

### 3. Development of "Division Hoods Type Shield Connection Method" -This Method is Possible To Connect Between Shield Tunnels Diagonally in The Earth-

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In general, the shaft is constructed in shallow-depth ground, and after soil improvement, we connect the inflow shield tunnel in the sewage shield tunnel. Moreover, when the construction of the shaft is difficult, and large depth, we are executing a large-scale soil improvement in the tunnel. Then, new technological development is expected.

In such a background, we basic designed "Division hoods type shield machine" that was able to connect between shield tunnels diagonally in the earth. Afterwards, we established the fundamental plan of "Division hoods type shield connection method" on the assumption of the secondary lining omission.

The feature of this industrial method is shown below.

- i . This method is possible to connect between shield tunnels diagonally.  
(The maximum connection angle :  $112.5^\circ$  )
- ii . This method can correspond to a small diameter tunnel and a big aperture rate.  
(Application minimum outside diameter :  $\phi 2680\text{mm}$ 、 The maximum aperture rate : 80%)
- iii . This method can simplify the reinforcement of the opening in the existing shield tunnel.
- iv . This method has achieved reduction in costs for the industrial method so far.

**Key words** : the sewage shield tunnel, the secondary lining omission, diagonal connection