QUALITY ASSURANCE / STATEMENT OF SPECIAL INSPECTIONS – MASONRY

Table 3 — Level A Quality Assurance

MINIMUM TESTS
None
MINIMUM INSPECTION
Verify compliance with the approved submittals

Table 4 — Level B Quality Assurance

MINIMUM TESTS				
Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Article 1.5 B.1.b.3 for self-consolidating grout				
Verification of f'_m and f'_{AAC} in accordance with Article 1.4 B prior to construction, except where specifically exempted by the Code.				
MINIMUM INSPECTION				
Inspection Task	**Frequency [a]**		**Reference for Criteria**	
	Continuous	Periodic	TMS 402/ ACI 530/ ASCE 5	TMS 602/ ACI 530.1/ ASCE 6
1. Verify compliance with the approved submittals		X		Art. 1.5
2. As masonry construction begins, verify that the following are in compliance:				
a. Proportions of site-prepared mortar		X		Art. 2.1, 2.6 A
b. Construction of mortar joints		X		Art. 3.3 B
c. Grade and size of prestressing tendons and anchorages		X		Art. 2.4 B, 2.4 H
d. Location of reinforcement, connectors, and prestressing tendons and anchorages		X		Art. 3.4, 3.6 A
e. Prestressing technique		X		Art. 3.6 B
f. Properties of thin-bed mortar for AAC masonry	X[b]	X[c]		Art. 2.1 C
3. Prior to grouting, verify that the following are in compliance:				
a. Grout space		X		Art. 3.2 D, 3.2 F
b. Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		X	Sec. 1.16	Art. 2.4, 3.4
c. Placement of reinforcement, connectors, and prestressing tendons and anchorages		X	Sec. 1.16	Art. 3.2 E, 3.4, 3.6 A
d. Proportions of site-prepared grout and prestressing grout for bonded tendons		X		Art. 2.6 B, 2.4 G.1.b
e. Construction of mortar joints		X		Art. 3.3 B

Table 4 — Level B Quality Assurance (Continued)

MINIMUM INSPECTION				
Inspection Task	**Frequency [a]**		**Reference for Criteria**	
	Continuous	Periodic	TMS 402/ ACI 530/ ASCE 5	TMS 602/ ACI 530.1/ ASCE 6
4. Verify during construction:				
a. Size and location of structural elements		X		Art. 3.3 F
b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction		X	Sec. 1.16.4.3, 1.17.1	
c. Welding of reinforcement	X		Sec.2.1.8.7.2, 3.3.3.4 (e), 8.3.3.4(b)	
d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C)) or hot weather (temperature above 90°F (32.2°C))		X		Art. 1.8 C, 1.8 D
e. Application and measurement of prestressing force	X			Art. 3.6 B
f. Placement of grout and prestressing grout for bonded tendons is in compliance	X			Art. 3.5, 3.6 C
g. Placement of AAC masonry units and construction of thin-bed mortar joints	X[b]	X[c]		Art. 3.3 B.8
5. Observe preparation of grout specimens, mortar specimens, and/or prisms		X		Art. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, 1.4 B.4

(a) Frequency refers to the frequency of inspection, which may be continuous during the task listed or periodically during the listed task, as defined in the table.
(b) Required for the first 5000 square feet (465 square meters) of AAC masonry.
(c) Required after the first 5000 square feet (465 square meters) of AAC masonry.

Table 5 — Level C Quality Assurance

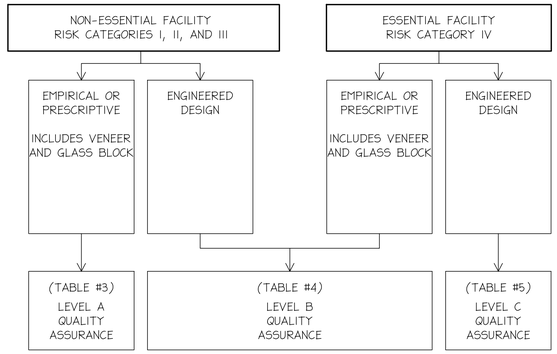
MINIMUM TESTS				
Verification of f'_m and f'_{AAC} in accordance with Article 1.4 B prior to construction and for every 5,000 sq. ft (465 sq. m) during construction				
Verification of proportions of materials in premixed or preblended mortar, prestressing grout, and grout other than self-consolidating grout as delivered to the project site				
Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Article 1.5 B.1.b.3 for self-consolidating grout				
MINIMUM INSPECTION				
Inspection Task	**Frequency [a]**		**Reference for Criteria**	
	Continuous	Periodic	TMS 402/ ACI 530/ ASCE 5	TMS 602/ ACI 530.1/ ASCE 6
1. Verify compliance with the approved submittals		X		Art. 1.5
2. Verify that the following are in compliance:				
a. Proportions of site-mixed mortar, grout, and prestressing grout for bonded tendons		X		Art. 2.1, 2.6 A, 2.6 B, 2.6 C, 2.4 G.1.b
b. Grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages		X	Sec. 1.16	Art. 2.4, 3.4
c. Placement of masonry units and construction of mortar joints		X		Art. 3.3 B
d. Placement of reinforcement, connectors, and prestressing tendons and anchorages	X		Sec. 1.16	Art. 3.2 E, 3.4, 3.6 A
e. Grout space prior to grouting	X			Art. 3.2 D, 3.2 F
f. Placement of grout and prestressing grout for bonded tendons	X			Art. 3.5, 3.6 C
g. Size and location of structural elements		X		Art. 3.3 F
h. Type, size, and location of anchors including other details of anchorage of masonry to structural members, frames, or other construction	X		Sec. 1.16.4.3, 1.17.1	
i. Welding of reinforcement	X		Sec. 2.1.8.7.2, 3.3.3.4 (c), 8.3.3.4(b)	
j. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C)) or hot weather (temperature above 90°F (32.2°C))		X		Art. 1.8 C, 1.8 D
l. Application and measurement of prestressing force	X			Art. 3.6 B
m. Placement of AAC masonry units and construction of thin-bed mortar joints	X			Art. 3.3 B.8
n. Properties of thin-bed mortar for AAC masonry	X			Art. 2.1 C.1
3. Observe preparation of grout specimens, mortar specimens, and/or prisms	X			Art. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, 1.4 B.4

(a) Frequency refers to the frequency of inspection, which may be continuous during the task listed or periodically during the listed task, as defined in the table.

TABLES 3,4, & 5 (FROM THE 2011 MSJC) PROVIDED COURTESY OF THE MASONRY SOCIETY.

THE MASONRY SOCIETY

FLOW CHART – DETERMINATION OF REQUIRED QUALITY ASSURANCE LEVEL



RISK CATEGORY OF BUILDINGS ARE DEFINED IN TABLE 1604.5 OF THE 2012 IBC.
CATEGORY EXAMPLES ARE AS FOLLOWS:

CATEGORY I (LOW HAZARD): AGRICULTURAL AND MINOR STORAGE FACILITIES.

CATEGORY II (MODERATE HAZARD): FACILITIES CLASSIFIED AS OTHER THAN CATEGORY I, II, OR IV.

CATEGORY III (SUBSTANTAL HAZARD): SCHOOLS (K-12) WITH AN OCCUPANT LOAD GREATER THAN 250, COLLEGES (ADULT EDUCATION) WITH AN OCCUPANT LOAD GREATER THAN 500, PUBLIC ASSEMBLY BUILDINGS WITH AN OCCUPANT LOAD GREATER THAN 300, ETC.

CATEGORY IV (ESSENTIAL FACILITY): HOSPITALS; FIRE, AMBULANCE AND POLICE STATIONS; EMERGENCY SHELTERS, ETC.

NOTE TO DESIGN PROFESSIONAL:
DETERMINE THE REQUIRED QUALITY ASSURANCE LEVEL (A, B, OR C) REQUIRED FOR THE PROJECT, AND INCLUDE THE CORRESPONDING TABLE IN THE DESIGN DRAWINGS. THE FLOW CHART ABOVE IS FURNISHED TO AID THE USER IN DETERMINING THE APPROPRIATE QUALITY ASSURANCE LEVEL.

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- GENERIC WALL DESIGN -
STRUCTURAL DETAILS

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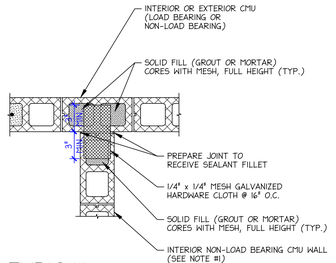
FAX (248)663-0420

MASONRY Institute of Michigan

DATE: 01/03/2014

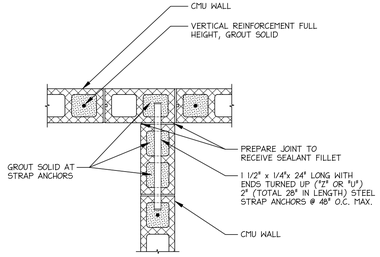
TITLE: QUALITY ASSURANCE

SHEET: S-1



1 S-2 TYPICAL INTERSECTING WALL DETAIL

NOTES:
1) INTERIOR LOAD BEARING WALLS USUALLY ACHIEVE LATERAL SUPPORT FROM SUPPORTING FRAMING MEMBERS, AND ARE NOT DEPENDENT ON INTERSECTING WALLS FOR LATERAL SUPPORT. SUCH WALLS NEED NOT BE CONNECTED TO OTHER CMU WALLS.

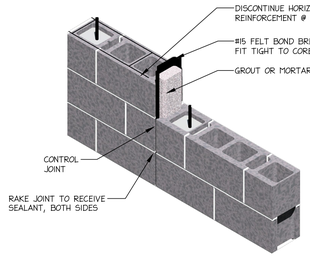


2 S-2 FLANGED SHEAR WALL CONNECTION DETAIL

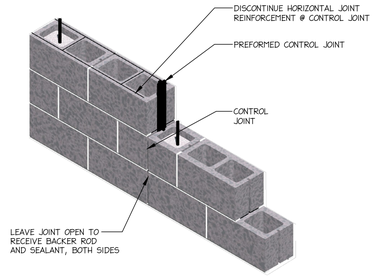
(APPLIES ONLY WHERE SPECIFICALLY CALLED FOR ON THE PLANS)

NOTE TO DESIGN PROFESSIONAL:
THIS DETAIL DEVELOPS FLANGE ACTION (SHEAR TRANSFER). FOR ECONOMY, DETAIL 1 IS RECOMMENDED WHEN FLANGE ACTION HAS NOT BEEN USED IN THE WALL DESIGN.

INTERSECTING WALL DETAILS



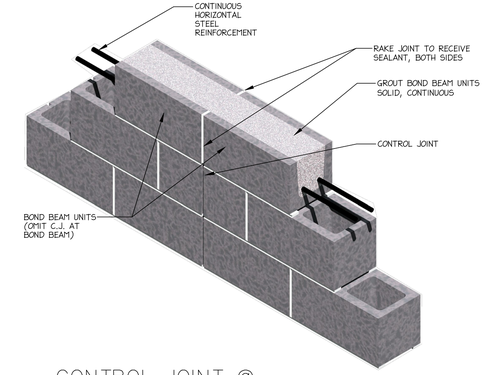
DETAIL A – "MICHIGAN" TYPE CONTROL JOINT



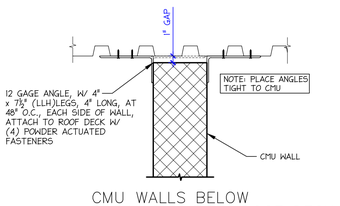
DETAIL B – GASKET TYPE CONTROL JOINT

3 S-2 TYPICAL CONTROL JOINT DETAILS
(CONTRACTOR OPTION TO CHOOSE BETWEEN A OR B)

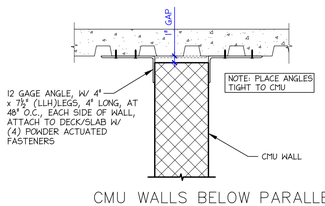
NOTES TO DESIGN PROFESSIONAL:
1) DETAIL "A" WILL ACHEIVE UP TO A 4 HOUR FIRE RATING, DETAIL "B" WILL ACHEIVE UP TO A 2 HOUR FIRE RATING.
2) IT IS USUALLY NOT NECESSARY TO INSTALL VERTICAL REBAR IN BOTH OF THE CELLS ADJACENT TO THE CONTROL JOINT. IT IS EVEN POSSIBLE THAT DOING SO CAN INTERFERE WITH THE FUNCTION OF THE CONTROL JOINT. HOWEVER, FOR WALLS RESISTING IN-PLANE SHEAR, SUCH REINFORCEMENT MAY BE REQUIRED DUE TO SEISMIC PRESCRIPTIVE REQUIREMENTS AND/OR STRUCTURAL LOADING.



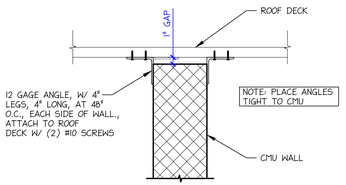
4 S-2 CONTROL JOINT @ CONTINUOUS BOND BEAM DETAIL
(PER STRUCTURAL REQUIREMENTS)



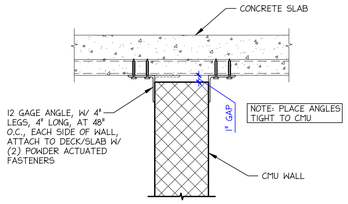
CMU WALLS BELOW PARALLEL METAL ROOF DECK
(ALTERNATE DETAIL)



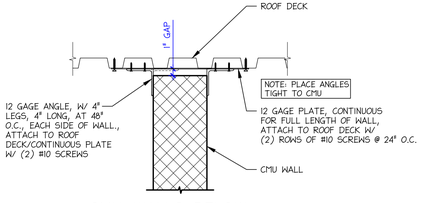
CMU WALLS BELOW PARALLEL CONCRETE SLAB DECK FLUTES
(ALTERNATE DETAIL)



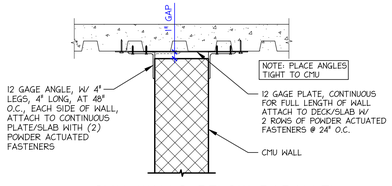
CMU WALLS BELOW PERPENDICULAR METAL ROOF DECK



CMU WALLS BELOW PERPENDICULAR CONCRETE SLAB DECK FLUTES



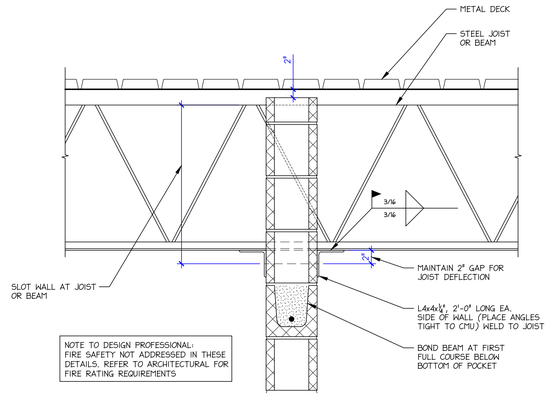
CMU WALLS BELOW PARALLEL METAL ROOF DECK



CMU WALLS BELOW PARALLEL CONCRETE SLAB DECK FLUTES

6 S-2 TOP OF WALL DETAILS – INTERIOR NON-LOAD BEARING WALLS

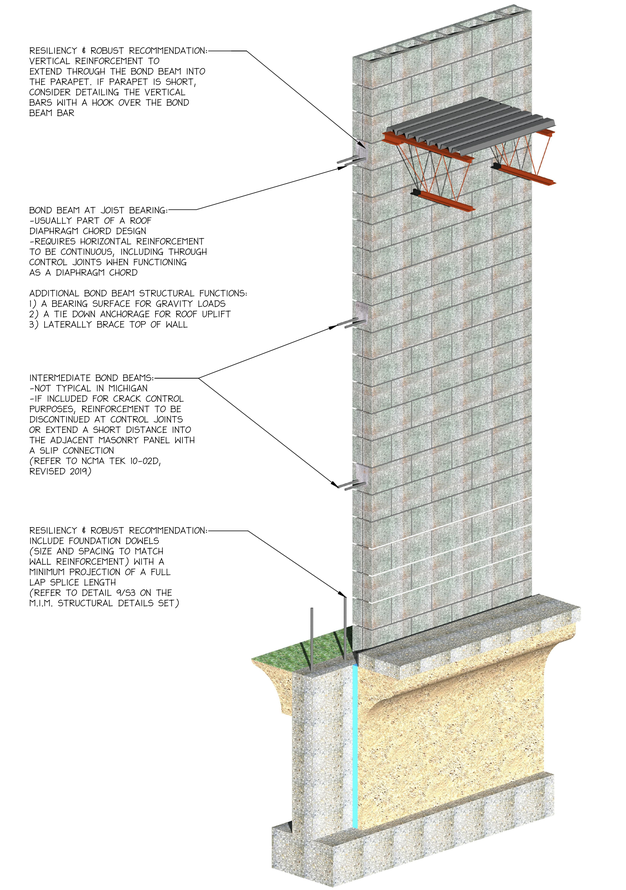
NOTES TO DESIGN PROFESSIONAL:
1) FIRE SAFETY NOT ADDRESSED IN THESE DETAILS. REFER TO ARCHITECTURAL FOR FIRE RATING REQUIREMENTS
2) VERIFY ANTICIPATED DEFLECTION GAP.



NOTE TO DESIGN PROFESSIONAL:
FIRE SAFETY NOT ADDRESSED IN THESE DETAILS. REFER TO ARCHITECTURAL FOR FIRE RATING REQUIREMENTS

5 S-2 TOP OF WALL @ STRUCTURAL FRAMING MEMBER DETAIL

ISOMETRIC VIEW



7 S2 CMU DESIGN RECOMMENDATIONS FOR BOND BEAMS & RESILIENCY

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STRUCTURAL DETAILS

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FAX (248)663-0420

MASONRY Institute of Michigan

DATE: 05/18/2020

TITLE: INTERSECTING WALLS, CONTROL JOINTS, & TOP OF WALL DETAILS

SHEET: S-2

NOTES TO DESIGN PROFESSIONAL:

TABLES IN THIS DETAIL CONTAIN REINFORCEMENT LAP SPLICE LENGTHS THAT ACHIEVE NOT ONLY BUILDING CODE COMPLIANCE, BUT ALSO COMPLIANCE WITH THE "STANDARD PRACTICE FOR BRACING MASONRY WALLS UNDER CONSTRUCTION" (WHICH IS IMPORTANT FOR LIFE SAFETY AT THE JOB SITE).

VARIOUS CODES AND CODE EDITIONS CONTAIN SIGNIFICANT VARIATIONS IN LAP SPLICE LENGTH REQUIREMENTS. ALTHOUGH LAP SPLICE LENGTH REQUIREMENTS SPECIFICALLY GIVEN IN THE 2015 IBC DIFFER FROM THOSE SPECIFICALLY GIVEN IN THE 2013 MSJC, 2015 IBC DOES PERMIT USE OF THE 2013 MSJC CRITERIA FOR LAP SPLICE LENGTHS. USE OF CONSTRUCTION BRACING CRITERIA, WHEN IT IS MORE RESTRICTIVE THAN THE MSJC REQUIREMENTS, PROVIDES FOR INCREASED SAFETY.

THEREFORE, THE VALUES INCLUDED IN THE TABLES ARE THE MORE RESTRICTIVE OF: 1) THE LAP LENGTHS DETERMINED USING THE 2013 MSJC CODE AND 2) 48 BAR DIAMETER (THE 24 HOUR SPLICE LENGTH CRITERIA FROM THE "STANDARD PRACTICE FOR BRACING"). MOST OF THE LISTED VALUES ARE CONTROLLED BY THE 48 BAR DIAMETER CRITERIA, WHICH IS NECESSARY FOR THE DEVELOPMENT OF BOTH INTERNAL AND EXTERNAL TEMPORARY BRACING IN THE VAST MAJORITY OF WALL CONDITIONS.

TABLE #1 – LAP SPLICE LENGTHS FOR MASONRY WALLS (INCHES)

BARS CENTERED IN WALL (SINGLE REINFORCING)						
BAR SIZE	6" CMU	8" CMU	10" CMU	12" CMU	14" CMU	16" CMU
#3	18	18	18	18	18	18
#4	24	24	24	24	24	24
#5	–	30	30	30	30	30
#6	–	**38**	36	36	36	36
#7	–	–	42	42	42	42
#8	–	–	–	**50**	48	48
#9	–	–	–	**64**	54	54

DESIGN CRITERIA:
fy = 60,000 PSI
f'm = 2,000 PSI

LEGEND:
VALUES IN BOLD BASED ON 2013 MSJC, ALL OTHER VALUES BASED ON STANDARD PRACTICE FOR BRACING MASONRY WALLS UNDER CONSTRUCTION.

TABLE DOES NOT APPLY TO EPOXY COATED BARS.

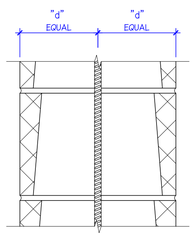
TABLE #2 – LAP SPLICE LENGTHS FOR MASONRY WALLS (INCHES)

BARS PLACED FOR MAXIMUM "d" (DOUBLE REINFORCING)					
BAR SIZE	8" CMU	10" CMU	12" CMU	14" CMU	16" CMU
#3	18	18	18	18	18
#4	24	24	24	24	24
#5	30	30	30	30	30
#6	**57**	**57**	**57**	**57**	**57**
#7	–	**80**	**80**	**80**	**80**
#8	–	–	–	–	–
#9	–	–	–	–	–

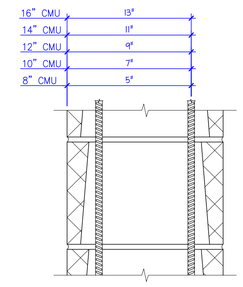
DESIGN CRITERIA:
fy = 60,000 PSI
f'm = 2,000 PSI

LEGEND:
VALUES IN BOLD BASED ON 2013 MSJC, ALL OTHER VALUES BASED ON STANDARD PRACTICE FOR BRACING MASONRY WALLS UNDER CONSTRUCTION.

TABLE DOES NOT APPLY TO EPOXY COATED BARS.

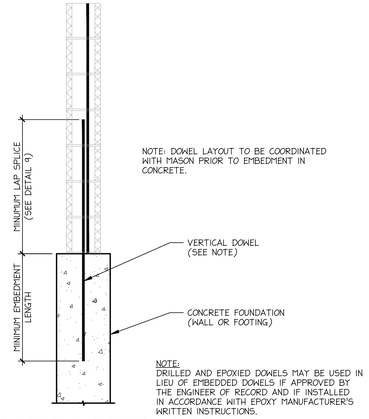


WALL SECTION–SINGLE REINFORCING
"d" = 1/2 x SPECIFIED UNIT THICKNESS



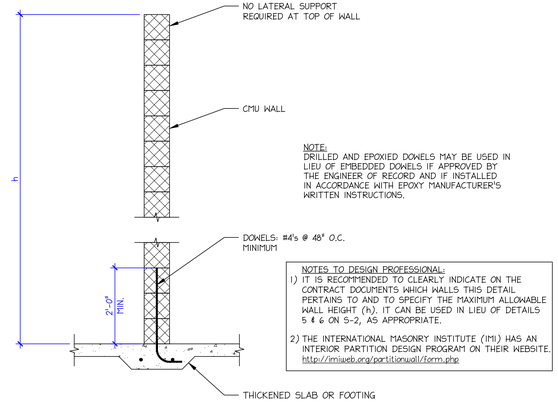
WALL SECTION–DOUBLE REINFORCING
"d" = NOMINAL UNIT THICKNESS MINUS 3.00 INCHES

9 / S-3 VERTICAL REINFORCEMENT LOCATION & LAP SPLICE LENGTHS

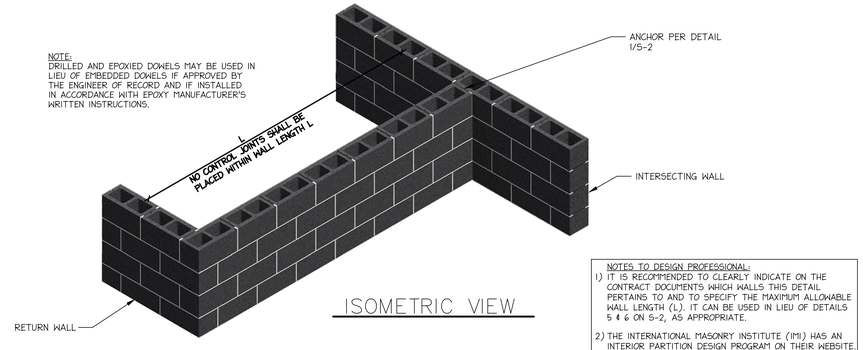


10 / S-3 FOUNDATION DOWEL DETAIL

NOTES TO DESIGN PROFESSIONAL:
THIS DETAIL MAY BE CAPABLE OF DEVELOPING FIXITY AT THE BASE. FOR TEMPORARY WALL BRACING DESIGN, FOUNDATION STABILITY AND WALL STRENGTH NEED TO BE CHECKED.
FIXITY AT THE BASE IS DESIRABLE FOR THE FOLLOWING REASONS:
1) INCREASED RESISTANCE TO WIND DURING CONSTRUCTION, CONTRIBUTING TO "INTERNAL BRACING".
2)POSSIBLE INCREASED FLEXURAL STRENGTH TO RESIST UNANTICIPATED LOADS.



7 / S-3 CANTILEVERED INTERIOR PARTITION WALL



8 / S-3 HORIZONTAL SPANNING INTERIOR PARTITION WALL

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PH. (248)663-0415
FAX (248)663-0420

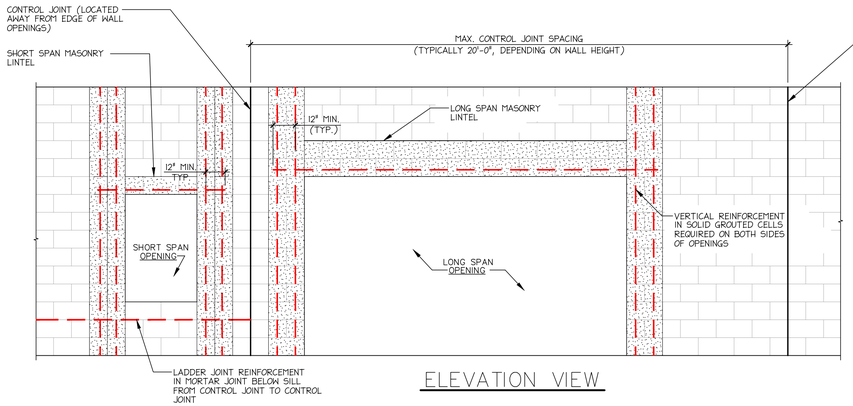
MASONRY Institute of Michigan

- GENERIC WALL DESIGN - STRUCTURAL DETAILS

DATE: 04/15/2020

TITLE: VERTICAL REINFORCEMENT LOCATION, LAP SPLICES, INTERIOR PARTITION WALLS

SHEET: S-3



ELEVATION VIEW

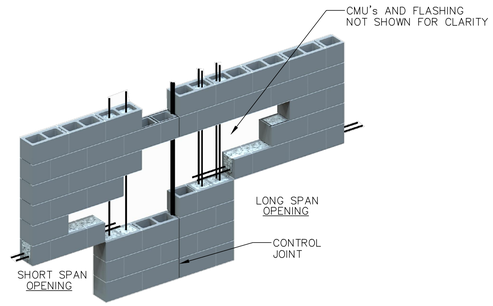
NOTES TO DESIGN PROFESSIONAL:

1) TRADITIONALLY, CONTROL JOINTS HAVE TYPICALLY BEEN LOCATED AT OR VERY CLOSE TO THE SIDES OF OPENINGS (AS IN DETAILS 12 AND 13). HOWEVER IT IS PREFERRED FOR CONTROL JOINTS TO BE LOCATED AWAY FROM THE EDGE OF OPENINGS AND TO ADD REINFORCEMENT AROUND THE OPENINGS.

2) FOR BEST PERFORMANCE, THE VERTICAL REINFORCEMENT SHOULD BE PREFERABLY PLACED IN THE CELL IMMEDIATELY ADJACENT TO THE OPENING. HOWEVER IF THIS CELL IS CONGESTED, THE VERTICAL REINFORCEMENT MAY BE PLACED IN THE 2nd. CELL FROM THE OPENING.

3) ON LONG SPAN OPENINGS IT IS RECOMMENDED TO GROUT BOTH THE 1st. AND 2nd. CELLS FROM THE OPENING TO PROVIDE ADDITIONAL RESISTANCE FOR ATTACHING THE DOOR OR WINDOW FRAME.

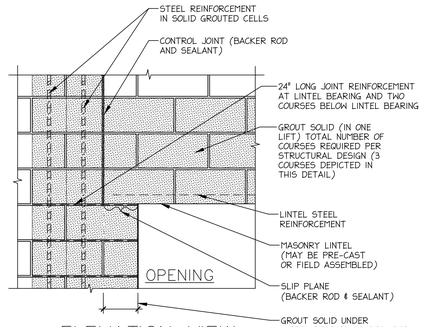
4) FOR CONTROL JOINT DETAILS SEE SHEET S-2.



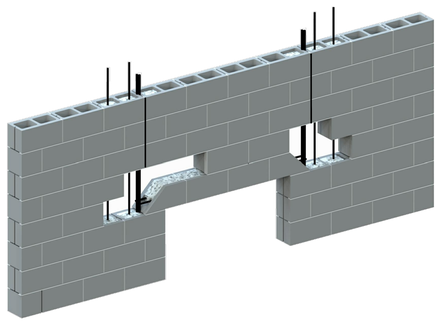
ISOMETRIC VIEW

11 S-4 REINFORCED MASONRY OPENINGS & ASSOCIATED CONTROL JOINT DESIGN (SPANS UP TO APPROXIMATELY 12')

NOTE TO DESIGN PROFESSIONAL:
8" BEARING IS SHOWN AND IS TYPICAL, BUT SHOULD BE INCREASED IF NECESSARY BASED ON STRUCTURAL BEARING CALCULATIONS

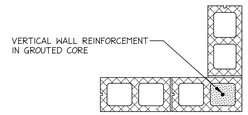


ELEVATION VIEW

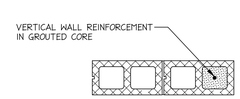


ISOMETRIC VIEW

12 S-4 UNREINFORCED MASONRY OPENINGS & SLIP PLANE/CONTROL JOINT @ LONG SPAN MASONRY LINTELS (SPANS OF APPROXIMATELY 12' UP TO 20')

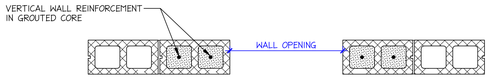


TYPICAL CORNER



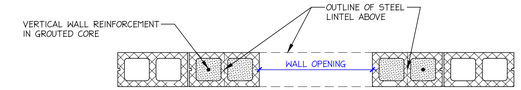
TYPICAL END OF WALL

14A S-4 MASONRY PLAN DETAILS, END OF WALLS



14-B.1 S-4 MASONRY PLAN DETAILS, TYPICAL JAMBS (MASONRY LINTEL)

**PROVIDE A MINIMUM OF ONE BAR AT EACH JAMB PLUS AN ADDITIONAL BAR FOR EACH BAR INTERRUPTED DUE TO THE WALL OPENING. TYPICAL FOR ALL OPENINGS IN EXTERIOR WALLS 6'-0" OR GREATER (U.N.O.)



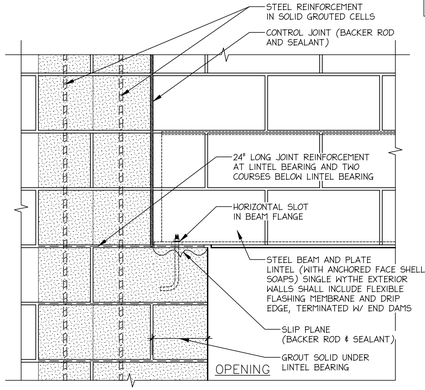
14-B.2 S-4 MASONRY PLAN DETAILS, TYPICAL JAMBS (STEEL LINTEL)

**PROVIDE A MINIMUM OF ONE BAR AT EACH JAMB PLUS AN ADDITIONAL BAR FOR EACH BAR INTERRUPTED DUE TO THE WALL OPENING. TYPICAL FOR ALL OPENINGS IN EXTERIOR WALLS 6'-0" OR GREATER (U.N.O.)

MASONRY LINTEL SCHEDULE

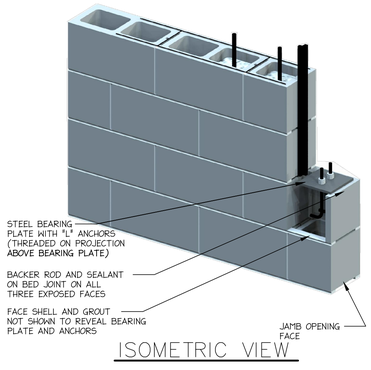
MARK	MIN. BEARING	NOMINAL WIDTH	NOMINAL HEIGHT	HORIZONTAL BOTTOM REINF.	HORIZONTAL TOP REINF.	SHEAR REINFORCEMENT

NOTE TO DESIGN PROFESSIONAL:
COMPLETE SCHEDULE INFORMATION.



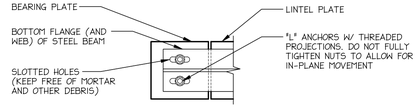
ELEVATION VIEW

NOTE TO DESIGN PROFESSIONAL:
8" BEARING IS SHOWN AND IS TYPICAL, BUT SHOULD BE INCREASED IF NECESSARY BASED ON STRUCTURAL BEARING CALCULATIONS



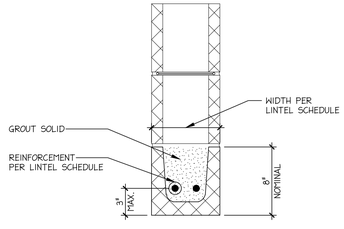
ISOMETRIC VIEW

13 S-4 UNREINFORCED MASONRY OPENINGS & SLIP PLANE/CONTROL JOINT @ LONG SPAN STEEL LINTELS

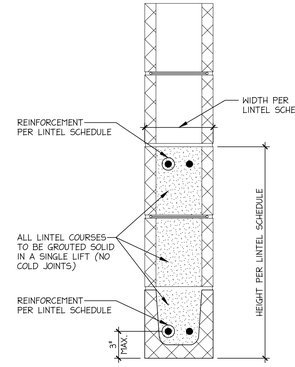


PLAN OF LINTEL/BEARING PLATE

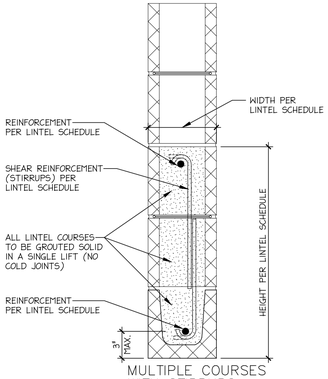
NOTES:
1) DO NOT WELD STEEL BEAM PLATE LINTEL TO BEARING PLATE (TYPICAL BOTH SIDES).
2) STEEL BEAM TO HAVE SLOTS ON BOTTOM FLANGES TO ALLOW FOR IN-PLANE MOVEMENT.



SINGLE COURSE



MULTIPLE COURSES WITHOUT STIRRUPS



MULTIPLE COURSES WITH STIRRUPS

15 S-4 MASONRY LINTELS

NOTE TO DESIGN PROFESSIONAL:
FLASHINGS, WEEPS, ETC. ARE NOT ADDRESSED IN THESE DETAILS, BUT SHOULD BE INCLUDED FOR SINGLE WYTHE EXTERIOR CMU WALLS. SEE SEE M.I.M. ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.
http://www.mim-online.org/architects/single-wyth-exterior-details

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- GENERIC WALL DESIGN - STRUCTURAL DETAILS

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SUITE 388
SOUTHFIELD, MICHIGAN 48034
PH. (248)663-0415
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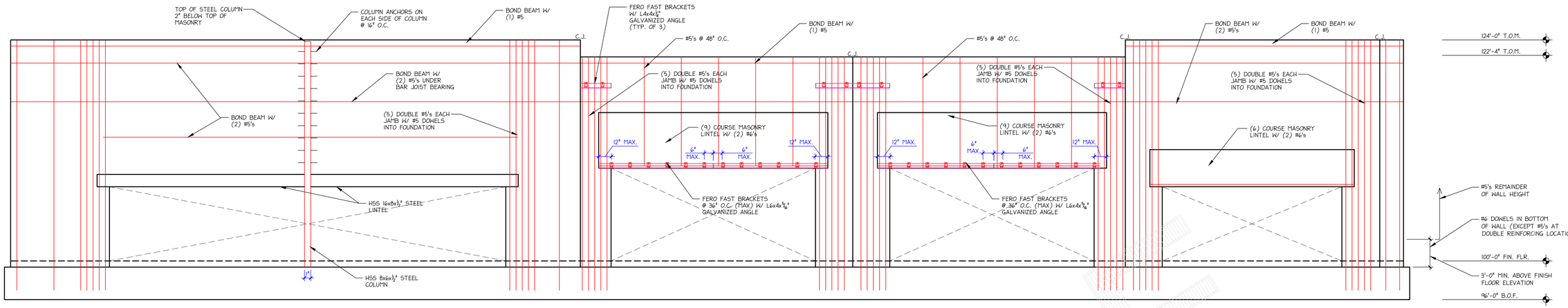
MASONRY Institute of Michigan

DATE: 01/03/2014

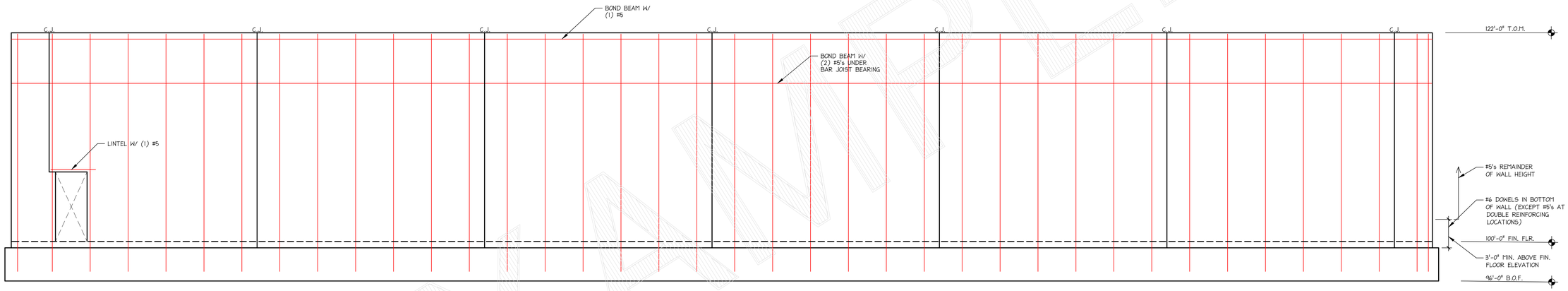
TITLE: CONTROL JOINT PLACEMENT & SLIP PLANE, MASONRY PLAN DETAILS & LINTELS

SHEET: S-4



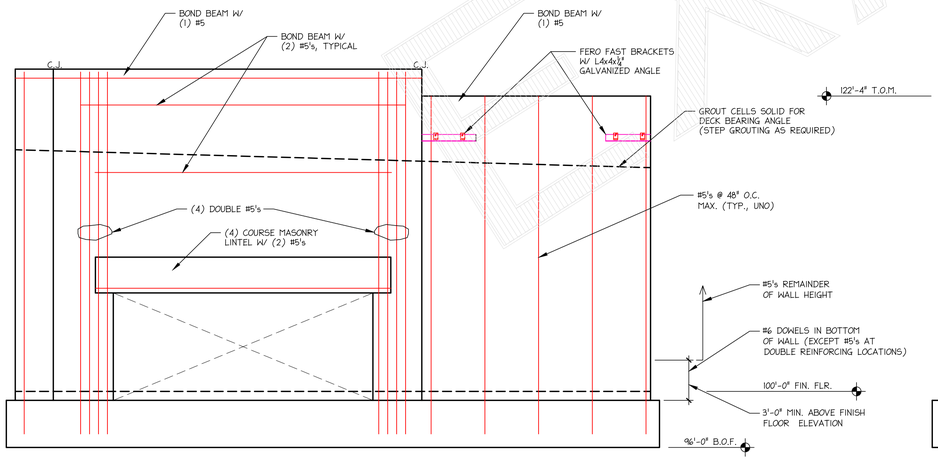
SOUTH ELEVATION

SCALE: 3/16"=1'-0"



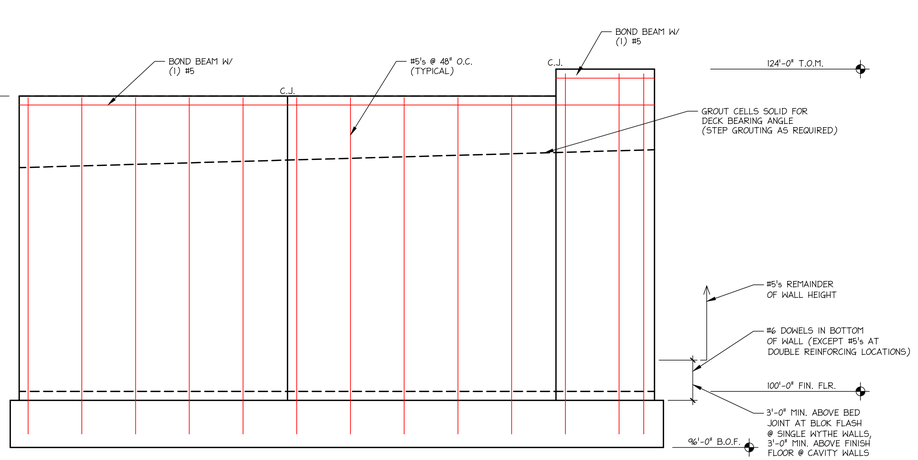
NORTH ELEVATION

SCALE: 3/16"=1'-0"



EAST ELEVATION

SCALE: 3/16"=1'-0"



WEST ELEVATION

SCALE: 3/16"=1'-0"

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SAMPLE WALL REINFORCING ELEVATIONS

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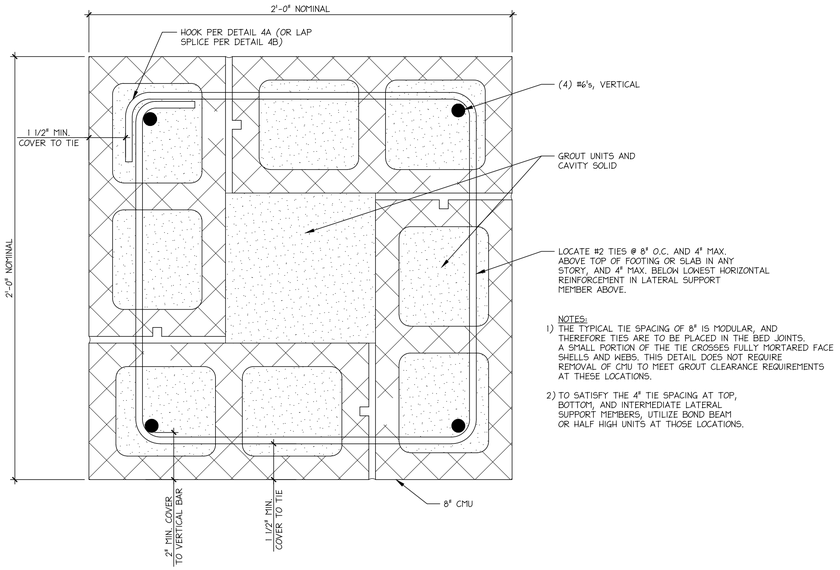
FAX (248)663-0420

MASONRY Institute of Michigan

DATE: 01/14/2015

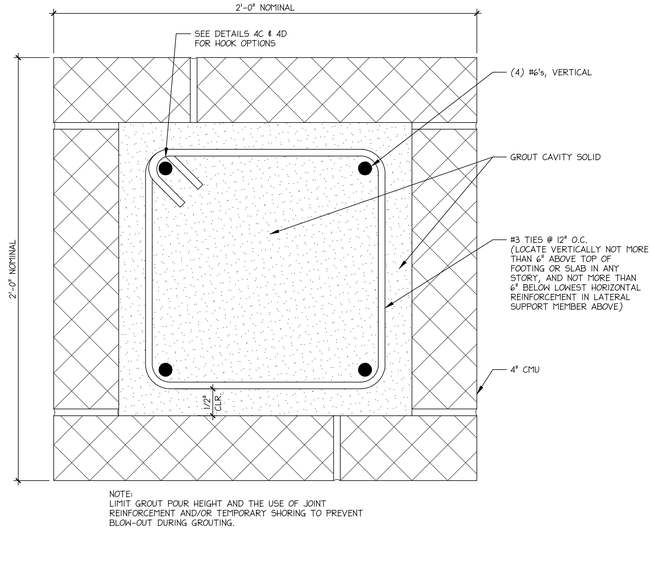
TITLE: SAMPLE REINFORCING ELEVATIONS

SHEET: S-5



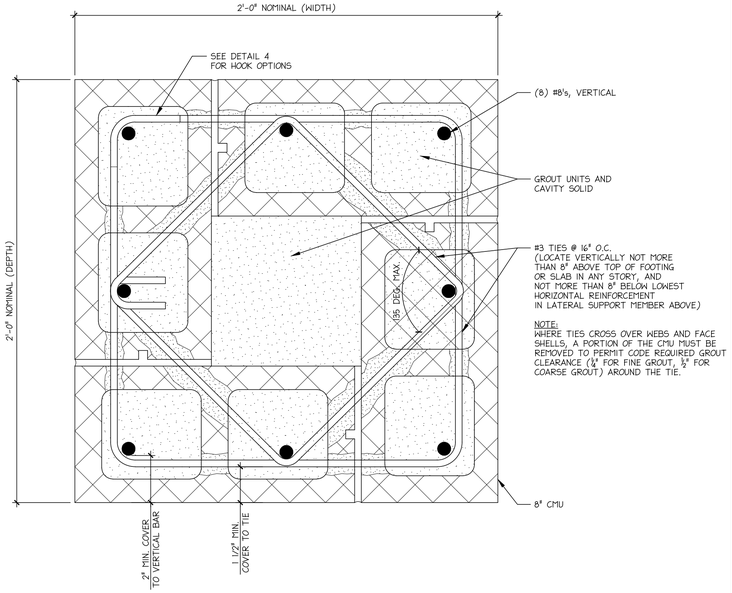
1 S6 24"x24" CMU COLUMN PLAN DETAIL #1

SCALE: 1½"=1'-0"



2 S6 24"x24" CMU COLUMN PLAN DETAIL #2

SCALE: 1½"=1'-0"



3 S6 24"x24" CMU COLUMN PLAN DETAIL #3

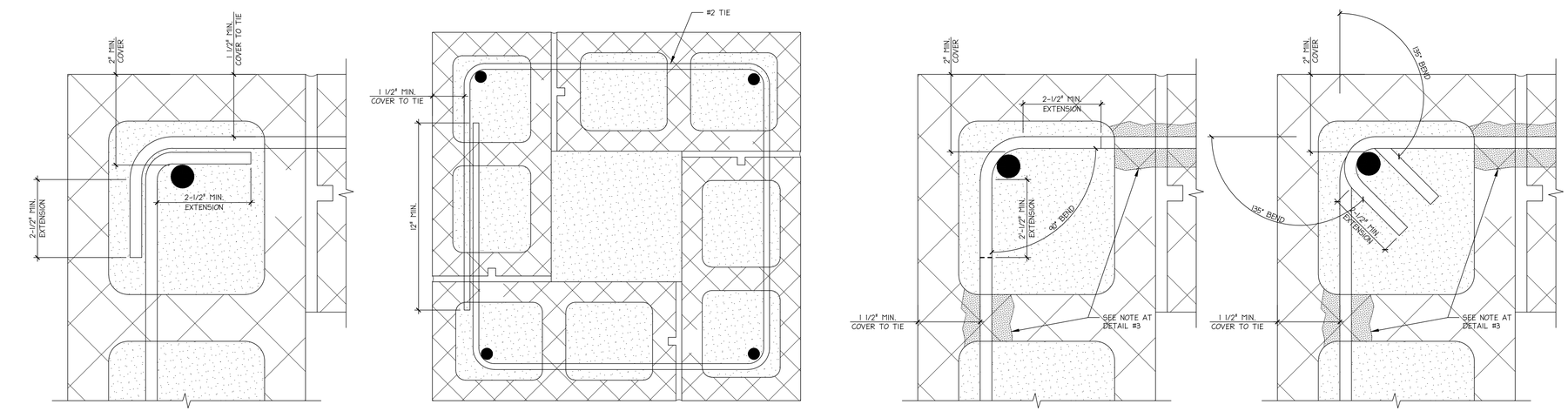
SCALE: 1½"=1'-0"

NOTES TO DESIGNER:

1) General:
- A) The three column details have been developed in an effort to clarify TMS 402/602-16 requirements and provide working details suitable for construction documents.
- B) Detail #1 is "Masonry Contractor" friendly (minimizes cutting and notching of units by allowing for ties to be placed in mortar joints, and places longitudinal bars in hollow cells of the units) and therefore is economical.
- C) The possible combinations of column size, shape, and reinforcement are endless. The notes below provide some guidance if the user desires to modify the details.

2) Longitudinal (Vertical) Reinforcement:
- A) Reinforcement is required to be within a range of 0.0025 An (minimum) to 0.04 An (maximum).
- B) A minimum of 4 bars is required.

3) Ties:
- A) Minimum size is ¼" diameter. A maximum size of 5/8" is recommended.
- B) Vertical spacing of ties shall be the lesser of:
  - -16 db of the longitudinal reinforcement
  - -48 db of the tie size
  - -Least cross sectional dimension of the member
- C) Ties may be either deformed bar or deformed wire.
- D) Every corner and alternate longitudinal bar shall have lateral support provided by the corner of a lateral tie with an included angle of not more than 135 degrees. No bar shall be farther than 6" clear on each side from such a laterally supported bar.
- E) In detail #4 the required hook extension is the greater of 6 db or 2-1/2".
- F) For additional information on standard hooks, see TMS 402-16 table 6.1.8.



OPTION 4A : 90° IN-PLANE TIE HOOK DETAIL

OPTION 4B : IN-PLANE LAP SPLICE DETAIL

OPTION 4C : 90° NON-PLANE TIE HOOK DETAIL

OPTION 4D : 135° TIE HOOK DETAIL

4 S6 TIE HOOK (AND LAP SPLICE) OPTIONS

SCALE: 1½"=1'-0"

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- GENERIC WALL DESIGN -
COLUMN DETAILS

DATE: 04/25/2018

TITLE: CMU COLUMN DETAILS

SHEET: S-6