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CONSULTATION REPORT

Inspector: Roger Hankey, ASHI #269

Property: ***3456 Real house disguised address, Flowertown, MN 55199*** ***08/09/06***

Client: *Dr. Sam Client and Dr. Jane Client*
3456 Real house disguised address
Flowertown, MN 55199

Lakeshore: ☐
Manufactured: ☐

Client Present: ☒
Owner Present: ☐
Agent Present: ☐

Area:	*Suburb*	Garage:	*Attached 3 car*
Building Type:	*Single Family*	Space Below Grade:	*Basement Walkout*
Year Built:	*1996*	Soil Condition:	*Dry*
Levels:	*2*	Sky:	*Clear*
Street Surface:	*Paved*	Precipitation:	*None*
Street Type:	*Residential*	Temperature:	*77*
		Start Time:	*9:00 AM*

Occupied: ☒
Water On: ☒
Electric On: ☒
Gas On: ☒

Consultation Report on 3456 Real house disguised address, Flowertown, MN — August 09, 06

MOISTURE INVESTIGATION CONSULTATION

Regarding:

Photo - Window in study - office

Client is concerned about moisture intrusion and needs to document any adverse structural conditions prior to the end of the ten year structural warranty period.

Purpose and Scope:

Photo - Moisture reading below dining room window

Identify & describe wet areas, investigate causes, and make recommendations. Visual examination and use of Protimeter SurveyMaster moisture meter.

Limitations:

Photo - Rear wall water entry locations

No walls were opened. Insulation was removed at several rim joist areas in the unfinished basement. The investigation is limited to the items and areas discussed in this report. Other components and areas were viewed in passing, but unless mentioned in this report, they are not part of this investigation. This report is not a warranty or guarantee that the house is free of any defects to components or areas not specifically mentioned in this report.

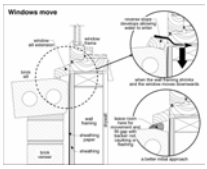
Information Provided:

Photo - Study carpet tack strip

Clients are the original owner of this house, and have found occasional moisture intrusion, particularly at the front first floor office - study window. The client states that the builder installed caulking at the joint between the brick and the bottom of the windows. The clients also experienced water entry into the basement at the area below the deck. The states that the builder removed and rebuilt a section of wall below the deck within a few years after the original construction.

Findings or Observations:

Exterior



Drawing - Window movement

SUMMARY:

There are three main areas of water intrusion (water leaking from exterior to interior) into the walls. The leaks are revealed as wet areas and water damage in the wall sheathing in the area between the top of the foundation and the subfloor. The leaks occur below the study and dining room windows, and below the short section of wall at the latch side of the door to the rear deck.

DETAILED OBSERVATIONS:

The front of the house is clad with brick veneer wainscoting up to the bottom of the windows and stucco from the windows to the eaves. The remainder of the house is clad with metal siding.

Unlike the brick shown in the drawing, the top course of the brick veneer wainscoting in this case is a row of "soldiers", (bricks standing on end). This soldier course is not the most common method of installing brick below a window. (see attached article from Brick Institute of America). There is a metal flashing behind the stucco and over the top of the brick. This flashing extends out onto the top of the brick only about 1/2 to 5/8". Many areas of this flashing now drain back toward the wall rather than away. Further, the rough surface of the top of the brick and the lack of slope on the top of the brick creates surfaces atop the bricks that do not drain away from the wall.

The joints between the top bricks and the bottom of the dining room and study windows are caulked. I could not determine if there is flashing under this caulking.

No drainage weeps were found at the bottom of the brick wainscoting, however if present, they may be covered by landscape rocks.

The rear deck is wood framed with synthetic wood deck boards. There is a metal trim piece covering the joint where the deck boards meet the siding. Metal flashing covers the top of the deck ledger, but the flashing extends down the exposed face of the ledger only about a half inch or less. No flashing was visible behind the deck ledger. The deck ledger has a joint at both the 90 degree corner and the diagonal corner. These 2 joints in the ledger are less than one foot apart. There is no caulk in these joints.

OTHER EXTERIOR ISSUES, not directly related to the moisture intrusion found in the basement:

The house does not have a complete set of rain gutters. (No gutters at several rear areas and left side of garage). Also there is no gutter on the roof over the door to the deck.

The left upper front gutter has no downspout and drains back onto the roof.

Several downspouts discharge onto the roof rather than into gutters or extend fully to the ground. Several downspouts lack extensions to carry water away from the house. The worst case is the downspout at the right of the front entry. Another poorly positioned downspout drains the upper right gutter and descends onto the left side of the entry roof next to the stucco wall - roof joint.

The roof wall intersections at the front of the house do not have "kickout" flashings at the bottom of the step flashings.

There are tree limbs and overgrown shrubs which touch the roof and walls.

The grade drainage on the left and right sides of the building is along the foundation rather than away from the foundation.

The rear paver patio extends to become a walk at the bottom of the deck steps. These pavers have settled and are offset from the edge of the wood timber boarders by more than an inch. This creates trip hazards.

The deck stair railing lacks a grippable handrail. The synthetic wood 2x6 forms the top of the guardrail, but has no finger grooves.

Joints between wood trim, stucco, and brick are not caulked, including at the garage door jamb.

There is no flashing atop the electric service meter box. This has caused the OSB (waferboard) backerboard behind the meter box to expand, deteriorate, and allow the meter box to sag away from the wall.

There are hail strike dents in the siding, particularly at the rear.

The sump pump has no discharge hose.

There is on chipped shingle on the right slope of the garage roof.

The faux gable louver over the garage door has dropped off and is being stored in the basement by the client.

Interior

Photo - Hole in sheathing below dining room window.

SUMMARY:

The wall sheathing is wet and water damaged in three areas, two of which have multiple wet spots. These areas were found by removal of the unfaced fiberglass insulation from the rim area between the top of the foundation and subfloor, below the study, below the dining room, and below the door to the rear deck. The area below the dining room has three wet spots, the area below the deck door has two wet spots. The water damage below the dining room has deteriorated the wall sheathing completely in a small area at the sill, revealing about 2 sq. in. of the back of the brick and mortar. Moisture content in the wet areas ranged from 22% to over 70%. The darkened areas were damp to the touch.

Another moisture concern is the formation of condensation and staining behind the plastic sheeting vapor retarder on the rear wall.

Finally, there is are structural questions regarding the installation of a wood column beneath and within an engineered wood floor truss, and a deflected floor truss.

Detailed observations.

Below the study:

The water damaged area is directly below the right side of the air duct and register, located below the front window of the study. Sheathing moisture content in the damp area was 59%. The area of wet sheathing was about 5" wide and 9" high and began at the framing just below the subfloor. The bottom extension jamb of the study window had visibly damaged and discolored finish, and had moisture readings in the red zone using the Protimeter SurveyMaster in scan mode. The carpet tack strip along the front wall below the window had rusted tacks and stained wood.

Below the dining room:

There were three visibly wet areas of sheathing in the rim below the front wall of the dining room window. They are: At the left front corner both at the sill and just below the subfloor, and at the right front corner at the sill. The window jamb extensions and carpet tack strips were not discolored. Moisture contents in these three areas ranged from 32% to 70%. The sheathing was completely rotted away in a small area at the bottom right corner of this rim area.

Below door to the rear deck:

There are two areas of wet - moisture damaged sheathing below the corners of the rear wall nearest the deck door. They are: below the 90 deg. corner next to the latch side of the door, and at the diagonal corner about one foot away from the door. Moisture content in the two visibly damp areas were 25% and 28%. Moisture content in an unstained area of sheathing was 24% See exterior remarks re: flashing of the deck ledger. Further, one lag screw for the deck ledger penetrates the sheathing only. The threads of the lag screw are in contact with the non-metallic sheathed wiring in this area.

Rear wall vapor retarder:

This unfinished basement is a walkout to the rear, and therefore has an unfinished frame wall supporting the above grade portions of the rear wall. These frame walls are unfinished, insulated with fiberglass batts between the studs, and have an interior surface of expose polyethylene plastic sheeting. Much of the plastic sheeting has dark speckles on the side facing the insulation. While there is evidence of occasional mouse activity in the rim behind the insulation, the distribution of the dark speckles is widespread across most of the plastic on the rear wall. Further, the plastic sheeting is punctured and torn in numerous areas from impact with sharp objects.

Structural concerns:

A 6"x6" treated wood column is placed beneath and within one of the floor trusses, about two feet from the bearing point of the truss on the center bearing wall. I saw no mark or label calling for a column at this point and I saw no evidence of a footing for the column or a designed bearing point in the truss at this location. I have not seen the truss manufacturers drawing for this floor.

The client's house keeper called my attention to a wall crack and opened miter in the casing over the door between the kitchen area and rear center living room. This doorway is likely above the first truss that bears directly on the rear wall (past the rear bay window). The housekeeper has placed a taut string line along the bottom of the truss. The line shows that this truss has deflected downward about 1/4" in mid-span.

Conclusions:

Photo - Rear wall plastic sheeting

1. Moisture intrusion in at least three areas is both currently active and historic, likely since shortly after the building was completed.

2. Prior repairs including caulking at the front windows, and rebuilding of the wall below the deck, have NOT eliminated the water intrusion.

3. The water intrusion must be prevented in order to prevent structural damage to the building, as well as damage to non-structural finish materials, and to prevent growth of fungi in and on the building materials.

4. Inadequate flashings and poor design detail at the deck and top of the brick wainscoting are the primary points of water entry.

5. Other contributing factors in the water entry likely include:

poorly designed and inadequately maintained gutters and downspouts,

complex roof design and adequate roof-wall flashing details, including lack of kickout flashings,

overgrown trees and shrubs which shade much of the front wall,

inadequate grade drainage along the left and right sides of the house,

lack of flashing atop the electric service meter box,

failure to repair the loose meter box will likely permit water entry into the electrical components in the meter box,

lack of caulking at wood to stucco joints.

6. Condensation has likely occurred on the back side of the exposed plastic vapor retarder in the basement during periods of hot humid summer weather (outdoor air dew points greater than 65 deg. F). This condensation has led to fungal growth on the insulation and back of the plastic sheeting. The lack of an air barrier behind the metal siding permits the high dewpoint outdoor air to reach the cooled surface of the plastic sheeting.

7. The installation of the wood column within and below an engineered floor truss is a non-standard detail and was likely done without approval of the truss manufacturer or a structural engineer.

8. The deflection of the floor truss below the kitchen-living room partition is the likely cause of the crack and open miter joint.

9. The lack of a proper handrail on the deck stairs, and the settled pavers at the landing of the deck stairs are fall hazards.

Recommendations:

Photo - Dining room corner, caulk and flashing

1. Consult with an attorney familiar with moisture intrusion cases to determine if you have the opportunity to recover from the builder for the cost of repairs.

2. Present this report to the attorney to inform the attorney of the current conditions in the house.

3. Take the following actions, if approved by your attorney, and as directed by your attorney:

a. Trim trees and shrubs to prevent contact with the wall and let more light reach the front wall,

b. Install downspout extensions where missing, particularly at the front entry. All spouts to extend out at least 5 feet from the building,

c. Have further investigations done to determine the full extent of moisture intrusion. These investigations will likely include infrared camera images, moisture readings through small test holes drilled in the stucco, or test cuts into the stucco. Firms with experience in these investigations include Private Eye, in New Brighton 651 639 0184, and the Center for Energy and Environment in Minneapolis, 612 335.5858,

c. have the bottom window casing removed at the study window to view the condition of the window rough opening,

d. obtain the floor truss manufacturers drawings and specifications for this house (from builder or your files) and the building permit records from the City of Roseville,

e. determine if the installation of the column in the floor truss had the approval of an engineer from the truss manufacturer,

f. have a representative of the floor truss manufacturer determine if the install of the truss is proper and if the deflection of the floor truss is within design specifications,

g. install suitable handrails on the stairs to the deck,

h. relay the pavers at the base of the deck stairs to eliminate trim hazards.

i. after the attorney has approved photo documentation of the rear wall, have all exposed plastic sheeting removed from the wall, new sheeting installed except at the wet areas below the deck door, and have the wall covered with gypsum drywall to protect the

plastic sheeting from physical damage and to reduce the risk of condensation on the plastic,

j. have the water damaged OSB waferboard backing for the electric service replaced, and the meter box re-installed with a suitable flashing over the box. This will require a temporary interruption of power while the box is being secured to the wall.

k. obtain estimates to remove the top course of soldier bricks and install a brick and flashing detail creates a successful drainage plane at the brick to stucco joint. A complete estimate of repairs can not be developed until after the infrared scan and moisture testing identifies the full extent of water damage. One firm with design experience in this area is Encompass of Bloomington, MN 952 854-4511

l. Have the landscape rock pulled back away from the brick to determine if drainage weeps are present. If not, obtain a proposal for properly draining the brick wainscoting.

4. Dispose of the insulation I removed from the rim areas. Allow the wet rim sheathing areas to dry.

5. Have the faux louver installed over the garage.

Non-Recommended Alternatives:

Mold testing is not recommended by the Minn. Dept. of Health. Elimination of the source of water intrusion is paramount.

Commentary:

Thank you for this assignment. Please contact me if you have questions, and keep me informed of your progress with these issues. I will be glad to speak with your attorney or others you designate.

Attachments:

Article from the Brick Institute of America (BIA), digital photos from this investigation (on a CD)