

# ATACMS

## MINIMUM REQUIREMENTS FOR THE HANDLING, STOWAGE, AND BRACING ABOARD SHIPS AND BARGES OF GUIDED MISSILE LAUNCHING ASSEMBLY (GMLA) FOR THE ARMY TACTICAL MISSILE SYSTEM

### INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES - - - - -	2
GUIDED MISSILE LAUNCHING ASSEMBLY DETAIL AND ATTACHMENT OF HANDLING SLING TO GUIDED MISSILE LAUNCHING ASSEMBLY - - - - -	3
BRACING OF ONE LAYER OF GUIDED MISSILE LAUNCHING ASSEMBLIES - - - - -	4
BRACING OF TWO LAYERS OF GUIDED MISSILE LAUNCHING ASSEMBLIES - - - - -	5
BRACING OF FOUR LAYERS OF GUIDED MISSILE LAUNCHING ASSEMBLIES - - - - -	6, 7
ALTERNATIVE METHODS OF BRACING GUIDED MISSILE LAUNCHING ASSEMBLIES - - - - -	8, 9
BRACING DETAILS - - - - -	10, 11
BRACING OF GUIDED MISSILE LAUNCHING ASSEMBLIES IN BARGES - - - - -	12
DETAILS - - - - -	13, 14

### U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY AVIATION AND MISSILE COMMAND  	ENGINEER	BASIC		<b>DO NOT SCALE</b>			
		REV.	<b>WALTER GORDON</b>		WEBSITE: <a href="http://www.dac.army.mil">HTTP://WWW.DAC.ARMY.MIL</a>		
	TECHNICIAN	BASIC	<b>RICHARD HAYNES</b>		<b>JULY 1993</b>		
	REV.	<b>RICHARD HAYNES</b>		REVISION NO. 2		JUNE 2001	
	DRAFTSMAN	BASIC		SEE THE REVISION LISTING ON PAGE 2			
		REV.		CLASS	DIVISION	DRAWING	FILE
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND  	TRANSPORTATION ENGINEERING DIVISION			19	48	5786	GM18AT1
	VALIDATION ENGINEERING DIVISION						
U.S. ARMY DEFENSE AMMUNITION CENTER	LOGISTICS ENGINEERING OFFICE						

**NOTES**

**(NOTES CONTINUED)**

**GENERAL:**

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THIS DRAWING DEPICTS MINIMUM PROCEDURES APPLICABLE TO THE HANDLING, STOWAGE AND BRACING ABOARD SHIPS AND BARGES OF THE ARMY TACTICAL MISSILE SYSTEM (ATACMS) COMPLETE ROUND WHEN PACKED IN THE GUIDED MISSILE LAUNCHING ASSEMBLY (GMLA).
- C. OTHER TYPES OF CARGO MAY BE STORED IN THE SAME HOLD OR TWEEN DECK PROVIDING THE ITEMS STOWED ARE COMPATIBLE WITH THE GMLA SHOWN HEREIN. PERTINENT REQUIREMENT OF TITLE 49 CODE OF FEDERAL REGULATION, PART 176, MUST BE APPLIED.
- D. FOR DETAILS OF THE GMLA, SEE THE "GUIDED MISSILE LAUNCHING ASSEMBLY" DETAIL ON PAGE 3.
- E. DUNNAGE LUMBER SPECIFIED 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" BY 5-1/2" WIDE.
- F. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM, AND ONE POUND EQUALS 0.45 KG.

**HANDLING:**

- A. PERTINENT PROVISIONS OF TITLE 49 CODE OF FEDERAL REGULATIONS APPLY.
- B. EACH GMLA WILL BE HANDLED INDIVIDUALLY AND SHOULD BE ACCOMPLISHED BY USING THE LIFT POINTS DESIGNATED HEREIN.
- C. THE HANDLING SLING SHOULD BE EQUIPPED WITH SAFETY TYPE HOOKS AND SHALL BE OF A DESIGN AND CONFIGURATION TO LIFT THE ITEM IN SUCH A MANNER THAT THE GMLA IS NOT DAMAGED.
- D. ALTHOUGH DESIRABLE, A LEVEL LIFT IS NOT MANDATORY. THE CENTER OF BALANCE OF THIS ITEM IS SHOWN TO ASSIST IN DETERMINING CABLE LENGTHS TO ASSURE A SAFE LIFT.
- E. LAY THE SLING LIFTING RINGS (GMLA LIFT POINTS) ON TOP OF ASSEMBLY FRAME TO FACILITATE HANDLING.

(CONTINUED AT RIGHT)

**STOWAGE AND BRACING:**

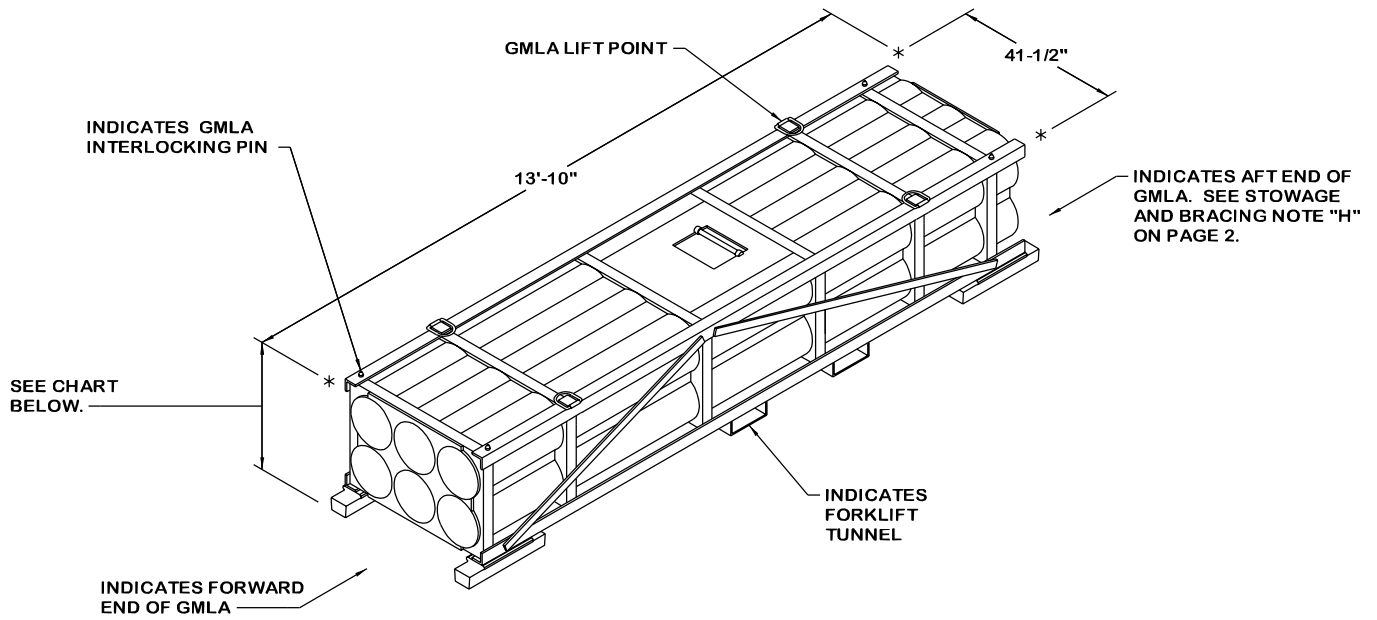
- A. STOWAGE OF THIS ITEM IS RESTRICTED TO FOUR LAYERS HIGH. UNLESS OPERATIONALLY NECESSARY, IT IS RECOMMENDED NOT TO STOW GMLAs MORE THAN THREE LAYERS HIGH. ALSO, OTHER CARGO ITEMS MUST NOT BE STACKED OR STOWED ON TOP OF THE GMLA.
- B. WHEN STOWING THE GMLAs WITHIN THE HOLD, OR TWEEN DECK, BRACING SHALL ONLY BE APPLIED AGAINST THE SKIDS AND/OR STRONG POINTS. SEE NOTES "F" AND "H" BELOW.
- C. ADJACENT GMLAs MUST BE SEPARATED BY BRACING MEMBERS AND/OR ANTI-CHAFING MATERIAL TO AVOID DAMAGE TO ITEMS BY DIRECT CONTACT WITH EACH OTHER. TO PREVENT DISPLACEMENT OF THE ANTI-CHAFING MATERIAL, .0800" DIA WIRE OR OTHER SUITABLE MATERIAL WILL BE PASSED AROUND THE FRAMEWORK OF THE GMLA AND AROUND THE ANTI-CHAFING PIECES.
- D. SUPPORT BLOCKS AS SHOWN ON PAGE 7 IN THE "GMLA STACKING DETAIL" MUST BE USED UNDER ALL LAYERS OF GMLAs EXCEPT FOR THE TOP LAYER, SO AS TO PREVENT DAMAGE TO THE SHOCK ISOLATORS. TWO SUPPORT BLOCKS WILL BE REQUIRED UNDER EACH GMLA.
- E. SPECIES, GRADE AND SIZE OF LUMBER TO BE USED WILL COMPLY WITH REQUIREMENTS OF CURRENT SHIPWRIGHT-CARPENTRY AND RELATED SERVICES CONTRACTS. BRACING METHODS AND LUMBER SIZES DEPICTED IN THIS DRAWING ARE CONSIDERED MINIMUM AND ARE NOT INTENDED TO CONFLICT WITH CONTRACT REQUIREMENTS.
- F. CAUTION: CARE MUST BE EXERCISED TO ENSURE THAT PRESSURE IS NOT APPLIED AGAINST THE ENDS AND SIDES OF THE GMLA OR THE UPPER RAIL NEAR THE CROSSMEMBER MARKED "NO STEP" DURING HANDLING OPERATIONS OR WHEN BRACED. ALSO, PERSONNEL SHALL NOT STAND OR WALK ON THE FIBERGLASS TOP OR THE CROSSMEMBERS SO MARKED.
- G. IT IS RECOMMENDED THAT THE GMLAs BE STOWED LENGTHWISE IN THE SHIP AS SHOWN; HOWEVER, CROSSWISE STOWAGE IS ACCEPTABLE. STACKED GMLAs SHALL BE STOWED WITH THE FORWARD END OF AN UPPER GMLA DIRECTLY ABOVE THE FORWARD END OF A LOWER GMLA.
- H. NEW STYLE GMLAs AS REFERENCED IN THE REVISION BLOCK ON THIS PAGE HAVE END COVERS ON THE AFT END OF THE GMLA THAT EXTEND SLIGHTLY BEYOND THE TOP AND BOTTOM RAILS. SEE THE END BLOCKING DETAILS ON PAGE 14, WHICH MUST BE USED WHEN BRACING AGAINST THE NEW GMLAs.

**MATERIAL SPECIFICATIONS**

- LUMBER - - - - - : VOLUNTARY PRODUCT STANDARD PS 20; DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE FROM MATERIAL DEFECTS.
- NAILS - - - - - : ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
- PLYWOOD - - - - - : COMMERCIAL ITEM DESCRIPTION A-A-55057, INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
- WIRE, CARBON STEEL - - : ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.
- ANTI-CHAFING MATERIAL - - - - - : MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

**REVISIONS**

- REVISION NO. 1, DATED JANUARY 1997, CONSISTS OF:
  - 1. ADDITION OF PLYWOOD SPACERS TO END BLOCKING ASSEMBLIES FOR USE WITH NEW STYLE MISSILE/LAUNCH POD ASSEMBLIES.
- REVISION NO. 2, DATED JUNE 2001, CONSISTS OF:
  - 1. CHANGING "MISSILE/LAUNCH POD ASSEMBLY" AND "MLPA" TO "GUIDED MISSILE LAUNCHING ASSEMBLY" AND "GMLA".
  - 2. ADDING HANDLING, STOWAGE, AND BRACING PROCEDURES FOR THE BLOCK IA, BLOCK II, TACMS 2K, AND IA UNITARY GUIDED MISSILE LAUNCHING ASSEMBLIES.
  - 3. ADDING HANDLING NOTE "E".
  - 4. ADDING ADDITIONAL DETAILS AND NOTES THROUGHOUT THE DRAWING.
  - 5. UPDATING DRAWING FORMAT.

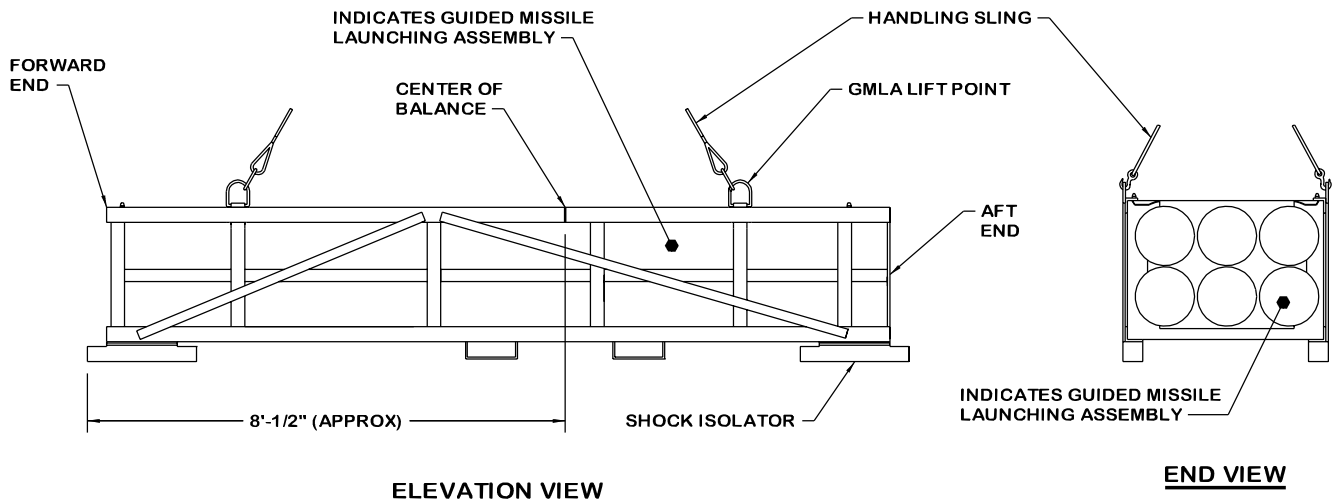


**GUIDED MISSILE LAUNCHING ASSEMBLY**  
(GMLA)

GROSS WEIGHT, DIMENSIONS, AND CUBE OF GUIDED MISSILE LAUNCHING ASSEMBLIES							
NSN	DODIC	TYPE	LENGTH	WIDTH	HEIGHT	WEIGHT (LBS)	CUBE (CU FT)
1427-00-000-0195	PL81	BLOCK I	13' -10"	41-1/2"	32-5/8"	5, 105	129. 7
1427-01-274-3904	PL81	BLOCK I	13' -10"	41-1/2"	32-5/8"	4, 814	129. 7
1427-01-386-3113	PL81	BLOCK I	13' -10"	41-1/2"	32-5/8"	5, 111	129. 7
1427-01-398-6538	PL38	BLOCK IA	13' -10"	41-1/2"	33-3/4"	4, 640	134. 6
1427-01-463-0001	PL38	BLOCK IA	13' -10"	41-1/2"	33-3/4"	4, 640	134. 6
1427-01-439-8639	PL47	BLOCK II	13' -10"	41-1/2"	33-3/4"	4, 985	134. 6
1427-01-481-1620	N/A	TACMS 2K	13' -10"	41-1/2"	33-3/4"	4, 985	134. 6
1427-01-480-8516	PL65	IA UNITARY	13' -10"	41-1/2"	33-3/4"	4, 682	134. 6

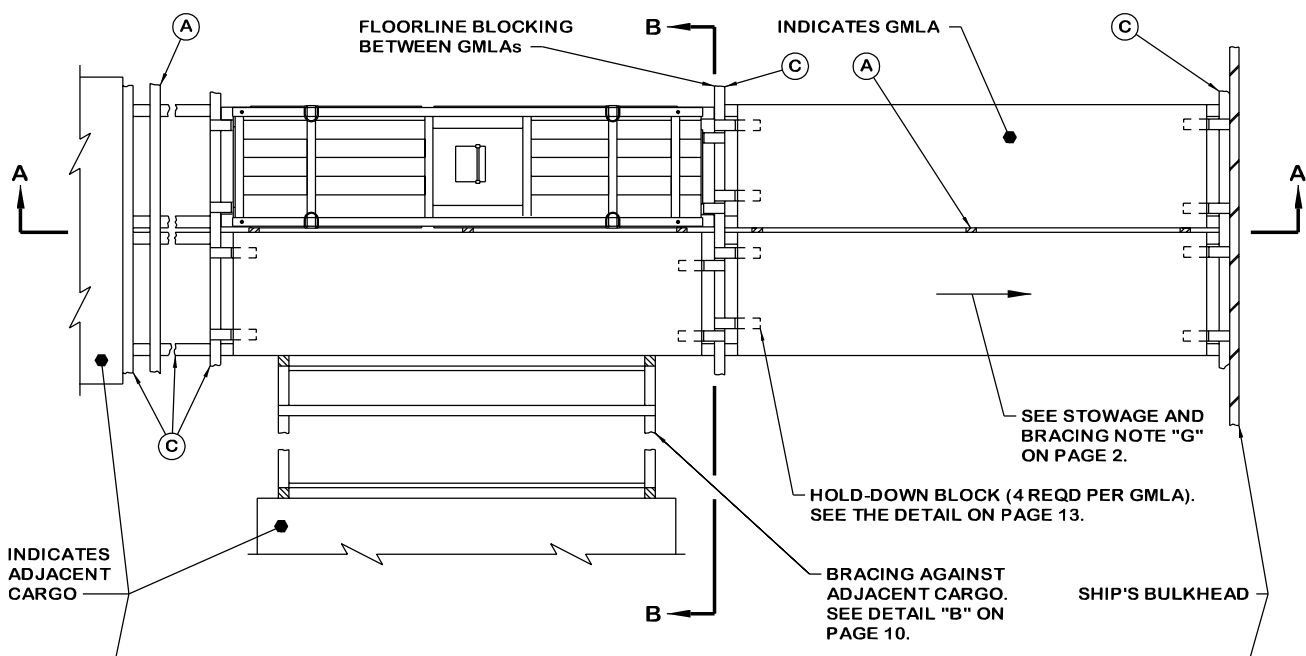
**CAUTION:** GUIDED MISSILE LAUNCHING ASSEMBLIES MUST BE SLING HANDLED INDIVIDUALLY. SLINGING OF MORE THAN ONE GMLA IN ONE LIFT WILL NOT BE ACCOMPLISHED. SEE HANDLING NOTE "B" ON PAGE 2.

**NOTE:** PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED.

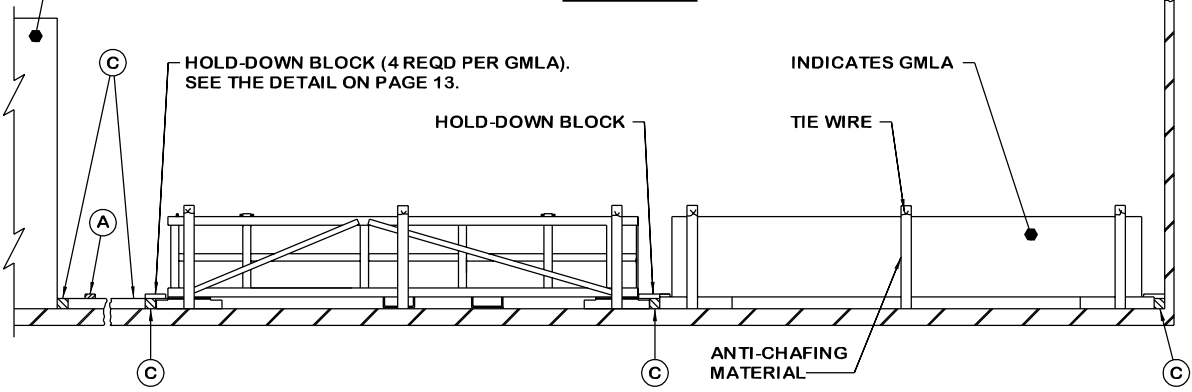


GMLAs STOWED LENGTHWISE TO THE SHIP. ADJUST WIDTH OF STOWAGE TO SUIT QUANTITY TO BE SHIPPED.

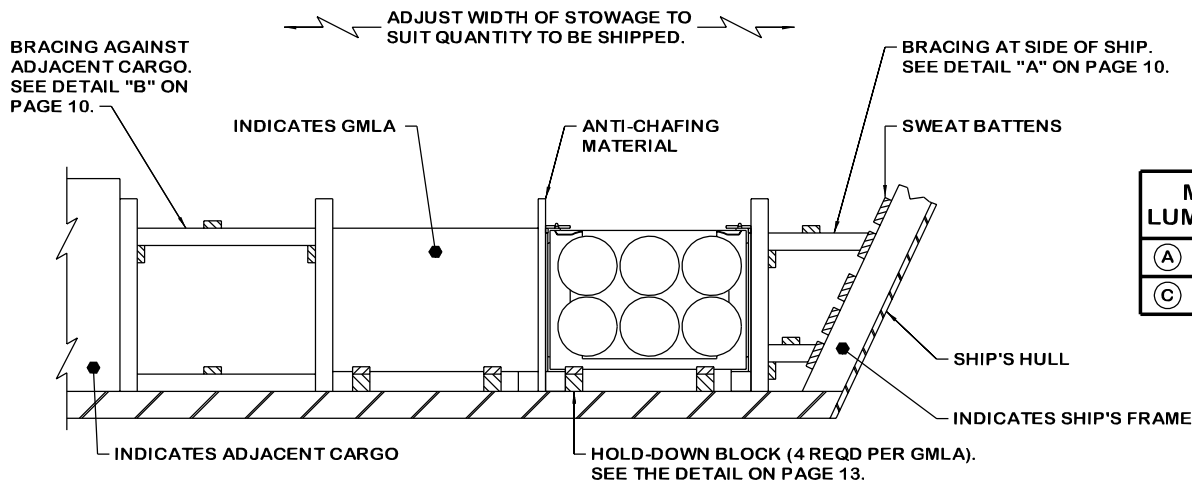
ADJUST WIDTH OF STOWAGE TO SUIT QUANTITY TO BE SHIPPED.



**PLAN VIEW**



**SECTION A-A**

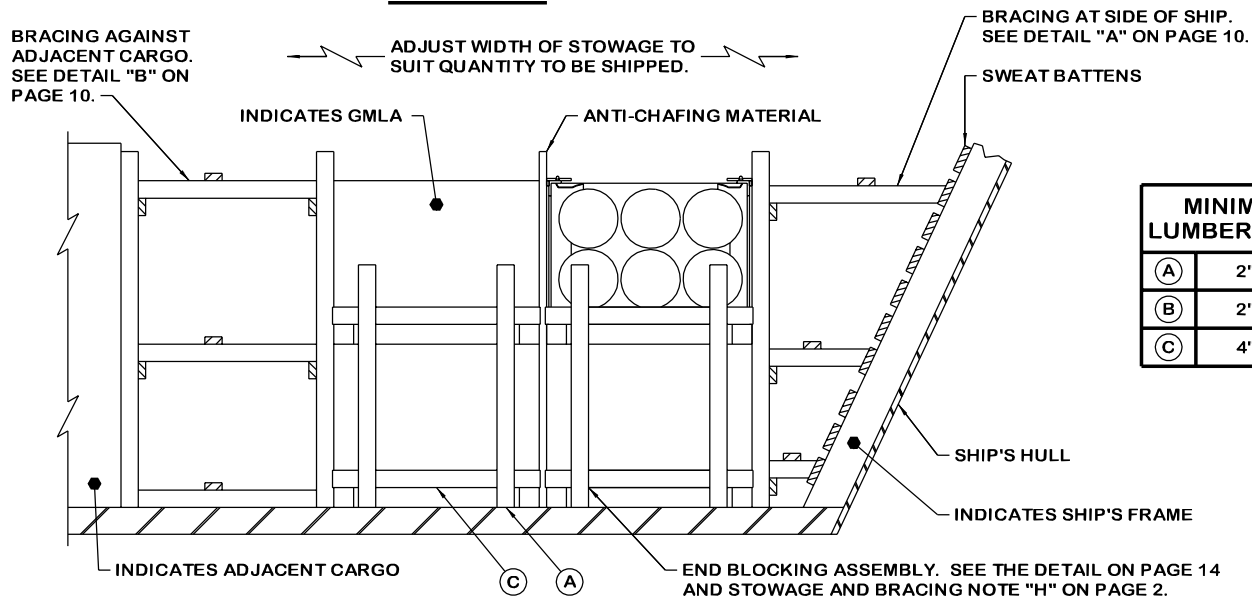
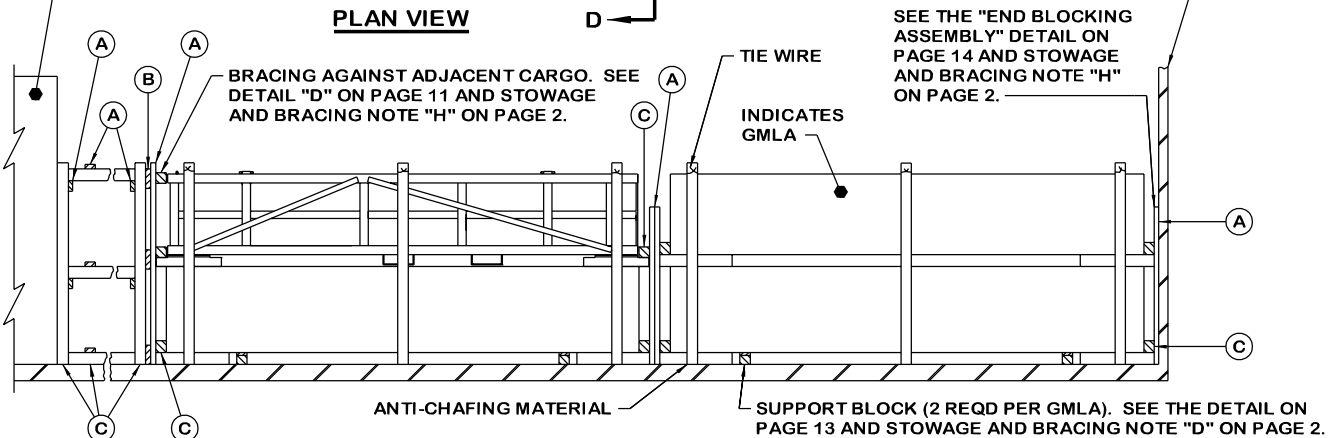
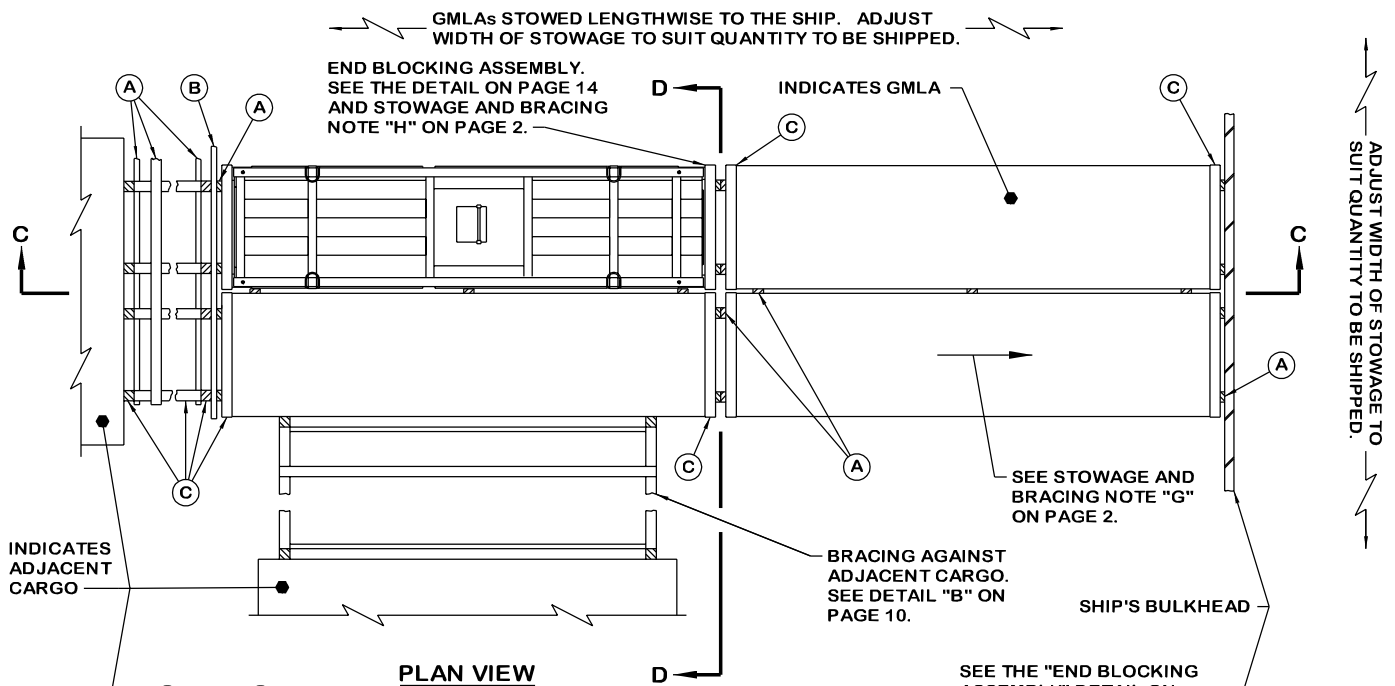


**SECTION B-B**

MINIMUM LUMBER SIZES	
(A)	2" X 4"
(C)	4" X 4"

THIS SECTION VIEW DEPICTS TWO LONGITUDINAL ROWS OF GMLAs ADJACENT TO THE SHIP SIDEWALL TO SHOW THE LATERAL BRACING AT THE SIDE OF THE SHIP.

NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.

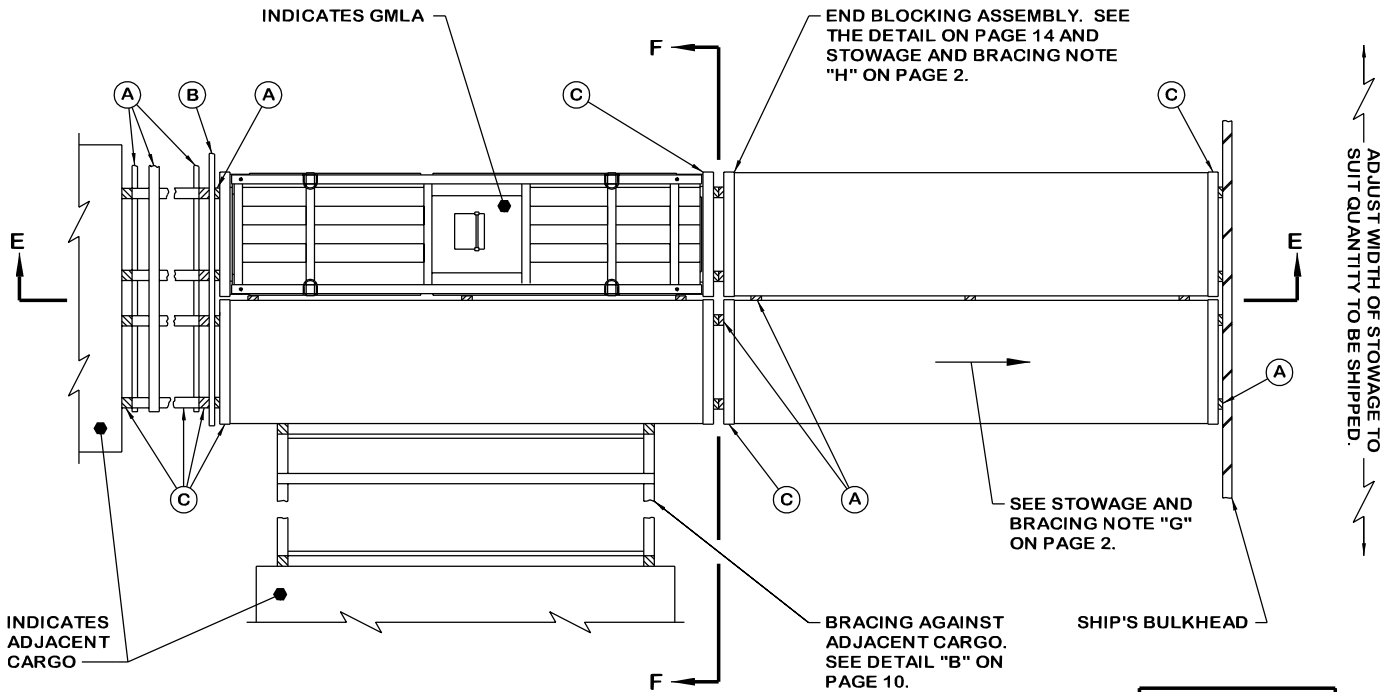


MINIMUM LUMBER SIZES	
(A)	2" X 4"
(B)	2" X 6"
(C)	4" X 4"

THIS SECTION VIEW DEPICTS TWO LONGITUDINAL ROWS OF GMLAs ADJACENT TO THE SHIP SIDEWALL TO SHOW THE LATERAL BRACING AT THE SIDE OF THE SHIP.

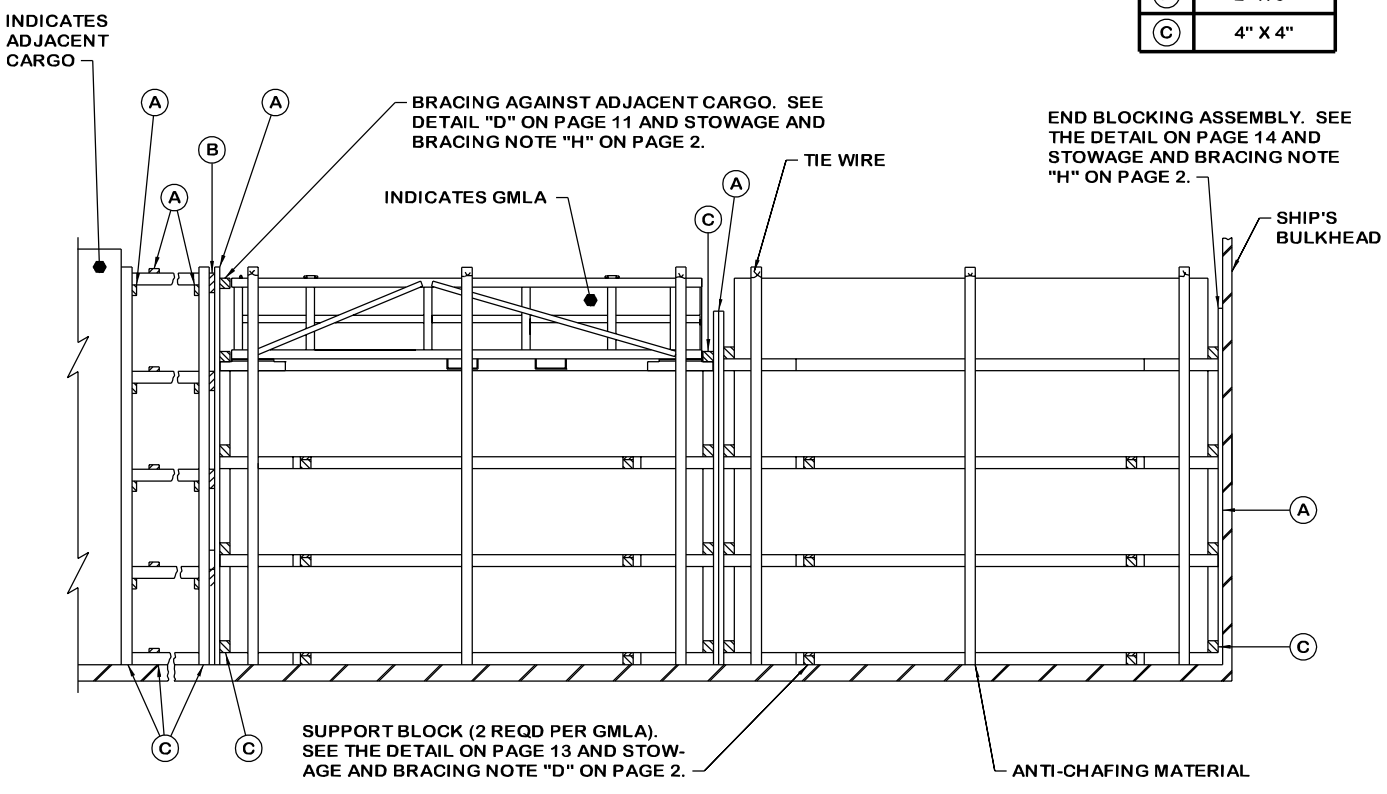
NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.

GMLAs STOWED LENGTHWISE TO THE SHIP. ADJUST WIDTH OF STOWAGE TO SUIT QUANTITY TO BE SHIPPED.



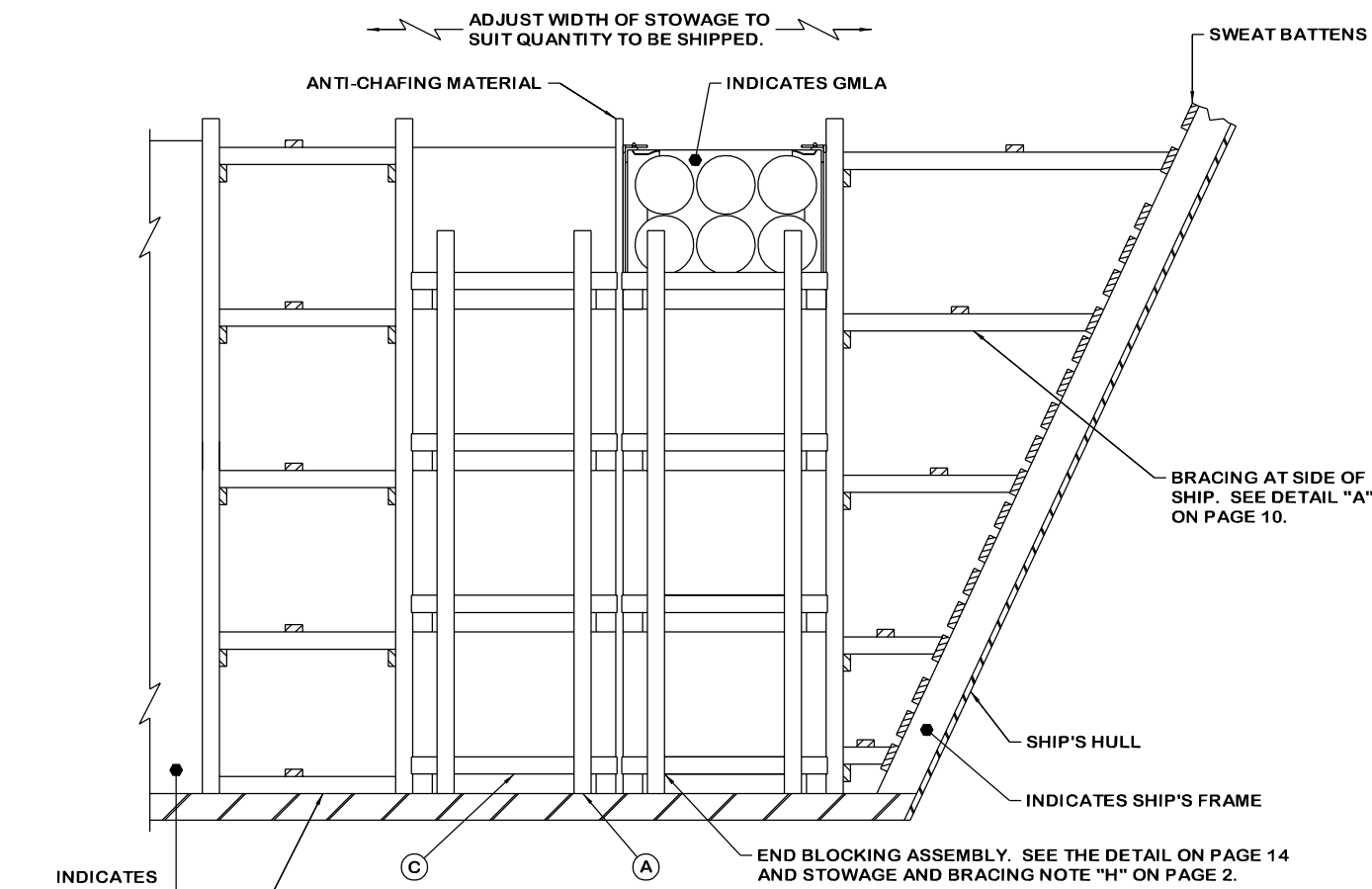
**PLAN VIEW**

MINIMUM LUMBER SIZES	
(A)	2" X 4"
(B)	2" X 6"
(C)	4" X 4"



**SECTION E-E**

NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.

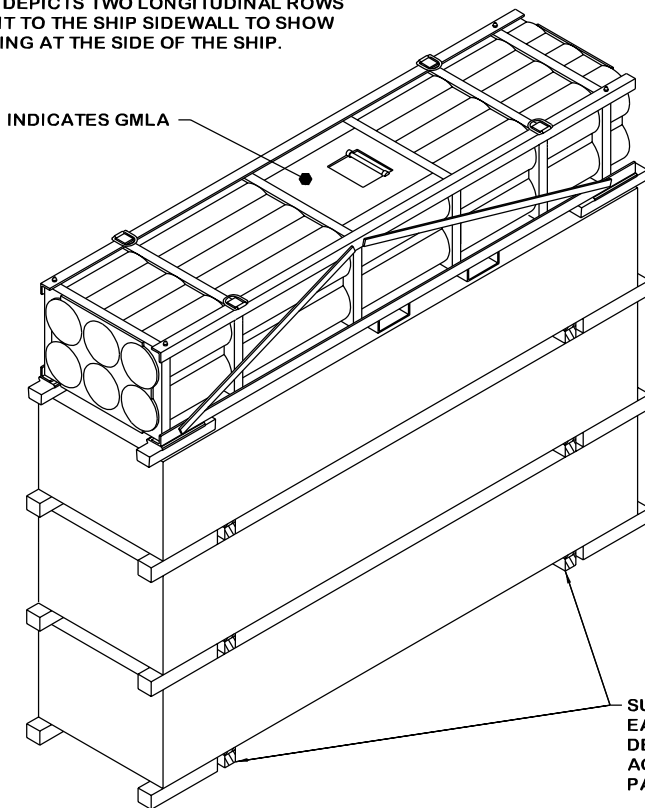


**SECTION F-F**

THIS SECTION VIEW DEPICTS TWO LONGITUDINAL ROWS OF GMLAs ADJACENT TO THE SHIP SIDEWALL TO SHOW THE LATERAL BRACING AT THE SIDE OF THE SHIP.

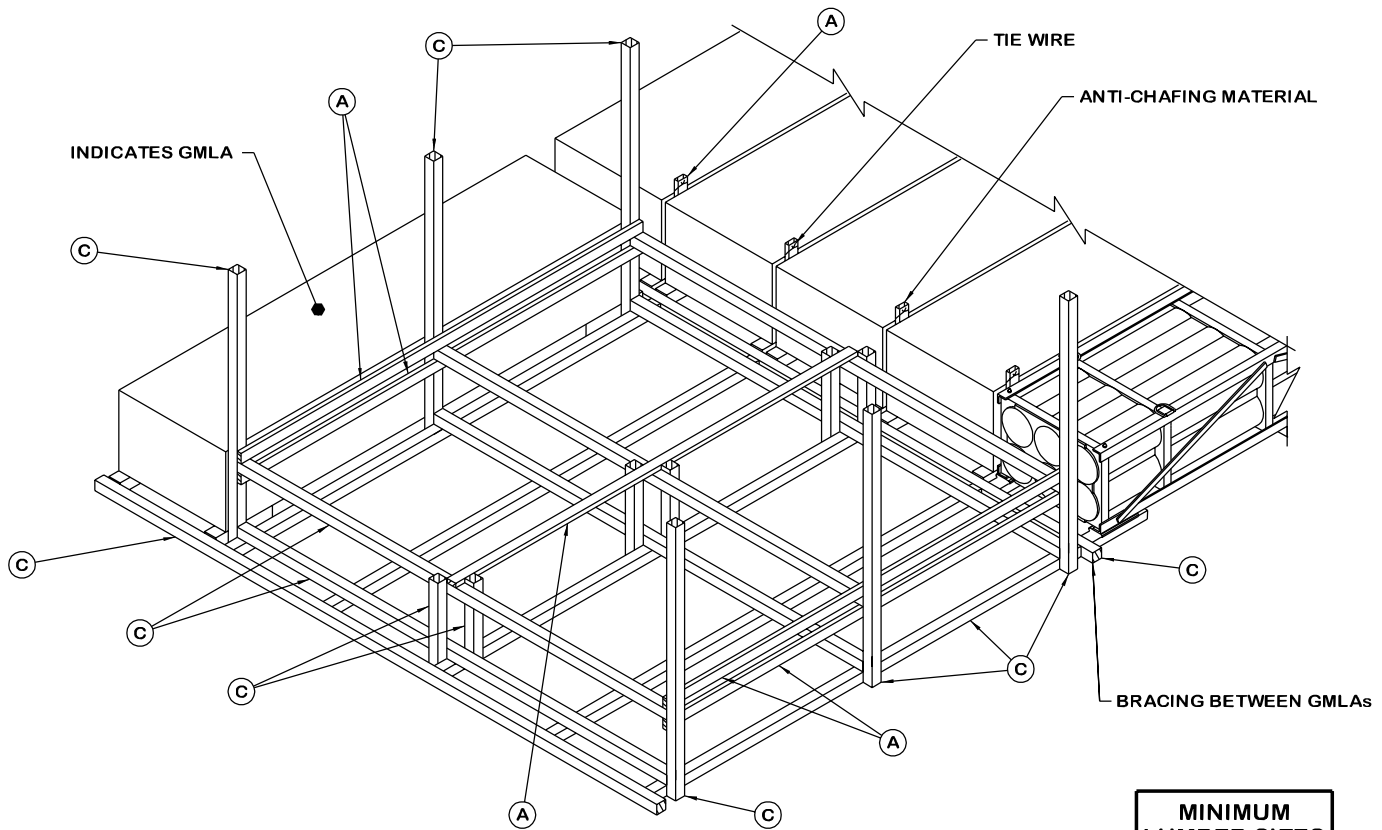
BRACING AGAINST ADJACENT CARGO. SEE DETAIL "B" ON PAGE 10.

MINIMUM LUMBER SIZES	
(A)	2" X 4"
(C)	4" X 4"



**GMLA STACKING DETAIL**

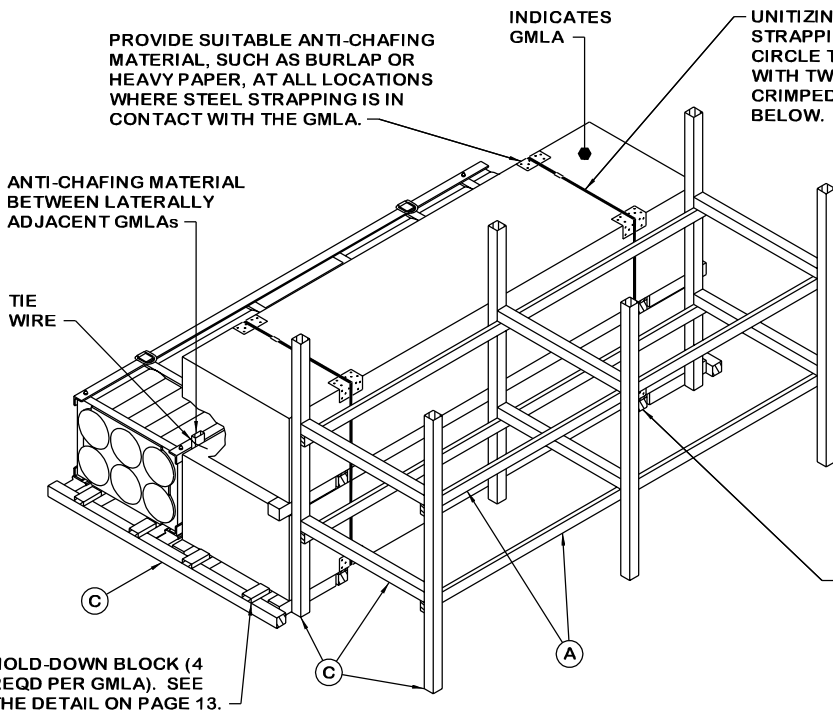
NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.



**ISOMETRIC VIEW**

THE BRACING METHOD DEPICTED ABOVE IS ONLY SHOWN FOR GUIDANCE PURPOSES. AS A MINIMUM, IT OR A COMPARABLE METHOD IS TO BE USED TO BRACE ACROSS A LARGE VOID WHEN SUFFICIENT GMLAs, OR OTHER CARGO ITEMS, ARE NOT AVAILABLE TO FILL THE VOID.

MINIMUM LUMBER SIZES	
(A)	2" X 4"
(C)	4" X 4"



**ISOMETRIC VIEW**

THIS BRACING METHOD DEPICTS THE USE OF STEEL STRAPPING TO SECURE A SINGLE GMLA TO A ONE-LAYER LOAD.

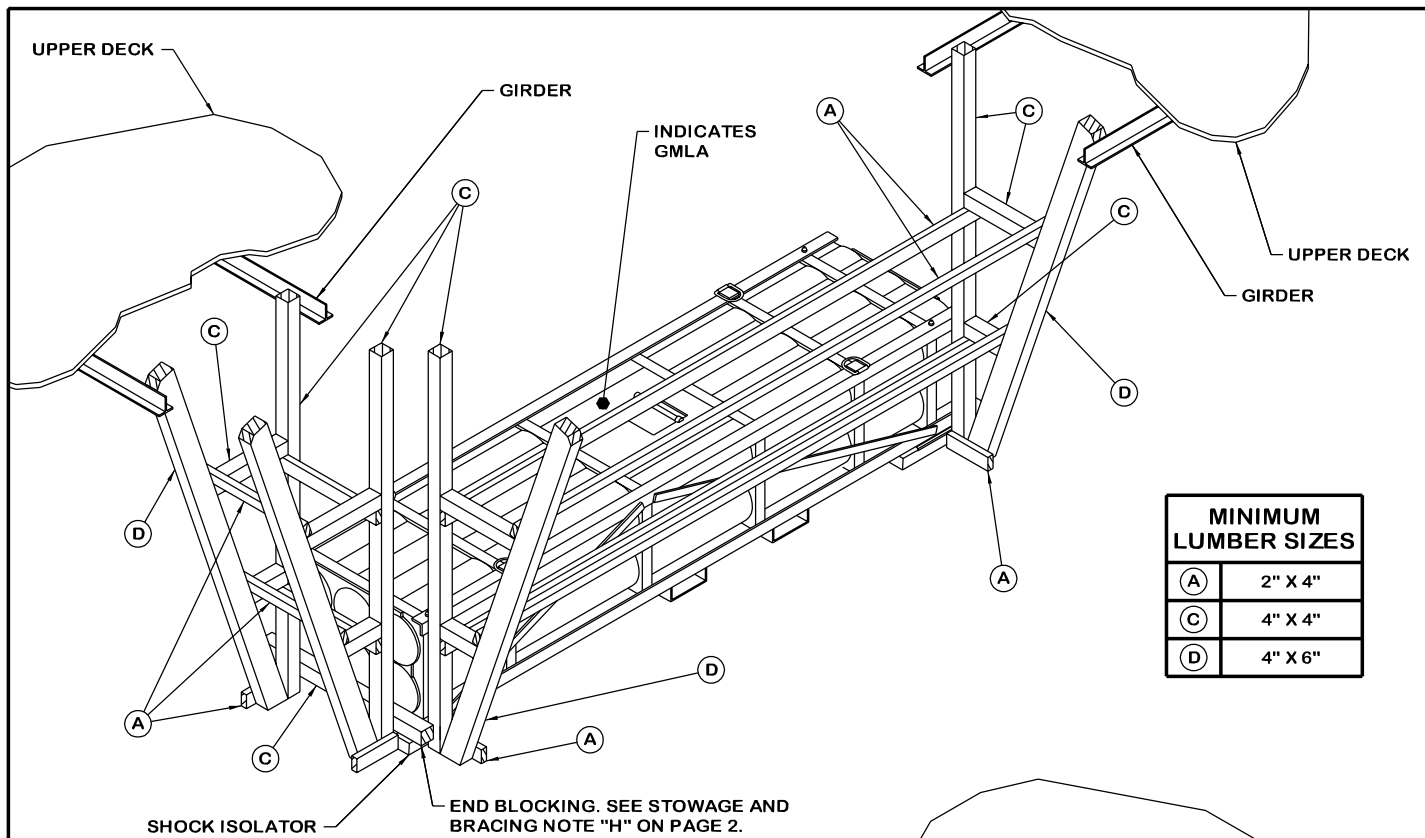
**SPECIAL NOTE:**

WHEN REDUCING A LOAD BY ONE OR MORE GMLAs, IT WILL BE NECESSARY TO UNITIZE THE STACK OF GMLAs WHICH ARE LATERALLY ADJACENT TO THE OMITTED GMLA AS DEPICTED IN THE ISOMETRIC VIEW AT LEFT. SEE HANDLING NOTE "B" ON PAGE 2.

SUPPORT BLOCK (2 REQD PER GMLA WHEN TWO GMLAs ARE UNITIZED). SEE THE DETAIL ON PAGE 13 AND STOWAGE AND BRACING NOTE "D" ON PAGE 2.

NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.

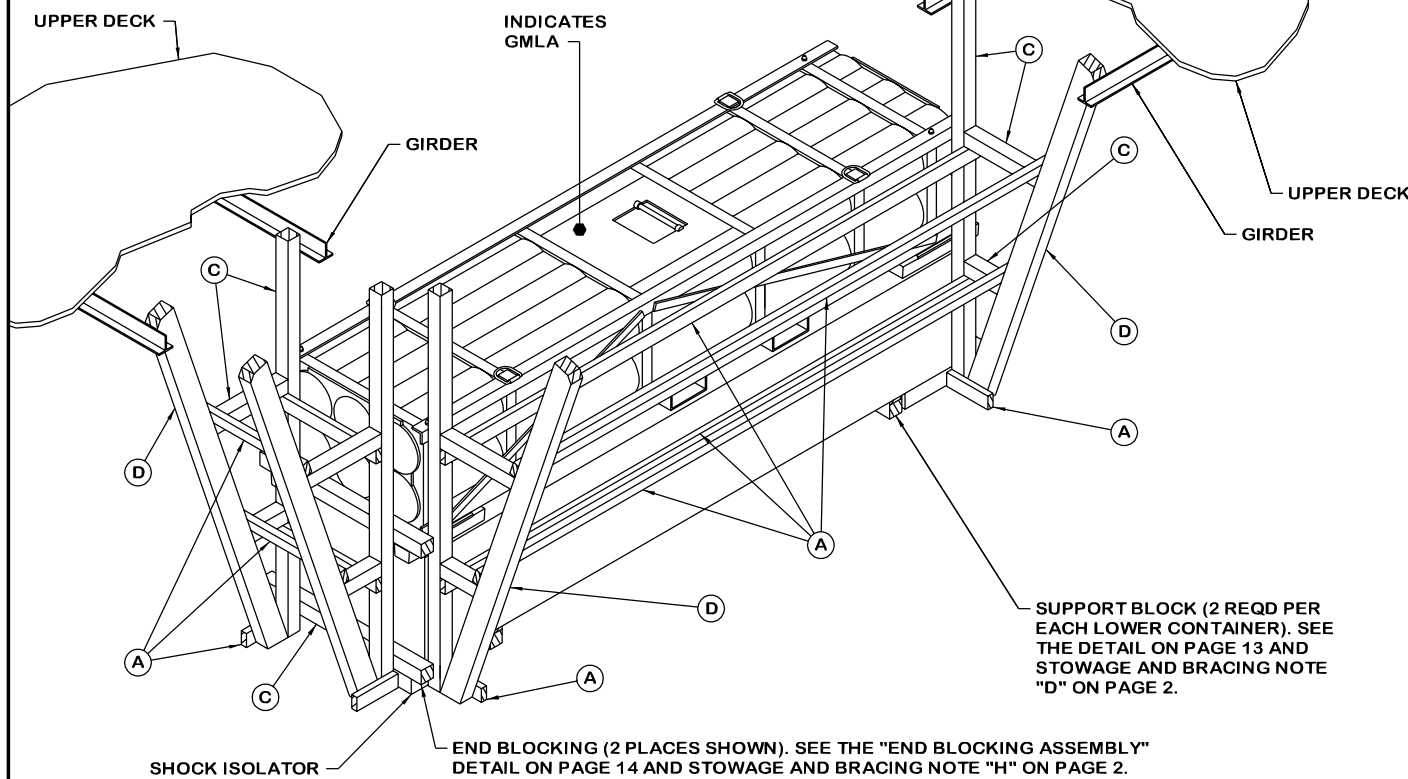




MINIMUM LUMBER SIZES	
(A)	2" X 4"
(C)	4" X 4"
(D)	4" X 6"

**ISOMETRIC VIEW**

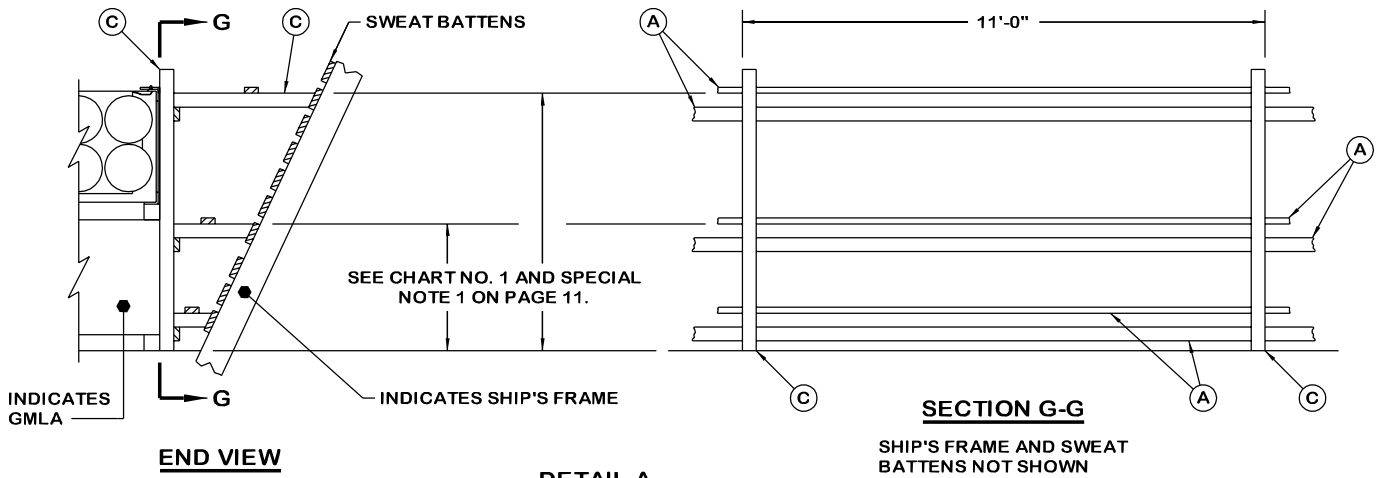
THE BRACING METHOD ABOVE DEPICTS LATERAL AND END BRACING OF ONE LAYER OF GMLAs AGAINST THE END OR SIDE BULKHEAD OF A SHIP. SEE NOTE BELOW.



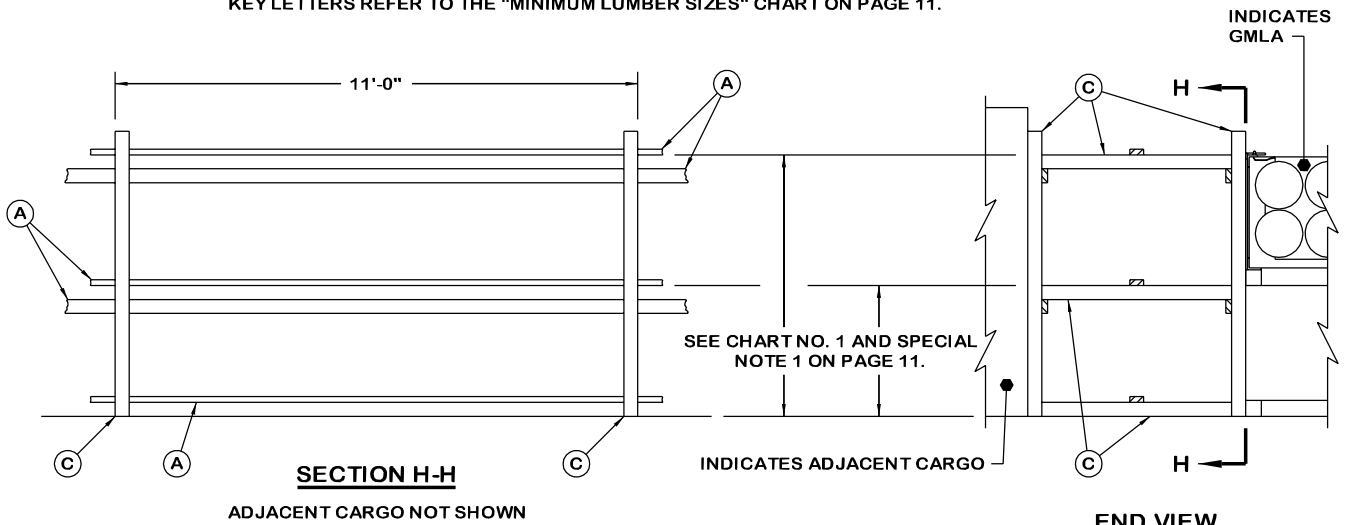
**ISOMETRIC VIEW**

THIS BRACING METHOD DEPICTS LATERAL AND END BRACING OF TWO LAYERS OF GMLAs AGAINST THE END OR SIDE BULKHEAD OF A SHIP. SEE NOTE AT RIGHT.

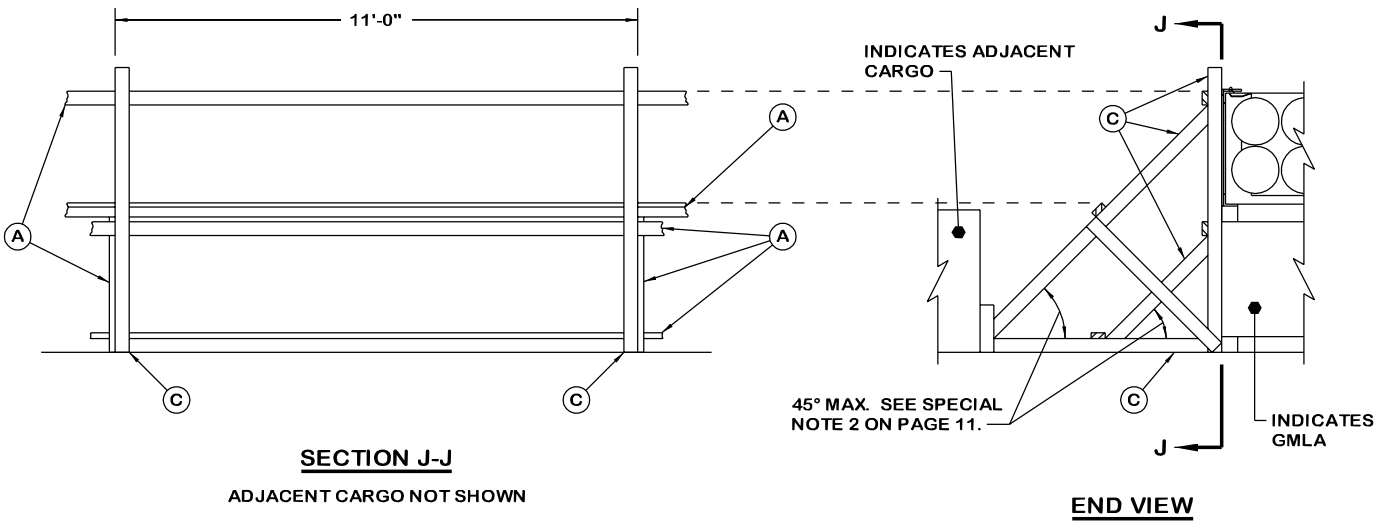
NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE. LATERAL AND LONGITUDINAL BRACING BETWEEN ADJACENT GMLAs ARE NOT SHOWN.



DEPICTED ABOVE IS A SUGGESTED METHOD OF BRACING AT SIDE OF SHIP. KEY LETTERS REFER TO THE "MINIMUM LUMBER SIZES" CHART ON PAGE 11.

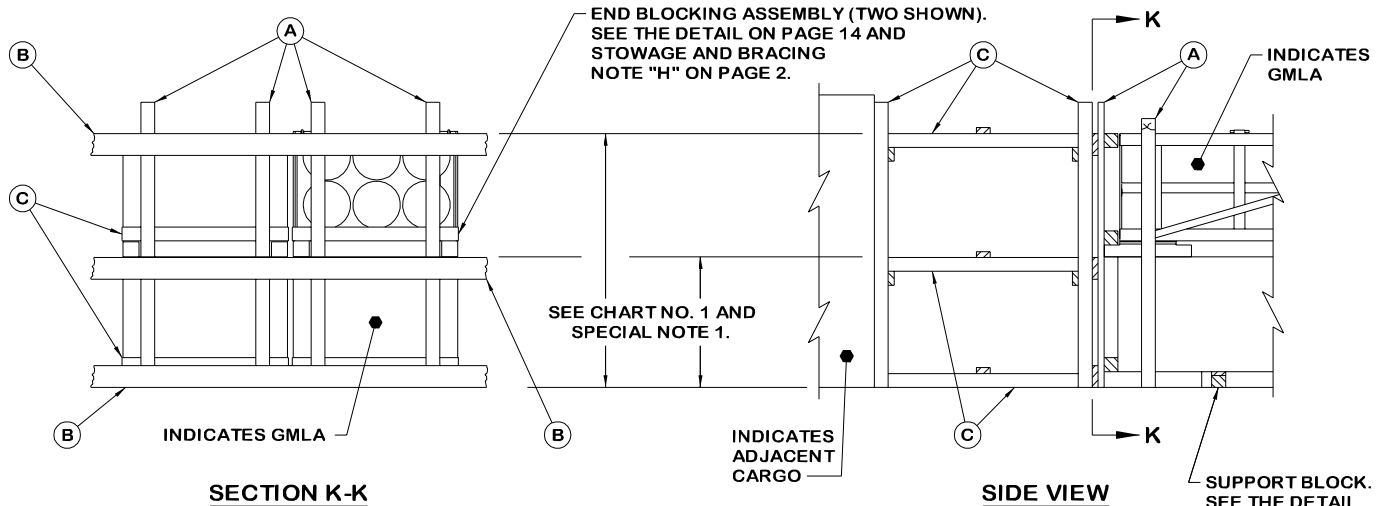


SUGGESTED METHOD OF BRACING AGAINST LATERALLY ADJACENT CARGO. KEY LETTERS REFER TO THE "MINIMUM LUMBER SIZES" CHART ON PAGE 11.



NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED.

SUGGESTED METHOD OF DIAGONAL BRACING AGAINST LATERALLY ADJACENT CARGO. KEY LETTERS REFER TO THE "MINIMUM LUMBER SIZES" CHART ON PAGE 11.



**SECTION K-K**

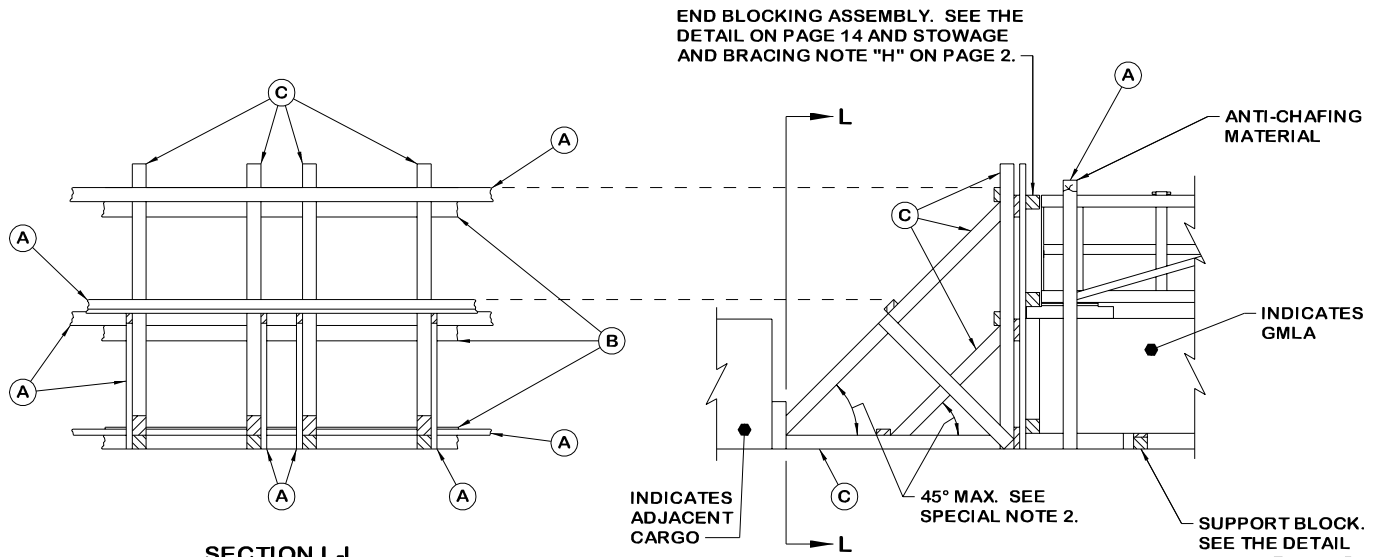
ANTI-CHAFING MATERIAL NOT SHOWN

**DETAIL D**

DEPICTED ABOVE IS A SUGGESTED METHOD OF BRACING AGAINST LONGITUDINALLY ADJACENT CARGO.

**SIDE VIEW**

SUPPORT BLOCK. SEE THE DETAIL ON PAGE 13 AND STOWAGE AND BRACING NOTE "D" ON PAGE 2.



**SECTION L-L**

GMLAs, END BLOCKING ASSEMBLIES, AND ANTI-CHAFING MATERIAL NOT SHOWN

**DETAIL E**

SUGGESTED METHOD OF DIAGONAL BRACING AGAINST LONGITUDINALLY ADJACENT CARGO.

**SIDE VIEW**

SUPPORT BLOCK. SEE THE DETAIL ON PAGE 10 AND STOWAGE AND BRACING NOTE "D" ON PAGE 2.

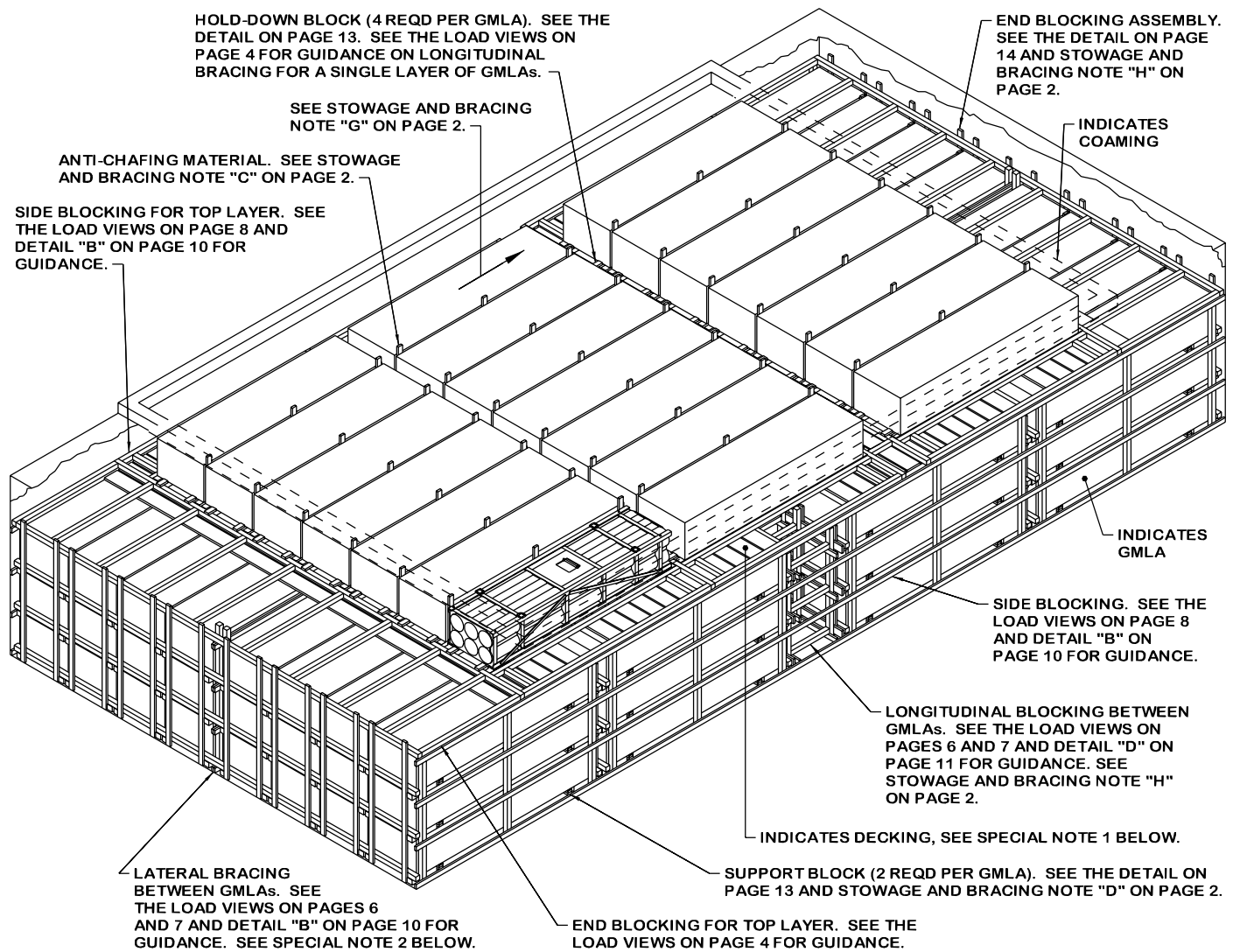
**SPECIAL NOTES:**

1. THE DIMENSIONS GIVEN IN CHART NO. 1 ARE THE LOCATIONS OF THE STRUTS MEASURED FROM THE DECK TO THE TOP OF THE STRUT. EACH LAYER OF GMLAs MUST HAVE A STRUT LOCATED NEAR THE TOP OF THE LAYER WITH THE EXCEPTION OF A SINGLE LAYER.
2. IF DIAGONAL BRACING IS USED, EACH LAYER OF GMLAs MUST HAVE A DIAGONAL BRACE THAT TERMINATES NEAR THE TOP OF THE LAYER, EXCEPT FOR A SINGLE LAYER. THE ANGLE BETWEEN THE DIAGONAL BRACE AND THE DECK MUST NOT EXCEED 45 DEGREES.

CHART NO. 1 STRUT LOCATIONS		
GMLA	BLOCK I	ALL OTHER GLMA
FIRST LAYER	32"	33-1/2"
SECOND LAYER	64"	67"
THIRD LAYER	8'-1"	8'-5"
FOURTH LAYER	10'-9"	11'-2"

MINIMUM LUMBER SIZES	
(A)	2" X 4"
(B)	2" X 6"
(C)	4" X 4"

NOTE: PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED.



### ISOMETRIC VIEW

THE VIEW SHOWN ABOVE DEPICTS A TYPICAL LOAD OF 117 GUIDED MISSILE LAUNCHING ASSEMBLIES. SEE SPECIAL NOTE 3 BELOW.

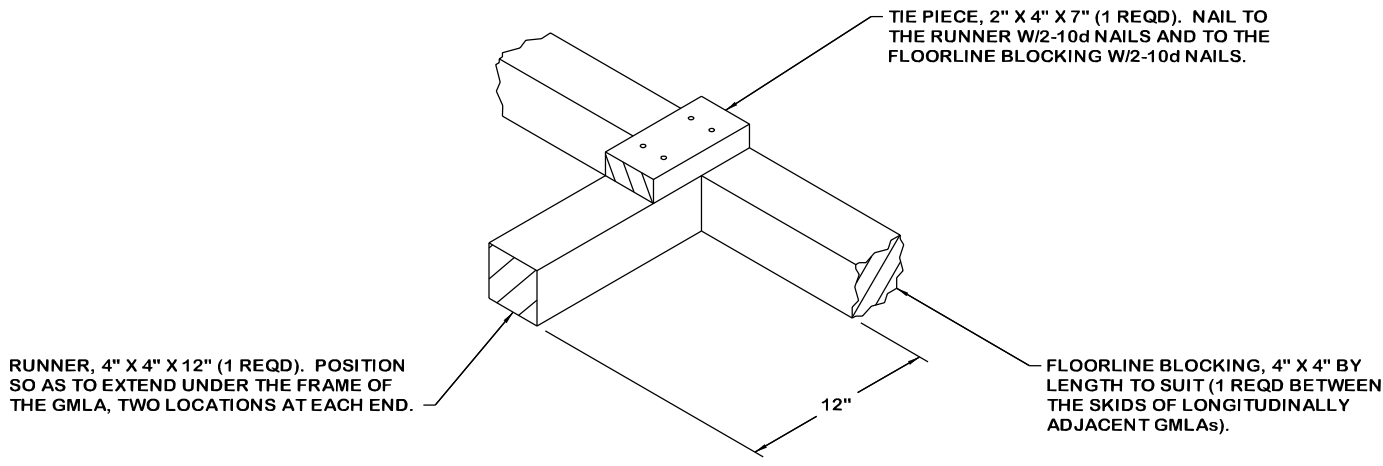
#### SPECIAL NOTES:

1. DECKING MUST BE PLACED ON TOP OF THE THIRD LAYER OF GMLAs IF A FOURTH LAYER IS LOADED. THE DECKING MUST BE A MINIMUM OF 1-1/2" THICK.
2. INCREASING THE THICKNESSES OF THE ANTI-CHAFING MATERIAL CAN ELIMINATE A SMALL LATERAL VOID. FOR LARGE VOIDS, LATERAL BRACING MUST BE USED.
3. THE QUANTITY OF GMLAs IN THE FOURTH LAYER MAY NEED TO BE ADJUSTED FROM THAT SHOWN TO ACCOMMODATE THE INSIDE HEIGHT OF THE BARGE AND THE SIZE OF THE OPENING.

**NOTE:** PRECAUTIONARY PROVISIONS FOR HANDLING, STOWAGE AND BRACING AS SPECIFIED IN THE NOTES ON PAGE 2 MUST BE OBSERVED. ONLY LATERAL AND LONGITUDINAL BRACING ARE DEPICTED ON THIS PAGE.

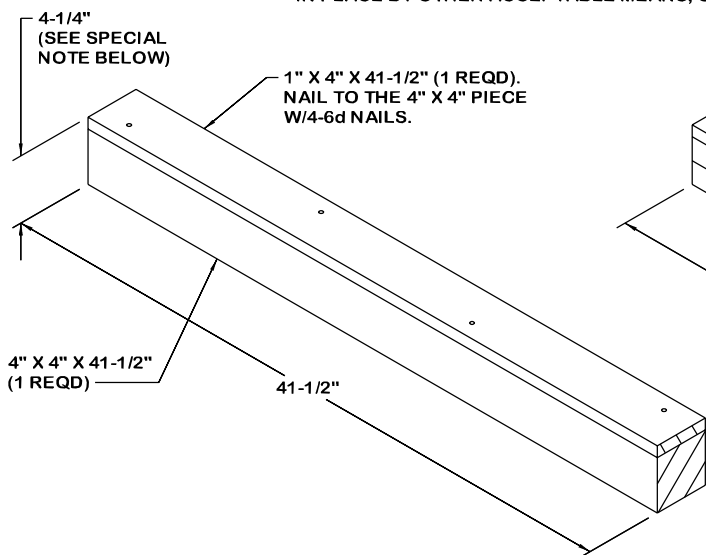
#### SEQUENTIAL LOADING PROCEDURES:

1. PREFABRICATE END BLOCKING ASSEMBLIES, SIDE BLOCKING ASSEMBLIES AND SUPPORT BLOCKS. SEE STORAGE AND BRACING NOTE "H" ON PAGE 2.
2. IT IS RECOMMENDED TO BEGIN LOADING THE GMLAs IN EACH END OF THE BARGE AND WORK TOWARD THE CENTER WHERE THE FINAL ASSEMBLIES MAY BE PLACED INTO POSITION BY SLINGING.
3. POSITION ONE SIDE BLOCKING ASSEMBLY AT THE END OF ONE SIDEWALL OF THE BARGE.
4. POSITION AN END BLOCKING ASSEMBLY AGAINST THE ENDWALL OF THE BARGE.
5. POSITION ONE GMLA AGAINST THE SIDE BLOCKING AND END BLOCKING ASSEMBLY. NOTE THAT SUPPORT BLOCKS MUST BE USED UNDER THE GMLAs.
6. POSITION SECOND AND THIRD GMLAs ON TOP OF THE ALREADY POSITIONED ASSEMBLY, AGAIN NOTING THAT SUPPORT BLOCKS MUST BE USED UNDER GMLAs.
7. POSITION ANTI-CHAFING MATERIAL PRIOR TO LOADING ANOTHER STACK OF GMLAs.
8. IF LOADING A FOURTH LAYER WITHIN THE HATCH OPENING, DECKING MUST BE PLACED UPON THE THIRD LAYER OF THE GMLAs.
9. PRE-POSITION END AND SIDE BLOCKING DUNNAGE PRIOR TO STOWING THE FOURTH LAYER.
10. LOWER FOURTH-LAYER GMLAs INTO THE PRE-POSITIONED DUNNAGE.



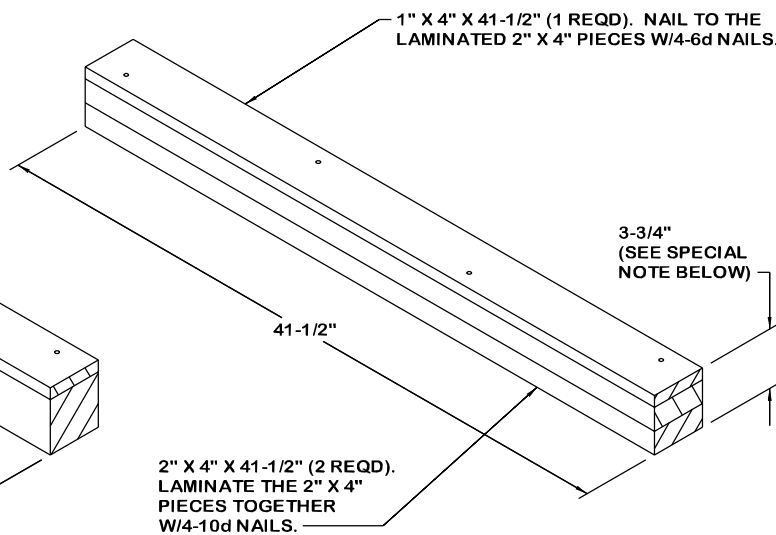
**HOLD-DOWN BLOCK**

THIS BLOCK MAY BE USED AS ONE METHOD TO PREVENT THE FLOORLINE BLOCKING AT THE ENDS OF OR BETWEEN LONGITUDINALLY ADJACENT ONE-LAYER HIGH LOADS FROM BECOMING DISPLACED. IF DESIRED, THE FLOORLINE BLOCKING MAY BE HELD IN PLACE BY OTHER ACCEPTABLE MEANS, SUCH AS VERTICAL BRACING, ETC.



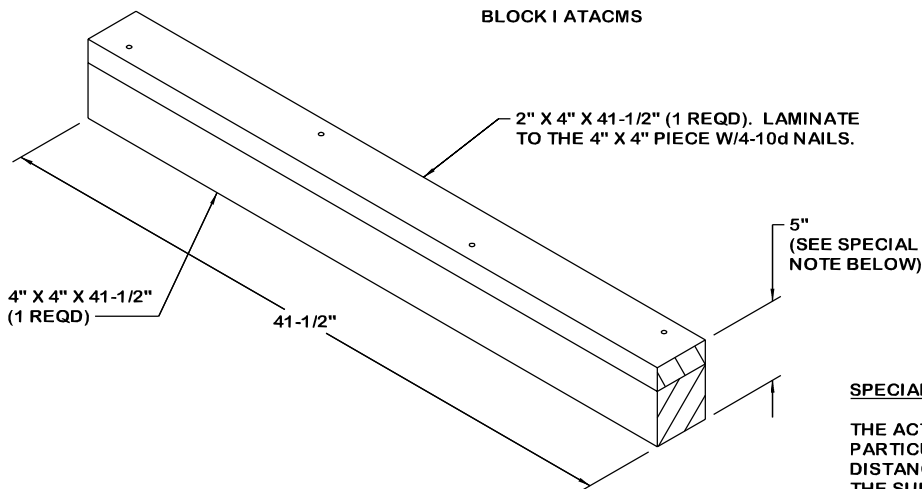
**SUPPORT BLOCK A**

BLOCK I ATACMS



**SUPPORT BLOCK B**

BLOCK I ATACMS ALTERNATIVE



**SUPPORT BLOCK C**

ALL ATACMS EXCEPT BLOCK I

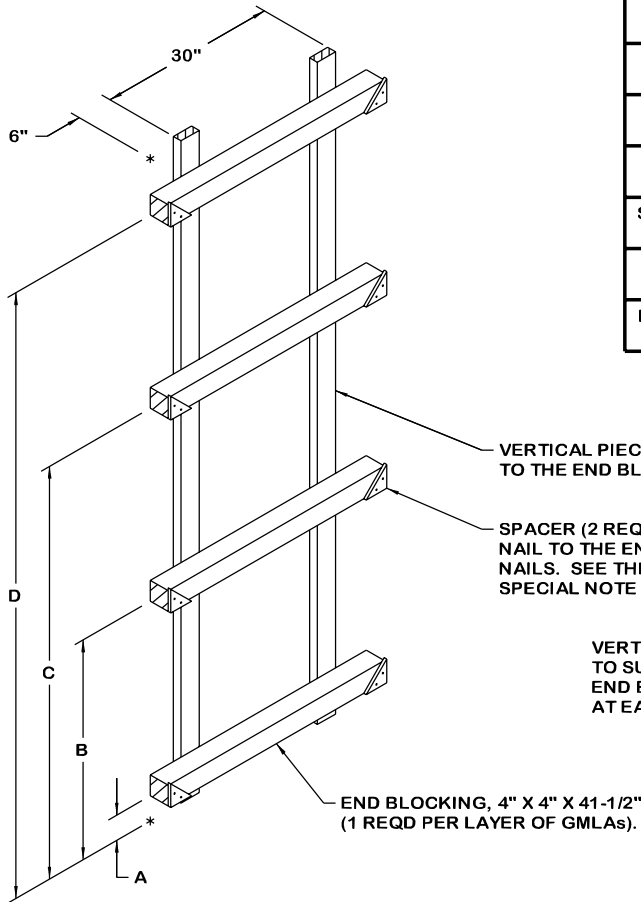
**SPECIAL NOTE:**

THE ACTUAL HEIGHT OF A SUPPORT BLOCK FOR A PARTICULAR GMLA SHOULD FILL THE VERTICAL CLEAR DISTANCE BETWEEN THE FRAME OF THE GMLA AND THE SURFACE THE GMLA IS PLACED UPON, WHILE STILL ALLOWING SKID CONTACT WITH THAT SURFACE. THE VERTICAL CLEAR DISTANCE CAN VARY BETWEEN GMLAs WHICH MAY NECESSITATE MODIFYING THE SUPPORT BLOCK TO ALLOW SKID CONTACT.

**DETAILS**

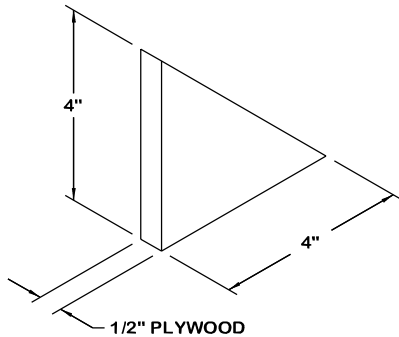
CHART NO. 2 END BLOCKING LOCATIONS						
GMLA	END BLOCKING ASSEMBLY			ALTERNATIVE END BLOCKING ASSEMBLY		
		BLOCK I	ALL OTHER GMLA		BLOCK I	ALL OTHER GMLA
FIRST LAYER*	A	4-1/4"	5-1/4"	E	30"	31-1/4"
SECOND LAYER	B	37"	39"	F	62-3/4"	65"
THIRD LAYER	C	69-1/2"	6'-3/4"	G	7'-11-1/4"	8'-2-3/4"
FOURTH LAYER	D	8'-6"	8'-10-1/2"	H	10'-8"	11'-1/2"

\* FLOORLINE BLOCKING IS RECOMMENDED FOR A ONE-LAYER LOAD.



**END BLOCKING ASSEMBLY**

THIS ASSEMBLY IS USED FOR BLOCKING AGAINST THE BOTTOM RAILS OF THE GMLA. THE LOCATIONS OF THE END BLOCKING ARE GIVEN IN CHART NO. 2. SEE SPECIAL NOTE 1 BELOW.

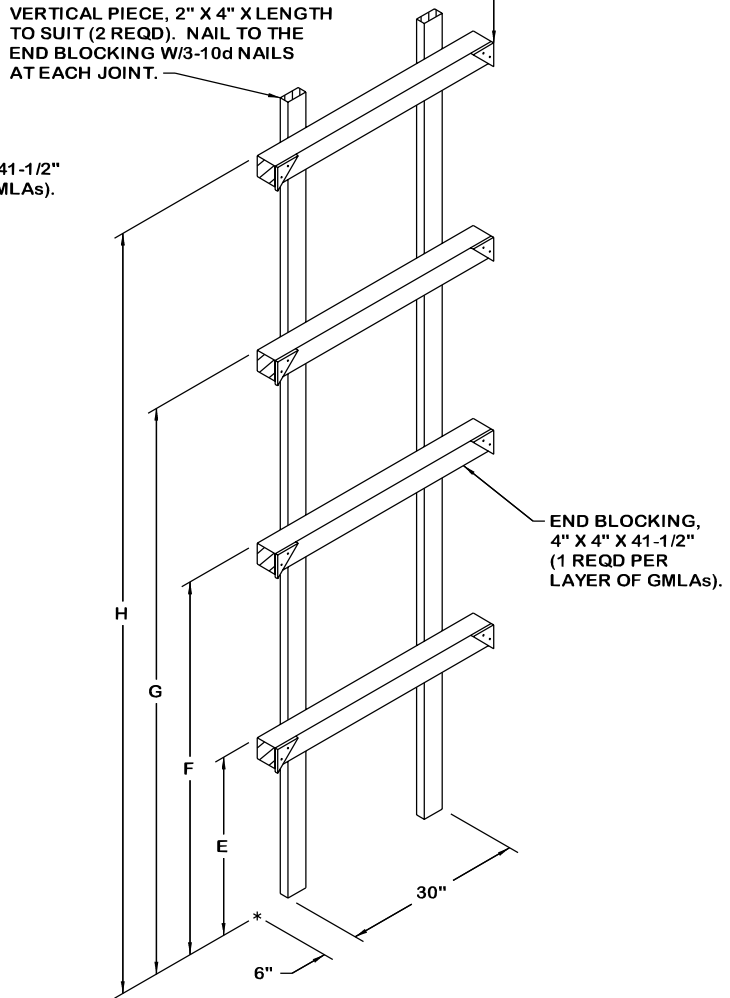


**SPACER**

THIS PIECE IS REQUIRED ON END BLOCKING ASSEMBLIES THAT BLOCK AGAINST THE TOP OR BOTTOM RAILS OF GMLAs WITH THE NEW STYLE AFT END COVERS. SEE SPECIAL NOTE 2 BELOW.

**SPECIAL NOTES:**

1. THE END BLOCKING AS DEPICTED ON THIS PAGE MUST CONTACT THE TOP OR BOTTOM RAILS OF THE GMLA, WHICH MAY REQUIRE MOVING THE BLOCKING UP OR DOWN TO ACCOMMODATE THE VARIATIONS IN HEIGHT OF DIFFERENT GMLAs.
2. SPACER PIECES ARE ONLY REQUIRED ON GMLAs WITH THE NEW STYLE AFT END COVERS AND MUST BE ATTACHED TO THE END BLOCKING AS DEPICTED ON THIS PAGE. THE SPACER PIECES SHALL BE LOCATED SO THAT THEY CONTACT EITHER THE TOP OR BOTTOM RAIL OF THE GMLA. SEE STOWAGE AND BRACING NOTES "F" AND "H".



**ALTERNATIVE END BLOCKING ASSEMBLY**

THIS ASSEMBLY IS USED FOR BLOCKING AGAINST THE TOP RAILS OF THE GMLA. THE LOCATIONS OF THE END BLOCKING ARE GIVEN IN CHART NO. 2. SEE SPECIAL NOTE 1 AT LEFT.