

## HYBRID ELECTRIC TRAIN (HET)

### 1. GENERAL

The HET has five (5) coaches: four (4) of which have an individual capacity of 220 passengers, while one (1) coach serves as the power coach. The trainset has a hybrid transport system, capable of running either by diesel or electricity, so it is more energy-efficient and emits less carbon. It also utilizes regenerative braking technology which recaptures the kinetic energy during braking and converts it into electricity, so that it can be used to recharge the train's batteries.



Description	Parameters
Maximum speed (kph)	80 (computed)
Operating Speed (kph):	60
Capacity per coach (passenger)	175 (design load) 220 (crush load)
Supply voltage (Vdc)	650
Track gauge (narrow, m)	1.067
Gross weight per coach (tons)	25.5
Coach dimension (LxWxH) (m)	12 x 2.85 x 4.432
No. of coaches	5 (1 pilot, 1 power, 3 passenger) (power coach is not rideable)

No. of bogies per coach	2
No. of powered bogie per coach	2
Maximum track grade (%)	1.2
Minimum turning radius (m)	50
Motor rating (hp)	125
Gear ratio	1:4
Generator Set KVA/kW	625/500
Battery numbers (12 volts, 40 Amp-hour)	260
Battery System distance capacity	2 km
Acceleration (m/s <sup>2</sup> )	0.18
Deceleration (m/s <sup>2</sup> )	0.6

## 2. HET SUBSYSTEMS

The train can be categorically subdivided into six (6) subsystems: carbody; propulsion; power supply; train control; pneumatic supply; and air-conditioning and ventilation. The components of each of the subsystems and their respective descriptions are listed below:

<b>CARBODY</b>	<b>PROPULSION</b>	<b>POWER SUPPLY</b>	<b>TRAIN CONTROL</b>	<b>PNEUMATIC SUPPLY</b>	<b>AIR-CONDITIONING AND VENTILATION</b>
Coach assembly	Bogie assembly	Generator Set	PLC	Air Compressors	Compressor
Coupler	Traction motor	Batteries	HMI		Evaporator
Anti-Climbing Mechanism	Propeller shafts		I/O Module		Condenser
			VFD		