

Closing Open ERL Items

D. Beavis

July 16, 2104

Overview

- ARR will occur at end of Month for ERL gun to dump operations (commissioning)
- Need to look at items that are open and get them closed
- Most likely will meet next week again to close more or review some modified documents

Minutes of June 25, 2014

- ATS Item for phased approach to protect against imperfections
 - Commissioning Plan coupled with beam fault studies
- CK electron Brems—closed, memo updated no impact
- CK Clarify laser port dose—closed, memo updated it was total dose
- ATS Examine best material for shims—remains open till roof pulled

Min. June 25, 2014 Cont.

- ATS Work permits for all roof work
 - ERL roof posted
 - All access points to bldg 912 roof being posted
 - I have suggested that all access points be fenced and locked with a key issued after work planning complete.
- Update dose for one MW waveguide port
 - July 14, 2014 memo
 - 50 mrad for 3.5 MeV beam loss at a beam power of 1 MW
- Established an ATS item for comprehensive set of beam fault studies and review. Closed individual items in database and ATS
- **CONCLUDE items from 6/25/14 meeting are ready for ARR**

ERL Chipmunks

- Memo July 15, 2014 provides information and logic on the chipmunks at ERL
- This should close IRR item
- Conclude that starting configuration will limit beam losses to less than 100 Watts (low energy transport (maybe in ring also)
- Suggest North gate (NMO171) be moved

Misc. Shielding Changes

- Memo of July 14, 2014
- 1 MW waveguide
 - 50 mrads for 3.5 MeV
 - 25 rads photons for 25 MeV (50kW)
- Dump shielding
 - Reduced in thickness
 - ODH port 220 mrads/hr for 1 MW

Misc. Shielding Changes Cont.

- Extraction line to dump (1 MW)
 - 75 rads out top of ODH port cap
 - 4 rads out side block
 - 100 rads/hr out north blocks
- Mis-steering last extraction dipole
 - Dipole off--19 TVLs of shielding (Pb, Steel, Concrete)
 - All angles checked.
 - Fault study should look near water pipes

Misc. shielding changes

- First extraction dipole mis-steering
 - Assumed 45 degrees max. Band
 - Direct concrete hit 11 rads/hr into PS enclosure which has personnel excluded
 - Add lead shield downstream of dipole
 - Determine maximum bend angle
 - near to a vertical wall seam
 - Cover vertical seam with Pb

Misc. shielding

- Dump shielding
 - 620 mrad/hr out roof where roof steps down. At 1kW 0.6 mrad/hr
 - Add one roof beam reduces to 2 mrad/hr
 - PS wall up to 40 mrad/hr (probably 4 mrad/hr in walkway)
 - Without more dump shielding the chipmunks will not allow the machine to operate if the chipmunks are located to be sensitive to 100 W losses

Special Modes of Operations

- These are low intensity modes only
- Zero degree to Faraday cup
- First dipole on at proper setpoint.
- First and second dipoles on a setpoint.
- Inducing beam losses to “calibrate” machine protection system

Low Intensity modes

- Propose that all low intensity modes have Access control system means to prevent intensity excursions.
- This may be also coupled with RS LOTO of machine components.

Dipole Interlocks

- There are no interlocks on any dipoles
- Require interlocks with date and intensity limit.
 - Ring dipole Interlocks
 - Gun to dump interlocks
- All dipoles get orange security tags before beam operations of a magnet.

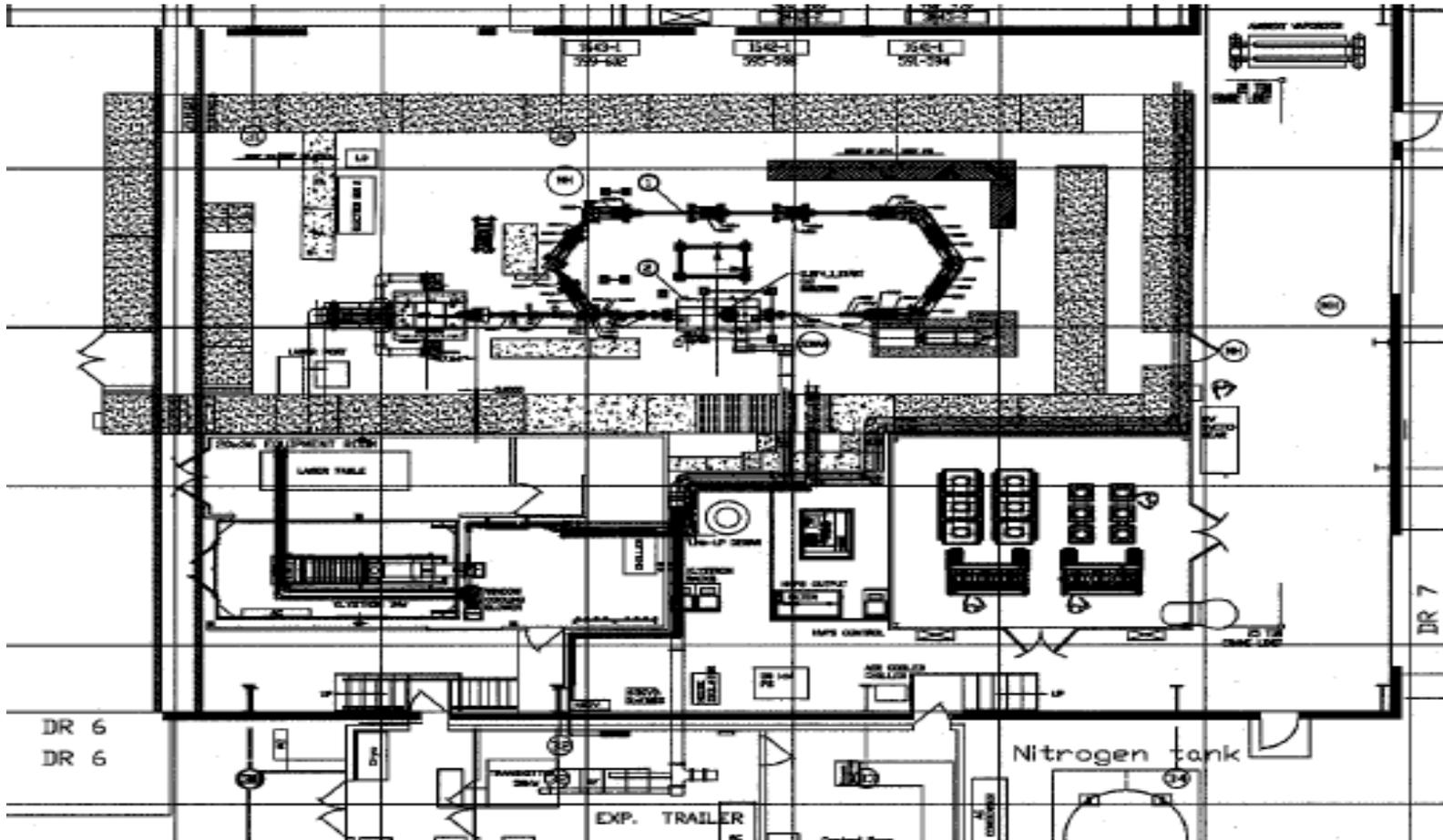
Radiation Surveys

- With solenoid issues the beam can only be on 5 seconds every minute
- This will extend the calendar time required to conduct radiation measurements
- We can verify that the chipmunks detect losses and that RCT check selected holes.

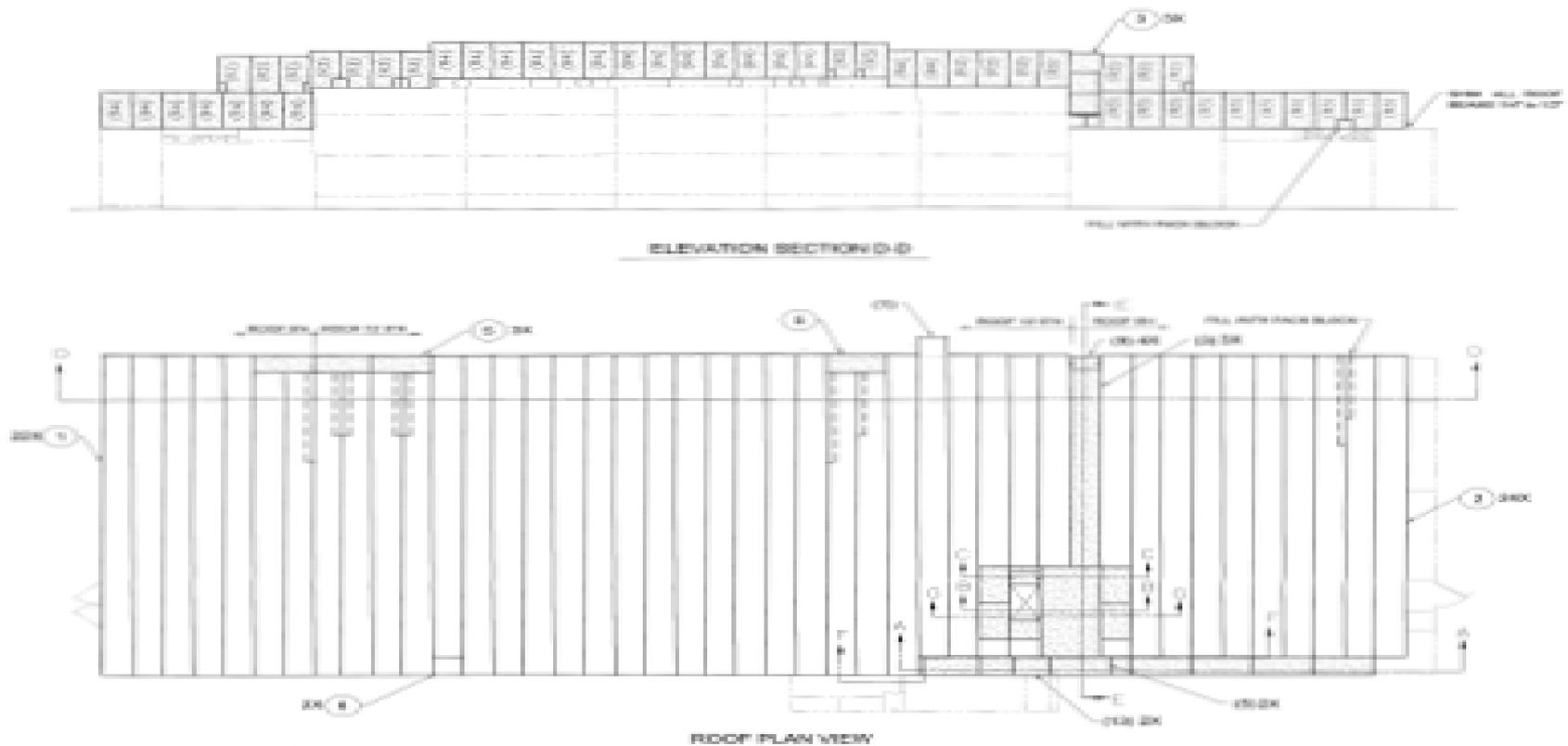
Vertical seams on side walls

- Requested that the vertical seams have four inches of Pb for the ones that can have brems losses directly across.
- There are additional vertical seams high
 - Some not much of an issue
 - Others on wall for second floor of the condo (utility building) More a problem for ring. Only a small section of low energy transport is an issue

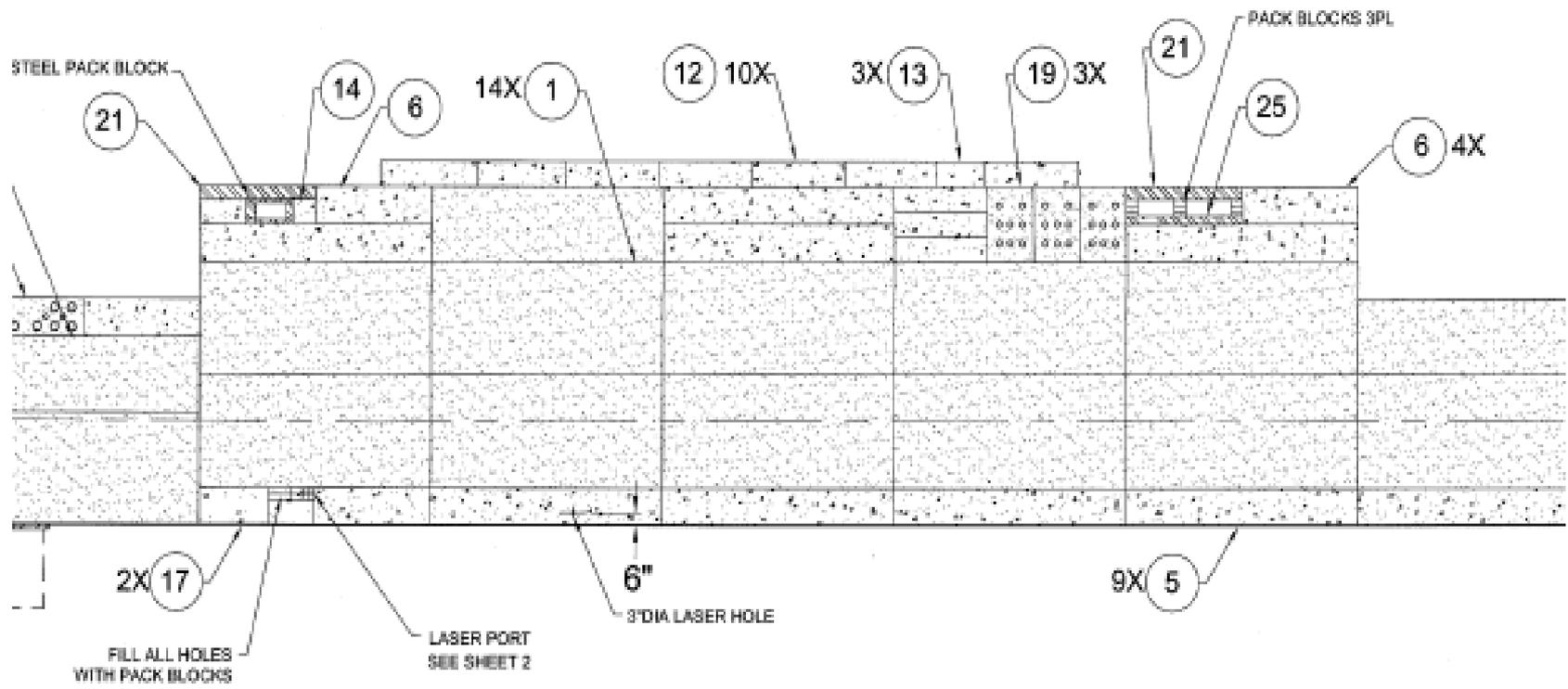
Overall Layout



ERL Roof



East wall looking from outside



ELEVATION SECTION A-A

Vertical Side Wall Seams

Table IV: Comments on Vertical Side Wall Seams

Vertical Seam number	East Wall	West wall
1	Upstream of gun beam	Upstream of gun beam
2	Blocked by 2 foot heavy concrete	Clocked by Large heavy concrete block
3	Has line of sight for low energy but not first beam test	Has line of sight for low energy but not first beam test
4	Covered by second layer of concrete	Covered by steel block but overlap small
5	Adjacent to dump shielding	Blocked by steel