



## **Operation & Maintenance Manual**

### **Earth Covered Magazines**

Thank you for your purchase of an Armag Corporation Earth Covered Magazine. We have invested decades in perfecting our pre-fabricated semi-permanent structures and the processes that fabricate them. Many of our products built as early as 1969 are still in service and, given proper care, your Magazine should provide years of useful life. We hope your purchase meets your expectations. Should you have any questions or concerns, do not hesitate to contact us at (502)348-3987 or at [info@armagcorp.com](mailto:info@armagcorp.com).

Dated 3-April-2020

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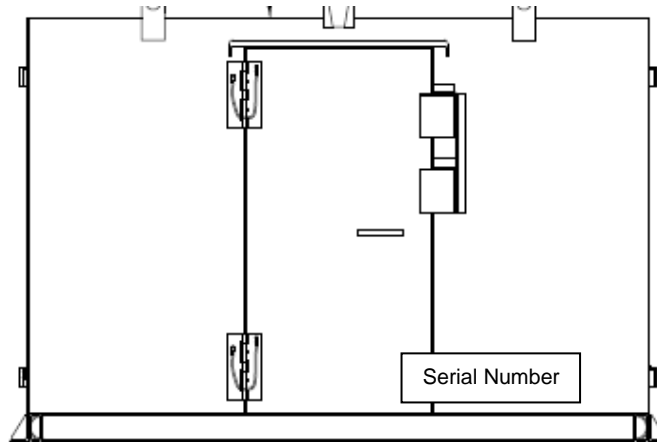
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## I. Product Identification

Each Armag has a product number and serial number. The serial number is welded to the exterior body of the unit, typically to the bottom right of the primary entrance door. A data label can be found on the inside of the primary door. Typical locations are shown in Figure 1. Typical information found on data label is shown in Figure 2.

Armag Magazines are constructed to either ATF specifications or US Military specifications, or both. ATF spec Magazines are constructed to 27 CFR 555.208. Military spec Magazines are constructed to NSWC 3046-93-1. There are slight differences between the two specifications. Please consult Armag if you are uncertain which type of Magazine you have purchased.



*Figure 1. Typical serial number location.*



*Figure 2. Sample data label.*

## II. Installation

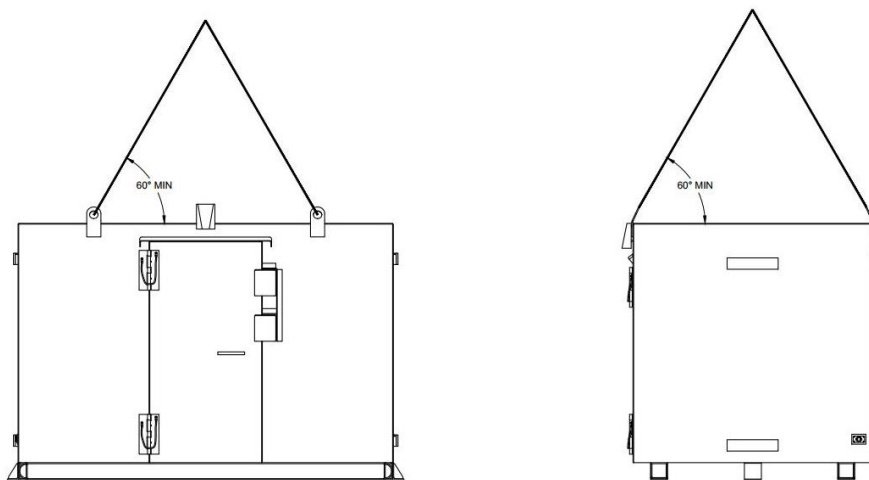
Installation requirements for Armag Magazines vary depending on the options selected at time of purchase. Below are common installation procedures, but other procedures may be required as necessary. Please consult Armag if you are uncertain of your requirements.

### A. Offloading

Armag Magazines are built with a steel base structure and two or four top-mounting lifting lugs. We recommend the use of a crane or forklift for offloading. Offloading requirements will vary depending on the size and weight of the Magazine. Please consult Armag or a local contractor before lifting. The weight of the Magazine can be found on:

- Armag data label
- Armag drawing
- Armag quote

For crane offloading, Armag recommends using slings long enough to project a minimum angle of 60 degrees with the horizontal. Spreader bars are not required but can be used. See Figure 3 for typical lifting arrangement. Exact location of lifting lugs can be provided by Armag upon request.



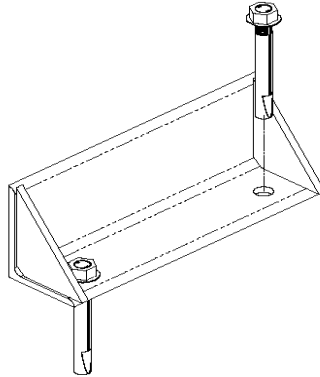
**Figure 3.** Typical lifting arrangement.

### B. Anchoring

Each Magazine is equipped with no less than four Anchor brackets; typical arrangement is one on each corner. Anchor bolts are supplied by Armag as an option but are typically provided. The anchor bolts are  $\frac{3}{4}$ " x 6" concrete expansion anchors, which are installed after placement of the Magazine. **Holes for anchor bolts should not be drilled prior to placement.** See figure 4 for installation example. Detailed installation instructions are as follows:

1. Drill the hole perpendicular to the work surface with a solid carbide bit that meets ANSI B212.5 specifications. The drill bit diameter will be the same as the anchor diameter that you are installing. \*To assure full holding power, do not ream the hole or allow the drill to wobble.

2. Drill the hole 1 diameter deeper than the intended embedment of the anchor, but not closer than two diameters to the bottom (opposite) surface of the concrete.
3. Clean the hole using compressed air and a nylon brush. A clean hole is necessary for proper performance.
4. Insert anchor into hole until washer rests solidly against fixture.
5. Tighten 1.5 to 3 turns past hand tight position but to a maximum torque of 170 ft-lbs

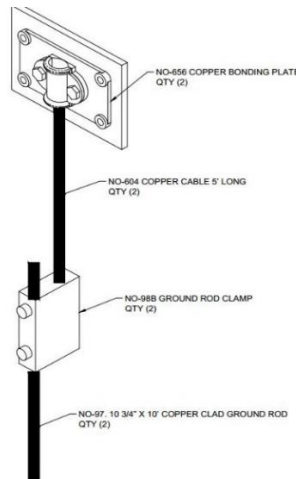


**Figure 4. Anchor bracket with bolts**

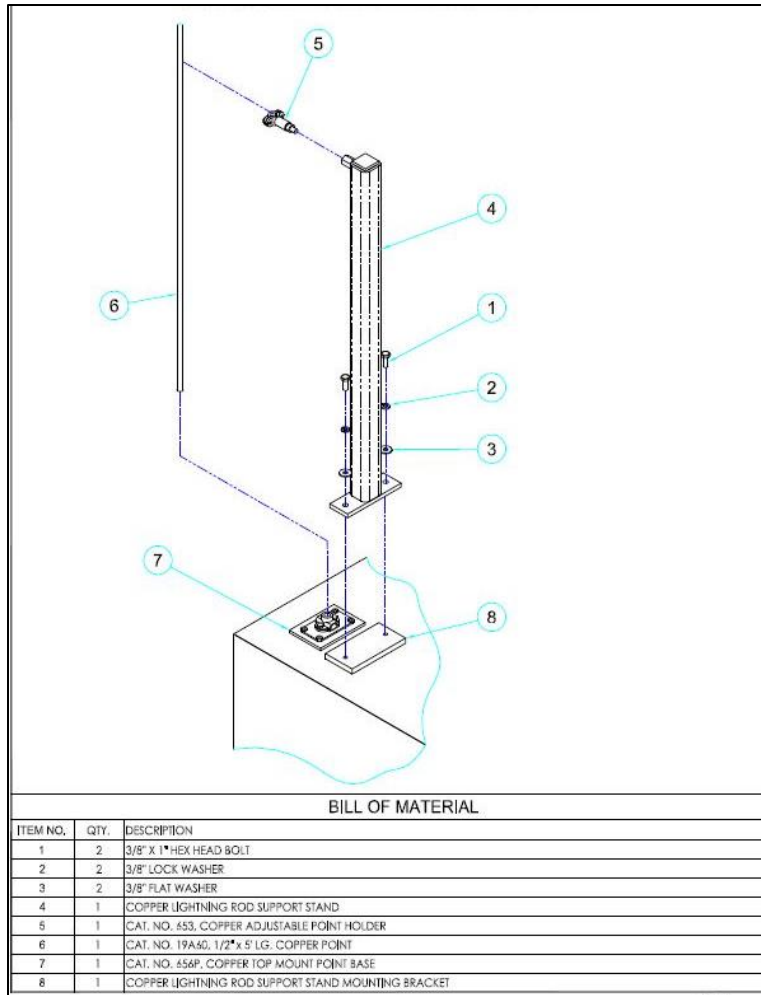
### C. Grounding

Each Magazine is equipped with grounding lugs welded to the exterior body. Grounding rods, cables, and clamps are supplied by Armag as an option but are typically provided. See Figure 5 for a list of grounding materials. Materials supplied by Armag are designed to comply with NFPA 780. Please consult a licensed electrician for proper installation of grounding systems.

Magazines are also equipped with top-mounted copper air terminals for lightning protection. The air terminals are screw-in type and are accompanied with a rod support bracket. For installation of the rod support bracket, see Figure 6. The air terminals are screwed into lugs, which are welded to the body of the Magazine. The ¼" steel body acts as a faraday cage and a downward conductor to the ground rods. Air terminals are also installed on the vent stacks. For proper installation of air terminals on vent stacks, see Figure 7. Note that the vent stack air terminals are to be attached to the grounding lug for proper conductivity.



**Figure 5. Ground Kit Materials**



**Figure 6.** Lightning Rod Support Bracket Assembly

#### D. Caulking

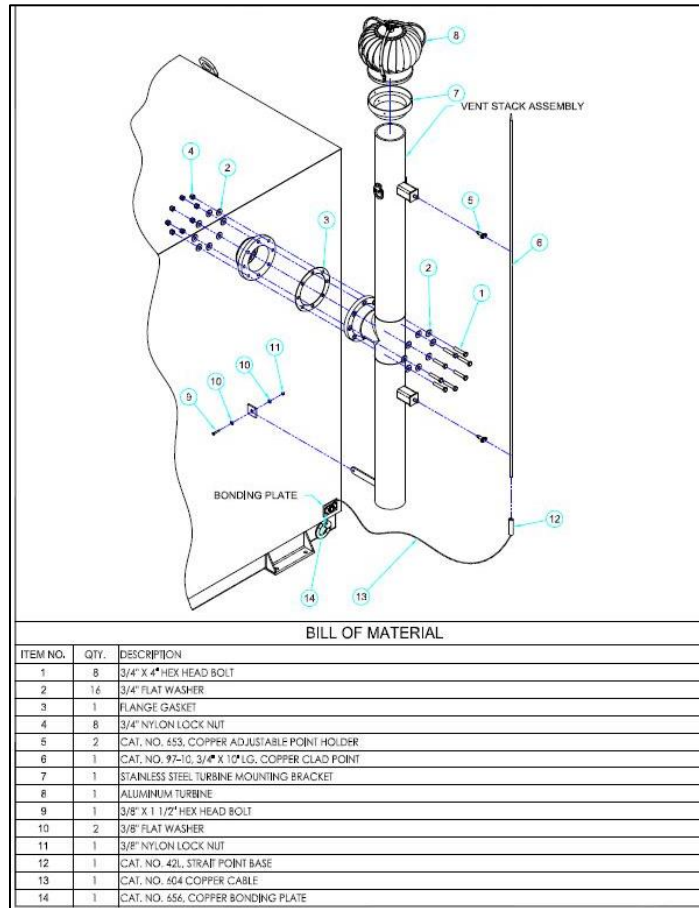
Upon delivery, we recommend inspecting the Magazine to determine if any cracking in the caulk has occurred during transit. The primary areas of concern are around the lip of the door(s) and the floor at the entrance(s). If touch-up caulking is necessary, use a Latex based caulk. If you have purchased a double-wide or multi-plex unit, the seams should be caulked using Silicone. This is generally applied by an Armag technician upon installation, but should be inspected every 60 days.

#### E. Paint

Upon delivery, we recommend inspecting the exterior of the Magazine to determine if any touch-up paint is required. Armag has supplied exterior touch-up paint to perform this operation. If additional touch up paint is necessary, we recommend a Urethane paint or equivalent.

## F. Ventilation

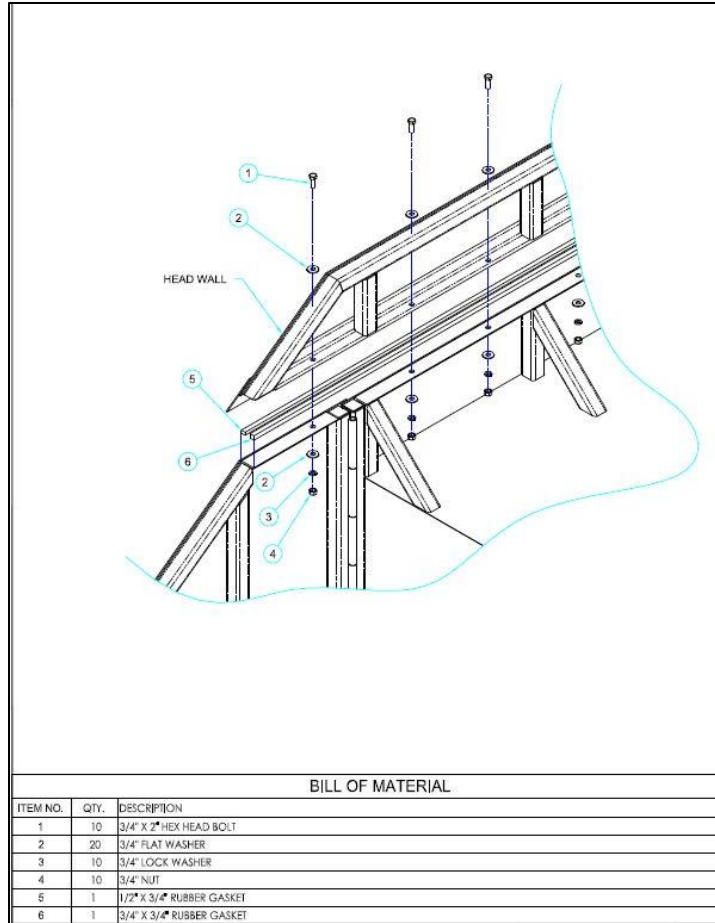
Armag Earth Covered Magazines are equipped with passive ventilation opening on the headwall and vent stacks on the back wall. See Figure 7 for proper installation of vent stacks.



**Figure 7. Vent Stack Assembly**

## G. Parapet

Armag Earth Covered Magazines greater than 9 feet in height are equipped with a removable parapet. The parapet is removed during transport and must be installed prior to earth fill. For proper installation of the parapet, refer to Figure 8.

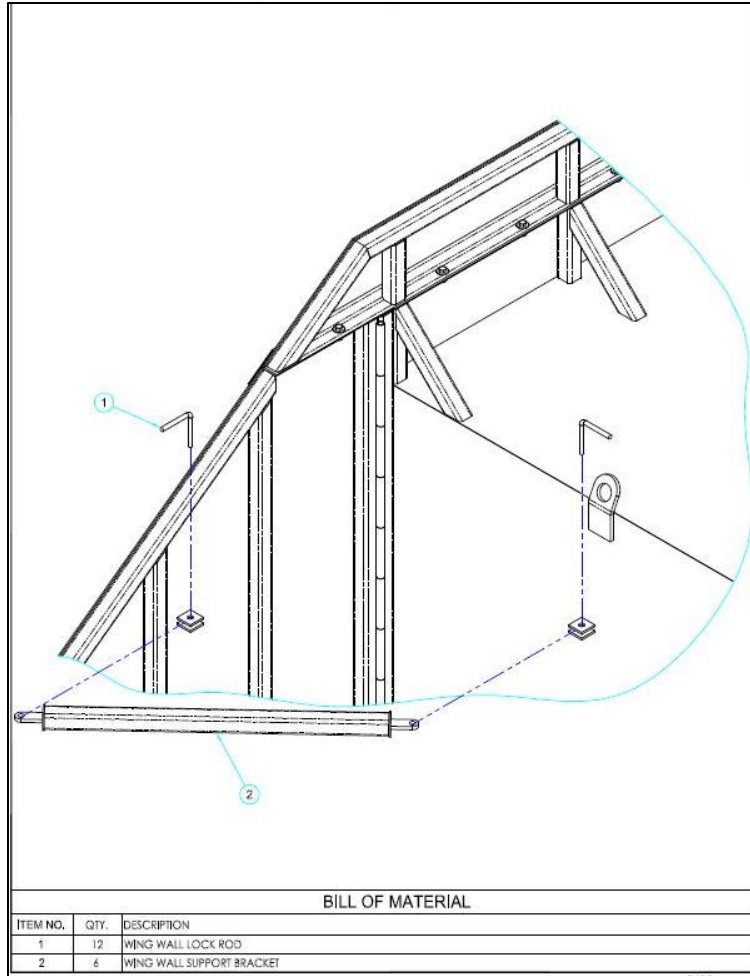


**Figure 8. Parapet Installation**

### H. Wing Walls

Armag Earth Covered Magazines are equipped with fold-out wing walls that are used as retaining walls for the earth. The wing walls must be drawn out and braced prior to earth fill. For proper installation of wing walls, refer to Figure 9.





**Figure 9. Wing Wall Installation**

**I. Other**

Your Armag Magazine may be equipped with other options that are not listed in this manual. If so, all necessary installation information is provided as a hard copy with your Magazine. Please consult Armag if you need additional assistance.

### III. Maintenance Schedule

Your Armag generally requires little maintenance, but following the maintenance schedule below is critical for maximizing the life of the unit. The maintenance schedule below should be performed every 60 days to identify any potential issues in a timely manner. If you have any questions regarding maintenance of your unit, please contact Armag.

Maintenance Item	Action
<b>Door Hinges</b>	Grease door hinges with Chevron Ultra EP#2
<b>Exterior Paint</b>	Inspect exterior paint for any chipping, scratching, or peeling; touch up as required with supplied touch up paint or contact Armag if more is required
<b>Foundation</b>	Inspect perimeter of unit (including HVAC housing if applicable and vents) for cracks, leaks, or blockages; repair as required or contact Armag for assistance
<b>Vault Door</b>	For magazines, inspect caulk where steel meets wood; reapply caulk as necessary to prevent moisture from getting behind wood
<b>Interior Paint</b>	Inspect interior paint for scratches or peeling; touch up as required with supplied touch up paint or contact Armag if more is required
<b>Interior Lights</b>	Replace bulbs and/or fixtures as necessary
<b>Weather Stripping</b>	Inspect weather stripping around door and replace as necessary
<b>Ventilation</b>	If unit is NOT equipped with HVAC, ensure all vents are open to allow proper air flow
<b>Ventilation</b>	If unit is equipped with HVAC, ensure all vents are closed for most efficient HVAC operation when in use
<b>HVAC</b>	If unit is equipped with HVAC, refer to specific owner's manual supplied with the equipment for maintenance and operation
<b>Electrical</b>	Contact a local licensed electrician for electrical support; if unable to find support, contact Armag for further assistance
<b>Depth Checks</b>	<b>**IMPORTANT**</b> Depth checks can be performed without driving a rod into the top of the ECM. Driving rods into the ECM can damage the protective coating of the ECM. We recommend using the Lighting Rod Stand to determine depth. The stand is 32.5 inches. Measure from the top of the stand to the ground to determine soil depth.
<b>Miscellaneous</b>	Each Armag is custom and may be equipped with specific equipment that requires its own maintenance schedule; please refer to each specific equipment's owner's manual for these or contact Armag for support

## **IV. Warranty**

### 12 Month Limited Structural Warranty

For a period of 12 months from the earlier of the date of shipment or the date Armag informs purchaser that the product is available for shipment (the "Warranty Period"), Armag Corporation ("Armag") warrants to the original purchaser that the steel structure, the lumber interior and the exterior coating of the Armag product will be free from defects due to faulty materials or workmanship. This warranty excludes all other items/parts built into or included with the Armag product including, but not limited to, parts subject to a manufacturer's warranty, including any original equipment manufacturer (OEM) warranty, moving parts, removable accessories, electronics, and HVAC. During the Warranty Period, Armag will cause to be repaired or, at its option, to be replaced (or at Armag's option, pay the original purchaser the reasonable cost of repairing or replacing), the steel structure, the lumber interior and the exterior coating of the Armag product, necessitated by a defect in material or workmanship, and Armag shall pay the full cost of labor and materials for any such repair or replacement.

Armag's total, aggregate liability is limited to the purchase price paid by the original purchaser for the product (excluding the cost of parts not included within the scope of the warranty). Steps taken by Armag to correct defects shall not act to extend the terms or duration of the warranty. Armag shall not be obligated to remedy any defects covered by this warranty unless Armag is notified in writing of the defect before the expiration of the applicable Warranty Period.

### Limitations and Exclusions

Armag's warranty obligations extend only to the original purchaser of the Armag product. Repair or replacement of defective structure in accordance with this warranty shall constitute fulfillment of all liabilities of Armag with respect to the Armag product. Armag is not responsible for damage due to negligence or failure to properly maintain the Armag product in accordance with the owner's manual or other specifications.

Armag neither expresses or implies any warranty at all with respect to parts or accessories manufactured by others which are incorporated into the Armag product. Those parts and accessories may carry warranties of their respective manufacturers. Armag will supply the original purchaser with any information it possesses concerning the warranties on parts and accessories and the identity and location of their respective manufacturers. However, Armag does not express or imply that any parts and accessories meet or will meet the expressed or implied warranties of their respective manufacturers or of any other person with respect to the parts and accessories.

Items not covered by Armag's warranty include (1) repairs arising from failure to maintain the Armag product, negligence, alteration, improper use of the Armag product, accident, vandalism or other casualty, or operation beyond rated capacity or specification; (2) repairs arising from abuse or neglect; (3) normal maintenance services, including bleeding rust issues associated

with movable steel parts (door hinges, lift hooks, D-rings, etc.); (4) replacement of wear items; (5) claims involving an Armag product that was damaged in transit; (6) claims involving an Armag product not then-currently owned and used by the original purchaser; (7) a lost or stolen Armag product; (8) repairs arising from any unauthorized modifications to the Armag product or unauthorized third party repairs; (9) removal and replacement of non-Armag parts; economic loss including lost profits; (10) unauthorized modifications or "field fixes"; and (11) defects in, or caused by, materials, work, designs or plans supplied by anyone other than Armag or its employees, agents or subcontractors.

Armag does not authorize any person to create for it any other obligation or liability in connection with an Armag product.

This warranty shall be governed by and construed in accordance with the laws of the Commonwealth of Kentucky, except for its conflict of laws principles, and the parties submit to the exclusive jurisdiction of the federal and state courts located in Louisville, Kentucky. By using your Armag product, you are agreeing to be bound by the terms of this Exclusive Certificate of Warranty.

IT IS THE MUTUAL INTENT OF ARMAG AND THE ORIGINAL PURCHASER THAT THE EXCLUSIVE WARRANTY AND EXCLUSIVE REMEDY SET FORTH ABOVE ARE GIVEN BY ARMAG IN LIEU OF: (1) ALL OTHER EXPRESS OR IMPLIED WARRANTIES AND REMEDIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF HABITABILITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND WORKMANLIKE CONSTRUCTION, WHICH ARE HEREBY DISCLAIMED; AND (2) ALL OTHER CONTRACTUAL, EQUITABLE, OR TORT-BASED CAUSES OF ACTION OR REMEDIES WHATSOEVER RELATING TO ARMAG'S WORK, IT BEING THE EXPRESS INTENT OF THE PARTIES THAT THE PURCHASER'S SOLE REMEDY WITH RESPECT TO THE ARMAG PRODUCT IS THE EXCLUSIVE WARRANTY AND EXCLUSIVE REMEDY. IN NO EVENT SHALL ARMAG BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES ARISING FROM A DEFECT IN THE ARMAG PRODUCT OR NONCONFORMITY IN ARMAG'S PERFORMANCE OF ITS OBLIGATIONS HEREUNDER OR FROM THE FAILURE OF THE ARMAG PRODUCT.