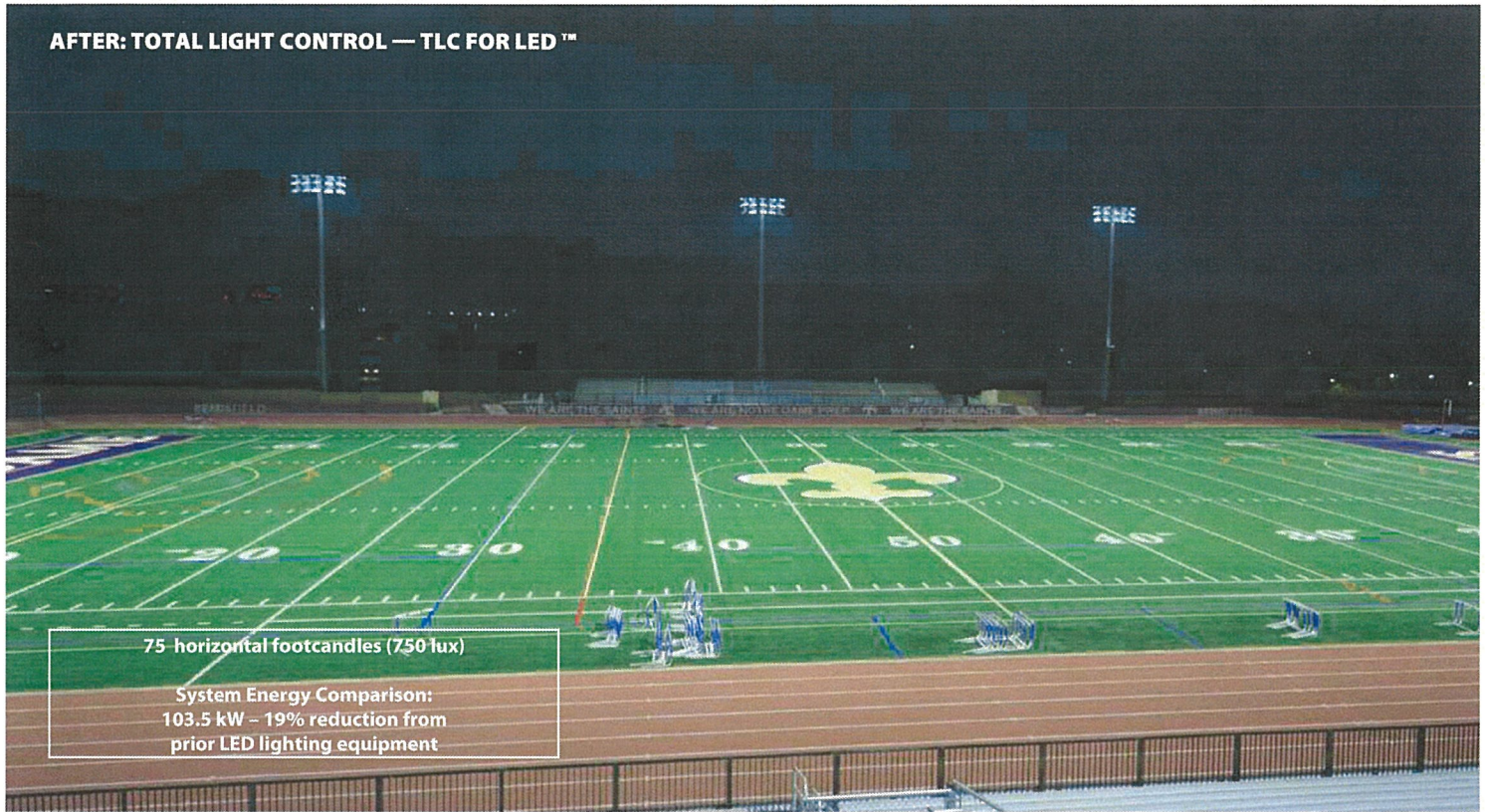


Musco: what can be

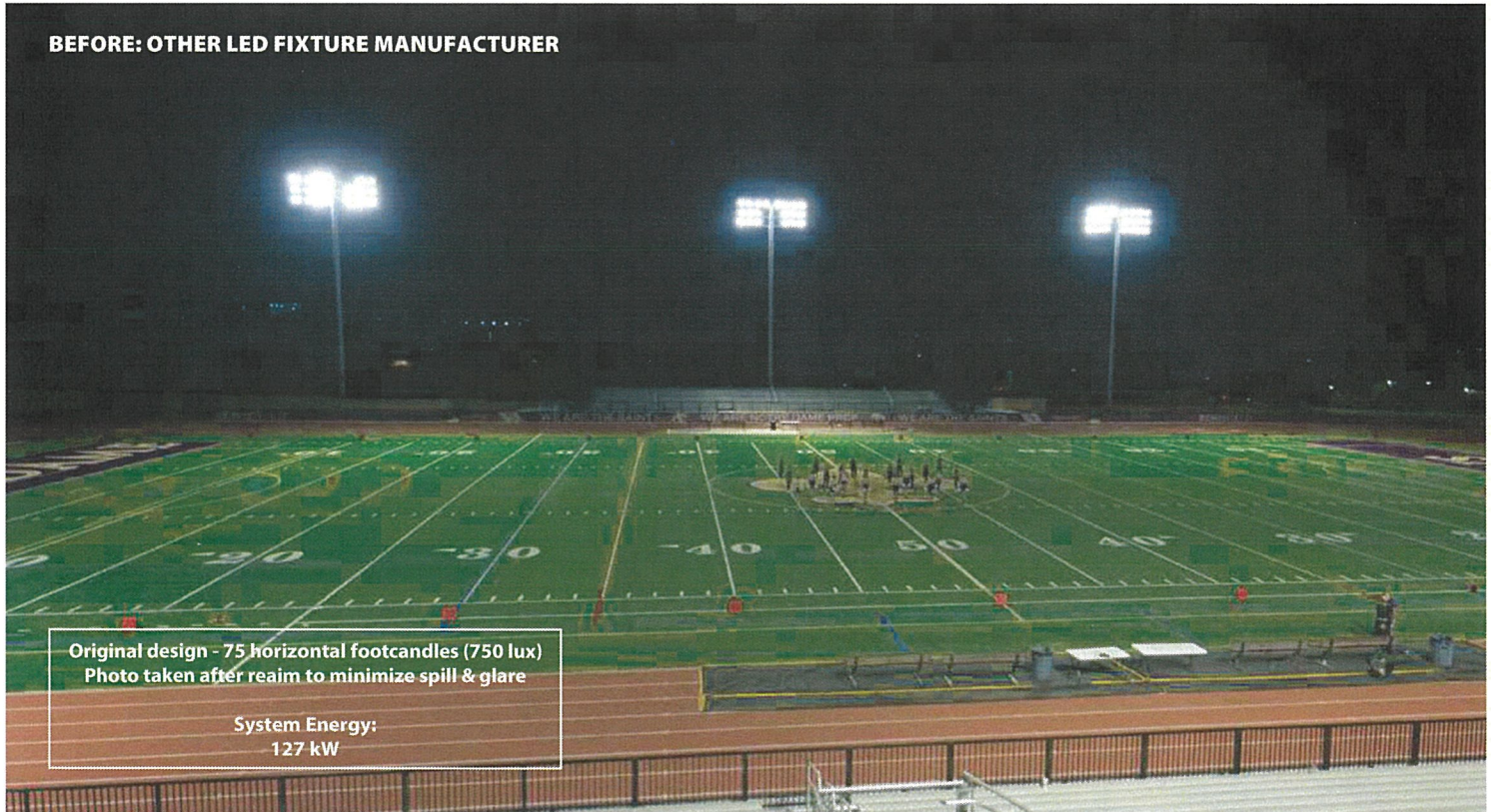
AFTER: TOTAL LIGHT CONTROL — TLC FOR LED™



75 horizontal footcandles (750 lux)
System Energy Comparison:
103.5 kW – 19% reduction from
prior LED lighting equipment

What often is

BEFORE: OTHER LED FIXTURE MANUFACTURER



Original design - 75 horizontal footcandles (750 lux)
Photo taken after reaim to minimize spill & glare
System Energy:
127 kW

©2017 Musco Sports Lighting, LLC · 141024 · M-2292-enUS-2 · Photographs taken with same camera at same settings: Nikon D800 camera with 14-24mm f/2.8 lens at 14mm; shutter speed - 1/60 sec.; lens aperture - f/2.8; ISO - 500

Musco: what can be



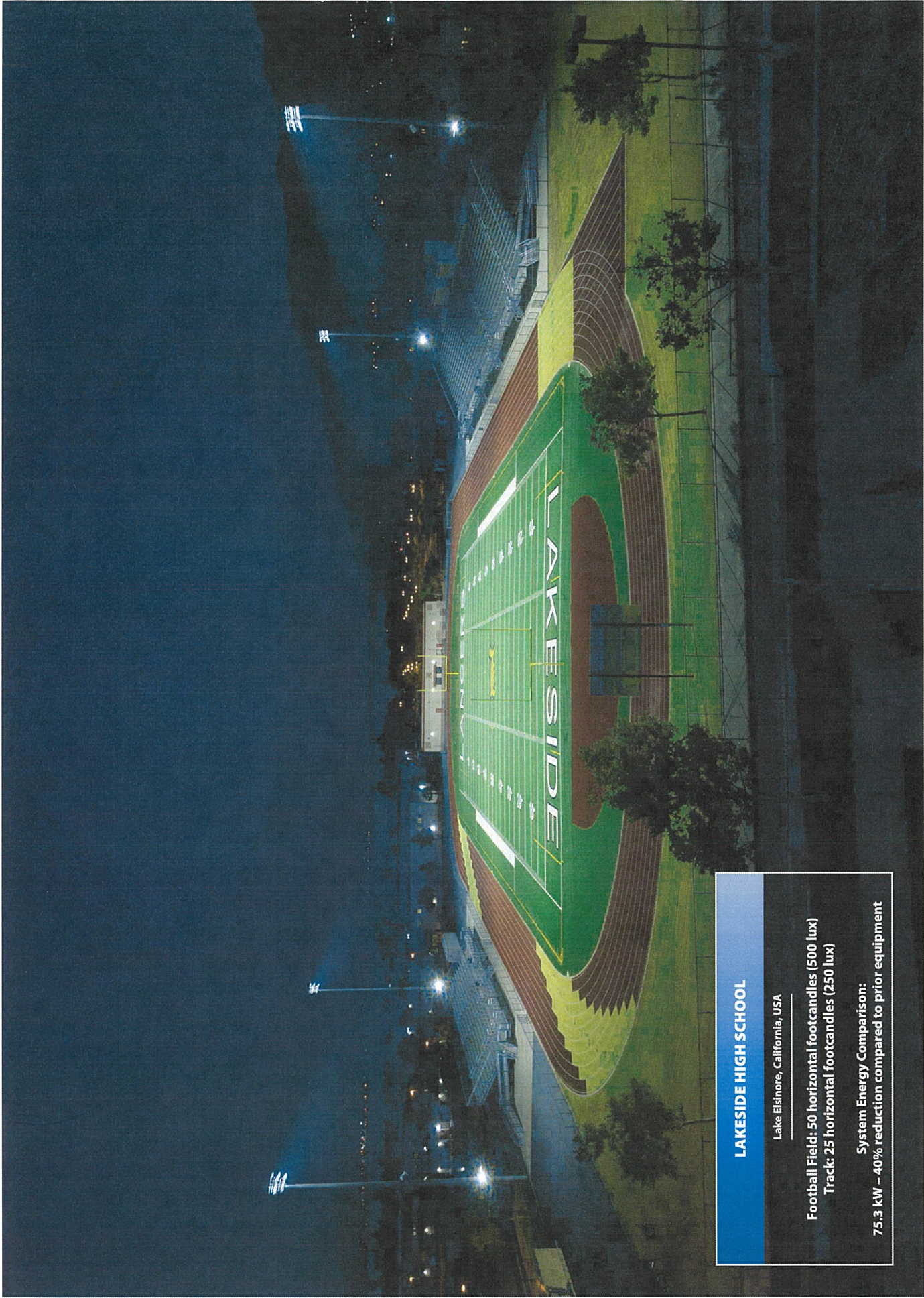
2014 Musco Light•Structure Green System™ with LED light source
LakePoint Sporting Community · Emerson, Georgia, USA

What often is



2014 Other manufacturer's fixture with LED light source

For more than 40 years the Musco Team has focused on researching control of light energy to deliver affordable systems that minimize glare and spill ... reduce energy ... provide optimal environment for athletes, spectators, and HD broadcasts ... and assure long term trouble-free operation.



LAKESIDE HIGH SCHOOL

Lake Elsinore, California, USA

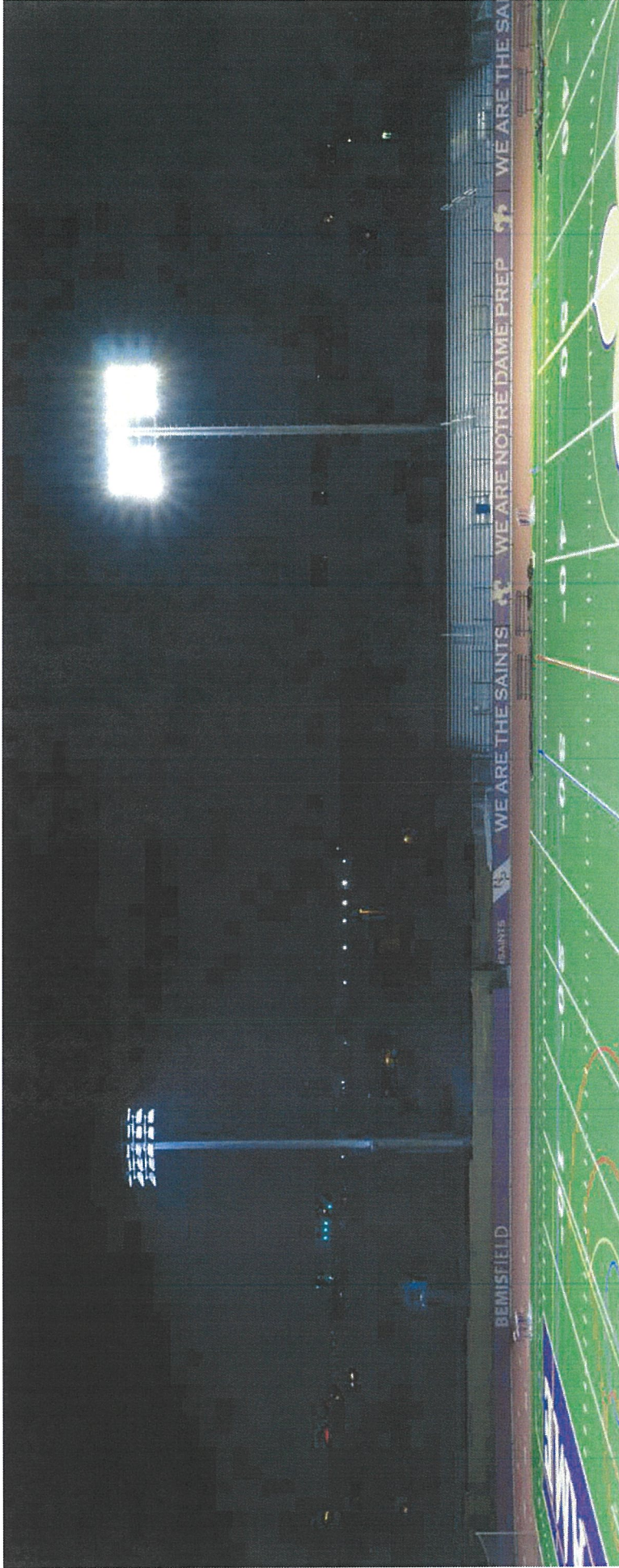
Football Field: 50 horizontal footcandles (500 lux)
Track: 25 horizontal footcandles (250 lux)

System Energy Comparison:
75.3 kW – 40% reduction compared to prior equipment

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Solutions for Lighting · TLC for LED®



Musco: what can be

TOTAL LIGHT CONTROL — TLC FOR LED™

75
horizontal footcandles
(750 lux)

What often is

OTHER LED MANUFACTURER

LIGHT LEVEL

75
horizontal footcandles
(750 lux)

ENERGY CONSUMPTION

103.5 kW

127 kW

PROJECT NAME
PROJECT LOCATION

PROJECT NAME (EDIT)
PROJECT LOCATION (EDIT)

From Hometown to Professional

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1-A2	60'	60'	3	TLC-LED-900	2.67 KW	A
		16'	1	TLC-BT-575	0.58 KW	A
B1-B2	60'	60'	4	TLC-LED-1200	4.68 KW	A
		16'	1	TLC-BT-575	0.58 KW	A
4			18		17.00 KW	

Circuit Summary			
Circuit	Description	Load	Fixture Qty
A	Softball	17.0 KW	18

Fixture Type Summary						
Type	Source	Wattage	Lumens	L90	L80	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	136,000	>81,000	>81,000	8
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>81,000	>81,000	6
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>81,000	>81,000	4

Light Level Summary

Calculation Grid Summary						
Grid Name	Calculation Metric	Illumination			Circuits	Fixture Qty
		Ave	Min	Max		
150' Spill	Horizontal Illuminance	0.01	0	0.03	A	18
150' Spill	Max Candela Metric	3120	186	6482	A	18
150' Spill	Max Vertical Illuminance Metric	0.05	0	0.14	A	18
Baseball (Infield)	Horizontal Illuminance	50.2	33	62	A	18
Baseball (Outfield)	Horizontal Illuminance	31.7	20	41	A	18



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EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires			
					LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	15.5'	TLC-BT-575	1	1	0
2	B1-B2	60'	-	15.5'	TLC-LED-900	3	3	0
4	TOTALS				TLC-BT-575	1	1	0
					TLC-LED-1200	4	4	0
						18	18	0

PROJECT NAME

PROJECT LOCATION

GRID SUMMARY

Name: Baseball
 Size: 180'/180'/180' - basepath 60'
 Spacing: 20.0' x 20.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Infield	Outfield
Guaranteed Average:	50	30
Scan Average:	50.15	31.70
Maximum:	62	41
Minimum:	33	20
Avg / Min:	1.50	1.58
Guaranteed Max / Min:	2	2.5
Max / Min:	1.86	2.06
UG (adjacent pts):	1.47	1.68
CU:	0.69	
No. of Points:	25	56

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI
 Luminaire Output: 136,000 / 89,600 / 52,000 lumens
 No. of Luminaires: 18
 Total Load: 17.0 kW

Luminaire Type	Lumen Maintenance		
	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

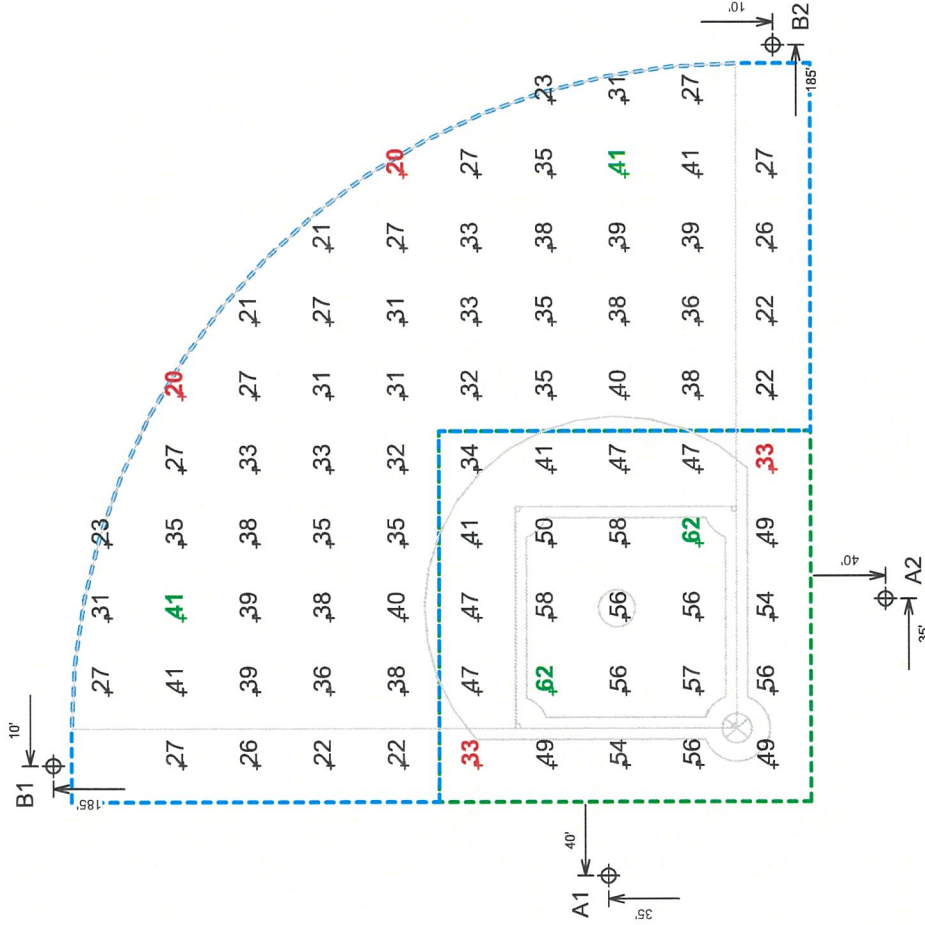
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY



Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 50
 0' 50' 100'

ENGINEERED DESIGN By: • File #5B53-181818-12-4P_C • 07-Aug-19

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires			
					LUMINAIRE TYPE	QTY / POLE	THIS GRID	
2	A1-A2	60'	-	15.5'	TLC-BT-575	1	1	0
2	B1-B2	60'	-	15.5'	TLC-LED-900	3	3	0
4				60'	TLC-BT-575	1	1	0
					TLC-LED-1200	4	4	0
TOTALS						18	18	0

PROJECT NAME

PROJECT LOCATION

GRID SUMMARY

Name: 150' Spill
 Spacing: 30.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

Entire Grid

Scan Average: 0.0115
 Maximum: 0.03
 Minimum: 0.00
 No. of Points: 54

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI
 Luminaire Output: 136,000 / 89,600 / 52,000 lumens
 No. of Luminaires: 18
 Total Load: 17.0 kW

Luminaire Type	Lumen Maintenance		
	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

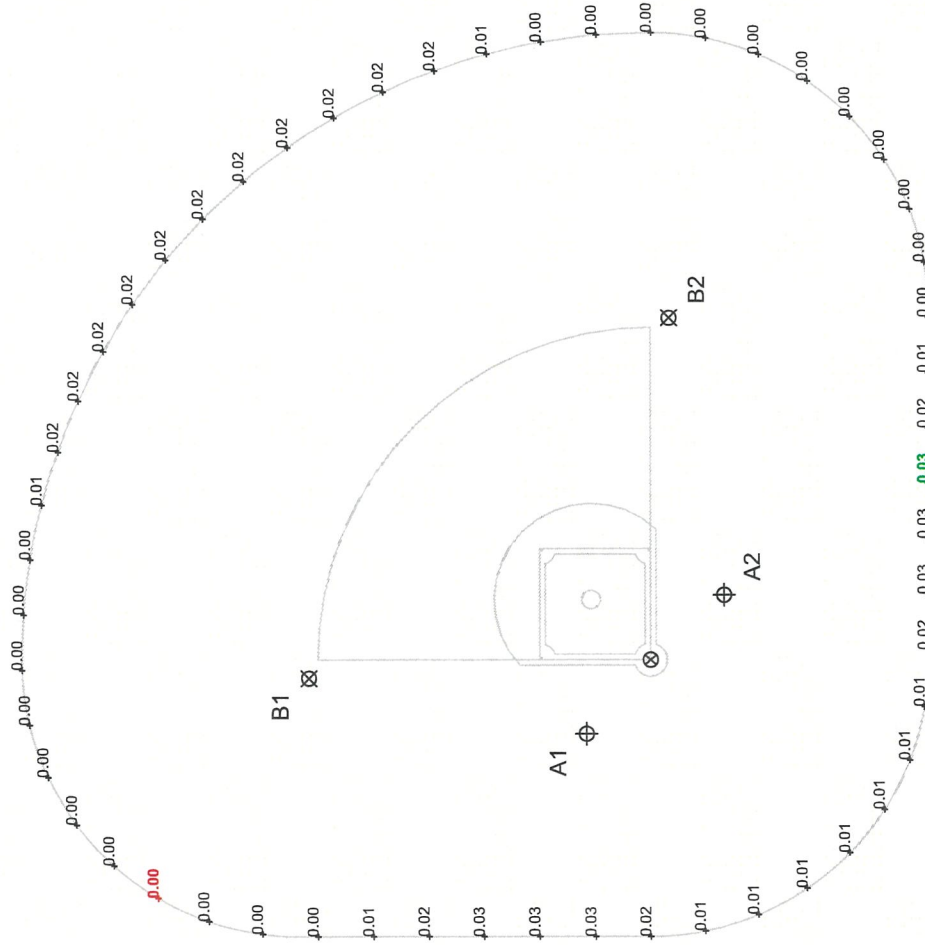
Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Pole location(s) Ⓢ dimensions are relative to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 100

ENGINEERED DESIGN By: • File #SB53-181818-12-4P_C • 07-Aug-19



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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires			
					LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	15.5'	TLC-BT-575	1	1	0
2	B1-B2	60'	-	60'	TLC-LED-900	3	3	0
				15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-1200	4	4	0
4	TOTALS					18	18	0

PROJECT NAME

PROJECT LOCATION

GRID SUMMARY

Name: 150' Spill
Spacing: 30.0'
Height: 3.0' above grade

ILLUMINATION SUMMARY

MAX VERTICAL FOOTCANDLES

Entire Grid

Scan Average: 0.0489

Maximum: 0.14

Minimum: 0.00

No. of Points: 54

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI

Luminaire Output: 136,000 / 89,600 / 52,000 lumens

No. of Luminaires: 18

Total Load: 17.0 kW

Luminaire Type	Lumen Maintenance	
	L90 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000
TLC-LED-900	>81,000	>81,000
TLC-BT-575	>81,000	>81,000

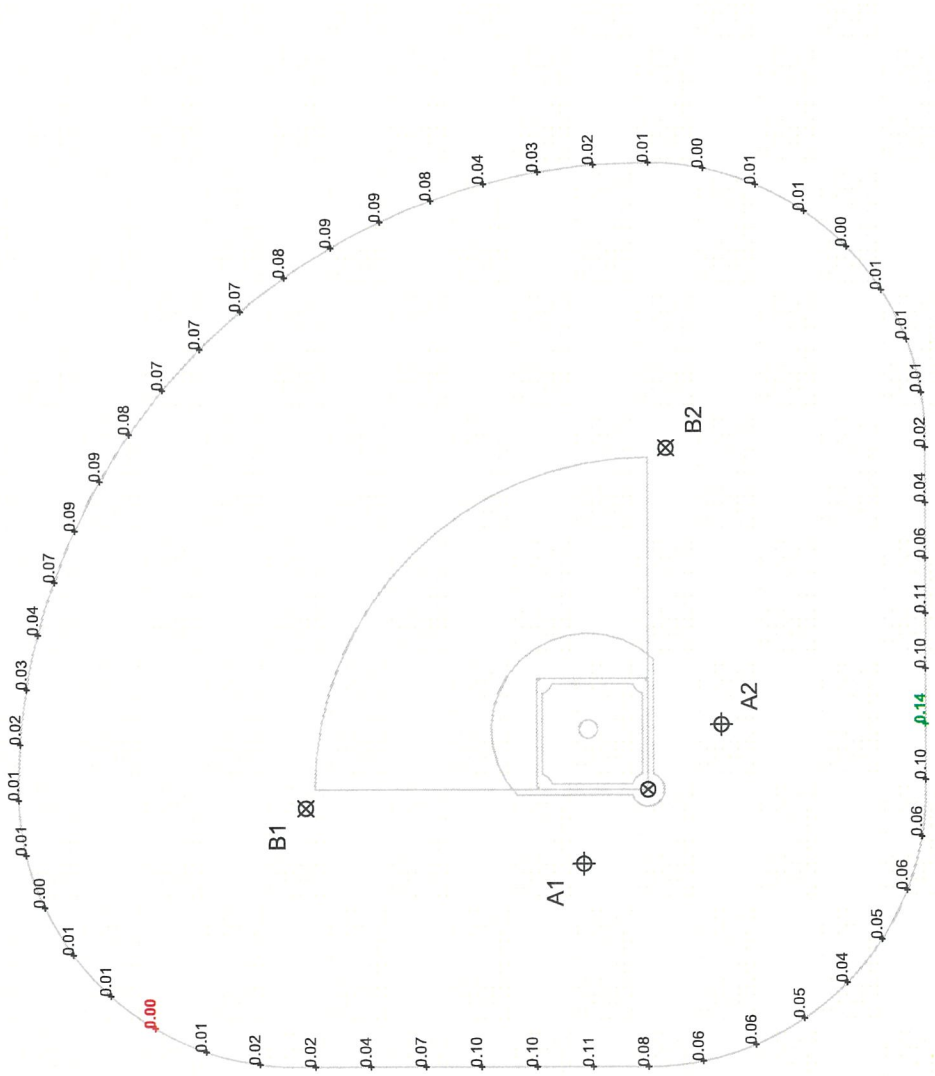
Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗



SCALE IN FEET 1 : 100

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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

Pole		Luminaires						
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	15.5'	TLC-BT-575	1	1	0
2	B1-B2	60'	-	15.5'	TLC-LED-900	3	3	0
4				60'	TLC-BT-575	1	1	0
4				60'	TLC-LED-1200	4	4	0
TOTALS						18	18	0

PROJECT NAME

PROJECT LOCATION

GRID SUMMARY

Name: 150' Spill
 Spacing: 30.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

CANDELA (PER FIXTURE)

Entire Grid

Scan Average: 3120,3503

Maximum: 6482.48

Minimum: 186.12

No. of Points: 54

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI

Luminaire Output: 136,000 / 89,600 / 52,000 lumens

No. of Luminaires: 18

Total Load: 17.0 KW

Luminaire Type	Lumen Maintenance		
	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

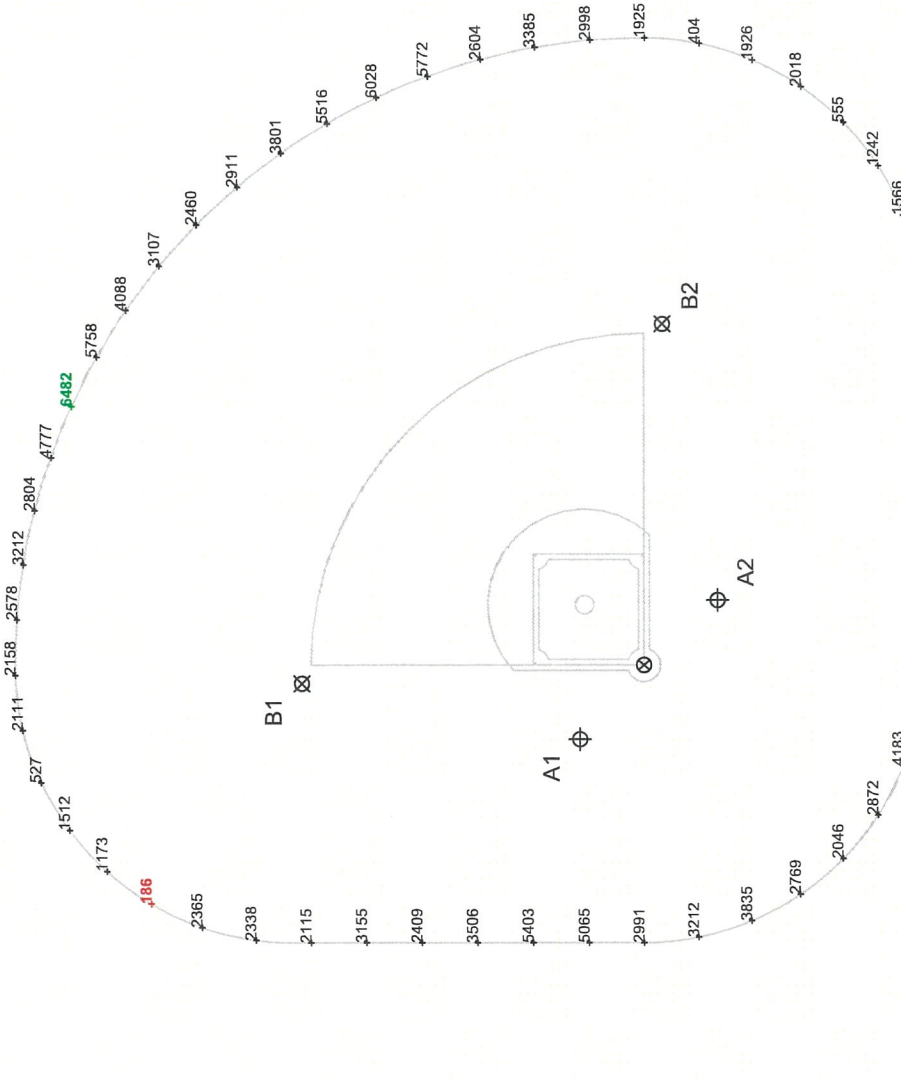
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY



Pole location(s) Ⓢ dimensions are relative to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 100



ENGINEERED DESIGN By: • File #SB53-181818-12-4P_C • 07-Aug-19

PROJECT NAME

PROJECT LOCATION

EQUIPMENT LAYOUT

INCLUDES:

- Baseball

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

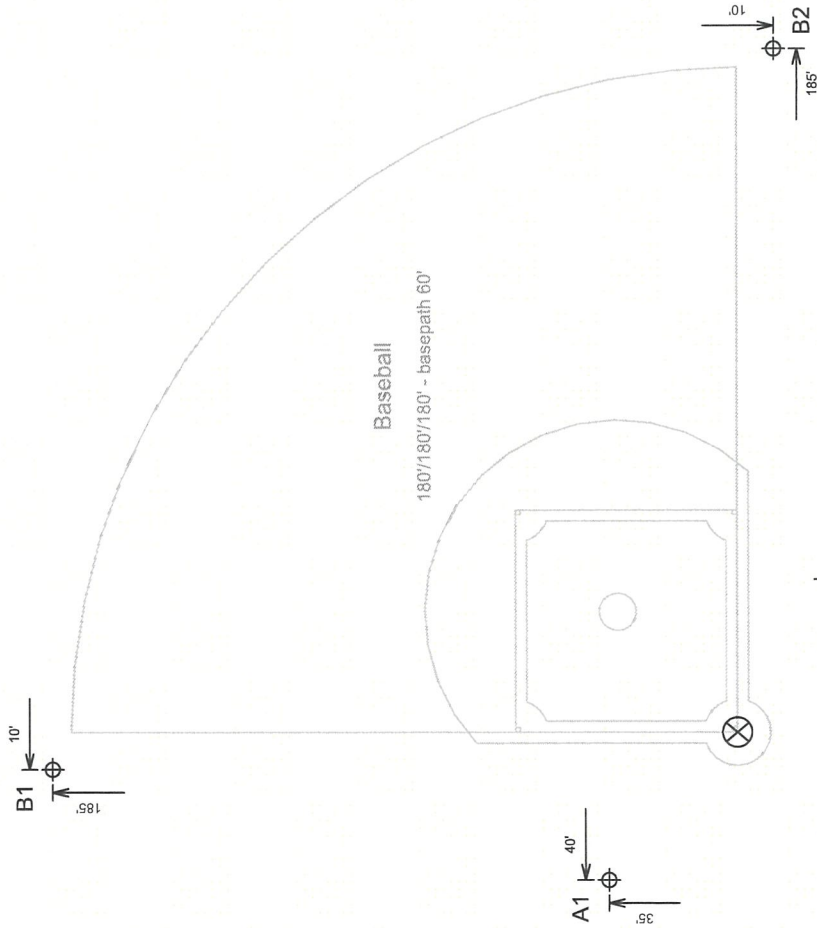
Installation Requirements: Results assume $\pm 3\%$ nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires		QTY/POLE
					LUMINAIRE TYPE	TYPE	
2	A1-A2	60'	-	15.5'	60'	TLC-BT-575	1
2	B1-B2	60'	-	15.5'	60'	TLC-LED-900	3
1						TLC-BT-575	1
4						TLC-LED-1200	4
TOTALS							18

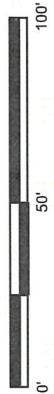
SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (50 min power factor)	Line Amperage Per Luminaire (max draw)					
	208 (0)	220 (0)	240 (0)	277 (0)	347 (0)	380 (0)
Single Phase Voltage	7.0	6.6	6.1	5.2	4.2	3.8
TLC-LED-1200	5.3	5.0	4.6	4.0	3.2	2.9
TLC-LED-900-A	3.4	3.2	2.9	2.5	2.0	1.8
TLC-BT-575						1.5



Pole location(s) Φ dimensions are relative to 0,0 reference point(s) \otimes

SCALE IN FEET 1 : 50



ENGINEERED DESIGN By: • File #SB53-181818-12-4P_C • 07-Aug-19



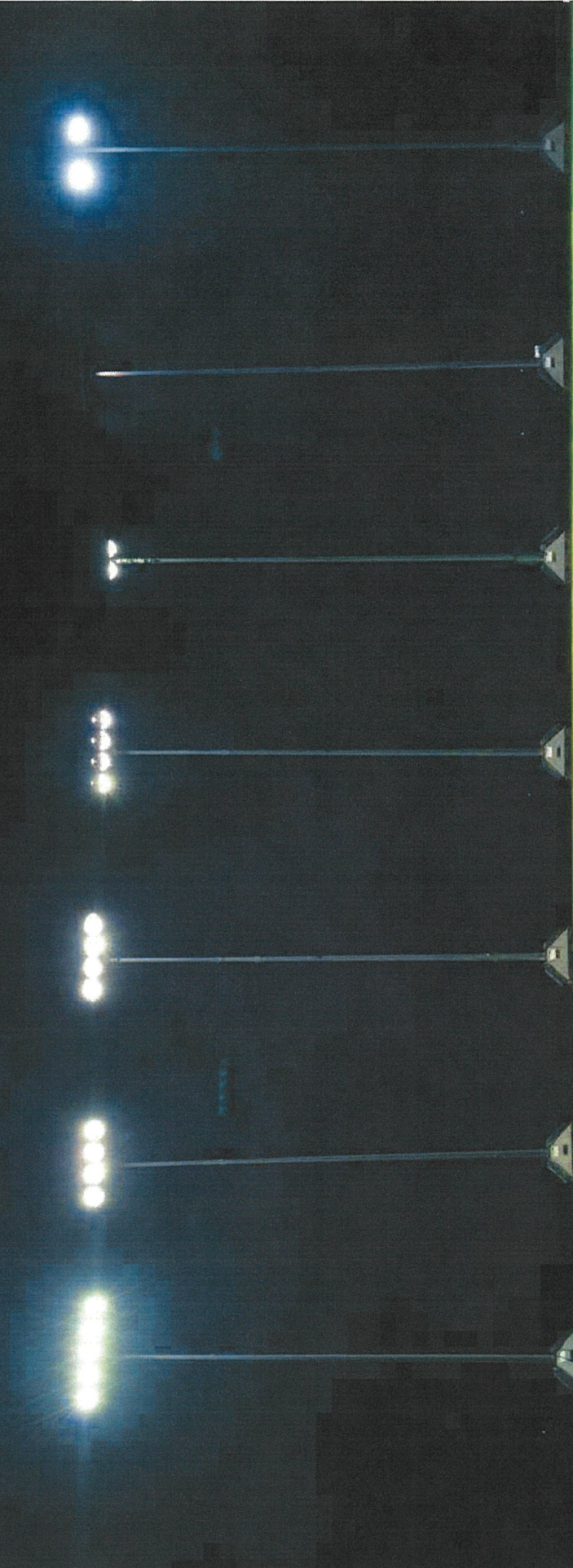
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What Matters in Lighting Technology

Light Control

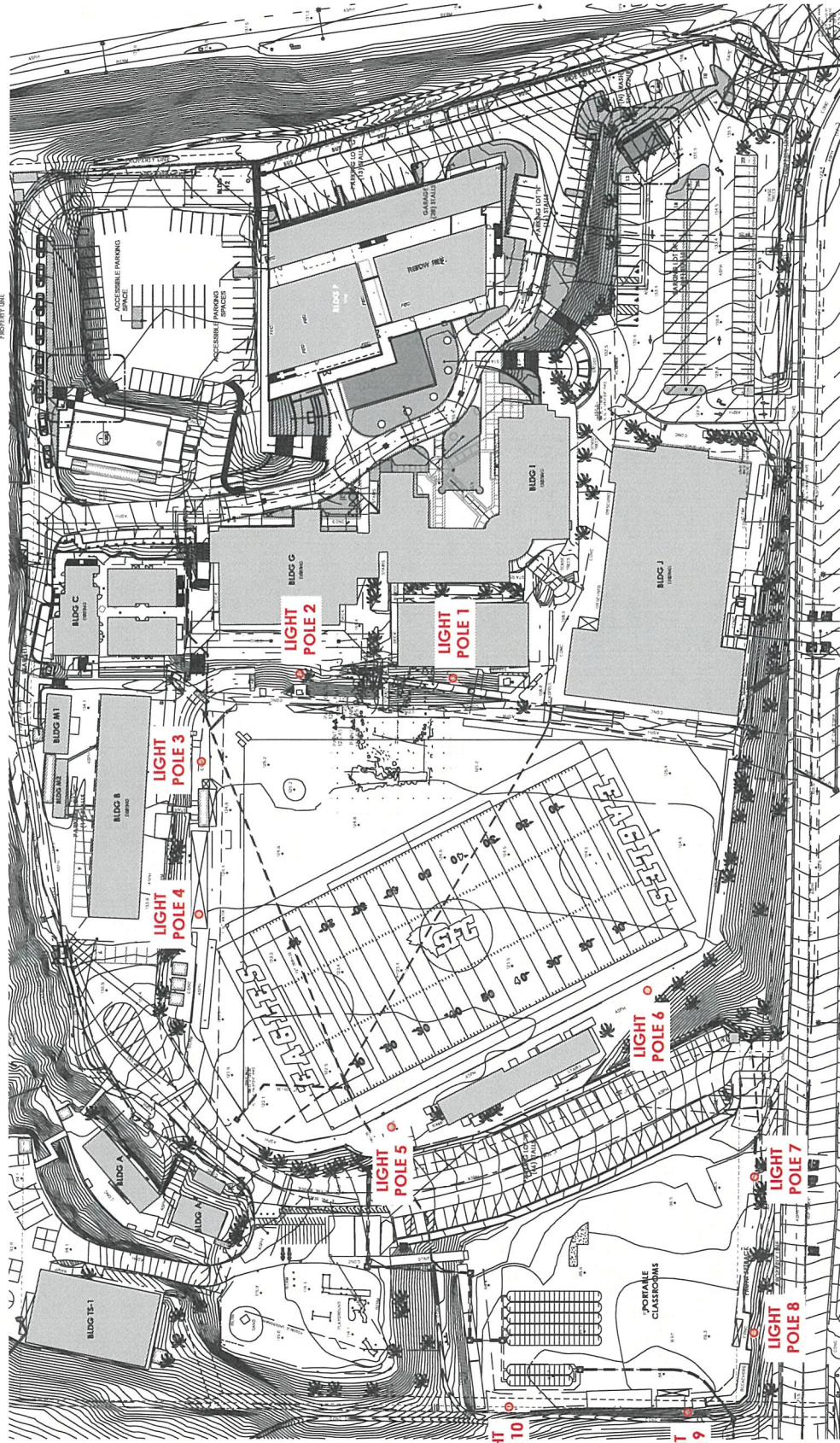
1977	1989	1989	2005	Today	Today
SportsCluster	SportsCluster.2	SportsCluster.2 Level 8"	SportsCluster.2 Total Light Control™	Light-Structure System™ TLC for LED™	Other Luminaire Manufacturer LED

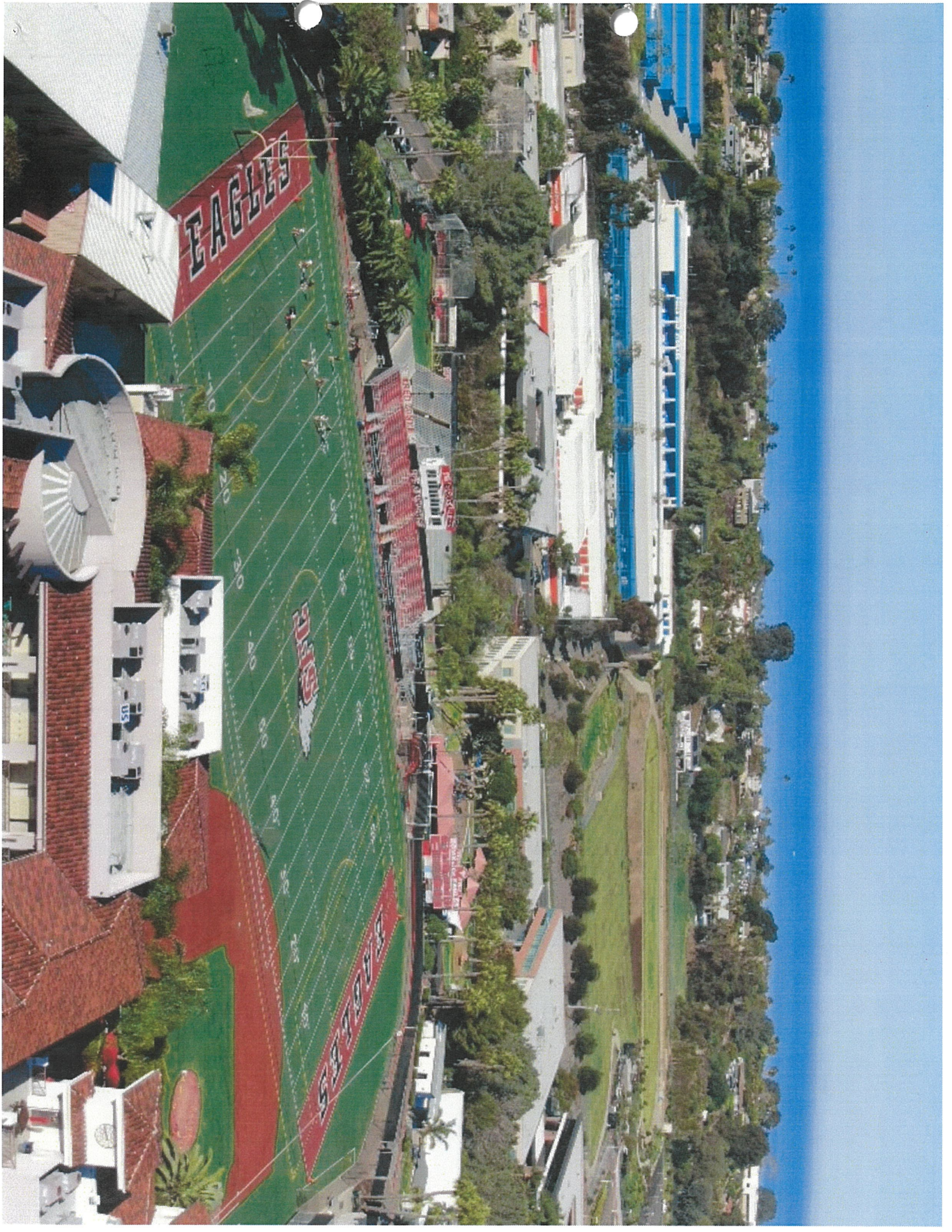


Photographed at 100 ft. (30 m) from field edge

Used equal parameters for:

- On-field light level per pole
- Wattage per luminaire
- Mounting height
- Luminaire aiming angles
- Pole distance from aiming point



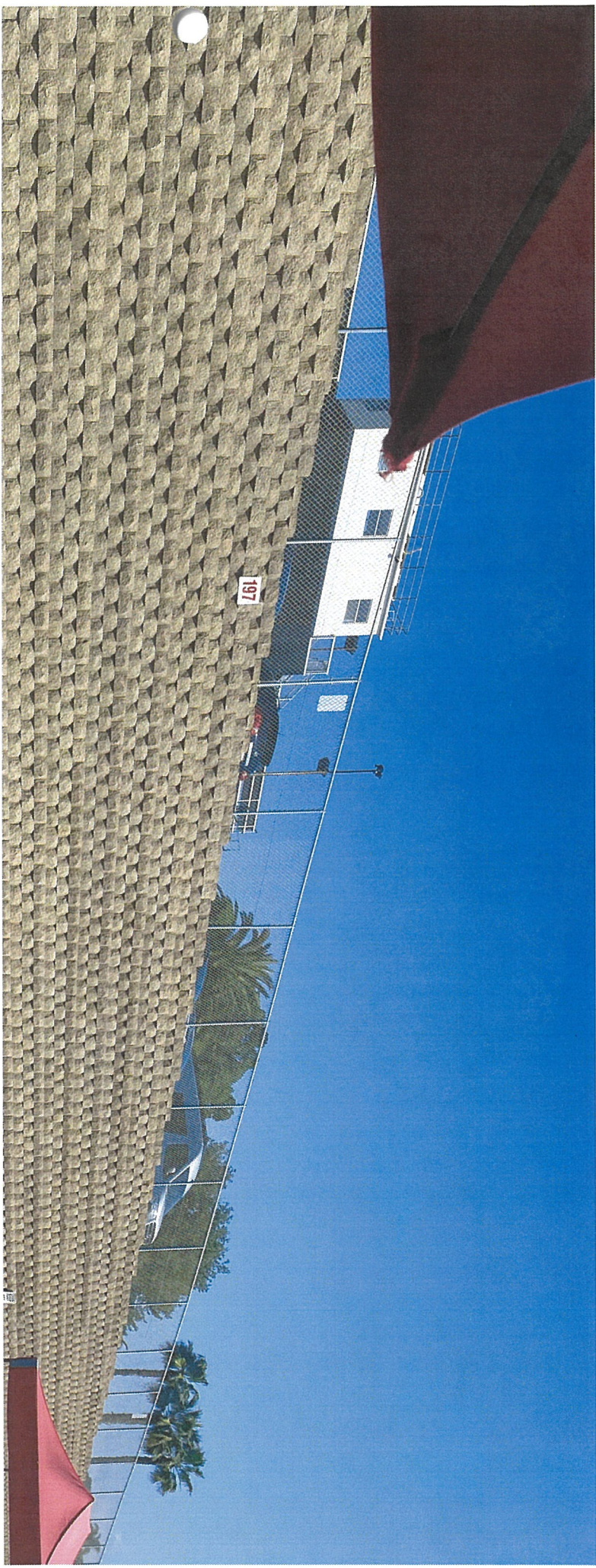






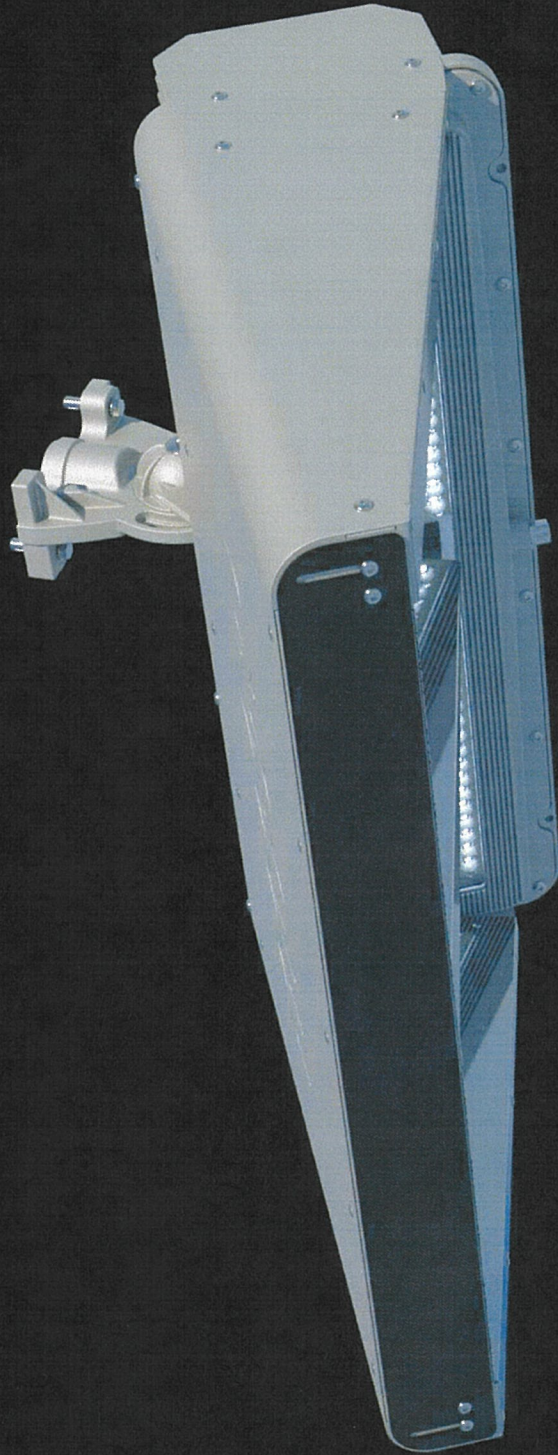






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Total Light Control™ - TLC-LED-1200 Luminaire



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Solutions for Lighting

Site Photo - Aerial View



Screenshot

Site Photo - Upper Field North



Site Photo - Upper Field South



Site Photo - Upper Field East



Site Photo - Upper Field West



Site Photo - Lower Field North



Site Photo - Lower Field South



ite Photo - Lower Field East



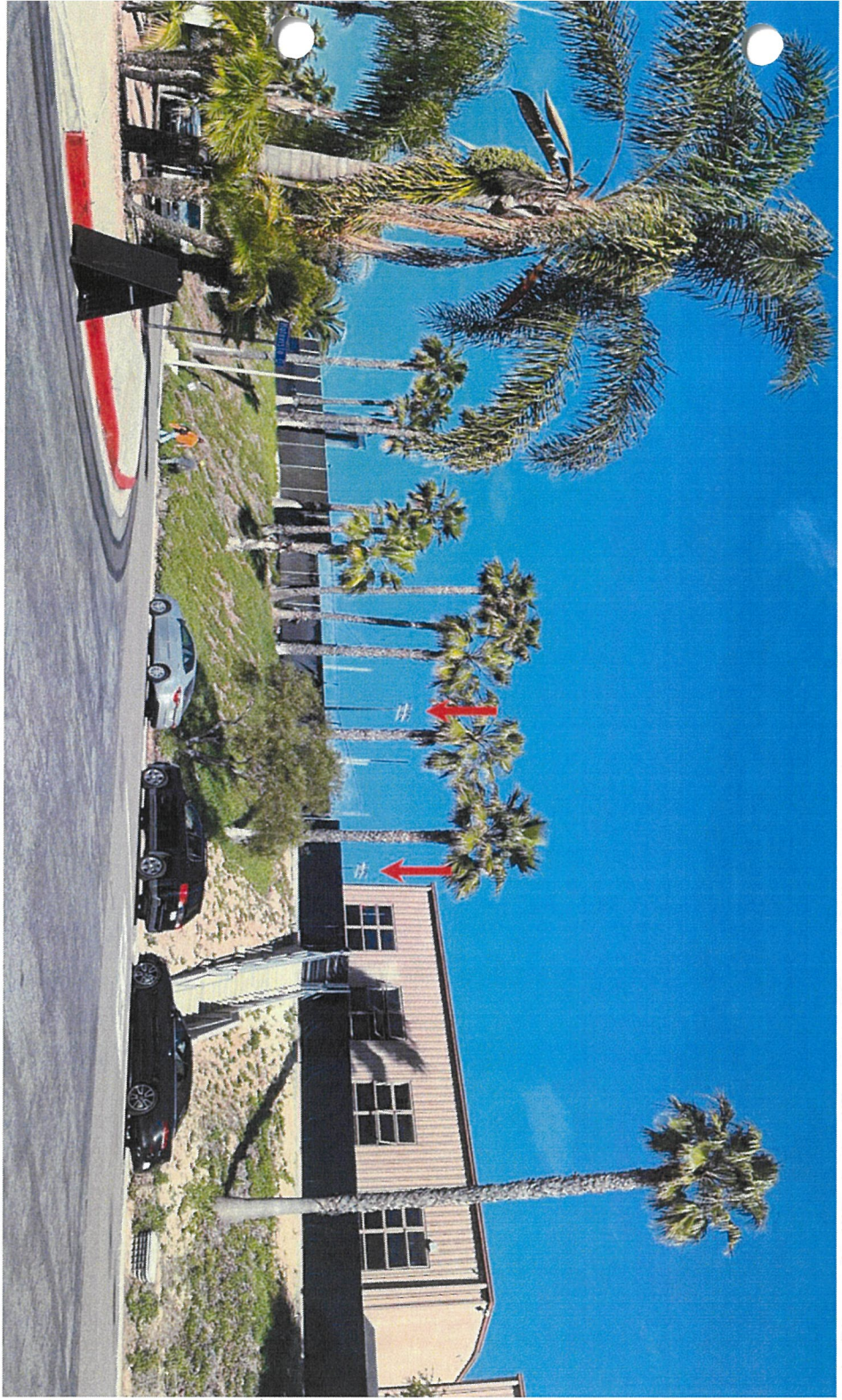
ite Photo - Lower Field West



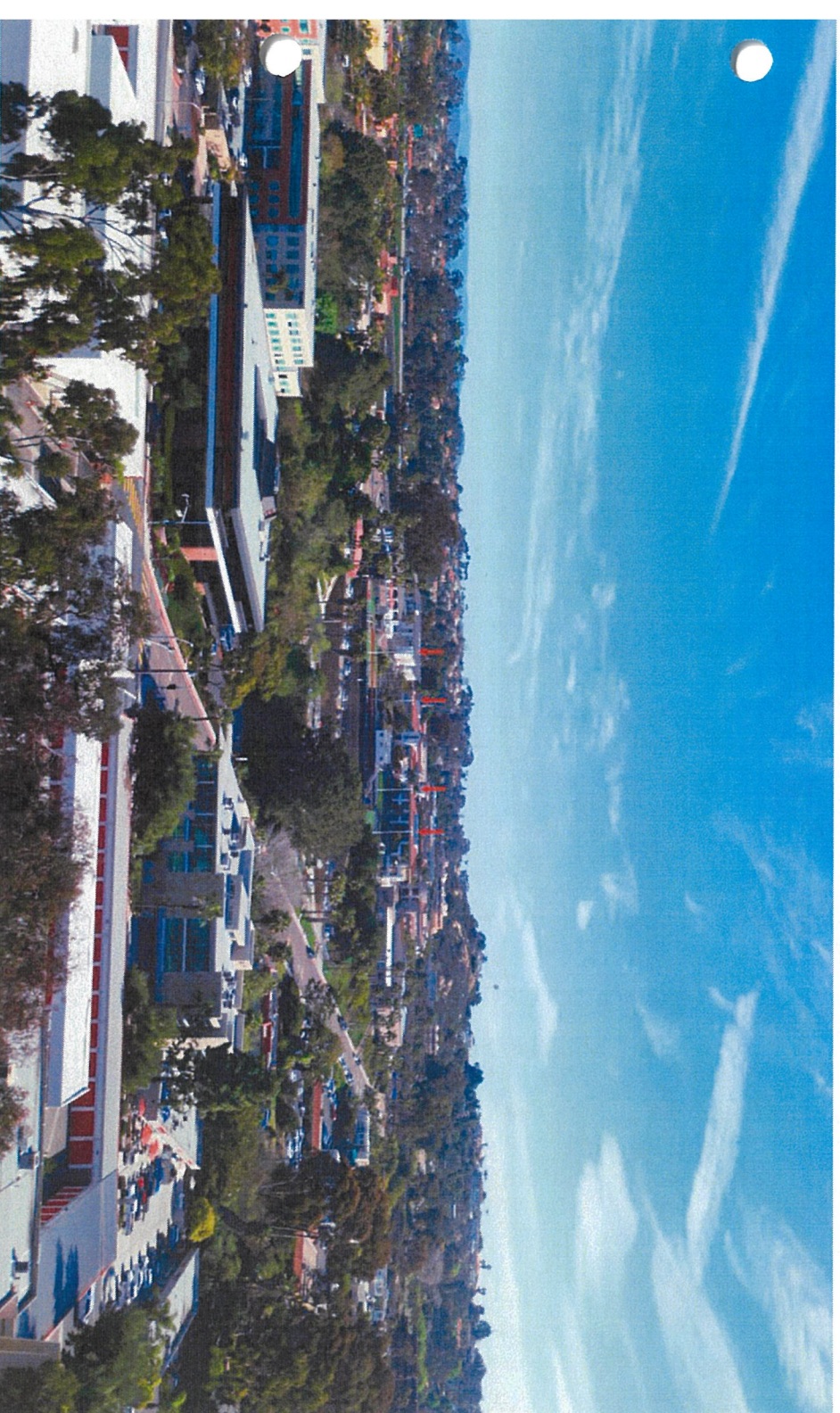
View Photo - Looking West

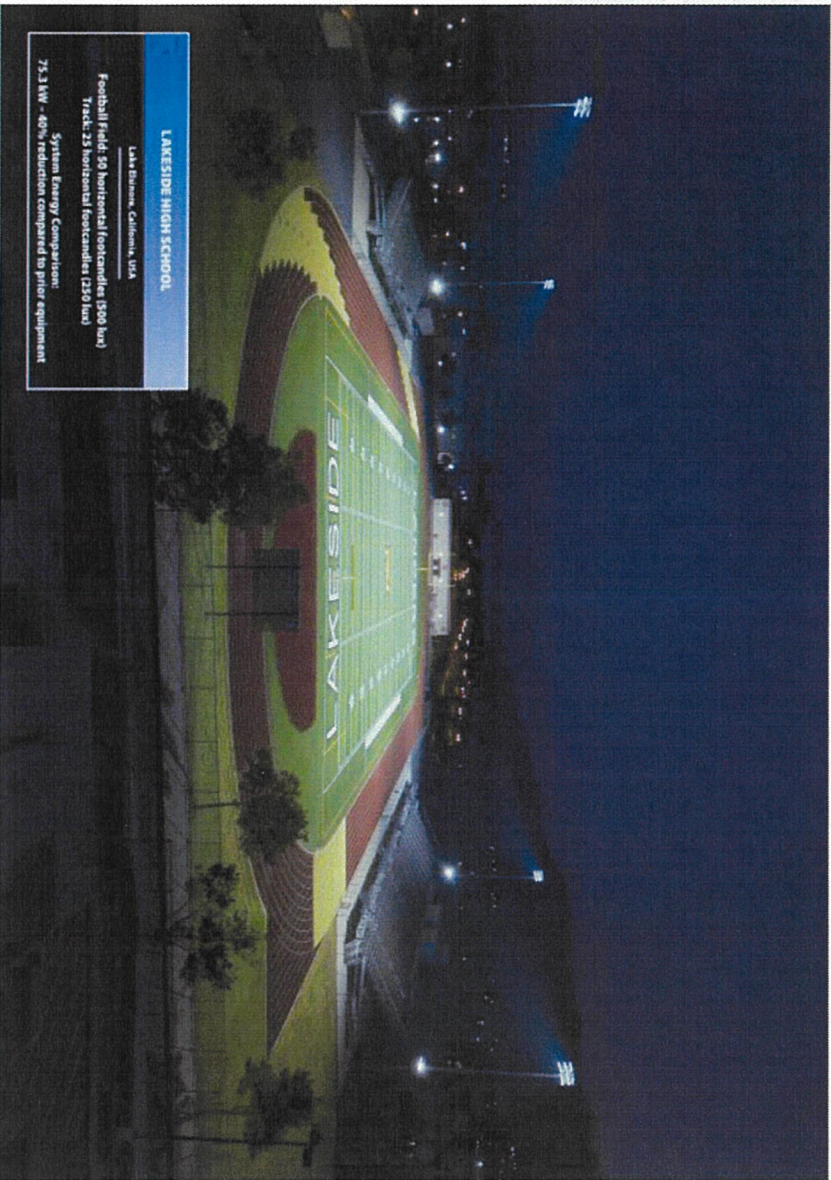


View Photo - Looking North



View Photo - Looking East





LAKE SIDE HIGH SCHOOL
Lake Elsinore, California, USA

Football Field: 50 horizontal footcandlers (500 lux)
Track: 25 horizontal footcandlers (250 lux)

System Energy Comparison:
79.1 kW - 40% reduction compared to prior equipment



Solutions for Lighting · TIC for LED®

What Matters in Lighting Technology Light Control

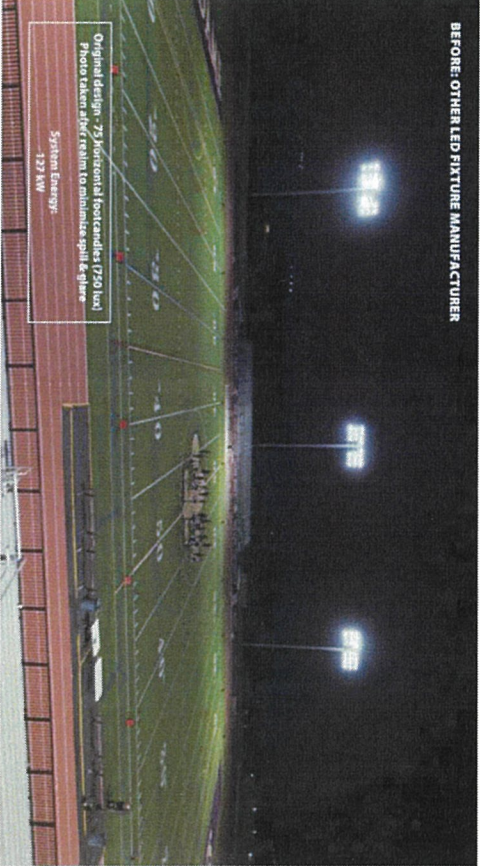
Musco: what can be

AFTER: TOTAL LIGHT CONTROL - TLC FOR LED™



What often is

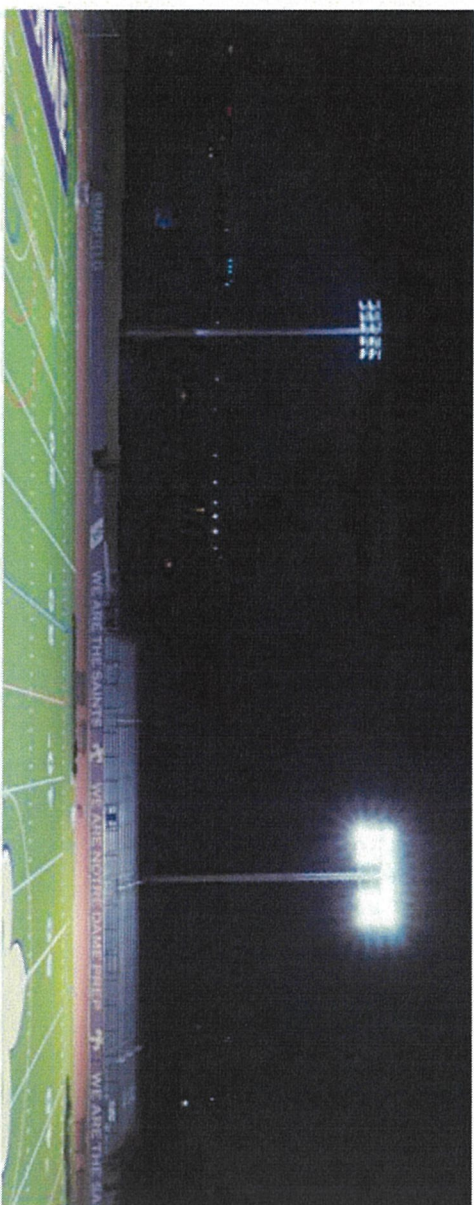
BEFORE: OBTAINED FIXTURE MANUFACTURER



Ausco Photos

What Matters in Lighting Technology

Light Control



Musco: what can be

What often is

TOTAL LIGHT CONTROL — TLC FOR LED™

OTHER LED MANUFACTURER

LIGHT LEVEL

75
horizontal footcandles
(759 lux)

75
horizontal footcandles
(750 lux)

ENERGY CONSUMPTION

103.5 kW

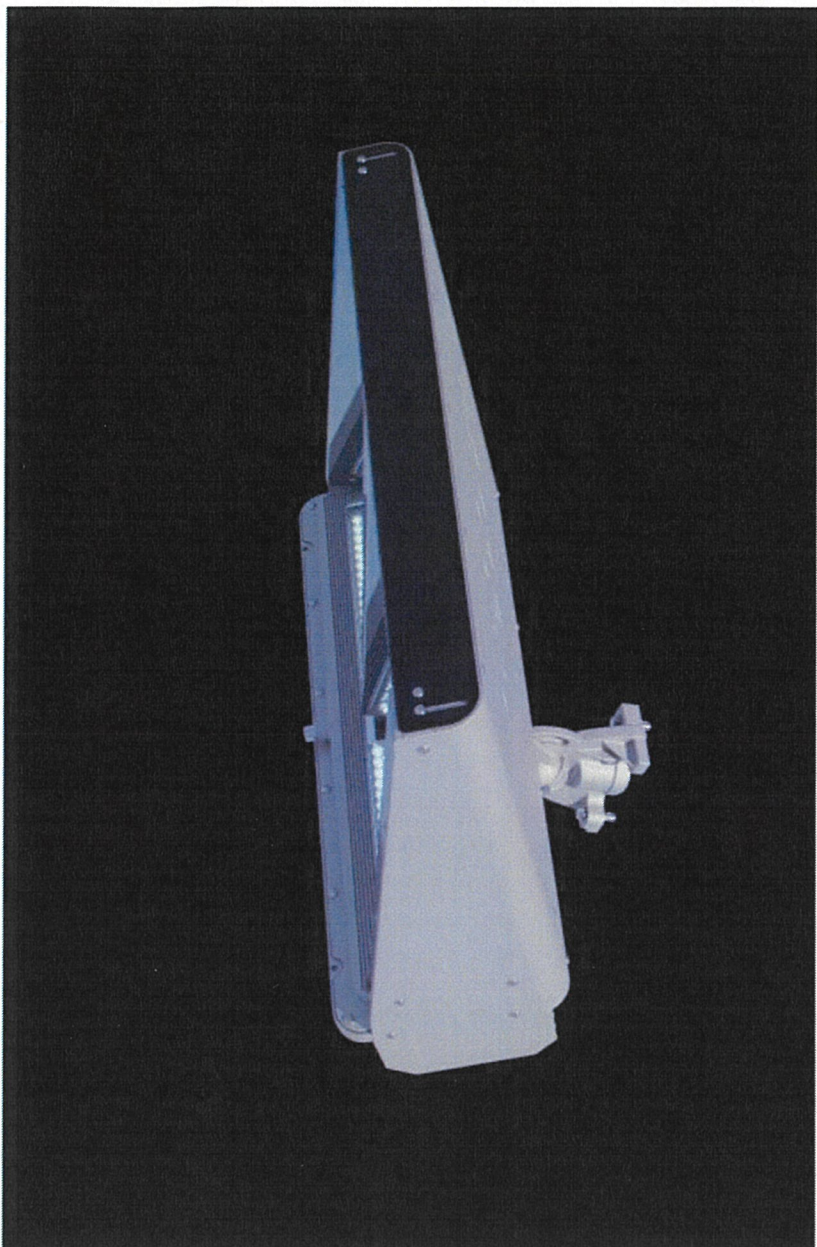
127 kW



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Solutions for Lighting

Total Light Control - TLC-LED-1200 Luminaire



www.ausco.com
AUSCO Lighting, Inc. 10000 10th Street, Suite 100, Houston, TX 77036

Solutions for Lighting

TLC for LED

Total Light Control

Superior light control and long term reliability

