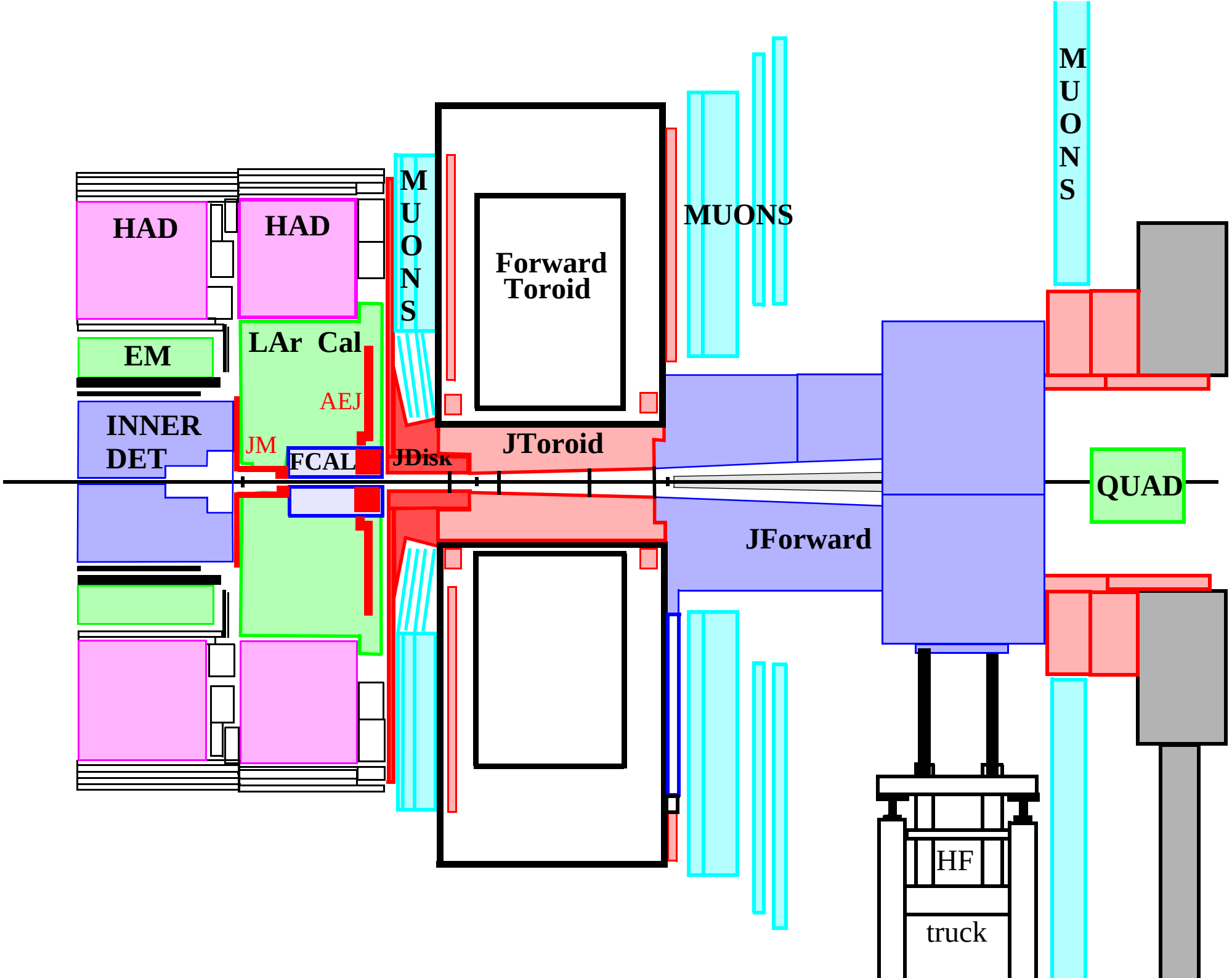
HAD
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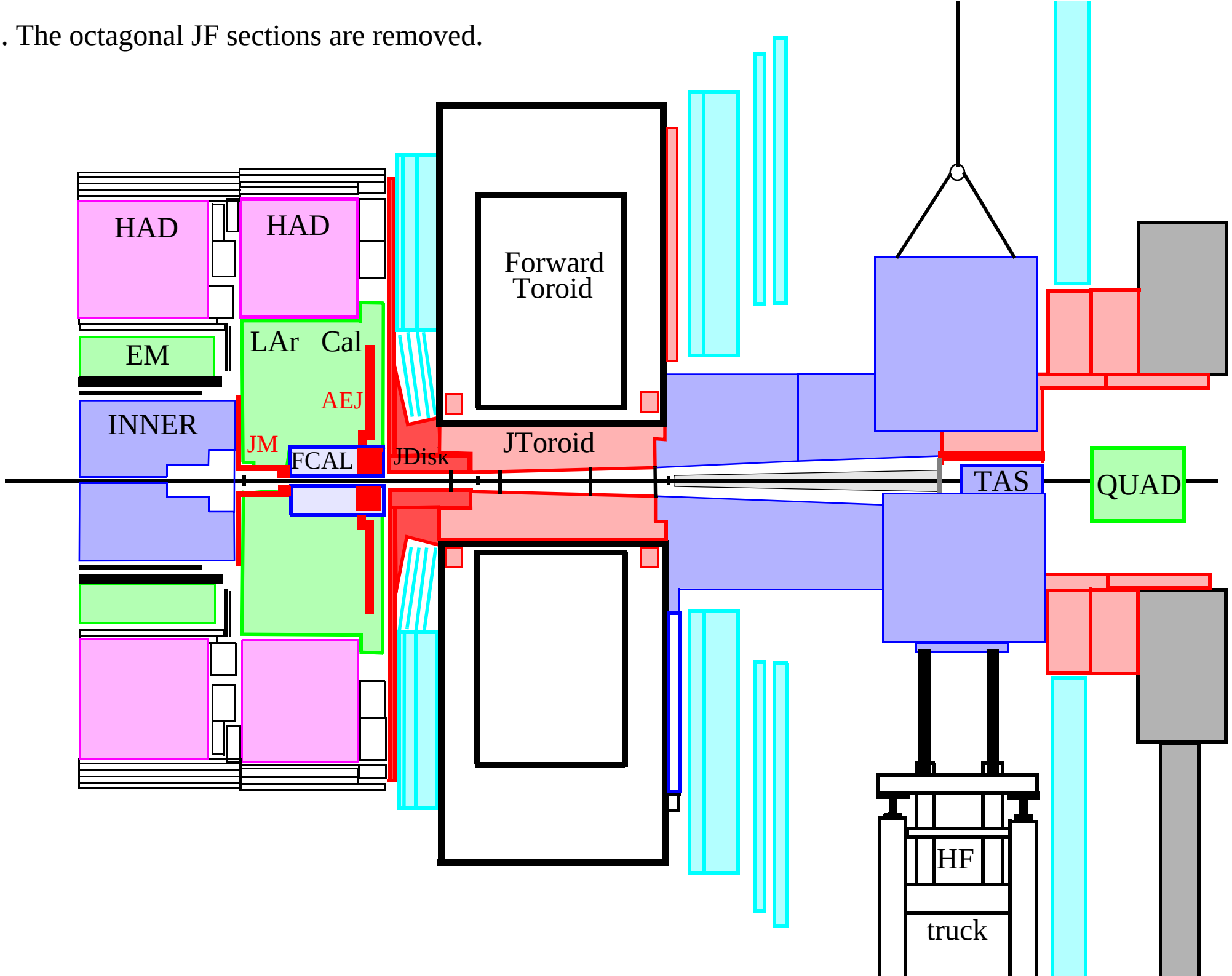
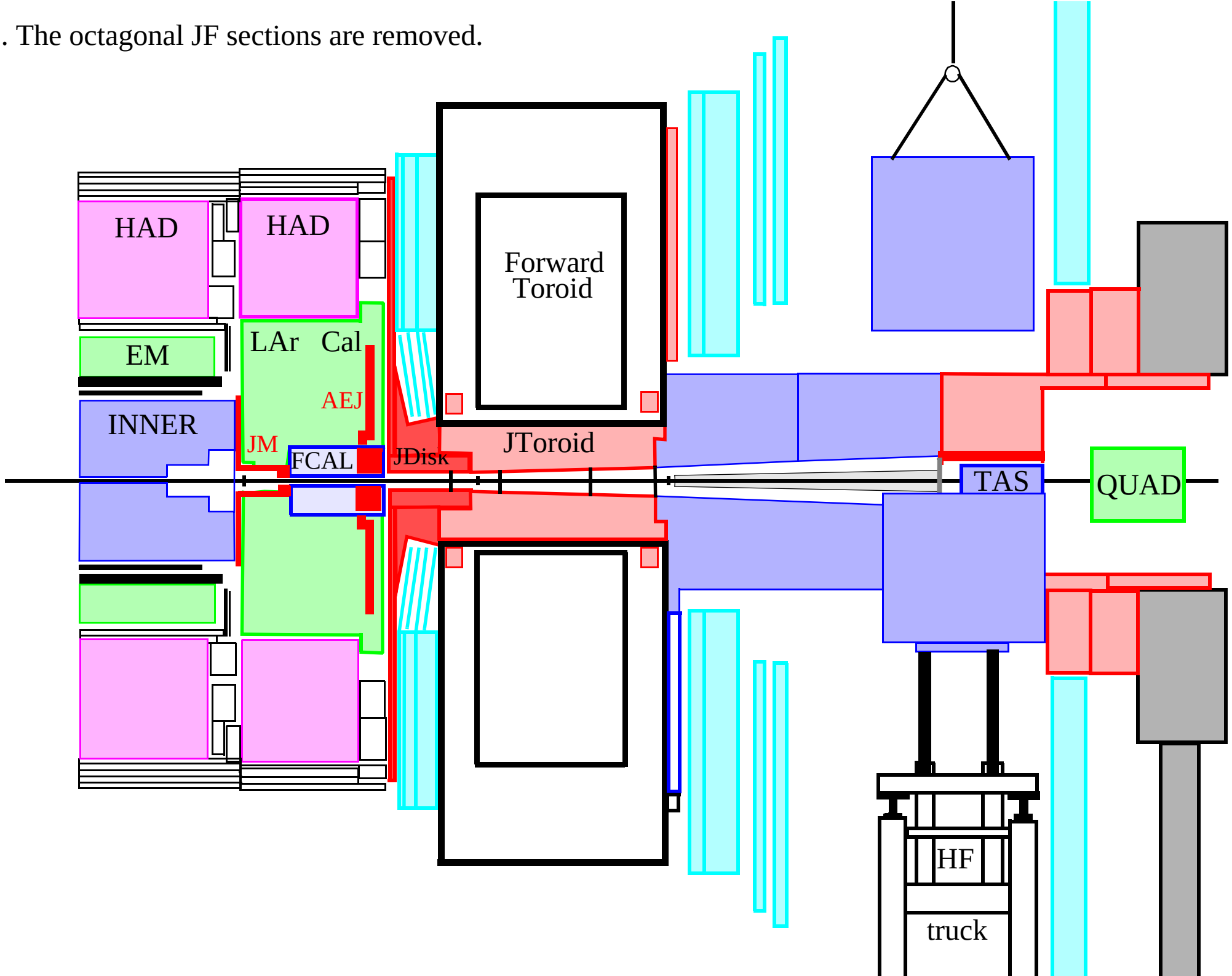
JToroid
MUONS
JForward
MUONS
QUAD
HF
truck

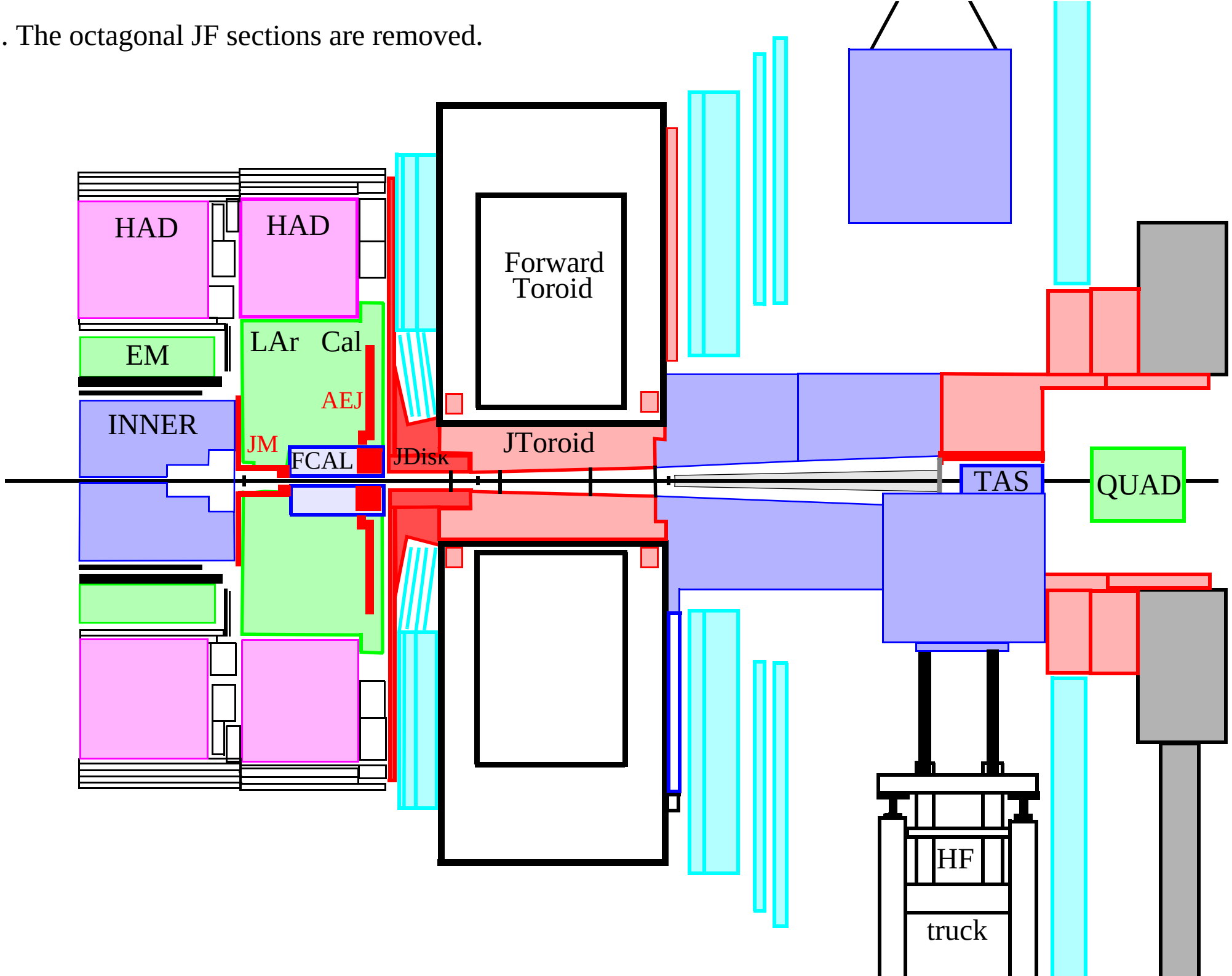
1. The octagonal JF sections are removed.



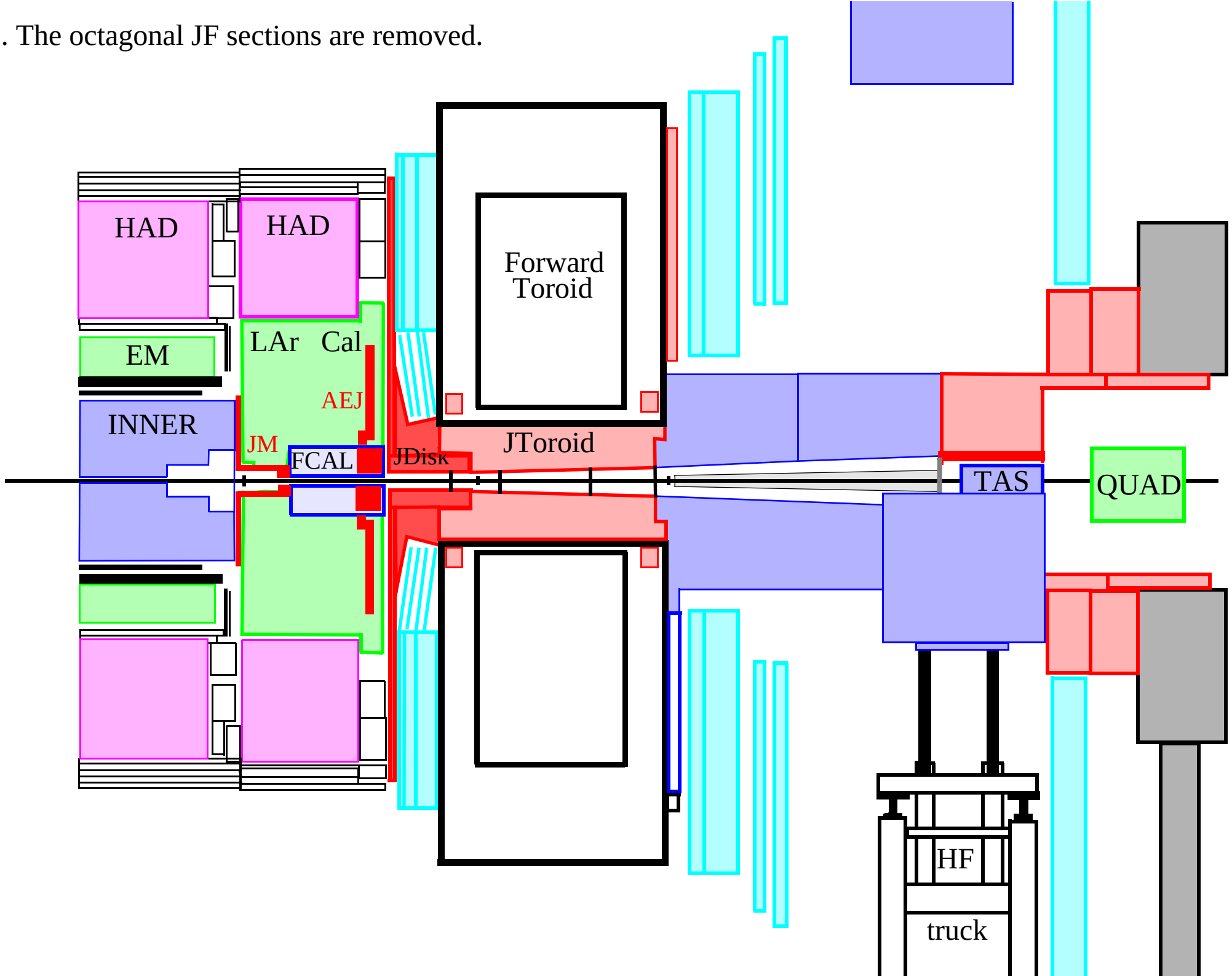
1. The octagonal JF sections are removed.



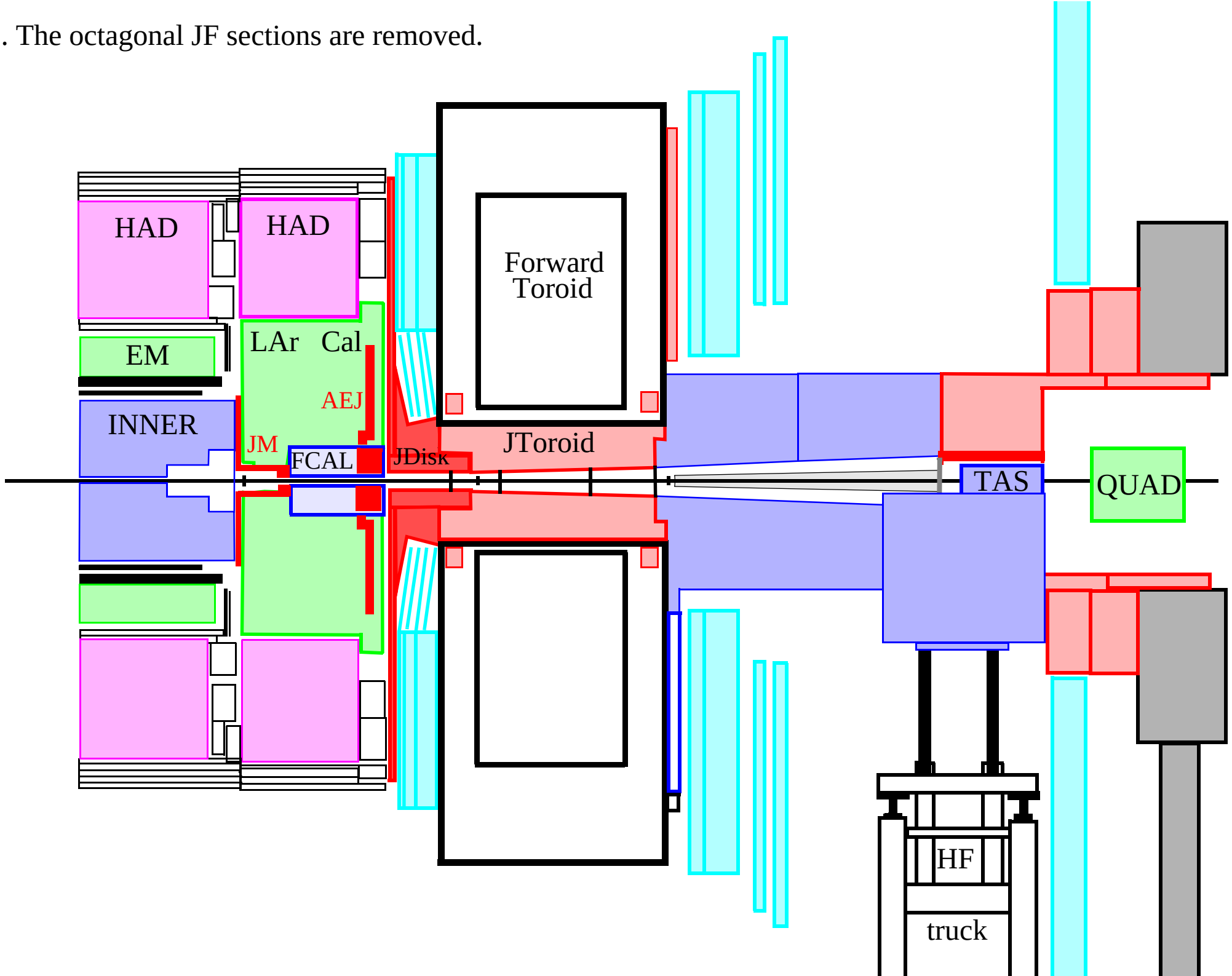
1. The octagonal JF sections are removed.



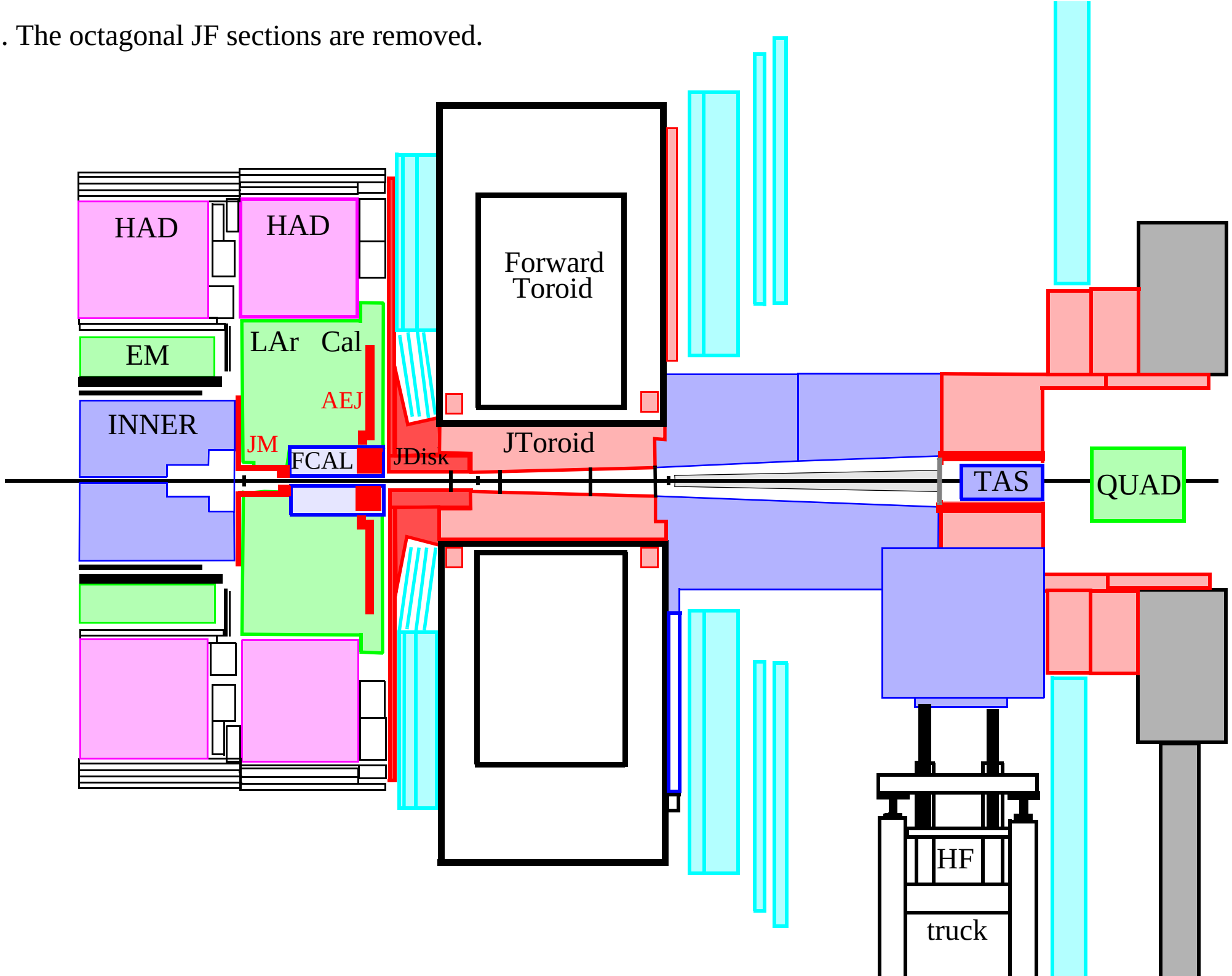
1. The octagonal JF sections are removed.



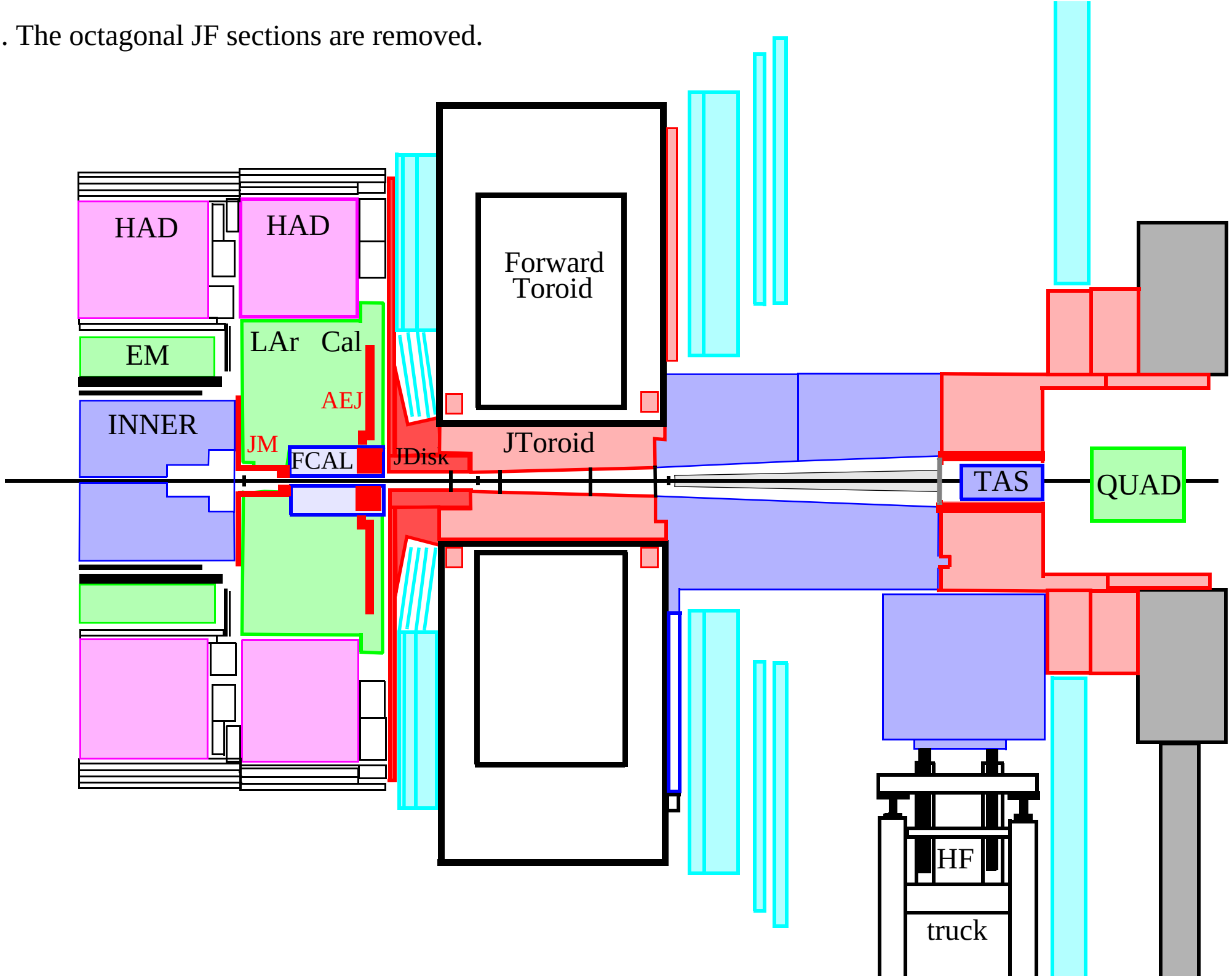
1. The octagonal JF sections are removed.



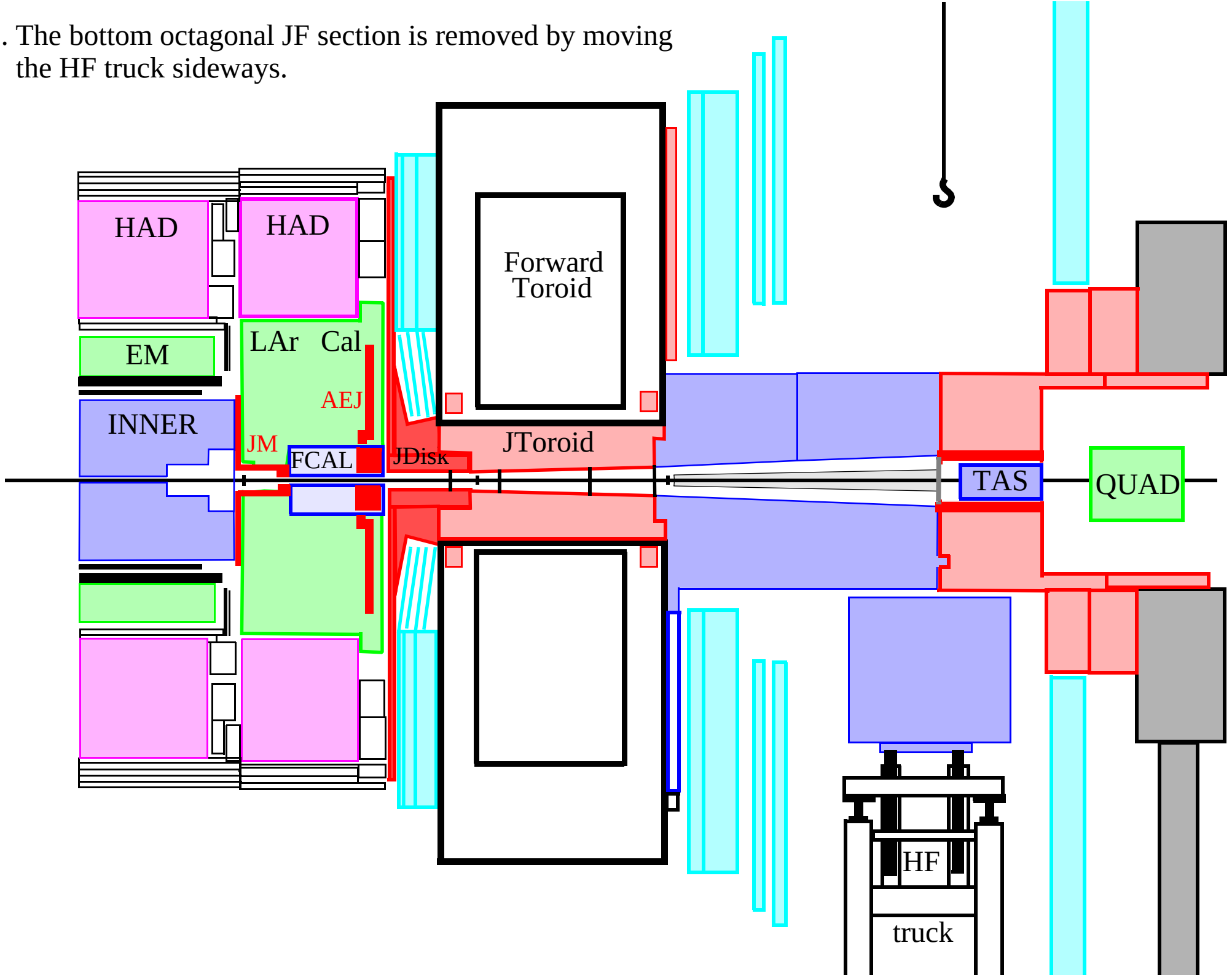
1. The octagonal JF sections are removed.

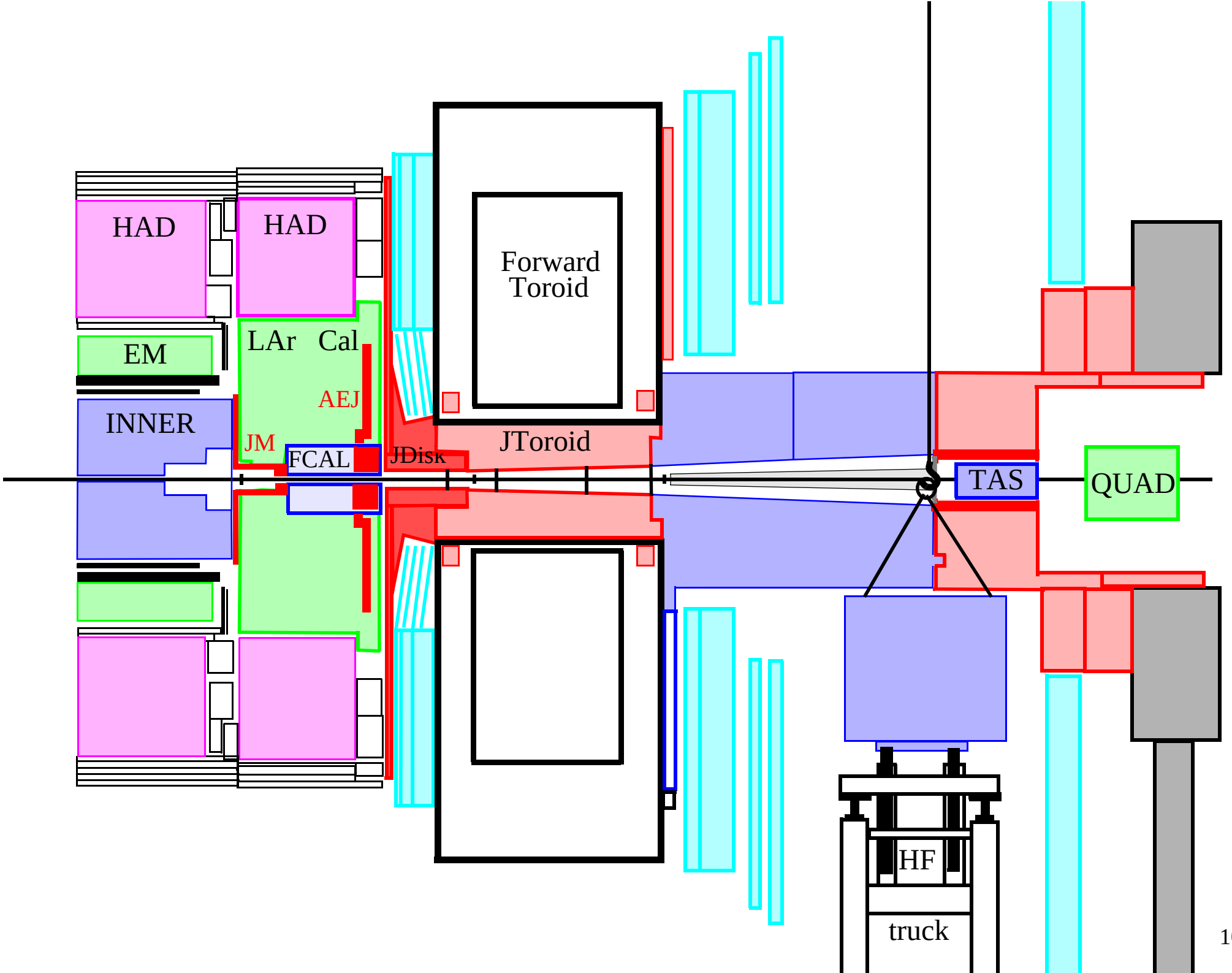


1. The octagonal JF sections are removed.



2. The bottom octagonal JF section is removed by moving the HF truck sideways.

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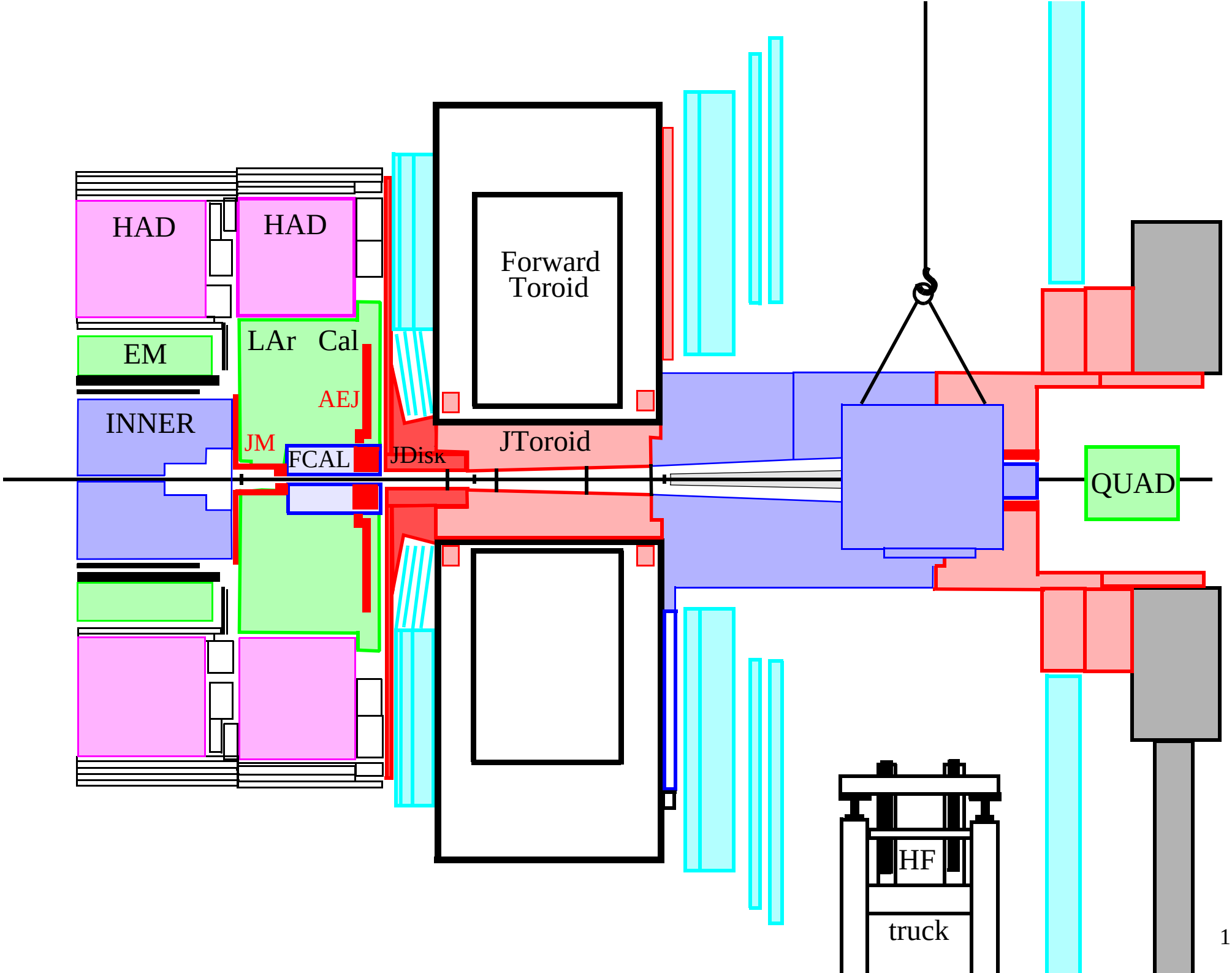
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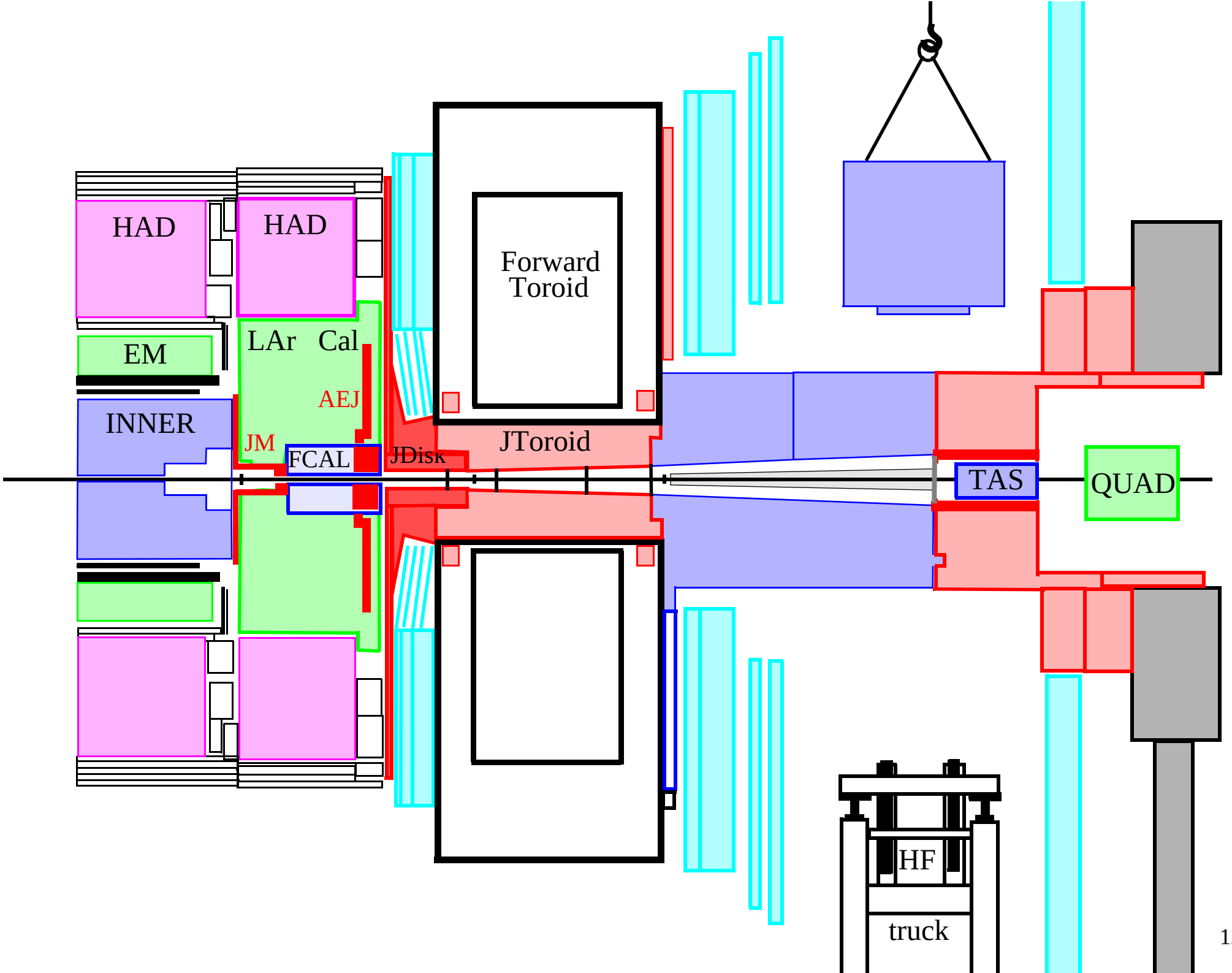
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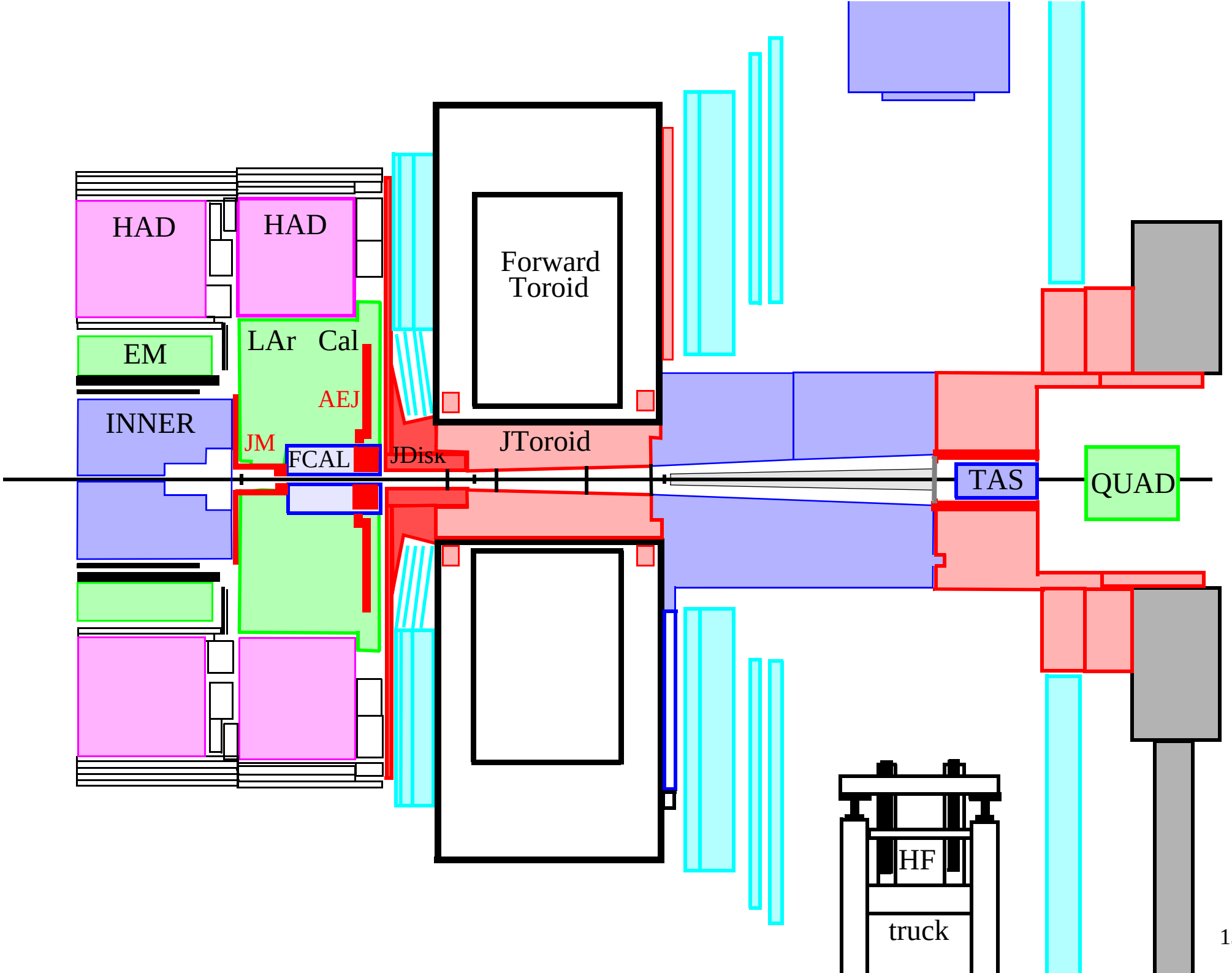
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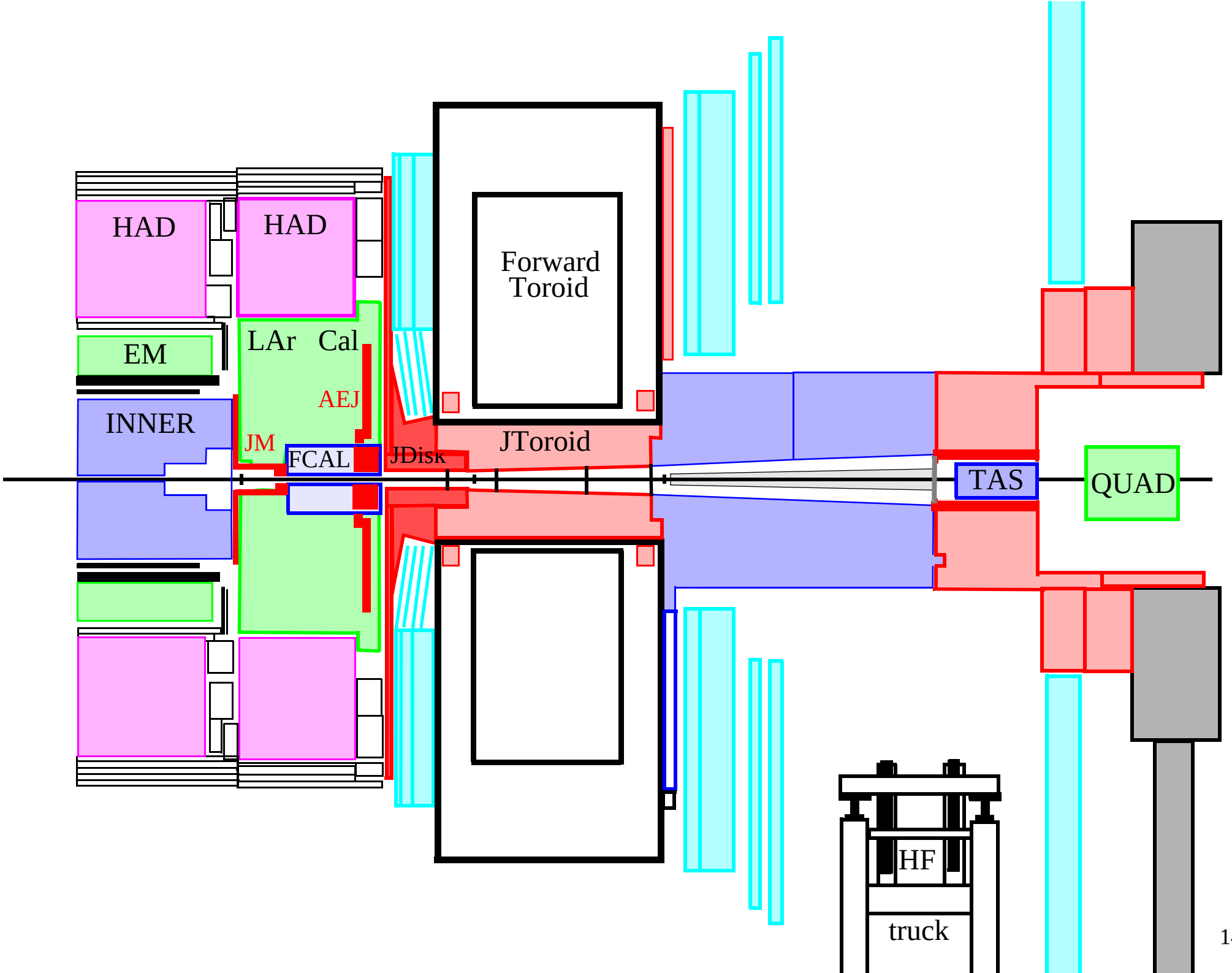
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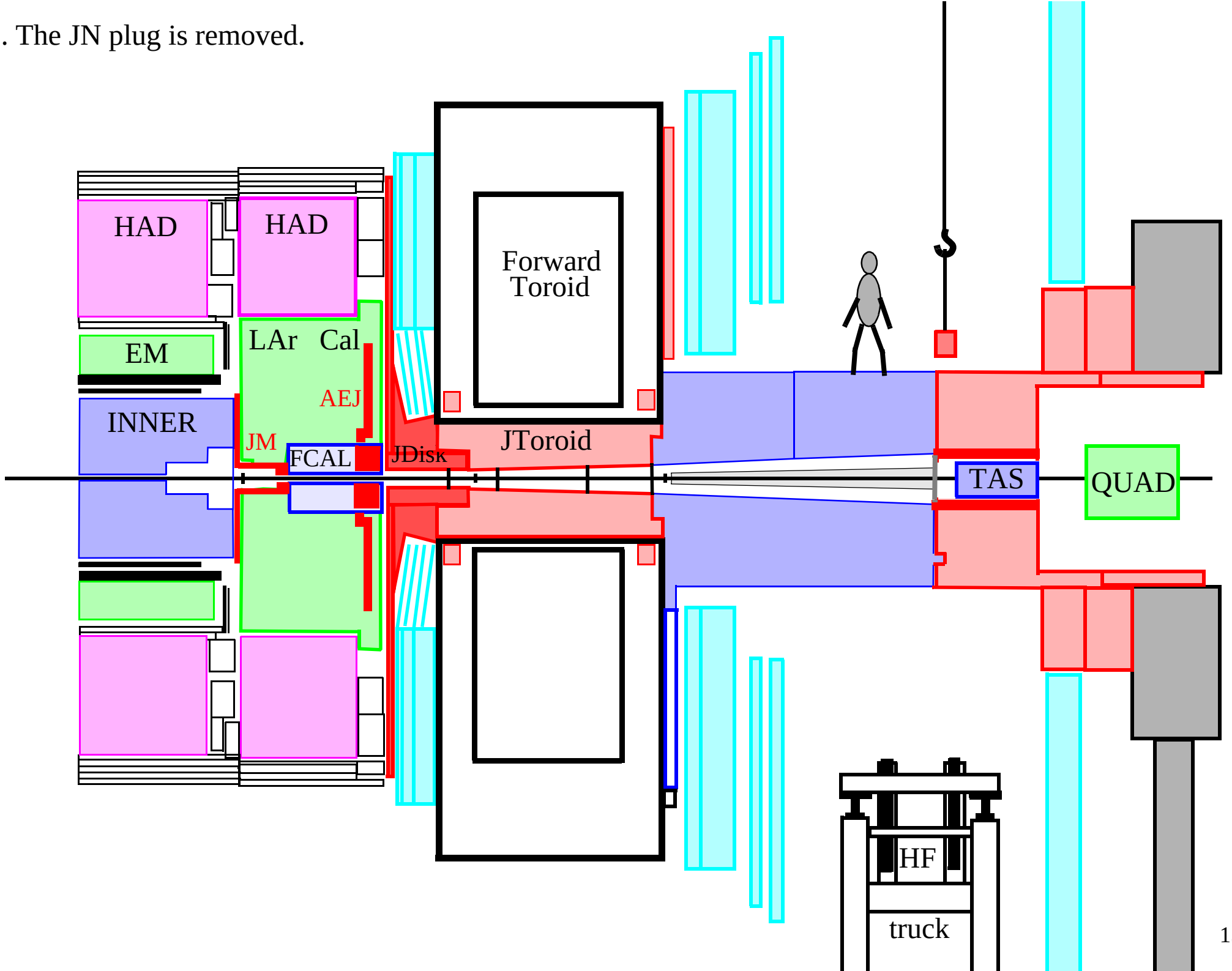
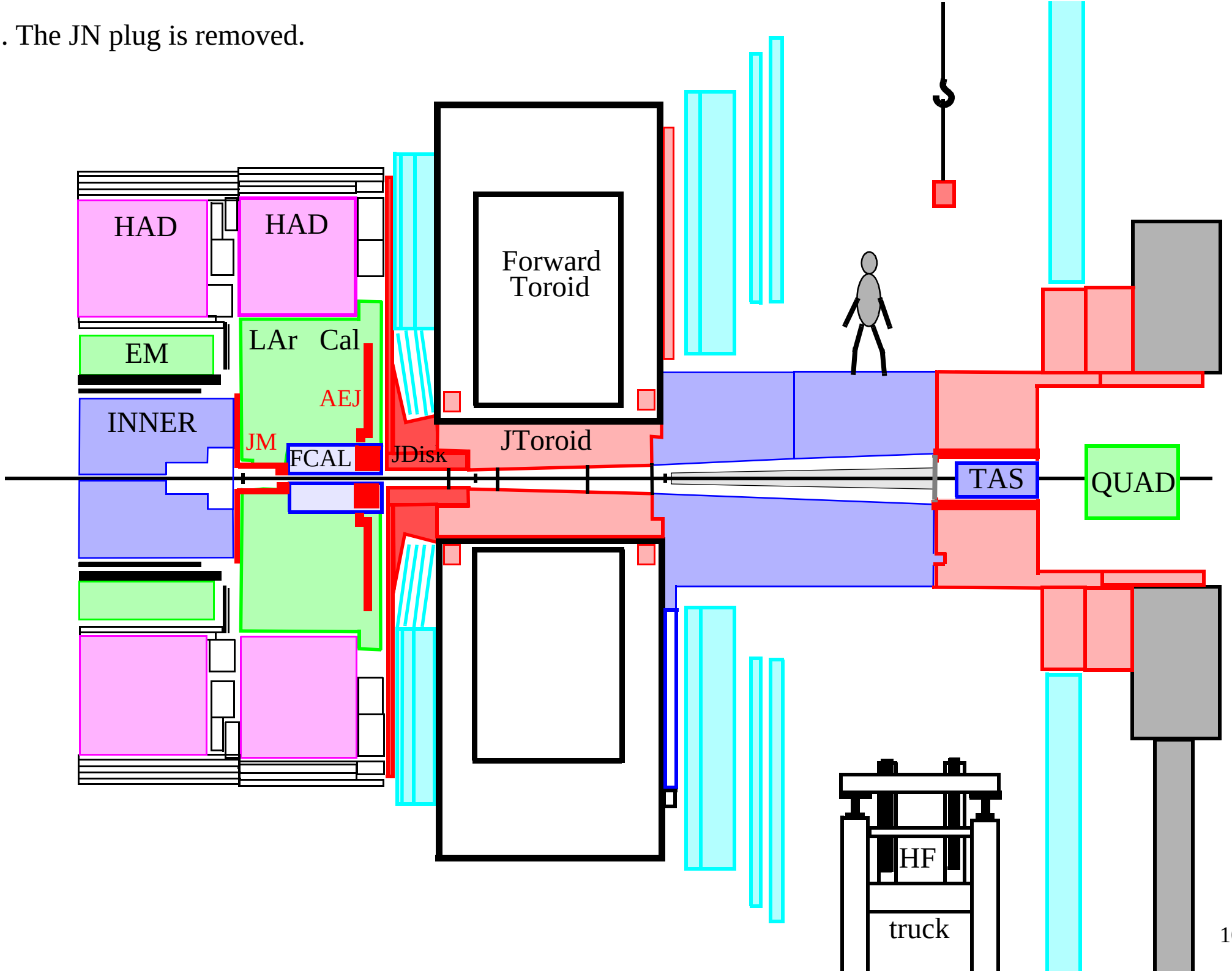
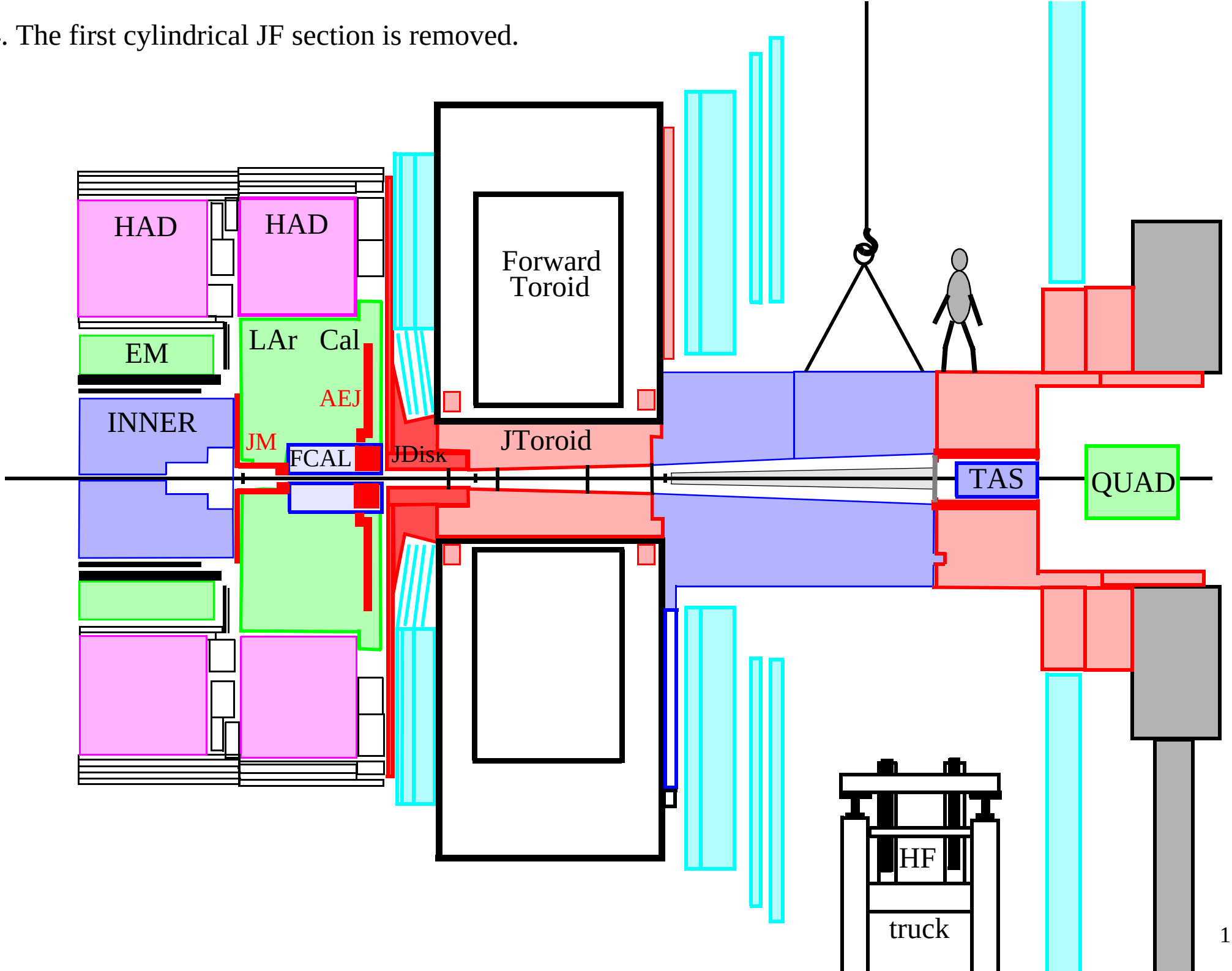
3. The JN plug is removed.



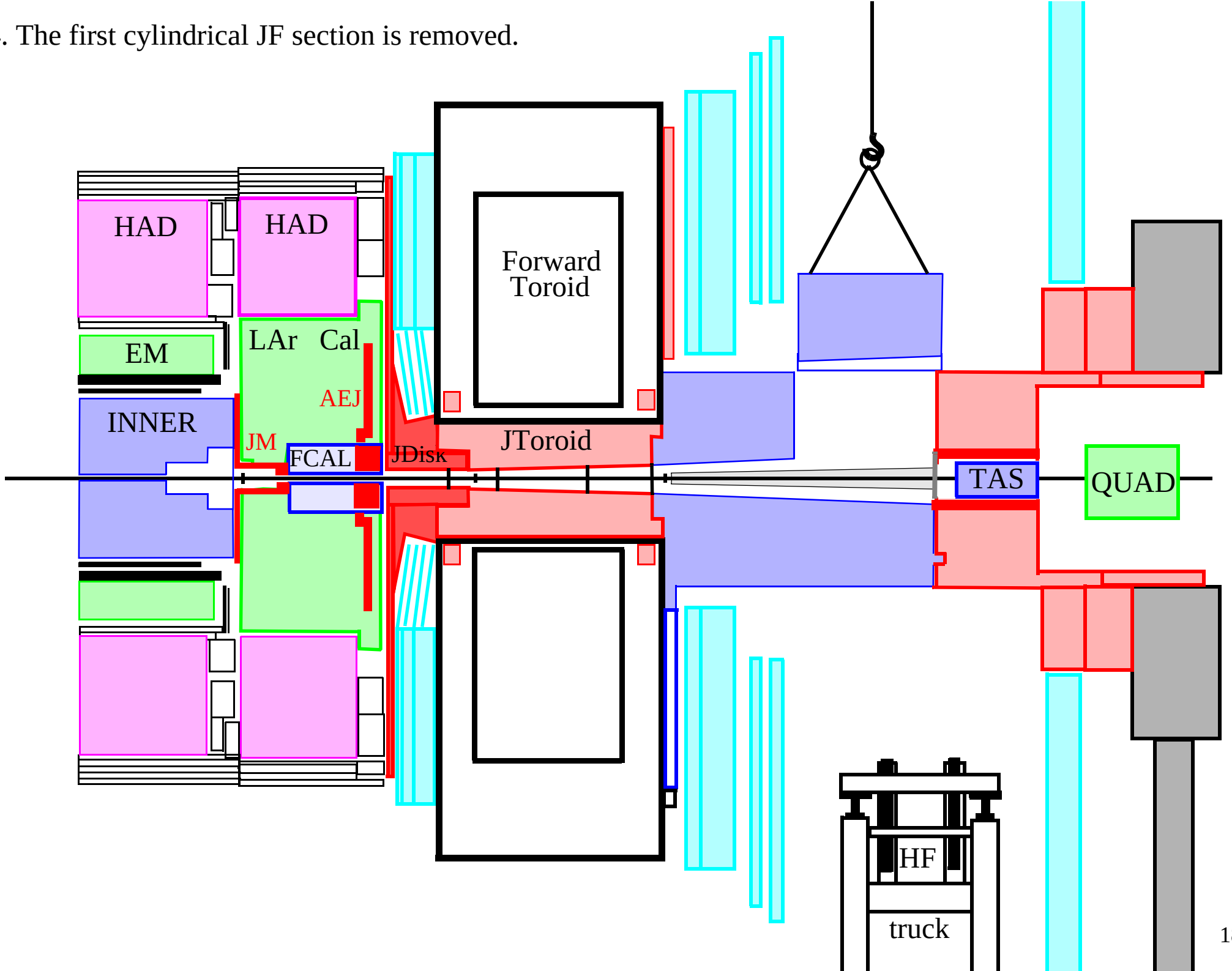
3. The JN plug is removed.



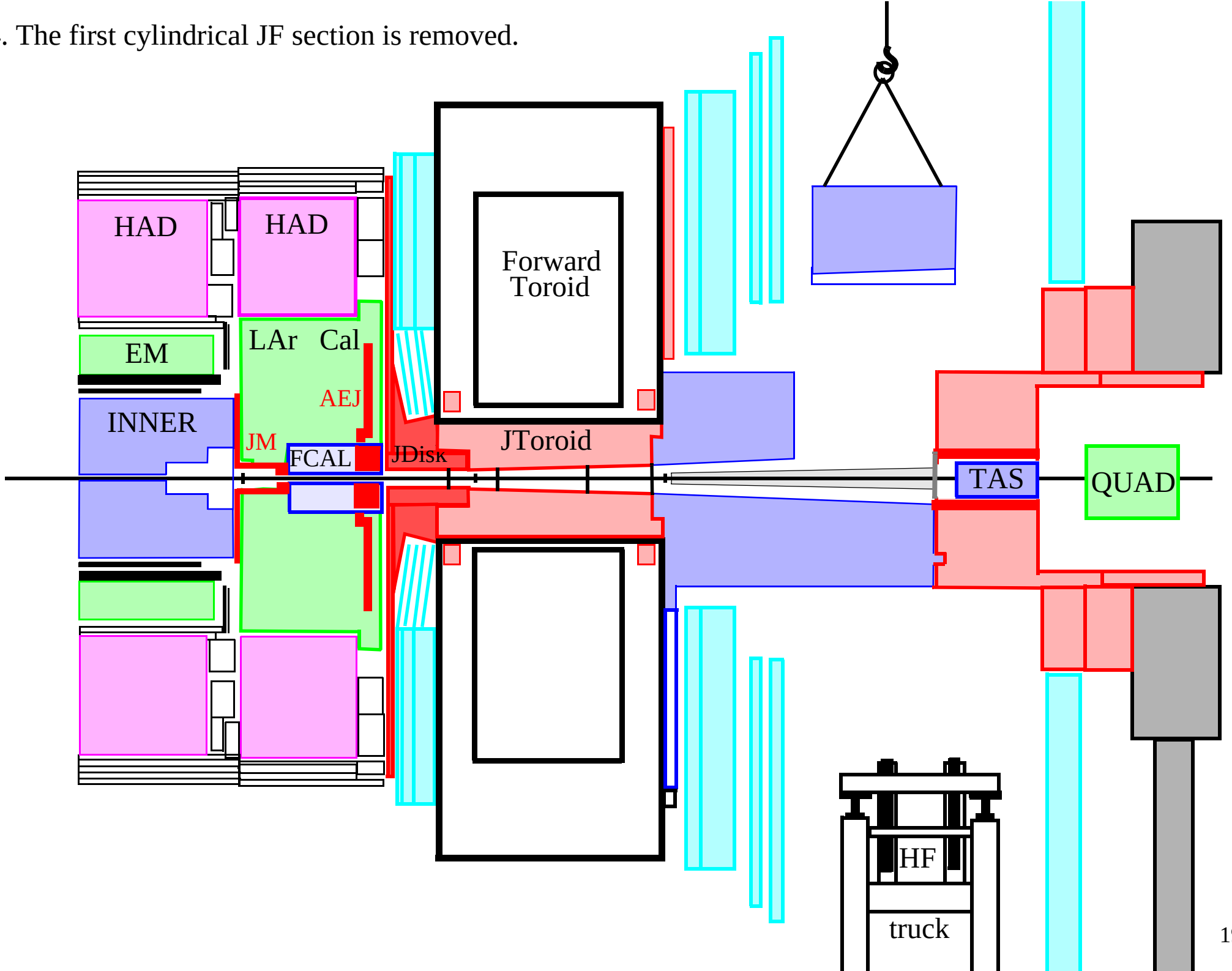
4. The first cylindrical JF section is removed.



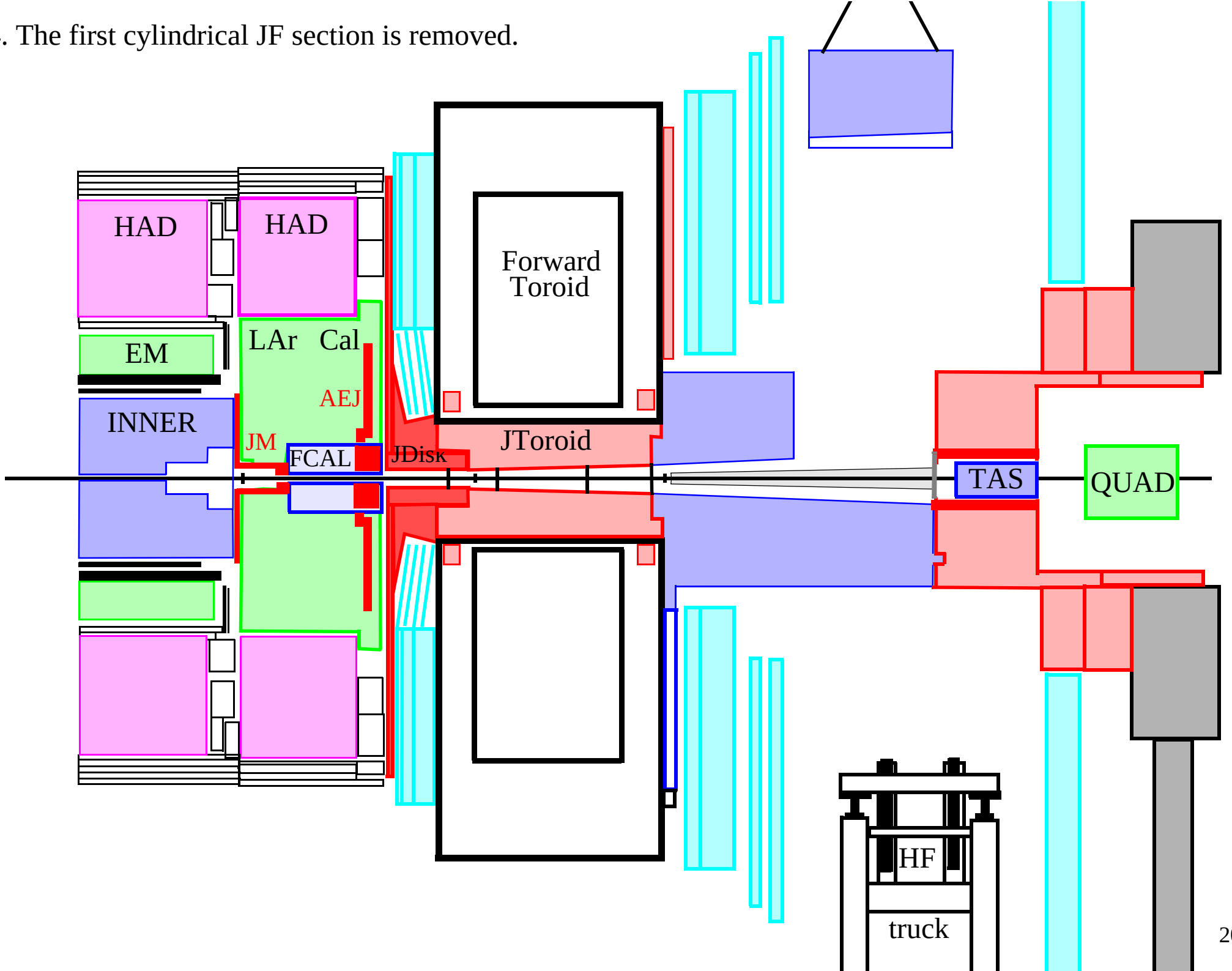
4. The first cylindrical JF section is removed.

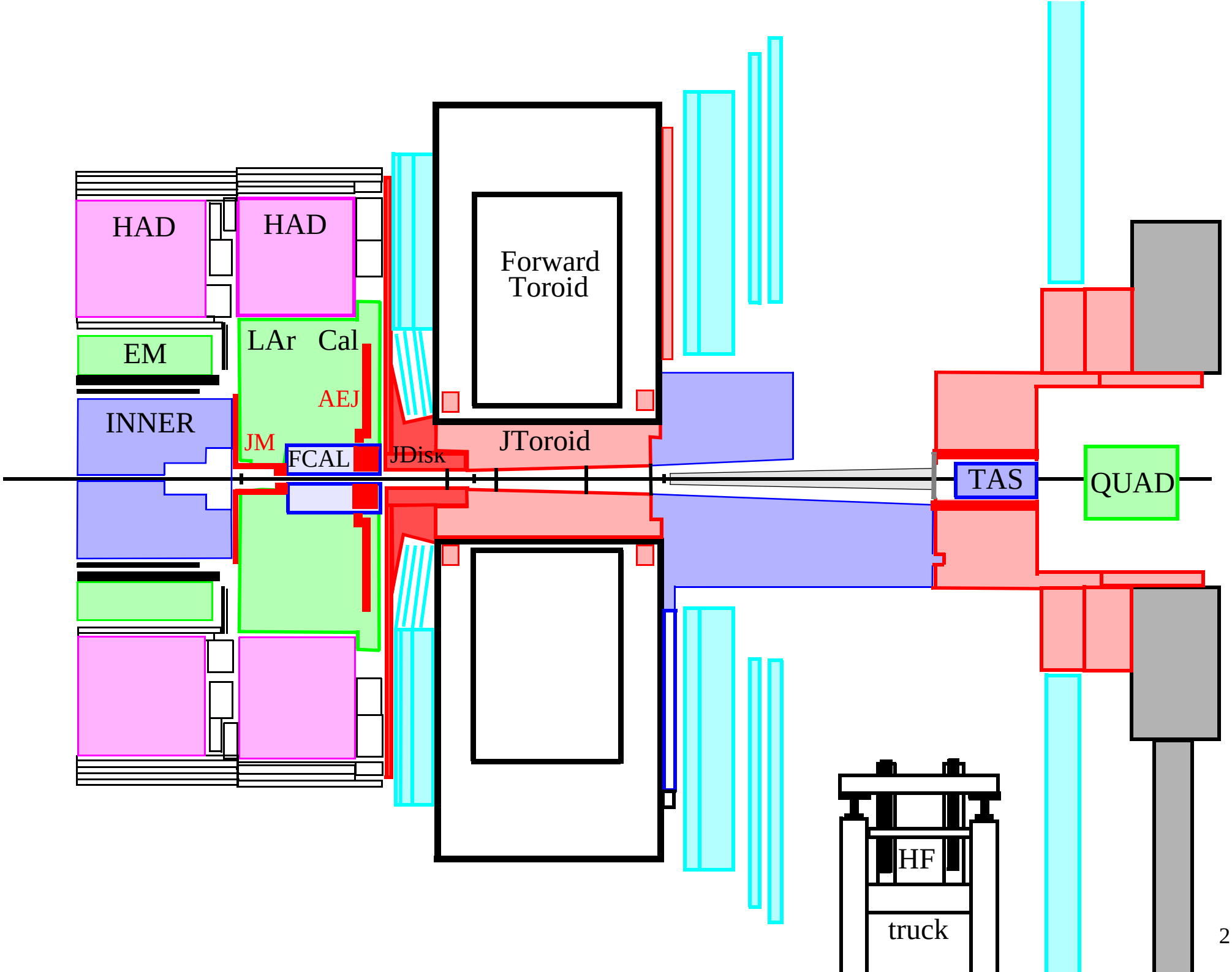


4. The first cylindrical JF section is removed.



4. The first cylindrical JF section is removed.

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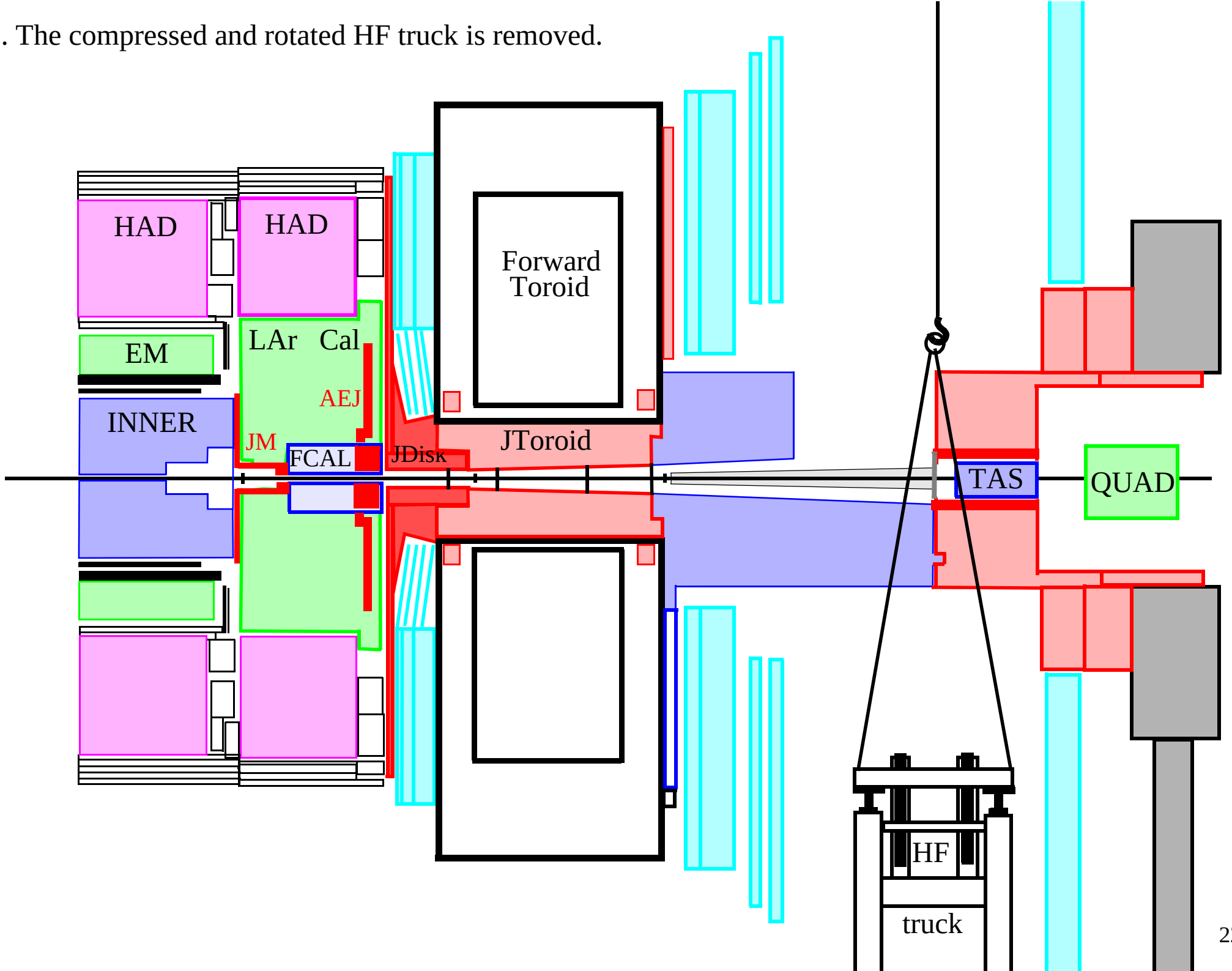
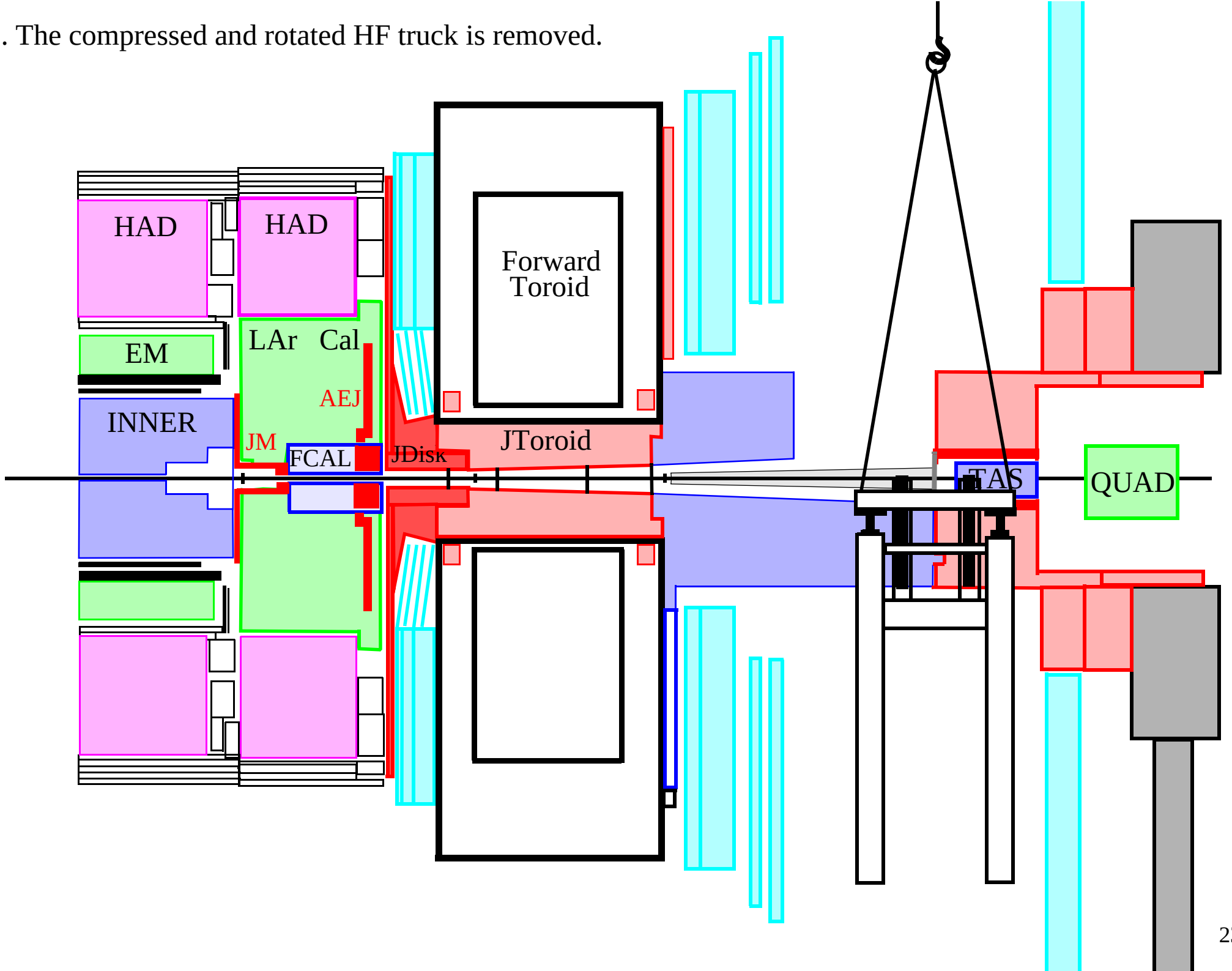
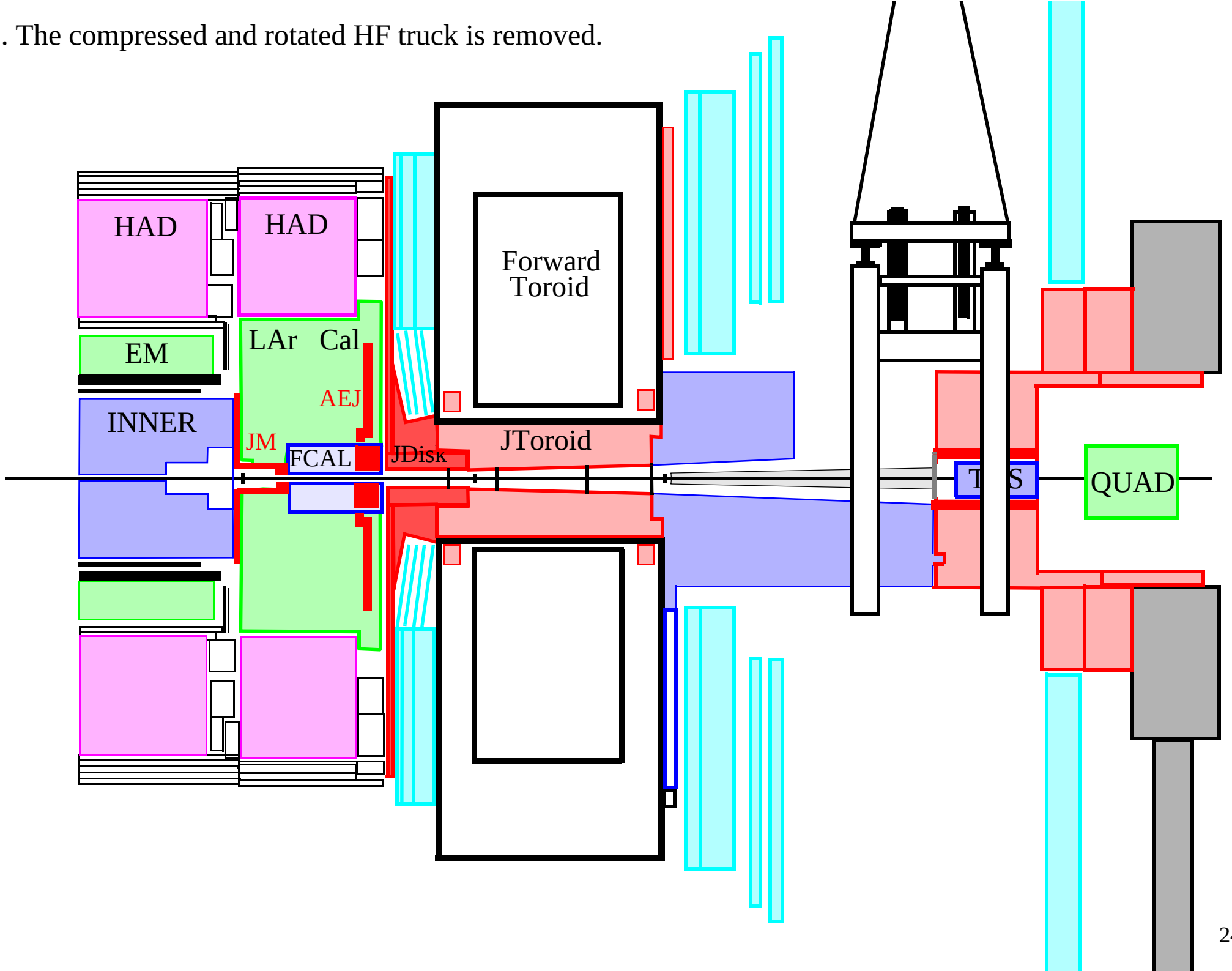
5. The compressed and rotated HF truck is removed.

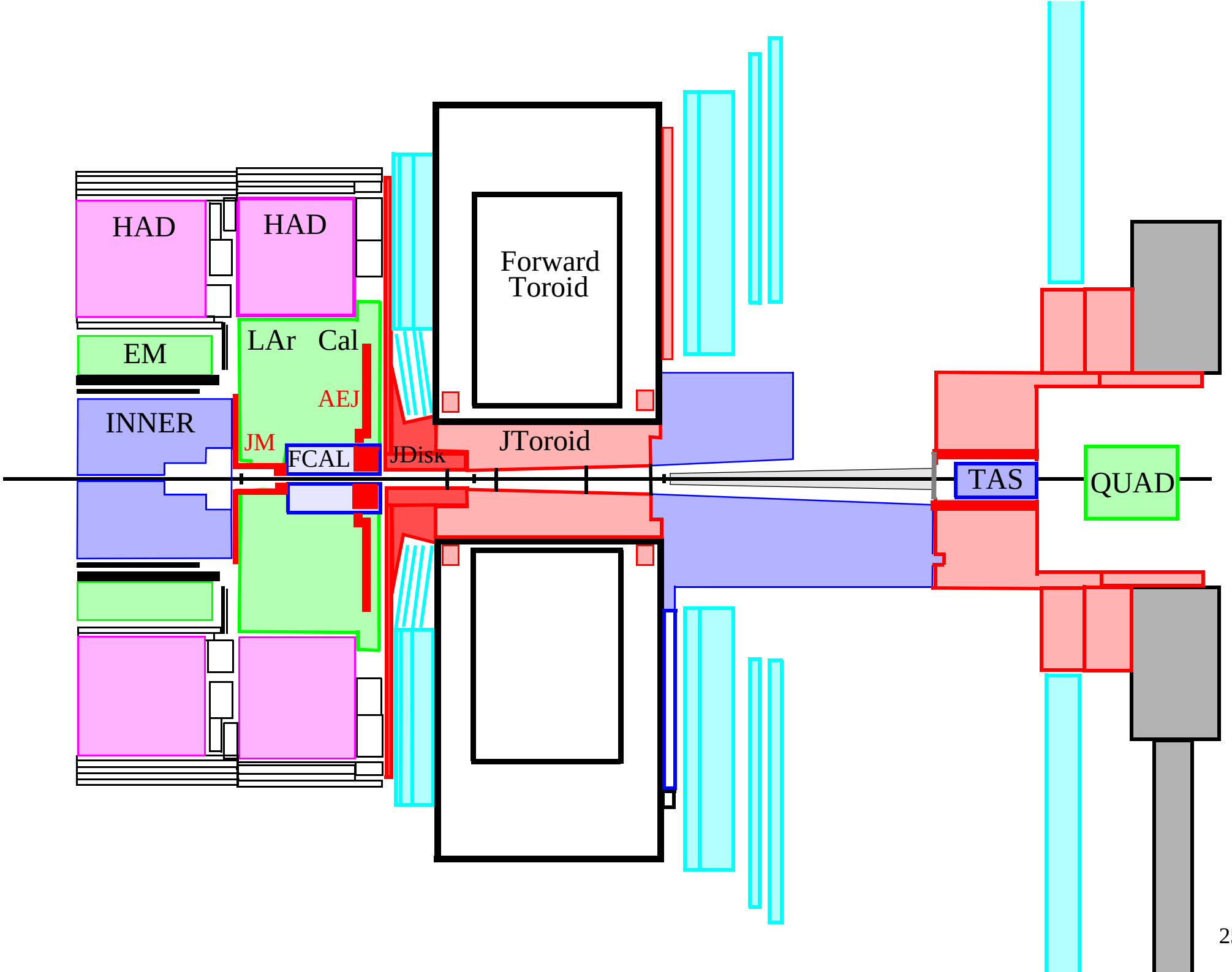


5. The compressed and rotated HF truck is removed.



5. The compressed and rotated HF truck is removed.

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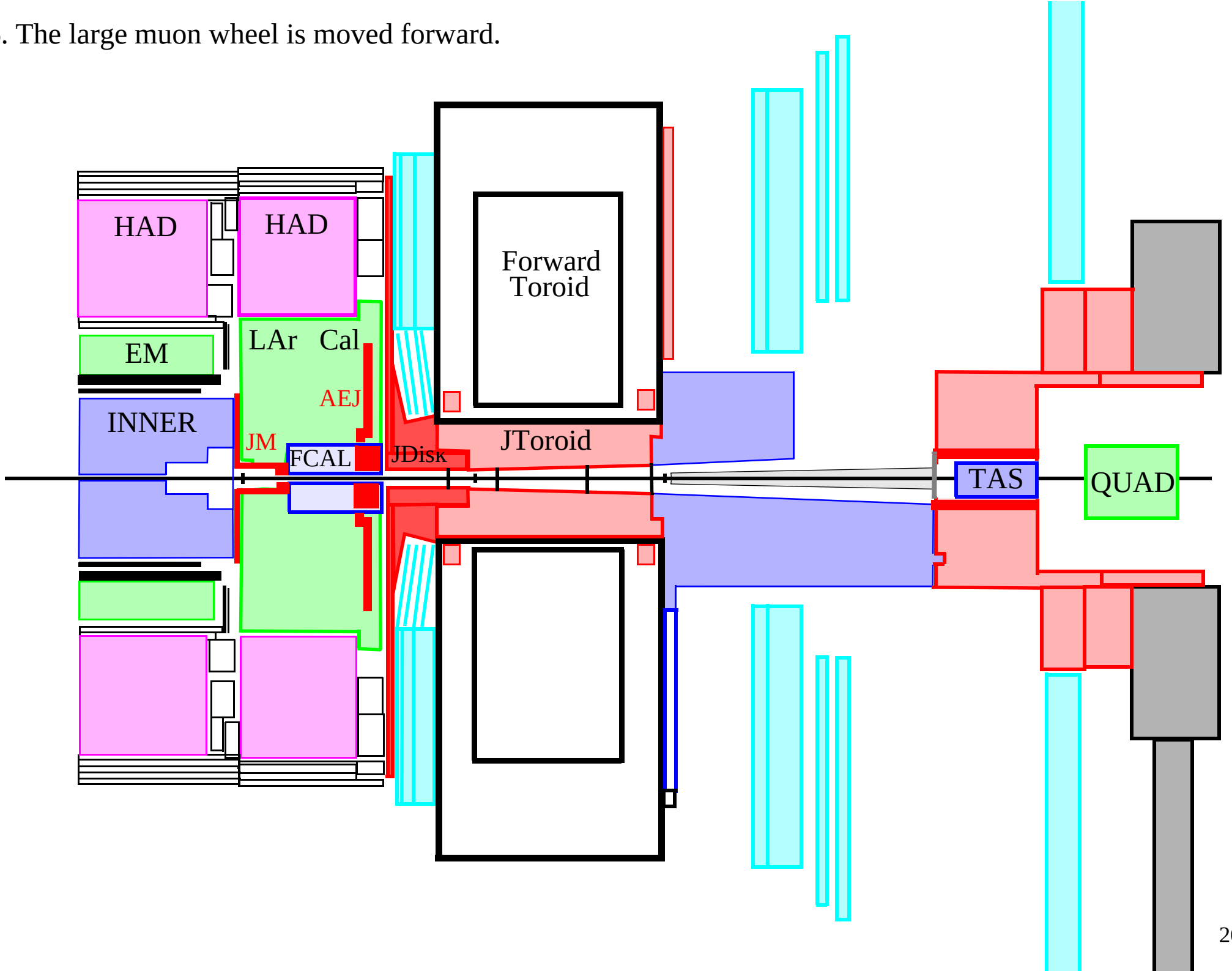
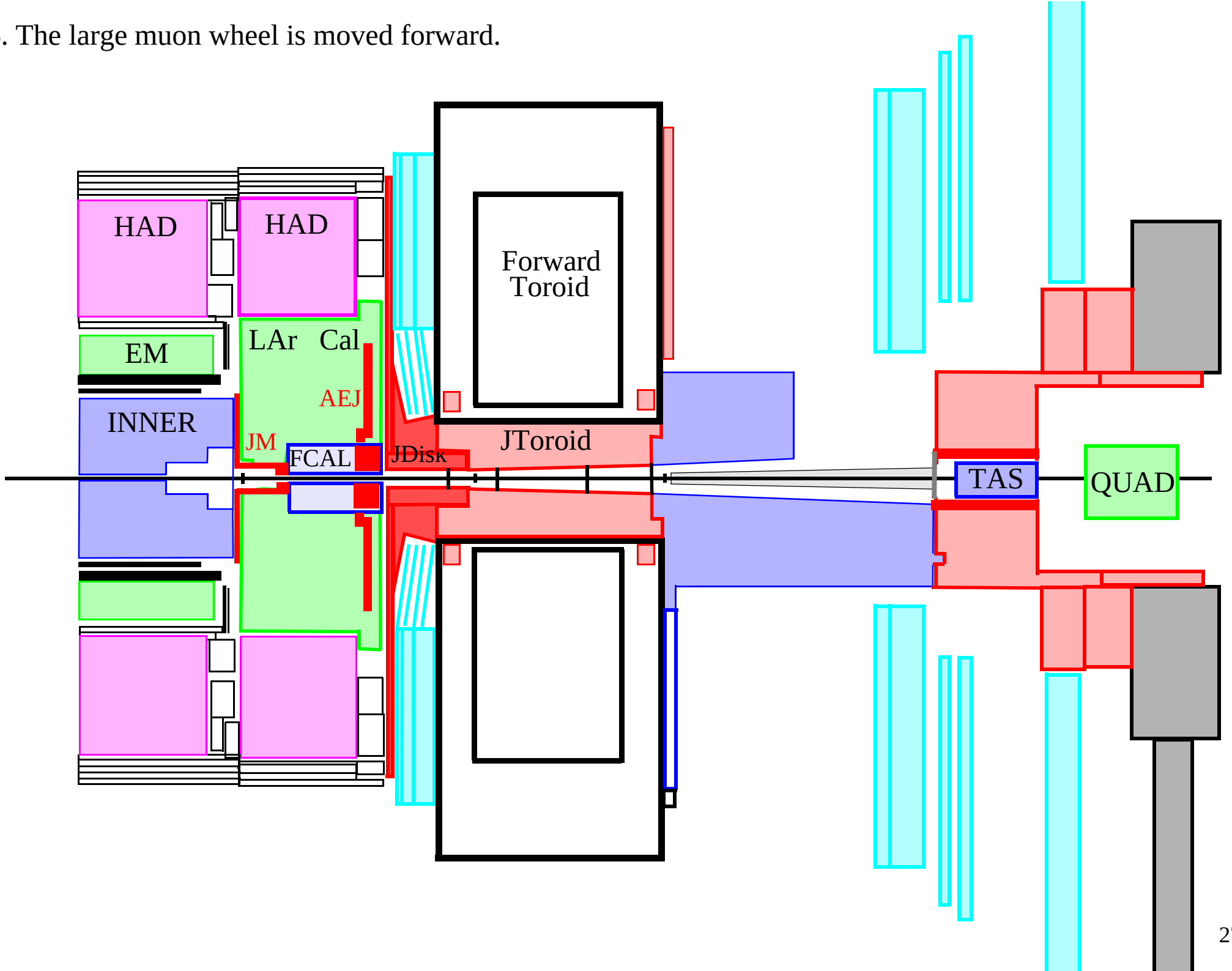
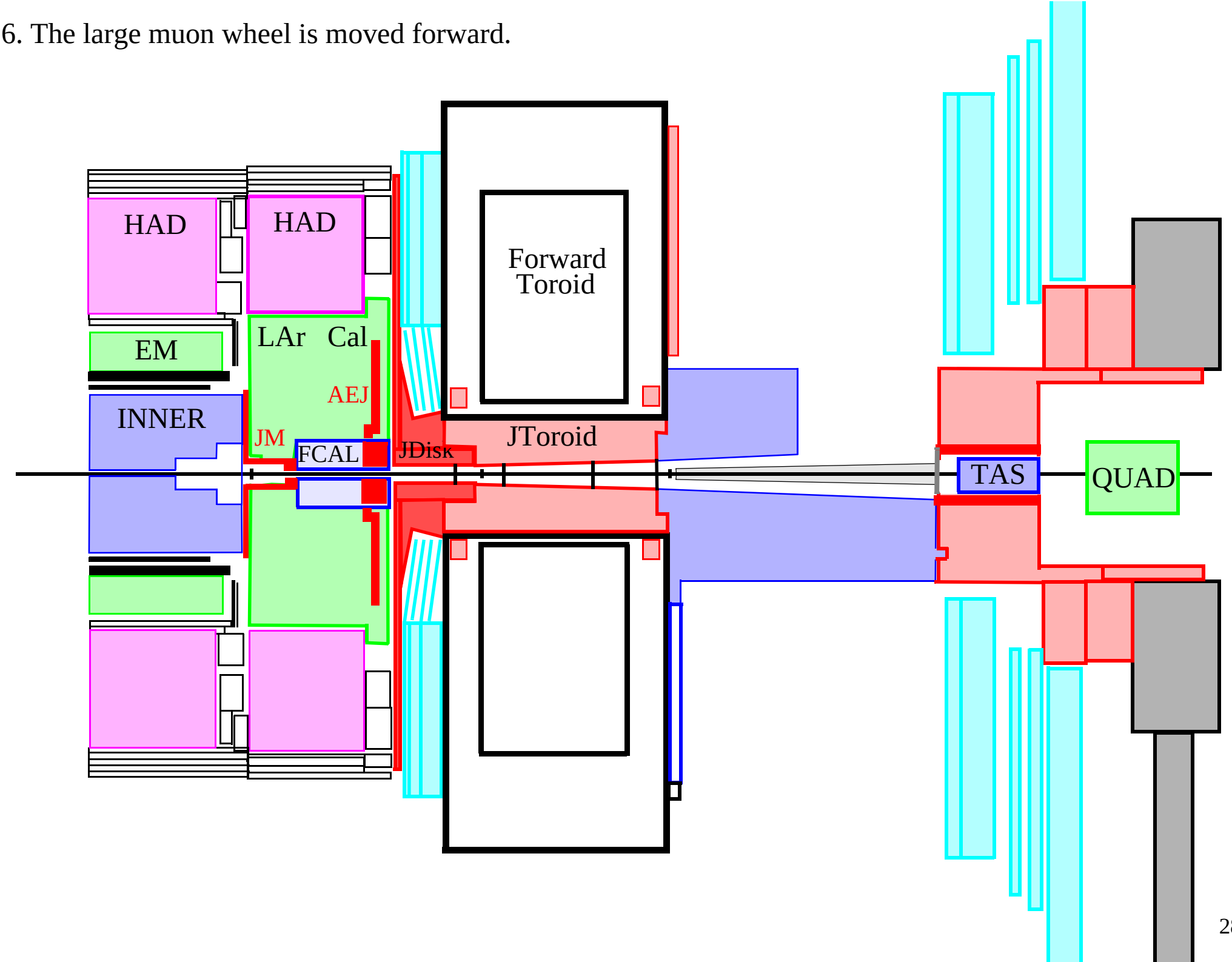
6. The large muon wheel is moved forward.



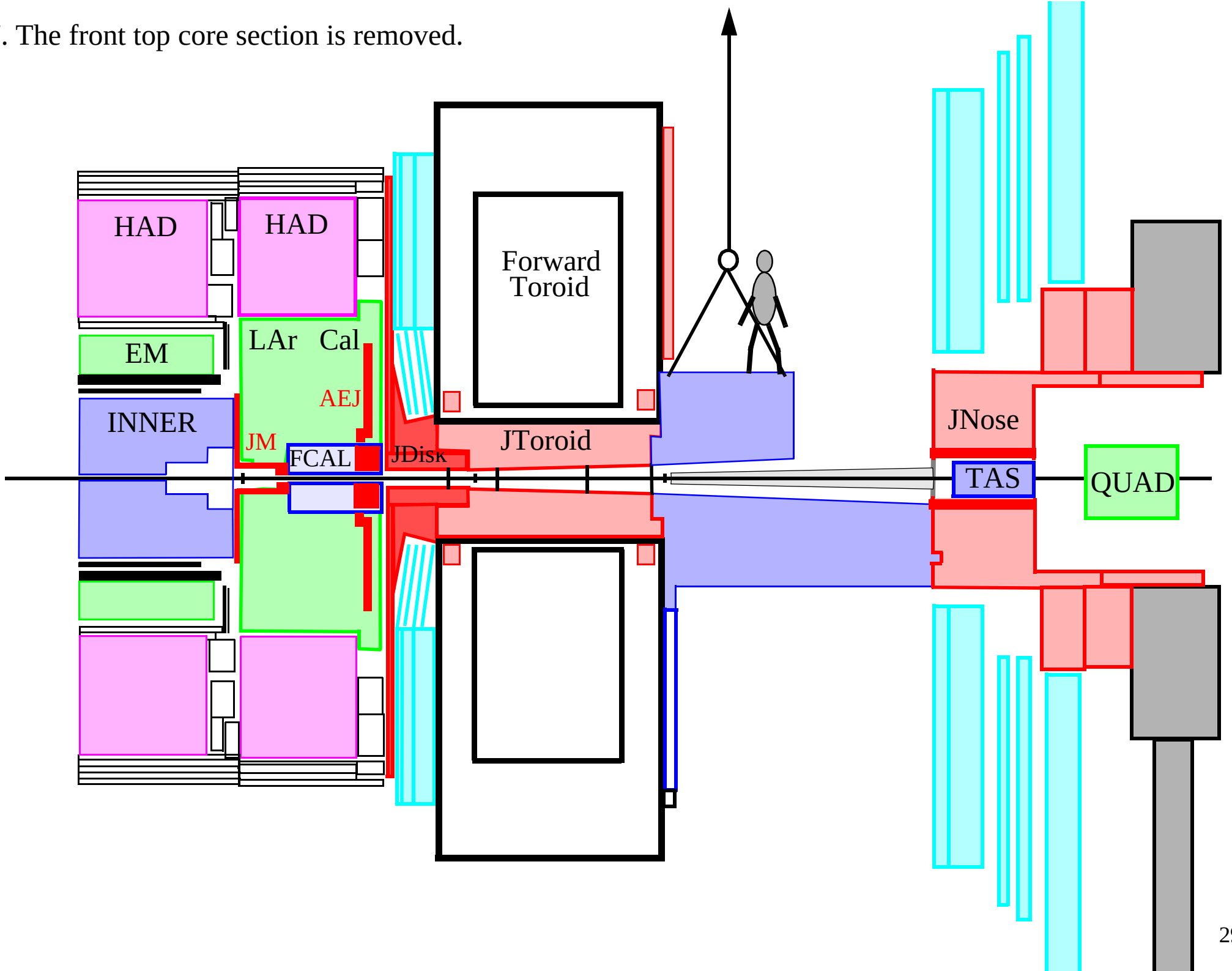
6. The large muon wheel is moved forward.



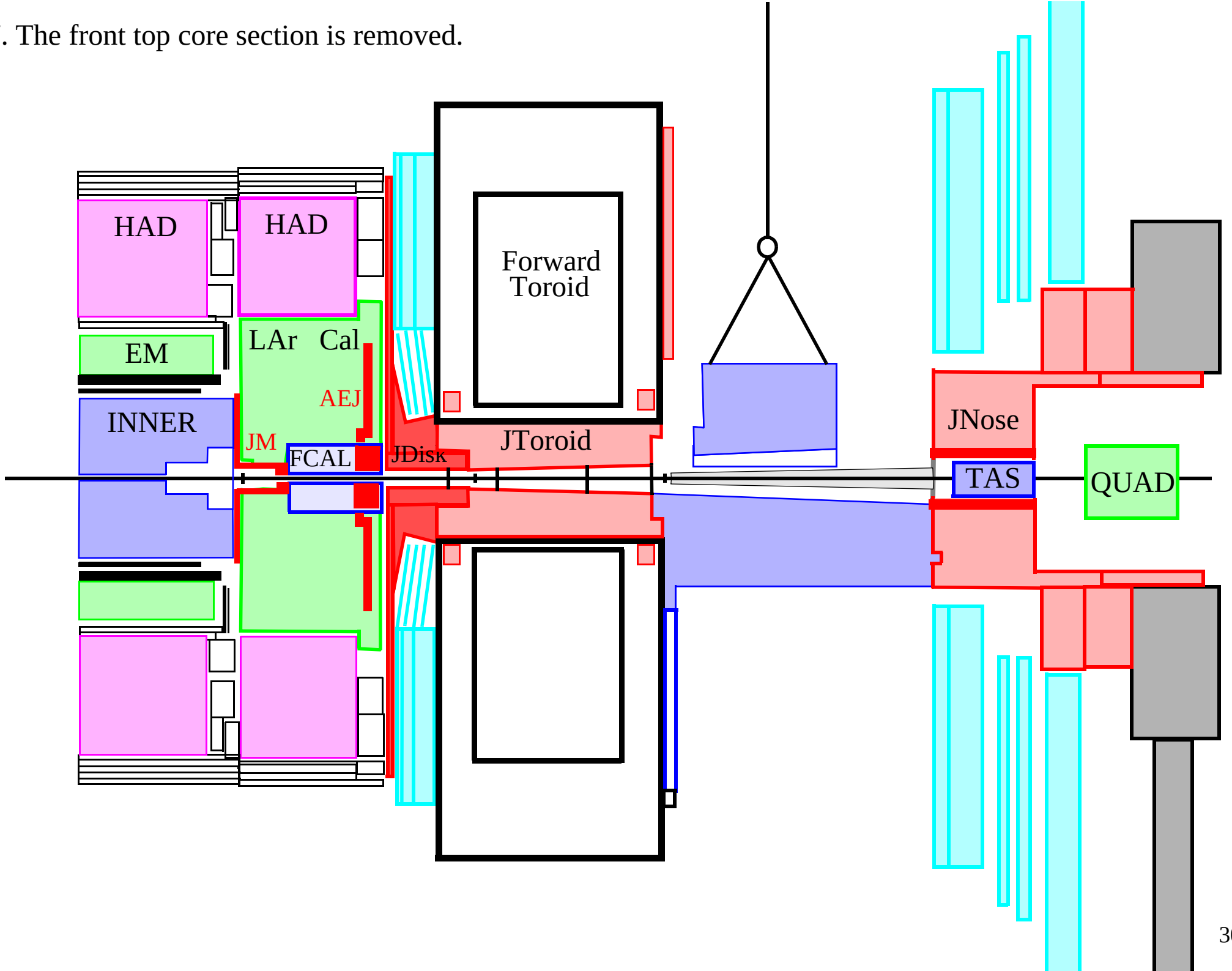
6. The large muon wheel is moved forward.



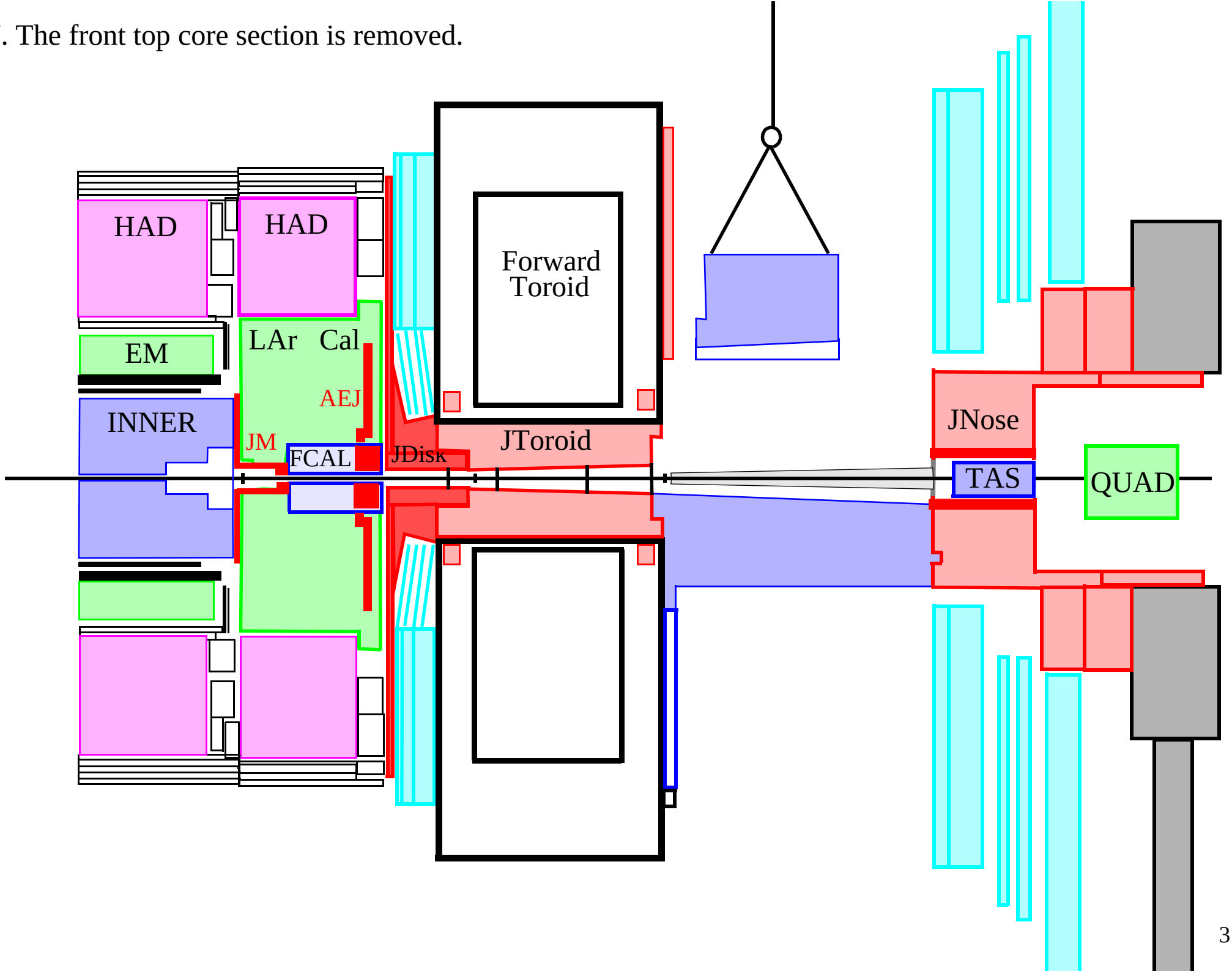
7. The front top core section is removed.



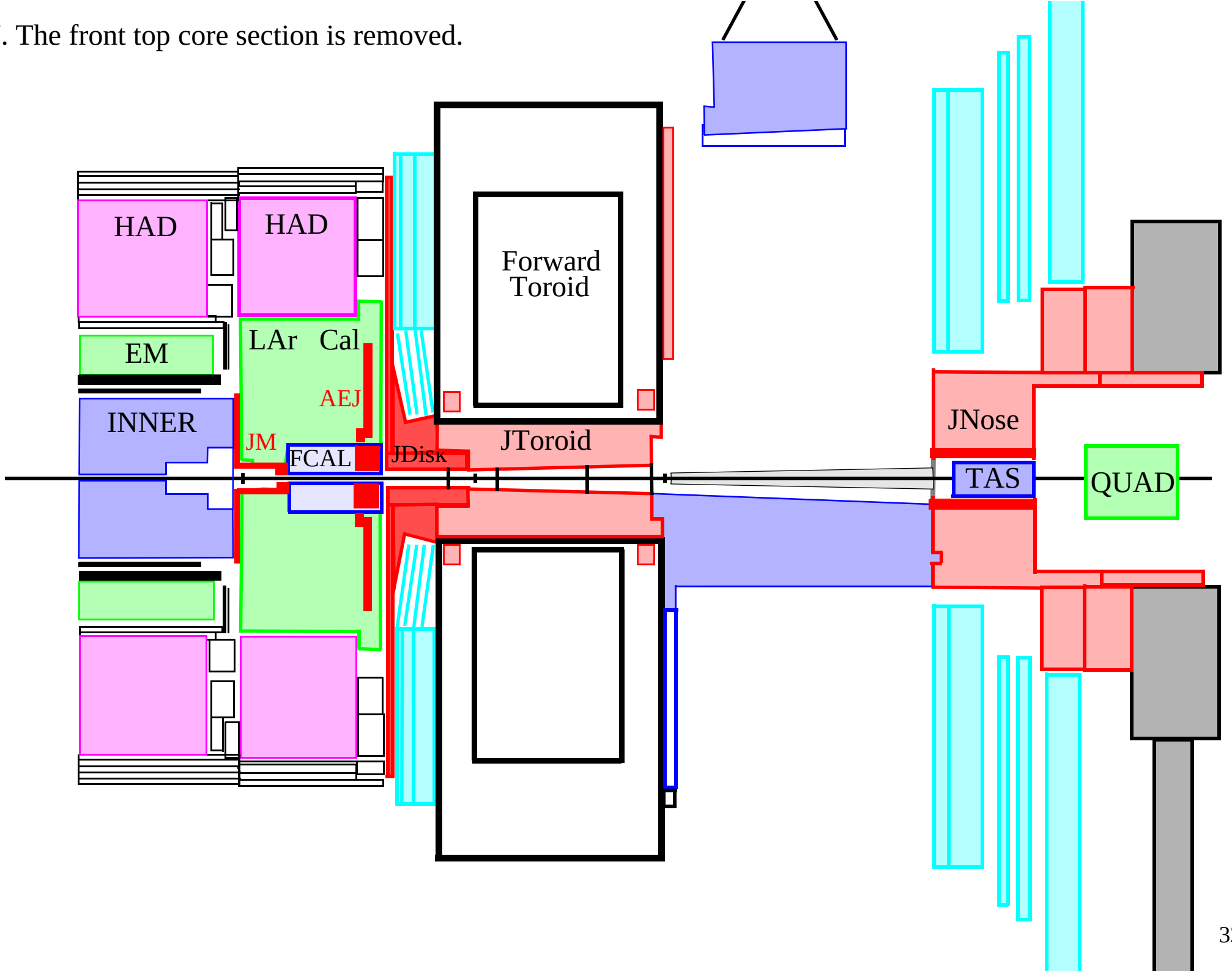
7. The front top core section is removed.



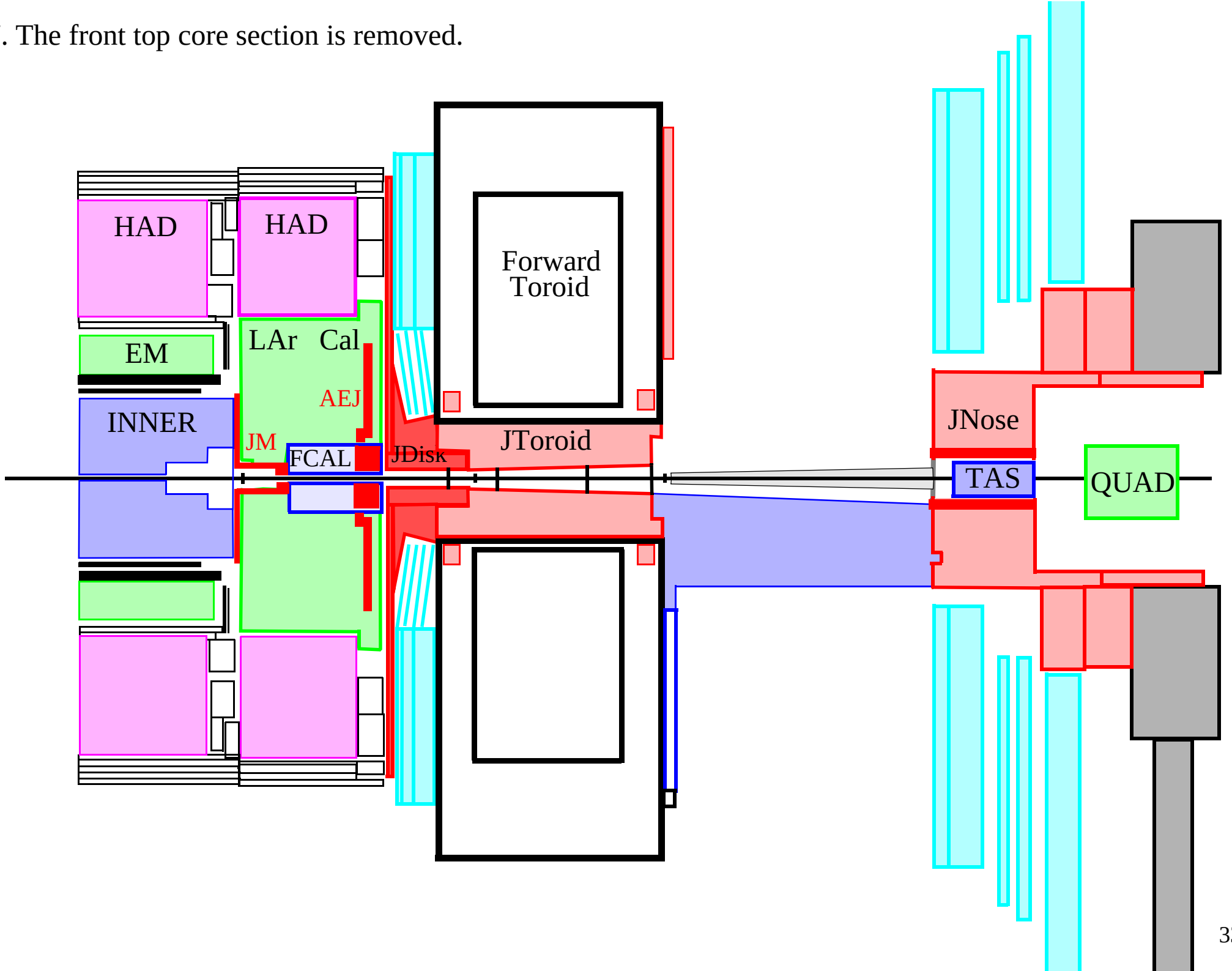
7. The front top core section is removed.



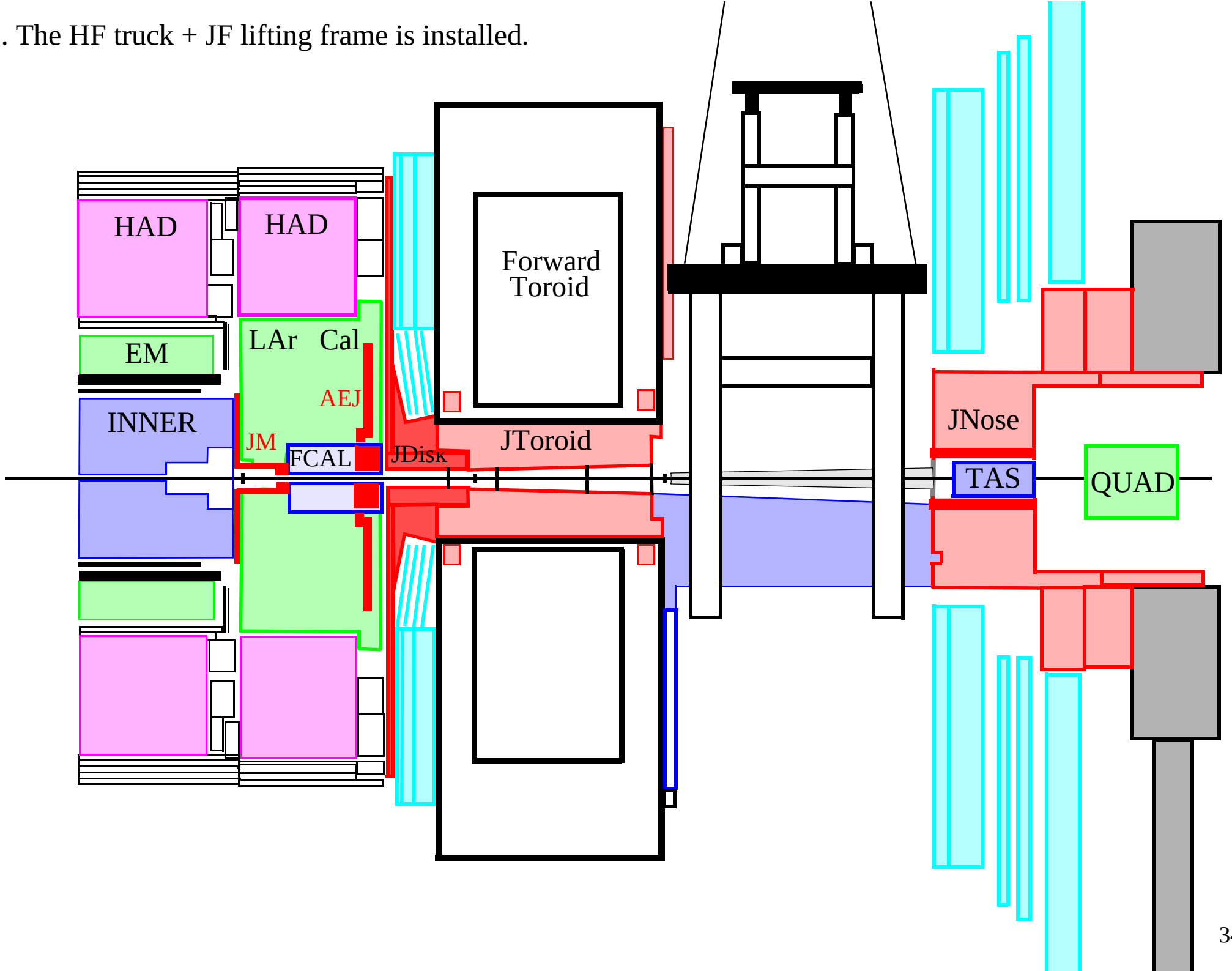
7. The front top core section is removed.



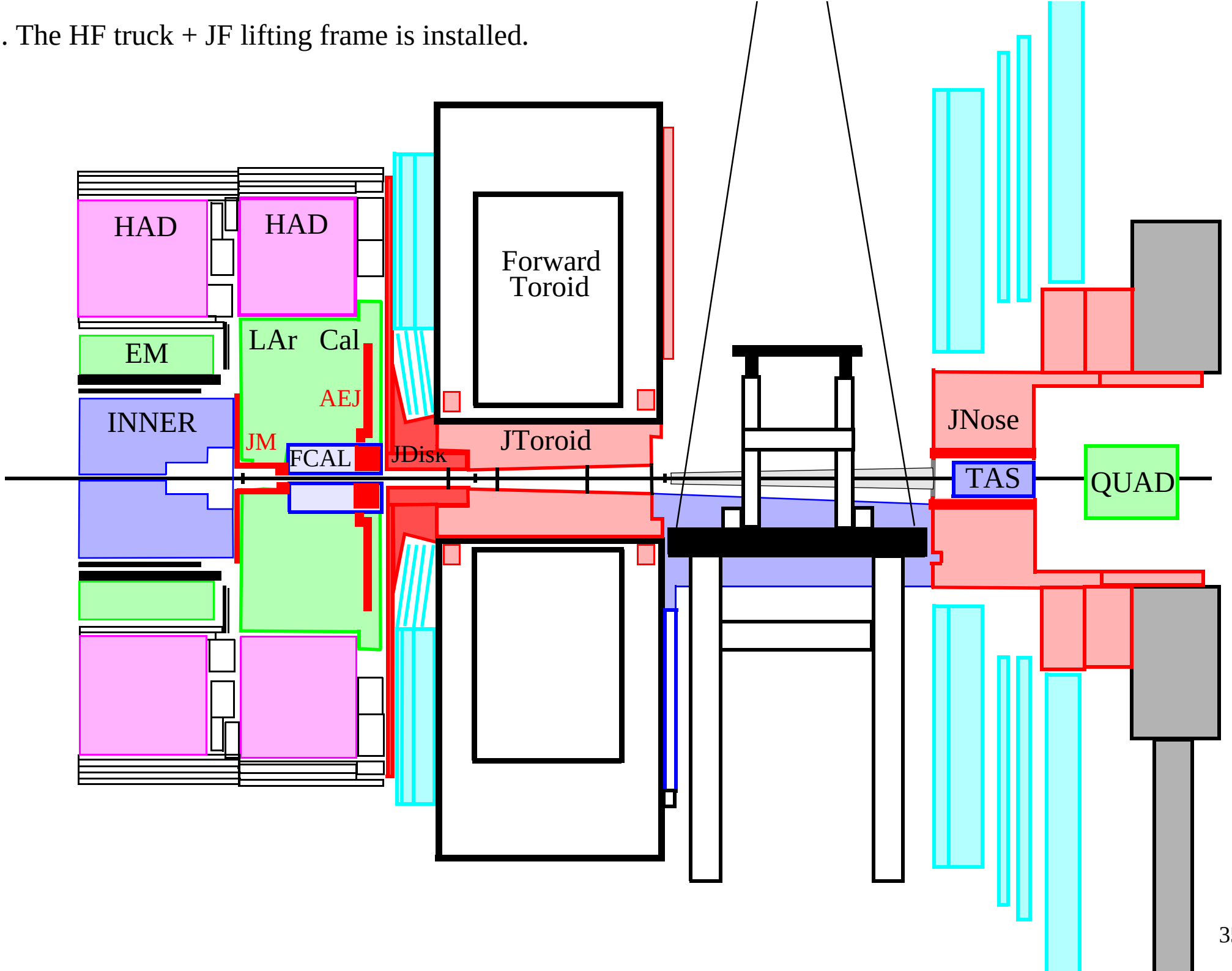
7. The front top core section is removed.



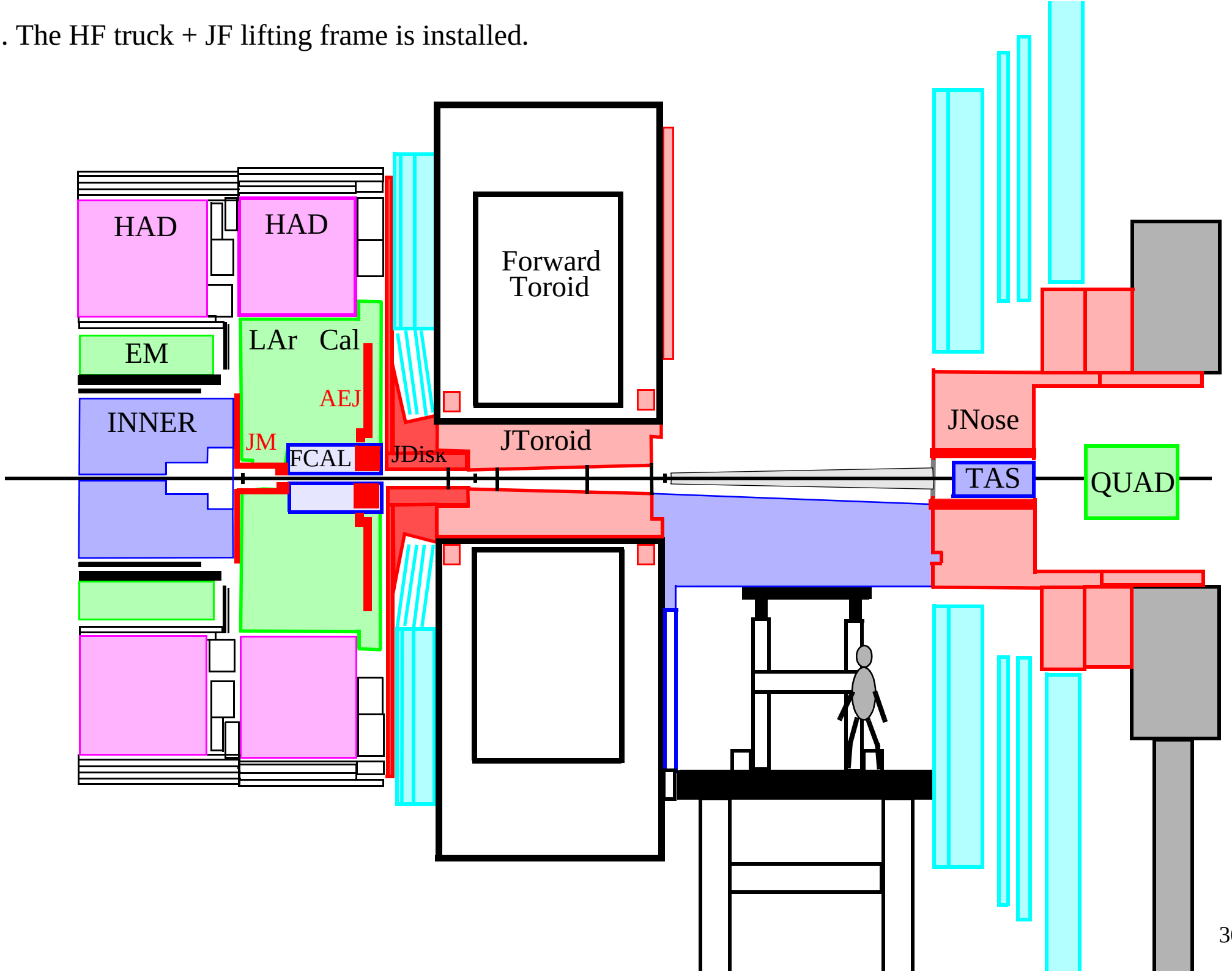
8. The HF truck + JF lifting frame is installed.



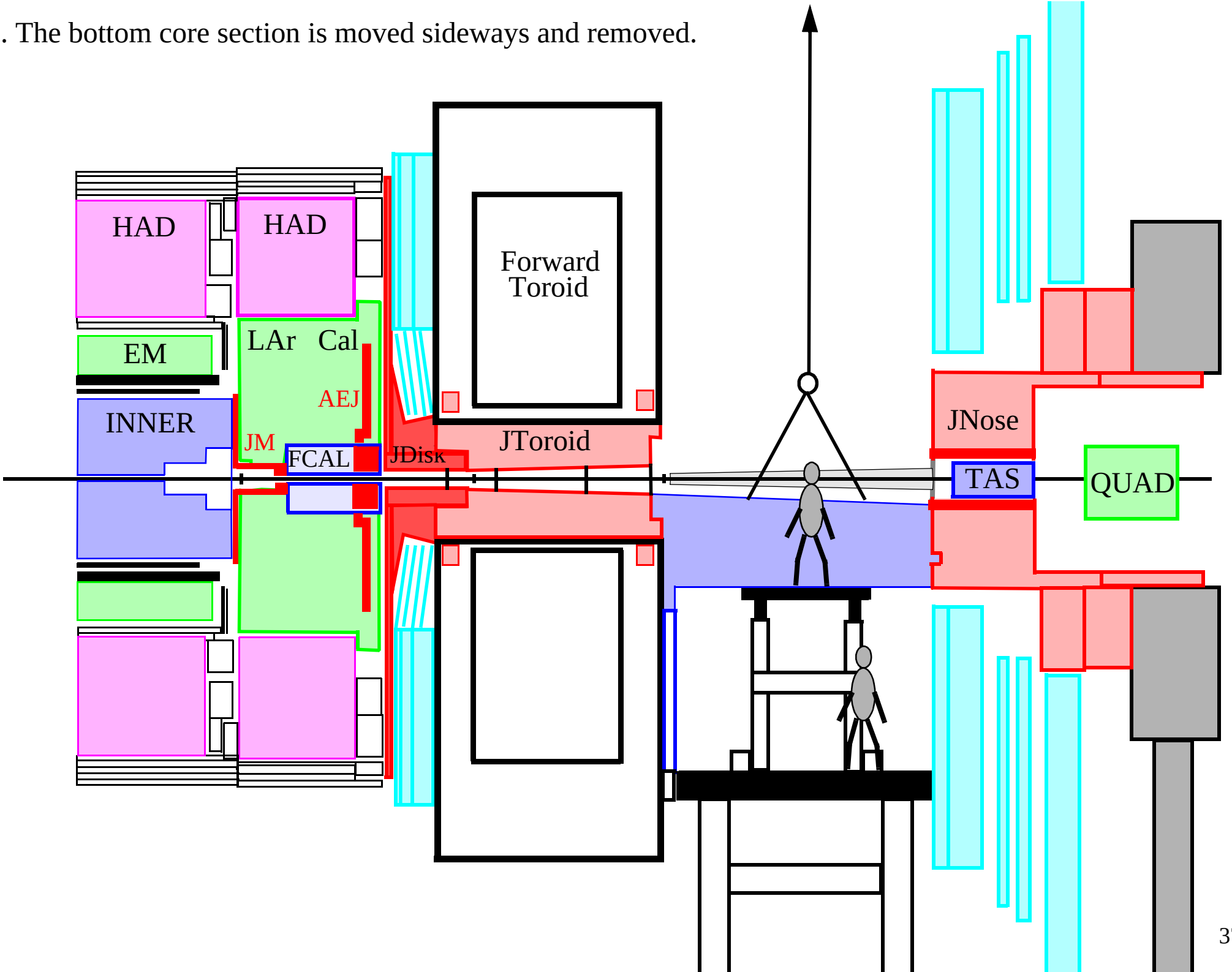
8. The HF truck + JF lifting frame is installed.



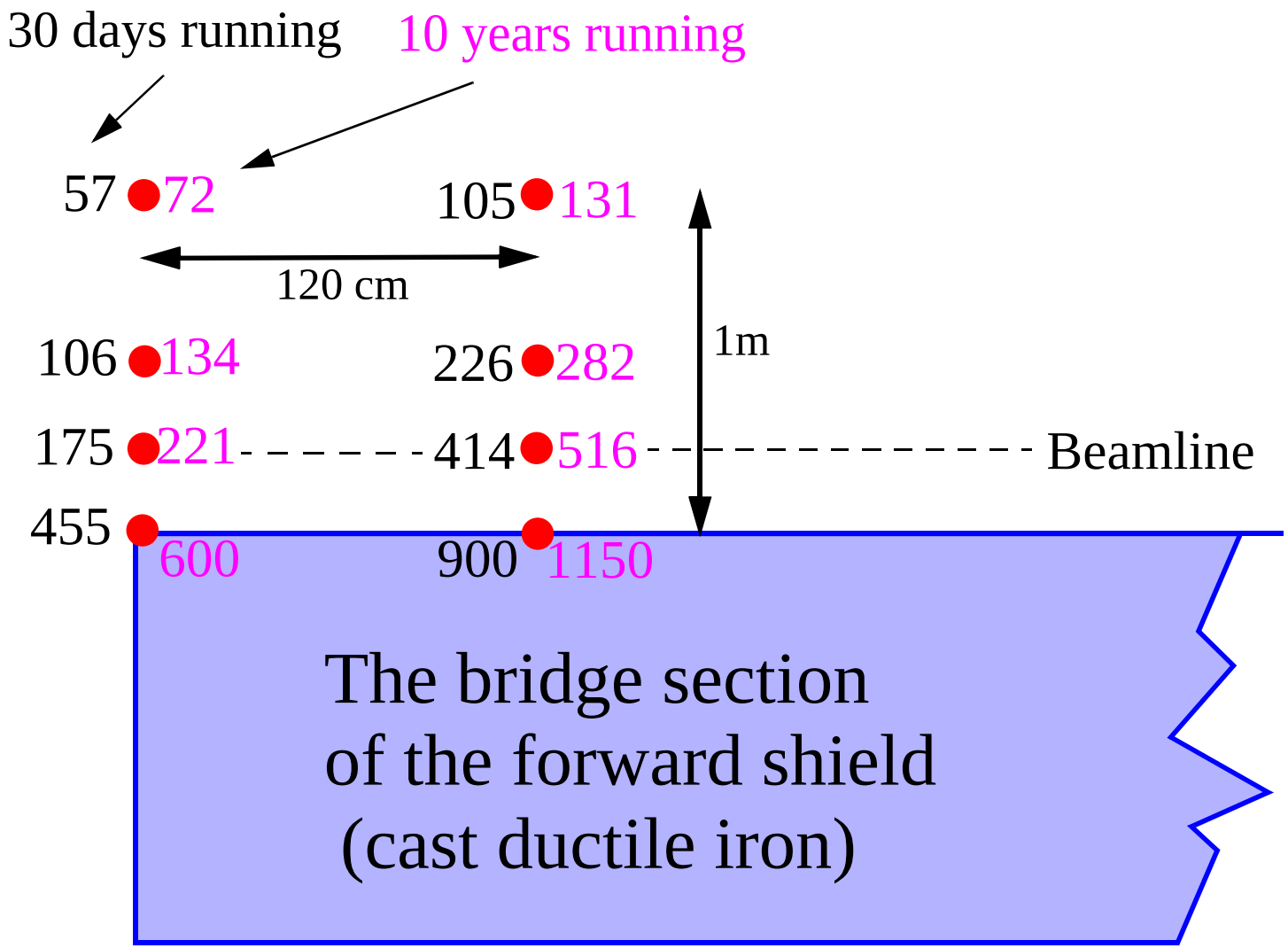
8. The HF truck + JF lifting frame is installed.



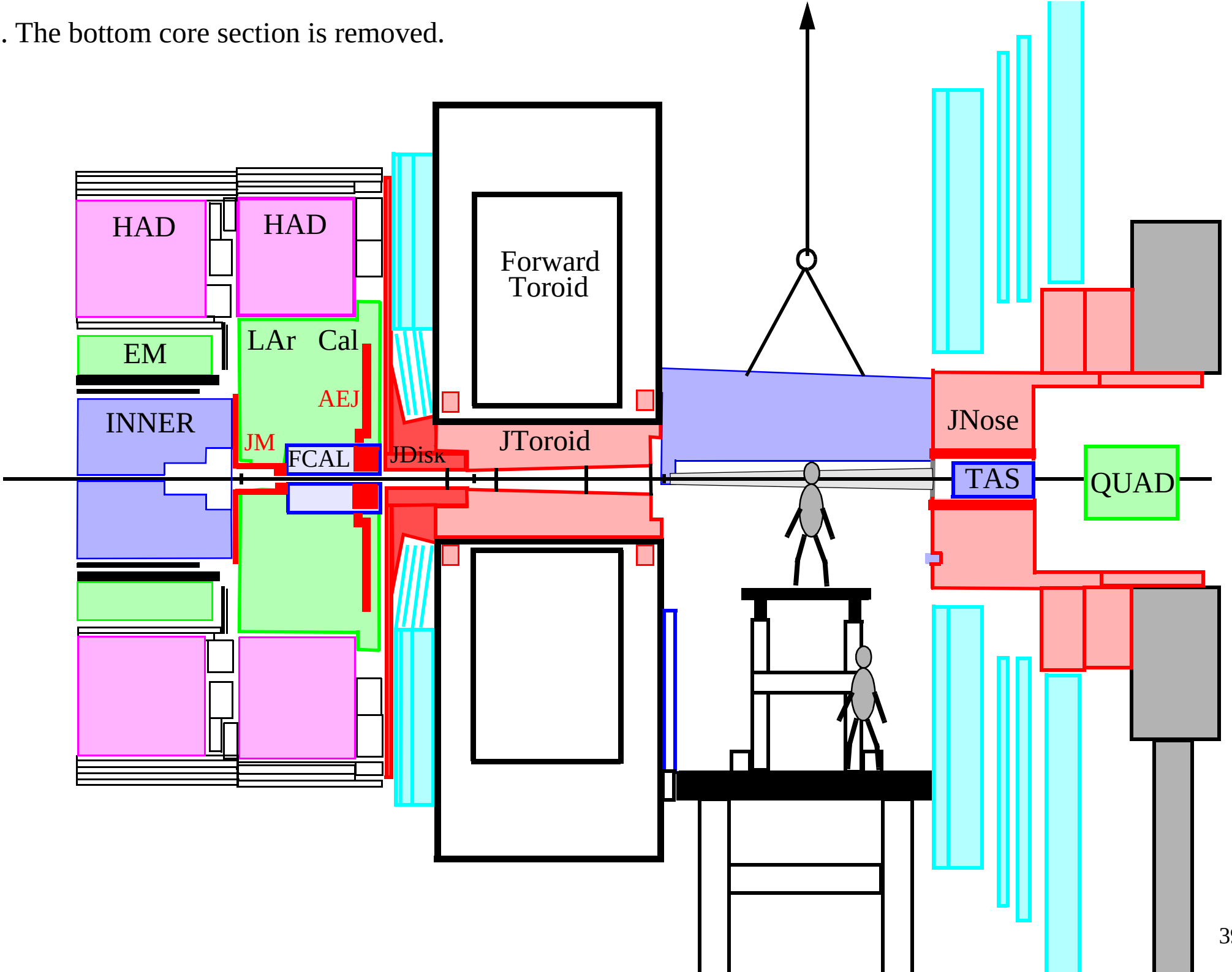
9. The bottom core section is moved sideways and removed.



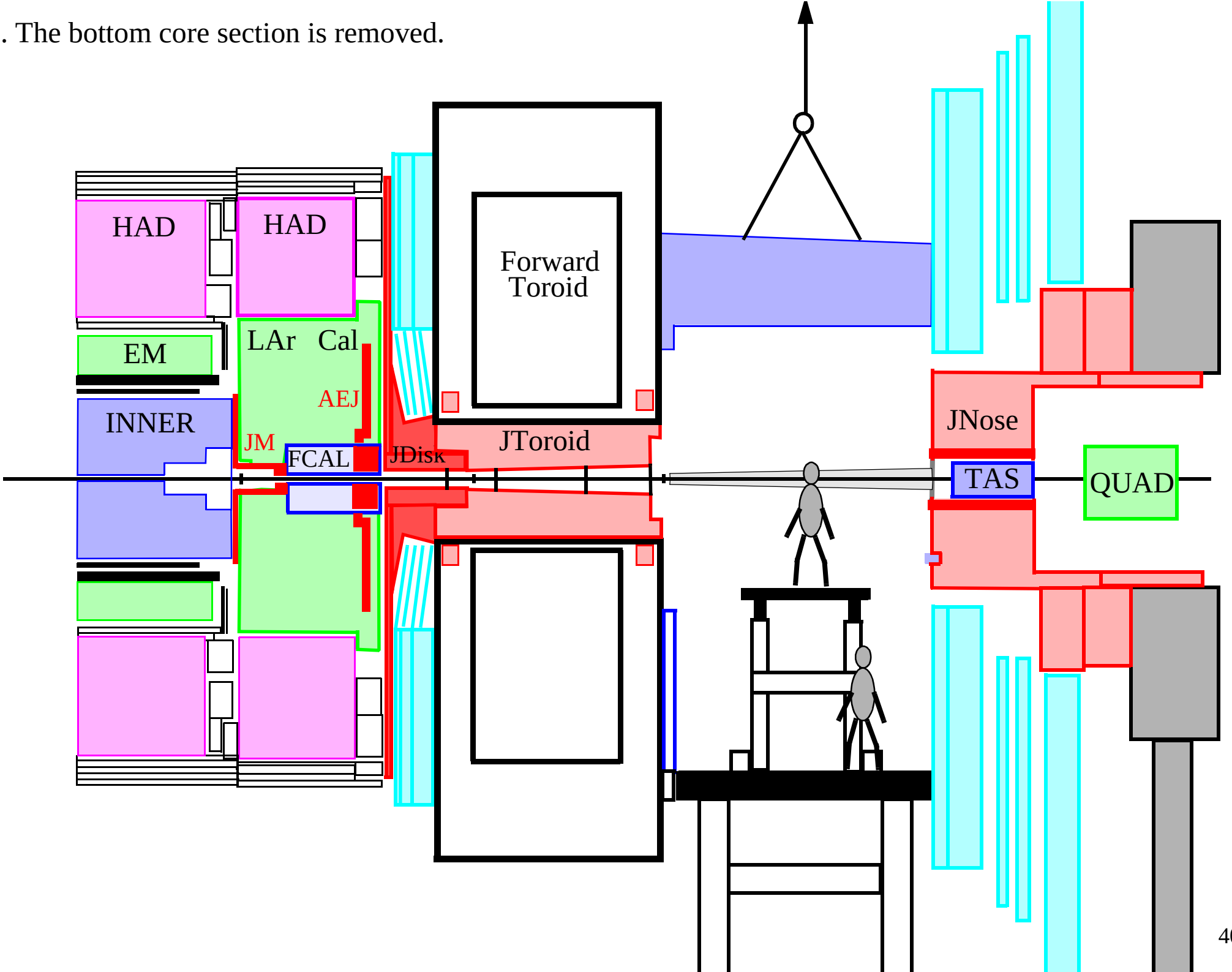
Dose rates in μSv/h after 1 day of cooling



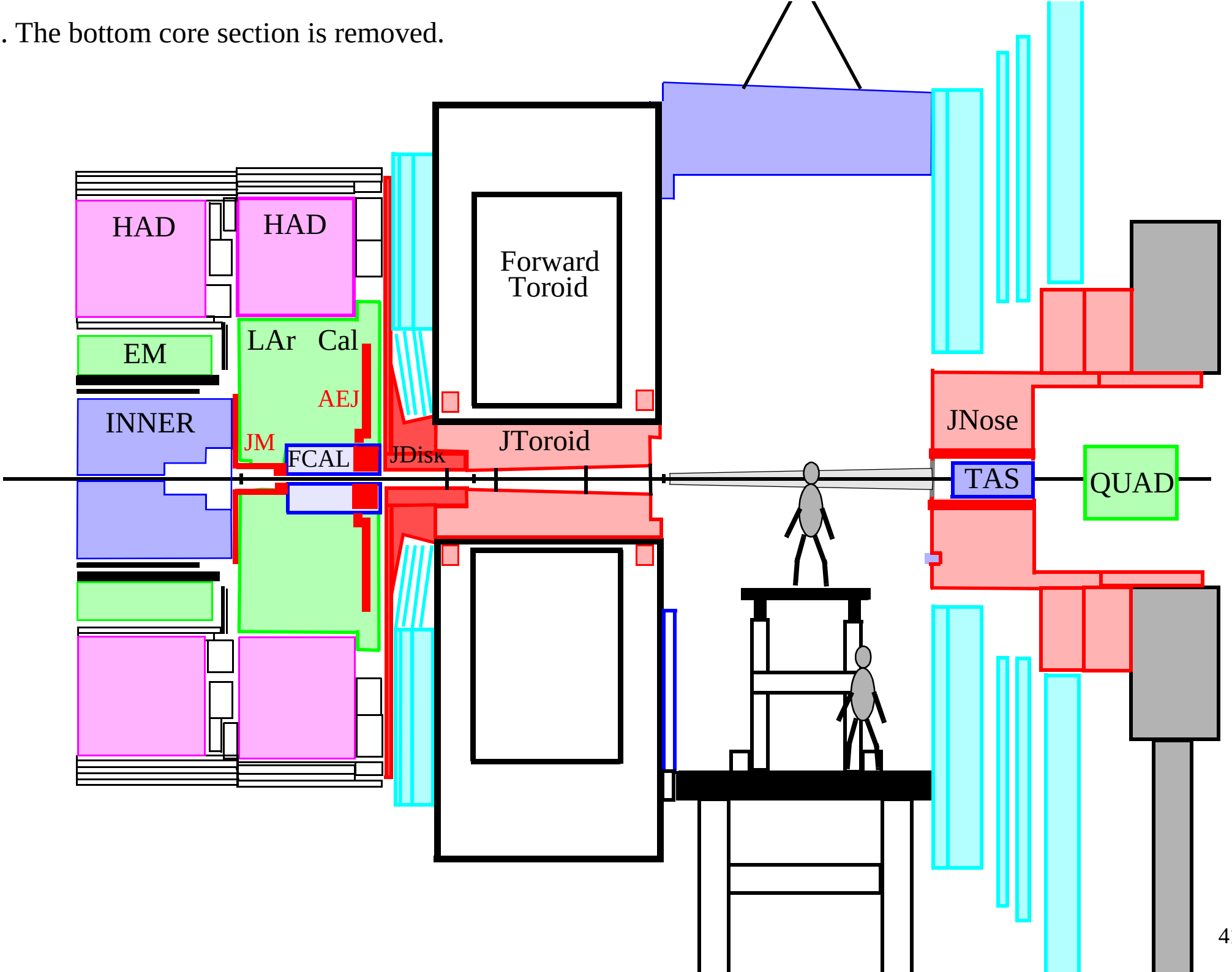
9. The bottom core section is removed.



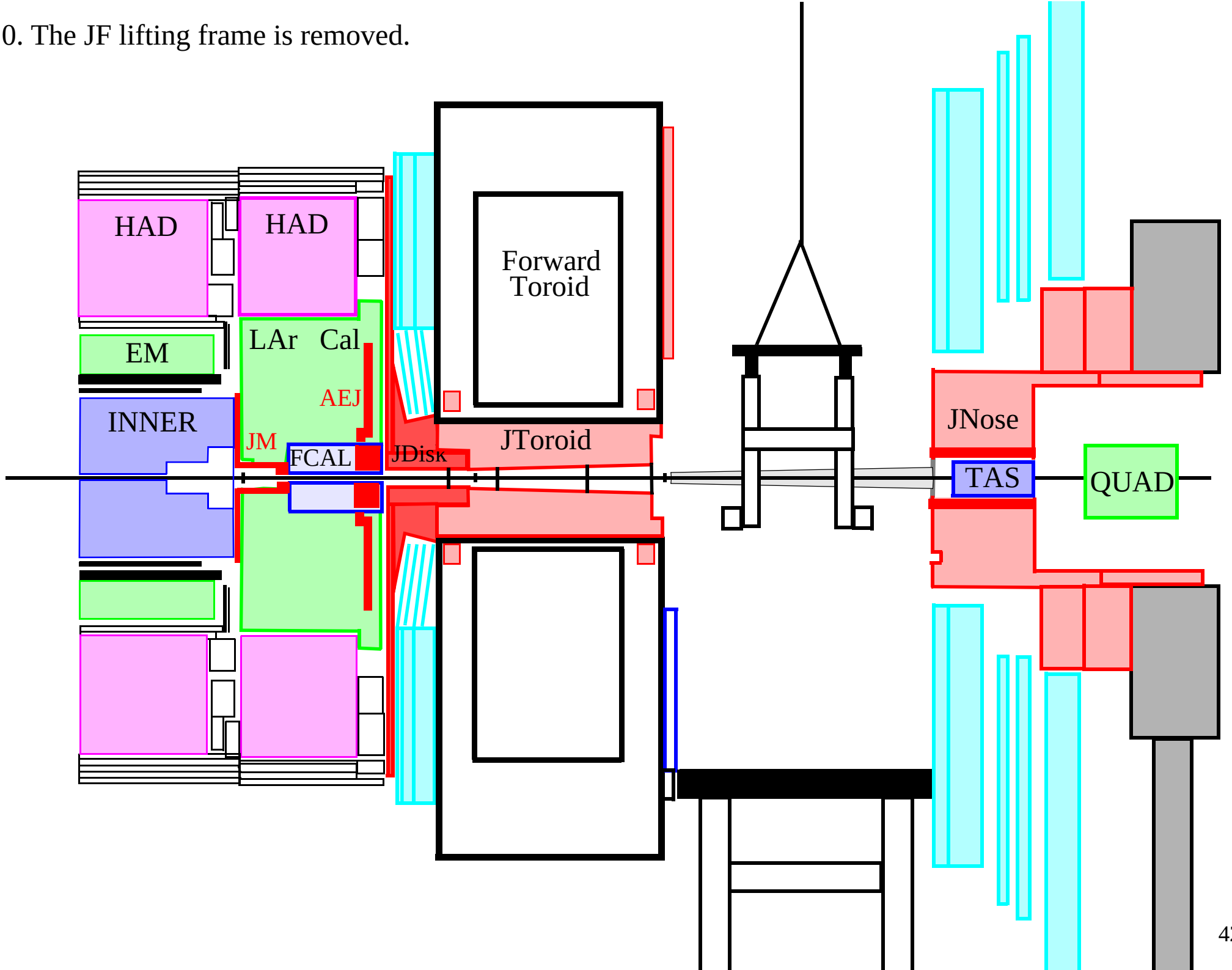
9. The bottom core section is removed.



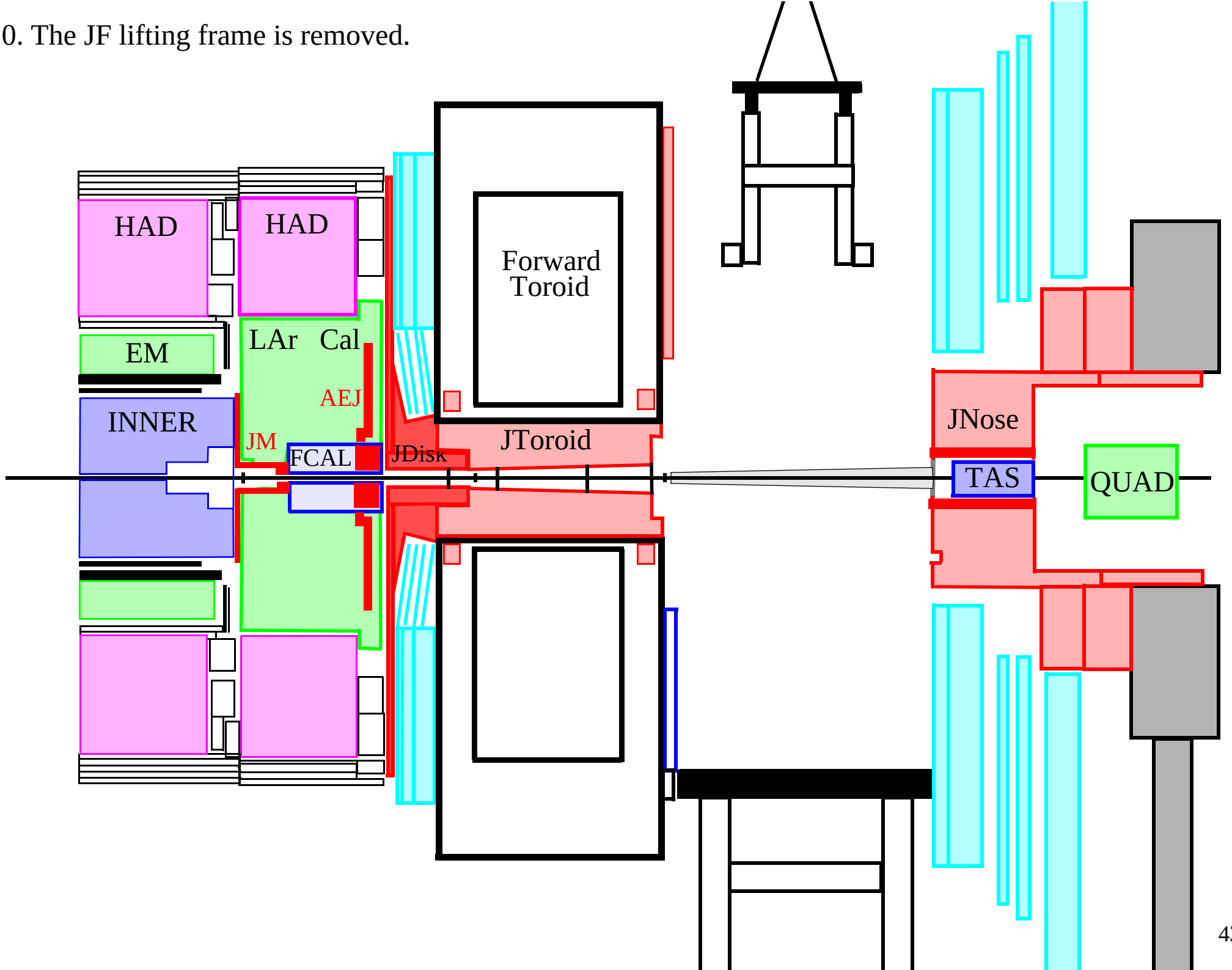
9. The bottom core section is removed.

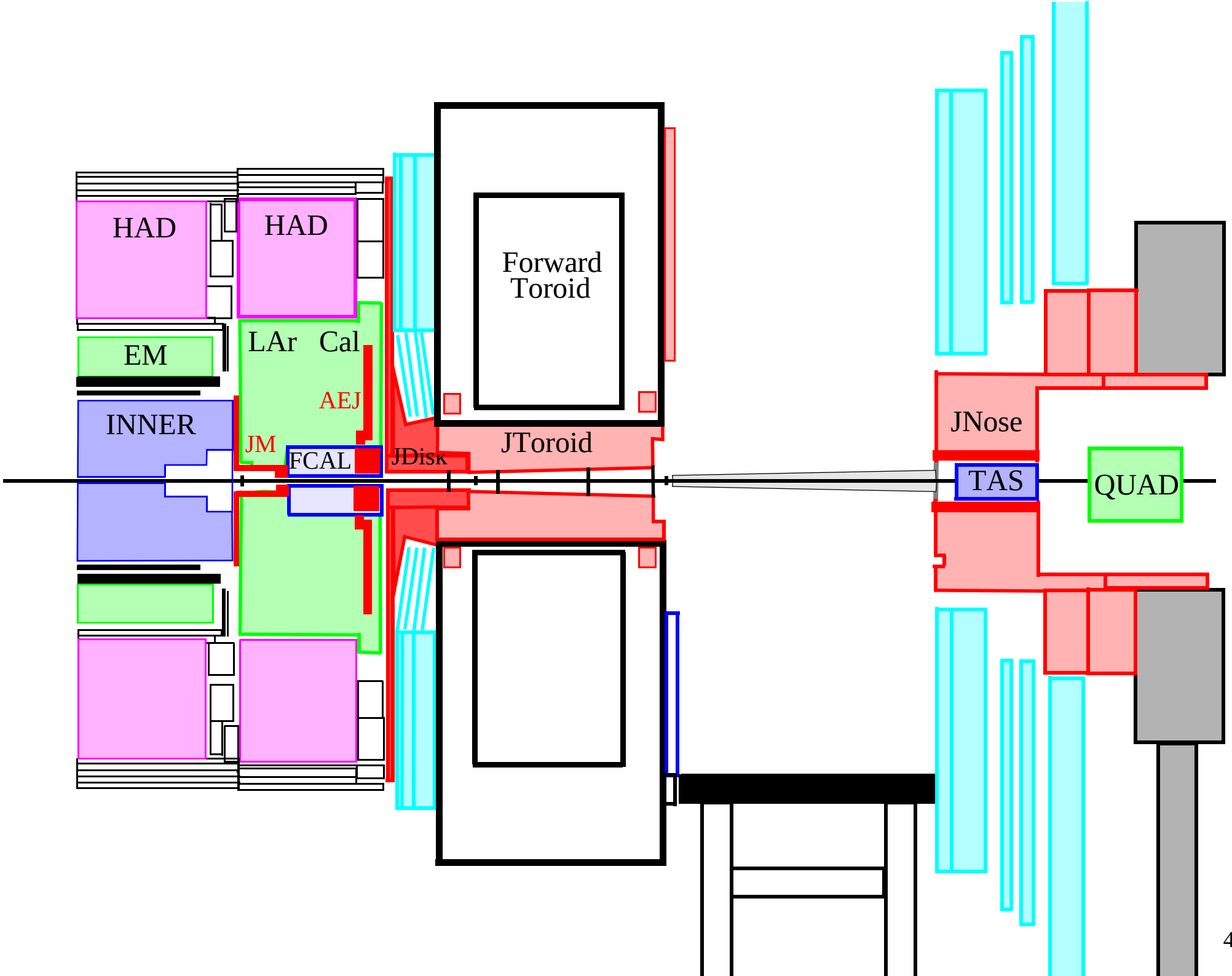


10. The JF lifting frame is removed.



10. The JF lifting frame is removed.

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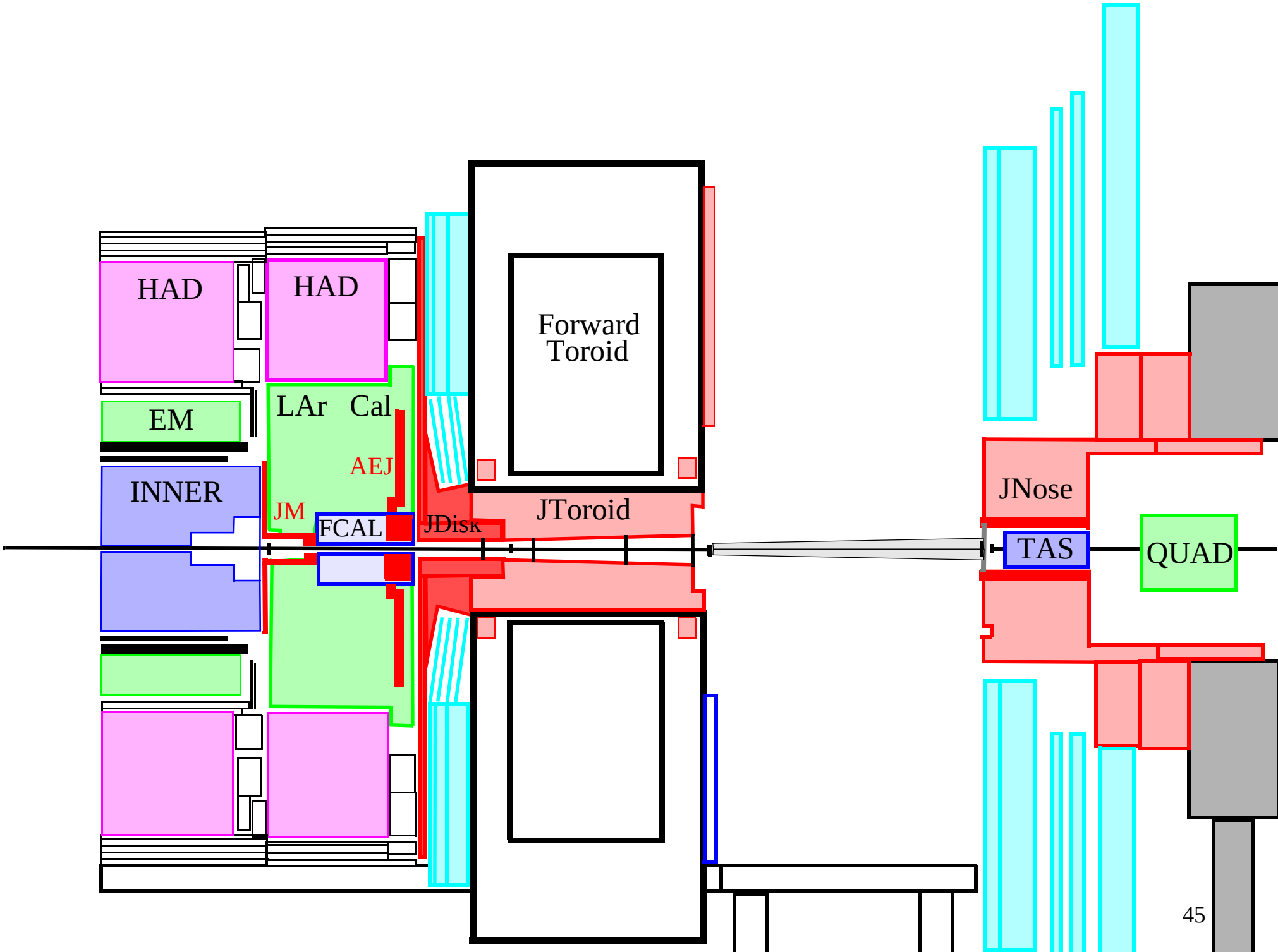
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Toroid
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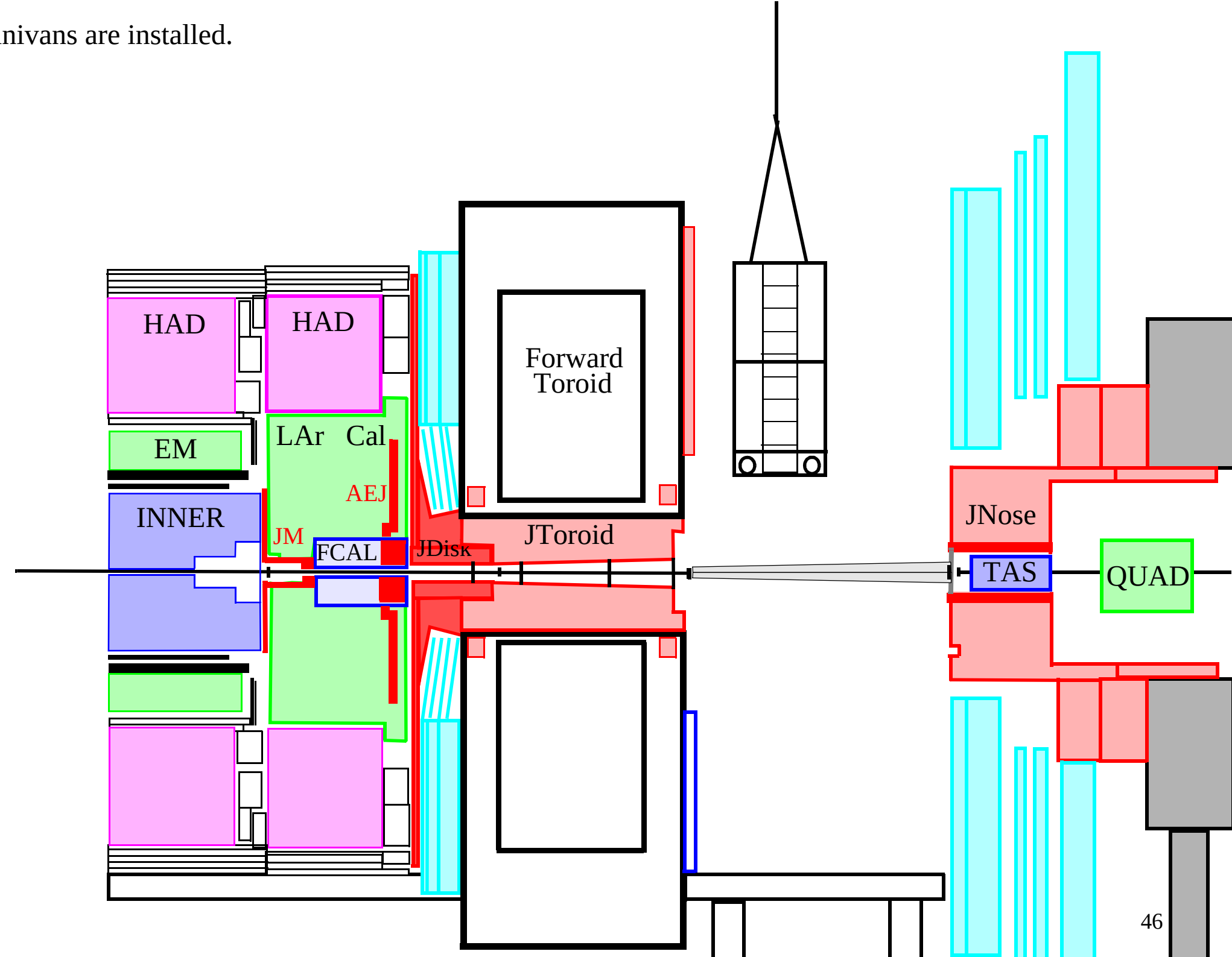
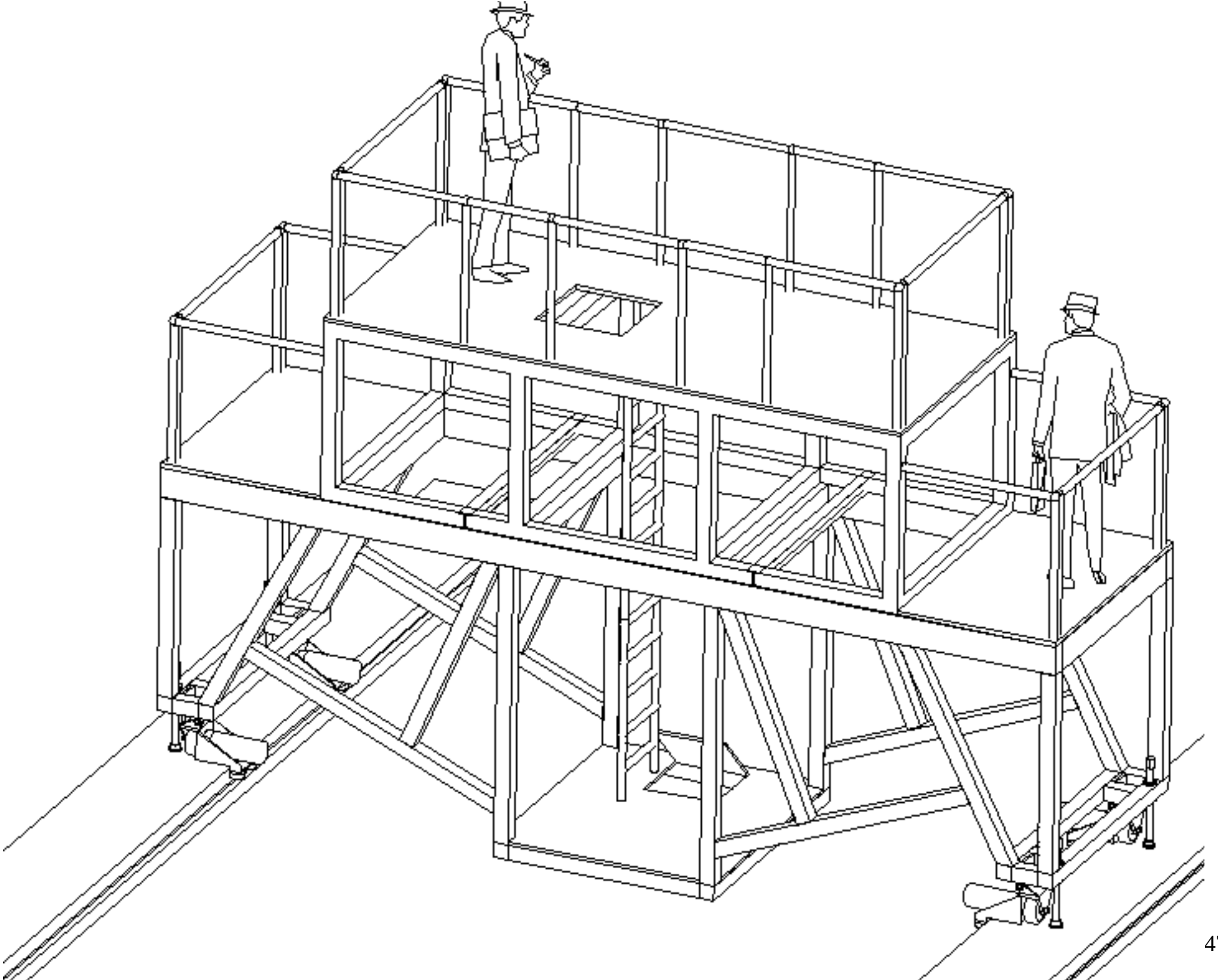
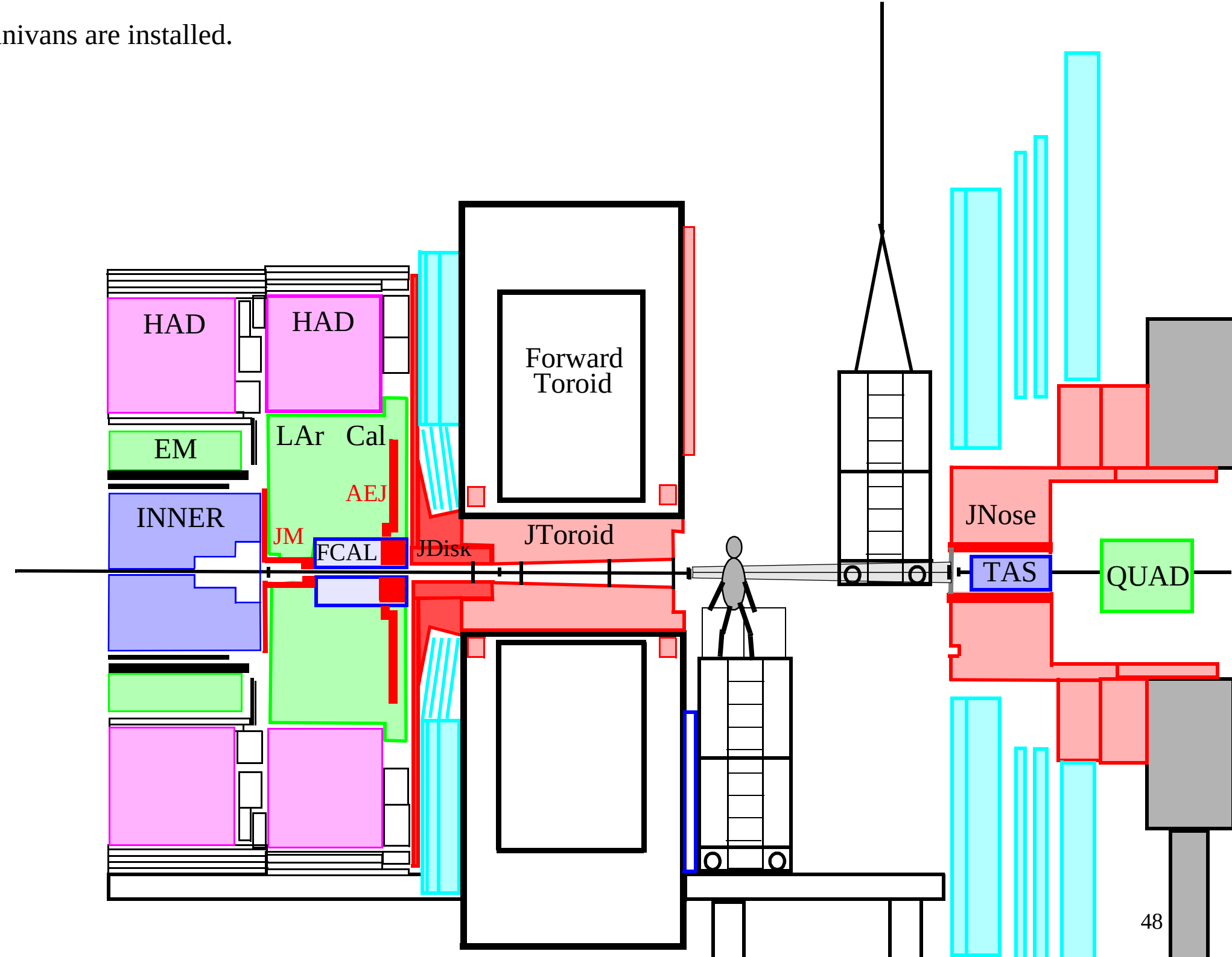
11. Minivans are installed.

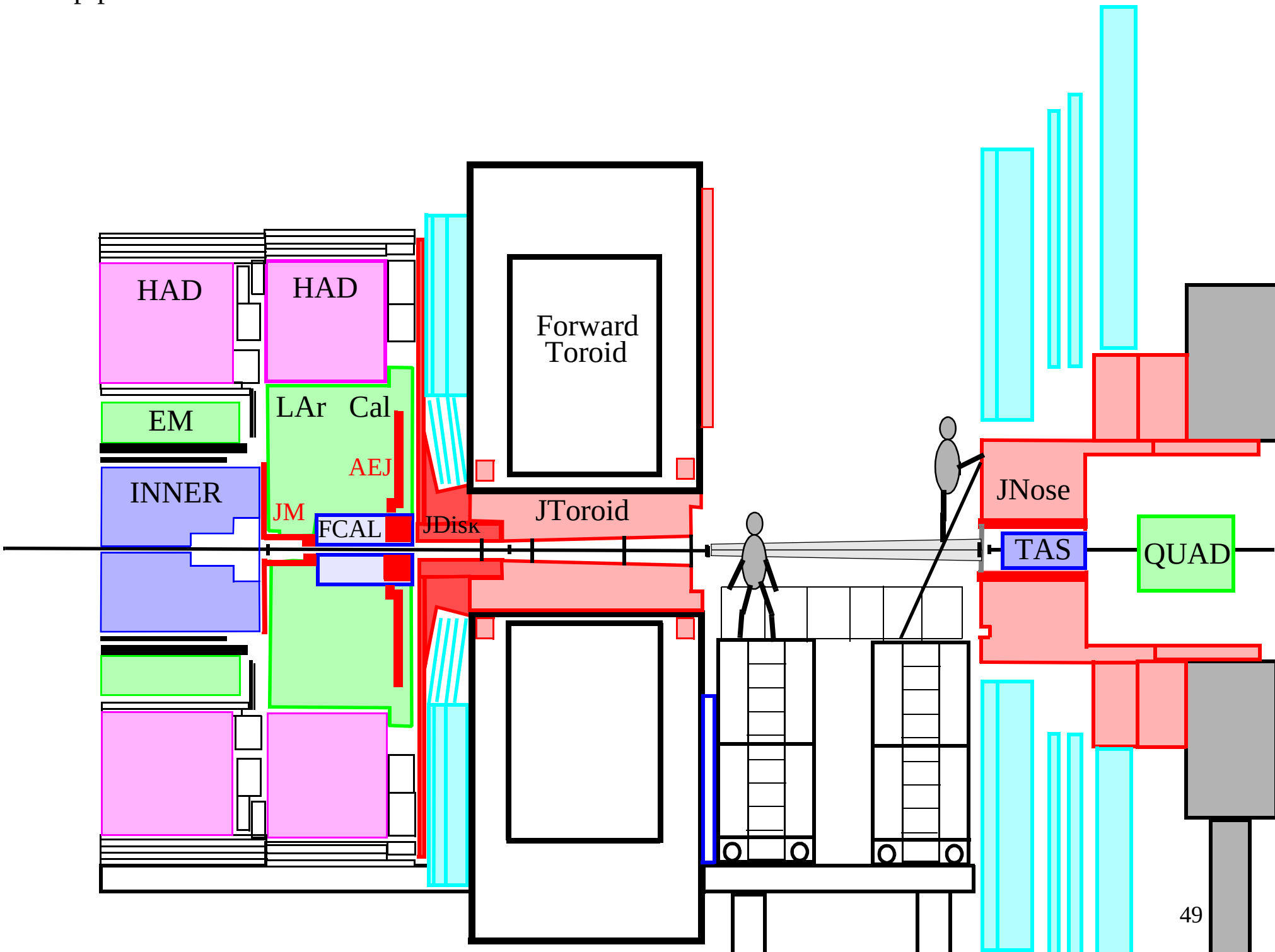




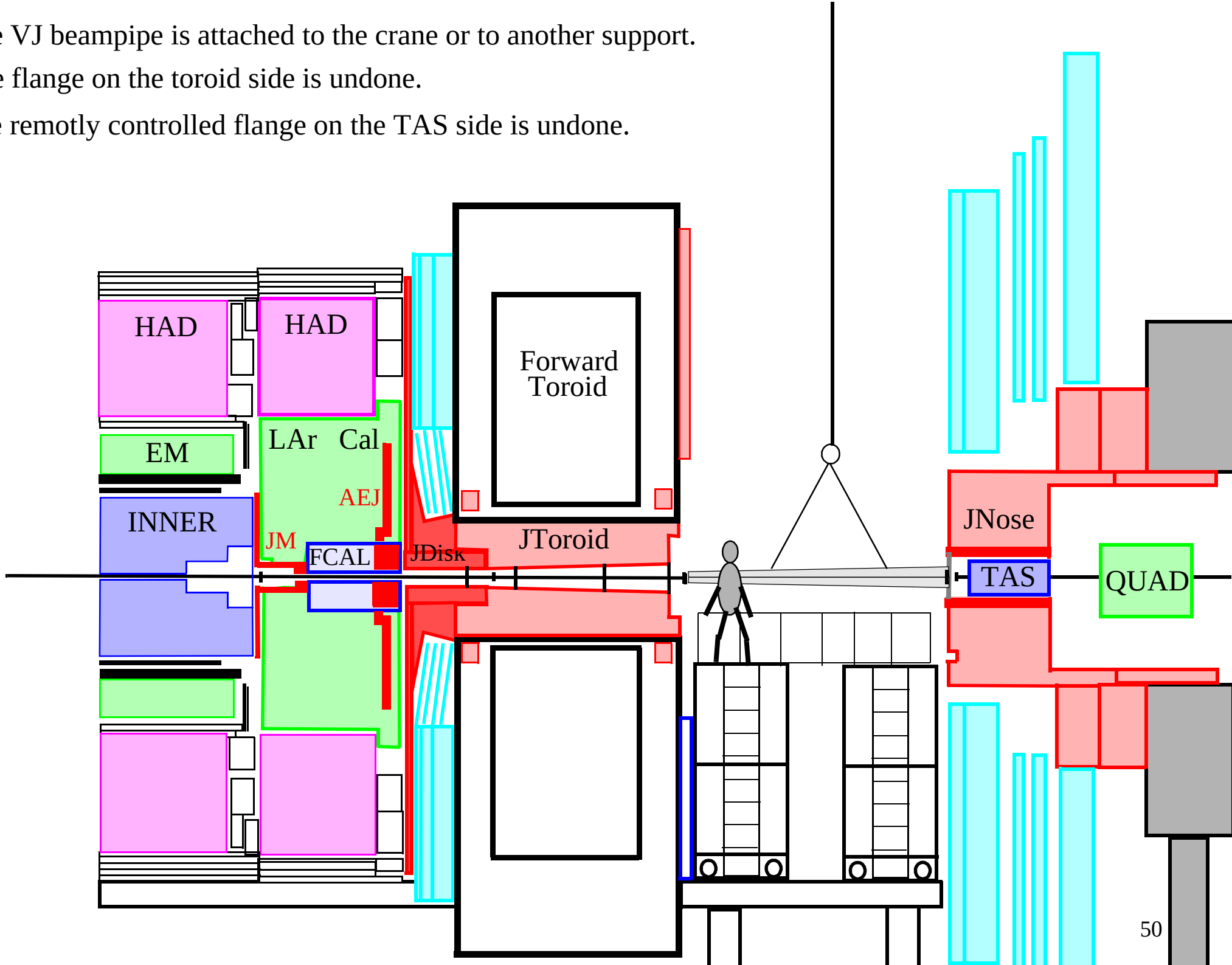
11. Minivans are installed.

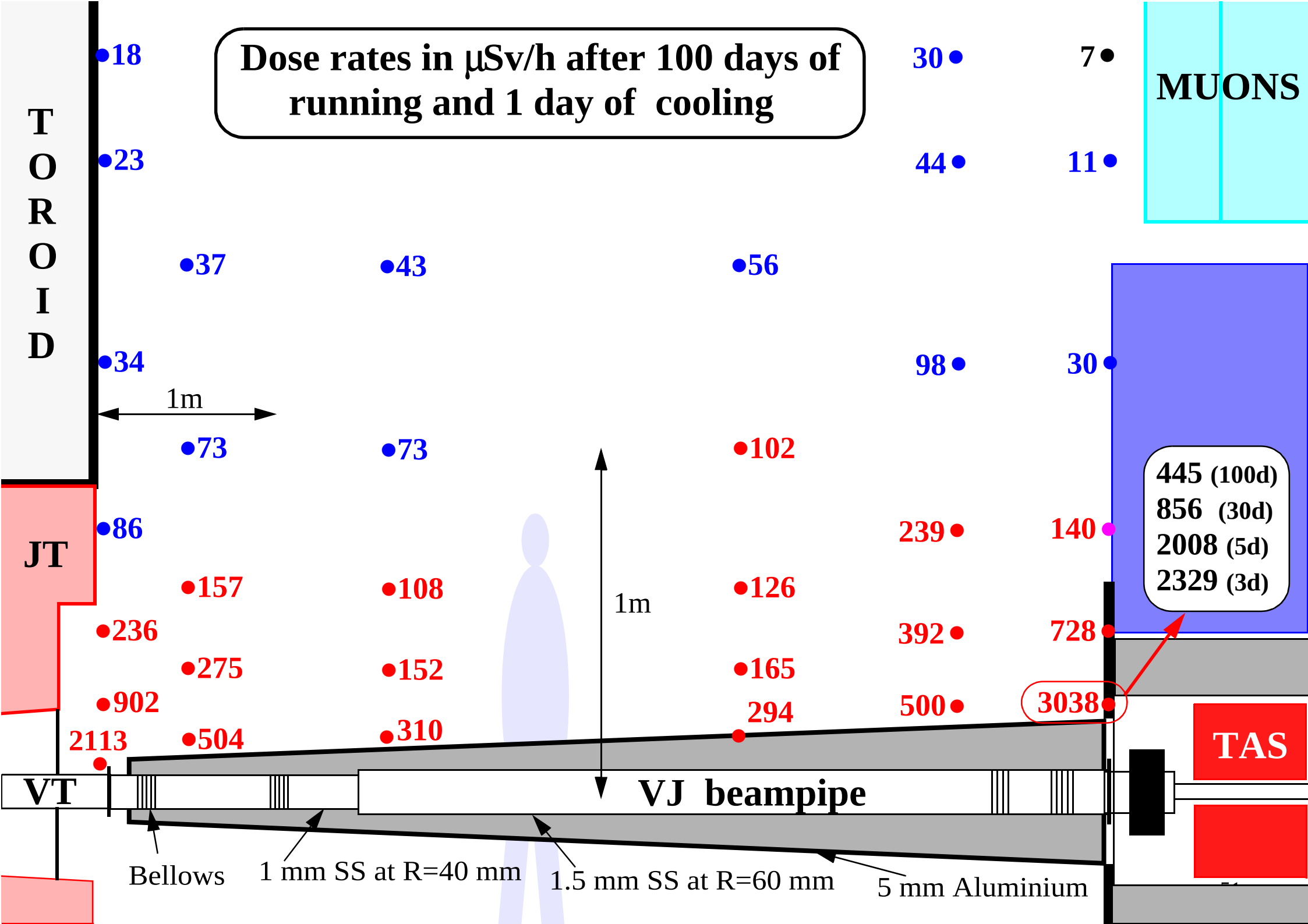


12. The beampipe services are disconnected.



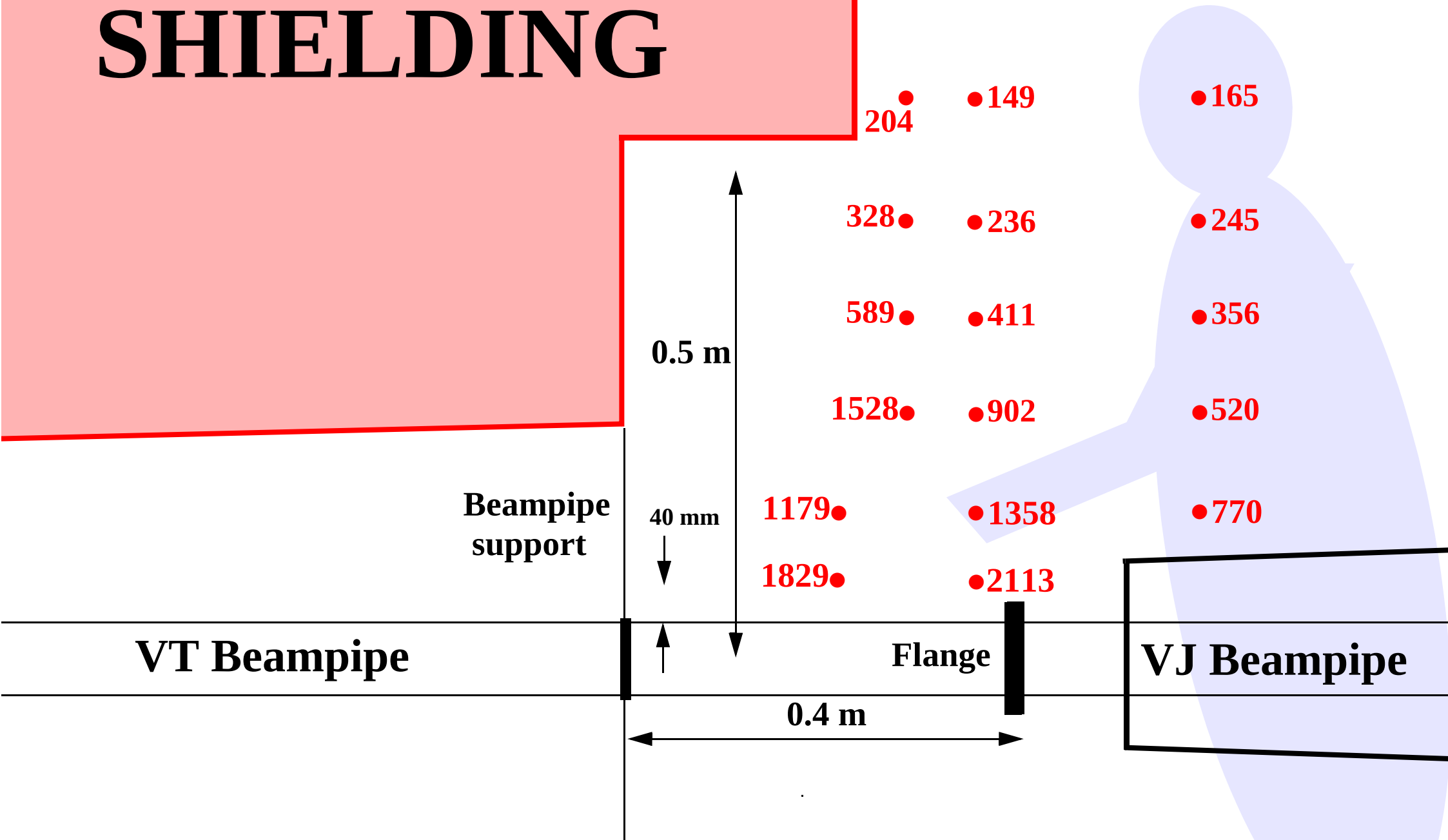
13. The VJ beampipe is attached to the crane or to another support.
14. The flange on the toroid side is undone.
15. The remotly controlled flange on the TAS side is undone.



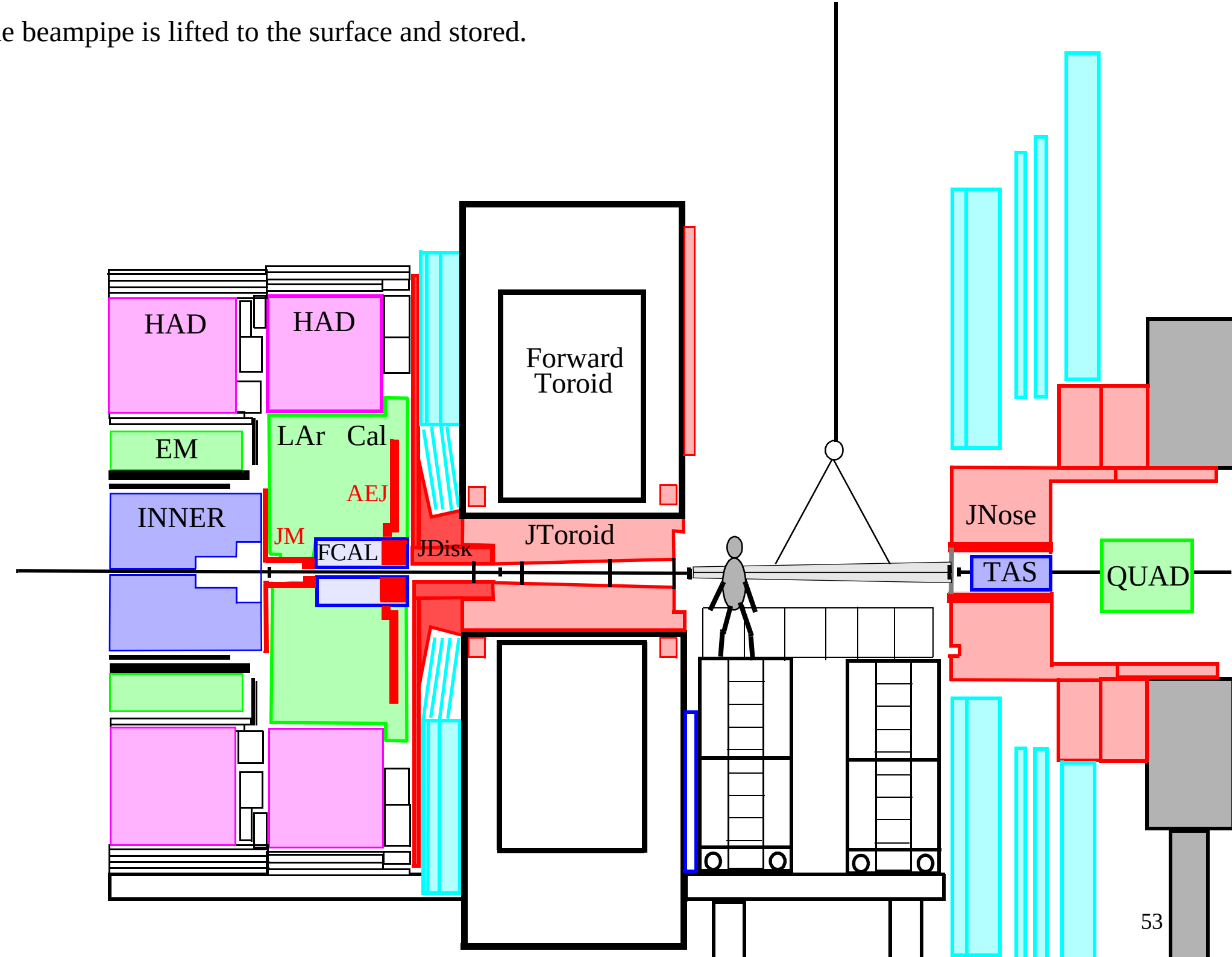

Dose rates in μSv/h after 100 days of running and 1 day of cooling
TOROID
MUONS
JT
VT
VJ beampipe
TAS
18
23
37
43
56
30
7
44
11
34
98
30
1m
73
73
102
86
239
140
157
108
126
1m
236
392
728
275
152
165
902
294
500
3038
2113
504
310
445 (100d)
856 (30d)
2008 (5d)
2329 (3d)
Bellows
1 mm SS at R=40 mm
1.5 mm SS at R=60 mm
5 mm Aluminium

TOROID SHIELDING

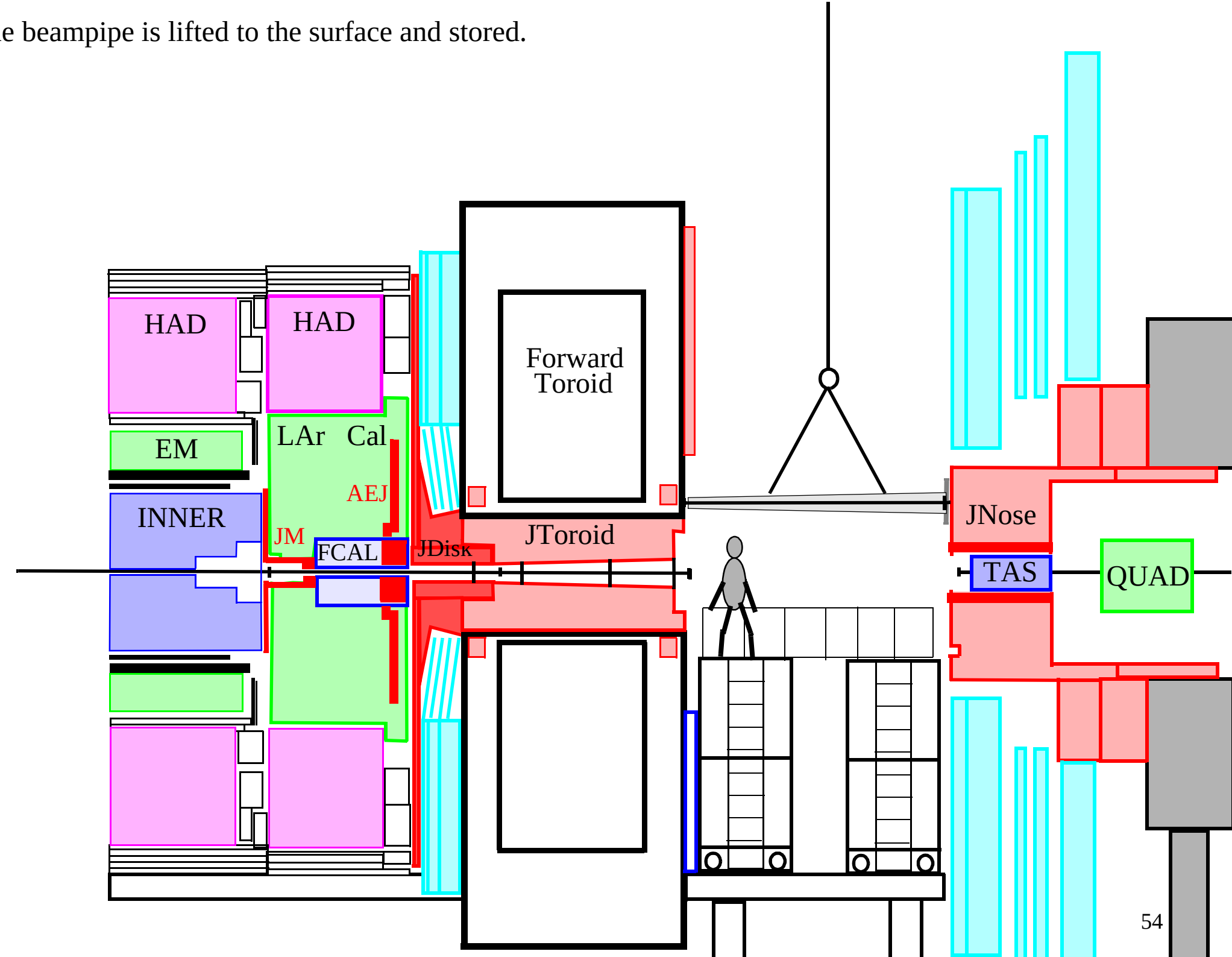
Dose rate in μSv/h for 100 days of running and 1 day of cooling.

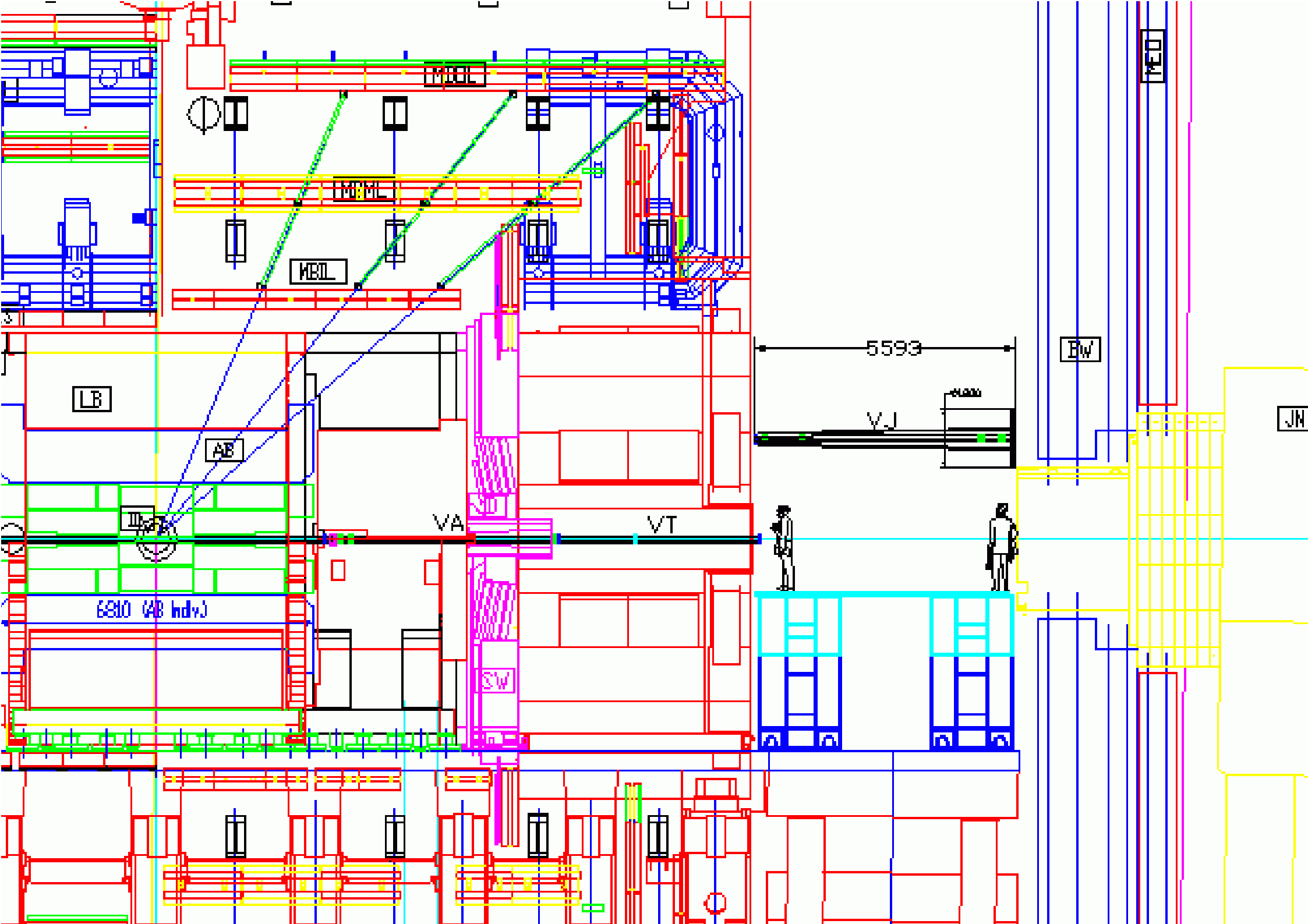


16. The beampipe is lifted to the surface and stored.

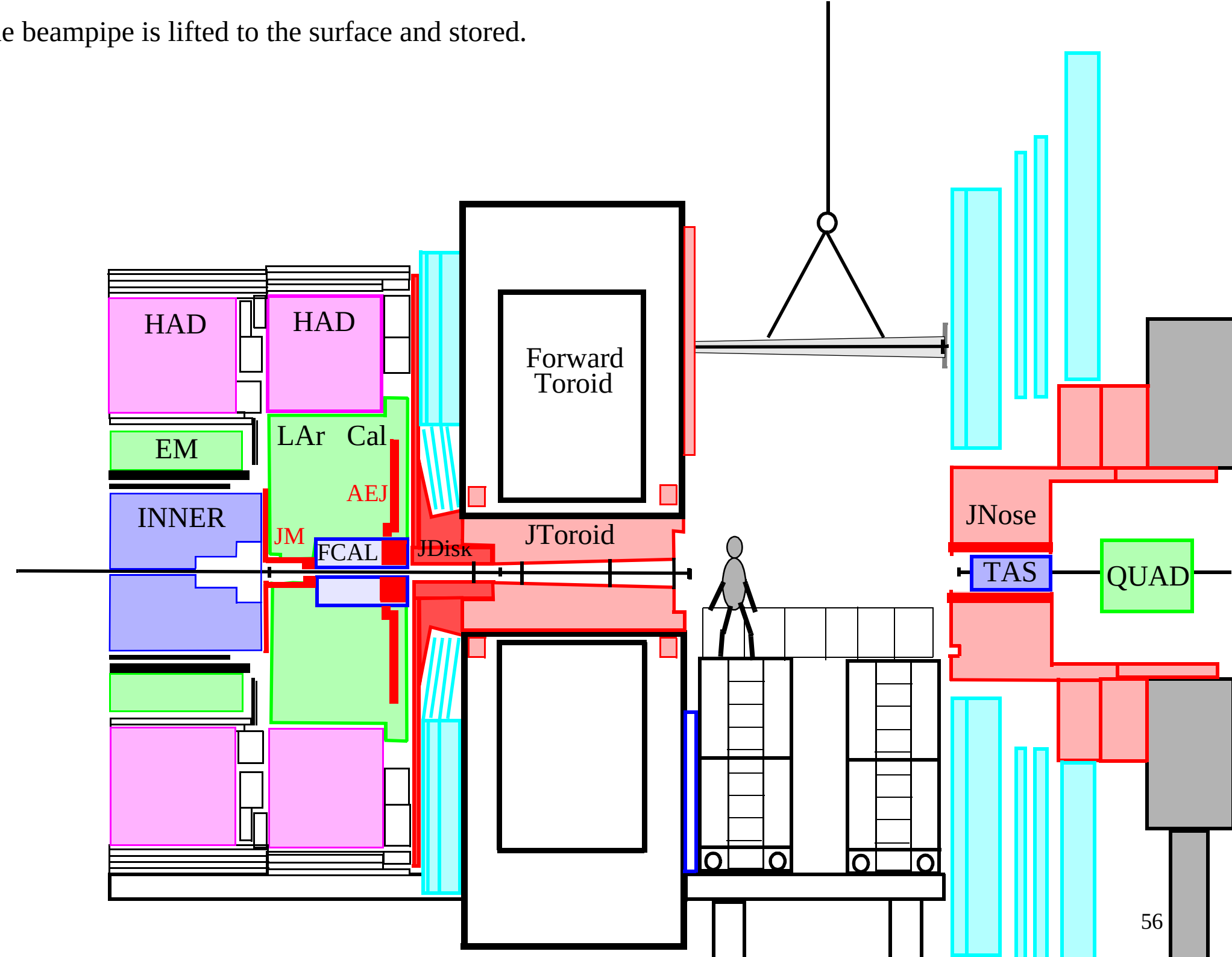


16. The beampipe is lifted to the surface and stored.

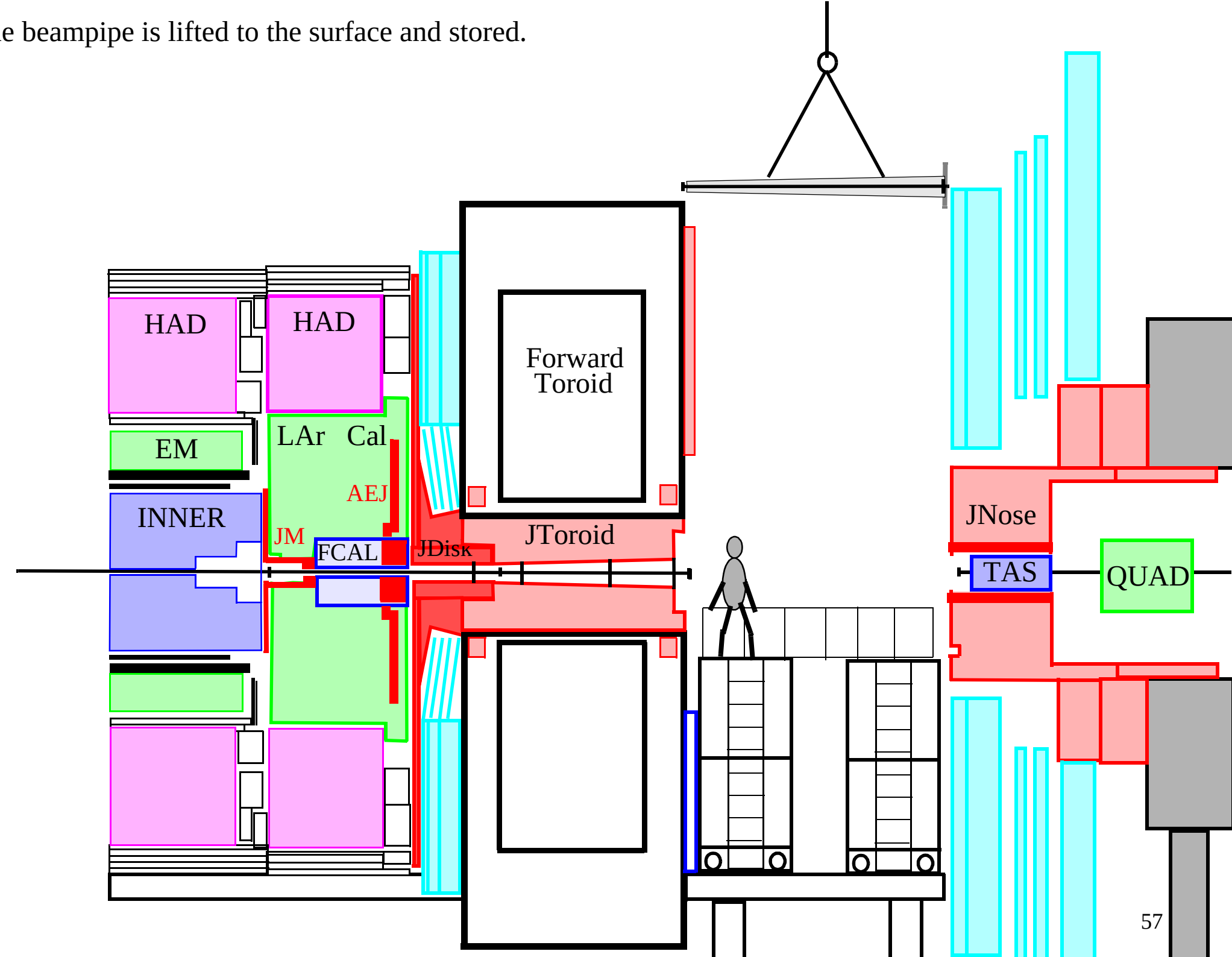



MBOL
MBIL
MBIL
LB
AB
VA
VT
5593
VJ
BW
JN
6810 (AB hdvJ

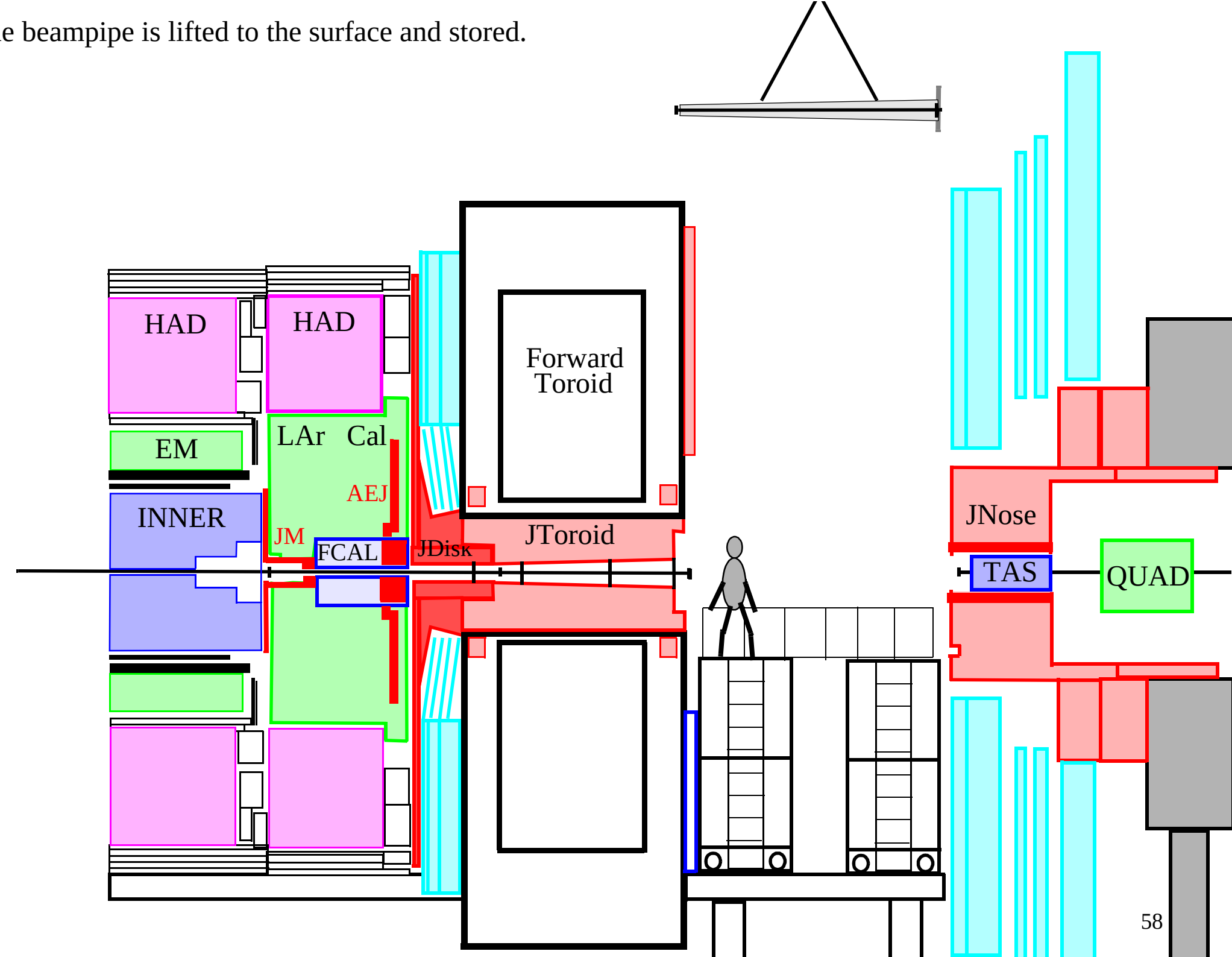
16. The beampipe is lifted to the surface and stored.

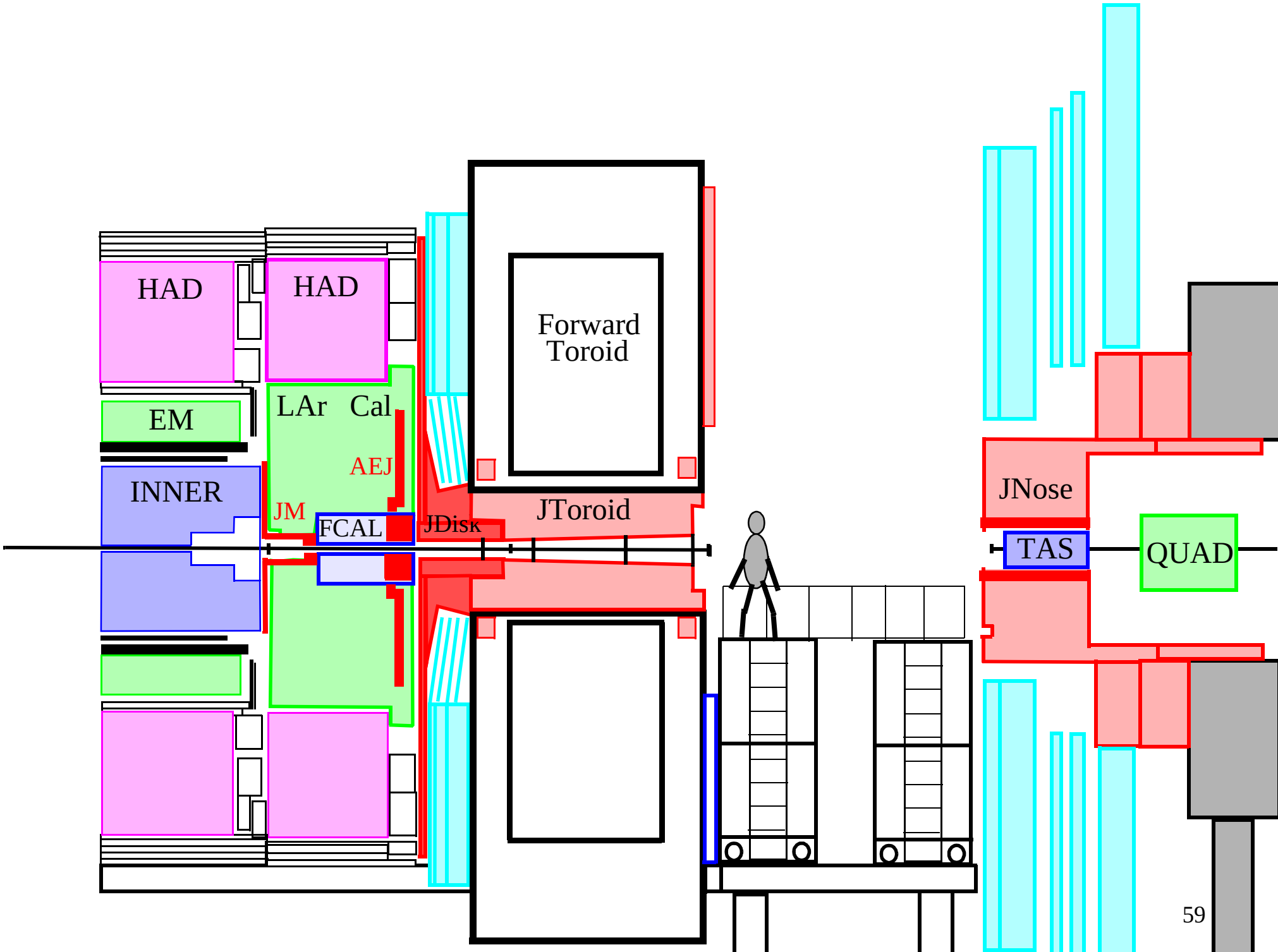


16. The beampipe is lifted to the surface and stored.

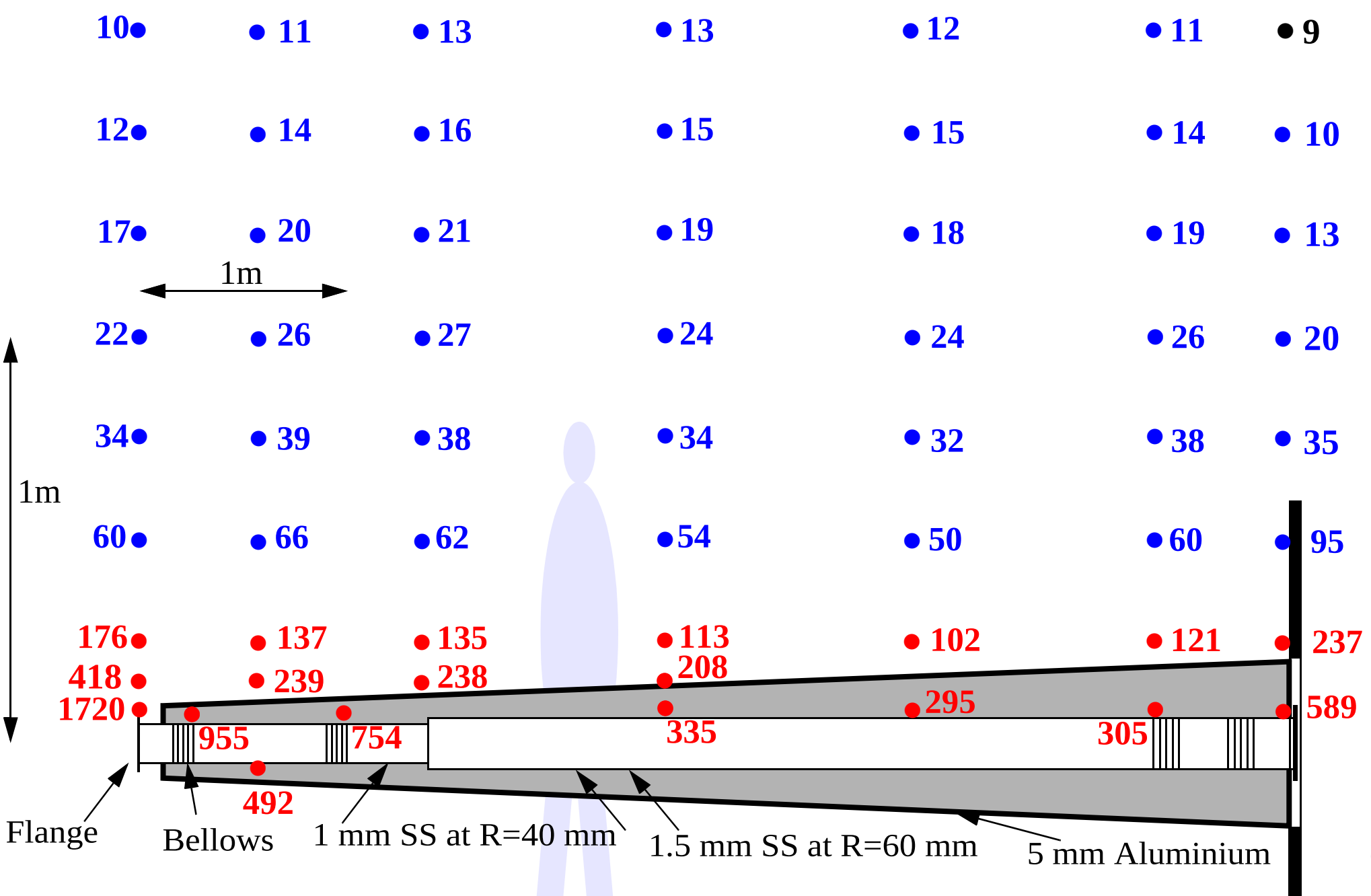


16. The beampipe is lifted to the surface and stored.



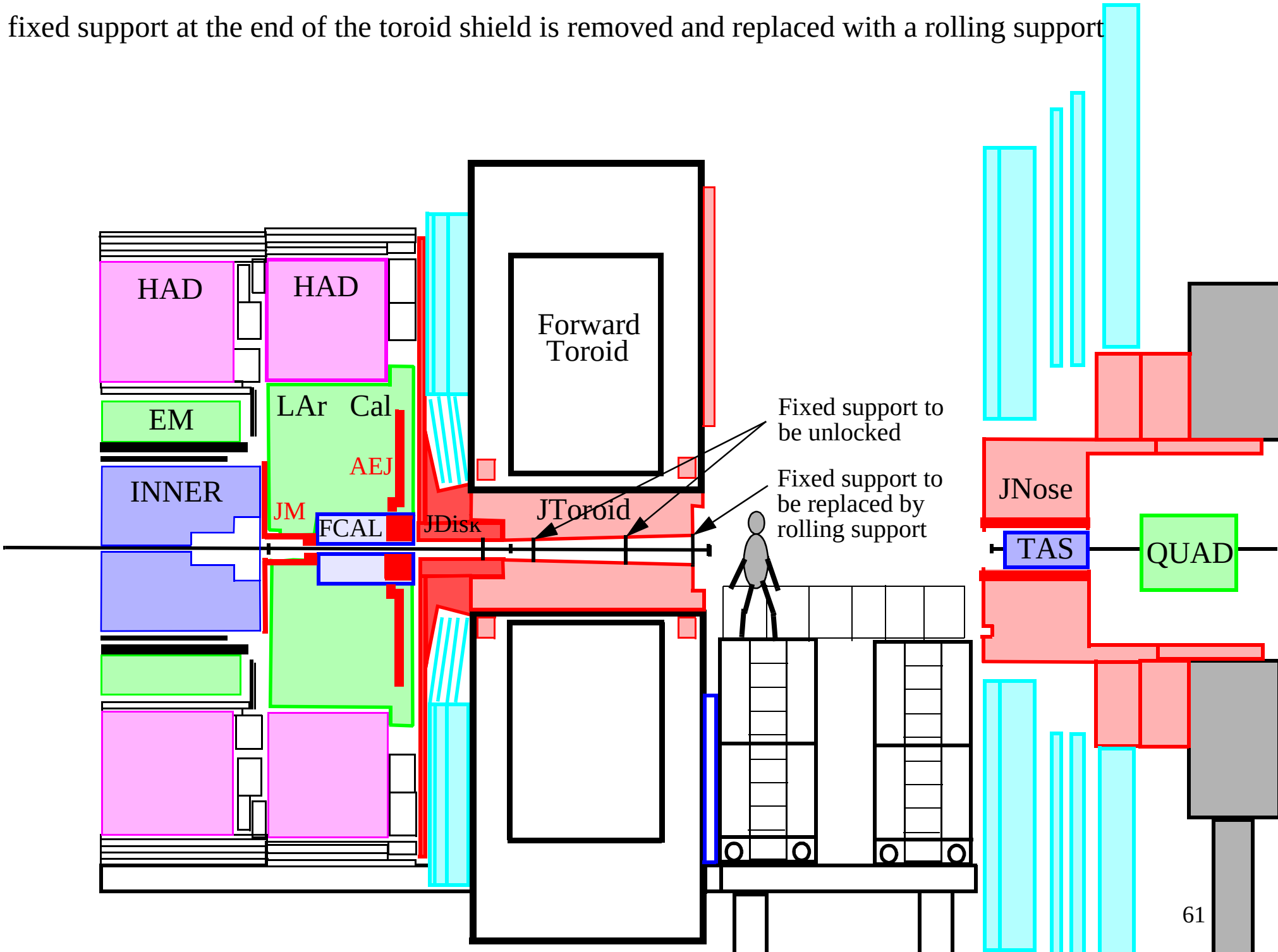

HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JDisk
Forward
Toroid
JToroid
JNose
TAS
QUAD

Dose rates in μSv/h after 100 days of running and 1 day of cooling

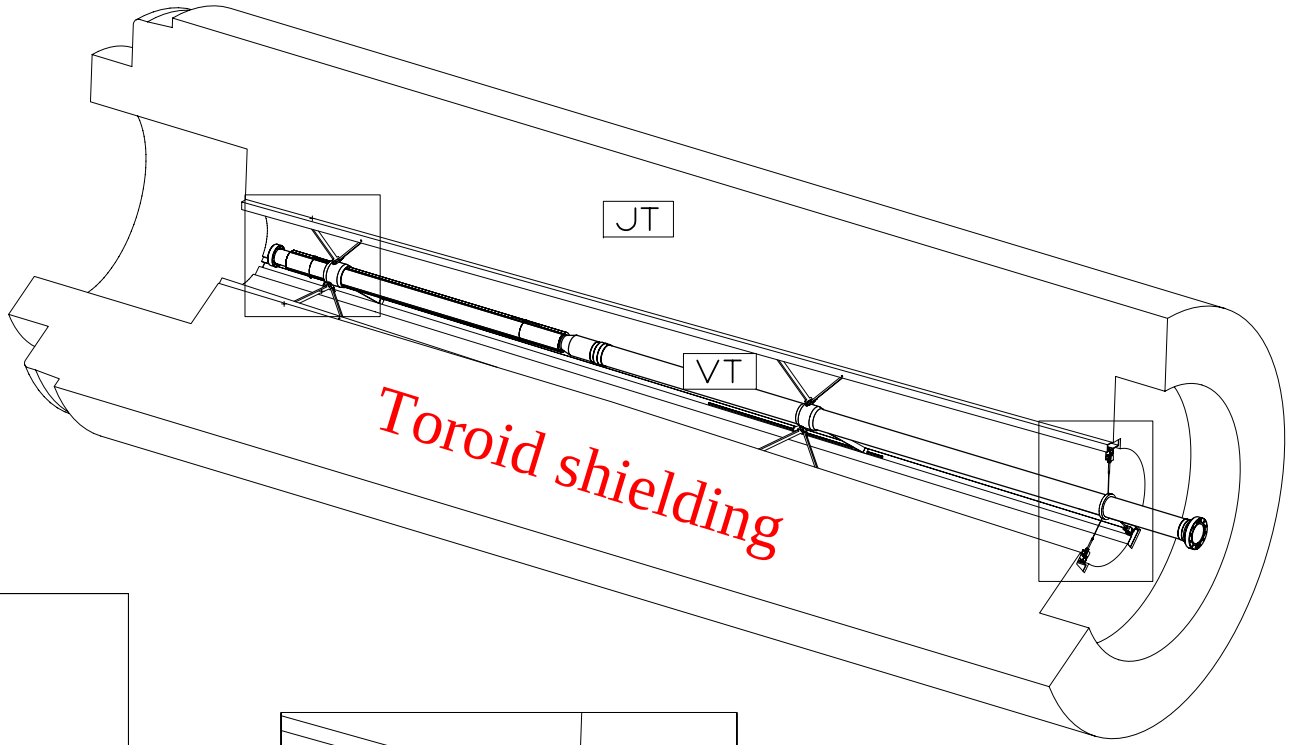


17. The two fixed supports inside the toroid shielding are unlocked

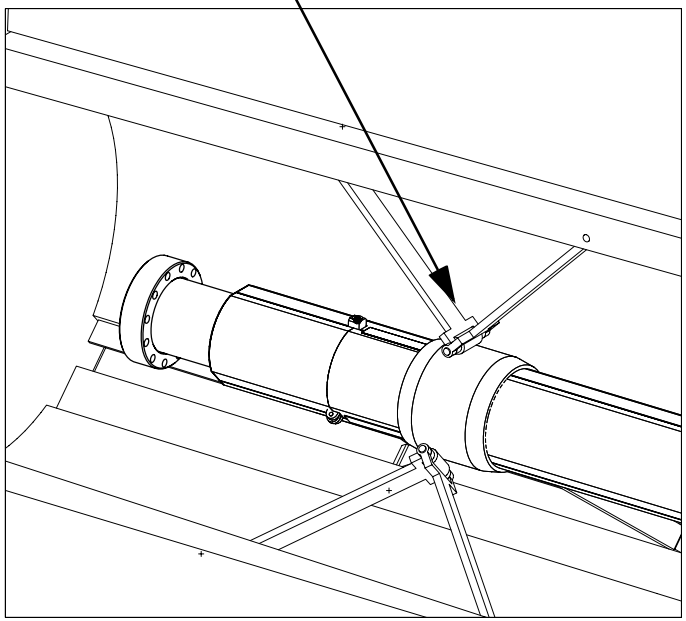
18. The fixed support at the end of the toroid shield is removed and replaced with a rolling support

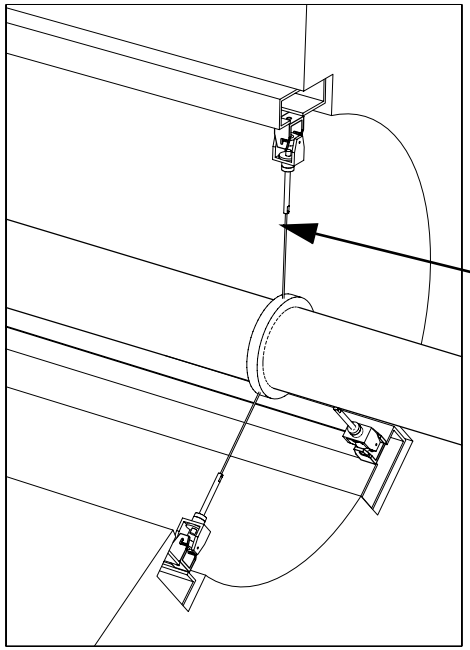


Beampipe supports

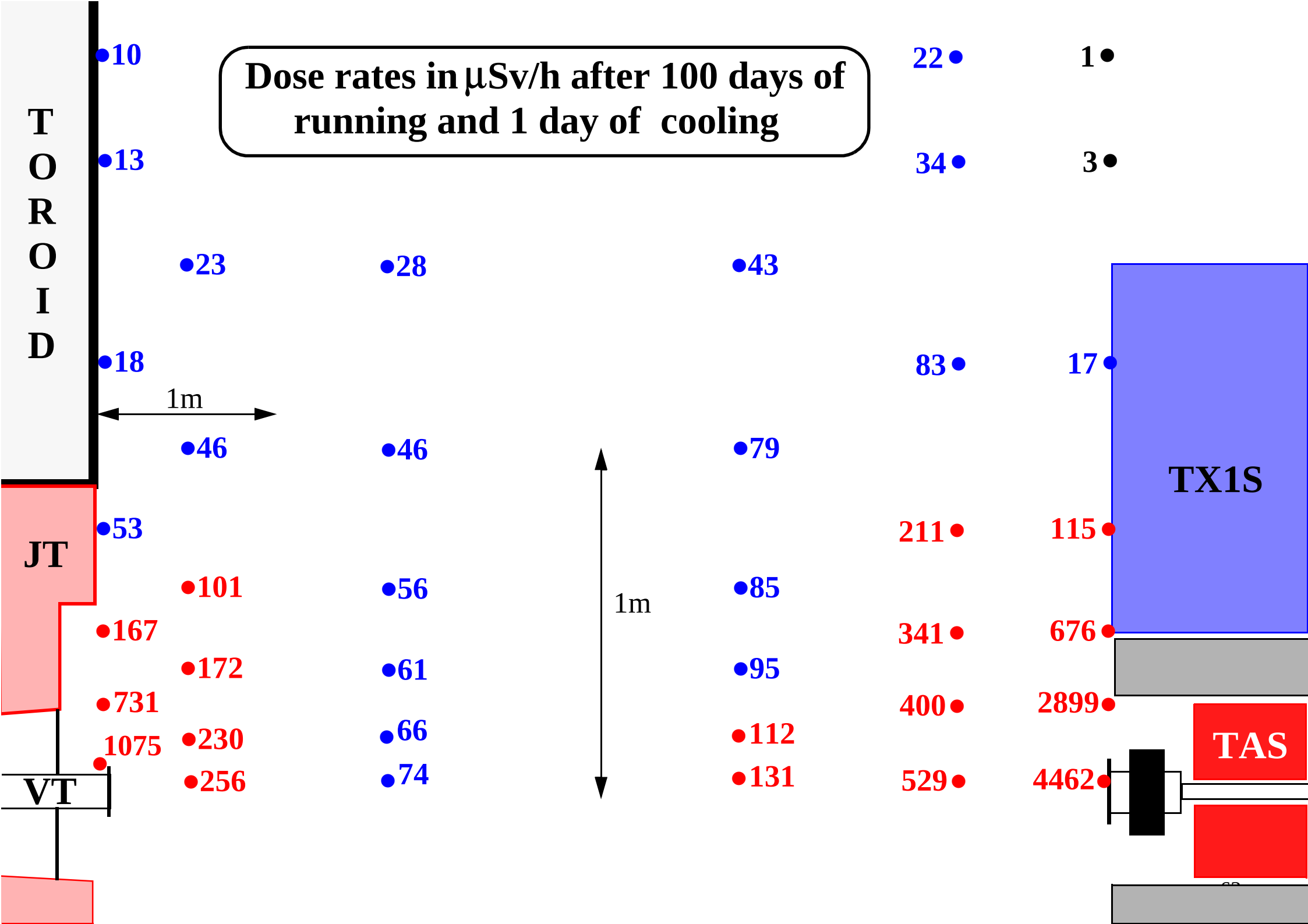


This support has to be retracted.





This support has to be removed and replaced by a support that rolls against the shielding.


Dose rates in µSv/h after 100 days of running and 1 day of cooling
TOROID
JT
VT
TX1S
TAS
1m
1m
10
13
23
28
43
18
46
46
79
53
101
56
85
167
172
61
95
731
230
66
112
1075
256
74
131
22
34
83
211
341
400
529
1
3
17
115
676
2899
4462

TOROID SHIELDING

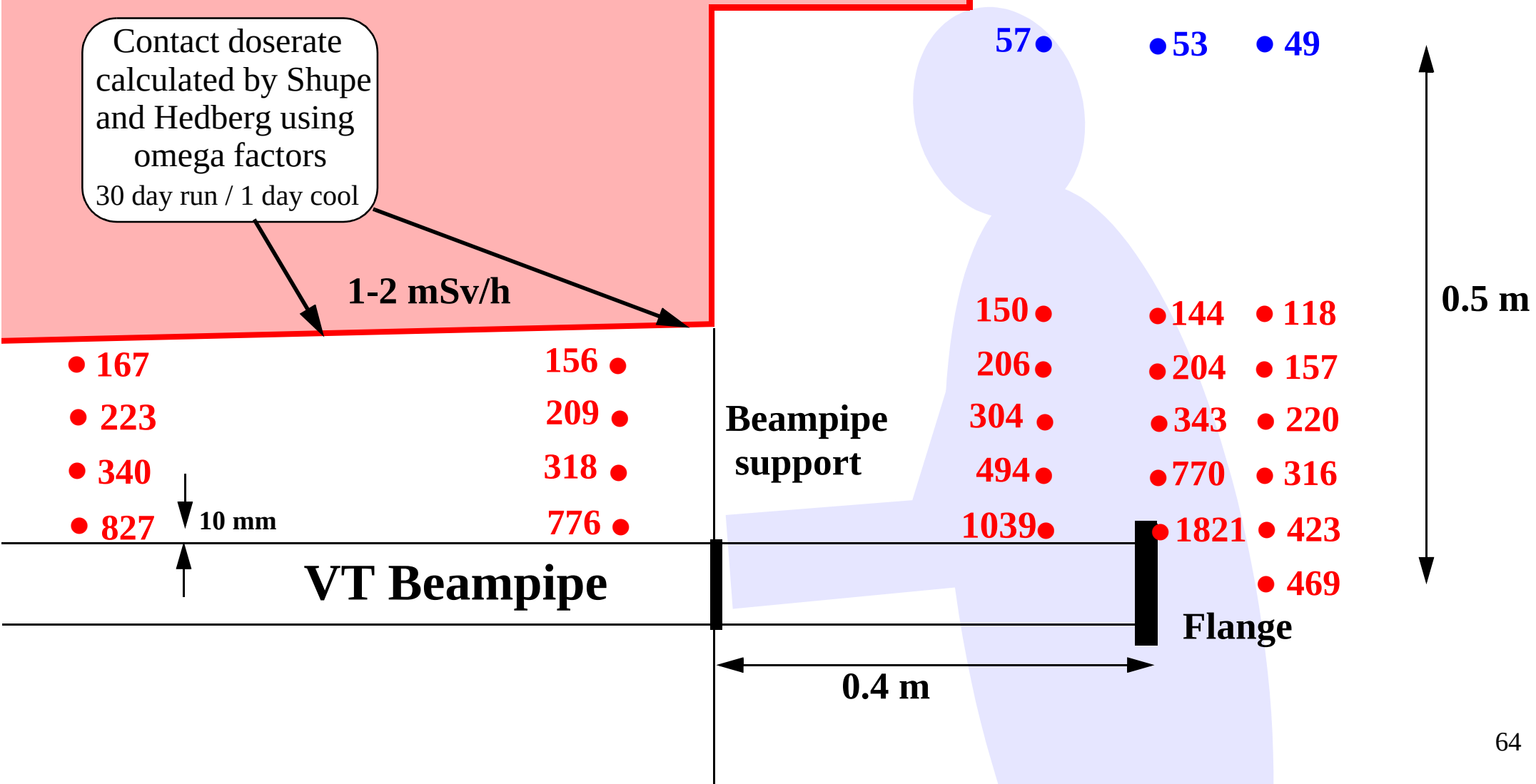
Dose rate in μSv/h from only the VT beampipe

(100 day running, 1 day cooling)

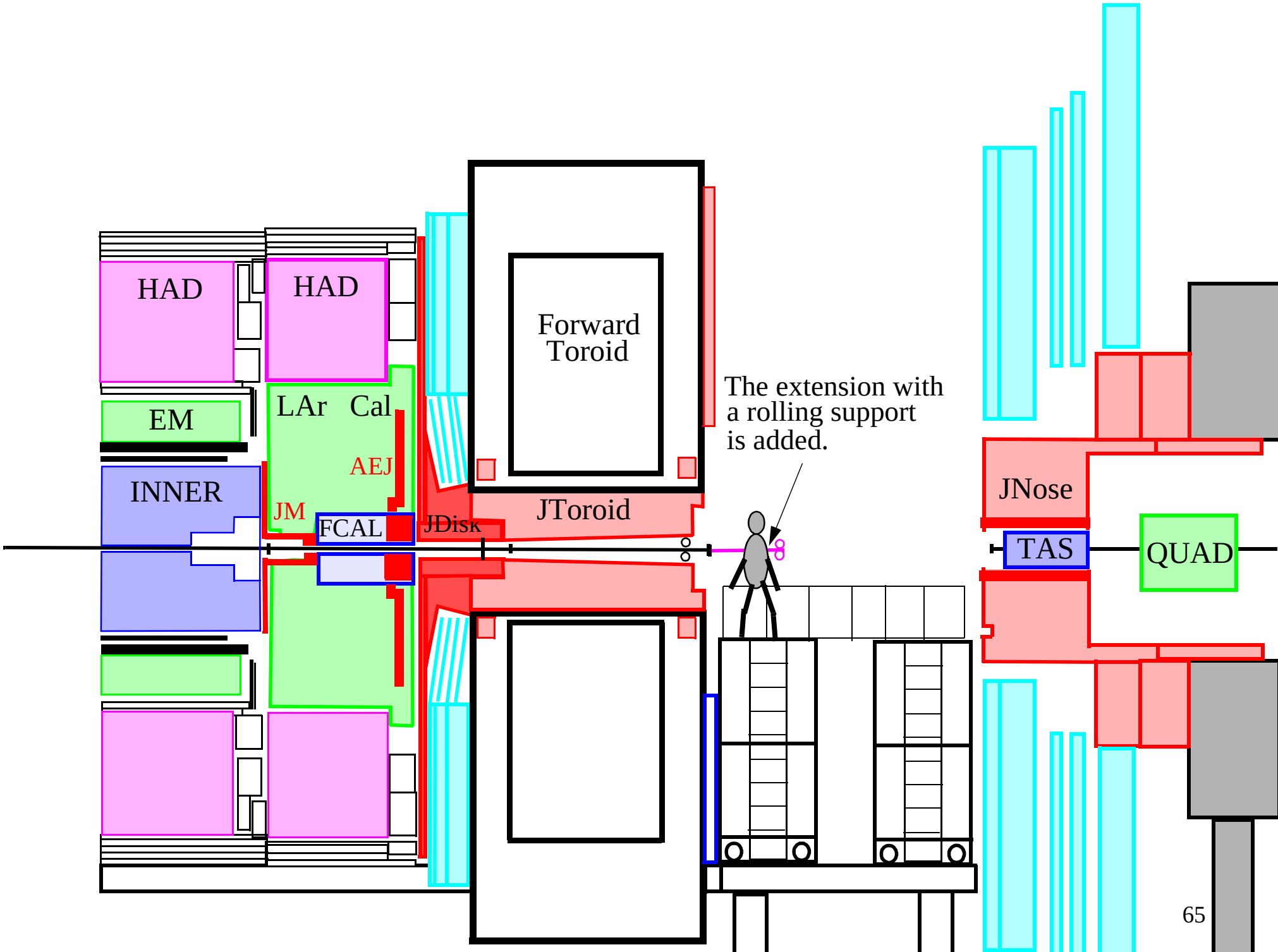
Contact doserate calculated by Shupe and Hedberg using omega factors

30 day run / 1 day cool

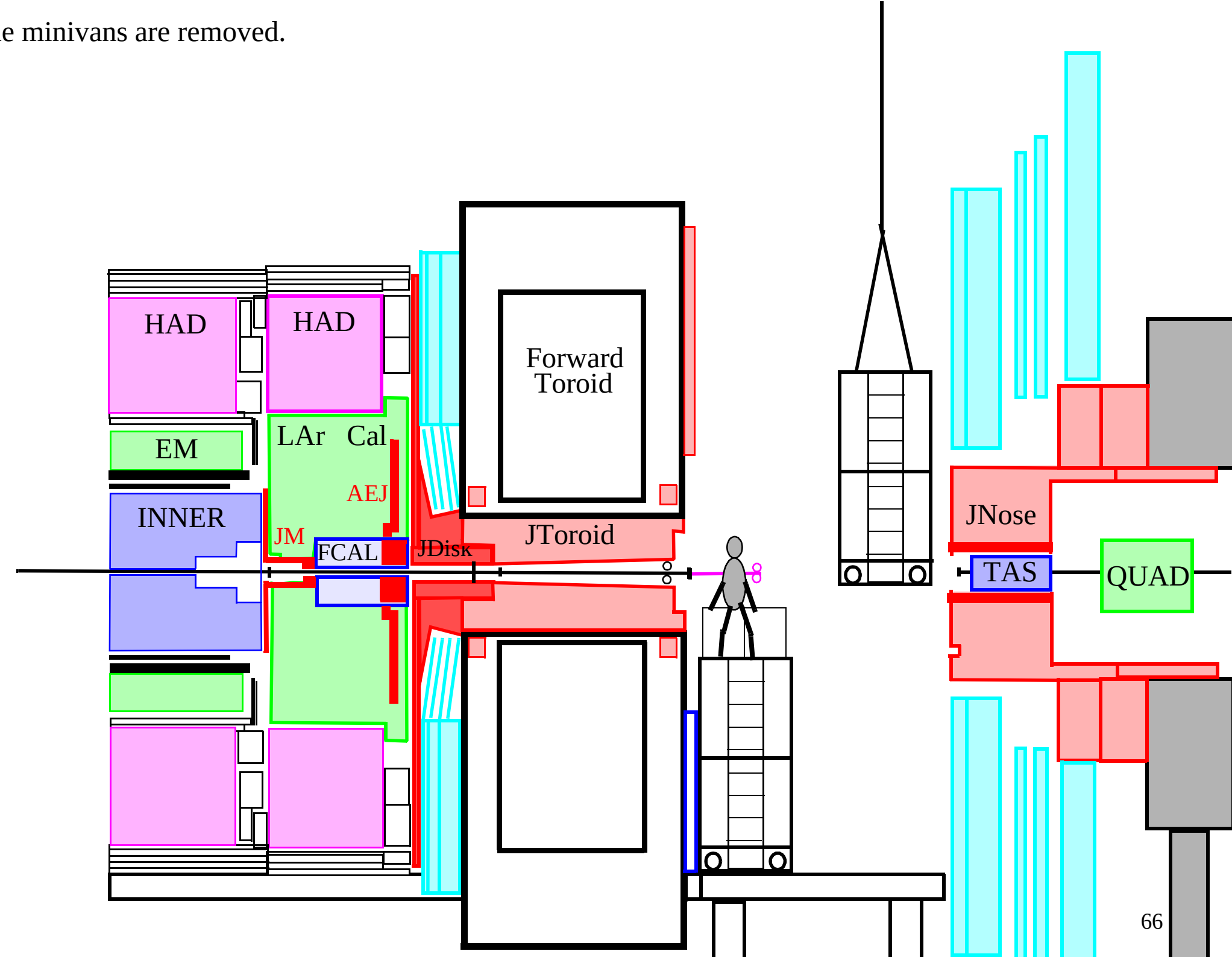
1-2 mSv/h



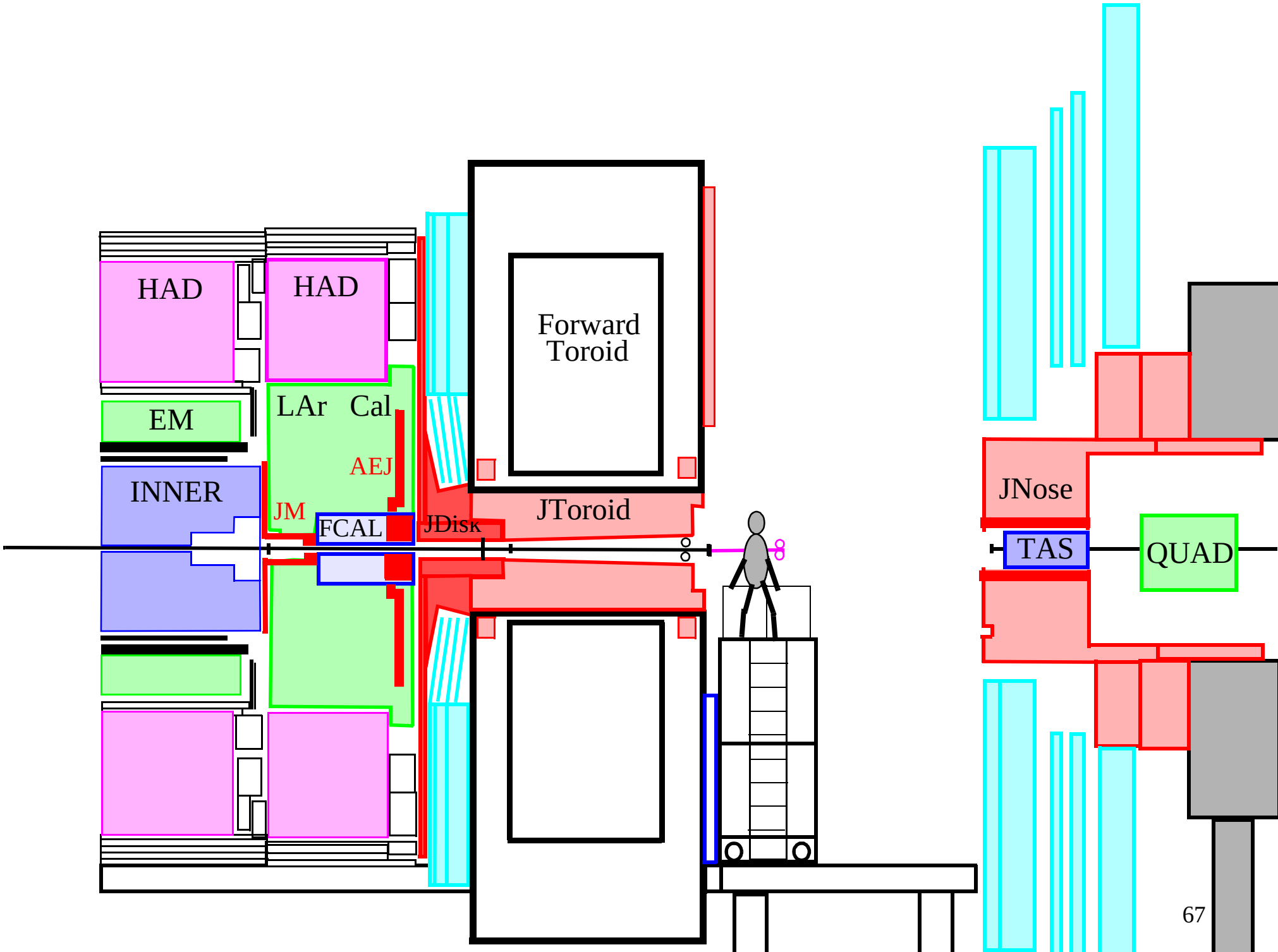
19. A beampipe extension with a rolling support is installed



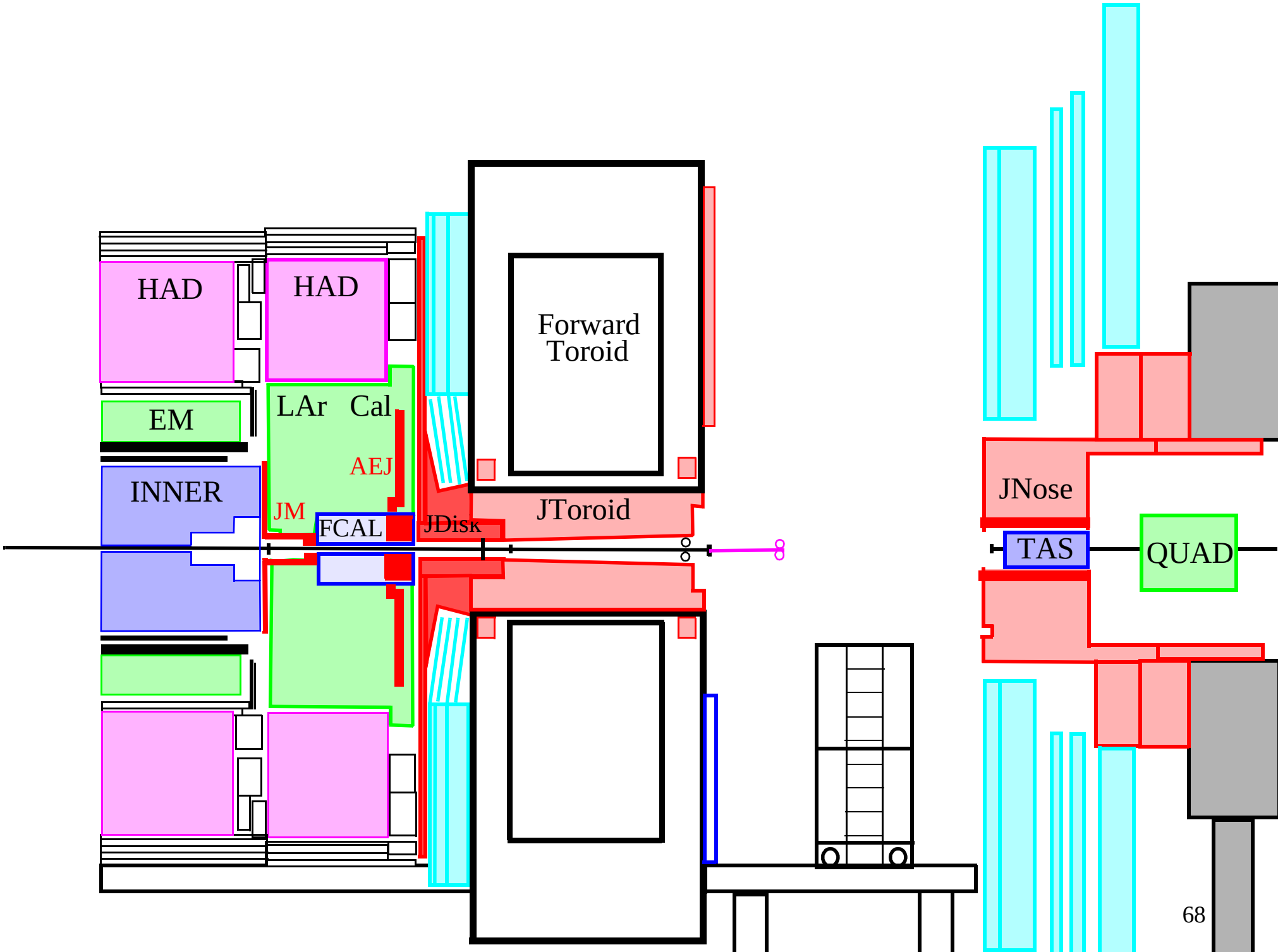
20. The minivans are removed.



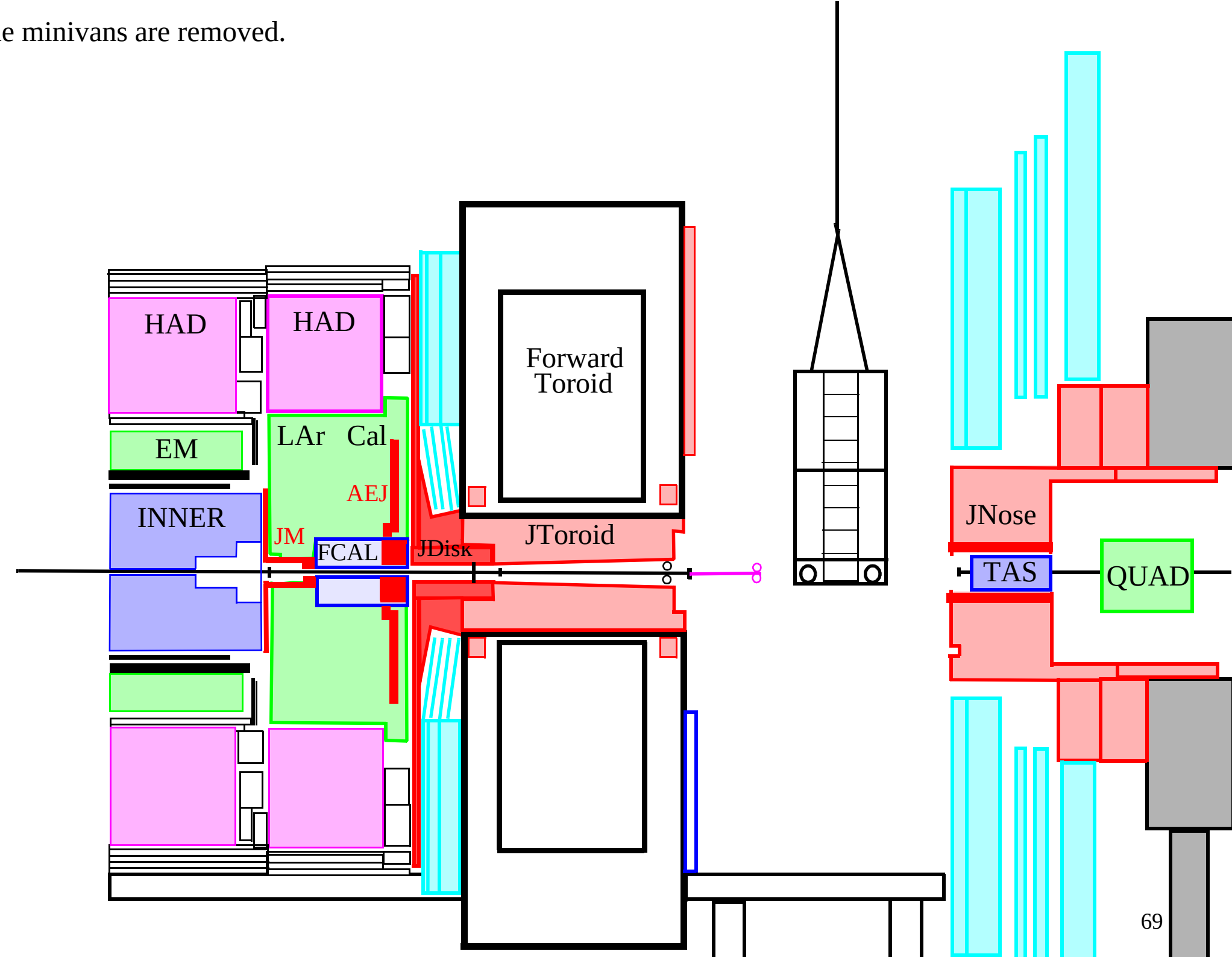
20. The minivans are removed.

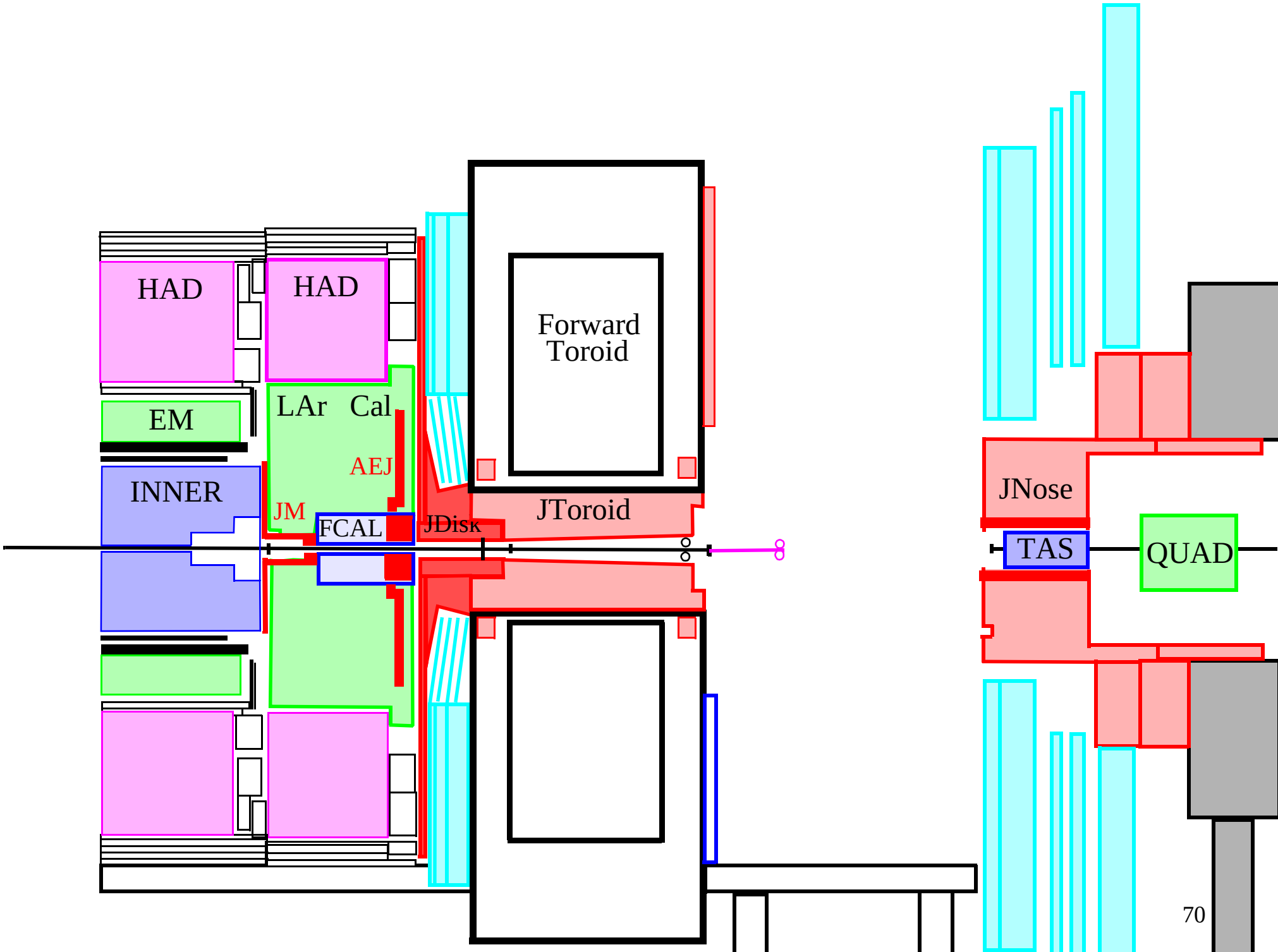


20. The minivans are removed.

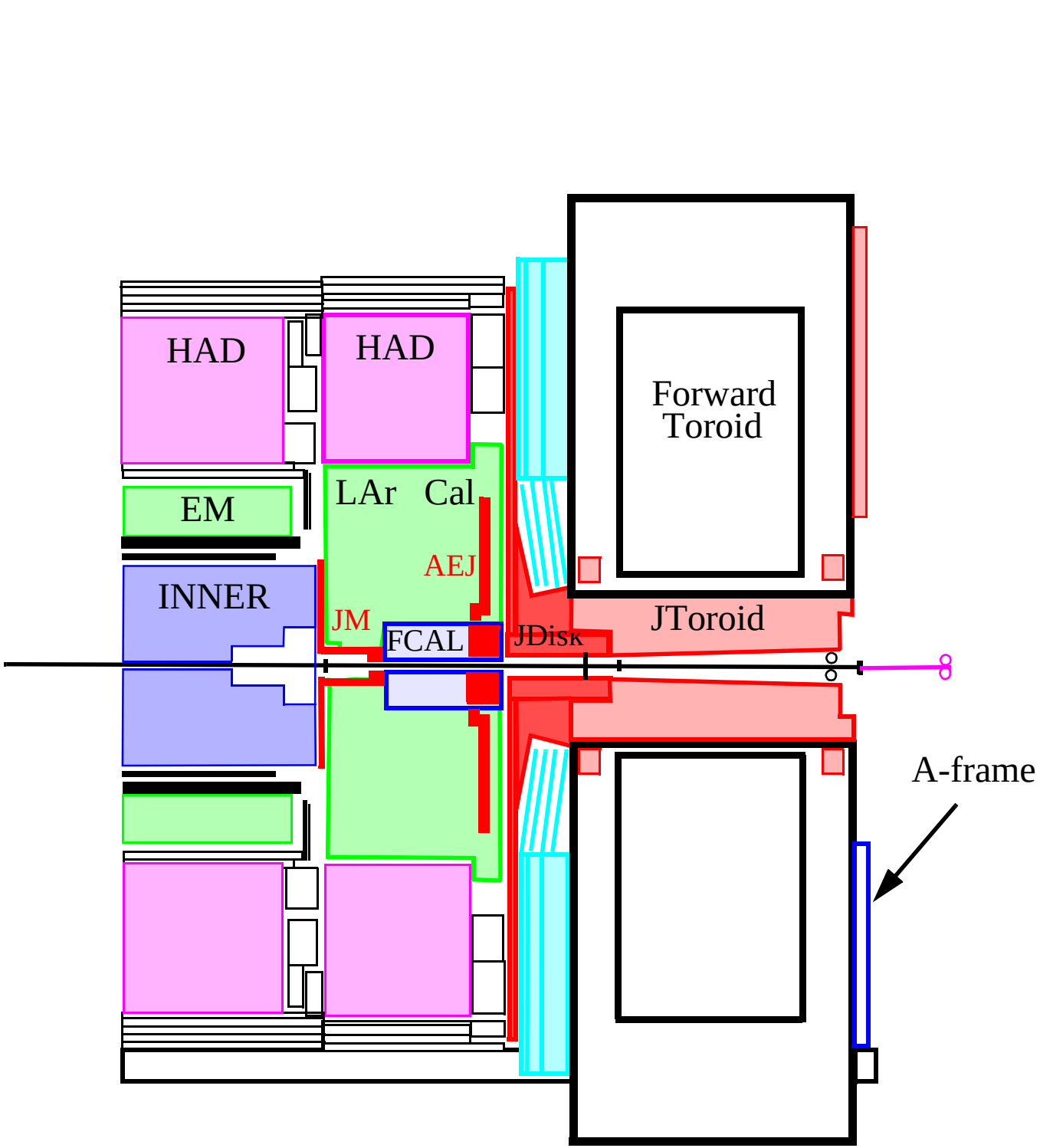


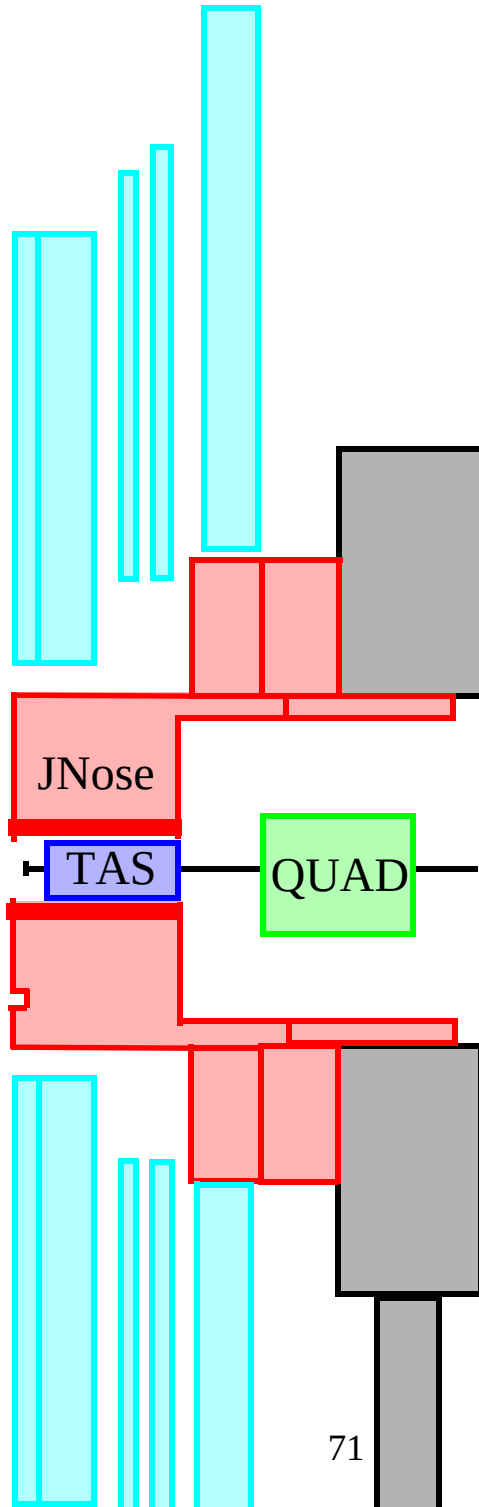
20. The minivans are removed.



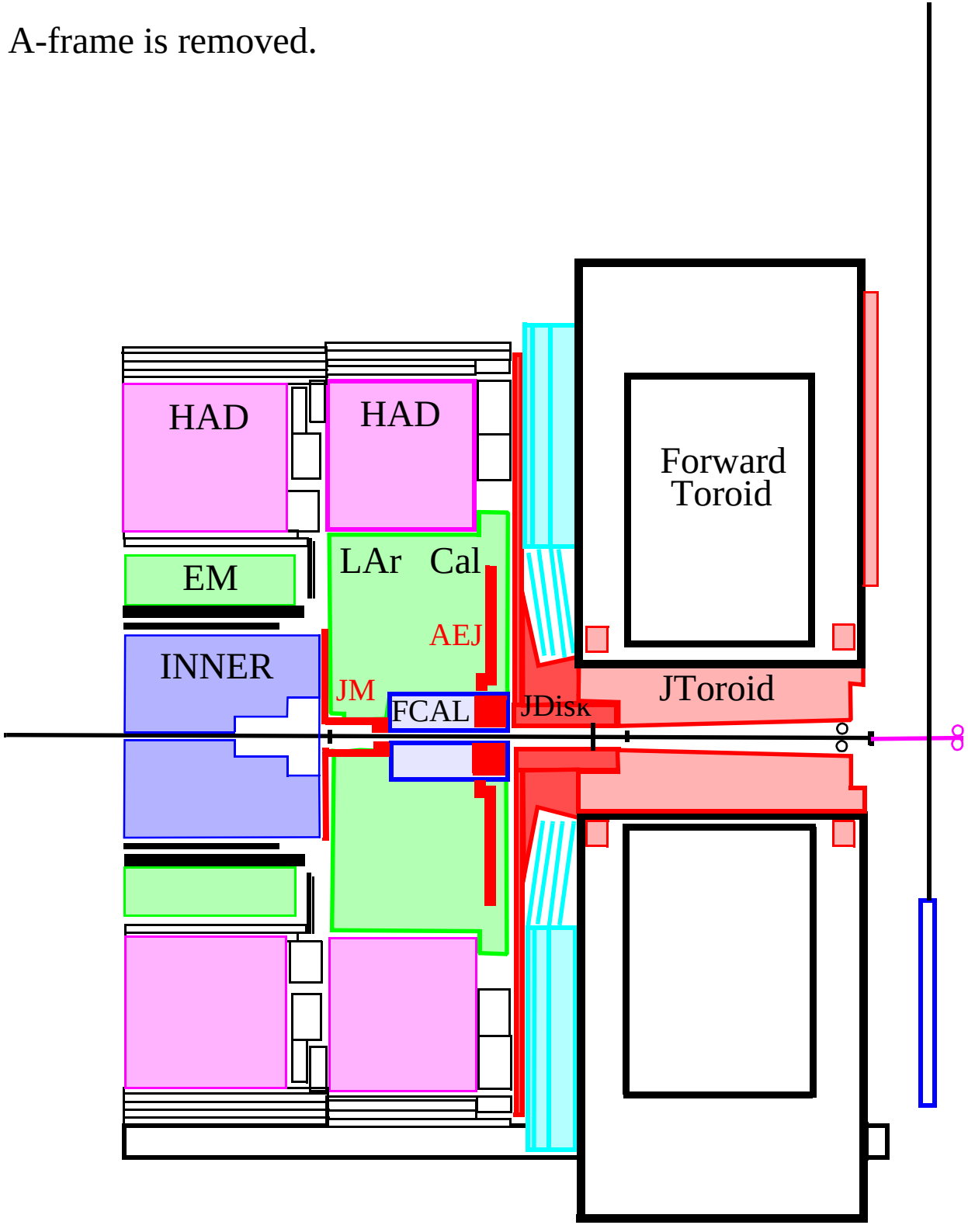

HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JDisk
Forward
Toroid
JToroid
JNose
TAS
QUAD

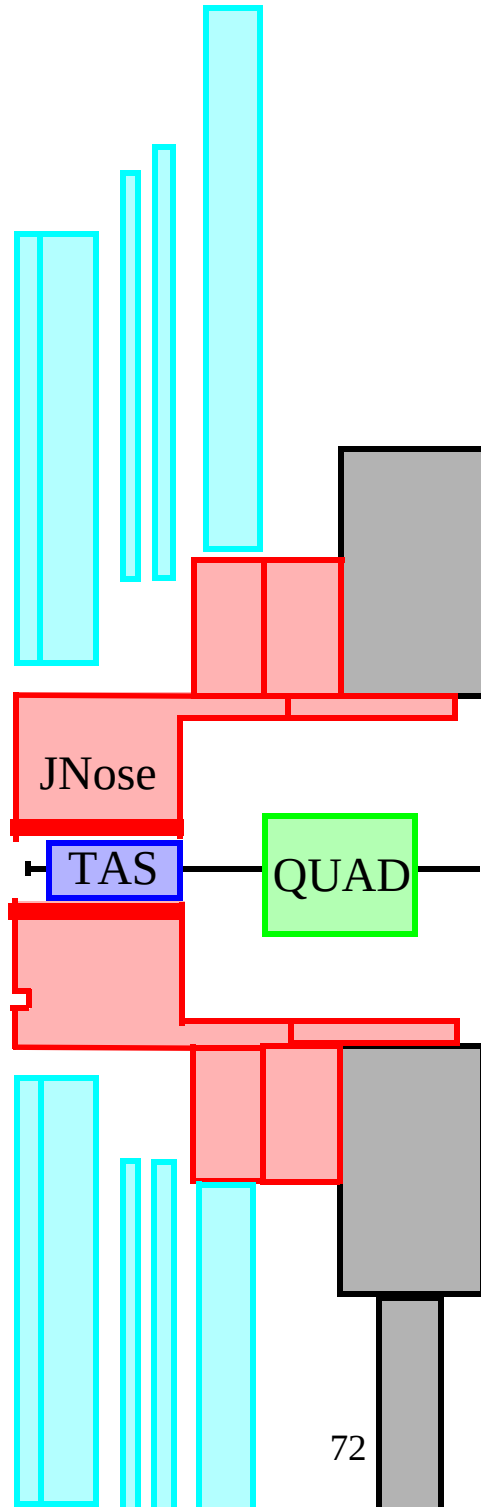
21. The HF truck is moved sideways so that the A-frame can be removed.



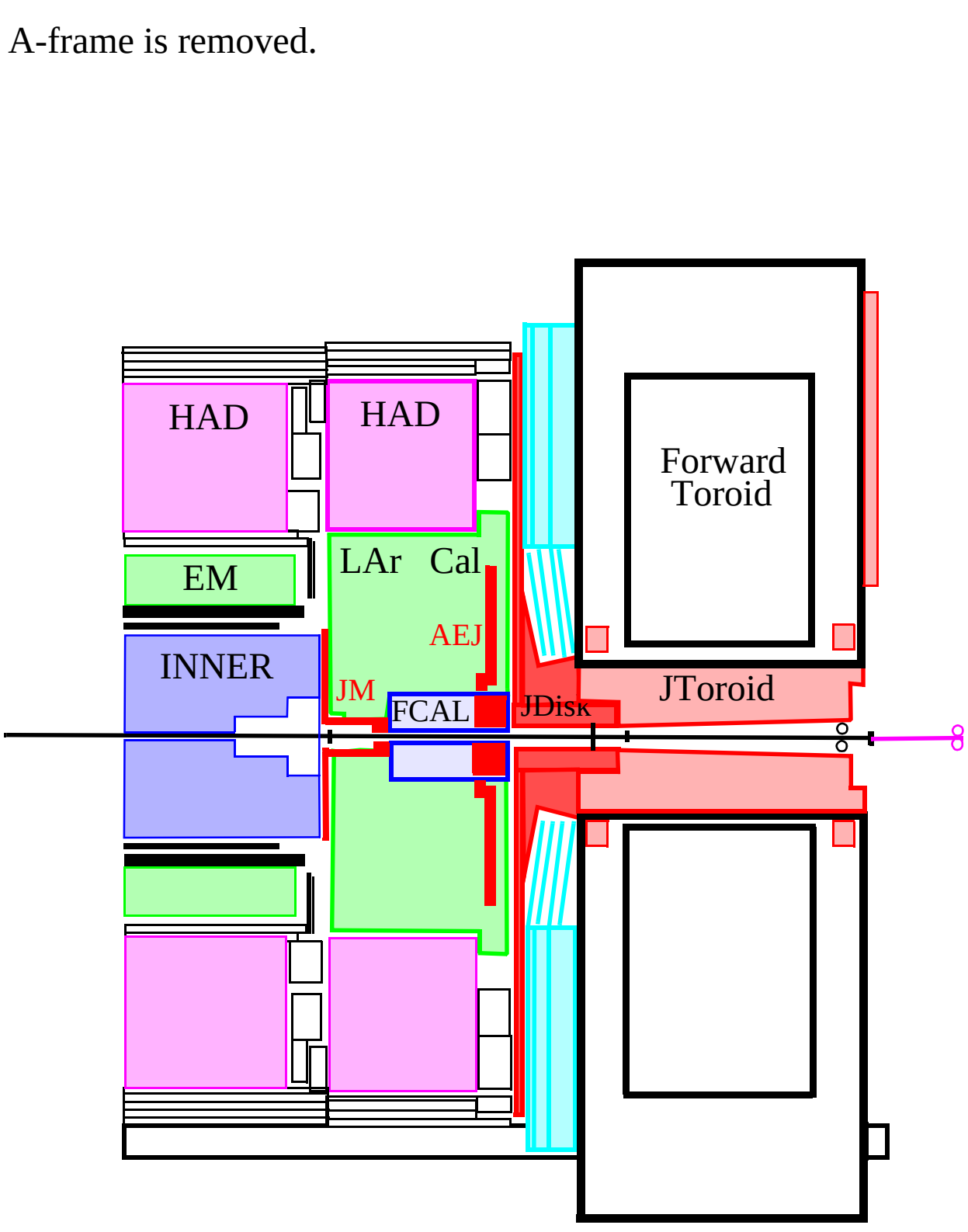


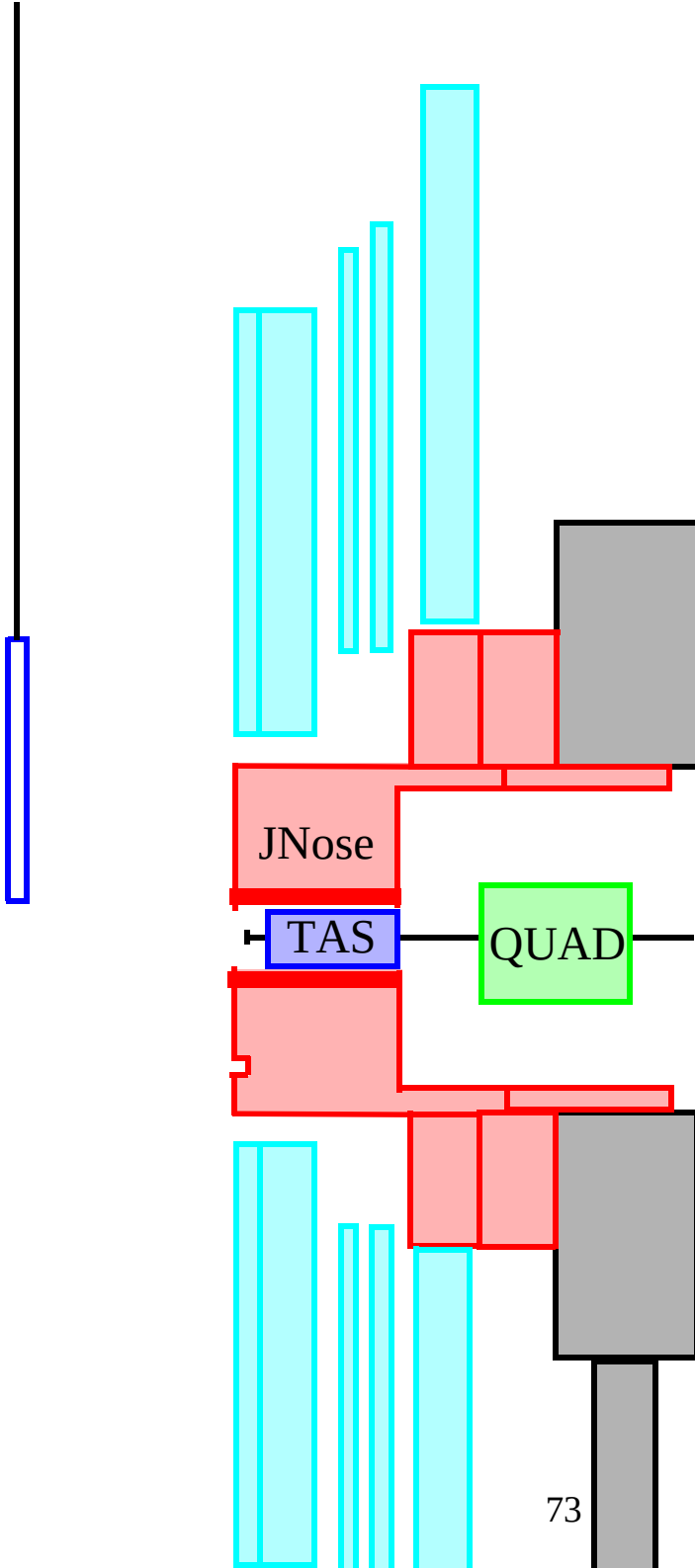
22. The A-frame is removed.



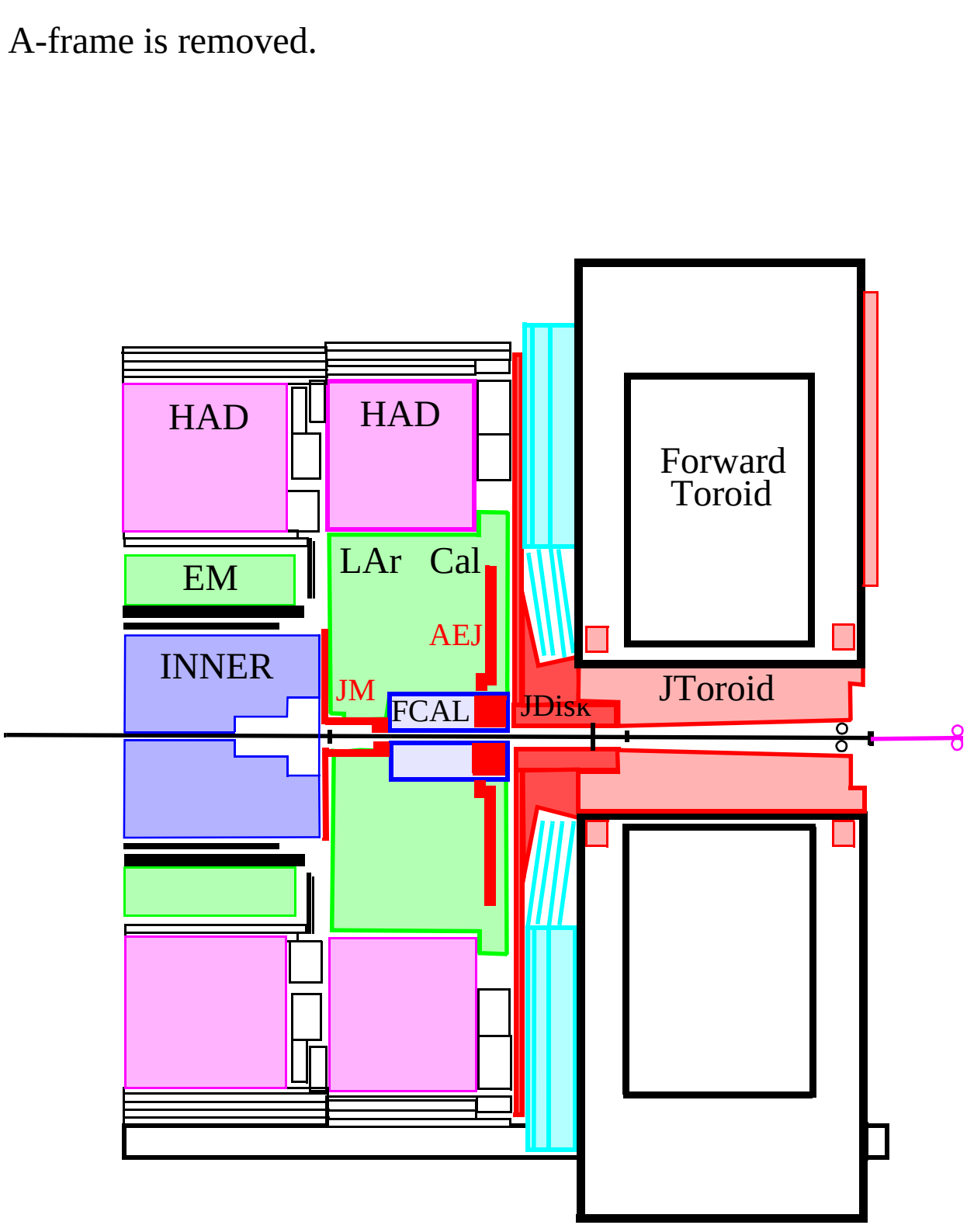


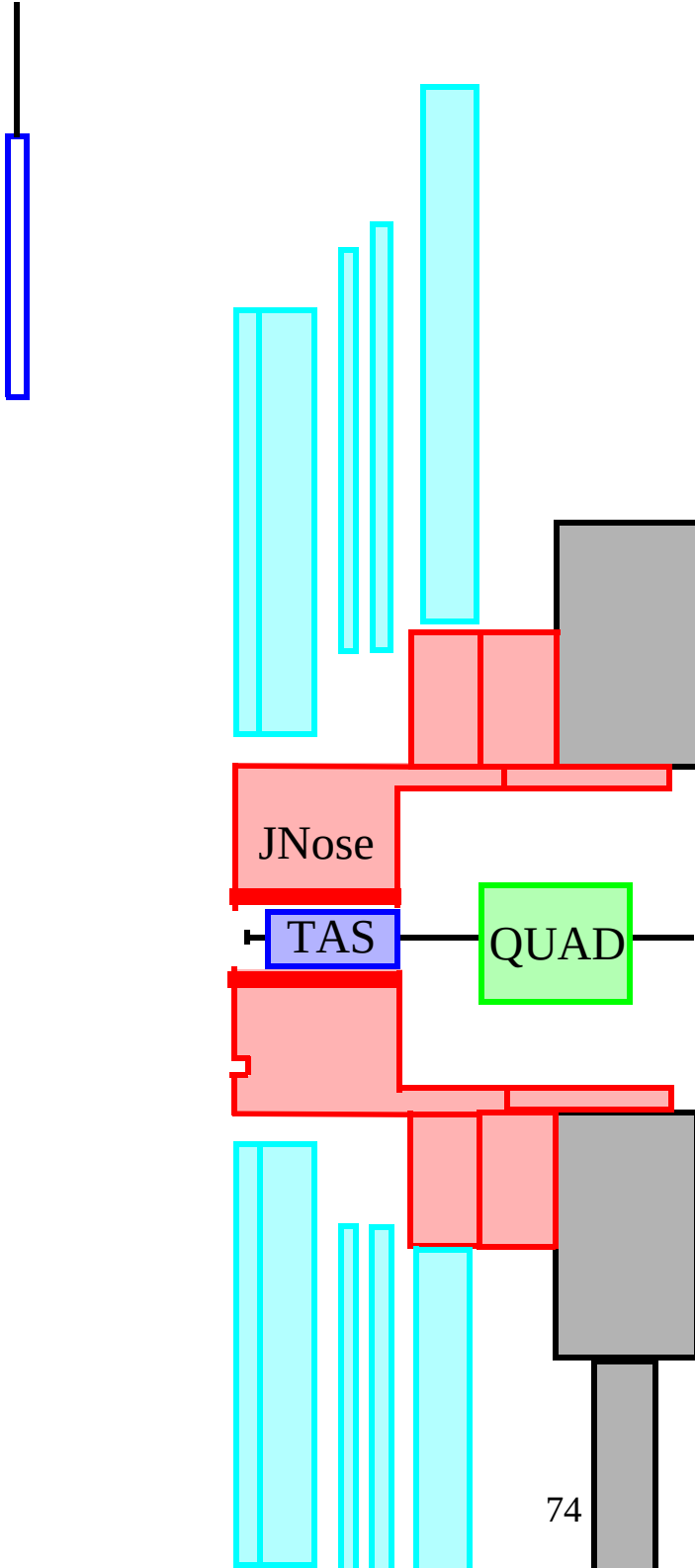
22. The A-frame is removed.



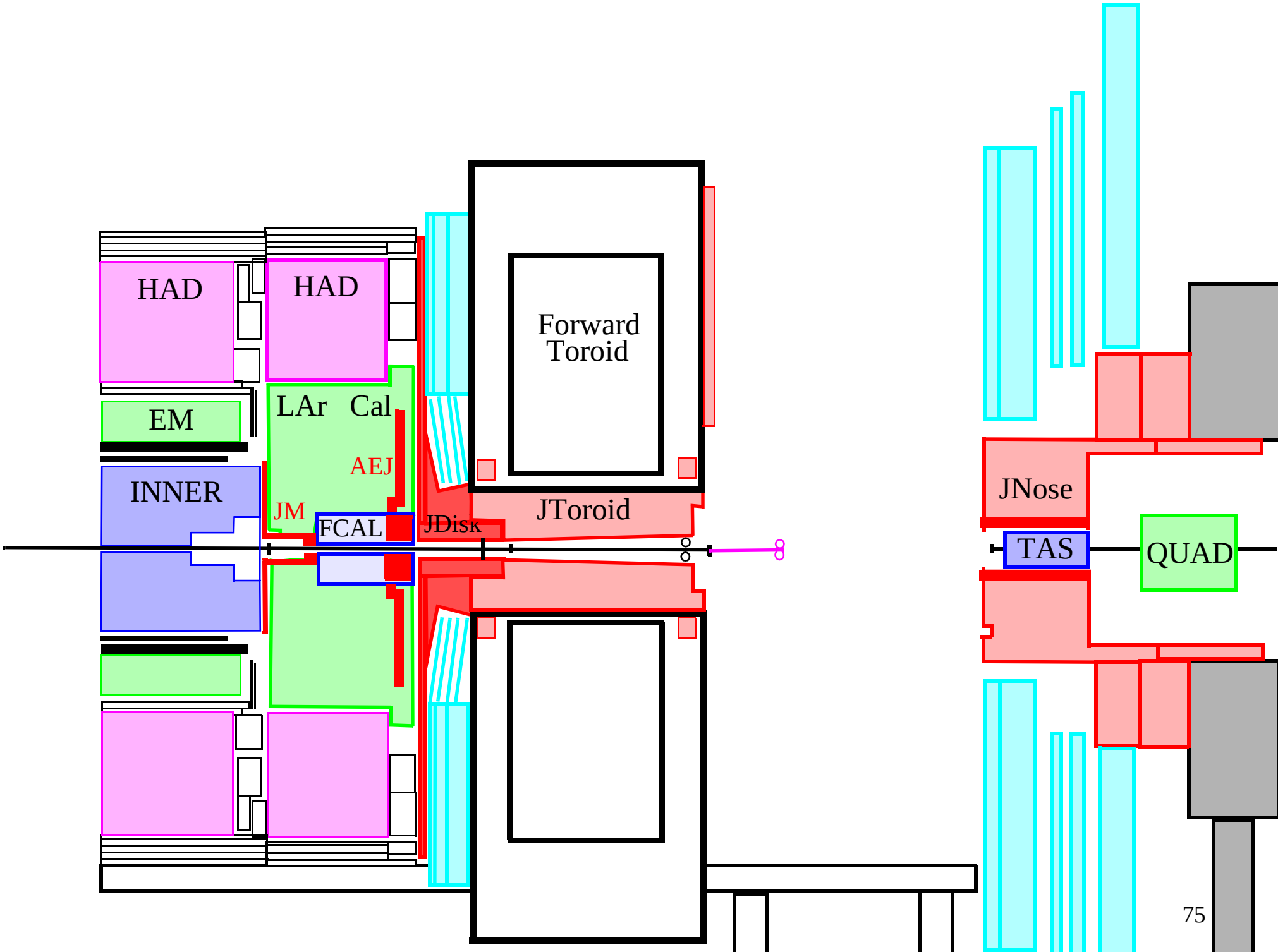


22. The A-frame is removed.

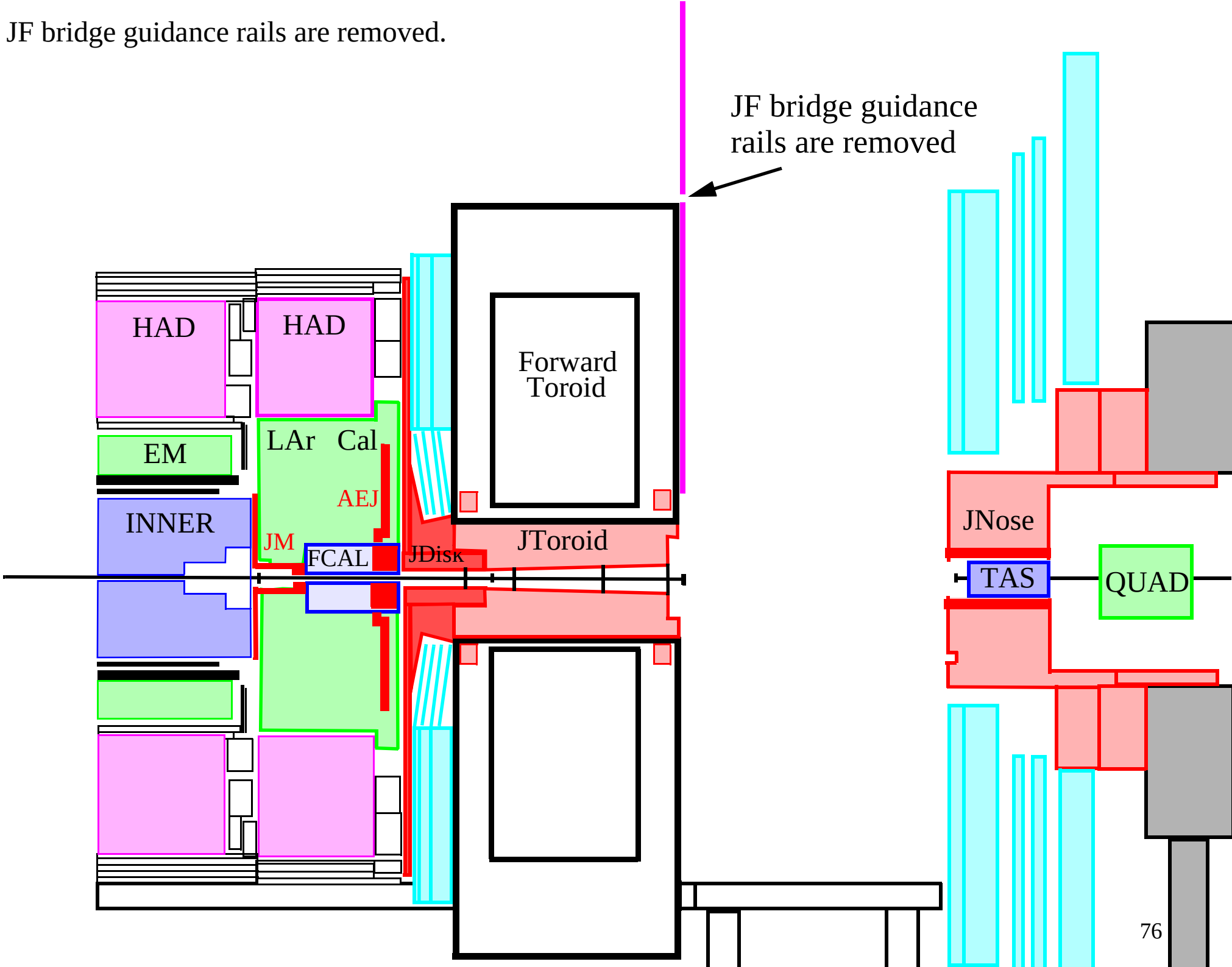


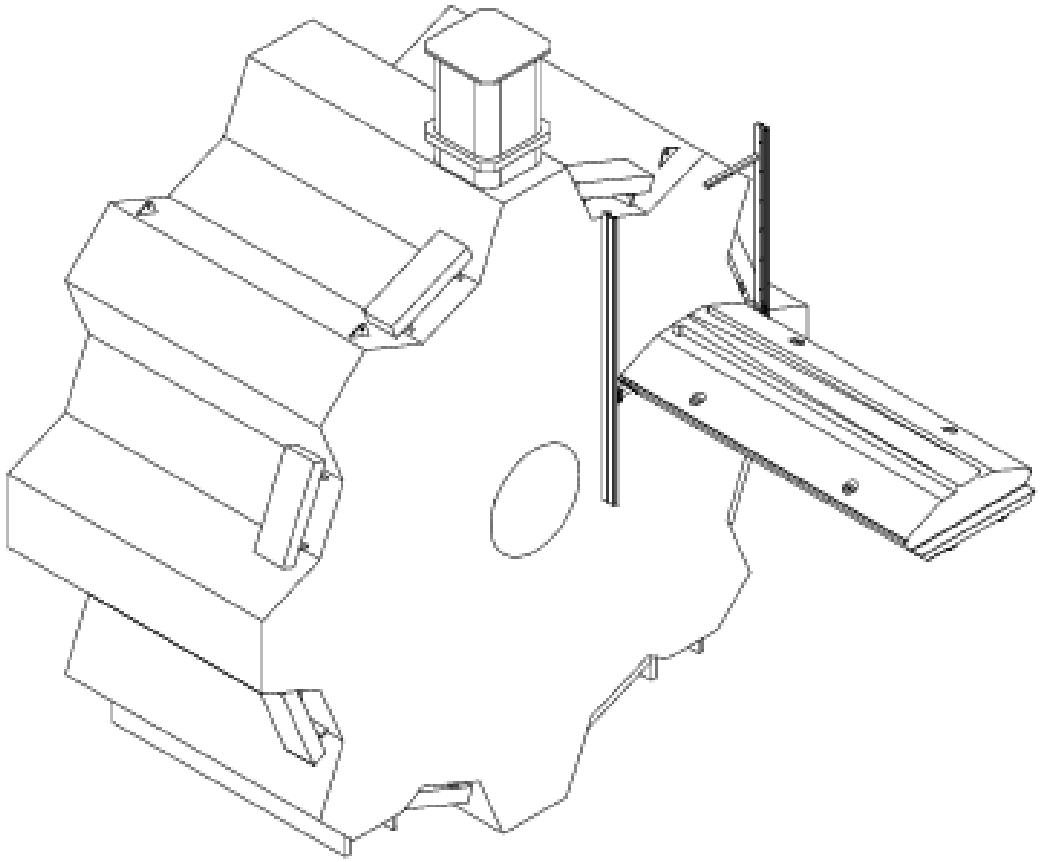


23. The HF truck is moved back.

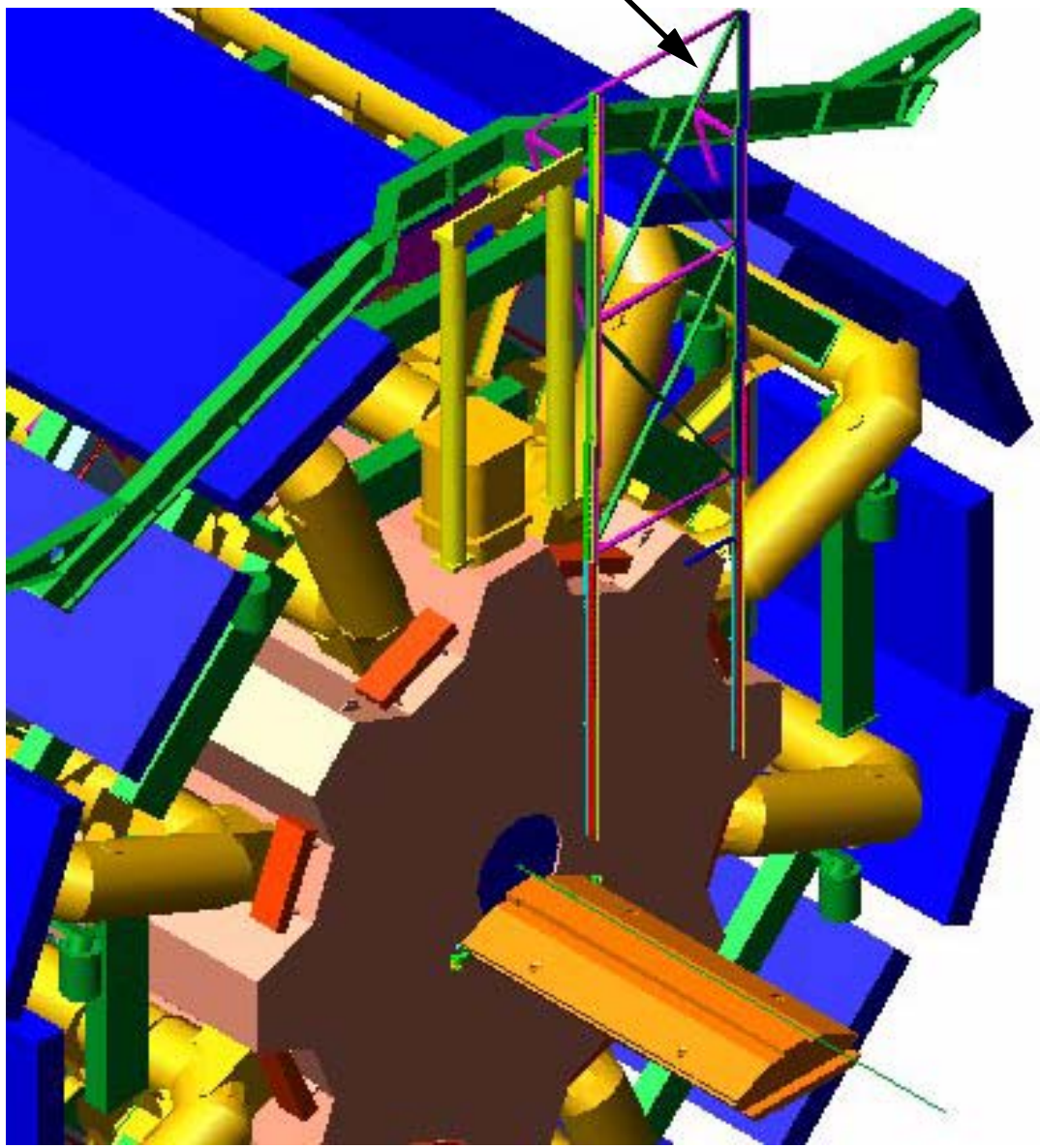


24. The JF bridge guidance rails are removed.

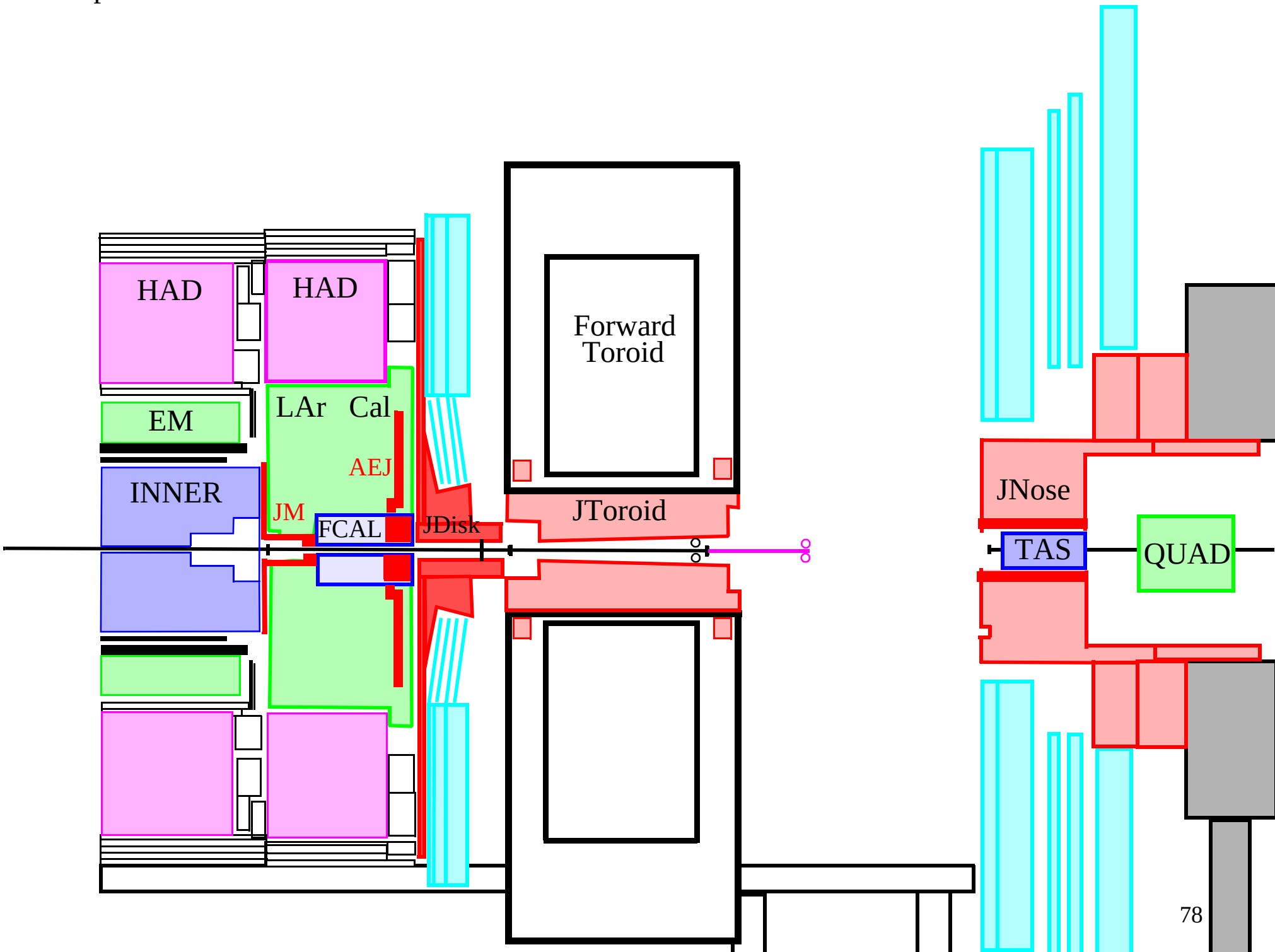




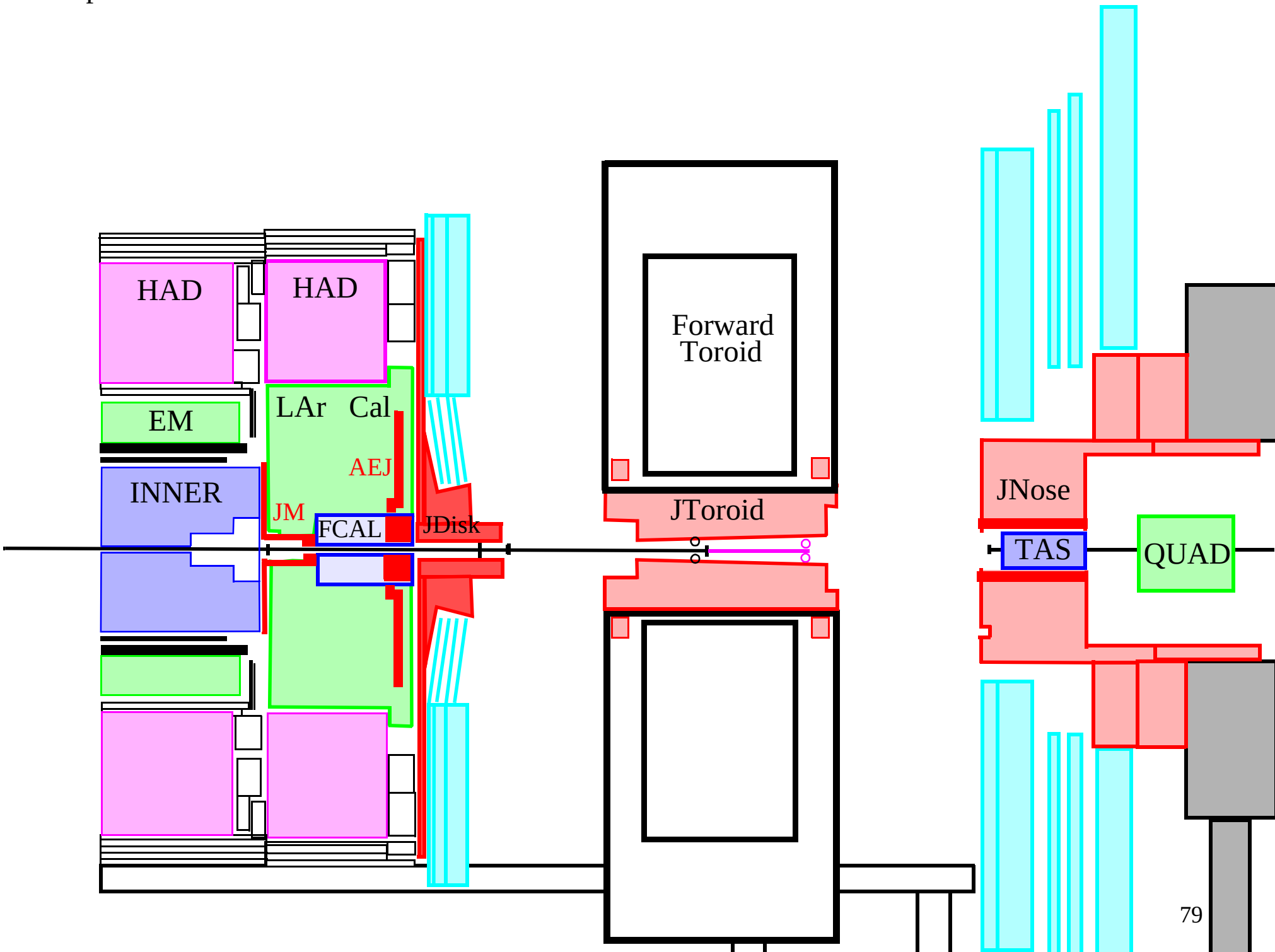
JF bridge guidance rails are attached to the rails above the toroid.



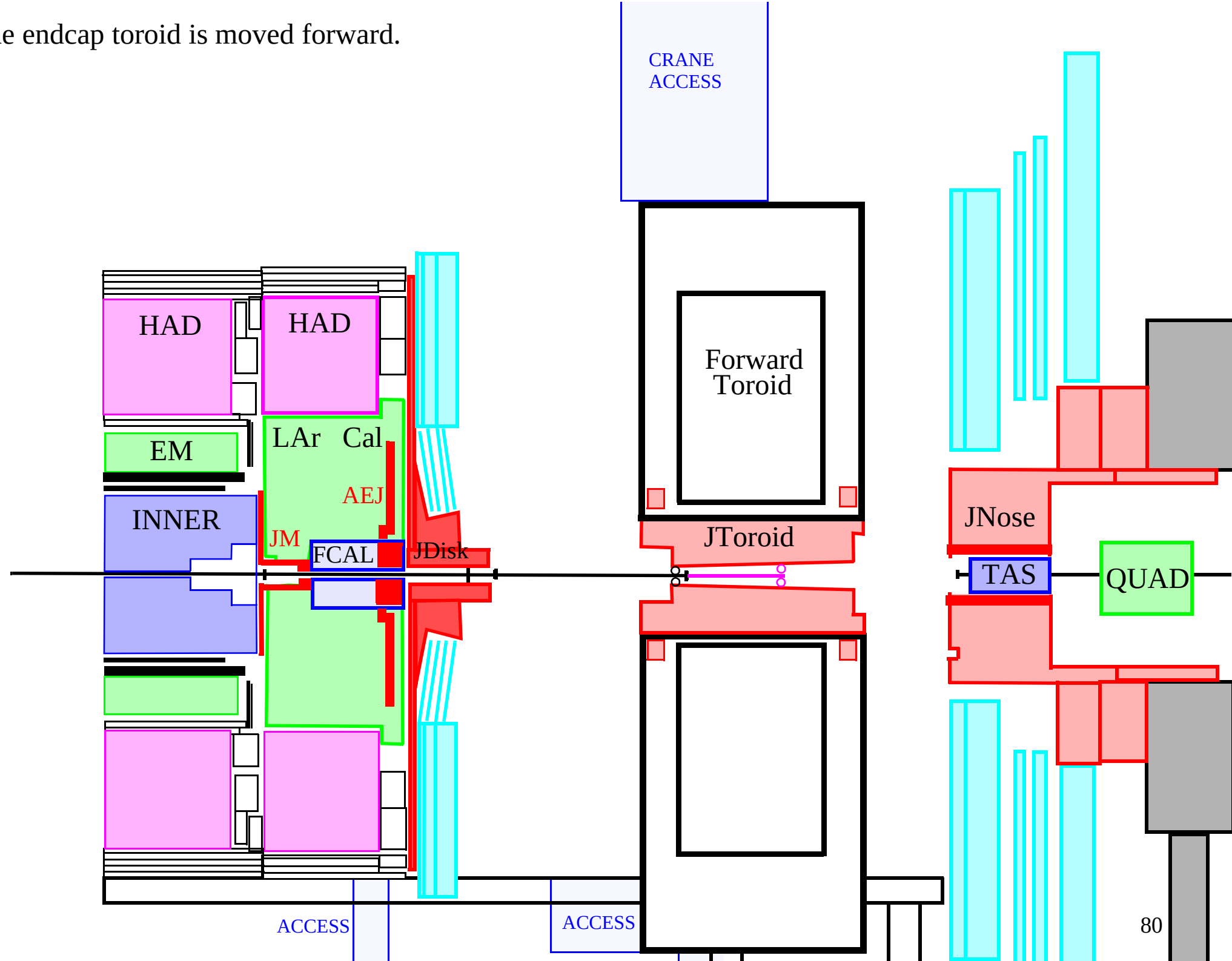
25. The endcap toroid is moved forward.



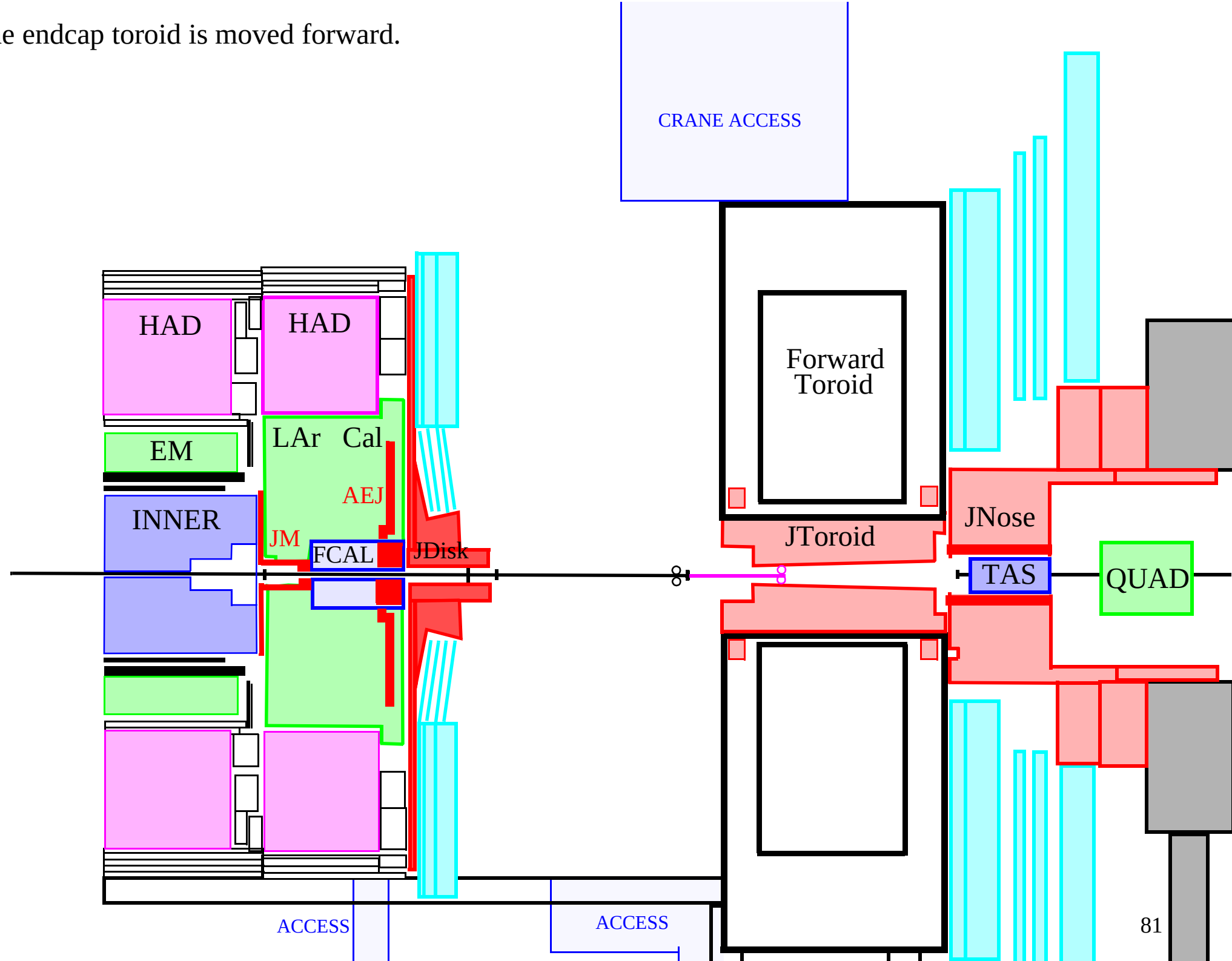
25. The endcap toroid is moved forward.

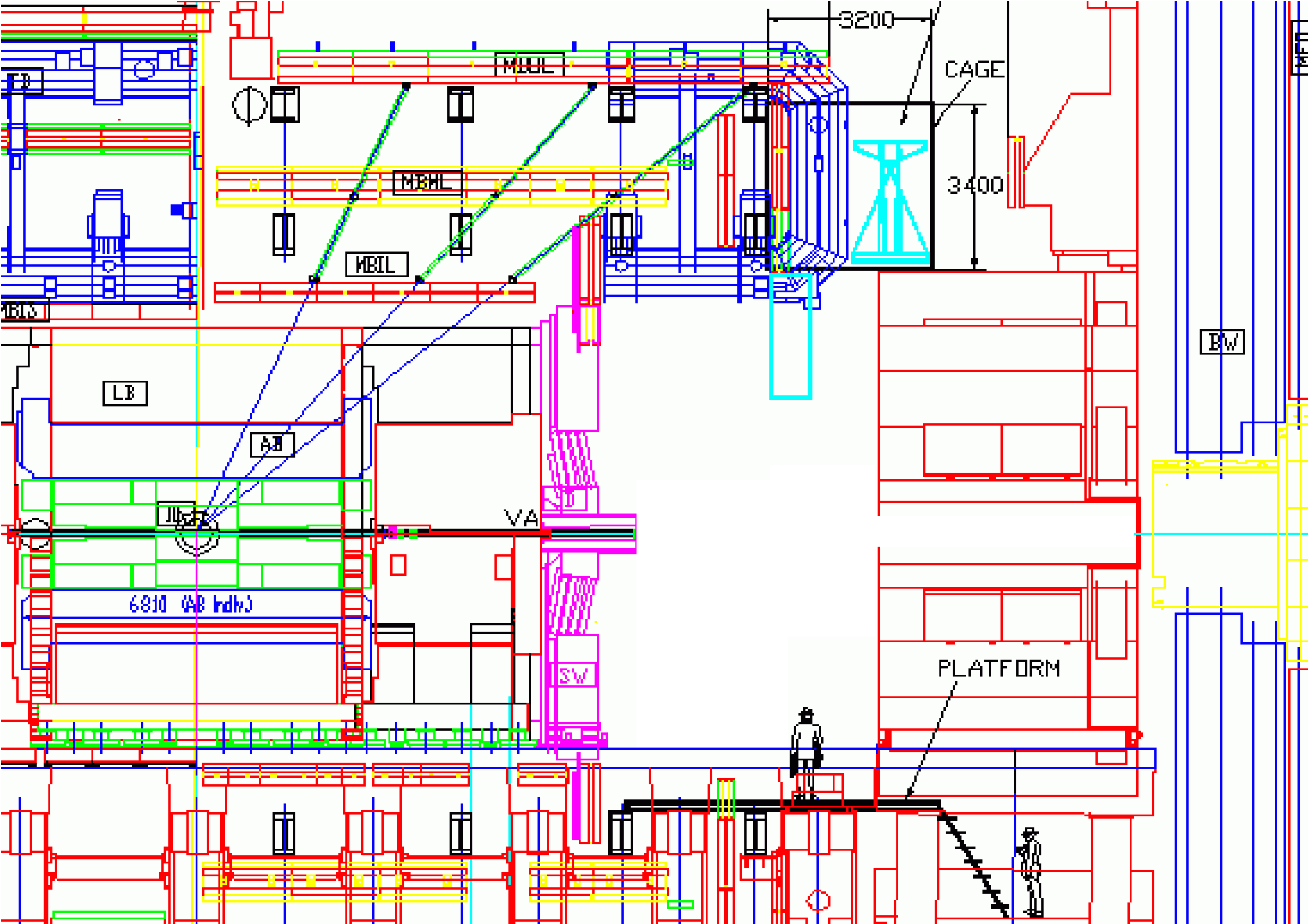


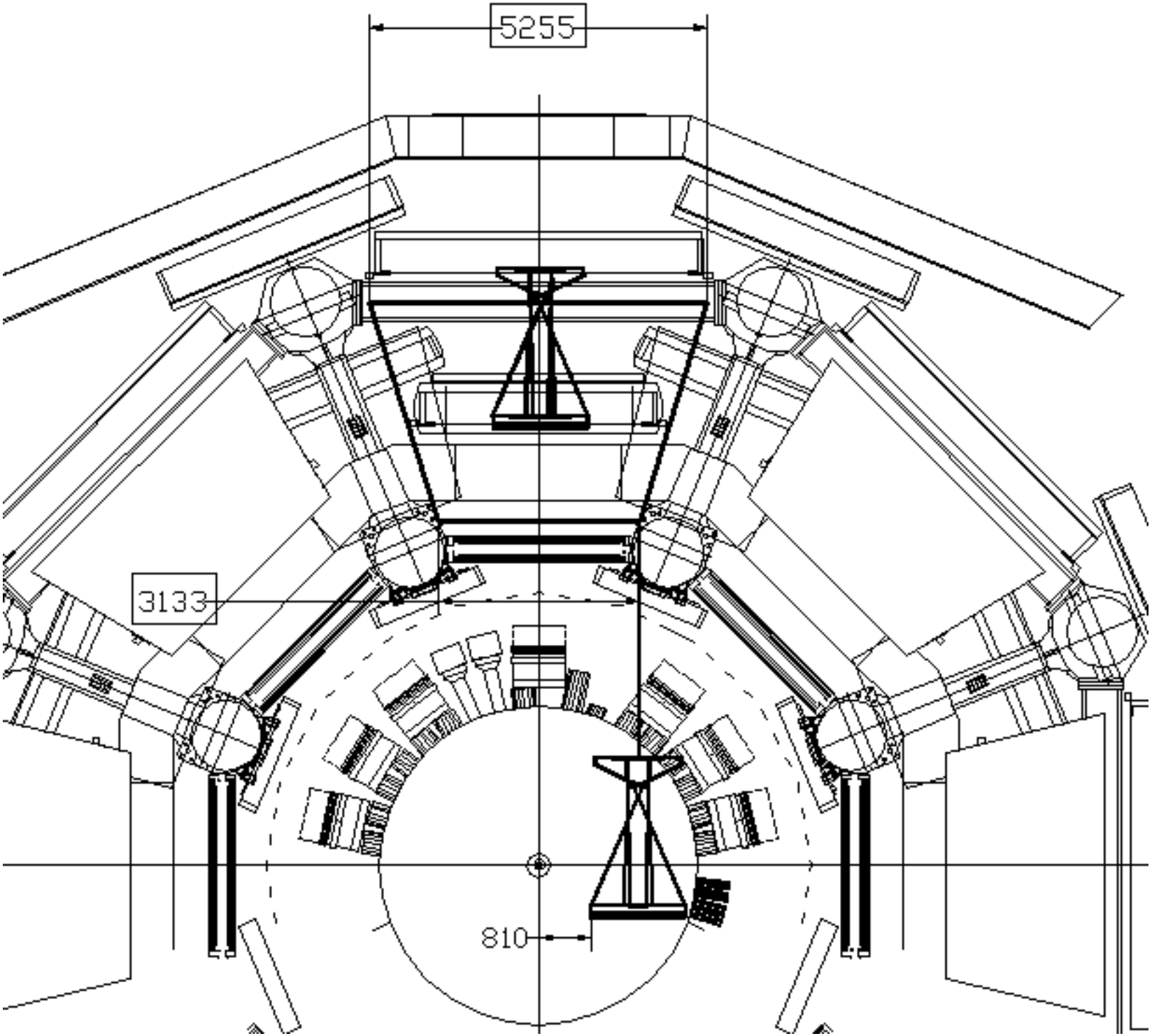
25. The endcap toroid is moved forward.

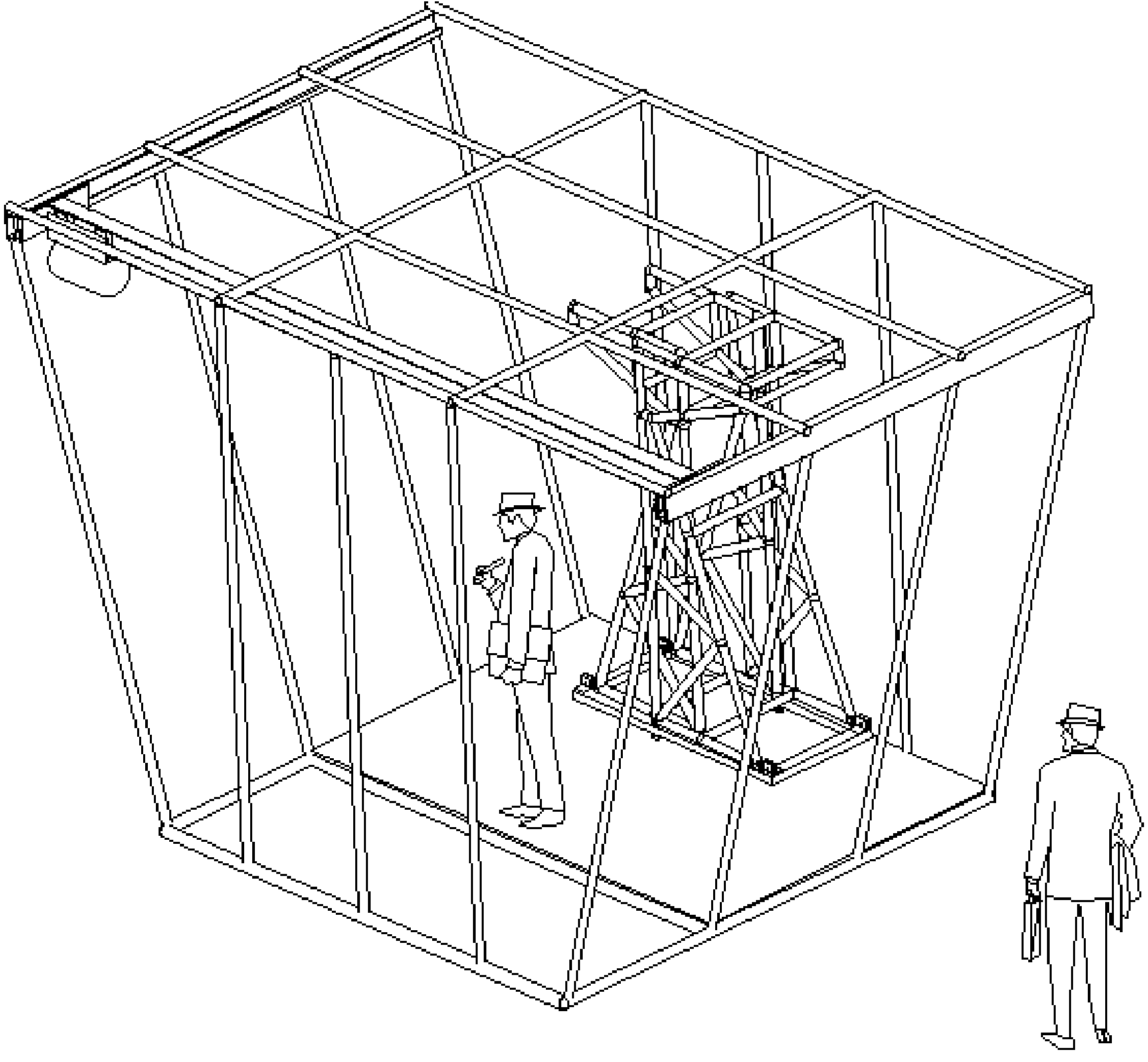


25. The endcap toroid is moved forward.

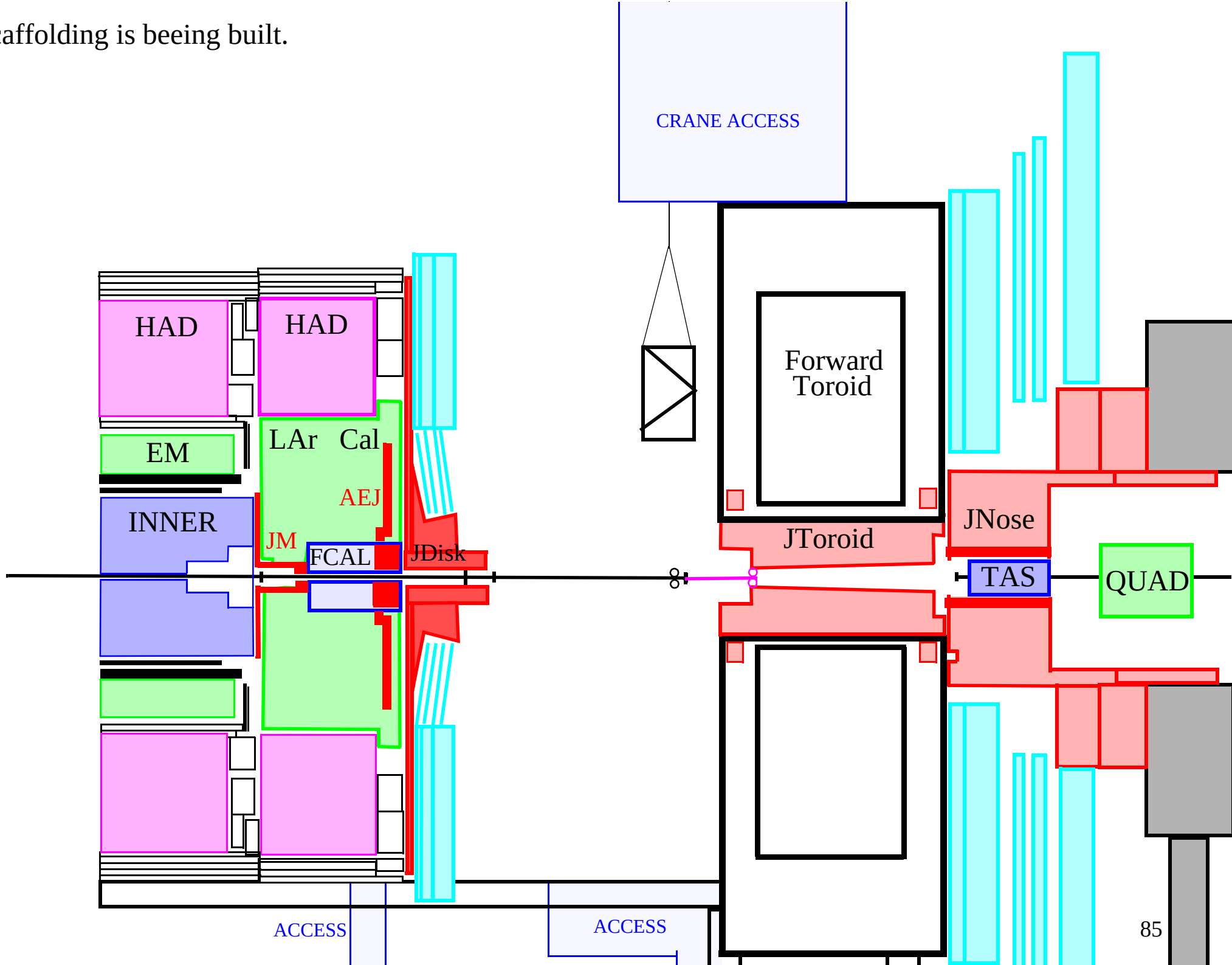



3200
CAGE
3400
MBHL
MBIL
LB
AB
VA
SV
BW
PLATFORM

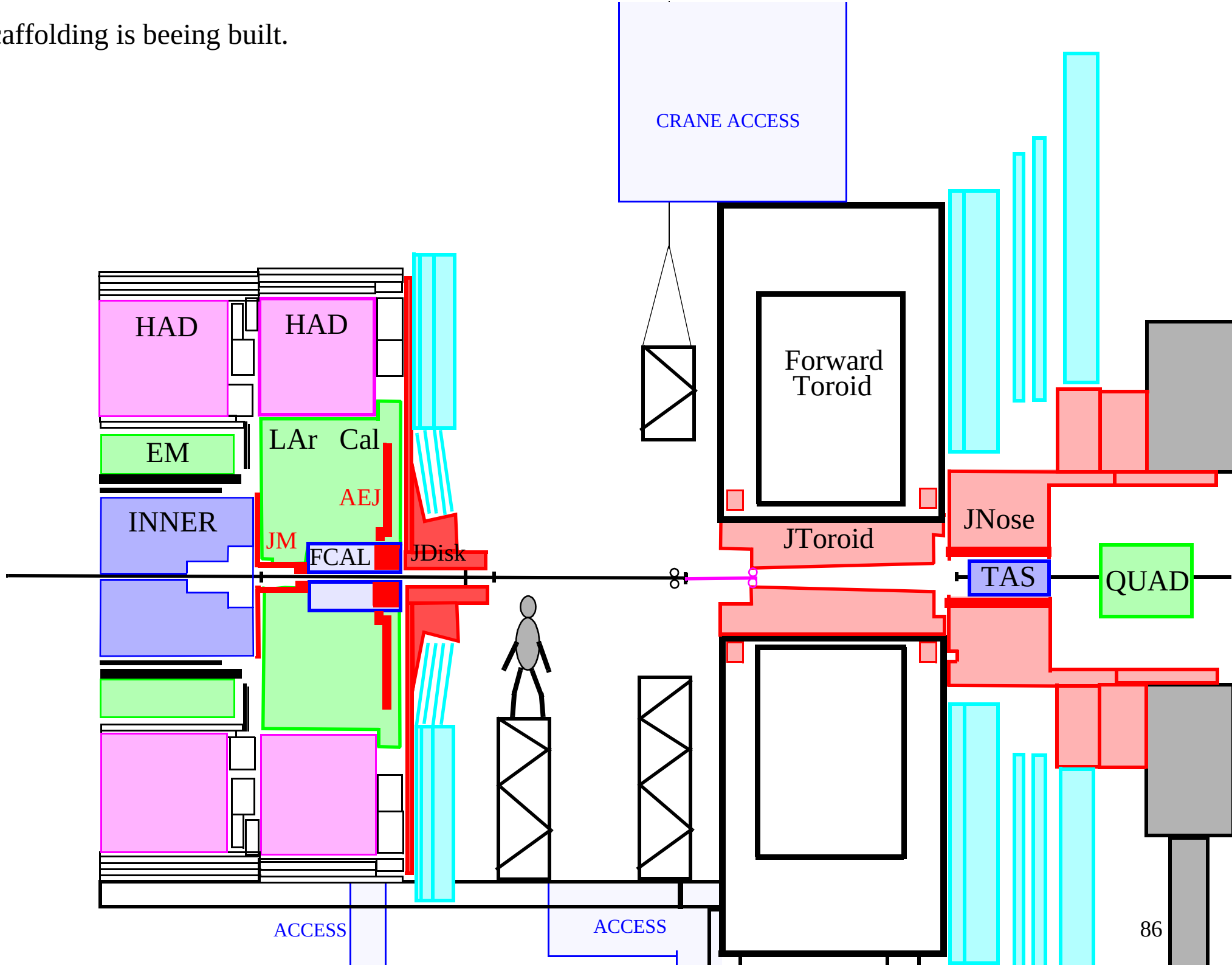

5255
3133
810



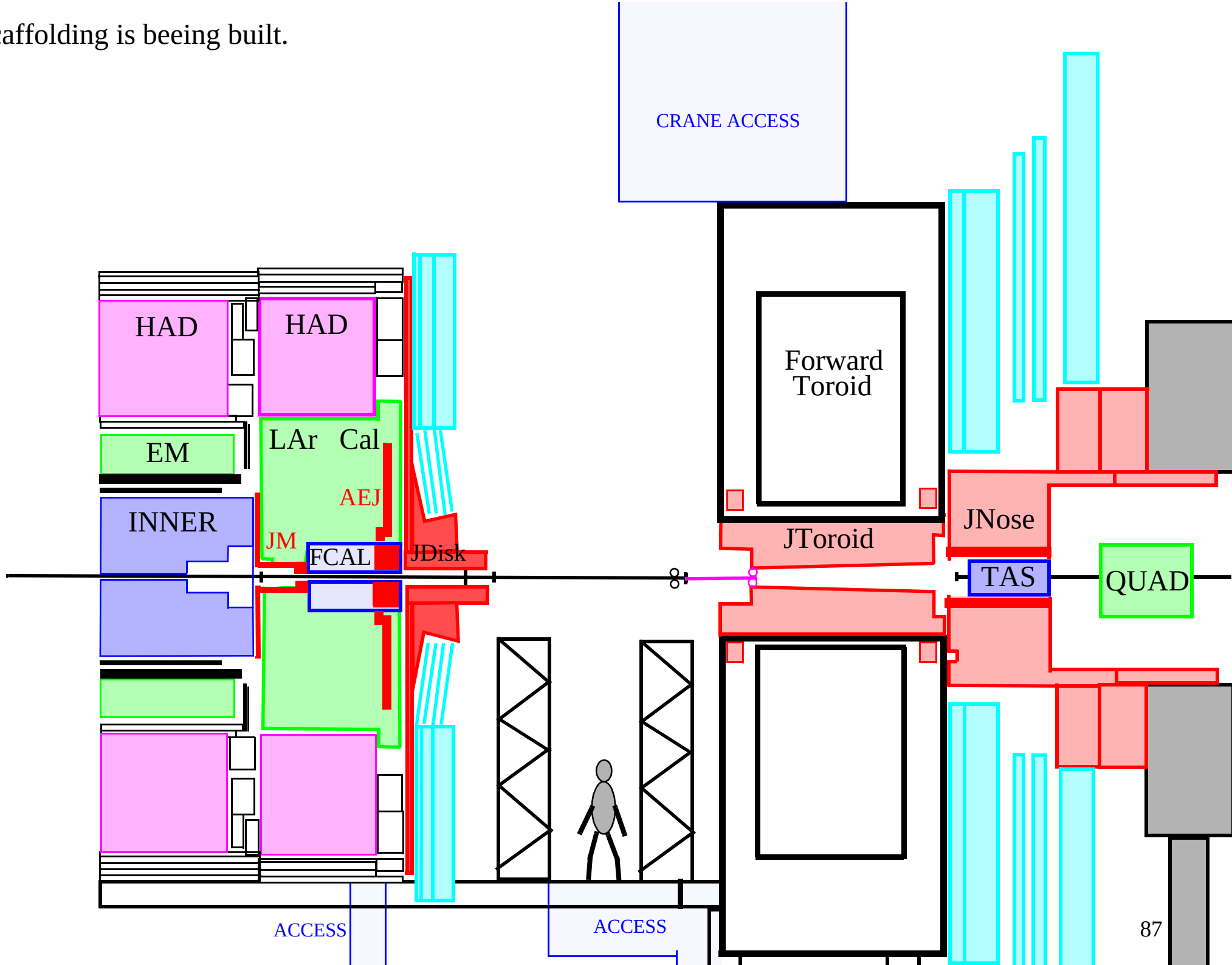
26. Scaffolding is beeing built.

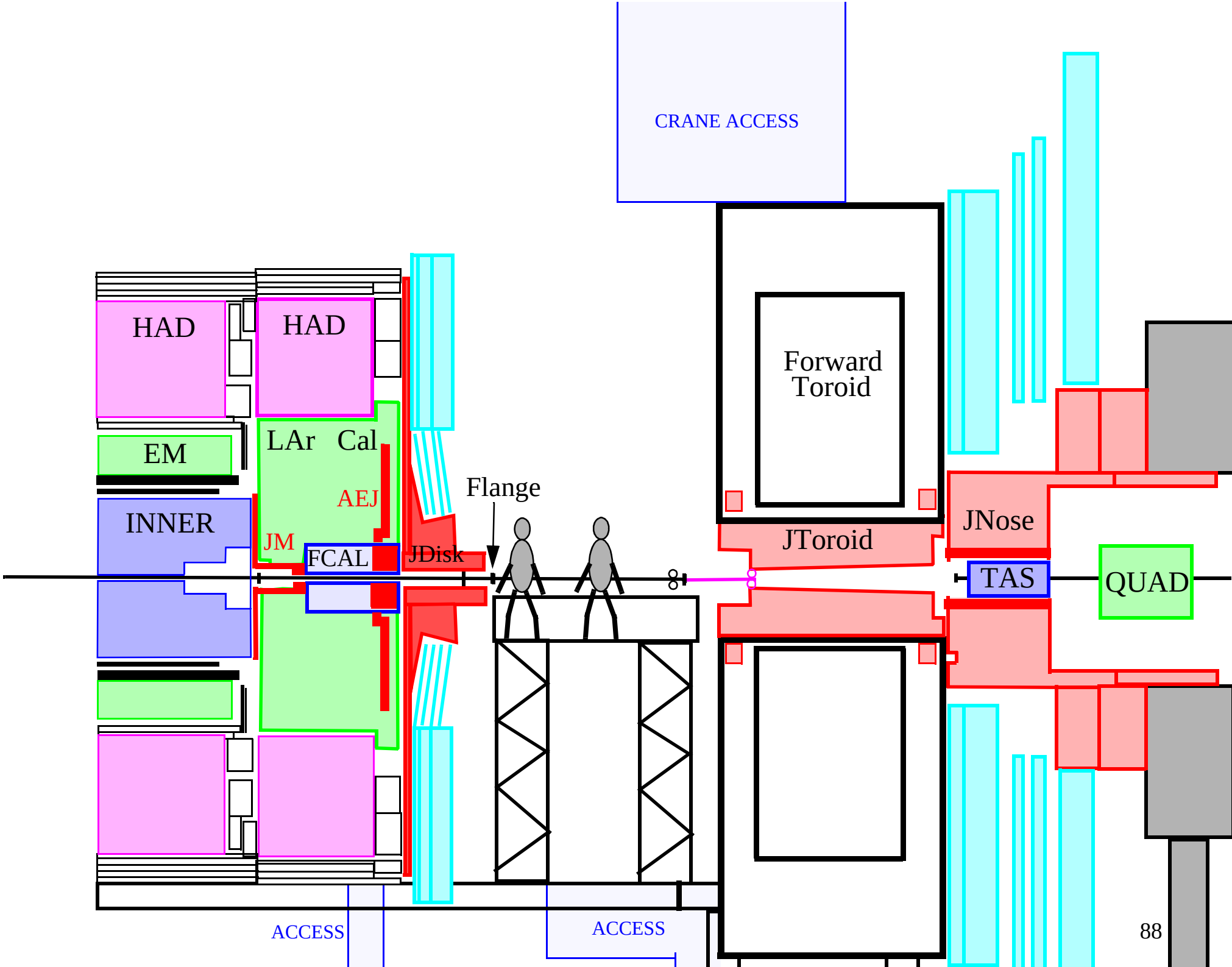


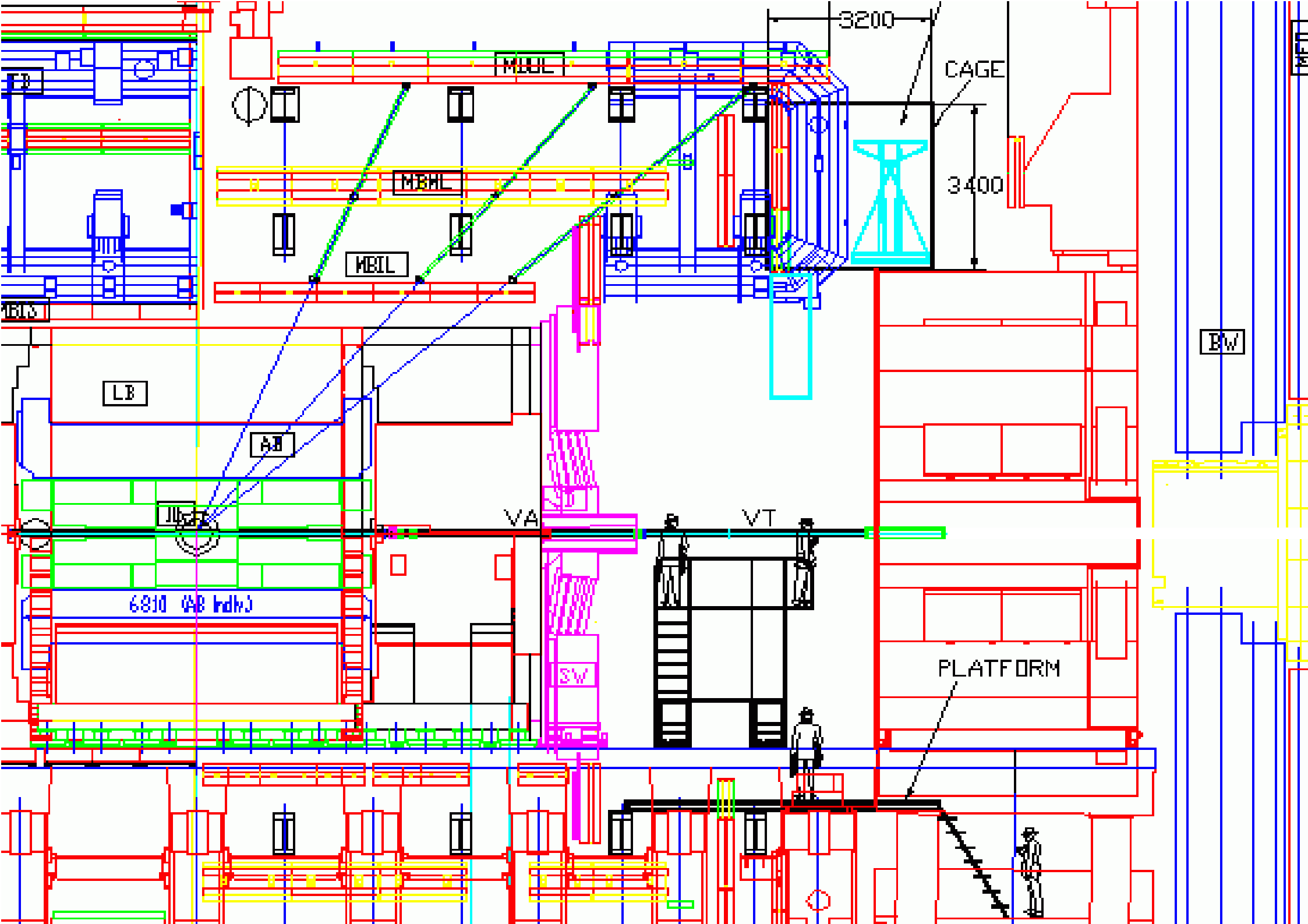
26. Scaffolding is beeing built.



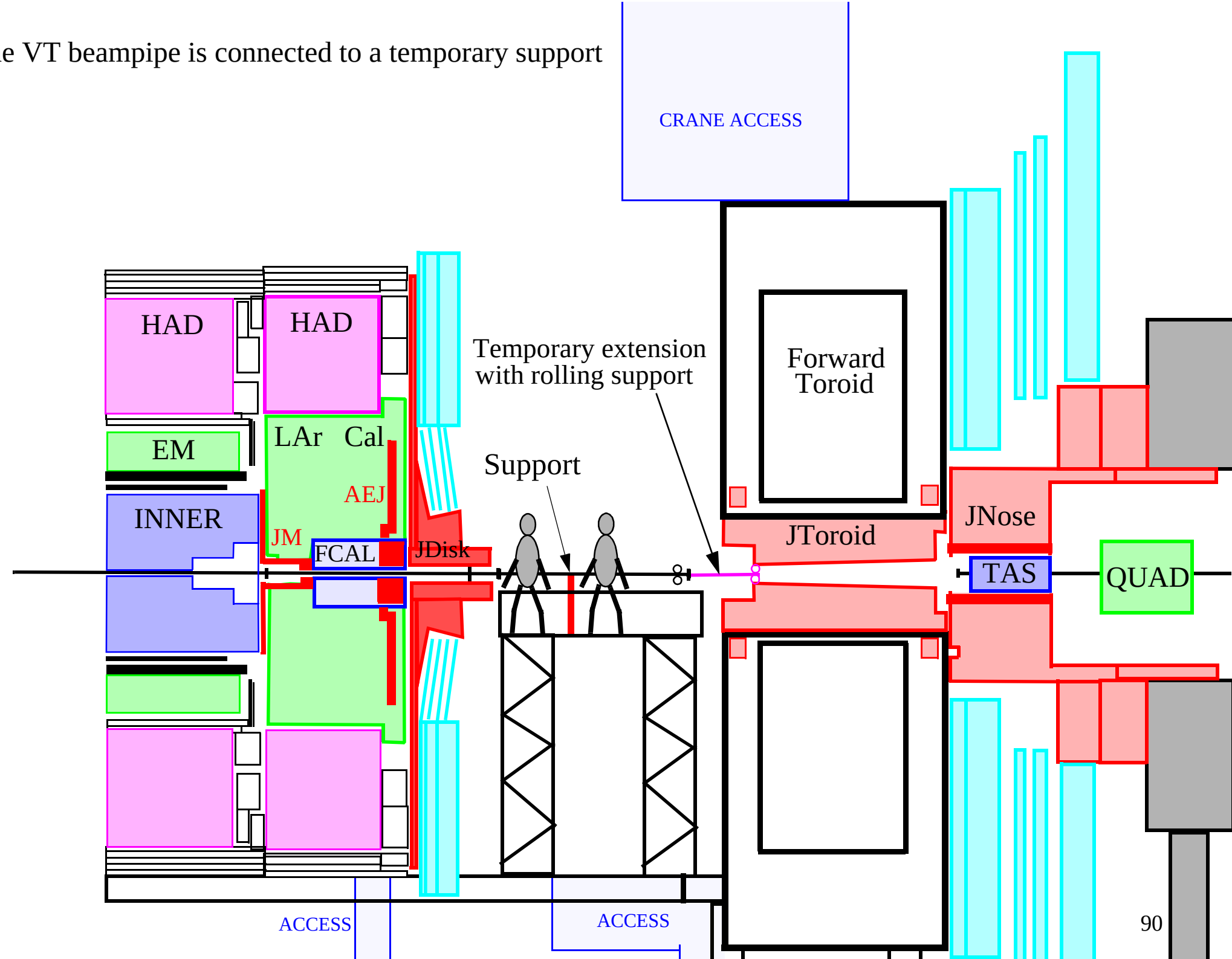
26. Scaffolding is beeing built.

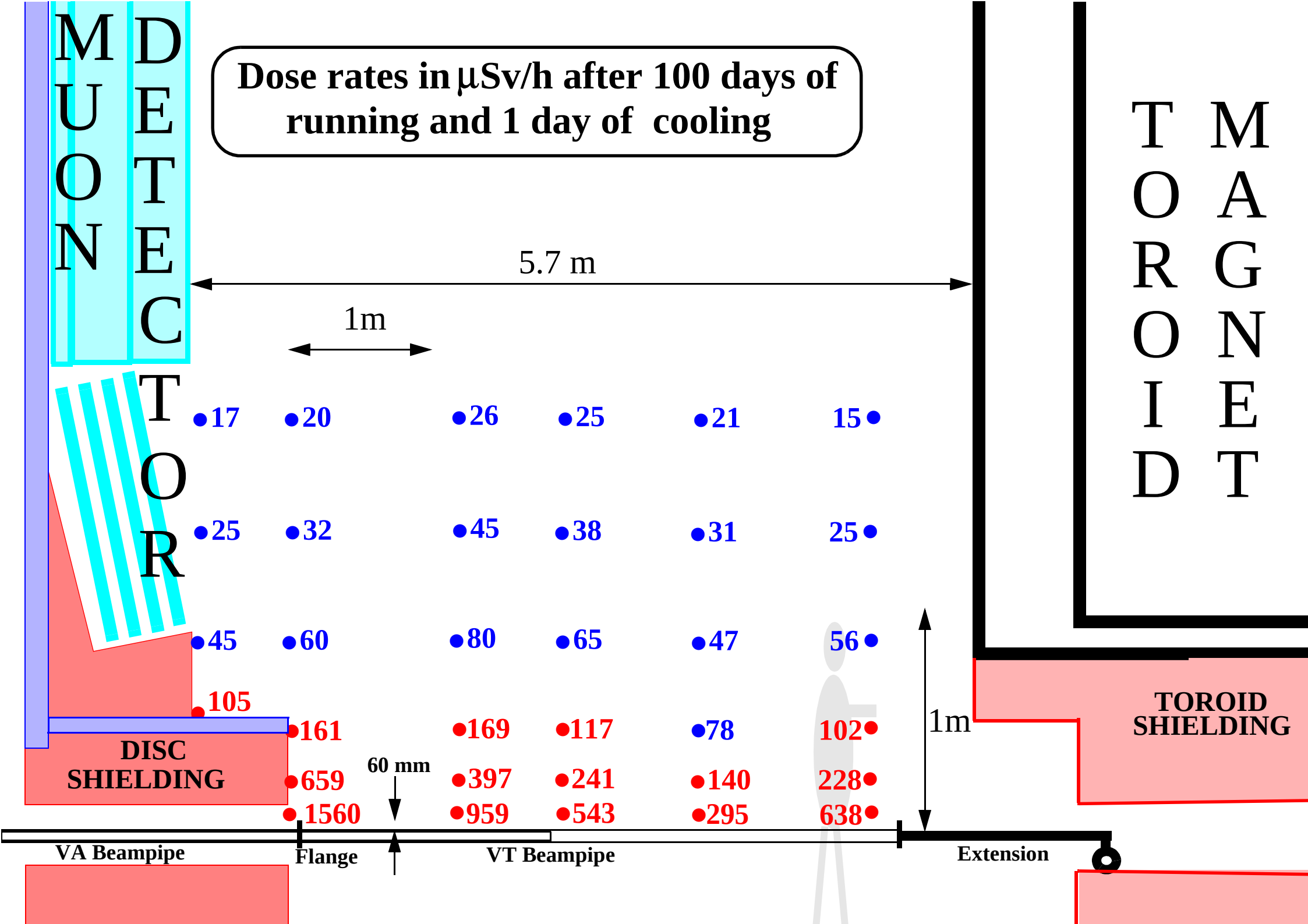



CRANE ACCESS
HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JDisk
Flange
Forward
Toroid
JToroid
JNose
TAS
QUAD
ACCESS
ACCESS

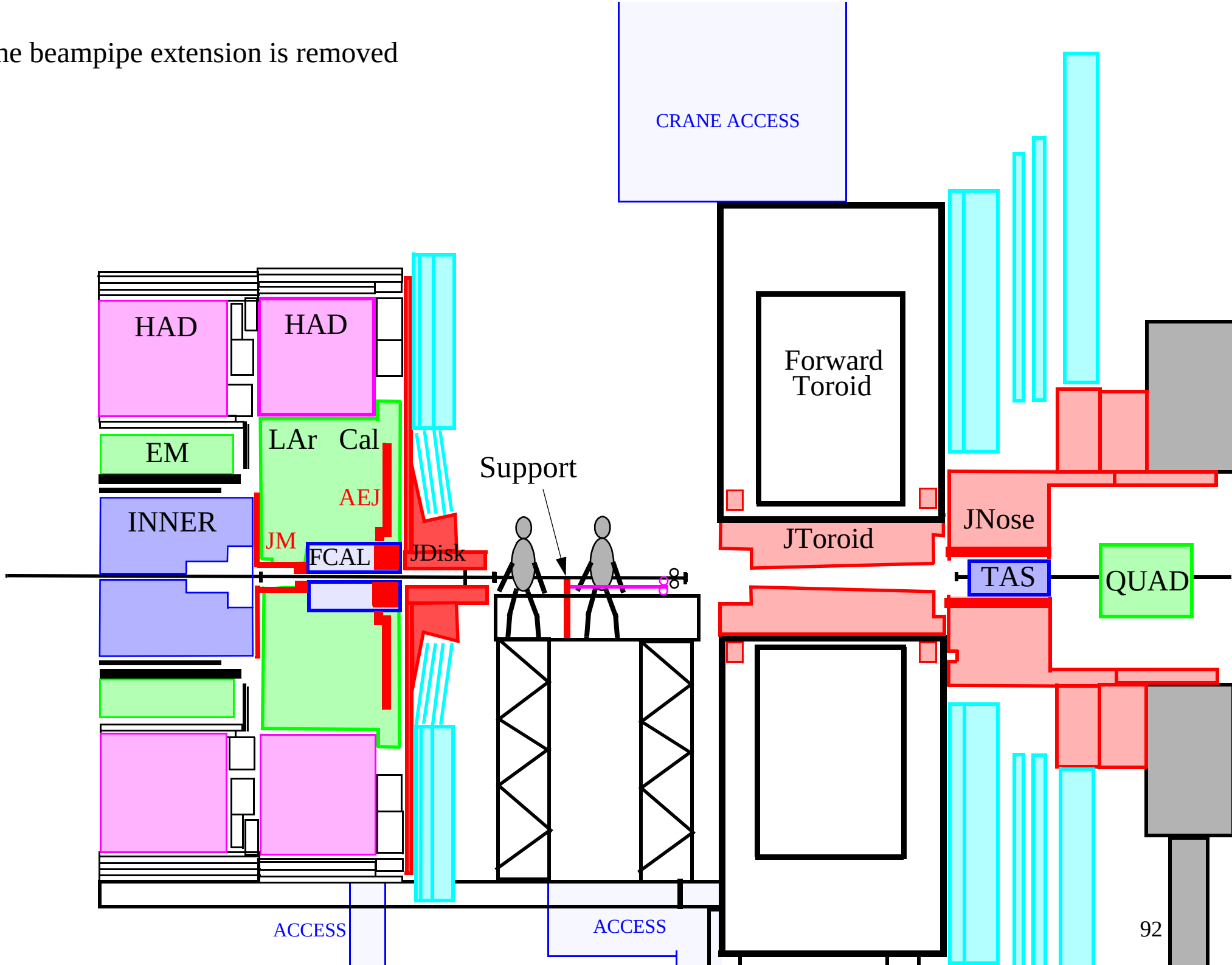

3200
CAGE
3400
MBAL
MBHL
MBIL
LB
AB
VA
VT
SV
BW
PLATFORM

27. The VT beampipe is connected to a temporary support

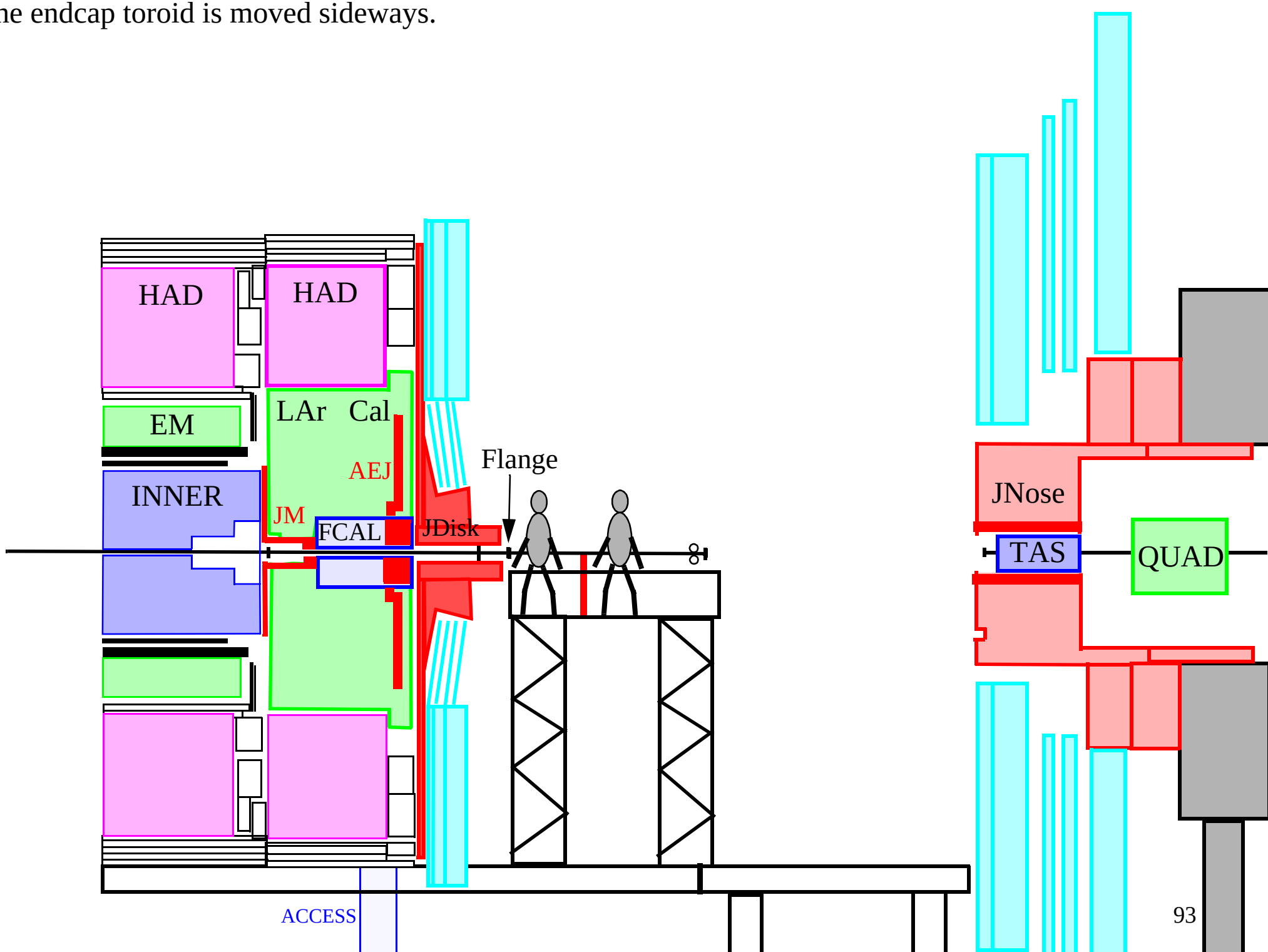



Dose rates in μSv/h after 100 days of running and 1 day of cooling
MUON DETECTOR
TOROID MAGNET
5.7 m
1m
17 20 26 25 21 15
25 32 45 38 31 25
45 60 80 65 47 56
105 161 169 117 78 102
659 397 241 140 228
1560 959 543 295 638
60 mm
1m
DISC SHIELDING
TOROID SHIELDING
VA Beampipe
Flange
VT Beampipe
Extension

28. The beampipe extension is removed

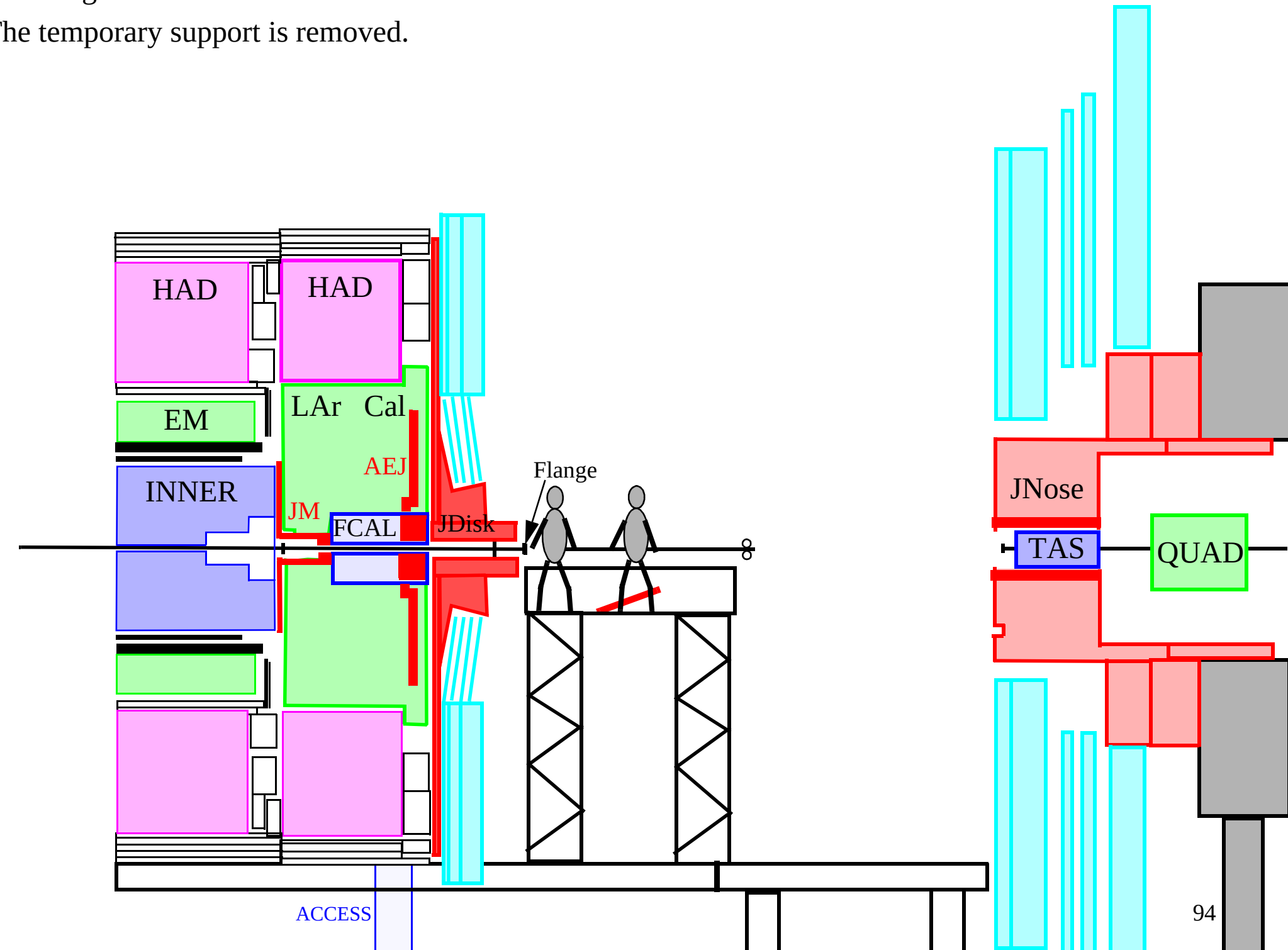


29. The endcap toroid is moved sideways.

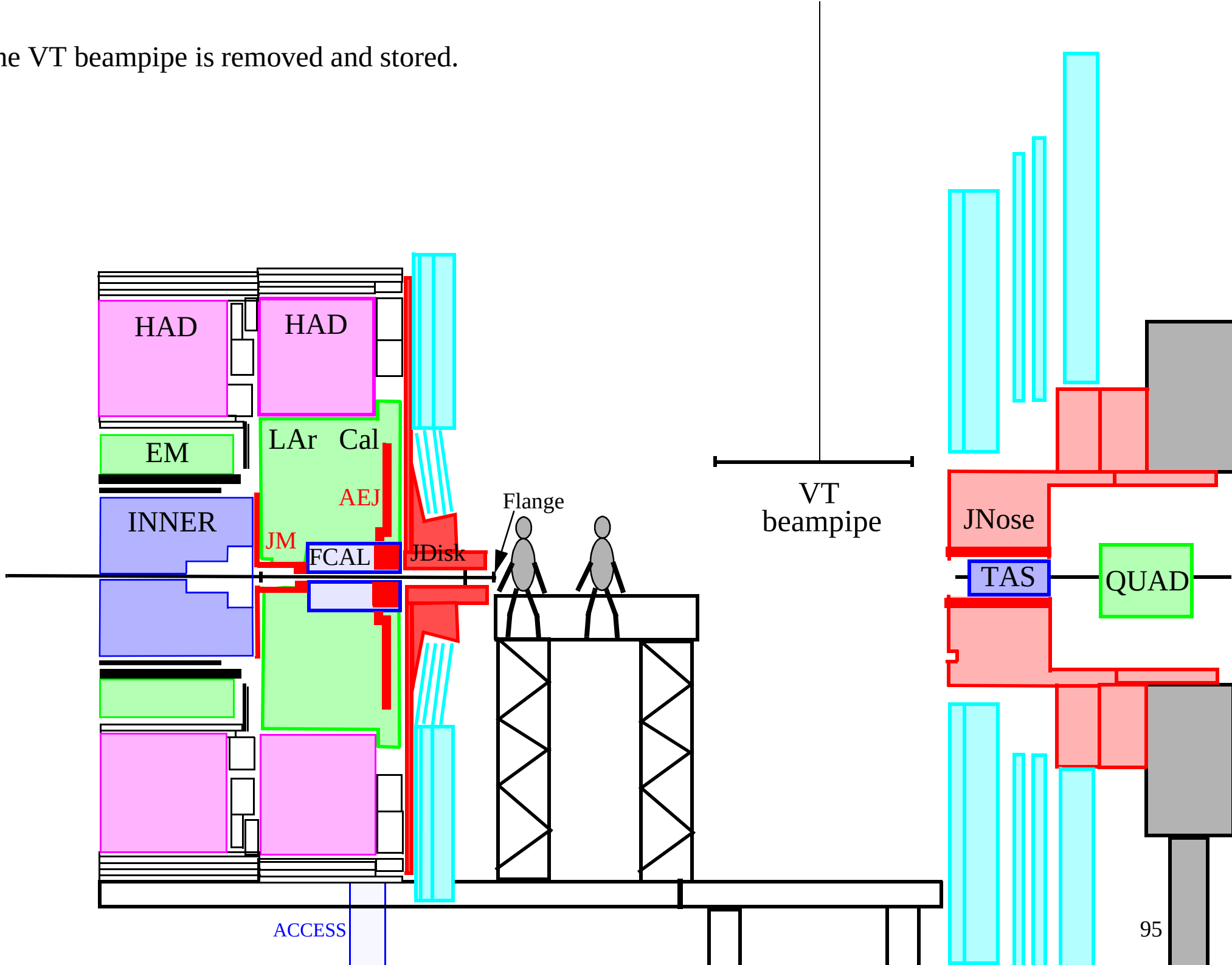


30. The flange is undone.

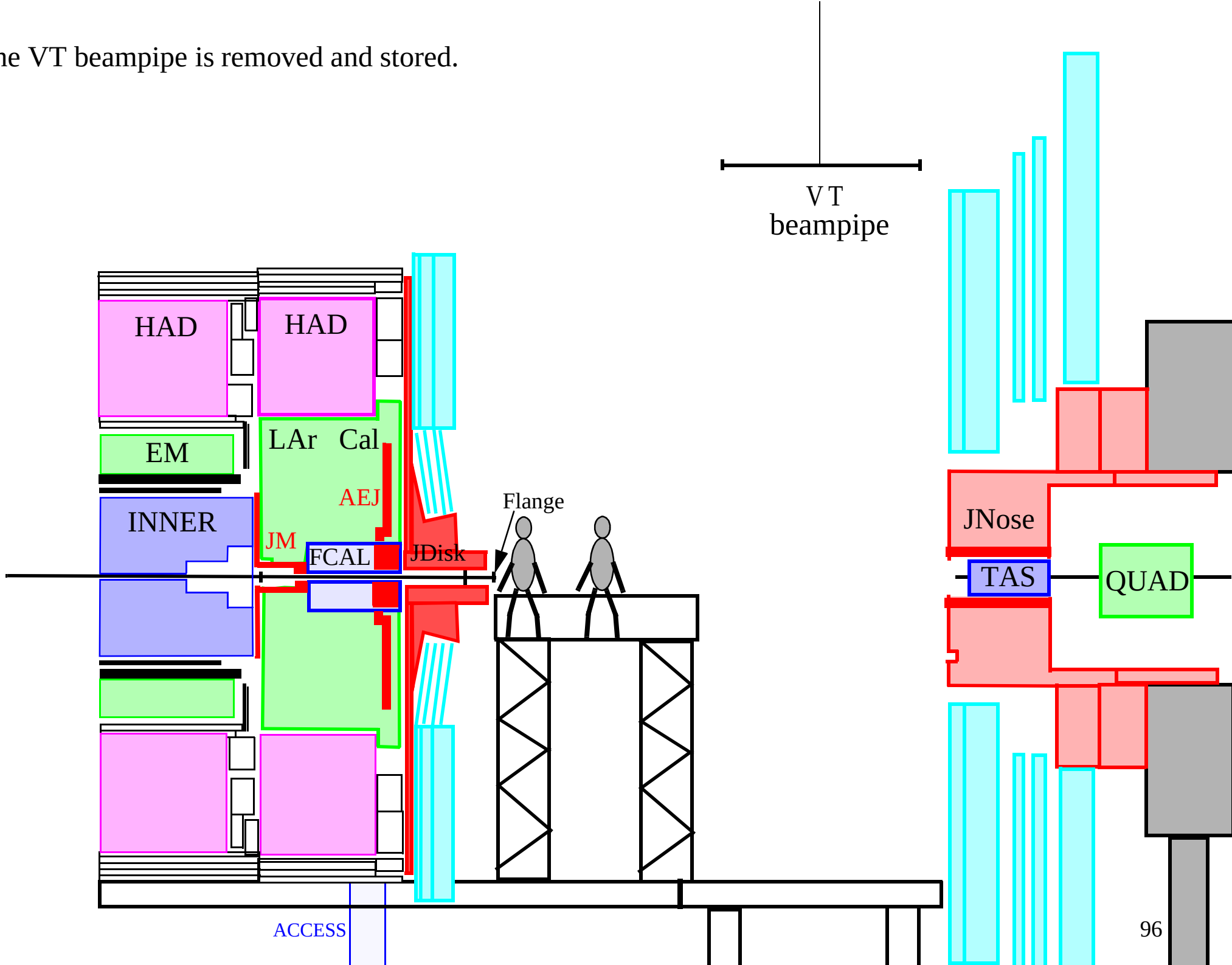
31. The temporary support is removed.



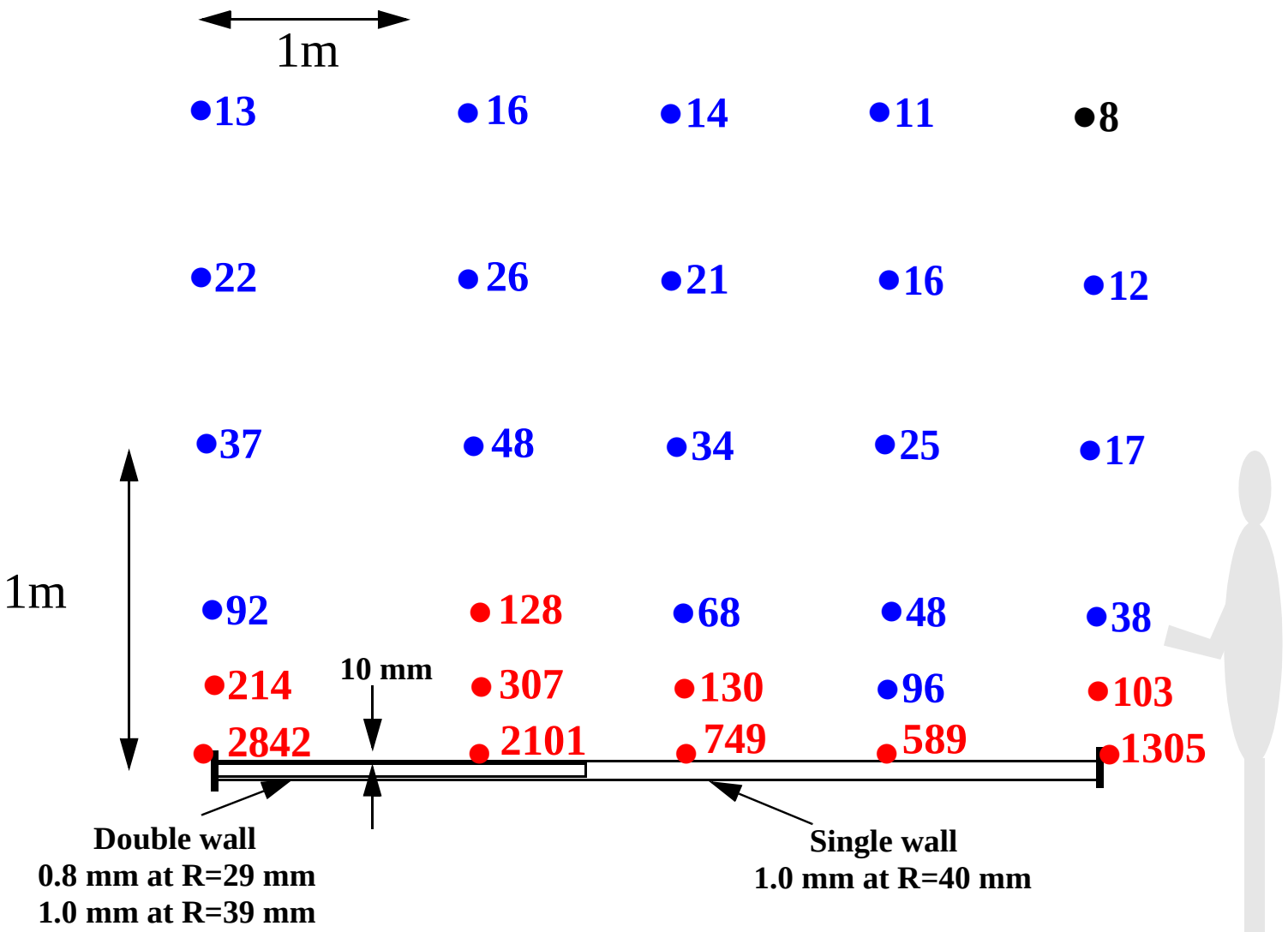
32. The VT beampipe is removed and stored.



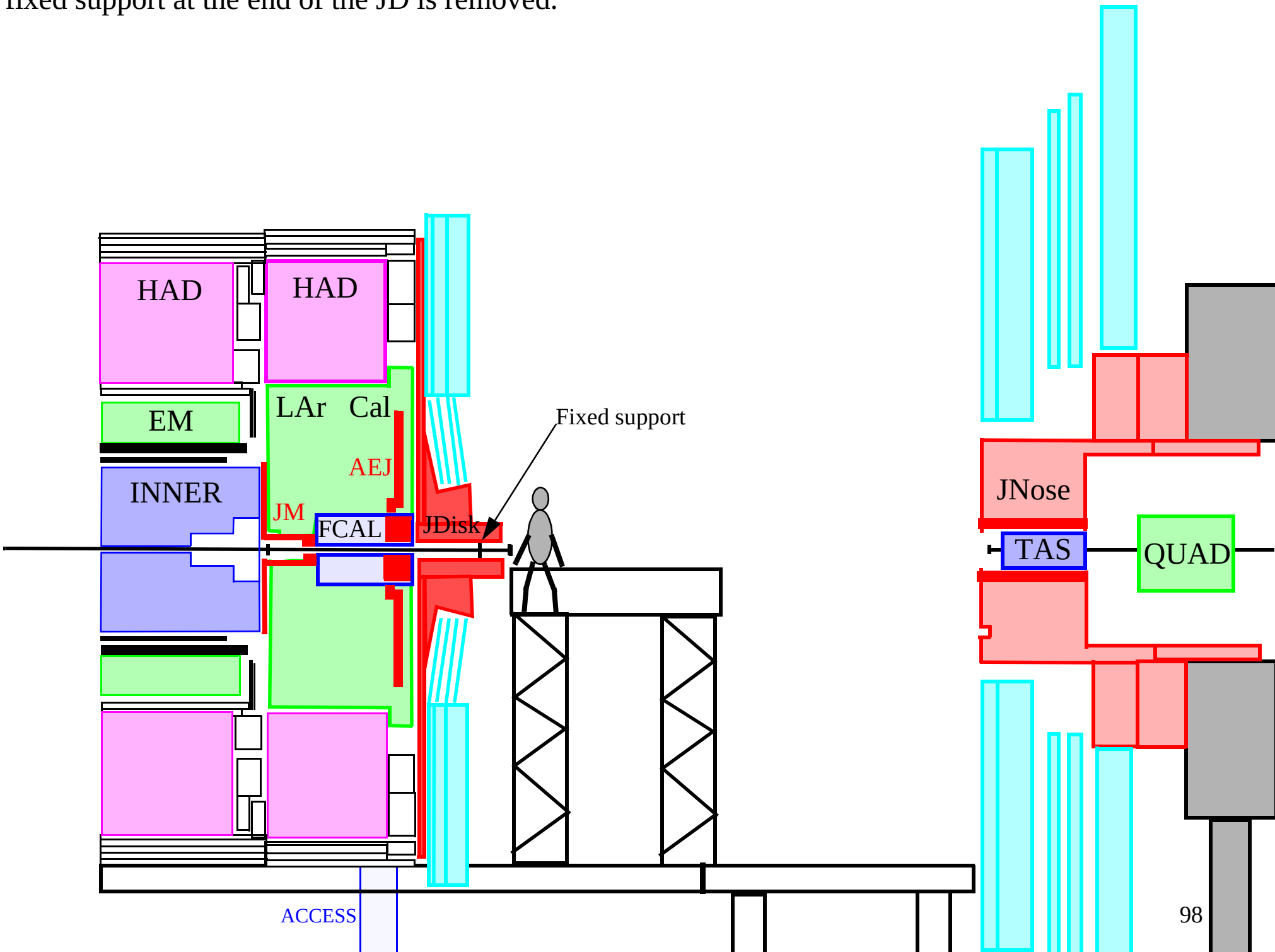
32. The VT beampipe is removed and stored.



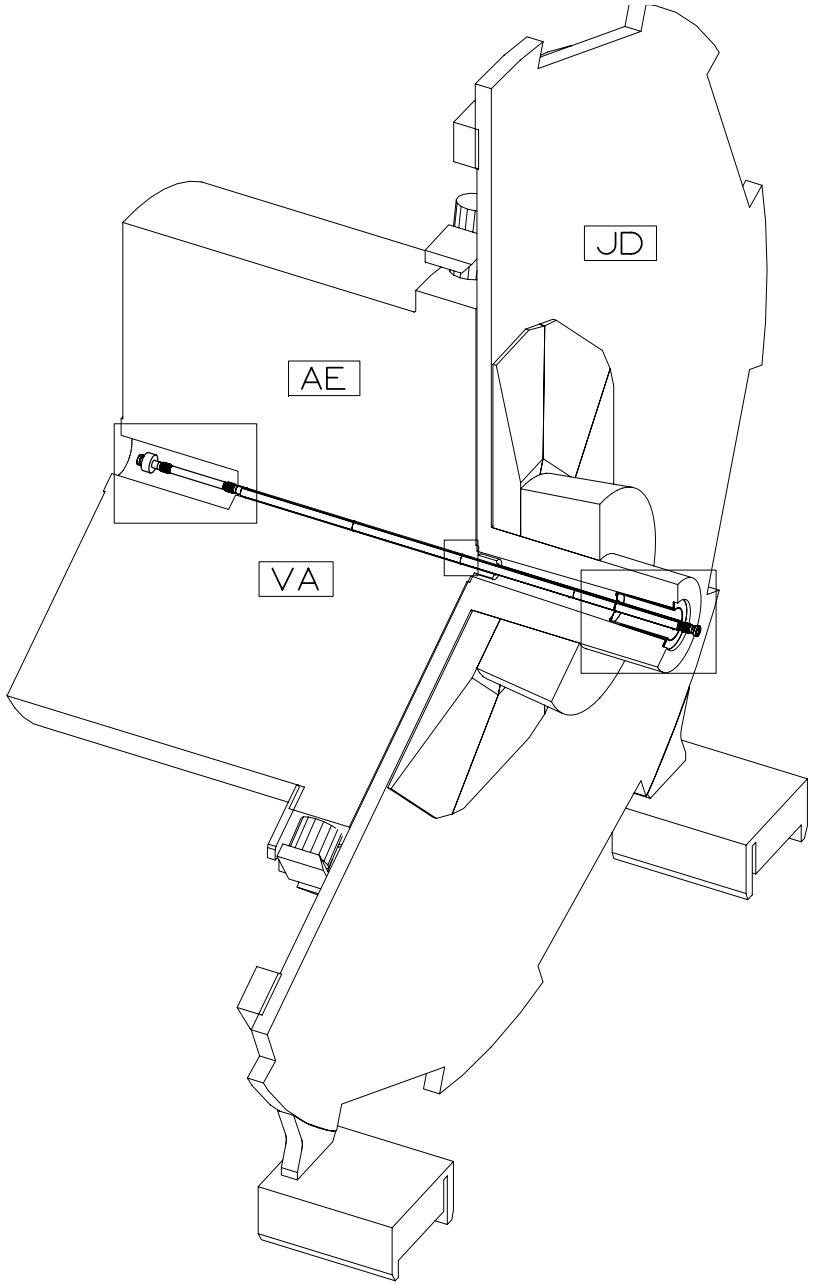
Dose rates in μSv/h from the VT beampipe after 100 days of running and 5 days of cooling.

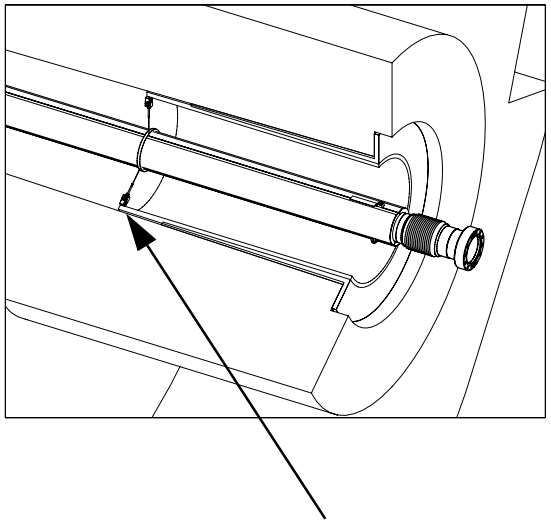


33. The fixed support at the end of the JD is removed.



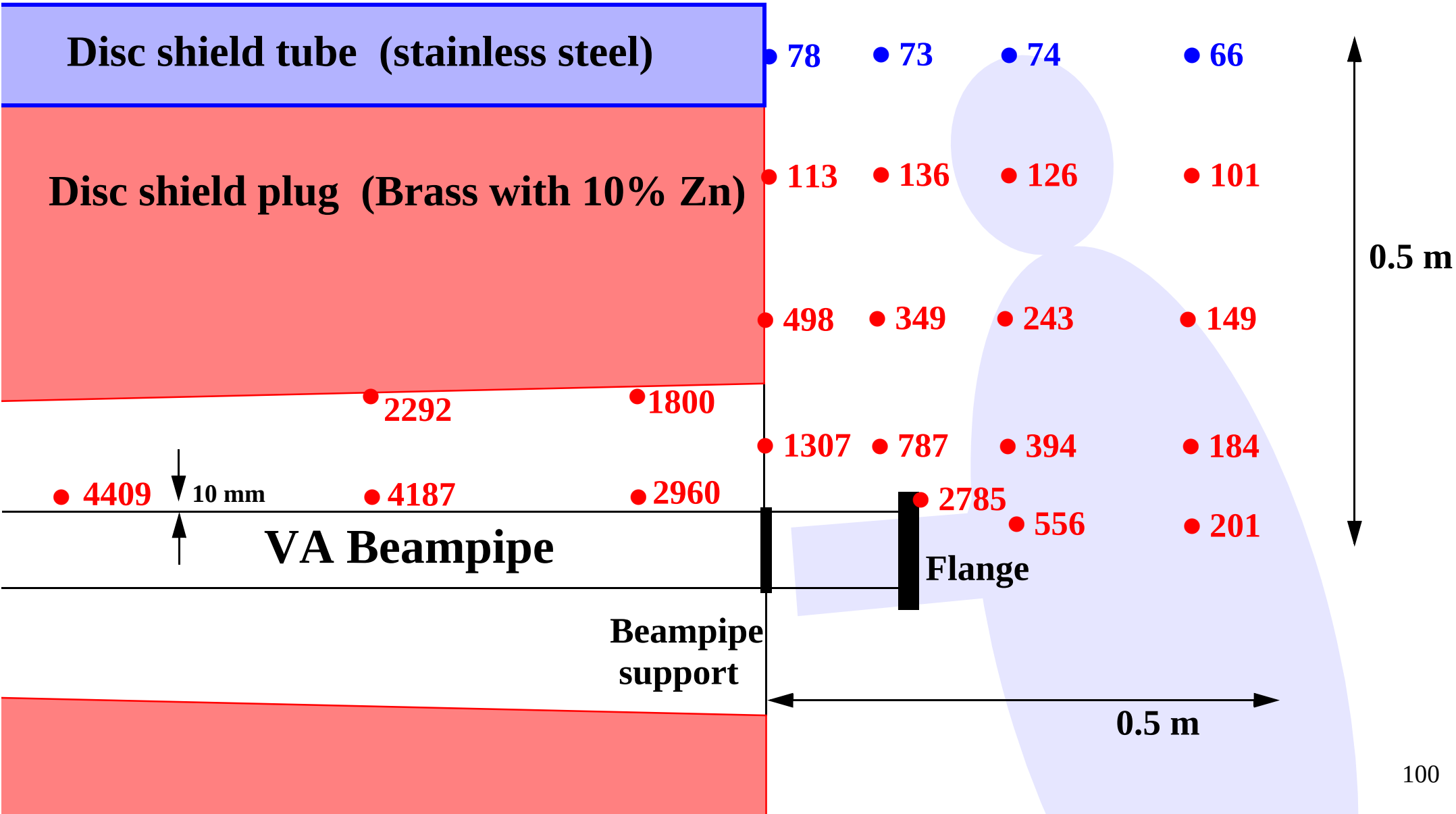
Beampipe supports



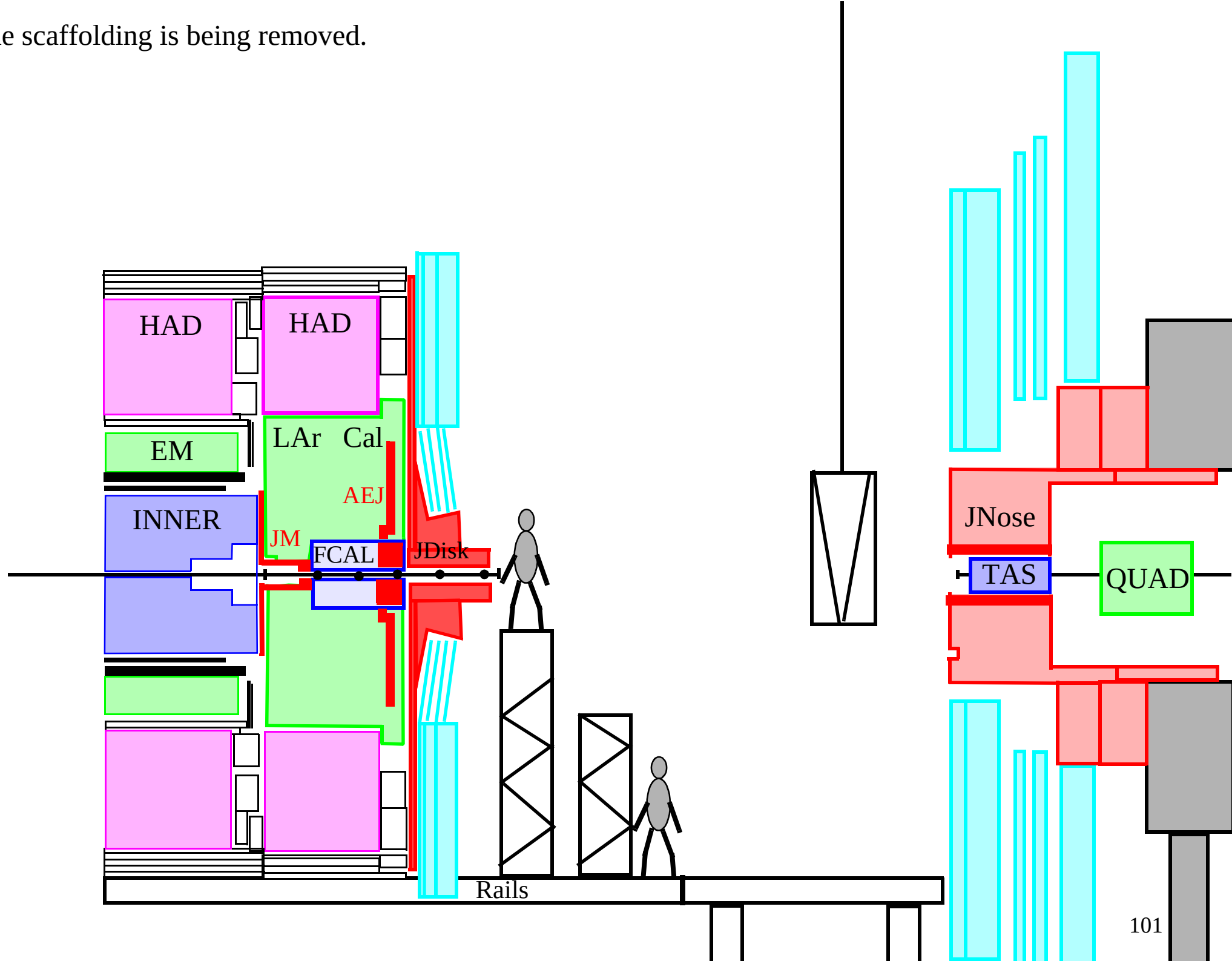


This support has to be removed.

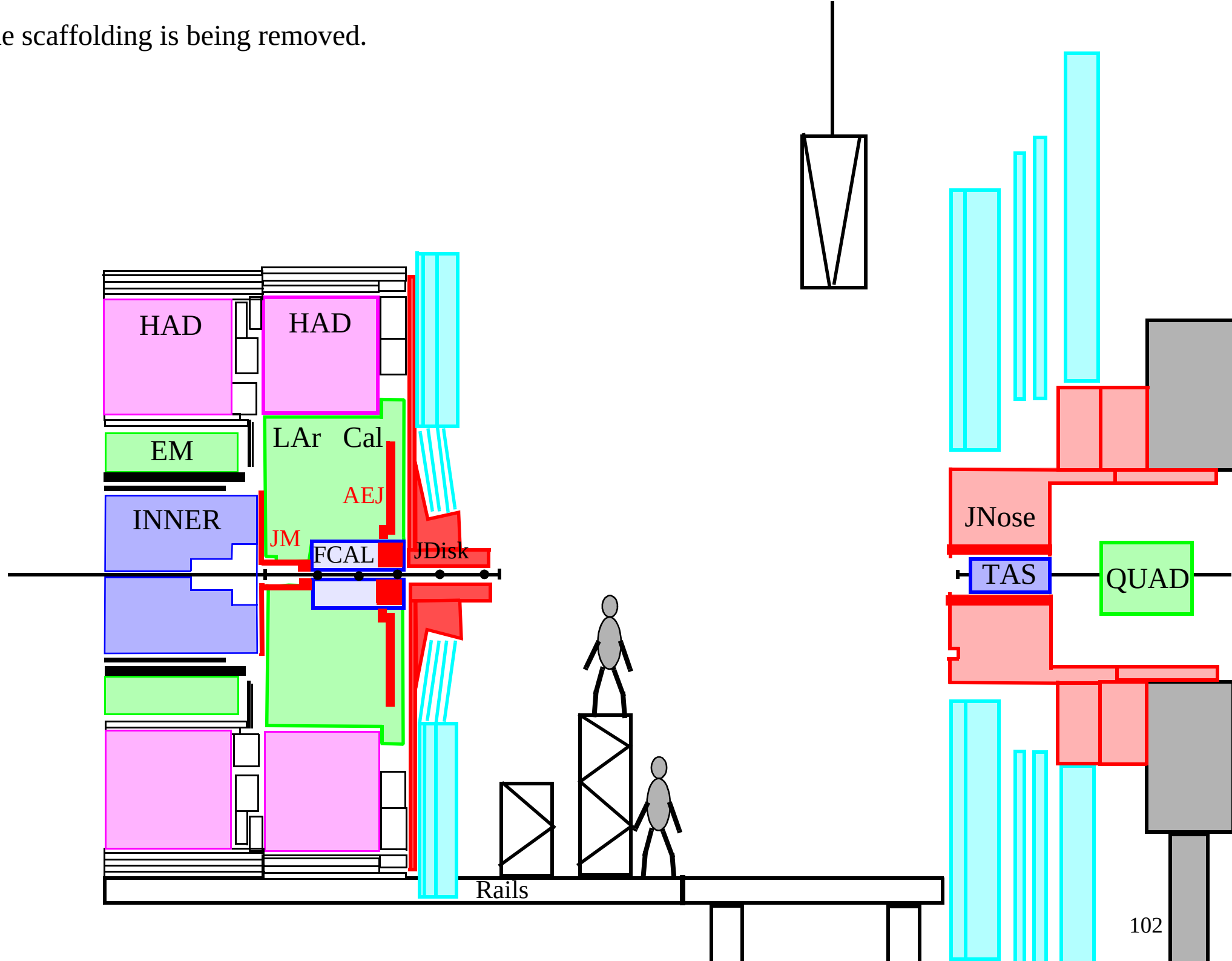
Dose rates in μSv/h after 100 days of running and 5 days of cooling

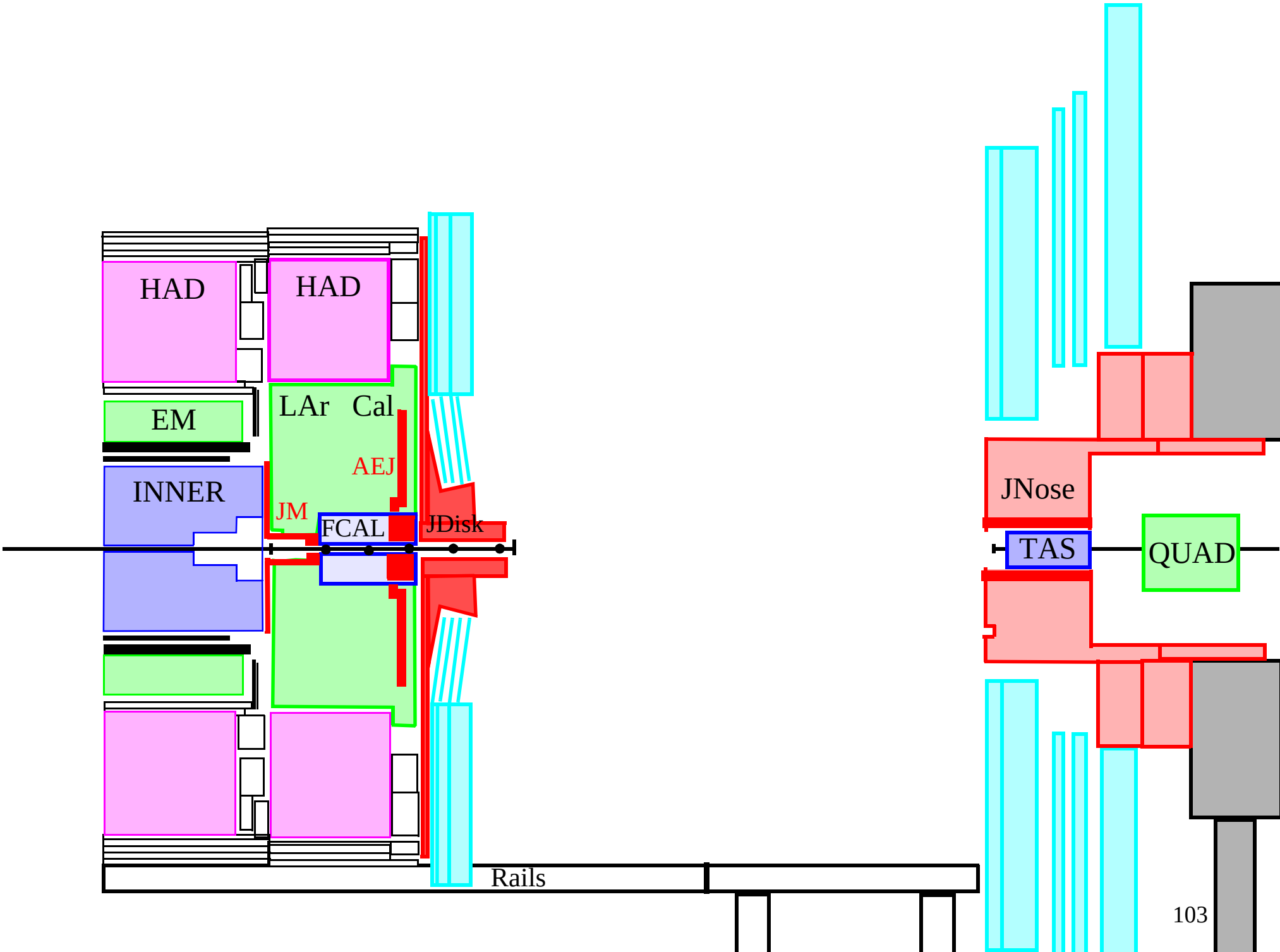


34. The scaffolding is being removed.

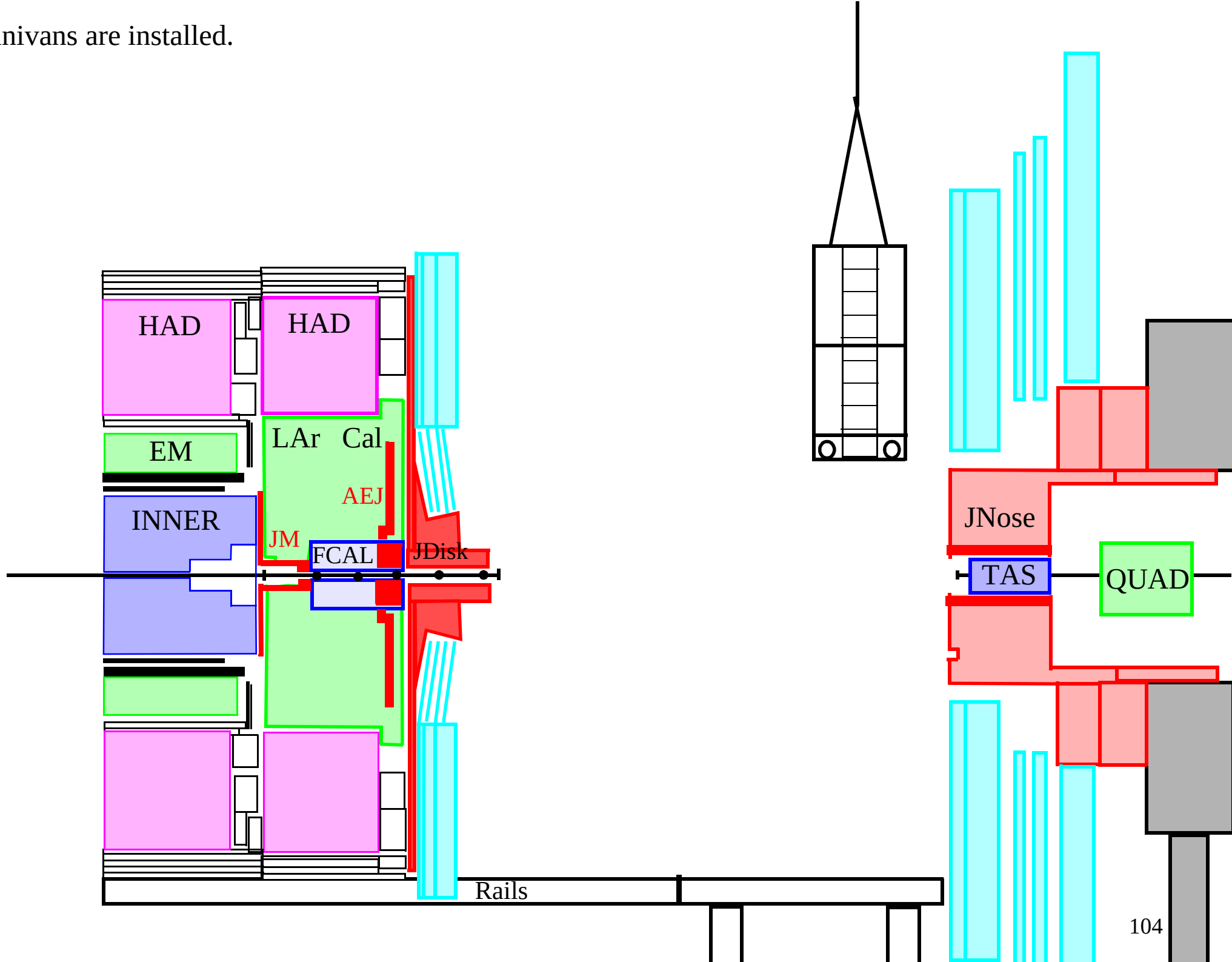


34. The scaffolding is being removed.

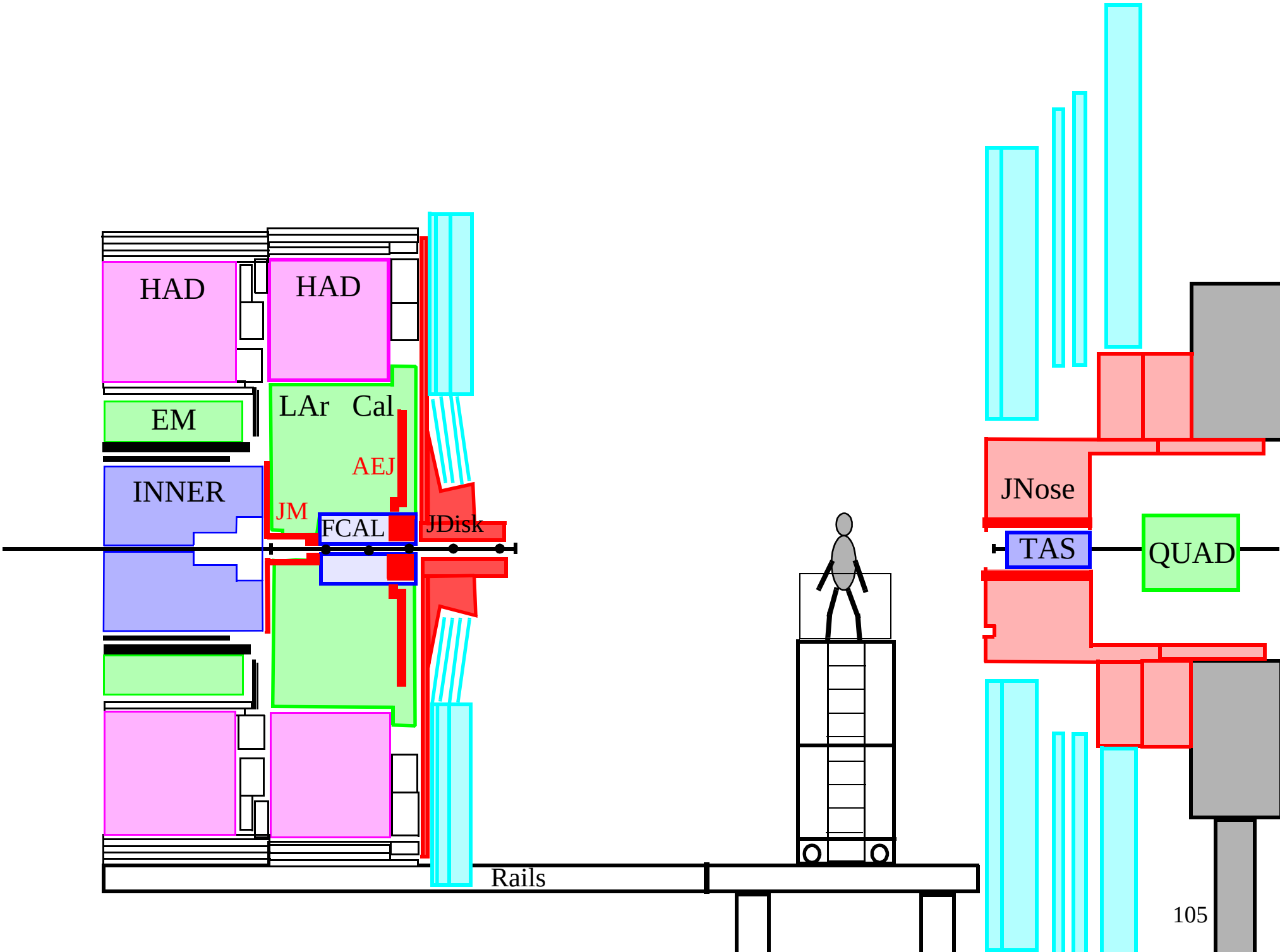



HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JDisk
JNose
TAS
QUAD
Rails

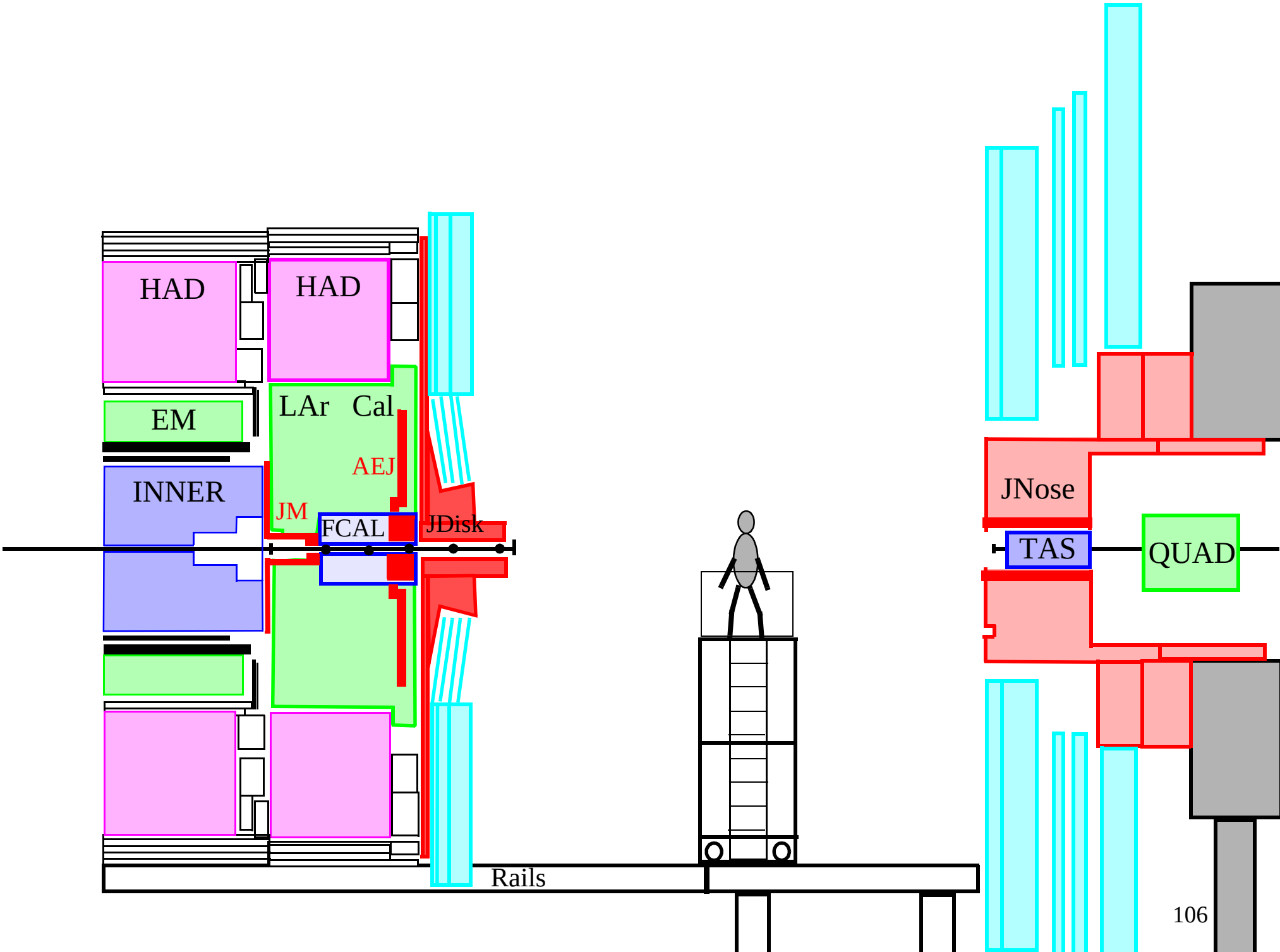
35. Minivans are installed.



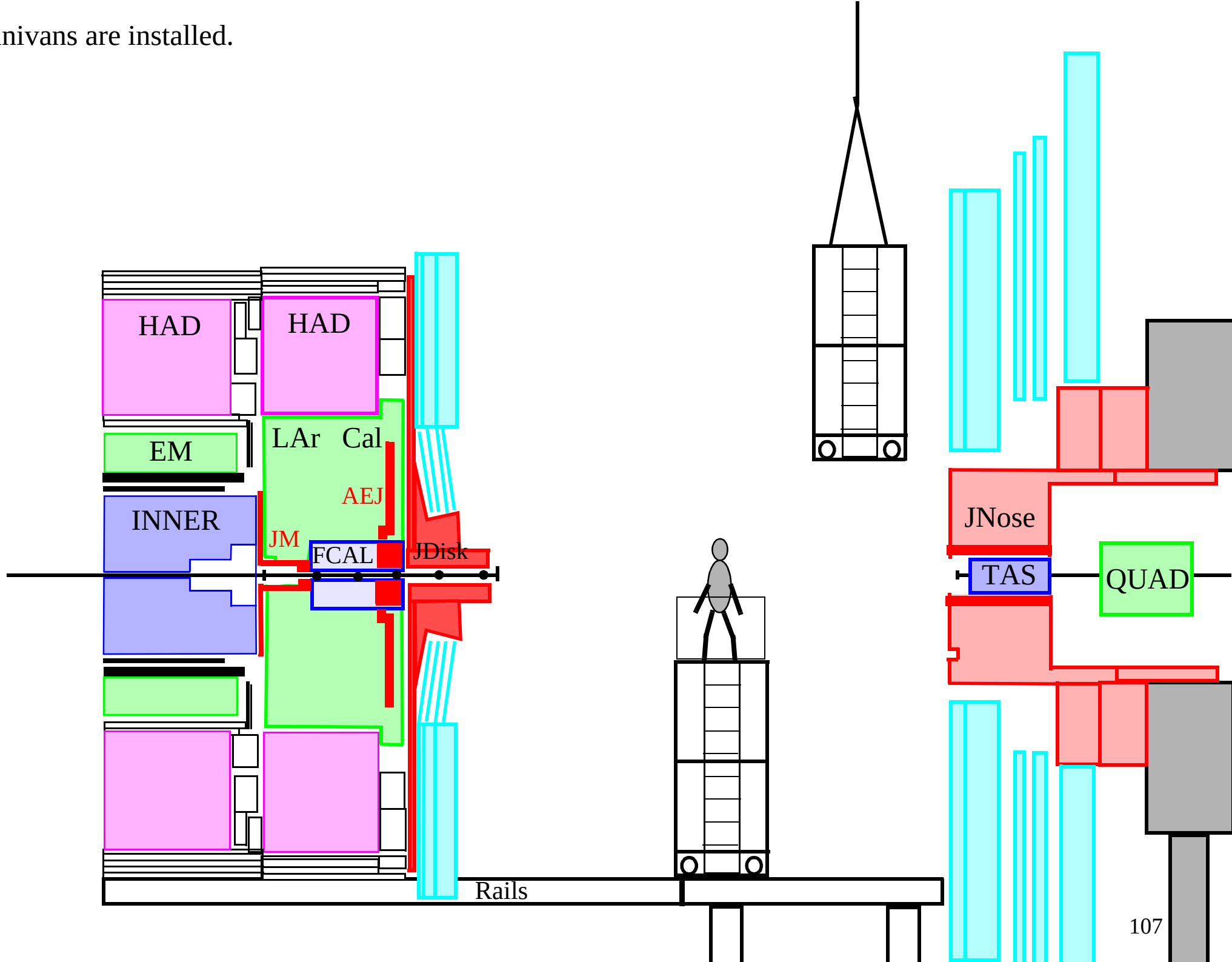
35. Minivans are installed.



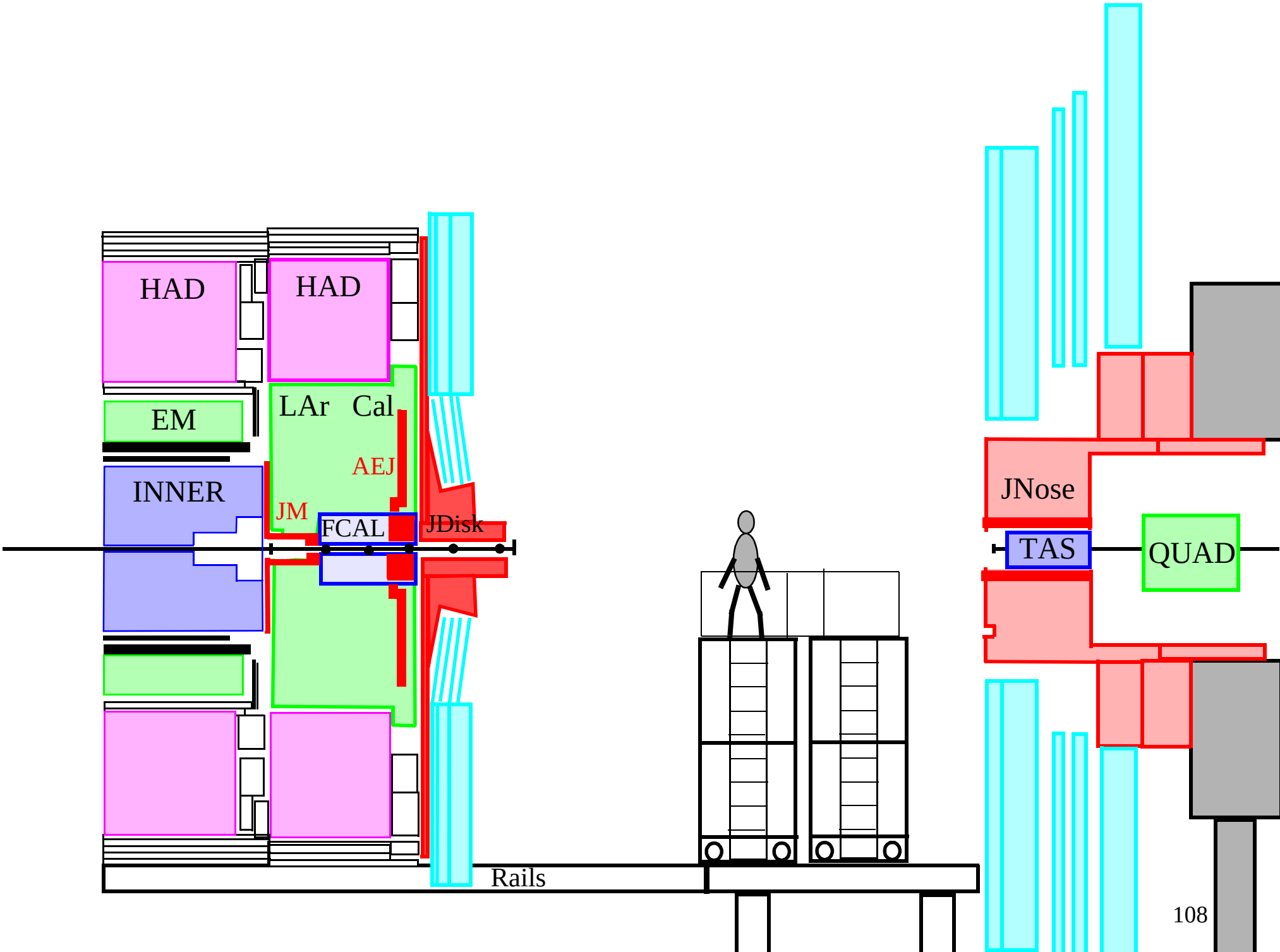
35. Minivans are installed.



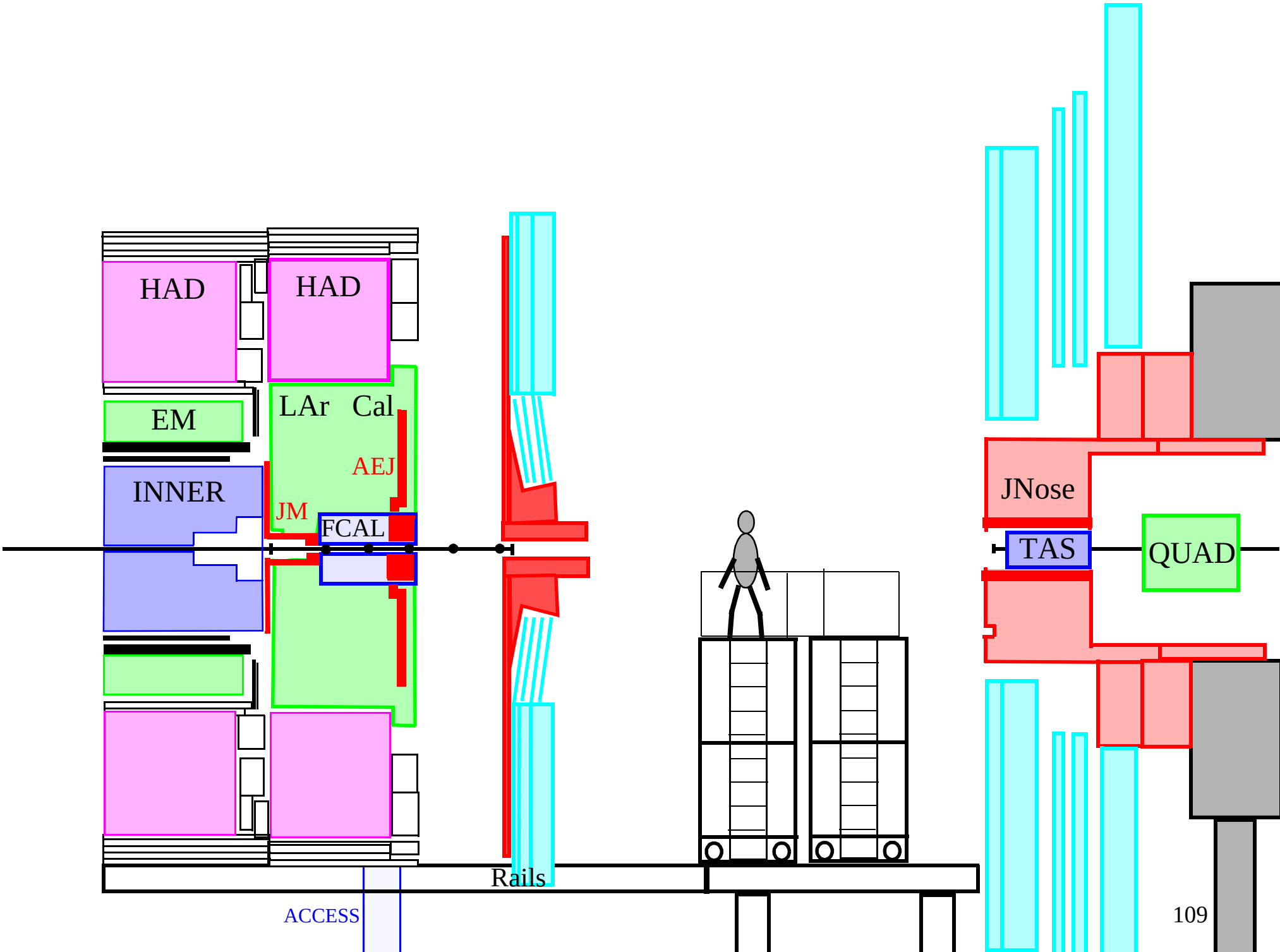
35. Minivans are installed.



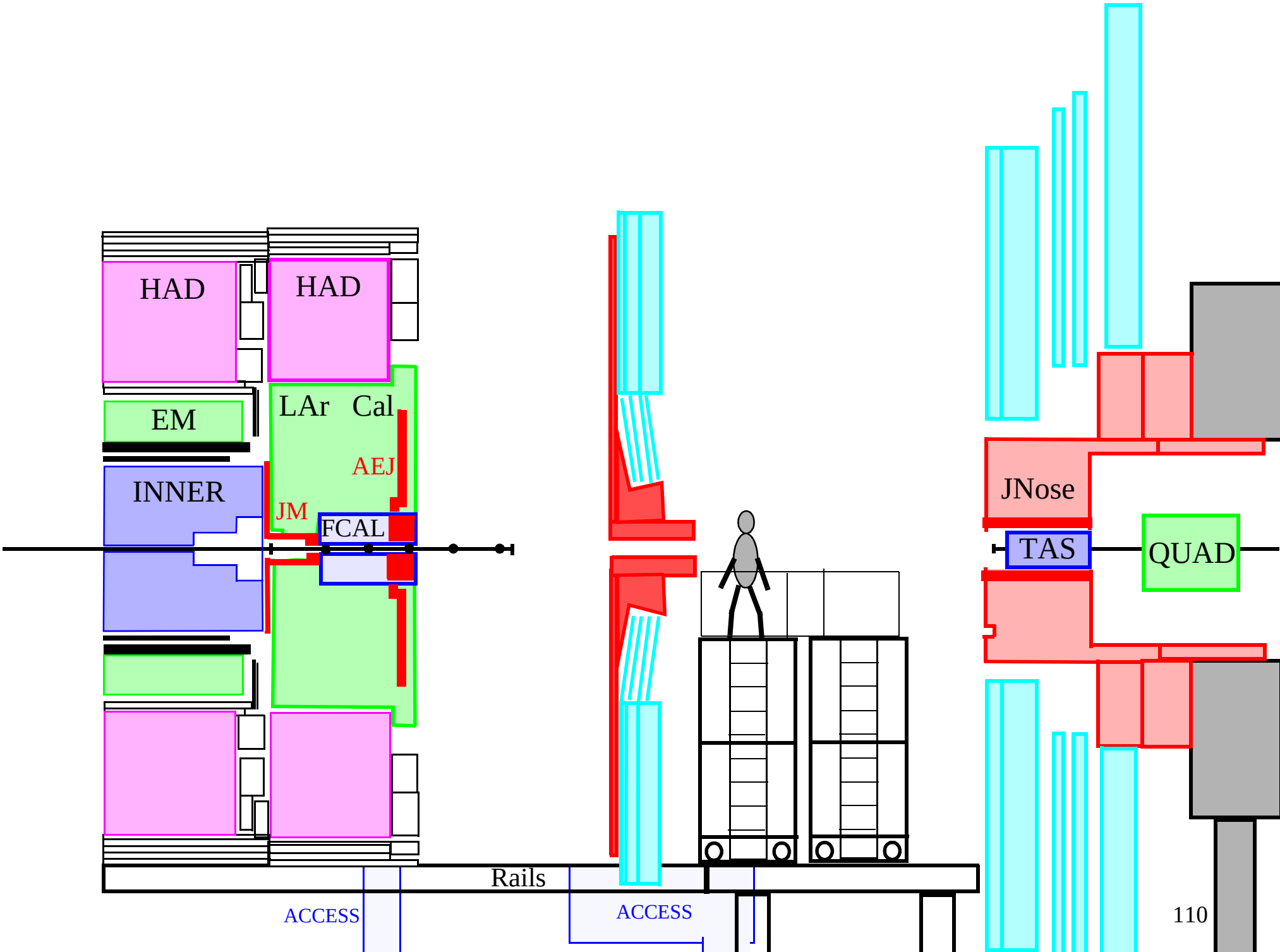
35. Minivans are installed.

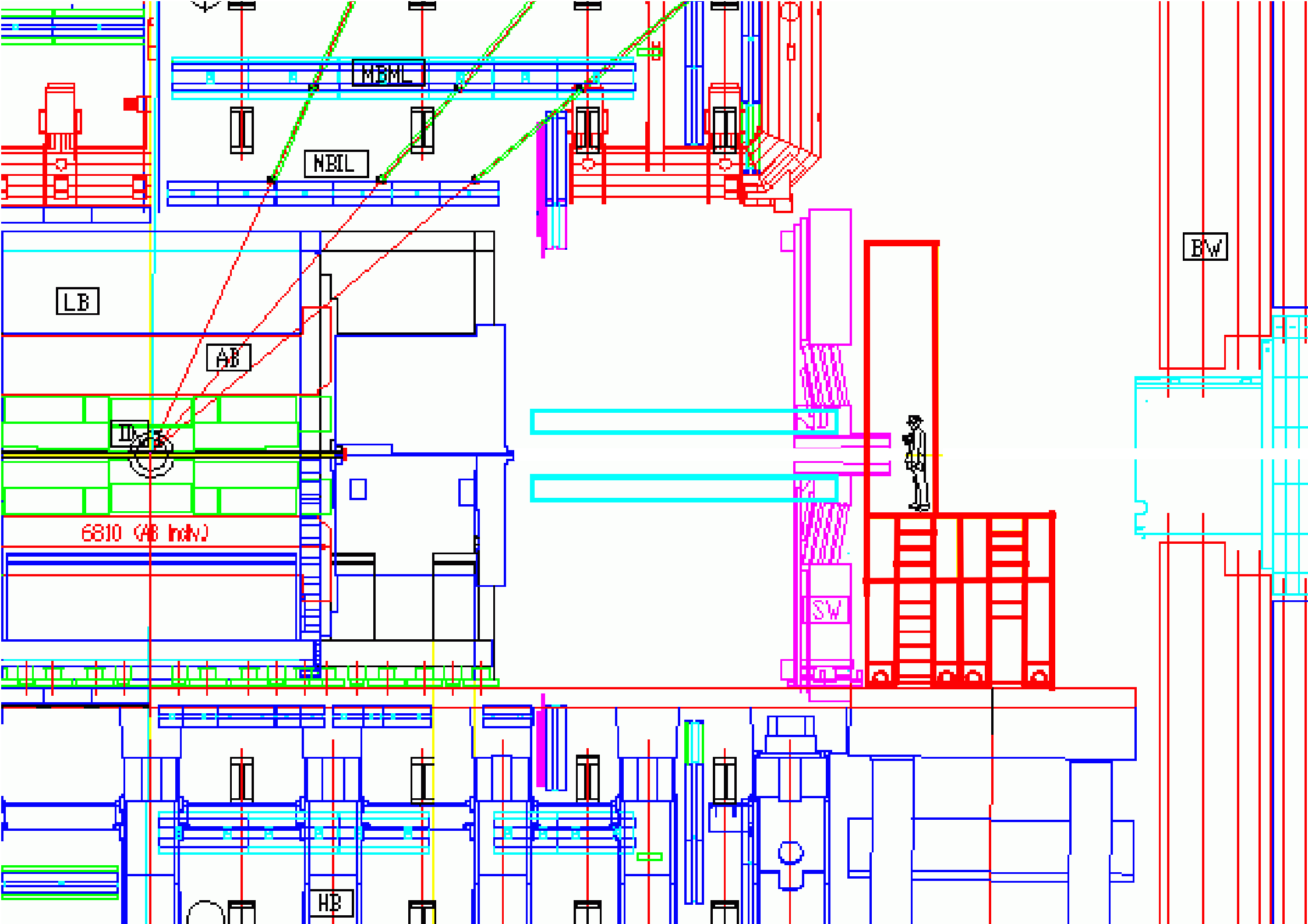


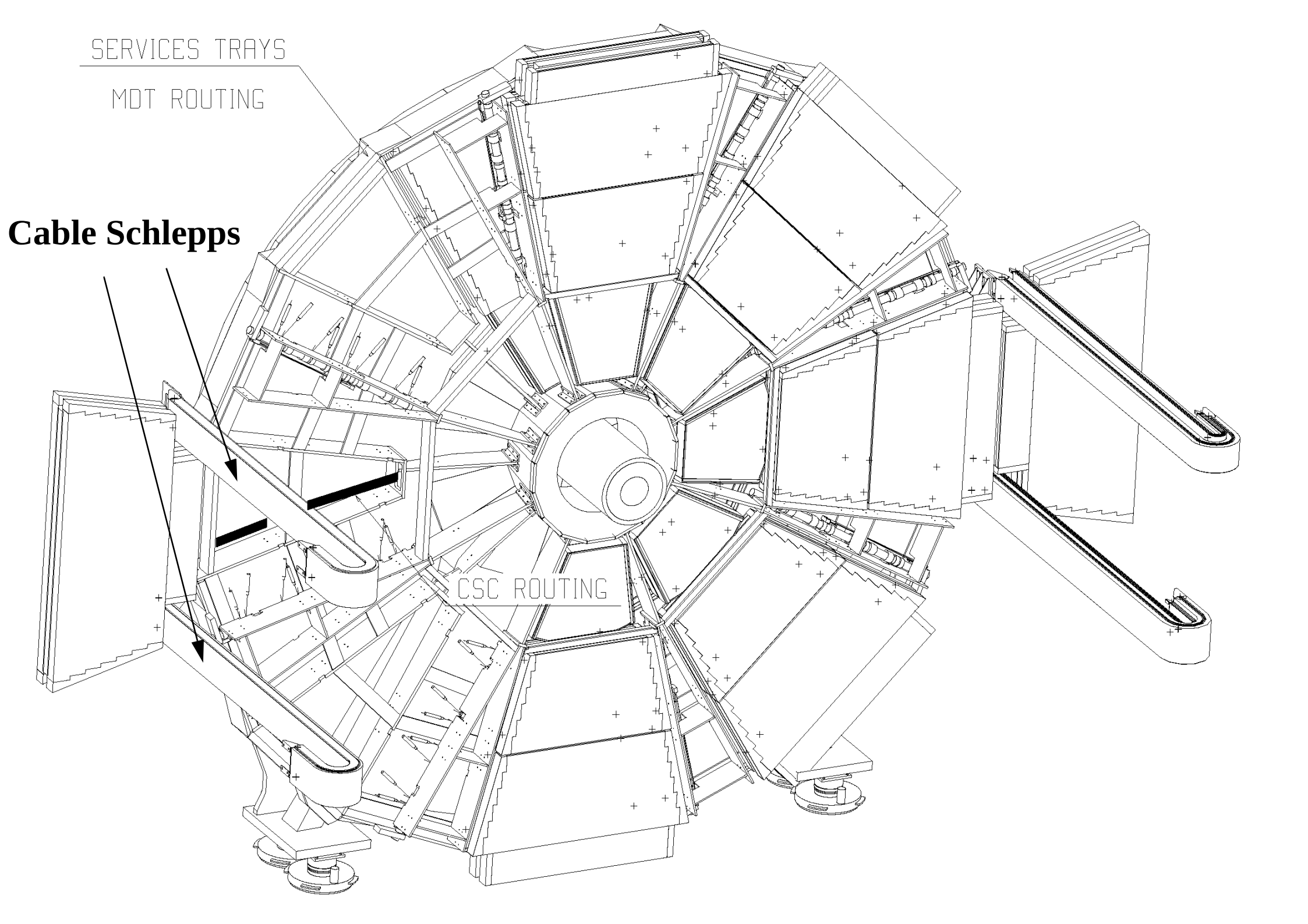
36. The JD/SW is moved forward.



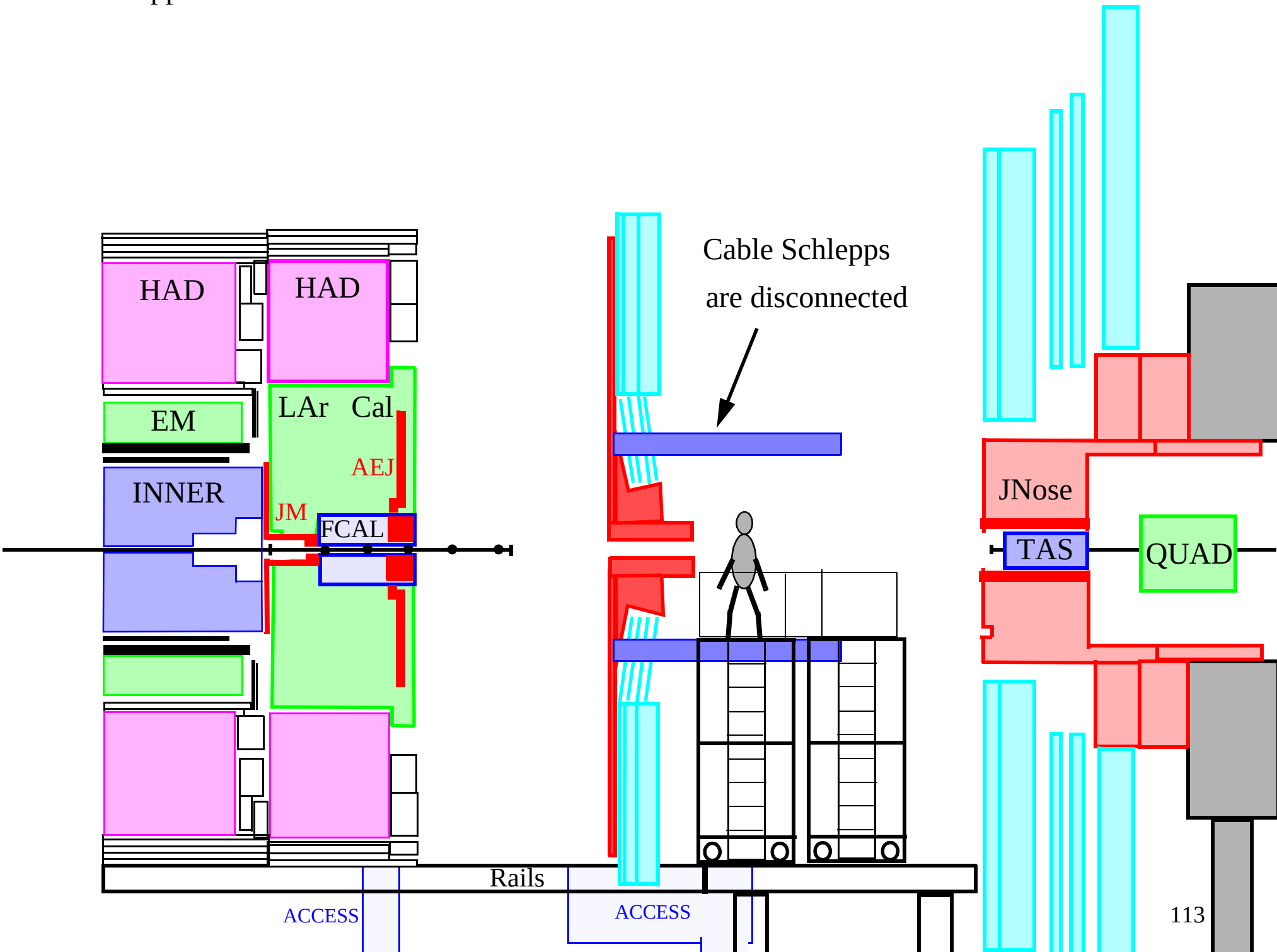
36. The JD/SW is moved forward.

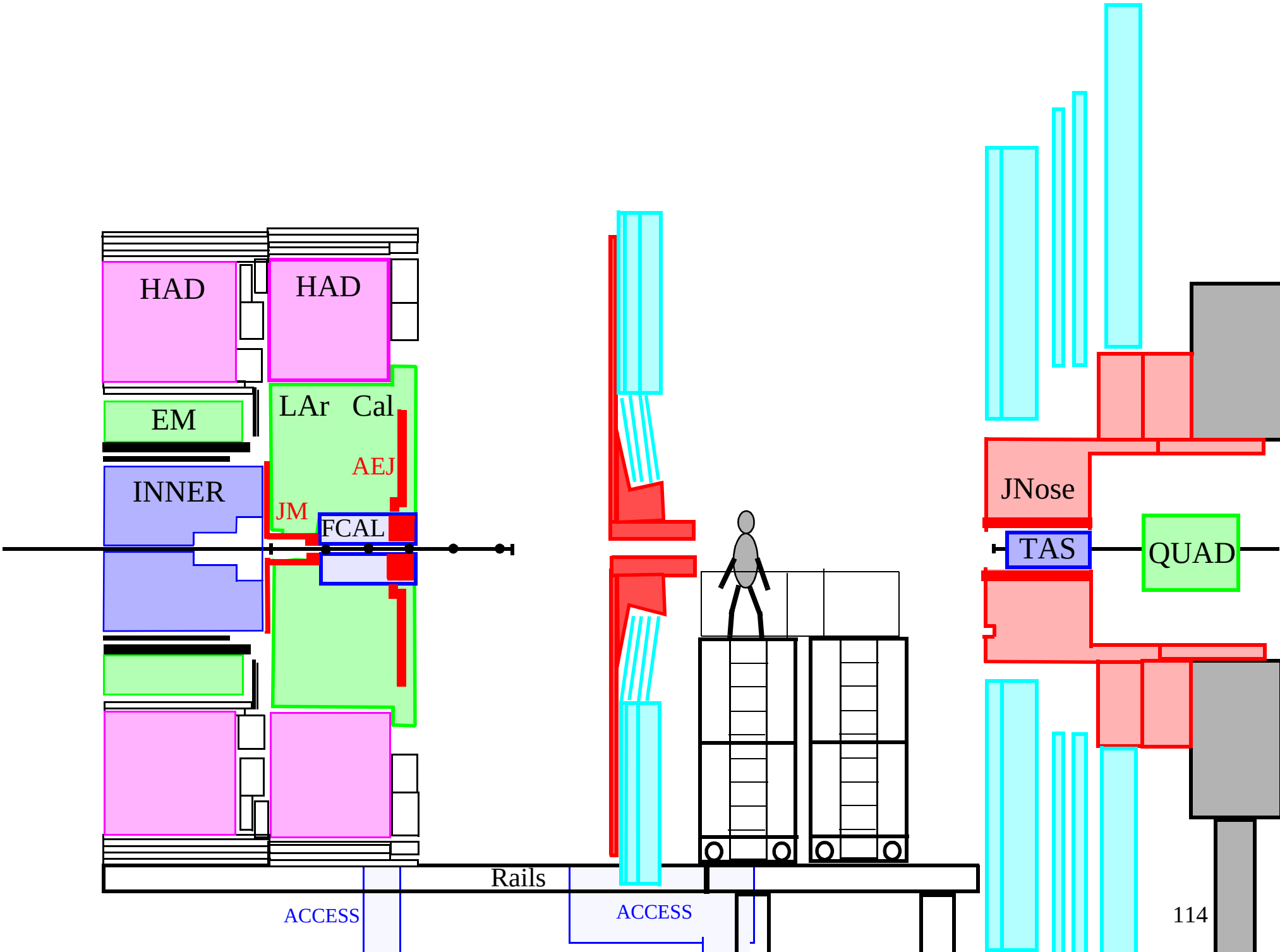



MBML
NBL
LB
AB
6810 (AB Indiv.)
SW
BW
HB

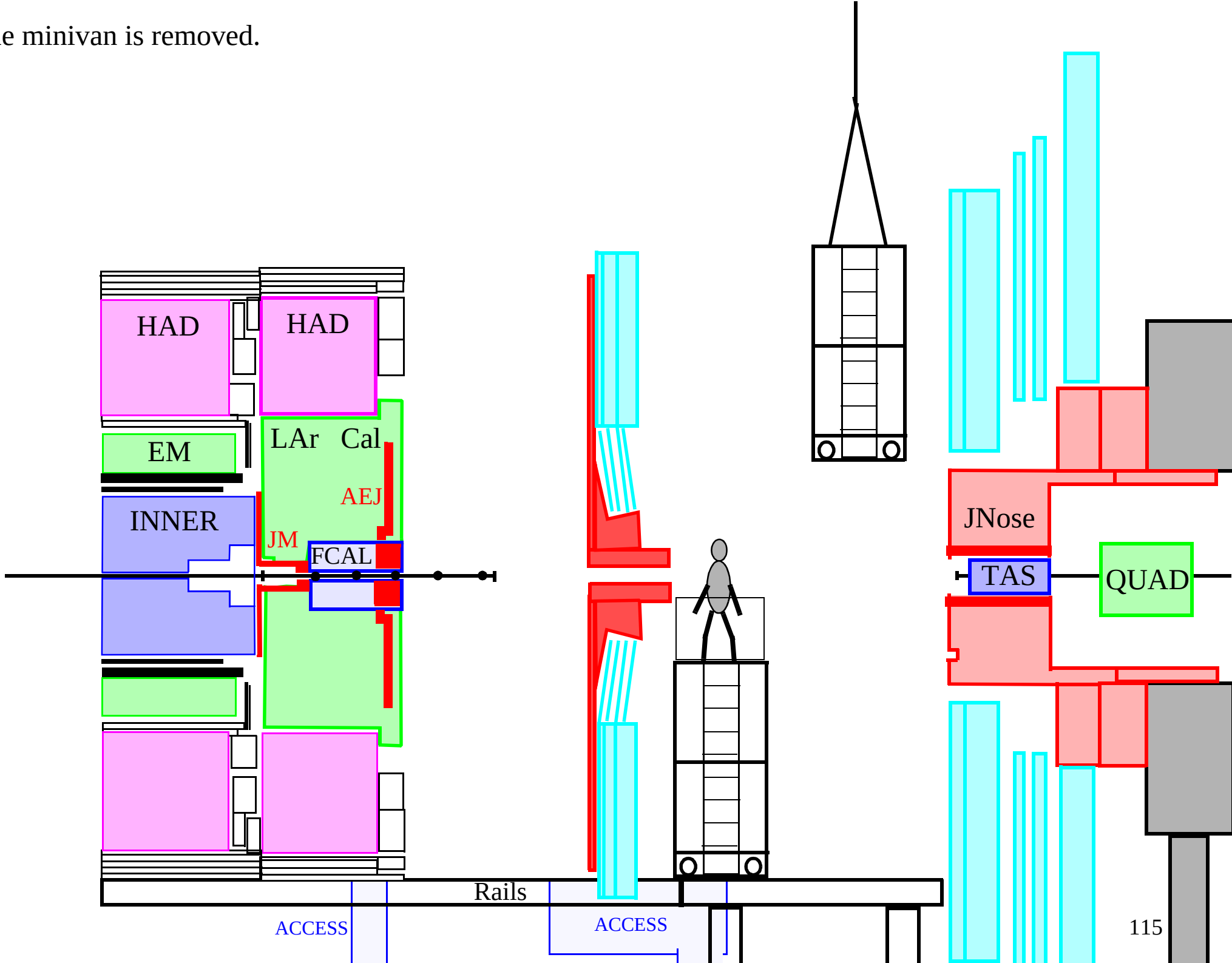

SERVICES TRAYS
MDT ROUTING
Cable Schlepps
CSC ROUTING

36. The cable schlepps are disconnected.

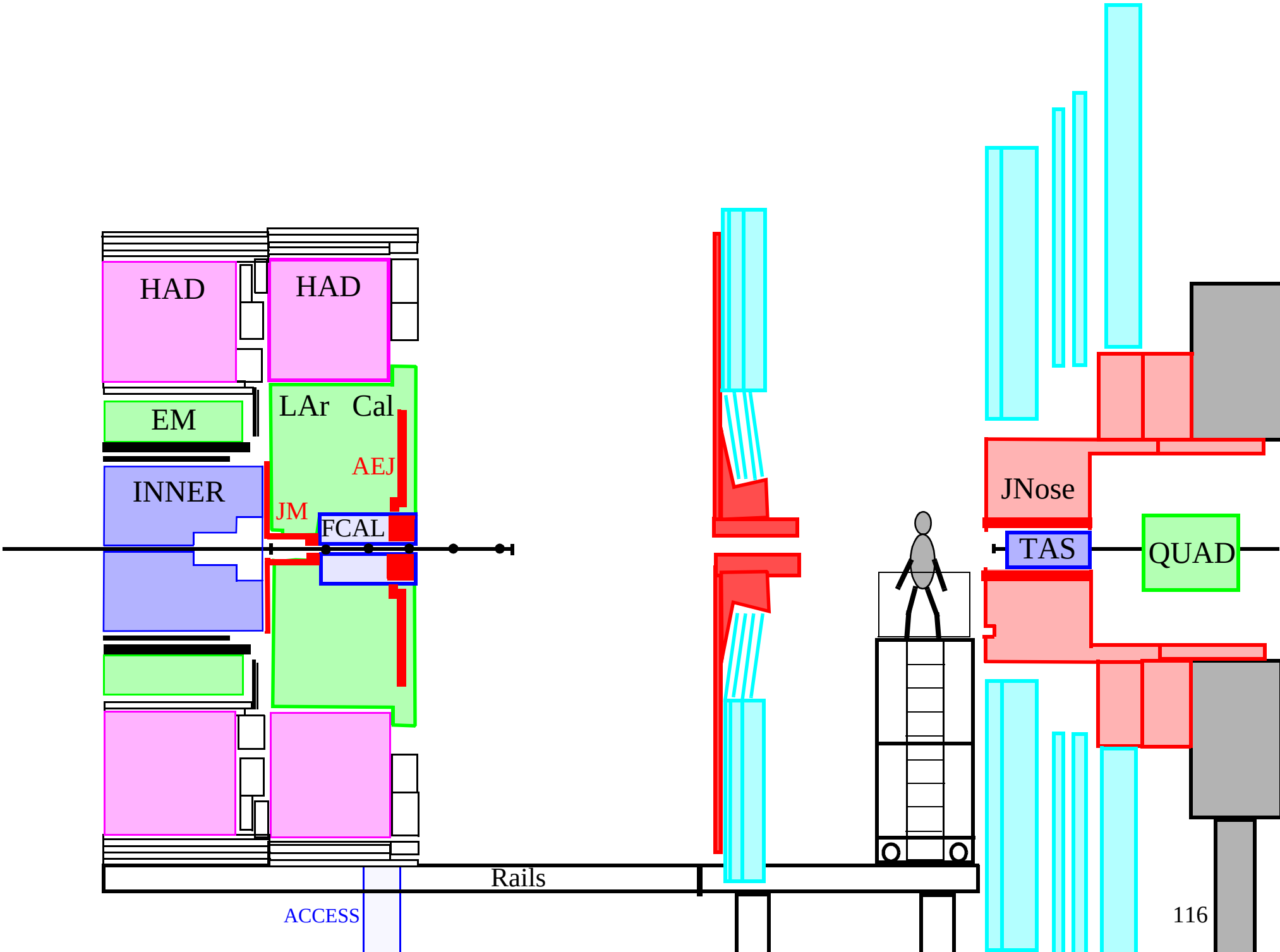



HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS
ACCESS

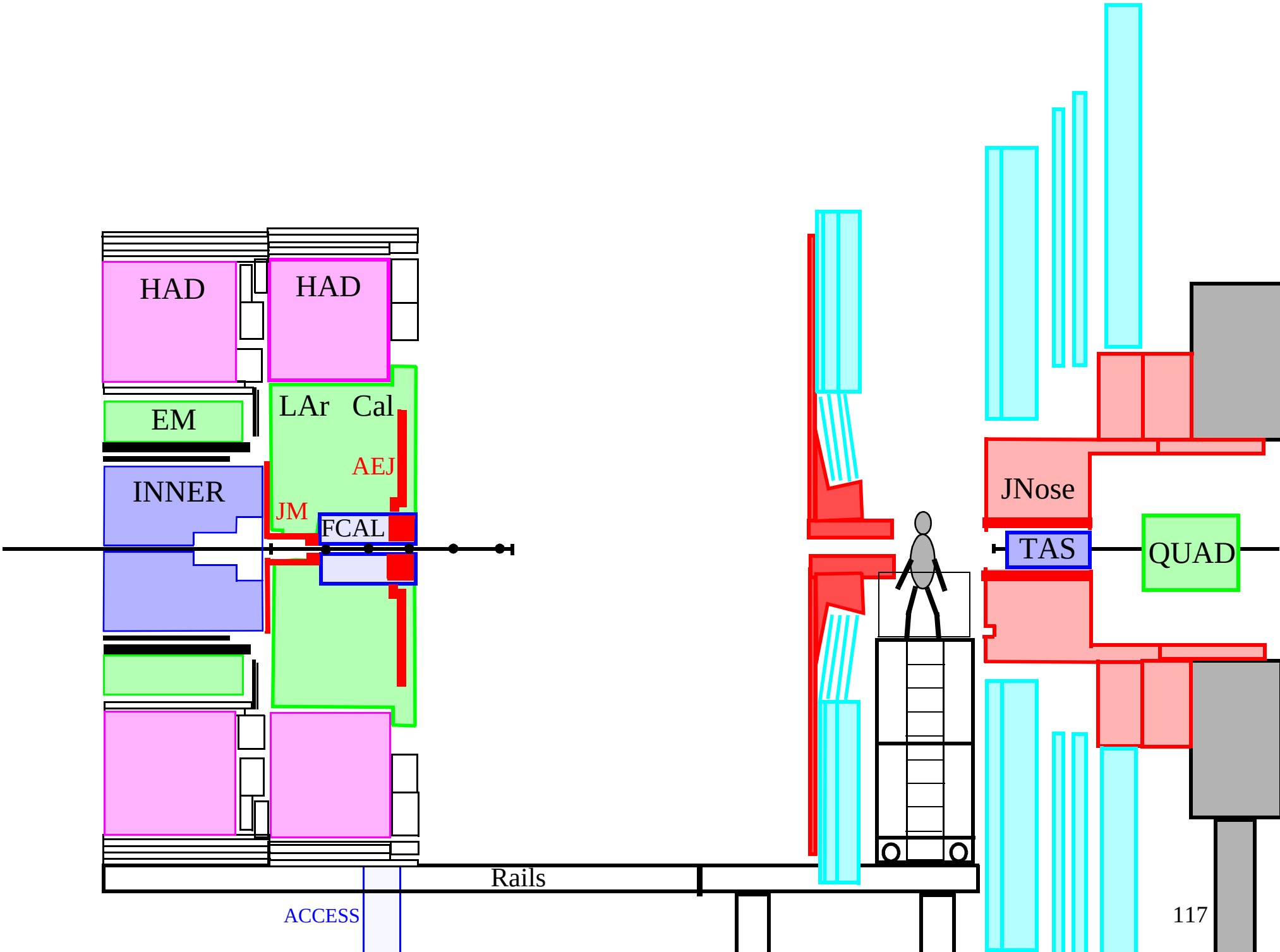
37. One minivan is removed.



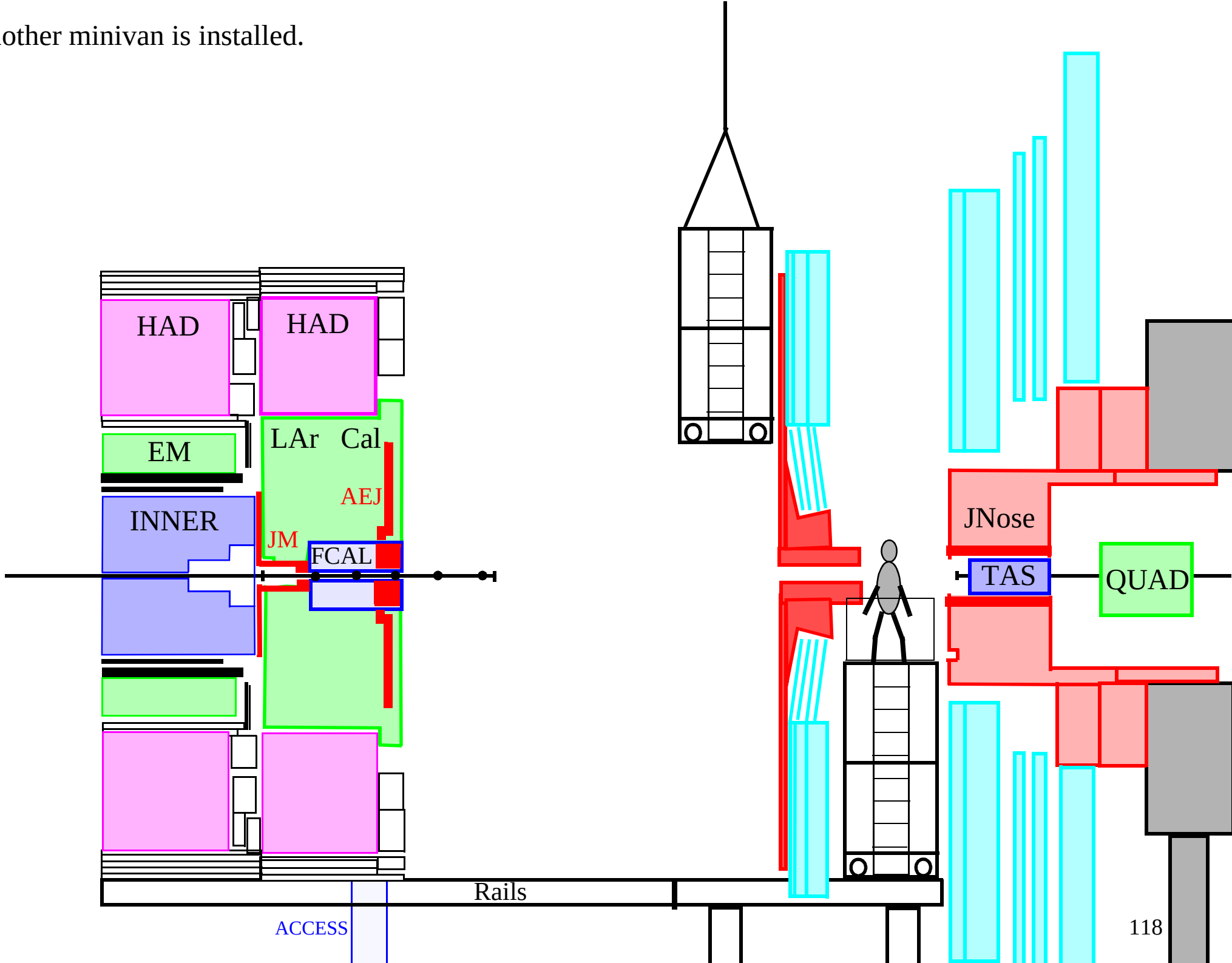
38. The JD/SW is moved further forward.

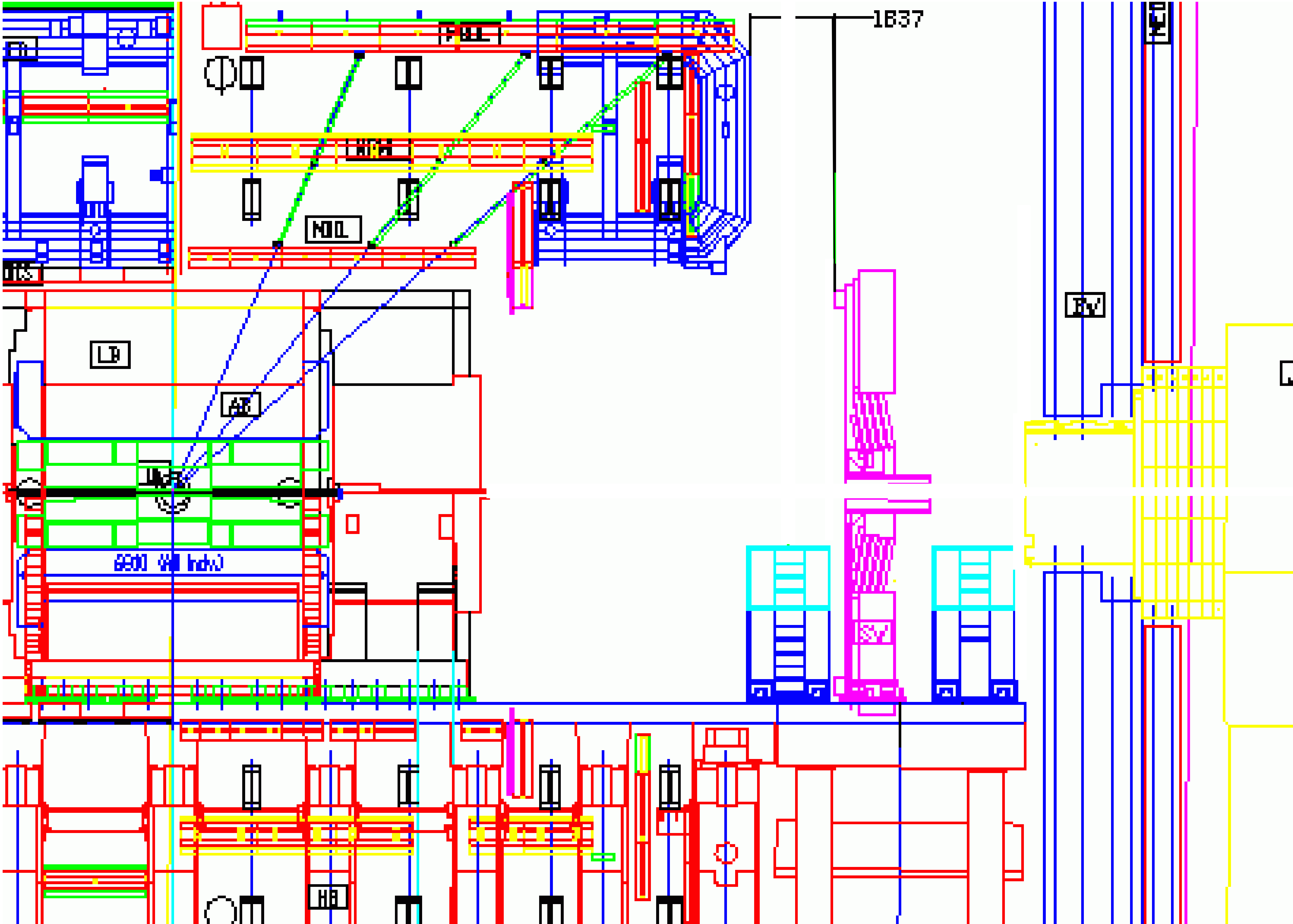


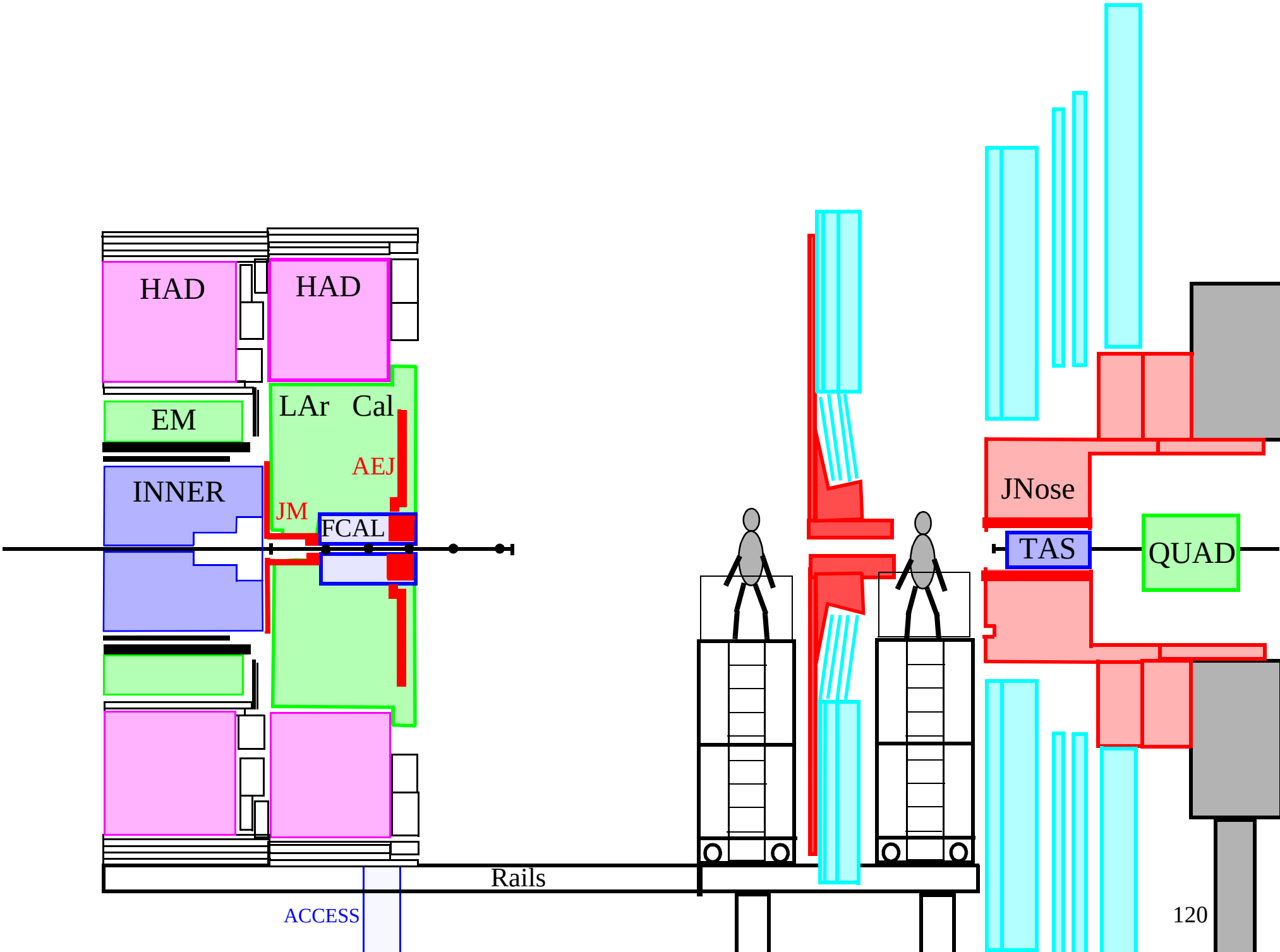
38. The JD/SW is moved further forward.



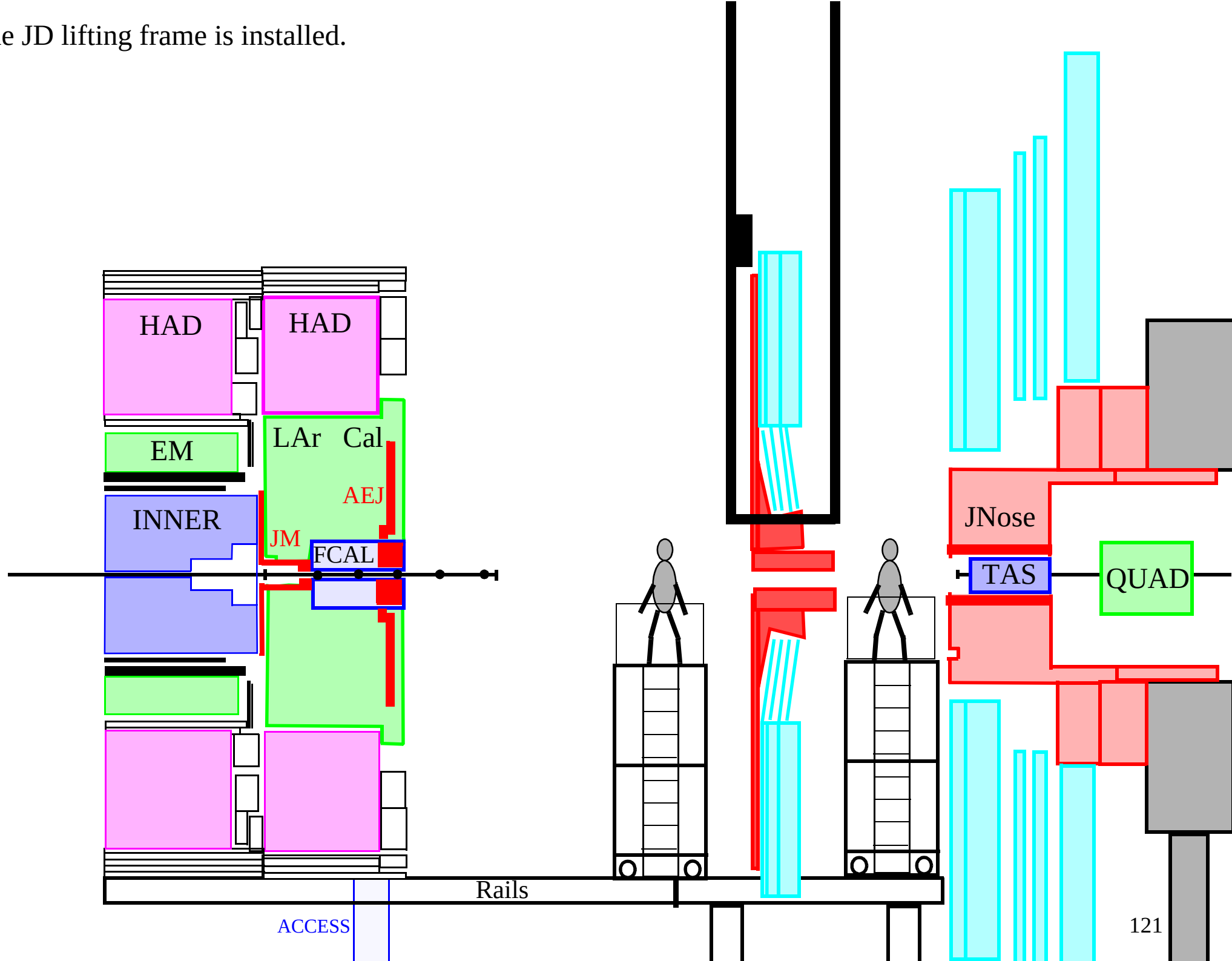
39. Another minivan is installed.



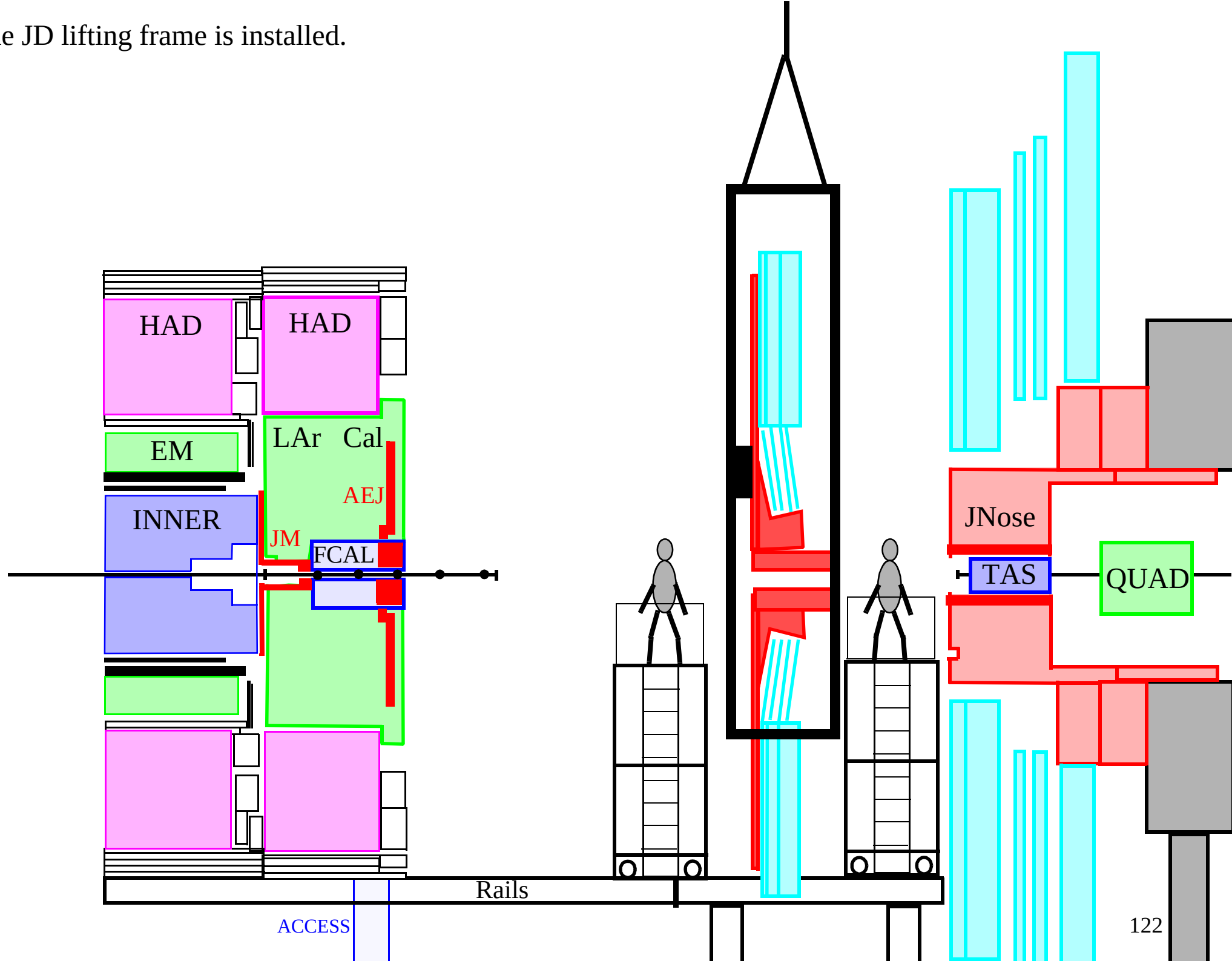



HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS

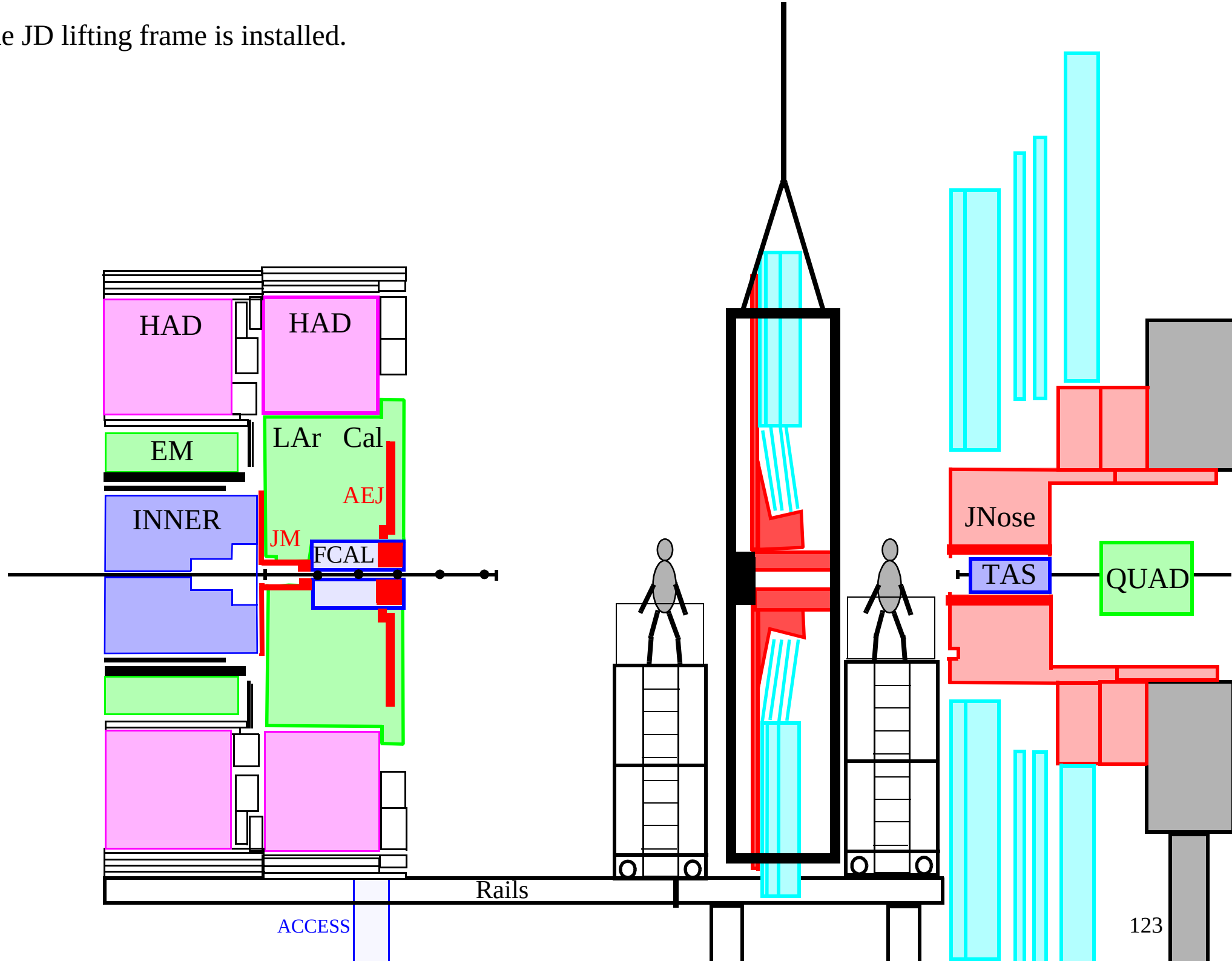
40. The JD lifting frame is installed.

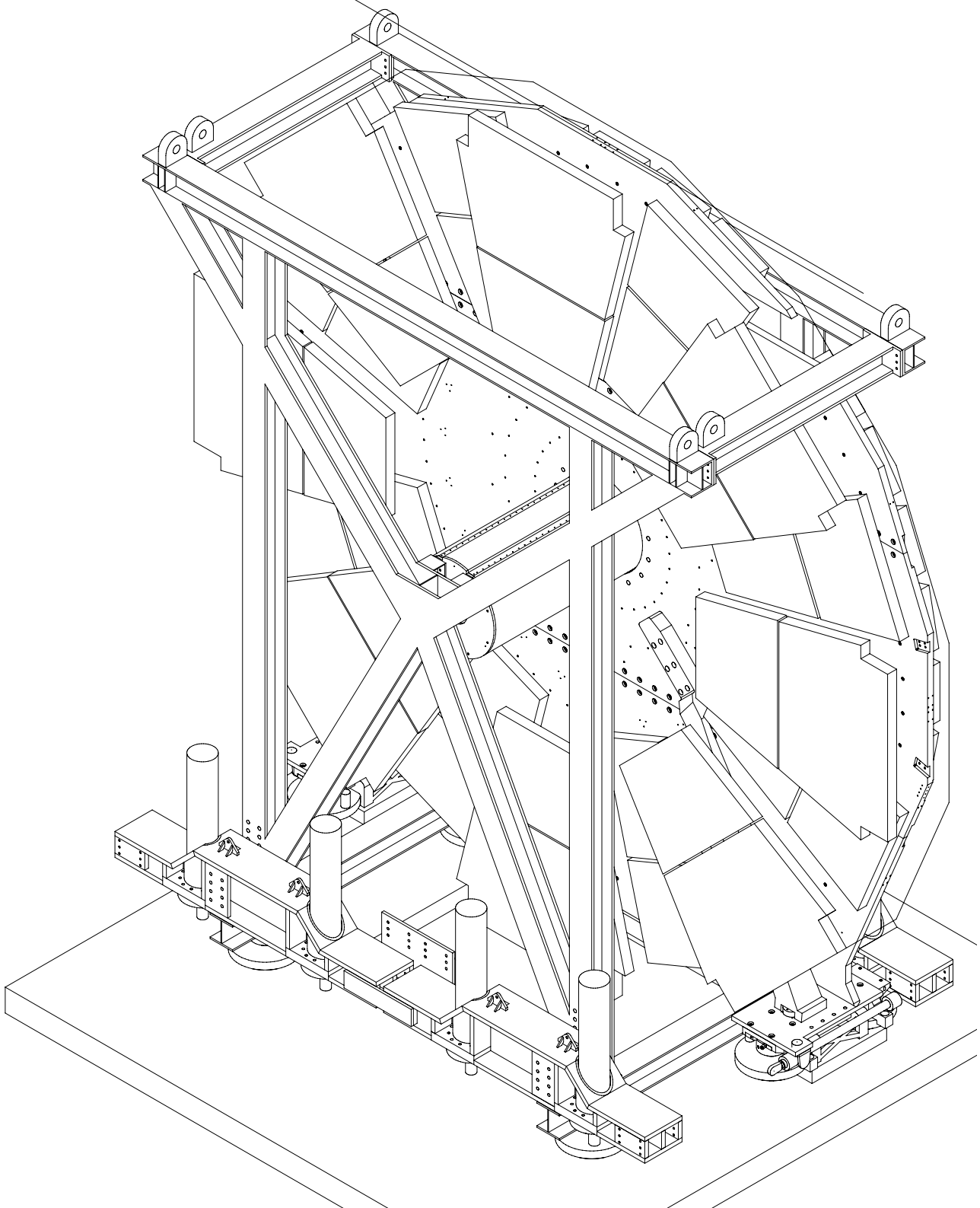


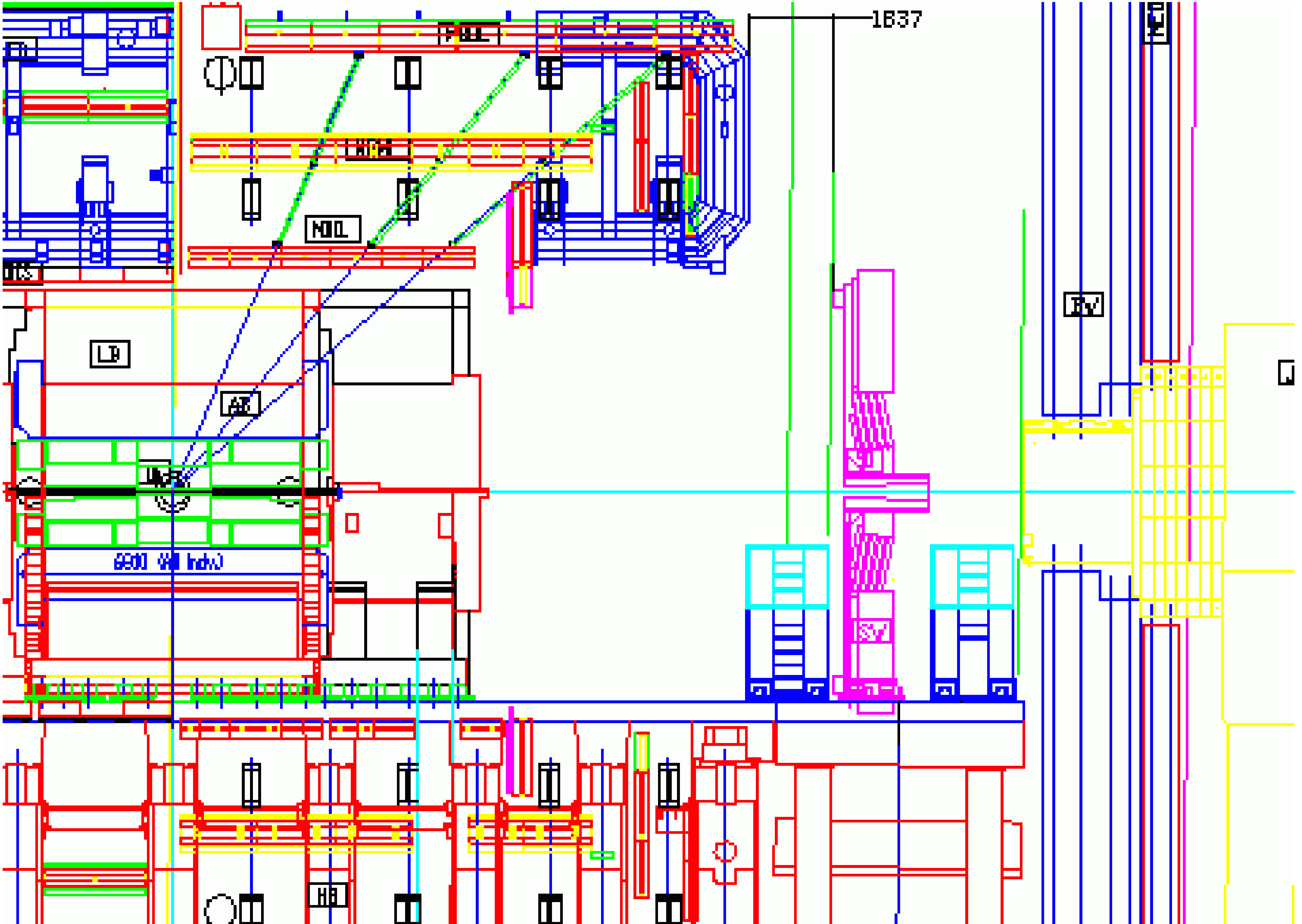
40. The JD lifting frame is installed.



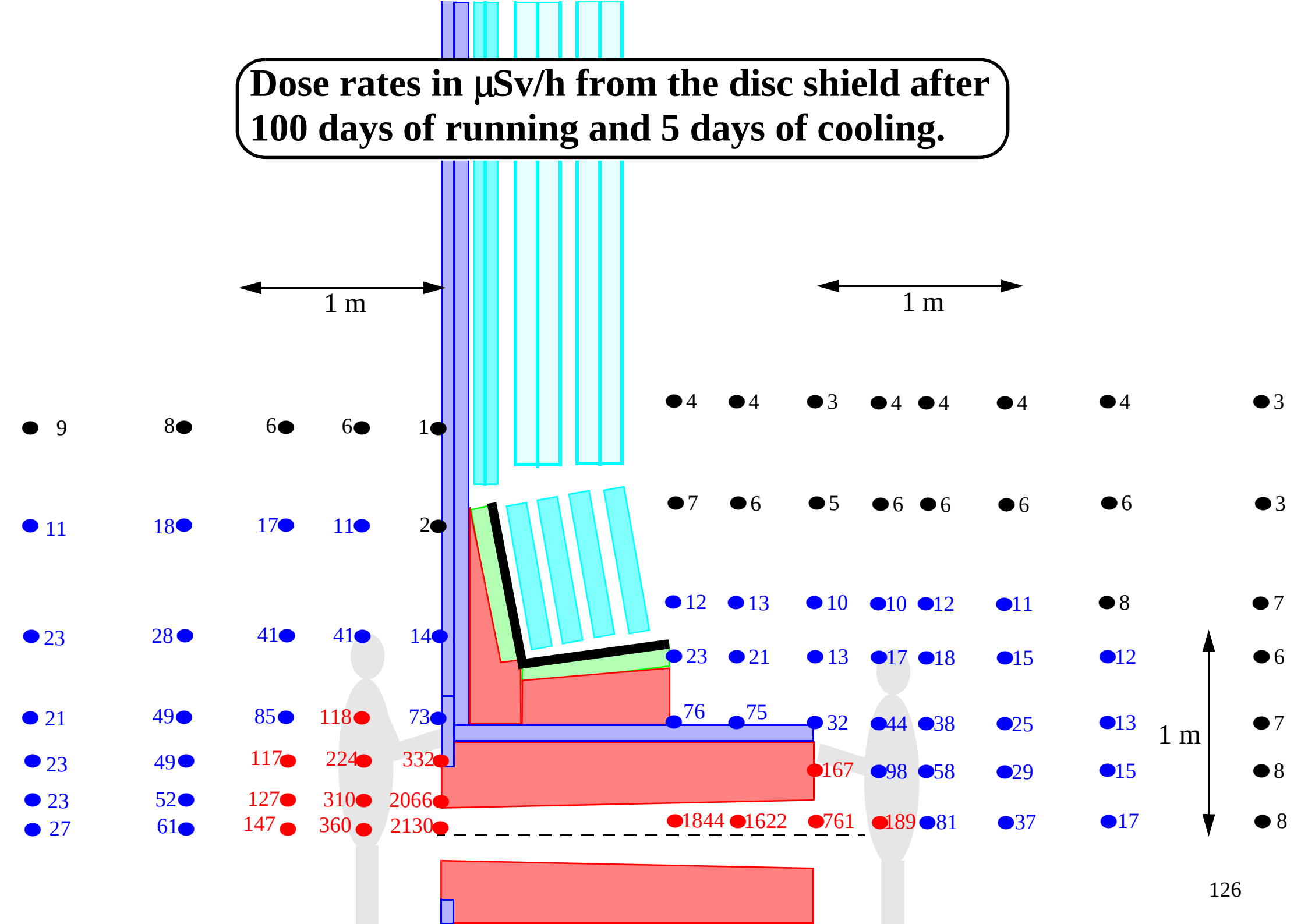
40. The JD lifting frame is installed.



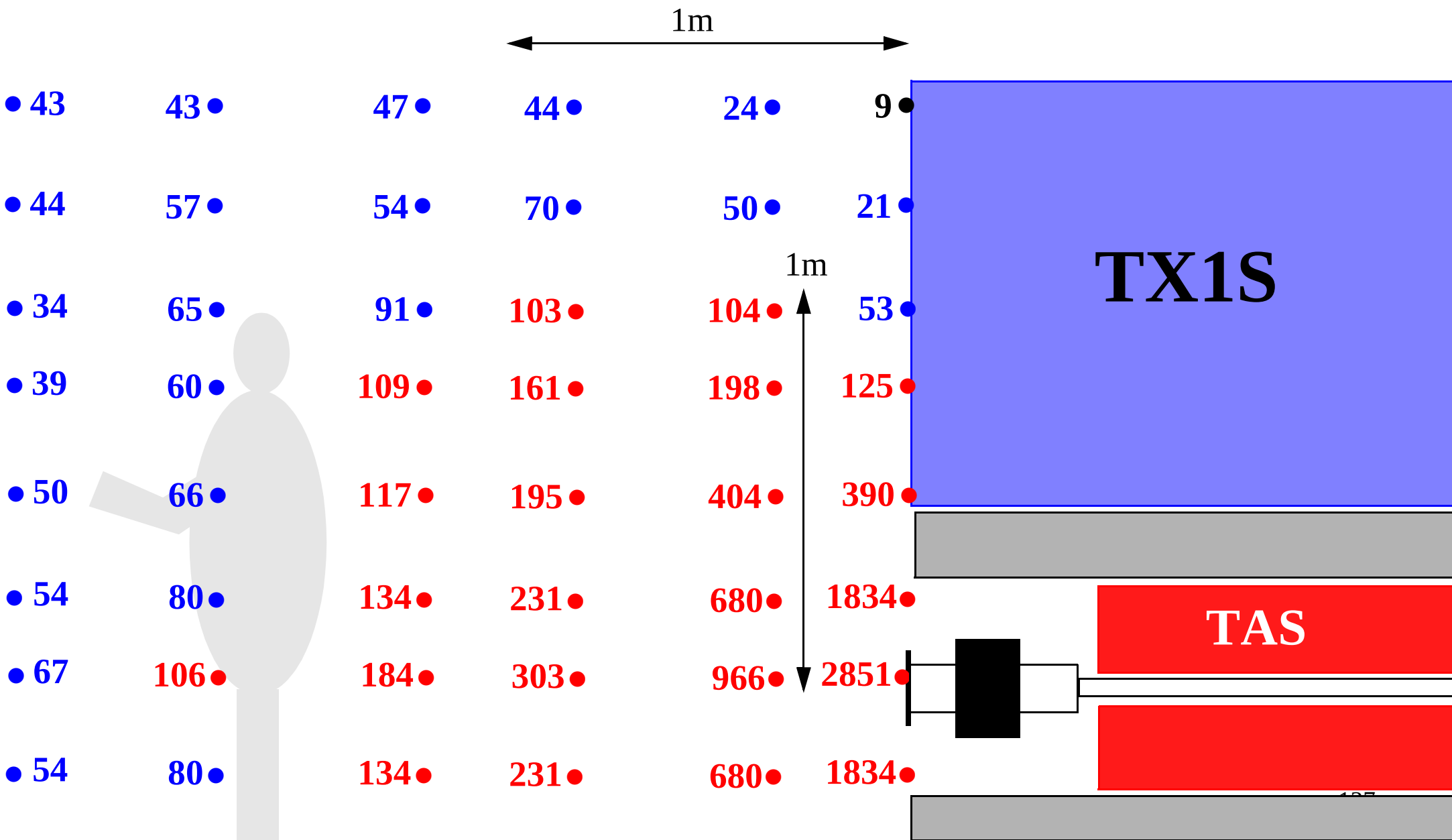




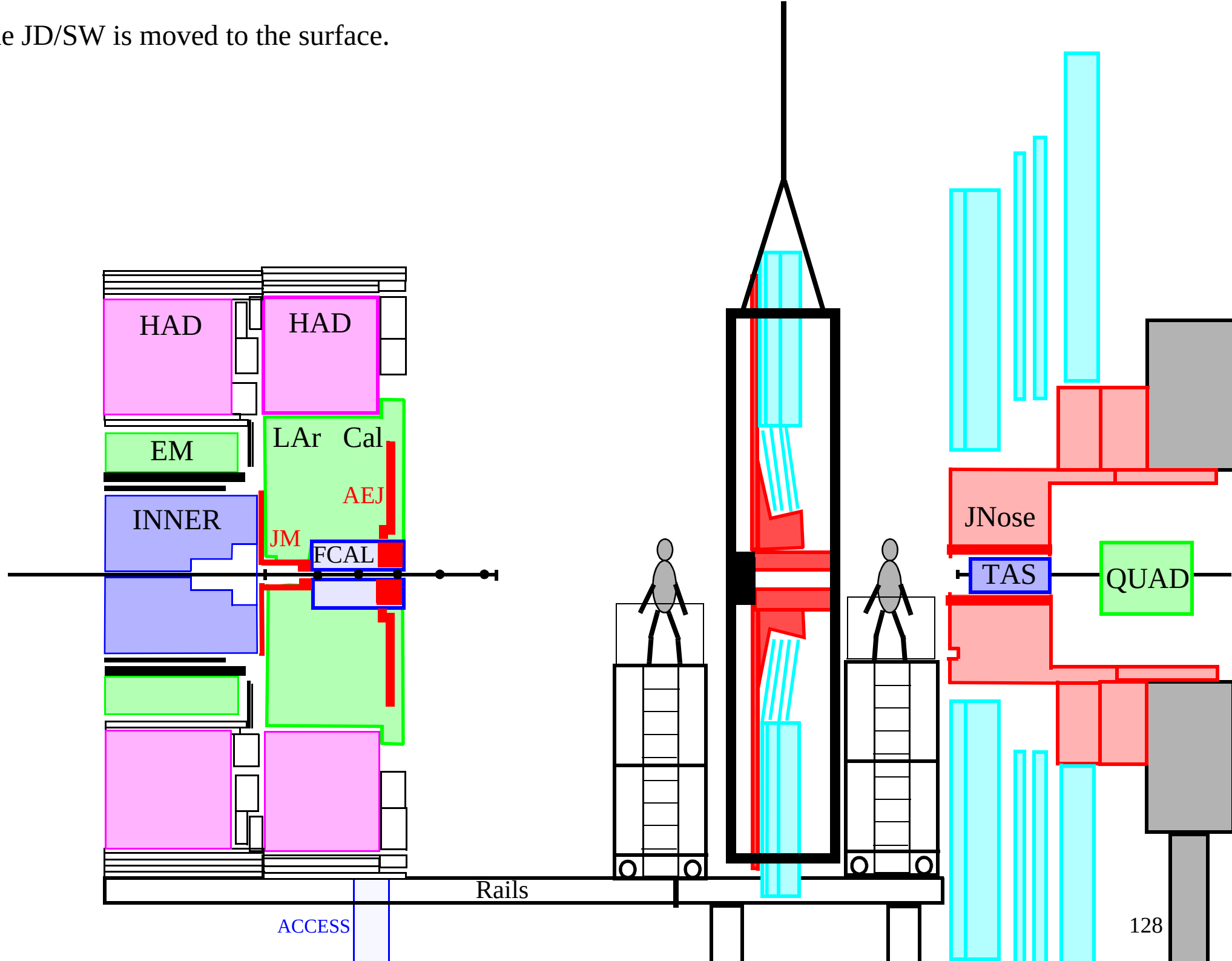
1B37


Dose rates in μSv/h from the disc shield after 100 days of running and 5 days of cooling.
1 m
1 m
1 m
9
8
6
6
1
11
18
17
11
2
23
28
41
41
14
21
49
85
118
73
23
49
117
224
332
23
52
127
310
2066
27
61
147
360
2130
4
4
3
4
4
4
4
3
7
6
5
6
6
6
6
3
12
13
10
10
12
11
8
7
23
21
13
17
18
15
12
6
76
75
32
44
38
25
13
7
167
98
58
29
15
8
1844
1622
761
189
81
37
17
8

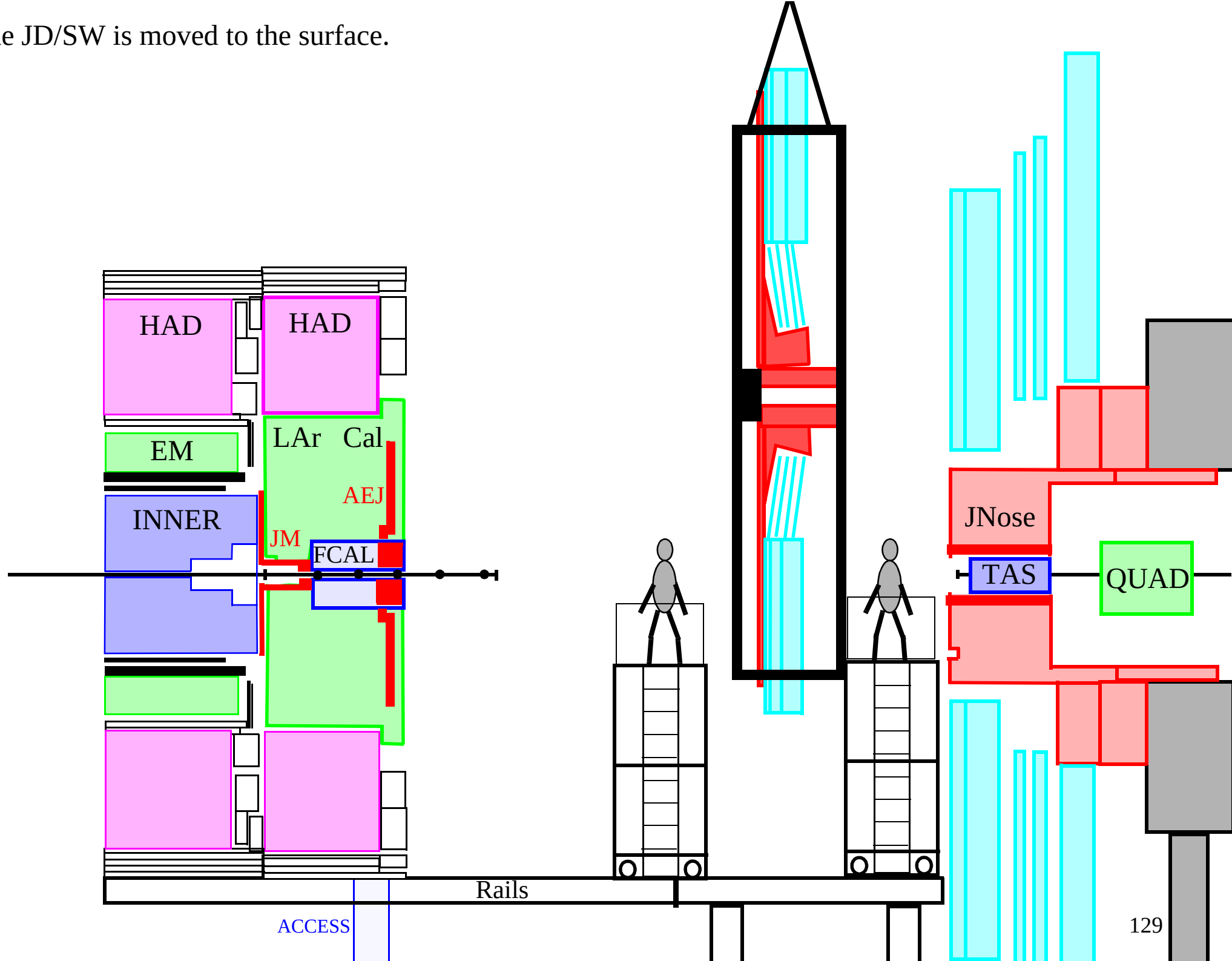
Dose rates in μSv/h after 100 days of running and 5 day of cooling



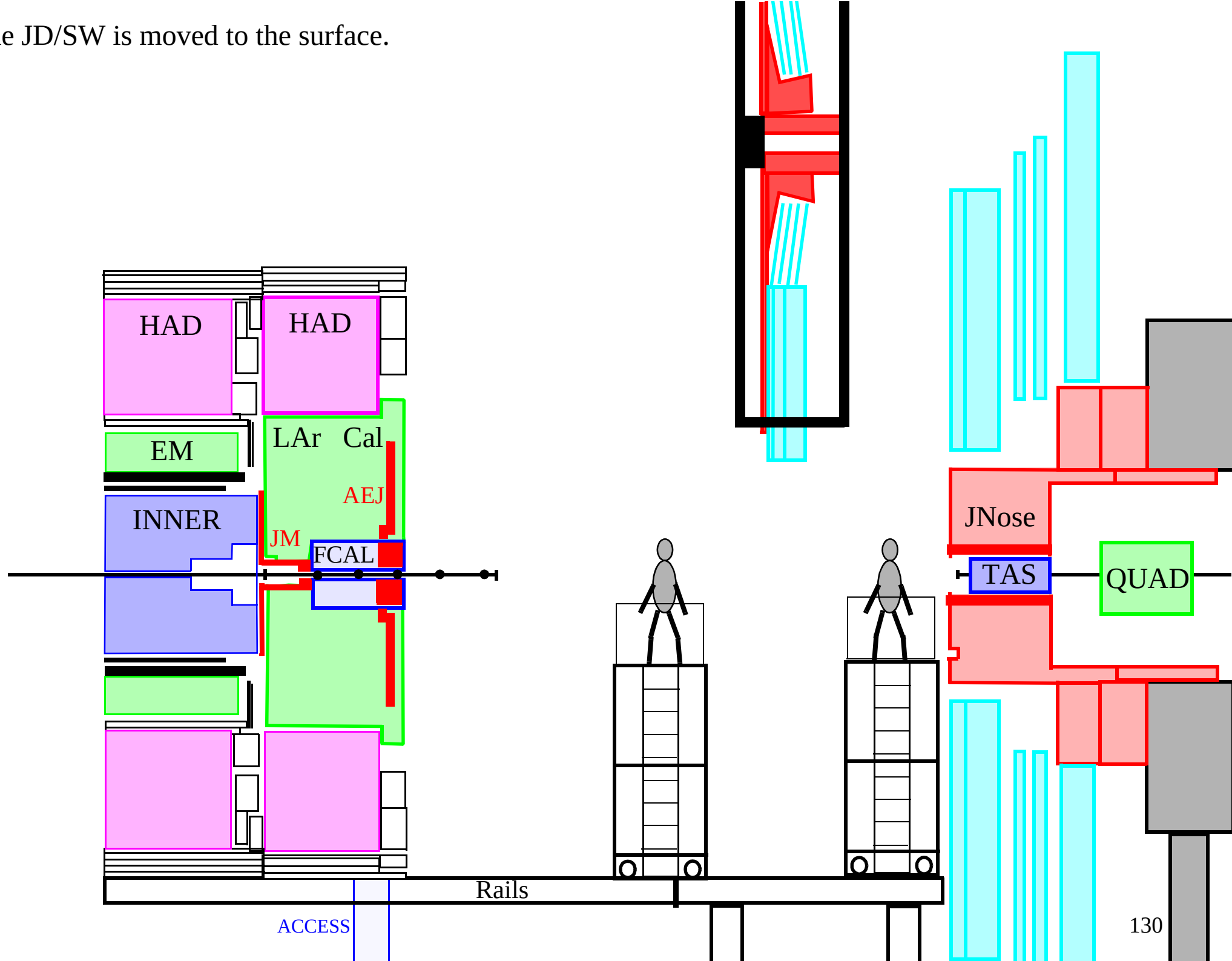
41. The JD/SW is moved to the surface.

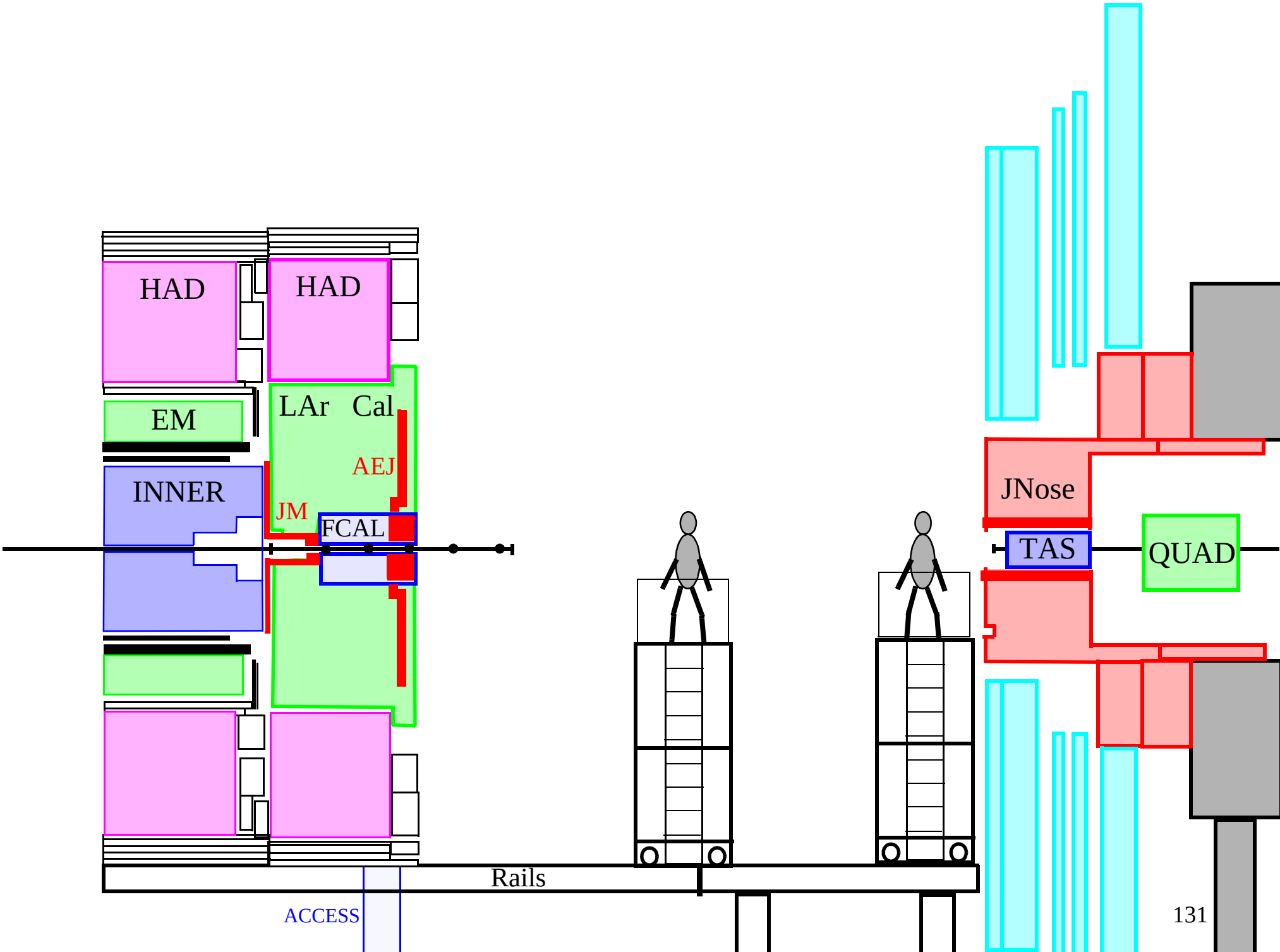


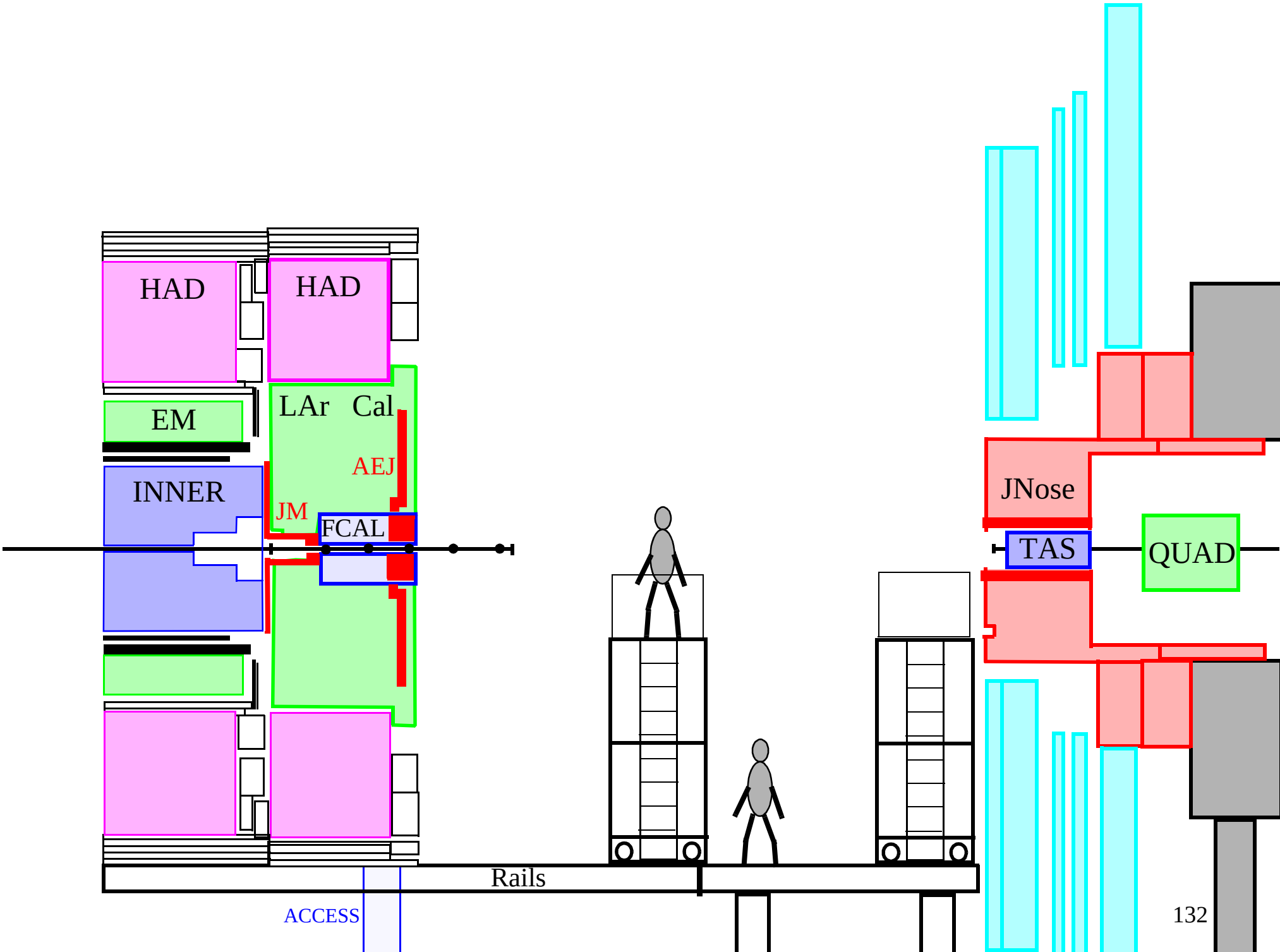
41. The JD/SW is moved to the surface.



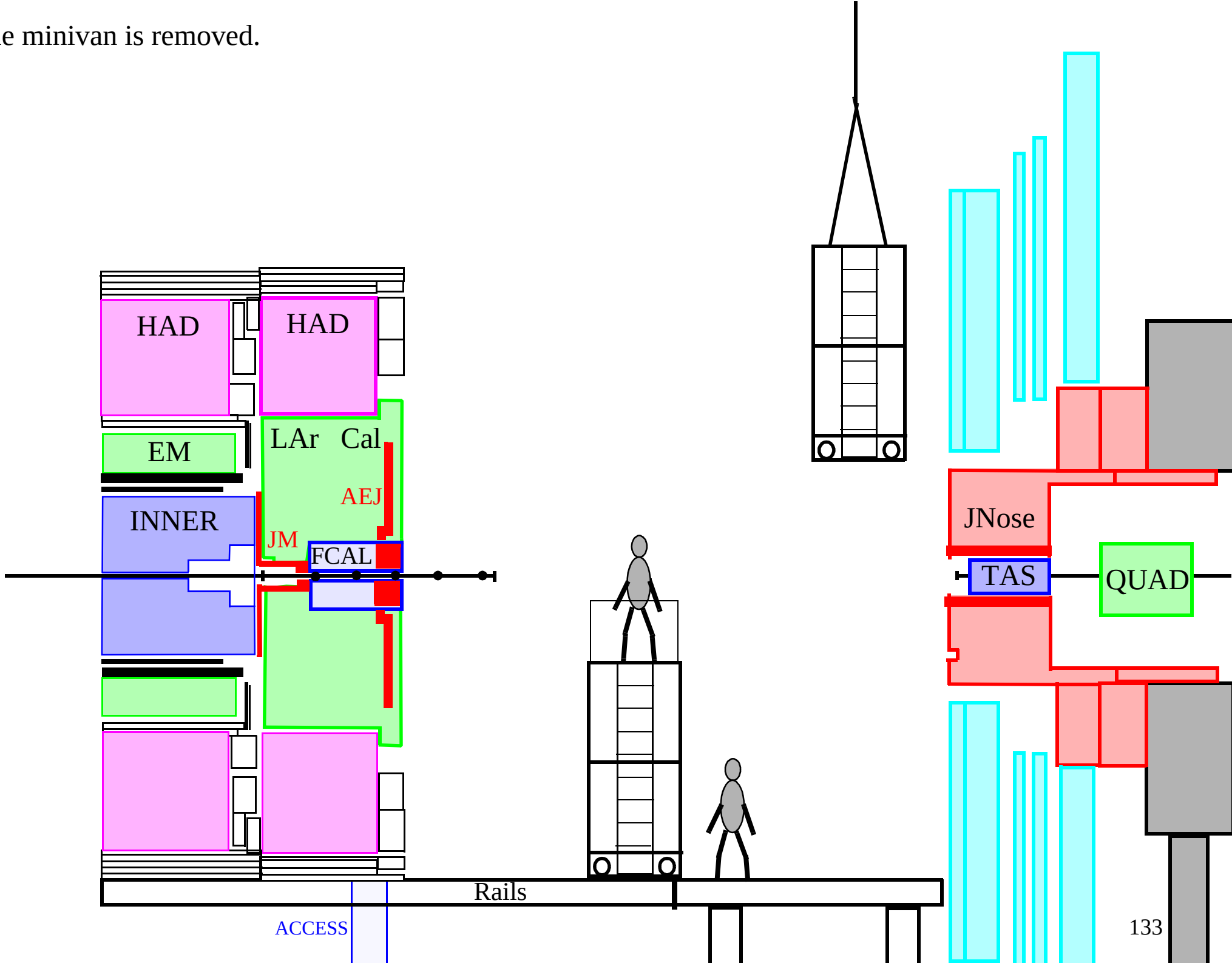
41. The JD/SW is moved to the surface.

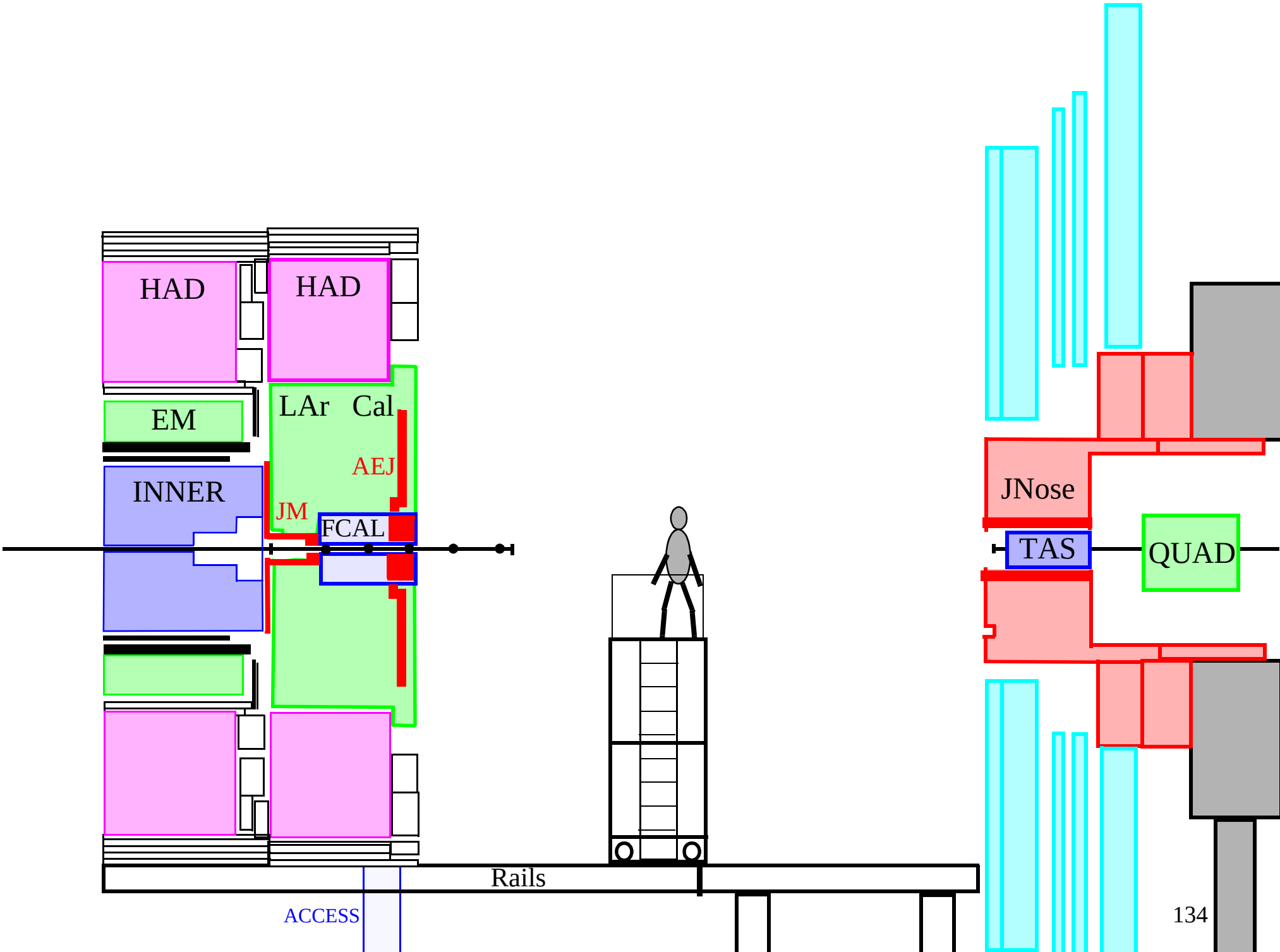


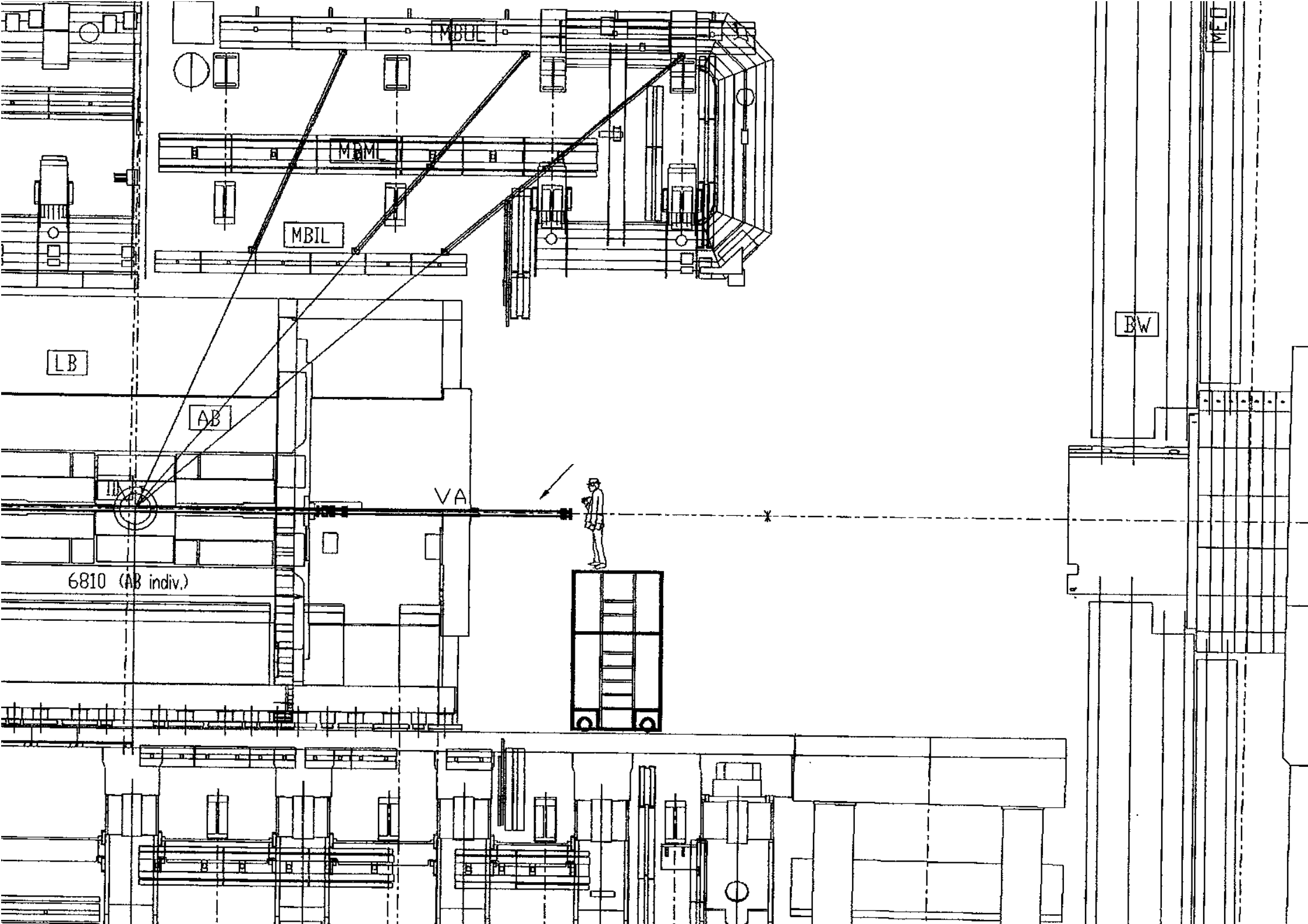

HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS


HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS

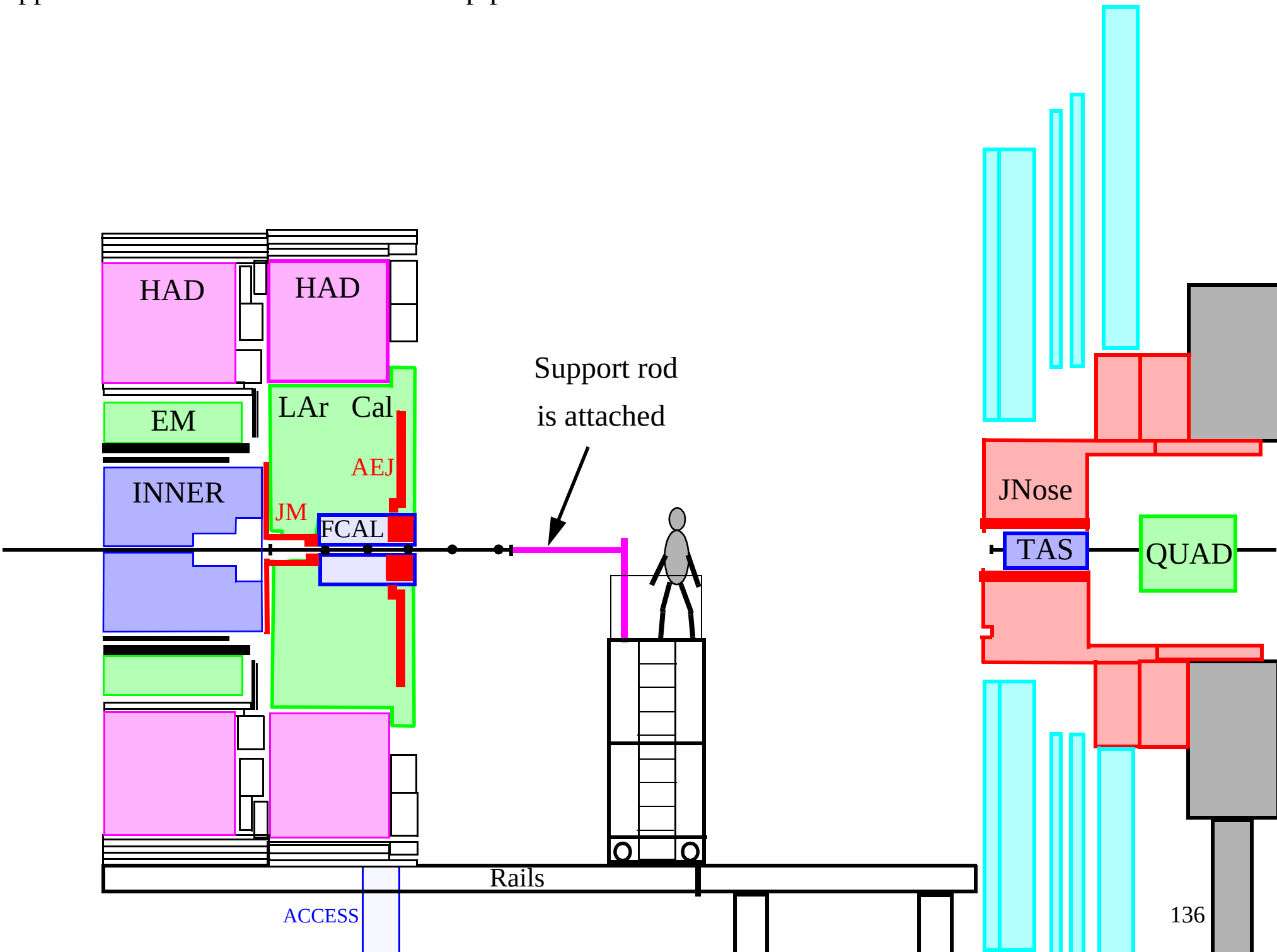
42. One minivan is removed.



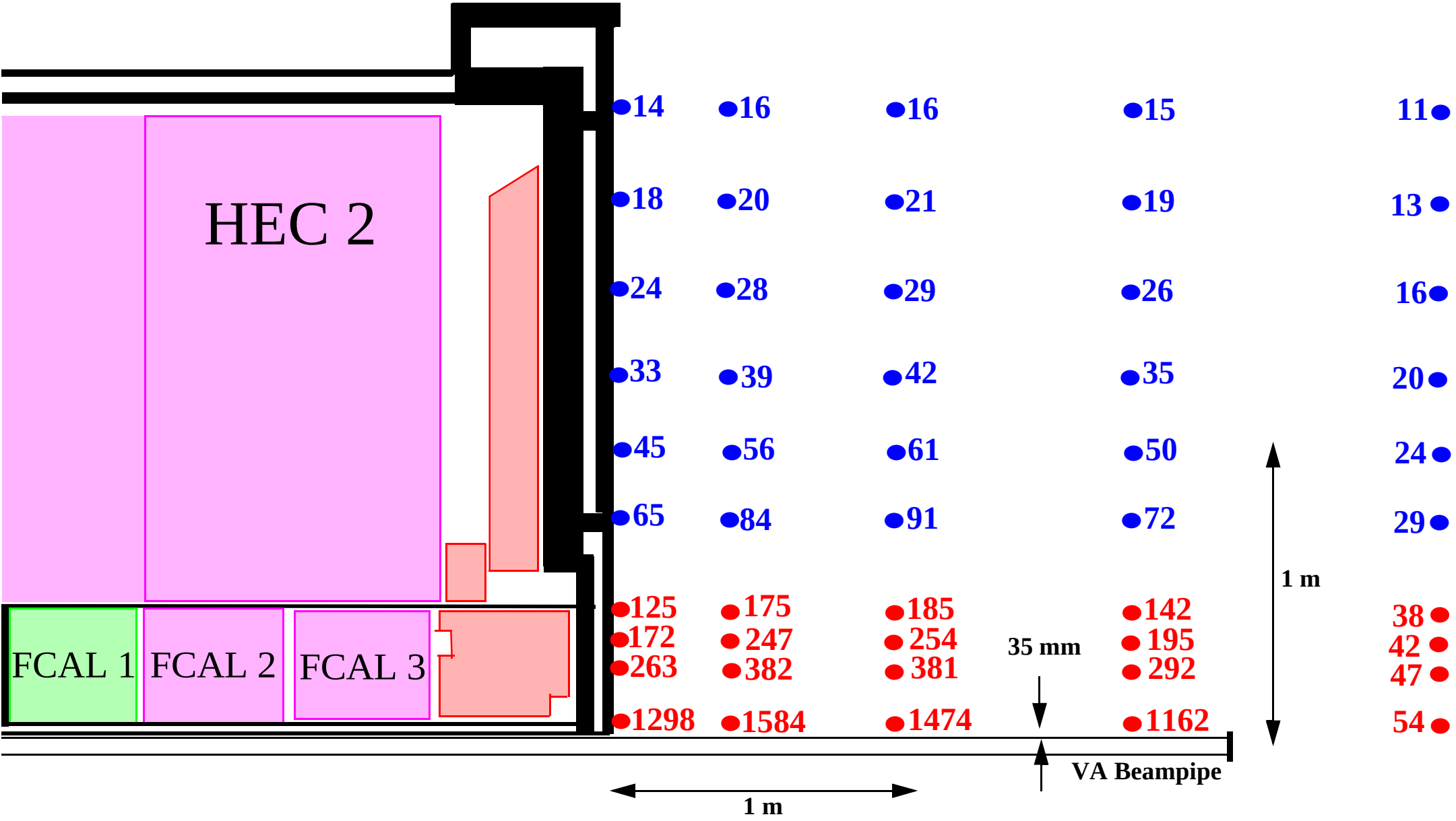

HAD
HAD
EM
LAr Cal
AEJ
INNER
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS


MBUL
MBM
MBIL
LB
AB
VA
6810 (AB indiv.)
BW
MEU

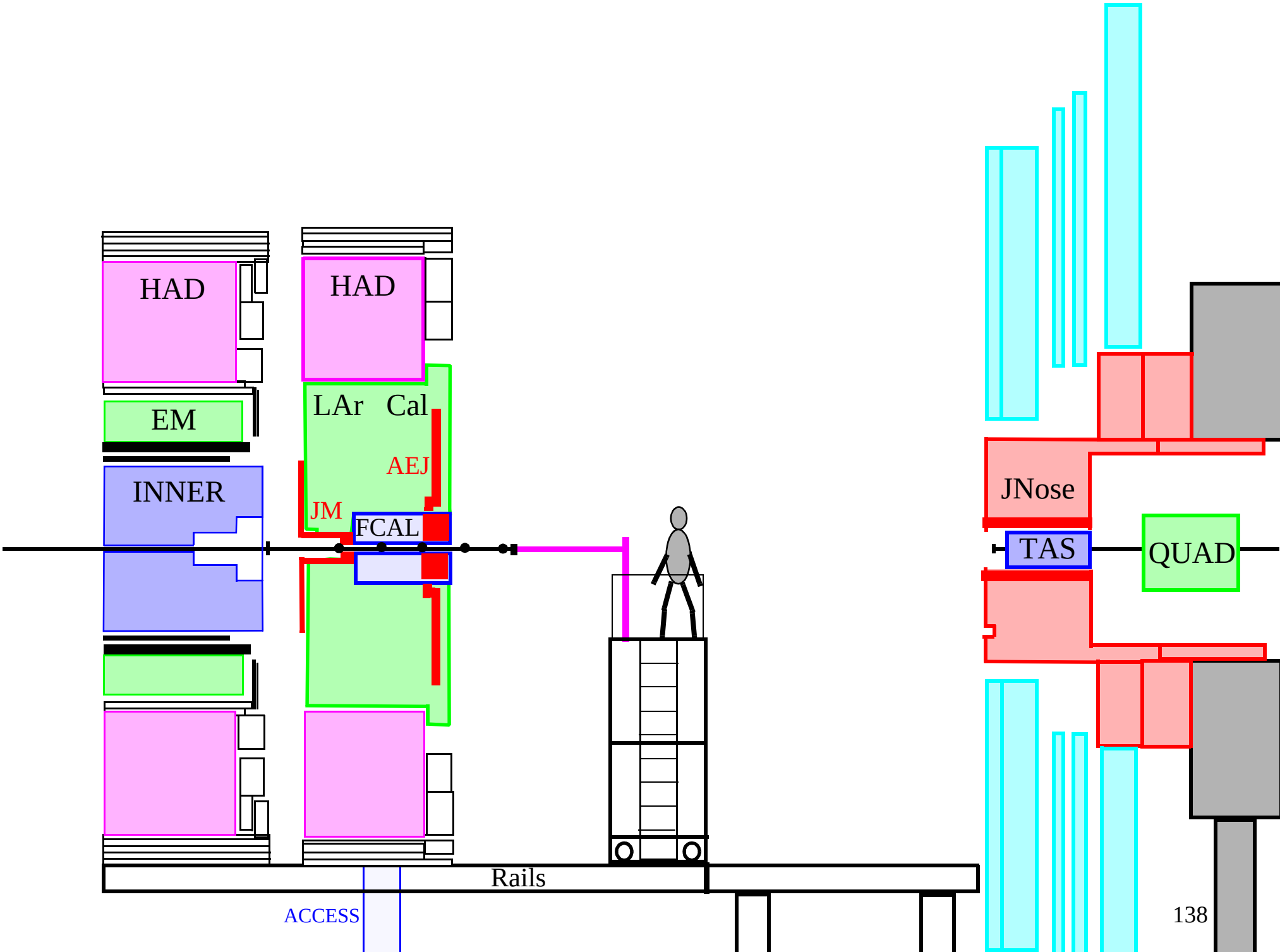
43. A support rod is attached to the VA beampipe.



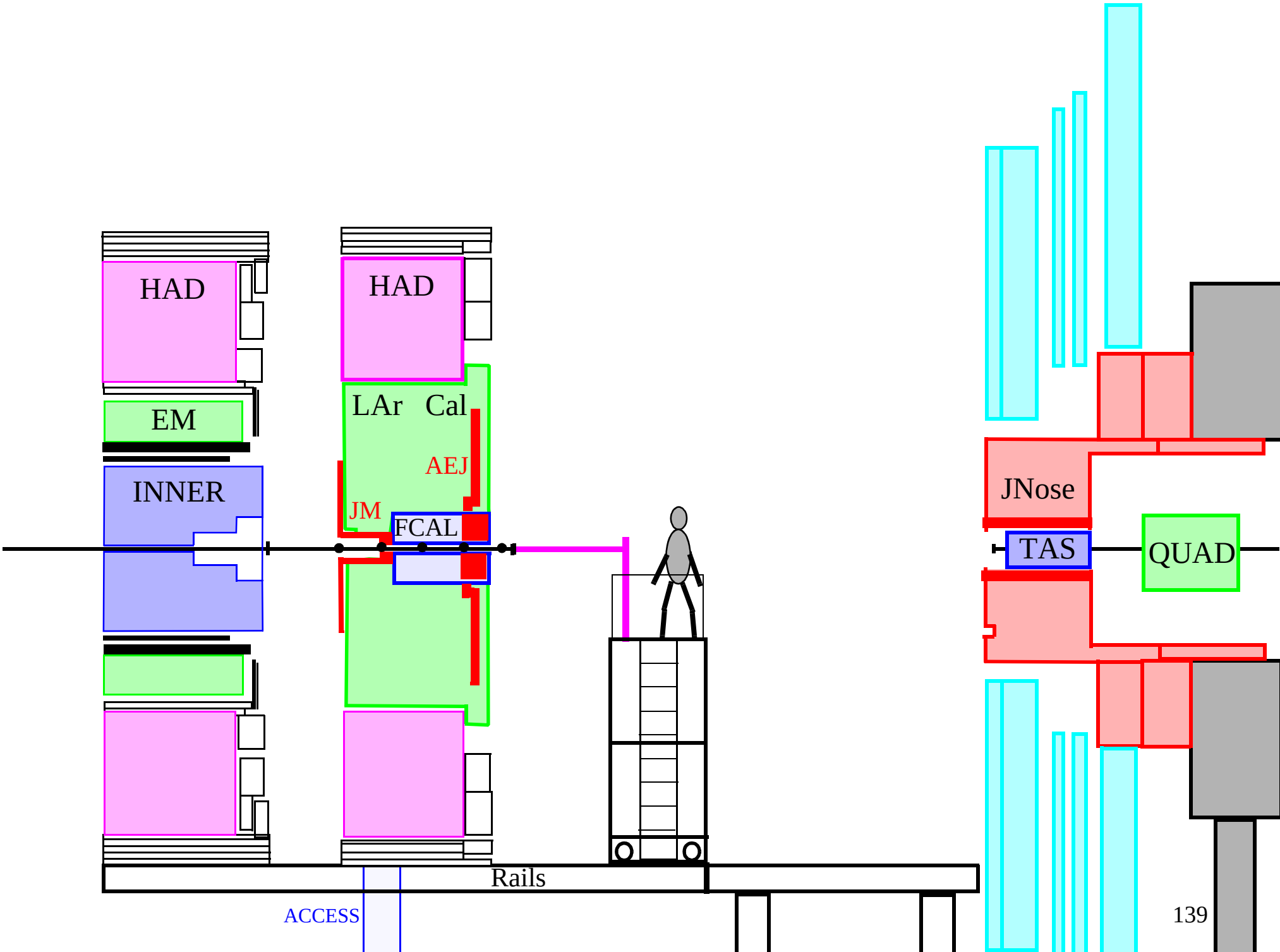
Dose rates in μSv/h after 100 days of running and 5 days cooling



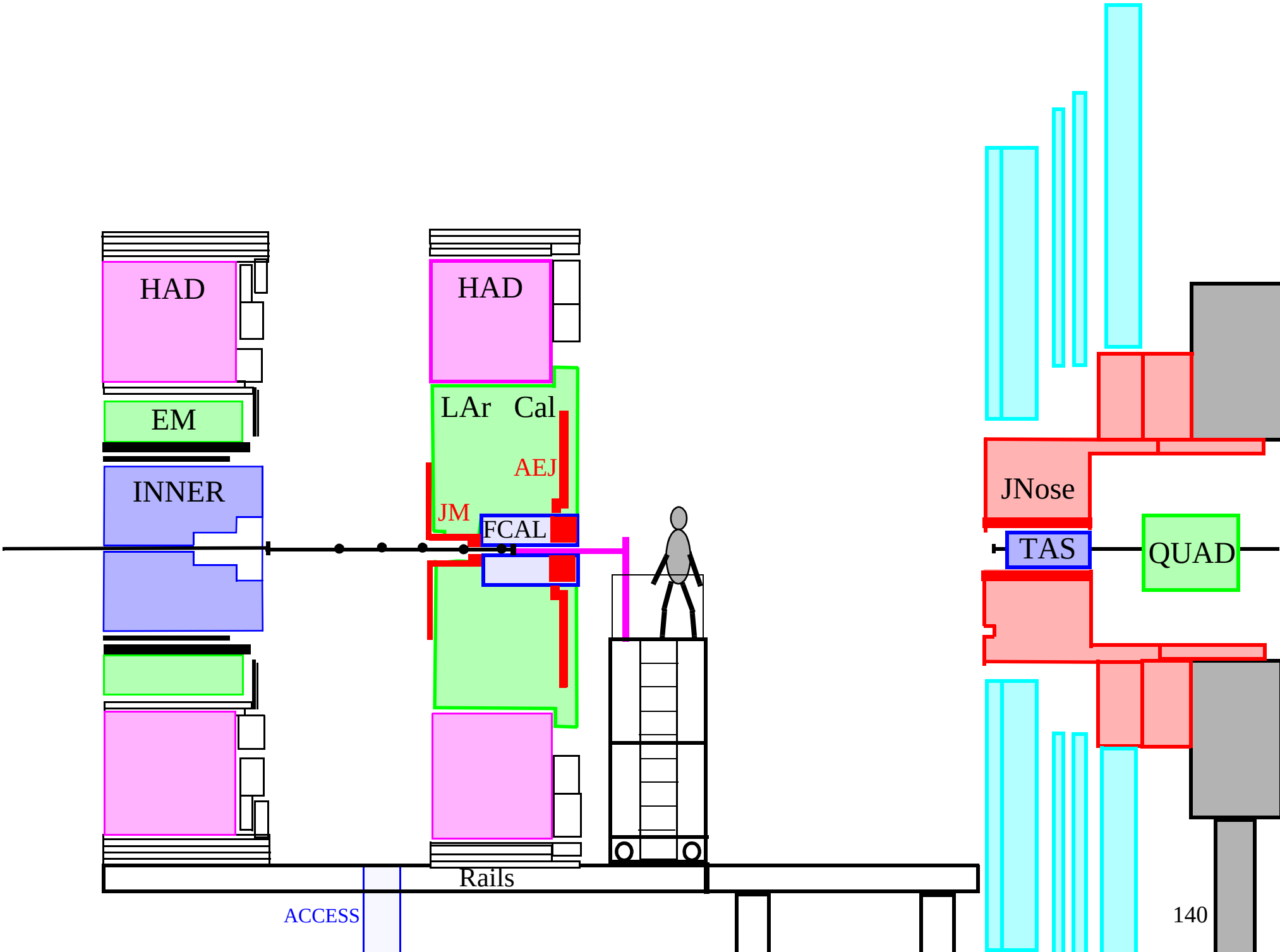
44. The calorimeter is moved forward.



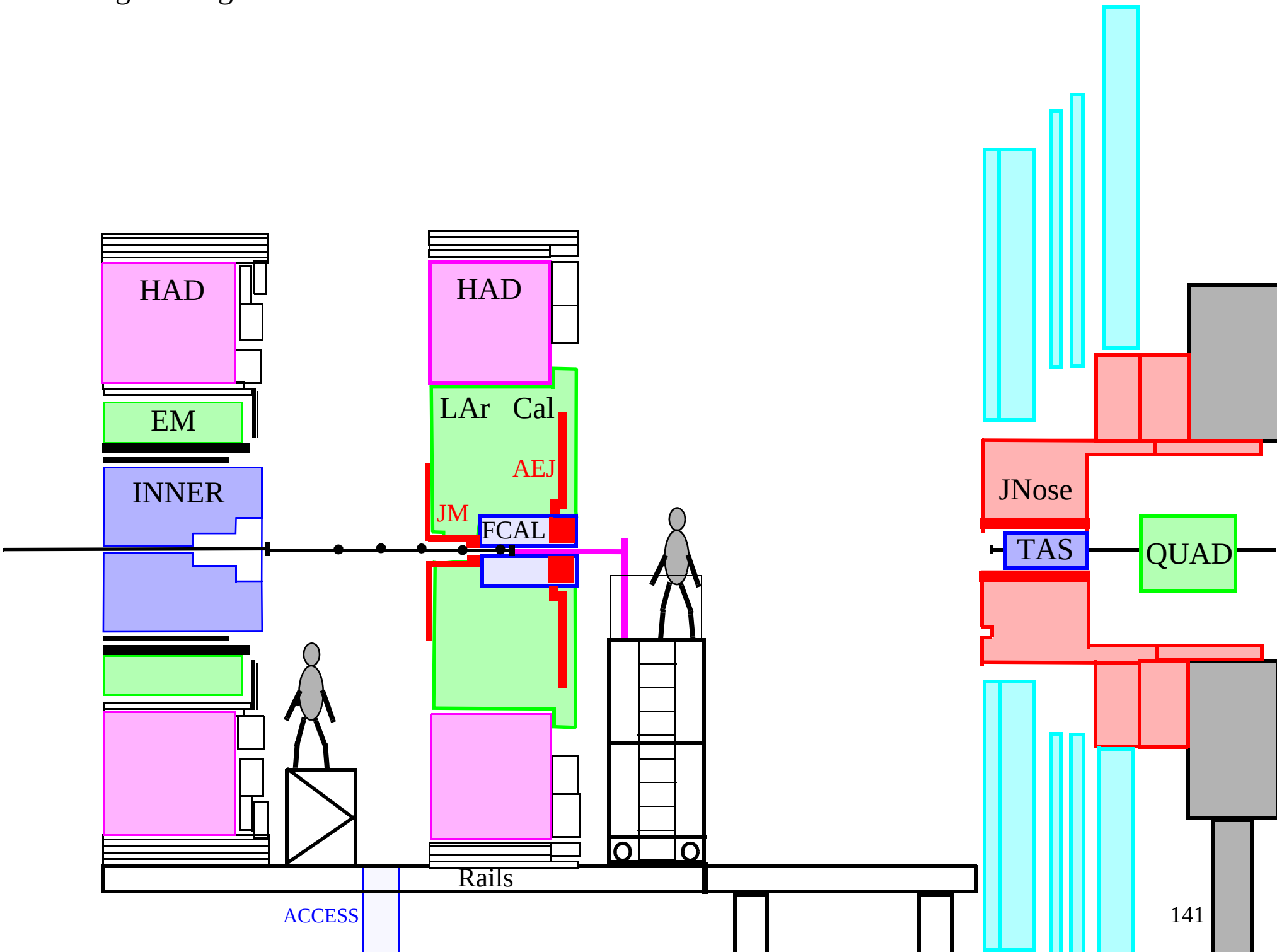
44. The calorimeter is moved forward.

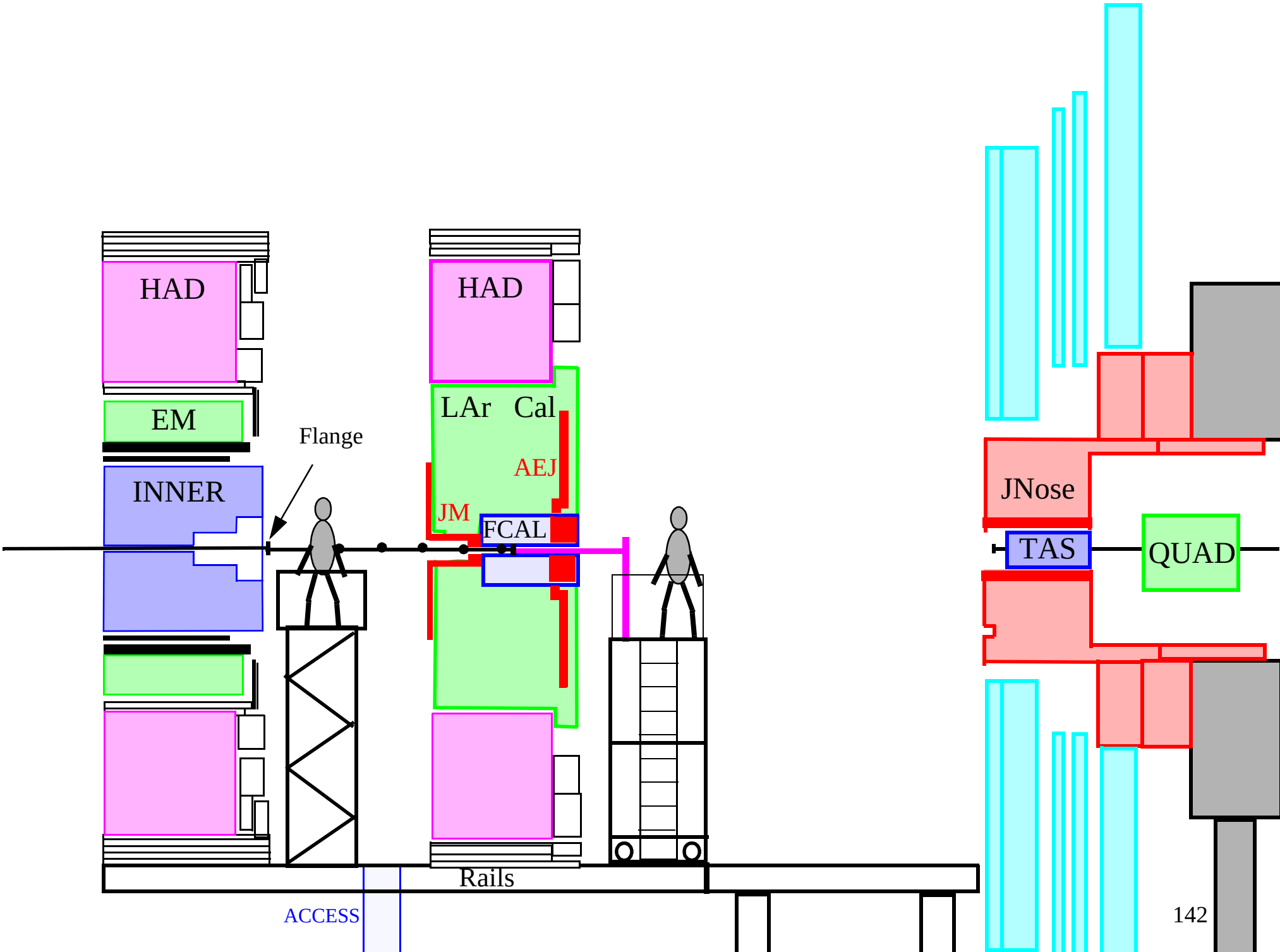


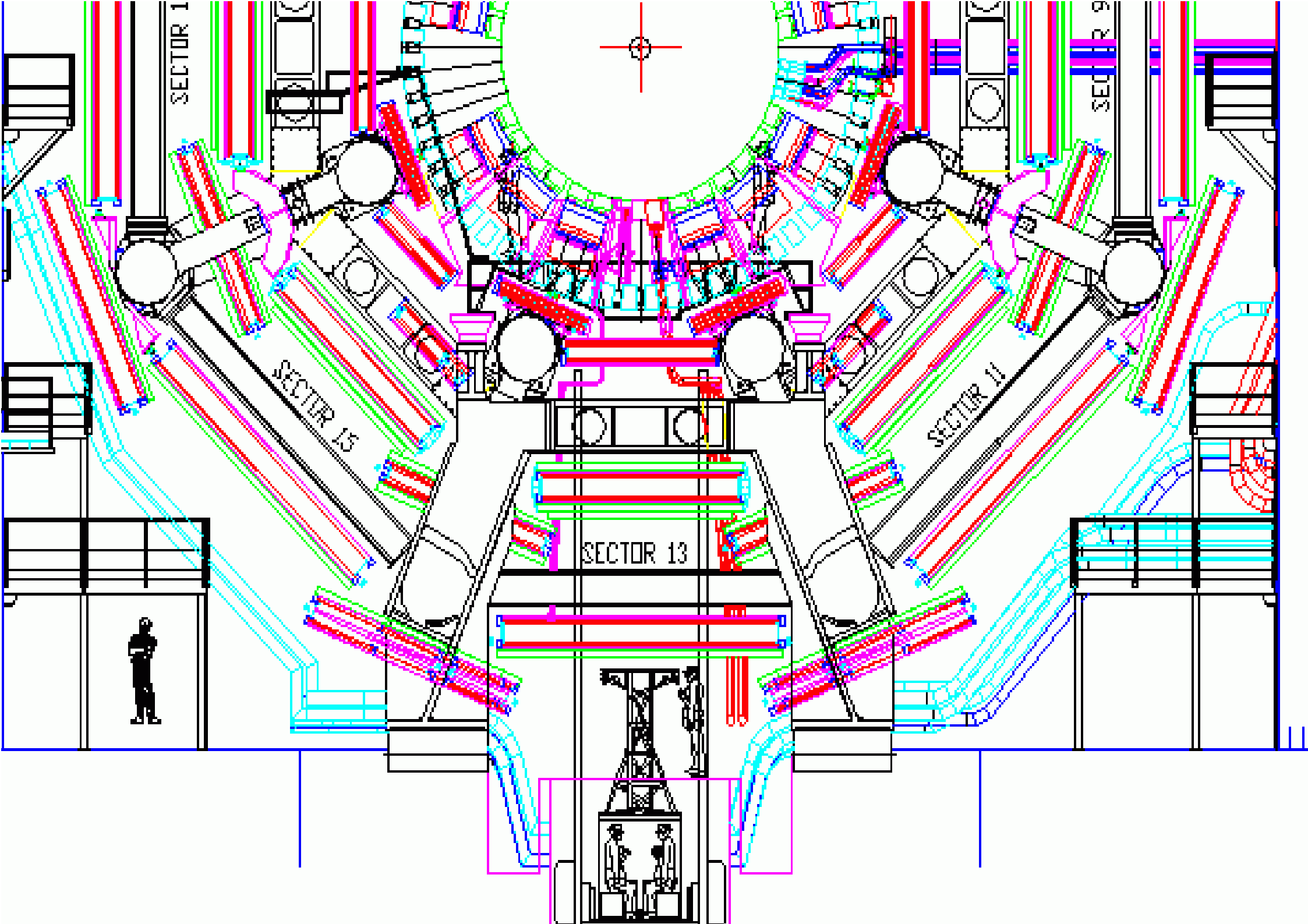
44. The calorimeter is moved forward.

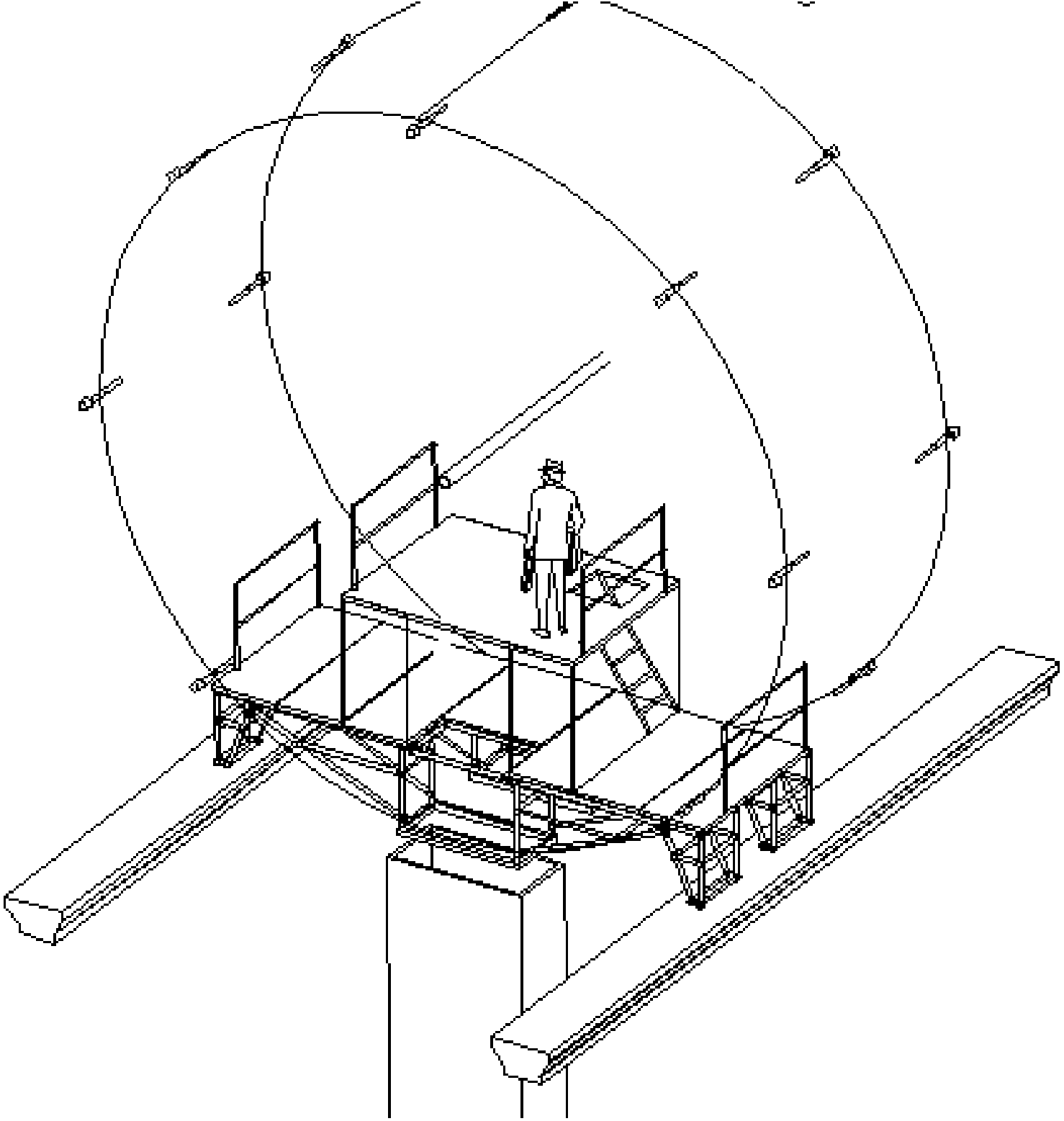


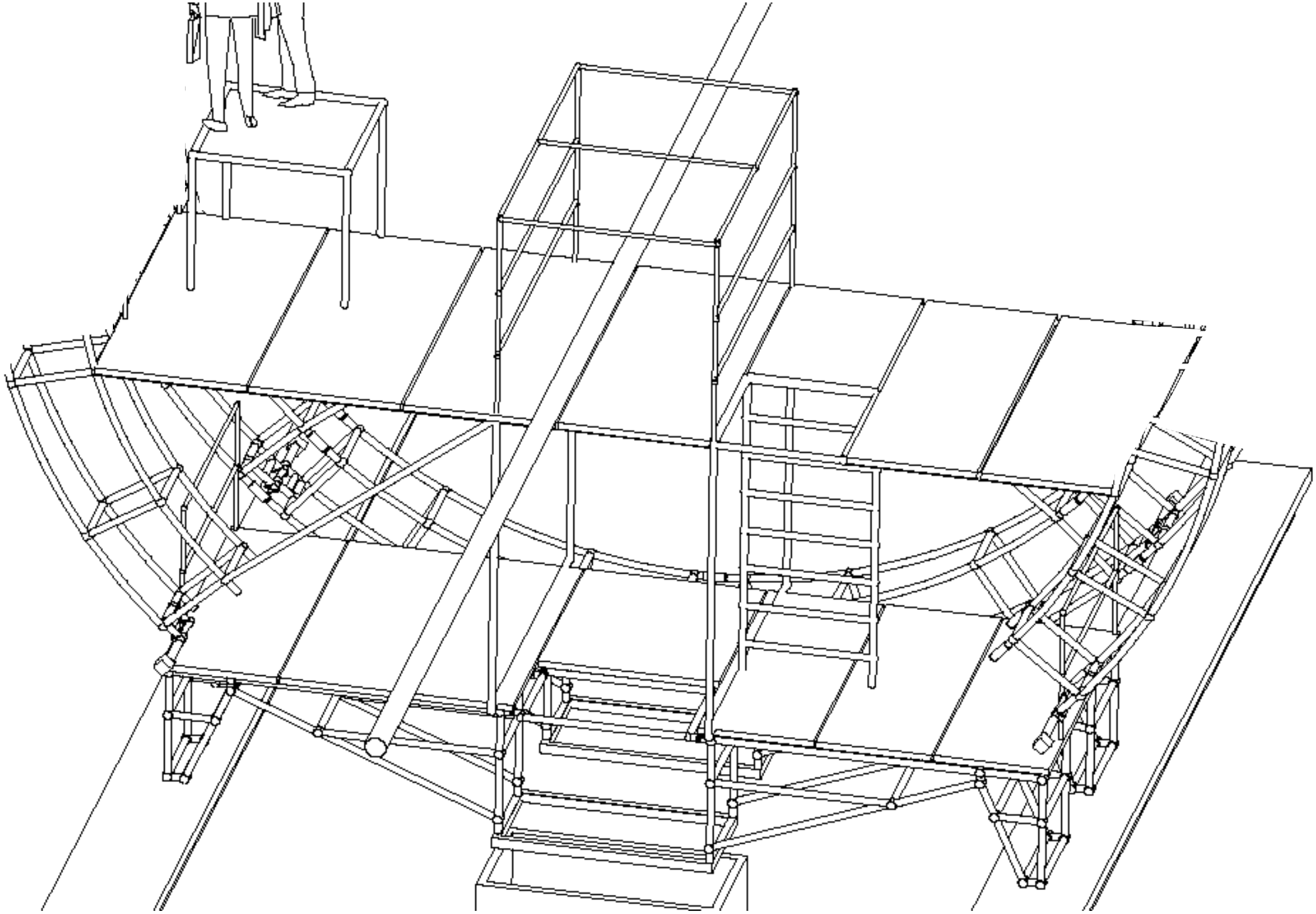
45. Scaffolding is being built.

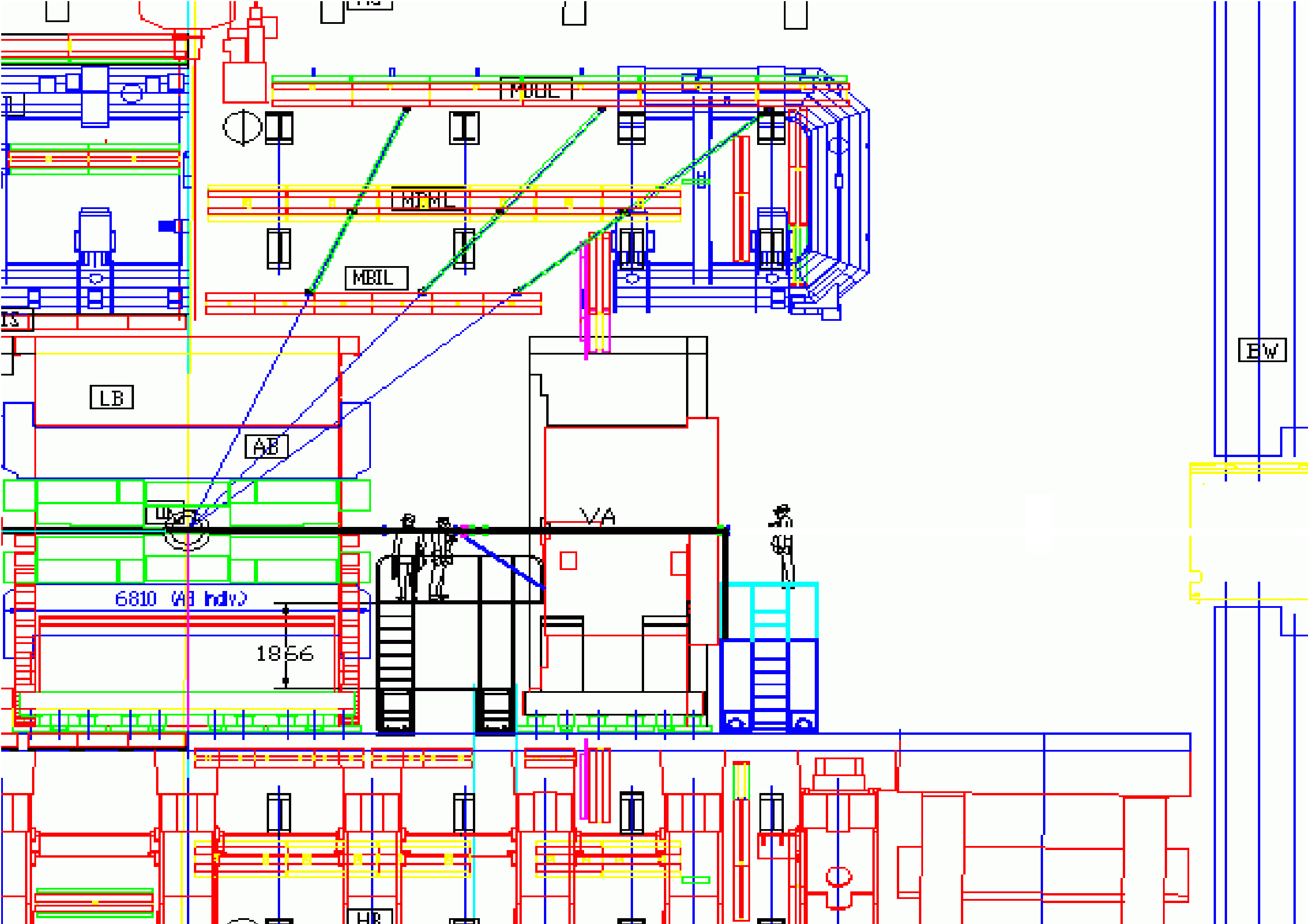



HAD
EM
INNER
Flange
HAD
LAr Cal
AEJ
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS

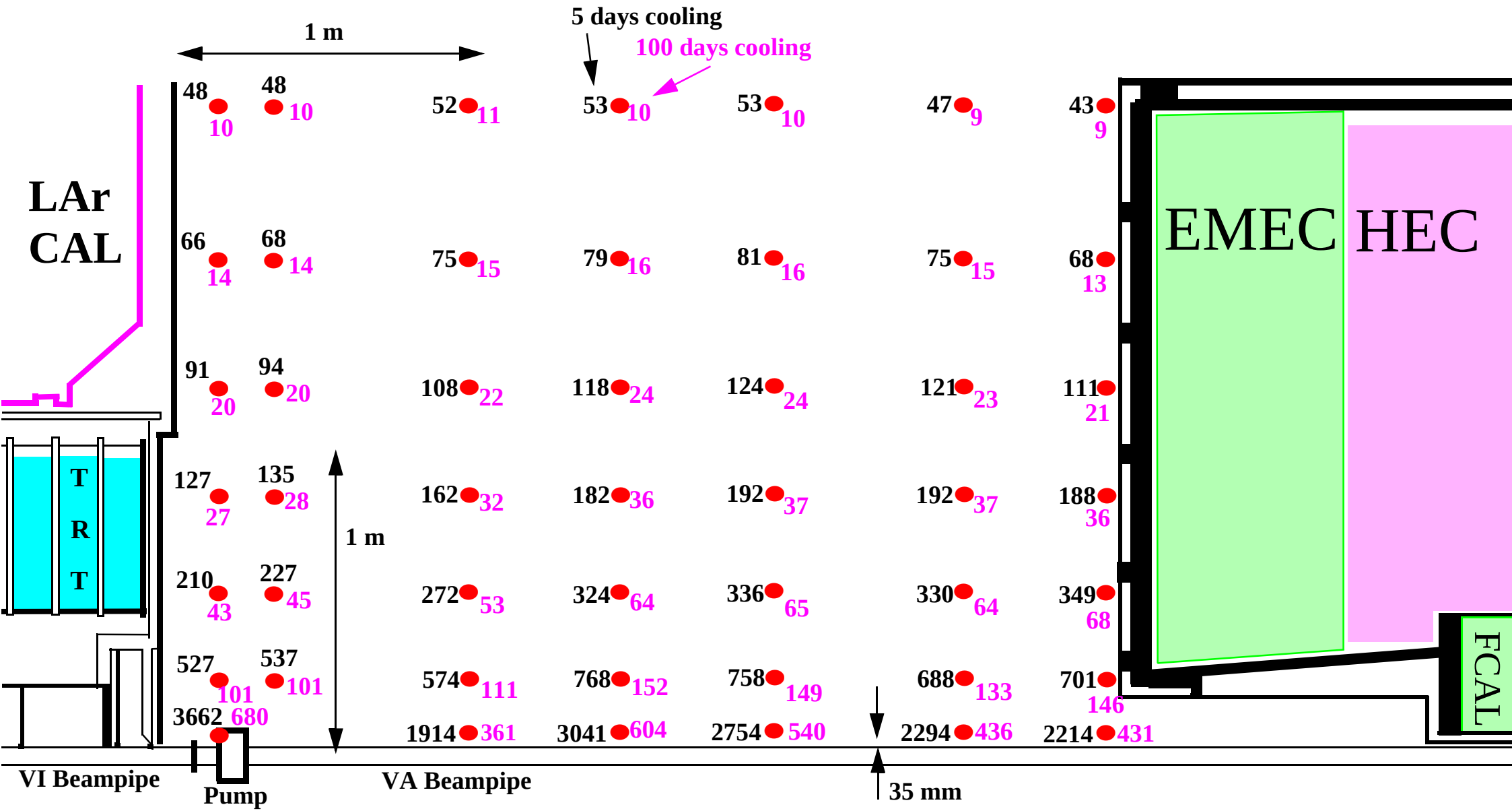

SECTOR 15
SECTOR 13
SECTOR 11



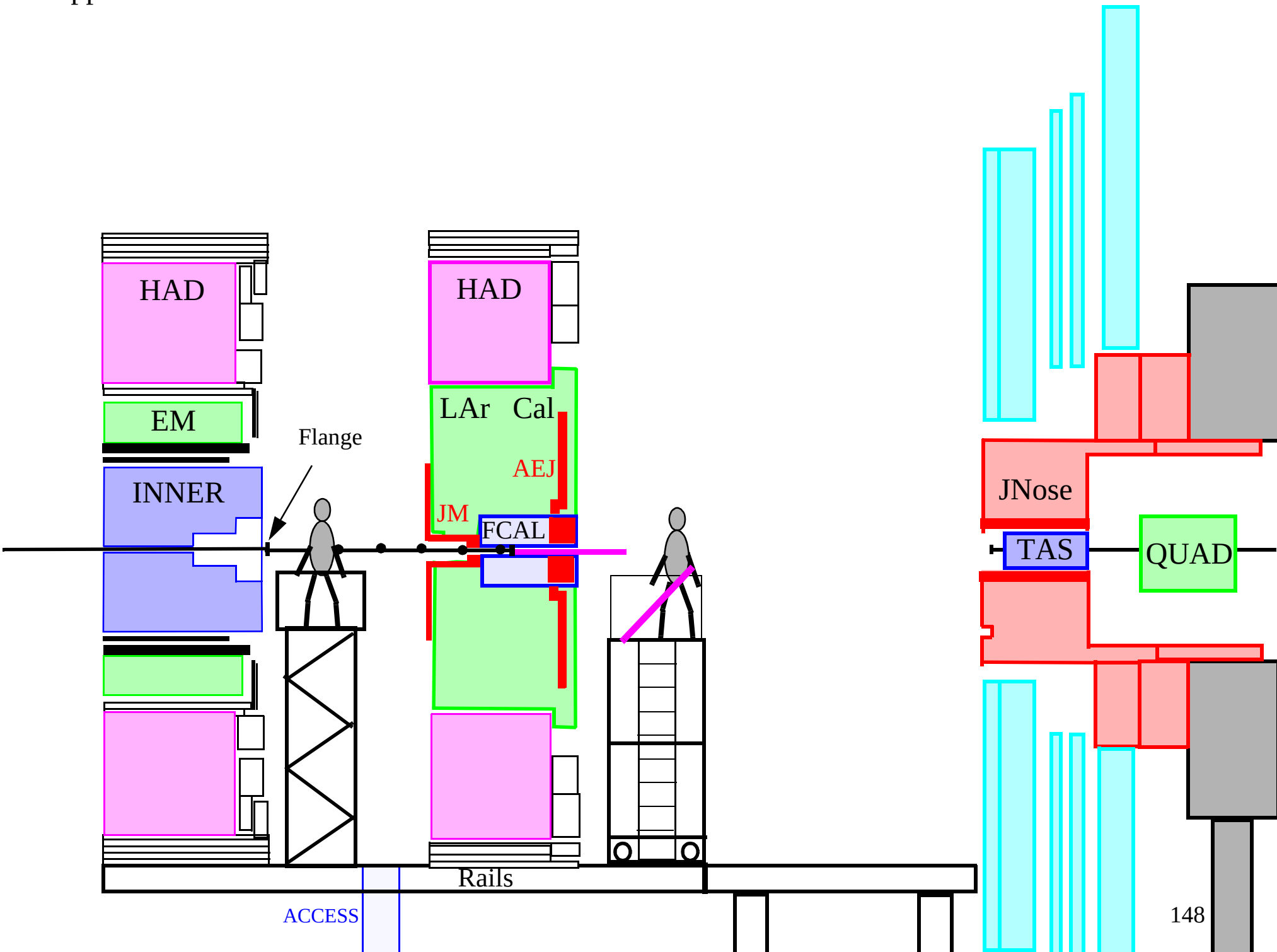



MUBL
MBIL
LB
AB
VA
BW
6810
1866

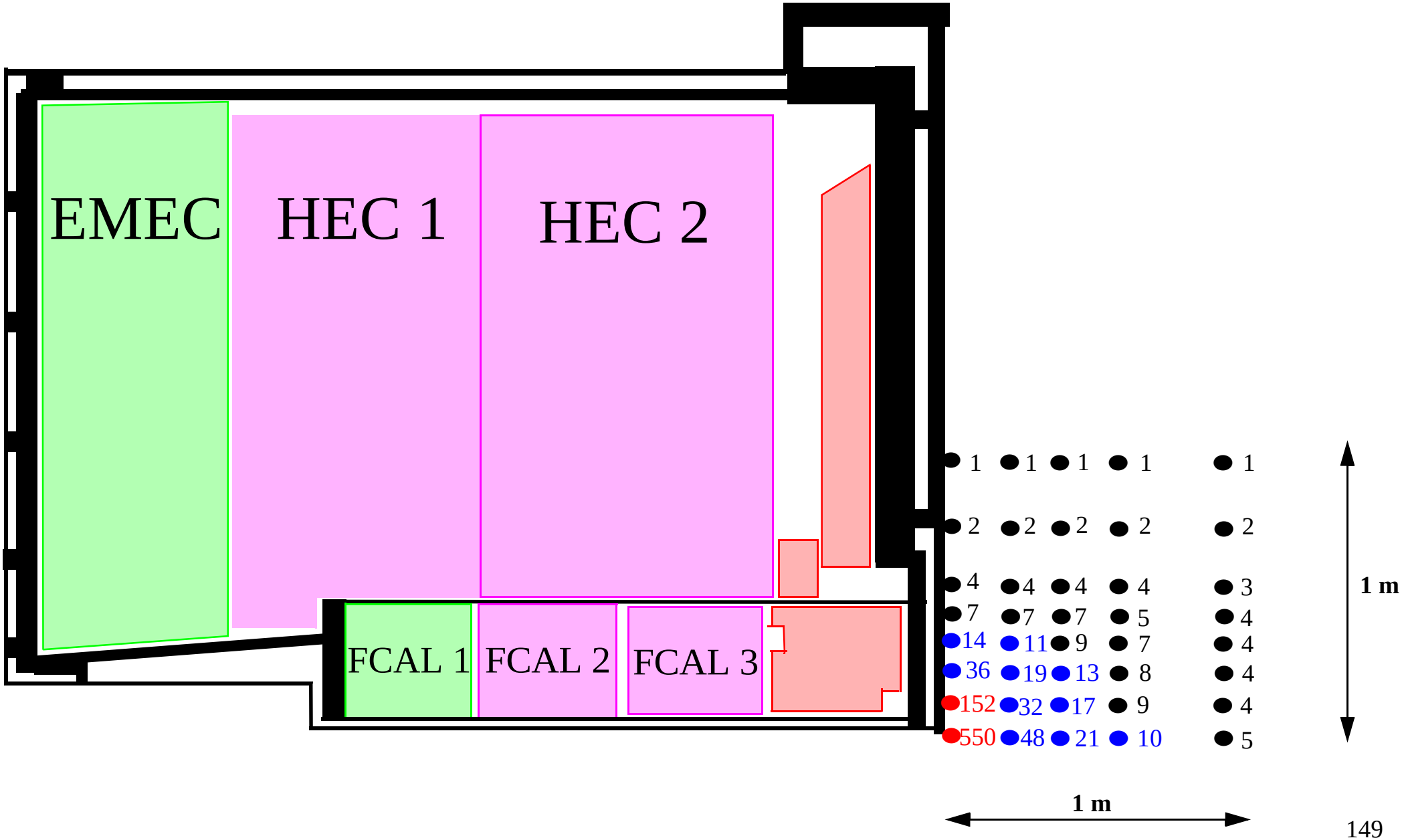
Dose rates in μSv/h after 100 days of running and 5 and 100 days cooling



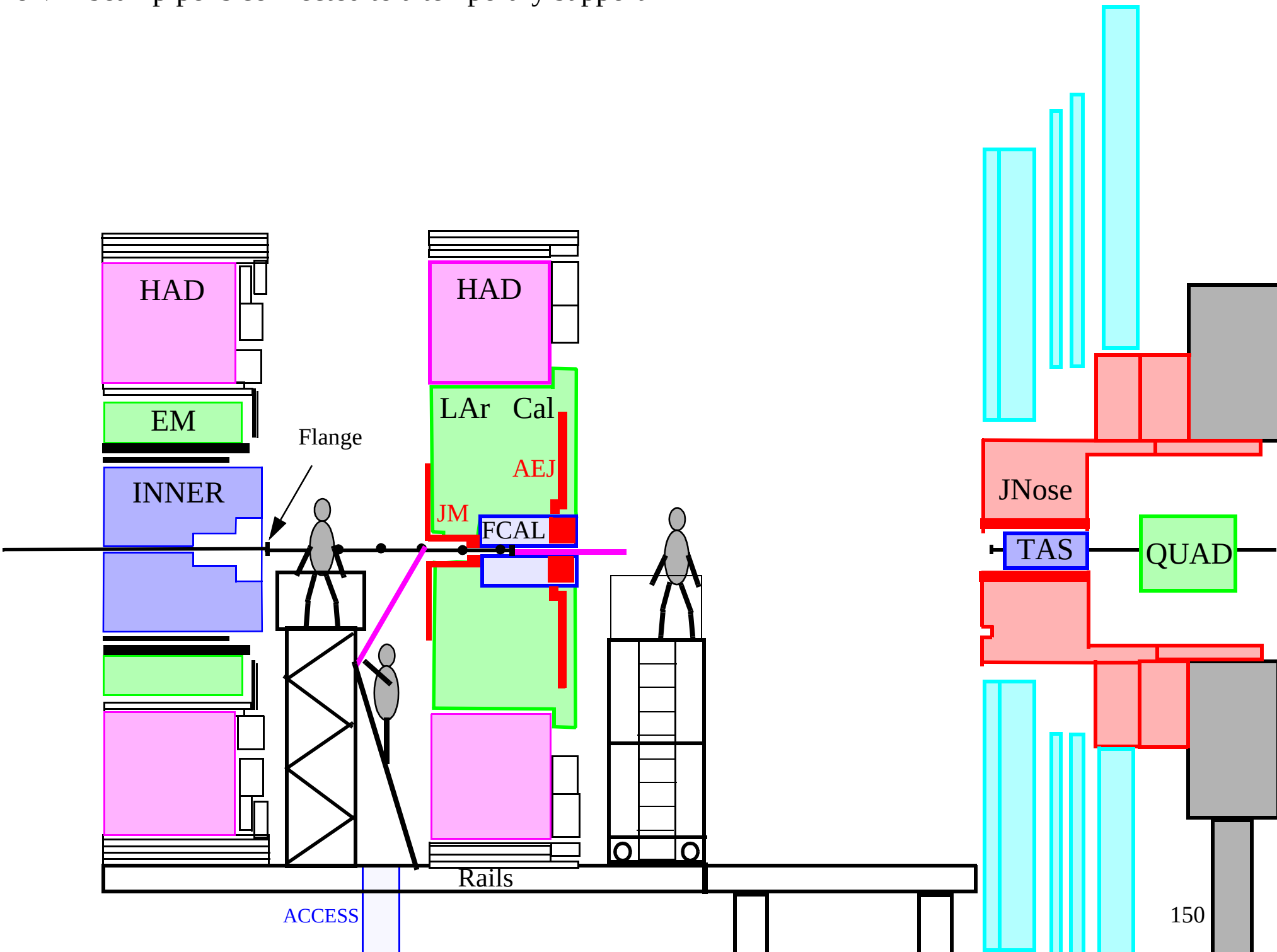
46. The support rod at the back of the VA is disconnected.



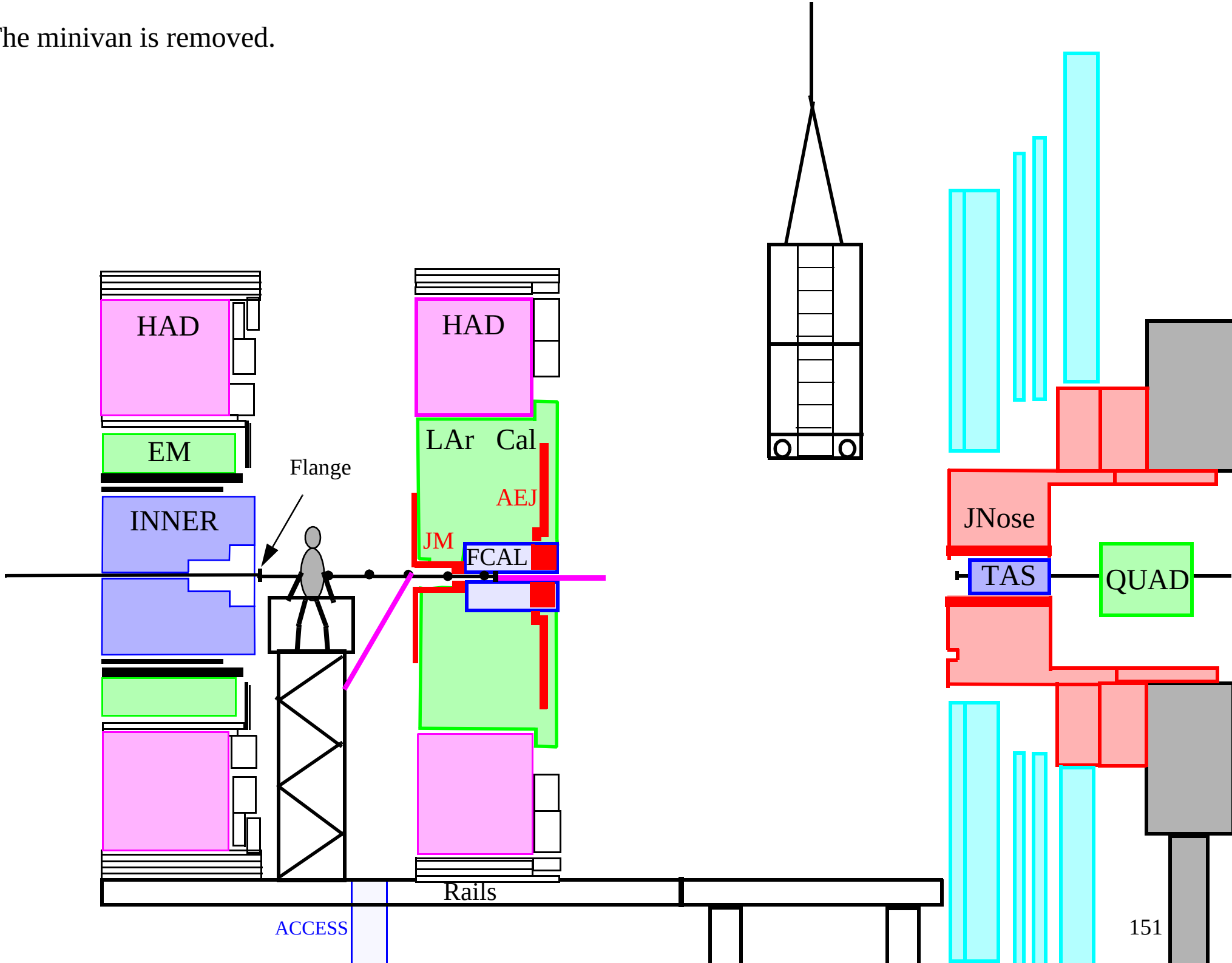
Dose rates in μSv/h after 10 years running and 5 days cooling



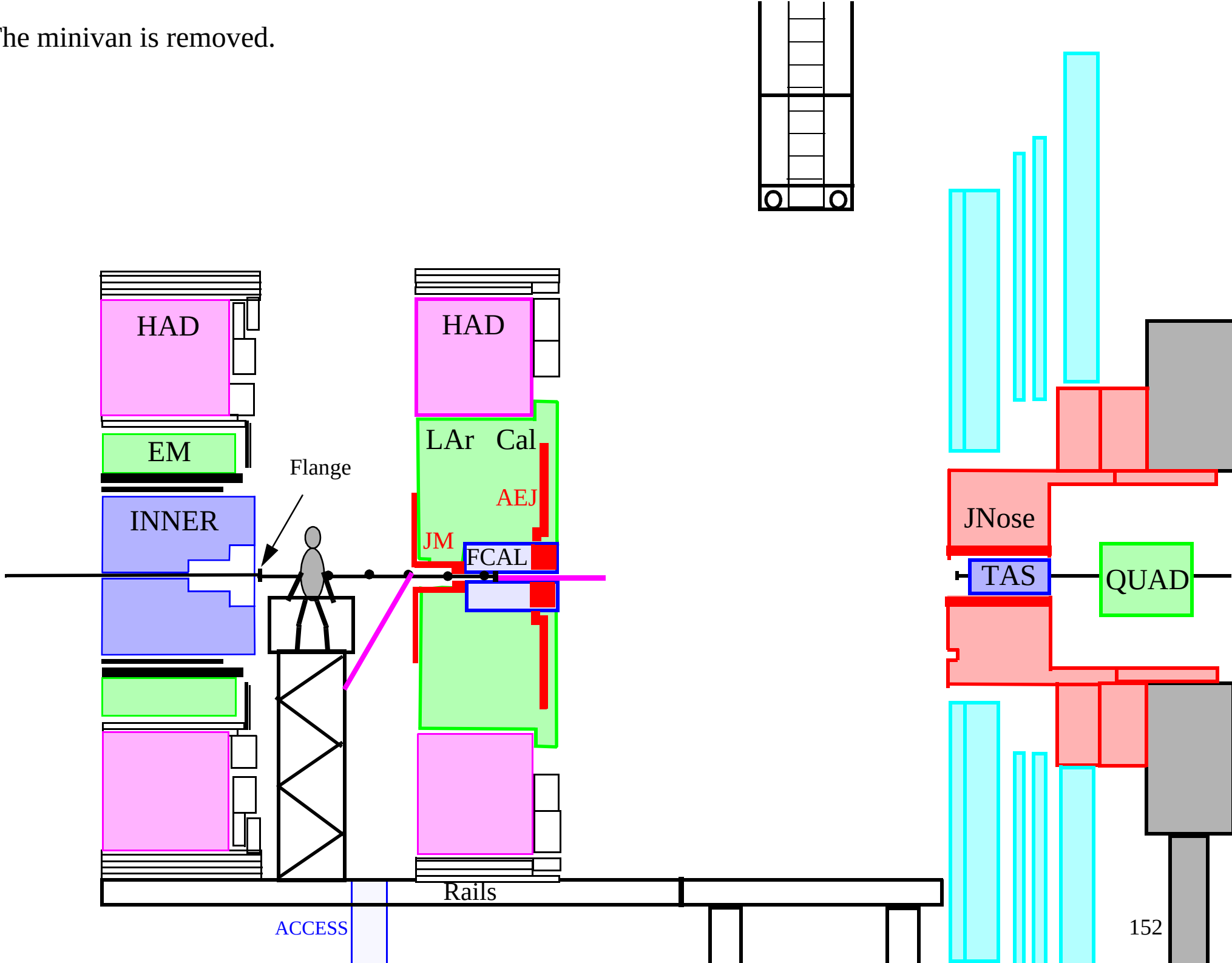
47. The VA beampipe is connected to a temporary support

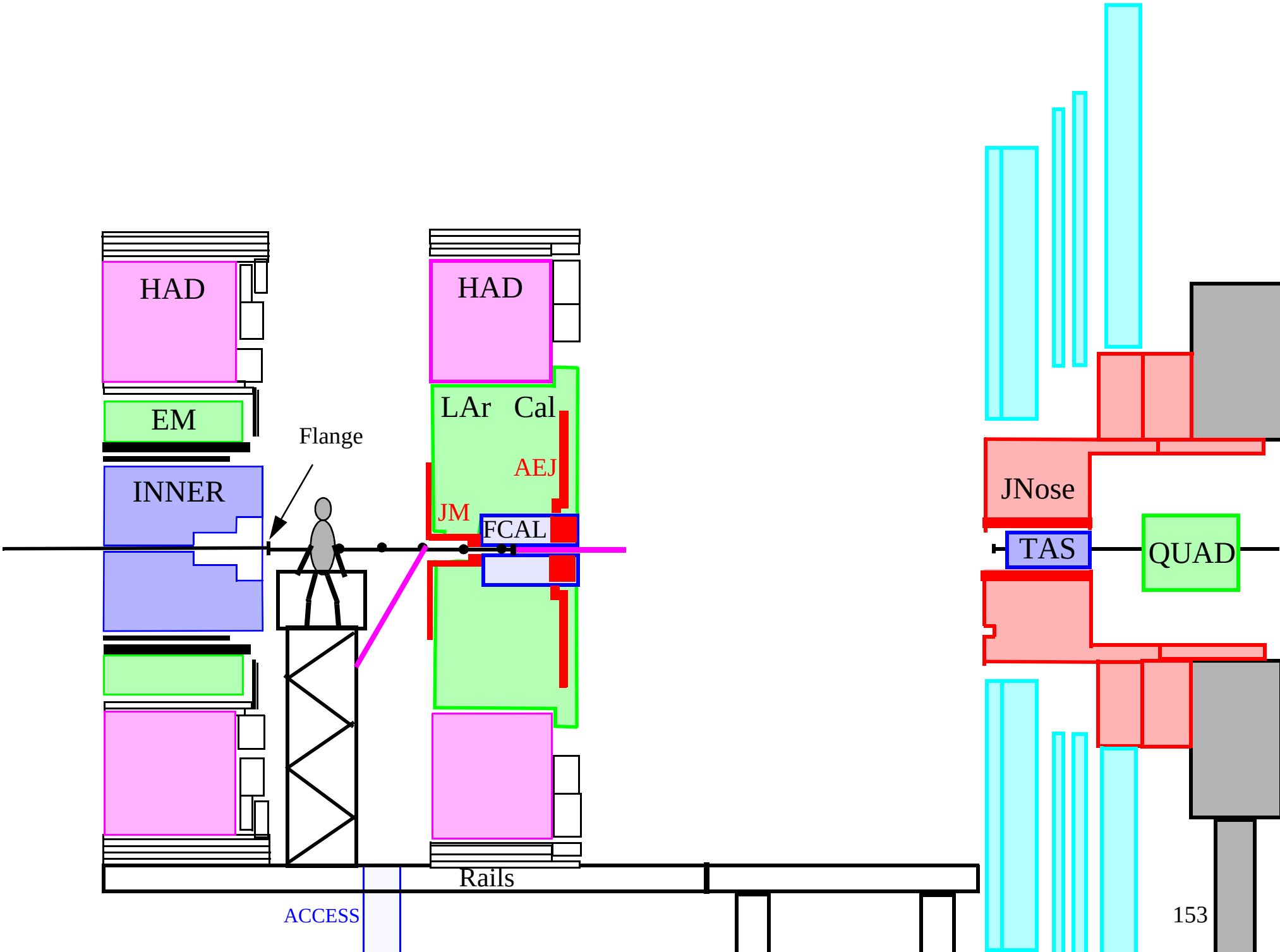


48. The minivan is removed.

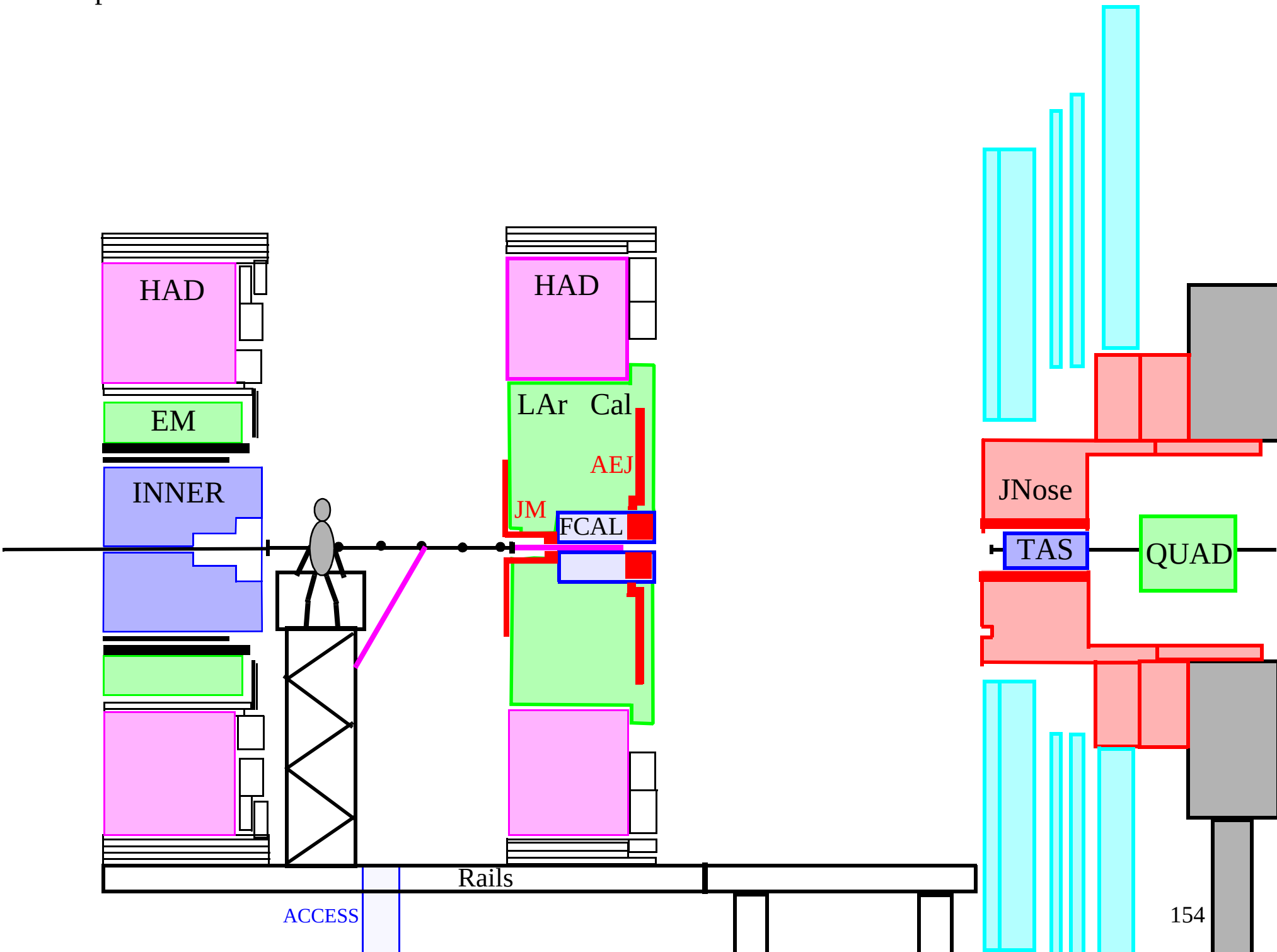


48. The minivan is removed.

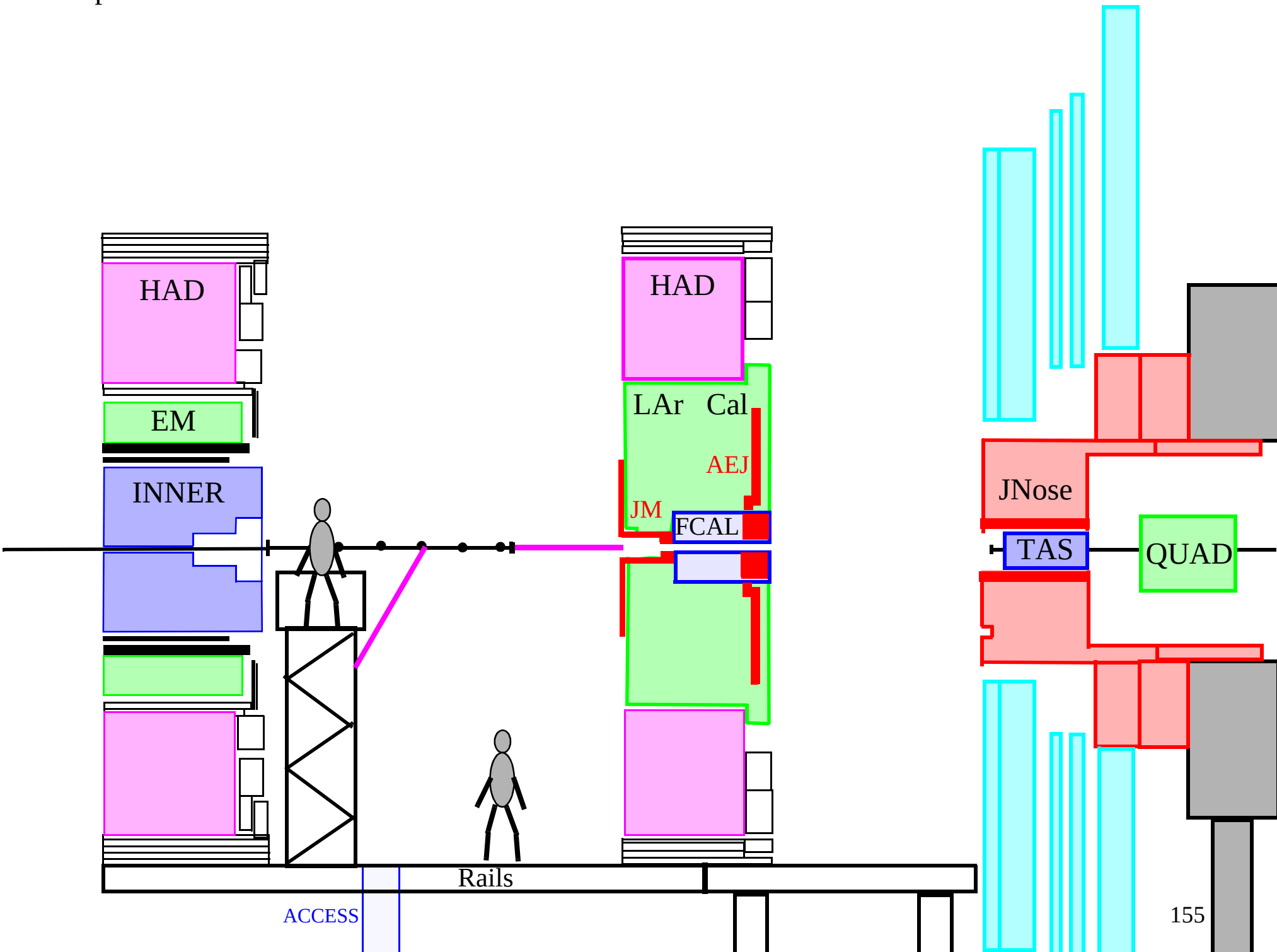



HAD
EM
INNER
Flange
HAD
LAr Cal
AEJ
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS

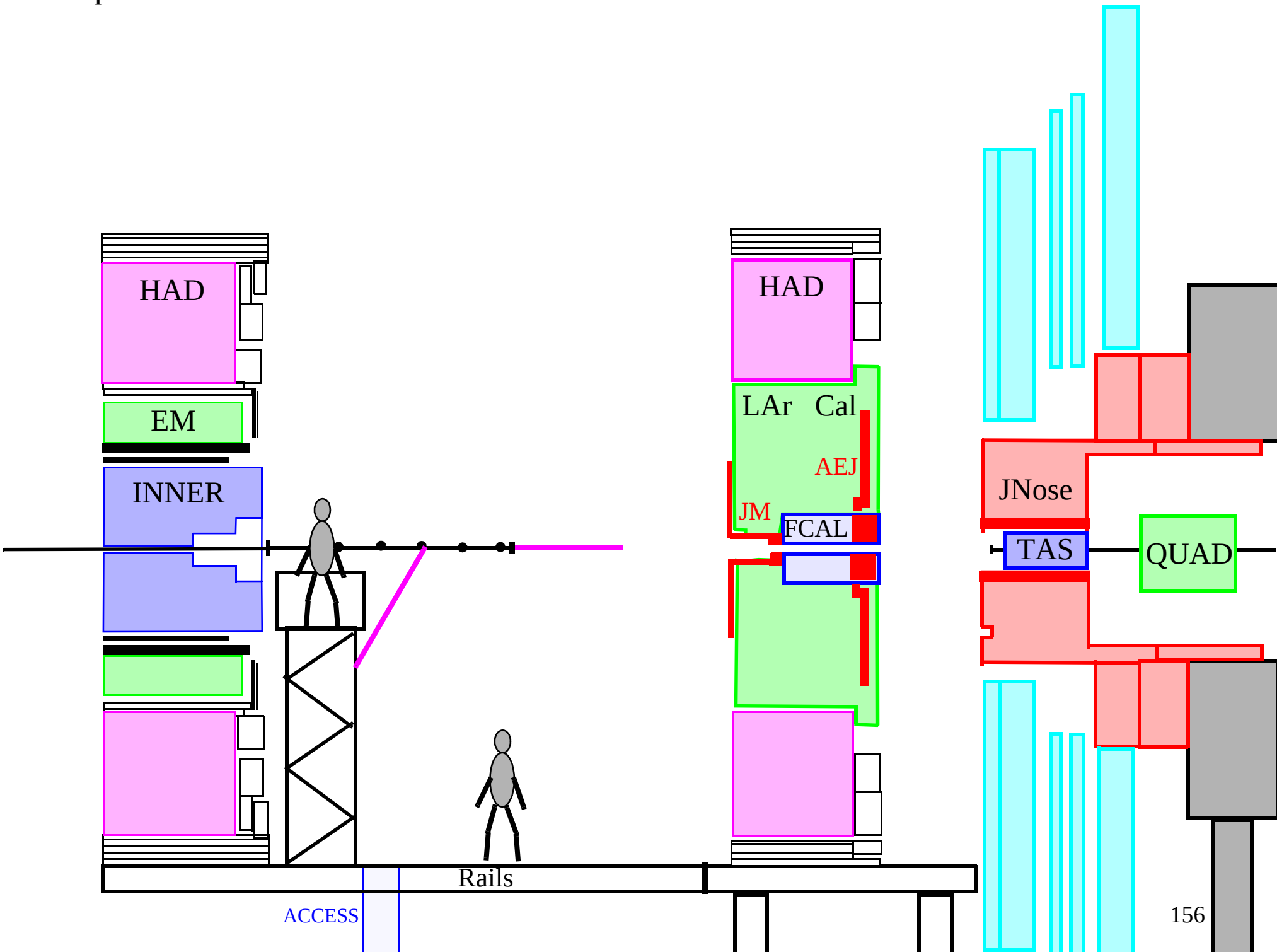
49. The endcap calorimeter is moved forward onto the HF truck.



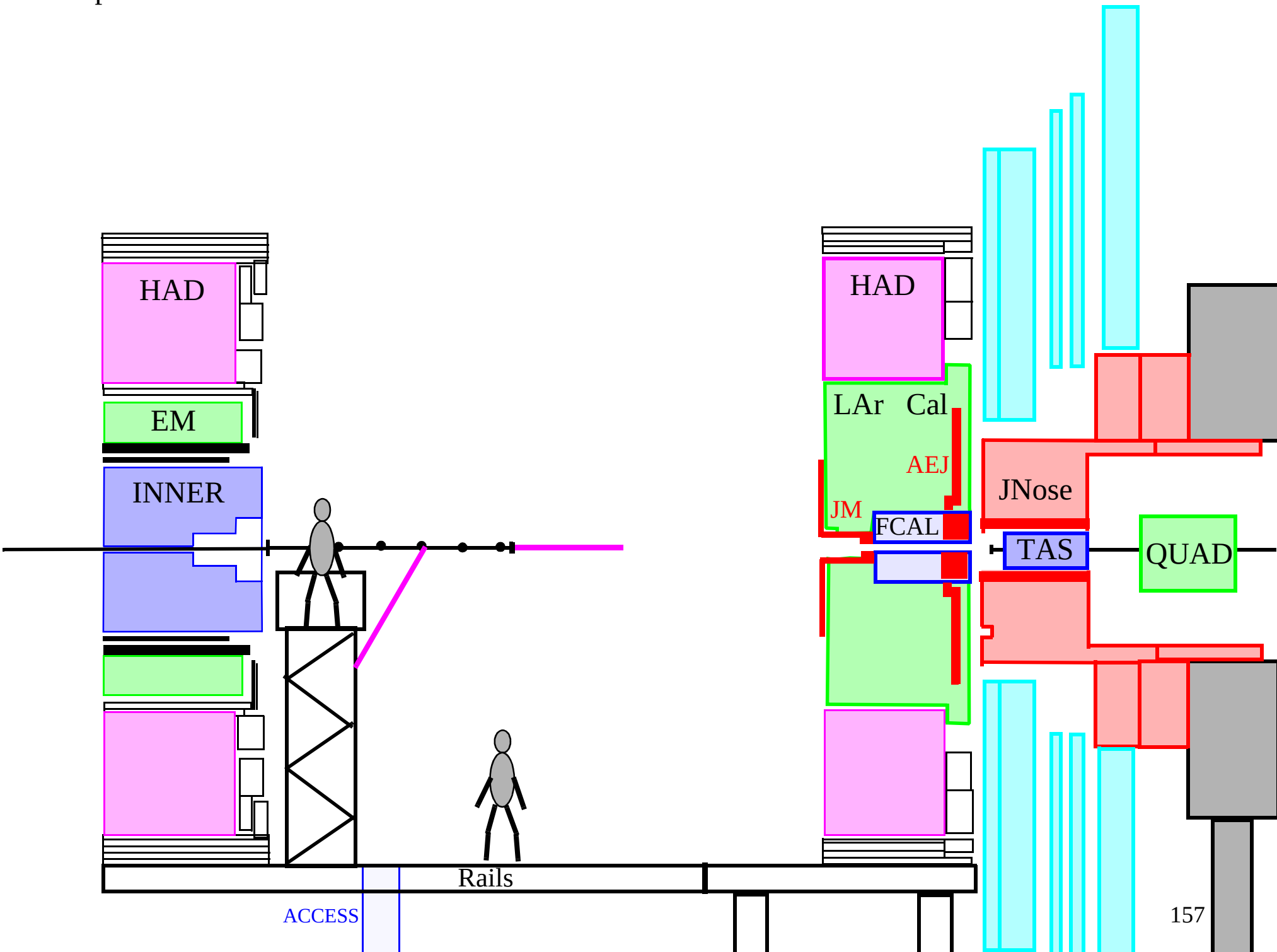
49. The endcap calorimeter is moved forward onto the HF truck.



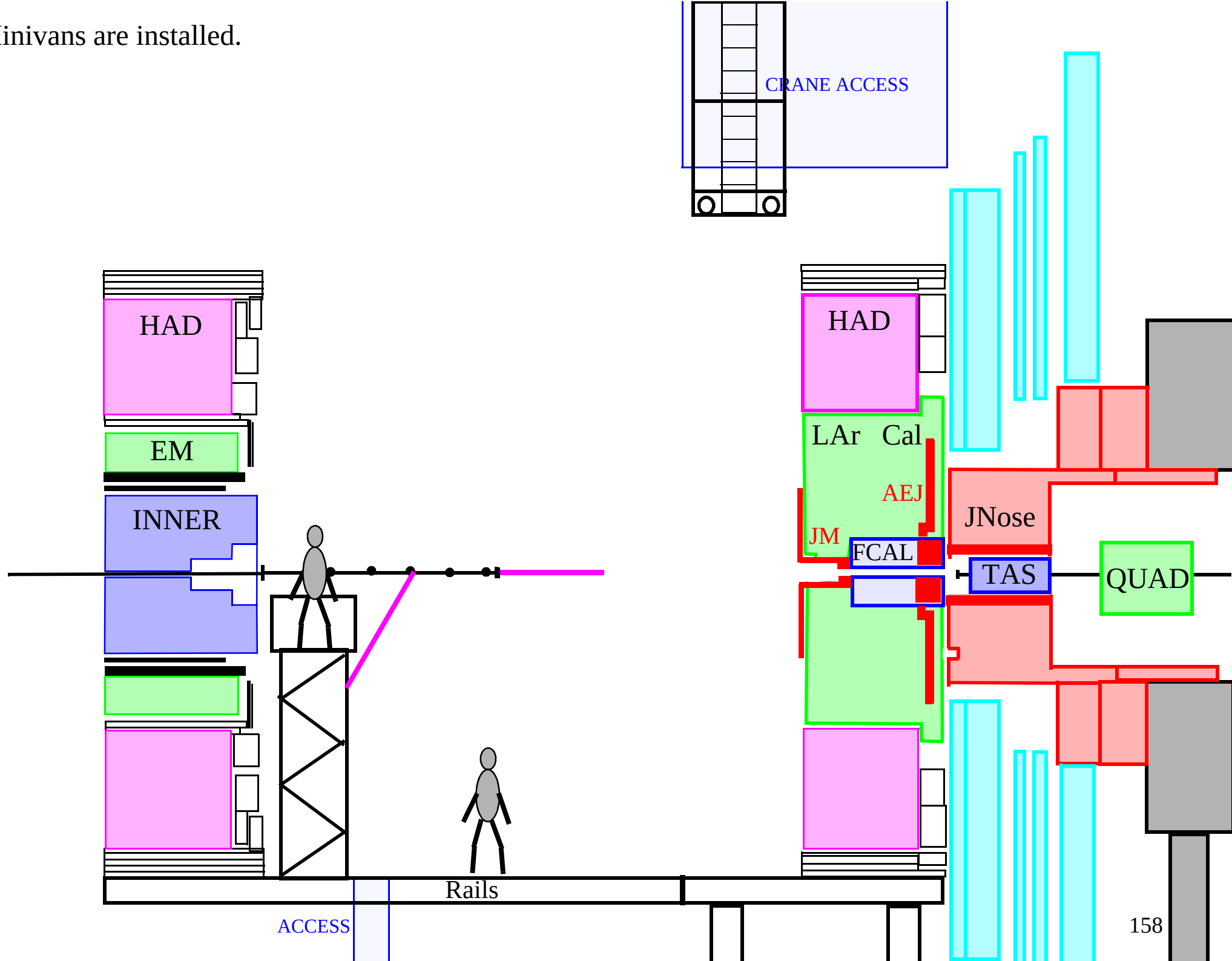
49. The endcap calorimeter is moved forward onto the HF truck.



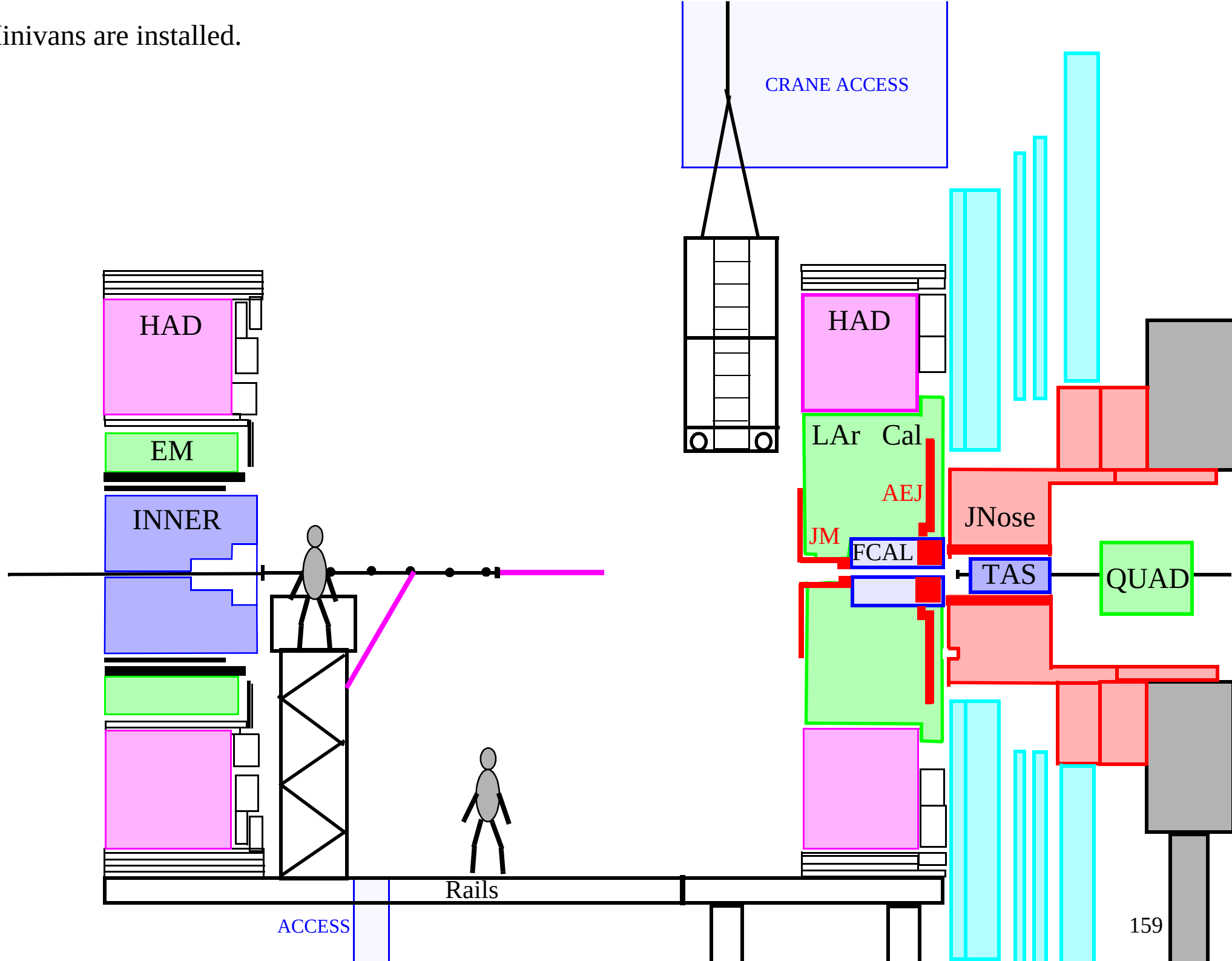
49. The endcap calorimeter is moved forward onto the HF truck.



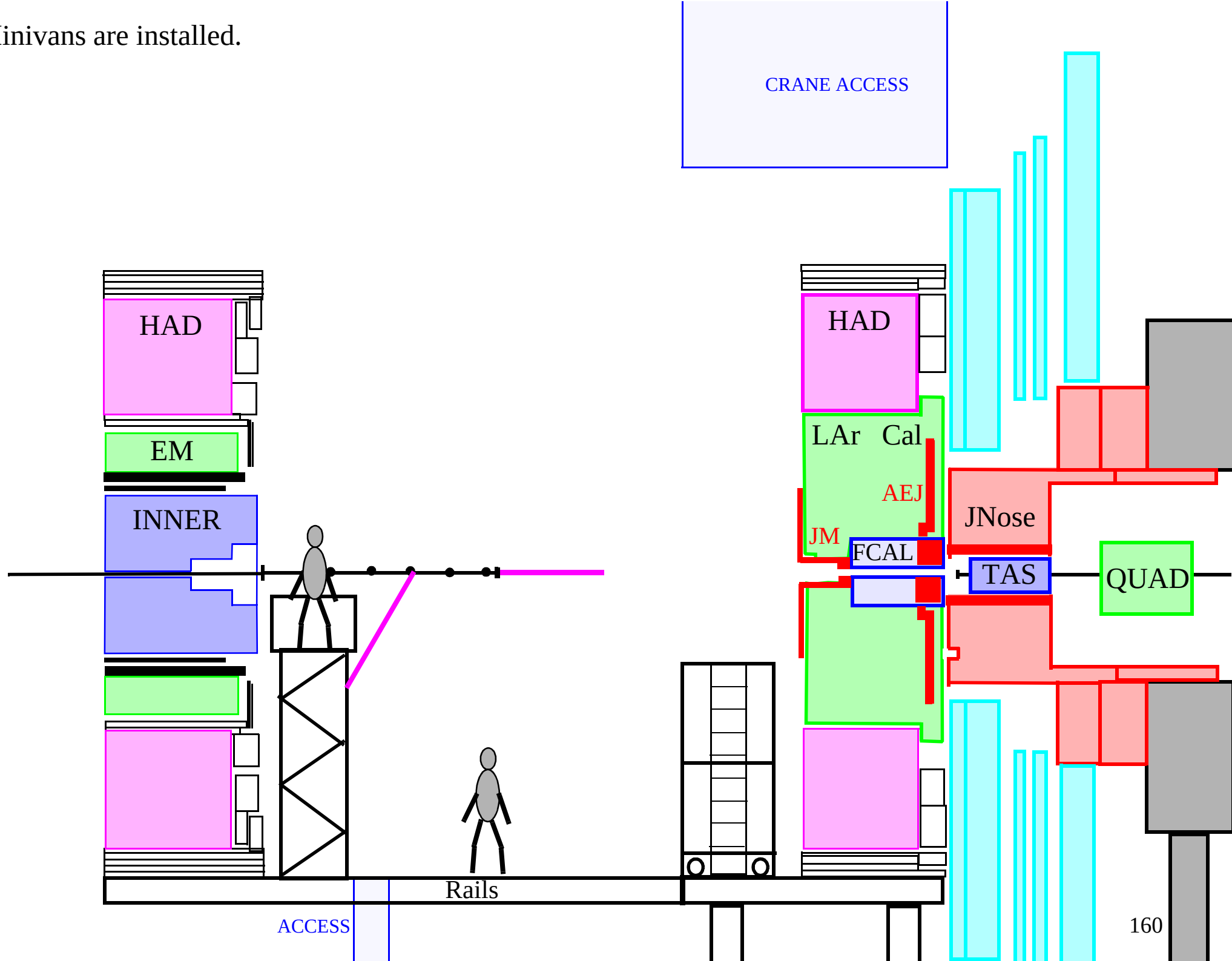
50. Minivans are installed.

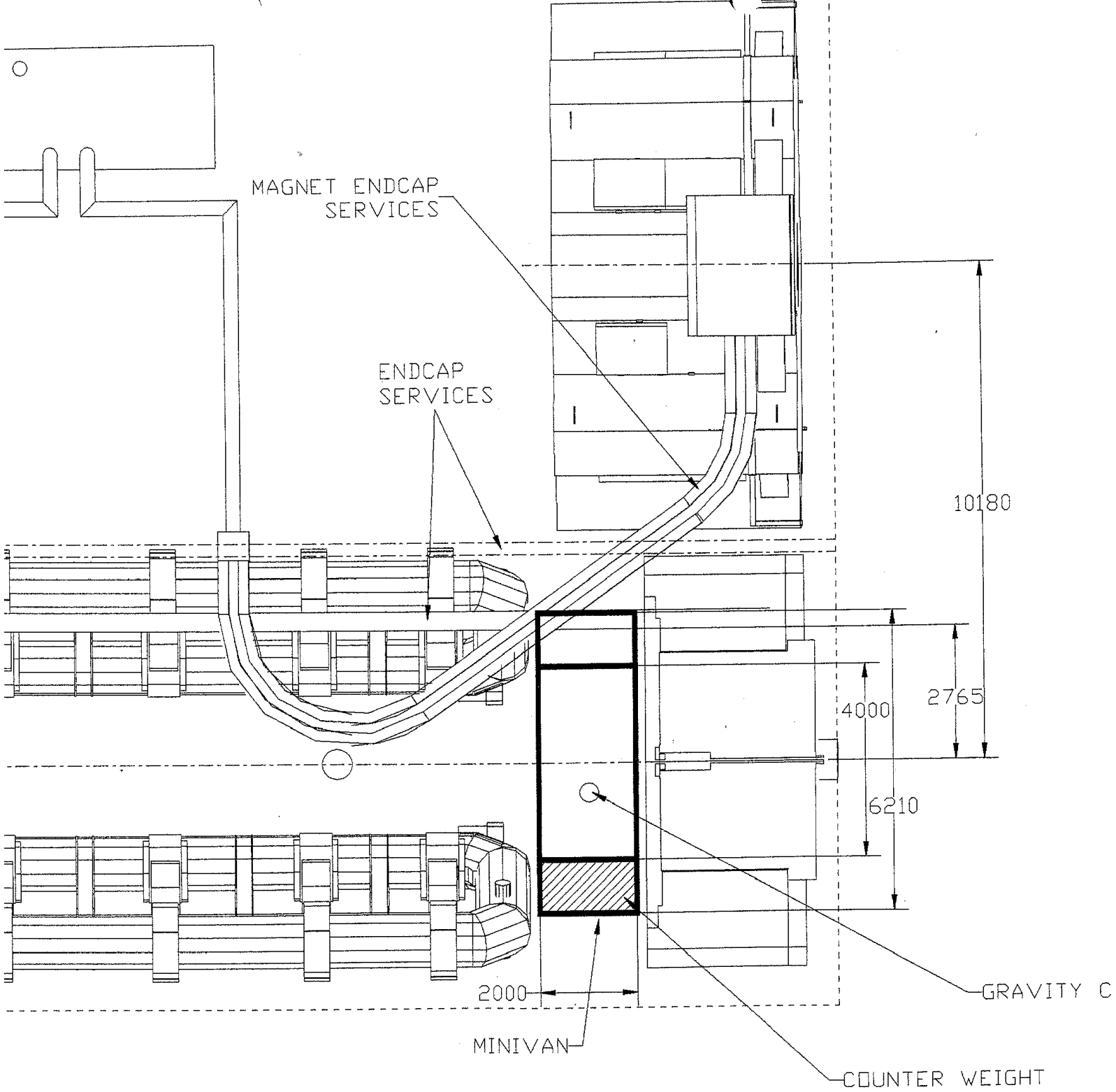


50. Minivans are installed.

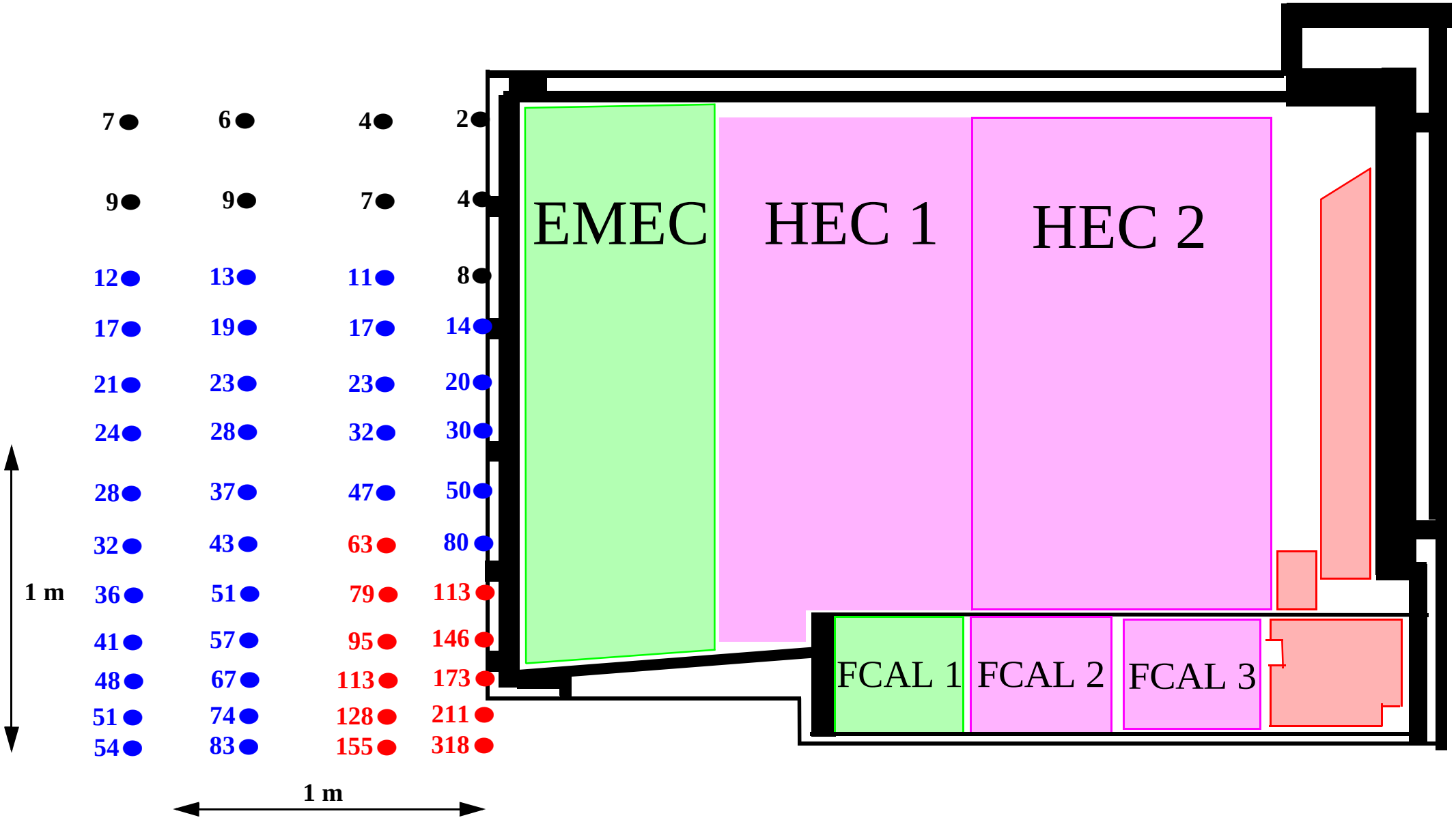


50. Minivans are installed.

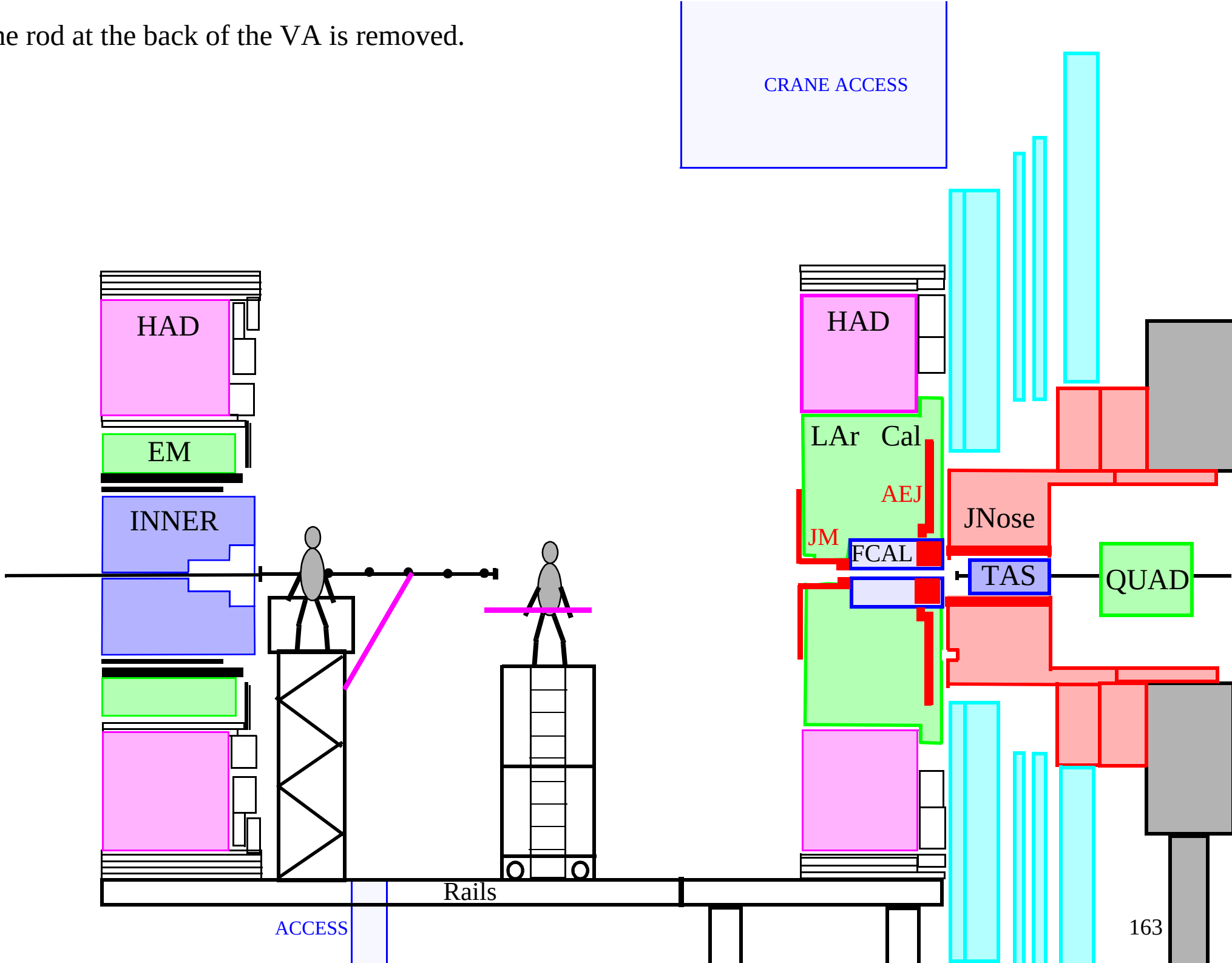



MAGNET ENDCAP
SERVICES
ENDCAP
SERVICES
10180
4000
2765
6210
2000
GRAVITY C
MINIVAN
COUNTER WEIGHT

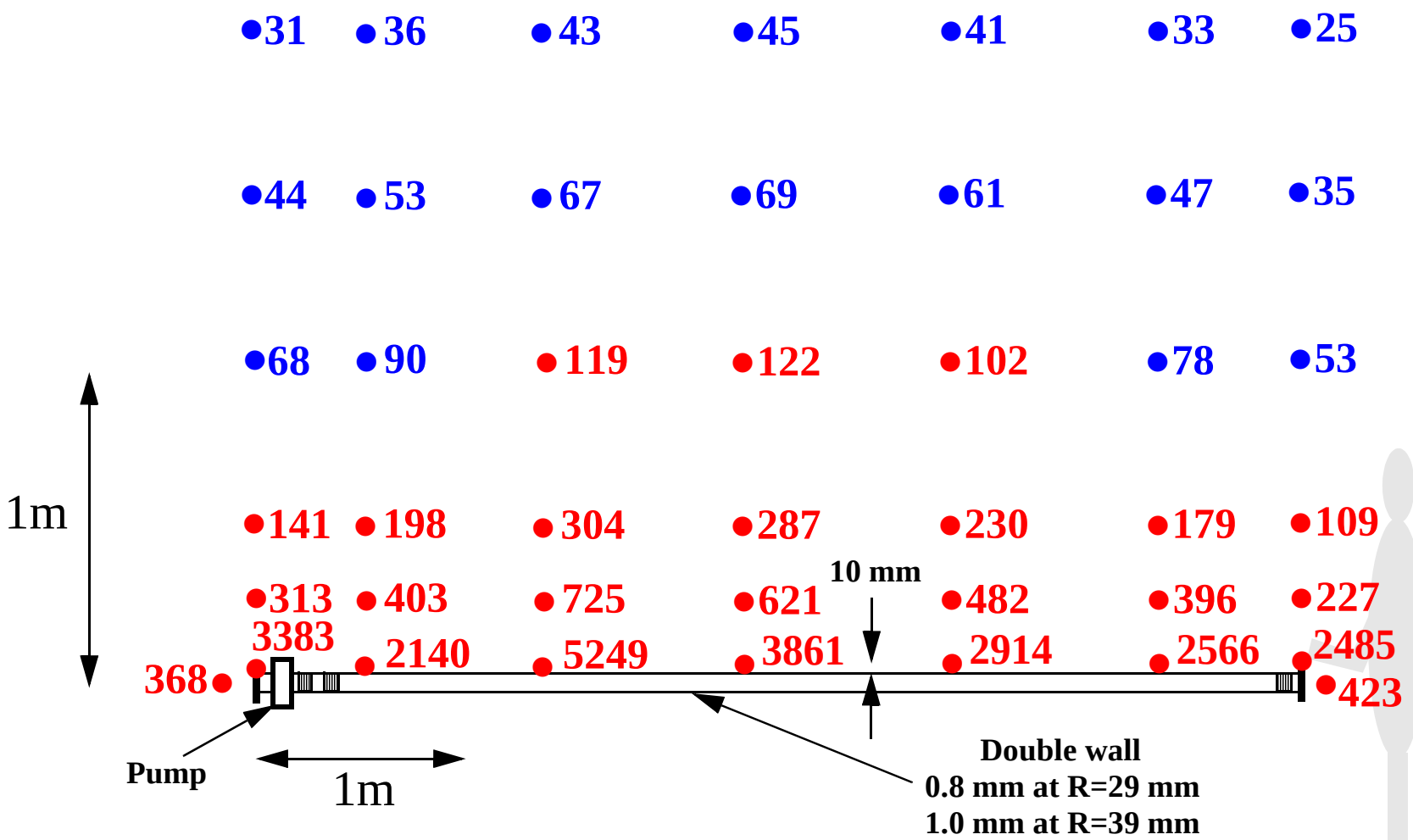
Dose rates in μSv/h after 100 days of running and 5 days cooling



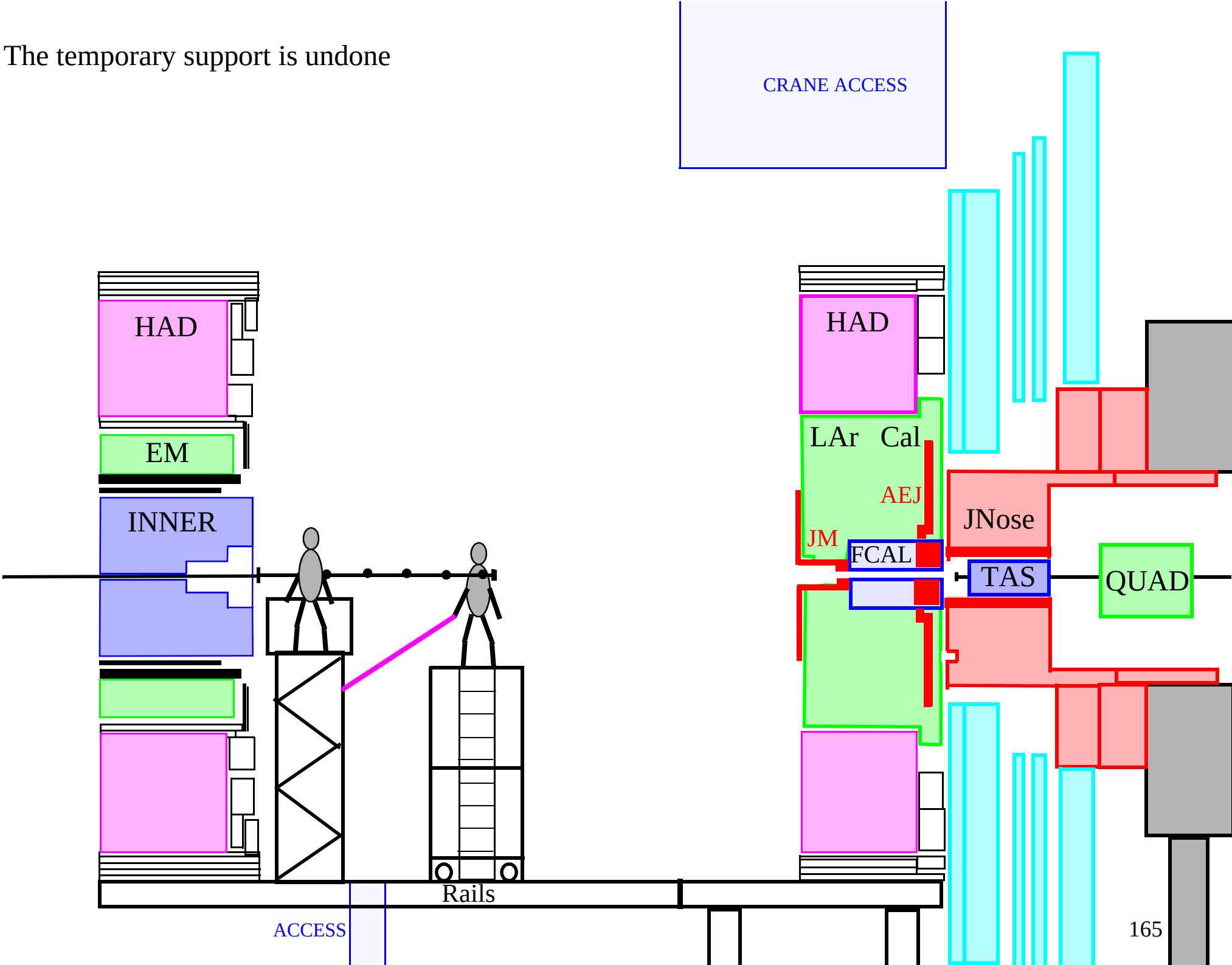
51. The rod at the back of the VA is removed.



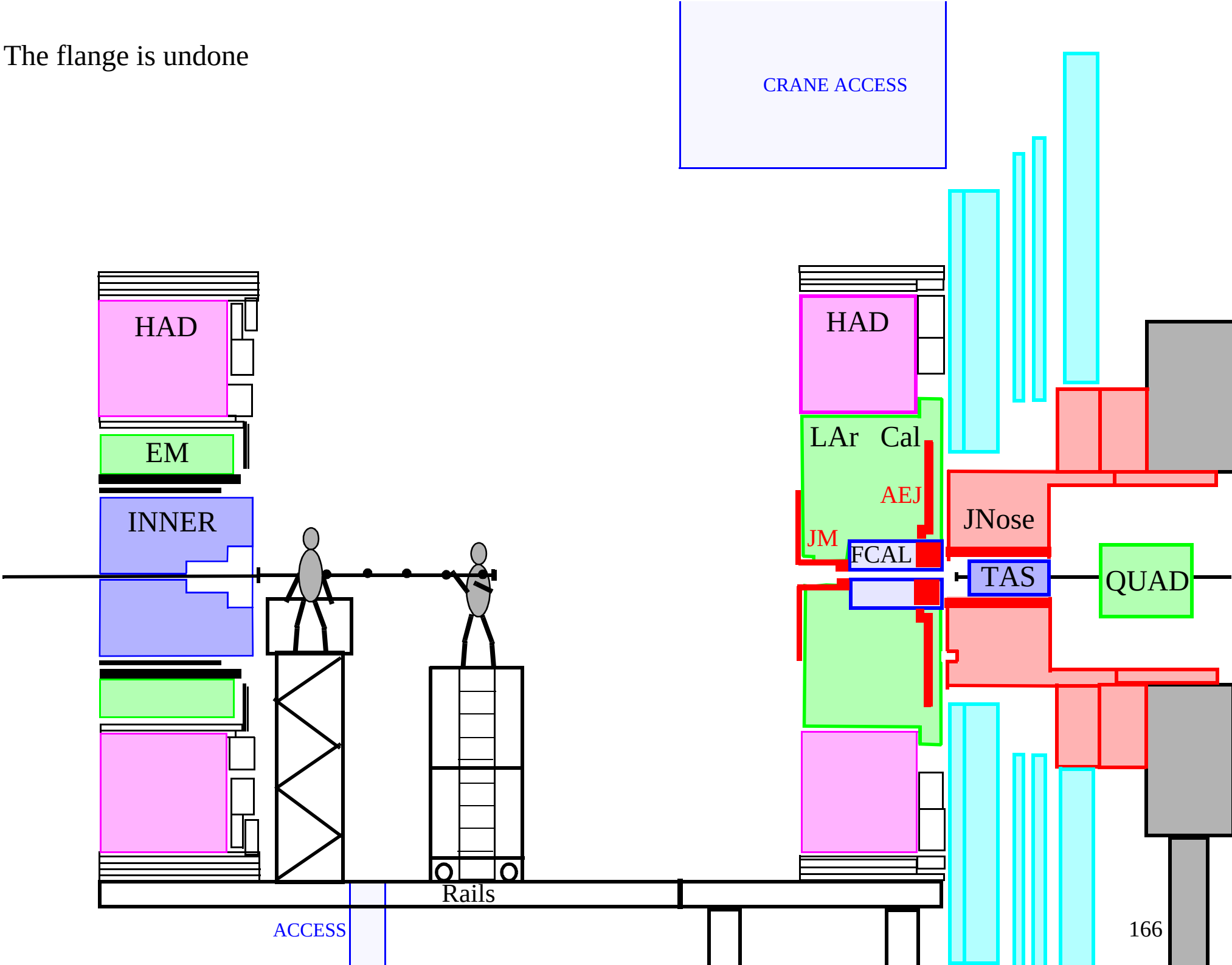
Dose rates in μSv/h from the VA beampipe after 100 days of running and 5 days of cooling.



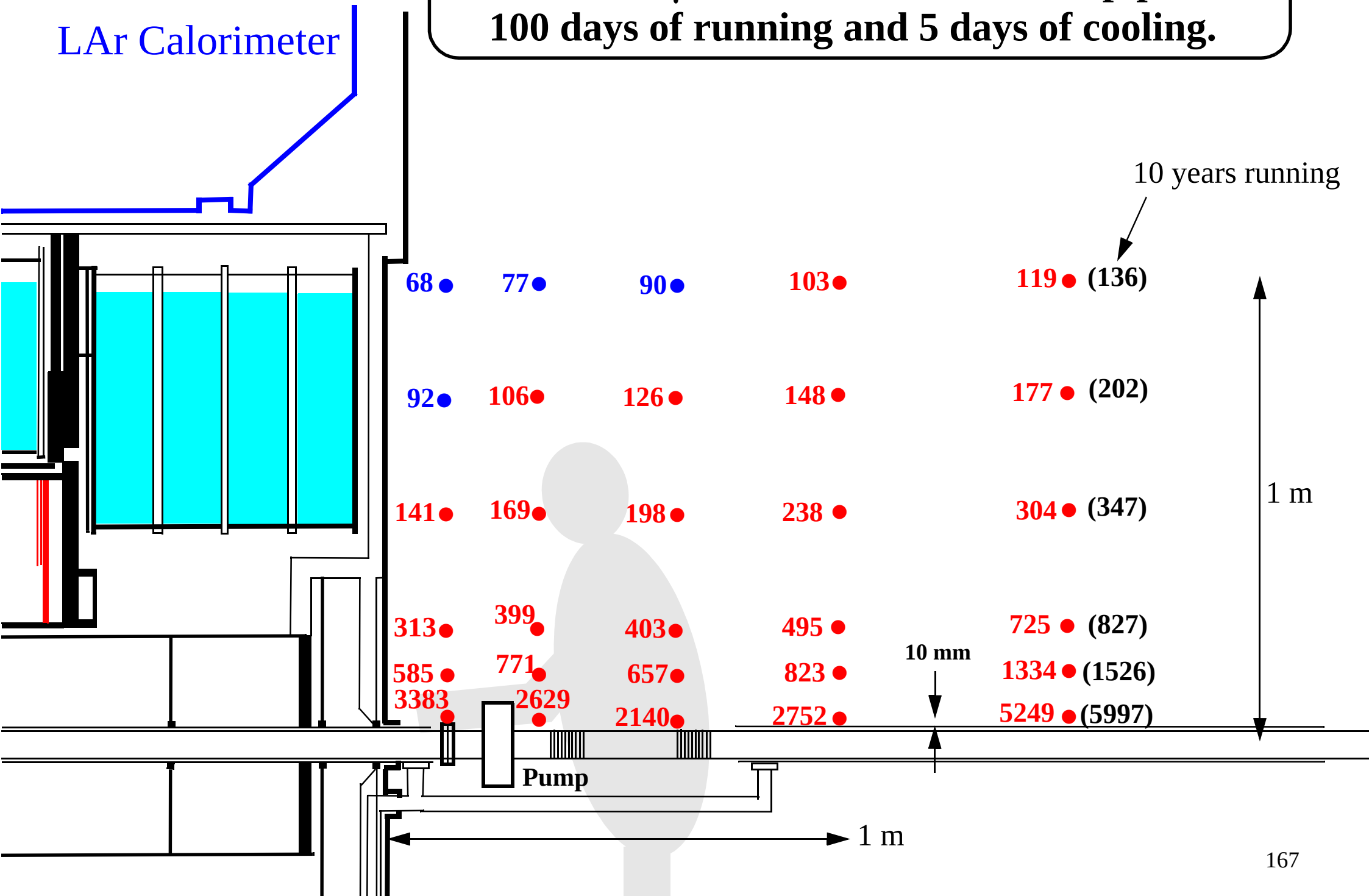
52. The temporary support is undone



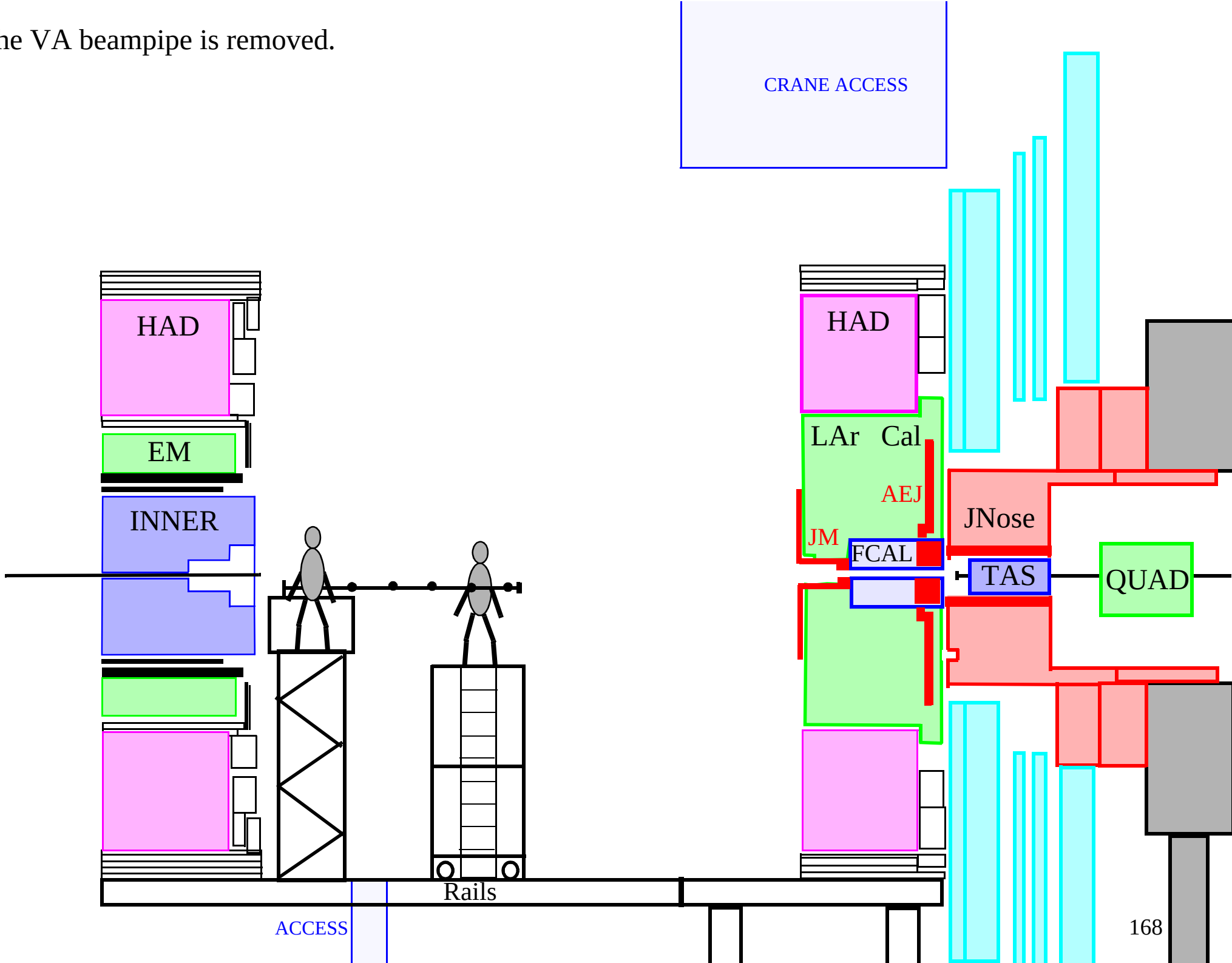
53. The flange is undone



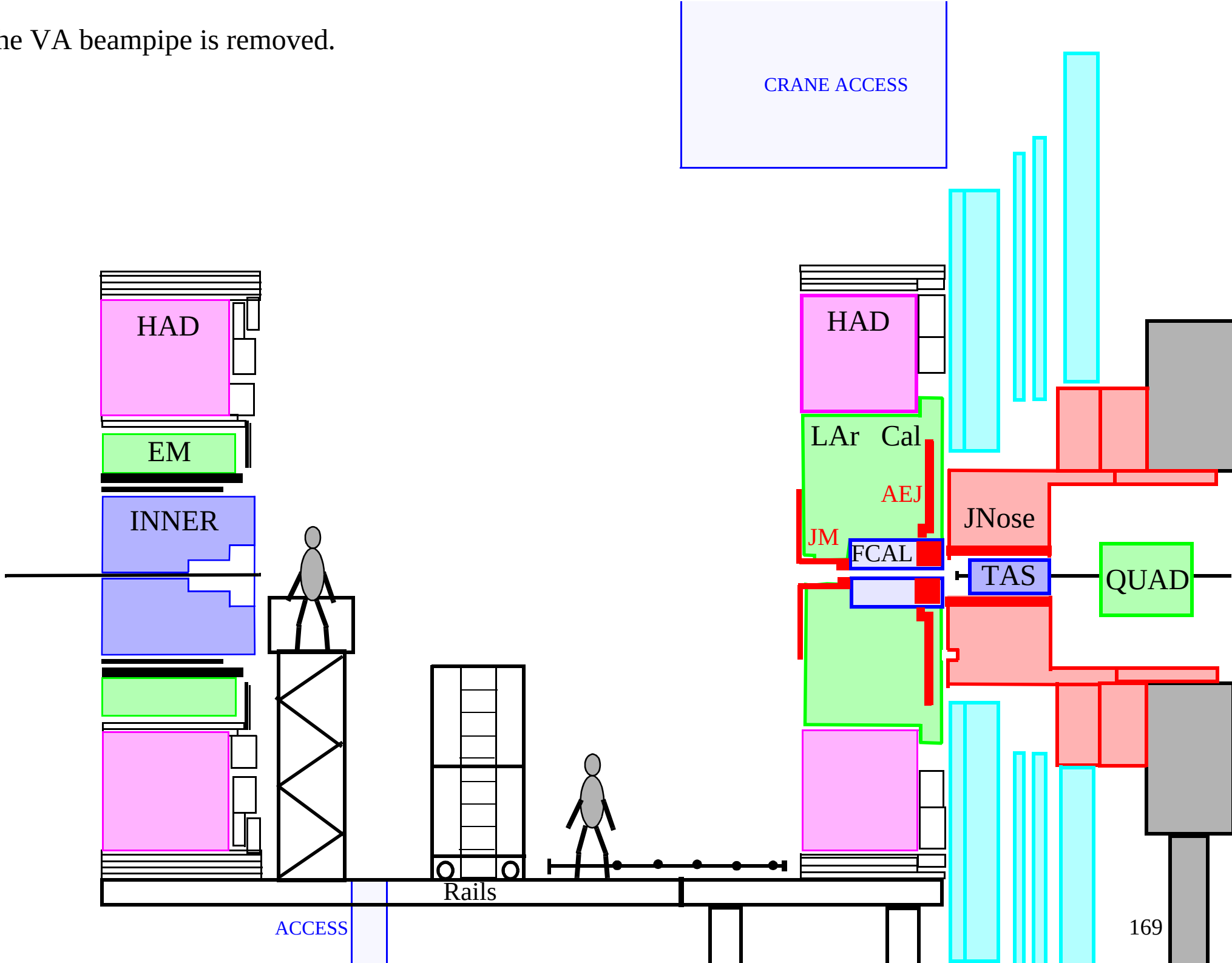
Dose rates in μSv/h from the VA beampipe after 100 days of running and 5 days of cooling.



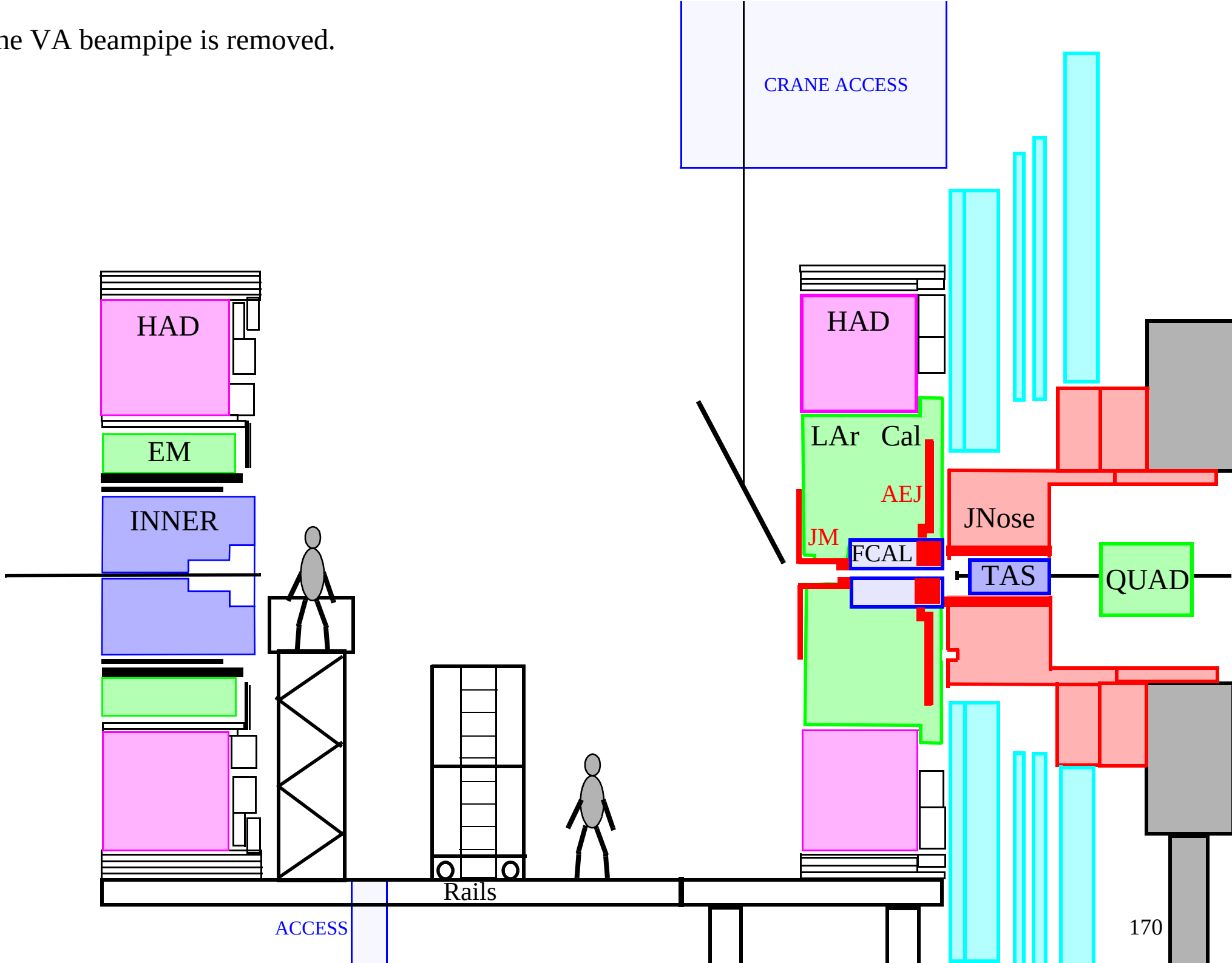
54. The VA beampipe is removed.



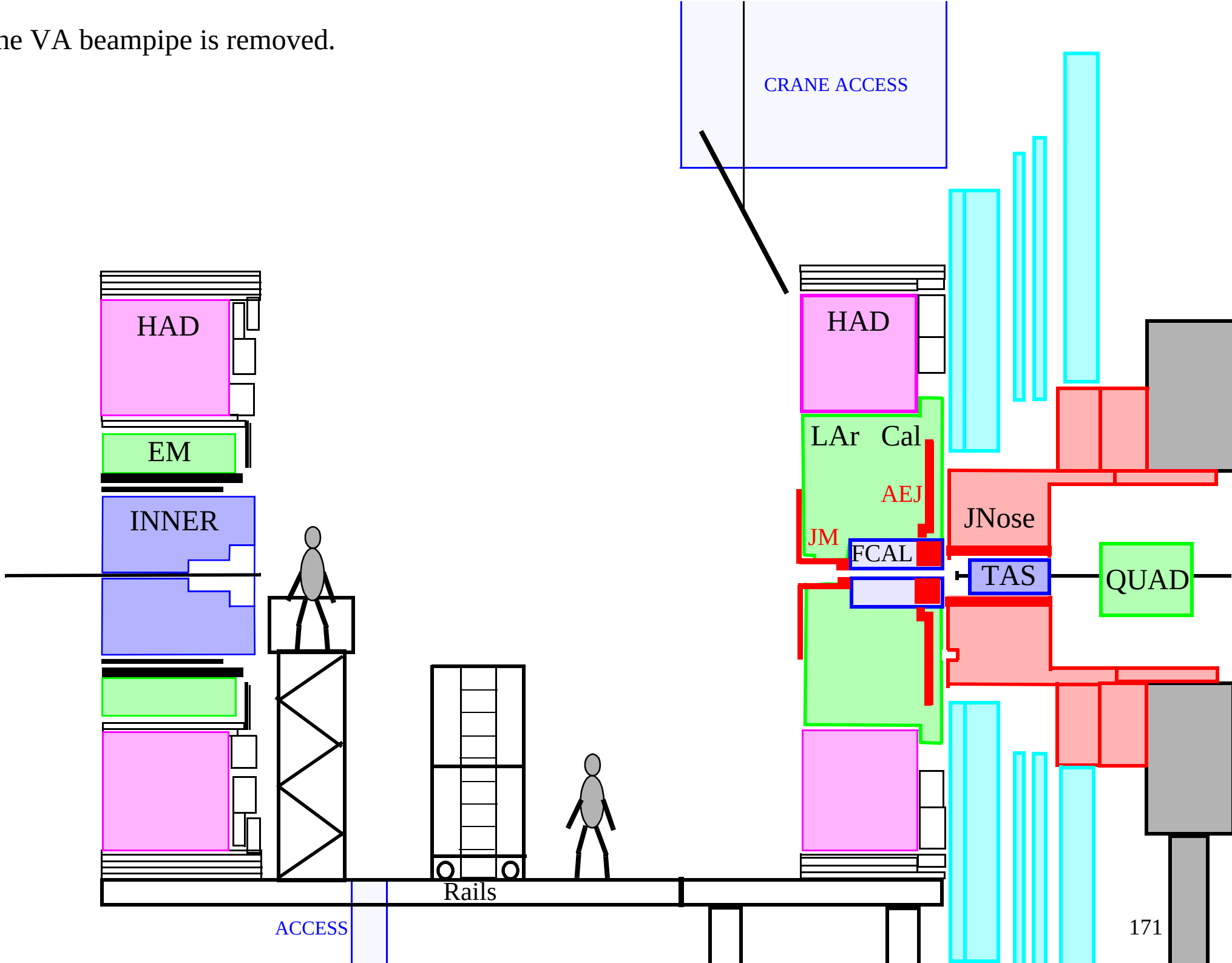
54. The VA beampipe is removed.



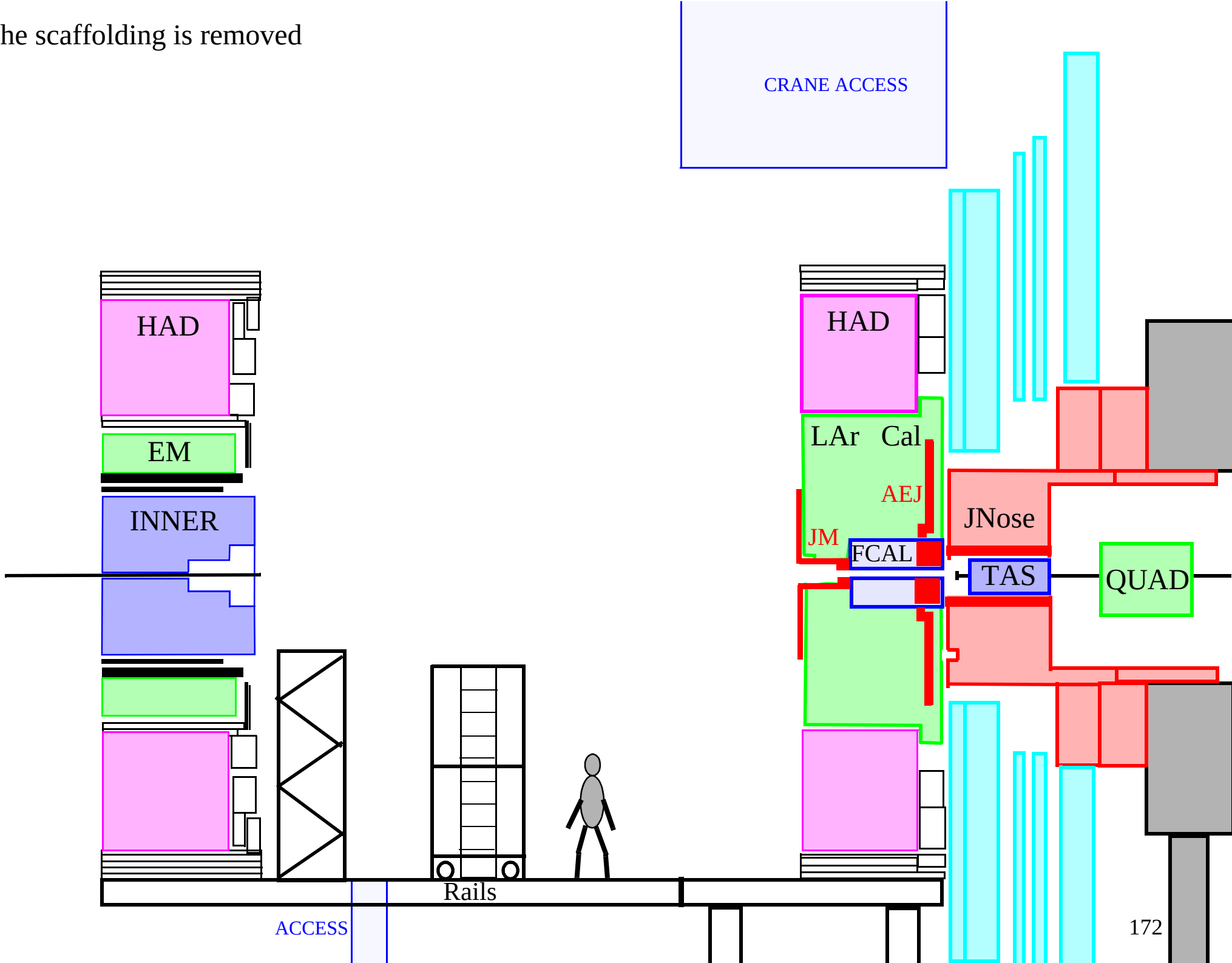
54. The VA beampipe is removed.



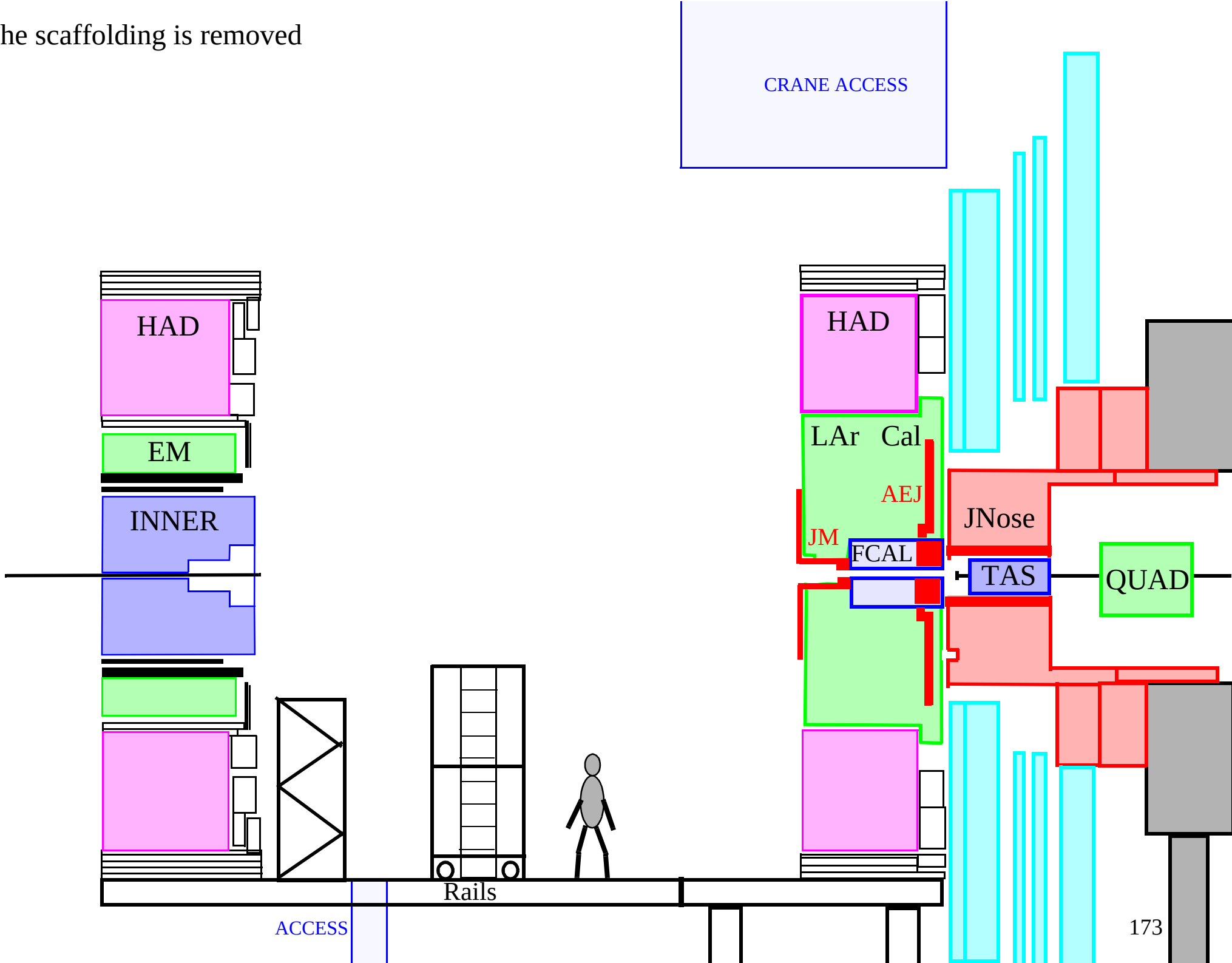
54. The VA beampipe is removed.



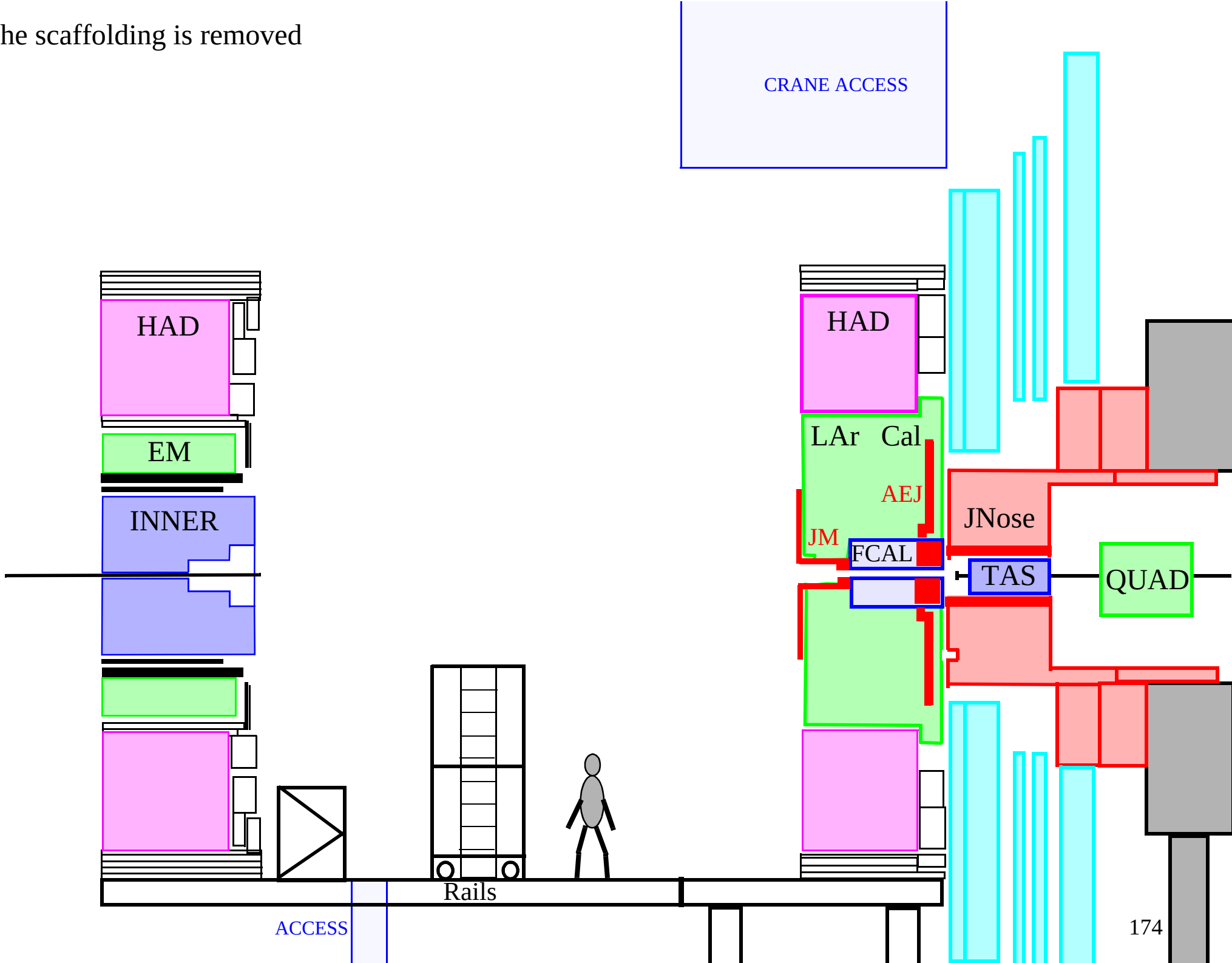
55. The scaffolding is removed



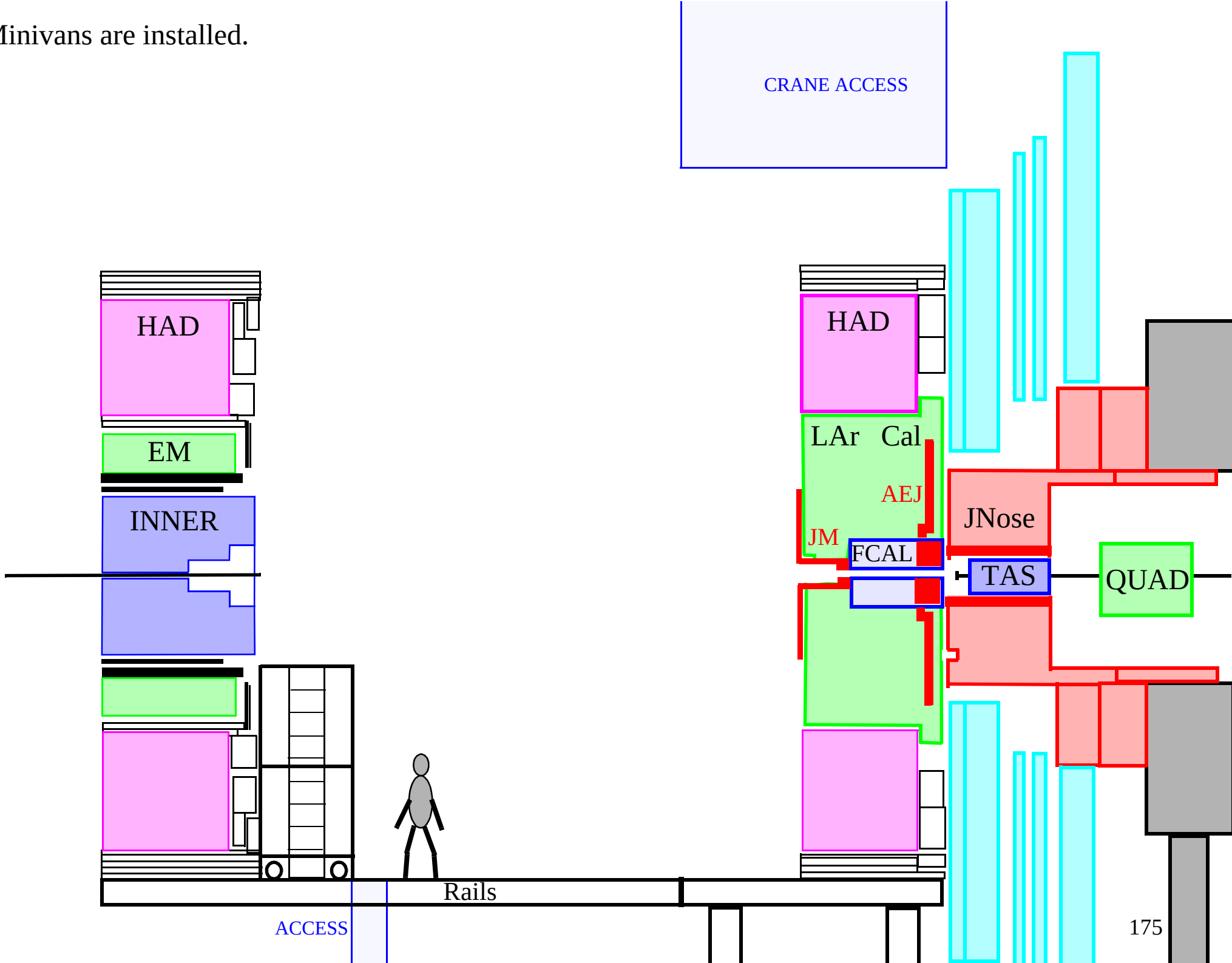
55. The scaffolding is removed

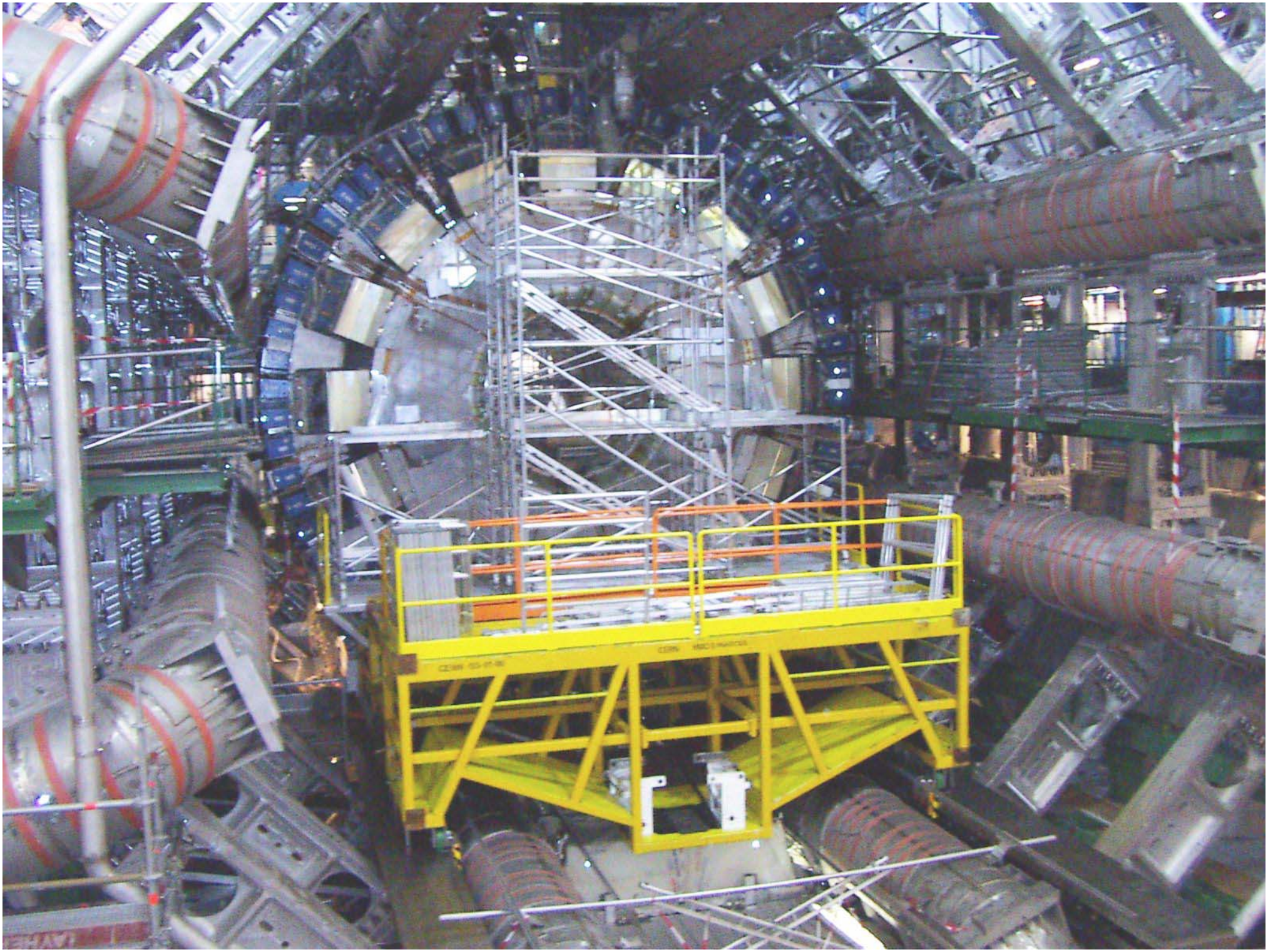


55. The scaffolding is removed

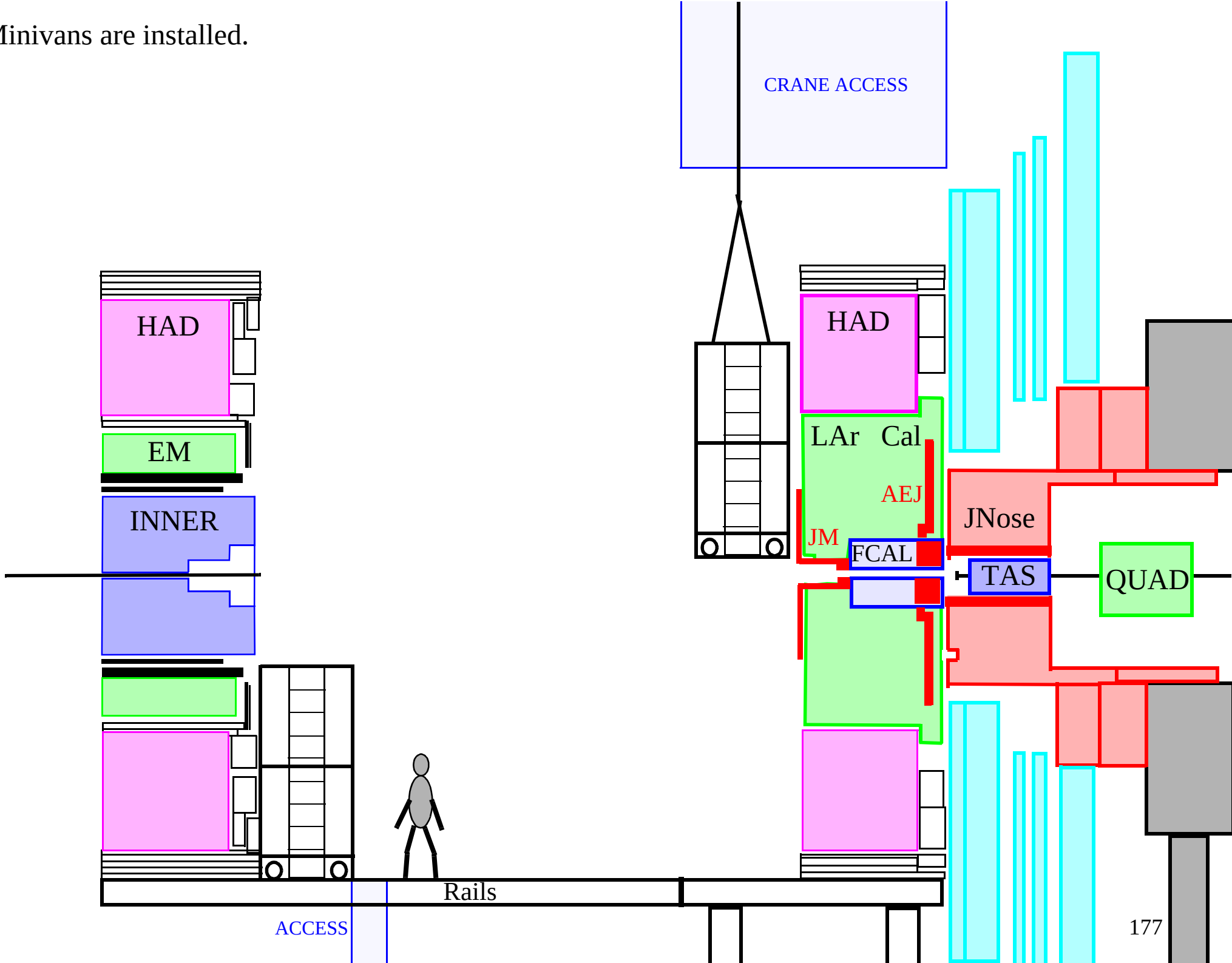


56. Minivans are installed.

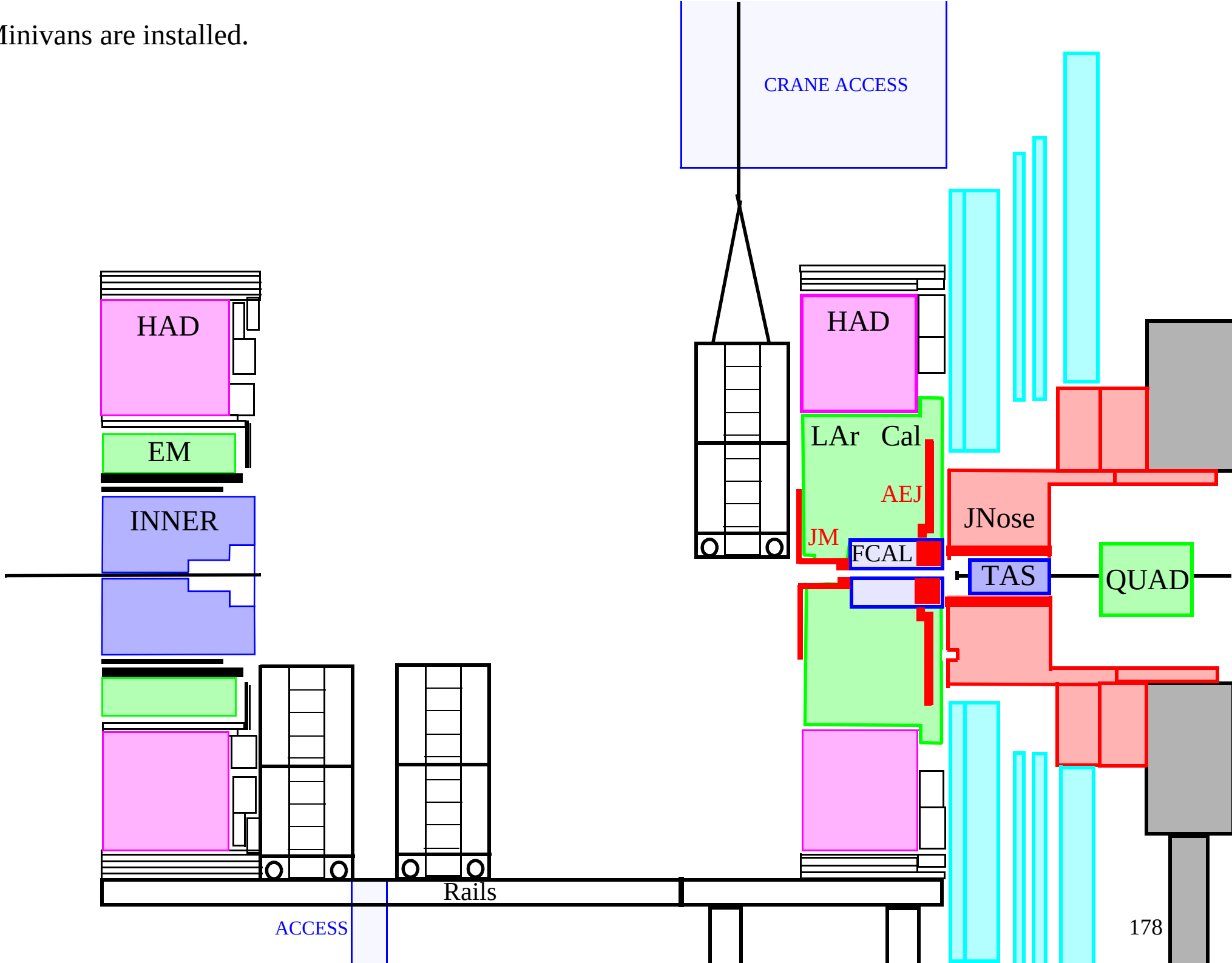




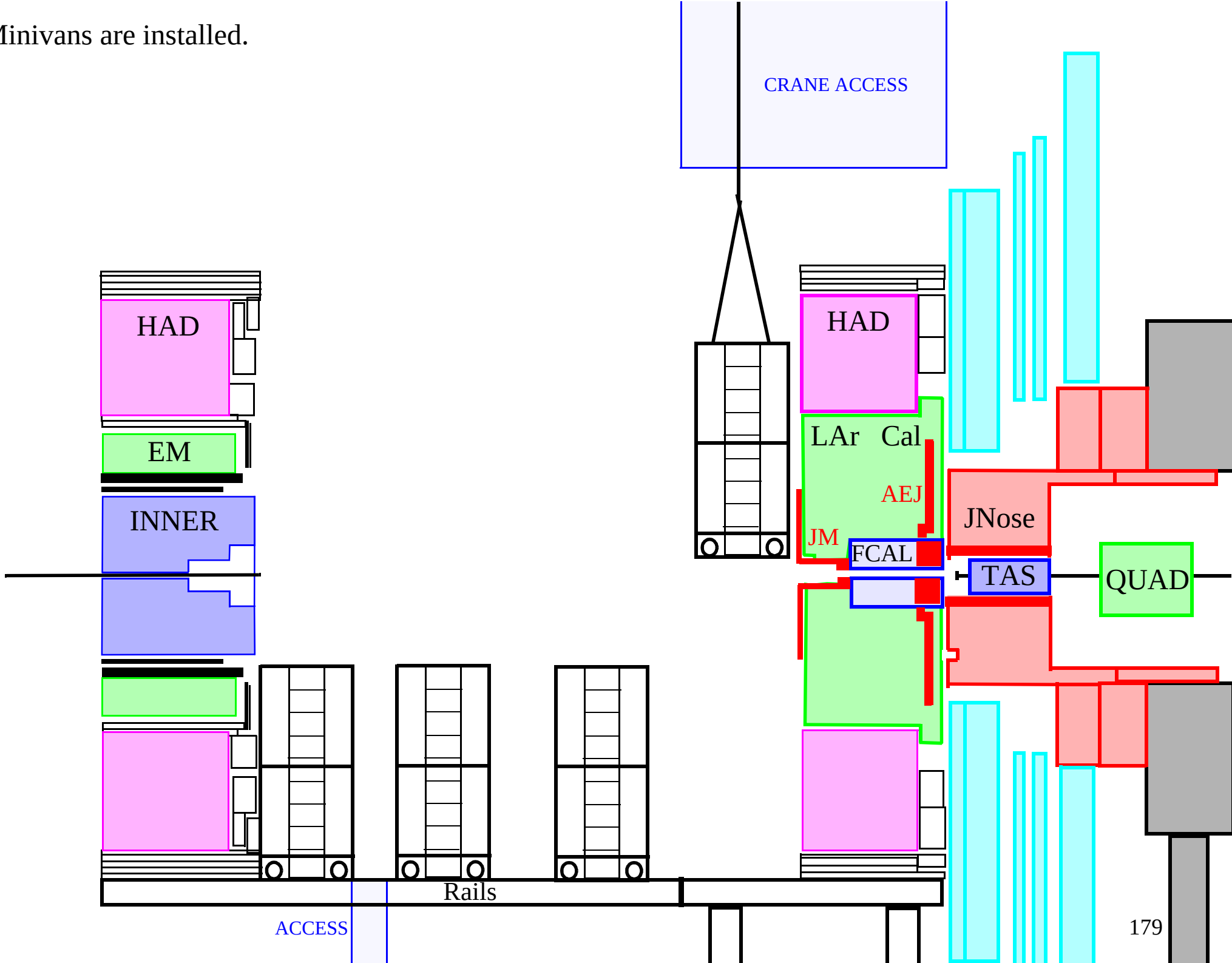
56. Minivans are installed.



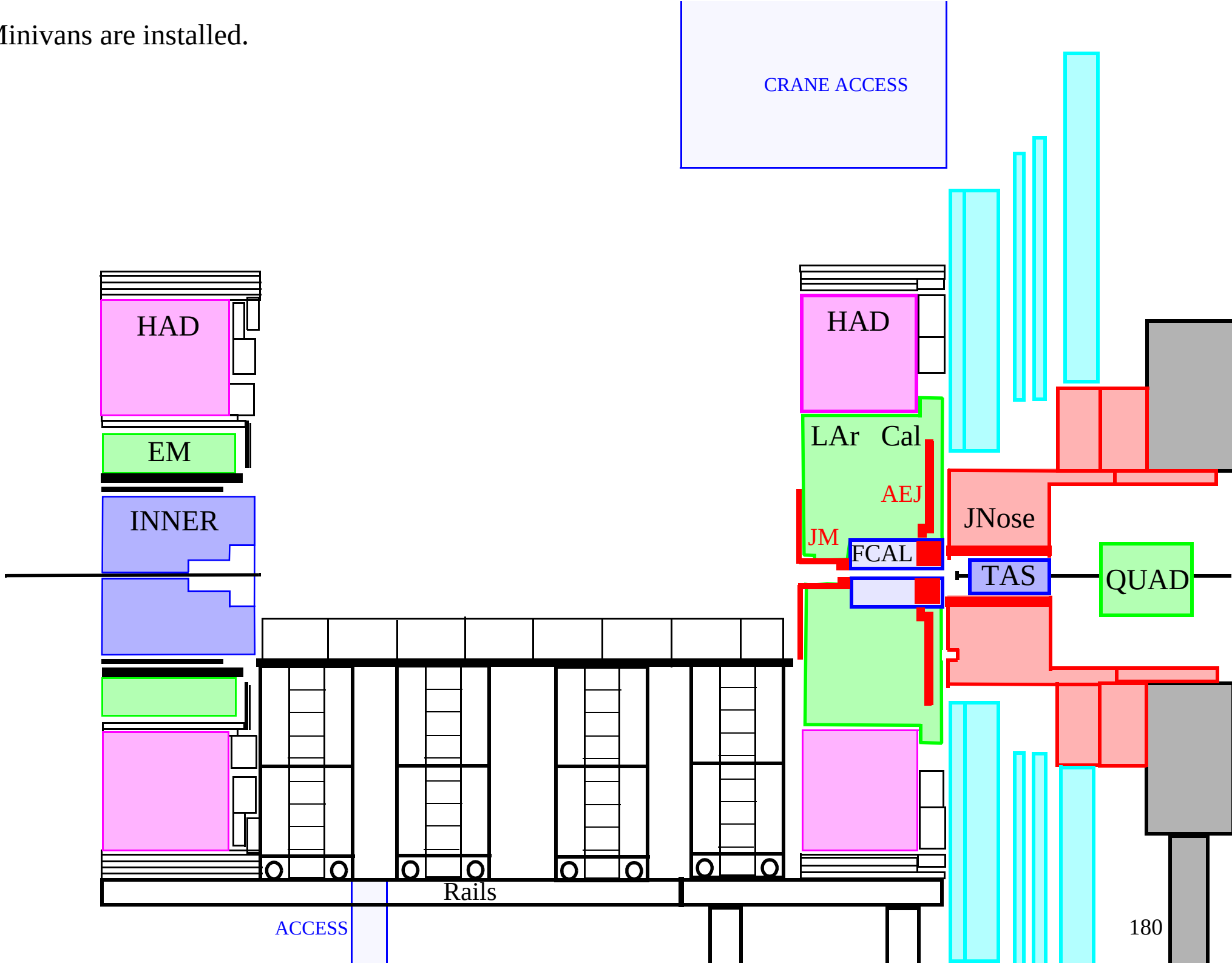
56. Minivans are installed.

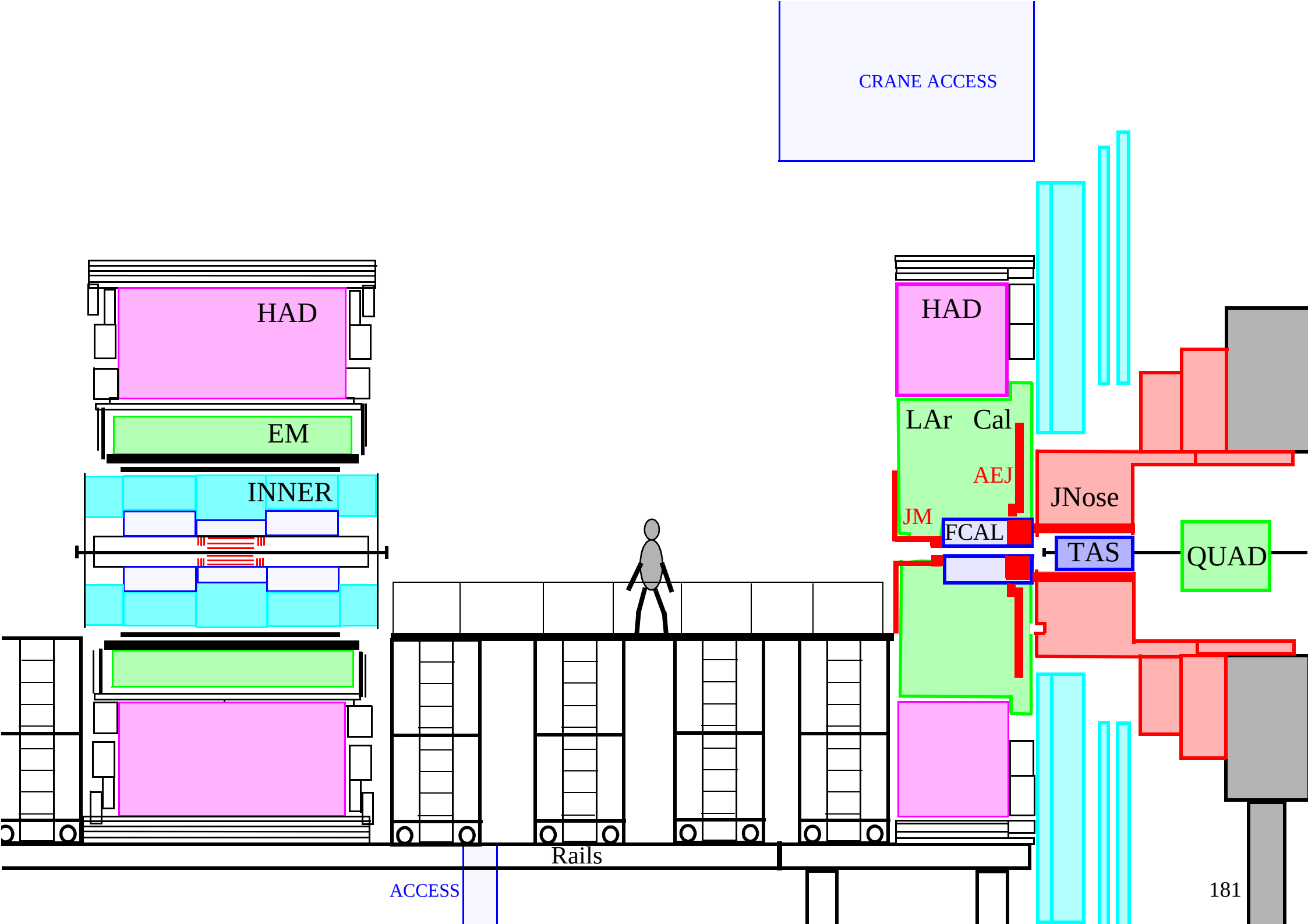


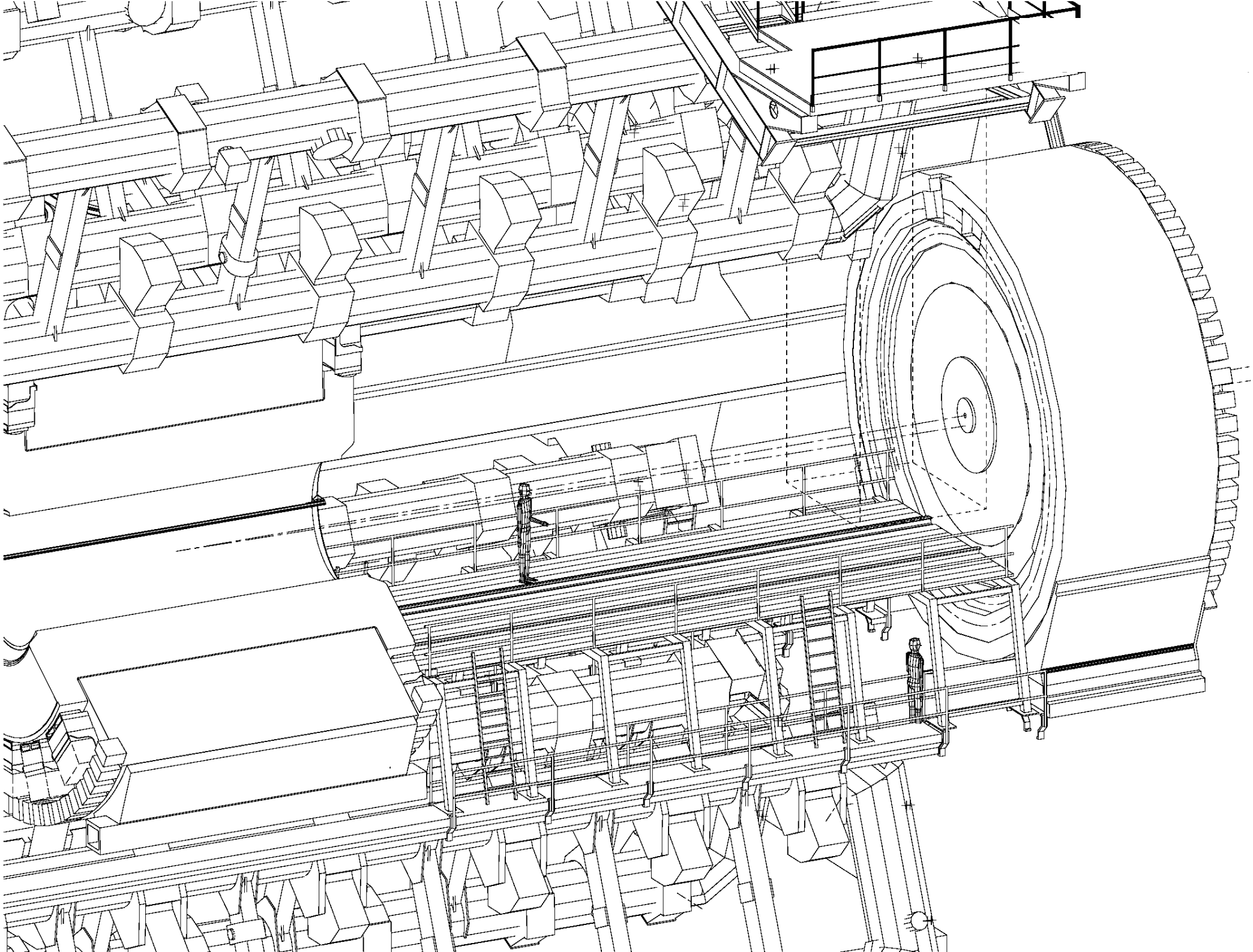
56. Minivans are installed.



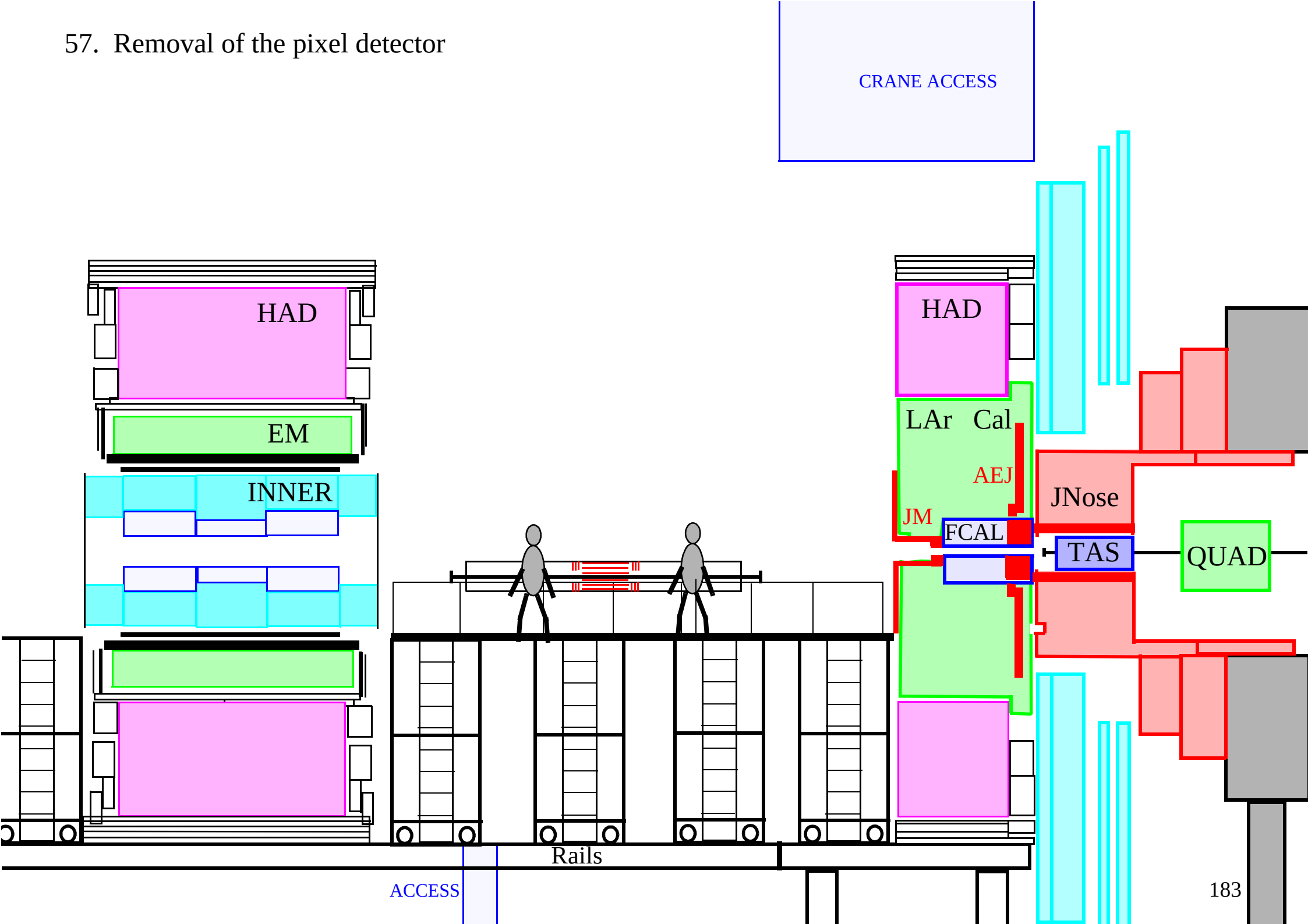
56. Minivans are installed.



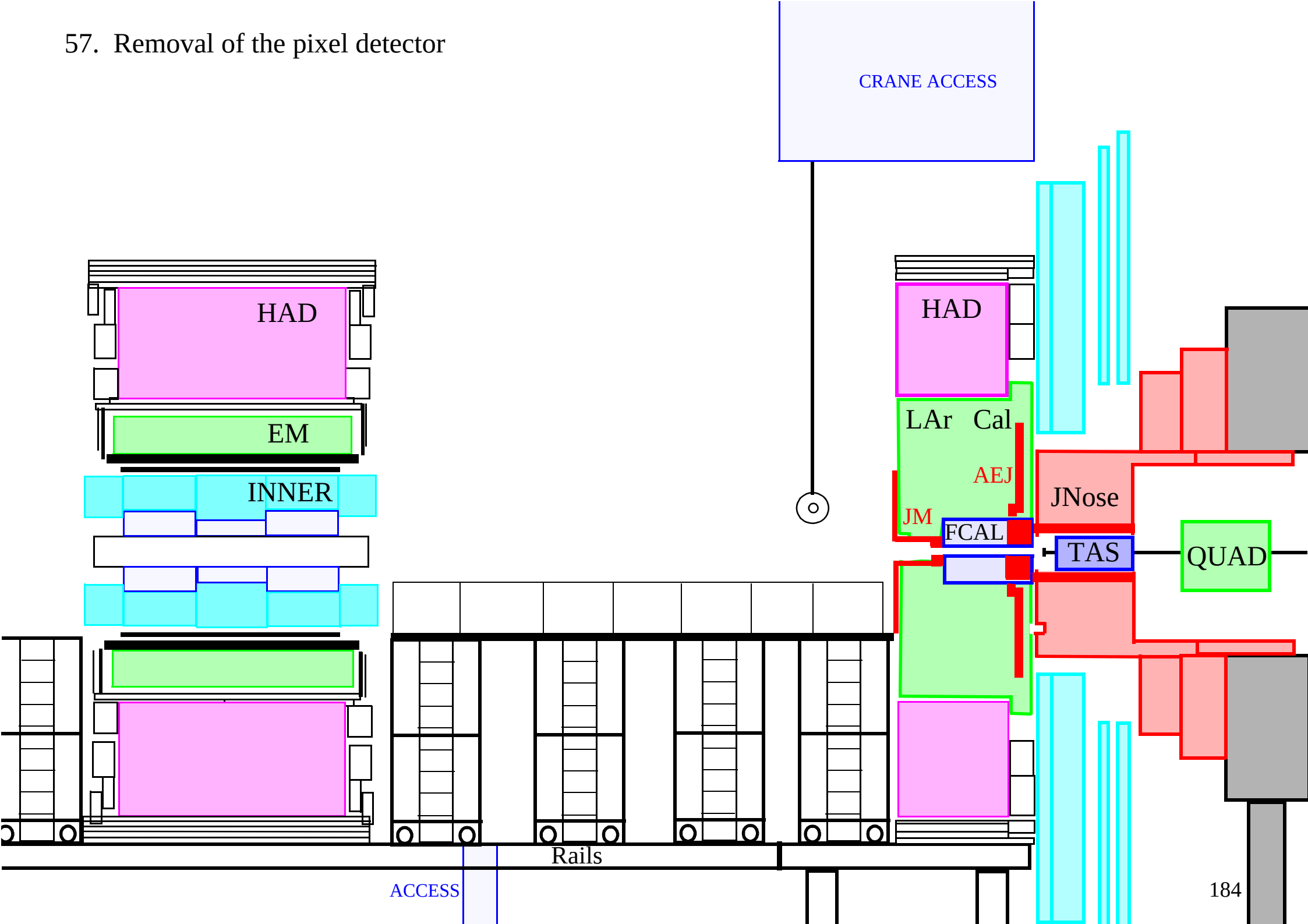

CRANE ACCESS
HAD
EM
INNER
HAD
LAr Cal
AEJ
JM
FCAL
JNose
TAS
QUAD
Rails
ACCESS

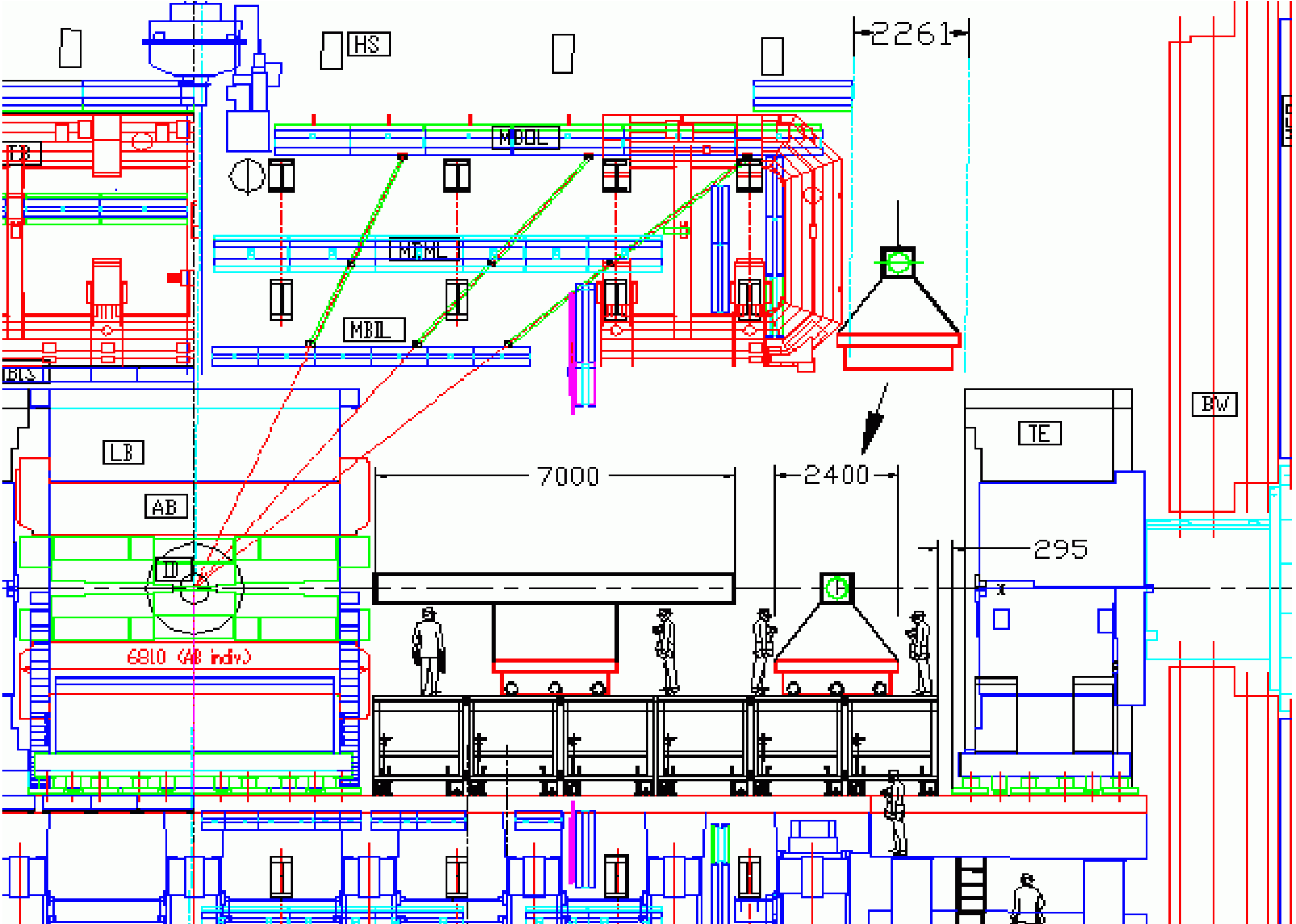


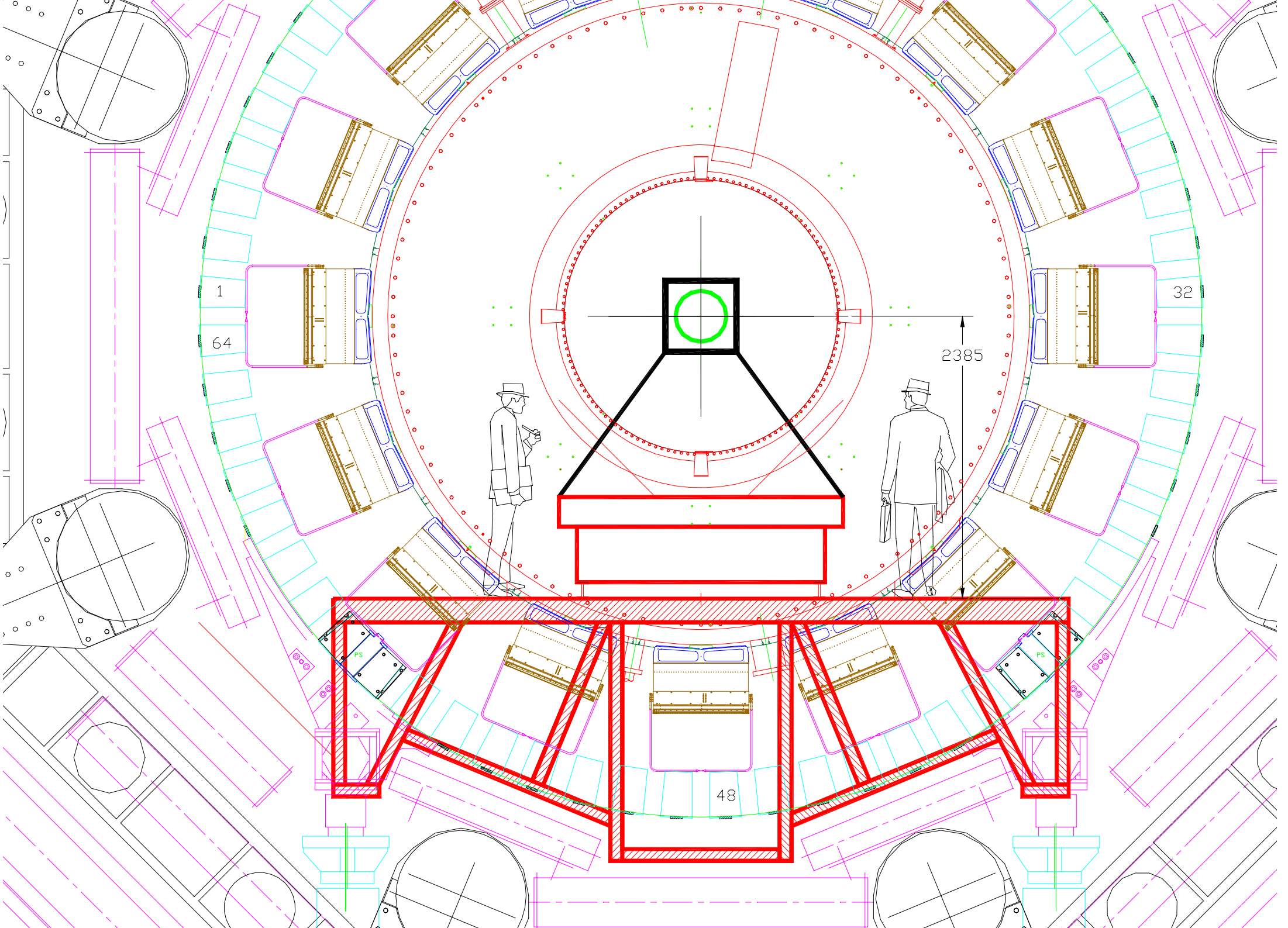
57. Removal of the pixel detector



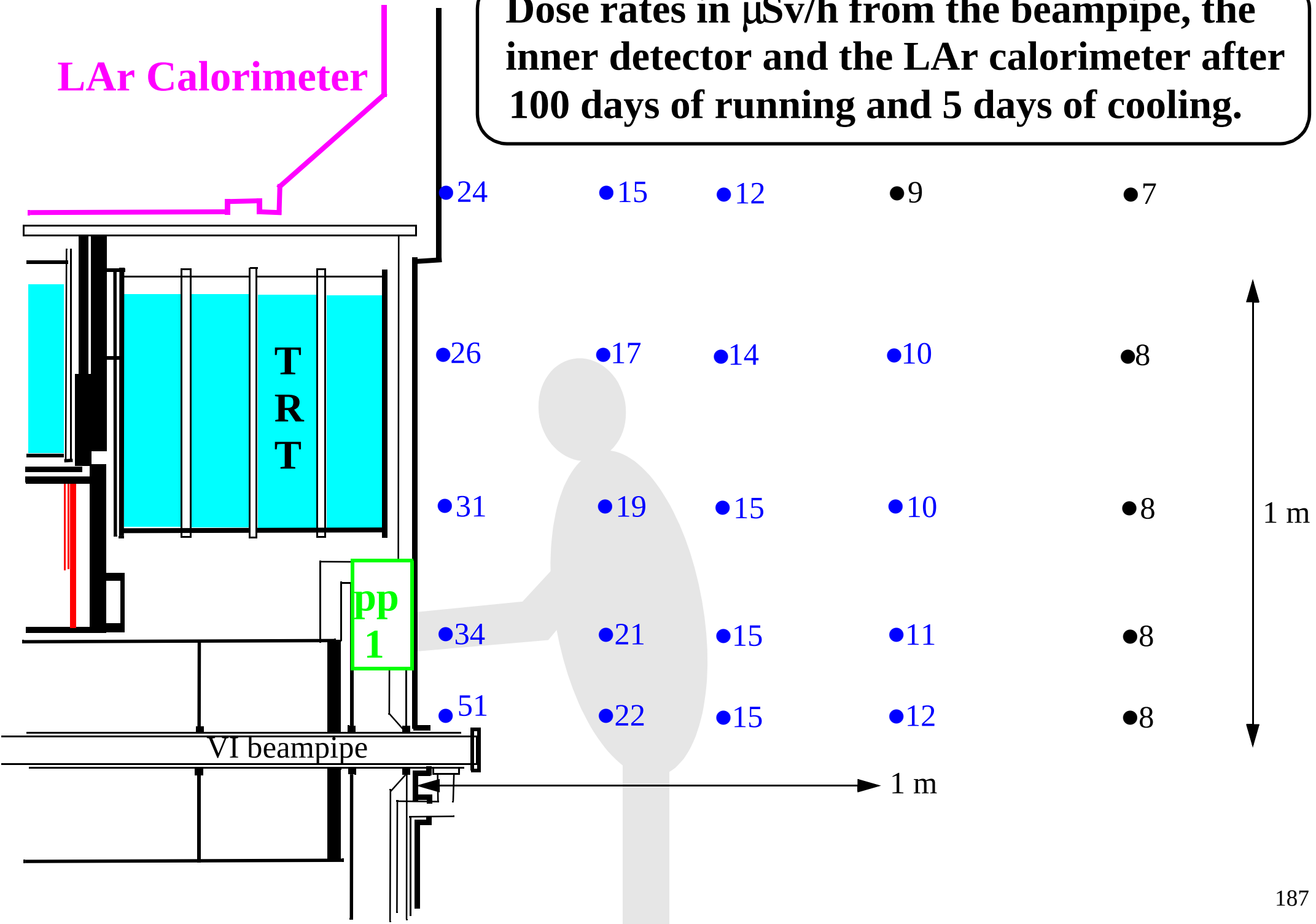
57. Removal of the pixel detector



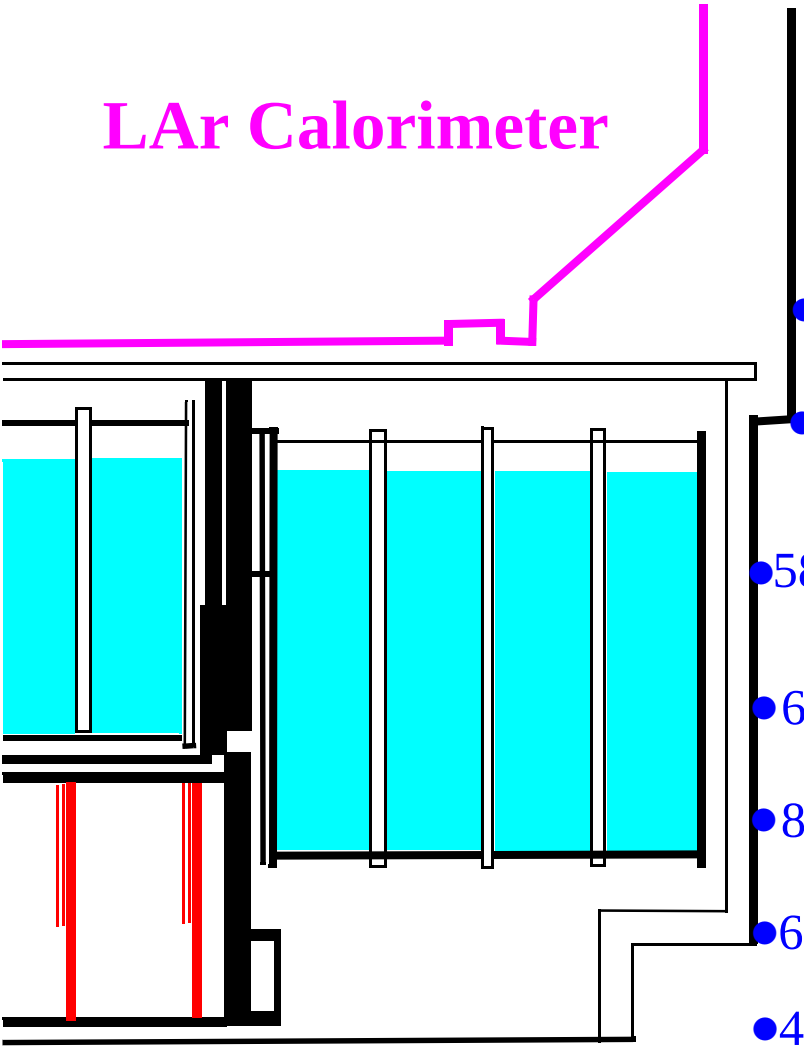

2261
HS
MBBL
MBML
MBIL
EB
BLS
LB
AB
TE
BW
7000
2400
295
6810 (AB indiv)


1
64
32
2385
48
PS
PS

Dose rates in μSv/h from the beampipe, the inner detector and the LAr calorimeter after 100 days of running and 5 days of cooling.



Dose rates in μSv/h from the beampipe, the inner detector and the LAr calorimeter after 10 years of running and 5 days of cooling.



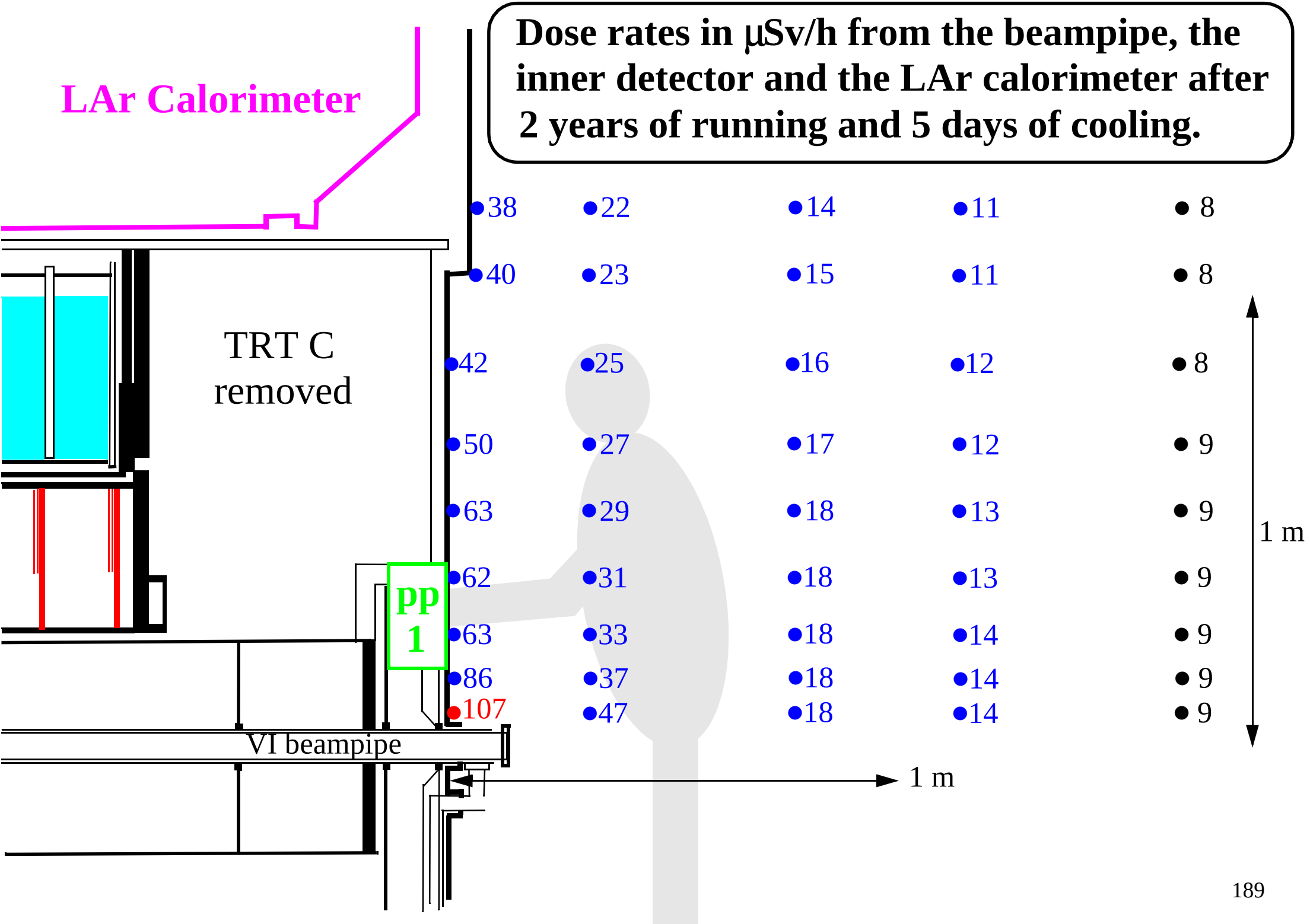
56	30	19	15	10
56	31	20	15	11
58	33	21	16	11
67	34	22	16	12
82	35	23	16	12
67	35	23	17	12
47	34	22	17	12
45	34	22	17	12
44	34	22	18	12

1 m

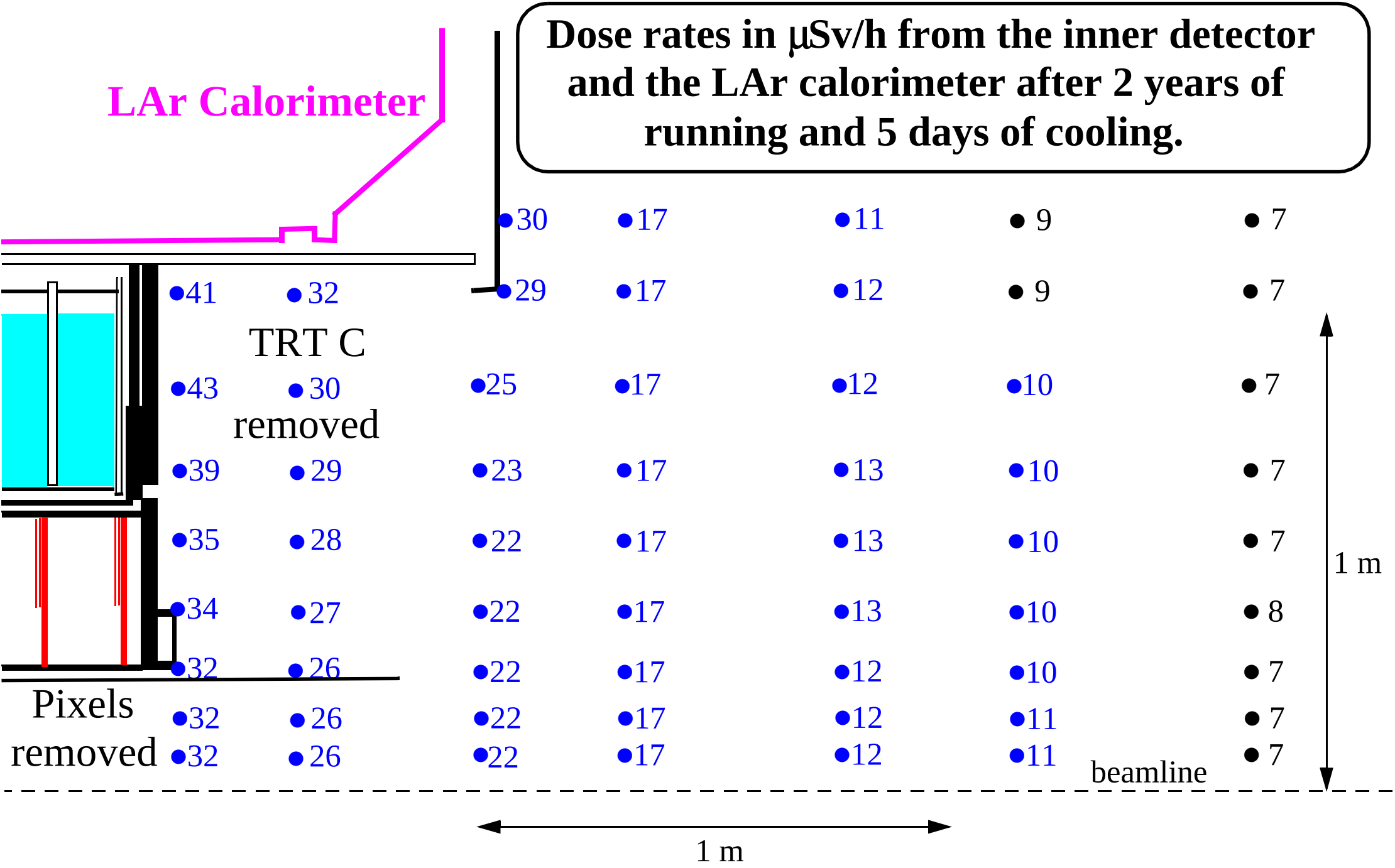
beamline

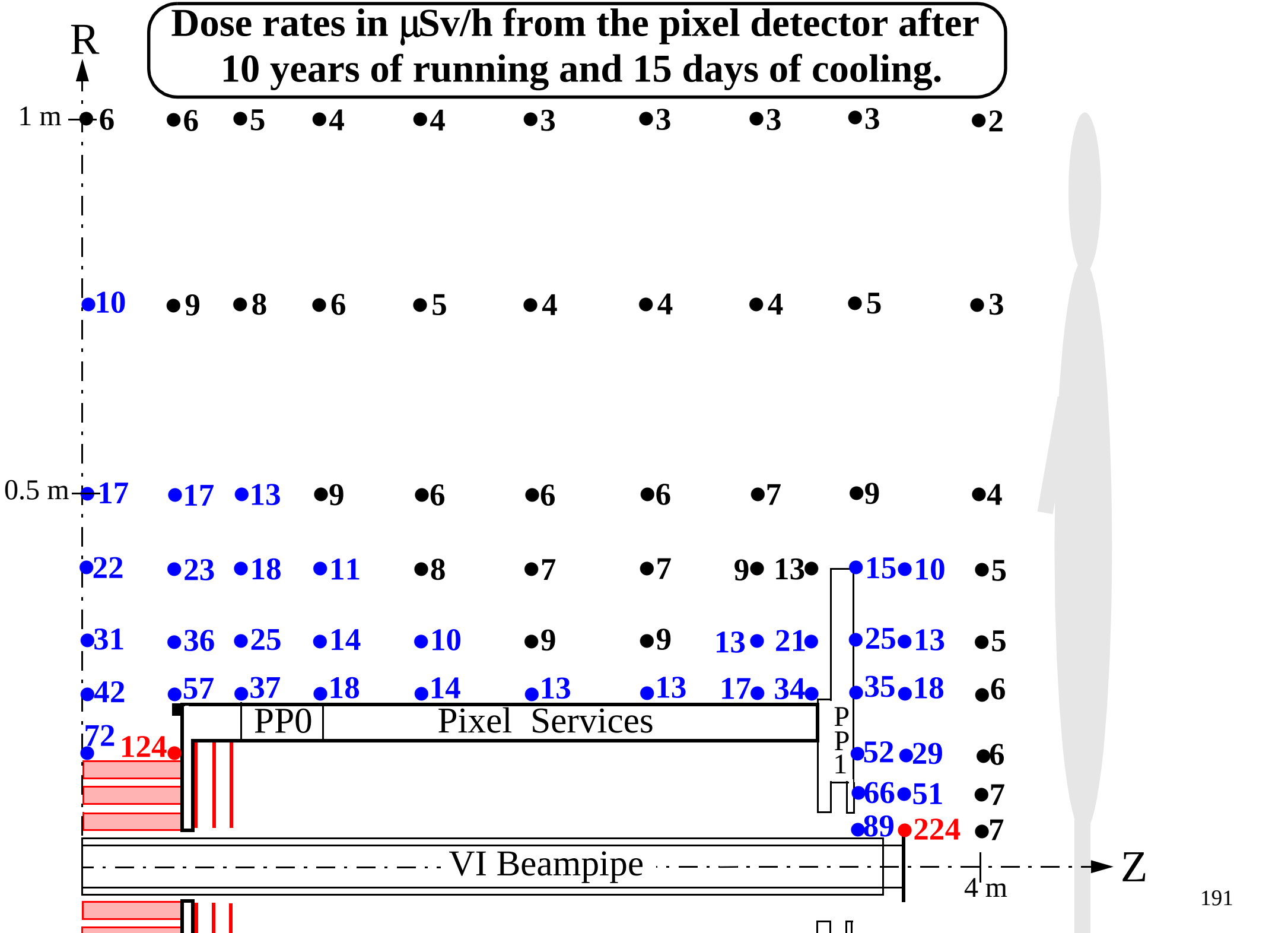
1 m

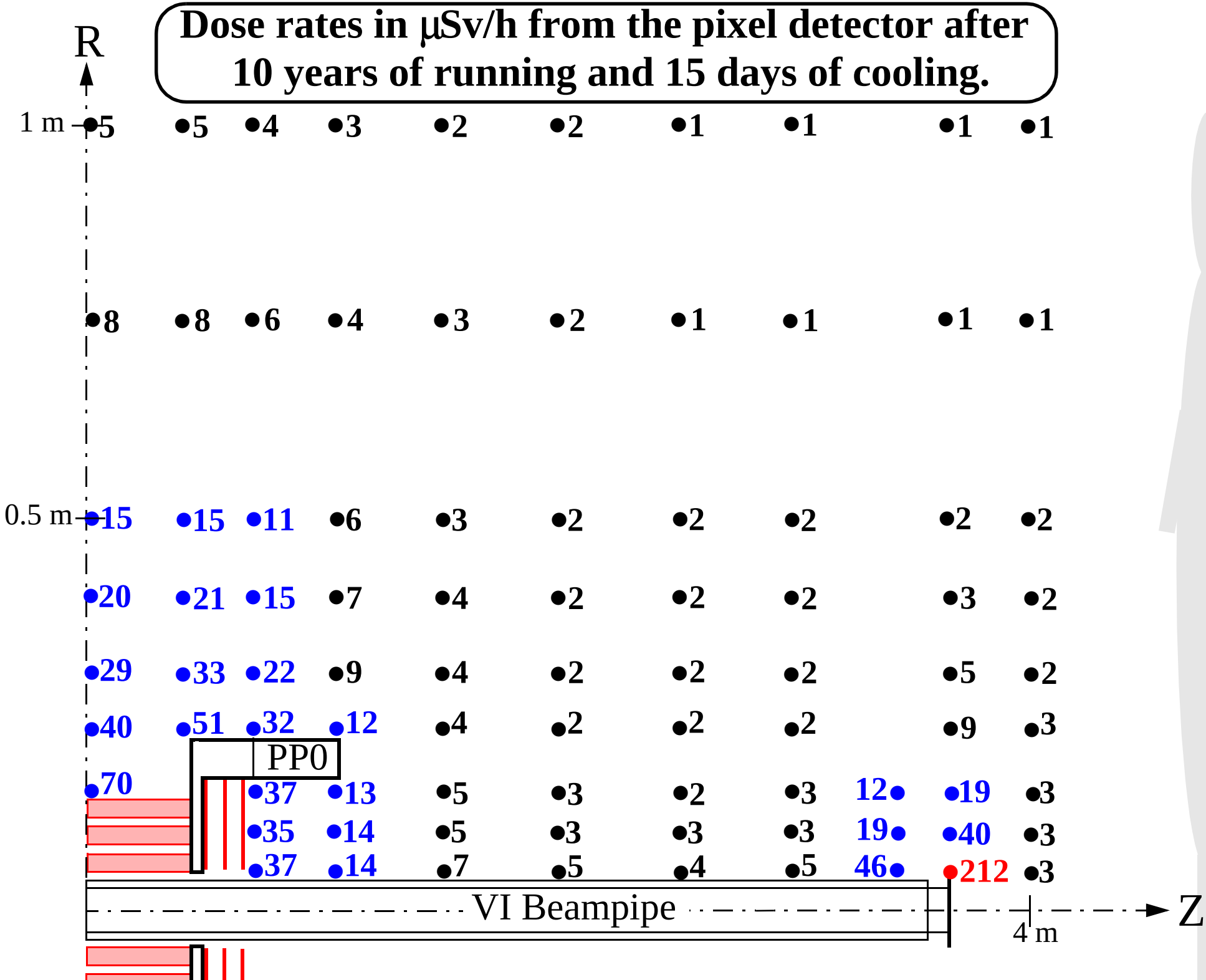
Dose rates in μSv/h from the beampipe, the inner detector and the LAr calorimeter after 2 years of running and 5 days of cooling.

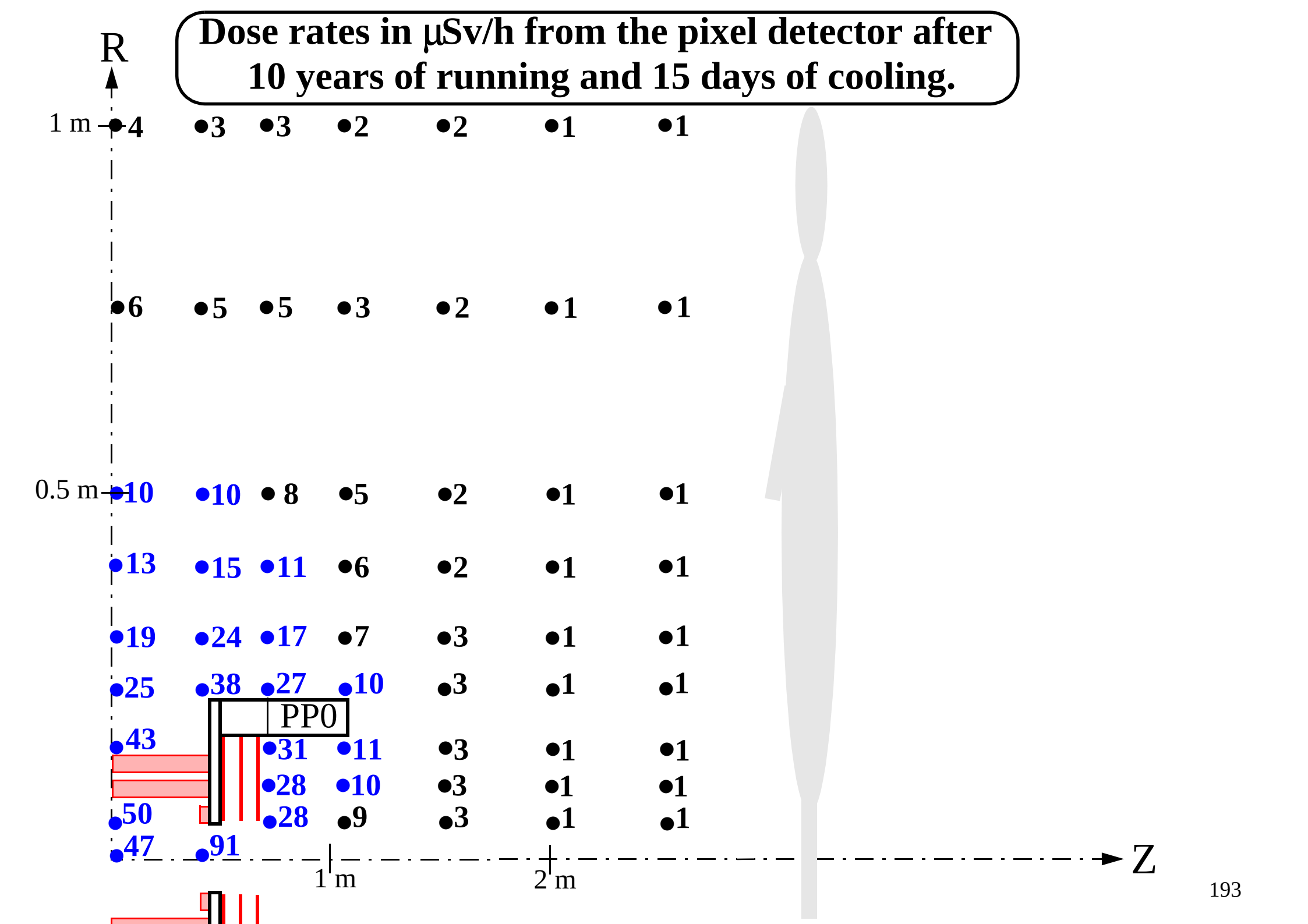


Dose rates in μSv/h from the inner detector and the LAr calorimeter after 2 years of running and 5 days of cooling.

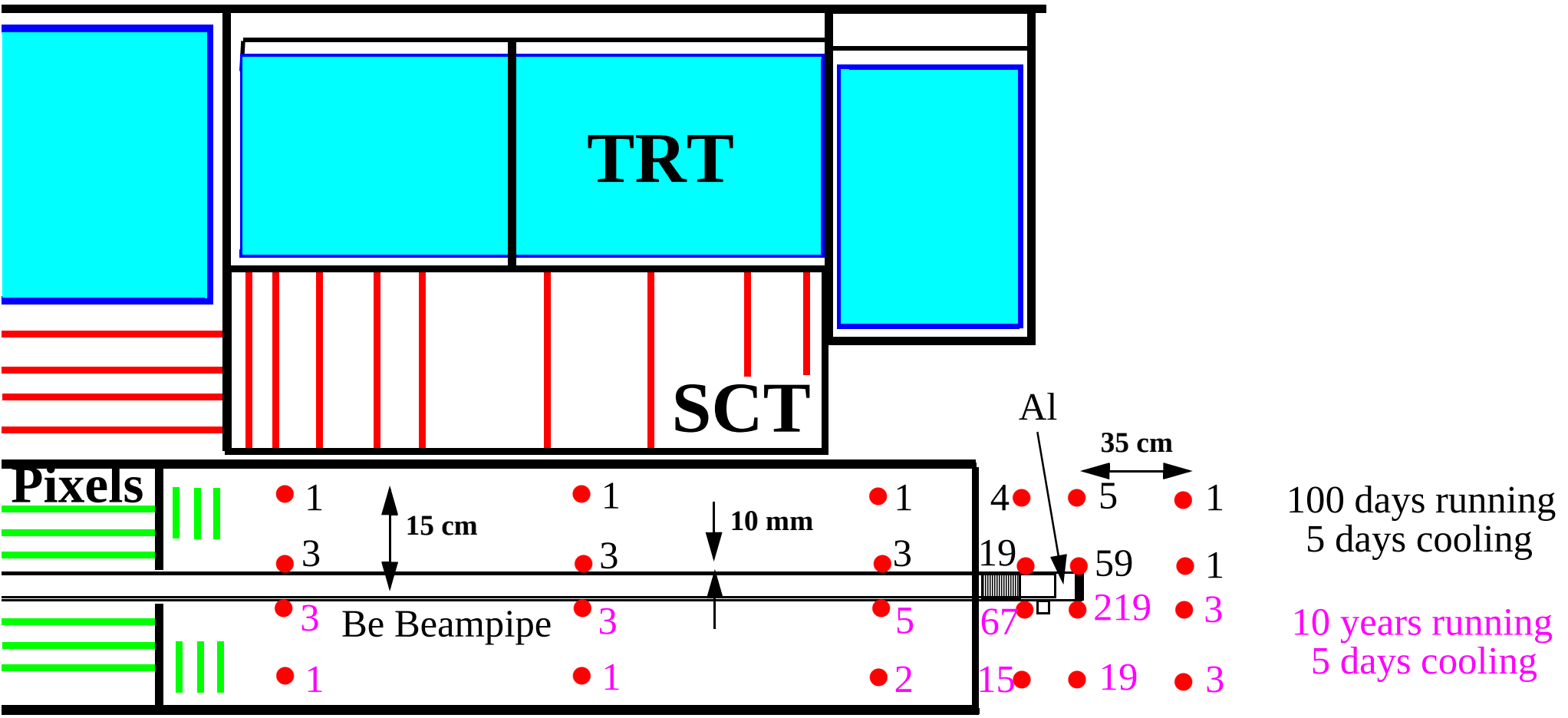



Dose rates in μSv/h from the pixel detector after 10 years of running and 15 days of cooling.
R
1 m
0.5 m
6 6 5 4 4 3 3 3 3 2
10 9 8 6 5 4 4 4 5 3
17 17 13 9 6 6 6 7 9 4
22 23 18 11 8 7 7 9 13 15 10 5
31 36 25 14 10 9 9 13 21 25 13 5
42 57 37 18 14 13 13 17 34 35 18 6
72 124
PP0
Pixel Services
PP1
52 29 6
66 51 7
89 224 7
VI Beampipe
Z
4 m

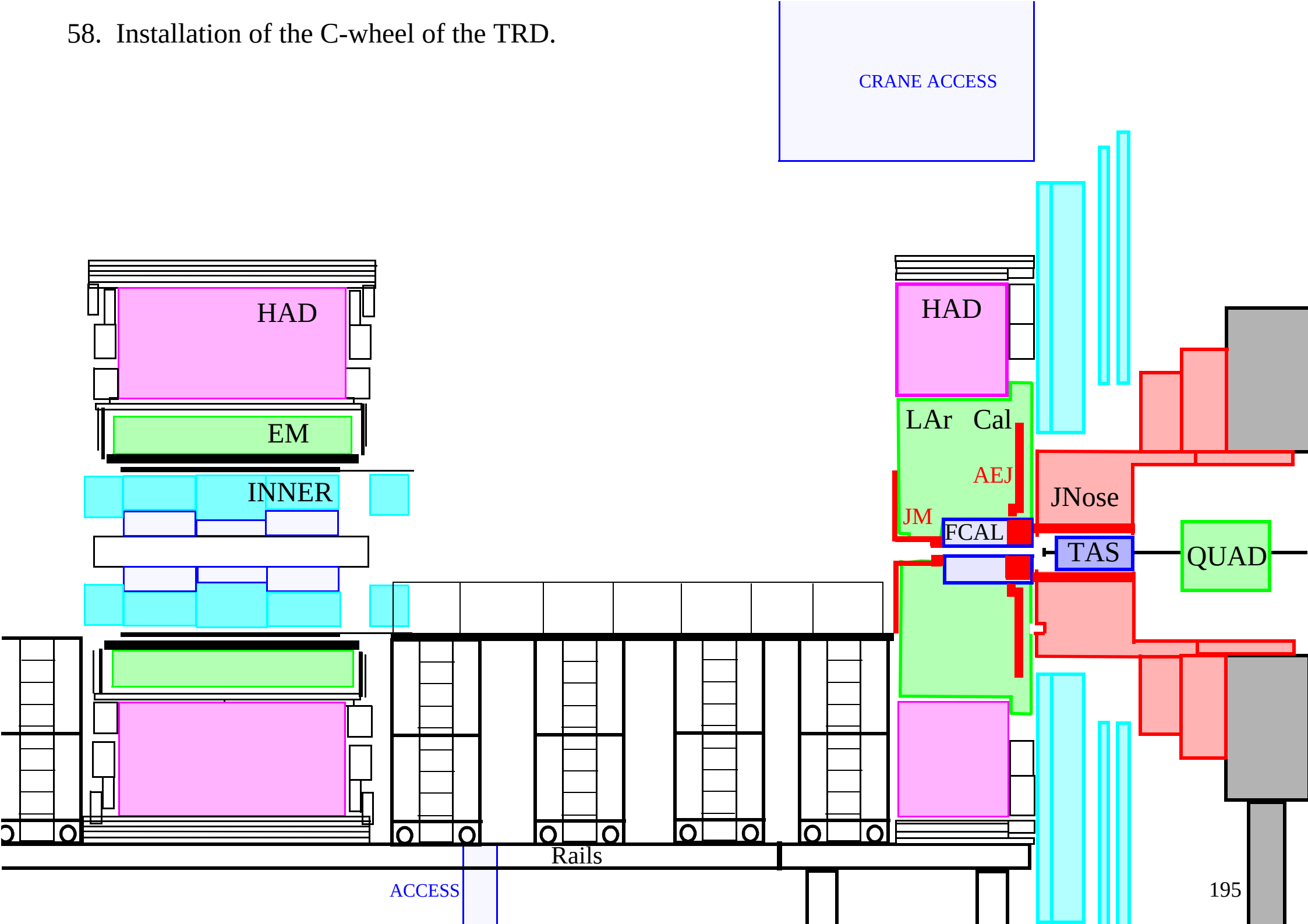

Dose rates in μSv/h from the pixel detector after 10 years of running and 15 days of cooling.
R
1 m
0.5 m
5 5 4 3 2 2 1 1 1 1
8 8 6 4 3 2 1 1 1 1
15 15 11 6 3 2 2 2 2 2
20 21 15 7 4 2 2 2 3 2
29 33 22 9 4 2 2 2 5 2
40 51 32 12 4 2 2 2 9 3
70 37 13 5 3 2 3 12 19 3
35 14 5 3 3 3 19 40 3
37 14 7 5 4 5 46 212 3
PP0
VI Beampipe
Z
4 m


Dose rates in μSv/h from the pixel detector after 10 years of running and 15 days of cooling.
R
1 m
0.5 m
4 3 3 2 2 1 1
6 5 5 3 2 1 1
10 10 8 5 2 1 1
13 15 11 6 2 1 1
19 24 17 7 3 1 1
25 38 27 10 3 1 1
PP0
43 31 11 3 1 1
28 10 3 1 1
50 28 9 3 1 1
47 91
1 m
2 m
Z

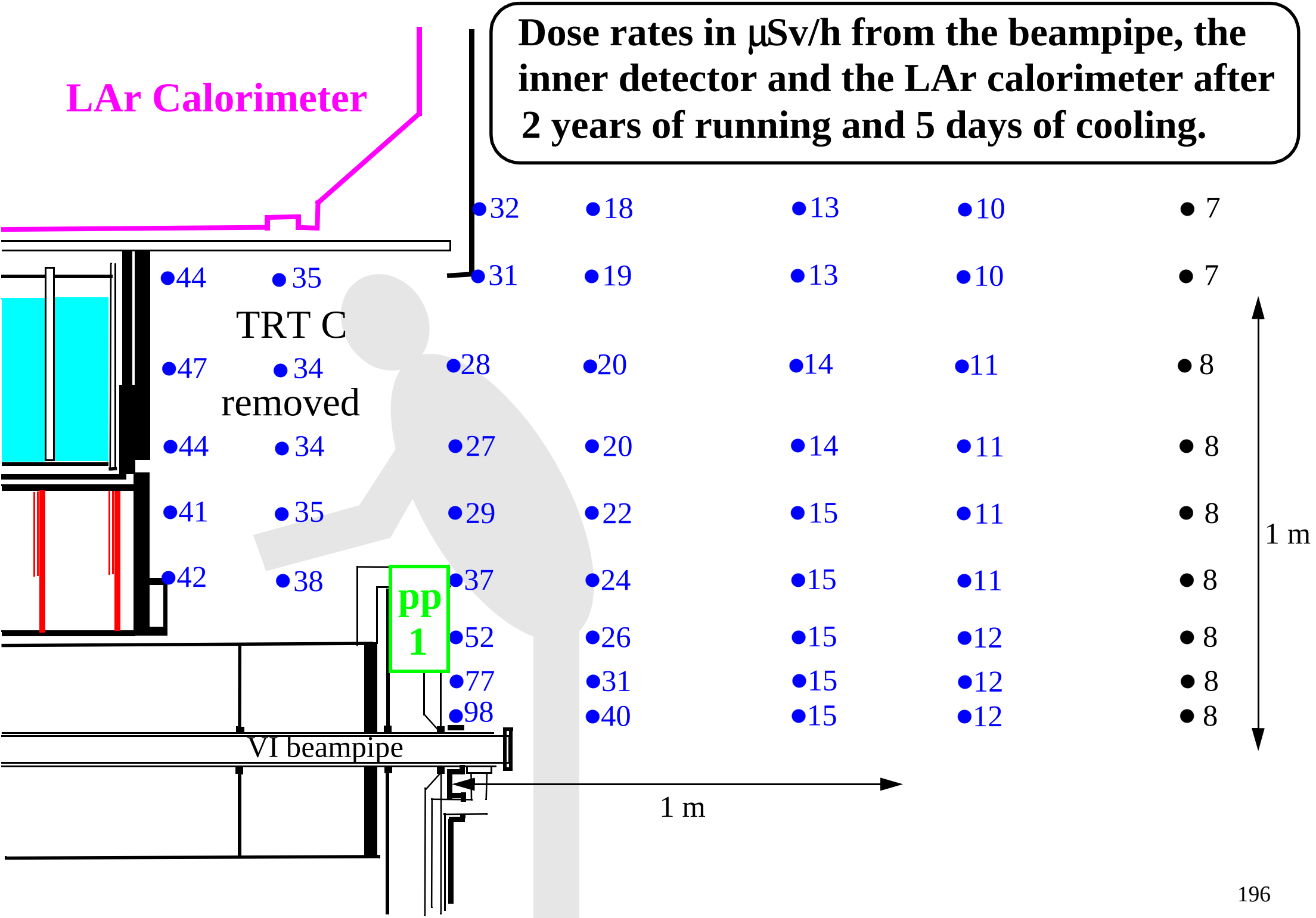
Dose rates in μSv/h from the VI beampipe.



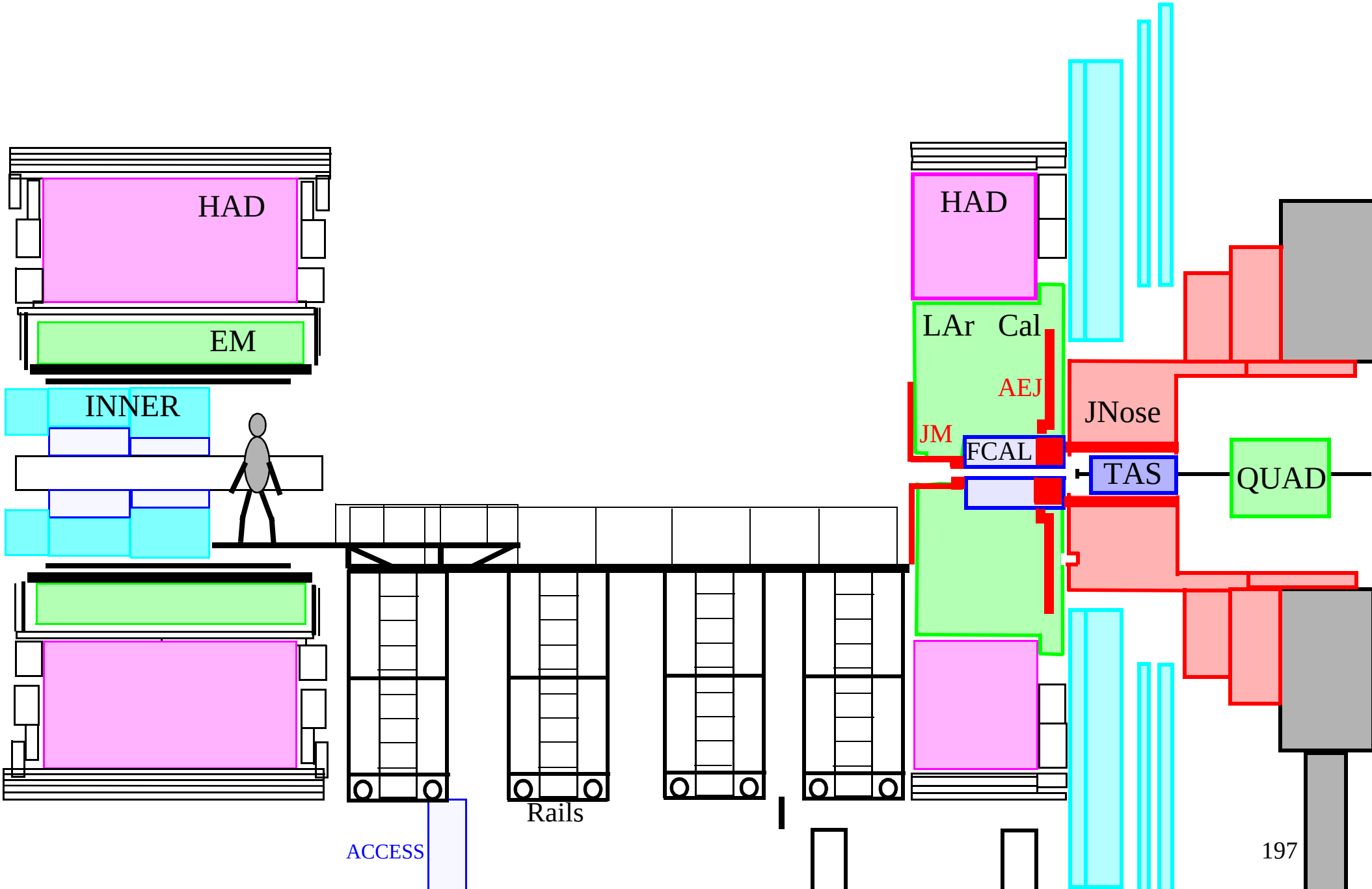
58. Installation of the C-wheel of the TRD.

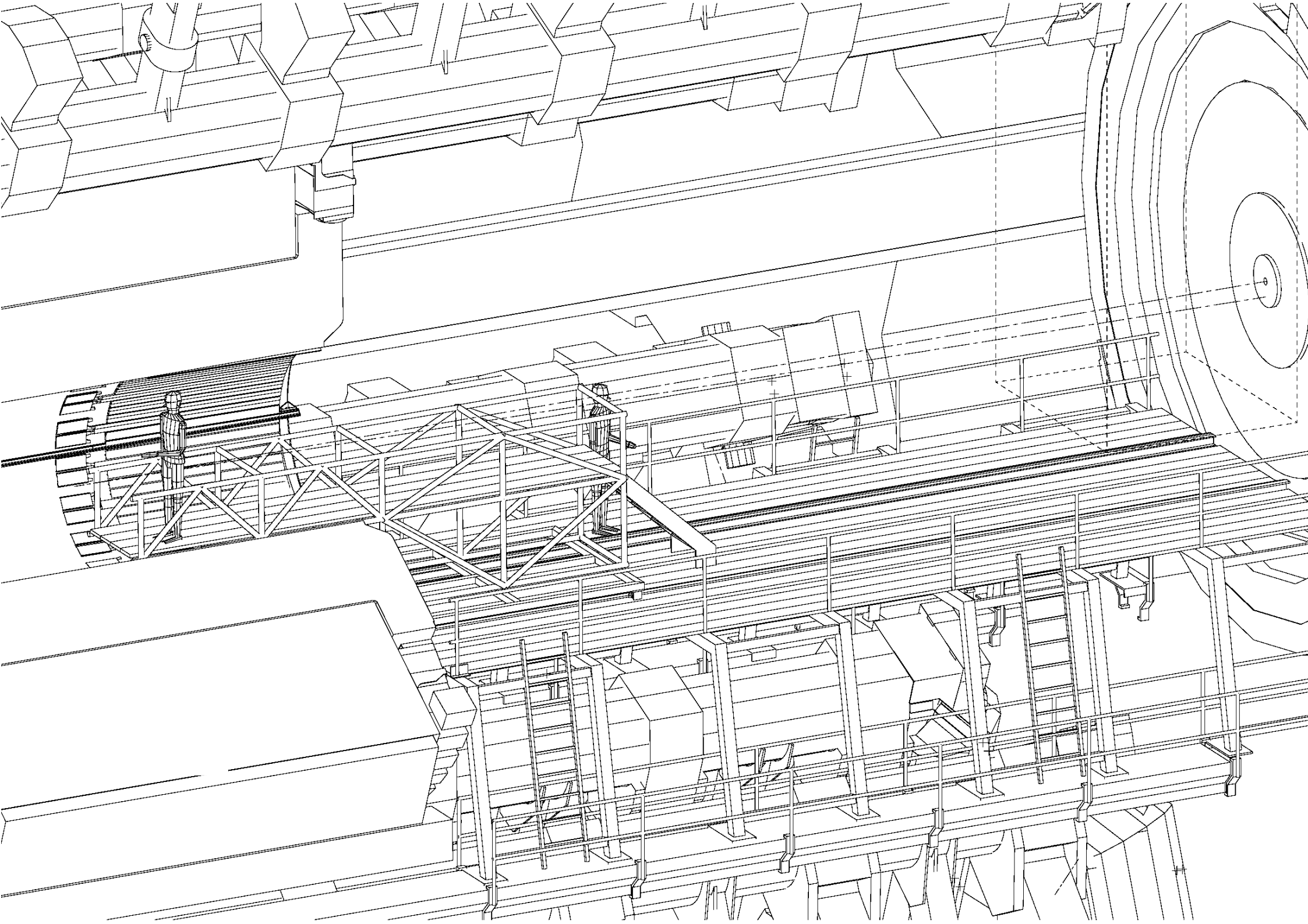


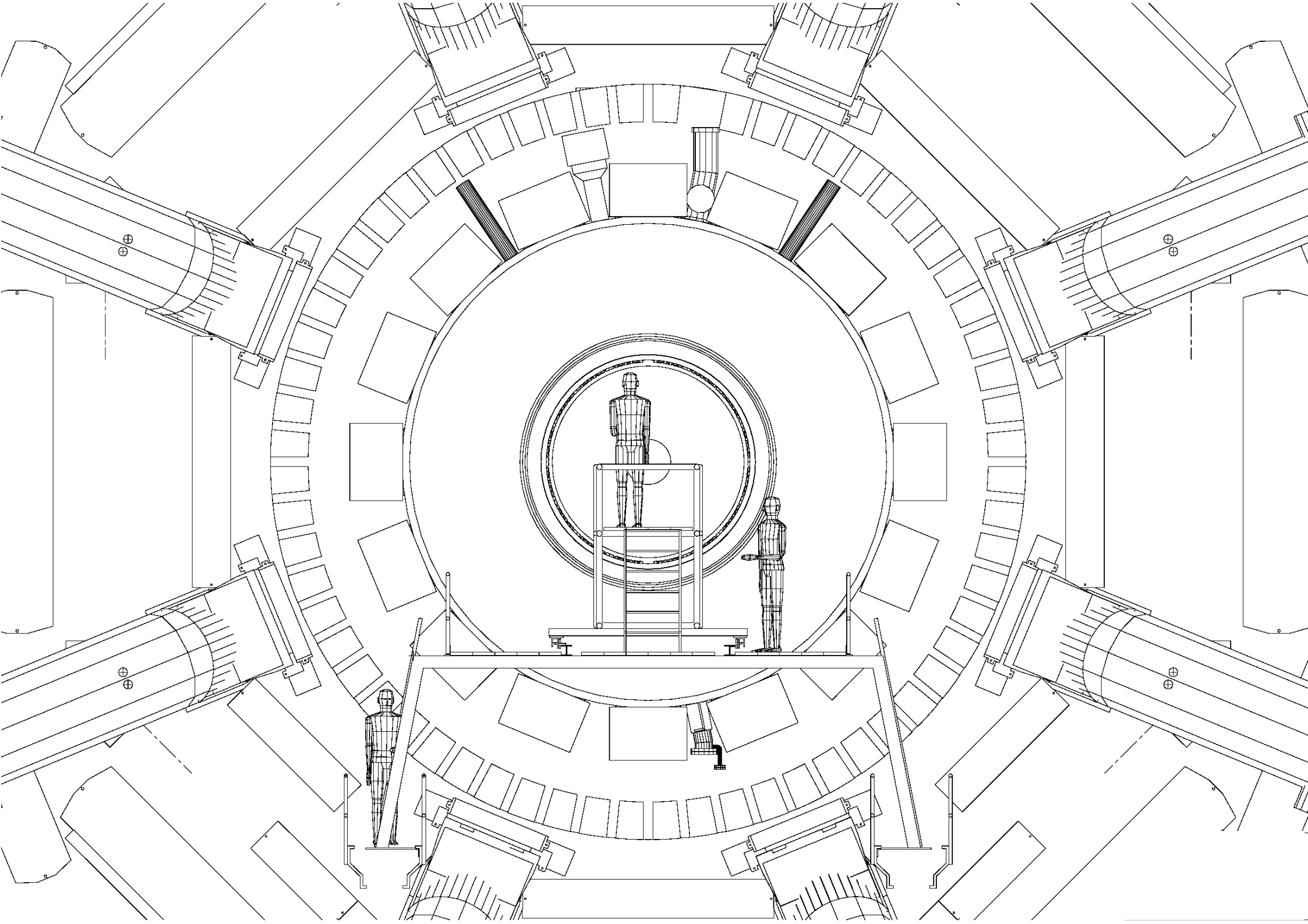
Dose rates in μSv/h from the beampipe, the inner detector and the LAr calorimeter after 2 years of running and 5 days of cooling.

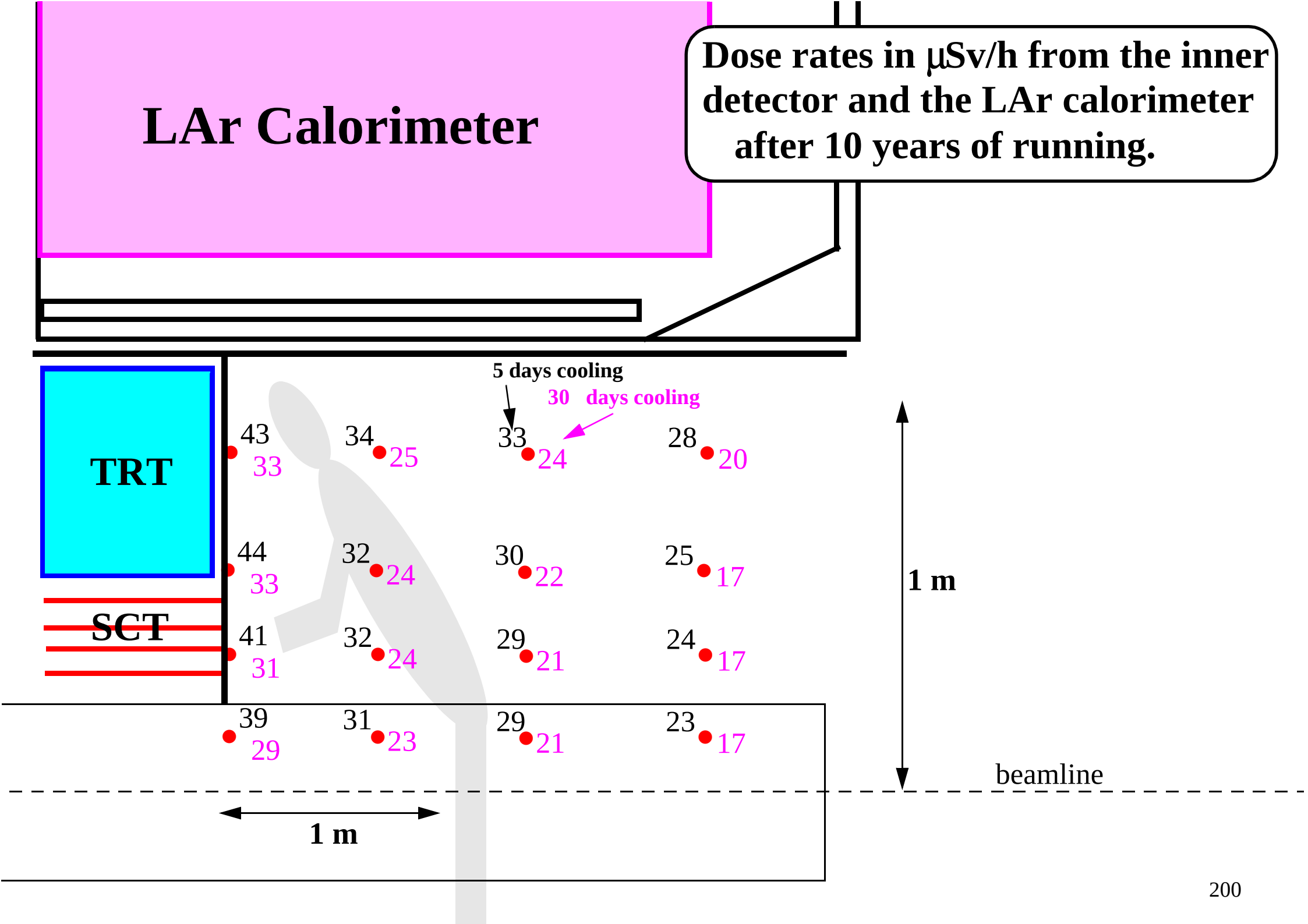


59. Maintenance of the barrel part of the inner detector.








LAr Calorimeter
Dose rates in μSv/h from the inner detector and the LAr calorimeter after 10 years of running.
TRT
SCT
5 days cooling
30 days cooling
43 33
34 25
33 24
28 20
44 33
32 24
30 22
25 17
41 31
32 24
29 21
24 17
39 29
31 23
29 21
23 17
1 m
beamline
1 m