

EVALUATION OF
HIGH MAST LUMINAIRE LOWERING DEVICES
IN OREGON

BY

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NOTICE

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INTRODUCTION

High mast luminaire lowering devices were installed on two projects in Oregon following approval by the Department of Transportation, Federal Highway Administration, of the installations as experimental features projects. Holophane Company, Inc., supplied 23 units that were installed on the Seventh Avenue - Willamette River Section of I-105 near Eugene in 1973. Valmont Industries, Inc., furnished 38 units that were installed on the South Tigard Interchange - East Portland Freeway Interchange section of I-5 south of Portland. The latter installations were made in 1976. Before these lowering devices were specified, high mast illumination was serviced by using a portable elevator. These fixed installations had several disadvantages. Principal among them was the reluctance of maintenance personnel to ride maintenance cars to the heights involved in servicing high mast lighting. Other disadvantages involved the difficulty of getting the elevator to the pole where access is not convenient and the potential hazard where the public has access to the pole and steps, cables and cabinets.

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PURPOSE: The purpose of this report is to summarize the performance of lowering devices for servicing high mast luminaires.

PROBLEM: Servicing the fixed lights on the previous high mast installations was hazardous and difficult. An alternative to the portable elevator that would allow the maintenance person to remain on the ground was needed.

SCOPE: This report briefly reviews the cost, effectiveness, reliability, and serviceability of the two types of high mast luminaire lowering devices.

LOCATION AND COSTS

The first installation of the mechanical lowering devices in Oregon was along the Seventh Avenue - Willamette River section of the Eugene - Springfield Highway, I-105, in Lane County. The installations were at the "Q" Street - Willagillespie Interchange and approaches as well as between this interchange and the Ferry Street Interchange. The Holophane Company, Inc., provided 22 units at an installed cost of \$2,703 each. One additional unit was installed under a change order at a similar cost. Pole heights on the project ranged from 100 to 150 feet.

The other experimental features project was along the South Tigard Interchange - East Portland Freeway Interchange section of the Baldock Freeway, I-5, in Washington and Clackamas counties. The project included 38 luminaire lowering devices furnished by Valmont Industries, Inc., at a cost of \$2,632 each, installed. Mast heights were in the same range as those on the earlier project.

EUGENE AREA INSTALLATION

Inspection reports were prepared on the 23 Holophane high mast luminaire lowering devices in 1974, 1975, and 1976. Figure 1 is an example of that report form. Only two difficulties were noted, and they both occurred in 1974. The latches on one of the devices failed to lock on the first attempt and those on another pole were difficult to unlatch. Additional experience showed that it is necessary to raise the device very solidly to the top of the tower to engage all the latches. This also eliminates any difficulties with unlatching the device the next time. Bright sunshine causes a significant bowing in the tall poles which makes the latching and unlatching more difficult.

The extension on the portable power unit used to operate the winch broke once and was replaced with a fail-safe unit. No further difficulties were reported. On the taller masts with a large diameter base, an adapter is added to the drive shaft of the portable tower unit in order to reach the winch.

More recently, it has been found that the split pin that connects the drive gear to the winch can work out, allowing the drive to spin. These pins are now replaced as necessary with a bolt and nut.

The luminaires are serviced approximately once a year. Observations made during this servicing have not detected any deterioration of the lowering devices since being installed.

SOUTH TIGARD AREA INSTALLATION

Inspection reports were not prepared for the 38 Valmont devices installed in 1976 on the South Tigard Interchange - East Portland Freeway Interchange section of I-5. However, oral reports from maintenance personnel indicate that these devices have performed satisfactorily, with one exception. During, or soon after installation, one winching device failed which allowed a ring of luminaires to crash to the ground. The manufacturer made corrections on the winches of all 38 units and there have been no further difficulties.

In explaining the failure, a workman for the contractor said as he was attempting to raise the luminaires the key on the winch shaft became stuck at the "A" frame. In order to loosen the key, the worker started the motor in reverse for a short time. As the luminaire ring began to lower, the winch began to spin on the shaft at a very fast rate. When the worker heard the wire rope singing he ran from the falling luminaire.

As the luminaire was accelerating downward, the safety latch caught. This happened approximately 35 feet from the top and 65 feet from the bottom. This sudden stop caused the winch cable to fail, allowing the luminaire ring to fall to the ground.

Following this failure, a remote cable control was provided for operating the power unit so the operator does not have to stand under the luminaire ring while it is being lowered or raised.

~~Two other problems were mentioned, neither of which was directly~~ related to the lowering device itself. The drill motor on the power unit is apparently undersized and burns out sometimes. In one instance, an electrical conductor wire broke inside the insulation. The insulation seemed intact and the defect was apparently not involved with the lowering device.

CONCLUSION

Both the Holophane and the Valmont high mast luminaire lowering devices have worked well. They make luminaire replacement easier, safer, and more efficient. If further high mast illumination installations of this type are specified for Oregon State Highway Division projects, either one of these devices would be acceptable.

INSPECTION REPORT
High Mast Lowering Device

LOCATION #2, "L" Station 90+75, 130' left DATE 7/1/74

SECTION 7th Ave. Willamette River HIGHWAY Eugene-Springfield

PREFIX 620-4475-177 COUNTY Lane TOWER HEIGHT 140' TEMP 70 F

WEATHER Heavy overcast WIND VELOCITY

1. OPERATION: RAISE SMOOTH LOWER SMOOTH
ERRATIC _____ ERRATIC _____

IF ERRATIC, EXPLAIN _____

2. NO. OF ATTEMPTS: TO ACHIEVE POSITIVE LATCH 1 NECESSARY TO UNLATCH 1

IF MORE THAN ONE, EXPLAIN _____

3. HAS UNIT BEEN REPAIRED: YES _____ NO IF YES, NATURE OF REPAIR _____

WHEN REPAIRED? _____ COST OF REPAIR _____

4. DRIVE UNIT: EASE OF ATTACHMENT O.K.

IF PROBLEMS, EXPLAIN: Use adapter for larger pole.

EASE OF ALIGNMENT BETWEEN DRIVE SHAFT AND WINCH: O.K. IF PROBLEMS, EXPLAIN _____

5. REMARKS OR ADDITIONAL PROBLEMS ENCOUNTERED _____

SIGNATURE Amos J. Oberman

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FIGURE 1