



ILLUMINATION MANAGEMENT PLAN

for

Loyal Heights Playfield

Purpose

This Illumination Management Plan for lighting improvements at Loyal Heights Playfield describes the program controls that establish the duration of field lighting, the types of operational controls that will be used, and the anticipated performance of the controls. The performance is described in terms of foot candles of illumination that will be measurable at various points on and around the playing field. The attached Exhibit A graphic shows that the design will reduce the lighting trespass to nearly zero (0) foot candles at the residential properties east, west and south of the playfield. Actual performance of the lighting system will be tested after installation, and adjusted if necessary to meet these planned levels.

Program Controls

The field lights proposed for Loyal Heights Playfield will be operated during several hours of darkness throughout the year, to accommodate evening play. The evening usage under these lights will be approximately 1090 hours per year, according to anticipated event scheduling six (6) days a week, Monday through Saturday, from dusk until 10 PM. Security lights will remain on until 10:15 PM to allow participants to leave the field safely. There will be no lights in operation on Sundays. Note that these hours and days of operation are as approved by the Seattle City Council action on September 25, 2006, Clerk File Number: 307855, and Resolution 30530 adopted October 7, 2002. Allowing for seasonal fluctuations of natural light, this will amount to lighting operation from 2 to 5 hours per night. The operational controls described below will allow for the lights to be turned off if there is no scheduled play on a given night because of inclement weather or other reasons.

Lighting Operation Controls

The field lights will be operated by an Energy Management Control System (EMCS). This is a remote programmable astronomical control system.

This wireless remote control system automatically turn lights on and off based on field reservations made within the City of Seattle Parks and Recreation Department's field reservation software. The lights will only be scheduled to go on during dark time and will be scheduled to go off according to field reservation ending times. Additionally, should there be any need to turn on or off the field lights due to rainouts, cancellations, last minute field reservations, etc., Seattle parks personnel can utilize any telephone or use the Internet to remotely control the lights from anywhere in the world. The control units receive their communication from a land and satellite based public wireless infrastructure. The system also entails manual override switches in case of remote control malfunction and/or if all else fails, the city maintains an emergency number at 206-910-0540 which is staffed daily until 10:00 pm to turn on or off problem lights. The controller manufacturer also maintains a 24/7/365 staffed technical support line to assist city personnel.

Lighting Design and Performance

The attached Exhibit A diagrams show numerically what the initial foot candles of illumination will be at various points on the field and nearby. There are three diagrams showing the lighting levels for each field during use. Only one field lighting pattern will be lit at one time. The inside contours show lighting levels within the field. The outside contour line shows where light levels will drop to one (1) foot candles. The light levels drop to nearly zero (0) at the residential properties east, west and south of the playfield.

Exhibit A, following

- Part 1 - Baseball Field Illumination Levels
- Part 2 - Softball Field Illumination Levels
- Part 3 - Soccer Field Illumination Levels

| EQUIPMENT LIST FOR AREAS SHOWN | | | | | | | | | |
|--------------------------------|----------|------|-----------------|-----------------|-----------|------------|-----------|-------------|---|
| Pole | | | | Luminaires | | | | | |
| QTY | LOCATION | SIZE | GRADE ELEVATION | MOUNTING HEIGHT | LAMP TYPE | QTY / POLE | THIS GRID | OTHER GRIDS | |
| 2 | A1-A2 | 80' | - | 80' | 1500W MZ | 3 | 3 | 0 | |
| 2 | B1-B2 | 80' | - | 80' | 1500W MZ | 7 | 7 | 0 | |
| 2 | B3-B4 | 80' | - | 80' | 1500W MZ | 6 | 6 | 0 | |
| 6 | TOTALS | | | | | | 32 | 32 | 0 |



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

BB BLANKET
Loyal Heights Playfields

BB BLANKET
· Grid Spacing = 30.0' x 30.0'
· Values given at 5.0' above grade

· Luminaire Type: Green Generation
· Rated Lamp Life: 5000 hours
· Avg Lumens/Lamp: 134,000

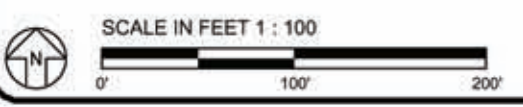
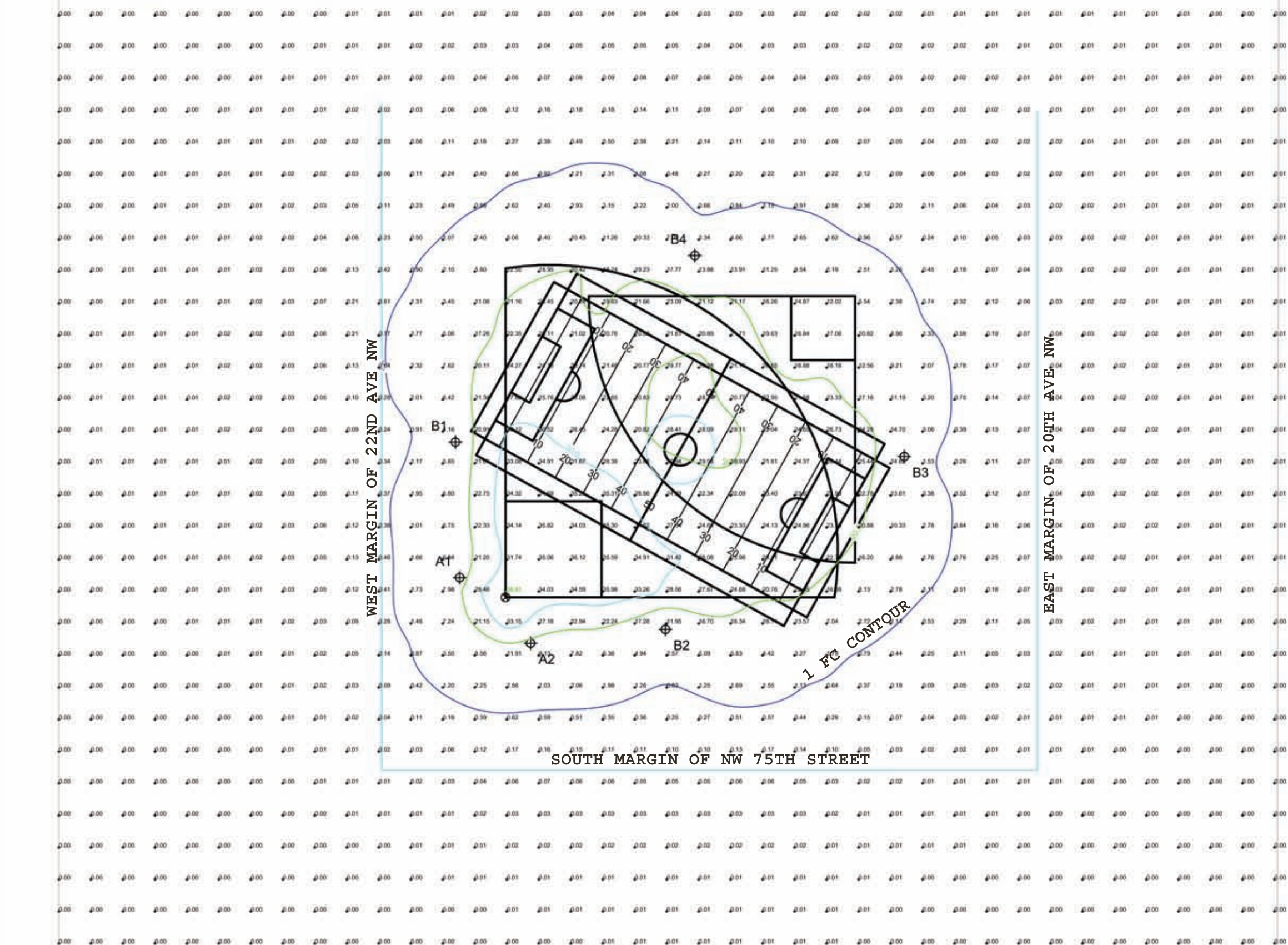
| CONSTANT ILLUMINATION HORIZONTAL FOOTCANDLES | |
|--|----------|
| Entire Grid | |
| No. of Target Points: | 1365 |
| Average: | 2.9 |
| Maximum: | 37 |
| Minimum: | 0 |
| Avg/Min: | 7258.12 |
| Max/Min: | 92285.96 |
| UG (Adjacent Pts): | 9.57 |
| CV: | 3 |
| Average Lamp Tilt Factor: | 1.000 |
| Number of Luminaires: | 32 |
| Avg KW over 5000 hours: | 50.05 |
| Max KW: | 54.4 |

Guaranteed Performance: The CONSTANT ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Averages shall be +/-10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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 ballast and structures located within 3 feet (1m) of design locations.



Pole location(s) + dimensions are relative to 0.0 reference point(s)

EXHIBIT A - PART 1
BASEBALL FIELD ILLUMINATION LEVELS

By: Matt Smith Date: 26-Oct-06
File #: 113859R2SP

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| EQUIPMENT LIST FOR AREAS SHOWN | | | | | | | | | |
|--------------------------------|----------|------|-----------------|-----------------|-----------|------------|-----------|-------------|---|
| Pole | | | | Luminaires | | | | | |
| QTY | LOCATION | SIZE | GRADE ELEVATION | MOUNTING HEIGHT | LAMP TYPE | QTY / POLE | THIS GRID | OTHER GRIDS | |
| 2 | A3-A4 | 80' | - | 80' | 1500W MZ | 2 | 2 | 0 | |
| 2 | B1-B2 | 80' | - | 80' | 1500W MZ | 7 | 7 | 0 | |
| 2 | B3-B4 | 80' | - | 80' | 1500W MZ | 6 | 6 | 0 | |
| 6 | TOTALS | | | | | | 30 | 30 | 0 |



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

SB BLANKET
Loyal Heights Playfields

SB BLANKET
· Grid Spacing = 30.0' x 30.0'
· Values given at 5.0' above grade

· Luminaire Type: Green Generation
· Rated Lamp Life: 5000 hours
· Avg Lumens/Lamp: 134,000

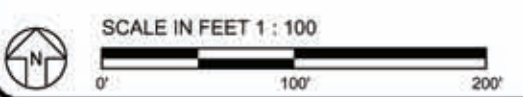
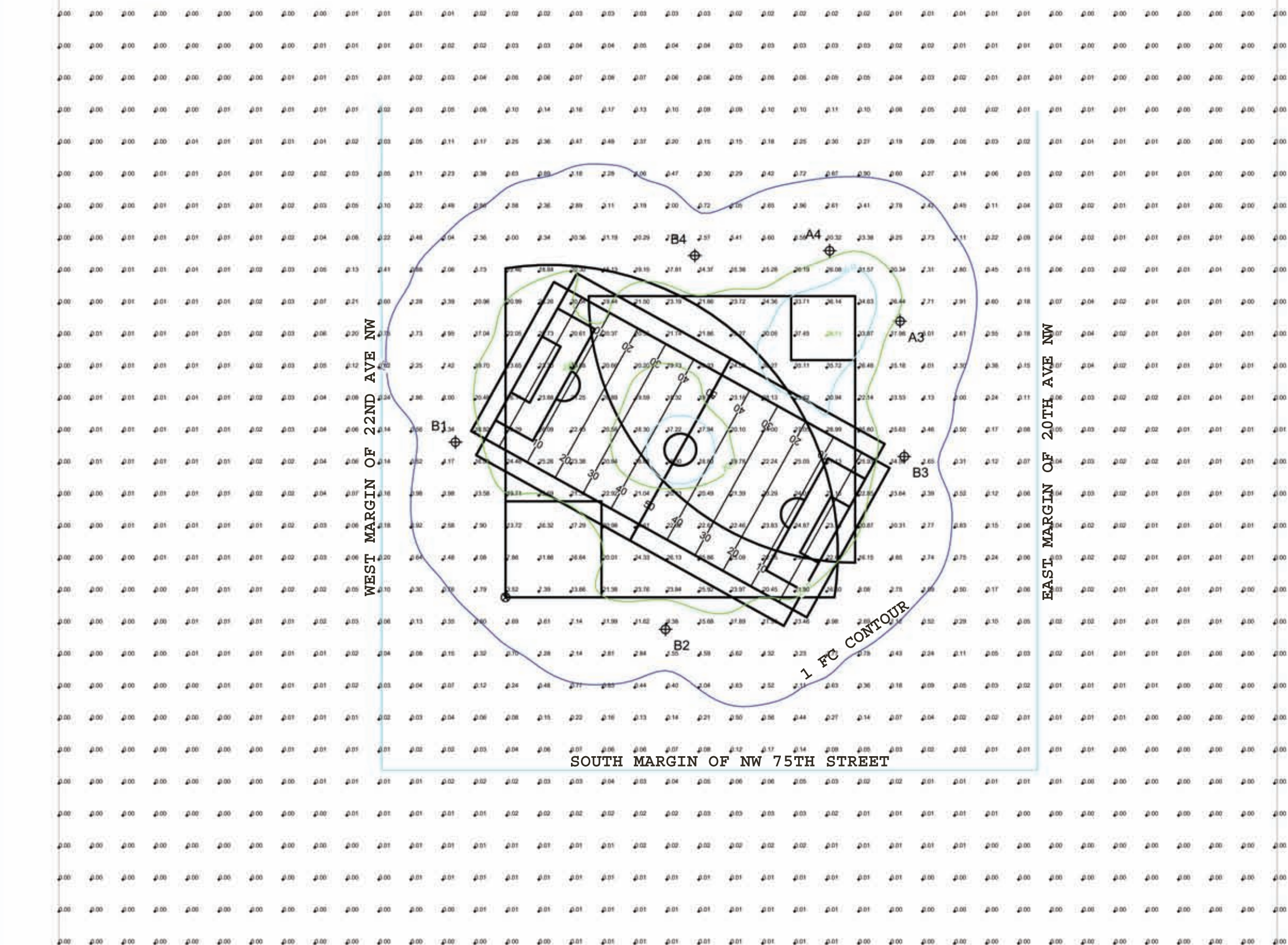
| CONSTANT ILLUMINATION HORIZONTAL FOOTCANDLES | |
|--|-----------|
| Entire Grid | |
| No. of Target Points: | 1365 |
| Average: | 2.7 |
| Maximum: | 38 |
| Minimum: | 0 |
| Avg/Min: | 7313.59 |
| Max/Min: | 103014.81 |
| UG (Adjacent Pts): | 9.02 |
| CV: | 3 |
| Average Lamp Tilt Factor: | 1.000 |
| Number of Luminaires: | 30 |
| Avg KW over 5000 hours: | 46.92 |
| Max KW: | 51.0 |

Guaranteed Performance: The CONSTANT ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Averages shall be +/-10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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 ballast and structures located within 3 feet (1m) of design locations.



Pole location(s) + dimensions are relative to 0.0 reference point(s)

EXHIBIT A - PART 2
SOFTBALL FIELD ILLUMINATION LEVELS

By: Matt Smith Date: 26-Oct-06
File #: 113859R2SP

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| EQUIPMENT LIST FOR AREAS SHOWN | | | | | | | | | |
|--------------------------------|----------|------|-----------------|-----------------|-----------|------------|-----------|-------------|---|
| Pole | | | | Luminaires | | | | | |
| QTY | LOCATION | SIZE | GRADE ELEVATION | MOUNTING HEIGHT | LAMP TYPE | QTY / POLE | THIS GRID | OTHER GRIDS | |
| 2 | B1-B2 | 80' | - | 80' | 1500W MZ | 7 | 7 | 0 | |
| 2 | B3-B4 | 80' | - | 80' | 1500W MZ | 6 | 6 | 0 | |
| 4 | TOTALS | | | | | | 26 | 26 | 0 |



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

FB BLANKET
Loyal Heights Playfields

FB BLANKET
· Grid Spacing = 30.0' x 30.0'
· Values given at 5.0' above grade

· Luminaire Type: Green Generation
· Rated Lamp Life: 5000 hours
· Avg Lumens/Lamp: 134,000

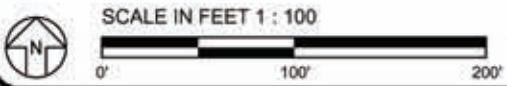
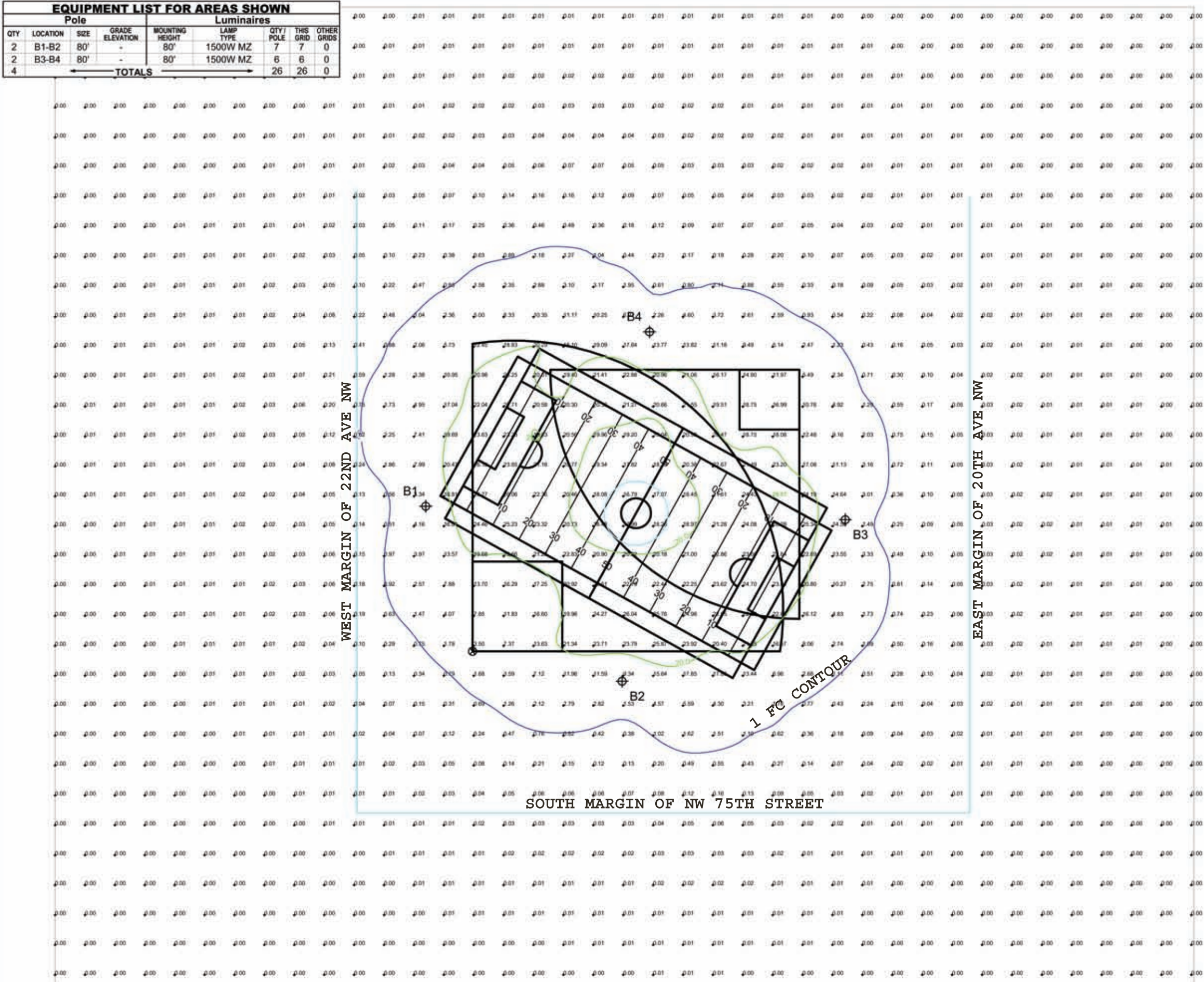
| CONSTANT ILLUMINATION HORIZONTAL FOOTCANDLES | |
|--|----------|
| No. of Target Points: | 1365 |
| Average: | 2.3 |
| Maximum: | 27 |
| Minimum: | 0 |
| Avg/Min: | 6312.41 |
| Max/Min: | 71828.01 |
| UG (Adjacent Pts): | 9.80 |
| CV: | 3 |
| Average Lamp Tilt Factor: | 1.000 |
| Number of Luminaires: | 26 |
| Avg KW over 5000 hours: | 40.66 |
| Max KW: | 44.2 |

Guaranteed Performance: The CONSTANT ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Averages shall be +/-10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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 ballast and structures located within 3 feet (1m) of design locations.



Pole location(s) + dimensions are relative to 0.0 reference point(s)

EXHIBIT A - PART 3
SOCCER FIELD ILLUMINATION LEVELS

By: Matt Smith Date: 26-Oct-06
File #: 113859R2SP

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