

# Overview of APS-U Beamline Installation Schedule and Review of Recent Activity



**Robert P. Winarski**

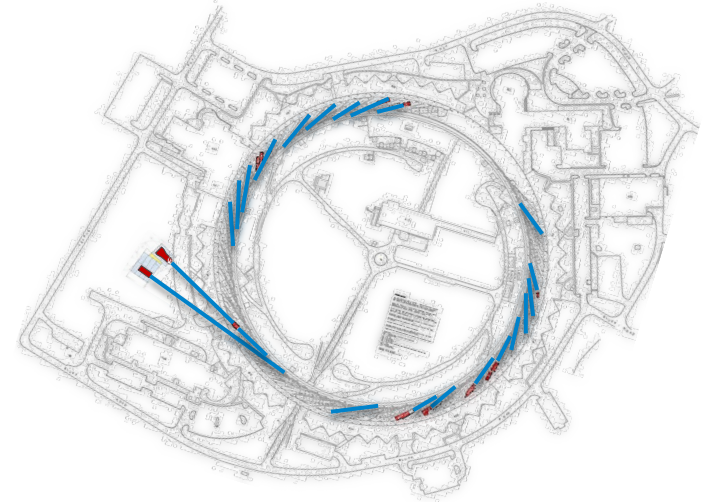
APS-U Beamline Installation Coordinator  
Argonne National Laboratory

APSUO/PUC Meeting

July 27, 2022

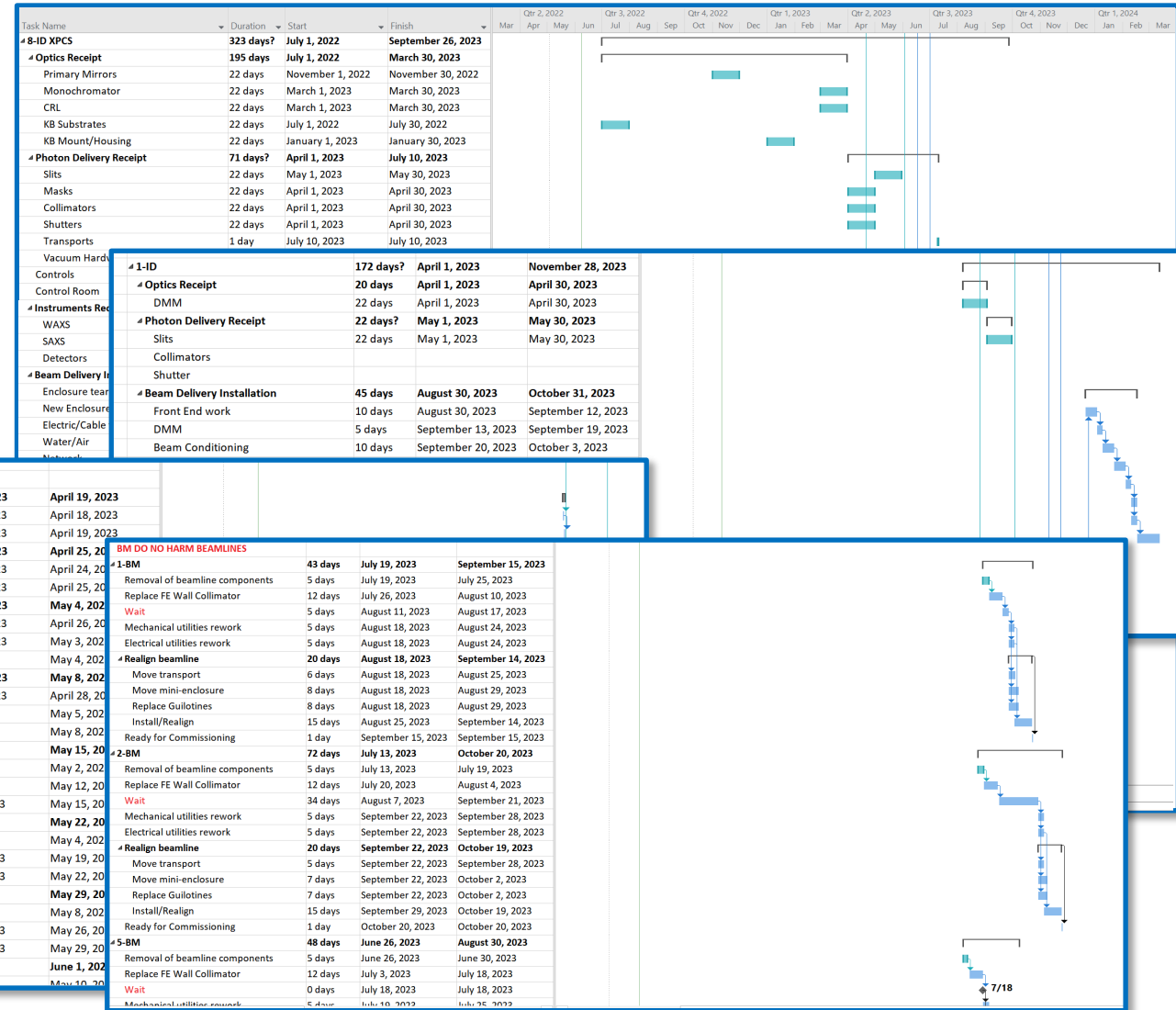
# Beamline Installation Scope

- Major installations (Feature Beamline and Major Enhancements) at 14 beamlines (13 currently operating)
  - Shielded enclosure contract includes:
    - Installation, modification and removal of shielded stations
    - Electrical, lighting, cable trays, PSS wiring
  - Contract work (BPA) to prepare sectors for construction and utility reconnection:
    - Disconnect and reconnect electrical, piping, network, cable trays
  - Installation of beamline optics, components, instruments
- Minor enhancement installations (optics, instruments) at 8 other beamlines (APS and CATs)
- New wall collimators and front-end exit tables for almost every ID beamline (BPA)
- Realignment of BM beamlines



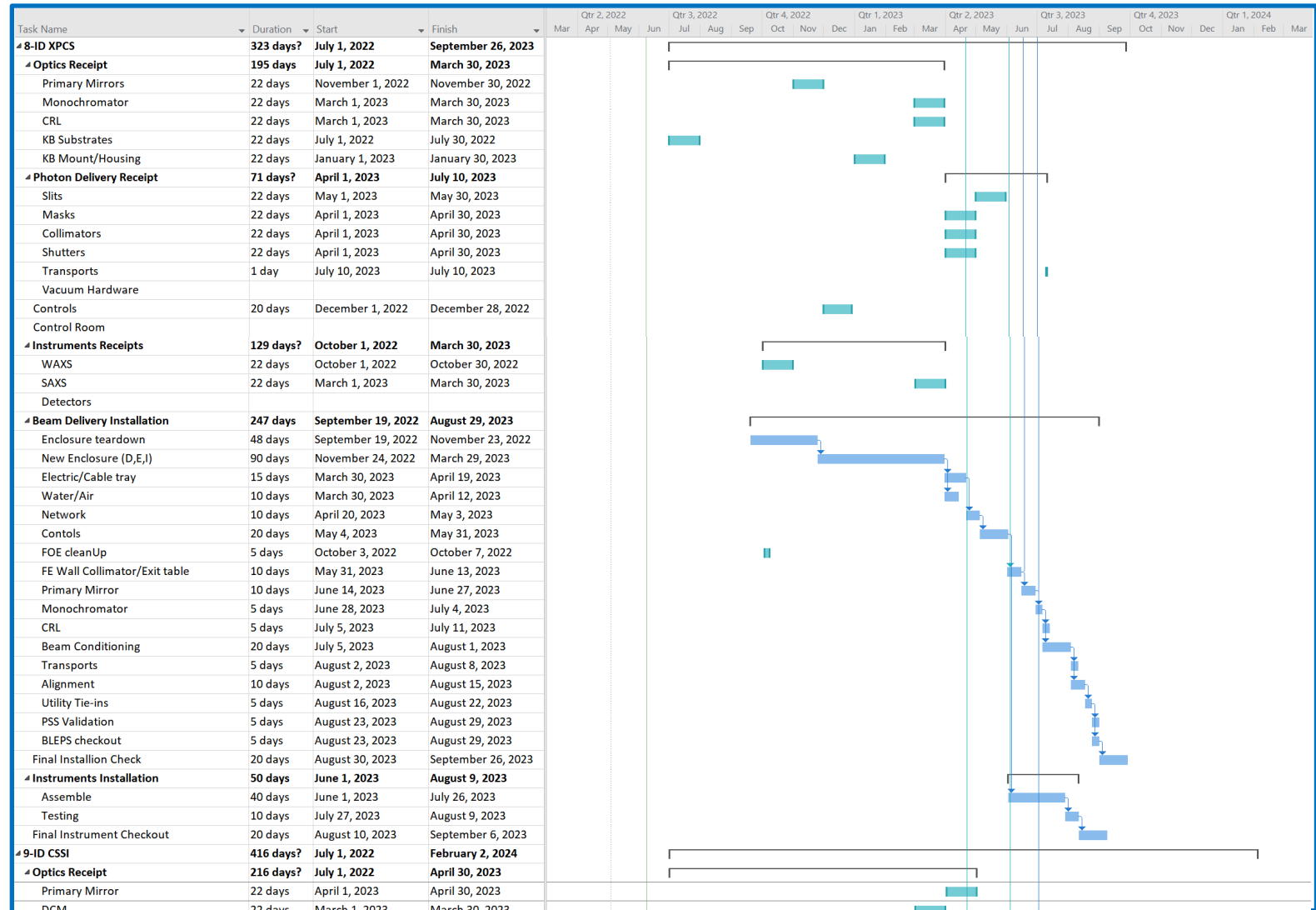
# Projected Schedule for ID and BM Beamlines

- Schedules for ID installations designed around shielded enclosure installation (component delivery) dates from vendors
- ID front-end and BM work based on dark time schedule



# Feature Beamlines and Major Enhancements

- Schedules reflect construction activities, infrastructure buildouts, beamline installation, safety systems, and final installation checks
- Not detailed are pre-construction removal activities (about two months prior), standard beamline commissioning activities
- All work utilizes e-traveler and CDB systems





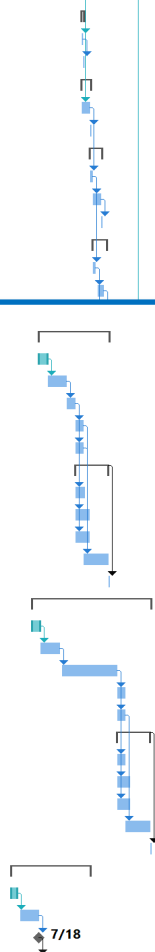


# ID and BM Schedules

- Coordination with beamline staff
- Access to FOEs requires removal of beamline components
- Scope of work has been identified
- Work handled through BPA and APS-U techs

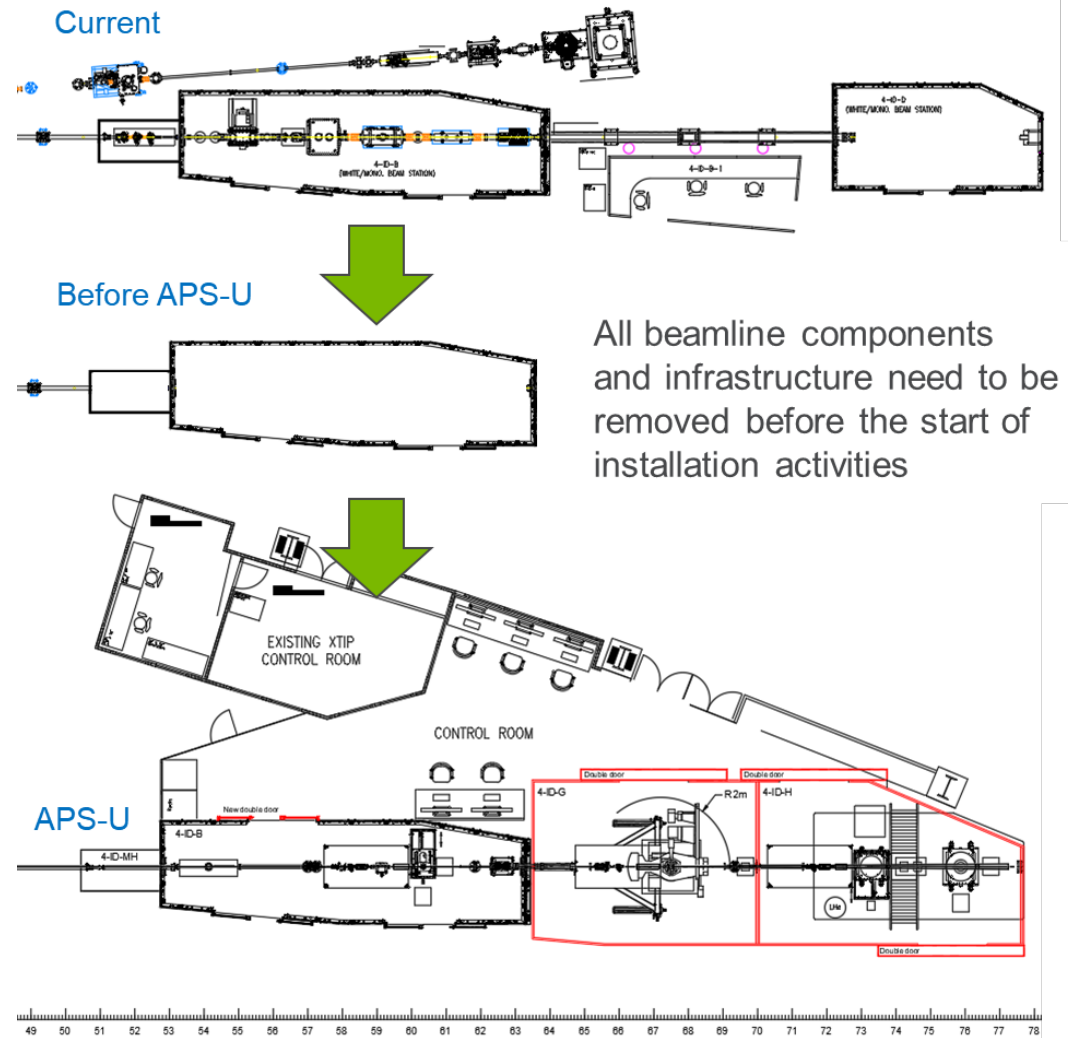
DO NO HARM BEAMLINES				
<b>27-ID</b>	<b>2 days</b>	<b>April 18, 2023</b>	<b>April 19, 2023</b>	
checkout	1 day	April 18, 2023	April 18, 2023	
Ready for Commissioning	1 day	April 19, 2023	April 19, 2023	
<b>25-ID</b>	<b>6 days</b>	<b>April 18, 2023</b>	<b>April 25, 2023</b>	
Realign Cant and checkout	5 days	April 18, 2023	April 24, 2023	
Ready for Commissioning	1 day	April 25, 2023	April 25, 2023	
<b>13-ID GSECCARS</b>	<b>8 days</b>	<b>April 25, 2023</b>	<b>May 4, 2023</b>	
Swap FE exit table	2 days	April 25, 2023	April 26, 2023	
Realign Cant and checkout	5 days	April 27, 2023	May 3, 2023	
Ready for Commissioning	1 day	May 4, 2023	May 4, 2023	
<b>16-ID HP</b>	<b>8 days</b>	<b>April 27, 2023</b>	<b>May 8, 2023</b>	
Swap FE exit table	2 days	April 27, 2023	April 28, 2023	
Realign Cant and checkout	5 days	May 1, 2023	May 5, 2023	

BM DO NO HARM BEAMLINES				
<b>1-BM</b>	<b>43 days</b>	<b>July 19, 2023</b>	<b>September 15, 2023</b>	
Removal of beamline components	5 days	July 19, 2023	July 25, 2023	
Replace FE Wall Collimator	12 days	July 26, 2023	August 10, 2023	
Wait	5 days	August 11, 2023	August 17, 2023	
Mechanical utilities rework	5 days	August 18, 2023	August 24, 2023	
Electrical utilities rework	5 days	August 18, 2023	August 24, 2023	
<b>Realign beamline</b>	<b>20 days</b>	<b>August 18, 2023</b>	<b>September 14, 2023</b>	
Move transport	6 days	August 18, 2023	August 25, 2023	
Move mini-enclosure	8 days	August 18, 2023	August 29, 2023	
Replace Guillotines	8 days	August 18, 2023	August 29, 2023	
Install/Realign	15 days	August 25, 2023	September 14, 2023	
Ready for Commissioning	1 day	September 15, 2023	September 15, 2023	
<b>2-BM</b>	<b>72 days</b>	<b>July 13, 2023</b>	<b>October 20, 2023</b>	
Removal of beamline components	5 days	July 13, 2023	July 19, 2023	
Replace FE Wall Collimator	12 days	July 20, 2023	August 4, 2023	
Wait	34 days	August 7, 2023	September 21, 2023	
Mechanical utilities rework	5 days	September 22, 2023	September 28, 2023	
Electrical utilities rework	5 days	September 22, 2023	September 28, 2023	
<b>Realign beamline</b>	<b>20 days</b>	<b>September 22, 2023</b>	<b>October 19, 2023</b>	
Move transport	5 days	September 22, 2023	September 28, 2023	
Move mini-enclosure	7 days	September 22, 2023	October 2, 2023	
Replace Guillotines	7 days	September 22, 2023	October 2, 2023	
Install/Realign	15 days	September 29, 2023	October 19, 2023	
Ready for Commissioning	1 day	October 20, 2023	October 20, 2023	
<b>5-BM</b>	<b>48 days</b>	<b>June 26, 2023</b>	<b>August 30, 2023</b>	
Removal of beamline components	5 days	June 26, 2023	June 30, 2023	
Replace FE Wall Collimator	12 days	July 3, 2023	July 18, 2023	
Wait	0 days	July 18, 2023	July 18, 2023	
Mechanical utilities rework	5 days	July 19, 2023	July 25, 2023	



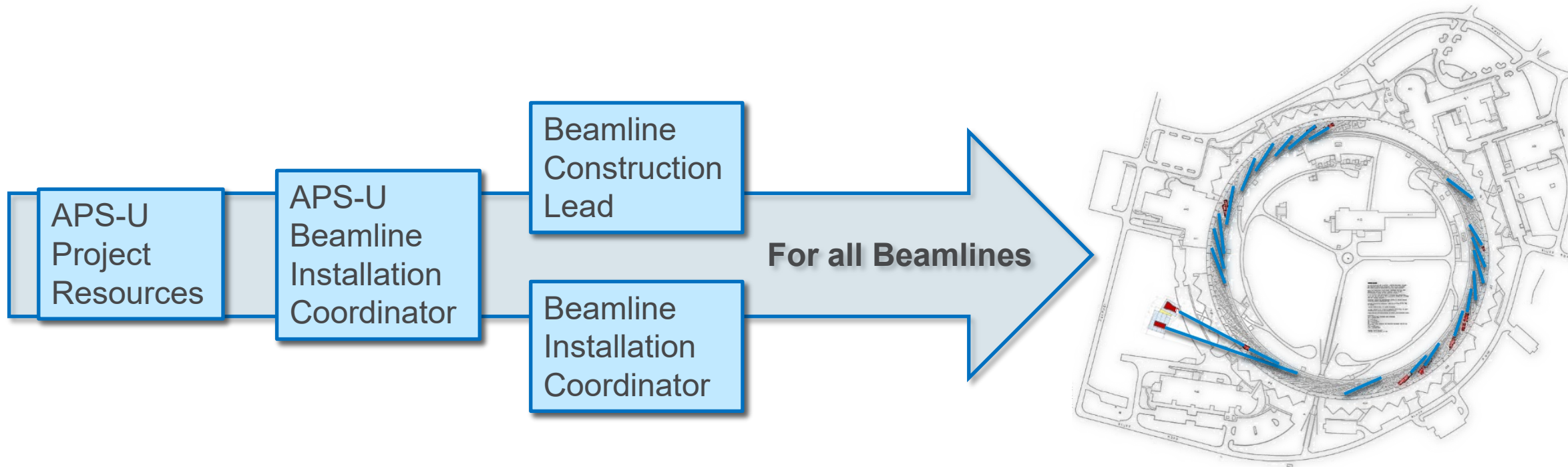
# Work on Feature Beamlines and Major Enhancements

- Requires coordination with currently operating research programs
  - Ramping down user programs (XSD management)
  - Possible operation of adjacent beamlines during construction
  - Removing and relocating beamline components and infrastructure (CDB)
  - Preparing sectors for enclosure and utility work
  - Installing beamline components and infrastructure
  - Preparing beamlines for commissioning
  - Preparing beamlines for user operations



# Team Approach for Beamline Installation Work

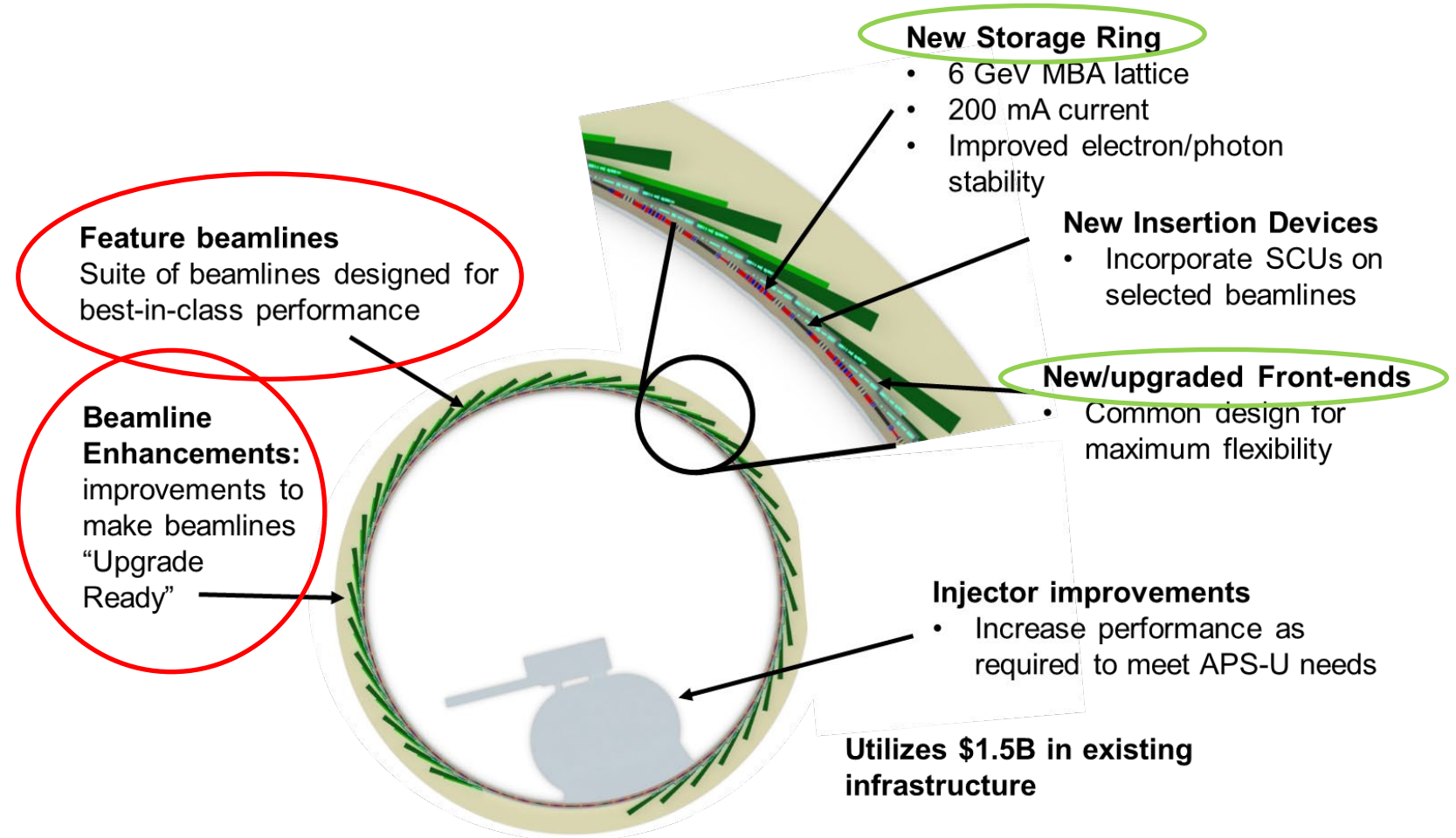
- Project resources will be assigned to beamline work
- Management is assigning the individual beamline leads (Construction Lead and Installation Coordinator for each beamline that will be modified for APS-U)





# Coordination Challenges for APS-U Installation Activities

- Resources (people) will be strained as the project enters the year-long shutdown and upgrade of the accelerator
- There is close coordination between the beamline, front-end and accelerator installation coordinators
- Plan to have a dedicated team working directly on beamline installations



# Budgeted Labor Resources for Installation Work

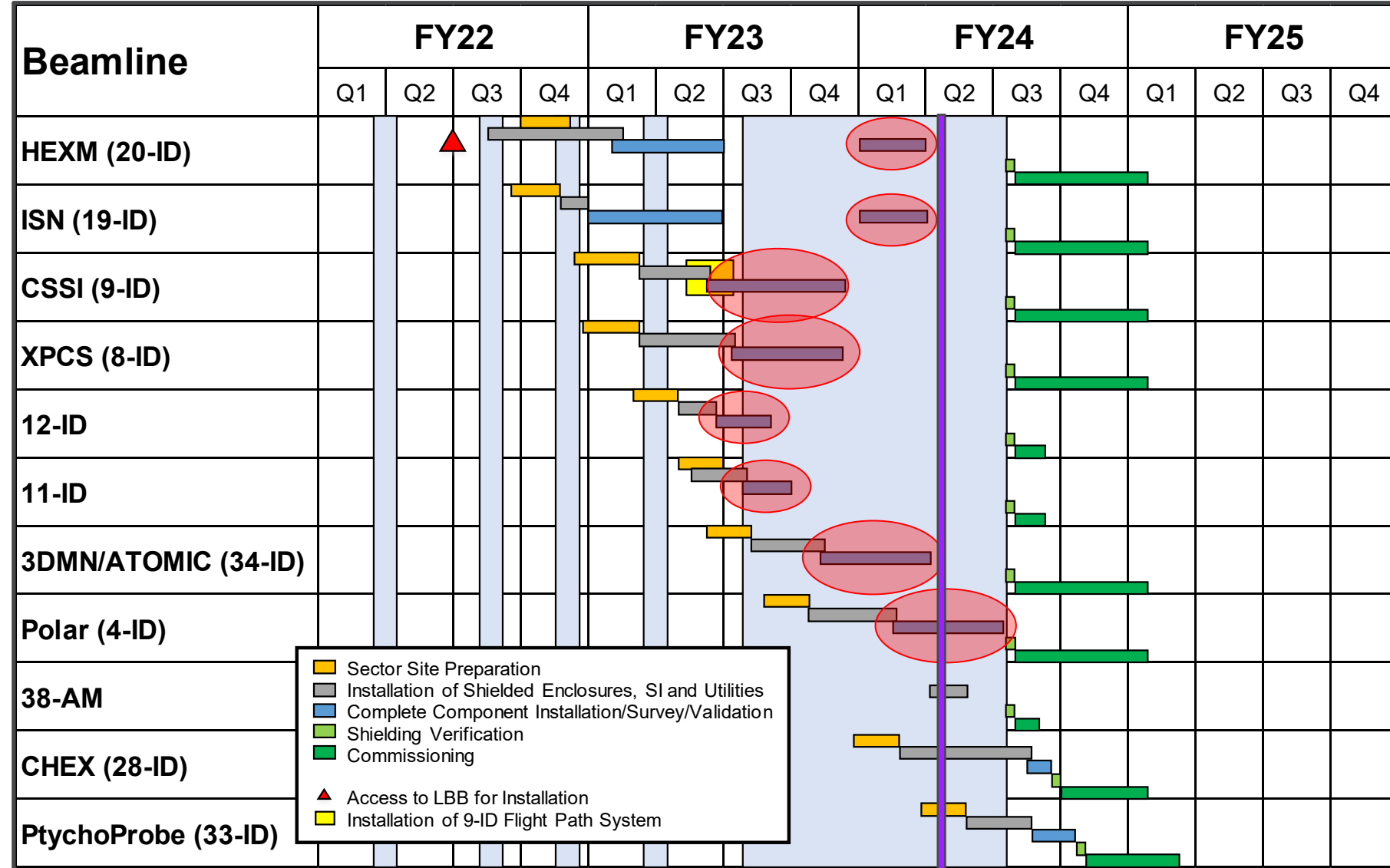
- Based on the projected technician resources needed for 25-ID installation work and the installation tasks needed for all the featured and major enhancement beamline installations, we have determined that we will need a dedicated team for beamlines from January 2022 through November 2024:

Technician Type	Estimated Days (Jan 22- Nov 24)	Number needed per year
Vacuum	2620	4
Water	1260	2
Survey	1125	2
Safety Interlocks	1170	2
Network	450	1
Controls	800	2

# Beamline Installation Schedule

Current Schedule - June 2022

- During accelerator removal and installation we anticipate possible technician shortages:
  - Vacuum
  - Water/Mechanical
  - Survey
  - Safety Interlocks
- Technician groups need to be coordinated (example: installation of RSS components requires multiple tech types working together)



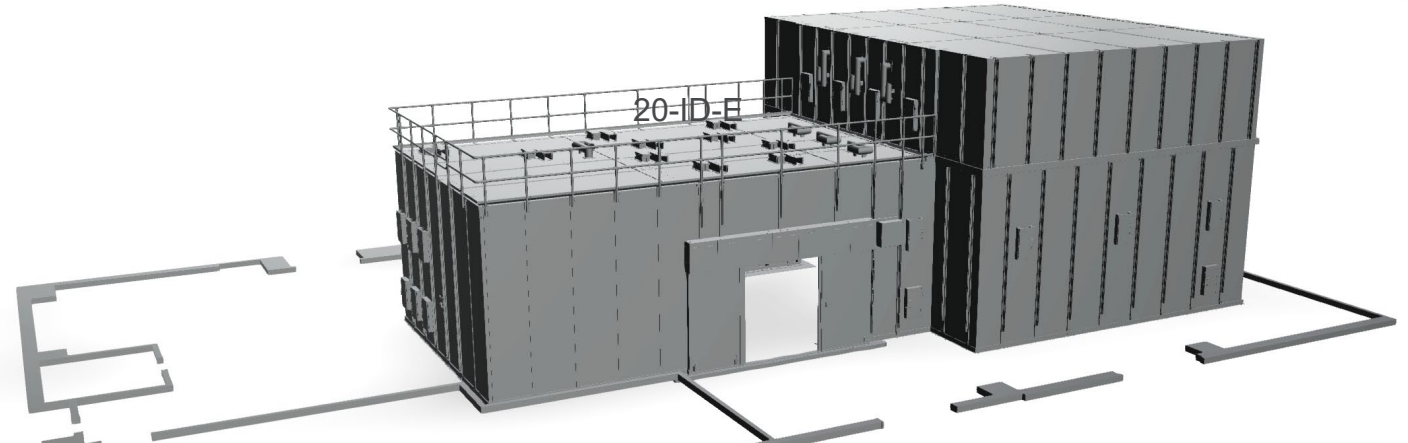
- Sector Site Preparation
- Installation of Shielded Enclosures, SI and Utilities
- Complete Component Installation/Survey/Validation
- Shielding Verification
- Commissioning
- ▲ Access to LBB for Installation
- Installation of 9-ID Flight Path System

Front-end work begins (5/1)      Accelerator Commissioning Starts (1/16)

# 19-ID (ISN) and 20-ID (HEXM)

- Installation of 7-m tall by 20-m long shielded enclosure (20-ID-E) for HEXM began on June 28
- Shielded door and roof labyrinths will be installed for ISN concrete enclosure (19-ID-D)

19-ID-D





# Beamline Installation Status (Completed in 2021)

## 28-ID IDEA Status

- IDEA is a testing phase beamline for APS-U that will become CHEX Beamlines starting in 2023
- Beamline is operational
- Completion of work with local contractors and technicians (COVID impact)
- Problems: **APS approval processes, available technicians**, inertia, IS delays, BPA agreement





# Beamline Installation Status (Deliver to XSD in July 2022)

## 25-ID ASL Status

- Canted beamline relocates two current XSD programs (20-ID and 11-ID)
- Shielded enclosures completed June 2021 (COVID delays)
- Beamline installation started November 2021
- Mirror systems and monochromators installed and tested in March and May 2022 (COVID delays)
- Shielding validation competed in June 2022
- XSD operation in July 2022
- Problems: **COVID, APS approval processes, available technicians, inertia, BPA agreement**



# Questions?

## Contact Information:

Robert Winarski

x9921

[winarski@anl.gov](mailto:winarski@anl.gov)

Thomas Gog

x0320

[gog@anl.gov](mailto:gog@anl.gov)

