

BILL OF MISCELLANEOUS ALUMINUM FOR PEDESTRIAN HANDRAIL/BICYCLE RAIL									
PANEL	No.	DESCRIPTION	SIZE	LENGTH	REMARKS	COMPONENT MASS	MASS PER UNIT	TOTAL MASS	
H1	1	HANDRAIL/BICYCLE PANEL	1250		AS DETAILED			25.69	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,184		7.77	7.77		
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	1,184		3.99	3.99		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	1,184		3.99	3.99		
	10	- ALUMINUM BALLUSTERS	25 13	925		0.81	8.12		
	1	- ALUMINUM FLAT BAR	6 76	1,014		1.25	1.25		
	2	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.06		
	2	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.36		
	2	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.17		
		25.69							
H2	1	HANDRAIL/BICYCLE PANEL	1800		AS DETAILED			38.56	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,734		11.38	11.38		
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	1,734		5.84	5.84		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	1,734		5.84	5.84		
	16	- ALUMINUM BALLUSTERS	25 13	925		0.81	12.99		
	1	- ALUMINUM FLAT BAR	6 76	1,564		1.93	1.93		
	2	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.06		
	2	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.36		
	2	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.17		
		38.56							
H3	1	HANDRAIL/BICYCLE PANEL	2684		AS DETAILED			58.71	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	2,618		17.17	17.17		
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	2,618		8.82	8.82		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	2,618		8.82	8.82		
	25	- ALUMINUM BALLUSTERS	25 13	925		0.81	20.29		
	1	- ALUMINUM FLAT BAR	6 76	2,448		3.01	3.01		
	2	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.06		
	2	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.36		
	2	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.17		
		58.71							
H4	1	HANDRAIL/BICYCLE PANEL	1765		AS DETAILED			37.24	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,699		11.15	11.15		
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	1,699		5.73	5.73		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	1,699		5.73	5.73		
	15	- ALUMINUM BALLUSTERS	25 13	925		0.81	12.18		
	1	- ALUMINUM FLAT BAR	6 76	1,529		1.88	1.88		
	2	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.06		
	2	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.36		
	2	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.17		
		37.24							
J1	92	HANDRAIL/BICYCLE PANEL	2440		AS DETAILED			2,972.58	
		EACH UNIT FABRICATED FROM:							
	2	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	2,374		15.57	31.15		
	4	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.11		
	4	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.72		
	4	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.33		
		32.31							
J2	2	HANDRAIL/BICYCLE PANEL	1900		AS DETAILED			50.45	
		EACH UNIT FABRICATED FROM:							
	2	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,834		12.03	24.06		
	4	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.11		
	4	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.72		
	4	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.33		
		25.23							
J3	10	HANDRAIL/BICYCLE PANEL	1700		AS DETAILED			226.02	
		EACH UNIT FABRICATED FROM:							
	2	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,634		10.72	21.44		
	4	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.11		
	4	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.72		
	4	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.33		
		22.60							
J4	2	HANDRAIL/BICYCLE PANEL	1480		AS DETAILED			39.43	
		EACH UNIT FABRICATED FROM:							
	2	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,414		9.28	18.55		
	4	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.11		
	4	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.72		
	4	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.33		
		19.72							
J5	1	HANDRAIL/BICYCLE PANEL	1400		AS DETAILED			18.67	
		EACH UNIT FABRICATED FROM:							
	2	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	1,334		8.75	17.50		
	4	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.11		
	4	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.72		
	4	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.33		
		18.67							

BILL OF MISCELLANEOUS ALUMINUM FOR PEDESTRIAN HANDRAIL/BICYCLE RAIL									
PANEL	No.	DESCRIPTION	SIZE	LENGTH	REMARKS	COMPONENT MASS	MASS PER UNIT	TOTAL MASS	
K	51	HANDRAIL/BICYCLE PANEL	2400		AS DETAILED			810.54	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	2,334		15.31	15.31		
	2	- ALUM. PLATE Mk. "P1"	6 26	67		0.03	0.06		
	2	- ALUM. PLATE Mk. "P2"	10 70	95		0.18	0.36		
	2	- ALUM. PLATE Mk. "P3"	10 44	70		0.08	0.17		
		15.89							
L1	22	HANDRAIL/BICYCLE PANEL	3500		AS DETAILED			1,186.89	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	3,434		11.57	11.57		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	3,434		11.57	11.57		
	33	- ALUMINUM BALLUSTERS	25 13	925		0.81	26.79		
	1	- ALUMINUM FLAT BAR	6 76	3,264		4.02	4.02		
		53.95							
L2	1	HANDRAIL/BICYCLE PANEL	2617		AS DETAILED			39.61	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	2,551		8.60	8.60		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	2,551		8.60	8.60		
	24	- ALUMINUM BALLUSTERS	25 13	925		0.81	19.48		
	1	- ALUMINUM FLAT BAR	6 76	2,381		2.93	2.93		
		39.61							
L3	1	HANDRAIL/BICYCLE PANEL	2574		AS DETAILED			39.26	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM CHANNEL TOP RAIL	C102 x 51 x 6	2,508		8.45	8.45		
	1	- ALUMINUM CHANNEL BOTTOM RAIL	C102 x 51 x 6	2,508		8.45	8.45		
	24	- ALUMINUM BALLUSTERS	25 13	925		0.81	19.48		
	1	- ALUMINUM FLAT BAR	6 76	2,338		2.88	2.88		
		39.26							
END UNIT	4	HANDRAIL/BICYCLE END PANEL			AS DETAILED			56.85	
		EACH UNIT FABRICATED FROM:							
	1	- ALUMINUM BICYCLE RAIL	88 Ø x 9.5	476		3.12	3.12		
	1	- ALUMINUM BICYCLE RAIL	89 Ø x 9.5	800		5.25	5.25		
	1	- ALUMINUM BICYCLE RAIL	90 Ø x 9.5	730		4.79	4.79		
	1	- ALUMINUM BASE PLATE Mk. "BP1"	200 13	150		1.05	1.05		
		14.21							
						TOTAL MASS OF ALUMINUM (kg) FOR PANELS = 5,600.48			

**NOTES:**

- ALUMINUM EXTRUSIONS SHALL CONFORM TO ASTM B221 ALLOY 6351-T6. ALUMINUM PLATES SHALL CONFORM TO ASTM B221 ALLOY 5083.
- THE M.I.G. PROCESS OF WELDING SHALL BE USED.
- S.S. DENOTES STAINLESS STEEL.
- RAIL POSTS AND BALUSTER SHALL BE SET VERTICAL.
- PLACE NEOPRENE PAD UNDER EACH POST BETWEEN BASE PLATE OR SHIM AND CONCRETE SURFACE. ALUMINUM SHIMS MAY BE REQUIRED FOR VERTICAL ALIGNMENT.
- HANDRAIL ANCHOR INSERTS SHALL BE STAINLESS STEEL

**NOTE:**

- FOR POST AND PANEL LAYOUT, REFER TO SHEET NO. 020

BILL OF MISCELLANEOUS METAL ANCHORAGE RODS				
MARK	No.	DESCRIPTION	MASS PER UNIT	TOTAL MASS
X1	--	HILTI S.S. 19 Ø x 254 LG HAS SUPER ROD. AS DETAILED		XX XX XX
			TOTAL MASS (kg) = XX.XX	

BILL OF MISCELLANEOUS METAL FOR PEDESTRIAN HANDRAIL (FASTENERS)				
POST	No.	DESCRIPTION	MASS PER UNIT	TOTAL MASS
P1	36	12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.40	57.60
	2	16 Ø x 90 LG S.S. VANDALPROOF SOCKET HEAD CAP SCREW C/W NYLON LOCK NUT AND WASHER	0.40	
	2	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.40	
	4	19 Ø S.S. NUT, WASHER AND LOCKWASHER	0.40	
		1.60		
P1	11	(AT NE EXISTING WALL) 12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.40	17.60
	2	16 Ø x 90 LG S.S. VANDALPROOF SOCKET HEAD CAP SCREW C/W NYLON LOCK NUT AND WASHER	0.40	
	2	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.40	
	4	16 Ø S.S. NUT, WASHER AND LOCKWASHER	0.40	
		1.60		
P2	4	12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.20	7.20
	2	16 Ø x 90 LG S.S. VANDALPROOF SOCKET HEAD CAP SCREW C/W NYLON LOCK NUT AND WASHER	0.40	
	6	13 Ø x 38 LG S.S. FLAT-HEADED SOCKET CAP SCREW C/W NUT & LOCKWASHER	0.60	
	1	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.20	
	2	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.40	
		1.80		
P2B	4	12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.40	8.00
	2	16 Ø x 90 LG S.S. VANDALPROOF SOCKET HEAD CAP SCREW C/W NYLON LOCK NUT AND WASHER	0.40	
	6	13 Ø x 38 LG S.S. FLAT-HEADED SOCKET CAP SCREW C/W NUT & LOCKWASHER	0.60	
	1	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.20	
	2	16 Ø x 50 LG S.S. HEX BOLT C/W NYLON LOCK NUT AND 2 PLATE WASHERS	0.40	
		2.00		
P3	22	13 Ø x 38 LG S.S. FLAT-HEADED SOCKET CAP SCREW C/W NUT & LOCKWASHER	1.20	35.20
	4	19 Ø S.S. NUT, WASHER AND LOCKWASHER	0.40	
		1.60		
P4	4	12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.60	5.60
	4	19 Ø S.S. NUT, WASHER AND LOCKWASHER	0.40	
	4	13 Ø x 38 LG S.S. FLAT-HEADED SOCKET CAP SCREW C/W NUT & LOCKWASHER	0.40	
		1.40		
P5	107	12.7 x 38.1 S.S. PIN-IN-HEAD TAMPER RESISTANT BUTTON-HEAD SOCKET CAP SCREWS C/W NYLON LOCKNUT AND WASHER	0.80	128.40
	4	19 Ø S.S. NUT, WASHER AND LOCKWASHER	0.40	
		1.20		
			TOTAL MASS (kg) FOR HANDRAIL FASTENERS = 259.60	

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UNDERGROUND STRUCTURES		B.M. ELEV.	DESIGNED BY	DRA
SUPV. U/G STRUCTURES	DATE		DRAWN BY	DJB
			CHECKED BY	DRA
			APPROVED BY	TJP
			HOR. SCALE	--
			VERTICAL	--
			0 ISSUED FOR TENDER	18/03/16 TJP