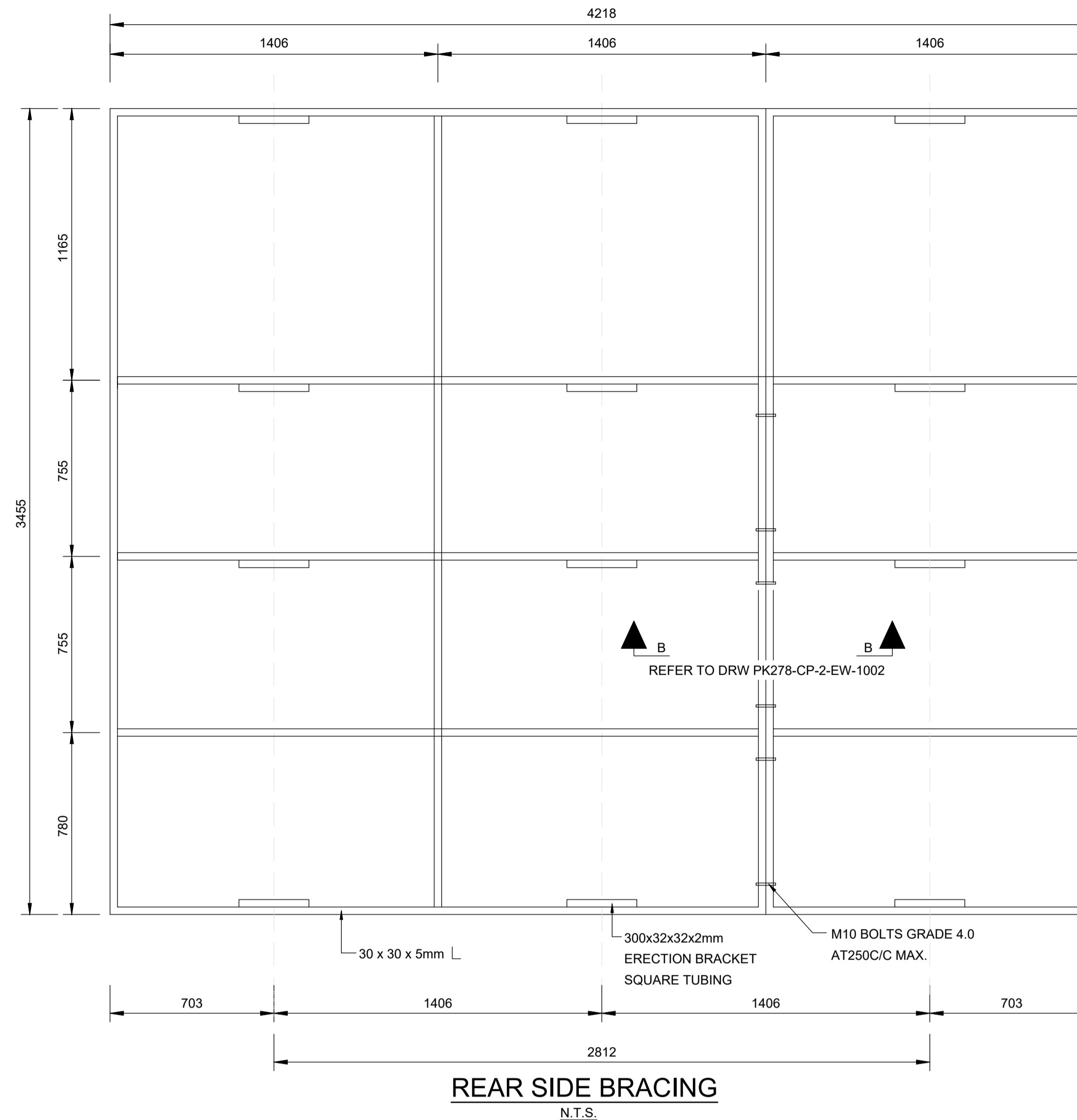




FRONT ELEVATION
N.T.S.



REAR SIDE BRACING
N.T.S.

NOTES:

PROJECT TITLE:
CONTRACT NO. PM 91/2019: CONSTRUCTION OF EARTHWORKS FOR POLOKWANE REGIONAL WASTEWATER TREATMENT WORKS

CONSULTANT'S NAME:
ZAKUMI CONSULTING ENGINEERS TEL: (015) 291 1176

DETERMINATION OF BREAK-AWAY HOLES	
POLE DIA (mm)	HOLE DIA (mm)
< 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65

TABLE 1: DETERMINATION OF POSTS & FOOTINGS

TYPE OF POST	ERECTION DETAILS			
	UPRIGHT	STAY	D	B(DIA)
TIMBER POST AND STAY	100mm	80mm	600mm	850mm
TIMBER POST	180mm	-	1000mm	1450mm
D SECTION STEEL POST	100mm x 4mm	-	1000mm	1450mm

NOTES:

- EMBLEMS:**
1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI-MATT BACKGROUND.
- LETTERS AND NUMBERS:**
2. DESCRIPTION : MATT-BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI-MATT SMOKE-GREY BACKGROUND.
- BORDERS:**
3. BORDER : GREEN NON-REFLECTORIZED.
- QUANTITY:**
4. TWO SIGN BOARDS, SHALL BE ERECTED AT POSITIONS AS DETERMINED BY THE ENGINEER.

CONTRACT NO.:

PM 91/2019

- NOTES:**
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS
 - ONE NAME BOARD TO BE ERECTED ON SITE; ONE NAME BOARD TO BE ERECTED AT THE SITE OFFICE.

CONSTRUCTION DRAWING

- NOTES:**
- DO NOT SCALE THE DRAWINGS.
 - ALL DIMENSIONS TO BE VERIFIED ON SITE, PRIOR TO MANUFACTURING OR ORDERING OF EQUIPMENT.
 - ANY IN-CLARITIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSULTING ENGINEER
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ZAKUMI
Consulting Engineers

21 COMPENSATIE ST. POLOKWANE, LIMPOPO, 0699
P.O BOX 3154, POLOKWANE, LIMPOPO, 0700

WEBSITE: www.zce.co.za
TEL: +27 15 291 1176
FAX: +27 15 291 1993

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE

NO.	DATE	REVISION DESCRIPTION
1	2023/03/29	ISSUED FOR CONSTRUCTION

ENGINEER
PR ENG no. 201030123
DATE 01/04/2023

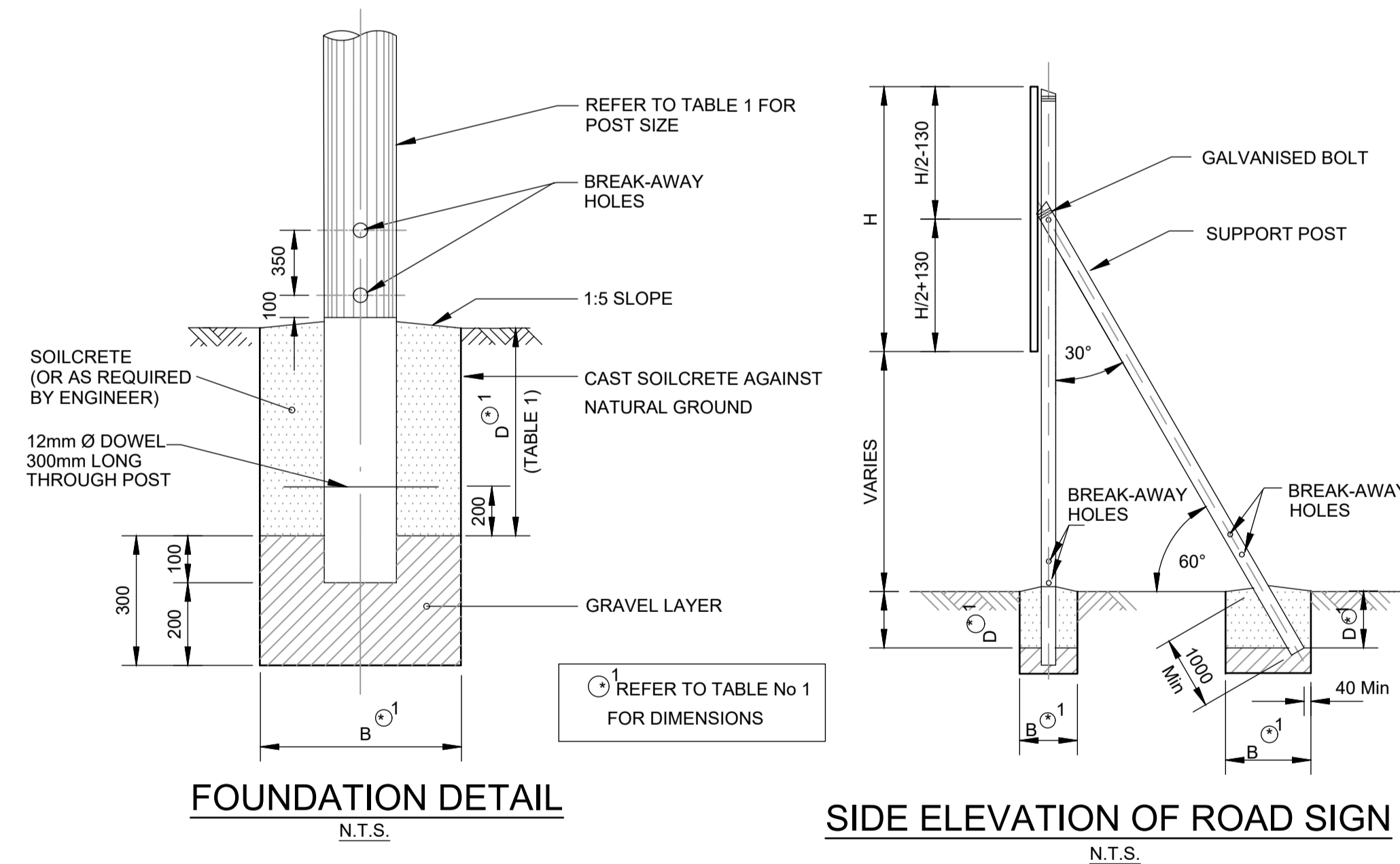
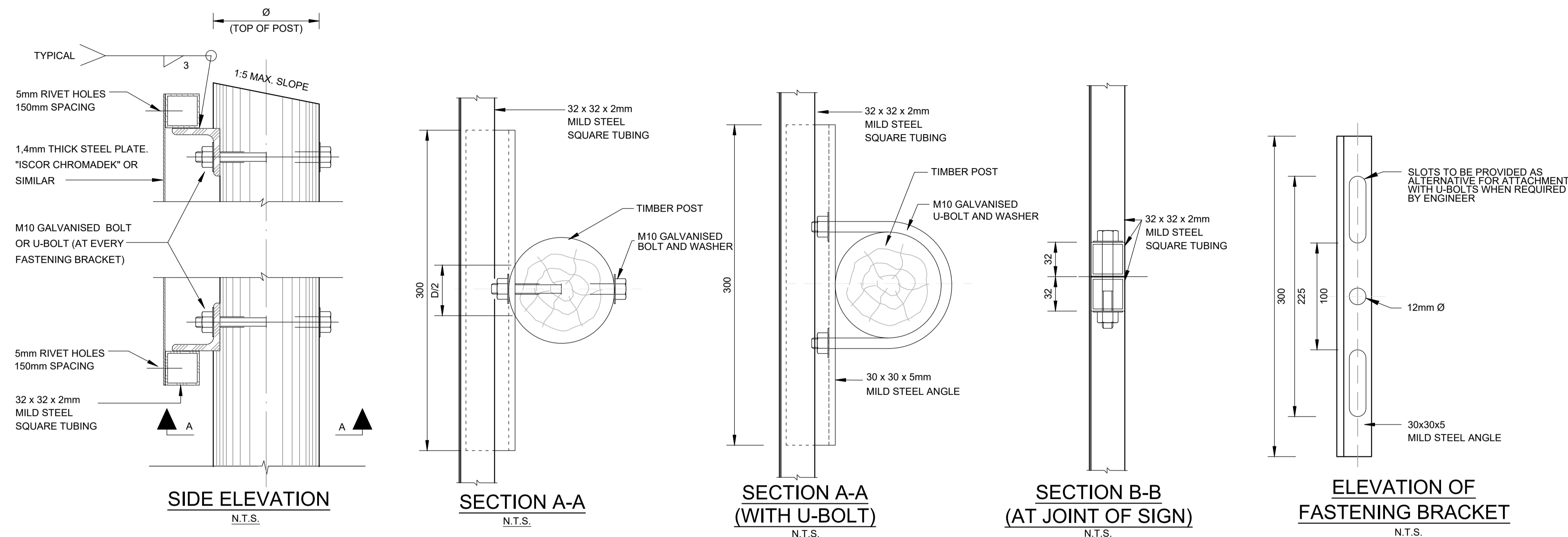
CLIENT _____ DATE _____

PROJECT
POLOKWANE REGIONAL WASTEWATER TREATMENT WORKS

DRAWING DESCRIPTION
REGIONAL WWTW NAME BOARD

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-03-29	N.T.S.	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1001	1	

- NOTES:
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS
 - ONE NAME BOARD TO BE ERRECTED ON SITE; ONE NAME BOARD TO BE ERRECTED AT THE SITE OFFICE.



FIXING DETAIL FOR SIGN BOARDS

CONSTRUCTION DRAWING

- NOTES
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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
1	2023/03/29	ISSUED FOR CONSTRUCTION

ENGINEER: *[Signature]* 201030123 01/04/2023
PR ENG no. DATE

CLIENT: _____ DATE: _____

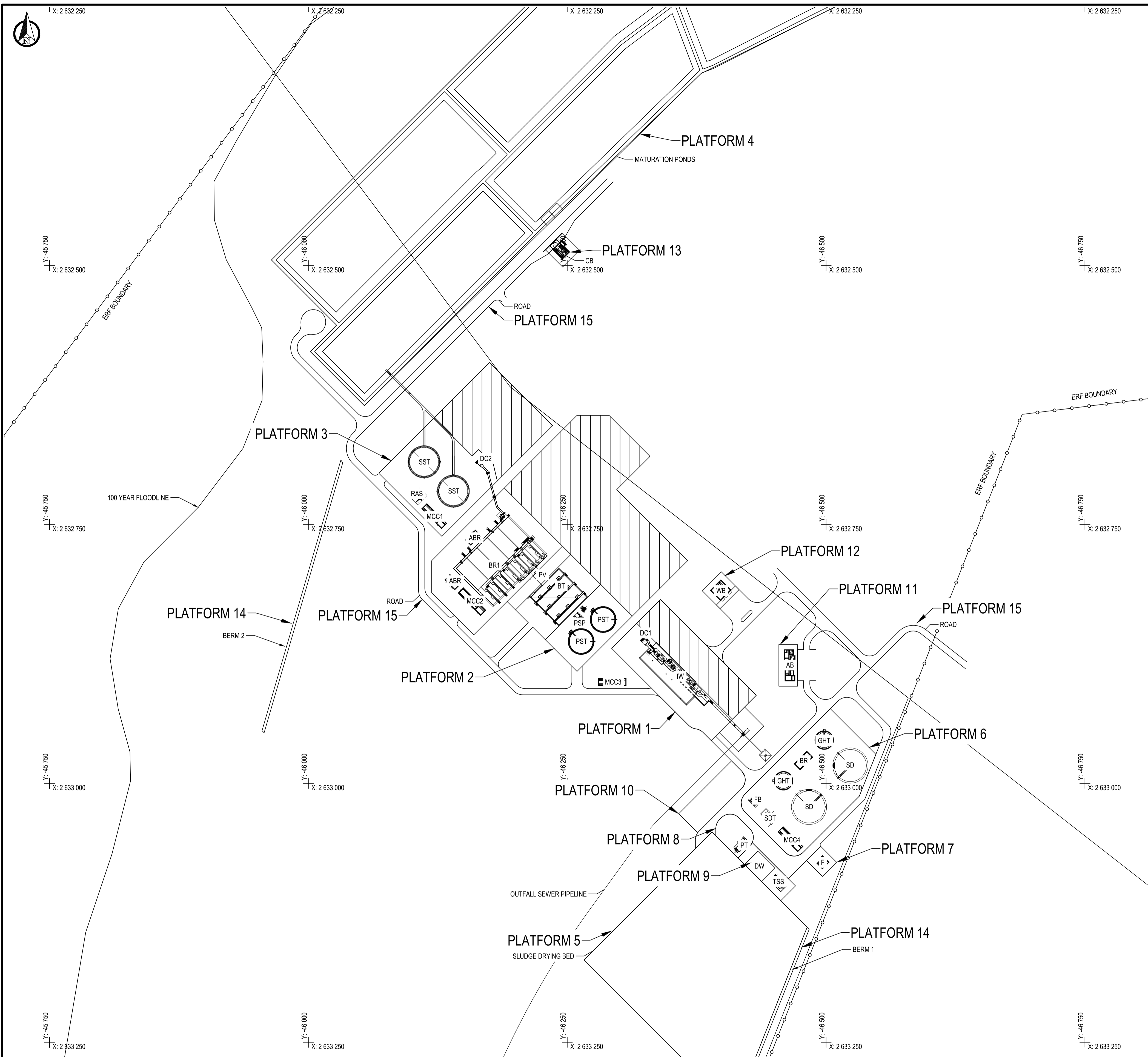
PROJECT

POLOKWANE REGIONAL WASTEWATER TREATMENT WORKS

DRAWING DESCRIPTION

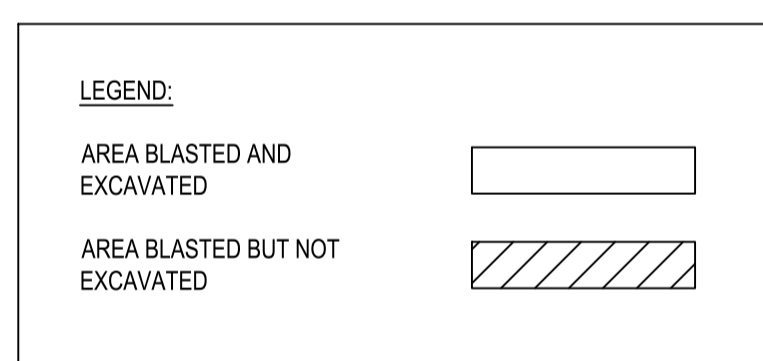
REGIONAL WWTW NAME BOARD DETAILS

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-03-29	N.T.S.	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1002	1	



PLATFORM ARRANGEMENT	
PLATFORM NAME	STRUCTURE
PLATFORM 1 PK278-CP-2A-EW-1100 TO PK278-CP-2A-EW-1105	INLET STRUCTURE DIVIDING CHAMBER 1
PLATFORM 2 PK278-CP-2A-EW-1200 TO PK278-CP-2A-EW-1205	PRIMARY SETTLING TANKS PRIMARY SLUDGE PUMP STATION BALANCING TANKS PINCH VALVE CHAMBER BIOLOGICAL REACTOR AIR BLOWER ROOMS MCC SUBSTATION
PLATFORM 3 PK278-CP-2A-EW-1300 TO PK278-CP-2A-EW-1305	SECONDARY SETTLING TANKS DIVIDING CHAMBER 2 RAS PUMP STATIONS MCC ROOM
PLATFORM 4 PK278-CP-2A-EW-1400 TO PK278-CP-2A-EW-1433-2	MATURATION PONDS
PLATFORM 5 PK278-CP-2A-EW-1500 TO PK278-CP-2A-EW-1502	SLUDGE DRYING BED
PLATFORM 6 PK278-CP-2A-EW-1600 TO PK278-CP-2A-EW-1604	SLUDGE DIGESTERS GAS HOLDING TANKS BOILER ROOM FERRIC CHLORIDE DOSING SYSTEM MCC ROOM SLUDGE DAY TANK
PLATFORM 7 PK278-CP-2A-EW-1700 TO PK278-CP-2A-EW-1701	OFFICE AND ABLUTION FACILITIES
PLATFORM 8 PK278-CP-2A-EW-1800 TO PK278-CP-2A-EW-1803	PRECIPITATION TANK
PLATFORM 9 PK278-CP-2A-EW-1900 TO PK278-CP-2A-EW-1901	DEWATERING BUILDING THICK SLUDGE SUMP
PLATFORM 10 PK278-CP-2A-EW-2000 TO PK278-CP-2A-EW-2001	NONE
PLATFORM 11 PK278-CP-2A-EW-2100 TO PK278-CP-2A-EW-2101	ADMIN BUILDING
PLATFORM 12 PK278-CP-2A-EW-2200 TO PK278-CP-2A-EW-2201	WORKSHOP
PLATFORM 13 PK278-CP-2A-EW-2300 TO PK278-CP-2A-EW-2301	CHLORINE BUILDING
PLATFORM 14 PK278-CP-2A-EW-2400 TO PK278-CP-2A-EW-2402	EARTH FILL BERMS
PLATFORM 15 PK278-CP-2A-EW-2500 TO PK278-CP-2A-EW-2530-2	ROADS
PLATFORM 16 PK278-CP-2A-EW-2600 TO PK278-CP-2A-EW-2605	INTERNAL RETICULATION

LEGEND	
AB	ADMINISTRATION BUILDING
ABR	AIR BLOWER ROOM
BR	BOILER ROOM
BR1	BIOLOGICAL REACTOR
BT	BALANCING TANK
CB	CHLORINE BUILDING
CCT	CHLORINE CONTACT TANK
DW	DEWATERING BUILDING
DC1	DIVIDING CHAMBER 1
DC2	DIVIDING CHAMBER 2
F	OFFICE AND ABLUTION FACILITIES
FB	FERRIC BUND
FS	FILTRATE SUMP
GHT	GAS HOLDING TANK
IW	INTEL WORKS
LS	LINEAR SCREEN BUILDING
MCC1	MCC SUBSTATION BIOREACTOR
MCC2	MCC ROOM
MCC3	MCC ROOM
MCC4	MCC ROOM
PT	PRECIPITATION TANK
PSP	PRIMARY SLUDGE PUMP STATION
PST	PRIMARY SEDIMENTATION TANK
PV	PINCH VALVE CHAMBER
SD	SLUDGE DIGESTER
SDT	SLUDGE DAY TANK
SST	SECONDARY SEDIMENTATION TANK
TSS	THICK SLUDGE SUMP
RAS	RAS PUMP STATION
WB	WORKSHOP
WST	WAS STORAGE TANK
WWD	WASH WATER DAY TANK



NOTES

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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2023-03	ISSUED FOR CONSTRUCTION

T. BANDA	PR ENG no.	DATE
ENGINEER		
CLIENT		DATE

PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

SITE LAYOUT

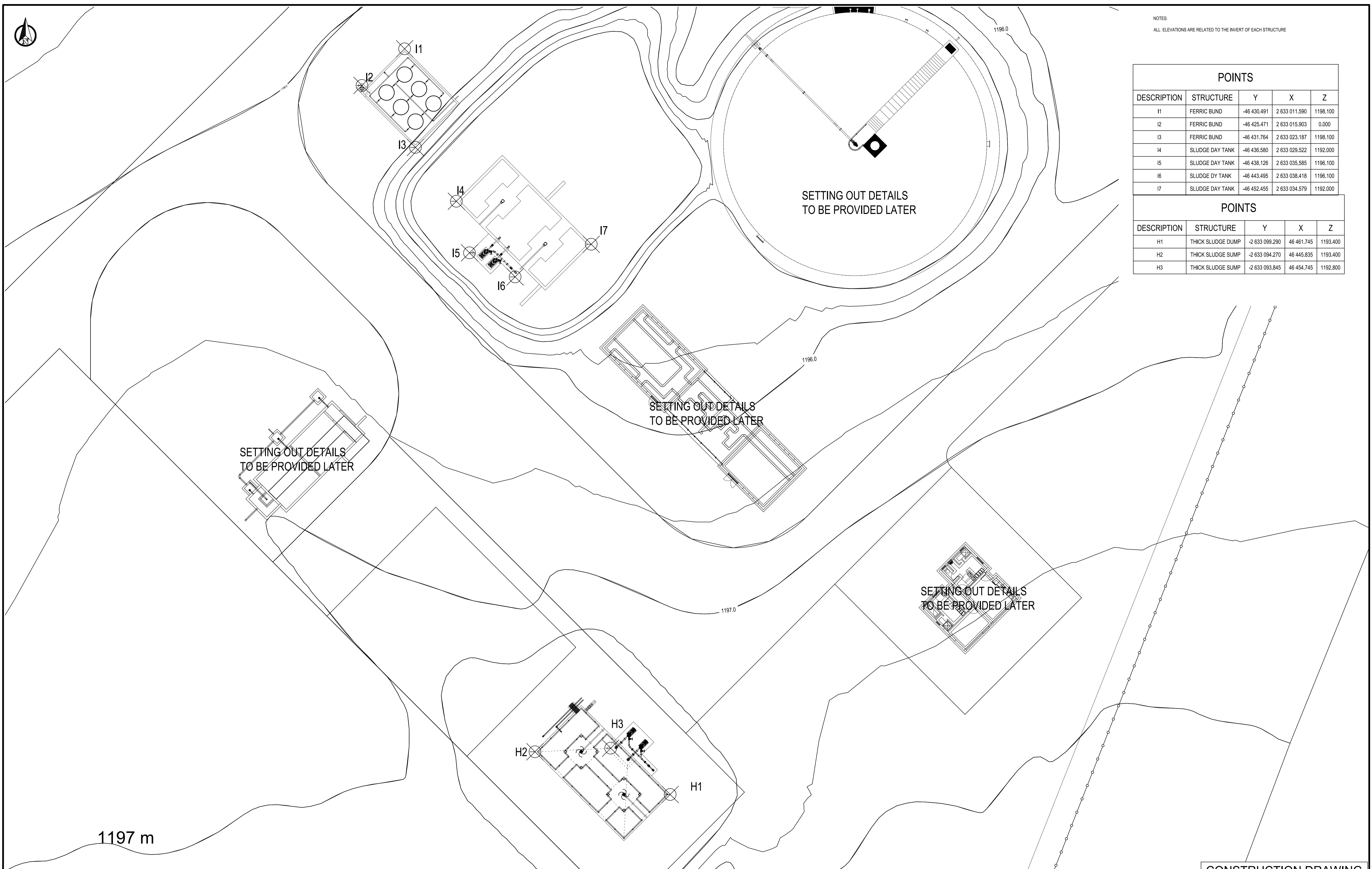
CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
X. SURNAME	X. SURNAME	X. SURNAME
REV DATE	SCALE	ORIGINAL SIZE
2023-03	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)		REV
PK278-CP-2-EW-1003		0



NOTES:
ALL ELEVATIONS ARE RELATED TO THE INVERT OF EACH STRUCTURE

POINTS				
DESCRIPTION	STRUCTURE	Y	X	Z
I1	FERRIC BUND	-46 430.491	2 633 011.590	1198.100
I2	FERRIC BUND	-46 425.471	2 633 015.903	0.000
I3	FERRIC BUND	-46 431.764	2 633 023.187	1198.100
I4	SLUDGE DAY TANK	-46 436.580	2 633 029.522	1192.000
I5	SLUDGE DAY TANK	-46 438.126	2 633 035.585	1196.100
I6	SLUDGE DY TANK	-46 443.495	2 633 038.418	1196.100
I7	SLUDGE DAY TANK	-46 452.455	2 633 034.579	1192.000

POINTS				
DESCRIPTION	STRUCTURE	Y	X	Z
H1	THICK SLUDGE DUMP	-2 633 099.290	46 461.745	1193.400
H2	THICK SLUDGE SUMP	-2 633 094.270	46 445.835	1193.400
H3	THICK SLUDGE SUMP	-2 633 093.845	46 454.745	1192.800



1197 m

CONSTRUCTION DRAWING

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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2023-06	ISSUED FOR CONSTRUCTION
1	2023-06	SETTING OUT TABLE UPDATED

T. BANDA	PR ENG no.	DATE
ENGINEER		
CLIENT		DATE

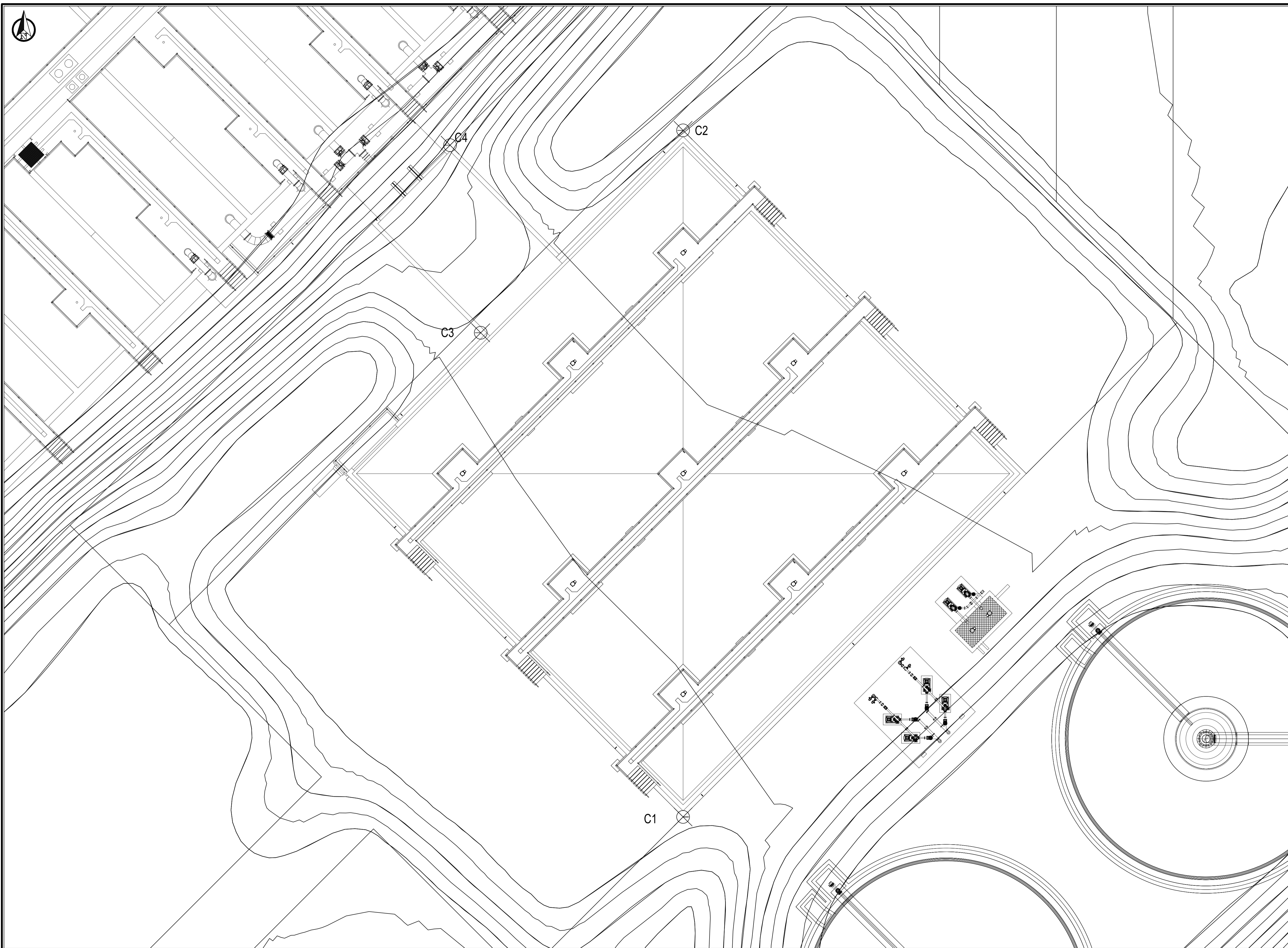
PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

SDT, FB AND TSS SETTING OUT

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-06	1:200	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1004	1	



NOTES:
ALL ELEVATIONS RELATE TO THE INVERT OF EACH STRUCTURE

POINTS			
DESCRIPTION	Y	X	Z
C1	-46 241.991	2 632 848.154	1187.765
C2	-46 241.991	2 632 792.152	1187.765
C3	-46 225.480	2 632 808.663	1185.900
C4	-46 222.976	2 632 793.361	1185.900

CONSTRUCTION DRAWING

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CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2023-06	ISSUED FOR CONSTRUCTION

T. BANDA	PR ENG no.	DATE
ENGINEER		
CLIENT		DATE

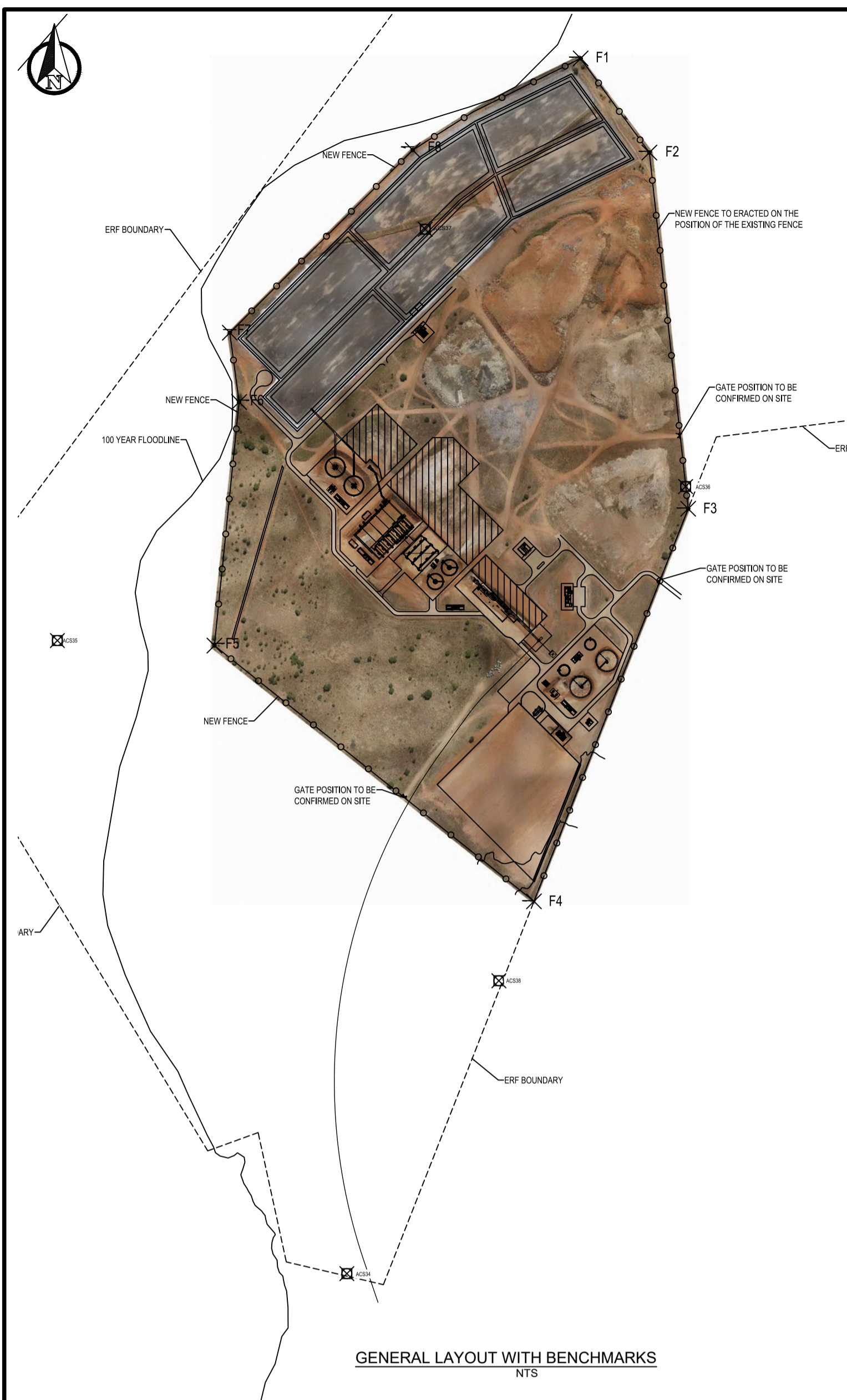
PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

BALANCING TANK AND PV CHAMBER SETTING OUT

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-06	1:200	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1005	0	



BENCHMARKS			
POINT	Y	X	Z
ACS34	-2 633 912.052	46 129.326	1194.218
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	46 248.152	1180.756
ACS38	-2 633 468.075	46 359.715	1200.721

COORDINATES		
POINT	Y	X
F1	-2 632 069.804	46 483.649
F2	-2 632 212.532	46 587.806
F3	-2 632 752.556	46 646.602
F4	-2 633 347.704	46 412.871
F5	-2 632 959.937	45 928.639
F6	-2 632 590.737	45 966.017
F7	-2 632 485.709	45 951.972
F8	-2 632 208.761	46 229.202
F9	-263 215.784	46 321.029

NOTES:

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL PROJECT DRAWINGS AND SPECIFICATIONS.
2. THE SPECIFICATIONS WILL GOVERN IN THE CASE OF A CONFLICT.
3. COORDINATES SYSTEM: WGS84 LQ29°

NOTES

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CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2023-06	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

PROJECT

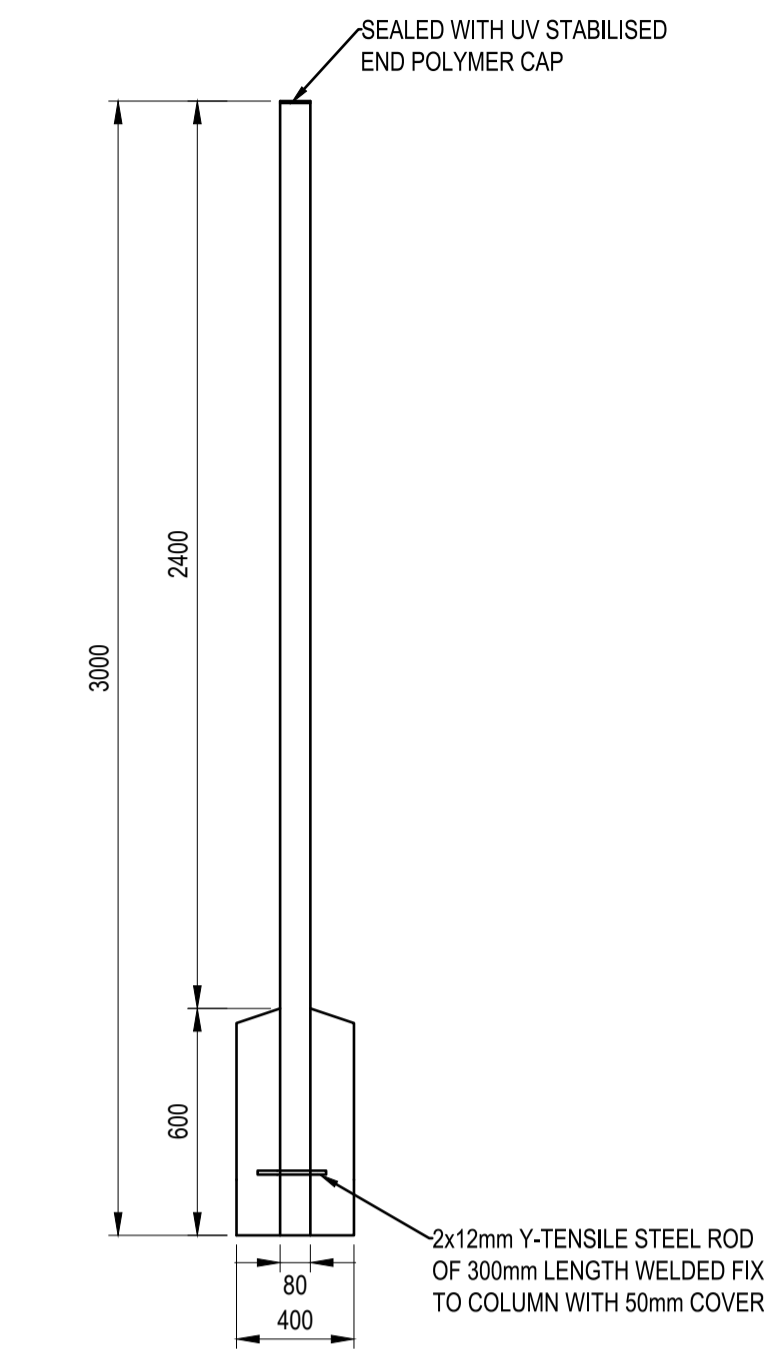
POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

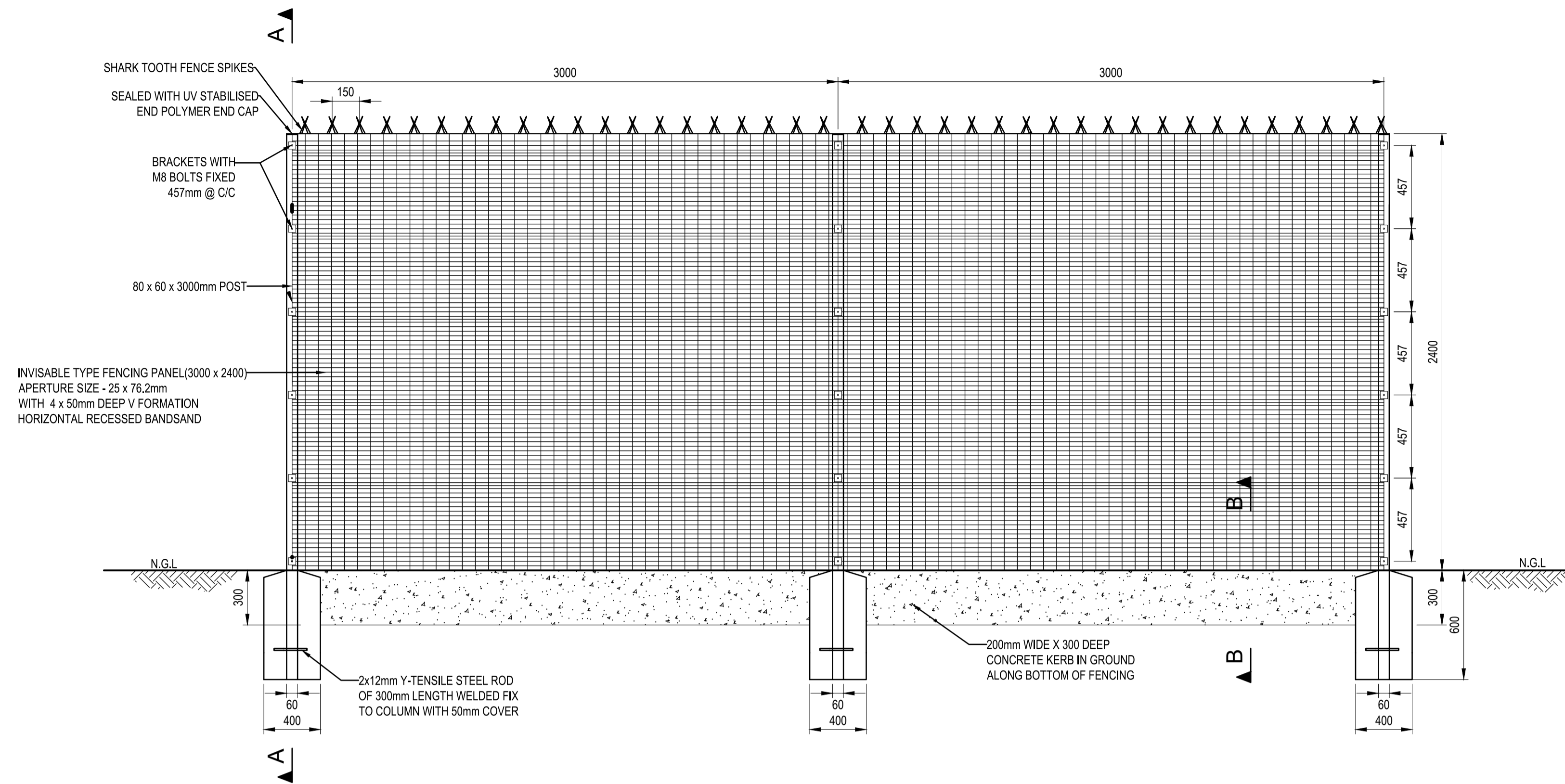
FENCE LAYOUT AND SETTING OUT

CONSTRUCTION DRAWING

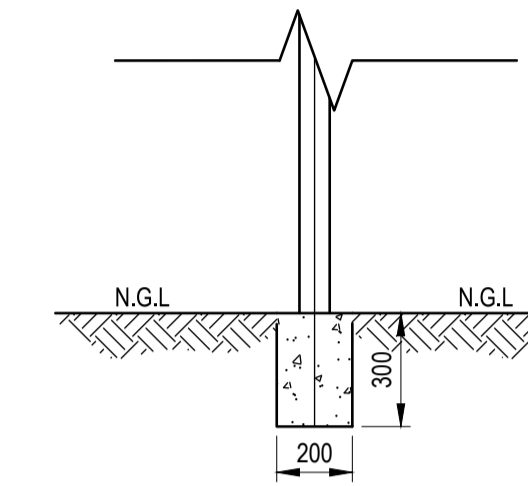
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-06	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1006	0	



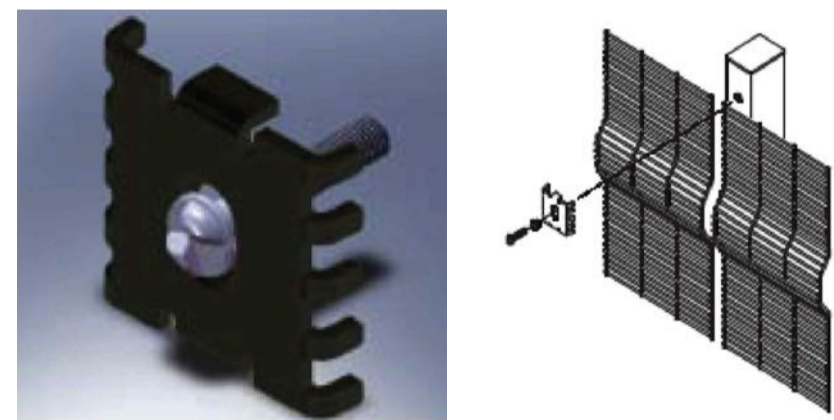
SECTION A - A
STANDARD SECURITY POST
SCALE 1:25



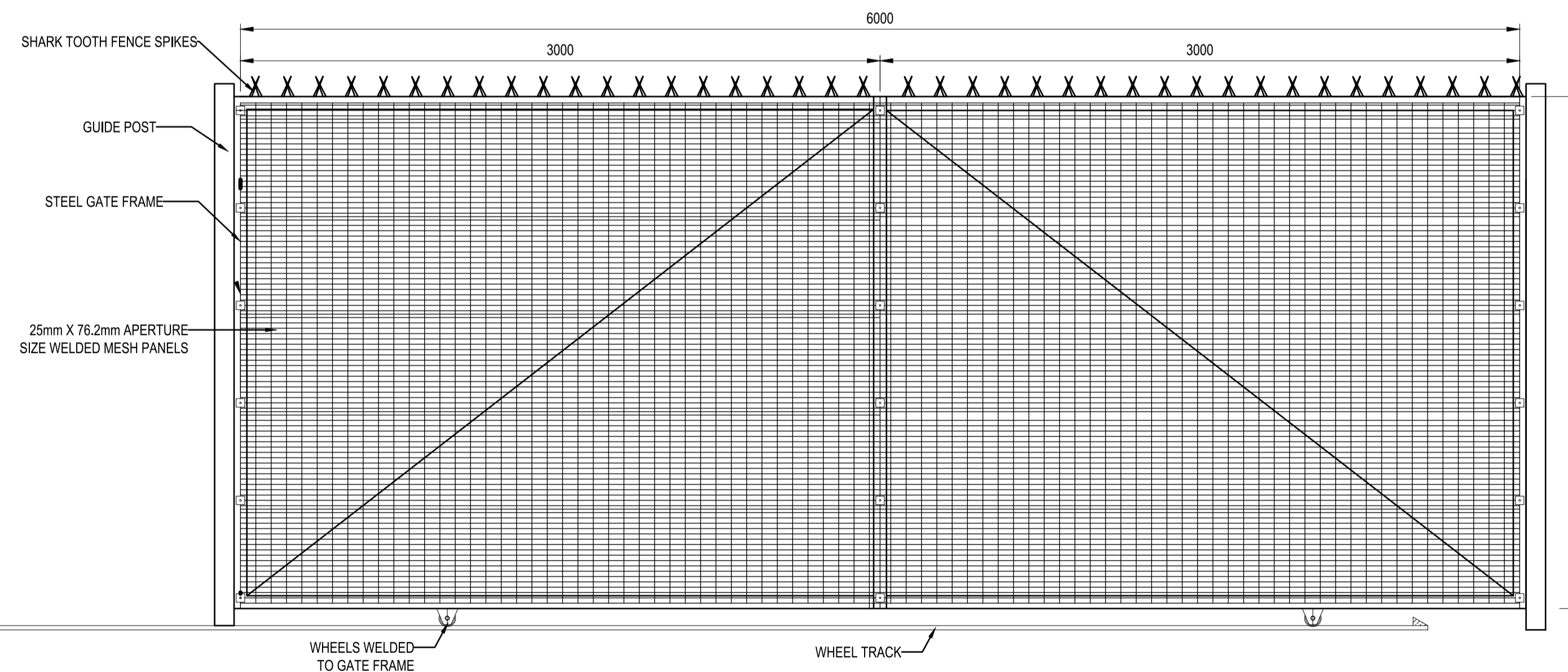
INVISIBLE TYPE FENCING
SCALE 1:20



SECTION B - B
KERB DETAIL
SCALE 1:20



TYPICAL FIXING BRACKET
NOT TO SCALE



SLIDING GATE
SCALE 1:20

NOTES:

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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2023-06	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER

PR ENG no. DATE

CLIENT DATE

PROJECT

**POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS**

DRAWING DESCRIPTION

FENCE DETAILS

CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2023-06	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2-EW-1007	0	



- GENERAL NOTES:
1. THESE DRAWINGS ARE COMPLEMENTARY TO THE PROJECT SPECIFICATIONS. THE PROJECT SPECIFICATIONS WILL GOVERN IN THE CASE OF ANY CONFLICTS.
 2. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL DETAIL DRAWINGS AND PROJECT SPECIFICATIONS.
 3. COORDINATE SYSTEM: WGS84 LQ29°
 4. CONTOUR INTERVALS: 1m
 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
 7. OUTER EMBANKMENT SLOPES ARE 1:2 (V:H).
 8. EMBANKMENT SLOPES INTO MATURATION POND BASINS ARE 1:3 (V:H).
 9. NO CLEARING AND GRUBBING AND TOPSOIL REMOVAL IS PERMITTED WITHIN THE DEMARCATED WETLAND SECTION.

BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	48 248.152	1180.756

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CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2020-04	ISSUED FOR CONSTRUCTION
1	2024-03	REVISED ANNOTATION

T. BANDA
ENGINEER

PR ENG no. DATE

CLIENT DATE

PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

Z22 PIPELINE DIVERSION: LAYOUT

LEGEND	
	NEW PROPOSED Z22 Ø315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 Ø315 uPVC PIPELINE
	FENCE
	WETLAND AREA

CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2024-03	N/A	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2700	1	



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 3. COORDINATE SYSTEM: WGS84 LQ29°
 4. CONTOUR INTERVALS: 1m
 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
 7. OUTER EMBANKMENT SLOPES ARE 1:2 (V:H).
 8. EMBANKMENT SLOPES INTO MATURATION POND BASINS ARE 1:3 (V:H).
 9. NO CLEARING AND GRUBBING AND TOPSOIL REMOVAL IS PERMITTED WITHIN THE DEMARCATED WETLAND SECTION.

BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	48 248.152	1180.756

LEGEND	
	NEW PROPOSED Z22 0315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 0315 uPVC PIPELINE
	FENCE
	WETLAND AREA

CONSTRUCTION DRAWING

NOTES

- 1.1 DO NOT SCALE THE DRAWINGS.
- 1.2 ALL DIMENSIONS TO BE VERIFIED ON SITE, PRIOR TO MANUFACTURING OR ORDERING OF EQUIPMENT.
- 1.3 ANY IN-CLEARITIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSULTING ENGINEER
- 1.4 THIS DRAWING, OR PART THEREOF, SHALL NOT BE USED FOR ANY OTHER INSTALLATION PROJECT OTHER THAN THIS ONE.
- 1.5 THIS DRAWING FORMS PART OF THE SPECIFICATION AND MUST BE READ IN CONJUNCTION WITH THE SAME.

ZAKUMI
Consulting Engineers

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WEBSITE: www.zoe.com
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FAX: +27 15 291 1993

CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE	
NO.	DATE
1	2020-04

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

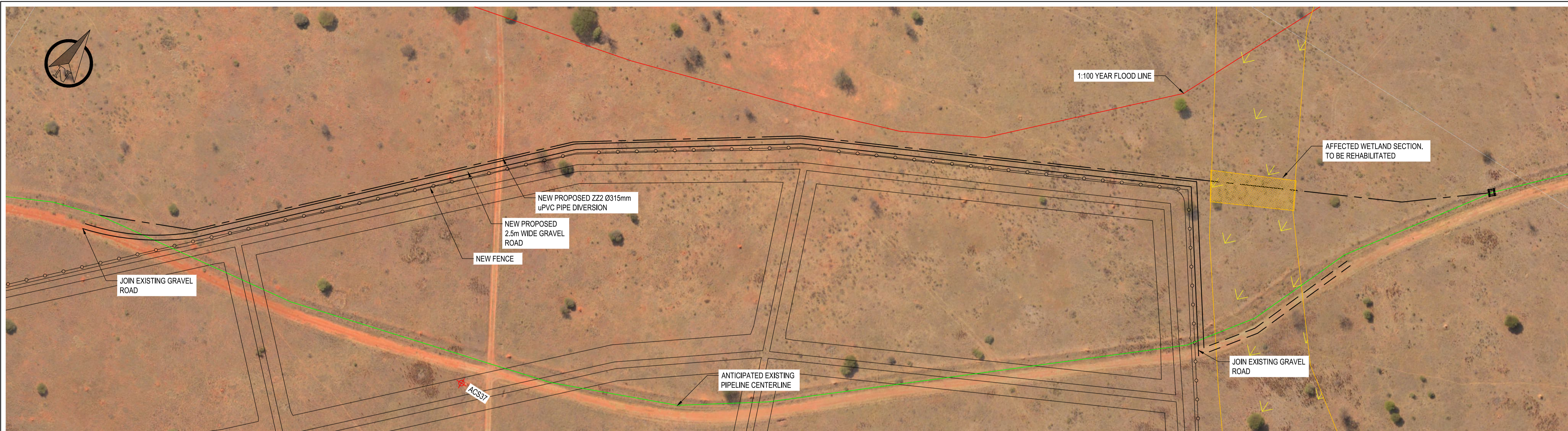
PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

Z22 PIPELINE DIVERSION: LAYOUT

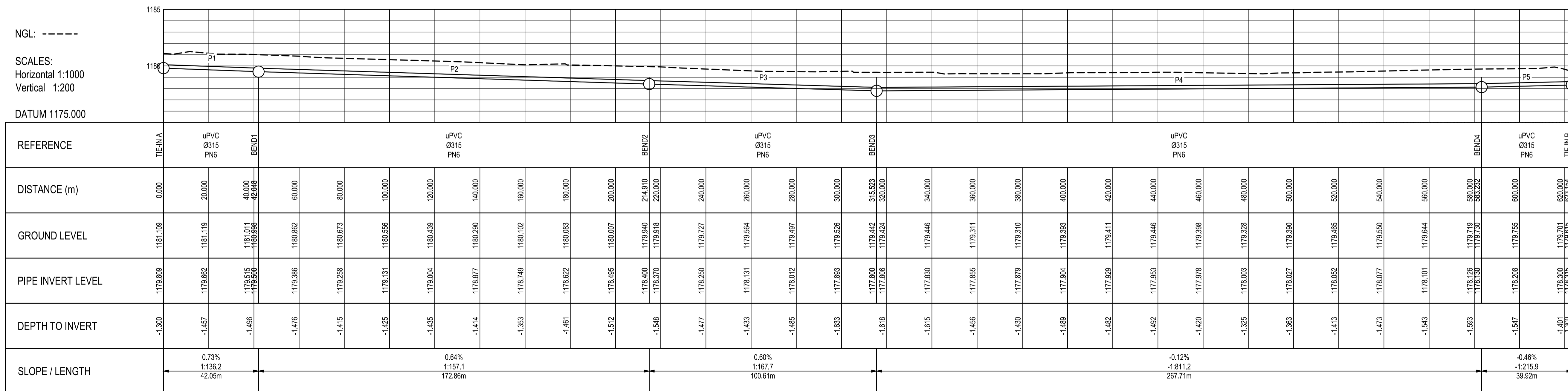
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-04	N/A	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2700	1	



- GENERAL NOTES:
1. THESE DRAWINGS ARE COMPLEMENTARY TO THE PROJECT SPECIFICATIONS. THE PROJECT SPECIFICATIONS WILL GOVERN IN THE CASE OF ANY CONFLICTS.
 2. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL DETAIL DRAWINGS AND PROJECT SPECIFICATIONS.
 3. COORDINATE SYSTEM: WGS84 L029°
 4. CONTOUR INTERVALS: 1m
 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
 7. OUTER EMBANKMENT SLOPES ARE 1:2 (V:H).
 8. EMBANKMENT SLOPES INTO MATURATION POND BASINS ARE 1:3 (V:H).
 9. NO CLEARING AND GRUBBING AND TOPSOIL REMOVAL IS PERMITTED WITHIN THE DEMARCATED WETLAND SECTION.

BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	46 248.152	1180.756

FITTING DETAILS AND SETTING OUT POINTS						
POINT NAME	Y	X	Z	CHAINAGE	ALLOCATED BEND	FITTING
TIE-IN A	-2 632 352.417	46 072.810	1181.109	0.000	0°	SOCKETED Ø315 uPVC CLASS 6 PIPE FITTING
BEND1	-2 632 335.631	46 111.362	1180.998	42.048	22.5°	SOCKETED Ø315 uPVC CLASS 9, 22.5° BEND
BEND2	-2 632 212.307	46 232.491	1179.940	214.910	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
BEND3	-2 632 155.995	46 315.870	1179.442	315.523	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
BEND4	-2 632 037.641	46 555.995	1179.730	583.232	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
TIE-IN B	-2 632 012.803	46 587.250	1179.615	623.154	0°	Ø315 KLAMFLEX COUPLING CLASS 6 OR SIMILAR APPROVED



LEGEND	
	NEW PROPOSED Z22 Ø315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 Ø315 uPVC PIPELINE
	FENCE
	WETLAND AREA

CONSTRUCTION DRAWING

NOTES

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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE	
NO.	DATE
1	2020-04
	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

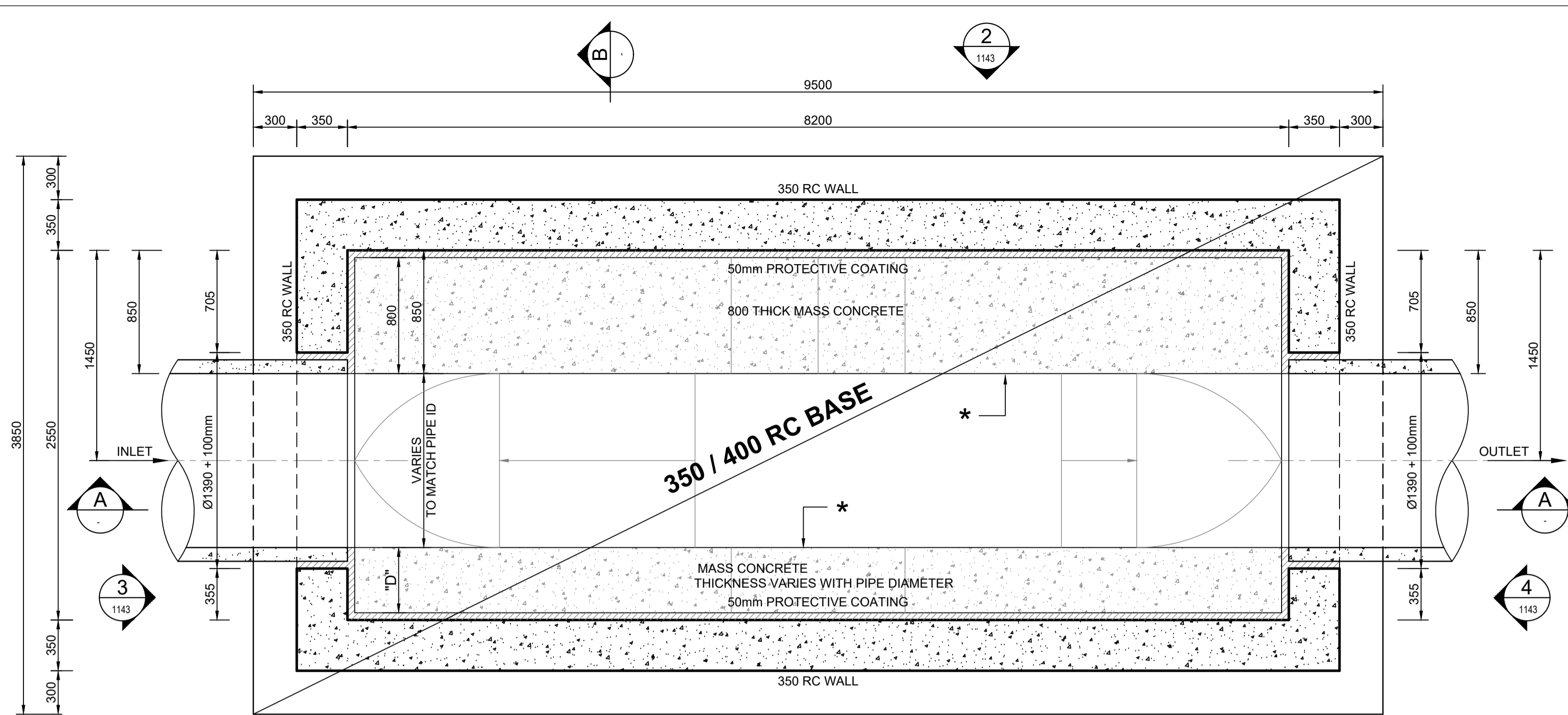
PROJECT

**POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS**

DRAWING DESCRIPTION

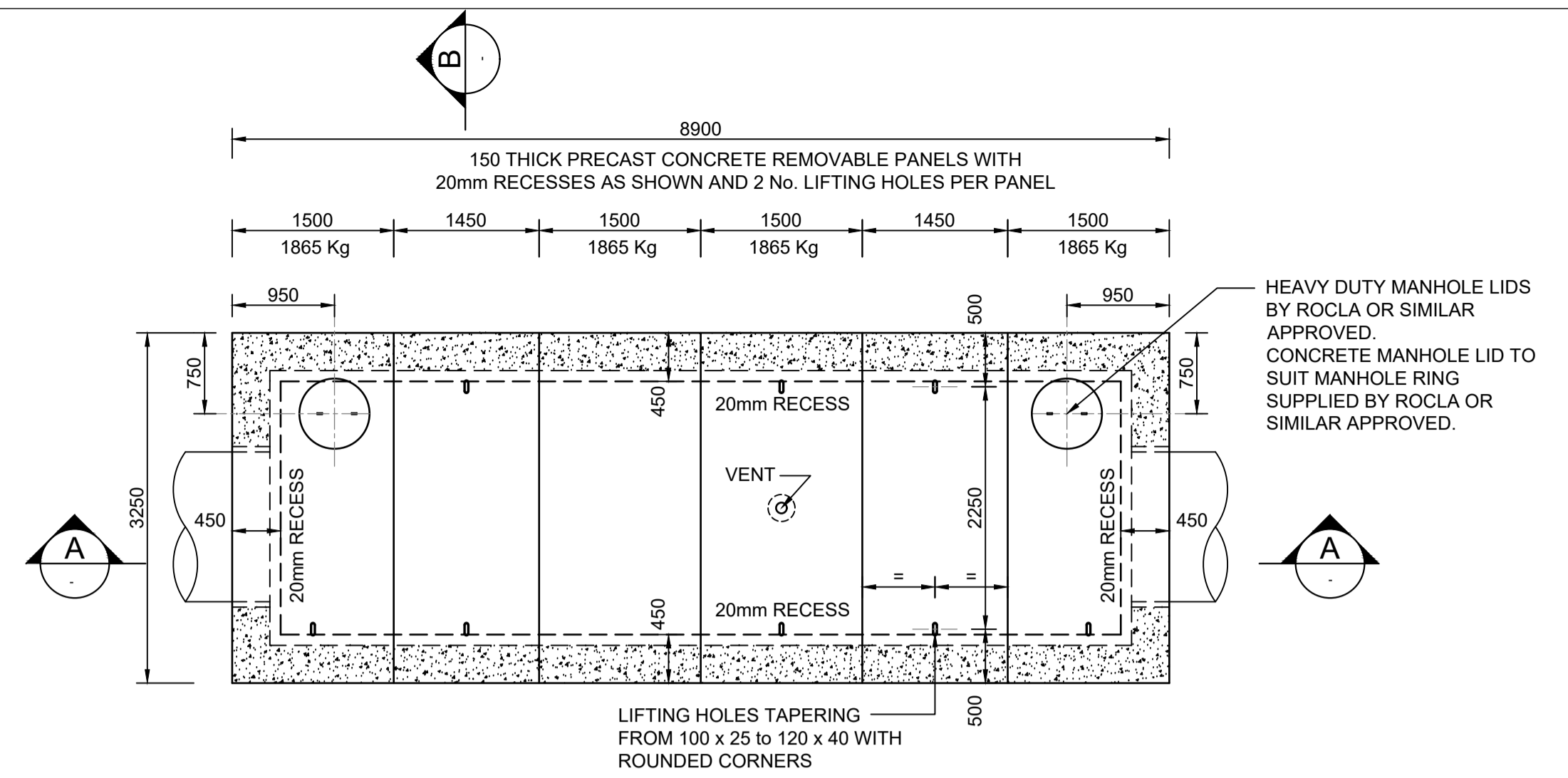
**Z22 PIPELINE DIVERSION:
LONGITUDINAL SECTION
AND SETTING OUT**

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-04	1:1000	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2701	1	

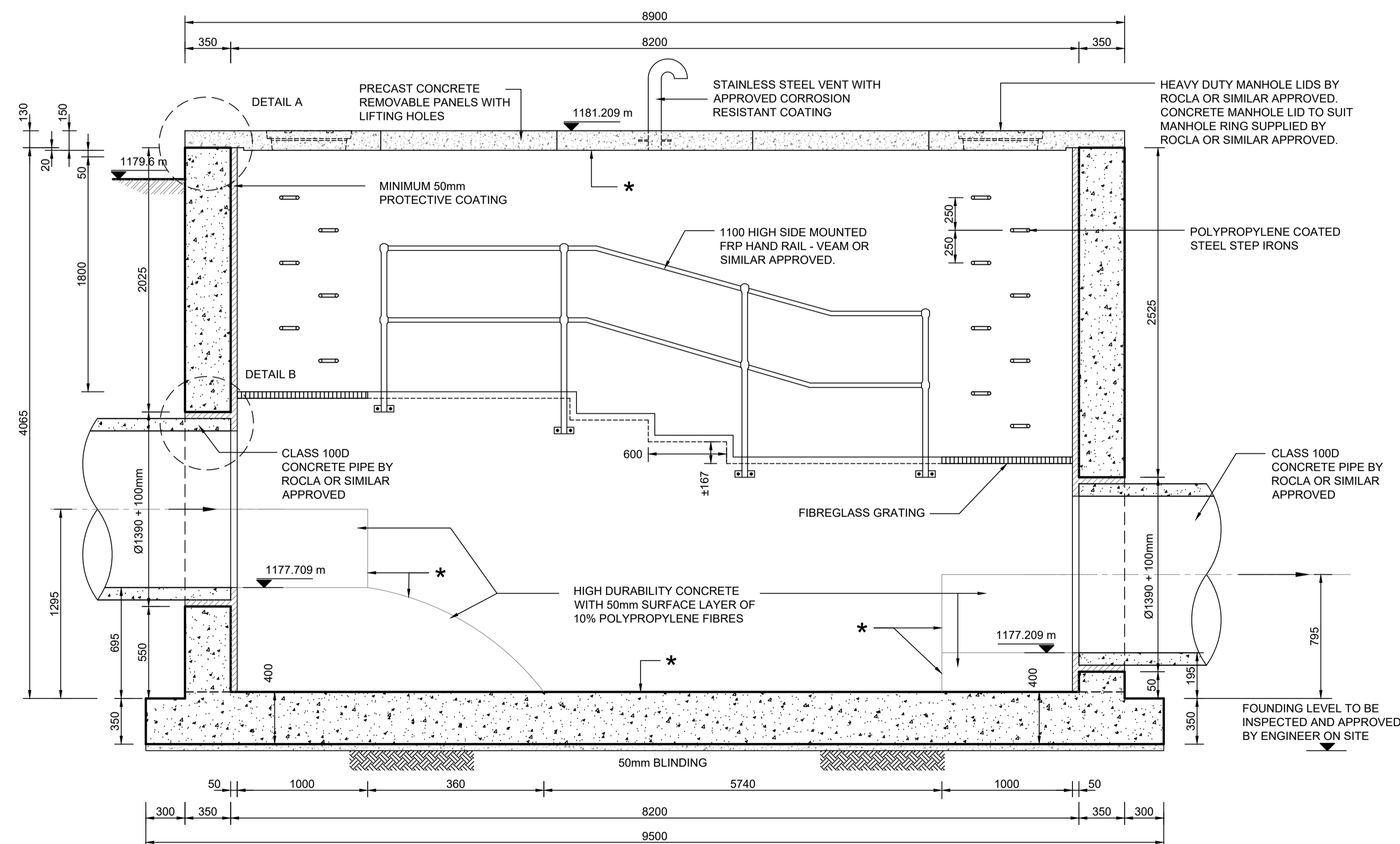


PLAN
SCALE 1:25

* - DENOTES SURFACE TO BE TREATED WITH 2mm Sikagard 720 EpoCem + 2 COATS Sikagard 63N APPLIED AS PER MANUFACTURERS SPECIFICATION.

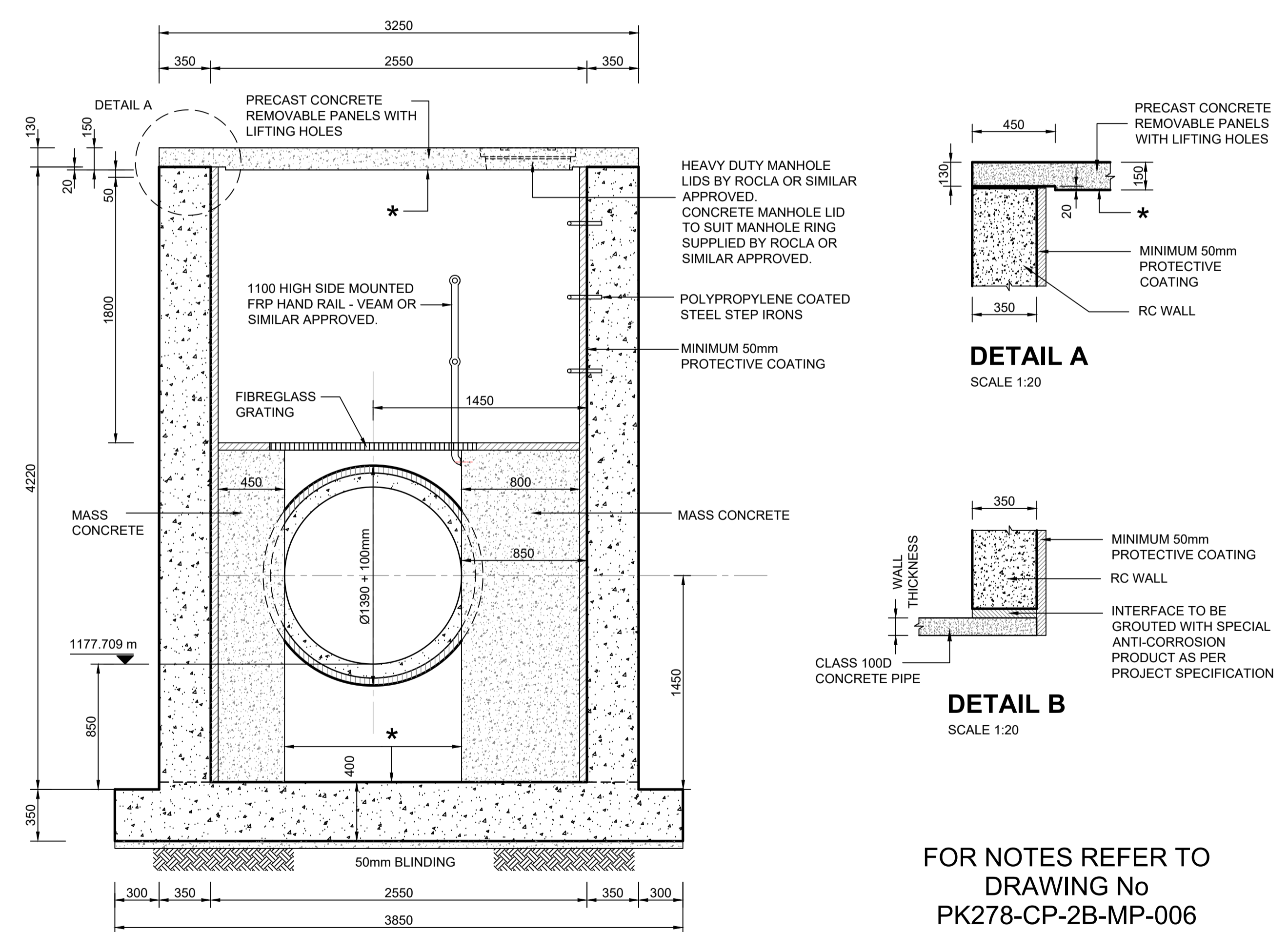


PLAN OF PRECAST CONCRETE PANELS
SCALE 1:50

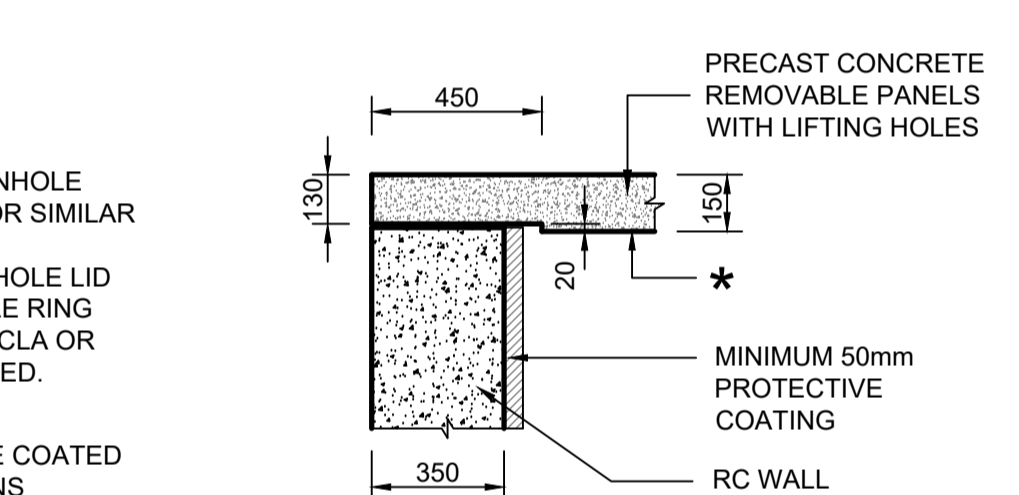


SECTION A - A
SCALE 1:25

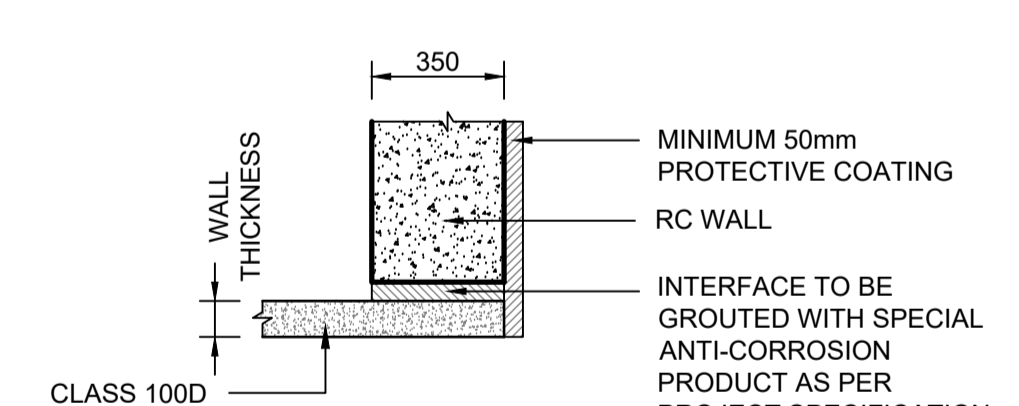
LEVEL A - LEVEL B = 500mm



SECTION B - B
SCALE 1:25



DETAIL A
SCALE 1:20



DETAIL B
SCALE 1:20

FOR NOTES REFER TO
DRAWING No
PK278-CP-2B-MP-006

CONSTRUCTION DRAWING

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NO.	DATE	REVISION DESCRIPTION
0	2024-05	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

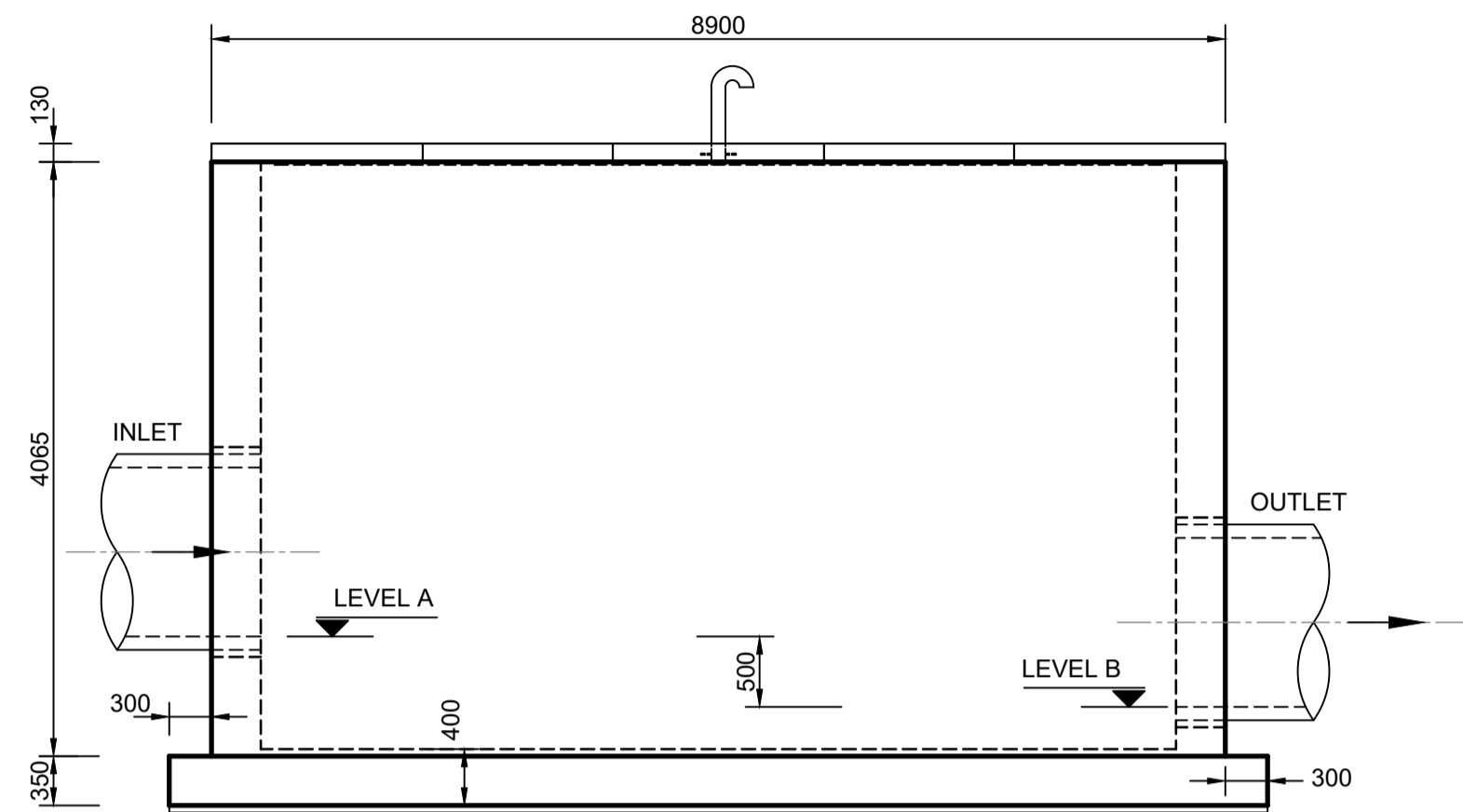
PROJECT

POLOKWANE REGIONAL WWTW

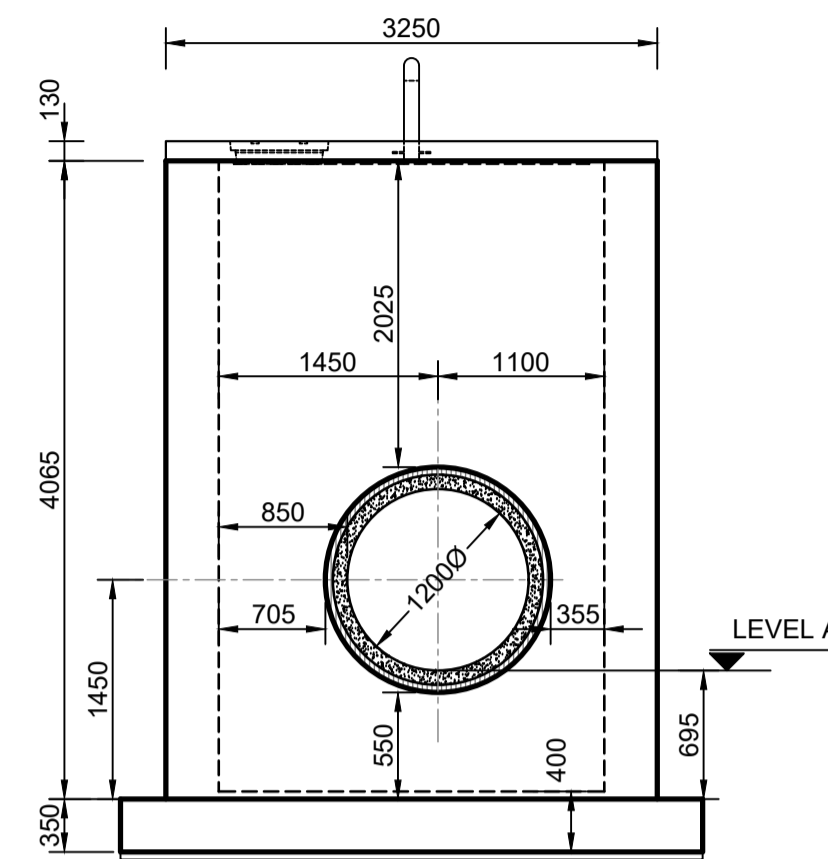
DRAWING DESCRIPTION

0.5m DROP STRUCTURE RC LAYOUTS SECTIONS AND DETAILS

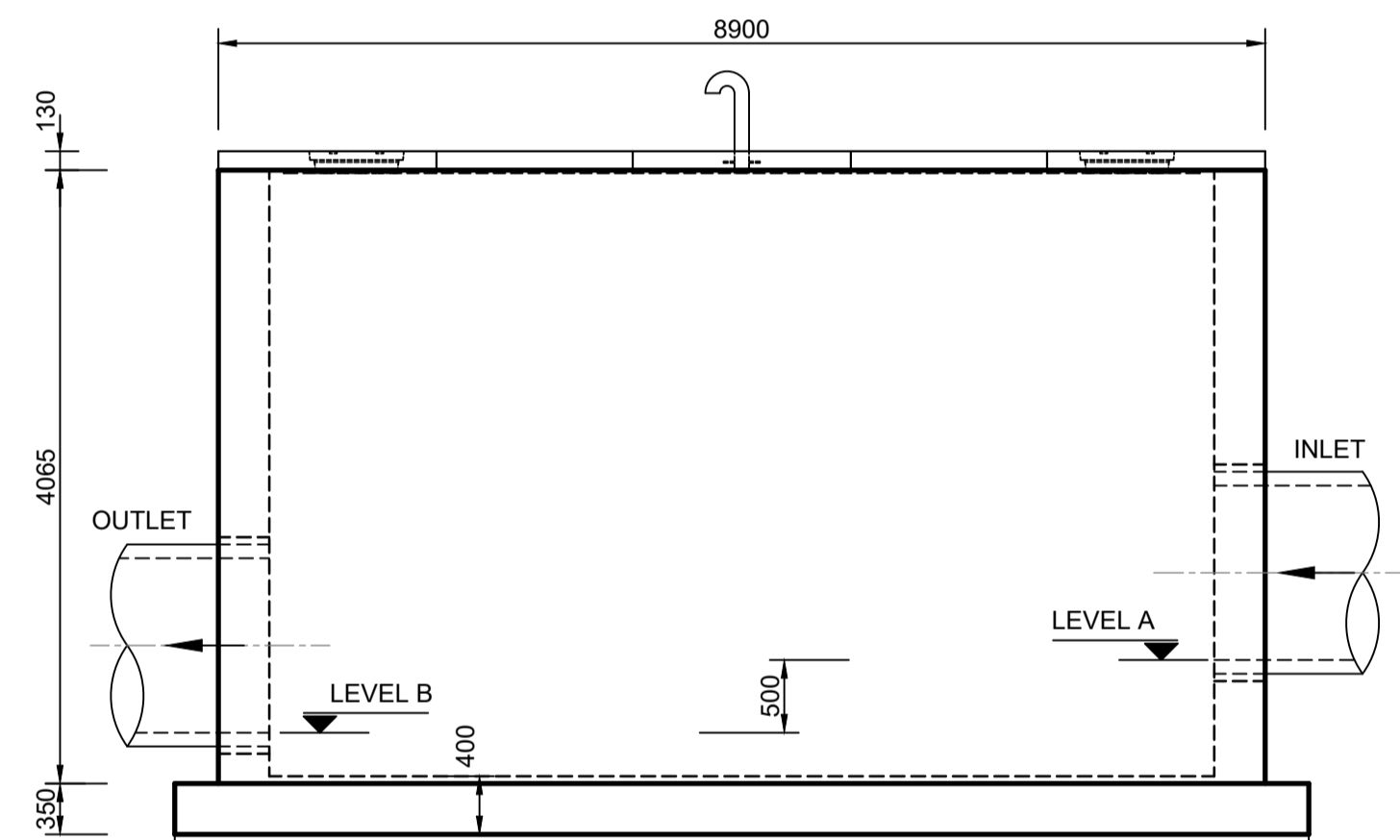
DESIGNED	DRAWN	CHECKED
A.M. FERREIRA	Y. PARUK	C. MEYER
REV DATE	SCALE	ORIGINAL SIZE
2024-05	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-005	0	



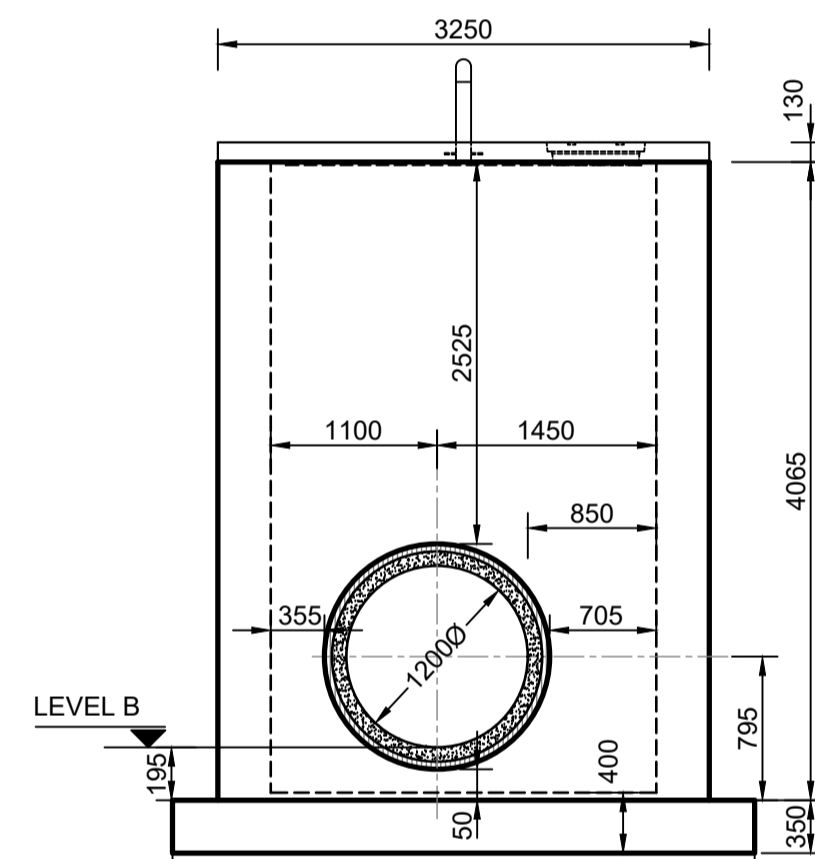
ELEVATION 1
SCALE 1:50
LEVEL A - LEVEL B = 500mm



ELEVATION 3
SCALE 1:50
12000 CONCRETE PIPE



ELEVATION 2
SCALE 1:50
LEVEL A - LEVEL B = 500mm



ELEVATION 4
SCALE 1:50
12000 CONCRETE PIPE

GENERAL NOTES:

- 1.1 THESE NOTES ARE COMPLEMENTARY TO THE SPECIFICATIONS AND WILL GOVERN IN CASE OF ANY CONFLICTS
- 1.2 ALL SETTING OUT DIMENSIONS SHALL BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES OR UNCLARITIES SHALL IMMEDIATELY BE REPORTED TO THE ENGINEER.
- 1.3 BUILDING WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- 1.4 FILL LAYERS TO BE CONSTRUCTED NOT THICKER THAN 150mm AND TO A COMPACTION OF 95% MOD AASHTO. CEMENT STABILISATION TO BE SPECIFIED BY THE STRUCTURAL ENGINEER AS PER DESIGN REQUIREMENTS AND SUITABILITY OF IN-SITU MATERIAL.
- 1.5 ALL EXCAVATED AREAS TO FORM A LOAD BEARING SURFACE MUST BE COMPACTIONED TO 93% MOD AASHTO OR OTHERWISE SPECIFIED ON THE DRAWINGS OR BY THE ENGINEER. CEMENT STABILISATION TO BE SPECIFIED BY THE STRUCTURAL ENGINEER.
- 1.6 NO SCALED MEASUREMENTS FROM THE DRAWINGS SHALL BE DONE. CONTRACTOR TO CONSTRUCT ACCORDING TO ANNOTATED DIMENSIONS.


CONCRETE NOTES:

- 2.1 ALL CONCRETE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
- 2.2 CONCRETE SHALL BE SPECIAL DESIGN MIX BASED "STRENGTH GRADE CONCRETE (MPA)" MAXIMUM STONE (DOLOMITIC AGGREGATE) SIZE (MM) AS SPECIFIED BELOW UNLESS OTHERWISE STATED:
 MASS CONCRETE - 15/19
 BLINDING - 15/19
 BASE / FLOORS - 40/19
 WALLS - 40/19
 SLABS - 40/19
- 2.3 THE CONTRACTOR SHALL ENSURE THAT ALL REINFORCEMENT IS PROPERLY HELD IN POSITION AND SHALL ALSO MAINTAIN THE CORRECT CONCRETE COVER UTILIZING APPROVED PATENT SPACERS (NOT STONES, OFFCUT REINFORCEMENT, BRICKS ETC.) AT ALL TIMES.
- 2.4 UNLESS OTHERWISE SPECIFIED, THE CONCRETE COVER SHALL BE THE GREATER OF THE BAR DIAMETER OR THE VALUES IN MM AS STATED BELOW:
 WALLS - 60mm
 BASE / FLOORS - 60mm
 SLABS - 60 / 110mm TOP
 - 60mm
- 2.5 ALL CONCRETE SHALL BE MECHANICALLY COMPACTIONED THROUGH THE USE OF VIBRATORS.
- 2.6 CONCRETE SHALL BE CAST CONTINUOUSLY.
- 2.7 OPENINGS IN THE CONCRETE WALLS TO BE GROUTED CLOSED WITH SPECIAL ANTI-CORROSION PRODUCT AS PER PROJECT SPECIFICATION AFTER THE INSTALLATION OF THE PIPEWORK.
- 2.8 CONCRETE CLASS AS SPECIFIED 40/19
- 2.9 ALL EXPOSED CORNERS TO HAVE A 25 x 25mm CHAMFER
- 2.10 NO CONCRETE SHALL BE PLACED PRIOR TO THE APPROVAL OF THE RESIDENT ENGINEER
- 2.11 ALL NON-SHUTTERED CONCRETE SURFACES SHALL HAVE A WOOD FLOAT FINISH.
- 2.12 50mm LAYER OF POLYPROPYLENE FIBRE FLOOR HARDENERS TO BE USED ON EXPOSED FLOOR, SILL AND SPILLWAY SURFACES AS PER SPECIFICATION.
- 2.13 INTERFACE BETWEEN PIPE AND STRUCTURE WALL TO BE GROUTED WITH SPECIAL ANTI-CORROSION PRODUCT AS PER PROJECT SPECIFICATION.
- 2.14 STRUCTURE TO BE TESTED FOR WATERTIGHTNESS AS PER PROJECT SPECIFICATIONS. RATE OF FILLING NOT TO EXCEED 2m IN 24 HOURS. FOR 0.2mm CRACK WIDTH STABILIZING PERIOD TO BE 21 DAYS. AFTER ALLOWING FOR EVAPORATION AND RAINFALL, DROP IN LEVEL NOT TO EXCEED 1/500th OF THE AVERAGE DEPTH OF THE FULL TANK.
- 2.15 ADD 50mm ANTI-CORROSION LAYER AS PER THE PROJECT SPECIFICATION.

CONSTRUCTION DRAWING

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 CITY OF
Polokwane
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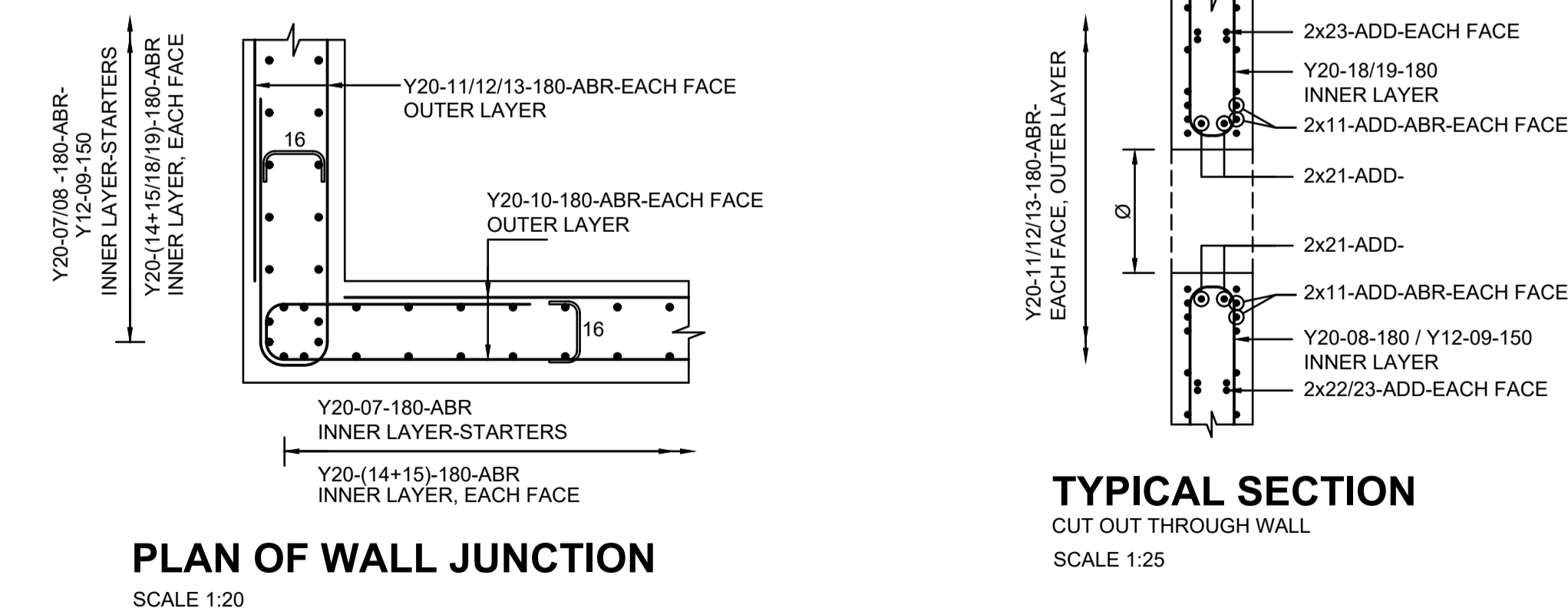
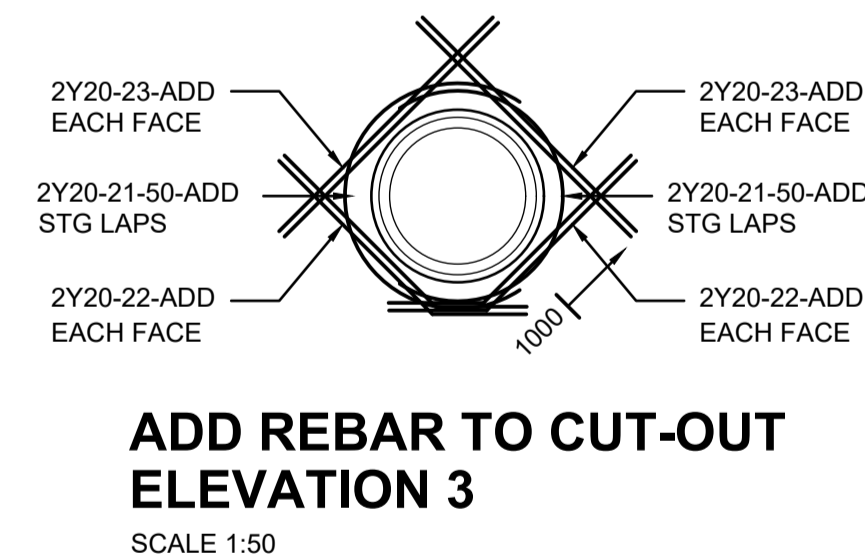
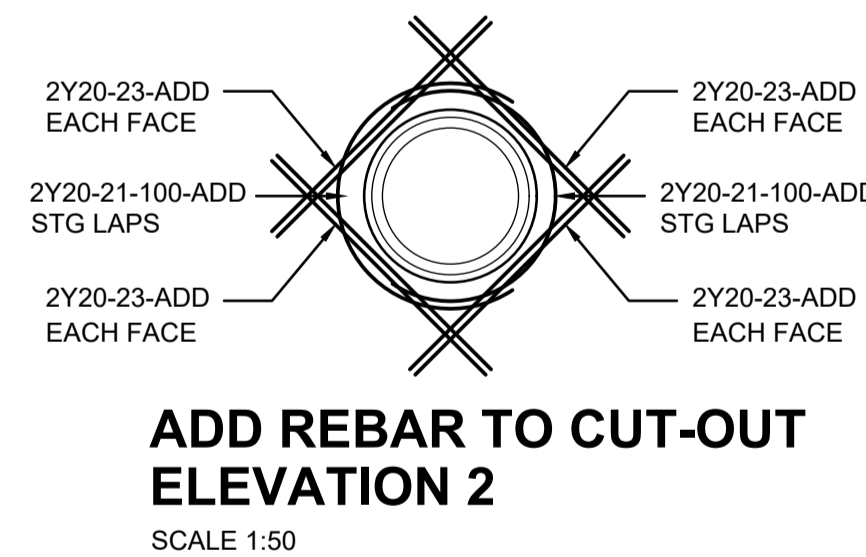
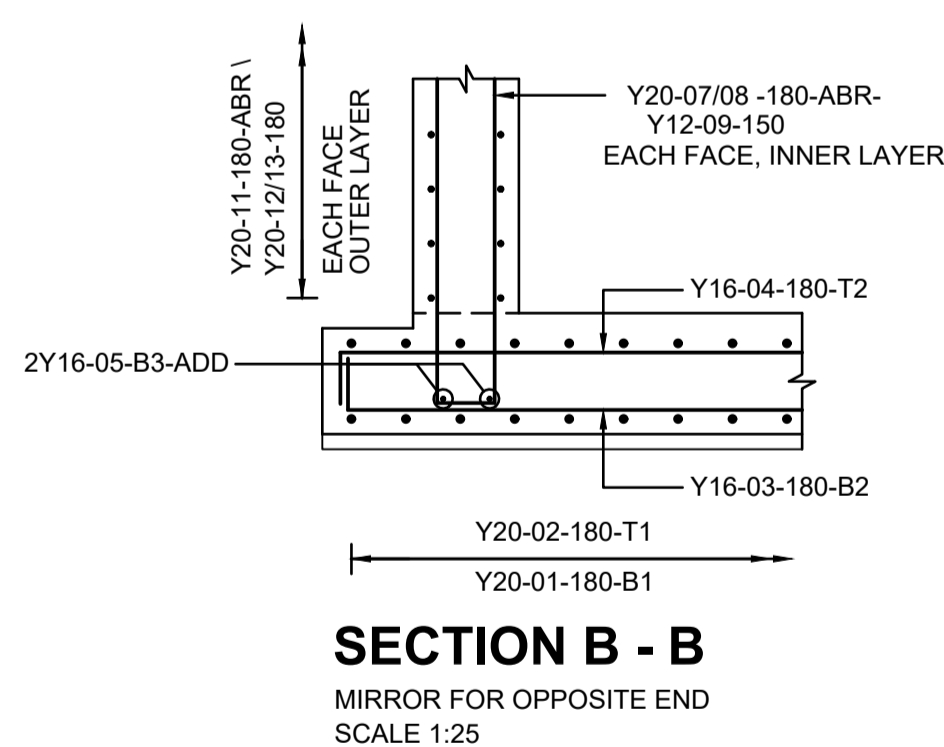
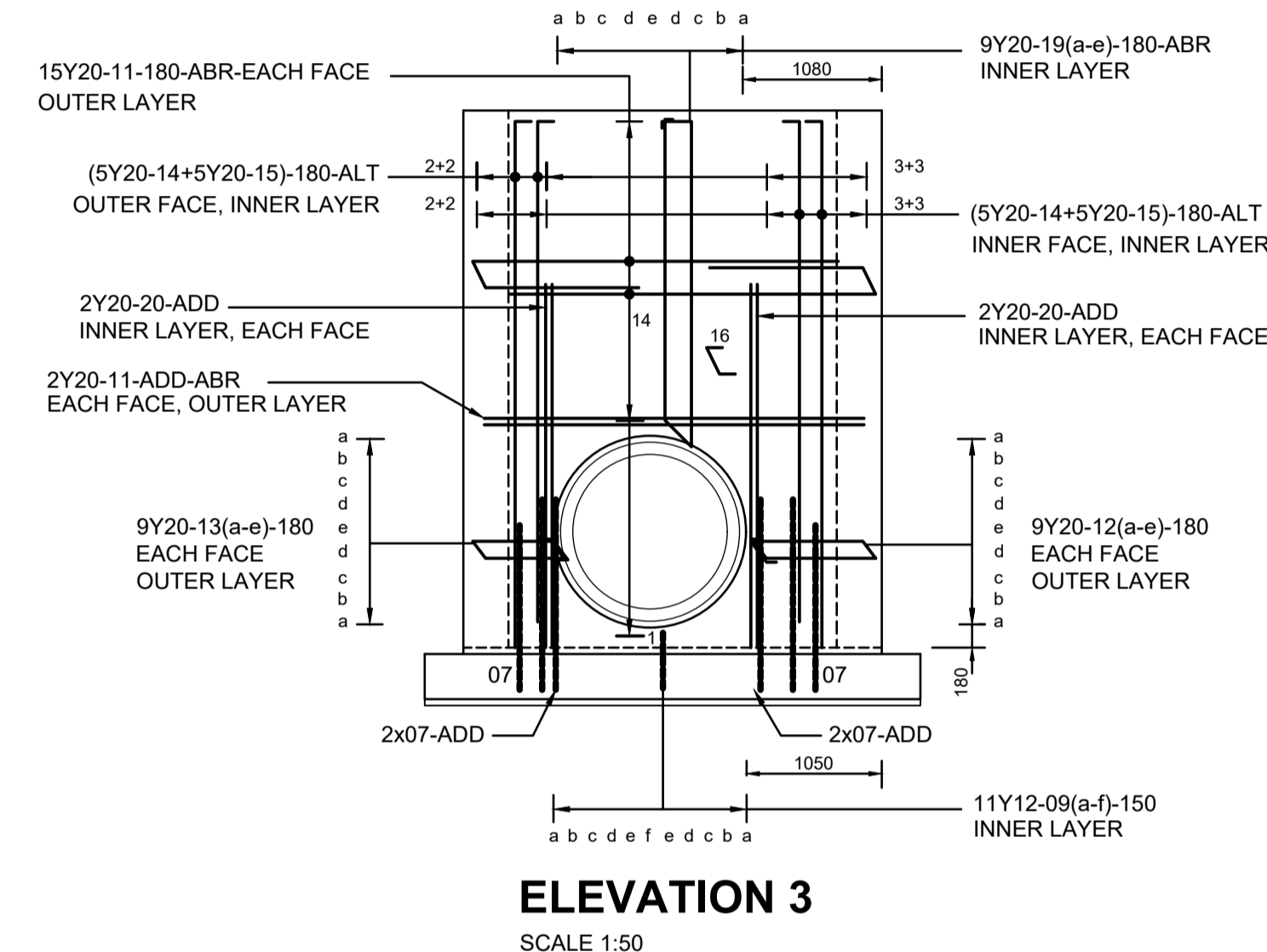
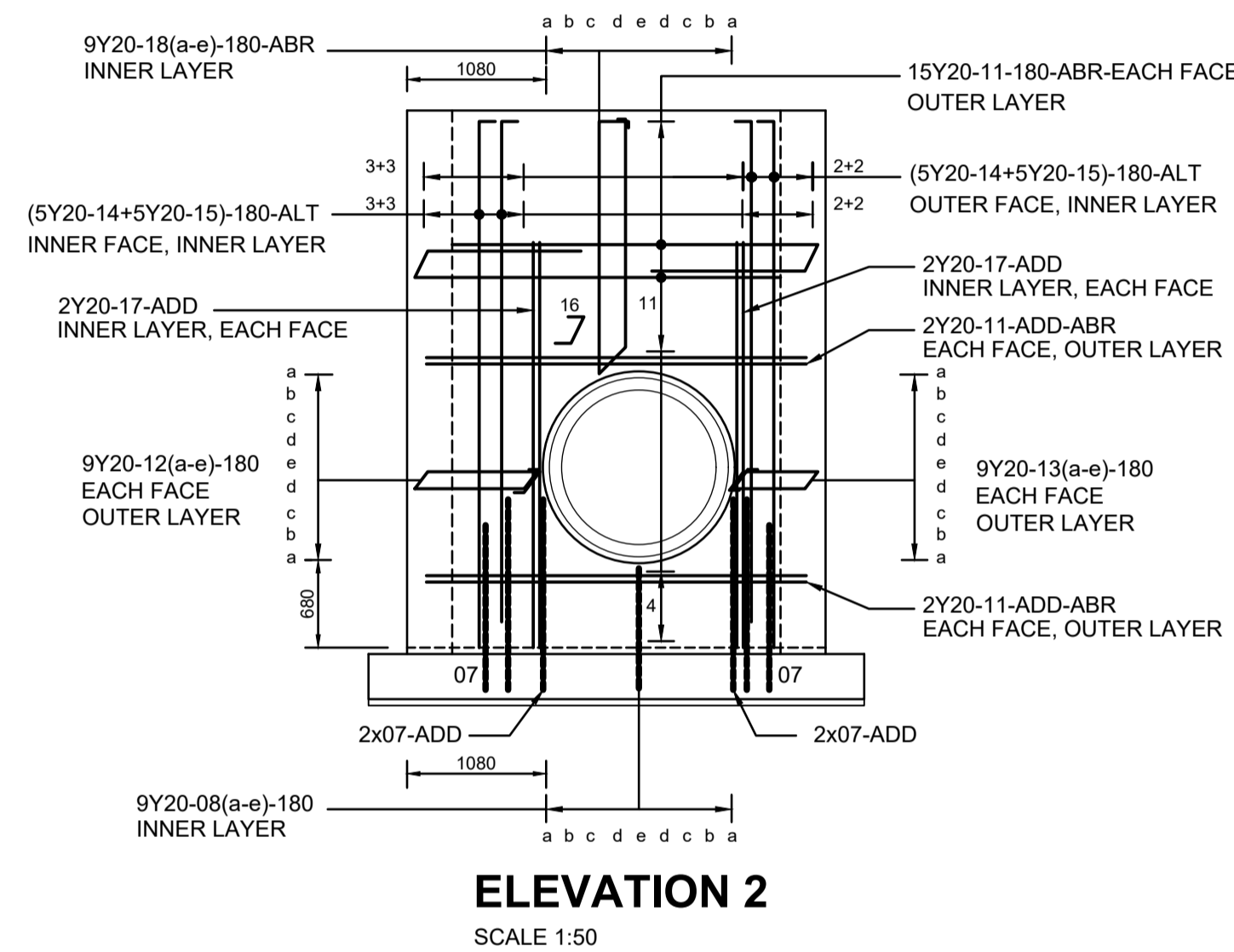
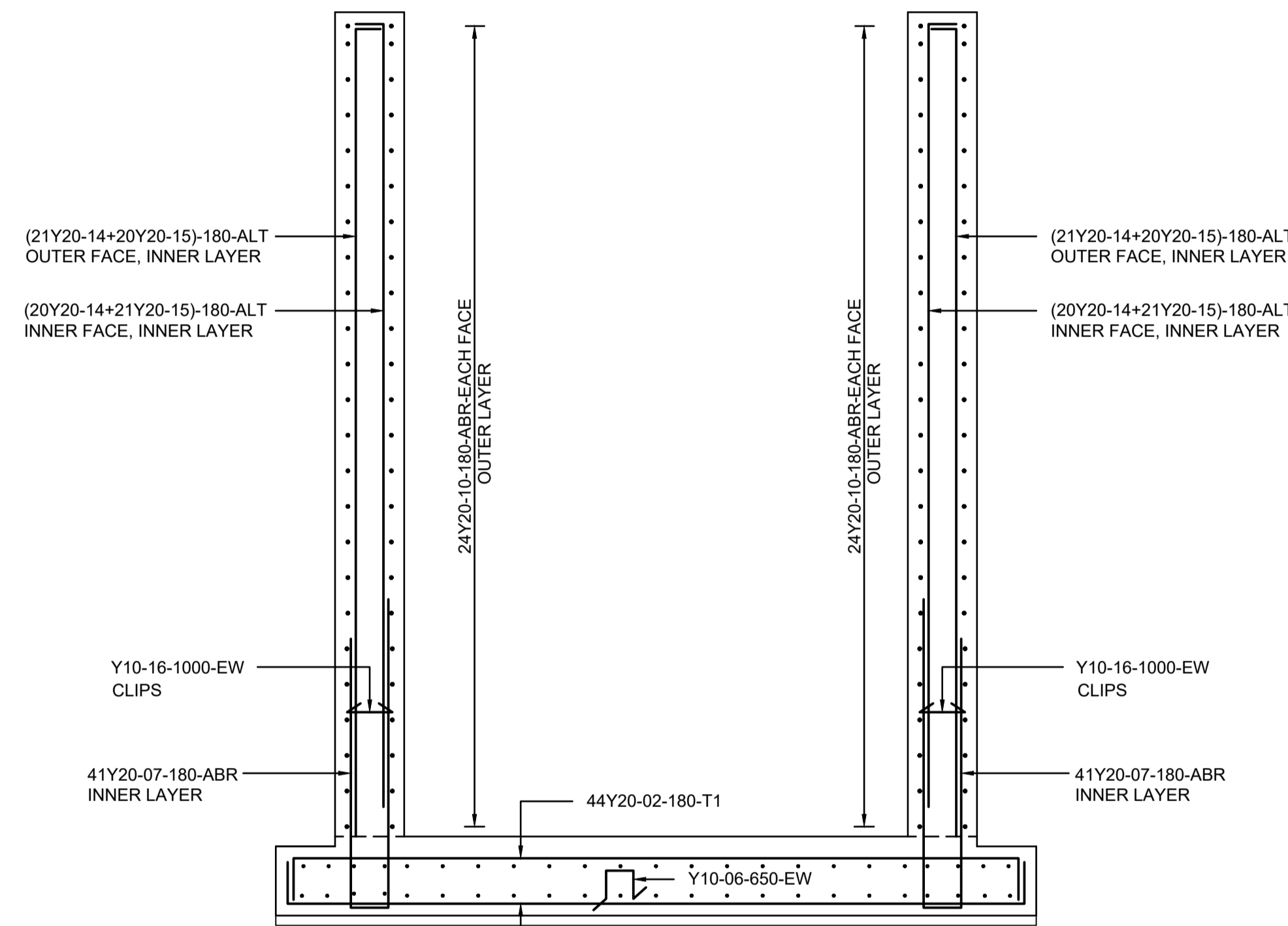
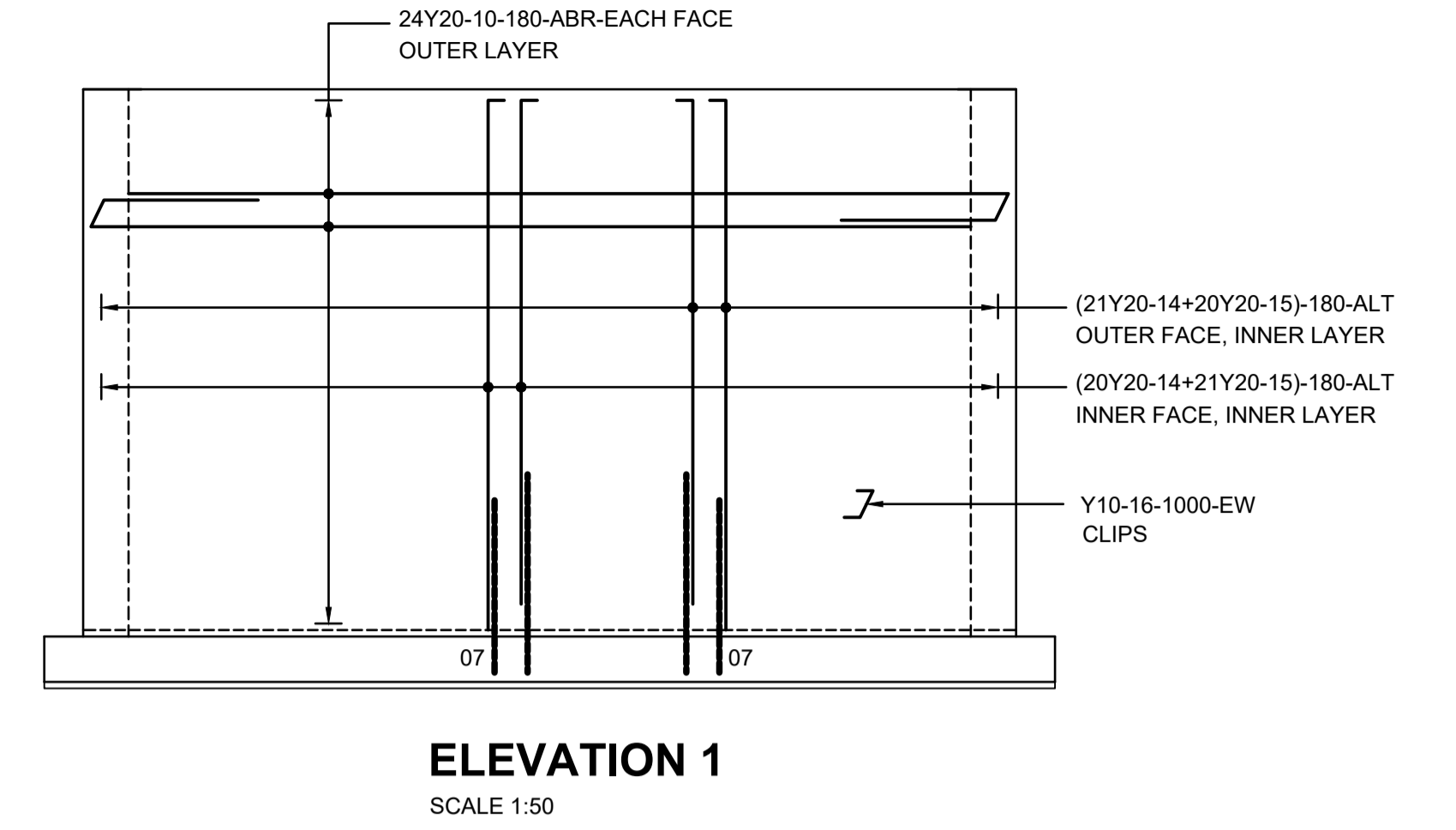
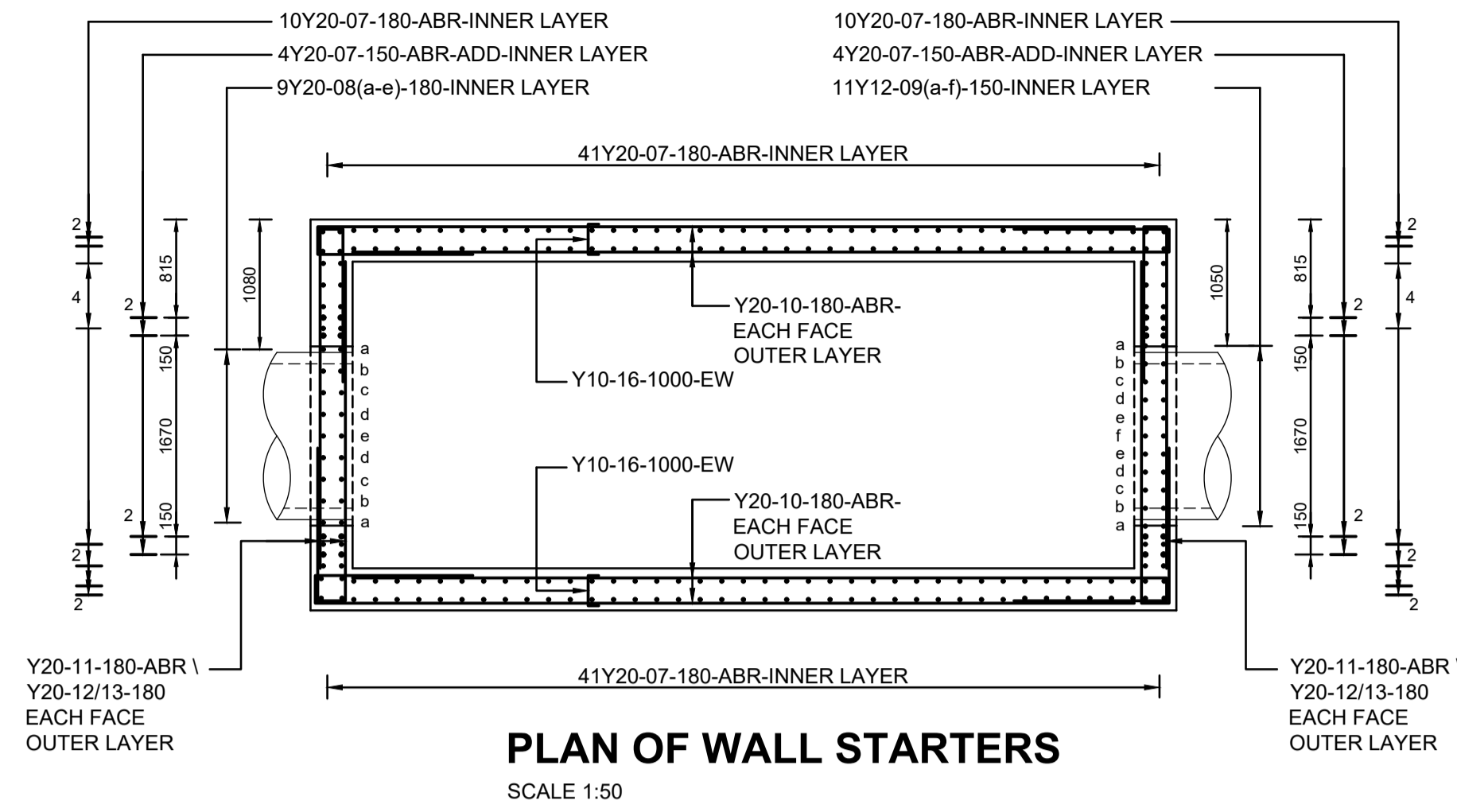
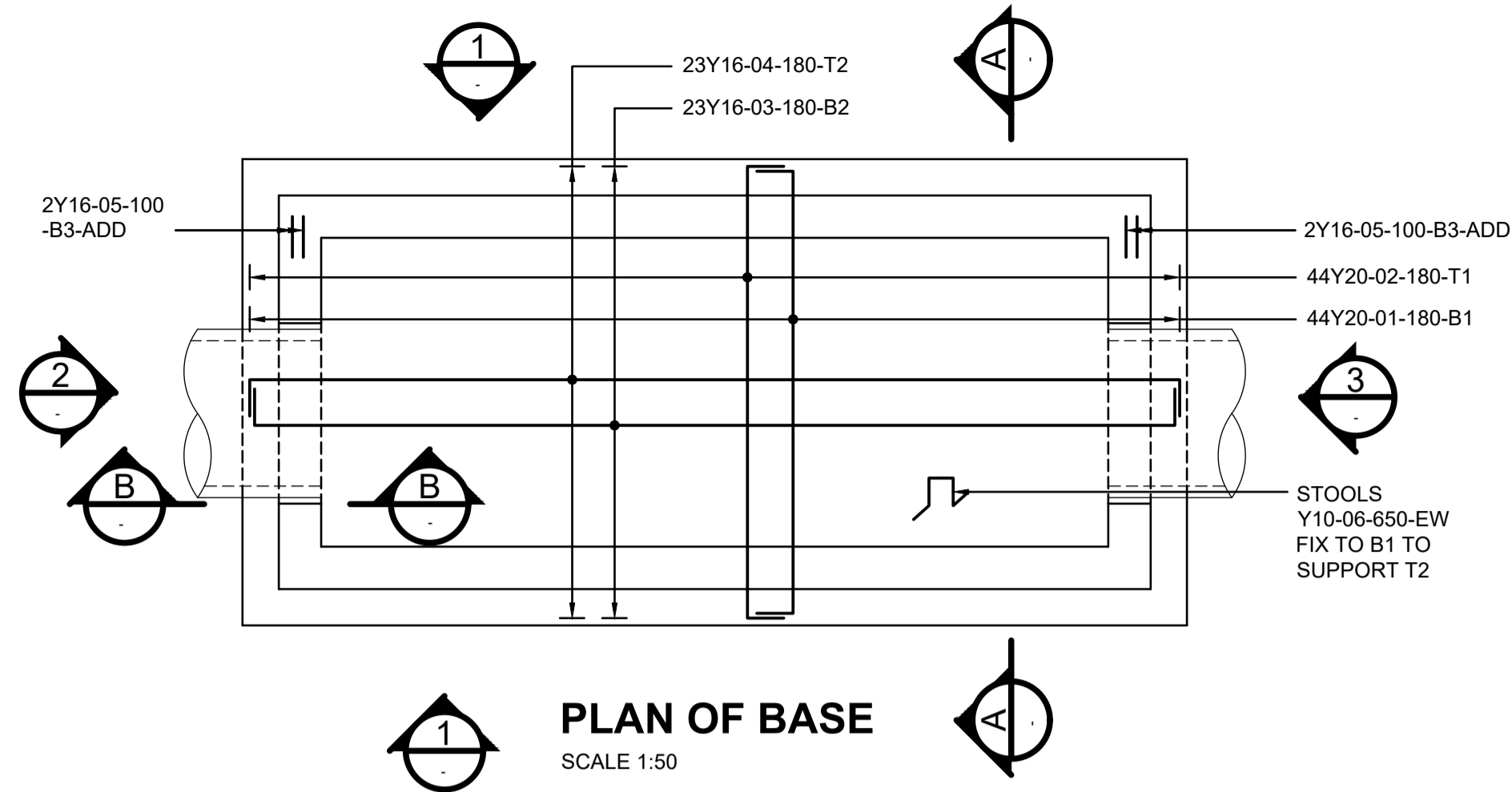
REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2024-05	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER
 PR ENG no. _____ DATE _____
 CLIENT _____ DATE _____

PROJECT
POLOKWANE REGIONAL WWTW

DRAWING DESCRIPTION
0.5m DROP STRUCTURE RC ELEVATIONS

DESIGNED	DRAWN	CHECKED
A.M. FERREIRA	Y. PARUK	C. MEYER
REV DATE	SCALE	ORIGINAL SIZE
2024-05	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-006	0	



PLAN OF WALL JUNCTION
SCALE 1:20

FOR PRECAST CONCRETE
REMOVABLE PANELS REFER TO
DWG. No. PK278-CP-2B-MP-008 & 009

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH DRAWING Nos PK278-CP-2B-MP-005 & 006

CONSTRUCTION DRAWING

MEMBER AND SIZE	No OFF	No/J UNIT	REINFORCEMENT		BENDING DIMENSIONS FOR SHAPE CODES TO SANS - 282 - 2004										
			TYPE AND SIZE	BAR MARK TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R					
1	44	Y20	01	44	4090	38	230	3730	230						
	44	Y20	02	44	4090	38	230	3730	230						
	23	Y16	03	23	7980	38	190	7680	190						
	23	Y16	04	23	7980	38	190	7680	190						
	4	Y16	05	4	3700	20									
	45	Y10	06	45	1200	83	300	175	320						
	110	Y20	07	110	3000	38	1350	190	1550						
	2	Y20	08a	2	3350	74	1340	190							
	2	Y20	08b	2	2900	74	1110	190							
	2	Y20	08c	2	2650	74	990	190							
	2	Y20	08d	2	2500	74	930	190							
	1	Y20	08e	1	2500	74	910	190							
	2	Y12	09a	2	2550	74	920	190							
	2	Y12	09b	2	2050	74	680	190							
	2	Y12	09c	2	1800	74	550	190							
	2	Y12	09d	2	1650	74	470	190							
	2	Y12	09e	2	1550	74	430	190							
	1	Y12	09f	1	1500	74	410	190							
	96	Y20	10	96	8250	38	6800	230	1320						
	72	Y20	11	72	4300	38	2850	230	1320						
	4	Y20	12a	4	3550	74	1360	230							
	4	Y20	12b	4	3050	74	1130	230							
	4	Y20	12c	4	2850	74	1010	230							
	4	Y20	12d	4	2700	74	950	230							
	2	Y20	12e	2	2650	74	930	230							
	4	Y20	13a	4	2850	74	1010	230							
	4	Y20	13b	4	2350	74	780	230							
	4	Y20	13c	4	2150	74	660	230							
	4	Y20	13d	4	2000	74	600	230							
	2	Y20	13e	2	1950	74	580	230							
	102	Y20	14	102	4240	37	4100	190							
	102	Y20	15	102	4040	37	3900	190							
	64	Y10	16	64	400	38	120	210	120						
	8	Y20	17	8	3200	20									
	2	Y20	18a	2	5250	60	2330	190							
	2	Y20	18b	2	4800	60	2100	190							
	2	Y20	18c	2	4550	60	1980	190							
	2	Y20	18d	2	4450	60	1920	190							
	1	Y20	18e	1	4400	60	1900	190							
	2	Y20	19a	2	6200	60	2830	190							
	2	Y20	19b	2	5750	60	2600	190							
	2	Y20	19c	2	5500	60	2480	190							
	2	Y20	19d	2	5400	60	2420	190							
	1	Y20	19e	1	5350	60	2400	190							
	8	Y20	20	8	3000	20									
	8	Y20	21	8	4000	65	4000								850
	8	Y20	22	8	2000	62	1300	920							
	24	Y20	23	24	2000	20									

NOTES
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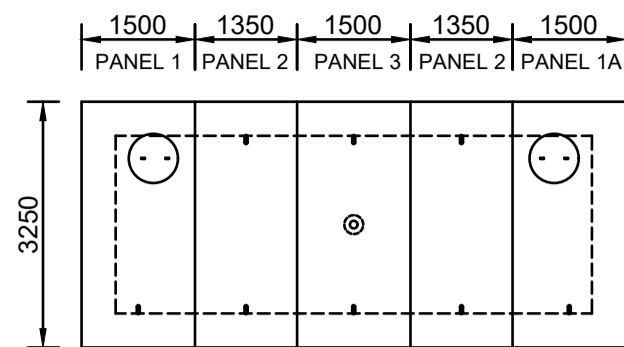
REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
1	2024-05	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER
PR ENG no. _____
DATE _____
CLIENT _____
DATE _____

PROJECT
POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS

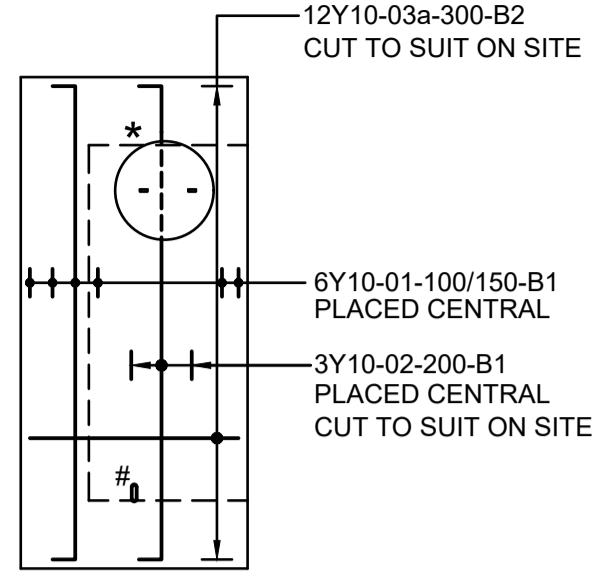
DRAWING DESCRIPTION
0.5m DROP STRUCTURE
1200Ø PIPE
REINFORCING DETAILS

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2024-05	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)		REV
PK278-CP-2B-MP-008		0

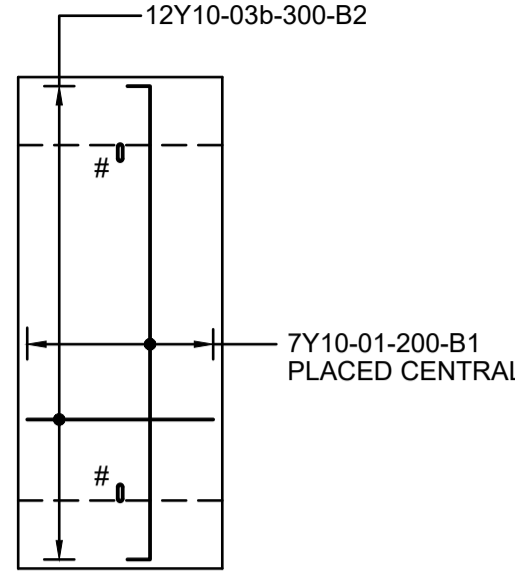


PLAN OF PRECAST CONCRETE PANELS
SCALE 1:100

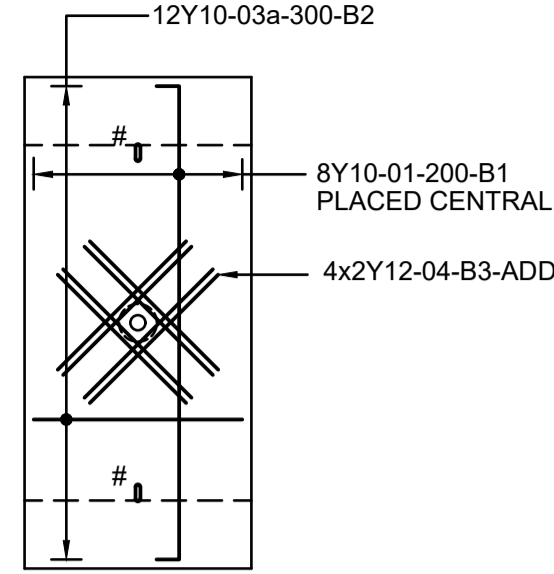
0,5m DROP STRUCTURE
REF. DWG : PK278-SD-1-1142



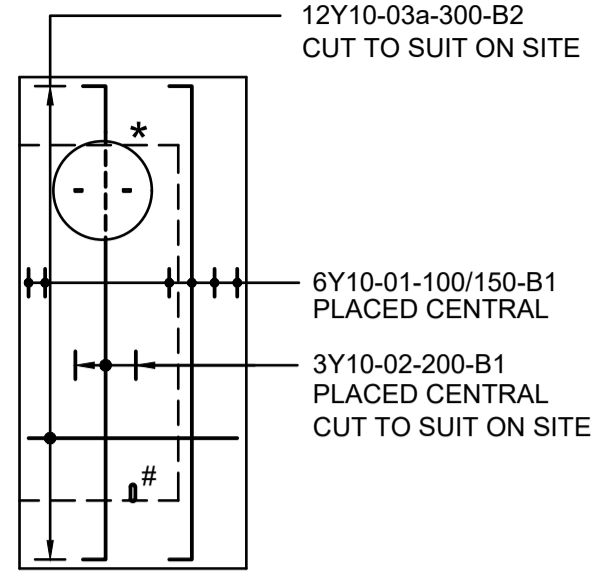
PANEL 1
SCALE 1:50



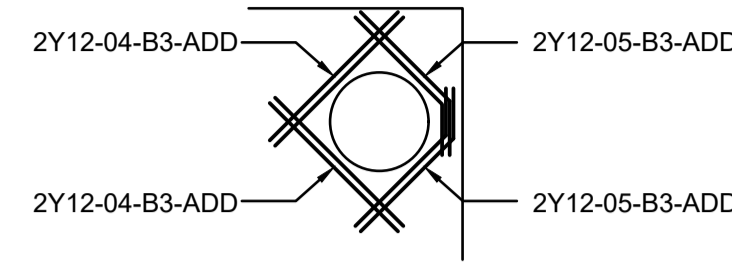
PANEL 2
SCALE 1:50



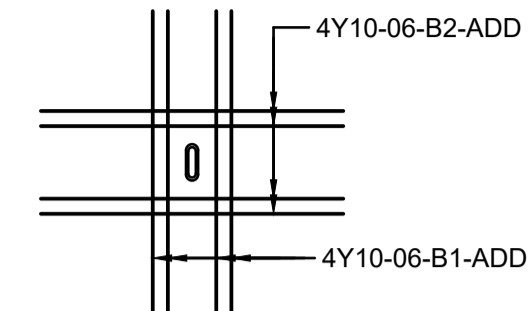
PANEL 3
SCALE 1:50



PANEL 1A
SCALE 1:50

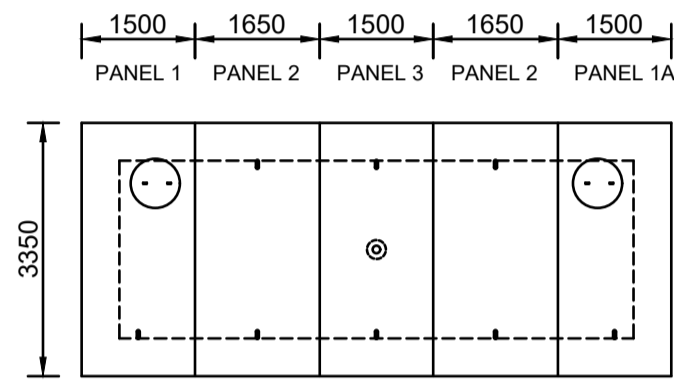


*** ADD REBAR TO MH CUT-OUT**
MIRROR FOR OPPOSITE END
SCALE 1:50



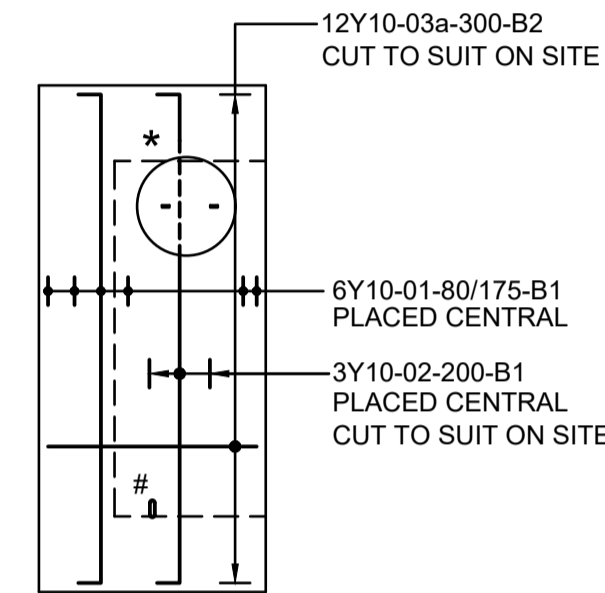
ADD REBAR LIFTING HOLES
SCALE 1:25

MEMBER		REINFORCEMENT					BENDING DIMENSIONS FOR SHAPE CODES TO SABS - 82					
MEMBER AND SIZE	No. OFF	No./UNIT	TYPE AND SIZE	BAR MARK	TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R	
0.5m DROP STRUCTURE	PANEL 1 & 1A	2	6	Y10	01	12	3280	38	100	3130	100	
		3	Y10	02	6	3280	38	100	3130	100		
		12	Y10	03a	24	1380	20					
		4	Y12	04	8	1200	20					
		4	Y12	05	8	1200	62	760	540			
		8	Y10	06	16	1000	20					
		7	Y10	01	14	3280	38	100	3130	100		
		12	Y10	03b	24	1230	20					
		16	Y10	06	32	1000	20					
		1	Y10	01	8	3280	38	100	3130	100		
		Y10	03a	12	1380	20						
		Y12	04	8	1200	20						
		Y10	06	16	1000	20						

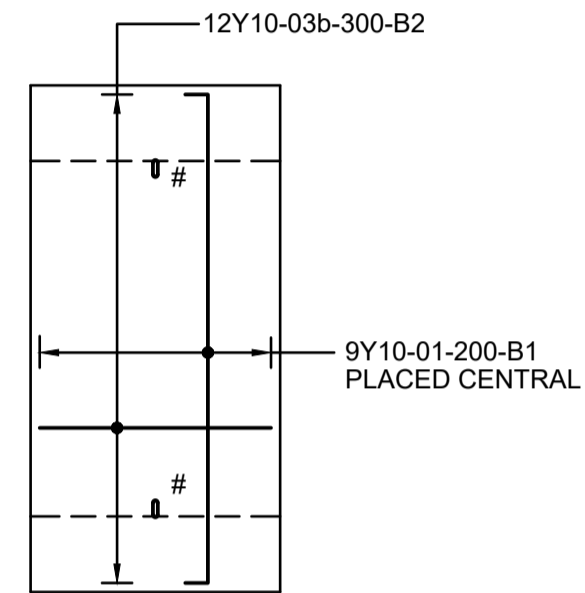


PLAN OF PRECAST CONCRETE PANELS
SCALE 1:100

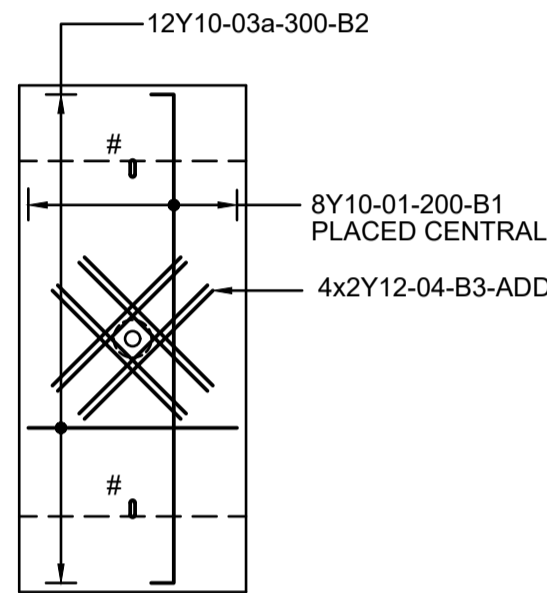
1,0m DROP STRUCTURE
REF. DWG : PK278-SD-1-1152



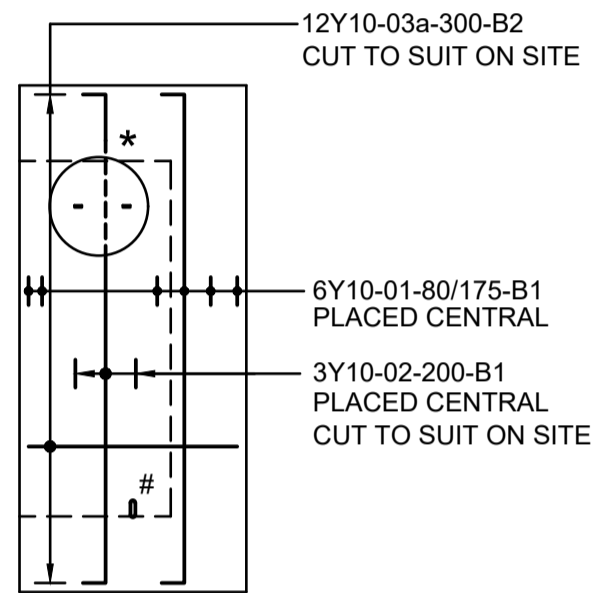
PANEL 1
SCALE 1:50



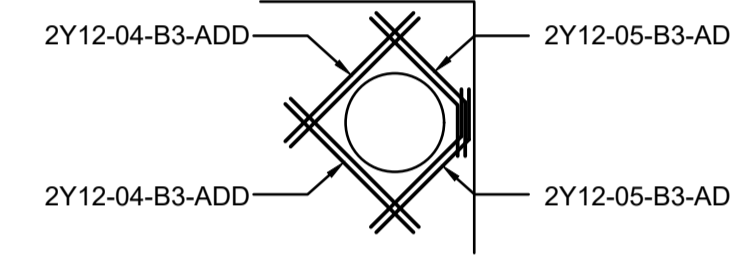
PANEL 2
SCALE 1:50



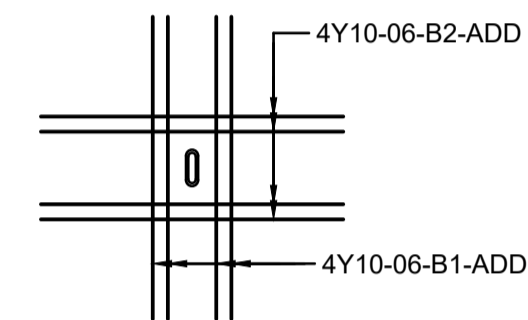
PANEL 3
SCALE 1:50



PANEL 1A
SCALE 1:50

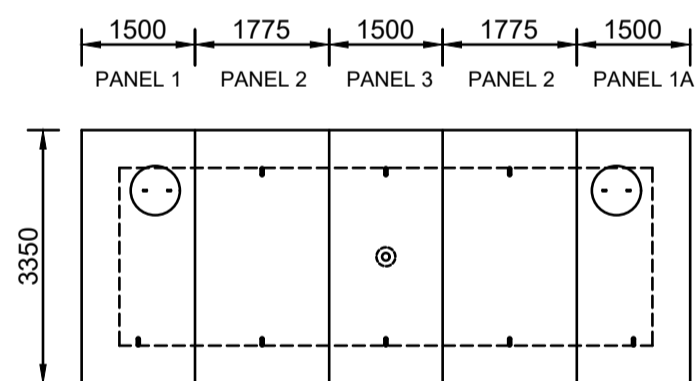


*** ADD REBAR TO MH CUT-OUT**
MIRROR FOR OPPOSITE END
SCALE 1:50



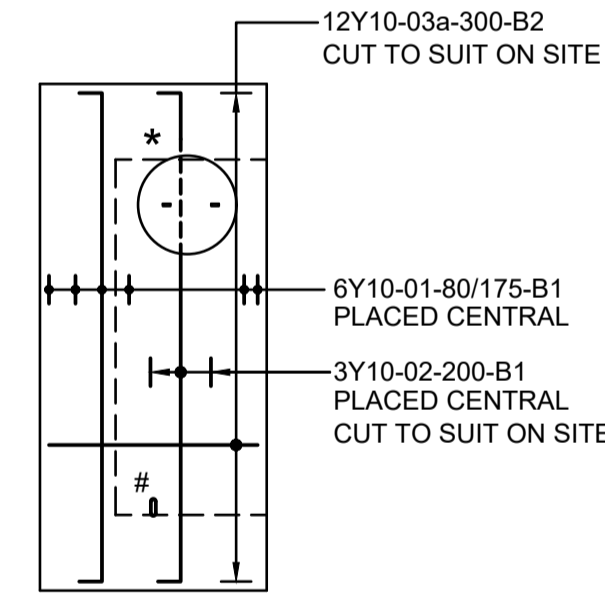
ADD REBAR LIFTING HOLES
SCALE 1:25

MEMBER		REINFORCEMENT					BENDING DIMENSIONS FOR SHAPE CODES TO SABS - 82					
MEMBER AND SIZE	No. OFF	No./UNIT	TYPE AND SIZE	BAR MARK	TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R	
1.0m DROP STRUCTURE	PANEL 1 & 1A	2	6	Y10	01	12	3380	38	100	3230	100	
		3	Y10	02	6	3380	38	100	3230	100		
		12	Y10	03a	24	1380	20					
		4	Y12	04	8	1200	20					
		4	Y12	05	8	1200	62	760	540			
		8	Y10	06	16	1000	20					
		9	Y10	01	18	3380	38	100	3230	100		
		12	Y10	03b	24	1530	20					
		16	Y10	06	32	1000	20					
		1	Y10	01	8	3380	38	100	3230	100		
		Y10	03a	12	1380	20						
		Y12	04	8	1200	20						
		Y10	06	16	1000	20						

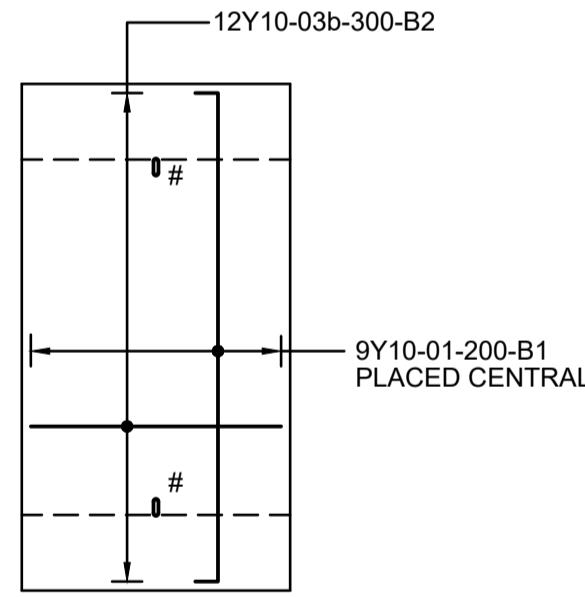


PLAN OF PRECAST CONCRETE PANELS
SCALE 1:100

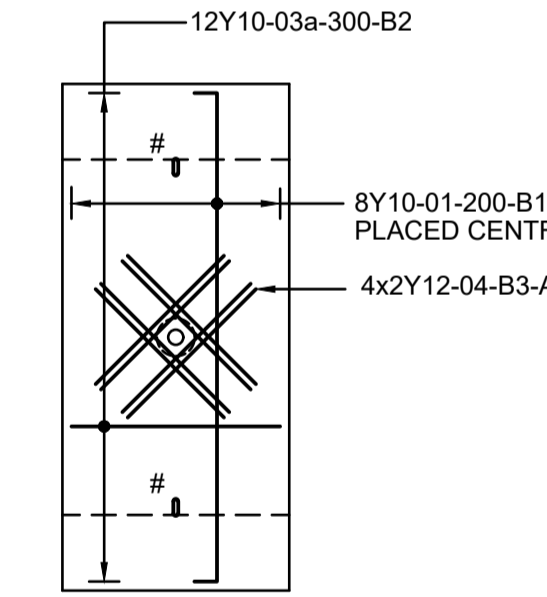
1,5m DROP STRUCTURE
REF. DWG : PK278-SD-1-1162



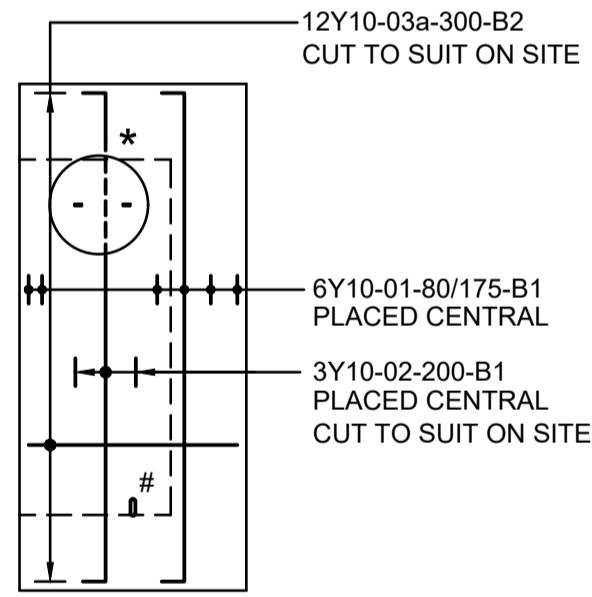
PANEL 1
SCALE 1:50



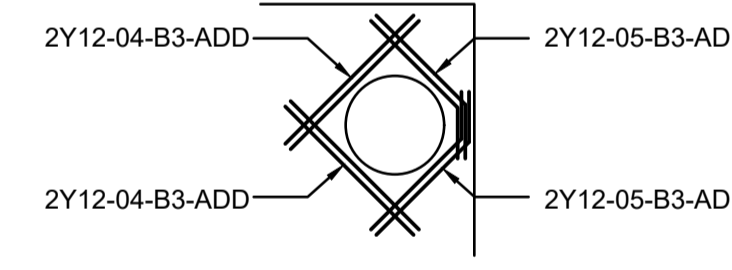
PANEL 2
SCALE 1:50



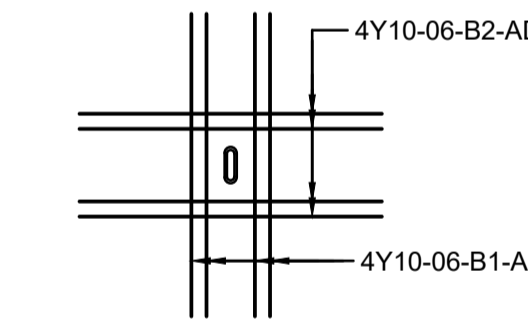
PANEL 3
SCALE 1:50



PANEL 1A
SCALE 1:50

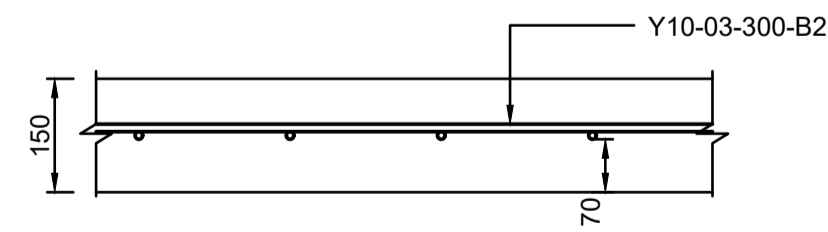


*** ADD REBAR TO MH CUT-OUT**
MIRROR FOR OPPOSITE END
SCALE 1:50



ADD REBAR LIFTING HOLES
SCALE 1:25

MEMBER		REINFORCEMENT					BENDING DIMENSIONS FOR SHAPE CODES TO SABS - 82					
MEMBER AND SIZE	No. OFF	No./UNIT	TYPE AND SIZE	BAR MARK	TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R	
1.5m DROP STRUCTURE	PANEL 1 & 1A	2	6	Y10	01	12	3380	38	100	3230	100	
		3	Y10	02	6	3380	38	100	3230	100		
		12	Y10	03a	24	1380	20					
		4	Y12	04	8	1200	20					
		4	Y12	05	8	1200	62	760	540			
		8	Y10	06	16	1000	20					
		9	Y10	01	18	3380	38	100	3230	100		
		12	Y10	03b	24	1650	20					
		16	Y10	06	32	1000	20					
		1	Y10	01	8	3380	38	100	3230	100		
		Y10	03a	12	1380	20						
		Y12	04	8	1200	20						
		Y10	06	16	1000	20						



TYPICAL SECTION
SCALE 1:10

CONSTRUCTION DRAWING

NOTES
1.1 DO NOT SCALE THE DRAWINGS.
1.2 ALL DIMENSIONS TO BE VERIFIED ON SITE. PRIOR TO MANUFACTURING OR ORDERING OF EQUIPMENT.
1.3 ANY UN-CLARITIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSULTING ENGINEER.
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1.5 THIS DRAWING FORMS PART OF THE SPECIFICATION AND MUST BE READ IN CONJUNCTION WITH THE SAME.

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FAX: +27 15 291 1993

CLIENT
CITY OF Polokwane
NATURALLY PROGRESSIVE

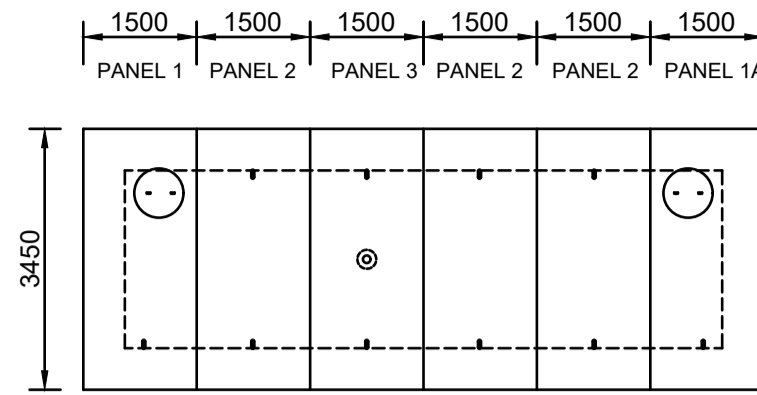
REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
1	2024-05	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER
PR ENG no. _____ DATE _____
CLIENT _____ DATE _____

PROJECT
POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS

DRAWING DESCRIPTION
PRECAST CONCRETE
PANELS
REINFORCING DETAILS
SHEET 1 OF 2

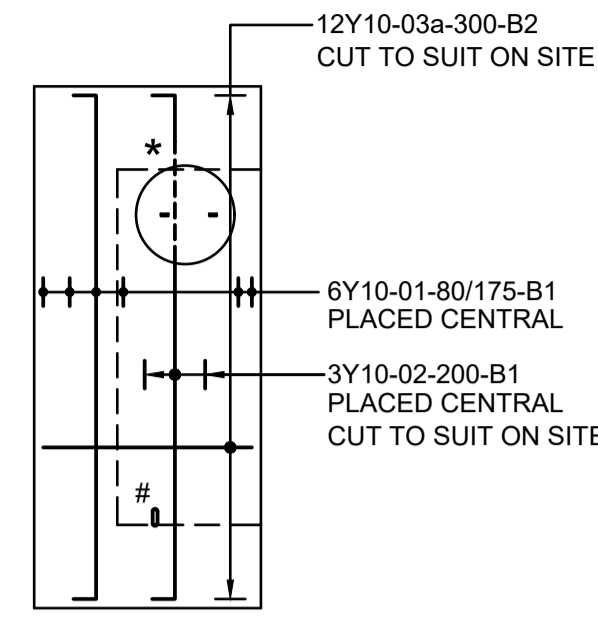
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2024-05	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)		REV
PK278-CP-2B-MP-008		0



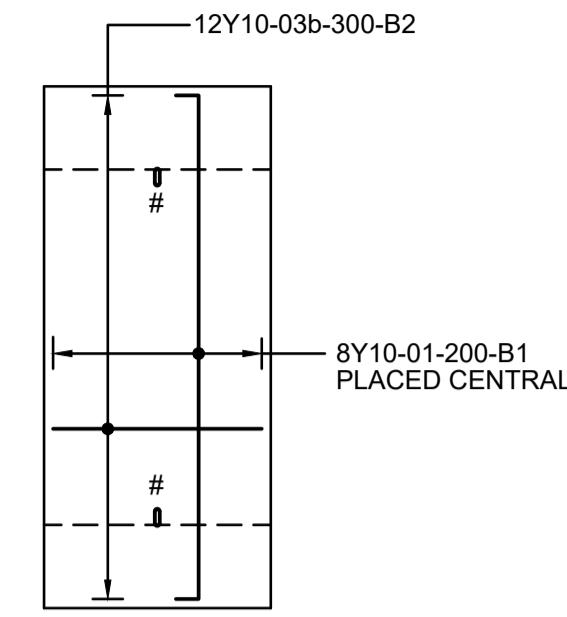
PLAN OF PRECAST CONCRETE PANELS

SCALE 1:100

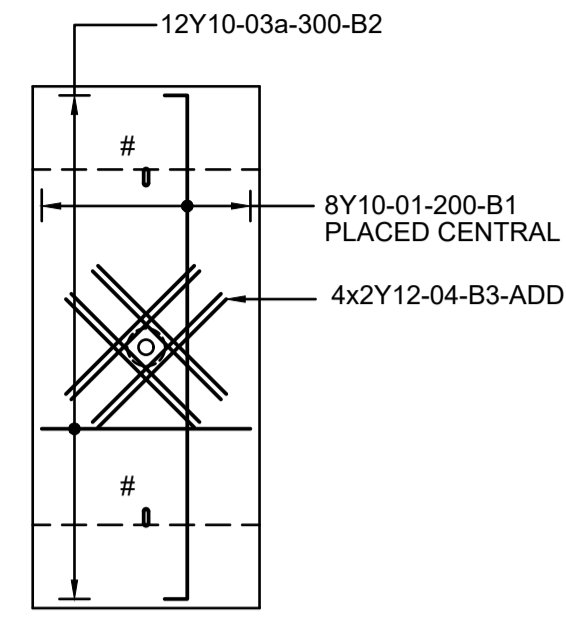
2,0m DROP STRUCTURE
REF. DWG : PK278-SD-1-1172



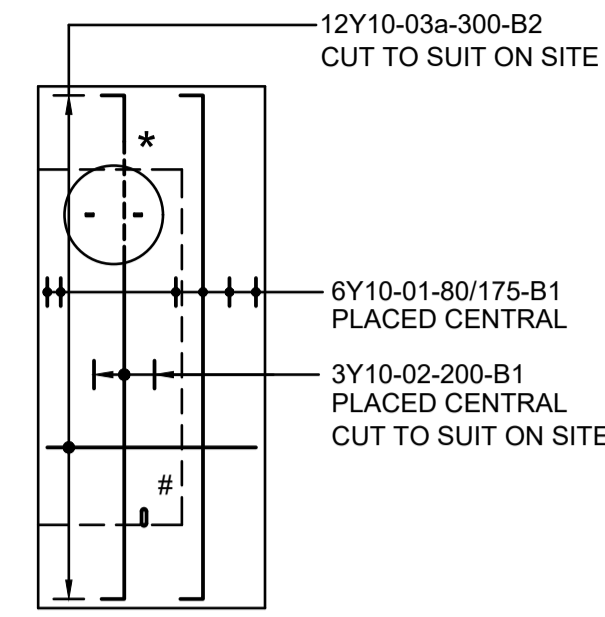
PANEL 1
SCALE 1:50



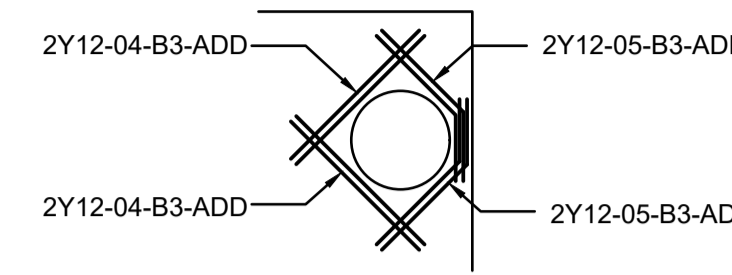
PANEL 2
SCALE 1:50



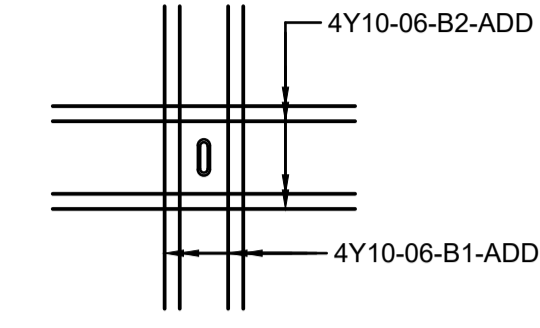
PANEL 3
SCALE 1:50



PANEL 1A
SCALE 1:50

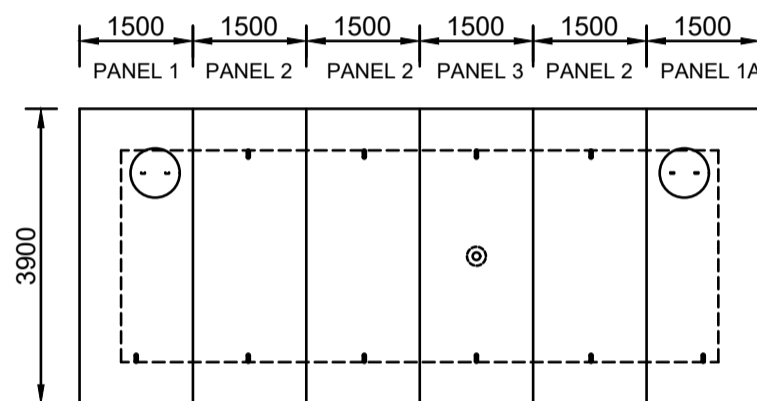


*** ADD REBAR TO MH CUT-OUT**
MIRROR FOR OPPOSITE END
SCALE 1:50



ADD REBAR LIFTING HOLES
SCALE 1:25

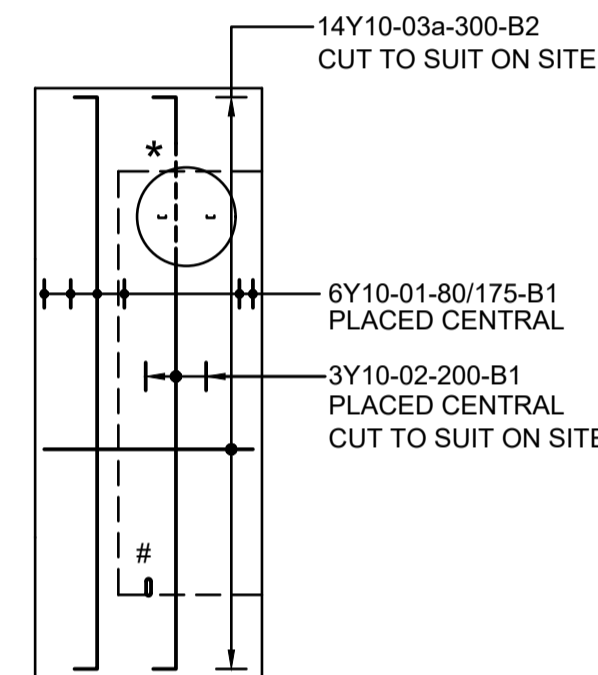
MEMBER AND SIZE	MEMBER OFF	No. UNIT	REINFORCEMENT			BENDING DIMENSIONS FOR SHAPE CODES TO SABS - 82								
			TYPE AND SIZE	BAR MARK	TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R			
2.0m DROP STRUCTURE	PANEL 1 & 1A	2	6	Y10 01	12	3480	38	100	3330	100				
		3	Y10 02	6	3480	38	100	3330	100					
		12	Y10 03a	24	1380	20								
		4	Y12 04	8	1200	20								
		4	Y12 05	8	1200	62	760	540						
		8	Y10 06	16	1000	20								
PANEL 2	PANEL 3	3	8	Y10 01	24	3480	38	100	3330	100				
		12	Y10 03b	36	1380	20								
		16	Y10 06	48	1000	20								
PANEL 3	PANEL 1A	1	Y10 01	8	3480	38	100	3330	100					
		Y10 03a	12	1380	20									
		Y12 04	8	1200	20									
		Y10 06	16	1000	20									



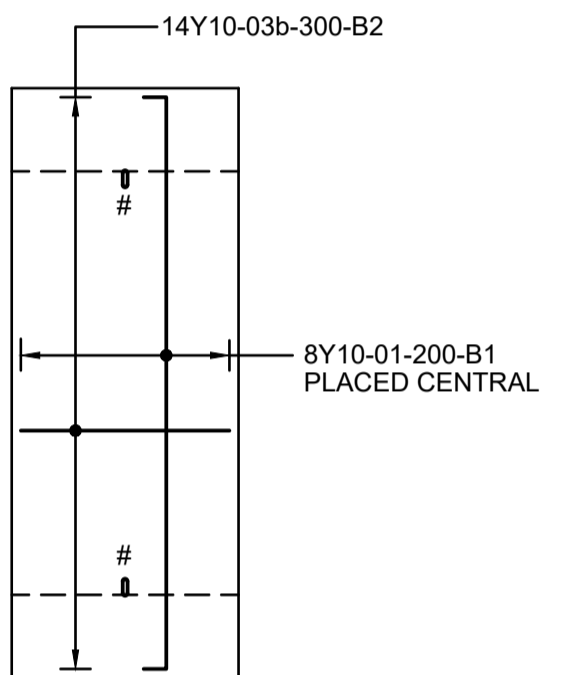
PLAN OF PRECAST CONCRETE PANELS

SCALE 1:100

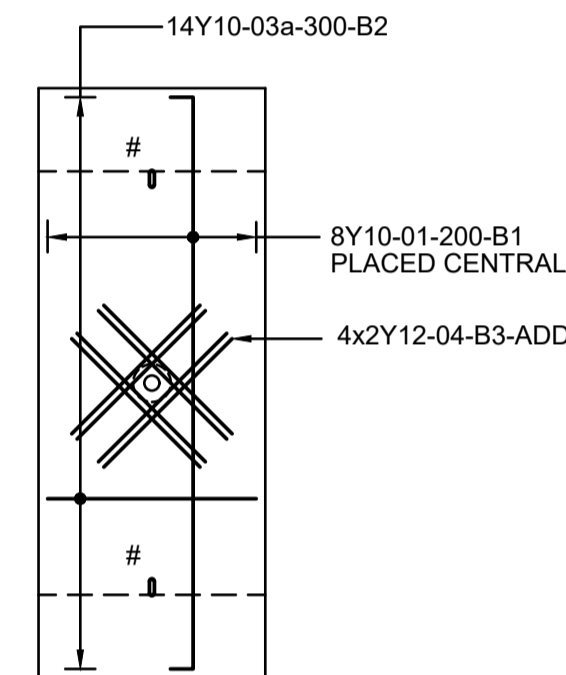
1,5m MAIN OUTFALL DROP STRUCTURE
REF. DWG : PK278-SD-1-1182



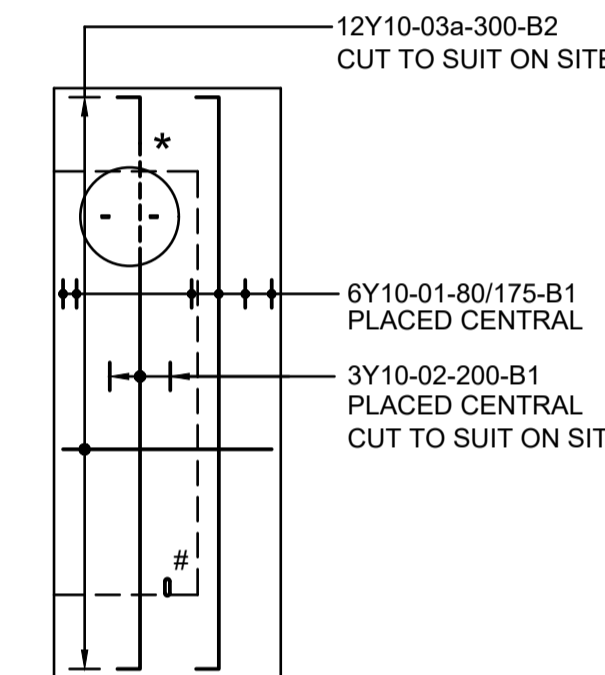
PANEL 1
SCALE 1:50



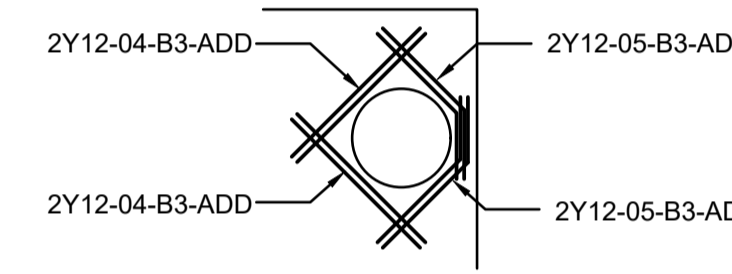
PANEL 2
SCALE 1:50



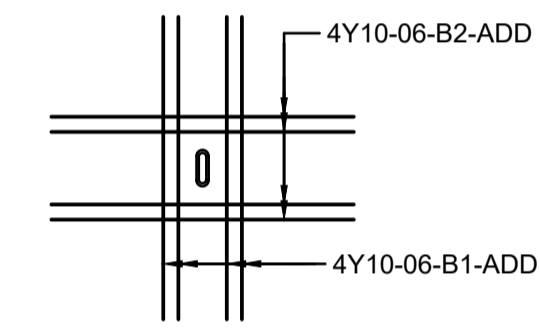
PANEL 3
SCALE 1:50



PANEL 1A
SCALE 1:50

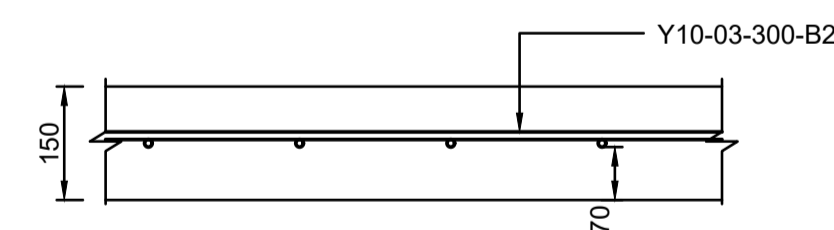


*** ADD REBAR TO MH CUT-OUT**
MIRROR FOR OPPOSITE END
SCALE 1:50



ADD REBAR LIFTING HOLES
SCALE 1:25

MEMBER AND SIZE	MEMBER OFF	No. UNIT	REINFORCEMENT			BENDING DIMENSIONS FOR SHAPE CODES TO SABS - 82							
			TYPE AND SIZE	BAR MARK	TOTAL LENGTH	SHAPE CODES	A	B	C	D	E/R		
1.5m MAIN OUTFALL DROP STRUCTURE	PANEL 1 & 1A	2	6	Y10 01	12	3930	38	100	3780	100			
		3	Y10 02	6	3930	38	100	3780	100				
		14	Y10 03a	28	1380	20							
		4	Y12 04	8	1200	20							
		4	Y12 05	8	1200	62	760	540					
		8	Y10 06	16	1000	20							
PANEL 2	PANEL 3	3	8	Y10 01	24	3930	38	100	3780	100			
		14	Y10 03b	42	1380	20							
		16	Y10 06	48	1000	20							
PANEL 3	PANEL 1A	1	Y10 01	8	3930	38	100	3780	100				
		Y10 03a	14	1380	20								
		Y12 04	8	1200	20								
		Y10 06	16	1000	20								



TYPICAL SECTION
SCALE 1:10

CONSTRUCTION DRAWING

NOTES
1.1 DO NOT SCALE THE DRAWINGS.
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CLIENT
CITY OF **Polokwane**
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
1	2024-05	ISSUED FOR CONSTRUCTION

T. BANDA ENGINEER
PR ENG no. _____ DATE _____
CLIENT _____ DATE _____

PROJECT
POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION
PRECAST CONCRETE PANELS REINFORCING DETAILS SHEET 2 OF 2

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2024-05	AS SHOWN	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-009	0	



- GENERAL NOTES:
1. THESE DRAWINGS ARE COMPLEMENTARY TO THE PROJECT SPECIFICATIONS. THE PROJECT SPECIFICATIONS WILL GOVERN IN THE CASE OF ANY CONFLICTS.
 2. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL DETAIL DRAWINGS AND PROJECT SPECIFICATIONS.
 3. COORDINATE SYSTEM: WGS84 LQ29°
 4. CONTOUR INTERVALS: 1m
 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
 7. OUTER EMBANKMENT SLOPES ARE 1:2 (V:H).
 8. EMBANKMENT SLOPES INTO MATURATION POND BASINS ARE 1:3 (V:H).
 9. NO CLEARING AND GRUBBING AND TOPSOIL REMOVAL IS PERMITTED WITHIN THE DEMARCATED WETLAND SECTION.

BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	48 248.152	1180.756

NOTES

- 1.1 DO NOT SCALE THE DRAWINGS.
- 1.2 ALL DIMENSIONS TO BE VERIFIED ON SITE, PRIOR TO MANUFACTURING OR ORDERING OF EQUIPMENT.
- 1.3 ANY IN-CLEARITIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSULTING ENGINEER
- 1.4 THIS DRAWING, OR PART THEREOF, SHALL NOT BE USED FOR ANY OTHER INSTALLATION PROJECT OTHER THAN THIS ONE.
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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2020-04	ISSUED FOR CONSTRUCTION
1	2024-03	REVISED ANNOTATION

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

PROJECT

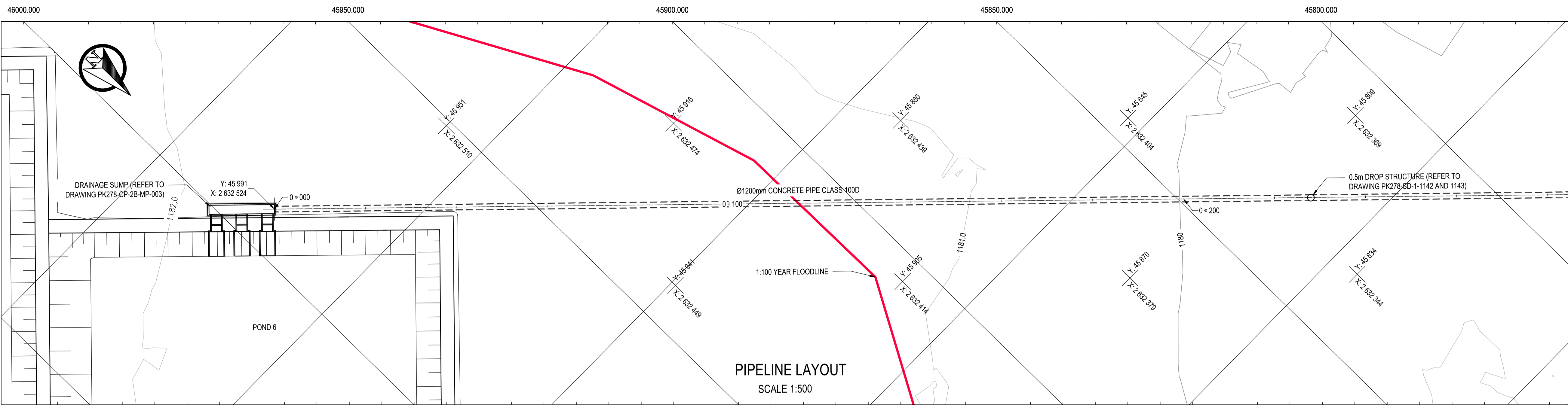
POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

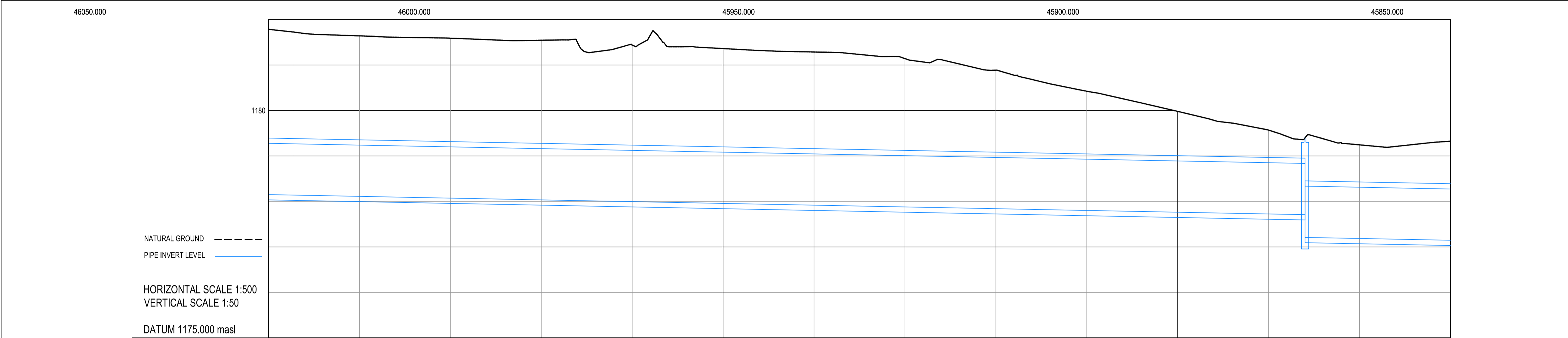
Z22 PIPELINE DIVERSION: LAYOUT

LEGEND	
	NEW PROPOSED Z22 0315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 0315 uPVC PIPELINE
	FENCE
	WETLAND AREA

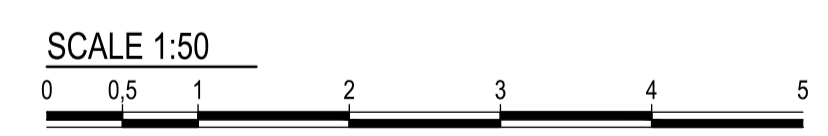
CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2024-03	N/A	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2700	1	



- NOTES:**
1. SURVEY DATUM IS WGS84 Lo29.
 2. ALL LEVELS IN METRES ABOVE SEA LEVEL (masl).
 3. THE CONCRETE PIPELINE IS SPIGOT AND SOCKET JOINTED.
 4. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL DETAIL DRAWINGS AND PROJECT SPECIFICATIONS.
 5. THESE DRAWINGS ARE COMPLEMENTARY TO THE PROJECT SPECIFICATIONS. THE PROJECT SPECIFICATIONS WILL GOVERN IN CASE OF ANY CONFLICTS.
 6. CONTOUR INTERVALS: 1m



GROUND LEVEL		1181.795	1181.641	1181.589	1181.544	1181.439	1181.361	1181.286	1181.141	1180.887	1180.423	1179.990	1179.568	1179.244	1178.324	
INVERT LEVEL		1178.150												1177.709 1177.269	1176.198	
CUT DEPTH		-3.655	-3.329	-3.517	-3.511	-3.444	-3.405	-3.399	-3.362	-3.048	-2.622	-2.218	-1.844	-1.851 -2.160	-2.060	-2.179
HYDRAULIC DESIGN	Internal Pipe Dia (mm)	1127														
	Bedding Class	CLASS C														
	Slope	0.197%														
	Design Flow (l/s)	1150														
	Design Velocity (m/s)	1.52														
	Froude Number	SUBCRITICAL FLOW: Fr < 0.8														
DISTANCE	Length (m)	228.00														
	Chainage (m)	0.000	20.000	40.000	60.000	80.000	100.000	120.000	140.000	160.000	180.000	200.000	220.000	227.882	240.000	260.000
REFERENCE		Ø1200mm CONCRETE PIPE CLASS 1000													0.5m DROP	Ø1200mm CONCRETE PIPE CLASS 1000



PIPELINE LONGSECTION
SCALE 1:500

CONSTRUCTION DRAWING

- NOTES**
- 1.1 DO NOT SCALE THE DRAWINGS.
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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE

NO.	DATE	REVISION DESCRIPTION
1	2020-05-12	ISSUED FOR CONSTRUCTION
2	2021-03-26	THE PIPE HAS BEEN RE-ALIGNED

PROJECT

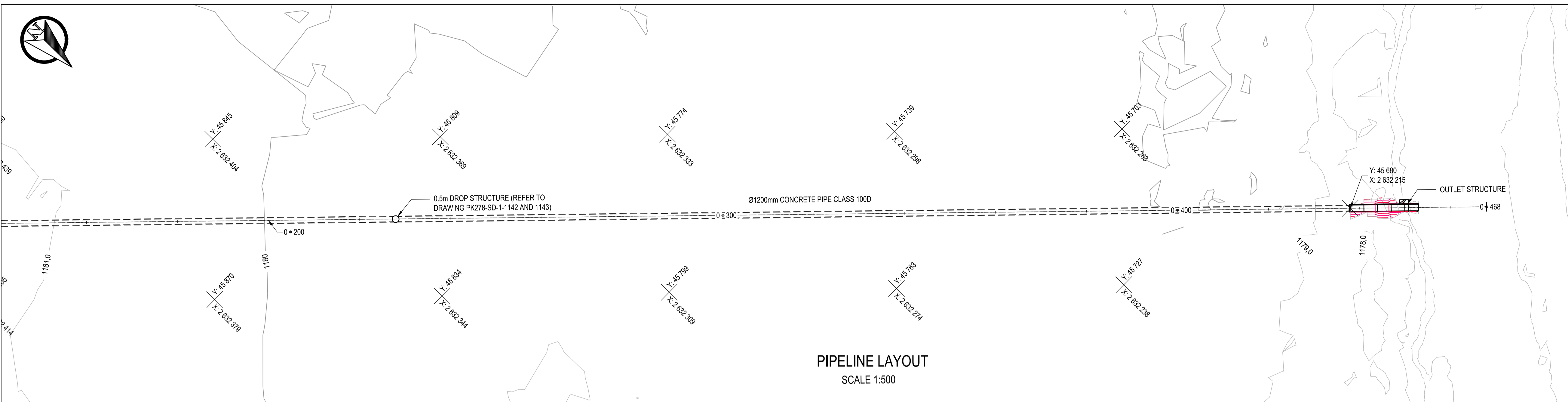
POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DESIGNED BY: T. BANDA ENGINEER
DRAWN BY: PR ENG no. DATE
CHECKED BY: DATE

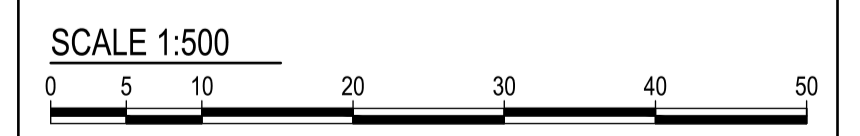
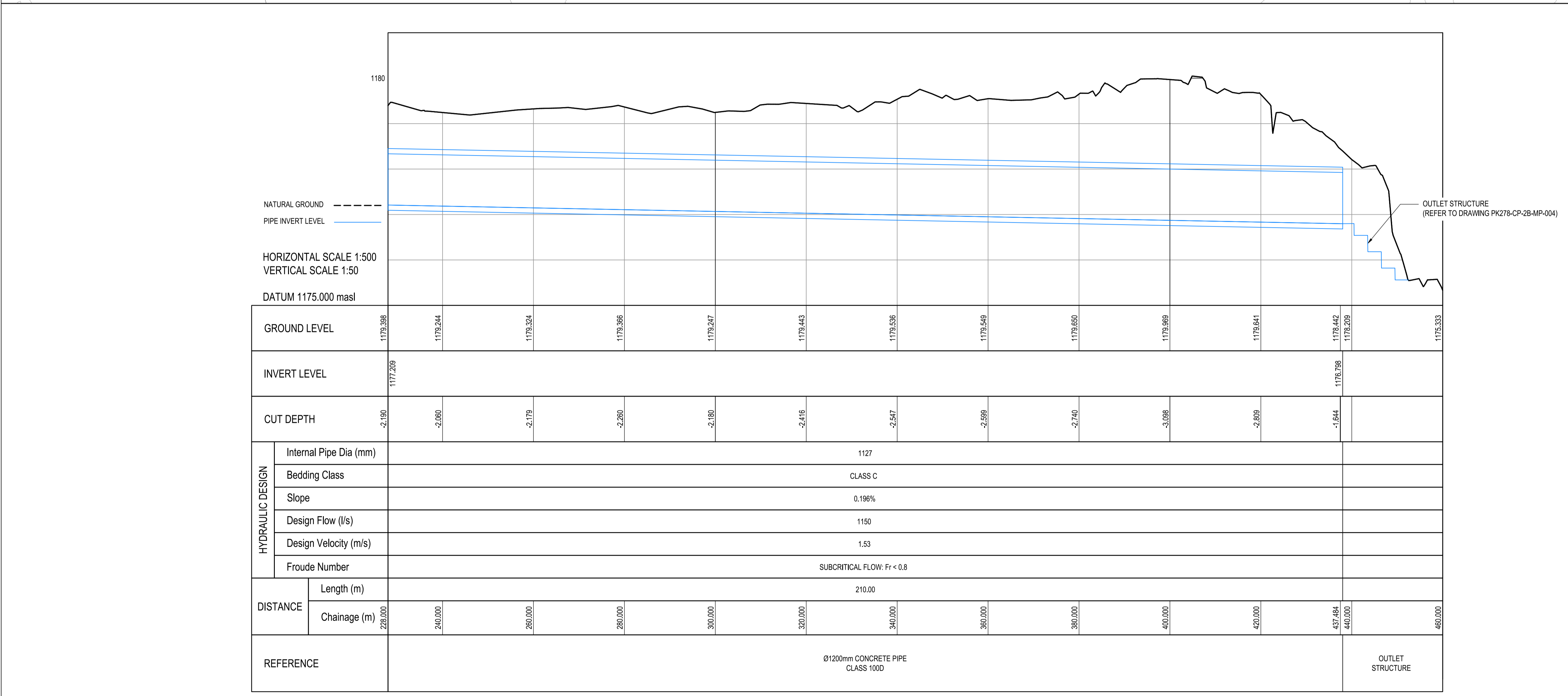
DRAWING DESCRIPTION

OUTLET PIPE LAYOUT AND LONG SECTION

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2021-03-26	1:500	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-001	2	



- NOTES:**
1. SURVEY DATUM IS WGS84 Lo29.
 2. ALL LEVELS IN METRES ABOVE SEA LEVEL (masl).
 3. THE CONCRETE PIPELINE IS SPIGOT AND SOCKET JOINTED.
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 6. CONTOUR INTERVALS: 1m



CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2021-03-26	1:500	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-002	2	

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CITY OF Polokwane
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T. BANDA
ENGINEER

PR ENG no. DATE

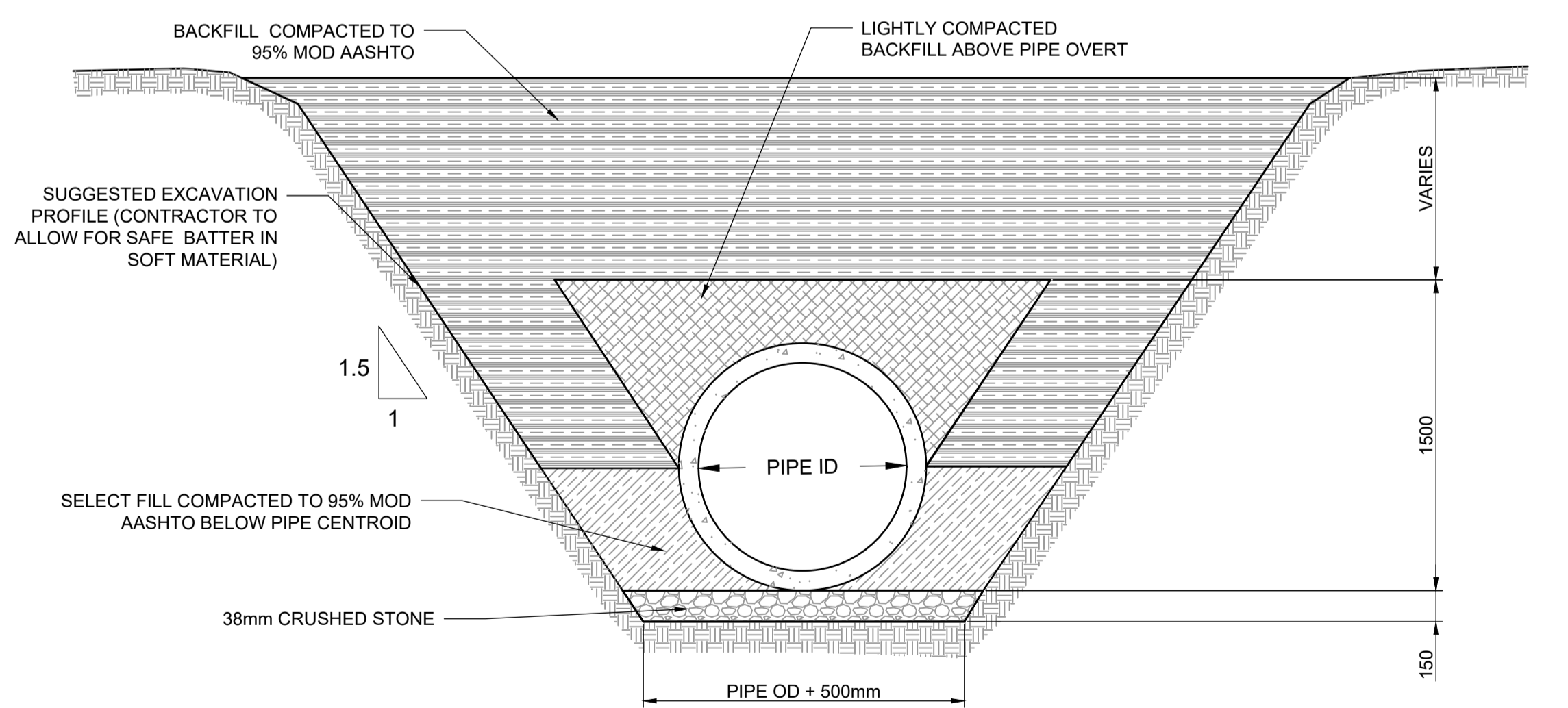
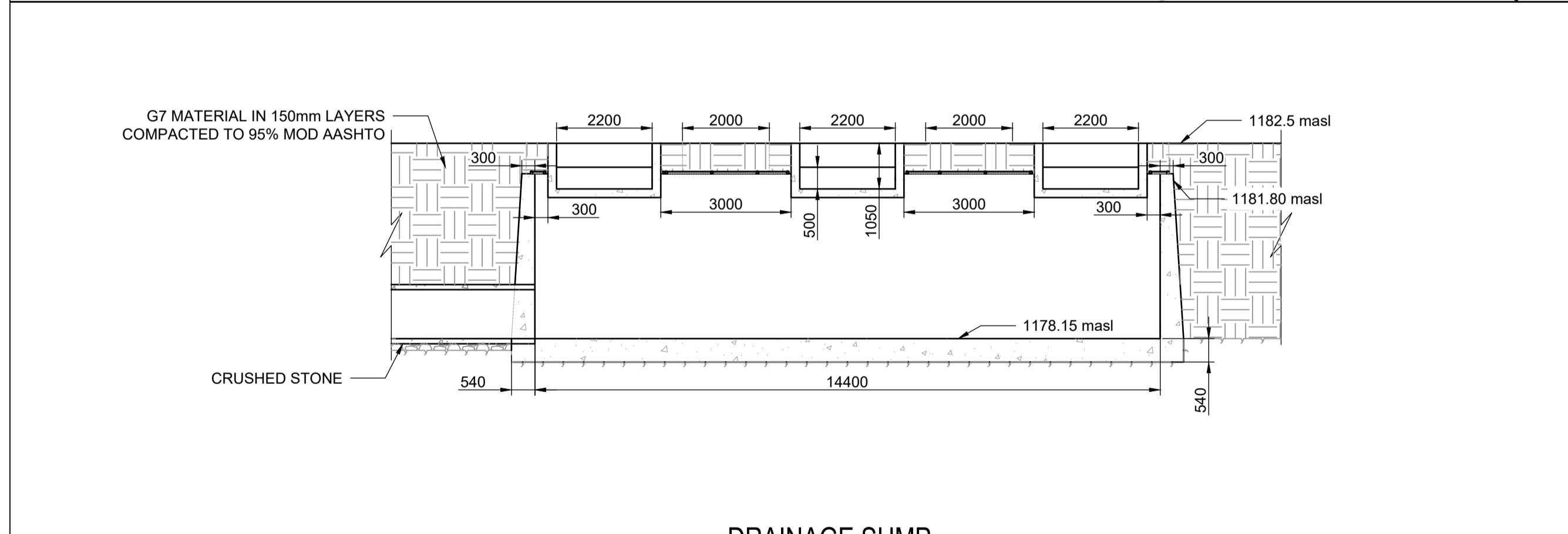
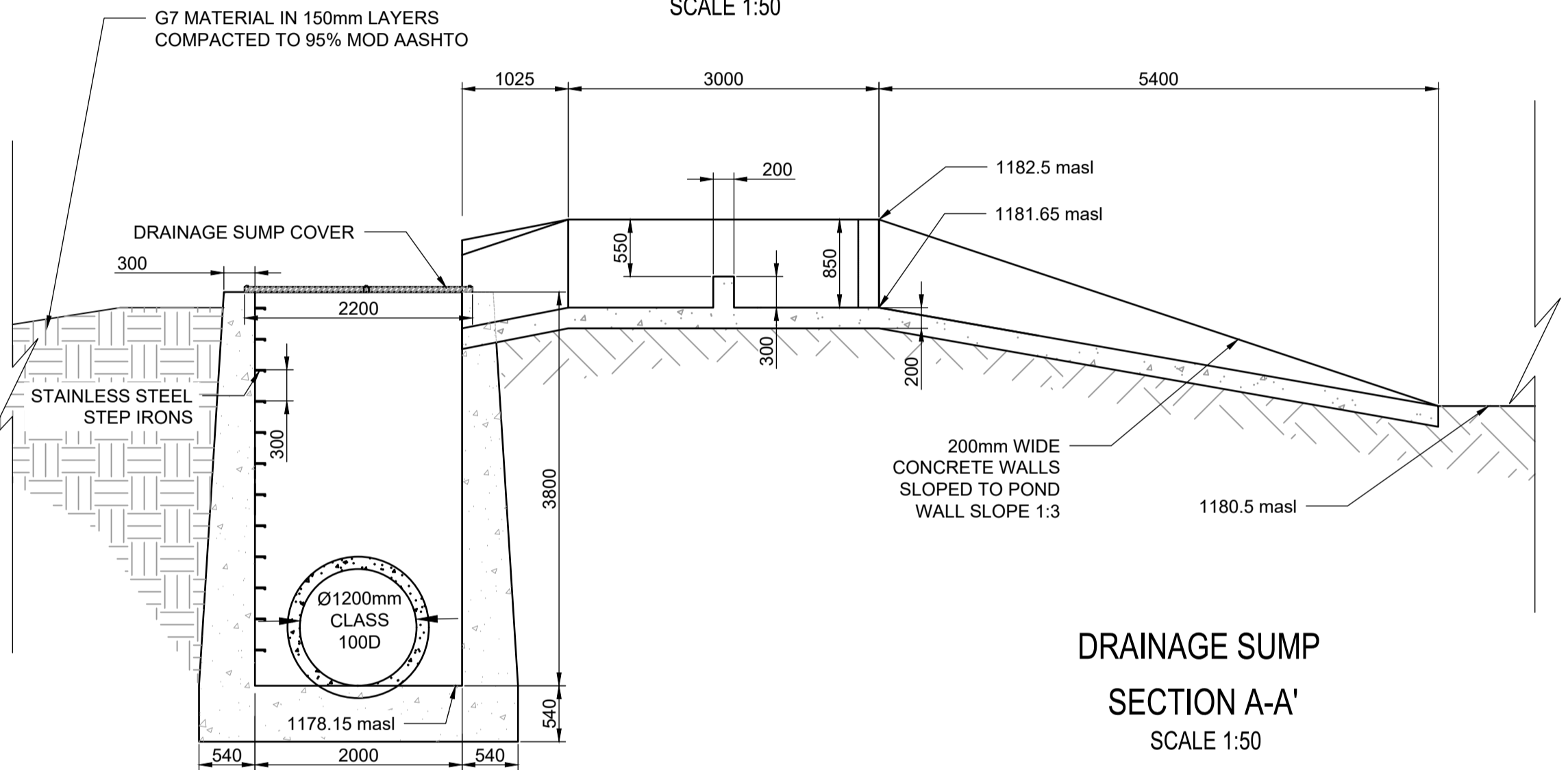
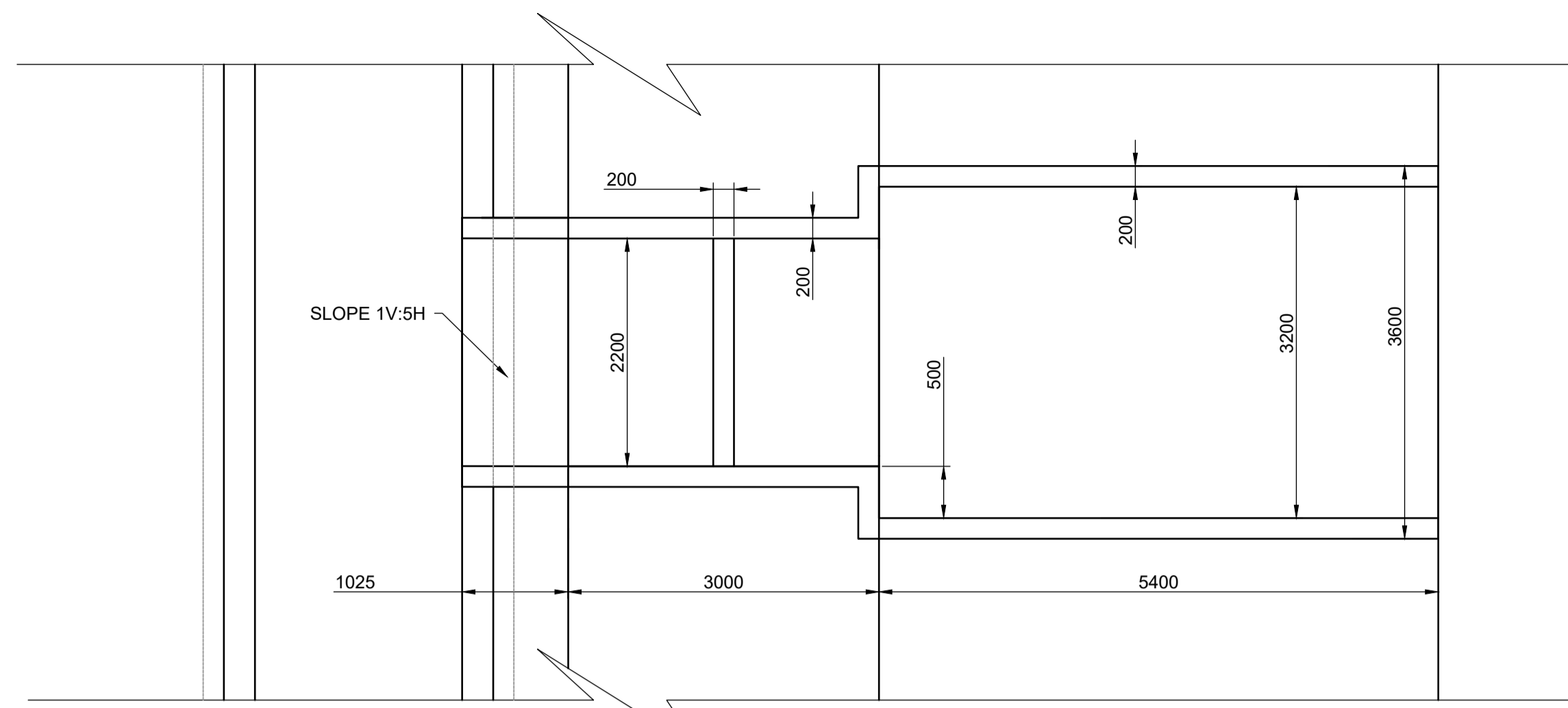
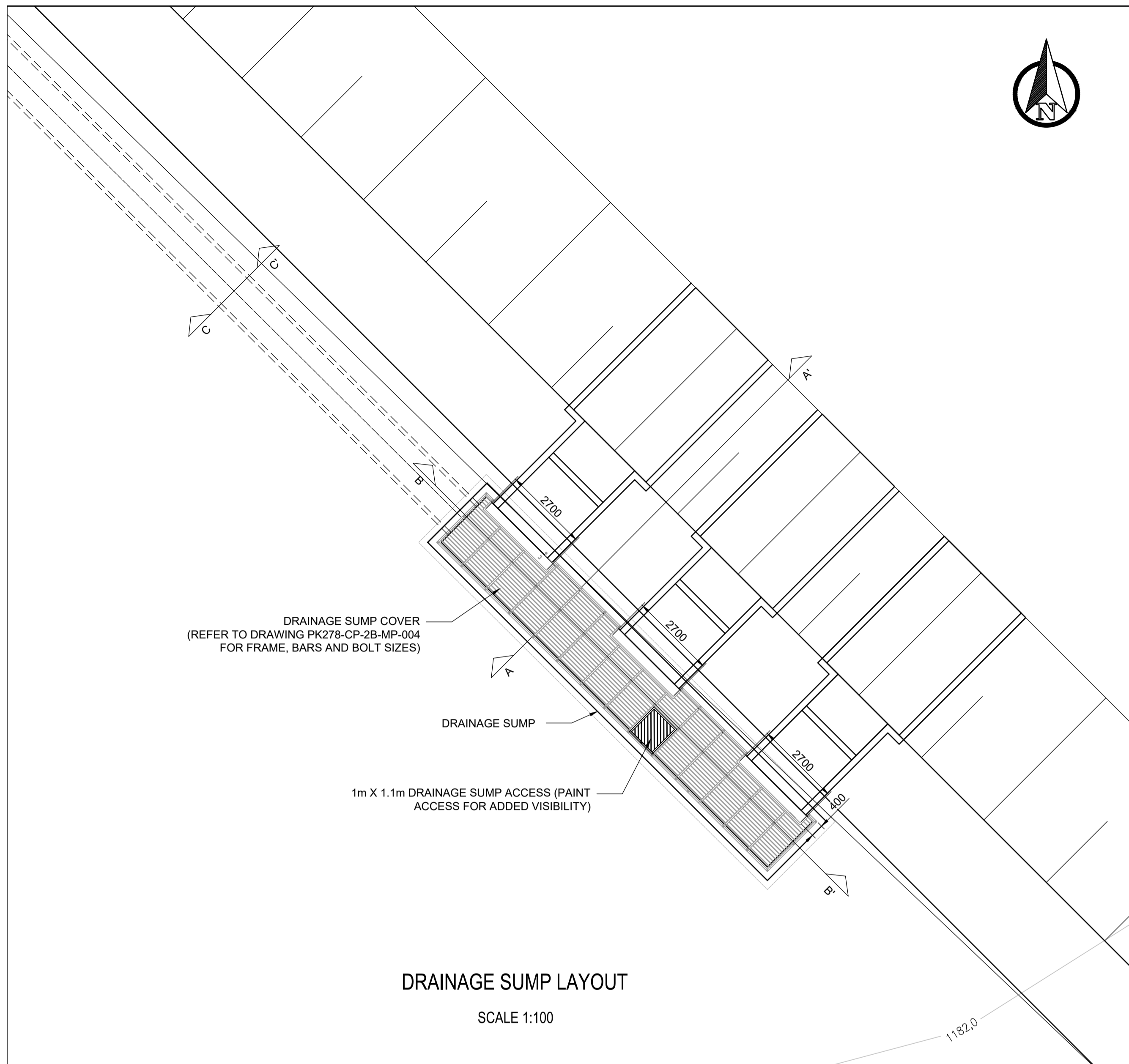
CLIENT DATE

PROJECT

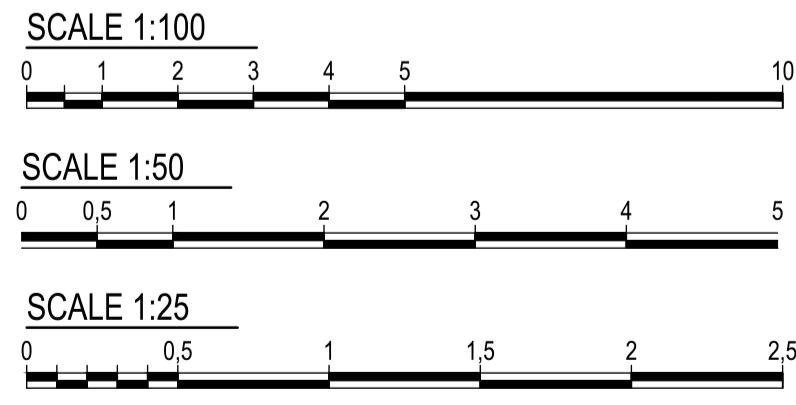
POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

DRAWING DESCRIPTION

OUTLET PIPE LAYOUT AND LONG SECTION



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CONSTRUCTION DRAWING

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ENGINEER		
CLIENT		DATE

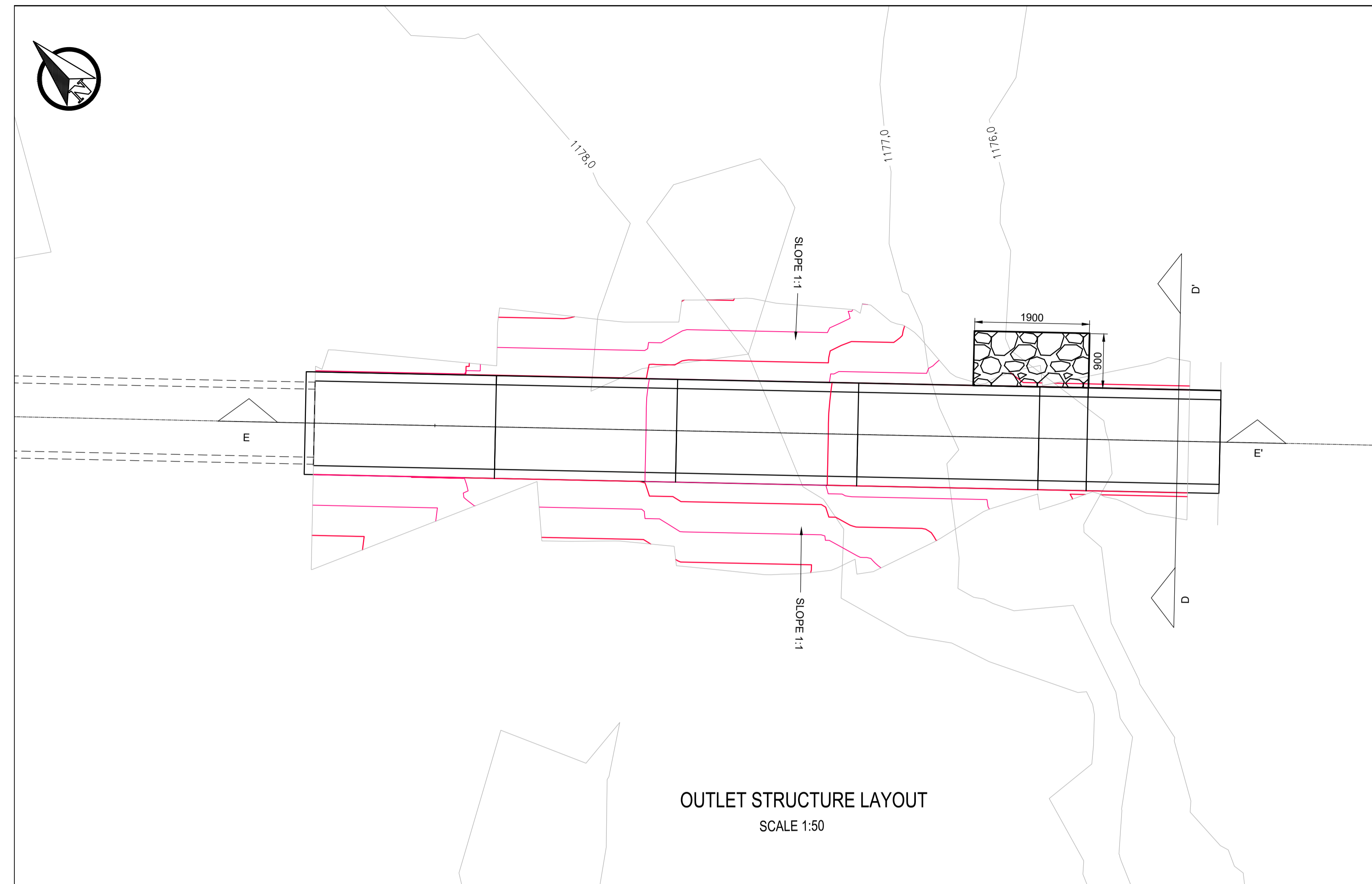
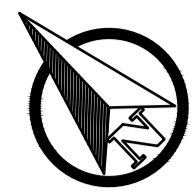
PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

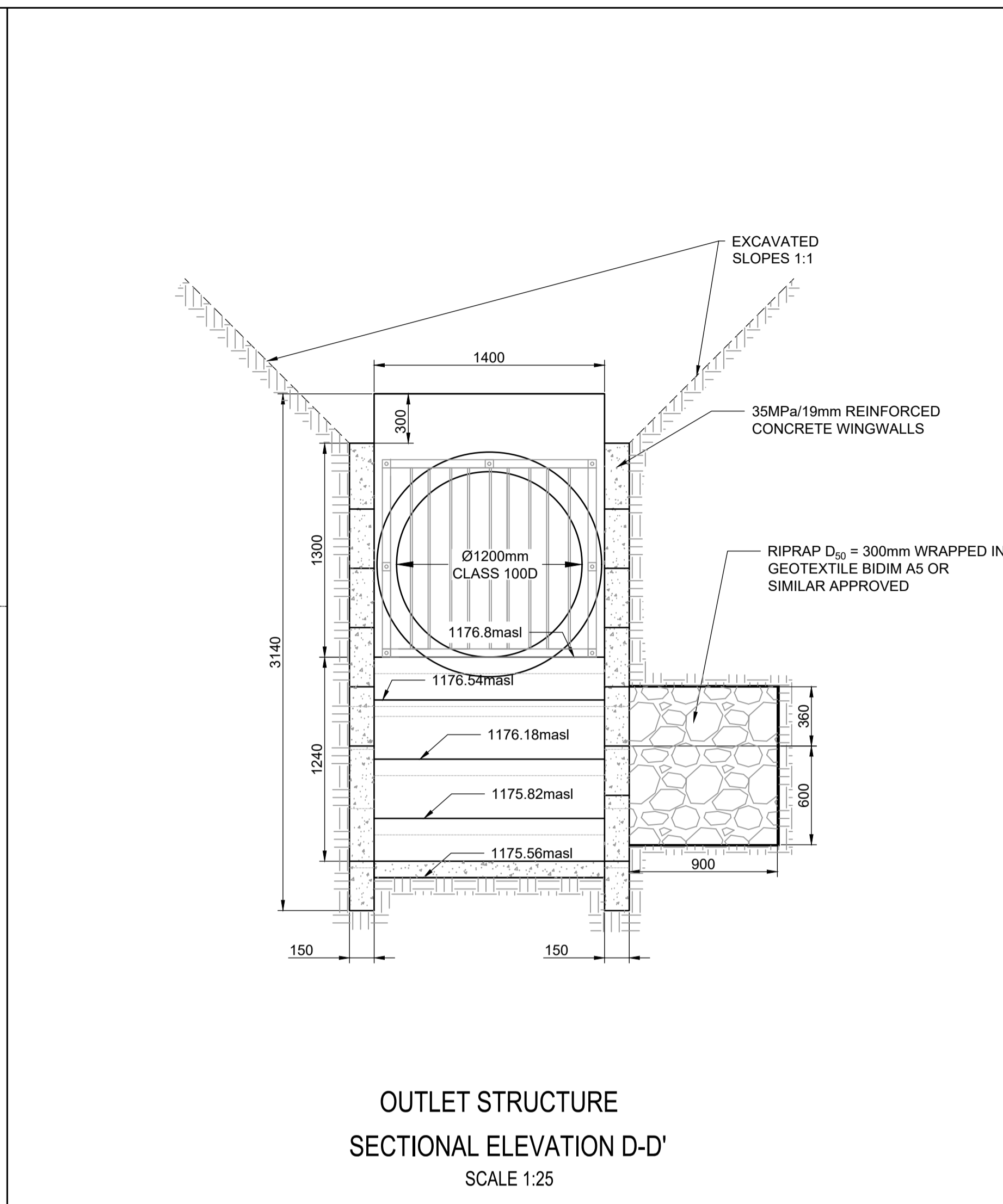
DRAWING DESCRIPTION

DRAINAGE SUMP AND PIPE SECTION AND DETAILS

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2021-03-26	1:75,50,25	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)		REV
PK278-CP-2B-MP-003		2



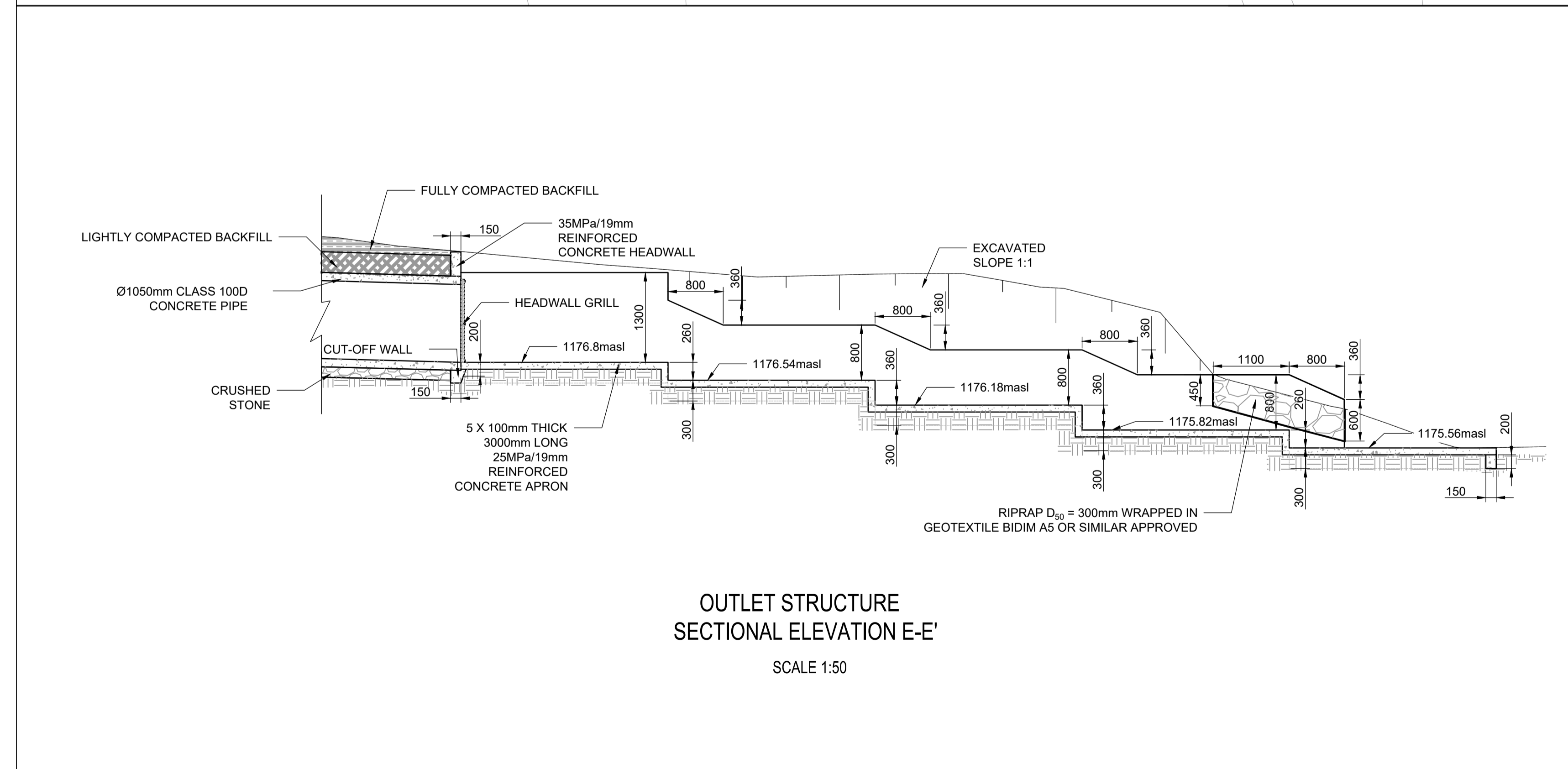
OUTLET STRUCTURE LAYOUT
SCALE 1:50



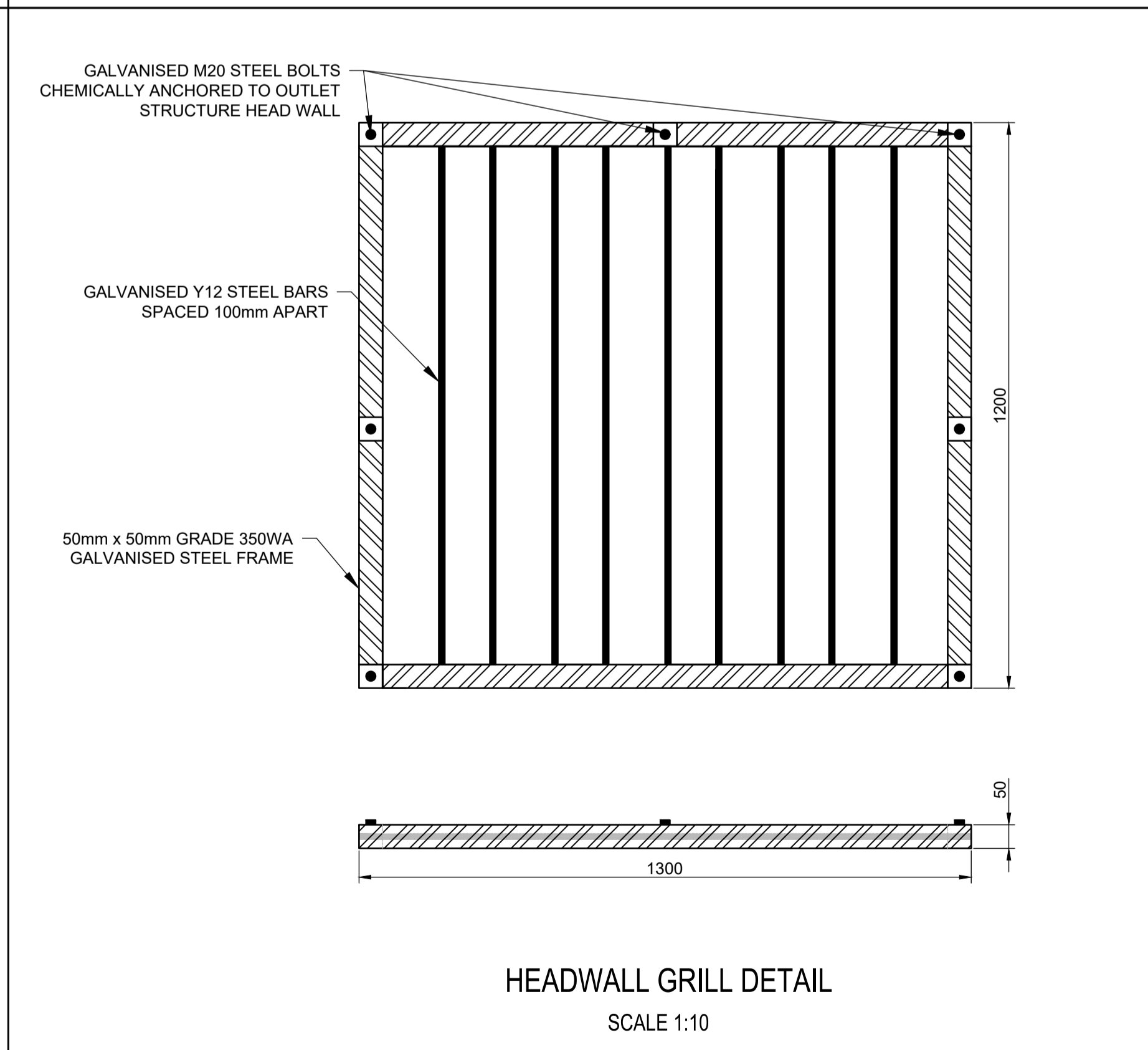
OUTLET STRUCTURE SECTIONAL ELEVATION D-D'
SCALE 1:25

NOTES:

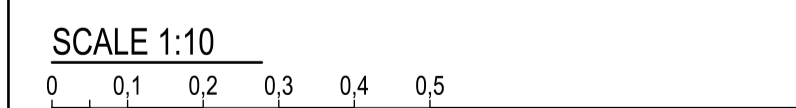
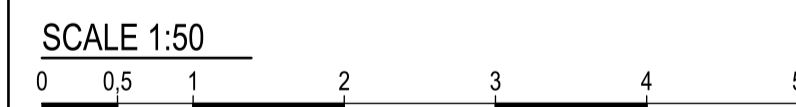
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6. CONTOUR INTERVALS: 1m



OUTLET STRUCTURE SECTIONAL ELEVATION E-E'
SCALE 1:50



HEADWALL GRILL DETAIL
SCALE 1:10



CONSTRUCTION DRAWING

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T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

PROJECT

POLOKWANE REGIONAL WASTE WATER TREATMENT WORKS

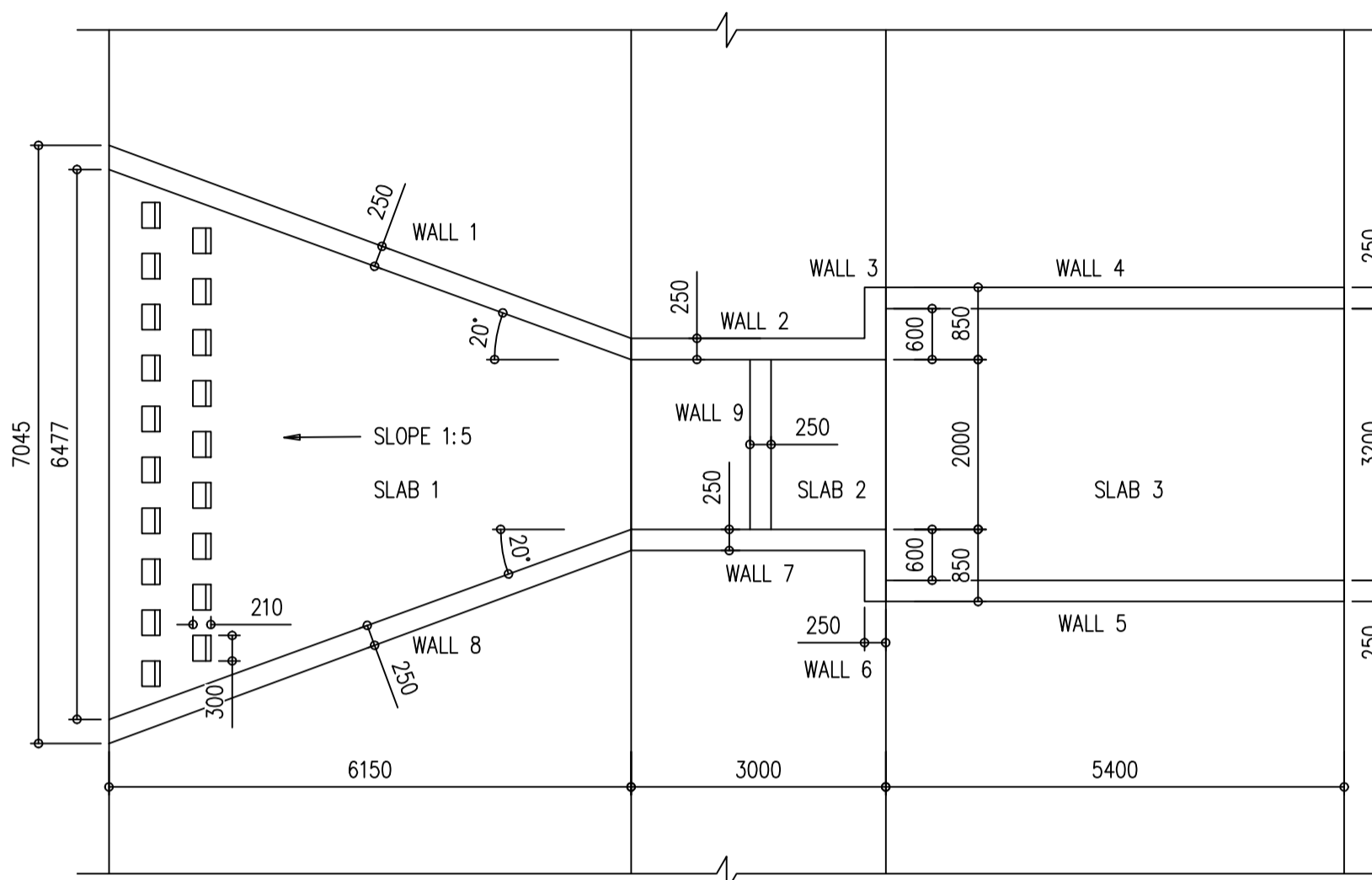
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OUTLET STRUCTURE SECTION AND DETAILS

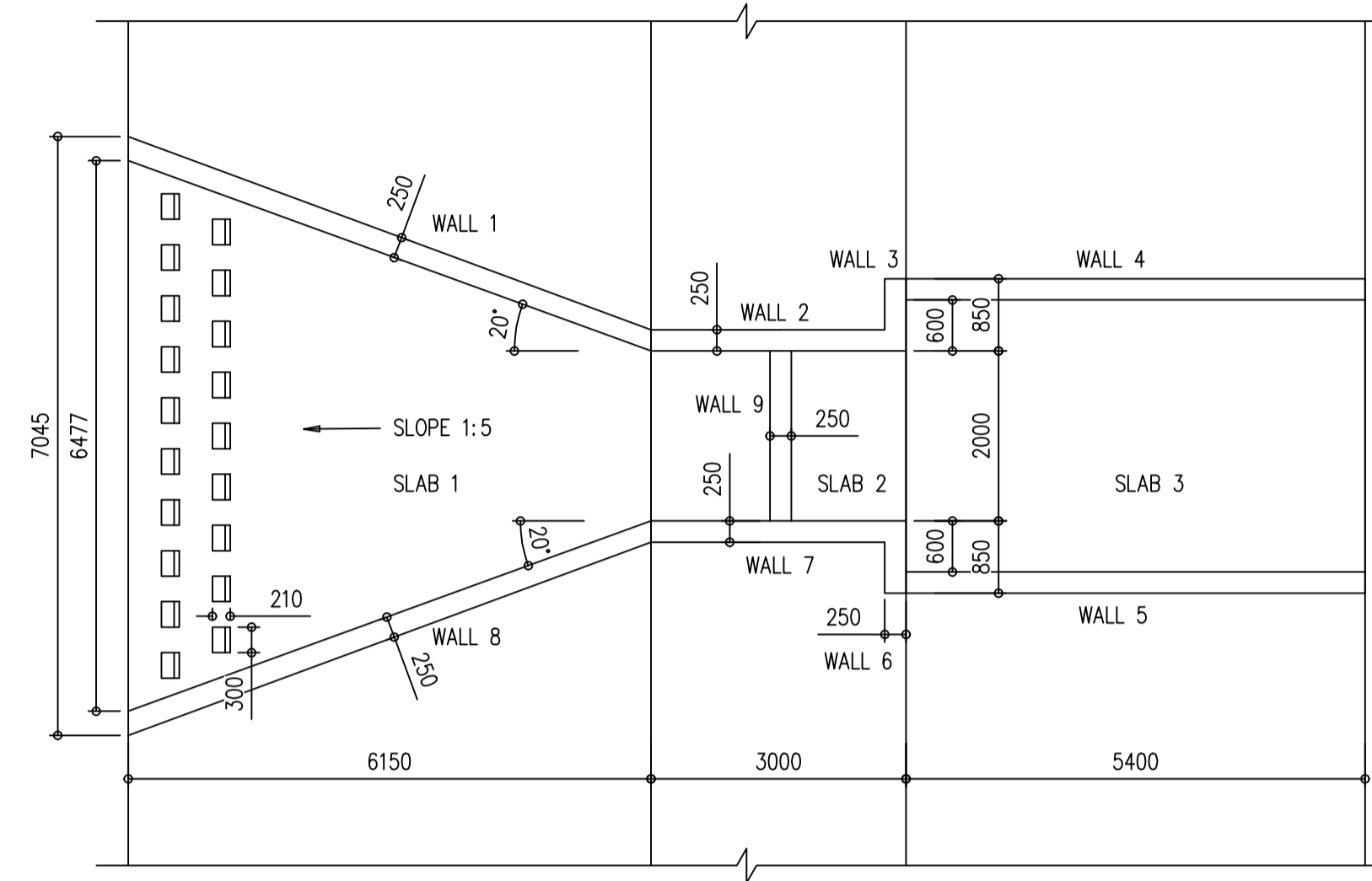
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
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DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2B-MP-004	2	

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 - 2.1 ALL CONCRETE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
 - 2.2 ALL CONCRETE SHALL MEET THE REQUIREMENTS FOR SULPHATE-RESISTING CONCRETE:
 DOLOMITE AGGREGATE SHALL BE USED
 MINIMUM CEMENT:WATER RATIO -2.0
 MINIMUM CEMENT CONTENT -450 kg/m³
 CEMENT SHALL CONTAIN A MINIMUM OF 30% FLY ASH.
 - 2.3 CONCRETE SHALL BE "STRENGTH GRADE CONCRETE (MPa)" / "MAXIMUM STONE SIZE (mm)" AS SPECIFIED BELOW, UNLESS OTHERWISE STATED:
 BLINDING -15/20
 MASS CONCRETE BELOW STRUCTURE -15/20
 MASS CONCRETE ABOVE STRUCTURE -20/20
 FLOORS -45/20
 WALLS AND FLOORS -45/20
 - 2.4 THE CONTRACTOR SHALL ENSURE THAT ALL REINFORCEMENT IS PROPERLY HELD IN POSITION AND SHALL ALSO MAINTAIN THE CORRECT CONCRETE COVER UTILIZING APPROVED PATENT SPACERS (NO STONES, OFF-CUT REINFORCEMENT, BRICKS ETC.) AT ALL TIMES.
 - 2.5 UNLESS OTHERWISE SPECIFIED, THE CONCRETE COVER SHALL BE THE GREATER OF THE BAR DIAMETER OR THE VALUES IN mm AS STATED BELOW:
 WALLS -60mm
 FLOORS -60mm
 SLABS -60mm
 - 2.6 ALL CONCRETE SHALL BE MECHANICALLY COMPACTED THROUGH THE USE OF VIBRATORS.
 - 2.7 CONCRETE SHALL BE CAST CONTINUOUSLY. IF STOPPAGES OF MORE THAN 40 MINUTES ARE UNAVOIDABLE, CONSTRUCTION JOINTS SHALL BE FORMED IN THE POSITIONS AND ACCORDING TO THE DETAILS AS PER PROJECT SPECIFICATION.
 - 2.8 OPENINGS IN THE CONCRETE WALLS TO BE GROUTED CLOSED WITH ANTI-CORROSION PRODUCT AS PER PROJECT SPECIFICATION AFTER THE INSTALLATION OF THE PIPEWORK.
 - 2.9 ALL EXPOSED CORNERS TO HAVE A 25 x 25mm CHAMFER
 - 2.10 NO CONCRETE SHALL BE PLACED PRIOR TO THE APPROVAL OF THE RESIDENT ENGINEER.
 - 2.11 A CLASS U3 SURFACE FINISH, INCLUDING STEEL FLOAT TO A SMOOTH SURFACE WITHIN 2mm OF LEVEL, SHALL BE PROVIDED TO ALL TOP OF WALL SURFACES SUPPORTING MECHANICAL COMPONENTS OR PRECAST ELEMENTS.
 - 2.12 STRUCTURE TO BE TESTED FOR WATER-TIGHTNESS AS PER PROJECT SPECIFICATION. RATE OF FILLING NOT TO EXCEED 2m IN 24 HOURS. FOR 0.2mm CRACK WIDTH, STABILIZING PERIOD TO BE 21 DAYS. AFTER ALLOWING FOR EVAPORATION AND RAINFALL, DROPS IN LEVEL NOT TO EXCEED 1/500TH OF AVERAGE DEPTH OF FULL TANK.
 - 2.13 DRAWING TO BE READ IN CONJUNCTION WITH WATER PROCESS DRAWINGS.

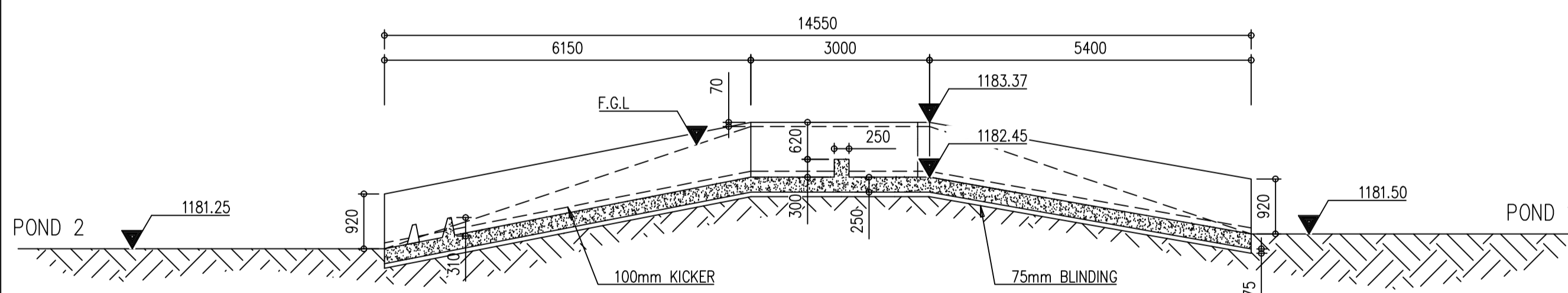
- LEGEND:**
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 - ND = NOMINAL DIAMETER
 - NGL = NATURAL GROUND LEVEL
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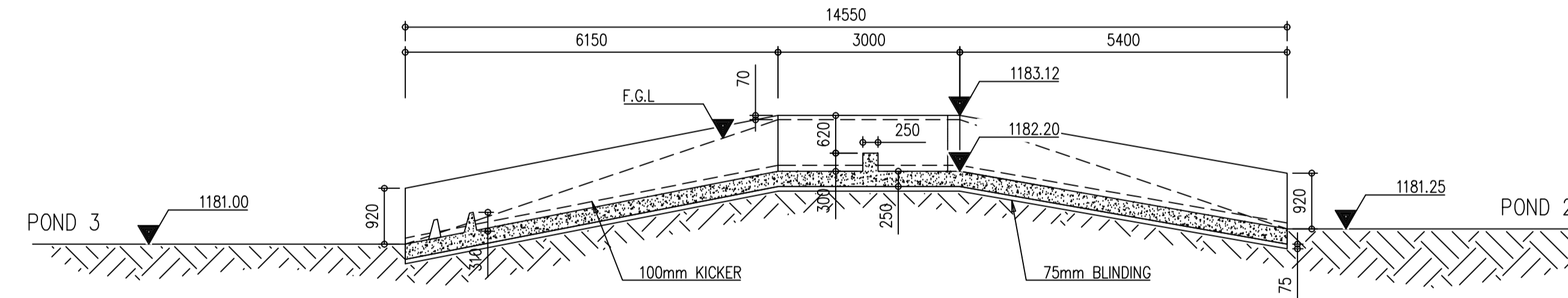
WEIR P1-P2
SCALE 1:75



WEIR P2-P3
SCALE 1:75



SECTION A-A
SCALE 1:75



SECTION B-B
SCALE 1:75

CONSTRUCTION DRAWING

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T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

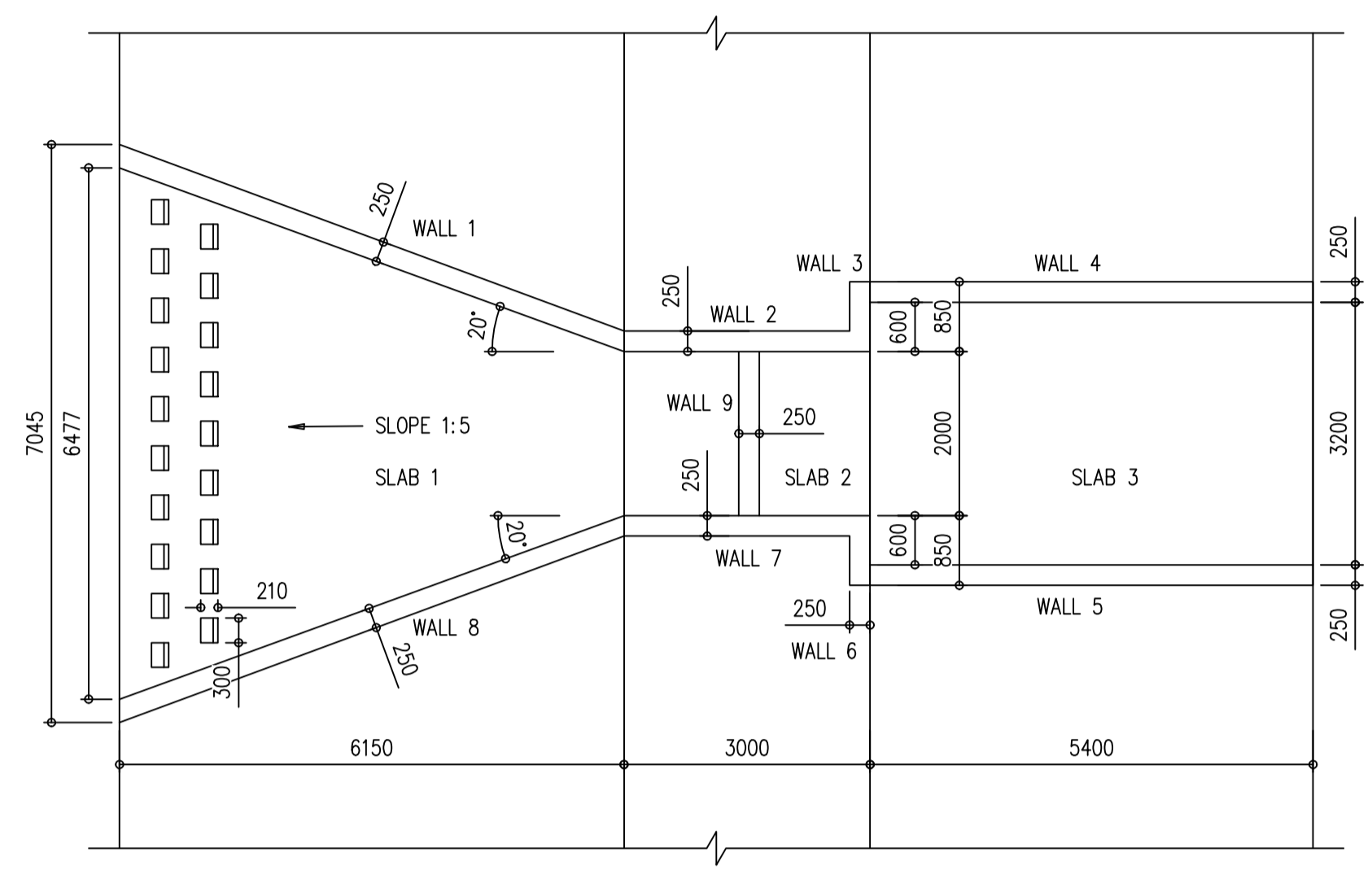
PROJECT

POLOKWANE
REGIONAL WWTW
CONTRACT 2B

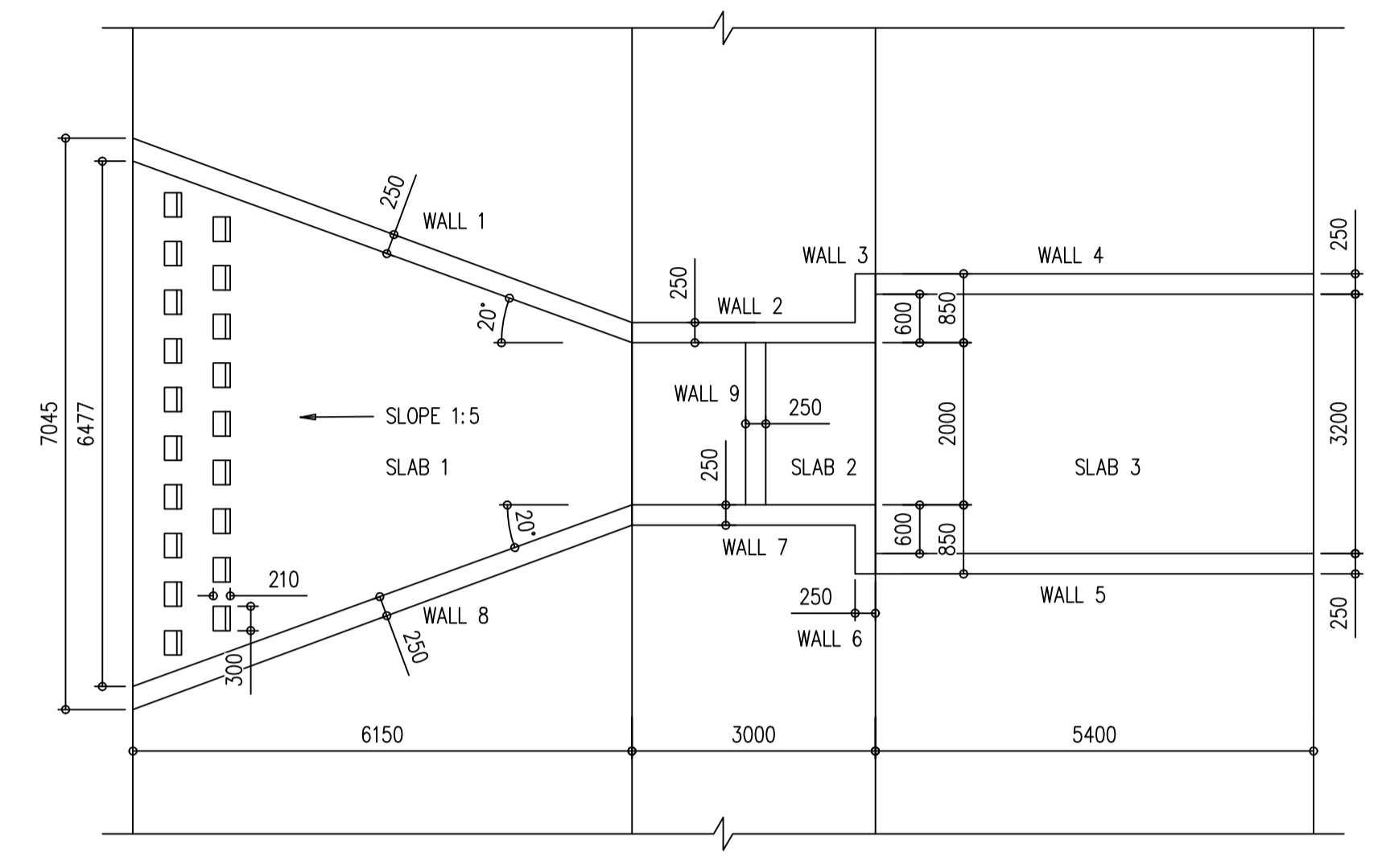
DRAWING DESCRIPTION

MATURATION PONDS
CONCRETE DETAILS P1-3

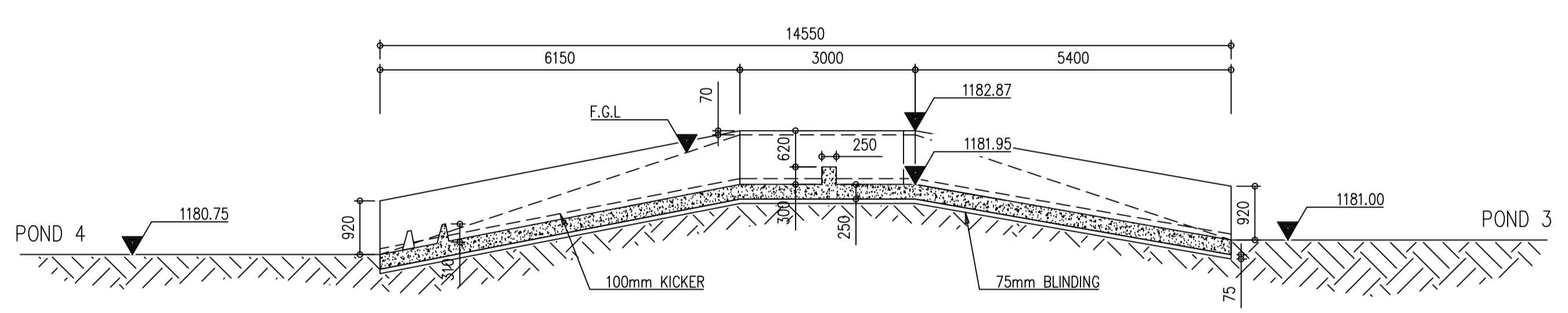
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-07	As indicated	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-SP-2B-MP-501	0	



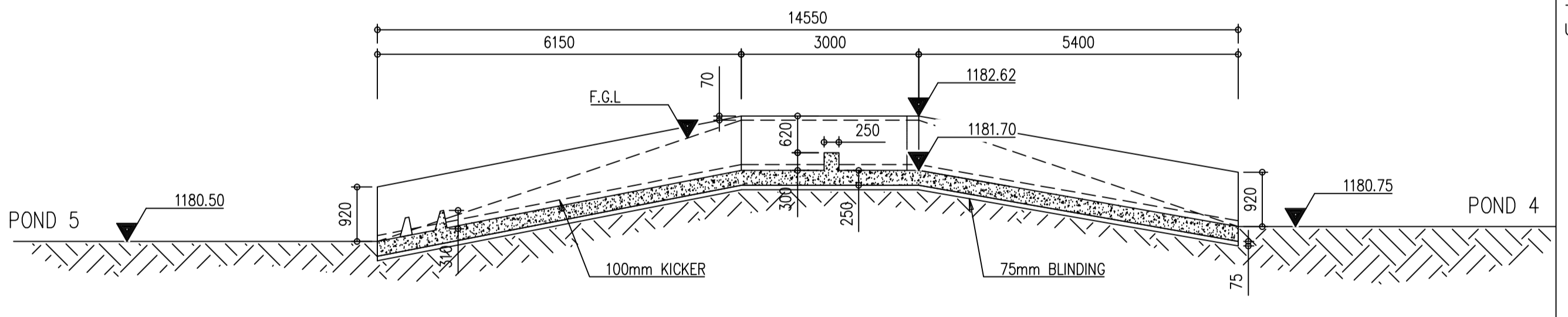
WEIR P3-P4
SCALE 1:75



WEIR P4-P5
SCALE 1:75



SECTION C-C
SCALE 1:75



SECTION D-D
SCALE 1:75

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 - 2.13

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 - ND = NOMINAL DIAMETER
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 - UF = UNDERSIDE OF FOOTING

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PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

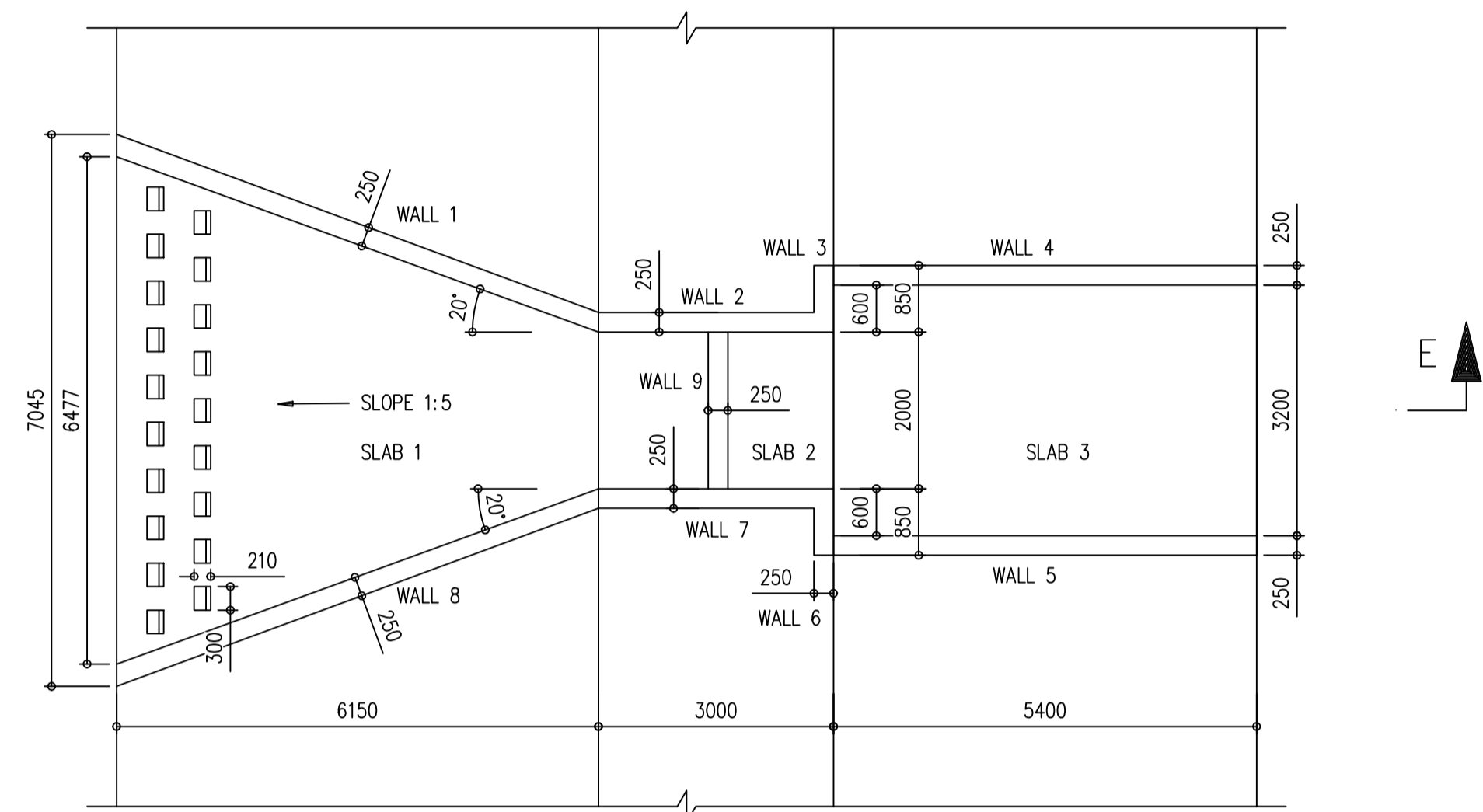
PROJECT

POLOKWANE
REGIONAL WWTW
CONTRACT 2B

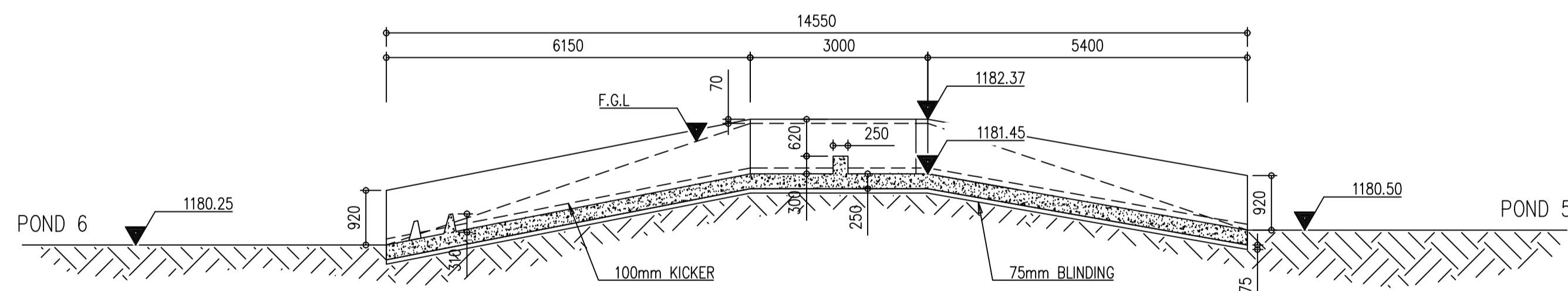
DRAWING DESCRIPTION

MATURATION PONDS
CONCRETE DETAILS P3-5

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-07	As indicated	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-SP-2B-MP-502	0	



WEIR P5-P6
SCALE 1:75



SECTION E-E
SCALE 1:75

- GENERAL NOTES:**
- 1.1 THESE NOTES ARE COMPLEMENTARY TO THE SPECIFICATIONS AND WILL GOVERN IN CASE OF ANY CONFLICTS.
 - 1.2 ALL SETTING OUT DIMENSIONS SHALL BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES OR UNCLARITIES SHALL IMMEDIATELY BE REPORTED TO THE ENGINEER.
 - 1.3 BUILDING WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
 - 2.1 ALL CONCRETE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
 - 2.2 ALL CONCRETE SHALL MEET THE REQUIREMENTS FOR SULPHATE-RESISTING CONCRETE:
 DOLOMITE AGGREGATE SHALL BE USED
 MINIMUM CEMENT:WATER RATIO -2.0
 MINIMUM CEMENT CONTENT: -450 kg/m³
 CEMENT SHALL CONTAIN A MINIMUM OF 30% FLY ASH.
 - 2.3 CONCRETE SHALL BE "STRENGTH GRADE CONCRETE (MPa) / MAXIMUM STONE SIZE (mm)" AS SPECIFIED BELOW, UNLESS OTHERWISE STATED:
 BLINDING -15/20
 MASS CONCRETE BELOW STRUCTURE -15/20
 MASS CONCRETE ABOVE STRUCTURE -20/20
 FLOORS -45/20
 WALLS AND FLOORS -45/20
 - 2.4 THE CONTRACTOR SHALL ENSURE THAT ALL REINFORCEMENT IS PROPERLY HELD IN POSITION AND SHALL ALSO MAINTAIN THE CORRECT CONCRETE COVER UTILIZING APPROVED PATENT SPACERS (NO STONES, OFF-CUT REINFORCEMENT, BRICKS ETC.) AT ALL TIMES.
 - 2.5 UNLESS OTHERWISE SPECIFIED, THE CONCRETE COVER SHALL BE THE GREATER OF THE BAR DIAMETER OR THE VALUES IN mm AS STATED BELOW:
 WALLS -60mm
 FLOORS -60mm
 SLABS -60mm
 - 2.6 ALL CONCRETE SHALL BE MECHANICALLY COMPACTED THROUGH THE USE OF VIBRATORS.
 - 2.7 CONCRETE SHALL BE CAST CONTINUOUSLY. IF STOPPAGES OF MORE THAN 40 MINUTES ARE UNAVOIDABLE, CONSTRUCTION JOINTS SHALL BE FORMED IN THE POSITIONS AND ACCORDING TO THE DETAILS AS PER PROJECT SPECIFICATION.
 - 2.8 OPENINGS IN THE CONCRETE WALLS TO BE GROUTED CLOSED WITH ANTI-CORROSION PRODUCT AS PER PROJECT SPECIFICATION AFTER THE INSTALLATION OF THE PIPEWORK.
 - 2.9 ALL EXPOSED CORNERS TO HAVE A 25 x 25mm CHAMFER
 - 2.10 NO CONCRETE SHALL BE PLACED PRIOR TO THE APPROVAL OF THE RESIDENT ENGINEER.
 - 2.11 A CLASS U3 SURFACE FINISH, INCLUDING STEEL FLOAT TO A SMOOTH SURFACE WITHIN 2mm OF LEVEL, SHALL BE PROVIDED TO ALL TOP OF WALL SURFACES SUPPORTING MECHANICAL COMPONENTS OR PRECAST ELEMENTS.
 - 2.12 STRUCTURE TO BE TESTED FOR WATER-TIGHTNESS AS PER PROJECT SPECIFICATION. RATE OF FILLING NOT TO EXCEED 2m IN 24 HOURS. FOR 0.2mm CRACK WIDTH, STABILIZING PERIOD TO BE 21 DAYS. AFTER ALLOWING FOR EVAPORATION AND RAINFALL, DROPS IN LEVEL NOT TO EXCEED 1/500TH OF AVERAGE DEPTH OF FULL TANK. DRAWING TO BE READ IN CONJUNCTION WITH WATER PROCESS DRAWINGS.

- LEGEND:**
- CJ = CONSTRUCTION JOINT
 - FGL = FINISHED GROUND LEVEL
 - IL = INVERT LEVEL
 - ND = NOMINAL DIAMETER
 - NGL = NATURAL GROUND LEVEL
 - TOC = TOP OF CONCRETE
 - TWL = TYPICAL WATER LEVEL
 - UF = UNDERSIDE OF FOOTING

CONSTRUCTION DRAWING

- NOTES**
- 1.1 DO NOT SCALE THE DRAWINGS.
 - 1.2 ALL DIMENSIONS TO BE VERIFIED ON SITE, PRIOR TO MANUFACTURING OR ORDERING OF EQUIPMENT.
 - 1.3 ANY UN-CLARITIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSULTING ENGINEER
 - 1.4 THIS DRAWING, OR PART THEREOF, SHALL NOT BE USED FOR ANY OTHER INSTALLATION PROJECT OTHER THAN THIS ONE.
 - 1.5 THIS DRAWING FORMS PART OF THE SPECIFICATION AND MUST BE READ IN CONJUNCTION WITH THE SAME.

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CLIENT

CITY OF
Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2020-07	ISSUED FOR CONSTRUCTION

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

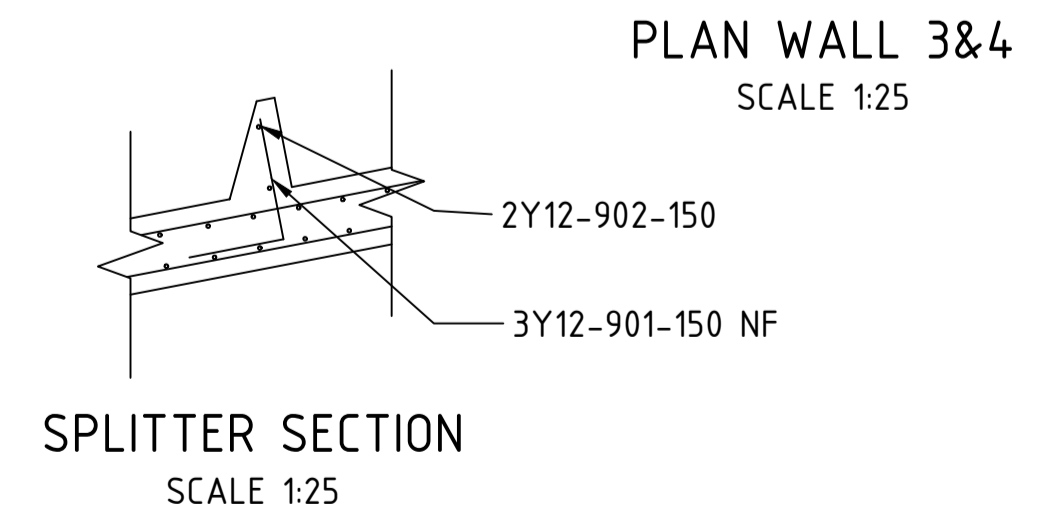
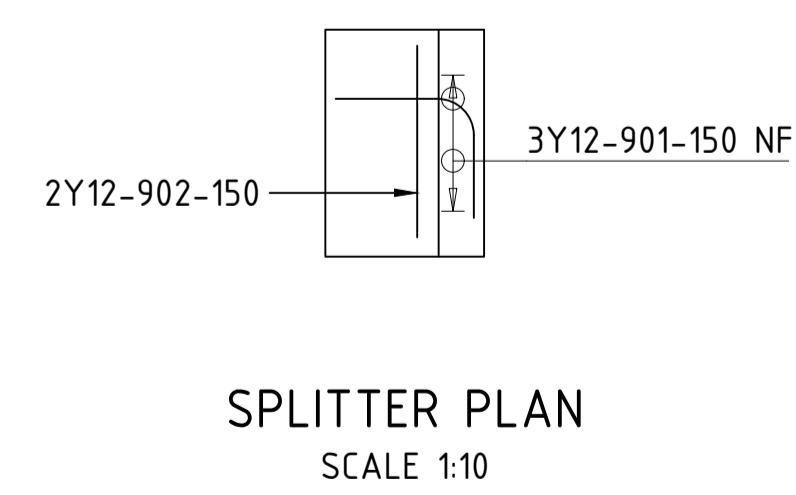
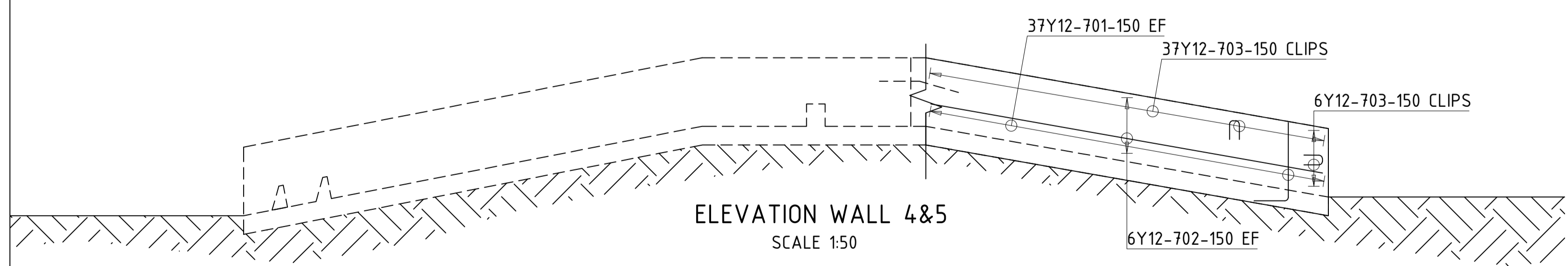
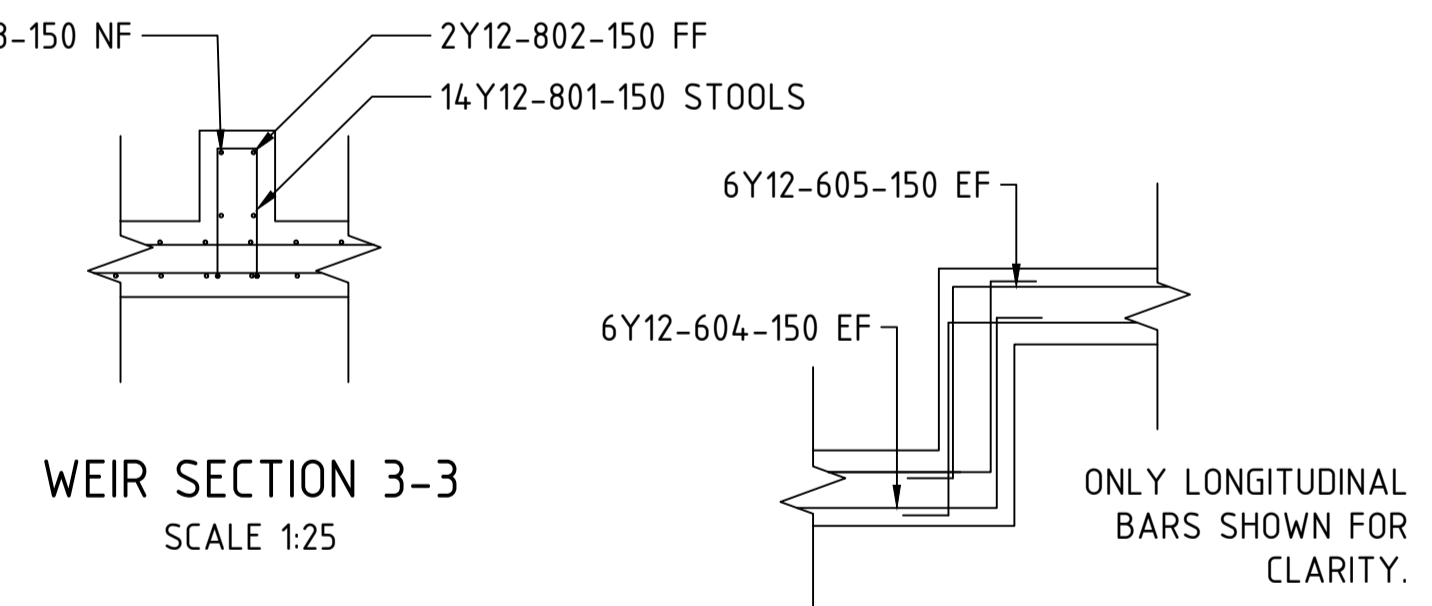
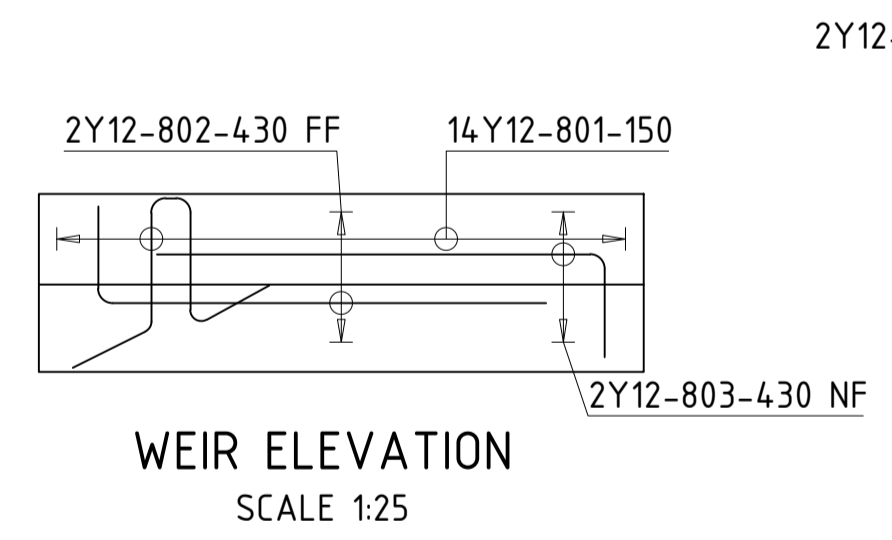
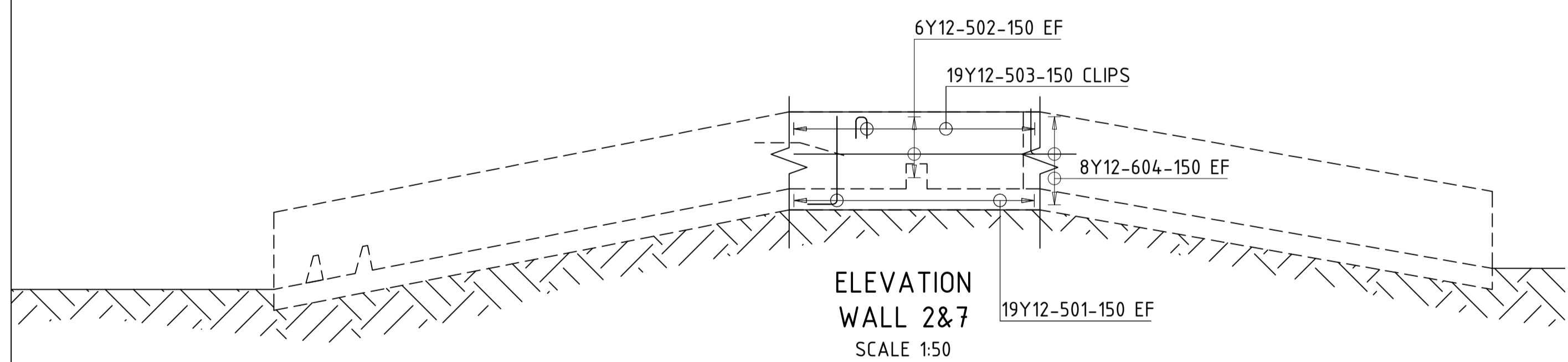
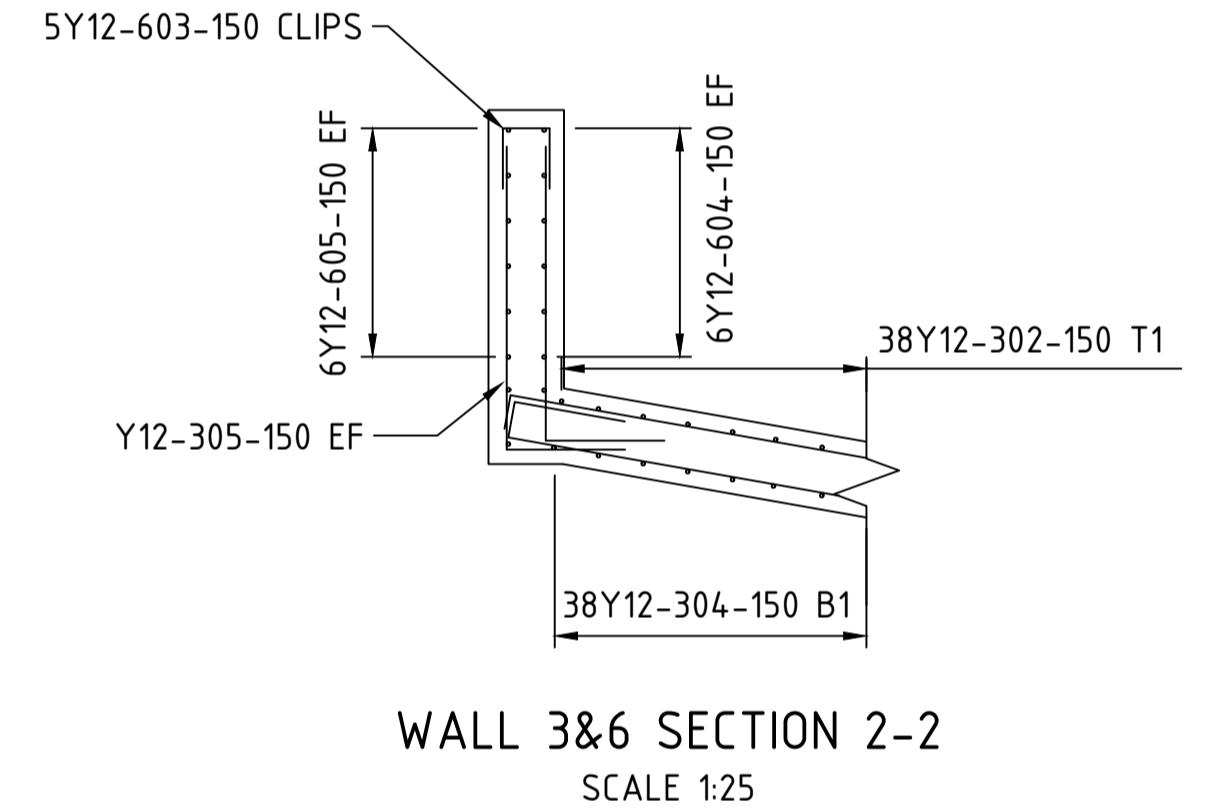
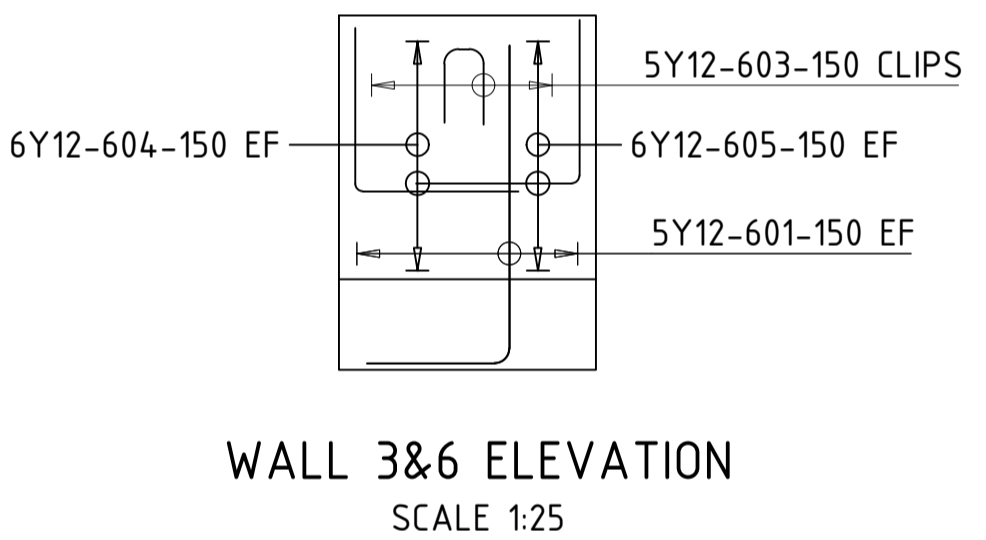
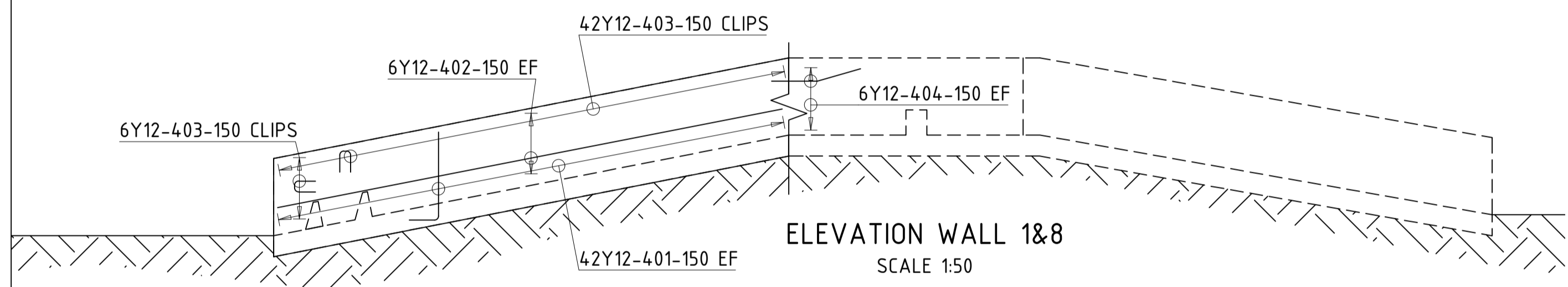
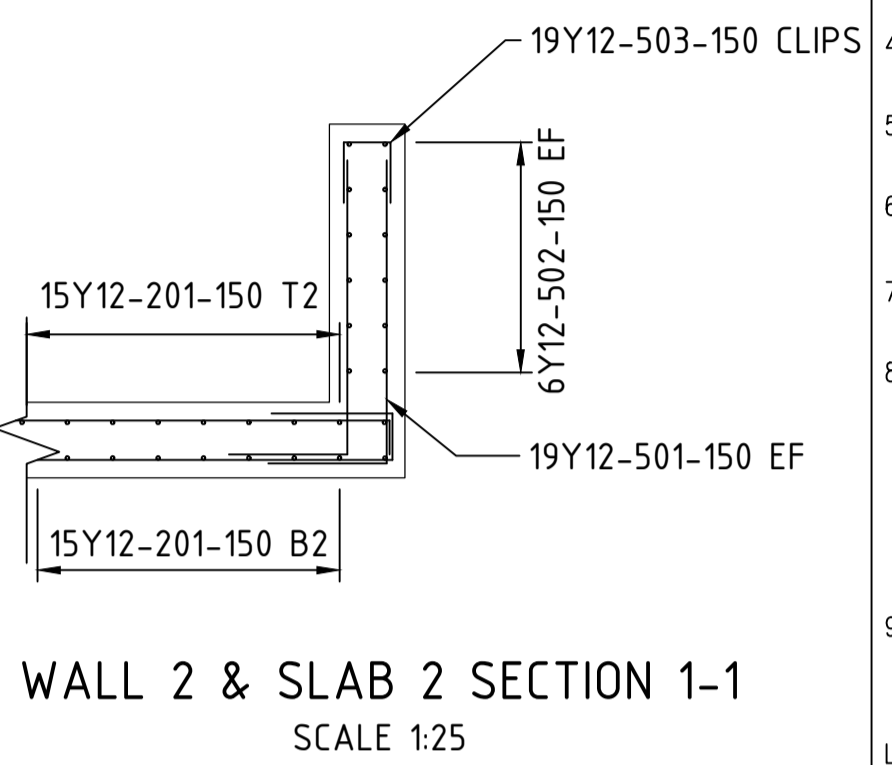
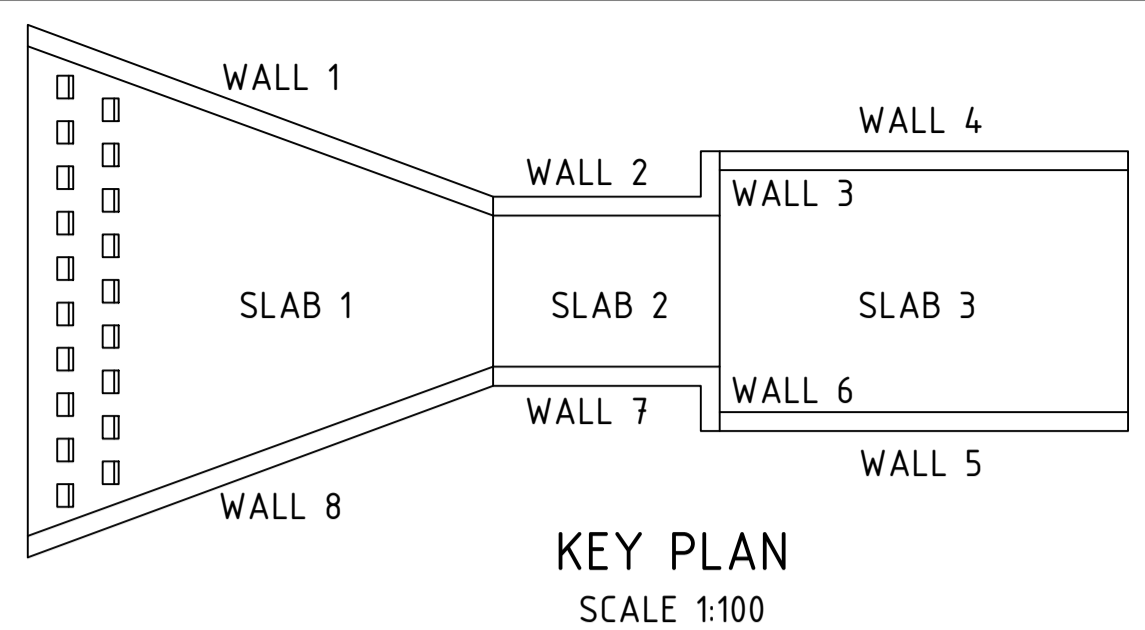
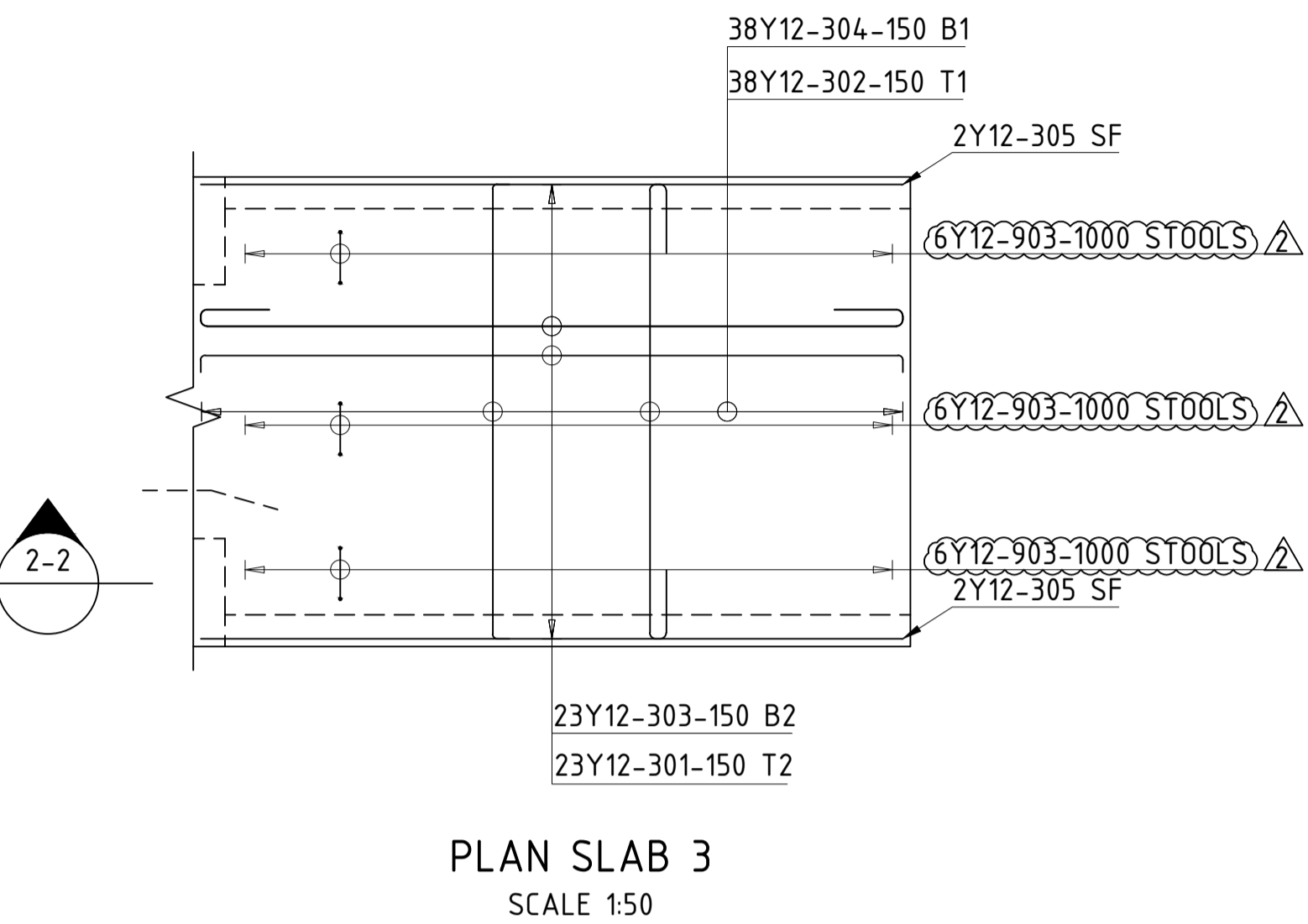
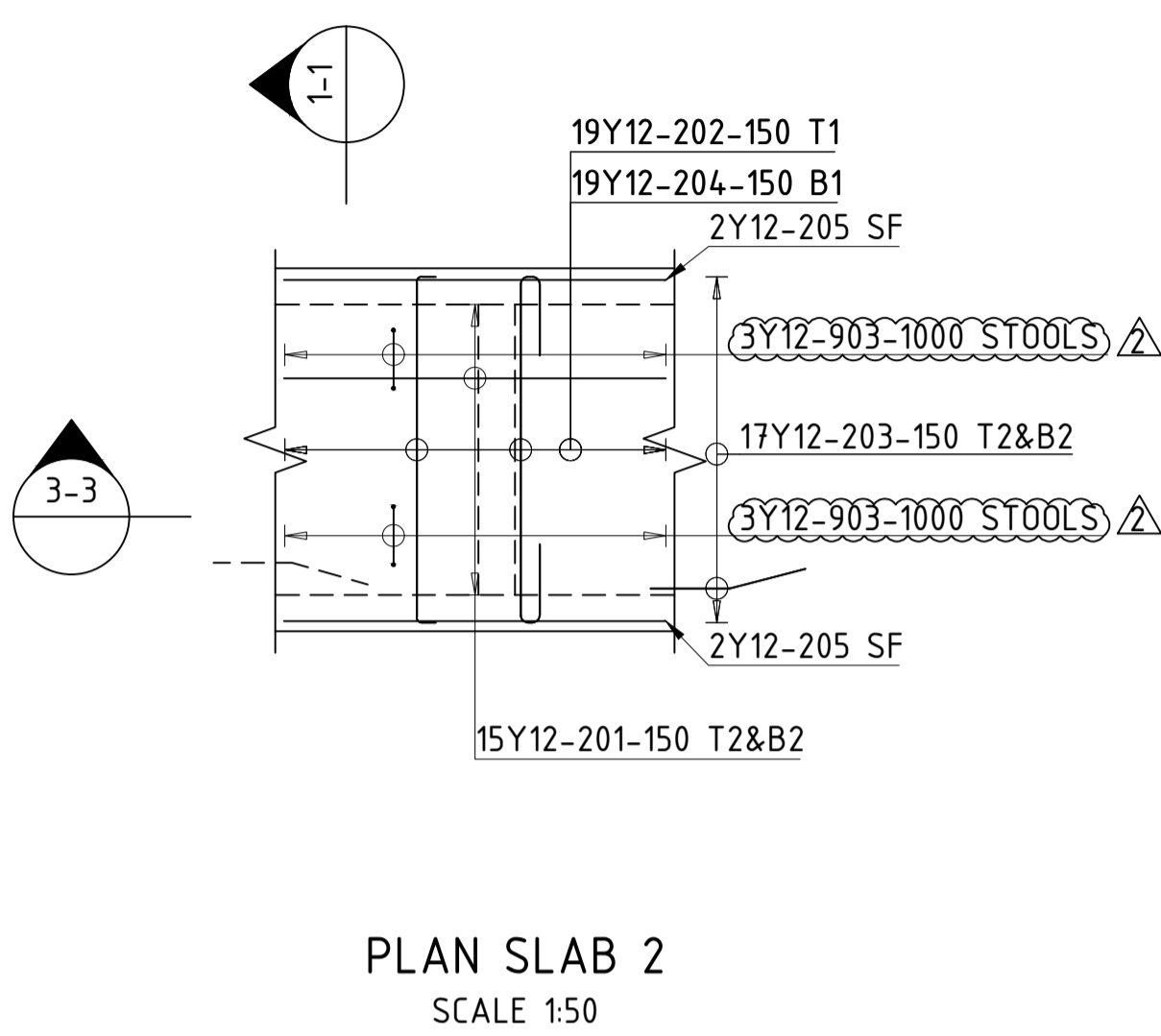
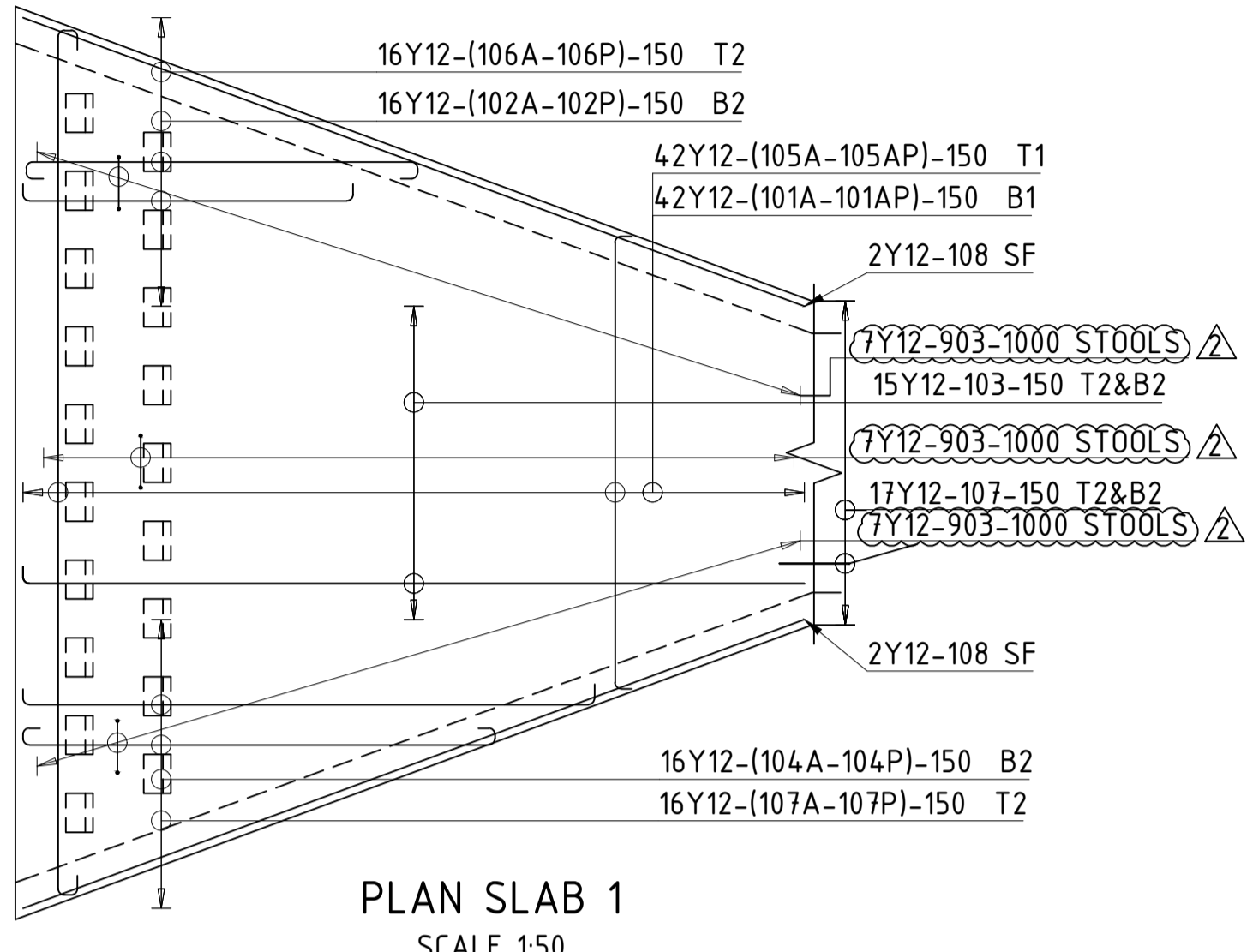
PROJECT

**POLOKWANE
REGIONAL WWTW
CONTRACT 2B**

DRAWING DESCRIPTION

**MATURATION PONDS
CONCRETE DETAILS P5-6**

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-07	As indicated	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-SP-2B-MP-503	0	



GENERAL NOTES:

- REINFORCEMENT TO BE HOT ROLLED AND TO COMPLY WITH THE STANDARD SPECIFICATIONS OF STEEL BARS FOR CONCRETE REINFORCEMENT SANS 920.
- MINIMUM CHARACTERISTIC STRENGTH:
MILD STEEL BARS 250 MPa
HIGH YIELD STEEL BARS 450 MPa
- REINFORCEMENT BARS, INCLUDING HELICAL REINFORCEMENT AND DOWELS BUT NOT FABRIC REINFORCEMENT, ARE CALLED UP ON THE DRAWINGS IN THE FOLLOWING MANNER:
NO. OFF : BAR TYPE : BAR DIA - BAR MARK - PITCH : POSITION AND/OR COMMENT
E.G. 7Y20-09-125 B
9R25-37-500 DOWELS
- BAR DESIGNATION IS AS FOLLOWS:
R = GRADE 250 PLAIN ROUND MILD STEEL BARS COMPLYING WITH SANS 920
Y = GRADE 450 DEFORMED TYPE 2 HIGH YIELD BARS COMPLYING WITH SANS 920
- BENDING AND SCHEDULING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH SANS 282 AND SABS 0144.
- SPACINGS GIVEN FOR ALL REINFORCEMENT ARE PERPENDICULAR TO BARS, UNLESS OTHERWISE INDICATED.
- BARS SPECIFICALLY CALLED UP AS GALVANISED TO BE HOT-DIPPED GALVANISED TO SANS 121/150 1461
- MINIMUM SPLICE LENGTH OF REINFORCING 45 x BAR DIAMETER.
- UNLESS OTHERWISE SPECIFIED, THE CONCRETE COVER SHALL BE THE GREATER OF THE BAR DIAMETER OR THE VALUES IN mm AS STATED BELOW:
WALLS - 60mm
FLOORS - 60mm
SLABS - 60mm
- DRAWING TO BE READ IN CONJUNCTION WITH CONCRETE DETAILS.

LEGEND:
T - TOP
B - BOTTOM
SF - SIDE FACE
EF - EACH FACE
ABR - ALTERNATING BARS REVERSED
ALT - ALTERNATING
STG - STAGGERED

NOTES

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FAX: +27 15 291 1993

CLIENT
CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE		
NO.	DATE	REVISION DESCRIPTION
0	2020-07	ISSUED FOR CONSTRUCTION
1	2020-11	REINFORCEMENT UPDATES
2	2021-02	STOOLS UPDATES

DESIGNED T. BANDA ENGINEER
DATE PR ENG no. DATE
CLIENT DATE

PROJECT
POLOKWANE REGIONAL WWTW CONTRACT 2B

DRAWING DESCRIPTION
MATURATION PONDS REINFORCING DETAILS 1

CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2021-02	As indicated	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-SP-2B-MP-504	2	

MEMBER	NO OF BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg	REV
SLAB 1	10	1	Y12	8100	10	101A	55	540	130	6870	130	[540]	72
	10	1	Y12	8000	10	101B	55	540	130	6760	130	[540]	72
	10	1	Y12	7900	10	101C	55	540	130	6650	130	[540]	71
	10	1	Y12	7800	10	101D	55	540	130	6545	130	[540]	70
	10	1	Y12	7700	10	101E	55	540	130	6435	130	[540]	69
	10	1	Y12	7600	10	101F	55	540	130	6325	130	[540]	68
	10	1	Y12	7500	10	101G	55	540	130	6215	130	[540]	67
	10	1	Y12	7400	10	101H	55	540	130	6110	130	[540]	66
	10	1	Y12	7300	10	101I	55	540	130	6000	130	[540]	65
	10	1	Y12	7200	10	101J	55	540	130	5890	130	[540]	64
	10	1	Y12	7100	10	101K	55	540	130	5780	130	[540]	64
	10	1	Y12	7000	10	101L	55	540	130	5675	130	[540]	63
	10	1	Y12	6900	10	101M	55	540	130	5565	130	[540]	62
	10	1	Y12	6800	10	101N	55	540	130	5455	130	[540]	61
	10	1	Y12	6700	10	101O	55	540	130	5345	130	[540]	60
	10	1	Y12	6600	10	101P	55	540	130	5240	130	[540]	59
	10	1	Y12	6500	10	101Q	55	540	130	5130	130	[540]	58
	10	1	Y12	6400	10	101R	55	540	130	5020	130	[540]	57
	10	1	Y12	6300	10	101S	55	540	130	4910	130	[540]	56
	10	1	Y12	6200	10	101T	55	540	130	4805	130	[540]	56
	10	1	Y12	6100	10	101U	55	540	130	4695	130	[540]	55
	10	1	Y12	6000	10	101V	55	540	130	4585	130	[540]	54
	10	1	Y12	5900	10	101W	55	540	130	4475	130	[540]	53
	10	1	Y12	5800	10	101X	55	540	130	4370	130	[540]	52
	10	1	Y12	5700	10	101Y	55	540	130	4260	130	[540]	51
	10	1	Y12	5600	10	101Z	55	540	130	4150	130	[540]	50
	10	1	Y12	5500	10	101AA	55	540	130	4040	130	[540]	49
	10	1	Y12	5400	10	101AB	55	540	130	3935	130	[540]	48
	10	1	Y12	5300	10	101AC	55	540	130	3825	130	[540]	48
	10	1	Y12	5200	10	101AD	55	540	130	3715	130	[540]	47
	10	1	Y12	5100	10	101AE	55	540	130	3605	130	[540]	46

8	10	12	16	20	25	32	40	TOT	Date	2021-02
R	X	X	X	X	X	X	X	X	Def by	C. ROSSOUW
Y	X	X	1817	X	X	X	X	1817	Ref Dwg	
TOT	X	X	1817	X	X	X	X	1817	Job No	
Revision 3										
Schedule No SRB-101										

MEMBER	NO OF BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg	REV
	10	1	Y12	5100	10	105S	38	130	4910	[130]			46
	10	1	Y12	5000	10	105T	38	130	4805	[130]			45
	10	1	Y12	4900	10	105U	38	130	4695	[130]			44
	10	1	Y12	4800	10	105V	38	130	4585	[130]			43
	10	1	Y12	4700	10	105W	38	130	4475	[130]			42
	10	1	Y12	4600	10	105X	38	130	4370	[130]			41
	10	1	Y12	4450	10	105Y	38	130	4260	[130]			40
	10	1	Y12	4350	10	105Z	38	130	4150	[130]			39
	10	1	Y12	4250	10	105AA	38	130	4040	[130]			38
	10	1	Y12	4150	10	105AB	38	130	3935	[130]			37
	10	1	Y12	4050	10	105AC	38	130	3825	[130]			37
	10	1	Y12	3900	10	105AD	38	130	3715	[130]			35
	10	1	Y12	3800	10	105AE	38	130	3605	[130]			34
	10	1	Y12	3700	10	105AF	38	130	3500	[130]			33
	10	1	Y12	3600	10	105AG	38	130	3390	[130]			33
	10	1	Y12	3500	10	105AH	38	130	3280	[130]			32
	10	1	Y12	3400	10	105AI	38	130	3170	[130]			31
	10	1	Y12	3300	10	105AJ	38	130	3065	[130]			30
	10	1	Y12	3150	10	105AK	38	130	2955	[130]			29
	10	1	Y12	3050	10	105AL	38	130	2845	[130]			28
	10	1	Y12	2950	10	105AM	38	130	2735	[130]			27
	10	1	Y12	2850	10	105AN	38	130	2630	[130]			26
	10	1	Y12	2750	10	105AO	38	130	2520	[130]			25
	10	1	Y12	2600	10	105AP	38	130	2410	[130]			24
	10	1	Y12	5650	10	106A	38	106	5490	[106]			51
	10	1	Y12	5300	10	106B	38	106	5160	[106]			58
	10	1	Y12	5000	10	106C	38	106	4830	[106]			45
	10	1	Y12	4650	10	106D	38	106	4500	[106]			42
	10	1	Y12	4300	10	106E	38	106	4170	[106]			39
	10	1	Y12	4000	10	106F	38	106	3840	[106]			36
	10	1	Y12	3650	10	106G	38	106	3510	[106]			33

8	10	12	16	20	25	32	40	TOT	Date	2021-02
R	X	X	X	X	X	X	X	X	Def by	C. ROSSOUW
Y	X	X	1114	X	X	X	X	1114	Ref Dwg	
TOT	X	X	1114	X	X	X	X	1114	Job No	
Revision 3										
Schedule No SRB-104										

NOTES

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ZAKUMI
Consulting Engineers

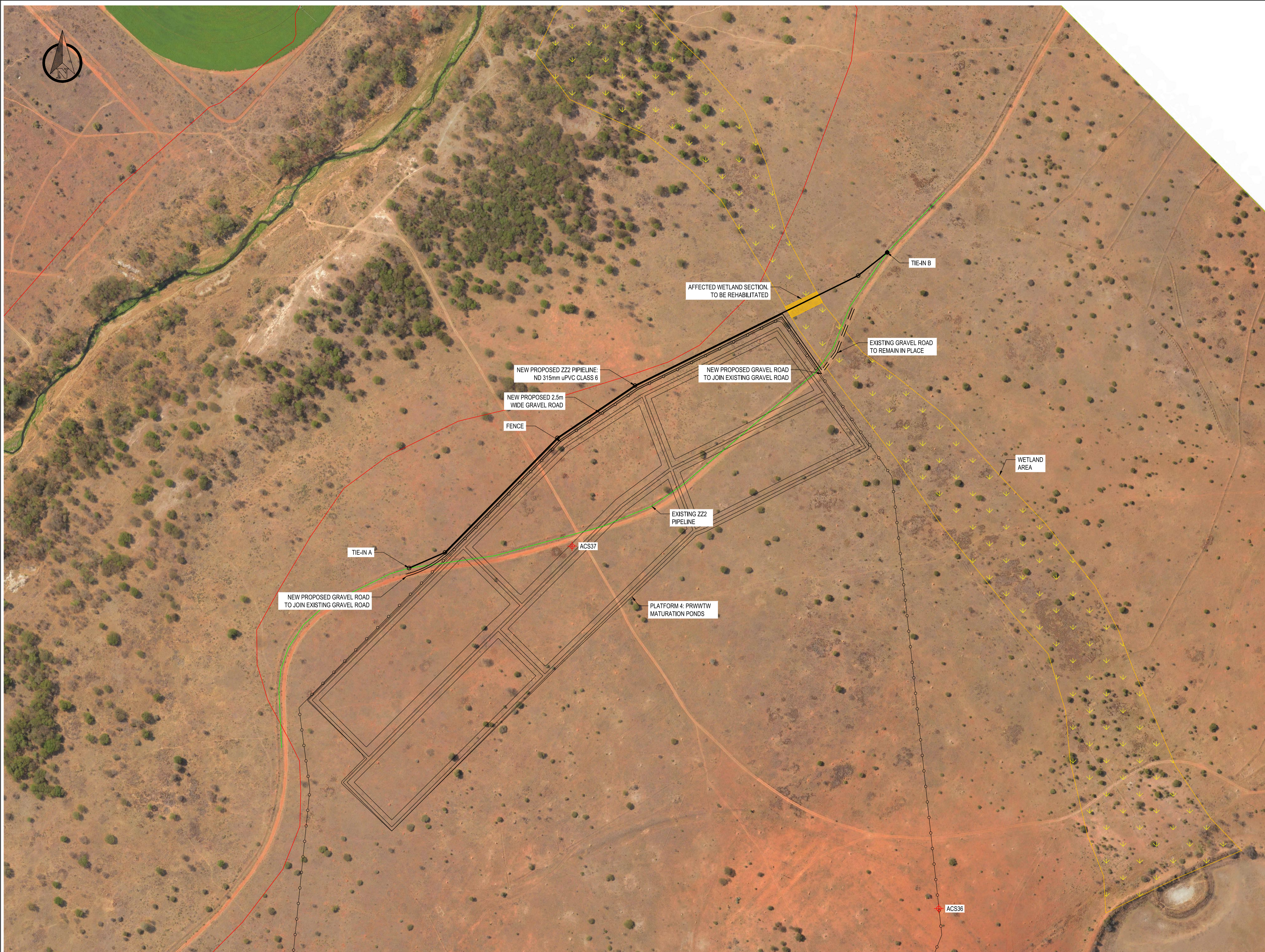
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MEMBER	NO OF BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg	REV
	10	1	Y12	5000	10	101AF	55	540	130	3500	130	[540]	45
	10	1	Y12	4900	10	101AG	55	540	130	3390	130	[540]	44
	10	1	Y12	4800	10	101AH	55	540	130	3280	130	[540]	43
	10	1	Y12	4700	10	101AI	55	540	130	3170	130	[540]	42
	10	1	Y12	4600	10	101AJ	55	540	130	3065	130	[540]	41
	10	1	Y12	4500	10	101AK	55	540	130	2955	130	[540]	41
	10	1	Y12	4400	10	101AL	55	540	130	2845	130	[540]	40
	10	1	Y12	4300	10	101AM	55	540	130	2735	130	[540]	39
	10	1	Y12	4200	10	101AN	55	540	130	2630	130	[540]	38
	10	1	Y12	4100	10	101AO	55	540	130	2520	130	[540]	37
	10	1	Y12	4000	10	101AP	55	540	130	2410	130	[540]	36
	10	1	Y12	6650	10	102A	55	540	106	5490	106	[540]	60
	10	1	Y12	6350	10	102B	55	540	106	5160	106	[540]	57
	10	1	Y12	6050	10	102C	55	540	106	4830	106	[540]	54
	10	1	Y12	5750	10	102D	55	540	106	4500	106	[540]	52
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	10	1	Y12	5150	10	102F	55	540	106	3840	106	[540]	46
	10	1	Y12	4850	10	102G	55	540	106	3510	106	[540]	44
	10	1	Y12	4550	10	102H	55	540	106	3180	106	[540]	41
	10	1	Y12	4250	10	102I	55	540	106	2850	106	[540]	38
	10	1	Y12	3950	10	102J	55	540	106	2520	106	[540]	36
	10	1	Y12	3650	10	102K	55	540	106	2190	106	[540]	33
	10	1	Y12	3350	10	102L	55	540	106	1860	106	[540]	30
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	10	1	Y12	2150	10	102P	55	540	106	540	106	[540]	20
	10	30	Y12	6150	300	103	37	130	[6030]				1638
	10	1	Y12	6650	10	104A	55	540	106	5490	106	[540]	60
	10	1	Y12	6350	10	104B	55	540	106	5160	106	[540]	57
	10	1	Y12	6050	10	104C	55	540	106	4830	106	[540]	54

8	10	12	16	20	25	32	40	TOT	Date	2021-02
R	X	X	X	X	X	X	X	X	Def by	C. ROSSOUW
Y	X	X	2872	X	X	X	X	2872	Ref Dwg	
TOT	X	X	2872	X	X	X	X	2872	Job No	
Revision 3										
Schedule No SRB-102										

MEMBER	NO OF BARS	DIA	CUT LENGTH	TOTAL	BAR MARK	SC	A	B	C	D	E/R	kg	REV
	10	1	Y12	3350	10	106H	38	106	3180	[106]			30
	10	1	Y12	3000	10	106I	38	106	2850	[106]			27
	10	1	Y12	2650	10	106J	38	106	2520	[106]			24
	10	1	Y12	2350	10	106K	38	106	21				



- GENERAL NOTES:
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 2. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH ALL DETAIL DRAWINGS AND PROJECT SPECIFICATIONS.
 3. COORDINATE SYSTEM: WGS84 LQ29°
 4. CONTOUR INTERVALS: 1m
 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
 7. OUTER EMBANKMENT SLOPES ARE 1:2 (V:H).
 8. EMBANKMENT SLOPES INTO MATURATION POND BASINS ARE 1:3 (V:H).
 9. NO CLEARING AND GRUBBING AND TOPSOIL REMOVAL IS PERMITTED WITHIN THE DEMARCATED WETLAND SECTION.

BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	48 248.152	1180.756

LEGEND	
	NEW PROPOSED Z22 Ø315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 Ø315 uPVC PIPELINE
	FENCE
	WETLAND AREA

NOTES

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CLIENT

CITY OF Polokwane
NATURALLY PROGRESSIVE

REVISION SCHEDULE	
NO.	DATE
1	2020-04

T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

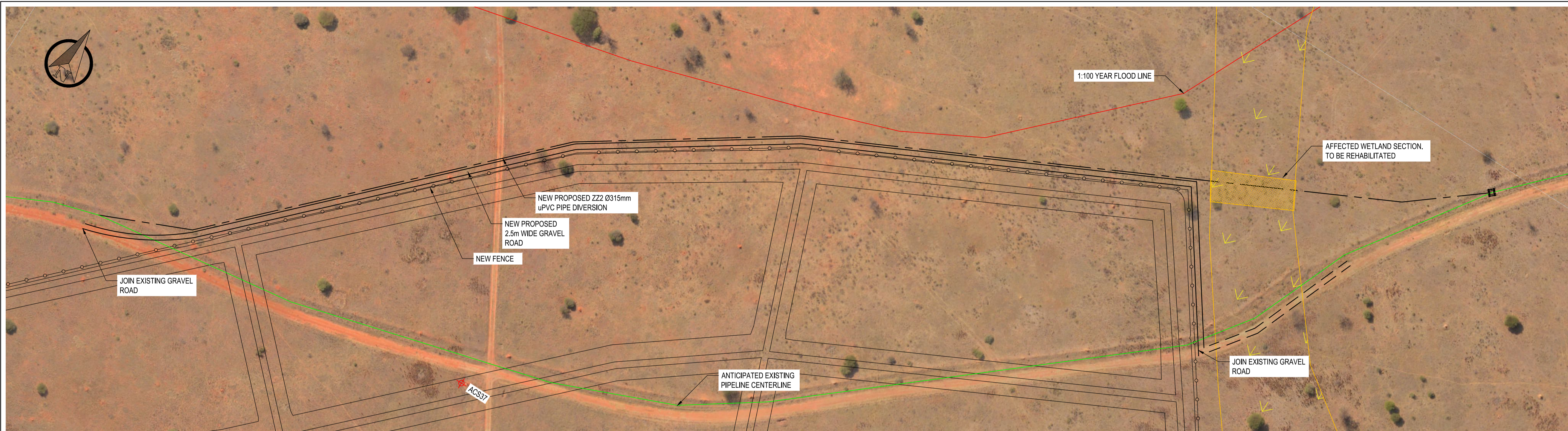
PROJECT

**POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS**

DRAWING DESCRIPTION

**Z22 PIPELINE DIVERSION:
LAYOUT**

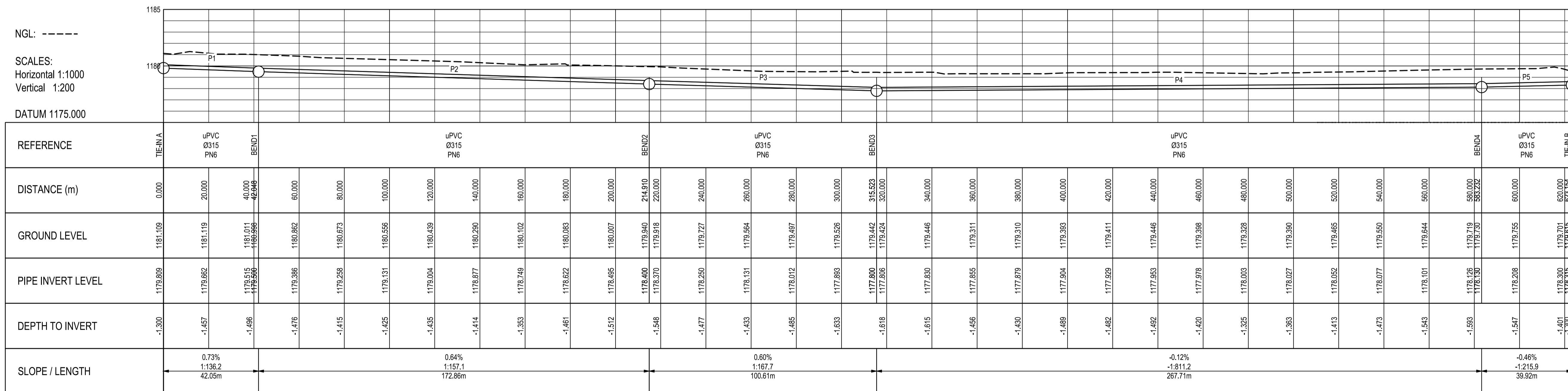
CONSTRUCTION DRAWING		
DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-04	N/A	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2700	1	



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BENCHMARKS SETTING OUT POINTS			
POINT	Y	X	Z
ACS35	-2 632 952.324	45 690.605	1182.306
ACS36	-2 632 718.840	46 642.763	1189.094
ACS37	-2 632 328.880	46 248.152	1180.756

FITTING DETAILS AND SETTING OUT POINTS						
POINT NAME	Y	X	Z	CHAINAGE	ALLOCATED BEND	FITTING
TIE-IN A	-2 632 352.417	46 072.810	1181.109	0.000	0°	SOCKETED Ø315 uPVC CLASS 6 PIPE FITTING
BEND1	-2 632 335.631	46 111.362	1180.998	42.048	22.5°	SOCKETED Ø315 uPVC CLASS 9, 22.5° BEND
BEND2	-2 632 212.307	46 232.491	1179.940	214.910	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
BEND3	-2 632 155.995	46 315.870	1179.442	315.523	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
BEND4	-2 632 037.641	46 555.995	1179.730	583.232	11.25°	SOCKETED Ø315 uPVC CLASS 9, 11.25° BEND
TIE-IN B	-2 632 012.803	46 587.250	1179.615	623.154	0°	Ø315 KLAMFLEX COUPLING CLASS 6 OR SIMILAR APPROVED



LEGEND	
	NEW PROPOSED Z22 Ø315 uPVC PIPE DIVERSION
	NEW PROPOSED 2.5m WIDE GRAVEL ROAD
	1:100 YEAR FLOOD LINE
	EXISTING Z22 Ø315 uPVC PIPELINE
	FENCE
	WETLAND AREA

CONSTRUCTION DRAWING

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NO.	DATE
1	2020-04
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T. BANDA
ENGINEER

PR ENG no. _____ DATE _____

CLIENT _____ DATE _____

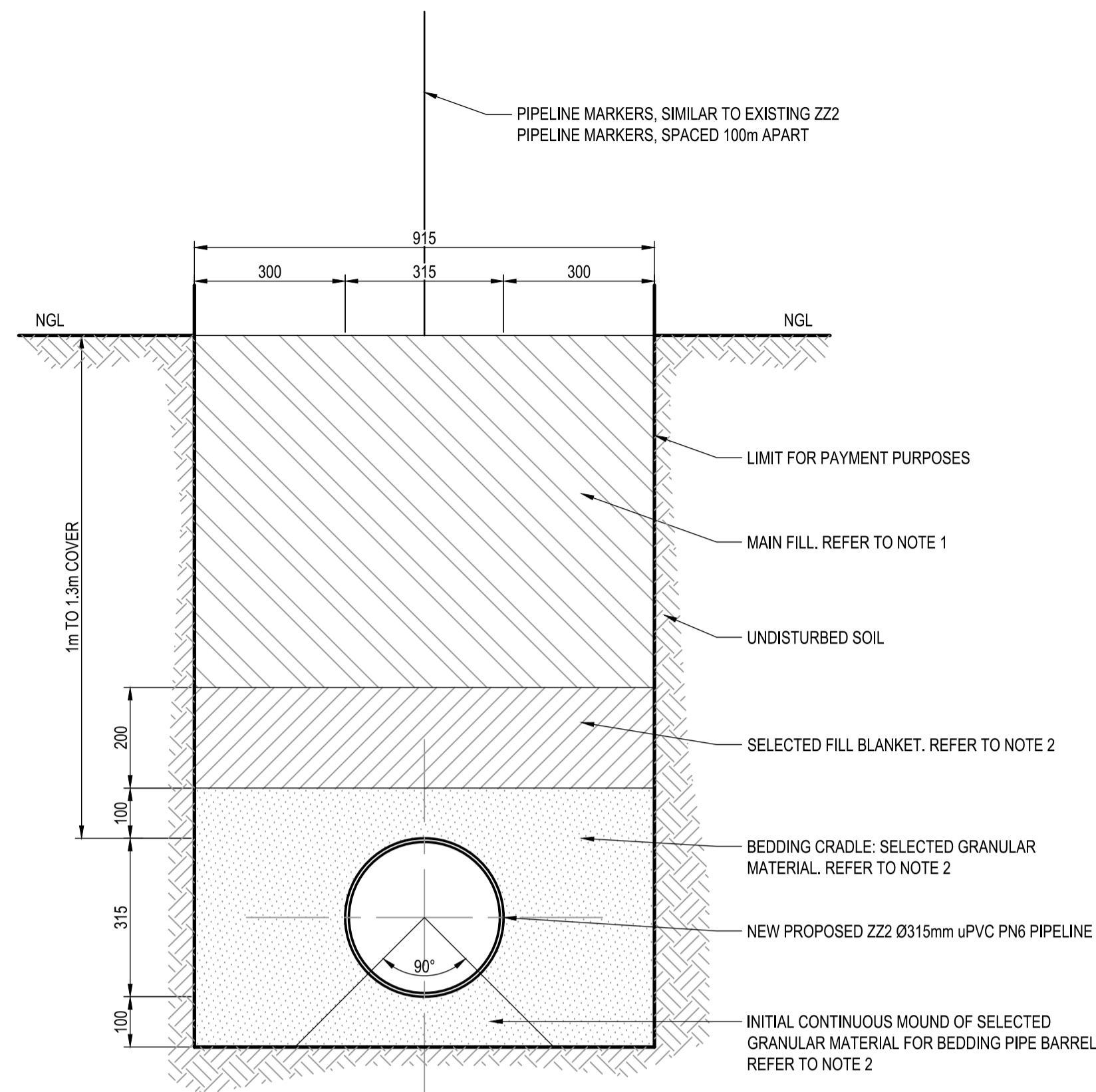
PROJECT

**POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS**

DRAWING DESCRIPTION

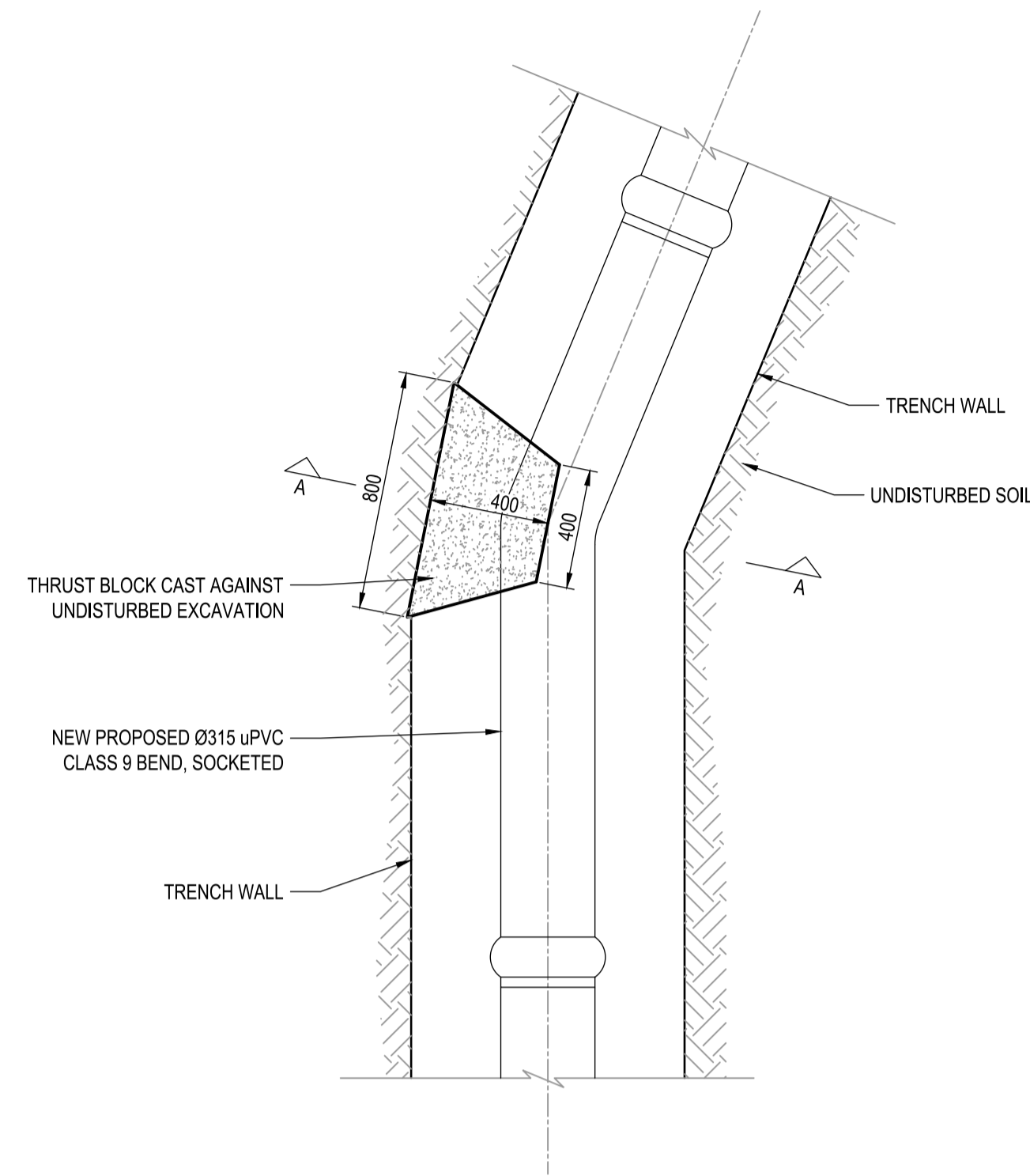
**Z22 PIPELINE DIVERSION:
LONGITUDINAL SECTION
AND SETTING OUT**

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-04	1:1000	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)	REV	
PK278-CP-2A-EW-2701	1	



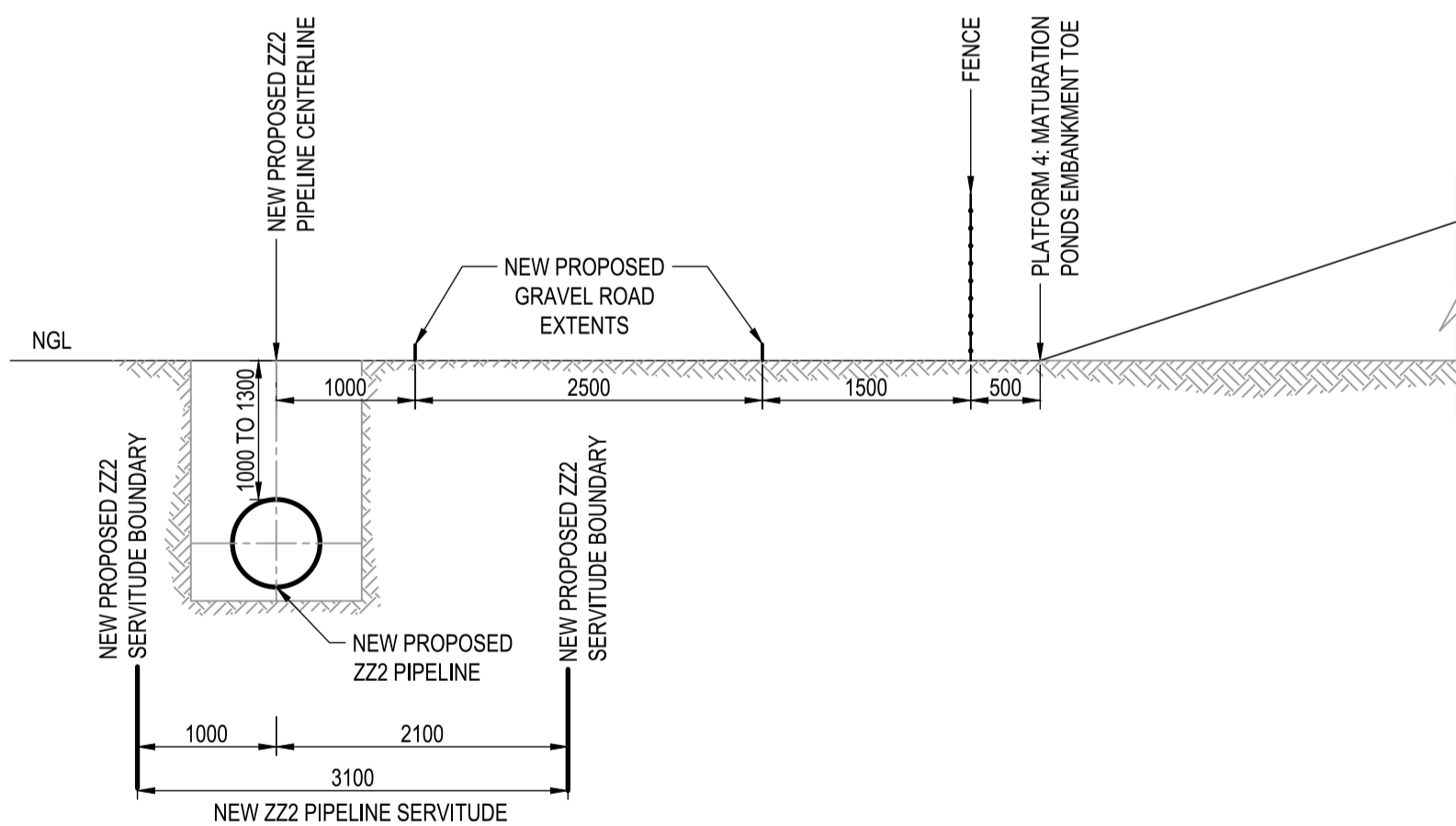
**FLEXIBLE PIPE BEDDING:
NORMAL PIPE TRENCH**

SCALE 1:10



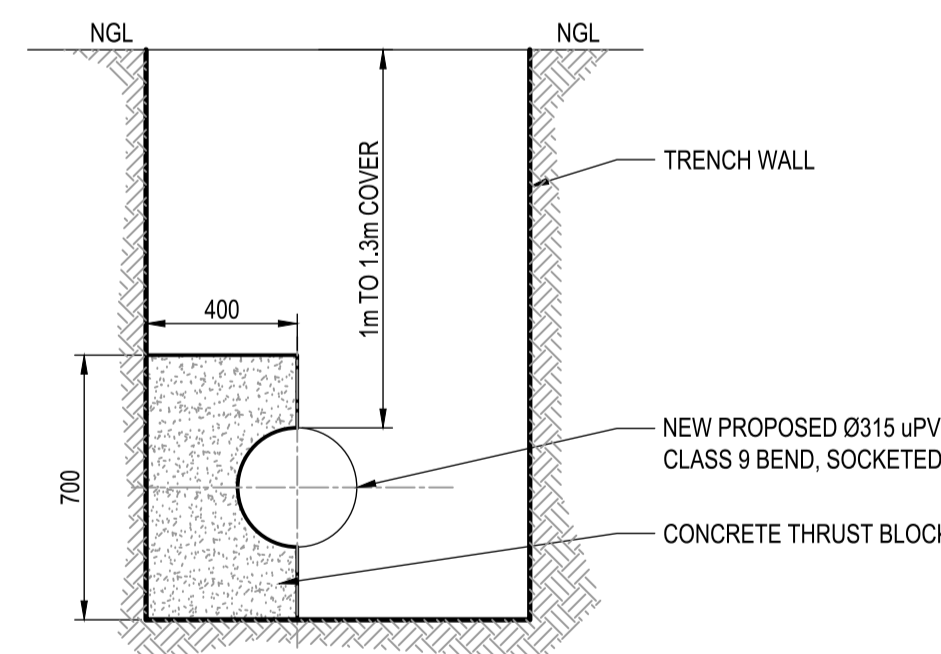
**THRUST BLOCK FOR 11.25°
AND 22.5° BENDS**

SCALE 1:20



SERVICES: TYPICAL CROSS SECTION

SCALE 1:50



**THRUST BLOCK FOR 11.25°
AND 22.5° BENDS**

SECTION A-A

SCALE 1:20

TRENCH EXCAVATION AND BACKFILL NOTES:

1. MAIN FILL

GENERAL

BACKFILLING OF PIPE TRENCHES SHALL COMMENCE AFTER THE PIPE HAS BEEN LAID AND FIRMLY BEDDED IN THE SPECIFIED CRADLE AND THE BLANKET HAS BEEN PLACED AND ADEQUATELY COMPACTED AT OMC AROUND, UNDER THE OVERHANG AND OVER THE TOP OF THE PIPE TO THE HEIGHT OF BLANKET COVER SPECIFIED ON THE DRAWING. BACKFILLING SHALL BE CARRIED OUT OVER THE FULL EXTENT OF THE ACTUAL TRENCH EXCAVATION AND TO ORIGINAL GROUND LEVEL, EXCEPT WHERE OTHERWISE DIRECTED, UNLESS PRIOR APPROVAL HAS BEEN OBTAINED, NO FILLING SHALL BE PLACED IN WATER.

MATERIAL FOR BACKFILLING

UNLESS THE CONTRACTOR IS AUTHORIZED BY THE ENGINEER TO USE OTHER MATERIAL, MATERIAL FOR BACKFILLING ABOVE THE BEDDING (CRADLE AND BLANKET) SHALL BE OBTAINED FROM TRENCH EXCAVATIONS. MATERIAL EXCAVATED FROM TRENCHES MAY BE USED AS BACKFILL IN ALL AREAS, PROVIDED ONLY THAT IT CONTAINS LITTLE OR NO ORGANIC MATERIAL, THAT IT EXCLUDES STONE OF AVERAGE DIMENSION EXCEEDING 150 mm, AND THAT IT CAN BE PLACED WITHOUT SIGNIFICANT VOIDS AND SO COMPACTED AS TO AVOID SIGNIFICANT SETTLEMENT. MATERIAL CONTAINING MORE THAN 10 % OF ROCK OR HARD FRAGMENTS THAT ARE RETAINED ON A SIEVE OF NOMINAL APERTURE SIZE 50 mm, AND MATERIAL CONTAINING LARGE CLAY LUMPS THAT DO NOT BREAK UP UNDER HARD AND ROCK MATERIAL SHALL BE INCORPORATED IN THE BACKFILL ABOVE THE BEDDING ONLY TO THE EXTENT APPROVED. DEPENDING ON THE QUALITY OF THE MATERIAL, THE ENGINEER MAY DIRECT THAT IT BE SUITABLY MIXED WITH OTHER BACKFILL MATERIAL.

IN AREAS SUBJECT TO ROAD TRAFFIC LOADS AND WHERE THE AVAILABLE BACKFILL HAS A PI HIGHER THAN 12, THE CONTRACTOR SHALL OBTAIN SPECIFIC INSTRUCTIONS FROM THE ENGINEER BEFORE PROCEEDING WITH THE PLACING OF THE BACKFILL.

DISPOSAL OF UNSUITABLE MATERIAL

EXCAVATION MATERIAL FROM THE TRENCH, WHICH IS UNSUITABLE OR HAS BECOME SURPLUS BECAUSE OF BULKING, DISPLACEMENT BY THE PIPE AND IMPORTATION, SHALL BE DISPOSED OF AT THE DEMARCATED STOCKPILE AREA ACCORDING TO DRAWING PK278-CP-2-EW-1002.

DEFICIENCY OF BACKFILL MATERIAL

ANY DEFICIENCY OF BACKFILL MATERIAL FROM TRENCH EXCAVATIONS BECAUSE OF THE REMOVAL OF EXCESSIVE QUANTITIES OF ORGANIC MATERIAL OR CLAY, UNSUITABLE PARTS OF THE TRENCH BOTTOM, OR EXCESSIVE QUANTITIES OF INTERMEDIATE OR HARD ROCK MATERIAL, SHALL BE MADE UP FROM SUITABLE SURPLUS MATERIAL FROM OTHER EXCAVATIONS ON THE SITE WITHIN THE FREE-HAUL DISTANCE. IF, IN THE OPINION OF THE ENGINEER, INSUFFICIENT OR NO SUITABLE MATERIAL IS AVAILABLE FOR THIS PURPOSE FROM SUCH EXCAVATIONS, AND THE SHORTAGE OF SUCH MATERIAL HAS NOT BEEN CAUSED BY THE METHODS USED BY THE CONTRACTOR, THE ENGINEER SHALL AUTHORIZE THE CONTRACTOR TO IMPORT SUFFICIENT SUITABLE MATERIAL. THE CONTRACTOR SHALL SO ARRANGE HIS WORK THAT THE IMPORTATION OF BACKFILL MATERIAL IS KEPT TO A MINIMUM IN RESPECT OF BOTH QUANTITY AND OVERHAUL.

COMPACTION EQUIPMENT

THE CONTRACTOR MAY USE MECHANICAL COMPACTION EQUIPMENT BUT HE SHALL SELECT SUCH EQUIPMENT AND OPERATE IT IN SUCH A MANNER THAT THE PIPELINE IS NOT STRESSED OR DAMAGED. MACHINE COMPACTION SHALL NOT BE USED DIRECTLY ABOVE THE PIPE UNTIL SUFFICIENT BACKFILL HAS BEEN PLACED TO ENSURE THAT MACHINE COMPACTION LOADS TRANSMITTED TO THE TOP OF THE PIPE ARE NO GREATER THAN WOULD BE IMPOSED BY NORMAL ROAD TRAFFIC OVER A PIPELINE WITH COVER OF DEPTH 600 mm.

2. BEDDING

SUITABLE MATERIAL AVAILABLE FROM TRENCH EXCAVATION THE CONTRACTOR MAY BE PERMITTED (BUT IS NOT REQUIRED), TO SCREEN, WASH OR OTHERWISE TREAT EXCAVATED MATERIAL IN ORDER TO PRODUCE MATERIAL SUITABLE FOR BEDDING OR COVERING THE PIPELINE. THE CONTRACTOR SHALL TAKE EVERY REASONABLE PRECAUTION TO AVOID BURYING OR CONTAMINATING MATERIAL THAT IS SUITABLE AND IS REQUIRED FOR BEDDING OR COVERING THE PIPELINE.

SUITABLE MATERIAL NOT AVAILABLE FROM TRENCH EXCAVATION WHEN MATERIAL SUITABLE FOR USE AS SELECTED FILL MATERIAL OR SELECTED GRANULAR MATERIAL IS NOT READILY AVAILABLE FROM TRENCH EXCAVATION WITHIN A DISTANCE NOT EXCEEDING 0.5 km, THE CONTRACTOR SHALL, SUBJECT TO THE ENGINEER'S APPROVAL FOR EACH MATERIAL, OBTAIN SUITABLE MATERIAL TO REPLACE THE SHORTFALL.

- a) FROM OTHER NECESSARY EXCAVATIONS ON THE SITE; OR
- b) BY OPENING UP BORROW PITS AT APPROVED AREAS LOCATED AT INTERVALS ALONG THE ROUTE OF THE PIPELINE; OR
- c) BY IMPORTING FROM COMMERCIAL OR OTHER SOURCES.

PLACING

NO BEDDING SHALL BE LAID UNTIL THE ENGINEER HAS APPROVED THE TRENCH, MEASURED THE DEPTH IF NECESSARY, AND AUTHORISED PIPELAYING TO PROCEED. IN THE PLACING OF BEDDING, ALL VOIDS UNDER THE OVERHANG OF THE PIPES SHALL BE FILLED AND THE COMPACTION SHALL BE CARRIED OUT UNIFORMLY ON EACH SIDE OF THE PIPE SO AS NOT TO CAUSE ANY LATERAL OR VERTICAL DISPLACEMENT OF THE PIPE. BEDDING SHALL BE CARRIED OUT AS PIPELAYING PROCEEDS, AND SHALL BE COMPLETED BEFORE THE ACCEPTANCE TEST IS CARRIED OUT.

COMPACTING

THE DEGREE OF COMPACTION ATTAINED FOR BEDDING (OTHER THAN THE MATERIAL OVER THE TOP OF THE PIPELINE) SHALL BE 90 % OF MODIFIED AASHTO MAXIMUM DENSITY.

PLACING AND COMPACTING OF THE 315mm uPVC PIPE IN ADDITION TO COMPLYING WITH THE REQUIREMENTS STATED ABOVE, THE CONTRACTOR SHALL CONSTRUCT BEDDING FOR THE PIPE IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

2.1. SELECTED FILL BLANKET

AFTER COMPLETION OF THE BEDDING CRADLE, SELECTED FILL BLANKET SHALL BE PLACED CAREFULLY IN LAYERS OF 100 mm UNCOMPACTED THICKNESS OVER THE FULL WIDTH OF THE TRENCH AND SHALL BE COMPACTED TO 90% OF MODIFIED AASHTO UP TO A HEIGHT OF AT LEAST 300 mm ABOVE THE CROWN OF THE PIPELINE. SPECIAL CARE SHALL BE TAKEN WHEN COMPACTING OVER THE PIPELINE.

SELECTED FILL MATERIAL SHALL BE MATERIAL THAT HAS A PI NOT EXCEEDING 6 AND THAT IS FREE FROM VEGETATION AND FROM LUMPS AND STONES OF DIAMETER EXCEEDING 30 mm.

2.2. SELECTED GRANULAR MATERIAL

THE PIPELINE SHALL BE SUPPORTED ON A CONTINUOUS BED OF SELECTED GRANULAR MATERIAL OF COMPACTED DEPTH AT LEAST 100 mm AND COVERING THE FULL WIDTH OF THE TRENCH. THE GRANULAR MATERIAL SHALL BE COMPACTED TO 90% OF MODIFIED AASHTO. ADDITIONAL SELECTED GRANULAR MATERIAL SHALL THEN BE PLACED CAREFULLY AND EVENLY BETWEEN THE SIDES OF THE TRENCH AND THE PIPELINE, IN LAYERS OF UNCOMPACTED THICKNESS APPROXIMATELY 100 mm. EACH LAYER SHALL BE COMPACTED INDIVIDUALLY TO THE ABOVE-SPECIFIED DENSITY. PARTICULAR CARE SHALL BE EXERCISED TO PREVENT DAMAGE, DEFLECTION, OR DISPLACEMENT OF THE PIPELINE.

SELECTED GRANULAR MATERIAL SHALL BE MATERIAL OF A GRANULAR, NON-COHESIVE NATURE THAT IS SINGULARLY GRADED BETWEEN 0.6 mm AND 19 mm, IS FREE-DRAINING, AND HAS A COMPACTIBILITY FACTOR NOT EXCEEDING 0.4.

THRUST BLOCK NOTES:

- 1. THRUST BLOCKS ARE TO BE INSTALLED AT EVERY BEND.
- 2. THRUST BLOCK DIMENSIONS ON THIS DRAWING ARE ONLY APPLICABLE UNDER THE FOLLOWING CONDITIONS:

- UNDISTURBED SAND-GROUND MIXTURES OR DENSE UNIFORM SAND WITH A BEARING CAPACITY OF AT LEAST 150kPa.
- UNSUBMERGED CONDITIONS.
- MAXIMUM INTERNAL PIPE PRESSURE OF 18Bar.

IF THE CONTRACTOR IS NOT IN A POSITION TO IDENTIFY THE ABOVE CONDITIONS, USE SHALL BE MADE OF AN ENGINEERING GEOLOGIST OR ENGINEER. IN ALL OTHER CONDITIONS THE ACTUAL IN SITU BEARING PRESSURE SHALL BE CALCULATED AND THE THRUST BLOCK DESIGNED BY A PROFESSIONAL ENGINEER.

- 2. USE 15 MPa CONCRETE.
- 3. HALF THE DEPTH OF THE THRUST BLOCK TO BE PLACED BELOW THE PIPE AXIS.
- 4. KEEP CONCRETE AWAY FROM THE COUPLINGS & THE PIPE JOINTS.
- 5. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED & DESIGNED BY A PROFESSIONAL ENGINEER.

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- 4. CONTOUR INTERVALS: 1m
- 5. ROCK LEVELS SHALL BE DETERMINED ON SITE.
- 6. EXCAVATIONS SHALL BE KEPT FREE FROM STANDING WATER.
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T. BANDA ENGINEER	PR ENG no.	DATE
CLIENT		DATE

PROJECT

**POLOKWANE REGIONAL
WASTE WATER TREATMENT
WORKS**

DRAWING DESCRIPTION

**ZZ2 PIPELINE DIVERSION:
TYPICAL TRENCH AND
SECTION DETAILS**

DESIGNED	DRAWN	CHECKED
Designer	Author	Checker
REV DATE	SCALE	ORIGINAL SIZE
2020-04	AS INDICATED	A1
DRAWING NUMBER		
PROJ No - DISCIPLINE - SERV - SEQ No - (SHEET)		REV
PK278-CP-2A-EW-2702		1