

# **Structural Evaluation of Six Duplexes,** **located in Tulsa.**

Dear Client:

## **PURPOSE AND SPECIFIC CONDITIONS OF THE INSPECTION**

This inspection report is provided to the above-named customer only upon the terms stated in the Inspection Agreement (IA) between the customer and Corinthian Solutions, Inc. (CSI). If the customer does not accept the terms of the Inspection Agreement, the customer shall immediately contact the office of CSI, and the inspection reports shall remain the sole property of CSI. Possession of this written inspection report by the customer shall constitute acceptance of the terms of the Inspection Agreement. The Inspection Agreement is available at our office, from any of our inspectors, or upon request it will be faxed, emailed, mailed, or delivered to you. CSI is a professional engineering firm (CA 4395), registered with the State of Oklahoma Board of Professional Engineers and Land Surveyors.

The following inspection report is intended to comply with the Customer's specific request and/or limited aspects of the Oklahoma Uniform Contract of Sale of Real Estate as approved by the Oklahoma Real Estate Commission 11-2009. Paragraph 7. B. The items inspected herein were generally evaluated by the definition of "Normal Working Order" as defined in said Contract of Sale. Components and improvements outside of the main buildings are not included herein and only available by separate request for inspection. Please review the important information at the end of this report.

The following Inspection report is for an examination of the main buildings (six duplexes) for evidence of defects in the readily visible structural components. Evaluation of improvements detached from the main buildings are available by specific request to our office and not included herein. The inspection was performed on XXXX.

## **DESCRIPTION OF PROPERTY AND IMPROVEMENTS**

The duplexes at (Location) face the street or circle at the South end of the street as indicated on each of the attached sketches. These duplexes are one-story, timber framed structures with brick veneers and plywood siding with wood trim on the exteriors, asphalt composition shingle roofing and each of the individual units (twelve total) have a two-car open carport with exterior storage rooms. The duplexes were reportedly constructed in 1969.

The foundation systems appeared to consist of conventional, continuous concrete perimeter footings with concrete stemwalls and a concrete slab-on-grade. Roof framing (in the attics which were accessible) consisted of prefabricated wood truss rafters at 24" on center with 1x8 solid wood decking to support the roofing surface.

The conditions of the roof shingles, roof flashings, and air distribution ducts were not included as a part of this "structural" evaluation.

There were either individual concrete slab porches (some of which were covered by soffits or extensions of roof framing) or front-entries located inside the covered carports as indicated on each individual sketch. Most, but not all, of the individual units are equipped with concrete slab patios behind or beside the units which were not covered. The exception is Unit 4711 which is covered by a prefabricated metal roof. The conditions of these individual patios vary. Some of these patios have significant cracks with grass or other vegetation growing up thorough the cracks.

The sites appear to have gradual engineered grades that generally direct water away from the foundations and channel it around the perimeter of the buildings to reduce the potential for water to pond against the foundation. However, on most of the buildings, there is some locations of drip-line-erosion (DLE), roof-valley-erosion (RVE), or areas of roof-valley-discharge (RVD) below un-guttered eaves and roof valleys. RVD occur where the roof valleys discharge onto sidewalks, patios, or driveways where erosion does not occur.

The elevations of interior floors were not measured or evaluated for "level" conditions. Where "levelness" may be a concern, CSI can perform a floor elevation survey using a ZipLevel Pro-2000 by Technidea, Corp to develop a topographic plan of the floor as an additional service. A survey of this type may be used to make recommendations for interior floor elevation adjustments as required.

## **OBSERVATIONS - STRUCTURAL**

### **ISSUES APPLICABLE TO MOST OF THE SIX BUILDINGS**

On the interiors, a representative number of doors as possible were checked for proper operation and to verify that the edges of the doors were parallel with the jambs and heads. Interior ceiling and wall surfaces were examined as possible to determine if any

visible evidence of structural activity was present at the time of inspection. Floor surfaces were examined as possible depending upon covering to determine if there was evidence of structural activity or deformation. Visible portions of the stem walls and slab in the carports and other areas were carefully examined as possible to determine if indications of structural activity were present in any of these areas. On the exterior of the buildings, the visible and readily accessible portions of the masonry veneer, siding or trim, exposed foundation elements and exterior door and window openings were carefully examined for evidence of structural activity. The functions of interior doors are checked because contact or misalignment at the edges are a common indicator of interior slab or perimeter foundation movement. Cracking on interior wall and ceiling surfaces are also common indicators of interior slab, perimeter foundation, or framing activity. The most typical locations for these cracks are the corners of window and door openings, and the intersections of exterior walls and interior partitions.

Detailed sketches are provided for each of the six duplexes showing the general locations (if applicable) of observed interior minor hairline cracks (MHLC) less than 1/32", minor cracks (MC) less than or equal to 1/16", cracks (C) greater than 1/16", compression cracks (CC), wrinkle-type cracks (W) at wall and/or ceiling intersections, repaired cracks (RC), and gaps (G) which occur inside the units. In units where plumbing leaks were discovered, some locations of slab settlement have led to interior walls dropping away from the ceilings leaving gaps (G) between these walls and the ceilings as indicated on the attached sketches. Where applicable, movement (i.e., settlement or heave) of the slabs have led to locations of out-of-square (OOS) door frames and binding (B) doors. These conditions are shown on the attached sketches. Stains (S) were also noted on wall and ceiling surfaces as indicated.

A common indicator of perimeter foundation activity is separation between the inside face of the stem wall and the edge of the concrete slab. Such movement tends to cause wrinkle-type (W) cracks in corners of rooms. Such conditions are noted as applicable on the attached sketches.

In the carports, examination of the visible portions of the slabs and stem walls were examined. Where cracks were observed, they are noted on each of the attached sketch.

The inspection of the attics (the ones which were accessible) included examination of the decking and framing elements. CSI does not generally crawl through undecked portions of attic areas for safety reasons, so most observations are limited to what can be seen from the decked portions and/or from the access openings. General configuration of the framing and a representative number of readily visible components were examined for damage or distortion. A complete examination of every framing member or decking area was not made. Loose fill insulation covered much of the ceiling framing but was relatively shallow in depth as noted in the Client Memorandum. Attic ventilation was provided by soffit and gravity vents except as noted below for at least two of the six buildings.

On the exterior of each building, a detailed sketch is provided showing the general locations (if applicable) of observed exterior minor hairline cracks (MHLC) less than 1/32", minor cracks (MC) less than or equal to 1/16", cracks (C) greater than 1/16", and repaired cracks (RC). The sketches also show the locations of gaps (G) between the brick veneer and wood trim or window frames that will require caulking. The locations of exterior piers are shown where their installation was obvious (i.e., patched concrete). However, no information was provided at the time of this site visit to indicate who had installed the piers, when the piers were installed, or where less obvious piers (those located below the soil) were located.

Although the scope of this inspection did not include physically probing to determine areas of wood rot to avoid damage to finished surfaces, where wood rot (WR) or wood-to-ground (WTG) conditions were observed as part of the visual assessment for structural conditions, it has been noted on the attached sketches. Wood-to-ground (WTG) conditions are those where wood siding or wood trim are located either against the ground or less than 6 inches from the ground. Water infiltration and other deteriorating conditions make WTG conditions more prone to wood rot and termite infestation. A more complete evaluation of wood rot is available through the termite inspector.

Other items noted on the exterior which are relevant, or which may become relevant to the structural condition of the home at some point in the future includes drip-line-erosion (DLE) and roof-valley-erosion (RVE) below un-guttered eaves and valleys that encourage water to pond against the foundations of the home. Variations in moisture below foundations often cause heave and/or settlement of the footings that result in stem wall cracks.

As a rule, none of the six buildings have gutters. In only a few locations, gutters were observed, but in these locations, none of the existing gutters appear to have been installed by a qualified contractor.

#### **BUILDING 4702/4704**

- Interior plumbing leaks were found, and some locations of slab settlement were observed. The locations of the most significant slab settlement (with associated gaps between the walls and ceilings, out-of-square door frames, and binding doors are indicated on the attached sketch by cross-hatching.
- Unit 4704 appears to be the unit most adversely affected by the plumbing leaks and slab settlement. This slab settlement has led to extensive interior damage.
- Significant exterior cracks were observed along the front (East side) and on the South side of Unit 4704 which indicated some foundation related movement.
- A slab crack was observed in Unit 4702, but the width of the crack could not be observed due to floor finishes. This crack may require repair prior to the installation of new floor finishes in the future.
- Wood rot and some damage was observed on the wood posts which support the carports on this building. Wood rot was also observed on the plywood siding and wood trim for the exterior storage units attached to the carport on Unit 4704.

### **BUILDING 4705/4707**

- It was reported that previous plumbing leaks had been discovered below this building and were repaired. As applicable, slabs were lifted using polyurethane foam injections.
- Most interior cracks and out-of-square (OOS) door frames were relatively minor in these two units.
- CSI observed a significant crack on the North side of Unit 4705 which indicates some foundation related movement and the need for exterior piers.
- Wood rot and some damage was observed on the wood posts which support the carports on this building. Wood rot was also observed on the plywood siding and wood trim for the exterior storage units attached to the carports.

### **BUILDING 4708/4710**

- Interior plumbing leaks were found, and some locations of slab settlement were observed. The locations of the most significant slab settlement (with associated gaps between the walls and ceilings, out-of-square door frames, and binding doors are indicated on the attached sketch by cross-hatching).
- Both Units (4708 & 4710) appear to be adversely affected by the plumbing leaks and slab settlement. This slab settlement has led to extensive interior damage.
- Significant exterior cracks were observed along the front (East sides) of both Units and on the South side of Unit 4710 which indicated some foundation related movement.
- It was reported that this building was pierced approximately 8 to 10 years ago, but information regarding who installed the piers or where the piers are located was not available at the time of this site visit.
- There are currently only soffit vents on this building and no gravity or continuous ridge vents.
- Wood rot and some damage was observed on the wood posts which support the carports on this building.

### **BUILDING 4711/4713**

- The tenant for Unit 4713 was not home to provide access to his Unit
- CSI observed some evidence of minor interior floor slab movement in Unit 4711 which has caused some minor damage to the interior and other minor defects (i.e., binding doors, etc.).
- CSI observed some water stains on the ceiling which may indicate some type of past or current roof or flashing leaks.
- On the exterior of Unit 4713, CSI observed a tree in contact with the East roof surface and some shrubs in contact with the roof of the South outside storage closet.
- Wood rot and some damage was observed on the wood posts which support the carports on this building. Wood rot was also observed on the plywood siding and wood trim for the exterior storage units attached to the carports

## **BUILDING 4714/4716**

- The tenant of Unit 4714 did not allow access to this unit and the tenant of Unit 4716 was not home. CSI returned later in the evening to meet the tenant of Unit 4716, but they did not show.
- CSI observed some significant cracks along the North, South, and West sides of this building. Along the West and South sides, it appears that not only has there been some foundation related movement, but it appears that the brick veneer may not have been installed without brick ties. The brick walls are rolling away from the building in several locations on the West and South sides.
- It appears that the columns supporting the carport on Unit 4716 may have been hit at some point in the past. The roof framing is sagging, and CSI observed that the fascia on the front of the carport is also damaged.
- There are currently only soffit vents on this building and no gravity or continuous ridge vents.
- Wood rot and some damage was observed on the wood posts which support the carports on this building.

## **BUILDING 4717/4719**

- CSI observed some miscellaneous size cracks on the interior of this duplex which appears to be mostly related to the natural movement and/or flexure of the building. None of the interior cracks appeared to be significant.
- CSI observed several cracks and gaps along the South end of the building which seems to indicate some minor differential movement of the foundations. Such movement may be related to variation in the moisture content of the soils because of the absence of gutters. The movement of the bricks and gaps may also indicate that the brick veneer was not secured to the home with brick ties (a similar condition to what was observed behind Units 4714 & 4716).
- The most significant gap (G) was observed next to the sliding glass door frame which leads from Unit 4219 to the back (South) patio. The gap seems to indicate some minor foundation related settlement at the Southwest corner of the building.
- Another crack was also observed on the back (South side) of Unit 4719 which needs to be tuck pointed to close the gap.
- Wood rot and some damage was observed on the wood posts which support the carports on this building.

## **CONCLUSIONS - STRUCTURAL**

### **CONCLUSIONS APPLICABLE TO MOST OF THE SIX BUILDINGS**

Except on locations indicated within each of the buildings as noted below, the "cosmetic" cracking and minor misalignment of the doorways which has occurred on the interior of many of these individual buildings from normal framing and minor foundation activity does not indicate that there has been any detrimental effect on the structure of the house. Similarly, some of the cracks and gaps described above on the

exteriors of these buildings indicate that there has been a minor amount of perimeter foundation movement at some time in the past. Such types of evidence are quite common in homes of this age and type of construction, built in areas where there are mildly active clay soils at the foundation level. Natural deflections of wood framing and flexure of the home during seasonal high winds can also contribute to minor hairline cracks in each individual unit.

The repaired cracks and gaps indicate past structural activity. The degree to which these areas of repair will re-open or become active is unknown. Only the person who had made the repairs knows the amount of structural activity (if any) prior to performing the cosmetic improvements.

Please note that it is common for structures built in areas with mildly active clay soils at the foundation level to experience minor amounts of foundation movement and/or slab movement over the expected life of the structure. If new activity should occur, it may be indicated by minor cracks and gaps. In most cases the movement is not significant and does not detrimentally affect the structural integrity of the building. However, if any future evidence indicates that significant amounts of movement or damage are occurring, it may be necessary to consider remedial measures.

The absence of gutters on each of the six buildings should be considered a defect which is causing foundation related movement and should be corrected by the professional installation of gutters and downspouts.

#### **BUILDING 4702/4704**

- Considering the evidence described above, it is the opinion of this inspector that there has been a history of movement or damage that should be considered structurally defective.
- The plumbing leaks have caused some significant slab settlement in some locations which have resulted in out-of-square door frames, binding doors, interior cracks, and gaps where walls have settled away from the ceilings leaving gaps.
- Exterior cracks along the East and South sides of Unit 4704 should be considered structural defects requiring the installation of piers.

#### **BUILDING 4705/4707**

- Considering the evidence described above, it is the opinion of this inspector that there has been a history of movement or damage that should be considered structurally defective. The crack on the North side of Unit 4705 should be considered a foundation related defect.

### **BUILDING 4708/4710**

- Considering the evidence described above, it is the opinion of this inspector that there has been a history of movement or damage that should be considered structurally defective.
- The plumbing leaks have caused some significant slab settlement in some locations which have resulted in out-of-square door frames, binding doors, interior cracks, and gaps where walls have settled away from the ceilings leaving gaps.
- Exterior cracks along the East sides of both Units and on the South side of Unit 4710 should be considered structural defects requiring the installation of piers.

### **BUILDING 4711/4713**

- Considering the evidence described above, it is the opinion of this inspector that there has not been a history of movement or damage that should be considered structurally defective at this time. Most of the issues observed on the interior appeared to be mostly cosmetic in nature.
- The trees and shrubs in contact with the roof surfaces should be considered defects to be corrected.
- There is a missing wood column on the carport for Unit 4713 which should be considered a defect to be corrected by the installation of a new column.

### **BUILDING 4714/4716**

- Considering the evidence described above, it is the opinion of this inspector that there has been a history of movement or damage that should be considered structurally defective.
- The exterior cracks in the brick indicated foundation and evidence of the brick rolling away from the building should be considered defects to be corrected.
- The sagging roof framing for the carport on Unit 4716 should also be considered a defect to be corrected.

### **BUILDING 4717/4719**

- Considering the evidence described above, it is the opinion of this inspector that there has been a history of movement or damage that should be considered structurally defective.
- The exterior cracks in the brick and/or gaps adjacent to windows/doors indicated foundation and evidence of the brick rolling away from the building should be considered defects to be corrected.



## **RECOMMENDATIONS – STRUCTURAL (Often referred to as "requirements" by lenders)**

### **RECOMMENDATIONS APPLICABLE TO MOST OF THE SIX BUILDINGS**

Where steel hydraulic piers are recommended on the individual sketches which follow, please note that some minor amounts of foundation movement may occur after the installation of the piers. This is quite common and may be indicated by a slight reopening of patched cracks and gaps, or by the formation of new cracks of minor width. This type of activity should not be reason for concern unless widths of cracks or gaps become significant.

If cosmetic repairs to interior features of this home are necessary or desirable after the installation of the piers, it is advisable to delay such repairs or improvements for several weeks after foundation stabilization measure have been completed.

It should be noted that the recommendations regarding piers in this report assume that adequate reinforced foundations are present. When the piers are being installed, if the contractor discovers foundation or soil related defects that could adversely affect the installation or stability of the piers, they should contact CSI and this engineer to make appropriate changes to these recommendations. It should also be noted that the installation of the recommended piers is no guarantee that additional piercing will not be required at some point in the future. CSI cannot predict the impact of moisture related issues or other factors that may affect the overall performance of the foundations of this home in the months and years ahead.

It is recommended that guttering be installed at all eaves on each of the six buildings to assist in controlling foundation movement. Splash blocks or extensions are to be installed at each downspout location so that water is discharged away from the perimeter foundations and encouraged to flow off-site. It is important to locate and direct new downspout in locations and in ways that will allow water to drain away from and around the home. Avoid conditions that will allow water from these new downspouts to pond against the foundation of the home. The gutter installation company should carefully examine the grading around the home to determine the best locations and directions for channeling this water away from the foundations. Once gutters are installed, all low areas of drip-line-erosion (DLE) and roof-valley-erosion (RVE) should be backfilled, compacted, and sloped away from the foundations to prevent foundation related movement. It may also be prudent to cover these areas with sod to stabilize the repaired areas and prevent further erosion.

These buildings were not evaluated for termites, termite damage, or wood rot as part of this structural evaluation. The condition of existing deteriorated wood and conditions conducive to deterioration of structural components is generally detailed in wood destroying insect (WDI) and wood destroying organism (WDO) inspections that are available from a Pest Inspection Company and provided independent of CSI. However, where wood rot is noted on the attached sketch and in reports by others, it should be repaired as required.

As with any structure, it will be necessary for the owner to exercise normal maintenance procedures to minimize or eliminate future structural activity in the home. It is extremely important to provide a complete copy of this report, including all descriptions, observations, conclusions, recommendations, drawings, and specifications to all repair personnel who may be providing cost estimates and/or repair services. Details of cosmetic repairs or similar improvements are not included as part of this inspection.

## **BUILDING 4702/4704**

- Enclosed is a drawing indicating the recommended locations of piers to support the continuous concrete footings. A detail for steel hydraulic piers, specifications for underpinning the foundations, and a list of some Tulsa area piercing and polyurethane injection leveling contractors is attached to this report.
- Plumbing leaks often cause voids below interior floor slabs when the soils are consolidated due to the moisture. Eventually the concrete slabs will deflect downward due to the absence of supporting soils below. This may account for the low areas observed and indicated on the attached sketch. Once plumbing leaks are found, they should be located and repaired. Following the repairs and closure of the slab where repairs are made, CSI recommends that low areas should be filled with polyurethane foam to provide support for the interior slab but lifting should be limited if the foam injections are being installed in areas of plumbing. Extreme caution should be exercised when lifting slabs adjacent to bathroom or kitchen plumbing lines. Too much lifting can damage or break the below slab plumbing lines. When lifting interior slabs, the closure of crack and gaps should be the general measure as to how much the slabs should be lifted.
- Following the installation of exterior piers, it is recommended that all cracked or open mortar joints wider than 1/16 inch be "tuck pointed" (T.P.) with a mortar which closely matches the existing in color and texture. (See the primary locations to tuck point (T.P.) on the attached sketch.) Prior to application of any new mortar, the existing damaged joints should be gouged or chiseled to a minimum depth of 1/2". Additionally, all gaps between masonry veneer and adjacent wood trim should be caulked with a high-quality silicone-based product. This product is available in a paintable grade or with integral color.
- After the piers are installed, it is recommended that the elevation of low areas, areas of drip-line-erosion (DLE), areas of roof-valley-erosion (RVE), areas of erosion at the base of downspouts, flower beds, and grading adjacent to the foundation that allows water to pond next to the house should be changed (or altered) to prevent water from accumulating and seeping beneath the foundation and to encourage water flow away from the house. These areas should be filled and graded to provide positive drainage away from the perimeter of the house.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.
- Damaged wood siding and trim on the exposed exterior storage closets should be repaired or replaced.

## **BUILDING 4705/4707**

- Enclosed is a drawing indicating the recommended locations of piers to support the continuous concrete footings. A detail for steel hydraulic piers, specifications for underpinning the foundations, and a list of some Tulsa area piercing and polyurethane injection leveling contractors is attached to this report.
- Following the installation of exterior piers, it is recommended that all cracked or open mortar joints wider than 1/16 inch be "tuck pointed" (T.P.) with a mortar which closely matches the existing in color and texture. (See the primary locations to tuck point (T.P.) on the attached sketch.) Prior to application of any new mortar, the existing damaged joints should be gouged or chiseled to a minimum depth of 1/2". Additionally, all gaps between masonry veneer and adjacent wood trim should be caulked with a high-quality silicone-based product. This product is available in a paintable grade or with integral color.
- After the piers are installed, it is recommended that the elevation of low areas, areas of drip-line-erosion (DLE), areas of roof-valley-erosion (RVE), areas of erosion at the base of downspouts, flower beds, and grading adjacent to the foundation that allows water to pond next to the house should be changed (or altered) to prevent water from accumulating and seeping beneath the foundation and to encourage water flow away from the house. These areas should be filled and graded to provide positive drainage away from the perimeter of the house.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.
- Damaged wood siding and trim on the exposed exterior storage closets should be repaired or replaced.

## **BUILDING 4708/4710**

- Enclosed is a drawing indicating the recommended locations of piers to support the continuous concrete footings. A detail for steel hydraulic piers, specifications for underpinning the foundations, and a list of some Tulsa area piercing and polyurethane injection leveling contractors is attached to this report. Since this building was previously pierced, the adjustment of any existing piers in the locations where new piers are shown may achieve the same results, assuming information can be found regarding the locations and contractor for the original pier installation.
- Plumbing leaks often cause voids below interior floor slabs when the soils are consolidated due to the moisture. Eventually the concrete slabs will deflect downward due to the absence of supporting soils below. This may account for the low areas observed and indicated on the attached sketch. Once plumbing leaks are found, they should be located and repaired. Following the repairs and closure of the slab where repairs are made, CSI recommends that low areas should be filled with polyurethane foam to provide support for the interior slab but lifting should be limited if the foam injections are being installed in areas of plumbing. Extreme caution should be exercised when lifting slabs adjacent to bathroom or kitchen plumbing lines. Too much lifting can damage or break the

below slab plumbing lines. When lifting interior slabs, the closure of crack and gaps should be the general measure as to how much the slabs should be lifted.

- Following the installation of exterior piers, it is recommended that all cracked or open mortar joints wider than 1/16 inch be "tuck pointed" (T.P.) with a mortar which closely matches the existing in color and texture. (See the primary locations to tuck point (T.P.) on the attached sketch.) Prior to application of any new mortar, the existing damaged joints should be gouged or chiseled to a minimum depth of 1/2". Additionally, all gaps between masonry veneer and adjacent wood trim should be caulked with a high-quality silicone-based product. This product is available in a paintable grade or with integral color.
- After the piers are installed, it is recommended that the elevation of low areas, areas of drip-line-erosion (DLE), areas of roof-valley-erosion (RVE), areas of erosion at the base of downspouts, flower beds, and grading adjacent to the foundation that allows water to pond next to the house should be changed (or altered) to prevent water from accumulating and seeping beneath the foundation and to encourage water flow away from the house. These areas should be filled and graded to provide positive drainage away from the perimeter of the house.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.

### **BUILDING 4711/4713**

- There are no recommendations for remedial structural measures (i.e., piers) resulting from evidence available at the inspection.
- The exception is that the missing wood column on the carport for Unit 4713 should be replaced.
- Trees and branches from shrubs should be cut away from the roof surfaces and any damage shingles repaired as required.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.
- Damaged wood siding and trim on the exposed exterior storage closets should be repaired or replaced.

### **BUILDING 4714/4716**

- Enclosed is a drawing indicating the recommended locations of piers to support the continuous concrete footings. A detail for steel hydraulic piers, specifications for underpinning the foundations, and a list of some Tulsa area piercing and polyurethane injection leveling contractors is attached to this report.
- Following the installation of exterior piers, it is recommended that all cracked or open mortar joints wider than 1/16 inch be "tuck pointed" (T.P.) with a mortar which closely matches the existing in color and texture. (See the primary locations to tuck point (T.P.) on the attached sketch.) Prior to application of any new mortar, the existing damaged joints should be gouged or chiseled to a minimum depth of 1/2". Additionally, all gaps between masonry veneer and adjacent wood trim should be caulked with a high-quality silicone-based product. This product is available in a paintable grade or with integral color.

- Where applicable, loose bricks which are not attached to the sheathing should be removed and reinstalled. When reinstalled, the brick should be secured to the building using brick ties.
- After the piers are installed, it is recommended that the elevation of low areas, areas of drip-line-erosion (DLE), areas of roof-valley-erosion (RVE), areas of erosion at the base of downspouts, flower beds, and grading adjacent to the foundation that allows water to pond next to the house should be changed (or altered) to prevent water from accumulating and seeping beneath the foundation and to encourage water flow away from the house. These areas should be filled and graded to provide positive drainage away from the perimeter of the house.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.

#### **BUILDING 4717/4719**

- Enclosed is a drawing indicating the recommended locations of piers to support the continuous concrete footings. A detail for steel hydraulic piers, specifications for underpinning the foundations, and a list of some Tulsa area piercing and polyurethane injection leveling contractors is attached to this report.
- Following the installation of exterior piers, it is recommended that all cracked or open mortar joints wider than 1/16 inch be "tuck pointed" (T.P.) with a mortar which closely matches the existing in color and texture. (See the primary locations to tuck point (T.P.) on the attached sketch.) Prior to application of any new mortar, the existing damaged joints should be gouged or chiseled to a minimum depth of 1/2". Additionally, all gaps between masonry veneer and adjacent wood trim should be caulked with a high-quality silicone-based product. This product is available in a paintable grade or with integral color.
- Where applicable, loose bricks which are not attached to the sheathing should be removed and reinstalled. When reinstalled, the brick should be secured to the building using brick ties.
- After the piers are installed, it is recommended that the elevation of low areas, areas of drip-line-erosion (DLE), areas of roof-valley-erosion (RVE), areas of erosion at the base of downspouts, flower beds, and grading adjacent to the foundation that allows water to pond next to the house should be changed (or altered) to prevent water from accumulating and seeping beneath the foundation and to encourage water flow away from the house. These areas should be filled and graded to provide positive drainage away from the perimeter of the house.
- Exterior wood rot and/or loose connections of the wood posts supporting the carports should be repaired or replaced as required.

### **Important information about this report:**

Per the Requirements prescribed by the State Board of Licensure for Professional Engineers and Land Surveyors, determination of need for repair and design of repairs to defective structural components (if any) is to be performed by a Licensed Professional Engineer. The complete remediation design, including but not necessarily limited to the drawings, specifications, and details of the repair(s) to the defective structural components (if any) described in this inspection report, is often beyond the scope of this initial inspection.

This inspection report represents only the inspector's opinion and visual observations at the time of the inspection. The report is based on the information provided to the inspector, the weather and soil moisture conditions, and the experience of many previous inspections. The inspection and report are not intended to provide a warranty, guarantee, or assurance of latent or disguised defects that may be discovered in the future. A bid or estimate of repair costs should be obtained from repair contractors in the respective trades. **Failure to obtain contractors' bids and perform all of the repairs recommended in this report before "closing" is a serious mistake!** There are often additional problems found when the original report recommendations are performed, resulting in a greater cost than anticipated. This singular inspection does not provide for a "complete" property inspection. The Inspection Agreement is an essential part and condition of this inspection report.

At the discretion of the Customer the repair process recommended by the Professional Engineer can be monitored by the Engineer or the Engineer's representative until completed by the repair contractor. A written document of completion will be provided to the Customer as prescribed in the Guidelines by the State Board of Professional Engineers. There is a fee (other than the original Inspection fee) for monitoring the repair process and providing the written document of completion to the Customer.

It may be necessary for the Engineer to consult with the repair contractor of the Customer's choice, re-visit the site to thoroughly investigate the visible conditions, and take measurements, to prepare the repair design drawing(s) and specifications by the State Board of Professional Engineers. Acquisition of any previous repair documentation for consideration by the Engineer is the responsibility of the Customer. There is a fee (other than the original Inspection fee) to prepare the drawing(s) and specifications (beyond the documents originally provided) for the recommendations described herein.

As directed by the customer's choice of inspection services, this inspection and report does not meet the terms of the Oklahoma State Law prescribing a particular type of general home inspection. The items included in this inspection were performed at the specific request of our client and to the terms described in this Report. We offer many different types of home inspections which include a variety of items to be inspected and criteria by which those items are evaluated, including the home inspection prescribed by the Oklahoma Home Inspection, Title 158, Chapter 70.

This Inspection *does not include* probing and / or inspection for deteriorated structural components as described in Oklahoma Statutes 158:70 as regulated by the Construction Industries Board. Any discussion or report of the items referenced in these sections of the law *does not constitute* an inspection of the referenced items, and scope of this inspection *does not include* inspection for the deterioration of the items referenced in the Oklahoma Statutes above. Inspection for the structural and exterior components described in the herein referenced Oklahoma Statutes is available only by a separate inspection individually offered on our price list and in the MAXIMUM INFORMATION INSPECTION GROUP.

If you have any questions regarding the contents of this report, please feel free to contact me.

Sincerely,

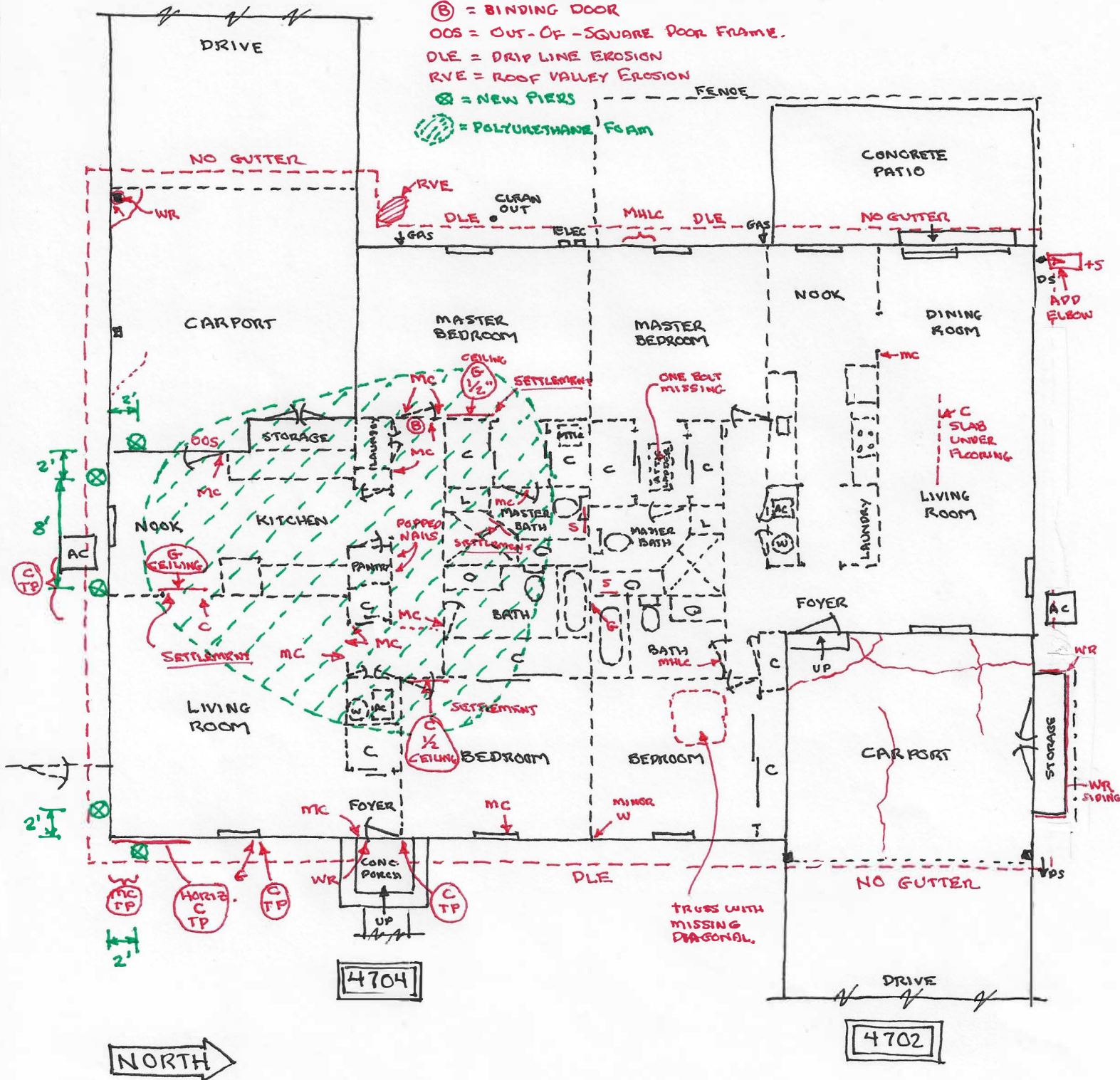
**Frist Name Last Name, P.E., S.E.**  
**Professional Civil/Structural Engineer**





WR = WOOD ROT  
 MHLIC = MINOR HAIRLINE CRACK ( $< \frac{1}{82}$ " )  
 MC = MINOR CRACK ( $\leq \frac{1}{16}$ " )  
 C = CRACK ( $> \frac{1}{16}$ " )  
 W = WRINKLE CRACK IN CORNER  
 G = GAP (REPAIR WITH CAULK)  
 TP = TUCK POINT (MORTAR CRACK REPAIR)  
 (B) = BINDING DOOR  
 OOS = OUT-OF-SQUARE DOOR FRAME.  
 DLE = DRIP LINE EROSION  
 RVE = ROOF VALLEY EROSION

(X) = NEW PIER  
 (X) = POLYURETHANE FOAM



**Bruce A. Clark, PE, SE**  
 PO Box 521112 / Tulsa 74152-1112  
 bruceclarkpe@gmail.com  
 P:(918) 380-0097 C:(918) 633-2786

Project:

TULSA, OK

Project No.: 210322-108

By: Bruce A. Clark, PE, SE

Date: 3/22/21

Checked:

Date:

Scale: NTS

Sheet:

of:



MHLC = MINOR HAIRLINE CRACK ( $< \frac{1}{32}$ " )

MC = MINOR CRACK ( $\leq \frac{1}{16}$ " )

C = CRACK ( $> \frac{1}{16}$ " )

RC = REPAIRED CRACK

TP = TUCK POINT

⊗ = NEW PIER LOCATION

RVE = ROOF VALLEY EROSION

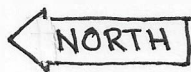
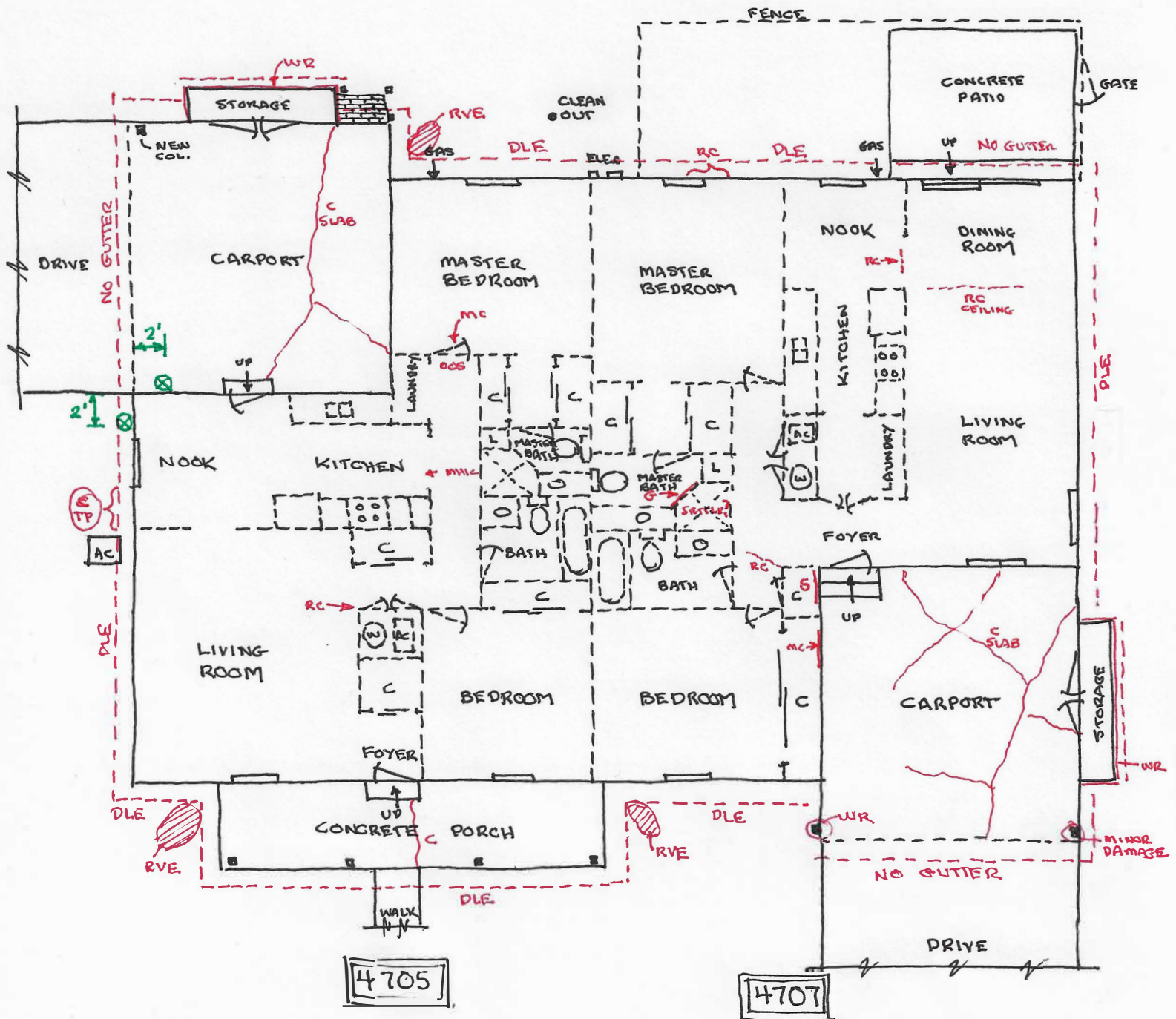
DLE = DRIP LINE EROSION

OOS = OUT-OF-SQUARE

G = GAP (REPAIR WITH CAULK)

WR = WOOD ROT

S = STAIN (ON WALL OR CEILING)



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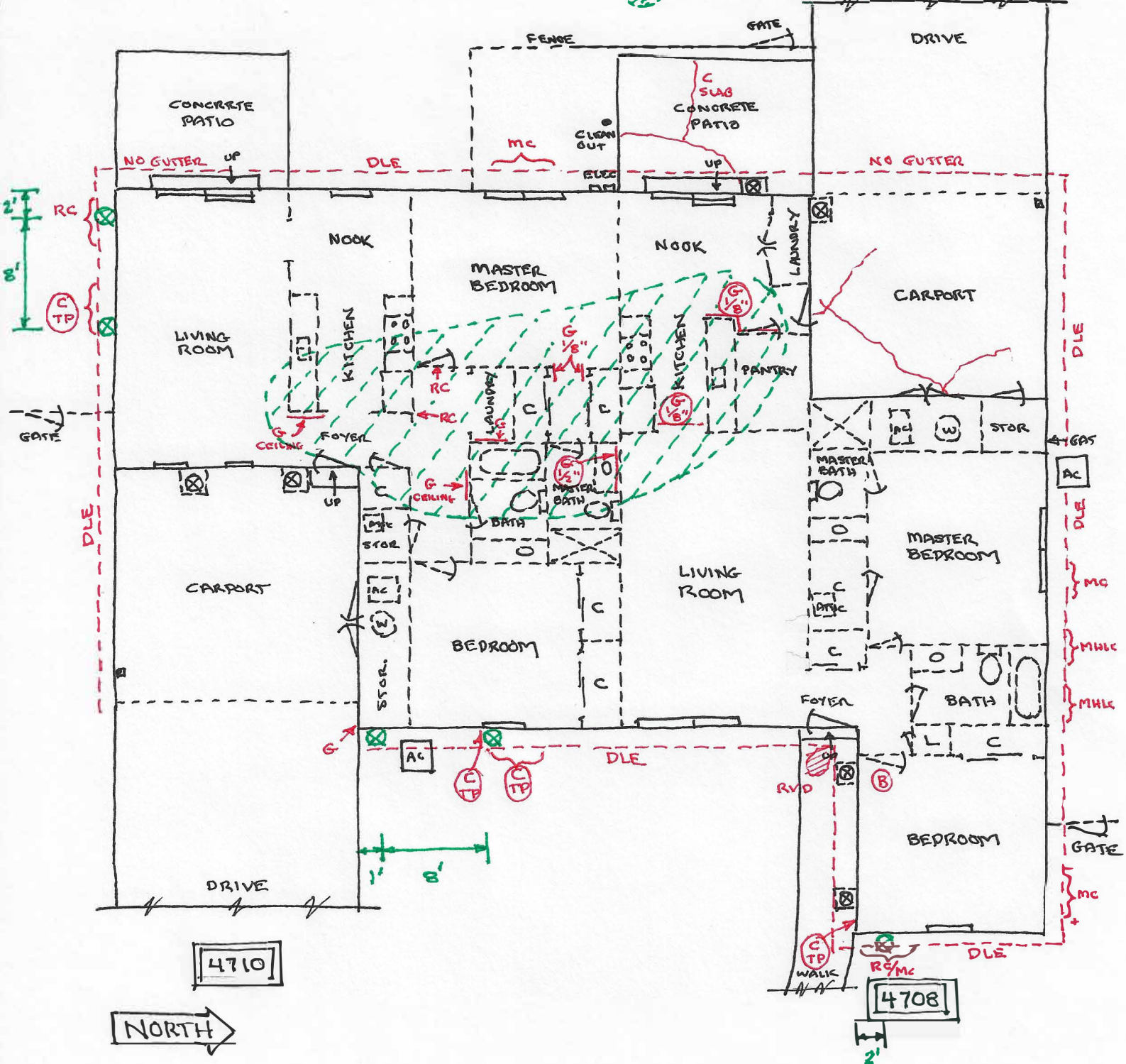
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 MC = MINOR CRACK ( $\leq \frac{1}{16}$ " )  
 C = CRACK ( $> \frac{1}{16}$ " )  
 RC = REPAIRED CRACK  
 G = GAP (REPAIR WITH CAULK)  
 TP = TUCK POINT (CRACK REPAIR)

DLE = DRIP LINE EROSION  
 RVD = ROOF VALLEY DISCHARGE  
 (B) = BINDING DOOR  
 (X) = EXISTING PIER  
 (N) = NEW PIER  
 (P) = POLYURETHANE FOAM LEVELING



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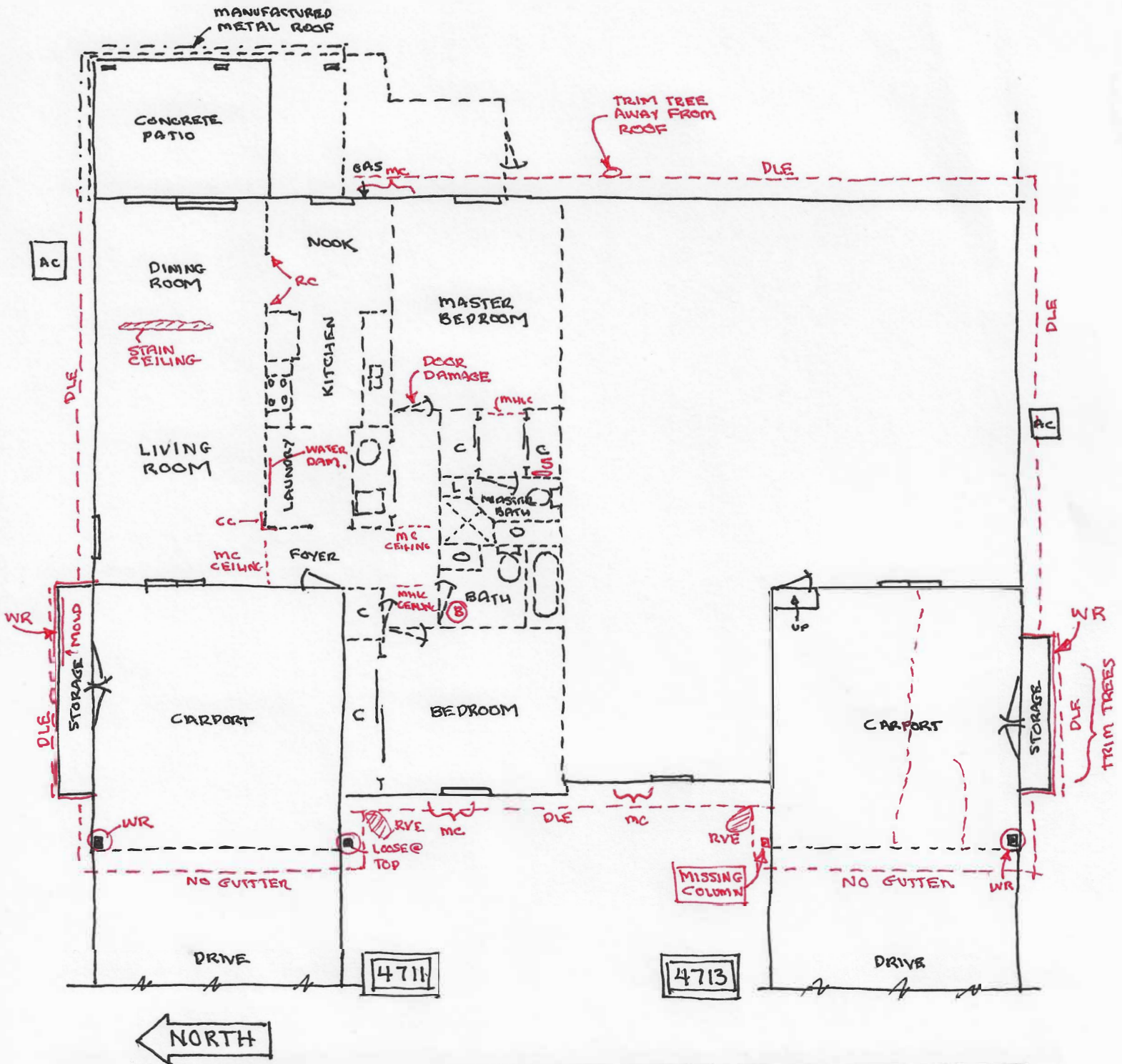
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MHLC = MINOR HAIRLINE CRACK ( $< \frac{1}{32}$ " )  
 MC = MINOR CRACK ( $\leq \frac{1}{16}$ " )  
 C = CRACK ( $> \frac{1}{16}$ " )  
 RC = REPAIRED CRACK  
 CC = COMPRESSION CRACK

DLE = DRIP LINE EROSION  
 RVE = ROOF VALLEY EROSION  
 WR = WOOD ROT  
 S = STAIN (WALL OR CEILING)  
 ⊕ = BINDING DOOR



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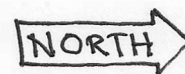
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