

Location	Description	OD (cm)	Straight Qty	Straight Length (meter)	Total Straight (meter)	Elbow Qty	Valve Qty	"T" Qty
Branch Tunnel#1 A1 –A2	Expansion joint: Chill water supply (CHWS)	20	2	1.0	2.0			
Branch Tunnel#1 A1 –A2	Expansion joint: Chill water return (CHWR)	20	2	1.0	2.0			
Branch Tunnel#1 A2	Anchor: CHWS	20	2	1.0	2.0			
Branch Tunnel#1 A2	Anchor: CHWR	20	2	1.0	2.0			
Branch Tunnel#1 A2 –A3	Expansion joint: CHWS	20	2	1.0	2.0			
Branch Tunnel#1 A2 –A3	Expansion joint: CHWR	20	2	1.0	2.0			
Branch Tunnel#1- afterA4	Bypass line: CHWS	10	1	0.5	0.5	2	1	
Branch Tunnel#1 – afterA4	Crossover #1 CHWR- HTHWR	25	2	0.5	1.0			2
Branch Tunnel#1 – afterA4	Crossover #1 CHWS-HTHWS	15	1	3.0	3.0		2	
Branch Tunnel#1 – afterA4	Crossover #2	25	2	0.5	1.0			2
Branch Tunnel#1 – afterA4	Crossover #2	15	1	3.0	3.0		2	
Branch Tunnel#1 – afterA4	CHWS	30					1	
Branch Tunnel#1 – afterA4	CHWR	30					1	

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Branch Tunnel#2	Long run Crossover : HTWS - CHWS	22	1	14.0	14.0	7		2
Branch Tunnel#2	Crossover long supply : HTHWS- CHWS	35					2	
Branch Tunnel#2	Long run Crossover : HTHWR-CHWR	22	1	14	14	7		2
Branch Tunnel#2	Crossover long return: HTHWR - CHWR	35					2	
Branch Tunnel#2	Short run Crossover: HTHWS - CHWS	22	1	4.0	4.0	2		2
Branch Tunnel#2	Crossover Short supply: HTHWS - CHWS	35					2	
Branch Tunnel#2	Short run Crossover: HTHWR - CHWR	22	1	4.0	4.0	2		2
Branch Tunnel#2	Crossover short return: HTHWR-CHWR	35					2	
Branch Tunnel#5 A2	Anchor CHWS	25	2	0.5	1.0			
Branch Tunnel#5 A2	Anchor CHWR	25	2	0.5	1.0			
Branch Tunnel#5 A1- A2	Expansion joint CHWS	25	2	1.0	2.0			
Branch Tunnel#5 A1-A2	Expansion joint CHWR	25	2	1.0	2.0			
Branch Tunnel#5 A3	Anchor CHWS	25	2	0.5	1.0			
Branch Tunnel#5 A3	Anchor CHWR	25	2	0.5	1.0			
Branch Tunnel#5 A3-A4	Crossover CHWR –HTHWR	18	1	6.0	6.0	4		2
Branch Tunnel#5 A3-A4	Crossover CHWR- HTHWR	30					2	
Branch Tunnel#5 A3 -A4	Expansion joint: CHWS	25	2	1.0	2.0			
Branch Tunnel#5 A3 -A4	Expansion joint: CHWR	25	2	1.0	2.0			
Branch Tunnel#5 A4	Chill water supply(CHWS)	25	2	0.5	1.0			

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Branch Tunnel#5 A4	Chill water return (CHWR)	25	2	0.5	1.0			
Branch Tunnel#6 A1-A2	Expansion joint: CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A1-A2	Expansion joint: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A2	Anchor :CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A2	Anchor: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A2-A3	Expansion joint: CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A2-A3	Expansion joint: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A3	Anchor :CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A3	Anchor: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A3-A4	Expansion joint: CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A3-A4	Expansion joint: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A5-A6	Expansion joint: CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A5-A6	Expansion joint: CHWR	40	2	0.5	1.0			
Branch Tunnel#6 A6	Anchor :CHWS	40	2	0.5	1.0			
Branch Tunnel#6 A6	Anchor: CHWR	40	2	0.5	1.0			

Location	Description	OD (cm)	Straight Qty	Straight Length (meter)	Total Straight (meter)	Elbow Qty	Valve Qty	"T" Qty
Branch Tunnel#6 >A6	Crossover CHWR-HTHWR	18	1	8.0	8.0	4		2
Branch Tunnel#6 >A6	Crossover CHWR-HTHWR	30					2	
Branch Tunnel#6 >A6	new valve – CHWS	40	1	2.0	2.0			
Branch Tunnel#6 >A6	new valve – CHWR	40	1	2.0	2.0			
Branch Tunnel#6A	Chill water supply(CHWS)	35	1	9.0	9.0			2
Branch Tunnel#6A	Chill water return (CHWS)	50					1	
Branch Tunnel#6A	CHWR	50					1	
Branch Tunnel#6A	CHWR	35	1	8.0	8.0			2
Branch Tunnel#6A	HTHWS	40					1	
Branch Tunnel#6A	HTHWR	40					1	
Branch Tunnel#8 A1	Crossover: HTHWR-CHWR	30					1	
Branch Tunnel#8 A1	Crossover: HTHWR-CHWR	18	1	6.0	6.0	3		2
Branch Tunnel#8 A2-A3	Expansion joint: CHWS	35	2	0.5	1.0			
Branch Tunnel#8 A3	Expansion joint: CHWR	35	2	0.5	1.0			
Branch Tunnel#8 A3	Anchor :CHWS	35	2	0.5	1.0			
Branch Tunnel#8 A3	Anchor :CHWR	35	2	0.5	1.0			
Branch Tunnel#8 A3-A4	Expansion joint: CHWS	35	2	0.5	1.0			
Branch Tunnel#8 A3-A4	Expansion joint: CHWR	35	2	0.5	1.0			

Location	Description	OD (cm)	Straight Qty	Straight Length (meter)	Total Straight (meter)	Elbow Qty	Valve Qty	"T" Qty
Branch Tunnel#9 basement 2	Crossover CHWS-HTHWS	40					2	
Branch Tunnel#9 basement 2	Crossover CHWS-HTHWS	30	1	4.0	4.0	2		2
Branch Tunnel#9 mechanical room	Crossover CHWR-HTHWR	30	1	3.0	3.0			2
Branch Tunnel#9 mechanical room	Crossover CHWR-HTHWR	40					2	
Main Tunnel after Branch Tunnel#9	CHWR and CHWS	50					4	
Main Tunnel after Branch Tunnel#9	CHWS	35	1	8.0	8.0	6		
Main Tunnel After Branch Tunnel#9	CHWR	35	1	8.0	8.0	6		
Main Tunnel - end	CHWS-HTHWS	40					1	
Main Tunnel - end	CHWS-HTSWS	25	1	1.0	1.0			1
Main Tunnel - end	CHWR-HTSWR	40					1	
Main Tunnel - end	CHWR-HTSWR	25	1	3.0	3.0			