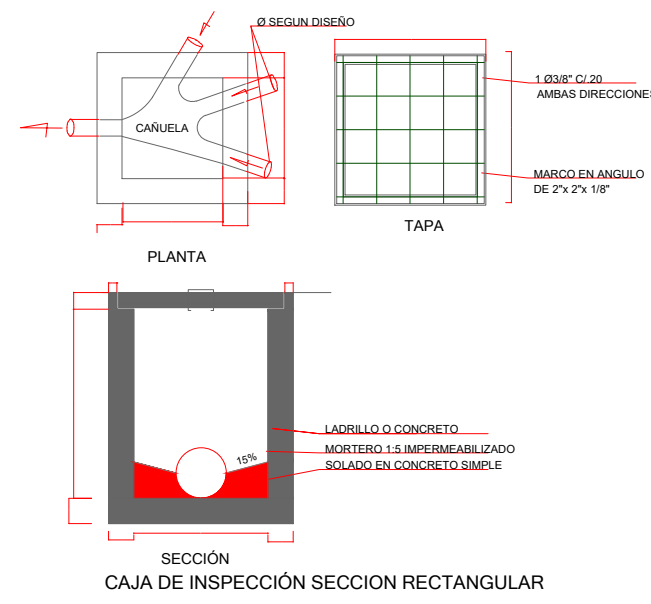


PARÁMETROS GLOBALES																				
C=		0.85	n=		0.009	τ_min(Pa)=		1.0	y/D_max=		0.85	Tr(años)=		10	dis(mm/h)=		211.45			
Tramo	Q_dis (L/s)	Ø (pulg)	D_int (mm)	D_int (m)	n	Pend. (%)	S (m/m)	A_II (m²)	V_II (m/s)	Q_II (m³/s)	τ_II (kg/m²)	q/Q	v/V	V_ef (m/s)	y/D	τ_ef (kg/m²)	√V	√q	√τ	
CANAL 1→C.ALL 1	28.208	8"	182.00	0.1820	0.009	1.00	0.0100	0.02602	1.416	0.036841	0.4550	0.7657	0.972	1.377	0.735	1.201	√V	√q	√τ	
C.ALL 1→C.ALL 2	28.208	8"	182.00	0.1820	0.009	1.00	0.0100	0.02602	1.416	0.036841	0.4550	0.7657	0.972	1.377	0.735	1.201	√V	√q	√τ	
CANAL 2→C.ALL 2	41.139	10"	227.00	0.2270	0.009	1.00	0.0100	0.04047	1.641	0.066406	0.5675	0.6195	0.917	1.504	0.640	1.145	√V	√q	√τ	
C.ALL 2→C.ALL 3	69.347	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.5746	0.898	1.711	0.611	1.121	√V	√q	√τ	
CANAL 3→C.ALL 3	61.908	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.5130	0.861	1.641	0.571	1.082	√V	√q	√τ	
C.ALL 3→C.ALL 4	131.255	14"	327.00	0.3270	0.009	1.00	0.0100	0.08398	2.093	0.175766	0.8175	0.7468	0.966	2.021	0.722	1.196	√V	√q	√τ	
CANAL 4→C.ALL 4	58.114	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.4815	0.853	1.625	0.551	1.060	√V	√q	√τ	
C.ALL 4→C.ALL 5	189.369	16"	362.00	0.3620	0.009	1.00	0.0100	0.10292	2.240	0.230514	0.9050	0.8215	0.991	2.221	0.772	1.213	√V	√q	√τ	
C.ALL 5→C.ALL 6	189.369	16"	362.00	0.3620	0.009	1.00	0.0100	0.10292	2.240	0.230514	0.9050	0.8215	0.991	2.221	0.772	1.213	√V	√q	√τ	
CANAL 13→C.ALL 6	227.961	18"	407.00	0.4070	0.009	1.00	0.0100	0.13010	2.422	0.315059	1.0175	0.7236	0.956	2.316	0.707	1.189	√V	√q	√τ	
C.ALL 6→C.ALL 7	227.961	18"	407.00	0.4070	0.009	1.00	0.0100	0.13010	2.422	0.315059	1.0175	0.7236	0.956	2.316	0.707	1.189	√V	√q	√τ	
C.ALL 7→C.ALL 8	227.961	18"	407.00	0.4070	0.009	1.00	0.0100	0.13010	2.422	0.315059	1.0175	0.7236	0.956	2.316	0.707	1.189	√V	√q	√τ	
CANAL 14→C.ALL 8	24.663	8"	182.00	0.1820	0.009	1.00	0.0100	0.02602	1.416	0.036841	0.4550	0.6695	0.937	1.327	0.672	1.168	√V	√q	√τ	
C.ALL 8→SALIDA CALLE 15	252.625	18"	407.00	0.4070	0.009	1.00	0.0100	0.13010	2.422	0.315059	1.0175	0.8018	0.985	2.385	0.759	1.209	√V	√q	√τ	
CANAL 6→C.ALL 9	78.034	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.6466	0.928	1.767	0.657	1.158	√V	√q	√τ	
C.ALL 9→C.ALL 10	78.034	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.6466	0.928	1.767	0.657	1.158	√V	√q	√τ	
CANAL 7→C.ALL 11	39.042	10"	227.00	0.2270	0.009	1.00	0.0100	0.04047	1.641	0.066406	0.5675	0.5879	0.903	1.482	0.620	1.128	√V	√q	√τ	
C.ALL 11→C.ALL 12	39.042	10"	227.00	0.2270	0.009	1.00	0.0100	0.04047	1.641	0.066406	0.5675	0.5879	0.903	1.482	0.620	1.128	√V	√q	√τ	
C.ALL 10→C.ALL 12	78.034	12"	284.00	0.2840	0.009	1.00	0.0100	0.06335	1.905	0.120686	0.7100	0.6466	0.928	1.767	0.657	1.158	√V	√q	√τ	
C.ALL 12→CANAL 12	117.076	14"	327.00	0.3270	0.009	1.00	0.0100	0.08398	2.093	0.175766	0.8175	0.6661	0.935	1.958	0.670	1.166	√V	√q	√τ	
CANAL 10→CANAL EXISTENTE	101.499	14"	327.00	0.3270	0.009	1.00	0.0100	0.08398	2.093	0.175766	0.8175	0.5775	0.899	1.881	0.612	1.122	√V	√q	√τ	
CANAL 11→CANAL EXISTENTE	295.411	20"	452.00	0.4520	0.009	1.00	0.0100	0.16046	2.597	0.416719	1.1300	0.7089	0.951	2.469	0.698	1.184	√V	√q	√τ	

DATOS DE ENTRADA					CAUDAL DISEÑO		TIRANTE	GEOMETRÍA HIDRÁULICA				VERIF. CI		HIDRÁULICA			FLUJO	CONTROLES	
Canal / Descripción	Material del canal (selector ▼)	n Manning	b Base (m)	s Pendiente (m/m)	Q dís (l/s)	Q dís (m³/s)	Y _n (*) Tiran. normal (m)	A = b·y Área esp. (m²)	T = b Tiran. agua (m)	P = b·y/2 Perimetro (m)	R = A/P Radio hid. (m)	Q. Manning (m³/s)	ΔQ (%)	Y _c = Q/A Velocidad (m/s)	P _c Froude (-)	E = yV³/2g Energía esp. (m)	Tipo de flujo	✓ V 2.0 m/s auto-limpieza	✓ Q error <1%
CANAL 1	Concreto (liso / encofrado)	0.013	0.400	0.00500	28.21	0.028208	0.084949	0.033980	0.4000	0.569898	0.059624	0.028208	0.00	0.8301	0.9094	0.1201	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 2	Concreto (liso / encofrado)	0.013	0.400	0.00500	41.14	0.041139	0.110216	0.044086	0.4000	0.620432	0.071058	0.041139	0.00	0.9331	0.8974	0.1546	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 3	Concreto (liso / encofrado)	0.013	0.400	0.00500	61.91	0.061908	0.147363	0.058945	0.4000	0.694726	0.084847	0.061908	0.00	1.0503	0.8735	0.2036	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 4	Concreto (liso / encofrado)	0.013	0.400	0.00500	58.11	0.058114	0.140797	0.056319	0.4000	0.681593	0.082628	0.058114	0.00	1.0319	0.8780	0.1951	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 5	Concreto (liso / encofrado)	0.013	0.400	0.00500	40.49	0.040490	0.108998	0.043599	0.4000	0.617995	0.070549	0.040490	0.00	0.9287	0.8981	0.1530	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 6	Concreto (liso / encofrado)	0.013	0.400	0.00500	78.03	0.078034	0.174492	0.069797	0.4000	0.748983	0.093189	0.078034	0.00	1.1180	0.8545	0.2382	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 7	Concreto (liso / encofrado)	0.013	0.400	0.00500	39.04	0.039042	0.106264	0.042505	0.4000	0.612527	0.069394	0.039042	0.00	0.9185	0.8996	0.1493	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 8	Concreto (liso / encofrado)	0.013	0.400	0.00500	51.12	0.051124	0.128470	0.051388	0.4000	0.656939	0.078223	0.051124	0.00	0.9949	0.8862	0.1789	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 9	Concreto (liso / encofrado)	0.013	0.400	0.00500	51.12	0.051124	0.128470	0.051388	0.4000	0.656939	0.078223	0.051124	0.00	0.9949	0.8862	0.1789	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 10	Concreto (liso / encofrado)	0.013	0.400	0.00500	101.50	0.101499	0.212325	0.084930	0.4000	0.824649	0.102989	0.101499	0.00	1.1951	0.8281	0.2851	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 11	Concreto (liso / encofrado)	0.013	0.400	0.00500	295.41	0.295411	0.497352	0.198941	0.4000	1.394704	0.142640	0.295411	0.00	1.4849	0.6723	0.6097	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 12	Concreto (liso / encofrado)	0.013	0.400	0.00500	223.27	0.223268	0.394422	0.157769	0.4000	1.188844	0.132708	0.223268	0.00	1.4152	0.7194	0.4965	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 13	Concreto (liso / encofrado)	0.013	0.500	0.00500	227.96	0.227961	0.312530	0.156265	0.5000	1.250606	0.138995	0.227961	0.00	1.4588	0.8331	0.4210	Subcrítico	✓ OK	✓ OK (<1%)
CANAL 14	Concreto (liso / encofrado)	0.013	0.400	0.00500	24.66	0.024663	0.077553	0.031021	0.4000	0.555105	0.055883	0.024663	0.00	0.7951	0.9115	0.1098	Subcrítico	✓ OK	✓ OK (<1%)

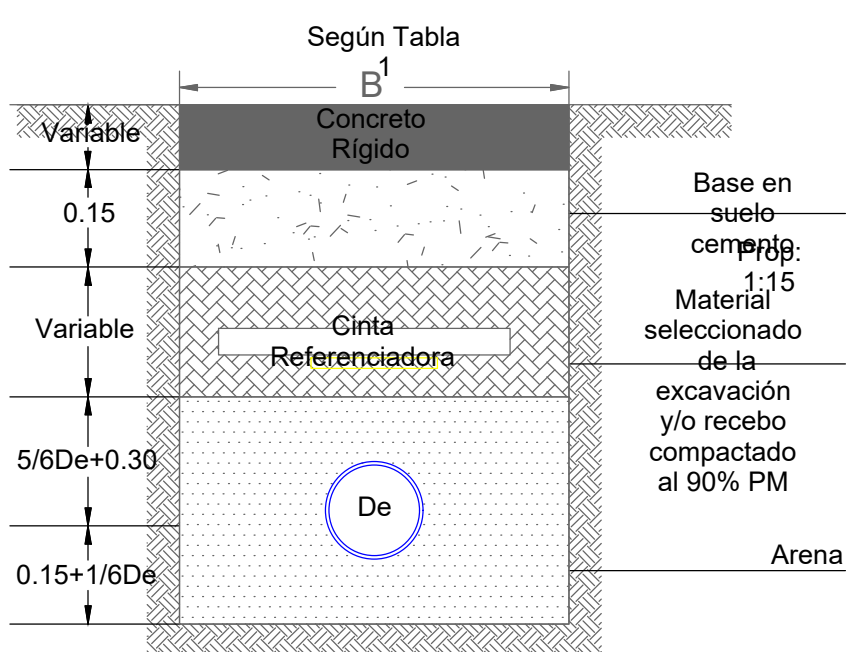
RESUMEN CANALES GEOMETRIAS ADOPTADAS				
Canal	b Base (m)	h Altura (m)	L Longitud (m)	S Pendiente (m/m)
CANAL 1	0.40	0.300	45.000	0.005
CANAL 2	0.40	0.300	38.000	0.005
CANAL 3	0.40	0.300	34.000	0.005
CANAL 4	0.40	0.300	40.000	0.005
CANAL 5	0.40	0.300	21.000	0.005
CANAL 6	0.40	0.300	25.000	0.005
CANAL 7	0.40	0.300	25.000	0.005
CANAL 8	0.40	0.300	30.000	0.005
CANAL 9	0.40	0.300	20.000	0.005
CANAL 10	0.40	0.300	45.000	0.005
CANAL 11	0.40	0.500	48.200	0.005
CANAL 12	0.40	0.400	29.250	0.005
CANAL 13	0.50	0.400	28.000	0.005
CANAL 14	0.40	0.300	27.000	0.005

TIPO DE DE CANALES				
Canal	b Base (m)	h Altura (m)	L Longitud (m)	S Pendiente (m/m)
CANAL TIPO 1	0.40	0.300	350.000	0.005
CANAL TIPO 2	0.40	0.400	57.250	0.005
CANAL TIPO 3	0.50	0.500	48.200	0.005

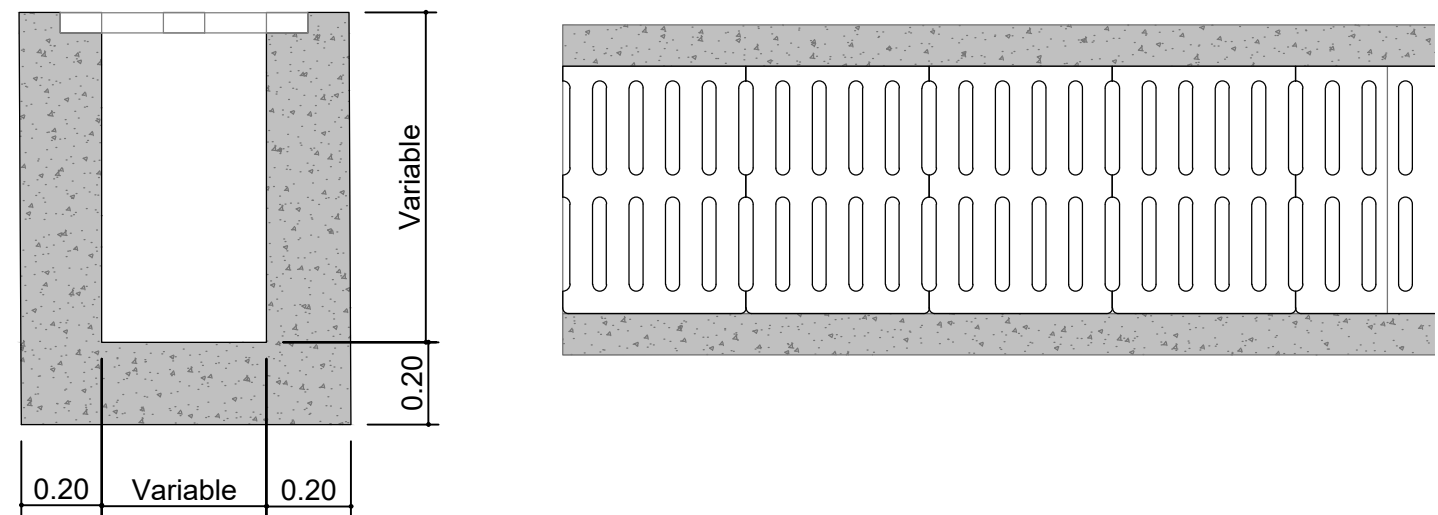


DETALLE CAJA DE INSPECCION
1 : 2000

Diámetro mm	Ancho de Zanja B	
	Mínimo cm	Medio cm
110	45	60
160	45	60
200	50	60
250	55	70
315	60	70



2 DETALLE EXCAVACION
1 : 10



CANAL AGUAS LLUVIAS

CAJAS AGUAS LLUVIAS	
Tipo	Recuento

ALL - 60cmx60cm	5
ALL - 60cmx80cm	2
ALL - 80cmx80cm	5
Total	12

TUBERIA PVC ALL		
Diámetro	Longitud	Notas

3"	37.21	
4"	65.55	
6"	418.41	
Total	521.18	



GOBERNADORA:

ELVIA MILENA SAN JUAN DAVILA

SECRETARIO DE INFRAESTRUCTURA DEPARTAMENTAL

JORGE ARMANDO MAESTRE JARABA

PROYECTO:

**"MEJORAMIENTO DE LA
INFRAESTRUCTURA EDUCATIVA
EN DISTINTOS MUNICIPIOS DEL
DEPARTAMENTO DEL CESAR".**

DESARROLLO DIGITAL DEL PROYECTO:

DISEÑO ARQUITECTONICO:



MARIA ALEXANDRA PALMERA CASTILLA
A68682008-1065564617

DISEÑO ESTRUCTURAL:


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M.P. No. 25202-278944 CND

DISEÑO TOPOGRÁFICO:
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RAFAEL CUELLO CARRILLO
MP.No. 01-14206
CNPT

DISEÑO ELECTRICO:

LUIS FELIPE SÁNCHEZ LLANOS
 No. AT205-41653.

DISEÑO HIDROSANITARIO Y RCI:



JUAN JOSE ONATE

M.P.No. 091037-0661809 CND

CONTIENE :
DETALLES DE AGUAS LLUVIAS,
NOTAS CANTIDADES Y DETALLES
GENERALES DE DISEÑO.
INSTITUCIÓN EDUCATIVA ALVARO
ARAUJO NOGUERA DE ASTREA

Vo.Bo. REVISÓ

Vo.Bo. PLANEACIÓN

FECHA: 06/2026		ESCALA: Indicada
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PLANO N°: ALL-AST-104 DE:104	ALL-ASR-104
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