

Appendix A Lighting Plan

Appendix

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Heideman Elementary School Park

Tustin, CA

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
BA1-BA2	40'	40'	2	TLC-LED-400	0.80 kW	B
BA3-BA4	40'	40'	2	TLC-LED-400	0.80 kW	C
S1-S2	70'	70'	4	TLC-LED-1200	4.68 kW	A
		70'	1	TLC-LED-900	0.89 kW	A
		16'	1	TLC-BT-575	0.58 kW	A
S3-S4	70'	70'	5	TLC-LED-1200	5.85 kW	A
		16'	1	TLC-BT-575	0.58 kW	A
8			32		28.34 kW	

Circuit Summary			
Circuit	Description	Load	Fixture Qty
A	Multipurpose	25.14 kW	24
B	Basketball 1	1.6 kW	4
C	Basketball 2	1.6 kW	4

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	136,000	>81,000	>81,000	>81,000	18
TLC-LED-400	LED 5700K - 75 CRI	400W	46,500	>81,000	>81,000	>81,000	8
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>81,000	>81,000	>81,000	4
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>81,000	>81,000	>81,000	2

Light Level Summary

Calculation Grid Summary								
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Baseball (Infield)	Horizontal Illuminance	50.4	38	64	1.70	1.33	A	24
Baseball (Outfield)	Horizontal Illuminance	36.3	23	48	2.11	1.58	A	24
Basketball 1	Horizontal Illuminance	45.7	37	60	1.60	1.23	B	4
Basketball 2	Horizontal Illuminance	45.7	37	60	1.60	1.23	C	4
Property Spill	Horizontal	0.03	0	0.41	0.00		A,B,C	32
Property Spill	Max Candela (by Fixture)	933	0	4769	0.00		A,B,C	32
Property Spill	Max Vertical Illuminance Metric	0.05	0	0.51	0.00		A,B,C	32
Soccer	Horizontal Illuminance	39.2	26	63	2.40	1.51	A	24

From Hometown to Professional



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EQUIPMENT LIST FOR AREAS SHOWN

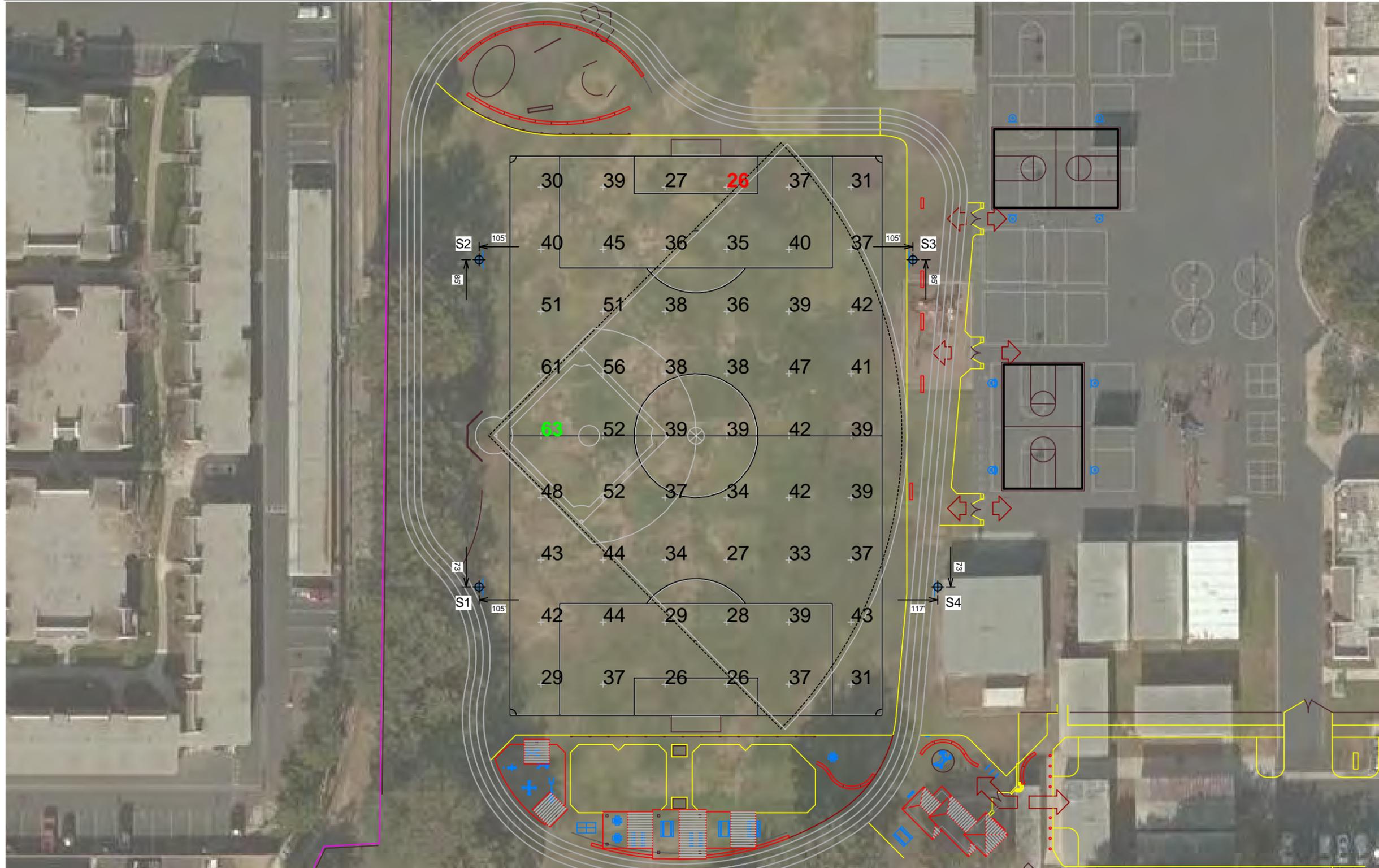
Pole			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	S1-S2	70'	-	70'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	4	4	0
2	S3-S4	70'	-	70'	TLC-BT-575	1	1	0
				15.5'	TLC-LED-1200	5	5	0
				70'	TLC-LED-1200	5	5	0
4	TOTALS					24	24	0

Heideman Elementary School Park
Tustin, CA

GRID SUMMARY	
Name:	Soccer
Size:	270' x 180'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
Entire Grid			
Guaranteed Average:	30		
Scan Average:	39.21		
Maximum:	63		
Minimum:	26		
Avg / Min:	1.49		
Guaranteed Max / Min:	2.5		
Max / Min:	2.40		
UG (adjacent pts):	1.52		
CU:	0.69		
No. of Points:	54		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	136,000 / 52,000 / 89,600 lumens		
No. of Luminaires:	24		
Total Load:	25.14 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000

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

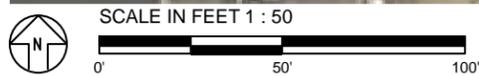


Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

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.



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



EQUIPMENT LIST FOR AREAS SHOWN

Pole		Luminaires						
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	S1-S2	70'	-	70'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	4	4	0
2	S3-S4	70'	-	15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	5	5	0
				70'	TLC-LED-1200	5	5	0
4	TOTALS					24	24	0

Heideman Elementary School Park
Tustin, CA

GRID SUMMARY	
Name:	Baseball
Size:	200'/200'/200' - 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:	50.36	36.27	
Maximum:	64	48	
Minimum:	38	23	
Avg / Min:	1.34	1.58	
Guaranteed Max / Min:	2	2.5	
Max / Min:	1.70	2.11	
UG (adjacent pts):	1.27	1.55	
CU:	0.57		
No. of Points:	25	73	
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	136,000 / 52,000 / 89,600 lumens		
No. of Luminaires:	24		
Total Load:	25.14 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000

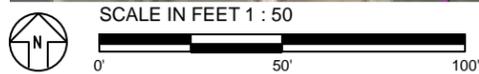
Reported per TM-21-11. See luminaire datasheet for details.

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EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	BA1, BA2	40'	-	40'	TLC-LED-400	2	2	0
2	TOTALS					4	4	0

Heideman Elementary School Park

Tustin, CA

GRID SUMMARY	
Name:	Basketball 1
Size:	60' x 38'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY	
MAINTAINED HORIZONTAL FOOTCANDLES	
Entire Grid	
Guaranteed Average:	40
Scan Average:	45.67
Maximum:	60
Minimum:	37
Avg / Min:	1.22
Guaranteed Max / Min:	2
Max / Min:	1.60
UG (adjacent pts):	1.47
CU:	0.60
No. of Points:	24

LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	46,500 lumens		
No. of Luminaires:	4		
Total Load:	1.6 kW		

Luminaire Type	Lumen Maintenance		
	L90 hrs	L80 hrs	L70 hrs
TLC-LED-400	>81,000	>81,000	>81,000

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

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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	BA3, BA4	40'	-	40'	TLC-LED-400	2	2	0
2	TOTALS							
						4	4	0

Heideman Elementary School Park

Tustin, CA

GRID SUMMARY	
Name:	Basketball 2
Size:	38' x 60'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
Entire Grid			
Guaranteed Average:	40		
Scan Average:	45.67		
Maximum:	60		
Minimum:	37		
Avg / Min:	1.22		
Guaranteed Max / Min:	2		
Max / Min:	1.60		
UG (adjacent pts):	1.47		
CU:	0.60		
No. of Points:	24		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	46,500 / 89,600 lumens		
No. of Luminaires:	4		
Total Load:	1.6 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-400	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
Reported per TM-21-11. See luminaire datasheet for details.			



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ILLUMINATION SUMMARY

Heideman Elementary School Park

Tustin, CA

EQUIPMENT LIST FOR AREAS SHOWN								
Pole			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	BA1, BA2 BA3, BA4	40'	-	40'	TLC-LED-400	2	2	0
2	S1-S2	70'	-	70'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	4	4	0
2	S3-S4	70'	-	15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	5	5	0
8	TOTALS					32	32	0

GRID SUMMARY	
Name:	Property Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
HORIZONTAL FOOTCANDLES			
		Entire Grid	
Scan Average:	0.0292		
Maximum:	0.41		
Minimum:	0.00		
No. of Points:	75		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	136,000 / 46,500 / 52,000 / 89,600 lumens		
No. of Luminaires:	32		
Total Load:	28.34 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-400	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
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Heideman Elementary School Park

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EQUIPMENT LIST FOR AREAS SHOWN								
Pole			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	BA1, BA2 BA3, BA4	40'	-	40'	TLC-LED-400	2	2	0
2	S1-S2	70'	-	70'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	4	4	0
2	S3-S4	70'	-	15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	5	5	0
8	TOTALS					32	32	0

GRID SUMMARY	
Name:	Property Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAX VERTICAL FOOTCANDLES			
Entire Grid	0.0544		
Scan Average:	0.51		
Maximum:	0.00		
Minimum:	75		
No. of Points:			
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	136,000 / 46,500 / 52,000 / 89,600 lumens		
No. of Luminaires:	32		
Total Load:	28.34 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-400	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
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Heideman Elementary School Park

Tustin, CA

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Pole			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	BA1, BA2 BA3, BA4	40'	-	40'	TLC-LED-400	2	2	0
2	S1-S2	70'	-	70'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	4	4	0
2	S3-S4	70'	-	15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	5	5	0
8	TOTALS					32	32	0

GRID SUMMARY	
Name:	Property Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
CANDELA (PER FIXTURE)			
Entire Grid			
Scan Average:	933.0376		
Maximum:	4768.77		
Minimum:	0.00		
No. of Points:	75		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	136,000 / 46,500 / 52,000 / 89,600 lumens		
No. of Luminaires:	32		
Total Load:	28.34 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-400	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
Reported per TM-21-11. See luminaire datasheet for details.			

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Heideman Elementary School Park

Tustin, CA

EQUIPMENT LAYOUT

INCLUDES:

- Baseball
- Basketball 1
- Basketball 2
- Soccer

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

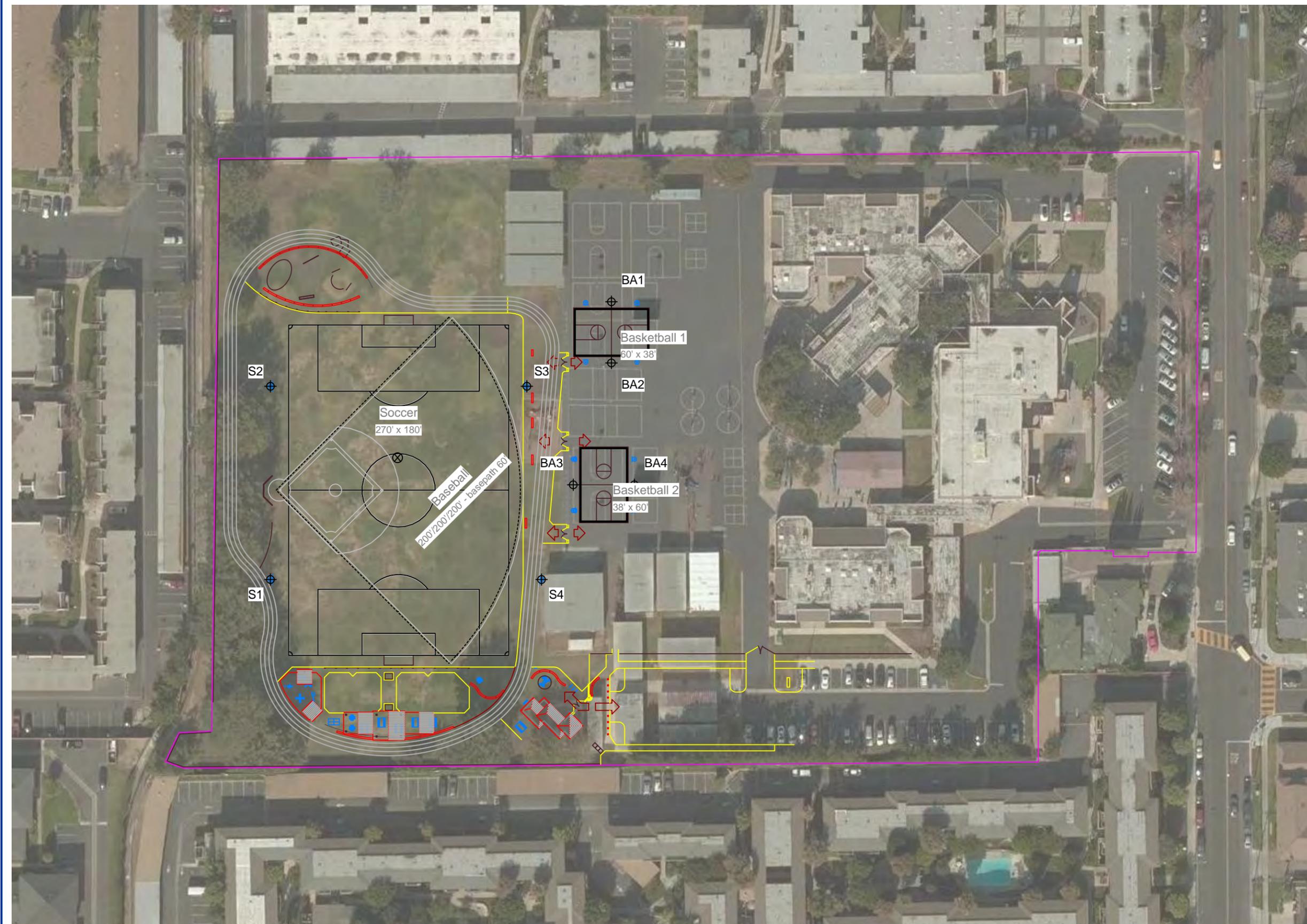
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EQUIPMENT LIST FOR AREAS SHOWN

QTY	Pole			Luminaires		
	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
4	BA1, BA2 BA3, BA4	40'	-	40'	TLC-LED-400	2
2	S1-S2	70'	-	70'	TLC-LED-900	1
				15.5'	TLC-BT-575	1
				70'	TLC-LED-1200	4
2	S3-S4	70'	-	15.5'	TLC-BT-575	1
				70'	TLC-LED-1200	5
8	TOTALS					32

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)					
	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	480 (60)
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	480 (60)
TLC-LED-1200	7.0	6.6	6.1	5.2	4.2	4.0
TLC-LED-400	2.3	2.2	2.0	1.7	1.4	1.3
TLC-BT-575	3.4	3.2	2.9	2.5	2.0	1.8
TLC-LED-900	5.3	5.0	4.6	4.0	3.2	2.9



SCALE IN FEET 1 : 80



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