

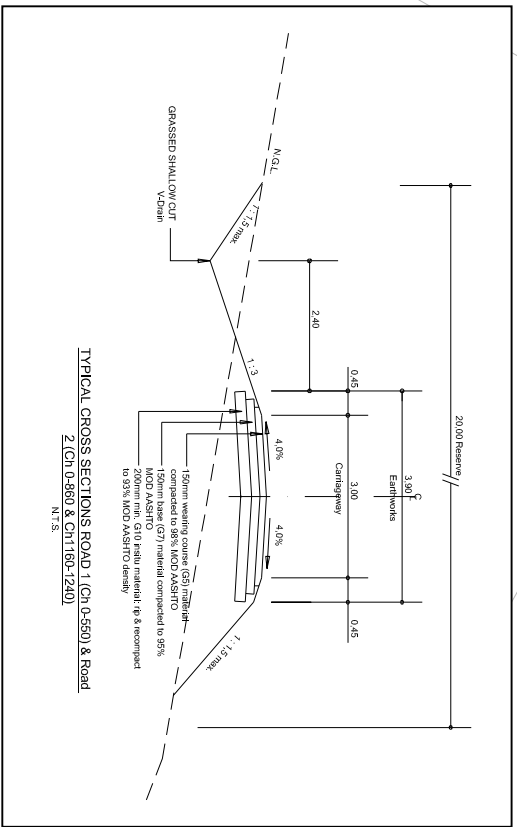
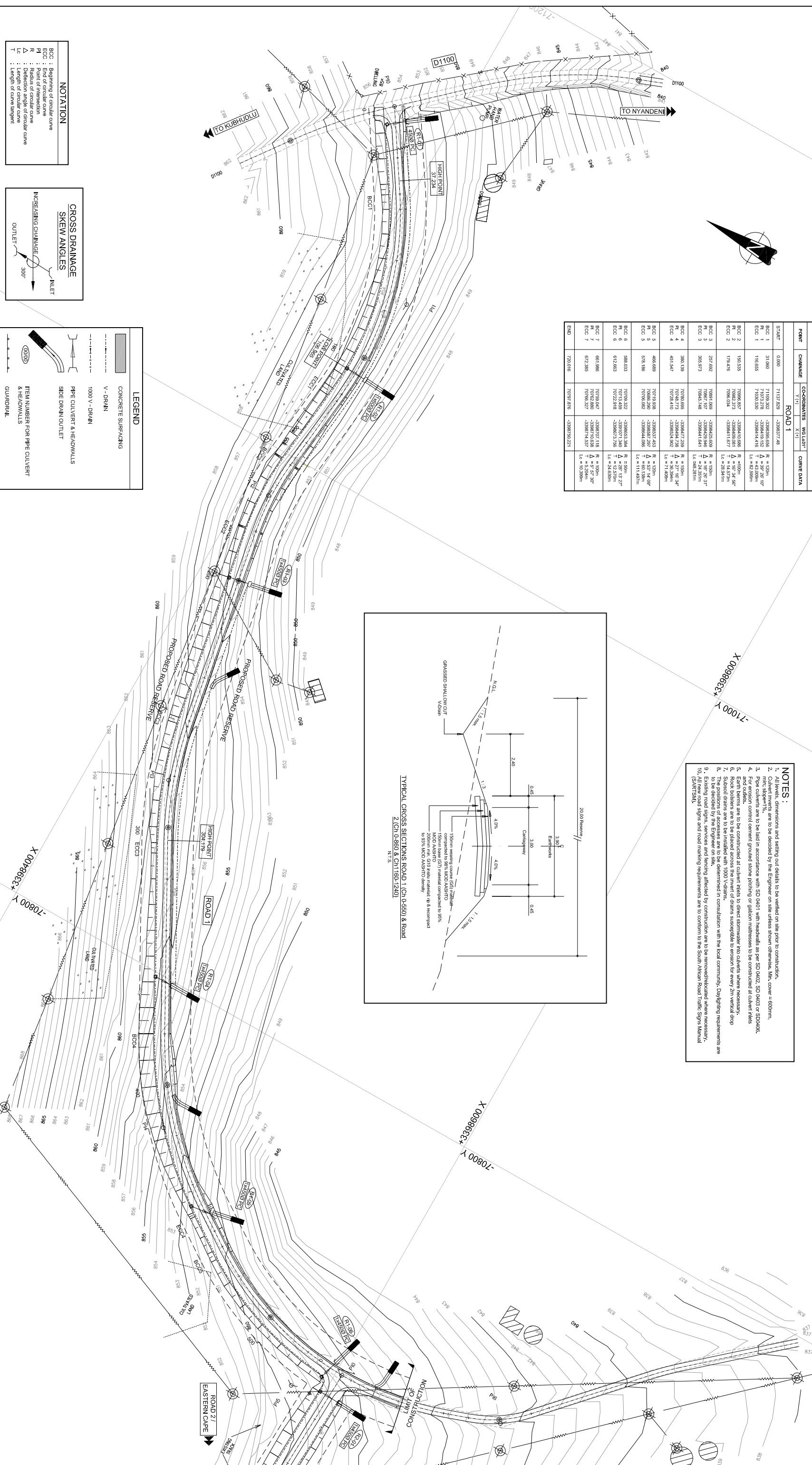
ITEM NO.	DISTANCE (m)	SIZE Ø (mm)	CLASS TYPE	BEGGING LENGTH (m)	SKEW TYPE	PIPE STRUCTURE		GRADIENT (%)	ACTUAL FLOW (m³/s)	OUTLET VELOCITY (m/s)	REMARKS	
						LL	HL					
R101	0,210	1 x 450	750 C	8	270°	653,72	MH	653,36	HW	2,0%	0,063	Stone Pitched Headwall
R102	0,110	1 x 600	750 C	7	270°	653,91	MH	653,77	HW	2,0%	0,26	Stone Pitched Headwall
R103	0,450	1 x 600	750 C	7	330°	645,54	MH	645,40	HW	2,0%	0,24	Stone Pitched Headwall

**PIPE CULVERT SCHEDULE**

- NOTES :**
- All levels, dimensions and setting out details to be verified on site prior to construction.
  - Culvert inverts are to be decided by the Engineer on site unless shown otherwise. Min. cover = 600mm.
  - Culvert structures to be constructed in accordance with SD 0401 with headwalls as per SD 0402, SD 0403 or SD0406.
  - For erosion control cement grouted stone pitching or gabion mattresses to be considered at culvert falls and outlets.
  - Earth berms are to be constructed at culvert falls to direct stormwater into culverts where necessary.
  - Special drains are to be provided with 1000 V-shaped drains susceptible to erosion for every 2m vertical drop.
  - The positions of accessses are to be determined in consultation with the local community. Divulging requirements are to be decided by the Engineer on site.
  - Existing road signs, services and fencing affected by construction are to be removed/relocated where necessary.
  - Existing road signs and road marking requirements are to conform to the South African Road Signs Manual (MARS/SA).
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POINT	CHAINAGE	COORDINATES		WGL (m)	CURVE DATA
		X (m)	Y (m)		
START	0+00	71137,829	-339837,748		
B/C 1	31,060	71109,302	-339836,656	R = 120m	Δ = 39° 26' 10"
E/C 1	116,655	71073,278	-339841,812	R = 120m	Δ = 39° 26' 10"
B/C 2	150,535	70968,337	-339841,812	R = 100m	Δ = 9° 57' 30"
E/C 2	179,476	70968,034	-339841,677	R = 100m	Δ = 14° 27' 21"
B/C 3	257,692	70981,069	-339843,009	R = 150m	Δ = 19° 26' 31"
E/C 3	303,973	70967,107	-339843,946	R = 150m	Δ = 19° 26' 31"
B/C 4	380,139	70790,695	-339847,232	R = 150m	Δ = 5° 57' 30"
E/C 4	451,547	70778,410	-339852,902	R = 150m	Δ = 5° 57' 30"
B/C 5	466,689	70719,538	-339857,453	R = 120m	Δ = 5° 57' 30"
E/C 5	576,186	70685,280	-339857,297	R = 120m	Δ = 5° 57' 30"
B/C 6	588,033	70709,322	-339855,334	R = 20m	Δ = 5° 57' 30"
E/C 6	612,883	70722,818	-339873,792	R = 20m	Δ = 12° 20' 00"
B/C 7	661,986	70759,947	-339870,118	R = 100m	Δ = 10° 29' 00"
E/C 7	672,385	70763,287	-339874,537	R = 100m	Δ = 10° 29' 00"
END	720,016	70797,818	-339870,221		

**HORIZONTAL ALIGNMENT**

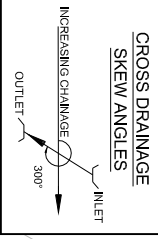


**LEGEND**

- CONCRETE SURFACING
- V - DRAIN
- 1000 V - DRAIN
- PIPE CULVERT & HEADWALLS
- SIDE DRAIN OUTLET
- ITEM NUMBERS FOR PIPE CULVERT & HEADWALLS
- GUARDRAIL
- LIMIT OF CONSTRUCTION

**NOTATION**

- ECC : Beginning of circular curve
- PC : Point of commencement
- PI : Point of intersection
- R : Radius of circular curve
- Δ : Deflection angle of circular curve
- Lc : Length of circular curve
- T : Length of curve tangents



**GENERAL NOTES**

**CLIENT:** UMUZIWABANTU MUNICIPALITY

**DESIGNED BY:** gm turner & associates

**PROJECT/DRAWING TITLE:** BHUDLU RIVER BRIDGE ROAD ACCESS ROAD 1 LAYOUT PLAN

**SCALE:** 1 : 500

**SHEET:** 1 OF 3

**CONTRACT NO.:** UMUZ/XX/2015

**PROJECT NO.:** UMUZ/XX/2015

**DRAWING NO.:** UMUZ/XX/01

**DATE:** 30/09/15

**CLIENT:** [Logo]

**DESIGNED BY:** [Logo]

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