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National Synchrotron Light Source II, Brookhaven National Laboratory			
Doc No. PS-C-XFD-PRC-055	Author: M. Benmerrouche	Effective Date: 29Feb2016	Version 1
Title: Beamline AMX/FMX (17-ID) Radiation Survey Plan			

Approved by:

2/26/2016

X 

Mo Benmerrouche
Physicist - Radiation Safety
Signed by: Benmerrouche, Mohamed

3/1/2016

X Lori Stiegler for

Robert Lee
ESH Manager
Signed by: Stiegler, Lori

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X John Aloï

John Aloï
Facility Support Representative
Signed by: Aloï Jr, John

2/28/2016

X 

Dieter Schneider
AMX Lead Beamline Scientist
Signed by: Schneider, Dieter

2/29/2016

X 

Martin Fuchs
FMX Lead Beamline Scientist
Signed by: Fuchs, Martin

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VERSION HISTORY LOG

VERSION	DESCRIPTION	DATE
1	First Issue.	29Feb2016

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Beamline AMX/FMX (17-ID, IVU 21) Comprehensive Commissioning Radiation Survey Plan

Date: _____

Before Survey Begins:

- Authorization/approval from the NSLS-II Director to initiate commissioning of the beamline has been received.
- A Beamline System Readiness Checklist has been completed in accordance with PS-C-XFD-PRC-003, *Enabling Beamlines for Operations*.
- The area(s) around the beamline are posted in accordance with SBMS Program Description: *Radiological Control Manual*.
- All shutters closed.
- Front end slits wide open (near maximum extent range).
Note: If FE slits cannot be wide open, record the FE slits parameter here: _____
- ID gap closed to minimum gap after first step of GB radiation survey.
Note: If ID cannot be closed to minimum gap, record the gap value here: _____
- All beamline slits fully open.
- Monochromator Bragg angle moved to the lower limit (~0 degree)

During Survey:

- Authorized Beamline Staff ensure that photon beam is where it should be using the appropriate diagnostic tools.
- Authorized Beamline Staff ensure that the Front End Shutter remains open.
- If at any point during performance of this plan a radiation dose rate of 5 mrem/hr or higher on contact is identified, the radiation survey shall be terminated and the cause investigated, and any hazards shall be mitigated before continuing.
- The step sequences of this procedure can be changed.
- This document, with the filled information from the measurements, will act as the "beamline radiation survey interim report," which shall be submitted to the PSD Director and the ESH Manager for review after the survey.
- Minor deviations from the procedure are allowed in the field, however the discrepancy shall be documented in this procedure and submitted to the PSD Director and the ESH Manager for review after the survey.
- During surveys performed in top-off mode, top-off will be adjusted for more frequent injections to keep the stored beam current within the allowable specifications.

Warning: Execution of this Comprehensive Commissioning Radiation Survey Plan, along with the evaluation of the data collected, may only be used as a basis by the PSD Director and the ESH Manager to approve commissioning activities at an electron beam current of up to 3 times the electron beam current measured during this survey. Approval of commissioning of the beamline at a higher electron beam current requires re-execution of this Comprehensive Commissioning Radiation Survey Plan.

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Initial Settings:

ID gap (AMX IVU, FMX IVU): _____

Electron Beam Current: _____ Straight Section Vacuum Condition: _____

BTS Injection Rate: _____ BTS Injection Efficiency: _____

AMX DCM settings: _____ AMX TDM settings: _____

FMX DCM settings: _____ FMX HFM settings: _____

Survey start date and time: _____

Authorized Beamline Staff & Radiological Control Technicians (RCTs): _____

Additional information if available: _____

The following scenarios are covered:

- I. **17 ID-A integrity:** GB/White beam on AMX/FMX White Beam Slits, AMX/FMX Monochromators, and beam stop, Monochromatic beam on AMX TDM and FMX HFM, AMX/FMX Photon Shutters, and FMX Pipe Junction Box.
- II. **17 ID-B integrity:** AMX Monochromatic beam on Mono beam stop, KB Mirror systems, and target(s) (Al or Si).
- III. **17ID-C:** FMX monochromatic beam on beam stop, FMX Secondary Source Aperture, and FMX KB mirror systems and target(s) (Al or Si)

Note: The transport pipe integrity check is included in this survey plan.

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Survey Conditions

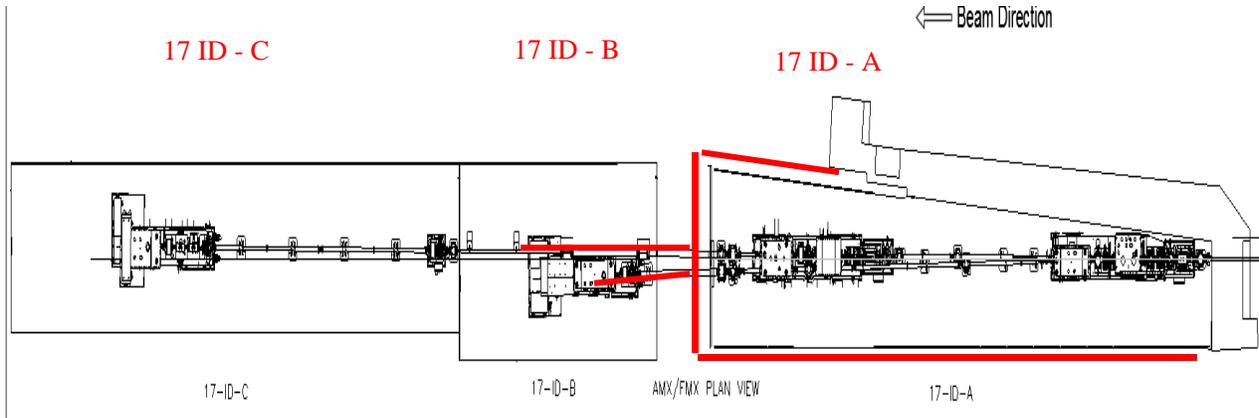
HOLD POINT: Evaluate and ensure that all applicable controls listed in the Commissioning Safety Approval Form are in place, including LOTO requirements for the beamline photon shutters (in accordance with PS-C-XFD-PRC-024, *Beamline Photon Shutter Centrally Controlled Lockout/Tagout Procedure*).

HOLD POINT: Before opening safety shutters in the front end, survey upstream wall of FOE to make sure no radiation comes through.

Note: Detailed diagrams of 17-IA-A, B and C are included in Attachment A.

I: Check the integrity of FOE (17-ID-A), transport pipe, and AMX/FMX PSH.

- 1. GB radiation survey: Gap open, FE slits wide open, GB on the white beam stops (WBS), survey all walls and roof of 17-ID-A, and downstream pipe behind downstream wall of 17-ID-A enclosure.**



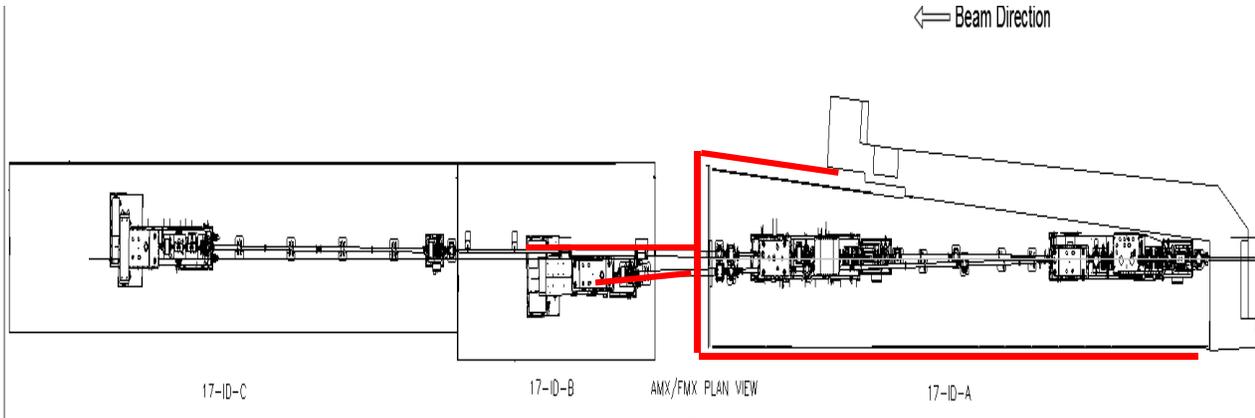
ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

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2. GB radiation survey: Gap open, FE slits wide open, close AMX White Beam Slits and FMX White Beam Slits², survey all walls and roof of 17-ID-A, and the downstream beam pipes. Open White Beam Slits after the survey.



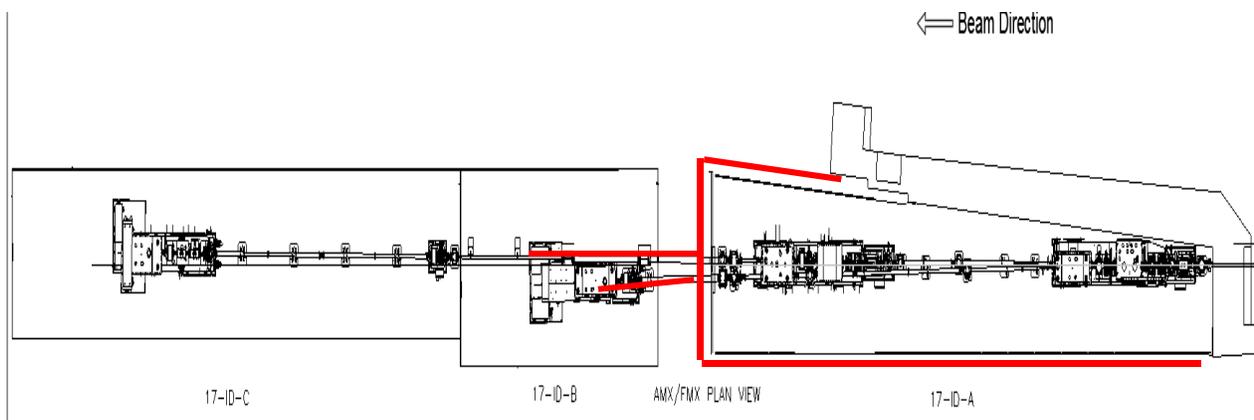
ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

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3. **Close gap, Monochromator Bragg angle moved to the lower limit (~0 degree), AMX and FMX White Beam Slits fully open, white beam on the white beam stop, survey all walls and roof of 17-ID-A, and the downstream beam pipes.**



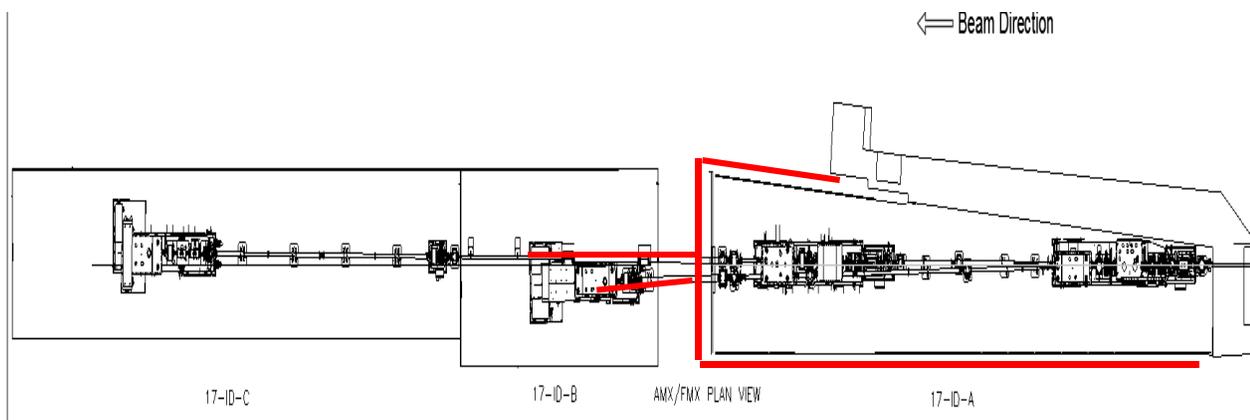
ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

Signature (ESH) _____ ***Signature (Beamline)*** _____

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4. Gap closed, Insert AMX DCM and FMX DCM into beam, set AMX and FMX to standard working range (~12 KeV), adjust AMX TDM and FMX HFM so Monochromatic beam is on AMX PSH and FMX PSH, survey all walls and roof of 17-ID-A, and the downstream beam pipes.



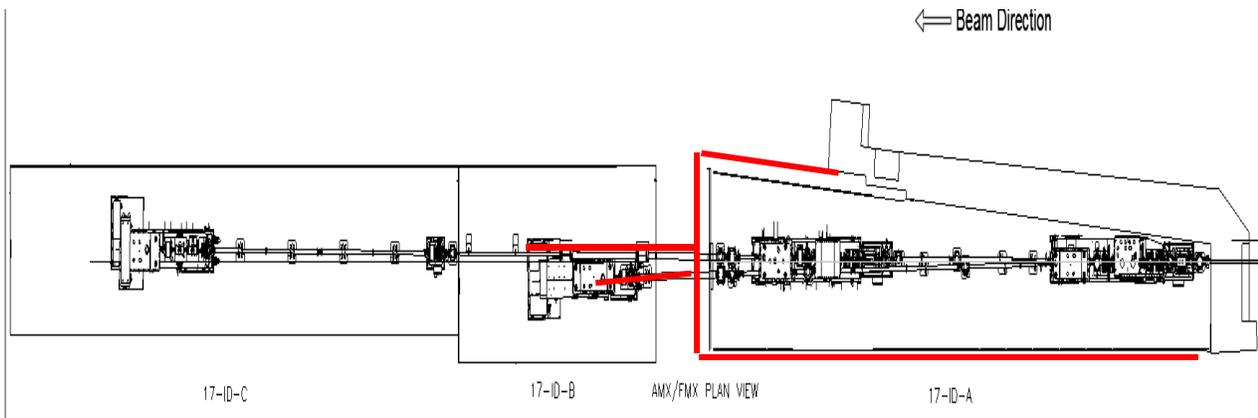
ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

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5. Gap closed, Move AMX White Beam Slits and FMX White Beam Slits to fully intercept white beam, survey all walls and roof of hutch 17-ID-A. Reset the White Beam Slits to their normal configuration.



ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

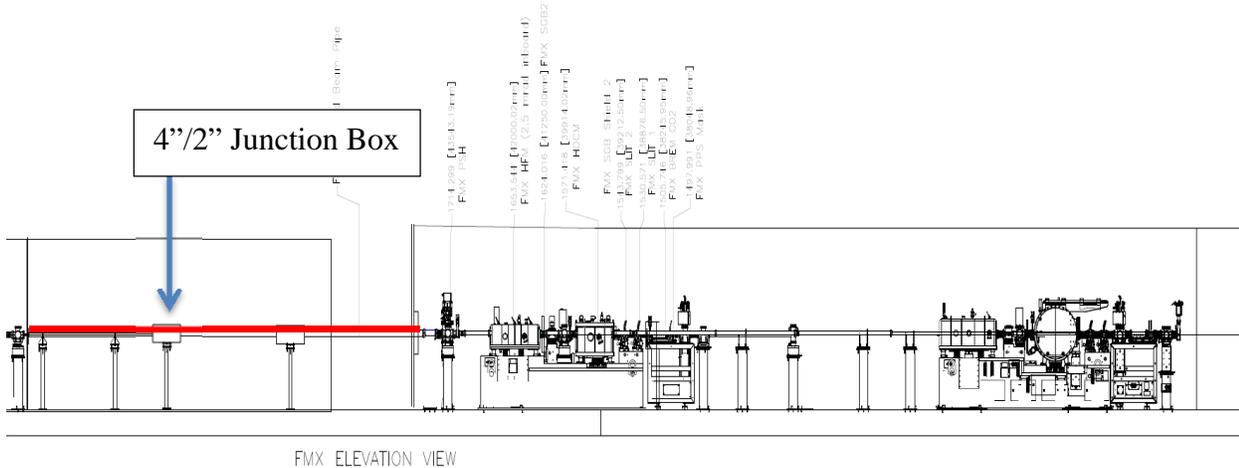
Signature (ESH) _____ ***Signature (Beamline)*** _____

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6. Gap closed, Open FMX PSH, move HFM out of the monochromatic beam, allow monochromatic beam to strike the junction box used to transition from the 4" pipe to 2" pipe. Survey the transport pipe between 17-ID-A and 17-ID-B and in vicinity of the Junction Box.

Note: Access to 17-ID-B is required and therefore AMX PSH shall remain closed.



ID Gap: _____
Straight Section Vacuum Conditions: _____
Radiation Survey Results _____
Additional information/comments:

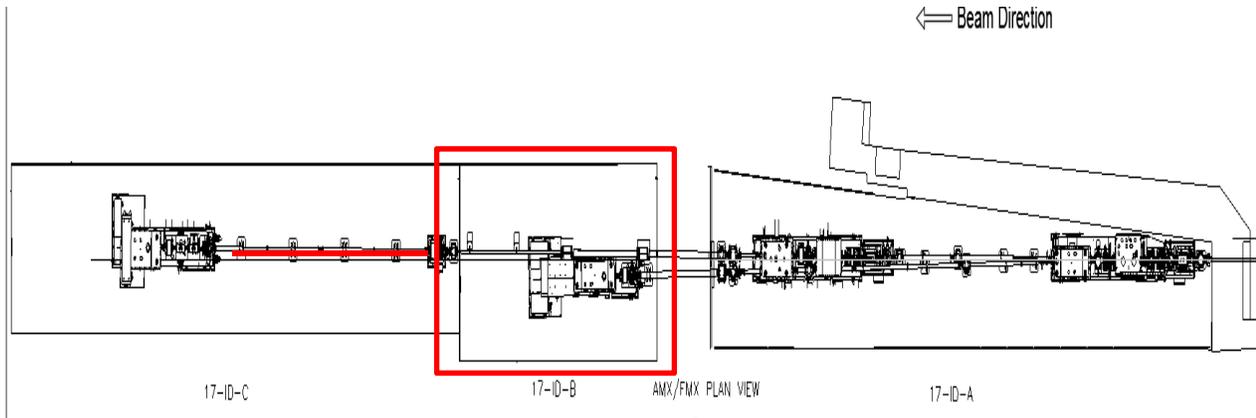
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II: Check the integrity of 17-ID-B and transport pipe.

7. Gap closed, Open AMX PSH, Insert AMX KB mirrors, survey all walls and roof of hutch 17-ID-B along with downstream beam pipes inside hutch 17-ID-C.



ID Gap: _____

Radiation Survey Results _____

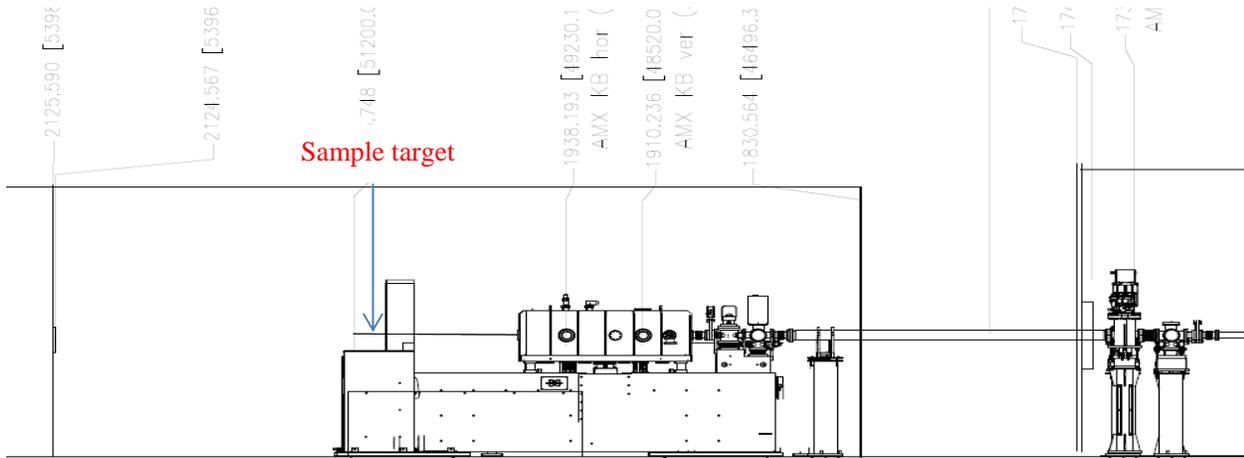
Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

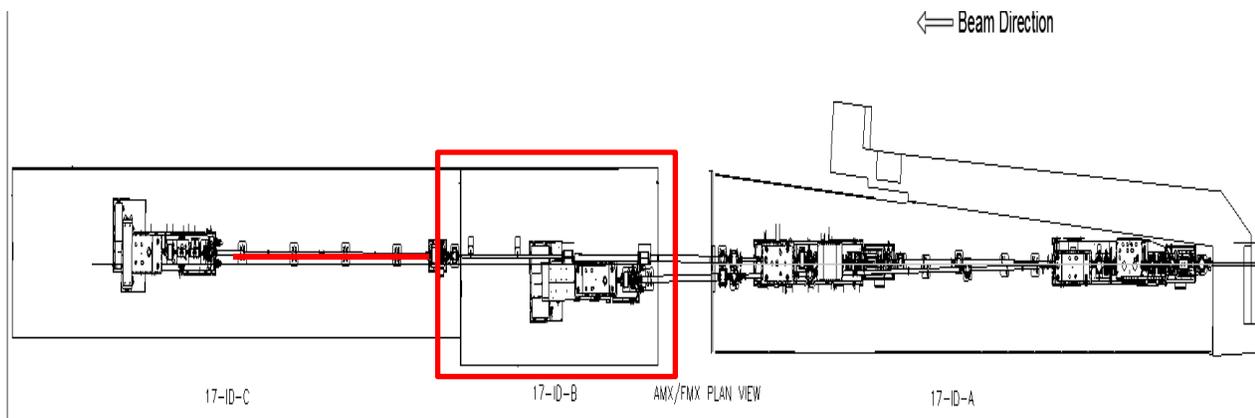
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8. Gap closed, Insert sample target in 17-ID-B at sample location. Survey 17-ID-B walls and roof.



AMX ELEVATION VIEW



ID Gap: _____

Radiation Survey Results _____

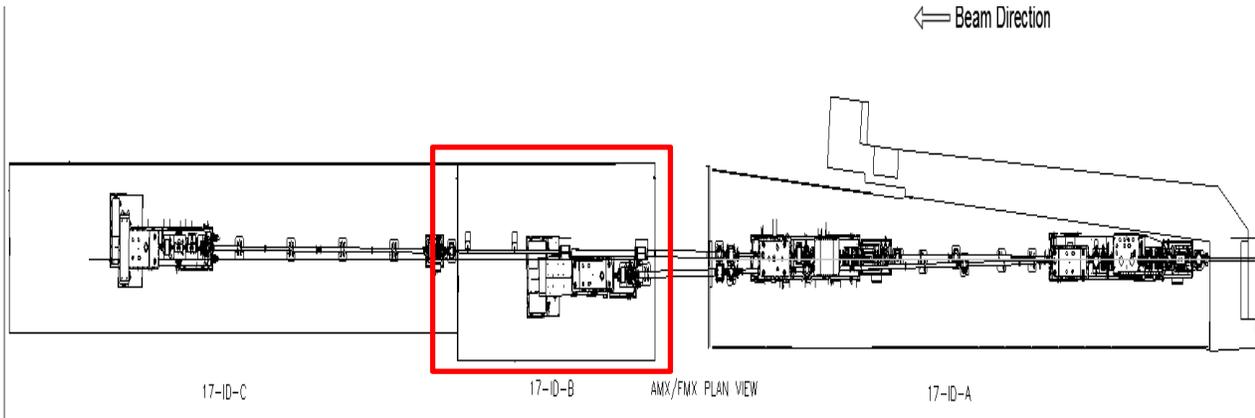
Additional information/comments:

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9. Gap closed, Allow beam to hit monobeam stop near the downstream wall of 17-ID-B. Survey 17-ID-B walls and roof.



ID Gap: _____

Radiation Survey Results _____

Additional information/comments:

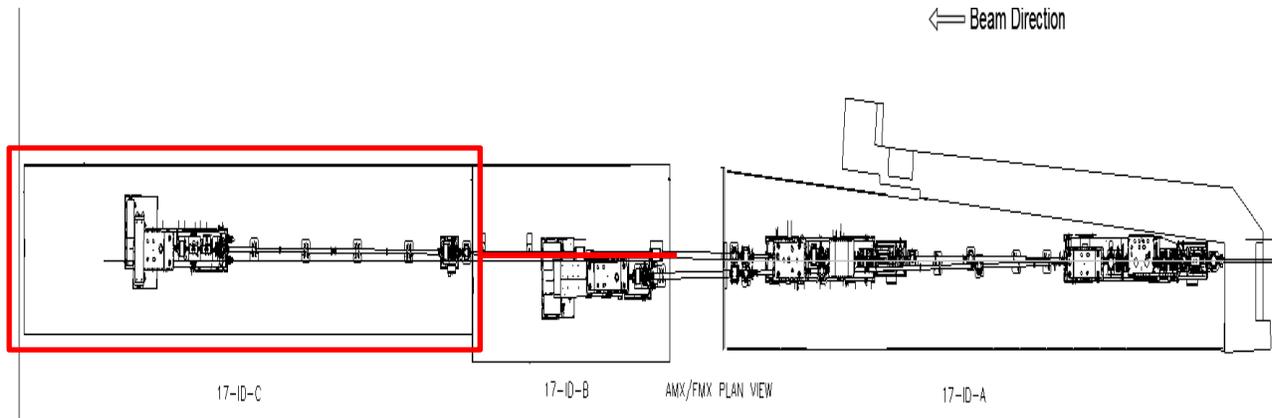
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III. Check the integrity of 17-ID-C.

10. Gap closed, Open FMX PSH and Allow beam to strike Secondary source aperture. Survey near the transport pipe and 17-ID-C walls and roof.



ID Gap: _____

Radiation Survey Results _____

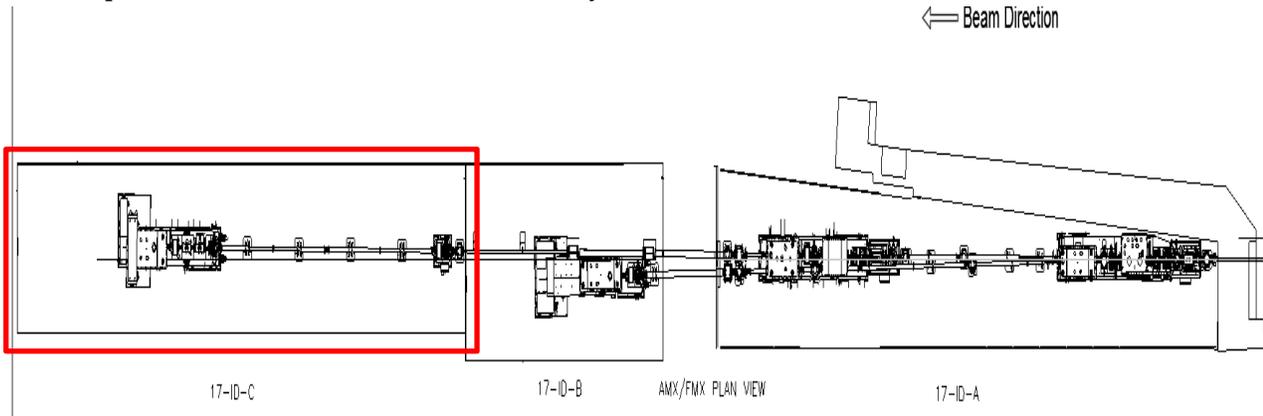
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11. Gap closed, Insert FMX KB mirrors, survey all walls and roof of hutch 17-ID-C.



ID Gap: _____

Radiation Survey Results _____

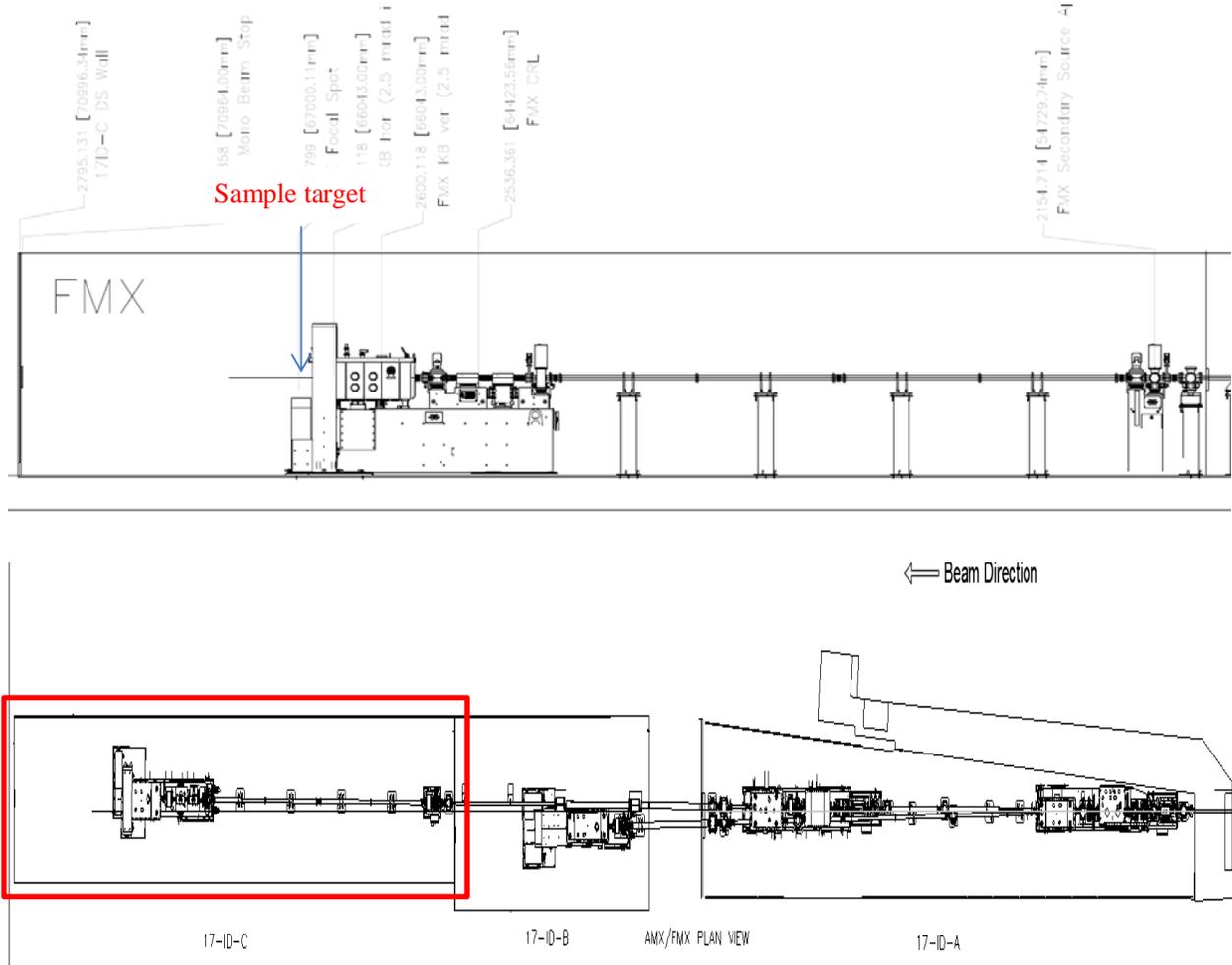
Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

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12. Gap closed, Insert sample target in 17-ID-C at sample location. Survey 17-ID-C walls and roof.



ID Gap: _____

Radiation Survey Results _____

Additional information/comments:

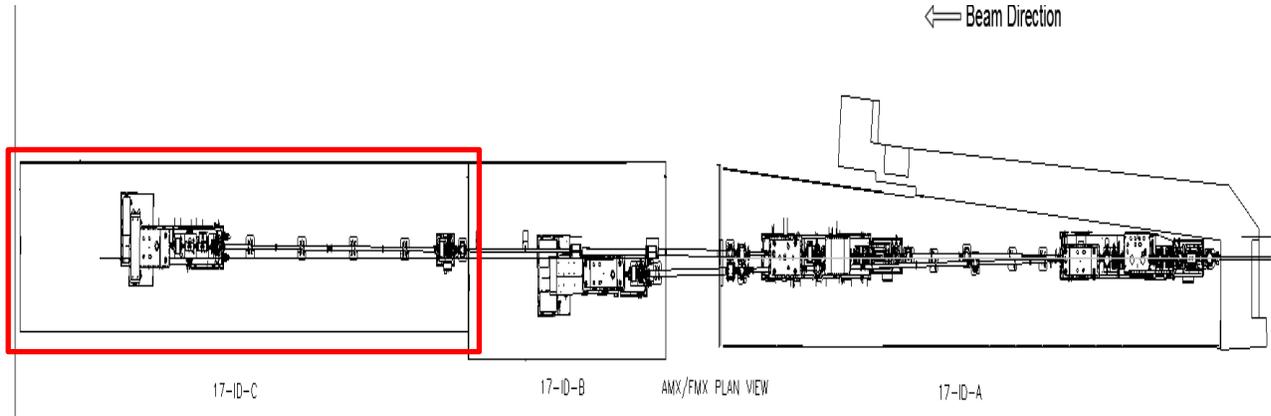
Signature (ESH) _____

Signature (Beamline) _____

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13. Gap closed, Allow beam to hit monobeam stop near the downstream wall of 17-ID-C. Survey 17-ID-C walls and roof.



ID Gap: _____

Radiation Survey Results _____

Additional information/comments:

Signature (ESH) _____ **Signature (Beamline)** _____

Survey end date and time: _____

Additional attachment, information or comments:

Signature (ESH) _____ **Signature (Beamline)** _____

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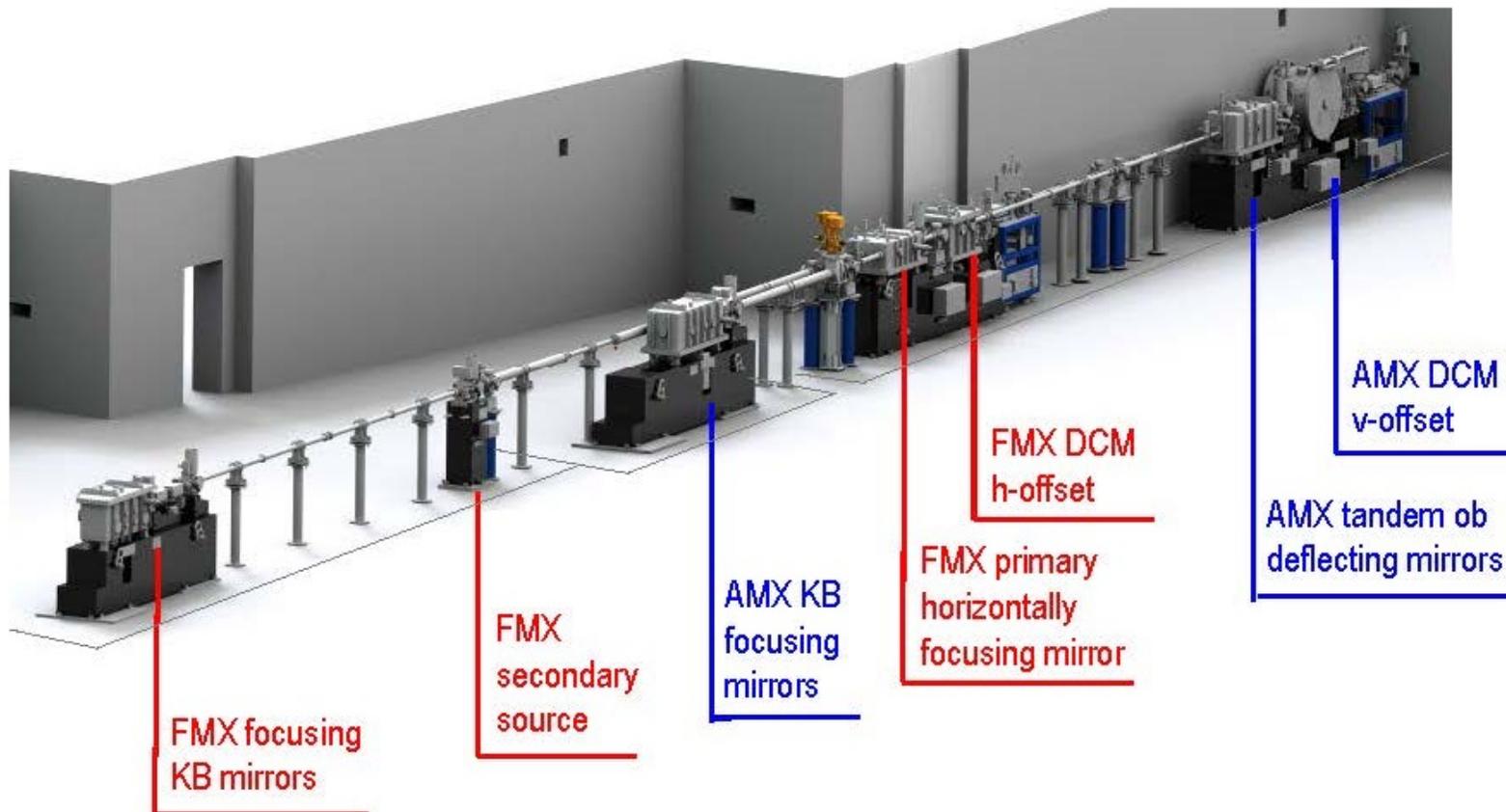
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Attachment A – 17-ID Enclosure Diagrams

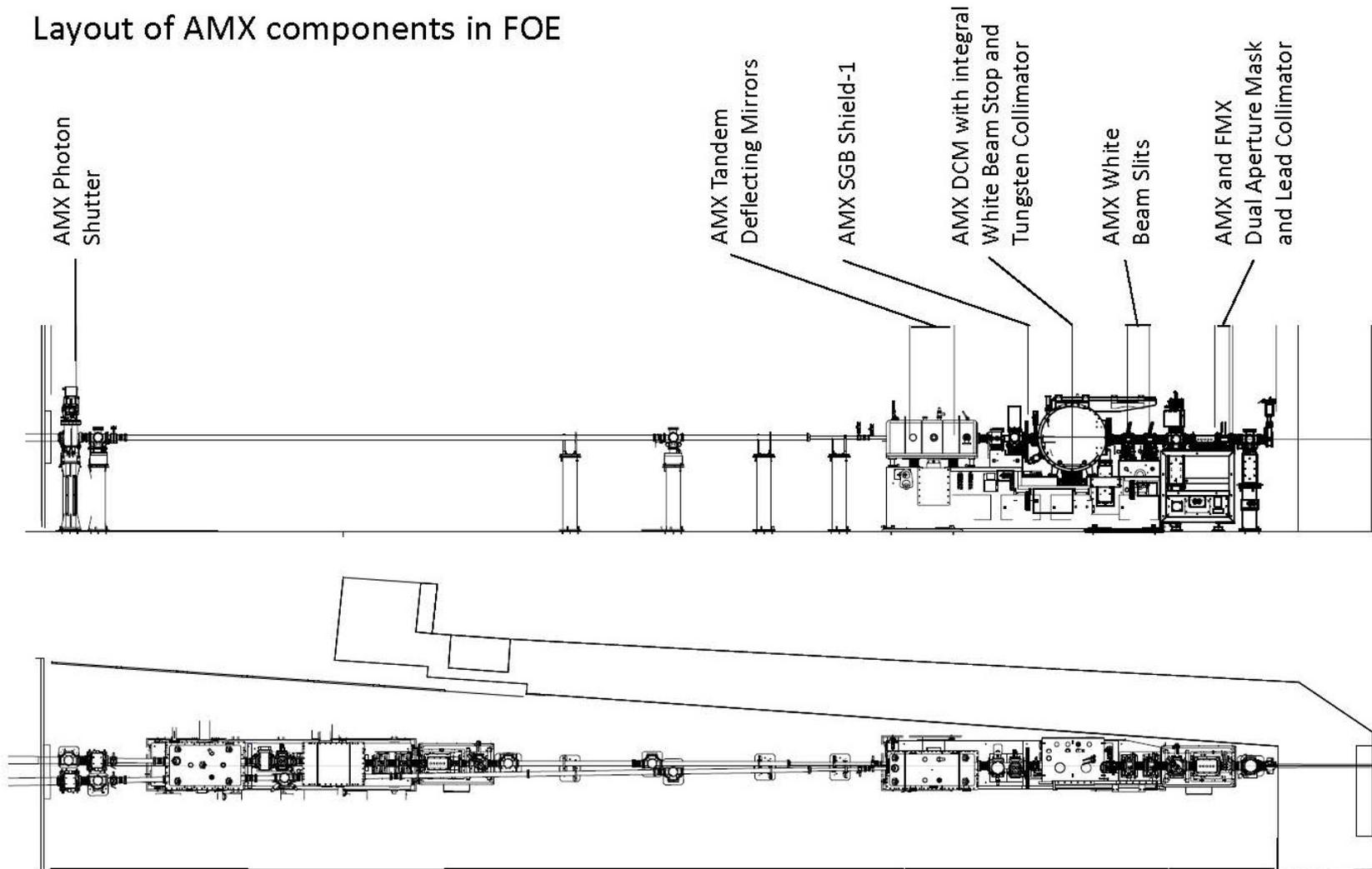
Layout of the AMX and FMX beamlines in sector 17-ID



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Layout of AMX components in FOE



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