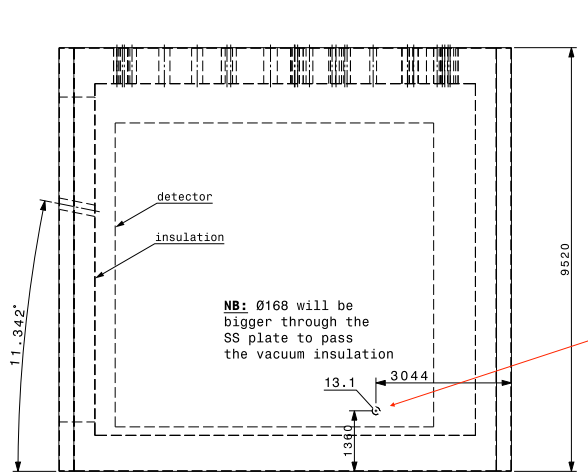
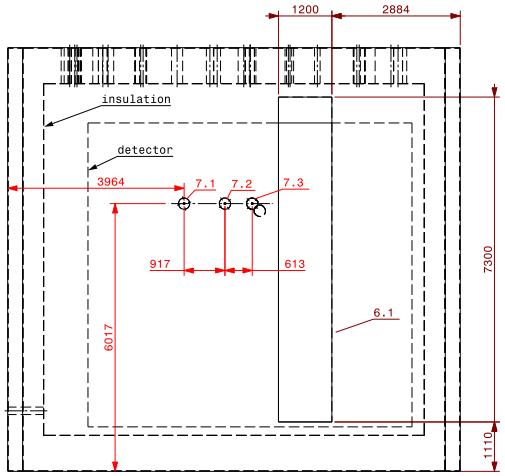
DM, May 2, 2016





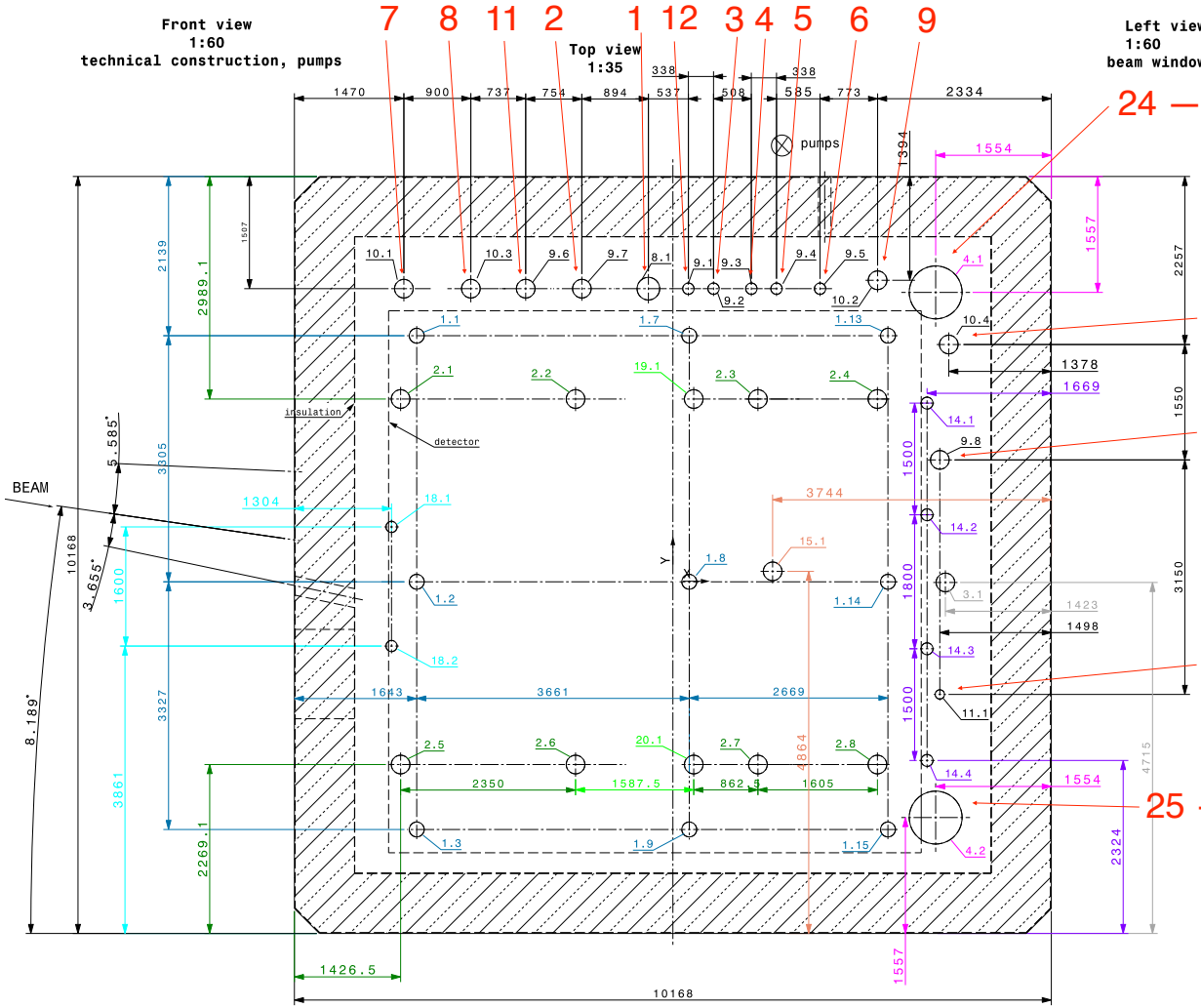
Detector penetrations

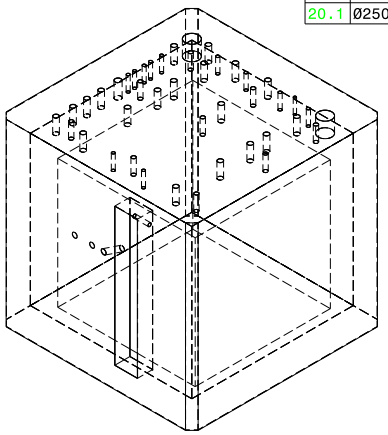
Pos.	Diameter [mm]	Description
1.1	Ø200	West transfer rail N support
1.2		West transfer rail Center support
1.3		West transfer rail S support
1.7		Center transfer rail N support
1.8		Center transfer rail Center support
1.9		Center transfer rail S support
1.13		East transfer rail N support
1.14		East transfer rail Center support
1.15		East transfer rail S support
2.1	Ø250	N Signal cable feed thru 1
2.2		N Signal cable feed thru 2
2.3		N Signal cable feed thru 3
2.4		N Signal cable feed thru 4
2.5		S Signal cable feed thru 1
2.6		S Signal cable feed thru 2
2.7		S Signal cable feed thru 3
2.8		S Signal cable feed thru 4
3.1	Ø250	High Voltage Feedthrough
4.1	Ø710	Manhole NE
4.2		Manhole SE
6.1	1200x7300mm	Temporary Construction Opening
7.1	Ø250	Beam Window
7.2		Beam Window
7.3		Beam Window
14.1	Ø160	Laser Port 1
14.2		Laser Port 2
14.3		Laser Port 3
14.4		Laser Port 4
15.1	Ø250	Calibration fibers
18.1	Ø150	Spare near CPA line West side
18.2		Spare near CPA line West side
19.1	Ø250	Spare on North APA signal cable port line
20.1	Ø250	Spare on South APA signal cable port line

Front view
1:60
technical construction, pumps

Top view
1:35

Left view
1:60
beam windows





Cryogenic penetrations

Pos.	Diameter [mm]	Description
8.1	Ø304	GAr Combo
~~9.1~~ 9.7	Ø152	LAr Cooldown
9.2		LAr Distribution
9.3		Lar to Cold Roof
9.4		LAr Cooldown to Condenser
9.5		Gar Boil Off
~~9.7~~ 9.1	Ø250	Spare
9.6		Spare
9.8		Spare
10.1	Ø250	Cryostat Pressure Relief 1
10.2		Cryostat Pressure Relief 2
10.3		Cryostat vacuum Relief 1
10.4		Cryostat vacuum Relief 2
11.1	Ø125	Instrumentation
13.1	Ø168 (See NB in Front view)	LAr Pump 1

24/25 150 mm OD Purity Monitors on 4.1 and 4.2

DUNE Cryostat
PROTODUNE PENETRATIONS
SCALE 1:1
DRAWN B. LACARELLE 2016-04-07
CONTROLLED
RELEASED
APPROVED
CAD Document Number ST0752304_02
REPLACES
NON VALABLE POUR EXECUTION
NOT VALID FOR EXECUTION
QAC -
CENDUNCR0078
SIZE 1
IND.