



Update on Infrastructure Integration UV Laser Room

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AWAKE Run 2 Meeting, CERN

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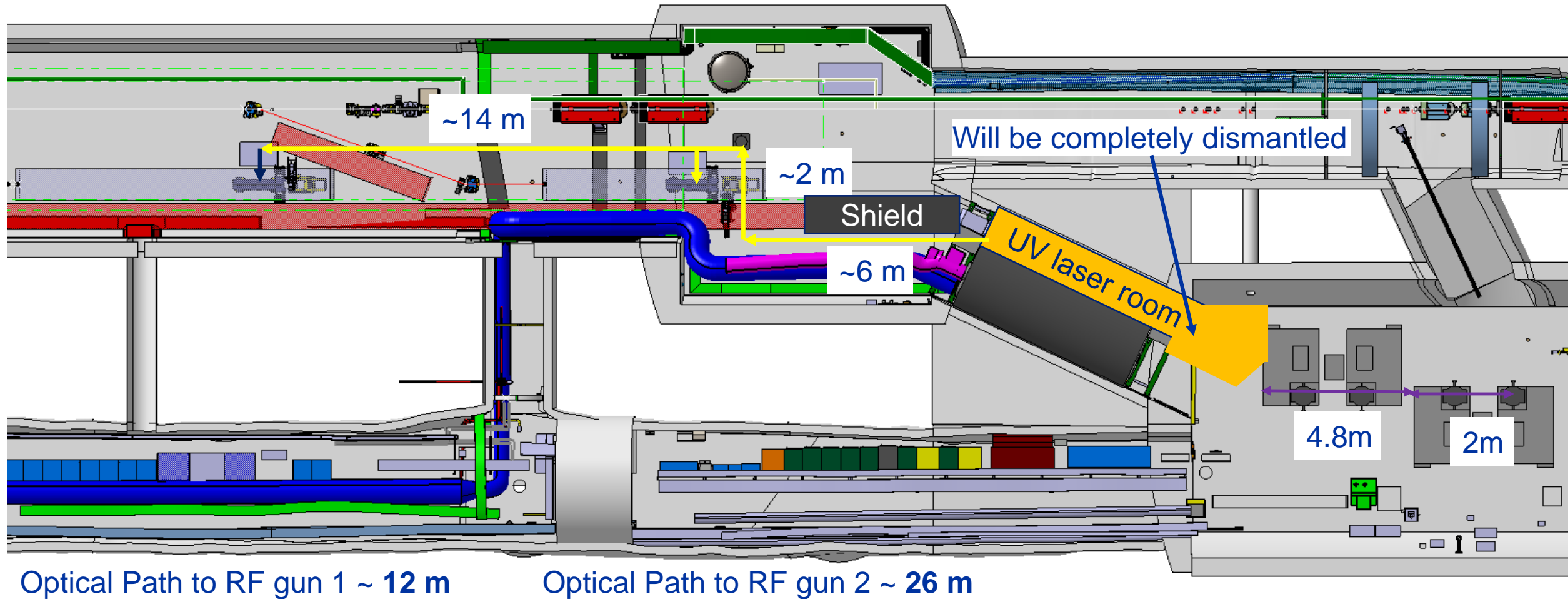
Outline

- Electron Sources & UV Laser Beam
- UV Laser Setup Relocation Proposal 1: TSG41 (replace the current streak room)
- UV Laser Setup Relocation Proposal 2: TSG42 tunnel
- UV Laser Setup Relocation Proposal 3: TSG4 (corner of the TSG42)
- UV Laser Room Requirements
- UV Laser Room Requirements vs Options
- Summaries

Electron Sources & UV Laser Beam

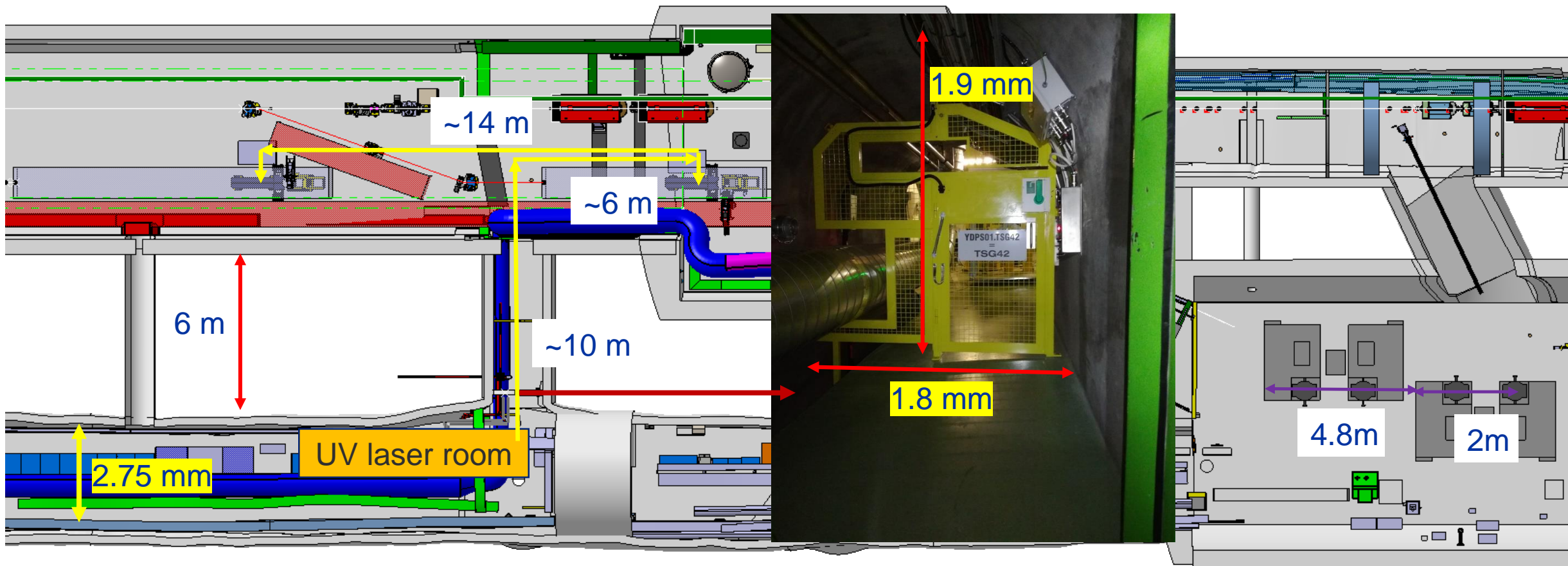
- Electron sources are relocated in TCC4 → increase UV laser beam length from the TSG40 (Run1)
- Requests to explore possibilities to relocate the UV laser beam setup out of TSG40 – closer to electron sources

Option 1: UV Laser in TSG41 (replace the current streak room)



- + Shorter optical path → laser beam stability requirement can be reached easier.
- Build a completely new room identical to TSG4 (cost/time)
- Block the transportation path.

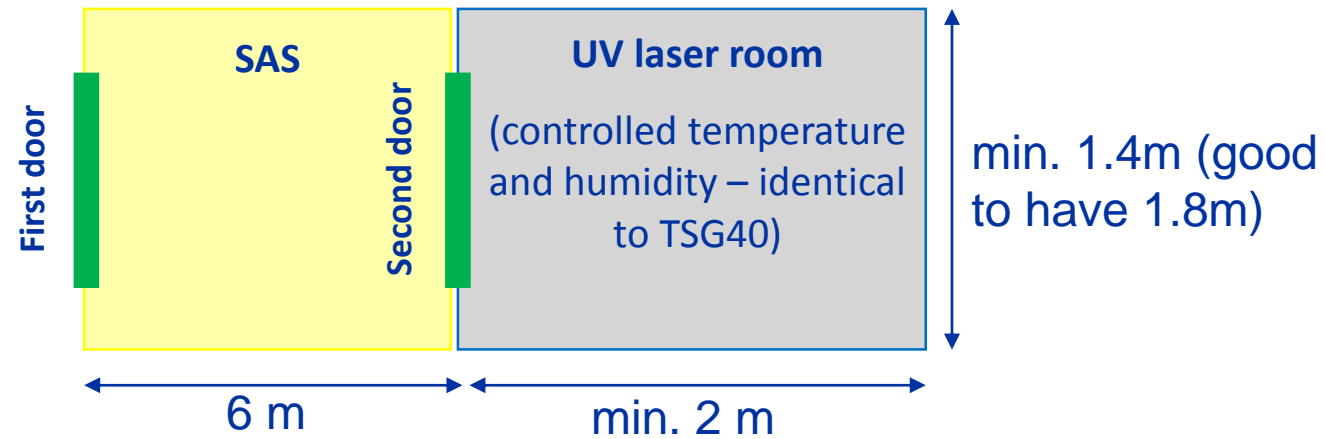
Options 2 & 3: TSG42 & TSG4 (corner of TSG42)



Option 3: TSG4Optical Path to RF gun 1 ~ 20 m Optical Path to RF gun 2 ~ 34 m

- + TSG4: Good position in terms of integration and access.
- + TSG4: More scalable: it gives more opportunity to add length if necessary.
- TSG4: Longer optical path than TSG41 – hard (but acceptable) to stabilize the laser beam
- TSG4: Build a completely new room identical to TSG4 (cost/time)

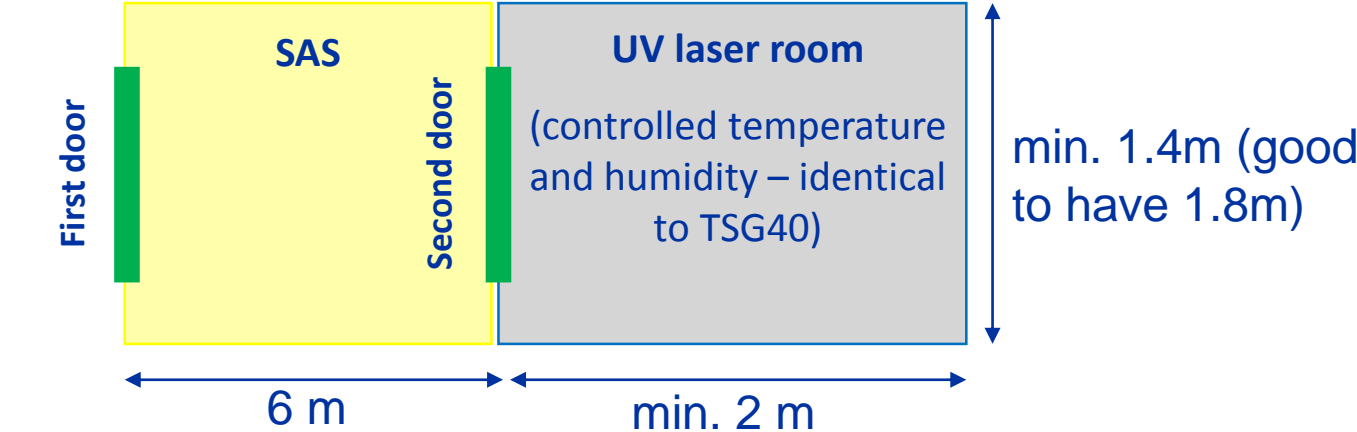
UV Laser Room Requirements



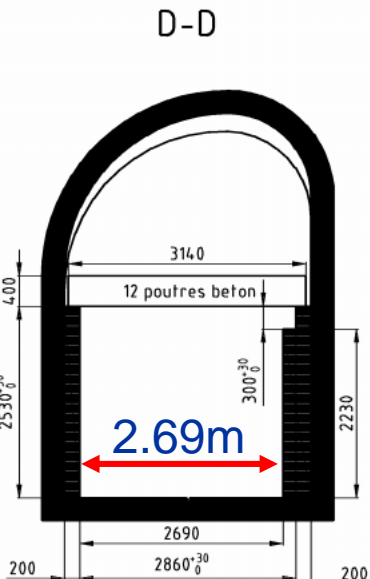
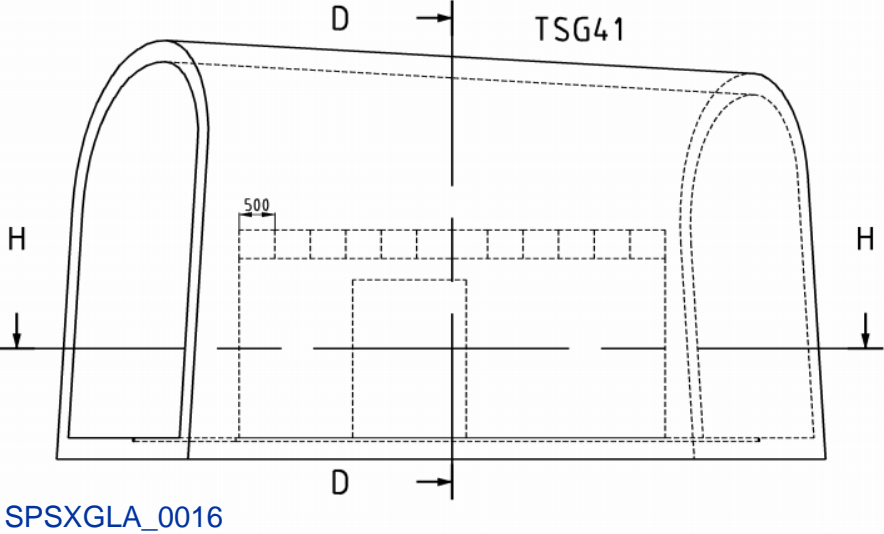
The general requirement for the UV laser room are the following:

- Air conditioning to control the room temperature and humidity level → identical to TSG40
- Vacuum pump for the UV laser beam pipe → identical to TSG40
- Access requirements:
 - Interlock that shuts off the UV laser
 - 2 shutters (There are already 2 shutters for the UV laser located in TSG40. It is these 2 shutters that will be relocated conveniently for the new UV laser room)

UV Laser Room Requirements vs Options

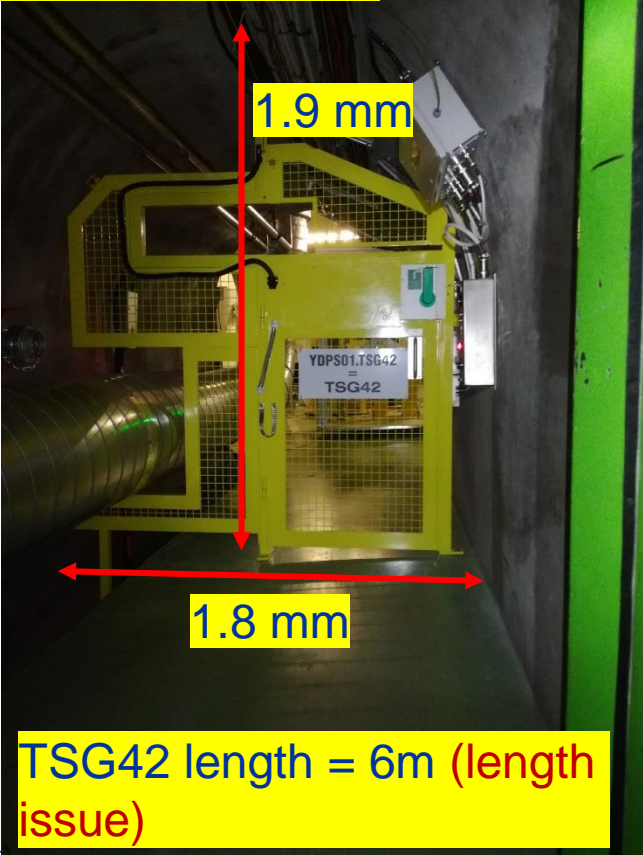


Option 1 (TSG41)



$2.69 - 1.4\text{m} = 1.29\text{m} < \text{trailer width}$ (transportation issue)

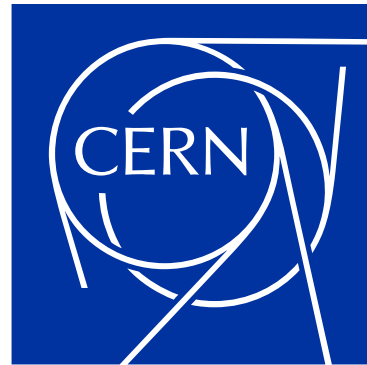
Option 2 (TSG42)



TSG42 length = 6m (length issue)

UV Laser Room Requirements vs Options Summaries

Locations	Beam Length	Block transportation	Room Geometry	Build a new room	Impact
TSG41	Shortest	Yes	Width issue (too narrow)	Yes, identical to TSG40	Cost, schedule
TSG42	Close to TSG4	No	Length issue (too short)	Yes, identical to TSG40	Cost, schedule
TSG4	Long	No	Length Scalable	Yes, identical to TSG40	Cost, schedule
TSG40	Longest	No	No issue	No Issue	No issue



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