Primary Beamline Radio-Activated Water (RAW) Peliminary Design Review

Raw Systems – General Overview

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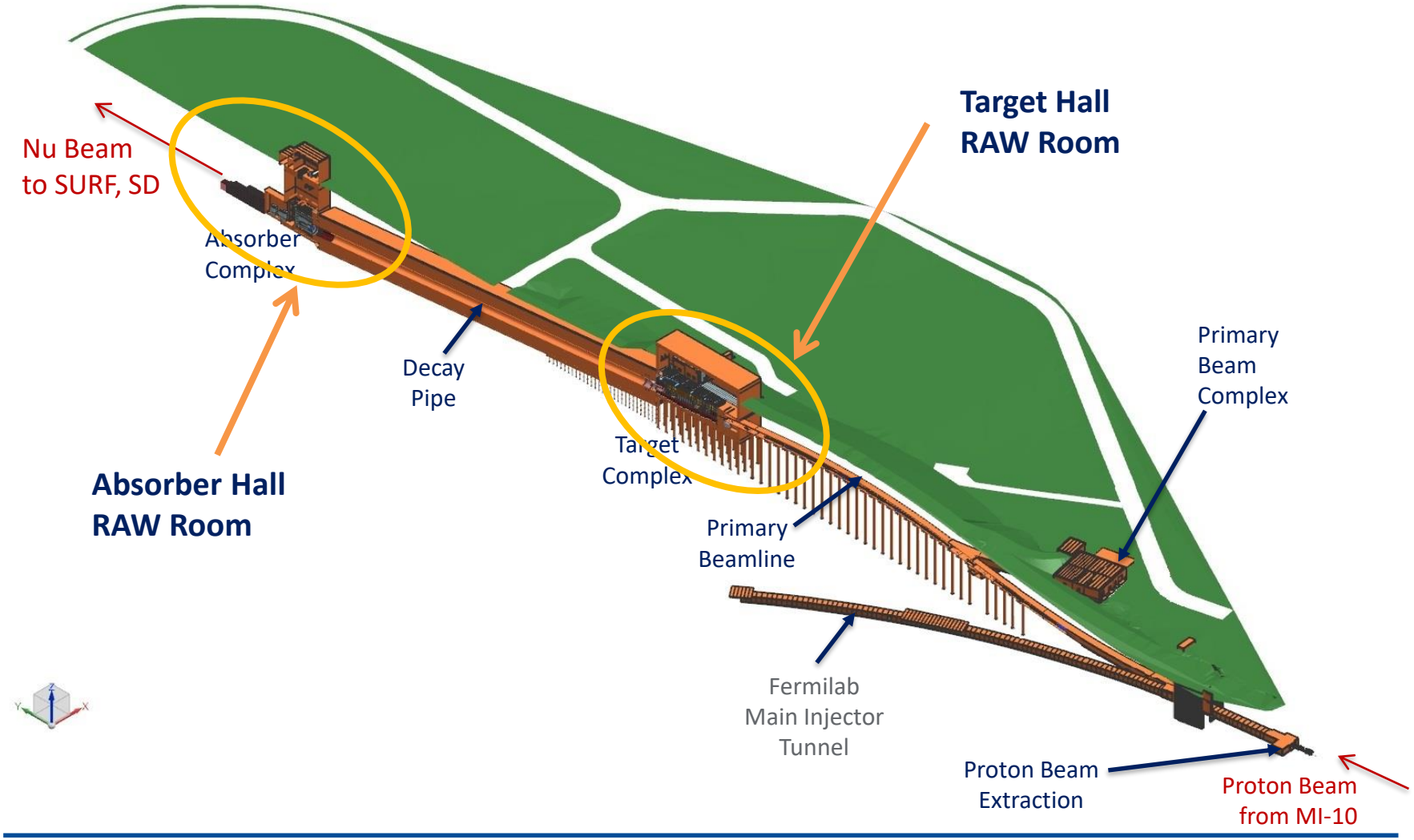
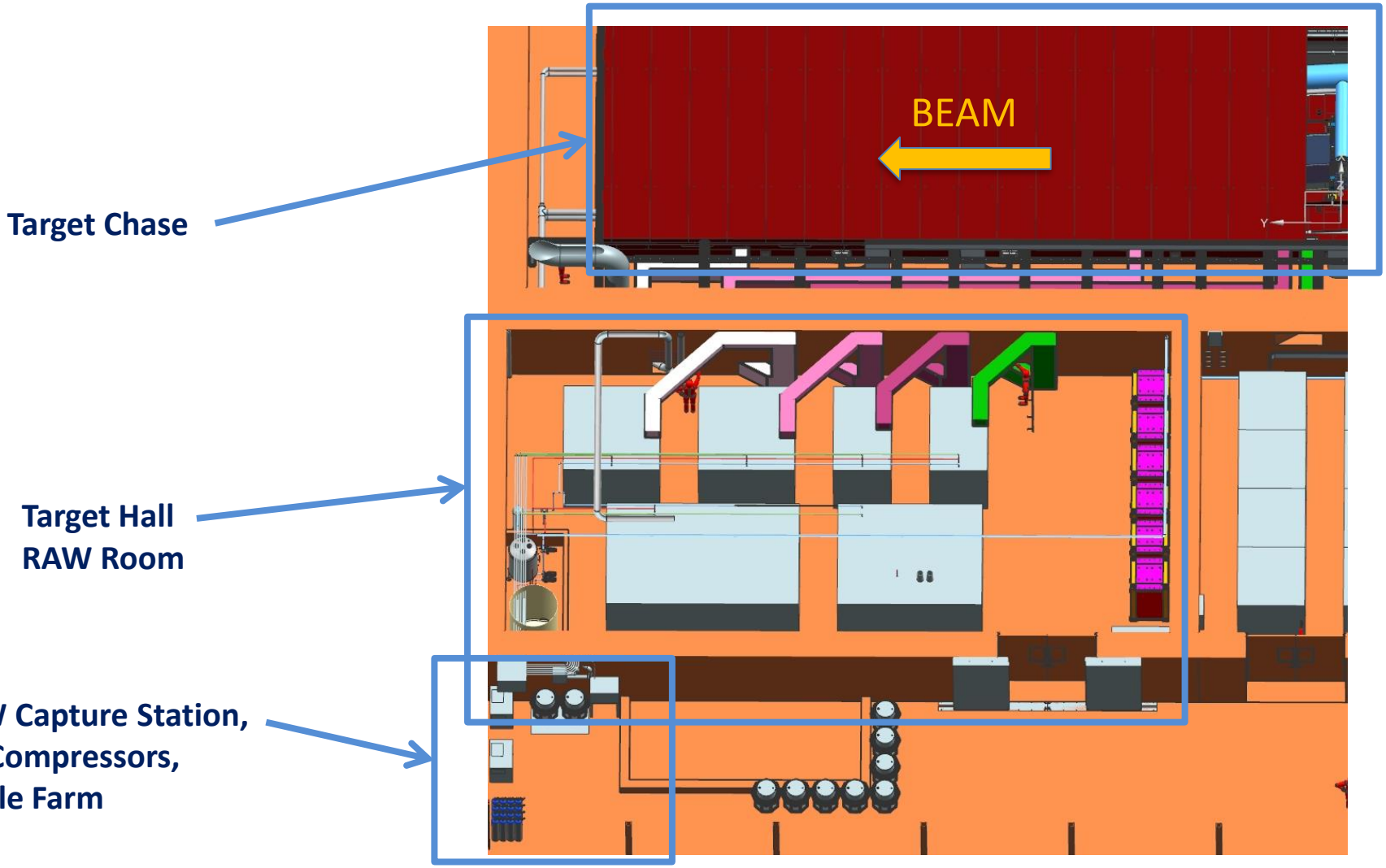
RAW System - Preliminary Design Review

ISO Section View of Near Site – MI-10 to LBNF-30 Absorber Complex



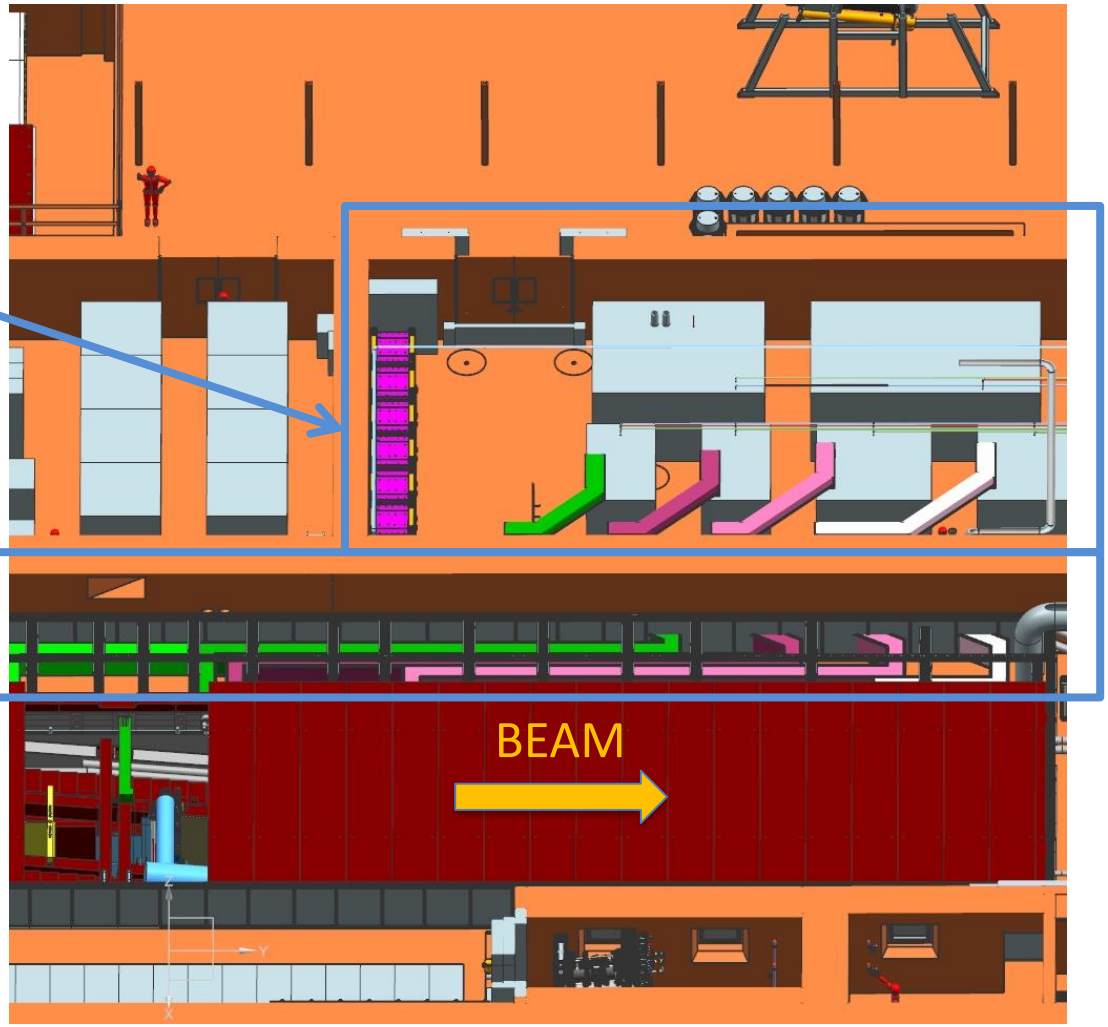
RAW System - Preliminary Design Review
Target Hall RAW Room Arrangement



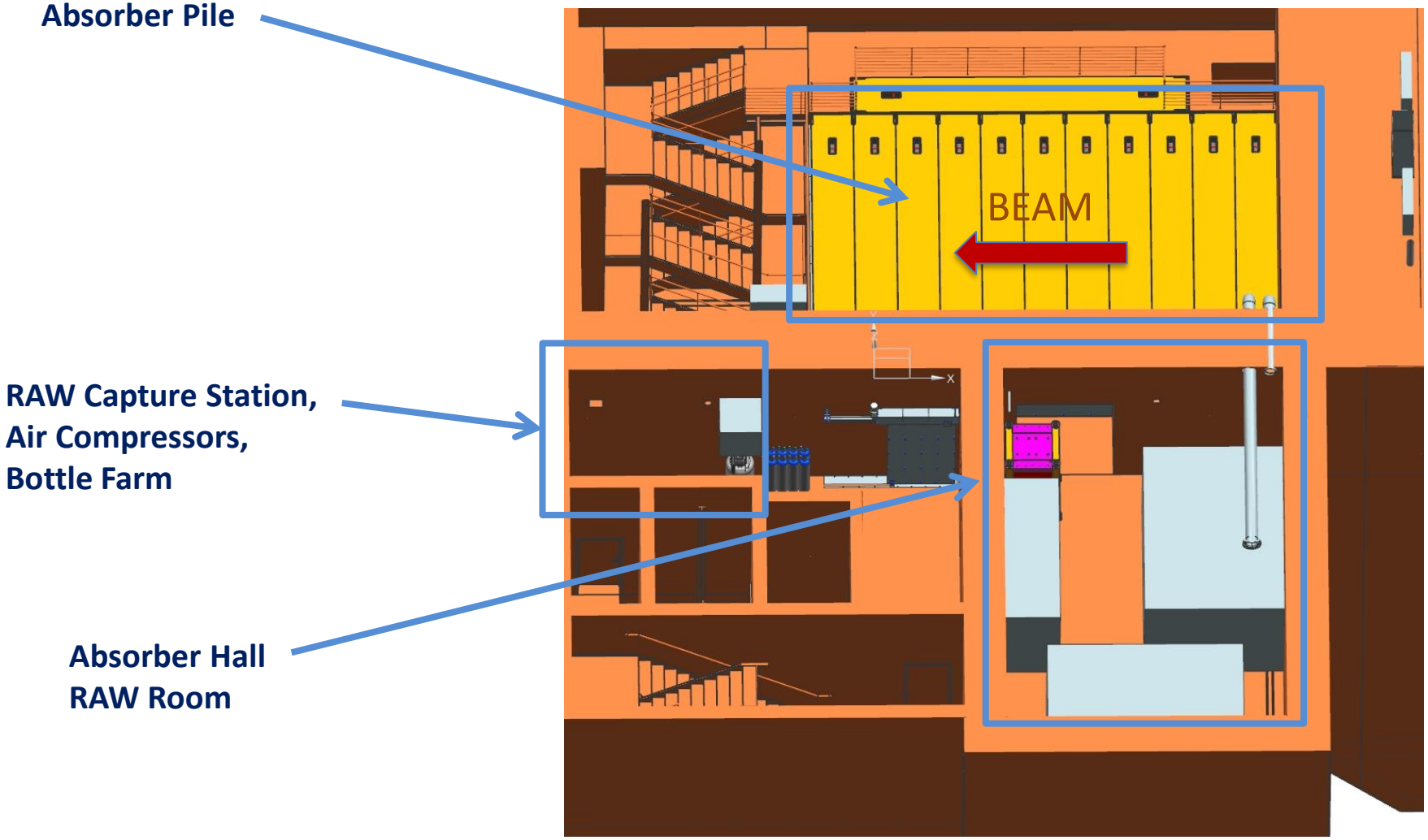
RAW System - Preliminary Design Review
Target Hall RAW Room Arrangement, cont.

Target Hall
RAW Room

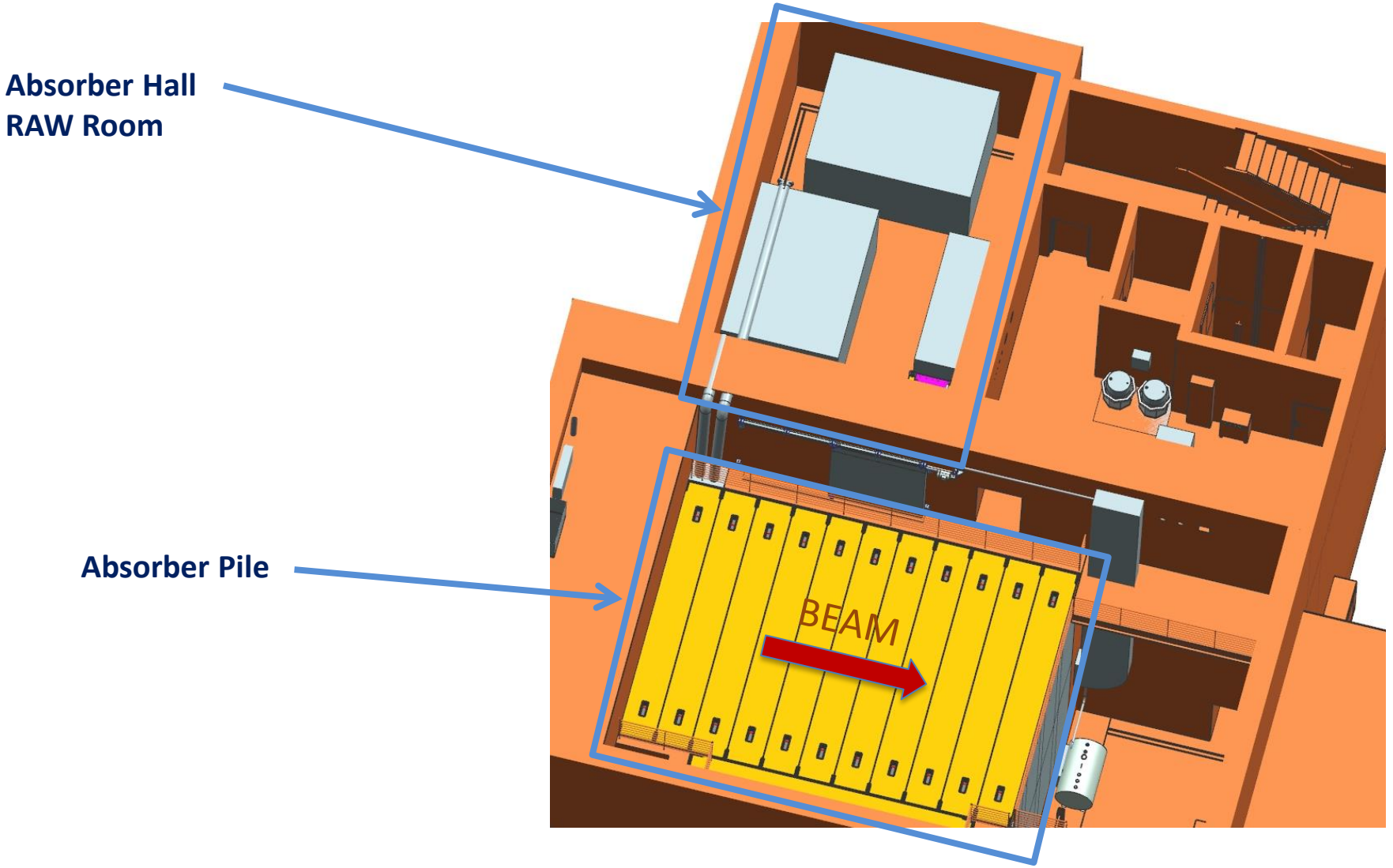
Piping Runs
between
RAW Room
and Chase



RAW System - Preliminary Design Review
Absorber Hall RAW Room Arrangement



RAW System - Preliminary Design Review
Absorber Hall RAW Room Arrangement, cont.



RAW System - Preliminary Design Review
Scope of Review

Review Emphasis:

The primary purpose of this review is technical in nature, to ensure the project is sufficiently mature to begin Final Design

RAW System - Preliminary Design Review
What Is RAW?

RAW

Radio-Activated Water

Water in a closed-loop system, regulating components in a radioactive environment, where the water will become activated due to direct or indirect exposure with beam and/or activated components

System is normally filled with deionized water, maintained at a high level of filtration, and DI status maintained if necessary, as it slowly becomes activated

RAW Systems - Preliminary Design Review
General Design Points

- Neutrino Beamline lattice is well established
- Components needing cooling are quite similar to those currently used in NuMI and MiniBooNE
- RAW System design will follow closely with proven systems already in use, I.E., MI and NuMI
- For both TH and AH, all RAW systems will have heat removed to the outside world via an Intermediate Cooling System (INTW), as a buffer between the RAW system and the outdoor chiller system (chiller system is part of NSCF)

RAW Systems - Preliminary Design Review
Preliminary Design Package

- The Preliminary Design package for each system includes the following (depending upon maturity):
  - System description & specifications
  - P&ID's and AFT Fathom system models
  - Preliminary Design Report
  - Integrated work with the Conventional Facilities (CF) and component stakeholders have tentative layouts and piping runs
  - BOM for major components, instrumentation, valves, controls

- Common Documents - Detailed Basis of Estimate (BOE), Gandtt Chart for schedule, Minimum Pipe Size by code

RAW Systems - Preliminary Design Review
System Maturity

- Design work at this stage is building off the Conceptual Design work as recorded over the past 10 years
- Designed for 2.4MW beam, some systems can have VE for smaller heat exchangers and/or pumps at 1.2MW beam
- RAW system preliminary design work at this stage is still in progress
- Largest Issue in Final Design:
  Keeping up with design changes as component designs mature

RAW Systems - Preliminary Design Review
System Maturity, cont.

- Confidence of maturity of beamline component design is:
  - Excellent –
    - TH & AH RAW Exchange Systems
  - Very Good –
    - Shielding RAW
    - Absorber RAW
    - Absorber Intermediate
  - Reasonable –
    - Target RAW
    - Horn A RAW
  - Low –
    - Horns B & C RAW
    - H+OH Mediation System

RAW System - Preliminary Design Review
Review Committee Charge