OUTLINE
OF
SHONAN MONORAIL

SHONAN MONORAIL, LTD.
Outline of Shonan Monorail Enoshima Line

1. History

Obtained License of Line: Oct. 29, 1965  
Construction Approved: May 30, 1968  
Construction Start: June 5, 1968  
Revenue Service Start: March 7, 1970 for Ofuna–Nishi Kamakura  
July 2, 1971 for Nishi Kamakura–Shonan Enoshima

2. Route

(1) Route Length: 6.6 km, single track  
(2) Route Conditions: Maximum grade 7.4% in five (5) sections  
Minimum radius of curvature 90 m  
50 m at switch portion

3. Stations

(1) Number of stations: Eight (8)  
(2) Location and Type of Platform

<table>
<thead>
<tr>
<th>Station</th>
<th>Distance (m)</th>
<th>Platform Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ofuna</td>
<td>0k040m</td>
<td>Parallel platform</td>
</tr>
<tr>
<td>Fujimichio</td>
<td>0k930m</td>
<td>Parallel platform</td>
</tr>
<tr>
<td>Shonan Machiya</td>
<td>1k990m</td>
<td>Single side platform</td>
</tr>
<tr>
<td>Shonan Fukasawa</td>
<td>2k660m</td>
<td>Island platform</td>
</tr>
<tr>
<td>Nishi Kamakura</td>
<td>4k740m</td>
<td>Island platform</td>
</tr>
<tr>
<td>Kataseyama</td>
<td>5k560m</td>
<td>Single side platform</td>
</tr>
<tr>
<td>Mejiroyamashita</td>
<td>6k210m</td>
<td>Island platform</td>
</tr>
<tr>
<td>Shonan Enoshima</td>
<td>6k600m</td>
<td>Parallel</td>
</tr>
</tbody>
</table>

4. Guideway

Elevated single track over entire route length  
(1) Girder: Reverse U type box welded steel structure  
Gauge: 840 mm  
Guide wheel width: 1,390mm  
Running surfaces: Epoxy mortar and wood  
(2) Pier: Steel welded column  
Shape: Reverse L type, T type and portal type  
Number of piers: 243  
Span: Standard 30 m  
Max. 36.3 m  
Min. 12.48 m
(3) Foundation: Concrete piled foundations and direct foundations
(4) Tunnel: Two (2) tunnels, Kamakurayama tunnel of 451 m and Kataseyama tunnel of 205 m

5. Switch: Horizontal movable type driven by hydraulic
Number of switches: Nine (9) sets in the main main line
Two (2) sets in the depot

6. Power Supply: 1500 V dc, 3 (three) rigid power rails, one for positive and two for negative

7. Substation: one (1) receiving substation and one traction substation at Kamakurayama
Receiving voltage 66 kV dual line from Tokyo Power Company.
Transformer (66 kV/ 6.6 kV/ 1.195 kV) 2 sets
Rectifier 3 sets

8. Signal System
Block system: Automatic fixed block
Train detection: Track circuit using two negative power rails
Train protection: Wayside pattern type ATS
Interlocking: No.1 kind Relay Interlocking

9. Automatic Traffic Supervision: Automatic Route Control

10. Depot
Location: 200m from Shonan Fukasawa Station (2k280m from Ofuna)
Facilities: Two storage lines and two inspection lines
Two maintenance and repair lines

11. Operation
(1) Operating hours: Down 5:35 ~ 23:50 from Ofuna
Up 5:25 ~ 23:26 from Shonan Enoshima
(2) Headway:
7.5 minutes for morning ~ 21.00
15.0 minutes after 21:00
(3) Number of operating trains: 266 trains Monday through Saturday
230 trains Sunday and holiday
(4) Car kilometer: Approx. 1.878 million km / year
(5) Maximum speed: 75 km / h
(6) Average speed: 36.7 km / h
(7) Scheduled speed: 28.8 km / h
(8) Transport Capacity: 3,712 persons / hour/direction
12. Carried passengers: 30,588 persons / day in April 1994 ~ March 1995
   11,160 million persons / year

13. Train
   (1) Vehicle type: Mitsubishi Suspended Type Two Axle Bogie Motor Car
   (2) Car body: Material: Aluminum light alloy
                  Size: LxWxH  12,750mm x 2,650mm x 3,094 mm
                      Max. length  13,350mm (Coupler to coupler)
   (3) Train formation: 3 Car-consists
   (4) Tare weight: 51.8 t / 3 cars
   (5) Capacity: Nominal load: 228 persons / 3 cars
                  Crush load:  464 persons / 3 cars
   (6) Truck: Rubber tyre air suspension two axle bogie type with differential gear
               Gauge: 840 mm
               Bogie center distance: 7,650 mm
               Wheel base: 1,500 mm
   (7) Suspension equipment: Trapezoidal link with oil damper
   (8) Traction motors: DC direct wound, one hour rate 55 kw x 4 x 3 / 3 cars
   (9) Controller: Switching of series and parallel of motor by cam shaft and limiting control by main resistor
   (10) Signal & communication: Automatic Train Stop control and train radio
   (11) Air Control: 17,000 kcal / h / car
   (12) Performance: Max. operating speed: 75 km/h
                     Acceleration: 4.0 km/h/s (service)
                     Deceleration: 4.0 km/h/s (service brake)
                     4.5 km/h/s (emergency brake)
Mitsubishi Suspended Monorail

GUIDEWAY

VEHICLE

STATION

SHONAN MONORAIL
Shonan Monorail Route Layout

OFUNA 600m
FUJIMICHI 6570m
SEONAN MACHEIYA 13990m
KATASEYAMA 5560m
MEJIROYAMASHITA 5210m
SHONAN ENOSHIMA 6060m

SHONAN MONORAIL, Ltd
Shonan Monorail Route Profile

SHONAN MONORAIL, Ltd
SHONAN MONORAIL ENOSHIMA LINE
PORTAL PIER & FOUNDATION

Steel Girder

Steel Pier
(Rectangular Cross Section)

P2-25
Place flying over JR Yokosuka Line

RC Foundation

Anchor Frame
Concrete Stone

PC Piles-12 sets

Unit:mm
Scale=1:10

Front View

Side View
Shonan Monorail

Relationship between Girder and Vehicle
Mitsubishi Suspended Monorail

ATS Antenna
Suspension Pipe
Bolster
Bolster Anchor
Power Collector (positive)
Traction Motor
Parking Brake
Traction Motor
Earth Brush
Guide Wheel
Auxiliary Wheel
Pneumatic Spring
Running Wheel
Disk Brake
Differential Gear
Guide Wheel

SHONAN MONORAIL
BOGIE ASSEMBLY