

Penetration in Cave

West Penetration

(Cryo)

Vapor return for QT transferline (0.5 inch SS/copper line with 0.5-1 inch foam)

QT transferline for LHe magnet filling (see QT step)

Main Flow (10 inch SS)

Separator Flow (25 mm flex hose with 1-2 inch foam)

LN2 fill (copper tubing with 5-6 inch foam)

He gas (1/8 hose HDPE for gas lines for backfilling fridge)

(Electrical)

Magnet power (two 14 mm cables) (66 ft from magnet to magnet power-supply on cryo-platform)

Internal magnet sensors

External magnet sensors TC lines (sixteen 1 mm cables) (highly length sensitive)

LHe level probe (one 7 mm cable)

LN2 level probe (one 7 mm cable)

Shim power (two 7 mm cable)

Top ceiling Penetration

Magnet boil off exhaust (25 mm flex hose with 0.5-1 inch foam) back to QT T-ed outside of cave to Quench relief outside of Hall

LN2 port exhaust (25 mm flex hose with 0.5-1 inch foam) should have a fan pulling vapor

East Penetration (less than 47ft from target to cryo-platform)

NMR lines <30 mm dim collection of multiple coax (highly length sensitive)

EIP cable 4 mm gore cable

Front Opening (remove one set of hand stacked shielding, shortest length is about 55ft from target to cryo-platform)

(Other)

Water lines for Microwave (two 3/8" SS tubing)

Pneumatic air lines (two 3/8" SS tubing)

(Cryo)

Manometer (25 mm flex hose with 1-2 inch foam)

(Electrical)

Annealing cables (one 7 mm cable)

Insert sensors (one 7 mm cable)

Fridge sensors (one 7 mm cable)

2 pressure sensors cabling (two 7 mm cable)

Microwave HV cables to PS (one 20 mm cable) Needs line conditioner

Microwave stepper controls (three 4 mm cable)

Actuator controls (two 7 mm cable)