



**Particle Physics Division
Mechanical Department Engineering Note**

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Project: MTA

Title: Hatch Shielding Installation Estimate

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Applicable Codes: none

Abstract Summary:

A shielding stacking plan has been prepared for the MTA hatch shielding. This note documents an installation estimate.

Assumptions:

1. Existing shielding is stacked to 13.5 feet above the top of the hatch floor. This estimate only includes the blocks to be set above the existing layer.
2. Only one set up of a large crane is included.
3. Only one removal of a large crane is included.
4. A time and materials (T&M) rigging contractor is used to set these blocks.

5. T&M rigging contractor effectively works 6.5 hours per day when time for lunch and breaks is taken into account.
6. Contractor Orientation training is NOT included in this estimate.
7. All needed blocks are pre-staged within picking distance to the crane before the work commences. Pre-staging costs are not included in this estimate.
8. Time required to set a single block is the same for A, B, C, D, E, and F size blocks.
9. Each large block takes 20 minutes to be picked by the crane, lifted to the top of the hatch, lowered into the hatch, nestled into place, and the crane hook returned to the next block.
10. Block Counts are:
 - 11 “C” blocks; 9 “D” blocks; 7 “E” blocks; and 4 “F” blocks. Total large block sum to 31 blocks.
11. Hand stacked blocks are pre-staged on 4 pallets, each with not more than eight blocks placed on the pallet. A pallet lifter is used by the crane to lift the pallet to the top of the shielding.
12. Total lifts performed by the crane is (31 large blocks and 4 pallets) 35 lifts.
13. Assume hatch is removed at the beginning of a day of work and replaced at the conclusion of each day.
14. A single, four hour duration suspension of the rigging work is needed to connect portions of the coaxial and wave guide segments. This is assumed to occur during normal working hours.
15. Eight hand stack blocks can be moved from the pallet to final location within the 20 minutes needed for the crane to deliver the next set of hand stack.

Estimate:

Crane set up time	2 hours
Hatch removal time day one25 hours
35 lifts at 20 minutes per lift.....	11.67 hours
Hatch replacement time day one25 hours
Hatch removal time day two25 hours
Hatch replacement time day two25 hours
Hatch removal time day three25 hours
Hatch replacement time day three25 hours
Crane removal time.....	1 hour

Total time working..... 14.17 hours
Suspension time for the wave guide and coax..... 4 hours.
Total time including work and suspension 18.17
Effective working hours per day..... 6.5
Net number of days required 2.8 days

Conclusion:

Three days of rigging crew effort is needed to complete this work.

Image 1, ISO of the entire MTA hatch shielding.

