

BOSPOORT NORTH RESERVOIR	
DRAWING NUMBER	DESCRIPTION
GENERAL	
1890.11.00.AAA.01.A004	DRAWING REGISTER
1890.11.00.AAA.01.A011	CONTRACT NAME BOARD DETAILS
1890.11.00.AAA.01.U004	ENGINEER'S CAMP: LAYOUT AND DETAILS
1890.11.00.AAA.01.U002	ENGINEER'S CAMP: PHOTO'S
1890.11.00.AAA.01.A012	SCHEMATIC OF PROPOSED SYSTEM (ULTIMATE)
1890.11.00.AAA.01.S001	LOCALITY PLAN
RESERVOIR PIPEWORK	
086-W-A02	NEW BOSPOORT RESERVOIR - EASTERN ELEVATION
086-W-A03	NOTES APPLICABLE TO PIPE SPECIALS, VALVES AND METERS
086-EW-LY01	NEW BOSPOORT RESERVOIR - MASS EARTHWORKS - SECTIONS
086-EW-LY02	NEW BOSPOORT RESERVOIR - DETAIL EXCAVATIONS - RESERVOIR
086-EW-LY03	NEW BOSPOORT RESERVOIR - DETAIL EXCAVATIONS - CHAMBERS AND PIPEWORK LAYOUT
086-W-LY01	NEW BOSPOORT RESERVOIR - CHAMBERS AND PIPEWORK LAYOUT
086-W-TD01	NEW BOSPOORT RESERVOIR - INLET PIPEWORK - LAYOUT AND DETAIL
086-W-TD02	NEW BOSPOORT RESERVOIR - INLET PIPEWORK AND CHAMBER - SECTIONS
086-W-TD03	NEW BOSPOORT RESERVOIR - CONTROL CHAMBER - LAYOUT AND DETAIL
086-W-TD04	NEW BOSPOORT RESERVOIR - OUTLET CHAMBERS AND PIPEWORK - LAYOUT AND DETAIL
086-W-TD05	NEW BOSPOORT RESERVOIR - OUTLET CHAMBERS AND PIPEWORK - SECTIONS
086-W-TD06	NEW BOSPOORT RESERVOIR - OUTLET PIPEWORK - LAYOUT AND SECTION
086-W-TD07	NEW BOSPOORT RESERVOIR - OVERFLOW CHAMBER AND PIPEWORK - LAYOUT AND DETAIL
086-W-TD08	NEW BOSPOORT RESERVOIR - OUTLET CHAMBER - LAYOUT AND DETAIL
086-W-TD09	NEW BOSPOORT RESERVOIR - METER AND AIR VALVE CHAMBER - LAYOUT AND SECTION
086-W-TD10	NEW BOSPOORT RESERVOIR - GENERAL DETAILS
086-W-TD11	NEW BOSPOORT RESERVOIR - DETAIL OF FENCE AND GATE
086-W-FL01	NEW BOSPOORT RESERVOIR - INLET PIPEWORK - FITTING LIST - SHEET 1
086-W-FL02	NEW BOSPOORT RESERVOIR - INLET PIPEWORK - FITTING LIST - SHEET 2
086-W-FL03	NEW BOSPOORT RESERVOIR - OUTLET PIPEWORK - FITTING LIST
086-W-FL04	NEW BOSPOORT RESERVOIR - OUTLET AND OVERFLOW PIPEWORK - FITTING LIST
086-W-RB01	NEW BOSPOORT RESERVOIR - METER AND AIR VALVE CHAMBER - REINFORCING
086-W-RB02	NEW BOSPOORT RESERVOIR - CONTROL CHAMBER - REINFORCEMENT
086-W-RB03	NEW BOSPOORT RESERVOIR - OUTLET CHAMBERS - REINFORCEMENT

BOSPOORT NORTH RESERVOIR	
DRAWING NUMBER	DESCRIPTION
1890.11.00.GZA.05.D050	CATHODIC PROTECTION - ELECTRICALLY ISOLATED FLANGED JOINTS
1890.11.00.GZA.05.D051	CATHODIC PROTECTION - ZINC RIBBON IN TRENCH PLACEMENT DETAIL
1890.11.00.GZA.05.D052	CATHODIC PROTECTION - VALVE CHAMBER EARTHING DETAIL
1890.11.00.GZA.05.D053	CATHODIC PROTECTION - AC & DC COUPON DETAILS
RESERVOIR STRUCTURE	
086-STR-F01	UNDERFLOOR DRAIN
086-STR-TD01	FOUNDATION DETAILS
086-STR-TD02	FOUNDATION LAYOUT
086-STR-TD03	SECTION THROUGH RESERVOIR CENTERLINE
086-STR-TD04	NEW BOSPOORT RESERVOIR - CAT LADDER - LAYOUT AND DETAIL
086-STR-R01	ROOF PLAN
086-STR-TD05	FOUNDATION LAYOUT
086-STR-TD06	FOUNDATION LAYOUT
086-STR-TD07	FOUNDATION LAYOUT
086-STR-TD08	FOUNDATION LAYOUT
086-STR-TD09	FOUNDATION LAYOUT
086-STR-LY01	FOUNDATION LAYOUT
BENDING SCHEDULES	
100	BOSPOORT NORTH RESERVOIR - FOUNDATION SLAB
101	BOSPOORT NORTH RESERVOIR - FOUNDATION SLAB
102	BOSPOORT NORTH RESERVOIR - FOUNDATION SLAB
103	BOSPOORT NORTH RESERVOIR - FOUNDATION SLAB
104	BOSPOORT NORTH RESERVOIR - WALL
105	BOSPOORT NORTH RESERVOIR - COLUMN
300	BOSPOORT NORTH RESERVOIR - ROOF SLAB BOTTOM REINFORCEMENT
301	BOSPOORT NORTH RESERVOIR - ROOF SLAB
302	BOSPOORT NORTH RESERVOIR - ROOF SLAB
303	BOSPOORT NORTH RESERVOIR - ROOF SLAB
304	BOSPOORT NORTH RESERVOIR - ROOF SLAB
305	BOSPOORT NORTH RESERVOIR - ROOF SLAB

BOSPOORT NORTH RESERVOIR	
DRAWING NUMBER	DESCRIPTION
1890.08.AA.01.A016	P&ID - PIPELINE
1890.08.PA.21.U001	COMMUNICATION MAST, ANTENNAS AND CONTROL ROOM LAYOUT
1890.08.PA.21.D001	SIGNAL PROFILES SHEET 1
1890.08.PA.21.D002	SIGNAL PROFILES SHEET 2
1890.08.AA.21.D001	TYPICAL DETAIL FOR LATTICE COMMUNICATION TOWER
1890.08.PA.23.D001	MOTOR CONTROL CENTRE AND SOFT STARTER LAYOUT
1890.08.SUH.23.D001	CONTROL ROOM EARTHING AND LIGHTNING, SMALL POWER, LIGHTING AND DISTRIBUTION LAYOUTS

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com

IN ASSOCIATION WITH

PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone: + 27 14 594 2912

info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



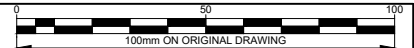
PROJECT TITLE:

**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:

**DRAWING REGISTER
BOSPOORT NORTH RESERVOIR AND
PIPEWORK**





ORIGINAL DRAWING SCALE: NA

ORIGINAL DRAWING SHEET SIZE: A1

APPROVED ON BEHALF OF CLIENT:

NAME: _____

DATE: _____

CLIENT DRAWING No.: _____

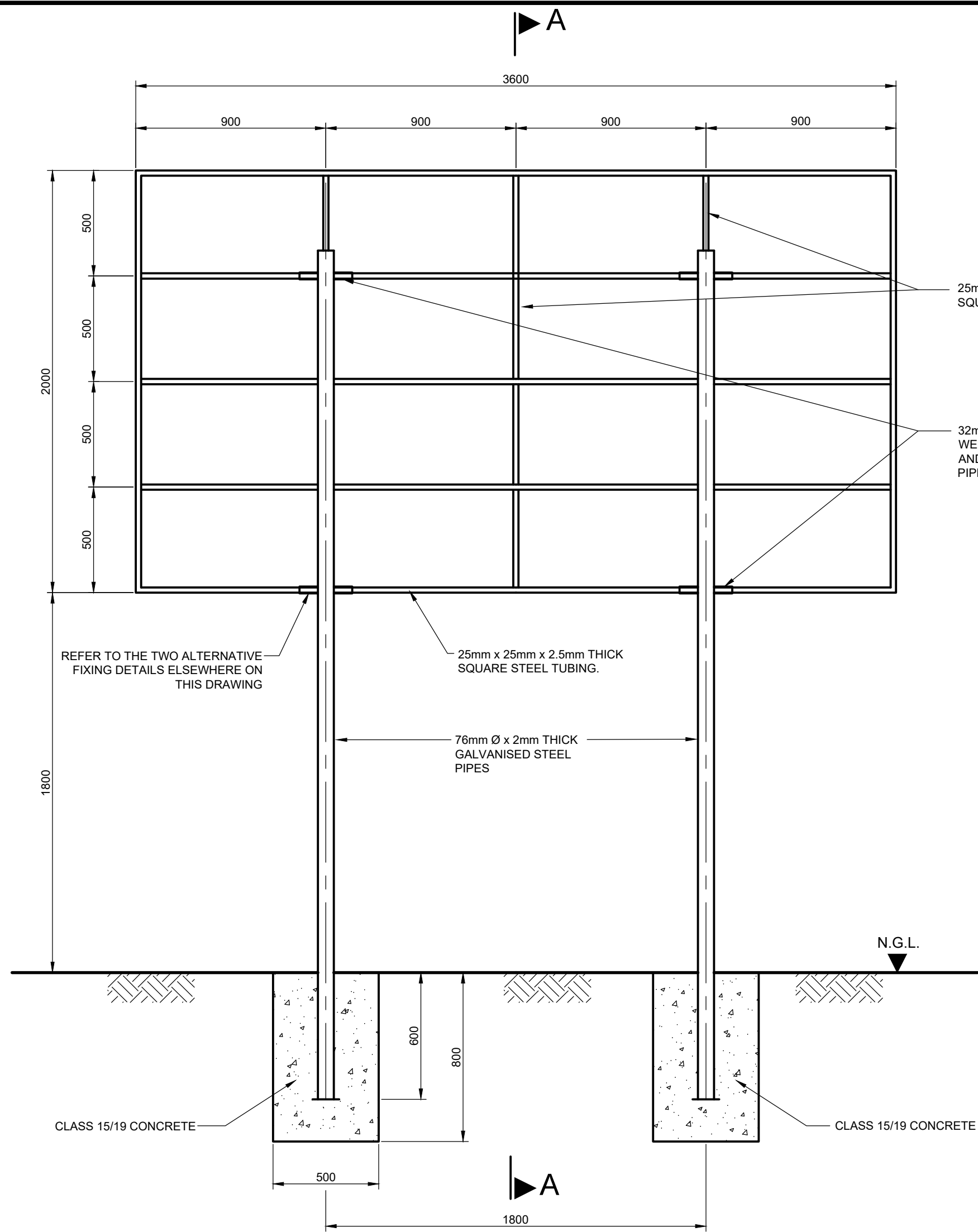
CLIENT REF No.: _____

SURVEYED	DESIGNED	KM
DRAWN	A STEENBERG	
COORD SYSTEM	WG27	DATE JANUARY 2024

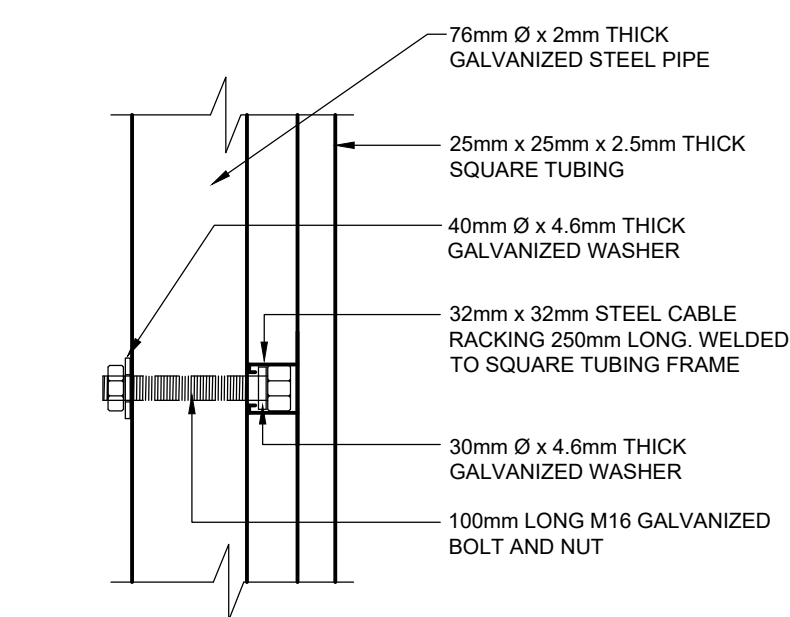
APPROVED ON BEHALF OF BIGEN:

DRAWING No.: 1890.11.00.AAA.01.A004	VERSION: 0
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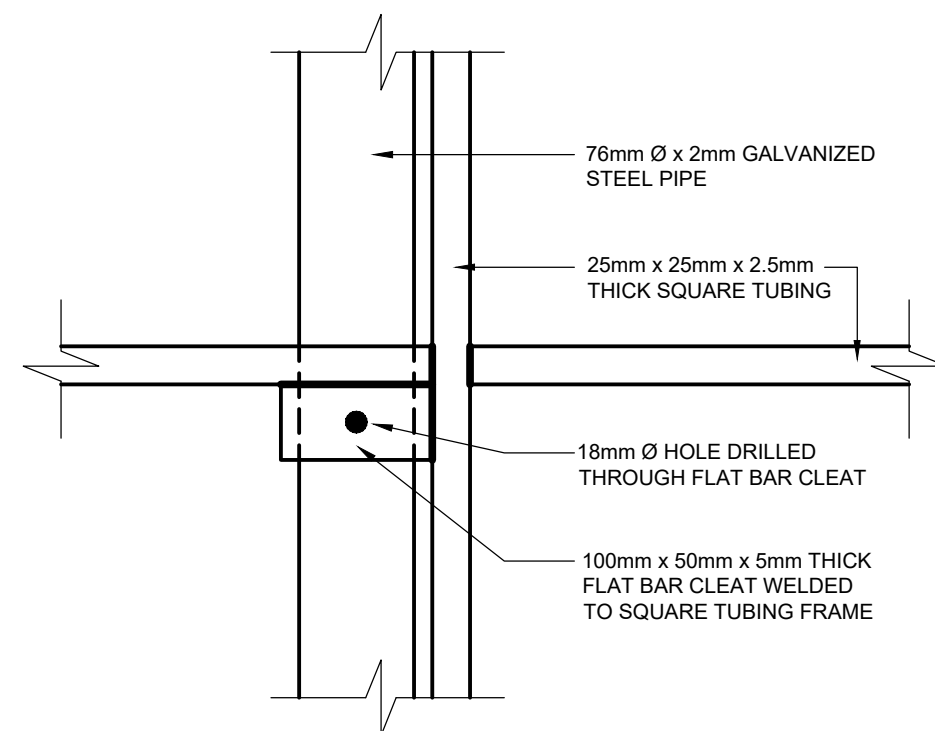
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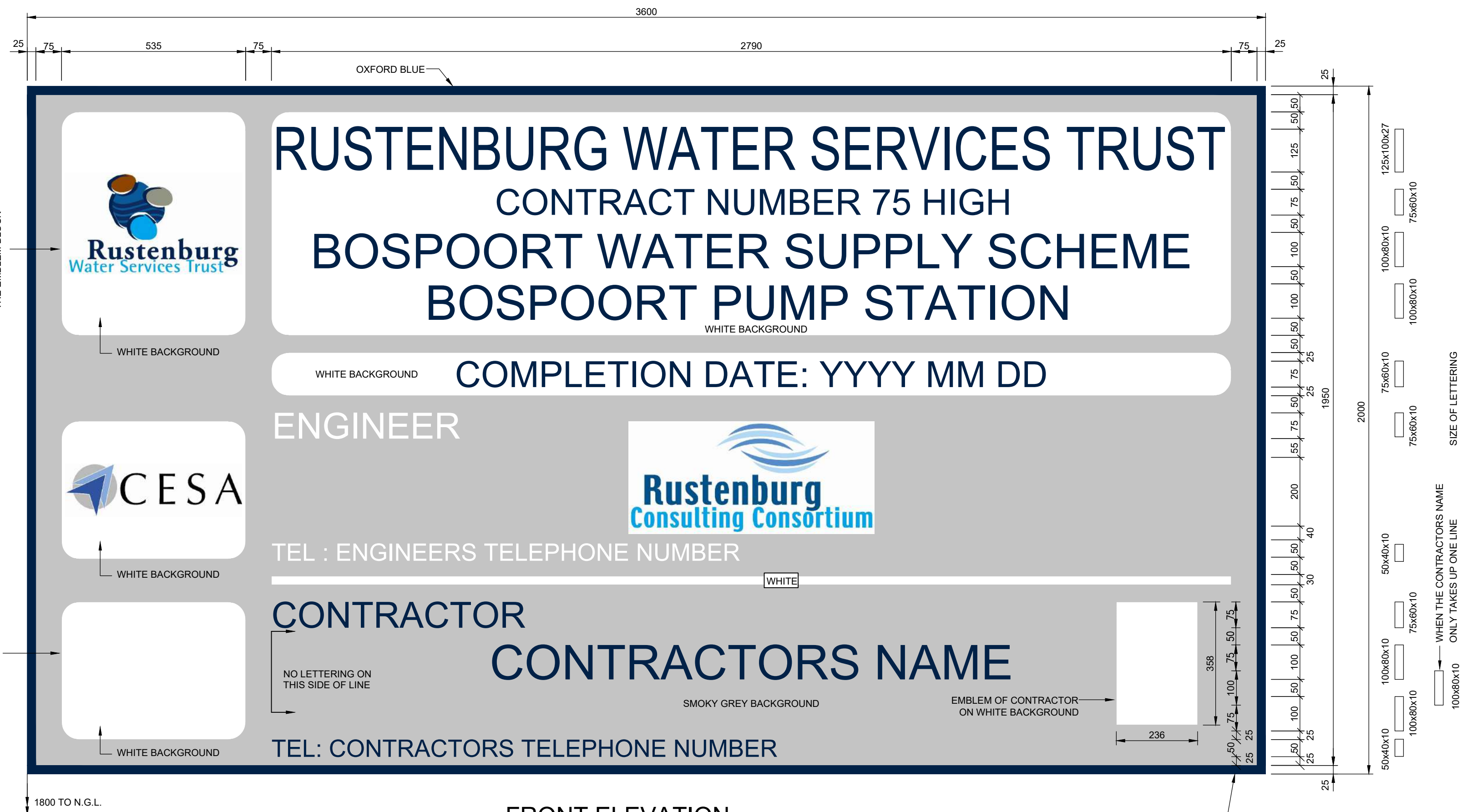
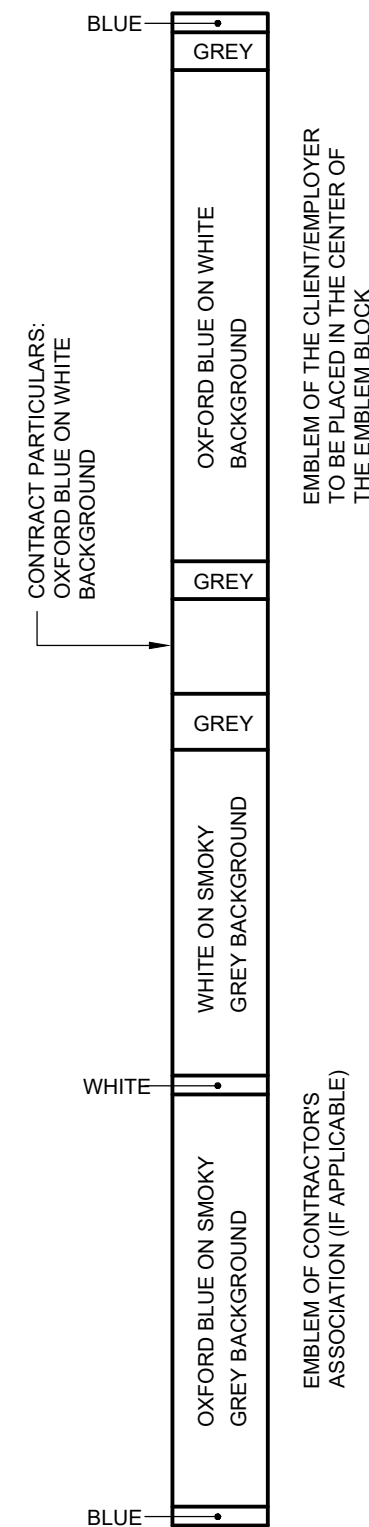
BACK ELEVATION
SCALE 1:20



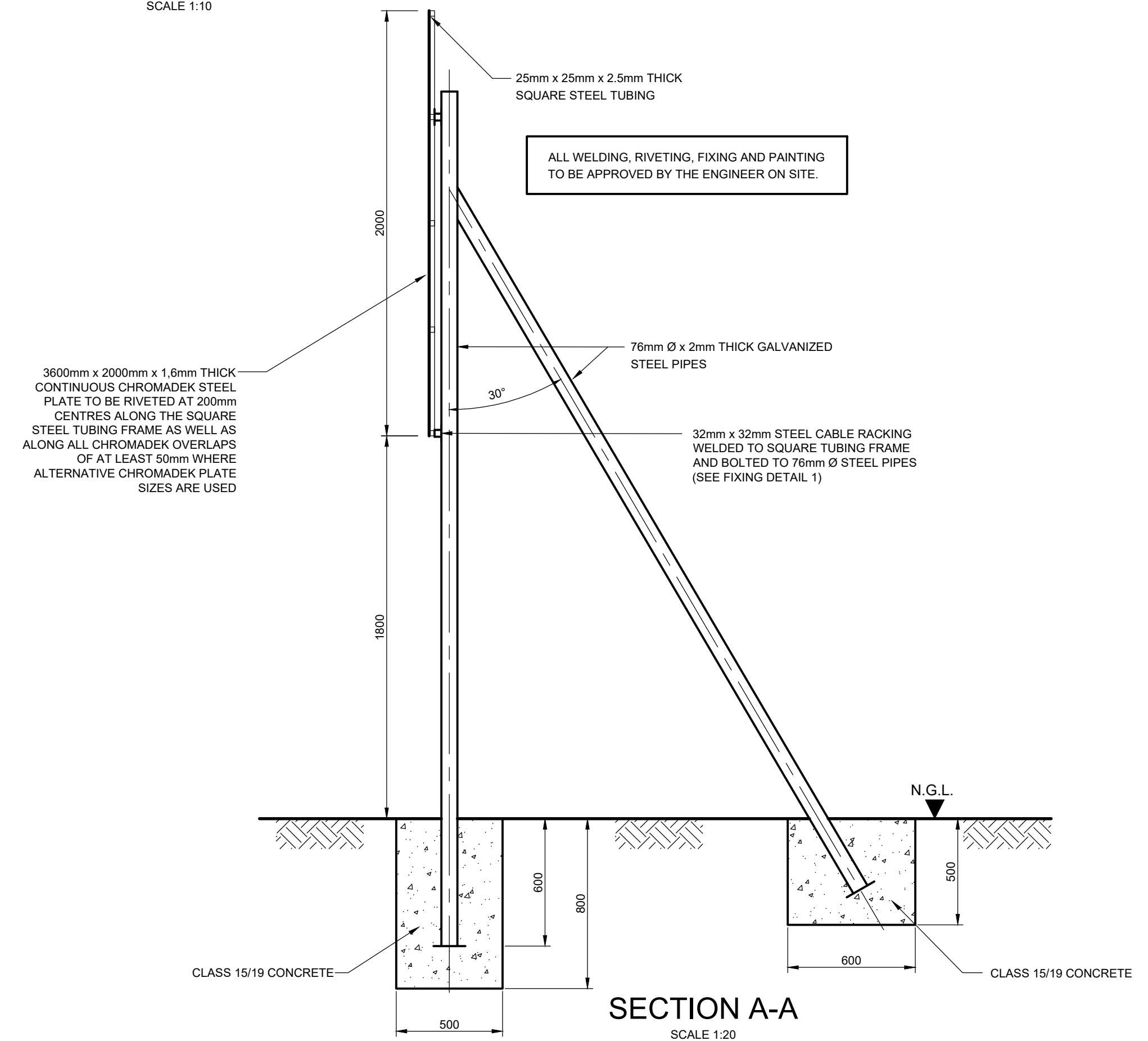
FIXING DETAIL 1
SCALE 1:5



FIXING DETAIL 2
SCALE 1:5
ALTERNATIVE FIXING DETAILS



FRONT ELEVATION
SCALE 1:10



SECTION A-A
SCALE 1:20

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www.bigengroup.com

Allan Cornack Street
The Innovation Hub
Pretoria

Phone: +27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PUMP STATION: MECHANICAL
AND ELECTRICAL UPGRADE**

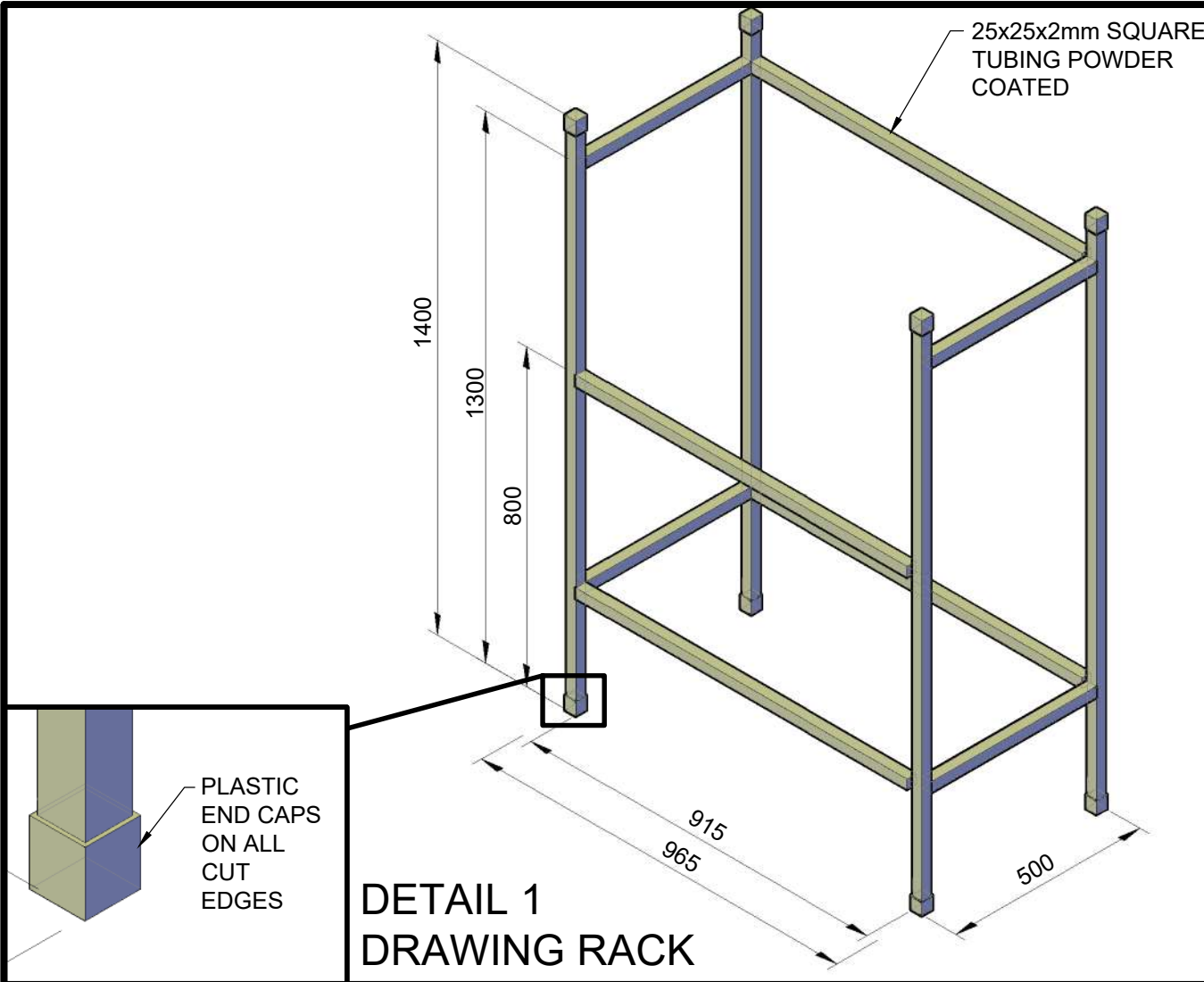
DRAWING TITLE:
CONTRACT NAME BOARD DETAILS



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	DATE:
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	DESIGNED	C VAN ECK
DRAWN	CHECKED	P DU PLESSIS
COORD SYSTEM	WG27	DATE
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.: 1890.11.00.AAA.01.A011		1.0

1890.11.00.AAA.01.A011



NOTES:
(FOR PHOTOS REFER TO DRAWING NO 1890.11.00.AAA.01.U002)

CAMP

- CLEAR, GRUB AND GRADE SITE TO BE SELF DRAINING
- 75mm THICK 19mm STONE GRAVELING THROUGHOUT
- MAST LIGHT TO BE PROVIDED 5m HIGH WOODEN MAST, 500 WATT GLOBE & DAY/NIGHT SWITCH
- FENCING TO BE 2.1m HIGH RAZOR MESH WIRE INCL. RAZOR FLAT WRAP ON TOP (SEE PHOTO 1).
- FULL TIME GATE GUARD TO BE PROVIDED WITH GUARD HOUSE (GH). GUARD HOUSE TO BE A 2.1m x 2.1m MODEL FROM RENT A SHED (WWW.RENTASHED.CO.ZA) OR SIMILAR APPROVED INCL CHAIR
- STEPS TO BE PROVIDED AT ALL OFFICE ENTRIES
- 1x FULL TIME CAMP ASSISTANT TO BE PROVIDED FOR CLEANING AND CAR WASH
- 3x CHEMICAL TOILETS TO BE PROVIDED (FLUSHABLE) (T)
- 80% SHADE CLOTH TO BE FIXED ON INSIDE OF FENCING IF SPECIFIED
- GALVANISED ROOF SHEETING (0.6mm THICK) CARPORT TO DRAIN TOWARDS THE BACK OF THE STRUCTURE (OPPOSITE ACCESS POINT). SIDES AND BACK OF CARPORT TO BE CLOSED WITH SHADE NETTING. THE STRUCTURE OF THE CARPORT STRUCTURE TO BE APPROVED BY A REGISTERED STRUCTURAL ENGINEER.
- 20m GARDEN HOSE TO BE PROVIDED
- CLO AND/OR LDO OFFICES NEED TO BE LOCATED OUTSIDE OF THE ENGINEER'S CAMP

OFFICE (SEE PHOTO 8)

- OFFICE B1 TO BE KWIKSPACE MODULAR BUILDINGS LTD (WWW.KWIKSPACE.CO.ZA) SINGLE WIDE 3mx3m OFFICE OR SIMILAR APPROVED
- OFFICE B2 TO BE KWIKSPACE MODULAR BUILDINGS LTD (WWW.KWIKSPACE.CO.ZA) SINGLE WIDE 3mx3m OFFICE OR SIMILAR APPROVED
- W/C TO BE KWIKSPACE MODULAR BUILDING LTD (WWW.KWIKSPACE.CO.ZA) STANDARD 3mx3m UNIT OR SIMILAR APPROVED
- 12000 BTU SPLIT AIRCON UNIT (LG) TO BE PROVIDED IN OFFICE B1 & B2.
- KWIKSPACE BLINDS AND BURGLAR PROOFING TO BE INSTALLED
- OFFICES TO BE CLEANED ON A DAILY BASIS

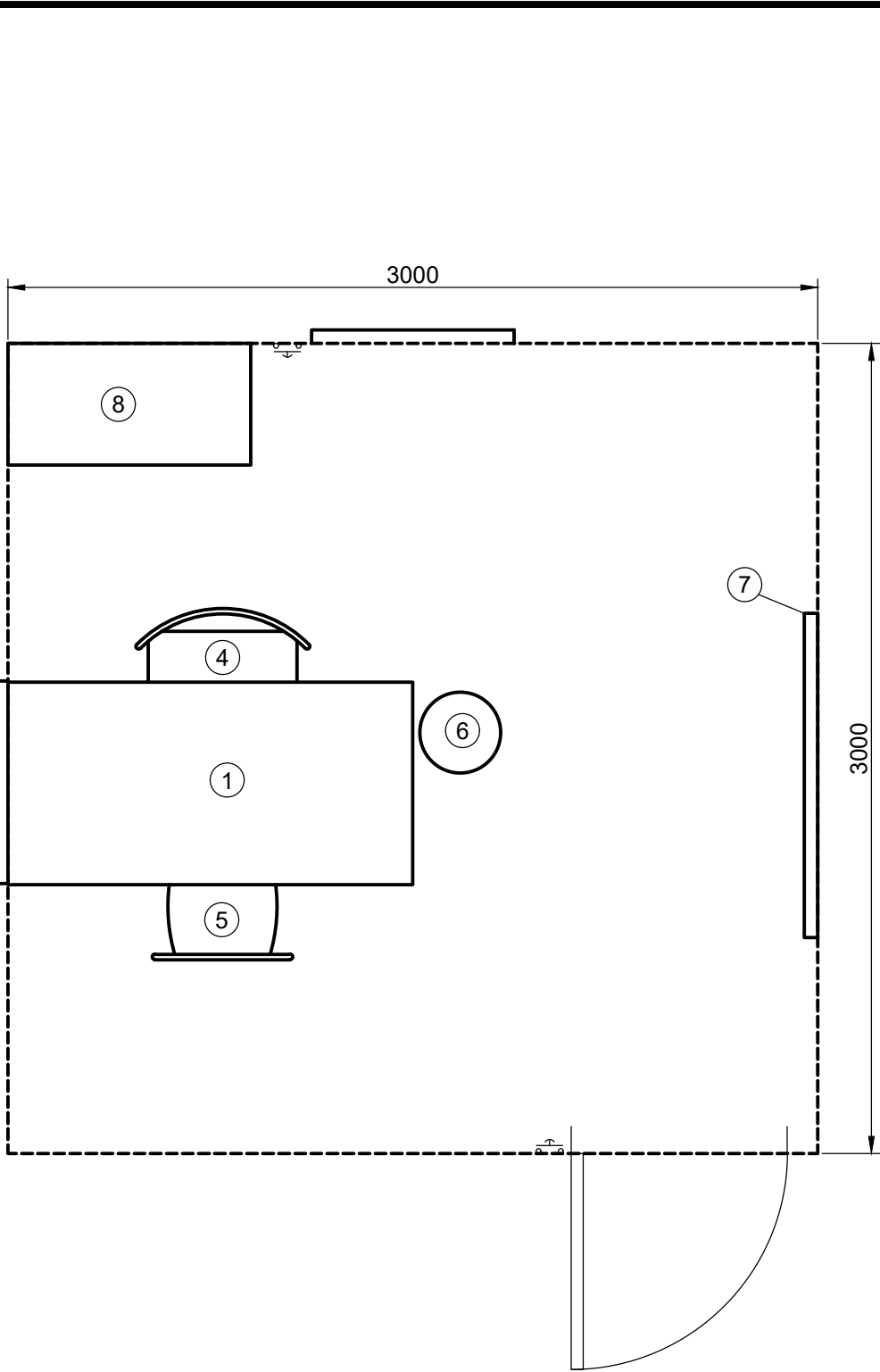
- OFFICE FURNITURE (ALL FURNITURE TO BE NEW)**
1. 1500x750mm OAK MELAMINE DESK (SEE PHOTO 2) INCLUDES DRAWERS
 2. DRAWING RACK - SEE DETAIL 1
 3. HALF FILING CABINET (SEE PHOTO 3)
 4. ROTATING HIGH BACK CHAIR (SEE PHOTO 4)
 5. 10x RICKSTACKER CHAIRS (SEE PHOTO 5)
 6. PLASTIC ROUND WASTE BIN
 7. 2mx1.2m MAGNETIC WHITE BOARD
 8. FULL STATIONERY CUPBOARD (SEE PHOTO 6)
 9. 2500x900mm BOARDROOM TABLE (SEE PHOTO 7)

- STATIONERY PACKAGE (TOTAL # OF SETS SPECIFIED IN TENDER DOCUMENT)**
- 3x PENS (2x BLACK, 1x RED)
 - 1x PENCIL & LEAD
 - 1x ERASER
 - 1x CORRECTION FLUID
 - 1x PRESTIK
 - 1x PRITT
 - 1x SCISSOR
 - 4x MAGNETS
 - 1x STAPLER & BOX OF STAPLES
 - 1x PUNCH
 - 1x BOX RUBBER BANDS
 - 1x BOX A4 PAPER

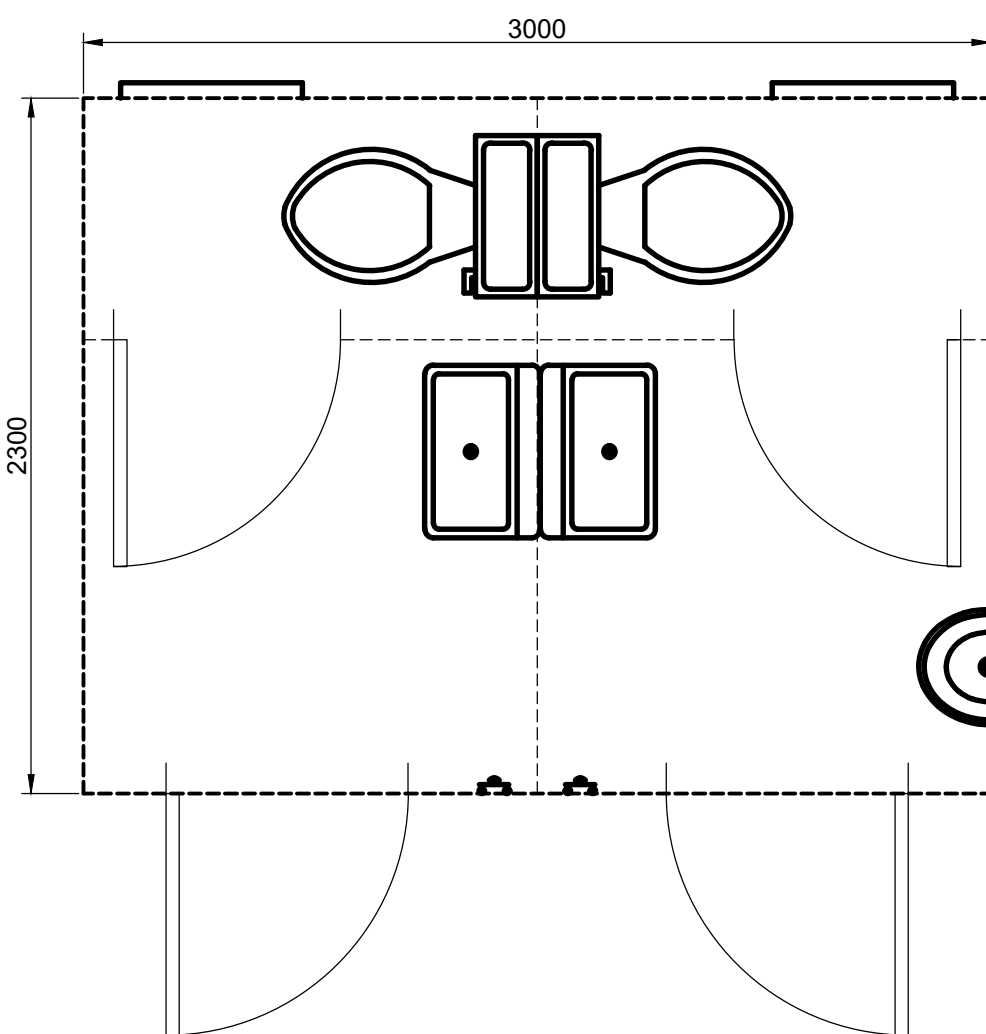
- KITCHEN (NEW)**
- 1x 220l FREEZER REFRIGERATOR COMBO
 - 1x 20l MANUAL MICROWAVE OVEN (800W)
 - 1x 1.7L KETTLE
 - 1x DOUBLE HOT PLATE (SOLID PLATE)
 - 6x MUGS, PLATES, UTENSILS (KNIVES, FORKS, TEASPOONS)
 - DISPOSABLE CUPS, KNIVES, FORKS, TEASPOONS (PROVIDED AND MAINTAINED ON A MONTHLY BASIS)
 - COFFEE, TEA, BOTTLED WATER & MILK (PROVIDED AND MAINTAINED ON A MONTHLY BASIS)
 - PAPER TOWEL, CLEANING MATERIALS (DISHWASHING LIQUID, HANDY ANDY, FURNITURE POLISH, CLOTHS, SPONGES), HAND SOAP AND TOILET PAPER (PROVIDED AND MAINTAINED ON A MONTHLY BASIS)

LEGEND

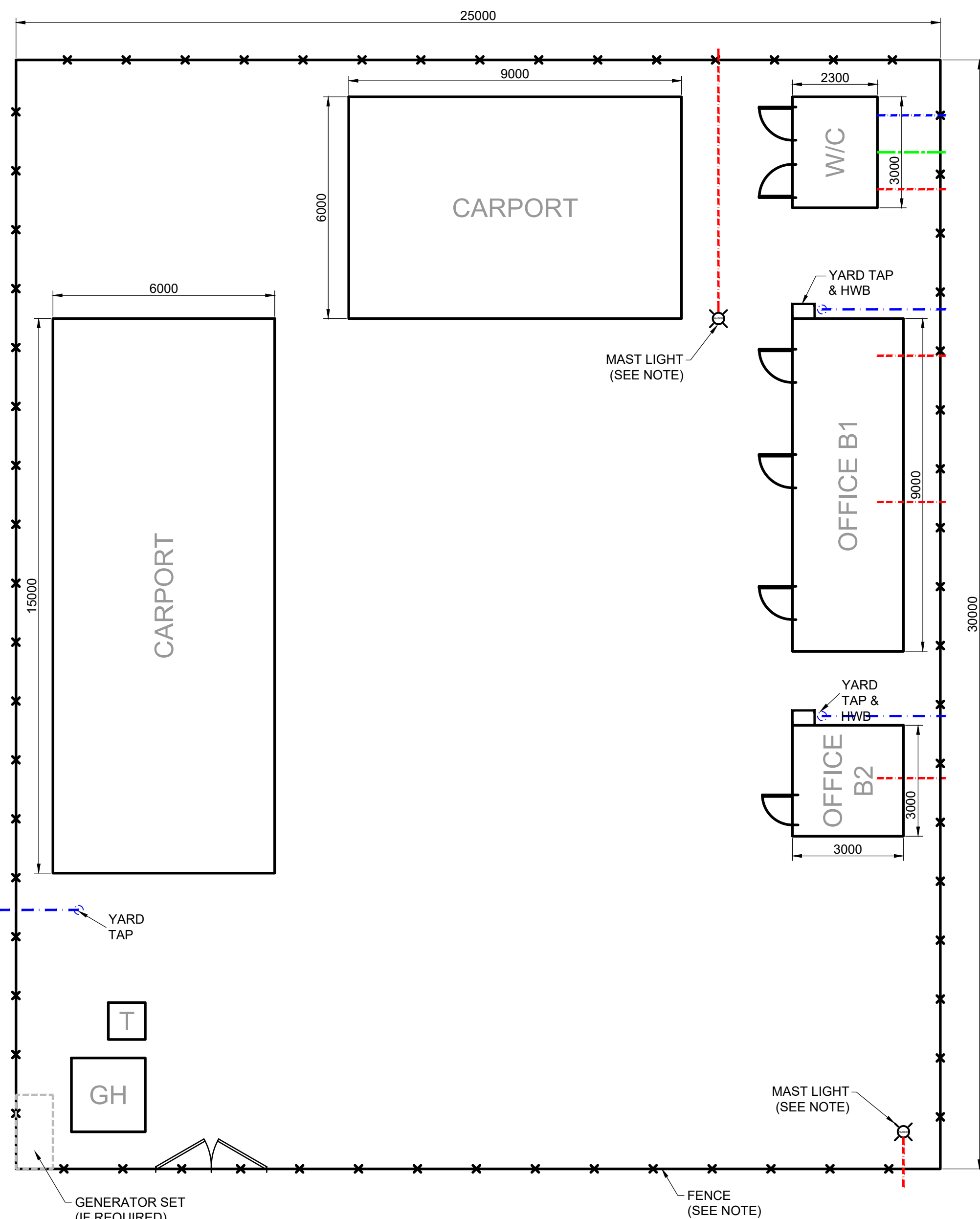
WATER: Blue dashed line
SEWER: Green dashed line
ELECTRICAL: Red dashed line



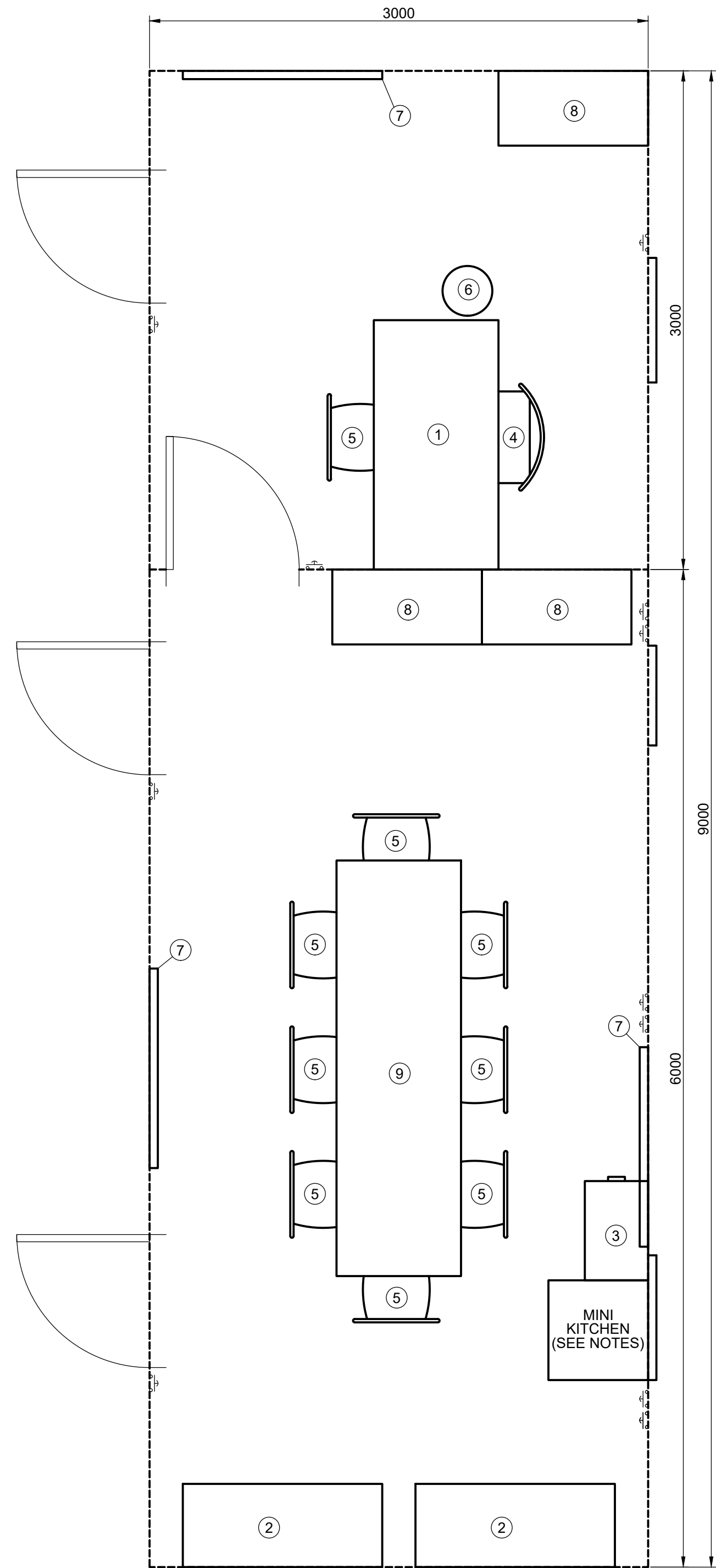
OFFICE B2
(SEE NOTES FOR FURNITURE)
SCALE 1:25



W/C
SCALE 1:25



**ENGINEER'S CAMP
SITE LAYOUT-TYPE B**
SCALE 1:1000



OFFICE B1
(SEE NOTES FOR FURNITURE)
SCALE 1:25

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www.bigengroup.com

Allan Cornack Street
The Innovation Hub
Pretoria

Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PUMP STATION: MECHANICAL
AND ELECTRICAL UPGRADE**

DRAWING TITLE:
**ENGINEER'S CAMP
LAYOUT AND DETAILS**



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED		DESIGNED	G LANDMAN
DRAWN	A STEENBERG	CHECKED	R ROSSOUW
COORD SYSTEM	NA	DATE	NOVEMBER 2020
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.: 1890.11.00.AAA.01.U004			VERSION: 1.0

1890.11.00.AAA.01.U004



PHOTO 1 FENCING



PHOTO 2 DESK



PHOTO 3 FILING CABINET



PHOTO 4 ROTATING HIGH BACK CHAIR



PHOTO 8 C1 PARK HOME



PHOTO 7 BOARDROOM TABLE



PHOTO 6 STATIONARY CUPBOARD



PHOTO 5 RICKSTACKER CHAIR

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www.bigengroup.com
Allan Cormack Street
The Innovation Hub
Perseus
Pretoria
Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



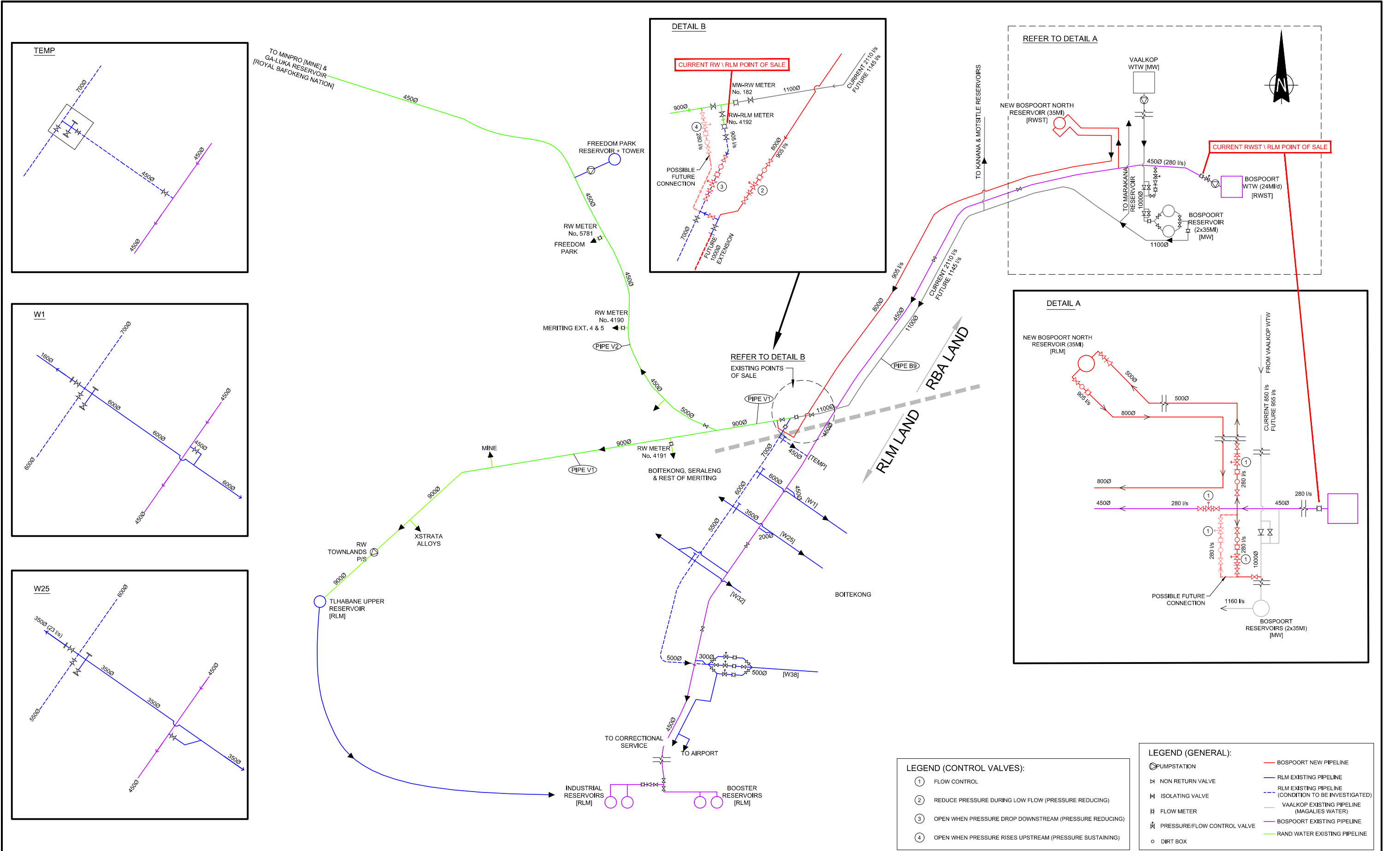
PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME BOSPOORT PIPELINES
DRAWING TITLE: ENGINEER'S CAMP PHOTOS



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APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	DESIGNED	G LANDMAN
DRAWN	A STEENBERG	G LANDMAN
COORD SYSTEM	WG27	DATE
APPROVED ON BEHALF OF BIGEN:		
DRAWING No.:	VERSION:	
1890.11.00.AAA.01.U002	1.0	

1890.11.00.AAA.01.U002



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www.bigengroup.com

Allan Cornack Street
The Innovation Hub
Pretoria

Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:

**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PIPELINES**

DRAWING TITLE:

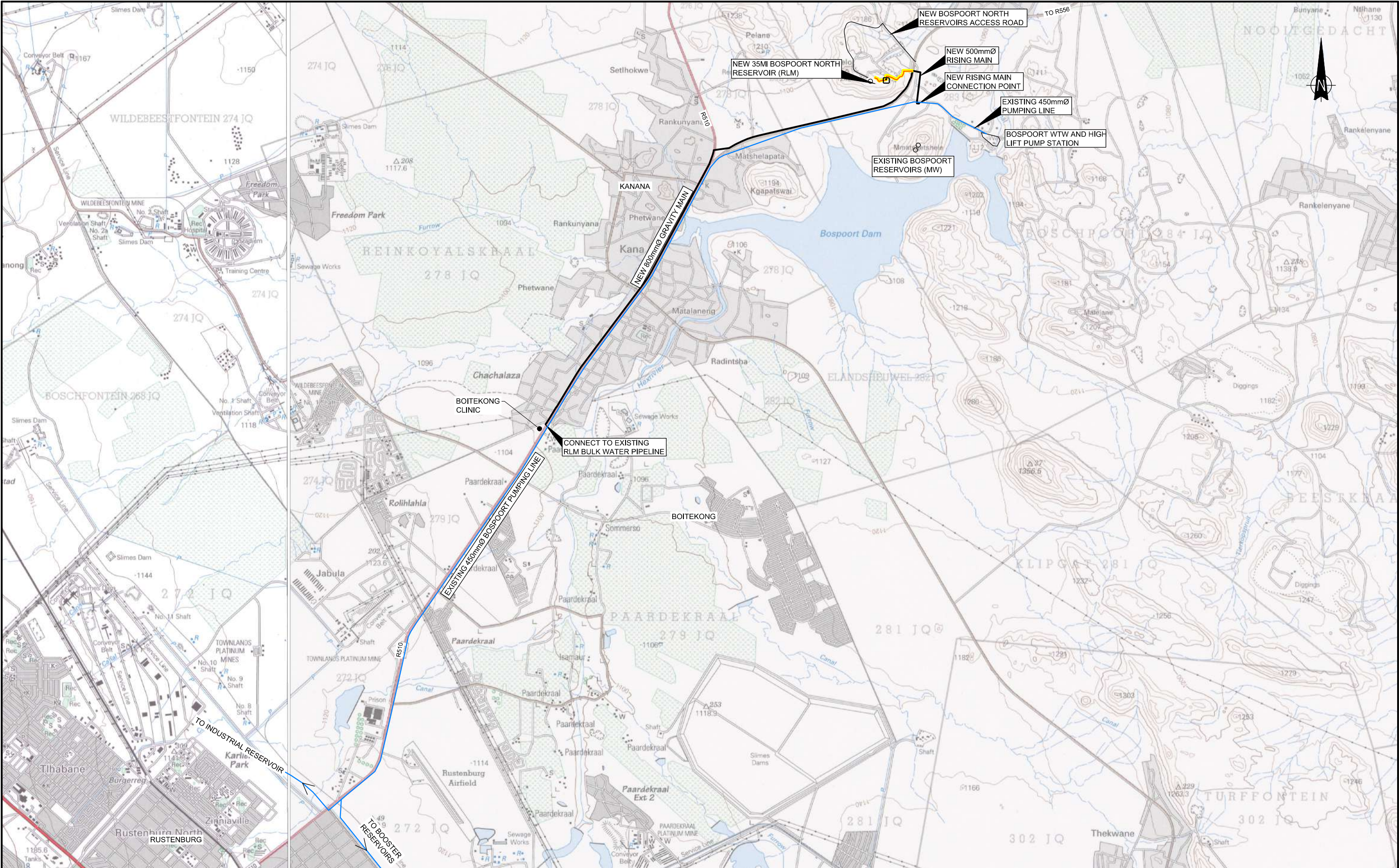
**SCHEMATIC OF PROPOSED SYSTEM
(ULTIMATE)**



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: NA	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	SMC	DESIGNED	C VAN ECK
DRAWN	A STEENBERG		P DU PLESSIS
COORD SYSTEM	WG27	DATE	NOVEMBER 2016
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.:	1890.11.00.AAA.01.A012		VERSION: 18.0

1890.11.00.AAA.01.A012



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www.bigengroup.com

Allan Cornack Street
The Innovation Hub
Pretoria

Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



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**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PIPELINES**

DRAWING TITLE:

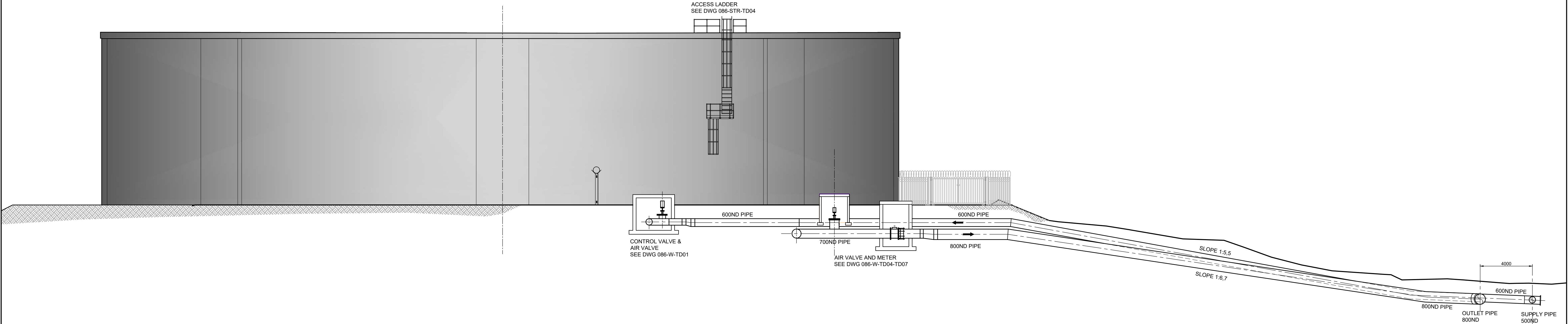
LOCALITY PLAN



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: 1:25 000	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	DESIGNED	C VAN ECK
DRAWN	JA SWART	P DU PLESSIS
COORD SYSTEM	WG27	DATE MAY 2020
APPROVED ON BEHALF OF BIGEN:		
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1890.11.00.AAA.01.S001		VERSION: 1.0

1890.11.00.AAA.01.S001



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www.bigengroup.com

IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912

info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
EASTERN ELEVATION**

0100
100mm ON ORIGINAL DRAWING

ORIGINAL DRAWING SCALE: 1:150

ORIGINAL DRAWING SHEET SIZE: **A1**

APPROVED ON BEHALF OF CLIENT:
NAME:
DATE:
CLIENT DRAWING No.:
CLIENT REF No.:

SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		APPROVED ON BEHALF OF BIGEN:	
DRAWING No.: 086-W-A02		VERSION:	

NOTES APPLICABLE TO PIPE SPECIALS, VALVES AND METERS

1. THE CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS AND LEVELS OF PROPOSED PIPEWORK AND THE DESIGN OF PIPEWORK AND CHAMBERS AS FOLLOWS:

- ON SITE AND ESPECIALLY AT EXISTING PIPES, OTHER SERVICES AND STRUCTURES;
 - WITH REGARDS TO DIMENSIONS OF PUMPS, VALVES, FLOW METERS ETC. THAT WILL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR;
 - DRILLING OF EXISTING FLANGES TO BE CONNECTED TO.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
3. ALL LEVELS IN METERS ABOVE MEAN SEA LEVEL UNLESS OTHERWISE SHOWN.
4. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELATED SPECIFICATIONS AND DRAWINGS.
5. POSITION AND SIZES OF HOLES, POCKETS, DUCTS ETC. MUST BE DETERMINED ON SITE AMONGST CIVIL, MECHANICAL AND ELECTRICAL CONTRACTORS.
6. DIMENSIONS SHOWN REFER TO:

- PIPE CENTRE LINES UNLESS OTHERWISE SHOWN;
 - OUTSIDE FACE OF FLANGE ON PIPE END;
 - CENTRE OF RESTRAINING FLANGES (FR) AND PUDDLE FLANGES (FP).
7. PUDDLE / ANCHOR / THRUST FLANGES TO HAVE THE SAME DIMENSIONS AS OTHER FLANGES BUT WITHOUT HOLES AND WITH FLAT FACES.
8. MINIMUM CLEARANCE BETWEEN PIPE WORK AND CONCRETE REINFORCEMENT SHALL BE 40mm.
9. REFER TO PARTICULAR SPECIFICATION PLN (MANUFACTURING, SUPPLY AND TESTING OF STEEL PIPES) FOR FLANGES.
- 10.THE CONTRACTOR SHALL SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER.
11. SHOULD THE CONTRACTOR WISH TO ASSEMBLE FITTINGS IN THE WORKSHOP TO REDUCE SITE WELDING THE CONTRACTOR MAY PROPOSE SAME AND MUST BE SHOWN ON THE DETAIL SHOP DRAWINGS
- 12.CORROSION PROTECTION
REFER TO PARTICULAR SPECIFICATION PLQ (CORROSION PROTECTION OF STEEL PIPES AND FITTINGS)

ABBREVIATIONS:

CML

CEMENT MORTAR

DT

DENSO THERM TAPE OR SIMILAR PMB TAPE APPROVED BY ENGINEER

DSR

DENSO S43/R23 TAPE SYSTEM (ONLY UNDERGROUND SECTIONS)

EP

EPOXY PAINT

FBE

FUSION BONDED EPOXY

FMDPE

FUSION BONDED MEDIUM DENSITY POLYETHYLENE (SINTAKOTE)

FRB

FIBRE REINFORCED BITUMEN

HDG

HOT-DIP GALVANISING

IZS

INORGANIC ZINC SILICATE

MPEP

MULTI-PURPOSE EPOXY PAINT - UV-RESISTANT

PMB

POLYMER MODIFIED BITUMEN (BITUGUARD)

PT

PETROLATUM TAPE WRAP

PU

POLYURETHANE (RE-COATABLE)

RPU

RIGID POLYURETHANE

ST

STOPAQ TAPE WRAP

- 13.ABBREVIATIONS FOR PIPEWORK

AL

ALUMINIUM

AV

AIR VALVE

BL

LONG RADIUS BEND

BM

MEDIUM RADIUS BEND

BV

BUTTERFLY VALVE

CL

CLASS

CP

CROTCH PLATE

CTO

CAP TOP OPERATED

CTS

PIPE LENGTH CUT TO SUIT ON SITE

DJ

DISMANTLING JOINT

DN

NOMINAL DIAMETER

DWG/DRG

DRAWING

EA

ELECTRIC ACTUATOR

FA

FLANGE ADAPTOR

FB

BLIND FLANGE / BLANK FLANGE

FC

FLEXIBLE COUPLING

FN

FLANGE

FP

PUDDLE FLANGE

F/F

FACE TO FACE DIMENSION

FDT

FLANGE DRILLING TABLE

FR

RESTRAINING FLANGE

GR

GRADE OF STEEL

GS

GALVANISED STEEL

HPWB

HANDWHEEL PEDESTAL ON WALL SUPPORT BRACKET

HW

HANDWHEEL

HWO

HANDWHEEL OPERATED

ID

INSIDE DIAMETER

IF

INSULATING FLANGE

LF

LOOSE FLANGE - WELDED ONTO PIPE END AFTER CUTTING PIPE LENGTH TO SUIT ON SITE

LH

LEFT HAND SIDE GEARBOX LOOKING IN FLOW DIRECTION

LO

LEFT HAND OFF-SET GEARBOX LOOKING FROM THE GEARBOX SIDE TO THE GEARBOX

MWP

MAXIMUM WORKING PRESSURE

OD

OUTSIDE DIAMETER

PCD

PITCH CIRCLE DIAMETER FOR FLANGES

PE

PLAIN PIPE END

PMP

PLATFORM-MOUNTED HANDWHEEL PEDESTAL

PN

NOMINAL PRESSURE

R

RADIUS

RB

RESTRAINING BOLT

RFA

RESTRAINED FLANGE ADAPTOR

RH

RIGHT HAND SIDE GEARBOX LOOKING IN FLOW DIRECTION

RO

RIGHT HAND OFF-SET GEARBOX LOOKING FROM THE GEARBOX SIDE TO THE GEARBOX

RSV

RESILIENT SEAL GATE VALVE

SB

SOLID BODY

SE

SPINDLE EXTENSION

SH

STUB HANDWHEEL PEDESTAL ON WALL SUPPORT BRACKET

SP

SPOOL PIPE

SS

STAINLESS STEEL GRADE 316L

SSF

SPIGOT AND SOCKETED END PREPARED FOR FILLET WELD, SIMILAR TO MAIN PIPE JOINTING SYSTEM

ST

MILD STEEL

ST-C

STEPPED COUPLING

SW

SITE WELDING - CERTAIN ITEMS WELDED TOGETHER ON SITE

WGV

WEDGE GATE VALVE

WT

PIPE WALL THICKNESS

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No.	DATE	DESCRIPTION	AUTH. BY

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PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912

info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



PROJECT TITLE:

BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR

DRAWING TITLE:

NOTES APPLICABLE TO PIPE SPECIALS,
VALVES AND METERS



0100

100mm ON ORIGINAL DRAWING

ORIGINAL DRAWING SCALE: NTS

ORIGINAL DRAWING SHEET SIZE: A1

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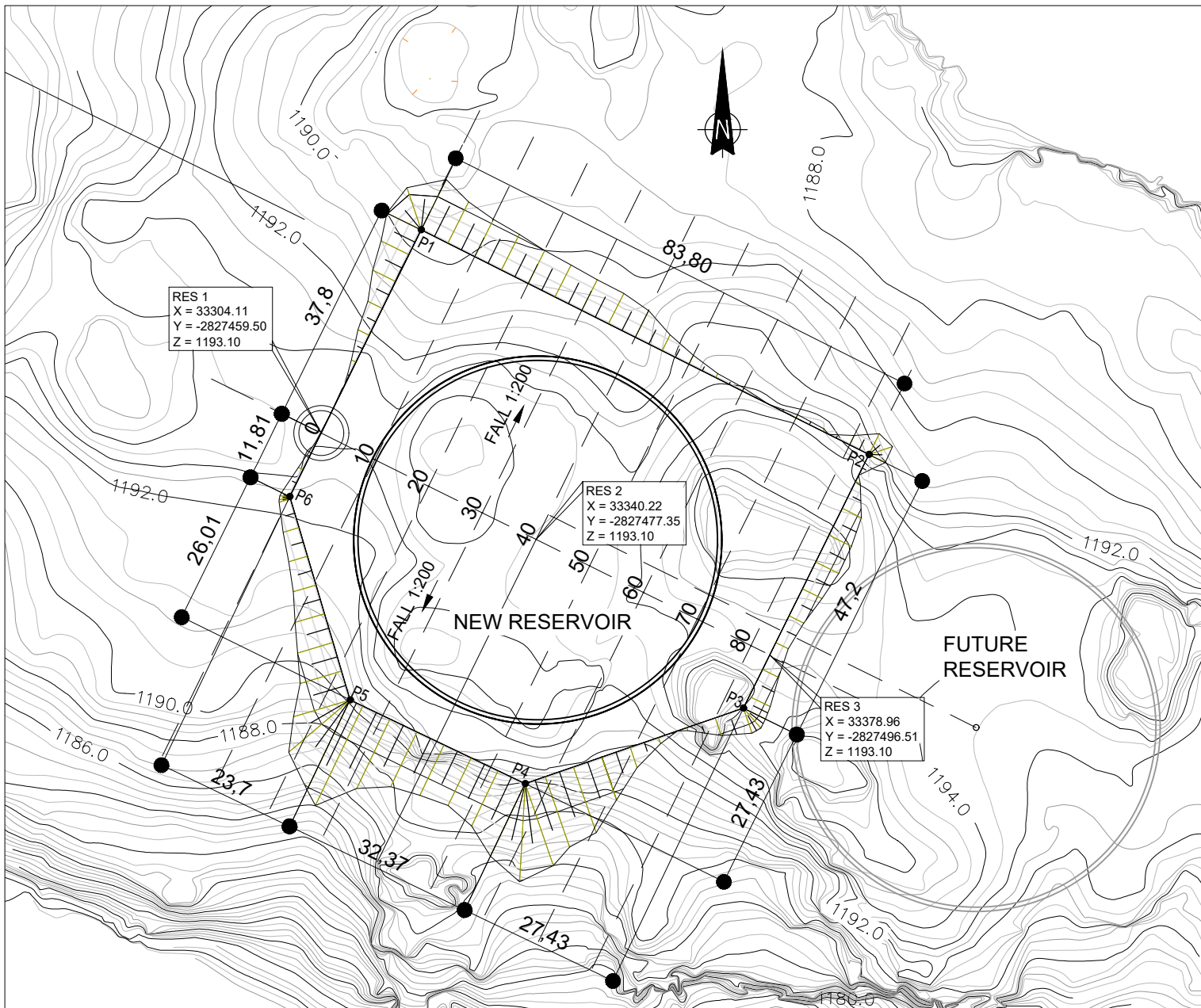
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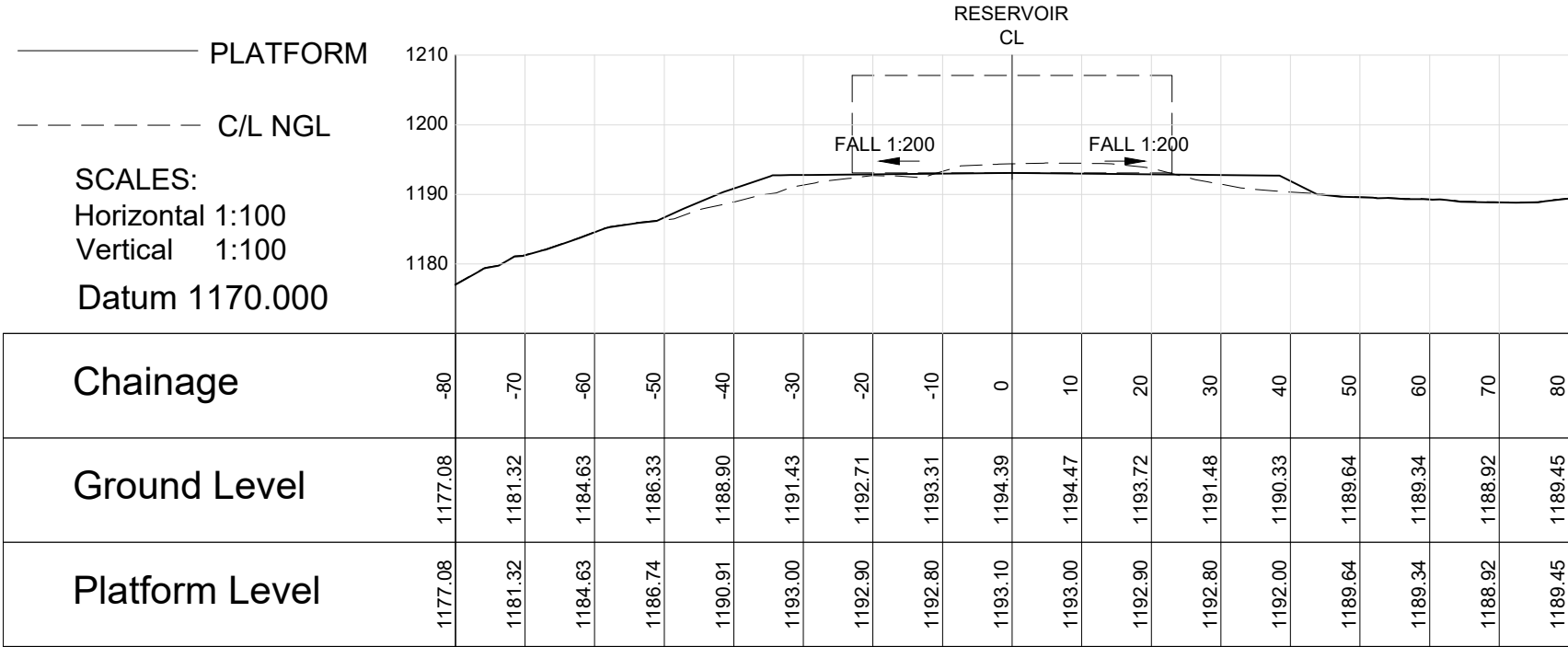
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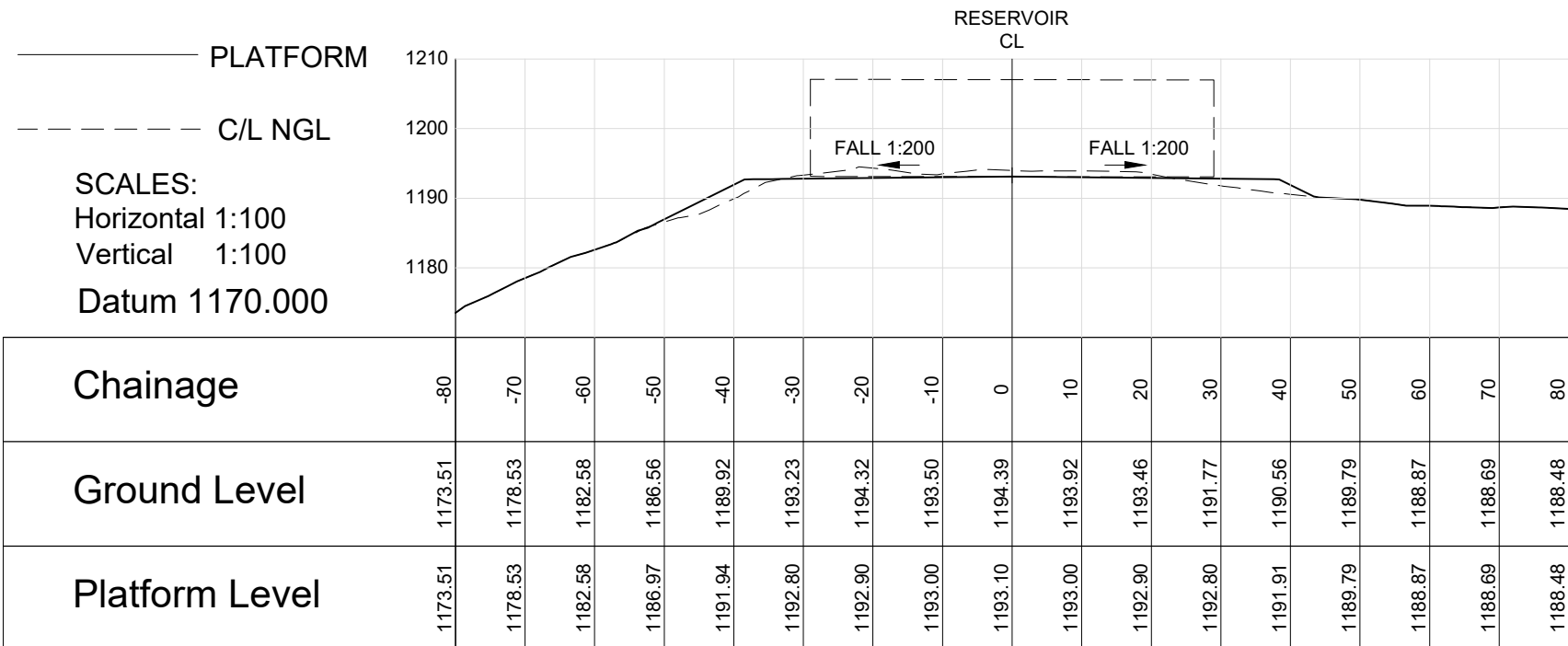
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DRAWN	A STEENBERG	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
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DRAWING No.: 086-W-A03			VERSION:



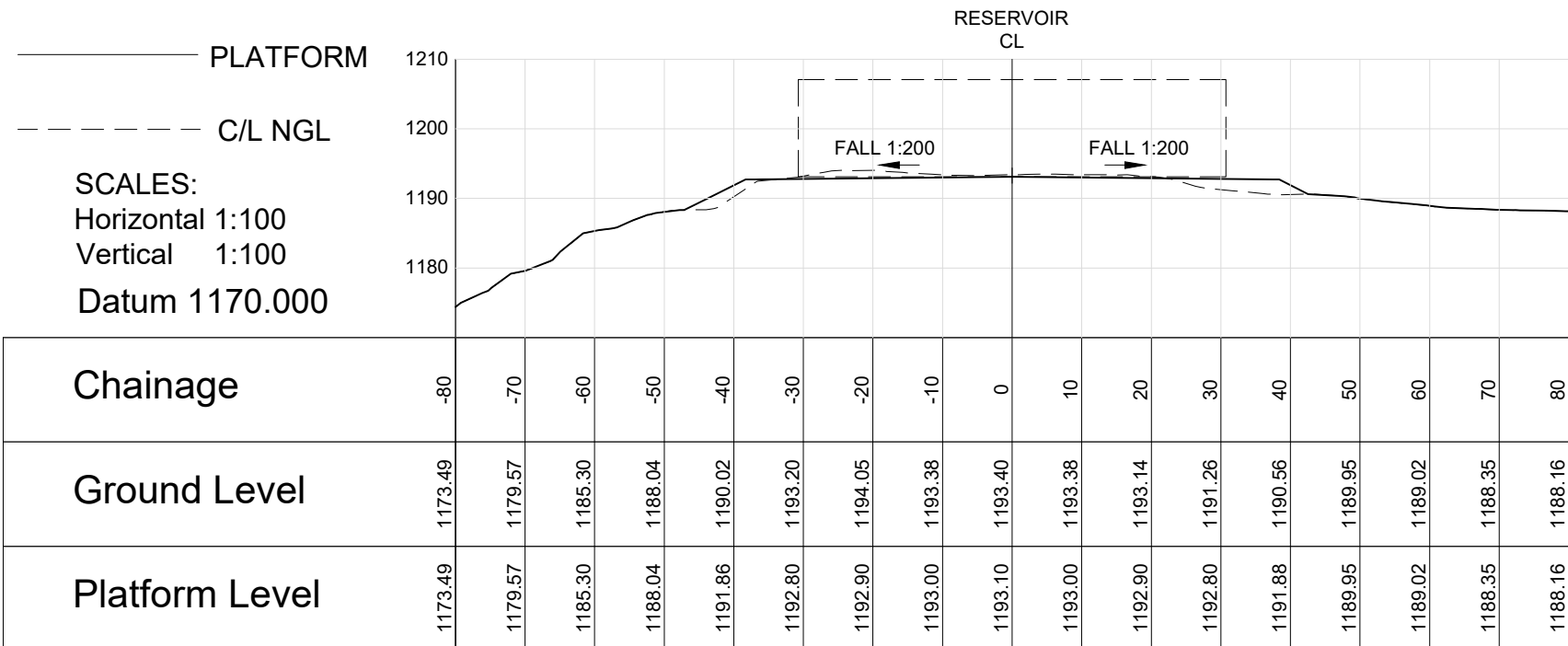
LAYOUT OF RESERVOIR PLATFORM



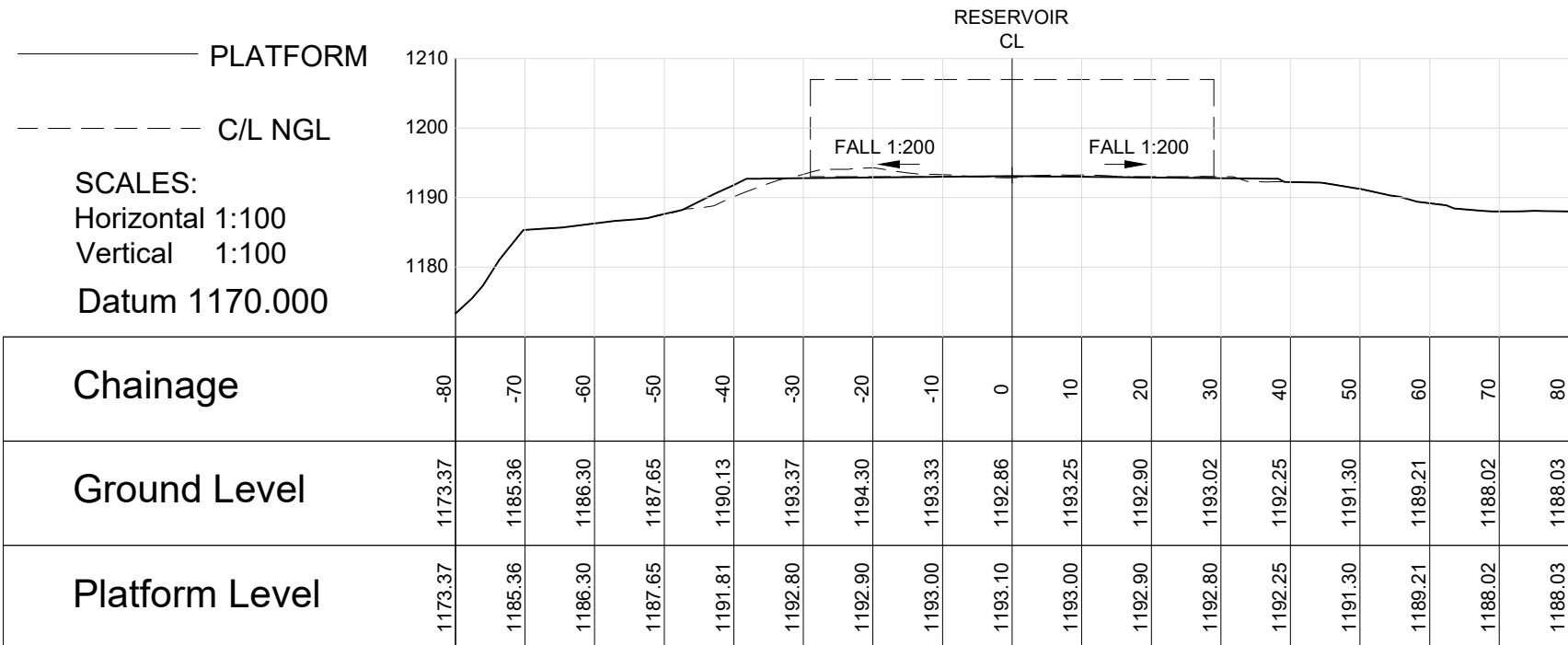
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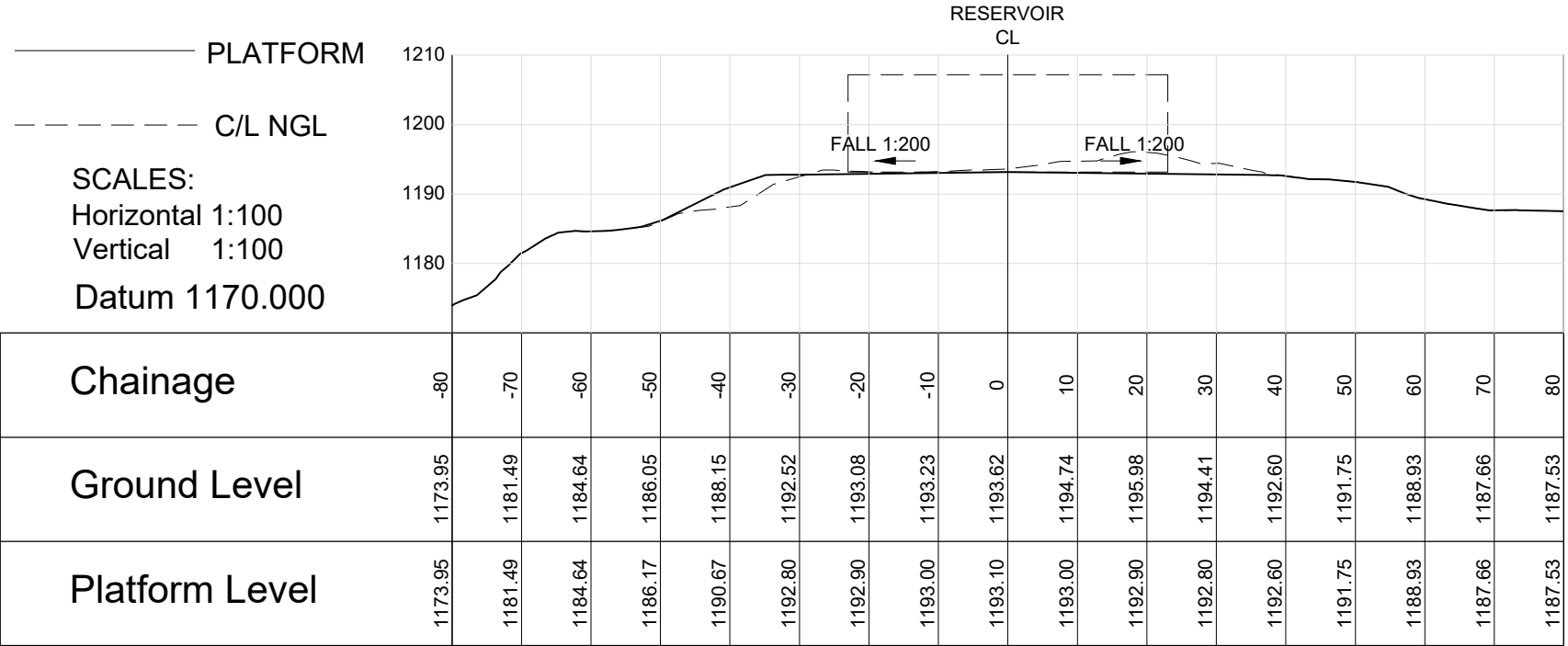
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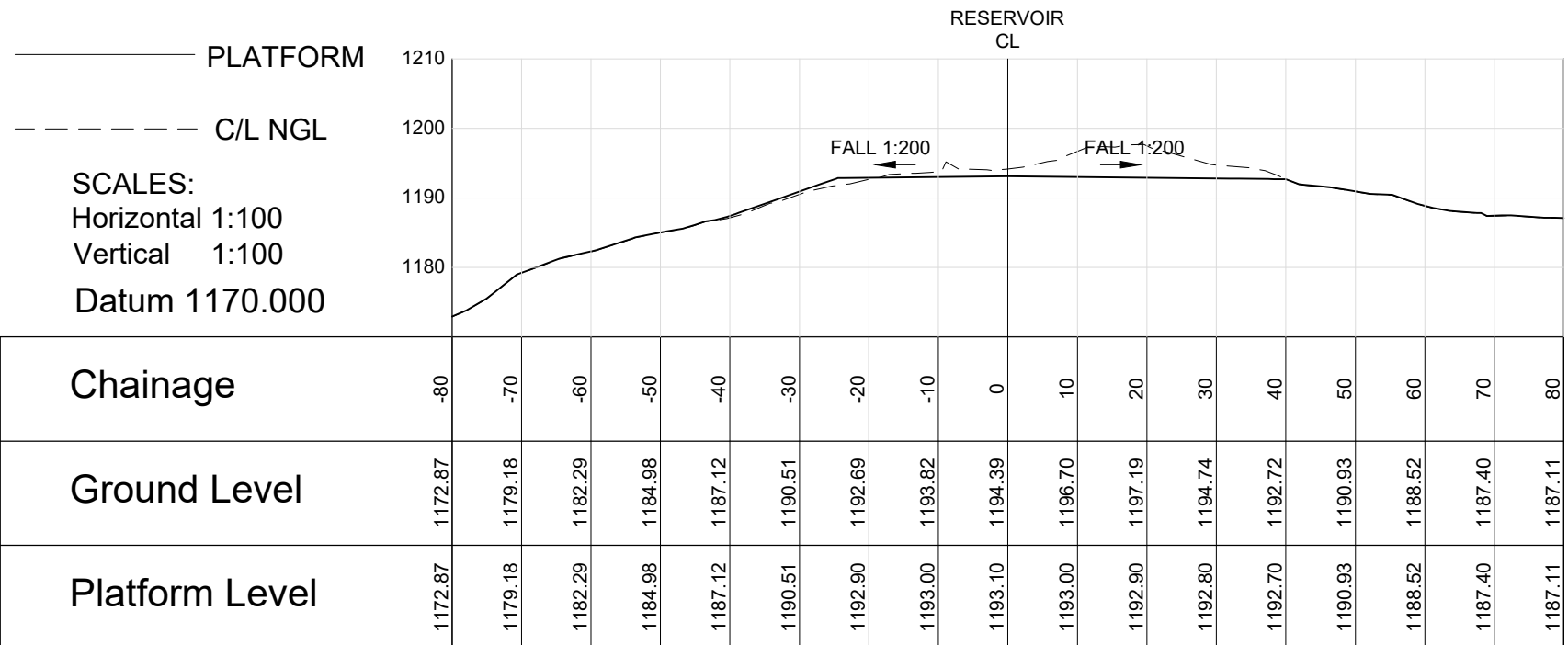
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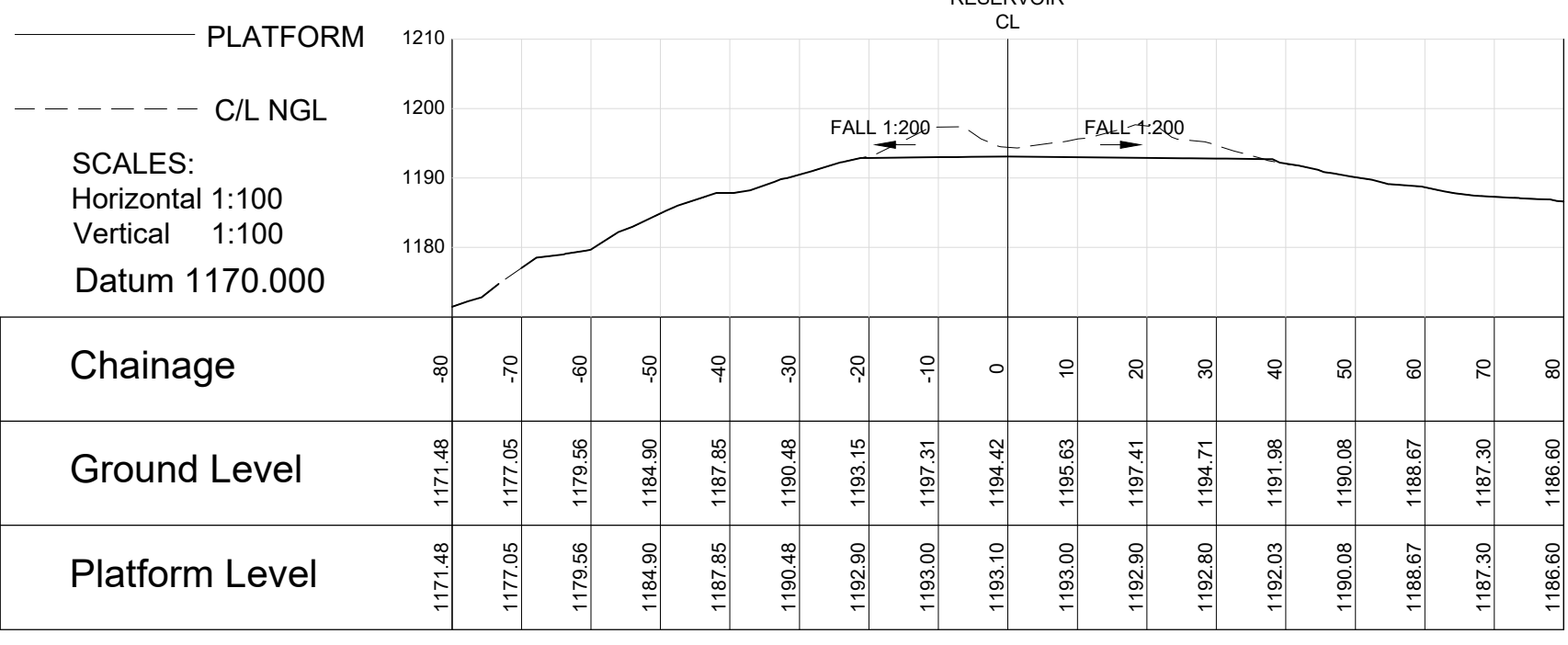
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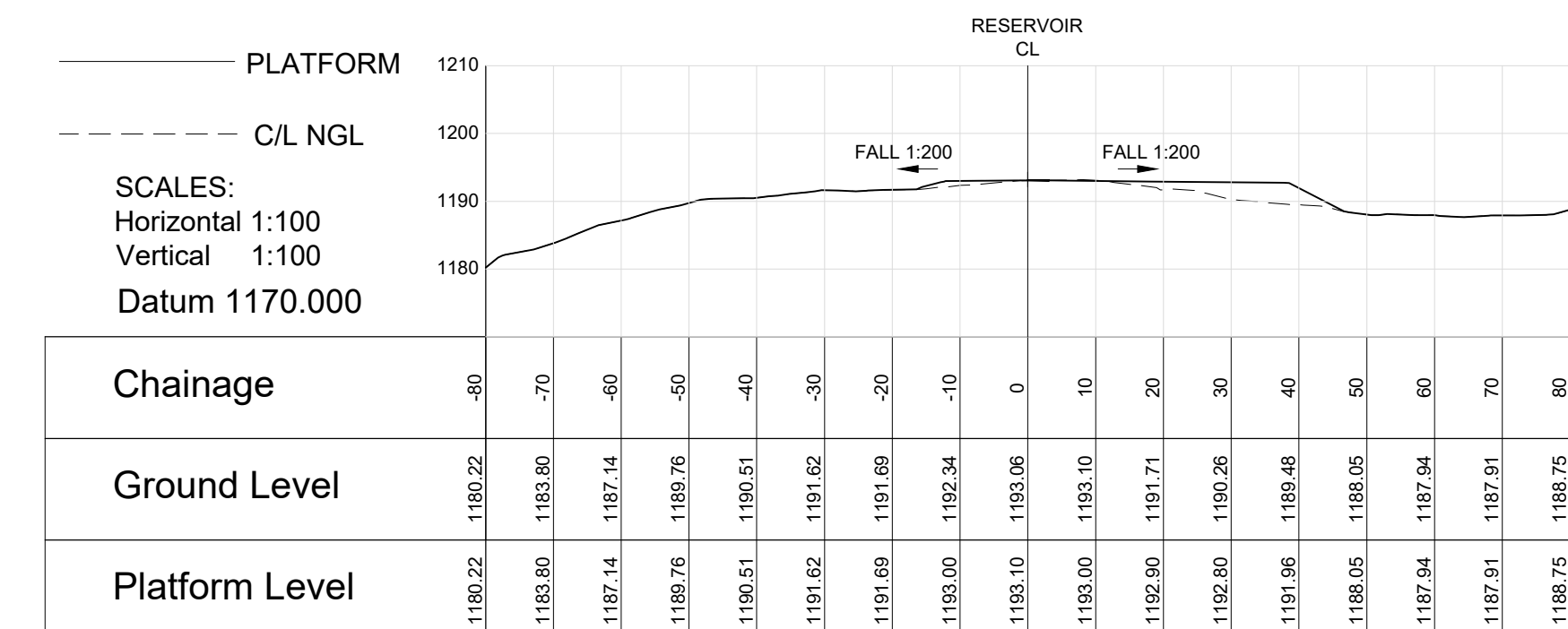
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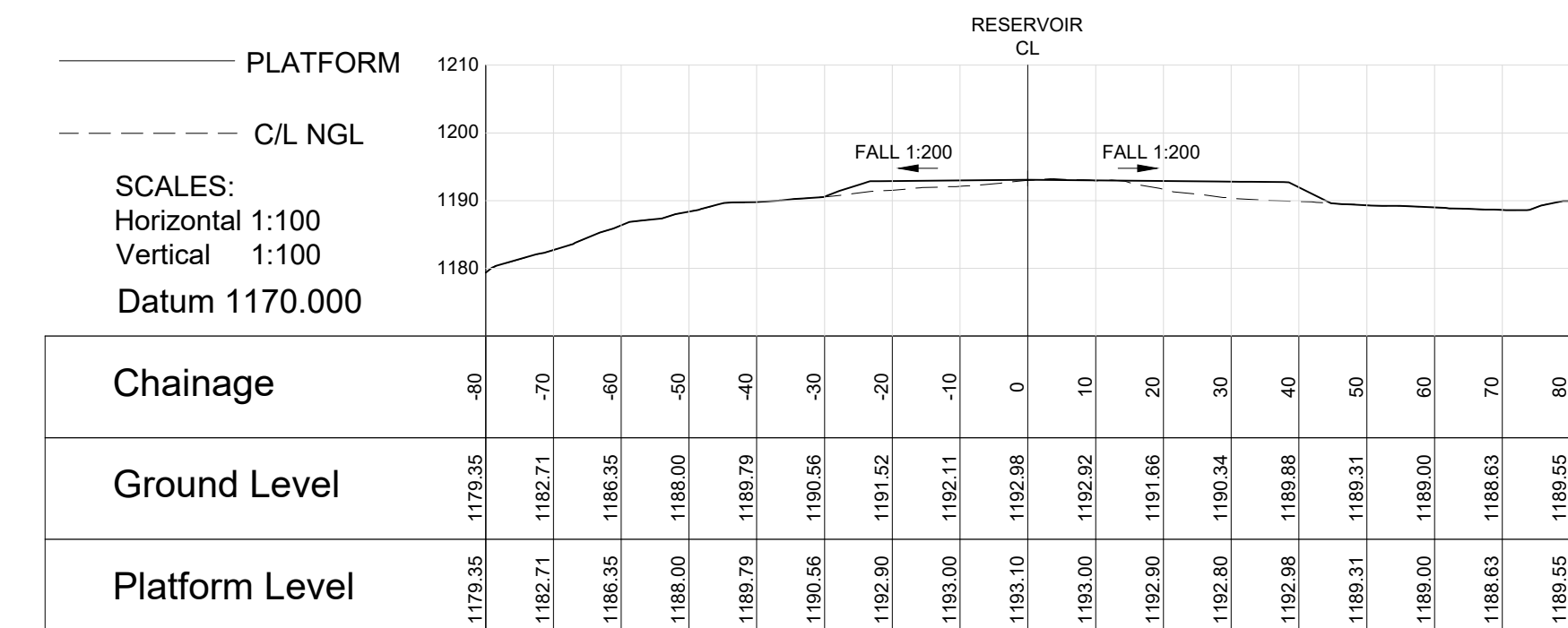
CHAINAGE 70



CHAINAGE 80



CHAINAGE 90



CHAINAGE 100

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19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

PROJECT TITLE:

**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:

**NEW BOSPOORT RESERVOIR
MASS EARTHWORKS
SECTIONS**

**Rustenburg
Water Services Trust**

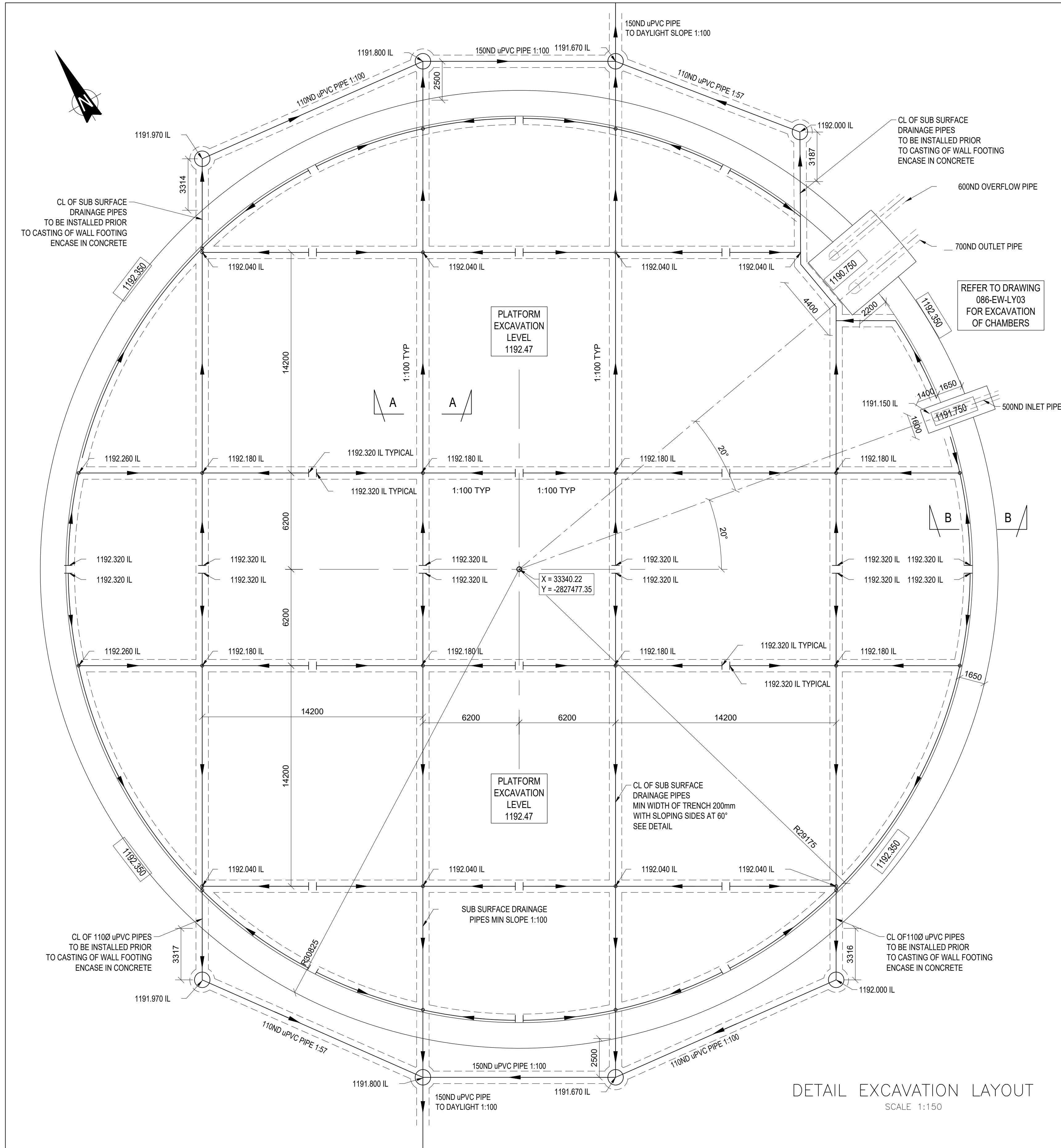
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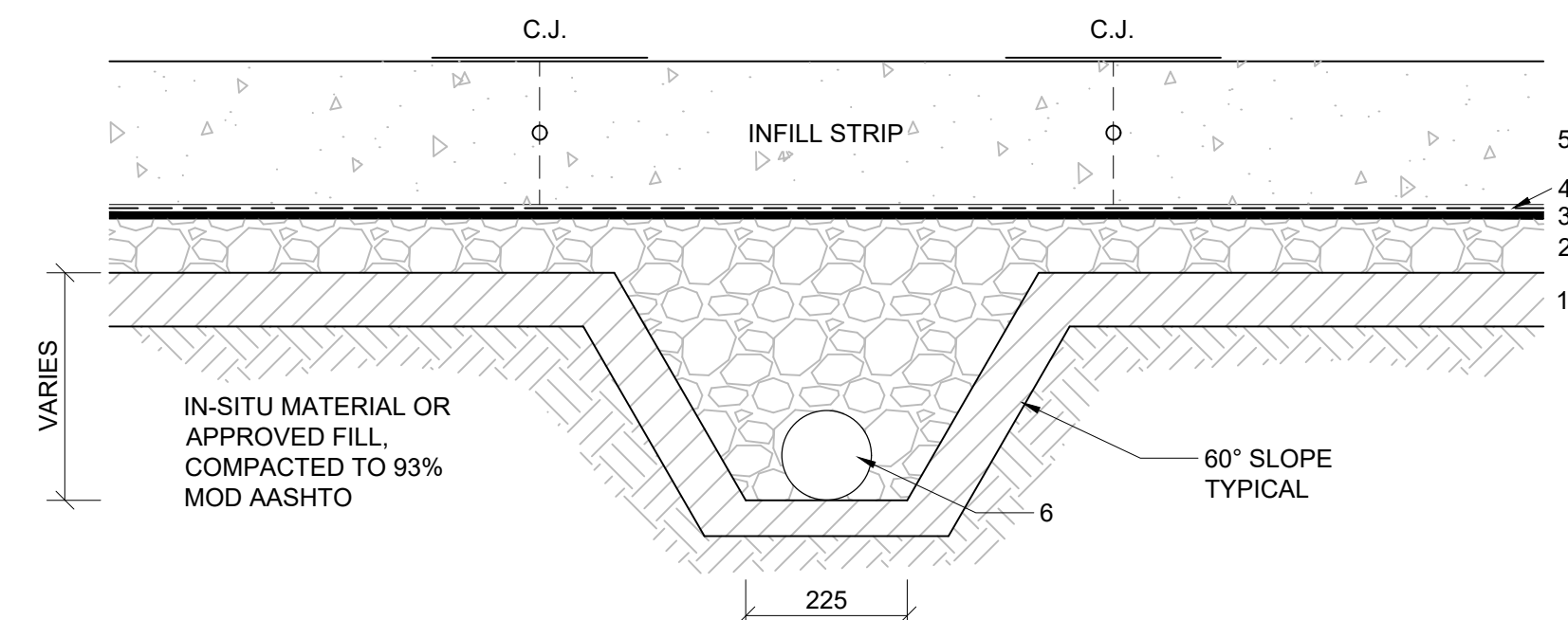
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NAME: DATE: CLIENT DRAWING No.: CLIENT REF No.:

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DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE
OCT 2021		VERSION:
DRAWING No.:		086-EW-LY01



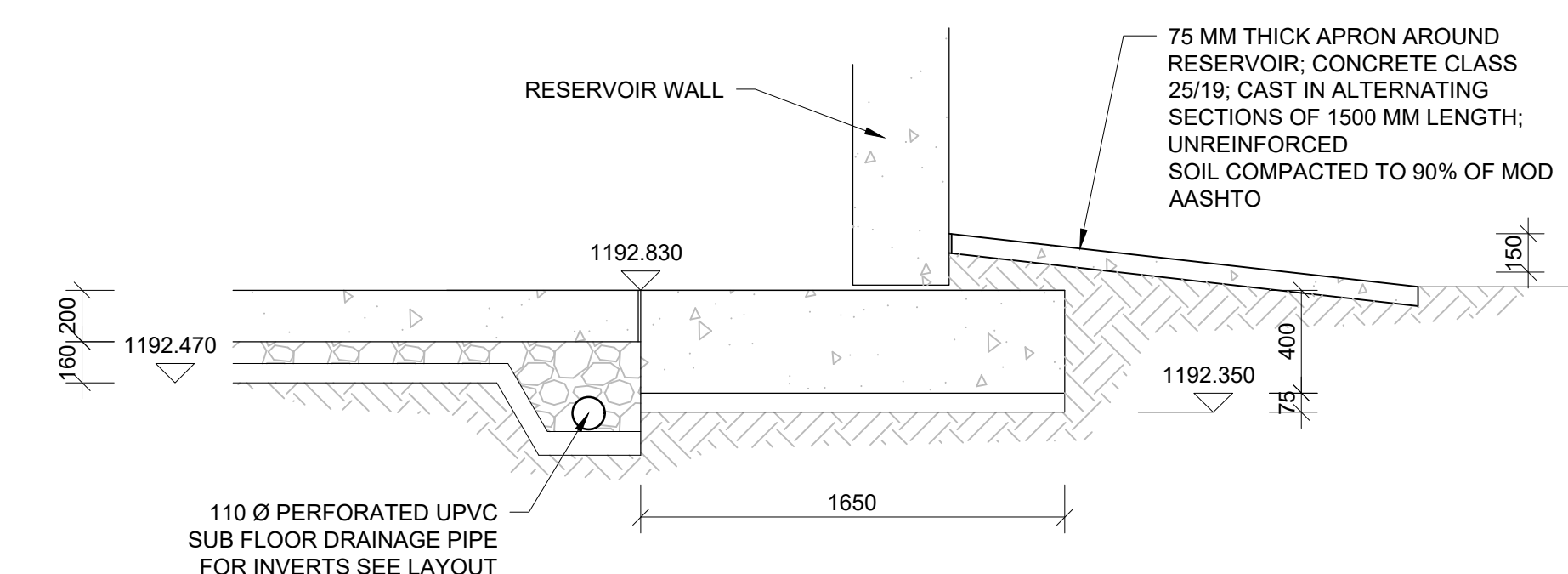
DETAIL EXCAVATION LAYOUT
SCALE 1:150



TYPICAL SECTION A-A THROUGH UNDERFLOOR DRAIN TRENCH

SCALE 1:10

- Legend:
- 75 MM BLINDING, CONCRETE CLASS 20/19
 - 75 MM NO-FINES CONCRETE
 - 10 MM CEMENT PLASTER TO A SMOOTH FINISH
 - 375 MICRON POLY-ETHYLENE SHEETING AS A SLIP LAYER
 - STRUCTURAL FLOOR SLAB; CONCRETE CLASS 35/19 WR
 - 110 MM DIA PERFORATED DRAIN PIPE SEE LAYOUT FOR INVERTS AND SLOPES



SECTION B-B THROUGH FOUNDATION

SCALE 1:25

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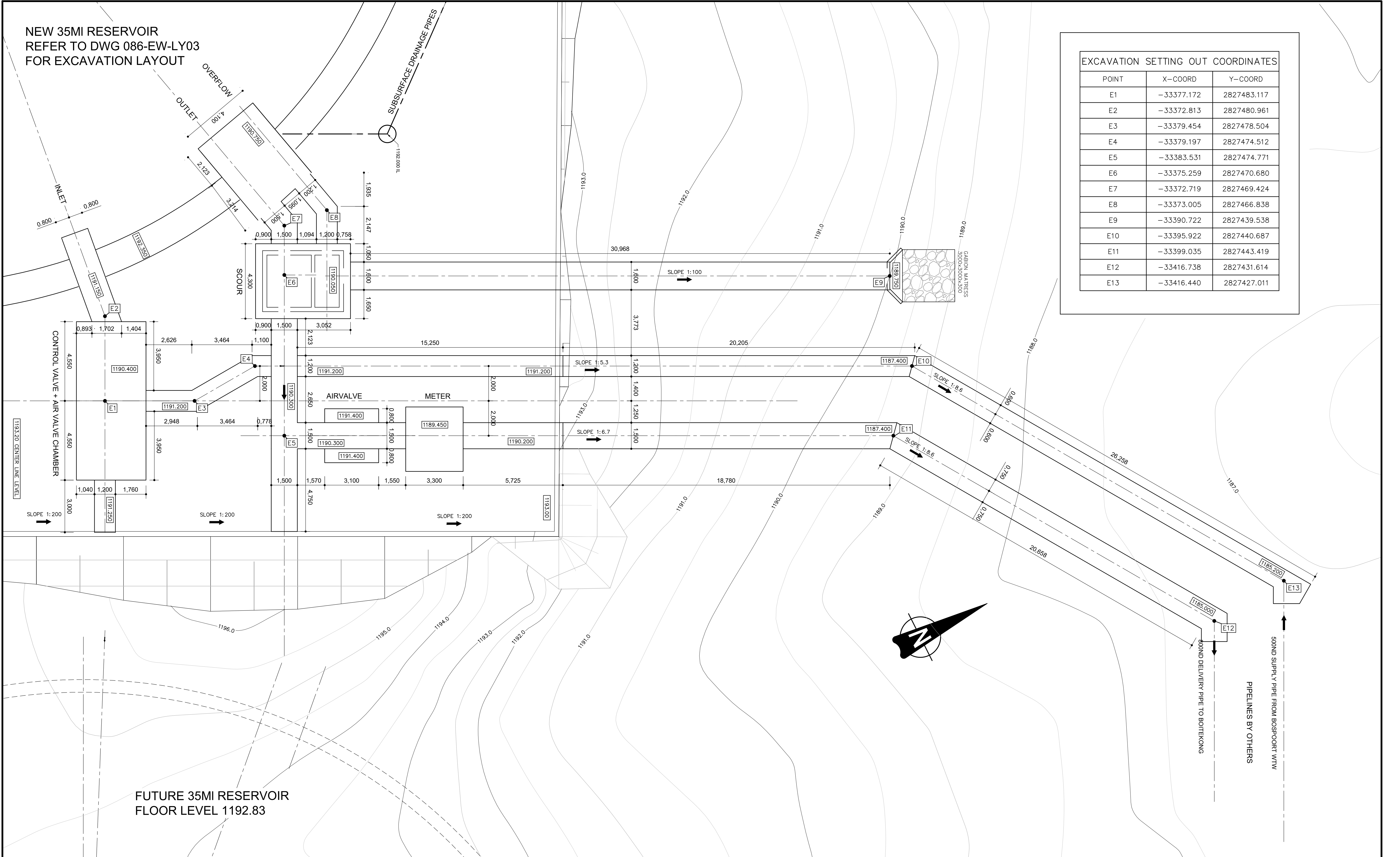
Rustenburg
Consulting Consortium

PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
DETAIL EXCAVATIONS
RESERVOIR**

Rustenburg
Water Services Trust

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ORIGINAL DRAWING SCALE: AS SHOWN		DRAWN	CHECKED	K MOODLEY
ORIGINAL DRAWING SHEET SIZE: A1		COORD SYSTEM	DATE	OCT 2021
APPROVED ON BEHALF OF CLIENT:		APPROVED ON BEHALF OF BIGEN:		
NAME:		DRAWING No.:		
DATE:		VERSION:		
CLIENT DRAWING No.:		CLIENT REF No.:		
		086-EW-LY-02		



EXCAVATION SETTING OUT COORDINATES		
POINT	X-COORD	Y-COORD
E1	-33377.172	2827483.117
E2	-33372.813	2827480.961
E3	-33379.454	2827478.504
E4	-33379.197	2827474.512
E5	-33383.531	2827474.771
E6	-33375.259	2827470.680
E7	-33372.719	2827469.424
E8	-33373.005	2827466.838
E9	-33390.722	2827439.538
E10	-33395.922	2827440.687
E11	-33399.035	2827443.419
E12	-33416.738	2827431.614
E13	-33416.440	2827427.011

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PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912

info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
DETAIL EXCAVATIONS
CHAMBERS AND PIPE TRNCHES**

ORIGINAL DRAWING SCALE: AS SHOWN

ORIGINAL DRAWING SHEET SIZE: **A1**

SURVEYED

DRAWN: P J KOELEWYN

COORD SYSTEM: WG27

DESIGNED: P J KOELEWYN

CHECKED: K MOODLEY

DATE: JAN 2021

APPROVED ON BEHALF OF CLIENT:

NAME: _____

DATE: _____

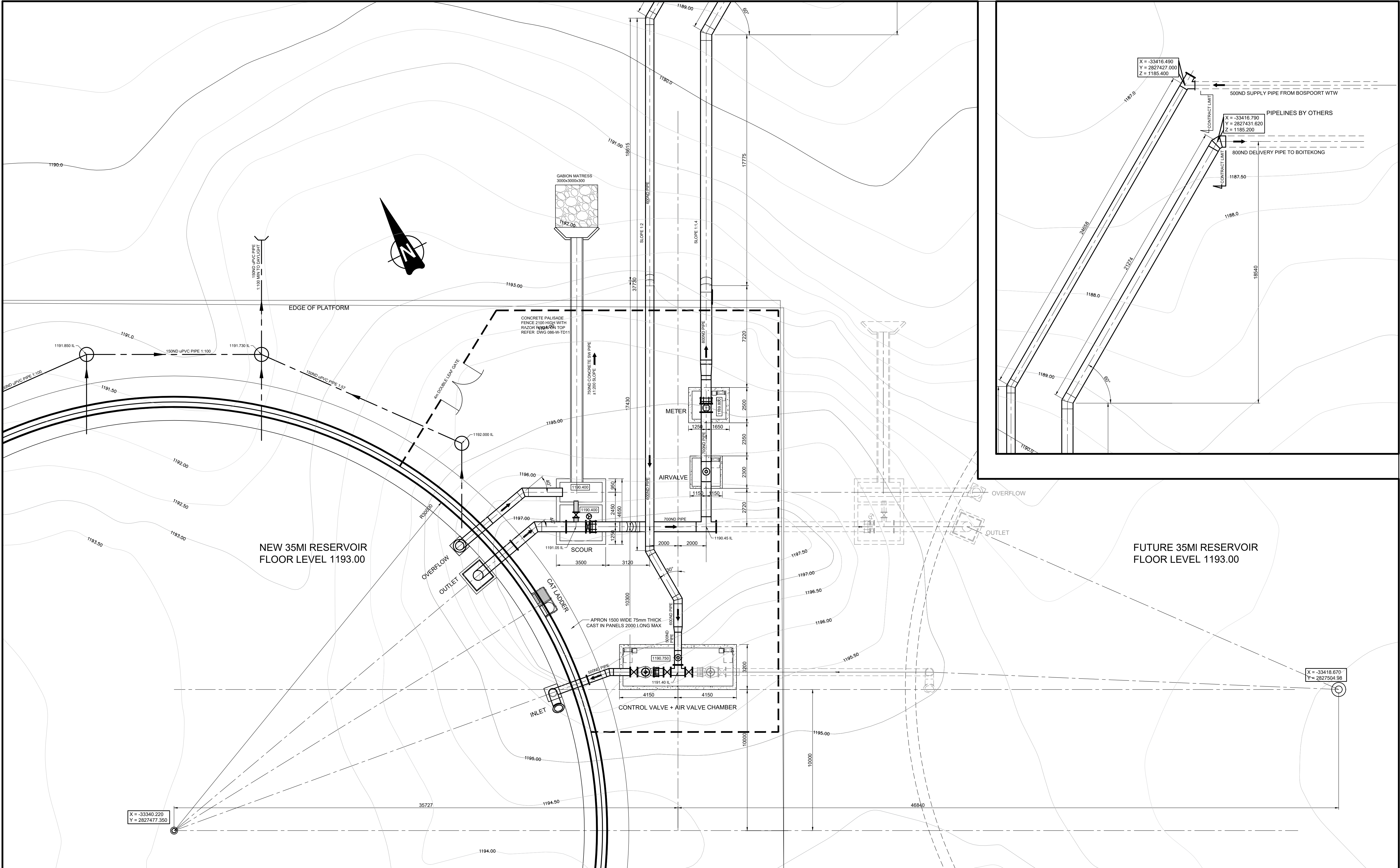
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CLIENT REF No.: _____

APPROVED ON BEHALF OF BIGEN:

DRAWING No.: **086-EW-LY03**

VERSION: **A2**



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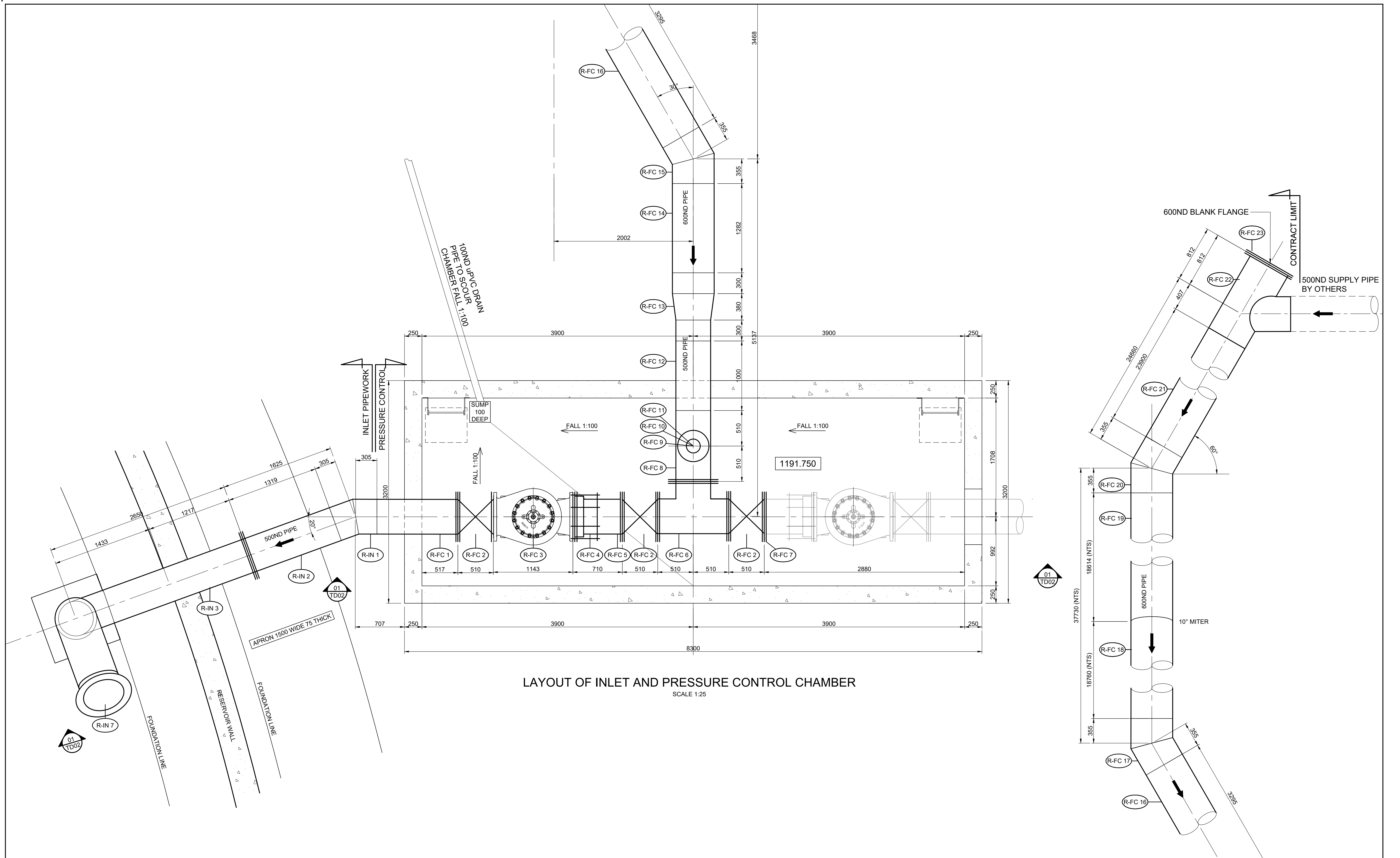
Rustenburg Consulting Consortium	



PROJECT TITLE:	
BOSPOORT WATER SUPPLY SCHEME	
PIPELINE AND	
BOSPOORT NORTH RESERVOIR	
DRAWING TITLE:	
NEW BOSPOORT RESERVOIR	
CHAMBERS AND PIPEWORK	
LAYOUT	

Rustenburg Water Services Trust	

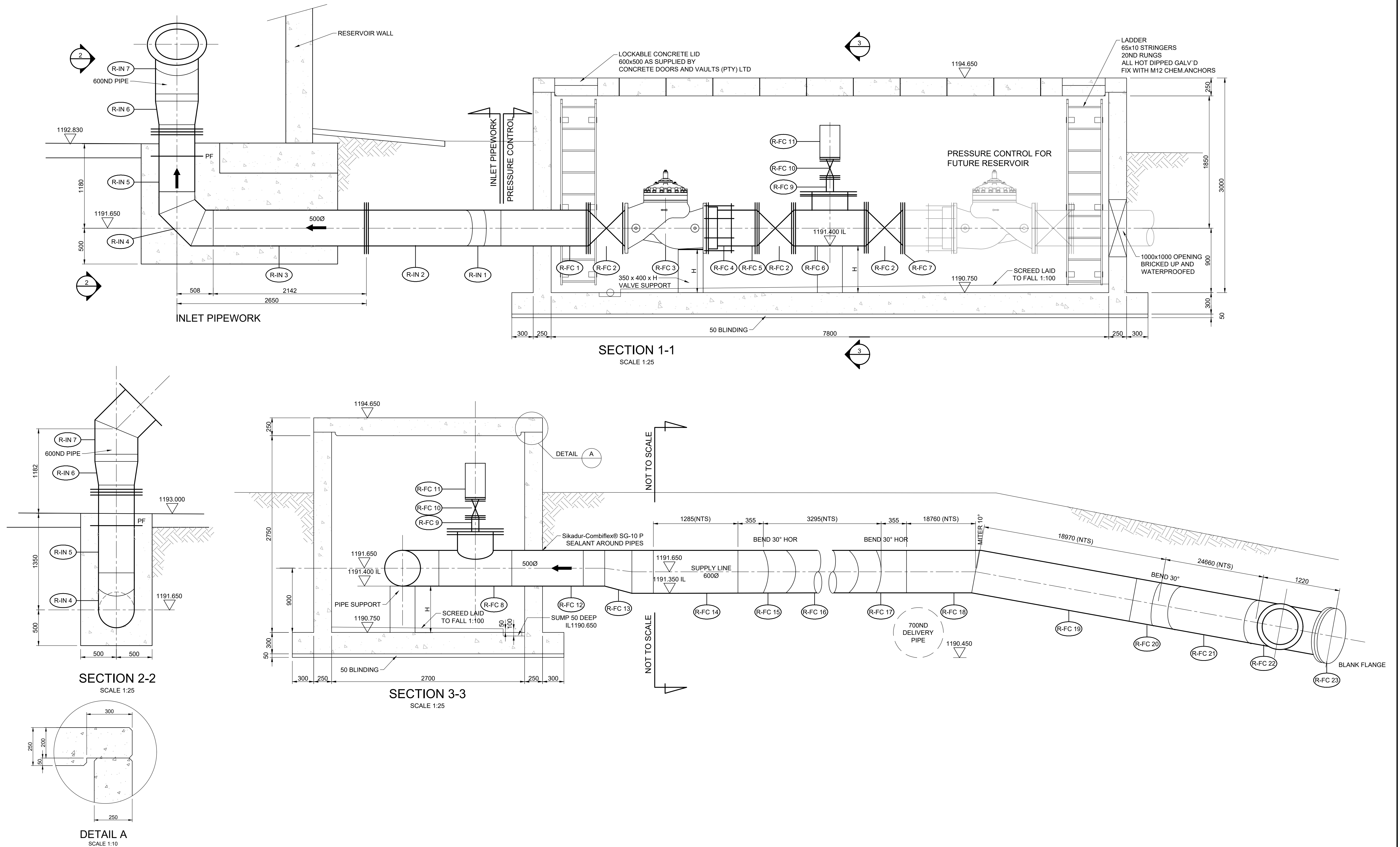
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NAME: _____	
DATE: _____	
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.: 086-W-LY01		



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No.	DATE	DESCRIPTION	AUTH. BY			DRAWING TITLE: NEW BOSPOORT RESERVOIR INLET PIPEWORK LAYOUT AND DETAIL			<div>ORIGINAL DRAWING SCALE: AS SHOWN</div>	<div>ORIGINAL DRAWING SHEET SIZE: A1</div>	<div>DRAWN</div>	<div>P J KOELEWYN</div>	<div>CHECKED</div>	<div>K MOODLEY</div>	
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						NAME:			CLIENT DRAWING No.:		CLIENT REF No.:		DRAWING No.:		
				DATE:							VERSION:				
											<div>086-W-TD01</div>				

086-W-TD01



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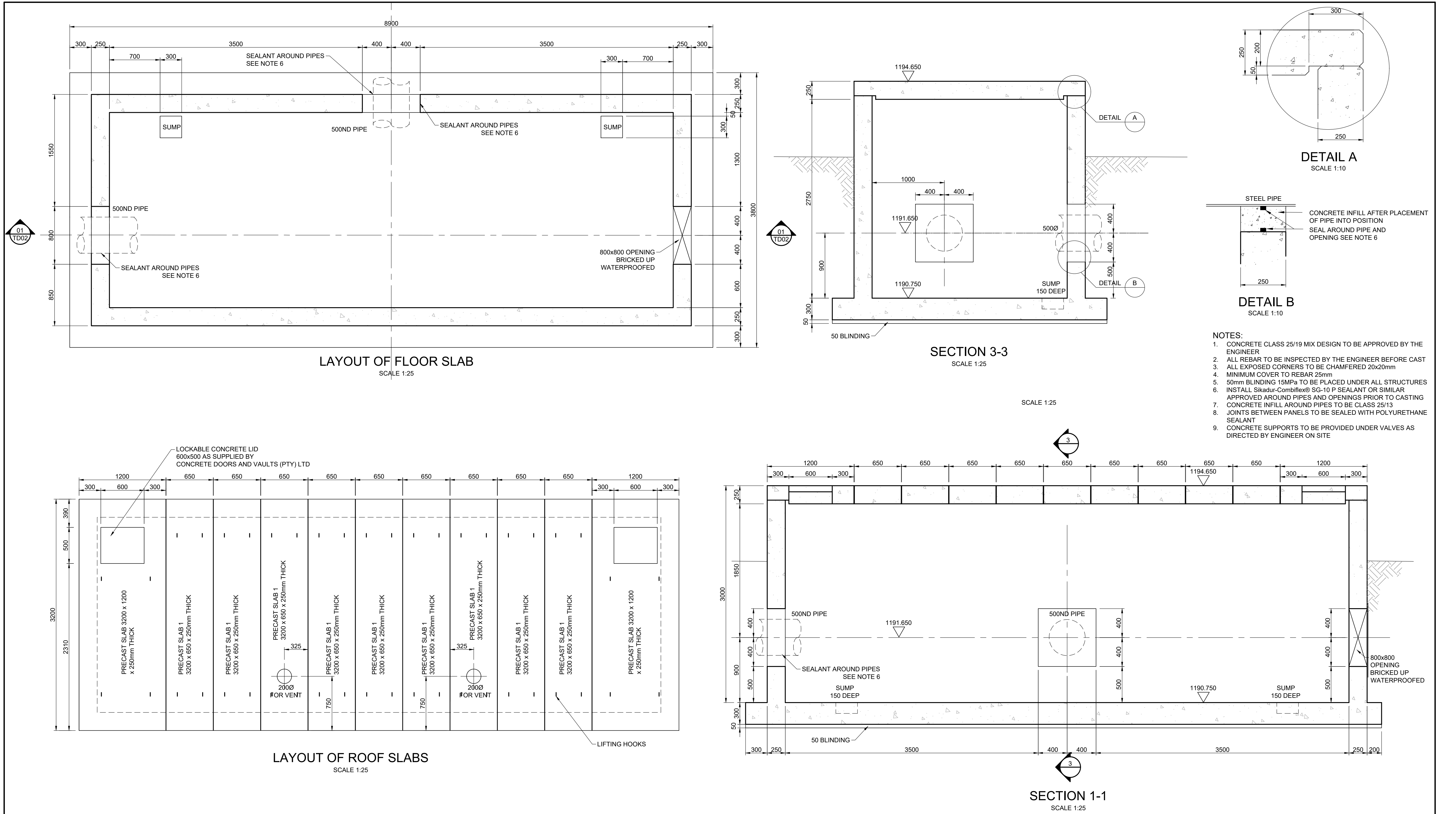
PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
INLET PIPEWORK AND CHAMBER
SECTIONS**



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME: _____	
DATE: _____	
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SURVEYED	DESIGNED	P J KOELEWYN
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COORD SYSTEM	WG27	DATE
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.: 086-W-TD02		



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PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
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PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

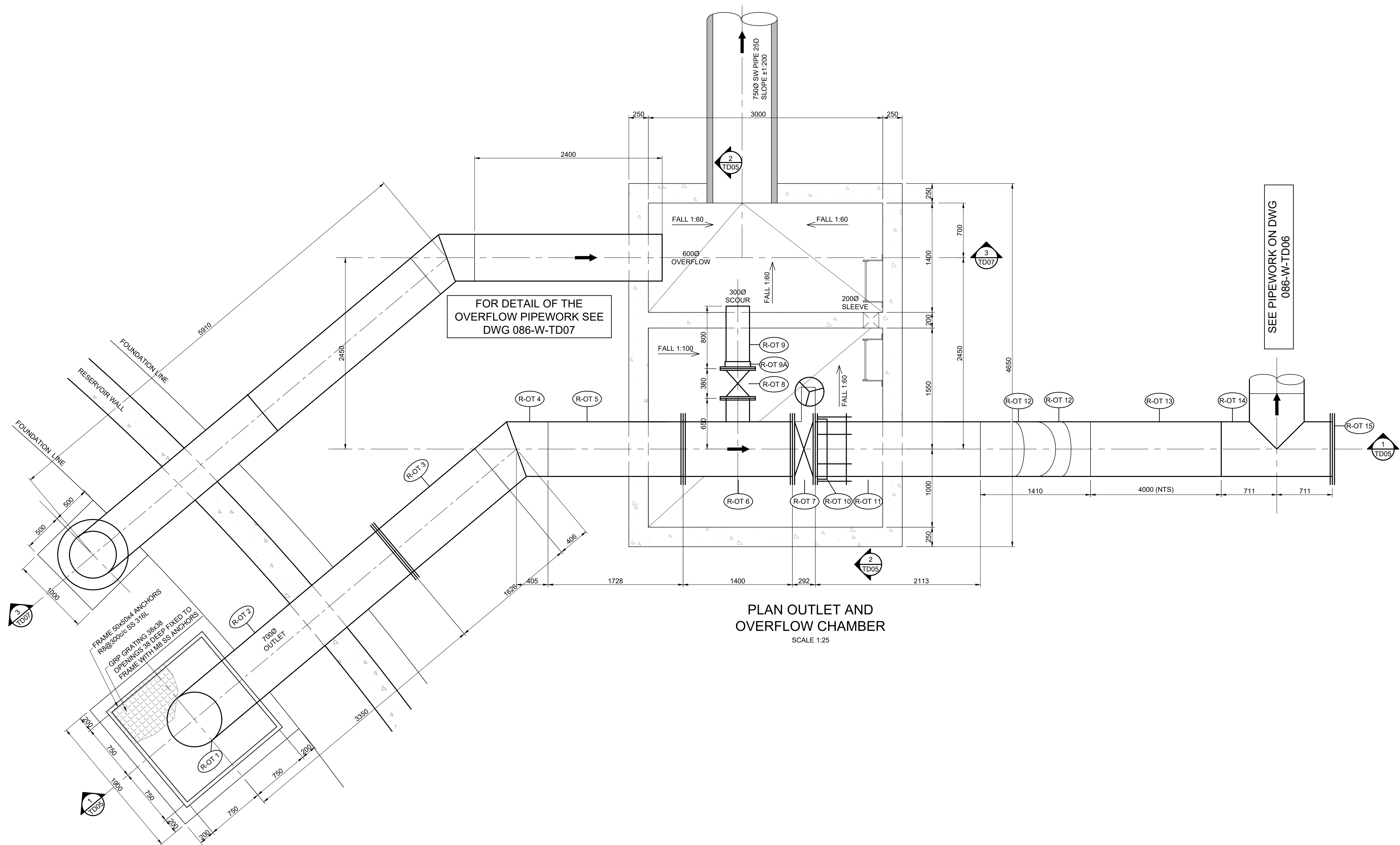
DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
CONTROL CHAMBER
LAYOUT AND DETAIL**



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NAME: _____	
DATE: _____	
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.: 086-W-TD03		

086-W-TD03



FOR DETAIL OF THE
OVERFLOW PIPEWORK SEE
DWG 086-W-TD07

SEE PIPEWORK ON DWG
086-W-TD06

PLAN OUTLET AND
OVERFLOW CHAMBER
SCALE 1:25

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info@phatwe.co.za
phatwe@telkomsa.net
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PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

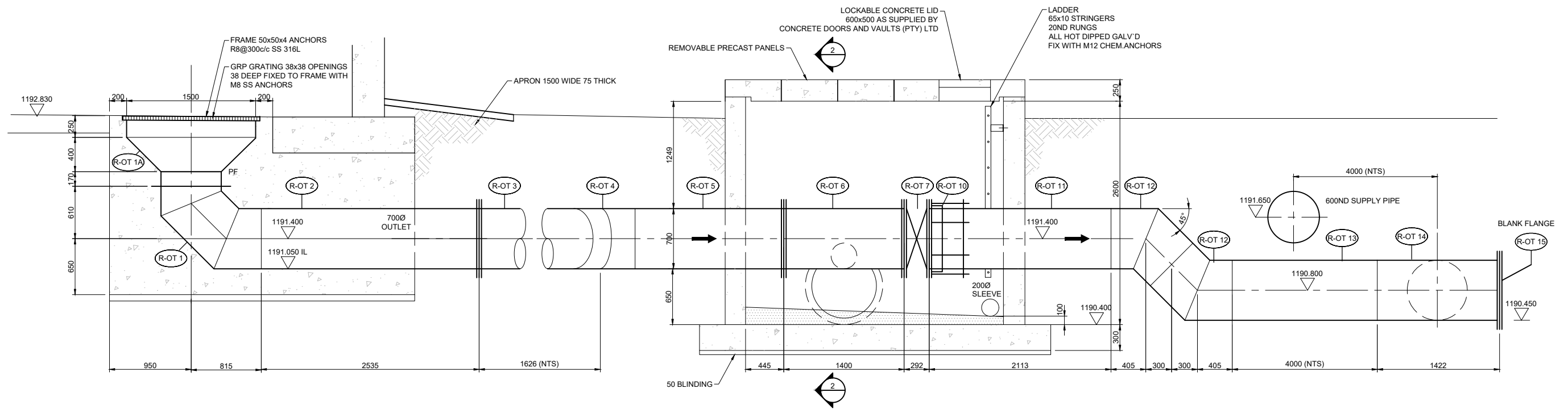
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OUTLET CHAMBERS AND PIPEWORK
LAYOUT AND DETAIL**



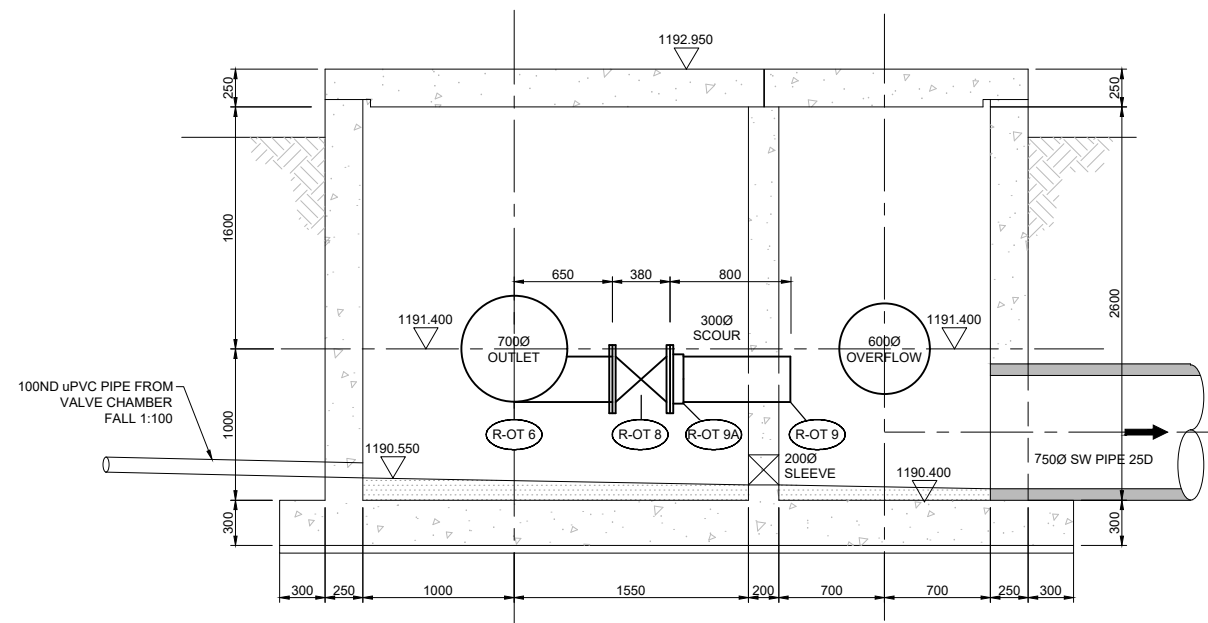
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DATE: _____	
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

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COORD SYSTEM	WG27	DATE	JAN 2021
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DRAWING No.: 086-W-TD04		VERSION:	

086-W-TD04



SECTION 1-1
SCALE 1:25



SECTION 2-2
SCALE 1:25

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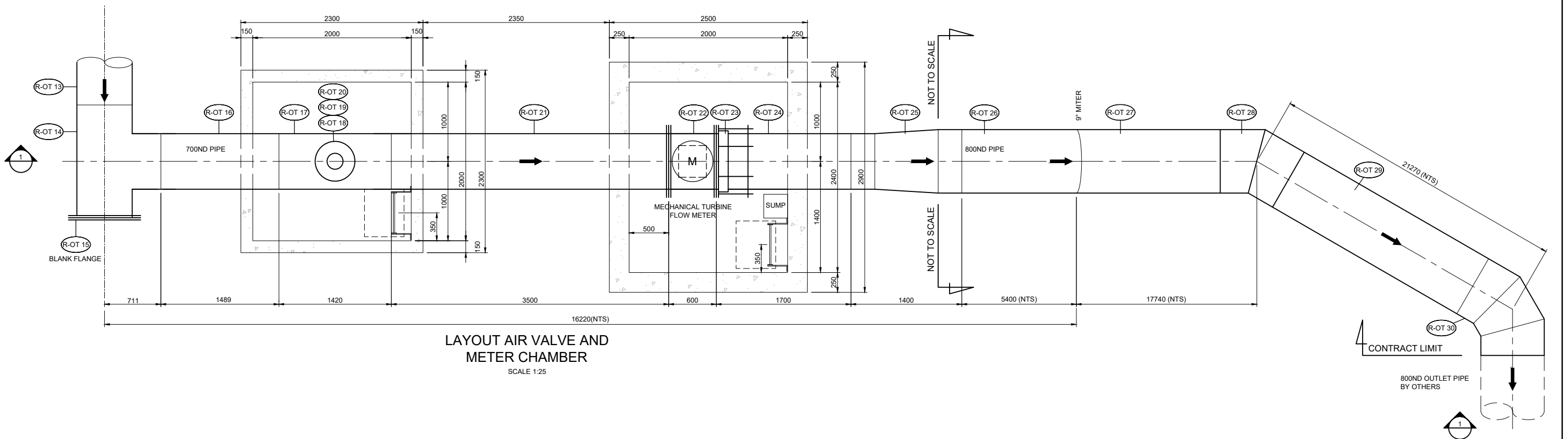
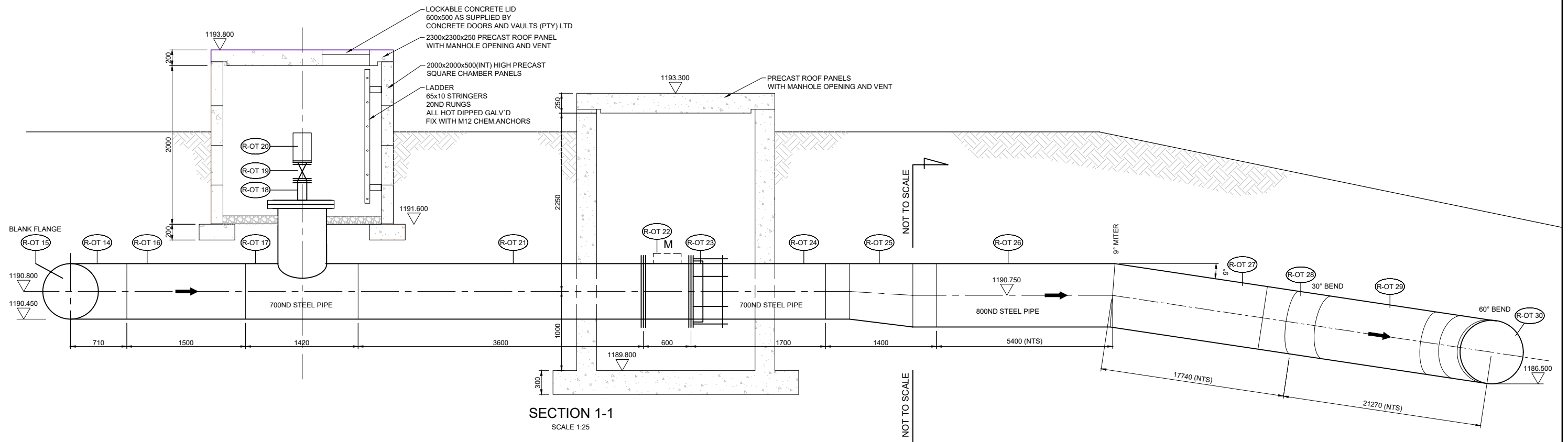
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**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
OUTLET CHAMBERS AND PIPEWORK
SECTIONS**



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NAME:	
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SURVEYED	DESIGNED	P J KOELEWYN
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COORD SYSTEM	WG27	DATE
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DRAWING No.:		086-W-TD05



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19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

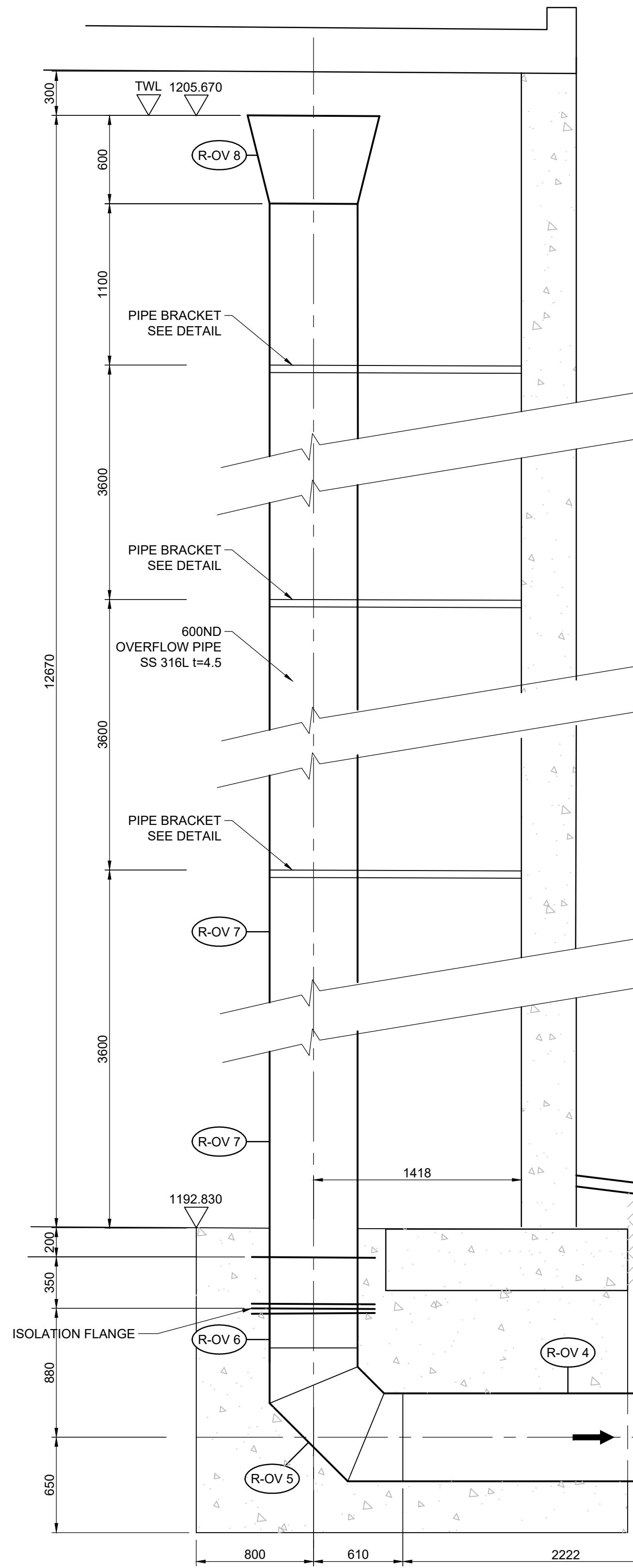
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**NEW BOSPOORT RESERVOIR
OUTLET PIPEWORK
LAYOUT AND SECTION**



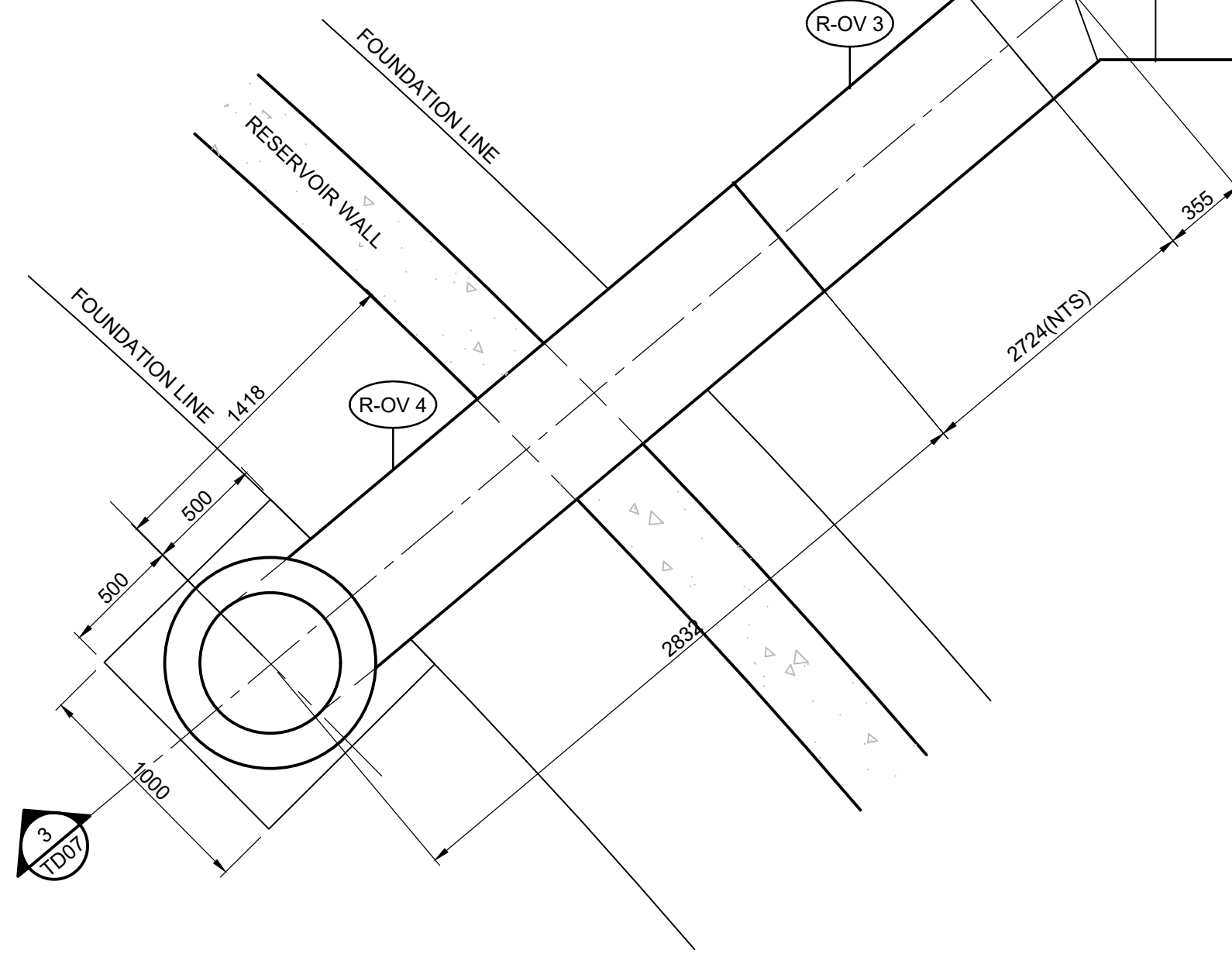
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DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	DATE	JAN 2021
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DRAWING No.: 086-W-TD06		

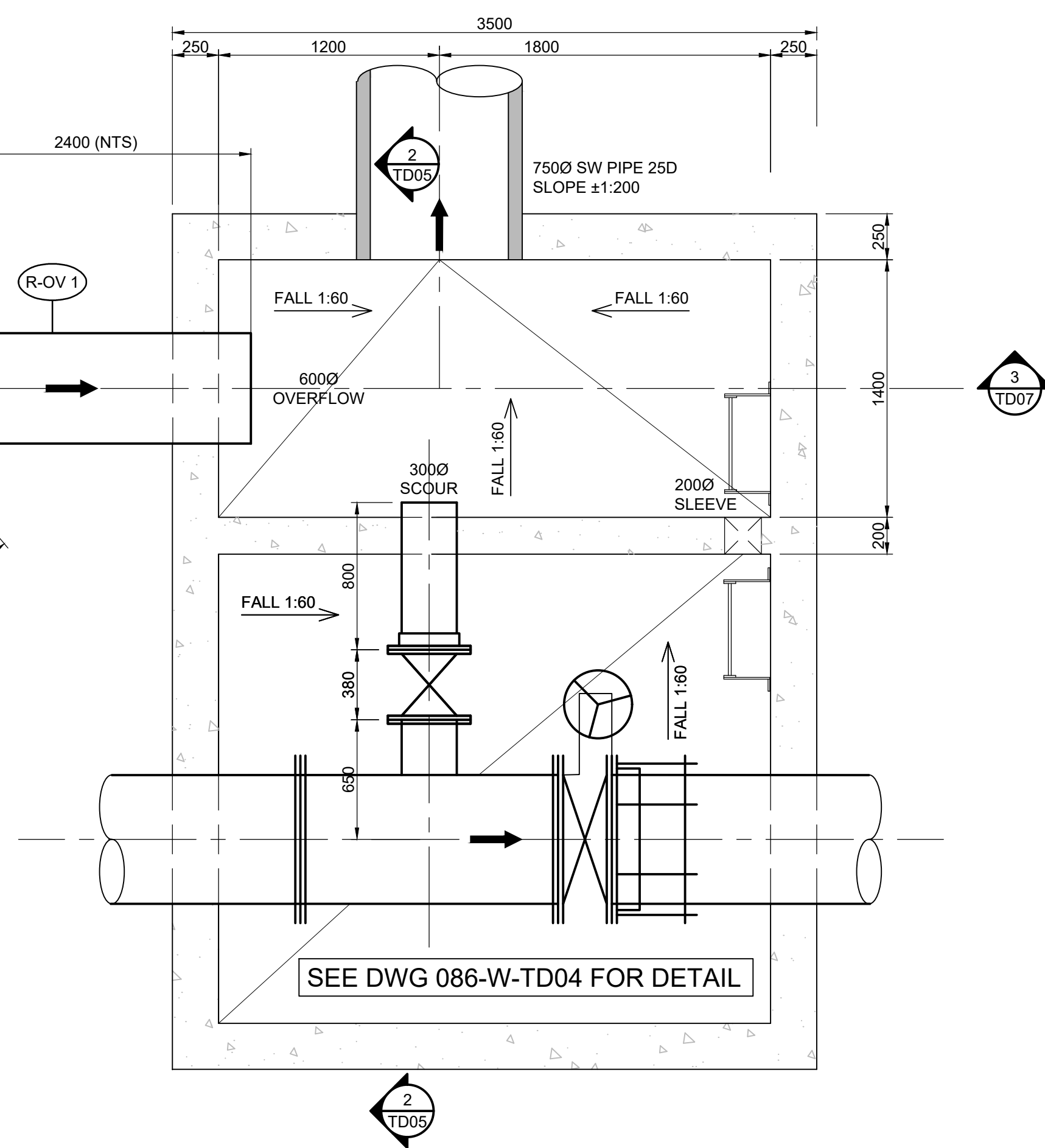
086-W-TD06



SECTION 3-3
SCALE 1:25



PLAN OUTLET AND
OVERFLOW CHAMBER
SCALE 1:25



DETAIL OF PIPE BRACKET
SCALE 1:25

DETAIL DESIGN AND SHOP DRAWINGS TO BE DONE BY THE CONTRACTOR AND SUBMITTED TO ENGINEER FOR APPROVAL

CONFIRM
DIMENSIONS ON SITE

SS BRACKET 80x6 BOLTS M12
ALL CLASS 316L STAINLESS STEEL
OVERFLOW PIPE 600ND
316L STAINLESS STEEL t=4,5mm
6mm NEOPRENE RUBBER GASKET
60x60x6 L STAINLESS STEEL 316L
SS 316L PLATE 100x100x6 FIXED WITH
M12-150 SS CHEM. ANCHORS

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19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
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PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

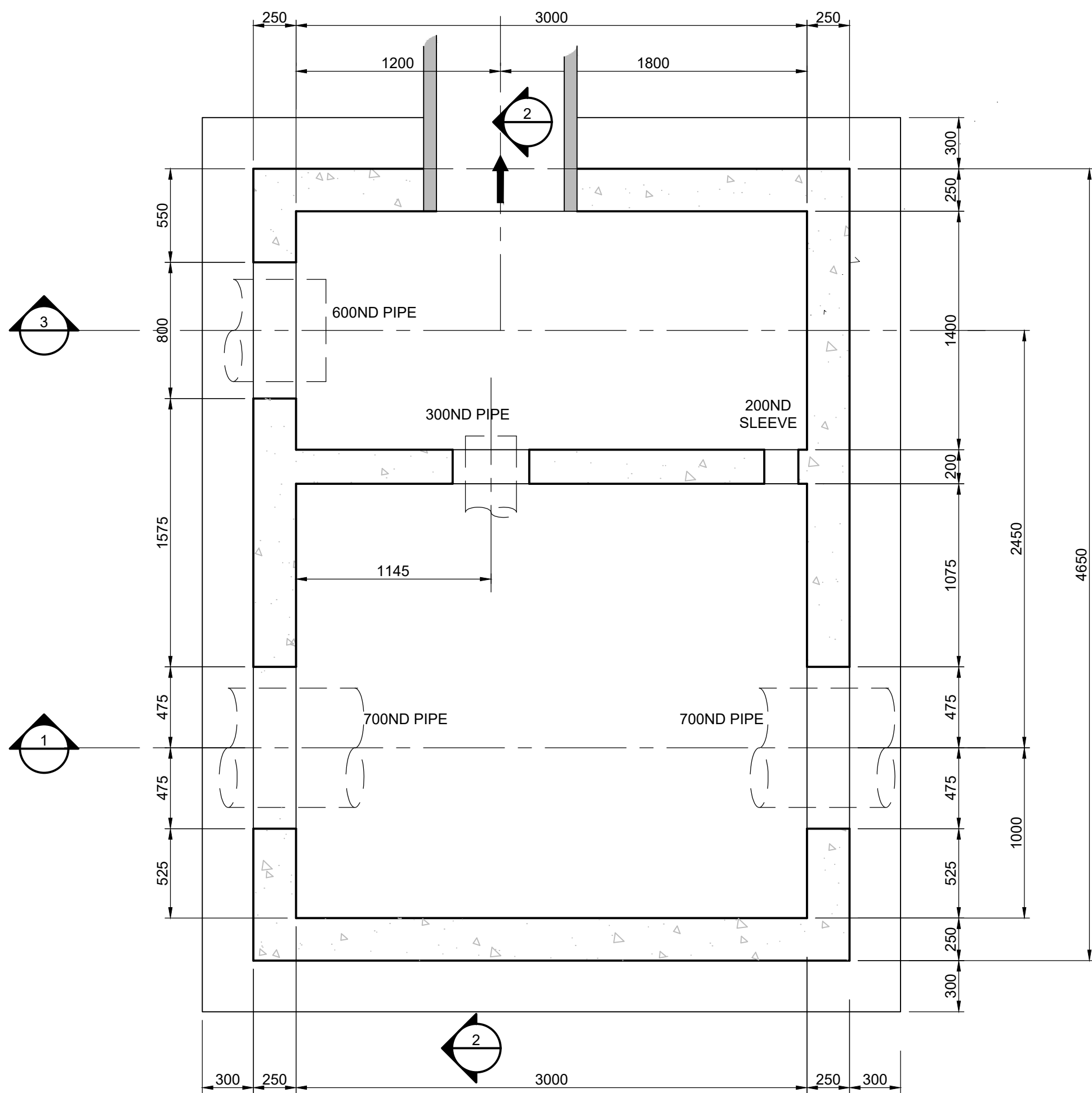
DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
OVERFLOW CHAMBER AND PIPEWORK
LAYOUT AND DETAIL**



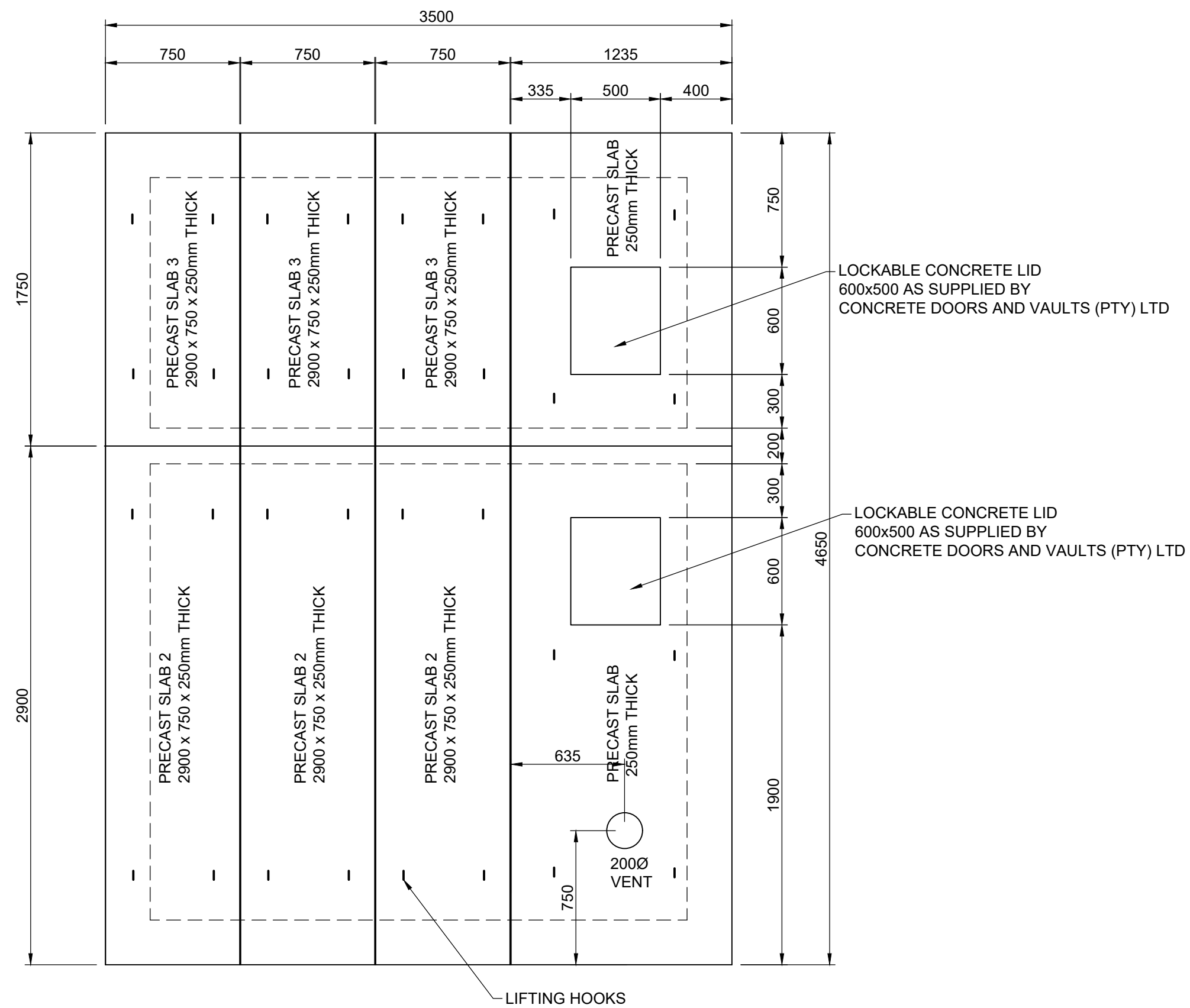
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NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.:		VERSION:	
086-W-TD07			

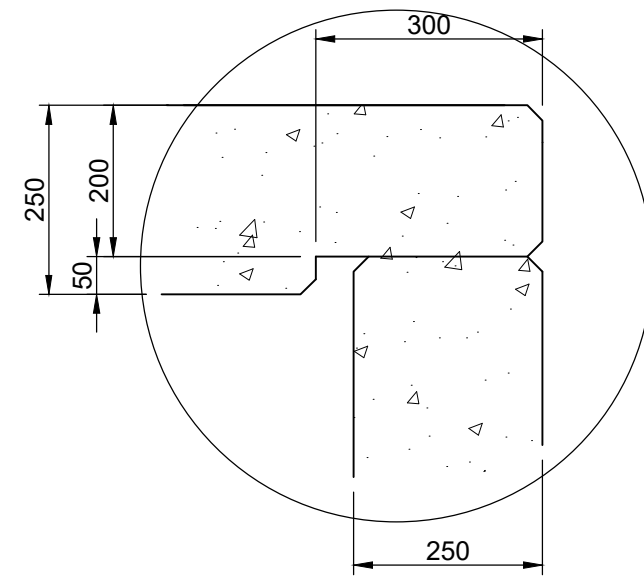
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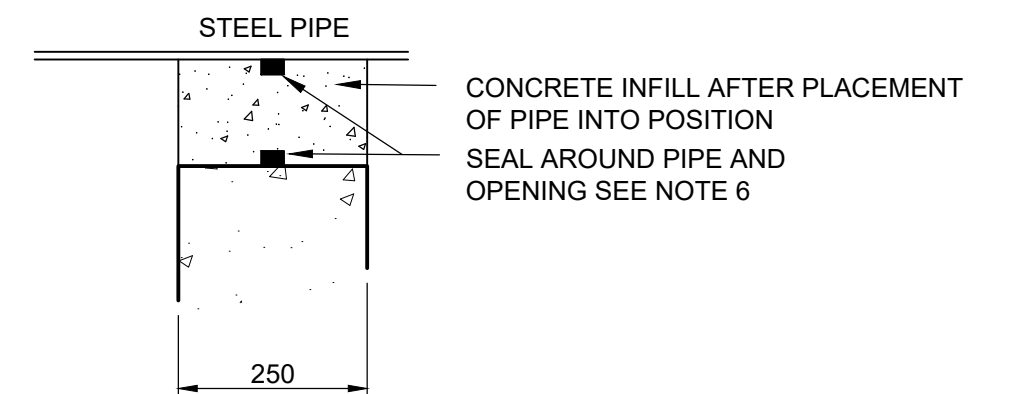
PLAN OUTLET AND
OVERFLOW CHAMBER
SCALE 1:25



ROOF PLAN OUTLET AND
OVERFLOW CHAMBER
SCALE 1:25



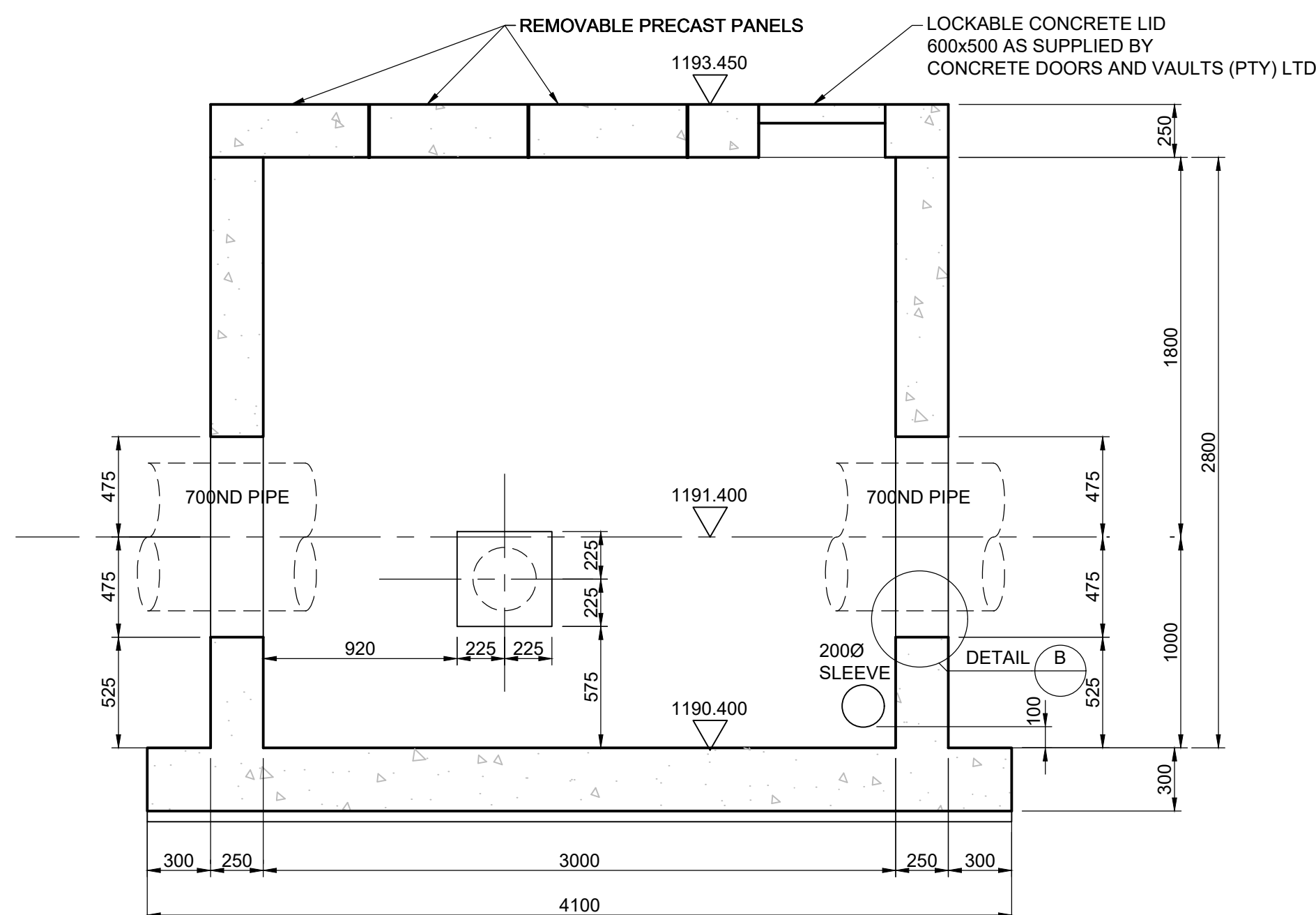
DETAIL A
SCALE 1:10



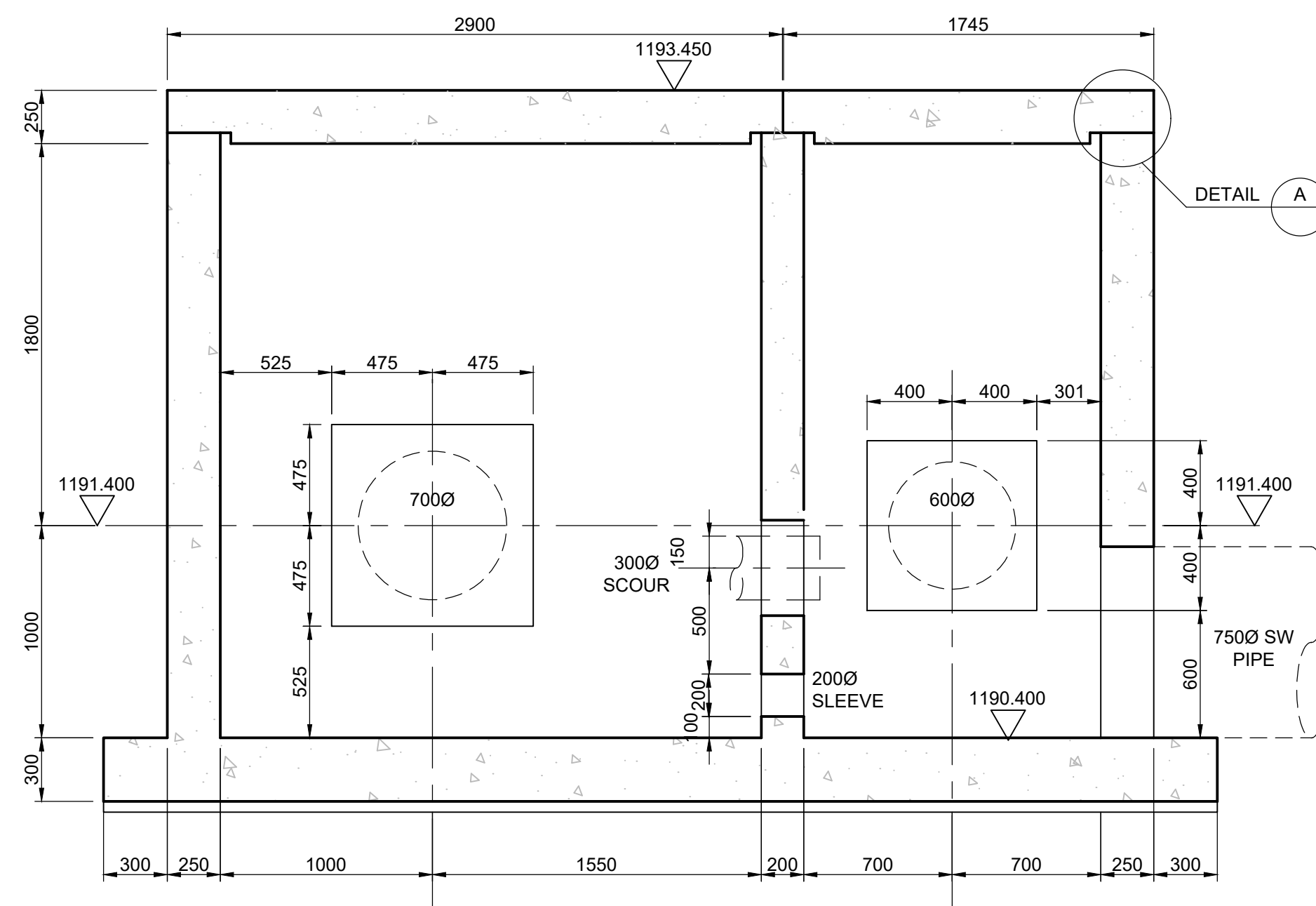
DETAIL B
SCALE 1:10

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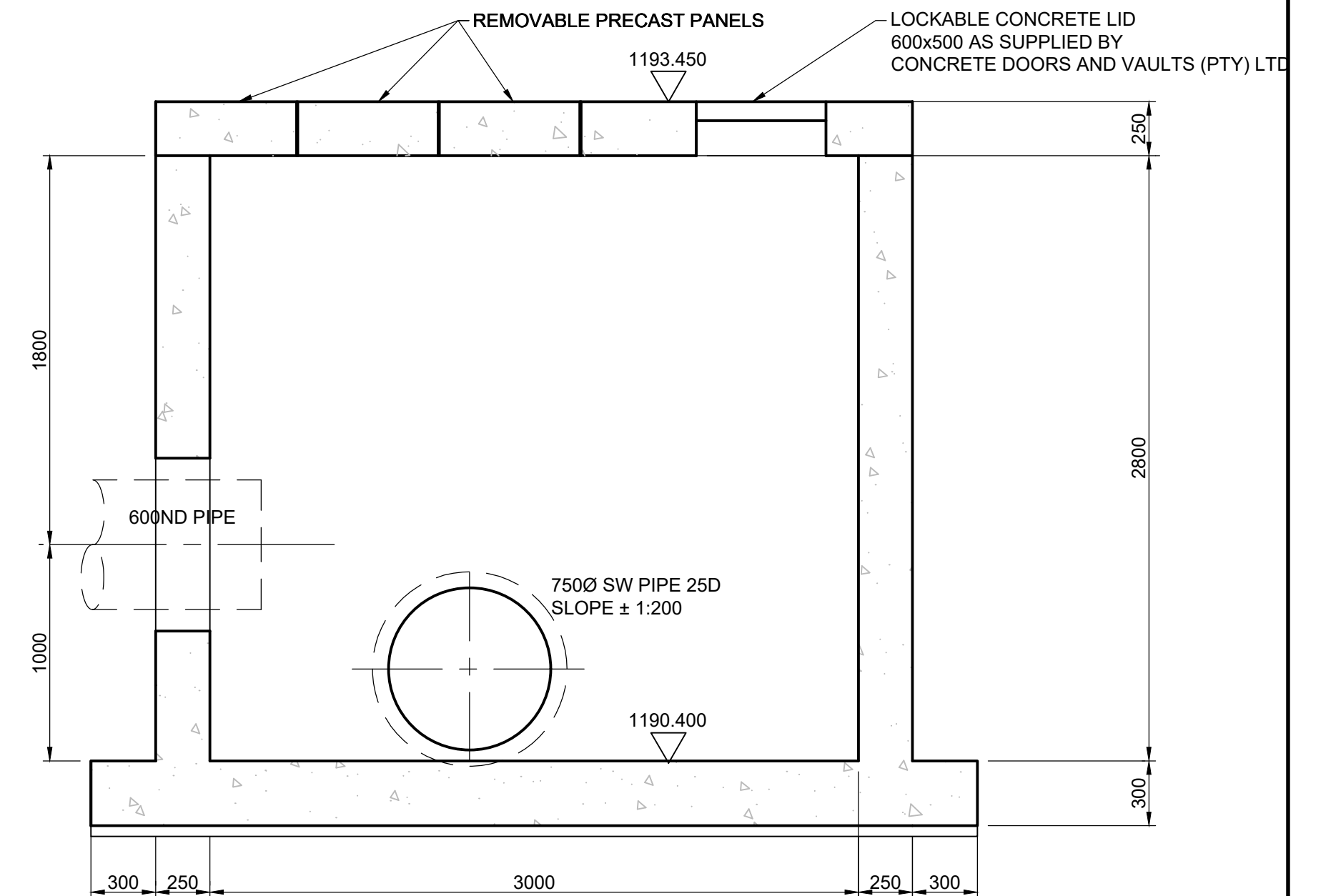
1. CONCRETE CLASS 25/19 MIX DESIGN TO BE APPROVED BY THE ENGINEER
2. ALL REBAR TO BE INSPECTED BY THE ENGINEER BEFORE CAST
3. ALL EXPOSED CORNERS TO BE CHAMFERED 20x20mm
4. MINIMUM COVER TO REBAR 25mm
5. 50mm BLINDING 15MPa TO BE PLACED UNDER ALL STRUCTURES
6. INSTALL Sikadur-Combiflex® SG-10 P SEALANT OR SIMILAR APPROVED AROUND PIPES AND OPENINGS PRIOR TO CASTING
7. CONCRETE INFILL AROUND PIPES TO BE CLASS 25/13 SEALANT
8. JOINTS BETWEEN PANELS TO BE SEALED WITH POLYURETHANE SEALANT
9. CONCRETE SUPPORTS TO BE PROVIDED UNDER VALVES AS DIRECTED BY ENGINEER ON SITE



SECTION 1-1
SCALE 1:25



SECTION 2-2
SCALE 1:25



SECTION 3-3
SCALE 1:25

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

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IN ASSOCIATION WITH
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19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



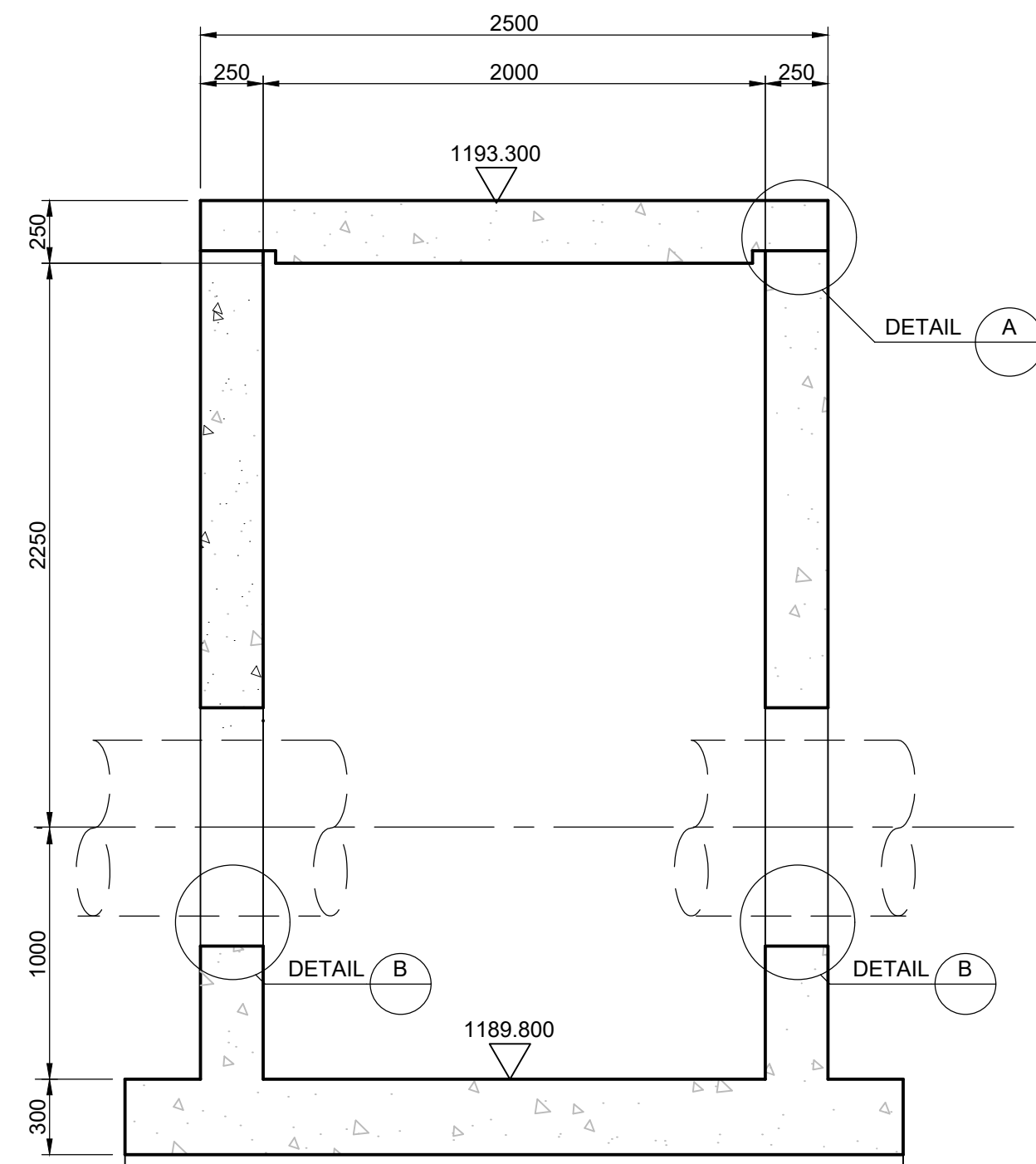
PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR	
DRAWING TITLE: NEW BOSPOORT RESERVOIR OUTLET CHAMBERS LAYOUT AND DETAIL	



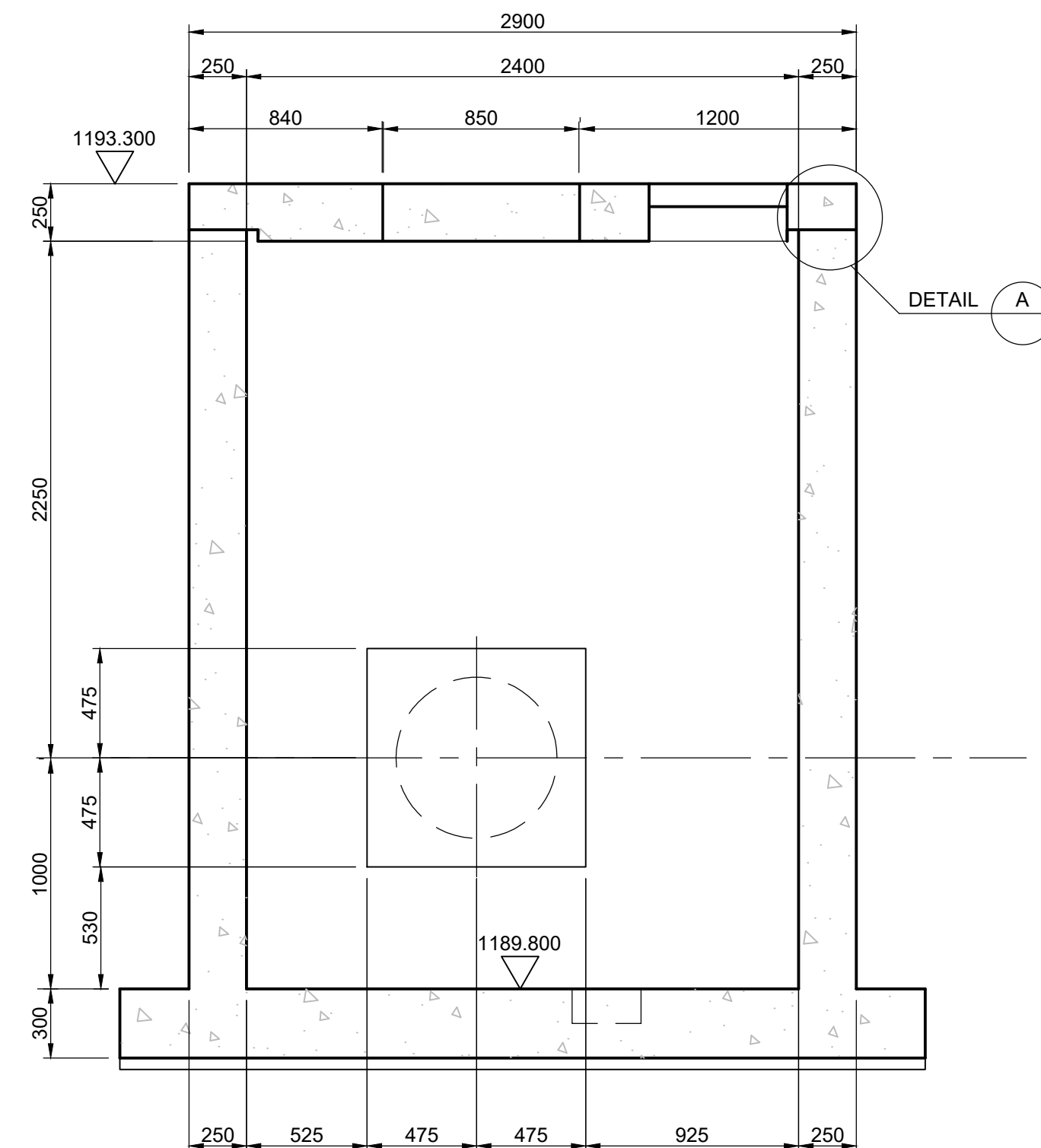
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APPROVED ON BEHALF OF CLIENT: NAME: _____ DATE: _____	
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN: DRAWING No.: 086-W-TD08		VERSION:

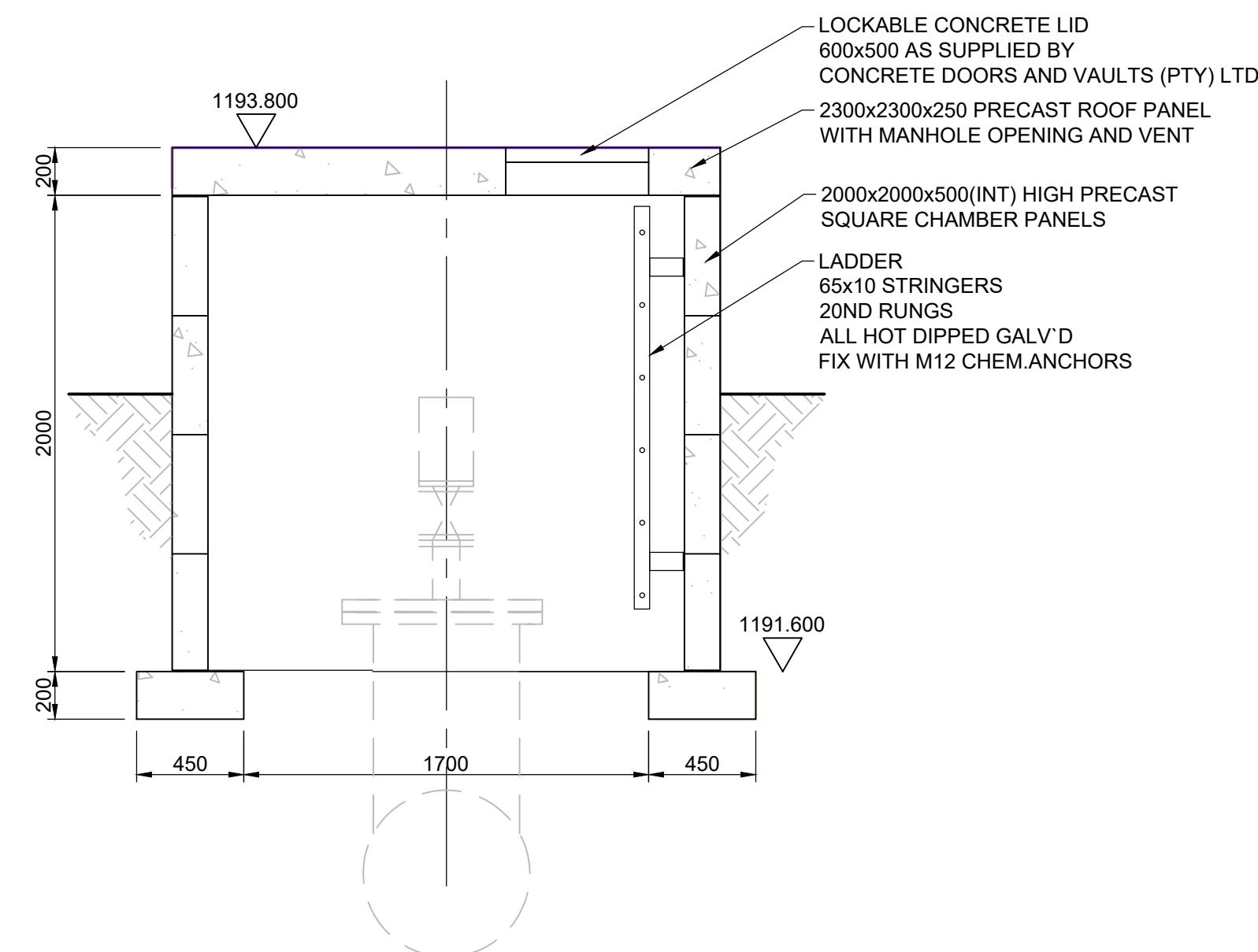
086-W-TD08



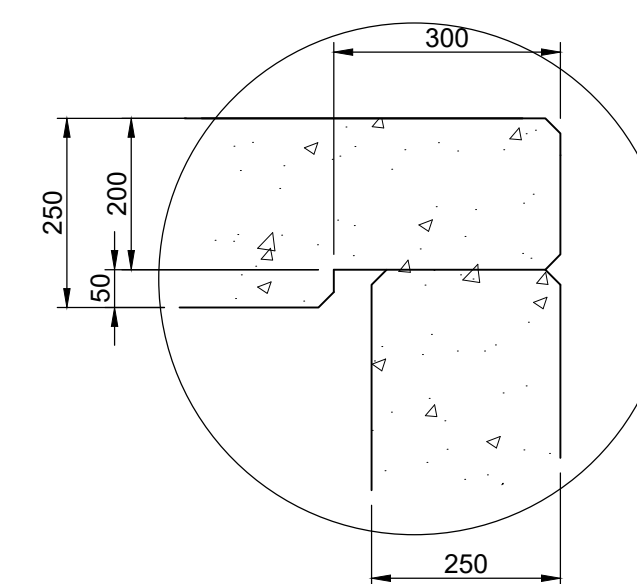
SECTION 1-1
SCALE 1:25



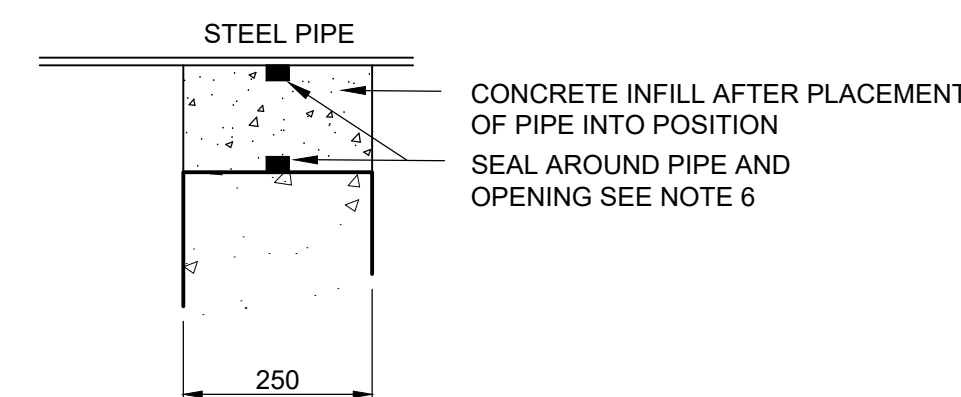
SECTION 2-2
SCALE 1:25



SECTION 3-3
SCALE 1:25

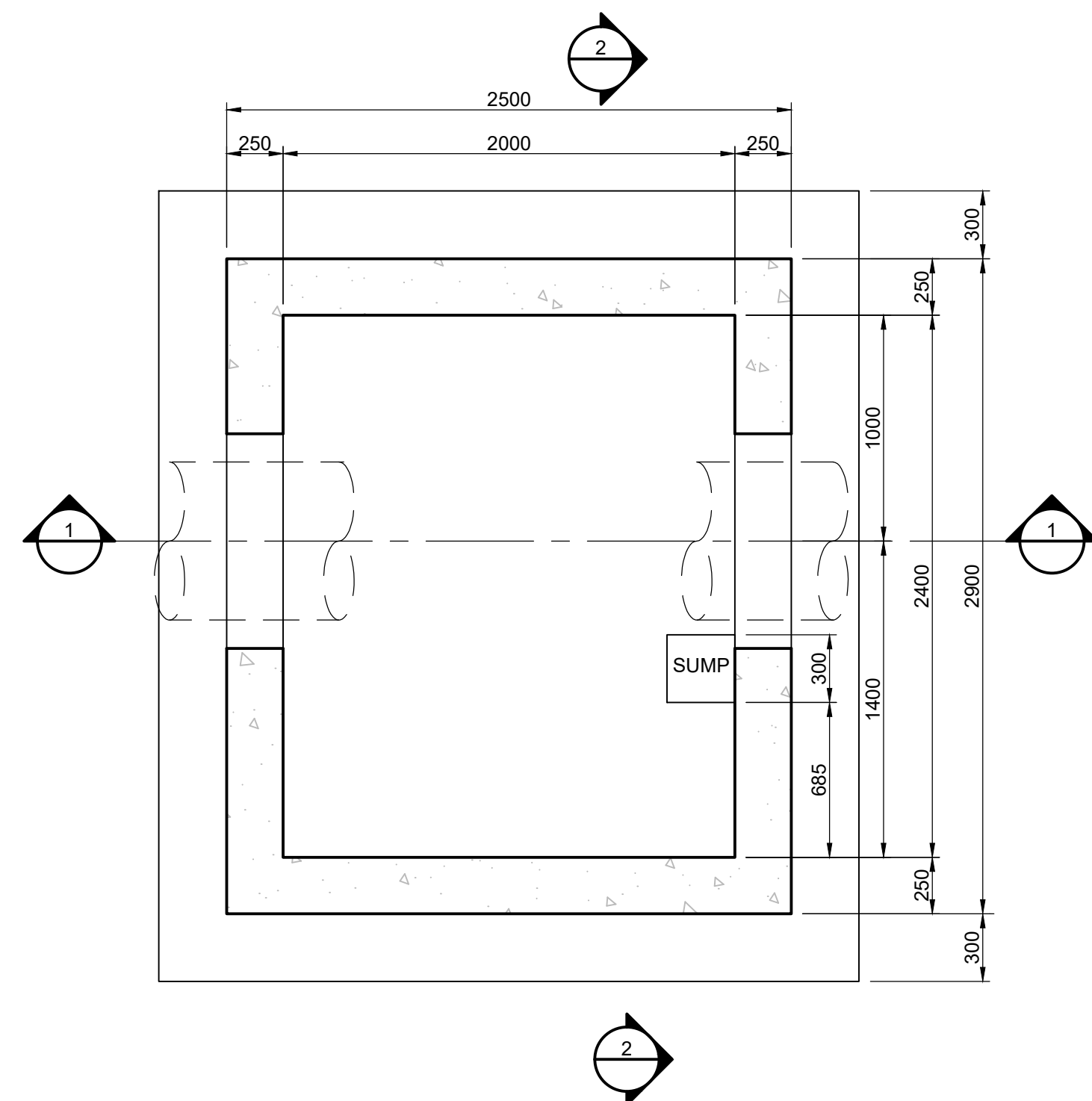


DETAIL A
SCALE 1:10

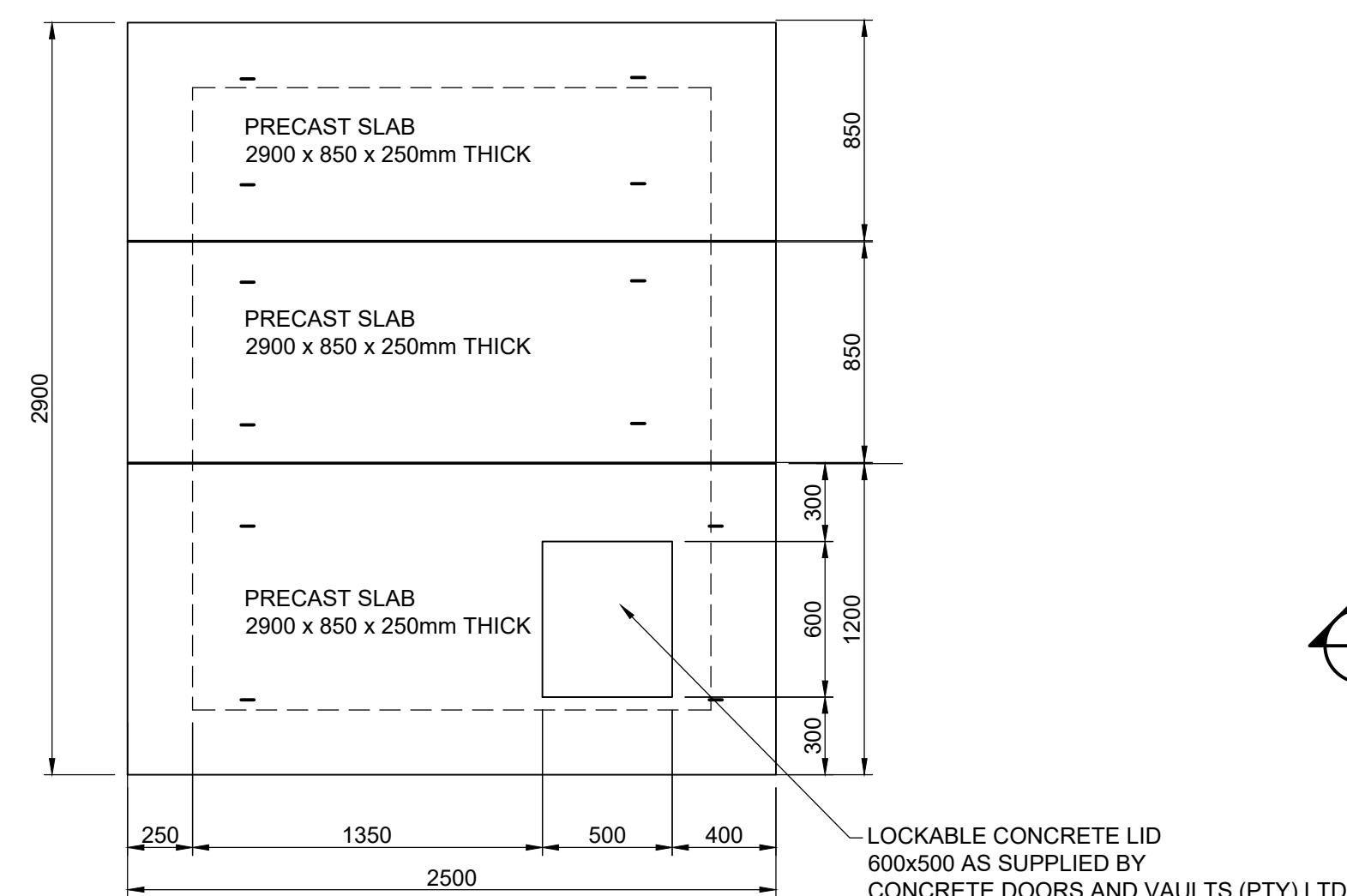


DETAIL B
SCALE 1:10

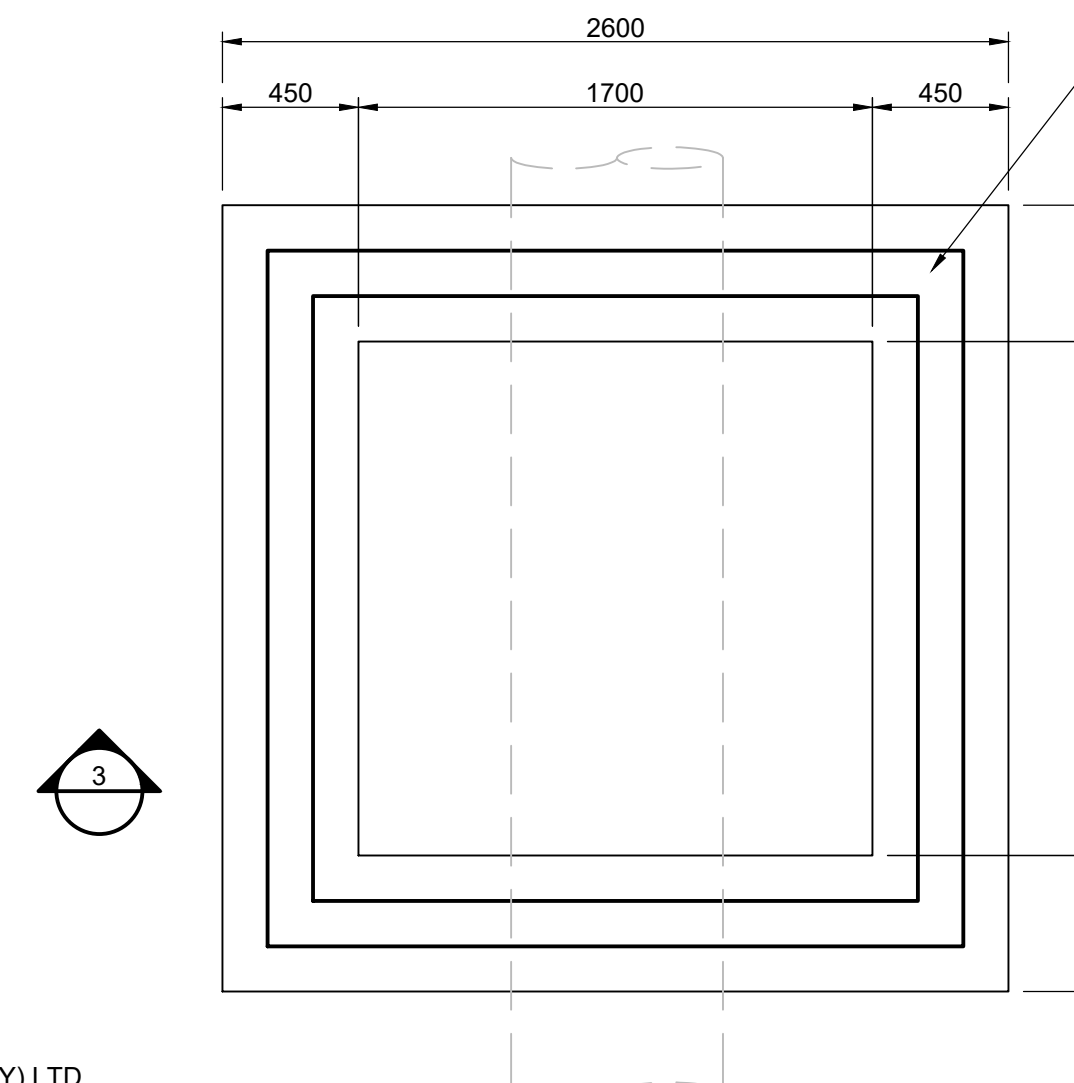
- NOTES:
1. CONCRETE CLASS 25/19 MIX DESIGN TO BE APPROVED BY THE ENGINEER
 2. ALL REBAR TO BE INSPECTED BY THE ENGINEER BEFORE CAST
 3. ALL EXPOSED CORNERS TO BE CHAMFERED 20x20mm
 4. MINIMUM COVER TO REBAR 25mm
 5. 50mm BLINDING 15MPa TO BE PLACED UNDER ALL STRUCTURES
 6. INSTALL Sikadur-Combiflex® SG-10 P SEALANT OR SIMILAR APPROVED AROUND PIPES AND OPENINGS PRIOR TO CASTING
 7. CONCRETE INFILL AROUND PIPES TO BE CLASS 25/13
 8. JOINTS BETWEEN PANELS TO BE SEALED WITH POLYURETHANE SEALANT
 9. CONCRETE SUPPORTS TO BE PROVIDED UNDER VALVES AS DIRECTED BY ENGINEER ON SITE



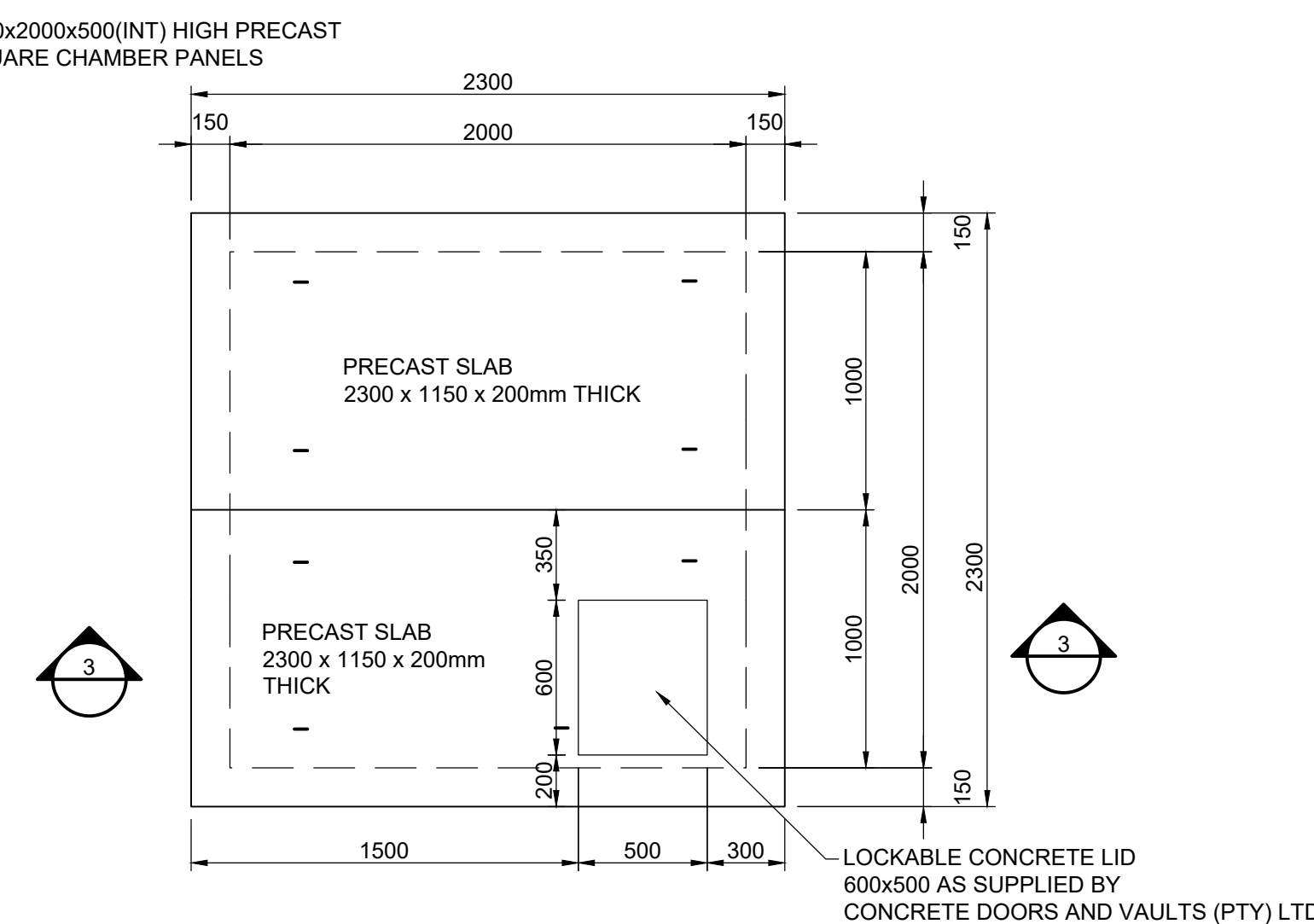
FLOOR LAYOUT METER CHAMBER
SCALE 1:25



ROOF PLAN METER CHAMBER
SCALE 1:25



FOUNDATION PLAN AIR
VALVE CHAMBER
SCALE 1:25



ROOF PLAN
AIR VALVE CHAMBER
SCALE 1:25

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www.bigengroup.com
IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg
Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

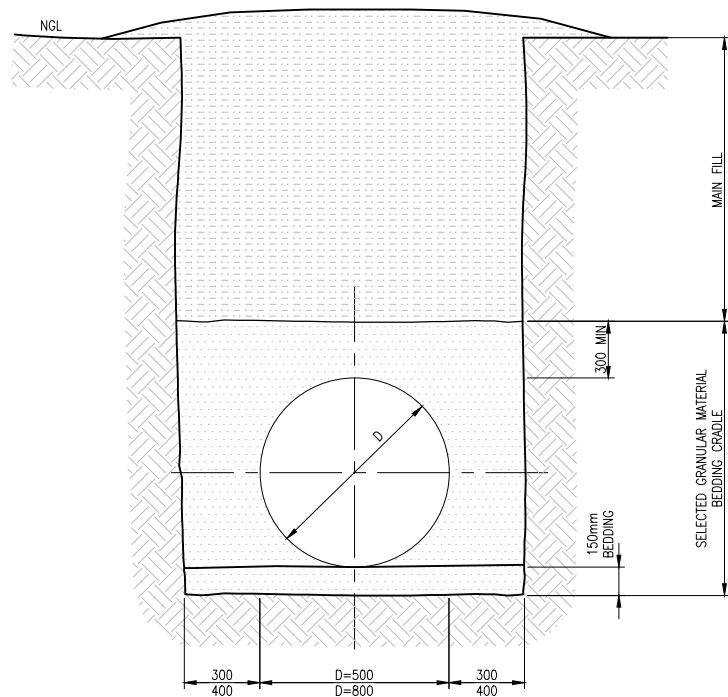
DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
METER AND AIR VALVE CHAMBERS
LAYOUT AND SECTIONS**



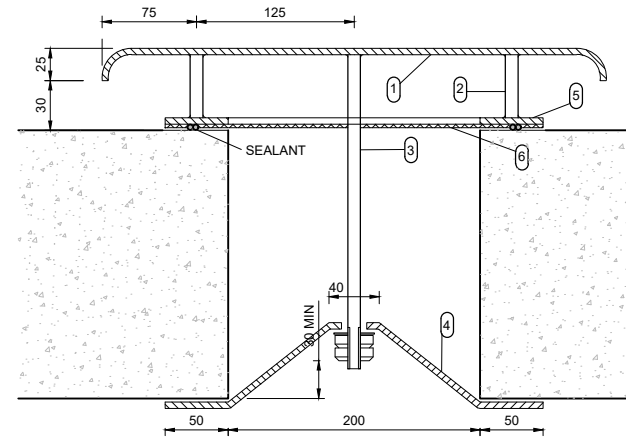
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ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.:	086-W-TD09	

086-W-TD09



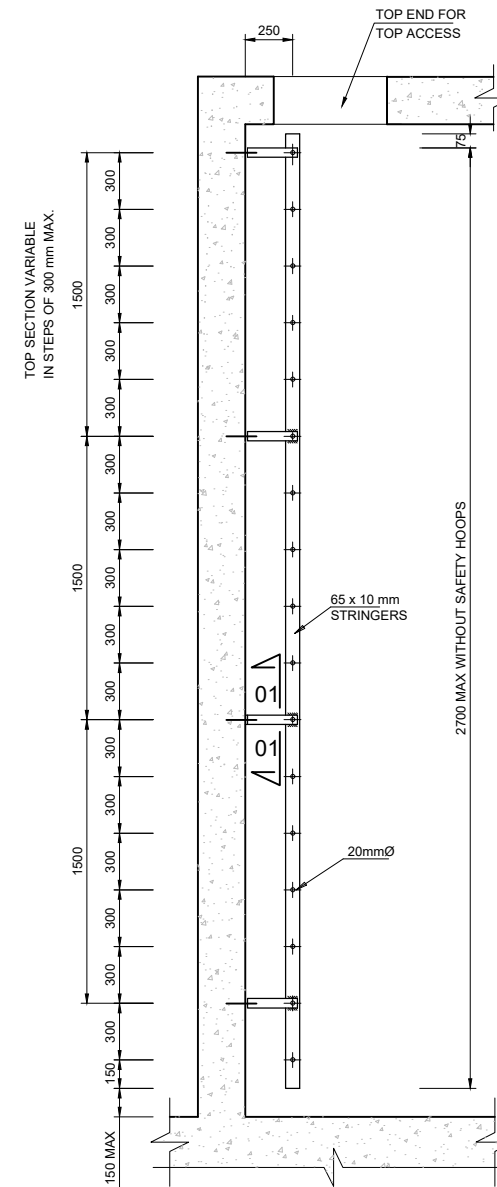
TYPICAL CROSS SECTION OF PIPE TRENCH



DETAIL OF VENTILATOR
TO OPENINGS IN PRECAST
ROOF SLABS TO CHAMBERS
N.T.S.

- 1 5mm THICK CIRCULAR GALVANISED STEEL PLATE
- 2 4 x 10mm Ø GALVANISED BRACES WELDED ONTO 1 AND 5
- 3 10mm Ø GALVANISED STEEL BOLT WELDED ONTO 1 WITH 2 NUTS AND WASHER ON END
- 4 50mm x 5mm THICK GALVANISED STEEL PLATE
- 5 5mm THICK CIRCULAR GALVANISED STEEL PLATE WITH 200 Ø HOLE
- 6 3mm THICK GALVANISED STEEL MESH MAXIMUM 5x5mm OPENINGS WITH INSECTPROOF PLASTIC GAUZE WITH A HOLE FOR 3

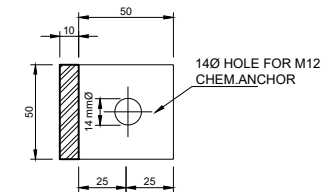
TOP SECTION VARIABLE
IN STEPS OF 300 mm MAX.



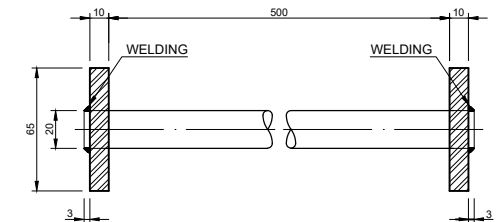
TYPICAL CAT LADDER FOR CHAMBERS
SCALE 1 : 20

NOTES:

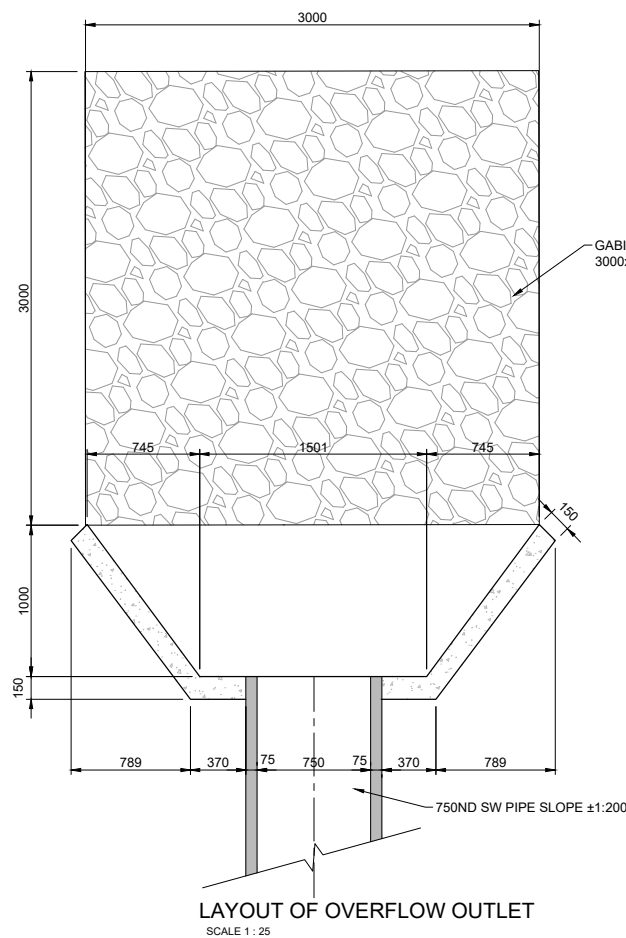
1. LADDERS LONGER THAN 2.5 m SHALL BE FITTED WITH SAFETY HOOPS.
2. ALL LADDER DETAILS SHALL CONFORM TO SABS 0162. THE MANUFACTURER WILL BE REQUIRED TO DESIGN THE WALL SUPPORTS.
3. BRACKETS FOR LADDER TO BE DESIGNED SO THAT IT WILL BE RIGID AFTER TIGHTENING OF TIE BAR.
4. INSTALLATIONS INCLUDING BOLTS AND NUTS TO BE HOT DIPPED GALVANISED IN ACCORDANCE WITH SANS 763.
5. ALL WELDING AND GALVANISING TO BE DONE IN WORKSHOP. ASSEMBLY OF ITEMS ON SITE ONLY.



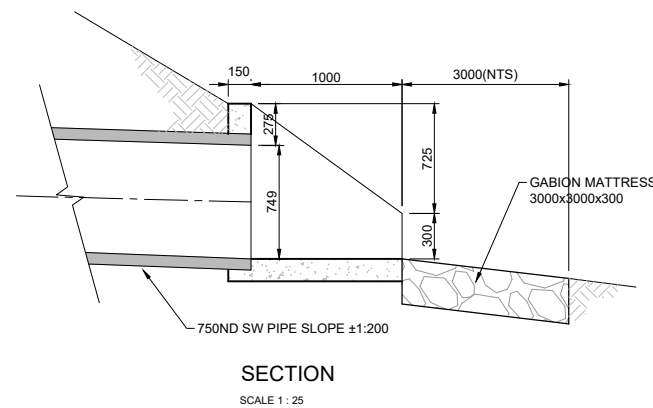
SECTION 01-01
SCALE 1 : 2



RUNG DETAIL CAT LADDER
SCALE 1 : 2



LAYOUT OF OVERFLOW OUTLET
SCALE 1 : 25



SECTION
SCALE 1 : 25

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IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg
Phone +27 14 594 2912
info@phatwe.co.za
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www.phatwe.co.za

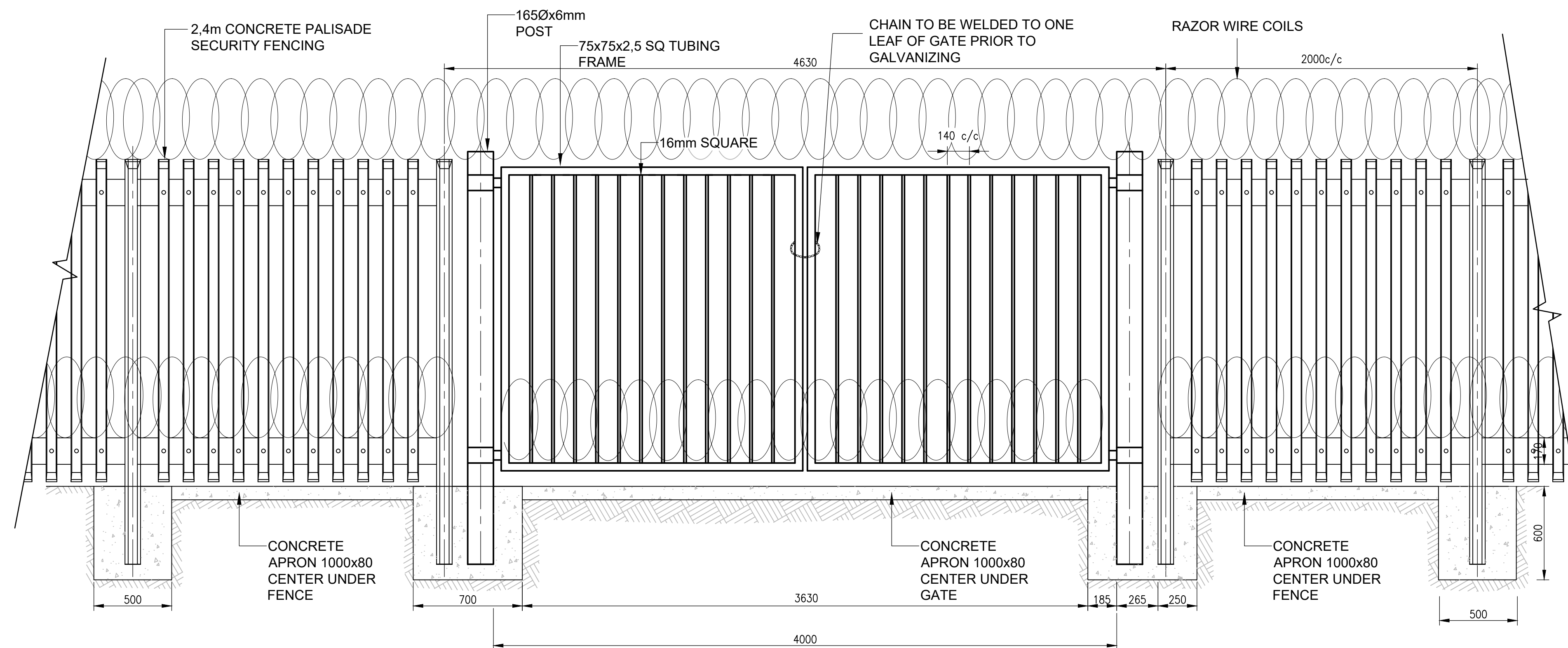
Rustenburg
Consulting Consortium

PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**
DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
GENERAL DETAILS**

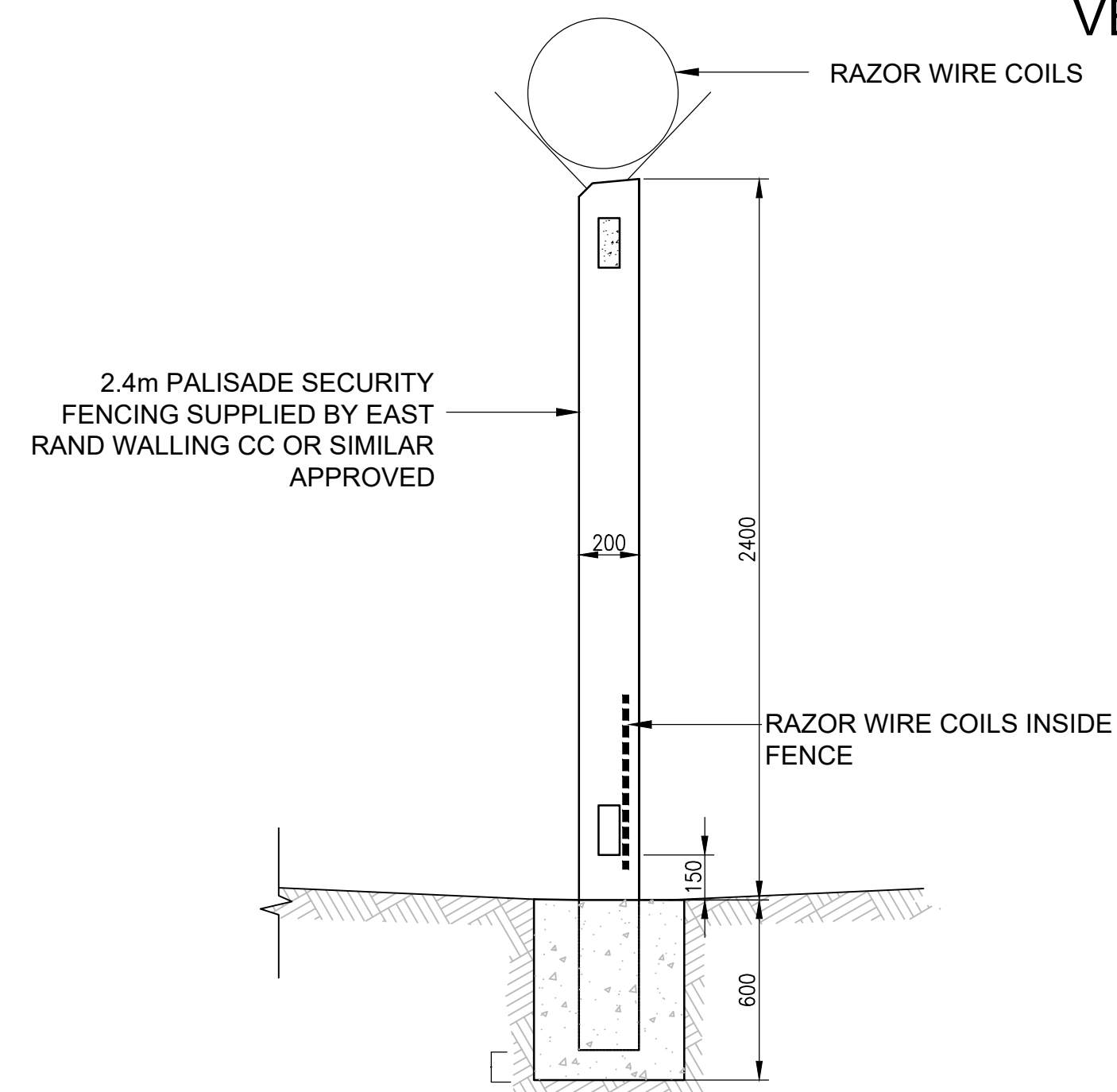
Rustenburg
Water Services Trust

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ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

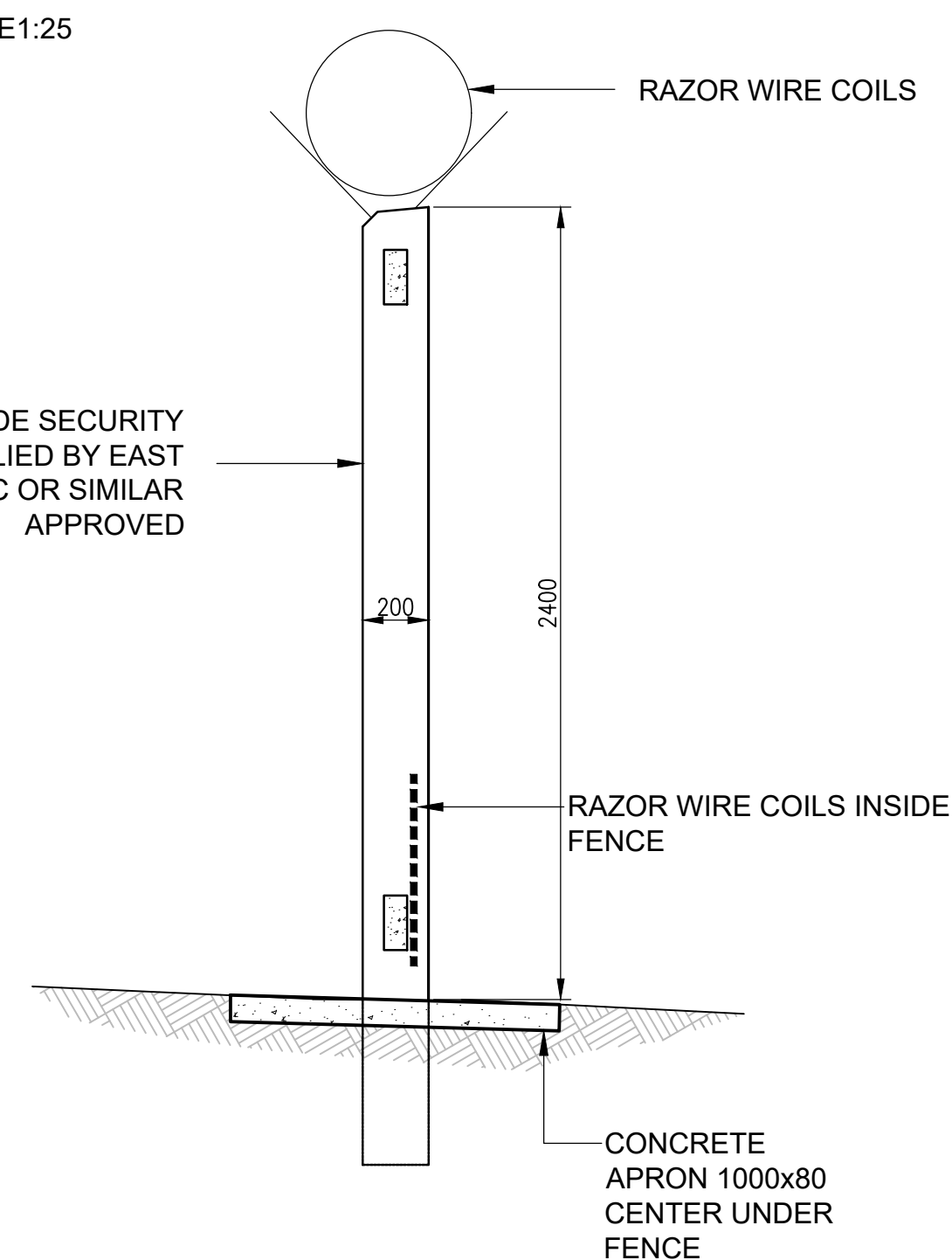
SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.:		086-W-TD10



CONCRETE PALISADE FENCE WITH VEHICLE GATE SCALE 1:25



CONCRETE PALISADE FENCE POST SCALE 1:25



CONCRETE APRON UNDER FENCE SCALE 1:25

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No.	DATE	DESCRIPTION	AUTH. BY

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IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg
Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

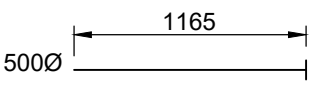
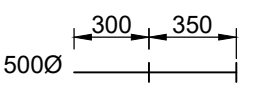
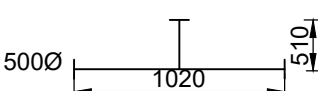
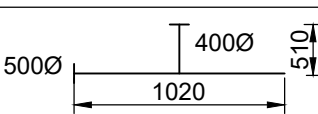
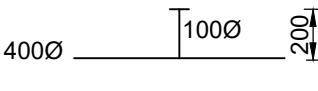
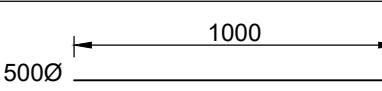

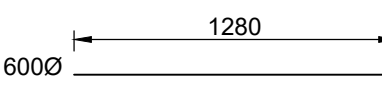
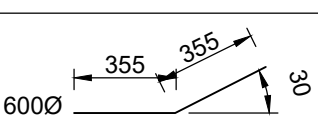
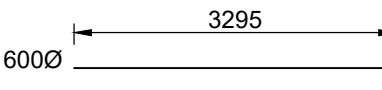
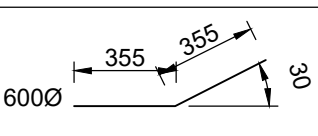
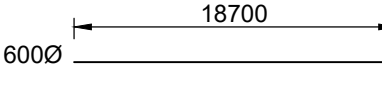
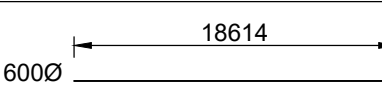
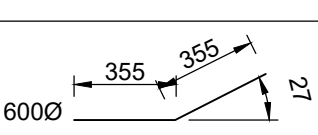
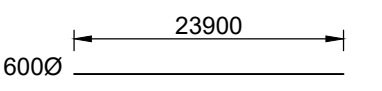
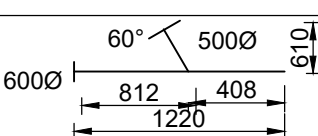


PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR
DRAWING TITLE: NEW BOSPOORT RESERVOIR DETAIL OF FENCE AND GATE



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	DESIGNED	P J KOELEWYN
DRAWN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE
APPROVED ON BEHALF OF BIGEN:		VERSION:
DRAWING No.:		086-W-TD11

REV	ITEM NO.	TOTAL (FOR ONE INSTALLATION)	REFER DRG.	DIA. LEFT	DIA. RIGHT	DIA. BRANCH 1	DIA. BRANCH 2	END LEFT	END RIGHT	END BRANCH 1	END BRANCH 2	BEND ANGLE (DEGREE)	BEND RADIUS	MATERIAL / WT OR PIPE CLASS / STEEL GRADE	FLANGE TABLE	CORROSION PROTECTION			DESCRIPTION	DIMENSIONS
																FACTORY		SITE APP		
																INTERNAL LINING	EXTERNAL COAT			
PRESSURE CONTROL PIPEWORK - DWG. 086-W-TD01 & TD02- BOSPOORT RESERVOIR																				
	R-FC 1	1	TD01	500	500			PE	F					ST / 6 / X42	1600/3	EP	EP	PU+DT	SP	
	R-FC 2	3	TD01	500	500			F	F						1600/3	FBE	FBE	PU	WEDGE GATE VALVE CLASS 16 WITH GEARING TO ENSURE VALVE CLOSURE EXCEEDS 4 MINUTES	STANDARD
	R-FC 3	1	TD01	500	500			F	F						1600/3	EP	EP	PU	PRESSURE REDUCING/CONTROL VALVE (SINGER MODEL S206-F-TYPE 5-RF OR SIMILAR APPROVED BY ENGINEER) INCLUDING • AUXILIARY CONTROL SYSTEM CONSISTING OF COMPRESSION FITTINGS & COPPER TUBING • SINGER MODEL #43 ON/OFF FLOAT PILOT (SIMILAR APPROVED BY ENGINEER) • SINGER MODEL #43STILL STILLING • CHAMBER TO BE MOUNTED ON CAT LADDER (SIMILAR APPROVED BY ENGINEER) • CHECK VALVE FUNCTION	STANDARD
	R-FC 4	1	TD01	500				FA							1600/3	EP	EP	PU	FLANGE ADAPTOR	STANDARD
	R-FC 5	1	TD01	500	500			PE+RF	F					ST / 6 / X42	1600/3	EP	EP	PU	SP WITH RF AND RESTRAINING BOLTS	
	R-FC 6	1	TD01	500	500	500		F	F	F				ST / 8 / X42	1600/3	EP	EP	PU	FLANGED TEE	
	R-FC 7	1	TD01	500										ST	1600/8	EP	EP	PU	BLANK FLANGE	
	R-FC 8	1	TD01	500	500	400		F	PE	F				ST / 8 / X42	1600/3	EP	EP	PU	UNEQUAL TEE	
	R-FC 9	1	TD01	100	100			F(400Ø)	F(100Ø)					ST / 4,5 / X42	1600/8	EP	EP	PU	FLANGED 100ND 200 LONG WELDED TO BLANK FLANGE 400ND WITH HOLE TO FIT	
	R-FC 10	1	TD01	100				F	F						1600/3	FBE	FBE	PU	100ND RSV	STANDARD
	R-FC 11	1	TD01	100				F							1600/3	FBE	FBE	PU	VENT-O-MAX RBXb DOUBLE ACTION AIR VALVE ABLE TO FUNCTION UNDER LOW PRESSURE CONDITIONS WITH ANTI SHOCK MECHANISM OR SIMILAR APPROVED BY ENGINEER	STANDARD
	R-FC 12	1	TD01	500	500			PE	PE					ST / 6 / X42		EP	EP+DT	PU	SP	
	R-FC 13	1	TD01	500	600			PE	PE					ST / 6 / X42		EP	EP+DT		ECCENTRIC REDUCER	
	R-FC 14	1	TD01	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-FC 15	1	TD01	600	600			PE	PE			30°		ST / 6 / X42		EP	EP+DT		ELBOW	
	R-FC 16	1	TD01	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
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	R-FC 18	1	TD01	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-FC 19	1	TD01	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-FC 20	1	TD01	600	600			PE	PE			27°		ST / 6 / X42		EP	EP+DT		ELBOW	
	R-FC 21	1	TD01	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-FC 22	1	TD01	600	600	500		F	PE	F				ST / 8 / X42	1600/3	EP	EP+DT	PT	UNEQUAL TEE WITH 30° OFFSET	
	R-FC 23	1	TD01	600										ST	1600/8	EP	EP+DT	PT	BLANK FLANGE	

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

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Rustenburg

Phone +27 14 594 2912

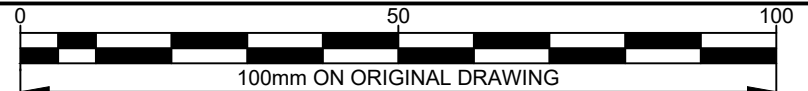
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
INLET PIPEWORK
FITTING LIST - SHEET 1**





ORIGINAL DRAWING SCALE: AS SHOWN ORIGINAL DRAWING SHEET SIZE: **A1**

APPROVED ON BEHALF OF CLIENT:

NAME: _____

DATE: _____

CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.: 086-W-FL01		VERSION: A3	

086-W-FL01

REV	ITEM NO.	TOTAL (FOR ONE INSTALLATION)	REFER DRG.	DIA. LEFT	DIA. RIGHT	DIA. BRANCH 1	DIA. BRANCH 2	END LEFT	END RIGHT	END BRANCH 1	END BRANCH 2	BEND ANGLE (DEGREE)	BEND RADIUS	MATERIAL / WT OR PIPE CLASS / STEEL GRADE	FLANGE TABLE	CORROSION PROTECTION			DESCRIPTION	DIMENSIONS
																FACTORY		SITE APP		
																INTERNAL LINING	EXTERNAL COAT			
INLET PIPEWORK - DWG.086-W-TD01 - BOSPOORT RESERVOIR																				
	R-IN 1	1	TD01	500	500			PE	PE			20°		ST / 6 / X42		EP	EP+DT		ELBOW	
	R-IN 2	1	TD01	500	500			F	PE					ST / 6 / X42	1600/3	EP	EP+DT	PT	SP	
	R-IN 3	1	TD01	500	500			PE	F					ST / 6 / X42	1600/3	EP	EP	PT	SP	
	R-IN 4	1	TD01	500	500			PE	PE			90°		ST / 6 / X42		EP	EP		ELBOW	STANDARD
	R-IN 5	1	TD01	500	500			PE	F					ST / 6 / X42	1600/3	EP	EP		SP WITH PUDDLE FLANGE	
	R-IN 6	1	TD01	500	600			F	PE					ST / 8 / X42	1600/3	EP	EP		REDUCER	
	R-IN 7	1	TD01	600	600			PE	F			45°		ST / 8 / X42	1600/8	EP	EP		FLANGED SP	

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

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IN ASSOCIATION WITH
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Rustenburg

Phone +27 14 594 2912

info@phatwe.co.za
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www.phatwe.co.za



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
INLET PIPEWORK
FITTING LIST - SHEET 2**



050100

100mm ON ORIGINAL DRAWING

ORIGINAL DRAWING SCALE: AS SHOWN

ORIGINAL DRAWING SHEET SIZE: A1

APPROVED ON BEHALF OF CLIENT:

NAME:

DATE:

CLIENT DRAWING No.:

CLIENT REF No.:

SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		APPROVED ON BEHALF OF BIGEN:	
DRAWING No.:		VERSION:	
086-W-FL02			

086-W-FL02

REV	ITEM NO.	TOTAL (FOR ONE INSTALLATION)	REFER DRG.	DIA. LEFT	DIA. RIGHT	DIA. BRANCH 1	DIA. BRANCH 2	END LEFT	END RIGHT	END BRANCH 1	END BRANCH 2	BEND ANGLE (DEGREE)	BEND RADIUS	MATERIAL / WT OR PIPE CLASS / STEEL GRADE	FLANGE TABLE	CORROSION PROTECTION			DESCRIPTION	DIMENSIONS
																FACTORY		SITE APP		
																INTERNAL LINING	EXTERNAL COAT			

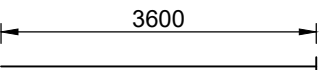
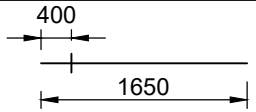
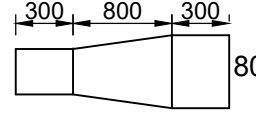
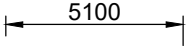
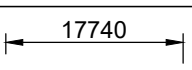
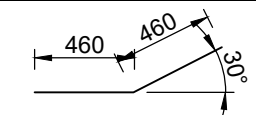
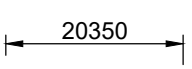
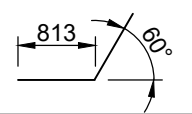
OUTLET PIPEWORK - DWG. 086-W-TD04, TD05 & TD06 - BOSPOORT RESERVOIR DELIVERY PIPEWORK																				
	R-OT 1A	1	TD04&5	700	1500			PE	PE					ST / 6 / X42		EP	EP		BELLMOUTH WELD TO R-OT 1	
	R-OT 1	1	TD04&5	700	700			PE	PE	950		90°		ST / 6 / X42	1600/3	EP	EP		ELBOW WITH PUDDLE FLANGE	
	R-OT 2	1	TD04&5	700	700			PE	F					ST / 6 / X42	1600/3	EP	EP+DT	PT	SP	
	R-OT 3	1	TD04&5	700	700			F	PE					ST / 6 / X42	1600/3	EP	EP+DT	PT	SP	
	R-OT 4	1	TD04&5	700	700			PE	PE					ST / 6 / X42		EP	EP+DT		ELBOW	
	R-OT 5	1	TD04&5	700	700			F	PE					ST / 6 / X42	1600/3	EP	EP+DT	PU	SP	
	R-OT 6	1	TD04&5	700	700	300		F	F	F				ST / 6 / X42	1600/3	EP	EP	PU	FLANGED SCOUR TEE	
	R-OT 7	1	TD04&5	700				F	F						1600/3	FBE	FBE		BUTTERFLY VALVE LH & LO WITH GEARING TO ENSURE VALVE CLOSURE EXCEEDS 4 MINUTES	STANDARD
	R-OT 8	1	TD04&5	300				F	F						1600/3	FBE	FBE		WGV	STANDARD
	R-OT 9	1	TD04&5	300				PE	PE					ST / 6 / X42	1600/3	EP	EP	PU	SP	
	R-OT 9A	1	TD04&5	300				F							1600/3	EP	EP		FLANGE ADAPTOR	STANDARD
	R-OT 10	1	TD04&5	700				F							1600/3	EP	EP		FLANGE ADAPTOR	STANDARD
	R-OT 11	1	TD04&5	700				PE+RF	PE					ST / 6 / X42		EP	EP+DT	PU	SP WITH RF AND RESTRAINING BOLTS	
	R-OT 12	2	TD04&5	700	700			PE	PE					ST / 6 / X42		EP	EP+DT	PU	ELBOW	
	R-OT 13	1	TD04&5	700	700			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-OT 14	1	TD04&5	700	700	700		PE	F	PE				ST / 6 / X42	1600/3	EP	EP+DT	PT	TEE	
	R-OT 15	1	TD04&5	700										ST	1600/8	EP	EP	PT	BLANK FLANGE	
	R-OT 16	1	TD06	700	700			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-OT 17	1	TD06	700	700	600		PE	PE	F				ST / 6 / X42	1600/3	EP	EP+DT	PU	TEE	
	R-OT 18	1	TD06	100	100			F 600ND	F 100ND					ST / 4,5 / X42	1600/3	EP	EP	PU	FLANGE WITH 100ND FLANGED PIPE	
	R-OT 19	1	TD06	100	100			F	F						1600/3	FBE	FBE	PU	100ND RSV	STANDARD
	R-OT 20	1	TD06	100				F							1600/3	FBE	FBE	PU	VENT-O-MAX RBx DOUBLE ACTING AIR VALVE ABLE TO FUNCTION UNDER LOW PRESSURE CONDITIONS WITH ANTI SHOCK MECHANISM OR SIMILAR APPROVED	STANDARD

CONTINUES ON DWG 086-W-FL04

VERSION / AMENDMENTS				www.bigengroup.com				PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR						SURVEYED		DESIGNED		P J KOELEWYN	
No.	DATE	DESCRIPTION	AUTH. BY	IN ASSOCIATION WITH PHATWE Consulting Engineers 19a Von Wielligh Street Rustenburg Phone +27 14 594 2912 info@phatwe.co.za phatwe@telkomsa.net www.phatwe.co.za				DRAWING TITLE: NEW BOSPOORT RESERVOIR OUTLET PIPEWORK FITTING LIST				ORIGINAL DRAWING SCALE: AS SHOWN		ORIGINAL DRAWING SHEET SIZE: A1		DRAWN		CHECKED	
												APPROVED ON BEHALF OF CLIENT:		COORD SYSTEM		DATE		JAN 2021	
												NAME:							
												DATE:							
												CLIENT DRAWING No.:		CLIENT REF No.:					
																DRAWING No.:		VERSION:	
																		086-W-FL03	

086-W-FL03

FROM ON DWG 086-W-FL03

REV	ITEM NO.	TOTAL (FOR ONE INSTALLATION)	REFER DRG.	DIA. LEFT	DIA. RIGHT	DIA. BRANCH 1	DIA. BRANCH 2	END LEFT	END RIGHT	END BRANCH 1	END BRANCH 2	BEND ANGLE (DEGREE)	BEND RADIUS	MATERIAL / WT OR PIPE CLASS / STEEL GRADE	FLANGE TABLE	CORROSION PROTECTION			DESCRIPTION	DIMENSIONS
																FACTORY		SITE APP		
																INTERNAL LINING	EXTERNAL COAT			
OUTLET PIPEWORK - DWG. 086-W-TD04, TD05 & TD06 - BOSPOORT RESERVOIR DELIVERY PIPEWORK																				
	R-OT 21	1	TD06	700	700			PE	F					ST / 6 / X42	1600/3	EP	EP+DT	PU	SP	700Ø 
	R-OT 22	1	TD06	700	700			F	F						1600/3	EP	EP	PU	SENSUS MECHANICAL TURBINE FLOW METER (OR SIMILAR APPROVED BY ENGINEER)	STANDARD
	R-OT 23	1	TD06	700	700									ST	1600/3	EP	EP		FLANGE ADAPTOR	STANDARD
	R-OT 24	1	TD06	700	700			PE+RF	PE					ST / 6 / X42	1600/3	EP	EP	PU	SP WITH RF AND RESTRAINING BOLTS	700Ø 
	R-OT 25	1	TD06	700	800			PE	PE					ST / 6 / X42		EP	EP+DT		ECCENTRIC REDUCER	700Ø 
	R-OT 26	1	TD06	800	800			PE	PE					ST / 6 / X42		EP	EP+DT		SP	800Ø 
	R-OT 27	1	TD06	800	800			PE	PE					ST / 6 / X42		EP	EP+DT		SP	800Ø 
	R-OT 28	1	TD06	800	800			PE	PE				36°	ST / 6 / X42		EP	EP+DT		ELBOW	800Ø 
	R-OT 29	1	TD06	800	800			PE	PE					ST / 6 / X42		EP	EP+DT		SP	800Ø 
	R-OT 30	1	TD06	800	800			PE	PE				90°	ST / 6 / X42		EP	EP+DT		ELBOW	800Ø 

REV	ITEM NO.	TOTAL (FOR ONE INSTALLATION)	REFER DRG.	DIA. LEFT	DIA. RIGHT	DIA. BRANCH 1	DIA. BRANCH 2	END LEFT	END RIGHT	END BRANCH 1	END BRANCH 2	BEND ANGLE (DEGREE)	BEND RADIUS	MATERIAL / WT OR PIPE CLASS / STEEL GRADE	FLANGE TABLE	CORROSION PROTECTION			DESCRIPTION	DIMENSIONS
																FACTORY		SITE APP		
																INTERNAL LINING	EXTERNAL COAT			
OVERFLOW PIPEWORK - DWG. 086-W-TD07 - BOSPOORT RESERVOIR OVERFLOW PIPEWORK																				
	R-OV 1	1	TD07	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-OV 2	1	TD07	600	600			PE	PE			40°		ST / 6 / X42		EP	EP+DT		ELBOW	
	R-OV 3	1	TD07	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-OV 4	1	TD07	600	600			PE	PE					ST / 6 / X42		EP	EP+DT		SP	
	R-OV 5	1	TD07	600	600			PE	PE			90°		ST / 6 / X42	1600/3	EP	EP		ELBOW	
	R-OV 6	1	TD07	600	600			PE	F					ST / 6 / X42	1600/3	EP	EP		SP	
	R-OV 7	1	TD07	600	600			F+PF	PE					SS 316L / 4,0					SP WITH PUDDLE FLANGE	
	R-OV 8	1	TD07	600	900			PE	PE					SS 316L / 4,0					REDUCER	

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com

IN ASSOCIATION WITH

PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912

info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za



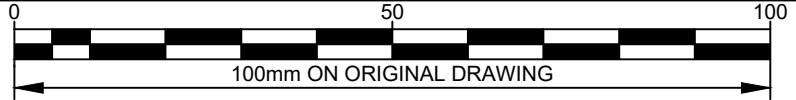
PROJECT TITLE:

**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:

**NEW BOSPOORT RESERVOIR
OUTLET AND OVERFLOW PIPEWORK
FITTING LIST**





ORIGINAL DRAWING SCALE: AS SHOWN

ORIGINAL DRAWING SHEET SIZE: **A1**

APPROVED ON BEHALF OF CLIENT:

NAME: _____

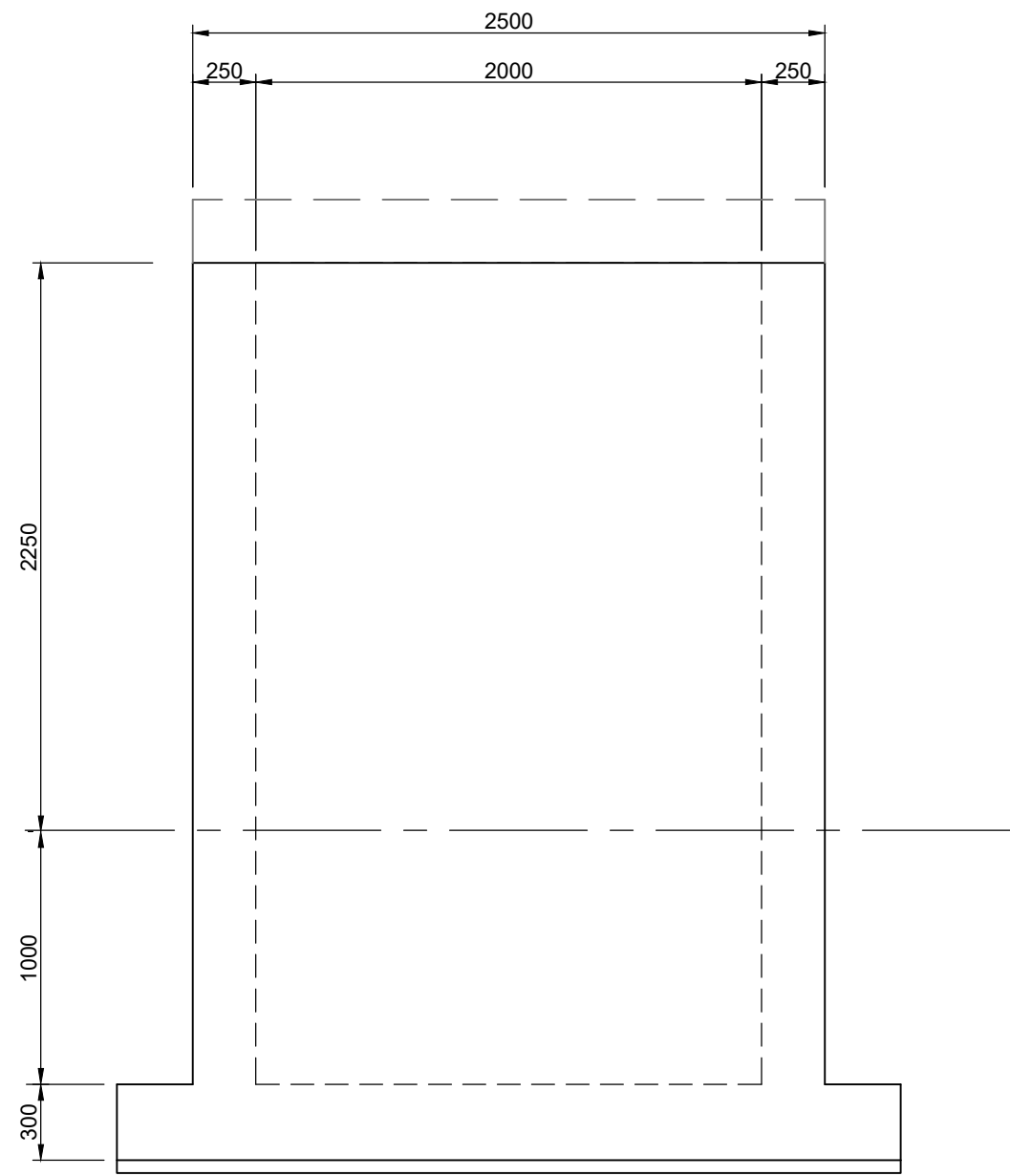
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CLIENT DRAWING No.: _____

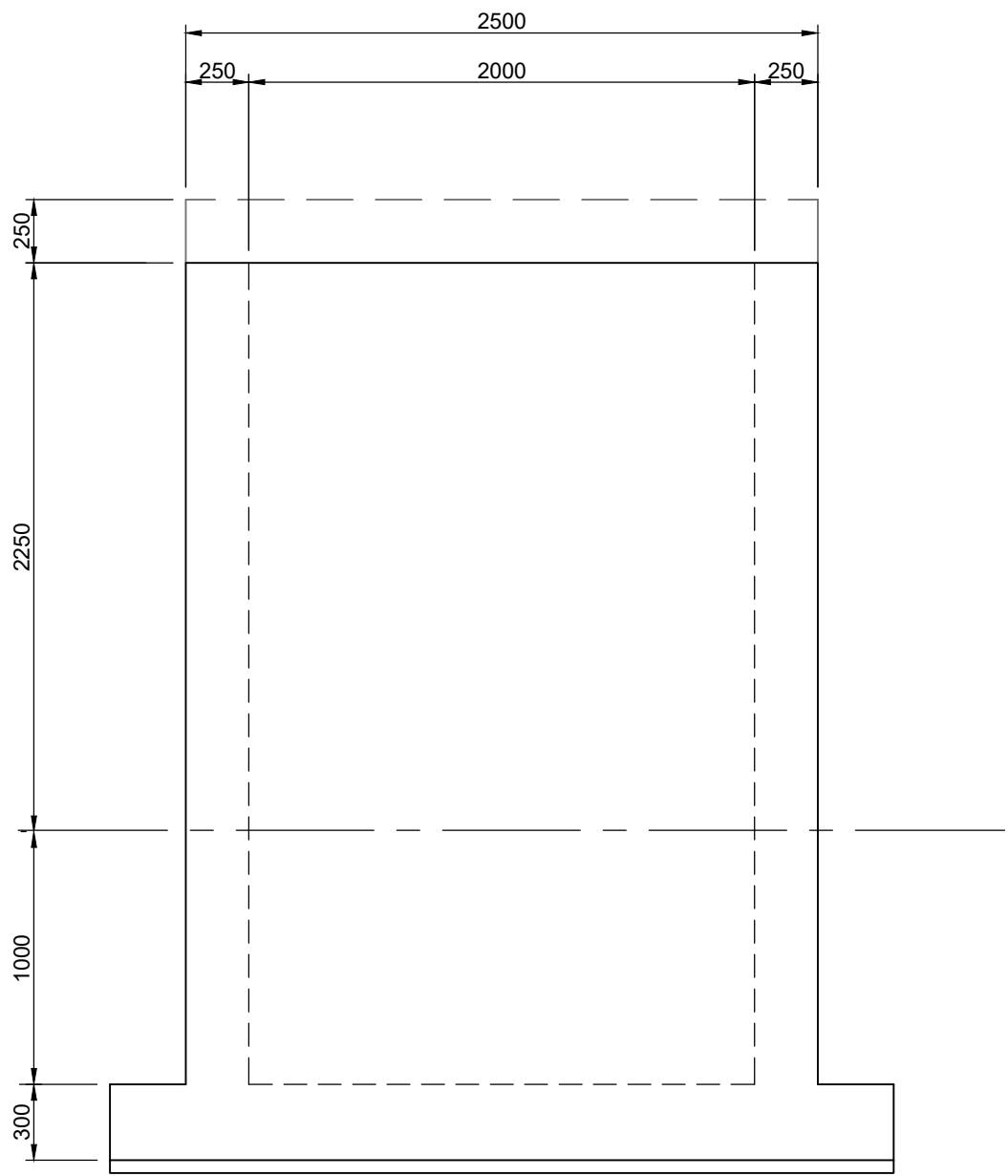
CLIENT REF No.: _____

SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:		APPROVED ON BEHALF OF:	
DRAWING No.: 086-W-FL04		VERSION:	

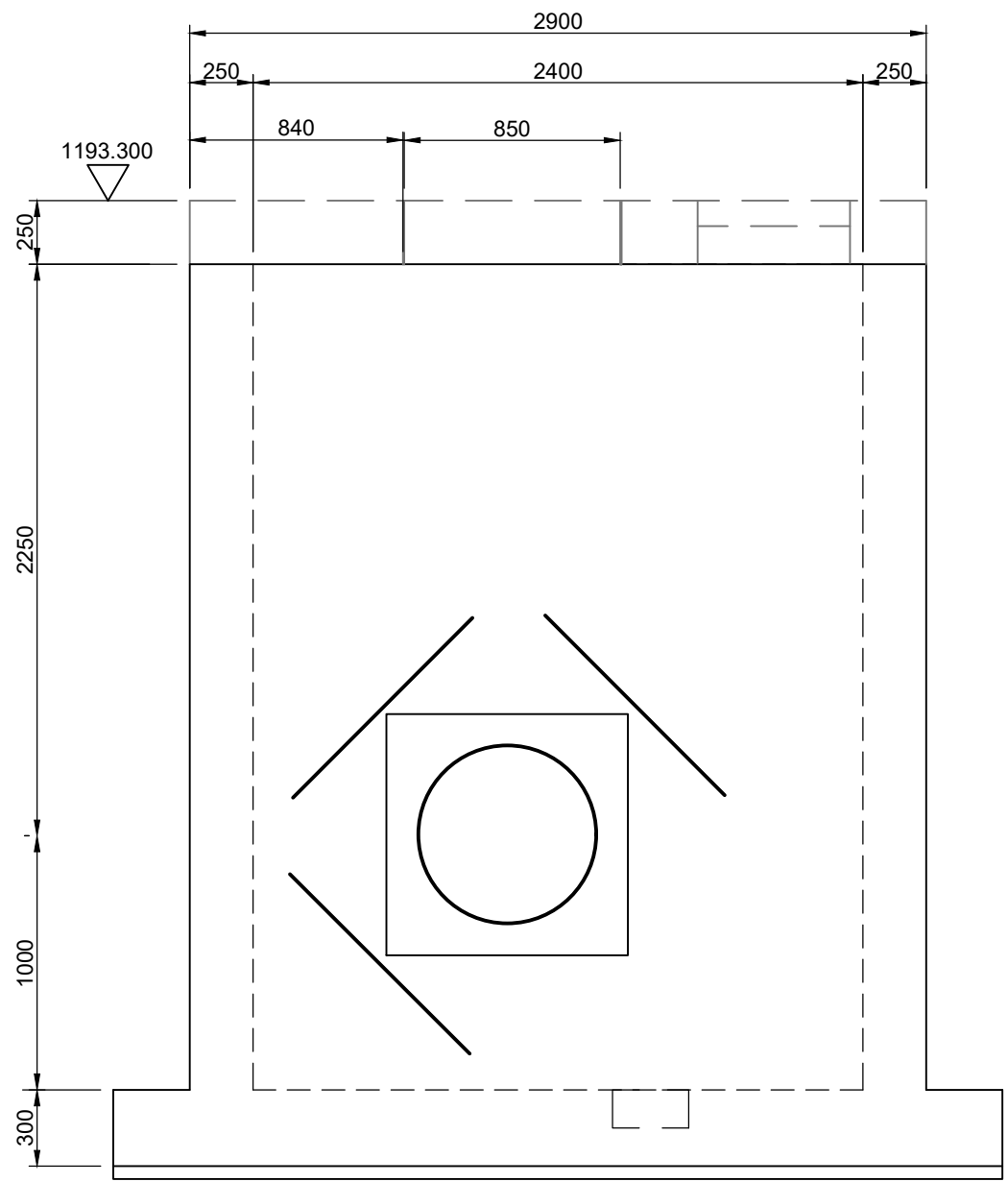
086-W-FL04



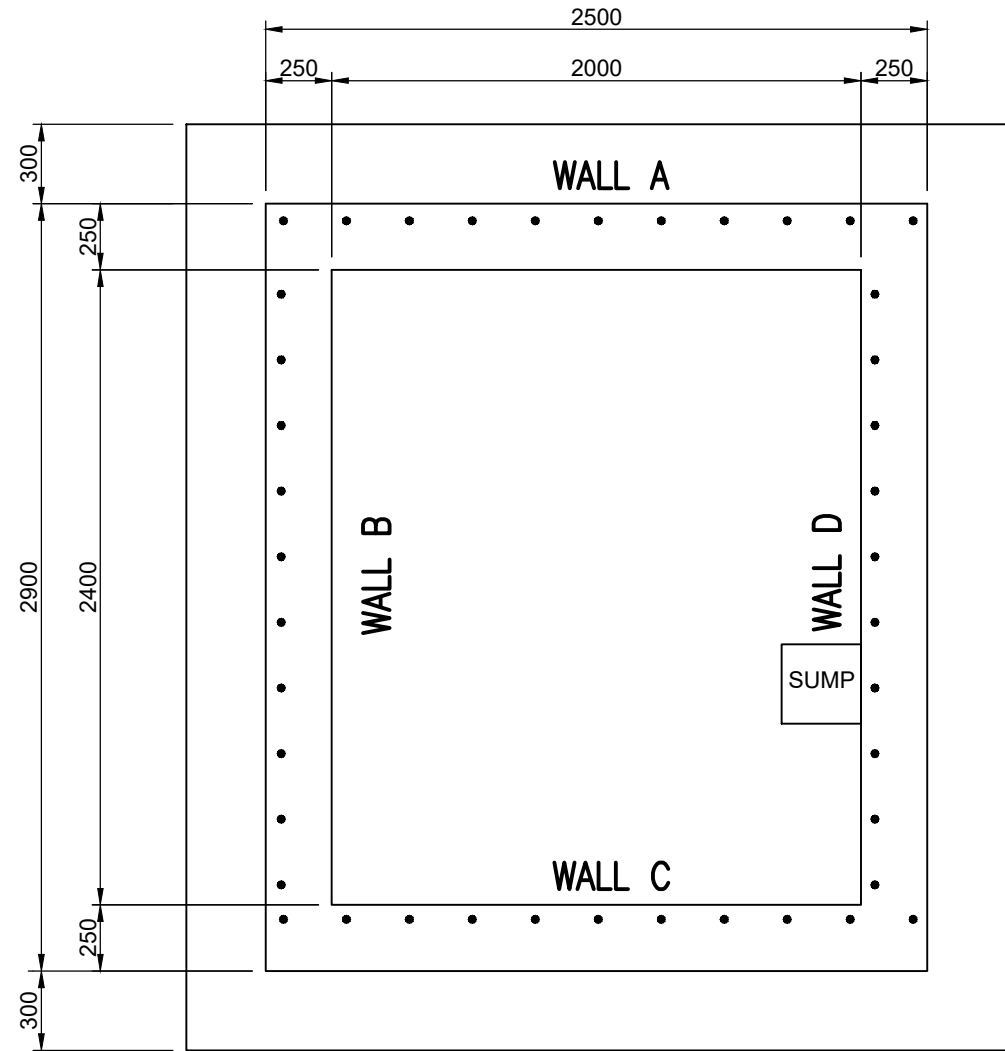
ELEVATION ON WALL A
SCALE 1:25



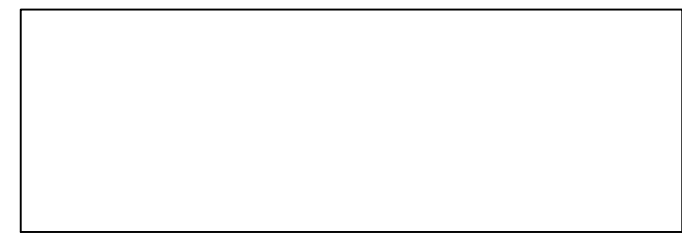
ELEVATION ON WALL C
SCALE 1:25



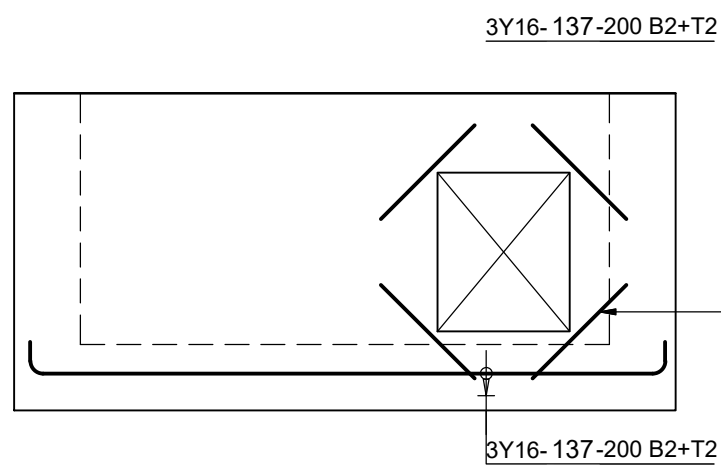
ELEVATION ON WALL B & D
SCALE 1:25



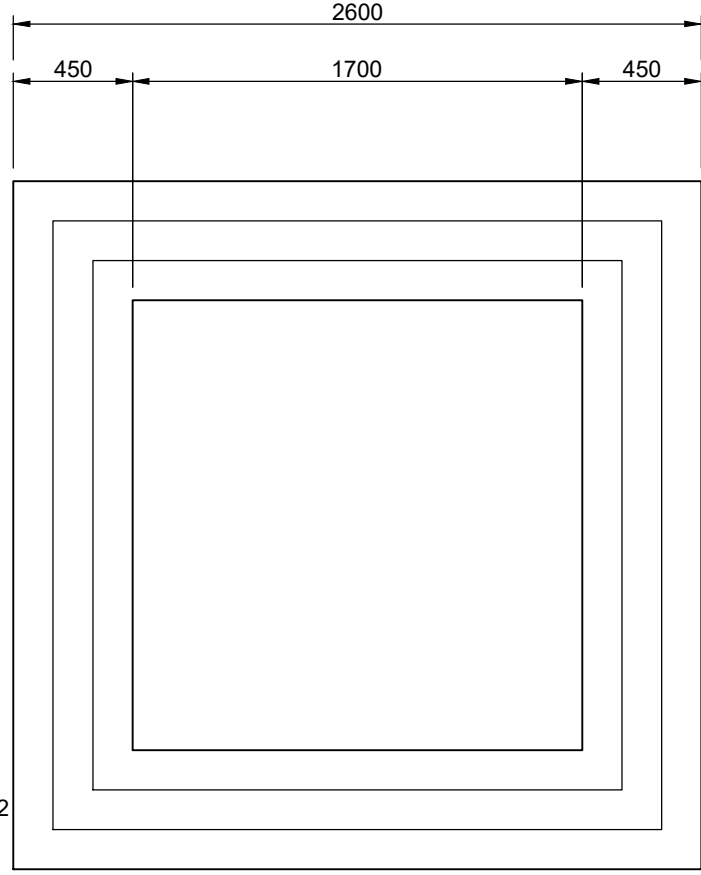
PLAN METER CHAMBER
SCALE 1:25



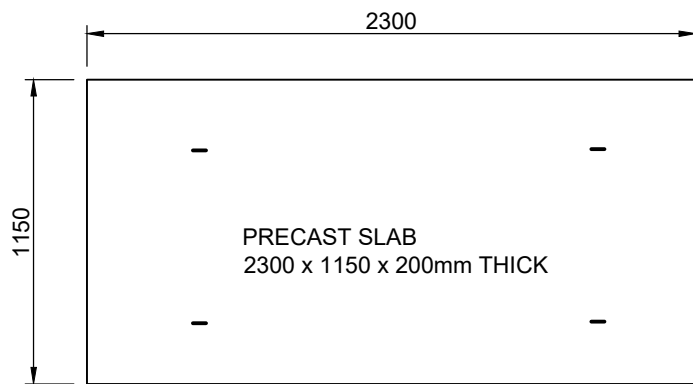
PLAN ON PRECAST COVER SLABS 2



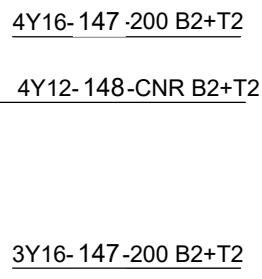
PLAN PRECAST SLAB 1
SCALE 1:25



FOUNDATION PLAN
SCALE 1:25



AV ROOF PRECAST PANELS
SCALE 1:25

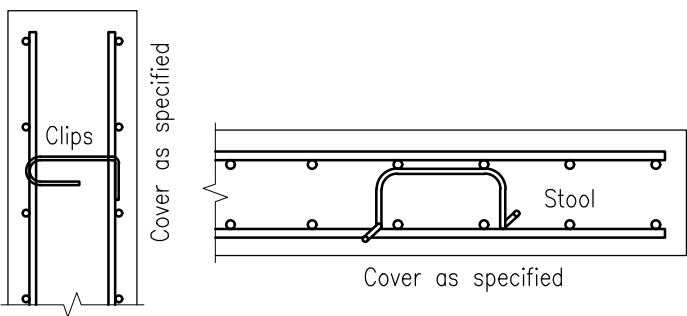


MEMBER	NO OF	NO BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg
AV FOUNDATION	1	26	Y12	2700	26	140	38	120	2510	[120]			62
	1	48	R8	1100	48	141	60	130	350				21
AV ROOF SLABS	1	12	Y12	2400	12	140	38	120	2190	[120]			26
	1	22	Y10	2500	22	141	60	130	1050				34
	1	4	R8	900	4	142	60	130	250				1
	1	4	R8	700	4	143	60	130	130				1
	1	4	R8	750	4	144	60	130	170				1
	1	6	Y12	1700	6	145	38	160	1450	[160]			9
	2	8	R8	850	16	146	81	250	100				5
	1	14	Y16	2400	14	147	38	120	2190	[120]			45
	1	8	Y12	500	8	148	20	120	500				4
FOUND SLAB	1	30	Y12	3250	30	100	38	160	3000	[160]			87
	1	26	Y12	3650	26	101	38	160	3400	[160]			84
	1	8	Y10	1100	8	102	83	300	140	300	300		5
	1	84	Y12	1000	84	103	37	200	800				75
PRECAST SLAB 1	1	11	Y10	2650	11	132	60	150	1100				18
	1	8	Y10	850	8	133	60	150	200				4
	1	12	Y12	2600	12	134	38	120	2400	[120]			28
	1	6	Y12	1750	6	135	38	160	1500	[160]			9
	1	4	R8	850	4	136	81	250	100				1
	1	12	Y16	2600	12	137	38	120	2400	[120]			49
PRECAST SLAB 2	1	8	Y12	500	8	138	20	120	500				4
	2	8	Y12	2600	16	130	38	120	2400	[120]			37
	2	11	Y10	1900	22	131	60	150	740				26
WALL A	2	4	R8	850	8	132	81	250	100				3
WALL B&D	1	28	Y12	2650	28	111	38	160	2400	[160]			66
	1	22	Y12	3250	22	112	37	3150	120		[70]		63
	1	14	R8	350	14	113	85	100	150	50			2
WALL C	2	8	Y12	3300	16	120	37	3150	150				47
	2	8	Y12	1700	16	121	20	1680					24
	2	12	Y12	3250	24	122	37	3150	120				69
	2	10	Y12	500	20	123	20	470					9
	2	22	Y12	3050	44	124	38	160	2800	[160]			119
	2	8	Y12	1350	16	125	38	160	1070	[160]			19
	2	6	Y12	1000	12	126	38	160	720	[160]			11
	2	8	Y12	1000	16	127	20	1000			[70]		14
	2	14	R8	350	28	128	85	100	150	50			4
WALL C	1	22	Y12	3300	22	110	37	3150	150				64
	1	28	Y12	2650	28	111	38	160	2400	[160]	[70]		66
	1	14	R8	350	14	112	85	100	150	50			2

	6	8	10	12	16	20	25	32	40	TOTAL
R		42								42
Y			87	968	103					1158
TOTAL		42	87	968	103					1200

REINFORCEMENT NOTES

- ALL REINFORCING TO SANS 920 : 2005
- R - PLAIN MILD STEEL BARS (TYPE A) ($f_y = 250 \text{ MPa}$ = 20mm \emptyset AND $f_y = 230 \text{ MPa}$ = 25 mm \emptyset)
- Y - HIGH YIELD STEEL (TYPE C : CLASS 2 : GRADE 1 : $f_y = 450 \text{ MPa}$) WHERE f_y = YIELD STRENGTH
- EXAMPLE
20Y25-D100-150 T2
20 - BARS
Y - HIGH YIELD STEEL
25 - DIAMETER IN mm
D100 - BAR MARK NUMBER
150 - SPACING c/c IN mm
T2 - LOCATION
NF - NEAR FACE
FF - FAR FACE
EF - EACH FACE
CTF - CUT TO FIT
ABR - ALTERNATIVE BARS REVERSED
ALT - ALTERNATIVELY
T - TOP
B - BOTTOM
CTL - CUT TO LENGTH
EW - EACH WAY



- NOTE:
- COVER TO REBAR 50mm
 - REBAR TO BE INSPECTED PRIOR TO CASTING OF CONCRETE
 - CONCRETE STRENGTH 25MPa

- STOOLS STAND ON B1 SUPPORTING T2.
- WELDING OF REINFORCING NOT ALLOWED.

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

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IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

Rustenburg Consulting Consortium

PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
METER AND AIR VALVE CHAMBER
REINFORCING**

Rustenburg Water Services Trust

0 50 100
100mm ON ORIGINAL DRAWING

ORIGINAL DRAWING SCALE: AS SHOWN
ORIGINAL DRAWING SHEET SIZE: A1

APPROVED ON BEHALF OF CLIENT:

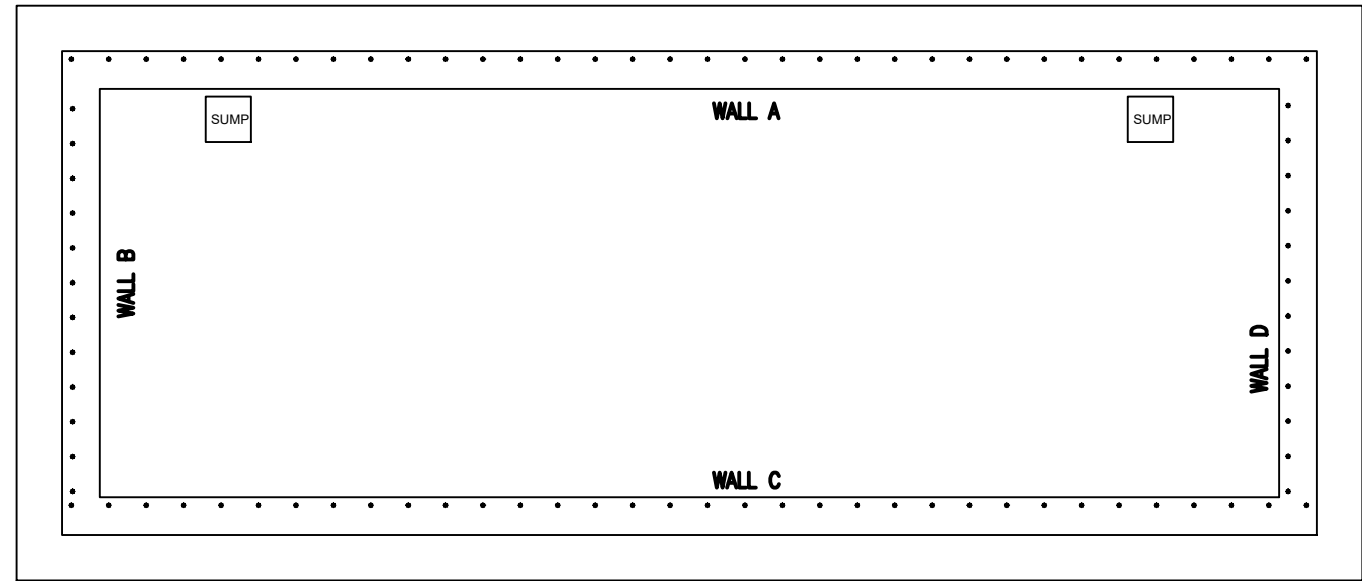
NAME: _____
DATE: _____
CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED: _____ DESIGNED: P J KOELEWYN
DRAWN: P J KOELEWYN CHECKED: K MOODLEY
COORD SYSTEM: WG27 DATE: JAN 2021

APPROVED ON BEHALF OF BIGEN:

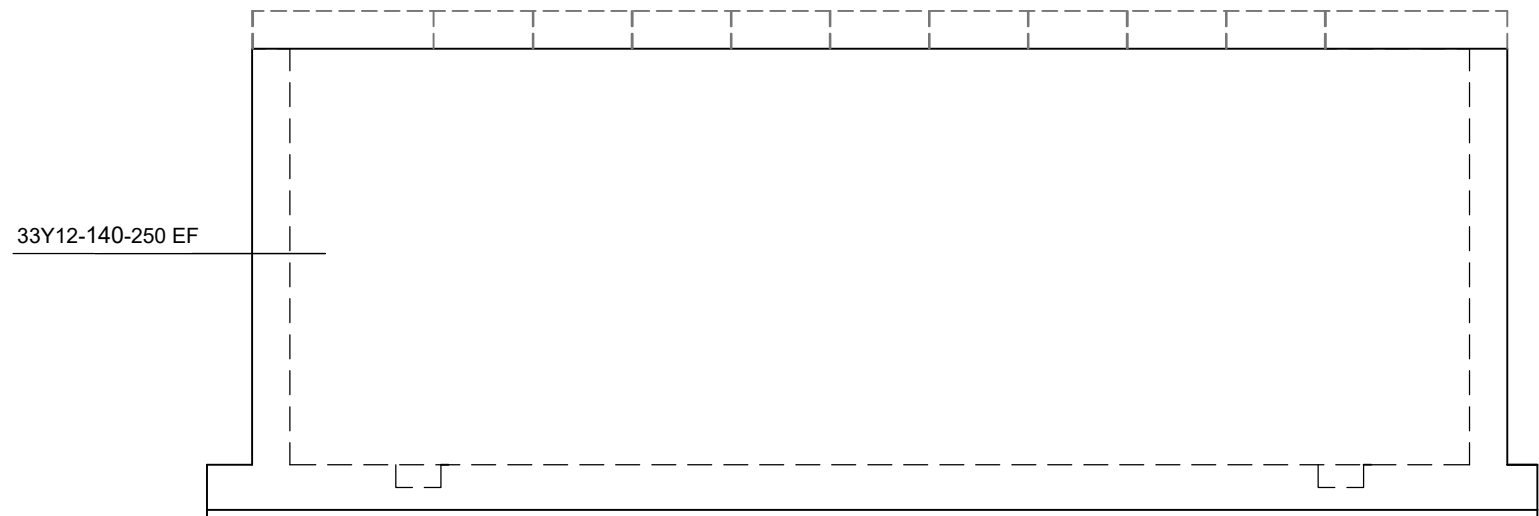
DRAWING No.: **086-W-RB01** VERSION: _____

086-W-RB01



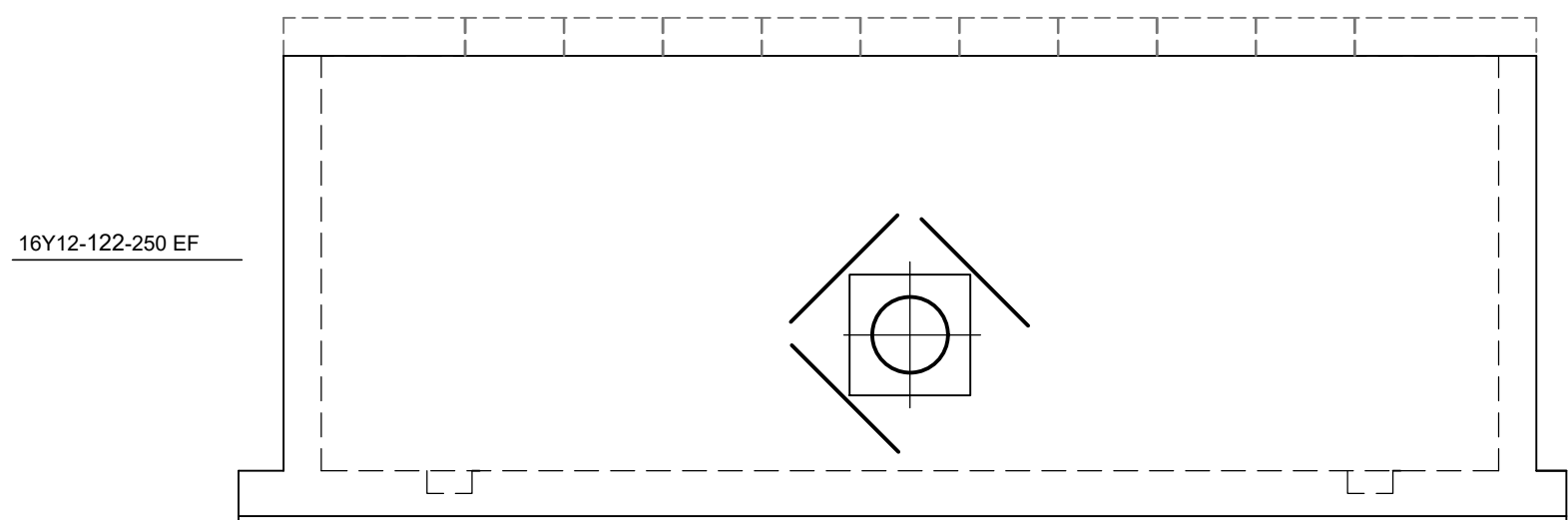
LAYOUT OF FLOOR SLAB

SCALE 1:50



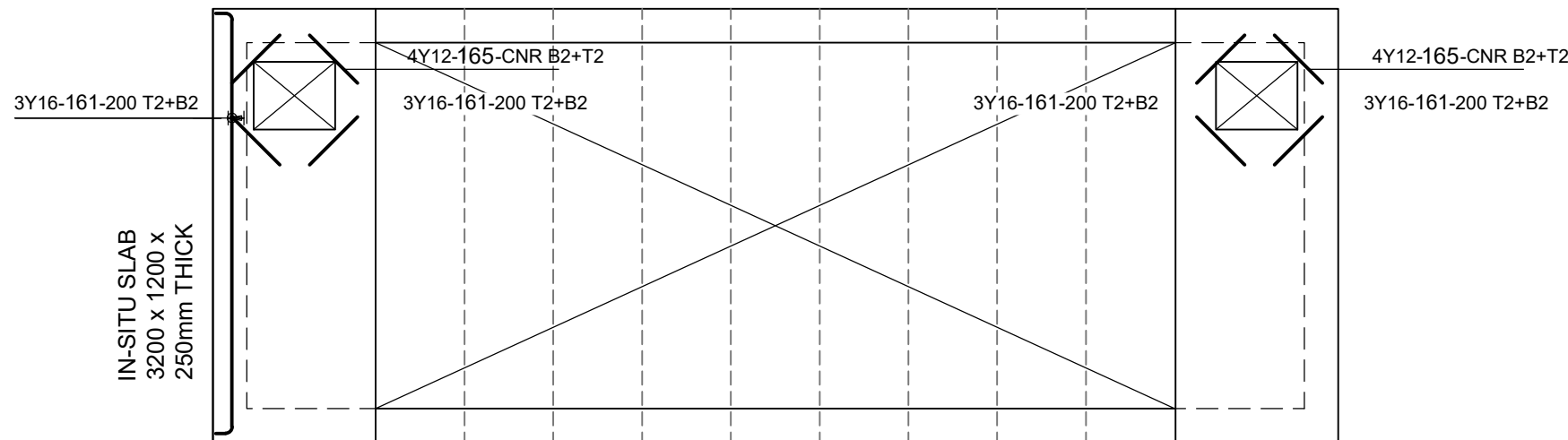
ELEVATION ON WALL C

SCALE 1:50



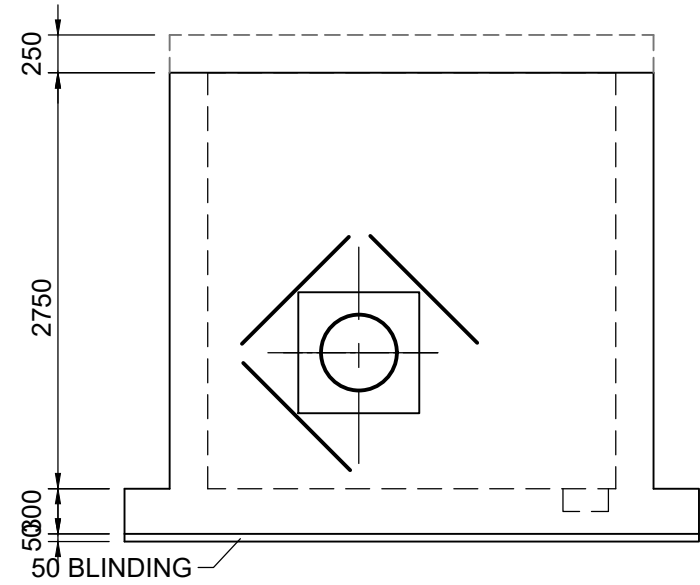
ELEVATION ON WALL A

SCALE 1:50



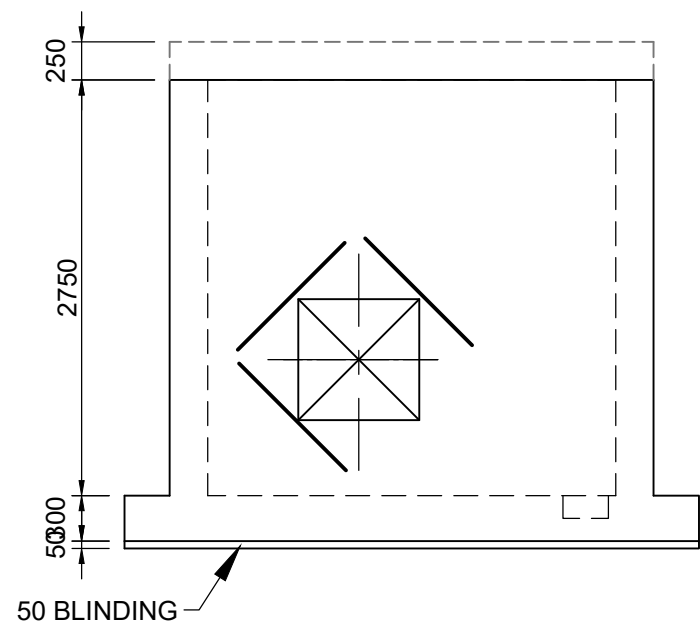
LAYOUT OF PRECAST ROOF SLABS

SCALE 1:50



ELEVATION ON WALL B

SCALE 1:50



ELEVATION ON WALL D

SCALE 1:50

MEMBER	NO OF	NO BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg
FOUND SLAB	1	64	Y12	4900	64	100	37	160	4740				278
	1	72	Y12	3950	72	101	38	160	3680	[160]			252
	1	50	Y10	1100	50	102	83	300	140	300	300		34
	1	184	Y6	1000	184	103	37	200	800				41
PRECAST SLABS	9	8	Y12	3300	72	170	38	120	3100	[120]			211
	9	14	Y10	1550	126	171	60	150	550				120
	9	4	R8	850	36	172	81	250	100				12
ROOF SLABS	1	6	Y12	3900	6	120	38	160	3650	[120]			21
	1	12	Y12	2450	12	160	38	160	2200	[160]			26
	1	24	Y16	3300	24	161	38	120	3100	[120]			126
	1	24	Y10	2650	24	162	60	150	1100				39
	1	16	Y10	850	16	163	60	150	200				8
	1	8	R8	850	8	164	81	250	100				3
	1	8	Y12	500	8	165	20	500					3
WALL A	1	6	Y12	3900	6	120	38	160	3650	[120]			21
	1	40	Y12	4600	40	121	37	160	4440				163
	1	64	Y12	2750	64	122	37	2650	120				156
	1	6	Y12	1550	6	124	38	120	1350	[120]			8
	1	8	Y12	1000	8	125	20	1000					7
	1	40	R8	350	40	126	85	100	150	50	[70]		6
WALL B	1	20	Y12	3350	20	130	38	160	3080	[160]			59
	1	6	Y12	1700	6	131	38	160	1450	[160]			9
	1	6	Y12	1000	6	132	38	160	750	[160]			5
	1	22	Y12	2750	22	133	37	2650	120				54
	1	8	Y12	1400	8	134	37	1300	120				10
	1	8	Y12	1000	8	135	20	1000					7
	1	10	R8	350	10	136	85	100	150	50	[70]		1
WALL C	1	66	Y12	2750	66	140	37	2650	120				161
	1	48	Y12	4600	48	142	37	160	4440				196
	1	40	R8	350	40	143	85	100	150	50	[70]		6
WALL D	1	20	Y12	3350	20	150	38	160	3080	[160]			59
	1	6	Y12	1700	6	151	38	160	1450	[160]			9
	1	6	Y12	1000	6	152	38	160	750	[160]			5
	1	22	Y12	2750	22	153	37	2650	120				54
	1	8	Y12	1400	8	154	37	1300	120				10
	1	8	Y12	1000	8	155	20	1000					7
	1	10	R8	350	10	156	85	100	150	50	[70]		1

	6	8	10	12	16	20	25	32	40	TOTAL
R		29								29
Y	41		202	1762	126					2163
TOTAL		29	202	1762	126					2192

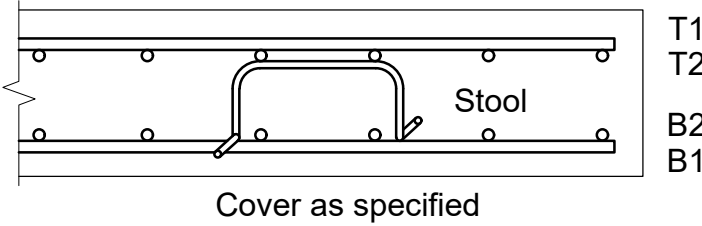
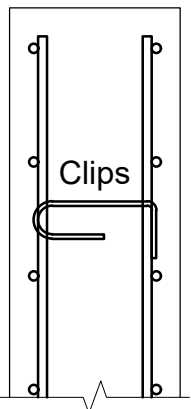
REINFORCEMENT NOTES

- ALL REINFORCING TO SANS 920 : 2005
- R - PLAIN MILD STEEL BARS (TYPE A) (fy = 250 MPa = 20mm Ø AND fy = 230 MPa = 25 mm Ø
- Y - HIGH YIELD STEEL (TYPE C : CLASS 2 : GRADE 1 : fy = 450 MPa) WHERE fy = YIELD STRENGTH
- EXAMPLE
20Y25-D100-150 T2

20 - BARS
Y - HIGH YIELD STEEL
25 - DIAMETER IN mm
D100 - BAR MARK NUMBER
150 - SPACING c/c IN mm
T2 - LOCATION

NF - NEAR FACE
FF - FAR FACE
EF - EACH FACE
CTF - CUT TO FIT
ABR - ALTERNATIVE BARS REVERSED
ALT - ALTERNATIVELY

T - TOP
B - BOTTOM
CTL - CUT TO LENGTH
EW - EACH WAY



- STOOLS STAND ON B1 SUPPORTING T2.
- WELDING OF REINFORCING NOT ALLOWED.

NOTE:
1 COVER TO REBAR 50mm
2 REBAR TO BE INSPECTED PRIOR TO CASTING OF CONCRETE
3 CONCRETE STRENGTH 25MPa

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com

IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwe@telkomsa.net
www.phatwe.co.za

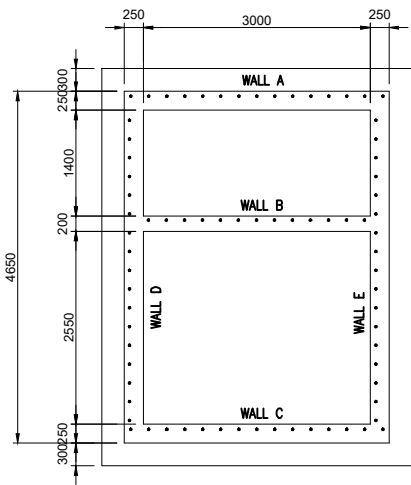


PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR
DRAWING TITLE: NEW BOSPOORT RESERVOIR CONTROL CHAMBER REINFORCEMENT

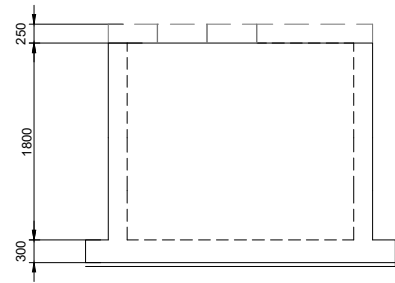


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NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

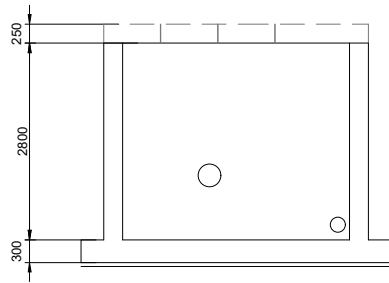
SURVEYED		DESIGNED	P J KOELEWYN
DRAWN	P J KOELEWYN	CHECKED	K MOODLEY
COORD SYSTEM	WG27	DATE	JAN 2021
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.:		VERSION:	
086-W-RB02			



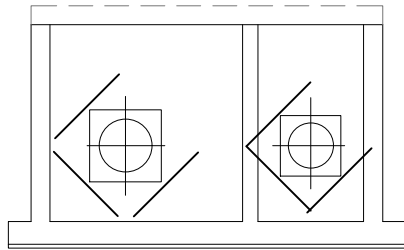
FOUNDATION PLAN
SCALE 1:50



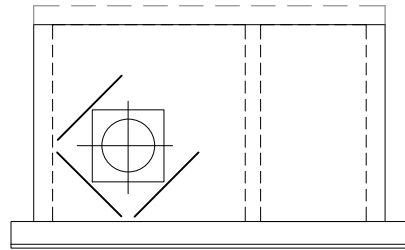
ELEVATION WALL C
SCALE 1:50



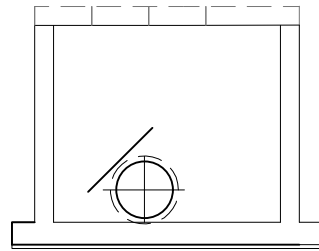
ELEVATION WALL B
SCALE 1:50



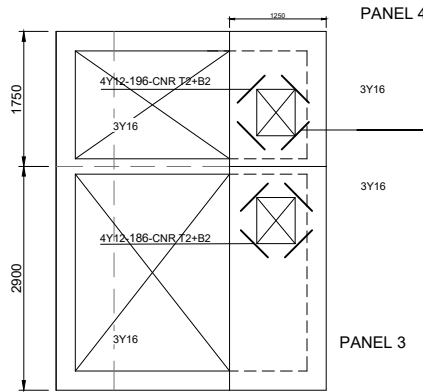
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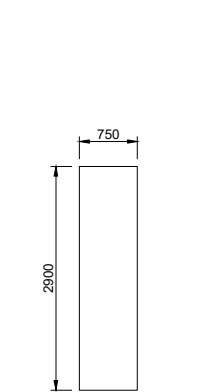
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SCALE 1:50



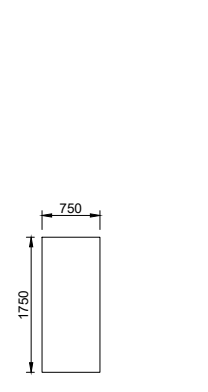
ELEVATION WALL A
SCALE 1:50



ROOF PANELS 3 & 4
SCALE 1:50



PRECAST PANEL 1
(3 OFF)
SCALE 1:50



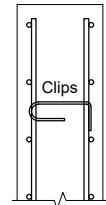
PRECAST PANEL 2
(3 OFF)
SCALE 1:50

REINFORCEMENT NOTES

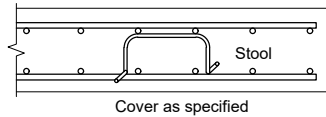
- ALL REINFORCING TO SANS 920 : 2005
- R - PLAIN MILD STEEL BARS (TYPE A) ($f_y = 250 \text{ MPa} = 20 \text{ mm } \varnothing$ AND $f_y = 230 \text{ MPa} = 25 \text{ mm } \varnothing$)
- Y - HIGH YIELD STEEL (TYPE C : CLASS 2 : GRADE 1 : $f_y = 450 \text{ MPa}$) WHERE $f_y = \text{YIELD STRENGTH}$
- EXAMPLE
20Y25-D100-150 T2

NF - NEAR FACE
FF - FAR FACE
EF - EACH FACE
CTF - CUT TO FIT
ABR - ALTERNATIVE BARS REVERSED
ALT - ALTERNATIVELY

T - TOP
B - BOTTOM
CTL - CUT TO LENGTH
EW - EACH WAY



Cover as specified



T1
T2
B2
B1

Cover as specified

- STOOLS STAND ON B1 SUPPORTING T2.
- WELDING OF REINFORCING NOT ALLOWED.

NOTE:
1 COVER TO REBAR 50mm
2 REBAR TO BE INSPECTED PRIOR TO CASTING OF CONCRETE
3 CONCRETE STRENGTH 25MPa

MEMBER	NO OF	NO BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg
FOUND SLAB	1	44	Y12	4250	44	100	38	160	4000	[160]			166
	1	34	Y12	5400	34	101	38	160	5150	[160]			163
	1	30	Y10	1100	30	102	83	300	140	300	300		20
	1	160	Y12	1000	160	103	37	200	800				142
PANEL 1	3	8	Y12	3000	24	170	38	120	2800	[120]			64
	3	12	Y10	1750	36	171	60	150	650				39
	3	4	R8	850	12	172	81	250	100				4
PANEL 2	3	8	Y10	1750	24	173	60	150	650				26
	3	8	Y12	2050	24	174	38	220	1650	[220]			44
	3	2	R8	850	6	175	81	250	100				2
PANEL 3	1	4	Y12	2000	4	180	38	120	1800	[120]			7
	1	12	Y16	3000	12	181	38	120	2800	[120]			57
	1	11	Y10	2750	11	182	60	150	1150				19
	1	6	Y10	1000	6	183	60	150	280				4
	1	4	Y12	550	4	184	38	120	350	[120]			2
	1	4	R8	850	4	185	81	250	100				1
	1	8	Y12	500	8	186	20	500					3
PANEL 4	1	4	Y12	550	4	190	38	120	350	[120]			2
	1	4	Y12	850	4	191	38	120	650	[120]			3
	1	7	Y10	2750	7	192	60	150	1150				12
	1	6	Y10	1000	6	193	60	150	280				4
	1	12	Y16	1850	12	194	38	120	1650	[120]			35
	1	4	R8	850	4	195	81	250	100				1
	1	8	Y12	500	8	186	20	500					3
WALL A	1	8	Y12	1750	8	120	37	120	1630				12
	1	24	Y12	2800	24	121	37	120	2680				60
	1	14	R8	350	14	122	85	100	150	50	[70]		2
	1	16	Y12	3650	16	123	38	160	3390	[160]			52
	1	8	Y12	1800	8	124	38	160	1510	[160]			13
	1	6	Y12	1200	6	125	38	160	940	[160]			6
WALL B	1	4	Y12	1200	4	126	20	1200					4
	1	28	Y12	2800	28	130	37	120	2680				70
	1	22	Y12	3650	22	131	38	160	3390	[160]			71
	1	14	R8	300	14	132	85	100	120	50	[70]		2
	1	30	Y12	2800	30	140	37	120	2680				74
WALL C	1	22	Y12	3650	22	141	38	160	3390	[160]			71
	1	14	R8	350	14	142	85	100	150	50	[70]		2
	1	26	Y12	2800	26	150	37	2680	120				65
	1	18	Y12	4800	18	151	38	160	4550	[160]			77
WALL D	1	10	Y12	1250	10	152	38	120	1050	[120]			11
	1	8	Y12	1700	8	155	38	160	1450	[160]			12
	1	6	Y12	950	6	156	38	160	670	[160]			5
	1	16	Y12	1200	16	157	20	1200					17
	1	14	R8	350	14	158	85	100	150	50	[70]		2
	1	6	Y12	1300	6	159	38	120	1100	[120]			7
	1	16	Y12	4800	16	160	38	160	4550	[160]			68
WALL F	1	34	Y12	2800	34	161	37	2680	120				85
	1	8	Y12	1200	8	162	38	120	1030	[120]			9
	1	8	Y12	950	8	163	38	160	680	[160]			7
	1	8	Y12	3050	8	164	38	160	2800	[160]			22
	1	14	R8	350	14	165	85	100	150	50	[70]		2
	1	8	Y12	1200	8	166	20	1200					9

	6	8	10	12	16	20	25	32	40	TOTAL
R		18								18
Y			123	1435	92					1650
TOTAL		18	123	1435	92					1668

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com

IN ASSOCIATION WITH
PHATWE Consulting Engineers
19a Von Wielligh Street
Rustenburg

Phone +27 14 594 2912
info@phatwe.co.za
phatwei@telkomsa.net
www.phatwe.co.za



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

DRAWING TITLE:
**NEW BOSPOORT RESERVOIR
OUTLET CHAMBERS
REINFORCEMENT**



0 50 100
100mm ON ORIGINAL DRAWING

ORIGINAL DRAWING SCALE: AS SHOWN
ORIGINAL DRAWING SHEET SIZE: A1

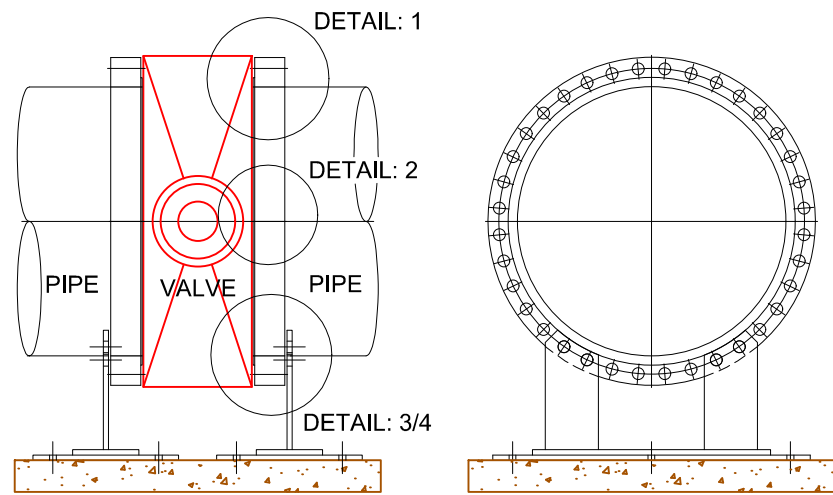
APPROVED ON BEHALF OF CLIENT:
NAME:
DATE:
CLIENT DRAWING No.:
CLIENT REF No.:

SURVEYED
DRAWN: P J KOELEWYN
COORD SYSTEM: WG27

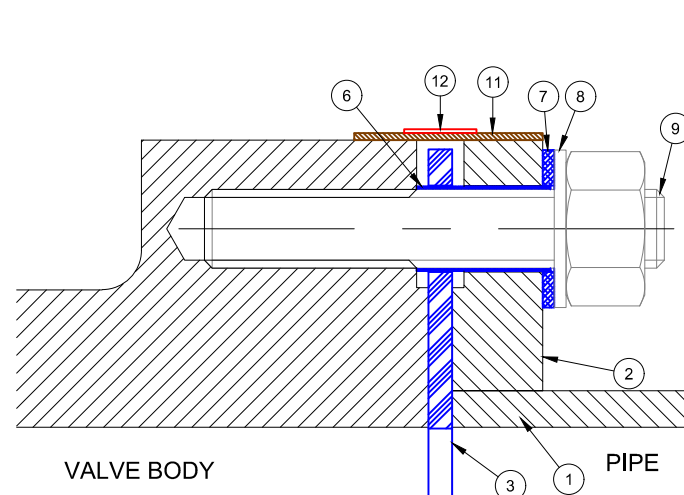
DESIGNED: P J KOELEWYN
CHECKED: K MOODLEY
DATE: JAN 2021

APPROVED ON BEHALF OF BIGEN:
DRAWING No.: **086-W-RB03**
VERSION:

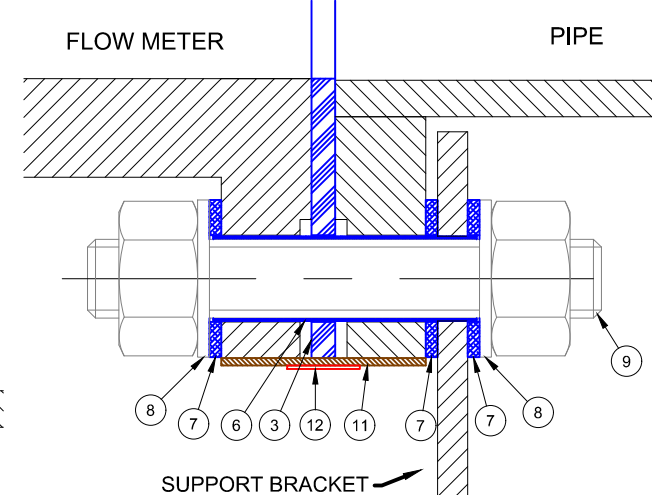
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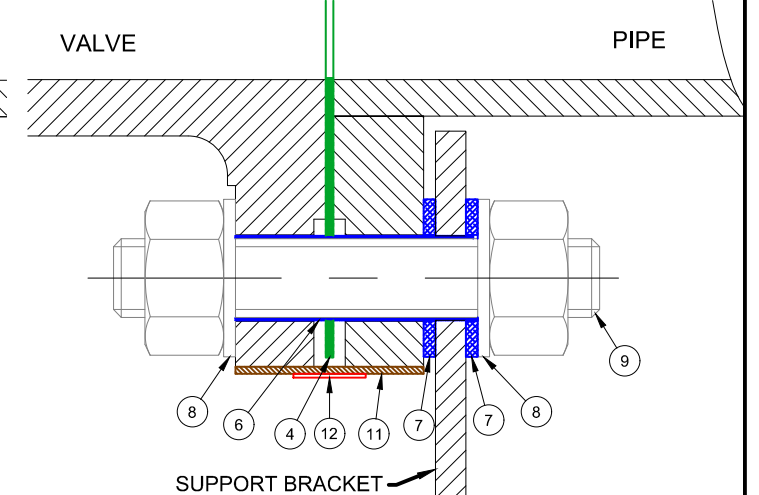
PIPE ISOLATING JOINT TO BUTTERFLY VALVE



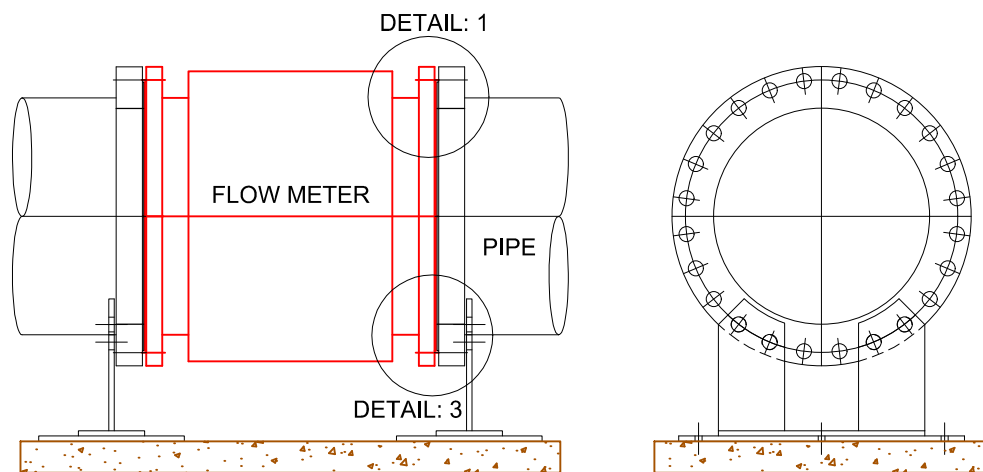
DETAIL: 2 - VALVE BODY WITH TAPPED HOLES



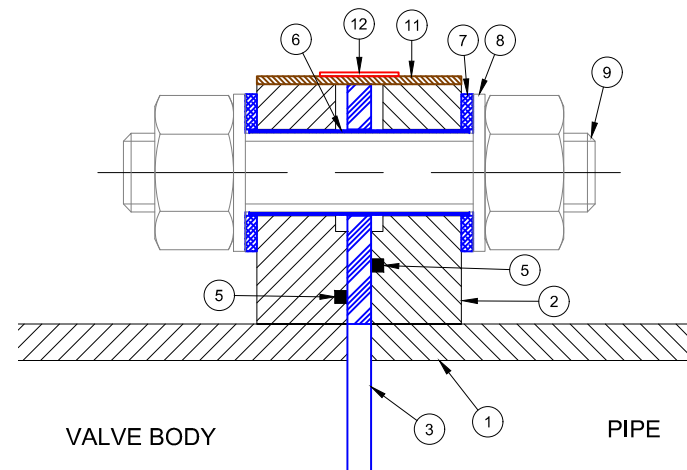
DETAIL: 3 - INSULATED FLANGE & INSULATED SUPPORT BRACKET



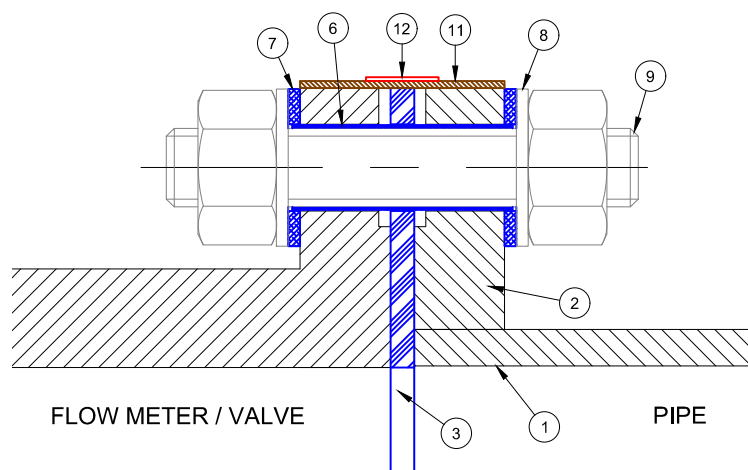
DETAIL: 4 - STANDARD FLANGE & INSULATED SUPPORT BRACKET



PIPE ISOLATING JOINT TO FLOW METER



TYPICAL HIGH PRESSURE VALVE ARRANGEMENT WITH O-RINGS



DETAIL: 1 - FLOW METER FLANGE ARRANGEMENT (NO EARTH RING) + LOW PRESSURE VALVE + STANDARD FLANGE ARRANGEMENT

FLANGE INSULATING MATERIAL LIST

1. PIPE - DIAMETER, WALL THICKNESS, STEEL GRADE, PROTECTION AND END PREPARATIONS TO BE SPECIFIED ELSEWHERE.
2. FLANGES - MANUFACTURED AND DRILLED AS PER SPECIFICATIONS, MACHINED ON FRONT, BACK AND OUTSIDE FACES.
3. INSULATING GASKET
4. STANDARD GASKET
5. 'O'-RING - AS PER FLANGE SPECIFICATIONS
6. INSULATING SLEEVE - 1mm TO 1.5mm THICK GLASS FIBRE REINFORCED POLYESTER SLEEVE FOR EACH BOLT. LENGTH OF SLEEVE TO BE SUCH THAT TOTAL GAP ON SLEEVE LENGTH BETWEEN INSIDE FACES OF STEEL WASHERS IS BETWEEN 2 TO 3mm.
7. INSULATING WASHERS - 6.3mm THICK FABRIC REINFORCED PHENOLIC RESIN WASHER WITH O.D. THE SAME AS THAT OF THE MACHINED STEEL WASHER, 2 OFF FOR EACH STUD BOLT: I.D. TO BE A SLIDING FIT OVER O.D. OF ITEM 6.
8. STEEL WASHERS - MACHINED WITH DIAMETER AND THICKNESS TO SABS 1149 TABLE 3.
9. STUD BOLTS & STUDS - GRADE 8.8 AND NUTS GRADE 8 TO SABS 136. STUD BOLT DIAMETERS SHALL BE SELECTED TO THE NEXT SMALLER SIZE FOR INSTALLATION IN STANDARD DRILLED FLANGES.
10. EXPLOSION PROOF SPARK GAP.
11. WHITE PLASTIC BACKED POLYMER MODIFIED BITUMINOUS TAPE - 1mm THICK OR SIMILAR APPROVED WITH A MINIMUM OF 25mm OVERLAP. IN CASE OF SURFACE IRREGULARITIES i.e. STEPPED FLANGES ETC. AN APPROVED MASTIC MATERIAL SHALL BE USED TO PROVIDE A SMOOTH CONTOUR FOR SUBSEQUENT TAPE APPLICATION.
12. CODING RED COLOUR BAND - OF 30mm WIDE PLASTIC BACKED ELECTRICAL TAPE TO SABS 122-1975.

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No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com
Allan Cormack Street
The Innovation Hub
Pretoria
Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME BOSPOORT PIPELINES
DRAWING TITLE: CATHODIC PROTECTION ELECTRICALLY ISOLATED FLANGED JOINTS



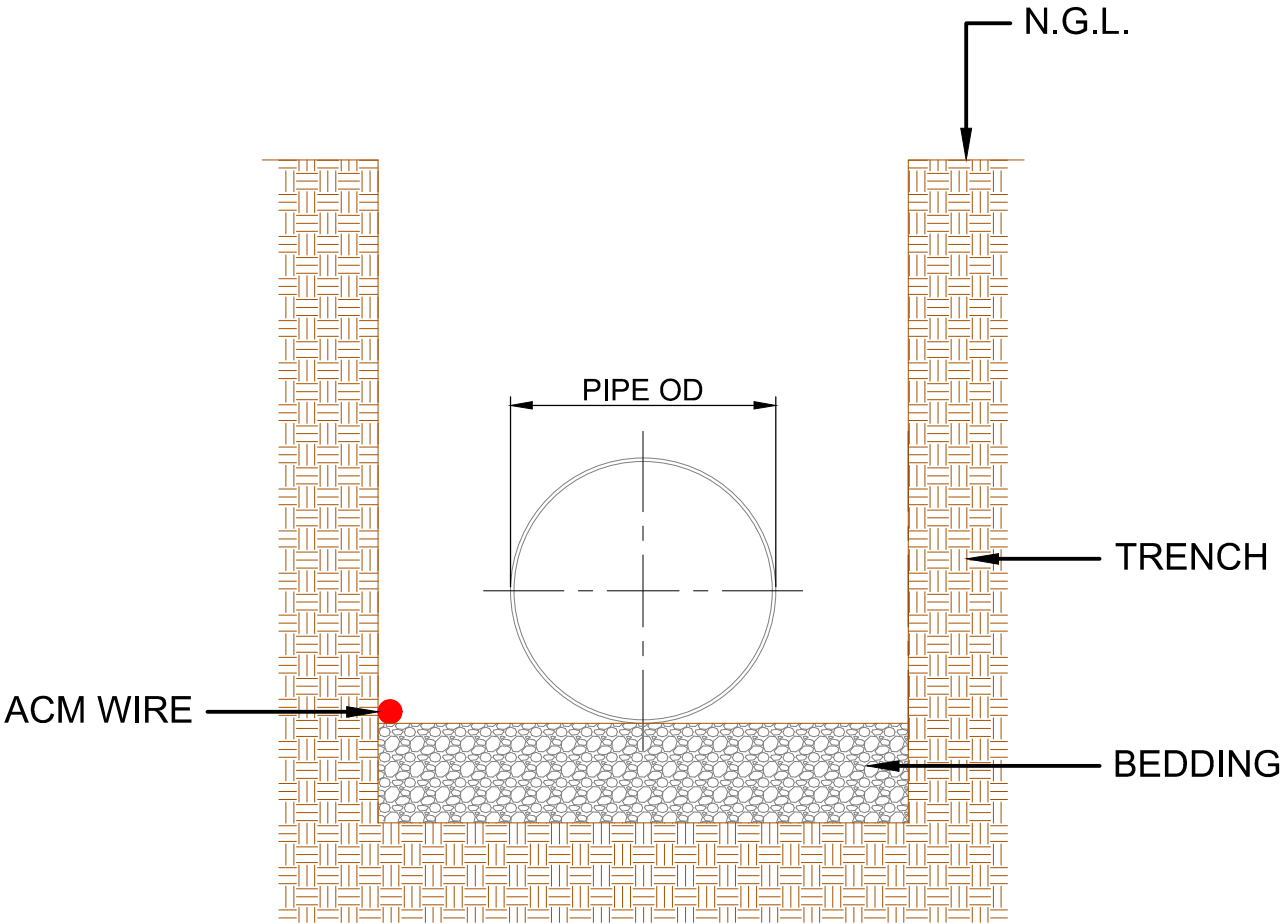
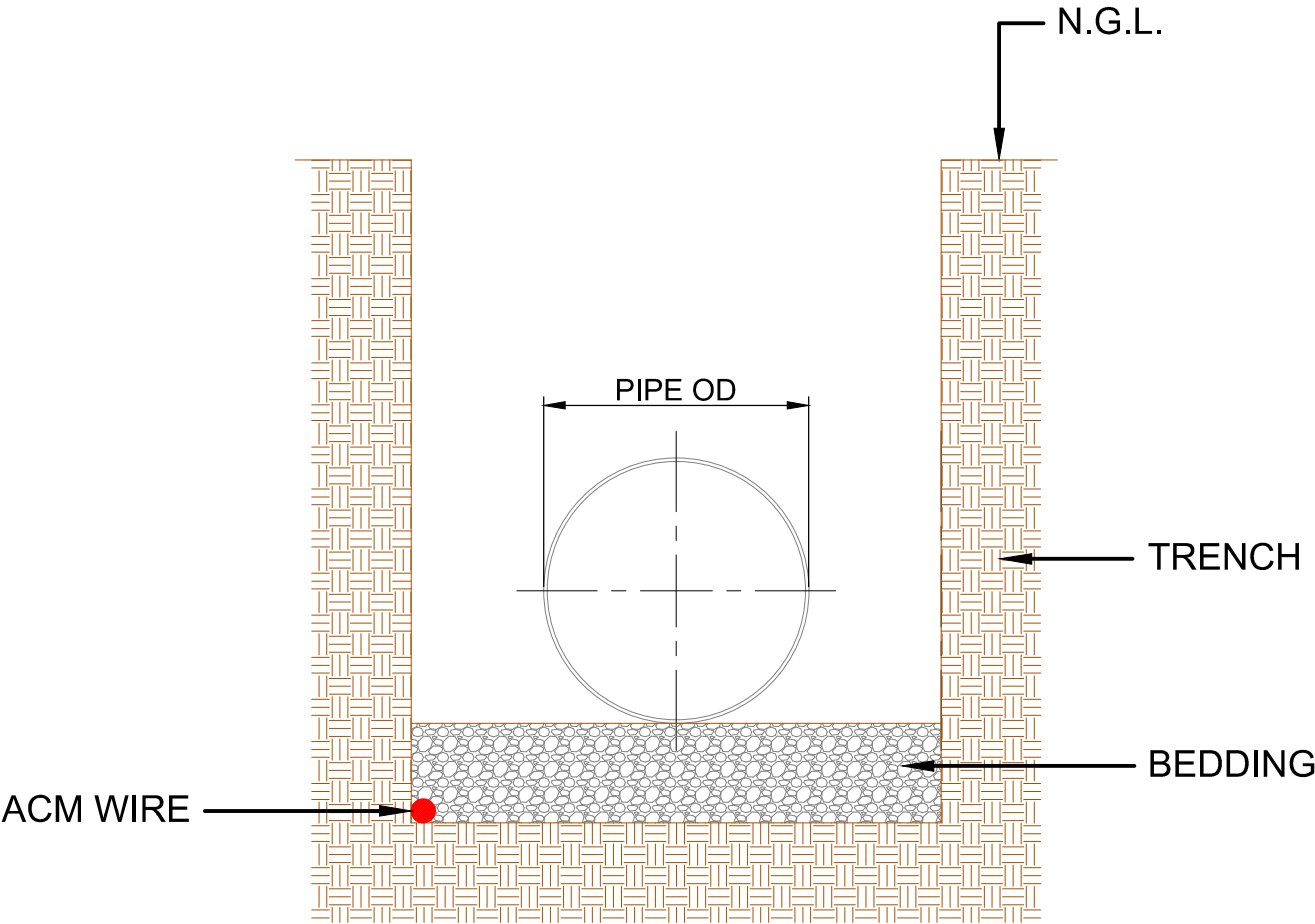
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ORIGINAL DRAWING SHEET SIZE: A1
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NAME:
DATE:
CLIENT DRAWING No.:
CLIENT REF No.:

SURVEYED: -	DESIGNED: S MARAIS
DRAWN: A STEENBERG	S MARAIS
COORD SYSTEM: WG27	DATE: AUGUST 2020
APPROVED ON BEHALF OF BIGEN:	
DRAWING No.: 1890.11.00.GZA.05.D050	VERSION: 1.0

1890.11.00.GZA.05.D050

OPTION 1: EXCAVATED TRENCH
INSTALL ZINC RIBBON AT BOTTOM OF TRENCH IN EXTREMITY
CLOSEST TO POWER LINE.

OPTION 2: INSTALL ZINC RIBBON ON TOP OF BEDDING IN EXTREMITY
CLOSEST TO POWER LINE.
THE ZINC RIBBON MUST BE COVERED AS SOON AS
POSSIBLE TO REDUCE THEFT RISK



PLEASE NOTE: THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE INTEGRITY OF THE RIBBON IS
NOT COMPROMISED DUE TO NEGLIGENCE, CONSTRUCTION DAMAGE, VANDALISM OR
THEFT

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com
Allan Cormack Street
The Innovation Hub
Perseus
Pretoria
Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PIPELINES**

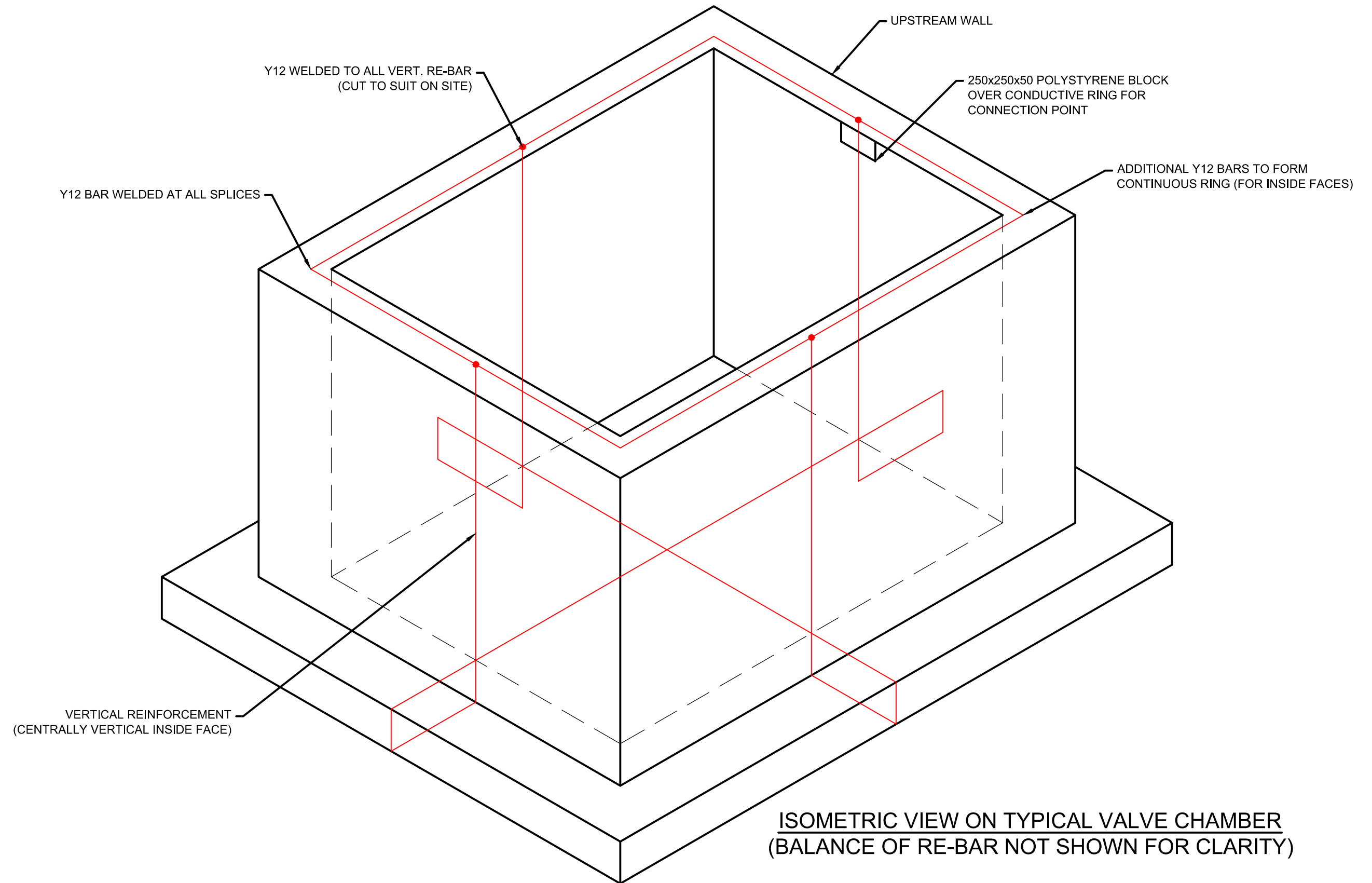
DRAWING TITLE:
**CATHODIC PROTECTION
ZINC RIBBON IN TRENCH
PLACEMENT DETAIL**



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ORIGINAL DRAWING SCALE: NTS	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME: _____	
DATE: _____	
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED	-	DESIGNED	S MARAIS
DRAWN	A STEENBERG	DATE	AUGUST 2020
COORD SYSTEM	WG27	DATE	AUGUST 2020
APPROVED ON BEHALF OF BIGEN:		APPROVED ON BEHALF OF CLIENT:	
DRAWING No.: 1890.11.00.GZA.05.D051		VERSION: 1.0	

1890.11.00.GZA.05.D051



NOTES:

1: DIMENSIONS IN mm O.U.S.

VERSION / AMENDMENTS			
No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com

Allan Cormack Street
The Innovation Hub
Perseus
Pretoria

Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:

**BOSPOORT WATER SUPPLY SCHEME
BOSPOORT PIPELINES**

DRAWING TITLE:

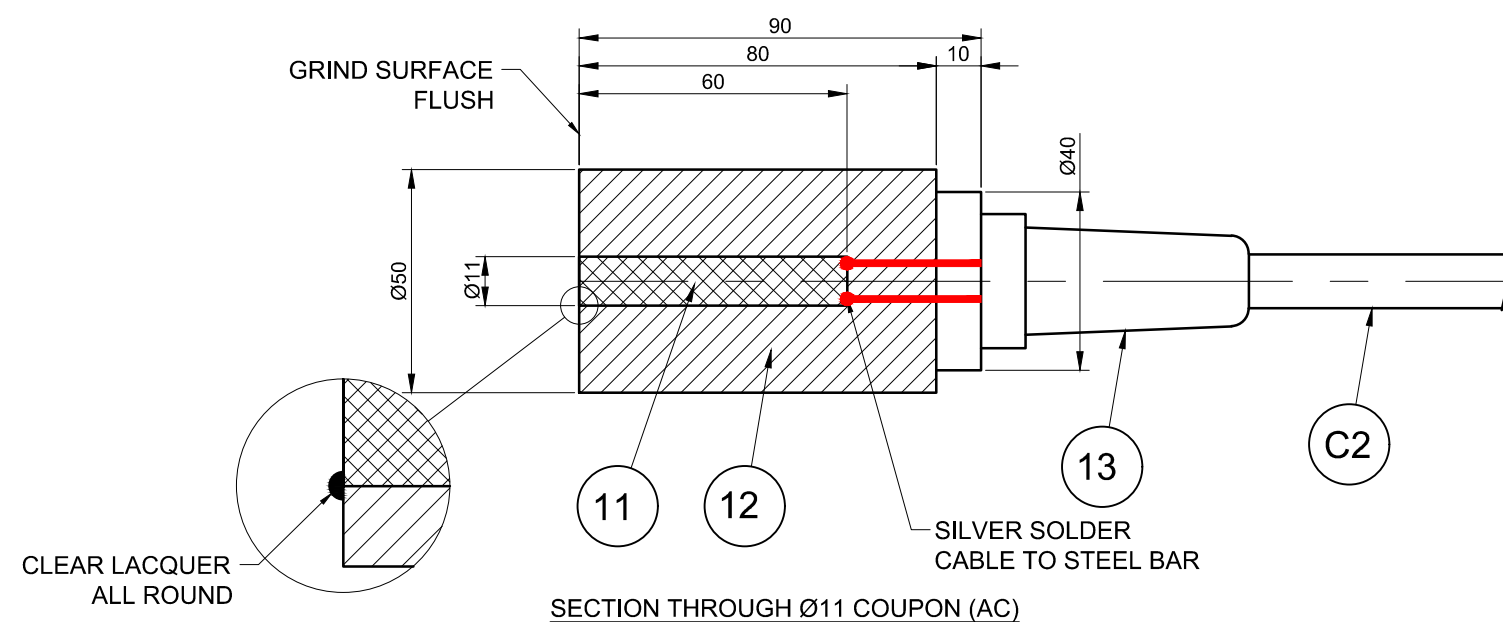
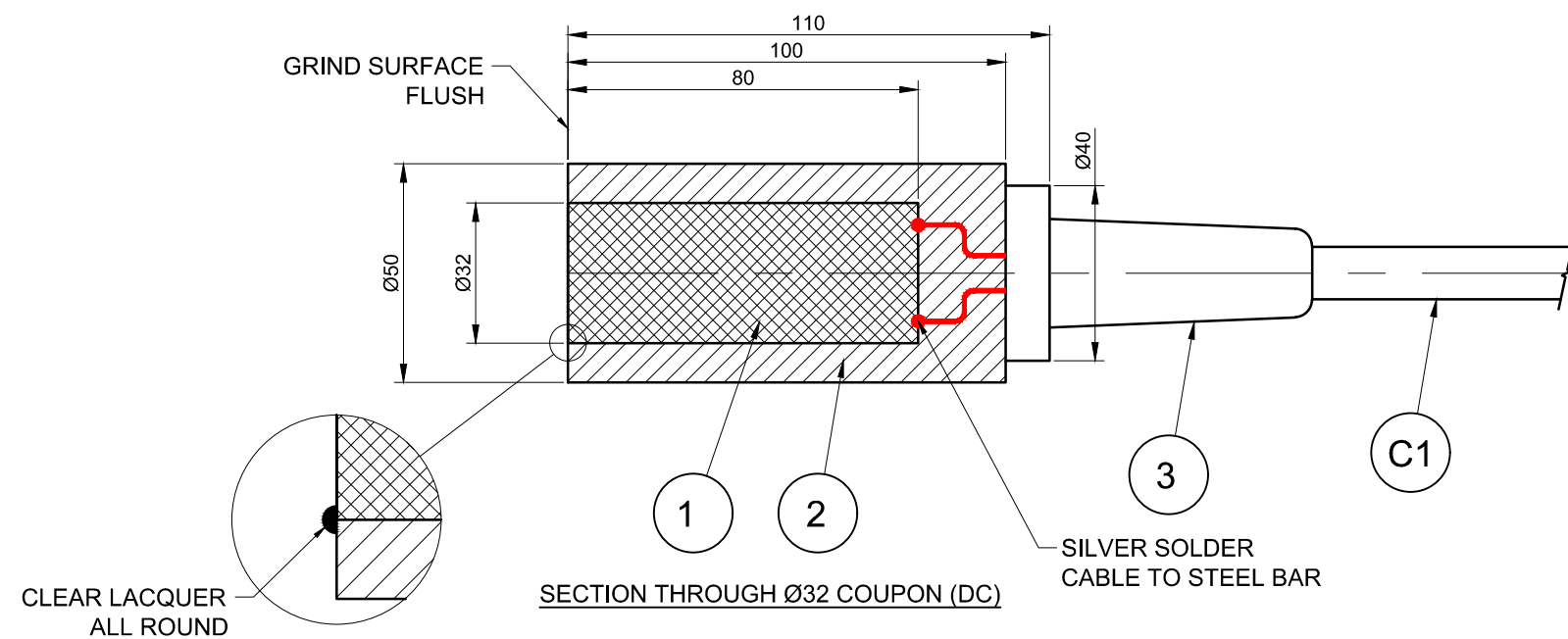
**CATHODIC PROTECTION
VALVE CHAMBER EARTHING DETAIL**



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: NTS	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED	-	DESIGNED	S MARAIS
DRAWN	A STEENBERG		S MARAIS
COORD SYSTEM	WG27	DATE	AUGUST 2020
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.:		VERSION:	
1890.11.00.GZA.05.D052		1.0	

1890.11.00.GZA.05.D052



MATERIAL LIST			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	ROD Ø32x80 LG	SABS1431 GR.300W
2	1	MOULDING Ø50x100	EPOXY
3	1	CABLE GLAND (BENDING PROTECTION)	POLYAMIDE BLACK
11	1	ROD Ø11x60 LG	SABS1431 GR.300W
12	1	MOULDING Ø50x80	EPOXY
13	1	CABLE GLAND (BENDING PROTECTION)	POLYAMIDE BLACK

NOTES:

1. INSPECT COUPONS FOR DAMAGE BEFORE INSTALLATION.
2. DIMENSIONS ARE IN mm U.O.S


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No.	DATE	DESCRIPTION	AUTH. BY

www.bigengroup.com
Allan Cormack Street
The Innovation Hub
Perseus
Pretoria
Phone: +27 (0) 12 842 8700
pretoria@bigengroup.com



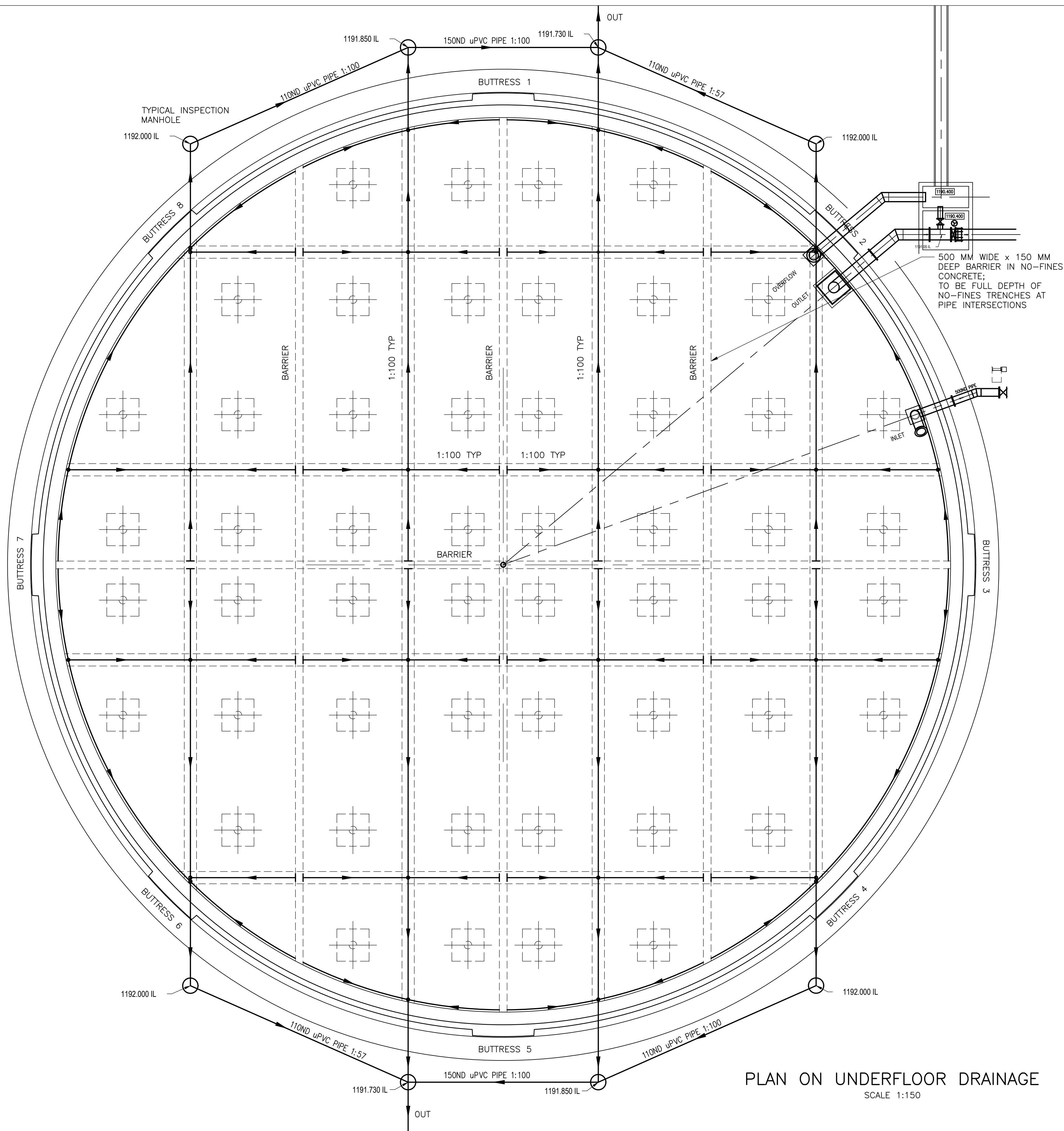
PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME BOSPOORT PIPELINES
DRAWING TITLE: CATHODIC PROTECTION AC & DC COUPON DETAILS



	
ORIGINAL DRAWING SCALE: NTS	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:

SURVEYED: -	DESIGNED: S MARAIS
DRAWN: A STEENBERG	S MARAIS
COORD SYSTEM: WG27	DATE: AUGUST 2020
APPROVED ON BEHALF OF BIGEN:	
DRAWING No.: 1890.11.00.GZA.05.D053	VERSION: 1.0

1890.11.00.GZA.05.D053



PLAN ON UNDERFLOOR DRAINAGE
SCALE 1:150

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The Innovation Hub
Pretoria

Phone: +27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

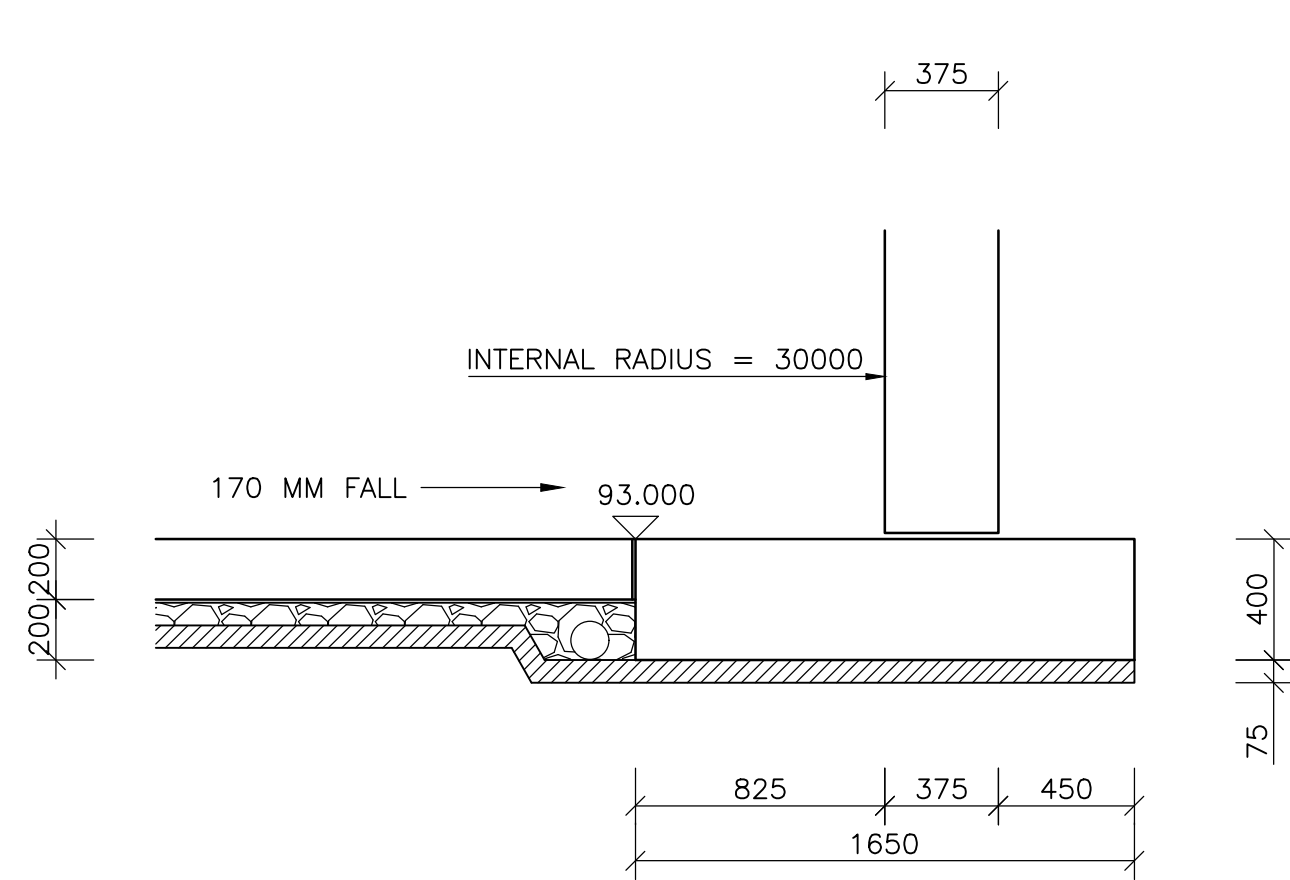
DRAWING TITLE:
UNDERFLOOR DRAIN



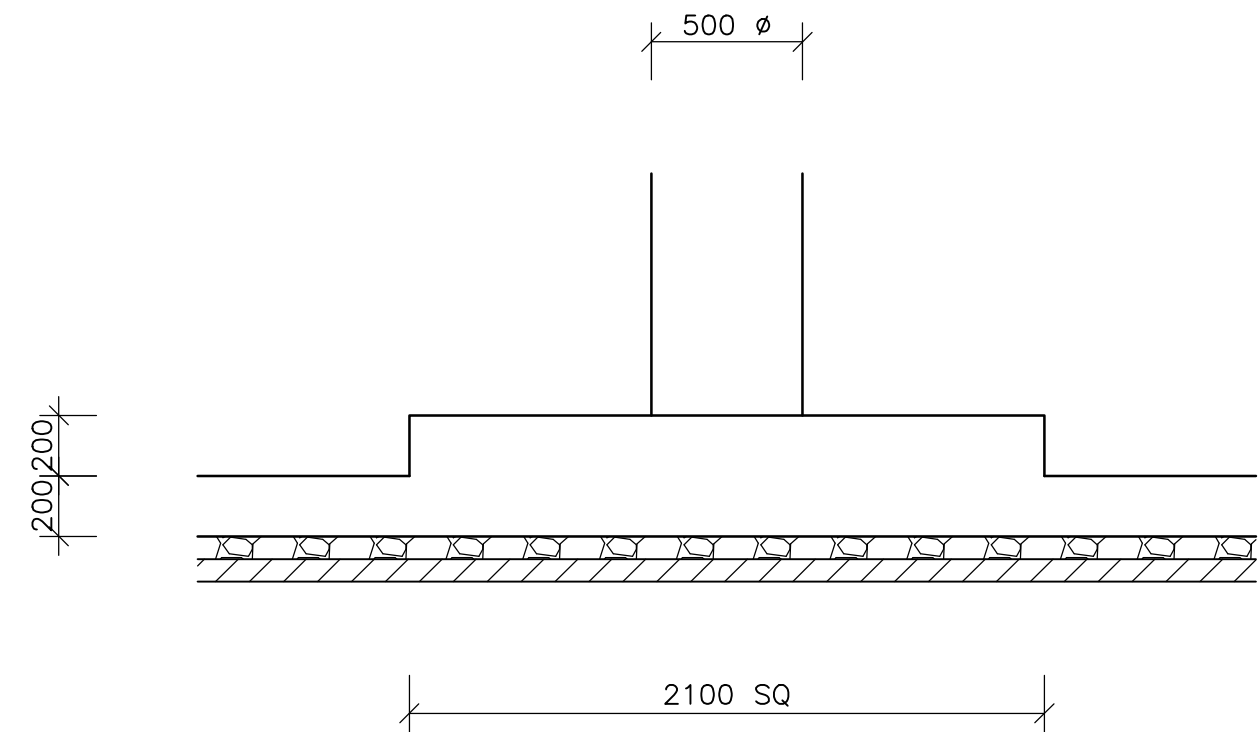
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CLIENT DRAWING No.: -	CLIENT REF No.: -

SURVEYED	SURVEYED	DESIGNED	JGB
DRAWN	JGB	CHECKED	KB
COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
APPROVED ON BEHALF OF BIGEN: DRAWING No.: 086-STR-F01			VERSION: A

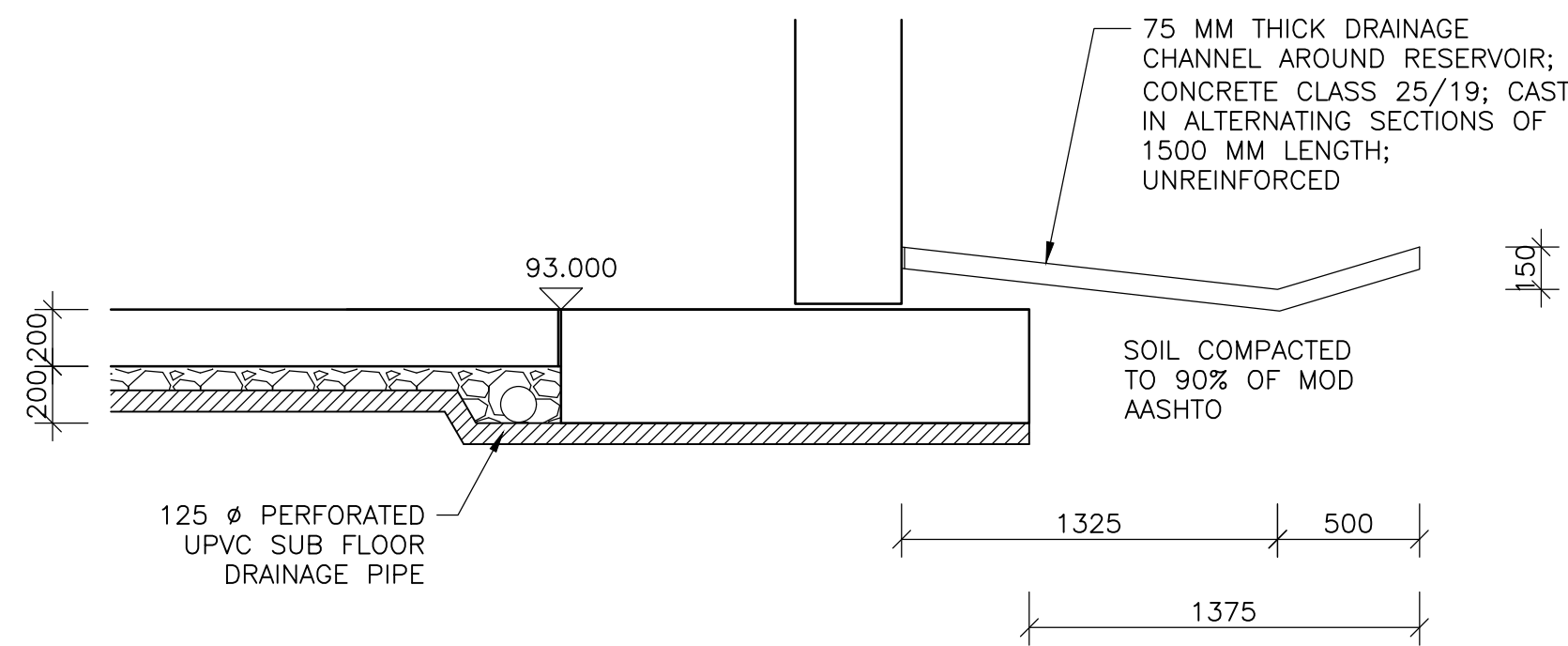
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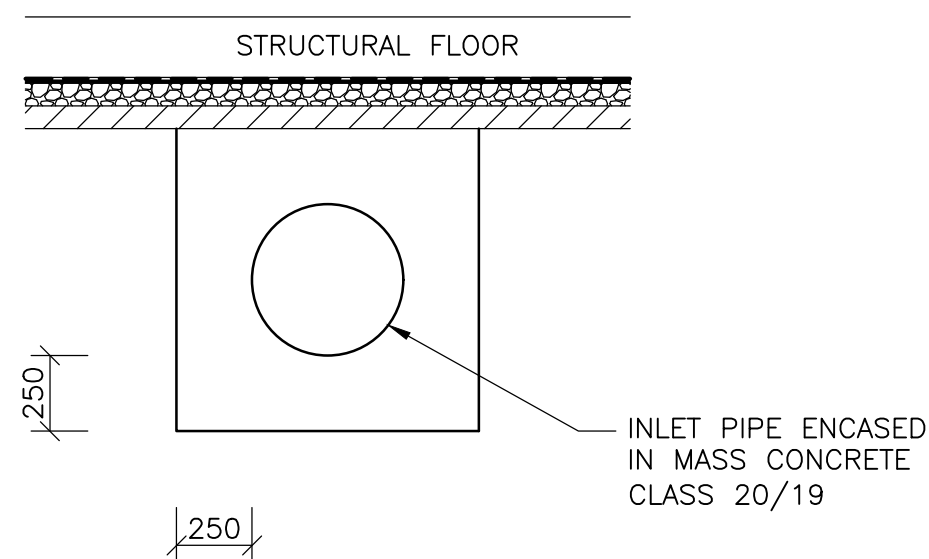
SECTION THROUGH RING FOUNDATION
SCALE 1:25



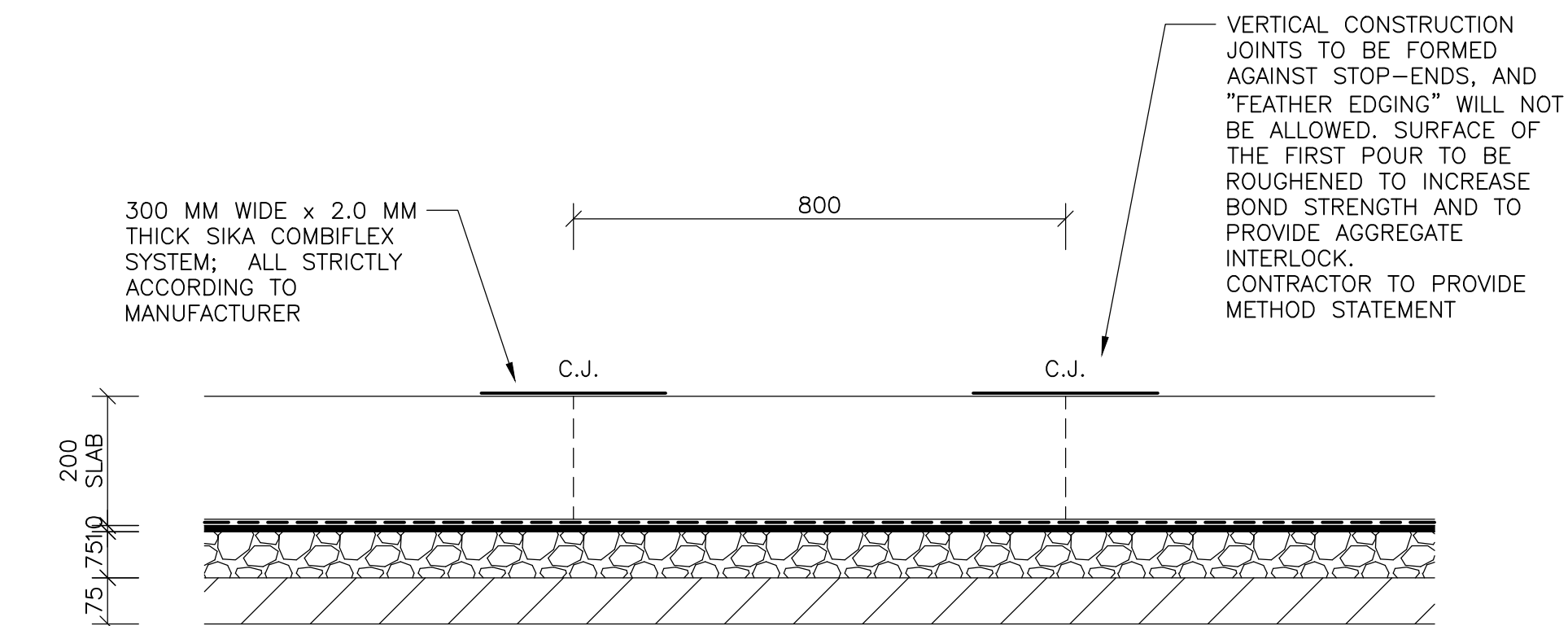
SECTION THROUGH COLUMN FOUNDATION
SCALE 1:25



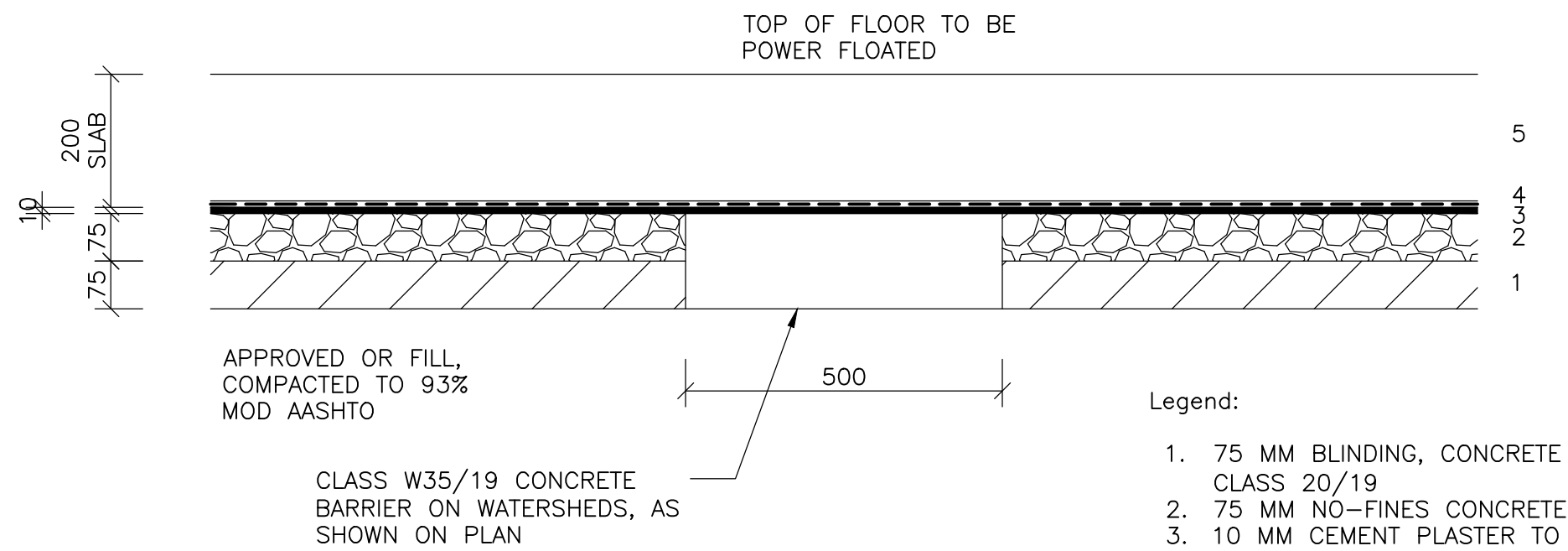
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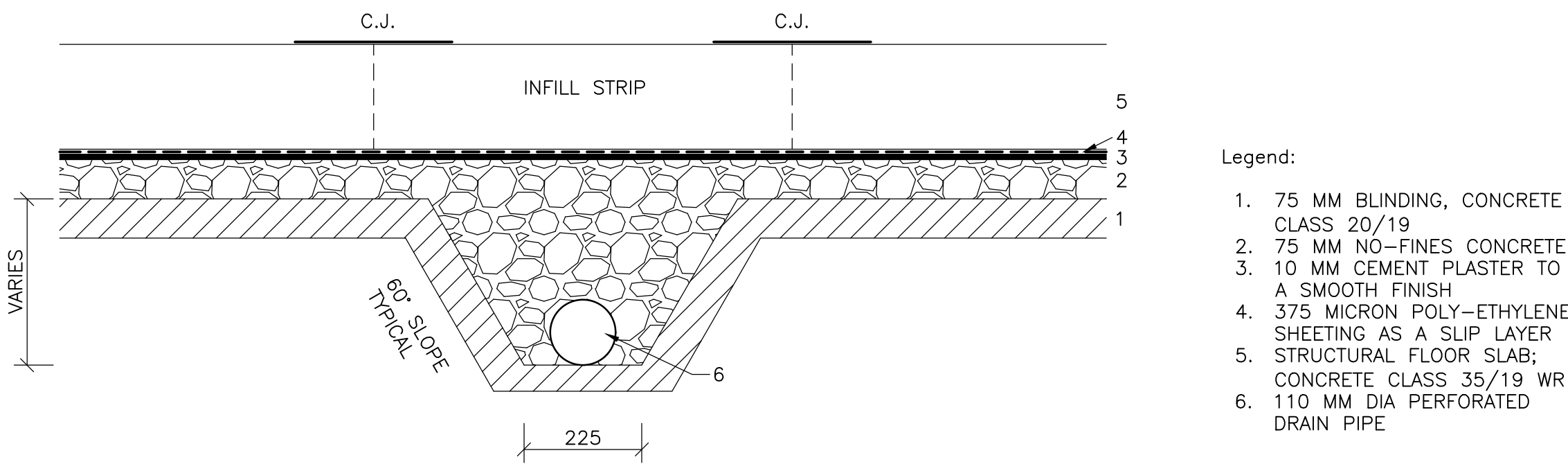
SECTION THROUGH INLET PIPE
SCALE 1:25 (OUTLET PIPE SIMILAR)



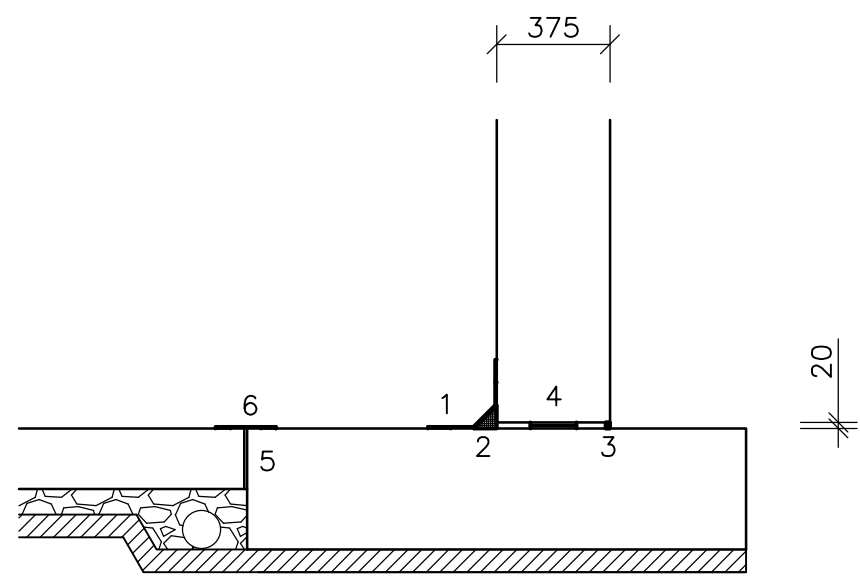
SECTION THROUGH INFILL STRIP
SCALE 1:10



TYPICAL UNDER FLOOR DETAIL
SCALE 1:10



SECTION THROUGH UNDERFLOOR DRAIN TRENCH
SCALE 1:10



JOINT DETAIL WALL/FLOOR
TO FOUNDATION
SCALE 1:25

LEGEND:

- 400 MM WIDE x 2.0 MM THICK SIKADUR-COMBIFLEX BANDAGE SYSTEM, GLUED TO BOTH WALL AND FLOOR OVER A WIDTH OF 75 MM, USING SIKADUR 31DW
- 75 x 75 HIGH DENSITY FOAM CORNER FILLER, MIN 100 DENSITY
- APPROX 20 x 15 SIKA POLY-URETHANE JOINT SEALANT
- TEFLON SLIDING BEARING FOR A SAFE WORKING LOAD OF 16 T/M; HORIZONTAL MOVEMENT = 38 MM SPACES BETWEEN PADS TO BE FILLED UP WITH A HIGH DENSITY FOAM
- 10 MM EXP. JOINT FORMED WITH HIGH DENSITY FOAM, SUITABLE FOR HIGH WATER PRESSURE
- 200 MM WIDE x 2.0 MM THICK SIKADUR COMBIFLEX BANDAGE SYSTEM, GLUED OVER 50 MM ON BOTH SIDES USING SIKADUR 31DW
- ALL MATERIAL TO BE CONFIRMED AS SUITABLE BY SUPPLIERS.

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The Innovation Hub
Pretoria
Phone: +27 (0) 12 842 8700
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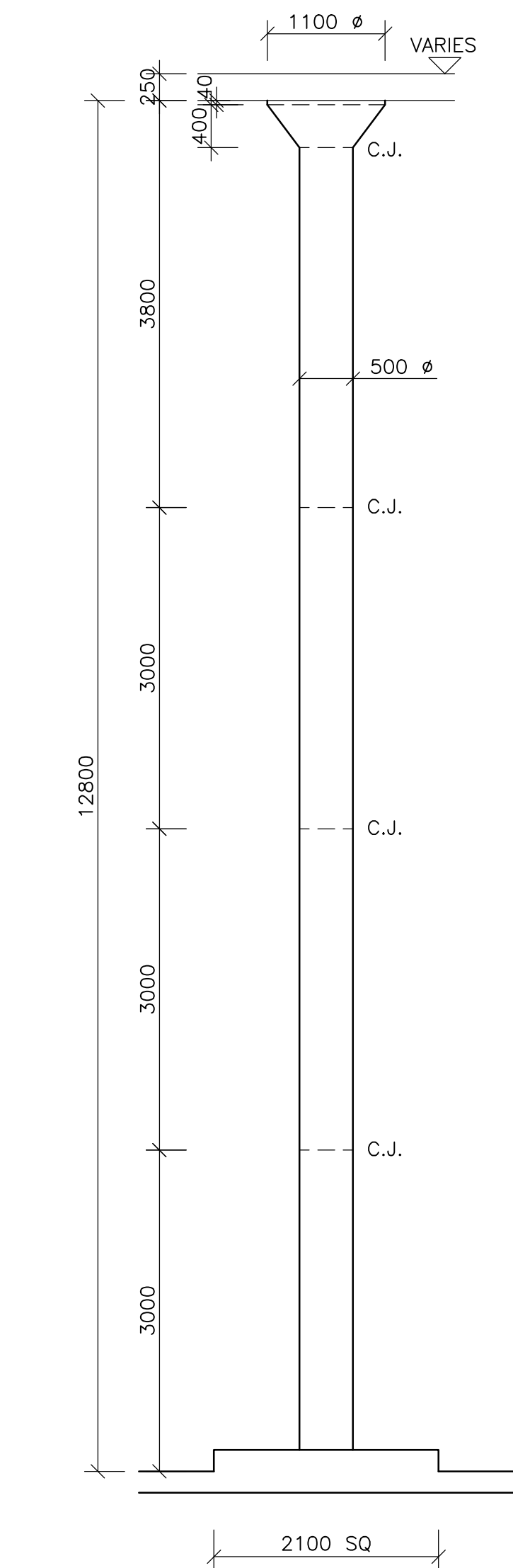
PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR
DRAWING TITLE: FOUNDATION DETAILS



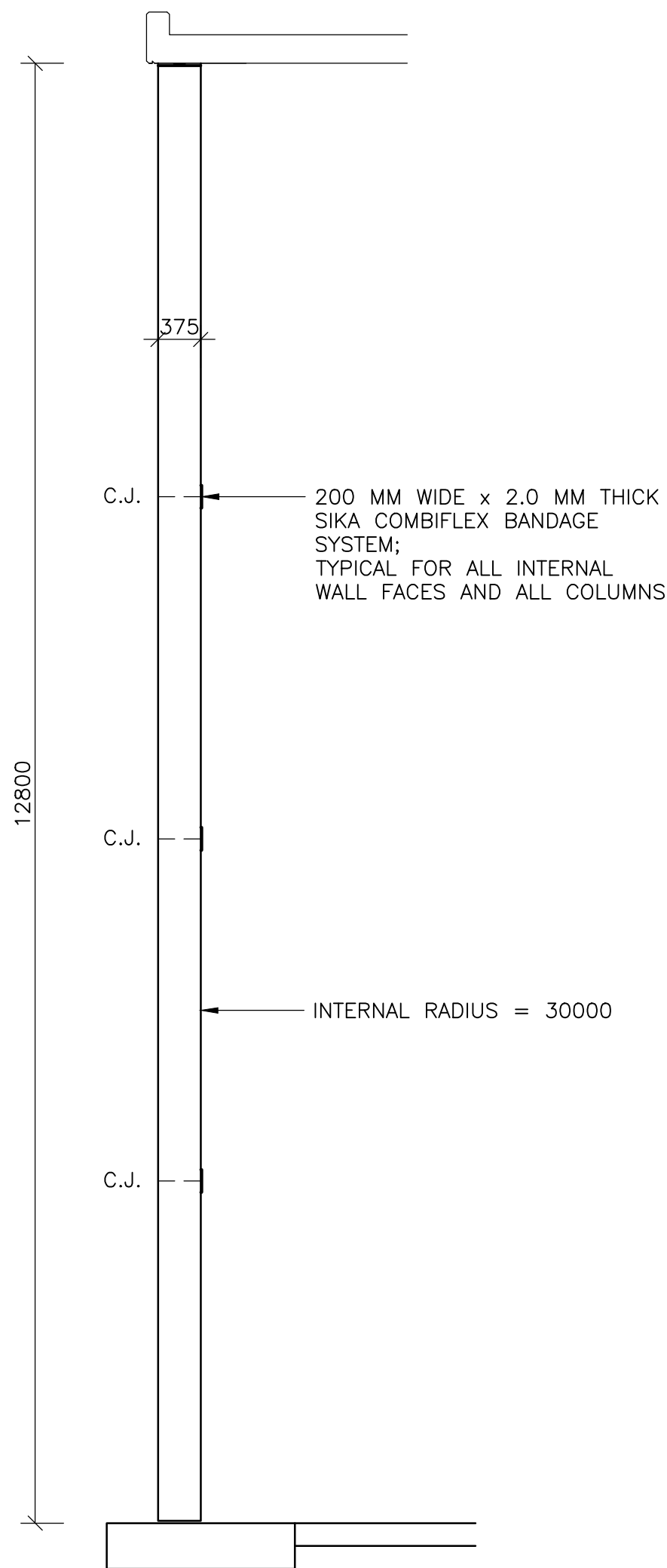
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CLIENT DRAWING No.: -	CLIENT REF No.: -

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DRAWN	JGB	CHECKED	KB
COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
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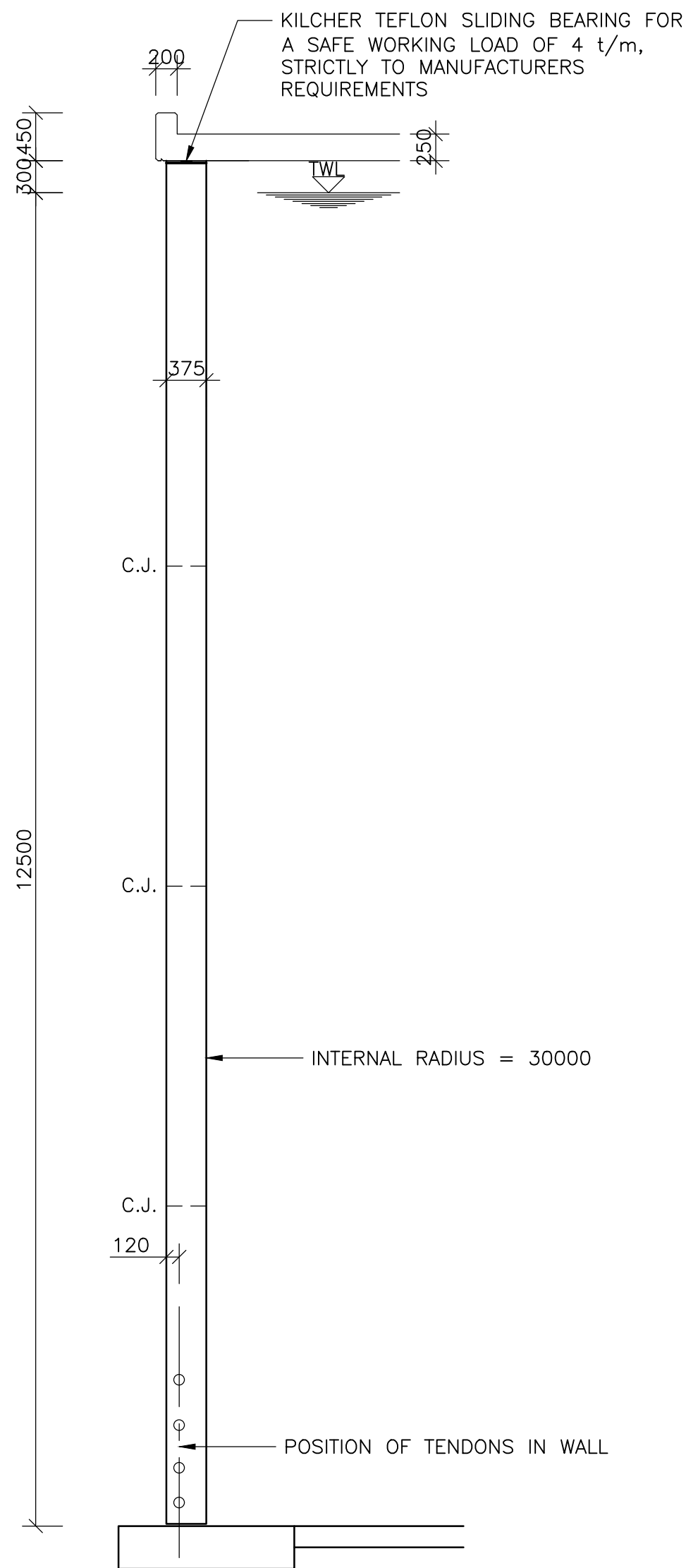
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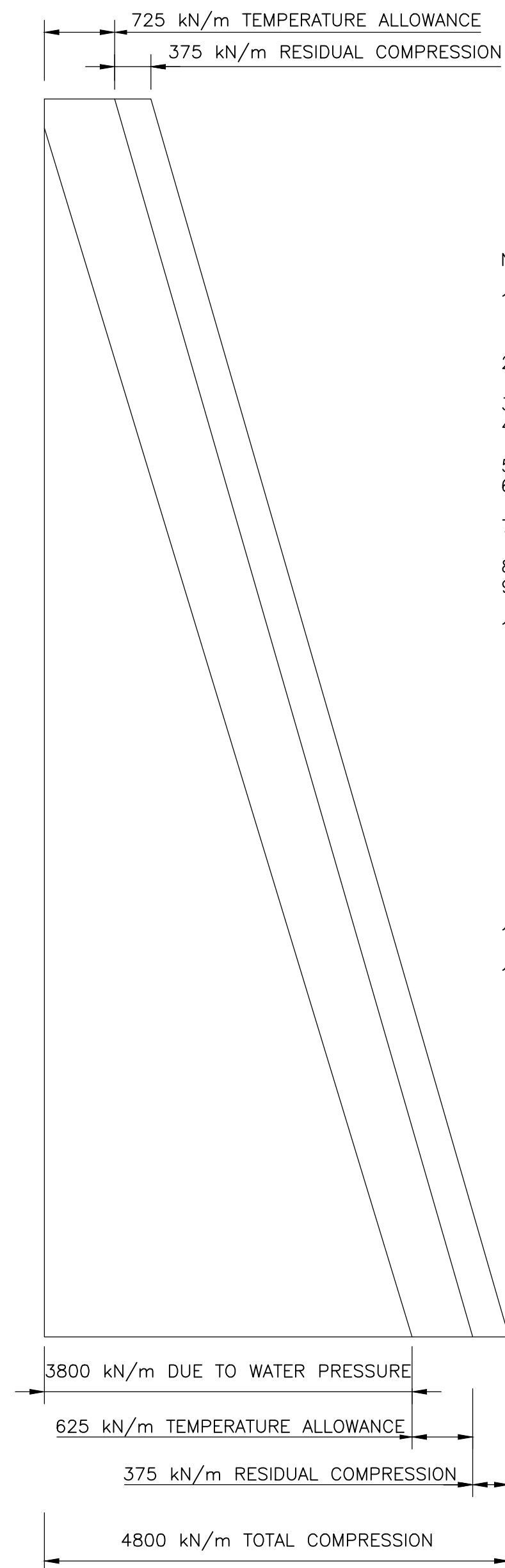
TYPICAL ELEVATION ON COLUMN
SCALE 1:50



TYPICAL SECTION THROUGH WALL
SCALE 1:50



TYPICAL SECTION THROUGH WALL
SCALE 1:50



FINAL REQUIRED POST-TENSIONING FORCES ON WALL

- NOTES TO POST TENSIONING:
- THE POST-TENSIONING DESIGN IS BASED ON A BONDED DYWIDAG SYSTEM 15.7, USING LUBRICATED UNCOATED LOW RELAXATION STRANDS IN CORRUGATED METAL SHEATHS, (NON GALVANISED).
 - THE CONTRACTOR MUST SUBMIT A FULL DETAILED POST-TENSIONING PROPOSAL FOR APPROVAL TO THE ENGINEER
 - CONCRETE CLASS FOR WALL AND BUTTRESSES TO BE W50/19
 - NOMINAL CONCRETE COVER TO VERTICAL WALL STEEL TO BE 40 MM, BOTH INSIDE AND OUTSIDE
 - ALL CABLES TO BE STRESSED FROM LIVE ANCHORS ON BOTH SIDES
 - ALL CABLES TO SPAN THROUGH 90 DEGREES ALTERNATING, I.E. SKIP ONE ALTERNATING BUTTRESS
 - SPIRAL REINFORCEMENT AT ANCHORS TO BE SUPPLIED BY THE POST-TENSIONING CONTRACTOR
 - ALL CABLE STOOLES TO BE SUPPLIED BY POST-TENSIONING CONTRACTOR
 - ALL ANCHORS TO BE SEALED BY AN APPROVED EPOXY MORTAR ON COMPLETION OF THE STRESSING
 - TECHNICAL VALUES/DATA USED IN THE DESIGN IS AS FOLLOWS:
- LONG TERM LOSSES: 17.0 % (INCLUDES 2.5 % RELAXATION)
- LOSSES DUE TO ELASTIC SHORTENING, FRICTION AND WEDGE SLIP:
- FRICTION AND WOBBLE 15.9 %
- ELASTIC SHORTENING 3.5 %
- WEDGE SLIP AT ANCHOR 6 MM
- THE FOLLOWING PARAMETERS WERE USED:
- WOBBLE FACTOR K=0.0017
- FRICTION FACTOR = 0.18
- UTS OF STRANDS = 1860 MPa
- CONCRETE CUBE STRENGTH AT STRESSING: 50 MPa
- INITIAL STRESSING TO 75% OF ULTIMATE
- TOTAL RADIAL INWARD MOVEMENT DUE TO PRESTRESSING, CONCRETE SHRINKAGE AND — CREEP IS ESTIMATED AS 38.8 MM
 - TOTAL RADIAL OUTWARD MOVEMENT DUE THE HYDROSTATIC WATER PRESSURE IS ESTIMATED AS 9.4 MM.

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The Innovation Hub
Pretoria

Phone: +27 (0) 12 842 8700
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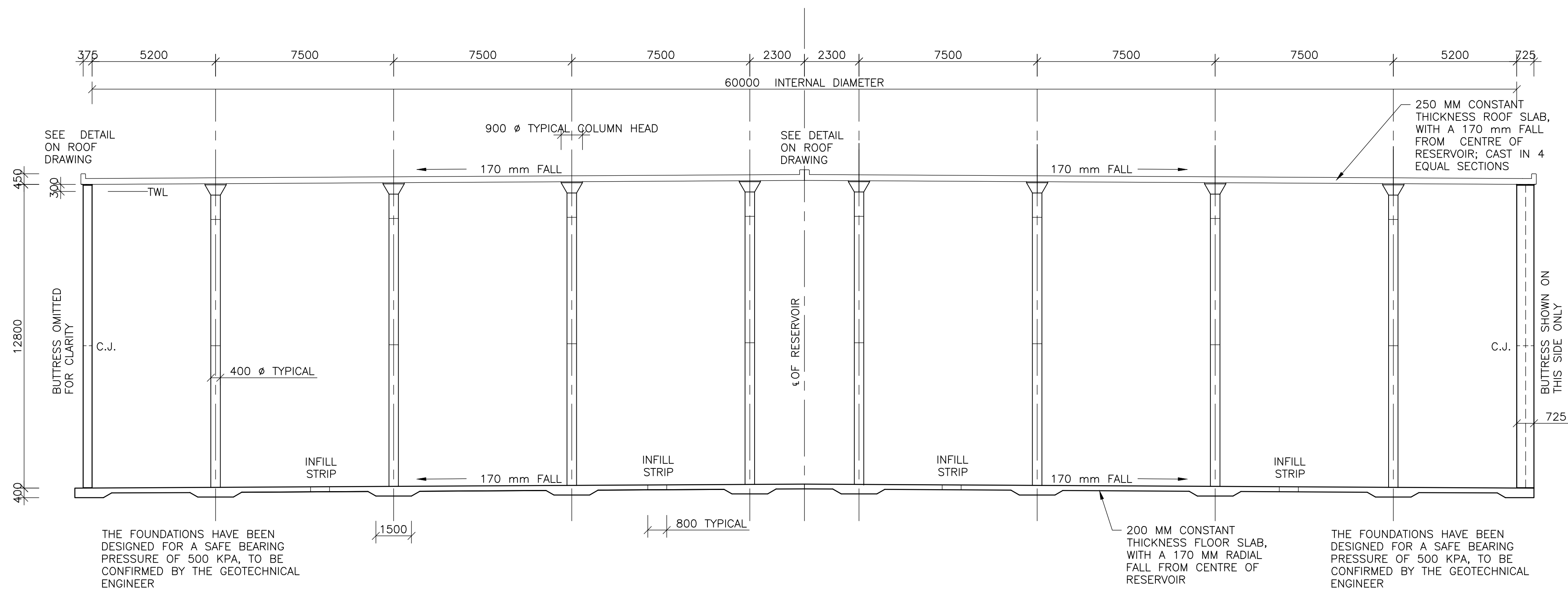
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DRAWING TITLE:	FOUNDATION LAYOUT



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APPROVED ON BEHALF OF CLIENT:	
NAME:	
DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:
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SURVEYED	SURVEYED	DESIGNED	JGB
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COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
APPROVED ON BEHALF OF BIGEN:		VERSION:	
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086-STR-TD02			

086-STR-TD02



CROSS-SECTION ON ϕ OF RESERVOIR
SCALE 1:125

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Allan Cormack Street
The Innovation Hub
Pretoria
Pretoria

Phone: + 27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
BOSPOORT NORTH RESERVOIR**

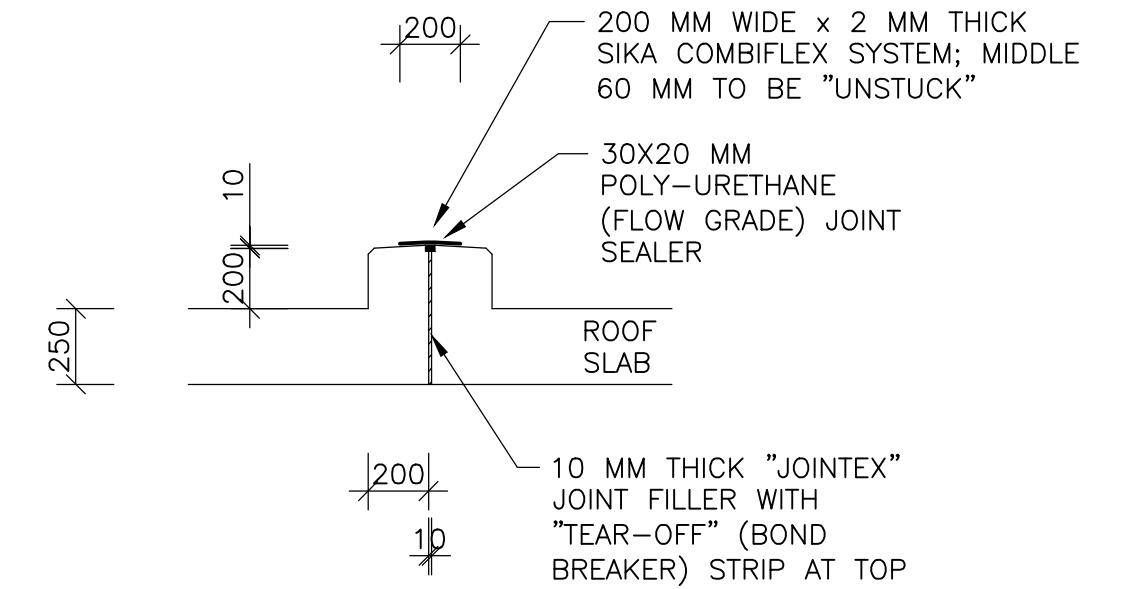
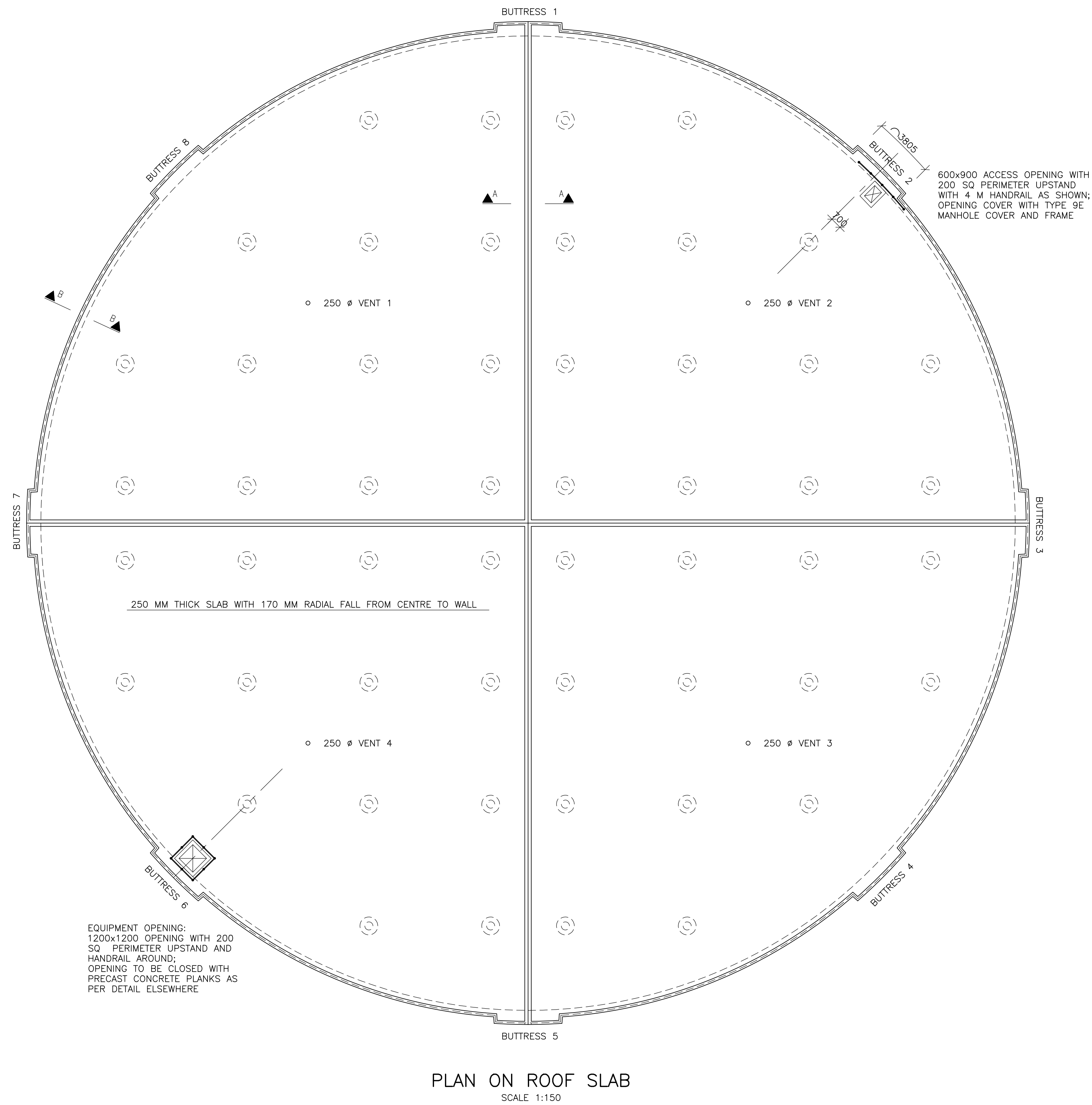
DRAWING TITLE:
SECTION THROUGH RESERVOIR CENTERLINE



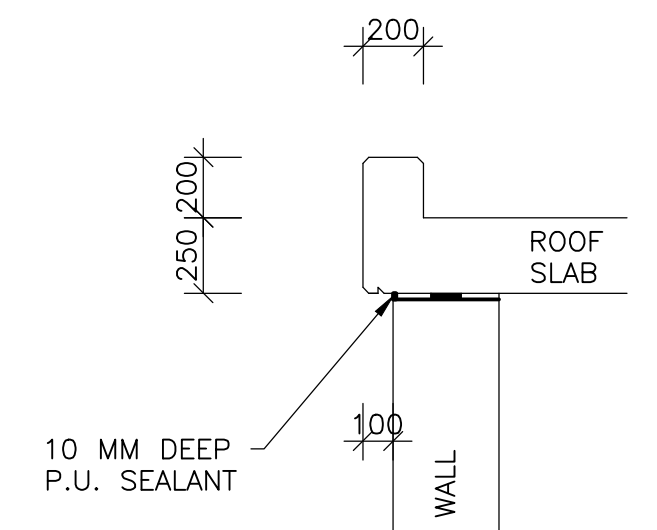
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COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
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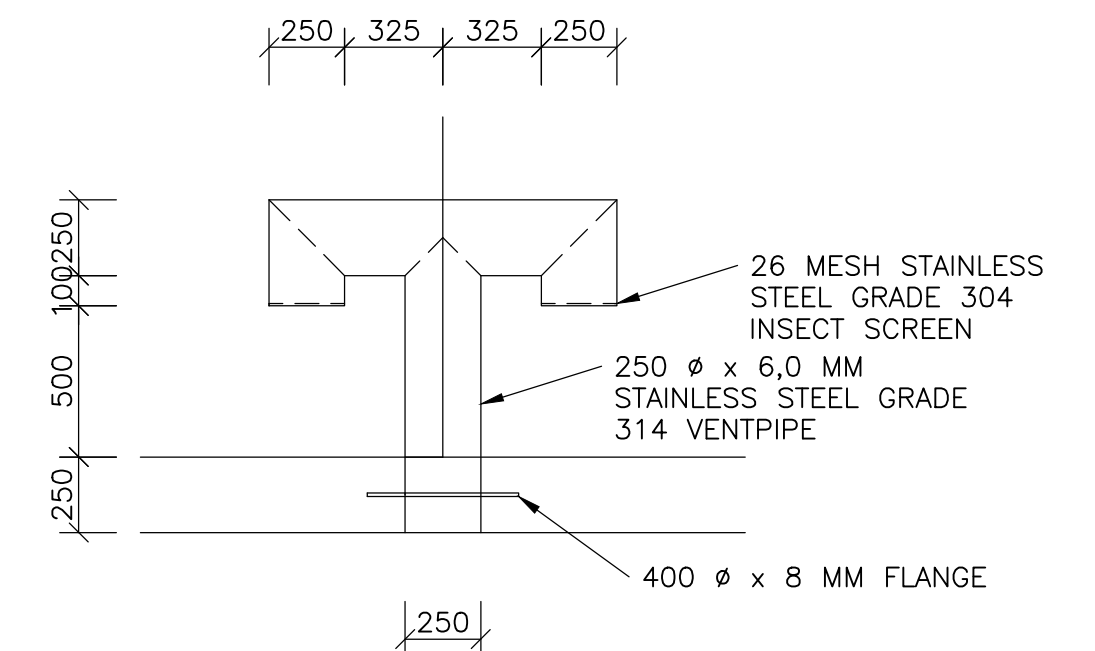
086-STR-TD03



SECTION A-A
SCALE 1:25



SECTION B-B
SCALE 1:25



VENT PIPE DETAIL
SCALE 1:25

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Allan Cornack Street
The Innovation Hub
Pretoria

Phone: +27 (0) 12 842 8700
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PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
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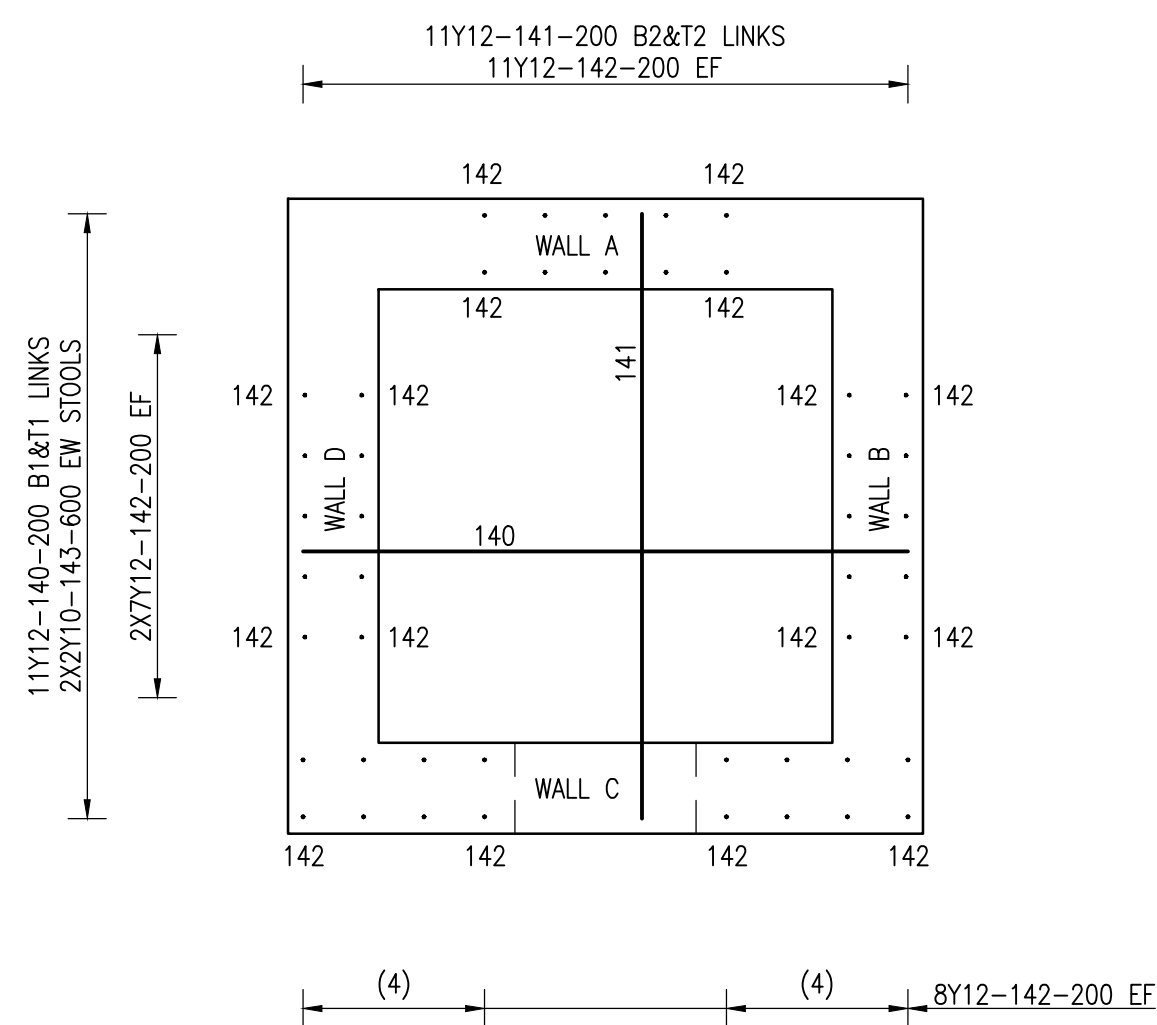
DRAWING TITLE:
ROOF PLAN



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APPROVED ON BEHALF OF CLIENT:	
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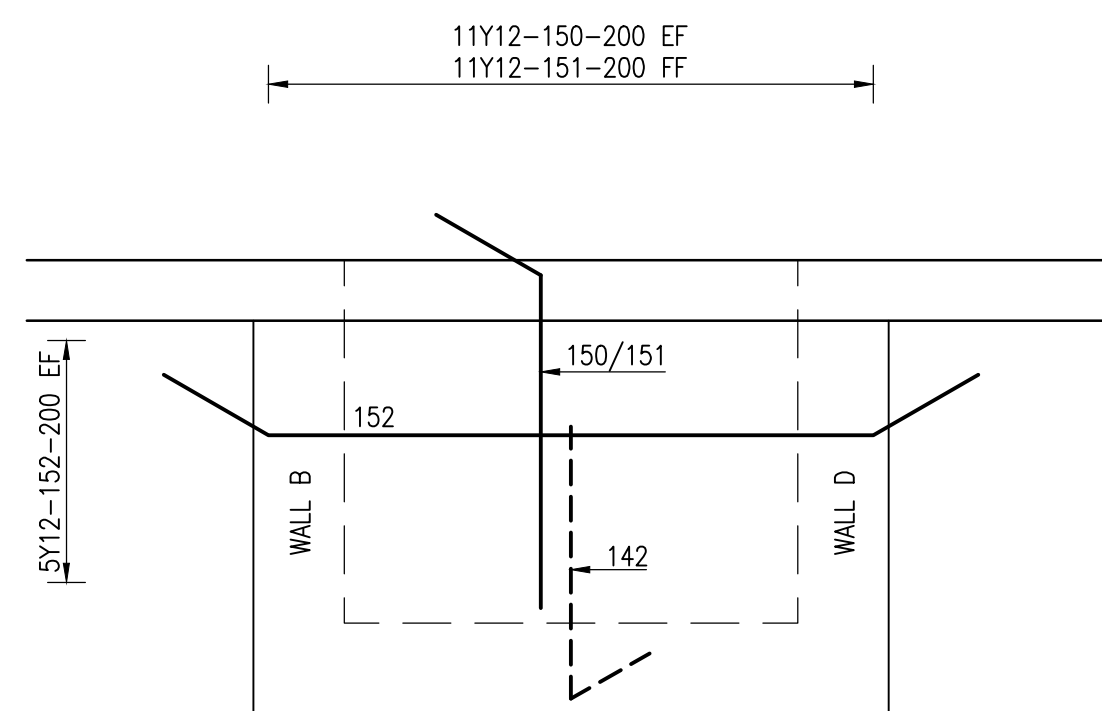
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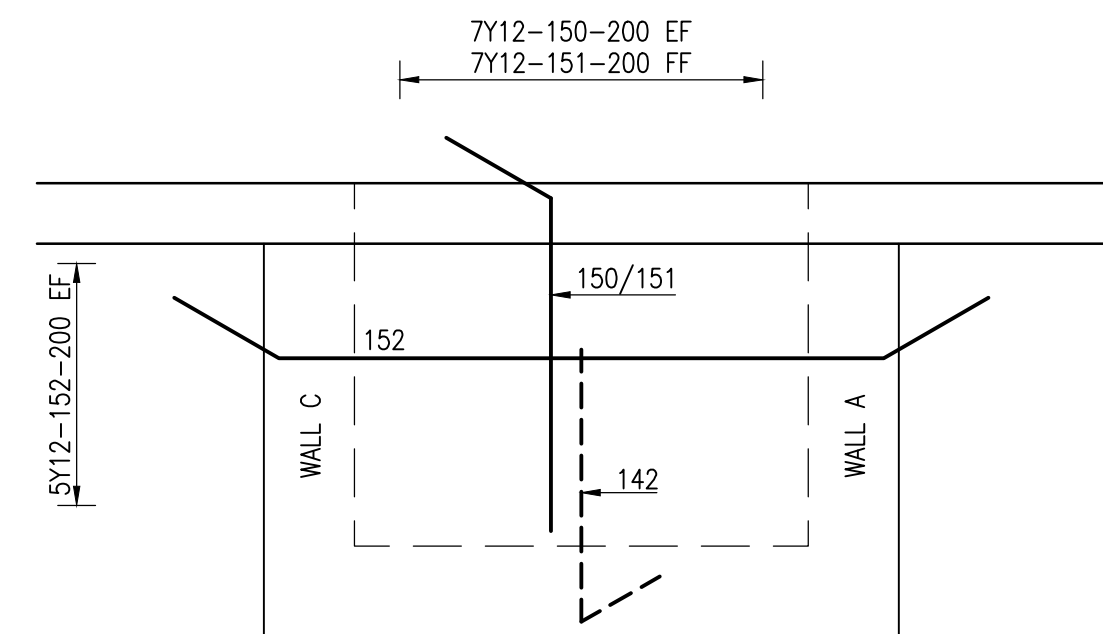
PLAN ON OUTLET
SCALE 1:25

NOTES:

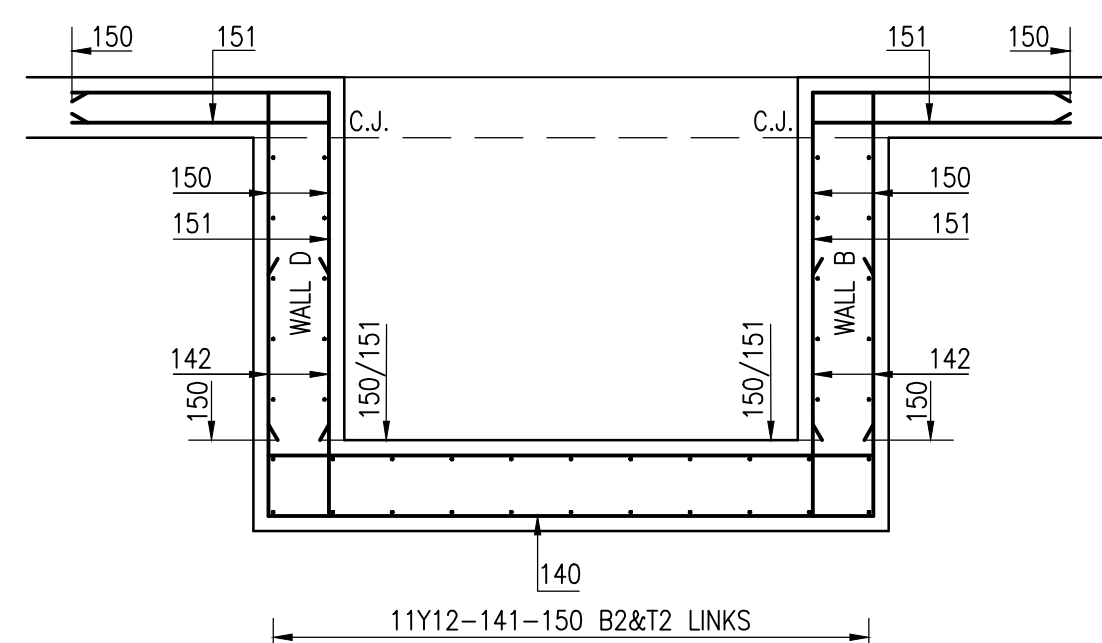
1. CONCRETE TO BE CLASS W35/19
MIX DESIGN TO BE APPROVED BY THE ENGINEER
2. CONCRETE COVER TO BE AS FOLLOW:
2.1. SLAB 50 mm
2.2. WALLS 50 mm
3. REINFORCEMENT TO BE INSPECTED AND APPROVED
BY ENGINEER BEFORE CASTING OF CONCRETE
4. PROVIDE STOOLS, MK143, AT 600 EW
5. PROVIDE WALL CLIPS, MK156, AT 2/m²



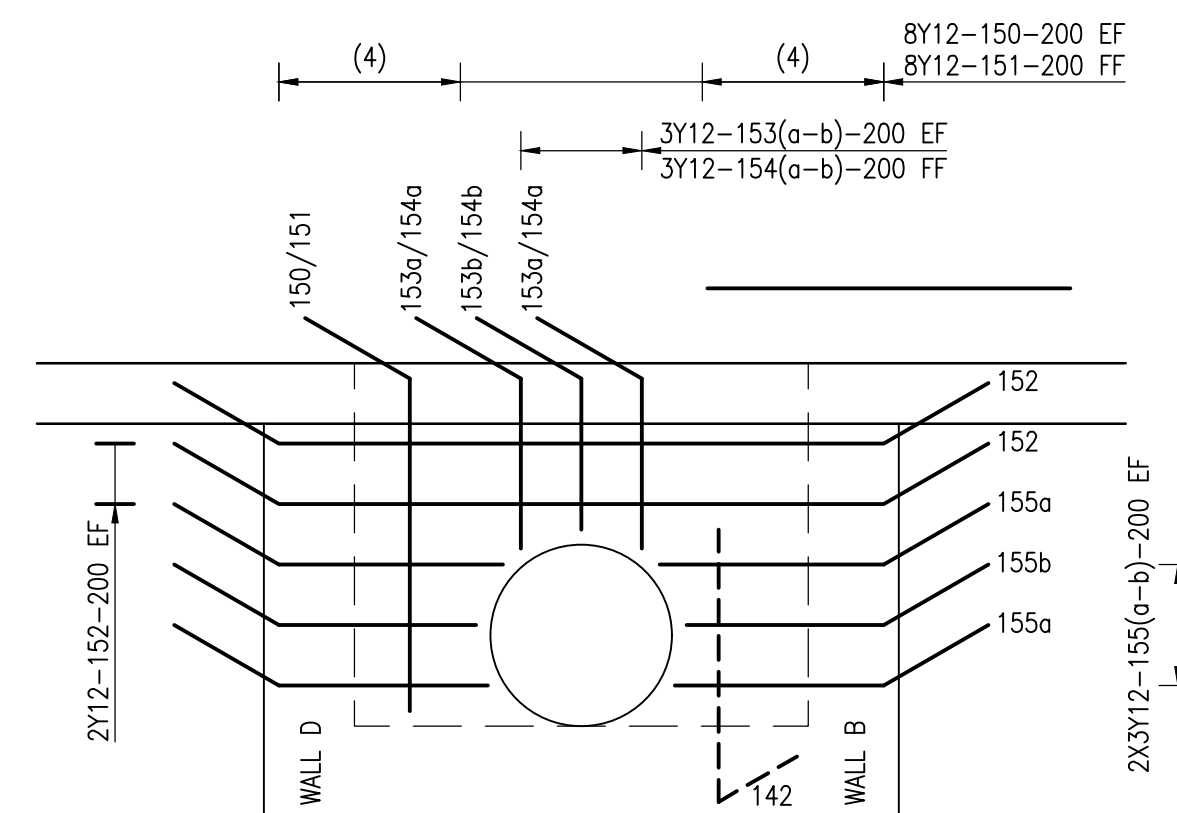
ELEVATION ON WALL A
SCALE 1:25



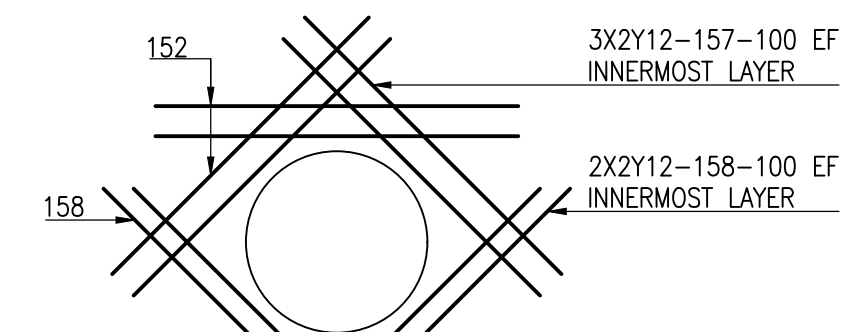
ELEVATION ON WALL B
WALL D SIMILAR
SCALE 1:25



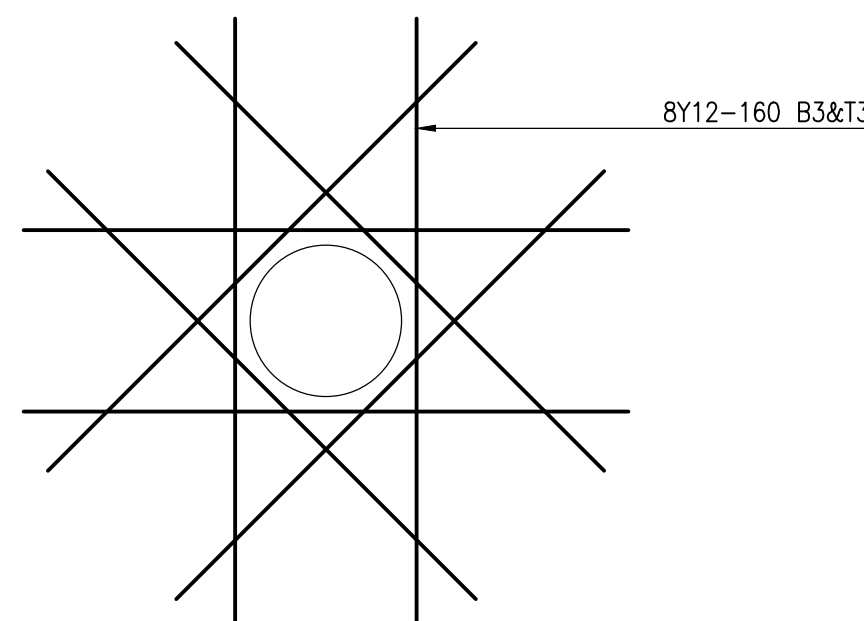
SECTION THROUGH OUTLET
SCALE 1:25



ELEVATION ON WALL C
SCALE 1:25



EXTRA REINFORCEMENT AT PIPE
OPENING
SCALE 1:25



EXTRA REINFORCEMENT AT PIPE OPENINGS
2 OFF
(FLOOR SLAB ONLY)
SCALE 1:25

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Allan Cornack Street
The Innovation Hub
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Phone: +27 (0) 12 842 8700
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PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR	
DRAWING TITLE: FOUNDATION LAYOUT	



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE:	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED ON BEHALF OF CLIENT:	
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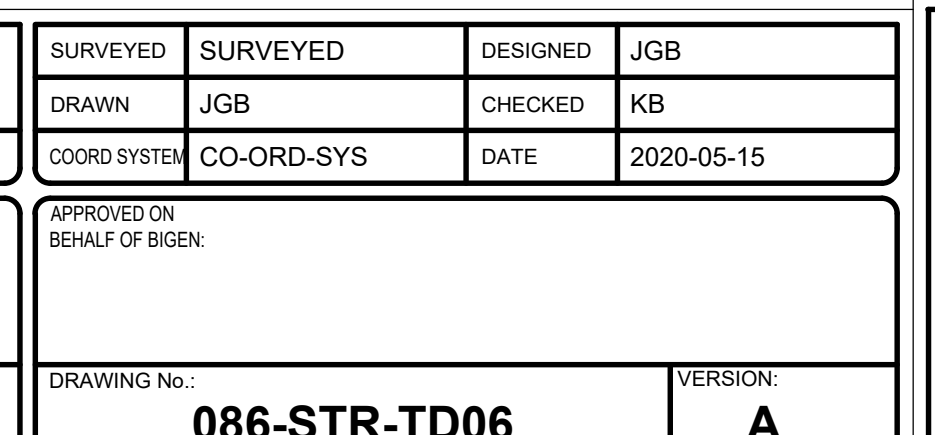
1. CONCRETE CLASSES TO BE AS FOLLOWS:
 - a. WALLS AND BUTTRESSES CLASS 50/19 WR
 - b. COLUMNS CLASS 35/19 WR
- MIX DESIGN TO BE APPROVED BY THE ENGINEER
2. CONCRETE COVER TO REINFORCEMENT TO BE AS FOLLOWS:
 - a. WALLS AND BUTTRESSES 40 MM
 - b. COLUMN STIRRUPS 40 MM
3. WALL THICKNESS TO BE CONSTANT AT 375 MM
4. ALL REBAR TO BE INSPECTED BY THE ENGINEER BEFORE CASTING
5. SPLITTING STEEL IN BUTTRESSES TO BE ADJUSTED TO SUIT CABLES AND ANCHORS
6. SPACING OF VERTICAL WALL STEEL TO BE MEASURED ON RADIUS SHOWN
7. LAPS OF MINIMUM 900 MM LENGTH IN HORIZONTAL WALL STEEL TO BE STAGGERED RANDOMLY.

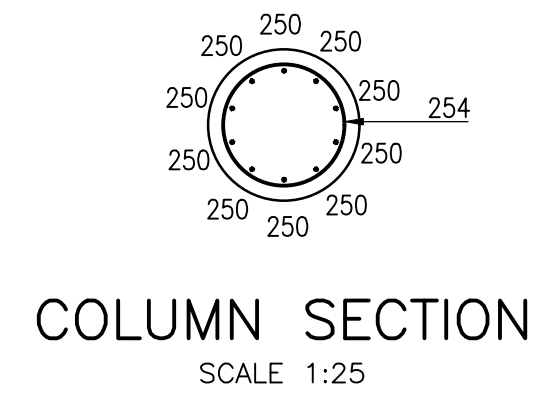
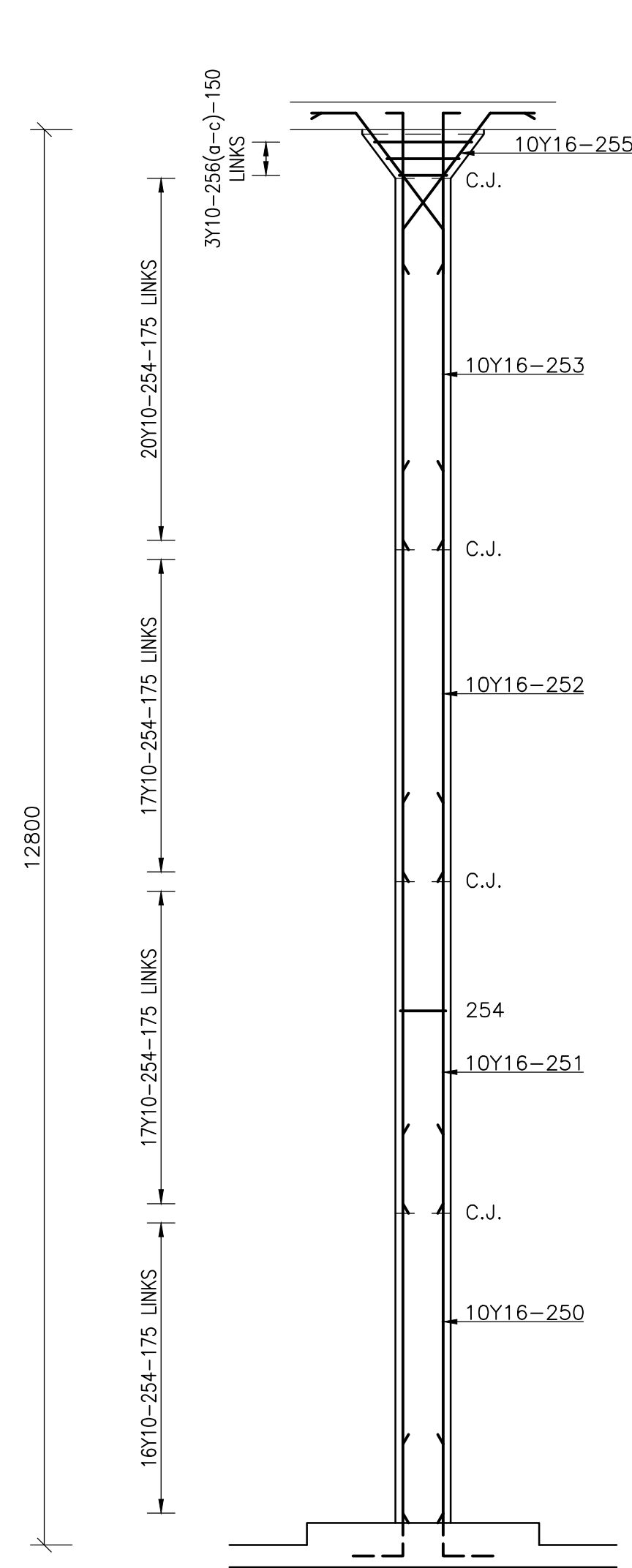
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DRAWING TITLE:

FOUNDATION LAYOUT





COLUMN ELEVATION
52 OFF
SCALE 1:50

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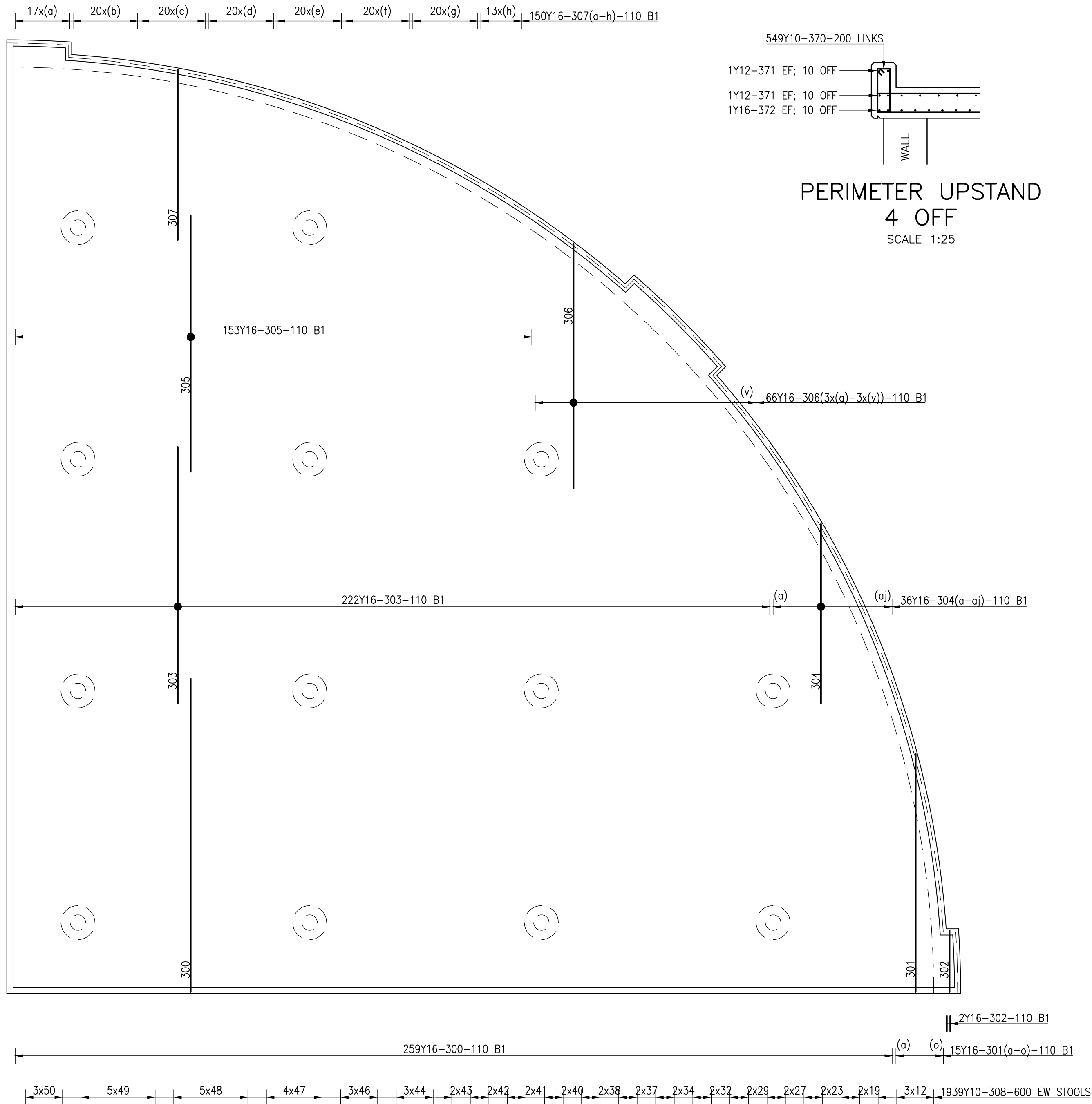
PROJECT TITLE: BOSPOORT WATER SUPPLY SCHEME PIPELINE AND BOSPOORT NORTH RESERVOIR
DRAWING TITLE: FOUNDATION LAYOUT



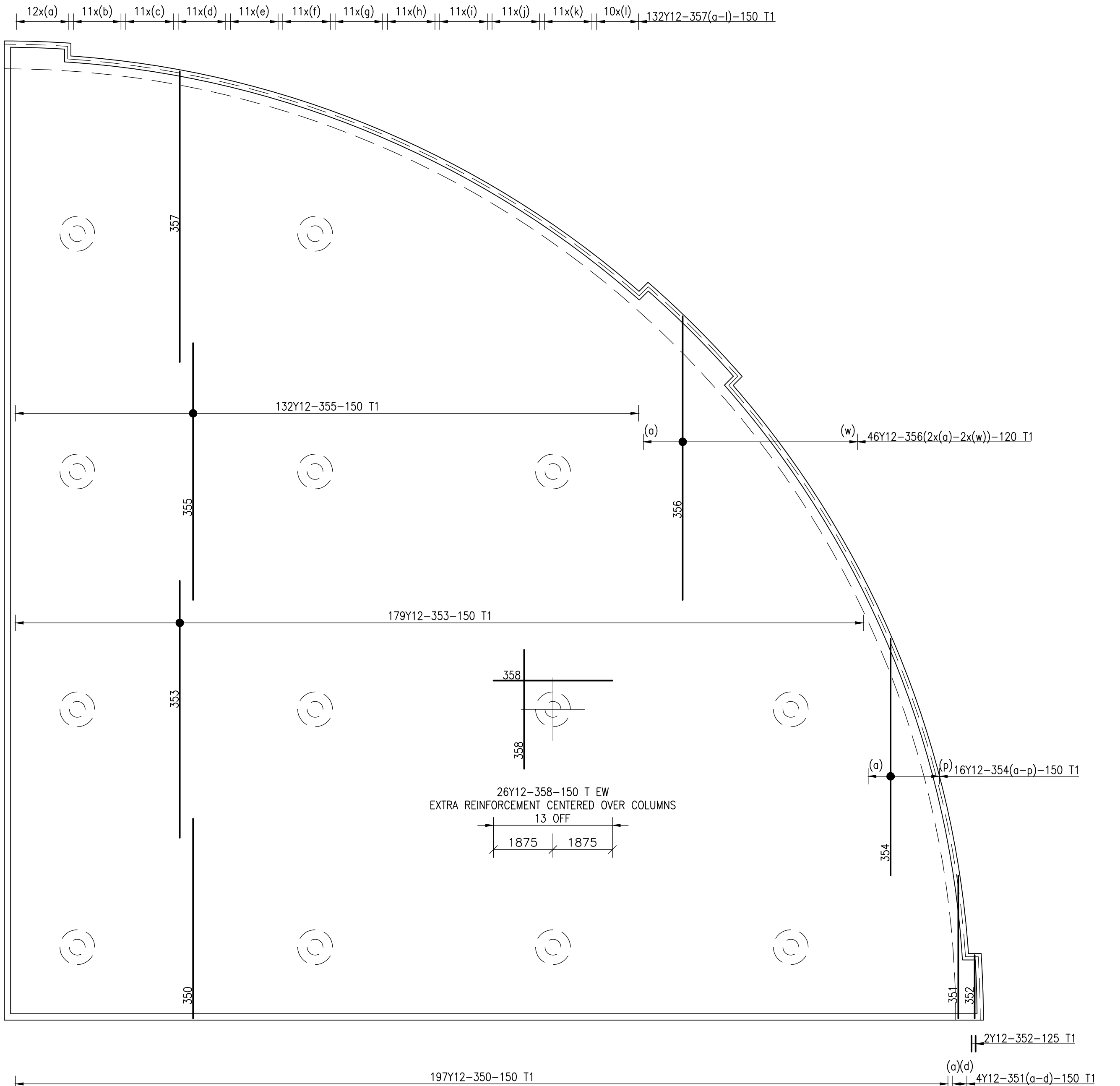
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COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
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086-STR-TD07



ROOF SLAB
BOTTOM REINFORCEMENT
4 OFF
SCALE 1:100



ROOF SLAB
TOP REINFORCEMENT
4 OFF
SCALE 1:100

- NOTES:
- CONCRETE CLASSES TO BE AS FOLLOWS:
 - ROOF SLAB CLASS 35/19 WR
 - UP-STAND WALLS CLASS 35/19 WRMIX DESIGN TO BE APPROVED BY THE ENGINEER
 - CONCRETE COVER TO REINFORCEMENT TO BE AS FOLLOWS:
 - ROOF SLAB 40 MM
 - UP-STAND WALLS 40 MM
 - SLAB THICKNESS TO BE CONSTANT AT 250 mm WITH A 170 mm RADIAL FALL FROM THE CENTER OF RESERVOIR TO THE INNER EDGE OF THE RESERVOIR WALL - IDENTICAL TO THE FLOOR SLAB RESULTING IN ALL COLUMN HEIGHTS TO BE EQUAL
 - PROVIDE STOOLES MK 308 AT 600 EW

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Allan Cornack Street
The Innovation Hub
Pretoria

Phone: + 27 (0) 12 842 8700
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PROJECT TITLE:
**BOSPOORT WATER SUPPLY SCHEME
PIPELINE AND
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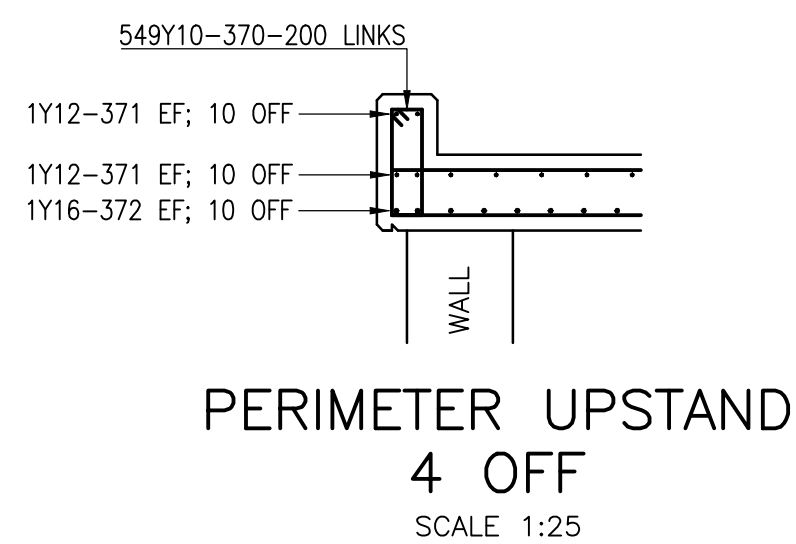
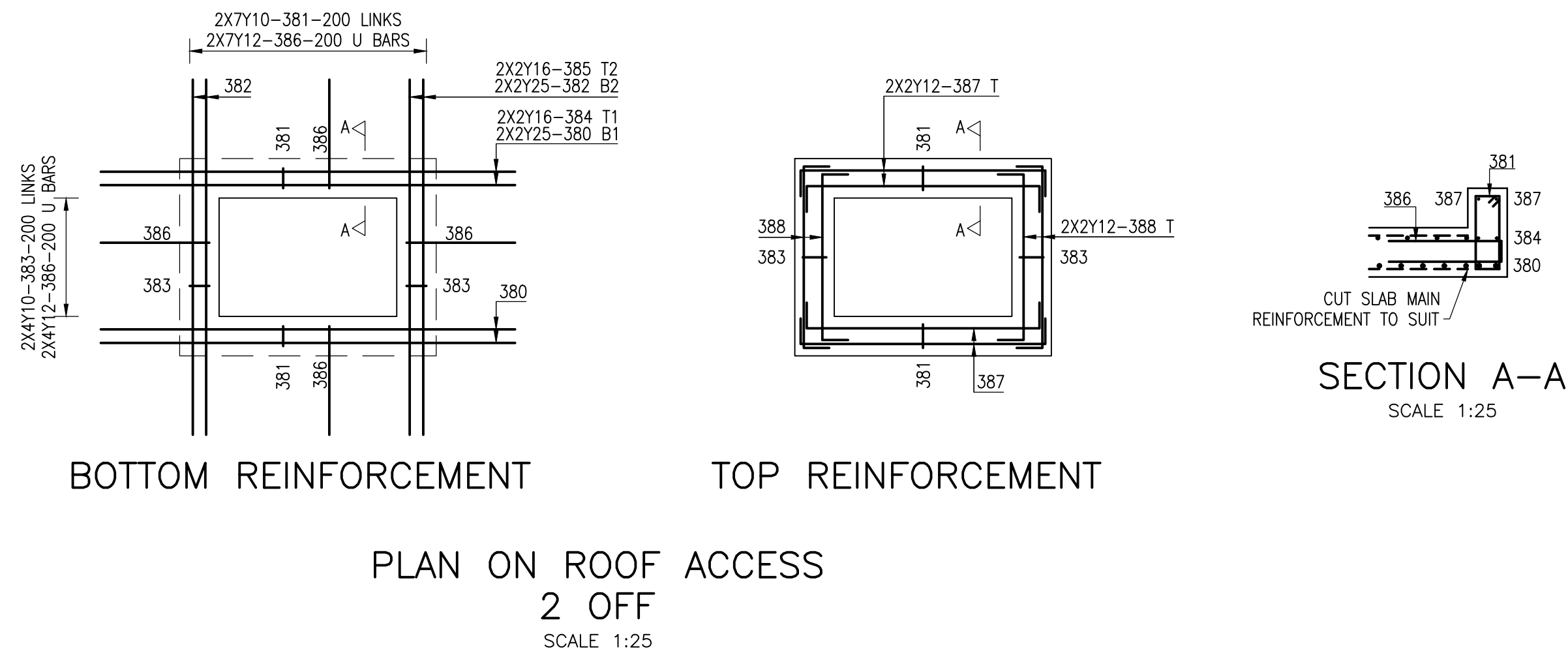
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FOUNDATION LAYOUT



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DRAWING No.: 086-STR-TD08			A

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Allan Cornack Street
The Innovation Hub
Peregrine
Pretoria

Phone: +27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
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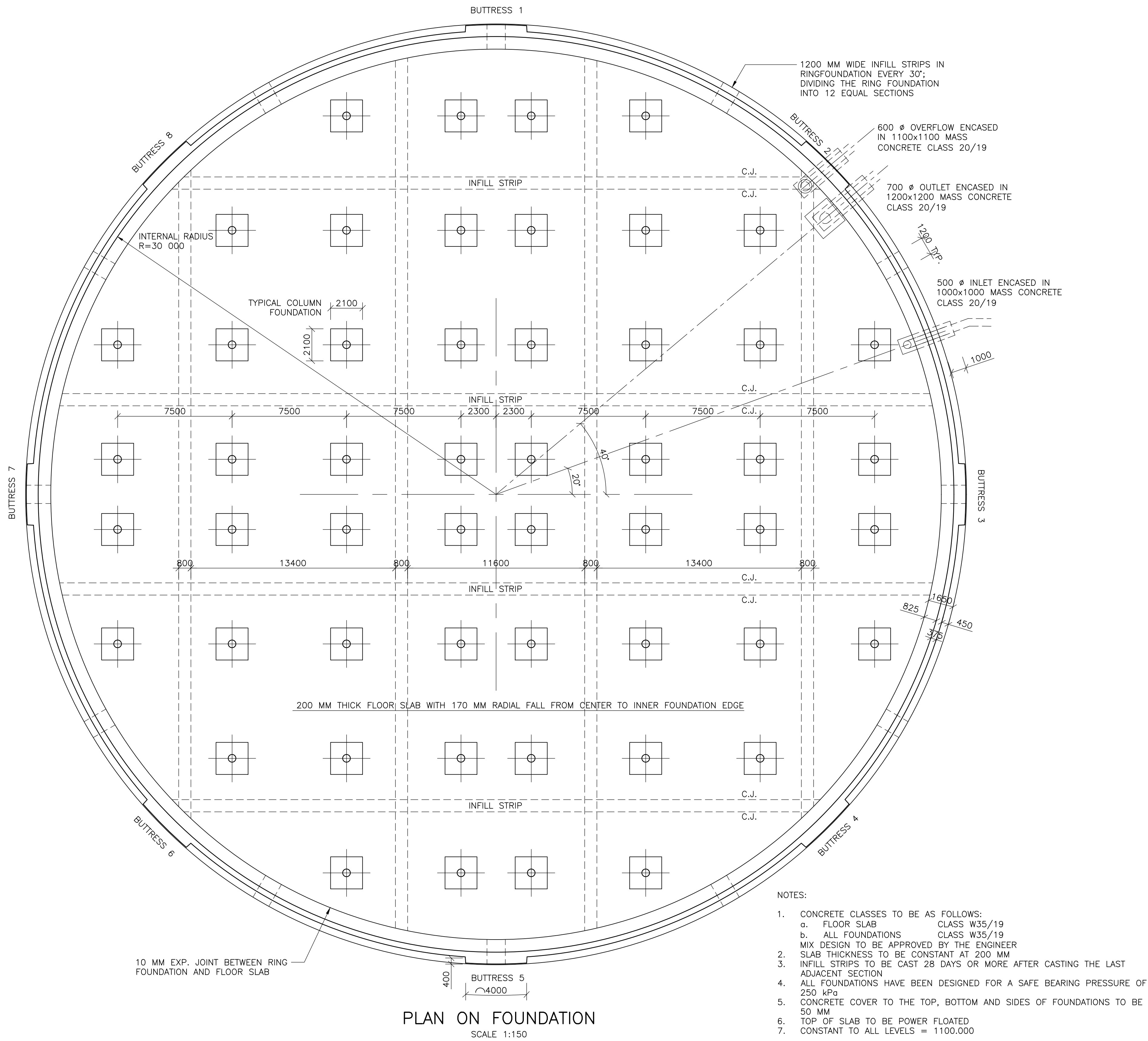
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FOUNDATION LAYOUT



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DATE:	
CLIENT DRAWING No.:	CLIENT REF No.:
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COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
APPROVED ON BEHALF OF BIGEN:			VERSION:
DRAWING No.: 086-STR-TD09			A

086-STR-TD09



- NOTES:
1. CONCRETE CLASSES TO BE AS FOLLOWS:
a. FLOOR SLAB CLASS W35/19
b. ALL FOUNDATIONS CLASS W35/19
MIX DESIGN TO BE APPROVED BY THE ENGINEER
 2. SLAB THICKNESS TO BE CONSTANT AT 200 MM
 3. INFILL STRIPS TO BE CAST 28 DAYS OR MORE AFTER CASTING THE LAST ADJACENT SECTION
 4. ALL FOUNDATIONS HAVE BEEN DESIGNED FOR A SAFE BEARING PRESSURE OF 250 kPa
 5. CONCRETE COVER TO THE TOP, BOTTOM AND SIDES OF FOUNDATIONS TO BE 50 MM
 6. TOP OF SLAB TO BE POWER FLOATED
 7. CONSTANT TO ALL LEVELS = 1100,000

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The Innovation Hub
Pretoria

Phone: +27 (0) 12 842 8700
pretoria@bigengroup.com



PROJECT TITLE:
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DRAWING TITLE:
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0 50 100
100mm ON ORIGINAL DRAWING

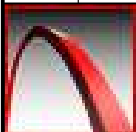
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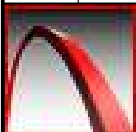
APPROVED ON BEHALF OF CLIENT:

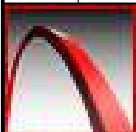
NAME: DATE: CLIENT DRAWING No.: CLIENT REF No.:

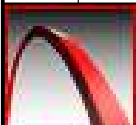
SURVEYED	SURVEYED	DESIGNED	JGB
DRAWN	JGB	CHECKED	KB
COORD SYSTEM	CO-ORD-SYS	DATE	2020-05-15
APPROVED ON BEHALF OF BIGEN:			
DRAWING No.: 086-STR-LY01			VERSION: A


086-STR-LY01

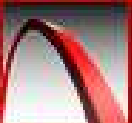
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Foundation slab	1	1296	Y10	13000	1296	100	20	(13000)				
		8	Y10	12400	8	101a	38	100	12225	(100)		
		8	Y10	10650	8	101b	38	100	10475	(100)		
		8	Y10	8500	8	101c	38	100	8325	(100)		
		8	Y10	5550	8	101d	38	100	5390	(100)		
		2016	Y10	13000	2016	102	20	(13000)				
		2016	Y10	2300	2016	103	20	(2300)				
		16	Y10	13000	16	104a	37	100	(12900)			
		16	Y10	12900	16	104b	37	100	(12820)			
		16	Y10	12700	16	104c	37	100	(12600)			
		16	Y10	12500	16	104d	37	100	(12400)			
		16	Y10	12250	16	104e	37	100	(12175)			
		16	Y10	12050	16	104f	37	100	(11950)			
		16	Y10	11800	16	104g	37	100	(11725)			
		16	Y10	11600	16	104h	37	100	(11500)			
		16	Y10	11350	16	104i	37	100	(11250)			
		16	Y10	11100	16	104j	37	100	(11010)			
		16	Y10	10850	16	104k	37	100	(10760)			
		16	Y10	10600	16	104l	37	100	(10500)			
		16	Y10	10350	16	104m	37	100	(10250)			
		16	Y10	10050	16	104n	37	100	(9980)			
		16	Y10	9800	16	104o	37	100	(9710)			
		16	Y10	9500	16	104p	37	100	(9430)			
		16	Y10	9250	16	104q	37	100	(9145)			
		16	Y10	8950	16	104r	37	100	(8850)			
		16	Y10	8650	16	104s	37	100	(8550)			
		16	Y10	8350	16	104t	37	100	(8240)			
		16	Y10	8000	16	104u	37	100	(7920)			
		16	Y10	7700	16	104v	37	100	(7590)			
		16	Y10	7350	16	104w	37	100	(7250)			
		16	Y10	7000	16	104x	37	100	(6900)			
		16	Y10	6600	16	104y	37	100	(6530)			
		16	Y10	6250	16	104z	37	100	(6150)			
		16	Y10	5850	16	104aa	37	100	(5760)			
		16	Y10	5450	16	104ab	37	100	(5355)			
		16	Y10	5000	16	104ac	37	100	(4925)			
		16	Y10	4550	16	104ad	37	100	(4480)			
		16	Y10	4100	16	104ae	37	100	(4010)			
		16	Y10	3600	16	104af	37	100	(3510)			
		16	Y10	3050	16	104ag	37	100	(2980)			
		16	Y10	2500	16	104ah	37	100	(2415)			
		16	Y10	1900	16	104ai	37	100	(1805)			
		16	Y10	1200	16	104aj	37	100	(1135)			
		224	Y10	9000	224	105	37	100	(8925)			
		128	Y10	8900	128	106a	37	100	(8815)			
		128	Y10	8750	128	106b	37	100	(8655)			
		128	Y10	8500	128	106c	37	100	(8430)			
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		35831							35831	Ref Dwg		
TOT		35831							35831	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
										Schedule No		100
Bospoort water supply scheme Bospoort North Reservoir Foundation slab												

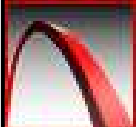
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Foundation slab	1	48	Y10	8200	48	107a	37	100	(8135)			
		48	Y10	8100	48	107b	37	100	(8000)			
		48	Y10	7950	48	107c	37	100	(7865)			
		48	Y10	7800	48	107d	37	100	(7710)			
		48	Y10	7650	48	107e	37	100	(7550)			
		48	Y10	7450	48	107f	37	100	(7380)			
		48	Y10	7300	48	107g	37	100	(7200)			
		48	Y10	7100	48	107h	37	100	(7000)			
		48	Y10	6900	48	107i	37	100	(6800)			
		48	Y10	6650	48	107j	37	100	(6575)			
		48	Y10	6450	48	107k	37	100	(6345)			
		48	Y10	6200	48	107l	37	100	(6100)			
		48	Y10	5950	48	107m	37	100	(5845)			
		48	Y10	5650	48	107n	37	100	(5575)			
		48	Y10	5400	48	107o	37	100	(5300)			
		48	Y10	5100	48	107p	37	100	(5000)			
		48	Y10	4750	48	107q	37	100	(4680)			
		48	Y10	4450	48	107r	37	100	(4355)			
		48	Y10	4100	48	107s	37	100	(4010)			
		48	Y10	3750	48	107t	37	100	(3650)			
		48	Y10	3350	48	107u	37	100	(3275)			
		48	Y10	2950	48	107v	37	100	(2880)			
		48	Y10	2550	48	107w	37	100	(2470)			
		48	Y10	2100	48	107x	37	100	(2030)			
		48	Y10	1650	48	107y	37	100	(1575)			
		48	Y10	1200	48	107z	37	100	(1100)			
		10696	Y10	900	10696	108	83	250	70	300	(300)	
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		10099							10099	Ref Dwg		
TOT		10099							10099	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
										Schedule No		101
Bospoort water supply scheme Bospoort North Reservoir Foundation slab												

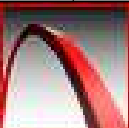
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Wall foundation	1	1078	Y12	5350	1078	120	74	300	1550			
		312	Y16	13000	312	121	20	(13000)				
		312	Y16	5000	312	122	20	(5000)				
		237	Y10	1350	237	123	83	300	260	300	(300)	
Column foundation	52	24	Y12	3400	1248	130	20	(3400)				
		4	Y10	1150	208	131	83	250	255	250	(250)	
		14	Y16	3050	728	132	53	300	300	2000	300	(300)
		14	Y16	3000	728	133	53	300	265	2000	265	(300)
		10	Y16	1450	520	134	51	400	(1150)			(300)
		3	Y10	2050	156	135	81	400	400			200
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		542	8887	17006					26435	Ref Dwg		
TOT		542	8887	17006					26435	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
										Schedule No		102
Bospoort water supply scheme Bospoort North Reservoir Foundation slab												

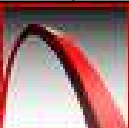
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Slab	1	11	Y12	4500	11	140	60	200	2000			
		11	Y12	4450	11	141	60	170	2000			
		66	Y12	1250	66	142	37	350	(900)			
		4	Y10	1100	4	143	83	250	160	300	(300)	
Wall A	1	22	Y12	1950	22	150	37	850	(1100)			
		11	Y12	1900	11	151	37	850	(1050)			
		10	Y12	3600	10	152	38	850	1950	(850)		
		4	Y8	300	4	156	85	100	190	50	(25)	
Wall B/D	2	14	Y12	1950	28	150	37	850	(1100)			
		7	Y12	1900	14	151	37	850	(1050)			
		10	Y12	3600	20	152	38	850	1950	(850)		
		4	Y8	300	8	156	85	100	190	50	(25)	
Wall C	1	16	Y12	1950	16	150	37	850	(1100)			
		8	Y12	1900	8	151	37	850	(1050)			
		4	Y12	3600	4	152	38	850	1950	(850)		
		4	Y12	1400	4	153a	37	850	(550)			
		2	Y12	1350	2	153b	37	850	(500)			
		2	Y12	1350	2	154a	37	850	(500)			
		1	Y12	1300	1	154b	37	850	(450)			
		8	Y12	1550	8	155a	37	850	(700)			
		4	Y12	1500	4	155b	37	850	(650)			
		2	Y8	300	2	156	85	100	190	50	(25)	
		12	Y12	1200	12	157	20	(1200)				
		8	Y12	700	8	158	20	(700)				
Floor openings	2	16	Y12	2000	32	160	20	(2000)				
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y	2	3	541						545	Ref Dwg		
TOT	2	3	541						545	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com		Bospoort water supply scheme Bospoort North Reservoir Foundation slab							Revision		0	
									Schedule No		103	

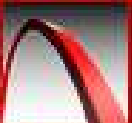
MEMBER		No OF	BARS PER MEMB	DIA.	LENGTH		TOTAL NUM- BER	MARK	S C	B E N D I N G					
										A	B	C	D	E/r	
Wall	1	1897	Y16	3850	1897	200	37	150	(3750)						
		1897	Y16	3800	1897	201	20	(3800)							
		1897	Y16	3800	1897	202	20	(3800)							
		1897	Y16	3750	1897	203	20	(3750)							
	1	640	Y16	13000	640	210	20	(13000)							
		640	Y16	13000	640	211	20	(13000)							
		640	Y16	13000	640	212	20	(13000)							
		800	Y16	13000	800	213	20	(13000)							
		1824	Y10	1250	1824	214	83	250					245	300	(300)
	Buttress	8	85	Y16	5650	680	220	53	300	650 (3750)	3900	650	(300)		
20			Y16	3850	160	221	37	150							
20			Y16	3800	160	222	20	(3800)							
20			Y16	3800	160	223	20	(3800)							
20			Y16	3750	160	224	20	(3750)							
36			Y10	2100	288	225	83	300	645					300	(300)
8		24	Y12	3700	192	230	37	150	(3550)						
		24	Y12	3600	192	231	20	(3600)							
		24	Y12	3600	192	232	20	(3600)							
		24	Y12	3750	192	233	20	(3750)							
		516	Y12	1850	4128	234	72	690					200		
		8	10	12	16	20	25	32	40	TOT	Date		2020/08/27		
R												Det. by		JGB	
Y			1779	9277	111223					122279		Ref Dwg			
TOT			1779	9277	111223					122279		Job No			
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com											Revision		0		
											Schedule No		104		
Bospoort water supply scheme Bospoort North Reservoir Wall															

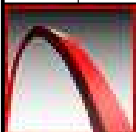
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Column	52	10	Y16	3600	520	250	20	(3600)				
		10	Y16	3800	520	251	20	(3800)				
		10	Y16	3800	520	252	20	(3800)				
		10	Y16	4050	520	253	37	150	(3950)			
		70	Y10	2050	3640	254	81	400	400			
		10	Y16	2150	520	255	48	400	1315	(400)	790	
		1	Y10	2200	52	256a	81	430	430			
		1	Y10	3300	52	256b	81	650	650			
		1	Y10	4450	52	256c	81	880	880			
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		4920		14281					19200	Ref Dwg		
TOT		4920		14281					19200	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
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Bospoort water supply scheme Bospoort North Reservoir Column												

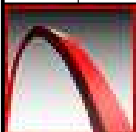
MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Slab	8	259	Y16	10150	2072	300	20	(10150)				
		1	Y16	9800	8	301a	20	(9800)				
		1	Y16	9500	8	301b	20	(9500)				
		1	Y16	9150	8	301c	20	(9150)				
		1	Y16	8800	8	301d	20	(8800)				
		1	Y16	8450	8	301e	20	(8450)				
		1	Y16	8050	8	301f	20	(8050)				
		1	Y16	7650	8	301g	20	(7650)				
		1	Y16	7200	8	301h	20	(7200)				
		1	Y16	6750	8	301i	20	(6750)				
		1	Y16	6250	8	301j	20	(6250)				
		1	Y16	5700	8	301k	20	(5700)				
		1	Y16	5100	8	301l	20	(5100)				
		1	Y16	4400	8	301m	20	(4400)				
		1	Y16	3600	8	301n	20	(3600)				
		1	Y16	2550	8	301o	20	(2550)				
		2	Y16	2000	16	302	20	(2000)				
		222	Y16	8300	1776	303	20	(8300)				
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y				57810					57810	Ref Dwg		
TOT				57810					57810	Job No		
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										Schedule No		300
Bospoort water supply scheme Bospoort North Reservoir Roof slab bottom reinforcement												

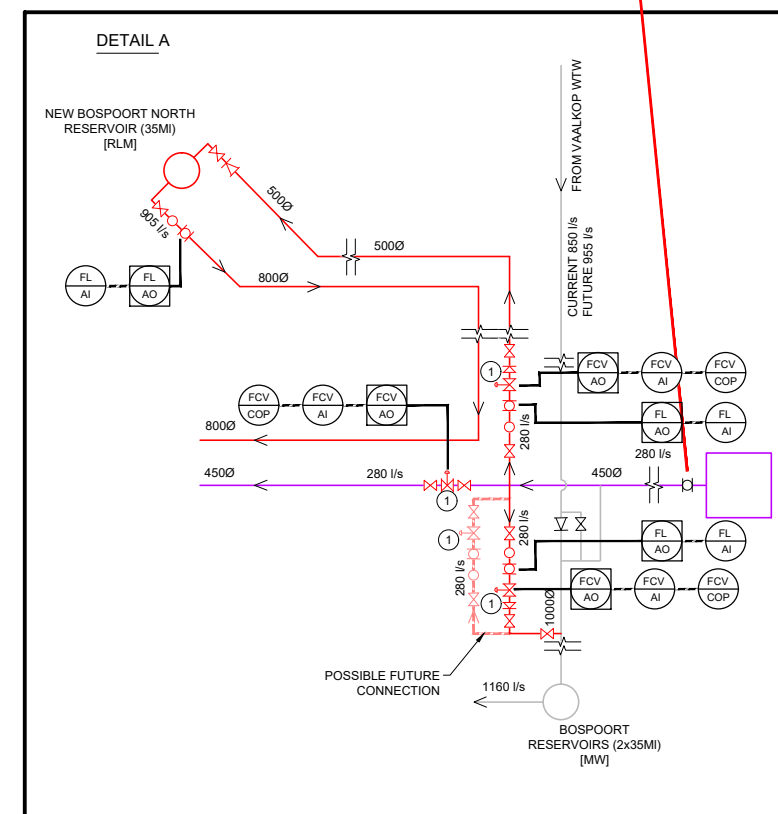
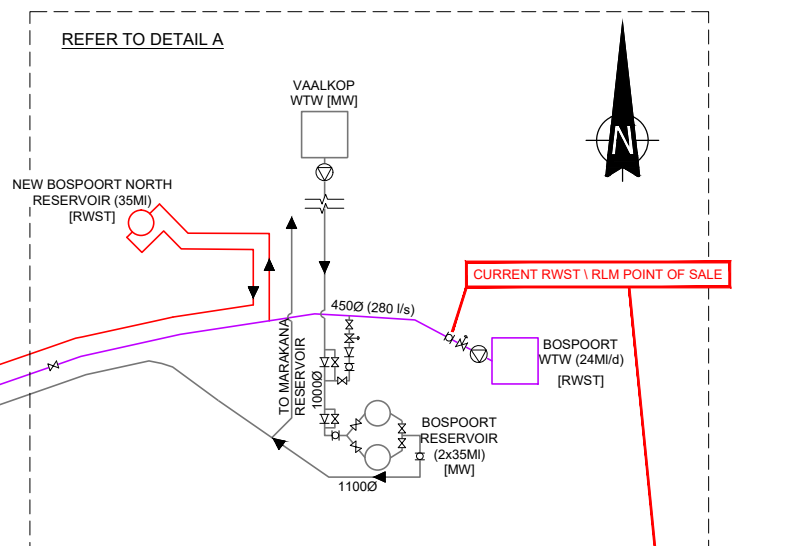
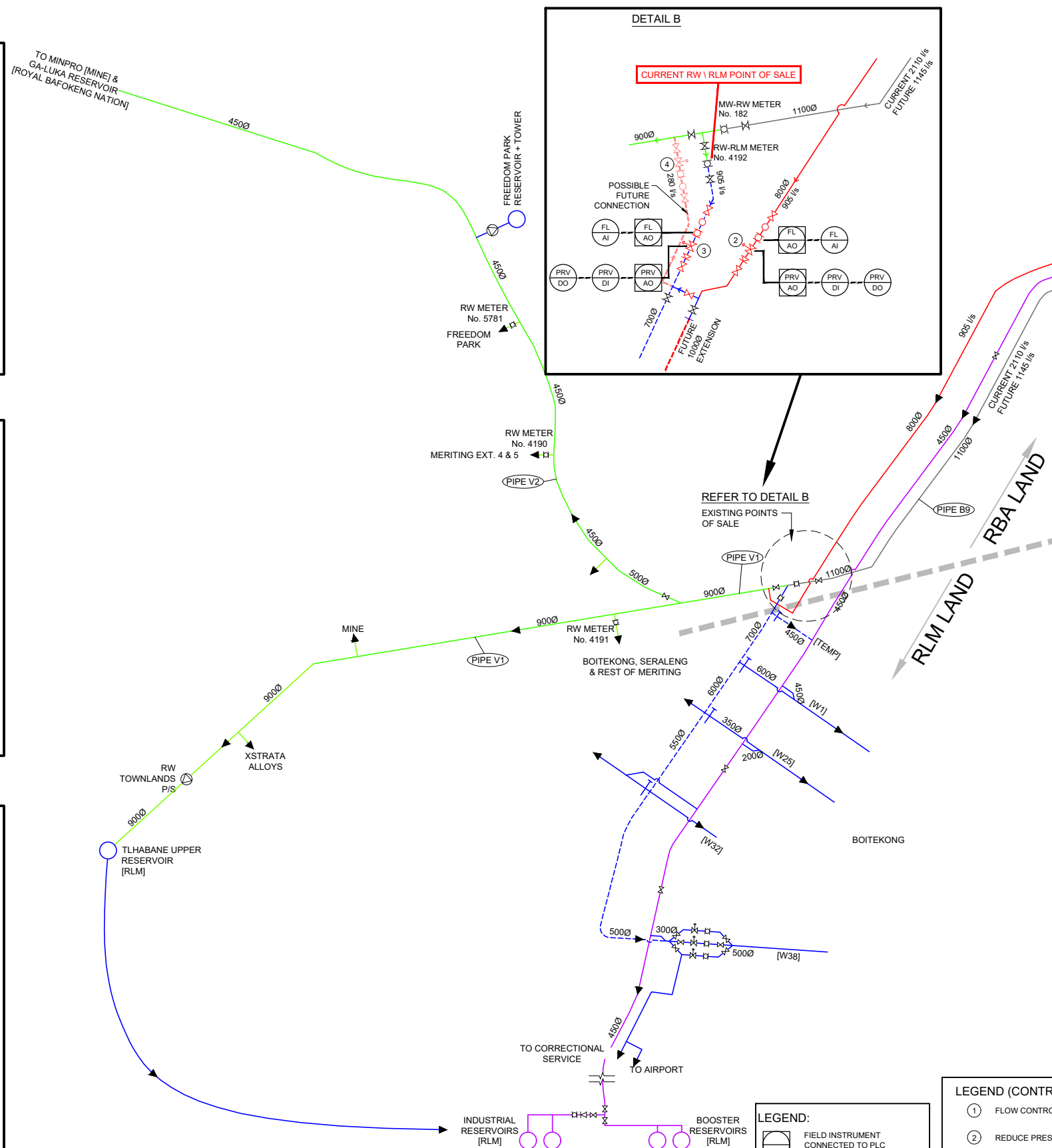
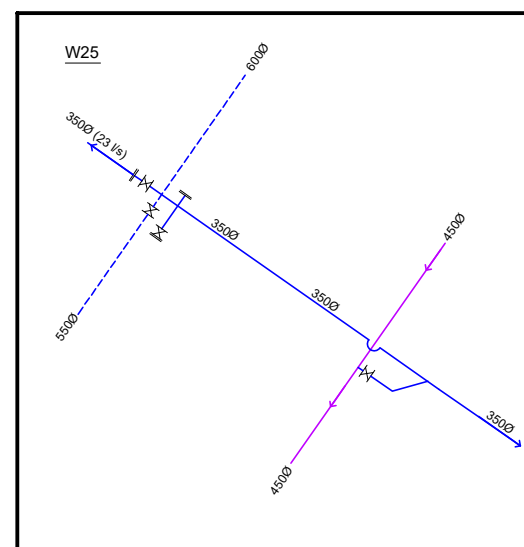
MEMBER		No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G							
									A	B	C	D	E/r			
Slab		8	1	Y16	8250	8	304a	20	(8250)							
			1	Y16	8100	8	304b	20	(8100)							
			1	Y16	8000	8	304c	20	(8000)							
			1	Y16	7750	8	304d	20	(7750)							
			1	Y16	7600	8	304e	20	(7600)							
			1	Y16	7450	8	304f	20	(7450)							
			1	Y16	7250	8	304g	20	(7250)							
			1	Y16	7100	8	304h	20	(7100)							
			1	Y16	6900	8	304i	20	(6900)							
			1	Y16	6750	8	304j	20	(6750)							
			1	Y16	6600	8	304k	20	(6600)							
			1	Y16	6400	8	304l	20	(6400)							
			1	Y16	6200	8	304m	20	(6200)							
			1	Y16	6050	8	304n	20	(6050)							
			1	Y16	5850	8	304o	20	(5850)							
			1	Y16	5650	8	304p	20	(5650)							
			1	Y16	5450	8	304q	20	(5450)							
			1	Y16	5250	8	304r	20	(5250)							
			1	Y16	5050	8	304s	20	(5050)							
			1	Y16	4850	8	304t	20	(4850)							
			1	Y16	4650	8	304u	20	(4650)							
			1	Y16	4400	8	304v	20	(4400)							
			1	Y16	4200	8	304w	20	(4200)							
			1	Y16	4000	8	304x	20	(4000)							
			1	Y16	3750	8	304y	20	(3750)							
			1	Y16	3500	8	304z	20	(3500)							
			1	Y16	3300	8	304aa	20	(3300)							
			1	Y16	3050	8	304ab	20	(3050)							
			1	Y16	2800	8	304ac	20	(2800)							
			1	Y16	2550	8	304ad	20	(2550)							
			1	Y16	2300	8	304ae	20	(2300)							
			1	Y16	2000	8	304af	20	(2000)							
			1	Y16	1750	8	304ag	20	(1750)							
			1	Y16	1450	8	304ah	20	(1450)							
			1	Y16	1150	8	304ai	20	(1150)							
			1	Y16	850	8	304aj	20	(850)							
	8	10	12	16	20	25	32	40	TOT	Date		2020/08/31				
R										Det. by		JGB				
Y				2250					2250	Ref Dwg						
TOT				2250					2250	Job No						
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Bospoort water supply scheme			Revision		0	
										Bospoort North Reservoir			Schedule No		301	
										Roof slab						



MEMBER		No OF	BARS PER MEMB	DIA.	LENGTH		TOTAL NUM- BER	MARK	S C	B E N D I N G				
										A	B	C	D	E/r
Slab		8	153	Y16	8300	1224	305	20	(8300)	130	200	200	(200)	
			3	Y16	8800	24	306a	20	(8800)					
			3	Y16	8600	24	306b	20	(8600)					
			3	Y16	8350	24	306c	20	(8350)					
			3	Y16	8100	24	306d	20	(8100)					
			3	Y16	7900	24	306e	20	(7900)					
			3	Y16	7600	24	306f	20	(7600)					
			3	Y16	7350	24	306g	20	(7350)					
			3	Y16	7100	24	306h	20	(7100)					
			3	Y16	6800	24	306i	20	(6800)					
			3	Y16	6850	24	306j	20	(6850)					
			3	Y16	6600	24	306k	20	(6600)					
			3	Y16	6450	24	306l	20	(6450)					
			3	Y16	6150	24	306m	20	(6150)					
			3	Y16	5850	24	306n	20	(5850)					
			3	Y16	5550	24	306o	20	(5550)					
			3	Y16	5200	24	306p	20	(5200)					
			3	Y16	4850	24	306q	20	(4850)					
			3	Y16	4500	24	306r	20	(4500)					
			3	Y16	3550	24	306s	20	(3550)					
			3	Y16	3150	24	306t	20	(3150)					
			3	Y16	2750	24	306u	20	(2750)					
			3	Y16	2300	24	306v	20	(2300)					
			17	Y16	6450	136	307a	20	(6450)					
			20	Y16	5950	160	307b	20	(5950)					
			20	Y16	5750	160	307c	20	(5750)					
			20	Y16	5350	160	307d	20	(5350)					
			20	Y16	4750	160	307e	20	(4750)					
			20	Y16	4000	160	307f	20	(4000)					
			20	Y16	3050	160	307g	20	(3050)					
			13	Y16	1900	104	307h	20	(1900)					
		1939	Y10	750	15512	308	83	200						
	8	10	12	16	20	25	32	40	TOT	Date		2020/08/31		
R										Det. by		JGB		
Y		7173		30106					37279	Ref Dwg				
TOT		7173		30106					37279	Job No				
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0		
										Schedule No		302		
Bospoort water supply scheme Bospoort North Reservoir Roof slab														

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Slab	8	197	Y12	6300	1576	350	20	(6300)				
		1	Y12	5550	8	351a	20	(5550)				
		1	Y12	4650	8	351b	20	(4650)				
		1	Y12	3600	8	351c	20	(3600)				
		1	Y12	2000	8	351d	20	(2000)				
		2	Y12	2000	16	352	20	(2000)				
		179	Y12	8100	1432	353	20	(8100)				
		1	Y12	9000	8	354a	20	(9000)				
		1	Y12	8700	8	354b	20	(8700)				
		1	Y12	8400	8	354c	20	(8400)				
		1	Y12	8050	8	354d	20	(8050)				
		1	Y12	7750	8	354e	20	(7750)				
		1	Y12	7400	8	354f	20	(7400)				
		1	Y12	7000	8	354g	20	(7000)				
		1	Y12	6650	8	354h	20	(6650)				
		1	Y12	6250	8	354i	20	(6250)				
		1	Y12	5850	8	354j	20	(5850)				
		1	Y12	5450	8	354k	20	(5450)				
		1	Y12	5000	8	354l	20	(5000)				
		1	Y12	4550	8	354m	20	(4550)				
		1	Y12	4050	8	354n	20	(4050)				
		1	Y12	3500	8	354o	20	(3500)				
		1	Y12	2950	8	354p	20	(2950)				
		1	Y12	8100	8	355	20	(8100)				
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y			20025						20025	Ref Dwg		
TOT			20025						20025	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
										Schedule No		303
Bospoort water supply scheme Bospoort North Reservoir Roof slab												








MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Slab	8	132	Y12	8100	1056	355	20	(8100)				
		2	Y12	9950	16	356a	20	(9950)				
		2	Y12	9850	16	356b	20	(9850)				
		2	Y12	9550	16	356c	20	(9550)				
		2	Y12	9300	16	356d	20	(9300)				
		2	Y12	9000	16	356e	20	(9000)				
		2	Y12	8700	16	356f	20	(8700)				
		2	Y12	8400	16	356g	20	(8400)				
		2	Y12	8100	16	356h	20	(8100)				
		2	Y12	7800	16	356i	20	(7800)				
		2	Y12	7450	16	356j	20	(7450)				
		2	Y12	6500	16	356k	20	(6500)				
		2	Y12	6150	16	356l	20	(6150)				
		2	Y12	5800	16	356m	20	(5800)				
		2	Y12	5400	16	356n	20	(5400)				
		2	Y12	5000	16	356o	20	(5000)				
		2	Y12	4600	16	356p	20	(4600)				
		2	Y12	4200	16	356q	20	(4200)				
		2	Y12	3750	16	356r	20	(3750)				
		2	Y12	3300	16	356s	20	(3300)				
		2	Y12	2800	16	356t	20	(2800)				
		2	Y12	2300	16	356u	20	(2300)				
		2	Y12	1800	16	356v	20	(1800)				
		2	Y12	1250	16	356w	20	(1250)				
		12	Y12	10050	96	357a	20	(10050)				
		11	Y12	9600	88	357b	20	(9600)				
		11	Y12	9450	88	357c	20	(9450)				
		11	Y12	9200	88	357d	20	(9200)				
		11	Y12	8850	88	357e	20	(8850)				
		11	Y12	8400	88	357f	20	(8400)				
		11	Y12	7850	88	357g	20	(7850)				
		11	Y12	7200	88	357h	20	(7200)				
		11	Y12	6400	88	357i	20	(6400)				
		11	Y12	5500	88	357j	20	(5500)				
		11	Y12	4500	88	357k	20	(4500)				
		10	Y12	3300	80	357l	20	(3300)				
Extra steel	52	52	Y12	3750	2704	358	20	(3750)				
Perimeter upstand	4	549	Y10	1100	2196	370	60	370	120			
		40	Y12	13000	160	371	20	(13000)				
		20	Y16	13000	80	372	20	(13000)				
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		1489	27548	1641					30679	Ref Dwg		
TOT		1489	27548	1641					30679	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com					Bospoort water supply scheme Bospoort North Reservoir Roof slab					Revision		0
										Schedule No		304

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM- BER	MARK	S C	B E N D I N G				
								A	B	C	D	E/r
Opening	2	4	Y25	2900	8	380	20	(2900)				
		14	Y10	1100	28	381	60	370	120			
		4	Y25	2600	8	382	20	(2600)				
		8	Y10	1050	16	383	60	340	120			
		4	Y16	2200	8	384	20	(2200)				
		4	Y16	1900	8	385	20	(1900)				
		22	Y12	1650	44	386	38	800	110	(800)		
		4	Y12	1400	8	387	38	130	1175	(130)		
		4	Y12	1100	8	388	38	130	875	(130)		
	8	10	12	16	20	25	32	40	TOT	Date		
R										Det. by		
Y		29	82	52		170			333	Ref Dwg		
TOT		29	82	52		170			333	Job No		
 PROKON Software Consultants (Pty) Ltd http://www.prokon.com										Revision		0
										Schedule No		305
Bospoort water supply scheme Bospoort North Reservoir Roof slab												



- LEGEND:**
- | | |
|---|---|
|  | FIELD INSTRUMENT
CONNECTED TO PLC
FIELD MOUNTED |
|  | INSTRUMENT FIELD MOUNTED |

- LEGEND (CONTROL VALVES):**
- ① FLOW CONTROL
 - ② REDUCE PRESSURE DURING LOW FLOW (PRESSURE REDUCING)
 - ③ OPEN WHEN PRESSURE DROP DOWNSTREAM (PRESSURE REDUCING)
 - ④ OPEN WHEN PRESSURE RISES UPSTREAM (PRESSURE SUSTAINING)

- LEGEND (GENERAL):**
- | | | | |
|---|-----------------------------|---|---|
|  | PUMPSTATION | | BOSPOORT NEW PIPELINE |
|  | NON RETURN VALVE | | RLM EXISTING PIPELINE |
|  | ISOLATING VALVE | | RLM EXISTING PIPELINE
(CONDITION TO BE INVESTIGATED) |
|  | FLOW METER | | VAALKOP EXISTING PIPELINE
(MAGALIES WATER) |
|  | PRESSURE/FLOW CONTROL VALVE | | BOSPOORT EXISTING PIPELINE |
|  | DIRT BOX |  | RAND WATER EXISTING PIPELINE |

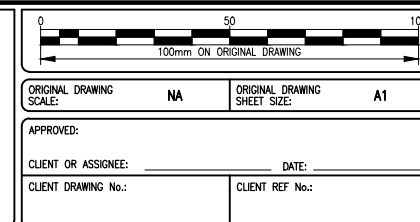
AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE

CERTIFIED AS-BUILT FOR CONTRACT :

_____ ENGINEER _____ DATE

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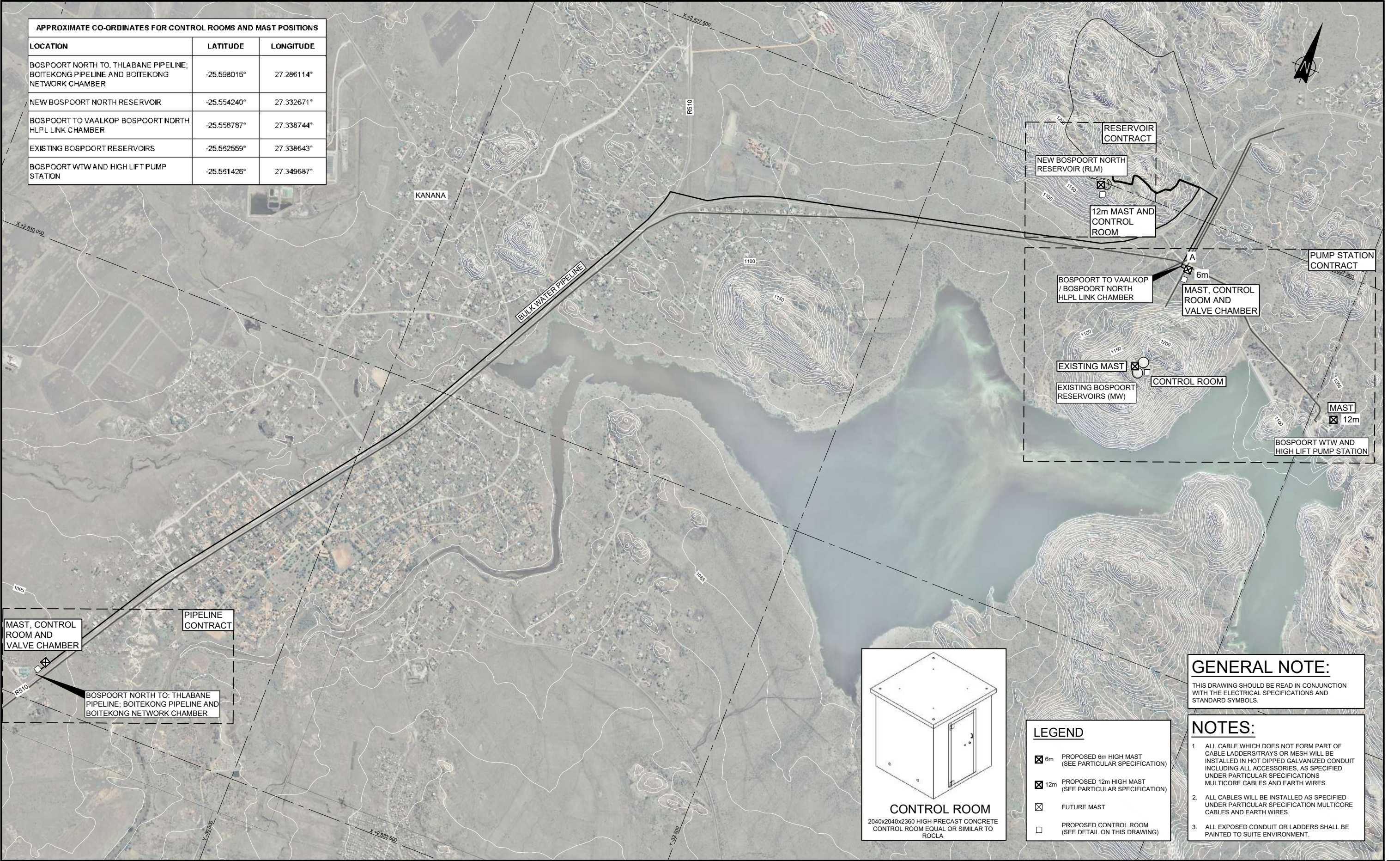
PROJECT TITLE:	BOSPOORT WTW 24MI/d PROCESS UPGRADE
DRAWING TITLE:	P & ID PIPELINE



SURVEYED	—	DESIGNED	J COETZEE
DRAWN	A STEENBERG	CHECKED	J COTZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	NOVEMBER 2016
APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:			
DRAWING No.: 1890.08.AA.01.A016			VERSION: 10

REVIEWER

1890.08.AA.01.A016

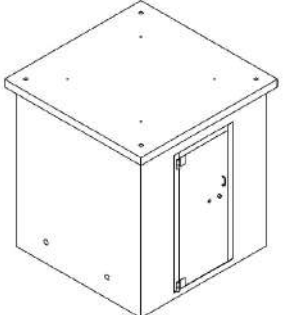


APPROXIMATE CO-ORDINATES FOR CONTROL ROOMS AND MAST POSITIONS		
LOCATION	LATITUDE	LONGITUDE
BOSPOORT NORTH TO. THLABANE PIPELINE; BOITEKONG PIPELINE AND BOITEKONG NETWORK CHAMBER	-25.598015°	27.286114°
NEW BOSPOORT NORTH RESERVOIR	-25.554240°	27.332671°
BOSPOORT TO VAALKOP BOSPOORT NORTH HLPL LINK CHAMBER	-25.556787°	27.338744°
EXISTING BOSPOORT RESERVOIRS	-25.562559°	27.338643°
BOSPOORT WTW AND HIGH LIFT PUMP STATION	-25.551426°	27.349687°

MAST, CONTROL ROOM AND VALVE CHAMBER

PIPELINE CONTRACT

BOSPOORT NORTH TO: THLABANE PIPELINE; BOITEKONG PIPELINE AND BOITEKONG NETWORK CHAMBER



CONTROL ROOM

2040x2040x2360 HIGH PRECAST CONCRETE CONTROL ROOM EQUAL OR SIMILAR TO ROCLA

LEGEND

☒ 6m

PROPOSED 6m HIGH MAST (SEE PARTICULAR SPECIFICATION)

☒ 12m

PROPOSED 12m HIGH MAST (SEE PARTICULAR SPECIFICATION)

☐

FUTURE MAST

☐

PROPOSED CONTROL ROOM (SEE DETAIL ON THIS DRAWING)

GENERAL NOTE:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATIONS AND STANDARD SYMBOLS.

NOTES:

1.

ALL CABLE WHICH DOES NOT FORM PART OF CABLE LADDERS/TRAYS OR MESH WILL BE INSTALLED IN HOT DIPPED GALVANIZED CONDUIT INCLUDING ALL ACCESSORIES, AS SPECIFIED UNDER PARTICULAR SPECIFICATIONS MULTICORE CABLES AND EARTH WIRES.

2.

ALL CABLES WILL BE INSTALLED AS SPECIFIED UNDER PARTICULAR SPECIFICATION MULTICORE CABLES AND EARTH WIRES.

3.

AS-BUILT RECORD


CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE

CERTIFIED AS-BUILT FOR CONTRACT :

ENGINEER DATE

VERSION/AMENDMENTS

No.	DATE	DESCRIPTION	AUTHORISED BY




PROJECT TITLE:

BOSPOORT WTW
24MI/d PROCESS UPGRADE

DRAWING TITLE:

COMMUNICATION MAST, ANTENNAS AND
CONTROL ROOM LAYOUT



0 50 100
100mm ON ORIGINAL DRAWING

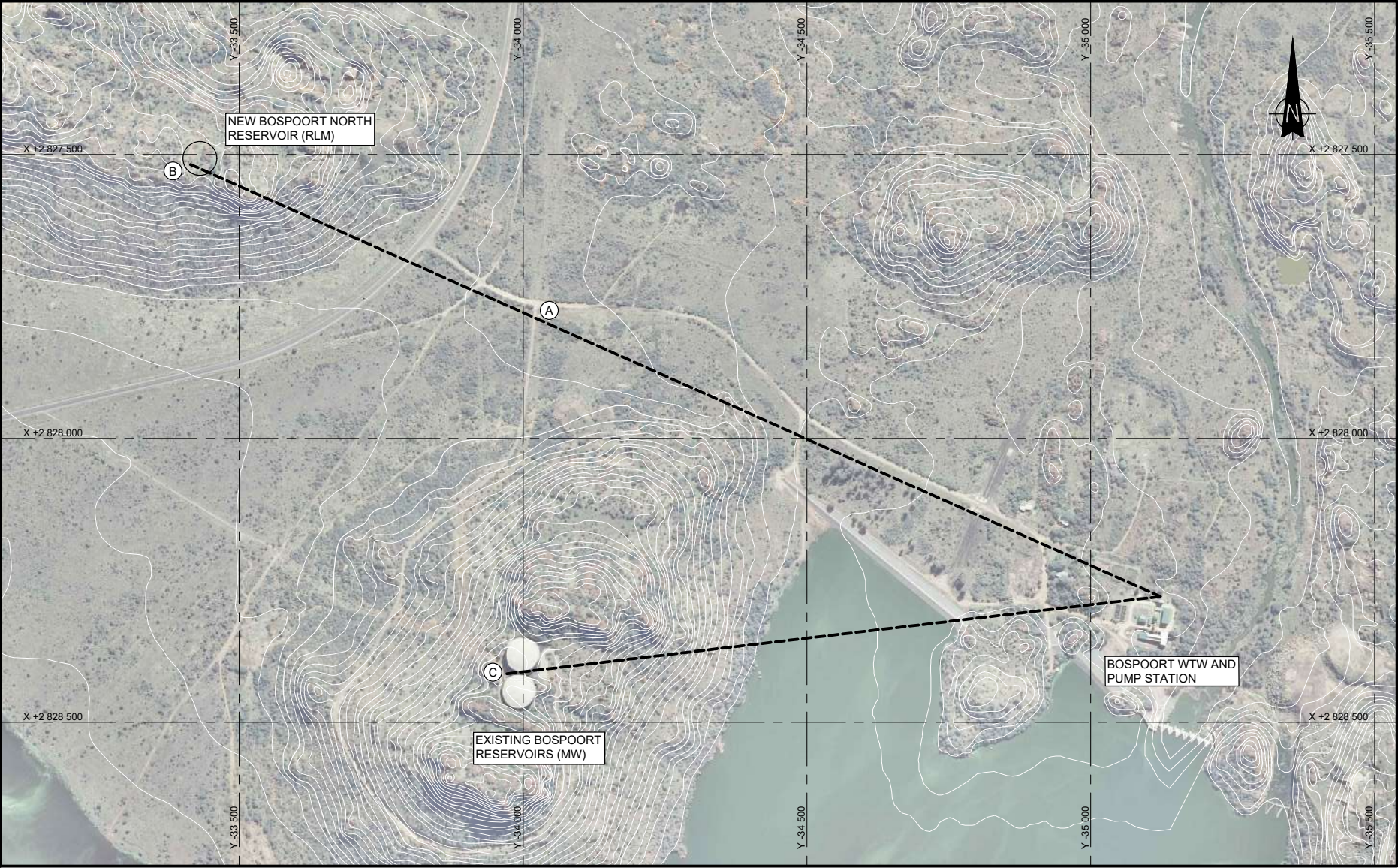
ORIGINAL DRAWING SCALE: 1:2 500 ORIGINAL DRAWING SHEET SIZE: A1

APPROVED:
CLIENT OR ASSIGNEE: _____ DATE: _____
CLIENT DRAWING No.: _____ CLIENT REF No.: _____

SURVEYED	—	DESIGNED	J COETZEE
DRAWN	H TURNER	CHECKED	J COETZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	JUNE 2018

APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:
DRAWING No.: 1890.08.PA.21.U001 VERSION: 10

1890.08.PA.21.U001



GENERAL NOTE:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATIONS AND STANDARD SYMBOLS.

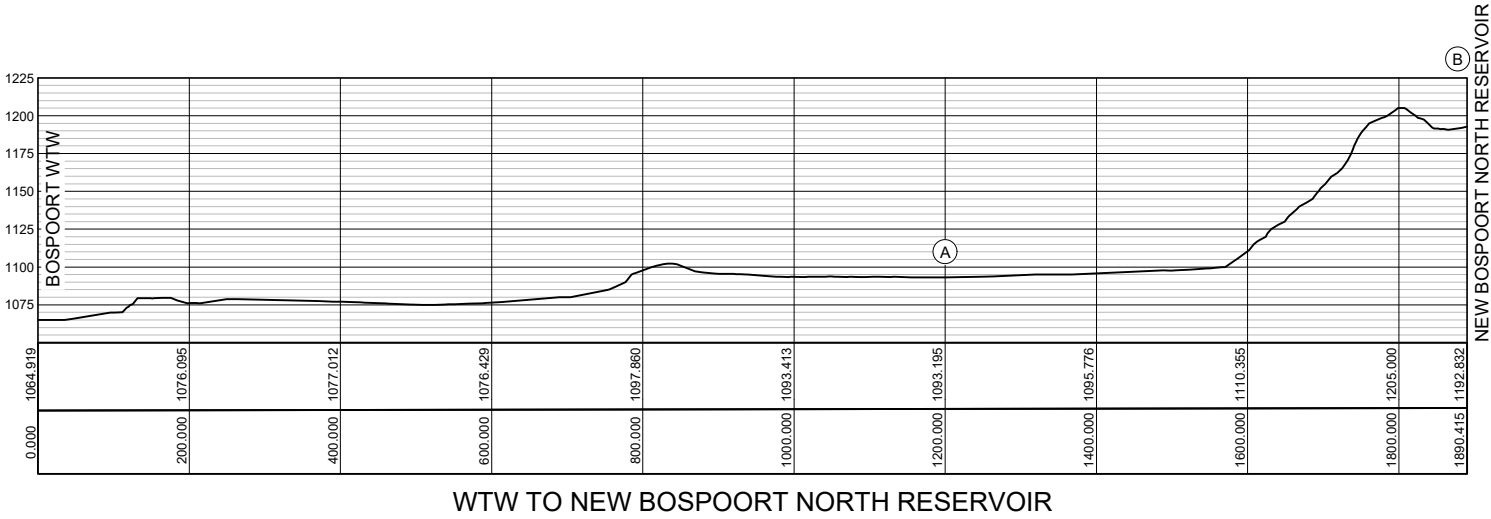
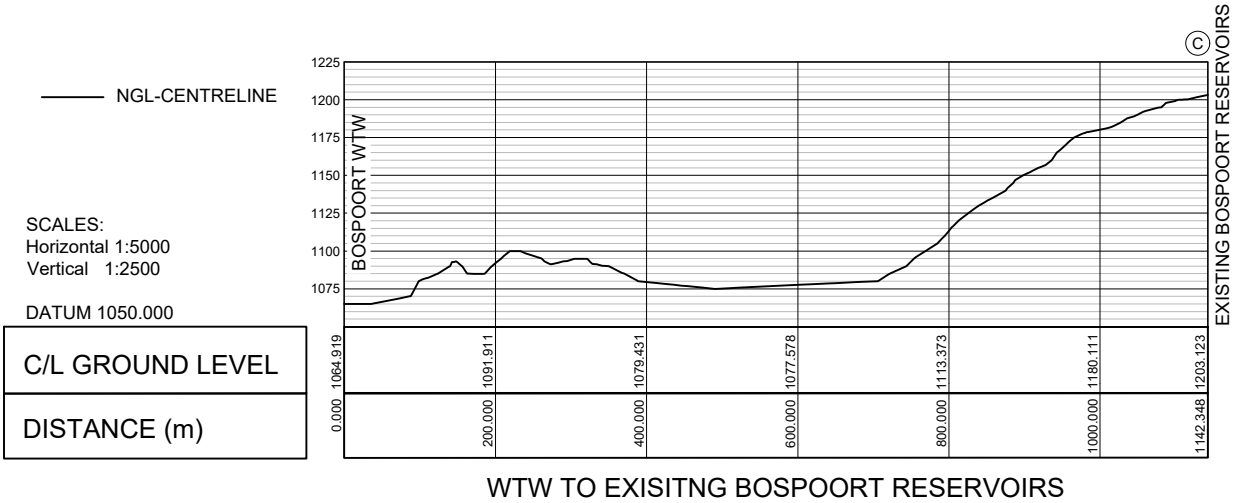
NOTES:

1. ALL CABLE WHICH DOES NOT FORM PART OF CABLE LADDERS/TRAYS OR MESH WILL BE INSTALLED IN HOT DIPPED GALVANIZED CONDUIT INCLUDING ALL ACCESSORIES, AS SPECIFIED UNDER PARTICULAR SPECIFICATIONS MULTICORE CABLES AND EARTH WIRES.
2. ALL CABLES WILL BE INSTALLED AS SPECIFIED UNDER PARTICULAR SPECIFICATION MULTICORE CABLES AND EARTH WIRES.
3. ALL EXPOSED CONDUIT OR LADDERS SHALL BE PAINTED TO SUITE ENVIRONMENT.

REFERENCE

REFER TO DRAWING 1890.08.PA.21.U001 FOR DETAIL LAYOUT OF MASTS

LAYOUT PLAN
SCALE 1:5000



AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
CERTIFIED AS-BUILT FOR CONTRACT :			
	ENGINEER		DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY



PROJECT TITLE:	BOSPOORT WTW 24MI/d PROCESS UPGRADE
DRAWING TITLE:	SIGNAL PROFILES SHEET 1



0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED:	
CLIENT OR ASSIGNEE: _____	DATE: _____
CLIENT DRAWING No.: _____	CLIENT REF No.: _____

SURVEYED	—	DESIGNED	J COETZEE
DRAWN	P DIKGALE	CHECKED	J COETZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	JUNE 2018
APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:			
DRAWING No.: 1890.08.PA.21.D001			VERSION: 10

REVIEWER:

1890.08.PA.21.D001



GENERAL NOTE:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATIONS AND STANDARD SYMBOLS.

- NOTES:**
1. ALL CABLE WHICH DOES NOT FORM PART OF CABLE LADDERS/TRAYS OR MESH WILL BE INSTALLED IN HOT DIPPED GALVANIZED CONDUIT INCLUDING ALL ACCESSORIES, AS SPECIFIED UNDER PARTICULAR SPECIFICATIONS MULTICORE CABLES AND EARTH WIRES.
 2. ALL CABLES WILL BE INSTALLED AS SPECIFIED UNDER PARTICULAR SPECIFICATION MULTICORE CABLES AND EARTH WIRES.
 3. ALL EXPOSED CONDUIT OR LADDERS SHALL BE PAINTED TO SUITE ENVIRONMENT.

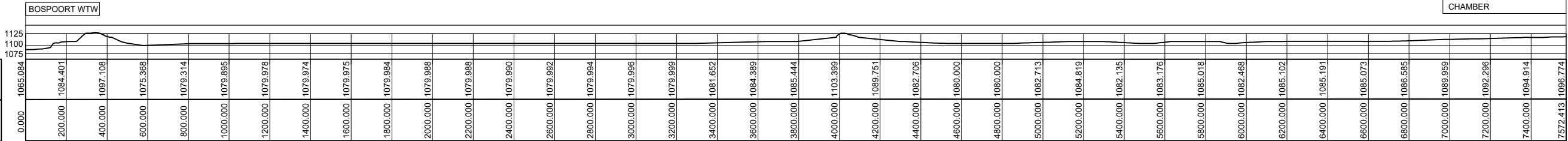
BOSPOORT NORTH TO:
THLABANE PIPELINE;
BOITEKONG PIPELINE AND
BOITEKONG NETWORK
CHAMBER

REFERENCE
REFER TO DRAWING 1890.08.PA.21.U001 FOR DETAIL LAYOUT OF MASTS

—— NGL-CENTRELINE

SCALES:
Horizontal 1:12000
Vertical 1:6000
DATUM 1050.000

C/L GROUND LEVEL
DISTANCE (m)



BOSPOORT NORTH TO:
THLABANE PIPELINE;
BOITEKONG PIPELINE AND
BOITEKONG NETWORK
CHAMBER

BOSPOORT WTW TO THLABANE PIPELINE; BOITEKONG PIPELINE AND BOITEKONG NETWORK CHAMBER

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
CERTIFIED AS-BUILT FOR CONTRACT :			
	ENGINEER		DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY



PROJECT TITLE:
**BOSPOORT WTW
24MI/d PROCESS UPGRADE**

DRAWING TITLE:
SIGNAL PROFILES SHEET 2

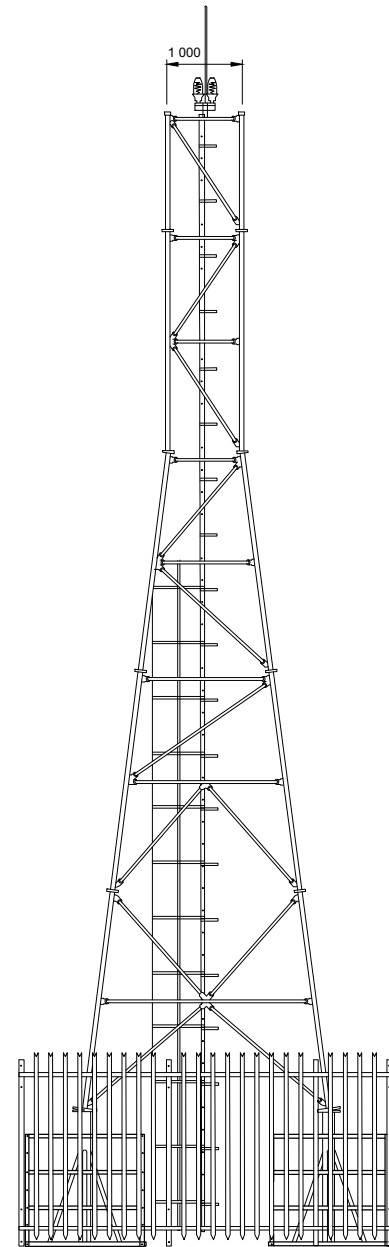


0 50 100 100mm ON ORIGINAL DRAWING	
ORIGINAL DRAWING SCALE: AS SHOWN	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED: _____ DATE: _____	
CLIENT OR ASSIGNEE: _____	CLIENT REF No.: _____

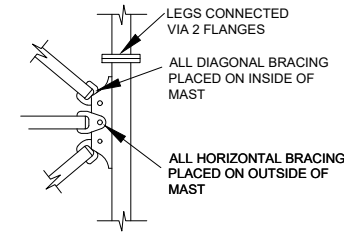
SURVEYED	—	DESIGNED	J COETZEE
DRAWN	P DIKGALE	CHECKED	J COETZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	JUNE 2018
APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:		APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:	
DRAWING No.: 1890.08.PA.21.D002		VERSION: 10	

REVIEWER:

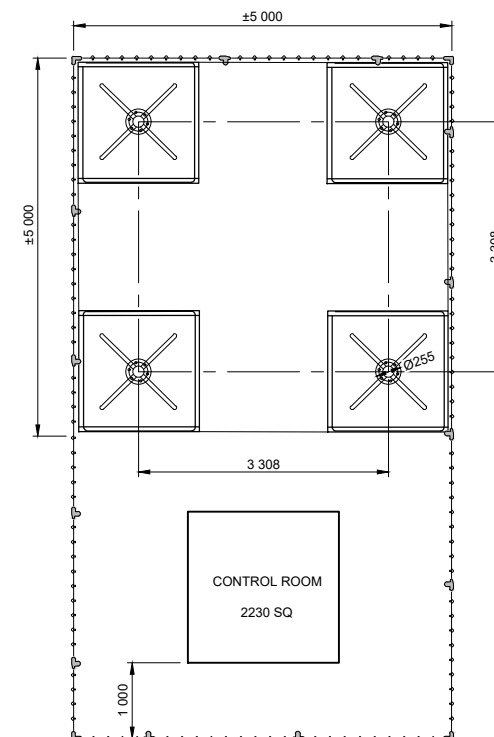
1890.08.PA.21.D002



ELEVATION



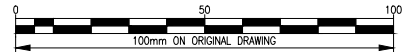


TYPICAL BRACING
AND LEG CONNECTION

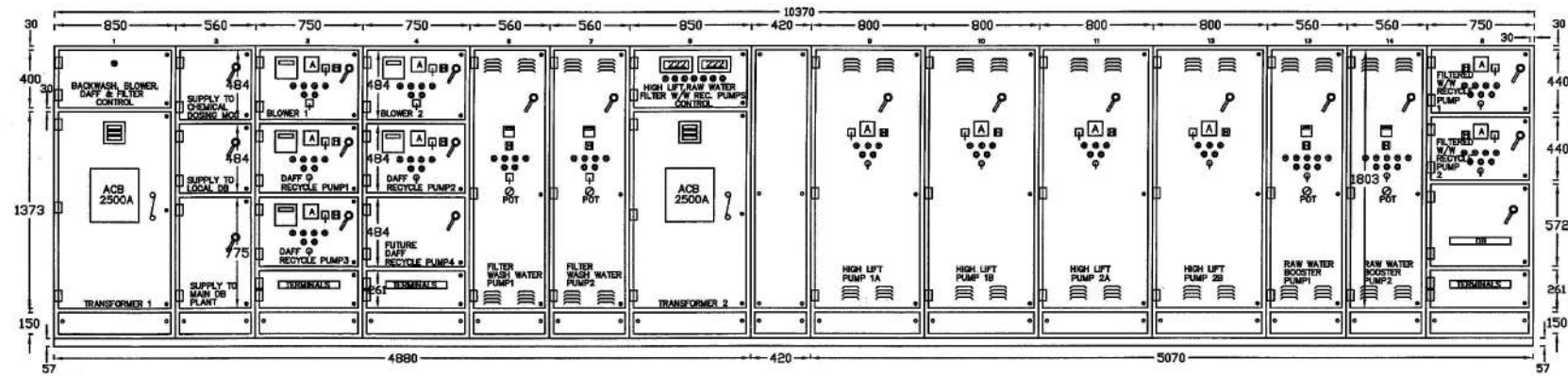


PLAN

FOR INFORMATION ONLY

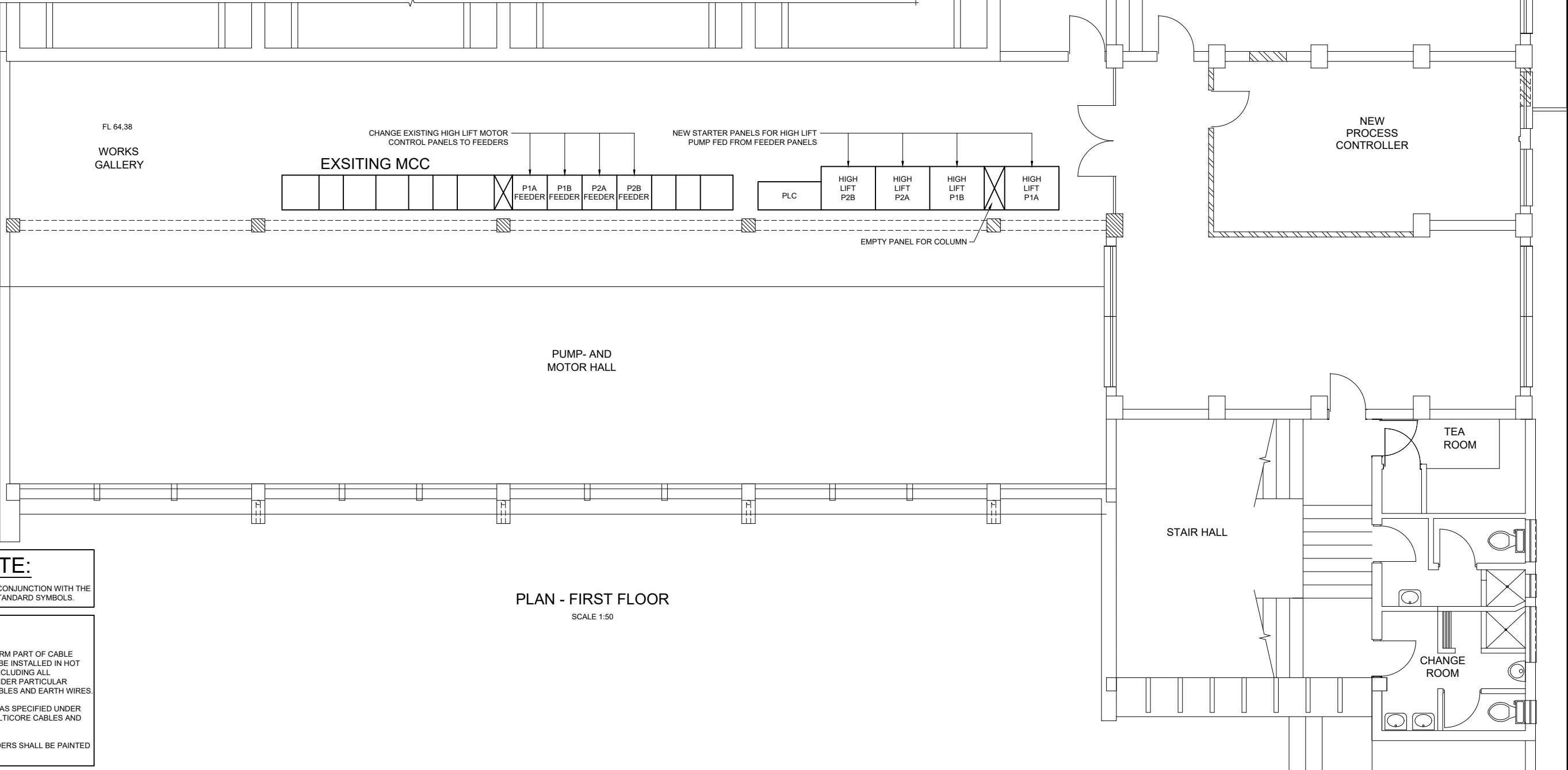
AS-BUILT RECORD				VERSION/AMENDMENTS						PROJECT TITLE: BOSPOORT WTW 24MI/d PROCESS UPGRADE						SURVEYED: —		DESIGNED: —			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE	No.	DATE	DESCRIPTION	AUTHORISED BY			DRAWN: H TURNER	CHECKED: J COETZEE										
CERTIFIED AS-BUILT FOR CONTRACT :										DRAWING TITLE: TYPICAL DETAIL FOR LATTICE COMMUNICATION TOWER				ORIGINAL DRAWING SCALE: NTS		ORIGINAL DRAWING SHEET SIZE: A1		CO-ORDINATE SYSTEM: WG27		DATE: JUNE 2018	
ENGINEER: _____ DATE: _____														APPROVED: _____		APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER: _____		DRAWING No.: 1890.08.AA.21.D001		VERSION: 10	
														CLIENT OR ASSIGNEE: _____ DATE: _____		CLIENT REF No.: _____				REVIEWER: _____	

1890.08.AA.21.D001



EXISTING MCC FRONT VIEW

SCALE 1:25



PLAN - FIRST FLOOR

SCALE 1:50

GENERAL NOTE:

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATIONS AND STANDARD SYMBOLS.

NOTES:

1. ALL CABLE WHICH DOES NOT FORM PART OF CABLE LADDERS/TRAYS OR MESH WILL BE INSTALLED IN HOT DIPPED GALVANIZED CONDUIT INCLUDING ALL ACCESSORIES, AS SPECIFIED UNDER PARTICULAR SPECIFICATIONS MULTICORE CABLES AND EARTH WIRES.
2. ALL CABLES WILL BE INSTALLED AS SPECIFIED UNDER PARTICULAR SPECIFICATION MULTICORE CABLES AND EARTH WIRES.
3. ALL EXPOSED CONDUIT OR LADDERS SHALL BE PAINTED TO SUITE ENVIRONMENT.

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
CERTIFIED AS-BUILT FOR CONTRACT :			
	ENGINEER		DATE

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY



PROJECT TITLE:	BOSPOORT WTW 24MI/d PROCESS UPGRADE
DRAWING TITLE:	MOTOR CONTROL CENTRE AND SOFT STARTER LAYOUT

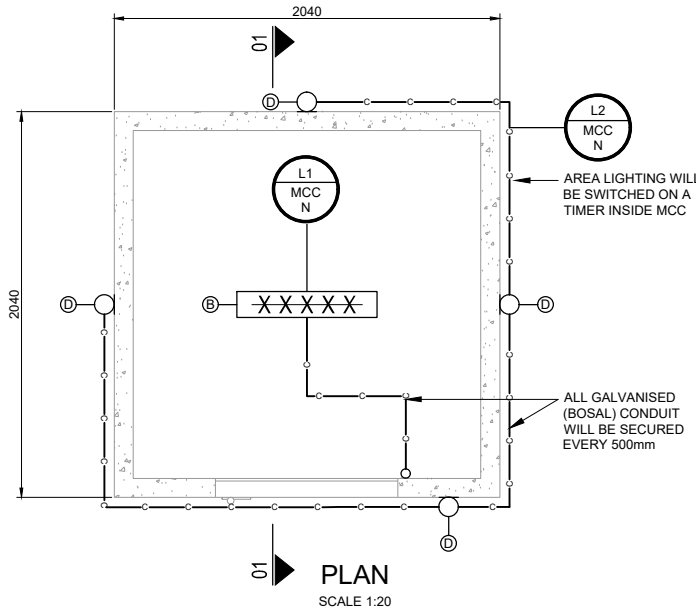


ORIGINAL DRAWING SCALE:	AS SHOWN	ORIGINAL DRAWING SHEET SIZE:	A1
APPROVED:		DATE:	
CLIENT OR ASSIGNEE:		CLIENT REF No.:	

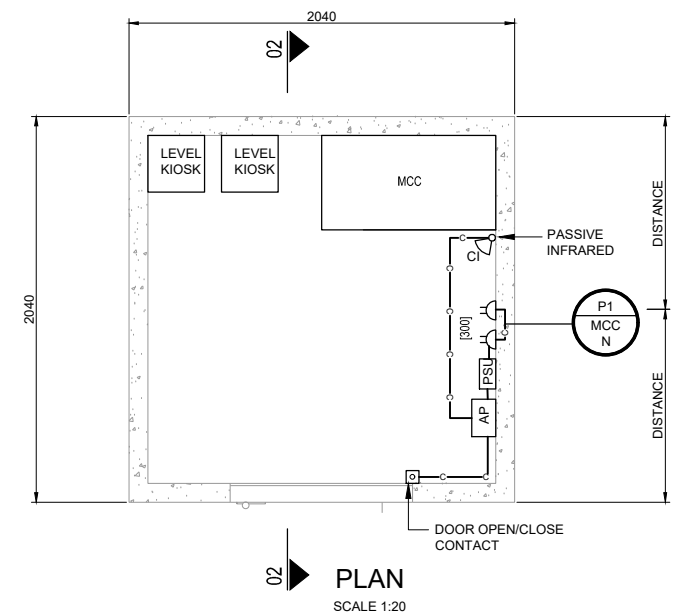
SURVEYED	-	DESIGNED	J COETZEE
DRAWN	A STEENBERG	CHECKED	J COETZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	JUNE 2018
APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:		DRAWING No.:	1890.08.PA.23.D001
		VERSION:	10

REVIEWER:

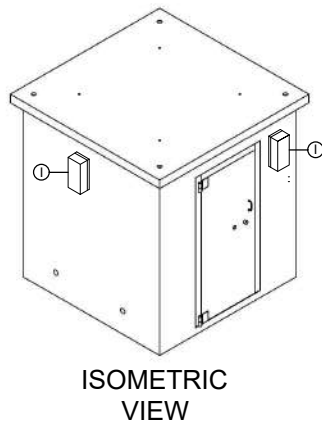
1890.08.PA.23.D001



LIGHTING LAYOUT AND SECTION



ELECTRICAL DISTRIBUTION LAYOUT AND SECTION



ISOMETRIC VIEW

LEGEND: SMALL POWER AND LIGHTING

○	SWITCH
⌋	16A 3-PIN DEDICATED DUBBLE PLUG
XX	LIGHT FIXTURE
○	WALL MOUNTED LIGHT FIXTURE
⊗	"X" REPRESENTS THE TYPE OF LUMINAIRE AS SPECIFIED IN THE PROJECT SPECIFICATIONS. REFER TO PS ESPL-4 LIGHT FITTINGS.
PSU	POWER SUPPLY UNIT
AP	ALARM PANEL
□	DOOR OPEN / CLOSE CONTACT
PI	PASSIVE INFRARED
CI	OPTIONS: 1. C/P/W INDICATES MOUNTING TYPE C - CEILING P - POLE W - WALL 2. CONDITIONS I - INDOOR MOUNTED O - OUTDOOR MOUNTED
⊗	THREE PHASE OUTLET
○	LEVEL INDICATOR
□	EMERGENCY STOP BUTTON
■	DISTRIBUTION BOARD
—	INDICATES CIRCUIT
- - -	INDICATES SWITCHING CIRCUIT
- - -	CABLE ROUTE
- - -	TUBING/CONDUIT ONLY
	CABLE LADDER
L1 DB-G X	CIRCUIT REFERENCE : CIRCUIT L1 ON DB-G "X" SECTION X = N - NORMAL POWER, G - GENERATOR, U - UPS

GENERAL NOTE:

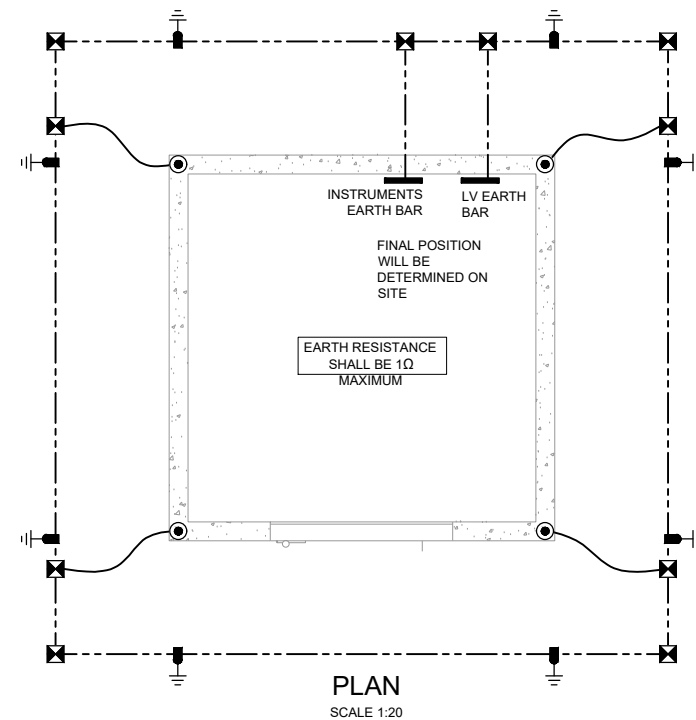
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE ELECTRICAL SPECIFICATIONS AND STANDARD SYMBOLS.

NOTES:

- ALL CABLE WHICH DOES NOT FORM PART OF CABLE LADDERS/TRAYS OR MESH WILL BE INSTALLED IN HOT DIPPED GALVANIZED CONDUIT INCLUDING ALL ACCESSORIES, AS SPECIFIED UNDER PARTICULAR SPECIFICATIONS MULTICORE CABLES AND EARTH WIRES.
- ALL CABLES WILL BE INSTALLED AS SPECIFIED UNDER PARTICULAR SPECIFICATION MULTICORE CABLES AND EARTH WIRES.
- ALL EXPOSED CONDUIT OR LADDERS SHALL BE PAINTED TO SUITE ENVIRONMENT.

EARTHING AND LIGHTNING PROTECTION NOTES:

- APPLICABLE STANDARDS:
10142-1, 10313, 60839-1, 62305-2, 62305-3 & 62305-4.
- DRAWING NOTES FORM PART OF THE SPECIFICATION.
- THE EARTH RING SHOWN SHALL BE TESTED FOR AN EARTH RESISTANCE VALUE OF LESS THAN 1Ω. SHOULD THIS VALUE NOT BE ACHIEVED THEN THE SYSTEM SHALL BE EXPANDED WITH ADDITIONAL EARTH CONDUCTORS AND ELECTRODES UNTIL THE REQUIRED RESISTANCE IS ACHIEVED.
- AT LEAST ONE TEST MANHOLE SHALL BE PROVIDED.
- THE EARTH MAT SHALL SERVE AS BOTH AN ELECTRICAL AND LIGHTNING PROTECTION EARTH SYSTEM. ALL BUILDING STEEL COLUMNS, OR THEIR BOLT CAGES, SHALL BE BONDED TO THE EARTH RING AS PER THE PARTICULAR SPECIFICATION.
- THE EARTH MAT SHALL BE INSTALLED AT A MINIMUM DISTANCE OF 1m FROM THE BUILDING AND WITHIN AN 1m DEEP TRENCH.
- EARTH ELECTRODES SHALL BE INSTALLED AS PER PARTICULAR SPECIFICATION AT EACH POINT SHOWN AND THEIR TOPS SHALL BE SEMI FLUSH WITH THE BOTTOM OF THE TRENCH.
- EARTH CONDUCTORS SHALL BE 70 mm² BARE COPPER EARTH.
- EARTH CONDUCTOR TAILS FROM STEEL COLUMNS OR REBAR CONNECTIONS, SHALL BE 70 mm² AS SPECIFIED UNDER PARTICULAR SPECIFICATION.
- ALL BONDS AND CONNECTIONS TO CONDUCTORS, REBAR AND STEEL COLUMNS, SHALL BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE COVERING UP THE WORK.
- EARTH BARS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND THE BARS SHALL BE INTERCONNECTED TO THE EARTH RING.
- THE EARTH BAR BELOW THE COMMUNICATION ROOM SHALL BE A DEDICATED INSTRUMENT EARTH BAR AND USED SOLELY FOR INSTRUMENT EARTH CONNECTIONS. THIS BAR SHALL BE CONNECTED TO THE EARTH RING AT ONE POINT AS SHOWN ON THE DRAWING.
- ALL EARTH BAR INTERCONNECTIONS AND CONNECTION TO THE EARTH RING SHALL BE DONE USING 70 mm² AS SPECIFIED UNDER THE PARTICULAR SPECIFICATION. ALL ABOVE GROUND BONDING SHALL BE DONE WITH KWENA CABLE.
- ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT DOORS ARE FITTED WITH EARTH STUDS AND EARTH WIRES, AND THAT THEY ARE CONNECTED TO THE EARTH BAR.
- ONLY INDIVIDUALLY RUN EARTH WIRES ARE SHOWN HERE, EARTH WIRES FORMING PART OF A MULTI CORE CABLE ARE NOT INDICATED ON THE DRAWING.
- EQUIPOTENTIAL BONDING AS PER PARTICULAR SPECIFICATION.



EARTHING AND LIGHTNING PROTECTION LAYOUT

LEGEND: EARTHING AND LIGHTNING

⊕	EARTH ELECTRODE
⊗	EXOTHERMIC WELD BETWEEN CONDUCTORS - TEE TYPE
⊙	EXOTHERMIC WELD OR BOLTED - CONDUCTOR TO STEELWORK
⊕	BRASS CLAMP COMPLETE WITH BRASS NUT AND BOLT
—	EARTH WIRE - EQUIPOTENTIAL BONDING
- - -	CABLE ROUTE
—	EARTH BAR
⊗	ELECTRODE INSPECTION WELL - 400x400x800 mm (LxWxD)

AS-BUILT RECORD			
CONTRACT No.	DESCRIPTION	CERTIFIED BY	DATE
CERTIFIED AS-BUILT FOR CONTRACT :			

VERSION/AMENDMENTS			
No.	DATE	DESCRIPTION	AUTHORISED BY



PROJECT TITLE:	BOSPOORT WTW 24MI/d PROCESS UPGRADE
DRAWING TITLE:	CONTROL ROOM EARTHING AND LIGHTNING, SMALL POWER, LIGHTING AND DITRIBUTION LAYOUTS



0 50 100 100mm ON ORIGINAL DRAWING	ORIGINAL DRAWING SCALE: 1:20	ORIGINAL DRAWING SHEET SIZE: A1
APPROVED:	CLIENT OR ASSIGNEE: DATE:	CLIENT DRAWING No.: CLIENT REF No.:

SURVEYED	-	DESIGNED	J COETZEE
DRAWN	JA SWART	CHECKED	J COETZEE
CO-ORDINATE SYSTEM:	WG27	DATE:	JUNE 2018
APPROVED ON BEHALF OF BIGEN AFRICA: PRACTITIONER:	DRAWING No.: 1890.08.SUH.23.D001	VERSION:	10

REVIEWER:

1890.08.SUH.23.D001