

# ILC-TOT Early Results

Tomoyuki Sanuki (Tohoku University)

# ILC-TOT meeting

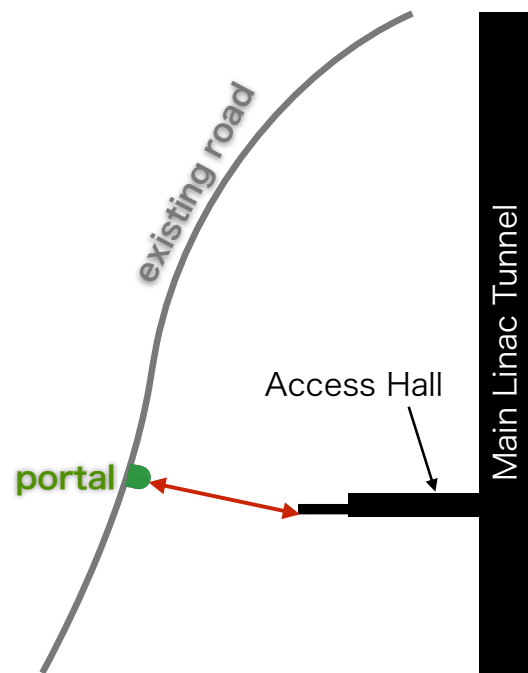
Tomo SANUKI

2016.1.26

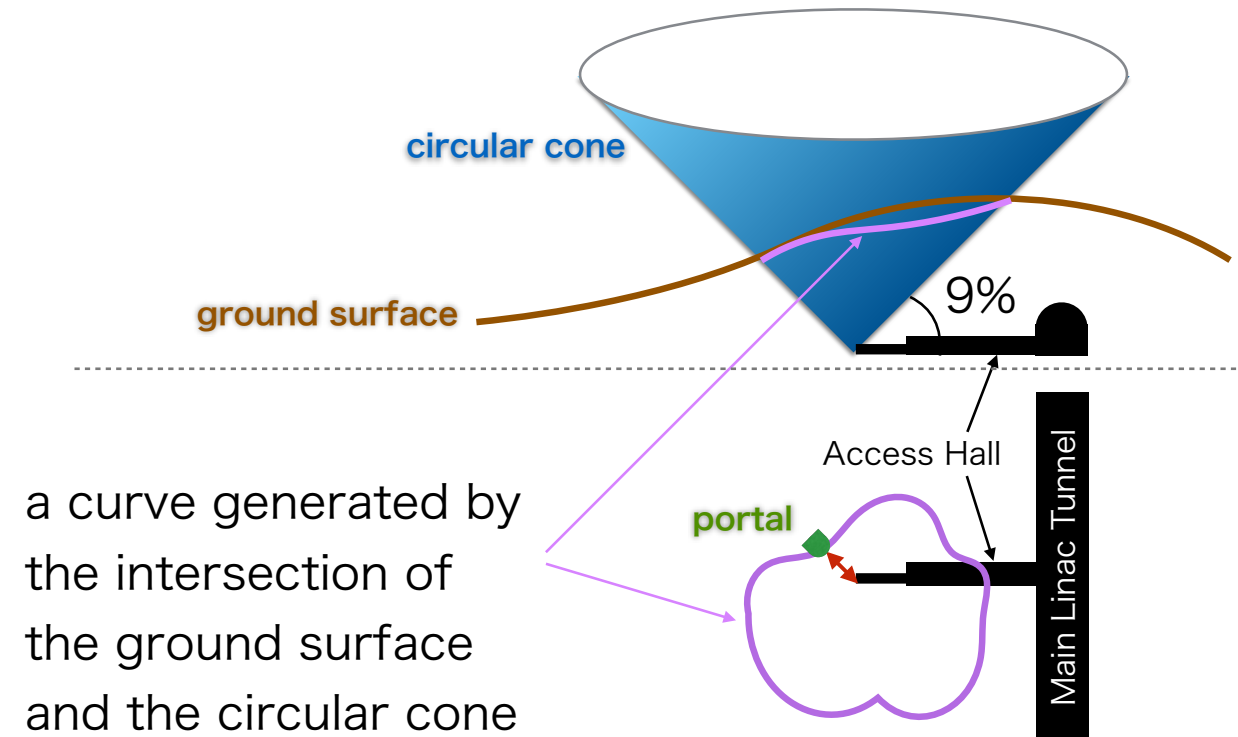
Further updates ?

# 5. How to fine the portals?

1) Portal along the nearest road



2) Portal for the shortest 9%-tunnel



These two portals are essential for us as references. Want to know the position of them every time move/rotate the LINAC on the map (buttons in the screen?)

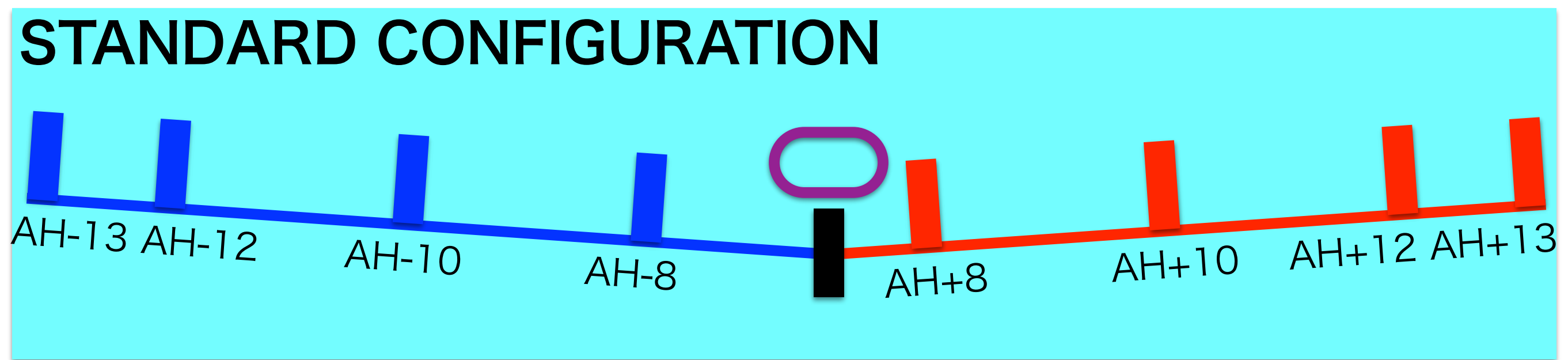
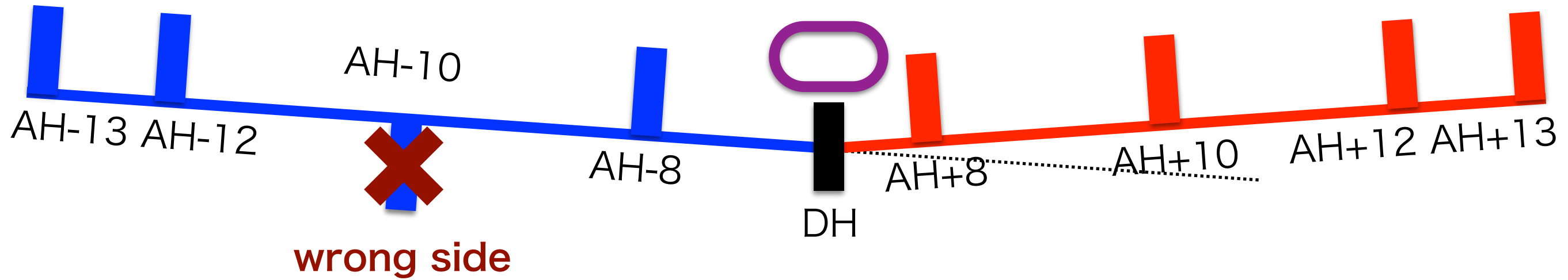
# Two possible updates

- 1** LINAC Configuration
- 2** Move/Rotate(/Flip) LINAC on the map (in the browser)

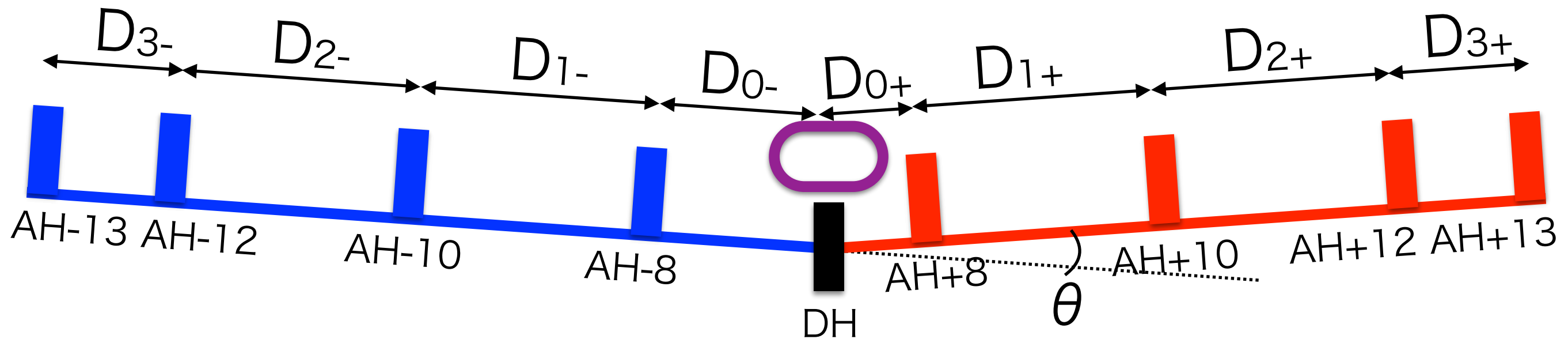


1

# Standard Configuration



# Standard Configuration



- Linac/AHs configuration can be defined by 9 params;
  - Distance ( $D_{i+/-}$ ) between adjacent halls (AH, DH)
  - Angle ( $\theta$ ) between two linacs

# LINAC Configuration

- Linac/AHs configuration can be defined by 10 params;
  - Distance ( $D_{i+/-}$ ) between adjacent halls (AH, DH)
  - Angle ( $\theta$ ) between two linacs
- For LINAC configuration, it would be more flexible to load one configuration file which include the above 9 params.

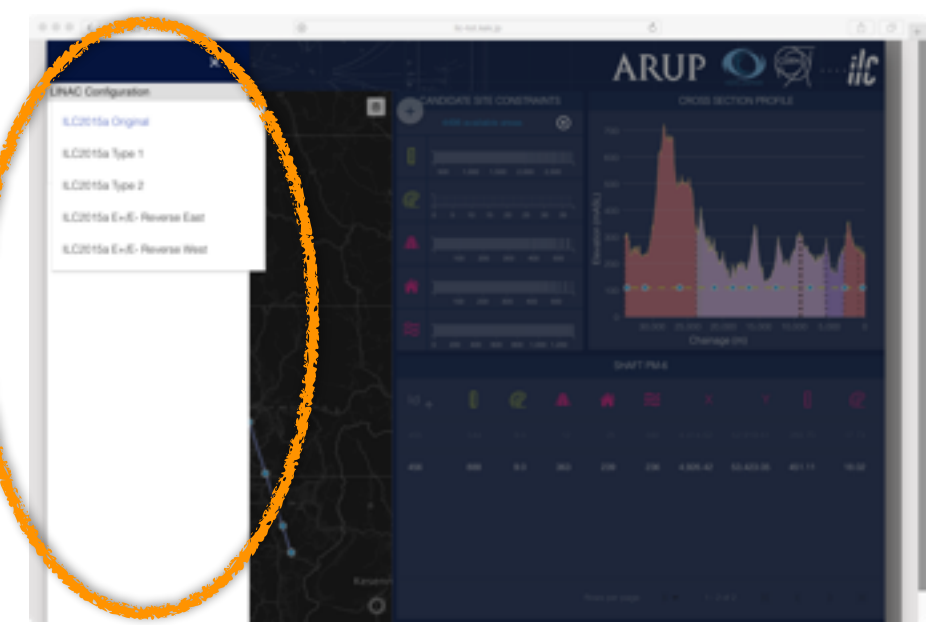


# LINAC Configuration

ILC-TOT

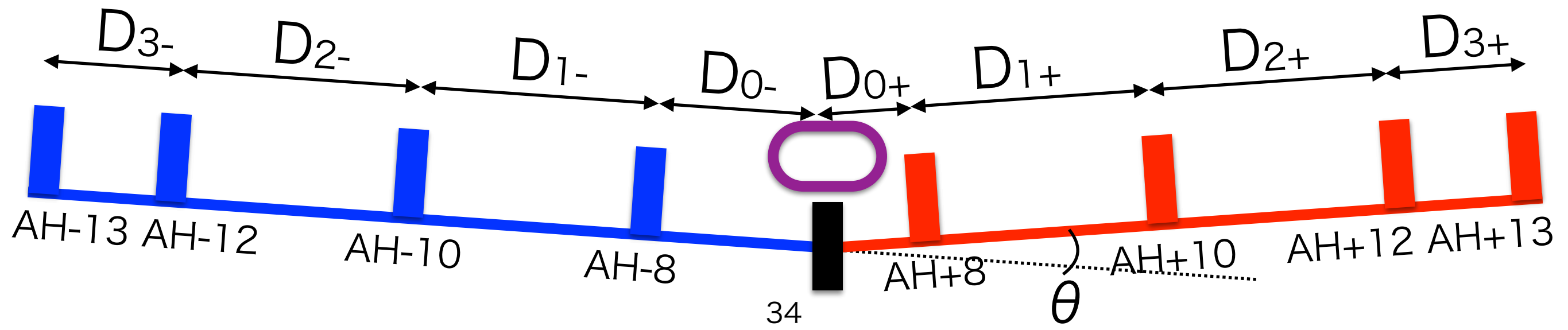
configuration file : FORMAT

EXAMPLE



$D_{3+}$  (m)  
 $D_{2+}$  (m)  
 $D_{1+}$  (m)  
 $D_{0+}$  (m)  
 $D_{0-}$  (m)  
 $D_{1-}$  (m)  
 $D_{2-}$  (m)  
 $D_{3-}$  (m)  
 $\theta$ (mrad)

2500.000  
 5000.000  
 5000.000  
 2500.000  
 3500.000  
 5000.000  
 5000.000  
 2500.000  
 14.000



Topic Area	Issue		Solution	Cost Estimate
Review of initial Constraints	Number of turning points: 1no. turning point too limited	1.1	- Create option for user to choose a westwards and eastwards tunnel exit	£12,198
	Radius of curvature: 20m should be regarded as critical limiting case condition.	1.2	- Create Case A: TOT to create a fixed 60m R' (~90°) tunnel at the 2no. turning points, given a user-defined portal location.	
	Access tunnel exits LINAC eastwards only: Option of westwards exit needs to be explored	1.3	- Create Case B: TOT to create a larger curved section (R' ~ 50-100m) across the 1no. turning point.	
		1.4	- Create Case C: TOT to create a non-fixed R' tunnel at the 2no. turning points, given a user-defined portal location, which crosses over the LINAC.	
	Geology: Access tunnels need to avoid known disadvantageous geology e.g. carboniferous limestone	1.5	- Create ability for tunnel to avoid entering disadvantageous limestone	
Updates & Fixes	PM-6 exists in TOT. This needs to be removed as not included in TDR	2.1	Noted and Removed	£0
	Cross Section Profile. Disagreement on profile	2.2	Noted and Removed	
	Number of Portals	2.3	Portal numbers are different per AH, dependent on no. of tunnels which user has chosen. This is automatically saved for next session [Further user management system needed?]	
	Font colour on the screen	2.4	Option is 'greyed out' if alignment is above surface level	
	How to find the portals?	2.5	User can apply hierarchy filters [Are further user filtering aids needed e.g. colours/groupings]	
LINAC Configuration	Rotate LINAC about DH	3.1	- Create ability to change angle between 2no. LINACS	£10,994
	Change distance between AHs	3.2	- Create ability to change distance between AHs	
	FLIP/Reverse LINAC	3.3	- FLIP/Reverse LINAC	
		3.4	- Create Configuration File Input TOT function	
		3.5	- Create a user input within TOT	
	Move/Rotate(/Flip) LINAC on the map (in the browser)	3.6	Create Drag/Drop Feature	
Utilisation by Field Work	Scope To be Determined	4.1	Scope To be Determined	£0
User Management System		5.1		£1,807
Project Management & Telecon Meetings		6.1		£4,434

3.1, 3.2, 3.3, 3.4

1

3.5 Either 3.4 or 3.5 is enough for me.

# LINAC Configuration

The screenshot displays the ILC configuration software interface. On the left, a 'LINAC Configuration' window lists parameters:  $D_{3+}$  (m) 2500.000,  $D_{2+}$  (m) 5000.000,  $D_{1+}$  (m) 5000.000,  $D_{0+}$  (m) 2500.000,  $D_{0-}$  (m) 3500.000,  $D_{1-}$  (m) 5000.000,  $D_{2-}$  (m) 5000.000,  $D_{3-}$  (m) 2500.000, and  $\theta$ (mrad) 14.000. The main interface shows 'CANDIDATE SITE CONSTRAINTS' with 4498 available areas and a 'CROSS SECTION PROFILE' graph of Elevation (mASL) vs Chainage (m). A 'SHAFT PM-6' table is also visible.

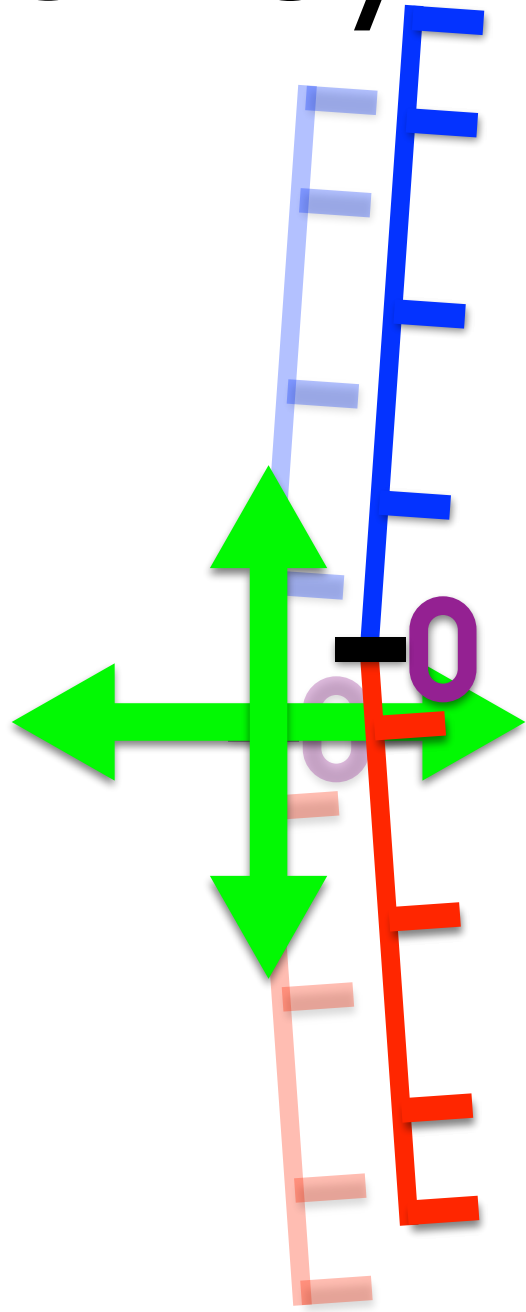
Id	Icon 1	Icon 2	Icon 3	Icon 4	Icon 5	X	Y	Icon 6	Icon 7
455	544	9.0	12	25	592	4,414.52	52,919.61	280.70	17.73
456	888	9.0	363	239	236	4,926.42	53,423.05	451.11	18.02

Or New menu ?

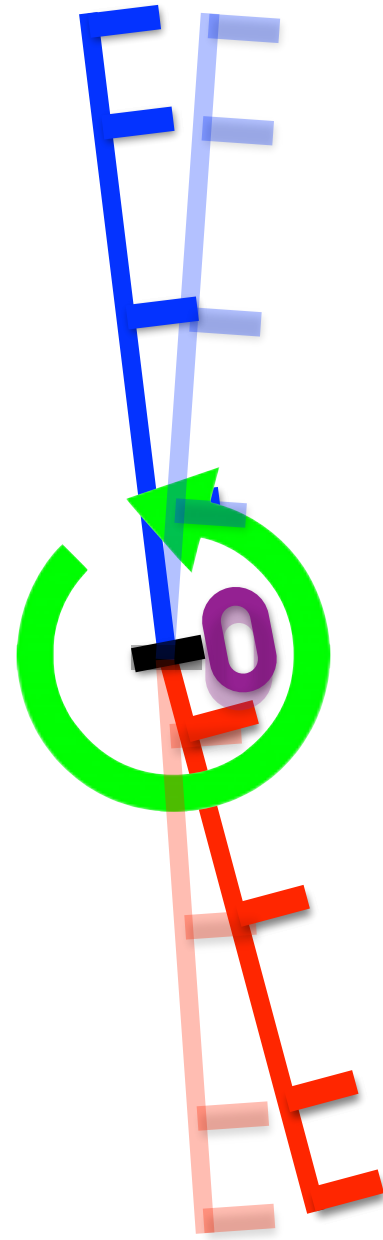
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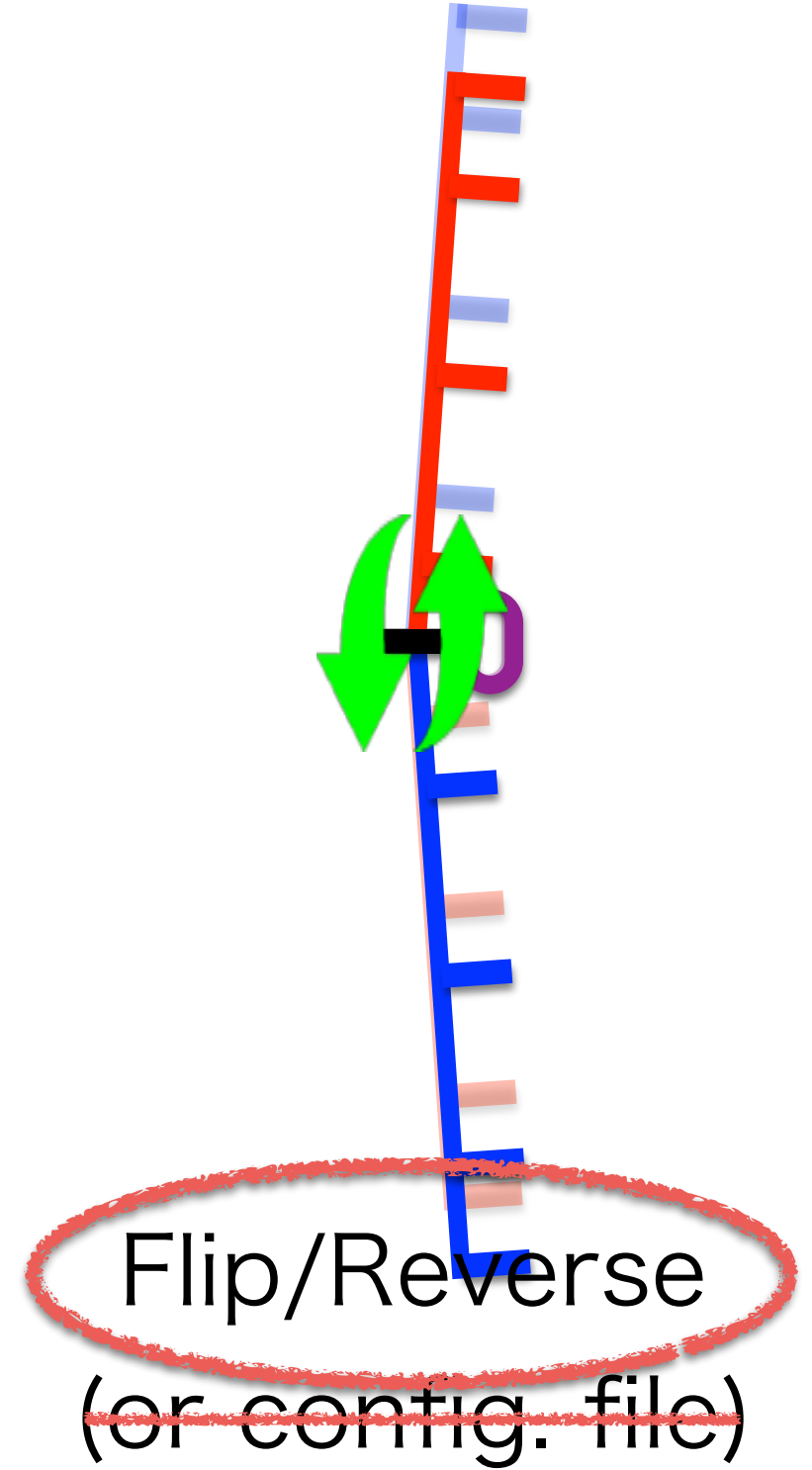
# Move/Rotate(/Flip) LINAC



Move IP  
drag & drop



Rotate linac  
around IP



Flip/Reverse  
~~(or config. file)~~

Topic Area	Issue	Solution	Cost Estimate
Review of initial Constraints	<p>Number of turning points: 1no. turning point too limited</p> <p>Radius of curvature: 20m should be regarded as critical limiting case condition.</p> <p>Access tunnel exits LINAC eastwards only: Option of westwards exit needs to be explored</p> <p>Geology: Access tunnels need to avoid known disadvantageous geology e.g. carboniferous limestone</p>	<p>1.1 - Create option for user to choose a westwards and eastwards tunnel exit</p> <p>1.2 - Create Case A: TOT to create a fixed 60m R' (~90°) tunnel at the 2no. turning points, given a user-defined portal location.</p> <p>1.3 - Create <b>Single configuration file + "Flip"</b> across the 1no. turning point.</p> <p>1.4 - Create Case C: TOT to create a fixed R' tunnel at the 2no. turning points, given a user-defined portal location for the LINAC.</p> <p>1.5 - Create ability for tunnel to avoid limestone</p>	<p>£12,198</p>
Updates & Fixes	<p>PM-6 exists in TOT. This needs to be removed as not included in TDR</p> <p>Cross Section Profile. Disagreement on profile</p> <p>Number of Portals</p> <p>Font colour on the screen</p> <p>How to find the portals?</p>	<p>2.1 Noted and Removed</p> <p>2.2 Noted and Removed</p> <p>2.3 Portal numbers are different to what user has chosen. This is a user management system requirement</p> <p>2.4 Option is 'greyed out' in the user interface</p> <p>2.5 User can apply hierarchy filters [Are further user filtering aids needed e.g. colours/groupings]</p>	<p>£0</p>
LINAC Configuration	<p>Rotate LINAC about DH</p> <p>Change distance between AHs</p> <p>FLIP/Reverse LINAC</p> <p>Move/Rotate(/Flip) LINAC on the map (in the browser)</p>	<p>3.1 - Create ability to change angle between 2no. LINACS</p> <p>3.2 - Create ability to change distance between AHs</p> <p>3.3 - FLIP/Reverse LINAC</p> <p>3.4 - Create Configuration File Input TOT function</p> <p>3.5 - Create a user input within TOT</p> <p>3.6 Create Drag/Drop Feature</p> <p><b>Move / Rotate / Flip</b></p>	<p>£10,994</p>
Utilisation by Field Work	Scope To be Determined	4.1 Scope To be Determined	£0
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I.I is not required when 3.6 is implemented

Single configuration file + "Flip"

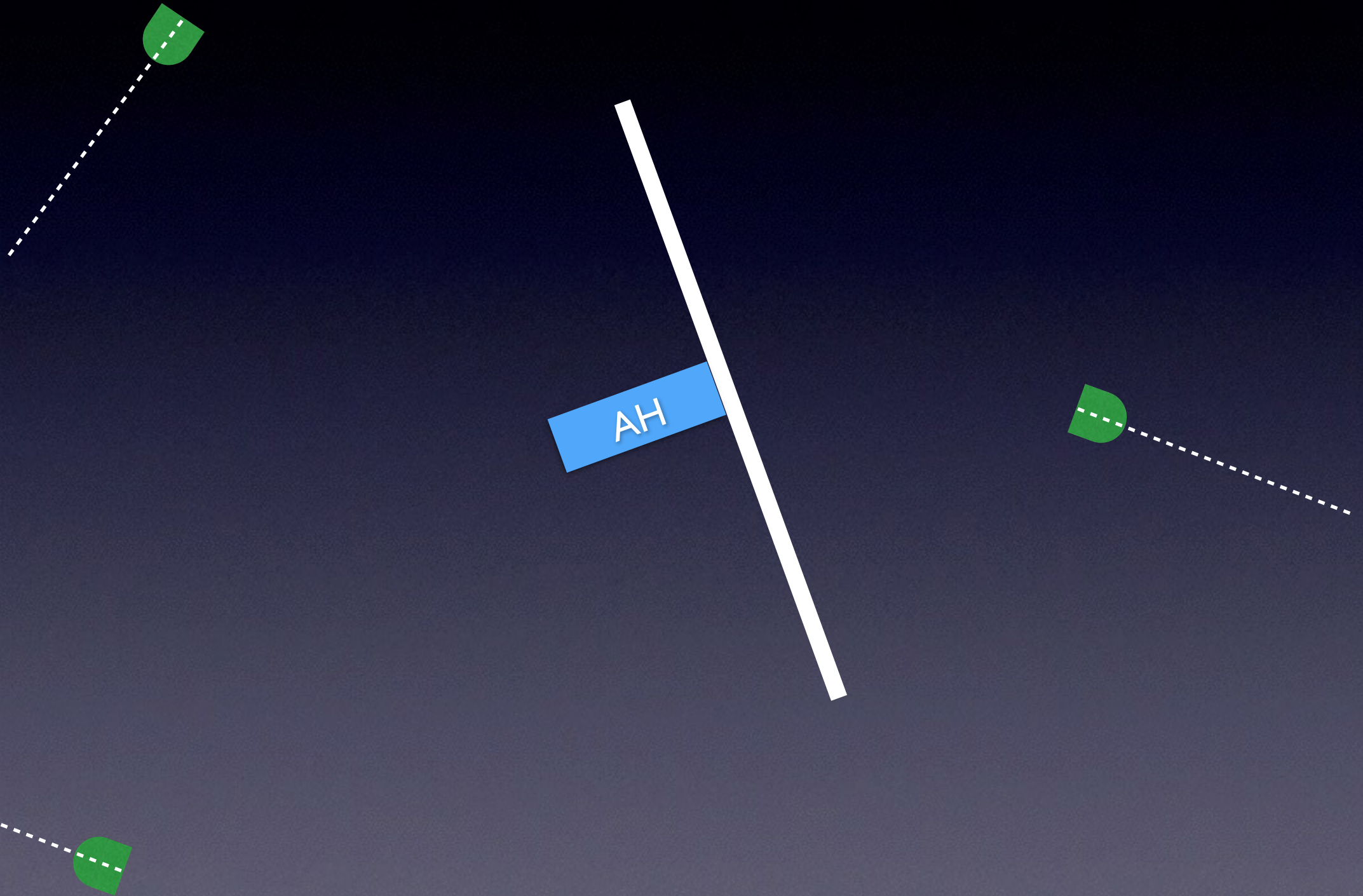
- D<sub>3+</sub> (m)
- D<sub>2+</sub> (m)
- D<sub>1+</sub> (m)
- D<sub>0+</sub> (m)
- D<sub>0-</sub> (m)
- D<sub>1-</sub> (m)
- D<sub>2-</sub> (m)
- D<sub>3-</sub> (m)
- θ(mrad)



How to draw  
access tunnels by hand

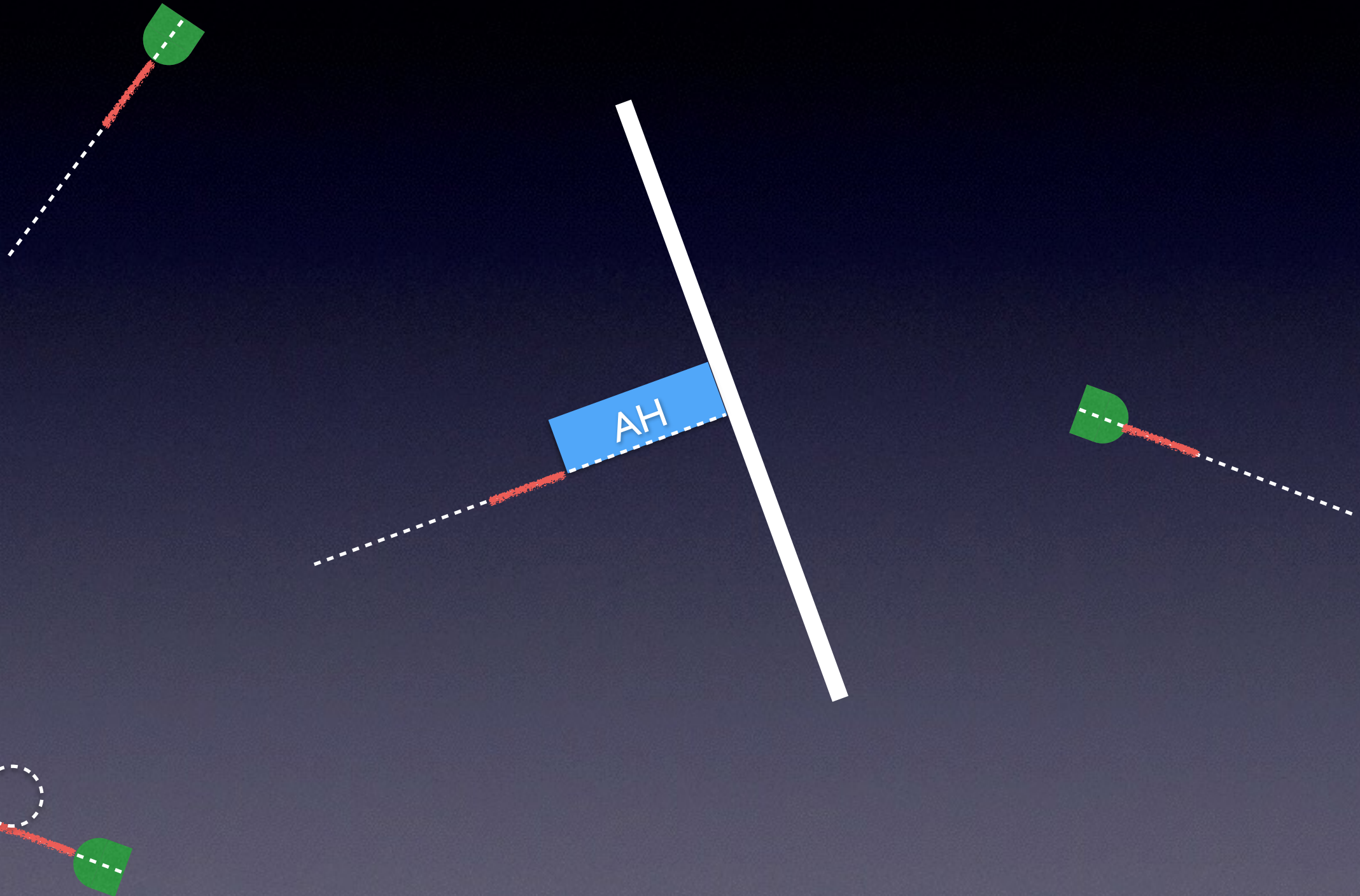


I. candidate portals (position/direction) are found based on the topography



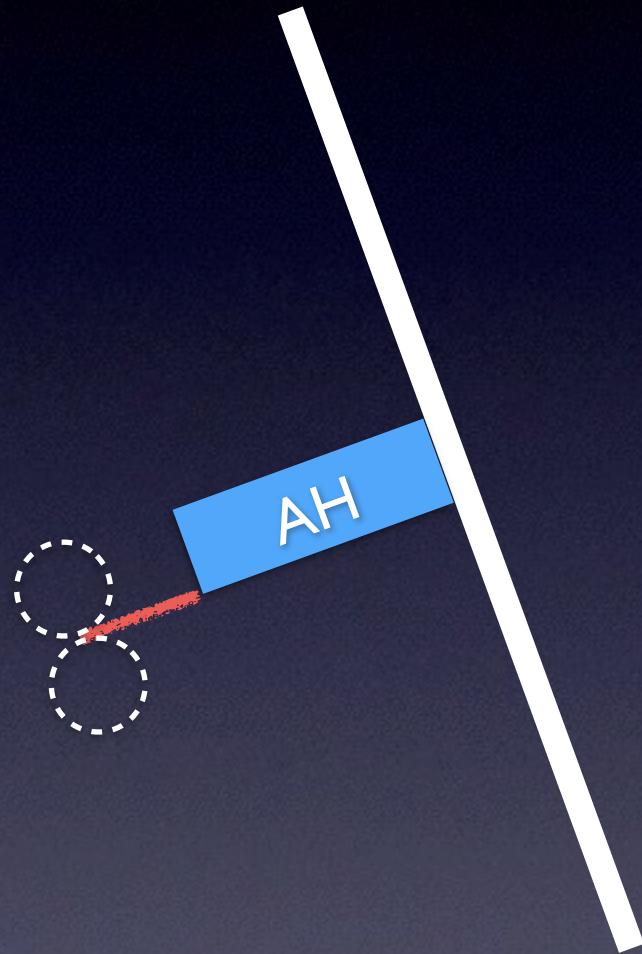
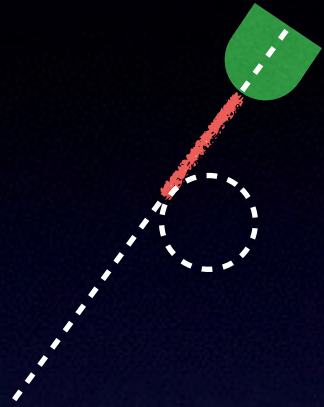


1. candidate portals (position/direction) are found based on the topography
2. straight section needed



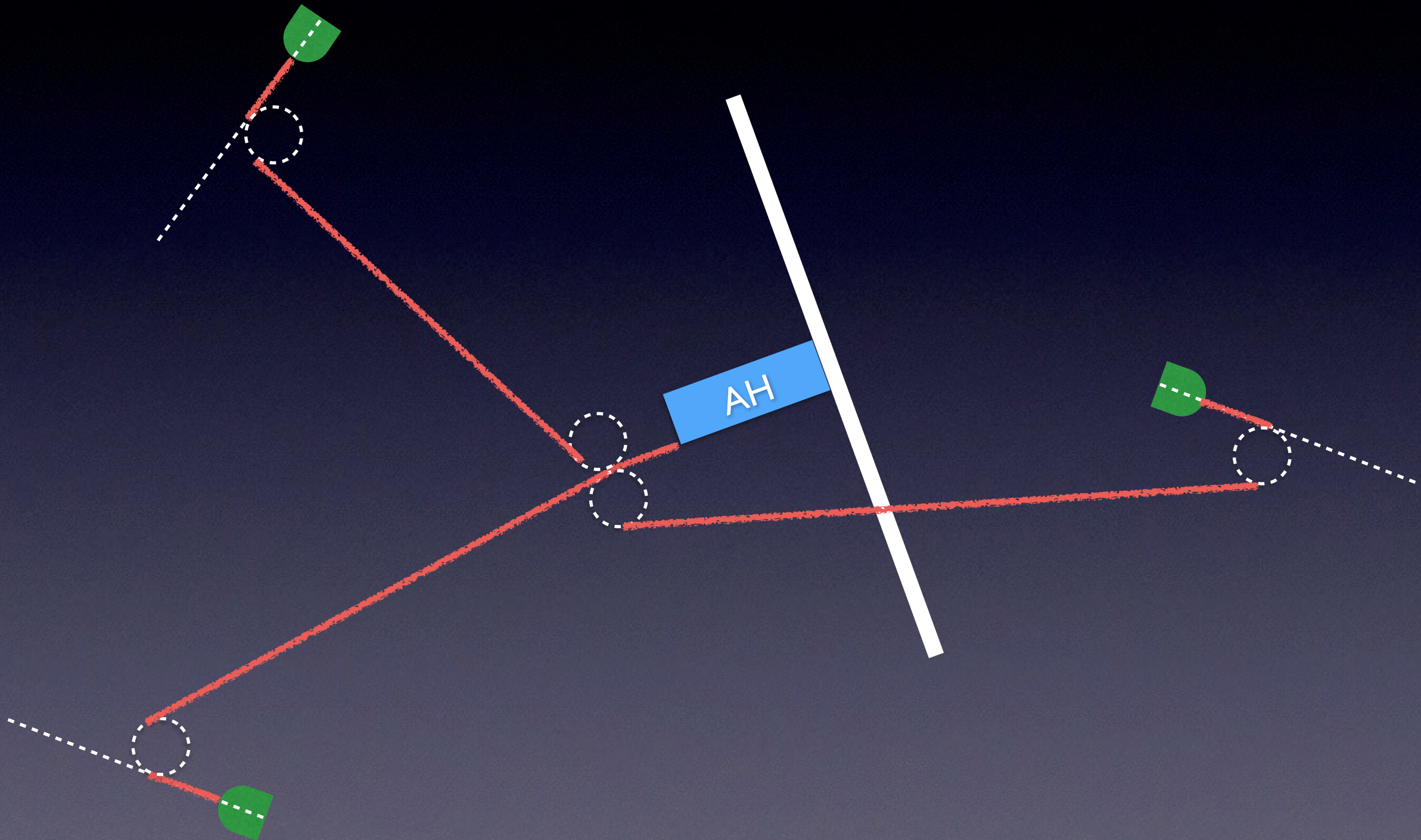


1. candidate portals (position/direction) are found based on the topography
2. straight section needed
3. minimum bending radius



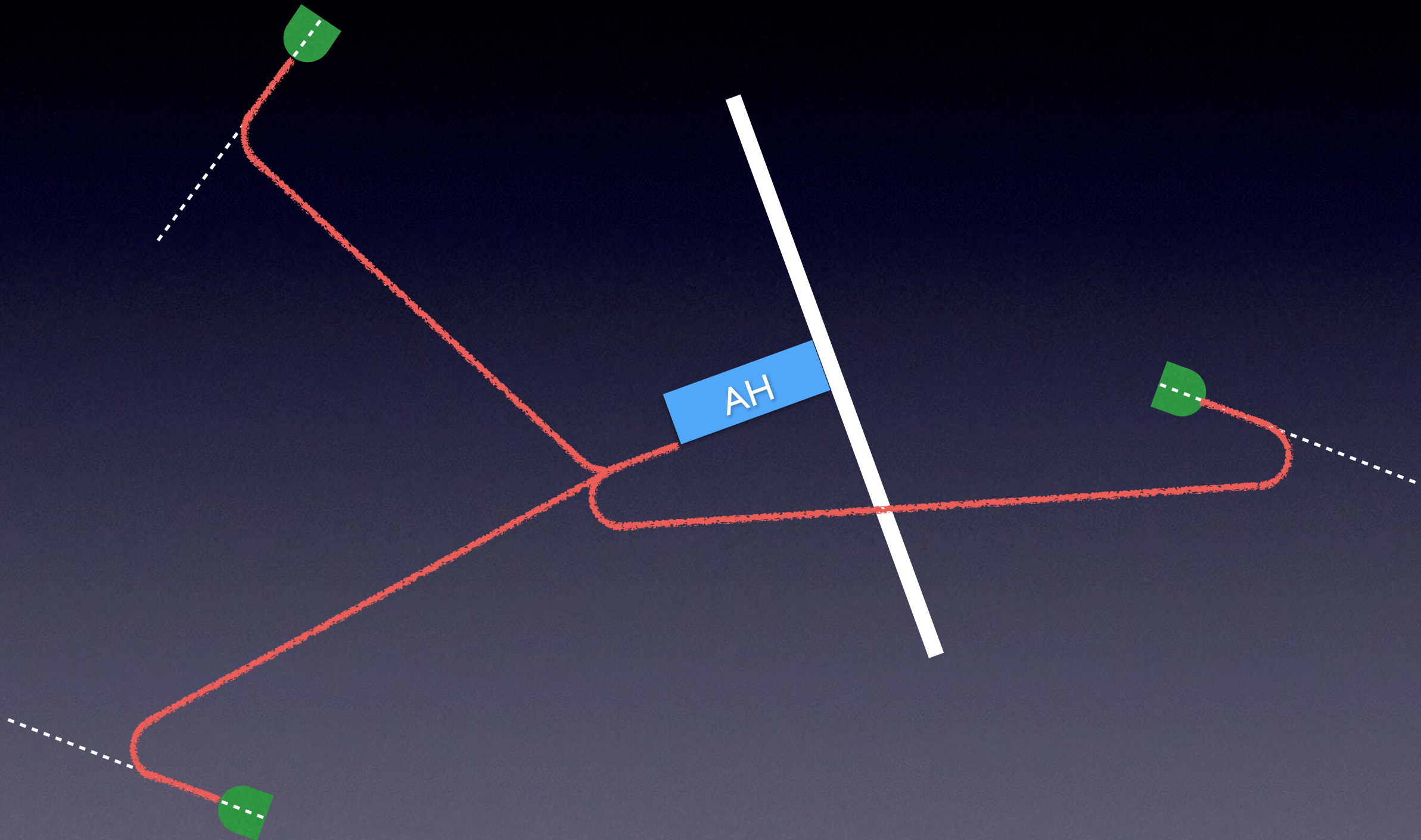


1. candidate portals (position/direction) are found based on the topography
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1. candidate portals (position/direction) are found based on the topography
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out of scope?

