



Full scale Stucco Model Testing  
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# Full Scale Testing Model Constructed with a Sealed Stucco System



### MAIN PURPOSE

- To refute the rising litigation claims involving stucco installation citing Florida Building Codes, and ASTM C-926, Standard Specification for Application of Portland Cement-Based Plaster and ASTM C-1063 Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.
- To show traditional evolved methodologies for Energy Code & Stucco Face Barrier System Application in the Florida and ICC Energy Zones 1 & 2 areas.
- Construct a full scale model with varying stucco installation conditions.

### APPLICATION PROBLEMS

- Failure to install coatings and sealants correctly during construction, refer to the 'Painting Issues' slides.
- To show proper application of coating and sealants; to document envelope maintenance problems; failure to maintain or replenish required coatings and sealants.

- Failure to properly diagnose common problem areas because of a lack of expertise and/or understanding with building envelope components.

### NEED FOR A FULL SCALE MODEL

- In order to demonstrate that many of these Florida procedures and modifications were either not violative of applicable codes or application procedures or alternatively were not causing the damage attributed to them, it was necessary to construct full scale modeling.
- The intent was to construct the model using proven stucco principles that have evolved for Florida's unique climatic environment. These modified procedures have successfully performed for over 40 years and are fully compliant when stucco is applied as a cladding.
- For a full analysis of Florida Stucco Provisions and the ASTM C-926 and 1063, review the Contractors Institute educational seminar titled: "The Truth about Florida's Stucco Codes."

- DETAILS OF THE FULL SCALE MODEL
- The stucco was installed with varying conditions on each of the four walls.
- All corners were rodded, and no corner bead was used; see attached 'Rodded Stucco' Slides
- Refer to Figure 2 for the Wall Section Configuration
- The separate wall configuration steps are outlined in the 'Wall Configuration Detail' Slides and the 'Wall Configuration' Slides
- On the North wall, the lath (in two separate areas) was installed "according to modern stucco experts" as incorrect and necessitating de-skinning:
  - 1. On the left side of the North wall, the lath was lapped incorrectly with a paper over metal configuration.
  - 2. On the right side of the North wall, the lath was installed with a vertical lap where the paper was placed over paper (not cut back).
- Refer to slides labeled 'Incorrect Lath Installation' for visual representation.
- TIMELINE OF COMPONENT INSTALLATION
- Tyvek Installation – 6/7/2015
- Lath Installation – 6/10/2015
- Stucco Installation – 6/24/2015
- Wall Crack Documentation – 7/13/2015
- Paint Installation – 7/22/2015
- INSTALLATION NOTES
- North and East walls were covered with expanded diamond metal lath, self-furring with dimples. (Amico)
- West and South walls were covered with Structalath by Structawire
- All walls were stuccoed to 5/8 minimum thickness.
- Stucco was applied as a monolithic application with a scratch, brown and finish coat.
- South wall was scarified at the scratch coat and finished with additional coats the next morning. This wall was dampened before subsequent applications the next morning.

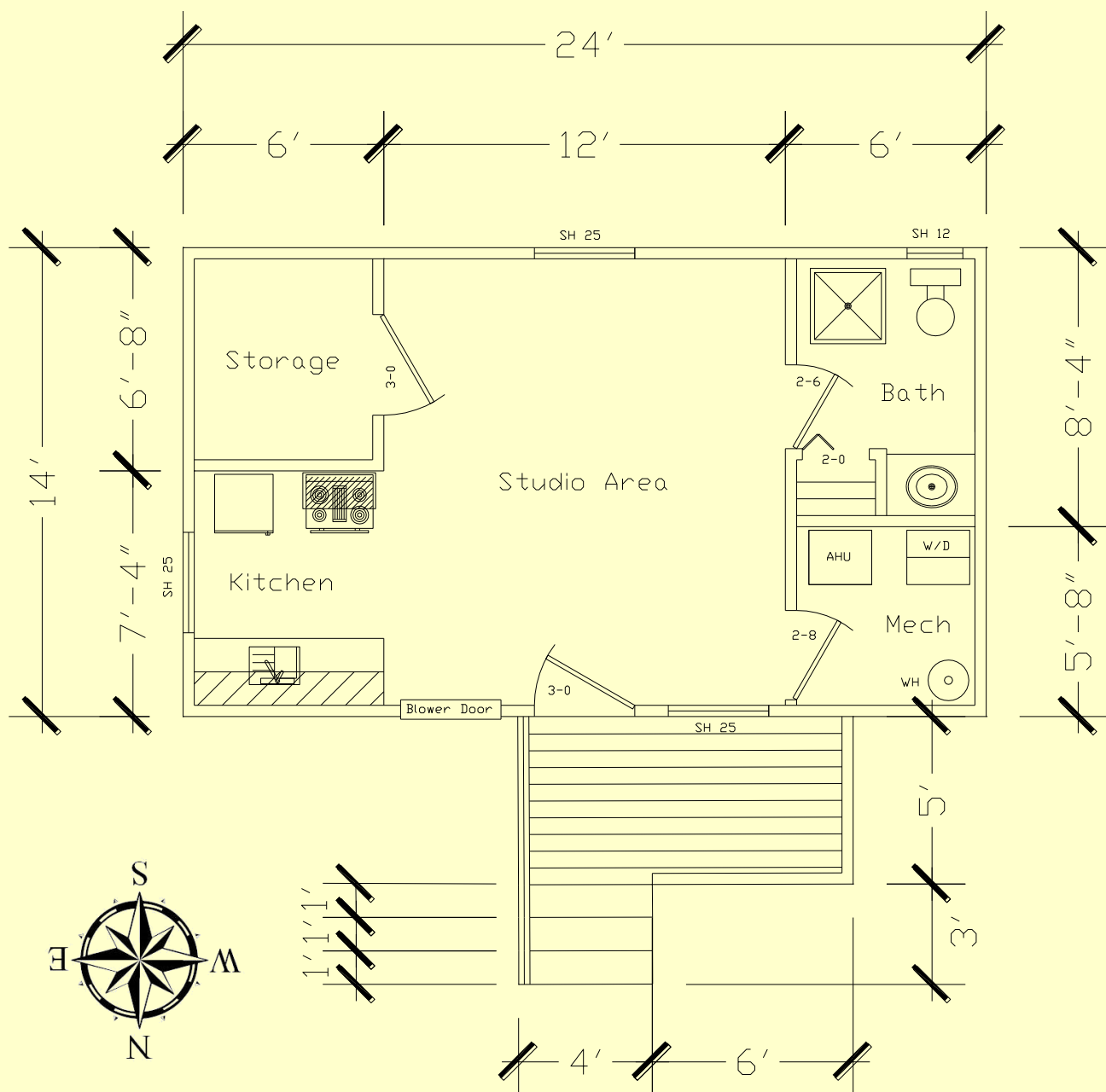


- Typical pinholes in the coating
- Observed on a high percentage of new construction homes
- Typically from use of an airless sprayer without sufficient back-rolling

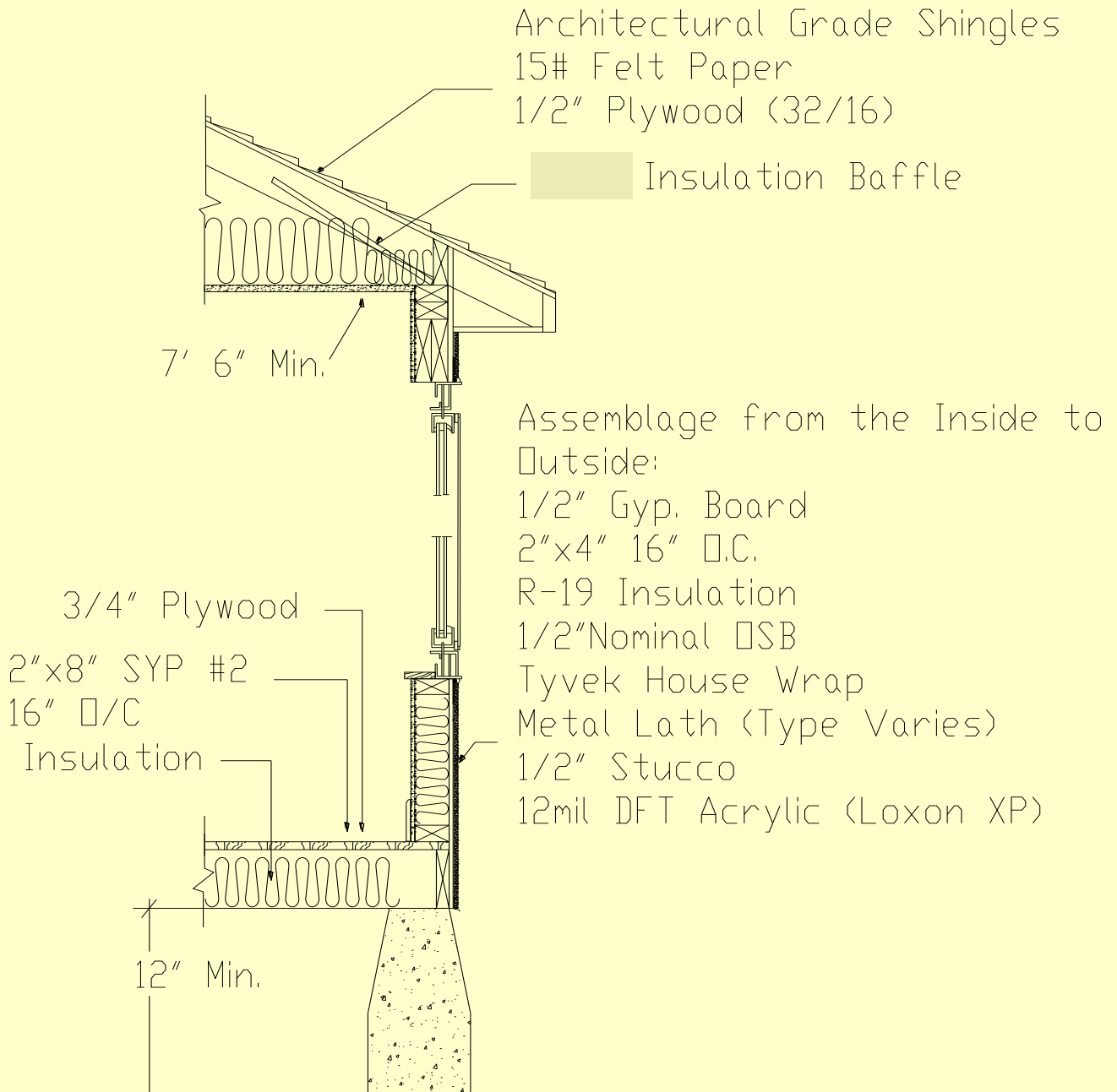


- Testing Model Painting
- Correct Mil thickness provides no visible pinholes in the coating
- Paint on the testing model was installed using traditional roller



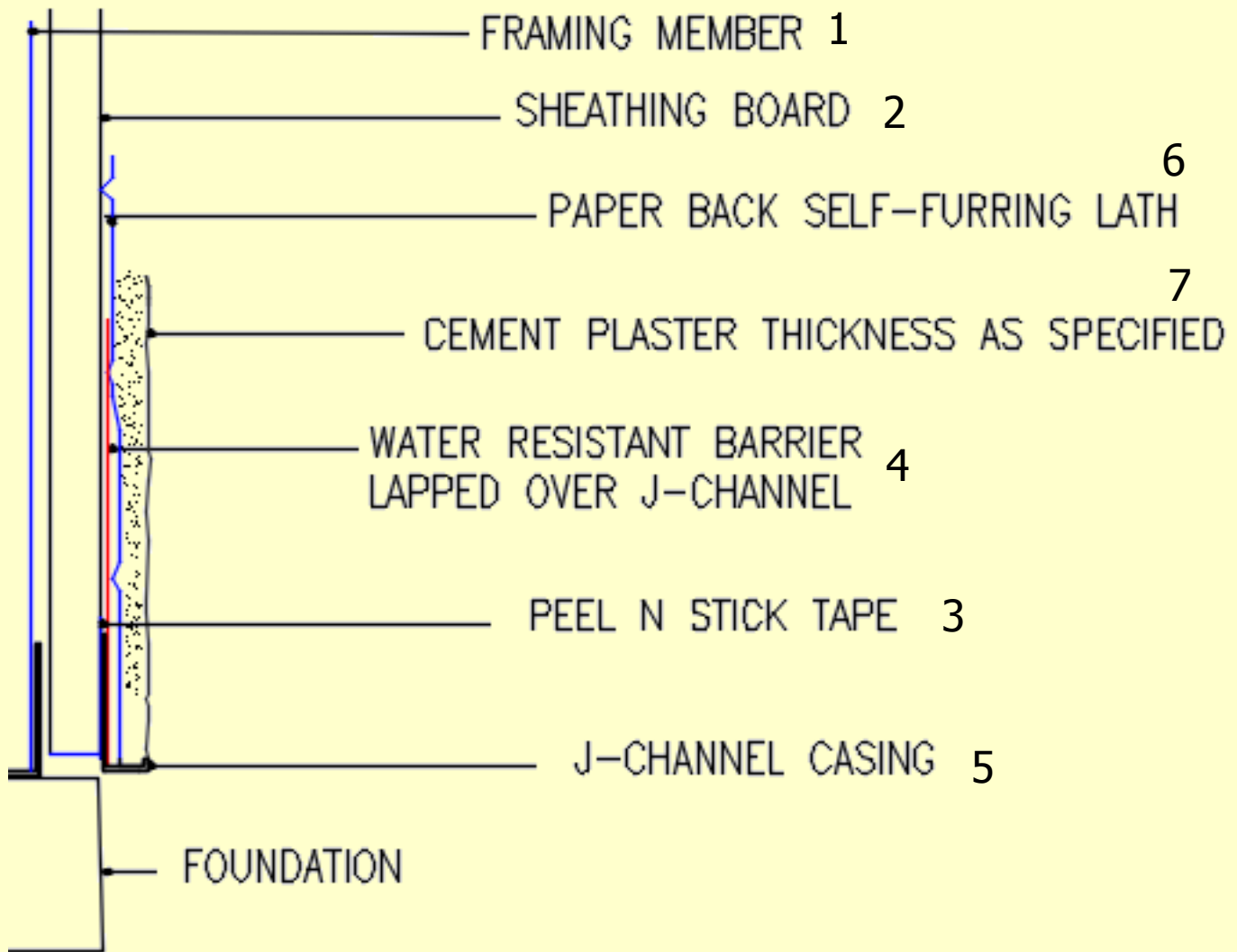


## Figure 2 – Wall Section





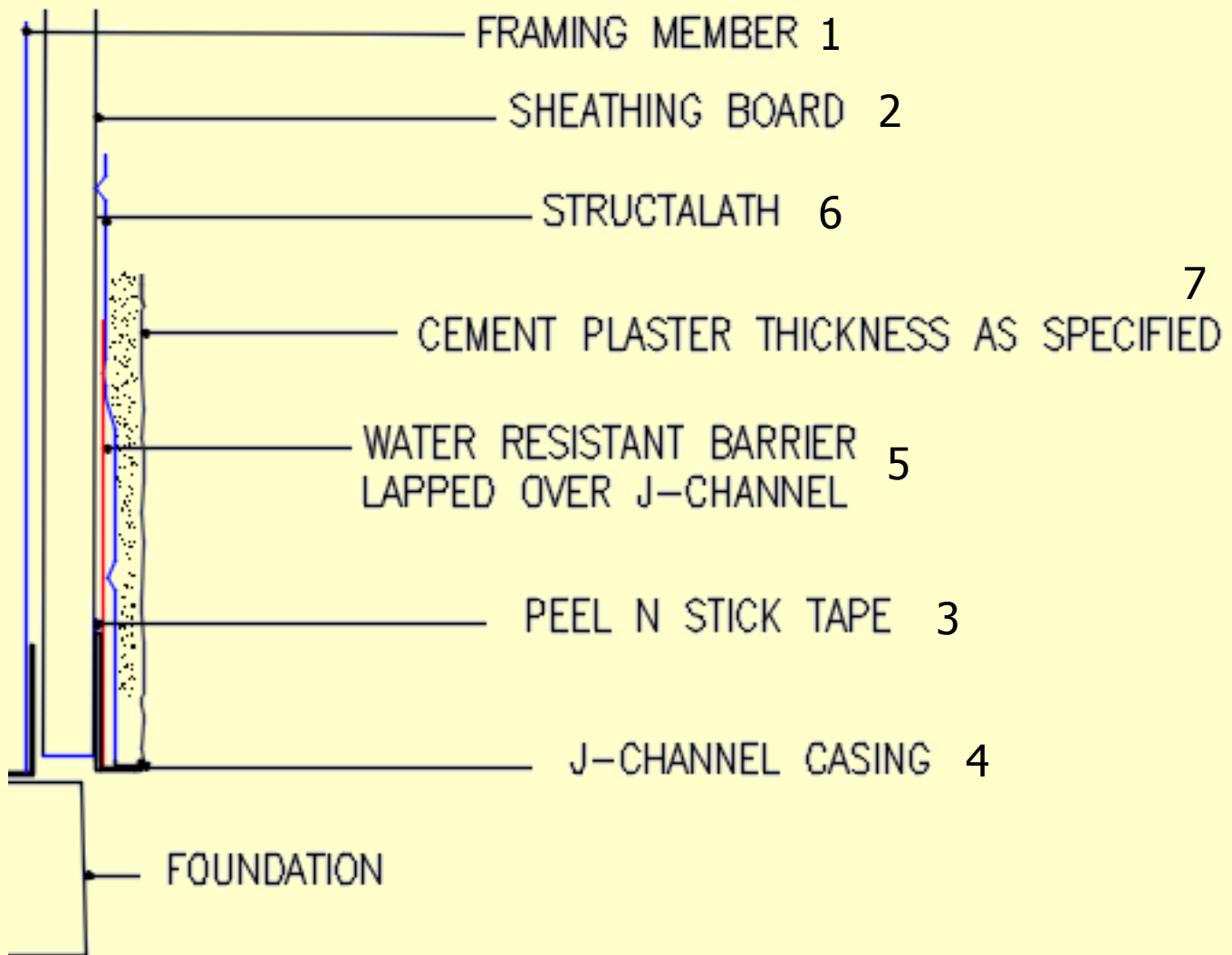
# Wall Configuration Detail – Sequence Indicated



## North Wall Detail

- 8. Two coats of Sherwin Williams "Loxon XP"
- 9. Masterseal NP150 Sealant tooled into grooves or applied over backer rod where indicated

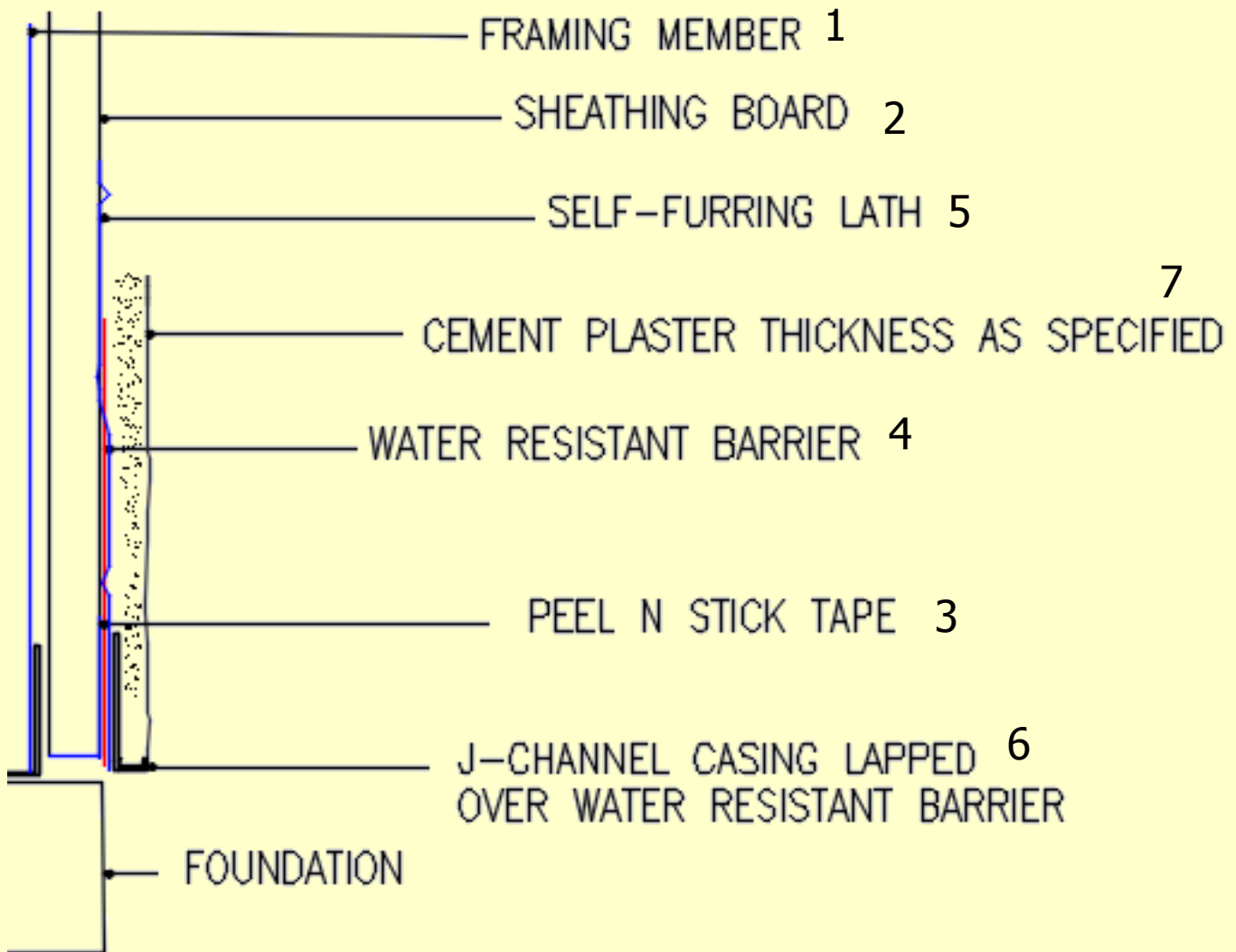
# Wall Configuration Detail



## West Wall Detail

- 8. Two coats of Sherwin Williams "Loxon XP"
- 9. Masterseal NP150 Sealant tooled into grooves or applied over backer rod where indicated

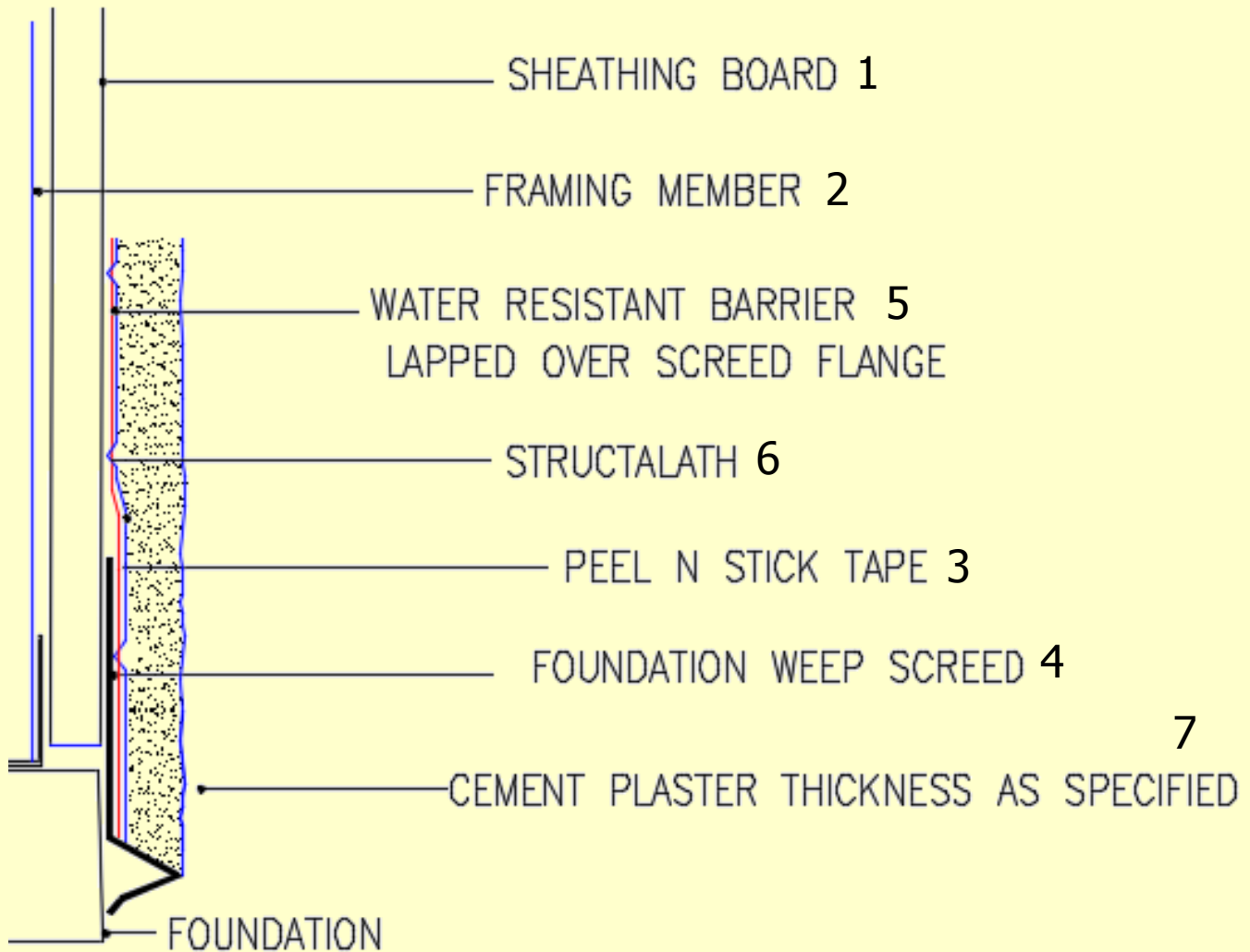
# Wall Configuration Detail



## East Wall Detail

- 8. Two coats of Sherwin Williams "Loxon XP"
- 9. Masterseal NP150 Sealant tooled into grooves or applied over backer rod where indicated

# Wall Configuration Detail



## South Wall Center Detail

8. Two coats of Sherwin Williams "Loxon XP"
9. Masterseal NP150 Sealant tooled into grooves or applied over backer rod where indicated



■ North wall Configuration Steps:

1. Peel-n-Stick
2. Tyvek House wrap
3. J-Channel Casing
4. Amico Wire Lath (Paper Back)
5. Stucco & Texture
6. Paint



- West wall Configuration Steps:
  1. Peel-n-Stick
  2. J-Channel Casing
  3. Tyvek House wrap
  4. Structalath
  5. Stucco & Texture
  6. Paint





- East Wall Configuration Steps:
  1. Peel-n-Stick
  2. Tyvek House wrap
  3. Amico Wire Lath (No Paper Back)
  4. J-Channel Casing
  5. Stucco & Texture
  6. Paint



- South wall Configuration Steps:
  1. Peel-n-Stick
  2. Weep Screed Casing
  3. Tyvek House wrap
  4. Structalath
  5. Stucco & Texture
  6. Paint





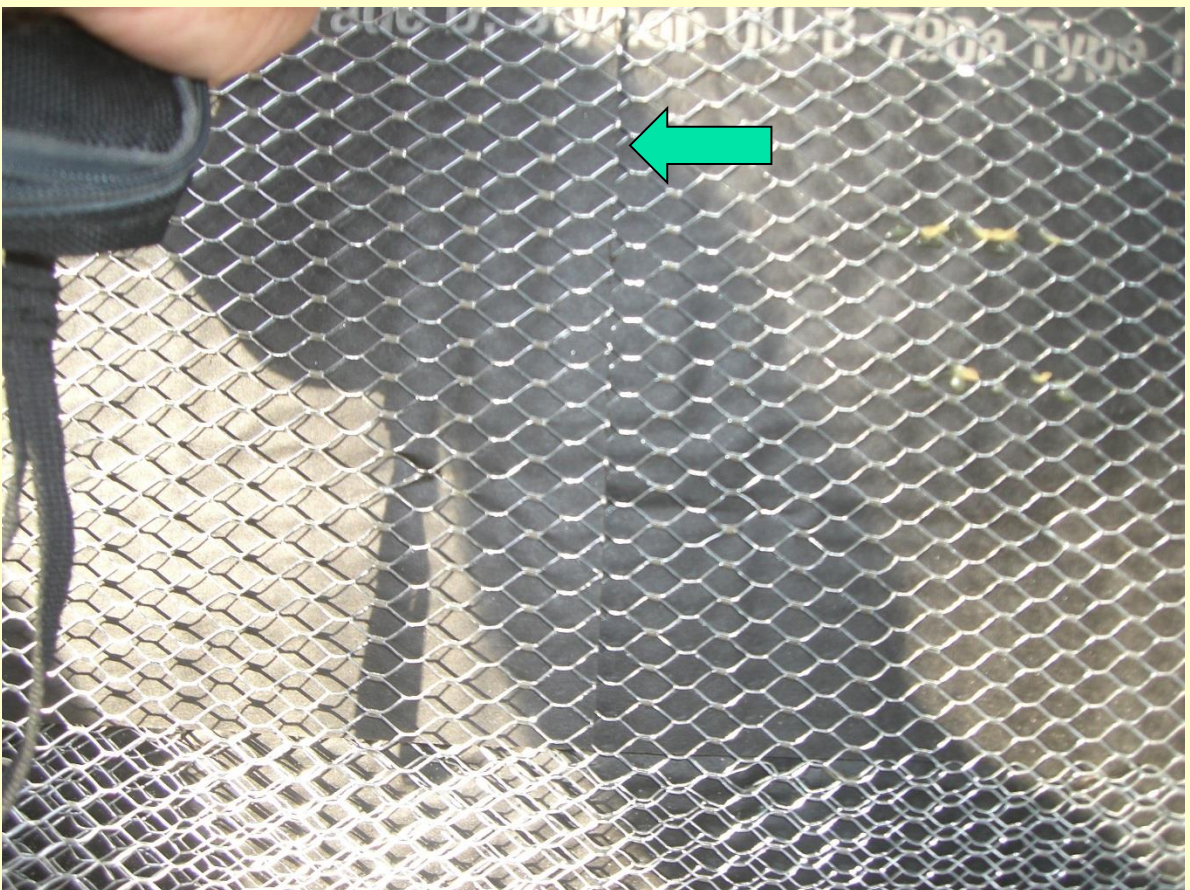
# 'Incorrect' Lath Installation

- North Wall lath installation
- Paper was not cut back on the vertical lap
- Installed July 10<sup>th</sup> 2015



# 'Incorrect' Lath Installation

- North Wall lath installation
- Paper was not cut back on the vertical lap
- Installed July 10<sup>th</sup> 2015





# 'Incorrect' Lath Installation

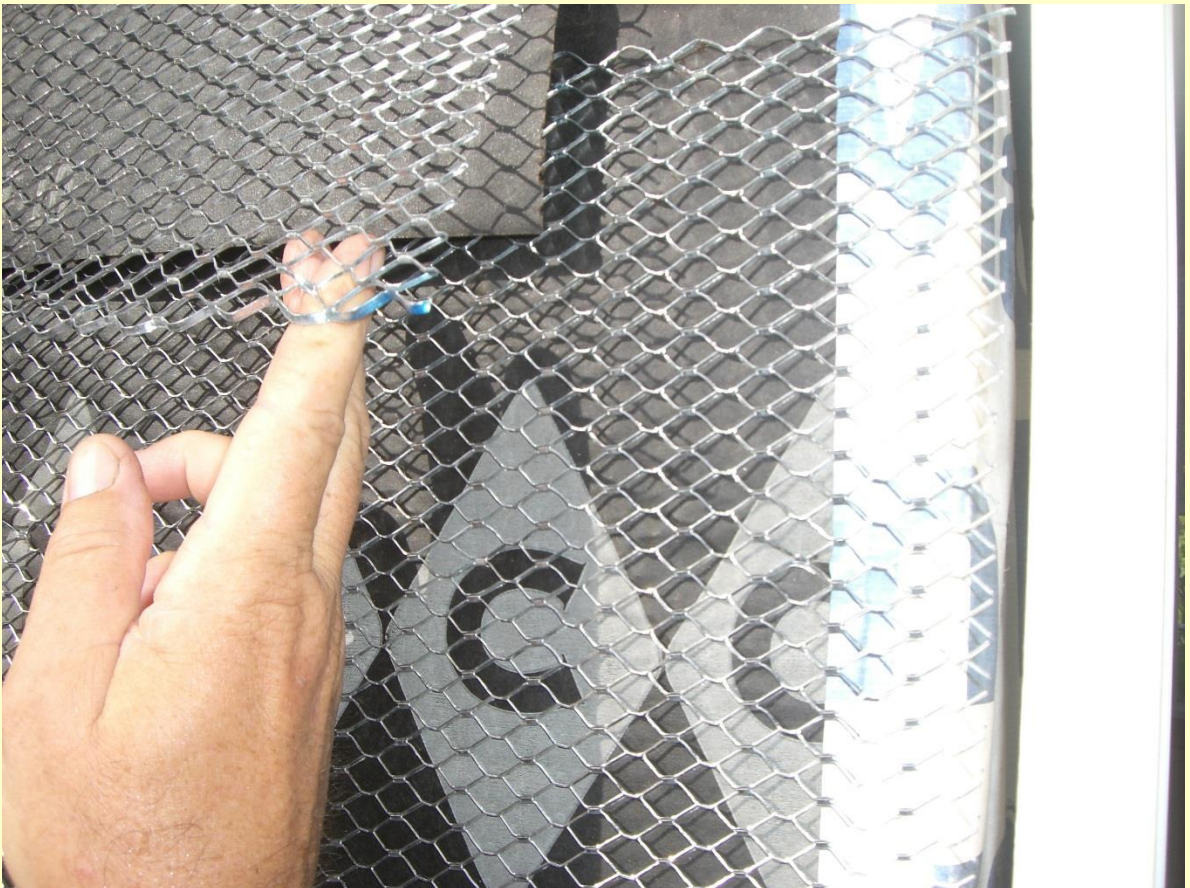
- North Wall lath installation
- Horizontal Lap in this area was installed with Paper over metal
- Installed July 10<sup>th</sup> 2015





# 'Incorrect' Lath Installation

- North Wall lath installation
- Horizontal Lap in this area was installed with Paper over metal
- Installed July 10<sup>th</sup> 2015





- West Wall lath installation
- Structalath installed directly over Tyvek Housewrap
- Installed July 10<sup>th</sup> 2015



- East wall lath installation
- Amico Wire Lath installed directly over Tyvek Housewrap
- Installed July 11<sup>th</sup> 2015





- South Wall lath installation
- Structalath installed directly over Tyvek Housewrap
- Installed July 10<sup>th</sup> 2015



- North Wall
- Stucco Installed 6/24/2015
- Cured for 19 days before any crack documentation
- All walls densified except east wall





- West Wall
- Stucco Installed 6/24/2015
- Cured for 19 days before any crack documentation
- All walls densified except east wall



- East Wall
- Stucco Installed 6/24/2015
- Cured for 19 days before any crack documentation
- East wall not densified





- South Wall
- Stucco Installed 6/24/2015
- Cured for 19 days before any crack documentation





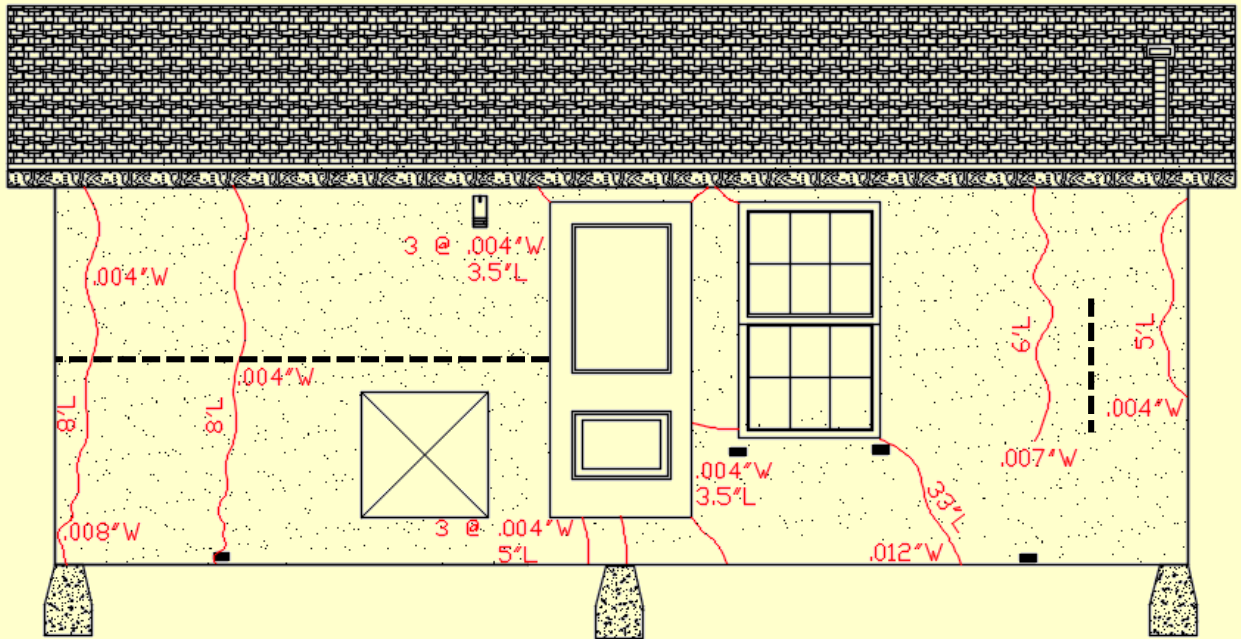






# Curing and Cracking

# North (Front) Elevation

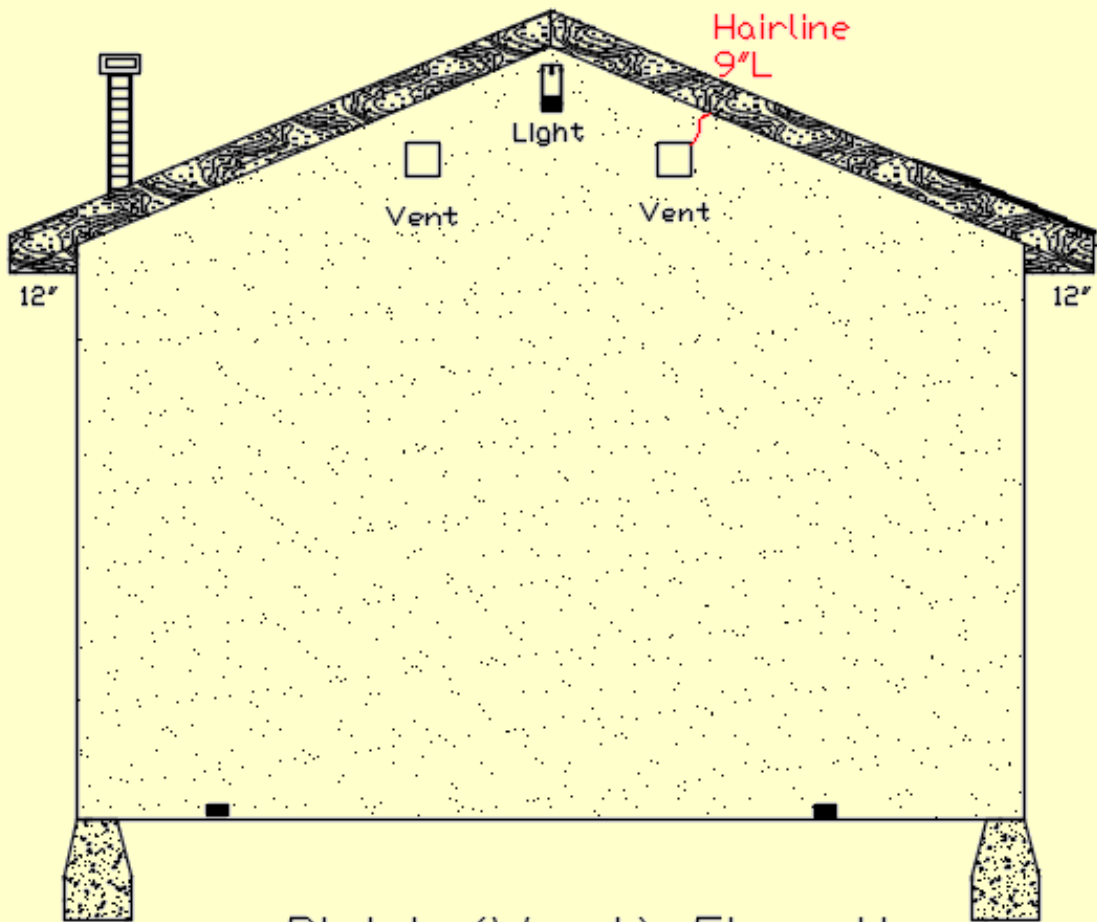


Front (North) Elevation

- The configuration on the front (North) elevation were as follows
- Traditional Amico Self Furring Paper back metal lath was installed over Tyvek Housewrap
- A 5/8" of stucco was installed over the lath and left to cure for 19 days.
- The above cracks were observed after the curing and settling process.
- The Horizontal dashed line represents a deliberate installation of a 2" lap of paper over metal
- The vertical dashed line represents a vertical lap where the paper extended to the edge of the metal and was not cut back

Area in SF	LF Cracks	LF Cracks PSF
192	31.583	.16

# West (Right) Elevation



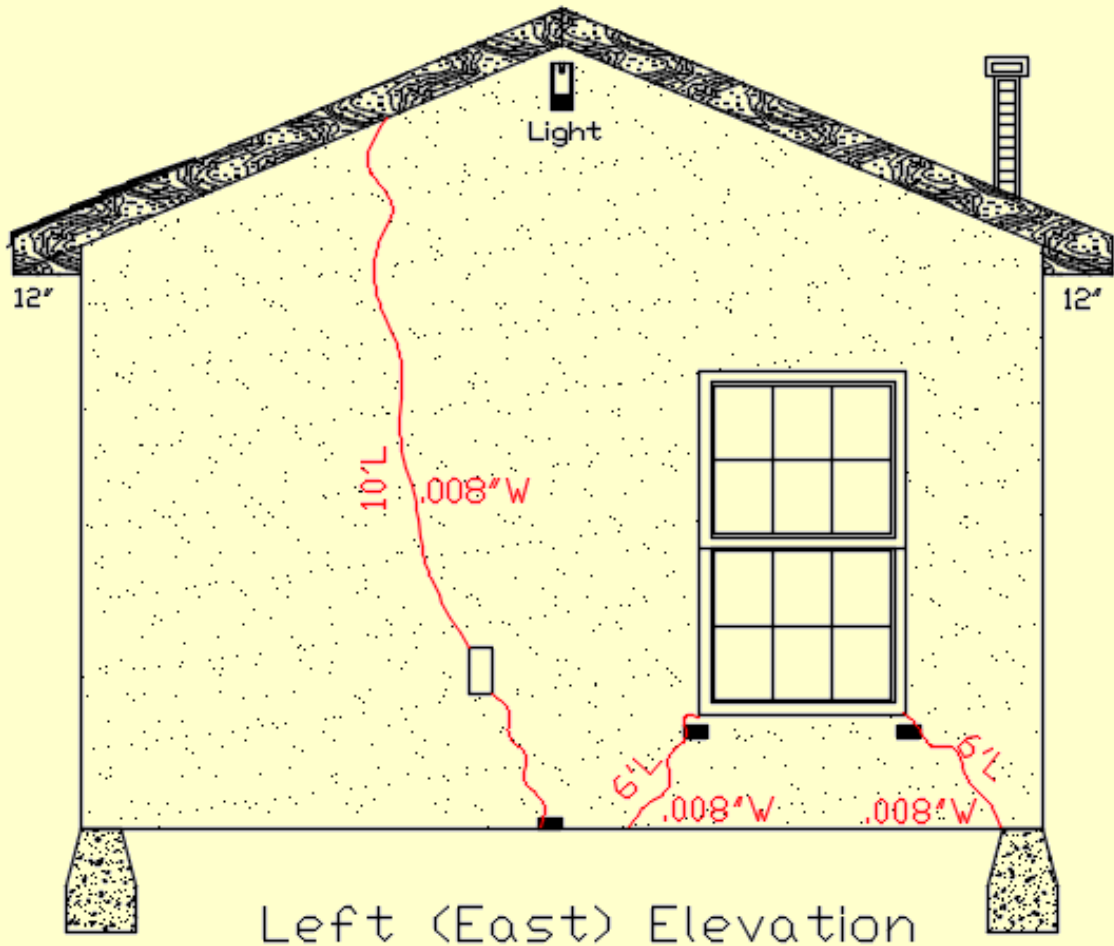
Right (West) Elevation

- The configuration on the Right(West) elevation were as follows:
- StructaWire StructaLath installed directly over Tyvek Housewrap
- A 5/8" stucco assembly was installed over the lath and left to cure for 19 days.
- One visible diagonal crack was observed at a penetration (Vent) approximately 9" in length at the top of the wall.
- The above crack was observed after the curing and settling process.

Area in SF	LF Cracks	LF Cracks PSF
140	.75	.01



## East (Right) Elevation

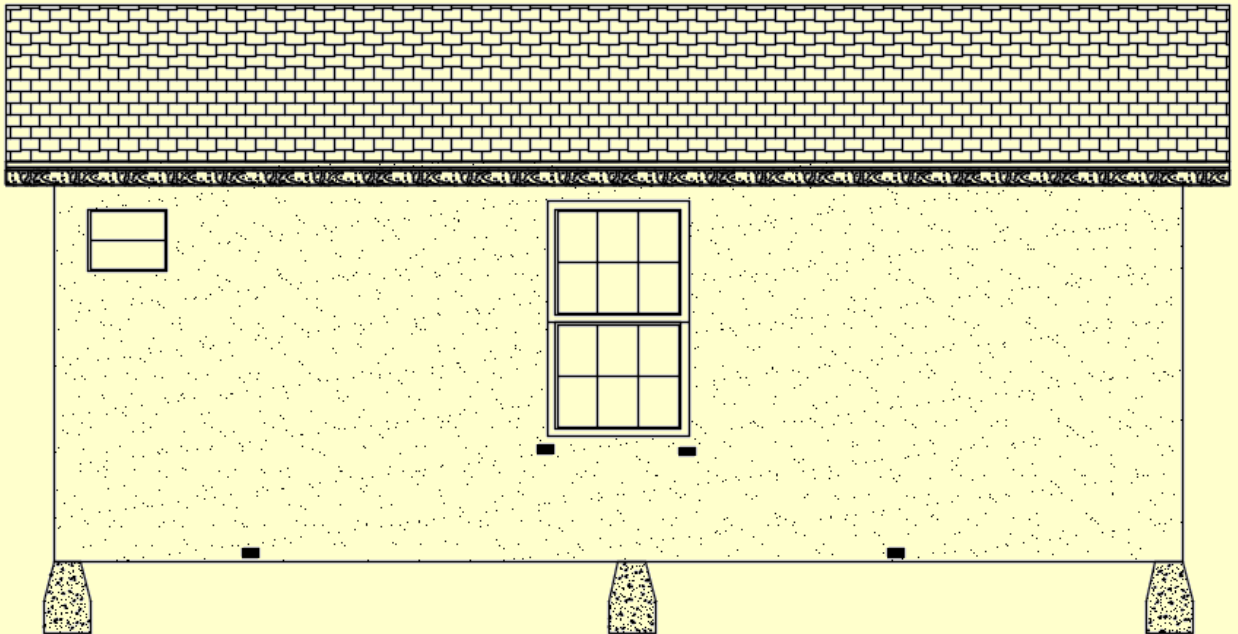


- The configuration on the front (North) elevation were as follows
- Traditional Amico Self Furring metal lath was installed directly over Tyvek Housewrap
- A 5/8" of stucco was installed over the lath and left to cure for 19 days.
- The above cracks were observed after the curing and settling process.

Area in SF	LF Cracks	LF Cracks PSF
140	22	.16

# South (Rear) Elevation

No Visible Cracks



Rear (South) Elevation

- The configuration on the Rear (South) elevation were as follows:
- StructaWire StructaLath Installed directly over Tyvek Housewrap
- A 5/8" of stucco was installed over the lath and left to cure for 19 days.
- No visible cracks were observed on this wall

Area in SF	LF Cracks	LF Cracks PSF
192	0	0

# Coating and Sealing



- North Wall
- Painted on - 7/22/2015
- 12mil DFT Acrylic (Loxon XP)



- West Wall
- Painted on - 7/22/2015
- 12mil DFT Acrylic (Loxon XP)





- East Wall
- Painted on - 7/22/2015
- 12mil DFT Acrylic (Loxon XP)





- South Wall
- Painted on - 7/22/2015
- 12mil DFT Acrylic (Loxon XP)



# Updated Cracking Monitoring and Information – Post Original Coating and Sealing

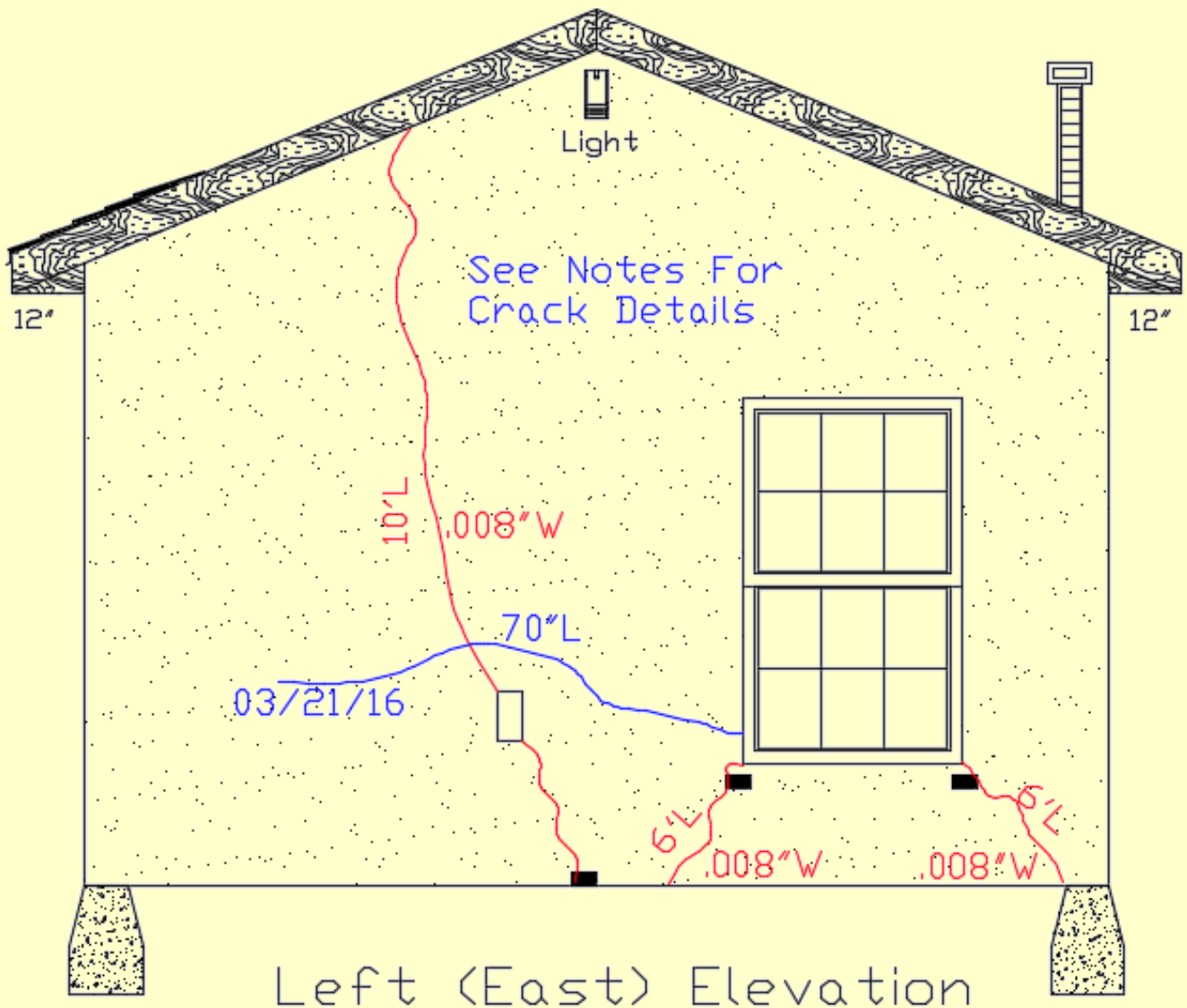


- Weekly Weather High and Low reports
- March 17-20, 2016
  - Highs – 79-86°
  - Lows – 70-79°
- March 21, 2016 – Crack appears after cold front moves in – 70" long and .006"-.007" in width
  - High – 68°
  - Low – 52°
  - Humidity - 31%
- March 23, 2016 – Crack appeared to shrink – from .007" to .004" – or "closed-in."
  - High – 79°
  - Low – 59°
  - Humidity – 38%



# Post Painting Fractures Developed March 21, 2016

Blue = New Crack (Post Coating)  
Red = Existing (During Curing)



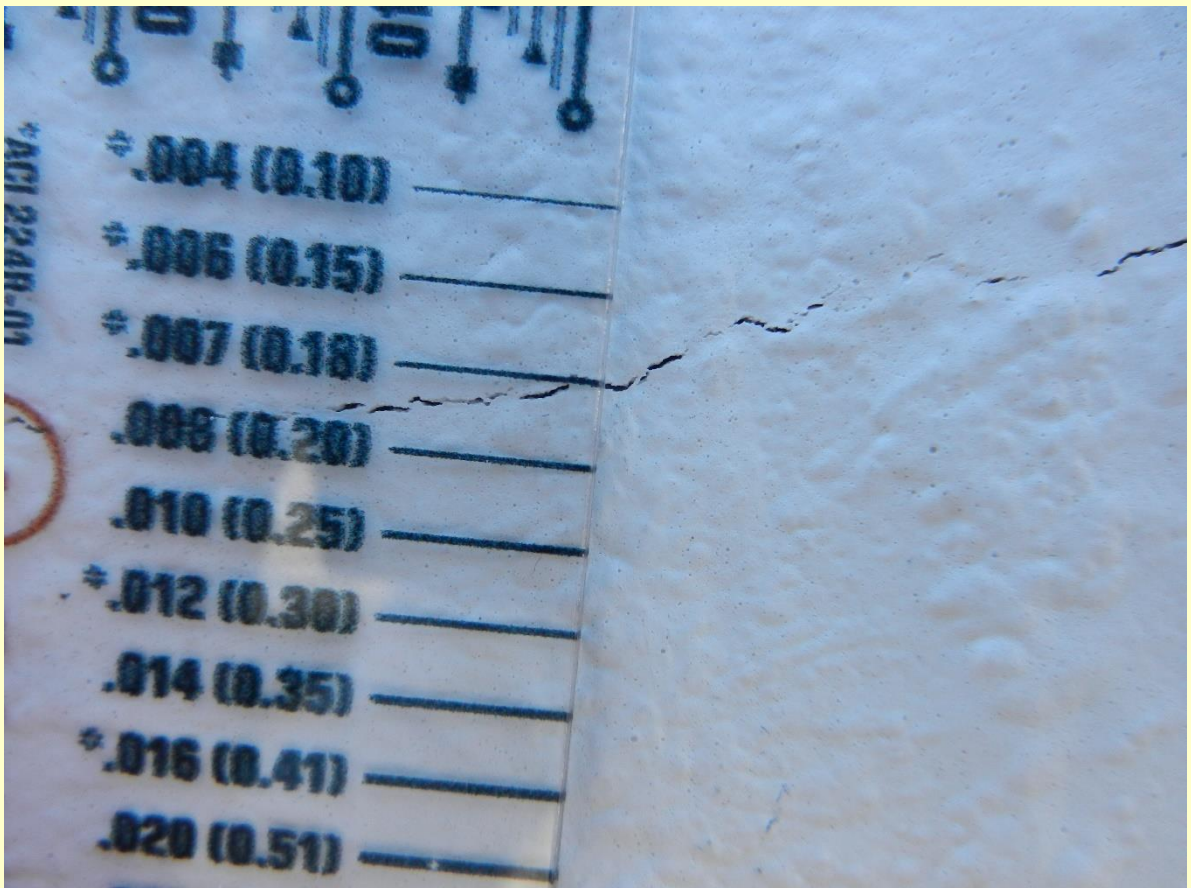
- The fracture appeared on March 21, 2016, after a cold front had passed through the area, dropping the temperatures to the low 50s. It is important to note that this fracture had not appeared during our initial crack identification before painting. It is also important to note that the cracking only occurred in the areas that were covered by the expanded metal lath. The areas that were covered with StructaLath still maintained zero cracks.
- Our hypothesis to why this has happened: The StructaLath has less mass and is a more rigid product than the expanded metal lath. The StructaLath provides more reinforcement with less mass than the other products. Therefore temperature induced changes in the metal mass and expanded the "diamond lath" at a greater rate than the cementitious stucco attached to it. That induced stresses that are causing cracking, further tests are warranted. However, the fracture has closed up during warmer temperatures and therefore will be monitored for future changes.

- As far as waterproofing, the initial fracture is too fine to allow water penetration to any measureable amount causing damage, and when closed in warmer temperatures like the summer months the fracture will be closed up therefore preventing any water intrusion.



## Post Painting Fracture

- 3/21/2016
- Fracture appears after cold front. .007" in width
- East Wall



# Post Painting Fracture

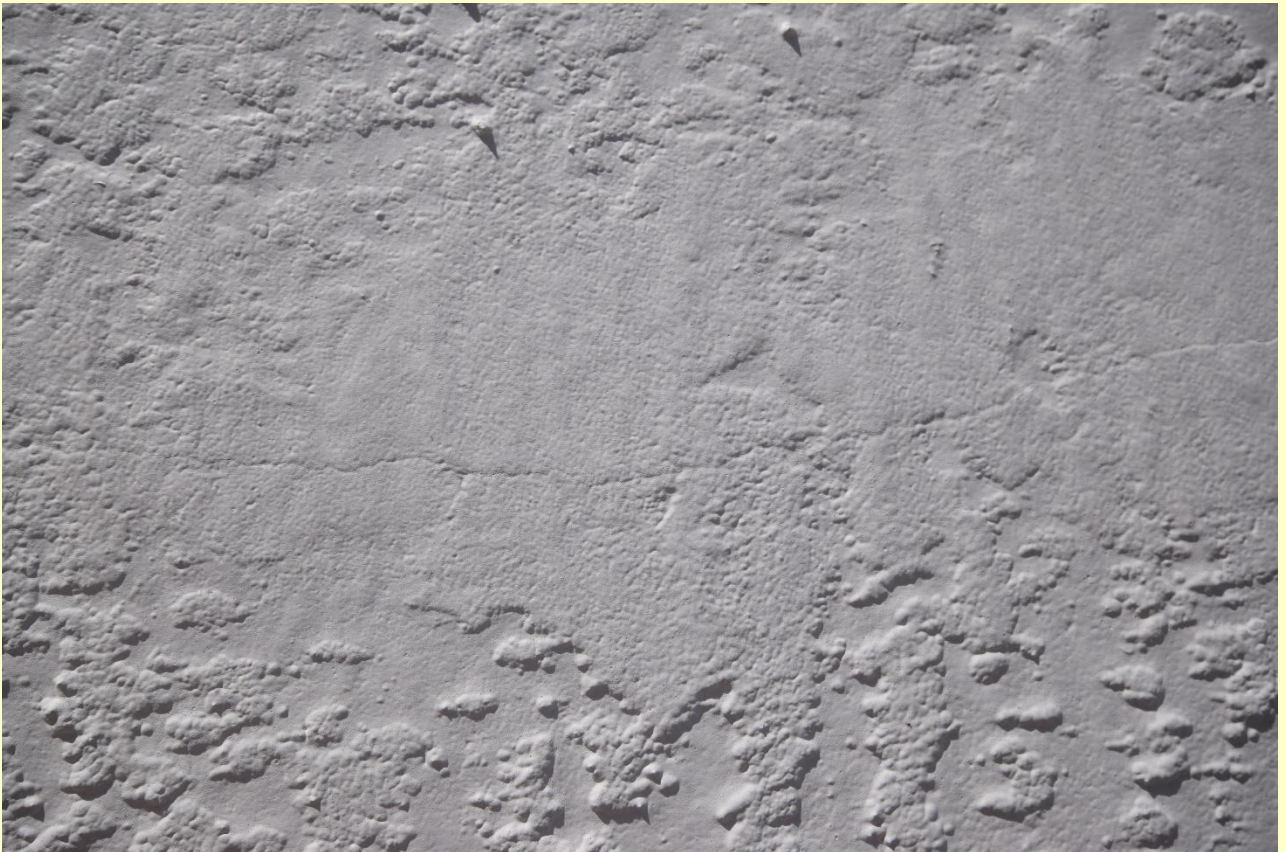
- 3/23/2016
- Fracture shrunk from .007" to .004", closed in certain areas
- East Wall





# Post Painting Fracture

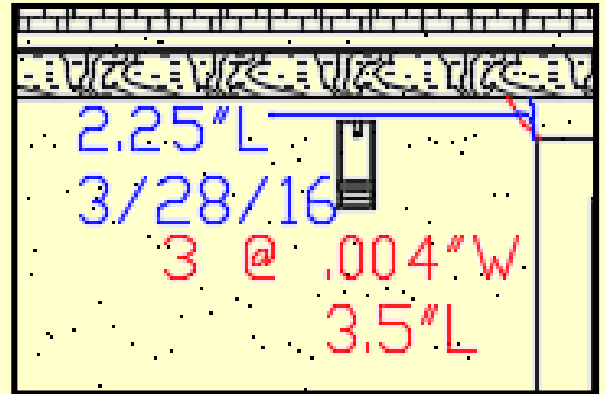
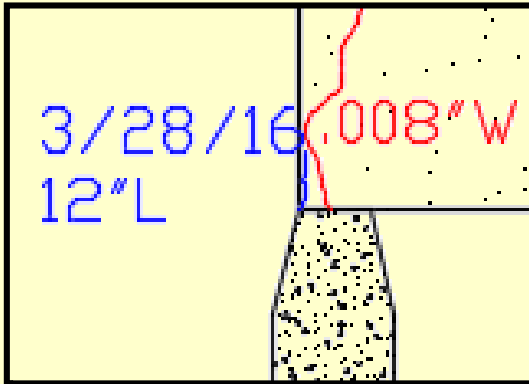
- 3/23/2016
- Fracture closed in most areas
- East Wall



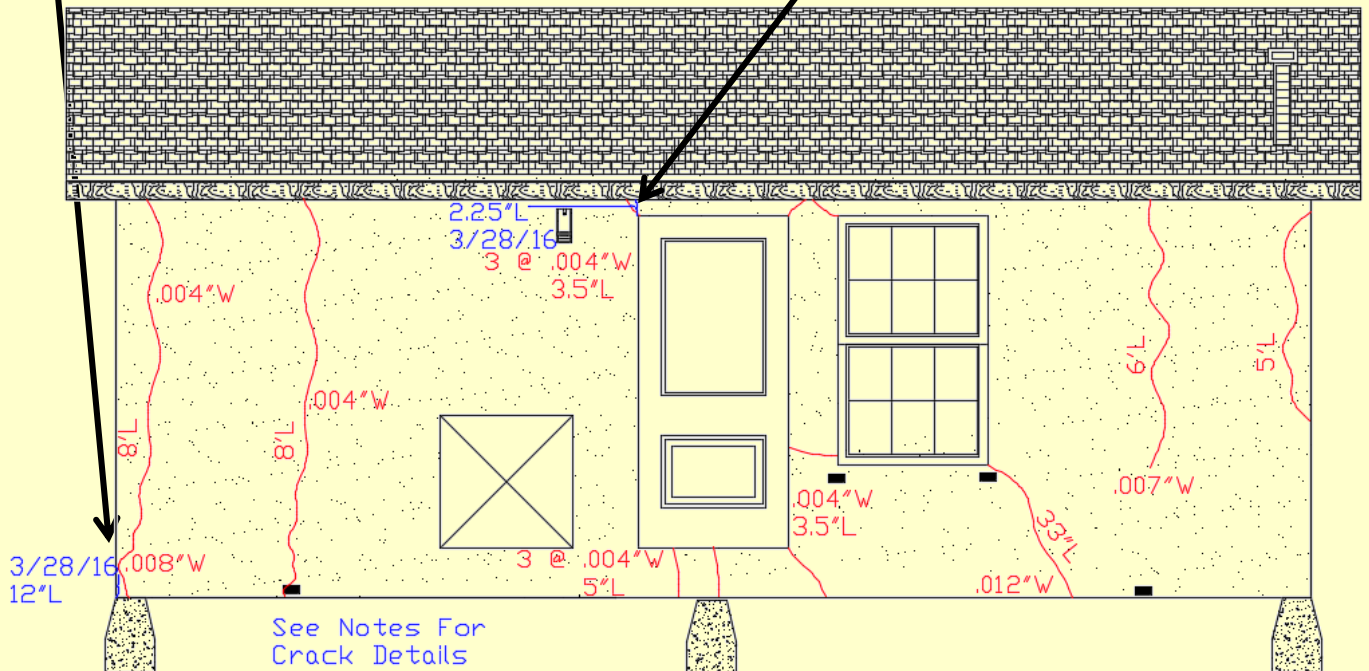


# 3/28/2016 Updated Crack Information

# Post Painting Fractures Developed March 28, 2016



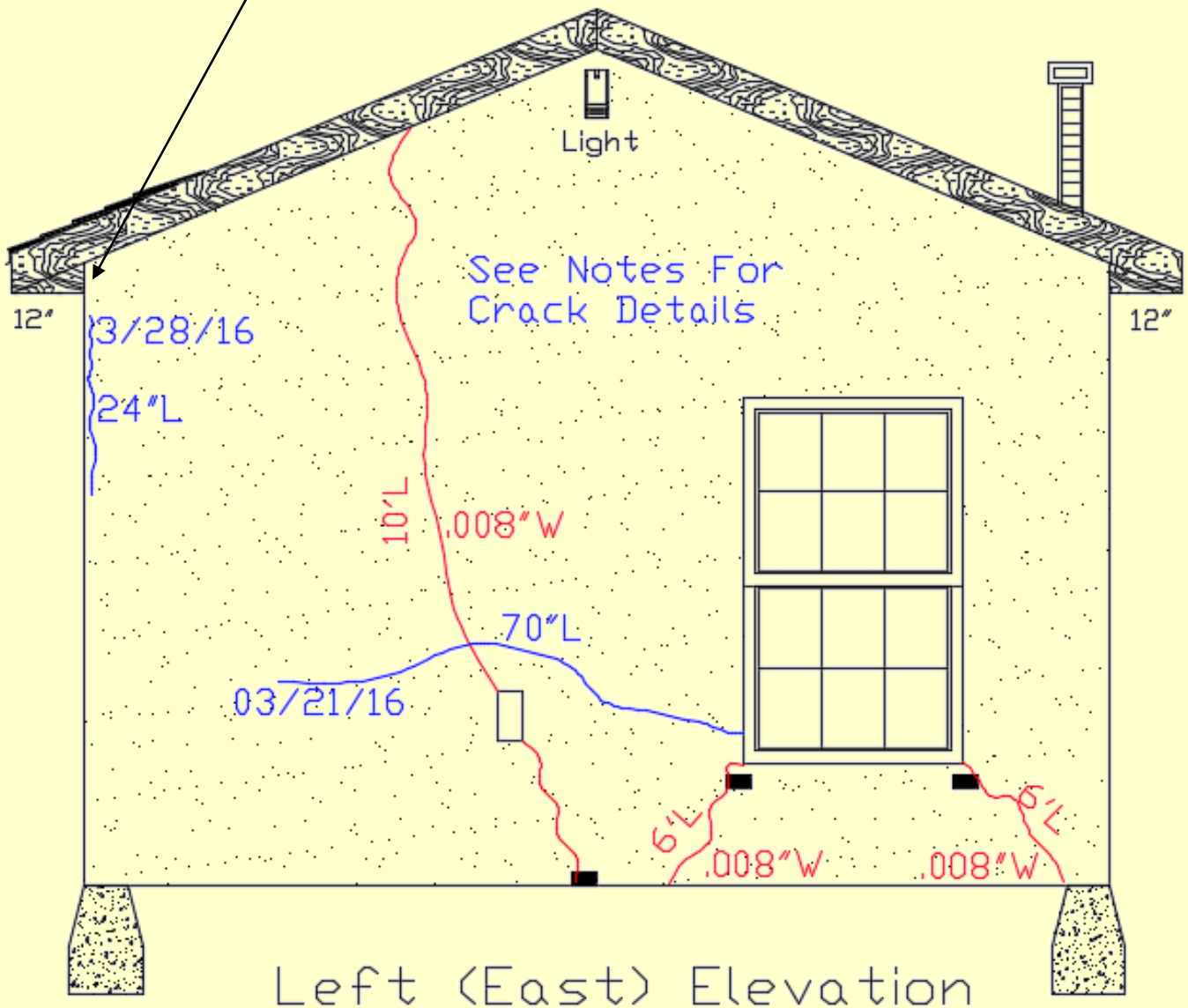
Blue = New Crack (Post Coating)  
Red = Existing (During Curing)



Front (North) Elevation

# Post Painting Fracture Updated March 28, 2016

Developed on March 28,  
2016





# Post Painting Fracture Updated March 28, 2016

- 3/28/2016
- New Crack Developed
- East Wall



# Post Painting Fracture

Updated March 28, 2016

- 3/28/2016
- New Crack Developed
- North Wall



# Post Painting Fracture

Updated March 28, 2016

- 3/28/2016
- New Crack Developed
- North Wall





# Post Painting Fracture Updated March 28, 2016

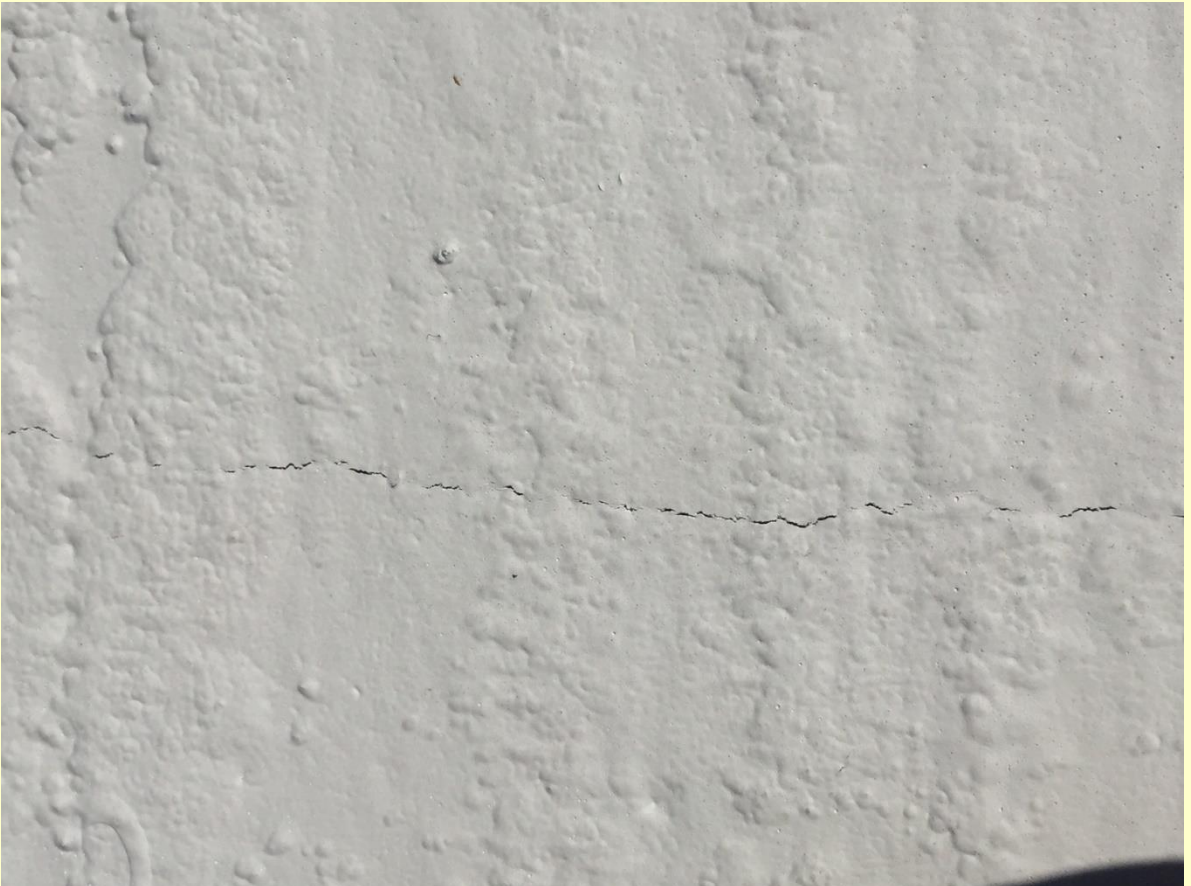
- 3/28/2016
- New Crack Developed
- North Wall



# Post Painting Fracture

## Updated March 28, 2016

- First Developed Crack Update
- After another cold front crack expanded to the original .007"



Although minor, none of these cracks  
appeared on the walls with Structa  
Wire



## SEALED STUCCO SYSTEM

- For more information on the standards and installation practices, refer to the Sealed Stucco System at: [www.sealedstuccosystem.com](http://www.sealedstuccosystem.com)
- The sealed stucco system is simply the traditional stucco application process used in Florida's type climate for over 40 years with some modern modifications and products.
- The system has been laboratory tested and approved.
- My Florida Code is a Public Code Discussion Forum for Florida Code, Construction and Licensing Issues, Downloads and Links

- [www.myfloridacode.org](http://www.myfloridacode.org)

