

# WALTERS CHAMBERS

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May 24, 2002

Job number: 02-1410

Lister Industries Limited  
7410 - 68 Avenue  
Edmonton, AB T6B 0A1

## Attention: Mr. Don Rowland

Dear Sir:

### Re: Lister Industries Rig Mat Test Results

This report outlines the methods and results of preliminary testing of sections of the standard Lister rig mat under concentrated loads and the final large scale test of a standard Lister rig mat carrying uniform loading across a 16'-5" span.

The purpose of the preliminary tests was to verify the lateral load transfer capability of the timber infill to the perimeter steel beams. We also wanted to determine a load carrying capacity for short term loading given that, in our opinion, we could allow larger than normal building deflections for the mats when in use. Through discussions with the owner we determined that a deflection of 3 inches for the wood infill between the beams and a deflection of 3 inches between supports was acceptable.

### PRELIMINARY TESTING OF SECTIONS OF RIG MAT

#### Test Procedure

Small sections of Lister's standard rig mat were constructed and tested to check the ability of the mats to distribute a concentrated load from the timber to the edge steel wide flange beams. These smaller mats were 5'-0" long and 3'-9 1/2" wide. Each was constructed to represent a section of the larger, full size mat.

The first test specimen had a 3/4" rod passing through the timbers. The second test specimen had 1/4" thick by 6" wide flat bars placed across the joints in timbers, top and bottom. See sketches A and B.

The mats were placed in a test frame and a temporary load was induced with a hydraulic jack. The load was applied until the mat failed or until the hydraulic jack was at its load capacity. Then the load was removed and if the section of mat had not failed, the specimen was loaded a second time. The loads and deflections were measured in each test.

#### Test Results

The mat section with a 3/4" rod through the timbers was able to transfer 4000 pounds (lbs) to the steel beams with an accompanying deflection of 2 7/8" and a permanent deflection of 1 1/8" upon removal of the load.

The mat section with ¼" plates top and bottom was able to transfer 12000 lbs to the steel beams with an accompanying deflection of 2" and a permanent deflection of 5/8" upon removal of the load.

## LARGE SCALE TEST OF STANDARD RIG MAT UNDER UNIFORM LOAD

### Testing Procedure

A standard Lister mat (see sketch C) was placed on supports with 16'-5" clear between supports (See sketch D). Two levels of 8 pallets of concrete blocks (16 pallets in total) were placed on the mat. Each pallet had a mass of 3380 lbs. The mat was left loaded for 24 hours and then a third tier of blocks (another 4 pallets) was placed in the middle 8'-0" of the mat. The mat was then unloaded and checked for recovery. Deflections of the mat at mid-span were monitored for the edge and middle beams at all stages of loading.

### Test Results

The standard Lister mat held 410 pounds per square foot (psf) of load across a 16'-5" span over a 24 hour period with a maximum deflection at mid-span in the center beam of 2 ½" and a deflection of 2 inches on the edge beam. This was greater than the calculated yield capacity of the steel beams at 300 psf. We then increased the load in the central 8'-0" of mat for a temporary load of 615 psf and measured a maximum deflection at mid-span of 2 7/8" in the center beam and 2 5/16 in the edge beams. The steel beams and timber infill did not fail during the test. The measured deflections were greater than the calculated yield strain deflections for the beams. Upon removal of the load, the mat fully regained its shape shy of a 7/16" permanent mid-span deflection of the edge beam.

### CONCLUSIONS

Due to its design and construction, the Lister mat is a very stiff and strong product. The timber infill demonstrated adequate capacity to transfer temporary point loads to the perimeter steel beams. The standard mat was able to support in excess of 400 psf over a short term across a 16' 5" clear span.

It should be noted that the tested mat was chosen at random from Lister Industries' inventory storage yard and it had not been subjected to any loading or harsh environmental conditions that could affect its performance. The loading condition for the test could be best described as temporary.

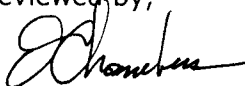
Yours truly,

WALTERS CHAMBERS & ASSOCIATES LTD.

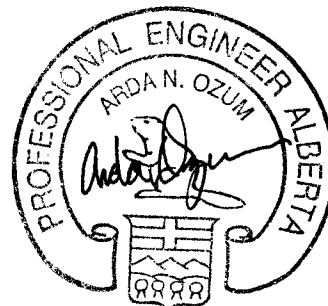


Arda Ozum, P.Eng.

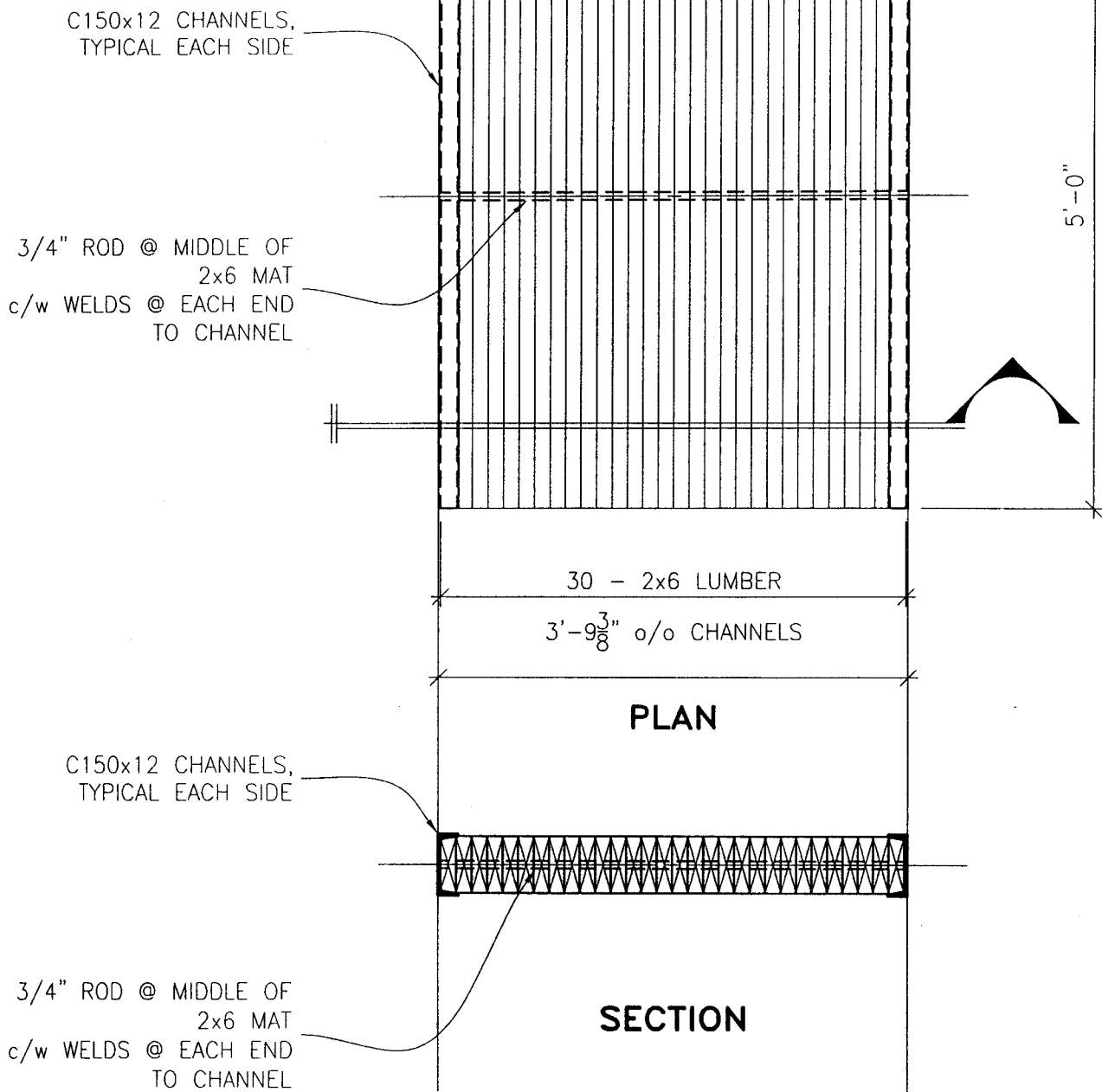
Reviewed by,



D.W. Chambers, P.Eng.



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**SKETCH A**

3/4" = 1'-0"

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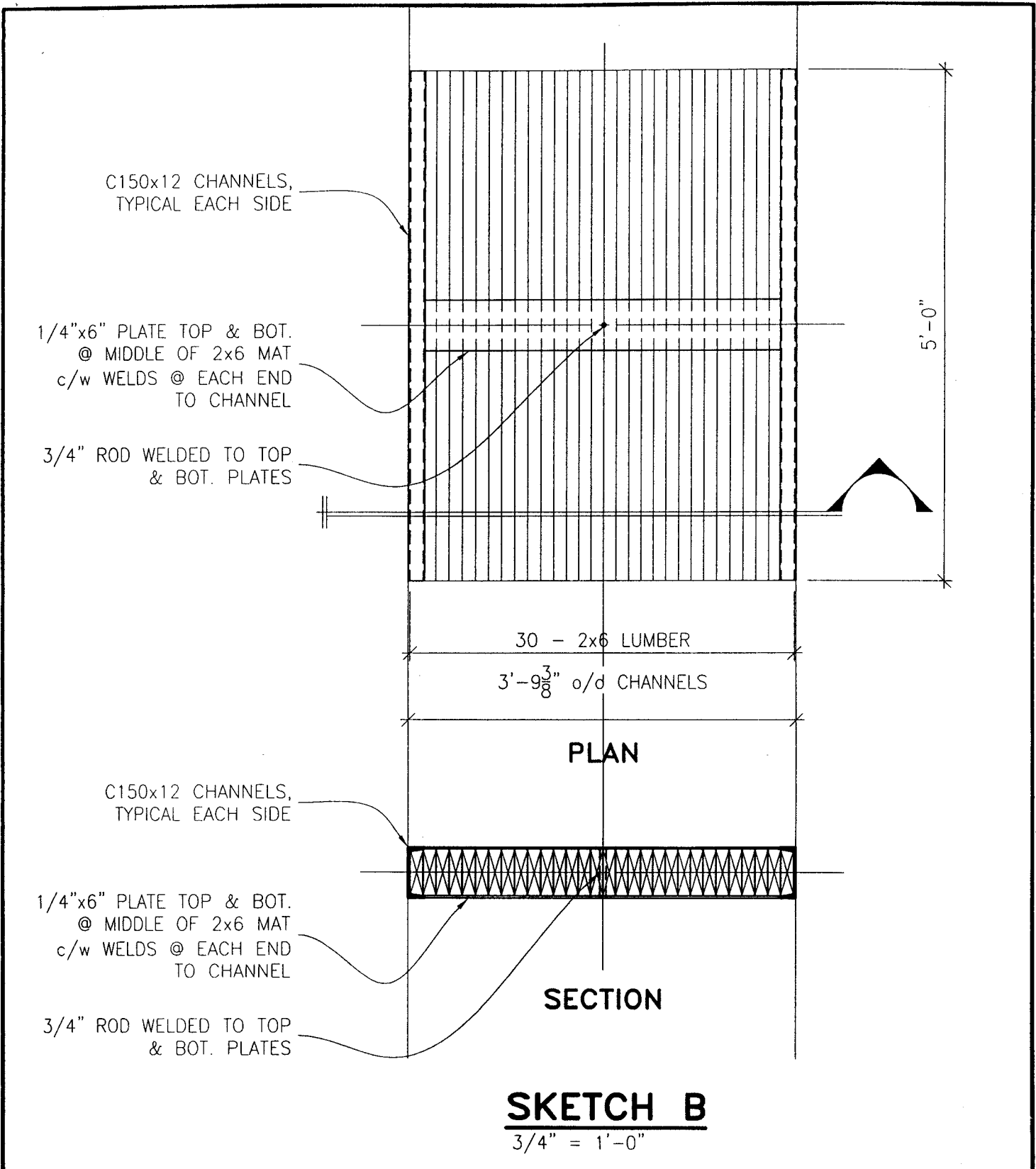
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SKETCH A

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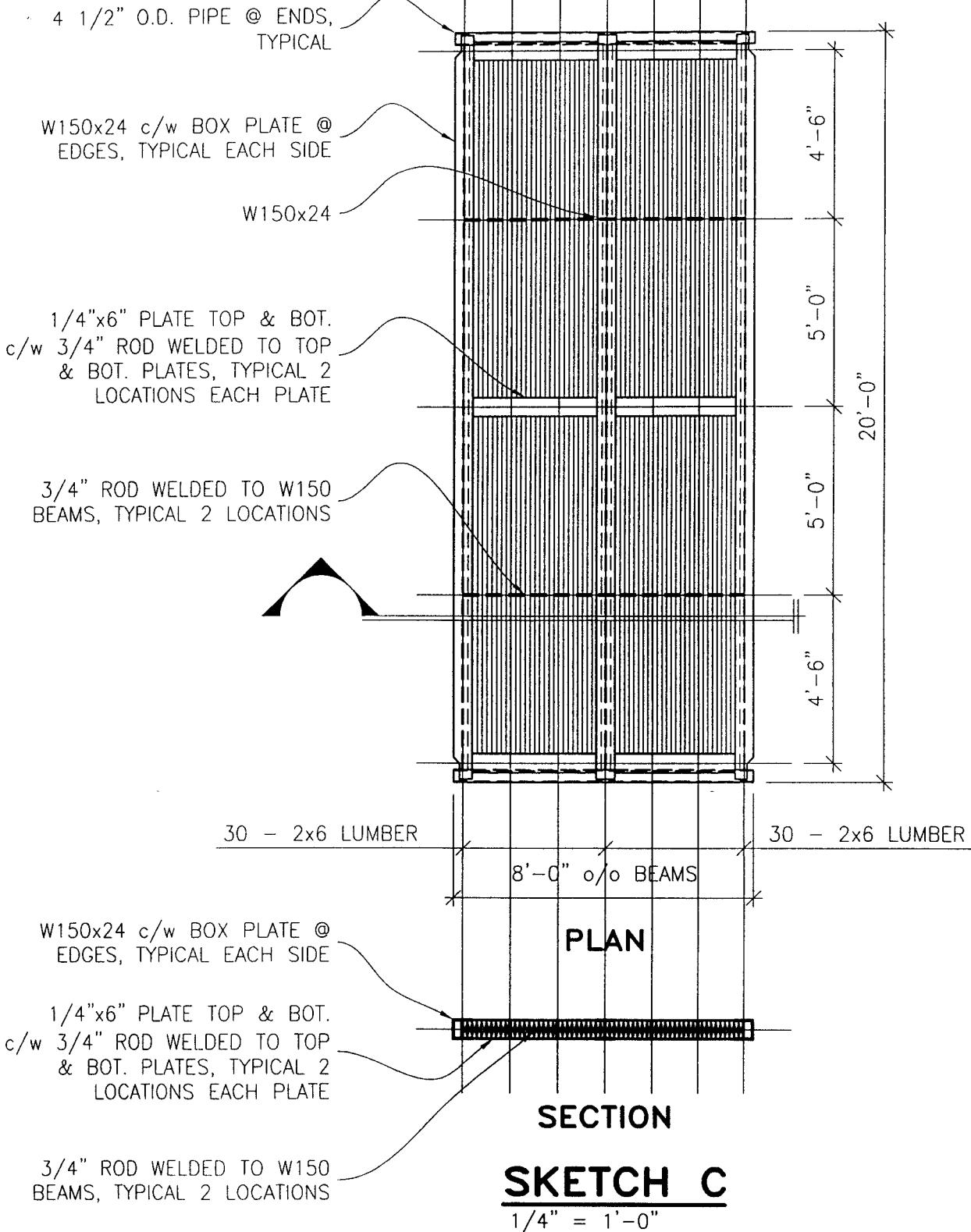
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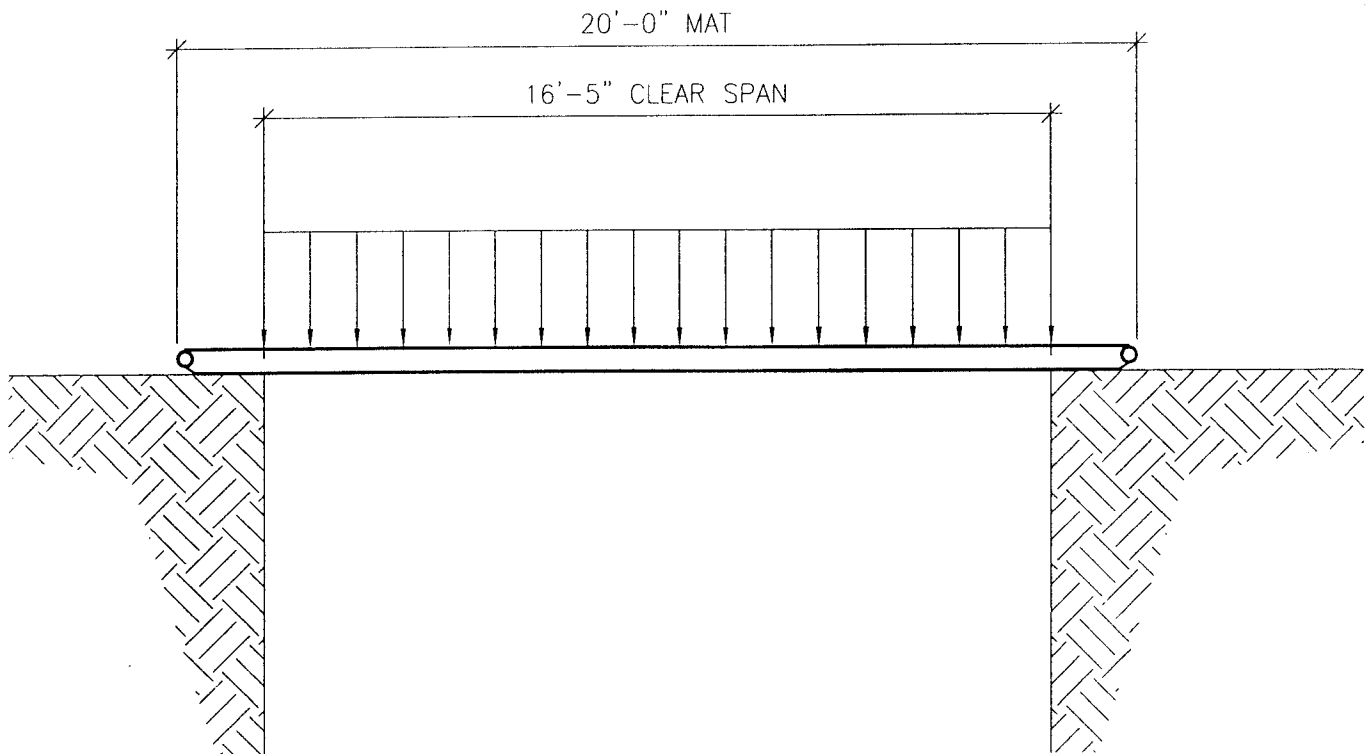
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**LISTER INDUSTRIES LTD.**  
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SKETCH C

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**SKETCH D**

1/4" = 1'-0"

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