

**DEL RIO THEATRE  
3300 ATCHISON STREET  
RIVERBANK, CALIFORNIA**

**FEBRUARY, 2009**

**STRUCTURAL EVALUATION REPORT**

Project Engineer: Casey Lubawy  
Project Manager: Brian Reil, S.E.  
B&B Project No. S08-027.00

February, 2009  
Page 1 of 16

Del Rio Theatre  
3300 Atchison St  
Riverbank, CA  
B&B Project No. S08-027.00

**TABLE OF CONTENTS**

**SCOPE OF STUDY AND REPORT ..... 4**  
**EXISTING BUILDING GENERAL DESCRIPTION ..... 4**  
**SUMMARY OF FINDINGS..... 4**  
    **Heavy Timber Trusses..... 4**  
    **Exterior Walls..... 5**  
    **Roof Framing at Banquet Hall #2..... 5**  
    **Roof Framing at Restaurant ..... 6**  
    **2nd Floor Framing at Office Suite..... 6**  
Appendix A – Roof Hip Trusses ..... 6  
Appendix B – Exterior Walls ..... 12  
Appendix C - Restaurant and Banquet Hall #2 ..... 14  
    **Roof Framing at Restaurant ..... 14**  
    **Roof Framing at Banquet Hall #2..... 15**  
Appendix D - 2<sup>nd</sup> Floor Office Suite ..... 15

**Del Rio Theatre**  
**Structural Evaluation Report**

*Riverbank, California*

*February, 2009*

**SCOPE OF STUDY AND REPORT**

The overall purpose of this evaluation is to investigate and identify deficiencies in the existing structure or any components of the structure. Buehler & Buehler has conducted a site visit on January 28-29, 2009, to the Del Rio Theatre in Riverbank, California in order to establish the general framing conditions of the existing building. This site visit was not intended to be a complete inspection of all structural items, however partial demolition of finish materials was provided to expose the structure and allow a more thorough observation at some locations. This report describes the findings from our visual evaluation of the existing condition of building materials and connections in the areas we were able to access. The primary focus was the South half of the structure as some damage had been observed previously at this portion of the structure.

**EXISTING BUILDING GENERAL DESCRIPTION**

The Del Rio Theatre was built in the late 1940's. The South half of the building consists of the main banquet hall (Banquet Hall #1) / Assembly Area and a 2-story office portion. The North half of the building consists of Restaurant and a second banquet hall (Banquet Hall #2). The roof framing over the main banquet hall consists of 1x diagonal sheathing over 2x framing spanning to heavy timber hip girder trusses (consisting of 8x10 top chords, 8x8 bottom chords, and 4x verticals and diagonals) spaced at roughly 20' center-to-center. The trusses clear span roughly 52'-0" and are supported by 8x10 timber posts at each end. The roof framing over the north half of the building consists of various 2x framing spanning to wood or steel beams or wood stud bearing walls. Exterior walls consist of 2x framing spaced at 16"cc with diagonal sheathing.

**SUMMARY OF FINDINGS**

***Heavy Timber Trusses***

The heavy timber trusses have excessive splitting at the joints and in the members. One joint has had extreme splitting of the members and cannot function as originally designed. The trusses are not sufficient or functional without remedial action. Over the years there appears to have been several attempts to either repair or retrofit the heavy timber trusses. The ceiling appears to have been originally attached to the truss bottom chord; however it was removed and now consists of a T-bar ceiling suspended from the roof joists. Some of the steel bucket connections show signs of rust and corrosion at the truss ends. There are apparent splits on all sides of the original truss members, many propagating through the bolts. In general the top chords have the most visible

damage. There are many bolts with insufficient edge distance, particularly at the diagonals. There are also many locations where bolts have been relocated, i.e. empty bolt holes. Sagging at some of the trusses was evident, creating separation between the top chord and the roof joists. This sagging may be the reason for excessive roof ponding, along with causing the South wall to deflect (bow out) and possibly damaging the exterior finishes. In general, the performance of the original truss members have been compromised and must be addressed. A more detailed description and photos of each specific truss can be found in Appendix A.

### ***Exterior Walls***

Observation of the structure showed that a complete lateral load path was not present and not adequate for the lateral demand. There are many areas where the diagonal roof sheathing and joists are damaged, along with wall studs and wall sheathing. There are areas where diagonal wall sheathing is not present and areas where the exterior plaster has completely delaminated from the wall sheathing. At a minimum, all damaged components of the lateral system would need to be evaluated and replaced with an engineered system to provide a fully developed load path.

Access was provided to the exterior walls on the South and East sides of the building. The exterior walls on these two sides consist of a concrete stem wall with a 2x8 sill and 2x8 studs spaced at 16" on center. There is diagonal sheathing over the studs with plaster and welded wire mesh on the outside. Upon removal of some of the interior sheet rock it was apparent that at some locations the diagonal sheathing was visibly missing. The plaster at these locations is not positively connected to the wall. The wall studs span vertically to an intermediate double top plate that runs horizontally between truss posts. This double top plate has no positive connection at the ends, creating a hinge and allowing large deflections. This condition has caused wall deflections and can be unstable. The length of the studs is also beyond code allowable limits. There are studs above that have been replaced in areas of severe rot. The double top plate and wall studs have severe water damage towards the South-East corner of the building. The sill plate appears to be generally in good condition. Existing anchor bolts were found, however a spacing pattern was not verified. The plaster and sheathing on the South and East walls was observed with damage and was delaminating from the structure. The studs are damaged and overstressed; essentially the existing wall system is not capable of functioning at an acceptable level at the South half of the structure. For additional information and photos of the existing exterior walls refer to Appendix B.

### ***Roof Framing at Banquet Hall #2***

The roof framing at the Banquet Hall #2 consisted of 2x12 roof joists spaced at 16" on center supporting 2x4 ceiling joists suspended from them. The roof joists have 1x diagonal sheathing and span between interior 2x bearing walls. It was apparent that an original hard-lid gypboard ceiling with insulation was attached to the bottom of the 2x4 joists. Severe signs of water stains and damage are present in some of the roof joists and diagonal sheathing. Parts of the bearing wall are missing plywood. The North wall from the inside has a damaged sill plate and no

anchor bolts. There is mold and mildew visible on the ceiling, wall, and floor tiles at the North-East corner. There is a considerable amount of water / weather damaged members at the Banquet Hall #2 that will need to be replaced. Refer to Appendix C for pictures of the Banquet Hall #2.

### ***Roof Framing at Restaurant***

The framing over the Restaurant appeared to be in good overall condition and did not show signs of water damage. Typical roof framing consists of 1x diagonal sheathing over 2x12 roof joists with 2x4's suspended, similar to the roof framing at Banquet Hall #2. Sheathing at the North exterior storefront wall could not be verified. The storefront wall studs are interrupted by a double 2x top plate which not positively connected at the ends. The Restaurant roof and wall framing seems to be adequate as is; the exterior storefront wall's ability for shear transfer (i.e. diagonal sheathing, plywood, anchor bolts, etc.) would need to be addressed. Photos of the restaurant framing can be found in Appendix C.

### ***2nd Floor Framing at Office Suite***

The second floor framing consisted of 2x4 gang-nail trusses, roughly 3' in depth, spaced at 24" on center, spanning between 2x4 interior bearing walls. These trusses show no signs of water damage and are in good overall shape. There was no apparent connection between the interior 2x4 partial height second floor bearing wall and the full height exterior 2x8 studs. The interior walls appear to only have gypboard and are lacking plywood or diagonal sheathing. A lateral system consisting of sheathing and possibly holdowns would need to be added to the office framing walls wherever not present. See Appendix D for photos of the second floor framing.

### **Appendix A – Roof Hip Trusses**

At the main Banquet Hall (Banquet Hall #1) / Assembly Area, there are six total hip girder roof trusses, spaced at about 20' on center (see Fig.1). The trusses have been numbered for reference, starting with Truss 1 at the far West end above the second floor offices (Truss 2 is also above the offices) and Truss 6 at the far East end above the stage.

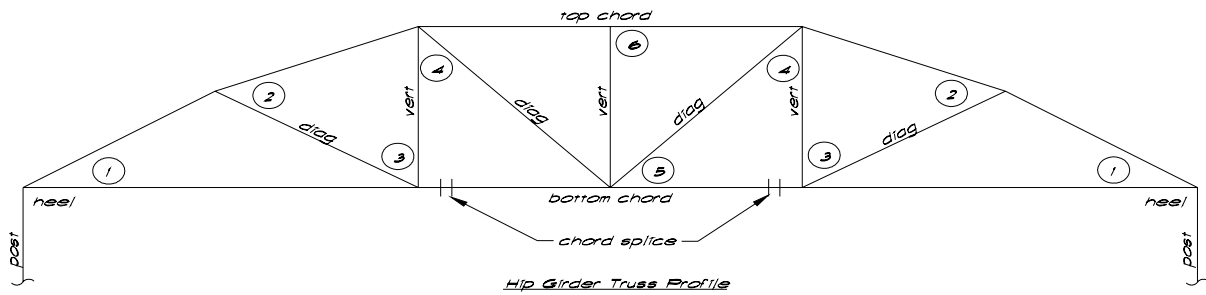


Figure 1 - Truss Profile

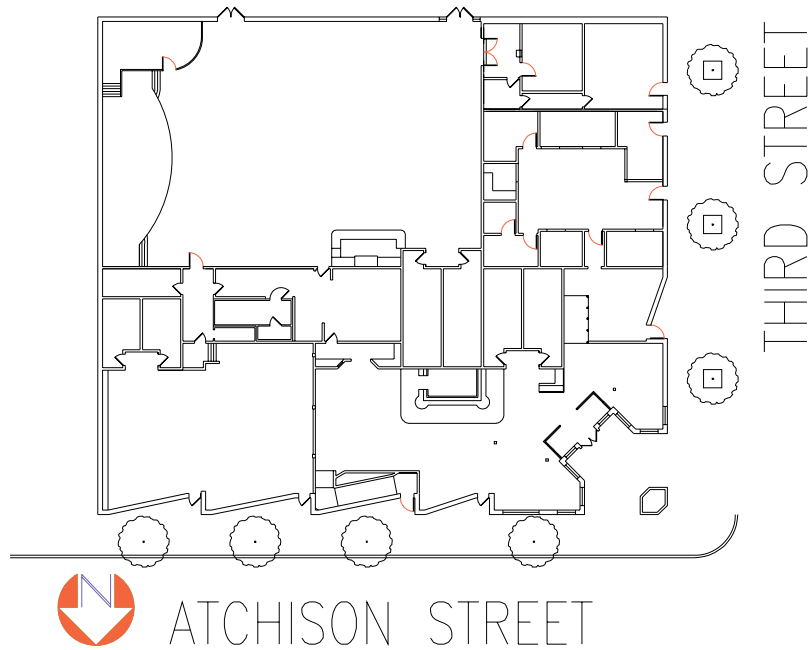


Figure 2 - Overall Building Plan

### ***Truss 1***

Trusses 1 and 2 were accessed from a ladder removing the ceiling above the second floor offices. The ladder was moved to achieve visual access down the length of the truss. Starting from the South end post to truss connection (connection #1), rust and signs of corrosion are apparent in the steel bucket. Some splitting is present down the vertical post, and splitting was discovered in both sides of the top and bottom chord. Splitting was also apparent in the bottom of the bottom chord. Severe splitting was noticed at connection #2 from the South end on the sides propagating from the bolt line. Connection #3 has splits in line with the bolts, empty holes drilled in line with active bolts, and insufficient edge distance for the bolts. At the first bottom chord splice (from South end) there is a split through the second bottom chord member; there is another split in the bolt line that starts at connection #5 at the bottom chord and runs throughout the entire diagonal to the top bolt connection. There is also a large split around 1/2" in width in the bottom chord at #5. It was noticed that the first three roof joists have roughly 1- 1/2" gap between the bottom of joists and top truss chord; the truss has appeared to sag down and the joists are not bearing. A 3/4" joint is present between the bottom chord and the chord splice member. At connection #3 from the North side there is splitting along the full length each side. There is some settlement at the midspan, similar to the South end, somewhat less severe, causing roughly 1/2"- 3/4" of separation between the top chord and a few roof joists at midspan, along with some separation at the North end and the first few roof joists. There is splitting present at the top chord on each side at connection #2 & #4, and at the bottom chord and diagonals at #3, all similar to the South end of the truss.



**Figure 3 – Non-bearing Separation @ Top Chord & Roof Joist**



**Figure 4 – Splitting in Bottom Chord**



**Figure 5 – Splitting in Diagonal @ Bolts**

### ***Truss 2***

There is a significant amount of rust present at the South connection #1. It appears that there is a 6x post outside of wall plane that is bolted back to the 8x post in line with the 2x8 wall, along with a new cap plate connected to the bottom chord. The entire top chord has additional members laminated to each side. Starting from South connection #1, there is splitting present in both sides of the top and bottom chords in line with the bolts, along with side plate corrosion. No splitting was detected at connection #3. Splitting is present in the bottom of the top chord, particularly around midspan. Two-2x's have been added to each side of the top chord with bolts at 12"cc through much of the midspan. A flat 6x8 has been added to the bottom of the bottom chord for about 10 feet at midspan. A similar gap can be seen between the roof joists and bearing wall East of Truss 2, which occurs for roughly 20 feet around the truss midspan. There is newly added scabbing that fills the depth for a missing diagonal (second diagonal from South); it appears that the existing diagonal was removed and replaced on one side only, leaving a large gap (roughly 3", or two -2x's) between the new diagonal and the existing bottom chord at connection #3 where the bolts are cantilevering. There appears to be a newly added 1/4" plate on the face of the bottom chord at this connection. At connection #1 on the North side, the bottom chord appears undamaged. There is a large split on the sides of the top chord at connection #1 in line with the bolts, and the post here is also sticking outside of the wall plane. The first few roof joists again don't appear to be bearing directly on the top chord here as well.



**Figure 6 - Separation @ (n) Vertical and (e) Bottom Chord**



**Figure 7 - Repair @ Top Chord**



**Figure 8 - Separation @ Roof Joists and Bearing Wall**

***Truss 3***

Trusses 3 through 6 were evaluated with the use of a lift; typically a minimum of three locations were inspected (North, midspan, and South ends) to achieve a full inspection. At Truss 3, the first vertical from the North side has significant visible water damage. The first diagonal connection #2 has severe splitting, with a width greater than 2" wide in the top chord and 1/2" in the diagonal. The bottom chord at the North end has splitting on each side with widths up to 1/2". Newly added members have been added at the truss midspan (roughly 10 feet in length, 5 feet each side of center of truss) with 7/8" diameter thru bolts spaced roughly at 12" on center at Truss 3, 4, and 5, consisting of a flat 6x8 under the 8x8 bottom chord with 2-2x6 ea side, top and bottom, of the 8x8, along with a new 1/4" plate on each side with 9- 3/4" diameter newer bolts and 4- 7/8" diameter reused bolts. The vertical rod at the North side is bent and appears to have failed.



**Figure 9 - Severe Splitting in Top Chord and Diagonal**



**Figure 10 - Bottom Chord Splitting**

#### ***Truss 4***

The same repair is present at the bottom chord as in Truss 3. Starting from the South end, there is significant water damage present at the wall studs. There is splitting in the bottom chord on the sides in line with the top row of bolts at connection #1, splitting in the top chord in line with the bottom row of bolts in #1, and splitting in the sides at the top chord at connection #2 in line with the bolts. There is no apparent gap between the roof joists and the top chord. Over at the North end there is splitting at the first top joint similar to that at the South but not quite as significant.



**Figure 11 - Double Top Plate (hinge) at Truss and Water Damage**

#### ***Truss 5***

The same retrofit scabbing is present at the midspan of Truss 5 as in Truss 3 & 4. The repairs conceal much of the damage present in the original bottom chord. The new  $\frac{1}{4}$ " plate at the center of this newer repair is roughly 30" wide x 18" tall with  $9\text{-}\frac{3}{4}$ " diameter bolts and  $4\text{-}\frac{7}{8}$ " diameter bolts, encompassing all of the newer retrofit members and bottom chord. There is occasional splitting in the top chord at the South end. At the North end there is more significant splitting in the top and bottom chords in line with the bolts at the heel connection.



**Figure 12 - (n) Steel Plate and Repair @ Bottom Chord**



**Figure 13 - Side View of (n) Repair at Bottom Chord**

### ***Truss 6***

Truss 6 was accessed from below from a ladder set on the East end of the stage. There is significant water damage at the South-East corner. Wall studs, double 2x wall top plate, and roof joists show excessive signs of water damage. There is negligible splitting visible at the bottom chord at the South connection #1; however there is some splitting on the sides of the top chord at connection #2. There is splitting on one side of the bottom chord that running to about midspan. At midspan there is splitting at connection #5 in the diagonal member in line with the bolts. Scabbing repair is present at midspan similar to previous. There is no apparent splitting in the top or bottom chord. At the North end there was splitting on the side of the bottom chord on down to the midspan, along with splitting at the top chord connection #2 in line with the bolts. The bolts at this connection appear to be loose and the nuts could be unscrewed by hand.



**Figure 14 - Bolt not in Diagonal**

### **Appendix B – Exterior Walls**

Bowing of the South exterior wall was discovered in the interior sheet rock and exterior plaster systems most predominantly at Truss 4. From the inside, many wall studs and diagonal sheathing show signs of water damage. There are about 6 newly added 2x6 studs between Truss 3 & 4 that are in the same plane as the 2x8 wall studs, essentially replacing the original 2x8's

that had significantly rotted away. From the top of the soffit above the existing ceiling up for about five feet there is no diagonal sheathing on the wall studs. The double 2x top plate spans horizontally at the soffit between truss posts with no positive connection, creating a hinge near the top of the wall and thus making the wall unstable. Anchor bolts potentially present at the existing sill plate were concealed, and the 8x10 posts at the trusses appear to be toe-nailed (4-5 nails) to the sill, and the post had slightly rotated at the base. The wall studs span vertically roughly 24' to a double 2x top plate that spans horizontally between truss posts. There is no positive connection between the double top plate and posts, and many of the studs on the South and East walls, particularly toward the SE corner, along with the double top plate show severe signs of water damage. The 2x8 studs extend above the double top plate roughly another 10'. The 2x8 wall was inspected at midheight at Truss 4, where wall deflection was most apparent, between the double top plate and finished floor. There is a large visible horizontal crack in the plaster on the outside of the building at the double top plate location on the South wall, along with the same type of crack at the outside of the East wall (the double top plate at the East wall appears to be lower at roughly 14' above finished floor. Upon removal of the sheetrock it was apparent that there were large portions of diagonal sheathing missing or rotted away, leaving the plaster with a separation (up to 1- 3/4" wide) from any connectivity. There are many studs above the double top plate that have been replaced and many others that show severe rot. The double top plate has severe water damage; water damage is greater in the plate and studs heading towards the South-East corner of the building.



**Figure 15 - Rooftop View of Bowing in South Wall**



**Figure 16 - East Exterior Elevation w/Horizontal Crack in Plaster**



**Figure 17 - Interior View of Double 2x Top Plate w/no Connection to Post**



**Figure 18- Interior View of Water Damaged Framing @ South/East Corner**



**Figure 19 - Figure 18 - Interior View of Exterior 2x8 Wall w/Missing Sheathing and Delaminated Plaster**

## Appendix C - Restaurant and Banquet Hall #2

### ***Roof Framing at Restaurant***

The framing over the Restaurant did not show signs of water damage. It was accessed from about 5 different locations via ladder and removal of ceiling panels. Typical roof framing consists of 1x diagonal sheathing over 2x12 roof joists at 16" on center with 2x4's suspended down that previously supported a hard-lid ceiling with insulation. A new steel wide flange beam was noticed spanning North to South to tube steel columns that was added to replace an original bearing wall. At the North storefront wall there are 2x4 studs running up from the soffit present on the inside. There is a double 2x top plate running horizontal that interrupts these studs that also appears to have no positive connection at the ends. Interior finish was still intact and interior studs, sill, and sheathing were concealed.

### ***Roof Framing at Banquet Hall #2***

The framing over the Banquet Hall #2 was viewed from a ladder by removing the suspended ceiling panels. Starting from the South side (wall adjacent to Banquet Hall #1), there are 2x12 roof joists spaced at 16" on center supporting 2x4 ceiling joists that are hung down. The roof joists span between interior 2x bearing walls and have diagonal sheathing on top. It was apparent that an original hard-lid gypboard ceiling with insulation was attached to the bottom of the 2x4 joists. Some signs of water stains and damage is present in the roof joists and diagonal sheathing, most predominantly toward the storage and walk-in refrigerator rooms (towards the South East). There is also significant rotting in the sheathing where a pipe has penetrated through the roof sheathing and allowed water to leak in. The bearing studs in the South wall of the Banquet Hall show water damage. The interior walls on the South and West sides of the area have damaged and in some areas not present sill plates. At the North side storefront there is diagonal sheathing on the exterior side up to the ceiling level over 2x6 studs with gypboard on the inside and then plywood on the inside of that. Nailing above the ceiling connecting the plywood and the wall studs and the plywood to wall double top plate from the inside above the ceiling could not be verified. The plywood at the bottom of the wall was cut away, exposing the interior wall studs from inside the room. There was only one anchor bolt present down the entire North wall line. There was severe water damage present in the studs and roof framing above the ceiling at the North East corner of the room, along with mold and mildew visible on the wall and floor tiles.



**Figure 20 - 2x12 Roof Joists with Suspended 2x's  
& Remnants of Previous Ceiling**

### **Appendix D - 2<sup>nd</sup> Floor Office Suite**

The second floor framing was inspected by ladder by removing the ceiling panels from below. The trusses show no signs of water damage and are in good overall shape. There was no apparent connection between the interior 2x4 partial height second floor bearing wall and the full height exterior 2x8 studs.



**Figure 21 - 2nd Floor Office Gang-Nail Truss Framing**



**Figure 22 - Interior View of 2x4 Bearing Wall @ Office Truss & Exterior 2x8 Wall**