

M.S. Collider Mechanical Group
Procedure C-A-CMS-8.1.0.2
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Revision 00

15.8.2 ARC CQS Installation

1. Purpose and Scope

- 1.1 Installation of the arc CQS and other magnets of similar length. Separate procedures cover the installation of the dipoles and shorter magnets such as D6 and D9.

2. Responsibilities

- 2.1 Persons installing dipole magnets are responsible for conducting this procedure and the documentation. This procedure requires the completion of the appropriate magnet traveler.

3. Prerequisites

- 3.1 All personnel shall be trained on this procedure and the equipment by the cognizant engineer, or the cognizant technical supervisor.

3.2 Required Tools

- A. Heavy duty strap (1 required) McMaster-Carr #8842T35, or equivalent.
- B. 100' length of Versicon non-conductive 300WP 0.25" ID air hose, or equivalent, with female QD fitting (BNL# 1-79740) on one end and a male QD fitting (BNL# 1-79720) on the other end.
- C. Arc CQS Transporter Cart with air regulator and water separator.
- D. Tape measure.
- E. Wrench, driver (ratchet) and socket required to drive 1" and 3/4" nuts.
- F. Hard Hats.

4. Precautions

- 4.1 Care must be taken not to shock or jar the magnet during transport. Failure to do so may cause damage to the CQS magnet.

5. Procedure

5.1 Shipping

The following steps shall be performed at the Magnet Division shipping point:

- 5.1.1 Verify the magnet Traveler has been signed off by the cognizant Magnet Division representative.
- 5.1.2 Check the slot assignment and orientation. See Attachment 1 for reference. The slot name indicates the ring color (Y, or B), Outer or Inner, Sector number, and the magnet number.

- 5.1.3 Position the Transporter Cart on a stable surface and lock the wheels. Verify that the regulator, mounted on the cart, is in the proper orientation for inner or outer ring installation, whichever is applicable.

CAUTION 1

Care must be taken to verify that the magnet orientation is correct, with reference to magnet location traveler and the position map (Attachment 1). Failure to do so could result in costly removal and repositioning of magnets in the **RHIC** tunnel.

CAUTION 2

To make the Transporter Cart as stable as possible, the Transporter Cart must be in the fully down position for magnet loading. Failure to do so could damage the equipment.

- 5.1.4 Place the Transporter Cart onto the truck bed using the proper slings and shackles.
- 5.1.5 Lift the magnet onto the Transporter Cart using the proper slings and shackles. Once in place, strap the magnet to the Transporter Cart using the heavy-duty band strap. With the hold down strap's hooks positioned in either side (i. e., right and left as opposed to forward and rear) of the carts base channel tighten the strap snugly across the CQS.
- 5.1.6 Set chains, wheel chocks and winch, if available, to hold the cart in place.
- 5.1.7 Move the whole assembly to the designated portal of entry, per Attachment 1.

CAUTION

If there is heavy rain, or snow, shipping should be avoided. If it is absolutely necessary to ship during inclement weather, the magnet should be covered such that all components of the magnet, with the exception of the cryostat outer diameter, remain dry.

5.2 Ring Installation

WARNING

Failure to level the flatbed may cause personal injury and/or equipment damage when the restraints between the magnet and truck are removed.

- 5.2.1 Position the truck carrying the magnet at the loading/unloading platform. Verify that the flatbed is level. Verify the hold down strap's hooks are positioned in either side of the carts base channel. Verify the hold down strap is tightened across the CQS.

- 5.2.2 Connect the pull bar of the cart to a specially modified electric pull cart (Geared-down, Taylor-Dunn C4-32). Remove the restraints between the magnet and truck. Release all caster brakes. Unlock the cart's steering lock pins nearest to the electric pull cart. Leave the steering on the remaining double wheel casters of the cart locked. Remove the chocks from the caster wheels.

CAUTION

To prevent damage to the COS magnet or Transporter Cart, drive slowly, checking that the Transporter Cart, including the regulator assembly, is clearing the nearest tunnel wall and the placed and installed magnets and stands.

- 5.2.3 Pull the Magnet/Transporter Cart off the flatbed onto the platform. Continue moving the system until it reaches the ring.

NOTE

At 4 o'clock and 8 o'clock entry points, continue moving the magnet to the designated slot location. At 12 O' clock, however, due to the shape of the entry port, it is necessary to switch the pull cart from one end to the other end before proceeding to the designated slot location.

- 5.2.4 At the slot location, attach the adjusting slider and all other related hardware to the cryostat legs as shown in Attachment 2
- 5.2.5 Adjust the longitudinal magnet position so the mounting holes on the magnet legs are aligned within an inch of the center of the large clearance holes in the magnet stand. Check that the Transporter Cart wheels, when rotated 90 degrees, will clear the stand.
- 5.2.6 Disconnect the pull bar and steering linkage from both ends of the Transporter Cart. Manually rotate each caster 90 degrees. Remove the hold down strap from the Transporter Cart

WARNING

The Transporter Cart's table-lifting scissor shall never be touched. Hands and limbs must be kept out from under the Transporter Cart's whenever a magnet is loaded on the table. Failure to do so may result in sever personal injury.

- 5.2.7 Verify the Transporter Cart's air control valve is at the "OFF" position. Connect the regulator of the Transporter Cart to an in-tunnel house air tap via the air hose. Rotate the knob on the cart's air control valve to the "UP" position. Monitor upward motion until the bottoms of the threaded rods clear the stands. Rotate the switch on the air control valve to "OFF."
- 5.2.8 Carefully push the cart's upper table to slowly begin the magnet assembly moving. Check to verify alignment before moving into final position.

Rotate the casters 90 degrees and adjust the longitudinal position, as required

- 5.2.9 Slowly lower the magnet to a nominal height of 34", as measured from the tunnel floor to the bottom of the magnet cradle, by rotating the knob on the Transporter Cart's air control valve to the "DWN" position.
- 5.2.10 Adjust the vertical position, as required. Return the valve knob to the "OFF" position when magnet rests on stands completely.
- 5.2.11 Center the sliders on the magnet stands using the X and Z adjustment bolts. Adjust the vertical position to the nominal dimension using the Y directional bolts. See Attachment 2. Verify that the protective end covers of the magnet are intact; re-wrap them if necessary.
- 5.2.12 Install the lower retaining plate and nut. Do not use a wrench to tighten the nut; leave it finger tight (Attachment 2).
- 5.2.13 Rotate the casters, as required. Move the Transporter Cable to the aisle. Turn the casters back 90 degrees. Attach the steering linkages and pull bar.
- 5.2.14 Tow the Transporter Cart and the heavy duty band strap back to the initial shipping point.

6. Documentation

- 6.1 The supervisor or designated lead person shall be responsible for signing and dating the appropriate boxes on the traveler (MAGNET PLACEMENT/SURVEY TRAVELER Type: ACQS).

7. References

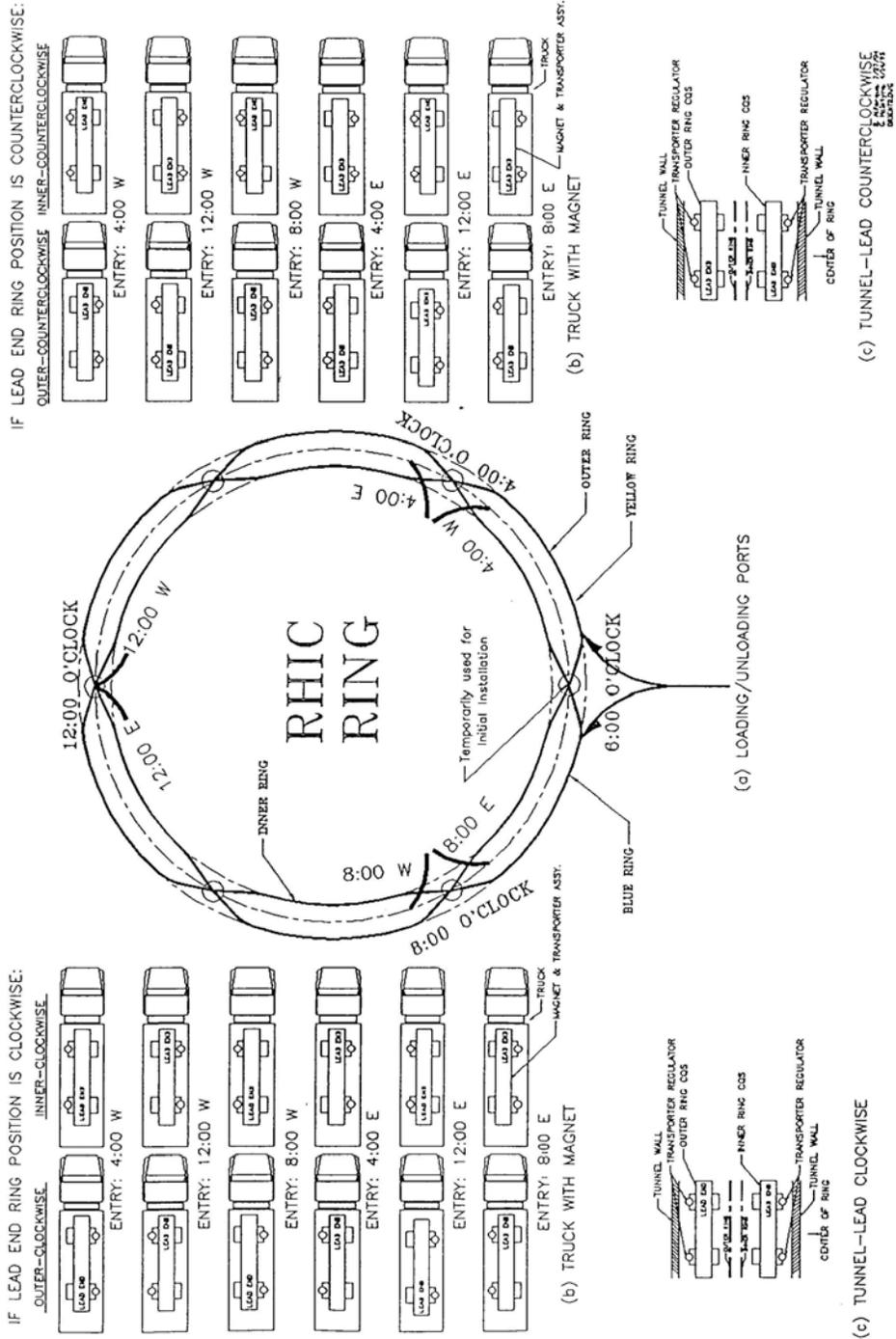
None

8. Attachments

- 8.1 Shipping and Installation Guide/CQS Magnet Orientation Table
- 8.2 Final Set-Up

Attachment 1

Shipping and Installation Guide



Attachment 2

Final Set-Up

