TABLE 3.1
TESLA parameters for the E_{cm}=500 GeV baseline design. The machine length includes a 2% overhead for energy management.

		TESLA-500
Accelerating gradient	E_{acc} [MV/m]	23.8[a]
RF frequency	f_{rf} [GHz]	1.3
Total site length	L_{tot} [km]	33
Active length	[km]	21.8
Repetition rate	f_{rep} [Hz]	5
Beam pulse length	T_P [μs]	950
Number of bunches per pulse	n_b	2820
Bunch spacing	Δt_b [ns]	337
Charge per bunch	N_e [10^{10}]	2
Emittance at IP	$\gamma\varepsilon_{x,y}$ [10^{-6} m·rad]	10, 0.03
Beta at IP	$\beta^*_{x,y}$ [mm]	15, 0.4
Beam size at IP	$\sigma^*_{x,y}$ [nm]	553, 5
Bunch length at IP	σ_z [mm]	0.3
Beamstrahlung	δ_E [%]	3.2
Luminosity	L_{e+e-} [10^{34} cm^{-2}s^{-1}]	3.4
Power per beam	$P_b/2$ [MW]	11.3
Two-linac primary electric power (main linac rf and cryogenic systems)	P_{AC} [MW]	97
e^-e^- collision mode:		
Beamstrahlung	$\delta_{E,e-e-}$ [%]	2.0
Luminosity	L_{e-e-} [10^{34} cm^{-2}s^{-1}]	0.47

[a] With the present site layout for TESLA, 23.4 MV/m was the required energy gain per meter of accelerator structure. A detailed analysis by the ILC-TRC revealed that the gradient has to be increased to 23.8 MV/m when rf phasing, especially for BNS damping, is taken into account.