CON: 12-15
Doc #39575

Radon & Soil Gas Mitigation Services

Anthony G. Hendricks P.E.

July 22, 2020

Mr. Terry Tiedemann, P.E.
Project Engineer, Cedar Rapids Public Works Dept.
City of Cedar Rapids
500 15th Ave SW
Cedar Rapids, IA 52404
(319) 429-4114

Communication Testing Report For
416 4th Ave SW Cedar Rapids, IA

Communication Testing was done, July 21, 2020 at 414 4th Av SW. The home is an older structure that had been damaged and is currently being extensively remodeled.

The purpose for communication testing is to determine connectivity for design of mitigation systems. Connectivity or sub slab communication is the ability to move soil gas under a slab to a pickup point(s) for routing outside of the structure.

Due to the age and condition of the building that being an older style of construction wherein over the stone walls (assumed) in the basement a 6 by 6 inch beam rests on top and then floor joists notched out and hung over the beam might be structurally at risk if a 4 inch hole is put through the beam for mitigation piping to exit the building.

Acura Services met with Terry Tiedemann and the owner/contractor at the building to evaluate all issues regarding installing a mitigation system that wouldn't risk causing the beam to be weakened or fail. After spending time with the owner/contractor discussing options we agreed that the best option would be to bring the pipe connecting the pickup point in the basement up through the floor in a closet area then run the pipe through the wall once above the floor. This would put the fan and discharge piping on the west side of the house near where the air conditioner and its connections sit.

Building(s) Footprint

Building foot print is approximately 21 feet wide by 35 feet long with a small addition on the west side at the back of about 10 feet by 10 feet. (The addition set on concrete slab per the owner/contractor.) Inside the basement are knee walls around most of the perimeter. There's a sump pit in the back (north end) near where an outside stairs enters the back of the house. There's no piping leaving the sump and no pump and no indication that one had never been installed. The

owner/contractor surmised that the sump had been for potential leakage from the back outside entrance but had never been needed.

Communication Test 1: A one inch test hole was drilled through the basement floor about 12 feet from the back end of the building. Another test hole was then drilled through the basement floor near where the water comes into the building on the front of the house near the south east corner. A shop vacuum applied suction to the first hole while a micro-manometer was used to take a vacuum reading in the second hole. The test holes were approximately 21 feet apart. The manometer read minus -0.004 indicating that communication exists between the two points.

Communication Test 2: After the decision was made to run the piping into the closet a second test was run to check the viability of locating the pickup point as near as possible to the exit point from the basement through the floor. This area is on the west side near a basement window where the knee wall is absent. A test hole was drilled through the floor at this point and then vacuum applied to the hole. Vacuum readings were then taken in the two other test holes. The hole near the front south-east corner where the water comes in is approximately 16 feet distant and had a reading of minus - 0.007. The hole on the north-west side is approximately 10 feet from this location and had a reading of -0.019.

Note: The soil pulled up by the drill bit was dark, tight and moist.

Slab Condition

The slab is about 3 to 4 inches thick where the test holes were drilled. Approximately 102 feet of floor cracks and joints need to be sealed with caulk.

Mitigation Design

Based on the communication testing one pickup point and one vacuum fan are recommended for this system. The second communication test indicates that the pickup point in the area below the window and near the floor area for exiting the basement is a good location. Since the soil/fill material below the basement slab is tight and moist the vacuum fan will need to pull a maximum of 4.0 inches of water gauge, at 3125 rpm; 115 volt; 160 watts. The pickup point will be excavated to facilitate collection of the soil gas. Following excavation a flat lid will be sealed over the top of the pickup point with concrete screws and caulk. A 3 by 4 hub will be installed on the lid over the hole. The 3 inch schedule 40 pipe will then be run into the closet area on the main floor then out through the wall. The fan will be mounted on the outside and electric run to it for operation. The discharge piping will be a minimum of 10 feet off the ground and a minimum of 1 foot above eave height

105 Chelsea Ct.
Oregon, WI 53575

(608) 772-2349 or (608) 835-8812
hendricks_at@yahoo.com

before termination. Note: The sump will be smoke tested for leakage and will need to be sealed if leakage is found. The floor cracks and joints will be sealed with caulk.

Estimated Mitigation Cost $ 3,875.00

Prepared by: Anthony G. Hendricks P.E.

105 Chelsea Ct.
Oregon, WI 53575

(608) 772-2349 or (608) 835-8812
hendricks_at@yahoo.com