GENERAL CMU NOTES AND TYP DETAILS
S-400
FOR BLUEBEAM LABEL INDOOR:

0"
1"

MASONRY:

1. MASONRY TESTING SHALL CONSIST OF A QUALIFIED TESTING LABORATORY PROVIDING THE FOLLOWING SERVICES:

   A. OBSERVE THE INSTALLATION OF MASONRY UNITS.

   B. VERIFY THE QUANTITY, SIZE AND THE SPACING OF THE REQUIRED REINFORCING THAT IS SHOWN ON THE DRAWINGS.

   C. INSPECT THE GROUT SPACE PRIOR TO THE CLOSING OF CLEANOUTS AND ALL GROUTING OPERATIONS. VERIFY THAT THE SPECIFIED CELLS ARE FULLY GROUTED AS NOTED.

   D. MONITOR THE PROPORTIONING, MIXING AND CONSISTENCY OF MORTAR AND GROUT. PROVIDE 28 DAY COMPRESSIVE STRENGTH TESTS ON EACH GROUT MIX IN ACCORDANCE WITH ASTM C1019. PROVIDE COMPRESSION TESTS ON MASONRY PRISMS FOR EACH TYPE OF WALL CONSTRUCTION, IN ACCORDANCE WITH ASTM C1314. CONTRACTOR SHALL PREPARE ONE SET FOR TESTING AT 28 DAYS. TESTS ARE TO BE CONDUCTED FOR EACH 2000 SQUARE FEET OF WALL INSTALLED, BUT NOT LESS THAN TWO TESTS.

MASONRY NOTES:

MATERIALS:

1. ALL CONCRETE MASONRY UNITS (CMU) SHALL SHALL CONFORM TO ASTM C90, TYPE 1, GRADE N, AND THE QUALITY CONTROL STANDARDS OF THE NATIONAL CONCRETE MASONRY ASSOCIATION.
2. ALL CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT (105 TO LESS THAN 125 PCF, OVEN DRY UNIT DENSITY).
3. ALL MASONRY UNITS SHALL HAVE A MAXIMUM LINEAR SHRINKAGE OF .06 OF 1% FROM THE SATURATED TO THE OVEN DRY CONDITION, WHEN TESTED WITH THE METHODS SET FORTH IN THE QUALITY CONTROL STANDARDS OF THE NATIONAL CONCRETE MASONRY ASSOCIATION.
4. MASONRY UNITS SHALL HAVE CURED FOR NOT LESS THAN 28 DAYS WHEN PLACED IN THE STRUCTURE.

COMPRESSIVE STRENGTHS :

1. THE MINIMUM COMPRESSIVE STRENGTH OF MASONRY (f'm) SHALL BE 2000 PSI AS DETERMINED BY THE UNIT STRENGTH METHOD OR BY THE PRISM TEST METHOD.
2. ALL MASONRY UNITS SHALL HAVE A MINIMUM NET COMPRESSIVE STRENGTH OF 2500 PSI AND A MINIMUM NET TENSILE STRENGTH OF 125 PSI, WHEN TESTED IN ACCORDANCE WITH THE METHODS SET FORTH IN THE QUALITY CONTROL STANDARDS OF THE NATIONAL CONCRETE MASONRY ASSOCIATION.

MORTAR:

1. UNLESS NOTED OTHERWISE, MORTAR SHALL CONFORM TO ASTM C270, TYPE 'S'. MORTAR SHALL BE FRESHLY PREPARED AND UNIFORMLY MIXED IN THE RATIO OF 1 PART PORTLAND CEMENT, 1/4 PART MINIMUM TO 1/2 PART MAXIMUM LIME PUTTY OR HYDRATED LIME, DAMP LOOSE SAND NOT LESS THAN 2-1/4 AND NOT MORE THAN 3 TIMES THE SUM OF THE VOLUMES OF THE CEMENT AND LIME USED.

GROUT:

1. GROUT FOR POURING SHALL BE OF FLUID CONSISTENCY AND MIXED IN THE RATIO BY VOLUMES, 1 PART PORTLAND CEMENT, 2 1/4 PARTS MINIMUM TO 3 PARTS MAXIMUM DAMP LOOSE SAND, 1 PART MINIMUM TO 2 PARTS MAXIMUM PEA GRAVEL, AND 0 TO 1/10 PART MAXIMUM HYDRATED LIME. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI, WHEN TESTED IN ACCORDANCE WITH ASTM C476.
2. GROUT FOR PUMPING SHALL BE OF FLUID CONSISTENCY AND SHALL HAVE NO LESS THAN 7 SACKS OF CEMENT IN EACH CUBIC YARD OF GROUT. SUBMIT THE MIX FOR APPROVAL.
3. ALL CELLS WITH REINFORCING BARS SHALL BE GROUTED SOLID.
4. ALL CELLS THAT WILL HAVE DRILLED EXPANSION ANCHORS, EMBEDDED HEADED STUDS OR OTHER EMBEDDED ANCHORS MUST BE GROUTED SOLID.

REINFORCEMENT:

1. PROVIDE HORIZONTAL JOINT REINFORCING (TRUSS OR LADDER TYPE, 9 GAGE) AT 16" OC VERTICALLY AT ALL CMU WALLS. PROVIDE PRE-FAB WIRE TIES AT ALL CORNERS AND INTERSECTIONS AT 16" O.C. REINFORCEMENT SHALL CONFORM TO ASTM A82 WITH A MINIMUM YIELD STRENGTH OF 60,000 PSI, AND SHALL BE HOT DIPPED GALVANIZED.
2. OPENINGS IN MASONRY WALLS SHALL HAVE EITHER MASONRY OR STEEL LINTELS AS SHOWN ON THE DRAWINGS. ALL HORIZONTAL REINFORCING IN BOND BEAMS AND LINTEL BLOCKSSHALL BE CONTINUOUS, AND GROUTED SOLID. WHEN NO LINTEL IS DETAILED, A MINIMUM OF (2) #4 BARS IN A LINTEL BLOCK SHALL BE INSTALLED. THE BARS SHALL EXTEND A MINIMUM OF EIGHT INCHES BEYOND THE EDGE OF THE OPENING, AND EACH JAMB SHALL BE GROUTED SOLID FOR A DISTANCE OF EIGHT INCHES WITH (2) #5 VERTICAL MINIMUM. STEEL LINTELS SHALL BEAR 8" MINIMUM AT EACH END. PROVIDE VERTICAL CONTROL JOINTS AT THE ENDS OF ANY STEEL LINTEL, UNLESS 15# FELT OR FLASHING IS PROVIDED AT THE TOP AND BOTTOM OF THE LINTEL ANGLE WHERE THE ANGLE BEARS ON BRICK.
3. LINTEL BLOCKS SHALL BE "U" SHAPED UNITS WITH SOLID BOTTOMS AND ARE TO BE USED OVER WINDOW AND DOOR OPENINGS. BOND BEAM BLOCKS SHALL BE OPEN BOTTOM UNITS AND ARE TO BE USED AT THE TOPS OF WALLS AND AT THE MID-HEIGHT, UNLESS THE WALL HEIGHT EXCEEDS 16 FEET, IN WHICH BOND BEAMS SHALL BE PROVIDED 8'-0" ON CENTER VERTICALLY MAXIMUM, UNLESS SHOWN OTHERWISE ON THE DRAWINGS. PROVIDE (2) #4 BARS IN A SOLID GROUTED BOND BEAM UNLESS NOTED OTHERWISE. LINTEL BLOCKS SHALL NOT BE USED IN PLACE OF BOND BEAM BLOCKS.
4. ALL MASONRY TIES TO BACKUP STRUCTURE SHALL BE HOT DIP GALVANIZED. UNLESS OTHERWISE NOTED ON THE DRAWINGS, PROVIDE HECKMANN NO. 315 ANCHOR WITH N0. 316 TRIANGULAR TIE ON COLUMNS AT 16" ON CENTER VERTICALLY AND A HECKMANN NO. 357 ANCHOR ON ALL BEAMS AT 16" ON CENTER HORIZONTALLY. MASONRY TIES TO WALL STUDS SHALL BE HECKMANN NO. 316 TRIANGULAR TIE WITH HECKMANN NO. 315-C SCREW ON ANCHOR STRAP SPACED 16" ON CENTER HORIZONTALLY VERTICALLY. AT WALL CORNERS, INTERSECTIONS AND OPENINGS, PROVIDE TWO VERTICAL ROWS OF ANCHORS SPACED 16" APART AND 16" ON CENTER VERTICALLY. TRIANGULAR TIES SHALL EXTEND 3/4" FROM FACE OF MASONRY. ANCHOR STRAPS SHALL BE ATTACHED TO METAL STUDS WITH TWO (2) #10-16x1 1/2" CADMIUM PLATED SHEET METAL SCREWS.
5. AT FREE VERTICAL EDGES OF WALLS, AND AT THE FIRST CELL EACH SIDE OF CONTROL JOINTS, PROVIDE (1) VERTICAL IN GROUT FILLED END CORES. THE VERTICAL REINFORCING SHALL MATCH TYPICAL VERTICAL WALL REINFORCING UNLESS NOTED OTHERWISE, AND SHALL EXTEND TO THE TOP OF THE WALL.
6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, PROVIDE A MINIMUM OF #4 VERTICAL BARS AND DOWELS IN FULLY GROUTED CELLS AT 48" O.C.
7. ALL BAR REINFORCING SHALL BE LAPPED AS FOLLOWS:

   - #3 LAP SPLICE LENGTH = 19 INCHES
   - #4 LAP SPLICE LENGTH = 34 INCHES
   - #5 LAP SPLICE LENGTH = 45 INCHES
   - #6 LAP SPLICE LENGTH = 54 INCHES
   - #7 LAP SPLICE LENGTH = 63 INCHES
   - #8 LAP SPLICE LENGTH = 72 INCHES
   - #9 LAP SPLICE LENGTH = 82 INCHES
   - INCREASE LAP SPLICE LENGTHS BY 50% FOR EPOXY COATED REINFORCING

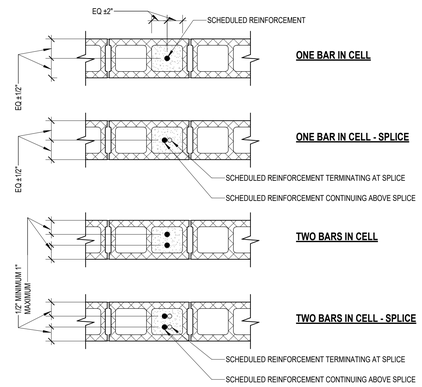
MISCELLANEOUS:

1. ALL MASONRY DESIGN IS BASED ON CHAPTER 21 OF INTERNATIONAL BUILDING CODE, LATEST EDITION AND ACI 530, LATEST EDITION.
2. SEE TYPICAL DETAILS FOR INTERIOR WALL BRACING, AND REINFORCING REQUIREMENTS.
3. UNLESS NOTED OTHERWISE PER PLANS, SPECS OR DETAILS, MASONRY WALLS SHALL HAVE VERTICAL CONTROL JOINTS PER NCMA GUIDELINES TEK 10-2C AS FOLLOWS:

   - AT APPROXIMATELY SIXTEEN FEET ON CENTER
   - CORNERS-AT A MAXIMUM DISTANCE NOT TO EXCEED ONE-HALF THE REQUIRED MAXIMUM DISTANCE
   - BETWEEN MAIN AND INTERSECTING WALLS
   - CHANGES IN WALL HEIGHTS
   - ADJACENT TO LINTELS AND THROUGH OPENINGS IF NOT CROSSING VERTICAL REINFORCEMENT
   - AT PILASTERS AND CHANGES IN WALL THICKNESS
   - ALL JOINT LOCATIONS SHALL BE COORDINATED WITH THE ARCHITECT.
4. UNLESS NOTED OTHERWISE PER PLANS, SPECS OR DETAILS, BRICK VENEER CONTROL JOINTS SHALL BE PER BIA GUIDELINES-TECHNICAL NOTE 18A.

   - WITHOUT OPENINGS, SPACE NO MORE THAN 25 FT
   - WITH MULTIPLE OPENINGS, SPACE NO MORE THAN 20 FT
   - AT OR NEAR CORNERS
   - AT OFFSETS AND SETBACKS
   - AT WALL INTERSECTIONS
   - AT CHANGES IN WALL HEIGHTS
   - AT WALL BACKING SYSTEM CHANGES (CMU TO DRYWALL)
   - AT SUPPORT CHANGES (CONCRETE TO STEEL)
   - AT WALL FUNCTION OR CLIMATIC EXPOSURE CHANGES (INTERIOR TO EXTERIOR)
5. GROUT LIFT LIMITS

   - GROUT POURS SHALL NOT EXCEED 5 FEET PER LIFT WHEN GROUTING THE CELLS OF REINFORCED CMU, UNLESS CLEANOUTS ARE PROVIDED IN THE BOTTOM COURSE OF EACH 5 FOOT SECTION.
   - GROUT POURS SHALL NOT EXCEED 24 FEET WHEN GROUTING THE CELLS OF HOLLOW CMU. WHEN GROUTING THE SPACE BETWEEN MULTI-WYTHE WALLS, THE TOTAL POUR SHALL NOT EXCEED 24 FEET FOR 3" SPACES, 12 FEET FOR 2 1/2" SPACES, AND 5 FEET FOR 2" SPACES.
   - MECHANICALLY VIBRATE ALL LIFTS IN EXCESS OF 1 FOOT.
   - ALL GROUT MUST BE PLACED WITHIN 1 1/2 HOURS FROM INTRODUCING WATER INTO THE MIXTURE.
   - GROUT LIFTS SHALL NOT BE STOPPED WITHIN 1 1/2" OF BED JOINT.
   - ALL CMU WALLS LOCATED ADJACENT TO EARTH FILL MUST BE FULLY GROUTED DIRECTLY ADJACENT TO, AND AT EAST 8" ABOVE, ALL SOIL IN CONTACT WITH THE WALL.



2 TYPICAL CMU VERTICAL BAR PLACEMENT
NO SCALE

NOTES:

1. REINFORCEMENT MUST BE PLACED USING REINFORCING BAR POSITIONERS THAT LOCATE THE BAR AS SPECIFIED AND PREVENT MOVEMENT OF THE BAR DURING CONSTRUCTION.
2. SPLICED REINFORCEMENT MUST BE A CONTACT LAP SPLICE WITH SPLICED BARS ALIGNED PARALLEL TO THE WALL AS SHOWN.
3. THE ENGINEER MUST BE NOTIFIED PRIOR TO PLACEMENT OF REINFORCEMENT THAT IS REQUIRED TO BE PLACED OUTSIDE OF THE TOLERANCES OF THIS DETAIL SUCH AS TO AVOID INTERFERENCE WITH OTHER REINFORCEMENT, CONDUITS, OR EMBEDDED ITEMS.

BRACE FRAMING (3 5/8" STUDS)

STUD TYPE	STUD PROPERTIES	SPACING	MAX LENGTH	MISCELLANEOUS
SJ 20 (40 KSI)	Ix = 0.541 IN^4	4'-0" OC	14'-0"	BRACE @ MID-PT FOR LENGTHS OVER 14'-0"
	rx = 1.429 IN			
	A = 0.2136 IN^2			
	Sx = 0.273 IN^3			

BRACE FRAMING (6" STUDS)

STUD TYPE	STUD PROPERTIES	SPACING	MAX LENGTH	MISCELLANEOUS
SJ 20 (40 KSI)	Ix = 1.787 IN^4	4'-0" OC	20'-0"	BRACE @ MID-PT FOR LENGTHS OVER 20'-0"
	rx = 2.253 IN			
	A = 0.2148 IN^2			
	Sx = 0.539 IN^3			

VERTICAL FRAMING (3 5/8" STUDS)

STUD TYPE	STUD PROPERTIES	SPACING	MAX LENGTH	MISCELLANEOUS
ST 25 (33 KSI)	Ix = 0.239 IN^4	1'-4" OC	16'-9"	ONE LAYER SHEATHING (MIN) *
	rx = 1.415 IN			
	A = 0.123 IN^2			
	Sx = 0.113 IN^3			
ST 20 (33 KSI)	Ix = 0.414 IN^4	1'-4" OC	22'-6"	ONE LAYER SHEATHING (MIN) *
	rx = 1.407 IN			
	A = 0.210 IN^2			
	Sx = 0.213 IN^3			

*OR PROVIDE 1 1/2x1 1/2x16 GA HORIZONTAL CHANNEL FASTENED TO STUDS WITH 1 1/2x1 1/2x14 GA CLIP AT 4'-0" OC VERTICALLY

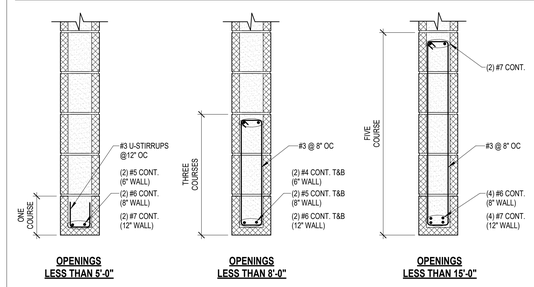
VERTICAL FRAMING (6" STUDS)

STUD TYPE	STUD PROPERTIES	SPACING	MAX LENGTH	MISCELLANEOUS
ST 25 (33 KSI)	Ix = 0.773 IN^4	1'-4" OC	20'-0"	ONE LAYER SHEATHING (MIN) *
	rx = 2.209 IN			
	A = 0.167 IN^2			
	Sx = 0.184 IN^3			
ST 20 (33 KSI)	Ix = 1.385 IN^4	1'-4" OC	32'-9"	ONE LAYER SHEATHING (MIN) *
	rx = 2.199 IN			
	A = 0.288 IN^2			
	Sx = 0.437 IN^3			

*OR PROVIDE 1 1/2x1 1/2x16 GA HORIZONTAL CHANNEL FASTENED TO STUDS WITH 1 1/2x1 1/2x14 GA CLIP AT 4'-0" OC VERTICALLY

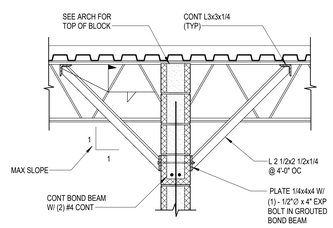
NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATIONS OF OPENINGS. PROVIDE BLOCK LINTELS FOR ALL OPENINGS AT INTERIOR AND EXTERIOR WALLS FOR WHICH A STEEL LINTEL IS NOT SCHEDULED.
2. PROVIDE 1" OF BEARING @ EACH JAMB FOR EACH FOOT OF CLEAR SPAN BUT NOT LESS THAN 8". REINFORCING SHALL EXTEND A MINIMUM OF 6" ONTO THE BEARING.
3. FOR REINFORCED CMU WALLS AT OPENINGS. PROVIDE EXTRA REINFORCED GROUTED FULL HEIGHT\ CONSECUTIVE CELLS EACH SIDE OF THE OPENING EQUAL TO ONE HALF OF THE TOTAL NUMBER OF CELLS INTERRUPTED BY THE OPENING. REINFORCE EACH CELL WITH THE SAME SIZE AND NUMBER OF BARS AS SPECIFIED FOR THE INTERRUPTED CELLS. PROVIDE A MINIMUM OF (2) REINFORCED GROUTED CELLS EACH SIDE OF OPENING. REFER TO TYPICAL CMU WALL OPENING DIAGRAM AND SCHEDULE FOR ADDITIONAL INFORMATION.
4. AS AN ALTERNATIVE TO USING A FILLED CMU BLOCK LINTEL (PER THE SCHEDULE ABOVE) FOR OPENINGS 5'-0" AND LESS, CONTRACTOR MAY USE CAST CRETE LINTEL (8U8).

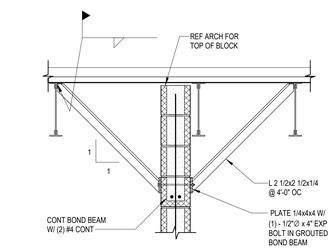


OPENINGS LESS THAN 5'-0" | **OPENINGS LESS THAN 8'-0"** | **OPENINGS LESS THAN 15'-0"**

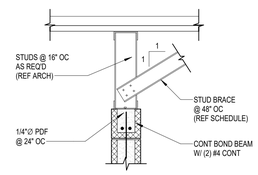
3 MASONRY LINTEL SCHEDULE
NO SCALE



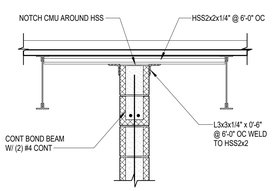
TYPE B (FLOOR / ROOF)



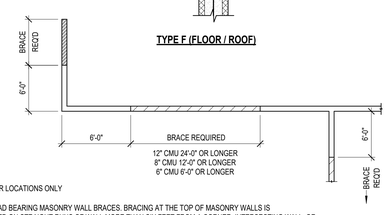
TYPE C (FLOOR / ROOF)



TYPE E (FLOOR / ROOF)



TYPE F (FLOOR / ROOF)



INTERIOR LOCATIONS ONLY

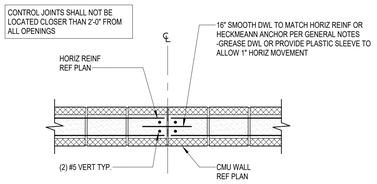
NON-LOAD BEARING MASONRY WALL BRACES. BRACING AT THE TOP OF MASONRY WALLS IS REQUIRED ON STRAIGHT RUNS OF WALL MORE THAN SIX FEET FROM A CORNER, INTERSECTING WALL, OR AS NOTED ABOVE.

WHEN THE MASONRY WALL TERMINATES AT THE BOTTOM OF THE DECK,
A TYPE 'B', 'C', OR 'F' ATTACHMENT AT ROOF MAY BE USED.
WHEN WALLS TERMINATE ABOVE THE CEILING A TYPE 'B', 'C' OR 'E'
ATTACHMENT SHOULD BE USED.

TYPICAL CMU WALL BRACING LOCATION PLAN

5 TYPICAL NON-STRUCTURAL CMU WALL BRACE CONNECTIONS
NO SCALE

CONTROL JOINTS SHALL NOT BE LOCATED CLOSER THAN 2'-0" FROM ALL OPENINGS



4 TYPICAL CONTROL JOINT DETAIL
NO SCALE

PBK
www.pbk.com
770-227-5473
GRIFFIN, GA

SRO Offices - Warhawk Fieldhouse Modifications
47 LEMON STREET MCDONOUGH, GA 30253

FINAL DOCUMENTS

HENRY COUNTY SCHOOLS

NORTH

GEORGIA REGISTERED STRUCTURAL ENGINEER No. SE000386 SIDDHANTH BAJPAI
03/12/2026

CLIENT	
DATE 03 / 12 / 2026	PROJECT NUMBER 250306

DRAWING HISTORY

No.	Description	Date

CHECKED BY: Checker
DRAWN BY: Author

GENERAL CMU NOTES AND TYP DETAILS

S-400

Plot Stamp:
3/26/2026 3:41:31 PM