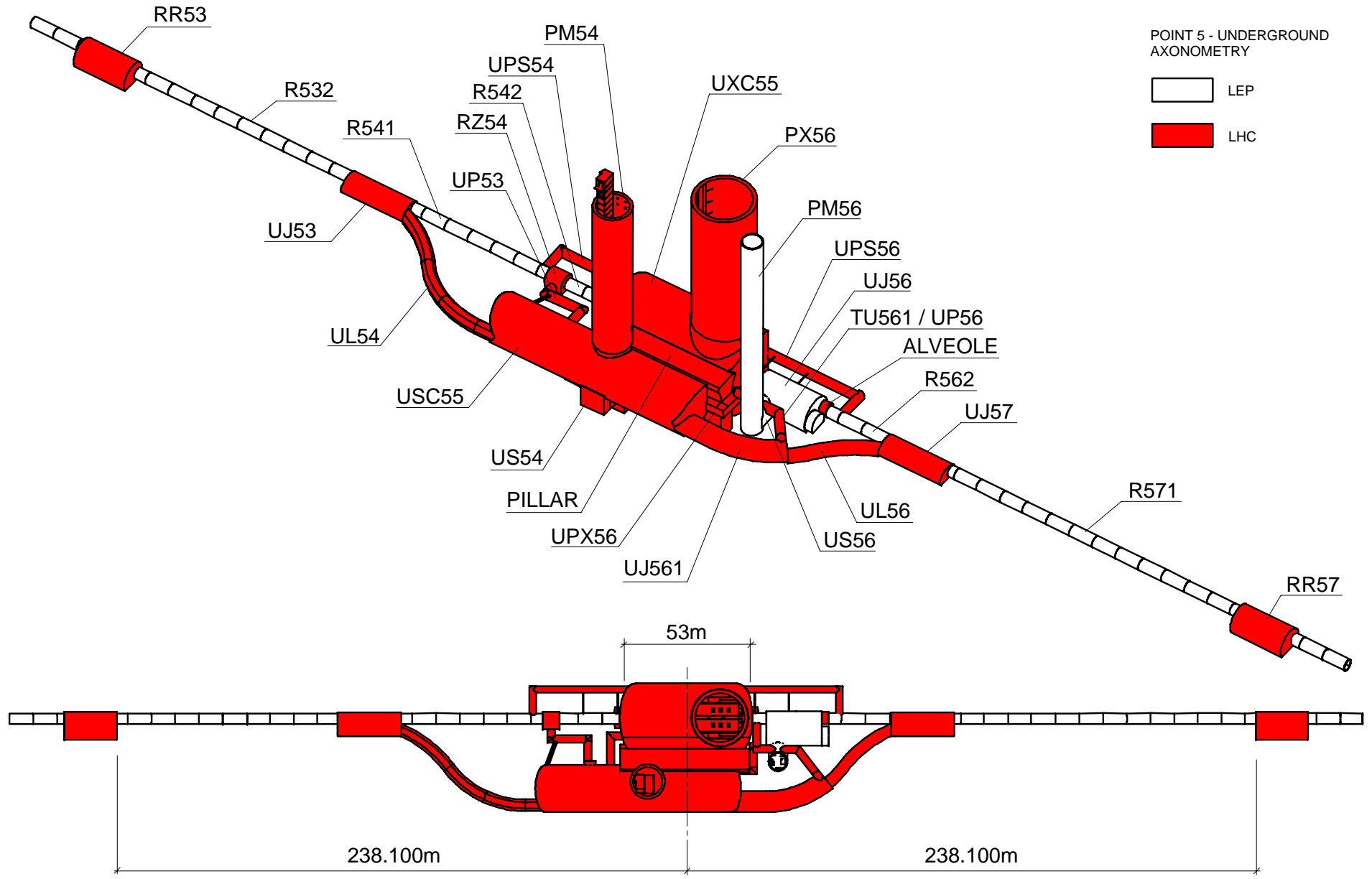


CMS Worksite

- Civil Engineering 1996-2005
- Fitting Out of Experimental Areas 2004-2006

POINT 5 - UNDERGROUND
 AXONOMETRY

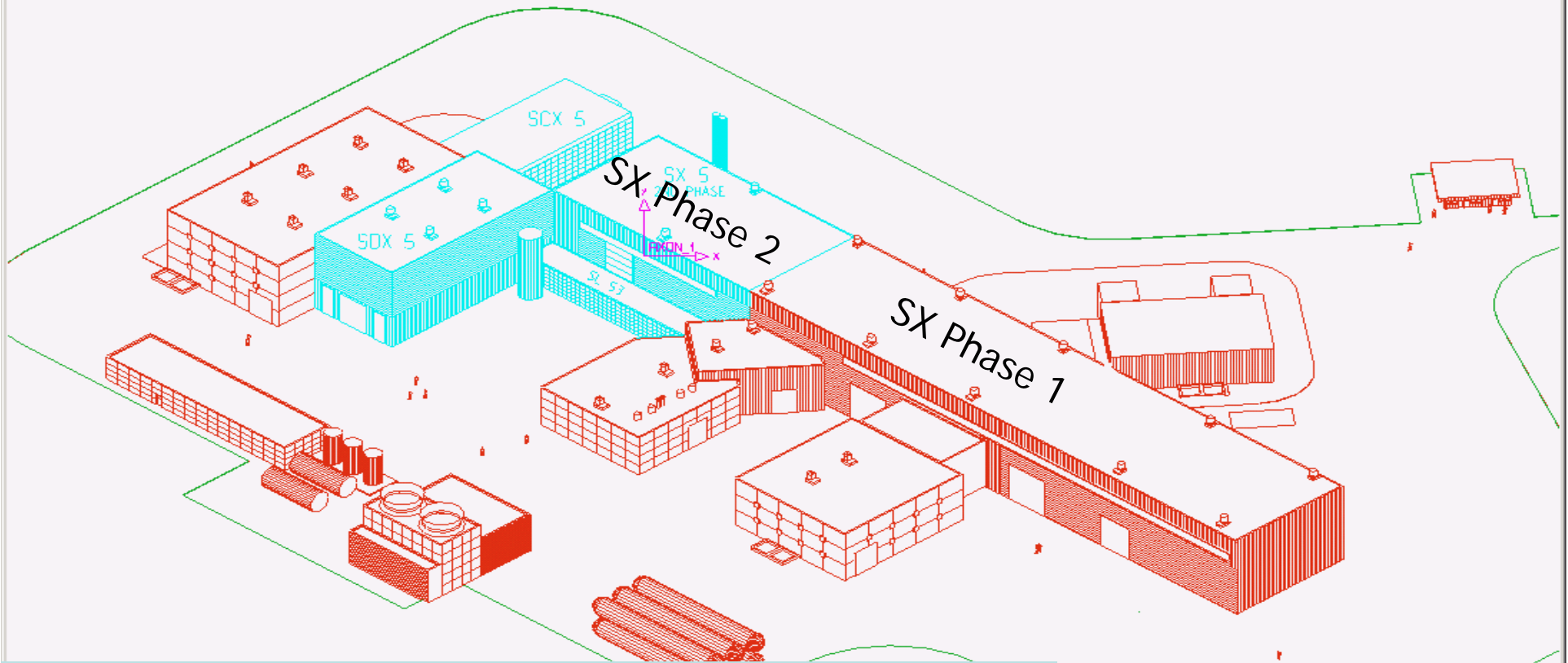
- LEP
- LHC



CMS Worksite – John Osborne

CMS – Surface buildings

K0082261PL EN COURS



•SX building staged construction

LHC CIVIL ENGINEERING POINT 5
OUTSTANDING SURFACE WORKS



1998

Existing LEP buildings

CMS Worksite – John Osborne



1999

CMS Worksite – John Osborne

1999



SX gantry cranes
installed in an
'intervention' window
written into CE
contract

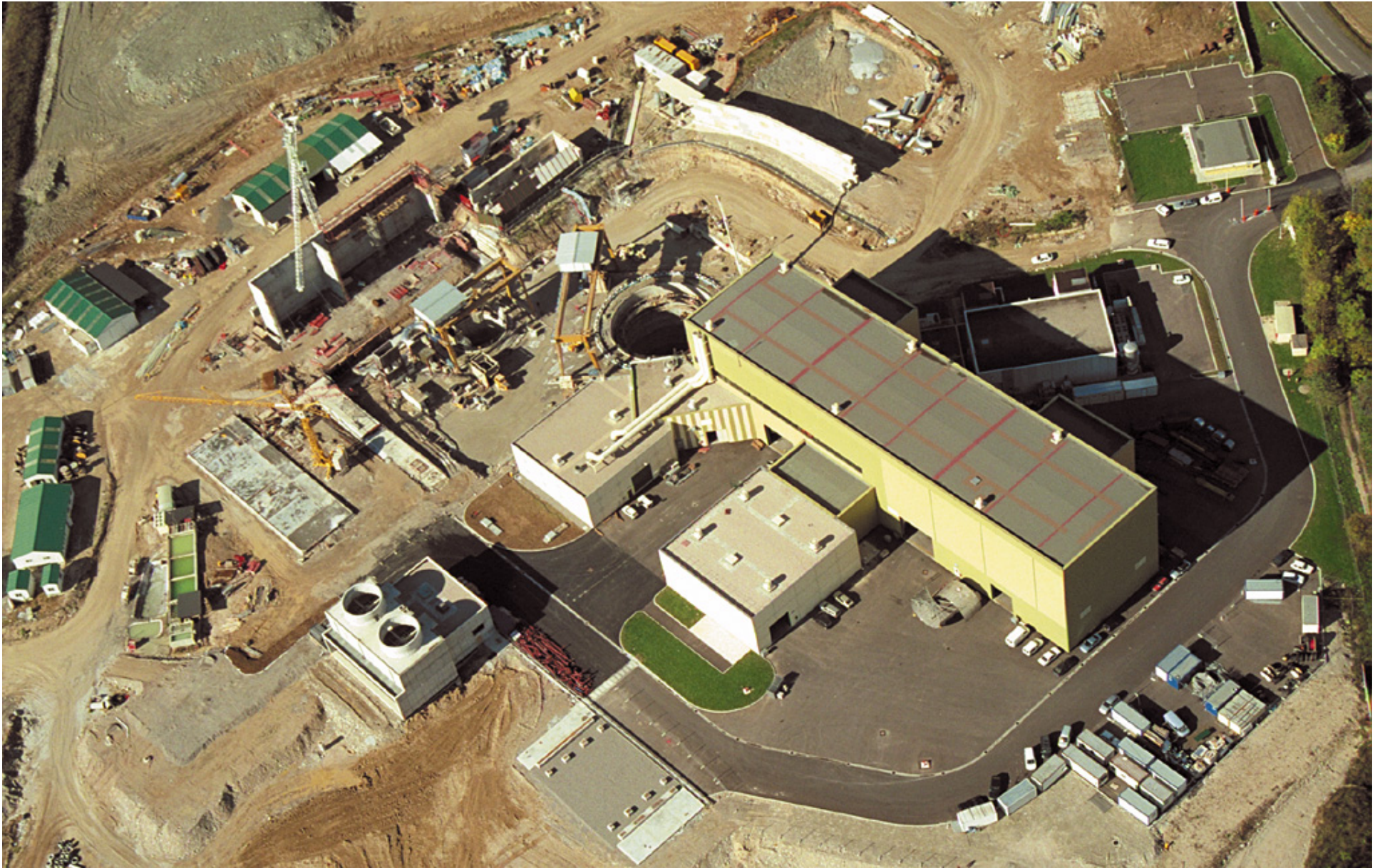
CMS Worksite – John Osborne



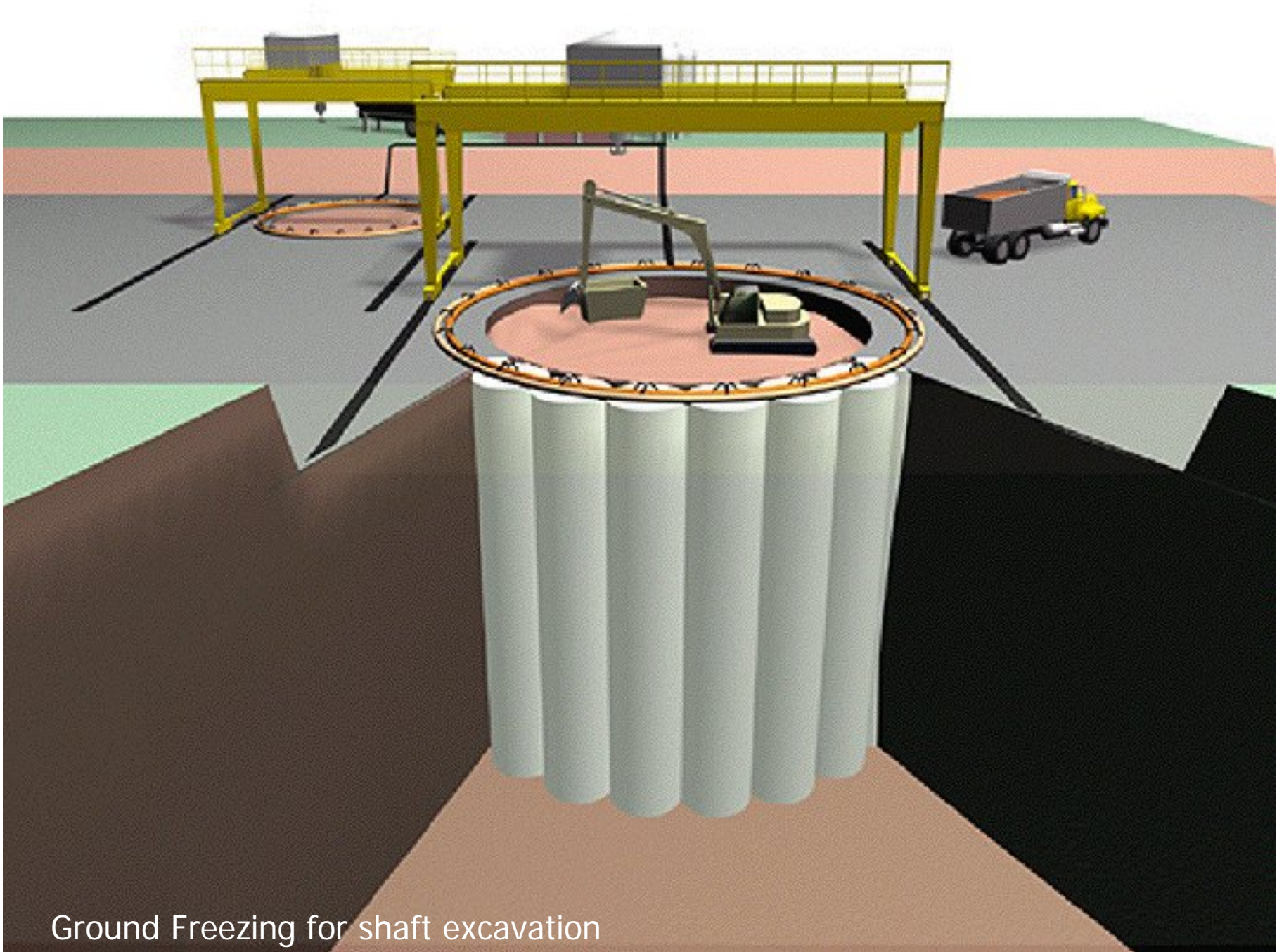
All spoil generated was used for landscaping

Access road for CE works

CMS Worksite – John Osborne



CMS Worksite – John Osborne



Ground Freezing for shaft excavation



CMS Worksite – John Osborne



CMS Worksite – John Osborne



CMS Worksite – John Osborne

Shafts 12.1m and 20.5m diameters,
both approx. 100m deep

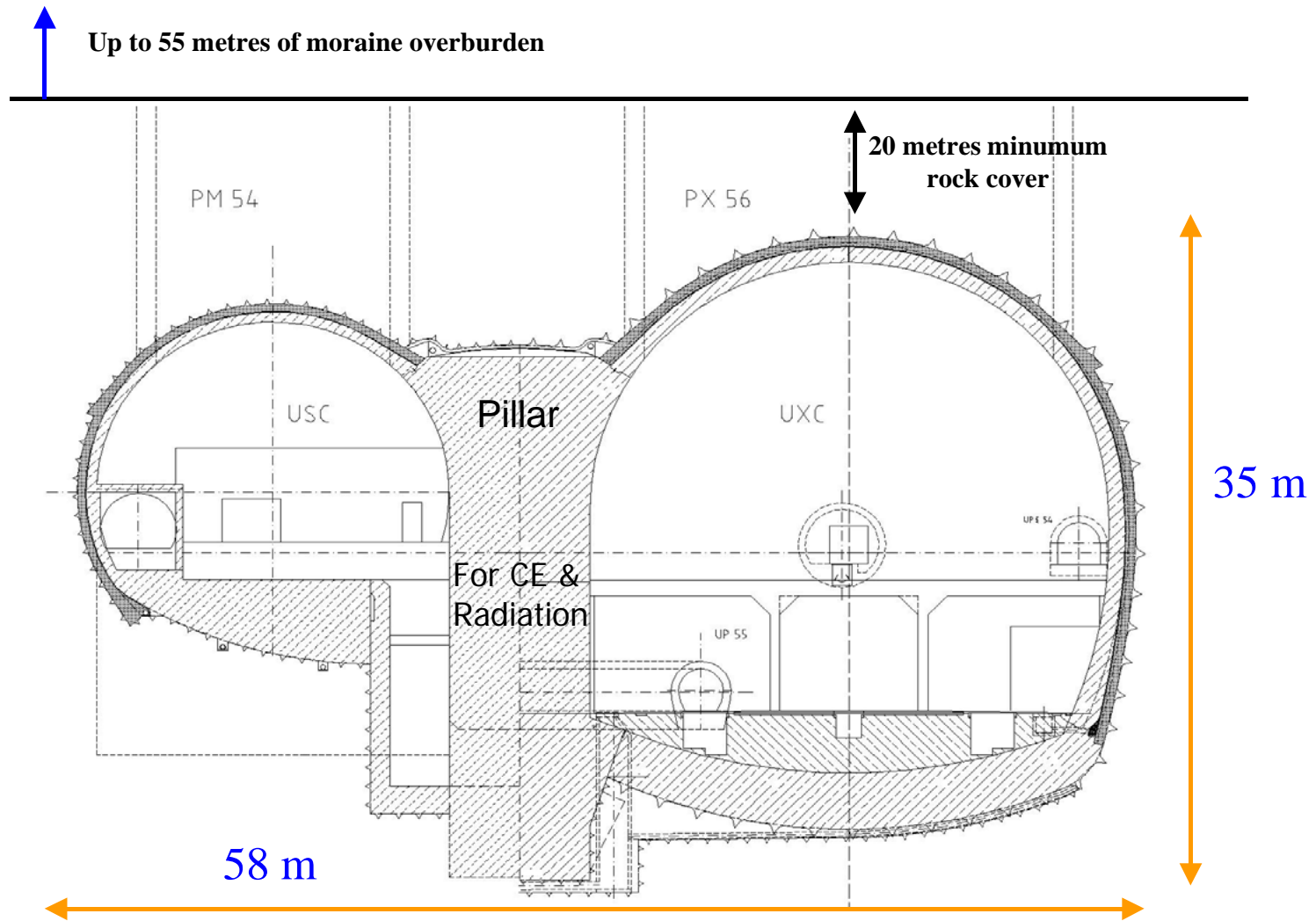


CMS Worksite – John Osborne



CMS Worksite – John Osborne

Section through cavern complex at point 5





Point 5 - Shuttering for the first layer of pillar concrete - April 20, 2001 - CERN ST-CE



Point 5 - UXC55 cavern excavation - LEP demolition - January 23, 2002 - CERN ST-CE



Total Volume excavated
= 216,000m³

2003

2003

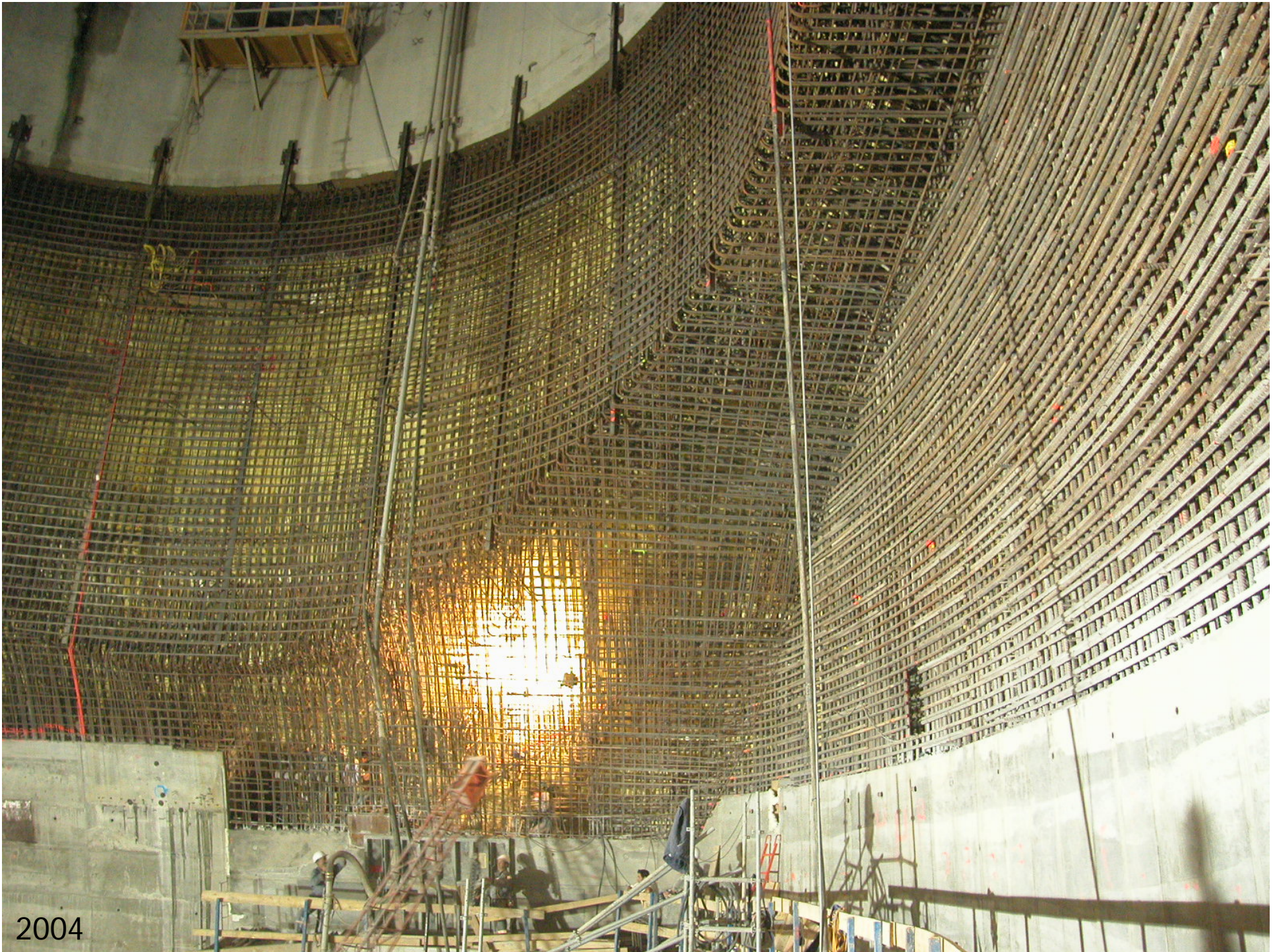




Total Concrete
Volume =
90,000m³

2004





2004



2004

Steel anchorages for
Blockhouse shielding



2004





CMS cavern 53m long, 27m wide by 25m high

2005



Access to
PM shaft

2005



2003

Plug constructed by main CE contractor using Variation Order mechanism



2004



2004



142 tons of high tensile steel in plug

2004



2004



2004

Total weight
of plug 2000
tons

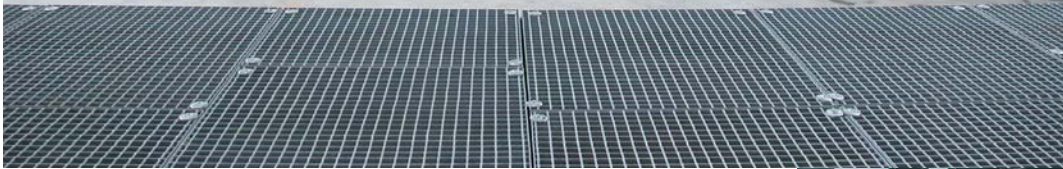


2004

Intervention
Window to install lift
modules before SDX
building completed

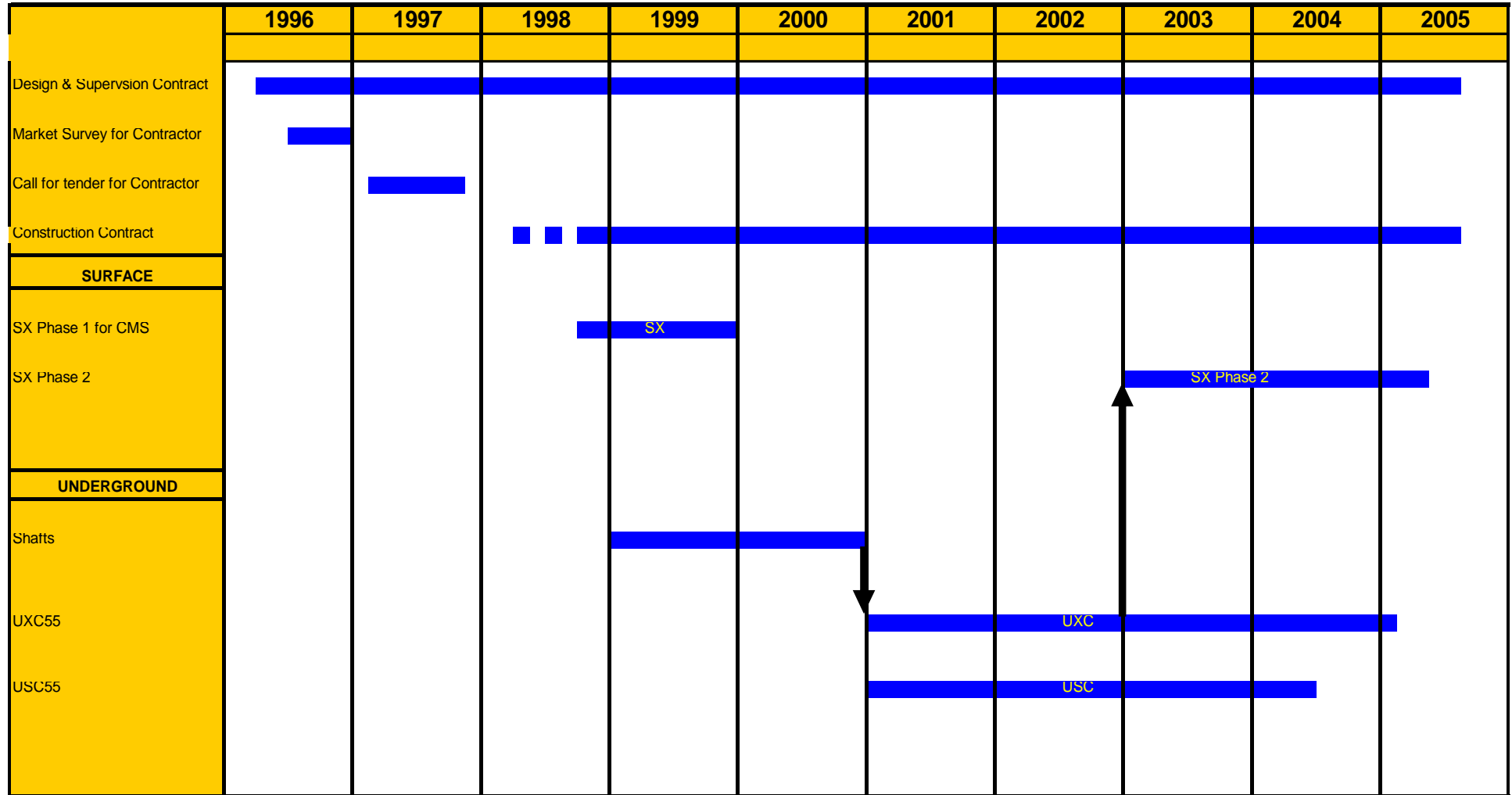


CMS Worksite – John Osborne



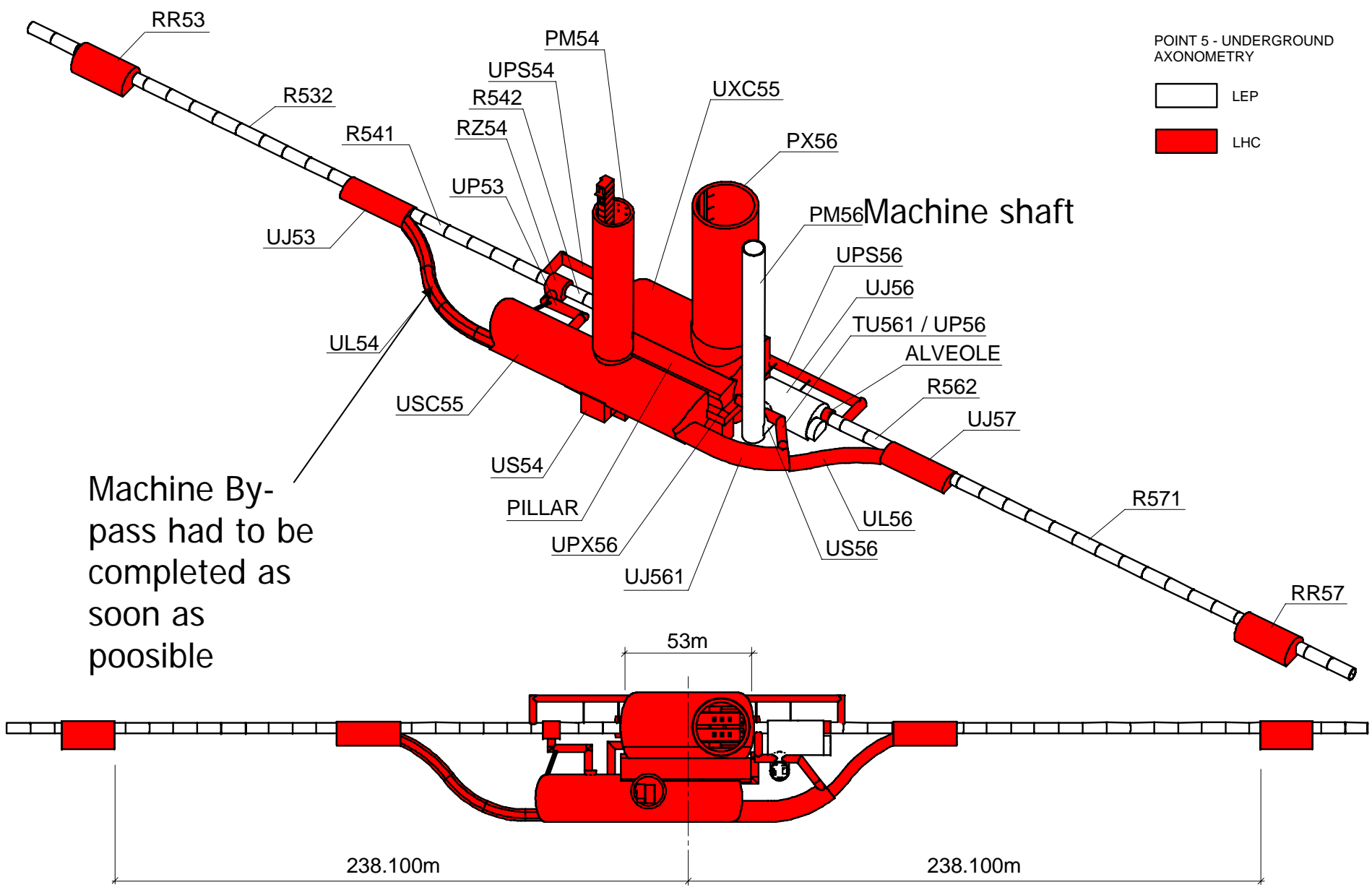
SX5 Extension Handed over
from CE : 9th March 2005

LHC CIVIL ENGINEERING AS-BUILT FOR CMS



J. Osborne October 2006

- Co-ordination of follow on activities ready for CMS lowering
- interaction with LHC Machine activities



POINT 5 - UNDERGROUND AXONOMETRY

- LEP
- LHC

Machine Bypass had to be completed as soon as possible

POINT 5 - UNDERGROUND LAYOUT

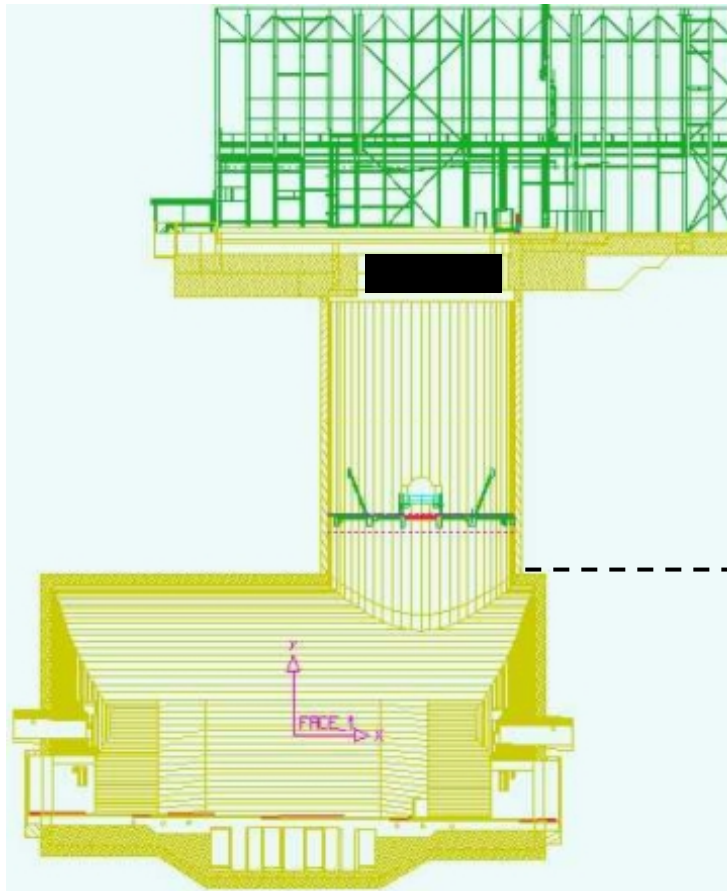


2003

Bypass
tunnel



Monday 9 October 2006



VSL lift load and PH-CMI move test load into building

Plug closed

ZEC: Install cooling and service pipes + ECAL heat system
Hadrelec: Install EL general services

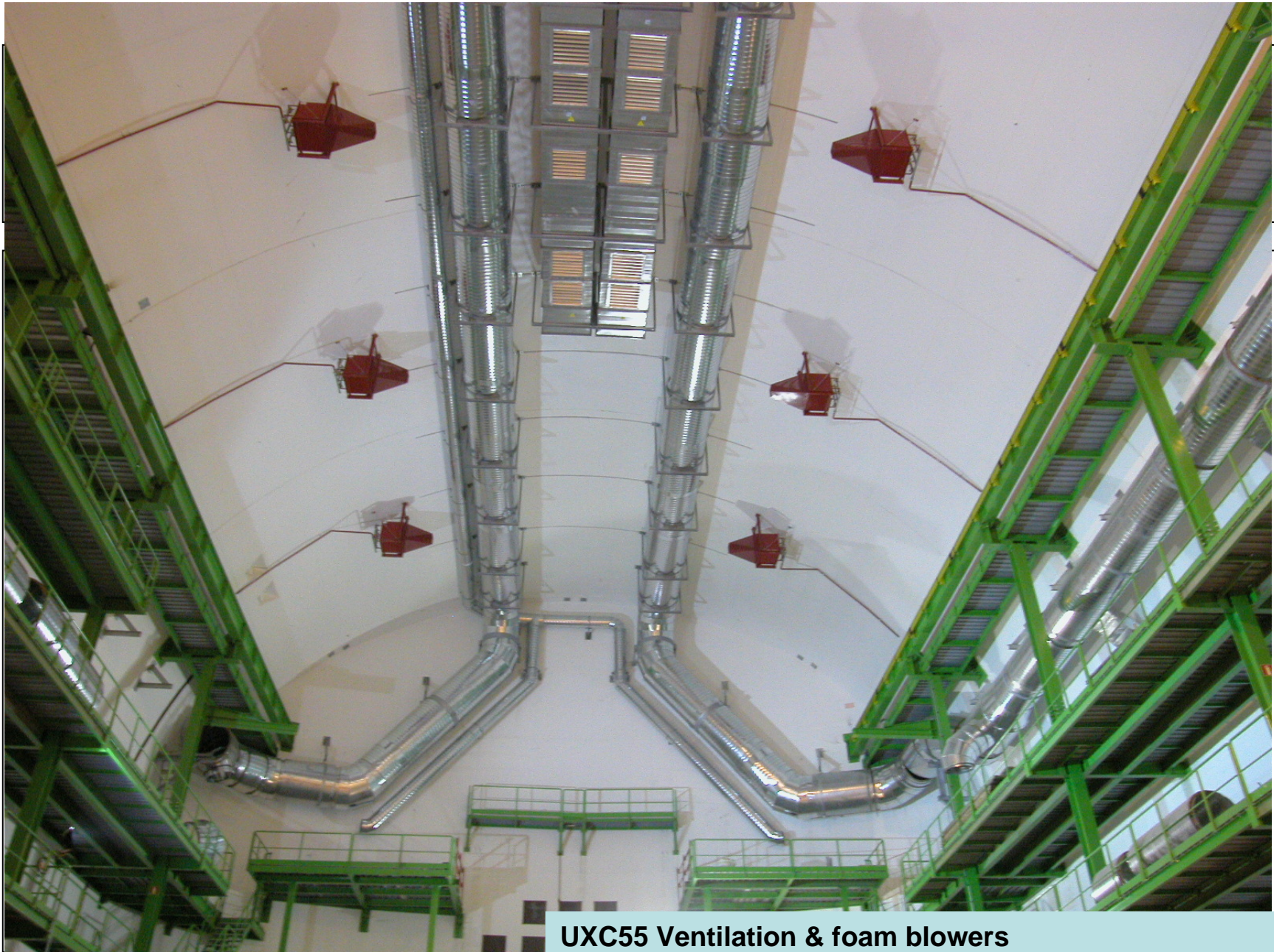
COSMI: Install garage rails +end garage – awaiting fixings

DBS : Install racks on steel platforms awaiting palans

Cable Chain cabling



UXC55 - steelwork platforms in UXC55



UXC55 Ventilation & foam blowers

CMS Worksite – John Osborne



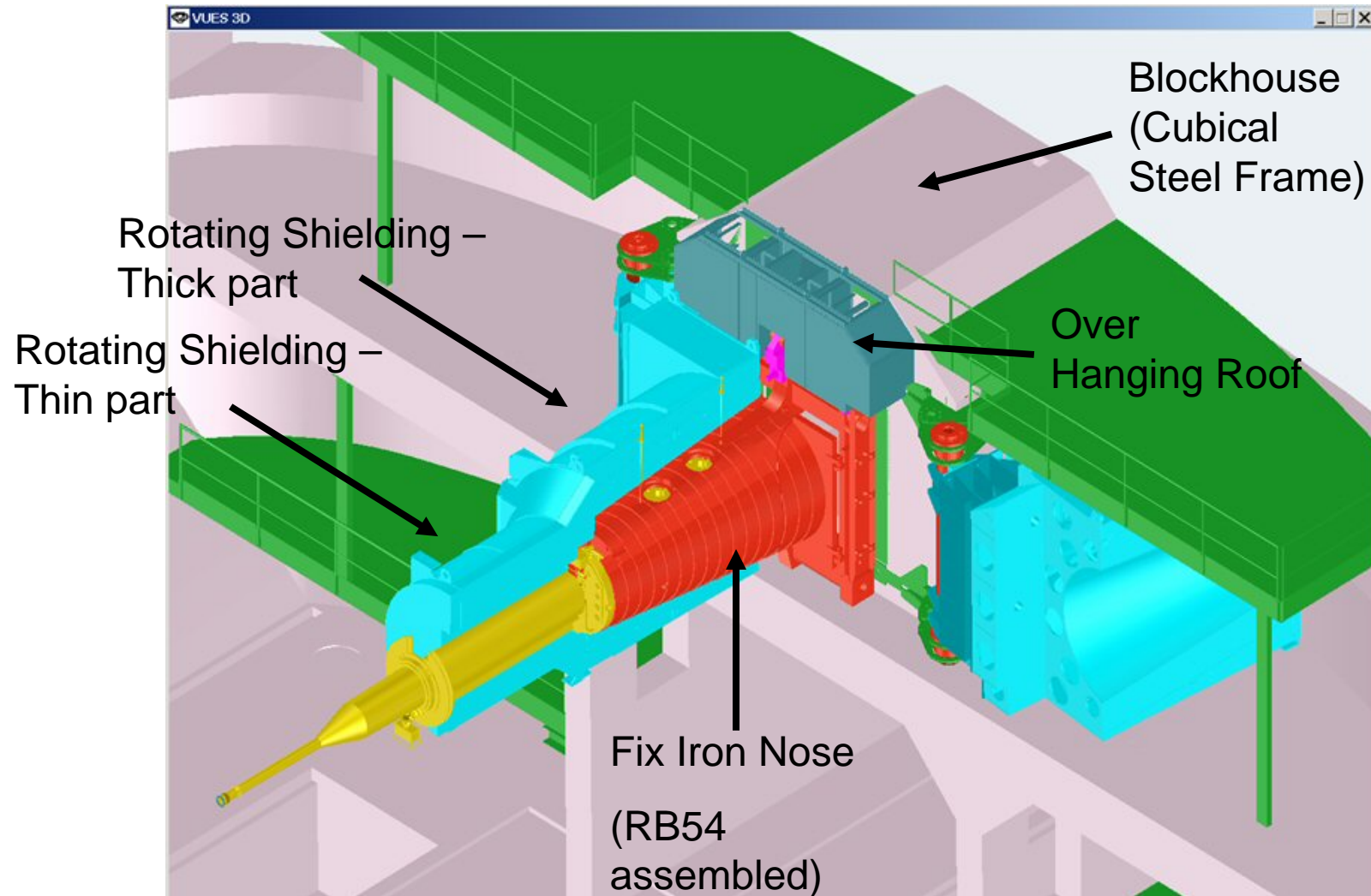
UXC55 CMS Floor Plates for air-pads

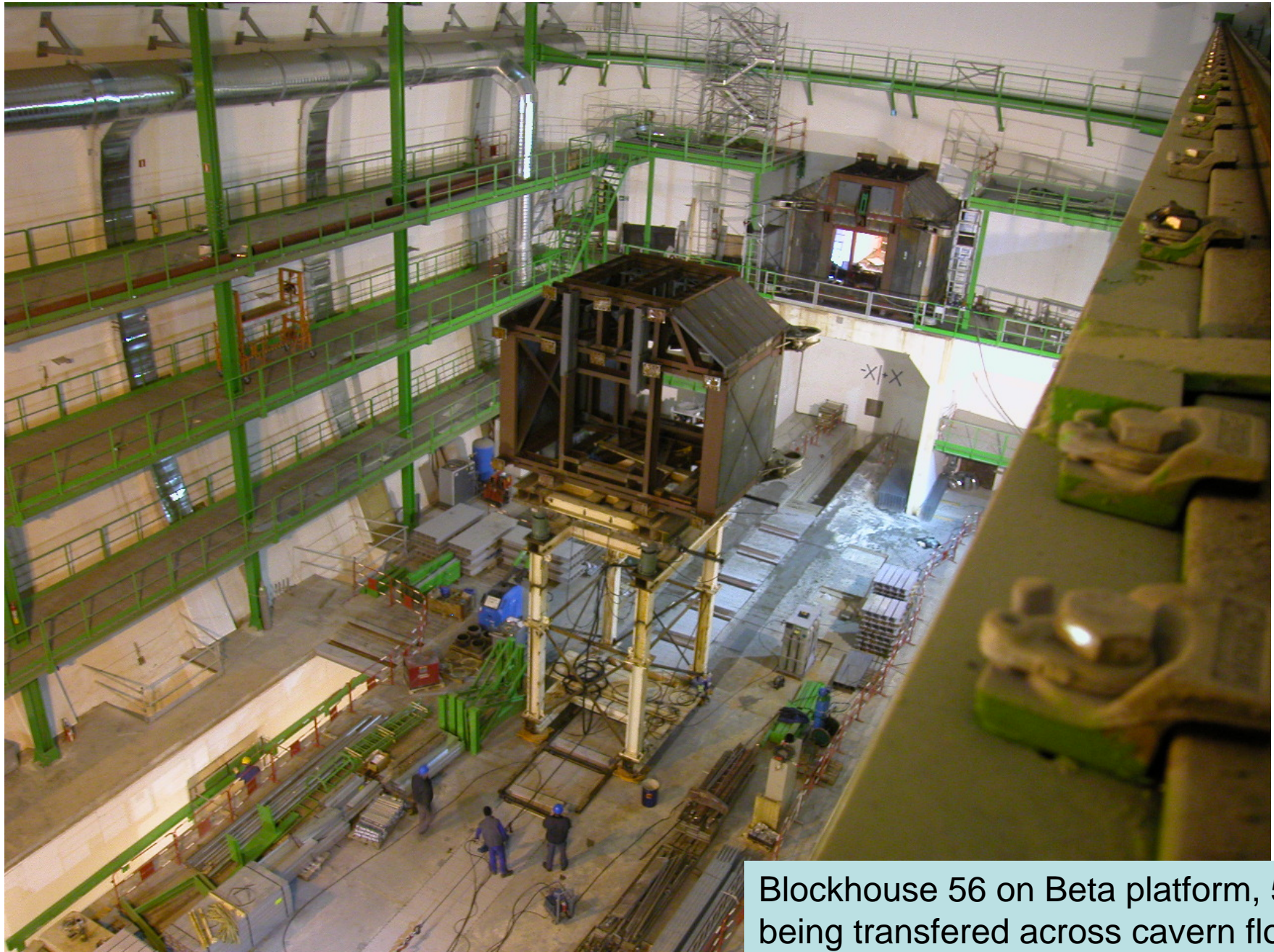


UXC CMS plates being installed and grouted

CMS Worksite – John Osborne

Forward Shielding Layout





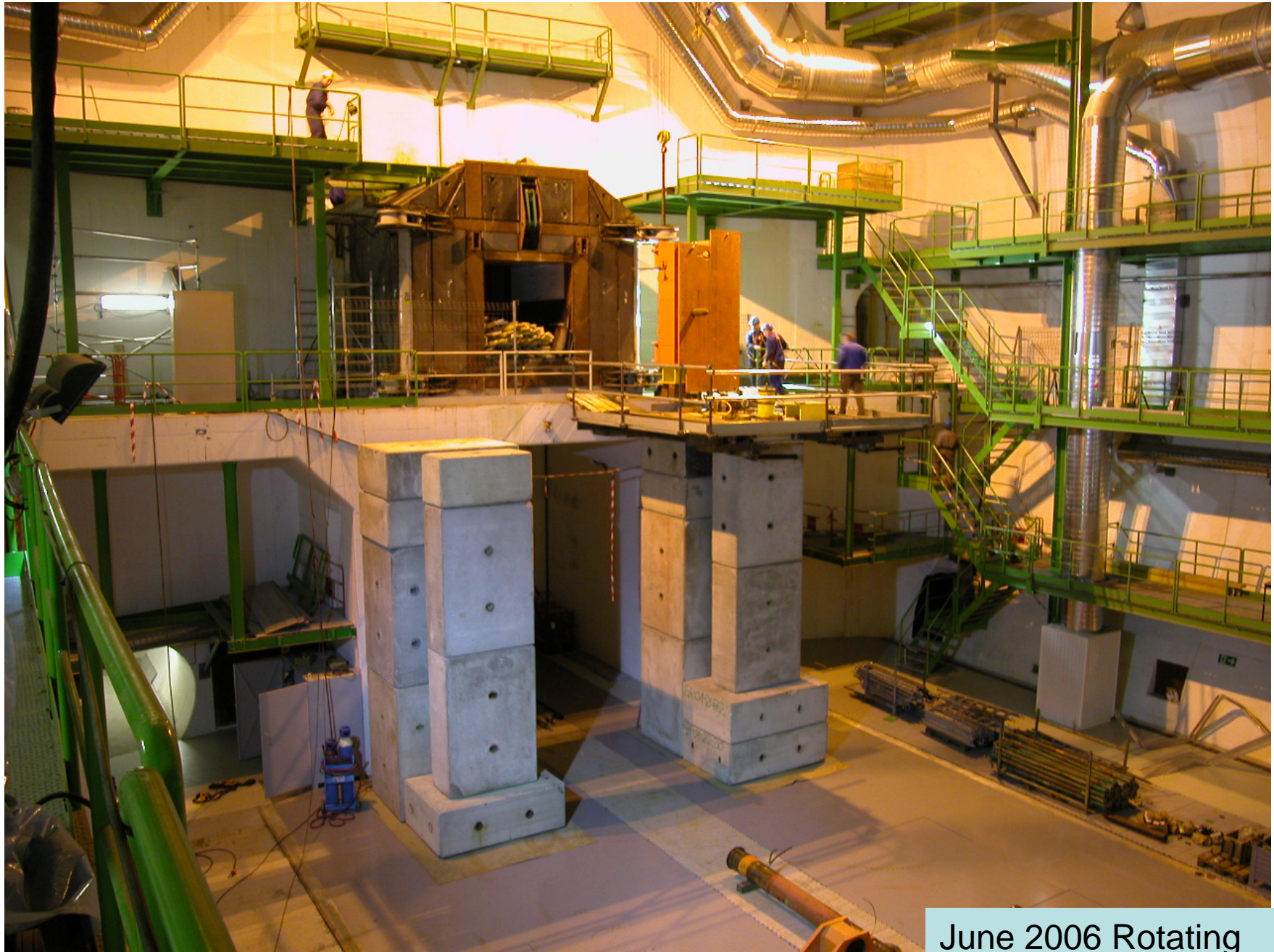
Blockhouse 56 on Beta platform, 54 being transferred across cavern floor via air pads

CMS Worksite – John Osborne



Concreting of blockhouses May 2006

CMS Worksite – John Osborne



CMS Worksite – John Osborne

June 2006 Rotating
Shielding started with
Hinges



UXC55 Rotating shielding 80m³ Boron & Scrap concrete Spring 2006

CMS Worksite – John Osborne

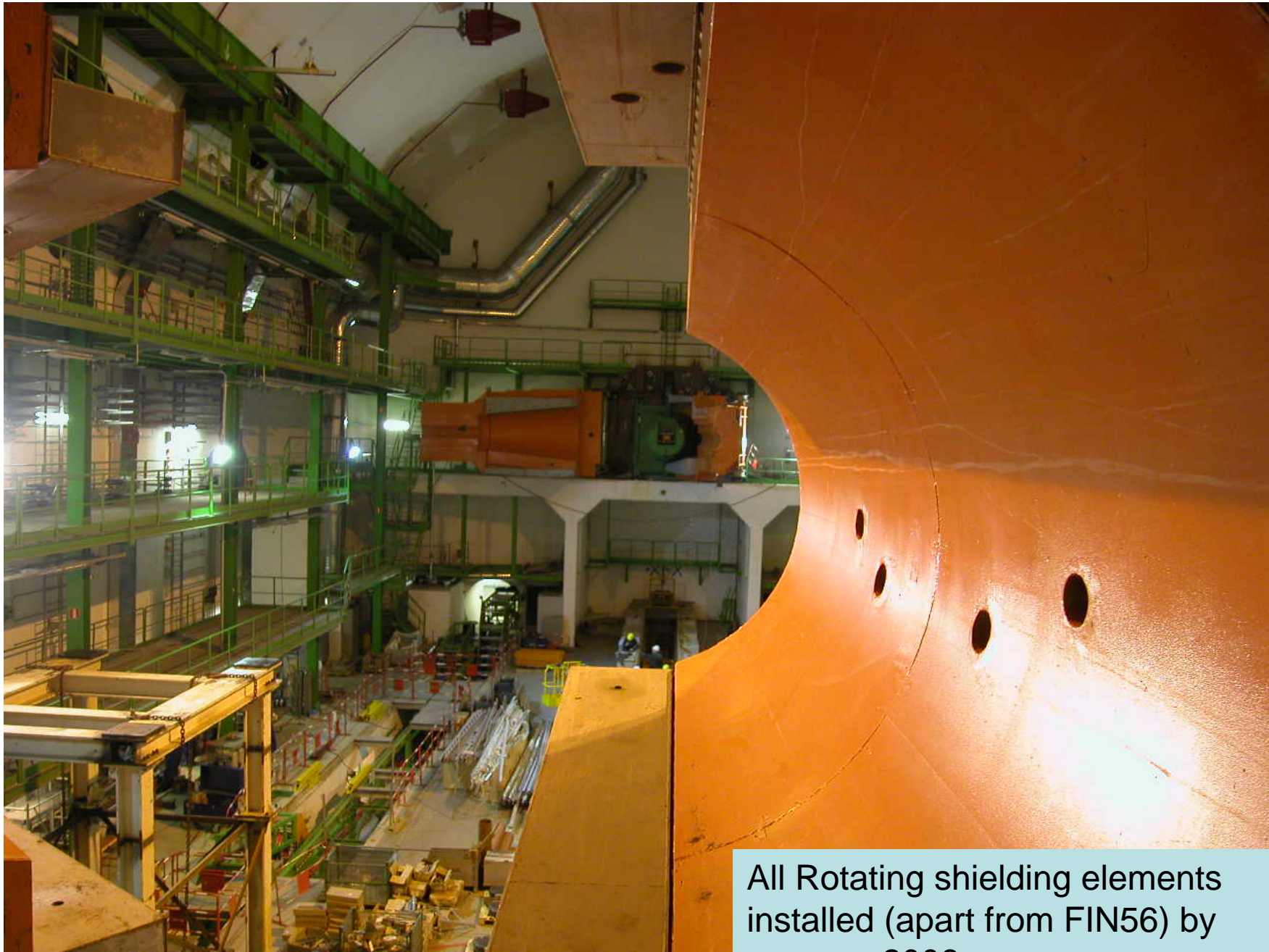


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First thick part lowered 7 June 2006

CMS Worksite – John Osborne



All Rotating shielding elements installed (apart from FIN56) by summer 2006

CMS Worksite – John Osborne



2004

Staicase, ventilation and lift installed in PM shaft in 'intervention window'

CMS – Service Cavern



USC55- Service Area (Point 4 End) Feb 05

CMS – Service Cavern



USC55 Controls end May 05

SX5: HF lowering schedule

Task Name			Jul	Aug	Sep	Oct	Nov	Dec	Jan	
SX5		816 days								
Extension Building		816 days								
Bouchon Area										
Perform VSL crane t										
Perform dynam						10/10	16/10			
Unload dummy						17/10	17/10			
Gantry crane install							17/10			
Lowering HF's		6 days								
Prepare							18/10			
Position							19/10			
Open P							20/10			
Close P							23/10			
Position 2nd HF on Plug	1 day	PH-CMI				24/10	24/10			
Open Plug + lower 2nd HF	1 day	PH-CMI				25/10	25/10			
UXC55		886 days?								
-Z side		851 days?								
CMS		228 days								
HF's		32 days								
Install HF-1 Garage rails	5 days	TS-IC			02/10	06/10				
Lower HF+1	1 day	PH-CMI			20/10	20/10				
Lower HF-1	1 day	PH-CMI			25/10	25/10				
Position HF-1 on jacks	1 day	PH-CMI			26/10	26/10				
Test jacks	1 day	PH-CMI			27/10	27/10				
Install cable trays under low beta platform	1 day	PH-CMI			30/10	30/10				
HF-1 Cable Chain complete	0 days					30/10				
Connect HF-1 cable chain + guiding system	2 days	PH-CMI			31/10	01/11				
Install HF-1 in garage	1 day	PH-CMI			02/11	02/11				
Install HF-1 Garage doors	1 wk	TS-IC			08/11	14/11				
YEs +Z side		14 days								
Lower End Cap YE+3	1 day	PH-CMI				20/11	20/11			
+Z side		737 days?								
CMS		119 days								
Install HF+1 Garage rails	5 days	TS-IC	25/09	29/09						
HF+1 Cable Chain complete	0 days					19/10				
Position HF+1 on jacks	2 days	PH-CMI			23/10	24/10				
Test jacks	1 day	PH-CMI			25/10	25/10				
Install cable trays under low beta platform	1 day	PH-CMI			26/10	26/10				
Connect HF+1 cable chain + guiding system	2 days	PH-CMI			27/10	30/10				
Install HF+1 in garage	1 day	PH-CMI			31/10	31/10				
Install HF+1 Garage doors	1 wk	TS-IC			01/11	07/11				

17-19 October VSL modify hydraulics
Tests on plug 23 Oct

Dummy load test in Shaft
26+27 October

Sequence to validate

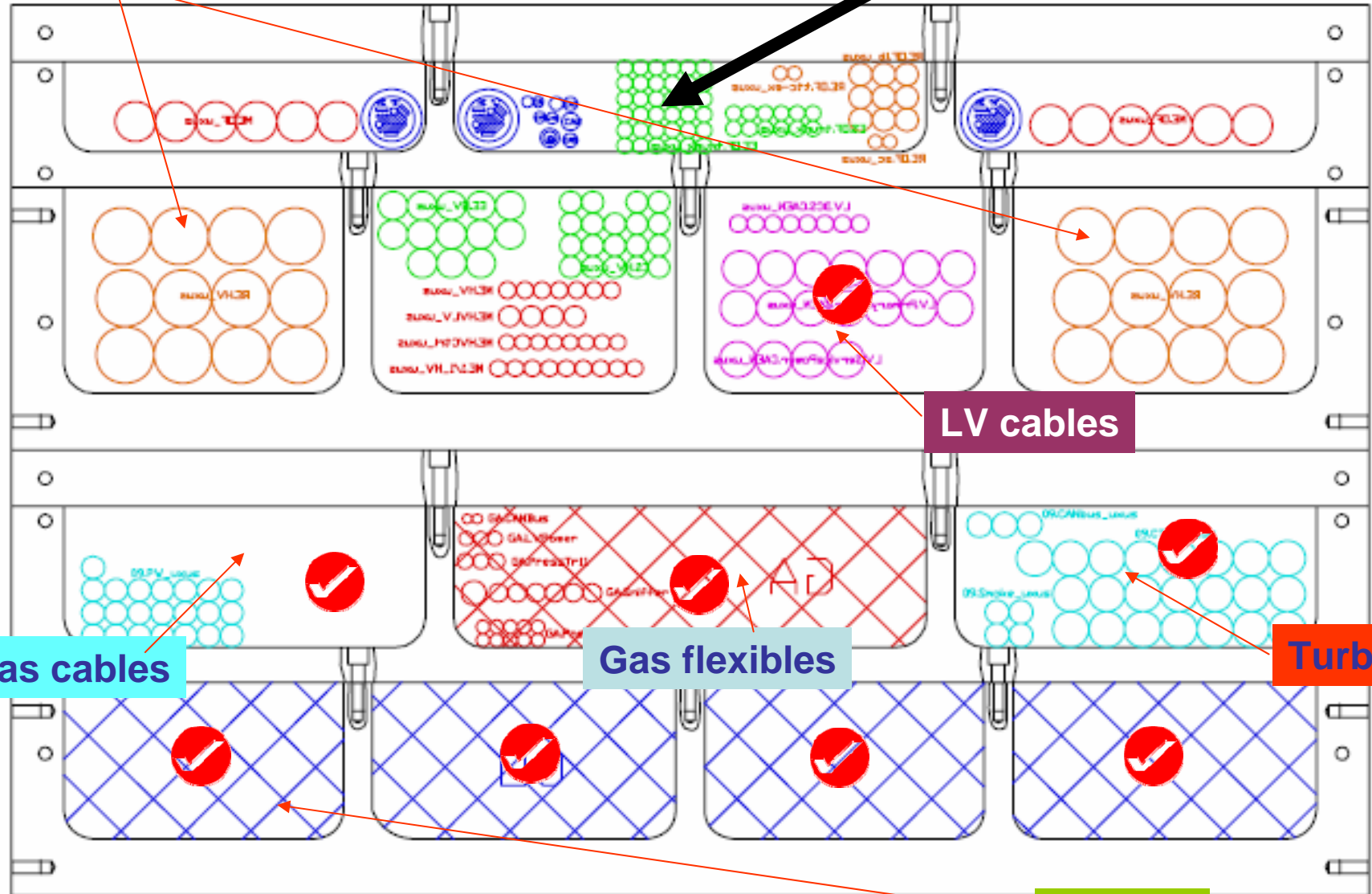


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YE+1 N

DRAKA delayed until 11 October ?

CMS cables 80%



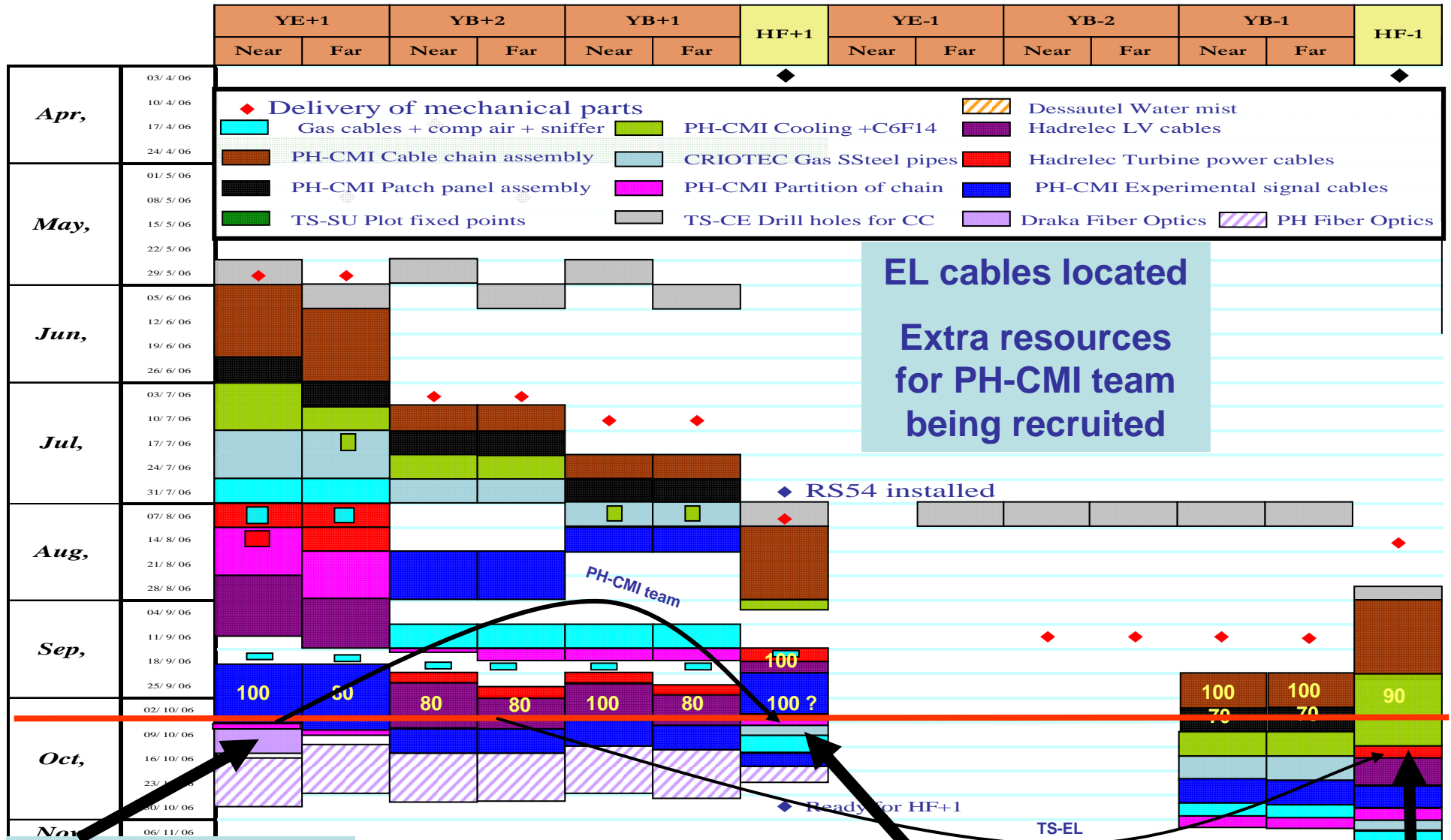
LV cables

Gas cables

Gas flexibles

Turbines

Cooling



EL cables located

Extra resources for PH-CMI team being recruited

◆ RS54 installed

PH-CMI team

MZ (DRAKA) start 11 October after pre-shower cables + partition ?

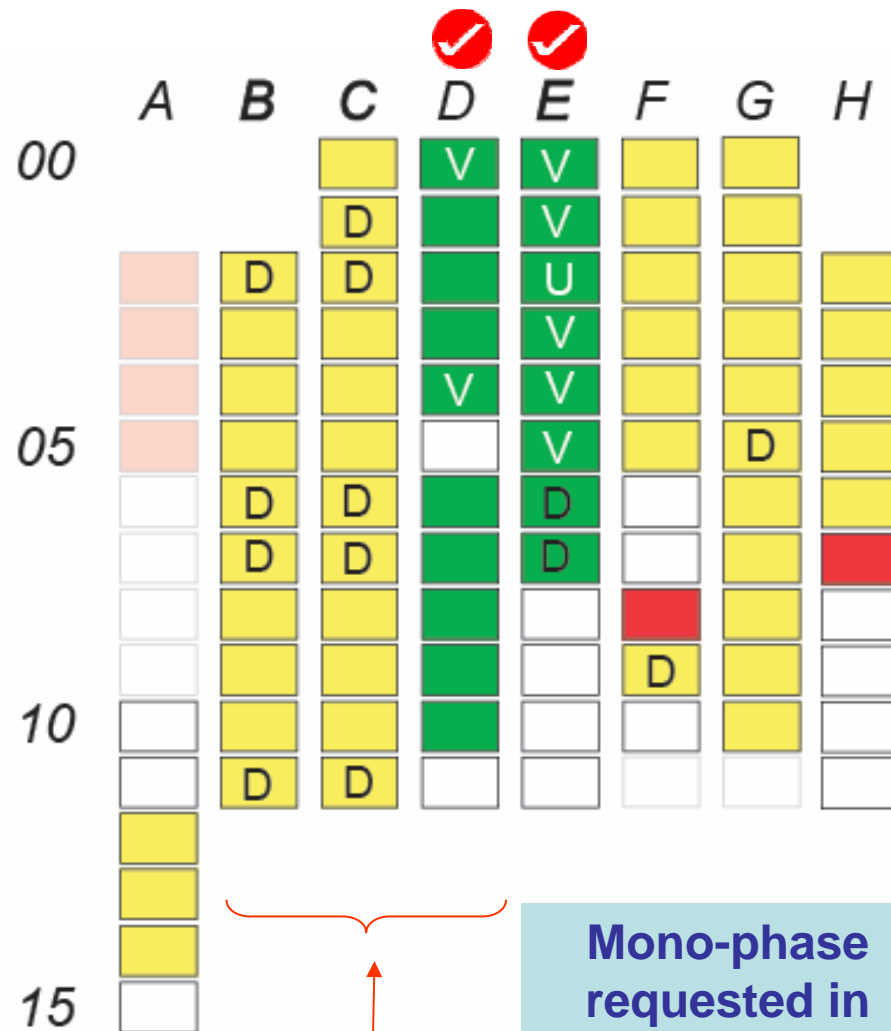
Criotec start 11th?

Hadrelec start 16 Oct



USC55 Rack Room

CMS Worksite – John Osborne



- USC55 S1 (-2) readiness**
- Priority rows
 - Rack ready
 - Empty rack (rack wizard)
 - Missing side plates etc.
 - Missing Turbine unit
 -
 -
- V = VME fibers deployed
 D = DAQ at least partially installed
 U = User moved in

DAQ racks already Installed

Mono-phase requested in Row E

Goal for next week: Install turbines in row C

40m in length
and 2
annexes to
be removed



After CMS underground, for environmental reasons the SX5 building will be lowered and reduced in length

Conclusions

- Building delivered very early for CMS pre-assembly and testing on-site.
- Even though civil engineering work was delayed due to geological problems, impact on overall schedule minimised.
- Co-ordination planning for follow-on activities should start as early as possible in the construction phase with 'intervention' windows included in the civil engineering planning.