NOTES

1) THIS SET OF DETAILS WILL RESULT IN A WALL WITH A CALCULATED (STEADY STATE) VALUE OF R=26. THE LARGE THERMAL MASS (TRANSIENT COMPONENT) TYPICAL OF MASONRY CONSTRUCTION WILL PROVIDE A HIGHER EFFECTIVE R-VALUE.

2) MULTIPLE VARIATIONS OF INSULATION THICKNESS, INSULATION TYPE, AND AIR SPACE WIDTHS ARE POSSIBLE WITH CAVITY WALL CONSTRUCTION. THIS SET OF DETAILS CALLS FOR 4" OF RIGID INSULATION, BUT WILL WORK FOR EITHER 3" OR 3 1/2" RIGID INSULATION WITHOUT REQUIRING ANY CHANGES TO THE OVERALL WALL THICKNESS (1"-4 3/4"

3) THE USE OF AN AIR CONTROL LAYER ("AIR BARRIER") WILL ALSO HAVE A SIGNIFICANT IMPACT ON THE THERMAL PERFORMANCE OF THE BUILDING ENVELOPE. (SEE SHEET A-13 FOR ADDITIONAL INFORMATION).

4) THIS SET OF DETAILS WILL RESULT IN A WALL WITH THREE CONTROL LAYERS: RAIN, THERMAL, AND AIR. (SEE SHEET A-13 FOR ADDITIONAL INFORMATION).

INDEX - HIGH R MULTI WYTHE (8" CMU W/ BRICK VENEER)

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The Masonry Institute of Michigan, Inc.

BASE DETAIL W/ VENEER BELOW GRADE

NOTES

1) CMU BELOW GRADE SHALL BE MEDIUM OR NORMAL WEIGHT.

2) SPECIAL CARE IN BRICK SELECTION MUST BE EXERCISED WHEN PLACING BRICK BELOW GRADE.

3) IF A Drip EDGE IS NOT DESIRED THE FLASHING MEMBRANE SHALL, MINIMALLY, EXTEND TO THE SURFACE OF THE EXTERIOR WALL FINISH. IF A METAL DRIP EDGE IS DESIRED, MODIFY THIS DETAIL SIMILAR TO THE 2-PIECE FLASHING SHOWN ON DETAIL 6D SHEET A-7. HOWEVER CAUTION SHOULD BE USED WHEN USING METAL DRIP EDGES AT ACCESSIBLE LOCATIONS DUE TO POSSIBLE SHARP METAL SEE:

http://www.mim-online.org/bulletins.html

A-2

IN CHARGE: \_\_\_\_\_

DRAWN: M.W.F.

APPROVED: \_\_\_\_

DATE: 05/03/2011

TITLE: BASE DETAIL

SHEET: A-3
ISOMETRIC VIEW

LADDER TYPE HORIZONTAL JOINT REINF. @ 16" O.C. W/ ADJUSTABLE VENEER TIES

4" BRICK (CLAY) VENEER

TOOL MORTAR JOINTS TO A CONCAVE PROFILE

4" RIGID INSULATION

8" LIGHTWEIGHT CMU BACK-UP

FLEXIBLE MEMBRANE FLASHING (NOTE 2)

DRAINAGE MATERIAL

WEEPS

FIN. FLOOR LINE

CONCRETE SLAB

STRIKE MORTAR JOINTS FLUSH ON OUTER FACE OF CMU

1 1/4" x 1/8" CONT. TERMINATION BAR W/ SEALANT

BASE DETAIL W/ VENEER ABOVE GRADE

NOTES

1) CMU BELOW GRADE SHALL BE MEDIUM OR NORMAL WEIGHT.

2) IF A DRIPE EDGE IS NOT DESIRED THE FLASHING MEMBRANE SHALL, MINIMALLY, EXTEND TO THE SURFACE OF THE EXTERIOR WALL FINISH. IF A METAL DRIPE EDGE IS DESIRED, MODIFY THIS DETAIL SIMILAR TO THE 2-PIECE FLASHING SHOWN ON DETAIL 60 SHEET A-7. HOWEVER CAUTION SHOULD BE USED WHEN USING METAL DRIPE EDGES AT ACCESSIBLE LOCATIONS DUE TO POSSIBLE SHARP METAL SEE:

http://www.mimc-online.org/bulletins.html
NOTE: MASONRY LINTEL MAY BE PRECAST OR FIELD ASSEMBLED

4" RIGID INSULATION
4" BRICK (CLAY) VENEER

FLEXIBLE MEMBRANE FLASHING

DRAINAGE MATERIAL
RIGID INSULATION
WEEPS

TWO-PIECE FLASHING (SEE DETAIL 6D, SHEET A-7)

GALVANIZED ANGLE ("LOOSE") STEEL LINTEL
SEALANT (BOTH SIDES)

A-1
MASONRY LINTEL (PREFERRED)

3A

LADDER TYPE HORIZONTAL
JOINT REINF@12" O.C.
W/ADJUSTABLE VENEER TIES

8" LIGHTWEIGHT CMU
BACK-UP

1 1/4" x 1/8" CONT.
TERMINATION BAR
W/ SEALANT

LINTEL UNIT
(W/ REINF, PER
STRUCTURAL DESIGN)
GROUTED SOLID

BREAK METAL (OR
OTHER ARCH. TREATMENT)

STRAP ANCHOR
HIGH EFFICIENCY
ALUM. WINDOW FRAME

3C
PRE-CAST CONCRETE LINTEL

4" RIGID INSULATION
4" BRICK (CLAY) VENEER

FLEXIBLE MEMBRANE FLASHING

DRAINAGE MATERIAL
RIGID INSULATION
WEEPS

TWO-PIECE FLASHING (SEE DETAIL 6D, SHEET A-7)

GALVANIZED ANGLE ("LOOSE") STEEL LINTEL
SEALANT (BOTH SIDES)

3B
STEEL ANGLE LINTEL

HIGH EFFICIENCY
ALUM. WINDOW FRAME

BREAK METAL (OR
OTHER ARCH. TREATMENT)

STRAP ANCHOR

3A

LADDER TYPE HORIZONTAL
JOINT REINF@12" O.C.
W/ADJUSTABLE VENEER TIES

8" LIGHTWEIGHT CMU
BACK-UP

1 1/4" x 1/8" CONT.
TERMINATION BAR
W/ SEALANT

LINTEL UNIT
(W/ REINF, PER
STRUCTURAL DESIGN)
GROUTED SOLID

BREAK METAL (OR
OTHER ARCH. TREATMENT)

STRAP ANCHOR
HIGH EFFICIENCY
ALUM. WINDOW FRAME

3C
PRE-CAST CONCRETE LINTEL

4" RIGID INSULATION
4" BRICK (CLAY) VENEER

FLEXIBLE MEMBRANE FLASHING

DRAINAGE MATERIAL
RIGID INSULATION
WEEPS

TWO-PIECE FLASHING (SEE DETAIL 6D, SHEET A-7)

GALVANIZED ANGLE ("LOOSE") STEEL LINTEL
SEALANT (BOTH SIDES)

A-1

SHORT SPAN LINTELS—WINDOW OPENINGS—USING STRAP ANCHORS

(3 OPTIONS FOR THE CMU BACK-UP)

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NOTE:
UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INurement DAMAGE. SEE PCA "MASONRY TODAY" VOLUME II, NO. 1 FOR RECOMMENDATIONS.
www.cement.org/masonry/cc_al_frames.asp

NOTE: MASONRY LINTEL MAY BE PRECAST OR FIELD ASSEMBLED

LADDER TYPE HORIZONTAL
JOINT REINF. @ 16" O.C.
W/ADJUSTABLE VENEER TIES

1 1/4" x 1/8" CONT.
TERMINATION BAR
W/ SEALANT

8" LIGHTWEIGHT CMU
BACK-UP

LINTEL UNIT
(W/ REINF, PER
STRUCTURAL DESIGN)
GROUTED SOLID

WEEPS

TWO-PIECE
FLASHING (SEE
DETAIL 6D, SHEET A-7)

GALVANIZED DOUBLE
ANGLE (LOSE) STEEL LINTEL

SEALANT (BOTH SIDES)

DOOR FRAME

MASONRY LINTEL (PREFERRED)

4A

A-1

4" BRICK (CLAY)
VENEER

4" RIGID INSULATION

FLEXIBLE MEMBRANE
FLASHING

DRAINAGE MATERIAL

WEEPS

GALVANIZED DOUBLE
ANGLE (LOSE) STEEL LINTEL

SEALANT (BOTH SIDES)

DOOR FRAME

LADDER TYPE HORIZONTAL
JOINT REINF. @ 16" O.C.
W/ADJUSTABLE VENEER TIES

1 1/4" x 1/8" CONT.
TERMINATION BAR
W/ SEALANT

8" LIGHTWEIGHT CMU
BACK-UP

DOUBLE ANGLE
(LOSE) STEEL LINTEL

WEEPS

TWO-PIECE
FLASHING (SEE
DETAIL 6D, SHEET A-7)

GALVANIZED DOUBLE
ANGLE (LOSE) STEEL LINTEL

SEALANT (BOTH SIDES)

DOOR FRAME

STEEL ANGLE LINTEL

4B

A-1

4" BRICK (CLAY)
VENEER

4" RIGID INSULATION

FLEXIBLE MEMBRANE
FLASHING

DRAINAGE MATERIAL

WEEPS

GALVANIZED DOUBLE
ANGLE (LOSE) STEEL LINTEL

SEALANT (BOTH SIDES)

DOOR FRAME

PRE-CAST CONCRETE LINTEL

4C

A-1

4" BRICK (CLAY)
VENEER

4" RIGID INSULATION

FLEXIBLE MEMBRANE
FLASHING

DRAINAGE MATERIAL

WEEPS

GALVANIZED DOUBLE
ANGLE (LOSE) STEEL LINTEL

SEALANT (BOTH SIDES)

DOOR FRAME

SHORT SPAN LINTELS—DOOR OPENINGS

(3 OPTIONS FOR THE CMU BACK-UP)

IN CHARGE:
DRAWN:
M.W.T.
APPROVED:
05/03/2011
DATE:
TITLE:
SHORT SPAN LINTEL DETAILS—DOORS
SHEET:
A-5

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5C MASONRY LINTEL @ O.H. DOOR OPENING

NOTES:

1) FOR ADDITIONAL INFORMATION ON THE REINFORCED BRICK LINTEL DEPICTED IN THESE THREE DETAILS SEE DETAIL 9B ON SHEET A–10.

2) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCRASE DAMAGE. SEE PC "MASONRY TONI" VOLUME II, NO. 1 FOR RECOMMENDATIONS.

www.cement.org/masonry/cc_al_frames.asp

5A MASONRY LINTEL @ WINDOW OPENING

5B MASONRY LINTEL @ MULTIPLE MAN DOOR OPENINGS

LONG SPAN LINTELS
(3 OPTIONS FOR WINDOWS, MAN DOORS & OVERHEAD DOORS)
OVERHEAD DOOR JAMB DETAIL

NOTES:

1) UNPROTECTED ALUMINUM DOOR AND WINDOW FRAMES CAN INTERACT WITH CEMENT-BASED MATERIALS AND INCUR DAMAGE. SEE PCA "MASONRY TODAY" VOLUME II, NO. 1 FOR RECOMMENDATIONS.

www.cement.org/masonry/cc_al_frames.asp

2) BRICK TIES SHALL BE PRESENT WITHIN 12" OF JAMB ENDS

TWO PIECE FLASHING

A-4, A-5, & A-6

MAN DOOR JAMB DETAIL

WINDOW JAMB DETAIL

(USING RECEPTOR)
NATURAL STONE OR PRECAST CONCRETE SILL DETAIL
(USING RECEPTORS)

ISOMETRIC VIEW

NATURAL STONE OR PRECAST CONCRETE SILL DETAIL
(USING STRAP ANCHORS)

ISOMETRIC VIEW

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NOTE:

THERE IS USUALLY NO NEED
FOR BRICK EXPANSION JOINTS
TO ALIGN DIRECTLY WITH CONTROL
JUNCTURE LOCATIONS IN THE CMU
BACKUP.

8D
BRICK EXPANSION JOINT (EJ)
A-1

#15 FELT BOND BREAKER
GROUT OR MORTAR
RAKE JOINT,
BACKER ROD & SEALANT
(ON INTERIOR FACE)
DISCONTINUE HORIZONTAL JOINT
REINFORCEMENT @ CONTROL JOINT

8A
CMU BACK-UP CONTROL
JOINT — MICHIGAN DETAIL
A-1

RAKE JOINT,
BACKER ROD & SEALANT
(ON INTERIOR FACE)
BOND BEAM UNITS
SOLID, CONTINUOUS

BOND BEAM UNITS
(OMIT C.J. AT
BOND BEAM)
CONTINUOUS
HORIZONTAL STEEL REINFORCEMENT

CONTINUOUS BOND BEAM DETAIL
(PER STRUCTURAL REQUIREMENTS)

8C
MASONERY CONTROL JOINT
A-1

8B
CMU BACK-UP CONTROL
JOINT — ALTERNATE DETAIL
A-1

Joints to be struck
flush on exterior face
of CMU back-up

Joints to be struck
flush on exterior face
of CMU back-up

PREFORMED CONTROL JOINT
GASKET
RAKE JOINT,
BACKER ROD & SEALANT
(ON INTERIOR FACE)
DISCONTINUE HORIZONTAL JOINT
REINFORCEMENT @ CONTROL JOINT

CONTROL JOINT

CONTROL JOINT
WHEN A JOINT IS TO BE USED AT A SMALL OPENING, LOCATE AT ONE SIDE OF OPENING

LOCATE JOINTS AT BOTH EDGES OF LARGE OPENINGS FOR A ONE PIECE STEEL LINTEL

HORIZONTAL SLIP PLANE FOR LOOSE LINTEL (SEE BIA TEK 18A FIGURE 5)

OPENING

OPENING

EQUAL

EQUAL

NOTE:
SEE BIA TEK NOTE 18A AND "BRICK EXPANSION JOINTS AND WALL OPENINGS" (BY J. GREGG BORCHELT, PE) (PUBLISHED IN "THE STORY POLE" JULY/AUG. 2007 VOL 38 NO. 4) FOR ADDITIONAL GUIDANCE ON LOCATING EXPANSION JOINTS.

JOINTS MAY BE LOCATED AWAY FROM EDGE OF MULTIPLE WALL OPENINGS IF THE JOINTS ON BOTH SIDES ARE SYMMETRICALLY PLACED

BRICK EXPANSION JOINTS—PLACEMENT LOCATION

9A
A-10

ELEVATION VIEW

MAX EXPANSION JOINT SPACING (TYPICALLY 20'-0')

STAINLESS STEEL HORIZONTAL JOINT REINFORCEMENT (PER STRUCTURAL DESIGN)

OPENING

PROVIDE SEALANT JOINTS AT THE TOE OF THE FLASHING SUPPORT ANGLE. ALSO INCLUDE BACKER ROD AT THE ENDS OF THE FLASHING SUPPORT ANGLE (SEE BIA TEK NOTE 18A, FIGURE 6 FOR ADDITIONAL INFORMATION)

JOINTS SYMMETRICALLY LOCATED AWAY FROM EDGE OF WALL OPENINGS

9B
A-10

BRICK EXPANSION JOINTS—PLACEMENT LOCATIONS WITH "REINFORCED BRICK LINTEL OPENINGS" (PREFERRED)

ELEVATION VIEW

NOTE:
TYPICALLY EXPANSION JOINTS HAVE BEEN LOCATED AT OR VERY CLOSE TO THE SIDES OF OPENINGS. HOWEVER IT IS PREFERRED FOR EXPANSION JOINTS TO BE LOCATED AWAY FROM THE EDGES OF THE OPENINGS AND TO ADD REINFORCEMENT ABOVE THE OPENINGS TO FUNCTION AS THE STRUCTURAL LINTEL. DETAIL 9B ILLUSTRATES THE APPLICATION OF THIS APPROACH.

IN CHARGE:
DRAWN:
M.W:
APPROVED:
DATE:
TITLE:
JOB:
SHEET:
A-10
NOTE:
TOP LAYER OF JOINT REINFORCEMENT TIES SHALL BE WITHIN 12" OF TOP OF MASONRY

NATURAL STONE OR PRECAST CONCRETE COPING
TREATED WOOD BLOCKING UNDER ANCHOR (BEYOND)
2" RIGID INSUL.
SEALANT (UNDER Drip)
COMPRessible FILLER

STAINLESS STEEL STRAP ANCHOR W/ SPLIT-TAIL AND EXPANSION PIN W/ GASKET, INCL. COMPRessIBLE MATERIAL IN SLOT
STAINLESS STEEL THROUGH WALL FLASHING W/ 2" VERTEX. LEG, HEMMED, NO Drip (BY MASON CONTRACTOR)

BACKER ROD & SEALANT AT EACH HEAD J oint
DRIP EDGE IN COPING BOTH SIDES
WEEPS, BOTH SIDES
COMPATIBLE METAL COUNTER FLASHING, HEMMED, W/ DRIP (BY ROOFING CONTRACTOR)
2" RIGID INSULATION
3/4" SHEATHING

TOP OF BOND BEAM
8" CMU BOND BEAM W/ REINF.
LADDER TYPE HORIZONTAL JOINT REINF. @ 16" O.C. U.N.O. W/ ADJUSTABLE VENEER TIES
8" LIGHTWEIGHT CMU BACK-UP

NATURAL STONE OR PRECAST CONCRETE COPING PARAPET DETAIL

ISOMETRIC VIEW
ISOMETRIC VIEW

1x4 NAILER (RIPPED)
2x4 NAILER
COMPRESSIBLE FILLER

SLOPING METAL COPING W/ CONTINUOUS CLEAT @ BOTH SIDES

SEALANT

4" BRICK (CLAY) VENEER

4" RIGID INSUL.

TOP OF BOND BEAM

8" CMU BOND BEAM W/ REINF.

LADDER TYPE HORIZONTAL JOINT REINF @ 16" O.C.
U.N.D. W/ ADJUSTABLE VENEER TIES

1"-4 3/4"
SLOPE TO ROOF

PLYWOOD SHEATHING TOP & BOTTOM
WOOD NAILER W/ EXPANSION ANCHORS
2" RIGID INSULATION
HIGH TEMPERATURE MEMBRANE WRAPPED UNDER METAL COPING
2" RIGID INSULATION
3/4" SHEATHING

NOTE:
TOP LAYER OF JOINT REINFORCEMENT TIES SHALL BE WITHIN 12" OF TOP OF MASONRY

10B METAL COPING PARAPET DETAIL
A-2
WALL AIR CONTROL LAYER ("AIR BARRIER") OPTIONS

- Paint on the interior face of the CMU back-up
  (full height of the wall, including above any suspended ceilings).

- Sealant applied to all joints and terminations of the rigid insulation located in the wall cavity.

- Liquid or membrane applied proprietary systems.

WALL CONTROL LAYER NOTES

1) The inclusion of an air control layer is essential for a high performance building. Several products and options are available, with differing levels of cost and complexity. Some of the more common systems are listed above for the building designer to evaluate for the particular project requirements.

2) The need and design of a vapor control layer should also be considered by the building designer, especially for high humidity and humidity sensitive environments.

3) Building designer shall consider interfacing of wall control layers to other components of the building envelope (roof, foundation, openings, etc.).