

NATIONAL ARCHITECTURAL PRACTICE COMMITTEE SOCIETY OF AMERICAN MILITARY ENGINEERS



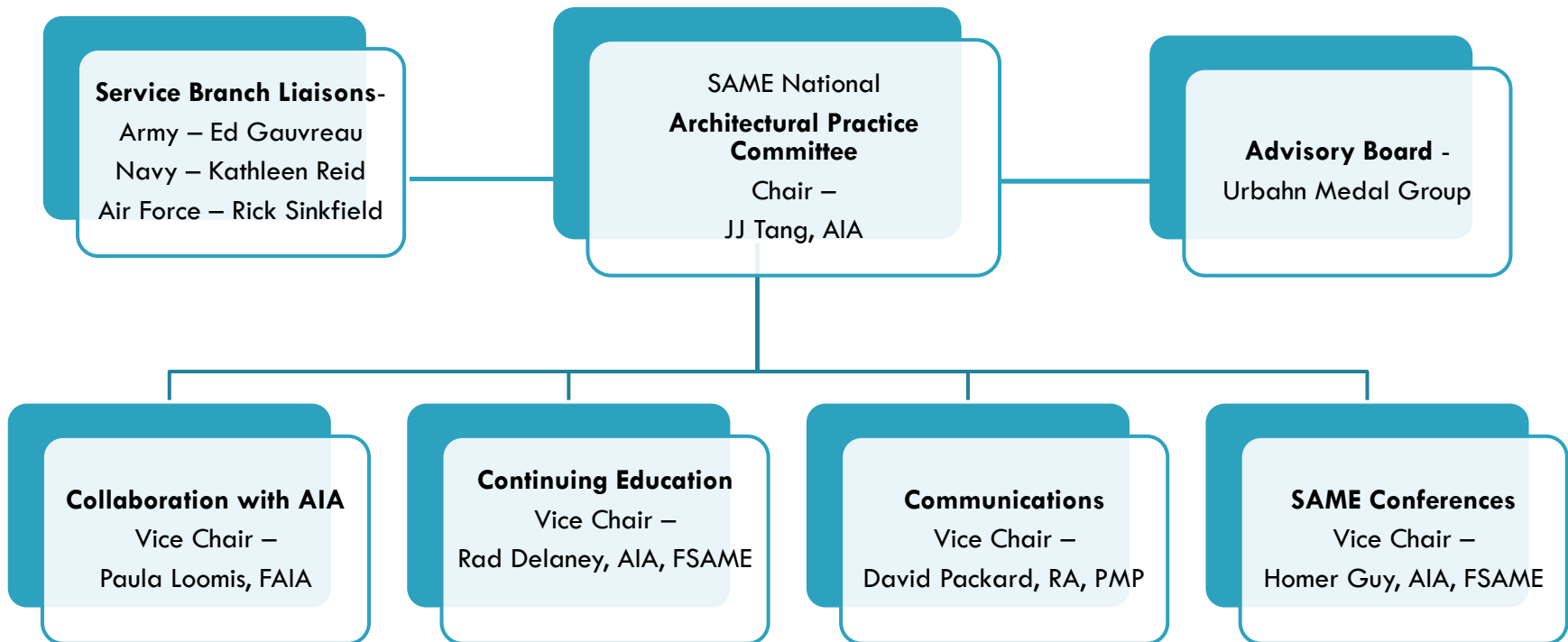
Agenda:

- Mission Statement and Organization Structural Review
- A Year of Reflection – What Have We Accomplished?
- Sub-committee Vice Chair and Service Liaison briefs.
- Local POC Report and Discussion
- Remarks by SAME President Gary Engle
- Presentation “Lessons Learned in the Masonry Field.” by Keith Lashway, the International Masonry Institute
- Q/A and Open Discussions

Mission Statement:

- Promote Architectural Practice within SAME.
- Broaden SAME's exposure in the architectural community to attract more architects in SAME.
- Networking and mentoring.

Architectural Practice Committee



A year of Reflection – What Have we Accomplished?

1. Quarterly Committee Video Conference Calls:

- January, April, July, October each meeting with a guest speaker
- 1 AIA LU/HSW for each conference web meeting
- About 50–60 participants, including three service branches.

2. Annual Architectural Practice Committee Meeting

- Discussing, and establishing committee annual initiatives
- Presentations by this year's Urbahn Medal Phil Tobey and Gus Ardura on DoD healthcare topic, receiving 1.5 AIA LU/HSW
- APC leadership social outing at Salk Institute and Dinner at Torrey Pines Golf Course

Architectural Practice Committee

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APC leadership social outing at Salk Institute and Dinner at Torrey Pines Golf Course



Architectural Practice Committee

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Connecting with team members at both national and local level



APC Leadership gathering in Alexandria, VA



Meeting with Pike's Peak post POC

3. Establishing Service Branch Liaison Each for USACE, NAVFAC, and AFCEC :

- ❑ Advising the committee on initiatives benefiting service branch architects.
- ❑ Encouraging and supporting interactions among industry and service branches.
- ❑ Encouraging participation from all service branches in SAME architectural activities.
- ❑ **Army Liaison: Ed Gauvreau, USACE HQ,
Edmond.G.Gauvreau@usace.army.mil**
- ❑ **Navy Liaison: Kathleen Reid, NAVFAC Atlantic,
kathleen.o.reid@navy.mil**
- ❑ **Air Force Liaison: Rick Sinkfield, Air Force Civil Engineer Center,
ralph.sinkfield@us.af.mil**

Architectural Practice Committee

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4. Establishing 22 POCs at Local SAME Post Level - Encouraging quality architectural programs in major SAME posts.

Post	Name	Email	Company
Atlanta	Caimbeul, David, AIA, NCARB, FAC-PPM	dcaimbeul@caimbeulandassociates.com	Caimbeul & Associates
Las Vegas	Gresser, Monica	mgresser@brazenarchitecture.com	Brazen Architecture
Omaha	Hailey, Robert, Lt Col AIA, LEED GA	rhailey@hdrinc.com	HDR
Alaska	Hightower, Harley, FAIA	hjh@aci.net	Harley Hightower
Pensacola	Lee, Yvonne, Assoc AIA	ylee@stoaarchitects.com	STOA Architects
Kentucky	Leising, Luke	luke@guidondesign.com	Guidon Design
Lake Michigan	O'Hara, MaryAnn	Maryanno@fgmarchitects.com	FGM Architects
Missouri (Whiteman & Kansas City)	Matthew Turner	mtturner@yainc.com	YAEGER ARCHITECTURE
St. Louis	Albinson, Bill	albinson@teamfourstl.com	TeamFour/Saur
Northern Virginia	Santer, William, AIA	wjs@samaha-arch.com	SAMAHA
Denver	Joe Cruz, AIA, NCARB	jhcruz@gmail.com	GSA
Hampton Roads	Richard Corner	RichardC@hbaonline.com	HBA Architecture
Baltimore	Bill McCarthy	bmccarthy@rtkl.com	RTKL
New York City	Suzanne DiGeronimo, FAIA	sdigeronimo@digeronimo-pc.com	DiGERONIMO ARCHITECTS
Seattle	Scott Harm	sharm@belayarchitecture.com	Belay Architecture
Albuquerque	Roger Basarich	roger.basarich@merrick.com	Merrick & Company
Kittyhawk	Drew Titone	Drew.Titone@Woolpert.com	Woolpert
Dallas	Laura Lavelle	Laura.Lavelle@jacobs.com	Jacobs
Tampa	Steve Tozer	<a href="mailto:Tozer, Steve <Steven.Tozer@hdrinc.com>">Tozer, Steve <Steven.Tozer@hdrinc.com>	HDR
Pikes Peak	Jim Pocock	James.Pocock@usafa.edu	USAF Academy
Rhein Main	Sandra Zettersten	SZettersten@BH-BA.com	Buchart-Horn GmbH
Portland Post	Mark Gillem	Mark@urbancollaborative.com	The Urban Collaborative

5. Collaborating with AIA

- Establishing allies organization with AIA the Public Architects Committee, a web link in both committees' webpage
- Working on a draft of MoA between AIA and SAME

6. SAME Continuing Education Course Webinars:

- Co-host with Sustainable Committee on The new High Performance and Sustainable Building Requirements UFC Webinar on June 24
- Design Professionals' Professional Liability Insurance: What it Covers, How it Works and Why it Matters by Karen Eager

7. Maintaining Architectural Practice Committee Webpage

- All presentations and newsletters are stored at committee webpage <http://www.same.org/apc>.
- The webpage is updated on monthly bases.

8. Quarterly Newsletter

- ❑ Two APC quarterly newsletters were issued – one in June, another in October.
- ❑ Great feedback: “Real Estate to product email blasts and newsletters fuel a constant in pouring of unread emails, but this one stopped me from clicking delete. Simply put...Awesome Newsletter!” Dana A. Pomeroy, SAME Member.

9. Architectural Sessions at SAME Regional Conference:

- ❑ Architectural session at 2013 SAME Great Lakes/Ohio Valley regional conferences in Davenport, Iowa on October 17.

10. Support to other committee and organizations:

- ❑ Boy’s Scout Architectural Merit Badge provided by Pike’s Peak post
- ❑ Architectural course for SAME Engineer camp at the Air Force Academy.

Architectural Practice Committee

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Recap of our committee 2013 major accomplishments:

- 1. Drawing SAME Architects together through quarterly calls, annual meetings, webpages, and educational programs.
- 2. SAME becoming more relevant organization to architects
- 3. Expanding SAME influence to architectural community

Committee focus for 2014:

- Stay the Course
- 2014 JETC Sessions – Service Branch Lead Architects’ Brief, Urbahn Medal Lecture/APC annual meeting.
- Two APC sponsored webinars – BIM in June and ATFP in October
- Special focus on collaborating with AIA – executing a MOA between AIA and SAME.
- Increasing Architectural Practice Committee visibility at local post or regional level.

Architectural Practice Committee

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- **Remarks by SAME President RADM Gary Engle**



Architectural Practice Committee

Guest Speakers –

Keith Lashway, Director of Technical Services

the International Masonry Institute

SAME Albany post president

“Lessons Learned in the Masonry Field.”

International Masonry Institute

www.imiweb.org

800-IMI-0988

lessons learned



International Masonry Institute

The International Masonry Institute is a Registered Provider with The American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of Completion for non-AIA members are available on request.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



Learning Objectives

Learn capabilities and properties of masonry materials

Understand basic strategies for moisture control

Realize why masonry walls move and how to accommodate that movement

Discover methods for Quality Control and how to improve your jobsites



brick properties

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

TOLERANCES ON DIMENSIONS

SPECIFIED DIM (in.)	MAX. PERMISSIBLE VARIATION FROM SPECIFIED DIMENSION, PLUS OR MINUS	
	TYPE FBX	TYPE FBS
3 AND UNDER	1/16	3/32
OVER 3 TO 4	3/32	1/8
OVER 4 TO 6	1/8	3/16
OVER 6 TO 8	5/32	1/4
OVER 8 TO 12	7/32	5/16
OVER 12 TO 16	9/32	3/8

ASTM C 216 facing brick

PROPERTIES

MODULARITY

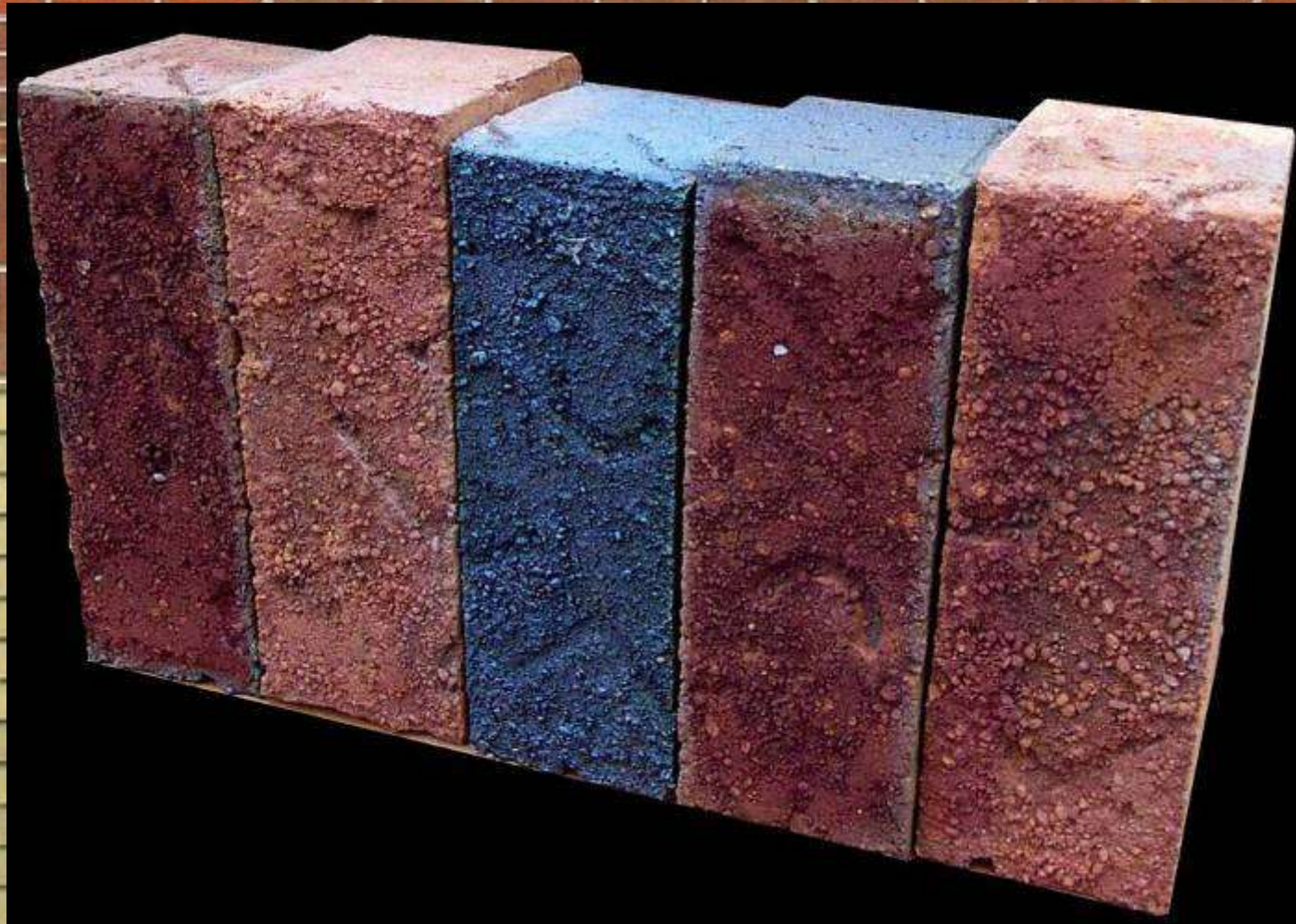
MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



ASTM C 216 facing brick

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

TOLERANCES ON DISTORTION

SPECIFIED DIM (in.)	MAX. PERMISSIBLE DISTORTION (in.)	
	TYPE FBX	TYPE FBS
8 AND UNDER	1/16	3/32
OVER 8 TO 12	3/32	1/8
OVER 12 TO 16	1/8	3/16

ASTM C 216 facing brick

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



brick properties

PROPERTIES

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TROUBLESHOOTING

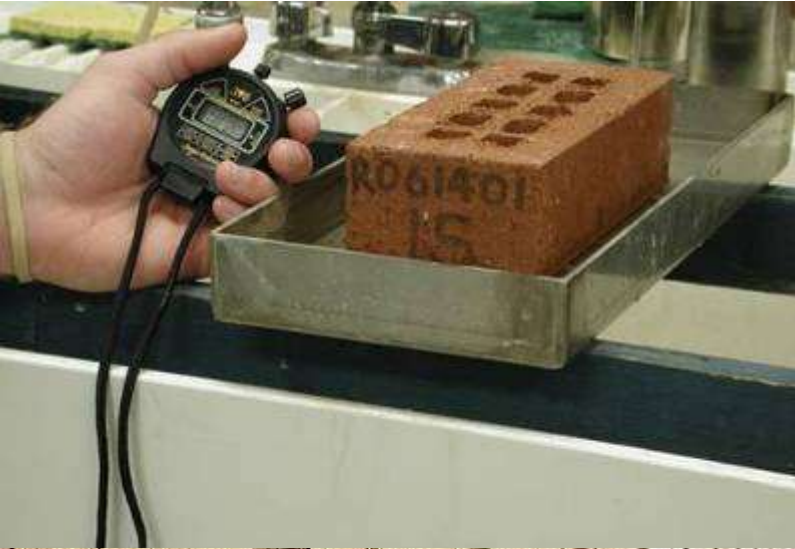
WORKMANSHIP

MAXIMUM PERMISSIBLE EXTENT OF CHIPPAGE FROM THE EDGES AND CORNERS OF FINISHED FACE OR FACES INTO THE SURFACE

	CHIPPAGE (in.) IN FROM	
	EDGE	CORNER
TYPE FBX	1/8	1/4
TYPE FBS (SMOOTH)	1/4	3/8
TYPE FBS (ROUGH)	5/16	1/2
TYPE FBA	AS SPECIFIED	

ASTM C 216 facing brick

initial rate of absorption



- Recommendation 5-25 g/min/30 in²

- *Not* a requirement in ASTM or MSJC



- Consider high IRA brick for cold weather construction
- Consider low IRA brick for hot weather construction



mortar

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

masonry mortars

- ASTM C 270
- Mortar Options:
 - Portland Cement and Lime
 - Masonry Cement
 - Mortar Cement
- Mortar Types: M, S, N, and O
- Mortar Quality Control

ASTM C 270 Table 1 Mortar Properties

PROPORTIONS BY VOLUME

MORTAR	TYPE	PORTLAND CEMENT OR BLENDED CEMENT	MORTAR CEMENT			MASONRY CEMENT			HYDRATED LIME OR LIME PUTTY	AGGREGATE RATIO (MEASURED IN DAMP, LOOSE CONDITIONS)
			M	S	N	M	S	N		
CEMENT-LIME	M	1	--	--	--	--	--	--	1/4	NOT LESS THAN 2 1/4 AND NOT MORE THAN 3 TIMES THE SUM OF SEPARATE VOLUMES OF LIME, IF USED, AND CEMENT
	S	1	--	--	--	--	--	--	OVER 1/4 TO 1/2	
	N	1	--	--	--	--	--	--	OVER 1/2 TO 1 1/4	
	O	1	--	--	--	--	--	--	OVER 1 1/4 TO 2 1/2	
MORTAR CEMENT	M	--	1	--	--	--	--	--	--	
	S	--	--	1	--	--	--	--		
	N	--	--	--	1	--	--	--		
	O	--	--	--	1	--	--	--		
MASONRY CEMENT	M	--	--	--	--	1	--	--	--	
	S	--	--	--	--	--	1	--		
	N	--	--	--	--	--	--	1		
	O	--	--	--	--	--	--	1		

PROPERTIES

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MOISTURE

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TROUBLESHOOTING

WORKMANSHIP

mixing mortar



PROPERTIES

MODULARITY

MOISTURE

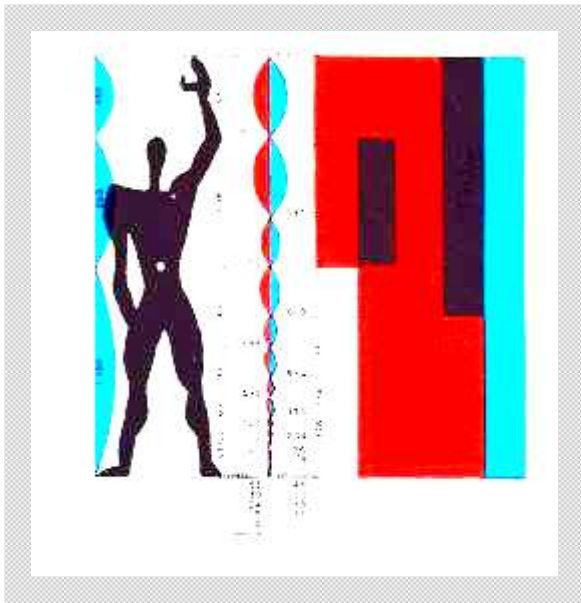
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

modularity



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

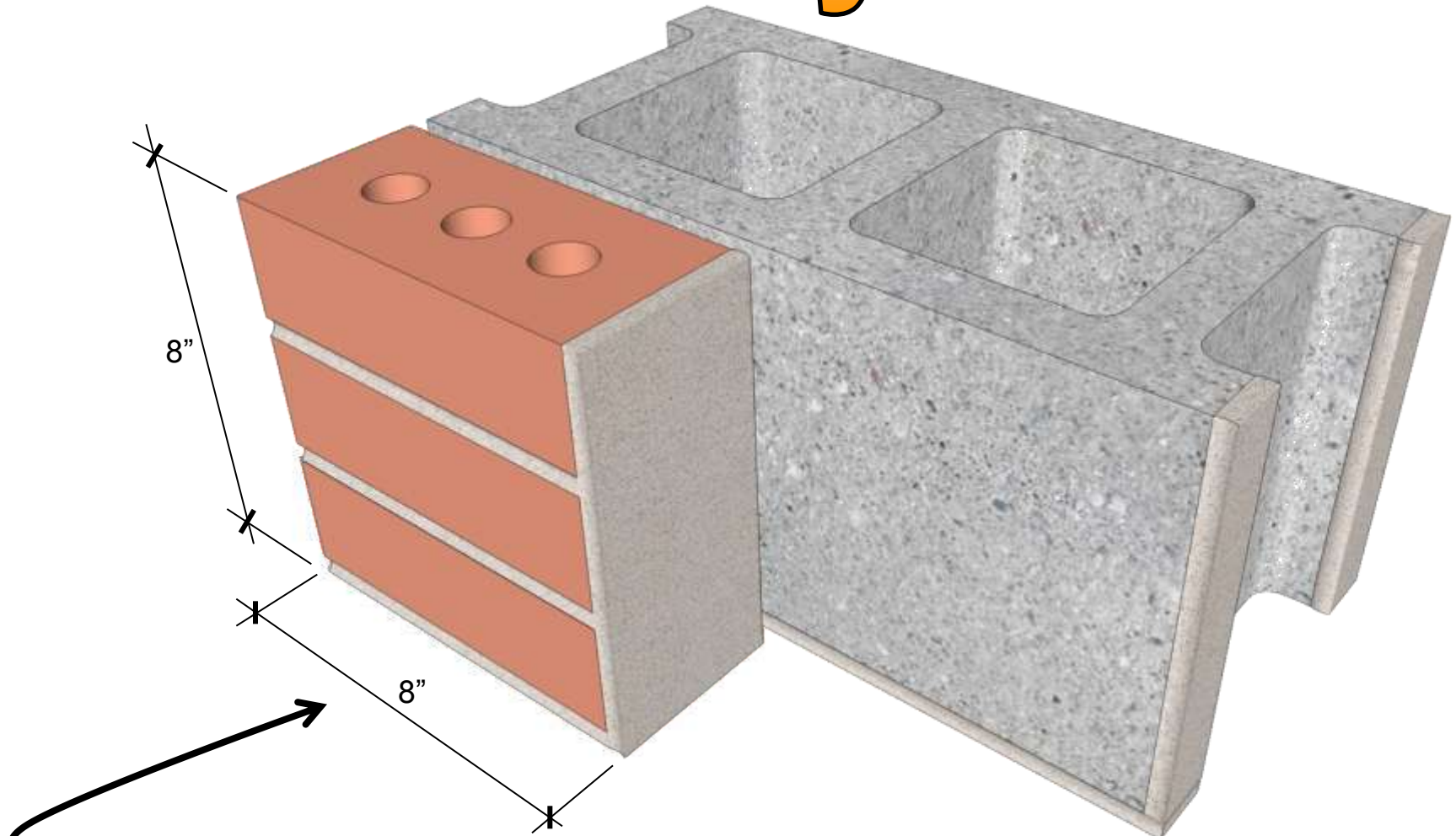
WORKMANSHIP

modularity

Goals

- Dimension structures/ elements to standard lengths/ heights to accommodate modular sized masonry units
- Standardize and simplify design and construction
- Decrease construction cost and duration

modularity



Unit + standard mortar joint = 8 inches

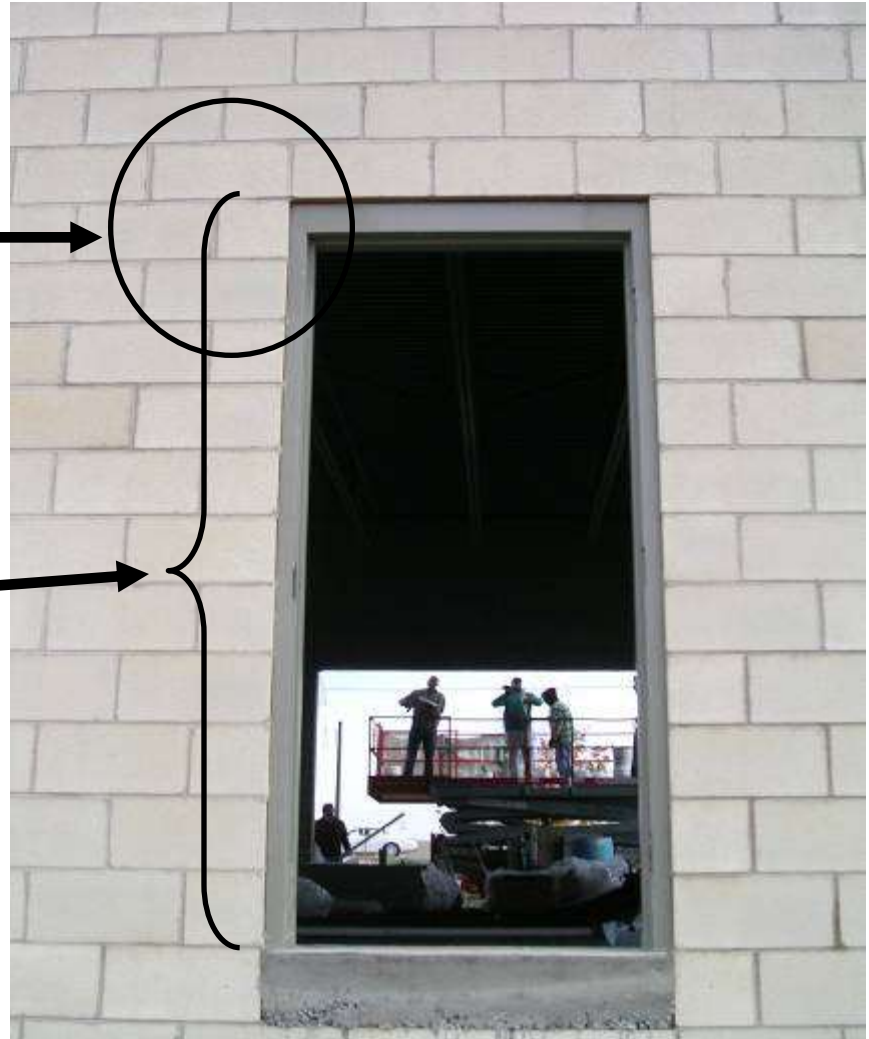
horizontal layout



- Avoid < half sized units
- Especially jambs and corners

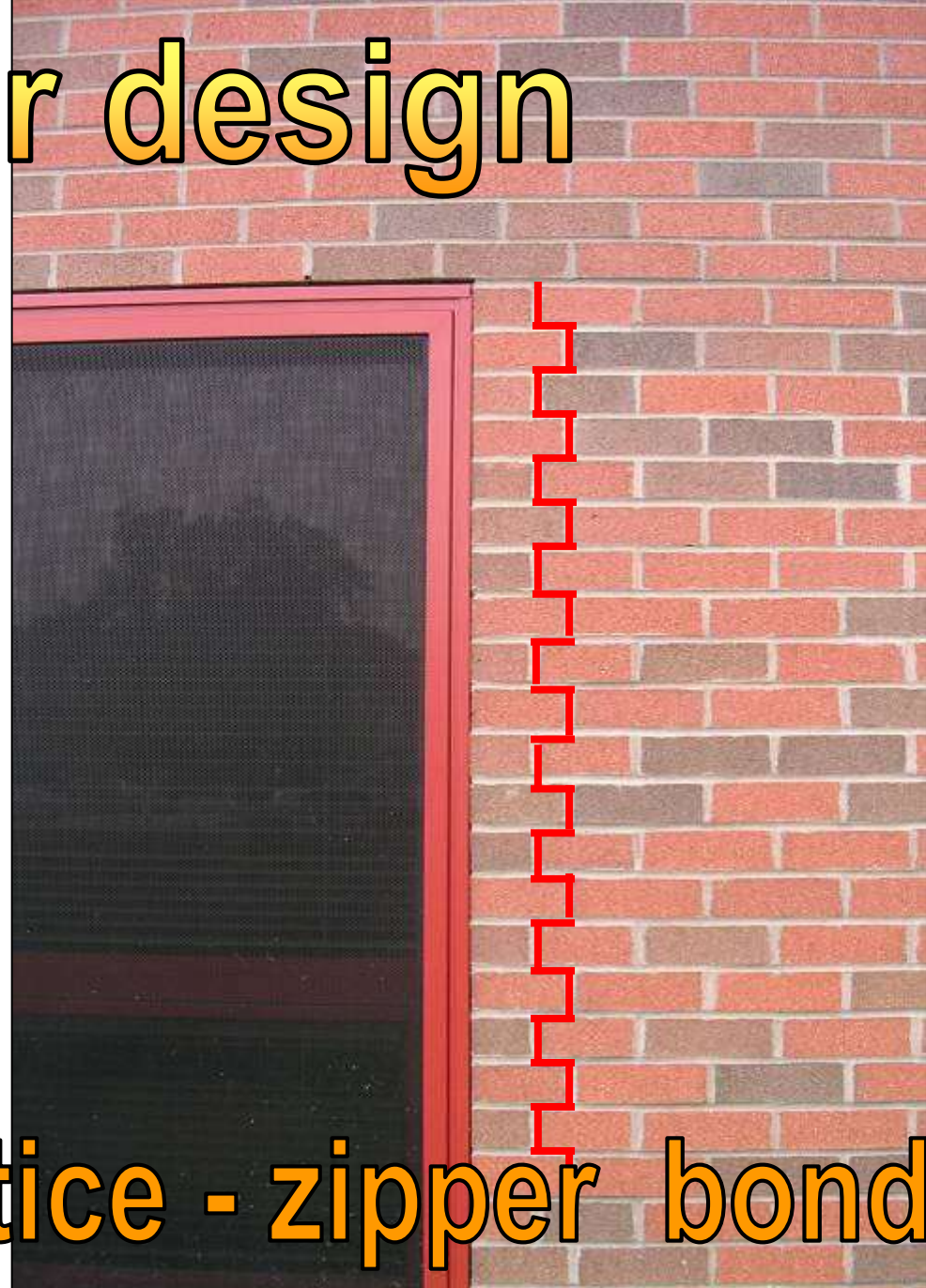
horizontal - good practice

- Door is located for full and half units at jambs
- Frames are stock items... no on-site cutting
- Looks symmetrical



non-modular design

- Aesthetically unpleasing
- Unnecessary cuts
- Costly to mason contractor



bad practice - zipper bond

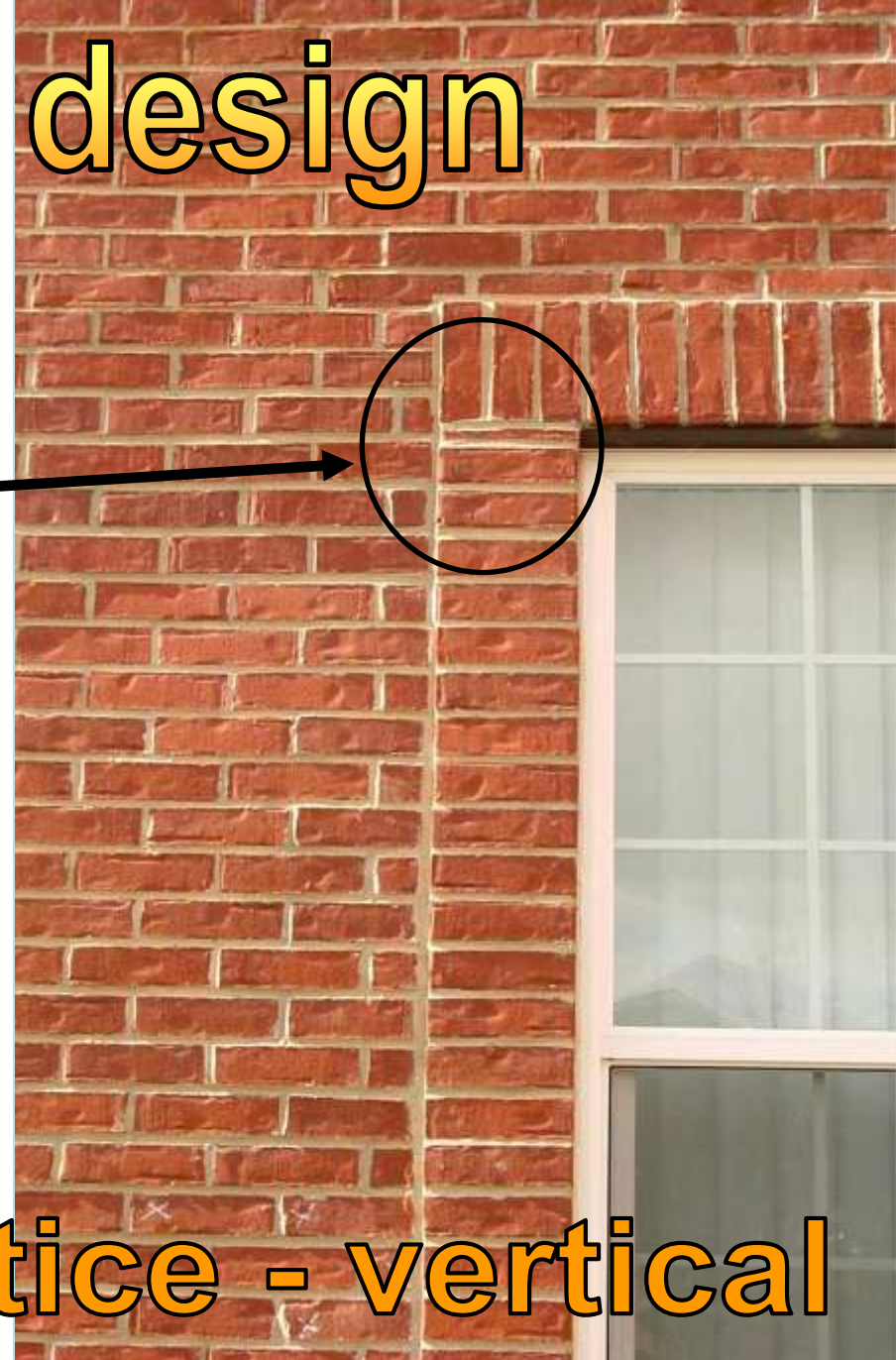
modular design

- Only full and half units at corners and jambs
- Full units are hand cut with the end or head turned out
- Efficient and economical



non-modular design

- Window lintel should be bearing on full brick
- This is most likely an installation error, coursed incorrectly



bad practice - vertical

modularity



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

non-modular design

- How is the masonry over door head supported/reinforced?



bad practice - vertical

modular design

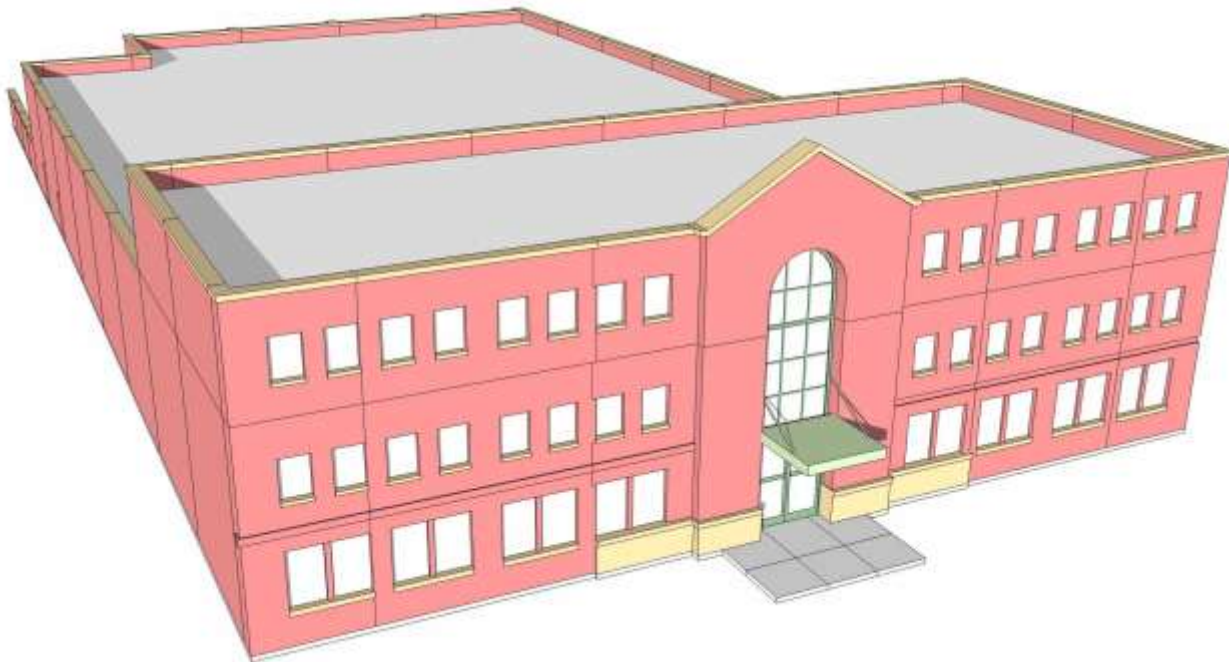
1. Top of door frame even coursing with CMU
2. Full height block above door
3. Easily adaptable options for mason to reinforce



good practice - vertical

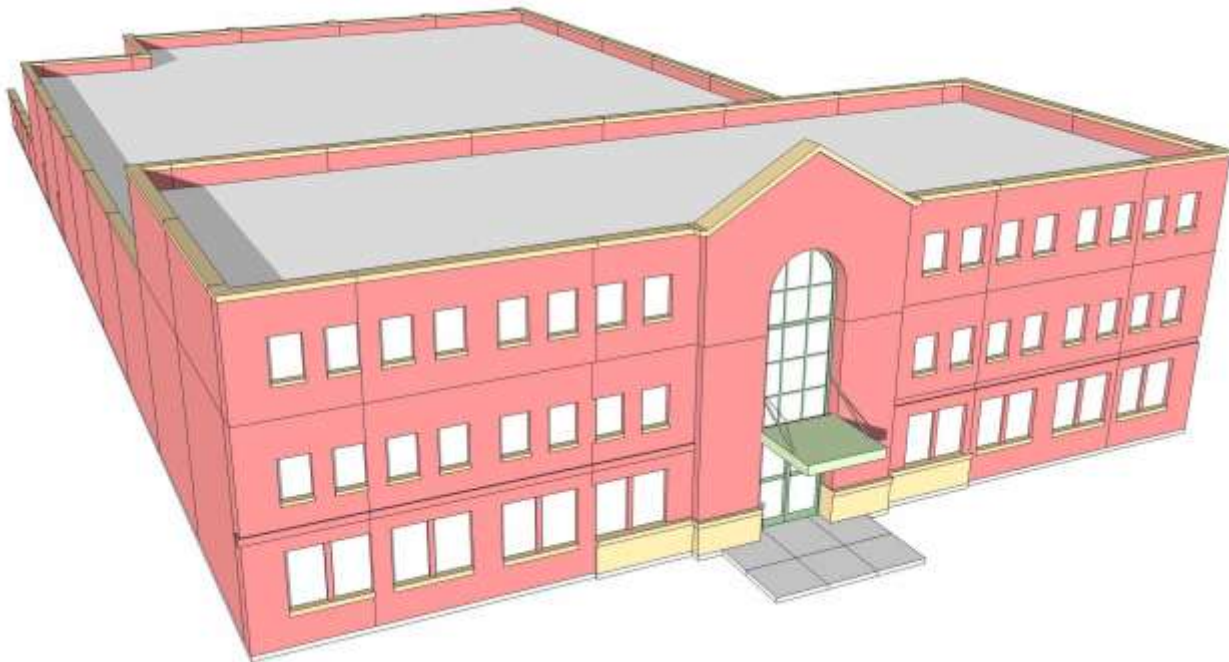
non-modular example

- Dormitory
- 200'-4" x 50'-0"
- 4 floors, 40 suites per floor
- Windows 4'-0" high x 3'-0" wide located 4'-2" off corners every 10'-0"



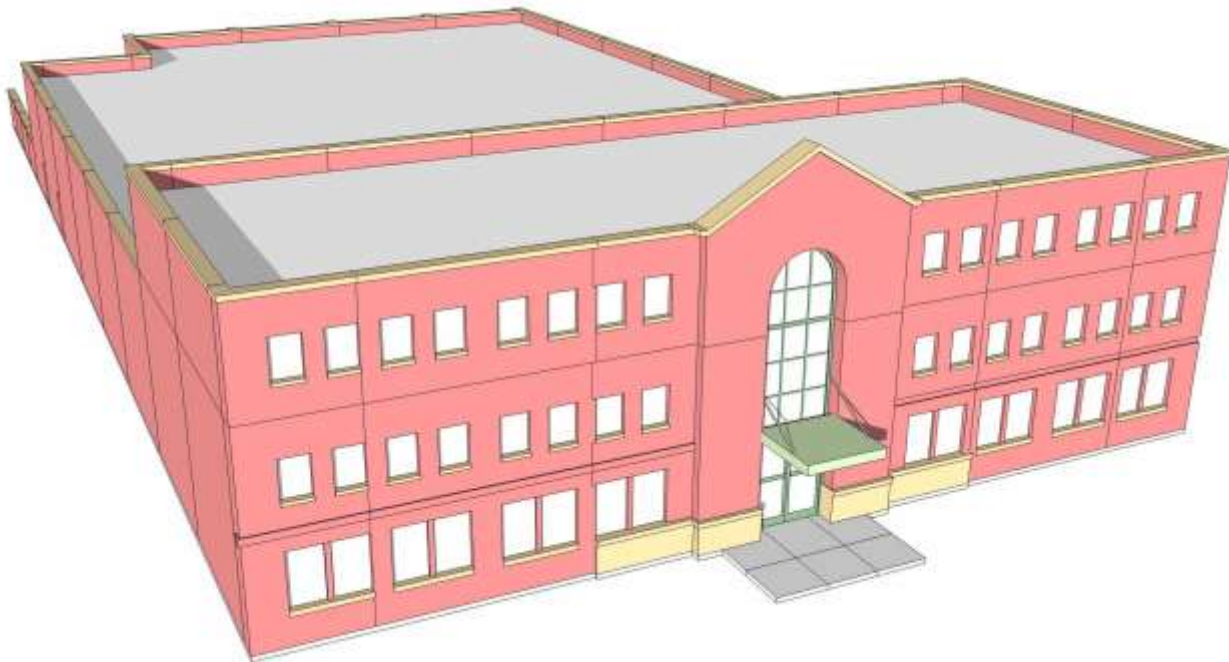
non-modular example

- 40 suites per floor x 4 floors = 160 windows
- 2 jambs per window = 320 jambs
- 18 brick courses in 4'-0" high window
- 1 cut per course per jamb



non-modular example

- 320 jambs x 18 cuts = 5,760 total brick cuts, not including backup block



non-modular solution

Solution:

- Position first window at modular dimension off corner with subsequent windows at modular intervals



variables

In Masonry Construction

- Dimensional stability of units
- Uniform mortar joint width
- Plumb points
- Head joint alignment is *consequential*



moisture penetration resistance

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

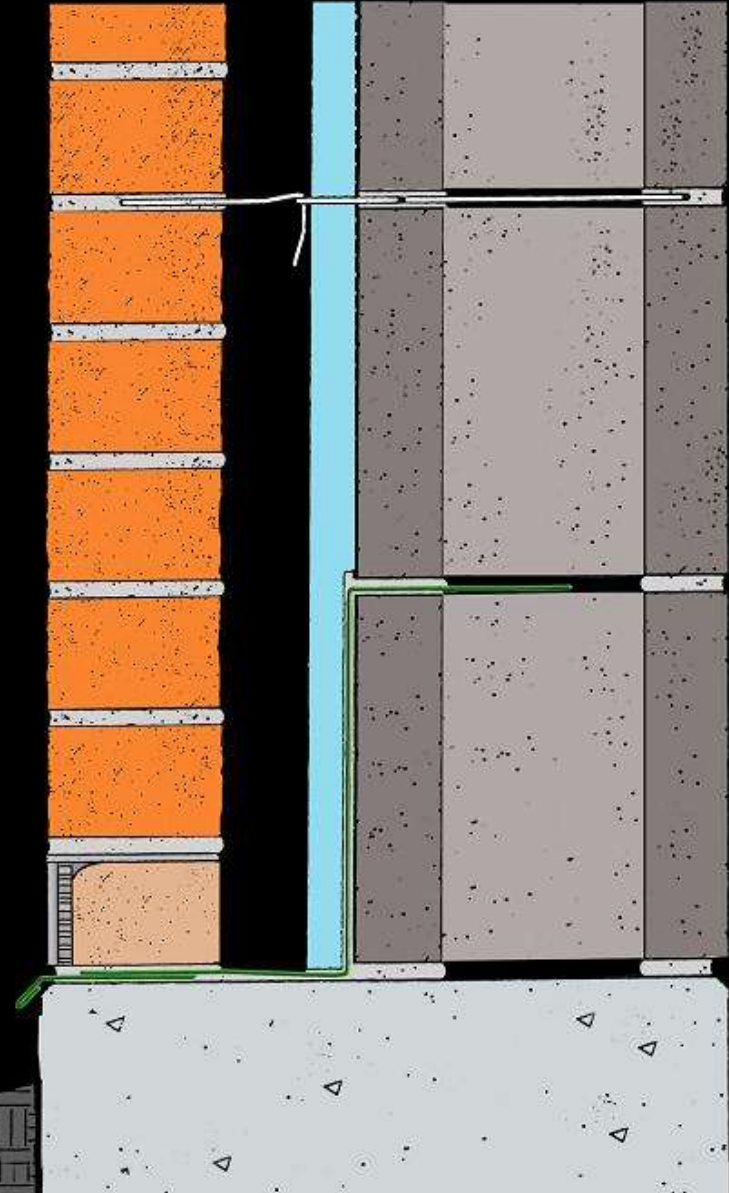
STRUCTURAL

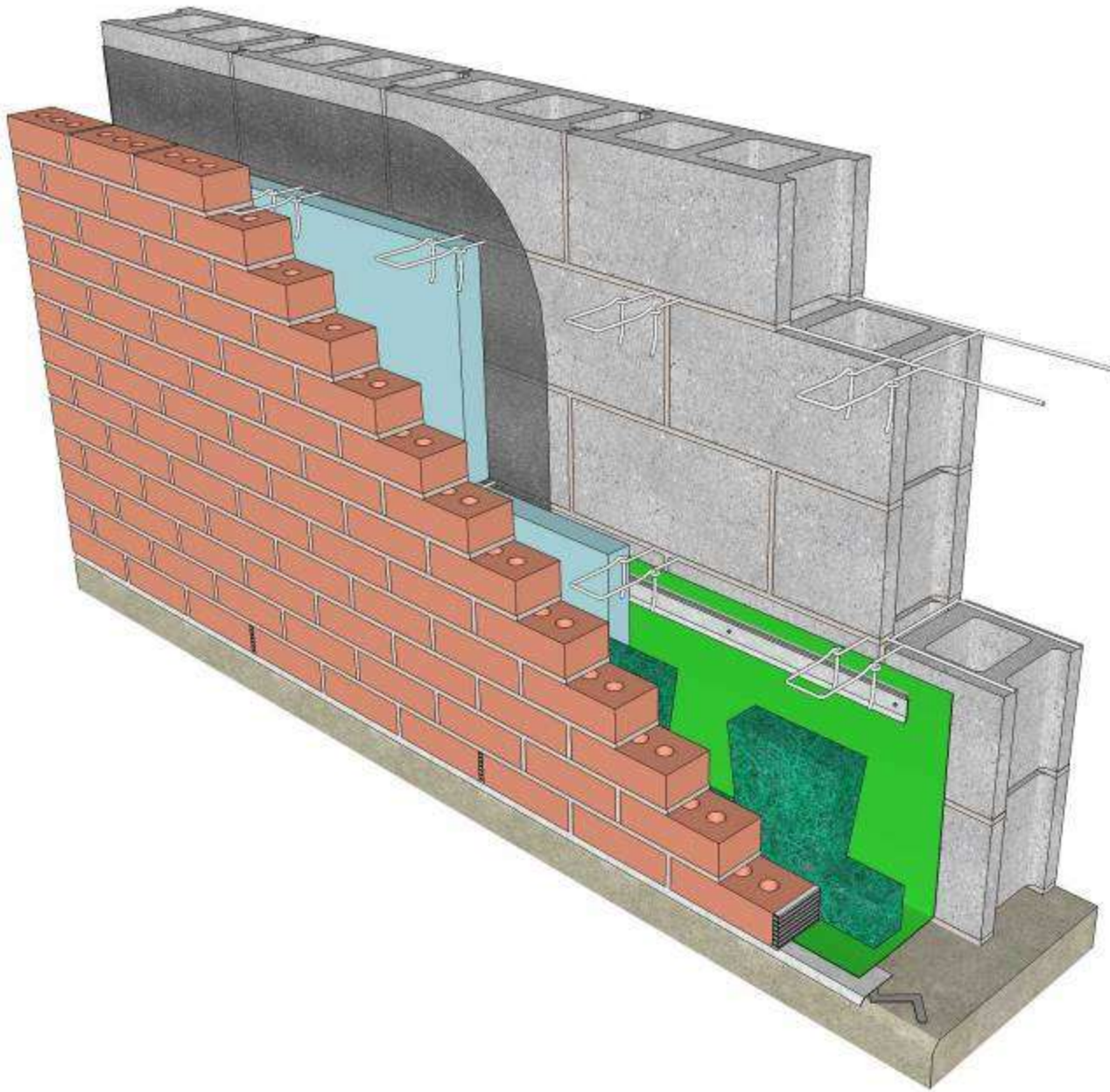
TROUBLESHOOTING

WORKMANSHIP

cavity wall aka [drainage wall]

- Air space
- Flashing
- Weep holes





PROPERTIES

MODULARITY

MOISTURE

Movement

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

air space

2" recommended

1" min. for veneers, code



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

mortar bridging



No mortar bridging
across the cavity!

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

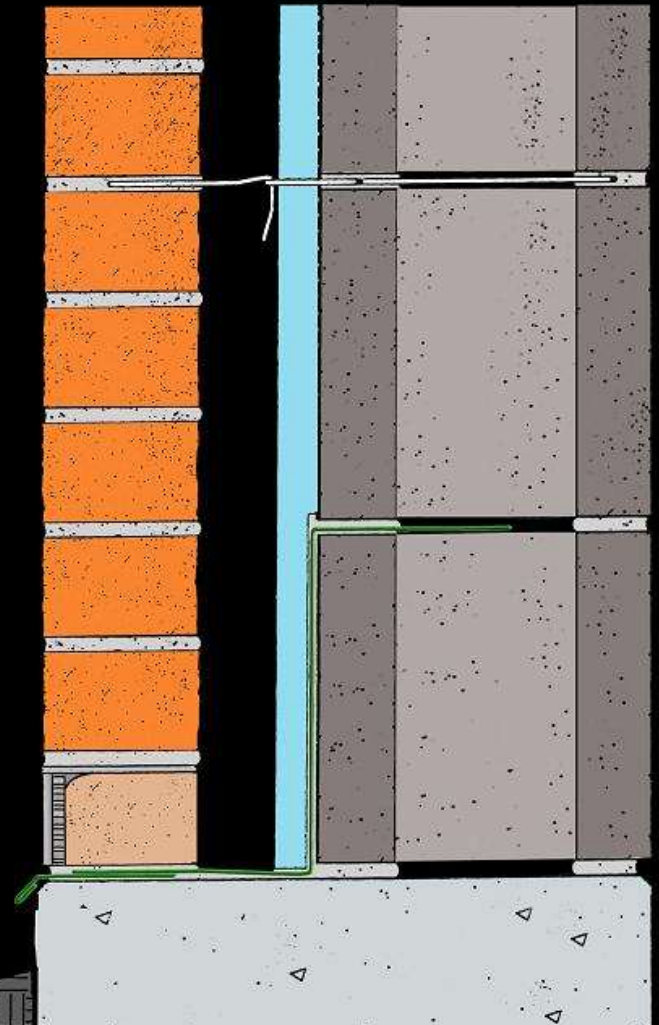
WORKMANSHIP

foundation height



Keep top of
foundation
above grade

Don't bury
the weeps!



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

flashing



PROPERTIES

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TROUBLESHOOTING

WORKMANSHIP

problems to avoid

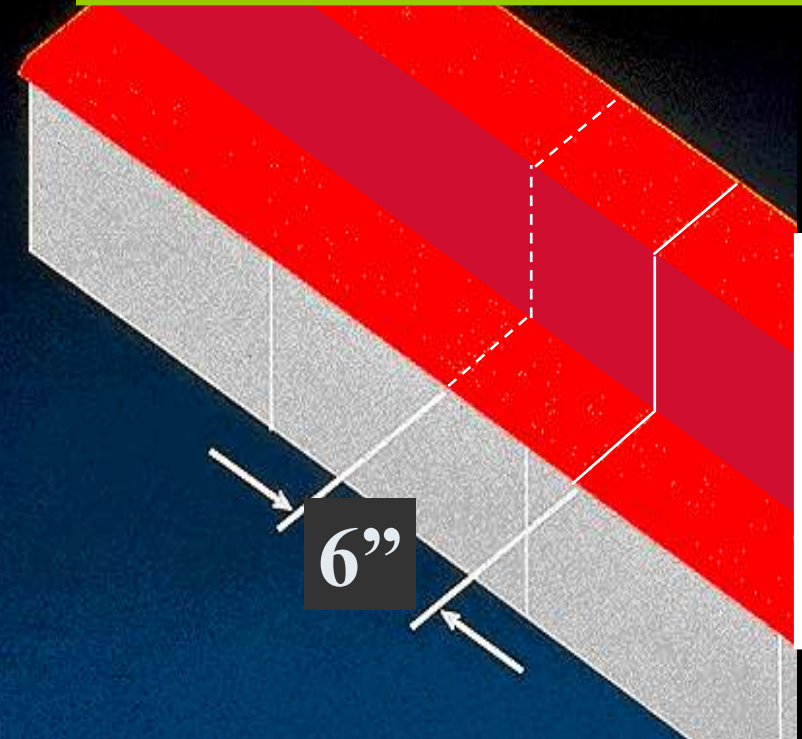


Lap all seams

...and adequately seal!

flashing splices

6" laps with sealed seams is best practice!



problems to avoid

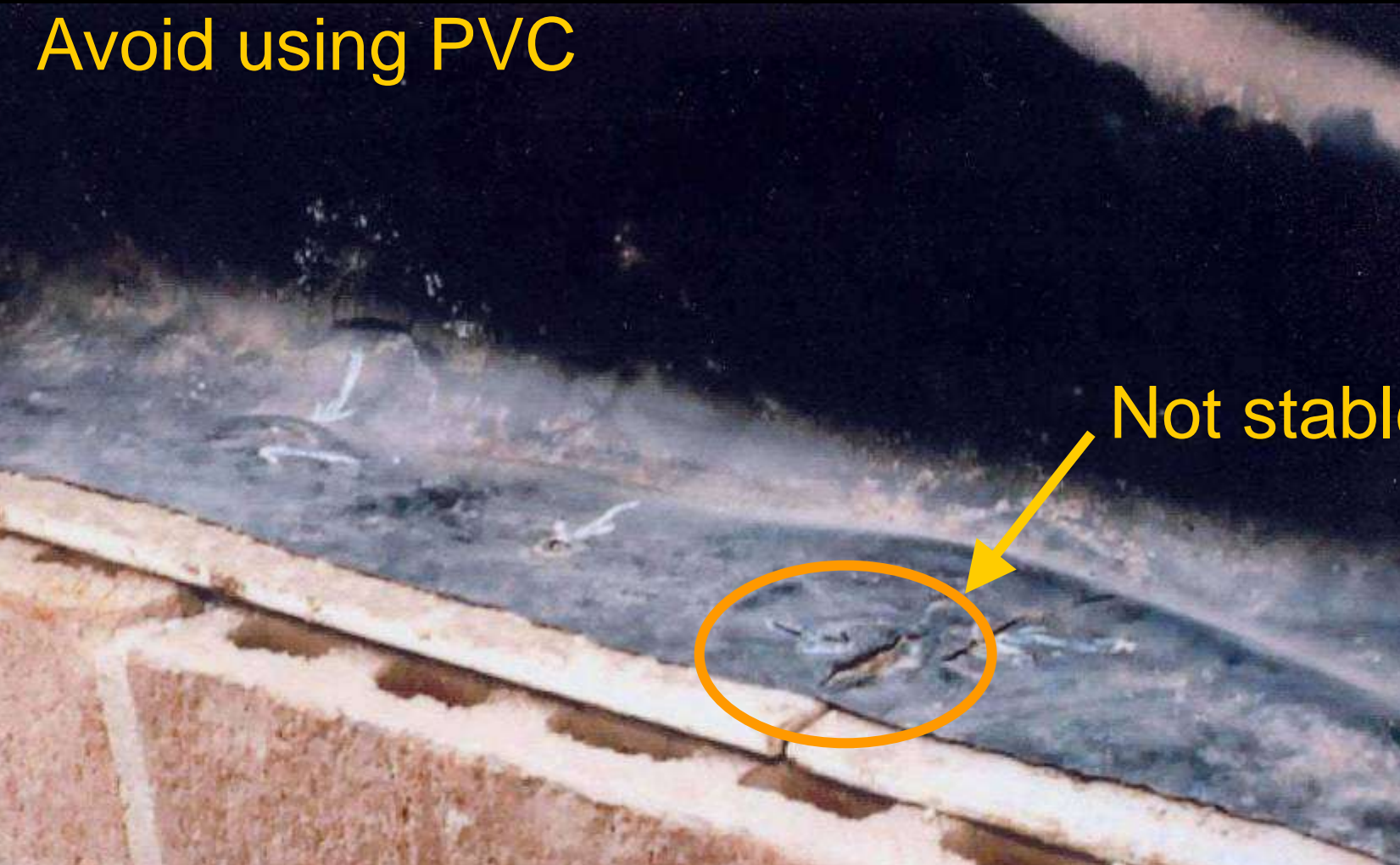


Avoid sharp corners

Use rounded corners

problems to avoid

Avoid using PVC



Not stable!

PROPERTIES

MODULARITY

MOISTURE

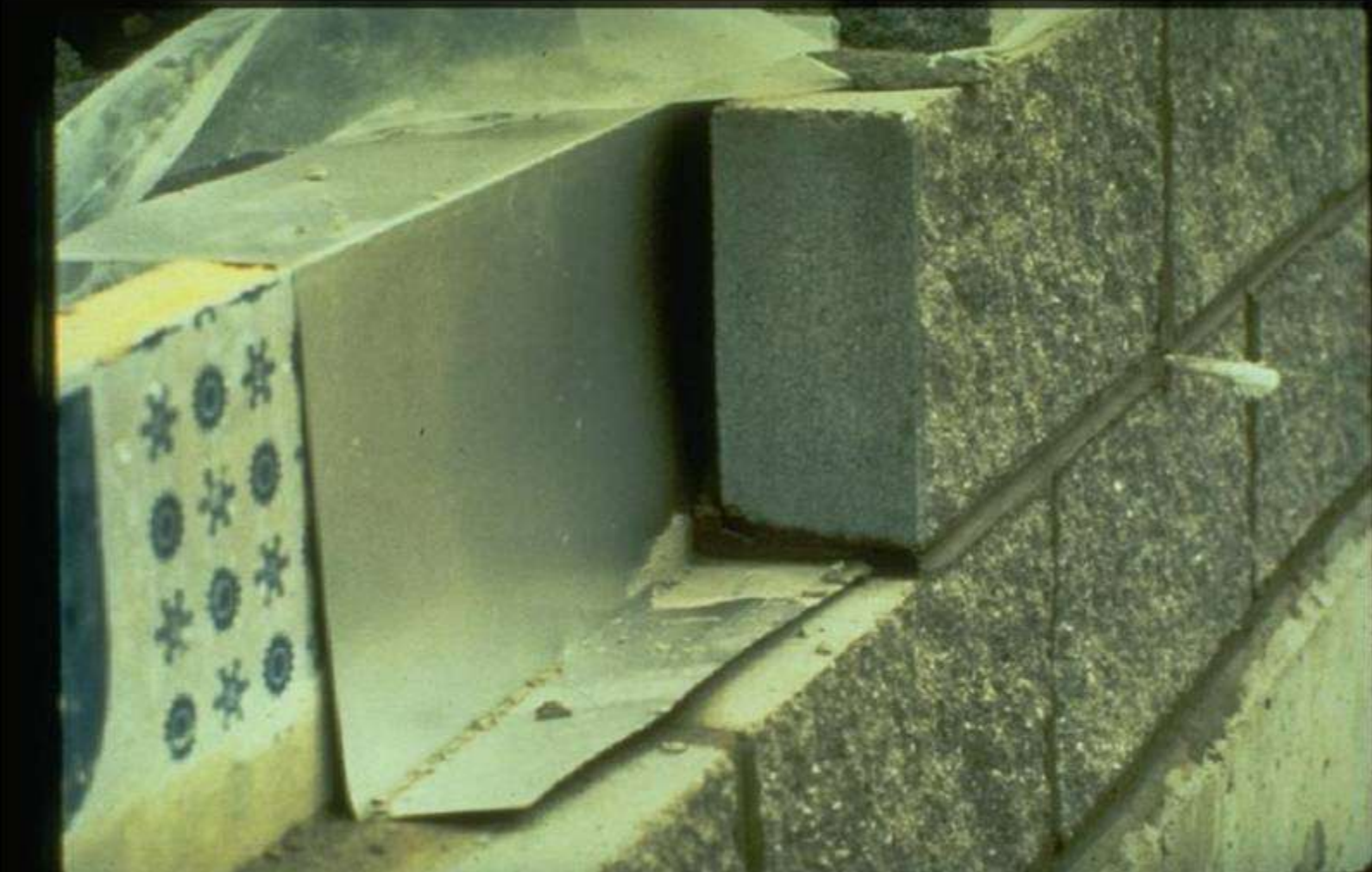
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

flashing failure



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

flashing failure



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

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WORKMANSHIP

flashing failure



PROPERTIES

MODULARITY

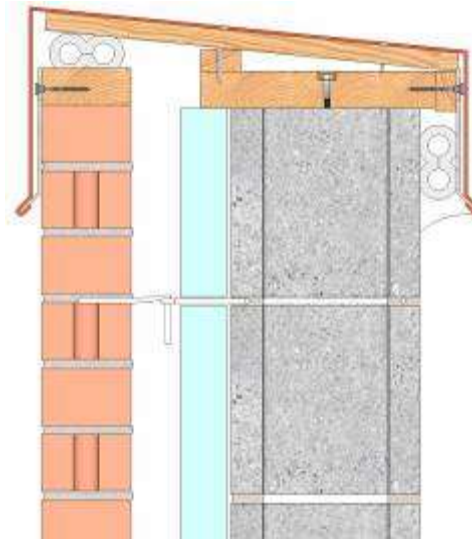
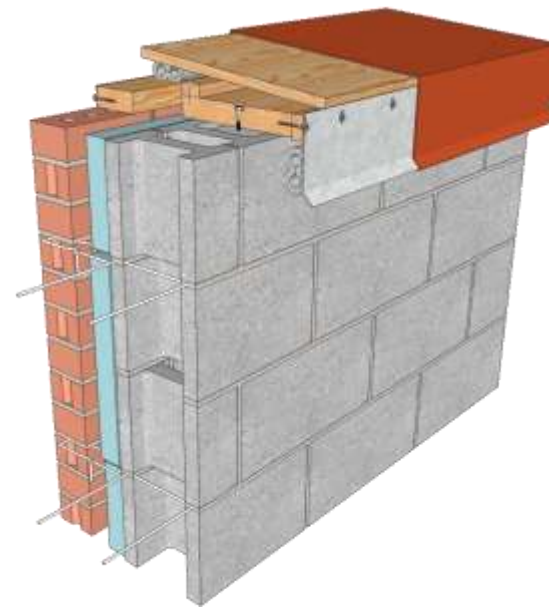
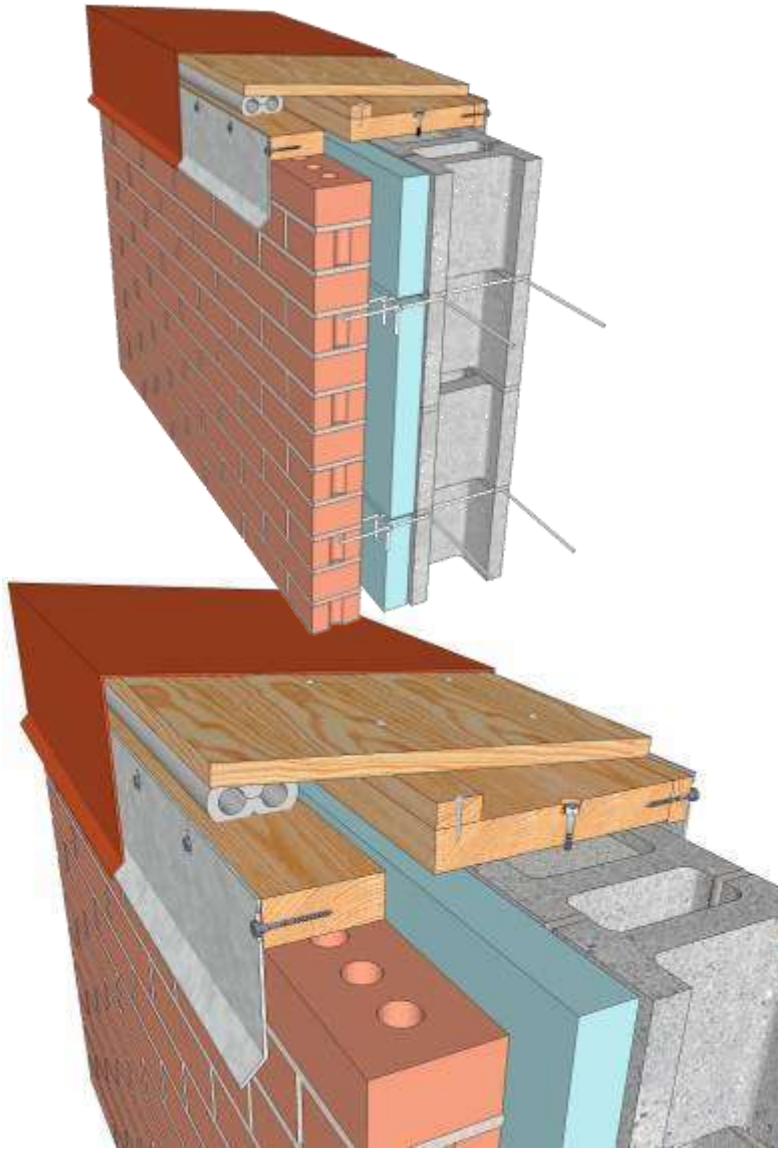
MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



- DETAIL FEATURES**
- SLOTTED HOLES AT CLEAT ALLOW FOR BRICK EXPANSION

metal coping detail

PROPERTIES

MODULARITY

MOISTURE

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TROUBLESHOOTING

WORKMANSHIP

field-applied corner boot



PROPERTIES

MODULARITY

MOISTURE

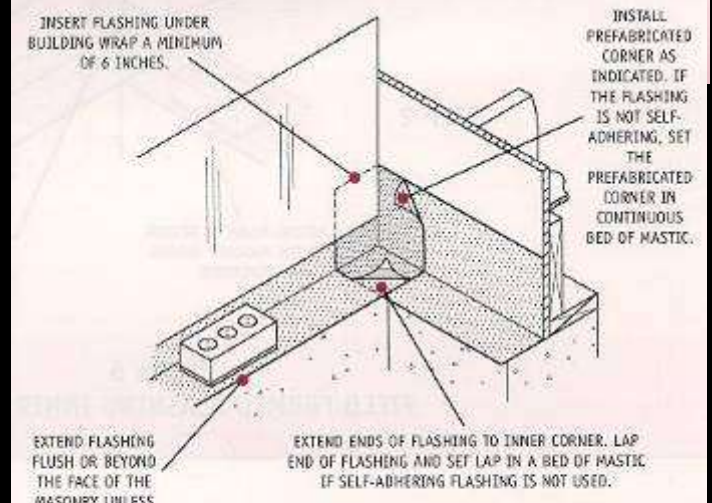
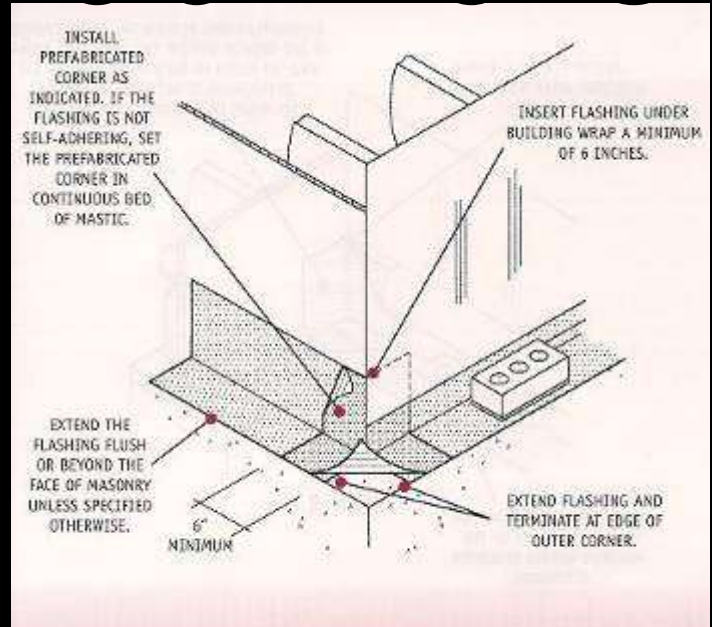
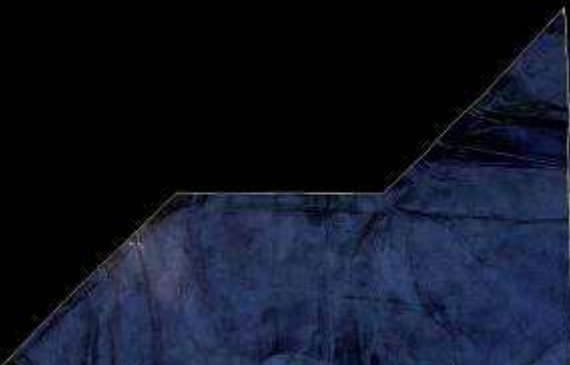
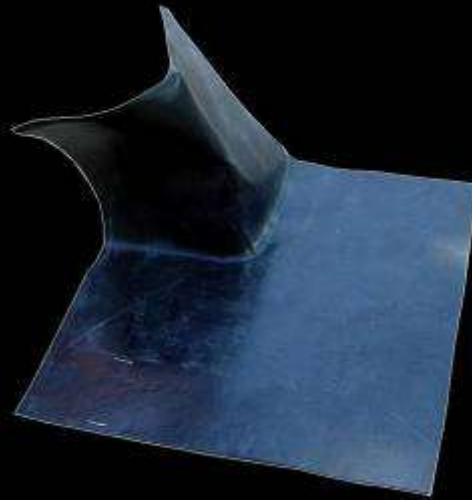
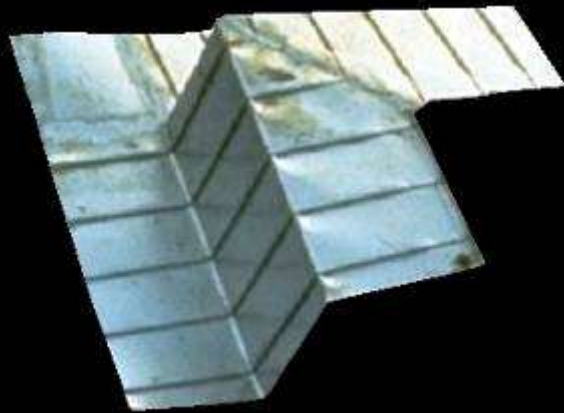
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

prefabricated corners



PROPERTIES

MODULARITY

MOISTURE

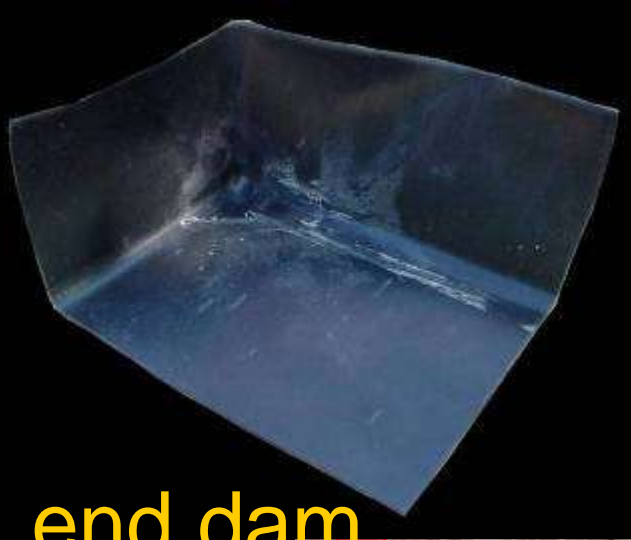
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

flashing stops short



end dam
required!



proper end dams



PROPERTIES

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WORKMANSHIP

end dam details

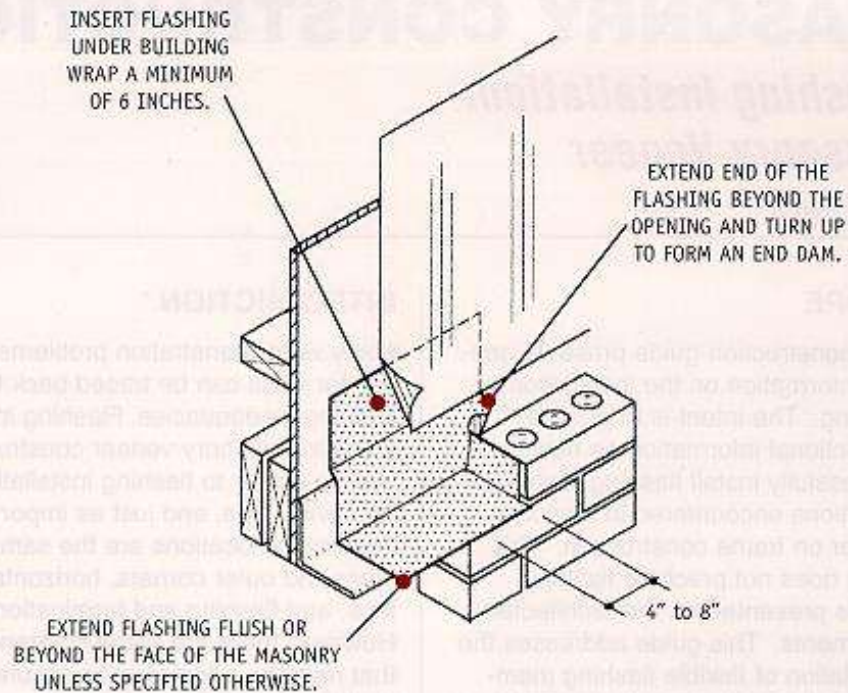


Figure 2
FIELD FORMED FLASHING END DAM

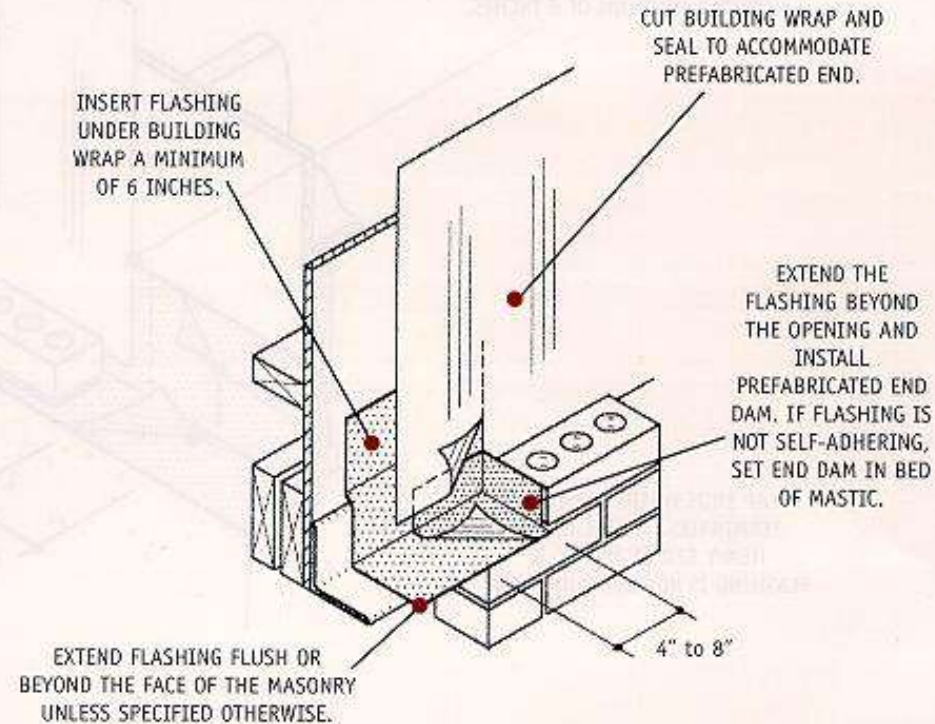
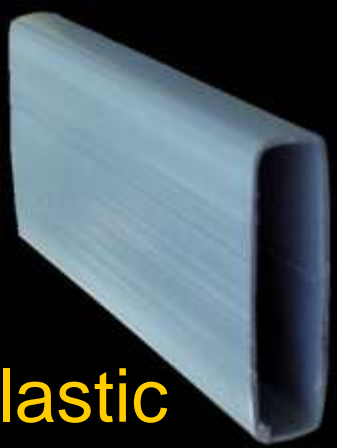


Figure 3
PREFABRICATED FLASHING END DAM

weep vent types



plastic sleeve



head joint vent



fiber mesh vent



sash cord



plastic tube



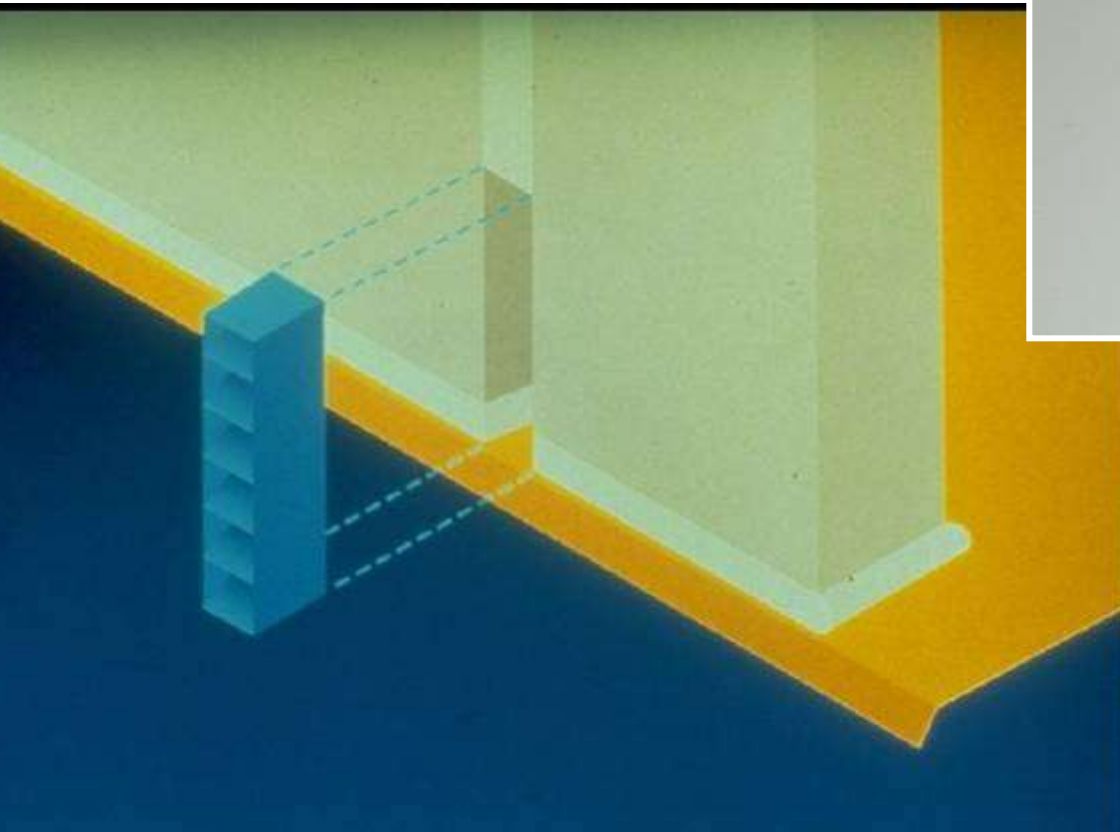
cell vent

open head joints

- Better moisture relief & ventilation
- May attract insects
- May mistakenly be caulked



weep vents



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weep vents



PROPERTIES

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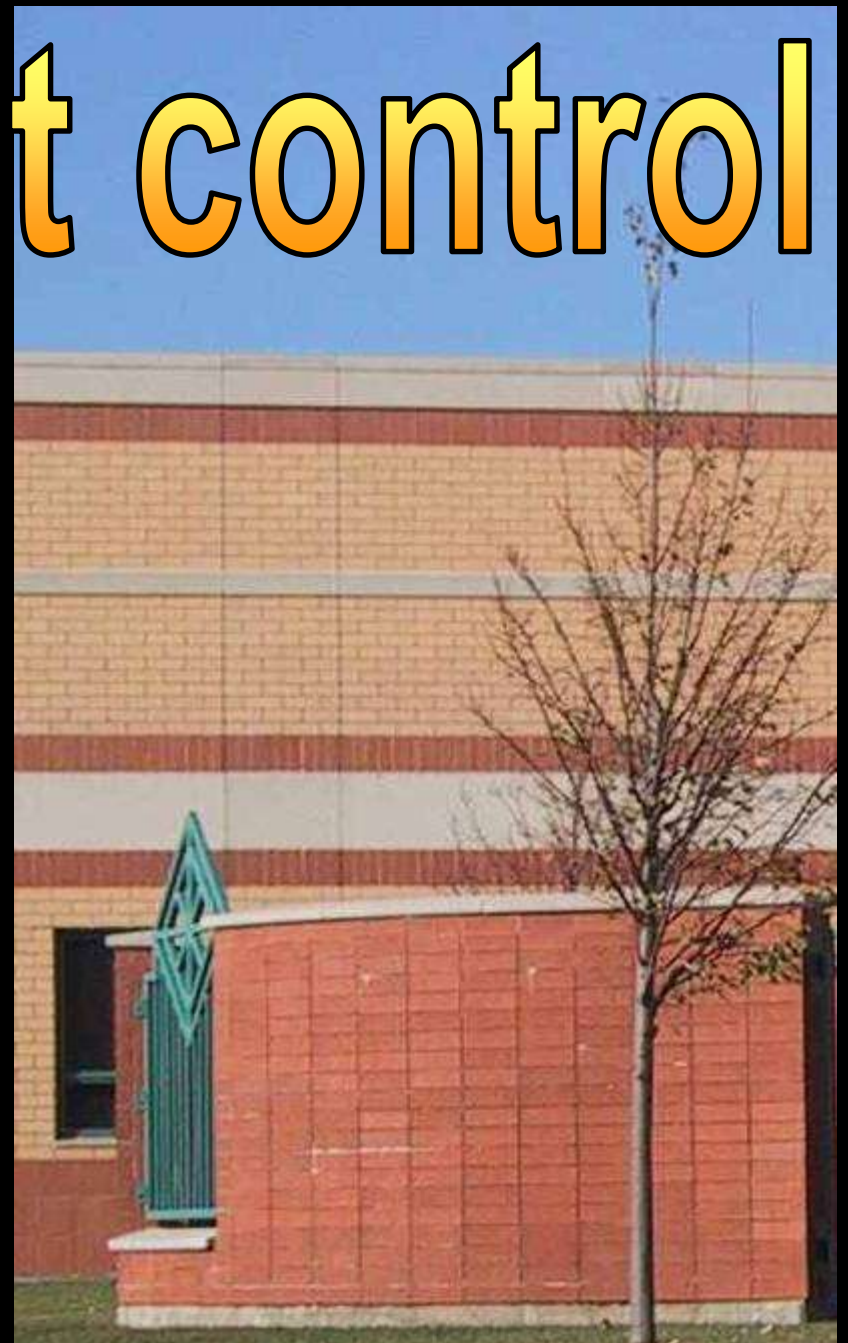
MOVEMENT

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movement control



PROPERTIES

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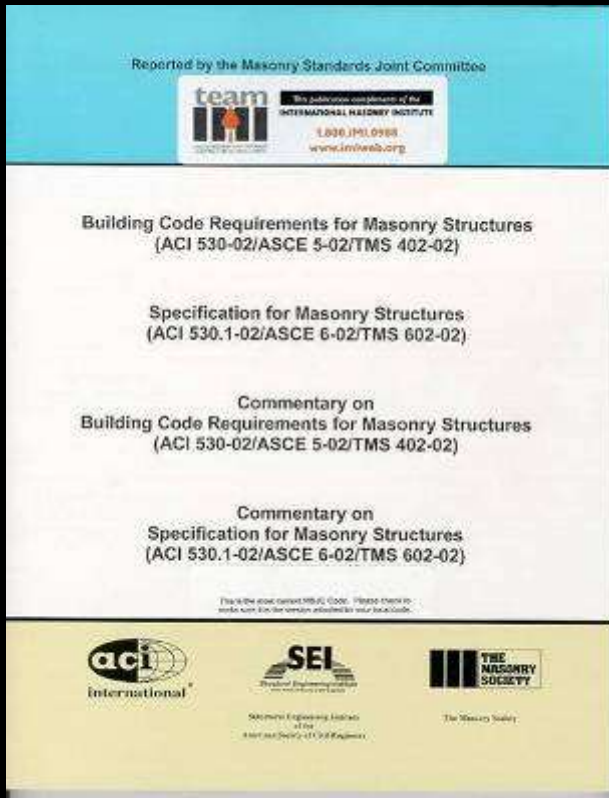
STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

ACI 530 Code

Building Code Requirements for Masonry Structures



Code 1.2.2: Show all Code required items on the project drawings, including:

1.2.2 (h) Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture

movement joint locations

change in
thickness

corners

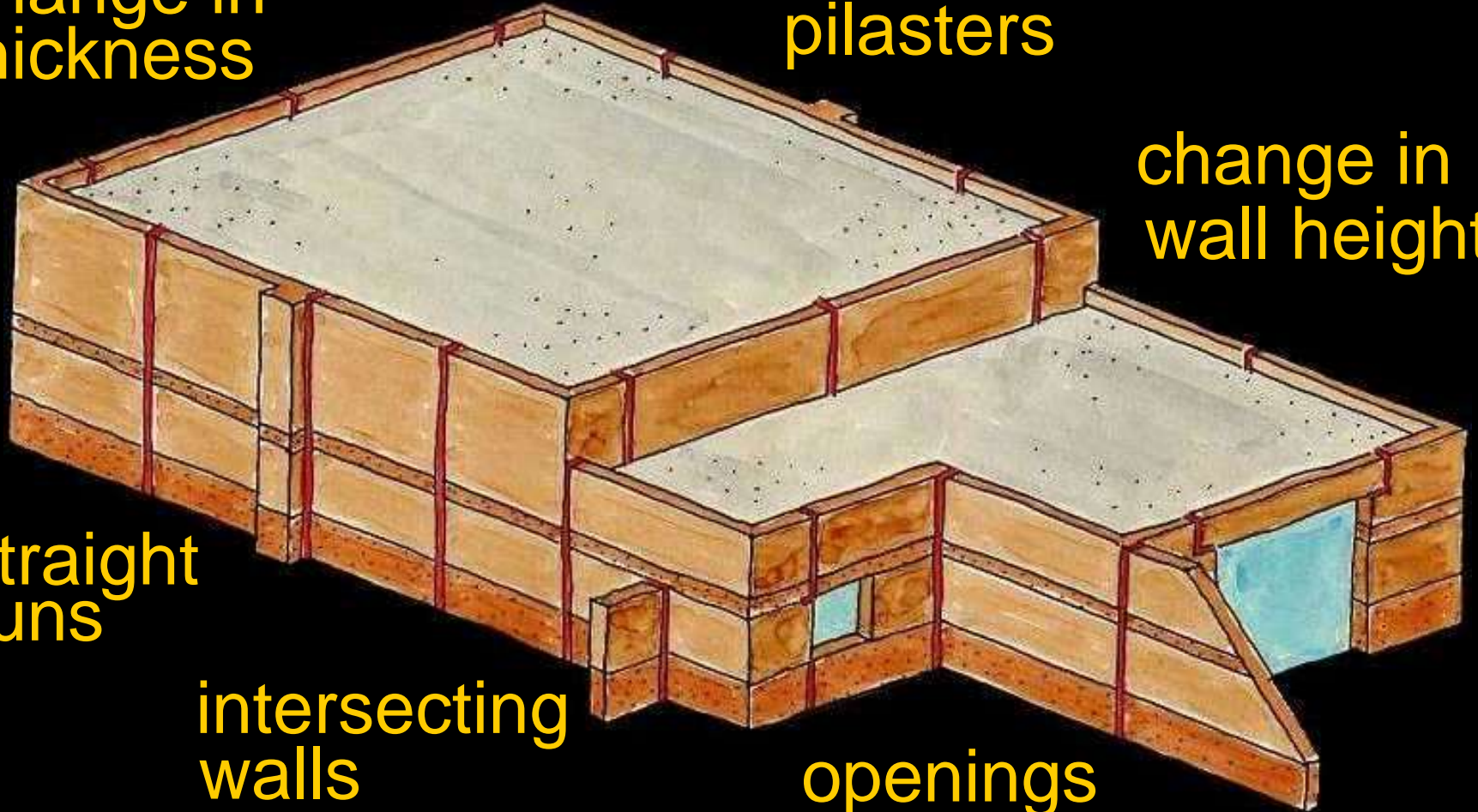
pilasters

change in
wall height

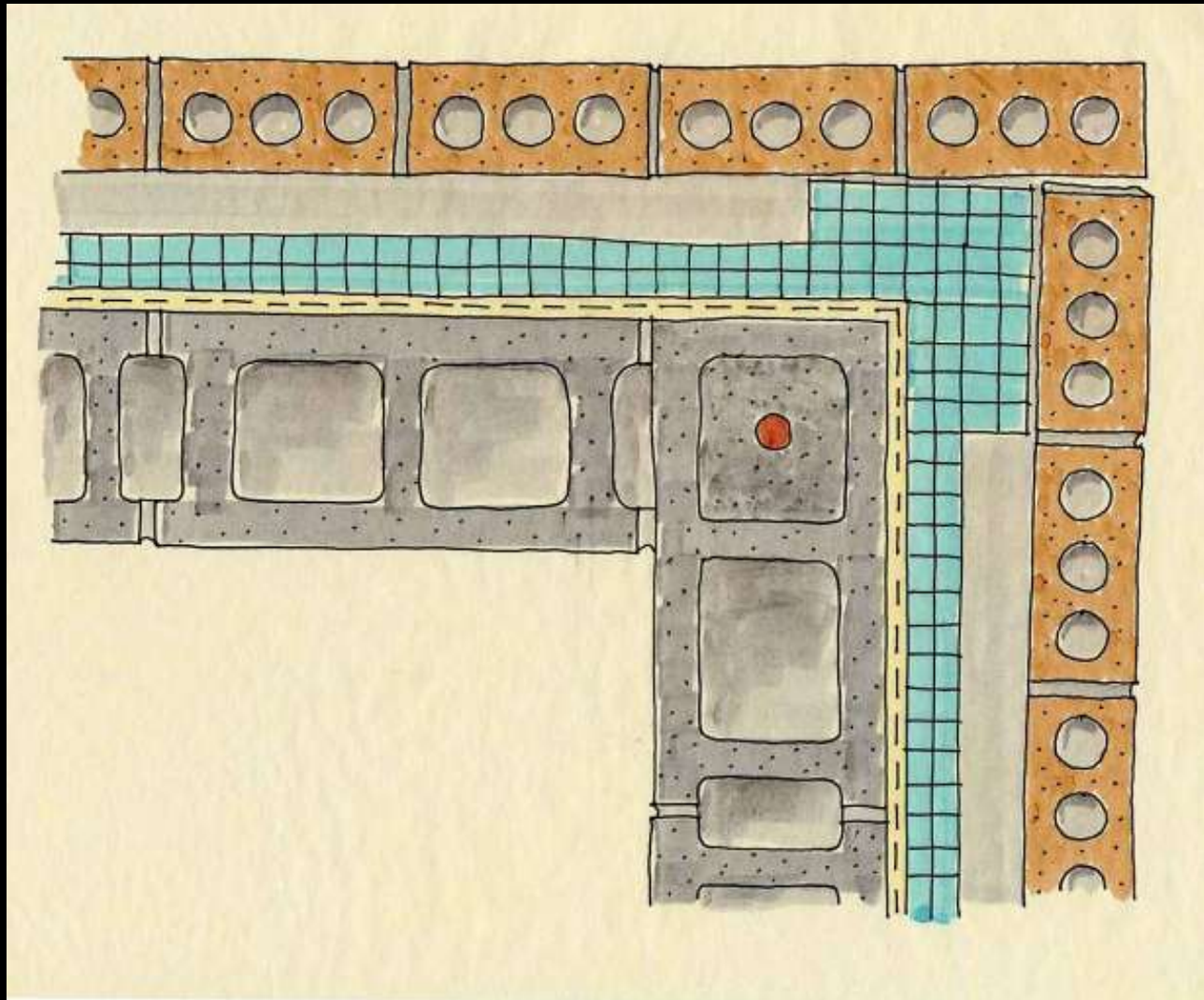
straight
runs

intersecting
walls

openings



corners



PROPERTIES

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detailing

Movement Control

PROPERTIES

MODULARITY

MOISTURE

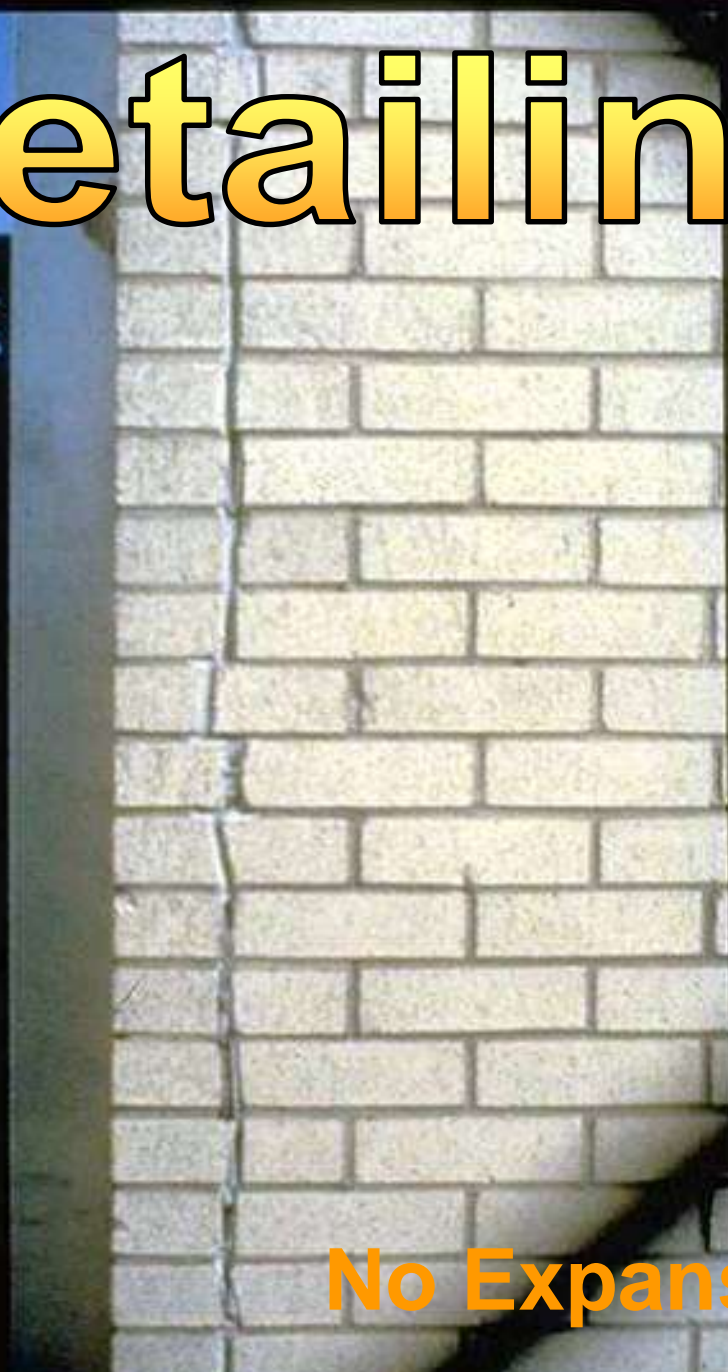
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

detailing



No Expansion Joint at Corner

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

detailing



Movement Control – Sealant Joint Color

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



detailing

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

wall ties

Match to application

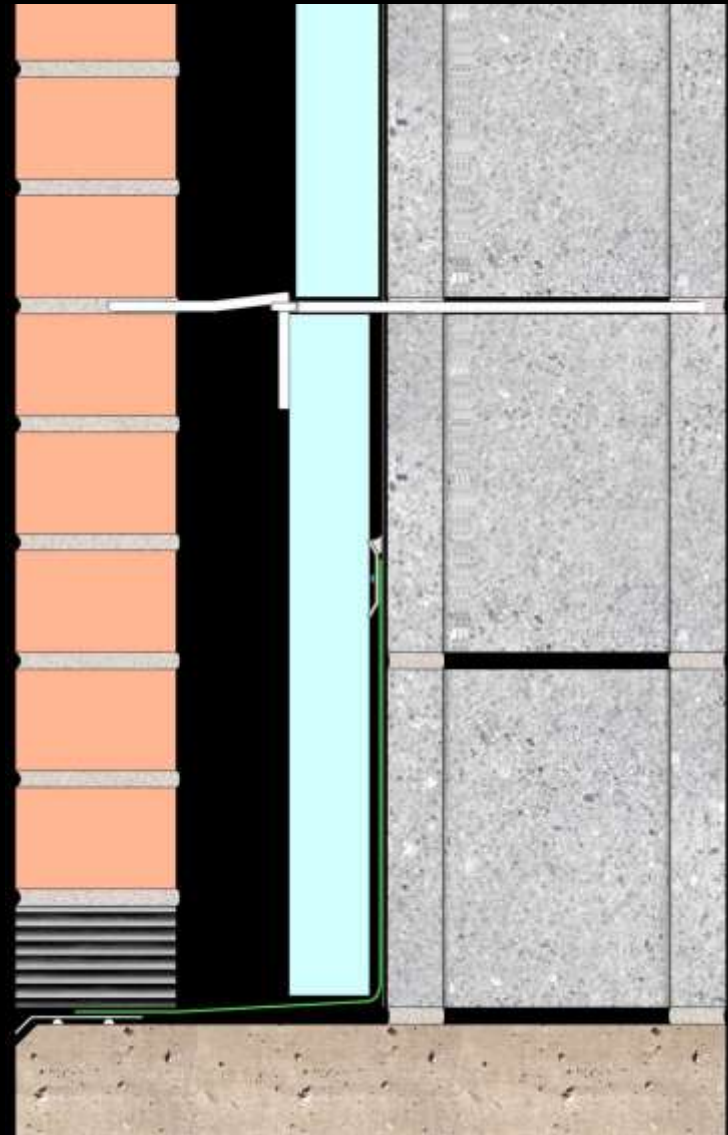


Commercial



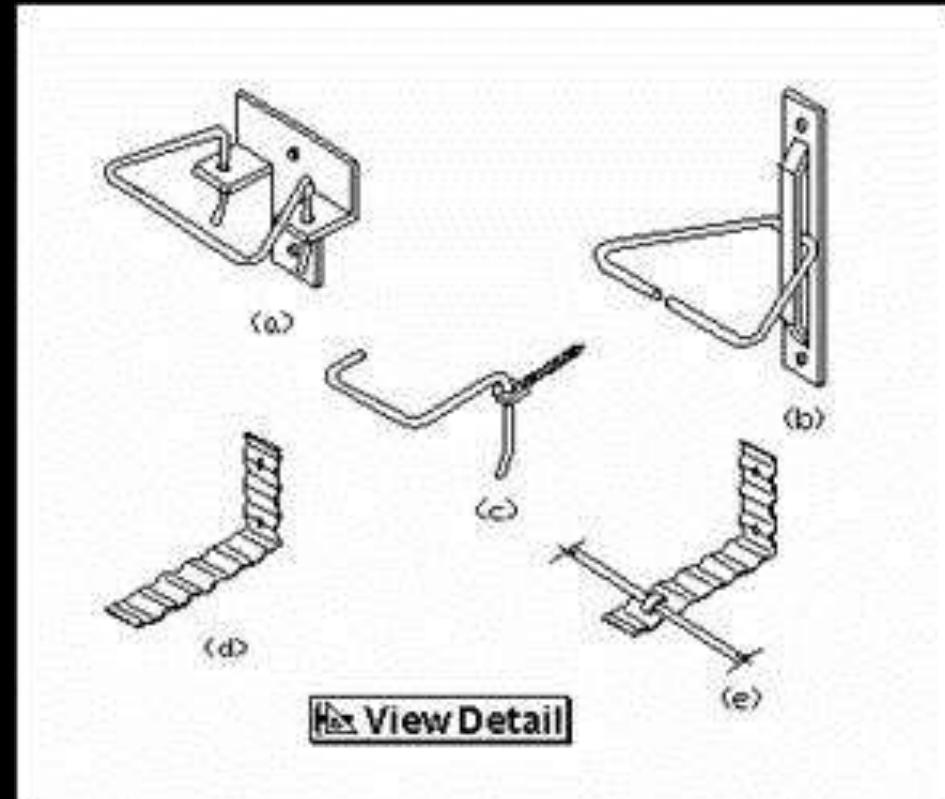
Residential

wall Ties



Wall Ties

“Masonry veneer shall be anchored to the supporting wall with corrosion-resistant metal ties”



wall ties

Masonry veneer anchored to wood backing (6.2.2.6)

“Veneer shall be attached with any anchor permitted in Section 6.2.2.5 (i.e. corrugated sheet metal, sheet metal, wire, or adj.)”

Masonry veneer anchored to steel backing

“Attach veneer with adjustable anchors” (6.2.2.7)

Masonry veneer anchored to masonry or concrete

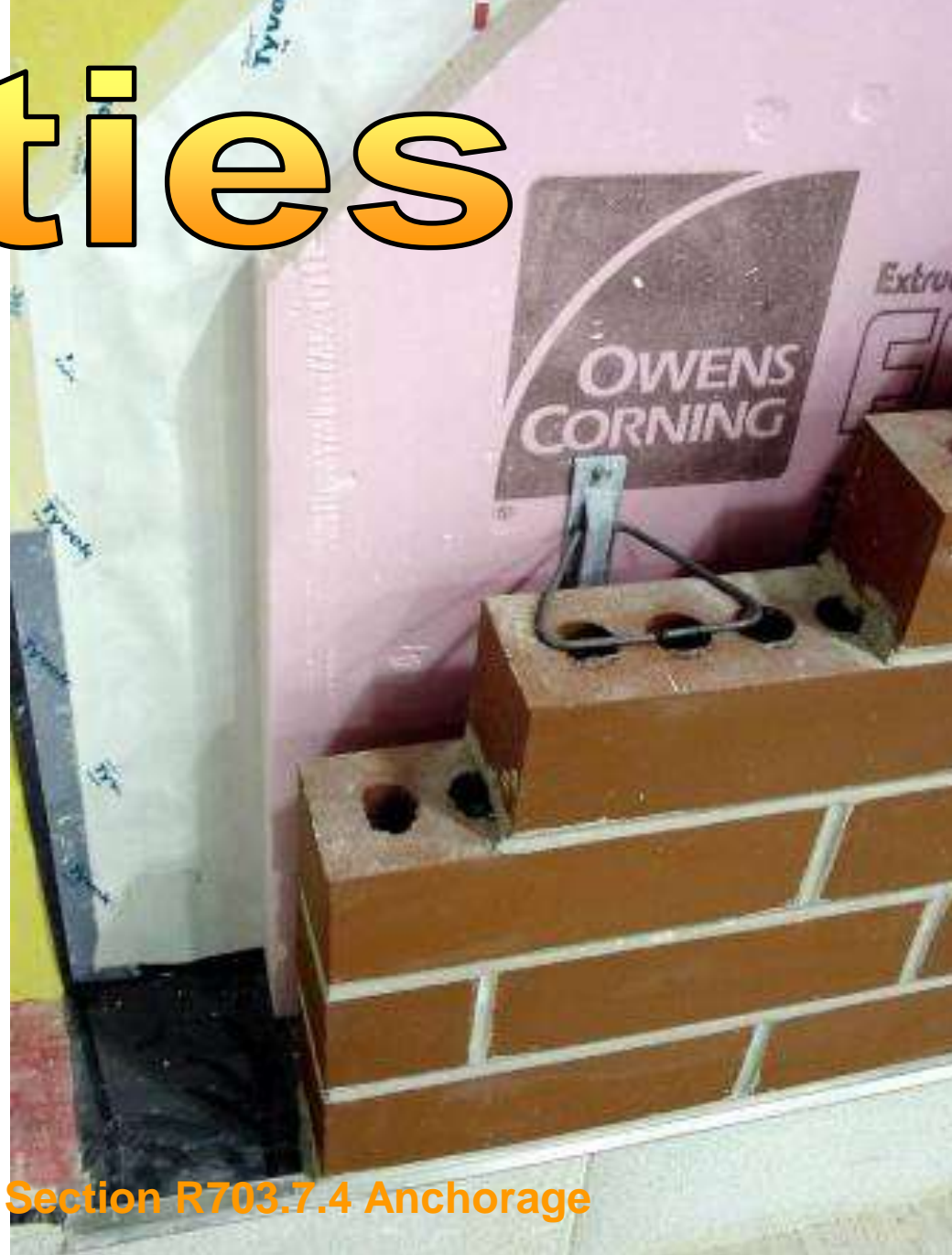
“Attach veneer to masonry backing with wire anchors, adjustable anchors, or joint reinforcement. Attach veneer to concrete backing with adjustable anchors” (6.2.2.8)

wall ties

Which Type?

Veneer anchored to cold-formed steel backings (steel studs)

Adjustable metal strand wire ties



International Residential Code 2000, Section R703.7.4 Anchorage

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

wall ties

Which Type?

Corrugated sheet metal wall ties are only permitted, within certain limitations, for wood stud backup.

International Residential Code 2000, Section R703.7.4 Anchorage

ACI 530-02/ASCE 5-02/TMS 402-02, Chapter 6 Veneer, Section 6.2.2.6.3

commercial



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

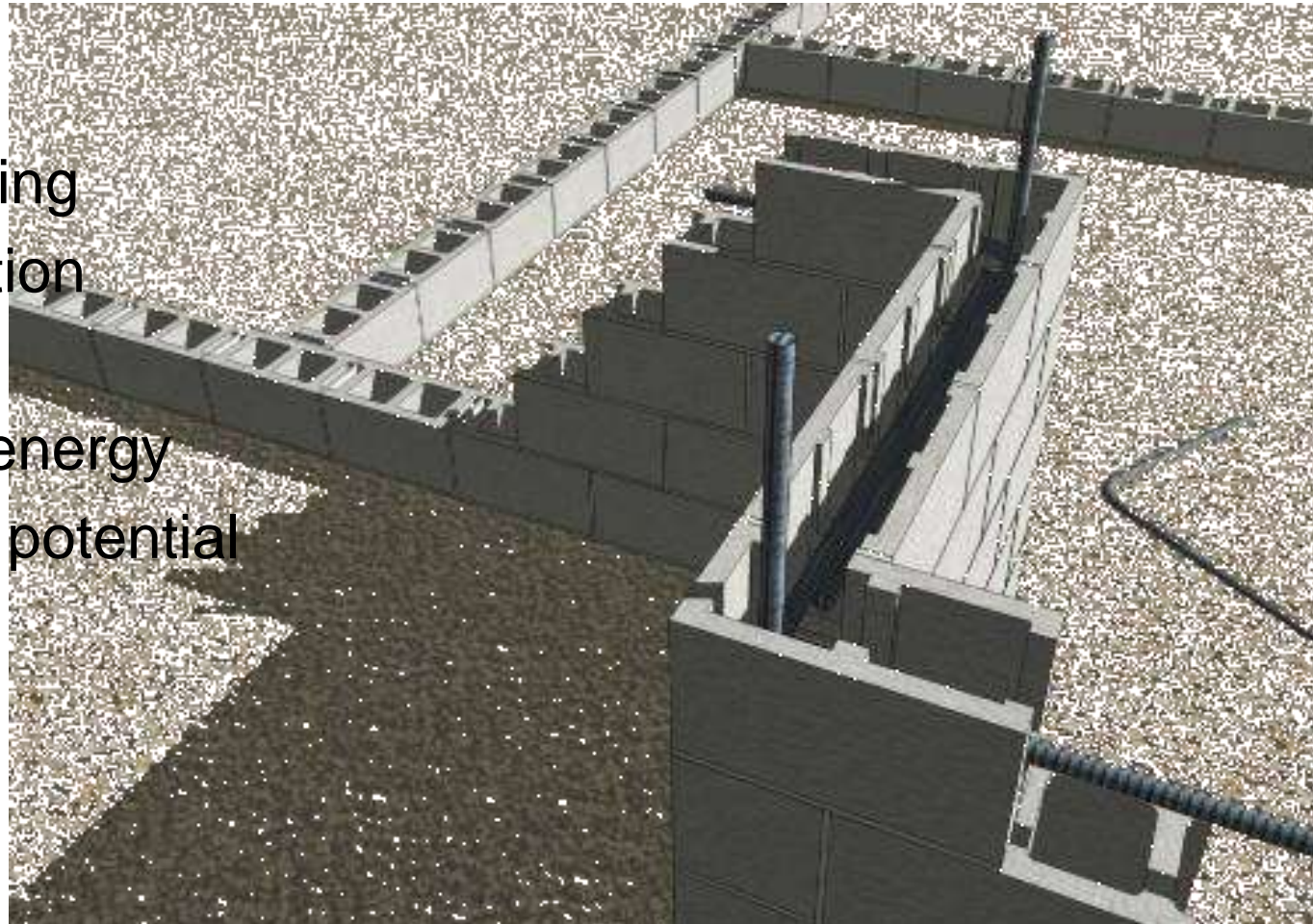
WORKMANSHIP

structural masonry

Strength of masonry simplifies construction

Balances:

- Manufacturing
- Transportation
- Production
- Embodied energy
- Recyclable potential



structural masonry

Reinforcing masonry improves masonry wall performance:

- Improved Resistance to Lateral Loads
 - Wind
 - Seismic Events
- Helps Withstand Various Axial Loadings
- Provides Redundancy & Robustness
 - Blast Resistance
 - Progressive Collapse response
- Walls Can Be Built Taller & Thinner
- Solid grouting improves fire resistance



self-consolidating grout

Daylighting and Views

- Loadbearing Construction
- Brick/CMU



The Flynn Center, MD



structural masonry

PROPERTIES

MODULARITY

MOISTURE

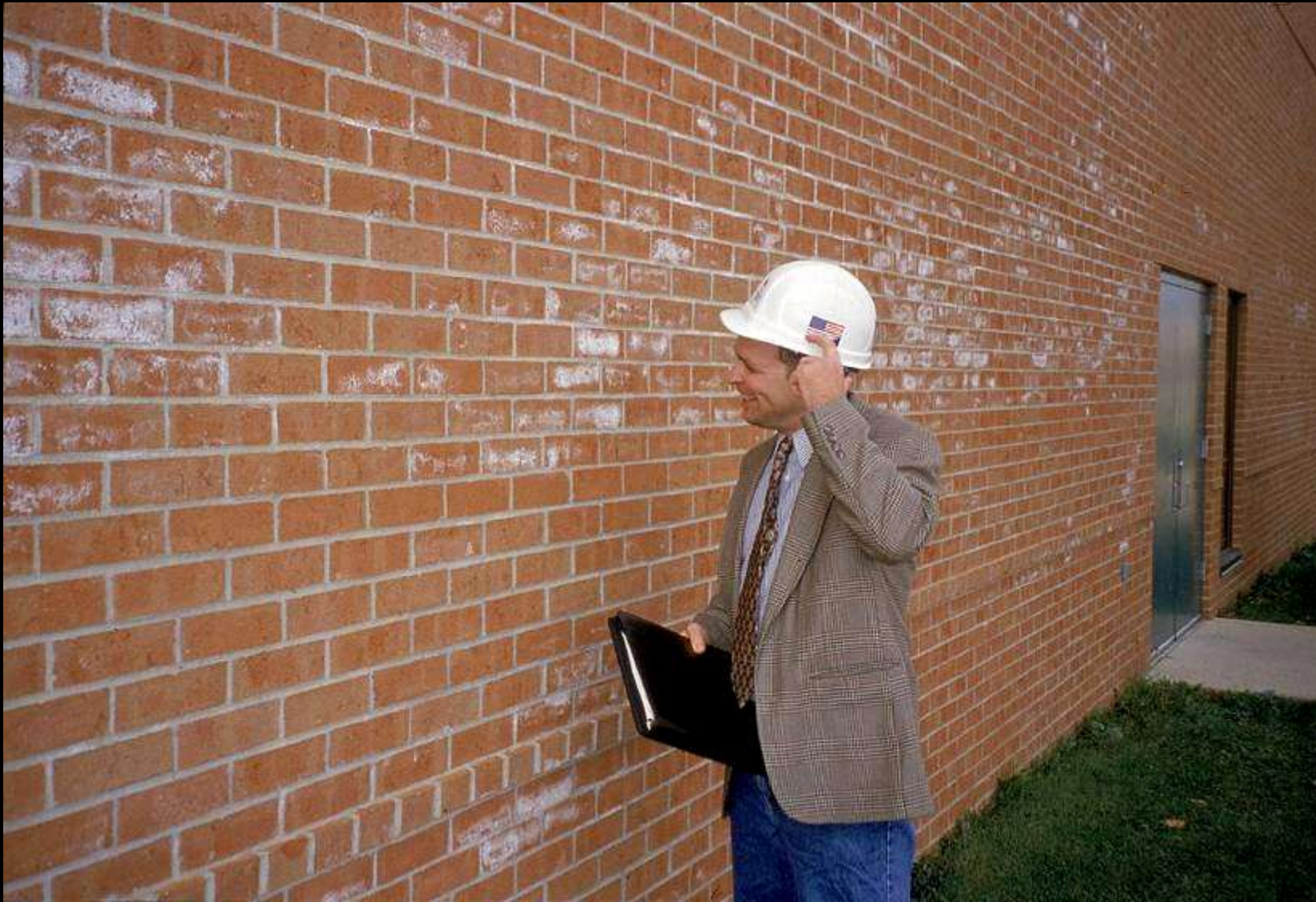
MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

efflorescence



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



lime runs

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

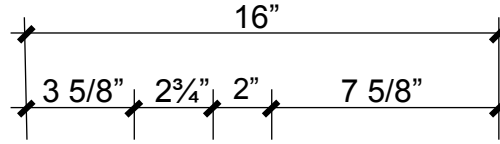
TROUBLESHOOTING

WORKMANSHIP



other stains

NOTE:
DEEP RECESSES MAY
RESULT IN MOISTURE
PENETRATION



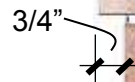
CMU BACKUP W/
GROUT &
REINFORCING

CORED BRICK

2" RIGID INSULATION

AIR/WATER/VAPOR
BARRIER AS REQ'D

100% SOLID BRICK

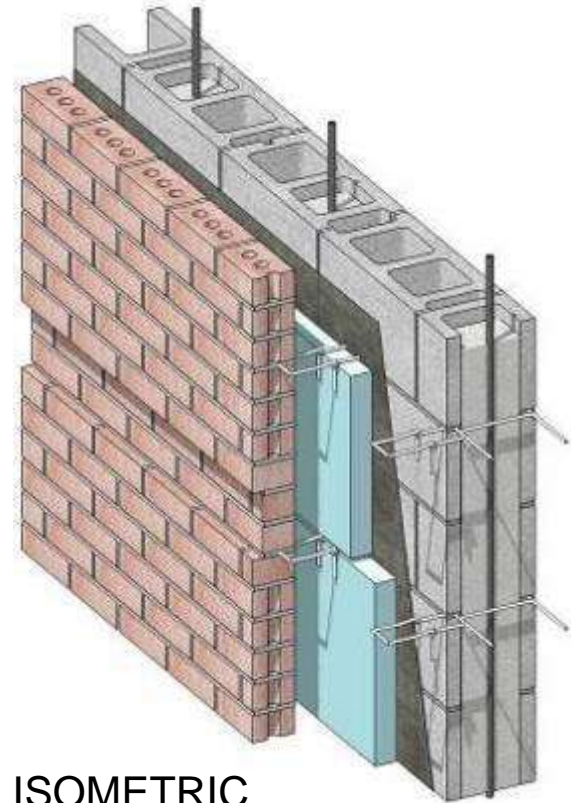


3" D. 100% SOLID
SPECIAL UNITS

100% SOLID BRICK

HORIZONTAL JOINT
REINFORCEMENT W/
INTEGRAL WALL TIES

CORED BRICK



ISOMETRIC

masonry detailing series

Cavity Wall Recessed Units

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

recessed course



PROPERTIES

MODULARITY

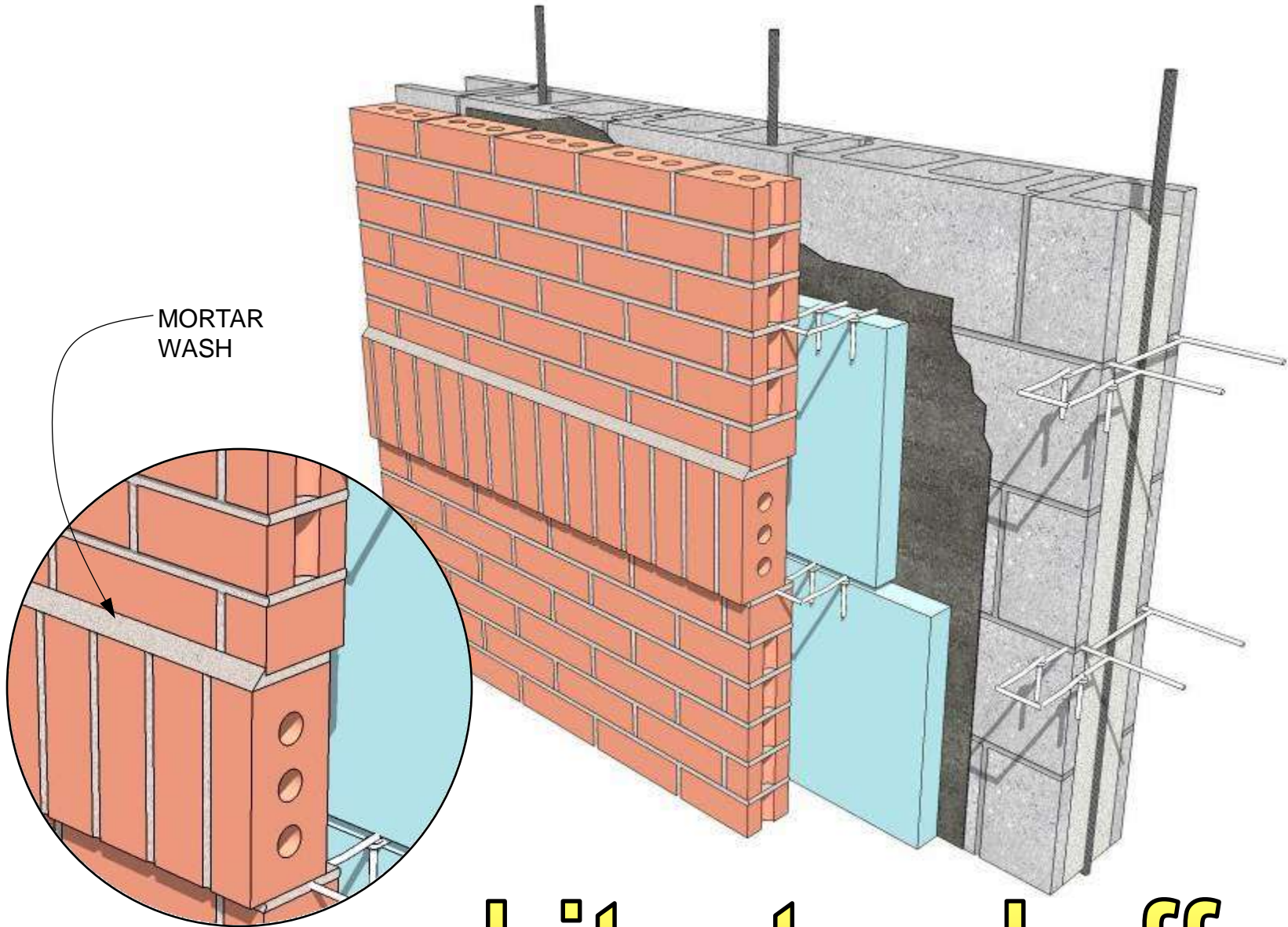
MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



architectural effect

PROPERTIES

MODULARITY

MOISTURE

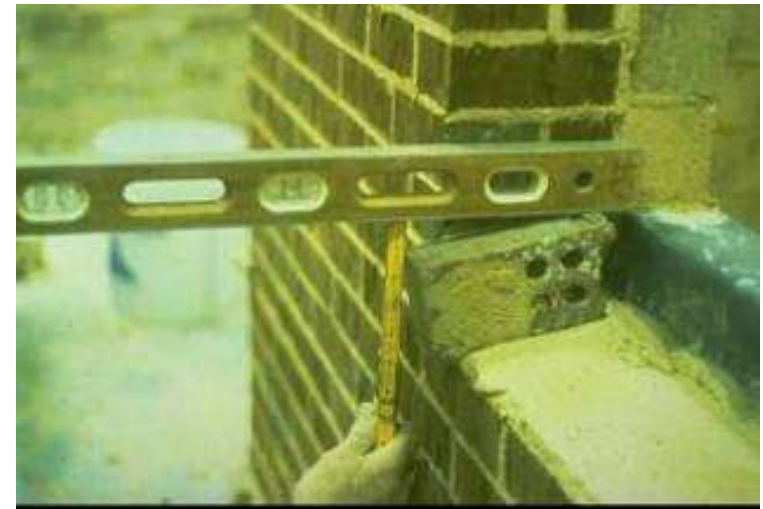
MOVEMENT

STRUCTURAL

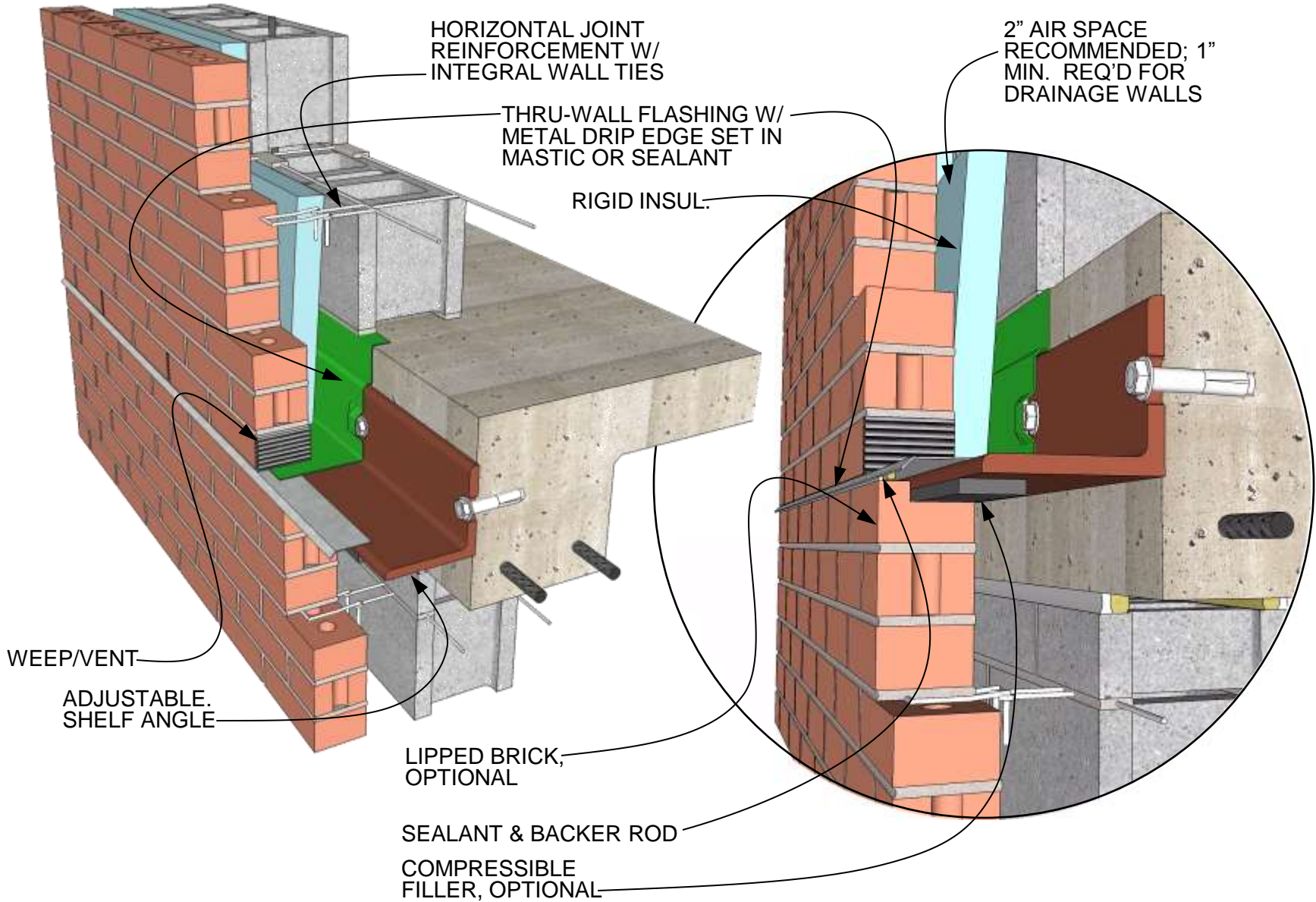
TROUBLESHOOTING

WORKMANSHIP

sills and ledges



Slope rowlocks at least
15 degrees



shelf angle detail



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP

quality control



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



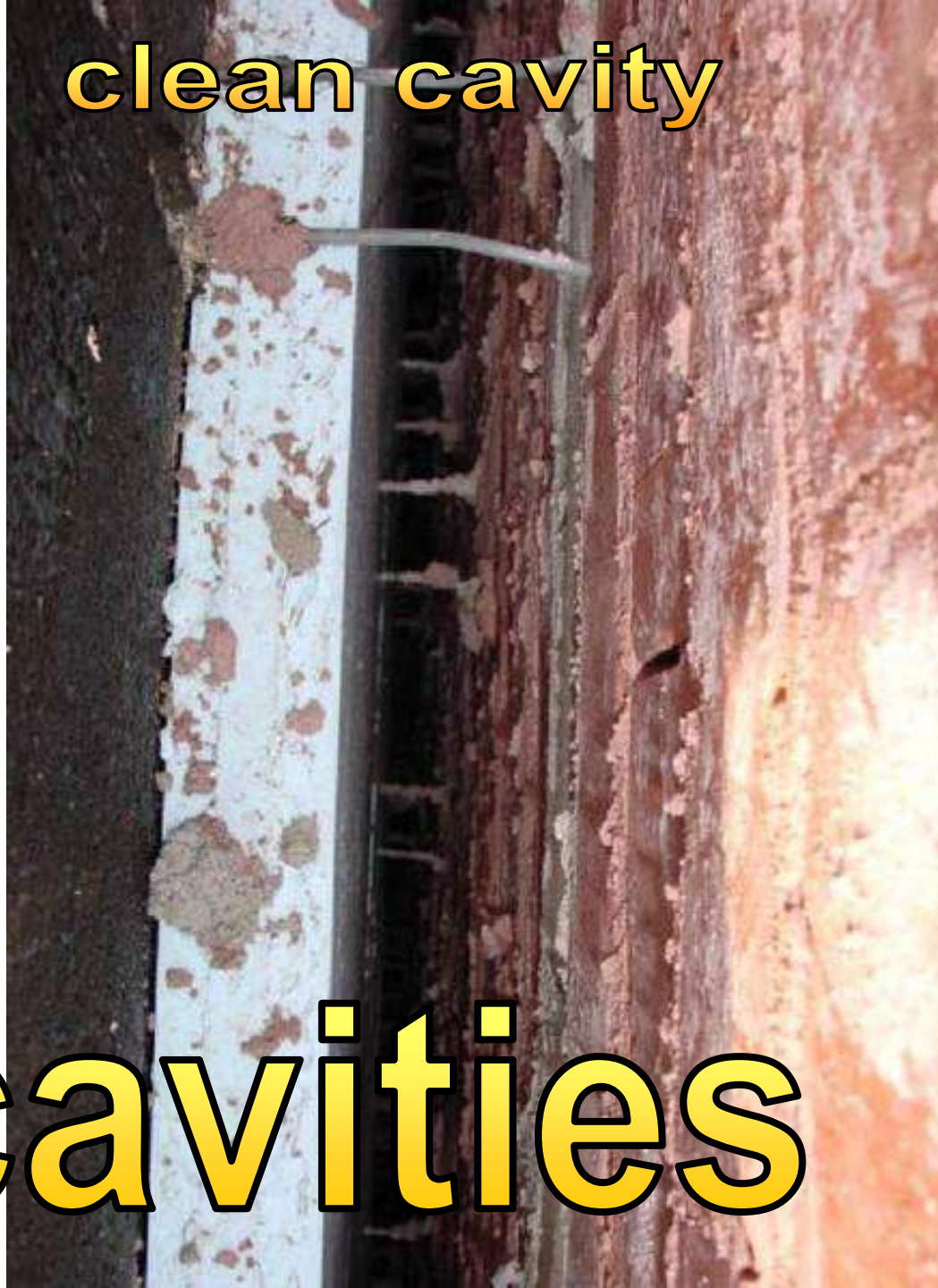
clean cavities

PROPERTIES	MODULARITY	MOISTURE	MOVEMENT	STRUCTURAL	TROUBLESHOOTING	WORKMANSHIP
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Mortar droppings

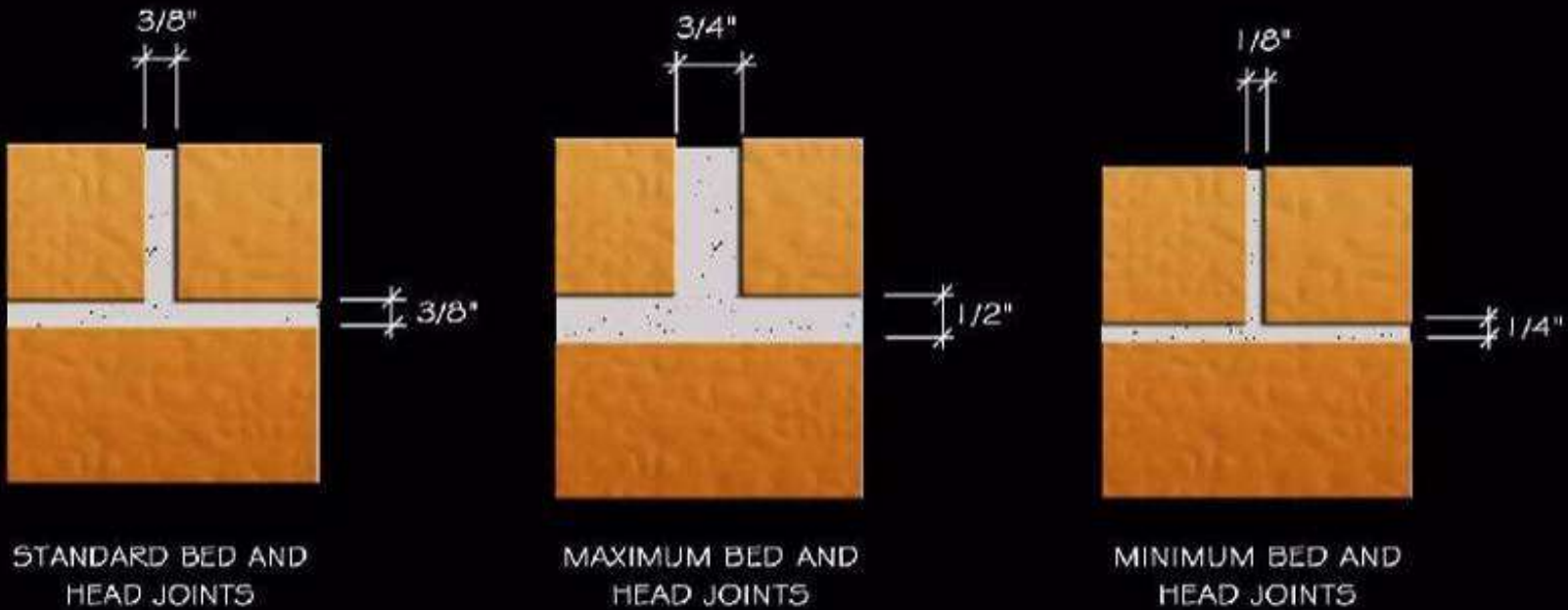
clean cavity



cavities

workmanship tolerances





JOINT

ALLOWABLE TOLERANCE

Bed Joint

+/- 1/8"

Head Joint

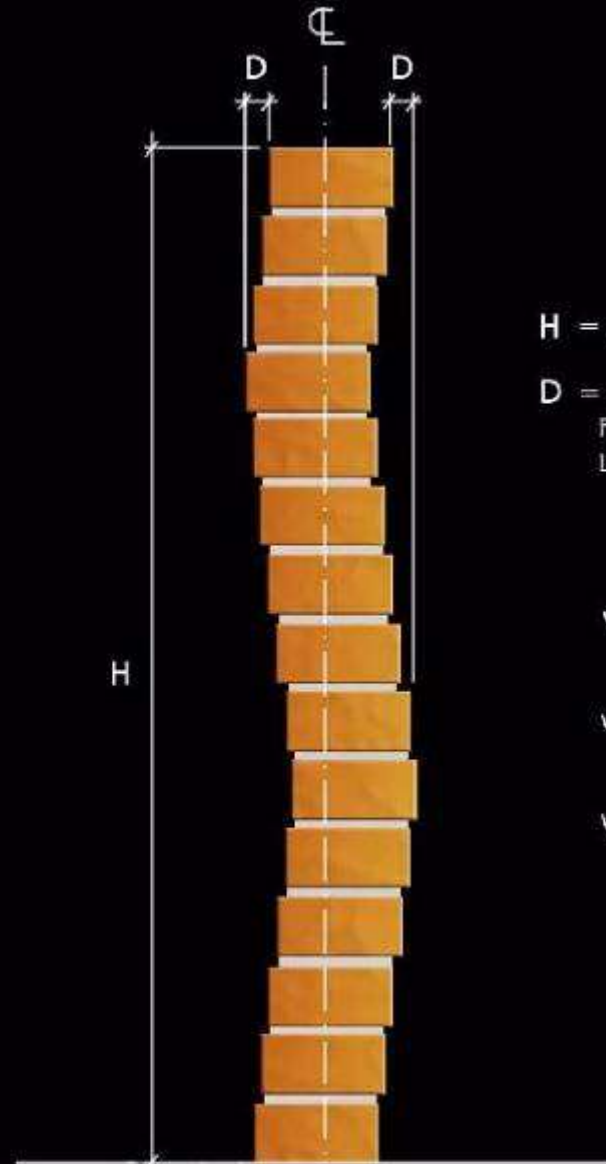
-1/4", +3/8"

Collar Joint

-1/4", +3/8"

mortar joint tolerances
ACI 530 Code

Allowable Variations



H = WALL HEIGHT

D = ALLOWABLE VARIATION
FROM PLUMB AT ANY
LOCATION

WHEN H < 10'-0"
D < 1/4"

WHEN H < 20'-0"
D < 3/8"

WHEN H > 20'-0"
D < 1/2"

masonry out-of-plumb

PROPERTIES

MODULARITY

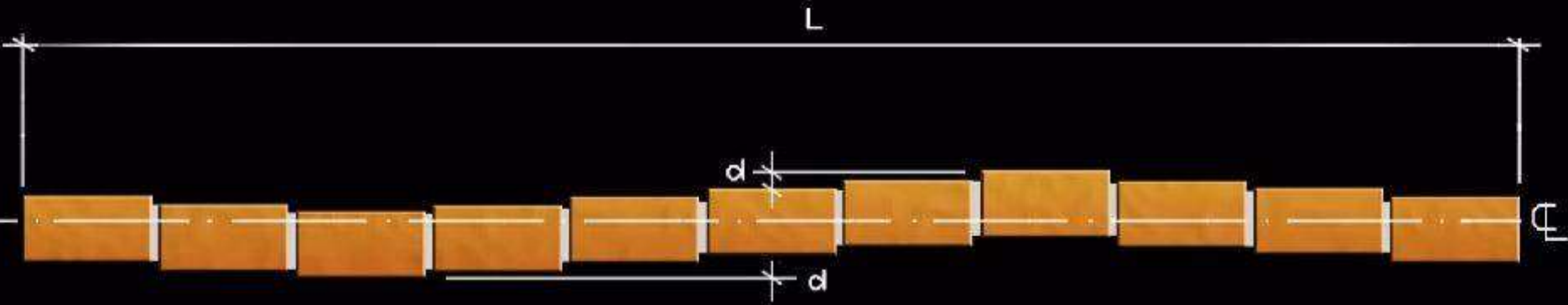
MOISTURE

MOVEMENT

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TROUBLESHOOTING

WORKMANSHIP



L = LENGTH OF WALL

d = ALLOWABLE VARIATION FROM PLAN AT ANY GIVEN POINT

WHEN $L \leq 10'-0"$
 $d \leq 1/4"$

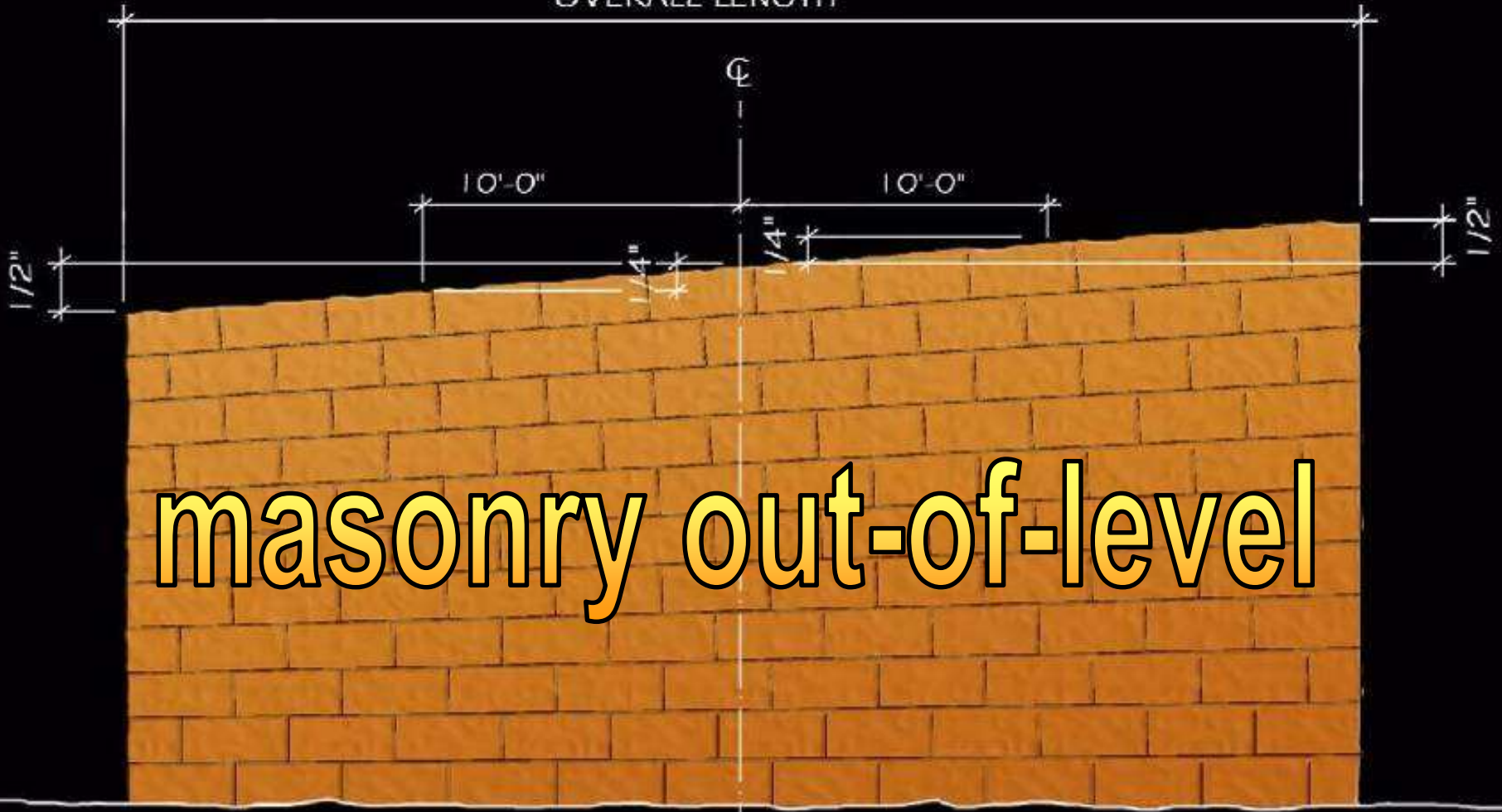
WHEN $L \leq 20'-0"$
 $d \leq 3/8"$

WHEN $L \geq 20'-0"$
 $d \leq 1/2"$

masonry out-of-plan

Allowable Variations

OVERALL LENGTH



masonry out-of-level

Allowable Variations

PROPERTIES

MODULARITY

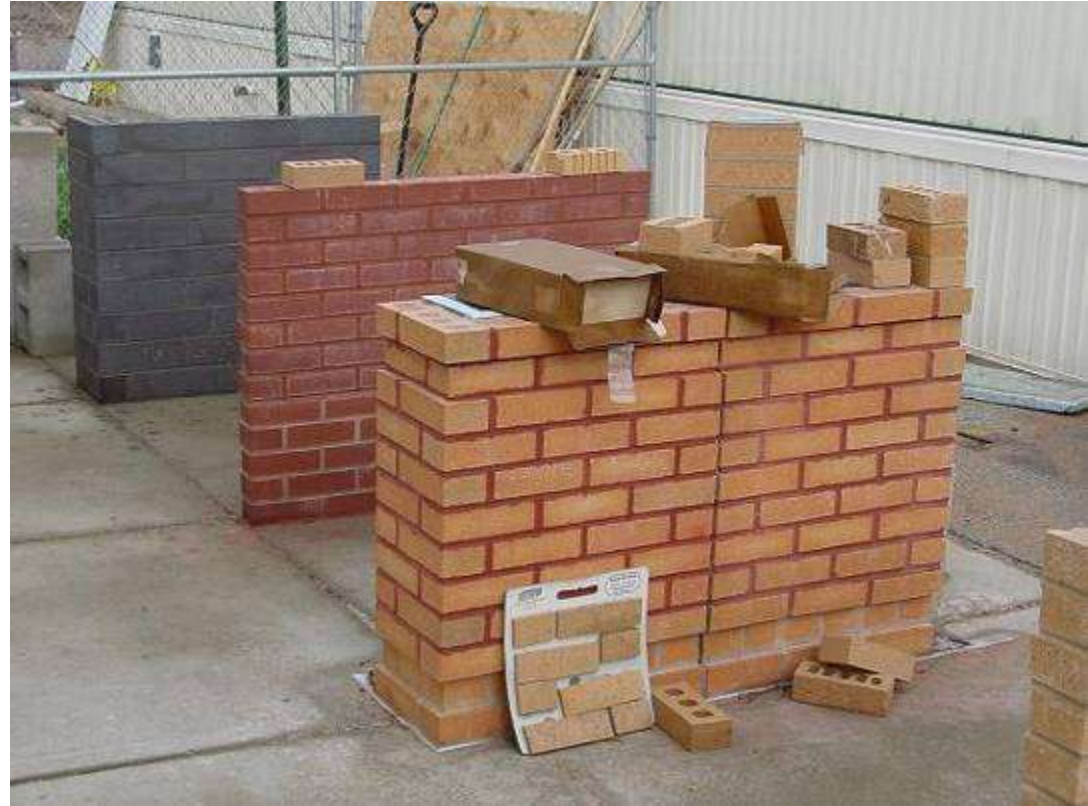
MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



samples panels

PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



communication



PROPERTIES

MODULARITY

MOISTURE

MOVEMENT

STRUCTURAL

TROUBLESHOOTING

WORKMANSHIP



Architectural Practice Committee

- Q/A
- Next APC video conference call in April, 2014
- Please email your AIA number to Rad Delaney raddelaney@gmail.com for your 1 AIA CEU.



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