

# TDM

## CONSULTING ENGINEER, P.C.

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January 31, 2012

Mr. Richard Wiedersum  
Wiedersum Associates Architects  
140 Adams Ave.  
Suite B-14  
Hauppauge, NY 11788

Re: Structural Condition Survey at  
Mastic Moriches Shirley Community Library  
Shirley, NY

Dear Mr. Wiedersum,

As requested by the facility, TDM Consulting Engineer, P.C. performed a structural condition survey of the existing building for the Mastic Moriches Shirley Community Library located at 407 William Floyd Parkway, Shirley, NY. The purpose of our inspection was to review the various components of the building structure to determine the overall structural condition of the building and identify any areas of potential concern. Our assessment was based on a visual inspection of the building during our January 25, 2012 field visit as well as our review of the original design documents provided by your office. The following is a summary of our investigation:

### Building Description

The building under investigation is a typical multi-story steel framed structure originally constructed around 1982. The original building, which measured approximately 20,000 square feet, consists of a one-story structure with a partial basement and mezzanine. The building construction consisted of a metal roof deck supported by open web steel joists, steel girders and steel columns. The mezzanine floor comprised of a concrete slab on metal deck floor system. The exterior walls were constructed of a metal stud back-up with a brick veneer and the building foundation consists of a standard spread footing system.

In 1995, an addition to the original building was constructed measuring approximately 24,000 square feet. The building construction was similar to the original building.

### Roof Structure

The roof construction at both the original building and the addition consists of a membrane roof system on rigid insulation and a 1 1/2" deep metal roof deck. The deck was supported by a combination of open web steel joists and structural steel beams. Based on our conversation

during our inspection, the roof at the original building was recently replaced and the roof at the addition was repaired.

The following conditions relating to the roof were observed:

1. Water Infiltration:

There was much evidence of roof leaks throughout the original building as can be seen by the severe water stains on many of the ceiling tiles. Most of the leaks seem to be concentrated around two main areas, at the columns adjacent to the clearstory and at the roof top mechanical unit adjacent to the circulation desk. We found no damage to the steel beams and or columns adjacent to the clearstory, however, there was some degree of rusting on the metal deck and steel beams below the roof top unit. Although it was very difficult to fully assess the extent of the damage at the time of our inspection, it appeared to be limited to moderate to severe surface rusting. With this type of decay, the beam will have to be cleaned of all rust and repainted to prevent further damage.

Based on our discussion with maintenance personal during our inspection, the leaks at the original building have mostly stopped since the roof was replaced a few years ago. The roof of the 1995 addition, although approximately 17 years old, appears to be in good condition at this time. No major leaks have been reported in this area.

2. Folding Partition Support Beam:

The steel beam originally designed to support the folding partition adjacent to the circulation desk has been cut at two locations to install ductwork in the ceiling. It appears that angles were added at the time to re-support the beam at either end of the notch. Based on our conversation with library personal, the folding partition is currently inactive and has been for many years. Since the beam is currently unloaded, the notch is not a serious structural concern at this time. However, if it is the intention of the library to use this door in the future, a full structural analysis of the beam will be have to be done and additional supports and/or strengthening of the beam may be required.



3. Skylights:

The smaller skylights in the addition portion of the building are beginning to show signs of wear. A few small cracks were observed in two of the skylights. Although not critical at this time, they should be monitored for sign of damage in the future.

4. Roof Dunnage:

The existing steel roof dunnage supporting the roof top mechanical units for the addition are showing signs of rust and decay. This is especially evident for the isolation springs, where severe rusting was observed. The steel dunnage beams will have to be cleaned and repainted and the springs may have to be replaced in the near future.



Floor Structure

The floor construction at both the original building and the addition consists of a concrete slab on metal deck floor system supported by open web steel joists and steel beams.

The following conditions relating to the floor were observed:



1. Water Stains at Perimeter Wall:

We observed evidence of water infiltration in the cellar along the rear (east) wall of the addition. We found water stains and very minor rust at the ends of some of the open web steel floor joists and shelf angle. There was no critical damage observed at this time and no repair of the steel is needed. We recommend correcting the water infiltration problem and monitoring the structure for damage in the future.



Foundation

The building foundation consists of a standard spread footing foundation system with a concrete slab on grade floor system at the lower levels. Although inspection of the foundation with this type of structure is somewhat limited, we observed no obvious signs of problems with the buildings foundations.

The following conditions relating to the building foundation were observed:

1. Slab Settlement:

We observed a small hump in the floor at the rear of the original building where the addition was constructed. This is an indication that there may have been a small amount of settlement in the slab of the addition after it was constructed. This condition appears to be minor in nature as there is no other evidence of a settlement issue throughout the

building. This condition is not critical at this time, however, it should be monitored for future movement.

### Building Exterior

The exterior construction of the building consists of a metal stud backer with a brick veneer at both the original building and at the addition. The building exterior was in mostly good condition with the exception of the following items:

#### 1. Lintel Beams:

A few of the existing steel lintel beams in the original building are severely rusted and in need of immediate repair. Specifically, the beams occur at the southwest and southeast corners of the building and at the front entrance. At each location, water appears to be penetrating the brick and has rusted the bottom plate of the lintel. The rusting has become so severe that the plate has separated from the support beam above.

This condition must be repaired as soon as possible to avoid further damage to both the steel lintel and the masonry wall. Although the repair will vary depending on a full analysis of the condition, it will likely consist of removing a portion of the brick wall, cleaning the rust from the steel beam and plate and reconnecting the lintel plate. If the rust has begun to delaminate the steel, replacement of the plate may be necessary.



#### 2. Exposed Steel at Clearstory:

The exposed steel columns and lintels at the clearstory area of the original building are showing the beginning signs of rusting. We observed surface rust on both the

columns and lintel plate along the clearstory wall on both sides of the library. Although this condition is not critical at this time, the steel should be cleaned and painted in the near future to prevent further damage.



### 3. Lintels at Roof:

We observed a few loose lintels on the roof at the front (west side) of the original building that are rusted and in need of repair. These lintels occur in the masonry walls which extend above the roof and appear to have been installed to facilitate drainage of separate portions of the roof. Although the rusting varies in severity, it mostly appears to be surface rust and can be repaired by cleaning and repainting.



Please call me should you have any questions or require additional information.

Very truly yours,

TDM Consulting Engineer, P.C.

A handwritten signature in cursive script, appearing to read "T. Mirabile".

Thomas Mirabile, P.E.