

STORAGE IN APPROVED MAGAZINES OF HAVNAP (AGM-142) MISSILES PACKED IN CNU-496 CONTAINERS

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U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND REHMSTEDT.MARK.J.1230548400 <small>Digitally signed by REHMSTEDT.MARK.J.1230548400 DN: cn=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=REHMSTEDT.MARK.J.1230548400 Date: 2015.03.20 10:41:11 -05'00'</small> RDAR-EIL-TP		CAUTION: VERIFY PRIOR TO USE AT HTTPS://MHP.REDSTONE.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 14.			
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U.S. ARMY DEFENSE AMMUNITION CENTER					FILE
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				8784	SP1-3-4-14-22J48

GENERAL NOTES

(GENERAL NOTES CONTINUED)

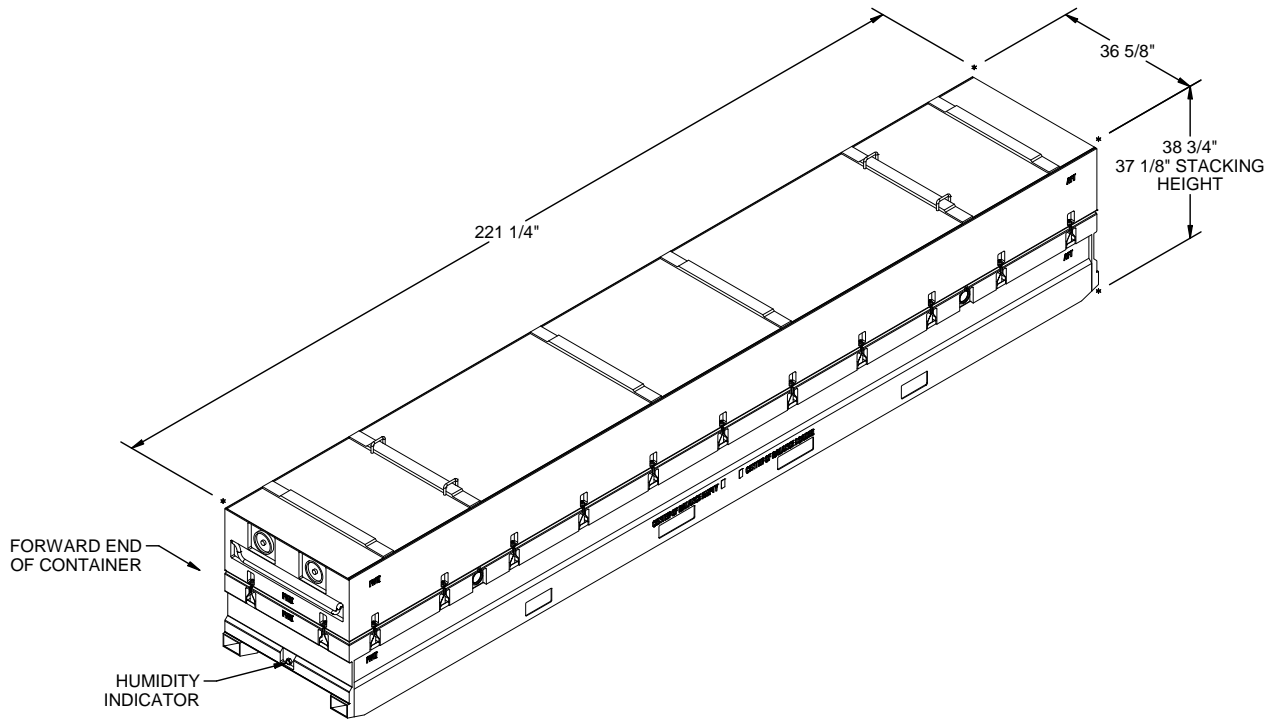
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE STORAGE PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR STORAGE IN VARIOUS TYPES AND SIZES OF MAGAZINES. THE STORAGE PROCEDURES DEPICTED FOR THE SPECIFIC TYPES OF MAGAZINES MAY ALSO BE UTILIZED TO STORE HAVNAP (AGM-142) MISSILES PACKED IN CNU-496 CONTAINERS IN OTHER TYPES OF APPROVED MAGAZINES. MINOR ADJUSTMENTS MAY BE MADE TO FACILITATE STORAGE IN OTHER TYPES OF MAGAZINES; HOWEVER, THE BASIC PRINCIPLES AS DEPICTED HEREIN WILL BE FOLLOWED.
- C. THE STORAGE PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE TO HAVNAP (AGM-142) MISSILES PACKED IN CNU-496 CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS CONTAINER WITH MIS-SILE ITEMS.
- D. **CAUTION:** THIS ITEM IS IN A "PROPULSIVE STATE" WITH MISSILES INSTALLED IN TWO ORIENTATIONS, AND MUST BE STORED WITH THE FORWARD AND AFT ENDS FACING TOWARD A SIDEWALL AS INDICATED BY THE DIRECTIONAL ARROWS IN THE STORAGE VIEWS. SEE PAGE 3 AND U.S. AIRFORCE DRAWING 9018070 FOR DETAILS OF THE CONTAINER.
- E. **CAUTION:** THE ALLOWABLE "EXPLOSIVE LIMIT" ESTABLISHED FOR A MAGAZINE IS NOT TO BE EXCEEDED. THIS LIMITATION MAY REQUIRE A QUANTITY REDUCTION FROM THE STORAGE AS SHOWN.
- F. STORED CONTAINERS MUST NOT CONTACT THE SIDES OF A MAGAZINE. THEREFORE, CONTAINERS MUST BE STORED A MINIMUM OF 6" FROM THE SIDEWALL OR CURVATURE OF THE MAGAZINE AS APPLICABLE. TO PROVIDE FOR THIS MANDATORY CLEARANCE REQUIREMENT, CONTAINERS MAY BE ELIMINATED FROM THE DEPICTED STORAGE PATTERN AS NECESSARY.
- G. AISLE DIMENSION SHOWN FOR STORAGE PROCEDURES IN MAGAZINES MAY BE ADJUSTED TO SUIT LOCAL CONDITIONS, VARIATIONS IN CONTAINER DIMENSIONS, AND/OR AVAILABLE MATERIAL HANDLING EQUIPMENT (MHE). HOWEVER, A 24" MINIMUM INSPECTION AISLE MUST BE MAINTAINED AT THE FORWARD END OF THE CONTAINERS WHERE HUMIDITY INDICATORS ARE LOCATED.
- H. THE MAXIMUM FLOOR LOAD FOR A MAGAZINE AS PRESCRIBED WILL NOT BE EXCEEDED.
- J. IF AVAILABLE MHE PERMITS, ADDITIONAL CONTAINERS MAY BE STORED WITHIN THE MHE AREA AND/OR OTHER AVAILABLE AREA OF THE MAGAZINE.
- K. THE HEIGHT OF THE PACKAGE GUARD ON SOME FORKLIFT TRUCKS MAY NOT PERMIT PLACEMENT OF SOME TOP LAYER CONTAINERS IN THE STACKS SHOWN IN THE STORAGE VIEWS HEREIN, UNLESS TWO UPPER CONTAINERS ARE HANDLED AS ONE LIFT OR THE PACKAGE GUARD IS REMOVED (TINE CARRIAGE WILL IN MOST INSTANCES PROVIDE ADEQUATE PACKAGE GUARD PROTECTION). ONLY A FORKLIFT TRUCK OF ADEQUATE CAPACITY WILL BE USED WHEN LIFTING TWO CONTAINERS AS ONE LIFT.
- L. THE USE OF NOMINAL SIZE 1" X 6" X 36" OR 2" X 6" X 36" FLOOR DUNNAGE UNDER EACH END OF EACH FIRST-LAYER CONTAINER IS OPTIONAL, ALTHOUGH THE USE OF THIS TYPE OF DUNNAGE IS DELINEATED WITHIN THIS STORAGE PROCEDURE DRAWING. THE PURPOSE OF FLOOR DUNNAGE IS TO HELP KEEP THE RUNNERS OF THE CONTAINERS DRY, THUS AIDING IN PREVENTING DETERIORATION DUE TO CORROSION. THEREFORE, FLOOR DUNNAGE SHOULD BE USED WHEN STORING IN A MAGAZINE THAT IS KNOWN TO HAVE A "DAMP" FLOOR. IN IGLOO, ARCH TYPE AND STRADLEY MAGAZINES WHICH HAVE FLOOR SLOPING TOWARD THE SIDEWALLS; THE DEPICTED STORAGE PATTERNS INCLUDE CONTAINER-STACKS WHICH STRADDLE THE RIDGE OF THE FLOOR AT THE CENTER OF THE MAGAZINE. THEREFORE, IN LIEU OF USING TWO-INCH THICK FLOOR DUNNAGE AS SPECIFIED, THE USE OF THINNER FLOOR DUNNAGE MAY BE REQUIRED, AND SHOULD BE USED, TO ACHIEVE THE DESIRED OBJECTIVE. STACK STABILIZING DUNNAGE IN THE FORM OF SHIMS WILL BE USED IF REQUIRED TO ACHIEVE SOUND AND ACCEPTABLE STABLE STACKS FROM THE FLOOR TO THE TOP OF THE STACK. SHIM MATERIAL OF VARYING THICKNESSES OR THICKER FLOOR DUNNAGE WILL BE USED AS REQUIRED UNDER THE LOAD BEARING LOCATIONS AT THE ENDS OF THE FIRST-LAYER CONTAINERS. **NOTE:** SOME VIEWS WITHIN THIS DRAWING WILL NOT DEPICT ALL FLOOR DUNNAGE THAT IS REQUIRED WHEN DUNNAGE IS USED. SEE THE "FLOOR DUNNAGE AND SHIM LOCATION DETAILS" ON PAGE 14 FOR A TYPICAL INSTALLATION.

(CONTINUED AT RIGHT)

- M. WHEN LOCAL STORAGE CONDITIONS ARE SUCH THAT AN AMMUNITION STORAGE MAGAZINE NET EXPLOSIVE WEIGHT LIMIT WILL BE REACHED BEFORE ALL AVAILABLE STORAGE SPACE WILL BE UTILIZED, A COMBINATION OF THE VARIOUS STORAGE PATTERNS DELINEATED HEREIN MAY BE USED IN LIEU OF BLOCK STORAGE PATTERNS TO FACILITATE INVENTORY, INSPECTION, THE USE OF MATERIAL HANDLING EQUIPMENT, SURVEILLANCE, ETC., OF THE AMMUNITION TO BE STORED WITHIN THE MAGAZINE.
- N. CONTAINERS PRESENTLY STORED IN ACCORDANCE WITH A PRIOR APPROVED DRAWING NEED NOT BE RE-STORED SOLELY TO CONFORM TO THE PROCEDURES SPECIFIED IN THIS DOCUMENT.
- O. OTHER COMPATIBLE ITEMS MAY BE STORED IN A MAGAZINE, WHICH IS PARTIALLY FILLED WITH THE DESIGNATED ITEM.
- P. PORTIONS OF THE MAGAZINES, SUCH AS SIDEWALLS, END WALLS, AND ROOFS HAVE NOT BEEN SHOWN IN THE STORAGE VIEWS FOR CLARITY PURPOSES.
- Q. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- R. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENT MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM, AND ONE POUND EQUALS 0.454 KG.

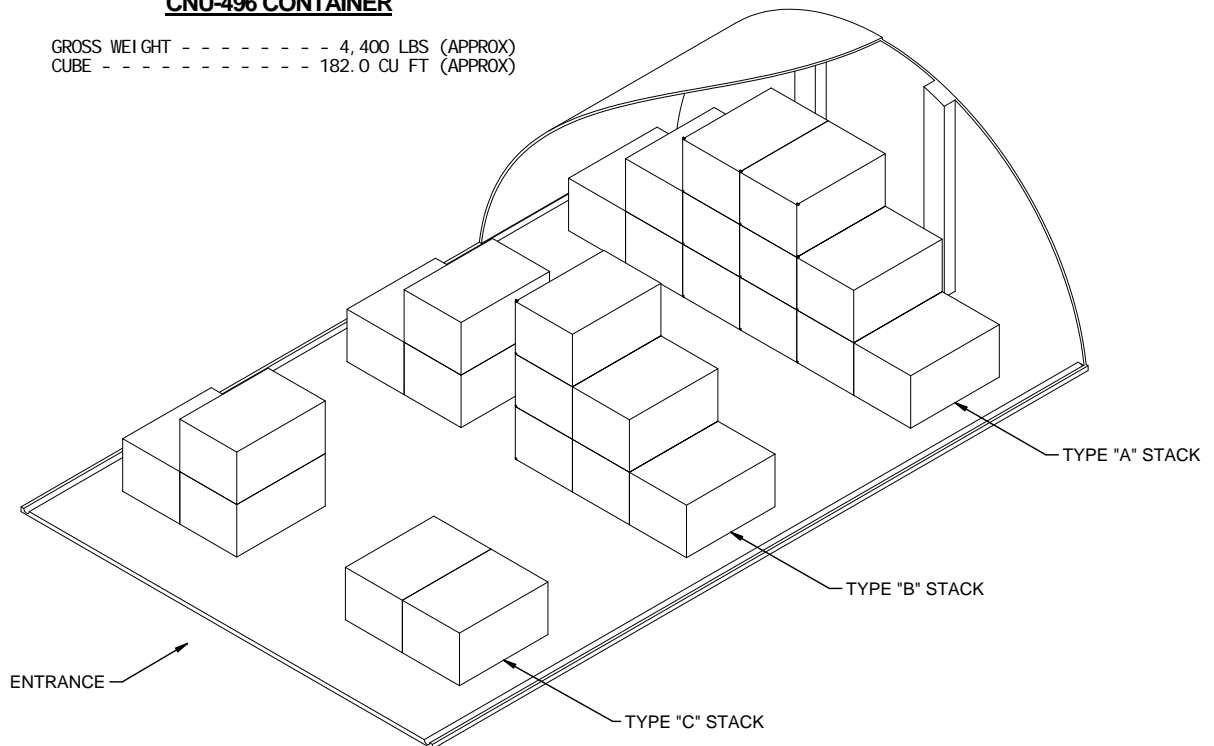
MATERIAL SPECIFICATIONS

LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.



CNU-496 CONTAINER

GROSS WEIGHT - - - - - 4,400 LBS (APPROX)
 CUBE - - - - - 182.0 CU FT (APPROX)

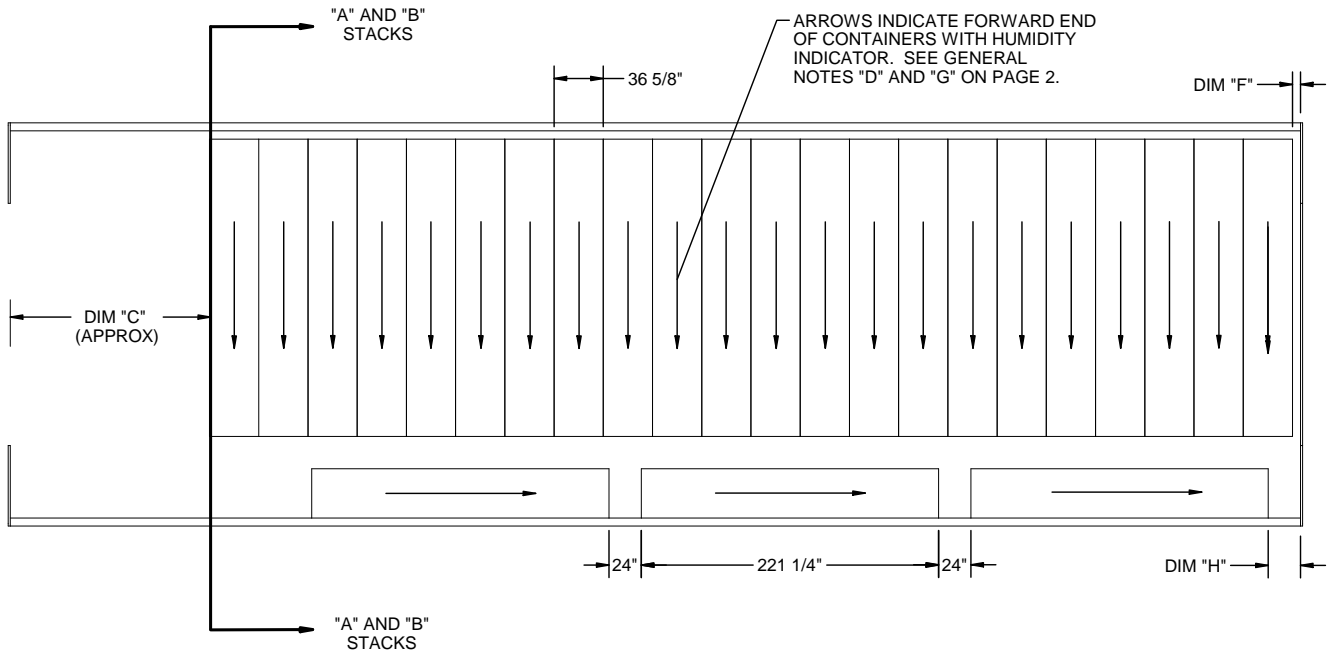


STACK IDENTIFICATION

A TYPE "A" STACK IS IDENTIFIED AS A GROUP OF ITEMS/UNITS WHICH EXTENDS FULL WIDTH AND HEIGHT OF THE MAGAZINE, AND IS ONE ITEM/UNIT LONG IN THE LENGTH OF THE MAGAZINE.

A TYPE "B" STACK IS IDENTIFIED AS A GROUP OF ITEMS/UNITS WHICH EXTEND FULL WIDTH AND HEIGHT OF THE MAGAZINE, AND IS ONE UNIT/ITEM LONG, BUT HAS AN AISLE AT OR NEAR THE CENTER OF THE WIDTH OF THE STACK.

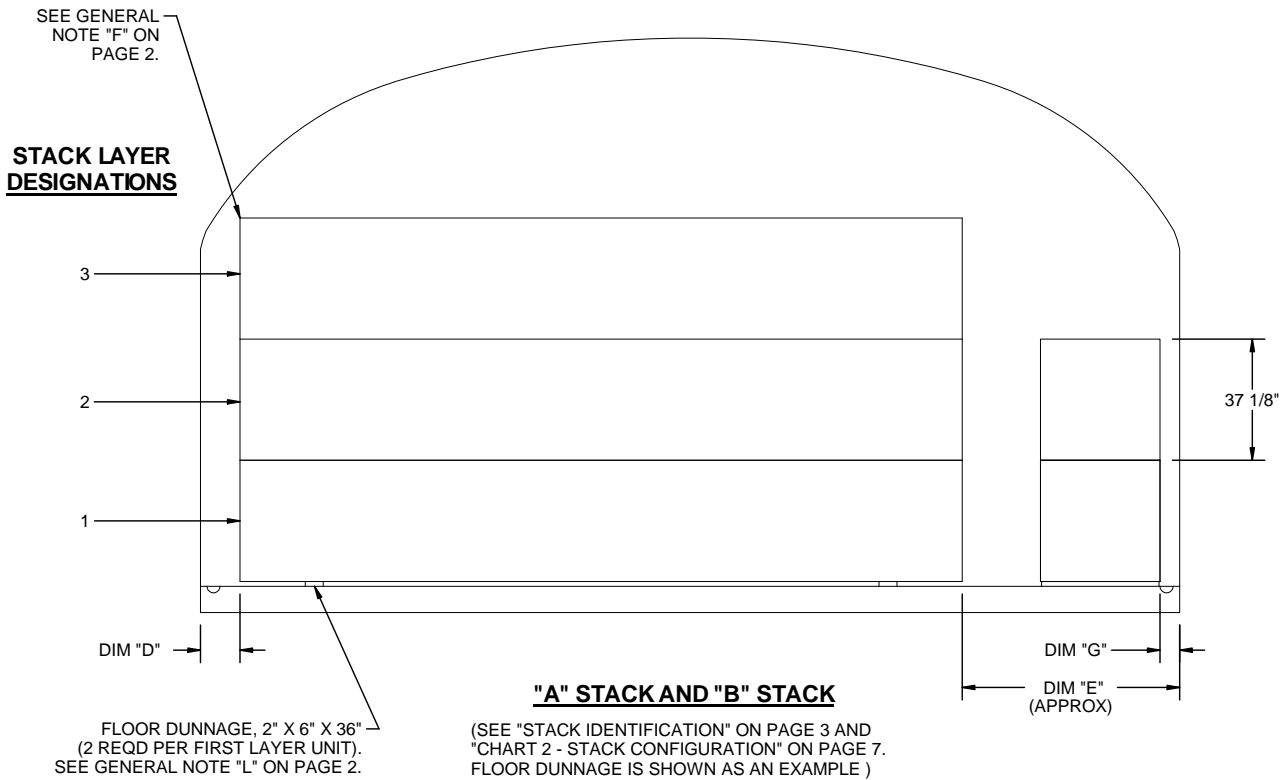
A TYPE "C" STACK IS IDENTIFIED AS A GROUP OF ITEMS/UNITS WHICH IS ONE UNIT/ITEM LONG AND CONSISTS OF PARTIAL STACKS ON EACH SIDE OF THE MAGAZINE, USUALLY ONE ITEM/UNIT HIGH ON ONE SIDE OF THE MAGAZINE.



PLAN VIEW

NOTE: FOR IDENTIFICATION OF LETTERED DIMENSIONS REFER TO CHART 1 ON PAGE 5.

STACK COLUMN DESIGNATIONS



SPECIAL NOTES:

1. THE FOLLOWING NOTES, CHART 1 ON THIS PAGE AND CHART 2 ON PAGE 7 ARE PRESENTED AS GUIDANCE IN THE SELECTION OF A STORAGE PATTERN, AND IN DETERMINING THE QUANTITY OF CONTAINERS WHICH CAN BE STORED IN THE STORAGE MAGAZINES LISTED IN THESE CHARTS.
2. CHART 1 ON THIS PAGE DESCRIBES THE STORAGE MAGAZINE GENERAL DIMENSIONS AND THE DIMENSIONS OF THE CONTAINER SPACING WITHIN THE STORAGE MAGAZINES.
3. DIMENSIONS "A" AND "B" HAVE BEEN OMITTED TO AVOID CONFUSION WITH STACKS "A" AND "B".
4. CHART 2 ON PAGE 7 DETAILS THE QUANTITY OF CONTAINERS IN EACH TYPE OF MAGAZINE AND THE LAYOUT OF THE STACKS FOR EACH TYPE OF MAGAZINE. THE CHART SHOWS THE NUMBER OF CONTAINERS IN EACH STACK LAYER AND THE LOCATION OF THE CONTAINER ON EACH LAYER.

(CONTINUED AT RIGHT)

EXAMPLE:

CHART 2 – "A" STACK CONFIGURATION
MAGAZINE: STRADLEY

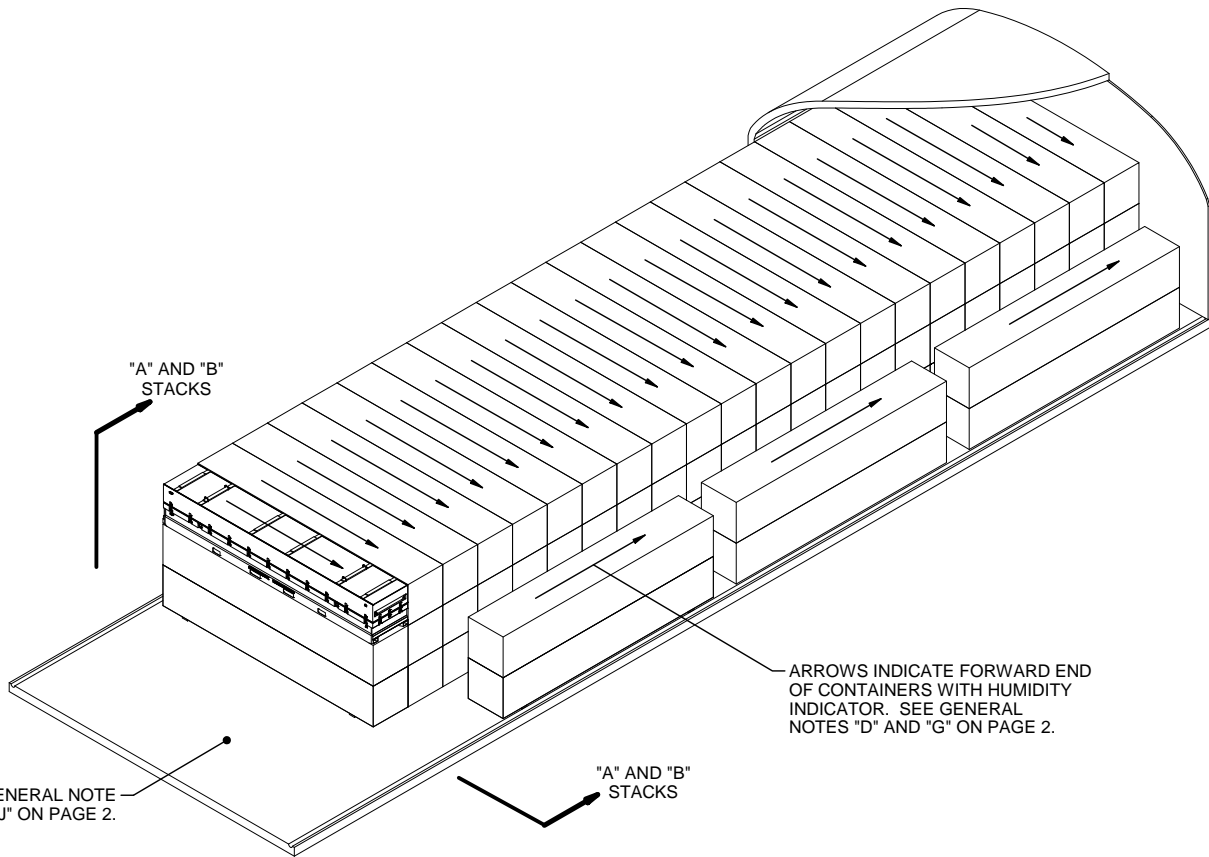
LAYER NUMBER 1: 1
LAYER NUMBER 2: 1
LAYER NUMBER 3: 1

EXPLANATION:

LAYER 1 (BOTTOM LAYER) HAS ONE CONTAINER.
LAYER 2 (ON TOP OF LAYER 1) HAS ONE CONTAINER.
LAYER 3 (ON TOP OF LAYER 2) HAS ONE CONTAINER.

CHART 1 - DIMENSIONS

MAGAZINE DIMENSIONS	MAGAZINE TYPE														
	IGLOO			ARCH 12'		ARCH 11'		ARCH 10'		OVAL ARCH	STRADLEY	STEEL ARCH			
LENGTH	40'-4"	60'-8"	81'-0"	26'-6"	25'-0"	40'-0"	80'-0"	40'-0"	80'-0"	40'-0"	80'-0"	89'-0"	80'-0"	59'-0"	89'-0"
WIDTH	26'-6"			26'-6"	25'-0"	25'-0"	25'-0"	25'-0"		25'-0"	24'-10"	25'-0"	25'-0"	25'-0"	24'-11"
HEIGHT	12'-9"			12'-1-3/4"		11'-0"		10'-0"		14'-5"	14'-0"	14'-0"	14'-0"	14'-0"	13'-6"
DIMENSIONS	CONTAINER SPACING DIMENSIONS														
DIM "C" (MHE AISLE APPROX)	12'-5"	11'-5"	13'-5"	12'-11"	12'-1"	11'-9"	11'-5"	11'-9"	12'-7"	12'-5"	12'-5"	12'-5"	12'-11"	12'-5"	
DIM "D" ("A" STACK LEFT)	48-1/2"	48-1/2"	48-1/2"	48"	39-1/2"	39-1/2"	38-1/2"	38-1/2"	38-1/2"	38-1/2"	15-1/2"	12"	39-1/2"	39"	
DIM "E" ("A" STACK RIGHT)	48"	48"	48"	47-1/2"	39"	39"	39"	39"	39"	39"	6'-4"	66-1/2"	39"	38-1/2"	
DIM "F" ("A" STACK BACK)	6"	6"	6"	14"	6"	14"	14"	14"	6"	6"	6"	6"	6"	6"	
DIM "G" ("B" STACK)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15"	6"	N/A	N/A	
DIM "H" ("B" STACK BACK)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24"	24"	N/A	N/A	



ISOMETRIC VIEW

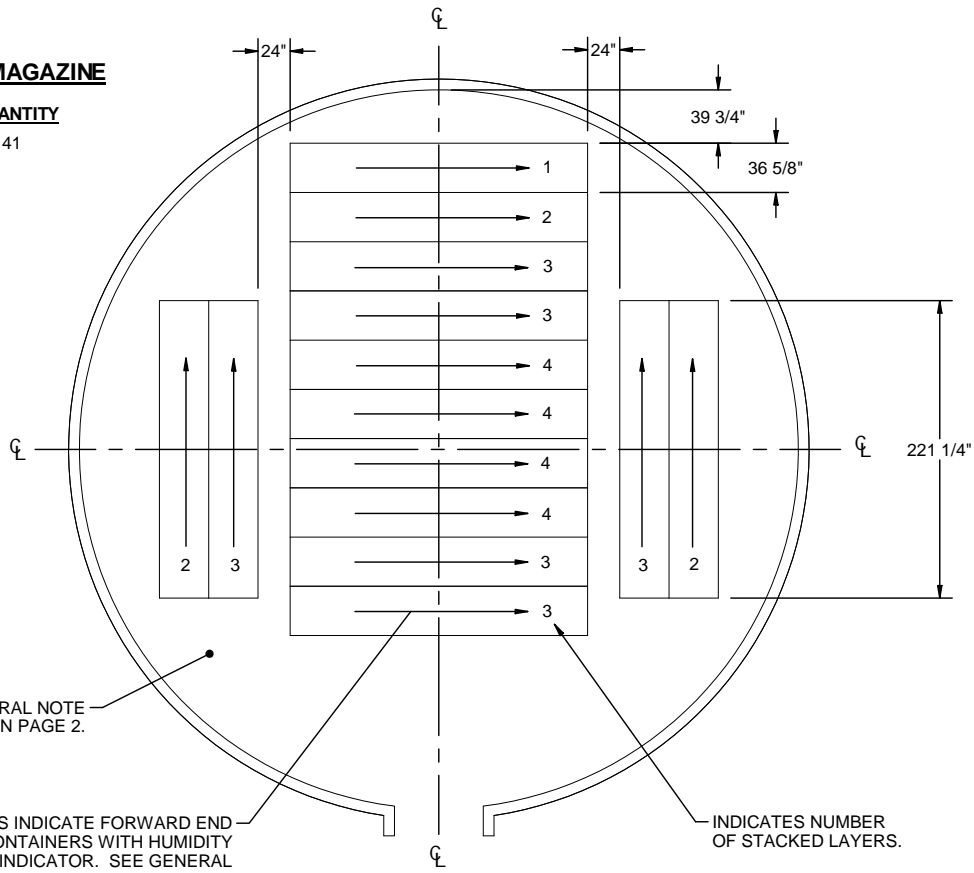
STRADLEY MAGAZINE SHOWN AS TYPICAL.

CHART 2 - STACK CONFIGURATION

MAGAZINE TYPE														
QUANTITY PER MAGAZINE	IGLOO			ARCH 12'	ARCH 12' X 25' W		ARCH 11'		ARCH 10'		OVAL ARCH	STRADLEY	STEEL ARCH	
	40'-4" L	60'-8" L	81'-0" L	26'-6" W	40'-0" L	80'-0" L	40'-0" L	80'-0" L	40'-0" L	80'-0" L			59'-0" L	89'-0" L
	18	32	44	44	18	44	9	22	9	22	87	72	30	50
"A" STACK CONFIGURATION														
LAYER	CONTAINERS PER LAYER													
1	1			1	1		1		1		1	1	1	
2	1			1	1		0		0		1	1	1	
3	0			0	0		0		0		1	1	0	
SINGLE STACK TOTAL	2			2	2		1		1		3	3	2	
NUMBER OF STACKS	9	16	22	22	9	22	9	22	9	22	25	22	15	25
"A" STACK TOTAL	18	32	44	44	18	44	9	22	9	22	75	66	30	50
"B" STACK CONFIGURATION														
LAYER	CONTAINERS PER LAYER													
1	0			0	0		0		0		1	1	0	
2	0			0	0		0		0		1	1	0	
3	0			0	0		0		0		1	0	0	
SINGLE STACK TOTAL	0			0	0		0		0		3	2	0	
NUMBER OF STACKS	0	0	0	0	0	0	0	0	0	0	4	3	0	0
"B" STACK TOTAL	0	0	0	0	0	0	0	0	0	0	12	6	0	0

STORAGE IN 44'-7" MAGAZINE

ITEM	QUANTITY
CONTAINER	----- 41



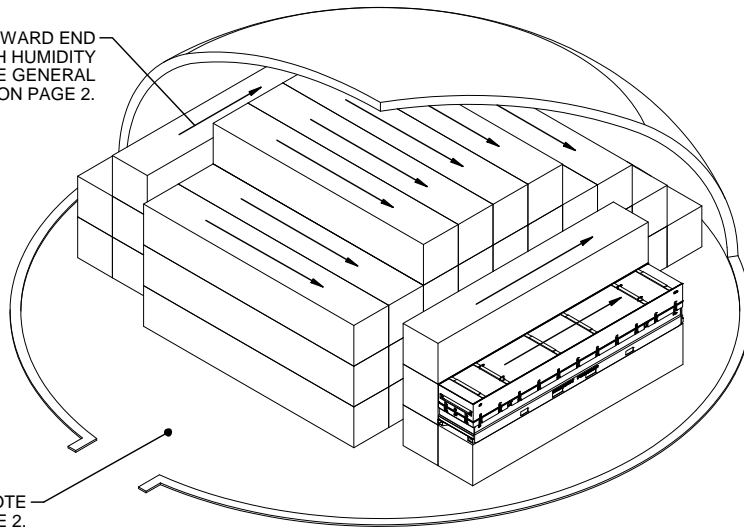
SEE GENERAL NOTE "J" ON PAGE 2.

ARROWS INDICATE FORWARD END OF CONTAINERS WITH HUMIDITY INDICATOR. SEE GENERAL NOTES "D" AND "G" ON PAGE 2.

INDICATES NUMBER OF STACKED LAYERS.

PLAN VIEW

ARROWS INDICATE FORWARD END OF CONTAINERS WITH HUMIDITY INDICATOR. SEE GENERAL NOTES "D" AND "G" ON PAGE 2.

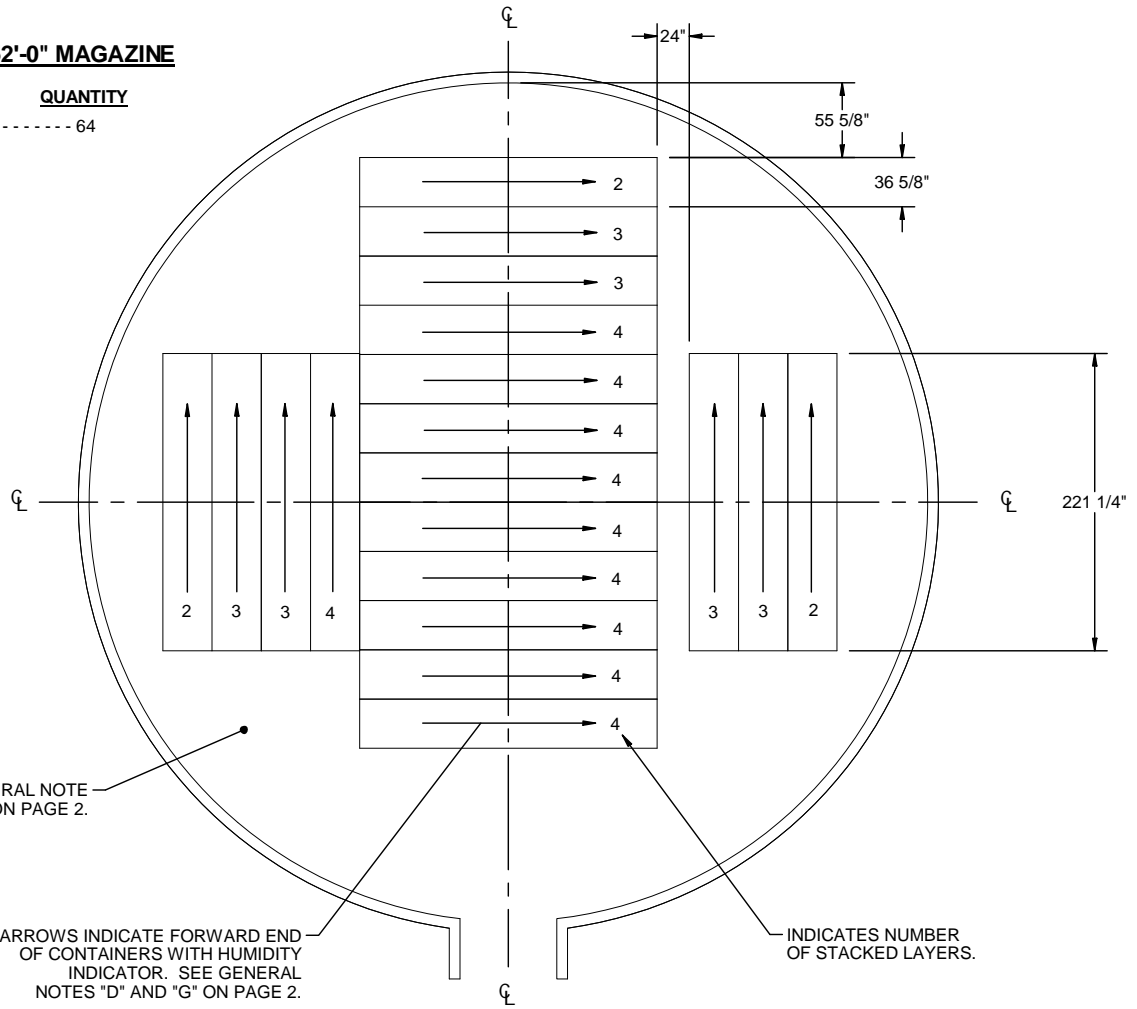


SEE GENERAL NOTE "J" ON PAGE 2.

ISOMETRIC VIEW

STORAGE IN 52'-0" MAGAZINE

ITEM	QUANTITY
CONTAINER	-----64



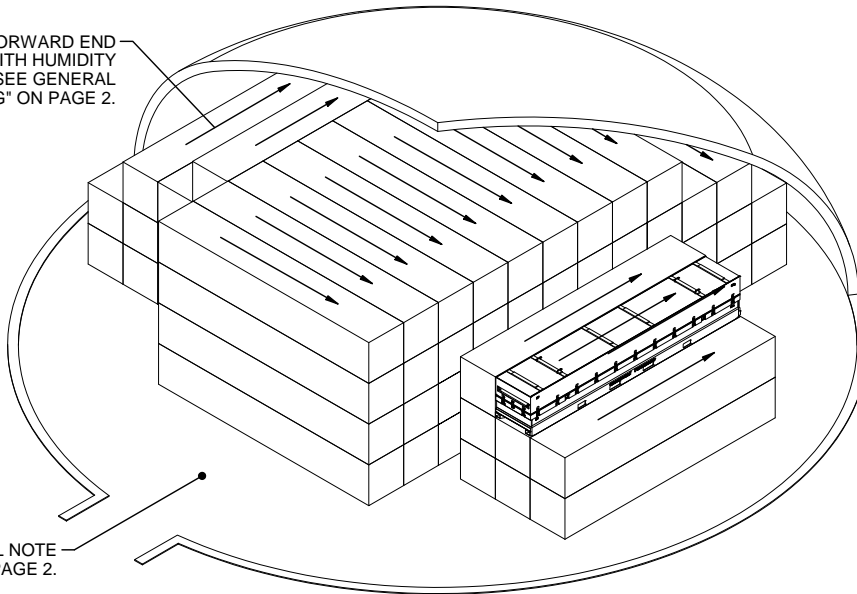
SEE GENERAL NOTE "J" ON PAGE 2.

ARROWS INDICATE FORWARD END OF CONTAINERS WITH HUMIDITY INDICATOR. SEE GENERAL NOTES "D" AND "G" ON PAGE 2.

INDICATES NUMBER OF STACKED LAYERS.

PLAN VIEW

ARROWS INDICATE FORWARD END OF CONTAINERS WITH HUMIDITY INDICATOR. SEE GENERAL NOTES "D" AND "G" ON PAGE 2.



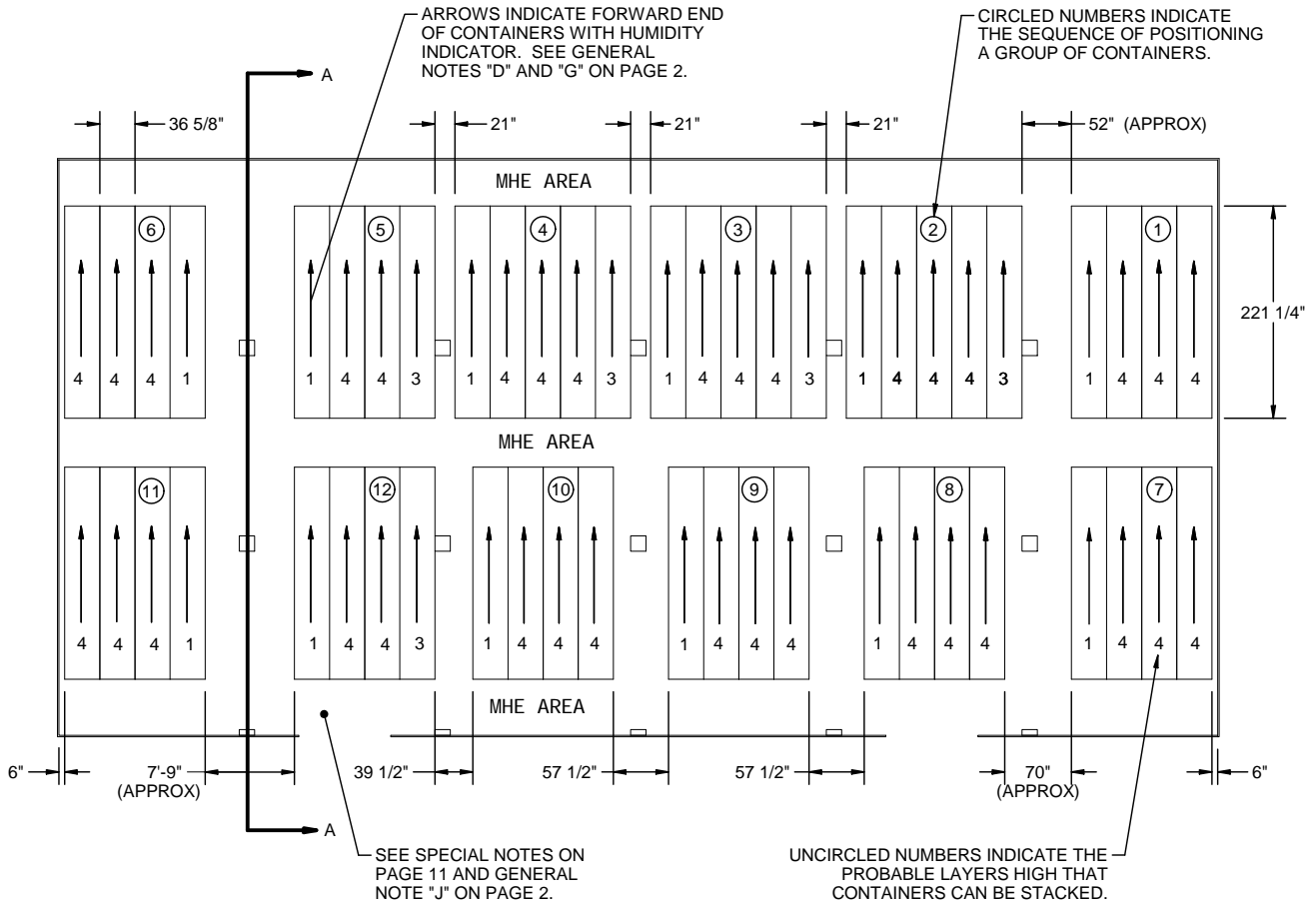
SEE GENERAL NOTE "J" ON PAGE 2.

ISOMETRIC VIEW

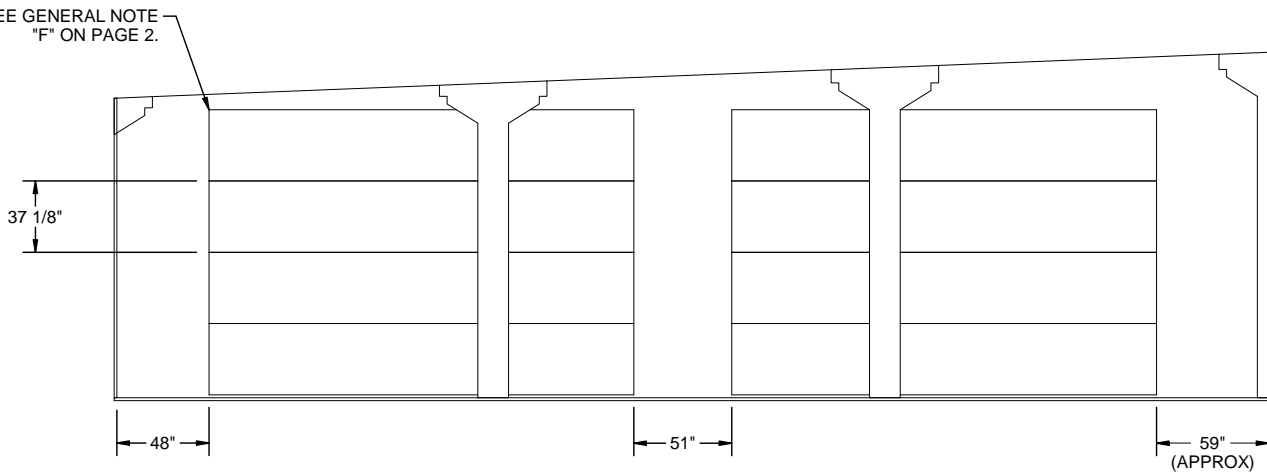
52"-0" CORBETTA MAGAZINE

STORAGE IN RECTANGULAR MAGAZINE

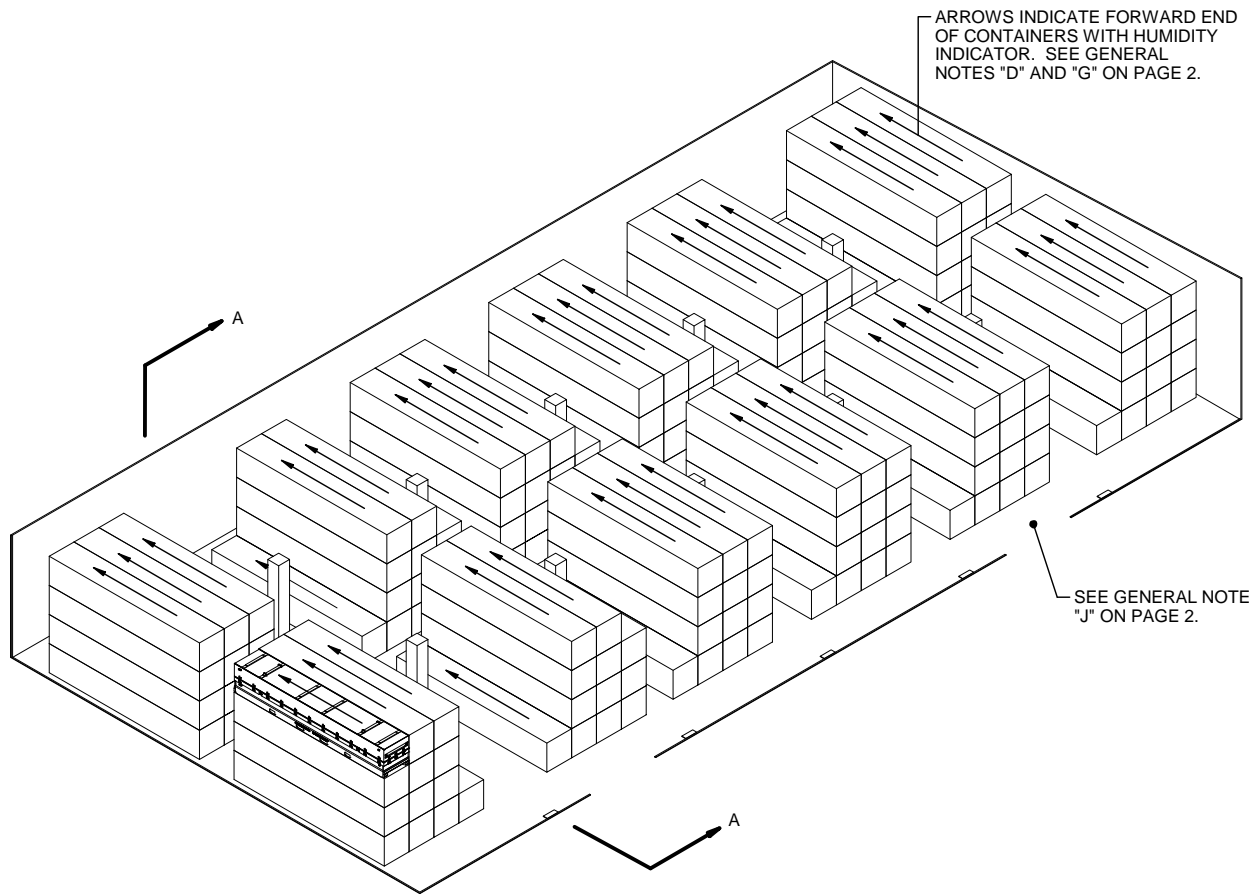
ITEM **QUANTITY**
CONTAINER ----- 163



PLAN VIEW



SECTION A-A



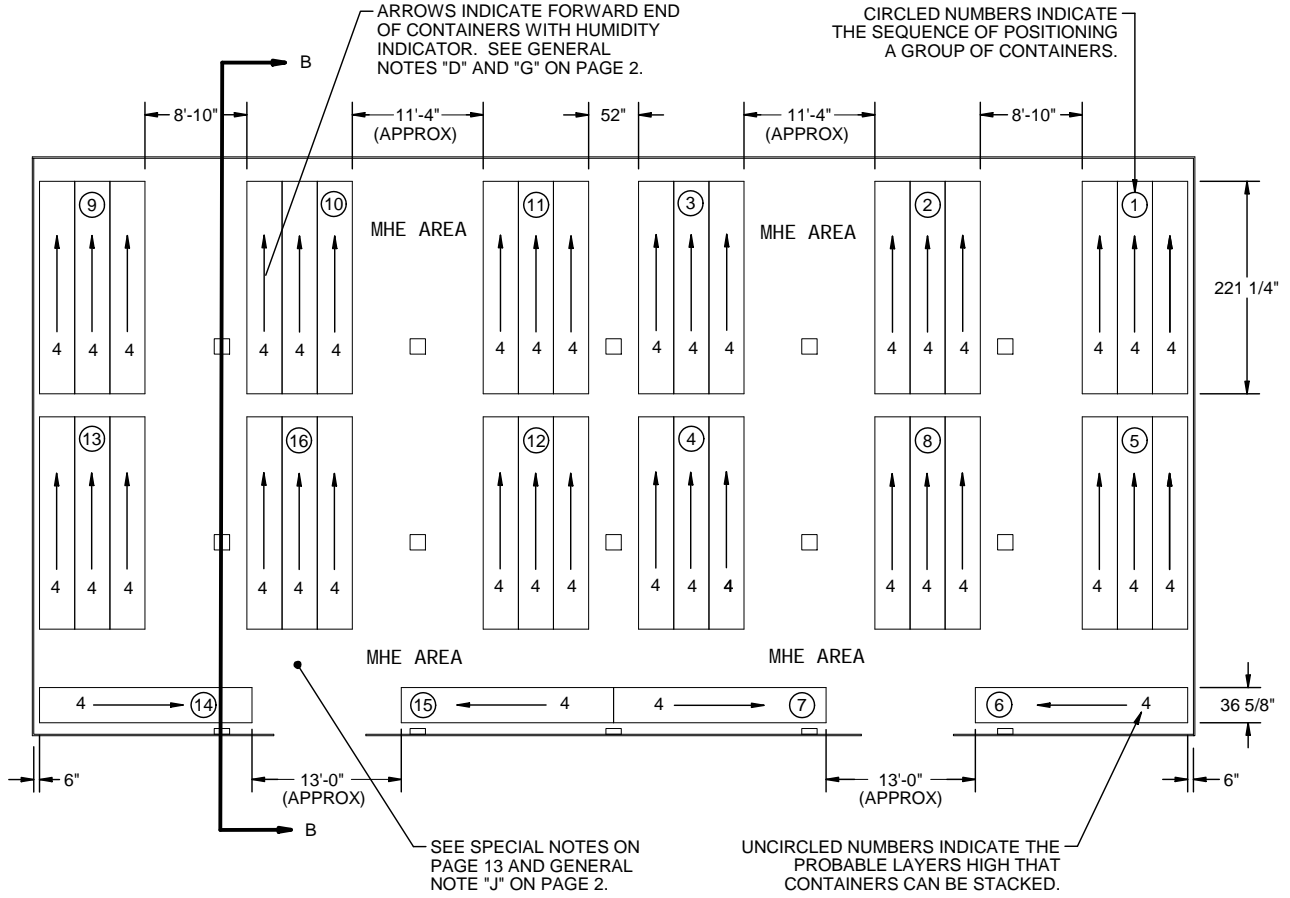
ISOMETRIC VIEW

SPECIAL NOTES:

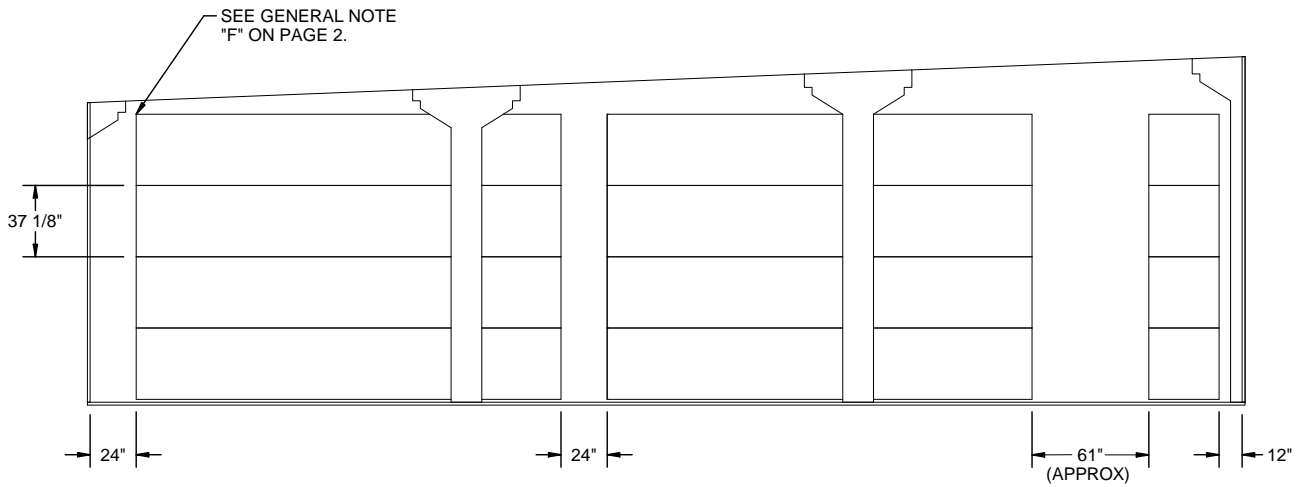
1. DUE TO THE LENGTH OF THE CONTAINER AND THE LOCATION OF THE COLUMNS IN THE MAGAZINE, THE PLAN VIEWS ON PAGES 10 AND 12 DEPICT TWO TYPES OF STORAGE PATTERNS WHICH CAN BE ACCOMPLISHED DEPENDING ON THE AVAILABLE MHE.
2. THE MAGAZINE ABOVE DEPICTS 4, 3, AND 1 CONTAINER HIGH STACKS WHICH CAN BE ACCOMPLISHED BY END-HANDLING A CONTAINER WITH 2 PALLET JACKS AND PLACING IT IN A STORAGE LOCATION. STACKING CONTAINERS UP TO 4 LAYERS HIGH CAN THEN BE ACCOMPLISHED BY USE OF A CONVENTIONAL FRONT LOADER FORKLIFT TRUCK. STACKS HAVE BEEN POSITIONED TO PROVIDE ADEQUATE SPACE FOR REMOVAL OF THE PALLET JACKS AND ALSO PROVIDE ACCESS FOR STACKING BY FORKLIFT TRUCK.

STORAGE IN RECTANGULAR MAGAZINE

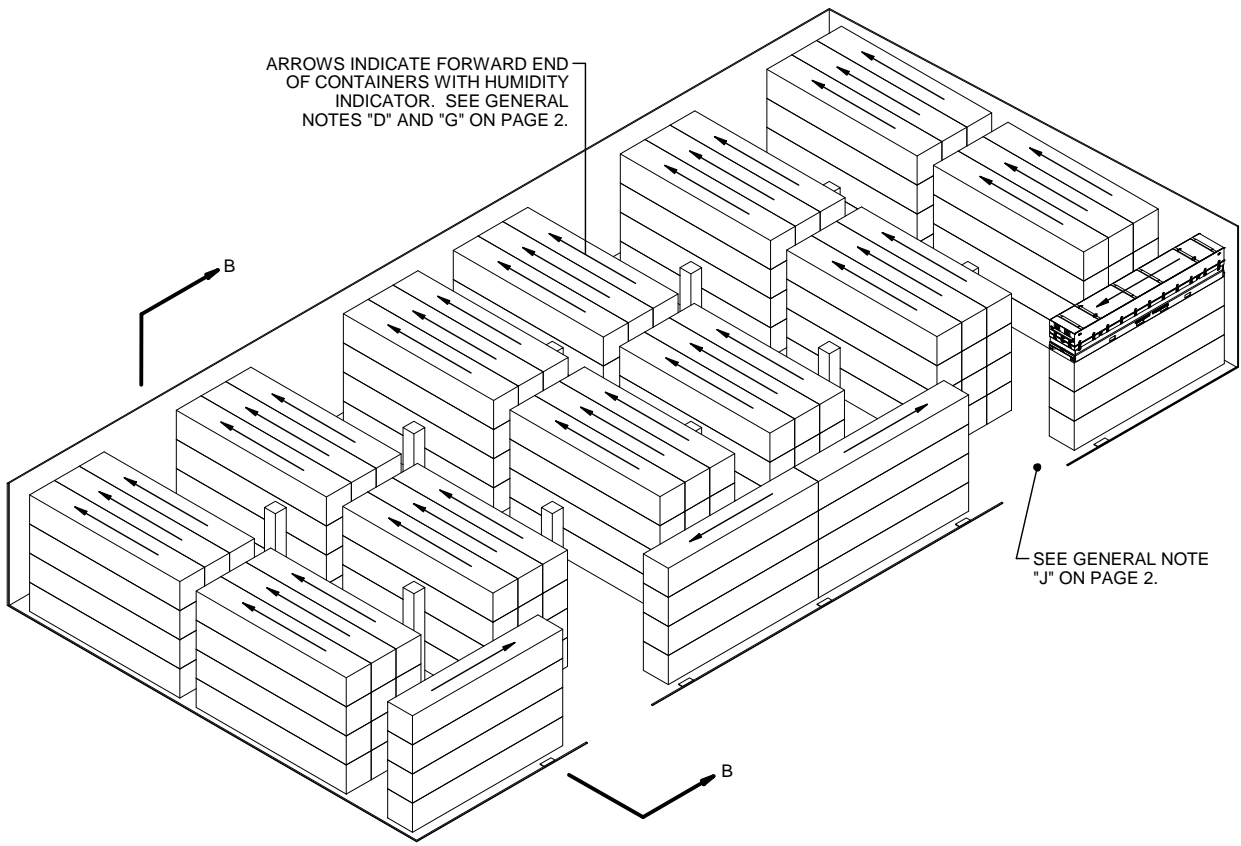
ITEM	QUANTITY
CONTAINER - - - - -	160



PLAN VIEW



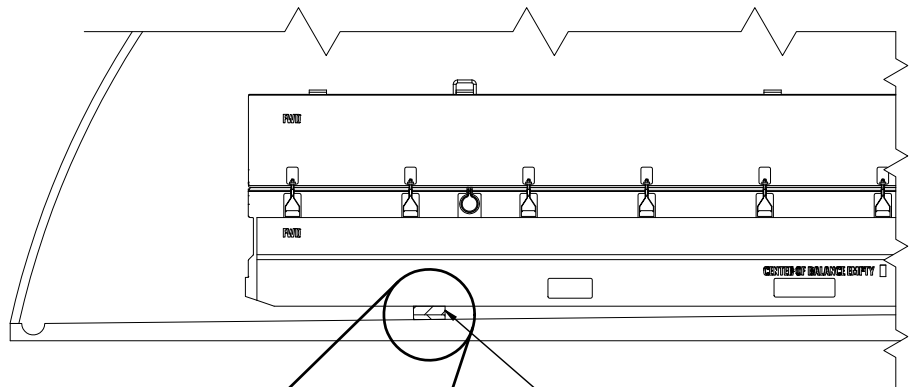
SECTION B-B



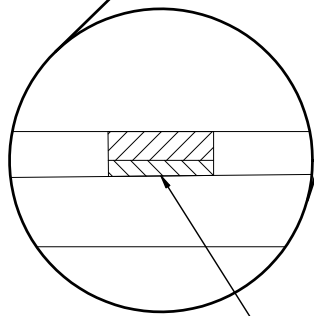
ISOMETRIC VIEW

SPECIAL NOTES

1. DUE TO THE LENGTH OF THE CONTAINER AND THE LOCATION OF THE COLUMNS IN THE MAGAZINE, THE PLAN VIEWS ON PAGES 10 AND 12 DEPICT TWO TYPES OF STORAGE PATTERNS WHICH CAN BE ACCOMPLISHED DEPENDING ON THE AVAILABLE MHE.
2. THE MAGAZINE ABOVE DEPICTS 4 CONTAINER HIGH STACKS WHICH CAN BE ACCOMPLISHED BY USE OF A FRONT/SIDE LOADER FORKLIFT TRUCK. THE FORKLIFT TRUCK MUST BE CAPABLE OF SIDE HANDLING A 18'-6" LONG CONTAINER; MUST HAVE ADEQUATE CAPACITY FOR LIFTING A CONTAINER TO THE VARIOUS HEIGHTS FOR STACKING; AND MUST HAVE THE CAPABILITY FOR MANEUVERING AROUND THE COLUMNS FOR PLACEMENT IN THE STACK. AN ADDITIONAL STACK CAN BE STORED AT ANY OF THE LOCATIONS SHOWN IF MHE PERMITS.



FLOOR DUNNAGE, 1" OR 2" X 6" X 36"
 (2 REQD PER FIRST LAYER CONTAINER).
 SEE GENERAL NOTE "L" ON PAGE 2.



SHIM (AS REQD TO PROVIDE A LEVEL
 BEARING SURFACE FOR THE FIRST
 LAYER CONTAINERS). POSITION
 UNDER CONTAINER SKIDS. SEE
 GENERAL NOTE "L" ON PAGE 2.