



The Baker Park Improvement Project – Protecting the Community with an Innovative Gas Mitigation System

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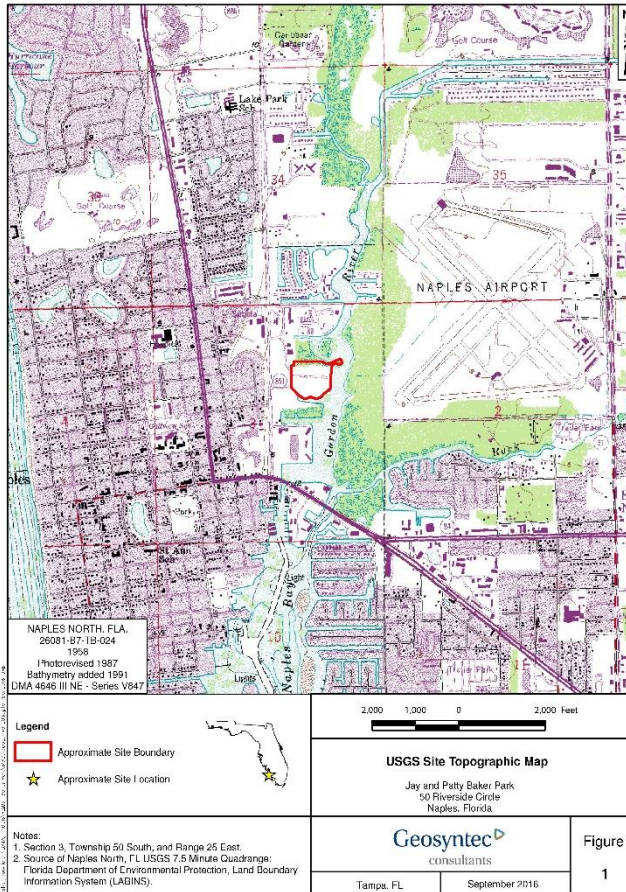


Presentation Outline



- Project Location and Overview
- Site History
- Project Details
- Summary of Geotechnical Design Analysis
- LFG Mitigation Design
- Description of the Cupolex[®] System
- Installation of Cupolex[®] System
- Final Inspection and Testing
- Conclusions
- Acknowledgment

Project Location and Overview

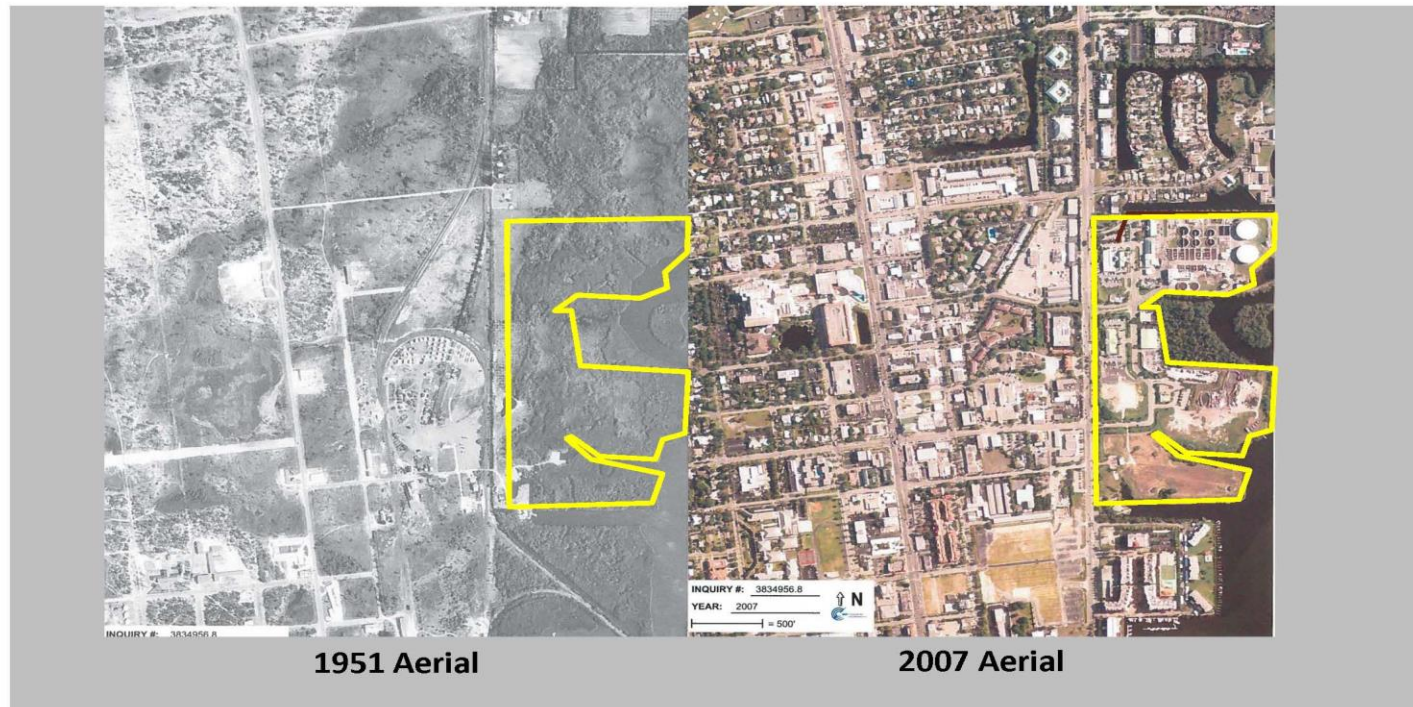


- USGS North Naples, FL 7.5-minute quadrangle map (see left)
- Between Gordon River and Riverside Circle in downtown Naples
- Southern Connector of the Gordon River Greenway
- Landscape, hardscape, and civil improvements to City-owned property

Site History



- 15-acre property, owned by the City of Naples
- Previously used as landfill for disposal of horticultural debris and dredged spoil material



Site History – Aerial Photographs



April 2017



May 2017



June 2017



July 2017



August 2017



September 2017 (post Irma)

Project Details – Park Improvements



- Roadway extensions, parking lot expansion
- Utility services
- Drainage improvements
- Creation of a Founders Garden, playgrounds, passive recreation
- Kayak launch
- Café building
- Family restrooms
- Pavilion, sunrise terrace, piers, boardwalks
- Walking paths, lawn areas, and art displays

Project Details – Park Improvements



90% BASE MASTER PLAN (Excludes Alternates)



- **Geotechnical Evaluations**
 - Soil Borings and Laboratory Testing
 - Dredge Spoils Material Suitability Evaluation
 - Foundation System Design and Analysis
 - Structural Design Support
 - Knoll (Dredge Spoil Mound) Preloading and Settlement Evaluation
- **LFG Mitigation Services**
 - Methane concentrations detected during drilling of soil borings
 - Active gas mitigation system for enclosed structures

LFG Mitigation System Design

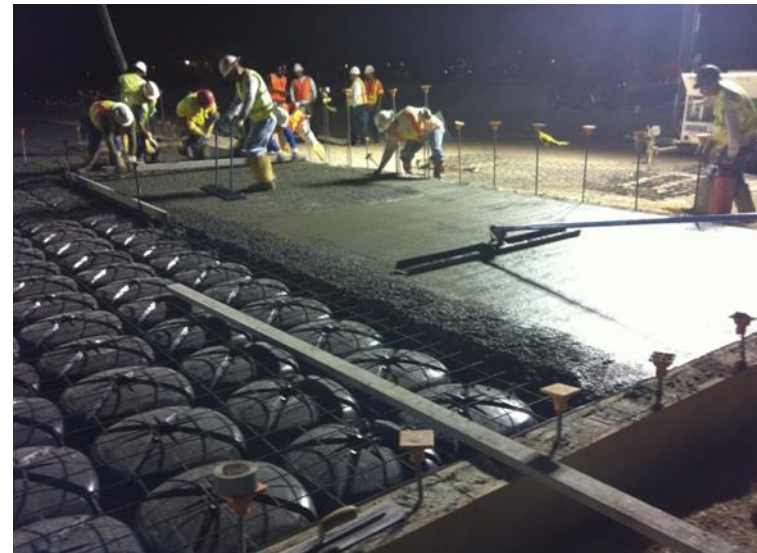


- **Primarily for enclosed structures**
 - Café and Restroom Buildings
 - Sub-slab ventilation to mitigate methane
- **Utilized Cupolex[®] concrete forming systems**
 - Vent void space created by using Cupolex[®] forms below the building footprint
- **Venting provided by small fans to draw outdoor air**
 - Methane concentrations below 10% LEL

What is Cupolex®



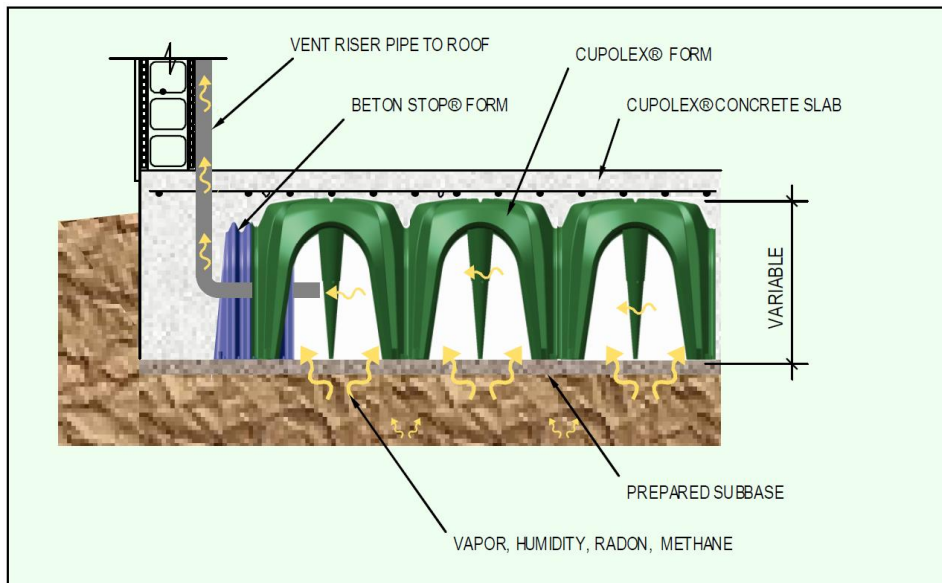
- 100% recycled plastic forms used to create a continuous void space below concrete slabs
- Also known as an “aerated floor”



How does it work?



- Aerated floors work the same way as traditional sub-slab depressurization (SSD) or sub-slab venting (SSV) systems, except the void space:

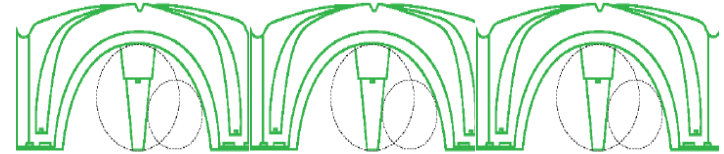


- eliminates the membrane and gravel layer,
- allows more efficient air flow and mass removal, and
- results in more efficient ventilation

Superior load support



- The dome shaped forms create an orthogonal grid of **arches** in the concrete slab
- Cupolex floors support greater loads than flat slabs with the same concrete volume
- Loads distributed over larger areas and can be designed for any subgrade condition



Cupolex is being used to replace aggregate for roads in Canada



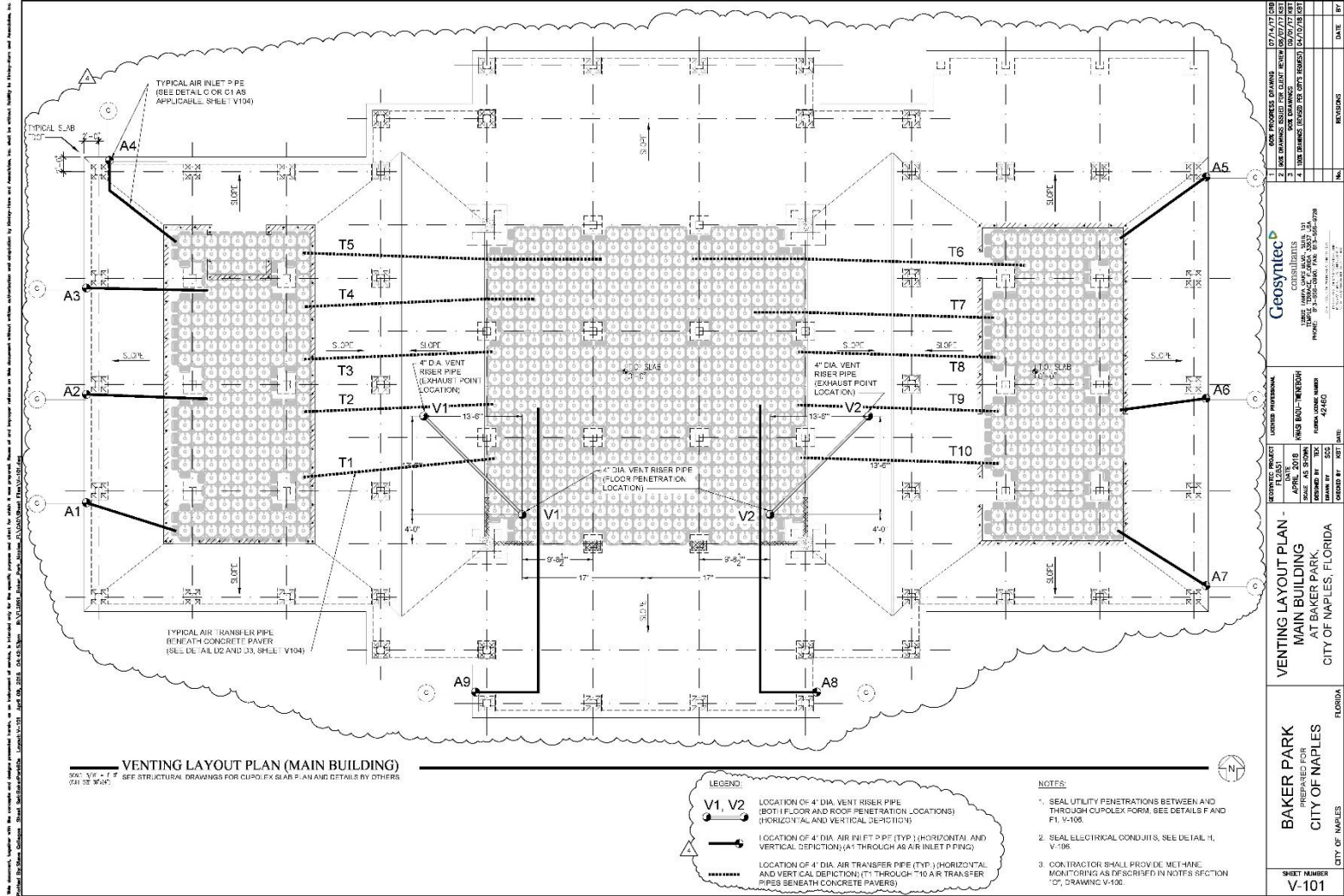
Less \$\$ than traditional systems



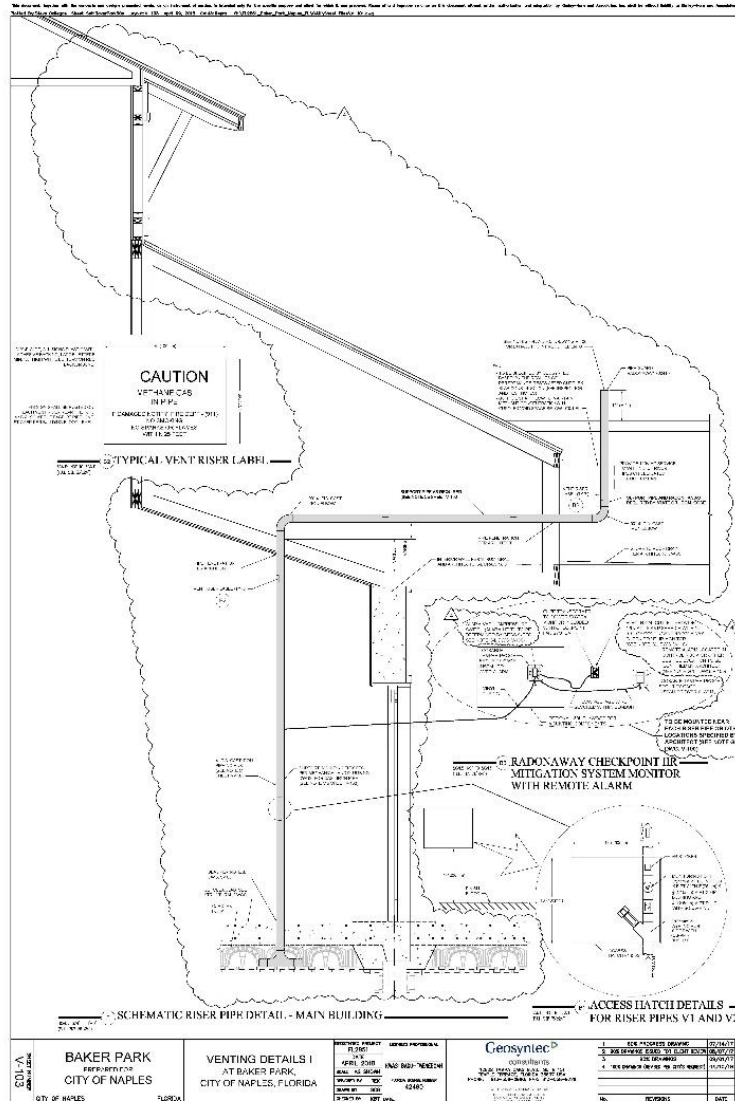
Item	Cupolex [®] Aerated Floor	Traditional Gravel & Liner System
Forms	1.75	NA
Concrete (5" equivalent)	same	same
¾" clean gravel (4-6")	NA	1.50
Welded Wire Mesh	0.30	NA
Steel	NA	0.75
Liner	NA	1.00 – 5.00
Perforated Pipe	NA	Not calculated
Total	\$2.05/SF	\$3.25 – \$7.25/SF

Additional savings can be realized with reduced concrete volumes and more efficient forming, potentially resulting in no additional cost over standard floor.

LFG Mitigation System Design Drawings



LFG Mitigation System Design Drawings



Cupolex® System Installation



- forms are placed by general labor
- field fabricated “boots” placed around pipe penetrations
- caps placed on perimeter of forms



Cupolex[®] System Installation



- reinforcement bar or welded wire mesh placed above Cupolex forms
- can be designed as fully structural slabs



Diagnostic and Testing



- Perform diagnostic tests to:
 - Check for leaks
 - Evaluate methane levels
 - Select fan(s) slabs



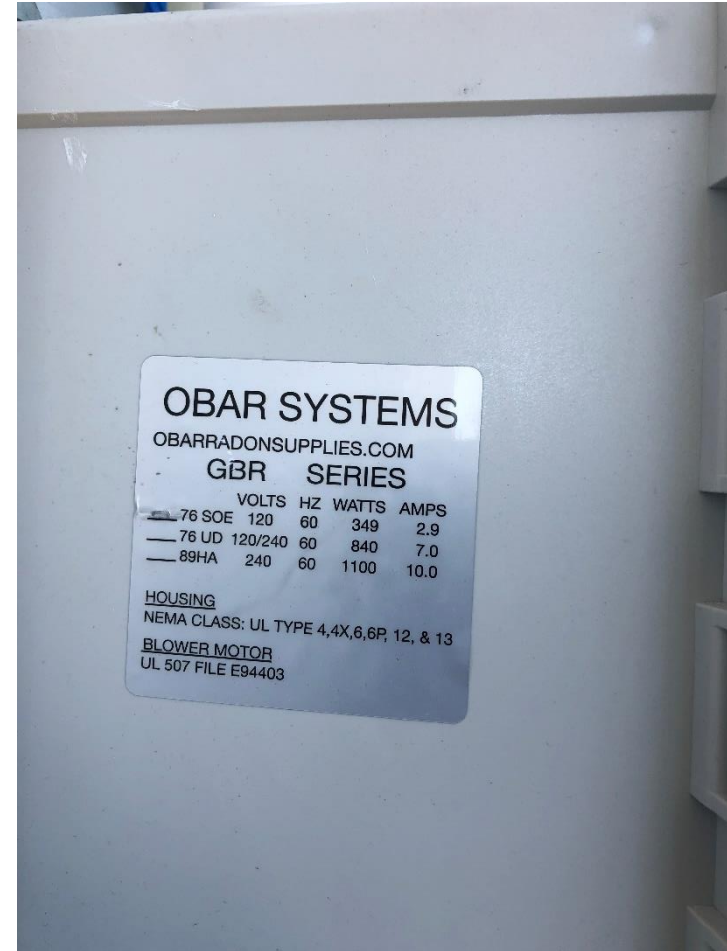
Final Inspection and Integrity Testing



Final Inspection and Integrity Testing



Final Inspection and Integrity Testing



Baker Park Improvement Completion



Group Photo for Opening Day



Acknowledgements



- City of Naples
- Kimley Horn Kimley»Horn
 - Prime Consultant
- Manhattan Construction
 - General Contractor
- Cupolex Building Systems
 - Vendor – Cupolex® forms
- Stirling & Wilbur Eng. Group
 - Structural Engineer

