



Oak Park - LED Lighting Project

Simplified Living
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History



Overview of Lend Lease

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History

More Than 50 Years' Property Experience



Leader

As a global leader, we understand the importance of building communities that stand the test of time, enrich people's lives and foster economic growth.

"Our future lies in building relationships with all stakeholders to deliver the best outcomes imaginable. Our leadership in sustainable practices ensures this will be achieved."

Steve McCann

Group Chief Executive Officer and
Managing Director
Lend Lease

Lend Lease:

- Is one of the leading fully integrated property solutions providers in the world
- Has more than 50 years of operation
- 18,000 employees
- Develops, constructs and/or manages large, complex projects
- Specializes across multiple asset classes
- A\$12.3 billion funds under management (30 June 2012)
- Is committed to creating and building innovative and sustainable solutions
- Operates Incident & Injury Free

Where we are - Americas



Key Areas of Focus



Americas

- 18 offices throughout U.S., and Latin America
- Project Experience in all 50 States, Latin America and Canada
- Approximately 2,100 employees

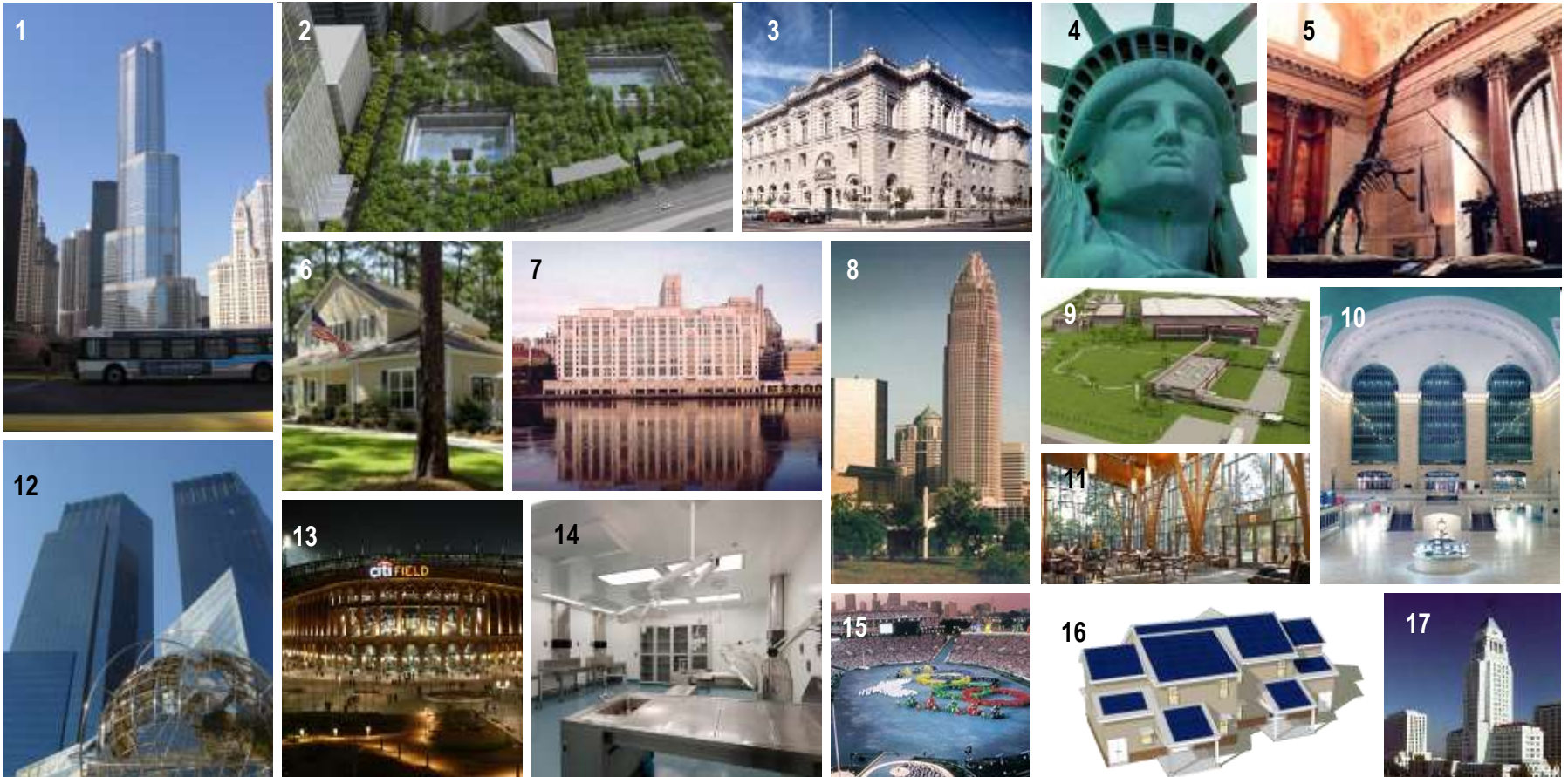
Project Management & Construction

- Ranked among the top fifteen construction managers/contractors for seventeen consecutive years by *Building Design + Construction* (1996 — 2012)
- Ranked largest Multi-Unit Residential Contractors by *ENR* Magazine in 2011
- Ranked as one of the top ten largest healthcare contractors for 22 consecutive years by *Modern Healthcare*

Public Partnerships

- Lend Lease manages 40,000 residential units and 8,000+ Army lodging rooms
- Largest share of privatized housing contracts with the U.S. Army
- Largest solar-powered communities at Army Hawaii and Davis-Monthan Air Force Base
- Constructed the first Zero Energy Homes on a Military Installation
- Won the first Privatized Army Lodging (PAL) program
- Won 2011 and 2010 Excellence in ENERGY STAR® Promotion Award for reducing greenhouse gas emissions

Reputational Excellence for Our Future



1. Trump International Hotel & Tower
2. National September 11 Memorial & Museum at the World Trade Center
3. US Court of Appeals Restoration
4. Statue of Liberty Restoration
5. American Museum of Natural History, Various

6. Camp Lejeune, Atlantic Marine Corps Communities
7. New York-Presbyterian Hospital, Various
8. Bank of America Corporate Center
9. SC Johnson Argentina New Industrial Plant
10. Grand Central Terminal Revitalization
11. Duke University School of Nursing

12. Time Warner Center
13. Citi Field, NY Mets Stadium
14. Genzyme Building 78
15. 1996 Summer Olympic Games
16. Fort Campbell Zero Energy Housing
17. Los Angeles City Hall Restoration

Sustainability Commitment



Americas Region Experience

- One of 14 original partners chosen to participate in President Obama's Better Buildings Challenge
- Management of \$11 billion of construction on green building projects in the Americas
- Over 40 Million square feet of LEED projects completed and in progress
- Delivered 1296 LEED for Homes certified projects at various levels including among the nation's first certified LEED Neighborhood, Ft. Shafter, Hawaii
- 40 Green Retrofit projects
- 255 employees are LEED Accredited Professionals
- 2010 Energy Star® Excellence in Energy Star Promotions Award
- 2011 & 2010 Energy Star® Leadership in Housing Award

We recognize the legacy of our activities and we are accountable for what we take, what we create and what we leave behind.

Green Building Experience



Home Depot
Smart Home
at Duke
University,
LEED-NC
Platinum ➤



▲
BP Bright Lights,
LEED-CI Platinum



Holloman AFB
Hawaii Solar
Panels ➤

Army Hawaii
Photovoltaic
systems ▼



◀
IKEA
Corporate
Headquarters,
LEED-NC
Certified



▲
440 South Church,
LEED-NC Gold





Lend Lease – Public Partnerships

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Locations of Private Partnerships in US



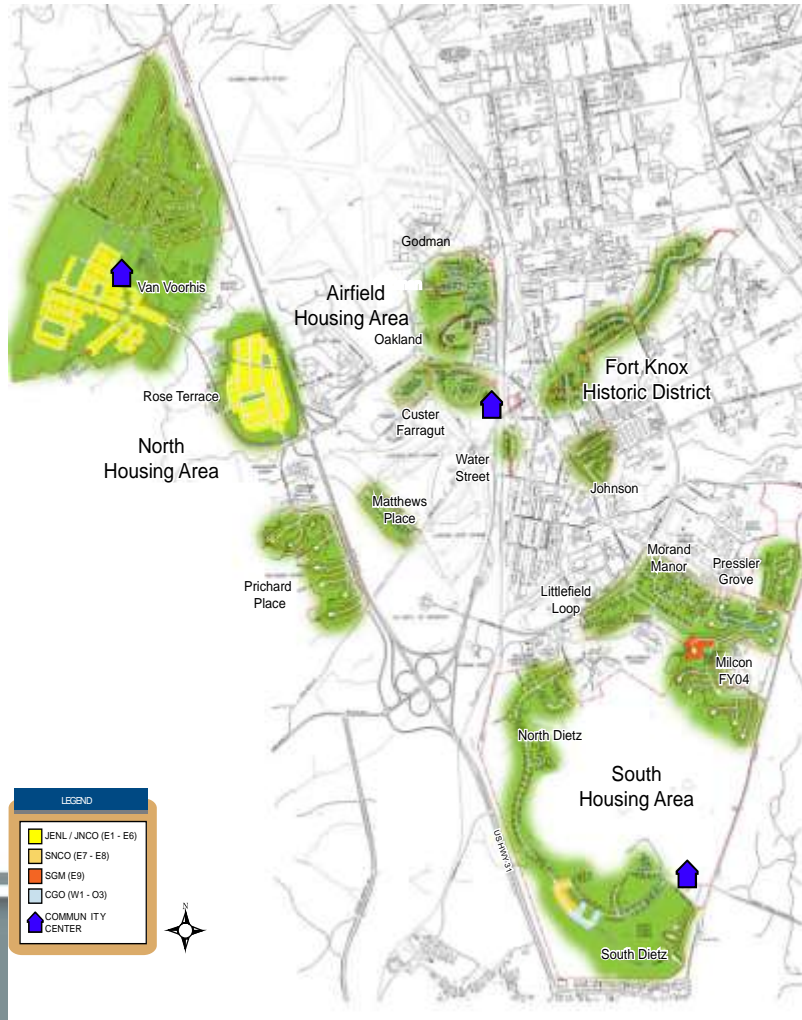


Overview on the Project

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Fort Knox Description



- **Fort Knox, KY**

- 109,000 Acres
- 1,578 Acres Transferred to Partnership
- 2,998 Homes Constructed by Army
- Four Distinct Housing Areas
 - North
 - Airfield
 - Historic
 - South

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What is Knox Hills?



- Partnership between Lend Lease and the US Army
- 50 Year Term with a 25 Year Option
- We are the Largest Gated Community in Kentucky
- We are in Direct Competition for the Soldiers Housing Dollars

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BAH – Is & Covers?

- **Basic Allowance for Housing is:**

- The money that is allotted for living to the Soldier
- Determined by Government Hired Contractor & Local Team
- Based on Local Conditions – Cost of Living
- Our Income Stream for Financing

- **Basic Allowance for Housing Covers:**

- Rent
- Utilities
- Renter's Insurance

Occupancy is Everything



- **Our Financial Plan Has Specific Occupancy Levels**
- **Greater than Planned**
 - More Revenue for Additional Construction / Better Resident Services
- **Less than Planned**
 - We Lose Construction Scope
 - We Lose Operating Income

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HMA - Housing Market Analysis



- **Analysis of:**
 - Projected Troop Strength
 - Local Housing Availability
 - On-Post Housing
- **Basis for Our Development Plan**
- **Tells Us:**
 - How Many Families
 - What Rank
 - What Bedroom Requirement
 - How Many Homes We Are Allowed to Build

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Financial Impacts of Utility Costs



- **Knox Hills:**
 - Utility Budget: \$5 Million FY13
- **All Lend Lease Military Housing Sites**
 - Approximately 40,000 Homes
 - Over \$100 Million spent on Utilities Last Fiscal Year

The Utility Costs have impacted Project Budgets!

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Initial Development Period

- **8 Year IDP** (2006 thru 2014)
 - 2,998 Homes - Beginning State
 - 992 New Homes
 - 1,218 Homes Renovated
 - 52 Conversions
 - 301 Homes - No Work
 - 1,427 Demolitions
 - **2,563 Homes - End State**
 - **Completed on Budget of \$260,000,000**



Sustainability Projects & LED Lighting Project

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Past Sustainability Projects



Geo-Thermal

- In all 992 New Homes & 3 Community Centers
- Individual well per each structure
- Average depth of 320 feet
- Used for Heating/Cooling and subsidize Hot Water
- Additional Costs of \$3,500 per unit
- Payback of additional costs is 7 years

Historic - Window Replacement

- 202 Historic Homes
- Historic appropriate (size, double hung, divided light)
- Triple Pane, Low - e glass

Compact Fluorescent Light Bulbs (CFL's)

- Switch all Incandescent Bulbs to CFL's – Started in 2009
- To date about 60,000 CFL's have been installed
- 60% savings on energy usage

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Past Sustainability Projects



Whirlybird Vents

- Total of 350 Homes
- Address Attic Ventilation/Asphalt Shingle Life
- Cost of \$110 per unit

LEED Certified Homes

- 42 Homes were Constructed
- Located in the South Dietz Neighborhood
- Submitted/Verified by Third Party Inspector
- Received LEED – GOLD Rating

Blown Insulation – Attics of Renovated Homes

- Joint Deal - Government/Local Utility/Lend Lease
- Currently 2" of insulation in attic
- 15"-18" of insulation to be blown into attics
- Cost for project - \$1.2 Million
- Savings in Utility Costs
- Payback approx 3 years

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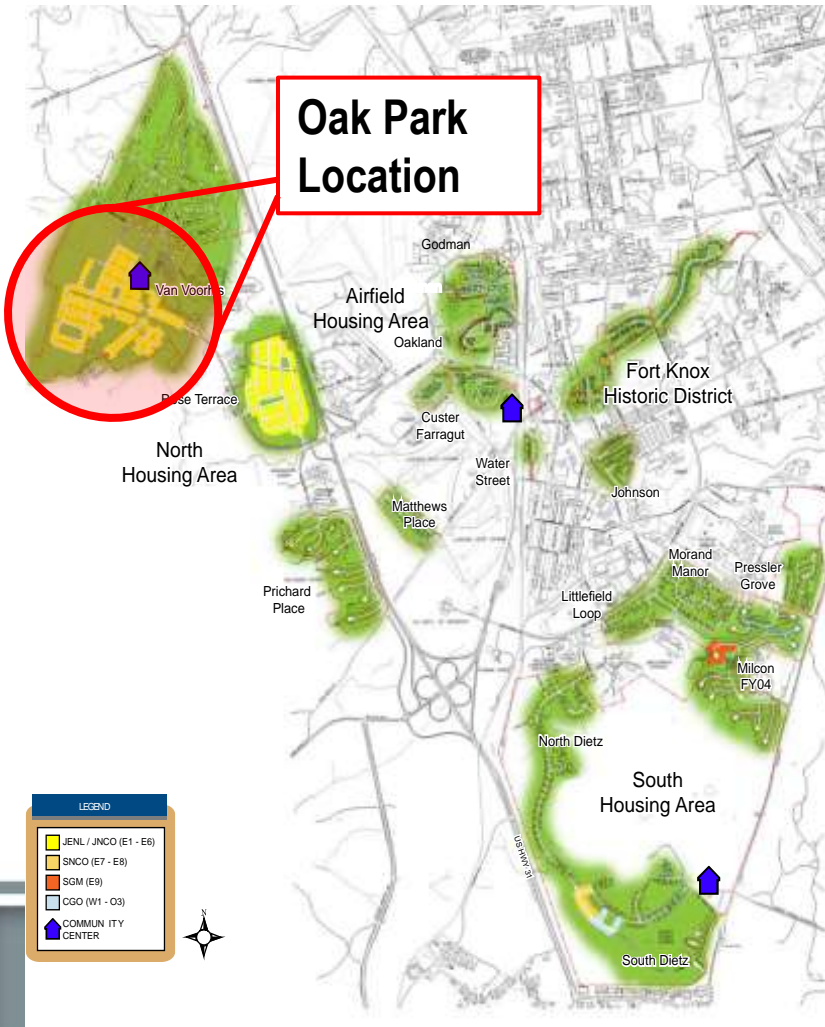
History

What is an LED?

LED - Light Emitting Diode, is a semiconductor that emits light when electrical energy is applied to it.

Oak Park - LED Project Location

Oak Park Location



- **Oak Park Overall**

629 Total New Homes

185 Homes – Area 16

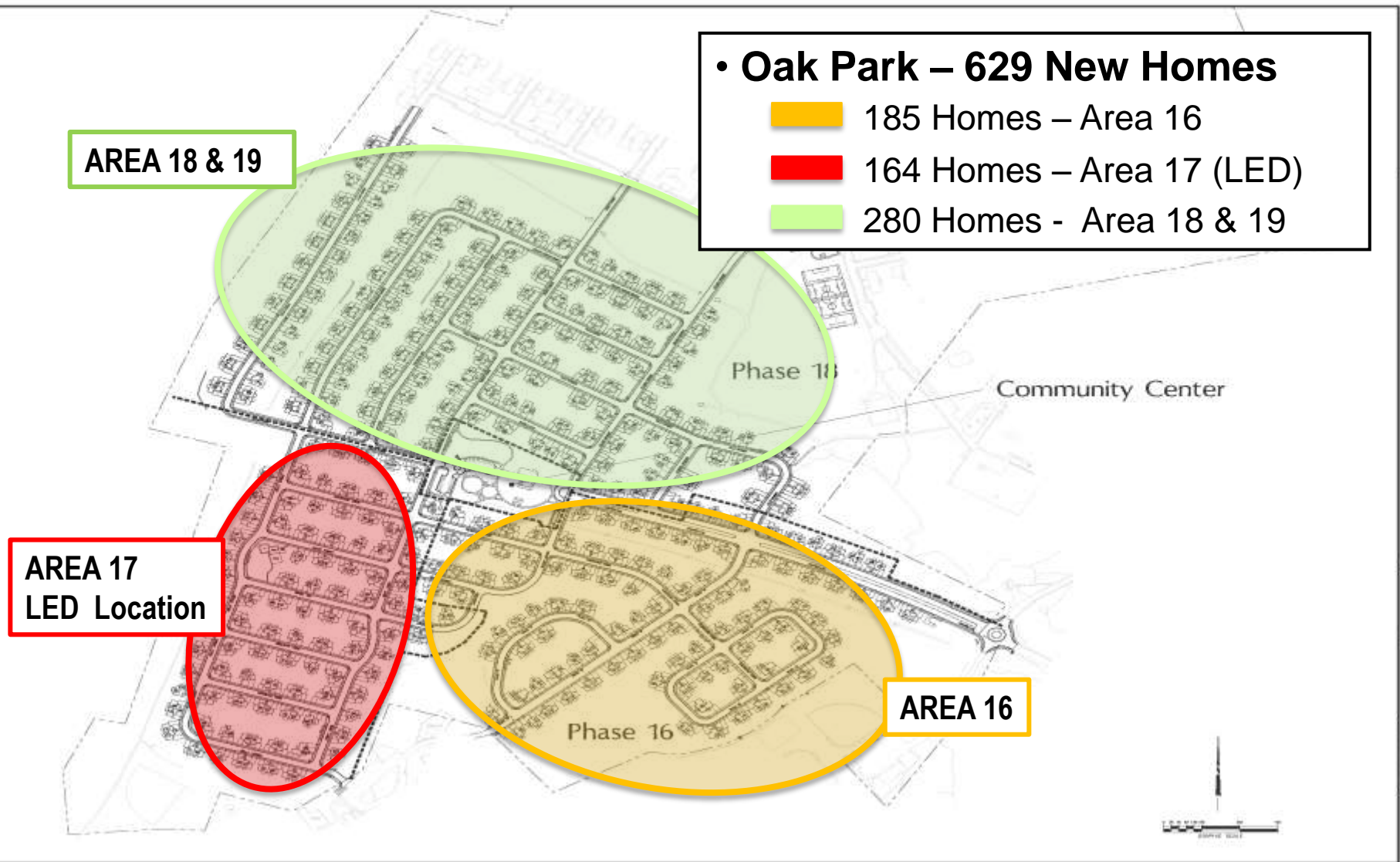
164 Homes – Area 17

280 Homes – Area 18 & 19

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Oak Park Site Plan/Build Out



Background Info on Project



- **Partnership with Polybrite International**
 - 17 Years Experience
 - Launch Customer – US Government
- **Countless Meetings, Conference Calls, etc**
- **4 Rounds of Custom LED Bulb Prototypes**
 - No Cost to Project
- **Process has taken 1.5 Years for Final Custom LED Bulb**
- **Re-designed Progress Light Fixtures**
 - Removal of Fixture Insulation
 - Re-Certification of UL for Fixtures
 - First fixture with LED certification for “enclosed fixture”, close-to-ceiling genre of fixtures
 - No Cost to Project



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Benefits of Borealis LED Bulbs



- Long Bulb Life (50,000 hrs)
- 5 Year Warranty
- 100% Dimmable
- 100% Recyclable
- No Ballast Required
- Financing Available
- No Environmental Issues
- Unbreakable Polymer Shell
- Built in Surge Protector
- Potential Energy Rebates
- Retro-fit to Existing Fixtures
- Up to 90% less Consumption
- UL, CE, RoHS & Energy Star Compliant

BOREALISSM
INNOVATIVE LED LIGHTING

by PolyBrite International, Inc.

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End Result - LED Bulb Comparison



	CFL	LED
Wattage	13	7.5
Useful Life	7,500 hours (3 Years)	50,000 hours (23 years)
Environmental Issues	YES	NO
Durability	Easily broken - requires a specific cleanup process	Virtually Unbreakable
Disposal	Must be safely disposed at a disposal center	No disposal issues - recyclable
Other	Prone to failure from power surges, frequent "on/off's"	Built-in surge protection, hearty, well built—ideal for often on/off

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Actual LED Bulb Used



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Current Fixture with CFL's



Actual light fixture in a residence with CFL bulbs

Fixture with LED vs. CFL



Actual light fixture in a residence with LED bulb on left hand side and CFL bulb on right hand side

Comparison of Fixtures with LEDs vs. CFLs



Fixture with CFL bulbs



Fixture with LED bulbs

Same light fixture in the residence with CFL bulbs vs. LED bulbs

164 Homes - LED vs. Incandescent



Summary

• Actual bulb count for 164 New Homes in Oak Park Area 17

• Incandescent bulb lasts 1.8+ yrs, LED Bulb 22.8+ yrs

• Total Savings over \$3.5 Million by switching to LED

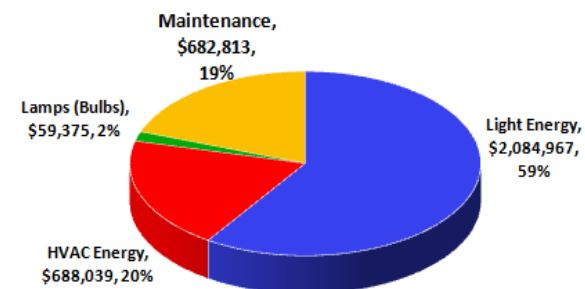
• Return on Investment on LED 1.85 yrs

Fort Knox - 164 Homes - LED vs Incandescent (\$.06 kWh)

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Various	Borealis
Product Quantity	9,500 lamps	9,500 lamps
ENERGY COST		
Watts Per Lamp (Avg)	60.0 W	7.5 W
Total kW	570 kW	71 kW
Hours in Application (Avg)	6.0 hours per day	
Annual Light Energy Consumption	1,248,300 kWh	156,038 kWh
Average Cost per kWh	\$.0600 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	\$74,898	\$9,362
Ratio of Light to HVAC Energy Savings	33%	
PRODUCT & MAINTENANCE COST		
Average Product Cost	\$0.50	\$30.00
(i.e. Lamps)	\$4,750 total	\$285,000 total
Average Fixture Costs	\$0 total	\$0 total
Average Maintenance Cost	\$5.75	\$0.00
(i.e. Installation)	\$54,625 total	\$0 total
USEFUL LIFE		
Useful Life in Application	4,000 Hours	50,000 Hours
	1.83 Years	22.83 Years
# of times replaced	Replaced 12.5x	

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	1,092,263 kWh	24,937,500 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide (Global Warming)	1,678,807 lbs	38,328,938 lbs
Sulfur Dioxide (Acid Rain)	10,682 lbs	243,889 lbs
Nitrogen Oxides (Acid Rain & Smog)	2,818 lbs	64,339 lbs
Environmental Benefit Equivalence		
Tree Plantings	228.9 acres	5,226.9 acres
Gasoline	86,733 gallons	1,980,210 gallons
Vehicles	145.2 vehicles	3,315.7 vehicles

Cost Savings



COST SAVINGS ANALYSIS	Average/Year	Useful Life
Light Energy Savings	\$65,536	\$2,084,967
HVAC Energy Savings	\$21,627	\$688,039
Product Savings (Lamps)	\$2,601	\$59,375
Maintenance Savings (Installation)	\$29,907	\$682,813
TOTAL SAVINGS (Energy, Product & Maint)	\$119,670	\$3,515,194

INVESTMENT ANALYSIS	Payback	IRR
Investment = \$225,625		
Light Energy Savings	3.44 Years	31.6%
Light & HVAC Energy Savings	2.59 Years	41.1%
TOTAL SAVINGS (Energy, Product & Maint)	1.89 Years	53.5%

164 Homes -LED vs. CFL



Fort Knox - 164 Homes - LED vs CFL (\$.06 kWh)

Summary

•Actual bulb count for 164 New Homes in Oak Park Area 17

•CFL bulb lasts 3.4+ yrs, LED bulb 22.8+ yrs

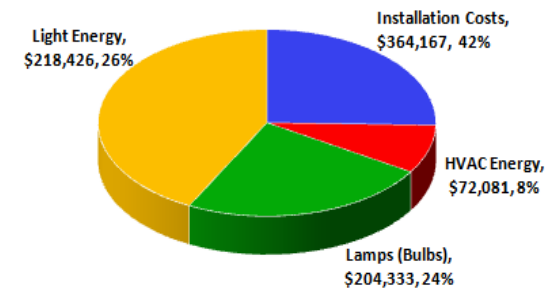
•Total Savings over \$859,000 by switching to LED

•Return on Investment on LED 5.87 yrs

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Various	Borealis
Product Quantity	9,500 lamps	9,500 lamps
ENERGY COST		
Watts Per Lamp (Avg)	13.0 W	7.5 W
Total kW	124 kW	71 kW
Hours in Application (Avg)	6.0 hours per day	
Annual Light Energy Consumption	270,465 kWh	156,038 kWh
Average Cost per kWh	\$0.0600 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	\$16,228	\$9,362
Ratio of Light to HVAC Energy Savings	33%	
PRODUCT & MAINTENANCE COST		
Average Product Cost	\$3.23	\$30.00
(i.e. Lamps)	\$30,650 total	\$285,000 total
Average Fixture Costs	\$0 total	\$0 total
Average Maintenance Cost	\$5.75	\$0.00
(i.e. Installation)	\$54,625 total	\$0 total
USEFUL LIFE		
Useful Life in Application	7,500 Hours	50,000 Hours
	3.42 Years	22.83 Years
# of times replaced	Replaced 6.7x	

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	114,428 kWh	2,612,500 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide (Global Warming)	175,875 lbs	4,015,413 lbs
Sulfur Dioxide (Acid Rain)	1,119 lbs	25,550 lbs
Nitrogen Oxides (Acid Rain & Smog)	295 lbs	6,740 lbs
Environmental Benefit Equivalence		
Tree Plantings	24.0 acres	547.6 acres
Gasoline	9,086 gallons	207,451 gallons
Vehicles	15.2 vehicles	347.4 vehicles

Cost Savings



COST SAVINGS ANALYSIS	1st Year	Useful Life
Light Energy Savings	\$6,866	\$218,426
HVAC Energy Savings	\$2,266	\$72,081
Product Savings (Lamps)	\$8,950	\$204,333
Maintenance Savings (Installation)	\$15,951	\$364,167
TOTAL SAVINGS (Energy, Product & Maint)	\$34,032	\$859,007

INVESTMENT ANALYSIS	Payback	IRR
Investment = \$199,725		
Light Energy Savings	29.09 Years	1.7%
Light & HVAC Energy Savings	21.87 Years	3.9%
TOTAL SAVINGS (Energy, Product & Maint)	5.87 Years	16.5%

164 Homes - Environmental & Financial Impact



Impacts of LED Lighting
in the **164 homes over the
22.8 years @ \$.06 kWh**

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	2,007 Tons
• Sulfur Dioxide (Acid Rain)	12 Tons
• Nitrogen Oxides (Acid Rain & Smog)	3 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	2,612,500 kWh
• Acres of Trees Planted	547 Acres
• Barrels of Gasoline Saved	4,939 Barrels
• Vehicles taken off the Road	347 vehicles

Financial Impact

• Investment for LED Lighting	\$199,725
• Total Savings for LED Lighting	\$859,007
• Return on Investment for LED Lighting	5.87 Years



By Switching
164 homes to
LED Lighting
will save
\$859,000!

When completed, this will be the Largest Residential LED Project in the WORLD!!!

Flip the Switch Event! - Sept 5, 2012



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Borealis Installation of LED Bulbs



Lighting in Bathroom



Lighting in Staircase/Hallway

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History

Largest Residential LED Installation gets 12 Times Bigger!



- **Polybrite International presents Letter of Intent for Financing to cover:**
 - 1,912 Homes
 - 1 Welcome Center
 - 2 Community Centers
- **Financing Amount of \$4 Million**

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History

1,912 Homes, Welcome Center & 2 Community Centers - LED vs. Existing Bulbs



Summary

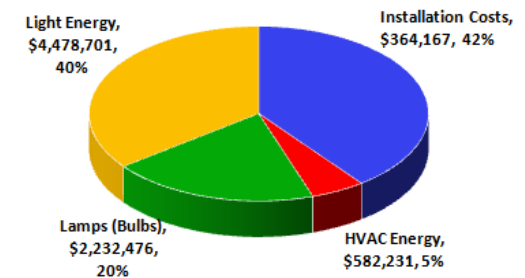
- Actual bulb count for 1,912 Remaining Homes, Welcome Center & 2 Community Centers
- CFL bulb lasts 3.5+ yrs, LED bulb 22.8+ yrs
- Total Savings over \$11.2 Million by switching to LED
- Return on Investment on LED 5.93 yrs

1,912 Homes, Welcome Center & 2 Community Centers for Knoxs Hills (\$.10 kWh)

COMPARATIVE ANALYSIS	Current	Proposed
Supplier	Various	Borealis
Product Quantity	108,810 lamps	108,810 lamps
ENERGY COST		
Watts Per Lamp (Avg)	13.8 W	7.9 W
Total kW	1,501 kW	860 kW
Hours in Application (Avg)	6.0 hours per day	
Annual Light Energy Consumption	3,296,936 kWh	1,889,167 kWh
Average Cost per kWh	\$1.000 per kWh	
Annual Energy Cost Change	3.00%	
Annual Light Energy Cost (Year 1)	\$329,694	\$188,917
Ratio of Light to HVAC Energy Savings	13%	
PRODUCT & MAINTENANCE COST		
Average Product Cost	\$3.23	\$28.60
(i.e. Lamps)	\$350,920 total	\$3,111,750 total
Average Fixture Costs	\$0 total	\$208,865 total
Average Maintenance Cost	\$5.76	\$2.02
(i.e. Installation)	\$627,225 total	\$219,600 total
USEFUL LIFE		
Useful Life in Application	7,859 Hours	50,000 Hours
	3.59 Years	22.82 Years
# of times replaced	Replaced 6.4x	

ENVIRONMENTAL ANALYSIS	1st Year	Useful Life
Light Energy Consumption Savings	1,407,769 kWh	32,129,022 kWh
Air Pollution & Environmental Damage Reduction		
Carbon Dioxide (Global Warming)	2,163,740 lbs	49,382,307 lbs
Sulfur Dioxide (Acid Rain)	13,768 lbs	314,222 lbs
Nitrogen Oxides (Acid Rain & Smog)	3,632 lbs	82,893 lbs
Environmental Benefit Equivalence		
Tree Plantings	295.1 acres	6,734.3 acres
Gasoline	111,787 gallons	2,551,266 gallons
Vehicles	187.2 vehicles	4,271.8 vehicles

Cost Savings



COST SAVINGS ANALYSIS	1st Year	Useful Life
Light Energy Savings	\$140,777	\$4,478,701
HVAC Energy Savings	\$18,301	\$582,231
Product Savings (Lamps)	\$97,818	\$2,232,476
Maintenance Savings (Installation)	\$174,838	\$3,990,268
TOTAL SAVINGS (Energy, Product & Maint)	\$431,734	\$11,283,677

INVESTMENT ANALYSIS	Payback	IRR
Investment = \$2,562,070		
Light Energy Savings	18.20 Years	5.5%
Light & HVAC Energy Savings	16.11 Years	6.6%
TOTAL SAVINGS (Energy, Product & Maint)	5.93 Years	16.8%

1,912 Homes, Welcome Center & 2 Community Centers – Environmental & Financial Impacts



Impacts of LED Lighting for the Remaining
**1,912 Homes, Welcome Center & two
Community Centers over the next
22.8 years @ \$.10 kWh**

Air Pollution & Environmental Damage Reduction

• Carbon Dioxide (Global Warming)	24,703 Tons
• Sulfur Dioxide (Acid Rain)	157,191 Tons
• Nitrogen Oxides (Acid Rain & Smog)	41,467 Tons

Environmental Benefit Equivalence

• Light Energy Consumption Savings	32,145,350 kWh
• Acres of Trees Planted	6,737 Acres
• Barrels of Gasoline Saved	60,775 Barrels
• Vehicles taken off the Road	4,274 Vehicles

Financial Impact

• Investment for LED Lighting	\$2,562,570
• Total Savings for LED Lighting	\$11,286,249
• Return on Investment for LED Lighting	5.93 Years



By Switching
the Remaining
**1,912 Homes,
Welcome
Center & 2
Community
Centers to
LED Lighting
will save**

**\$11.2
MILLION**