

US FOODSERVICE

Issue: Mounting height for visual fire alarms.

Analysis: The applicant is requesting a waiver from installing visual fire alarms a maximum of 80 inches above the finish floor or 6 inches below the ceiling, whichever is lower. The project is a food distribution center with a 246,628 square foot warehouse containing both dry and refrigerated storage areas. Employees use forklifts to move supplies from one area to the next and frequently damage or destroy the alarms when mounted at the specified height. The applicant wishes to relocate the alarms to the higher height specified in NFPA 72-2002 Table 7.5.4.1.1(b), (See attached.) which would permit the alarms to be mounted up to 30 feet from finish floor. The new ADAAG Standards for Accessible Design does not specify a mounting height, but refers to NFPA 72 for specifications.

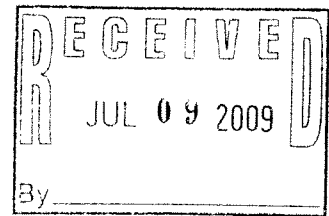
Project Progress: This project is being built in phases, which is currently in plan review.

Items to Be Waived:

Mounting height for visual alarms, as required by Section 11-4.28.3(6).

11-4.28.3(6) The appliance shall be placed 80 inches above the highest floor level within the space of 6 inches below the ceiling, whichever is lower.

Waiver Criteria: There is no specific guidance for a waiver of this requirement in the code. The Commission's current rule, authorized in Section 553.512, Florida Statutes, provides criteria for granting waivers and allows consideration of unnecessary or extreme hardship to the applicant if the specific requirements were imposed.



**REQUEST FOR WAIVER FROM ACCESSIBILITY REQUIREMENTS
OF CHAPTER 553, PART V, FLORIDA STATUTES**

Your application will be reviewed by the Accessibility Advisory Council and its recommendations will be presented to the Florida Building Commission. You will have the opportunity to answer questions and/or make a short presentation, not to exceed 15 minutes, at each meeting. The Commission will consider all information presented and the Council's recommendation before voting on the waiver request.

1. Name and address of project for which the waiver is requested.

Name: US Foodservice – South Florida Division

Address: 7598 N.W. 6th Avenue
Boca Raton, FL 33487

2. Name of Applicant. If other than the owner, please indicate relationship of applicant to owner and written authorization by owner in space provided:

Applicant's Name: Timothy P. Gibbons – ESI Architectural & Engineering Services Inc.

Applicant's Address: 950 Walnut Ridge Drive, Hartland, WI 53029

Applicant's Telephone: (262) 369-3543 **FAX:** (262) 369-3592

Applicant's E-mail Address: tgibbons@esigroupusa.com

Relationship to Owner: Architect of Record

Owner's Name: USF PROPCO I, LLC

Owner's Address: 9939 Higgins Road - Suite 500 - Rosemont, IL

Owner's Telephone: (847) 720-8051 **FAX** (847) 720-8099

Owner's E-mail Address: sandy.raine@usfood.com

Signature of Owner: *Sandy Raine*, V.P. - Corp. Real Estate, U.S. Foodservice, Inc.
SOLE MANAGING MEMBER, USF PROPCO I, LLC

Contact Person: Jason Weber - Senior Project Designer

Contact Person's Telephone: (262) 369-3547 **E-mail Address:** jweber@esigroupusa.com

3. **Please check one of the following:**

- New construction.
- Addition to a building or facility.
- Alteration to an existing building or facility.
- Historical preservation (addition).
- Historical preservation (alteration).

4. **Type of facility.** Please describe the building (square footage, number of floors). Define the use of the building (i.e., restaurant, office, retail, recreation, hotel/motel, etc.)

The facility consists of 246,628 SF of one story Warehouse (dry and refrigerated); 28,056 SF of one story Administrative Offices; 10,433 SF of one story w/mezzanine Operations Offices and 10,378 SF of Accessory Buildings. In addition, a phase 2 addition is currently in design to add 57,216 SF of one story Warehouse (dry and refrigerated). The total current project area is 295,495 SF and after the proposed phase 2 addition the project area will be 352,711 SF. This facility is used as a regional food distribution center.

5. **Project Construction Cost (Provide cost for new construction, the addition or the alteration):**

Approximate Project Construction cost for the current project is \$25 Million and the approximate Project Construction Cost for the proposed phase 2 addition is \$5 Million.

6. **Project Status:** Please check the phase of construction that best describes your project at the time of this application. Describe status.

- Under Design Under Construction*
- In Plan Review Completed*

* Briefly explain why the request has now been referred to the Commission.

During the City of Boca Raton's Building Department plan review, a comment was identified by the Fire Department reviewer regarding placement of fire alarm visual strobes. The City has indicated that it cannot grant a waiver and that we need to apply to the State of Florida for a determination of the waiver issue in question. We are requesting a waiver as explained in items 7 and 8, below.

7. **Requirements requested to be waived.** Please reference the applicable section of Florida law. Only Florida-specific accessibility requirements may be waived.

Issue

1: FBC 11-4.28.3 Visual Alarms (6). The appliance shall be placed 80" above highest floor level within the space or 6" below ceiling, whichever is lower.

2: _____

3: _____

8. **Reason(s) for Waiver Request:** The Florida Building Commission may grant waivers of Florida-specific accessibility requirements upon a determination of unnecessary, unreasonable or extreme hardship. Please describe how this project meets the following hardship criteria. Explain all that would apply for consideration of granting the waiver.

The hardship is caused by a condition or set of conditions affecting the owner which does not affect owners in general.

Due to the nature of forklift truck traffic within the warehouse aisles and the movement of palletized products in and out of the racking system, compliance with the above referenced code section will result in continual repair or replacement of damaged fire alarm strobes (see attached photographs) or a less than fully functioning fire alarm strobe system in the existing warehouse and the current and proposed warehouse additions. We are requesting a waiver to the 80" mounting height that would allow the fire alarm strobes to be mounted at the bottom of roof joists within aisles using equivalent facilitation to significantly minimize possible damage to fire alarm strobes.

Substantial financial costs will be incurred by the owner if the waiver is denied.

The owner has made a **diligent investigation** into the costs of compliance with the code, but cannot find an efficient mode of compliance. Provide detailed cost estimates and, where appropriate, photographs. Cost estimates must include bids and quotes.

9. **Provide documented cost estimates for each portion of the waiver request and identify**

any additional supporting data which may affect the cost estimates. For example, for vertical accessibility, the lowest documented cost of an elevator, ramp, lift or other method of providing vertical accessibility should be provided, documented by quotations or bids from at least two vendors or contractors.

Cost is not a determining factor in asking for this waiver. We are only looking to provide a reliable fire alarm system that will be less likely to be damaged by the daily operations of the forklift trucks and the palletized product they are moving in and out of the racking system.

10. **Licensed Design Professional:** Where a licensed design professional has designed the project, his or her comments **MUST** be included and certified by signature and affixing of his or her professional seal. The comments must include the reason(s) why the waiver is necessary.

This waiver is being requested to avoid the inevitable collision damage to the visual notification devices (fire alarm strobes) that has and will occur when mounting these devices at 80" above the floor within the storage rack aisles as required by FBC 11-4.28.3 Visual Alarms (6). We have attached six (6) photographs to this request depicting typical damage inflicted on these devices when mounted to the storage rack.

The intent of our design is to mount the visual notification devices (fire alarm strobes) to the bottom of the roof joists within the traffic aisles of the racked warehouse. Mounting heights will vary with the slope of the roof from 32' to 35' above the floor. The design is based on the requirements of NFPA 72 - 2002 as referenced in the Florida Building Code.

Referencing instead NFPA Section 7.5.4.3, Performance-Based Alternative, we have applied the allowed performance based design criteria to determine adequate quantity and spacing of visual devices to meet or exceed the required minimum light intensity at floor level.

The attached two (2) diagrams (Details FA-2 & FA-3) with explanatory notes document the calculations made to assure compliance. The diagrams and notes provide calculations for the minimum and maximum mounting heights. Intent is to show that either extreme and therefore at any height in between at the maximum spacing shown the required strobe coverage will be met within the warehouse aisle spaces. The attached partial floor plan (Sheet FA-1) depicts typical warehouse aisles, racking and visual notification device location.

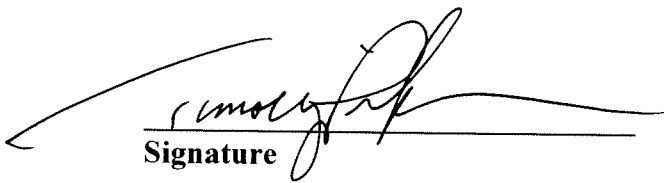
Furthermore the commentary in the NFPA 72 Fire Alarm Code Annex A (A.7.5.3) addresses this very situation:

The appliance and application requirements are based on extensive research. However, the research was limited to typical residential and commercial applications such as school classrooms, offices, hallways, and hotel rooms. While these specific appliances and applications will likely work in other spaces, their use might not be the most effective solution and might not be as reliable as other visible notification methods.

For example, in large warehouse spaces and large distribution spaces such as super stores, it is possible to provide visible signaling using the appliances and applications of this chapter. However, mounting strobe lights at a height of 2.0m (80 in.) to 2.4m (96 in.) along aisles with rack storage subjects the lights to frequent mechanical damage by forklift trucks and stock. Also, the number of appliances required would be very high. It might be possible to use other appliances and applications not specifically addressed by this chapter at this time. Alternative applications must be carefully engineered for reliability and function and would require permission of the authority having jurisdiction.'

In our professional opinion providing fire alarm strobes mounted at the bottom of roof joists using equivalent facilitation as an alternative to the code required fire alarm strobes mounted at 80" above floor within the racking system, provides a fire alarm system less likely to become damaged and inoperable.

In all other areas of the project not subject to forklift traffic, the fire alarm strobes will be wall mounted per FBC 11-4.28.3(6).



Signature

Timothy P. Gibbons
Printed Name

Phone number: (262) 369-3543

(SEAL)

REVIEW AND RECOMMENDATION BY LOCAL BUILDING DEPARTMENT.

Please state why the issue is being referred to the Florida Building Commission as well as a recommendation for disposition. The Building Official or his or her designee should review the application and indicate that to the best of his or her knowledge, all information stipulated herein is true and accurate. Further, if this project is complete, explain why it is being referred to the Commission. The Building Official or his or her designee should sign a copy of the plans accompanying this application as certification that such plans are the same as those submitted for building department review. Please reference the applicable section of the Accessibility Code.

- a. FBC 907.9.3 and 11-4.28.3 require visual alarms be placed 80" above floor
- b. Strict compliance with these codes causes frequent device damage when moving
- c. product with a forklift in the warehouse rack system.

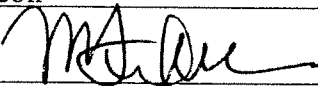
Has there been any permitted construction activity on this building during the past three years? If so, what was the cost of construction?

[X] Yes [] No Cost of Construction \$25 million current project, \$5 proposed expansion

Comments/Recommendation FBC 907.9.3 and 11-4.28.3 are Florida specific
accessibility codes. All other FBC 907 and NFPA 72 requirements are met
with ceiling mounted devices.

Jurisdiction City of Boca Raton

Building Official or Designee



Signature

Michael Fichera

Printed Name

BU 775

Certification Number

561-393-7894

Telephone/FAX

Address: 201 W. Palmetto Park Rd.
Boca Raton, FL 33432

Table 7.5.4.1.1(a) Room Spacing for Wall-Mounted Visible Appliances

Maximum Room Size		Minimum Required Light Output (Effective Intensity, cd)		
		One Light per Room	Two Lights per Room (Located on Opposite Walls)	Four Lights per Room (One Light per Wall)
m	ft			
6.10 × 6.10	20 × 20	15	NA	NA
8.53 × 8.53	28 × 28	30	Unknown	Unknown
9.14 × 9.14	30 × 30	34	15	NA
12.2 × 12.2	40 × 40	60	30	15
13.7 × 13.7	45 × 45	75	Unknown	Unknown
15.2 × 15.2	50 × 50	94	60	30
16.5 × 16.5	54 × 54	110	Unknown	Unknown
18.3 × 18.3	60 × 60	135	95	30
21.3 × 21.3	70 × 70	184	95	60
24.4 × 24.4	80 × 80	240	135	60
27.4 × 27.4	90 × 90	304	185	95
30.5 × 30.5	100 × 100	375	240	95
33.5 × 33.5	110 × 110	455	240	135
36.6 × 36.6	120 × 120	540	305	135
39.6 × 39.6	130 × 130	635	375	185

NA = Not allowable.

Table 7.5.4.1.1(b) Room Spacing for Ceiling-Mounted Visible Appliances

Maximum Room Size		Maximum Ceiling Height		Minimum Required Light Output (Effective Intensity); One Light (cd)
m	ft	m	ft	
6.1 × 6.1	20 × 20	3.05	10	15
9.14 × 9.14	30 × 30	3.05	10	30
12.2 × 12.2	40 × 40	3.05	10	60
15.2 × 15.2	50 × 50	3.05	10	95
6.1 × 6.1	20 × 20	6.1	20	30
9.14 × 9.14	30 × 30	6.1	20	45
12.2 × 12.2	40 × 40	6.1	20	80
15.2 × 15.2	50 × 50	6.1	20	115
6.1 × 6.1	20 × 20	9.14	30	55
9.14 × 9.14	30 × 30	9.14	30	75
12.2 × 12.2	40 × 40	9.14	30	115
15.2 × 15.2	50 × 50	9.14	30	150

7.5.4.1.3 Room spacing in accordance with Table 7.5.4.1.1(a) and Figure 7.5.4.1.1 for wall-mounted appliances shall be based on locating the visible notification appliance at the halfway distance of the wall.

7.5.4.1.4 In square rooms with appliances not centered or nonsquare rooms, the effective intensity (cd) from one visible wall-mounted notification appliance shall be determined by maximum room size dimensions obtained either by measuring the distance to the farthest wall or by doubling the distance to the farthest adjacent wall, whichever is greater, as required by Table 7.5.4.1.1(a) and Figure 7.5.4.1.1.

7.5.4.1.5 If a room configuration is not square, the square room size that allows the entire room to be encompassed or allows the room to be subdivided into multiple squares shall be used.

7.5.4.1.6* If ceiling heights exceed 9.14 m (30 ft), ceiling-mounted visible notification appliances shall be suspended at or

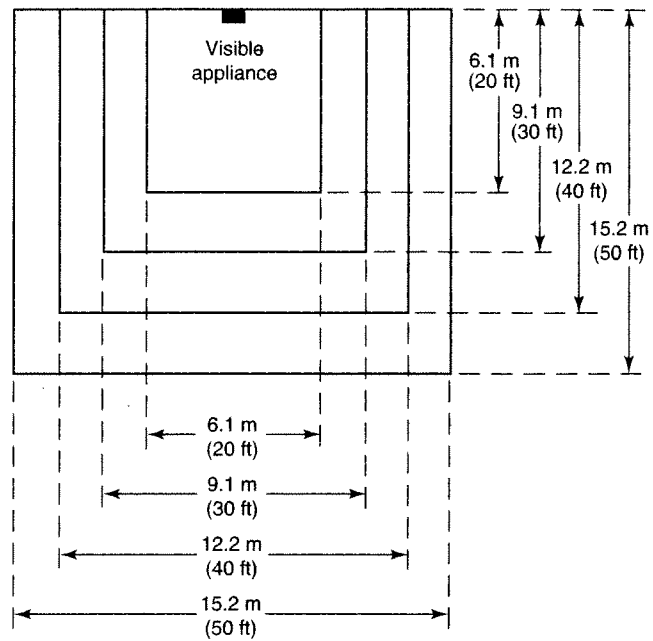


FIGURE 7.5.4.1.1 Room Spacing for Wall-Mounted Visible Appliances.

below 9.14 m (30 ft) or wall-mounted visible notification appliance shall be installed in accordance with Table 7.5.4.1.1(a).

7.5.4.1.7 Table 7.5.4.1.1(b) shall be used if the ceiling-mounted visible notification appliance is at the center of the room. If the ceiling-mounted visible notification appliance is not located at the center of the room, the effective intensity (cd) shall be determined by doubling the distance from the appliance to the farthest wall to obtain the maximum room size.

7.5.4.2* Spacing in Corridors.

7.5.4.2.1 Subsection 7.5.4.2 shall apply to corridors not exceeding 6.1 m (20 ft) in width.

7.5.4.2.2 In a corridor application, visible appliances shall be rated not less than 15 cd.

7.5.4.2.3 Corridors greater than 6.1 m (20 ft) wide shall comply with the spacing requirements for rooms in accordance with 7.5.4.1.

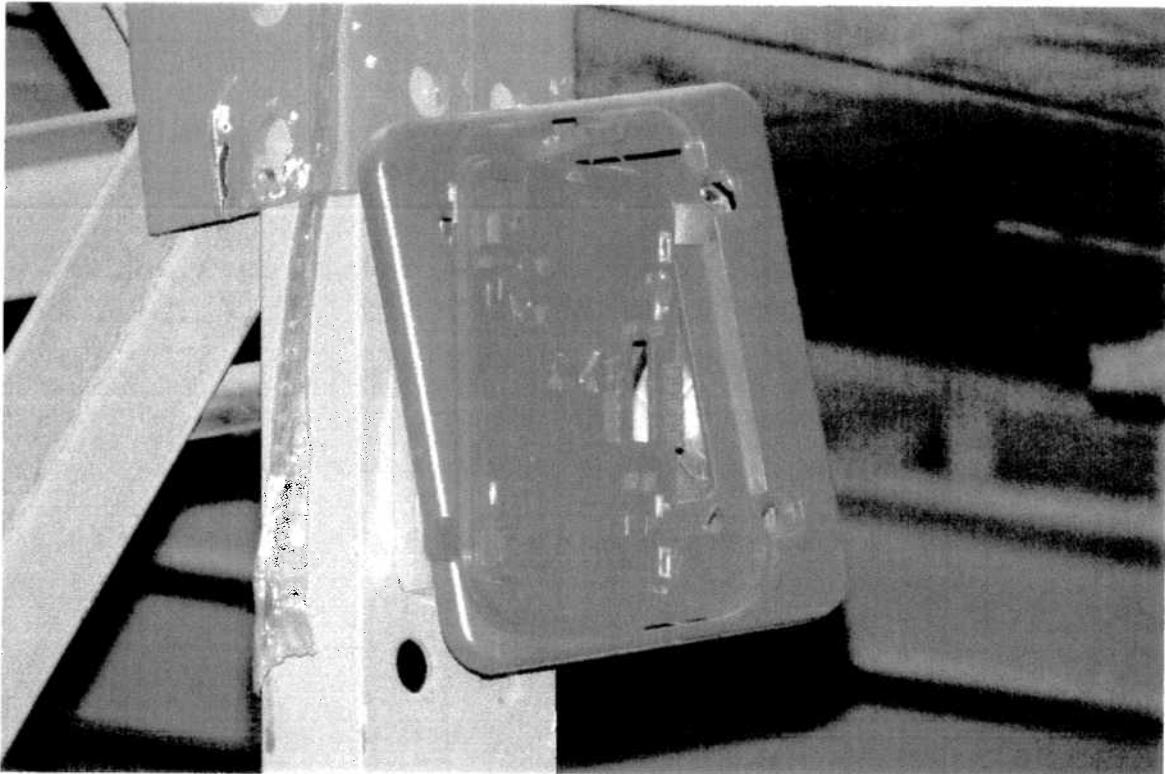
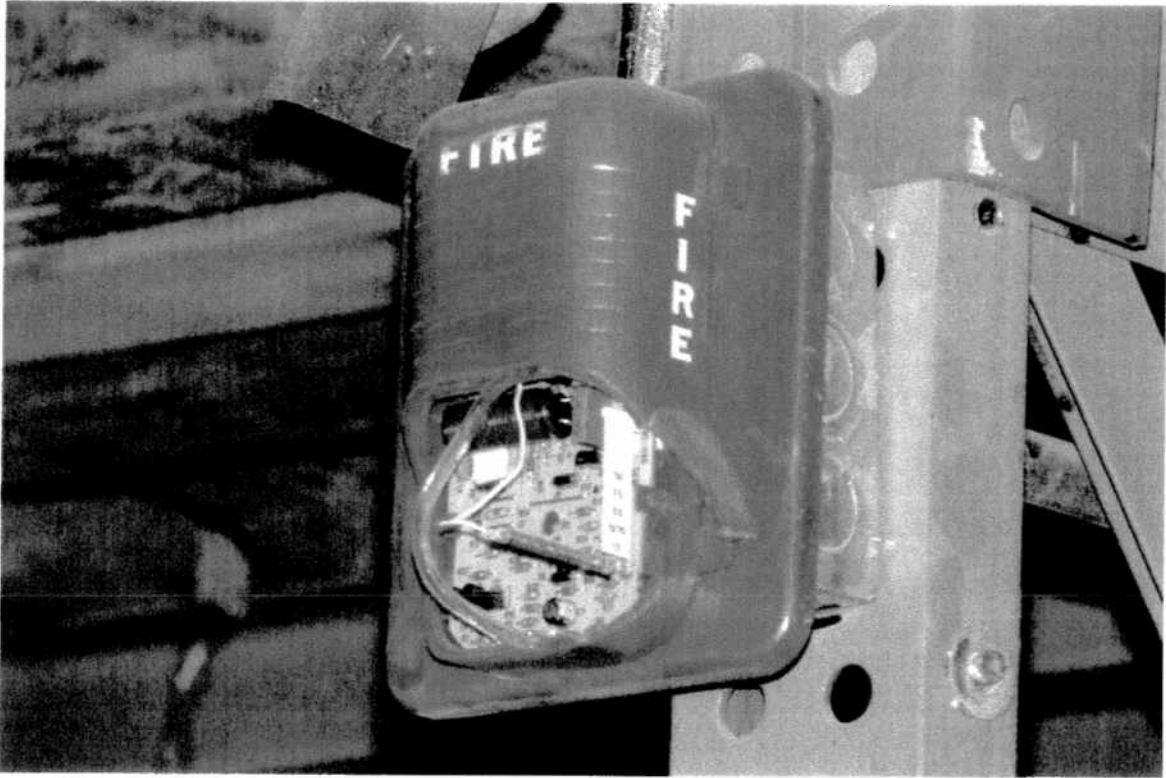
7.5.4.2.4 The installation of visible notification appliances in corridors 6.1 m (20 ft) or less in width shall be in accordance with the requirements of either 7.5.4.1 or 7.5.4.2.

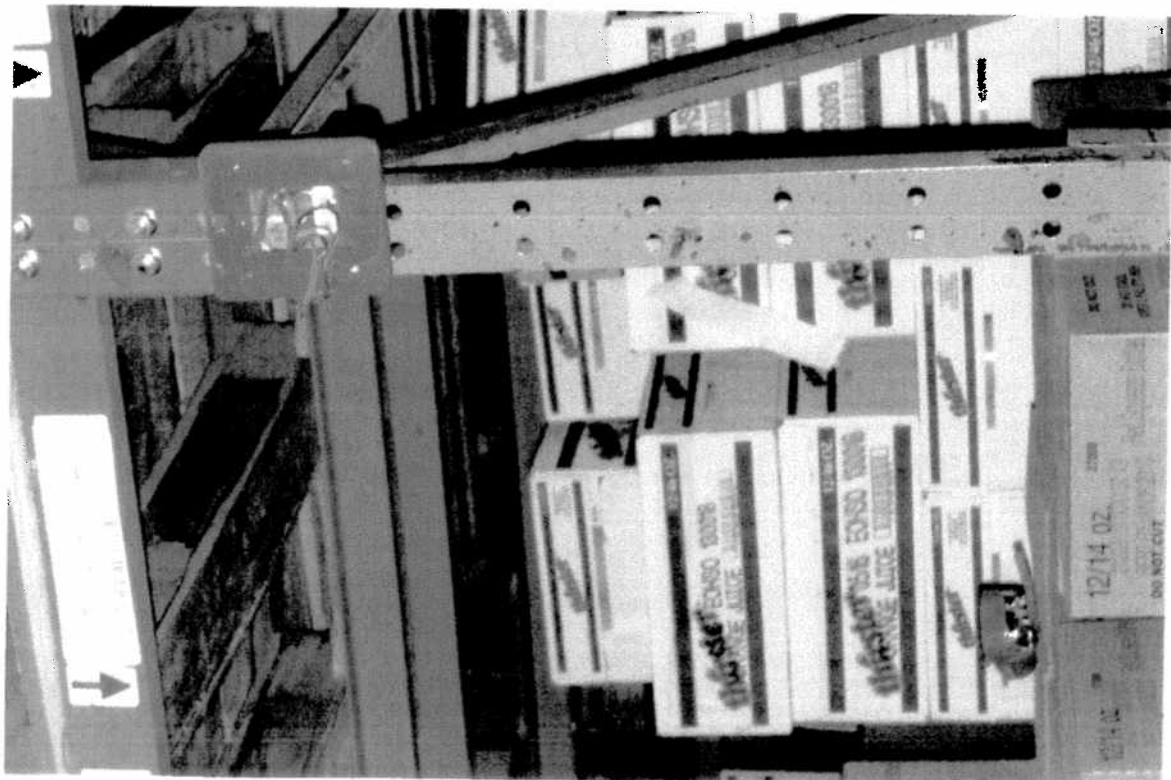
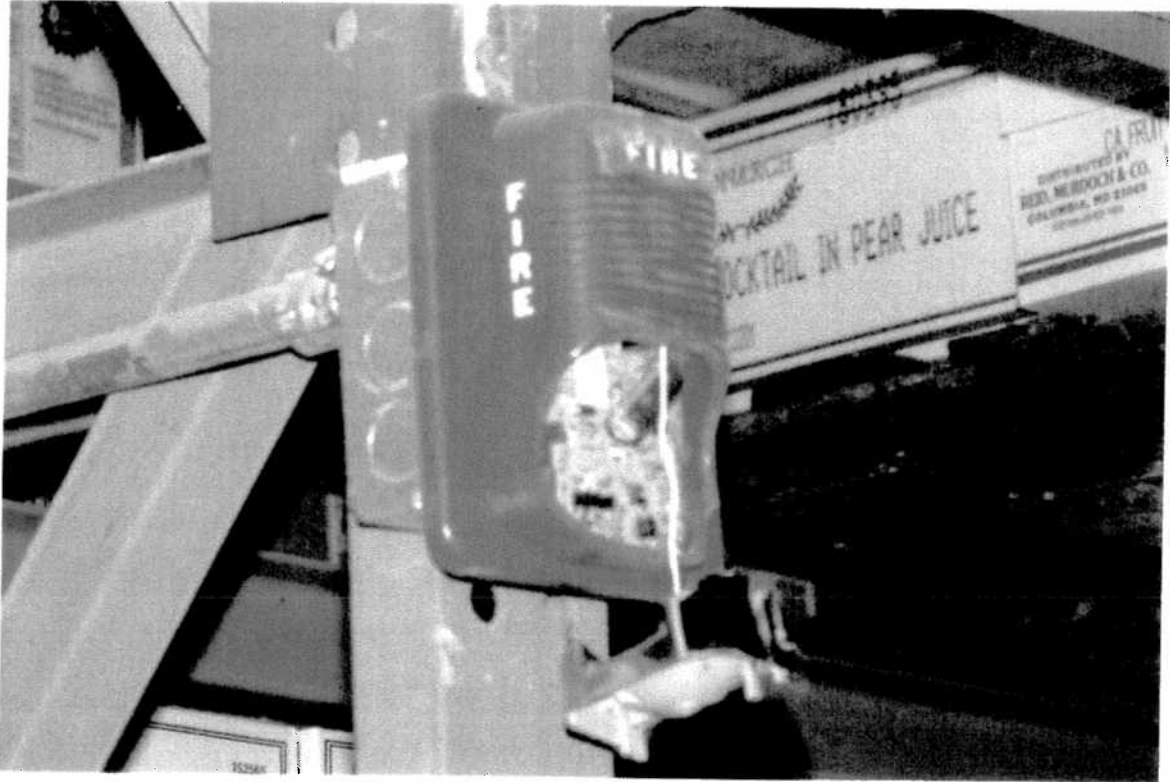
7.5.4.2.5* Visible notification appliances shall be located not more than 4.57 m (15 ft) from the end of the corridor with a separation not greater than 30.4 m (100 ft) between appliances.

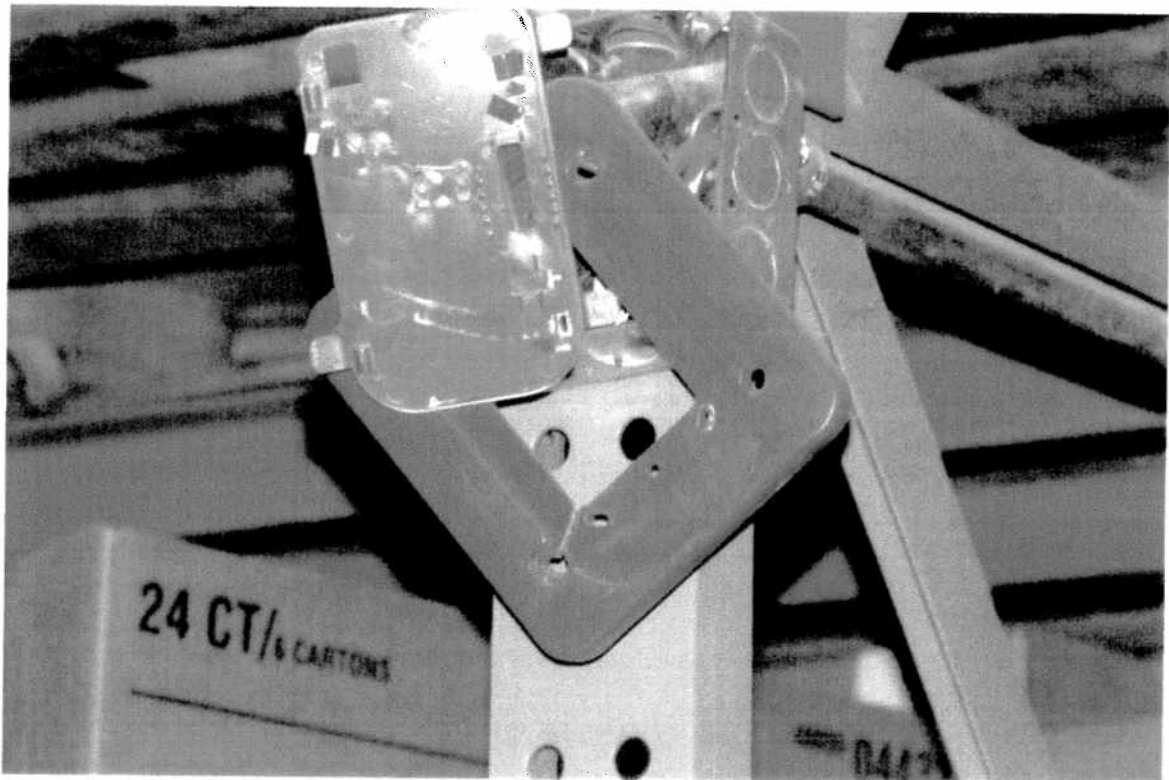
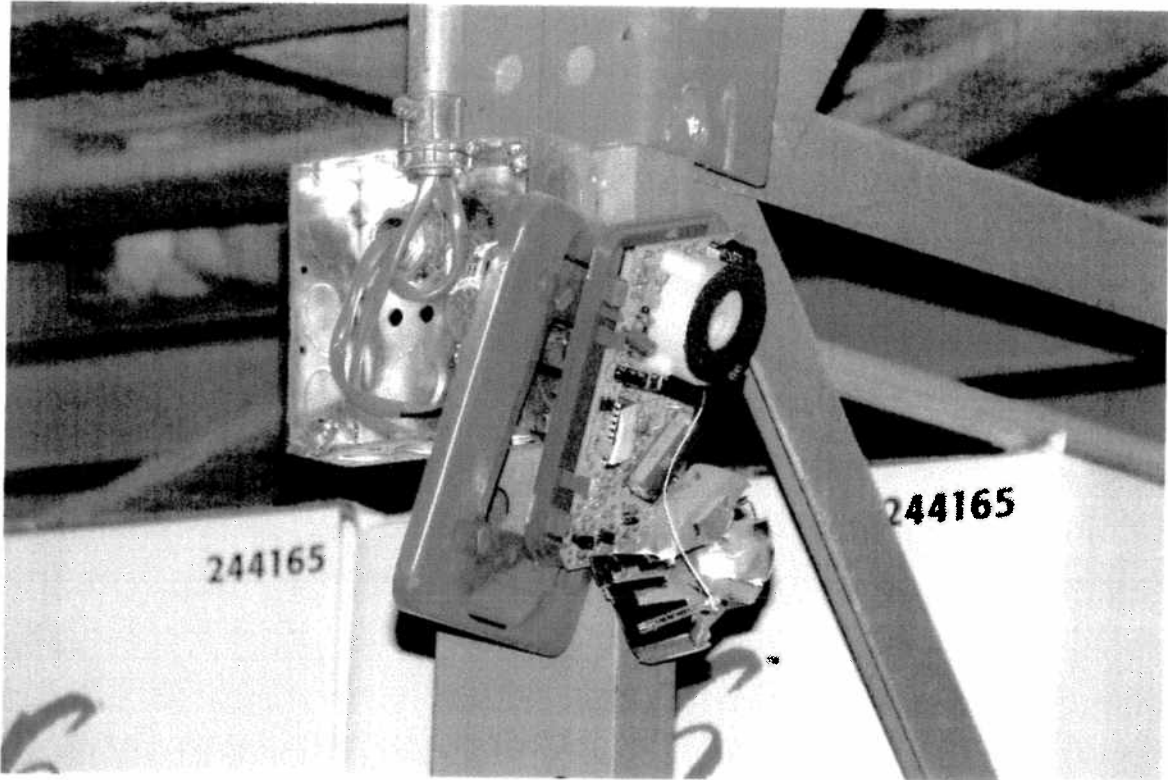
7.5.4.2.6 If there is an interruption of the concentrated viewing path, such as a fire door, an elevation change, or any other obstruction, the area shall be treated as a separate corridor.

7.5.4.2.7 In corridors where more than two visible notification appliances are in any field of view, they shall flash in synchronization.

7.5.4.2.8 Wall-mounted visible notification appliances in corridors shall be permitted to be mounted on either the end wall







**CALCULATED DATA FROM SYSTEM SENSOR
EQUIVALENT FACILITATION PROGRAM**

NOTE: This calculator uses data provided by the user to perform the calculations described in Chapter 7 of the 2002 edition of NFPA 72, which permits the use of a performance-based alternative in lieu of tables for spacing ceiling mounted audible/visible devices. The user must utilize either Table 7.5.4.1.1(b) Room Spacing Table for Ceiling-Mounted Visible Appliances or the performance-based alternative to determine the required light output, not both.

Square Room Size: Up to 200' x 200'
Ceiling Height: 32'
Candela: 150
Inscribed Circle
Radius: 100'

Inscribed Equivalent Facilitation			
Angle	UL Required	Distance	Lumens/ft ²
0	150	32	0.1455
5	155	32.12	0.1308
10	135	32.49	0.1279
15	135	33.13	0.123
20	135	34.06	0.1164
25	135	35.31	0.1083
30	112.5	36.95	0.0824
35	112.5	39.06	0.0737
40	112.5	41.77	0.0645
45	112.5	45.25	0.0549
50	82.5	49.78	0.0433
55	67.5	55.79	0.0317
60	60	64	0.0246
65	52.5	75.72	0.0182
70	52.5	83.58	0.0136
75	45	103.53	0.0092
80	45	101.54	0.0084
85	37.5	100.38	0.0087
90	37.5	100	0.0096

- ASSUMPTIONS:
1. Minimum calculated illumination requirement of 0.0375 lm/ft².
 2. Square rooms with ceiling mounted strobes in the center of the ceiling.
 3. Illumination is calculated for two perpendicular planes with brightest profile.

CALCULATION OF SPACING LIMITS VS. MOUNTING HEIGHT

1. CALCULATION OF INSCRIBED COVERAGE FOR A SINGLE 150cd STROBE:

1.1. REQUIRED MINIMUM INCIDENT LUMENS/FT² IS 0.0375. FROM TABLE OF CALCULATED VALUES 0.0549 LUMFT² AT AN ANGLE OF 45 DEG IS CLOSEST VALUE ABOVE MINIMUM.

1.2. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE TO A POINT FROM THE CALCULATION TABLE:

HOR. DISTANCE = INCIDENT DISTANCE * SIN(ANGLE)
AT 0.0549 LUMENS/FT² INCIDENT DISTANCE IS 45.25' AT AN ANGLE OF 45 DEG
HOR. DISTANCE = 45.25 * SIN(45) = 32.0'

2. CALCULATION OF INSCRIBED COVERAGE FOR TWO 150cd STROBES IN A WAREHOUSE AISLE:

2.1. TO ACHIEVE THE MINIMUM REQUIRED ILLUMINATION OF 0.0375 LUMFT² ON THE FLOOR FROM TWO ADJACENT STROBES THE MINIMUM OVERLAPPING LIGHT OUTPUT FROM EACH STROBE IS

$0.0375 / 2 = 0.01875 \text{ LUMENS/FT}^2$

2.2. FROM THE TABLE OF CALCULATIONS AT AN ANGLE OF 55 DEG, THE LIGHT OUTPUT OF 0.0217 EXCEEDS THE REQUIRED 0.01875 LUMENS/FT² PER STROBE

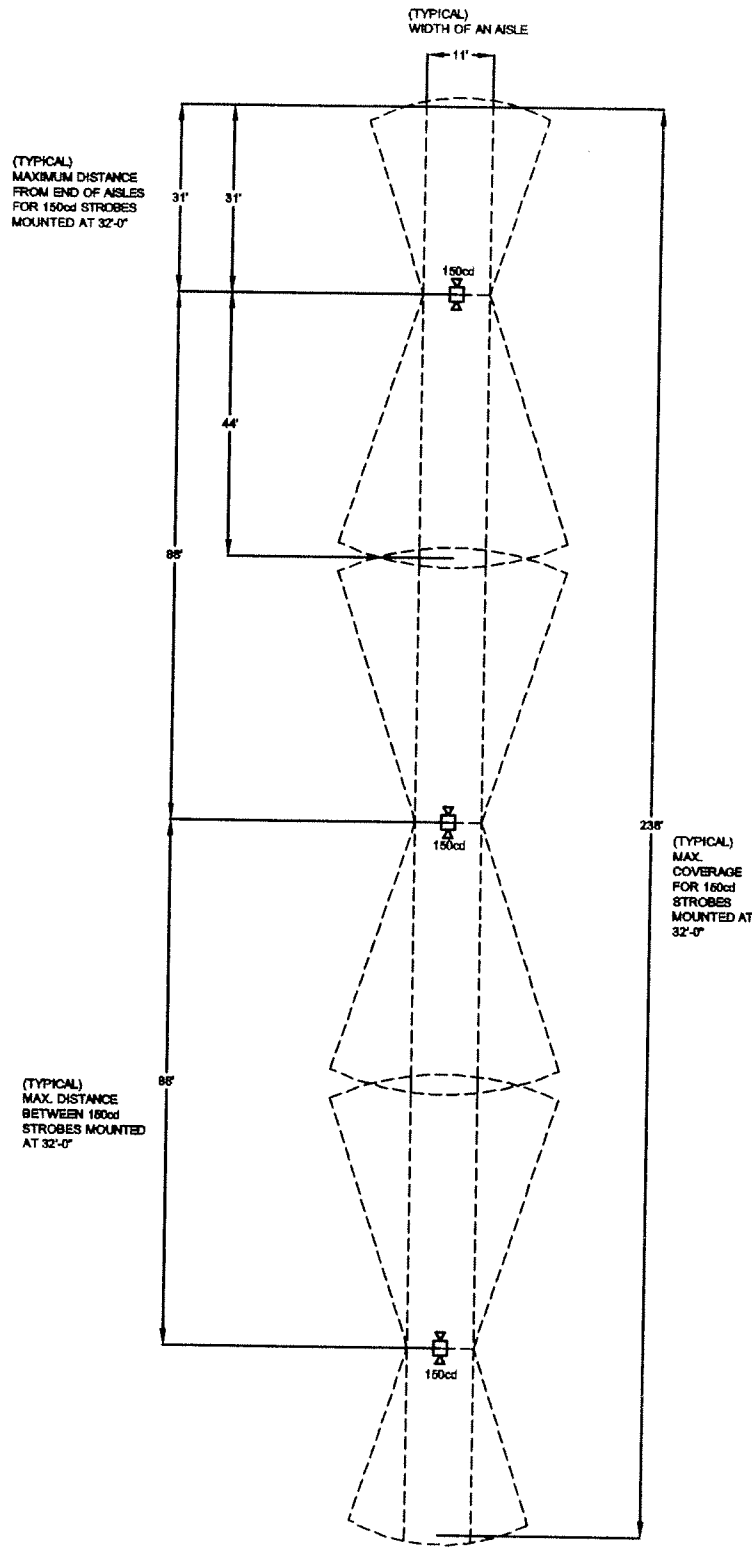
2.3. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE UNIT TO A POINT FROM THE CALCULATION TABLE

HOR. DISTANCE = INCIDENT DISTANCE * SIN(ANGLE)
AT 0.0217 LUMENS/FT² INCIDENT DISTANCE IS 55.79' AT AN ANGLE OF 55 DEG.
HOR. DISTANCE = 55.79 * SIN(55) = 45.7'

3. MAXIMUM PROBE SPACING TO PROVIDE REQUIRED OVERLAP OF INCIDENT ILLUMINATION IS 2 X THE CALCULATED DISTANCE:

MAXIMUM SPACING = 2 X 45.7' = 91.4'

4. AS INDICATED ON THE ADJACENT SKETCH, CONSERVATIVE MAXIMUM SPACINGS OF 31' FROM AISLE ENDS AND 88' BETWEEN 150cd STROBE APPLIANCES HAVE BEEN USED AS THE LIMITS FOR SYSTEM PLANS. STROBES ARE TO BE MOUNTED AT THE BOTTOM OF THE ROOF TRUSSES. HEIGHTS WILL VARY WITH ROOF SLOPE. MAXIMUM ACTUAL MOUNTING HEIGHT IS APPROXIMATELY 32'-0"



DETAIL FA-2: MAX. STROBE SPACING AT 32' HEIGHT
EQUIVALENT FACILITATION CALCULATION DATA
FOR 150cd STROBE APPLIANCES AT 32' MOUNTING HEIGHT

PROJECT: 037-08-01, WAREHOUSE ADDITION, US FOODS OF BOCA RATON

**CALCULATED DATA FROM SYSTEM SENSOR
EQUIVALENT FACILITATION PROGRAM**

NOTE: This calculator uses data provided by the user to perform the calculations described in Chapter 7 of the 2002 edition of NFPA 72, which permits the use of a performance-based alternative in lieu of tables for spacing ceiling mounted audible/visible devices. The user must utilize either Table 7.5.4.1.1(b) Room Spacing Table for Ceiling-Mounted Visible Appliances or the performance-based alternative to determine the required light output, not both.

Square Room Size: Up to 200' x 200'
Ceiling Height: 35'
Candela: 150
Inscribed Circle
Radius: 100'

Inscribed Equivalent Facilitation			
Angle	UL Required	Distance	Lumens/Ft ²
0	150	35	0.1224
5	135	35.13	0.1084
10	135	35.54	0.1000
15	135	36.23	0.1026
20	135	37.25	0.0973
25	135	38.62	0.0906
30	112.5	40.41	0.0889
35	112.5	42.73	0.0816
40	112.5	45.69	0.0739
45	112.5	49.5	0.0459
50	82.5	54.45	0.0278
55	67.5	61.02	0.0181
60	60	70	0.0122
65	62.5	82.82	0.0077
70	52.5	102.33	0.006
75	45	103.53	0.0042
80	45	101.54	0.0044
85	37.5	100.38	0.0037
90	37.5	100	0.0039

- Assumptions:
1. Minimum calculated illumination requirement of 0.0375 lm/ft².
 2. Square rooms with ceiling mounted strobes in the center of the ceiling.
 3. Illumination is calculated for two perpendicular planes with brightest profile.

CALCULATION OF SPACING LIMITS VS. MOUNTING HEIGHT

1. CALCULATION OF INSCRIBED COVERAGE FOR A SINGLE 150cd STROBE:

1.1. REQUIRED MINIMUM INCIDENT LUMENS/FT² IS 0.0375. FROM TABLE OF CALCULATED VALUES 0.0459 LUM/FT² AT AN ANGLE OF 45 DEG IS CLOSEST VALUE ABOVE MINIMUM.

1.2. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE TO A POINT FROM THE CALCULATION TABLE:

$$\text{HOR. DISTANCE} = \text{INCIDENT DISTANCE} \times \sin(\text{ANGLE})$$

AT 0.0459 LUMENS/FT² INCIDENT DISTANCE IS 49.5' AT AN ANGLE OF 45 DEG
HOR. DISTANCE = 49.5' * SIN(45) = 35.0'

2. CALCULATION OF INSCRIBED COVERAGE FOR TWO 150cd STROBES IN A WAREHOUSE AISLE:

2.1. TO ACHIEVE THE MINIMUM REQUIRED ILLUMINATION OF 0.0375 LUM/FT² ON THE FLOOR FROM TWO ADJACENT STROBES THE MINIMUM OVERLAPPING LIGHT OUTPUT FROM EACH STROBE IS

$$0.0375 / 2 = 0.01875 \text{ LUMENS/FT}^2$$

2.2. FROM THE TABLE OF CALCULATIONS AT AN ANGLE OF 50 DEG, THE LIGHT OUTPUT OF 0.0278 EXCEEDS THE REQUIRED 0.01875 LUMENS/FT² PER STROBE

2.3. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE UNIT TO A POINT FROM THE CALCULATION TABLE

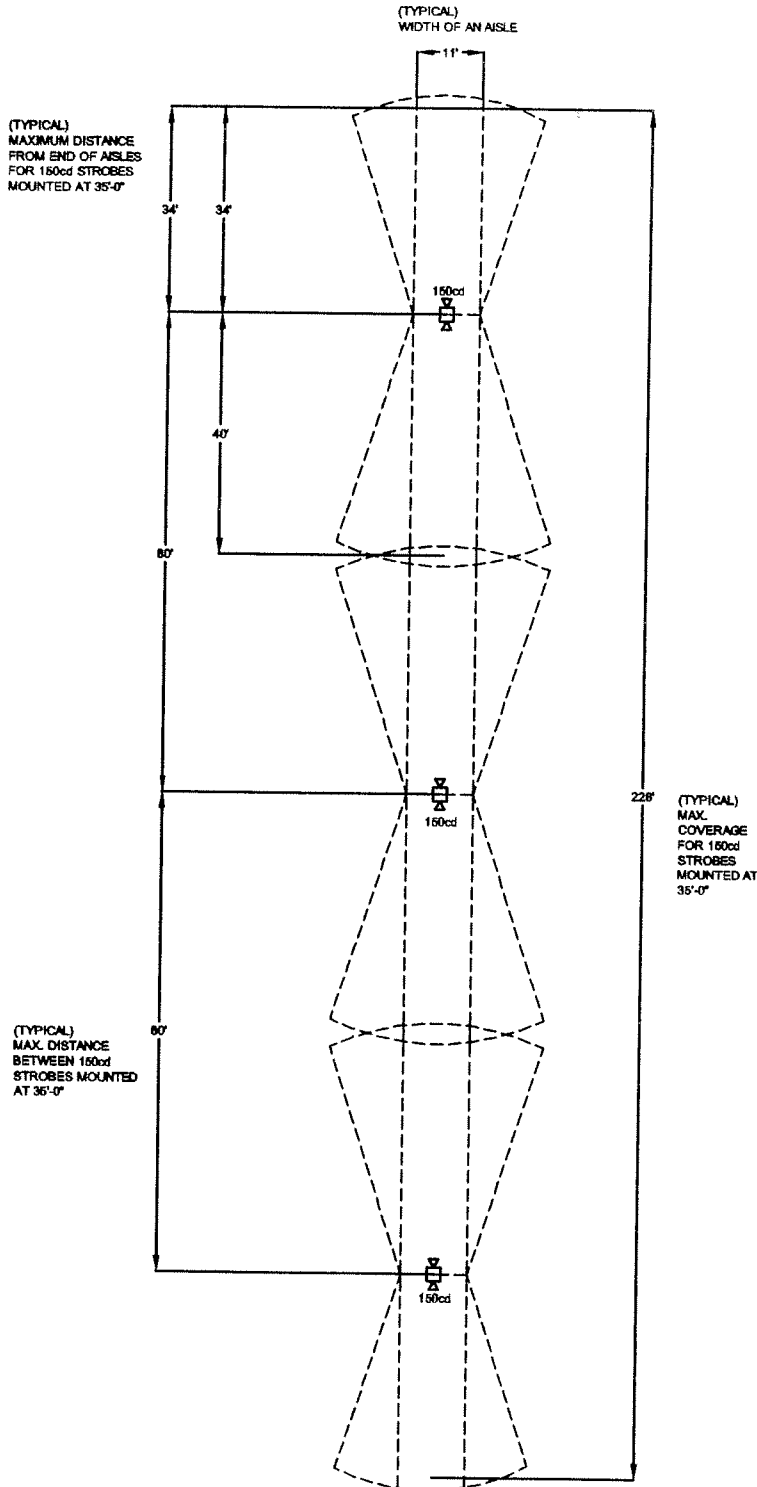
$$\text{HOR. DISTANCE} = \text{INCIDENT DISTANCE} \times \sin(\text{ANGLE})$$

AT 0.0278 LUMENS/FT² INCIDENT DISTANCE IS 54.45' AT AN ANGLE OF 50 DEG.
HOR. DISTANCE = 54.45' * SIN(50) = 41.7'

3. MAXIMUM PROBE SPACING TO PROVIDE REQUIRED OVERLAP OF INCIDENT ILLUMINATION IS 2 X THE CALCULATED DISTANCE:

$$\text{MAXIMUM SPACING} = 2 \times 41.7' = 83.4'$$

4. AS INDICATED ON THE ADJACENT SKETCH, CONSERVATIVE MAXIMUM SPACINGS OF 34' FROM AISLE ENDS AND 80' BETWEEN 150cd STROBE APPLIANCES HAVE BEEN USED AS THE LIMITS FOR SYSTEM PLANS. STROBES ARE TO BE MOUNTED AT THE BOTTOM OF THE ROOF TRUSSES. HEIGHTS WILL VARY WITH ROOF SLOPE. MINIMUM ACTUAL MOUNTING HEIGHT IS APPROXIMATELY 35'-0"



DETAIL FA-3: MAX. STROBE SPACING AT 35' HEIGHT

**EQUIVALENT FACILITATION CALCULATION DATA
FOR 150cd STROBE APPLIANCES AT 35' MOUNTING HEIGHT**

PROJECT: 037-08-01, WAREHOUSE ADDITION, US FOODS OF BOCA RATON

DATE: 6-10-09 BY: ESI DESIGN SERVICES, INC., 950 WALNUT RIDGE DR., HARTLAND, WI. PH: 262-369-3535 DRAWN: JH CHECKED: TM

**ESI Design Services**

950 Walnut Ridge Drive

Hartland, WI 53029

TRANSMITTAL**No. 00270****Phone:** 262-369-3535**Fax:** 262-369-3592**PROJECT:** U.S. Foodservice-Boca Raton FL A&ES**DATE:** 8/3/2009

TO: Department of Community Affairs
 Florida Building Commission
 2555 Shumard Oak Boulevard
 Tallahassee, FL 32399-2100
 Phone: Fax:

JOB NO: 037-08-01

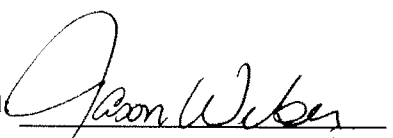

REF: Waiver Application
 Official Agency Correspondence

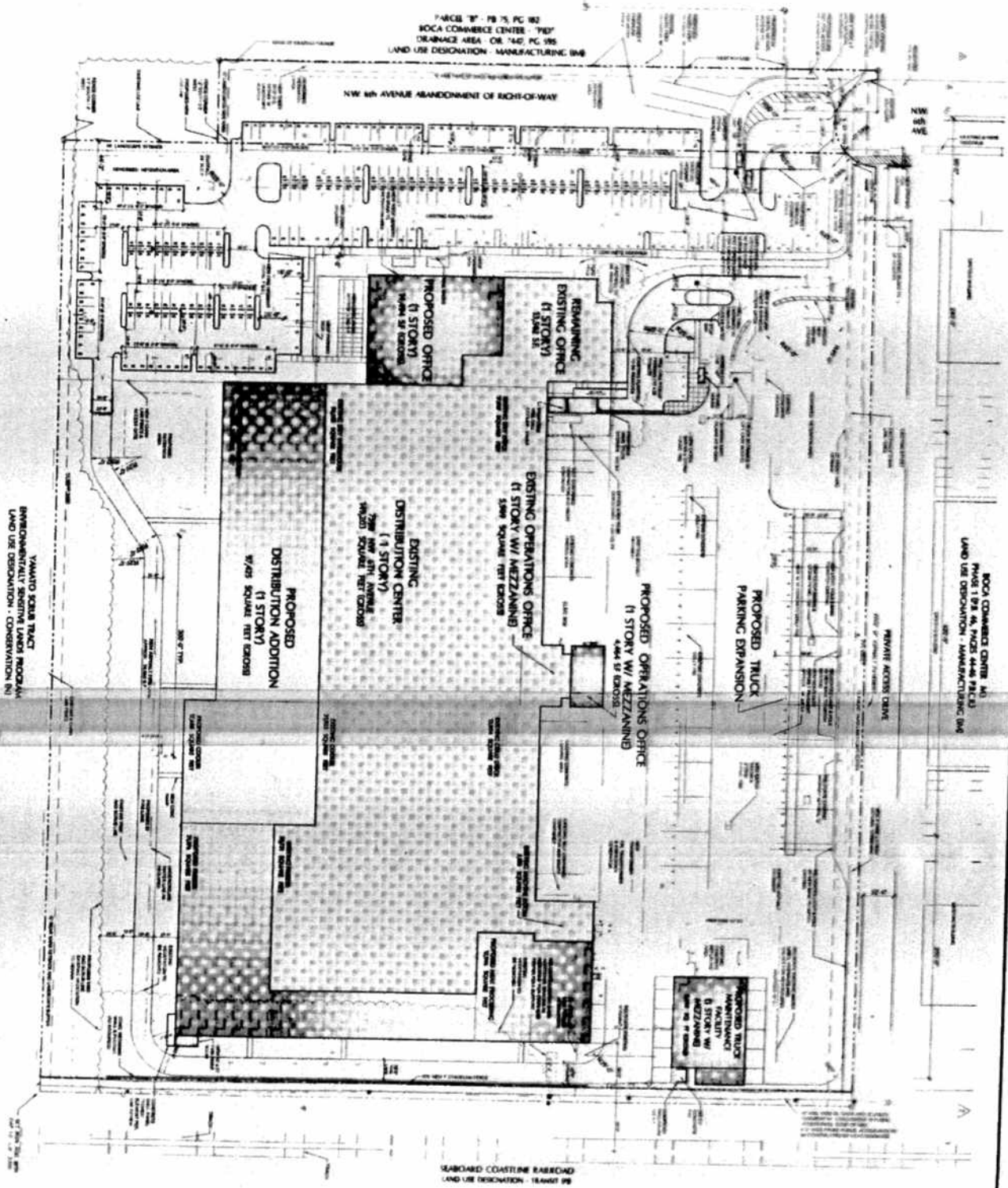
ATTN:

	SUBMITTED FOR:	ACTION TAKEN:
<input type="checkbox"/> Shop Drawings	<input checked="" type="checkbox"/> Approval	<input type="checkbox"/> Approved as Submitted
<input type="checkbox"/> Letter	<input checked="" type="checkbox"/> Your Use	<input type="checkbox"/> Approved as Noted
<input type="checkbox"/> Prints	<input type="checkbox"/> As Requested	<input type="checkbox"/> Returned After Loan
<input type="checkbox"/> Change Order	<input type="checkbox"/> Review and Comment	<input type="checkbox"/> Resubmit 0 Copies for Approval
<input checked="" type="checkbox"/> Plans		<input type="checkbox"/> Submit 0 Copies
<input type="checkbox"/> Samples	SENT VIA:	<input type="checkbox"/> Returned
<input type="checkbox"/> Specifications	<input checked="" type="checkbox"/> Attached UPS 2 Day	<input type="checkbox"/> Returned for Corrections
<input checked="" type="checkbox"/> Other:	<input type="checkbox"/> Separate Cover Via:	<input type="checkbox"/> Due Date:

ITEM NO.	COPIES	DATE	ITEM NUMBER	REV. NO.	DESCRIPTION	STATUS
01	1				List of Required Information	NA
02	1				Request of Waiver	NA
03	1				Review and Recommendations by Local Building Department	NA
04	5				(6) Photos	NA
05	1				Enlarged Plans, 11x17 Plans & Overhead Transparencies of plans	NA
06	1				CD of Application, Photos & Plans	NA

CC: File

Signed 
 Jason Weber 



ARCHITECTURAL SITE DEVELOPMENT PLAN



NORTH

7'-0" = 1'-0"

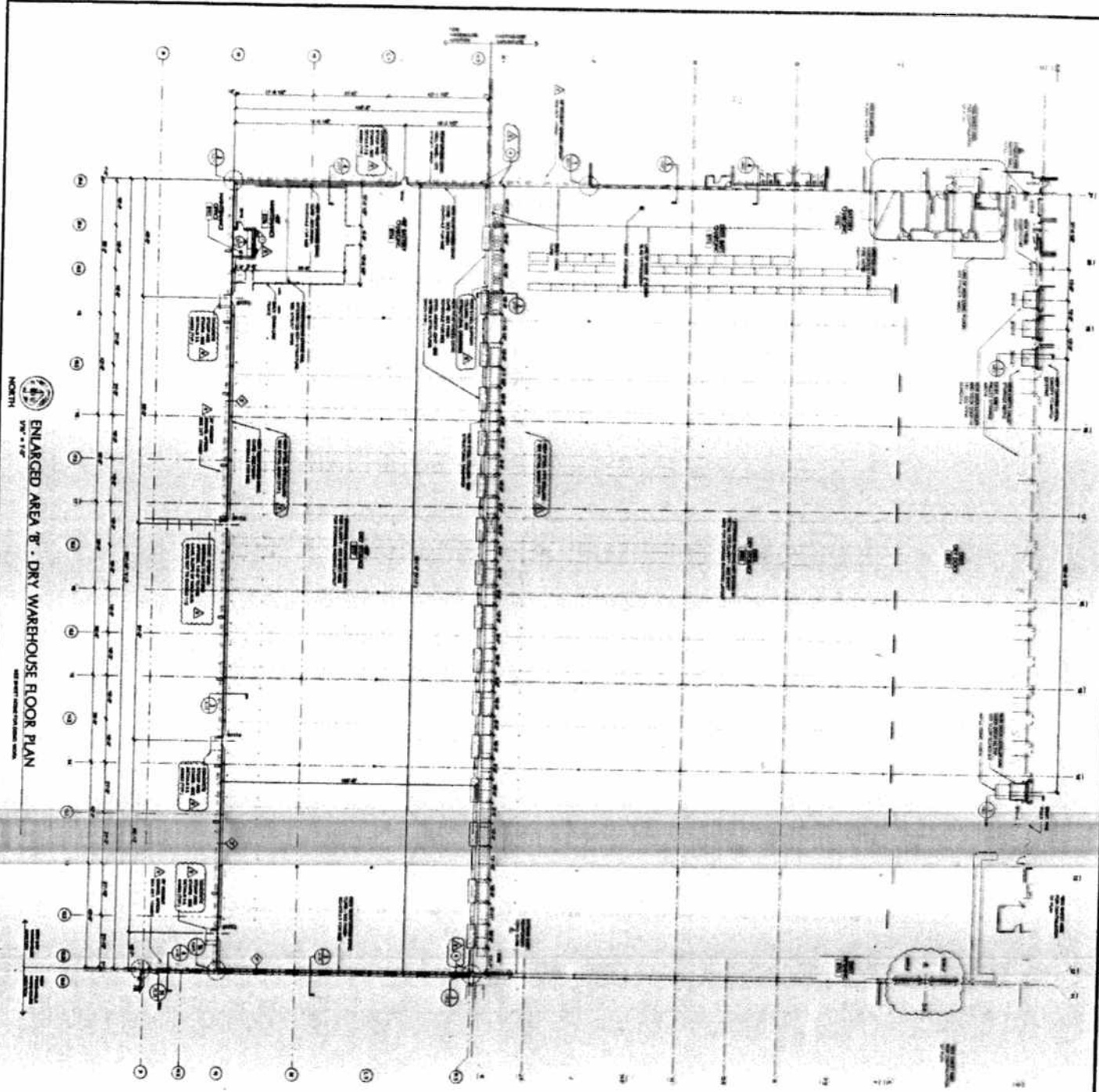
ARCHITECTURAL

A0710

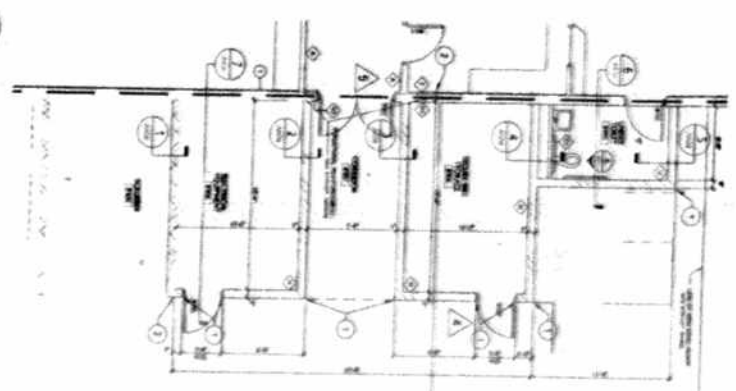
FACILITY EXPANSION
 U.S. FOODSERVICE, INC.
 7598 NW 6TH AVENUE
 BOCA RATON, FLORIDA 33487



NO.	DATE	DESCRIPTION
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2	01/14/11	REVISED PER COMMENTS
3	02/01/11	REVISED PER COMMENTS
4	02/01/11	REVISED PER COMMENTS
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100	02/01/11	REVISED PER COMMENTS



ENLARGED AREA 'B' - DRY WAREHOUSE FLOOR PLAN
 NORTH



ENLARGED SUPPORT AREA FLOOR PLAN
 NORTH

GENERAL NOTES

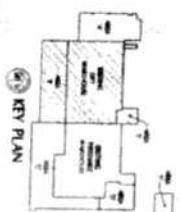
1. SEE SHEET 100 FOR GENERAL NOTES.
2. SEE SHEET 101 FOR GENERAL NOTES.
3. SEE SHEET 102 FOR GENERAL NOTES.

KEYED NOTES

1. SEE SHEET 100 FOR GENERAL NOTES.
2. SEE SHEET 101 FOR GENERAL NOTES.
3. SEE SHEET 102 FOR GENERAL NOTES.

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
(Symbol)	DOOR
(Symbol)	WINDOW
(Symbol)	WALL
(Symbol)	FLOOR FINISH
(Symbol)	CEILING FINISH
(Symbol)	MECHANICAL EQUIPMENT
(Symbol)	ELECTRICAL EQUIPMENT
(Symbol)	PLUMBING EQUIPMENT
(Symbol)	STRUCTURAL COLUMN
(Symbol)	STRUCTURAL BEAM
(Symbol)	STAIR
(Symbol)	ELEVATOR
(Symbol)	MECHANICAL ROOM
(Symbol)	ELECTRICAL ROOM
(Symbol)	PLUMBING ROOM
(Symbol)	RESTROOM
(Symbol)	OFFICE
(Symbol)	RECEPTION
(Symbol)	STORAGE
(Symbol)	UTILITY
(Symbol)	MECHANICAL EQUIPMENT
(Symbol)	ELECTRICAL EQUIPMENT
(Symbol)	PLUMBING EQUIPMENT
(Symbol)	STRUCTURAL COLUMN
(Symbol)	STRUCTURAL BEAM
(Symbol)	STAIR
(Symbol)	ELEVATOR
(Symbol)	MECHANICAL ROOM
(Symbol)	ELECTRICAL ROOM
(Symbol)	PLUMBING ROOM
(Symbol)	RESTROOM
(Symbol)	OFFICE
(Symbol)	RECEPTION
(Symbol)	STORAGE
(Symbol)	UTILITY



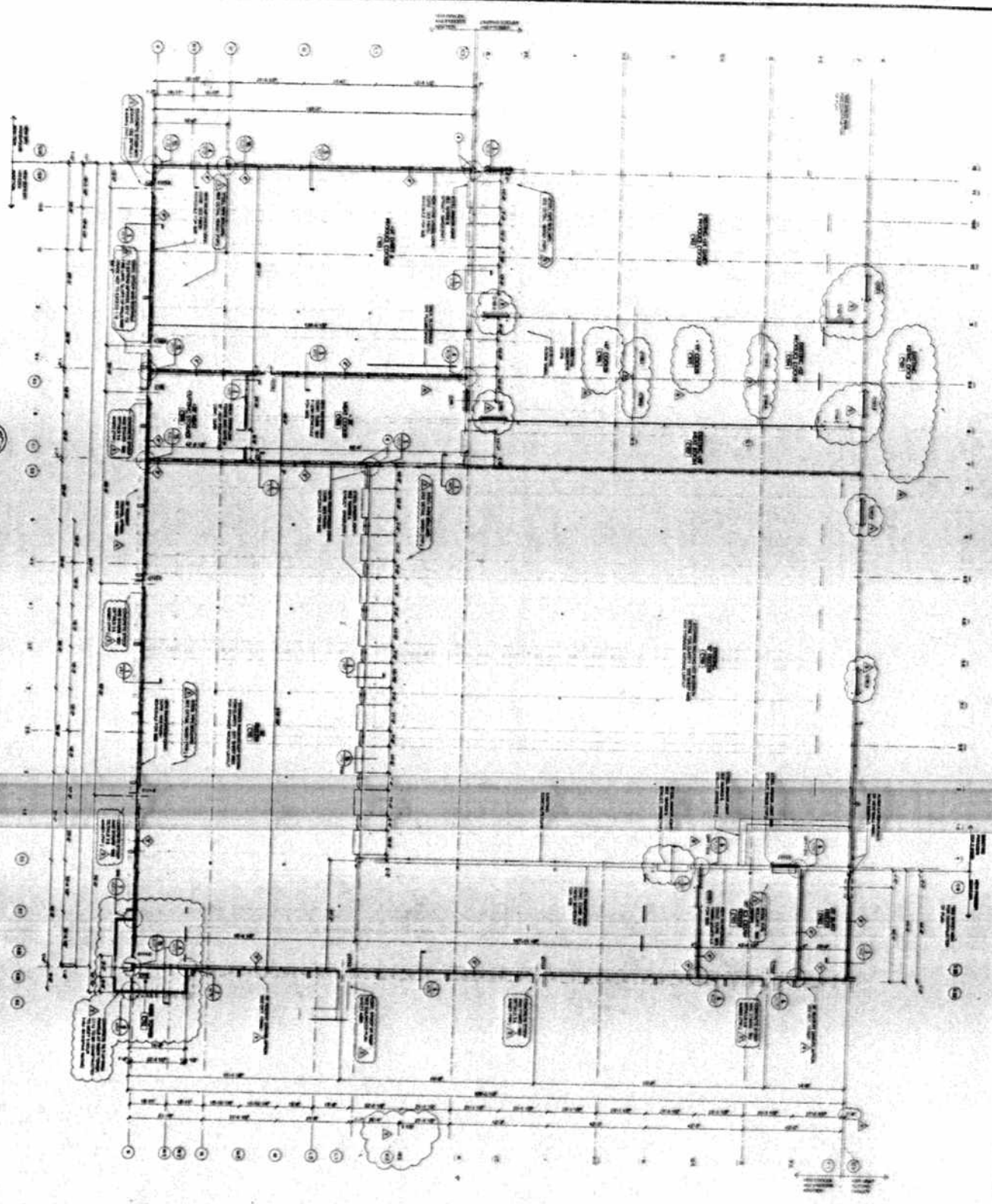
KEY PLAN

FACILITY EXPANSION
 U.S. FOODSERVICE, INC.
 7598 NW 6TH AVENUE
 BOCA RATON, FLORIDA 33487

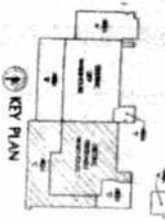


A202
 ARCHITECTURAL

DESIGNED BY: [Name]
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]




ENLARGED AREA C - PERISHABLE WAREHOUSE FLOOR PLAN
 NORTH



SYMBOLS LEGEND

	Column
	Beam
	Wall
	Door
	Window
	Roof
	Stair
	Elevator
	Structural Steel
	Other

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE BUILDING CODES AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
3. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ARCHITECT.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING UTILITIES AND STRUCTURES.
5. ALL DIMENSIONS SHALL BE AS SHOWN UNLESS OTHERWISE NOTED.

KEY PLAN NOTES

1. THIS KEY PLAN IS FOR INFORMATION ONLY.
2. THE SHADING INDICATES THE AREA OF THE ENLARGED FLOOR PLAN.

AREA C - PERISHABLE WAREHOUSE FLOOR PLAN
 PROJECT NO. A203
 ARCHITECTURAL

FACILITY EXPANSION
 U.S. FOODSERVICE, INC.
 7590 NW 6TH AVENUE
 BOCA RATON, FLORIDA 33487



**CALCULATED DATA FROM SYSTEM SENSOR
EQUIVALENT FACILITATION PROGRAM**

NOTE: This calculator uses data provided by the user to perform the calculations described in Chapter 7 of the 2002 edition of NFPA 72, which permits the use of a performance-based alternative in lieu of tables for spacing ceiling mounted audible/visible devices. The user must utilize either Table 7.5.4.1.1.(b) Room Spacing Table for Ceiling-Mounted Visible Appliances or the performance-based alternative to determine the required light output, not both.

Square Room Size: Up to 200' x 200'
Ceiling Height: 32'
Candela: 150
Inscribed Circle
Radius: 100'

Angle	L _v Req. req	Distance	Lumens/ft ²
0	150	32	0.1485
5	135	32.12	0.1308
10	135	32.49	0.1279
15	135	33.13	0.123
20	135	34.06	0.1164
25	135	35.31	0.1083
30	112.5	36.95	0.0824
35	112.5	39.06	0.0737
40	112.5	41.77	0.0645
45	112.5	45.25	0.0549
50	82.5	49.78	0.0433
55	67.5	55.79	0.0217
60	60	64	0.0148
65	52.5	76.72	0.0092
70	52.5	93.56	0.006
75	45	103.53	0.0042
80	45	101.54	0.0044
85	37.5	100.38	0.0027
90	37.5	100	0.0033

Assumptions:

1. Minimum calculated illumination requirement of 0.0375 lm/ft².
2. Square rooms with ceiling mounted strobes in the center of the ceiling.
3. Illumination is calculated for two perpendicular planes with brightest profile.

CALCULATION OF SPACING LIMITS VS. MOUNTING HEIGHT

1. CALCULATION OF INSCRIBED COVERAGE FOR A SINGLE 150cd STROBE:

1.1. REQUIRED MINIMUM INCIDENT LUMENS/FT² IS 0.0375. FROM TABLE OF CALCULATED VALUES 0.0549 LUM/FT² AT AN ANGLE OF 45 DEG IS CLOSEST VALUE ABOVE MINIMUM.

1.2. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE TO A POINT FROM THE CALCULATION TABLE:

HOR. DISTANCE = INCIDENT DISTANCE * SIN(ANGLE)

AT 0.0549 LUMENS/FT² INCIDENT DISTANCE IS 45.25' AT AN ANGLE OF 45 DEG
HOR. DISTANCE = 45.25 * SIN(45) = 32.0'

2. CALCULATION OF INSCRIBED COVERAGE FOR TWO 150cd STROBES IN A WAREHOUSE AISLE:

2.1. TO ACHIEVE THE MINIMUM REQUIRED ILLUMINATION OF 0.0375 LUM/FT² ON THE FLOOR FROM TWO ADJACENT STROBES THE MINIMUM OVERLAPPING LIGHT OUTPUT FROM EACH STROBE IS

$0.0375 / 2 = 0.01875 \text{ LUMENS/FT}^2$

2.2. FROM THE TABLE OF CALCULATIONS AT AN ANGLE OF 55 DEG, THE LIGHT OUTPUT OF 0.0217 EXCEEDS THE REQUIRED 0.01875 LUMENS/FT² PER STROBE

2.3. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE UNIT TO A POINT FROM THE CALCULATION TABLE

HOR. DISTANCE = INCIDENT DISTANCE * SIN(ANGLE)

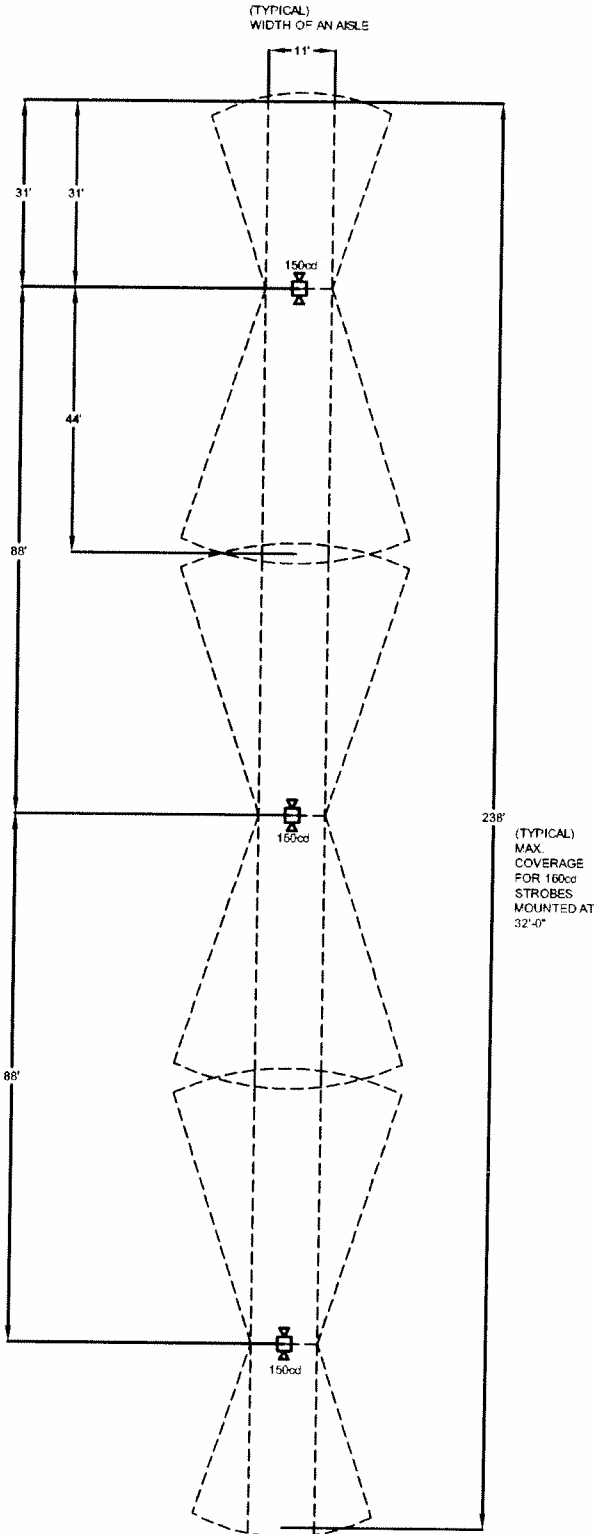
AT 0.0217 LUMENS/FT² INCIDENT DISTANCE IS 55.79' AT AN ANGLE OF 55 DEG
HOR. DISTANCE = 55.79 * SIN(55) = 45.7'

3. MAXIMUM PROBE SPACING TO PROVIDE REQUIRED OVERLAP OF INCIDENT ILLUMINATION IS 2 X THE CALCULATED DISTANCE:

MAXIMUM SPACING = 2 X 45.7' = 91.4'

4. AS INDICATED ON THE ADJACENT SKETCH, CONSERVATIVE MAXIMUM SPACINGS OF 31' FROM AISLE ENDS AND 88' BETWEEN 150cd STROBE APPLIANCES HAVE BEEN USED AS THE LIMITS FOR SYSTEM PLANS. STROBES ARE TO BE MOUNTED AT THE BOTTOM OF THE ROOF TRUSSES. HEIGHTS WILL VARY WITH ROOF SLOPE. MAXIMUM ACTUAL MOUNTING HEIGHT IS APPROXIMATELY 32'-0"

(TYPICAL)
MAXIMUM DISTANCE
FROM END OF AISLES
FOR 150cd STROBES
MOUNTED AT 32'-0"



DETAIL FA-2: MAX. STROBE SPACING AT 32' HEIGHT

**EQUIVALENT FACILITATION CALCULATION DATA
FOR 150cd STROBE APPLIANCES AT 32' MOUNTING HEIGHT**

PROJECT: 037-08-01, WAREHOUSE ADDITION, US FOODS OF BOCA RATON

DATE: 6-10-09 BY: ESI DESIGN SERVICES, INC., 950 WALNUT RIDGE DR., HARTLAND, WI. PH: 262-369-3535 DRAWN: JH CHECKED: TM

**CALCULATED DATA FROM SYSTEM SENSOR
EQUIVALENT FACILITATION PROGRAM**

NOTE: This calculator uses data provided by the user to perform the calculations described in Chapter 7 of the 2002 edition of NFPA 72, which permits the use of a performance-based alternative in lieu of tables for spacing ceiling mounted audible/visible devices. The user must utilize either Table 7.5.4.1.1(b) Room Spacing Table for Ceiling-Mounted Visible Appliances or the performance-based alternative to determine the required light output, not both.

Square Room Size: Up to 200' x 200'
Ceiling Height: 35'
Candela: 150
Inscribed Circle
Radius: 100'
Inscribed Equivalent Facilitation

Angle	U.I. Req. - fc	Distance	Lumens/Ft ²
0	150	35	0.1224
5	135	35.13	0.1094
10	135	35.54	0.1069
15	135	36.23	0.1028
20	135	37.25	0.0973
25	135	38.82	0.0905
30	112.5	40.41	0.0869
35	112.5	42.73	0.0816
40	112.5	45.89	0.0759
45	112.5	49.5	0.0459
50	82.5	54.45	0.0278
55	67.5	61.02	0.0177
60	60	70	0.0122
66	52.5	82.82	0.0077
70	52.5	102.33	0.005
75	45	103.63	0.0042
80	45	101.54	0.0044
85	37.5	100.38	0.0037
90	37.5	100	0.0031

Assumptions:

1. Minimum calculated illumination requirement of 0.0375 lm/ft².
2. Square rooms with ceiling mounted strobes in the center of the ceiling.
3. Illumination is calculated for two perpendicular planes with brightest profile.

CALCULATION OF SPACING LIMITS VS. MOUNTING HEIGHT

1. CALCULATION OF INSCRIBED COVERAGE FOR A SINGLE 150cd STROBE:
 - 1.1. REQUIRED MINIMUM INCIDENT LUMENS/FT² IS 0.0375. FROM TABLE OF CALCULATED VALUES 0.0459 LU/FT² AT AN ANGLE OF 45 DEG IS CLOSEST VALUE ABOVE MINIMUM.
 - 1.2. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE TO A POINT FROM THE CALCULATION TABLE:

$$\text{HOR. DISTANCE} = \text{INCIDENT DISTANCE} * \sin(\text{ANGLE})$$
 AT 0.0459 LUMENS/FT² INCIDENT DISTANCE IS 49.5' AT AN ANGLE OF 45 DEG

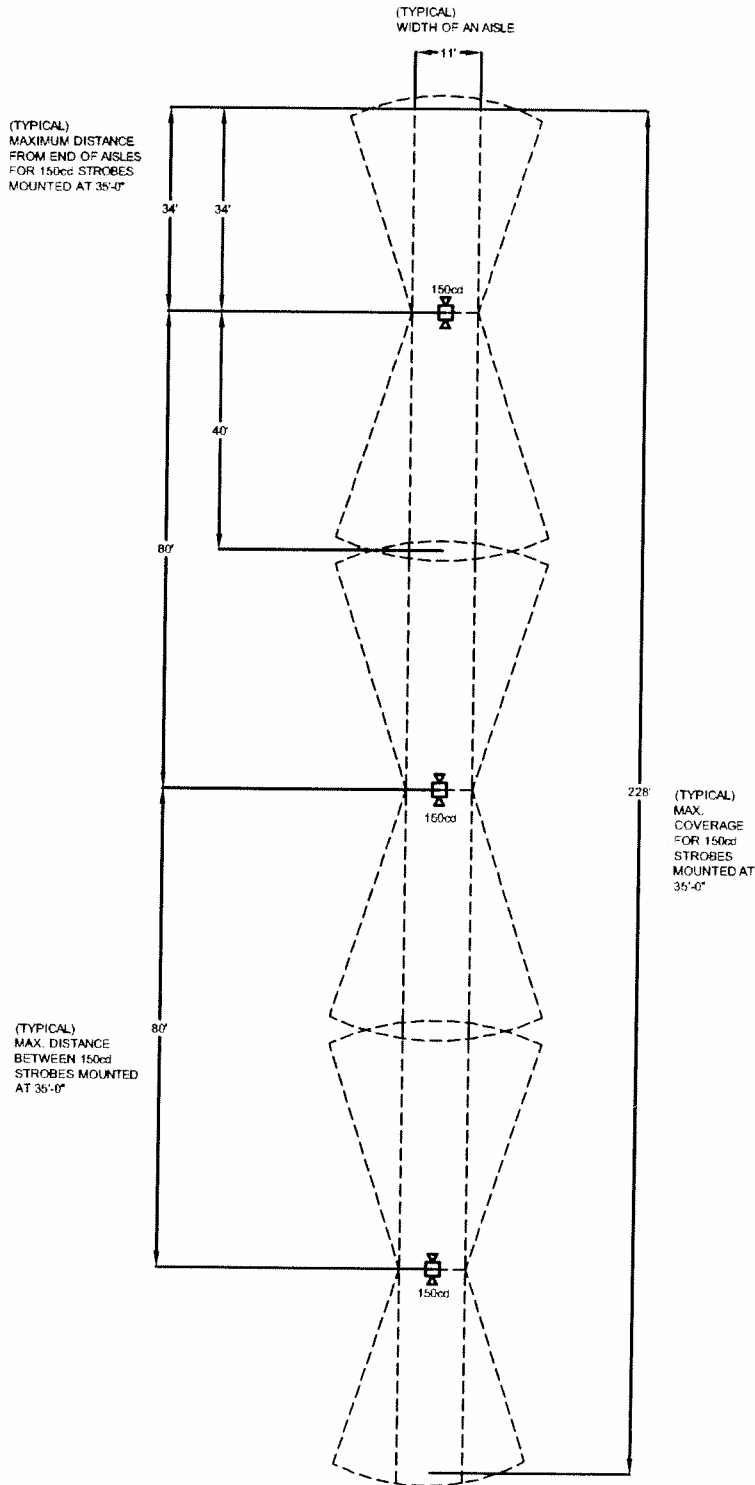
$$\text{HOR. DISTANCE} = 49.5 * \sin(45) = 35.0'$$
2. CALCULATION OF INSCRIBED COVERAGE FOR TWO 150cd STROBES IN A WAREHOUSE AISLE.
 - 2.1. TO ACHIEVE THE MINIMUM REQUIRED ILLUMINATION OF 0.0375 LU/FT² ON THE FLOOR FROM TWO ADJACENT STROBES THE MINIMUM OVERLAPPING LIGHT OUTPUT FROM EACH STROBE IS

$$0.0375 / 2 = 0.01875 \text{ LUMENS/FT}^2$$
 - 2.2. FROM THE TABLE OF CALCULATIONS AT AN ANGLE OF 50 DEG, THE LIGHT OUTPUT OF 0.0278 EXCEEDS THE REQUIRED 0.01875 LUMENS/FT² PER STROBE
 - 2.3. TO FIND THE HORIZONTAL DISTANCE ALONG THE FLOOR FROM THE STROBE UNIT TO A POINT FROM THE CALCULATION TABLE

$$\text{HOR. DISTANCE} = \text{INCIDENT DISTANCE} * \sin(\text{ANGLE})$$
 AT 0.0278 LUMENS/FT² INCIDENT DISTANCE IS 54.45' AT AN ANGLE OF 50 DEG

$$\text{HOR. DISTANCE} = 54.45 * \sin(50) = 41.7'$$
3. MAXIMUM PROBE SPACING TO PROVIDE REQUIRED OVERLAP OF INCIDENT ILLUMINATION IS 2 X THE CALCULATED DISTANCE:

$$\text{MAXIMUM SPACING} = 2 * 41.7' = 83.4'$$
4. AS INDICATED ON THE ADJACENT SKETCH, CONSERVATIVE MAXIMUM SPACINGS OF 34' FROM AISLE ENDS AND 80' BETWEEN 150cd STROBE APPLIANCES HAVE BEEN USED AS THE LIMITS FOR SYSTEM PLANS. STROBES ARE TO BE MOUNTED AT THE BOTTOM OF THE ROOF TRUSSES. HEIGHTS WILL VARY WITH ROOF SLOPE. MINIMUM ACTUAL MOUNTING HEIGHT IS APPROXIMATELY 35'-0"



DETAIL FA-3: MAX. STROBE SPACING AT 35' HEIGHT
EQUIVALENT FACILITATION CALCULATION DATA
FOR 150cd STROBE APPLIANCES AT 35' MOUNTING HEIGHT

PROJECT: 037-08-01, WAREHOUSE ADDITION, US FOODS OF BOCA RATON