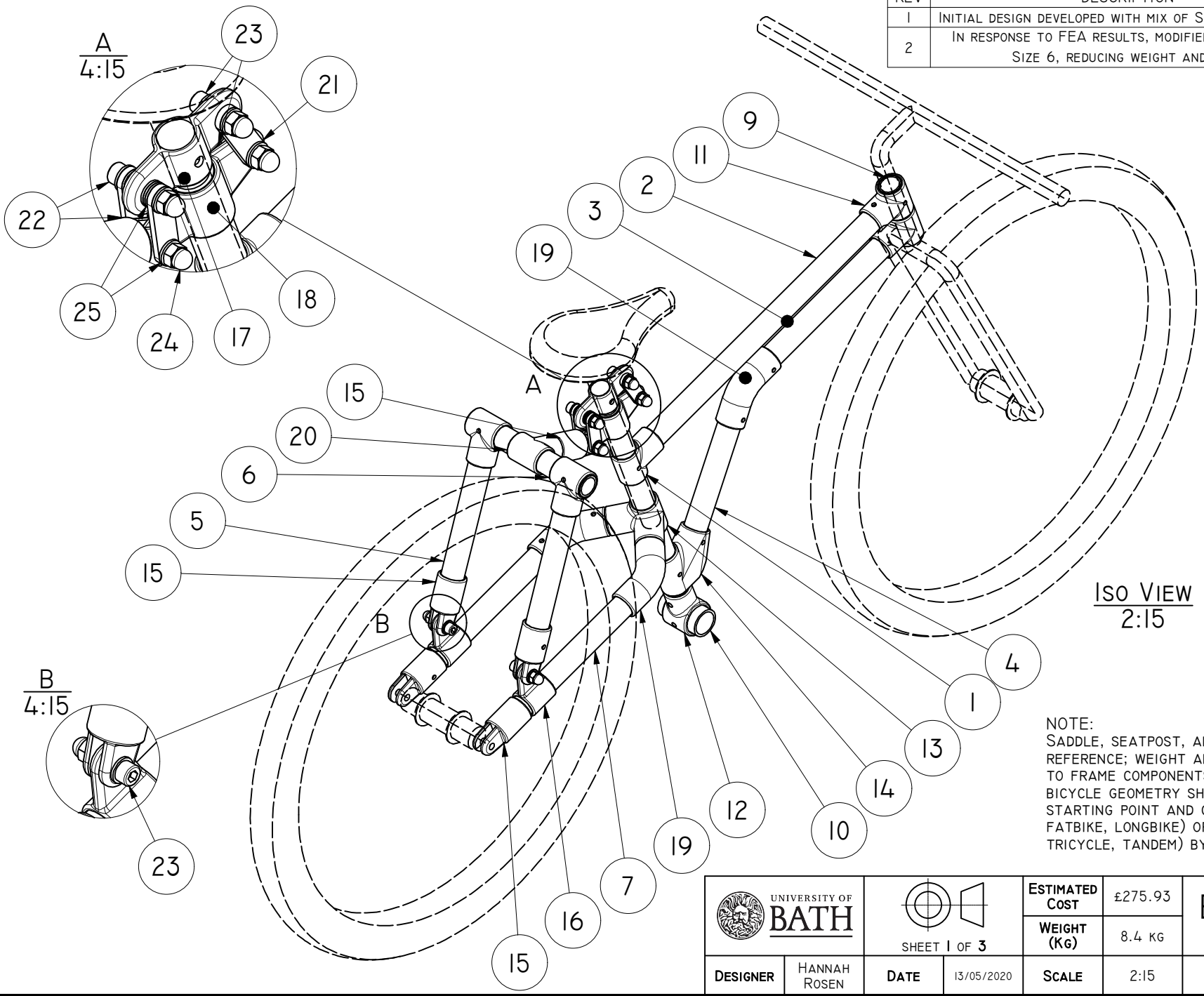
REV	DESCRIPTION	DATE
1	Initial design developed with mix of Size 6 and Size 7	08/05/2020
2	In response to FEA results, modified to use only Size 6, reducing weight and cost	10/05/2020



NOTE:
Saddle, seatpost, and wheels are shown for reference; weight and estimated cost apply to frame components only. The simple bicycle geometry shown here is intended as a starting point and can be customized (ie. fatbike, longbike) or adapted (ie. cargo tricycle, tandem) by the user if desired.

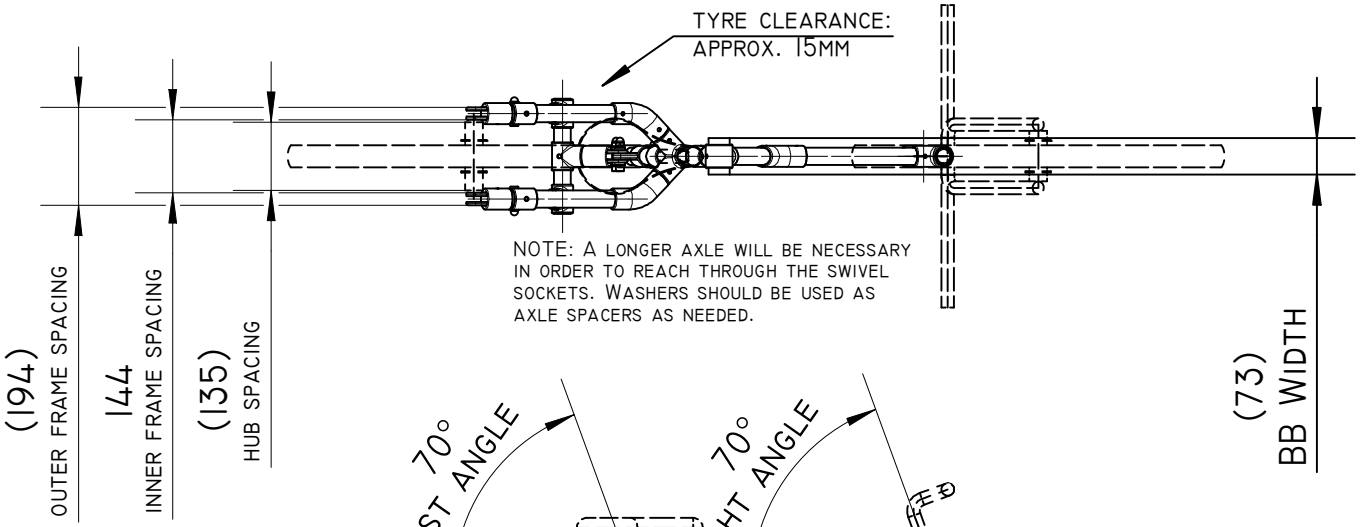
University of Bath		Sheet 1 of 3		Estimated Cost	£275.93
				Weight (kg)	8.4 kg
Designer	Hannah Rosen	Date	13/05/2020	Scale	2:15

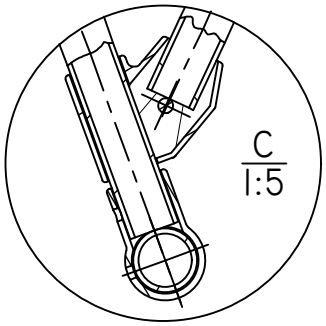
Bicycle Frame
Design for Performance

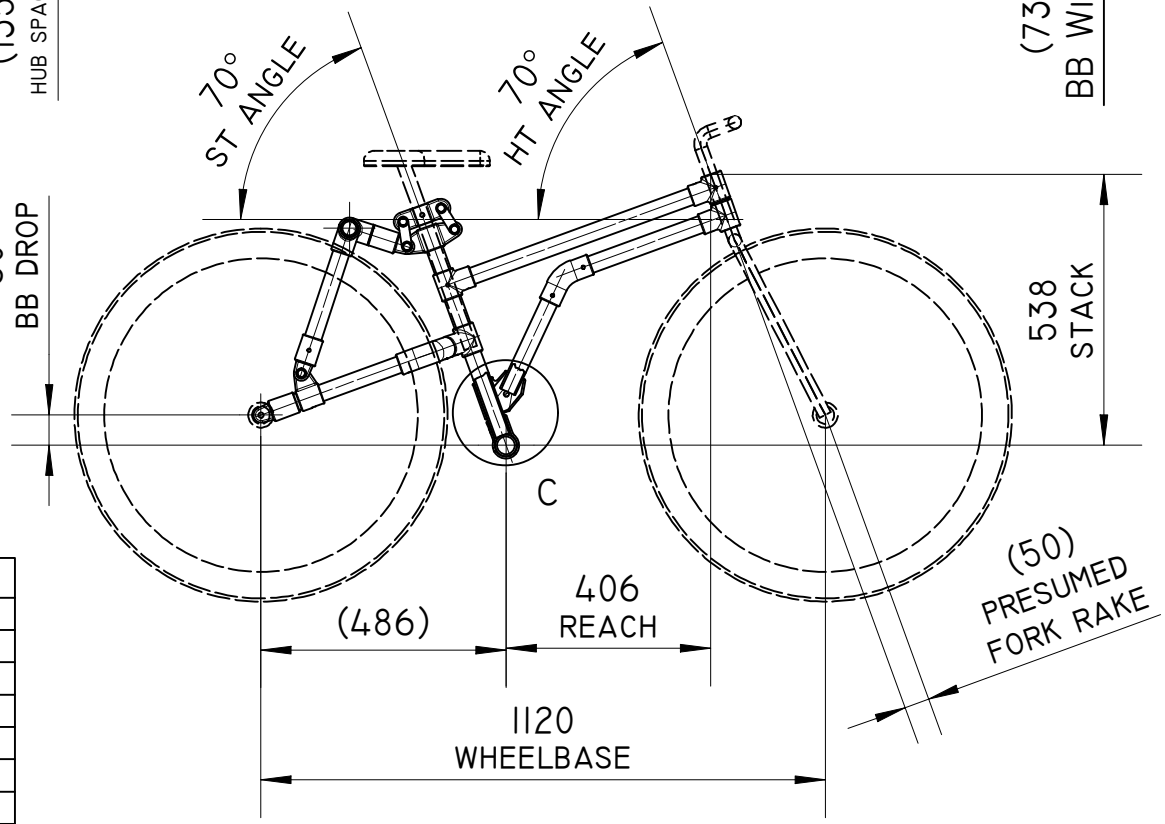
BCL-DFP
REV 2

NOTES ON COMPATIBILITY:
Components below can be taken from a cheap second-hand donor bike or purchased seperately. Use shims if necessary, leaving a gap for the clamp's grub screw.

1. Bottom Bracket: 73mm English Thread
2. Fork: 1" ISO standard fork steerer. Ø41mm HT for a 1⅛" fork also available (Ceeway ZALCI8210), but needs size 7 clamps.
3. Seatpost: 26-27.5mm OD for Size 5 clamp (M51-5, shown here) or 21-22.5mm OD for Size 4 clamp (M50-4).
4. Wheels: 29" rims with 44mm tyres and 135mm rear hub spacing shown for reference. For larger wheels (or longer wheelbase) - use longer CS, SS, CSS, and/or SSS tubes. For smaller wheels - use shorter CS and SS tubes, and/or longer axle spacers (CSS shown at minimum).
5. Brakes: Front - any compatible brake. Rear - use coaster brake or create attachment points for calipers with additional clamps.
6. Gears: Single speed or hub gears are the simplest but not the only options. Consider the weight of the entire bike when selecting gear ratio(s).







NOTE: All tube lengths are provisional as there is limited information on how far into the clamps each tube is inserted. Leaving a 10-20mm margin for adjustment is advised when cutting tubes.

SAMPLE GEOMETRIES			
DIM	SMALL*	MEDIUM	LARGE
RIDER HEIGHT (IN)	5'3" TO 5'7"	5'7" TO 6'0"	6'0" TO 6'4"
STACK (MM)	538	556	585
REACH (MM)	406	410	416
WHEELBASE (MM)	1120	1130	1147
DTA LENGTH (MM)	304	298	289
DTB LENGTH (MM)	230	252	288
TT LENGTH (MM)	532	542	557
MASS (KG)	8.4	8.4	8.4
ESTIMATED COST (£)	275.93	276.08	276.31

*SHOWN HERE

UNIVERSITY OF BATH

SHEET 2 OF 3

DESIGNER	HANNAH ROSEN	DATE	13/05/2020	SCALE	1:15

ESTIMATED COST	£275.93
WEIGHT (KG)	8.4 KG

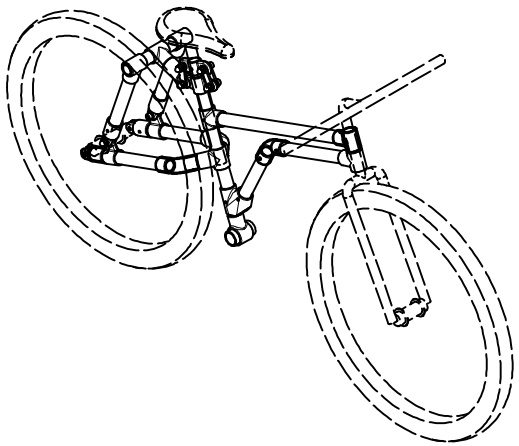
BICYCLE FRAME

DESIGN FOR PERFORMANCE

BCL-DFP
REV 2

PARTS LIST

ITEM	PART NUMBER	REV	DESCRIPTION	QTY	SIZE	OD (MM)	LENGTH (MM)	MATERIAL	MASS (KG)	ESTIMATED COST	VENDOR
1	ST	2	SEAT TUBE	1	6	33.7	440	ALUMINIUM 6082 T6	0.364	£2.41	SCAFFOLDING DIRECT
2	TT	2	TOP TUBE	1	6	33.7	532	ALUMINIUM 6082 T6	0.44	£2.92	SCAFFOLDING DIRECT
3	DTA	1	DOWN TUBE A	1	6	33.7	304	ALUMINIUM 6082 T6	0.252	£1.67	SCAFFOLDING DIRECT
4	DTB	1	DOWN TUBE B	1	6	33.7	230	ALUMINIUM 6082 T6	0.19	£1.26	SCAFFOLDING DIRECT
5	SS	1	SEATSTAY	2	6	33.7	260	ALUMINIUM 6082 T6	0.215	£1.42	SCAFFOLDING DIRECT
6	SSP	1	SEATSTAY SPACER	1	6	33.7	228	ALUMINIUM 6082 T6	0.189	£1.25	SCAFFOLDING DIRECT
7	CS	2	CHAINSTAY	2	6	33.7	300	ALUMINIUM 6082 T6	0.248	£1.64	SCAFFOLDING DIRECT
8	CSP	2	CHAINSTAY SPACER	2	6	33.7	78	ALUMINIUM 6082 T6	0.065	£.43	SCAFFOLDING DIRECT
9	OR0G18180	-	HEAD TUBE	1	6	32.4	115	STEEL AISI 4130	0.188	£10.00	CEEWAY
10	BBSLEEVE73.42	-	BOTTOM BRACKET	1	7	42	73	STEEL, MILD	0.243	£7.00	CEEWAY
11	L10-6	-	SINGLE SOCKET TEE	5	6			ALUMINIUM CAST	0.13	£9.56	KEE SYSTEMS
12	10-76	-	COMBINATION SINGLE SOCKET TEE	1	6.5			IRON, CAST	0.43	£12.53	KEE SYSTEMS
13	L21-6	-	90 DEG SIDE OUTLET TEE	1	6			ALUMINIUM CAST	0.16	£12.18	KEE SYSTEMS
14	29-6	-	30 TO 60 DEG TEE	1	6			IRON, CAST	0.44	£9.59	KEE SYSTEMS
15	LF50-6	-	FEMALE SWIVEL SOCKET	5	6			ALUMINIUM CAST	0.17	£8.64	KEE SYSTEMS
16	LM50-6	-	MALE SINGLE SWIVEL SOCKET	2	6			ALUMINIUM CAST	0.12	£10.97	KEE SYSTEMS
17	M51-5	-	MALE DOUBLE SWIVEL SOCKET	1	5			IRON, CAST	0.33	£10.30	KEE SYSTEMS
18	LM51-6	-	MALE DOUBLE SWIVEL SOCKET	1	6			ALUMINIUM CAST	0.16	£15.59	KEE SYSTEMS
19	55-6	-	120 TO 150 DEG ELBOW	3	6			IRON, CAST	0.51	£9.01	KEE SYSTEMS
20	L114-6	-	SWIVEL TEE	1	6			ALUMINIUM CAST	0.18	£18.50	KEE SYSTEMS
21	LINK	1	SEATPOST CLAMP LINK	4				ALUMINIUM 6082 T6	0.016	£3.00	CUSTOM
22	M10X35 SHCS A2	-	M10 X 35MM SOCKET HEAD CAP SCREW	2				STAINLESS STEEL AISI 304	0.041	£.66	ACCU
23	M10X45 SHCS A2	-	M10 X 45MM SOCKET HEAD CAP SCREW	4				STAINLESS STEEL AISI 304	0.035	£.65	ACCU
24	M10 DN A2	-	M10 DOME NUT	6				STAINLESS STEEL AISI 304	0.019	£.62	ACCU
25	M10 W A2	-	M10 WASHER (2MM THICK)	18				STAINLESS STEEL AISI 304	0.004	£.23	ACCU



NOTES:

1. SADDLE, SEATPOST, AND WHEELS ARE SHOWN FOR REFERENCE; WEIGHT AND ESTIMATED COST APPLY TO FRAME COMPONENTS ONLY.
2. THE SIMPLE BICYCLE GEOMETRY SHOWN HERE IS INTENDED AS A STARTING POINT AND CAN BE CUSTOMIZED (IE. FATBIKE, LONGBIKE) OR ADAPTED (IE. CARGO TRICYCLE, TANDEM) BY THE USER IF DESIRED.
3. GRUB SCREWS MUST BE TIGHTENED TO 40NM WITH A TORQUE WRENCH. A GOOD QUALITY THREAD LOCKER MUST BE USED ON ALL THREADS. LOCTITE 243 IS A GOOD CHOICE AS IT IS STRONG ENOUGH TO RESIST LOOSENING DUE TO SHOCK AND VIBRATION, BUT CAN STILL BE DISASSEMBLED WITH HAND TOOLS. IT ALSO TOLERATES CONTAMINATION WITH OIL TO A CERTAIN EXTENT (SUCH AS CHAIN GREASE). THERE ARE ALSO CHEAPER ALTERNATIVES AVAILABLE SUCH AS RS COMPONENTS' OWN BRAND THREAD LOCKERS.
4. CARE SHOULD BE TAKEN TO CHOOSE A FORK, BOTTOM BRACKET BEARINGS, WHEELS, AND OTHER COMPONENTS WHICH ARE COMPATIBLE WITH THE FRAME COMPONENTS (SEE SHEET 2).
5. ALL TUBE LENGTHS ARE PROVISIONAL AS THERE IS LIMITED INFORMATION ON HOW FAR INTO THE CLAMPS EACH TUBE IS INSERTED. LEAVING A 10-20MM MARGIN FOR ADJUSTMENT IS ADVISED WHEN CUTTING TUBES.

UNIVERSITY OF BATH		SHEET 3 OF 3		ESTIMATED COST	£275.93	BICYCLE FRAME DESIGN FOR PERFORMANCE
				WEIGHT (KG)	8.4 KG	
DESIGNER	HANNAH ROSEN	DATE	13/05/2020	SCALE	1:20	BCL-DFP REV 2