



Citizens Warehouse in the early 1950s

Citizens Warehouse

Building Condition Assessment Report

Draft Report
April 2007



DRAFT

POSTER
FROST
ASSOCIATES, INC.

ARCHITECTURE
PLANNING
URBAN DESIGN

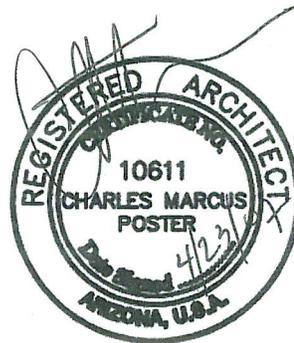
Citizens Warehouse

Building Condition Assessment Report

Poster Frost Associates, Inc.

In Association with:

TLCP Structural, Inc.
SMU Mechanical Engineering L.L.C.
and
Hy-Lite Design



April 2007

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2.1 Scope of Work

This architectural assessment was completed based on detailed site observations and archival research conducted from February to April of 2007. Historical information on the Citizens Warehouse, including historic photos, was obtained from Mr. Bill Belton, the son of the company's original owner. Drawings of the second floor addition were located during this research.

2.2 Location

The Citizens Warehouse is located at 44 West 6th Street, at the northeast corner of 9th Avenue and 6th Street. Ash Avenue forms the eastern edge of the site.

2.3 Developmental History

Citizens Transfer and Storage Co., Inc. opened in 1907 as a cartage and drayage business, delivering goods and merchandise from the railroad, by horse-drawn wagons, to homes and individuals throughout the region. In its early days, Citizens was located on Congress Street, including a location at the intersection of Congress St. and Stone Ave.

The first known activity by Citizens at 44 W. 6th Street was in 1929 when a single-story building with a full basement was designed by architect Roy Place and built by Frank Putter Construction. Constructed entirely with cast-in-place reinforced concrete, the structure was designed to support up to five stories. A second floor was eventually added in 1951.

The building was originally oriented towards the railroad tracks to the south, with what appears to be several large openings and a raised loading platform. From the late 1920s through the early 1940s, Citizen's employees would have to go to the rail yard at the southeast corner of 6th Street and 9th Avenue to unload merchandise and transport it to their warehouse. By the late 1940s the company had its own railroad spur and could off-load directly onto their dock.

In 1951 a second story was added to the structure.



Citizens Warehouse from the SW before second story addition



Citizens Warehouse from the SE before second story addition

This addition was also designed by Roy Place and his son, Lew, who joined with him in 1940 to form Place and Place architects. The contractor was once again Frank Putter Construction. Later that same year, a one-story brick addition was added to the west of the main structure after a fire destroyed the metal buildings that were located in this location.

In 1963, a two-story building was added to the north of the two-story structure. The architect for the addition was Howard Peck. This building is a single pour concrete structure with 15' pilasters built into the foundation. The structure is built over a drainage box angles westerly below the railroad tracks toward the Tucson Electric Power facility. A clear-space trestle was built over the box so that there was no load bearing weight on the box. This building, known as Lucky Street Studios, is not a part of this assessment.

In 1984 Citizens Transfer and Storage was sold, along with two other structures and a vacant lot, to the Arizona Department of Transportation for a proposed expansion of the Aviation Corridor. This plan never went through and since the early 1990s the Citizens Warehouse has seen new life as artists' studios and community space.

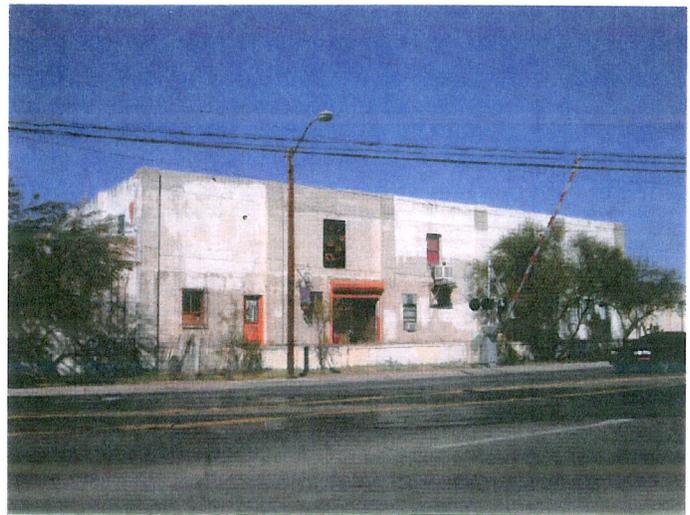
In its reincarnation as artist space, the Citizens Warehouse has undergone minor changes to address code and user comfort issues. Upon acquiring the building, the floor plates were not subdivided and the electrical wiring and lighting was antiquated and inadequate for the new use. Similarly, a lack of windows created a cold and cavernous indoor space. A number of alterations, a number of which were completed with minor loans from the Art District Partnership, have made the spaces satisfactory for art purposes. In the early 1990s, sprinklers were added to the basement, allowing occupancy of the first floor. At this time, interior partitions were added and new electrical conduit and wiring was run to support overhead lights and outlet boxes. In 1995, an open steel exit stair was added on the north side of the structure to provide a second exit from the second floor. The second floor was subdivided into six studio spaces. New window openings were saw-cut into the existing poured in place walls to provide more illumination on the interior. Plumbing fixtures were added to several of the studio spaces on the second floor to make them more functional.

2.4 Significance

The Citizens Warehouse is a contributing structure to the Tucson Warehouse Historic District, listed on the National Register of Historic Place in October 1999. The Tucson Warehouse Historic District is significant for its contributions to the growth of industry and commerce in Tucson and Southern Arizona during the first half of the twentieth century. During this time, Citizens Transfer Company became one of Tucson's most prominent storage and delivery companies, capitalizing on the growth of Tucson and through its prime location directly adjacent to

the railroad tracks. The Citizens Warehouse is a good example of trends in construction technology, including the use of a reinforced concrete structure.

The Citizens Warehouse is also significant for being designed by prominent Tucson architect Roy Place. Place designed many of the noteworthy public buildings at the University of Arizona. In 1929, the same year that Citizens Warehouse was constructed, Place designed the iconic Pima County Courthouse. Just blocks from the Citizens Warehouse, the elaborate Moorish influenced, Spanish Colonial style Courthouse is a sharp contrast to the utilitarian, banal building Place created for Citizens. In these two buildings it is possible to understand the breadth of Place's architectural practice and his faculties for working with different architectural styles and construction techniques. In 1929, Place's Citizens Warehouse may have contributed as much to the region's growing commercial infrastructure as the Pima County Courthouse contributed to its civic character.



Citizens Warehouse from the SW, across 6th Street

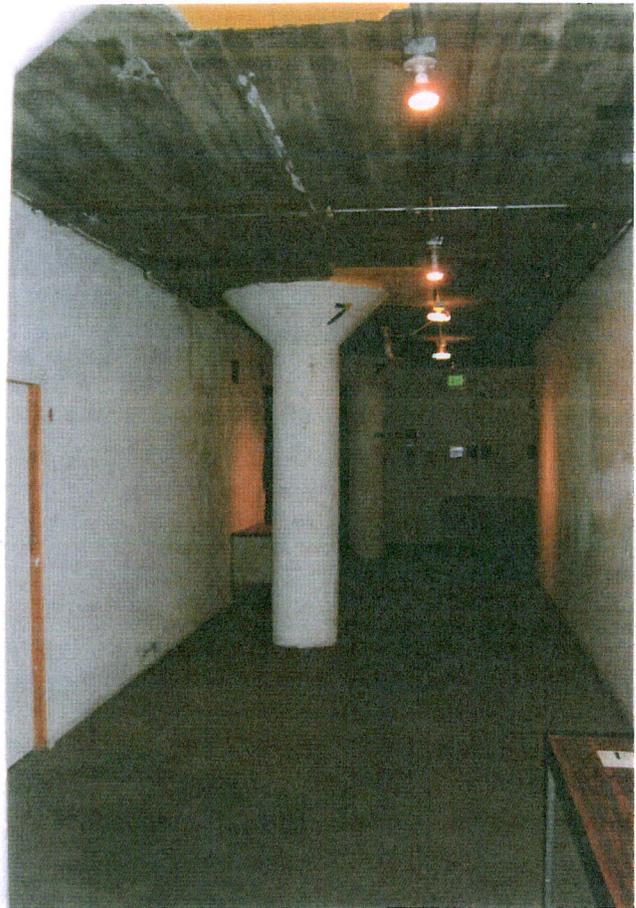
2.5 Architectural Description

Citizens Warehouse consists of a rectangular two story cast-in-place concrete structure with a one story brick addition. The two story structure was completed in two phases, beginning with the construction of the basement and first floor in 1929. The second floor was added in 1951. Reinforced concrete columns are placed at a uniform twenty-one foot spacing and define a grid five bays wide and three bays deep. At the interior, round columns, measuring 8 feet in circumference and with tapered capitals, support a flat slab system with drop slabs at all columns. The columns are square and are expressed on the exterior. Exterior walls are 8 inch thick poured in place concrete. A parapet extends above the roofline. Consistent with its warehouse purpose, windows were minimal in the original building. Since being converted to artist spaces, more opening have been added to the shell of the building.

The second story structural grid follows the spacing established in the lower levels and consists of the same poured-in-place construction system. A stair connecting the first and second floors and a hydraulic elevator, currently deactivated and sealed, were also added.

The one story brick addition consists of two wythe unreinforced brick walls with a wood frame roof. Large roll-up doors puncture the west and north elevations of the addition.

The monumental, heavy qualities of a warehouse are experienced in its exposed structure of solid concrete columns, deck, and walls. The building's starkness provides a backdrop for the artistic activities of its residents.



Cast-in-place concrete columns at the first floor corridor



B.I.C.A.S' bike repair classroom, workshop, and storage occupies the entire basement of Citizens.

2.6 Integrity

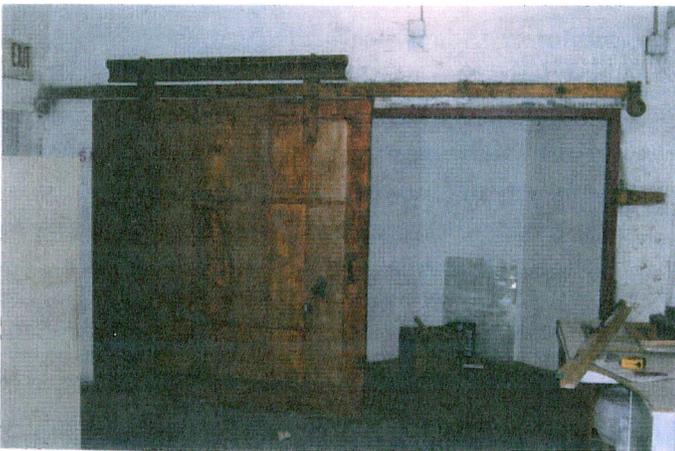
Although the Citizens Warehouse has undergone a change of use, many of its original features remain intact. Changes to the building have been in the spirit of its origins as a no-frills commercial structure. While the elevator itself is non operational, the shaft is being used to allow light and fresh air into the basement.

2.7 Condition

The two story poured-in-place concrete structure has no obvious structural deficiencies. As noted in the structural report, the one story brick addition has structural deficiencies that should be addressed. See mechanical and electrical reports for additional recommendations.



Exit stair and bicycle repair storage at north elevation



Interior warehouse door at second floor



Former elevator shaft provides light to the basement



Roll up door at north side of the one story brick addition

3.0 ARCHITECTURAL RECOMMENDATIONS

3.1 Summary

Following are specific architectural recommendations for the Citizens Warehouse. The recommendations include both code required, life-safety issues as well as specific programmatic concerns that would improve the functionality and user comfort of the space. Structural, mechanical, and electrical recommendations are included elsewhere in this report.

3.2 Architectural Treatment Guidelines

From an architectural perspective, the building retains most of its historic features. Maintenance, repairs, and new construction should be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Overall, the recommended treatment strategies are preservation and rehabilitation.

Citizens Warehouse offers excellent opportunities for continued adaptive use. While no structural drawings or structural calculations have been completed on the two story structure, it was supposedly designed to accommodate up to five stories. The possibility of adding additional square footage to the structure by adding additional stories is appropriate for this building and its current use.

It is possible that the building footprint will be impacted by the proposed 6th Street underpass project. To accommodate the underpass, it may be possible to reduce the building footprint of Citizens by removing a portion of its structural gird. Additional structural studies are required to determine the feasibility of altering the slab and walls. A combination of a reduced footprint and construction of additional stories could also be considered. The spatial layout of the Citizens is such that a reconfiguration of units to a north/south orientation could provide excellent live work studio spaces with the benefits of northern and southern exposure.

Based on what is known about the original design of

the building and the possibility of the road needing additional space, four possibilities are envisioned.

1. Building footprint remains as it is.
2. Footprint remains as is, but an additional story or stories is added. (add new elevator / exit stairs)
3. Southern bay is removed and the space is reconfigured without any additional stories. Access is from north and a new façade is added to the south
4. The southern bay is removed and an additional story or stories is added.

The fate of the one-story structure on the west end of the site is undetermined. From a historical / architectural standpoint it could be completely or partially demolished to make room for the road or to accommodate other needs on the site. According to the structural report, the one story building has structural deficiencies that should be addressed.

3.3 Recommendations

A. Health and Safety

1. *See Mechanical And Electrical Reports for Recommendations.*

B. Code Required Improvements

1. *Improve Basement Exiting*

Ramp to basement from north does not meet basic accessibility requirements, including slope and clearances at the door opening. No other exit leads directly to the exterior. If the basement remains a business use, a second exit should be created.

Cost: \$20,000

2. *Provide Accessible Route to First Floor.*

The first floor is elevated 3' above grade. Currently, there is no accessible route to the first floor. Provide a ramp per code.

Cost: \$5,000

3. *Provide Accessible Toilet Room at First Floor*

A new public rest room that is fully ADA compliant should be located on the first floor. Include a drinking fountain

Cost: \$15,000, including plumbing fixtures

C. Programmatic Issues

1. *Redesign Space between Citizens Warehouse and Lucky Street Studios*

The space north of Citizens Warehouse is currently used for parking, staging, storage, pedestrian access to BICAS, and special events. The space could be reconfigured and a landscape plan developed for making better use of this space. The maximum available space for the court is approximately 10,000 SF.

Cost: \$8 - \$10 per square foot = \$80,000 - \$100,000

2. *Repair the Elevator*

The original elevator shaft remains, but a new elevator car and hydraulic lift is needed.

Cost: To be determined, but possibly \$50,000

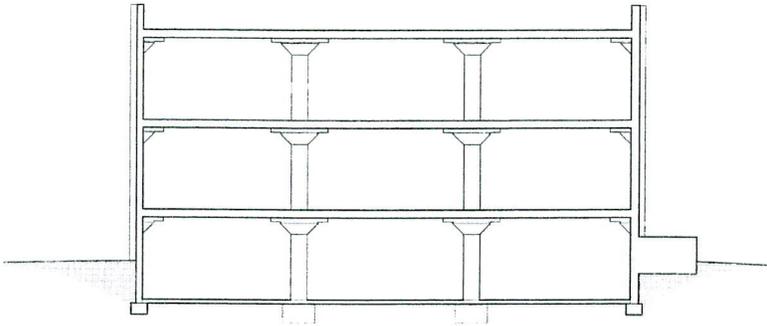
D. Maintenance and Payback Items

1. *Insulate the Building Envelope*

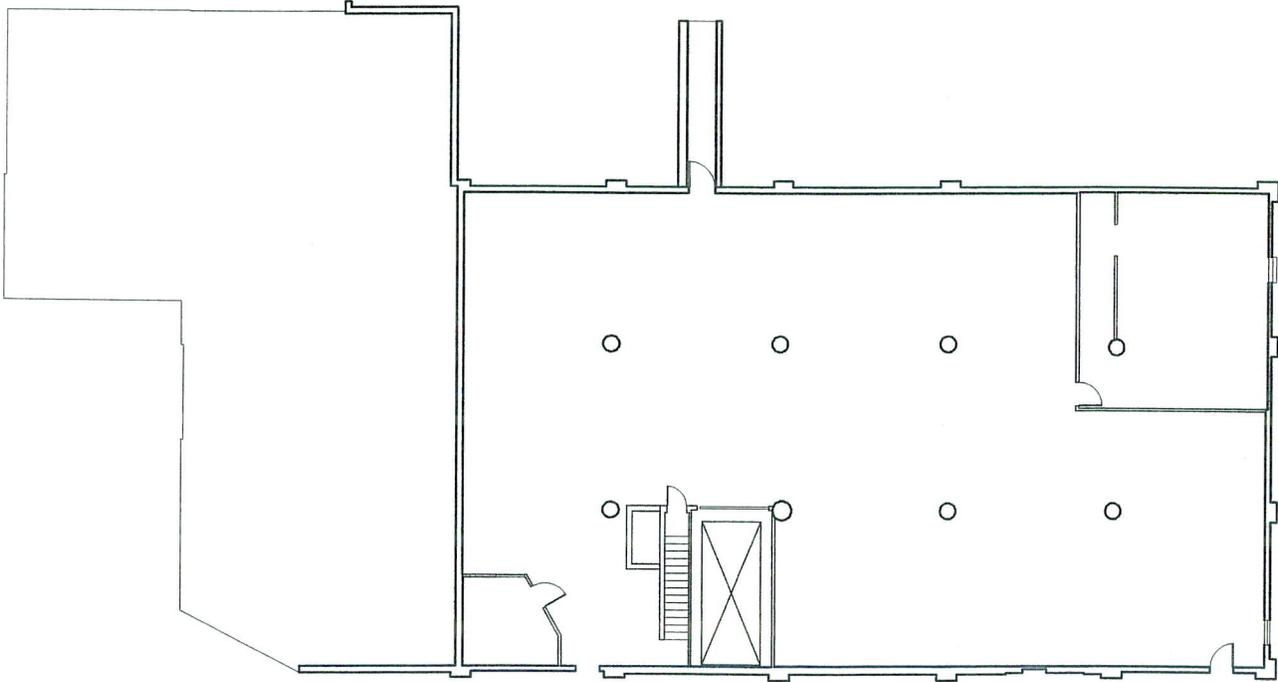
The user comfort of the building could be improved by insulating the walls and roof.

Cost: 8050 SF wall x \$10 SF = \$80,500

6070 SF roof x \$4 SF = \$24,280



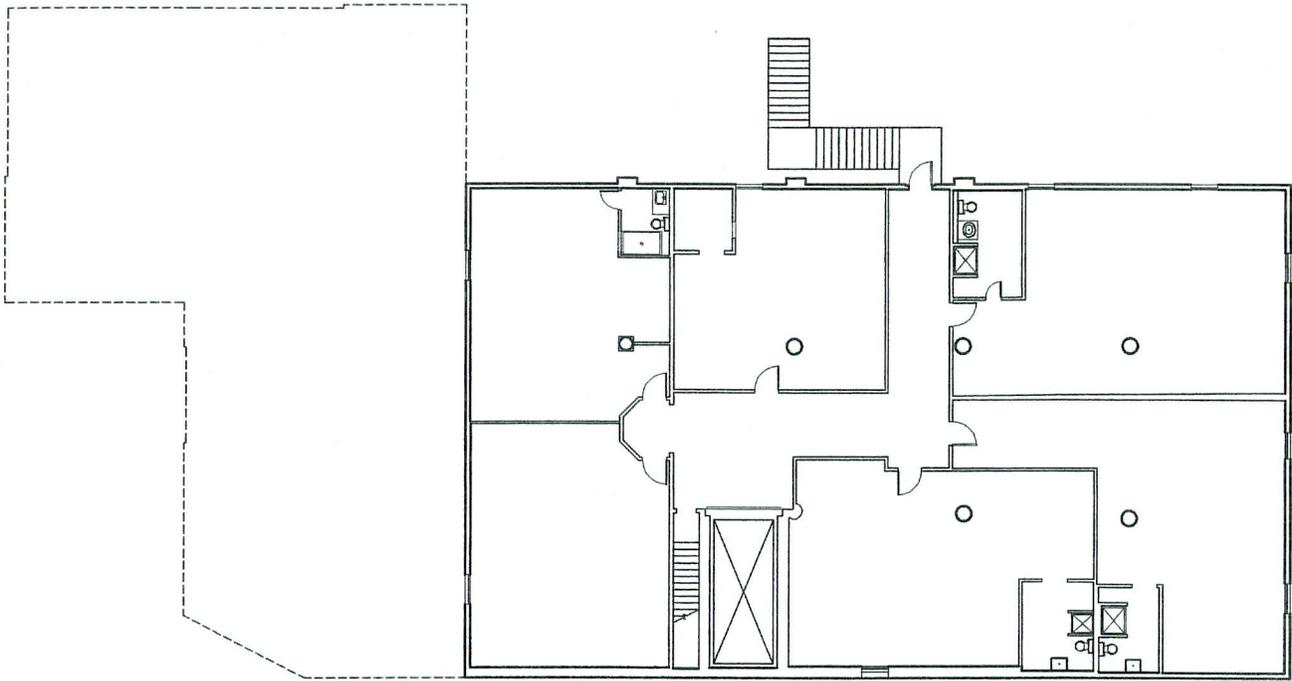
SECTION LOOKING EAST



BASEMENT FLOOR PLAN

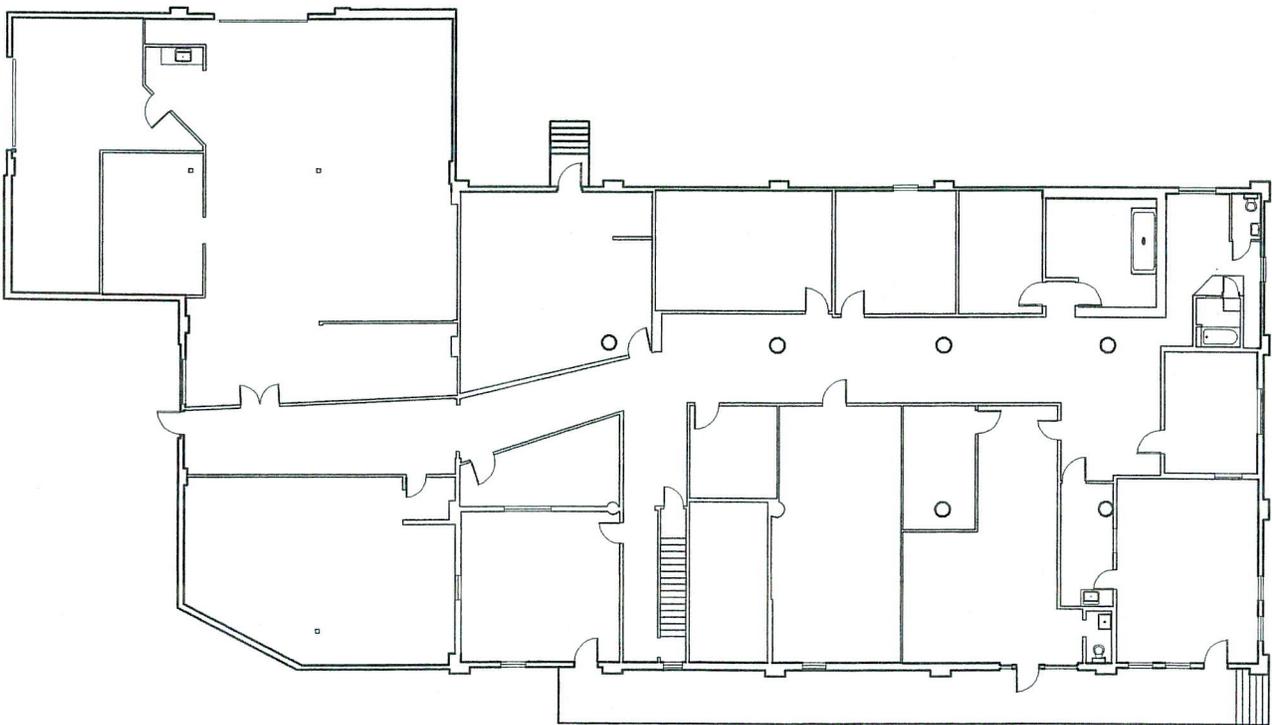
6,292 GSF





SECOND FLOOR PLAN

6,355 GSF



FIRST FLOOR PLAN

10,025 GSF



CITIZENS WAREHOUSE

Prepared For

Poster Frost Associates, Inc.

Prepared By

T L C P
STRUCTURAL INC.



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April 17, 2007

DRAFT

Corky Poster
Poster Frost Associates, Inc.
317 N. Court Avenue
Tucson, AZ 85701

Re: **Building Assessment for Citizens Warehouse**
TLCP Job No. T07028

Dear Corky:

We have completed our structural evaluation of the Citizens Warehouse. Our critique was based on a site visit that we made with you on February 27, 2007, and on the engineering analysis that we performed with field data obtained during that visit. Note that there are no original construction documents for the building.

SCOPE

Our scope of work is as follows:

1. Review the structural condition of the building via an on-site visit and document any observed deficiencies.
2. Perform an engineering analysis of the framing systems to estimate their load-carrying capacity.
3. Provide a professional opinion of the structural integrity of the building along with recommended repairs and modifications.
4. Provide a cost estimate for the proposed structural repairs and modifications.
5. Address the issues, as they relate to the building, associated with the proposed 6th Street railroad underpass.

DESCRIPTION

The original building is an existing one-story, approximately 12,600 square-foot structure, with basement, located at 44 West 6th Street in Tucson, Arizona. It was constructed in 1927 and initially used as a storage warehouse. It was evidently designed to support up to five floors and in 1951 a second floor was added that increased the square footage to 18,900 including the basement. Roof and floor construction consists of mildly reinforced cast-in-place concrete slabs supported by cast-in-place concrete columns and walls.

In 1963 a one-story, approximately 3,900 square-foot addition was constructed on the west end of the building. Construction consists of a wood-framed roof supported by unreinforced, two-wythe brick walls.

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ROOF FRAMING: TWO-STORY BUILDING (see Figure S5.1)

Framing consists of a mildly reinforced cast-in-place concrete slab supported by cast-in-place concrete columns and walls. Since the original construction documents are not available, it is not known how the slab was designed or what the reinforcing is. Because there is an absence of beams spanning between the columns, it is very likely that the slab was designed as a two-way slab. This means that the structural reinforcing was placed in both the longitudinal and transverse directions.

ROOF FRAMING: ONE-STORY ADDITION (see Figure S4.1)

Framing consists of 1 x tongue and groove lumber decking that spans horizontally over 2 x 12 wood joists spaced at 24 inches on-center. The joists are supported by a series of 6 x 14 wood beams. The entire roof system is supported by 6 x 6 wood columns and two-wythe (8"), unreinforced brick walls.

FIRST AND SECOND FLOOR FRAMING: TWO-STORY BUILDING (see Figures S3.1 and S4.1)

The 1st and 2nd floor framing systems are the same system as the roof for the two story building described above.

FOUNDATION: TWO-STORY BUILDING AND ONE-STORY ADDITION (see Figures S2.1 and S3.1)

Since the foundation system is not exposed at any portion of the building, it is not certain what the system is. It is very likely however, that all columns and walls bear on cast-in-place concrete footings.

LATERAL FORCE RESISTING SYSTEMS

The lateral resisting system for the original two-story building consists of rigid concrete floor and roof diaphragms that are supported by concrete shear walls. From these elements, wind and seismic forces are transmitted to the soil mass through the foundation.

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The lateral system for the one-story addition consists of a flexible wood roof diaphragm that is supported by brick shear walls. From these elements, wind and seismic forces are transmitted to the soil mass through the foundation.

SITE OBSERVATION AND ENGINEERING ANALYSIS

Note that an engineering analysis was not performed for the original two-story building because the structural characteristics of the building are not known (i.e.; reinforcing size and location, concrete strength, slab thickness, etc.). The one-story addition was analyzed with the following design criteria.

ASSUMPTIONS FOR ANALYSIS FOR THE ONE-STORY ADDITION

1. Roof live load = 20 psf.
2. Wind and seismic forces per the 2006 International Building Code.
3. Douglas Fir No. 1 allowable stresses for all beams and columns.
4. Douglas Fir No. 2 allowable stresses for all wood decking and joists.

The site visit of February 27, 2007, and the subsequent engineering analysis for the one-story addition, resulted in the following discoveries:

TWO-STORY BUILDING

The site visit resulted in finding no structural deficiencies in the building and the overall structure appeared to be in excellent condition. There were no obvious signs of distress in any of the slabs, walls or columns.

ONE-STORY ADDITION

ROOF

1. Stress levels in the roof joists, beams and wood deck are within allowable design values for dead load and live load and all members appeared to be in excellent condition.
2. The age of the roof membrane is not known, but as shown in Photos 1 through 3, minor leakage has occurred. Observation of the roof membrane showed that it should be replaced in the near future.
3. As shown in Photo 1, the wood deck diaphragm is not connected to the brick shear walls.

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COLUMNS

1. Stress levels in the wood columns are within allowable design values for dead load and live load and all members appeared to be in excellent condition.

WALLS

1. Although the brick walls are in good condition, they are approximately 21% overstressed for combined gravity and wind forces. Stress levels for gravity loads only are within allowable design values for dead load and live load.

FOUNDATION

1. Since footing sizes and soil characteristics are not known, calculations for the foundation were not performed. However, there were no signs of settlement or distress.

LIFE SAFETY ISSUES

TLCP did not observe any life threatening situations.

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CONCLUSIONS, RECOMMENDATIONS AND COST ESTIMATE

TWO-STORY BUILDING

Based on our site visit, it is our opinion that the structural integrity of the building is intact and that major structural strengthening and retrofitting is not required.

ONE-STORY ADDITION

ROOF

1. Remove the existing roof membrane(s) to the decking and replace with a new roof to prevent leaking and subsequent structural damage to the roof framing.
Approx. 3,900 sf at \$10/sf = \$39,000.
2. As noted above, the roof diaphragm consists of 1 x tongue and groove lumber decking. The ability of this material to transfer wind and seismic forces to the shear walls is limited. Therefore, we recommend overlaying the existing deck with new plywood panels.
Approx. 3,900 sf at \$2/sf = \$7,800.
3. Connect perimeter brick walls to roof diaphragm with tension-ties.
Approx. 200 lineal feet at \$50/ft = \$10,000.
4. Install ledgers to connect roof diaphragm to shear walls at all brick walls.
Approx. 260 lineal feet at \$50/ft = \$13,000.

COLUMNS

Column repair is not required.

WALLS

1. Install steel angle braces at 4' o.c. at the roof level of the perimeter walls in order to brace them against wind and seismic forces.
Approx. 200 lineal feet at \$50/ft = \$10,000.

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FOUNDATION

Foundation repair is not required.

Subtotal	\$79,800
20%contingency	\$15,960

**TOTAL ESTIMATED COST FOR STRUCTRAL REPAIRS AND
MODIFICATIONS** **\$95,760**

This estimate is for preliminary budgeting purposes only. It includes material and labor costs and does not include costs for contractor mark-ups, testing and inspections, permits, etc. Final construction costs shall be based on a complete set of contract documents.

PROPOSED 6TH STREET RAILROAD UNDERPASS

We understand that a new vehicular underpass may be constructed along 6th Street at the existing railroad crossing that runs northwest to southeast. Preliminary design of the underpass indicates that it will be within several feet to the south of the existing south wall of the building. The bottom of the new tunnel could be as much as twenty feet below the bottom of the existing basement floor.

Because of the proximity of the new tunnel to the building, there is a possibility of the building settling during construction of the underpass. This could result in significant structural damage (i.e. movement of roof and floor framing, cracks in walls, and even framing and wall failure).

To reduce the potential for this, we recommend that the following procedures be taken prior to construction of the underpass:

1. Retain a geotechnical engineer to design an underpinning system for the building that will minimize foundation settlement during construction. Significant settlement of the building cannot be tolerated. But it is also not possible to accurately determine how much settlement can be tolerated before damage occurs. Therefore, we have estimated that settlements over 1/2" may cause significant secondary stresses in the building and consequently the underpinning system should be designed to that limit.

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TLCP Job No. T07028

2. All of the structural repairs and modifications to the one-story addition, as described in the Conclusions, Recommendations and Cost Estimate Section above, shall be implemented.
3. Shore the existing roof beams along the south side of the one-story addition in order to take as much load as possible off of the south brick wall.
4. Install the underpinning system while closely monitoring the building for movement and distress.
5. Construct the underpass while closely monitoring the building for movement and distress.

Even with these precautions, damage to the building may still occur.

This concludes our report. Please call if you have any questions or if we can be of further assistance.

Sincerely,

TLCP STRUCTURAL, INC.



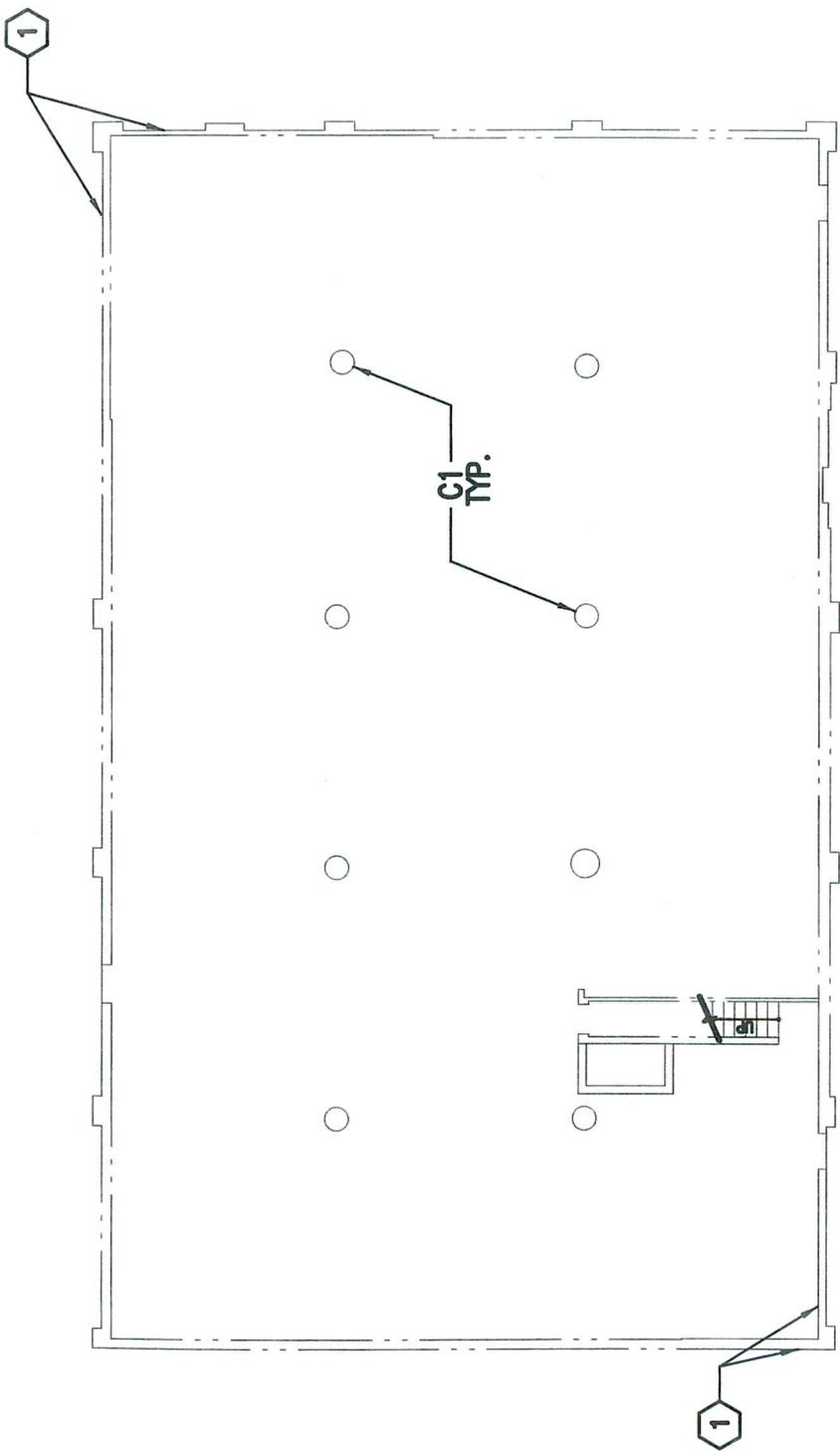
James M. Galvin, P.E.
Principal



Citizens Warehouse

APPENDIX A

Figures S2.1, S3.1, S4.1 and S5.1



FOUNDATION/BASEMENT PLAN
 N.T.S. (APPROX. 6,300 SQUARE FEET)



PLAN NOTES:

- 1 CAST-IN-PLACE CONCRETE WALL.

COLUMNS
 C1: 24" Ø CIP CONCRETE COLUMN

- PHOENIX, ARIZONA, 602-553-8155, (FAX) 602-553-8255 - TUCSON, ARIZONA, 520-323-7889, (FAX) 520-323-1267 -

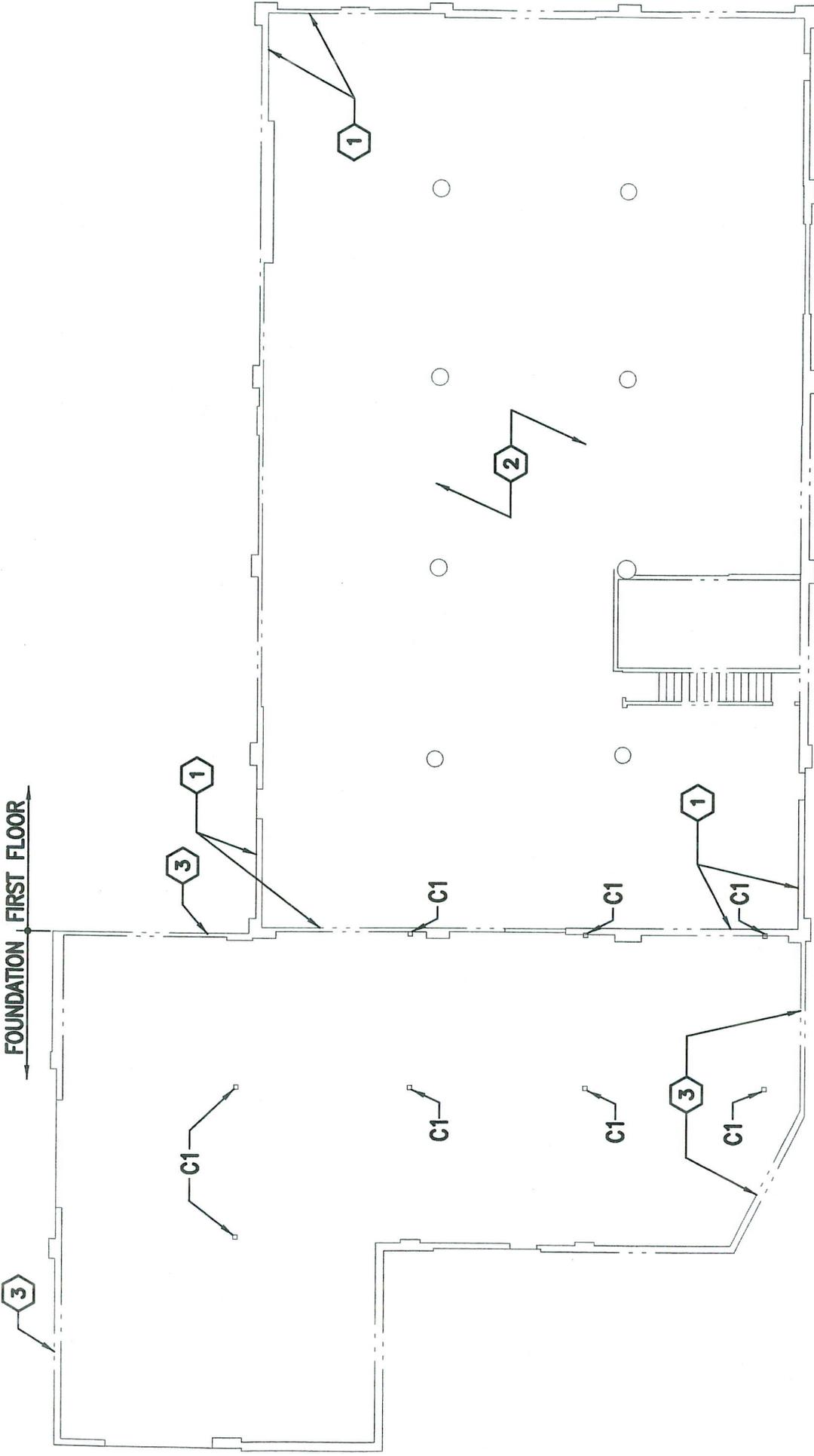
CITIZENS WAREHOUSE
TUCSON, AZ

JOB NO: T07026



FIG. S2.1

FOUNDATION FIRST FLOOR



FOUNDATION AND FLOOR FRAMING PLAN

N.T.S. (APPROX. 10,200 SQUARE FEET)



COLUMNS
C1: 6 X 6 WOOD

PLAN NOTES:

- ① CAST-IN-PLACE CONCRETE WALL.
- ② CAST-IN-PLACE MILDLY REINFORCED CONCRETE SLAB.
- ③ TWO-WYTHE BRICK WALL.

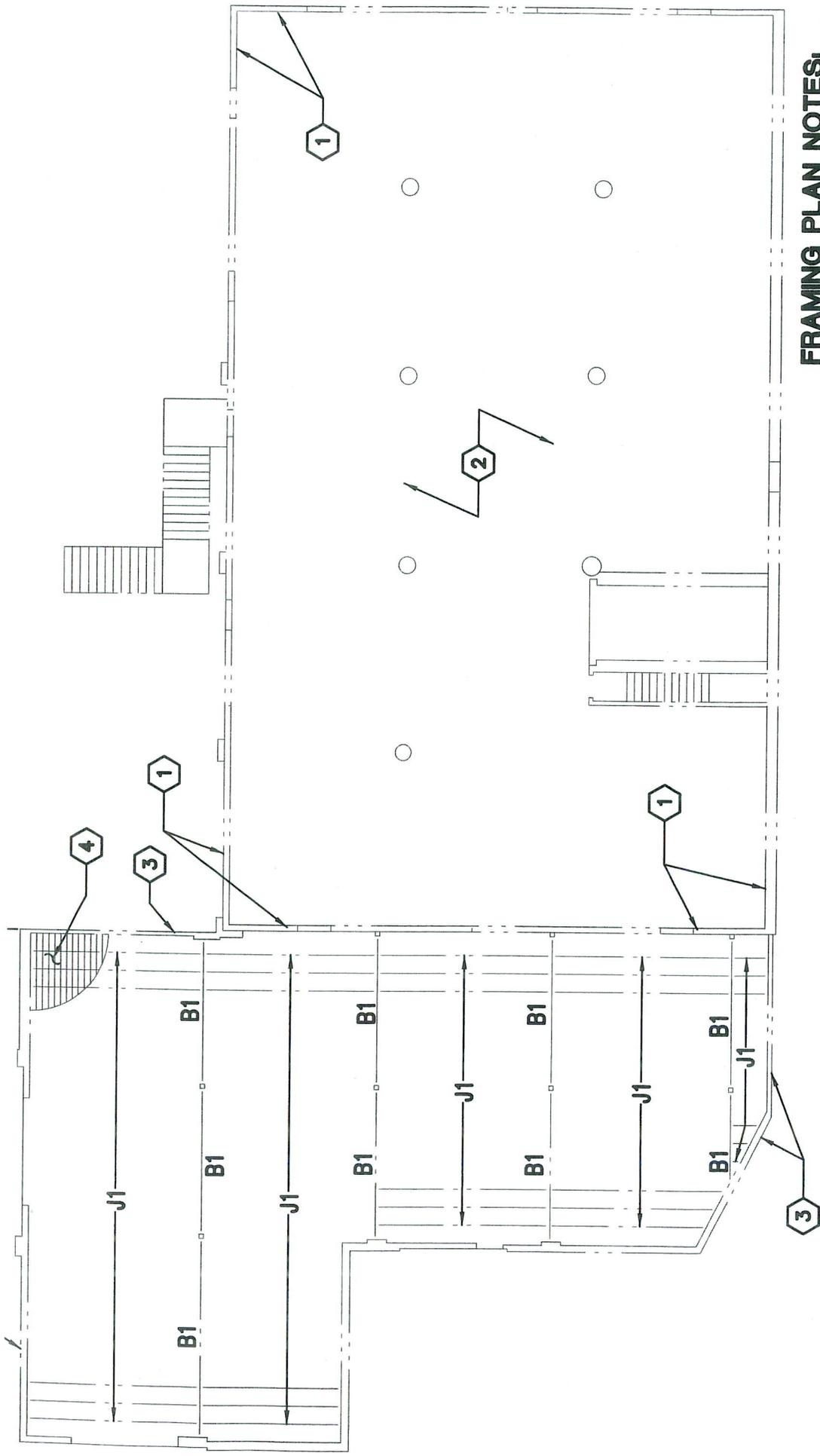
- PHOENIX, ARIZONA, 602-553-8155, (FAX)602-553-8255 - TUCSON, ARIZONA, 520-323-7889, (FAX)520-323-1287 -



CITIZENS WAREHOUSE
TUCSON, AZ

JOB NO: T07028

FIG. S3.1



FRAMING PLAN NOTES:

- ① CAST-IN-PLACE CONCRETE WALL.
- ② CAST-IN-PLACE MILDLY REINFORCED CONCRETE SLAB.
- ③ TWO-WYTHE BRICK WALL.
- ④ 1 X TONGUE AND GROOVE WOOD DECKING.

ROOF AND 2ND FLOOR FRAMING PLAN

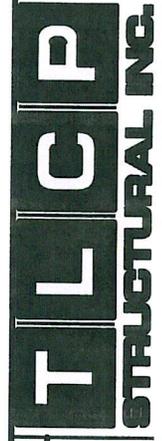
N.T.S. (APPROX. 6,300 SQUARE FEET)

BEAMS
B1: 6 X 14 WOOD

JOISTS
J1: 2 X 12 AT 24" O.C.



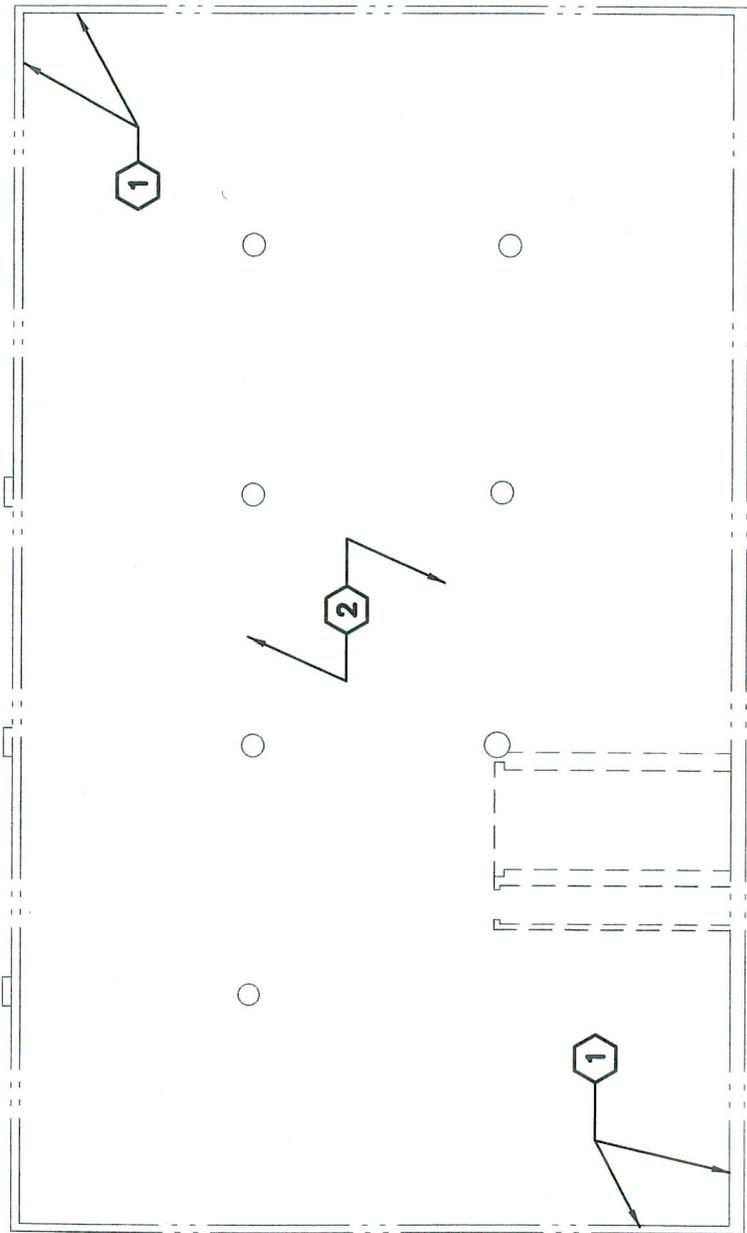
- PHOENIX, ARIZONA, 602-653-8155, (FAX) 602-553-0255 - TUCSON, ARIZONA, 520-323-7888, (FAX) 520-323-1287 -



**CITIZENS WAREHOUSE
TUCSON, AZ**

JOB NO: T07026

FIG. S4.1



ROOF FRAMING PLAN
N.T.S.



FRAMING PLAN NOTES:

- ① CAST-IN-PLACE CONCRETE WALL.
- ② CAST-IN-PLACE MILDLY REINFORCED CONCRETE SLAB.

— PHOENIX, ARIZONA, 602-553-8155, (FAX)602-553-8255 — TUCSON, ARIZONA, 520-323-7689, (FAX)520-323-1267 —

CITIZENS WAREHOUSE
TUCSON, AZ



JOB NO: 10702B

FIG. S5.1



Citizens Warehouse

APPENDIX B

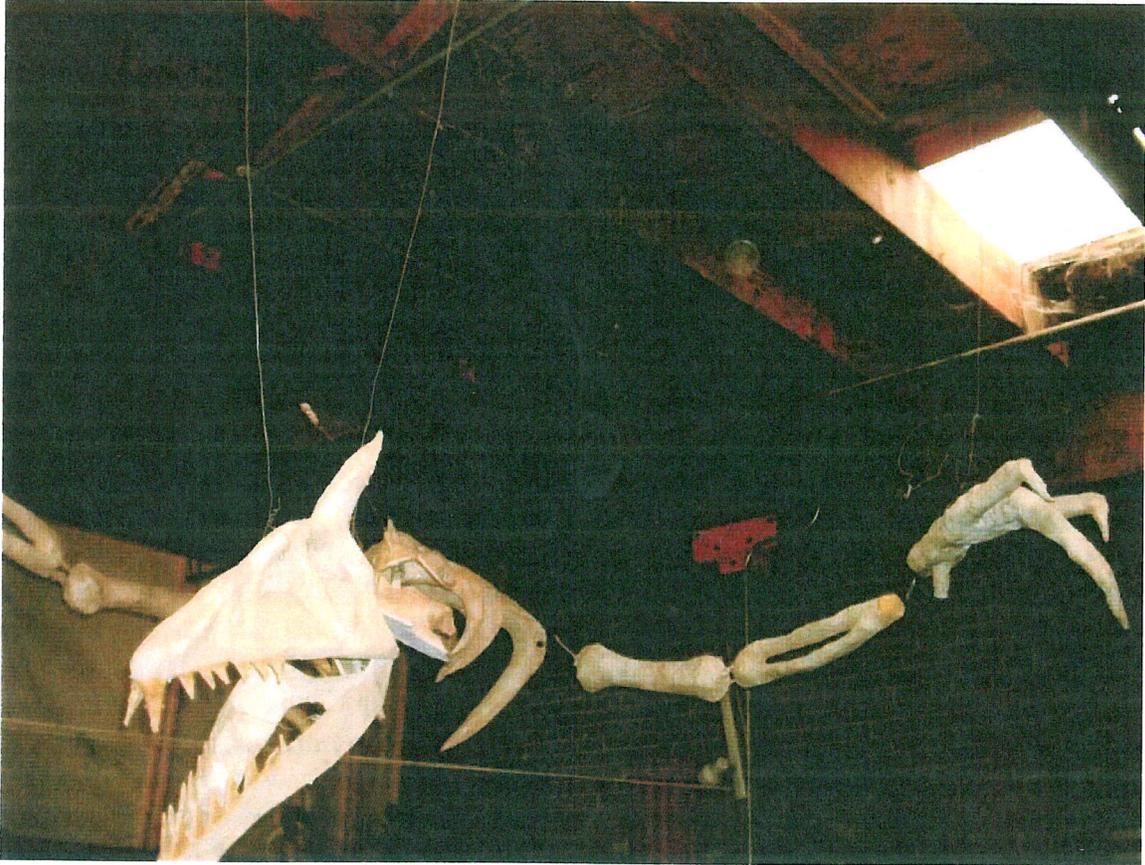
Photographs



Citizens' Warehouse - Photo 1
2/27/07



Citizens' Warehouse - Photo 2
2/27/07



Citizens' Warehouse - Photo 3
2/27/07

SMU Mechanical Engineering L.L.C.

April 16, 2007

Re: Citizens Warehouse
44 W. 6th St.
Tucson, AZ 85705
SMU Project # 12907

MECHANICAL REPORT

EXISTING CONDITIONS:

PLUMBING:

The building consists of two above grade floors, one basement floor and a one-story adjoining structure at the west end of the building. The building contains artist studio spaces on the first and second floors, and a bicycle shop in the basement. Water is delivered to the west end of the building by a 1-1/4" water line, however, no meter and reduced pressure backflow preventer could be found in the area. There are a total of four private bathrooms on the second floor, as well as one private and one public bathroom on the first floor. In what private bathrooms that were observed, the fixtures appeared to be in working order and fair condition. The fixtures in the public bathroom on the first floor also appear to be in working order, but are in very poor condition and need replacement. There are also several photo or utility sinks throughout the studio spaces, all of which appear to be in working order. Hot water for each bathroom is provided by a separate small electric water heater adjacent to or above the bathroom. Because of the building construction, all piping is visible from the floor below. In addition, a majority of the vent piping is mounted on the exterior of the building. No gas service was found serving the building.

FIRE PROTECTION:

The existing fire protection system is a wet pipe sprinkler system; however, it currently only serves the basement and the one-story adjoining structure. The fire riser for the sprinkler system is located inside the adjoining structure near the northwest corner. No fire department connection or electric alarm on the exterior of the building could be found.

HVAC:

Most of the studio spaces have at least one operable window and some are also utilizing window air conditioning units or window evaporative coolers. There are several rooms, however, which have no ventilation. The large studio in the adjoining building has an

evaporative cooler on the roof with a splash pan discharging directly to the space. There is currently no ventilation to the corridor on either floor or the entire occupied basement except for two small operable windows. In addition, none of the private bathrooms in the artist spaces have an operable window or a direct exhaust to the outdoors. The single public bathroom on the first floor has no mechanical ventilation, but has two operable windows.

RECOMMENDATIONS:

PLUMBING:

Life Safety / Code Deficiencies

The public restroom needs a minimum of one new water closet, lavatory and shower or bathtub. The estimated construction cost to install these three new plumbing fixtures in the existing locations is approximately \$5,000.00.

The public restroom also does not appear to meet ADA requirements. This restroom may need to be re-designed per architectural recommendations.

The building also needs to have a minimum of one drinking fountain and needs be handicap accessible. The estimated construction cost to install an additional drinking fountain is approximately \$3,000.00.

Other

Per architectural options 2 and 4, additional stories are added to the building. As part of this option, each floor would most likely be reconfigured into 5 artist spaces, each with its own private restroom and water heater. The estimated cost to install these restrooms would be approximately \$12,000.00 each.

Depending on the total number of plumbing fixtures added to the building with options 2 and 4, the existing water service for the building will likely need to be increased. So long as the water service can remain in the existing position, the estimated construction cost to install a larger water meter by Tucson Water and reduced pressure backflow preventer is approximately \$25,000.00.

FIRE PROTECTION:

Life Safety / Code Deficiencies

In order to properly protect the entire building, the portions of building on the first floor and entire second floor should have sprinkler systems installed, as well as a fire department connection and electric alarm added to the exterior of the building if ones currently do not exist, or if the adjoining 1 story structure is removed. The estimated cost

to extend the existing wet pipe sprinkler system to the remainder of the building or install a new sprinkler system and install an FDC and electric alarm is approximately \$40,000.00. This figure would increase for square footage increases per architectural options 2 and 4 to approximately \$50,000.00 and \$60,000.00 each respectively.

HVAC:

Life Safety / Code Deficiencies

Many areas of the building are not sufficiently ventilated per code. In addition, many areas of the building are without cooling or heating or any kind. These areas will be addressed in the subsequent section of this report on a space by space basis.

Each private bathroom is currently without operable windows or direct exhaust to the outdoors. The estimated cost to install these exhaust fans is approximately \$500.00 each. Each additional restroom added will also required an exhaust fan at the same price.

The studio space on the first floor which is being used for developing photographs has no mechanical ventilation or operable windows. The estimated cost to install an exhaust fan to properly ventilate this space is approximately \$2,000.00.

Other

The intent of the mechanical recommendations is to describe the feasibility of removing or modifying the existing HVAC system, specifically window air conditioning and evaporative cooling units. The following is a list of possible approaches for the owner to consider. The one-story adjoining structure at the west end of the building is discussed separately from the original building.

All occupied areas in the basement as well as on the first and second floor most likely necessitate air conditioning. In the buildings current configuration, the most likely option would be rooftop package heat pump units on the roof for the second floor spaces, with ductwork on the roof or exposed below the roof deck. Split system fan coils with heat pump condensing units on the roof or on grade would be the best option for the first floor and basement. With this configuration, refrigerant lines must be routed between each fan coil and condensing unit pair, but larger duct openings through the roof and mechanical chases down to lower floors are not needed. The estimated cost to air condition the existing building as a whole (~18,000 sq. ft.) is approximately \$175,000.00. Per architectural options 2 and 4, the square footage would increase to approximately 23,500 sq. ft. and 30,000 sq. ft. respectively. The estimated cost to air condition the building per these scenarios is approximately \$225,000.00 and \$275,000.00 each.

A second option would be to use an air-cooled chiller to condition the spaces in lieu of DX equipment. With this configuration, a single chiller would be mounted on grade or on the roof, supplying chilled water to fan coils located in each space. While more expensive

up front, this system would be more energy efficient than smaller DX units. This configuration would also only require a single piece of equipment outside of the building, reducing the need for multiple condensing units on the roof or on grade in the courtyard area. Heating would either need to be provided by a boiler, piping heating water to the system, or by gas or electric heating. The estimated cost to condition the existing building, utilizing an air cooled chiller, chilled water fan coils, pumps and all applicable piping is approximately \$300,000.00 depending on the heat source selected. The estimated cost to air condition per scenarios 2 and 4 in this method is approximately \$400,000.00 and \$500,000.00 each respectively.

HY-Lite Design

Hyman Kaplan, IALD, PE

ELECTRICAL REPORT

CITIZENS WAREHOUSE, 44 W. 6TH ST., TUCSON

EXISTING CONDITIONS:

1. The overall electrical system in this building is in reasonably good conditions as the individual spaces are maintained by their tenant. There are general Electrical Code violations that some tenants have installed and should be addressed, but none are life safety concerns.
2. There are 2 electrical services on the building. A 200 amp main and meter on the south side of the building that serves the majority of the spaces and a 100 amp main and meter on the north corner that service a panel immediately inside the building. The 200 amp service is on 6th Street and will not be able to be served by T.E.P. when the work on 6th Street occurs, a new electrical service will have to be developed.
3. There is one electrical feed into the elevator shaft, which is now abandoned, which is difficult to follow. This should be observed in greater detail if the building is to remain unchanged.
4. The electrical panels throughout are in reasonably good condition, some minor maintenance is required. There is one plug-fuse panel that should be replaced with a circuit breaker type.
5. There are exit and emergency lights throughout the building. They do not meet all of the requirements for egress and more lights would be required for complete coverage.
6. There is not any lighting for the outside stair from the Second Floor.
7. The lighting throughout is older and inefficient. Since the building is a single meter, a program to upgrade the lighting with energy efficient and effective lighting would save considerable energy cost and would have a reasonably rapid payback.
8. There is not a Fire Alarm system for this building, one may be required.

RECOMMENDATIONS:

Health and Life Safety Items –

1. The emergency and egress lighting system will have to be completed throughout all of the spaces in the building and there will required dedicated exit ways. The construction cost for the additional emergency & egress lighting throughout will be approximately \$10,000, not including the exit ways.
2. The exterior stairway from the 2nd floor to grade will have to be illuminated, including emergency lighting provisions, the construction cost will be approximately \$ 2,000.

Code Deficiencies

1. Not a Code item, but a new electrical service will have to be provided for the building, as the existing service is facing 6th Street and T.E.P. will not be apply to provide service there. A new electrical service with adequate capacity to provide air condition to the space and reconnection to the existing panels in all of the spaces will be approximately \$ 40,000. A few of the existing panels will have to be replaced and new panels will be installed near the existing panels and the existing will be used as pull boxes for the circuits to be extended to the new panels.
2. With the new electrical service and if air conditioning is added to the space, the Energy Code will require that the lighting circuits have an automatic shut off system that will cost approximately \$12,000.
3. General maintenance to correct the minor Code violations, such as covers missing, etc. will be approximately \$ 6,000.
4. The existing exterior lighting does not meet the requirement of the City of Tucson Outdoor Lighting Code and for new lighting to meet the Code and provide reasonable safety and security the construction cost will be approximately \$10,000.

Maintenance and Payback Items –

1. The lighting throughout is old and inefficient. Since the building is a single meter, a program to upgrade the lighting with energy efficient and effective lighting would save considerable energy cost and would have a reasonably rapid payback as well as reduce the heating load that will have to be air conditioned. The construction cost to retrofit the building interior light will be approximately \$ 16,000 and the pay back would be approximately 4 years with normal operation.

Programmatic items

There are not any programmatic items for the electrical systems.

6th STREET UNDERPASS CONSTRUCTION:

It appears that when the 6th Street underpass is reconstructed there will be major changes to the building. The southerly 20 feet of the building will most probably be removed from the structure which will leave the 2 story with basement portion at about 12,700 square feet and the 1 story portion to the west would be about 3000 square feet. The removal of the southerly portion would remove the existing electrical service and some of the existing panels. There are also some concepts of the building increasing in height. Without a complete knowledge of what is to happen with the building and how it is to be used it is not possible to include recommendations to the upgrading and modifying the electrical in the building. For budget purposes include \$10 to \$12 per square foot of the building configuration for the electrical systems.