



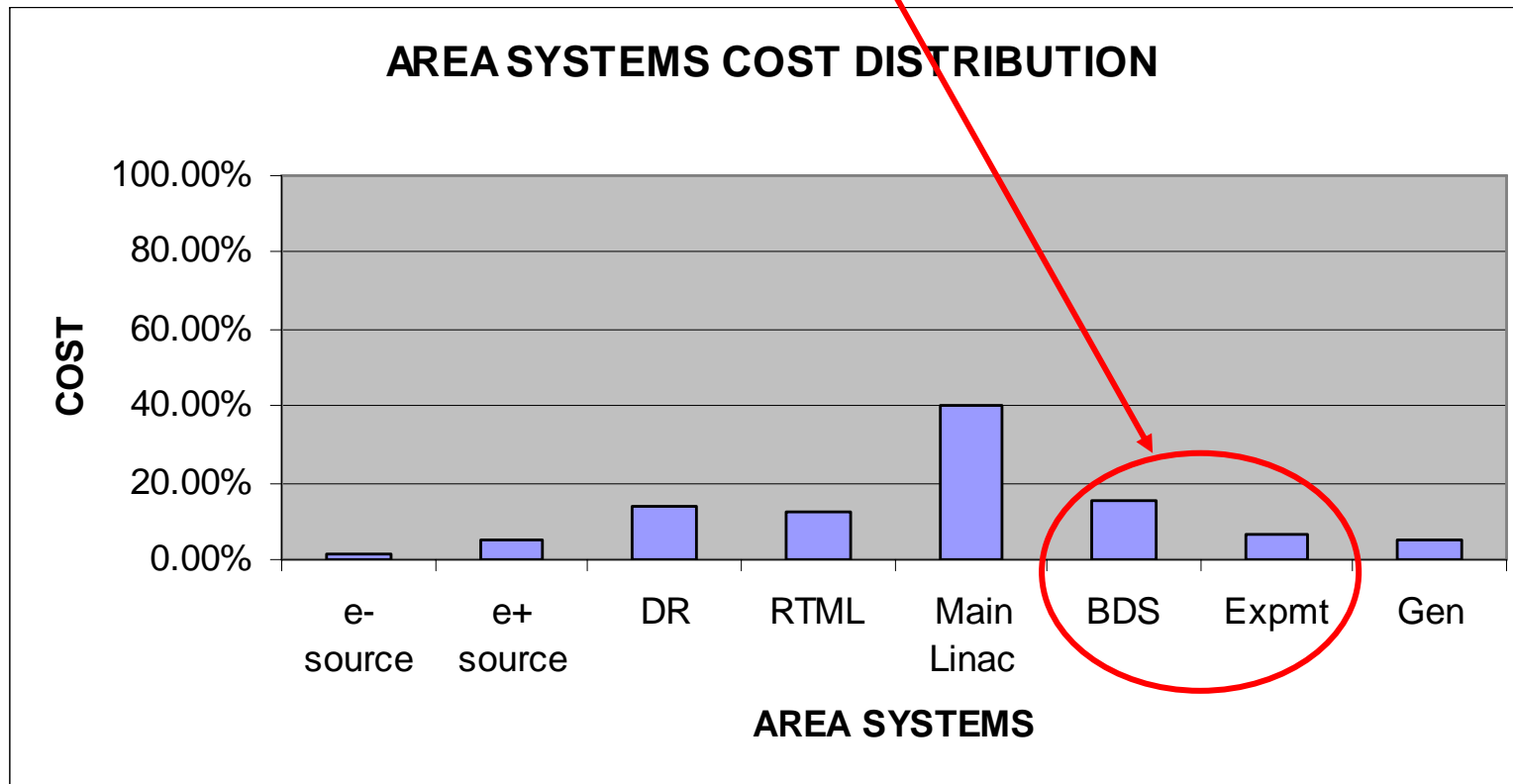
# Beam Delivery System

Fred Asiri  
CF&S Point of Contact



# Area System Cost Distributions

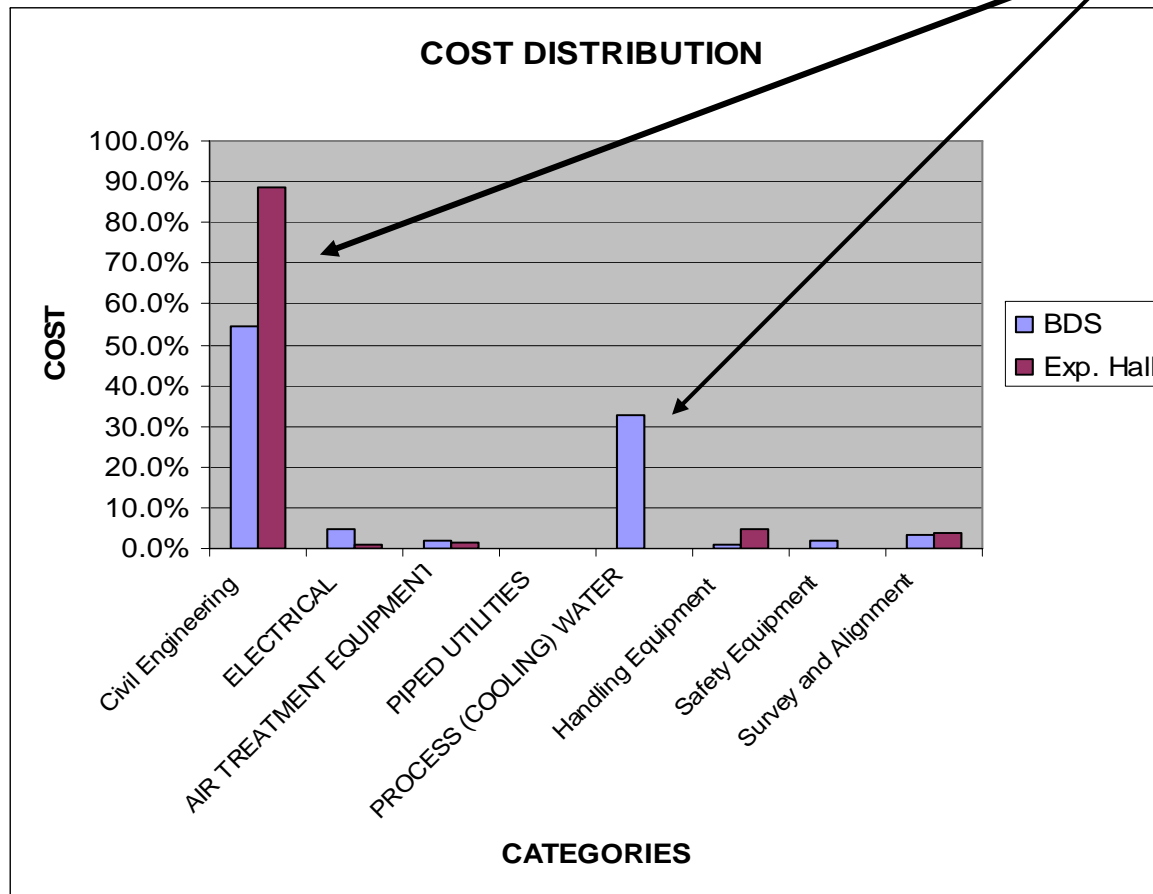
- At Vancouver; Beam Delivery System including Experimental Halls is ~ 22% of the CF costs





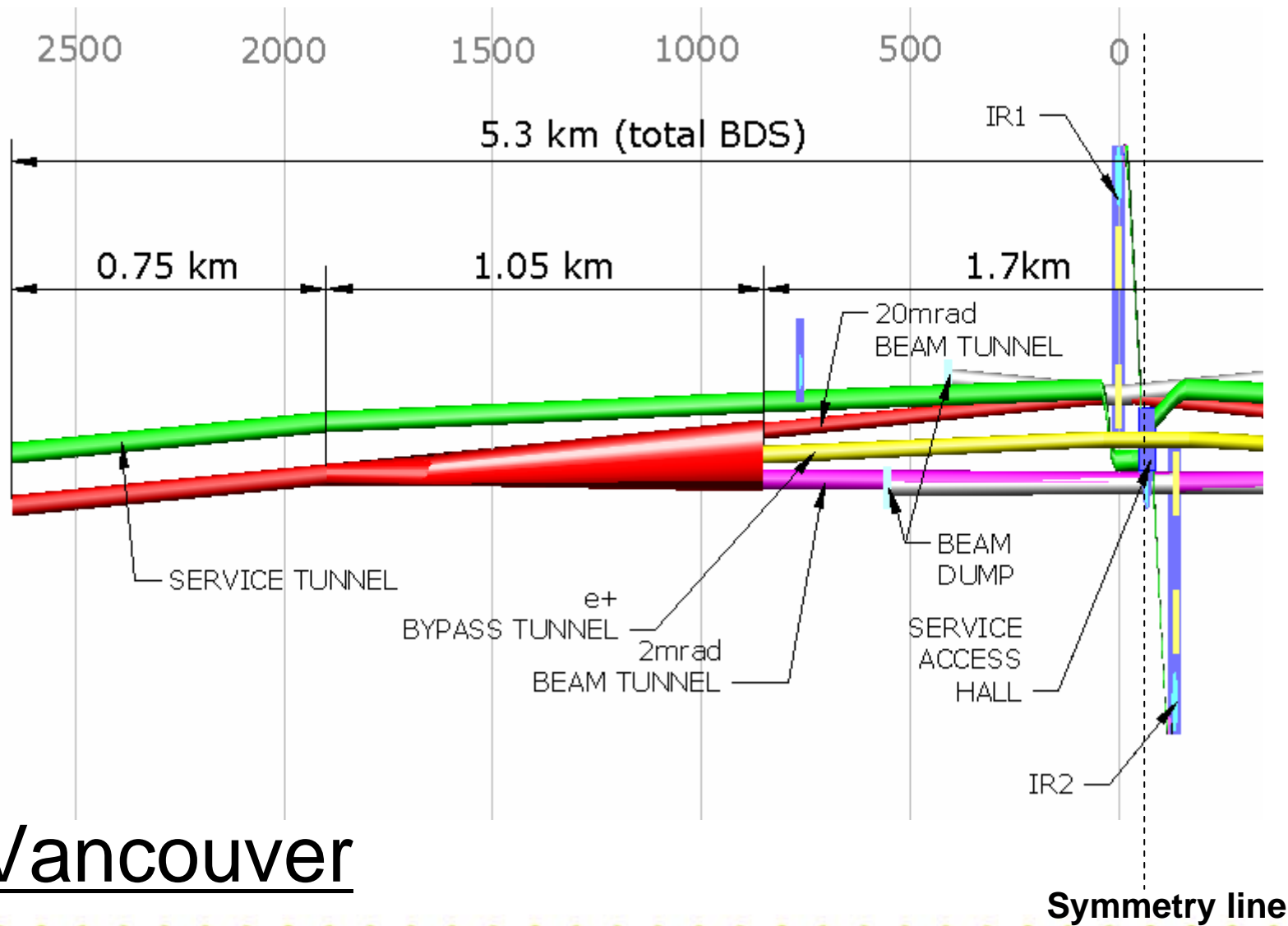
# BDS & E H Cost Drivers

- Underground and Process (Cooling) Water are identified as major cost drivers



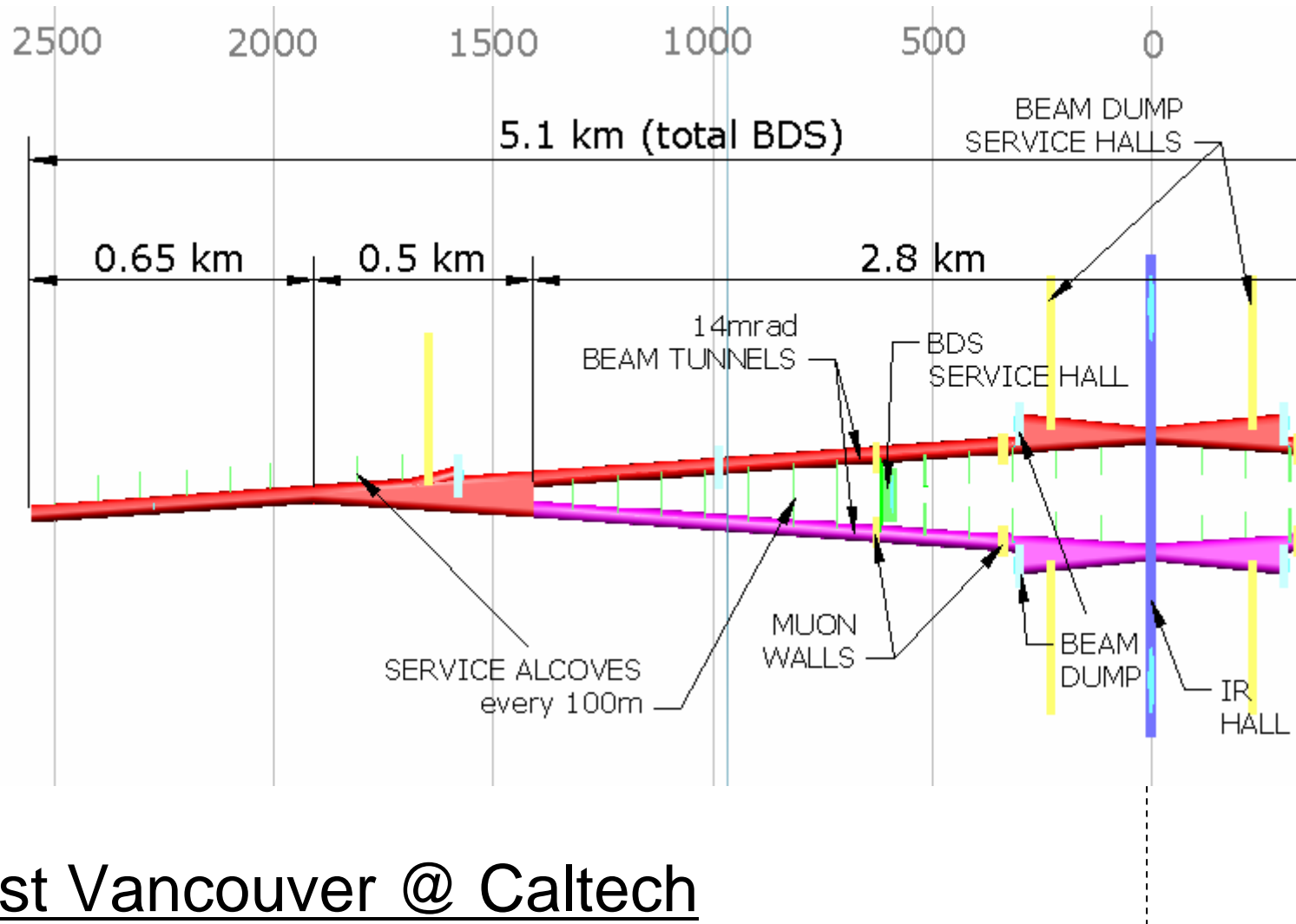


# BDS General Layout





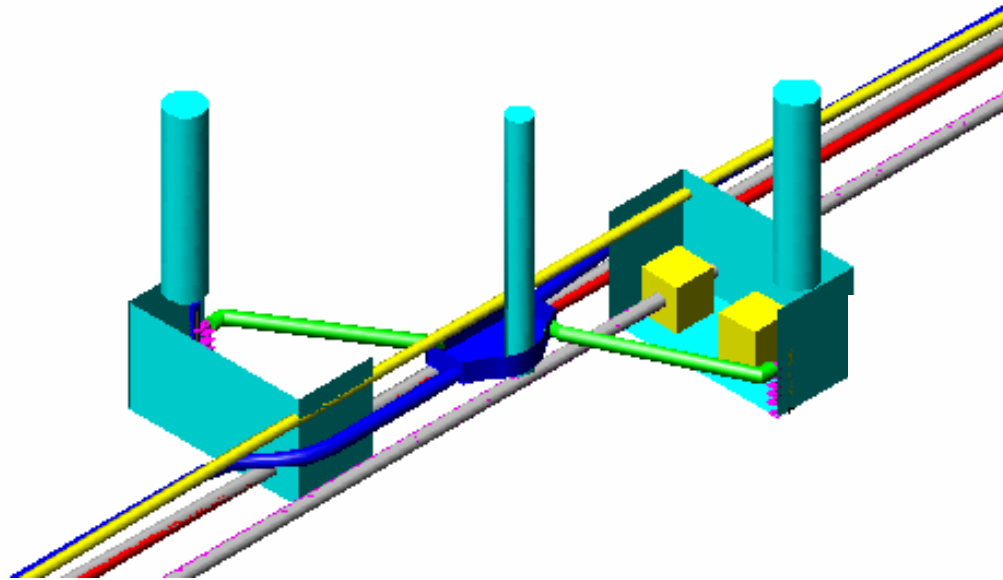
# BDS General Layout



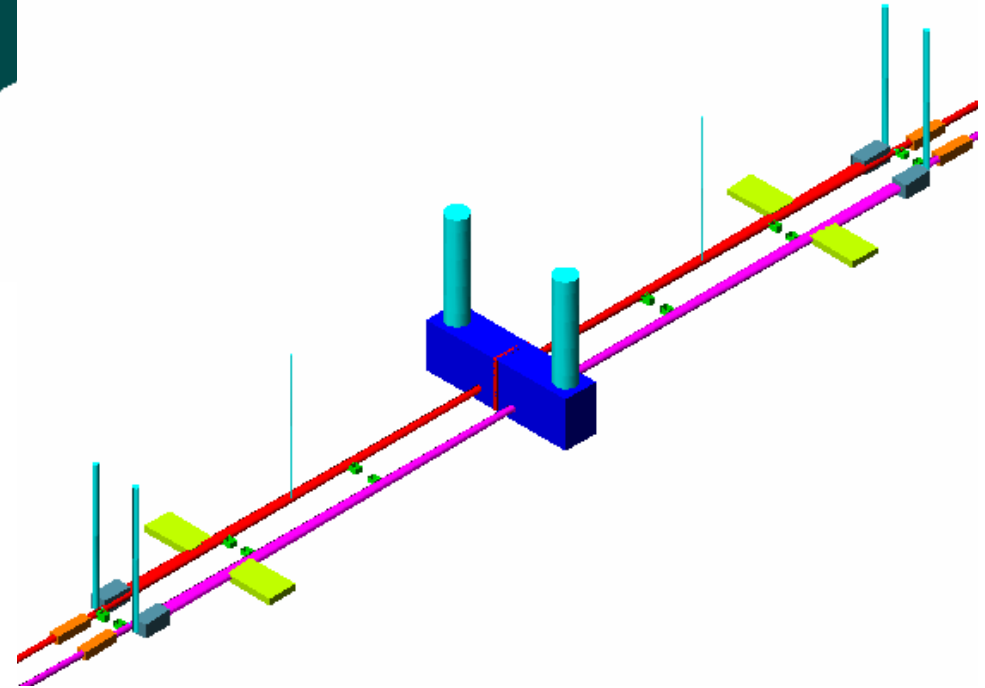
## Post Vancouver @ Caltech



# Snapshots at Interaction Regions



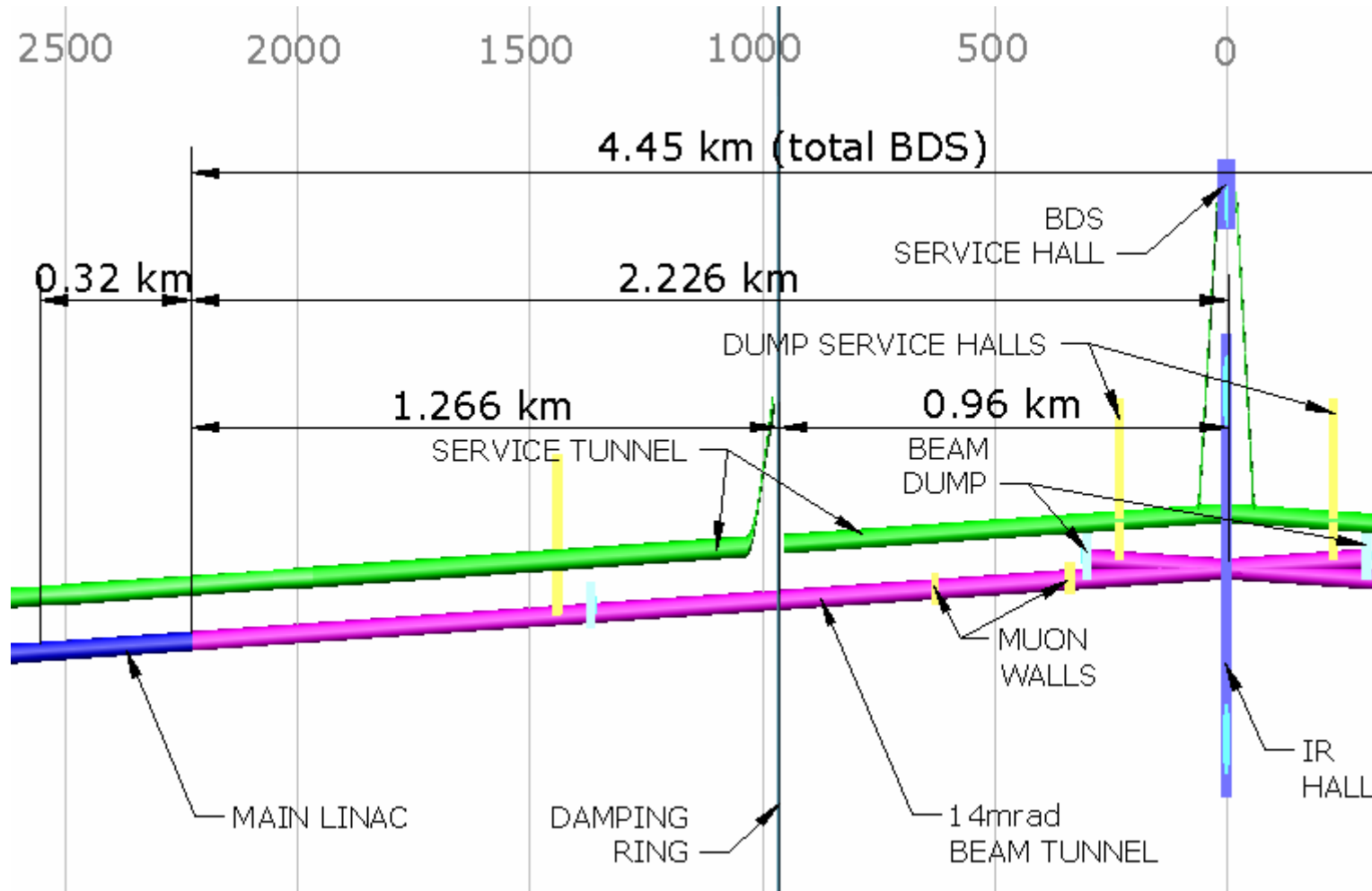
Vancouver



Post Vancouver



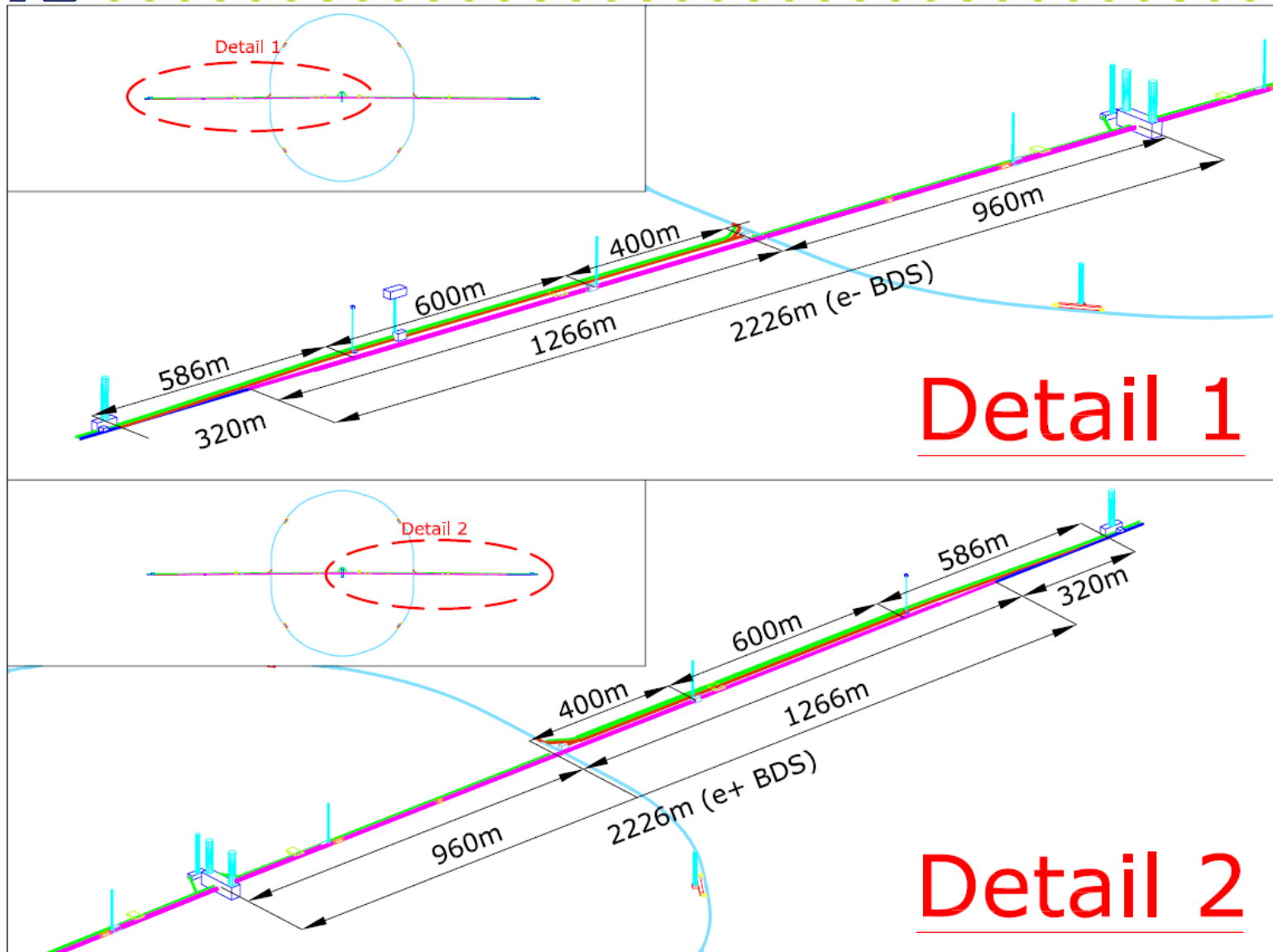
# Snapshots at Interaction Regions



## Valencia



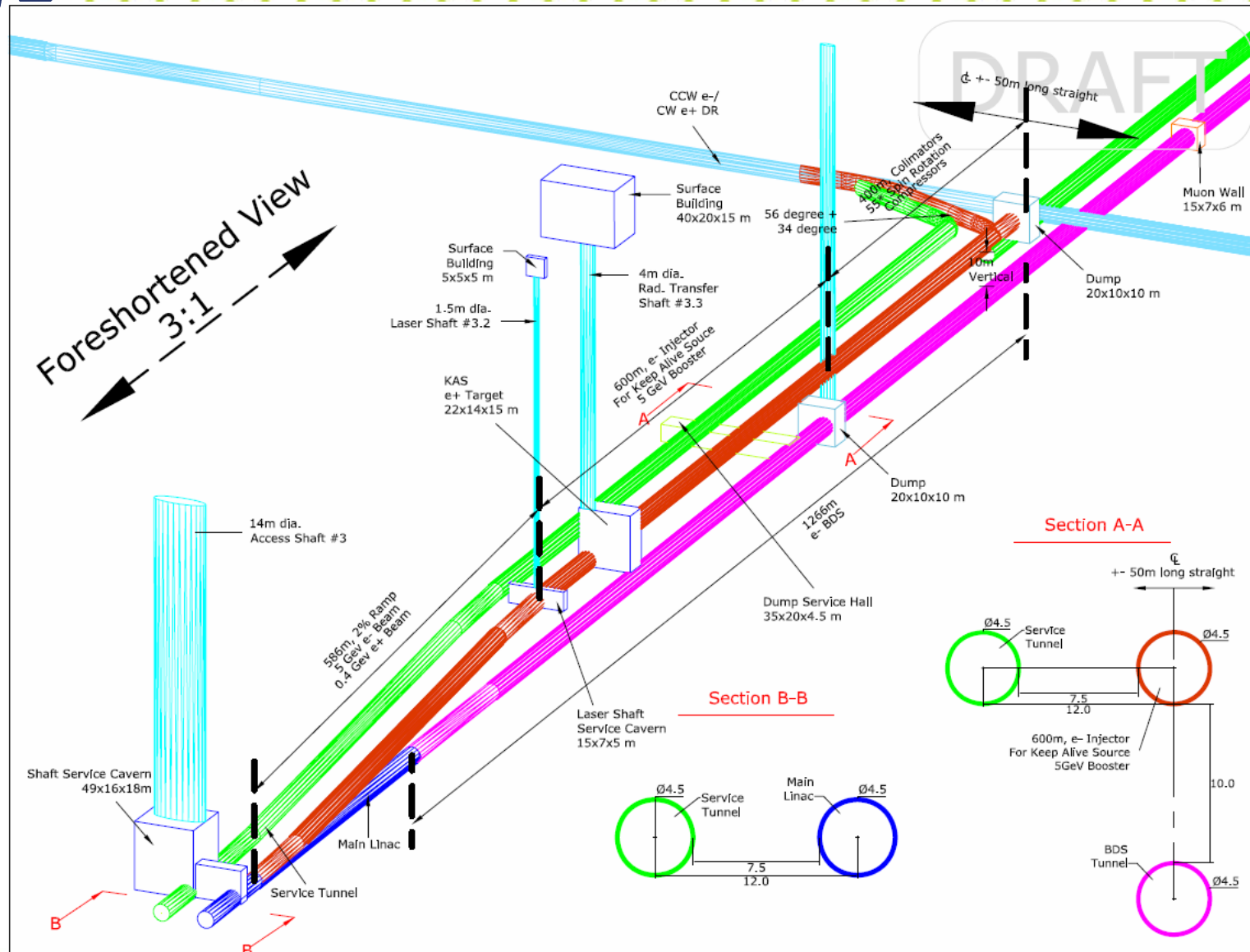
# Snapshots at Interaction Regions





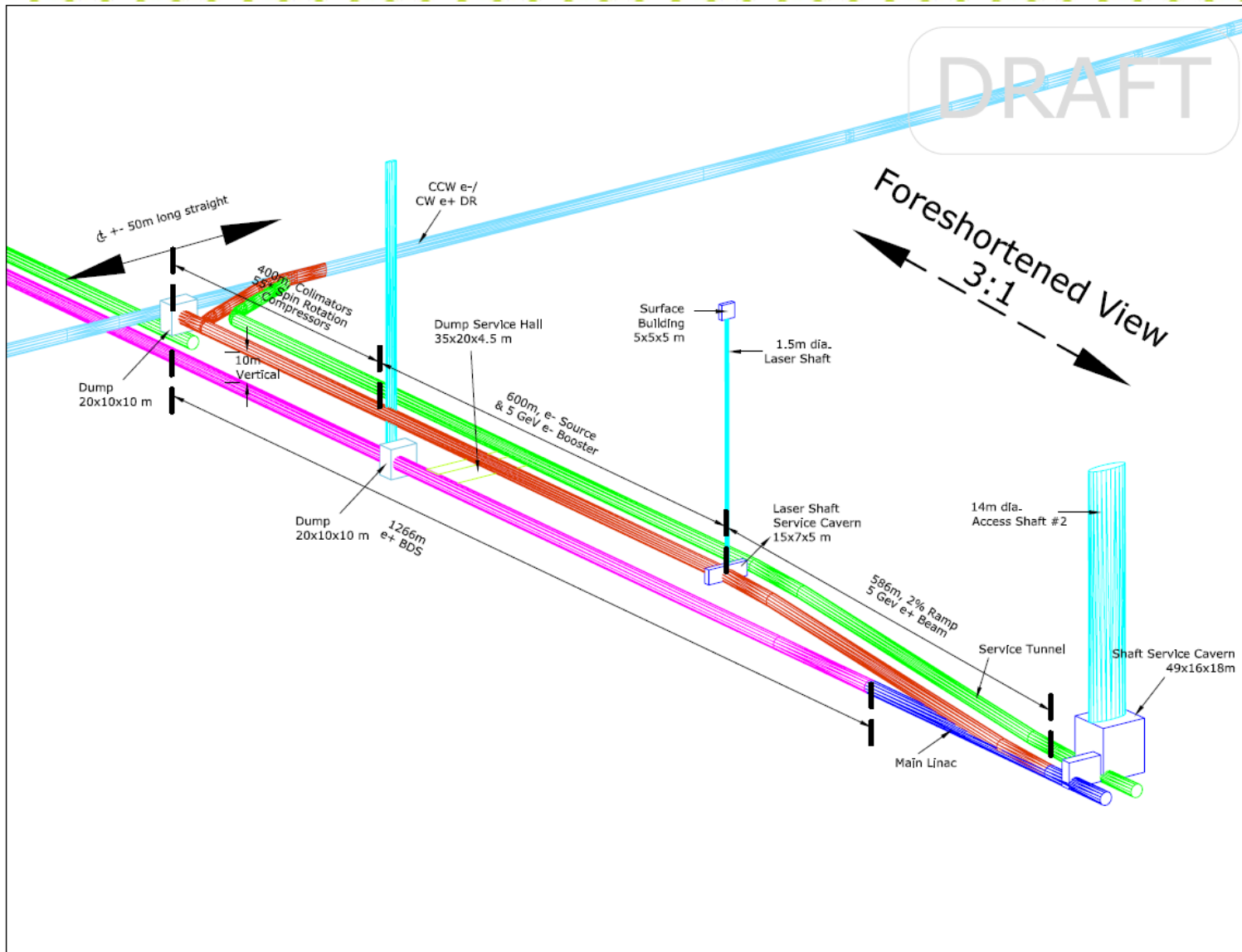


# Snapshots at Interaction Regions





# Snapshots at Interaction Regions





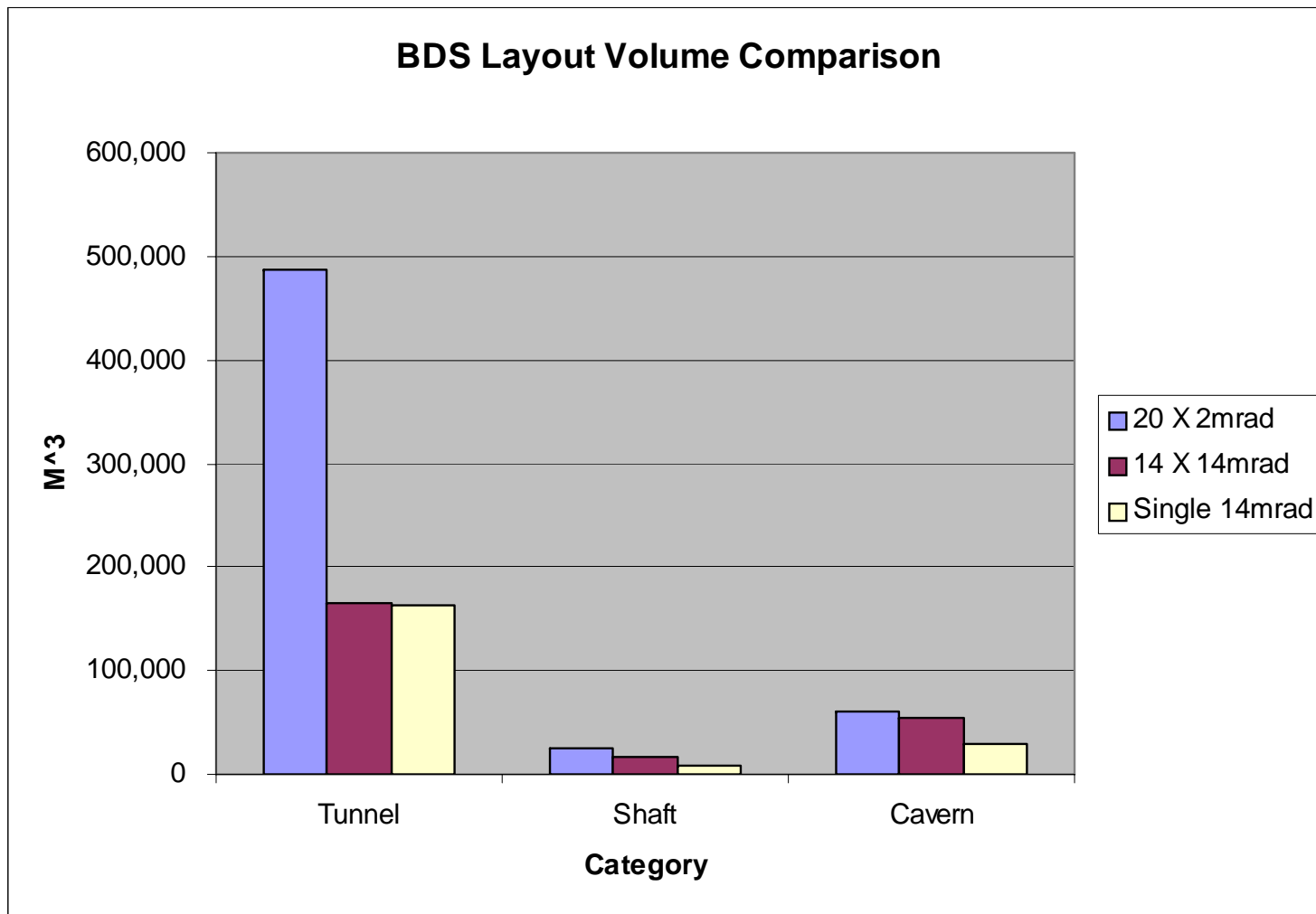
# BDS Changes from Vancouver

Underground Construction	~ Dimension	Vancouver	Post Vancouver	Changes Approx.
Beam Tunnels (ML to Ys)	Lengths , Diameter	1.5 km/ 5 m	1.3 km/ 4 m	- 13% -20%
Tapered tunnel (@ Ys)	Lengths, Dia. To Dia.	2.1 km, 5 m To 17.5 m	1.0 km, 4m To 15 m	-52% -15%
Beam Tunnels (Y to Y)	Lengths , Diameter	2 X1.7=3.4km 5 m	2 X 2.8= 5.6 km 4 m	65% -20%
E+ Bypass	Lengths , Diameter	1.7 km, 5 M	N.A.	-100% -100%
Service Tunnel	Lengths , Diameter	5.5 km, 5m	N.A.	-100
Service Alcoves	Numbers, Length/ width	N.A.	60, 6m X4.5 m	100%
Experimental Hall	Sizes (L,W,H) Volume	2 (72X32X40 m) 2 (92000)=184000 m3	110 X 25 X 35 m 96000 m3	-47%
Service Shafts & Bottom Caverns	Dia. X Depth Sizes	3 (9 X 100m) 60 X 20 X 8	2 (9 X 100m) 2 (40 X 12 X 8)	-33% -20%



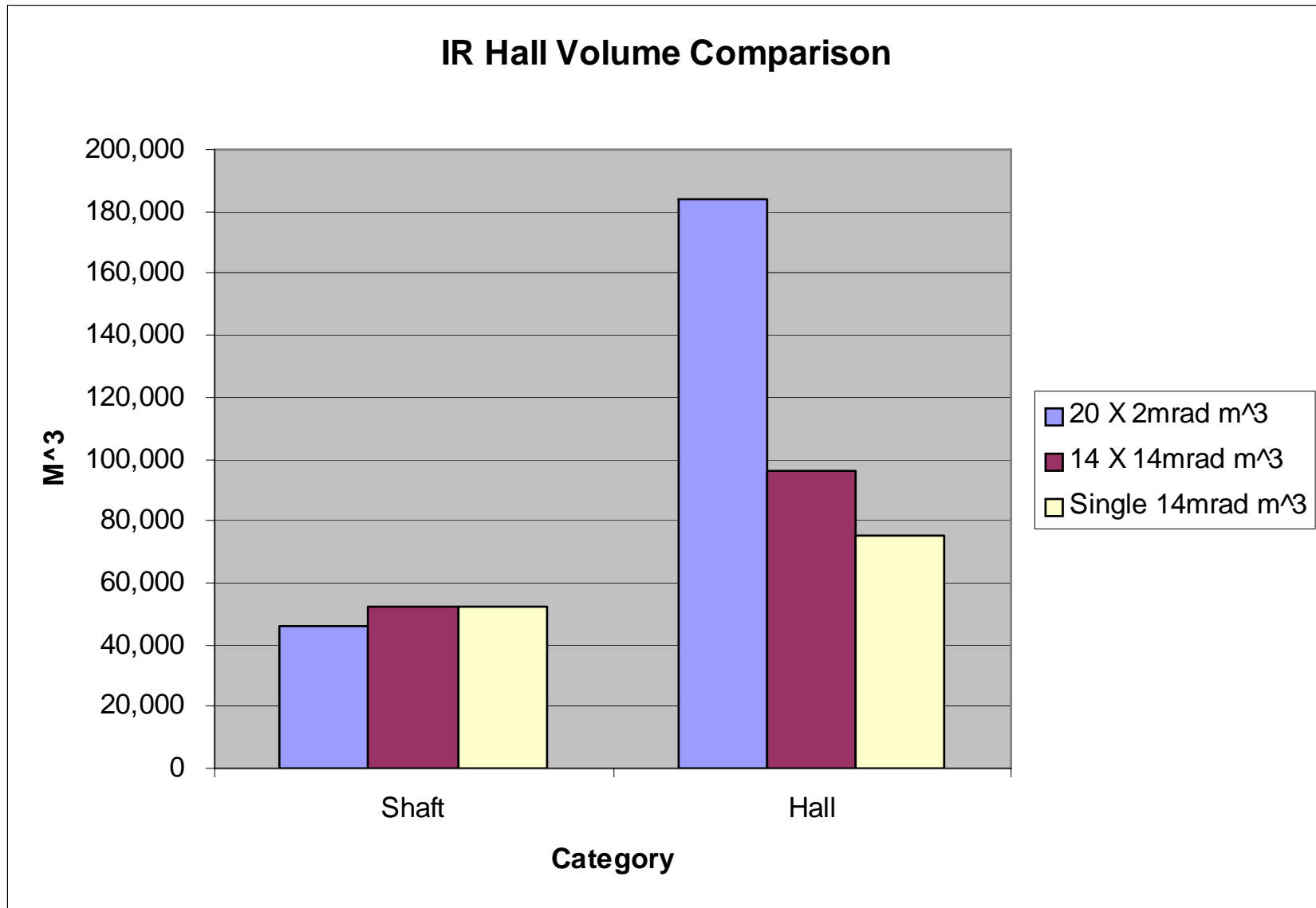
# Snapshots at Interaction Regions

Reduction in CF from Vancouver to Valencia is about 23%



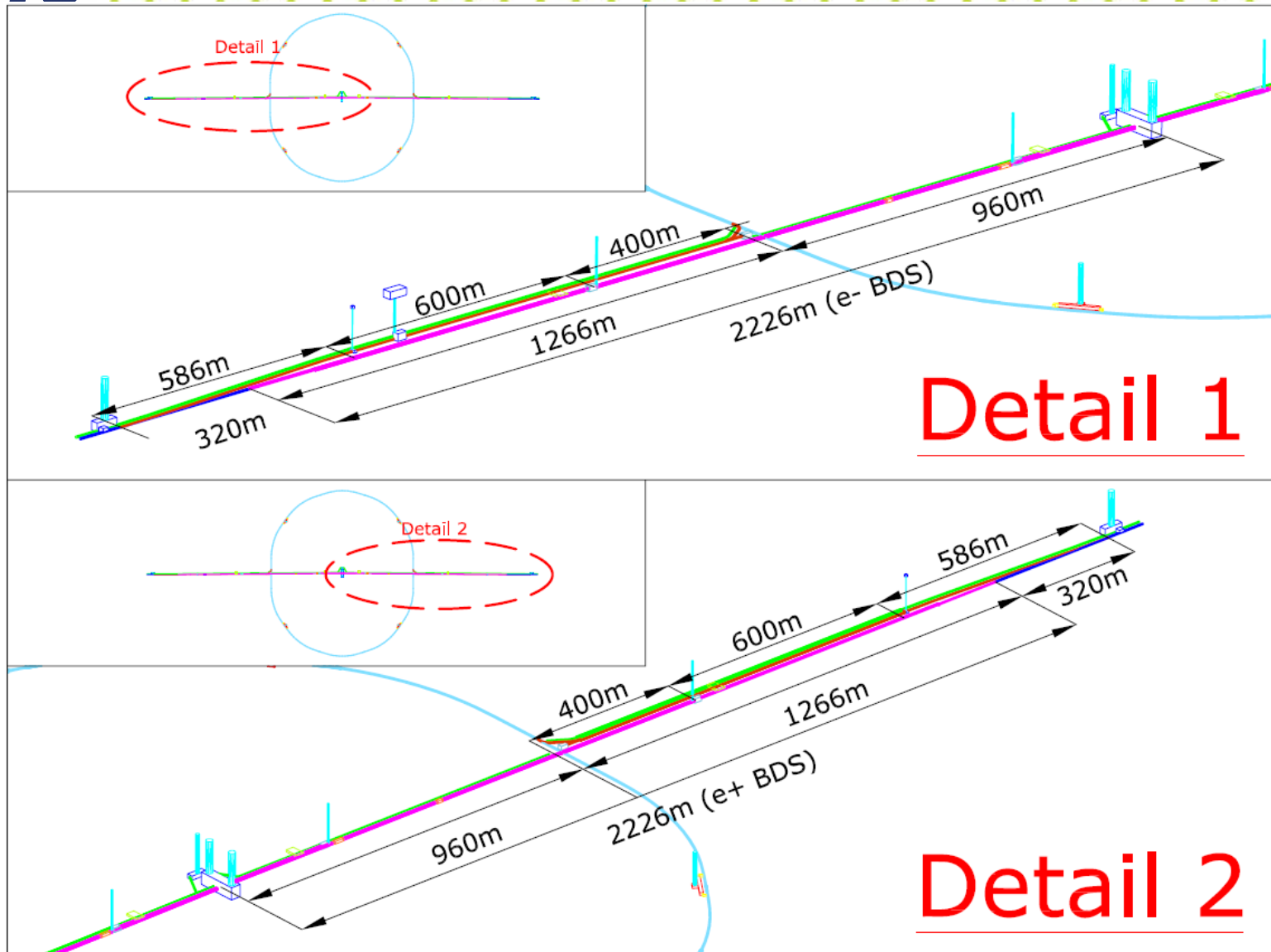


# Snapshots at Interaction Regions



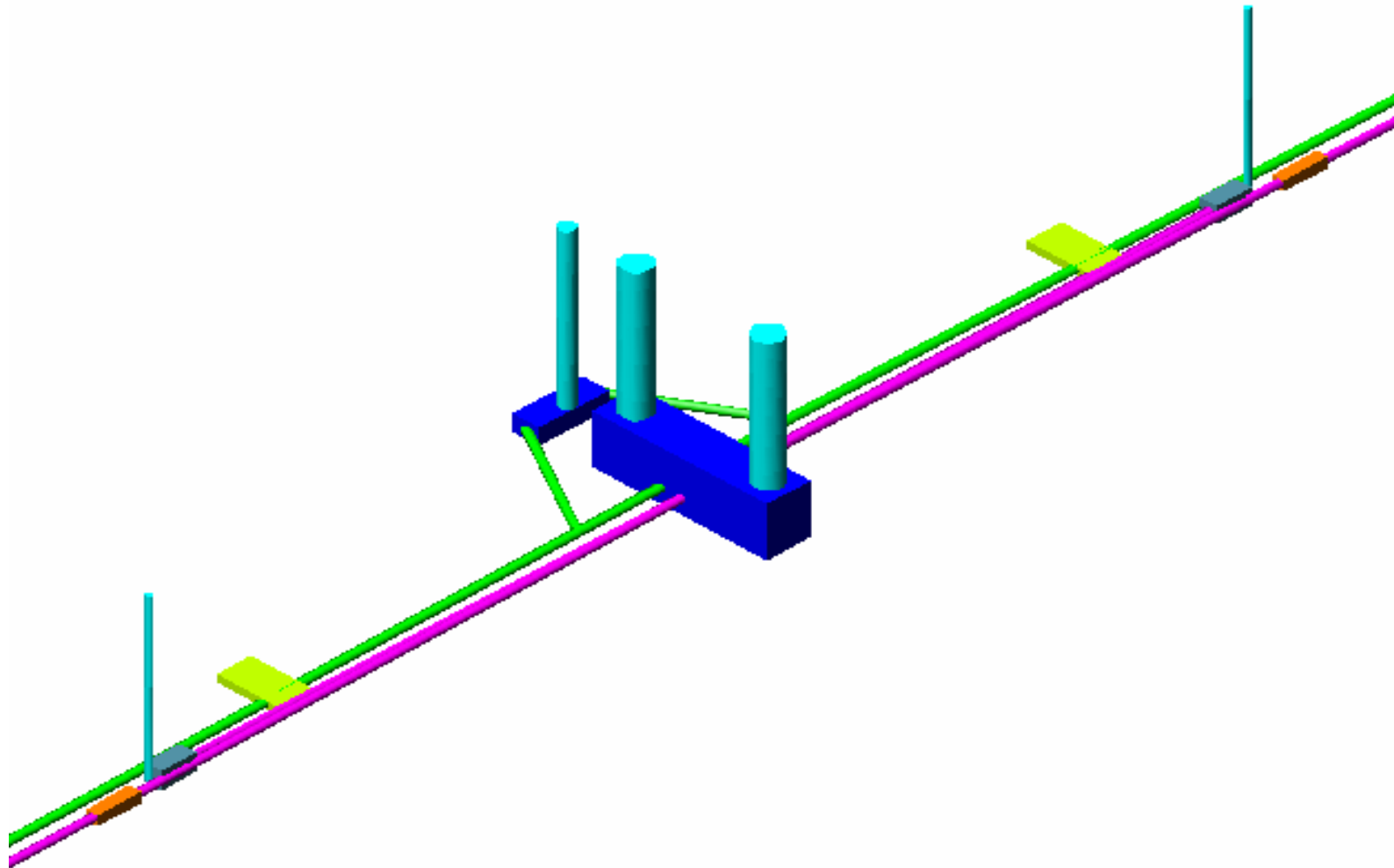


# Snapshots at Interaction Regions





# Snapshots at Interaction Regions



## IR REGION (VALENCIA)



# BDS Changes Since Vancouver

<b>Items</b>	<b>20/2mrad</b>	<b>14/14mrad</b>	<b>Single 14mrad</b>
<b>Magnets/Power Supplies</b>	<b>1805</b>	<b>1689</b>	<b>845</b>
<b>Vacuum Pipe Assemblies</b>	<b>5480</b>	<b>4250</b>	<b>2125</b>
<b>Ion Pumps</b>	<b>3574</b>	<b>3450</b>	<b>1725</b>
<b>Beam Dumps</b>	<b>8 (6 large,2 photon)</b>	<b>6 large</b>	<b>3 large</b>
<b>Instrumentation</b>	<b>340</b>	<b>340</b>	<b>170</b>
<b>Deflecting Cavities</b>	<b>4</b>	<b>4</b>	<b>2</b>
<b>Crab Cavities</b>	<b>2</b>	<b>4</b>	<b>2</b>