

## ELENA Transfer Lines Installation

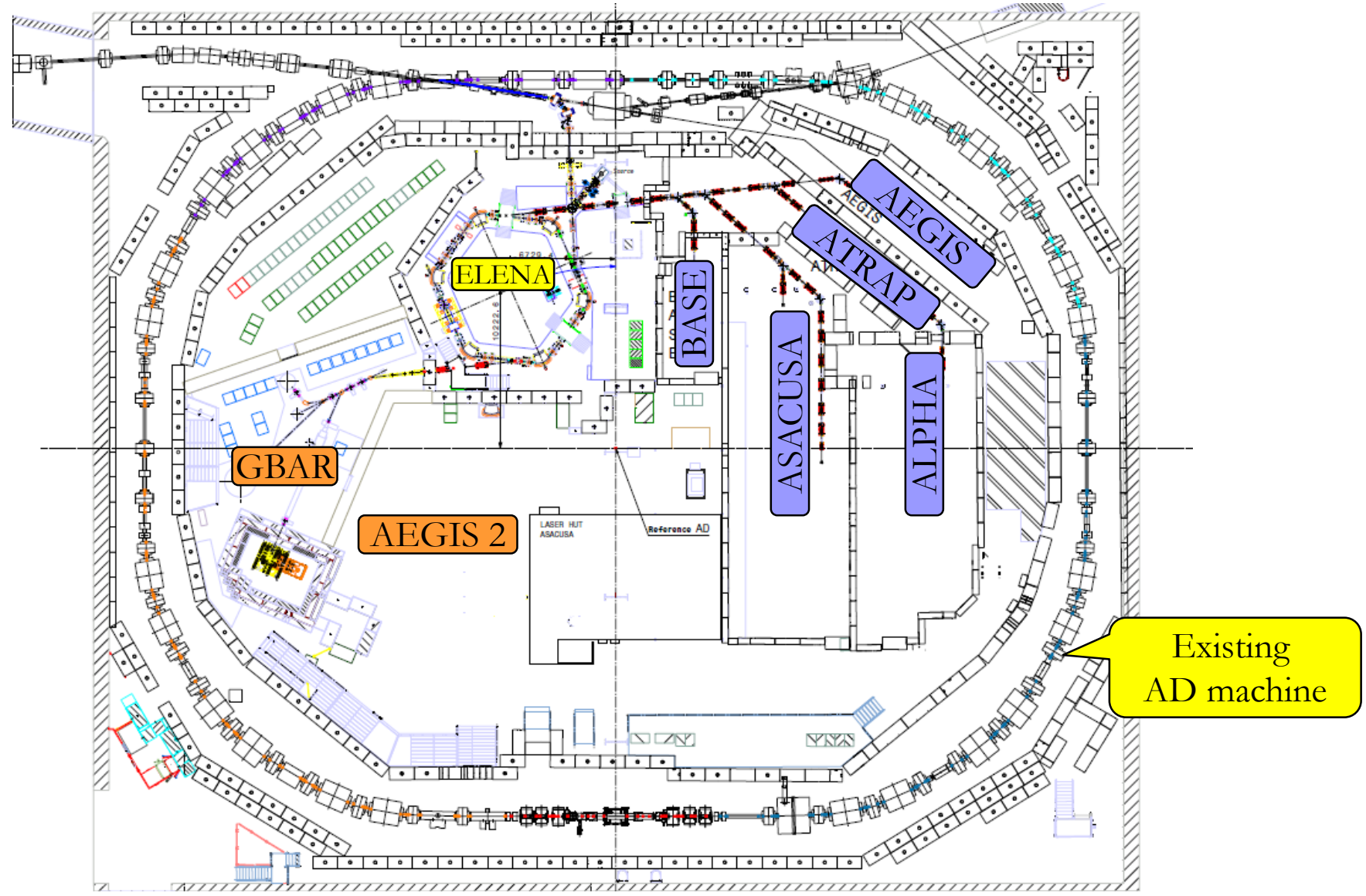
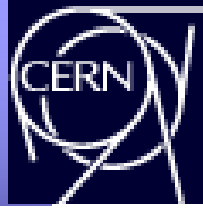


ANTIMATTER  
FACTORY





# ELENA in CERN AD hall

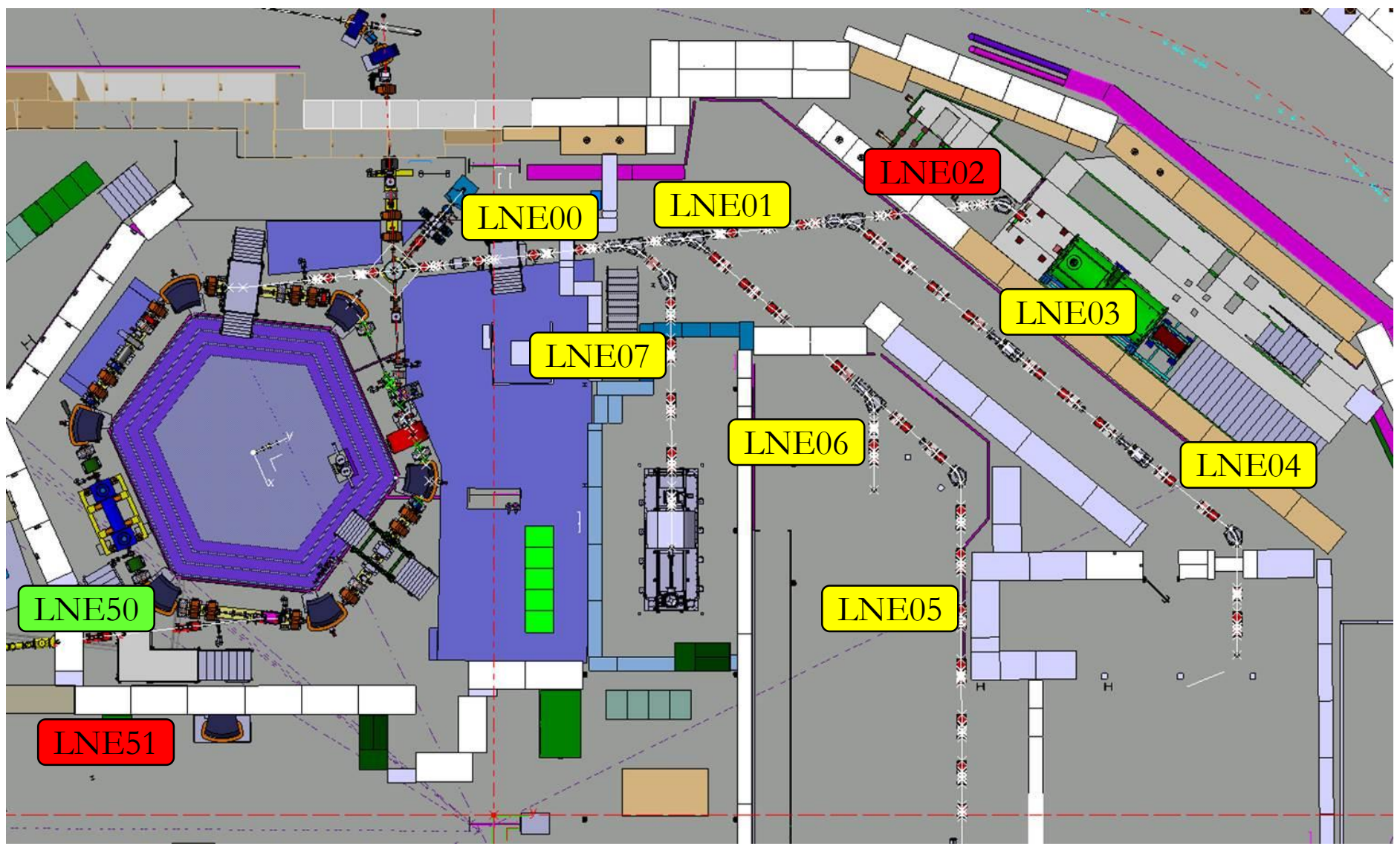


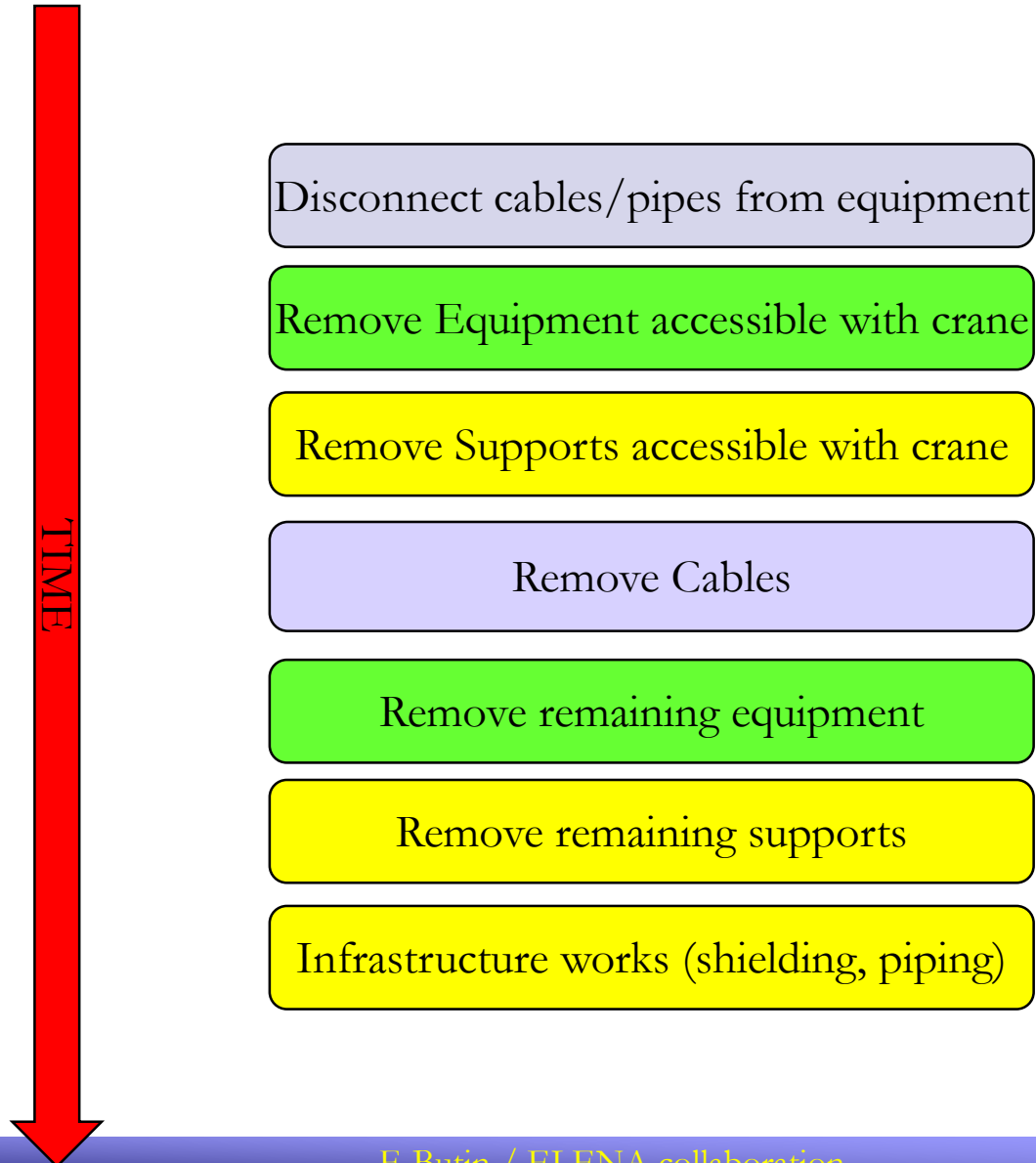
- **Remove all magnetic transfer lines plus corresponding supports and services**
- **Re-organize part of the shielding walls**
- **Re-route cable trays and water pipes**
- **Install electrostatic transfer lines and services**
- **Commission new transfer lines**

## Beam lines to be replaced by electrostatic TL



# Electrostatic lines to be installed

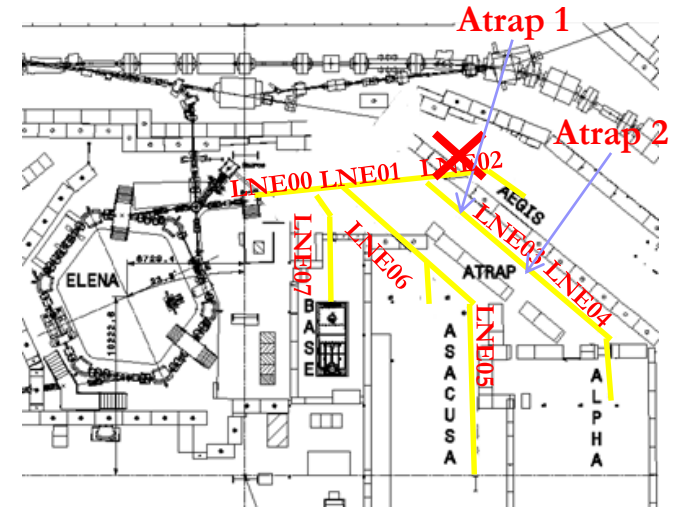




# Installation of the new lines

TIME

- Survey Marking
- Floor drilling
- Install mechanical supports
- Install new cables (signal, AC, optical fibres)
- Install Equipment (Electrostatic + vacuum + SEM)
- Survey /Align Equipment
- Connect equipment
- Vacuum connections
- Pump and bake-out

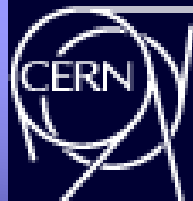


▸ <b>Redevelopment TL towards experiments LS2</b>	408.75 days	Fri 14/12/18	Wed 05/08/20
<b>LS2 start</b>	0 days	Fri 14/12/18	Fri 14/12/18
▸ <b>Dismantling of current Transfer lines</b>	53.25 days	Fri 14/12/18	Wed 13/03/19
▸ <b>AEGIS</b>	15 days	Mon 06/01/20	Fri 24/01/20
▸ <b>Infrastructure modifs</b>	35 days	Wed 13/03/19	Wed 01/05/19
▸ <b>Installation of the Transfer lines</b>	125 days	Wed 01/05/19	Wed 23/10/19
▸ <b>Vacuum work</b>	75.5 days	Wed 23/10/19	Wed 19/02/20
<b>Commissioning ELENA TL's</b>	<b>24 wks</b>	<b>Wed 19/02/20</b>	<b>Wed 05/08/20</b>





# 1st stage: Dismantling



LS2 start	0 days	Fri 14/12/18	Fri 14/12/18	↓ 14/12
<ul style="list-style-type: none"> <li> <b>▣ Dismantling of current Transfer lines</b> <ul style="list-style-type: none"> <li>Cable disconnections</li> <li>Flexible cooling pipe removal</li> <li>Dismantling of accessible equipment in the central part</li> <li>Cable removal of DE0 zone only - not up to the racks</li> </ul> </li> <li> <b>▣ BASE transfer line</b> <ul style="list-style-type: none"> <li>Equipment dismantling (magnets, GEM, ...)</li> <li>Mechanical support dismantling</li> </ul> </li> <li> <b>▣ ASACUSA Transfer line</b> <ul style="list-style-type: none"> <li>Equipment dismantling (magnets, GEM, ...)</li> <li>Mechanical support dismantling</li> </ul> </li> <li> <b>▣ ATRAP/ALPHA Transfer line</b> <ul style="list-style-type: none"> <li>Equipment dismantling (magnets, GEM, ...) + supports</li> </ul> </li> </ul>	53.25 days	Fri 14/12/18	Wed 13/03/19	
	1 wk	Fri 14/12/18	Thu 20/12/18	14/12  20/12/2018 - Cable disconnections
	2 wks	Fri 21/12/18	Thu 17/01/19	21/12  17/01/2019 - Flexible cooling pipe removal
	6 days	Fri 18/01/19	Fri 25/01/19	18/01  25/01/2019 - Dismantling of accessible
	3 wks	Mon 28/01/19	Fri 15/02/19	28/01  15/02/2019 - Cable ren
	3 days	Mon 18/02/19	Wed 20/02/19	18/02  20/02/2019 - BASE
	2 days	Mon 18/02/19	Tue 19/02/19	18/02  19/02/2019 - Equip
	1 day	Wed 20/02/19	Wed 20/02/19	20/02  20/02/2019 - Mech
	3.75 days	Thu 21/02/19	Tue 26/02/19	21/02  26/02/2019 - )
	2.5 days	Thu 21/02/19	Mon 25/02/19	21/02  25/02/2019 - E
	1.25 days	Mon 25/02/19	Tue 26/02/19	25/02  26/02/2019 - I
	10.5 days	Tue 26/02/19	Wed 13/03/19	26/02  13/03/2019 - )
	10.5 days	Tue 26/02/19	Wed 13/03/19	26/02  13/03/2019 - )



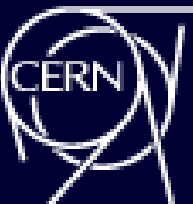
# 2<sup>nd</sup> stage: Infrastructure modifs



Infrastructure modifs	30 days	Wed 13/03/19	Wed 24/04/19	13/03	24
Remove stochastic cooling equipment	1 wk	Wed 13/03/19	Wed 20/03/19	13/03	20/03/2019 - Remove stochastic
Removal of big piping on the wall	1 wk	Wed 13/03/19	Wed 20/03/19	13/03	20/03/2019 - Removal of big pip
Removal of cable trays on the wall	1 wk	Wed 20/03/19	Wed 27/03/19	20/03	27/03/2019 - Removal of c
Shielding wall modification	3 wks	Wed 27/03/19	Wed 17/04/19	27/03	17/04/2019 - Shielding wall modification
Re-install stochastic cooling equipment	1 wk	Wed 17/04/19	Wed 24/04/19	17/04	24/04/2019 - Re-install stochastic cooling equipment
New demi water piping install	1 wk	Wed 17/04/19	Wed 24/04/19	17/04	24/04/2019 - New demi water piping install



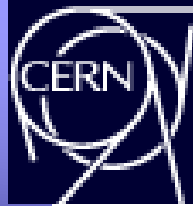
# 3rd stage: TL's installation



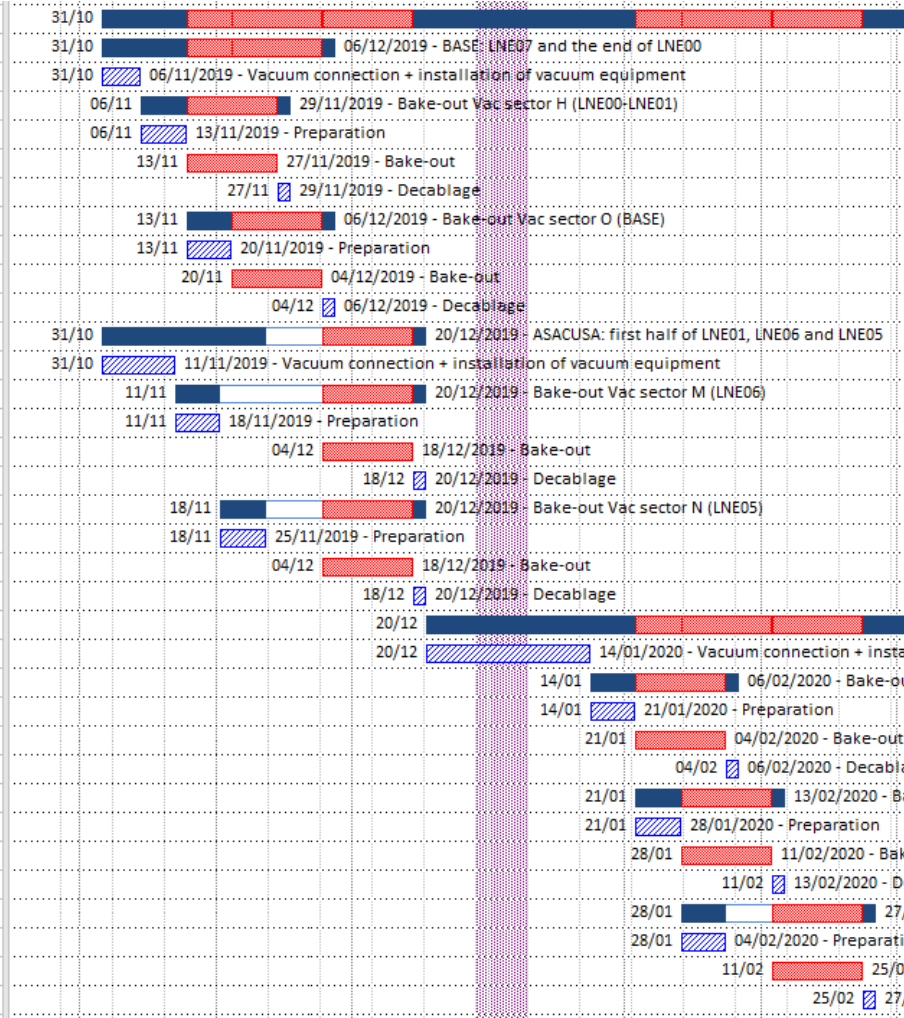
Task	Duration	Start Date	End Date	Start Date	End Date
<b>Installation of the Transfer lines</b>	125 days	Wed 01/05/19	Wed 23/10/19	01/05	
Survey Marking (including holes marking)	2 wks	Wed 01/05/19	Wed 15/05/19	01/05	15/05/2019 - Survey Marking (including holes marking)
Drilling for the mechanical support	2 wks	Wed 15/05/19	Wed 29/05/19	15/05	29/05/2019 - Drilling for the mechanical support
Installation of the new mechanical support	3 wks	Wed 29/05/19	Wed 19/06/19	29/05	19/06/2019 - Installation of the new mechanical support
Alignment of supports by the survey	2 wks	Wed 19/06/19	Wed 03/07/19	19/06	03/07/2019 - Alignment of supports by the survey
Installation of power sockets for bake-out	3 wks	Wed 03/07/19	Wed 24/07/19	03/07	24/07/2019 - Installation of power sockets for bake-out
Cabling campaign	9 wks	Wed 03/07/19	Wed 04/09/19	03/07	04/09/2019 - Cabling campaign
Installation of electrostatics element + SEM	3 wks	Wed 04/09/19	Wed 25/09/19	04/09	25/09/2019 - Installation of electrostatics element + SEM
Alignment of electrostatic elements by the survey	2 wks	Wed 25/09/19	Wed 09/10/19	25/09	09/10/2019 - Alignment of electrostatic elements by the survey
Connection of electrostatic elements	2 wks	Wed 09/10/19	Wed 23/10/19	09/10	23/10/2019 - Connection of electrostatic elements
Connection of SEM	2 wks	Wed 09/10/19	Wed 23/10/19	09/10	23/10/2019 - Connection of SEM



# 4th Stage: vacuum work



▲ Vacuum work	141.5 days	Thu 31/10/19	Fri 29/05/20
▲ BASE: LNE07 and the end of LNE00	26 days	Thu 31/10/19	Fri 06/12/19
Vacuum connection + installation of vacuum equipment	4 days	Thu 31/10/19	Wed 06/11/19
▲ Bake-out Vac sector H (LNE00-LNE01)	17 days	Wed 06/11/19	Fri 29/11/19
Preparation	5 days	Wed 06/11/19	Wed 13/11/19
Bake-out	2 wks	Wed 13/11/19	Wed 27/11/19
Decablage	2 days	Wed 27/11/19	Fri 29/11/19
▲ Bake-out Vac sector O (BASE)	17 days	Wed 13/11/19	Fri 06/12/19
Preparation	5 days	Wed 13/11/19	Wed 20/11/19
Bake-out	2 wks	Wed 20/11/19	Wed 04/12/19
Decablage	2 days	Wed 04/12/19	Fri 06/12/19
▲ ASACUSA: first half of LNE01, LNE06 and LNE05	36 days	Thu 31/10/19	Fri 20/12/19
Vacuum connection + installation of vacuum equipment	1.5 wks	Thu 31/10/19	Mon 11/11/19
▲ Bake-out Vac sector M (LNE06)	28.5 days	Mon 11/11/19	Fri 20/12/19
Preparation	5 days	Mon 11/11/19	Mon 18/11/19
Bake-out	2 wks	Wed 04/12/19	Wed 18/12/19
Decablage	2 days	Wed 18/12/19	Fri 20/12/19
▲ Bake-out Vac sector N (LNE05)	23.5 days	Mon 18/11/19	Fri 20/12/19
Preparation	5 days	Mon 18/11/19	Mon 25/11/19
Bake-out	2 wks	Wed 04/12/19	Wed 18/12/19
Decablage	2 days	Wed 18/12/19	Fri 20/12/19
▲ ALPHA/TRAP Second half of LNE01, LNE03 and LNE04	105.5 days	Fri 20/12/19	Fri 29/05/20
Vacuum connection + installation of vacuum equipment	1.5 wks	Fri 20/12/19	Tue 14/01/20
▲ Bake-out Vac sector K (LNE03)	17 days	Tue 14/01/20	Thu 06/02/20
Preparation	5 days	Tue 14/01/20	Tue 21/01/20
Bake-out	2 wks	Tue 21/01/20	Tue 04/02/20
Decablage	2 days	Tue 04/02/20	Thu 06/02/20
▲ Bake-out Vac sector L (LNE04)	17 days	Tue 21/01/20	Thu 13/02/20
Preparation	5 days	Tue 21/01/20	Tue 28/01/20
Bake-out	2 wks	Tue 28/01/20	Tue 11/02/20
Decablage	2 days	Tue 11/02/20	Thu 13/02/20
▲ Bake-out Vac sector I (LNE02)	22 days	Tue 28/01/20	Thu 27/02/20
Preparation	5 days	Tue 28/01/20	Tue 04/02/20
Bake-out	2 wks	Tue 11/02/20	Tue 25/02/20
Decablage	2 days	Tue 25/02/20	Thu 27/02/20



- About 13 months of intense activity for ELENA
- To be done in parallel with AD machine consolidation / AD hall and exp areas infrastructure works / potentially AEGIS relocation

