Before the SAD:

All parts ordered, in house

All viewer parts assembled, all viewer anomalies resolved before SAD

Girders setup in TL1137, build as much of the beamline as possible (e.g., buncher won’t be available till we turn OFF machine)

Booster sitting on top of Cave2 waiting for delivery to tunnel (under vacuum)

Elements have been assigned names, CED workspace setup my Michele

SAD starts:

CM warm up

As-founds S&A

In parallel, start making things safe for eventual disconnection: magnets, I&C things, RF components, water lines

Below, steps are focused on injector work, but early in process 123 MeV dump gets removed, sections of west arc beamline get removed….to clear a path, Wilson/Dipette planning this work

Pull utubes from ¼ CM

Vacuum work:

Prep for vacuum work: close valves on ¼ CM, prevent them from opening. Other valves closed, prevent them from opening: upstream chopper 1, downstream of dif pump station, at the gun, etc.,

Ion pumps that need to be OFF, turn them OFF as appropriate

keV spectrometer beamline needs to be vented and removed early in the process, in order to set up clean hoods. And spectrometer needs to be removed in order to pull the ¼ CM into aisle. (let RCG know, since the lead shielding is credited control)

At this point, we might choose to vent the chopper region, to repair the viewer near A2 that charges up – will coordinate with gun group. Vent choppers in sensible manner, disconnecting one port at a time with GN2 purge. When viewer top hat installed, blank off chopper 2 exit port and pull temporary vacuum on choppers once viewer work complete, i.e., don’t leave choppers at atmosphere for long periods of time.

Coordinate with SRF Vacuum Installation group the vacuum disconnect of the ¼ CM: Setup hoods, perform the clean vacuum disconnect of ¼ CM. Do the viton-sealed valves seal? If not, add pinch offs. The ¼ CM needs to be treated gently, it will be used somewhere

Vent the rest of the phase 2 beamline

Bring some components from phase2 beamline to TL1137, (clean the components?) install them on girders: buncher, FCup1, diff pump can, A3, A4, dipole (SSG should help with dipole removal, there are hall probes inside)

Pull capture section – do it cleanly. Store under vacuum at UITF. Water skid too, I guess. Do we need to build a stand for it? likely YES

Throughout all this, confer with gun group re: gun installation. Coordinate in advance, shared resources, need for cleanliness

¼ CM removal:

¼ CM has been disconnected from the beamline, it is under vacuum, happy.

Disconnect any remaining “stuff” attached to ¼ CM, to prep for removal from beamline. Cables, insulating vacuum turbo, RF waveguides, utubes if they haven’t already been pulled. (BTW, we will re-use the utubes for booster)

Move the ¼ CM into the aisle and out through the NL access building, move it to Cave2 rooftop. Keep the beamline ion pump ON as much as possible.

Prepare the site for the booster:

Finish making the disconnects of the phase2 beamline, and the downstream warm girder: I&C, magnets, RF, water lines

When do we drop stone from three penetrations? Before or after booster is delivered to tunnel?

Bring the booster to CEBAF and set in place, but blanked OFF

(once booster in place, the west arc and 123 MeV spectrometer can be put back together)

Cable pulls, relabel cables as appropriate, in parallel with other work

Vacuum work continued:

Bring down girder#1 and set in place. This lets us install the new valve that will permit final pump down of chopper region, restore chopper vacuum as soon as possible (leak check, activate NEG once deemed leak free)

Then focus shifts to the “warm girder” sections, upstream and downstream of booster, work with vacuum installation group making connections to booster.

Upstream warm girder assembled upstairs and delivered to tunnel as clean as possible, blanked off. Components like A3 and A4 might need to be installed from within the hood

Downstream warm girder assembled where?

Dif pump station pulled, cleaned and rebuilt with new WP1250 NEG pumps?

Spectrometer girder installed last

Vacuum leak checks as we go. Good leak checks! Before and after NEG pump activation.

Activate all the NEGs on the beamline, one section at a time, verify acceptable vacuum (not planning to bake the beamline. This means cable connections can be made relatively quickly, but not before good leak check performed)

Wrapping up:

Align components

Cable up components and HCO as you go, working to ensure accurate CED

Do we imagine needing to pump the insulating vacuum “all the time”?

When to re-fill penetrations with stone?

Gun HV conditioning via OSP (and non-functioning PSS?)

Making beam along the way, to get a jump on restoration? But with incomplete beamline and not all components ready? keV beam operations to where? Viewer limited, beam dumped on valve downstream of Chopper 2?

Power outages that might impact bakeouts?

Volunteers to do the LCW plumbing connections? (choppers, buncher on separate skid? What else? FCup1, A3, A4 and keV spectrometer dump – request 0.5 gpm for each item)