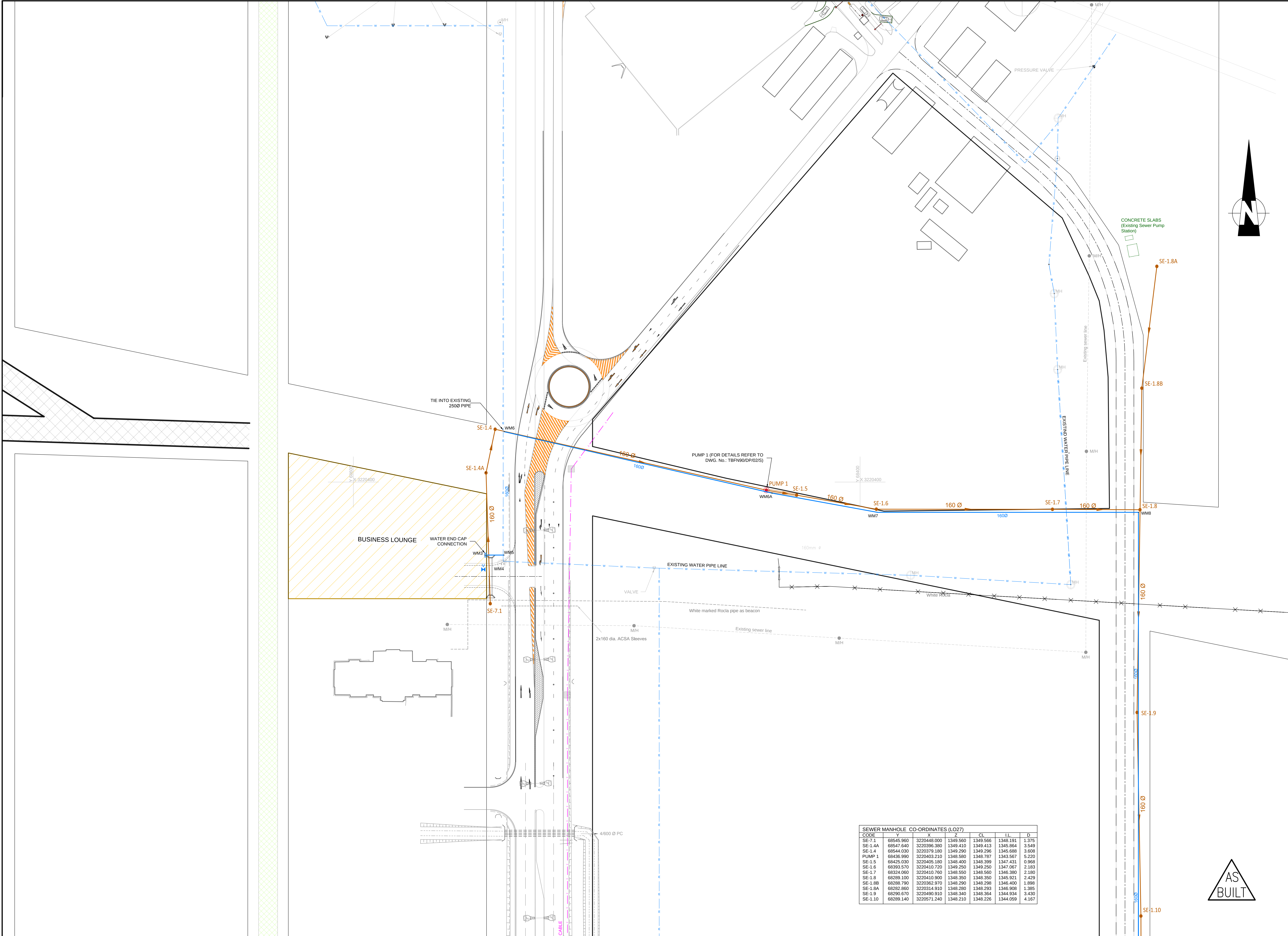






WATER VALVES SETTING OUT		
Code	Y	X
WV2	68435.601	3220635.530
WV3	68426.058	3220634.140
WV4	68426.058	3220638.180
WV6	68304.144	3221032.341
WV9	68303.258	3221033.330
WV10	68299.800	3221244.440
WV10a	68286.810	3221248.680
WV11	68311.172	3221257.380
WV12	68360.100	3221257.380
WV13	68362.318	3221259.693

WATER SETTING OUT		
Code	Y	X
WM3	68548.071	3220428.823
WM33	68306.613	3221247.230
WM32	68283.729	3221248.586
WM31	68271.799	3221248.830
WM13	68426.058	3220638.060
WM12	68426.058	3220643.060
WM37	68362.318	3221257.330
WM36	68309.872	3221257.380
WM35	68306.588	3221258.000
WM30	68290.340	3221241.220
WM29	68290.386	3221147.663
WM28	68290.289	3221043.036
WM25	68290.278	3221003.202
WM19	68290.223	3220792.294
WM18	68290.199	3220702.318
WM14	68416.731	3220628.060
WM10	68434.861	3220638.060
WM8	68290.124	3220411.946
WM7	68393.216	3220411.943
WM6	68540.674	3220380.783
WM6A	68434.759	3220404.351
WM4	68540.653	3220402.366
WM31	68375.286	3221210.220
WM32	68362.318	3221210.340
WM40	68375.286	3221346.570
WM41	68362.318	3221346.560
WM24	68290.277	3220999.330
WM23	68276.117	3221016.170
WM22	68276.117	3221016.960
WM21	68271.517	3221016.960
WM43	68362.318	3221414.110
WM42	68362.318	3221435.810
WM54	68425.529	3221400.980
WM57	68422.538	3221344.000
WM58	68415.659	3221131.110
WM61	68373.534	3221131.110
WM62	68365.132	3221131.110
WM63	68362.318	3221136.610
WM38	68362.318	3221266.700
WM39	68362.318	3221276.630
WM44	68398.924	3221414.110
WM45	68415.659	3221414.110
WM46	68422.538	3221410.860
WM47	68425.529	3221404.240
WM34	68306.593	3221259.850
WM64	68365.616	3221150.830
WM65	68362.318	3221190.830
WM48	68438.508	3221350.740
WM49	68425.529	3221350.730
WM50	68438.508	3221276.110
WM51	68425.529	3221276.110
WM52	68438.508	3221207.460
WM53	68425.529	3221207.460
WM55	68438.532	3221199.810
WM59	68394.603	3221117.520
WM60	68394.596	3221131.110
WM5	68540.563	3220428.823

- GENERAL NOTES:
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 2. All workmanship to be in accordance with the relevant project specifications as included in the contract document.
 3. All existing services are to be located and identified by the Contractor prior to commencement of any work. Any found in unresolvable conditions are to be replaced unless otherwise shown.
 4. All drawings referenced to the service layouts are as follows:

SEWER	TBFN90/DP/01_04/S
	TBFN90/S/01_02/S
STORM WATER	TBFN90/DP/01_02/SW
	TBFN90/S/01_03/SW
	TBFN90/S/01/SW
WATER	TBFN90/DP/01_02/W
ELECTRICAL SLEEVES	BL13/29/12/E02
	BL13/29/12/E05
	BL13/29/12/E07

- LEGEND:
- EXISTING WATER
 - EXISTING TELKOM
 - EXISTING ELECTRICAL CABLE
 - EXISTING SEWER
 - SEWER RETICULATION
 - 2m. CHANNELS
 - 2m. CONCRETE CHANNELS
 - 4m. CHANNELS
 - WATER RETICULATION
 - STORMWATER CULVERT
 - WATER DUCT
 - SECURITY DUCT
 - TELKOM DUCT

SEWER MANHOLE CO-ORDINATES (LO27)						
CODE	Y	X	Z	CL	IL	D
SE-7.1	68545.960	3220448.000	1349.560	1349.566	1348.191	1.375
SE-1.4A	68547.640	3220396.380	1349.410	1349.413	1345.864	3.549
SE-1.4	68544.030	3220379.180	1349.290	1349.296	1345.688	3.608
PUMP 1	68436.990	3220403.210	1348.580	1348.787	1343.567	5.220
SE-1.5	68425.030	3220405.180	1348.400	1348.399	1347.433	0.968
SE-1.6	68393.670	3220410.720	1349.250	1349.250	1347.067	2.183
SE-1.7	68324.060	3220410.760	1348.550	1348.560	1346.380	2.180
SE-1.8	68289.100	3220410.900	1348.350	1348.350	1345.921	2.429
SE-1.8B	68288.790	3220362.970	1348.290	1348.298	1346.400	1.898
SE-1.8A	68282.860	3220314.910	1348.280	1348.293	1346.908	1.385
SE-1.9	68290.670	3220400.010	1348.340	1348.354	1344.934	3.430
SE-1.10	68289.140	3220571.240	1348.210	1348.226	1344.059	4.167

7	07/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
6	12/03/2013	ELEC. DUCT OMITTED	
5	15/02/2013	SW CHANNELS AND DUCTS SETTING OUT	
4	11/02/2013	SEWER & DUCT LAYOUT REVISED	
3	28/01/2013	WATER & SEWER LAYOUT REVISED DUCTS NOT SHOWN	
2	25/01/2013	WATER & SEWER LAYOUT REVISED	
1	15/01/2013	WATER CO-ORDINATE EDIT	
0	26/12/2012	ISSUED FOR CONSTRUCTION	
No.	DATE	REVISION	CONSULT. ENG.



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDHOF
9324
BLOEMFONTEIN
TEL: (051) 430 7200
FAX: (051) 430 8220

DESIGNED BY S.S.	Name : D. COLLET Prof. Reg. No. : 200170067 Date : 16/03/2013
DRAWN BY R.M.	CONSTRUCTION RECORD DRAWING
CHECKED BY D.C.	Name : Prof. Reg. No. : Date :

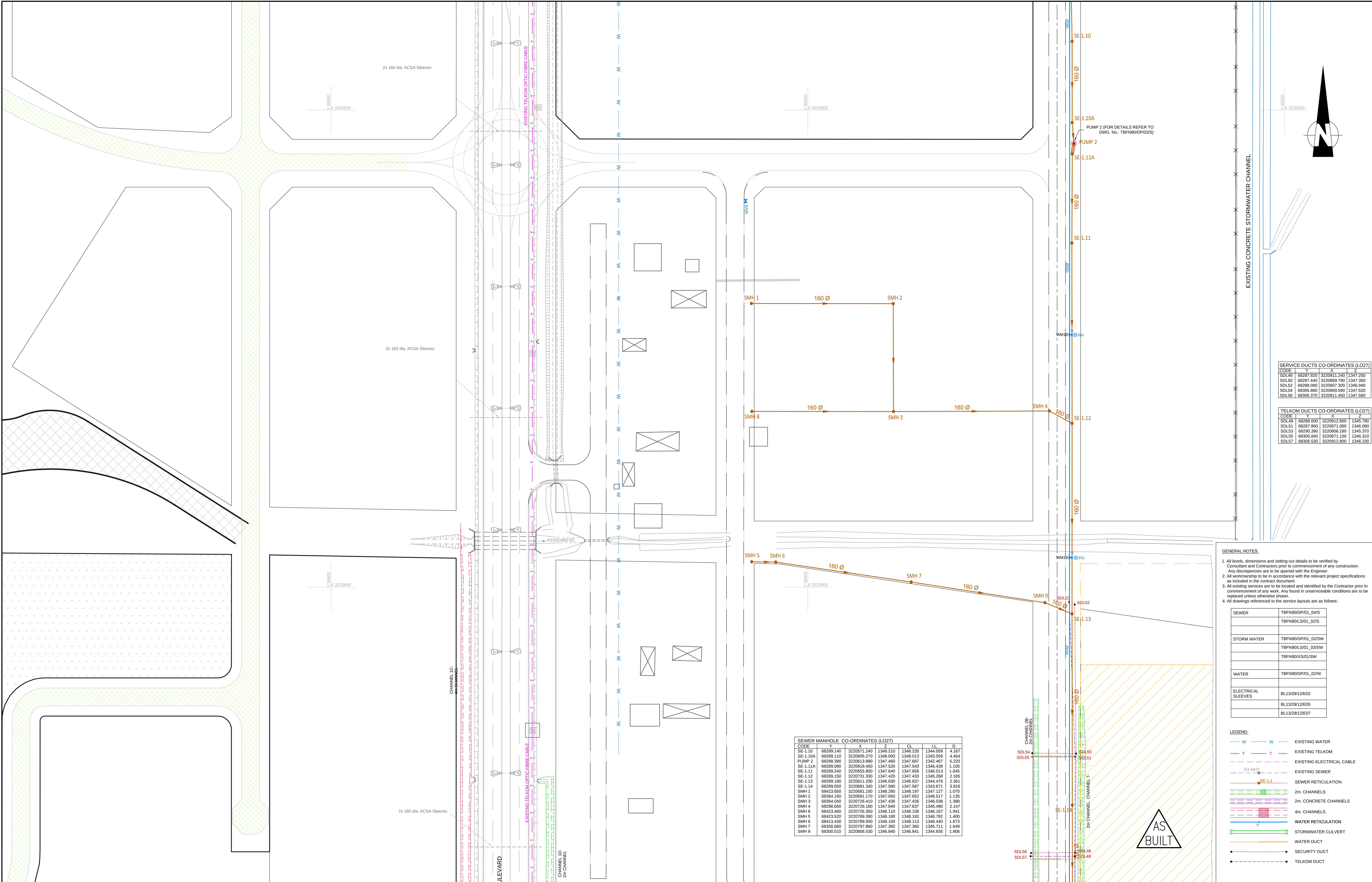


ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
AIRPORTS COMPANY SOUTH AFRICA
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : 1:500

DRAWING DESCRIPTION
GENERAL ARRANGEMENT: SEWER, STORMWATER AND WATER
SHEET 2 OF 5

CONTRACT NUMBER	BL13/29/AU/02	
DRAWING LOCATION DATA	START	END
ROUTE	-	-
SECTION	-	-
DRAWING km DISTANCE	-	-
DRAWING TYPE	WATER RELATED	
DRAWING NUMBER	TBFN90 KP 02 S	
REV.	A	



SERVICE DUCTS CO-ORDINATES (LO27)			
CODE	Y	X	Z
SDL48	68287.820	3220911.240	1347.250
SDL50	68287.440	3220869.780	1347.350
SDL53	68289.000	3220807.300	1348.940
SDL54	68305.860	3220869.590	1347.620
SDL56	68306.370	3220911.450	1347.580

TELKOM DUCTS CO-ORDINATES (LO27)			
CODE	Y	X	Z
SDL49	68288.000	3220912.850	1345.780
SDL51	68287.960	3220871.060	1346.060
SDL53	68290.390	3220806.180	1345.370
SDL55	68305.840	3220871.100	1346.310
SDL57	68306.530	3220912.800	1346.230

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 - All drawings referenced to the service layouts are as follows:

SEWER	TBFN90/DP/01_04/S
	TBFN90/LS/01_02/S
STORM WATER	TBFN90/DP/01_02/SW
	TBFN90/LS/01_03/SW
	TBFN90/XS/01/SW
WATER	TBFN90/DP/01_02/W
ELECTRICAL SLEEVES	BL13/29/12/E02
	BL13/29/12/E05
	BL13/29/12/E07

LEGEND:

- | | |
|--|---------------------------|
| | EXISTING WATER |
| | EXISTING TELKOM |
| | EXISTING ELECTRICAL CABLE |
| | EXISTING SEWER |
| | SEWER RETICULATION |
| | 2m. CHANNELS |
| | 2m. CONCRETE CHANNELS |
| | 4m. CHANNELS |
| | WATER RETICULATION |
| | STORMWATER CULVERT |
| | WATER DUCT |
| | SECURITY DUCT |
| | TELKOM DUCT |

SEWER MANHOLE CO-ORDINATES (LO27)					
CODE	Y	X	Z	CL	IL
SE-1.10	68289.140	3220571.240	1348.210	1348.226	1344.059
SE-1.10A	68289.110	3220605.270	1348.000	1348.013	1343.559
PUMP 2	68288.390	3220613.990	1347.460	1347.687	1342.467
SE-1.11A	68289.080	3220616.480	1347.520	1347.543	1346.438
SE-1.11	68289.240	3220655.800	1347.640	1347.658	1346.013
SE-1.12	68289.150	3220731.330	1347.420	1347.433	1345.268
SE-1.13	68289.180	3220811.200	1346.830	1346.837	1344.476
SE-1.14	68289.050	3220891.340	1347.580	1347.587	1343.671
SMH 1	68423.050	3220681.100	1348.280	1348.197	1347.127
SMH 2	68364.100	3220681.170	1347.650	1347.652	1346.517
SMH 3	68364.040	3220726.410	1347.430	1347.426	1346.038
SMH 4	68298.660	3220726.180	1347.640	1347.637	1345.490
SMH 5	68423.460	3220726.350	1346.110	1346.108	1346.167
SMH 6	68423.520	3220789.390	1348.180	1348.182	1346.782
SMH 7	68413.430	3220789.500	1348.100	1348.113	1346.440
SMH 8	68355.660	3220797.860	1347.360	1347.360	1345.711
SMH 9	68300.510	3220806.530	1346.840	1346.841	1344.935

No.	DATE	REVISION	CONSULT. ENG.
7	07/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
6	13/03/2013	ELEC. DUCT OMITTED	
5	13/03/2013	SW CHANNELS & DUCT SETTING OUT	
4	11/02/2013	SEWER & DUCT LAYOUT REVISED	
3	28/01/2013	WATER & SEWER LAYOUT REVISED DUCTS NOT SHOWN	
2	25/01/2013	WATER & SEWER LAYOUT REVISED	
1	15/01/2013	WATER CO-ORDINATE EDIT	
0	06/12/2012	ISSUED FOR CONSTRUCTION	



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDFONTEIN
9324
BLOEMFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220

DESIGNED BY
S.S.
DRAWN BY
R.M.
CHECKED BY
D.C.

APPROVED
Name : D. COLLET
Prof. Reg. No. : 200170067
Date : 18/03/2013
CONSTRUCTION RECORD DRAWING
Name :
Prof. Reg. No. :
Date :

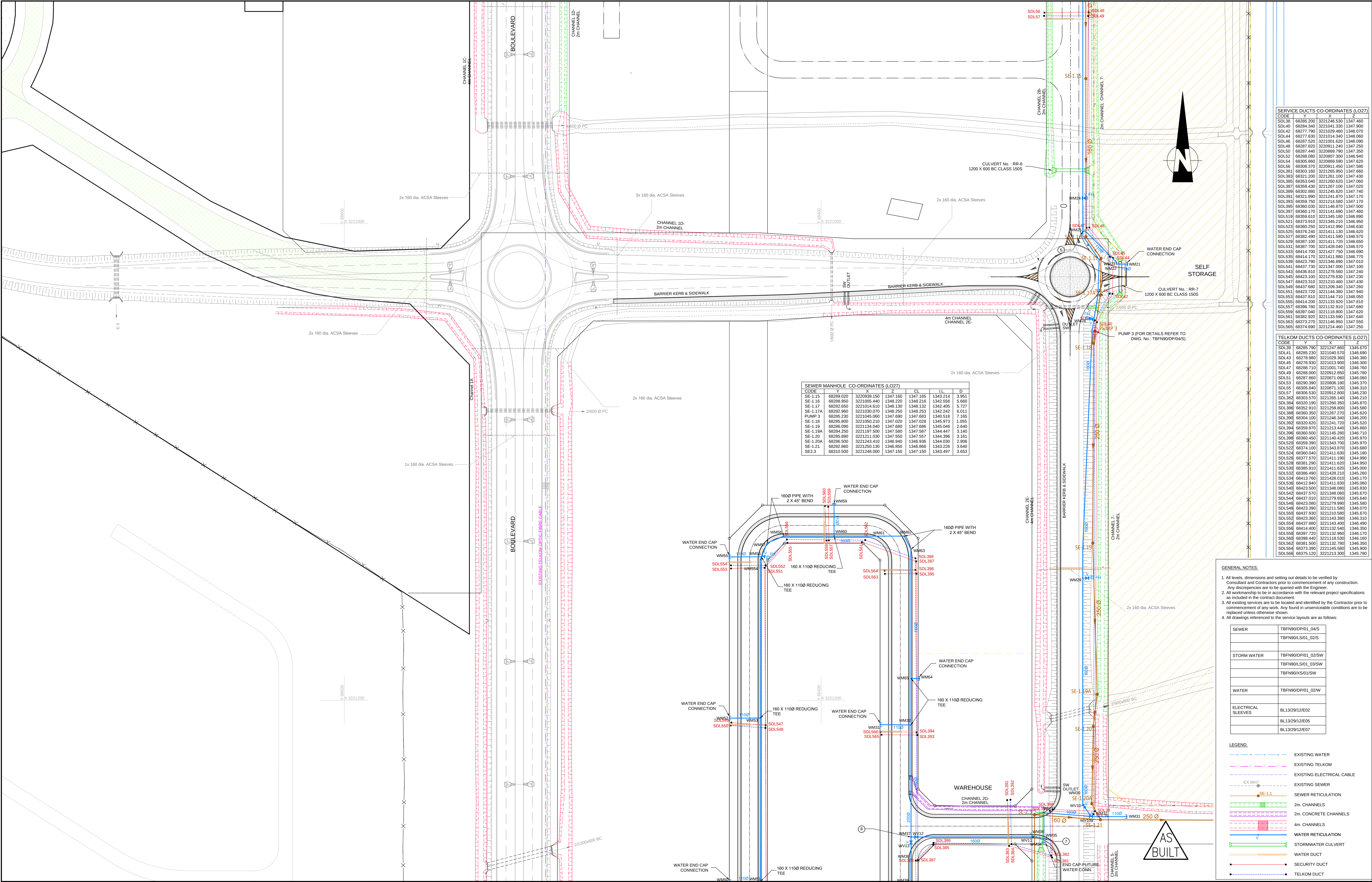


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PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : 1:500

DRAWING DESCRIPTION
GENERAL ARRANGEMENT: SEWER, STORMWATER AND WATER
SHEET 3 OF 5

CONTRACT NUMBER		BL13/29/AU/02	
DRAWING LOCATION DATA	ROUTE	START	END
SECTION	DRAWING km DISTANCE	-	-
DRAWING TYPE	WATER RELATED		
DRAWING NUMBER	TBFN90 KP 03 S		
REV.	A		



No.	DATE	REVISION	CONSULT. ENG.
7	07/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
6	18/03/2013	SECURITY DUCT ON ROAD IS SHOWN	
5	13/03/2013	CHANNEL 1B REALIGNED & ELEC. DUCT OMITTED	
4	15/02/2013	SW CHANNELS & DUCT SETTING OUT	
3	11/02/2013	SEWER & DUCT LAYOUT REVISED	
2	28/01/2013	WATER & SEWER LAYOUT REVISED, DUCTS NOT SHOWN	
1	15/01/2013	WATER CO-ORDINATE EDIT	
0	06/12/2012	ISSUED FOR CONSTRUCTION	



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S.S.
DRAWN BY
R.M.
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D.C.

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Name : D. COLLET
Prof. Reg. No. : 200170067
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CONSTRUCTION RECORD DRAWING
Name :
Prof. Reg. No. :
Date :

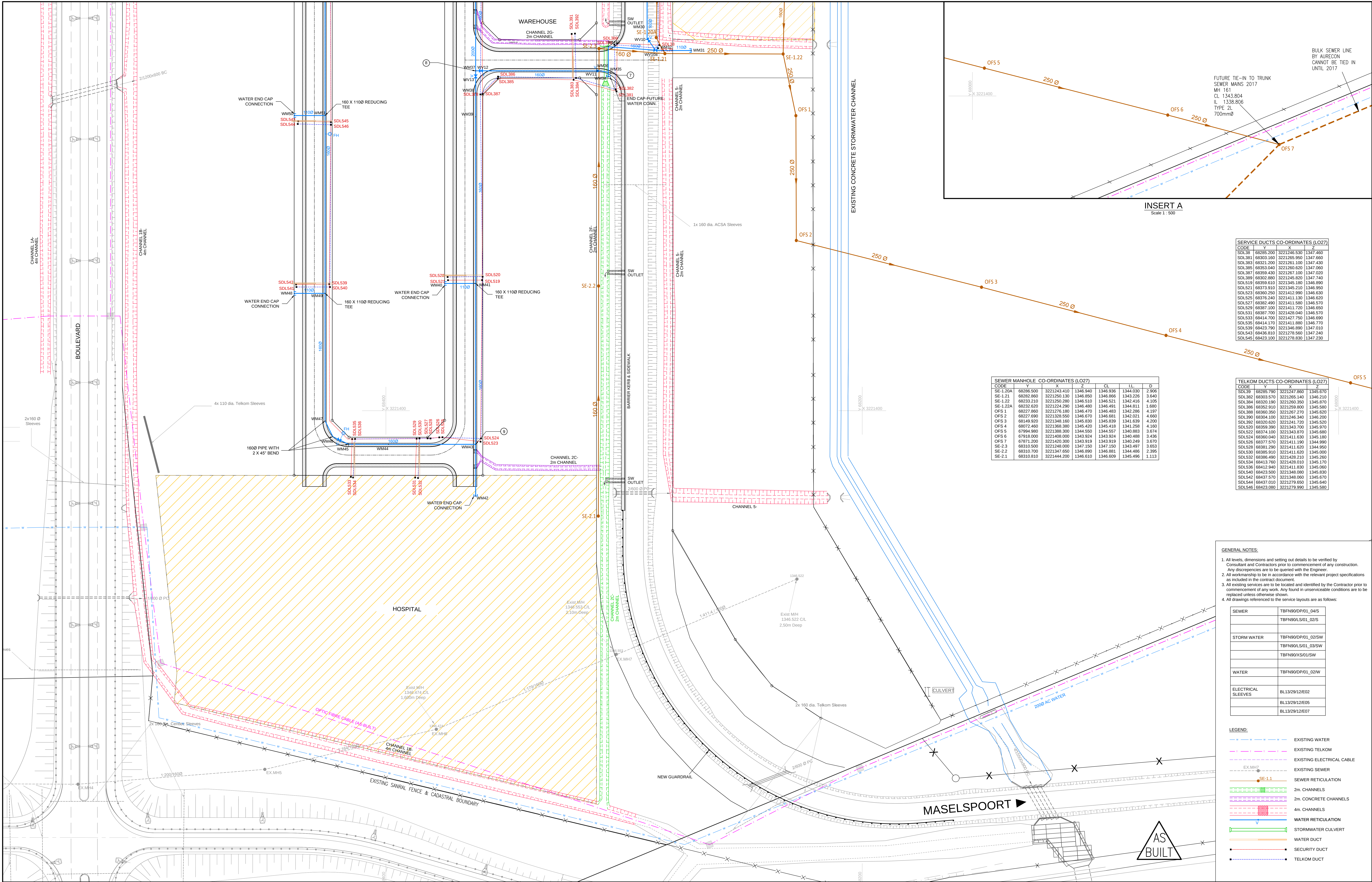


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AIRPORTS COMPANY SOUTH AFRICA
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : 1:500

DRAWING DESCRIPTION
GENERAL ARRANGEMENT: SEWER, STORMWATER AND WATER
SHEET 4 OF 5

CONTRACT NUMBER	BL13/29/AU/02
DRAWING LOCATION DATA	START - END
ROUTE	- -
SECTION	- -
DRAWING km DISTANCE	- -
DRAWING TYPE	WATER RELATED
DRAWING NUMBER	TBFN90 KP 04 S



SEWER MANHOLE CO-ORDINATES (LO27)						
CODE	Y	X	Z	CL	IL	Ø
SE-1.20A	68285.500	3221243.410	1346.940	1346.936	1344.030	2.906
SE-1.21	68282.860	3221250.130	1346.850	1346.866	1343.226	3.640
SE-1.22	68233.210	3221250.280	1346.510	1346.521	1342.416	4.105
SE-1.22A	68232.620	3221224.290	1346.480	1346.491	1344.811	1.680
OFS 1	68227.860	3221276.180	1346.470	1346.483	1342.286	4.197
OFS 2	68227.690	3221328.550	1346.670	1346.681	1342.021	4.660
OFS 3	68149.920	3221348.160	1345.830	1345.839	1341.639	4.200
OFS 4	68072.460	3221368.380	1345.420	1345.418	1341.258	4.160
OFS 5	67994.980	3221388.200	1344.550	1344.557	1340.883	3.674
OFS 6	67918.000	3221408.000	1343.924	1343.924	1340.488	3.436
OFS 7	67871.200	3221420.300	1343.919	1343.919	1340.249	3.670
SE-2.3	68310.500	3221248.000	1347.150	1347.150	1343.497	3.653
SE-2.2	68310.700	3221347.650	1346.890	1346.881	1344.486	2.395
SE-2.1	68310.810	3221444.200	1346.610	1346.609	1345.496	1.113

TELKOM DUCTS CO-ORDINATES (LO27)						
CODE	Y	X	Z	CL	IL	Ø
SDL38	68285.200	3221246.530	1347.460			
SDL381	68303.100	3221265.950	1347.660			
SDL383	68321.200	3221261.100	1347.450			
SDL385	68353.040	3221260.620	1347.060			
SDL387	68359.430	3221267.100	1347.020			
SDL389	68302.880	3221245.820	1347.740			
SDL519	68359.610	3221345.180	1346.890			
SDL521	68373.910	3221345.210	1346.950			
SDL523	68360.250	3221417.980	1346.630			
SDL525	68376.240	3221411.130	1346.620			
SDL527	68382.490	3221411.580	1346.570			
SDL529	68387.100	3221411.710	1346.650			
SDL531	68387.700	3221428.040	1346.570			
SDL533	68414.700	3221427.750	1346.690			
SDL535	68414.170	3221411.880	1346.770			
SDL539	68423.790	3221346.890	1347.010			
SDL543	68436.810	3221278.560	1347.240			
SDL545	68423.100	3221278.930	1347.230			

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 3. All existing services are to be located and identified by the Contractor prior to commencement of any work. Any found in unserviceable conditions are to be replaced unless otherwise shown.
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SEWER	TBFN90DP01_04/S
	TBFN90L501_02/S
STORM WATER	TBFN90DP01_02/SW
	TBFN90L501_03/SW
	TBFN90X501/SW
WATER	TBFN90DP01_02/W
ELECTRICAL SLEEVES	BL13/29/12/E02
	BL13/29/12/E05
	BL13/29/12/E07

- LEGEND:
- EXISTING WATER
 - EXISTING TELKOM
 - EXISTING ELECTRICAL CABLE
 - EXISTING SEWER
 - SEWER RETICULATION
 - 2m CHANNELS
 - 2m CONCRETE CHANNELS
 - 4m CHANNELS
 - WATER RETICULATION
 - STORMWATER CULVERT
 - WATER DUCT
 - SECURITY DUCT
 - TELKOM DUCT

No.	DATE	REVISION	CONSULT. ENG.
7	07/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
6	18/03/2013	SECURITY DUCT ON ROAD G SHOWN	
5	13/03/2013	CHANNEL 1B REALIGNED & ELEC. DUCT OMITTED	
4	15/02/2013	SW CHANNELS & DUCT SETTING OUT	
3	11/02/2013	SEWER & DUCT LAYOUT REVISED	
2	28/01/2013	WATER & SEWER LAYOUT REVISED DUCTS NOT SHOWN	
1	15/01/2013	WATER CO-ORDINATE EDIT	
0	06/12/2012	ISSUED FOR CONSTRUCTION	



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TEL: (051) 400 7200
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DESIGNED BY
S.S.
DRAWN BY
R.M.
CHECKED BY
D.C.

APPROVED
Name : D. COLLET
Prof. Reg. No. : 200170067
Date : 18/03/2013
CONSTRUCTION RECORD DRAWING
Name :
Prof. Reg. No. :
Date :

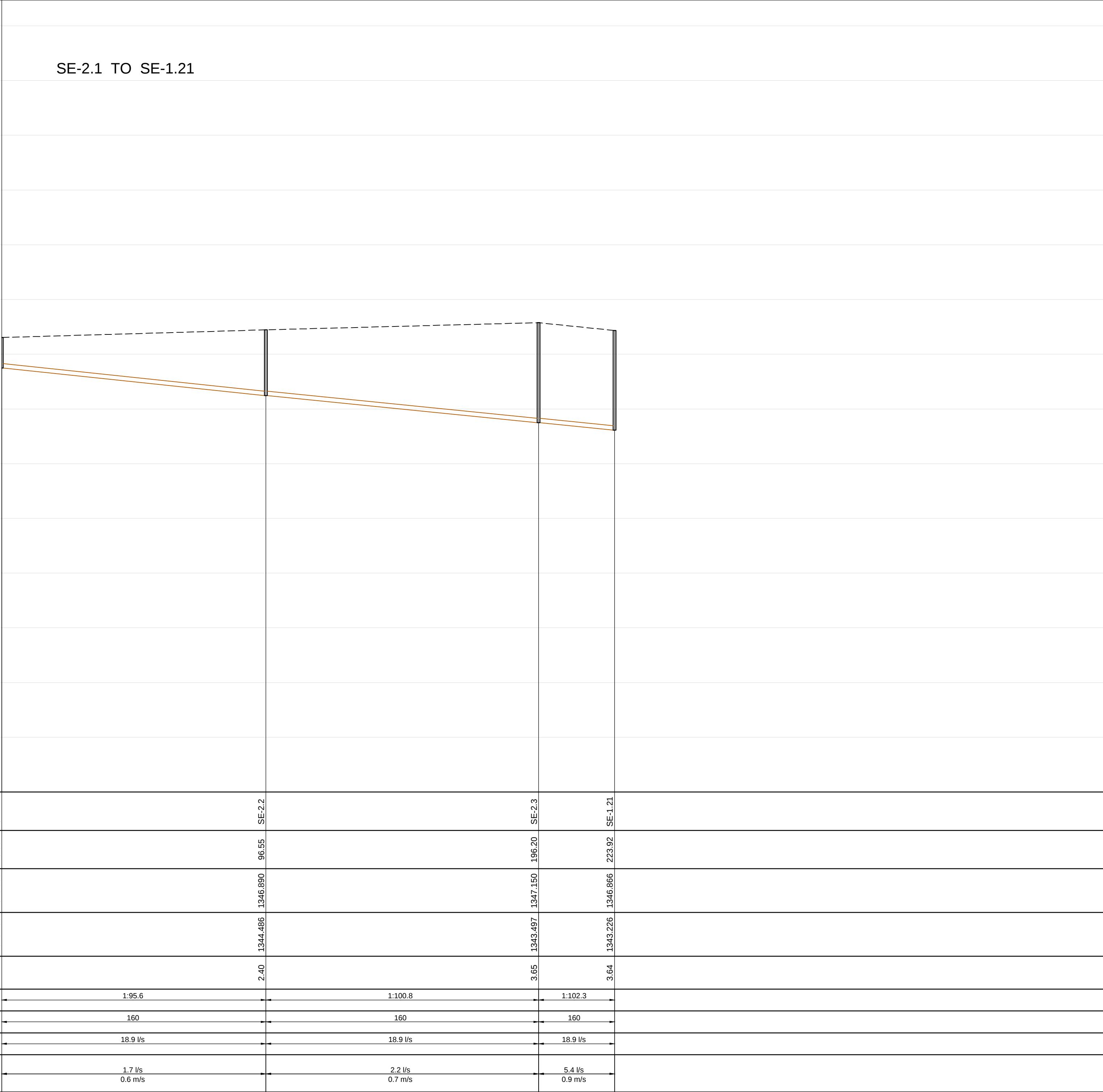
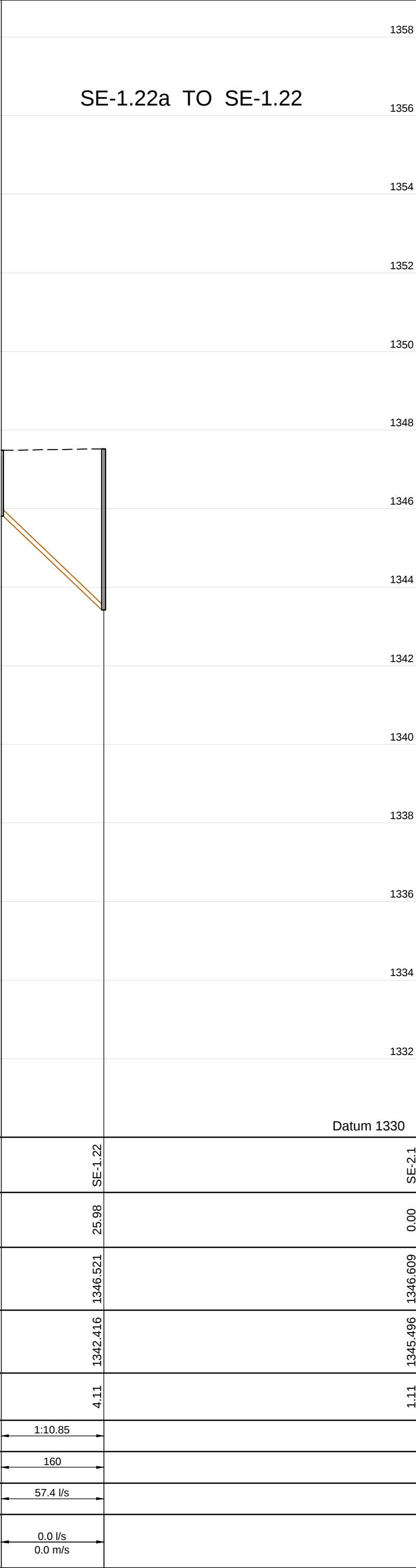
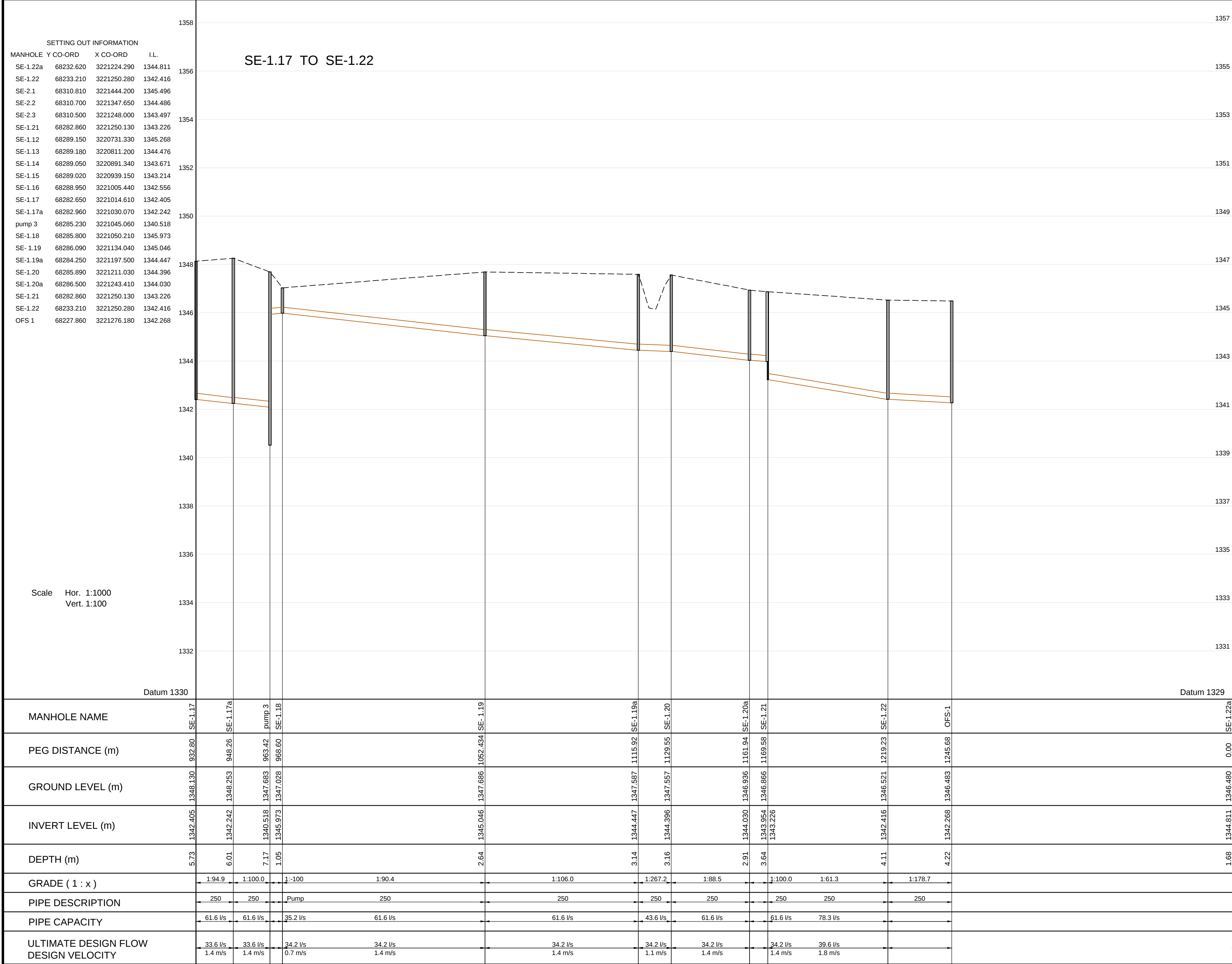
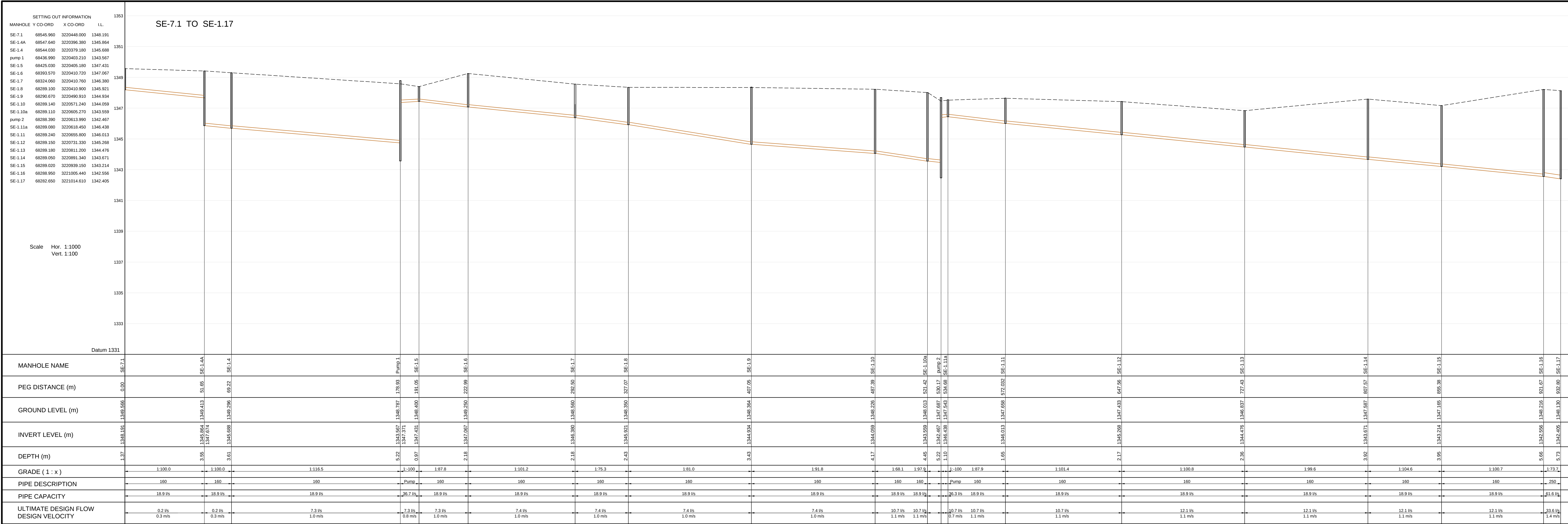


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AIRPORTS COMPANY SOUTH AFRICA
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : 1:500

DRAWING DESCRIPTION
GENERAL ARRANGEMENT: SEWER, STORMWATER AND WATER
SHEET 5 OF 5

CONTRACT NUMBER	BL13/29/AU/02
DRAWING LOCATION DATA	START END
ROUTE	- -
SECTION	- -
DRAWING km DISTANCE	- -
DRAWING TYPE	WATER RELATED
DRAWING NUMBER	TBFN90 KP 05 S
REV.	△



No.	DATE	REVISION
4	13/5/2014	CONSTRUCTION RECORD DRAWING
3	11/02/2013	ALL SEWER LINES REVISED
2	28/01/2013	ALL SEWER LINES REVISED
1	15/12/2013	SHEET NO REVISED
0	06/12/2012	ISSUED FOR CONSTRUCTION



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
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DESIGNED BY
S.S.

DRAWN BY
R.M.

CHECKED BY
D.C.

APPROVED
Name : D. COLLET
Prof. Reg. No. : 200170067
Date : 05/12/2012

CONSTRUCTION RECORD DRAWING
Name :
Prof. Reg. No. :
Date :



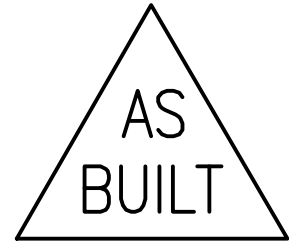
BRAM FISCHER
INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

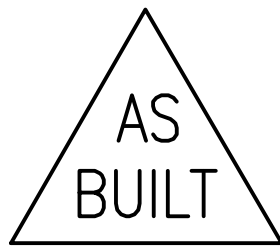
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AIRPORTS COMPANY SOUTH AFRICA
Date:

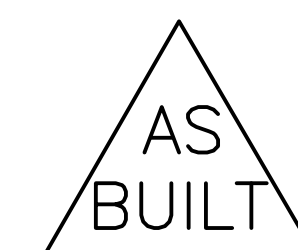
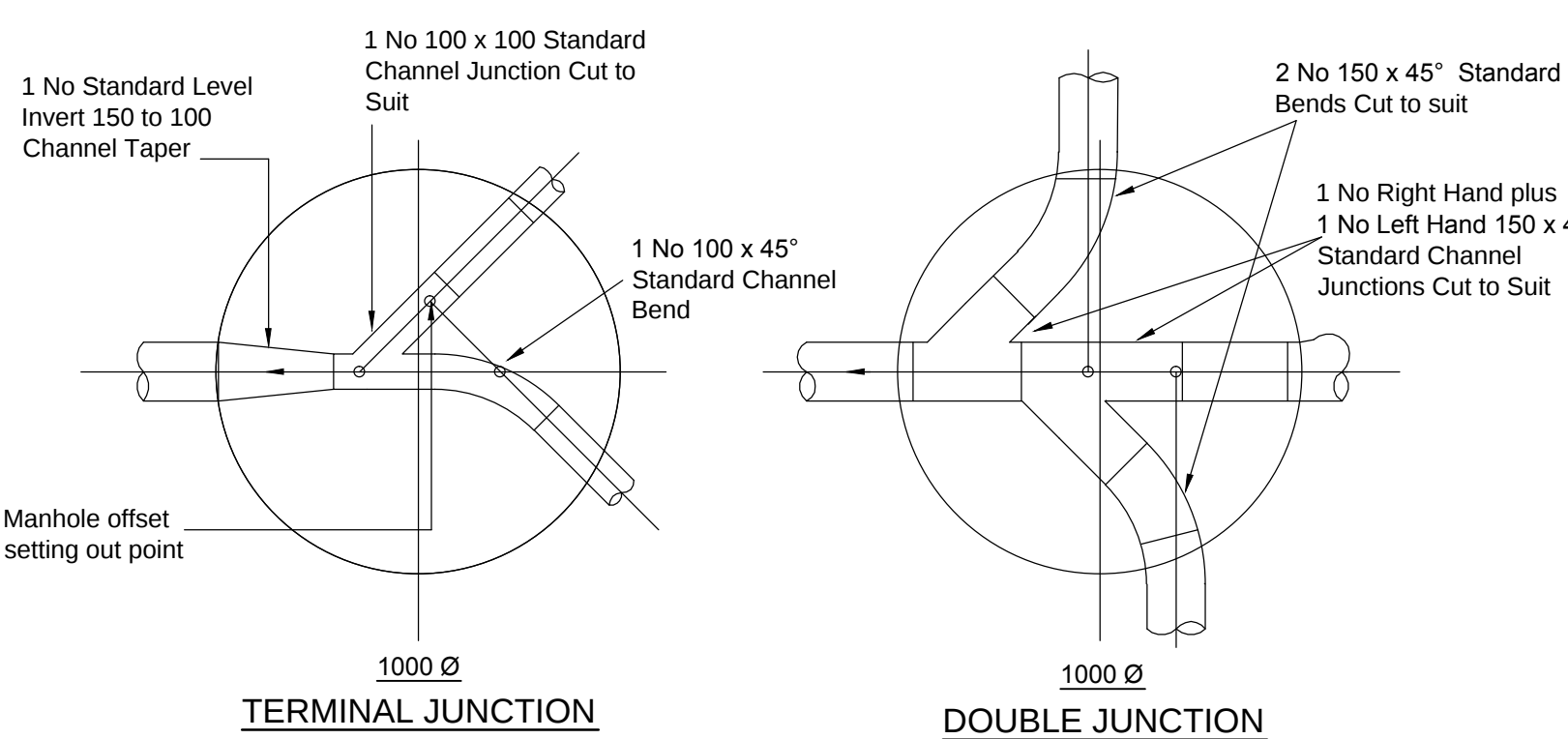
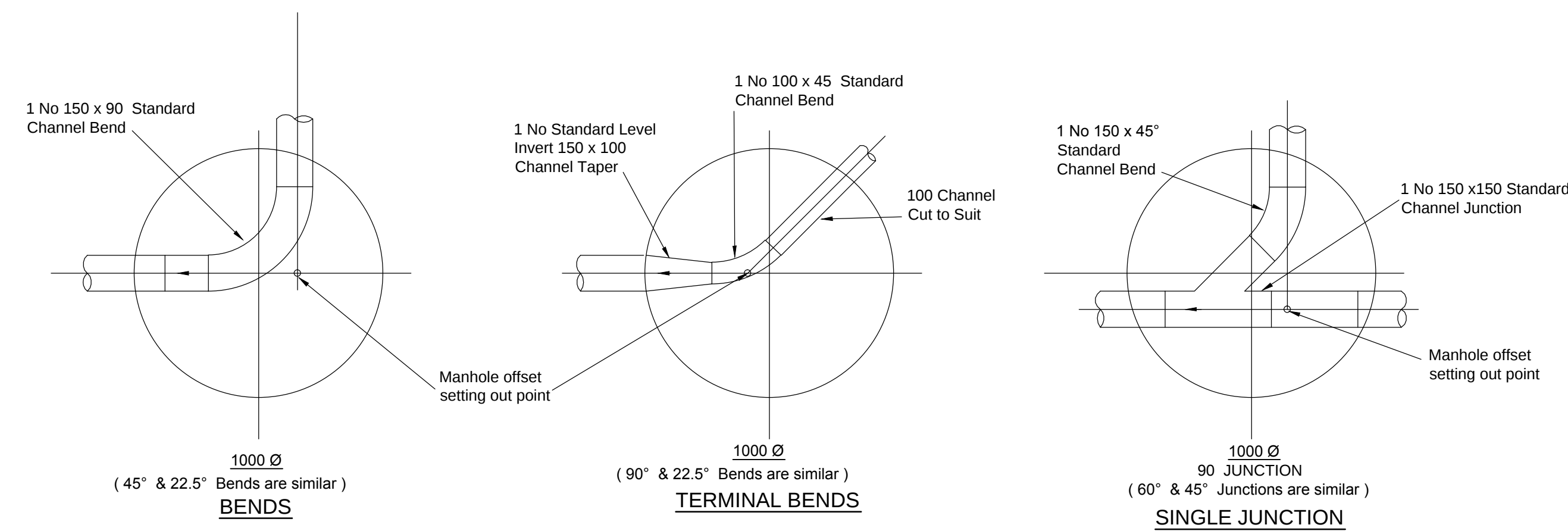
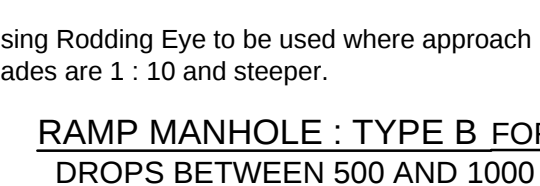
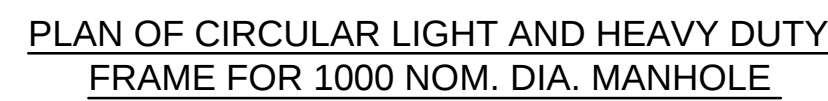
PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : AS SHOWN

DRAWING DESCRIPTION
SEWER LONGITUDINAL SECTIONS
SE7.1 – SE1.22
SE2.1 – SE1.21
SE1.22a – SE1.22
SHEET 1 OF 2

CONTRACT NUMBER	BL13/29/AU/02	
DRAWING LOCATION DATA	START	END
ROUTE	-	-
SECTION	-	-
DRAWING km DISTANCE	-	-
DRAWING TYPE	WATER RELATED	
DRAWING NUMBER	TBFN90 LS 01 S	
REV.	4	



ORIGINAL DRAWING SIZE: A



NOTES:

A. GENERAL

1. ALL PRECAST CONCRETE MANHOLE COMPONENTS TO COMPLY WITH THE REQUIREMENTS OF S.A.B.S.1294 (WHERE APPLICABLE).
2. LENGTHS OF INDIVIDUAL WALL UNITS ARE TO VARY IN MULTIPLES OF 250mm.
3. HEAVY DUTY CAST IRON COVERS AND FRAMES TO ARE TO BE USED ON MANHOLES UNDER VEHICULAR TRAFFIC.
4. FOR DETAILS OF STEEL REINFORCEMENT TO MANHOLE COVERS,COVER SLAB/ AND FRAMES - SEE STANDARD PRECAST DETAILS LISTED ABOVE.

B. STORMWATER MANHOLE

5. DIMENSION D VARIES WITH THE DIAMETER OF THE PIPES. DIMENSION D SHALL BE TO A POINT 50mm ABOVE THE HIGHEST CROWN OF THE PIPES.
6. RENDERING FOR MANHOLE BENCHING SHALL CONSIST OF 1 PART CEMENT TO 3 PARTS SAND THOROUGHLY MIXED AND APPLIED TO CONCRETE SURFACES WHILE THE LATTER ARE STILL GREEN. RENDERING SHALL BE AT LEAST WHILE THE LATTER 20mm THICK.
7. THE LENGTH OF PIPE BUILT INTO THE MANHOLE SHALL NOT EXCEED 2.5m.

C. SEWER MANHOLE:-

8. REPAIRING FOR MANHOLE BENCHING SHALL CONSIST OF PART 1 CHART A TO 2 PARTS SAND THOROUGHLY MIXED AND APPLIED TO CONCRETE SURFACES WHILE THE LATTER ARE STILL GREEN. RENDERING SHALL BE AT LEAST 20mm THICK.
9. ALL PIPES BUILT INTO MANHOLES SHALL NOT EXCEED 1.0m IN LENGTH, AND THE ADJOINING PIPE SHALL NOT EXCEED 2.0m IN LENGTH.
10. EVERY U.P.V.C. PIPE BUILT INTO A MANHOLE SHALL HAVE CLEAN DRY SAND (TO S.A.B.S. 1083 TABLE 1.) GULDED TO ITS OUTSIDE AS RECOMMENDED BY PIPE MANUFACTURER USING SPECIAL PVC CEMENT (HENKEL S.A. PUT, TANGIT OR SIMILAR) TO ENSURE GOOD ADHESION TO BASE CONCRETE.
11. IN LOCATIONS DEFINED BY THE ENGINEER AS SUBJECT TO FLOODING, ALL MANHOLE COVERS AND JOINTS SEALED WITH BOSTIK BUTYL TAPE OR SIMILAR, SHALL BE USED.

SEWER RING MANHOLE

Scale 1:10

NOTE :

1. Where approach grades into the manhole are 1 : 15 or steeper and associated with a change in direction in the manhole of 30 or more, the benching is to be brought up two pipe diameters above the pipe invert (Type B benching sewers)
2. Dimension D varies with the diameter of the sewer pipes and shall be to a point 50mm above the highest crown of the pipes.
3. Rendering for manhole benching shall consist of one part H.A.C. to two parts sand thoroughly mixed and applied to concrete surfaces while the latter are still green. Rendering shall be at least 20mm thick.

PRECAST CONCRETE SEWER MANHOLE

Scale 1:10



**Royal
HaskoningDHV**
Enhancing Society Together

DESIGNED BY

SSI ENGINEERS AND ENVIRONMENTAL
CONSULTANTS (Pty) Ltd TRADING AS
ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDHOF
9324
BLOEMFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220



BRAM FISCHER
INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

AIRPORTS COMPANY SOUTH AFRICA

Date:

CONSTRUCTION OF NEW
WATER AND DRAINAGE
SERVICES AT BLOEMFONTEIN
AIRPORT

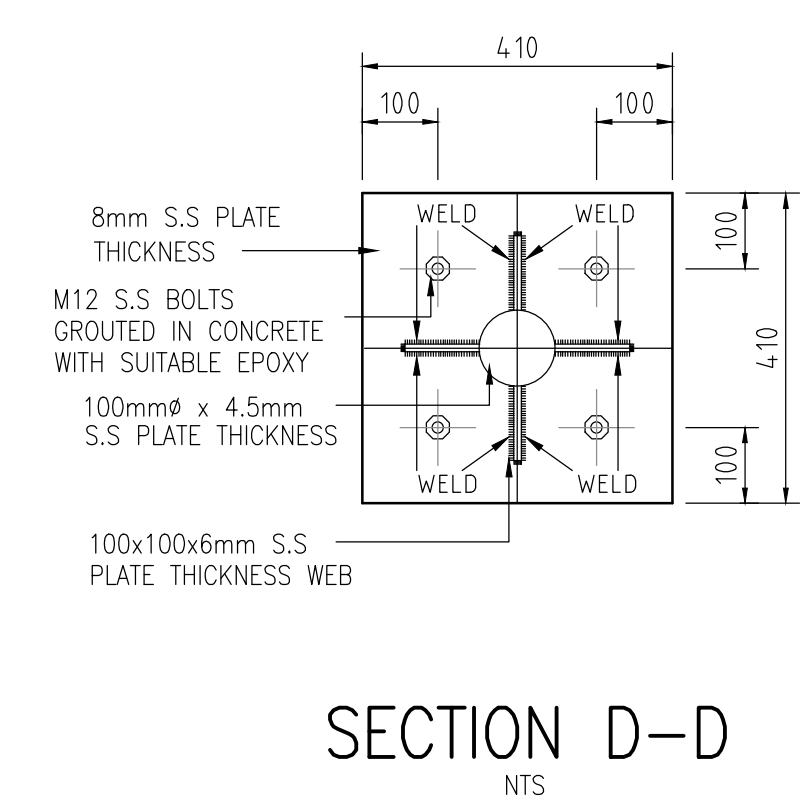
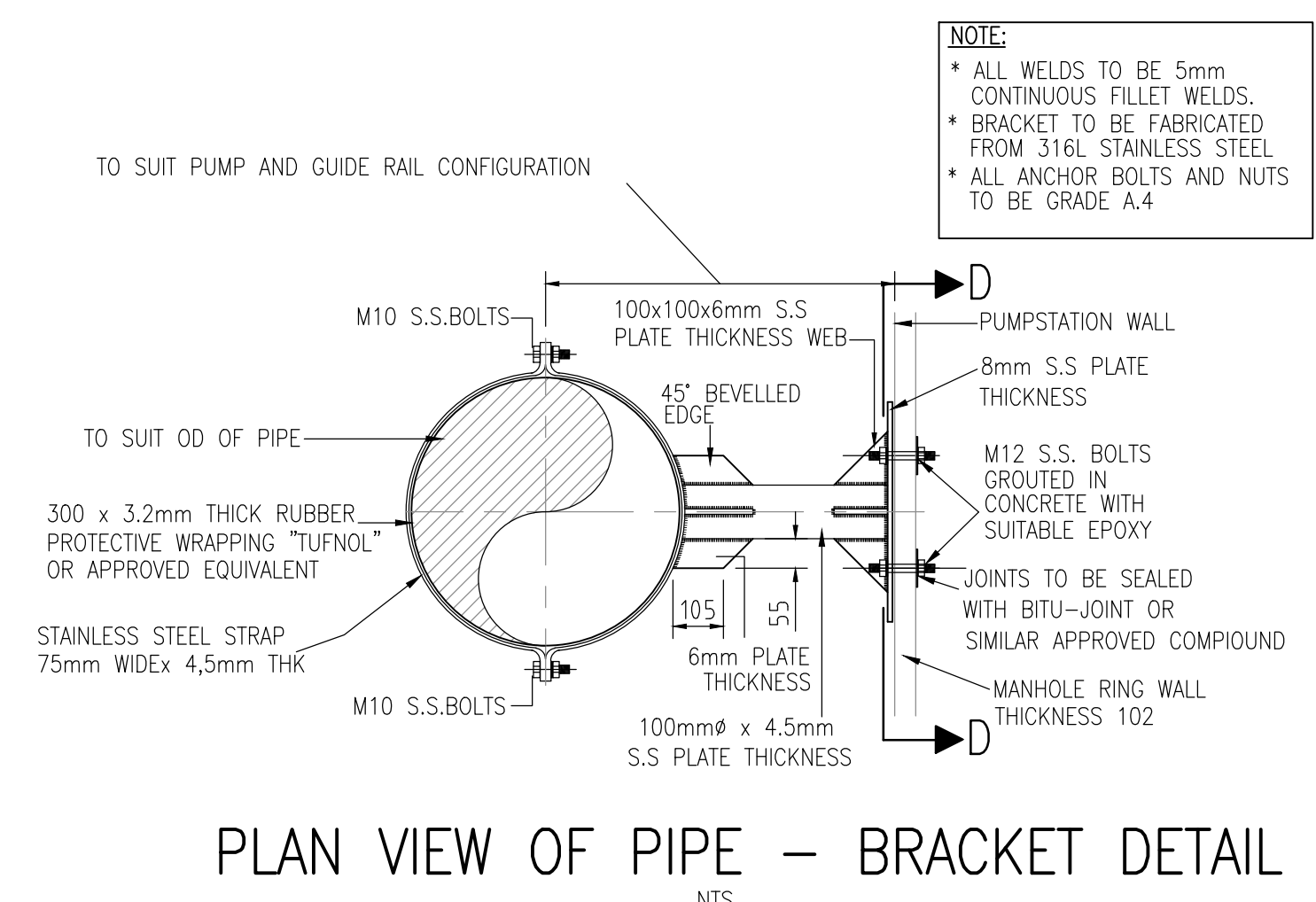
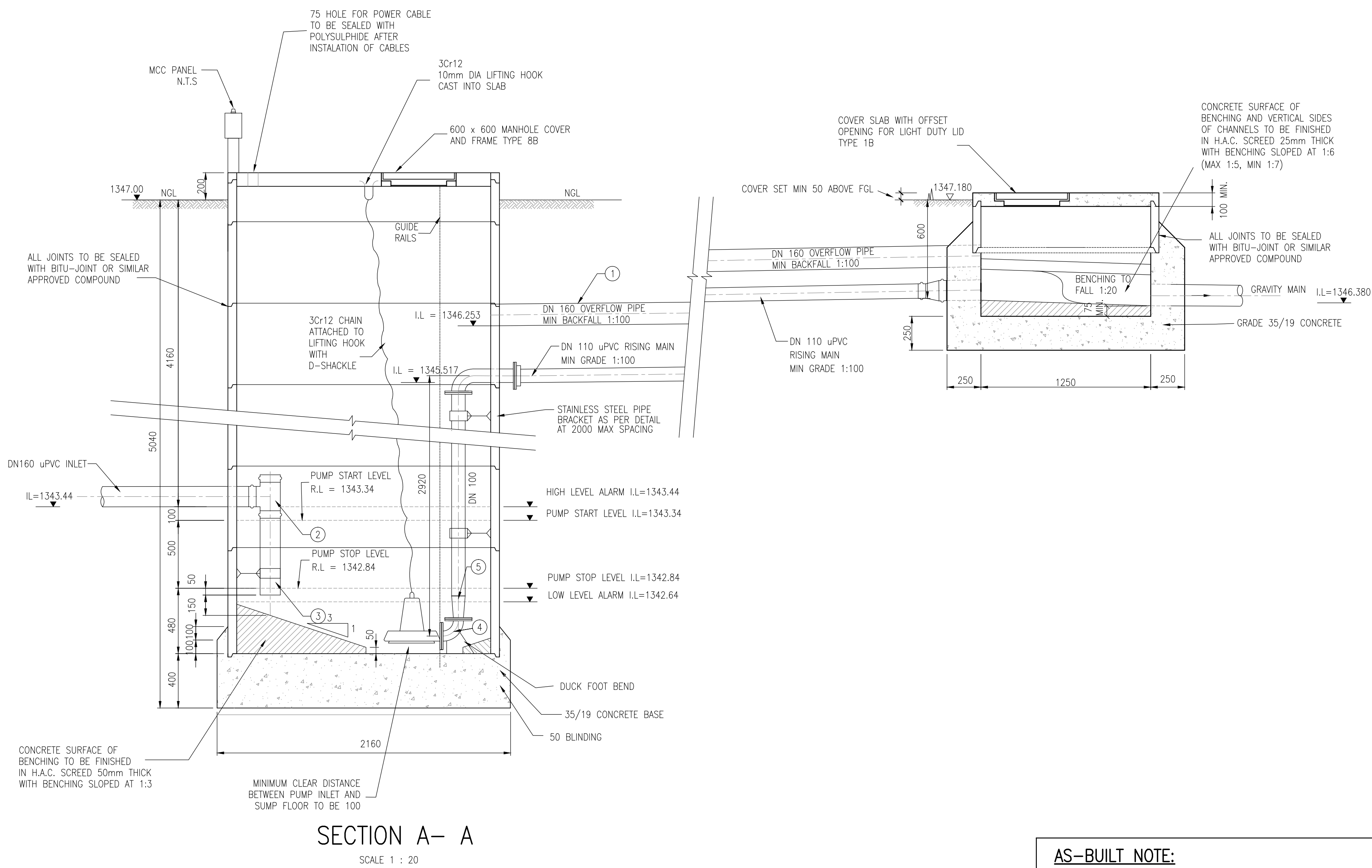
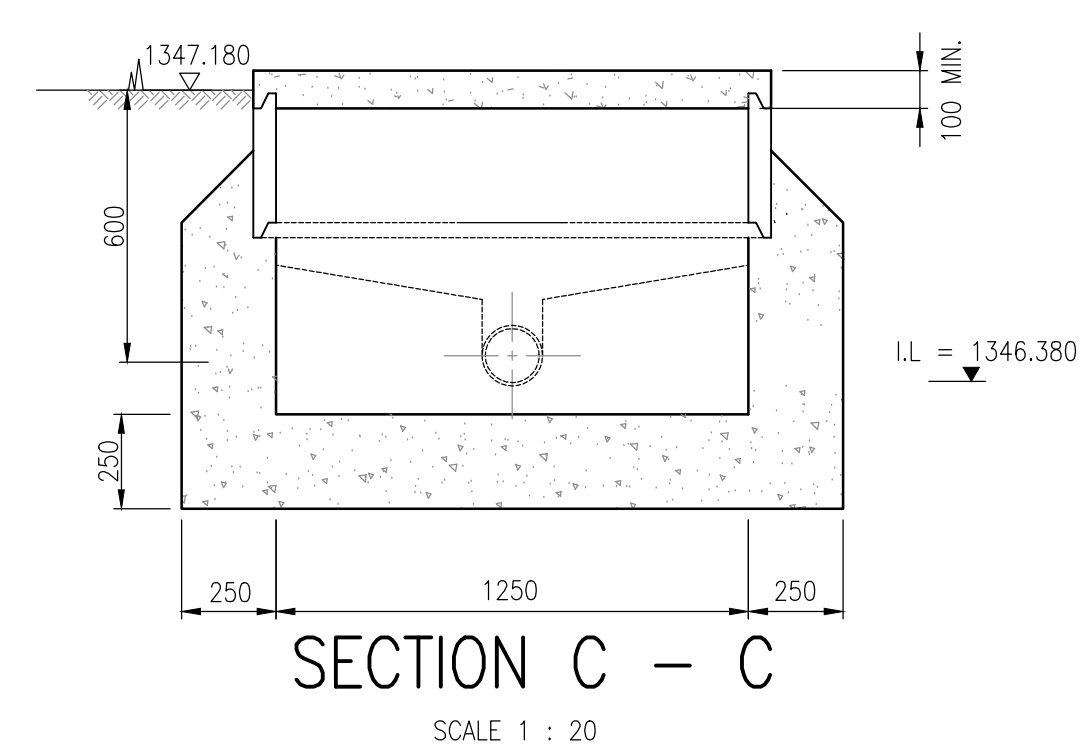
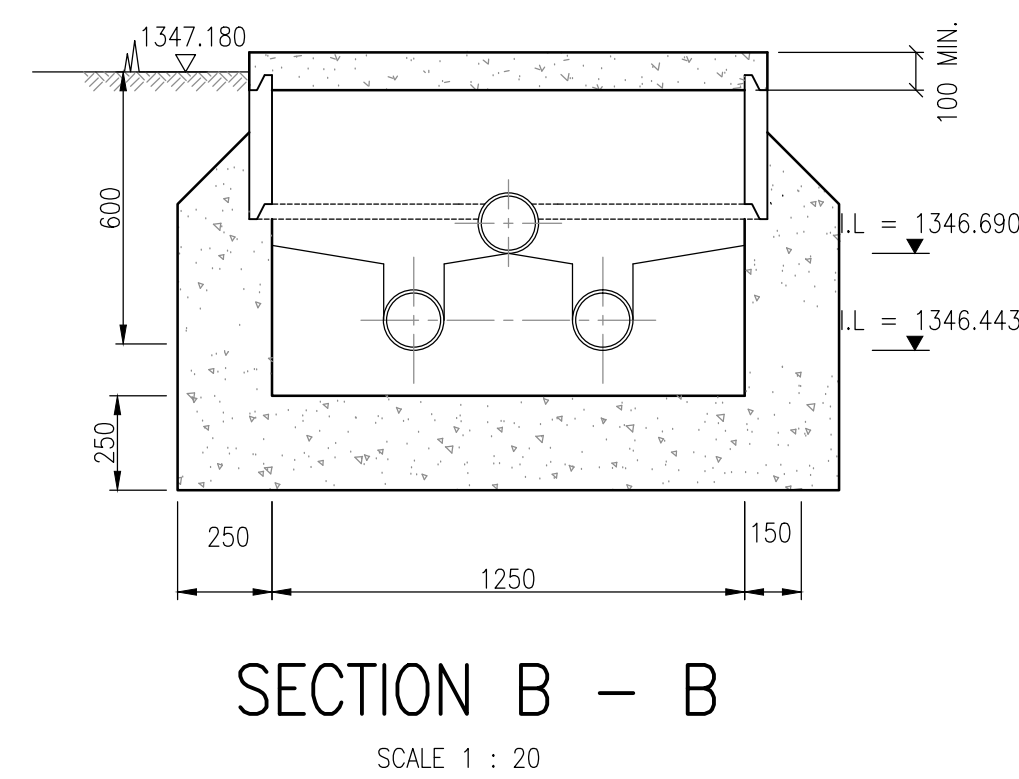
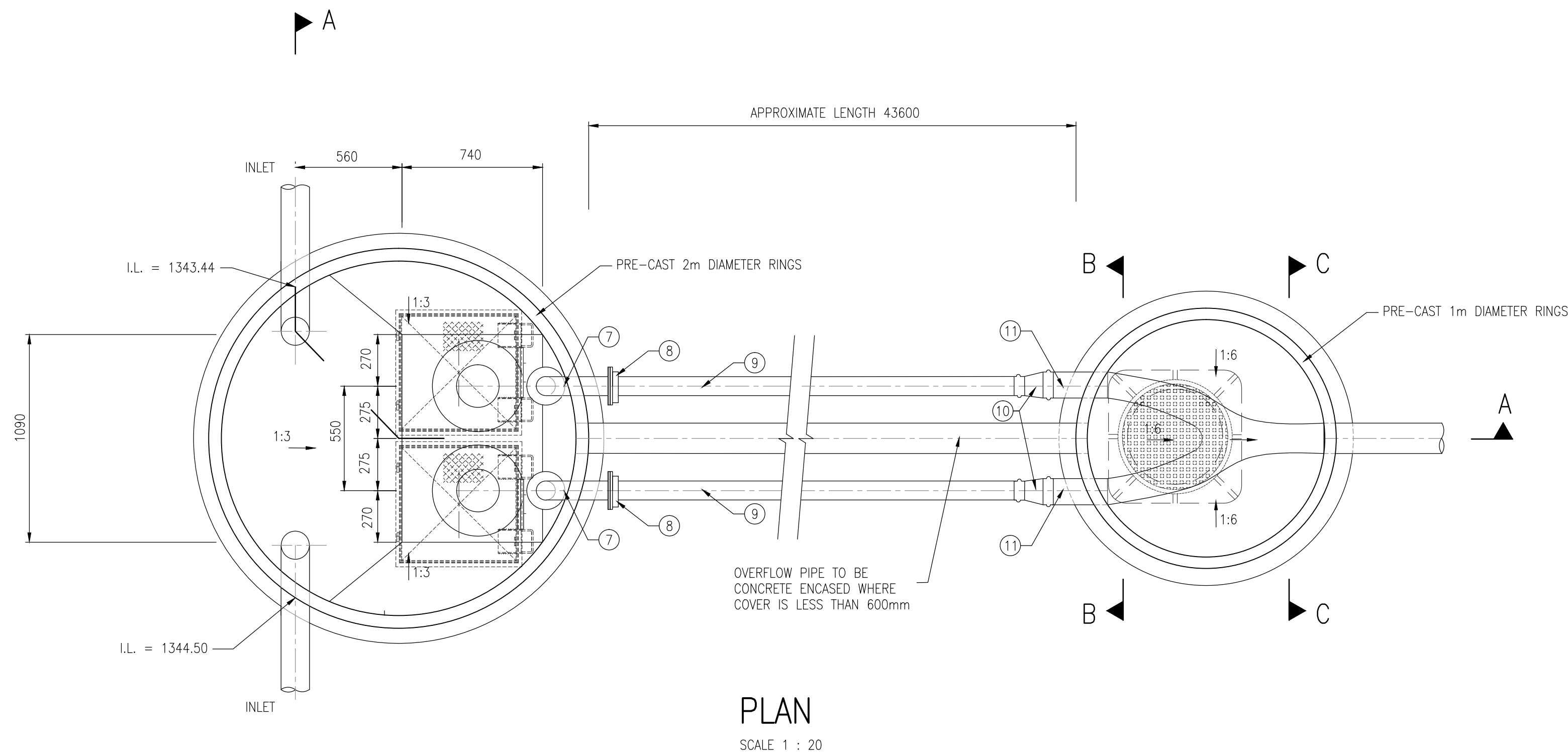
SCALE : AS SHOWN

DRAWING DESCRIPTION

STANDARD SEWER DETAILS

SHEET 1 OF 1

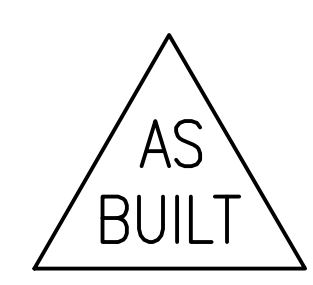
CONTRACT NUMBER		BL13/29/AU/02	
DRAWING LOCATION DATA	START	END	
ROUTE	-	-	
SECTION	-	-	
DRAWING km DISTANCE	-	-	
DRAWING TYPE	WATER RELATED		
DRAWING NUMBER	TBFN90 DP 01 S		REV. 



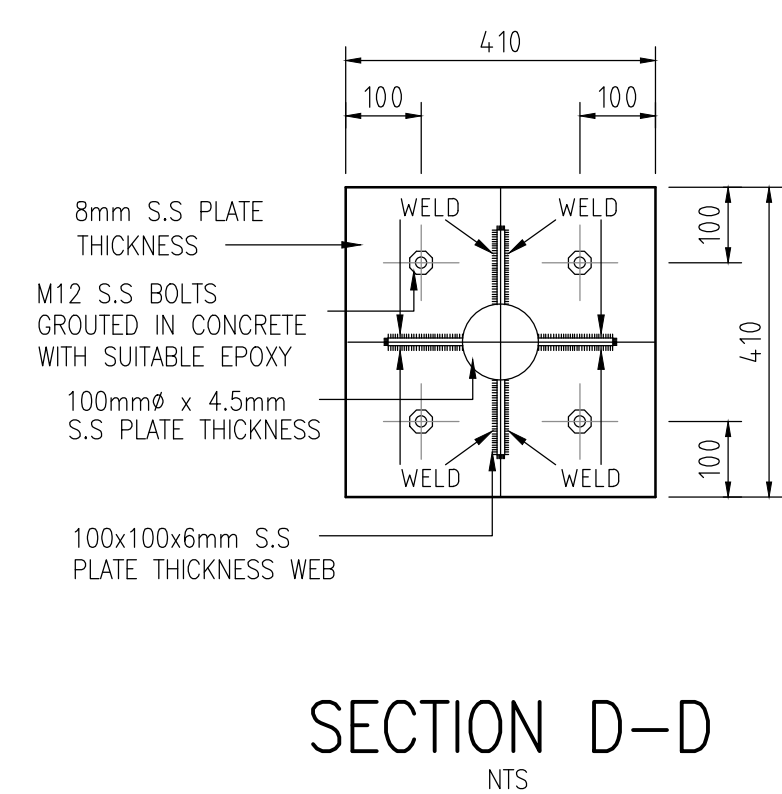
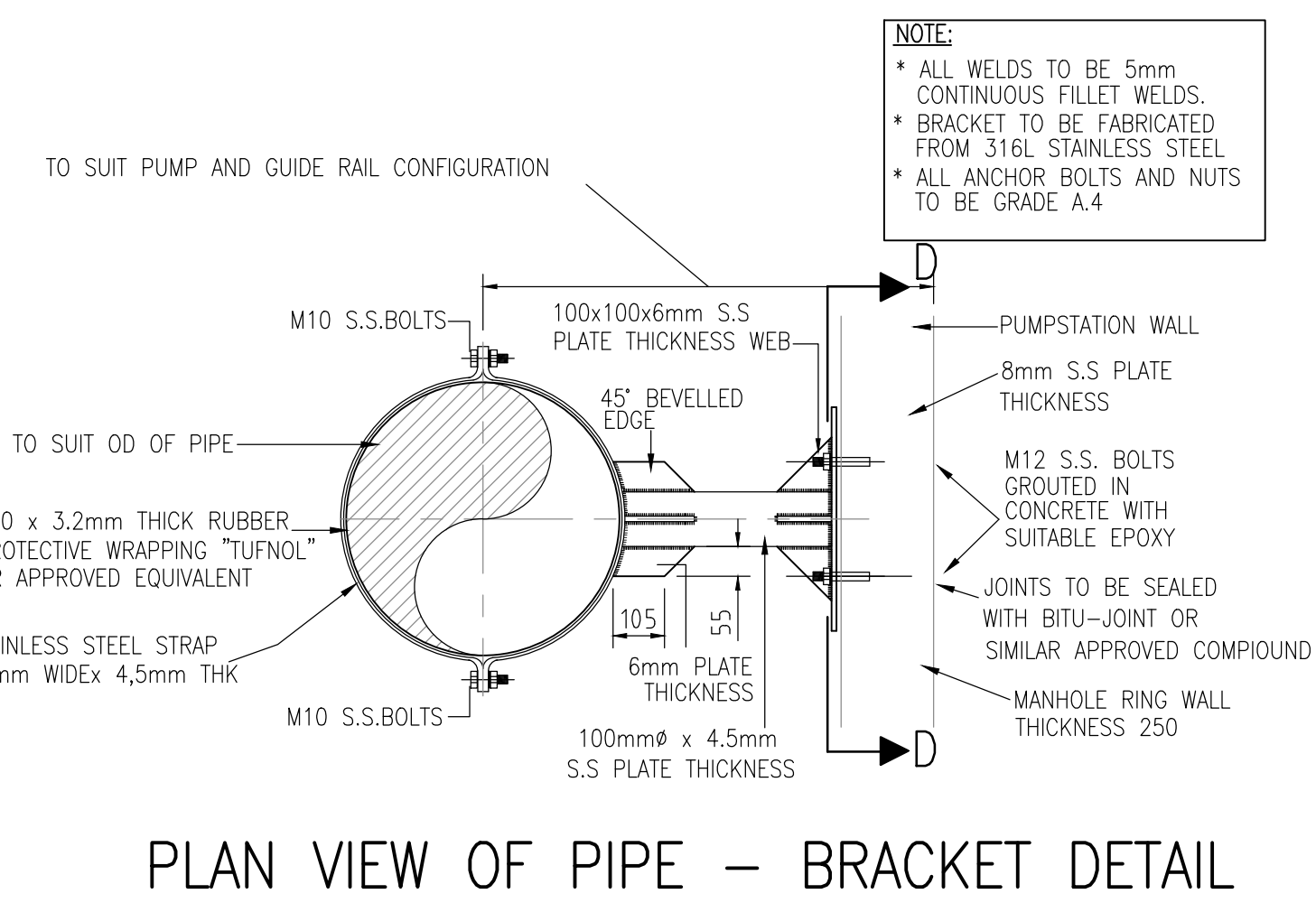
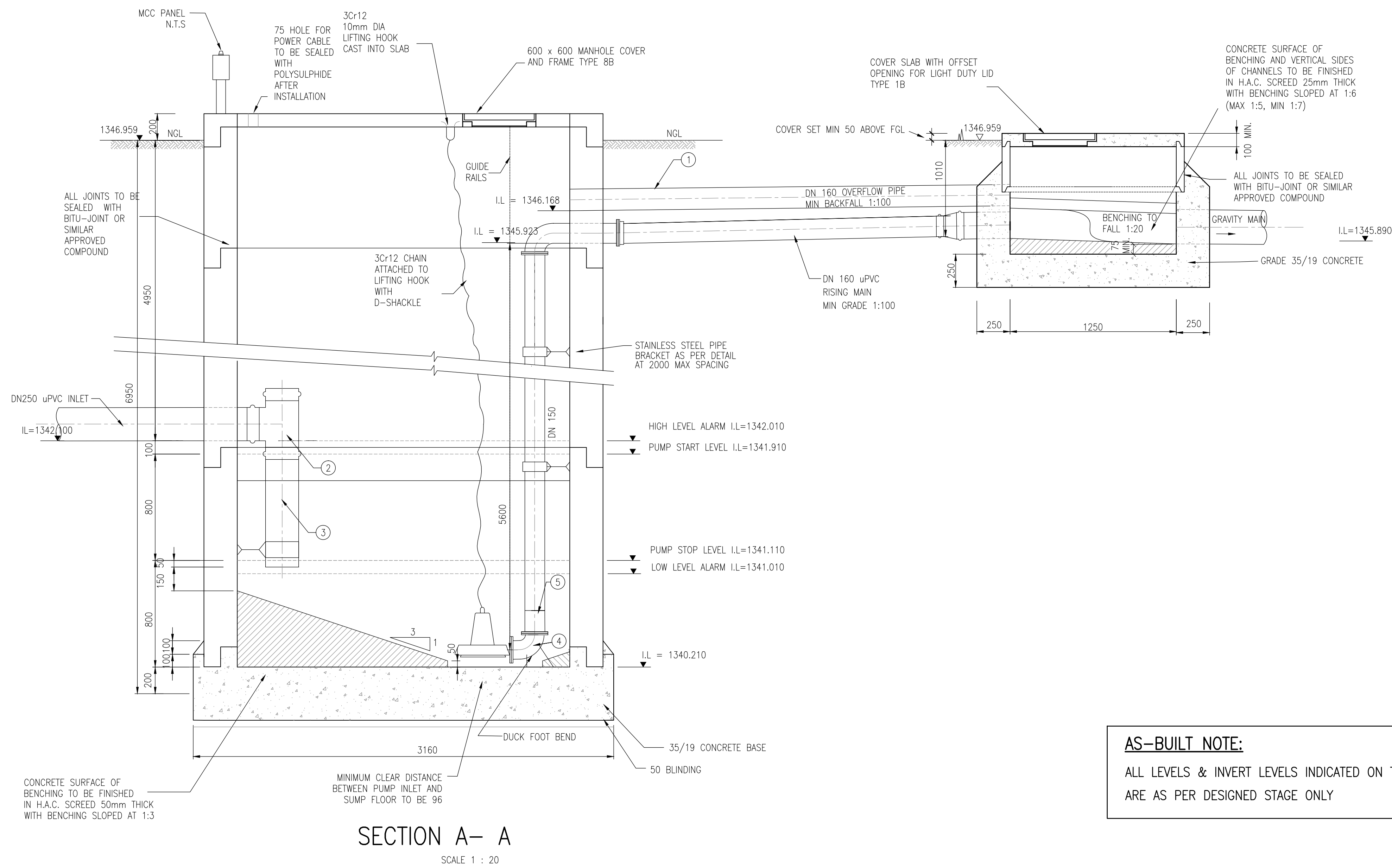
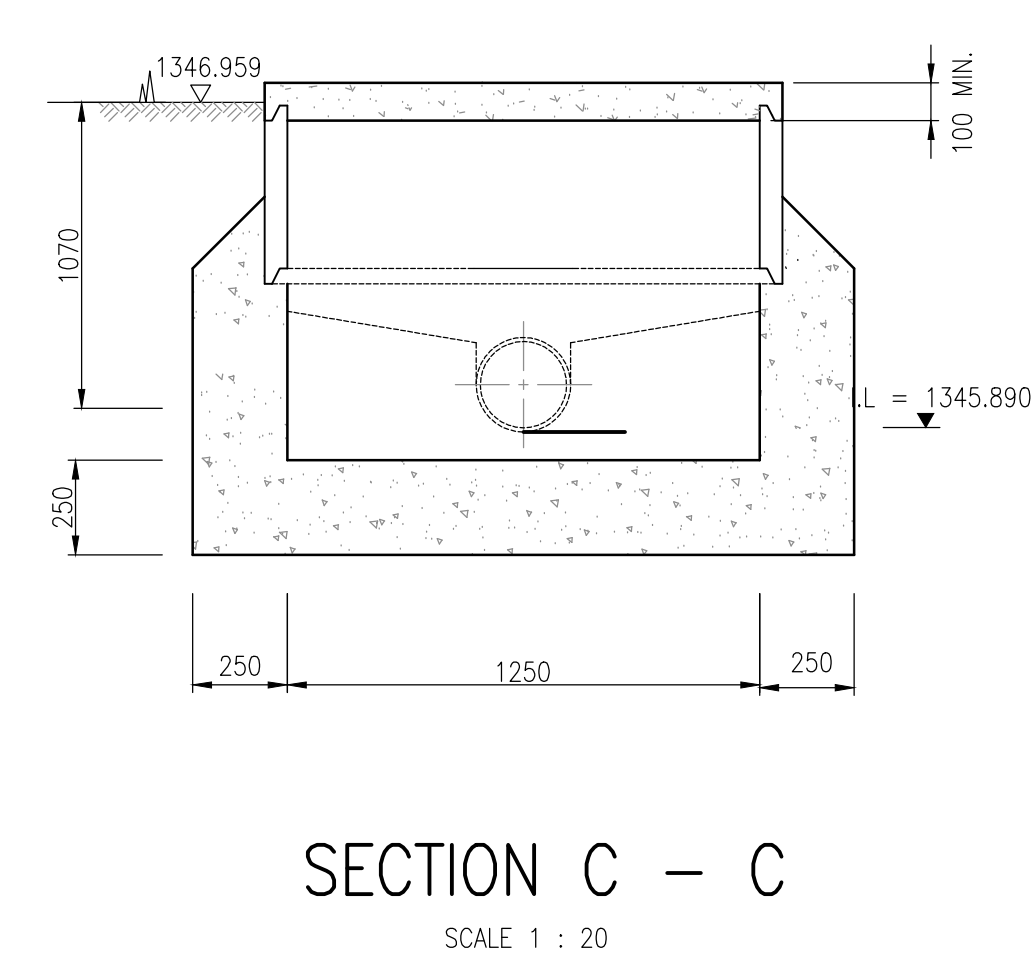
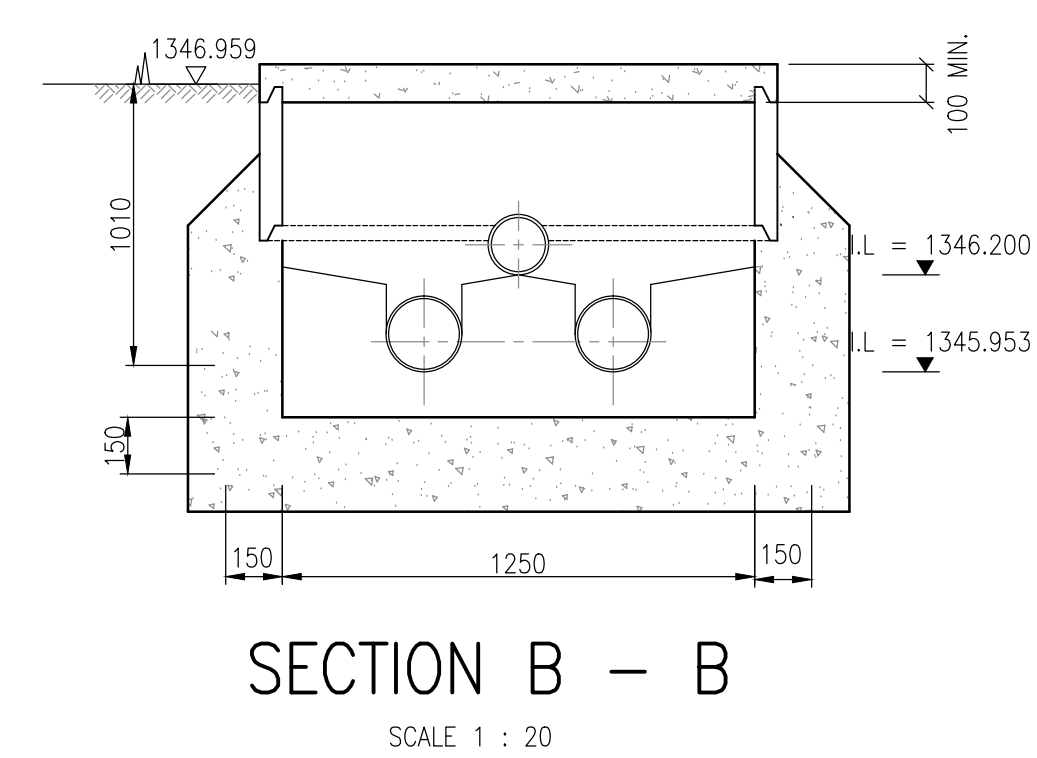
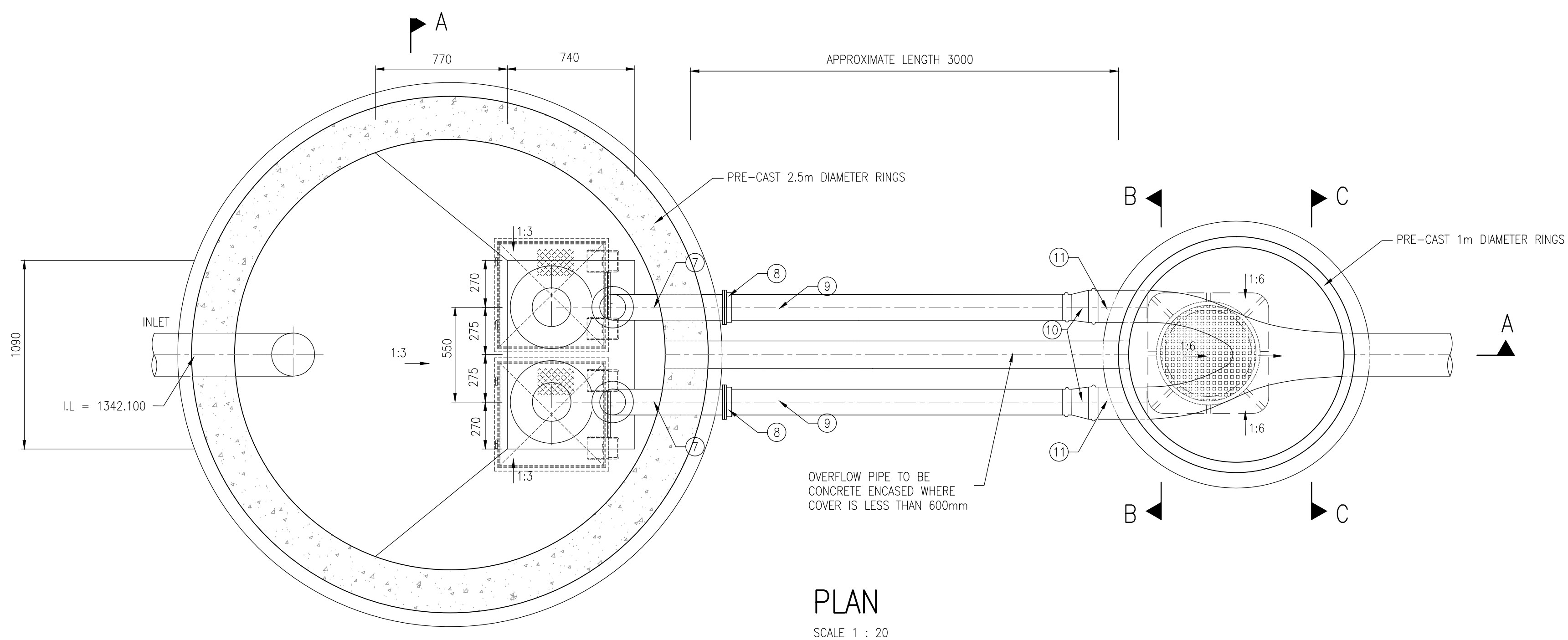
ITEM	DESCRIPTION	No. OFF
1	DN 160 CLASS 9 uPVC PIPE	43.6m
2	DN 160 CI SOCKETED TEE	2
3	DN 160 uPVC PIPE, APPROX 0.6m LONG	2
4	DN 80 x 90° D/FL STAINLESS STEEL DUCKFOOT BEND, 125mm C/F	2
5	DN 100 FL/PE STAINLESS STEEL PIPE 2920mm LONG WITH DN 80 x DN 100 FL/PE (FL ON THE DN 80) REDUCER WELDED ONTO THE DN 100 PIPE	2
7	DN 100 x 90° D/FL STAINLESS STEEL SMOOTH RADIUS BEND, ONE LEG 125mm C/F OTHER LEG 405mm C/F	2
8	DN 110 CI FLANGE ADAPTOR COUPLING	2
9	DN 110 CLASS 9 uPVC PIPE	86m
10	DN 110 x DN 160 CI REDUCER	2
11	DN 160 CLASS 9 uPVC PIPE	2m

AS-BUILT NOTE:
ALL LEVELS & INVERT LEVELS INDICATED ON THIS DRAWING ARE AS PER DESIGNED STAGE ONLY

- NOTES:**
- PIPEWORK
 - ALL PIPEWORK INSIDE MANHOLE TO BE STAINLESS STEEL WITH FLANGED ENDS
 - ALL FLANGES TO BE SABS 1123 TABLE 1000/3
 - ALL BURIED INTER CONNECTING PIPEWORK TO BE CLASS 9 uPVC
 - ALL PIPEWORK DIMENSIONS TO BE CHECKED ON SITE PRIOR TO FABRICATION
 - ALL BURIED FLANGES TO BE WRAPPED WITH APPROVED MASTIC AND BITUMASTIC TAPE
 - BEDDING AND BACKFILL TO BE COMPACTED TO 93% MOD AASHTO
 - BEDDING AND BACKFILL UNDERNEATH ROADS TO BE COMPACTED TO 95% MOD AASHTO
 - PUMPS
 - SUBMERSIBLE PUMPS TO SUIT PERFORMANCE SPECIFICATION OF Q=146/s AND H=5m (KSB AMAREX KRT F 80-210 Ø 1450rpm OR SIMILAR APPROVED)
 - PUMPS TO OPERATE ON A SINGLE DUTY AND STANDBY BASIS
 - ELECTRICAL
 - GENERAL MCC REQUIREMENTS:
 - CONTRACTOR RESPONSIBLE FOR THE DESIGN OF THE PANEL, IN ACCORDANCE WITH PUMP SIZES, FAULT LEVELS,ETC
 - PANEL TO BE OF THE OUTDOOR, WEATHERPROOF, PLUNTH MOUNTED, IP65, DOUBLE DOOR SYSTEM TYPE
 - PANEL TO BE MANUFACTURED FROM 3CR12, 1.6MM, POWDER COATED ELECTRIC ORANGE
 - MCC TO BE OF FORM 3B OR 4A
 - ENGINEER TO APPROVE SHOP DRAWINGS (TO BE SUBMITTED BY CONTRACTOR) PRIOR TO MANUFACTURE
 - COMPARTMENTS REQUIRED
 - INCOMER COMPARTMENT
 - PUMP 1 COMPARTMENT
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 - CONTROLS COMPARTMENT
 - CLASS 1 AND 2 SURGE PROTECTION DEVICES TO BE INSTALLED IN INCOMER
 - STARTER REQUIREMENTS (FOR EACH PUMP):
 - DOL WITH THERMAL OVERLOAD PROTECTION, INCORPORATING PHASE
 - EARTH LEAKAGE PROTECTION REQUIRED
 - CONTROLS:
 - MANUAL/OFF/AUTO SELECTION
 - MANUAL: CONTROL VIA START AND STOP PUSH BUTTONS
 - AUTO: CONTROL VIA LEVEL ELECTRODES AND LEVEL CONTROLLER
 - DUTY SELECTOR SWITCH
 - INDICATIONS
 - INCOMER COMPARTMENT
 - MAINS ON (WHITE)
 - PHASE FAILURE (BLUE)
 - 96 X 96 VOLTMETER WITH 7 WAY SELECTOR SWITCH
 - 3 OFF 96 X 96 AMMETER FOR EACH PHASE
 - PUMP COMPARTMENT
 - PUMP RUNNING
 - PUMP OFF
 - PUMP TRIPPED
 - MOISTURE INGRESS
 - RUN HOUR METER
 - 72 X 72 AMMETER
 - GENERAL
 - STROPOSOPIC ALARMS INDICATOR WITH SIREN FOR ALL FAULTS AND TRIPS
 - INSTRUMENTATION
 - THREE LEVEL SS316 LEVEL ELECTRODES TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR (COMMON, LOW, HIGH)
 - CONTRACTOR TO PROVIDE CERTIFICATE OF COMPLIANCE ON COMPLETION OF INSTALLATION



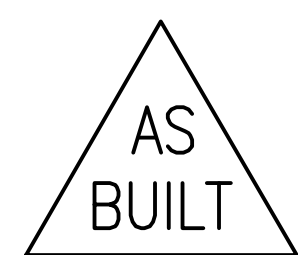
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PIPE ASSEMBLIES		
ITEM	DESCRIPTION	No. OFF
1	DN 160 CLASS 9 uPVC PIPE	3m
2	DN 250 CI SOCKETED TEE	1
3	DN 160 uPVC PIPE, APPROX 0.92m LONG	1
4	DN 150 x 90° D/FL STAINLESS STEEL DUCKFOOT BEND, 150mm C/F	2
5	DN 150 FL/PE STAINLESS STEEL PIPE 560mm LONG	2
7	DN 150 x 90° D/FL STAINLESS STEEL SMOOTH RADIUS BEND, ONE LEG 150mm C/F OTHER LEG 405mm C/F	2
8	DN 160 CI FLANGE ADAPTOR COUPLING	2
9	DN 160 CLASS 9 uPVC PIPE	6m
10	DN 150 x DN 200 CI REDUCER	2
11	DN 200 CLASS 9 uPVC PIPE	2m

AS-BUILT NOTE:
ALL LEVELS & INVERT LEVELS INDICATED ON THIS DRAWING ARE AS PER DESIGNED STAGE ONLY

- NOTES:**
- PIPEWORK
 - ALL PIPEWORK INSIDE MANHOLE TO BE STAINLESS STEEL WITH FLANGED ENDS
 - ALL FLANGES TO BE SABS 1123 TABLE 1000/3
 - ALL BURIED INTER CONNECTING PIPEWORK TO BE CLASS 9 uPVC
 - ALL PIPEWORK DIMENSIONS TO BE CHECKED ON SITE PRIOR TO FABRICATION
 - ALL BURIED FLANGES TO BE WRAPPED WITH APPROVED MASTIC AND BITUMASTIC TAPE
 - BEDDING AND BACKFILL TO BE COMPACTED TO 93% MOD AASHTO
 - BEDDING AND BACKFILL UNDERNEATH ROADS TO BE COMPACTED TO 95% MOD AASHTO
 - PUMPS
 - SUBMERSIBLE PUMPS TO SUIT PERFORMANCE SPECIFICATION OF Q=40l/s AND H=6m (KSB AMAREX KRT F 150-315 Ø 960rpm OR SIMILAR APPROVED)
 - PUMPS TO OPERATE ON A SINGLE DUTY AND STANDBY BASIS
 - ELECTRICAL
 - GENERAL MCC REQUIREMENTS:
 - CONTRACTOR RESPONSIBLE FOR THE DESIGN OF THE PANEL, IN ACCORDANCE WITH PUMP SIZES, FAULT LEVELS, ETC
 - PANEL TO BE OF THE OUTDOOR, WEATHERPROOF, PLINTH MOUNTED, IP65, DOUBLE DOOR SYSTEM TYPE
 - PANEL TO BE MANUFACTURED FROM 3CR12, 1.6MM, POWDER COATED ELECTRIC ORANGE
 - MCC TO BE OF FORM 3B OR 4A
 - ENGINEER TO APPROVE SHOP DRAWINGS (TO BE SUBMITTED BY CONTRACTOR) PRIOR TO MANUFACTURE
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 - DOL WITH THERMAL OVERLOAD PROTECTION, INCORPORATING PHASE
 - EARTH LEAKAGE PROTECTION REQUIRED
 - CONTROLS:
 - MANUAL/OFF/AUTO SELECTION
 - MANUAL CONTROL VIA START AND STOP PUSH BUTTONS
 - AUTO: CONTROL VIA LEVEL ELECTRODES AND LEVEL CONTROLLER
 - DUTY SELECTOR SWITCH
 - INDICATIONS
 - INCOMER COMPARTMENT
 - MAINS ON (WHITE)
 - PHASE FAILURE (BLUE)
 - 96 X 96 VOLTMETER WITH 7 WAY SELECTOR SWITCH
 - 3 OFF 96 X 96 AMMETER FOR EACH PHASE
 - PUMP COMPARTMENT
 - PUMP RUNNING
 - PUMP OFF
 - PUMP TRIPPED
 - MOISTURE INGRESS
 - RUN HOUR METER
 - 72 X 72 AMMETER
 - GENERAL
 - STROBOSCOPIC ALARMS INDICATOR WITH SIREN FOR ALL FAULTS AND TRIPS
 - INSTRUMENTATION
 - THREE LEVEL SS316 LEVEL ELECTRODES TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR (COMMON, LOW, HIGH)
 - CONTRACTOR TO PROVIDE CERTIFICATE OF COMPLIANCE ON COMPLETION OF INSTALLATION



No.	DATE	REVISION	CONSULT. ENG.
2	13/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
1	15/02/2013	REVISED LEVELS	
0	07/12/2012	ISSUED FOR CONSTRUCTION	
A	02/7/2012	ISSUED FOR TENDER PURPOSES	



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220

DESIGNED BY	S.S.
DRAWN BY	R.M.
CHECKED BY	D.C.

APPROVED	Name : DOMING COLLETT Prof. Reg. No. : 200170067 Date : FEB 2013
CONSTRUCTION RECORD DRAWING	Name : Prof. Reg. No. : Date :

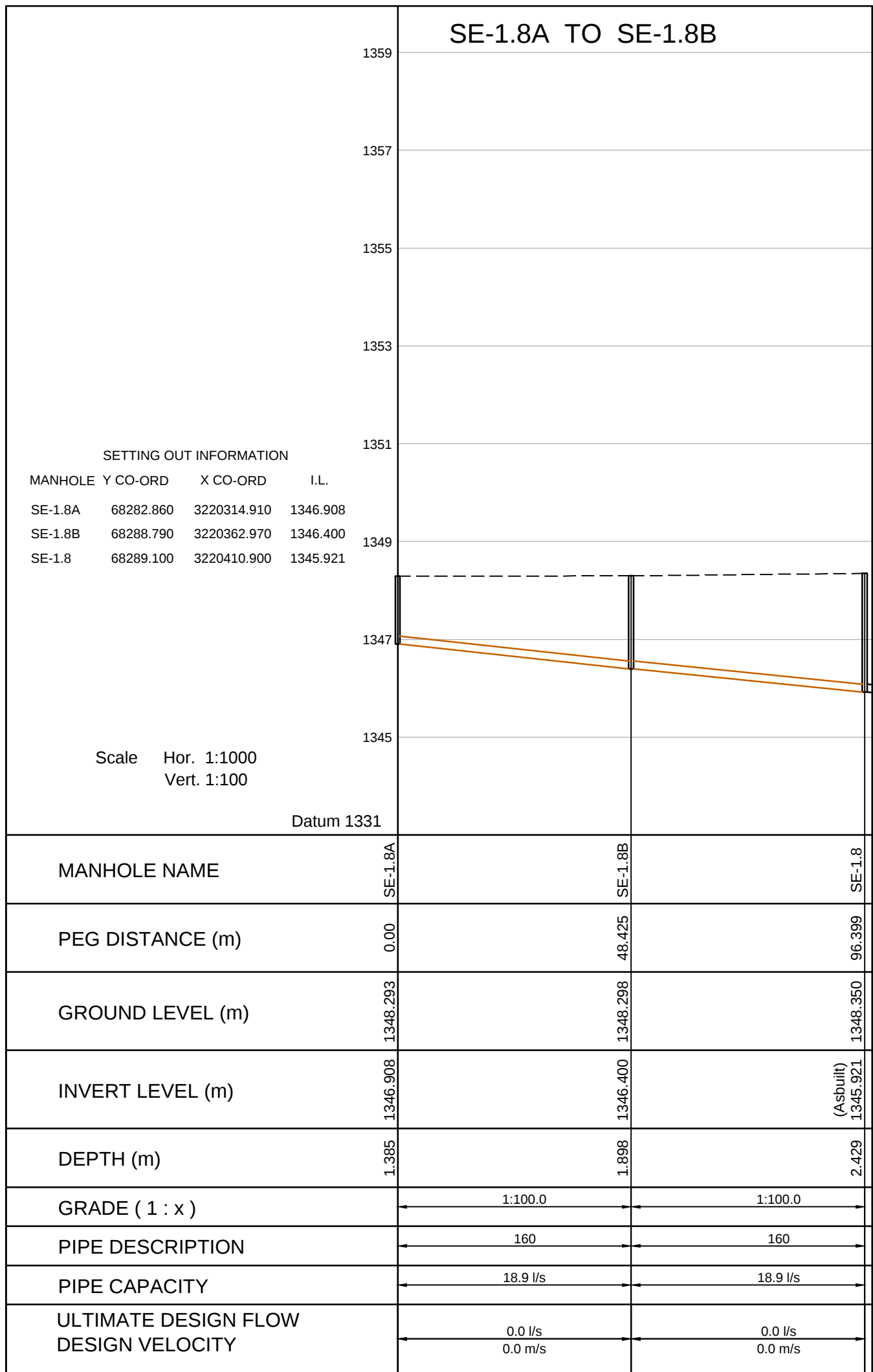
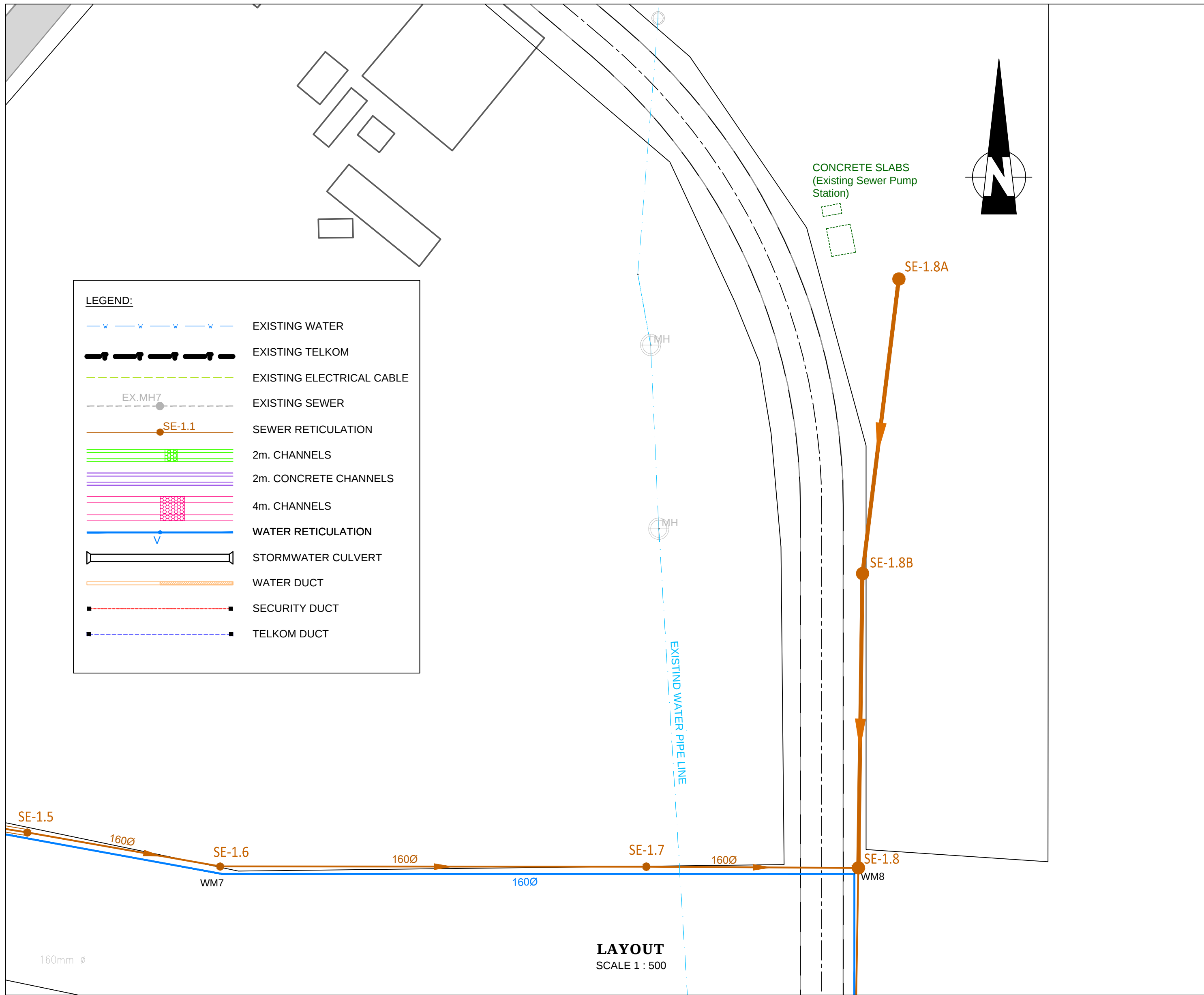


ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
AIRPORTS COMPANY SOUTH AFRICA
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : 1 : 20

DRAWING DESCRIPTION
SEWER PUMP STATION NO.3
SHEET OF

CONTRACT NUMBER	BL13/29/AU/02
DRAWING LOCATION DATA	START END
ROUTE	- -
SECTION	- -
DRAWING km DISTANCE	- -
DRAWING TYPE	WATER RELATED
DRAWING NUMBER	TBFN90 DP 04 S
REV.	2



No.	DATE	REVISION	CONSULT. ENG.
1	13/5/2014	ISSUED FOR TENDER PURPOSES	THUSO CONSULTING
0	27/5/2013	ISSUED FOR CONSTRUCTION	



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL
CONSULTANTS (Pty) Ltd TRADING AS
ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDHOF
3324
BLOEMFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220

DESIGNED BY	222802620
Name :	DOMINIC COLLETT
Prof. Reg. No. :	200370067
Date :	MAY 2013
DRAWN BY	
Name :	
Prof. Reg. No. :	
Date :	
CHECKED BY	
Name :	
Prof. Reg. No. :	
Date :	

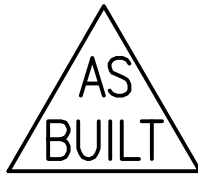


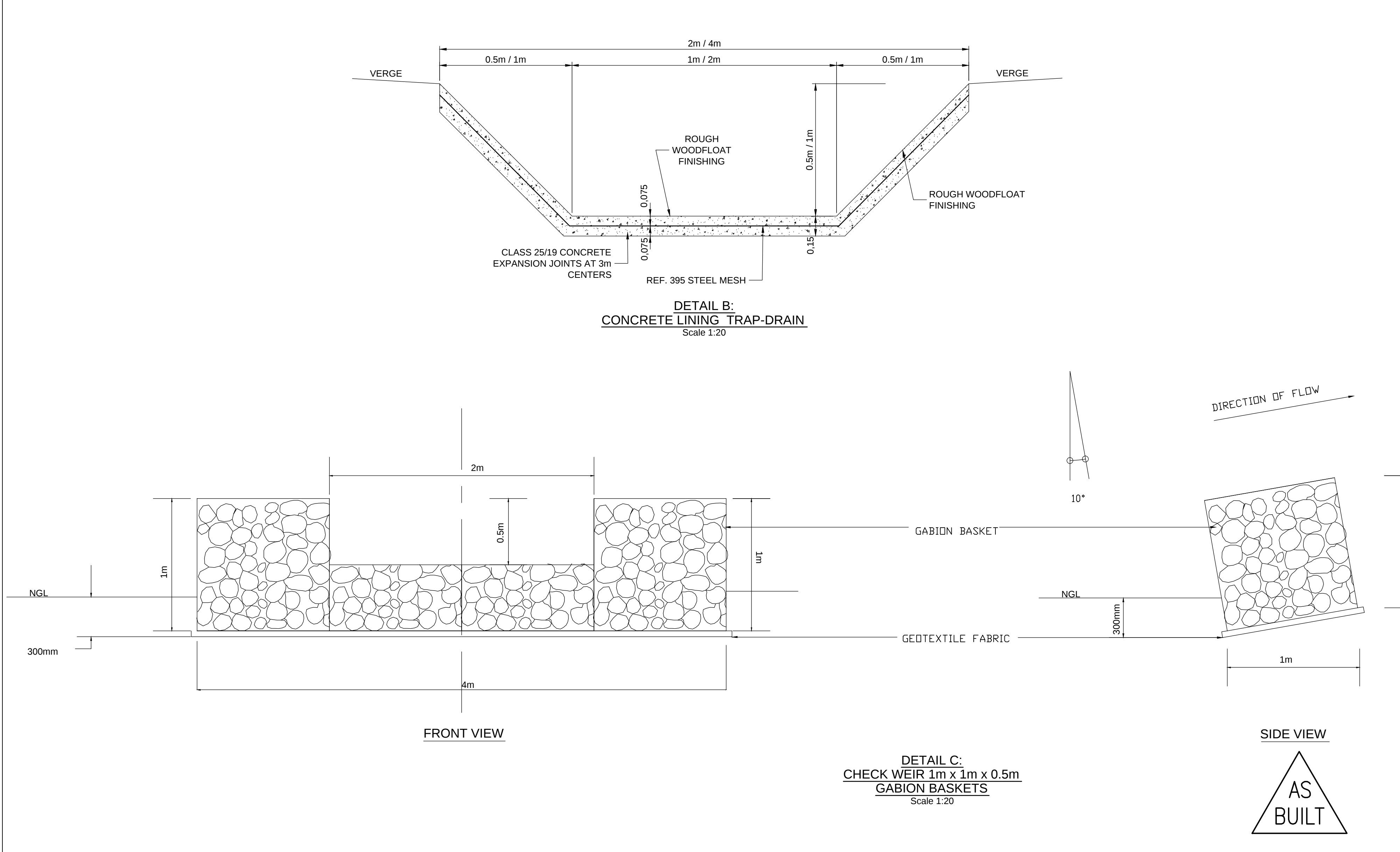
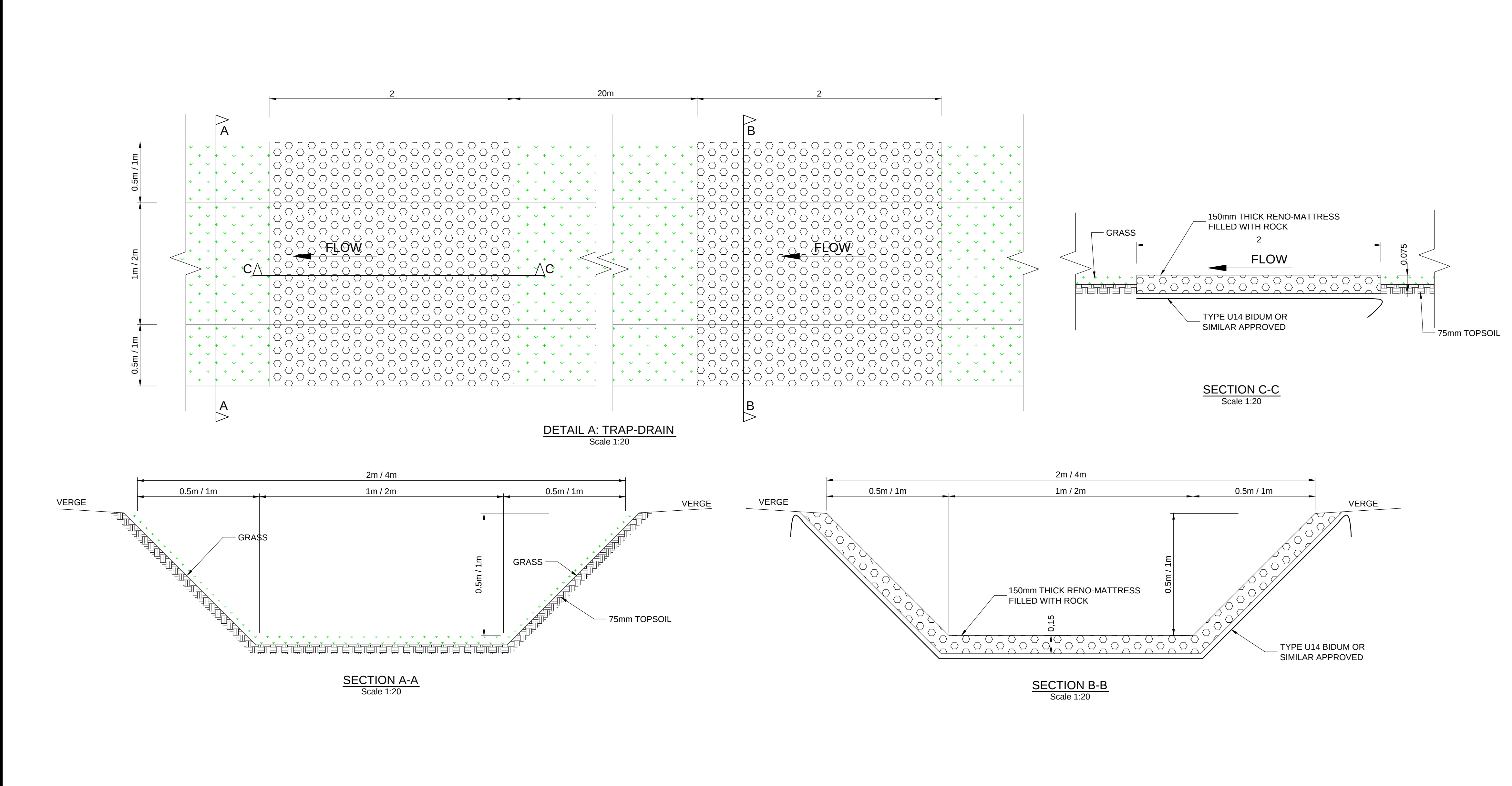
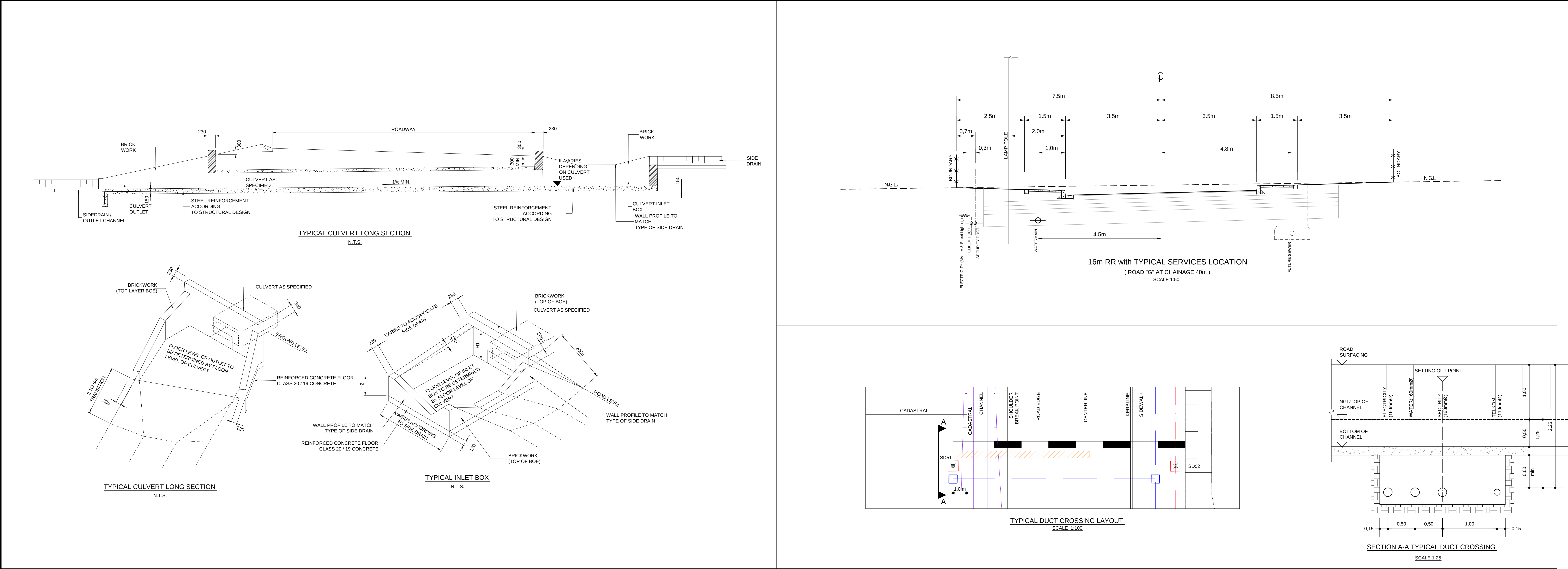
ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND
ADMINISTRATIVE REVIEW PURPOSES ONLY
AND DOES NOT ATTRACT LEGAL LIABILITY OR
LIABILITY OF ANY KIND FROM WHATSOEVER
CAUSE OR HOWEVER ARISING
AIRPORTS COMPANY SOUTH AFRICA
Date:

PROJECT DESCRIPTION
CONSTRUCTION OF NEW
WATER AND DRAINAGE
SERVICES AT BLOEMFONTEIN
AIRPORT
SCALE : AS SHOWN

DRAWING DESCRIPTION
ADDITIONAL SEWER
LINE TO EXISTING PUMP
STATION
SHEET OF

CONTRACT NUMBER		BL13/29/AU/02	
DRAWING LOCATION DATA		START	END
ROUTE		-	-
SECTION		-	-
DRAWING km DISTANCE		-	-
DRAWING TYPE		WATER RELATED	
DRAWING NUMBER		TBFN 90/DP/05/S	
		REV.	0





DESIGNED BY			DESIGNED BY			APPROVED			ACCEPTANCE			PROJECT DESCRIPTION			DRAWING DESCRIPTION			CONTRACT NUMBER			BL13/29/AU/02		
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV			S.S.			Name : D. COLLET			THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING			CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT			TYPICAL STORMWATER DETAILS			DRAWING LOCATION DATA			START		
P.O. BOX 12671 BRANDVORST 9324 BLOEMFONTEIN TEL: (051) 430 7200 FAX: (051) 430 8220			DRAWN BY			Date : 18/03/2013			AIRPORTS COMPANY SOUTH AFRICA			SCALE : AS SHOWN			SHEET 1 OF 2			ROUTE			-		
3 13/5/2014 CONSTRUCTION RECORD DRAWING THUSO CONSULTING			R.M.			CONSTRUCTION RECORD DRAWING			Date:			SECTION			DRAWING km DISTANCE			DRAWING TYPE			WATER RELATED		
2 18/03/2013 TYPICAL SERVICES SECTIONS EDITED			CHECKED BY			Name :			Date:			DRAWING NUMBER			TBFN90 DP 01 SW			REV			3		
1 15/03/2013 TYPICAL SECTION, RENO MATTRESSES & DUCT SECTION			D.C.			Prof. Reg. No. :			Date:			AS BUILT											
0 26/12/2012 ISSUED FOR CONSTRUCTION																							
No. DATE REVISION			CONSULT. ENG.																				



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
P.O. BOX 12671 BRANDVORST 9324 BLOEMFONTEIN
TEL: (051) 430 7200
FAX: (051) 430 8220

DESIGNED BY
S.S.
DRAWN BY
R.M.
CHECKED BY
D.C.

APPROVED
Name : D. COLLET
Prof. Reg. No. : 200170067
Date : 18/03/2013
CONSTRUCTION RECORD DRAWING
Name :
Prof. Reg. No. :
Date :

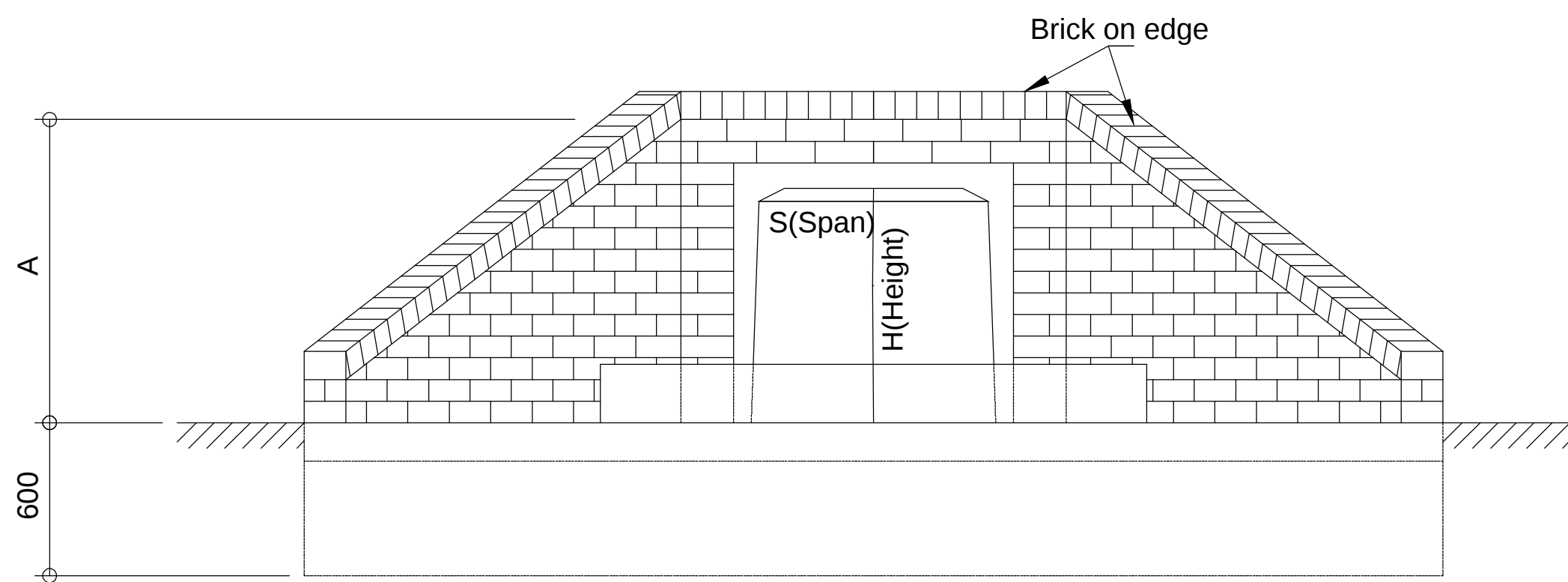


ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
AIRPORTS COMPANY SOUTH AFRICA
Date:

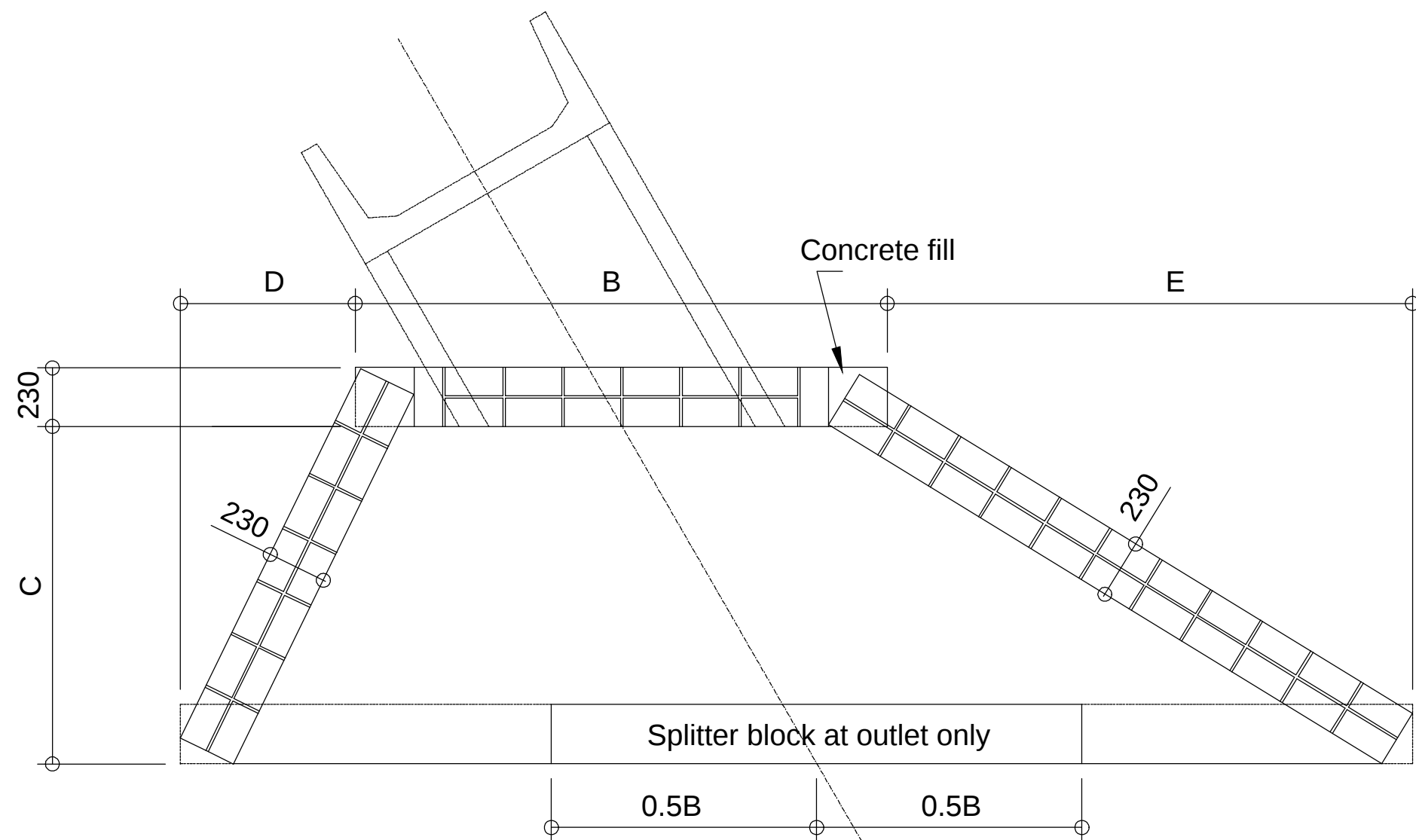
PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT
SCALE : AS SHOWN

DRAWING DESCRIPTION
TYPICAL STORMWATER DETAILS
SHEET 1 OF 2

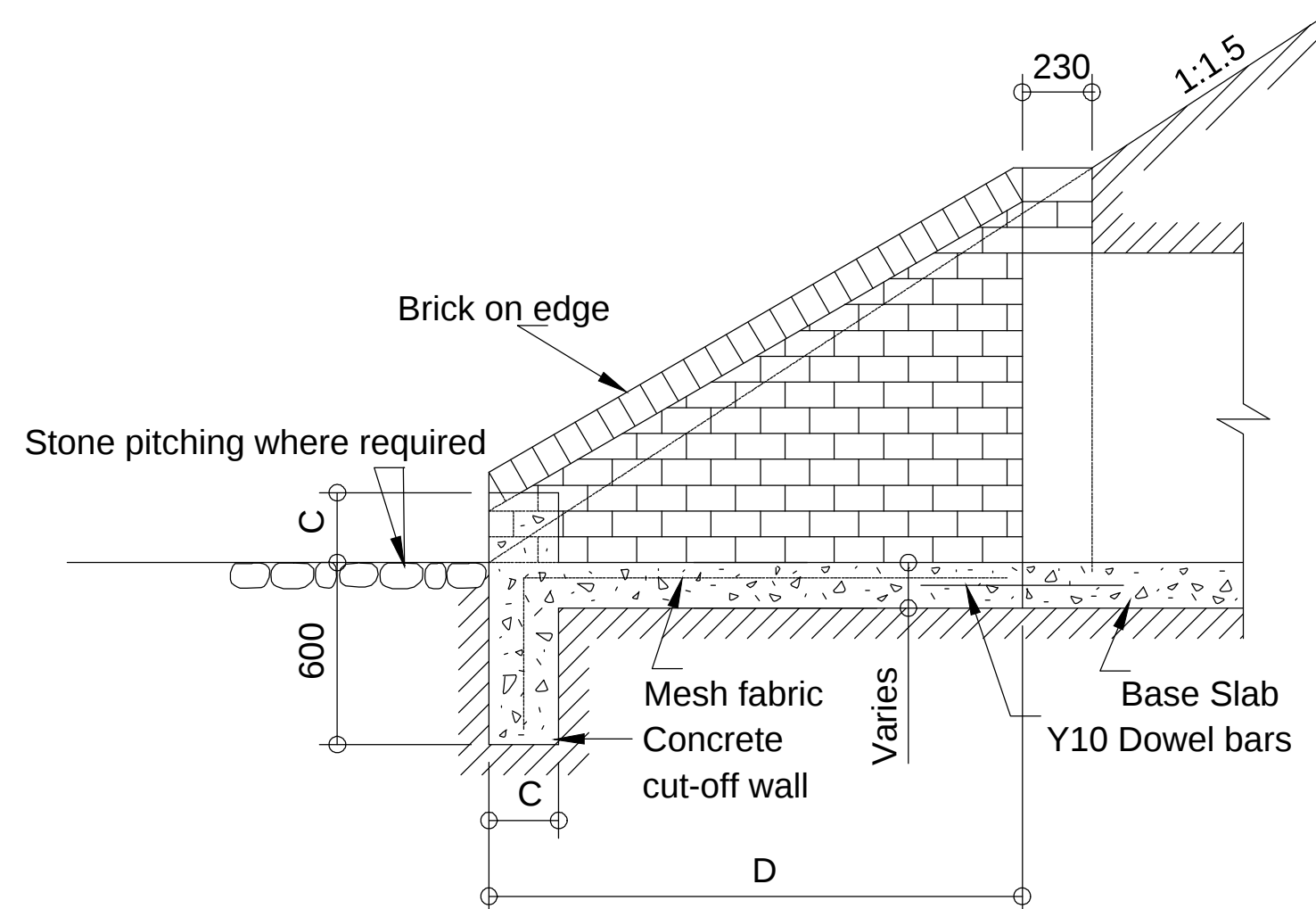
CONTRACT NUMBER		BL13/29/AU/02	
DRAWING LOCATION DATA		START	END
ROUTE		-	-
SECTION		-	-
DRAWING km DISTANCE		-	-
DRAWING TYPE		WATER RELATED	
DRAWING NUMBER		TBFN90 DP 01 SW	
		REV	3



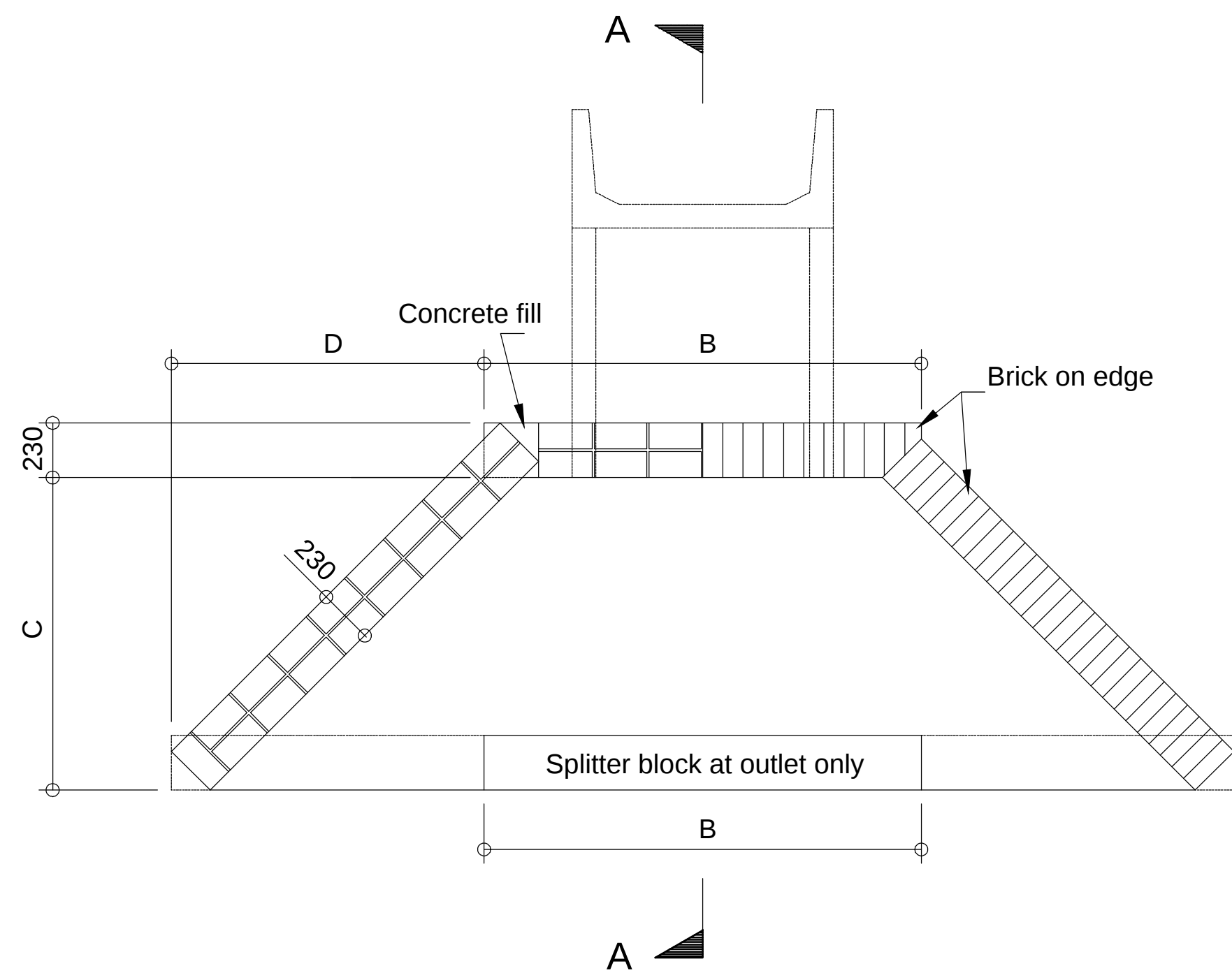
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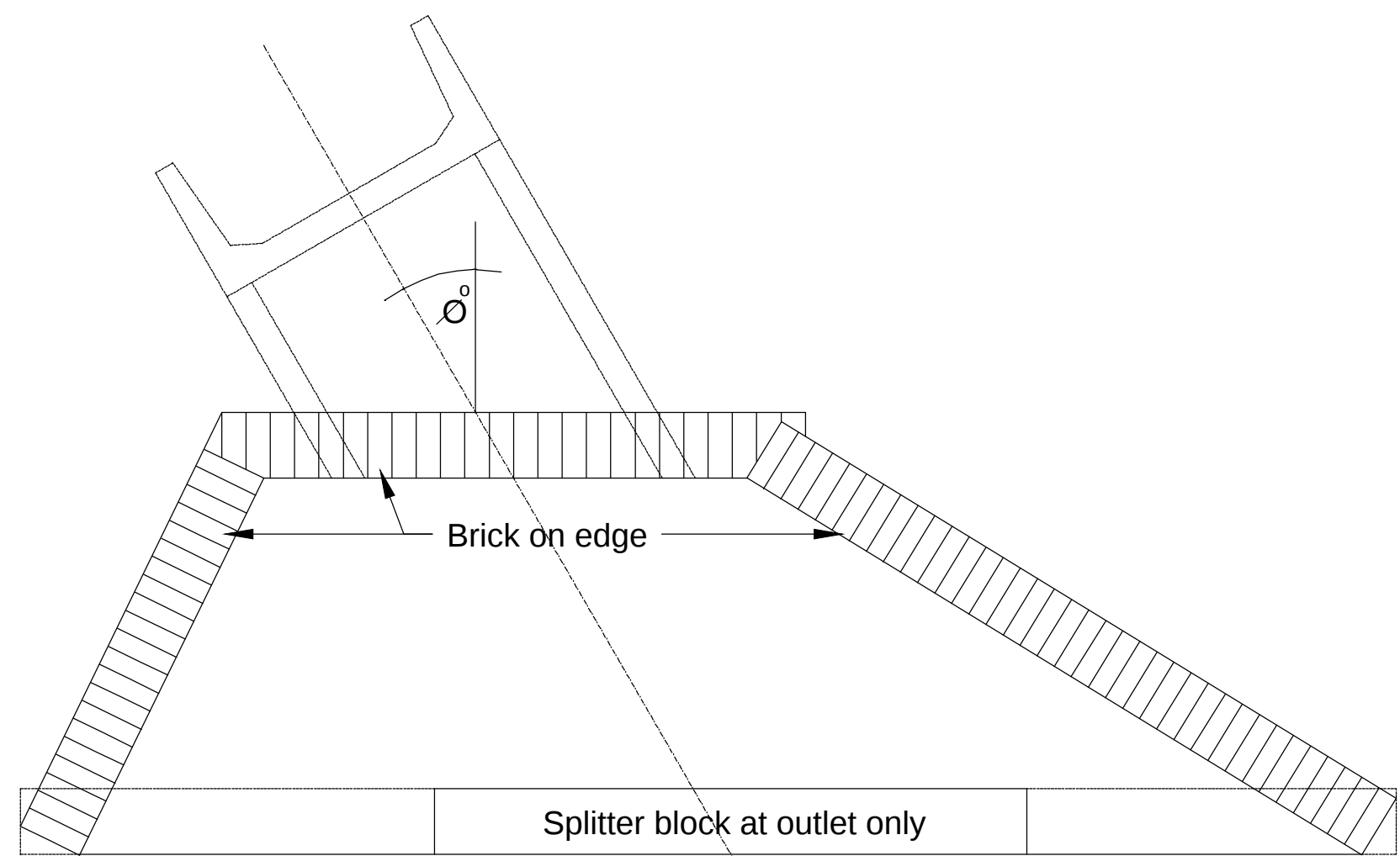
LAYOUT OF SKEW CULVERT BRICKWORK



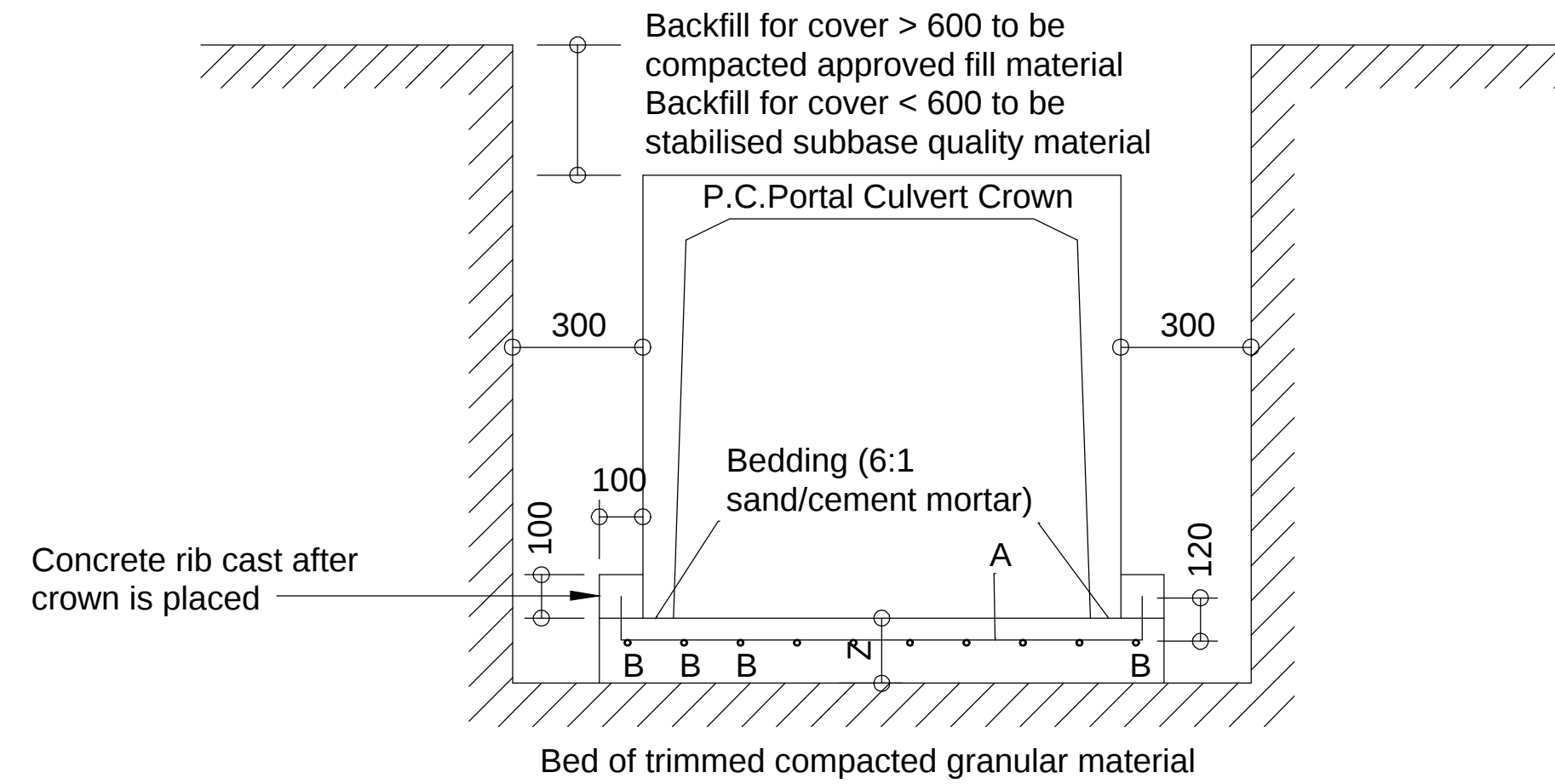
SECTION A-A



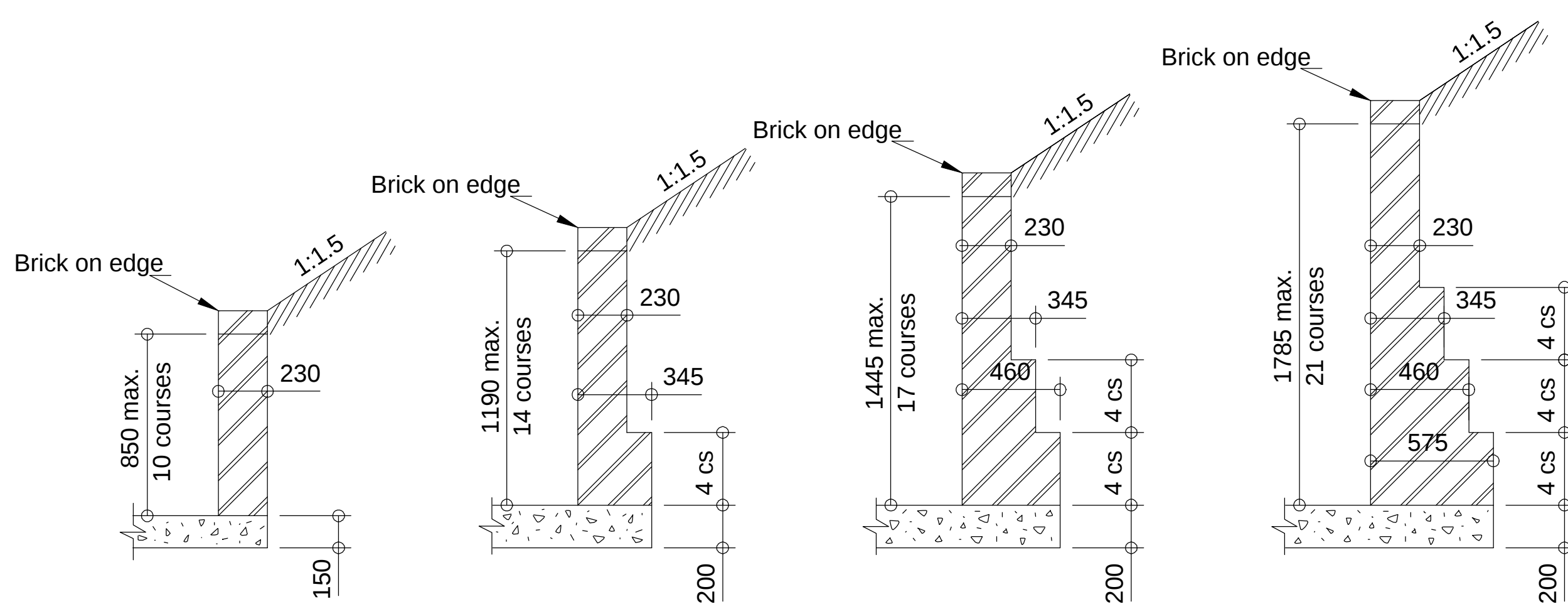
PART LAYOUT OF BRICKWORK/PART PLAN



PLAN OF SKEW CULVERT



SECTION SHOWING CAST IN-SITU BASE SLAB



TYPICAL RETAINING WALL DETAILS

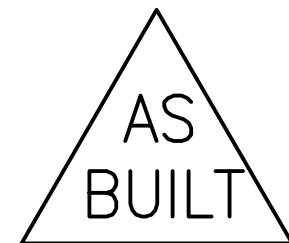
Dimensions (mm) for Skew 0°- 22.5 °						
S x H	A	B	C	D	E	F
600x450	680	1 495	700	700	700	150
750x600	850	1 610	900	900	900	150
900x900	1 190	1 840	1 300	1 300	1 300	230
1200x1200	1 445	2 185	1 800	1 800	1 800	230
1500x1500	1 785	2 530	2 200	2 200	2 200	230
Dimensions (mm) for Skew 23°- 45 °						
S x H	A	B	C	D	E	F
600x450	680	1 725	700	350	1 050	150
750x600	850	1 840	900	450	1 350	150
900x900	1 190	2 070	1 300	650	1 950	230
1200x1200	1 445	2 415	1 800	900	2 700	230
1500x1500	1 785	2 760	2 200	1 100	3 300	230
Dimensions (mm) for Skew > 46 °						
S x H	A	B	C	D	E	F
600x450	680	1 955	700	0	1 400	150
750x600	850	2 070	900	0	1 800	150
900x900	1 190	2 300	1 300	0	2 600	230
1200x1200	1 445	2 645	1 800	0	3 600	230
1500x1500	1 785	2 990	2 200	0	4 400	230

DETAILS OF CAST IN-SITU BASE					
SPAN	SLAB	BARS 'A'		BARS 'B'	
	THICKNESS (Z)	DIA.	SPACING	DIA.	SPACING
600	150	Y12	150	Y10	200
750	150	Y16	150	Y10	200
900	150	Y16	150	Y10	200
1200	230	Y16	200	Y10	200
1500	230	Y16	200	Y10	200
NOTE: 1.Min. lap length for Bars 'B' = 400mm 2.Cover to reinforcement = 50mm					

MAXIMUM OVERFILL FOR PORTAL CULVERTS	
SPAN	FILL HEIGHT (m)
600	10.5
750	9.0
900	7.5
1200	6.0
1500	4.5
NOTE: Min. total cover over any portal shall be 200mm	

NOTES :

- Splitter block and pitching to be provided at all outlets where erosion is likely to occur.
- Splitter block may be omitted if discharge velocity is less than 0.9 m/s.
- Cut-off walls may be omitted if structure is founded on rock.
- Where multiples of portals are used they shall be placed 100mm apart and the spaces filled with well rammed concrete.
- All joints between precast units shall be covered with an approved 600mm wide geofabric strip glued to the portal.
- All portal lifting holes must be plugged to the satisfaction of the Engineer.
- End portal units to be cut to skew.
- For skew culverts the headwall shall be parallel to the centre line of the road.
- All concrete is to be 20MPa.
- Square mesh fabric (Reference S.M.F.193) is to be placed 50mm from top in all apron slabs and centrally in cut-off walls.
- Brickwork is to consist of good quality burnt clay common bricks in accordance with SABS 227 Specification, or cement bricks in accordance with SABS 987 Specification, uniform in size and shape layed in stretcher bond style with the skins tied together with galvanised crimped wire wall ties.
- Brickforce is to be placed every 4th course.
- Jointing on all visible faces to be pointed.
- No in-fill shall be larger than a half standard brick size unless 15MPa concrete is used.



No.	DATE	REVISION	CONSULT. ENG.
1	13/5/2014	CONSTRUCTION RECORD DRAWING	THUSO CONSULTING
0	06/12/2012	ISSUED FOR CONSTRUCTION	



DESIGNED BY
SSI ENGINEERS AND ENVIRONMENTAL CONSULTANTS (Pty) Ltd TRADING AS ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDFONTEIN
9324
BLOEMFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220

DESIGNED BY	DESIGNED BY
S.S.	S.S.
DRAWN BY	R.M.
CHECKED BY	D.C.

APPROVED	APPROVED
Name : D. COLLET Prof. Reg. No. : 200170067 Date : 03/12/2012	Name : Prof. Reg. No. : Date :

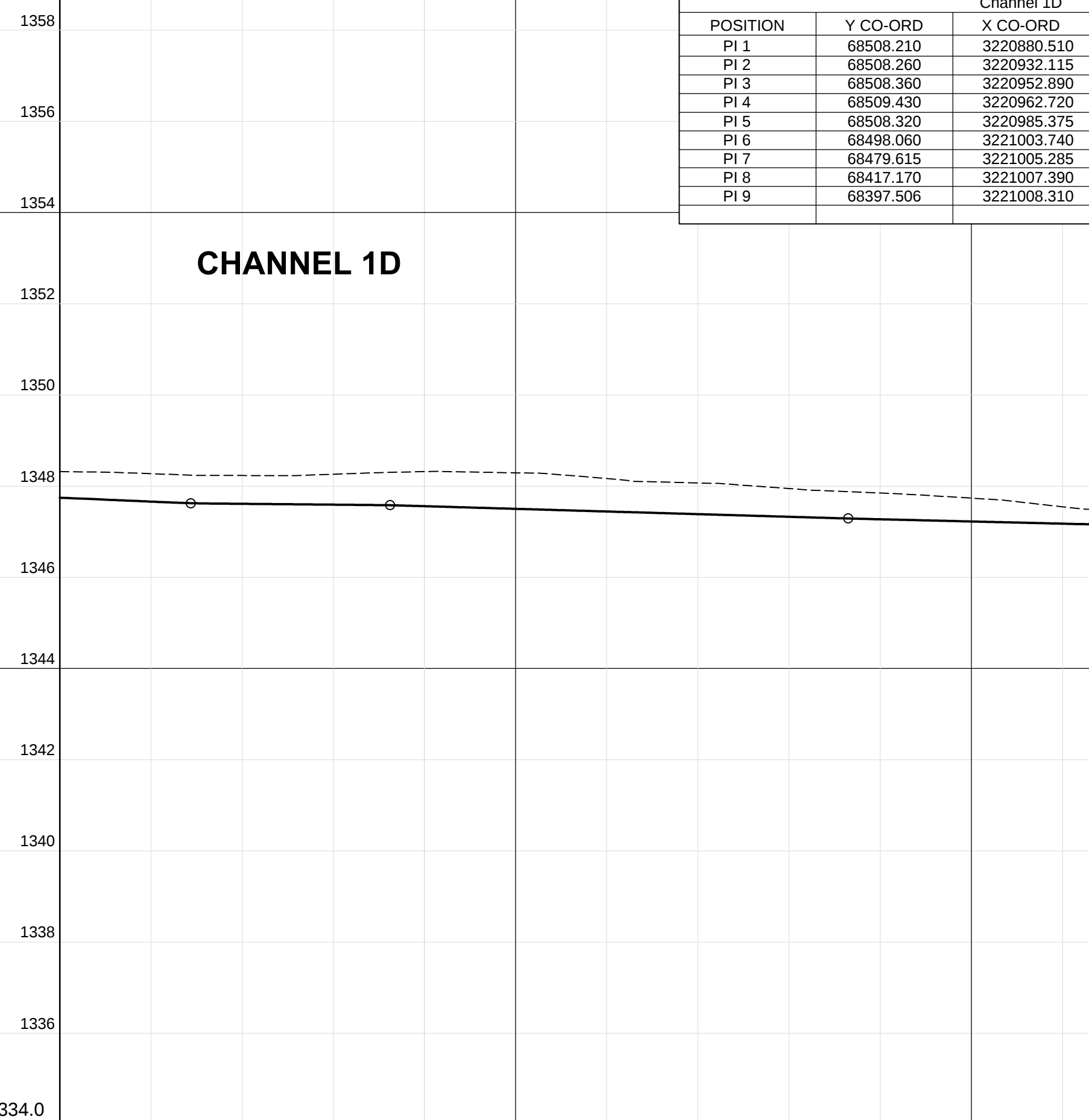
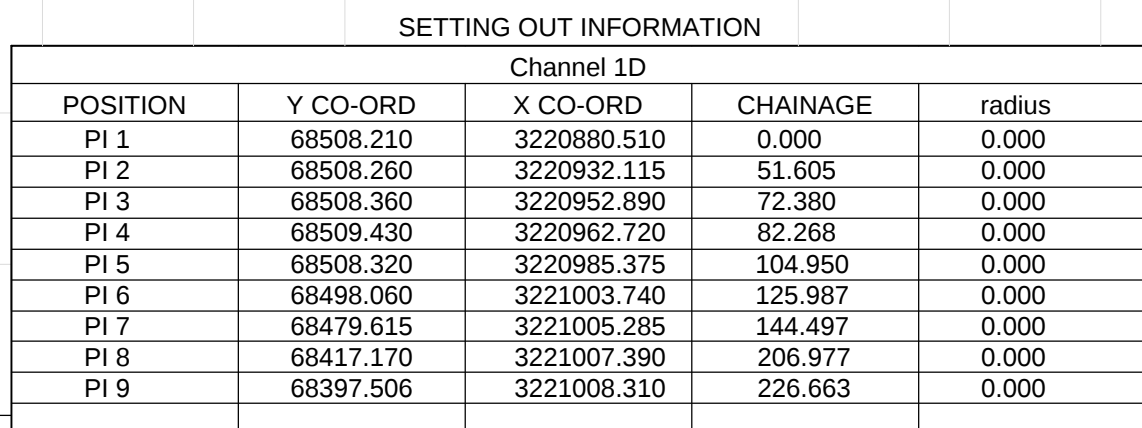
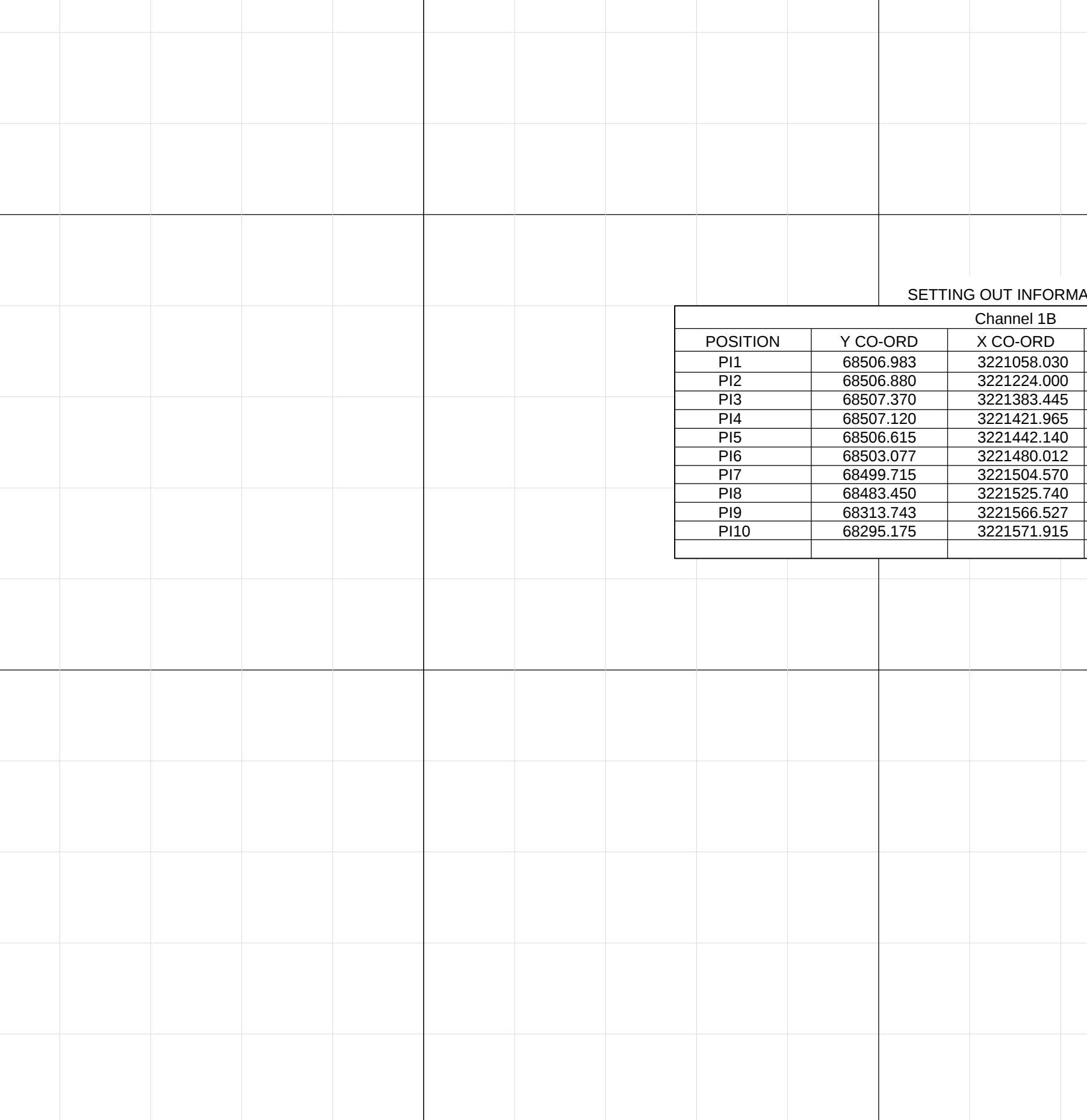


ACCEPTANCE	ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING	NAME : DATE :

PROJECT DESCRIPTION	PROJECT DESCRIPTION
CONSTRUCTION OF NEW WATER AND DRAINAGE SERVICES AT BLOEMFONTEIN AIRPORT	SCALE : N.T.S.

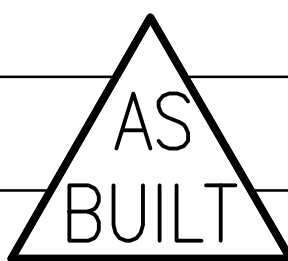
DRAWING DESCRIPTION	DRAWING DESCRIPTION
TYPICAL STORMWATER DETAILS	SHEET 2 OF 2

CONTRACT NUMBER	BL13/29/AU/02		
DRAWING LOCATION DATA	START	END	
ROUTE	-	-	
SECTION	-	-	
DRAWING km DISTANCE	-	-	
DRAWING TYPE	WATER RELATED		
DRAWING NUMBER	TBFN90 DP 02 SW		REV. 

[illegible]

72.0	1345.653	1347.032	500
140	1345.653	1346.988	540
210	1345.615	1346.692	560
280	1345.598	1346.566	590
350	1345.595	1346.502	600
420	1345.572	1346.344	620
490			
560	1345.497	1346.192	640
630			
700	1345.453	1346.054	660
770	1345.444	1345.970	67.513
840			

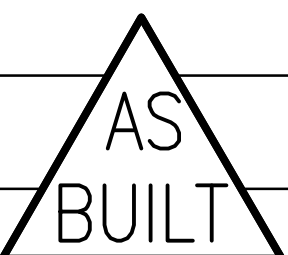
SETTING OUT INFORMATION				
Channel B1				
POSITION	Y CO-ORD	X CO-ORD	CHAINAGE	radius
P11	8650.983	322100.000	0.000	0.000
P12	8650.880	3221224.000	165.970	0.000
P13	86507.370	3221383.445	326.416	0.000
P14	86507.130	3221421.965	362.877	0.000
P15	86505.615	3221442.140	384.118	0.000
P16	86503.477	3221480.012	422.155	0.000
P17	86496.715	3221604.710	446.942	0.000
P18	86483.450	3221525.740	473.639	0.000
P19	66831.743	3221566.527	648.179	0.000
P10	66829.175	3221571.915	667.513	0.000



BL13/29/AU/02	
START	END
-	-
-	-
-	-

WATER RELATED

TBFN90/LS/01/SW	REV. 
-----------------	--



**Royal
HaskoningDHV**
Enhancing Society Together

DESIGNED BY
S.S.
DRAWN BY
R.M.
CHECKED BY
D.C.

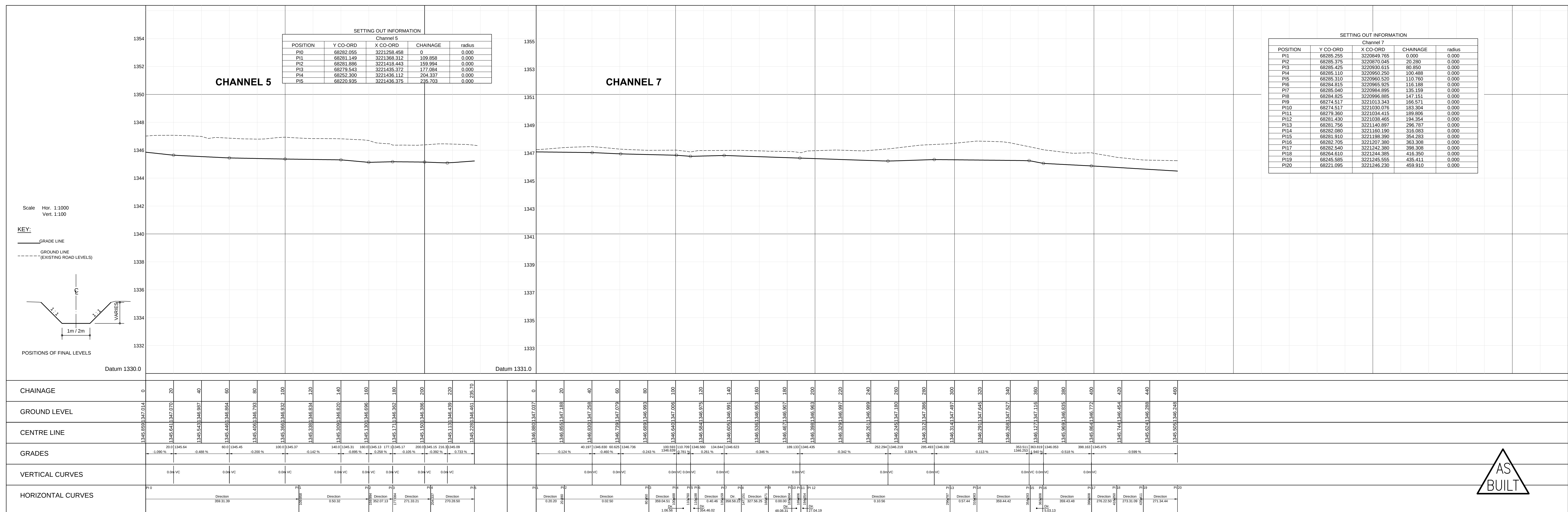


BRAM FISCHER
INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

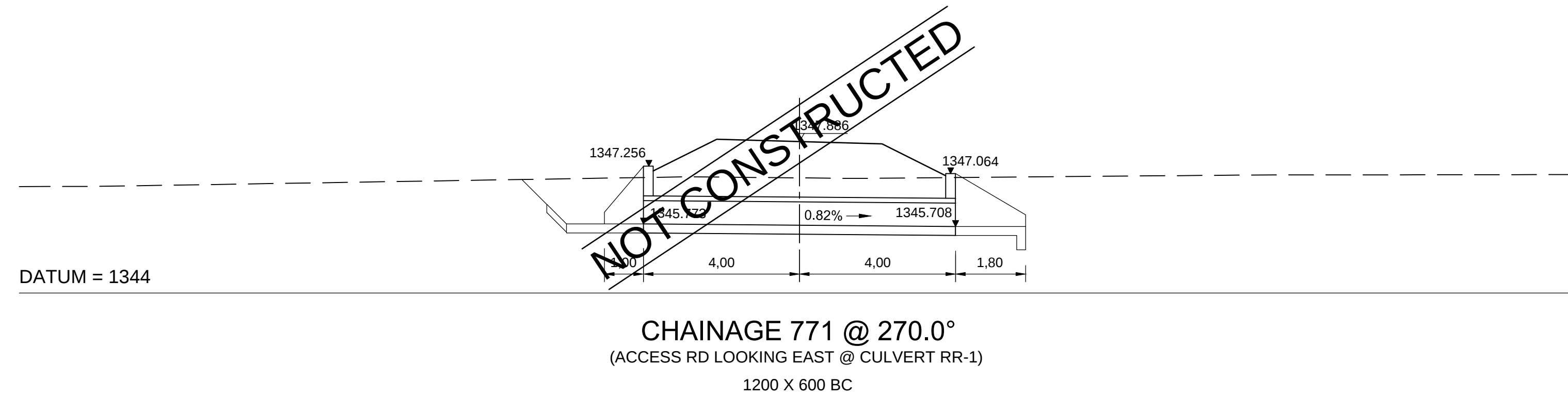
PROJECT DESCRIPTION

CONSTRUCTION OF NEW
WATER AND DRAINAGE
SERVICES AT BLOEMFONTEIN
AIRPORT

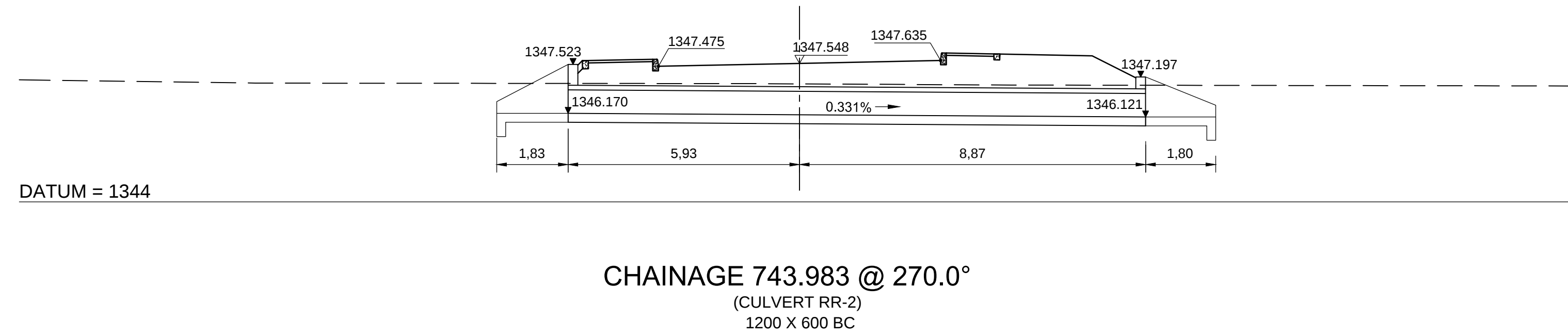
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DRAWING LOCATION DATA	START	END	
ROUTE	-	-	
SECTION	-	-	
DRAWING km DISTANCE	-	-	
DRAWING TYPE	WATER RELATED		
DRAWING NUMBER	TBFN90/LS/02/SW		REV 

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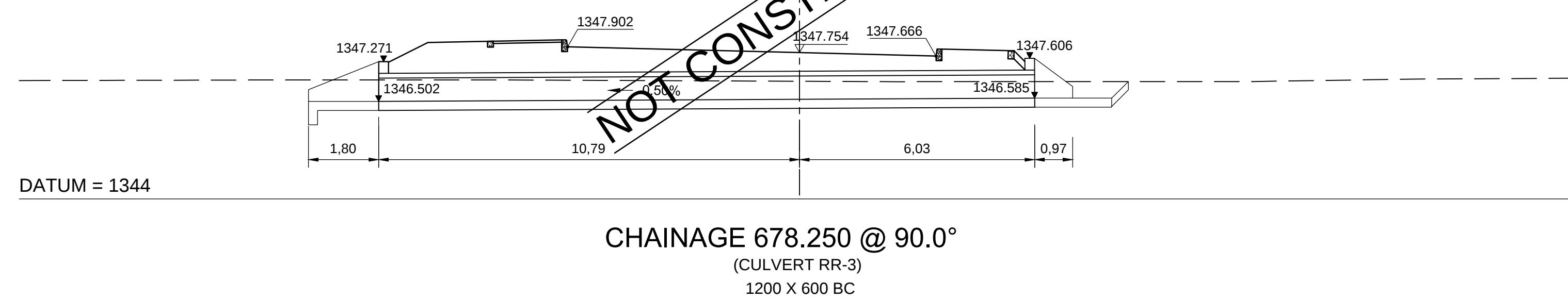
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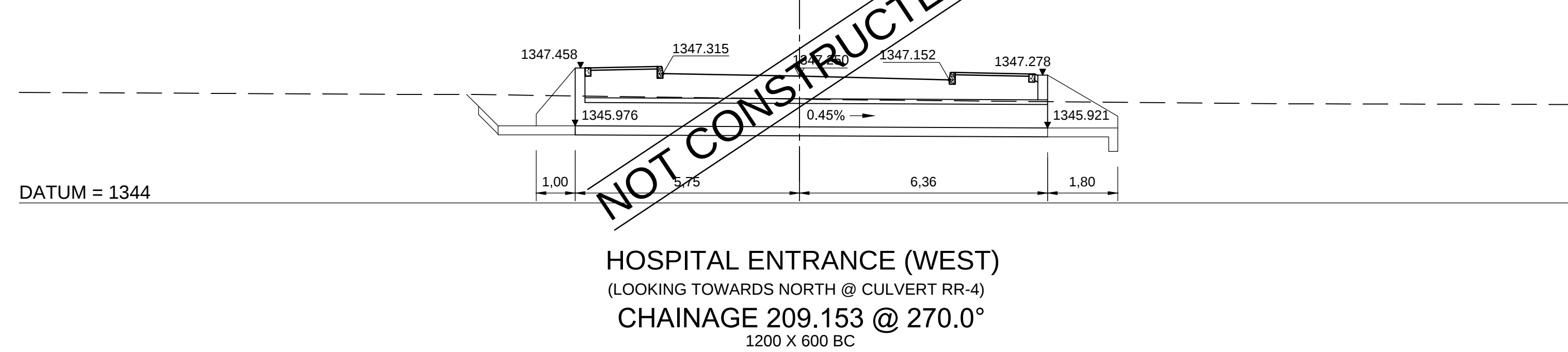
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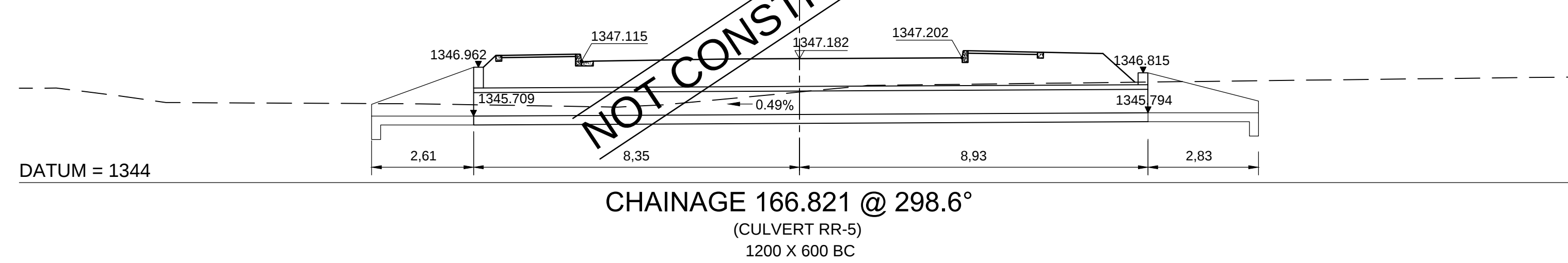
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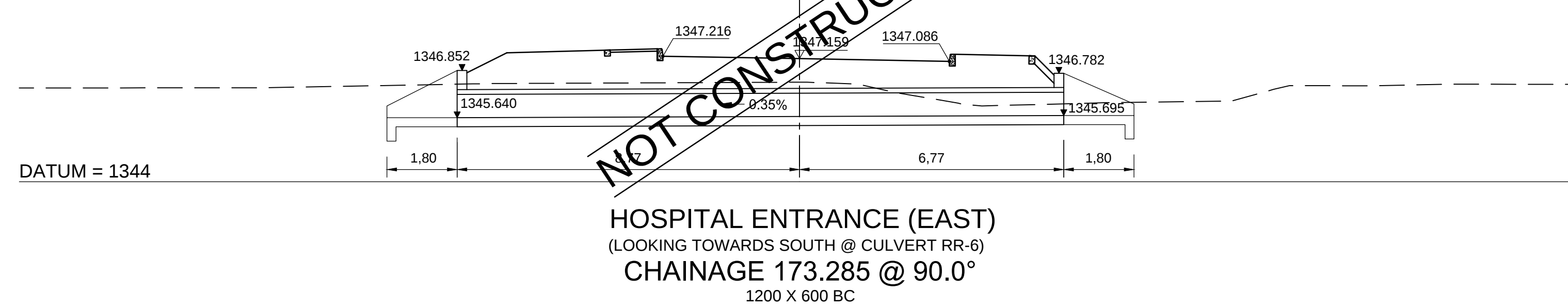
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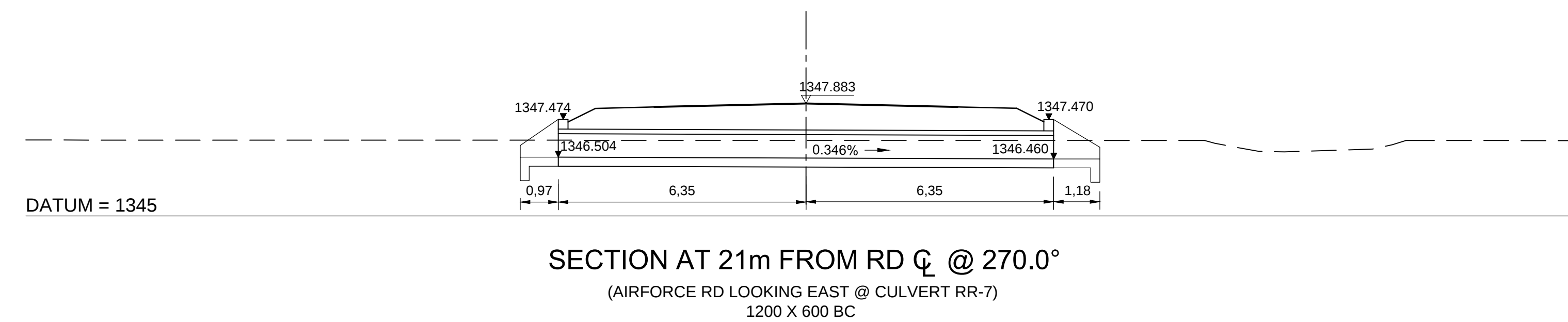
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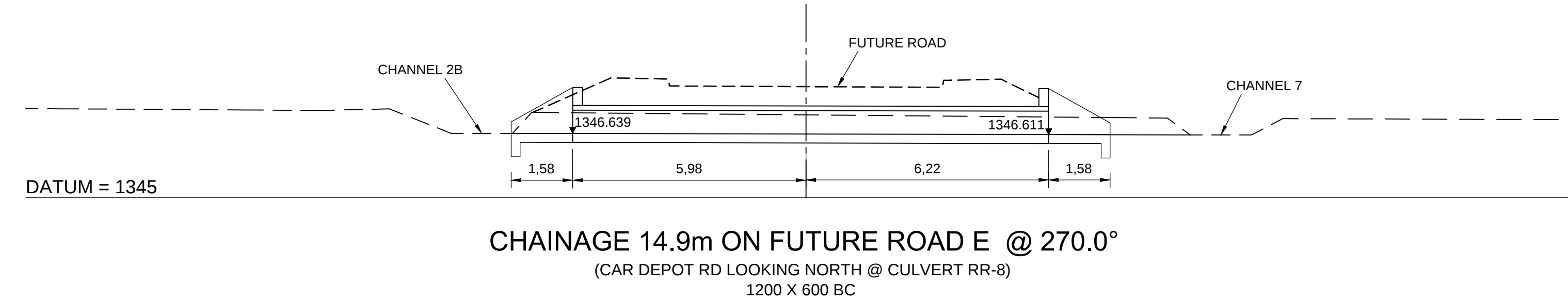
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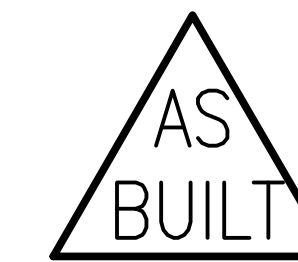
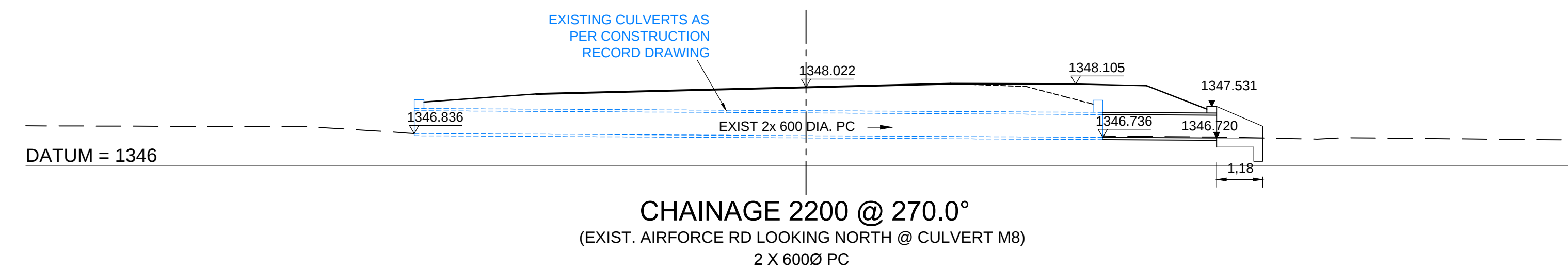
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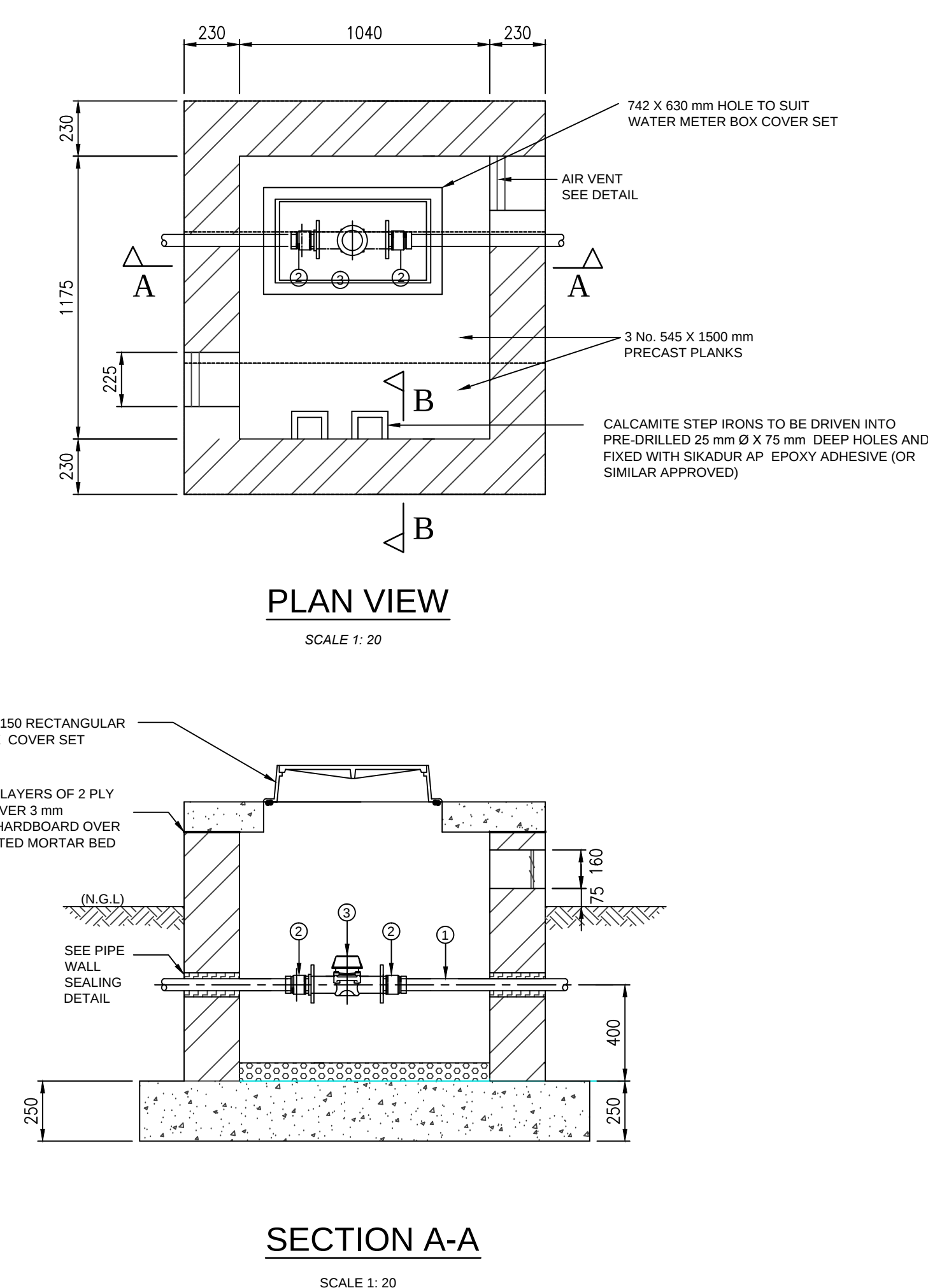


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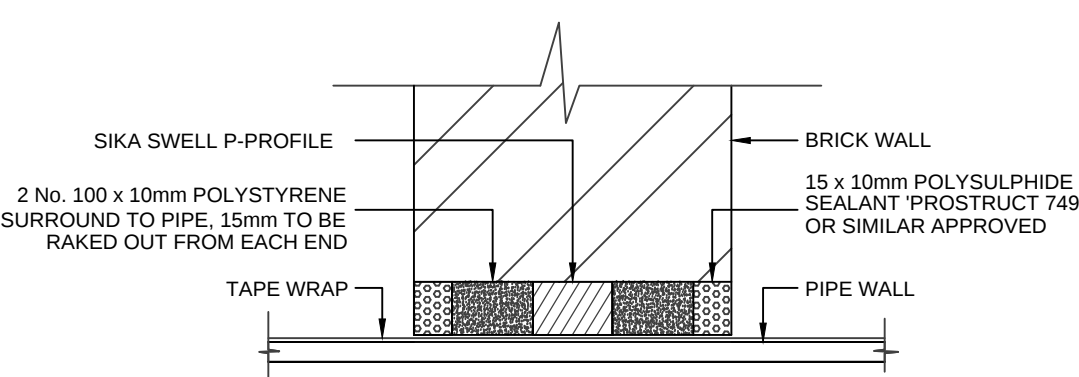


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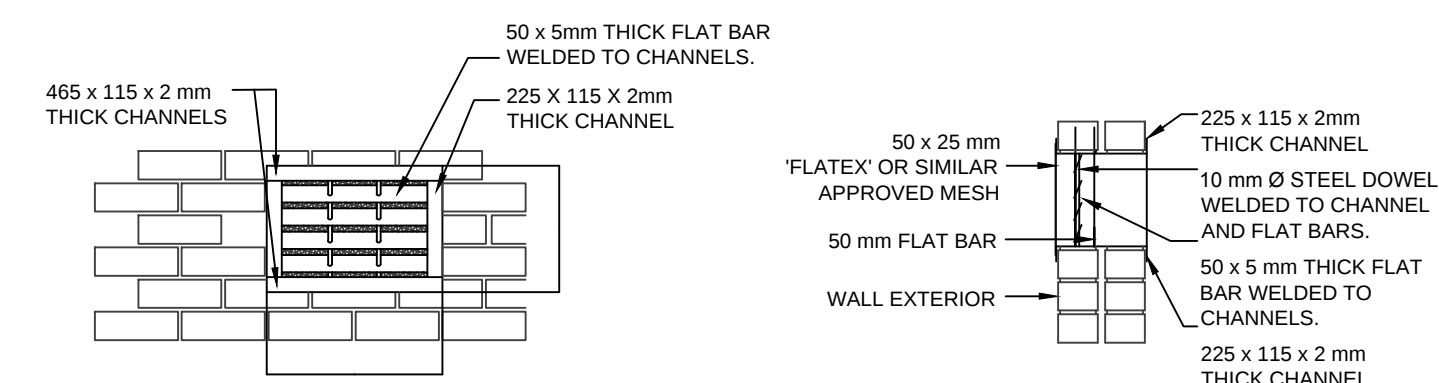
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PIPE SCHEDULE		
ITEM	DESCRIPTION	No.
1.	DN 50 PVC PIPE CUT TO SUIT	2
2.	DN 50 MALE ADAPTOR TO SUIT	2
3.	DN 50 THREADED WATER METER, 300 mm F/F	1



PIPE WALL SEALING DETAIL

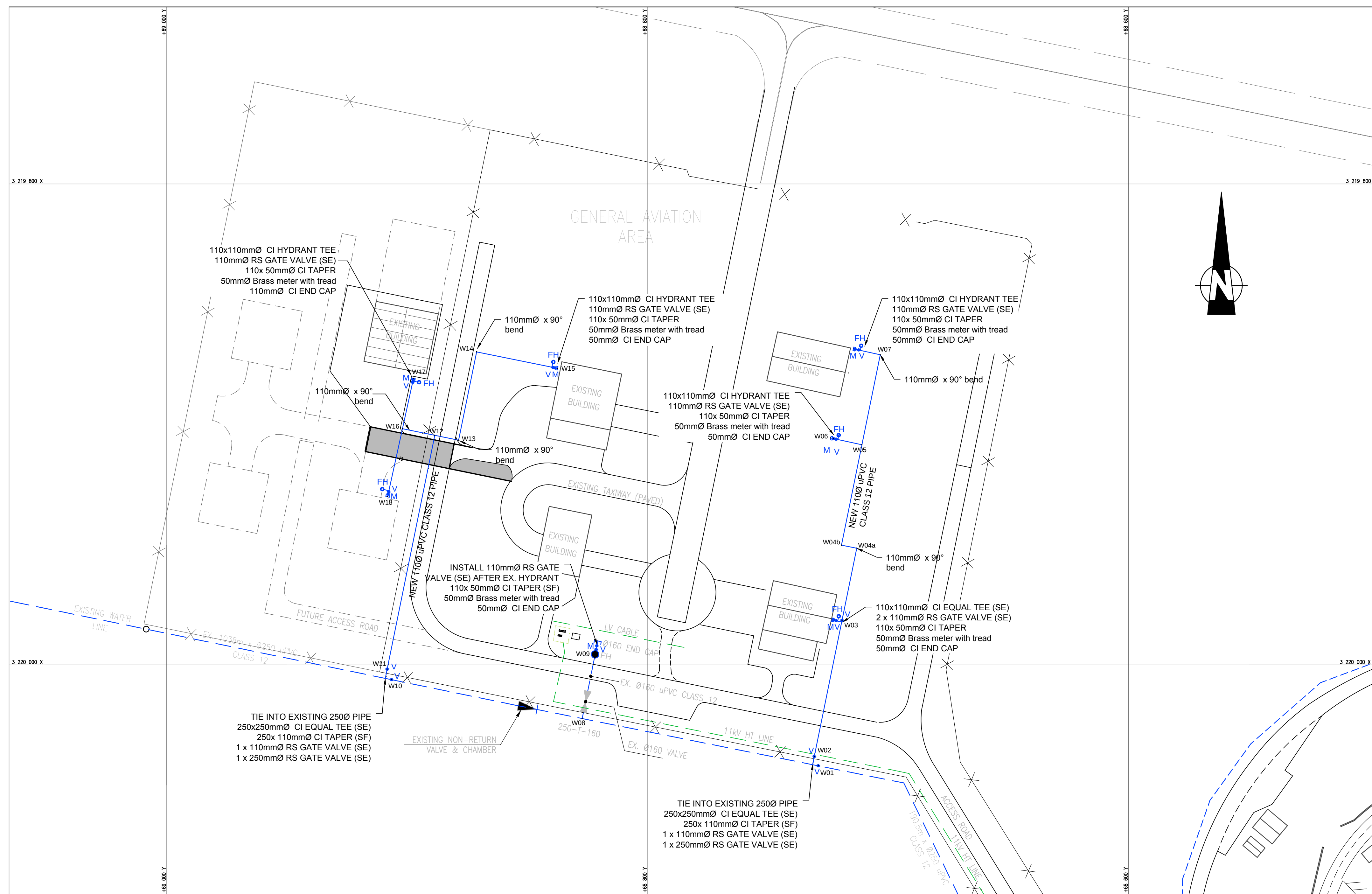


FRONT ELEVATION

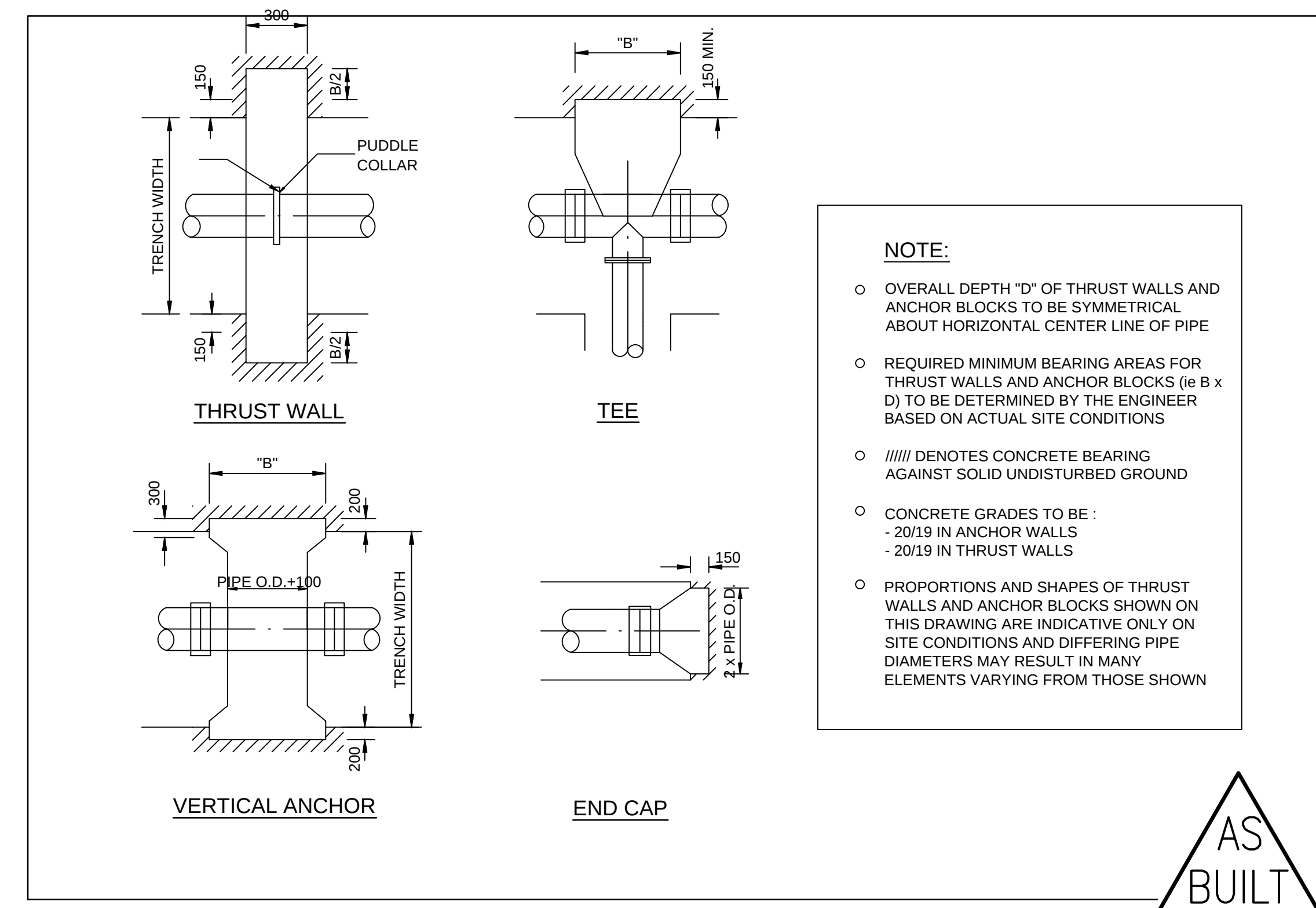
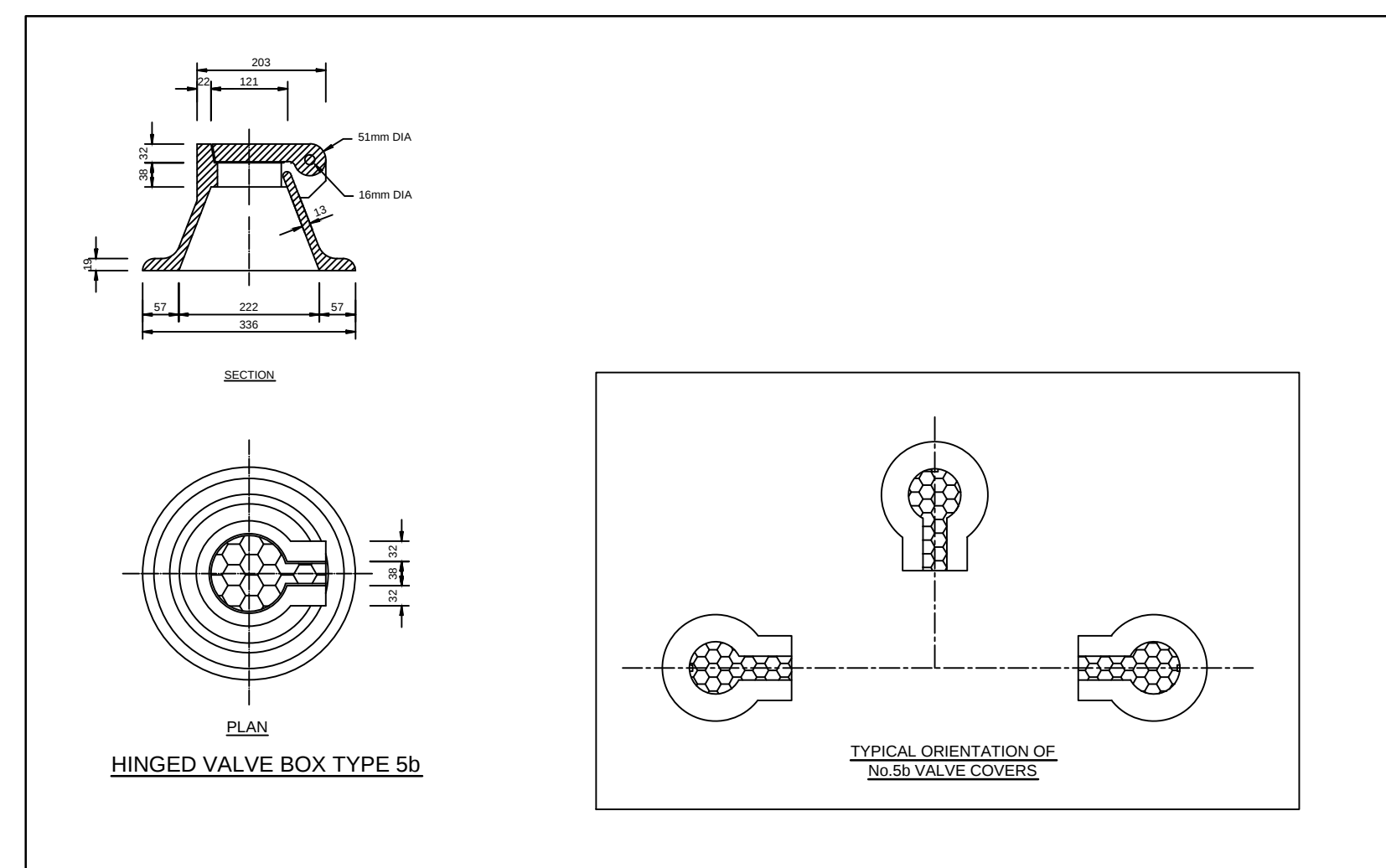
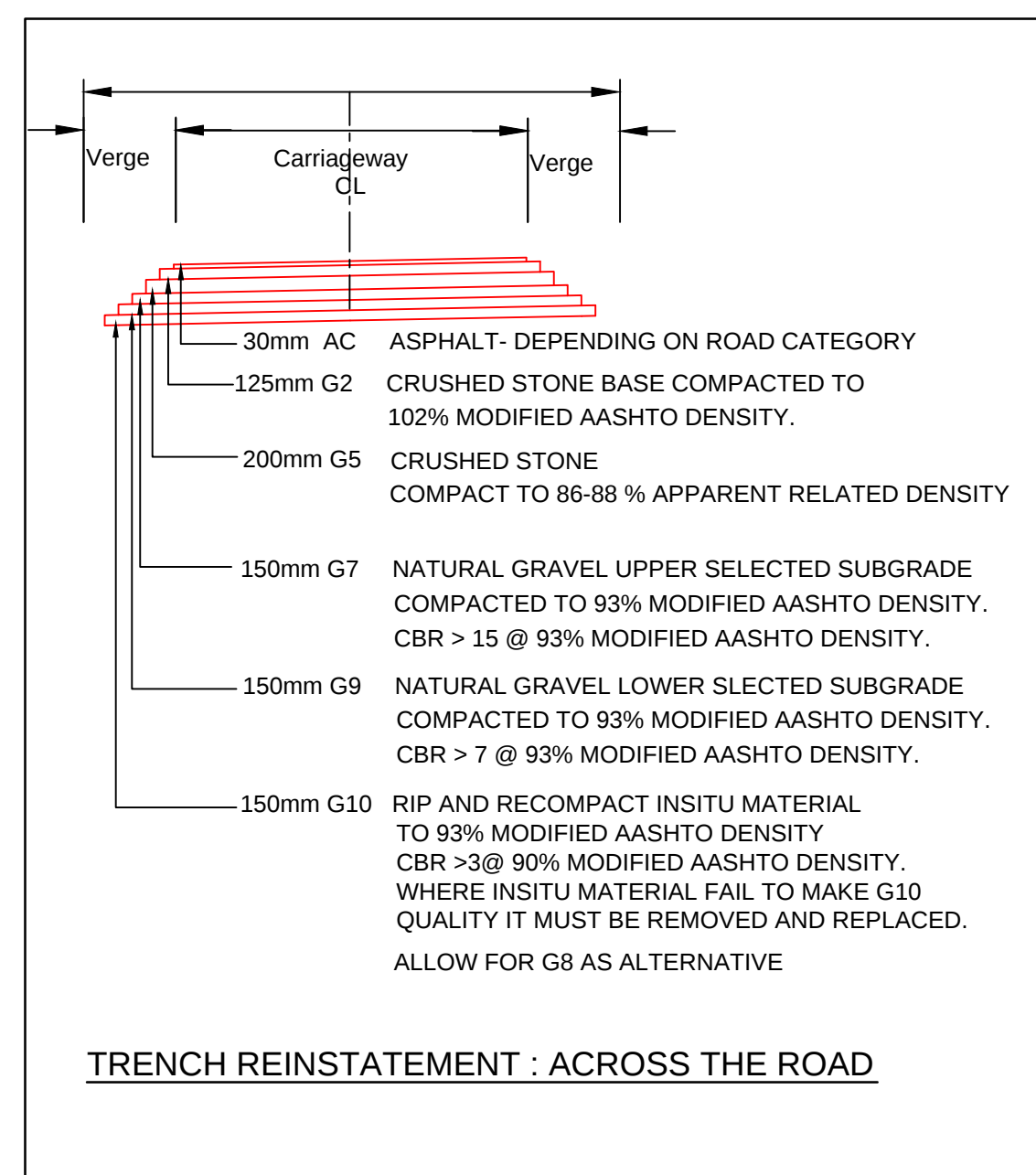
SECTION

AIR VENT DETAIL (2 No.)

NTS



WATER SETTING OUT			
Code	Y	X	
W01	68729.080	3220041.920	
W02	68730.728	3220083.072	
W03	68719.190	3219981.384	
W04a	68713.092	3219951.438	
W04b	68719.418	3219950.150	
W05	68710.923	3219908.416	
W06	68723.901	3219905.600	
W07	68703.303	3219870.985	
W08	68827.234	3220022.266	
W09	68821.865	3219995.613	
W10	68906.480	3220006.110	
W11	68908.350	3220001.740	
W12	68888.554	3219904.492	
W13	68878.641	3219906.512	
W14	68871.140	3219869.810	
W15	68837.490	3219876.660	
W16	68901.995	3219901.752	
W17	68897.410	3219880.760	
W18	68908.180	3219930.070	



NOTE:

OVERALL DEPTH "D" OF THRUST WALLS AND ANCHOR BLOCKS SHOULD BE SYMMETRICAL ABOUT HORIZONTAL CENTER LINE OF PIPE

REQUIRED MINIMUM BEARING AREAS FOR THRUST WALLS AND ANCHOR BLOCKS ($B \times D$) TO BE DETERMINED BY THE ENGINEER BASED ON ACTUAL SITE CONDITIONS

/////// DENOTES CONCRETE BEARING AGAINST SOLID UNDISTURBED GROUND

CONCRETE GRADES TO BE :

- 20319 IN ANCHOR WALLS
- 20319 IN THRUST WALLS

PROPORTIONS AND SHAPES OF THRUST WALLS AND ANCHOR BLOCKS SHOWN ON THIS DRAWING ARE INDICATIVE ONLY ON SITE CONDITIONS AND DIFFERING PIPE DIAMETERS MAY RESULT IN MANY ELEMENTS VARYING FROM THOSE SHOWN

AS
BUILT

2	20/03/2014	CONSTRUCTION RECORD	D. COLLET
1	26/03/2013	WATER SETTING OUT TEXT ADDED	D. COLLET
0	26/02/2013	ISSUED FOR CONSTRUCTION	D. COLLET
No.	DATE	REVISION	CONSULT. INC.



DESIGNED BY

SSI ENGINEERS AND ENVIRONMENTAL
CONSULTANTS (Pty) Ltd TRADING AS
ROYAL HASKONINGDHV
P.O. BOX 12671
BRANDHOF
9324
BLOEMFONTEIN
TEL: (051) 400 7200
FAX: (051) 430 8220

DESIGNED BY	APPROVED
D. COLLET	Name : D. COLLET
DRAWN BY	Prof. Reg. No. : 200170067
S. SAROOP	Date : 26/02/2013
CHECKED BY	CONSTRUCTION RECORD DRAINING
D. COLLET	Name : D. COLLET
	Prof. Reg. No. : 200170067
	Date : 20/03/2014



ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

AIRPORTS COMPANY SOUTH AFRICA

Date: _____

PROJECT DESCRIPTION	
CONSTRUCTION OF NEW WATER SERVICES AT BLOEMFONTEIN AIRPORT – GENERAL AVIATION AREA	
SCALE : 1 : 100	

DRAWING DESCRIPTION

GENERAL ARRANGEMENT:
WATER RETICULATION

CONTRACT NUMBER		BL13/29/AU/02	
DRAWING LOCATION DATA		START	END
ROUTE		-	-
SECTION		-	-
DRAWING km DISTANCE		-	-
DRAWING TYPE		DETAILS	
DRAWING NUMBER		TBFN90 DP 03 W	