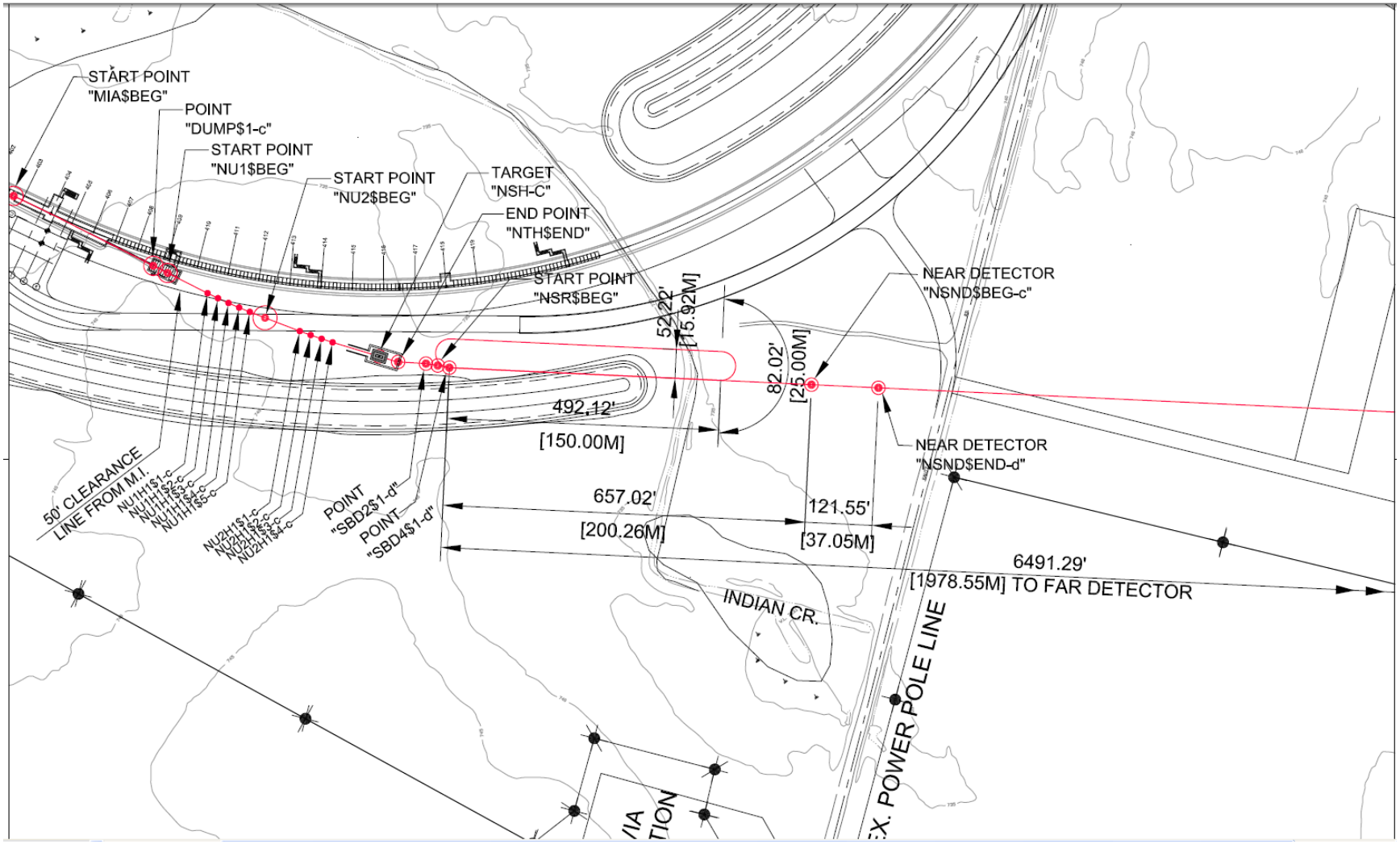
NuStorm Facility Status at Fermilab

NuStorm Facility Status at Fermilab

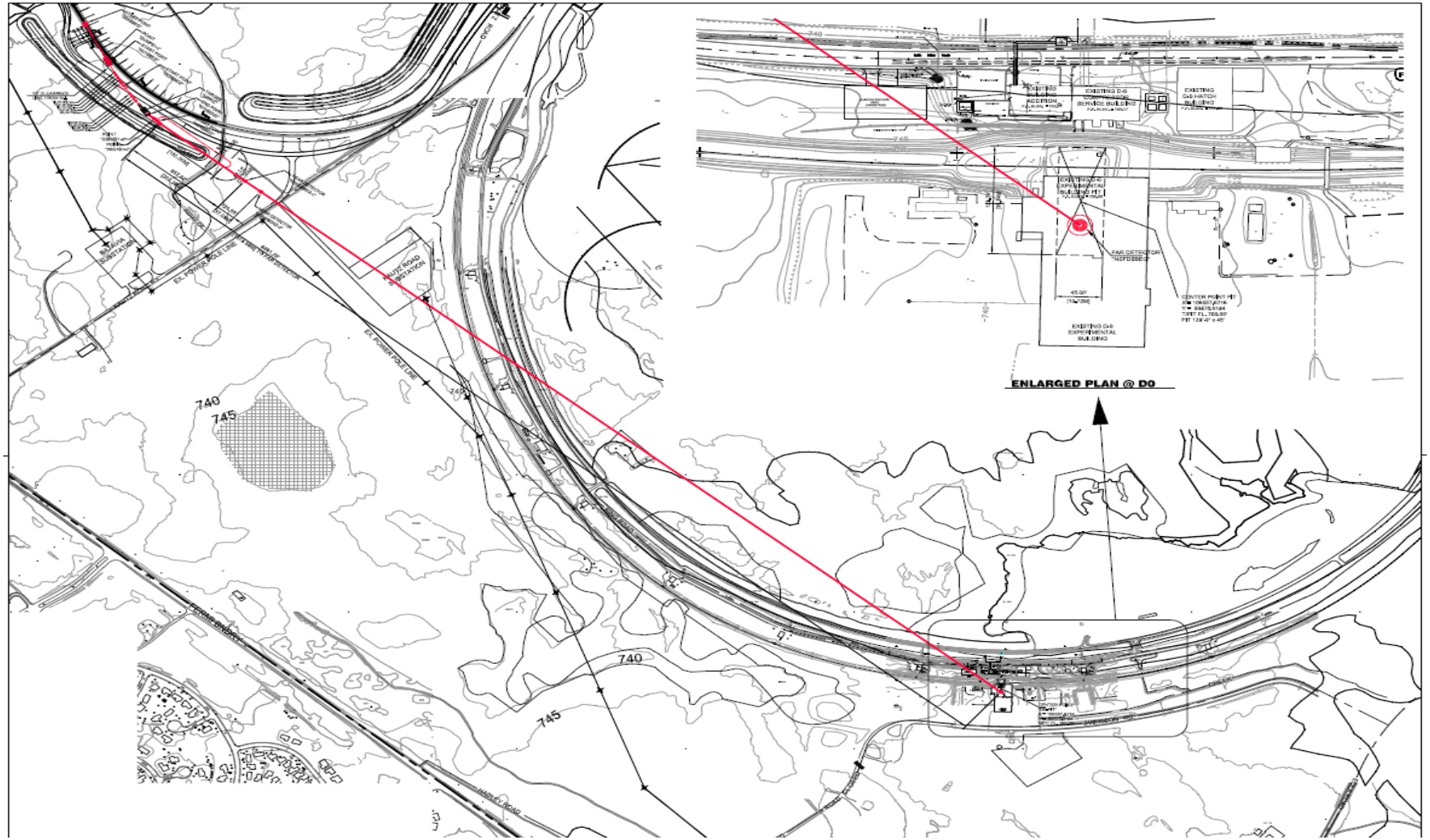
- Location of Facility
- Primary Beamline
- MI Abort Line Reconfiguration
- Extraction

Location of Facility

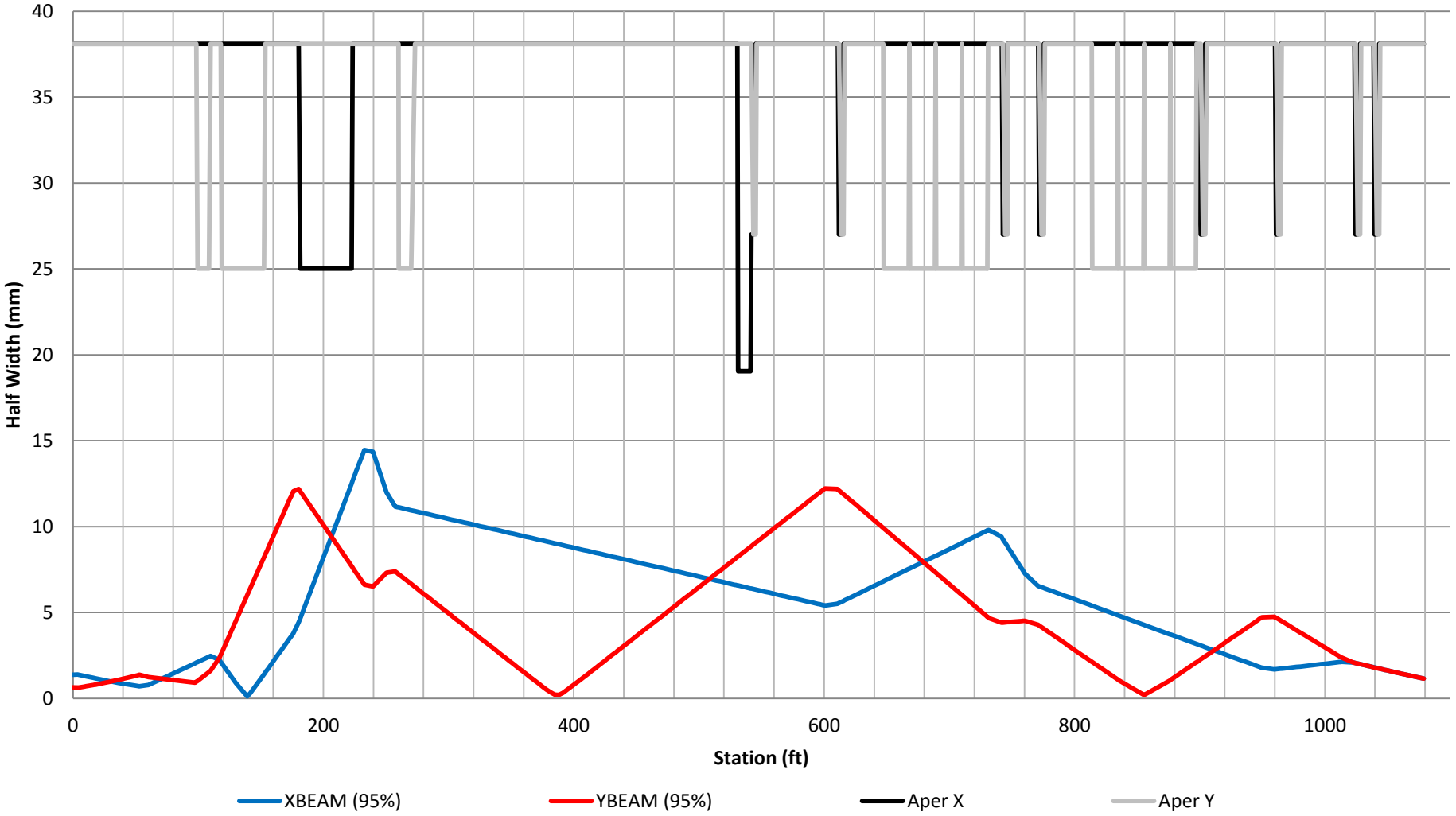
Location of Facility



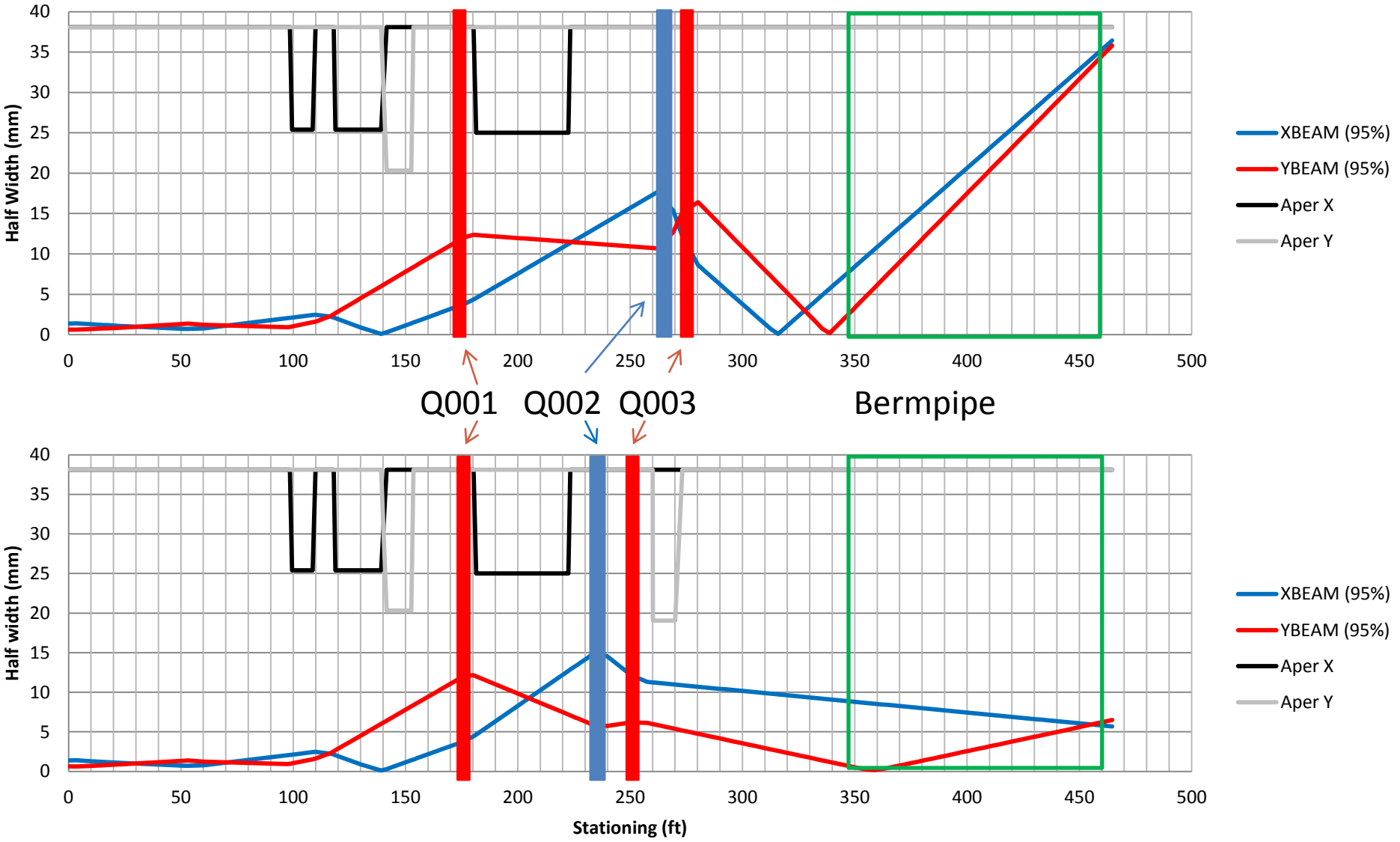
Location of Facility



NuStorm Primary Beamline

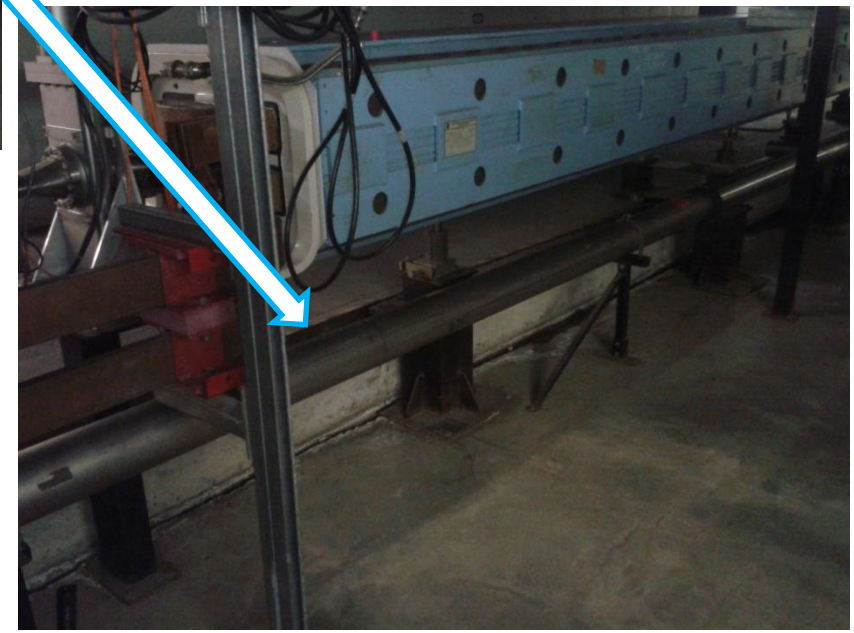


MI Abort line Reconfiguration



MI Abort line Reconfiguration

Current (Amps)	Present	Future
Q001	2770.5	1883.2
Q002	2828.0	1423.9
Q003	2770.5	853.0



Move Q002 and Q003 upstream by 30’ and 23’, along with different currents, NS/Abort beam reduces in size through the bermpipe

MI Abort line Reconfiguration

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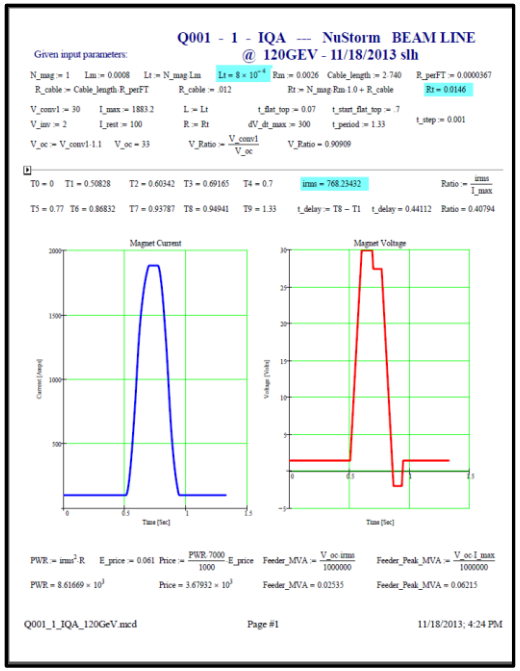
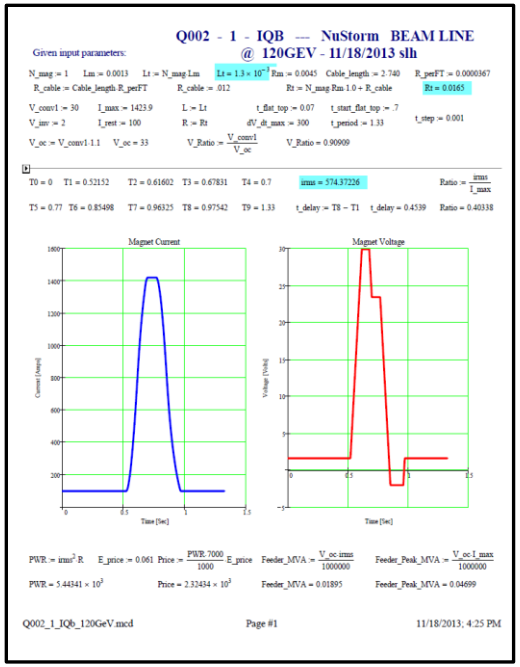
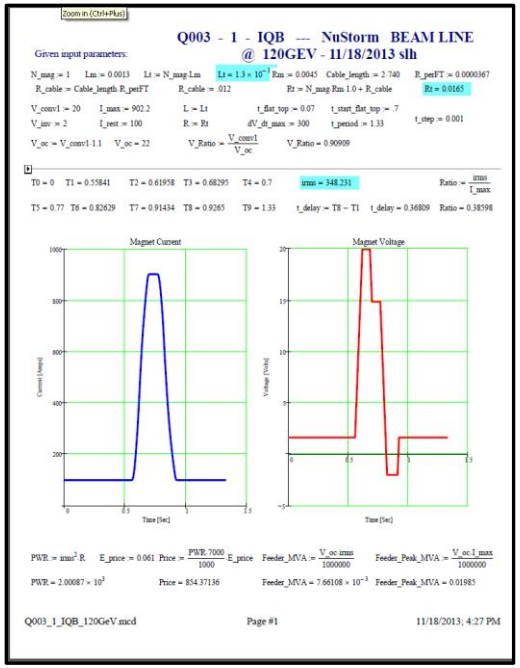
Q002	2828.0	1423.9
Q003	2770.5	853.0







Compiled from Steve Hays*

MI Abort line Reconfiguration

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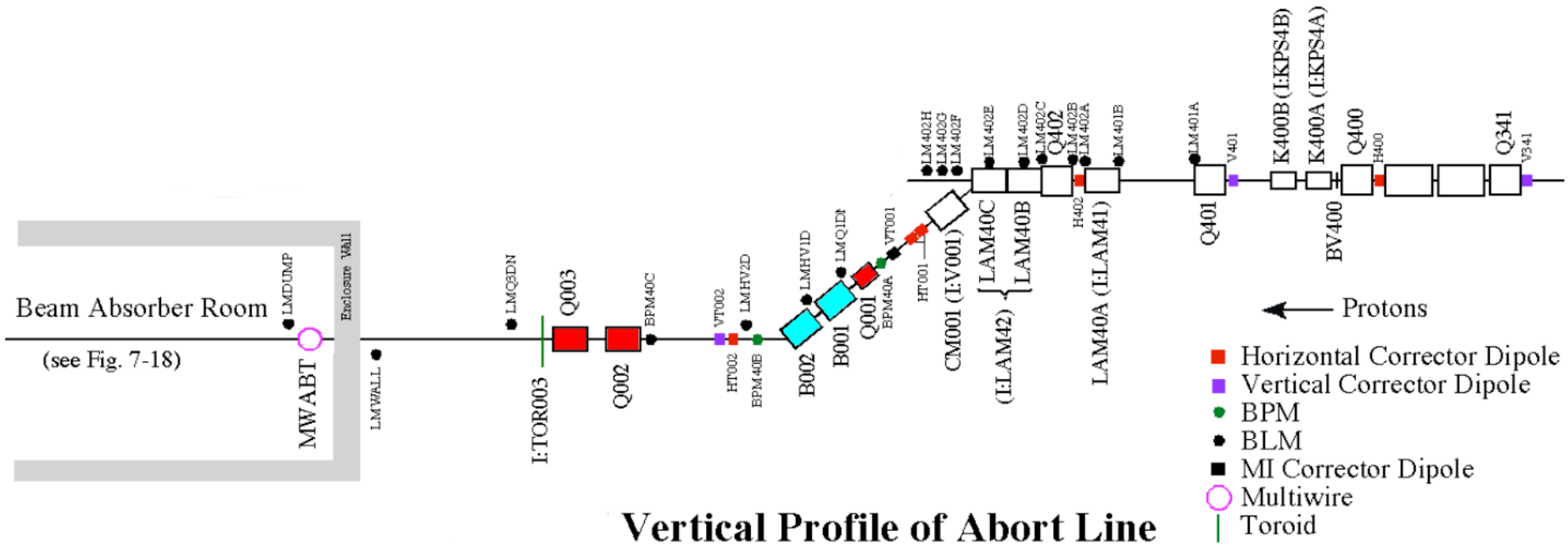
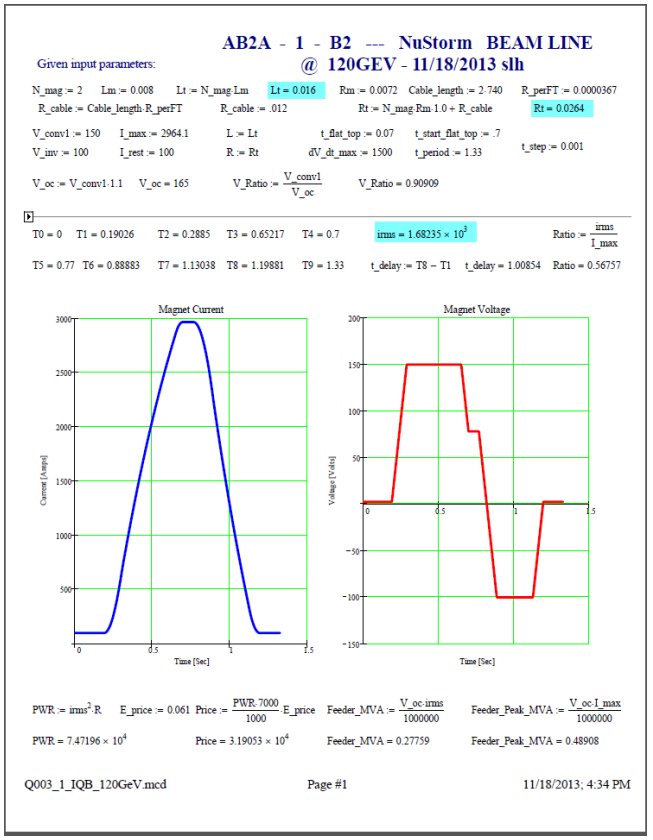


Vertical Profile of Abort Line

MI Abort line Reconfiguration

Current (Amps)	Present	Future
B2	2964.1	2964.1



Compiled from Steve Hays*

MI Abort line Reconfiguration

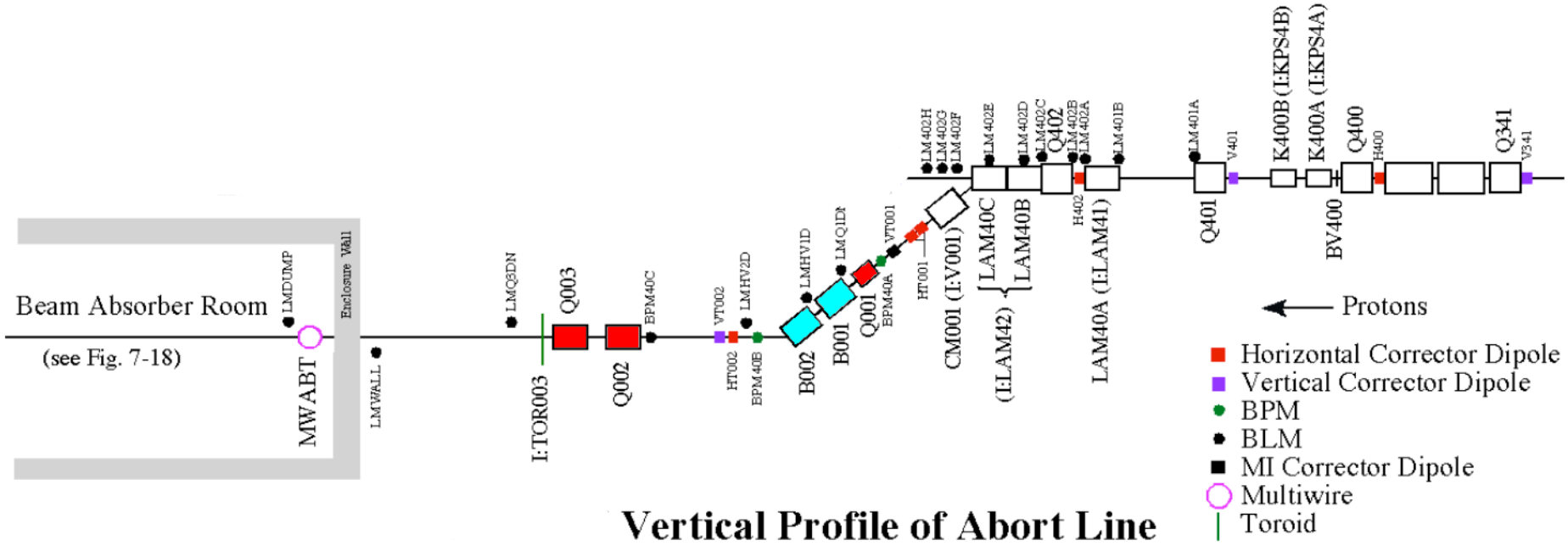
With these changes we are pursuing an Accelerator Improvement Project, or AIP. This AIP will be many focused on converting the Abort line magnets to their own individual power supplies. Currently there are multiple AIPs majority for the Muon Campus here at Fermilab.

- Cryo AIP (Muon Campus)
- Muon Campus Beam Transport
- Muon Campus Delivery Ring AIP
- Muon Campus Recycler RF AIP
- MI Gap Clearing Kickers

Each AIP has a written document called a Project Execution Plan, or PEP. With these calculations completed by Steve Hays of AD Electrical Engineering, we can continue this effort. Currently we are starting to gather this information and propose to AD that the purpose of this AIP is for twofold. First create a simplified extraction line for MI, and second have tunable magnets for NuStorm in the future.

This AIP requires $105,000 for the power supply, cabling, and electricians. Not all details though have been worked out i.e. location of power supplies, control cards, etc.

Extraction



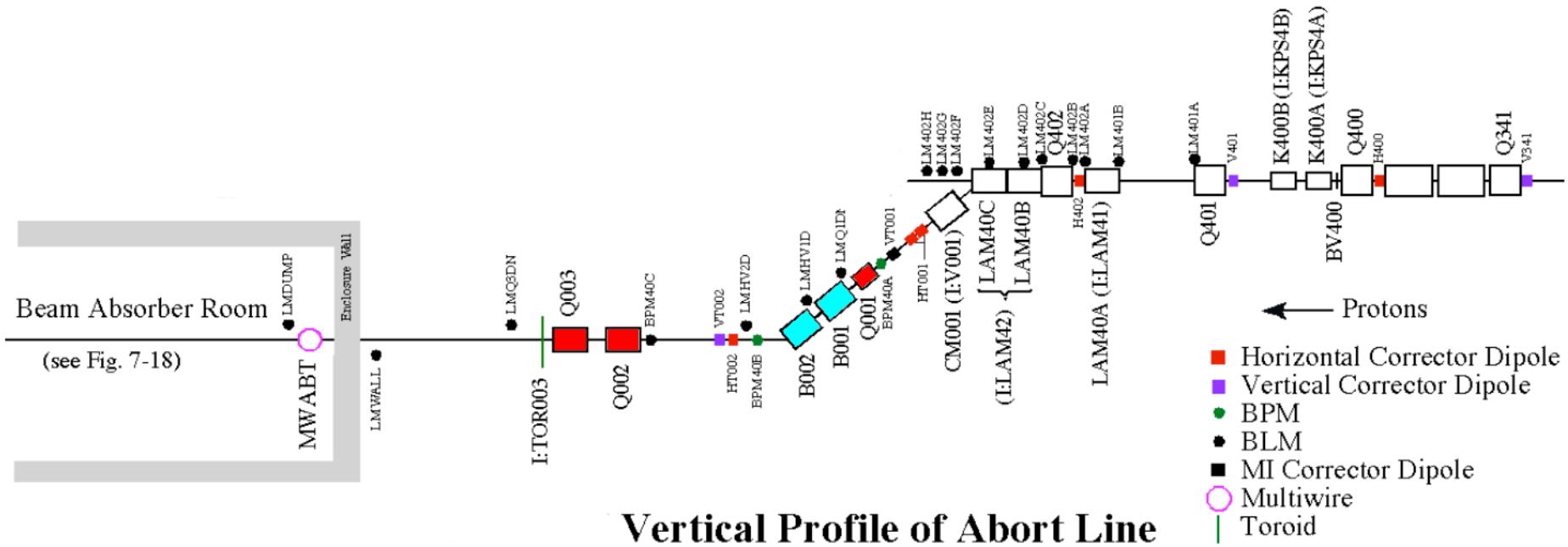
Currently MI Abort line has 2 “long” kickers for extraction. These kickers are for full turn at flattop ~5% . NuStorm does not require this type. It requires 3 partial turn kickers such as LBNE style or “short” kickers ~1%.

Extraction

MI Abort Kickers

In order to use the short kickers these two long kickers will need to be moved creating a new bend center…

Extraction

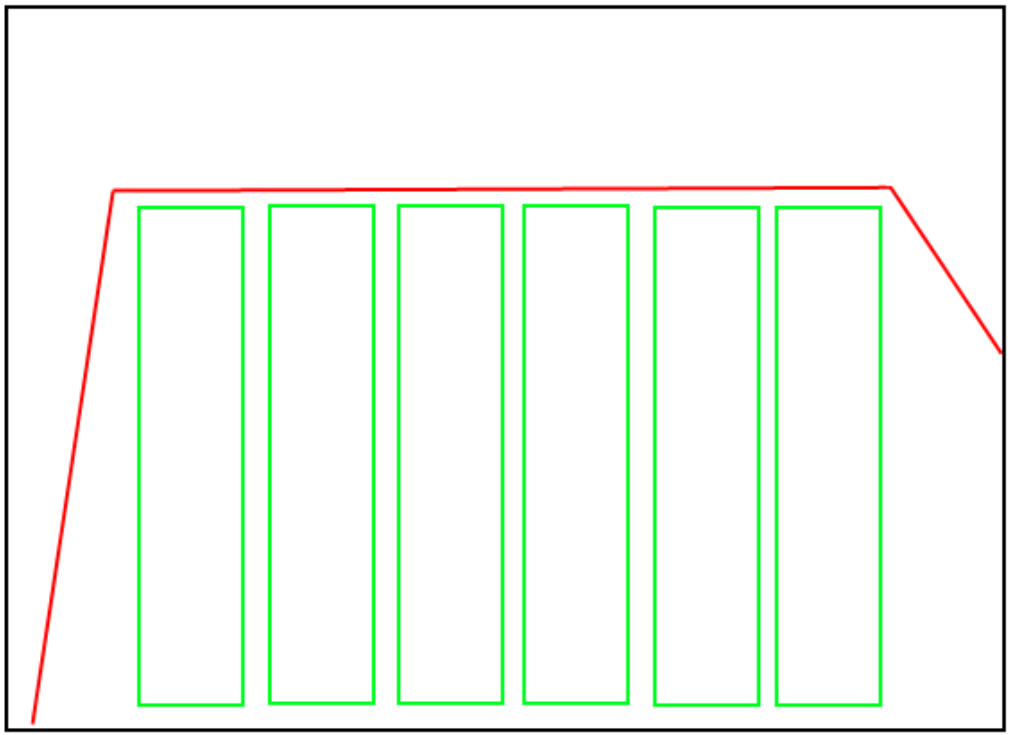


Vertical Profile of Abort Line

MI Abort Kickers

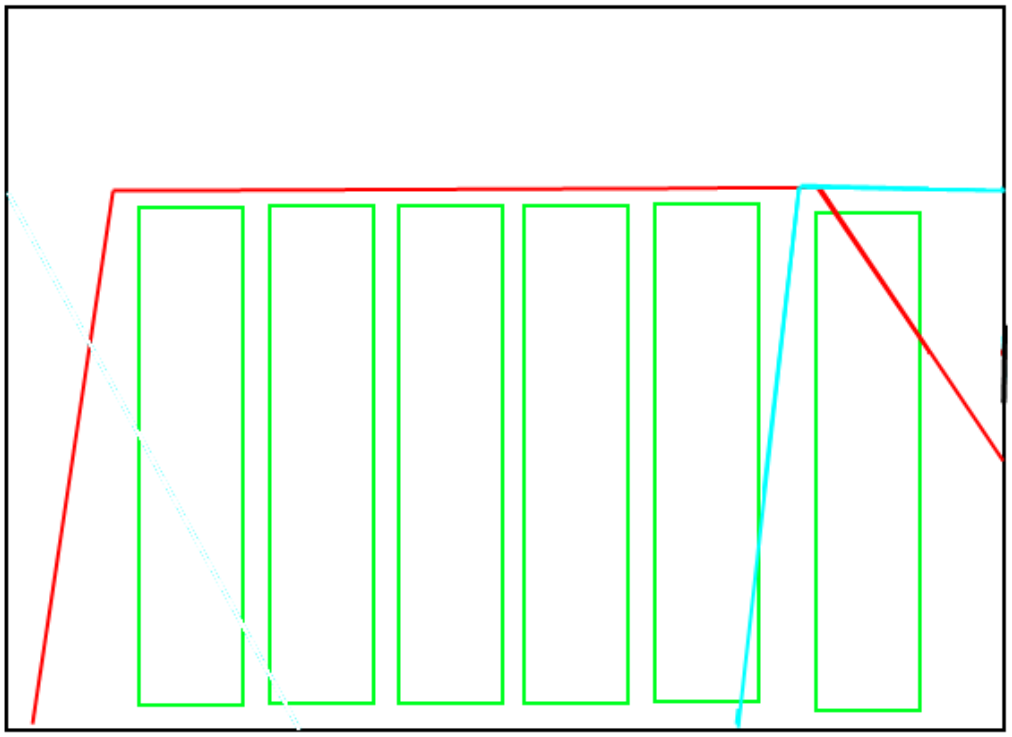
In order to use the short kickers these two long kickers will need to be moved creating a new bend center…

Extraction



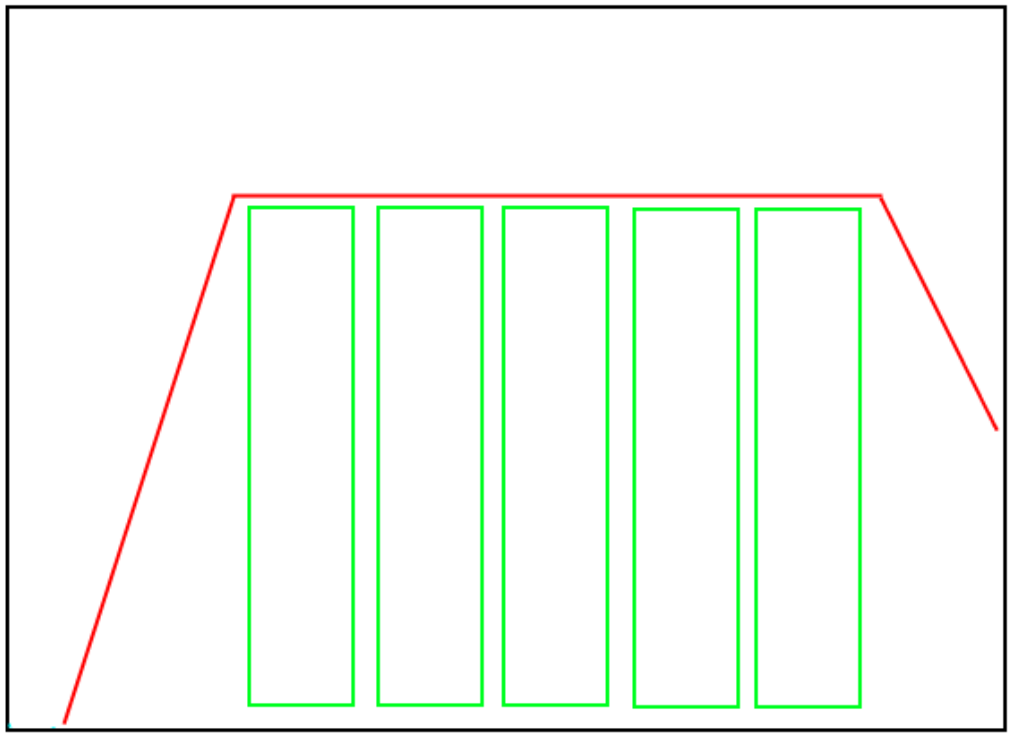
LBNE MI Beam in Booster Batches

Extraction



NuStorm Beam extraction at the end deflects the last NuMI/LBNE Beam using Abort Kickers

Extraction



NuStorm Beam extraction at the beginning with fast rise and fall time kicker doesn't deflect NuMI or LBNE Beam. Basically we are recreating our MI-52 kicker scenario for Collider Operation

NuStorm Facility Status at Fermilab

Needs to be done

- Continue AIP via PEP document
- Research more on Kicker configuration

Thank You


Special thanks to:
Steve Hays, Chris Jensen
Photo by Marty Murphy

Back up

MI Abort line Reconfiguration

With these changes we are pursuing a Accelerator Improvement Project, or AIP. This AIP will be many focused on converting the Abort line magnets to their own individual power supplies. Currently there are multiple AIPs for the Muon Campus here at Fermilab.

- Cryo AIP (Muon Campus) ($9.74M)
- Muon Campus Beam Transport
- Muon Campus Delivery Ring AIP
- Muon Campus Recycler RF AIP ($8.6M)
- MI Gap Clearing Kickers ($4.4M)

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This AIP requires $105,000 for the power supply, cabling, and electricians. Not all details though have been worked out.

Extraction

LBNE has cost estimated ~$6.7 M for 5 kicker magnets fully loaded.