



Obayashi Corp's Beacon Hill Tunnel and Station Light Rail Project

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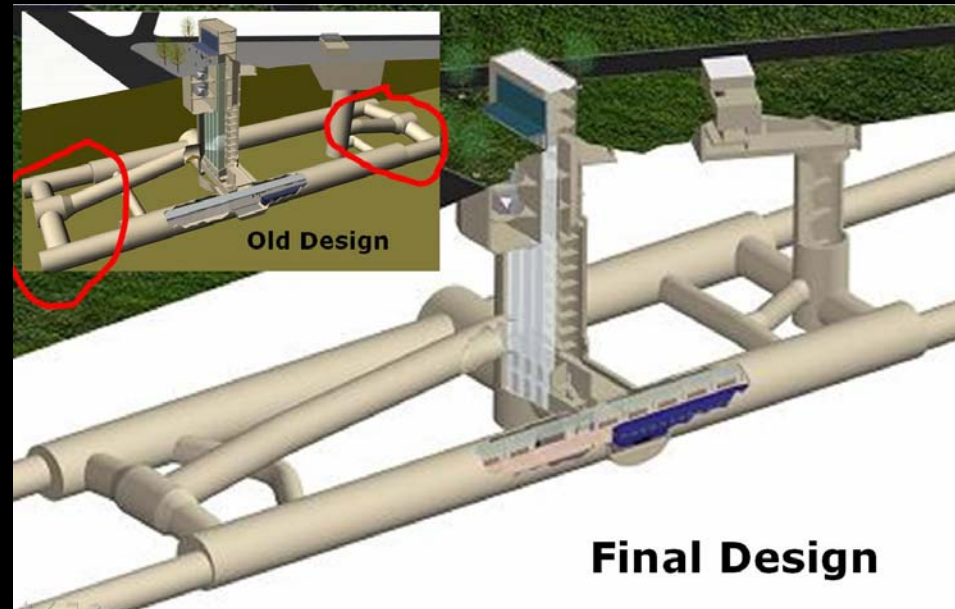
Project Scope

- 4300 ft twin tunnel
- 2100 ft elevated guideway
- 4100 ft of elevated station
- Totality of tunnel
Connects Sea-Tac
To Seattle



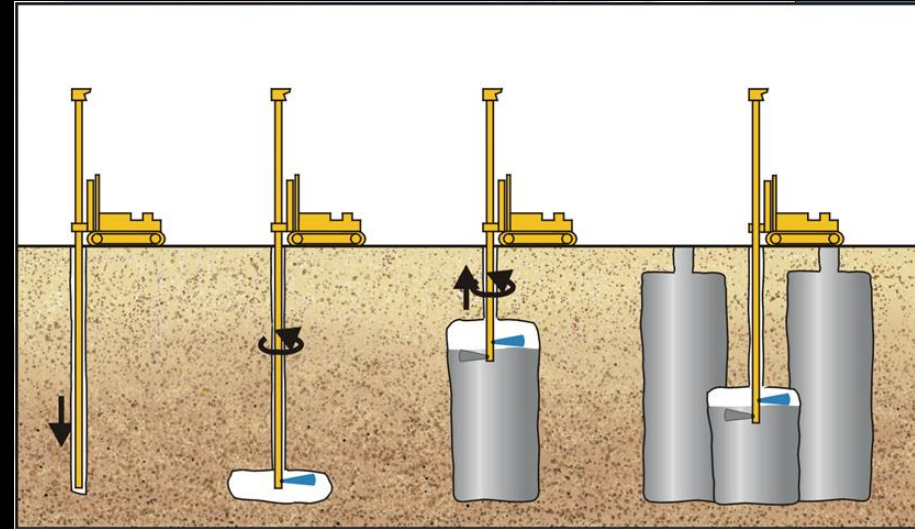
Timeline

- Project Start: June 2004
- Expected Finish Date May 2008
 - Many Delays
- New Projected Finish: June 21, 2009
 - Contracted at 280 million dollars
 - Final cost 384 million



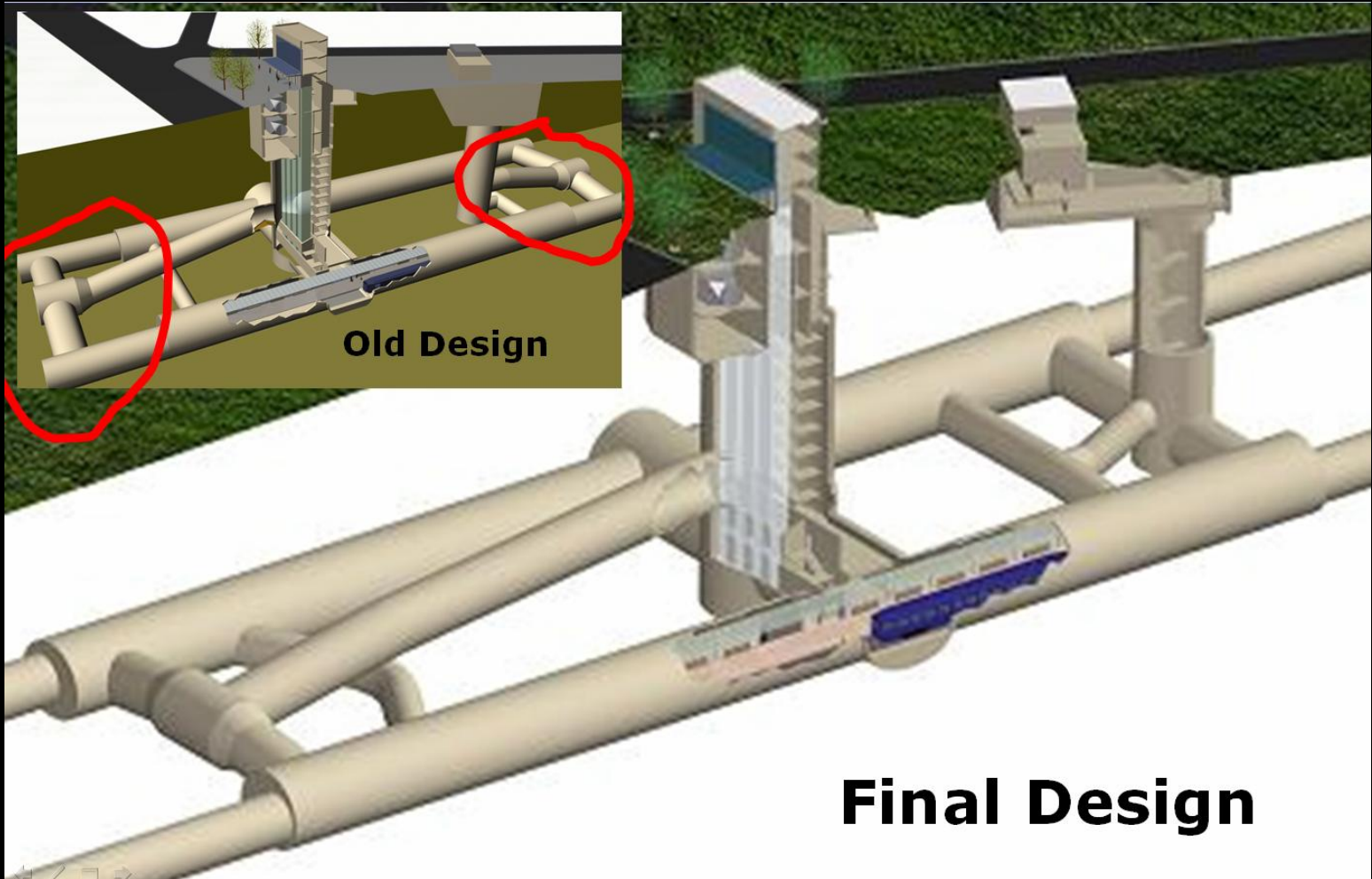
Delays and Problems

- TBM excavating through unconsolidated soil
- Sand lenses
- Jet Grouting necessary to solidify ground
- Jet Grouting became hard enough to hinder TBM's movement



Delays (continued)

- Platform Redesign



Mitsubishi TBM



Used to excavate rail
leading up to the

Capital cost of 5.44
million dollars



Other Equipment

- Kobelco 200 Tonne Crawler Crane
- Liebherr Mining Excavator
- Tamrock Jumbo Drill
- Cat Hydraulic Hammer

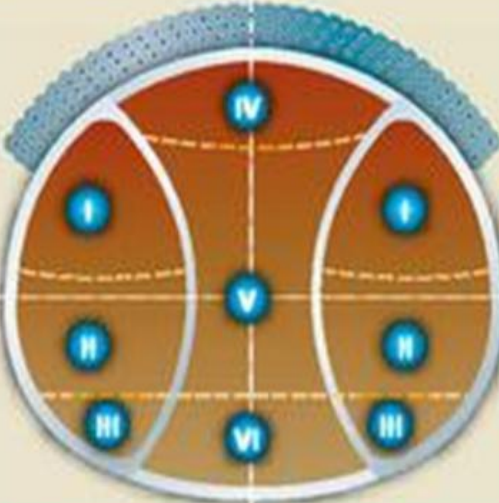
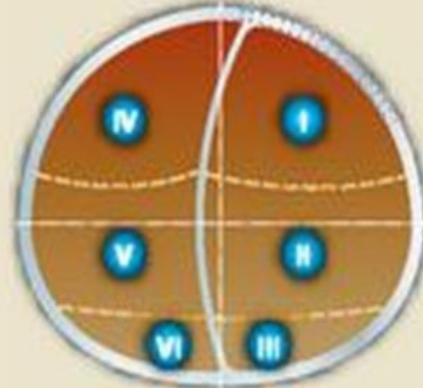
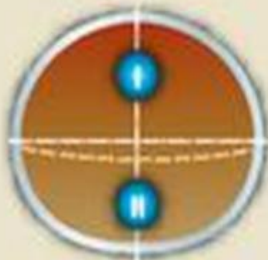


Sequential Excavation

- Used to excavate the station itself
- Walls erected between section and each section mined out sequentially



Sequential Excavation (continued)

Tempory	Twin sidewall drift excavation	Single sidewall drift excavation	Top heading/ bench/invert excavation
Location	Concourse Cross Adit	Platform Tunnel	Ventilation Adit
Excavation sequence			
Excavation support	Shotcrete t=14" Girder ϕ 3'-3" WWF W12xW12, 6x6	Shotcrete t=12" Girder ϕ 4" WWF W12xW12, 6x6	Shotcrete t=10" Girder ϕ 4" WWF W8xW8, 6x6

Thanks to...

- Val Vinyar, Project Surveyor
 - Many Diagrams and images
 - Site Tour

