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December 2, 2015

Dan Sundling
Livingston Vault Investigations
101 S. Main Street
Livingston, MT 59047

Dan;

As requested Bruce Haroldson and George Mullen conducted a site visit (November 12th, 2015) to vaults located in Livingston, MT. Specific vaults were investigated and the following report will discuss items noted in field.

The following vaults were investigated:

- 1- Paoli and Brown & The Wok, 102 W. Callender St.
- 2- Taylor-Levitt Insurance, 104 S. Main St./ Sax & Fryer 109 W. Callender St/ Wild West Custom Clothing 109 W. Callender
- 3- The Frame Garden, 101 S. Main St
- 4- The Mint Bar & Liquor Store, 102 N. Main St
- 5- Livingston Bakery & Bodega 101 N. Main St. & The Salon 102 Calender/ Curated Closet 110 Callender St./ & Reed Lehman Pottery 112 Callender St.
- 6- The Mint Bar & Liquor Store, 102 N. Main St
- 7- Park County Senior Citizens Center 206 S. Main St

The following report is an assessment of existing conditions based on our field investigation. Drawings of existing conditions are included for each vault. Construction cost estimates are included with options to infill or maintain each vault. Cost estimates to complete the Civil Engineering portion of the project are included and are based on the average cost per square foot from the Butte URA restorations and include the following items: Equipment Mobilization, Permits, traffic Control, Curb Installation, Asphalt Patch, Paint, Sign Relocation, ADA Ramps, and new sidewalks.

Please be aware that the cost to produce construction documents and specifications have not been included in the preliminary investigation. Construction documents and specifications from the civil and structural engineer will be required for construction.

Based on previous work in estimating the total cost and unforeseen expenses the cost estimates include a 12% contingency. We feel that the contingency is useful as construction conditions can change once demolition is in progress.

Livingston Vaults
November 16, 2015
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Please call with any further questions related to this matter, please contact our office at your earliest convenience.

Sincerely,
Beaudette Consulting Engineers

A handwritten signature in black ink, appearing to read 'Bruce Haroldson', with a horizontal line extending to the right.

Bruce Haroldson, Project Manager

A handwritten signature in black ink, appearing to read 'George Mullen', with a horizontal line extending to the right.

George Mullen, EI

**Paoli & Brown Law Offices 116 W. Callender St.
The Wok 102 North 2nd St.**

Vault Description General: There is a 9'-0" x 115'-0" vault located along Callender St. There is also a 9'-0" x 25'-0" vault at the front entrance of The Wok, on 2nd St. The vault is about 7'-6" tall. There is a concrete base slab level with the concrete basement floor.

Vault Walls:

Street Side & End Walls: The vault street side and end walls along Callender and 2nd Street are concrete walls. The concrete walls support a twostep concrete vault lid. The majority of the foundation walls are in fair to good condition. A few sections of the street side vault walls are cracking and will need to be upgraded, if the vault is to be maintained. Water infiltration and freeze thaw cycles have contributed to the deterioration of the foundation walls.

Building Line Walls: The building line walls are supported by steel beams spanning between concrete columns. The steel beams also support the vault lid. The steel beams in the Paoli & Brown vault section have additional steel posts installed to provide support along building line. The building line beams were noted to be in good condition, however corrosion has occurred due to water infiltration.

Vault Lid: The vault concrete lid is leaking and is in poor condition. The concrete slab is approximately 6". The Wok vault lid was placed as an arch between concrete encased steel beams. The encased steel beams are corroded and additional shoring and bracing was required. Additional wood shoring was placed to provide support to the vault lid, however considered temporary. The Paoli & Brown vault lid was placed with a flat ceiling. There is currently wood and steel framing supporting the vault lid. The top surface of the vault lid is extensively cracked and allows water infiltration.

Vault Miscellaneous: There are several utility pipes located in the vaulted area. It was not determined if the utility pipes are abandoned or are currently in use. There is a brick steam vault tunnel connecting The Wok and the Edward Jones Investment offices across Callender St. It was discussed on site that the city may infill the steam vault during the vault/sidewalk construction. In addition to the utility pipes, mechanical ductwork was noted in the Paoli-Brown section.

The 'Gardener- Miles 1904' stamp on the sidewalk may be difficult to saved, the lid is severely cracked. The entrance concrete decorative posts add complexity to the project and will require coordination to remove and replace for any vault or sidewalk upgrades.



Photo #1: The Wok- Paoli & Brown Building



Photo #2: The Wok- Paoli & Brown Building-
Gardener – Miles Entrance

Brick veneer bears directly on the concrete slab along The Wok building line. This was specifically noted at the column locations. The Paoli & Brown Building has a steel ledger support located above the vault lid.

Conclusion: The vault lid is in poor condition and needs to be replaced. The Wok and the Paoli & Brown Law office vaults are considered good candidates for maintain the vaulted area. Though some of the street side and end walls are damaged the majority of the foundation walls are in good shape. The steam tunnel could be infilled, however this should be coordinated by the city engineers.

Additional Images Below:
Shoring and Utility Pipes in the Vaults.



Street Wall Intersection of 2nd and Callender St.
Steam Vault under Callender St.



Paoli & Brown Law Offices 116 W. Callender St.

Infill Vault:

Structural Cost Estimate:	\$30,000
Civil Cost Estimate:	\$15,000
Total Cost Estimate w/ 12% Contingency:	<u>\$50,500</u>
URA 90%:	\$45,450
Property Owner (10%):	\$5,050

Maintain Vault:

Structural Cost Estimate:	\$75,000
Civil Cost Estimate:	\$15,000
Total Cost Estimate w/ 12% Contingency:	<u>\$100,700</u>
URA 90%:	\$90,700
Property Owner (10%):	\$10,000

The Wok 102 North 2nd St.

Infill Vault:

Structural Cost Estimate:	\$35,700
Civil Cost Estimate:	\$22,620
Total Cost Estimate w/ 12% Contingency:	<u>\$65,400</u>
URA 90%:	\$58,800
Property Owner (10%):	\$6,600

Maintain Vault:

Structural Cost Estimate:	\$90,000
Civil Cost Estimate:	\$22,600
Total Cost Estimate w/ 12% Contingency:	<u>\$126,300</u>
URA 90%:	\$113,700
Property Owner (10%):	\$12,627

Taylor-Levitt Insurance 104 S. Main St.
Sax & Fryer 109 W. Callender St
Wild West Custom Clothing 109 W. Callender St

Vault Description General: There is an 8'-0" x 62'-0" vault located along Callender St. in front of Sax & Fryer and Wild West Custom Clothing. Sax & Fryer and the Wild West Custom Clothing vaults are used for storage. The vaults are about 7'-10" tall. There is a concrete base slab in the vault level with the concrete basement floor.

An 8'-0" vault section is located in the Taylor-Levitt Insurance building portion. The Taylor-Levitt Insurance vault section has limited access and is not being used. The vault is about 7'-10" tall. There is a concrete base slab in the vaults. The Taylor Levitt Insurance building section along Main St does not have a vaulted area that could be detected. The Callender St stairway into the Taylor-Levitt Insurance Building basement has been infilled.

Vault Walls:

Street Side & End Walls: The vault street side and end walls along Callender Street are stone rubble foundation walls. The Stone rubble walls support a twostep concrete vault lid. A 3'-0" section of the vault wall has collapsed in the Wild West Custom Clothing vault. The vault wall damaged looks to be caused by water infiltration. The vault foundation wall mortar between stones is crumbling away. The foundation wall will need to be repointed if the vault is to be maintained.

Building Line Walls: The front of the building is supported by concrete columns with brick infill. Concrete walls were also noted supporting the building line. The building line of the boiler room (south end of the Wild West building section) is rubble stone walls. A 3' section of the rubble foundation building line wall was not present in the boiler room.

Vault Lid: The vault concrete lid is leaking and is in poor condition. The concrete slab is approximately 6". The slab is supported by concrete encased steel railroad rails. There is wood spanning between the encased steel beams. The wood and steel beams have been exposed to moisture and are corroding. Steel framing supporting the vault glass skylights are corroded and showing signs of distress. There is a steel sidewalk access in front of Sax & Fryer, however it appeared that it is no longer being used.



Photo #1: 109 West Callender



Photo #2: 109 West Callender- Vault Skylight

Vault Miscellaneous: There was one utility pipes located in the vaulted area. The utility line was capped at the Taylor-Levitt Insurance section. Brick veneer bears directly on the concrete slab along building line. Additional support and stabilization of the brick veneer will be required during and after construction.

Conclusion: The vault lid is in poor condition and needs to be replaced. The Sax & Fryer and the Wild West Custom Clothing vaults could be upgraded to maintain storage. Sax & Fryer and the Wild West Custom Clothing vault street side walls will need to be upgraded and repointed. The section where the foundation wall failed will require upgrades. The Taylor-Levitt Insurance section is not being used and is a good candidate to be infilled.

Additional Images Below:

Main Street looking at Taylor-Levitt Insurance Building and sidewalks along Callender St.



Sax & Fryer Metal access and Glass Skylights



Taylor-Levitt Insurance 104 S. Main St.

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$1,500
Civil Cost Estimate:	\$26,100
Total Cost Estimate w/ 12% Contingency:	<u>\$31,100</u>
URA 90% Cost Estimate:	\$28,000
Estimated Cost to Property Owner (10%):	\$3,100

Maintain Vault Cost Estimate:
Not Determined

Sax & Fryer 109 W. Callender St

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$3,900
Civil Cost Estimate:	\$8,300
Total Cost Estimate w/ 12% Contingency:	<u>\$13,500</u>
URA 90% Cost Estimate:	\$12,200
Estimated Cost to Property Owner (10%):	\$1,300

Maintain Vault Cost Estimate:	
Structural Cost Estimate:	\$32,400
Civil Cost Estimate:	\$8,300
Total Cost Estimate w/ 12% Contingency:	<u>\$45,500</u>
URA 90% Cost Estimate:	\$41,000
Estimated Cost to Property Owner:	\$4,500

Wild West Custom Clothing 109 W. Callender St

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$4,600
Civil Cost Estimate:	\$8,400
Total Cost Estimate w/ 12% Contingency:	<u>\$14,500</u>
URA 90% Cost Estimate:	\$13,100
Estimated Cost to Property Owner (10%):	\$1,400

Maintain Vault Cost Estimate:	
Structural Cost Estimate:	\$19,500
Civil Cost Estimate:	\$8,400
Total Cost Estimate w/ 12% Contingency:	<u>\$31,300</u>
URA 90% Cost Estimate:	\$28,200
Estimated Cost to Property Owner:	\$3,100

The Frame Garden 101 S. Main St

Vault Description General: The majority of the vault measures 4'-0" x 145'-0" along Callender St. The vault starts at the alley and runs to the front of the building. There are two locations where the vault increases to 9'-3" wide along Callender St. There is a 5'-0" x 24'-0" vault located along Main St. The vault is about 7'-6" tall. The floor of the vault is concrete slab level with the basement slab.



Photo #1: 101 S. Main & W. Callender St. Building

Vault Walls:

Street Side & End Walls: The vault street side and end walls are concrete foundation walls. The concrete foundation wall supports the concrete vault lid. The walls are in good shape with little to no water infiltration damage.

Building Line Walls: The front of the building is supported by steel beams spanning between concrete columns, see photo #2. The 12" deep steel beams bear on 24" square concrete columns. The concrete columns are about 16'-0" on center. The steel beam is in good condition however corrosion was noted on the top flange. The building Line steel beam supports the concrete vault lid.



Photo #2: Building Line Steel Bm & Conc Column

Vault Lid: The concrete vault lid is cracked and water infiltration is evident especially at the 9'-0" vault locations. The concrete lid looks to have #5 reinforcing steel at 5" on center each direction. Concrete encased steel beams support the larger 9'-0" vault areas. The steel

beams are rusted and the concrete around the beams is cracked and damaged. The concrete slab is approximately 6". The south portion of the main street vault is supported by recently installed wood joists and plywood sheathing. The reinforcement in the concrete slab is unknown.

Vault Miscellaneous: There are old wood storage units in the 4'-0" vaulted area. The owner will need to determine if the storage units will remain during construction. If the storage unit framing is to remain there is expected to be additional cost to save and work around.

The buildings veneer bears directly on the concrete slab along building line. The Frame Garden has marble veneer that will need to be protected during construction.

There are abandoned steel access hatches in the vault lid that are no longer used. There is a fire hydrant located in the sidewalk near the alley, however it is outside the vault space. The metal garbage can and bench near the alley will be removed and replaced.

Conclusion: The vault lid in the 4' sections is in good condition however the 9'-0" vaulted sections are in poor condition and should be replaced. The existing street side concrete foundation walls are in good condition. The vault area is used for storage including the wood framed storage units. The building line steel beams are in good condition however exposure to moisture infiltration will continue to damage the beams. This vault would be a good candidate to be maintained.

Additional Images Below:

Front Storage Unit Wood Walls



Marble Veneer @ the Slab



Callender St. Surface View



Main St. Surface View



The Frame Garden 101 S. Main St

Infill Vault Cost Estimate:
Structural Cost Estimate: \$60,900
Civil Cost Estimate: \$29,900
Total Cost Estimate w/ 12% Contingency: \$101,700
URA 90% Cost Estimate: \$91,550
Estimated Cost to Property Owner (10%): \$10,150

Maintain Vault Cost Estimate:
Structural Cost Estimate: \$95,638
Civil Cost Estimate: \$29,900
Total Cost Estimate w/ 12% Contingency: \$140,600
URA 90% Cost Estimate: \$126,500
Estimated Cost to Property Owner: \$14,000

The Mint Bar & Liquor Store 102 N. Main St

Vault Description General: The vault measures 8'-0" x 65'-0" along Callender St. The vault starts at the alley. The vault is not located on Main St or at the front of the bar along Callender St. The vault is about 7'-6" tall. The floor of the vault is concrete slab on grade.

Vault Walls:

Street Side & End Walls: The vault street side and end walls along Callender Street are stone rubble foundation walls. The Stone rubble walls support the concrete vault lid. Portions of the vault walls are damaged, possibly from water infiltration. The mortar between the stones is crumbling away or not present. The foundation wall will need to be repointed if the vault is to be maintained.



Photo #1: 102 N. Main & W. Callender St.

Building Line Walls: The front building line where there is no vault is supported by a stone rubble foundation wall. The building line with the vault section is supported by brick and concrete columns. There are several door and window openings in the basement building line at the vault section. Steel railroad tie headers are installed at the window openings to support the vault lid. Moisture infiltration is also damaging the mortar of the foundation walls.

Vault Lid: The vault concrete lid has been patched several times and is leaking. The concrete slab is approximately 6". The slab is supported by concrete encased steel railroad rail beams. Wood planks span between the railroad rail beams. The railroad rail beams and the wood planking show significant corrosion from water infiltration.

Vault Miscellaneous: There are old utility and electrical lines in the vaulted area. It was not determined if the utility lines are abandoned or are currently in use.

The buildings veneer bears directly on the concrete slab along building line.

There are abandoned steel access hatches in the vault lid that are no longer used.



Photo #2: Callender St. Vault Wall and Lid

Conclusion: The vault lid is in poor condition and should be replaced. The existing street side foundation walls is in fair condition, however the walls will need to be repointed. The vault area is being used for little to no storage. This vault could be maintained if desired by the owner. If the vault was to be infilled the building line windows and doors shall be infilled with reinforced CMU blocking.

Additional Images Below:
Surface View of Vault Lid



Building Line Wall with Steel Beams @ Lid



The Frame Garden 101 S. Main St

Infill Vault Cost Estimate:

Structural Cost Estimate:	\$15,100
Civil Cost Estimate:	\$26,100
Total Cost Estimate w/ 12% Contingency:	<u>\$46,200</u>
URA 90% Cost Estimate:	\$41,500
Estimated Cost to Property Owner (10%):	\$4,700

Maintain Vault Cost Estimate:

Structural Cost Estimate:	\$55,800
Civil Cost Estimate:	\$26,100
Total Cost Estimate w/ 12% Contingency:	<u>\$91,800</u>
URA 90% Cost Estimate:	\$82,600
Estimated Cost to Property Owner:	\$9,200

Livingston Bakery & Bodega 101 N. Main St.
Reed Lehman Pottery 112 W. Callender St.
Curated Closet 110 Callender St
The Salon 102 Callender St

Vault Description General: The vault measures 9'-0" x 96'-0" along Callender St. The vault starts at the alley and extends to the Bakery & Bodega building portion. The vault is not located on Main St of the Bakery & Bodega. The vault is about 7'-0" tall. There is a concrete base slab in the Pottery and Curated Closet sections. The floor of the Bakery and Salon vault sections is wood framing on basement grade.



Photo #1: N. Main & W. Callender St. Building

Vault Walls:

Street Side & End Walls: The vault street side walls along Callender are stone rubble wall with a concrete parge coat along the Bakery and Salon vault sections. The street side and end walls of the Pottery and Curated Closet are stone rubble foundation walls. The stone rubble and concrete walls support a twostep concrete vault. The mortar between the stone foundation walls is crumbling away. The foundation wall will need to be repointed if the vault is to be maintained.

Building Line Walls: The front of the building is supported by rubble and brick foundation walls. A section of the building foundation wall has been infilled with CMU where the vault has been infilled. The building support walls are in good condition. Deterioration of the building line was noted in the alley near the stairway. Repointing the brick and stone veneer is required.

Vault Lid: The vault concrete lid is leaking in a few locations. The vault lid was originally encased steel railroad rails. Wood planking spanned between the encased steel rail beams. More recently vault lid was replaced and light gauge delta rib metal decking was placed over the steel rail beams. The metal decking is non-structural decking. The slab is in good condition except where it transfers from vault to sidewalk. The concrete slab is approximately 6".

Vault Miscellaneous: There are several utility pipes located in the vaulted area. It was not determined if the utility pipes are abandoned or are currently in use. There is a down spout near the center of the building (left of the stairs), see photo #2. There is a street light pole near the alley, however this is outside the vaulted space.

Brick veneer bears directly on the concrete slab along building line. This was specifically noted at the column locations. There is also a concrete stair that bears directly on the sidewalk slab, see photo #2.



Photo #2: Stair at Callender St. Entry

Conclusion: The vault lid is in poor to good condition and will be replaced. The existing street side foundation walls is in good condition, however the stone rubble foundation walls will required repointing. Vaults of the Reed Lehman Pottery and Curated Closet are used for storage and can be maintained. The vault area accessed through the bakery has minimal storage, this vault could be maintained. The brick veneer, concrete step, and roof down spout increase the complexity of the project.

Additional Images Below:

Street Side Foundation Wall & Vault Lid



Street Side (left) Building Wall (right)



Stone Rubble End Wall & Building Foundation



Surface View From Alley



Livingston Bakery & Bodega 101 N. Main St.

The Salon 102 Callender St

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$5,800
Civil Cost Estimate:	\$22,800
Total Cost Estimate w/ 12% Contingency:	<u>\$32,000</u>
URA 90% Cost Estimate:	\$28,800
Estimated Cost to Property Owner (10%):	\$3,200

Maintain Vault Cost Estimate:	
Structural Cost Estimate:	\$51,800
Civil Cost Estimate:	\$22,800
Total Cost Estimate w/ 12% Contingency:	<u>\$85,600</u>
URA 90% Cost Estimate:	\$75,200
Estimated Cost to Property Owner:	\$8,400

Curated Closet 110 Callender St

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$3,200
Civil Cost Estimate:	\$4,900
Total Cost Estimate w/ 12% Contingency:	<u>\$9,100</u>
URA 90% Cost Estimate:	\$8,200
Estimated Cost to Property Owner (10%):	\$900

Maintain Vault Cost Estimate:	
Structural Cost Estimate:	\$21,300
Civil Cost Estimate:	\$4,900
Total Cost Estimate w/ 12% Contingency:	<u>\$29,400</u>
URA 90% Cost Estimate:	\$26,500
Estimated Cost to Property Owner:	\$2,900

Reed Lehman Pottery 112 W. Callender St.

Infill Vault Cost Estimate:	
Structural Cost Estimate:	\$3,100
Civil Cost Estimate:	\$4,200
Total Cost Estimate w/ 12% Contingency:	<u>\$8,220</u>
URA 90% Cost Estimate:	\$7,400
Estimated Cost to Property Owner (10%):	\$820

Maintain Vault Cost Estimate:	
Structural Cost Estimate:	\$21,500
Civil Cost Estimate:	\$4,200
Total Cost Estimate w/ 12% Contingency:	<u>\$28,800</u>
URA 90% Cost Estimate:	\$25,900
Estimated Cost to Property Owner:	\$2,900

Park County Senior Citizens Center 206 S. Main St

Vault Description General: There are several voids under the existing side walk along Lewis St. There is one vault area 5'-0" x 15'-6 x 7'6" tall near the boiler room. There are four 5' to 3' openings along Lewis Street. There are voids under the sidewalk slab in the boiler room. There is a 7'-0" deep void under the sidewalk along Main St. near the entrance to the upper floor.



Photo #1: 206 Main & Lewis Street

Vault Walls:

Street Side & End Walls: The vault street side and end walls along Lewis Street are stone rubble foundation walls. The stone rubble walls support the concrete vault lid. Portions of the vault walls show signs of water infiltration and the mortar between the stones is crumbling away. The foundation wall will need to be repointed if the vault is to be maintained.

Building Line Walls: The building is supported by stone foundation walls. There are openings in the foundation wall. Wood has been placed in the opening to try retain the soil below the sidewalk slab along Lewis St. The wood shoring is susceptible to moisture and has failed creating voids under sidewalk slab. In the boiler room, CMU, wood framing supports the building line. The voids under the slab in the boiler room where the 2x support wall framing is located.

Vault Lid: The vault concrete lid is was not visible there is wood planking supporting the slab. The vault slab thickness is not known.

Conclusion: The vault lid/sidewalk slab is to be replaced. The vaults are not being used. It is suggested that the openings and the vault space along the building line be infilled with a concrete or CMU grouted blocks to replace the voids and wood shoring. Once the building line voids are infilled compacted soil or lean create can be placed to support the new sidewalk.

Park County Senior Citizens Center 206 S. Main St

Infill Vault Cost Estimate:

Structural Cost Estimate:	\$9,400
Civil Cost Estimate:	\$32,900
Total Cost Estimate w/ 12% Contingency:	<u>\$47,400</u>
URA 90% Cost Estimate:	\$42,700
Estimated Cost to Property Owner (10%):	\$4,700

Maintain Vault Cost Estimate:

Not Determined