MASONRY Institute of Michigan

12" SINGLE WYTHE CMU

- "SEMI-HEATED" BUILDINGS/SPACES
- "HEATED" BUILDINGS/SPACES

HIGH PERFORMANCE ATTRIBUTES

- ARCHITECTURAL
- STRUCTURAL
- ENERGY
- FIRE
- SOUND
- MOISTURE
- AIR

FOR ADDITIONAL INFORMATION ON HIGH PERFORMANCE ATTRIBUTES OF MASONRY WALLS, SEE "MASS BENEFITS"

NOTES

1) MOISTURE MANAGEMENT: THIS SET OF DETAILS CALLS FOR THE USE OF AN INTEGRAL WATER REPELLANT (IWR) ADDED TO BOTH THE UNITS AND THE MORTAR. ADDITIONALLY, AFTER CLEANING A COMPATIBLE, BREATHABLE, FIELD-APPLIED WATER REPELLANT SHALL ALSO BE FIELD APPLIED.

2) JOINT TOOLING SHOULD BE PERFORMED ONLY WHEN THE MORTAR IS "THUMBPRINT HARD". THE TIME OF TOOLING IS ESPECIALLY IMPORTANT FOR MORTAR AND UNITS CONTAINING INTEGRAL WATER REPELLANTS.

3) THIS SET OF DETAILS SHOWS WALL CONSTRUCTION PRIMARILY AT HOLLOW CELLS. WHERE VERTICAL REINFORCEMENT AND GROUT OCCURS, THE PAN FLASHING, DRAINAGE MATERIAL AND INSULATION IS OMITTED. FOR CLARITY, SEE PHOTOGRAPH ON SHEET A-3 OF THE PAN FLASHING AT THE BASE OF A PARTIALLY GROUTED WALL. FLASHING IS NOT REQUIRED IN SOLID GROUTED SINGLE WYTHE WALLS PER NCMA 19-02B (2012).

4) THIS SET OF DETAILS WILL RESULT IN A WALL WITH THREE CONTROL LAYERS: THERMAL, AIR AND MOISTURE. (SEE SHEETS A-12 AND A-13 FOR ADDITIONAL INFORMATION). MOST DETAILS SHOWN IN THIS SET ARE FOR A "SEMI-HEATED BUILDING" DEPICTING ONLY CELL FILL INSULATION. IN CONTRAST, SHEETS A-8.1 AND A-8.2 DEPICT RIGID INSULATION AT THE INTERIOR SURFACE OF THE MASONRY WALL, WHICH CAN BE PART OF A COMPLIANCE OPTION FOR HEATED BUILDINGS.

5) FOR PLACING CONTROL JOINTS (CJs), TWO OPTIONS ARE AVAILABLE:
   A) AWAY FROM THE OPENINGS (PREFERRED): SEE SHEETS A-10.1, AND A-10.2
   B) AT THE OPENINGS: SEE SHEETS A-11.1, A-11.2 AND A-11.3

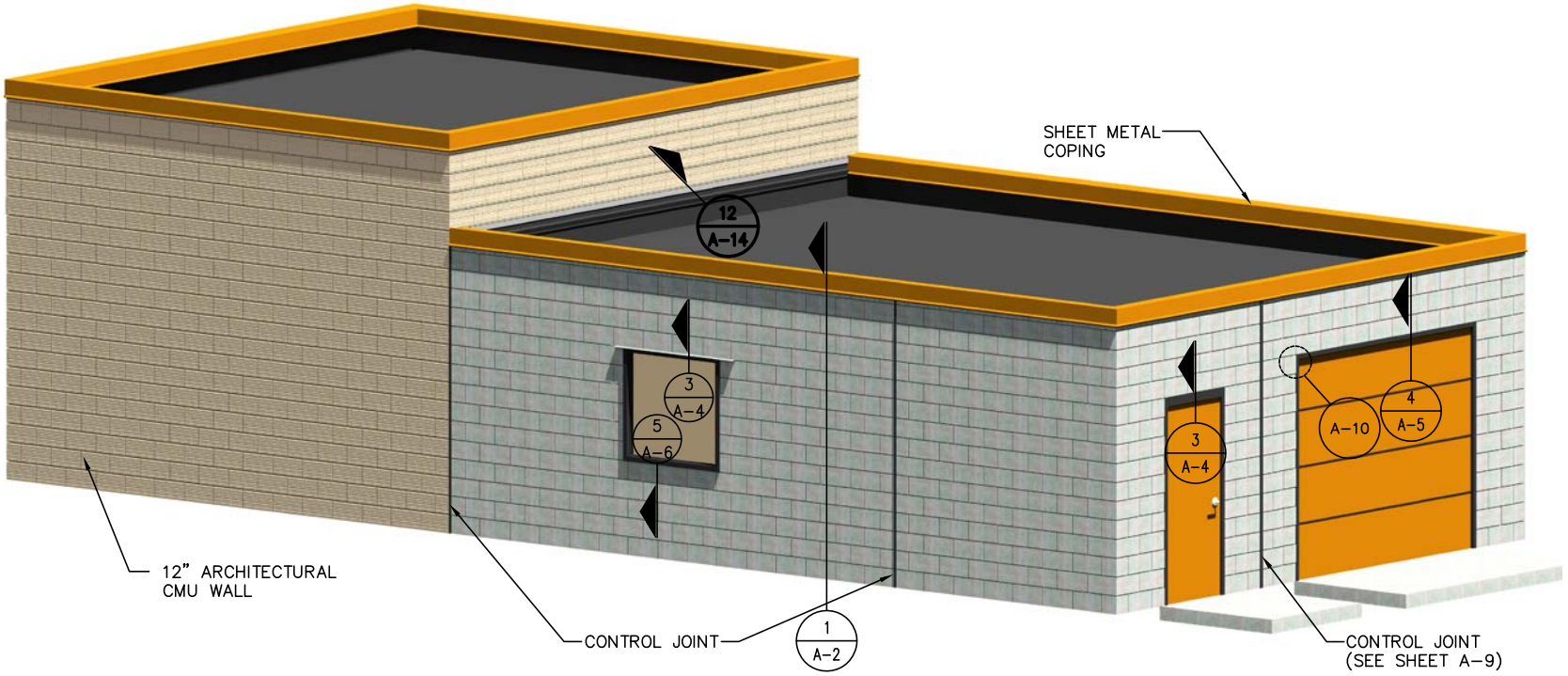
INDEX - 12" SINGLE WYTHE CMU

DAILEY ENGINEERING, INC.
8485 STEPHENSON ROAD
ONSTED, MI 49265
PH. # (517) 467-9000
FAX # (517) 467-9010

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	COVER SHEET
SHEET:	A-1.0



GENERIC BUILDING
NOT TO SCALE

DAILEY ENGINEERING, INC.
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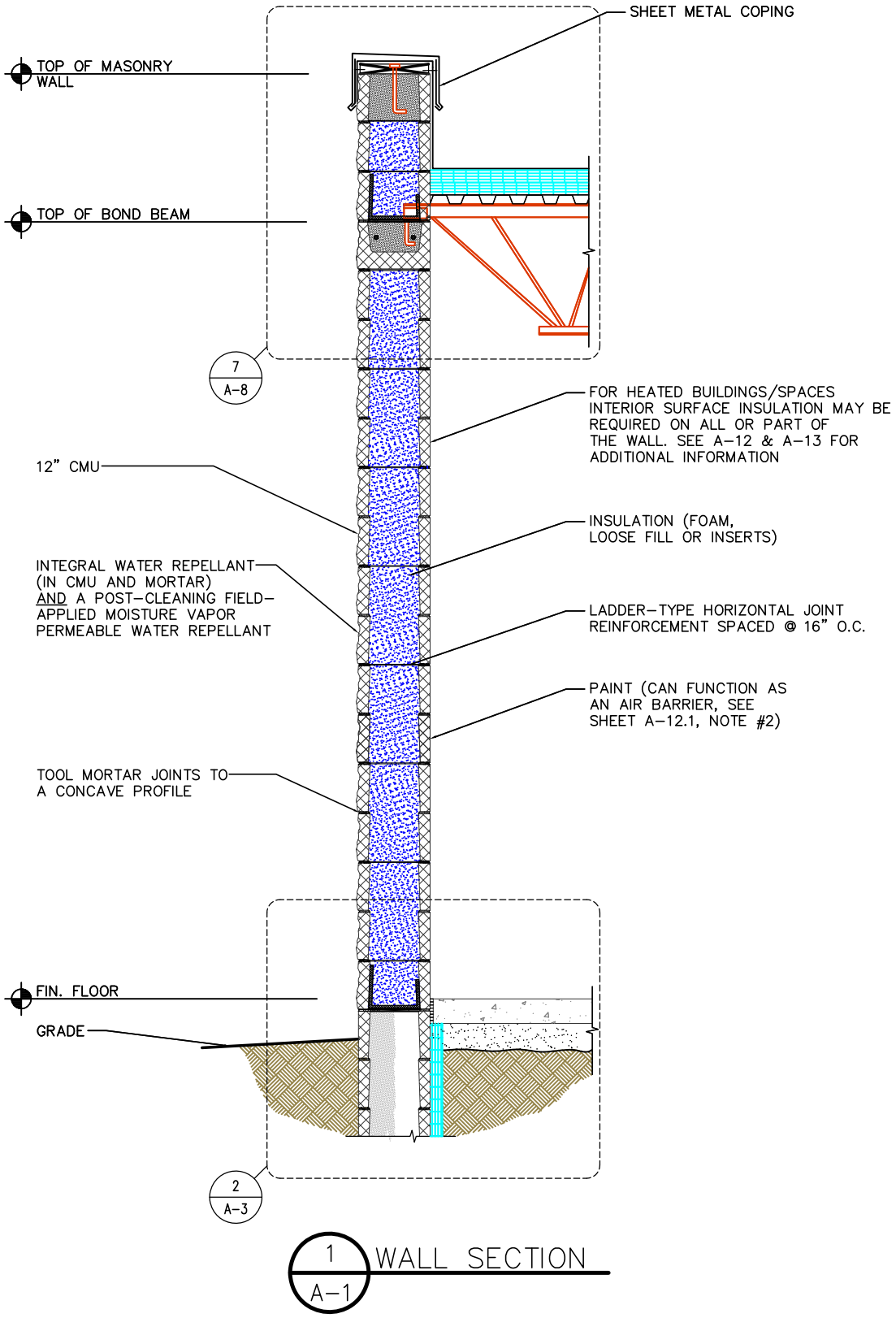
FAX # (517) 467-9010

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	GENERIC BUILDING ISOMETRIC
SHEET:	A-1.1



1 / A-1 WALL SECTION

SHEET:	A-2
TITLE:	WALL SECTION
DATE:	01/28/2020
APPROVED:	
DRAWN:	M.W.F.
IN CHARGE:	

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

DAILEY ENGINEERING, INC.
8485 STEPHENSON ROAD
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PH. # (517) 467-9000
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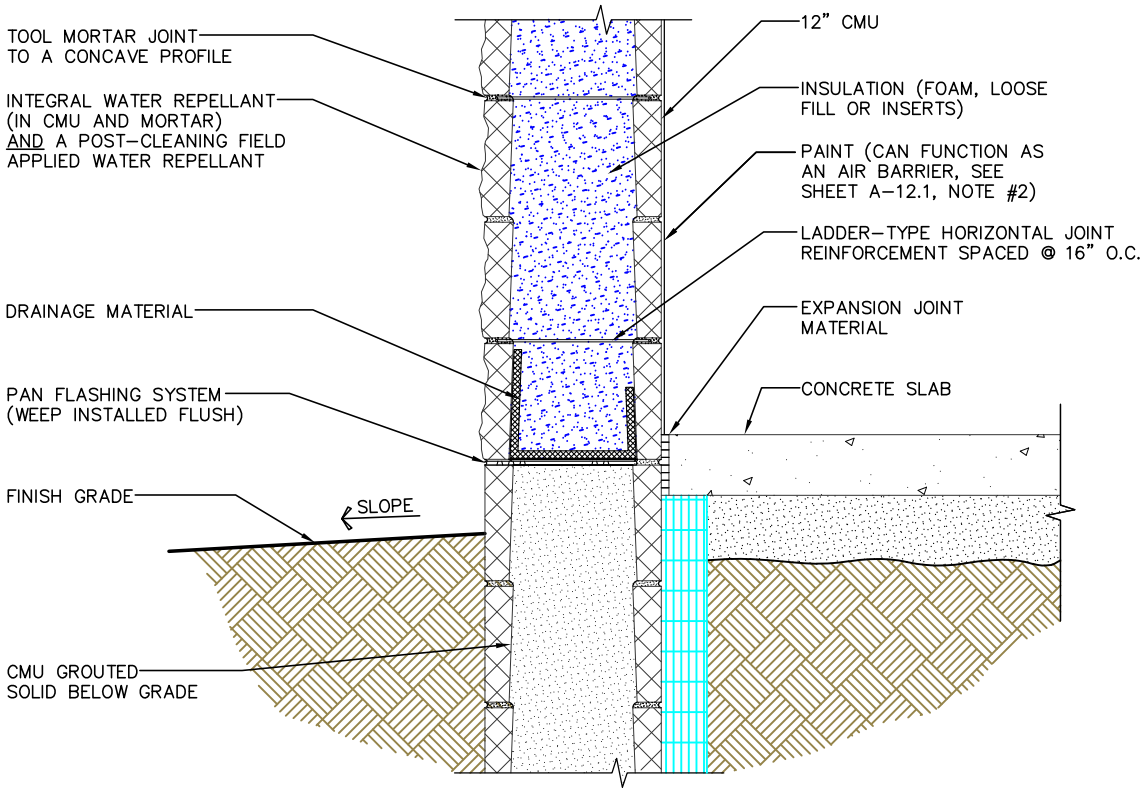
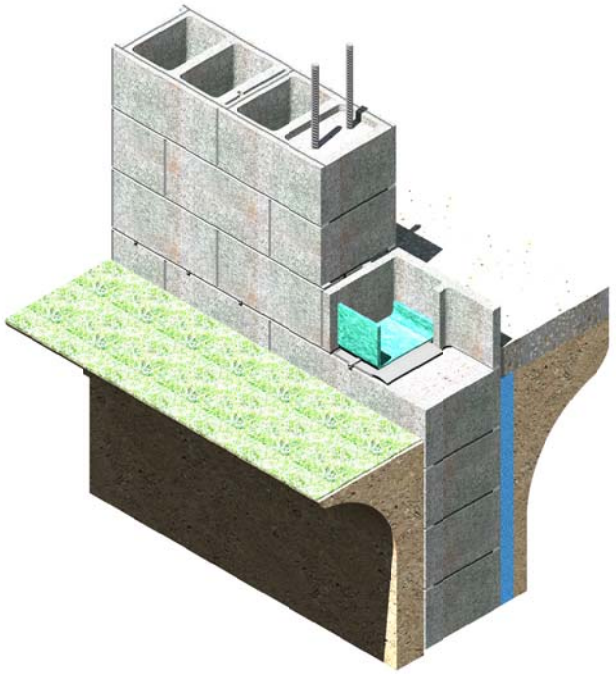


2 / A-2 BASE DETAIL

NOTE: TOP OF CONCRETE SLAB TO BE ABOVE PAN FLASHING, BOTH OF WHICH ARE TO BE ABOVE FINISH GRADE.



ISOMETRIC VIEW

REINFORCED CELL PICTURE

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PH. # (517) 467-9000
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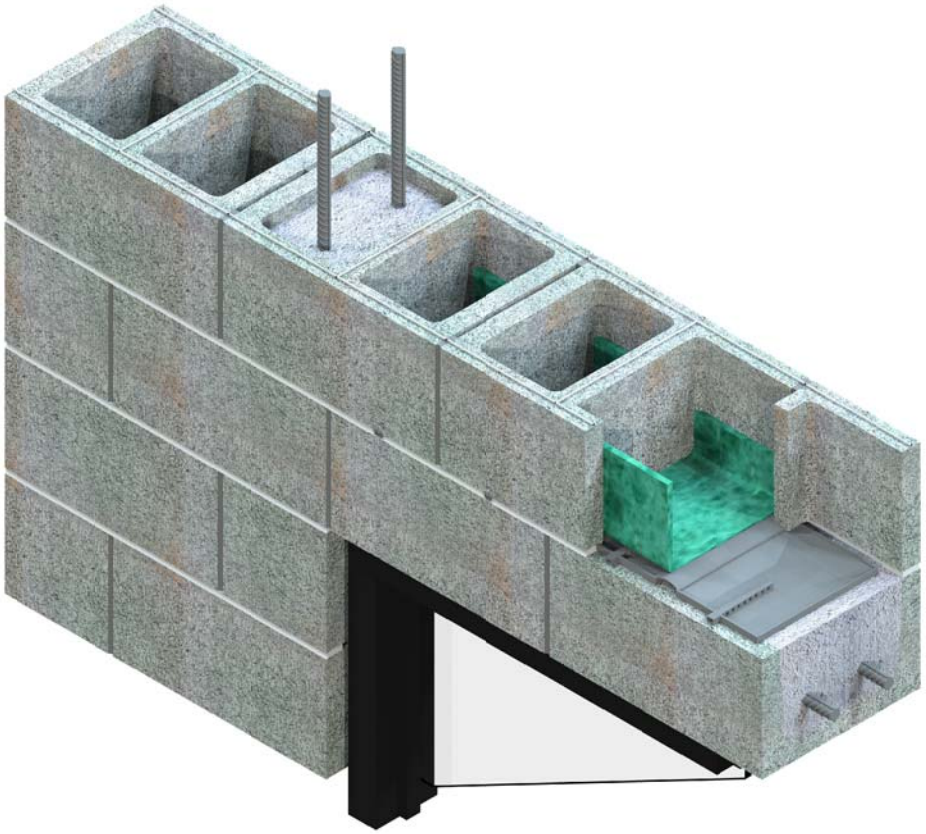
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

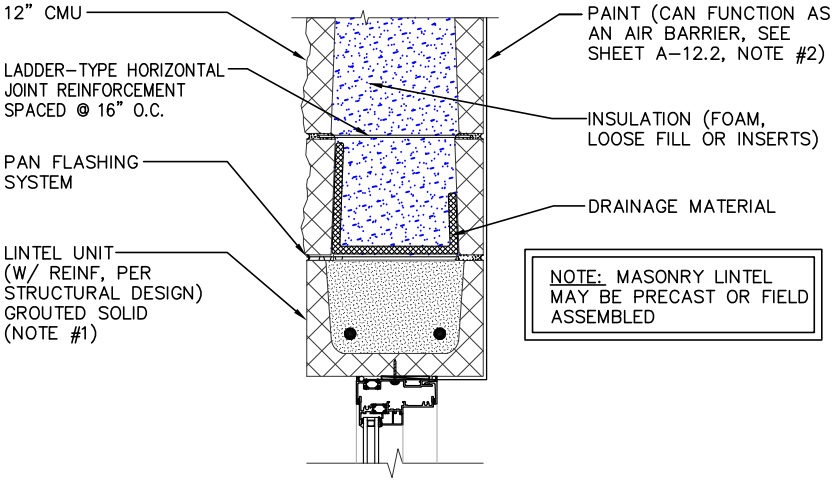
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	BASE DETAIL
SHEET:	A-3

NOTES:
1) LINTEL UNITS AND OPEN BOTTOM UNITS ARE NOT AVAILABLE WITH SPLIT-FACE CMU. THEREFORE THE DETAIL SHOWS A SMOOTH FACE UNIT.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



ISOMETRIC VIEW



SECTION VIEW

3A / A-1

SHORT SPAN MASONRY LINTEL (PREFERRED)

(PREFERRED DETAIL)

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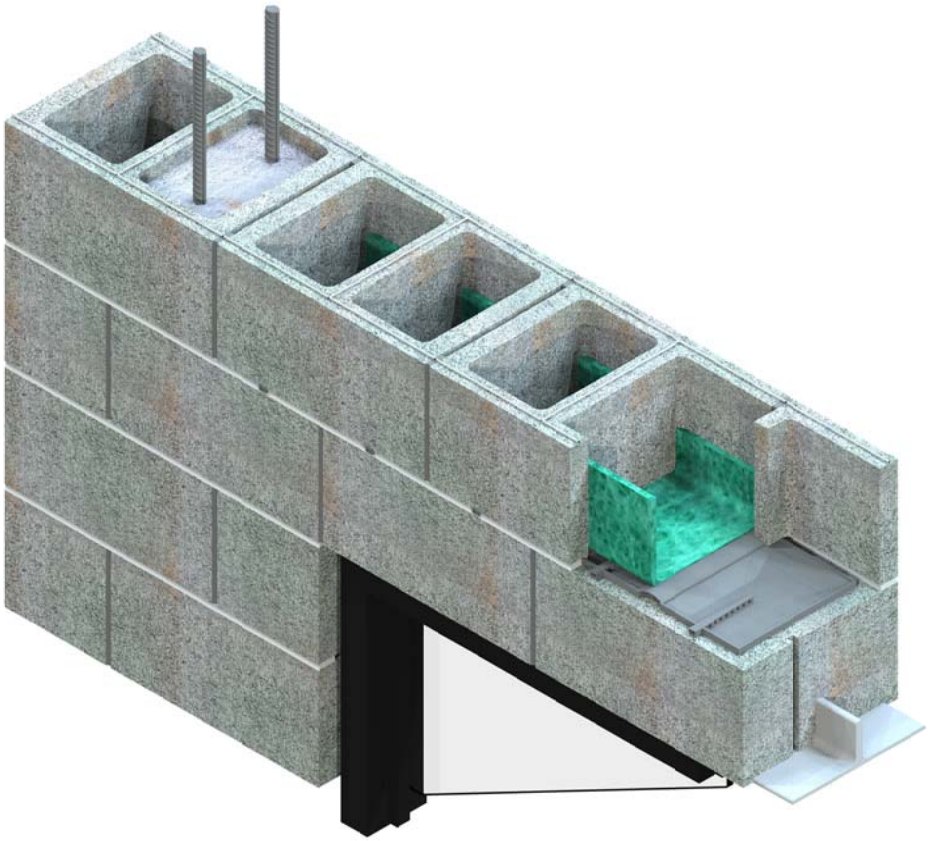
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

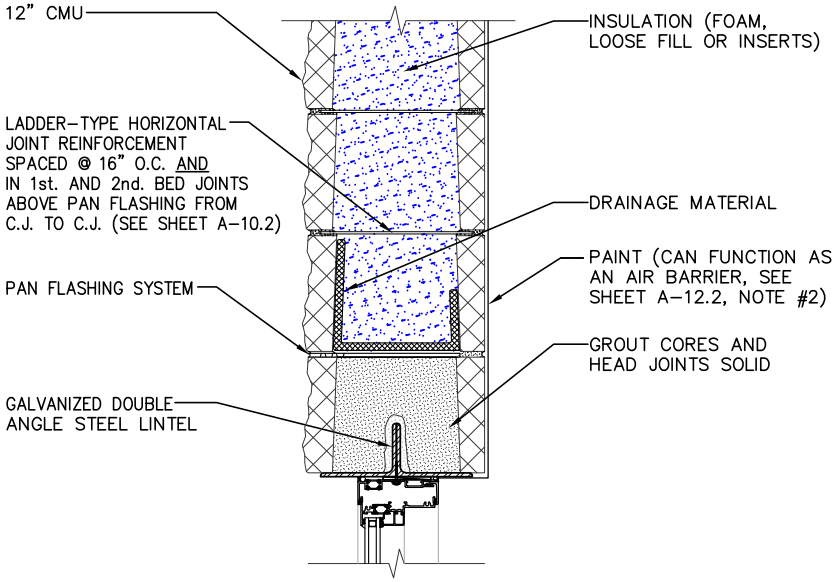
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SHORT SPAN MASONRY LINTEL
SHEET:	A-4.1

NOTES:
1) CONTINUE PAN FLASHING SYSTEM A MINIMUM OF ONE CELL BEYOND BOTH JAMB EDGES OF THE OPENING.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



ISOMETRIC VIEW



SECTION VIEW

3B / A-1 SHORT SPAN DOUBLE ANGLE STEEL LINTEL

DAILEY ENGINEERING, INC.
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PH. # (517) 467-9000
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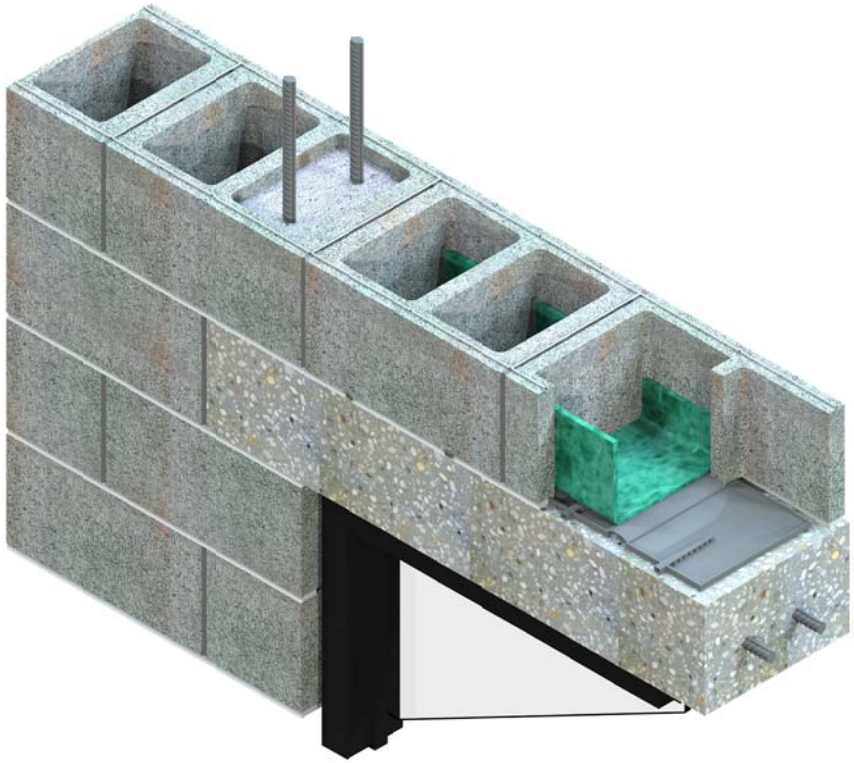
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

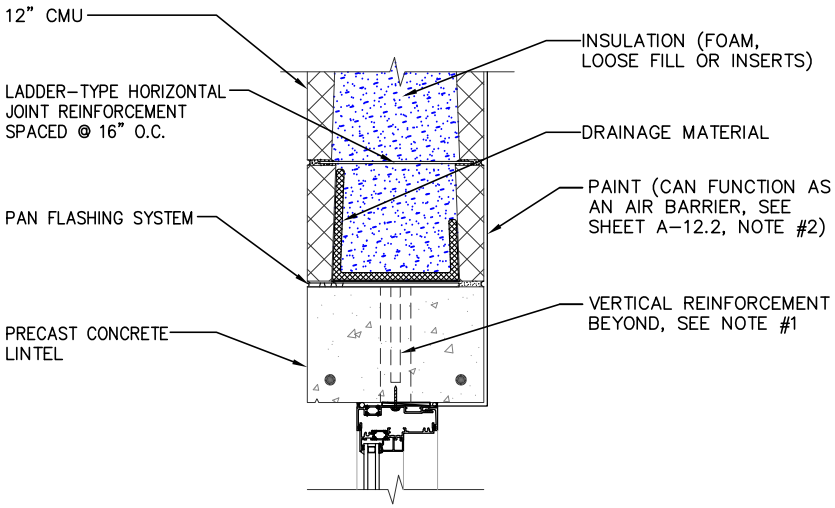
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SHORT SPAN DOUBLE ANGLE STEEL LINTEL
SHEET:	A-4.2

NOTES:
1) NOTCH ENDS OF PRECAST LINTEL AS REQUIRED FOR VERTICAL REINFORCEMENT.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT–BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



ISOMETRIC VIEW



SECTION VIEW

NOTE: FOR AESTHETIC REASONS, THIS DETAIL IS NORMALLY USED ONLY ON WALLS CONSTRUCTED OF STANDARD UNITS, NOT THOSE WITH ARCHITECTURAL CMU UNITS.

3C / A–1 SHORT SPAN PRECAST CONCRETE LINTEL

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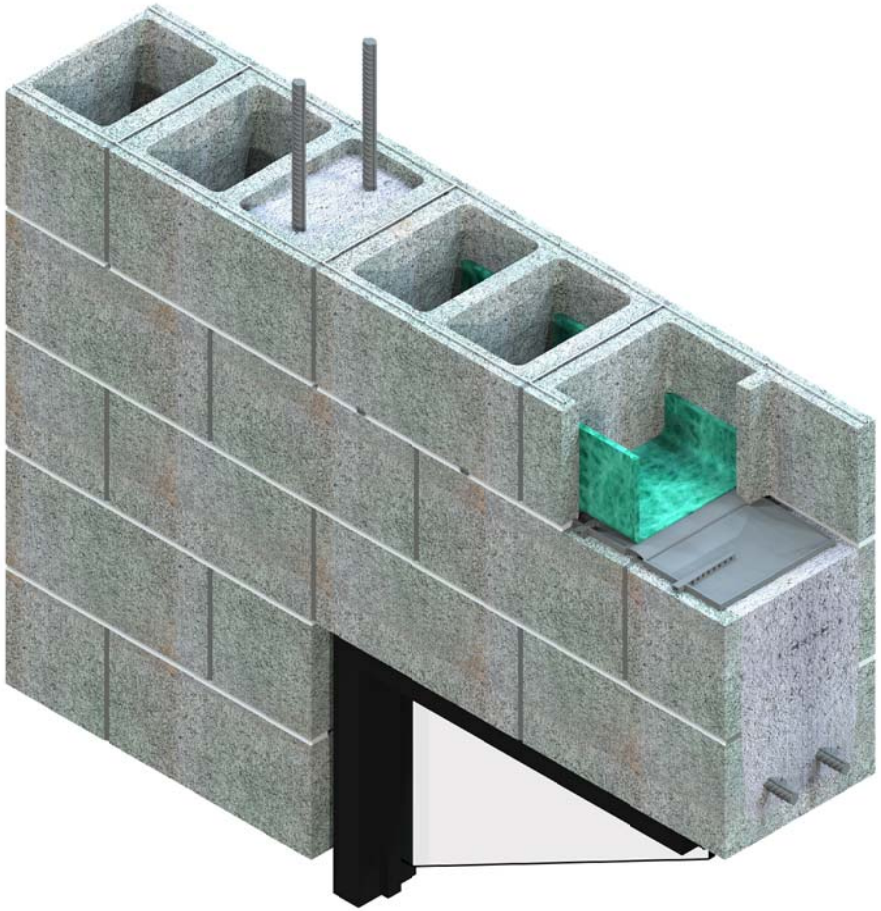
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

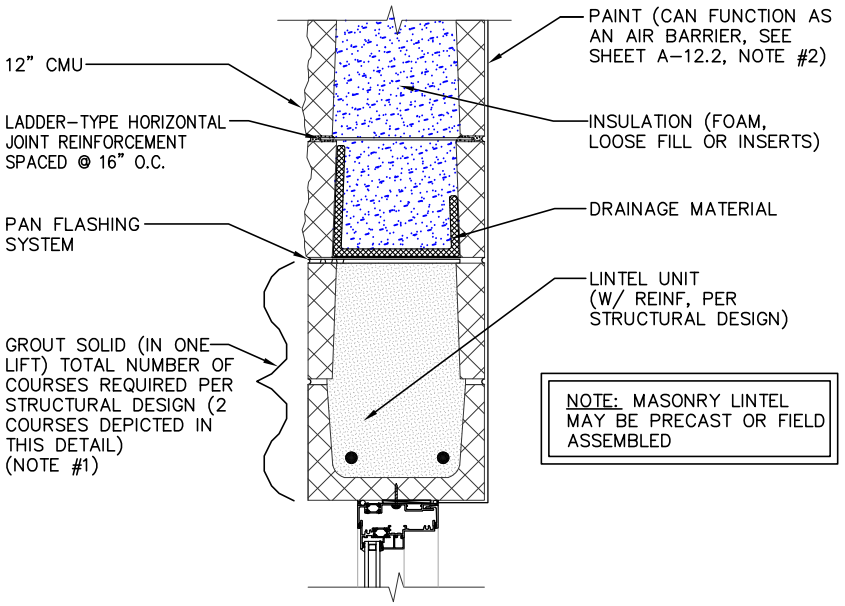
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SHORT SPAN PRECAST CONCRETE LINTEL
SHEET:	A–4.3



ISOMETRIC VIEW

NOTES:
1) LINTEL UNITS AND OPEN BOTTOM UNITS ARE NOT AVAILABLE WITH SPLIT-FACE CMU. THEREFORE THE DETAIL SHOWS A SMOOTH FACE UNIT.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



NOTE: MASONRY LINTEL MAY BE PRECAST OR FIELD ASSEMBLED

SECTION VIEW

4A / A-1

LONG SPAN MASONRY LINTEL (PREFERRED)

(PREFERRED DETAIL)

DAILEY ENGINEERING, INC.
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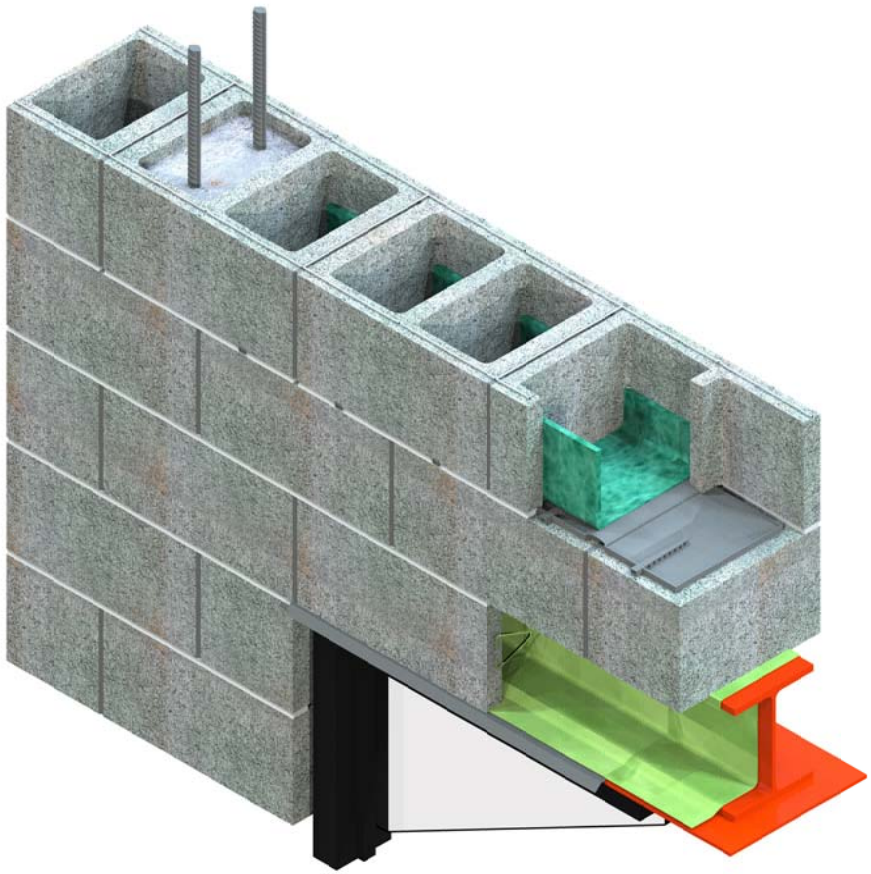
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

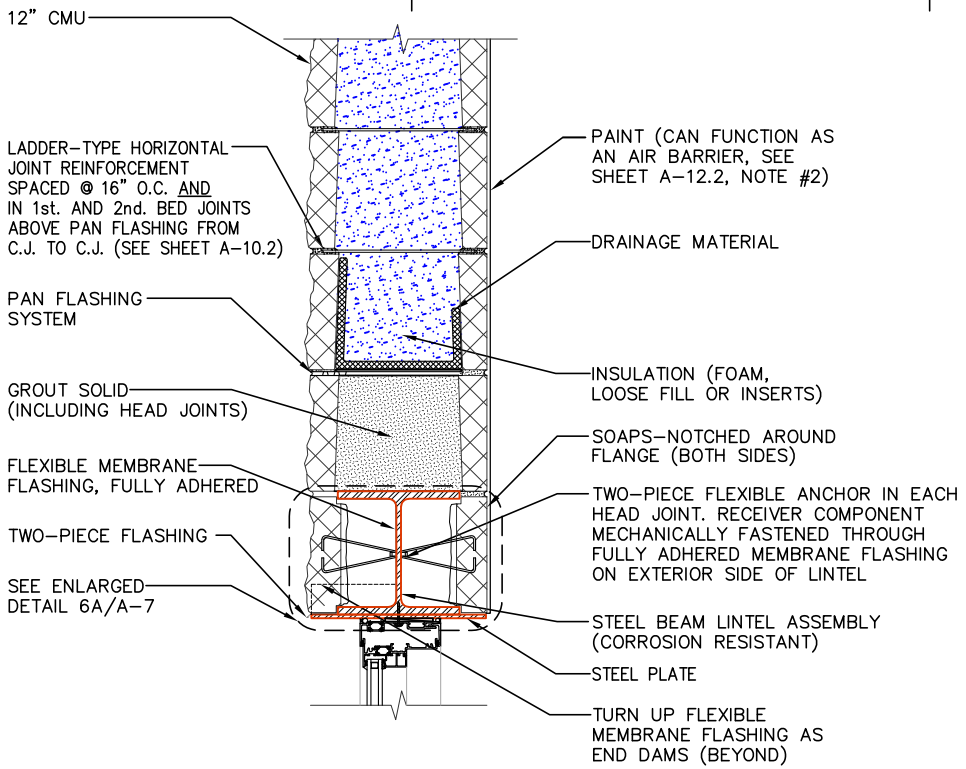
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	LONG SPAN MASONRY LINTEL
SHEET:	A-5.1



ISOMETRIC VIEW

NOTES:
1) CONTINUE PAN FLASHING SYSTEM A MINIMUM OF ONE CELL BEYOND BOTH JAMB EDGES OF THE OPENING.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



SECTION VIEW

NOTE: WITH THIS DETAIL SOAPS REQUIRE NOTCHING.

4C / A-1 LONG SPAN WIDE FLANGE 8" STEEL LINTEL DETAIL

DAILEY ENGINEERING, INC.
8485 STEPHENSON ROAD
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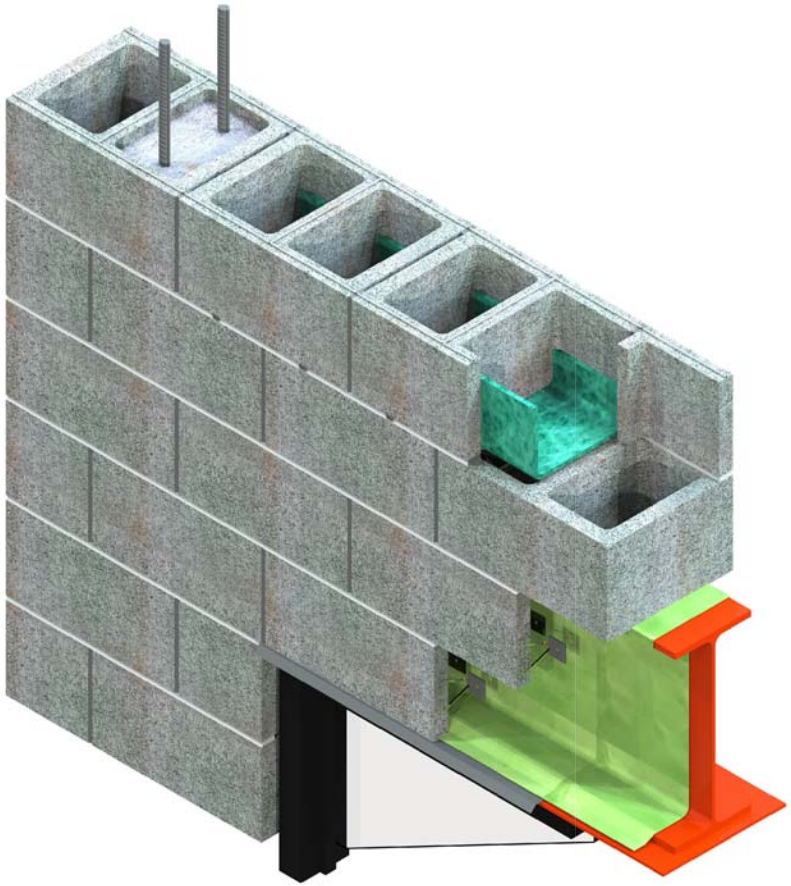
FAX # (517) 467-9010

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

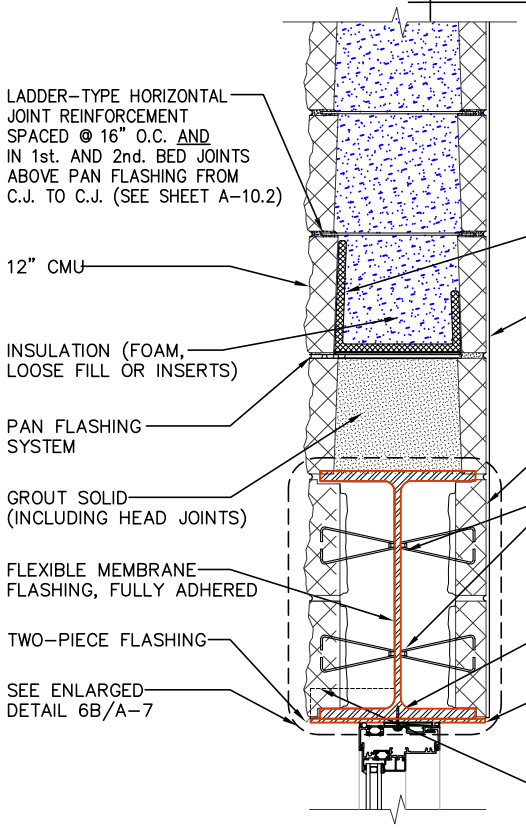
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	LONG SPAN WIDE FLANGE 8" STEEL LINTEL DETAIL
SHEET:	A-5.3



ISOMETRIC VIEW

NOTES:
1) CONTINUE PAN FLASHING SYSTEM A MINIMUM OF ONE CELL BEYOND BOTH JAMB EDGES OF THE OPENING.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT–BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



SECTION VIEW

4D / A–1 LONG SPAN 16" DEPTH STEEL LINTEL DETAIL

NOTE: WITH THIS DETAIL SOAPS REQUIRE NOTCHING.

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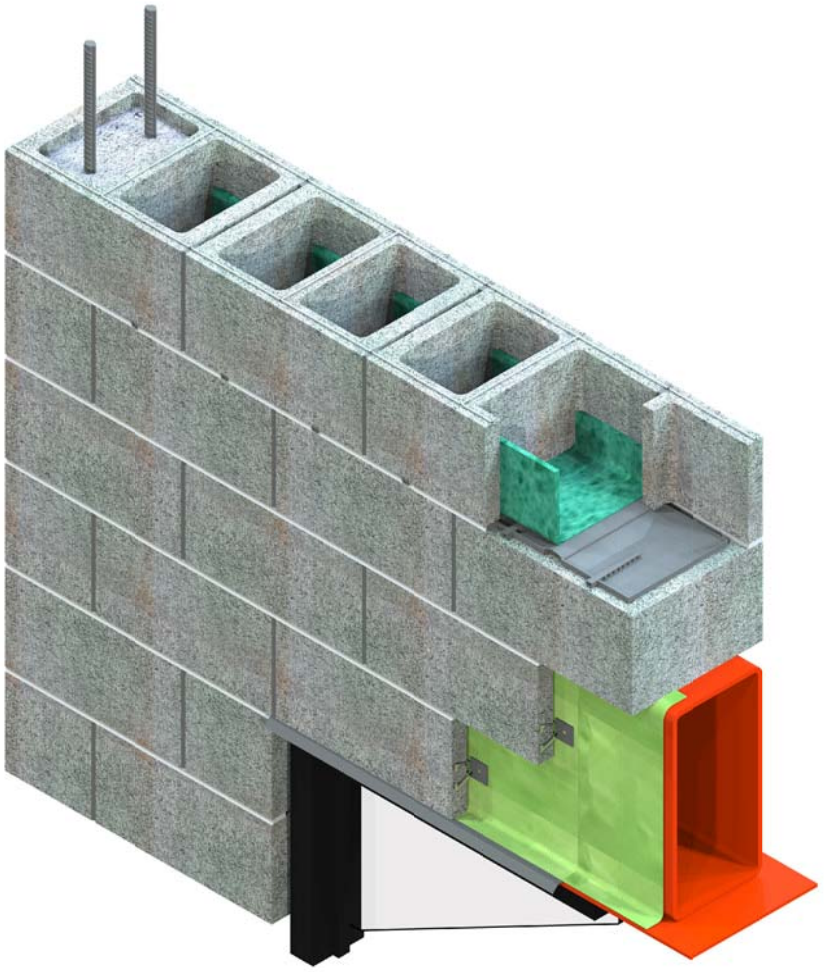
FAX # (517) 467-9010

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

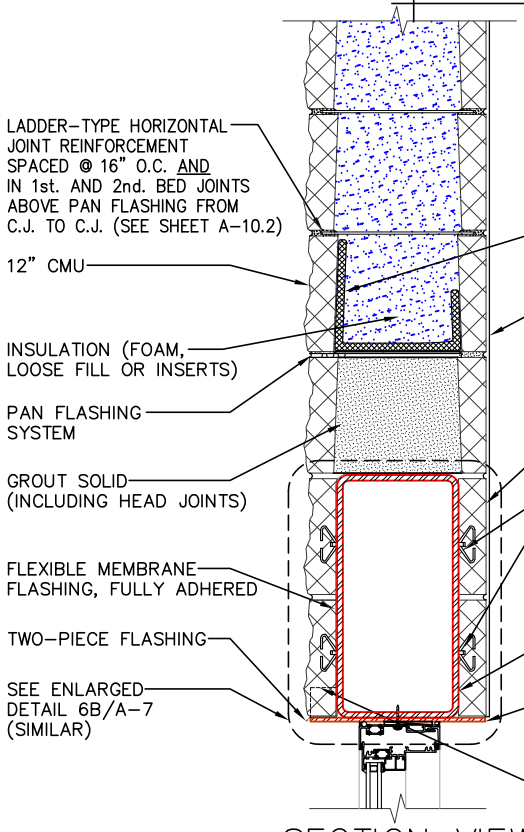
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	LONG SPAN 16" DEPTH STEEL LINTEL DETAIL
SHEET:	A–5.4



ISOMETRIC VIEW

NOTES:
1) CONTINUE PAN FLASHING SYSTEM A MINIMUM OF TWO CELLS BEYOND BOTH JAMB EDGES OF THE OPENING.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "ALUMINUM FRAMES IN MASONRY WALLS" FOR RECOMMENDATIONS.
http://www.cement.org/for-concrete-books-learning/materials-applications/masonry/construction/aluminum-frames-in-masonry-walls



SECTION VIEW

4E / A-1 LONG SPAN HSS STEEL LINTEL DETAIL

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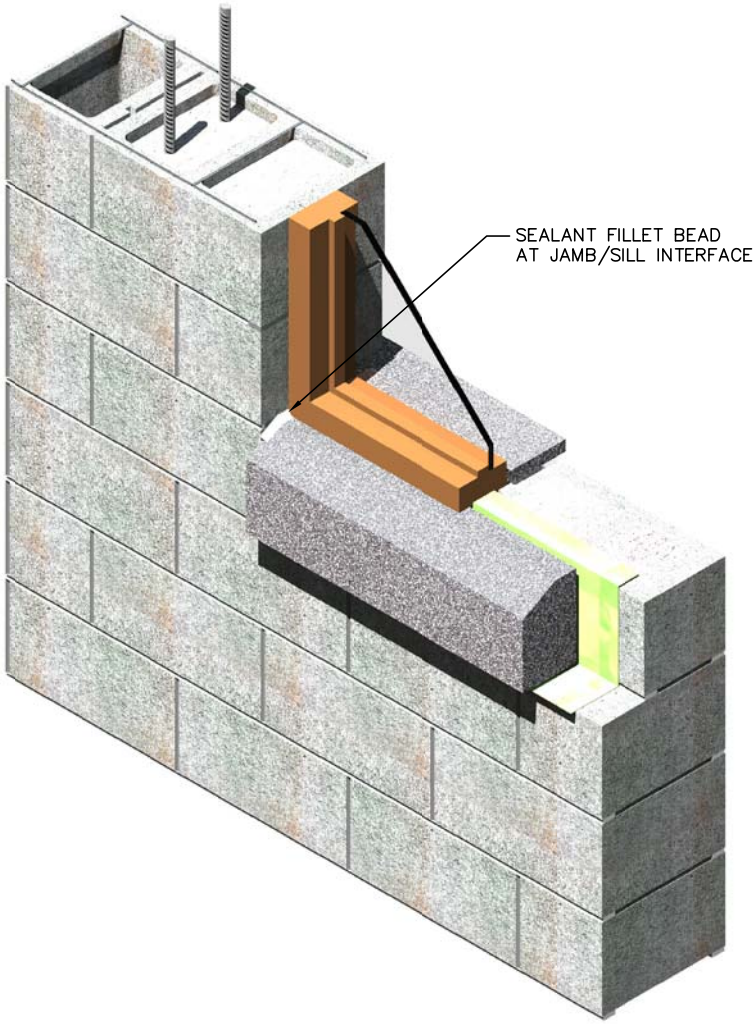
FAX # (517) 467-9010

MASONRY Institute of Michigan

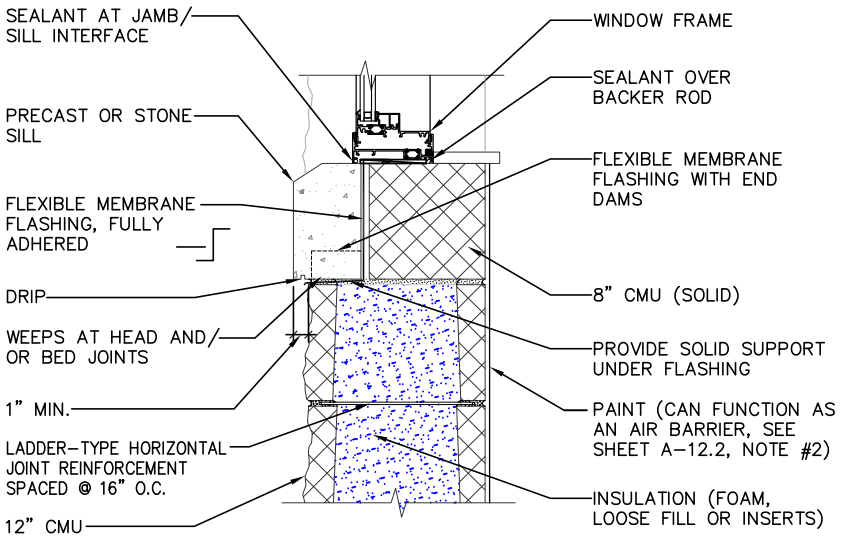
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	LONG SPAN HSS STEEL LINTEL
SHEET:	A-5.5



ISOMETRIC VIEW

NOTE: MULTIPLE PIECE SILLS MAY REQUIRE MASONRY ANCHORS IN THE HEAD JOINTS



SECTION VIEW

5A / A-1 PRECAST OR STONE SILL

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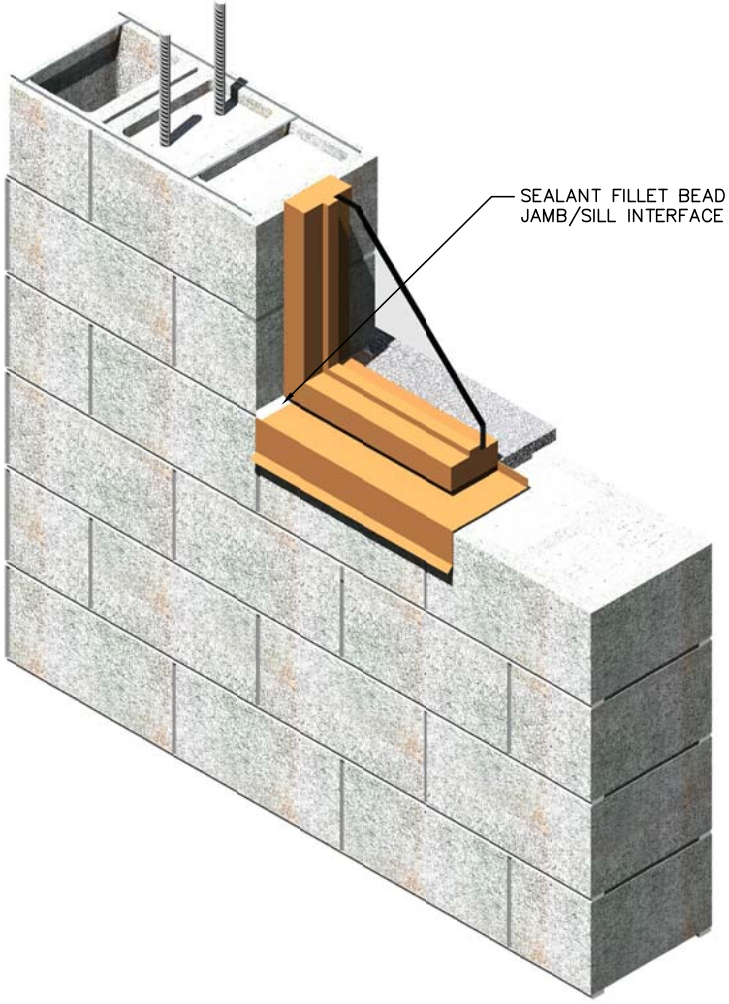
MASONRY Institute of Michigan

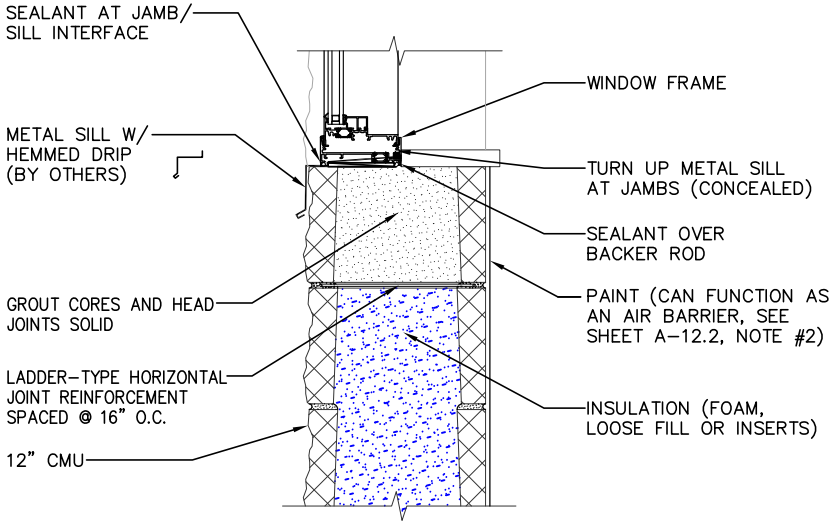
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	PRECAST SILL DETAIL
SHEET:	A-6.1



ISOMETRIC VIEW

NOTES:
CAUTION SHOULD BE USED WHEN USING EXPOSED METAL DRIP EDGES AT LOCATIONS WITHIN PEDESTRIAN REACH. SEE M.I.M. "EXPOSED METAL FLASHING" BULLETIN FOR ADDITIONAL INFORMATION.



SECTION VIEW

5B / A-1 METAL SILL

DAILEY ENGINEERING, INC.
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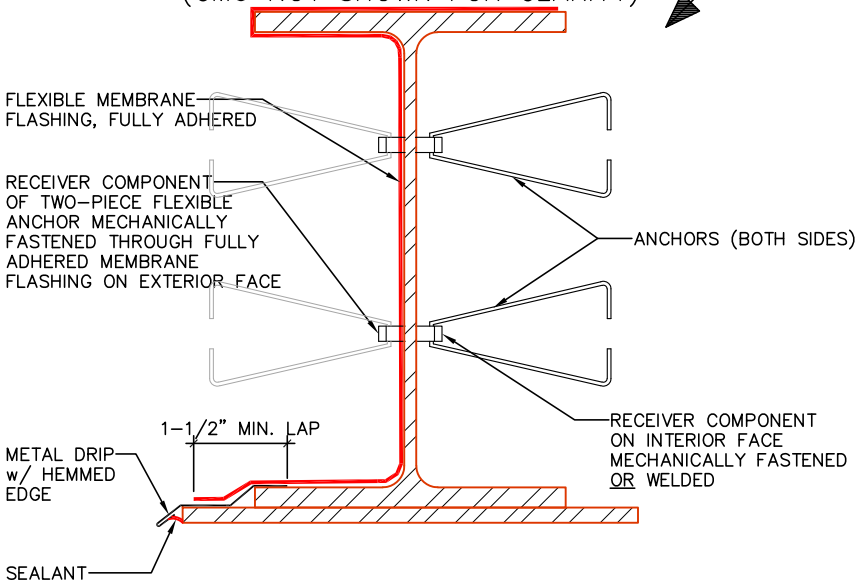
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	METAL SILL DETAIL
SHEET:	A-6.2

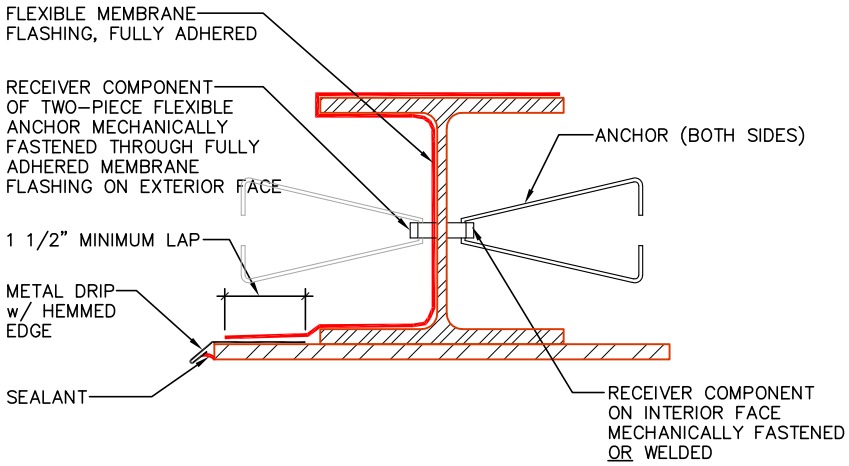
NOTE:
TURN UP FLEXIBLE MEMBRANE FLASHING AS END DAMS AT BOTH ENDS OF STEEL BEAM

(CMU NOT SHOWN FOR CLARITY)

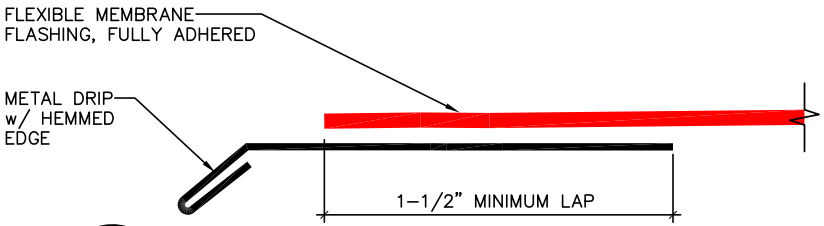


6B / A-5 ENLARGED FLASHING DETAIL AT 16" DEPTH STEEL BEAM LINTELS

(CMU NOT SHOWN FOR CLARITY)



6A / A-5 ENLARGED FLASHING DETAIL AT 8" DEPTH STEEL BEAM LINTELS



6C / A-5 ENLARGED TWO-PIECE FLASHING DETAIL

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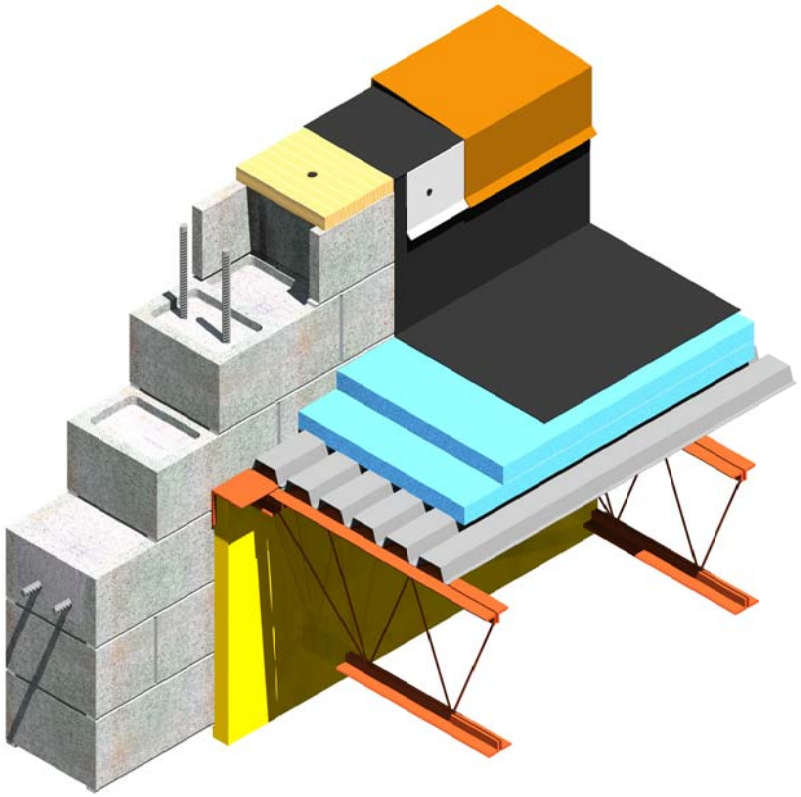
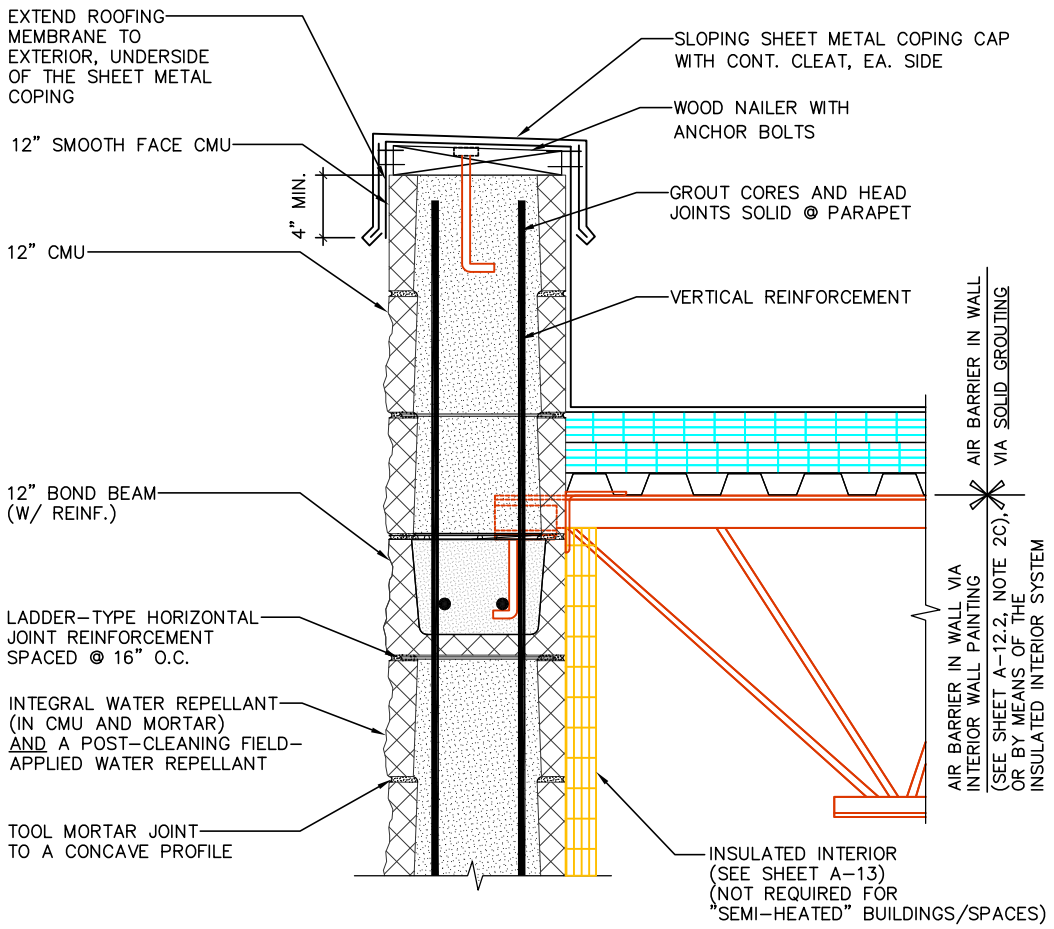
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	TWO-PIECE FLASHING DETAILS
SHEET:	A-7



ISOMETRIC VIEW



SECTION VIEW

7A / A-2 SHORT PARAPET DETAIL

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FAX # (517) 467-9010

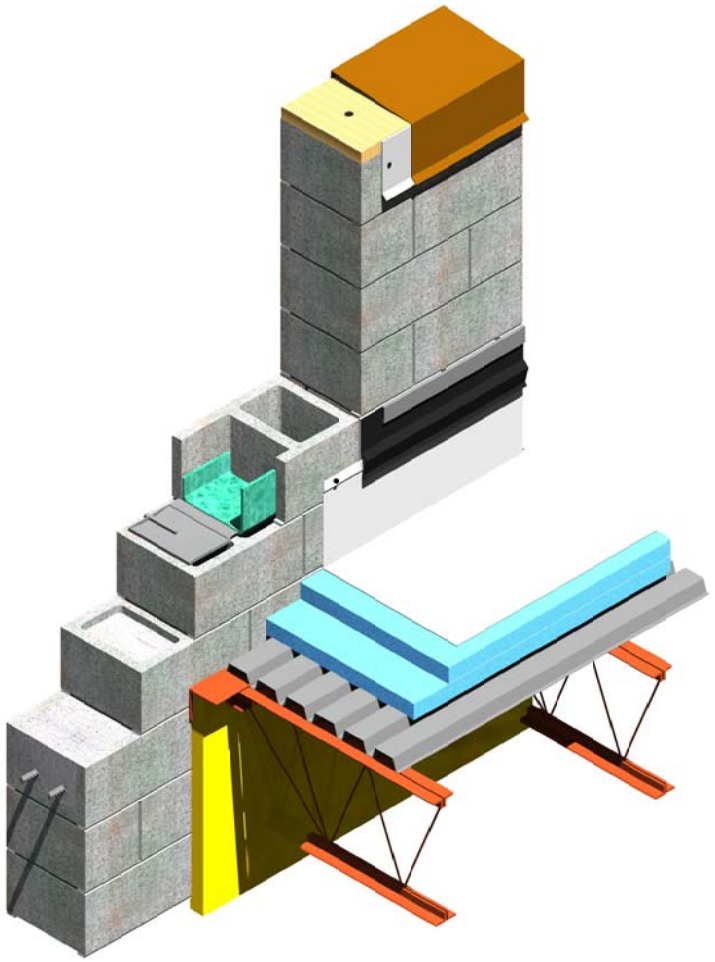
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

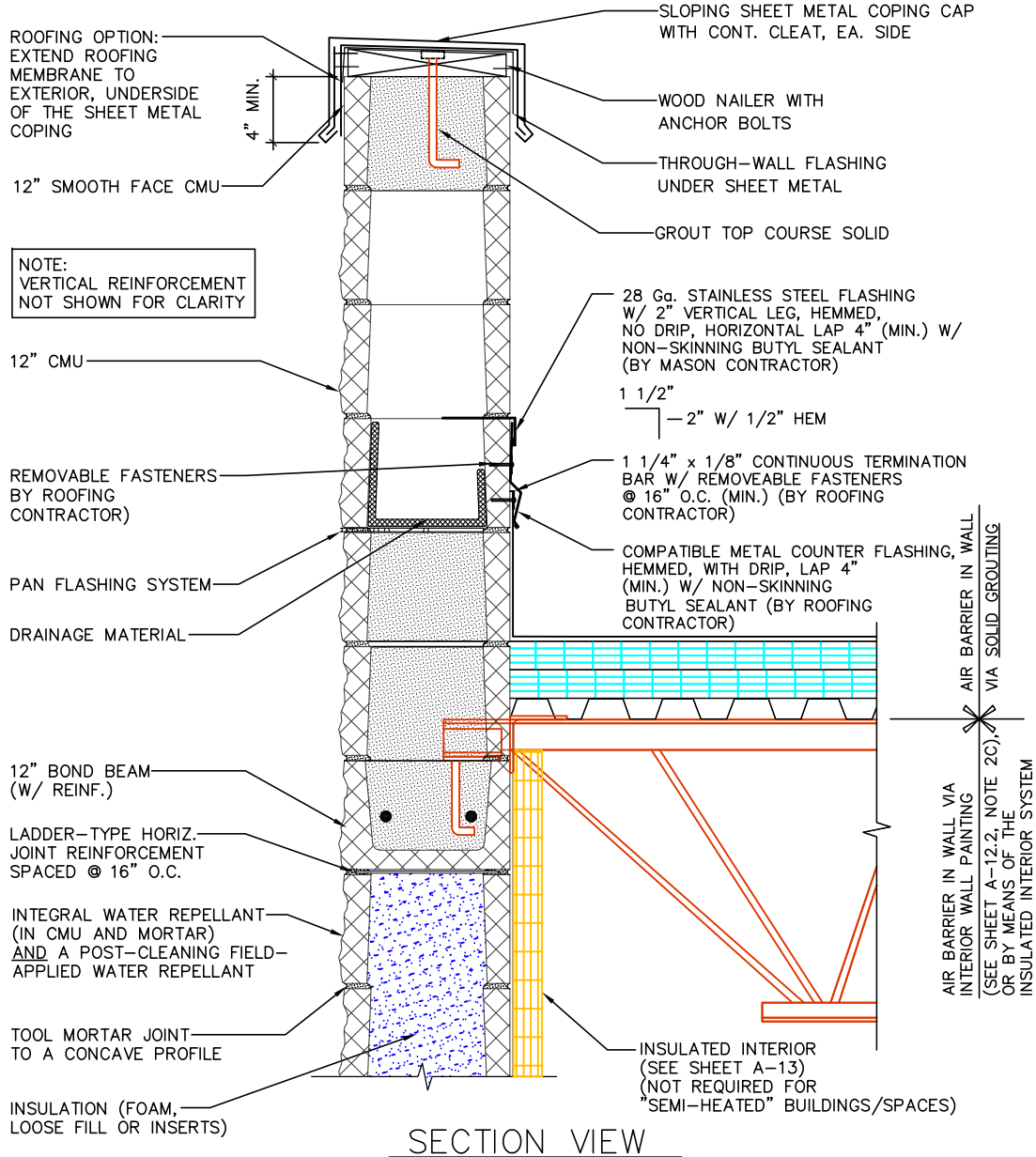
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SHORT PARAPET DETAIL
SHEET:	A-8.1

NOTES:

1) THIS DETAIL ONLY APPLICABLE TO A REINFORCED WALL DUE TO FLASHING/BOND BREAK CONCERNS.



ISOMETRIC VIEW



SECTION VIEW

7B / A-2 TALL PARAPET DETAIL

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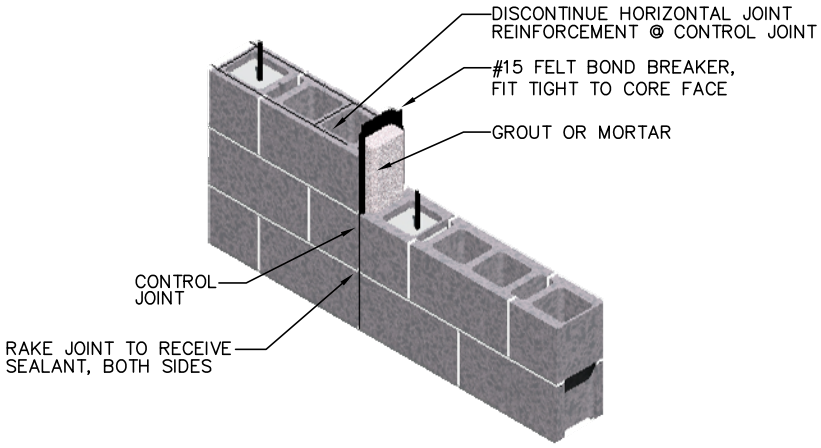
PH. # (517) 467-9000
FAX # (517) 467-9010

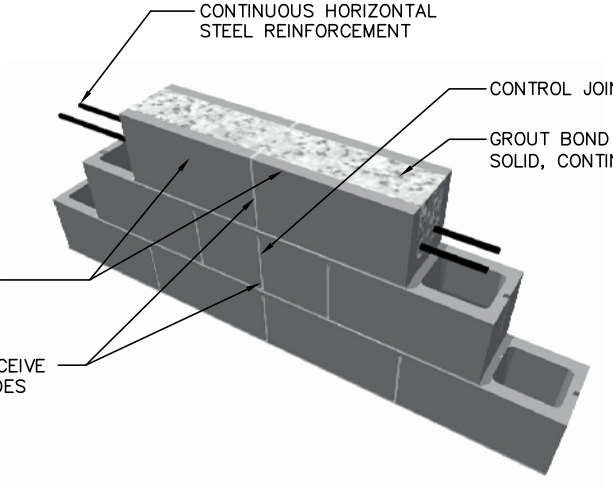
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

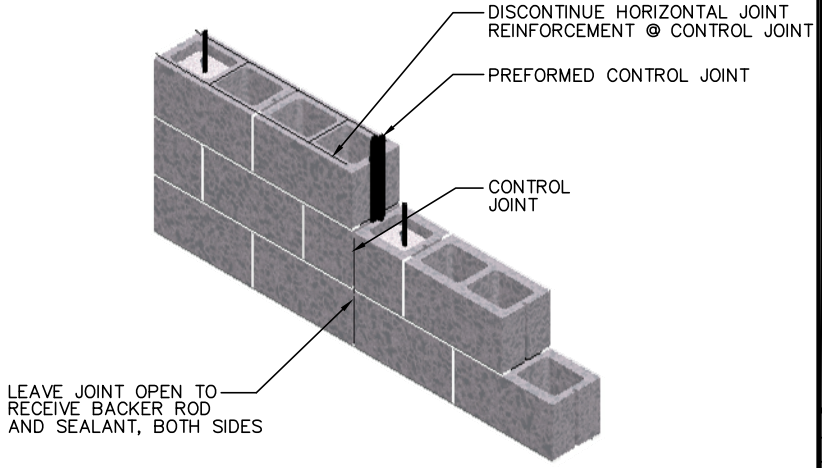
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	TALL PARAPET DETAIL
SHEET:	A-8.2



8A / A-9 MASONRY CONTROL JOINT – MICHIGAN DETAIL



8C / A-9 MASONRY CONTROL JOINT @ CONTINUOUS BOND BEAM DETAIL (PER STRUCTURAL REQUIREMENTS)



8B / A-9 MASONRY CONTROL JOINT – ALTERNATE DETAIL

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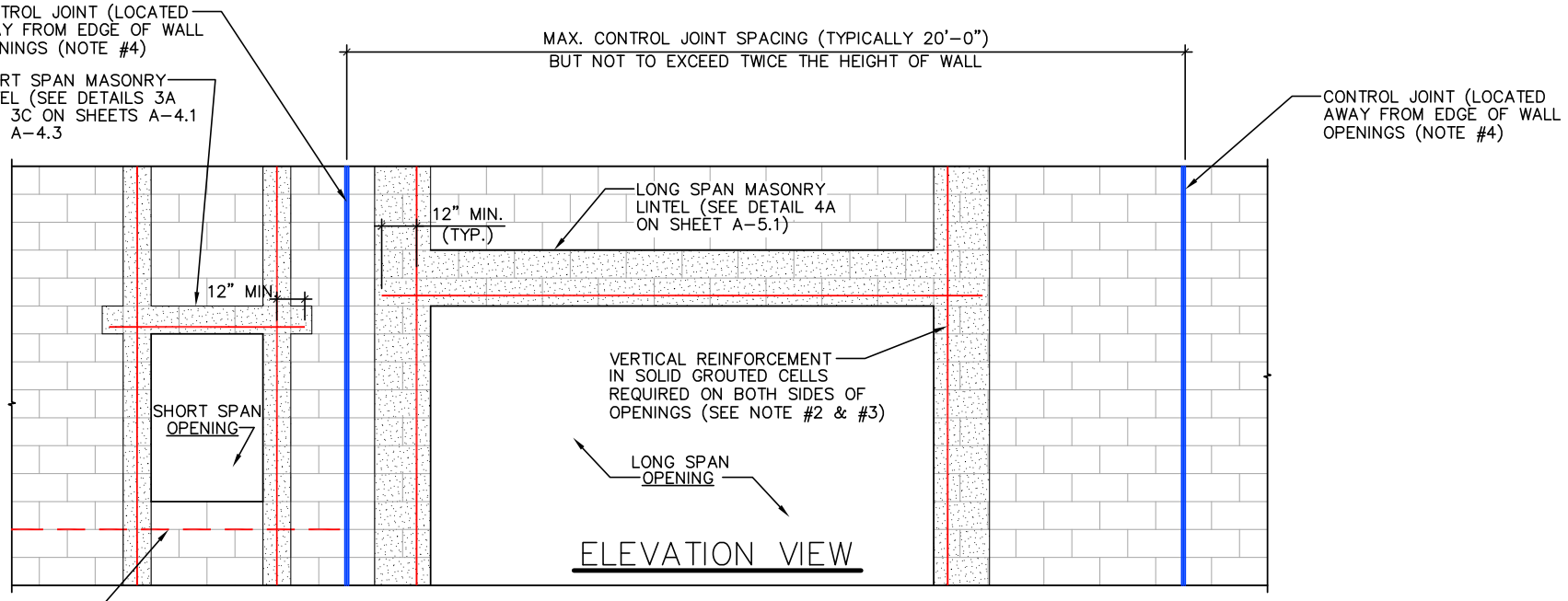
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	CONTROL JOINT DETAILS
SHEET:	A-9



REINFORCED MASONRY OPENING & ASSOCIATED CONTROL JOINT DESIGN FOR MASONRY LINTELS

9A / A-10

NOTES:

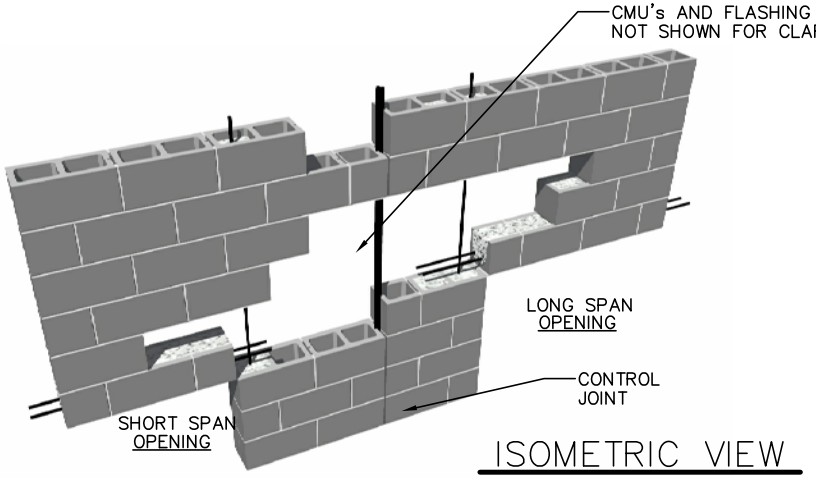
1) TRADITIONALLY, CONTROL JOINTS HAVE TYPICALLY BEEN LOCATED AT OR VERY CLOSE TO THE SIDES OF UNREINFORCED OPENINGS. HOWEVER IT IS THE MIM's PREFERENCE FOR CONTROL JOINTS TO BE LOCATED AWAY FROM THE EDGE OF OPENINGS AND TO ADD REINFORCEMENT AROUND THE OPENINGS.

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 A-9.

5) FOR ADDITIONAL INFORMATION ON CONTROL JOINT SPACING/LOCATIONS, SEE NCMA TEK 10-3.



ISOMETRIC VIEW

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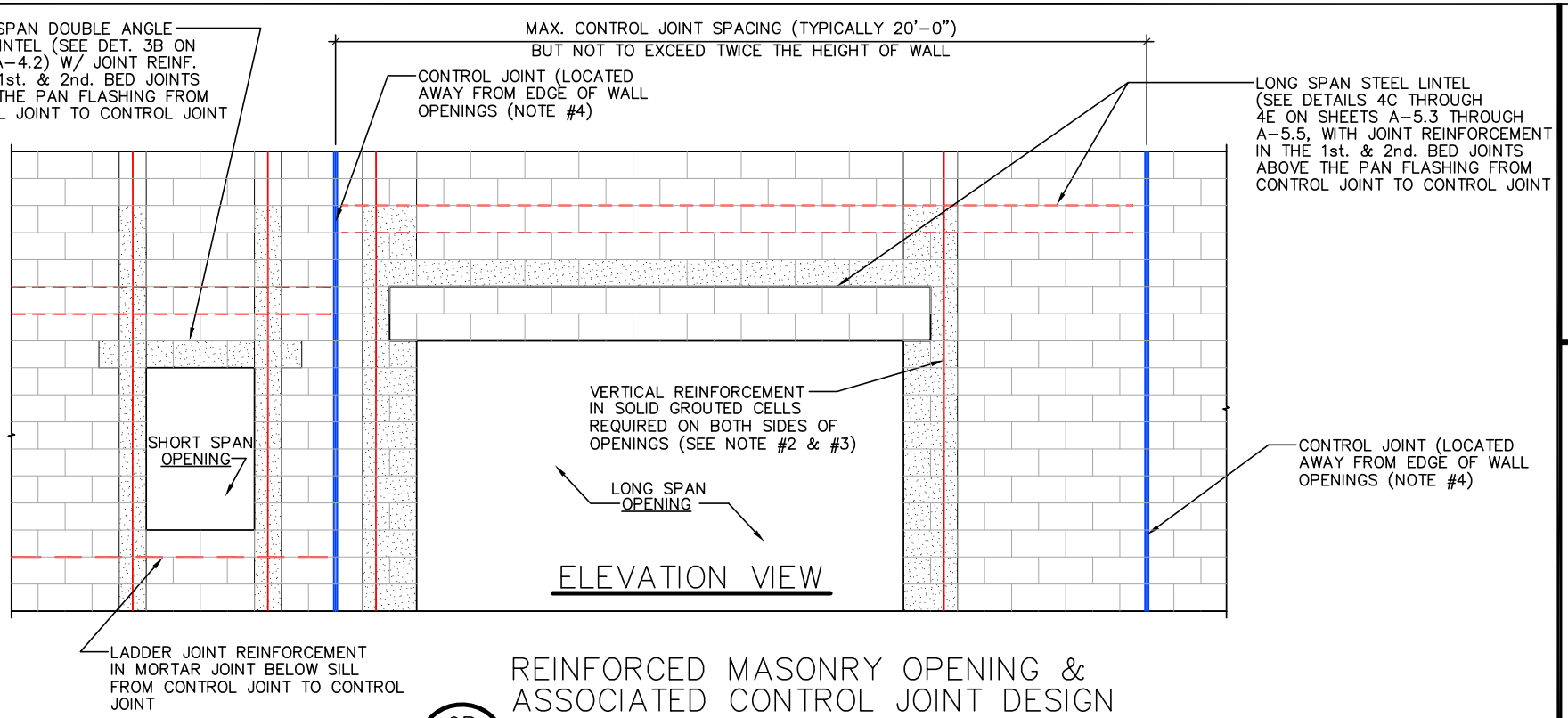
GENERIC WALL DESIGN - 8" SINGLE WYTHE CMU

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	REINFORCED MASONRY OPENING & ASSOCIATED CONTROL JOINT DESIGN
SHEET:	A-10.1



REINFORCED MASONRY OPENING & ASSOCIATED CONTROL JOINT DESIGN FOR STEEL LINTELS

9B / A–10

NOTES:

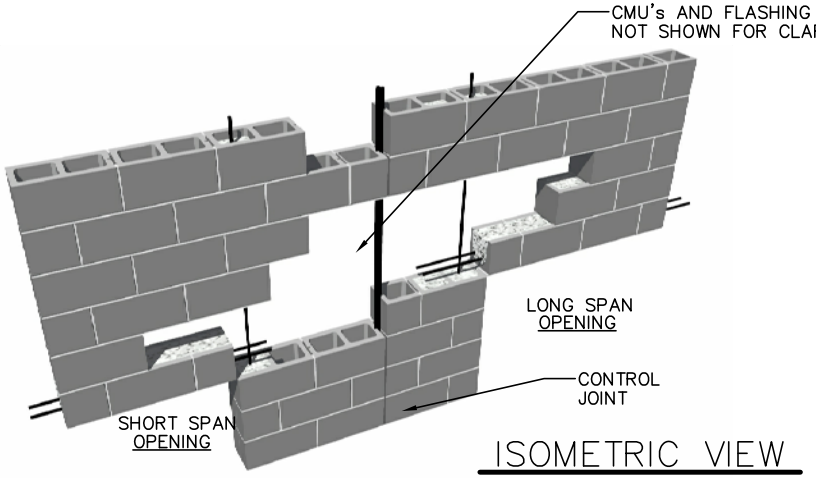
1) TRADITIONALLY, CONTROL JOINTS HAVE TYPICALLY BEEN LOCATED AT OR VERY CLOSE TO THE SIDES OF UNREINFORCED OPENINGS. HOWEVER IT IS THE MIM's PREFERENCE FOR CONTROL JOINTS TO BE LOCATED AWAY FROM THE EDGE OF OPENINGS AND TO ADD REINFORCEMENT AROUND THE OPENINGS.

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 A–9.

5) FOR ADDITIONAL INFORMATION ON CONTROL JOINT SPACING/LOCATIONS, SEE NCMA TEK 10–3.



ISOMETRIC VIEW

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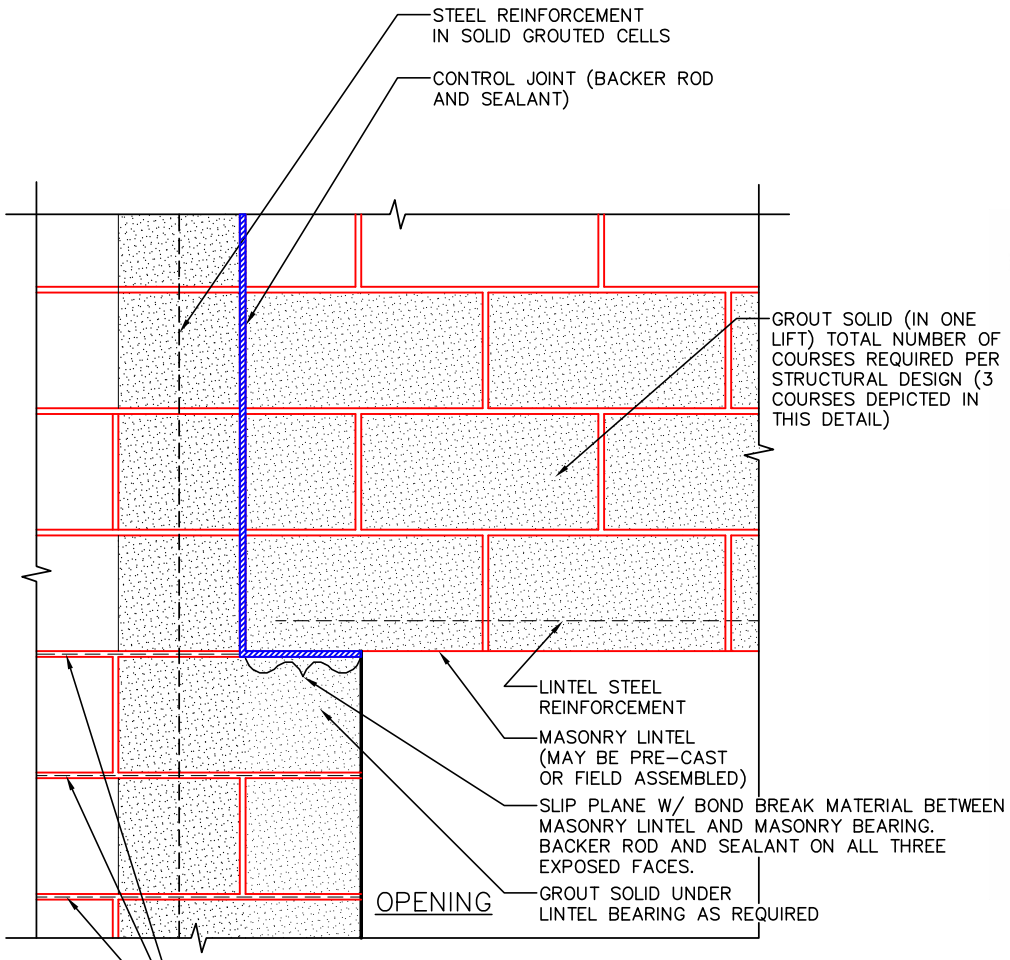
GENERIC WALL DESIGN – 8" SINGLE WYTHE CMU

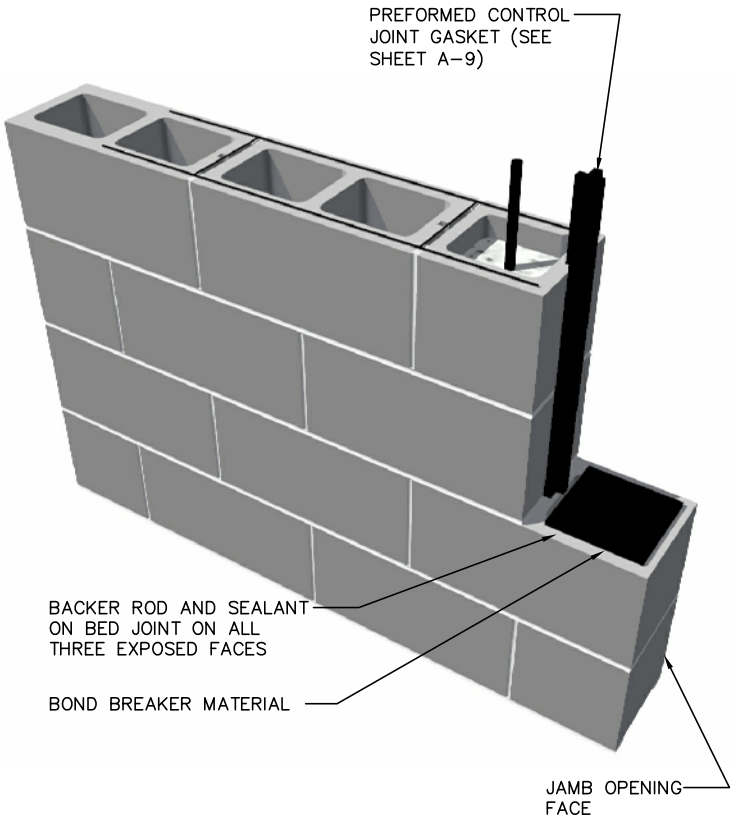
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	REINFORCED MASONRY OPENING & ASSOCIATED CONTROL JOINT DESIGN
SHEET:	A–10.2

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

NOTE: EVEN FOR FIELD ASSEMBLED MASONRY LINTELS, DO NOT OVERLAP/INTERLOCK THE LINTEL REINFORCING WITH THE WALL REINFORCING. NO REINFORCING (VERTICAL OR HORIZONTAL) SHALL PASS THROUGH THE CONTROL JOINT.



ELEVATION VIEW



ISOMETRIC VIEW

10A
A-11.1

SLIP PLANE/CONTROL JOINT @ LONG SPAN MASONRY LINTEL

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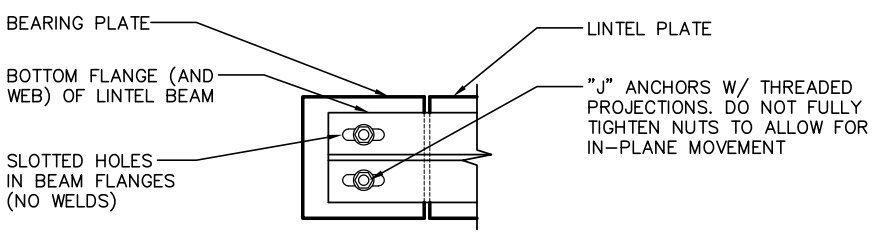
MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

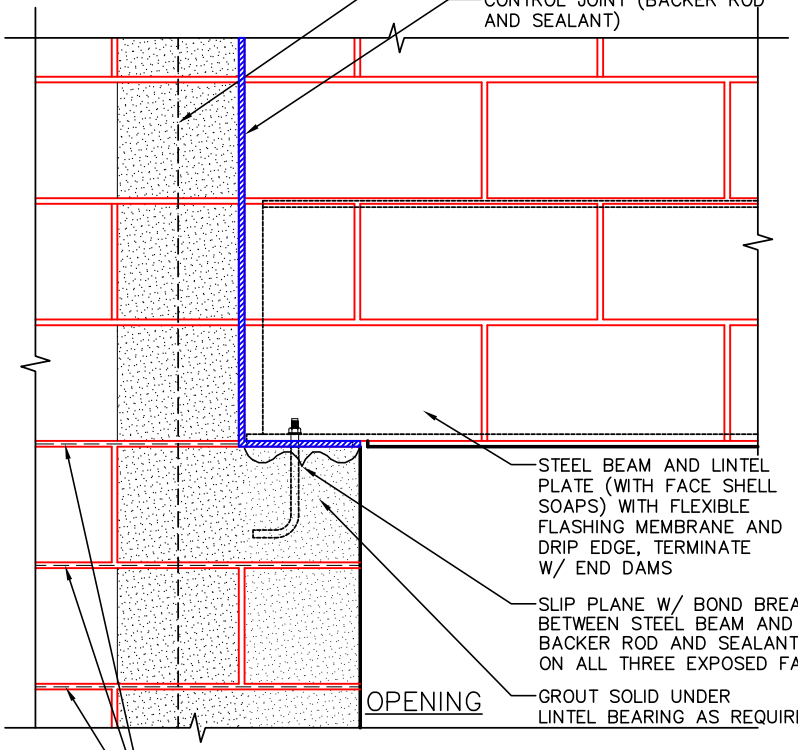
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SLIP PLANE/ CONTROL JOINT @ MASONRY LINTEL
SHEET:	A-11.1



PLAN OF LINTEL/BEARING PLATE

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

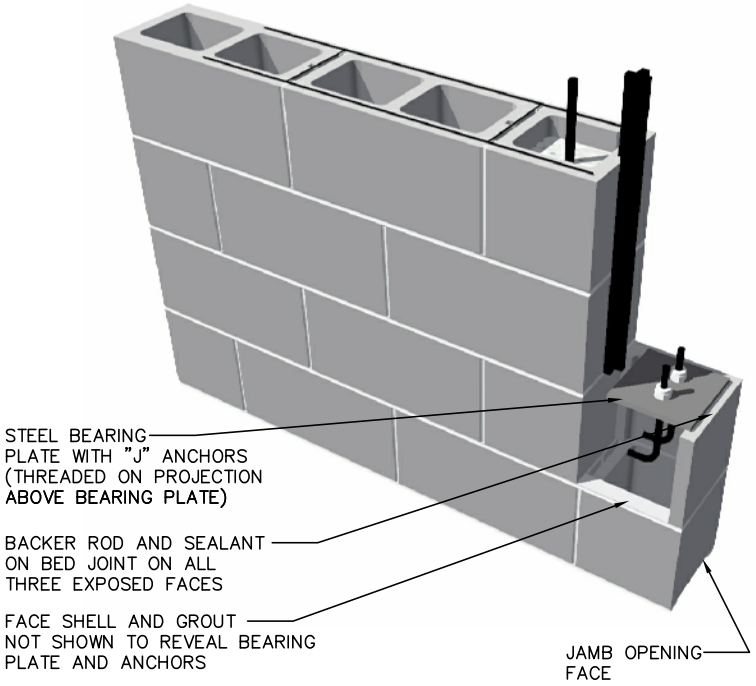
NOTE: 8" BEARING IS SHOWN AND IS TYPICAL, BUT SHOULD BE INCREASED IF NECESSARY BASED ON STRUCTURAL BEARING CALCULATIONS



ELEVATION VIEW

NCMA RECOMMENDS WIRE: 24" LONG HORIZONTAL JOINT REINFORCEMENT AT LINTEL BEARING AND TWO COURSES BELOW LINTEL BEARING

NOTE:
NO REINFORCEMENT (VERTICAL OR HORIZONTAL) SHALL PASS THROUGH THE CONTROL JOINT.



ISOMETRIC VIEW

10B
A-11.2

SLIP PLANE/CONTROL JOINT @ LONG SPAN WIDE FLANGE STEEL LINTEL

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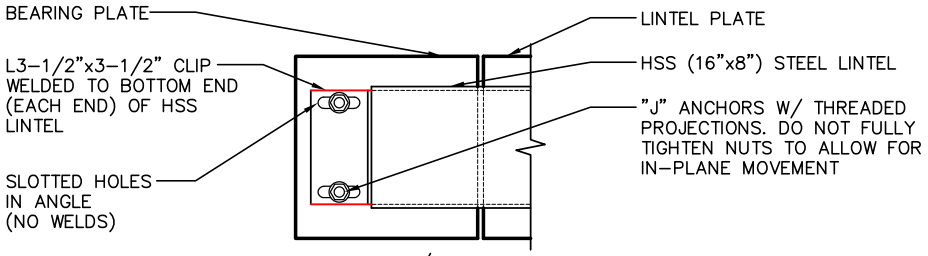
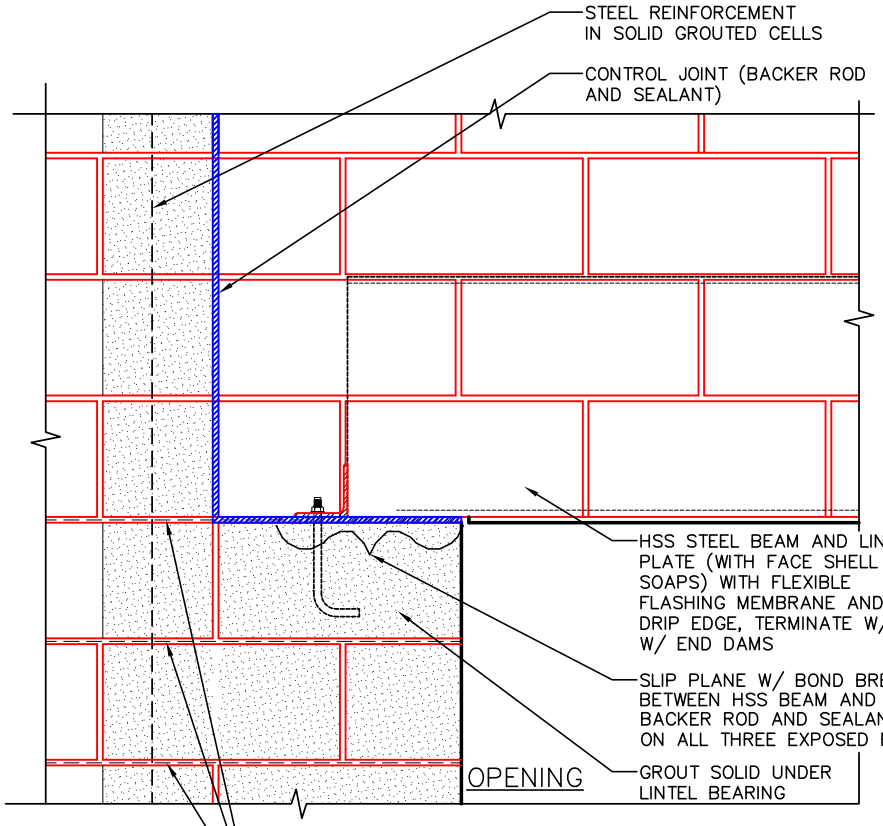
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SLIP PLANE/ CONTROL JOINT @ STEEL LINTEL
SHEET:	A-11.2



PLAN OF LINTEL/BEARING PLATE

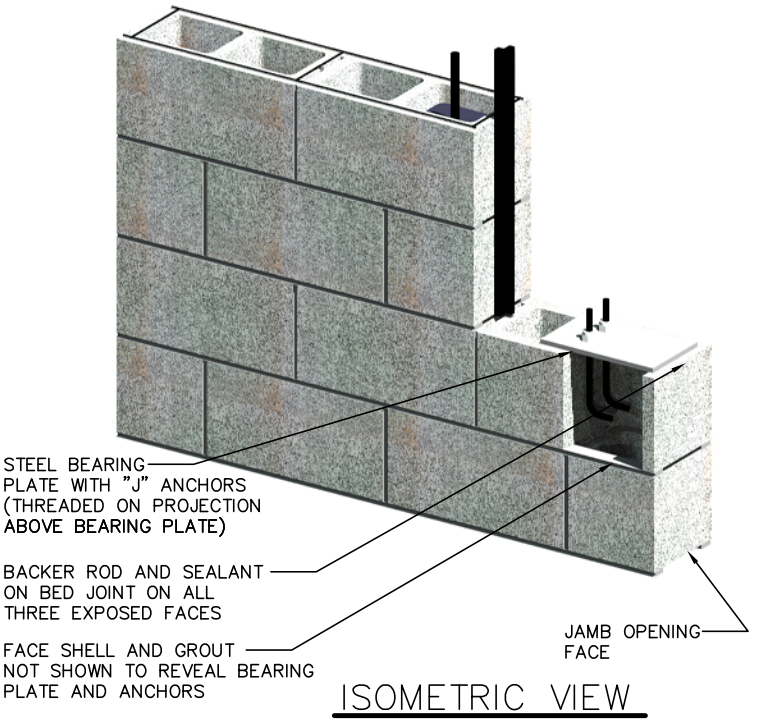
NOTES:
1) DO NOT WELD STEEL BEAM LINTEL PLATE TO BEARING PLATE (TYPICAL BOTH SIDES).



ELEVATION VIEW

NCMA RECOMMENDS WIRE: 24" LONG HORIZONTAL JOINT REINFORCEMENT AT LINTEL BEARING AND TWO COURSES BELOW LINTEL BEARING

NOTE:
NO REINFORCEMENT (VERTICAL OR HORIZONTAL) SHALL PASS THROUGH THE CONTROL JOINT.



ISOMETRIC VIEW

SLIP PLANE/CONTROL JOINT @ LONG SPAN HSS STEEL LINTEL

10C
A–11.2

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DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SLIP PLANE/ CONTROL JOINT @ STEEL LINTEL
SHEET:	A–11.3

"CONTROL LAYER" INFORMATION

1) THERMAL CONTROL LAYER OVERVIEW:

COMPLIANCE OPTIONS:

1) FOR "SEMI-HEATED" BUILDINGS SEE NOTE 1A BELOW AND SHEET A-12.3.
(CONVENTIONAL UNITS - PRESCRIPTIVE METHOD, COMCHECK NOT REQUIRED).

2) FOR "HEATED" BUILDINGS:
A) FOR SINGLE WYTHE WALLS EXPOSED ON THE EXTERIOR AND FULLY INSULATED ON THE INTERIOR FACE, SEE NOTE 1BA BELOW AND SHEET A-13,
(CONVENTIONAL UNITS - PRESCRIPTIVE METHOD, COMCHECK NOT REQUIRED).

B) FOR SINGLE WYTHE WALLS EXPOSED ON THE EXTERIOR AND PARTIALLY INSULATED ON THE INTERIOR FACE, SEE NOTE 1BB BELOW AND SHEETS A-12.4 THRU A-12.7 (CONVENTIONAL UNITS - COMCHECK METHOD).

C) FOR SINGLE WYTHE WALLS EXPOSED ON THE EXTERIOR AND EXPOSED ON THE INTERIOR FACE (USING SPECIAL ENERGY UNITS), SEE NOTE 1BC BELOW AND SHEET A-12.8
(SPECIALITY ENERGY UNITS - PRESCRIPTIVE METHOD, COMCHECK NOT REQUIRED).

1A) THERMAL CONTROL LAYER - "SEMI-HEATED" BUILDINGS/SPACES:

A) ASHRAE 90.1-2013 PRESCRIPTIVE COMPLIANCE REQUIREMENTS FOR MASS WALLS FOR CLIMATE ZONES 5, 6, & 7; AND ALTERNATE INSULATION OPTION:

	WALLS ABOVE GRADE		
ZONE	CONTINUOUS INSULATION METHOD (Rci MINIMUM)	Umax METHOD (Umax OF ENTIRE WALL ASSEMBLY)	ALTERNATE INSULATION OPTION:
5	Rci $\geq$ 5.7	Uassembly $\leq$ 0.151	ASTM C90 CONCRETE BLOCK WALLS, UN-GROUTED OR PARTIALLY GROUTED AT 32" OR LESS ON CENTER VERTICALLY AND 48" OR LESS ON CENTER HORIZONTALLY, WITH ALL UN-GROUTED CORES FILLED WITH MATERIAL HAVING A MAXIMUM THERMAL CONDUCTIVITY OF 0.44 BTU·in/h·ft^2·°F, COMPLY PER SECT. 5.5.3.2 EXCEPTION (SEE SHEET A-12.3)
6	Rci $\geq$ 5.7	Uassembly $\leq$ 0.151	
7	Rci $\geq$ 7.6	Uassembly $\leq$ 0.123	NOT APPLICABLE

TABLE NOTES:

1) MICHIGAN RANGES FROM ZONE 5 IN THE SOUTH TO ZONE 7 IN THE NORTH.
2) SEE NCMA TEK 06-02C, TABLE 5, FOR R-VALUES AND U-FACTORS OF SINGLE WYTHE CONCRETE MASONRY WALLS, AND ADDITIONAL THERMAL DATA INFORMATION.
B) IN ORDER TO USE THE PRESCRIPTIVE PROVISIONS OF REFERENCED ENERGY CODE, WALL OPENINGS ARE LIMITED TO A MAXIMUM 40% OF GROSS WALL AREA, AND SKYLIGHTS ARE LIMITED TO A MAXIMUM 5% OF THE GROSS ROOF AREA.

1B) THERMAL CONTROL LAYER - "HEATED" BUILDINGS/SPACES:

A) FOR OCCUPANCIES SUCH AS OFFICE, RETAIL, ASSEMBLY, ETC.; WHERE THE EXTERIOR WALLS ARE COMMONLY FINISHED ON THE INTERIOR SIDE WITH FURRING AND INSULATION, SEE SHEET A-13 FOR EXAMPLES OF INSULATION OPTIONS.

B) FOR INDUSTRIAL WAREHOUSE OCCUPANCIES, IT IS POSSIBLE TO HAVE EXPOSED CMU ON THE LOWER PART OF THE WALL (FOR SUPERIOR DURABILITY), AND DIRECT APPLY RIGID FOAM INSULATION ON THE UPPER PART OF THE WALL. SEE SHEETS A-12.4 THRU A-12.7 FOR GUIDANCE ON USING "COMCHECK" TO ACHIEVE ENERGY CODE COMPLIANCE USING THIS APPROACH.

C) SPECIAL ENERGY UNITS (PROPRIETARY) PROVIDE ANOTHER OPTION. SEE SHEET A-12.8 FOR ADDITIONAL INFORMATION.

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DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	CONTROL LAYER INFORMATION
SHEET:	A-12.1

"CONTROL LAYER" INFORMATION (CONTINUED)

2) AIR CONTROL LAYER:

A) THE AIR CONTROL LAYER IS OFTEN REFERED TO AS AN "AIR BARRIER" (SYSTEM). SEVERAL PRODUCTS AND OPTIONS (SUCH AS LIQUID OR MEMBRANE APPLIED PROPRIETARY SYSTEMS) ARE AVAILABLE, WITH DIFFERING LEVELS OF COST AND COMPLEXITY. SEE NOTE # 2 ON SHEET A–13.1 FOR MORE COMMENTS ADDRESSING AN AIR CONTROL LAYER.

B) THIS SET OF DETAILS REFLECTS AN AIR BARRIER SYSTEM ACHIEVED WITH SPECIFIC MASONRY DETAILING/CONSTRUCTION AND NON–PROPRIETARY COATINGS DESCRIBED IN NOTE C BELOW.

C) THE FOLLOWING NON–PROPRIETARY COATINGS ARE CONSIDERED TO MEET AN AIR LEAKAGE OF LESS THE 0.04 CFM/SQ. FT. @ 75 Pa. (SEE NCMA TEK 6–14A FOR ADDITIONAL INFORMATION).

1) PRESCRIPTIVE COMPLIANCE:
   - FULLY GROUTED CMU
   - CMU WALL WITH ONE APPLICATION OF BLOCK FILLER AND TWO APPLICATIONS OF A PAINT OR SEALER COATING
   - CMU WALL WITH A PORTLAND CEMENT/SAND PARGE, STUCCO OR PLASTER WITH A MINIMUM THICKNESS OF 1/2".

2) BY LABORATORY TESTING:
   - 12" CMU SEALED WITH AT LEAST (2) COATS OF COMMERCIAL–GRADE LATEX PAINT.
   - 8" CMU COATED WITH A SINGLE COAT OF HIGH QUALITY LATEX PAINT.
   - 8" CMU COATED WITH A SINGLE COAT OF MASONRY BLOCK FILLER.

3) MOISTURE CONTROL LAYER:

A) SINGLE WYTHE WALL ASSEMBLIES DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THESE DETAILS PROVIDE PROTECTION AGAINST WATER PENETRATION, ESPECIALLY FOR LOW–RISE BUILDINGS. FOR IMPROVED PROTECTION, CONSIDER THE DRAINAGE WALL ASSEMBLIES SHOWN IN M.I.M. DETAIL SET CW.8 (8" CAVITY WALL). SEE NOTE #3 ON SHEET A–13 FOR MORE COMMENTS ADDRESSING A VAPOR CONTROL LAYER.

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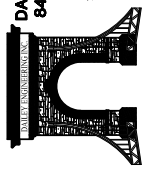

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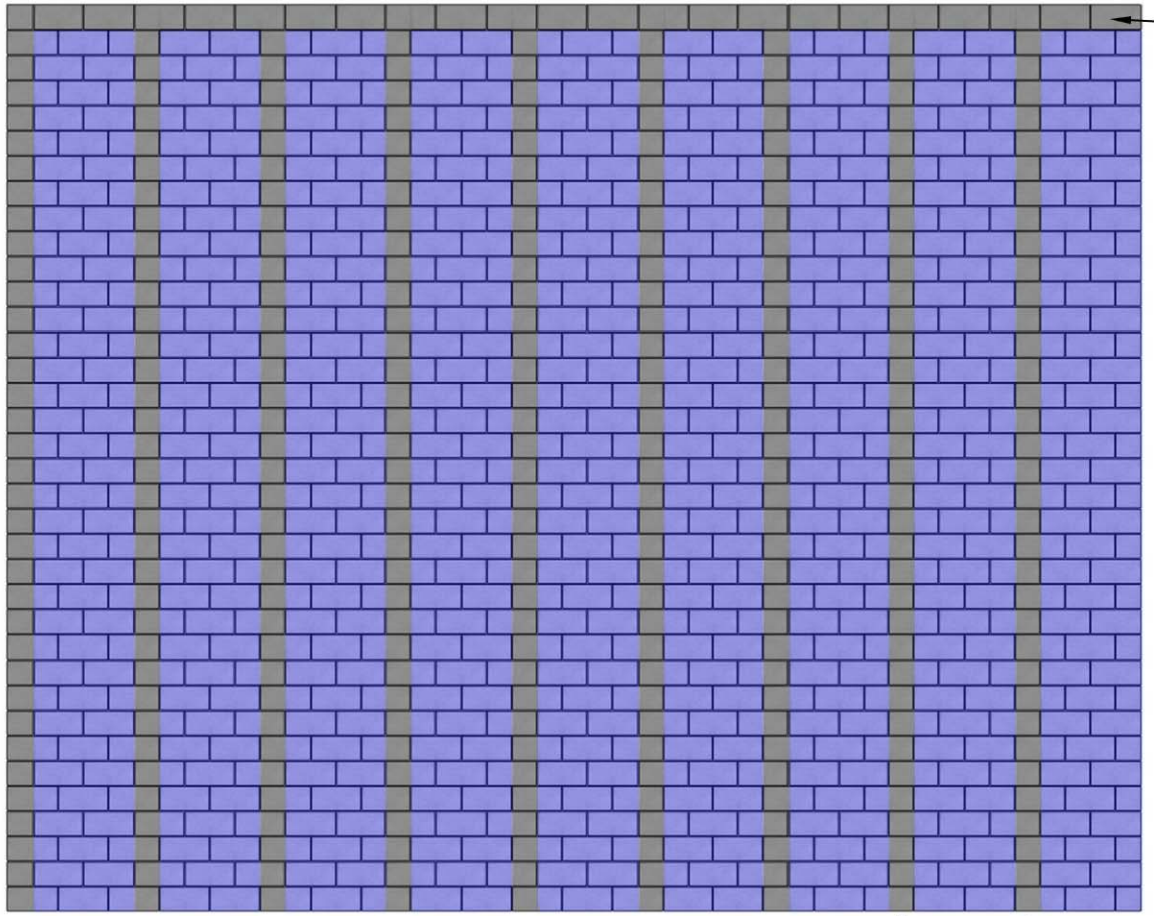
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	CONTROL LAYER INFORMATION
SHEET:	A–12.2

SEMI-HEATED BUILDING W/CONVENTIONAL UNITS (PRESCRIPTIVE METHOD, COMCHECK NOT REQUIRED) ALTERNATE INSULATION OPTION



Grout

Insulation: Maximum Thermal Conductivity of 0.44 Btu·in/H·Ft^2 °F
(See NCMA TEK 6-2C, Table 5)

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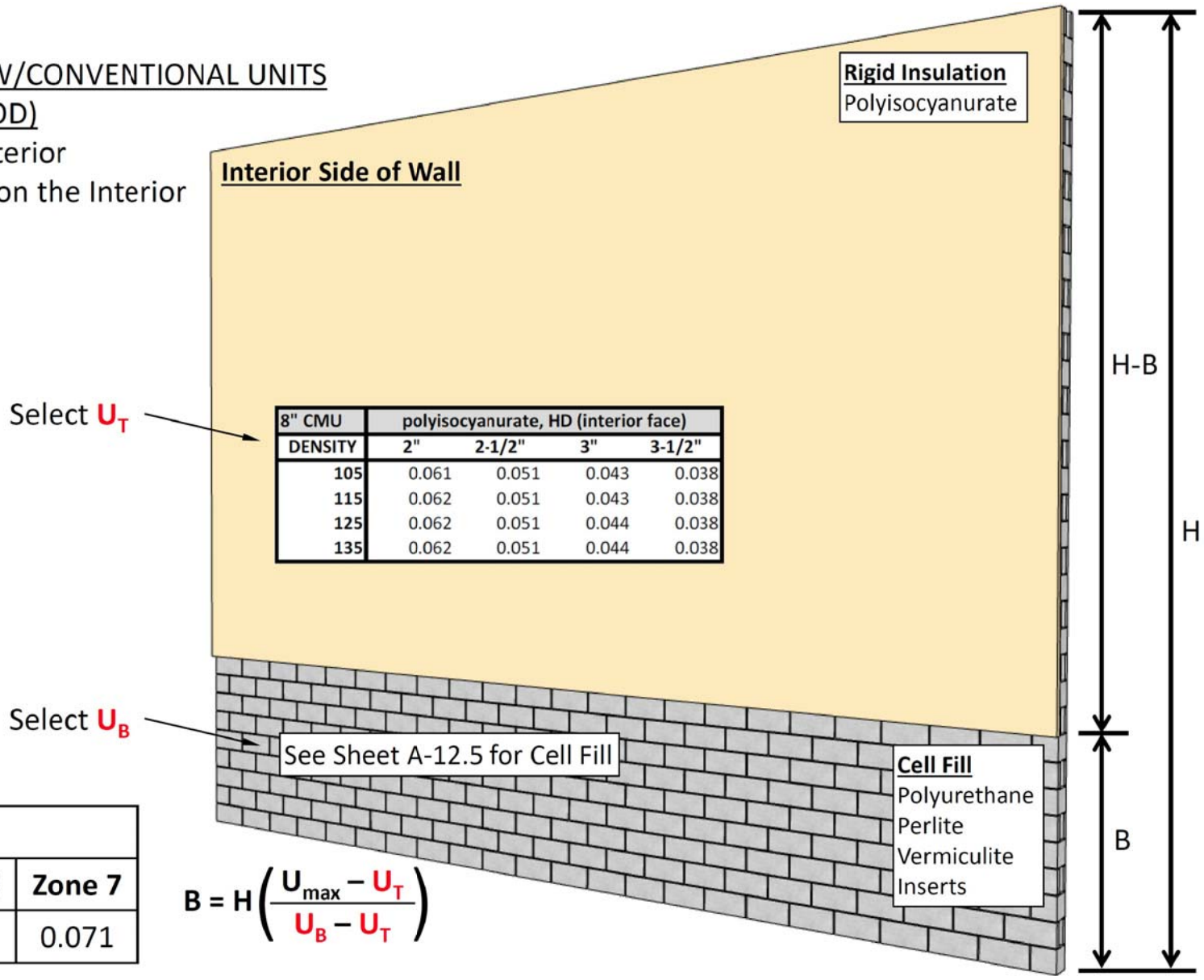
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SEMI-HEATED ALTERNATE INSULATION OPTION
SHEET:	A-12.3

HEATED BUILDING W/CONVENTIONAL UNITS (COMCHECK METHOD)

- Exposed on the Exterior
- Partially Insulated on the Interior



Select U_T

8" CMU	polyisocyanurate, HD (interior face)			
DENSITY	2"	2-1/2"	3"	3-1/2"
105	0.061	0.051	0.043	0.038
115	0.062	0.051	0.043	0.038
125	0.062	0.051	0.044	0.038
135	0.062	0.051	0.044	0.038

Select U_B

See Sheet A-12.5 for Cell Fill

U_{max}		
Zone 5	Zone 6	Zone 7
0.090	0.080	0.071

$$B = H\left(\frac{U_{max} - U_T}{U_B - U_T}\right)$$

SAMPLE WALL FOR COMCHECK EXAMPLE

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DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	COMCHECK SUPPORT INFORMATION
SHEET:	A–12.4

HEATED BUILDING W/CONVENTIONAL UNITS (COMCHECK METHOD)

- Exposed on the Exterior
- Partially Insulated on the Interior

POLYURETHANE

12" CMU	BAR SPACING, polyurethane foamed-in-place, R=5.9 per in. (cell fill)														
DENSITY	8"	16"	24"	32"	40"	48"	56"	64"	72"	80"	88"	96"	104"	112"	120"
105	0.427	0.277	0.227	0.202	0.187	0.177	0.170	0.164	0.160	0.157	0.154	0.152	0.150	0.148	0.147
115	0.446	0.296	0.246	0.221	0.206	0.196	0.188	0.183	0.179	0.176	0.173	0.170	0.168	0.167	0.166
125	0.466	0.316	0.267	0.242	0.227	0.217	0.210	0.204	0.200	0.197	0.194	0.192	0.190	0.188	0.187
135	0.485	0.339	0.290	0.265	0.250	0.241	0.234	0.228	0.224	0.221	0.219	0.216	0.214	0.213	0.211

PERLITE

12" CMU	BAR SPACING, perlite, R=3.12 per in. (cell fill)														
DENSITY	8"	16"	24"	32"	40"	48"	56"	64"	72"	80"	88"	96"	104"	112"	120"
105	0.427	0.281	0.233	0.209	0.194	0.184	0.178	0.172	0.168	0.165	0.163	0.160	0.158	0.157	0.155
115	0.446	0.300	0.252	0.227	0.212	0.203	0.196	0.191	0.187	0.183	0.181	0.178	0.177	0.175	0.174
125	0.466	0.320	0.272	0.248	0.233	0.224	0.217	0.211	0.207	0.204	0.202	0.199	0.197	0.196	0.195
135	0.485	0.342	0.295	0.271	0.257	0.247	0.241	0.235	0.231	0.228	0.226	0.223	0.222	0.220	0.219

VERMICULITE

12" CMU	BAR SPACING, vermiculite, R=2.27 per in. (cell fill)														
DENSITY	8"	16"	24"	32"	40"	48"	56"	64"	72"	80"	88"	96"	104"	112"	120"
105	0.427	0.285	0.238	0.214	0.200	0.190	0.184	0.178	0.174	0.171	0.169	0.167	0.165	0.163	0.162
115	0.446	0.303	0.256	0.232	0.218	0.208	0.202	0.196	0.193	0.189	0.187	0.185	0.183	0.181	0.180
125	0.466	0.324	0.276	0.253	0.238	0.229	0.222	0.217	0.213	0.210	0.208	0.205	0.203	0.202	0.201
135	0.485	0.346	0.299	0.276	0.262	0.252	0.246	0.241	0.237	0.234	0.232	0.229	0.227	0.226	0.225

Conventional Unit w/Insert*
(Typical U-values range from 0.14 to 0.20)

*NOTES:

1) This is a proprietary product, consult the manufacturer for U-Values and technical information and guidance for structural design
2) Basis of design for Conventional Units with inserts is "Korfil ICON."

CONVENTIONAL CMU'S "U_B" VALUES

DAILEY ENGINEERING, INC.
8485 STEPHENSON ROAD
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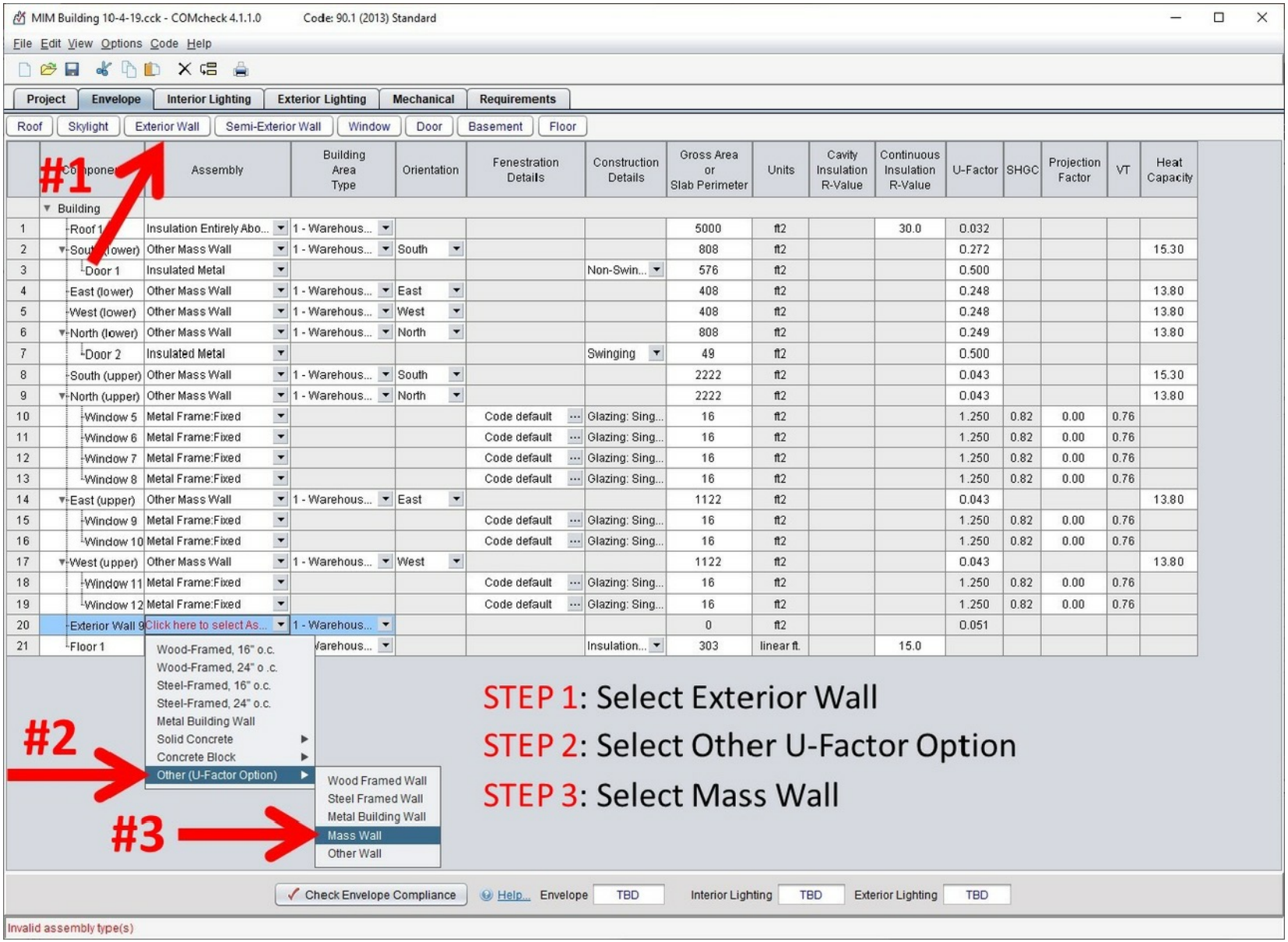
PH. # (517) 467-9000

MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	U-VALUE REFERENCE CHARTS
SHEET:	A-12.5



COMCHECK STEPS #1–#3

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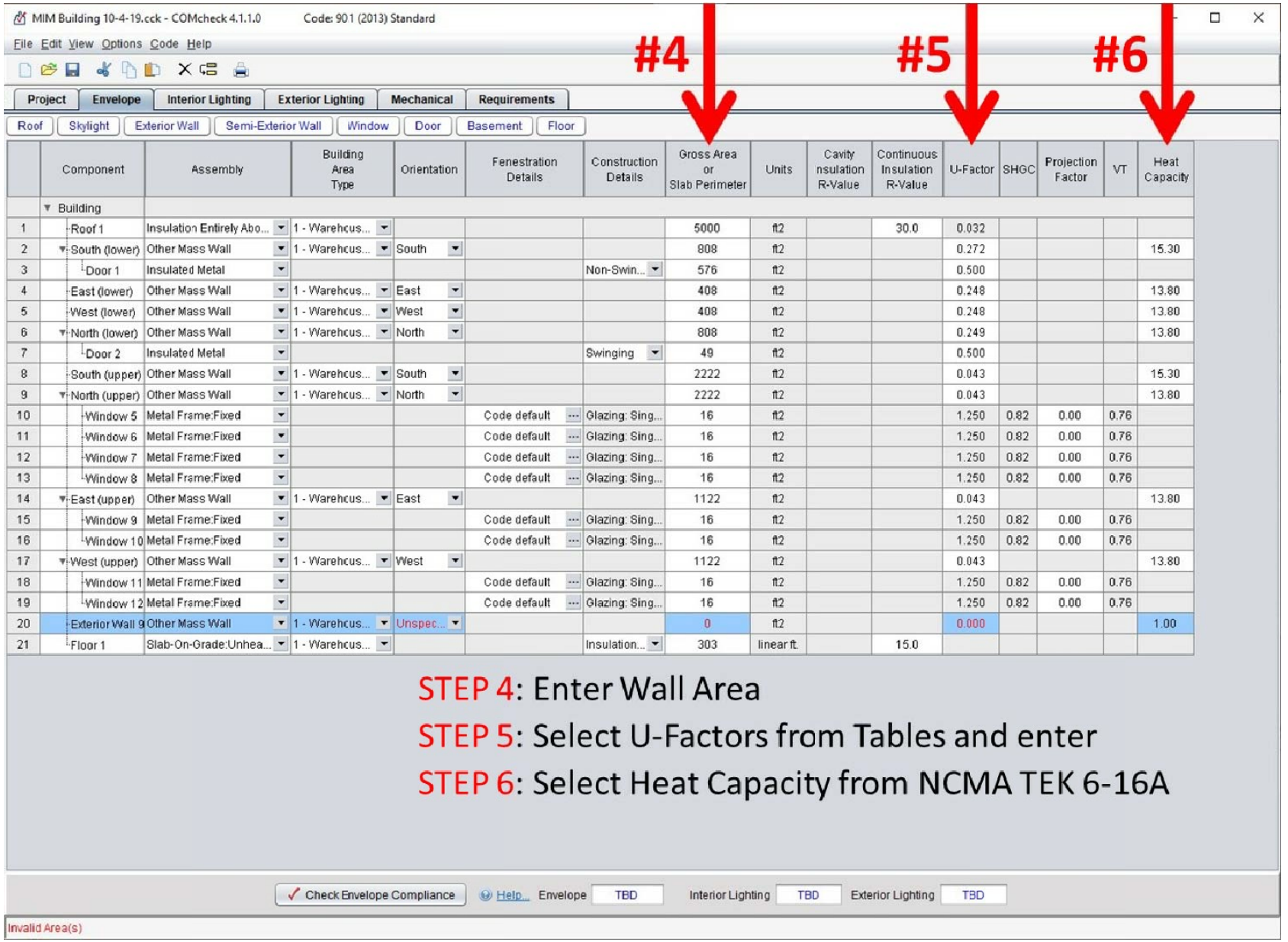
DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	COMCHECK SUPPORT INFORMATION
SHEET:	A–12.6



	Component	Assembly	Building Area Type	Orientation	Fenestration Details	Construction Details	Gross Area or Slab Perimeter	Units	Cavity nsulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor	VT	Heat Capacity
	Building														
1	Roof 1	Insulation Entirely Abo...	1 - Warehous...				5000	ft2		30.0	0.032				
2	South (lower)	Other Mass Wall	1 - Warehous...	South			808	ft2			0.272				15.30
3	Door 1	Insulated Metal				Non-Swin...	576	ft2			0.500				
4	East (lower)	Other Mass Wall	1 - Warehous...	East			408	ft2			0.248				13.80
5	West (lower)	Other Mass Wall	1 - Warehous...	West			408	ft2			0.248				13.80
6	North (lower)	Other Mass Wall	1 - Warehous...	North			808	ft2			0.249				13.80
7	Door 2	Insulated Metal				Swinging	49	ft2			0.500				
8	South (upper)	Other Mass Wall	1 - Warehous...	South			2222	ft2			0.043				15.30
9	North (upper)	Other Mass Wall	1 - Warehous...	North			2222	ft2			0.043				13.80
10	Window 5	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
11	Window 6	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
12	Window 7	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
13	Window 8	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
14	East (upper)	Other Mass Wall	1 - Warehous...	East			1122	ft2			0.043				13.80
15	Window 9	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
16	Window 10	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
17	West (upper)	Other Mass Wall	1 - Warehous...	West			1122	ft2			0.043				13.80
18	Window 11	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
19	Window 12	Metal Frame:Fixed			Code default	Glazing: Sing...	16	ft2			1.250	0.82	0.00	0.76	
20	Exterior Wall 9	Other Mass Wall	1 - Warehous...	Unspec...			0	ft2			0.000				1.00
21	Floor 1	Slab-On-Grade:Unhea...	1 - Warehous...			Insulation...	303	linear ft		15.0					

COMCHECK STEPS #4–#6

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DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:
DRAWN: M.W.F.
APPROVED:
DATE: 01/28/2020
TITLE: COMCHECK SUPPORT INFORMATION
SHEET: A–12.7

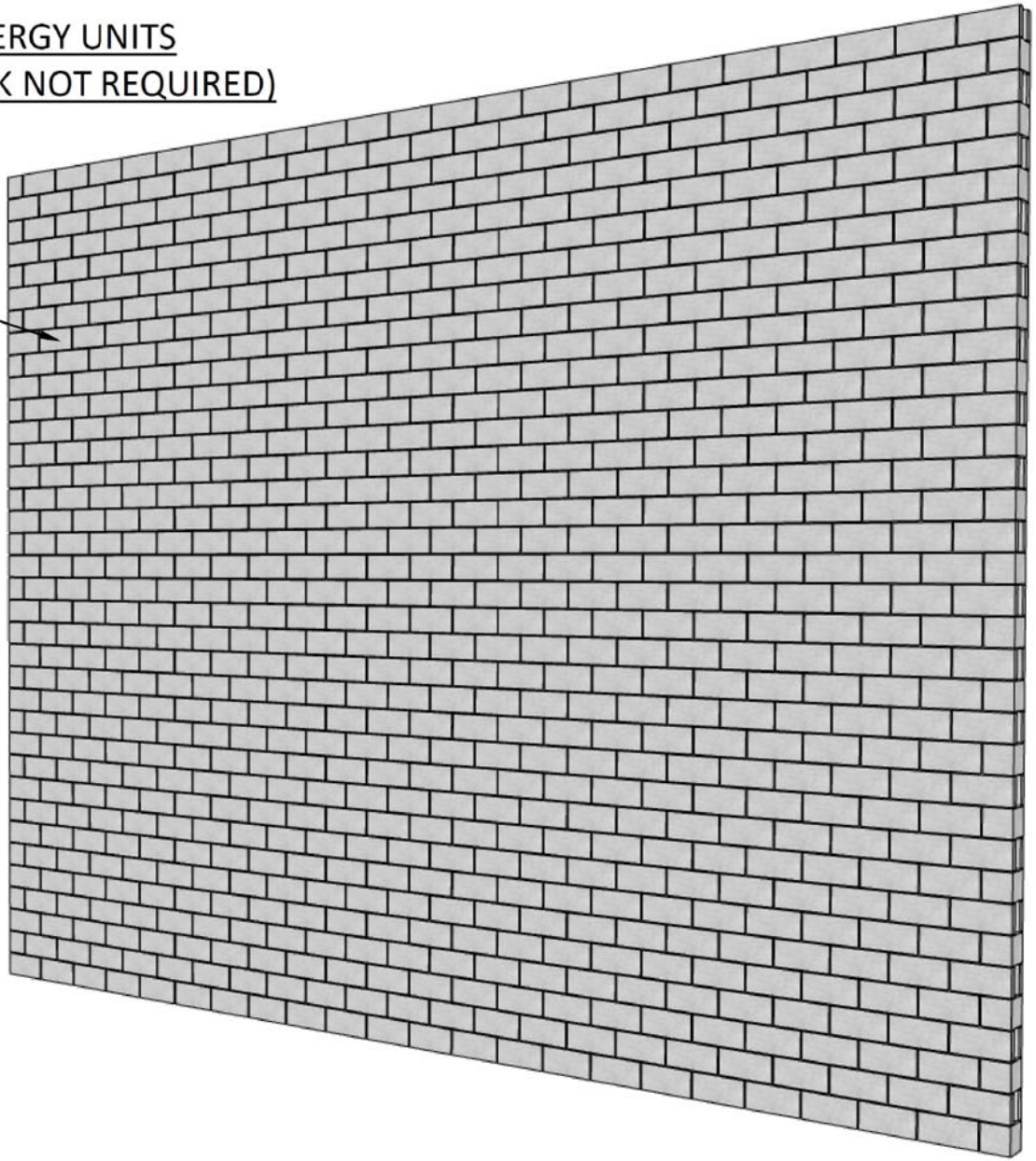
HEATED BUILDING W/SPECIALTY ENERGY UNITS (PRESCRIPTIVE METHOD, COMCHECK NOT REQUIRED)

- Exposed on the Exterior
- Exposed on the Interior

Specialty Energy Unit

Special Energy Unit #1*
(Typical U-values range from 0.033 to 0.035)

Special Energy Unit #2*
(Typical U-values range from 0.07 to 0.09)



*NOTES:

1) These are proprietary products, consult the manufacturer for U-Values and technical information and guidance for structural design
2) Basis of design for Special Energy Unit #1 is "Omniblock." Basis of design for Special Energy Unit #2 is "Korfil HiR-H."

U_{max}		
Zone 5	**Zone 6**	**Zone 7**
0.090	0.080	0.071

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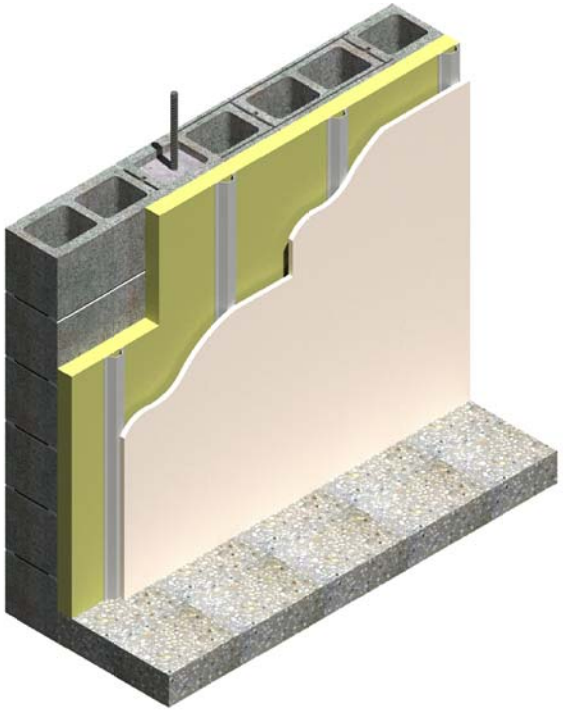
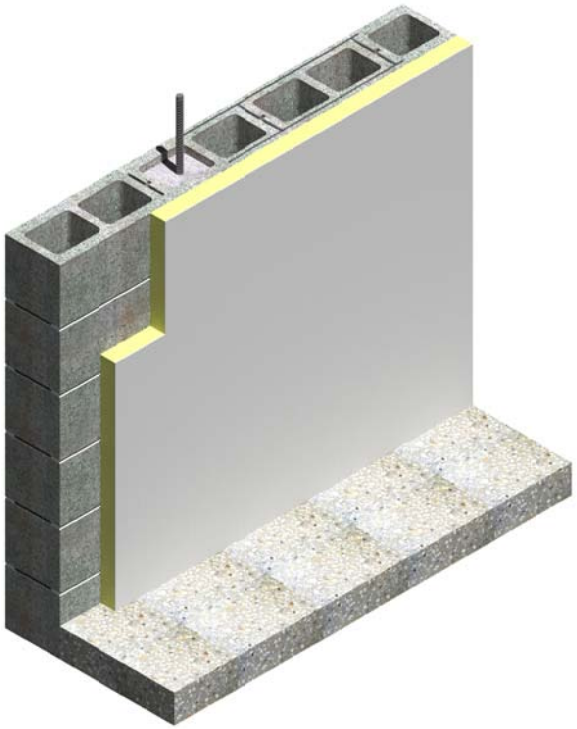
DETAIL SET SW.12 (12" SINGLE WYTHE)

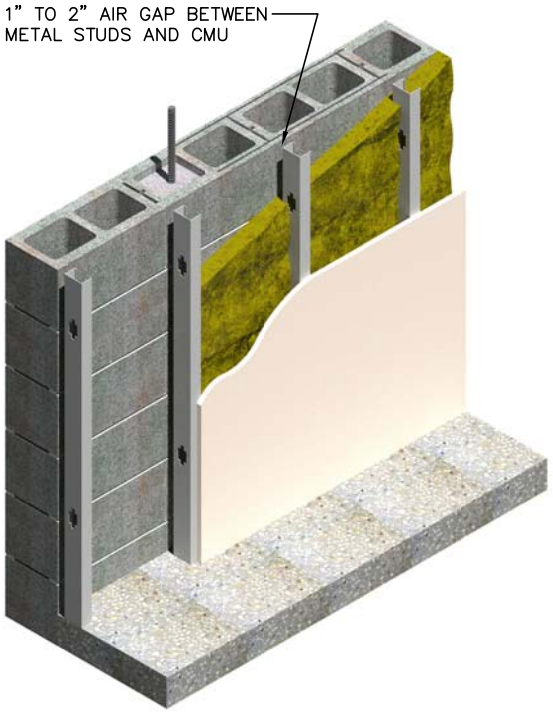
IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	SPECIAL ENERGY UNITS
SHEET:	A-12.8



RIGID INSULATION WITH FURRING/GYP. BOARD



RIGID FOAM WITH COMPOSITE THERMAL BARRIER



SPRAY FOAM WITH METAL STUDS/GYP. BOARD

NOTES:
THE THREE OPTIONS SHOWN ABOVE:

1) ARE JUST A FEW REPRESENTATIVE SAMPLES OF THE MULTITUDE OF AVAILABLE INTERIOR INSULATION SYSTEMS:
   - A) RIGID BOARD – EXTRUDED OR EXPANDED POLYSTYRENE, OR POLYISOCYANURATE
   - B) CLOSED–CELL SPRAY POLYURETHANE FOAM
   - C) CELLULAR GLASS
   - D) FIBROUS BATT
   - E) FIBROUS BLOW–IN

2) DO NOT ADDRESS A VAPOR CONTROL LAYER, AND HAVE VARYING LEVELS OF VAPOR PERMEABILITY. THE DEGREE OF VAPOR PERMEABILITY AND INTERIOR SPACE HUMIDITY SHOULD BE CAREFULLY EVALUATED (DEWPOINT ANALYSIS) IN ORDER TO ACHIEVE PROPER CONDENSATION CONTROL.

3) HAVE NOT BEEN ANALYZED FOR AIR CONTROL LAYER PERFORMANCE. THE OTHER DETAILS IN THIS SET REFLECT AN AIR BARRIER SYSTEM ACHIEVED WITH SPECIFIC MASONRY DETAILING/ CONSTRUCTION AND NON–PROPRIETARY COATINGS APPLIED DIRECTLY TO THE CMU (SEE SHEET A–12, NOTE #2). IF AN INTERIOR WALL INSULATION SYSTEM IS INCLUDED IN THE DESIGN, THE USER MAY WISH TO CONSIDER OTHER AIR BARRIER SYSTEMS (PERHAPS EVEN UTILIZING COMPONENTS OF THE INTERIOR WALL INSULATION SYSTEM, IF APPLICABLE).

11A / A–13.1

INSULATION OPTIONS FOR INTERIOR SURFACE OF EXTERIOR WALL

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ONSTED, MI 49265
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FAX # (517) 467-9010

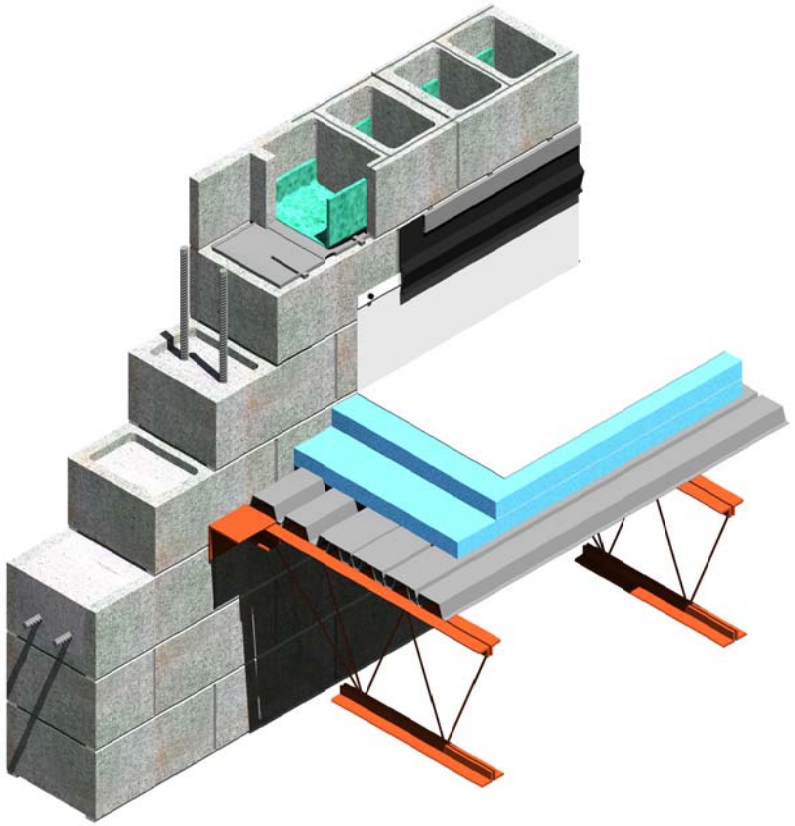
11 MASONRY Institute of Michigan

DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	INSULATION OPTIONS FOR INTERIOR SURFACE OF EXTERIOR WALL
SHEET:	A–13

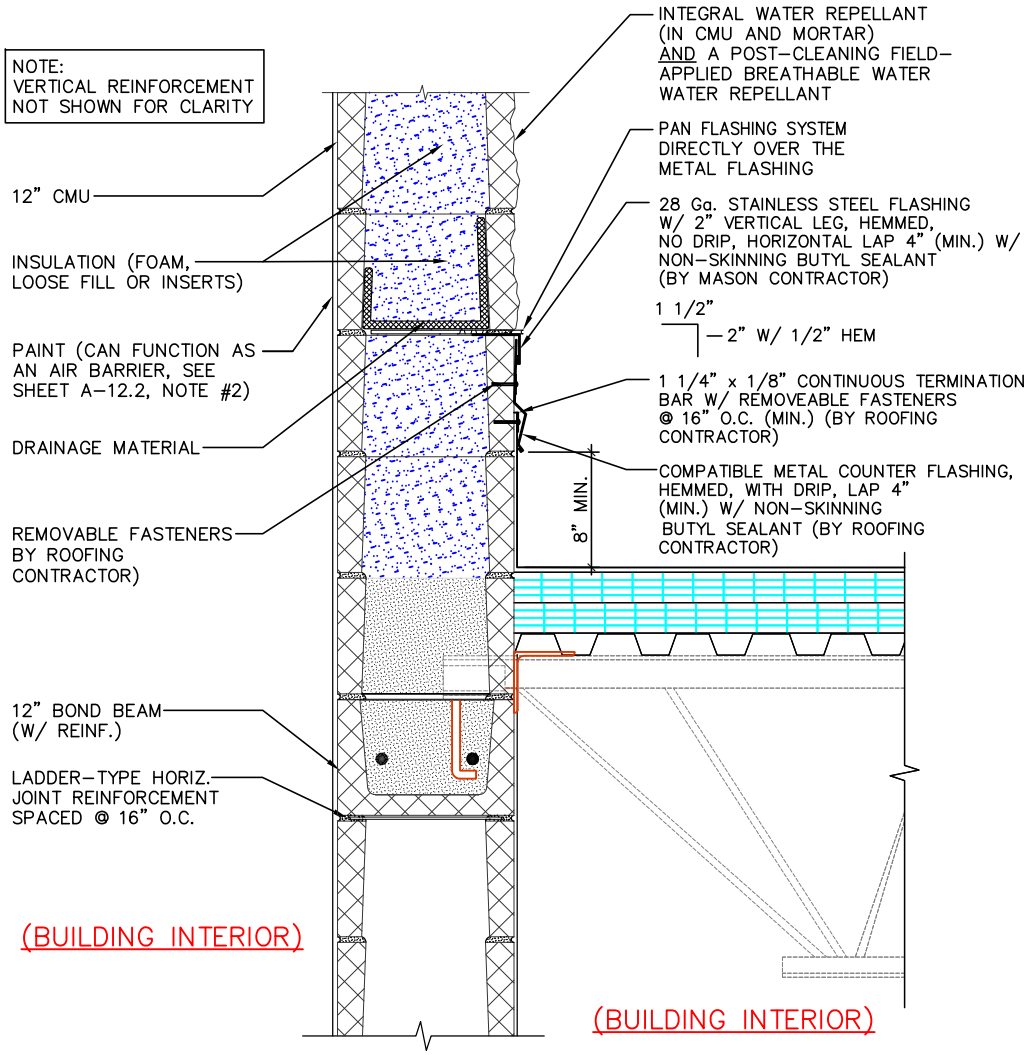
NOTES:

1) THIS DETAIL ONLY APPLICABLE TO A REINFORCED WALL DUE TO FLASHING/BOND BREAK CONCERNS.



ISOMETRIC VIEW

NOTE:
VERTICAL REINFORCEMENT NOT SHOWN FOR CLARITY



SECTION VIEW

12 / A-1.1 UPPER WALL / LOW ROOF FLASHING DETAIL

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DETAIL SET SW.12 (12" SINGLE WYTHE)

IN CHARGE:	
DRAWN:	M.W.F.
APPROVED:	
DATE:	01/28/2020
TITLE:	UPPER WALL / LOW ROOF FLASHING DETAIL
SHEET:	A-14