIT005&AIT009

FILE No
BWW 1500

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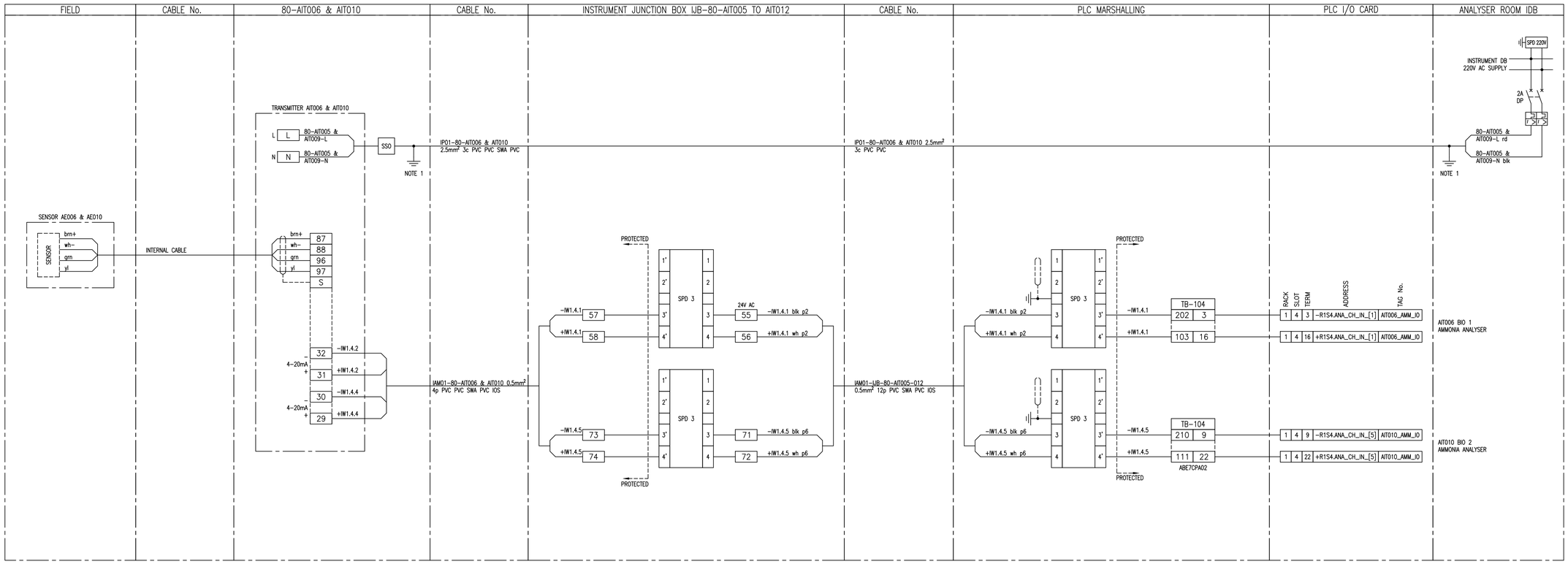

NOTES:

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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 1 AND 2 AMMONIA ANALYSERS – AIT006 & AIT010

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

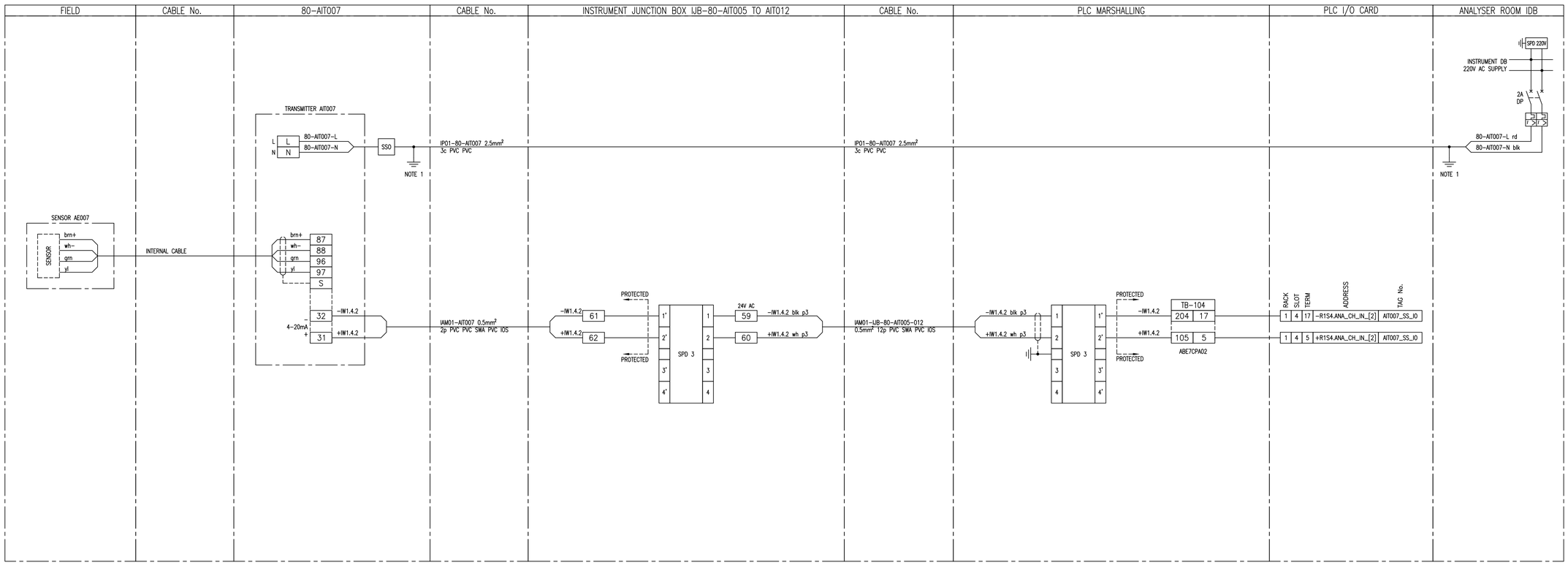
JW NUMBER
JW13898-80-AIT006&AIT010

CONSULTANT'S NUMBER
ING0645D-80-AIT006&AIT010

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT006&AIT010 revT0.dwg May 30, 2019 – 2:18pm



NOTES:

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SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 1 SS PROBE – AIT007

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

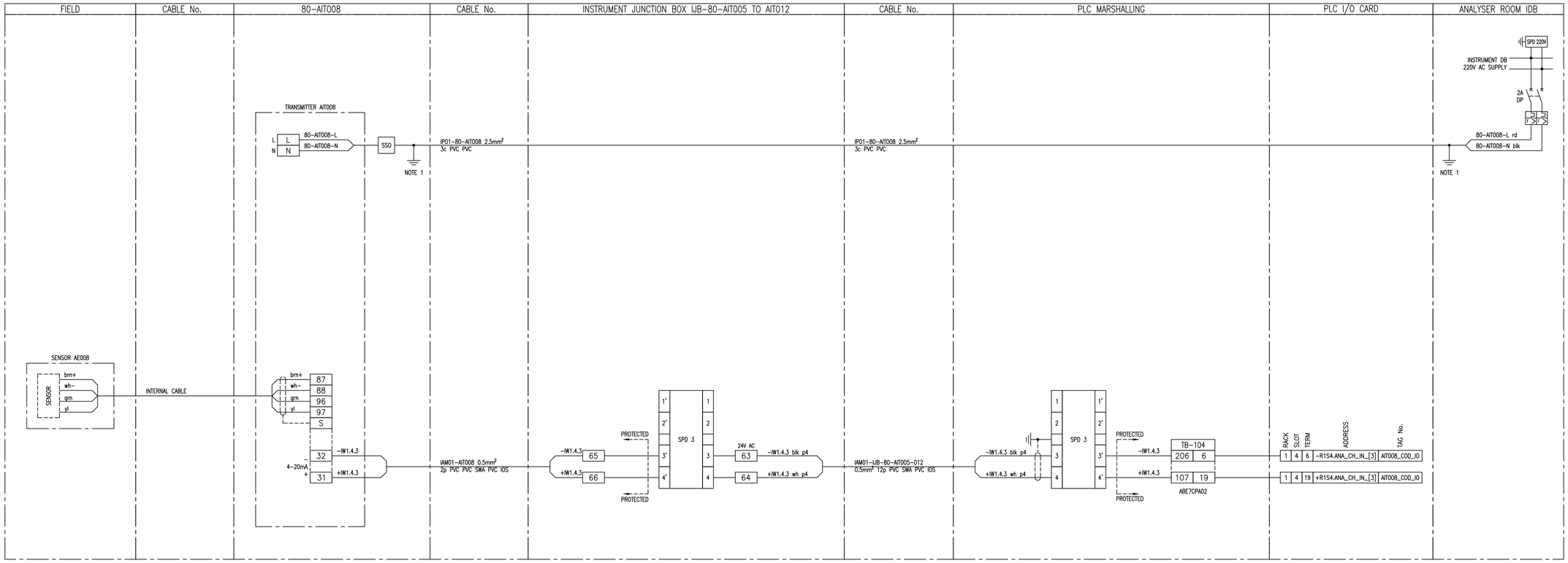
JW NUMBER
JW13898-80-AIT007

CONSULTANT'S NUMBER
ING0645D-80-AIT007

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT007 revT0.dwg May 30, 2019 – 2:18pm



NOTES:

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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 1 COD PROBE – AIT008

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

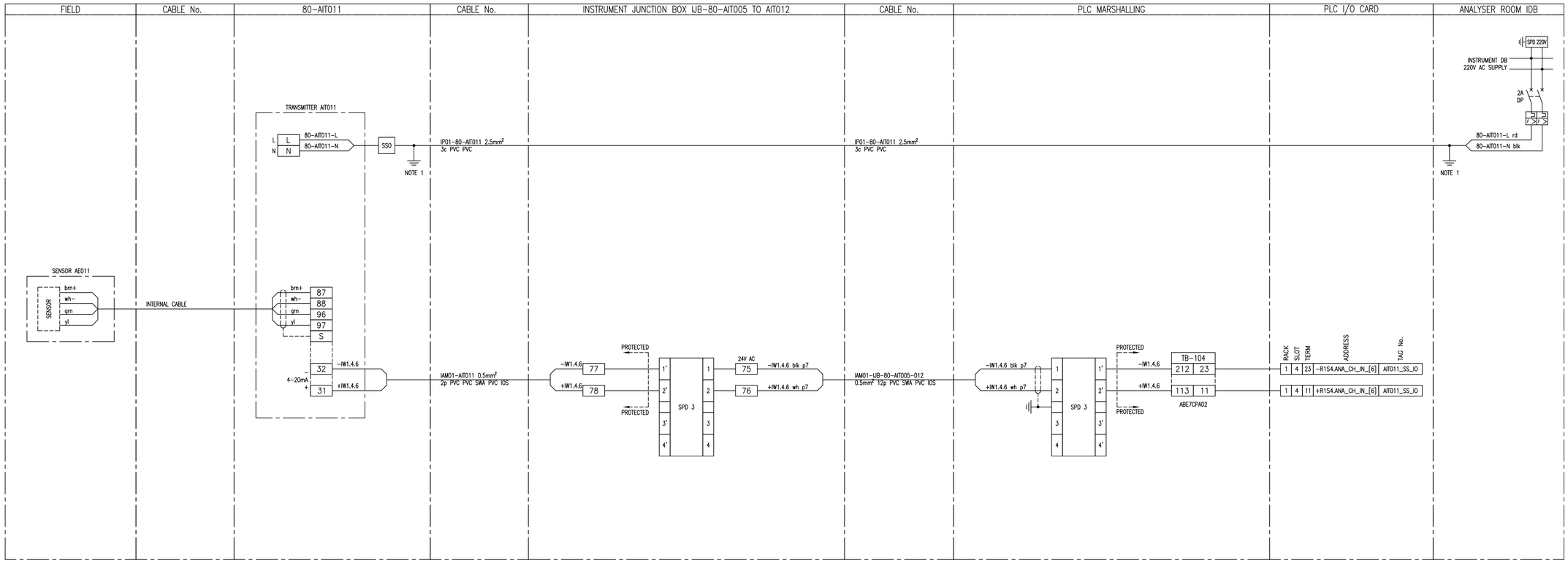
JW NUMBER
JW13898-80-AIT008

CONSULTANT'S NUMBER
ING0645D-80-AIT008

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT008 revT0.dwg May 30, 2019 – 2:18pm



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NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 2 SS PROBE – AIT011

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-AIT011

CONSULTANT'S NUMBER
ING0645D-80-AIT011

FILE No
BWW 1500

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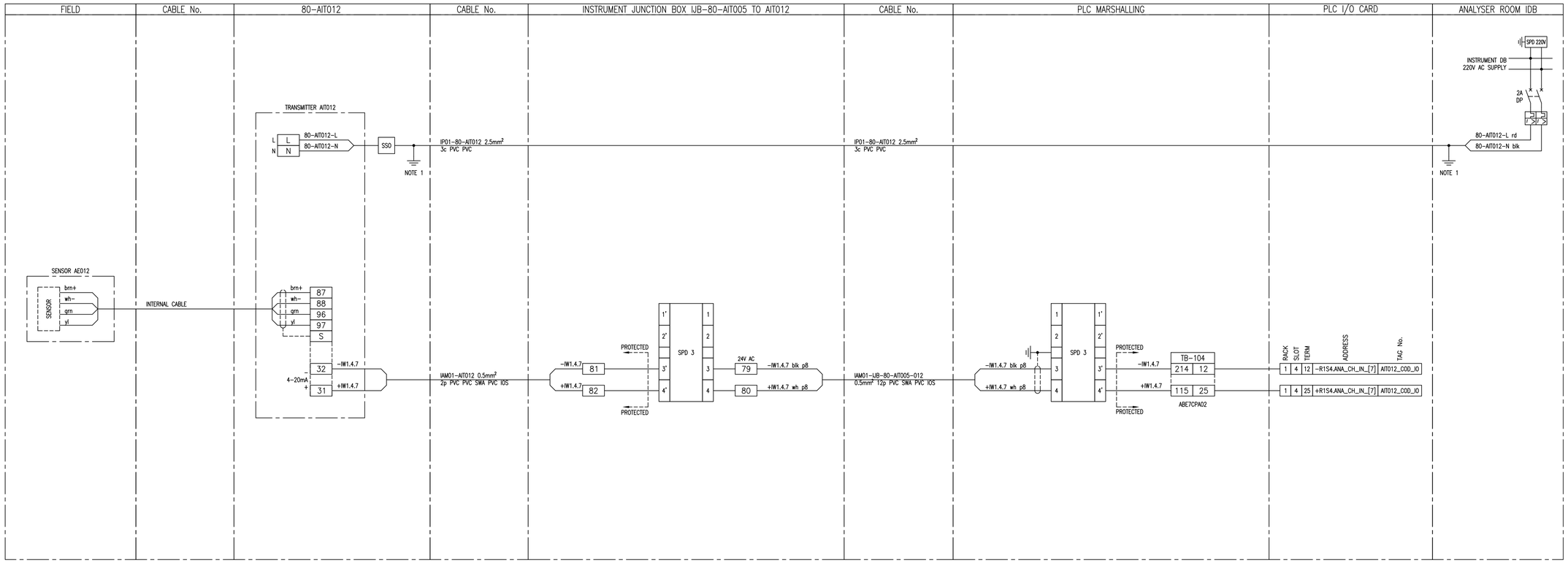
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT011 revT0.dwg May 30, 2019 – 2:18pm



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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

BIOREACTOR 2 COD PROBE – AIT012

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

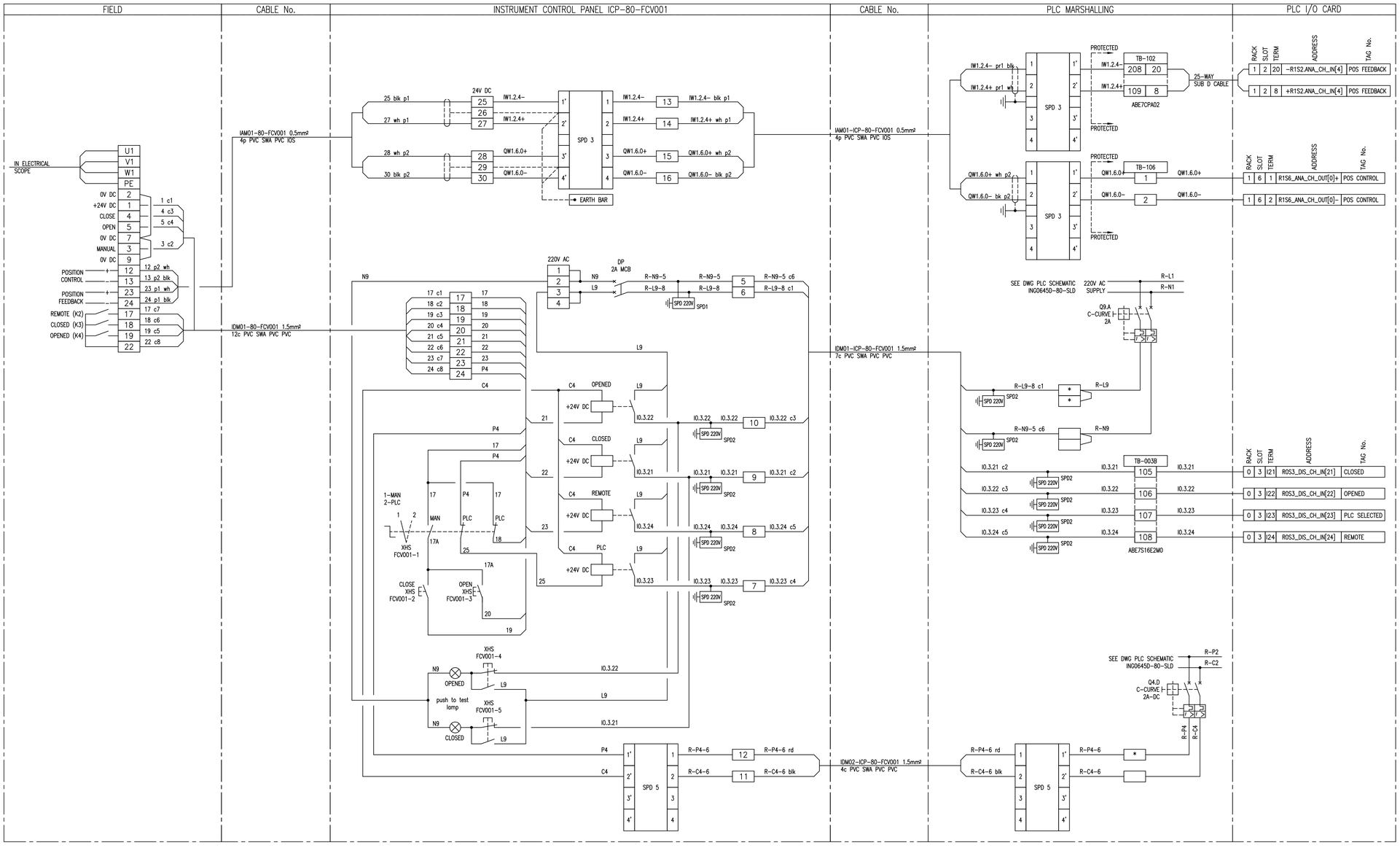
JW NUMBER
JW13898-80-AIT012

CONSULTANT'S NUMBER
ING0645D-80-AIT012

FILE No
BWW 1500

TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-AIT012 revT0.dwg May 30, 2019 – 2:18pm



NOTES:

1. EARTH CORE MUST BE YELLOW/GREEN OR IT MUST BE FITTED WITH A YELLOW/GREEN SLEEVE.

SUB-BASE 1: ABE-7S16E2M0: 230V AC DIGITAL INPUT

SUB-BASE 2: ABE-7CPA02: 8ch ANALOG INPUT

SUB-BASE 3: ABE-7R16S210: RELAY OUTPUT

SUB-BASE 4: ABE-7CPA21: 4ch ANALOG OUTPUT

SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

Knight Piésold CONSULTING
P.O. BOX 221
RIVONIA
2128
TEL. 011-806 7111
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SURVEYED	
DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
UNIT 5 – BIOREACTOR 2 PLC-80
WAS FLOW CONTROL VALVE – FCV001
LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-FCV001

CONSULTANT'S NUMBER
ING0645D-80-FCV001

FILE No
BWW 1500

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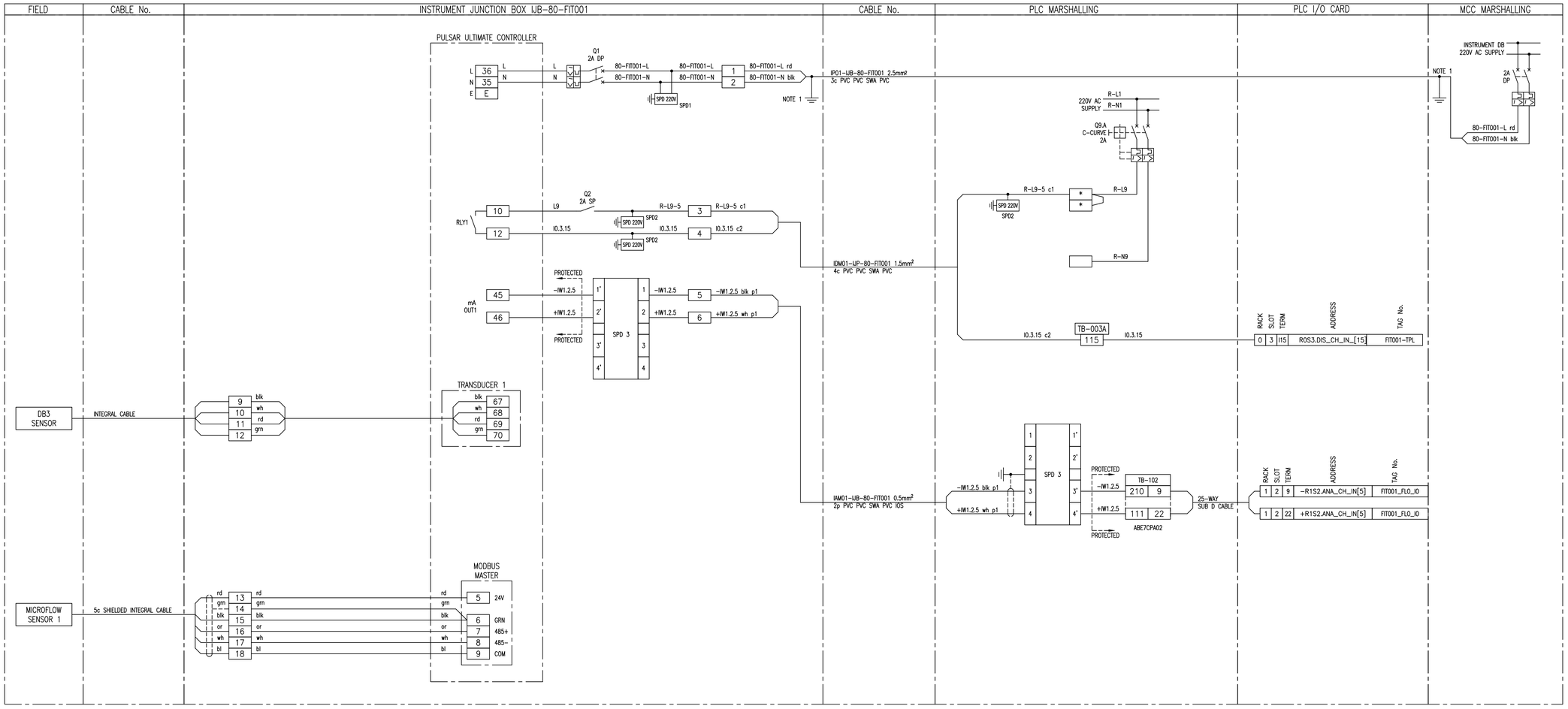
I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-FCV001 revT0.dwg May 30, 2019 – 2:18pm



NOTES:

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SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

SPD 4: BLITZDUCTOR BXT ML2 BD S 24 + BASE BXT BAS

SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

RAS FLOW – FIT001

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
TO	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-FIT001

CONSULTANT'S NUMBER
ING0645D-80-FIT001

FILE No
BWW 1500

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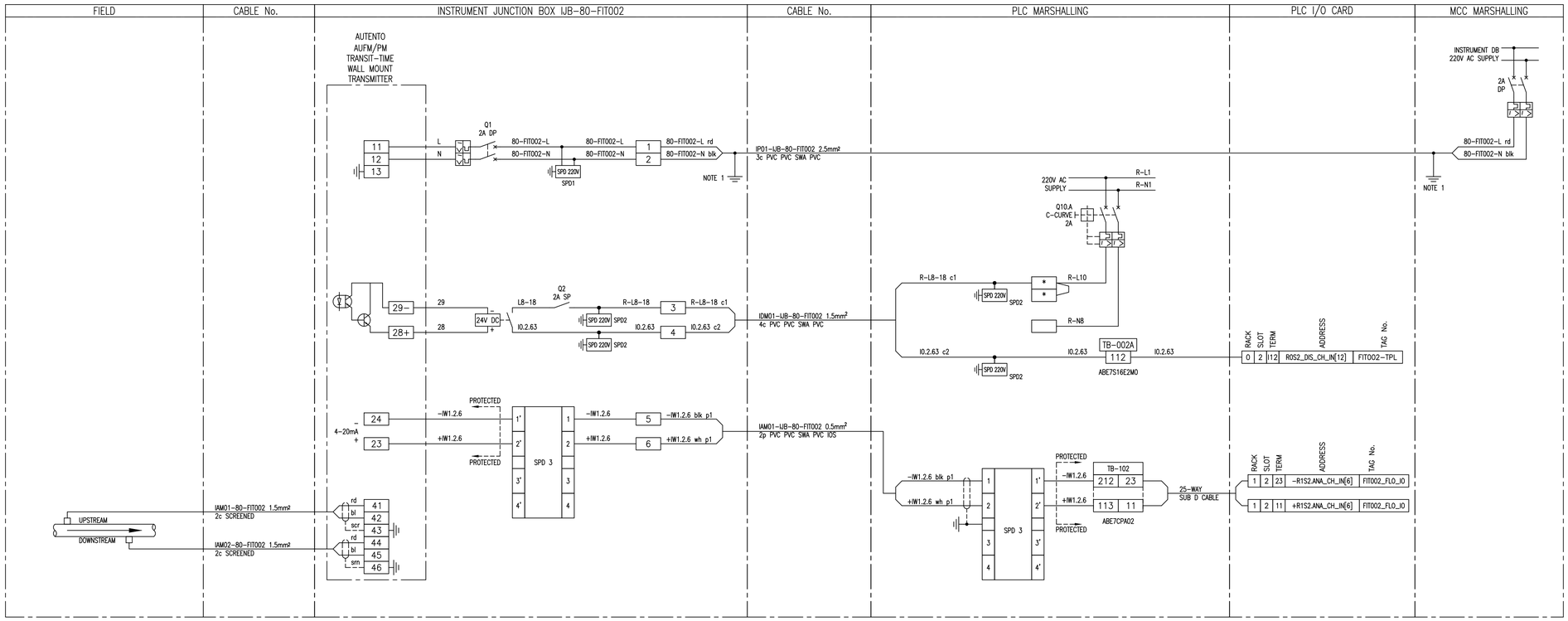

NOTES:

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SPD 1: DEHNguard DG M TN 275

SPD 2: DEHNguard DG S 275 VA

SPD 3: BLITZDUCTOR BXT ML4 BD 24 + BASE BXT BAS

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SPD 5: BLITZDUCTOR BXT ML4 BE 24 + BASE BXT BAS

SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

WAS FLOW – FIT002

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-FIT002

CONSULTANT'S NUMBER
ING0645D-80-FIT002

FILE No
BWW 1500

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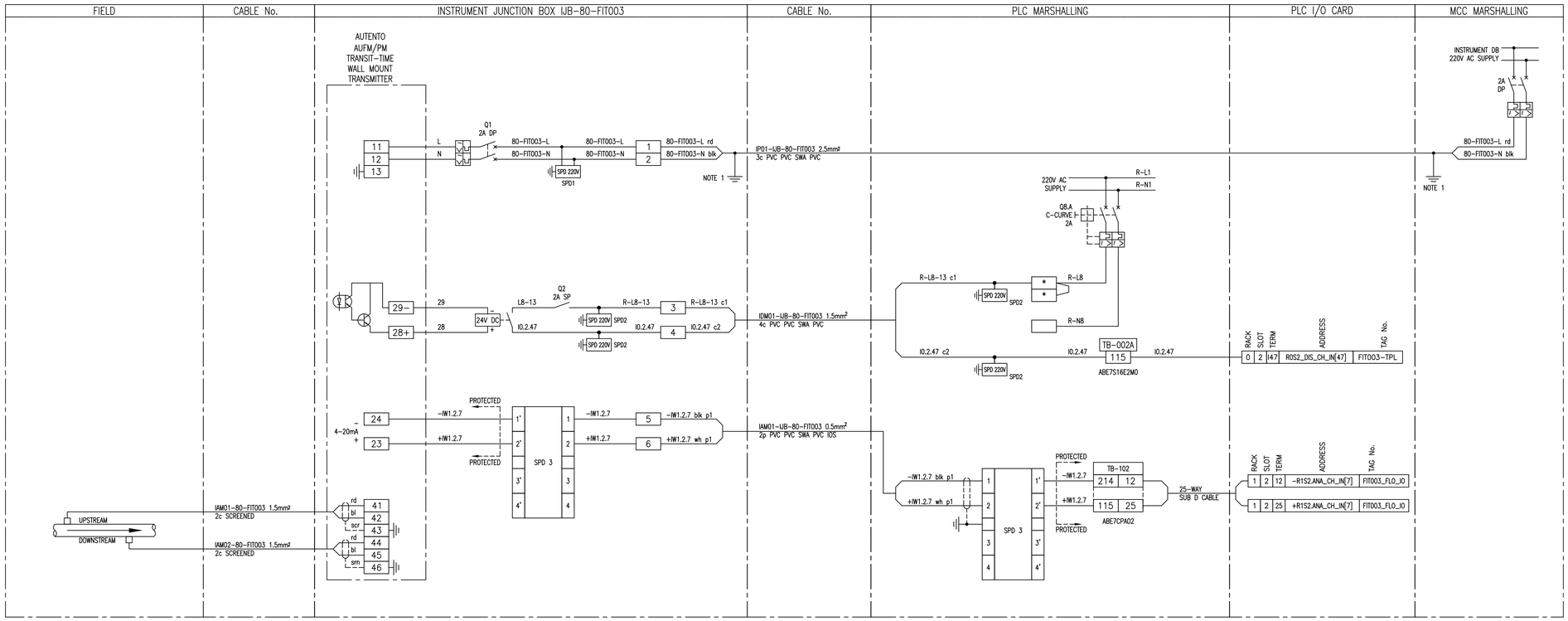

NOTES:

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[*] FUSED TERMINAL (500mA)

[ ] LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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SERVITUDES	
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JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

REACTOR DOSING FLOW – FIT003

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

JW NUMBER
JW13898-80-FIT003

CONSULTANT'S NUMBER
ING0645D-80-FIT003

FILE No
BWW 1500

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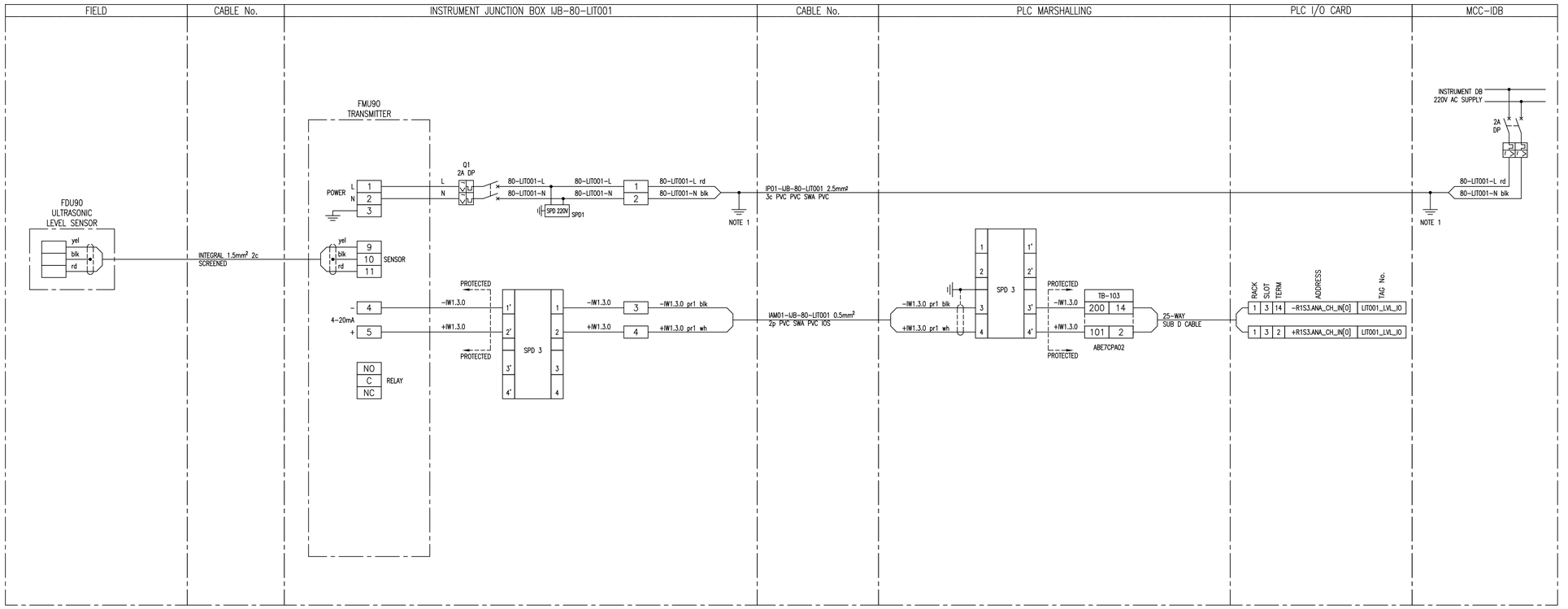

NOTES:

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SPD 6: BLITZDUCTOR BXT ML2 BE S 24 + BASE BXT BAS

* FUSED TERMINAL (500mA)

LINK TERMINAL

DEPARTMENT	APPROVED	DESIGNATION	DATE

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GEOTECHNICAL INVESTIGATION	
SERVITUDES	
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JOHANNESBURG WATER SOC LTD

Johannesburg Water

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MARSHALLTOWN
2107

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS

UNIT 5 – PHASE 2

UNIT 5 – BIOREACTOR 2 PLC-80

CHEMICAL DOSING TANK LEVEL – LIT001

LOOP DIAGRAM

DESIGN MANAGER

DATE

SCALE

NTS

AMENDMENTS

		APPROVED	DATE
T0	ISSUED FOR TENDER	W BRITZ	20.11.18

DRAWING No.

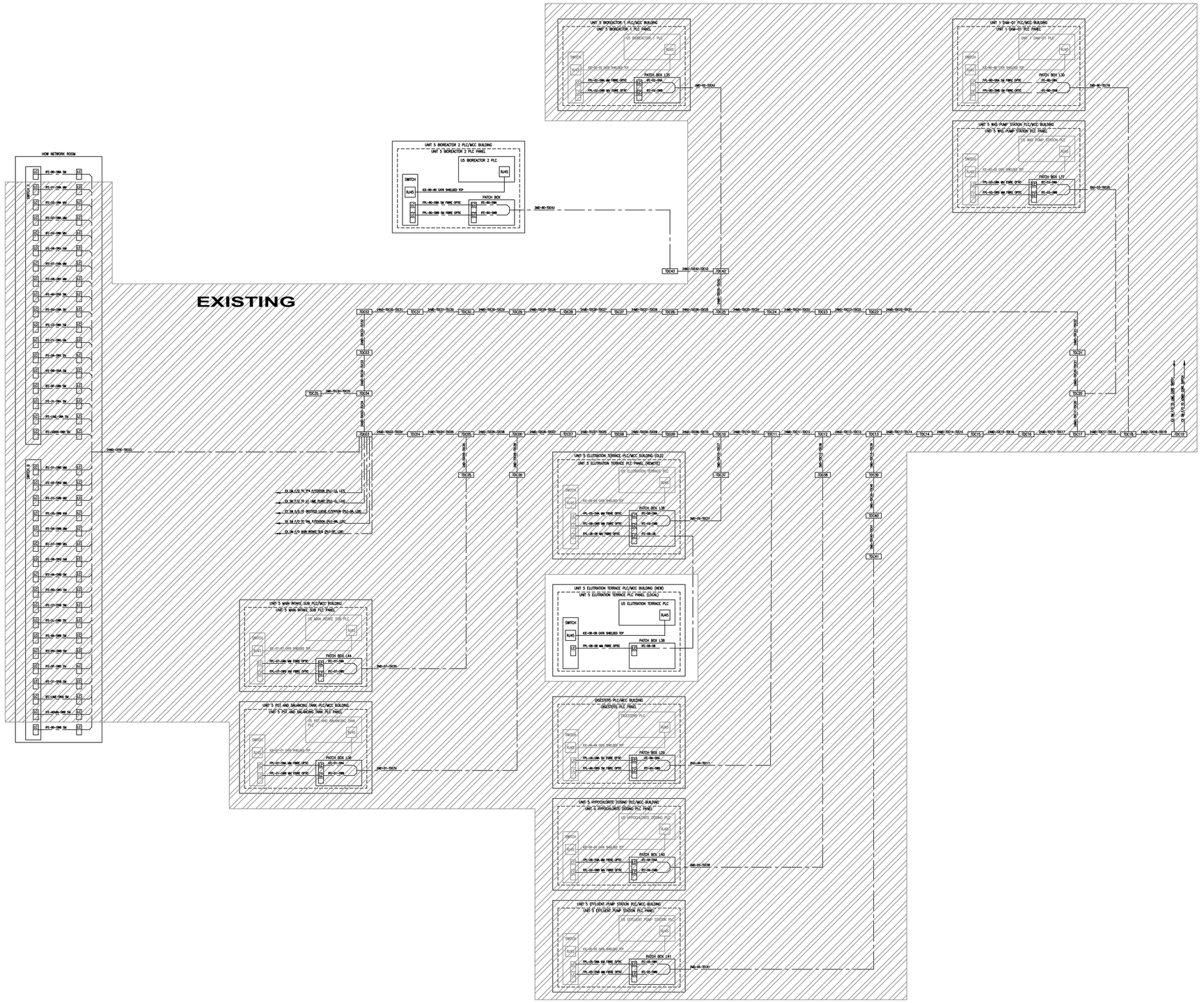
JW NUMBER
JW13898-80-LIT001

CONSULTANT'S NUMBER
ING0645D-80-LIT001

FILE No
BWW 1500

T0

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\PLC-80 (U5 MOD 2)\Loop Diagrams\ING0645D-80-LIT001 revT0.dwg May 30, 2019 – 2:18pm



DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS			JOHANNESBURG WATER SOC LTD	CITY OF JOHANNESBURG	DESIGN MANAGER	SCALE	AMENDMENTS	APPROVED	DATE	DRAWING No.
Knight Piésold CONSULTING P.O. BOX 221 RIVONIA 2128 TEL. 011-806 7111 FAX. 011-806 7100 EMAIL enquiries@kprsa.co.za	WSP Group Africa (Pty) Ltd Industrial Division Building C, Knightsbridge, 33 Sloane Street, Bryanston, 2191 Tel: +27 11 361 1300 Fax: +27 11 361 1431 www.wsp.com	SURVEYED DESIGNED W BRITZ DRAWN M DYKE CHECKED W BRITZ SERVICES CHECKED GEOTECHNICAL INVESTIGATION SERVITUDES APPROVED Pr. Eng. No. DATE	Johannesburg Water 17 HARRISON STREET MARSHALLTOWN 2107 TEL: (011) 688-1400 FAX: (011) 688-1529	NORTHERN WASTEWATER TREATMENT WORKS UNIT 5 – PHASE 2 NEW CABLE NETWORK CABLE BLOCK DIAGRAM	DATE	NTS	TO FOR TENDER	W BRITZ	28.05.19	JW NUMBER JW13898–NET–CBD2 CONSULTANT'S NUMBER ING0645D–NET–CBD2 FILE No BWW1300 TO T1

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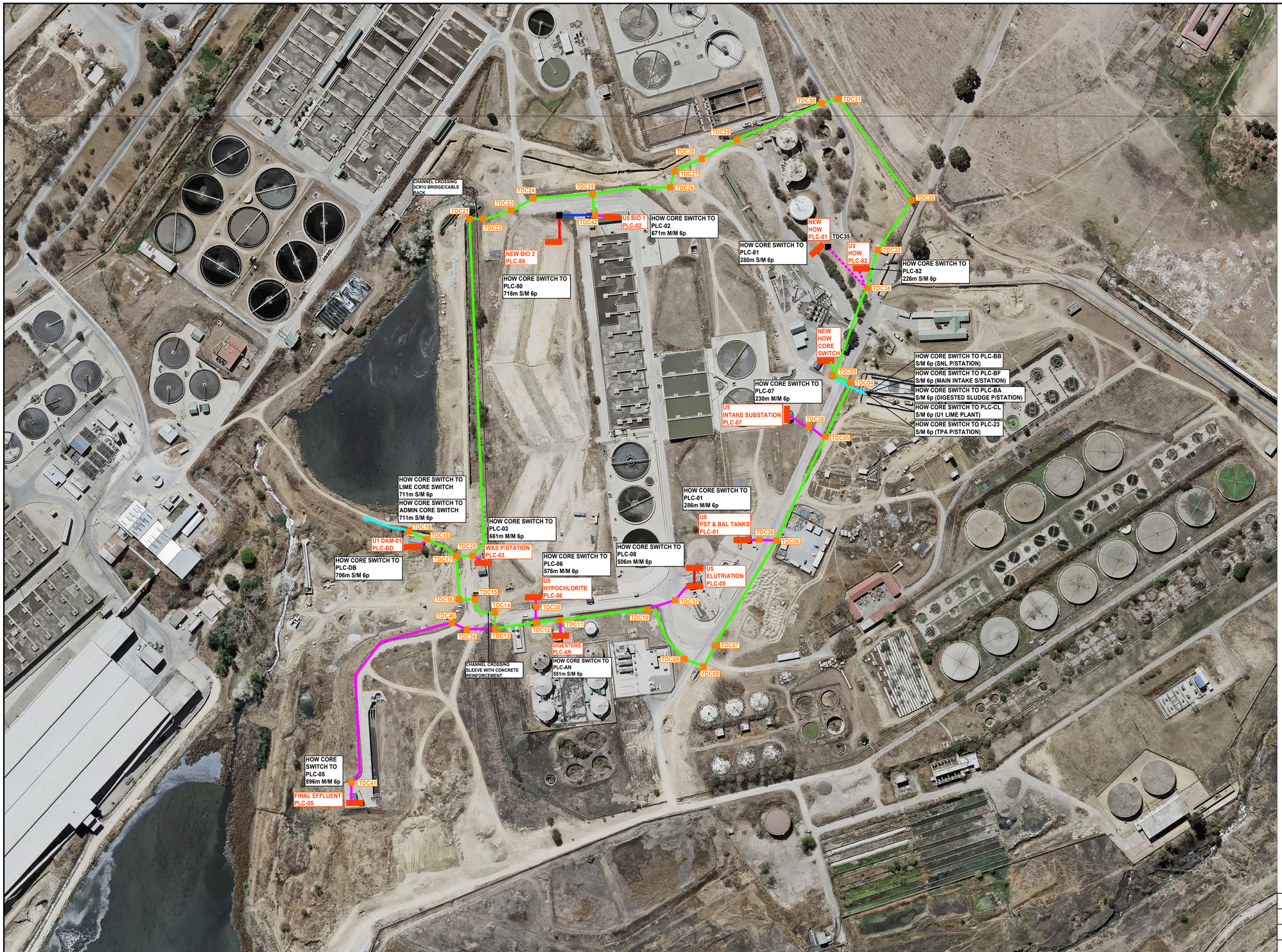

NOTES:

CARE MUST BE TAKEN NOT TO DAMAGE FIBRE.
METHODOLOGY STATEMENT MUST BE INCLUDED IN TENDER.

- EXISTING SINGLE MODE FIBRE
- EXISTING BLOWN-IN FIBRE DUCT (24 TUBE)
- FUTURE BLOWN-IN FIBRE DUCT (24 TUBE)
- NEW BLOWN-IN FIBRE DUCT (24 TUBE)
- EXISTING BLOWN-IN FIBRE DUCT (2 TUBE)
- FUTURE NEW BLOWN-IN FIBRE DUCT (2 TUBE)
- NEW BLOWN-IN FIBRE DUCT (2 TUBE)
- EXISTING FIBRE OPTIC MANHOLES
- NEW FIBRE OPTIC MANHOLES
- BUILDINGS THAT CONTAIN NETWORK EQUIPMENT

DEPARTMENT	APPROVED	DESIGNATION	DATE

CONSULTING ENGINEERS

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SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

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2107

TEL: (011) 688-1400
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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
CABLE ROUTE LAYOUT
NEW, EXISTING
AND RE-ROUTED

DESIGN MANAGER

DATE

SCALE: NTS

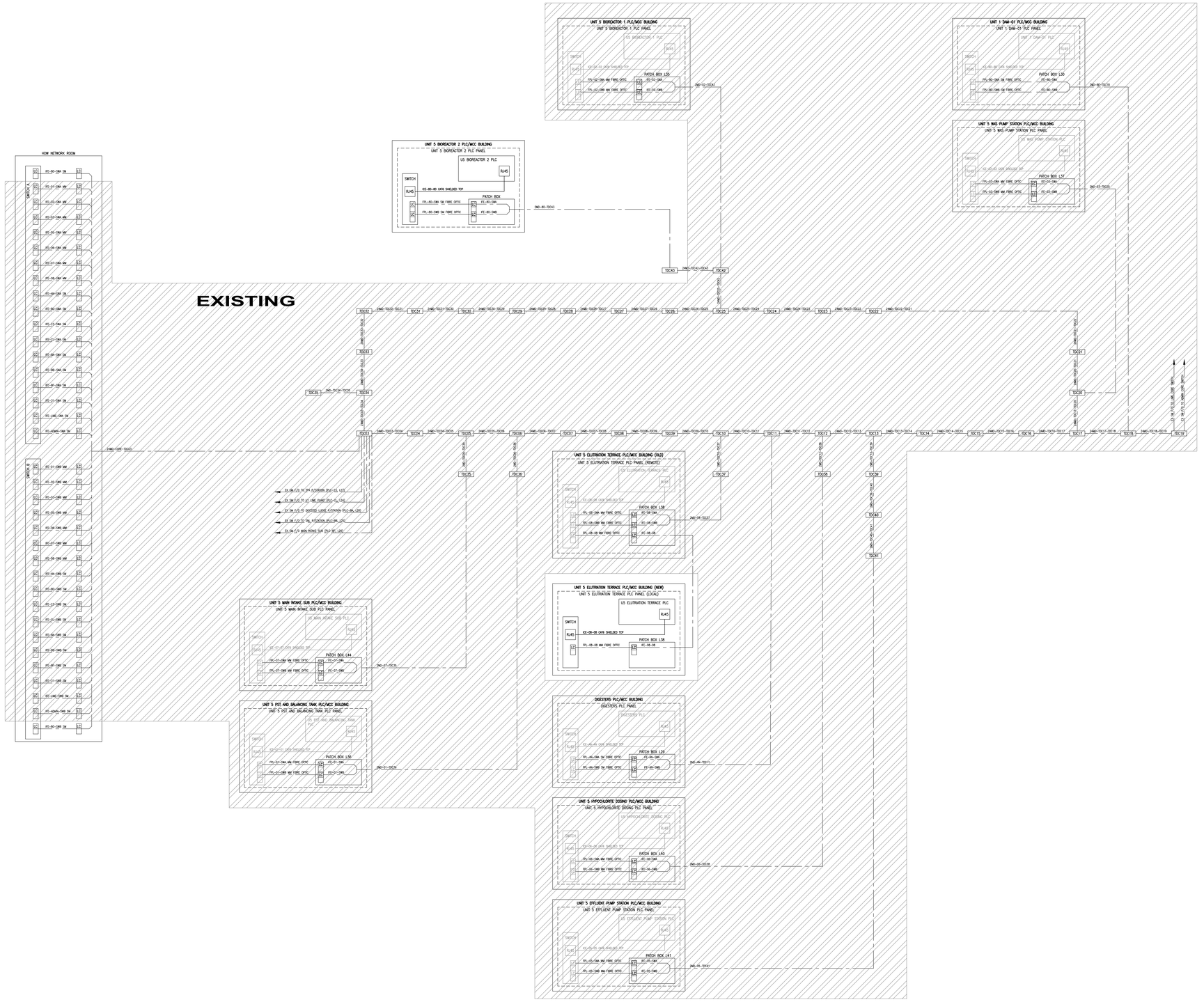
AMENDMENTS

TO		APPROVED	DATE
	FOR TENDER	W BRITZ	29.05.19

DRAWING No.

JW NUMBER: JW13898-NET-CR02
CONSULTANT'S NUMBER: ING0645D-NET-CR02
FILE No: BWW1300
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\Common\ING0645D-NET-CR02 revT0.dwg May 29, 2019 – 1:48pm



DATE | DESIGNATION | APPROVED | DEPARTMENT

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GEOTECHNICAL INVESTIGATION	
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Pr. Eng. No.	
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JOHANNESBURG WATER SOC LTD

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
NEW CABLE NETWORK
CABLE BLOCK
DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	W BRITZ	28.05.19

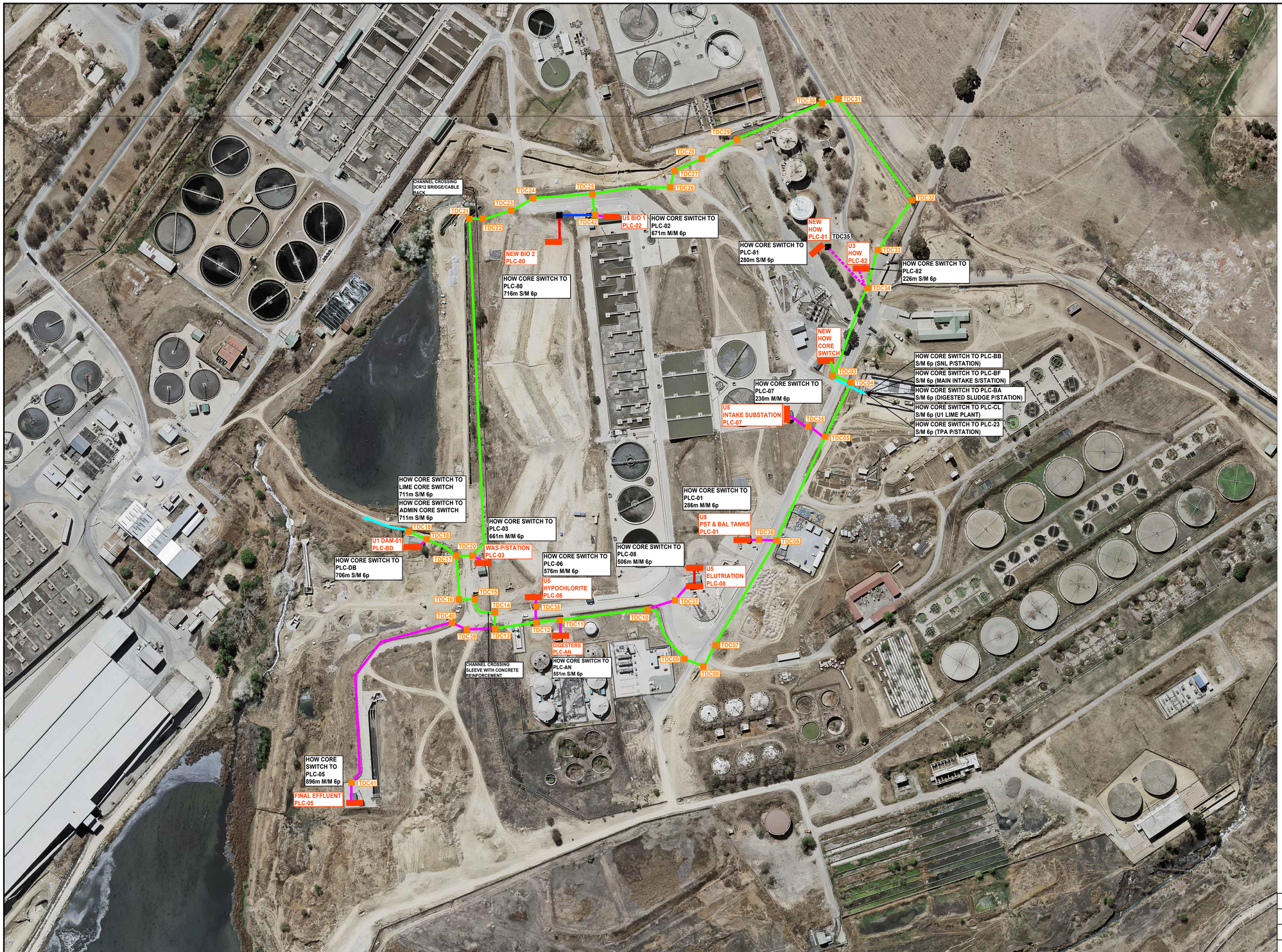
JW NUMBER
JW13898-NET-CBD2

CONSULTANT'S NUMBER
ING0645D-NET-CBD2

FILE No
BWW1300

DRAWING No.

T0 T1



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DEPARTMENT	APPROVED	DESIGNATION	DATE

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CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
CABLE ROUTE LAYOUT
NEW, EXISTING
AND RE-ROUTED

DESIGN MANAGER

DATE

SCALE: NTS

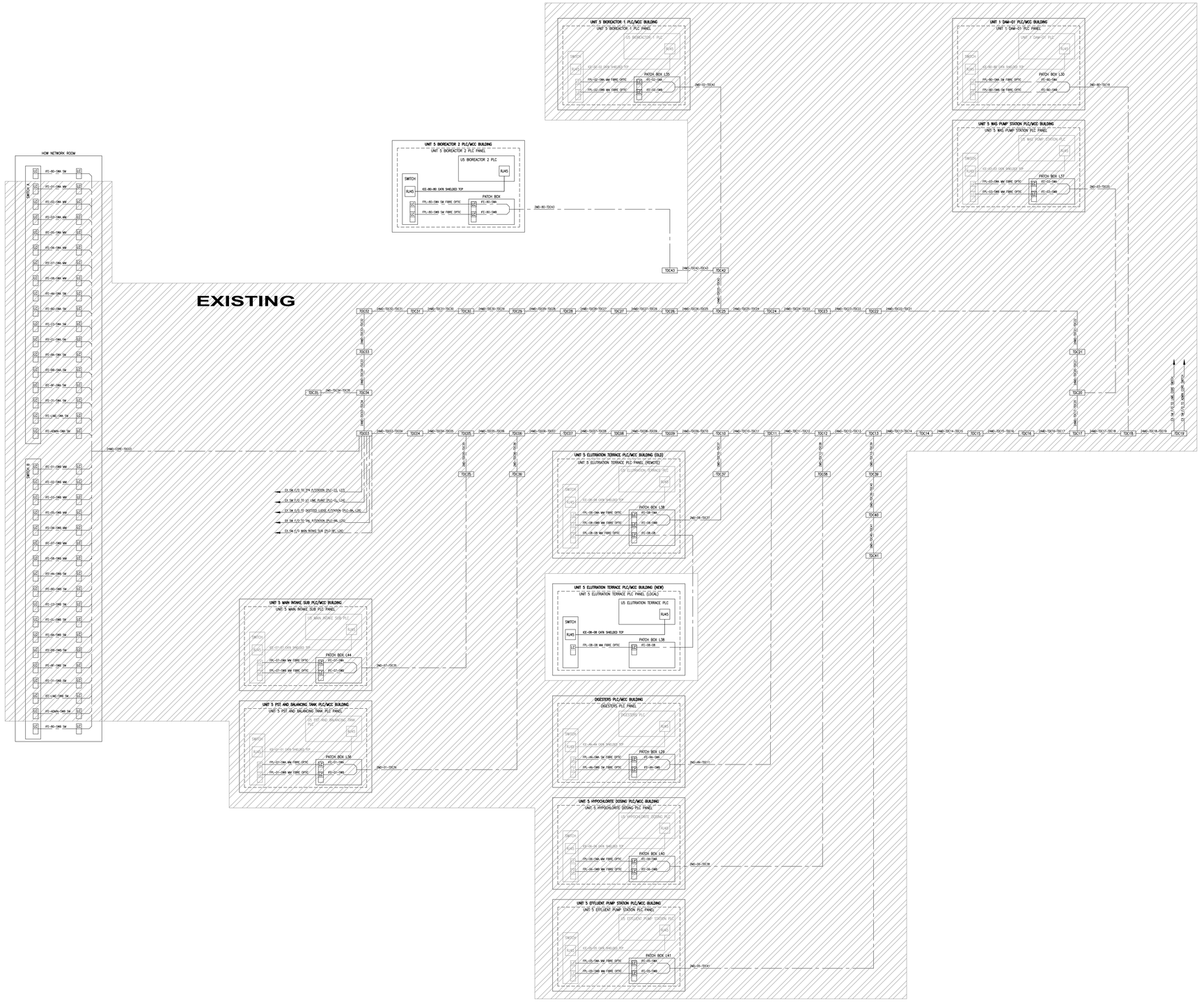
AMENDMENTS

TO		APPROVED	DATE
	FOR TENDER	W BRITZ	29.05.19

DRAWING No.

JW NUMBER: JW13898-NET-CR02
CONSULTANT'S NUMBER: ING0645D-NET-CR02
FILE No: BWW1300
TO

I:\ING – Projects – Drawings\ING0645D – BWW1407 NSW Unit 5 Module 2\2. C&I and Software\Common\ING0645D-NET-CR02 revT0.dwg May 29, 2019 – 1:48pm



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DESIGNED	W BRITZ
DRAWN	M DYKE
CHECKED	W BRITZ
SERVICES CHECKED	
GEOTECHNICAL INVESTIGATION	
SERVITUDES	
APPROVED	
Pr. Eng. No.	
DATE	

JOHANNESBURG WATER SOC LTD

Johannesburg Water

17 HARRISON STREET
MARSHALLTOWN
2107

TEL: (011) 688-1400
FAX: (011) 688-1529

CITY OF JOHANNESBURG

NORTHERN WASTEWATER TREATMENT WORKS
UNIT 5 – PHASE 2
NEW CABLE NETWORK
CABLE BLOCK
DIAGRAM

DESIGN MANAGER

DATE

SCALE
NTS

AMENDMENTS

		APPROVED	DATE
T0	FOR TENDER	W BRITZ	28.05.19

JW NUMBER
JW13898-NET-CBD2

CONSULTANT'S NUMBER
ING0645D-NET-CBD2

FILE No
BWW1300

DRAWING No.

T0 T1