

SURFACE DRAINAGE

Surface drainage is critical to the performance of foundations, floor slabs and concrete flatwork. Recommendations in this report are based on effective drainage for the life of the structure and cannot be relied upon if effective drainage is not maintained. We recommend the following precautions be observed during construction and maintained at all times after construction is completed:

1. The ground surface surrounding the exterior of the building should be sloped to drain away from the building in all directions. We recommend providing a slope of at least 12 inches in the first 10 feet in landscape areas. There are instances where this slope cannot be achieved. A slope of 6 inches in the first 10 feet should be used as a minimum. We recommend a slope of at least 3 inches in the first 10 feet in paved areas. A swale should be provided around the uphill side of the building to divert surface runoff.
2. Backfill around the exterior of foundation walls should be placed as described in Foundation Wall Backfill. Increases in the moisture content of the backfill soils after placement often results in settlement. Settlement is most common adjacent to north facing walls. Re-establishing proper slopes (homeowner maintenance) away from the building may be necessary.
3. Landscaping should be carefully designed to minimize irrigation. Plants used near foundation walls should be limited to those with low moisture requirements; irrigated grass should not be located within 5 feet of the foundation. Lawn sprinklers should not discharge within 5 feet of the foundation and should be directed away from the building. Low-volume emitters can be used within 5 feet of the foundation.

LISCOTT CUSTOM HOMES, LTD.
PROPOSED RESIDENCE
LOT 5, BLOCK 16, WHISPERING PINES RANCH SUB #8
CTL | THOMPSON PROJECT NO. SU01733.000-120
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4. Impervious plastic membranes should not be used to cover the ground surface immediately surrounding the building. These membranes tend to trap moisture and prevent normal evaporation from occurring. Geotextile fabrics can be used to control weed growth and allow some evaporation to occur.
5. Roof downspouts and drains should discharge well beyond the limits of all backfill. Splash blocks and/or extensions should be provided at all downspouts so water discharges onto the ground beyond the backfill. We generally recommend against burial of downspout discharge. Where it is necessary to bury downspout discharge, solid, rigid pipe should be used and it should slope to an open gravity outlet. Buried downspout discharge pipes should be heated (with thermostat) during winter months to prevent freezing. Downspout extensions, splash blocks and buried outlets must be maintained by the homeowner.

The costs to properly address this condition and any costs associated with this work is the responsibility of the Liscott.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 4, DLC, 101 Mule Deer Court, no drainage swale in place to direct water away from the foundation.



May 17, 2023, Disc OBS1, Photograph 8, DLC, 101 Mule Deer Court, spoil materials piled without a swale to direct water off the site.



May 17, 2023, Disc OBS1, Photograph 9, DLC, 101 Mule Deer Court, spoil materials piled without a swale to direct water off the site.



May 17, 2023, Disc OBS1, Photograph 10, DLC, 101 Mule Deer Court, spoil materials piled without a swale to direct water off the site.



May 17, 2023, Disc OBS1, Photograph 12, DLC, 101 Mule Deer Court, spoil materials piled without a swale to direct water off the site.



Owner provided photo showing water coming through the basement window.

b. Foundation Excavation and Backfill

At the time of the site observation, the materials that had been placed as backfill had been removed, due to improper placement and compaction. The Homeowner noted that Liscott had simply pushed the material into the excavation in deep lifts and then drove over it with a mini-excavator to try and achieve the necessary compaction. CTETS also understands that the material used by Liscott for the backfilling was not clean structural fill, but instead was the native soils originally excavated. The native soils observed, and currently left on-site, contain significant amount of cobbles and other unacceptable materials.

The backfilling and compaction should have been done by placing the fill materials in lifts of approximately 6- to 10-inches then use a smaller roller type compactor. This will result in proper consolidation of the materials and compaction. Use of the smaller roller type equipment will also minimize the potential for damage to the foundation wall by reducing the imposed excess surcharge loads placed on the wall.

The local building codes and industry standards require proper soil preparation. The international Code Council (ICC) publication titled "2018 IRC® Code and Commentary," Chapter 4, "Foundations," Section 401 "General," Subsection 401.2 "Requirements," states the following:

- ***"R401.2 Requirements.*** *Foundation construction shall be capable of accommodating all loads in accordance with Section 301 and of transmitting the resulting loads to the*

supporting soil. Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice."

The Manufactured Housing Research Alliance publication titled, "Manufactured Home Installation Guide," 2008, Section "Prepare the Site," states the following:

- *"Step 4. Determine Soil Conditions*

...

The soil under every portion of the support system must meet the following criteria:

- *The soil must be firm and undisturbed (not previously excavated) or fill compacted to at least 90% of its maximum relative density. Uncompacted fill will settle over time, causing the home to shift and become unlevel.*
- *Fill must not contain large debris. This too will settle over time."*

Sheet T1.1 indicated that the backfill was to be placed in equal lifts on the foundation to reduce loading and allow for proper compaction in 12 inch maximum lifts

EARTHWORK AND FOUNDATION NOTES:

CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO - UNCC PRIOR TO ANY EXCAVATIONS AT 811 TO HAVE ALL BURIED UTILITIES LOCATED. CONTRACTOR SHALL ALSO LOCATE THE WELL SUPPLY LINE AND SEPTIC DRAIN WHEN APPROPRIATE.

FOUNDATION ELEMENTS SHALL BE SUPPORTED ON UNDISTURBED NATURAL SOILS OR ENGINEERED FILL COMPACTED APPROVED BY THE SOILS ENGINEER. BACKFILL SHALL BE COMPACTED TO 90% (MINIMUM) MODIFIED PROCTOR DENSITY PER ASTM D1557 UNLESS OTHERWISE RECOMMENDED IN THE SOILS REPORT OR GEOTECHNICAL ENGINEER. IF SOFT SPOTS ARE ENCOUNTERED REMOVE SOIL AND RE-COMPACT WITH APPROVED FILL. FOUNDATIONS, FOOTINGS AND WALLS ARE DESIGNED ASSUMING NON-EXPANSIVE SOILS WITH A MINIMUM BEARING CAPACITY OF 3000 PSF. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY UNANTICIPATED SOILS CONDITIONS.

INTERIOR CONCRETE SLABS TO BE PLACED OVER 12-MIL (MIN) ASTM E 96 CLASS I MOISTURE BARRIER/VAPOR RETARDER (PERM RATING LESS THAN 0.1), SEAMS OVERLAPPED 6" AND SEALED WITH TAPE AND SEALED TO THE FOUNDATION ELEMENTS WITH 2-SIDED BUTYL RUBBER TAPE.

CONTRACTOR SHALL BACKFILL EQUALLY ON EACH SIDE OF FOUNDATION WALLS IN 12 INCH MAXIMUM VERTICAL LIFTS WITH NATIVE SOILS OR AS RECOMMENDED IN THE SOILS REPORT. REFER TO SOILS REPORT FOR BACKFILL MATERIAL.

DO NOT BACKFILL AGAINST ANY FOUNDATION WALLS HAVING A HEIGHT GREATER THAN 4'-0" UNTIL THE CONCRETE HAS REACHED 2250 PSI STRENGTH AND THE BASEMENT FLOOR SLAB, OR STRUCTURAL BASEMENT SUBFLOOR, AND FIRST FLOOR FRAMING (INCLUDING SUBFLOOR, JOIST-TO-BILL CONNECTIONS, AND RIM JOIST BLOCKING) ARE COMPLETELY IN PLACE. AS AN ALTERNATE, THE TOPS OF THE WALLS SHALL BE BRACED EVERY 8 FEET MAXIMUM WITH STEEL PIPE BRACES SIMILAR TO TILT-UP CONCRETE PIPE BRACES HAVING A MINIMUM CAPACITY OF 2500 POUNDS, WITH BOLTS OR DEADMAN AT THE BOTTOM OF THE BRACES HAVING SIMILAR CAPACITY. COMPACT BACKFILL TO 85% RELATIVE DENSITY.

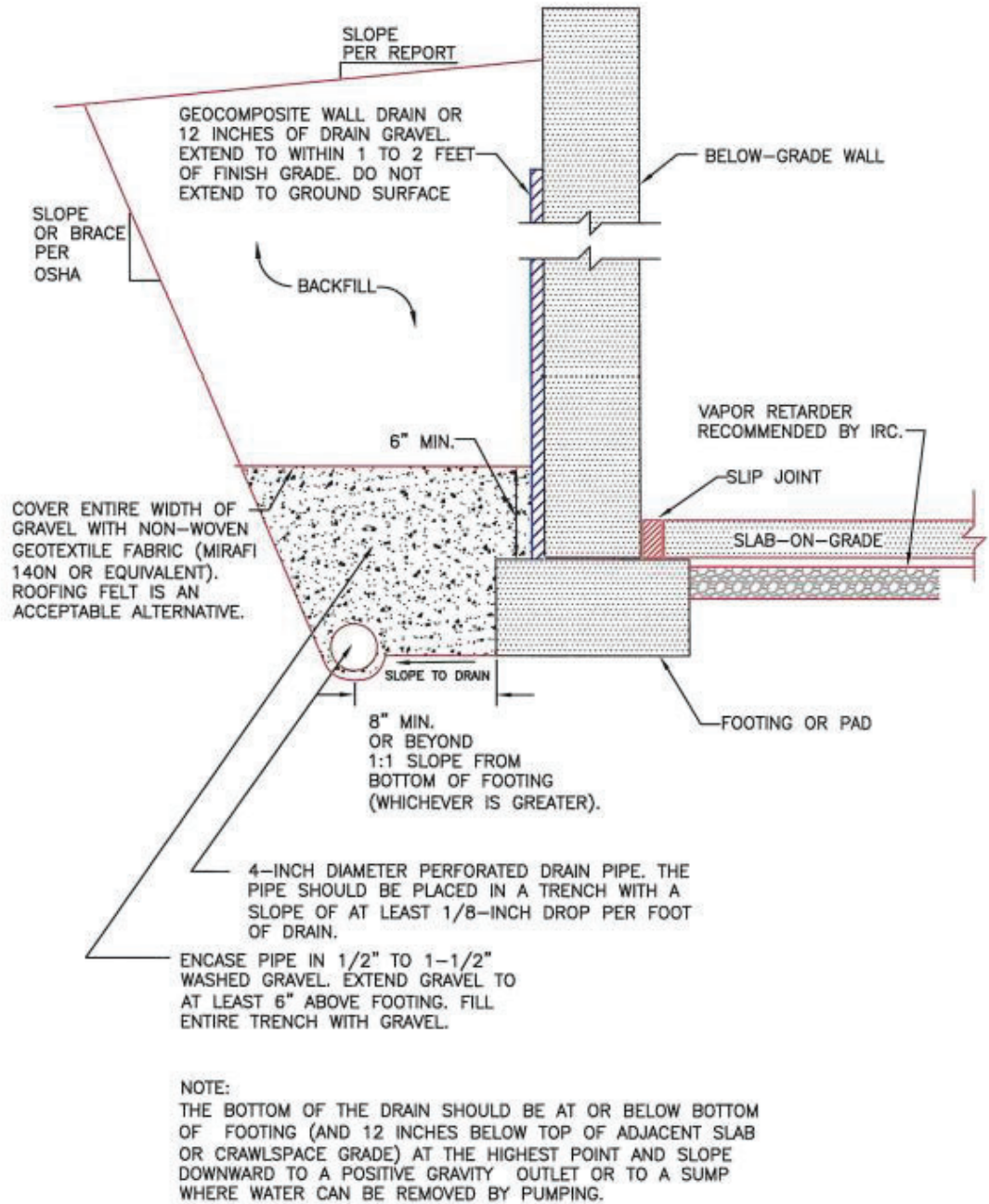
NOTIFY SOILS ENGINEER WHEN EXCAVATION IS COMPLETED SO THAT CONDITIONS MAY BE INSPECTED PRIOR TO PLACEMENT OF ANY FILL OR CONCRETE.

FINISHED EXCAVATION FOR FOUNDATION SHALL BE NEAT AND TRUE TO LINE WITH ALL LOOSE MATERIAL AND STANDING WATER REMOVED FROM EXCAVATIONS.

As stated previously the CTL Thompson report prepared for Liscott provided the minimum requirements for the backfill.

Foundation Wall Backfill

Proper placement and compaction of foundation backfill is important to reduce infiltration of surface water and settlement of backfill. Backfill which will support surface improvements (sidewalks, driveways, etc.) should be placed in thin loose lifts, moisture conditioned to within +/-2 percent of optimum moisture content, and compacted to at least 95 percent of ASTM D 698 maximum dry density. We recommend using imported granular soils (CDOT 4, 5, or 6 road base or similar soil) in pavement and walkway areas. Backfill in landscape areas should be compacted to at least 90 percent of ASTM D 698 maximum dry density. The natural clay soils can be used as backfill in landscape areas, provided they are free of rocks larger than 6 inches in diameter, organics, and debris. Clay backfill should be placed at a moisture content slightly above optimum to reduce expansion potential. The upper 2 feet of fill should be a relatively impervious material to limit infiltration. Thickness of lifts will likely need to be reduced if there are small confined areas of backfill, which limit the size and weight of compaction equipment. Some settlement of the backfill should be expected even if the material is placed and compacted properly. In our experience, settlement of properly compacted granular backfill could be on the order of 0.5 to 1 percent of backfill thickness. Backfill with on-site clay soils could have a slightly higher (1 to 2 percent) settlement or heave potential. Methods to reduce the risk of backfill settlement or heave include using a granular material and increasing the minimum compaction level. Moisture content and density of the backfill should be tested during placement by a representative of our firm.



EXTERIOR FOUNDATION WALL DRAIN

Figure 8

Project No. SU01733.000-120

As a result of the improper backfill and compaction, the footings and foundations for the porches and other attached structures had experienced excess settling and had to be removed. In addition, some of the out-of-plumb wall conditions appear related to the contractor's backfill efforts (noted in the offset framing at the sill plate). These items will be reconstructed after the proper backfill and compaction has been achieved.

It is CTETS's opinion that Liscott is responsible for this failure and any costs associated with the demolition, repairs, and reconstruction of this work is the responsibility of Liscott.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 23, DLC, 101 Mule Deer Court, improper backfill and poor support of gas meter and line at south elevation.



May 17, 2023, Disc OBS1, Photograph 29, DLC, 101 Mule Deer Court, backfilling along west elevation.



May 17, 2023, Disc OBS1, Photograph 31, DLC, 101 Mule Deer Court, improper backfill at southwest corner of structure.



May 17, 2023, Disc OBS1, Photograph 37, DLC, 101 Mule Deer Court, backfilling along west elevation.

c. Incomplete Site Flatwork

As of the date of the site observation, none of the concrete site flatwork has been completed.

The General Contractor Agreement between Liscott Homes (Contractor) and Ben and Holly Smith (Owner), signed and dated December 19, 2020, states the following:

- *“2.) Scope of Work: Subcontractor agrees to assist Contractor in coordination of operations on said property, including:*

Site work for new home, foundation, New Custom System Built home installation, garage, water and sewer tie-ins, porches, walkways, inspections, labor and equipment to provide a Final CO. All GC work will be detailed on the schedule of values provided on the invoice, the SOV will be contractual. These numbers are estimates and subject to change during construction.”

- *6.) Warranty: Contractor warrants that all materials and equipment furnished under the Contract Agreement shall be new and in conformance with the Contract Documents.”*

The Manufactured Housing Research Alliance publication titled, “Manufactured Home Installation Guide,” 2008, Section “Complete Exterior Work,” states the following:

- *“Step 5. Complete Site Built Structures*

Install site-built structures such as steps, landings, garages, awnings, carports, breezeways, porches, decks, railings, sheds, and utility rooms according to manufacturer’s instructions (if any), in compliance with all local regulations including fire separation and electrical requirements, and according to the following:

- *Do not obstruct any of the two required exit doors from the home.*
- *Construct site-built structures to be structurally independent unless provided for in the design of the home (instructions will be provided by the manufacturer).*
- *Do not damage the integrity of the home’s structural or weatherproofing system. Seal any weatherproofing connections between the site-built structure and the home and flash any roof connections.*
- *Utilize only GFCI outlets for site-built structures.*
- *Install and test smoke alarms in any site-built structures according to local code.”*

These items are considered to be included in Liscott’s scope or work. Therefore, any costs to complete these items are the responsibility of Liscott.

d. Out-of-plumb Utilities in the Backfill Zone

This item is discussed further in Section E.3.c below.

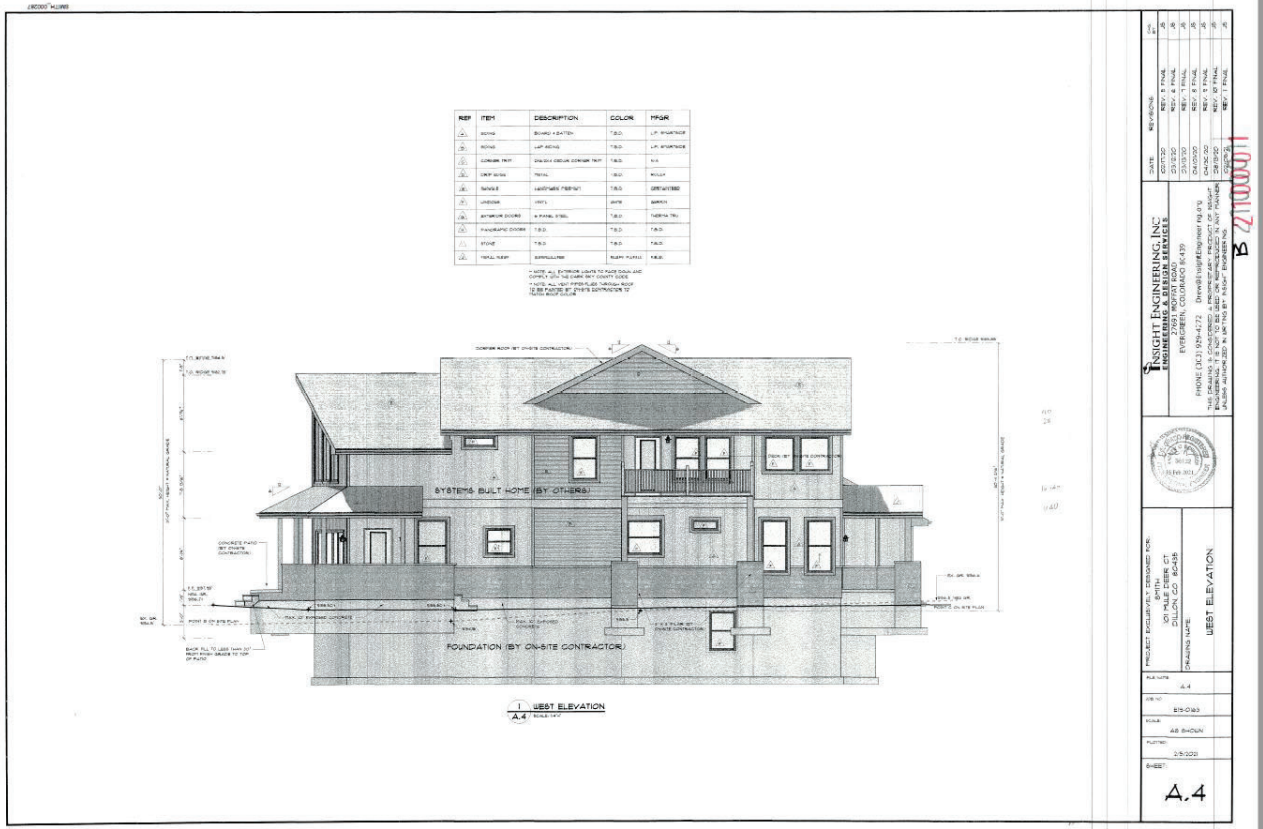
C. BUILDING ENVELOPE

The exterior façades are generally a board and batten panel siding and trim with a cultured stone wainscoting. Although the Heritage Homes elevation drawings call for the siding materials to be LP SmartSide products, the manufacturers of the façade materials are not definitively known at this time. There were not loose pieces of the siding and trim components visible during the site visit; therefore,

no material labeling of the siding was noted or confirmed. Since the time of the site observation, CTETS has learned that the Owner has sample of the siding material provided by Heritage. CTETS will review this product and the associated information upon receipt.

The manufacturer of the faux stone is not known at this time. The site roofing is called out to be Landmark Premium asphalt shingles manufactured by CertainTeed. Areas of incomplete roofing work are present at the lower and upper roof areas.

According to Insight Engineering, the following materials were to be used:



REF	ITEM	DESCRIPTION	COLOR	MFGR
A	SIDING	BOARD & BATTEN	T.B.D.	L.P. SMARTSIDE
B	SIDING	LAP SIDING	T.B.D.	L.P. SMARTSIDE
C	CORNER TRIM	2X6/2X4 CEDAR CORNER TRIM	T.B.D.	N/A
D	DRIP EDGE	METAL	T.B.D.	ROLEX
E	SHINGLE	LANDMARK PREMIUM	T.B.D.	CERTAINTED
F	WINDOWS	VINYL	WHITE	GERKIN
G	EXTERIOR DOORS	6 PANEL STEEL	T.B.D.	THERMA TRU
H	PANORAMIC DOORS	T.B.D.	T.B.D.	T.B.D.
I	STONE	T.B.D.	T.B.D.	T.B.D.
J	METAL ROOF	CORRUGATED	RUSTY PATINA	T.B.D.

* NOTE: ALL EXTERIOR LIGHTS TO FACE DOWN AND COMPLY WITH THE DARK SKY COUNTY CODE

* NOTE: ALL VENT PIPES/FLUES THROUGH ROOF TO BE PAINTED BY ON-SITE CONTRACTOR TO MATCH ROOF COLOR

Based on the window stickers in the provided disclosures, the windows are WinTech (Bates Number_Smith_00306).

Each of the building’s vertical façade materials are considered moisture-managed systems. The façades themselves do not provide weather protection. Instead, the weather-resistive barrier (WRB) and related flashings behind the façades limit air and water intrusion into the building assemblies. Proper installation and integration of these materials is critical to the long-term performance of the property.

The construction of the building requires that the marriage components on the modularity be integrated with each other.

The following non-compliant conditions were discovered during CTETS’s visual site observations:

1. FAÇADE (EXTERIOR CLADDING AND SEALANTS) TYPE 1 – SIDING

The primary exterior claddings include siding, trim, and a stone veneer. None of these materials are considered to be a barrier system; therefore, it is expected that water will penetrate the face of the veneers as well as at interfaces between dissimilar materials. Each product also can absorb and release some water to a limited degree. However, the hygrothermal effects of the products cannot be relied on as a means to handle the wetting and drying. The elevations, solar exposure, and shadows all impact each area and each elevation will behave differently. Proper water shedding detailing is a necessity to allow for durability and performance of the cladding systems in the protection of the building components.

To compensate for the expectation of water migration through the cladding face, the exterior claddings, as installed, rely on a secondary WRB to minimize air and manage moisture infiltration that occurs past the exterior sheathing and into the wall cavity. This WRB and related flashings are required by the building code, cladding manufacturers, and industry standards, due to this expectation of cladding leakage. The WRB is a material that lies behind the façade claddings and over the exterior sheathing and is lapped in coordination with the flashing and weep systems to allow the water to move through the system and discharge away from the building with flashing and/or weep mechanism. These components, in whole, make up the moisture-management system.

Siding is a moisture-managed cladding, requiring the necessary detailing and installation to provide functional moisture management behind the system.

a. Non-Compliant or Incomplete Siding and Trim Installation

The exterior siding consists of a vertical panel and batten and horizontal lap siding above an approximately 4-foot high adhered pre-manufactured stone wainscot. As of the date of the site visit, approximately 50-percent of the surfaces called out to receive this siding material have been completed. The remaining consist of a Dupont Tuff-R ¾-inch foil face rigid foam board with dual reflective faces. Damage to the foil facing is present across all areas of this exposed surface.

Per the Heritage Homes drawings and notations shown at the details on sheet S2.1, the intent of the foil facing is to serve as a weather-resistive barrier. Drawing details 1, 3, and 4 on Sheet S2.1 state the following:

- *“3/4” foil faced rigid foam board R5.0 or better. All seams taped for weather-resistive barrier.”*

Any breaks, tears, or damage to this surface creates a location where moisture can reach the underlying rigid foam core. If moisture is allowed to reach this core, it can lead to moisture reaching the underlying moisture sensitive materials, which will result in a continuous and progressive deterioration of these materials. It will also lead to a reduction in the intended insulating value of this material. Any areas that are damaged need to be either removed and replaced or repaired in accordance with the manufacturer’s recommendations or procedure. All seams, joints, or other breaches of the foil surface must be sealed prior to the installation of the siding components.

The General Contractor Agreement between Liscott Homes (Contractor) and Ben and Holly Smith (Owner), signed and dated December 19, 2020, states the following:

- *“6.) Warranty: Contractor warrants that all materials and equipment furnished under the Contract Agreement shall be new and in conformance with the Contract Documents.”*

When the repairs or replacement is performed, additional care should be taken to ensure proper and full integration with the other building components and correct lapping at the flashings and fenestration openings.

As stated elsewhere in this report, in order to address all of the issues related to the siding and its related components, it is CTETS’s opinion that full removal and replacement of all siding components is necessary. It is also CTETS’s opinion that any costs associated with these repairs are the responsibility of Liscott.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 8, DLC, 101 Mule Deer Court, incomplete exterior siding installation at west elevation.



May 17, 2023, Disc OBS1, Photograph 9, DLC, 101 Mule Deer Court, incomplete siding installation at northeast elevation.



May 17, 2023, Disc OBS1, Photograph 11, DLC, 101 Mule Deer Court, incomplete siding installation at north elevation.



May 17, 2023, Disc OBS1, Photograph 12, DLC, 101 Mule Deer Court, incomplete siding installation at east elevation.



May 17, 2023, Disc OBS1, Photograph 26, DLC, 101 Mule Deer Court, incomplete exterior finish installation at south elevation.



May 17, 2023, Disc OSB1, Photograph 35, DLC, 101 Mule Deer Court, exterior deck not constructed and incomplete siding installation on west elevation.

b. Untreated Cut Ends and Siding Edges

Untreated cut ends and untreated edges of the siding and wood trim were noted at the residence. Siding and trim are moisture-sensitive materials that must be treated to limit capillary absorption into the products. The trim manufacturers require that all field-cut edges be primed, painted, or sealed to protect the exposed edges from moisture intrusion. Particular

care must be taken to treat-cut ends that will not be accessible after installation for maintenance or repainting cycles. In addition, the real wood trim would require similar cut end treatment, as outlined in the Western Red Cedar Siding General Installation.⁷

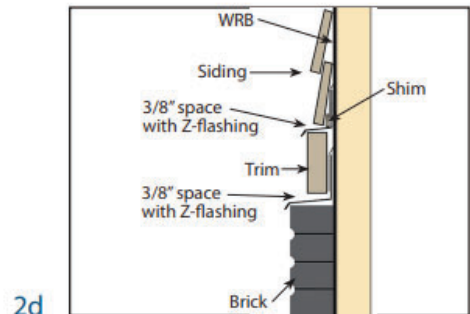
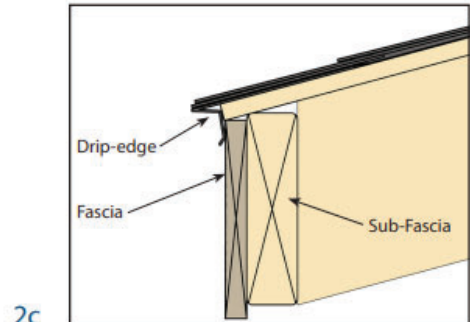
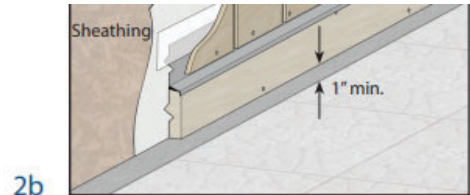
As constructed, the siding and trim at the Property contain untreated cut ends that are in violation of the manufacturers' requirements. The as-built untreated edges will promote moisture absorption and result in premature deterioration of the products in the forms of swelling, delamination, strength loss, and probable biogrowth. These issues are compounded where untreated cut ends are placed without compliant clearance to adjacent surfaces and flashings, as may be discussed in other sections of this report.

The housewrap on the garage exterior placed by Liscott used staples instead of the required capped fasteners, as stated by the manufacturer. The fasteners would be too short to properly engage into the OSB fully, versus proper placement into the framing systems. The staples create additional holes in the WRB, making it susceptible to water migration.

LP SmartSide, as specified in the Insight Engineering drawings, requires that the field cut ends be treated.⁸

Cutting

- For the cleanest cut and longer blade life, a fine-tooth carbide tipped blade is recommended.
- Trim and fascia are manufactured with a special edge coating which reduces moisture-related issues. **Do not** rip and/or rout the trim and fascia, as it will leave the edges unprotected.
 - If the trim or fascia materials are ripped, you must take special care to seal all wood exposed to the weather as described in the Finishing Instructions. (See page 12)
- Climb cut the surface of the trim and fascia such that the rotation of the blade cuts downward on the primed or prefinished surface.
- **Do not** miter trim ends or edges. 45 degree diagonal cuts of trim ends around door and window opening is acceptable, as well as joining. (See diagram 2e)



⁷ [Western Red Cedar Siding General Installation - Real Cedar](#)

⁸ [lp-smartside-trim-fascia \(lpcorp.com\)](#)

LP SmartSide Trim & Fascia

INSTALLATION

Finishing Instructions

- Seal all exposed surfaces, including all drip edges or where water will hang.
- Apply finish coat as soon as possible or 180 days of application.
- Follow coating manufacturer's application and maintenance instructions
- For best results use exterior-quality 100% acrylic latex paint, specially formulated for use on wood and engineered wood substrates; oil paint is acceptable.
 - Alkyd acrylic hybrid paint used as a primer is acceptable, not as finish coat.
 - DO NOT USE shake or shingle paint.
 - DO NOT USE semi-transparent or transparent stain.
 - DO NOT USE Vinyl-based resin formulas such as vinyl acetate, PVA, vinyl acetate/acrylic copolymer paint.

SMOOTH FINISH Trim:

- For best results use satin finish.

CEDAR TEXTURE Trim:

- For best results use satin or semi-gloss finish.

PREFINISHED Trim:

- Handle prefinished LP SmartSide trim with extreme care during storage and application.
- Touch up any damage to finish that may occur during application per the Prefinishers specifications.

LIMITED WARRANTY

The Louisiana-Pacific Corporation ("LP") LP® SmartSide® trim and fascia (the "Products") limited warranty (the "Warranty") applies only to structures on which the Products have been applied, finished and maintained in accordance with the published application, finishing and maintenance instructions in effect at the time of application. Products affected by a failure to follow such application, finishing or maintenance instructions ("Affected Products") will be excluded from coverage under the Warranty.

LP assumes no liability for any loss or damage caused by the Affected Products and is expressly released by the purchaser or owner from any such loss or liability.

Any modification of the Warranty or the application, finishing and maintenance requirements is void unless approved in writing by LP prior to application.

For a copy of the warranty or installation and technical support, visit the LP Web site at: www.lpcorp.com
WARRANTY REMEDIES ARE NOT AVAILABLE IF REQUIREMENTS ARE NOT FOLLOWED.

or for additional support call 800-450-6106

Where untreated cut ends exist, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, industry standards, and manufacturer requirements and, therefore, the contractor and subcontractors who performed the work are responsible for any costs associated with the repairs required to resolve these conditions.

The international Code Council (ICC) publication titled "2018 IRC® Code and Commentary," Chapter 7, "Wall Covering," Section 703.10 "Fiber cement siding," states the following:

- **"R703.10.1 Panel siding.** Fiber-cement panels shall comply with the requirements of ASTM C1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be protected with caulking, or with battens or flashing, or be vertical or horizontal shiplap, or otherwise designed to comply with Section R703.1. Panel siding shall be installed with fasteners in accordance with Table 703.3(1) or the approved manufacturer's instructions.
- **"R703.10.2 Lap siding.** Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. Lap siding shall be lapped a minimum of 1 1/4 inches (32 mm) and lap siding not having tongue-and-groove end joints shall have the ends protected with caulking, covered with an H-section joint cover, located over a strip of flashing, or shall be designed to comply with Section R703.1. Lap siding courses shall be

installed with the fastener heads exposed or concealed, in accordance with Table R703.3(1) or approved manufacturer's instructions."

The following are excerpts from the LP SmartSide product literature for the panel and batten installation instructions for the treating of the cut ends prior to installation. Also included are references for the James Hardie and Collins TruWood products to demonstrate that all of the manufacturers required proper treating of the cut ends and edges of the siding and trim.

PREPARATION

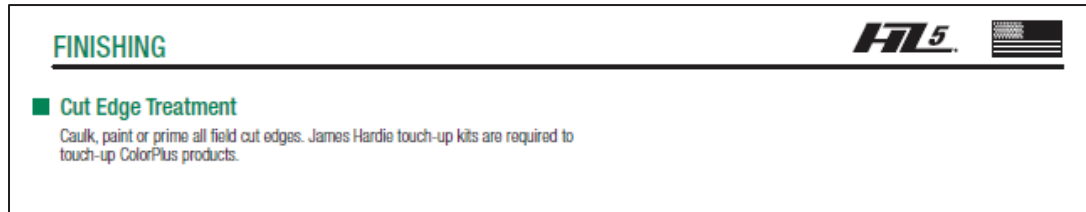
Water Run-Off Control

- Properly installed flashing materials will help direct water away from common water collecting areas.
- All flashing material shall be metal or another durable material that under normal outdoor environmental conditions will last for a period of not less than 50 years.
- **All flashing materials must have a minimum 4 inch (102 mm) upper leg.** Add a 4 inch (102 mm) wide adhesive flashing to flashing legs less than 4 inches (102 mm).
- Properly integrate flashing with the secondary WRB. Use housewrap, flashing tape, kick-out flashing, step flashing, Z-flashing, drip edge, gutters or other items as needed to maintain the counter-flashing principle. 3a
- Install kick-out flashing to direct the water into the gutter. (See diagram 3a)
- Install step flashing that has a minimum 4 inch (102 mm) upper leg. (See diagram 3a)
- Maintain a minimum 1 inch (25 mm) clearance between the end of the gutter and the adjoining wall to allow for proper maintenance of the siding. (See diagram 3b)
- **Do not extend the siding or trim into the kick-out flashing or gutter.**
- Seal ALL exposed cut edges of siding and trim. (See age 1) 3b

Screen capture from LP SmartSide Trim and Fascia Application Instructions.

The following screen captures from the LP SmartSide application instructions show the required minimum clearance between the bottom of the siding and trim components and the flashing material above windows, doors, or other fenestrations.

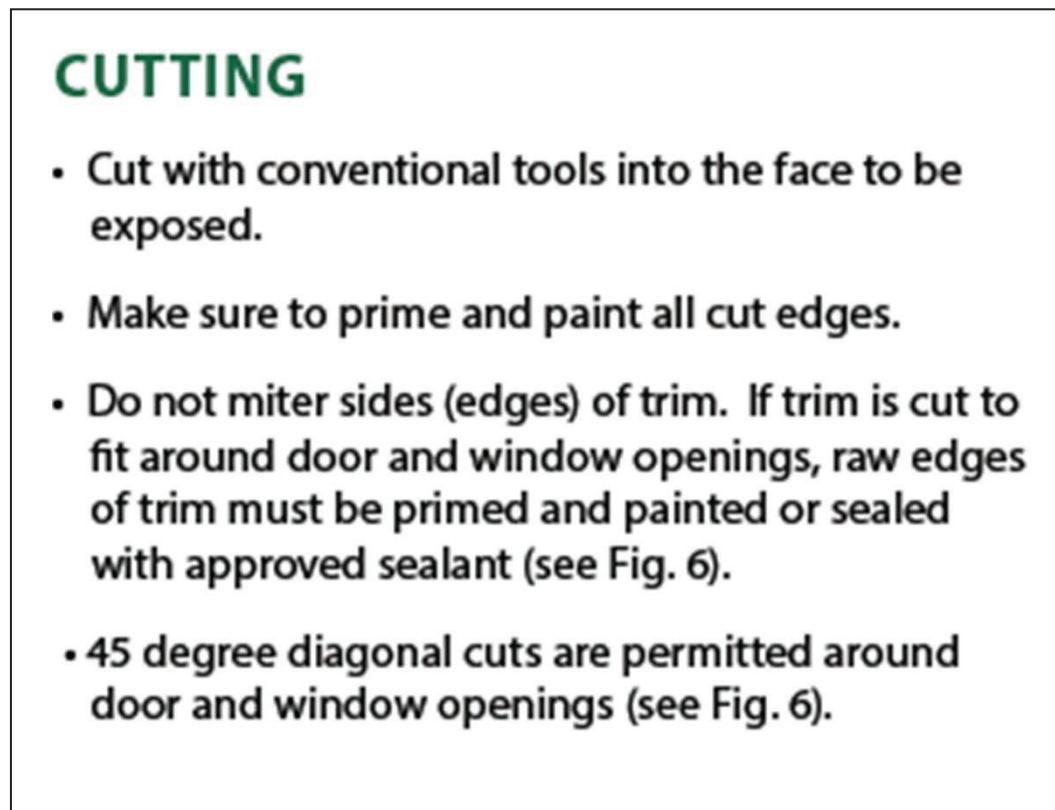
Other manufacturers include similar discussions regarding the need to provide sealing of all cut ends.



Screen capture from the Hardie Trim NT3 HZ5 Boards product literature.

Collins Products, "Installation Instructions, TruWood Reversible Trim," Revised November, 2018, Section "Cutting," states the following:

- *"Make sure to prime and paint all cut edges."*
- *"If trim is cut to fit around door and window openings, raw edges of trim must be primed."*



Screen capture from the TruWood Installation Instructions for TruWood Reversible Trim

It is CTETS's opinion that, due to this condition being present at all locations where the siding and trim have been installed, the only reasonable remedy to these conditions would be to fully remove and replace all siding and trim installed on the Project.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 271, DLC, 101 Mule Deer Court, looking west from garage roof.



May 17, 2023, Disc OBS1, Photograph 274, DLC, 101 Mule Deer Court, untreated cut ends and cut siding edges.



May 17, 2023, Disc OBS1, Photograph 275, DLC, 101 Mule Deer Court, untreated cut ends of vertical batten.



May 17, 2023, Disc OBS1, Photograph 276, DLC, 101 Mule Deer Court, untreated cut ends of vertical batten.



May 17, 2023, Disc OBS1, Photograph 277, DLC, 101 Mule Deer Court, untreated cut ends of vertical batten.



May 17, 2023, Disc OBS1, Photograph 280, DLC, 101 Mule Deer Court, untreated cut ends and short cut siding below upper level windows. The small piece of trim is used to fill to undercut panel below the window.



May 17, 2023, Disc OSB1, Photograph 281, DLC, 101 Mule Deer Court, untreated cut ends and short cut siding below upper level windows. The small piece of trim is used to fill to undercut panel below the window. Also overcut mark from the saw blade. This requires filling and sealing.

c. Non-Compliant Clearance Between Siding and Flashing

The moisture-management system behind the building façades relies on the WRB to direct moisture out to the façade exterior via integration with outward-sloping sheet metal flashings. These flashings must provide clearance from the claddings immediately above them to provide a clear and open path for water to exit. When claddings are installed tight to integrated sheet metal flashings, positive drainage cannot be accomplished, effectively eliminating the cladding's ability to weep. The ineffectiveness of the flashing is further compounded when the cladding is sealed to the flashing. Sealing or blocking integrated flashings causes moisture that is behind the cladding to accumulate. This accumulated moisture is either trapped or directed along the flashing to the ends, overwhelming the systems and promoting continuous and progressive deterioration of the underlying water-sensitive building components, including damage to the cladding.



The siding manufacturer and the Real Cedar association provide typical installation instructions and state that depending on the manufacturer, installation requires a 1/4-inch to 3/8-inch unsealed clearance of siding from metal flashings. The siding components are required to be installed in such a way as to provide for the collection, direction, and discharge of water so that the accumulation of moisture against the material does not occur. Other industry standards, such as SMACNA, as well as many others, also recommend proper clearances from claddings to sheet metal flashings. At the Property, the siding and trim are frequently installed in contact with sheet metal flashings or do not have compliant clearance to sheet metal flashings.

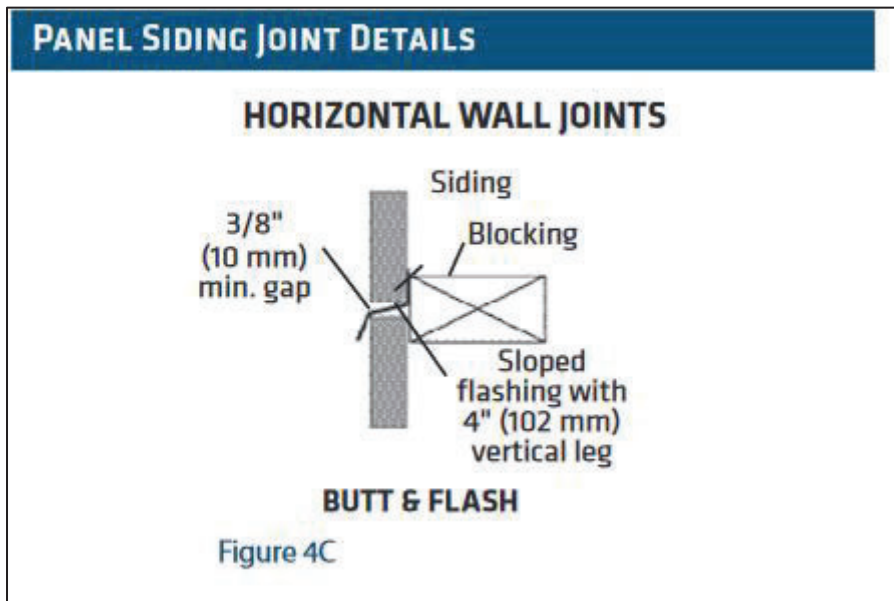
The following information is included to demonstrate the requirement for proper clearance between the siding and trim and flashings.

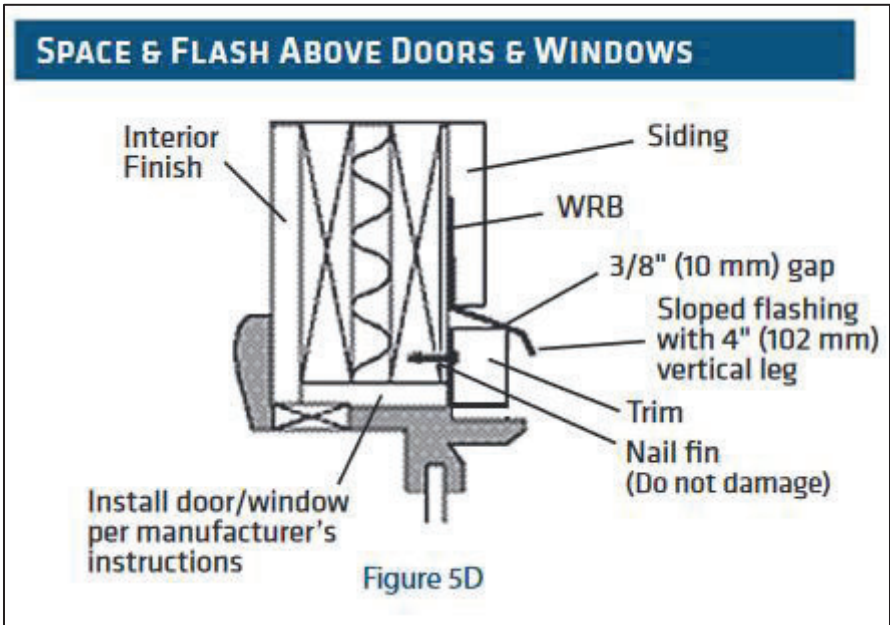
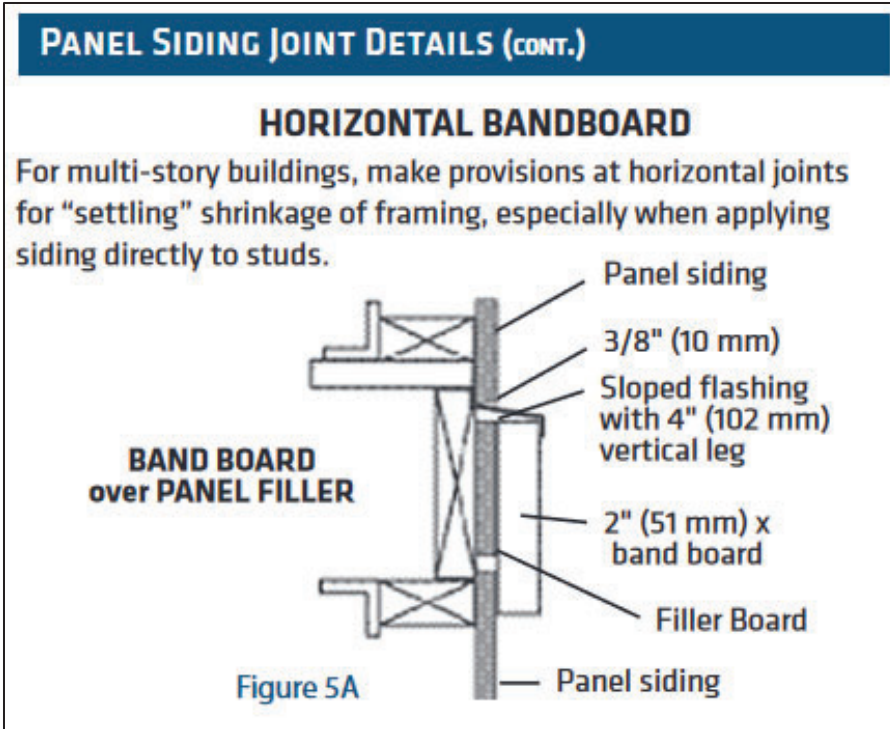
Applicable Code/Industry Standard References/Project-Specific Documents/Representative Manufacturer Installation Requirements:

The international Code Council (ICC) publication titled "2018 IRC® Code and Commentary," Chapter 7, "Wall Covering," Section 703.1.1 "Water resistance," states the following:

- **"R703.1.1 Water resistance.** *The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior cladding as required by Section R703.2 and a means of draining to the exterior water that penetrates the exterior cladding.*"

APPLICATION INSTRUCTIONS	
	
38, 76 AND 190 SERIES SMOOTH FINISH OR CEDAR TEXTURE PRIMED & PREFINISHED PANEL SIDING (including SilverTech & SmartFinish)	



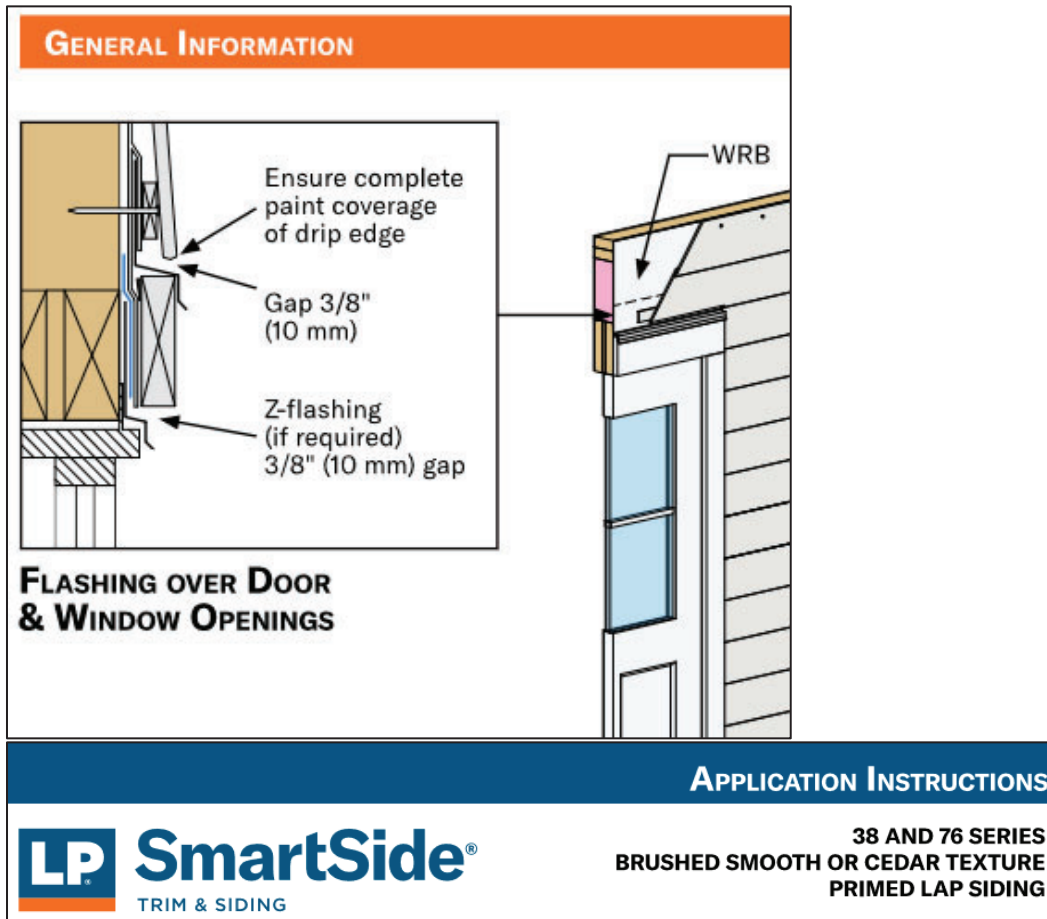


Screen captures from LP SmartSide Siding and Trim Application Instructions.



- All wood substrate that is exposed to the weather must be sealed in a manner that prevents moisture intrusion and water build up.
 - Seal ALL exposed cuts of siding and trim. Field spray applied coatings on cuts are not recommended.
 - Sealing can be accomplished by applying a paint or sealant according to the manufacturer's requirements.

Screen capture from LP SmartSide Siding and Trim Application Instructions.



Screen capture from LP SmartSide Trim and Siding Application Instructions for Flashing over Window and Door Heads.

CTETS has also included the following representative excerpt from the Collins Products installation instructions, demonstrating the required clearance between the bottom of the siding components and the flashing as a demonstrative that all manufacturers require a clearance be maintained between the bottom of the siding and trim and thru-wall flashing.

Collins Products, "Installation Instructions for Standard Lap and Self-Aligning Lap Siding," Revised November, 2018, "Flashing", states the following:

- *"In areas where the bottom drip edge of the siding is adjacent to flashing, provide a minimum 3/8 in. gap between bottom drip edge of the siding and the flashing (see Fig. 7)."*

Collins Products, "Installation Instructions for Standard Lap and Self-Aligning Lap Siding," Revised November, 2018, Figure 7 "Flashing", illustrates the following:

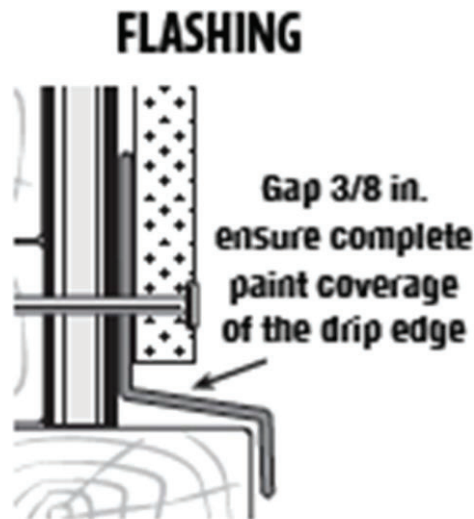


Figure 7

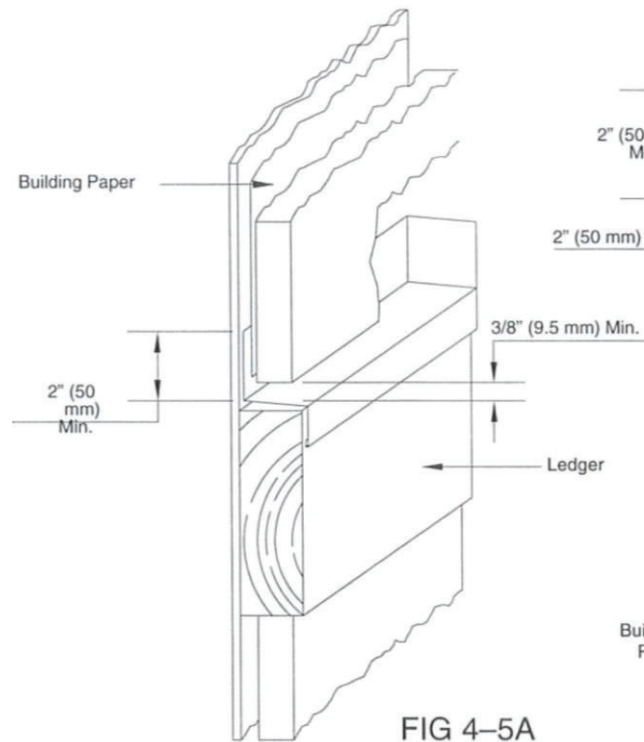
American Society for Testing and Materials International (ASTM), "ASTM E2112-07 – Standard Practice for Installation of Exterior Windows, Doors and Skylights," 2007, Section 5 "Related Issues and Procedures," subsection 5.3 "Moisture Entrapment," states the following:

- *"At no time shall an exterior seal be installed in a manner that will trap moisture in the perimeter cavity between the fenestration product and the wall."*

Sheet Metal and Air Conditioning Contractors' National Association Inc. (SMACNA), "Residential Sheet Metal Guidelines," First Edition, December 2001, Chapter 4 "Windows," Section 4.5 "Horizontal Protrusions," subsection 4.5.1 "Installation," states the following:

- *"The exterior finish should terminate 3/8 in. (10 mm) above flashing to provide a weep space."*

Sheet Metal and Air Conditioning Contractors' National Association Inc. (SMACNA), "Residential Sheet Metal Guidelines," First Edition, December 2001, Chapter 4 "Windows," Section 4.5 "Horizontal Protrusions," Figure 4-5A "Horizontal Protrusions," partially illustrates the following:



Where non-compliant clearance between claddings and flashings exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, industry standards, and manufacturer requirements, and therefore, the contractor and subcontractors who performed the work are responsible for any costs associated with the repairs required to resolve these conditions.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 271, DLC, 101 Mule Deer Court, looking west from garage roof.



May 17, 2023, Disc OBS1, Photograph 272, DLC, 101 Mule Deer Court, non-compliant clearance between siding and thru-wall flashing. Flashing also installed flat.



May 17, 2023, Disc OBS1, Photograph 273, DLC, 101 Mule Deer Court, non-compliant clearance between siding and thru-wall flashing. Flashing also installed flat, minimum of five-degree slope is required.



May 17, 2023, Disc OBS1, Photograph 310, DLC, 101 Mule Deer Court, non-compliant clearance between siding and thru-wall flashing. Flashing also installed flat, minimum of five-degree slope is required.



May 17, 2023, Disc OBS1, Photograph 311, DLC, 101 Mule Deer Court, non-compliant clearance between siding and thru-wall flashing. Flashing also installed flat, minimum of five-degree slope is required.



May 17, 2023, Disc OBS1, Photograph 312, DLC, 101 Mule Deer Court, missing flashing at window head and non-compliant thru-wall flashing between horizontal joint in vertical panel siding.

d. Non-Compliant Clearance – Garage Door Jambs to Hard Surfaces

Siding and trim are components of a moisture-managed system and susceptible to moisture; thus, they require clearance from adjacent surfaces such as concrete flatwork, asphalt pavement, decks, roofing, and finish grade to allow water to discharge to the façade exterior,

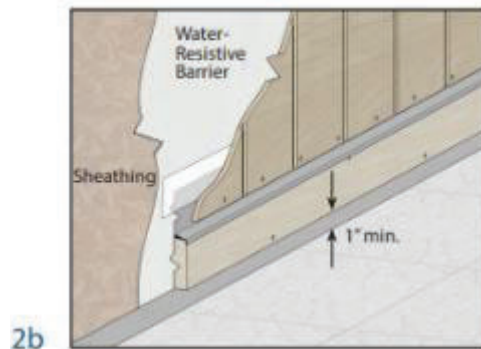
minimize the impact of precipitation buildup, and allow for maintenance of the exposed ends of the products such as priming and painting. The capillary break provided by this clearance is required to reduce the ability of moisture to wick up into the materials.

Without a capillary break, the materials wick moisture up and into the products and wall assembly, resulting in damage such as staining and deterioration of the wall cladding, weather-resistant barrier (WRB), underlying moisture-sensitive sheathing and framing, and interstitial spaces.

Additionally, siding and trim are often placed with less than the minimum required clearances to adjacent surfaces. This non-compliant condition occurs at garage door jambs where they meet the concrete surface.

Louisiana-Pacific's publication titled, "LP SmartSide Trim & Fascia Application Instructions," 2020, states and illustrates the following:

- *"Trim applied to roofs, porches, patios, sidewalks, etc. must have a clearance of at least 1 inch (25mm) above any surface where water might collect. The surface must be sloped or otherwise designed to provide proper drainage so the trim is at no time directly exposed to standing water. (See diagram 2b)."*



Where non-compliant clearance from siding and trim to adjacent surfaces exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, industry standards, and manufacturer requirements and, therefore, the contractor and subcontractors who performed the work are responsible for any costs associated with the repairs required to resolve these conditions.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 87, DLC, 101 Mule Deer Court, trim tight to concrete at garage door jamb.



May 17, 2023, Disc OBS1, Photograph 88, DLC, 101 Mule Deer Court, trim tight to concrete at garage door jamb.

e. Missing Flashing at Window and Fenestration Heads

Flashings were noted to have been missing over the window and door heads. The exterior siding is considered a moisture-managed system. The intent of these flashings is to provide a proper

drainage mechanism to direct any water that might enter into the exterior walls system cavity out to the exterior of the wall surface.

The international Code Council (ICC) publication titled “2018 IRC® Code and Commentary,” Chapter 7, “Wall Covering,” Section 703.4 “Flashing,” states the following:

- **“R703.4 Flashing.** *Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at the following locations:*
 1. *Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:*
 - 1.1. *The fenestration manufacturer’s installation and flashing instructions, or for applications not addressed in the fenestration manufacturer’s instructions, in accordance with the flashing manufacturer’s instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.*
 - 1.2. *In accordance with the flashing design or method of a registered design professional.*
 - 1.3. *In accordance with other approved methods.*
 2. *At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.*
 3. *Under and at the ends of masonry, wood or metal copings and sills.*
 4. *Continuously above all projecting wood trim.*
 5. *Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.*
 6. *At wall and roof intersections.*
 7. *At built-in gutters.”*

Due to the installation configuration of the panel and batten system, the only way to properly install these flashing will be to fully remove and replace the siding components. This is the same recommendation for the horizontal lap siding area. The repairs for this issue to be coordinated with the work discussed in other sections of this report.

It is CTETS’s opinion that any costs associated with these repairs or replacement are the responsibility of Liscott.

Example Photograph:

May 17, 2023, Disc OBS1, Photograph 312, DLC, 101 Mule Deer Court, missing head flashing at window.

f. Incomplete Soffit and Trim Installation

At the time of the site observation, several areas of incomplete soffit and fascia are present. With these areas being incomplete, it allows pigeons to access the attic space. It is also creating a pathway for blowing snow and rain to enter into the attic space. This can lead to excess moisture accumulation in the insulation, as well as potential deterioration of the moisture sensitive framing components. Bird droppings have been shown to be a source of potential health hazards if allowed to accumulate and not be properly removed and cleaned.

The General Contractor Agreement between Liscott Homes (Contractor) and Ben and Holly Smith (Owner), signed and dated December 19, 2020, states the following:

- *“6.) Warranty: Contractor warrants that all materials and equipment furnished under the Contract Agreement shall be new and in conformance with the Contract Documents.”*

It is CTETS’s opinion that Liscott is responsible for any costs to complete this work, as well as any potential costs to remove the birds and their droppings from the attic. These costs may also include removal and replacement of any damaged insulation or framing components.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 50, DLC, 101 Mule Deer Court, missing soffit.



May 17, 2023, Disc OBS1, Photograph 291, DLC, 101 Mule Deer Court, missing weather protection, WRB, trim and siding.



May 17, 2023, Disc OBS1, Photograph 292, DLC, 101 Mule Deer Court, missing trim and siding.



May 17, 2023, Disc OBS1, Photograph 293, DLC, 101 Mule Deer Court, missing trim and siding.

g. Damaged or Broken Windows and Panoramic Door Installation

Damage was incurred to the window in the first-floor bathroom #1 and one of the clerestory windows on the north elevation during the structural leveling of the steel beam and modular units. The replacement windows are on site for replacement. The removal and replacement of the clerestory window will require removal and replacement of the interior drywall finishes.

The General Contractor Agreement between Liscott Homes (Contractor) and Ben and Holly Smith (Owner), signed and dated December 19, 2020, states the following:

- “6.) *Warranty: Contractor warrants that all materials and equipment furnished under the Contract Agreement shall be new and in conformance with the Contract Documents.*”

Due to this damage being a direct result of Liscott’s failures during the foundation construction, steel beam installation, and improper modular unit installation, all costs associated with this work are the responsibility of Liscott.

The panoramic installation has been performed twice due to the issues related to the out of levelness of the structural components. At the time of the site observation, the final trim components that would complete the closure between the door system and rough opening have not been installed or properly sealed. It is CTETS’s understanding that it is within Liscott’s scope of work to complete the required trim out and closure at these openings.

Example Photographs:



May 17, 2023, Disc OBS1, Photograph 319, DLC, 101 Mule Deer Court, broken window at first floor bath.