Steinfeld Warehouse. Photo possibly from late 1940s

Steinfeld Warehouse

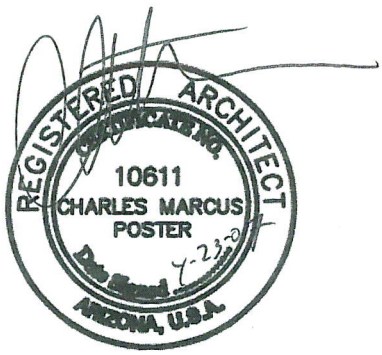
Building Condition Assessment Report

Draft Report
April 2007

POSTER FROST ASSOCIATES, INC.
ARCHITECTURE
PLANNING
URBAN DESIGN

Steinfeld 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

The Steinfeld Warehouse contains 16,673 GSF of work space on a single floor and an additional 16,673 of GSF in an unimproved basement for a total of 33,346 GSF of potentially usable space. The building currently contains studio spaces, a small gallery, and the Alamo Woodworkers Cooperative. The basement is unfinished storage.

The Steinfeld Warehouse was constructed in 1907 for local businessman, Albert Steinfeld, and his retail establishments. The building is a contributing structure to the Tucson Warehouse Historic District. It is architecturally significant for its association with early warehouse buildings in Tucson. It is considered the best surviving example of a turn-of-the-century warehouse building. Its architectural character consists of heavy timber, post and beam construction and unreinforced, load-bearing brick masonry walls.

Years of neglect and significant water damage have severely compromised the structural integrity of the brick masonry walls, including the parapets. In several locations, bricks are missing and eroding. The cost for replacing all spalled and missing bricks below the roof is $125,000 and $105,000 for the parapets. Remortaring and sealing of brick and stone foundation walls is worth $10,000.

The roof membrane has been damaged by water and does not properly transfer wind and seismic loads to the shear walls. The cost to repair the damaged roof, apply a layer of plywood to transfer loads, and install a new roof membrane is $207,900. Attaching the roof diaphragm to brick walls will cost an additional $97,500. Attaching the floor diaphragm to the walls is also $97,500. Most of the heavy timber framing members are in good condition. Deck, beam, and column repairs will cost $21,000. Work on the mezzanines is estimated to cost $73,000.

Replacing the steel canopy at the west service yard will cost $60,000. Repairs to the ramp and dock on the west side is estimated to cost $12,000. Stabilization of the south and west service yard walls is $37,500.

The total cost of all structural repairs, with 20% contingency is $1,015,680.

Items that should be addressed to improve the usability and safety of the building are reconstructing the east loading dock ($33,950) and restoring other exterior features like windows and downspouts ($45,000). On the interior, new basement stairs ($5,000) and improved exiting is needed.

Improving the building's heating and cooling could cost anywhere from $105,000 to $250,000 depending upon the type of system installed. Upgrading plumbing, including two new bathrooms and sinks in all studio spaces is $20,000-$25,000. Repairs to the sprinkler system could cost $5,000. $60,000-$70,000 of electrical upgrades are recommended to address limits to the existing service.

If the basement is more fully occupied, basic code provisions will have to be met. A second exit and access is required and basic ventilation and heating/ cooling provisions will have to be met. Installing a live/ work artist space on the first floor ($66,500) is another possibility. Finally, the west service yard could be redesigned ($50,000) as a multifunctional courtyard space for loading, parking, and entertainment.

The cost of non-structural repairs, using mid-point figures on all ranges and using the lowest number for HVAC, is $397,950.

The grand total for recommended repairs, using mid-point figures on all ranges and using the lowest number for HVAC, is $1,413,630.

Replacement cost for a good quality building of comparable size is roughly $5-$6 million.

The Steinfeld Warehouse could be occupied during the completion of most repairs, including masonry wall and parapet repairs and roof resheathing. Where the roof decking is severely damaged, it may be necessary to temporarily restrict access while repairs are being made. Repairs to the mezzanines and attachment of floor and roof beams to masonry walls would cause minor disruptions to the occupants. The cost estimates reflect an assumption that the entire structure would be repaired at one time. Completion of the work in phases would increase the overall cost of the project due to additional contractor costs.

It is anticipated that a minimumdeflection retaining wall and underpinning will be required to protect the Steinfeld Warehouse against damage from the 6th Street Underpass itself. The structural report includes more detailed recommendations for protecting the Steinfeld Warehouse from damage during the underpass project. These additional costs associated with the underpass construction are unavailable and not included in this analysis.

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. No original plans of the building could be located and other sources of historic documentation are limited. Historic photos are limited to a single photo of the northeast corner, possibly dating to the late 1940s. Because the architectural integrity of the building remains high, much of the report could be conducted solely on field observations.

2.2 Location

The Steinfeld Warehouse is located at 101 West 6th Street, at the southwest corner of 9th Avenue and 6th Street.

2.3 Developmental History

The Steinfeld Warehouse was constructed in 1907 by prominent Tucson merchant, Albert Steinfeld, as a warehouse for groceries, dry goods, hardware, and furniture. The structure was used by Steinfeld and other local merchants until the 1970s. Other merchants associated with the building, who may have leased space from Steinfeld include: Arizona Grocery Company, Pak n Takit Grocery and J.A. Dick Co. Grocery. In the early 1980s the building was converted to artists' studios and workshops. In 1984, the Arizona Department of Transportation purchased the building to make room for the completion of Aviation Parkway. By the late 1980s, with the road project scrapped, many of the artists who currently occupy the building began using the space. Long term residents of the building include the Alamo Woodworkers Co-op, CHAX Press, and Cynthia Miller. In recent years, a portion of the building has served as the Dinnerware Contemporary Arts Gallery.

2.4 Significance

The Steinfeld Warehouse is a contributing structure to the Tucson Warehouse Historic District, listed on the National Register of Historic Place in October 1999. The building is considered the best surviving example of a early 20th century warehouse building in Tucson.

Dinnerware Contemporary Arts Gallery

View of the Steinfeld Warehouse from across 6th Street and the Railroad Tracks

2.5 Architectural Description

The structure is a one story building with full basement. It is constructed of unreinforced, load-bearing exterior brick masonry walls with heavy timber beams and columns. The interiors are largely open due to the post and beam construction. Many of the spaces include mezzanines cantilevered on the brick masonry and hung from the roof beams. The L-shaped plan consists of two short bays oriented perpendicular to 9th Avenue and a long bay that runs the length of 6th Street. The foundation walls are 24" unreinforced "A" Mountain stone.

The plan creates a west facing service yard accessed off the Perry Ave alley. 12" brick masonry walls create enclosure for the yard on the west and south sides. Unimproved space, used for storage, has been created against these enclosure walls. The first floor is elevated approximately four feet above grade and is served by loading docks on both the east and west sides. The basement is accessed by a concrete ramp and wood stair from the western yard and by an internal stair in the northern bay. A service elevator in the northern bay is no longer functional.

Former warehouse space being used for woodworking

Basement window set into "A" Mountain stone foundation

West facing service yard

2.6 Character-Defining Features

The character-defining features of the building are a product of its design as a warehouse. As such, the building contains no applied ornament, with the exception of the northeast corner where wire cut face brick and cast stone was added to the façade in the early 1920s. Architectural character, expressed in the articulation of materials, includes brick corbelling at parapet walls and foundations constructed of local A-Mountain stone. A steel canopy with corrugated metal roofing is attached to the north and west walls of the courtyard.

Brick segmental arches span the openings of the basement windows and the loading dock doors. Several of the heavy, sliding wood doors and overhead tracks are still present. Along 6th Street, windows are wood, double-hung units. The northern bay has clerestory windows spanned by simple wood lintels. Pitched skylights allow generous amounts of light into the cavernous interiors of all three bays.

Natural light illuminates the gallery space

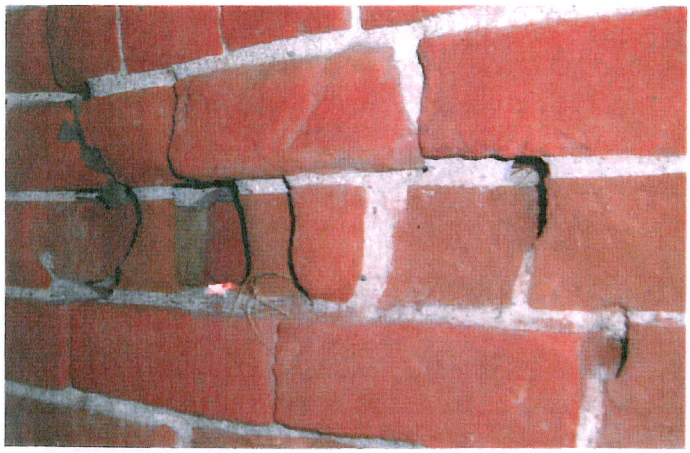
1920s decorative brick facade at NE corner

Corbelled brick detail at east wall

2.7 Integrity

The Steinfeld Warehouse retains its architectural integrity, including most of it original structural and architectural components. Interior partitions have been added to create offices, studios, a gallery, and support spaces, but none of these alternations infringes on the architectural character of the building. The integrity of the structure is most compromised by changes to its exterior appearance. These changes include damaged and missing window components and replacement awnings that are incompatible with the historic look of the building. Much of the exterior masonry walls structural integrity, particularly along the east and north walls, is severely compromised.

Non-historic canopy at entrance to gallery



Water damaged bricks at interior of east wall of south bay

Parapet walls are severely deteriorated

Original conductor head with non-historic downspout

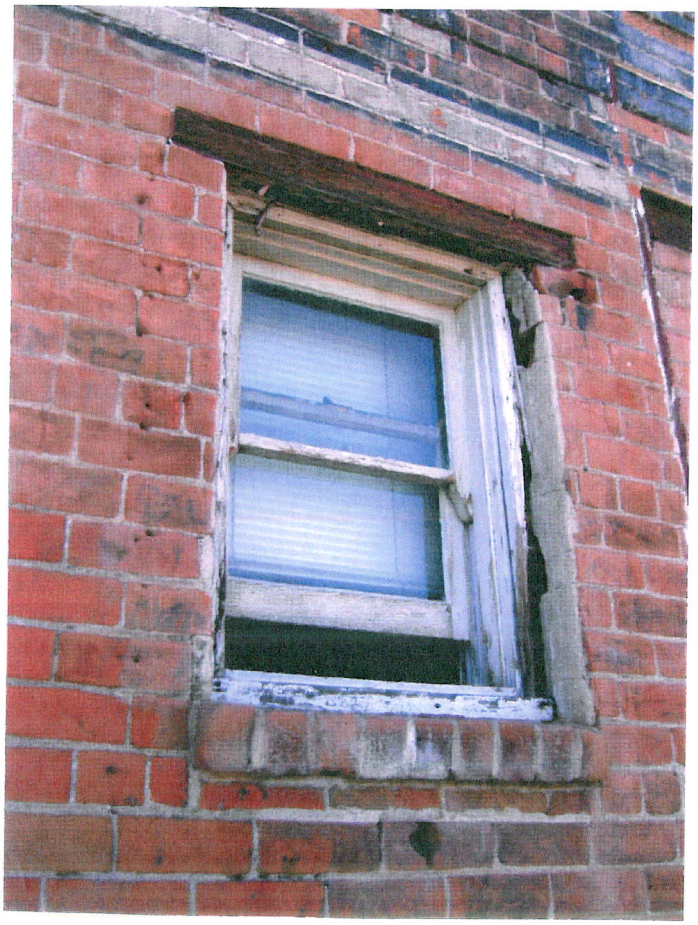
Original wood plank floors are worn but in good condition

2.8 Condition

The overall condition of the building is fair with many of the brick walls, including parapets, in poor to very poor condition. The structural report outlines the structure's major structural deficiencies. From an architectural perspective, many of the wood plank floors are well-worn having withstood heavy use over the past 100 years. Furthermore, isolated areas of flooring have sustained significant water damaged from roof leaks. Some of the wire glass panels in the skylights are cracked. Many of the windows are in poor condition, especially along 6th Street.

Serious water damage to wood sheathing at south bay

Damaged brick at east elevation



Damaged wood, double hung window at north elevation

3.1 Summary

Following are specific architectural recommendations for the Steinfeld 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. The preservation and rehabilitation treatments allow for limited health and safety upgrades as long as they do not damage or destroy the character-defining spaces and features. Accessibility considerations can also be corrected through sensitive alternations. Care should be taken to insure that new mechanical and electrical equipment does not distract from the interior character of the space. Missing exterior features of the building, including steel awnings, conduit heads, and downspouts should be restored or replaced with compatible features.

3.3 Recommendations

A. Health and Safety

1. *Repair East Loading Dock*

The surface of the east loading dock has large cracks and a buckled surface.

Cost: Demo existing walls and slab = $6,500
153 LF Wall x $100 LF = $15,300
1,430 SF slab x $5 SF = $7,150
New stairs to loading dock = $5,000

2. *See Mechanical And Electrical Reports for Additional Recommendations.*

B. Code Required Improvements

1. *Provide Additional Exit at Wood Shop.*

To meeting exiting requirements, an additional exit should be created at the west end of the wood shop. An exit door in the SW corner of the space, with stairs leading to grade, would meet this requirement.

Cost: $10,000

2. *Provide New Stair from Wood Shop to Basement.*

The existing stair from the basement to the wood shop has no handrail and does not meet tread and riser requirements.

Cost: $5,000

3. *Address Basement Exiting Requirements*

If the basement is converted to artist studios or uses other than storage, a second exit will be required. A possible solution would be to create an exit corridor along the east wall of the basement. When the east loading dock is reconstructed, the possibility of incorporating exit stairs in this area should be considered.

Cost: $20,000

C. Programmatic Issues

1. *Restore Exterior Architectural Features*

Many of the exterior features are missing, severely damaged or in need of repair. This includes wood windows and trim, scuppers and downspouts, brick and stone work, and steel canopies along the east facade.

Cost for window repairs: $20,000
Cost for downspouts, scuppers, etc.: $5,000
Cost for new Entry Canopies: $5,000
Miscellaneous costs: $15,000

2. *Redesign service yard to be multifunctional*

The service yard on the west side of the building is currently used for service, parking, and storage. It is enclosed by building on the north and east sides and

masonry walls on the west and south. Shed space has been constructed against the south and southwest walls. The shed space is unimproved and depending on programmatic needs, could be removed to allow for a bigger service yard. The open space available in the service yard is approximately 6,500 SF with 1,500 SF currently occupied by the storage area.

The service yard space could be reconfigured to better fulfill the parking, service, and programmatic needs of the building. The existing drainage scheme that directs some of the water off the roof towards the foundation should be corrected. Courtyard improvements, including cobblestone paving and new plant material create a multipurpose space suitable for many occasions.

Cost: $8 - $10 per square foot
5,000 SF x $10 SF = 50,000

3. Provide One Live / Work Residence
Currently, no residential housing units are contained in the Steinfeld Warehouse. Creating a live / work space is seen as desirable for hosting visiting artists. Based on the existing use of the building, the logical place to create a residential unit is in the southern bay. This location would avoid its placement adjacent to the woodworking shop and allow the gallery space to remain intact. There are code requirements for residential use that may require upgrades to the building.

Cost: 1,200 SF x $55 SF = $66,000

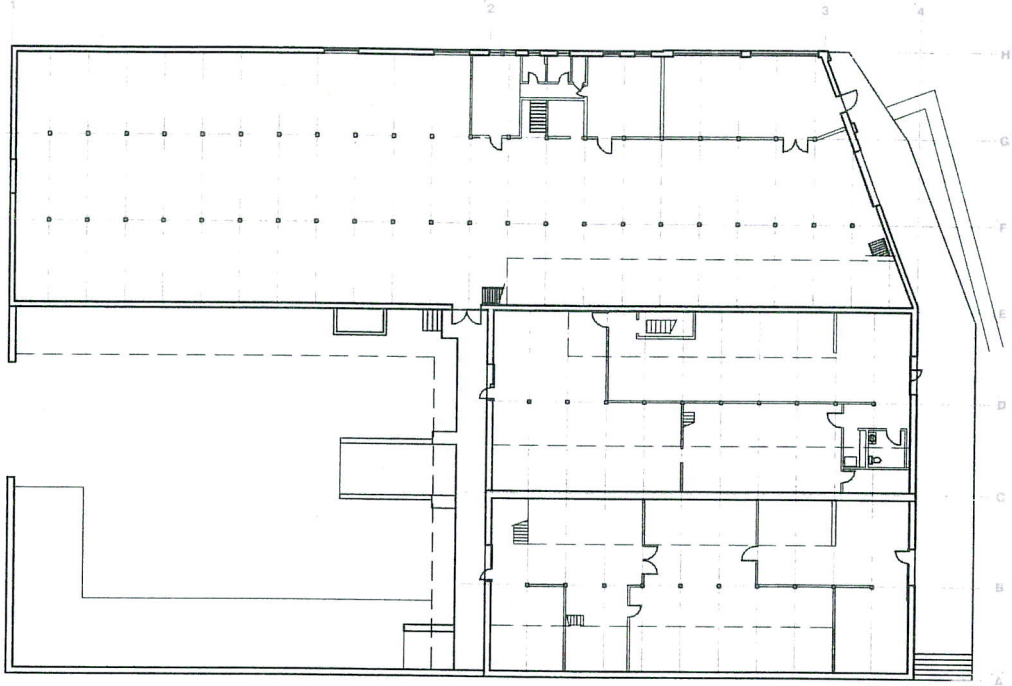
4. *Improve Gallery Functionality and Security*
A new security system is desirable for the gallery space. An expanded service area, including larger kitchenette is also desirable.

Cost: $10,000

D. Maintenance and Payback Items

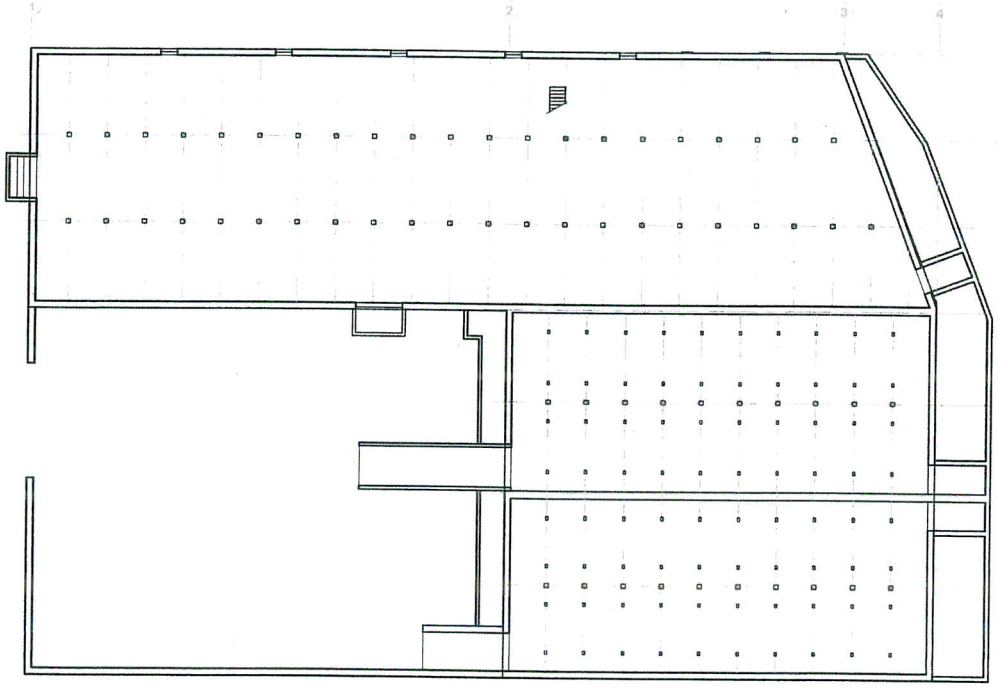
1. *Improve Performance of Skylights*
The skylights are a wonderful character defining feature of the space, but their performance could be improved to prevent unwanted thermal gain and loss and to improve the quality of daylighting. Wire glass is currently installed in the panels of the skylight. It may be possible to upgrade the glazing to insulated panels of laminated glass. The panels could be coated or tinted to reduce solar heat gain and to improve the quality of light for the gallery and studio spaces. To increase daylighting, additional skylights may be considered for the two southern most bays. The benefits of increased daylight should be weighted against the potential for reducing the thermal performance of the building through too much heat gain /loss.

Cost to reglaze: $1,000 per existing skylight



FIRST FLOOR PLAN

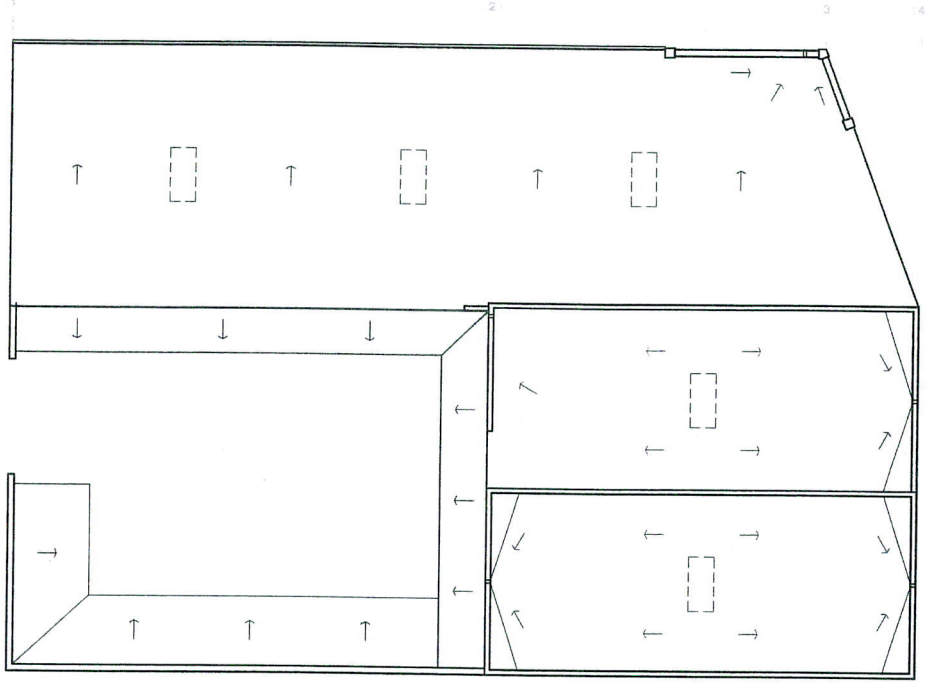
16,673 GSF



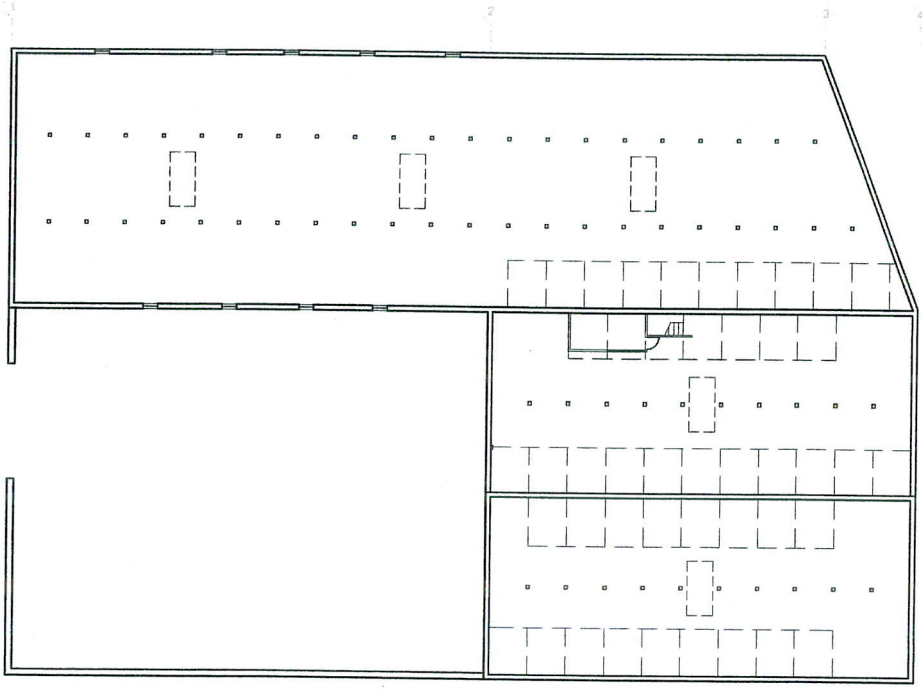
BASEMENT FLOOR PLAN

16,673 GSF

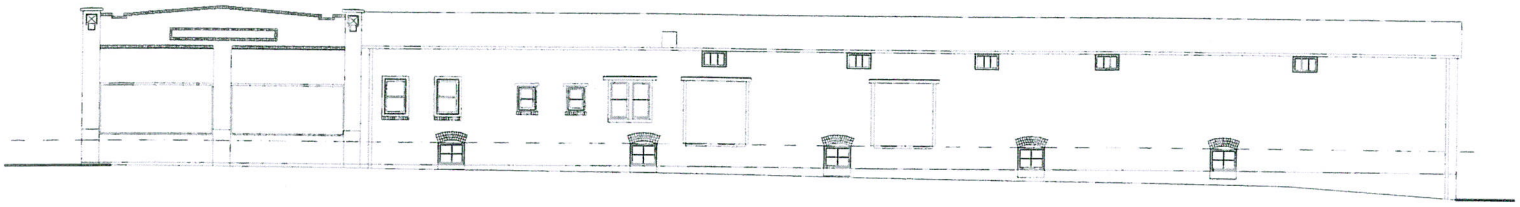
North



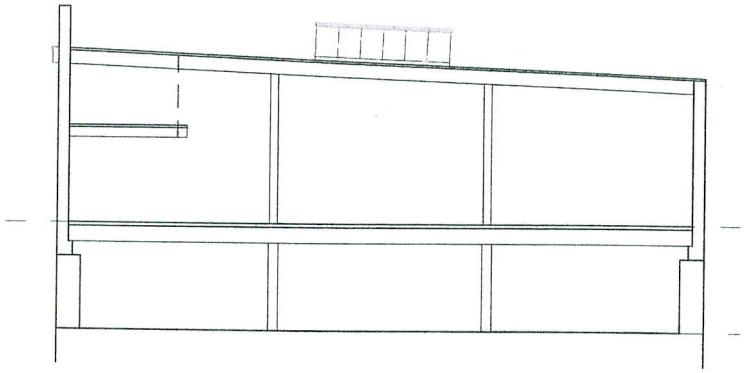
ROOF PLAN



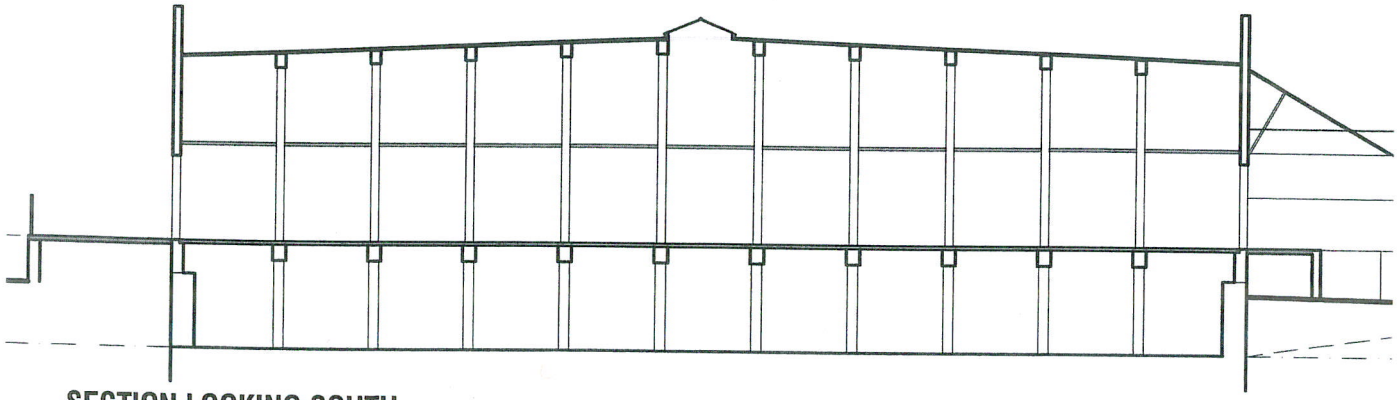
MEZZANINE PLAN



6TH STREET ELEVATION



SECTION LOOKING WEST



SECTION LOOKING SOUTH

STEINFELD WAREHOUSE

Prepared For

Poster Frost Associates, Inc.

Prepared By

TLCP
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 Steinfeld Warehouse**
TLCP Job No. T07029

Dear Corky:

We have completed our structural evaluation of the Steinfeld 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 building is an existing one-story, approximately 33,000 square-foot structure located at 101 West 6th Street in Tucson, Arizona. It was constructed in 1907 and initially used as a storage warehouse. There is a basement, elevated floor at grade level and a partial mezzanine. Roof and floor construction consists of heavy-timber framing supported by wood columns and unreinforced brick walls.

ROOF FRAMING (see Figure S5.1)

Framing consists of 2 x tongue and groove lumber decking that spans horizontally over 8 x 12 wood beams spaced at 8 feet on-center. The beams are supported by a series of 8 x 8 interior wood columns and three-wythe (12"), unreinfocred brick walls.

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MEZZANINE FRAMING (see Figure S4.1)

Framing consists of 2 x tongue and groove lumber decking that spans horizontally over 6 x 10 wood beams spaced at 8 feet on-center. One end of each of the beams is hung from a roof beam with a steel rod, while the other end bears on a brick wall.

FLOOR FRAMING (see Figure S3.1)

Framing consists of 4 x tongue and groove lumber decking that spans horizontally over 14 x 16 wood beams spaced at 8 feet on-center. The beams are supported by a series of 10 x 10 interior wood columns and three-wythe, unreinforced brick walls.

FOUNDATION (see Figure S2.1)

The interior wood columns appear to bear on cast-in-place concrete footings of unknown size that are probably not reinforced, while the brick walls are supported by an ureinforced rock foundation.

LATERAL FORCE RESISTING SYSTEM

The lateral system 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 rock foundation.

CANOPY AND SHED AT SERVICE YARD (see Figure S5.1)

The canopy framing over the loading dock consists of metal roof decking supported by built-up steel trusses spaced at about 10 feet on-center that are anchor bolted to the brick walls. The loading dock walls are cast-in-place concrete. The shed framing consists of conventional 2 x wood framing supported by posts and unreinforced brick walls.

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SITE OBSERVATION AND ENGINEERING ANALYSIS

ASSUMPTIONS FOR ANALYSIS

1. Roof live load = 20 psf.
2. Mezzanine floor live load = 40 psf.
3. Floor live load = 125 psf.
4. Wind and seismic forces per the 2006 International Building Code.
5. Douglas Fir No. 1 allowable stresses for all beams and columns.
6. Douglas Fir No. 2 allowable stresses for all wood decking.

The site visit of February 27, 2007, and the subsequent engineering analysis, resulted in the following discoveries:

ROOF

1. Stress levels in the roof beams and wood deck are within allowable design values for dead load and live load, with the exception of the roof beams supporting the mezzanines. However, if the mezzanine live load is reduced from 40 psf to 30 psf and if there are no mechanical units on the beams, then they are structurally acceptable.
2. The age of the roof membrane is not known, but as shown in Photo 1 it has been patched several times to stop leaking. Photo 2 indicates that leakage is an on-going concern. The roof membrane is in extremely poor condition.
3. As a result of water infiltration through the roof, the wood deck has failed in several locations (see Photos 3 and 4). However, the beams do not appear to have been affected.
4. The wood deck diaphragm is not connected to the brick shear walls.
5. Minor checking was observed in some beams, but not enough to affect their integrity. However, one beam has a severe spit in it apparently from pipe loading (see Photo 5).

MEZZANINE

1. Stress levels in the mezzanine beams, 1" diameter beam hanger rods and wood deck are within allowable design values for dead load and live load. However, deflection calculations of the deck do not meet minimum code requirements. The deck has shrunk over the years so that the tongues and grooves have separated. Noticeable movement of the decking was observed while walking on it.
2. The wood mezzanine stairs, and their connections to the mezzanine, are inadequate (see Photo 6).
3. The wood deck diaphragm is not connected to the brick shear walls.

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FLOOR

1. Stress levels in the floor beams that are not split, and wood deck are within allowable design values for dead load and live load.
2. Significant checking and splitting has occurred is several floor beams reducing their load carrying capacity by as much as 50% (see Photo 7).
3. The wood deck diaphragm is not connected to the brick shear walls.
4. With the exception of an isolated location, the wood deck appears to be in good condition.

COLUMNS

1. Stress levels in the columns are within allowable design values for dead load and live load.
2. With the exception of significant checking in four columns, all of the remaining columns appear to be in good condition.

WALLS

1. Stress levels in the first floor unreinforced brick walls (i.e.: walls from the first floor to the roof) are within the allowable design values for dead load, live load, seismic and wind loads. These include only the walls that are still intact.
2. The condition of several of the walls is extremely poor - particularly the north wall along 6th Street. There are several large cracks, spalled brick units, missing brick units and deteriorated mortar joints (see Photos 8 through 12).
3. As shown in Photos 13 and 14, deterioration of the brick parapet walls on the roof is extensive.

FOUNDATION/BASEMENT

1. Since footing sizes and soil characteristics are not known, calculations for the foundation were not performed.
2. A large crack was observed in the north rock foundation wall approximately 20 feet from the west end of the building and appears to be the result of soil settlement. Additionally, much of the mortar in this wall has eroded away.
3. The remainder of the foundation system appears to be in good condition.

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TLCP Job No. T07029

CANOPY AND SHED AT SERVICE YARD

1. Due to the extremely poor condition of the canopy framing and shed framing (see Photos 15, 16 and 17), calculations were not performed for these areas.
2. As shown in Photo 18, both ramp walls that support the elevated slab over the basement entrance have failed.
3. The wood and metal roof of the shed provides no lateral support for the approximately 10-foot tall, unreinforced brick wall along the south side.

LIFE SAFETY ISSUES

TLCP considers the following conditions to be life threatening and should be addressed immediately:

1. All stairs to all mezzanines should be shored until properly designed stairs can be installed. Temporary handrails should also be constructed.
2. All areas in which the roof deck has failed should be clearly identified on the roof and cordoned off until the deck can be replaced.
3. The slab over the basement entrance at the Service Yard should be shored until it and the walls supporting it can be replaced.
4. The wood roof beam along Grid 2 between Grids H and G (see Fig. S5.1 and Photo 5) shall be shored until a new beam can be installed.

CONCLUSIONS, RECOMMENDATIONS AND COST ESTIMATE

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. 16,700 sf at $10/sf = $167,000.
2. After removing the existing roof membrane, but prior to installing the new roof membrane as described above, replace damaged and failed 2 x wood decking with new members of the same size.
   Approx. 1,500 sf at $5/sf = $7,500.
3. As noted above, the roof diaphragm consists of 2 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. 16,700 sf at $2/sf = $33,400.

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4. Connect perimeter brick walls to roof diaphragm with tension-ties.
   Approx. 800 lineal feet at $50/ft = $40,000.
5. Install ledgers to connect roof diaphragm to shear walls at all brick walls.
   Approx. 1,150 lineal feet at $50/ft = $57,500.
6. Replace one split beam.
   Approx. 30 lineal feet at $100/ft = $3,000.

MEZZANINE

1. Replace all stairs that access the mezzanines from the first floor.
   Five stairs at $2000/stair = $10,000.
2. Replace 2 x decking with 3 x T & G wood decking.
   Approx. 3,600 sf at $5/sf = $18,000.
3. Connect all brick walls to floor diaphragm with tension-ties.
   Approx. 450 lineal feet at $50/ft = $22,500.
4. Install ledgers to connect floor diaphragm to all brick walls.
   Approx. 450 lineal feet at $50/ft = $22,500.

FLOOR

1. Repair checked and split beams.
   Approx. 30 beams at $500/bm = $15,000.
2. Replace damaged T & G wood decking.
   Approx. 200 sf at $5/sf = $1,000.
3. Connect perimeter brick walls to floor diaphragm with tension-ties.
   Approx. 800 lineal feet at $50/ft = $40,000.
4. Install ledgers to connect floor diaphragm to shear walls at all brick walls.
   Approx. 1,150 lineal feet at $50/ft = $57,500.

COLUMNS

1. Repair checked and split columns.
   Approx. 4 columns at $500/col = $2,000.

WALLS

1. Replace all spalled and missing brick units in the walls from the top of the foundation up to the roof diaphragm.
   Approx. 5,000 square feet at $25/sf = $125,000.
2. Replace all parapet walls with new and reinforced walls and anchor them to the existing walls below.
   Approx. 3,500 square feet at $30/sf = $105,000.

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3. Seal cracks in walls with silicon sealant.
   Approx. 500 lineal feet at $10/ft = $5,000.

FOUNDATION/BASEMENT

1. Remortar rock foundation walls along the north wall.
   Approx. 1,000 square feet at $5/sf = $5,000.

CANOPY AND SHED AT SERVICE YARD

1. Replace the entire cantilevered steel canopy and wood/metal roof at the shed with new framing.
   Approx. 4,000 square feet at $15/sf = $60,000.
2. Replace the concrete ramp walls and the elevated slab over the basement entrance.
   Approx. 30 cu. yds. conc. at $400/cy = $12,000.
3. Stabilize the south and west cantilevered walls of the shed with pilasters and steel framing.
   Approx. 150 lineal feet at $250/ft = $37,500.

Subtotal	$846,400
20%contingency	$169,280

TOTAL ESTIMATED COST FOR STRUCTRAL REPAIRS AND MODIFICATIONS **$1,015,680**

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 approximately eight feet to the north of the existing north 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.

Re: **Building Assessment for Steinfeld Warehouse**
TLCP Job No. T07029

Because of the proximity of the new tunnel to the building and the poor condition of the building, there is a very distinct 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, additional cracks in the already cracked 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. Because the building's walls and footings are all unreinforced, and compounded by the fact that they are in such poor condition, significant settlement 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 ½" may cause significant secondary stresses in the building and consequently the underpinning system should be designed to that limit.
2. All of the structural repairs and modifications to the building, as described in the Conclusions, Recommendations and Cost Estimate Section above, shall be implemented.
3. Shore the existing roof and floor beams along the north side of the building in order to take as much load as possible off of the north 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.

Re: **Building Assessment for Steinfeld Warehouse**
TLCP Job No. T07029

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

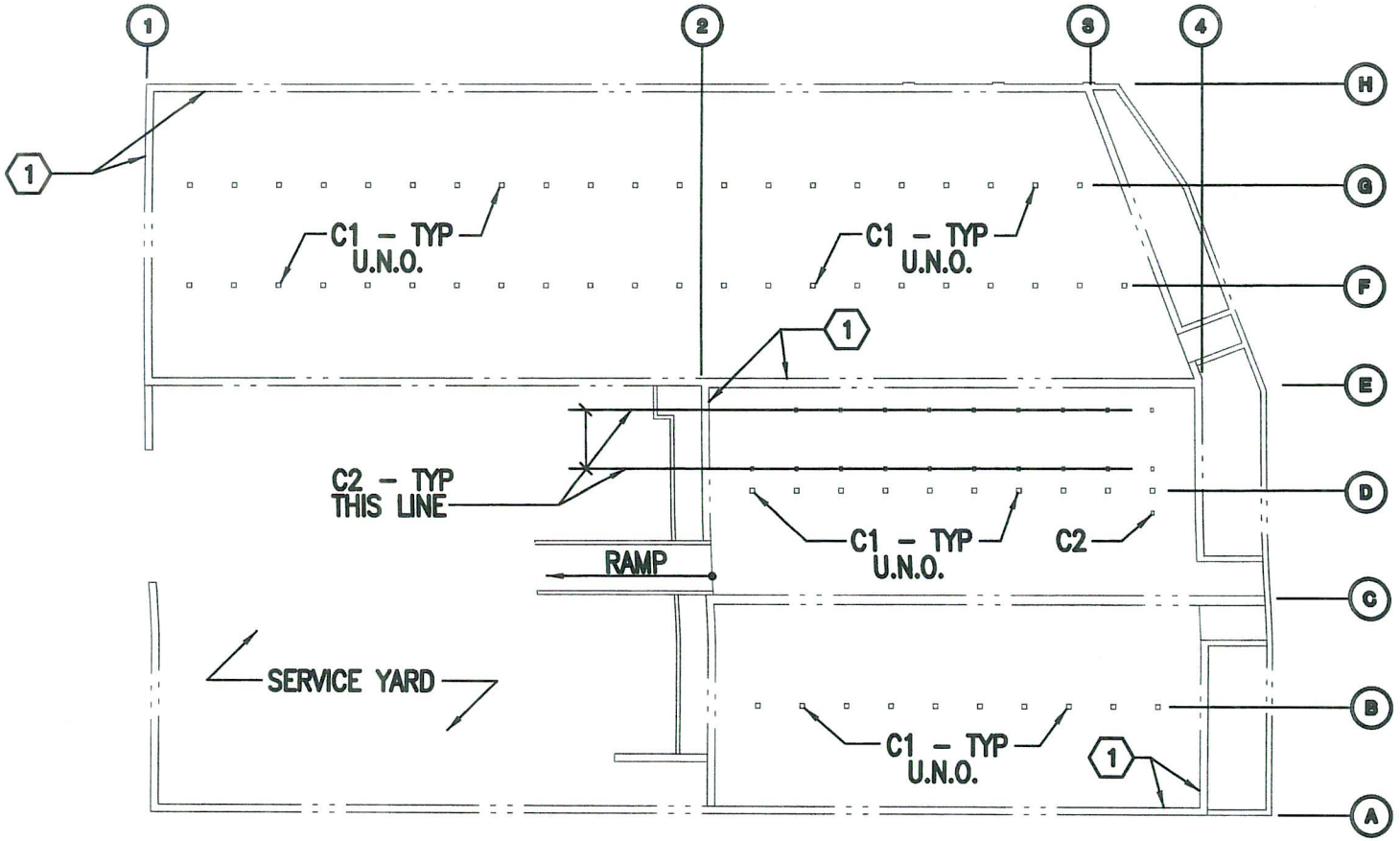
Sincerely,

TLCP STRUCTURAL, INC.

James M. Galvin, P.E.
Principal

APPENDIX A

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



FOUNDATION/BASEMENT PLAN

N.T.S. (APPROX. 16,700 SQUARE FEET)

N

FOUNDATION PLAN NOTES:

(1) THREE–WYTHE BRICK WALL.

COLUMNS

C1: 10 X 10 WOOD
C2: 6 X 8 WOOD

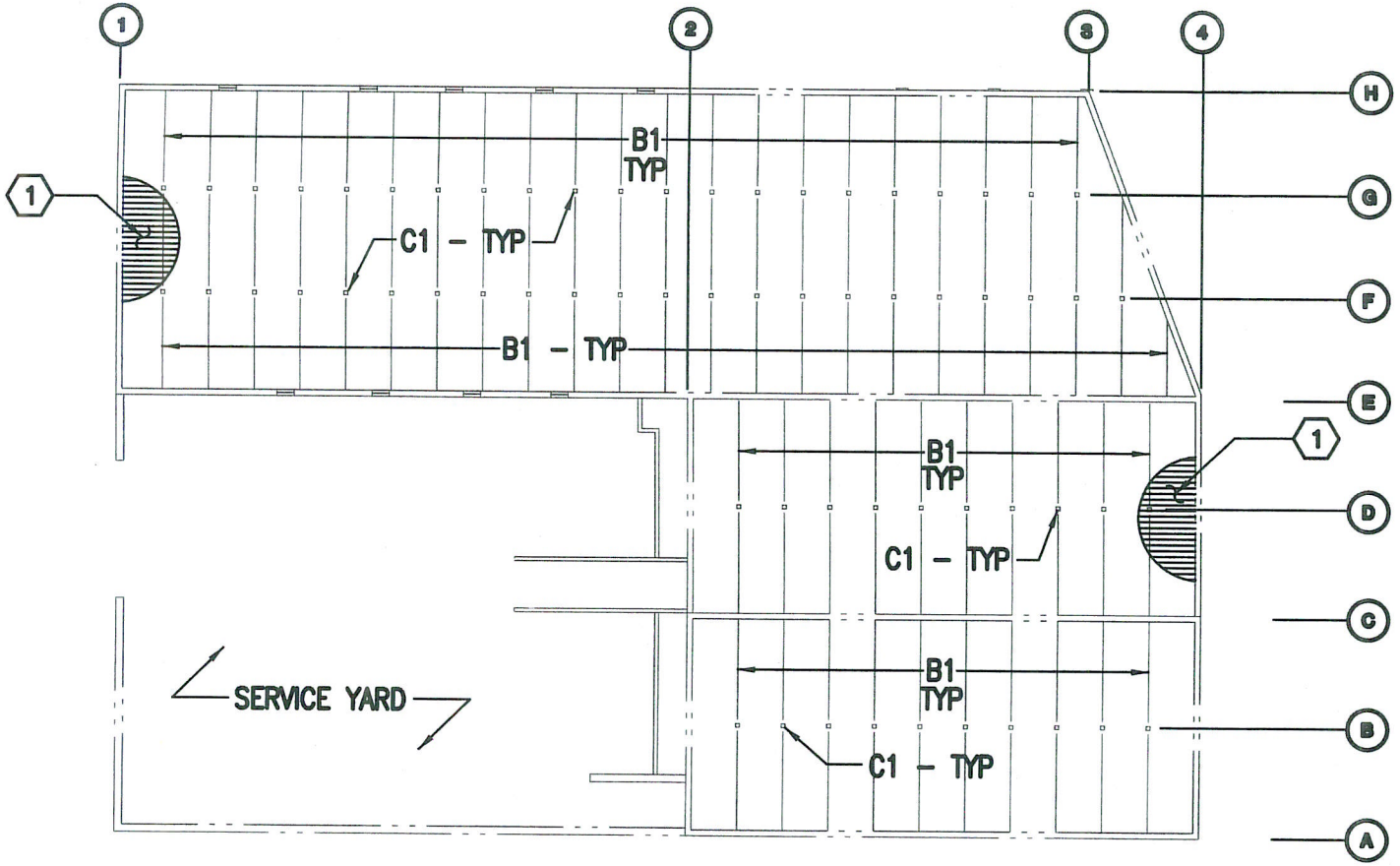
– PHOENIX, ARIZONA, 602–553–8155, (FAX)602–553–8255 – TUCSON, ARIZONA, 520–323–7689, (FAX)520–323–1287 –

STEINFELD WAREHOUSE
TUCSON, AZ

TLCP STRUCTURAL INC.

JOB NO: T07029

FIG. S2.1



FLOOR FRAMING PLAN

N.T.S. (APPROX. 16,700 SQUARE FEET)

N

BEAMS

B1: 14 X 16 WOOD AT 8'–0" O.C.

COLUMNS

C1: 8 X 8 WOOD

FRAMING PLAN NOTES:

(1) 4 X TONGUE AND GROOVE WOOD DECKING.

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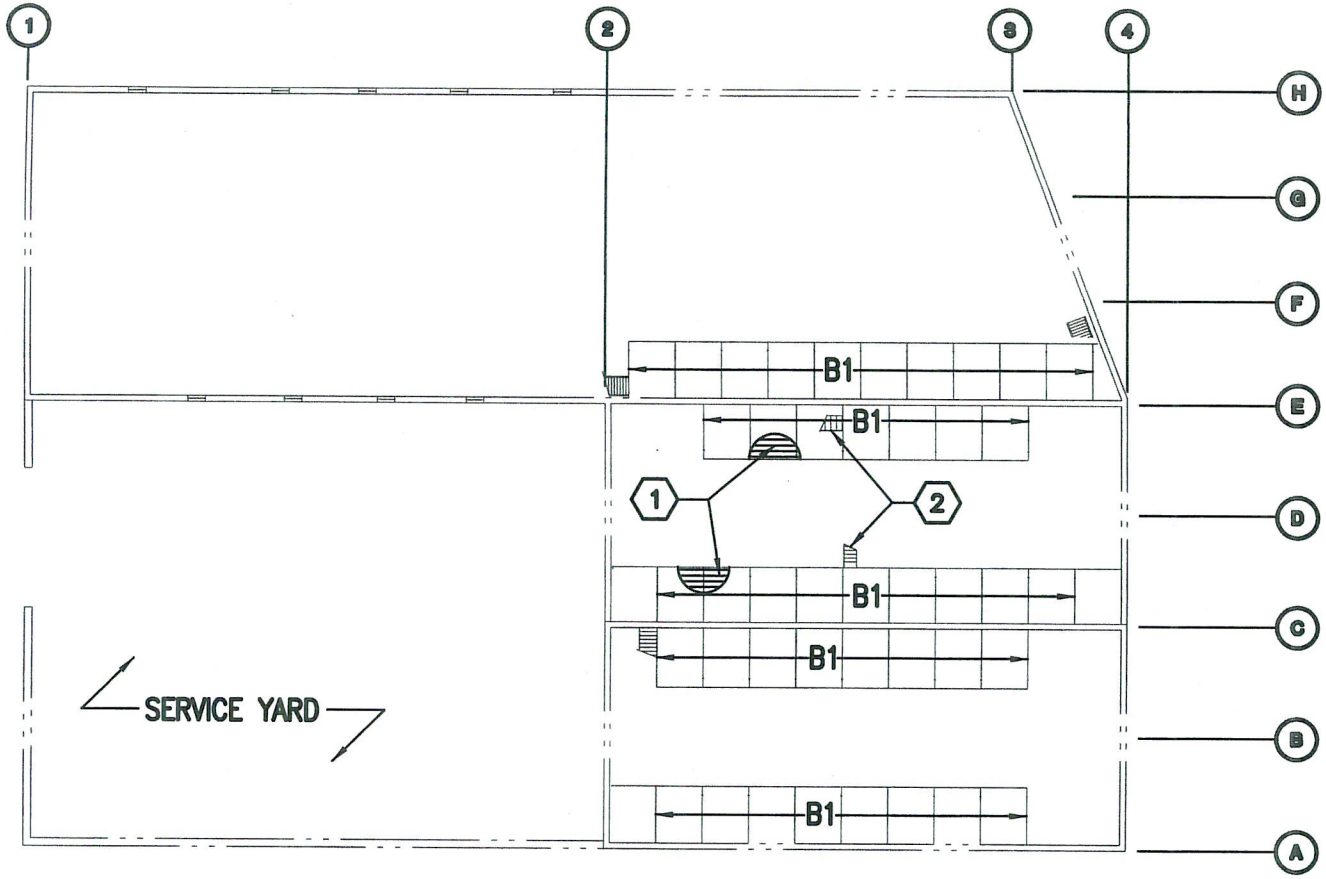
TUCSON, AZ

TLCP STRUCTURAL INC.

JOB NO: T07029

FIG. S3.1



MEZZANINE FRAMING PLAN

N.T.S. (APPROX. 3,600 SQUARE FEET)

N

BEAMS

B1: 6 X 10 WOOD AT 8'–0" O.C.

FRAMING PLAN NOTES:

1. 2 X TONGUE AND GROOVE WOOD DECKING.
2. WOOD STAIR – TYP.

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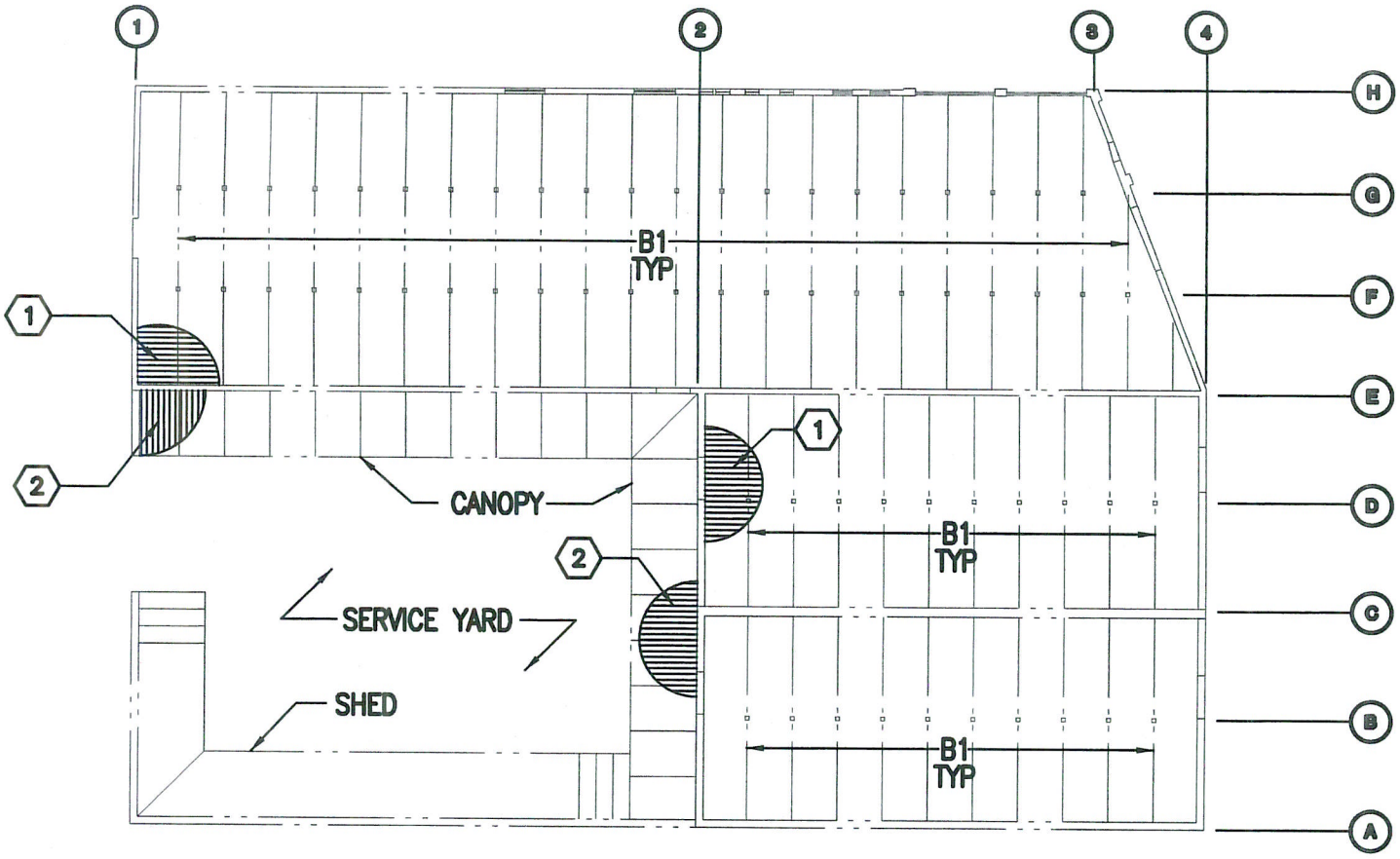
TUCSON, AZ

TLCP STRUCTURAL INC.

JOB NO: T07029

FIG. S4.1



ROOF FRAMING PLAN

N.T.S.

N

BEAMS

B1: 8 X 12 WOOD AT 8'–0" O.C.

FRAMING PLAN NOTES:

1. 2 X TONGUE AND GROOVE WOOD DECKING.
2. METAL ROOFING.

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STEINFELD WAREHOUSE
TUCSON, AZ

TLCP STRUCTURAL INC.

JOB NO: T07029

FIG. S5.1

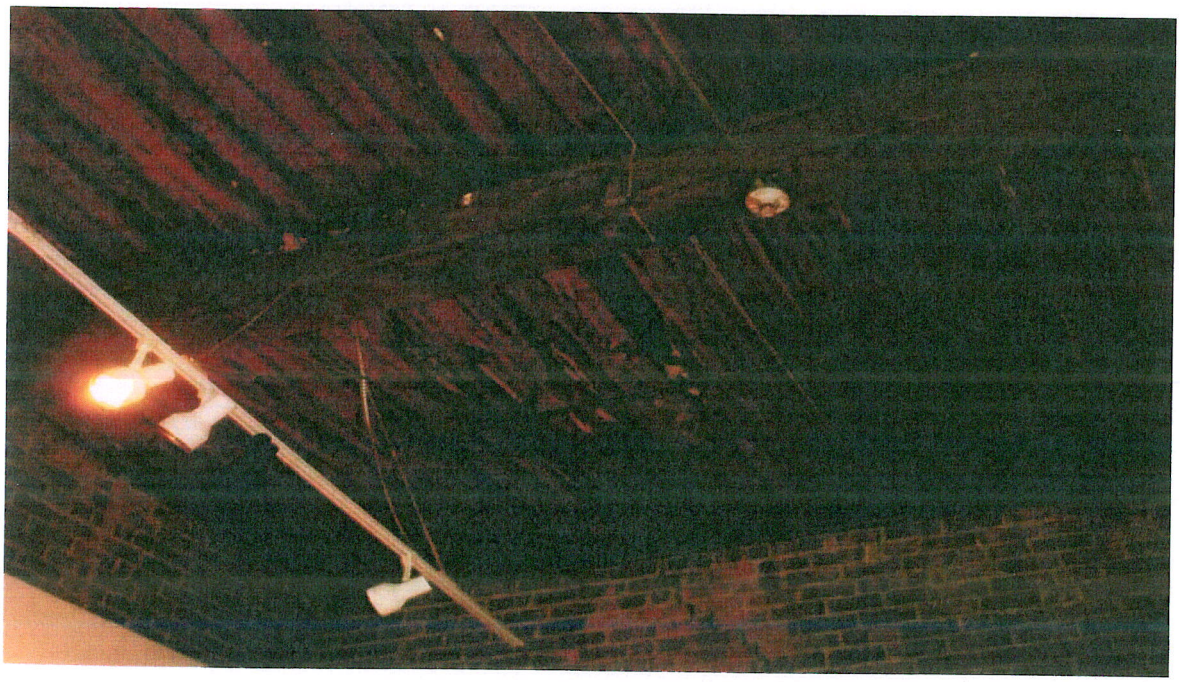
APPENDIX B

Photographs

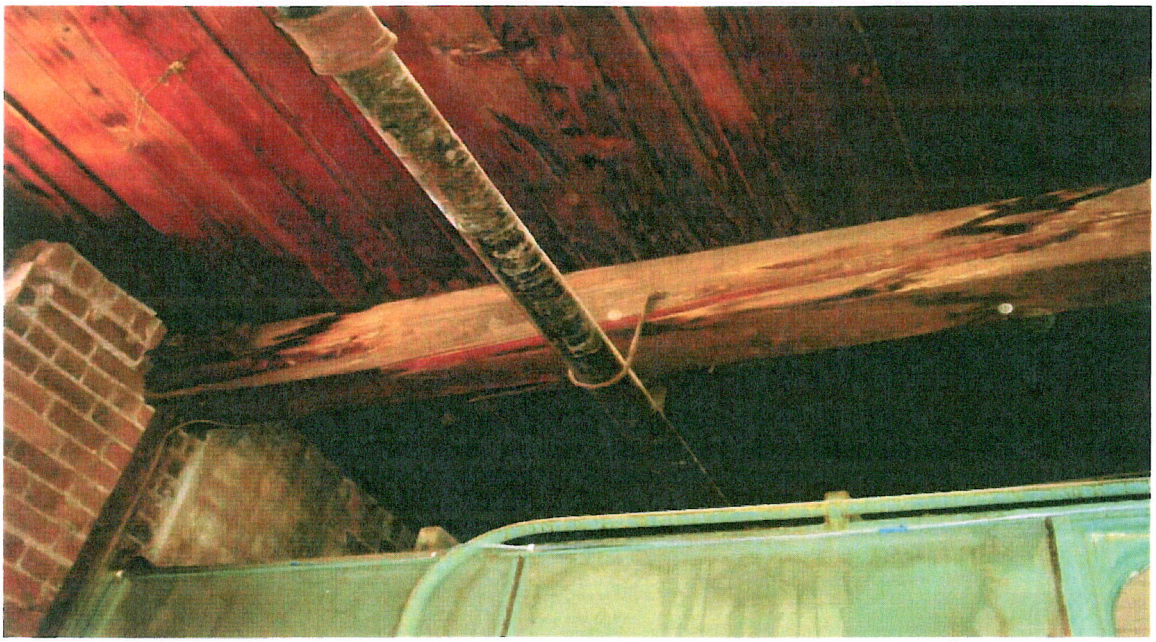
Steinfeld Warehouse – Photo 1
2/27/07

Steinfeld Warehouse – Photo 2
2/27/07

Steinfeld Warehouse – Photo 3
2/27/07

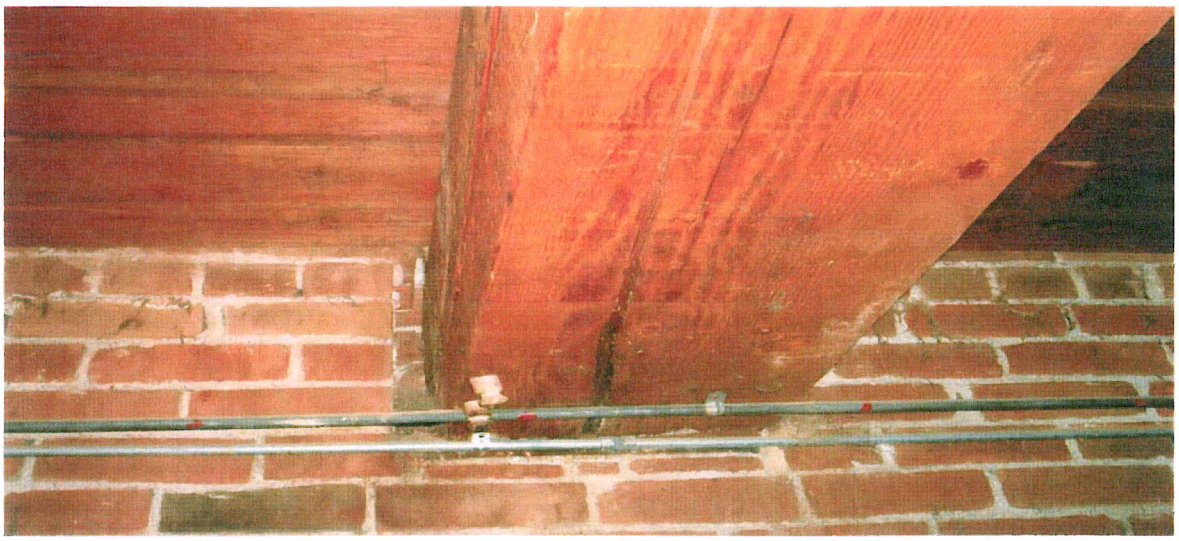


Steinfeld Warehouse – Photo 4
2/27/07

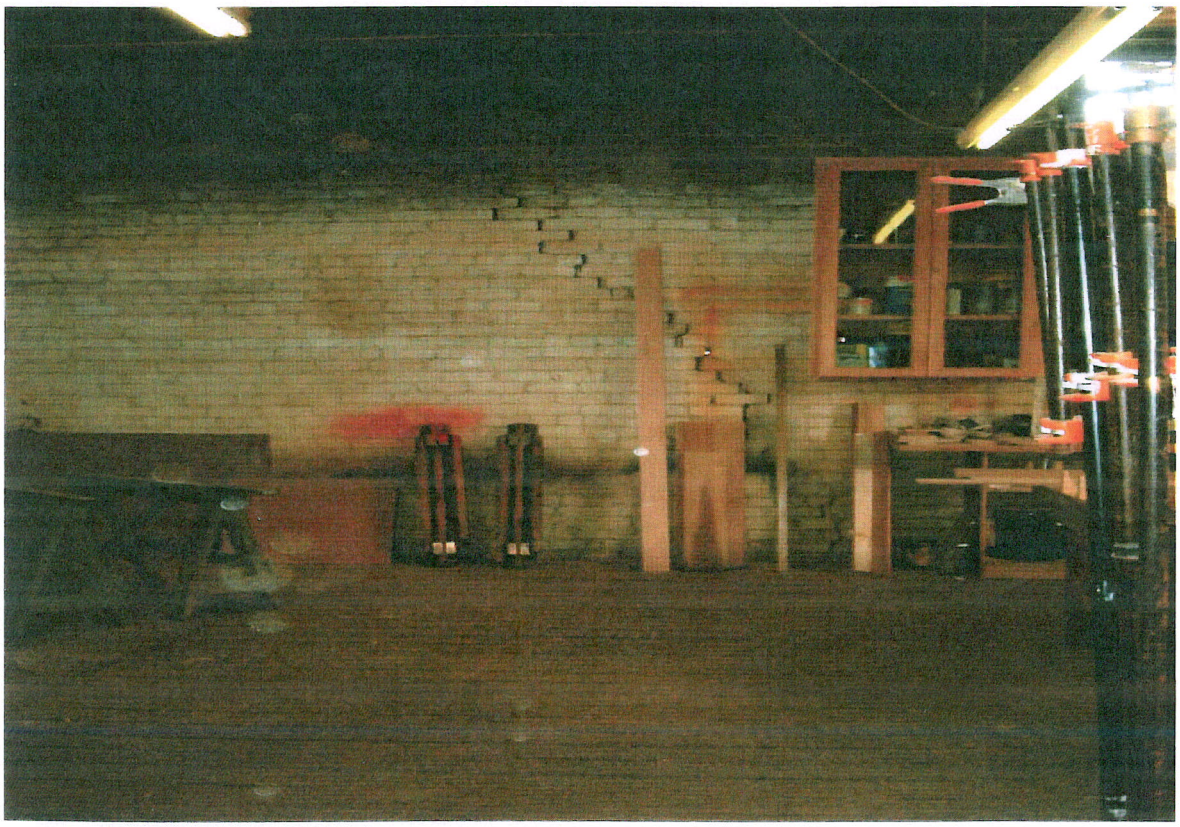


Steinfeld Warehouse – Photo 5
2/27/07

Steinfeld Warehouse – Photo 6
2/27/07



Steinfeld Warehouse – Photo 7
2/27/07

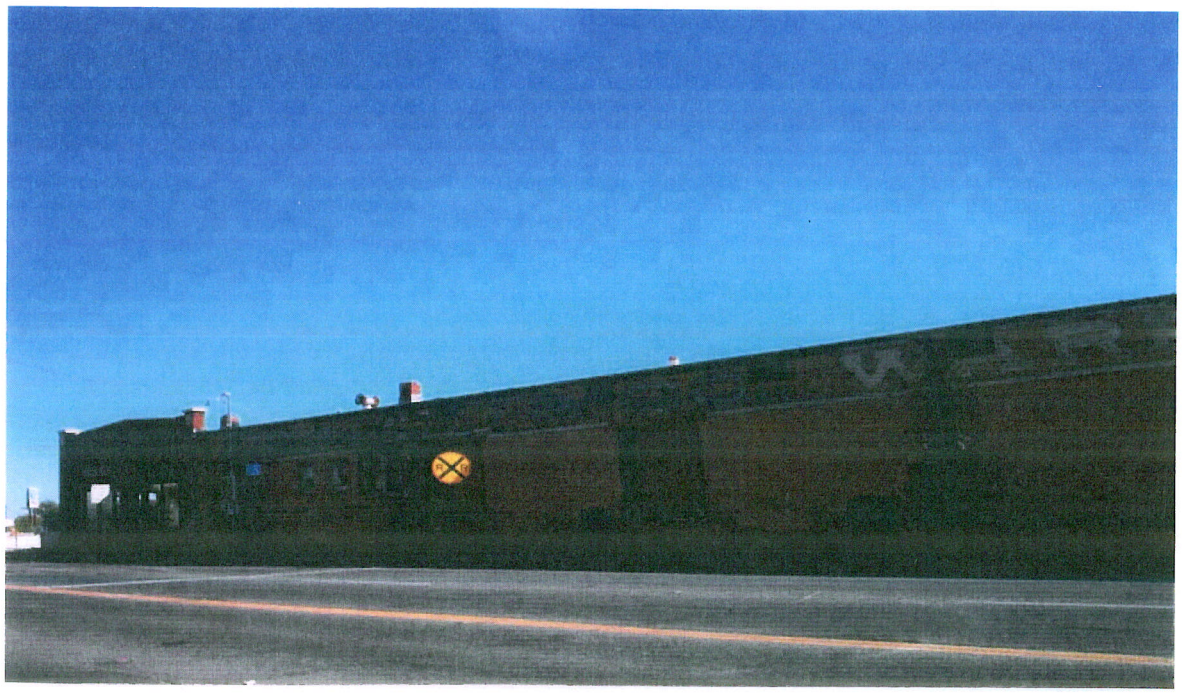


Steinfeld Warehouse – Photo 8
2/27/07

Steinfeld Warehouse – Photo 9
2/27/07

Steinfeld Warehouse – Photo 10
2/27/07

Steinfeld Warehouse – Photo 11
2/27/067



Steinfeld Warehouse – Photo 12
2/27/07

Steinfeld Warehouse – Photo 13
2/27/07

Steinfeld Warehouse – Photo 14
2/27/07

Steinfeld Warehouse – Photo 15
2/27/07

Steinfeld Warehouse – Photo 16
2/27/07

Steinfeld Warehouse – Photo 17
2/27/07

Steinfeld Warehouse – Photo 18
2/27/07

SMU Mechanical Engineering L.L.C.

April 16, 2007

Re: Steinfeld Warehouse
101 W. 6th St.
Tucson, AZ 85701
SMU Project # 12907

MECHANICAL REPORT

EXISTING CONDITIONS:

PLUMBING:

Water is delivered to the building by way of a 1" water meter and reduced pressure backflow preventer at the north end of the building. Water is then delivered to three restrooms, two on the north end, one near the east entrance as well as several evaporative coolers. While the restroom near the east entrance, which is utilized for patron use, appears to be in good condition and working order, the fixtures in the restrooms on the north end are in desperate need of replacement. These north end restrooms also do not appear to meet ADA requirements. No source of hot water could be found at any restroom, and no gas service was found to be serving the building.

There is an air compressor in the basement which distributes compressed air to the different woodworking areas on the north end first floor. The air compressor size and capacity were not verified.

FIRE PROTECTION:

The existing fire protection system is a wet pipe sprinkler system. The interior of the building is sprinklered throughout as well as the exterior loading dock. The exterior piping was previously insulated; however, large sections of the insulation are now deteriorating or missing altogether. The fire riser for the sprinkler system is located in the north basement near the center of the building, and the fire department connection is on the exterior of the building near the east entrance.

There is also a second fire riser in the center basement area near the entrance, which is mounted sideways in an underground vault with a metal lid. There is an 8" line from this system which extends up through the first floor and roof where it terminates. This appears to be an old fire protection system which was abandoned in place.

HVAC:

The larger warehouse area on the north end of the building is cooled by three evaporative coolers on the roof extending down past the roof deck with splash pans. The center and south open areas have one larger evaporative cooler each with a single splash pan. There is also a side discharge evaporative cooler on the north end of the building supplying air to a small office area. In addition, there is an office in the mezzanine area which is utilizing a thru the wall type air conditioning unit; however, since it is in a fully interior location, it is dissipating the heat back into the center office/warehouse area. Relief is provided from each of the spaces by operable windows and doors as well as openings in the skylights on the roof.

While the two restrooms on the north end of the building both have operable windows, neither has any direct mechanical ventilation. The restroom on the east end does have exhaust fan which discharges at the roof, but still no direct supply air.

There is a small room in the north warehouse area which contains a small dust capture system for processes involving woodworking with an exhaust fan on the roof. The air flow of this system is unknown but the configuration of the system is inconsistent with a typical duct collection system in that rectangular ductwork is used instead of round spiral and that the fan is on the roof instead of in the space. In addition, woodworking processes are occurring at throughout the north area of the building, necessitating a central duct collection system or single systems at each location.

RECOMMENDATIONS:

PLUMBING:

Life Safety / Code Deficiencies

The two restrooms on the north end of the building each need a new water closet and lavatory. The estimated construction cost to install these four new plumbing fixtures in the existing locations is approximately $4,000.00.

All three restrooms also do not appear to meet ADA requirements. These restrooms 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.

There been an expressed interest in constructing additional restrooms at the south end of the building as well as utility sinks in the woodworking area. The estimated cost to install the new plumbing fixtures and extend water and waste to the new locations is approximately $6,000.00 each for the restroom and a pair of utility sinks.

Other

For the planned construction to take place on Sixth Street and the building to remain operational, the existing water service entering the building and waste service exiting the building need to be relocated to another location. The proposed location would be to the west end of the building to Perry Avenue, placing the water meter and reduced pressure backflow preventer in or around the courtyard area. Another possible location would be to route the utilities to Ninth Avenue, on the east end of the building. In relocating these services to either location, the water service should be increased at this time as required for the proposed future plumbing additions. The estimated construction cost to relocate water and waste service to the west end of the building, install a larger water meter if required by Tucson Water, and modify all applicable piping inside the building is approximately $25,000.00.

FIRE PROTECTION:

Life Safety / Code Deficiencies

The exterior sprinkler piping needs to have new exterior insulation installed on the existing piping or the size of the piping needs to be increased to prevent freezing in cold weather. The approximate cost of this work is $5,000.00.

HVAC:

Life Safety / Code Deficiencies

The building currently lacks dust collection/capture systems as required in the woodworking areas in the north end of the building. The existing duct collection system in the single room should be removed and a central duct collection system installed to collect dust from all of the areas where woodworking processes are being conducted. The estimated construction cost to install a central dust collection system to serve the entire north end on the building is approximately $30,000.00.

There is currently no heating which can be found in the building which is required by code. This will be addressed in the subsequent section of this report on a space by space basis.

Other

The intent of the mechanical recommendations is to address code compliance issues as well as describe the feasibility of removing or modifying the existing HVAC system, specifically evaporative coolers. The following is a list of possible approaches for the owner to consider.

The larger warehouse area on the north end of the building is used primarily for woodworking with the exception of the small office area. Being such a large warehouse area (~8000 sq. ft.), and the type of work being performed, it is more cost effective for this area to remain evaporative cooled; however, in its current configuration, there is no heat to the space. One or more of these evaporative coolers should be replaced with make-up air units or have furnaces installed in conjunction with the evaporative coolers in order to provide heat to the space and still be able to bring in enough outside air to compensate what is being exhausted by the dust collection system. Either of these options would require gas service being brought to the building. The estimated construction cost to install a gas furnace in this area to provide heat is approximately $10,000.00. The estimated construction cost to replace an existing evaporative cooler with a make-up air unit in this area to provide cooling and heat is approximately $15,000.00.

The office areas on the north end, as well as the center and south open areas and the office in the mezzanine most likely necessitate air conditioning. In the buildings current configuration, the most likely option would be rooftop package air conditioning units (gas or heat pump) on the roof, routing ductwork on the roof, exposed in the truss space or the above ceiling where applicable. Another option would be split system fan coils with heat pump condensing units on the roof or on grade would be another option. The estimated cost to air condition the office area on the north end, the office in the mezzanine and the center and south open areas (total of ~7900 sq. ft.) with package DX equipment is approximately $80,000.00 depending on the amount of ductwork required.

Another option would be to use an air-cooled chiller to condition the spaces. With this configuration, a single chiller would be mounted on grade, supplying chilled water to fan coils located in the space. While more expensive up front, this system would be more energy efficient than smaller DX units. Due to the weight of the unit, it would need to be placed on grade, most likely in the parking area. This configuration would also only require a single piece of equipment outside of the building, reducing the weight on the roof or need for multiple condensing units in the parking area. In addition, chilled water from this system could be used to condition the north warehouse area or basement areas, while still bringing in high amounts of outside air for ventilation. 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 all office areas, utilizing an air cooled chiller, chilled water fan coils, pumps and all applicable piping is approximately $125,000.00 depending on the heat source selected. The estimated cost to condition all office and warehouse areas is approximately $250,000.00.

The owner has also expressed an interest in creating usable space out of one or more of the basement areas. While the north end basement has operable window and doors for adequate ventilation, the center and south basement areas are currently without heating, cooling or ventilation on any kind apart from the single door to the exterior. If ventilation is the only concern, this could be accomplished naturally or mechanically by increasing the quantity of operable openings to the exterior, or by utilizing fan units to bring in outside air. If conditioning the space was desired, the most likely scenario would be to

condition any or all of these spaces similar to the center and south areas on the first floor. One difference would be that if package units on the roof were used, the air would need to be ducted down to the basement, either exposed or in shafts. If fan coils with condensing units were used, air intake louvers would need to be located as required to bring outside air into the space. These areas could also be tied into the chilled water system if that option is chosen. The estimated cost to ventilate the center and south areas as required by code, depending on the method chosen is approximately $10,000.00 per area. The estimated cost to condition the basement spaces with package DX equipment (ranging from 3100-9300 sq. ft. each) is approximately $30,000.00-$70,000.00 per area depending on the amount of ductwork required. The estimated cost to condition the basement spaces with chilled water equipment is approximately $40,000.00-$100,000.00 per section depending on the amount of ductwork required.

Hy-Lite Design
Hyman Kaplan, IALD, PE

ELECTRICAL REPORT

STEINFELD WAREHOUSE, 101 W. 6TH ST., TUCSON

EXISTING CONDITIONS:

1. Overall the electrical systems in the building are old and have no experience a regular amount of maintenance. There are general Electrical Code violations throughout that can be address by detailed maintenance, such as cover missing from outlet boxes.

2. The electrical service is a single 400 amp meter to a 200 amp disconnect that service the general panels in all of the spaces and a 100 amp disconnect that service the Wood Working Shop panel. The electrical service is on the north side of the building and is served overhead. This will be in the way of the 6th Street expansions and a new electrical service will have to be provided to the building.

3. The panel for the Wood Working Shop is in the working area and the wood planer is in close proximity, this is casing wood shaving to possibly enter the panel and could be a fire hazard.

4. The only space that appears to have performed any upgrading is the Art Gallery. They have installed track lighting for their specific needs and have provide exit and emergency egress lighting, though part of the path of egress is not through a legal exit passage. A stairway to the mezzanine has been installed which is in front of the electrical panel, this is an Electrical Code violation that should be addressed.

5. The other panels in the Wood Working Shop and the other spaces in the building, except the Art Gallery, are served from the general electrical service and are very old and in poor condition, they should be upgraded.

6. The lighting throughout, except for the track lighting in the Gallery, is old and inefficient.

7. The exterior lighting is relatively new, but it did not meet the Outdoor Lighting Code, even when it was installed.

8. The existing sky lights should be addressed to provide usable solar illumination into the spaces.

9. There is some form of Fire Alarm system in the building, could not verify its total system. It would not comply with present Codes.

RECOMMENDATIONS:

Health & Safety Issues –

1. Remove the existing fire alarm system as it does not appear to be operating. I do not believe that this size and occupancy building require a Fire Alarm system and there is no need to install one, removal would be approximately $ 500.00.

2. The alarm for the Fire Sprinkler system can be a water gong and there is no electrical work required.

3. There will have to be a complete system of emergency and egress lights install in all of the spaces in the building and there will required dedicated exit ways. The construction cost for the emergency & egress lighting throughout will be approximately $15,000, not including the exit ways.

4. Relocate the wood planer away form the electrical panel, no electrical work.

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 new general panels in all of the spaces will be approximately $ 30,000. This will also eliminate the Code violation of the panel in the Art Gallery that has the stairway in front of it. The new general 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 $5,000.

3. For the basement to be a viable space, other than dead storage, now lighting and receptacle will have to be added. For basic fluorescent lighting and receptacle served from a local panel the construction cost will be approximately $16,000.

4. General maintenance to correct the minor Code violations, such as covers missing, etc. will be approximately $ 3,000.

5. 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 $7,500.

Maintenance and Payback Items –

1. The lighting throughout, except for the track lighting in the Gallery, 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 first floor light will be approximately $ 7,000 and the pay back would be approximately 4 years with normal operation.

Programmatic Items –

1. The concept of modifying the sky lights to make them a more effective source of usable day lighting would mean changing the materials from clear glass to a diffusing, heat absorbing material and controlling the electric lights that are in the vicinity. This would also have an effect of reducing the amount of solar heat gain that would have to be cooled by the air conditioning system. The cost for this would have to be work out by the Architect.