

# TECHNICAL REPORT I



## ***The Mary J. Drexel Home Assisted Living Addition***

**Bala Cynwyd, PA**

**Gjon Tomaj**  
**Construction Management**  
**Dr. Gannon | Faculty Advisor**  
**09/16/2013**

## Executive Summary

The purpose of this technical report is to evaluate the conditions under which the Mary J. Drexel Project is constructed and the scope of work. Thorough investigation of the construction features such as the project schedule, building systems, site conditions, and cost data were evaluated to provide a higher level of understanding the entirety of the project conditions.

### Client Information

Liberty Lutheran Services is a Human Service Organization founded in 1887 that create communities and change lives by offering their help and support for people of all ages. In 2005, Liberty Lutheran expanded their services to help seniors in communities who desire to maintain their independence but require in-home assistance. This led to the acquisition of The Mary J. Drexel Home located in Bala Cynwyd, PA in 2008. The Mary J. Drexel Home (MJD) is a 150 year old facility where Liberty Lutheran wants its residents to feel as if they were home instead of a traditional institutional assisted living concept.

The existing MJD Mansion will remain with new additions of two-story East and West Wings that will serve 80 Assisted Living residents. The East Wing will have a size of 40,600 gross square feet and the West Wing a size of 44,100 gross square feet. The existing Mansion is roughly 21,000 gross square feet.

### Project Delivery

Liberty Lutheran's main priorities in the new construction of the MJD Home consisted of cost and quality. By using the Design-Bid-Build project delivery system they focused their greatest amount of time to work on the design with their contracted Architect, SFCS, Inc. and the Lower Merion Township Historical Commission. Wohlsen Construction was appointed with a GMP Contract to provide construction management services due to their prior success in Assisted Living Projects. The major MEP Systems were contracted in the GMP Contract as Design/Build services at first and then Wohlsen was asked to manage the construction of the MEP trades as well. Lump-Sum contracts were used by the Liberty Lutheran and Wohlsen to hire respective subcontractors, as shown in Figure 1 on the following page, because they both felt confident that there will not be many changes to the original bid documents once the contracts were awarded.

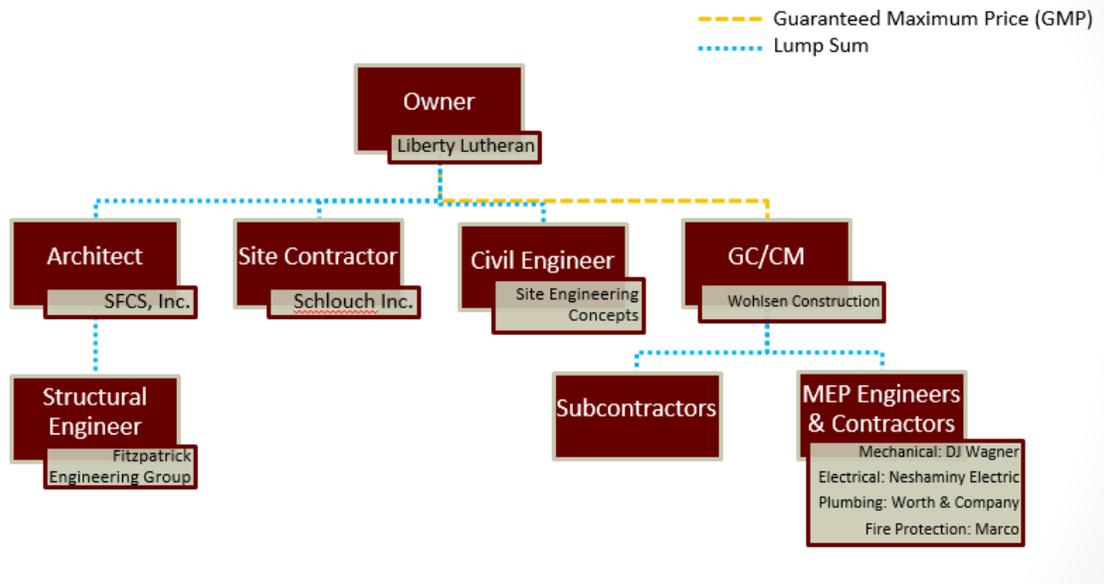


Figure 1 – Project Delivery System w/ Contract Types

**Project Milestone Schedule Summary**

Major coordination took place during the design phase and finalized documents were issued in February of 2012. This allowed Wohlsen to provide an estimate and receive an executed contract by September of 2012. Construction quickly started in November of the same year and is currently undergoing. The Substantial Completion date by contract is February 5, 2013 and the Project Milestone Schedule has a date of November 7, 2014. This will allow Liberty Lutheran to have plenty of time to furnish the new additions prior to opening in the Spring of 2014.

**Project Cost Evaluation**

Liberty Lutheran currently has an estimate of total project cost to be \$ 14.6 million with building construction equaling approximately 12.7 million. When compared to RS Means Square Foot estimate of \$ 10.4 million, The MJD Assisted Living Addition project cost is relatively higher due to the state-of-the-art high quality finishes and equipment.

**Existing Conditions**

When purchased in 2008 the campus consisted of a three-story mansion constructed in 1878. It will continue to be used for various organized events. There was a single story Nursing Home and existing Cottage that were not in use that are being demolished so the new East and West Wing additions can be built in its place. An existing barn will remain to be used as storage for both construction and post-construction purposes. The site will become very congested and tight once the additions start going up since the topography of the site slopes down away from the construction boundary/silt fence that will be put up.

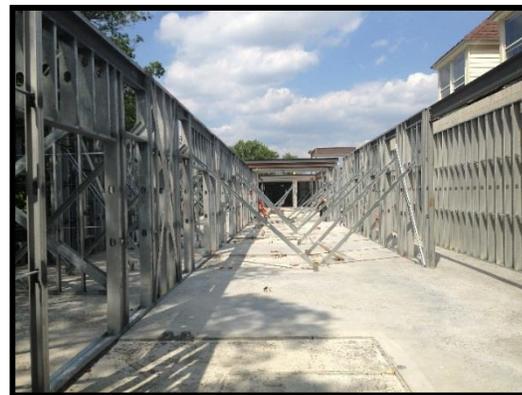
**Building Systems**

As stated above, the Nursing Home and Cottage will be demolished to make room for the new construction. Given the age of the buildings there is a high chance of encountering asbestos and shall be removed properly before any demolition is performed. Also given its age the wall construction consists of two feet thick stone walls that will need to safely be demolished.

This project uses a load-bearing metal stud wall system known as “The Infinity Structural System”. This system is ideal for mid-rise residential projects such as Apartments, Condos, Lofts, Student Housing, Hotels and Senior Living Facilities up to seven or eight stories in height. The Infinity wall panels are pre-fabricated off-site and are delivered on trailers and sometimes laid down on site or stay on the trailer and are lifted off and placed in their proper location. Figure 2 & 3 on the following page show the panels installed on the East Wing and how they are temporarily braced with light gauge metal framing until the deck is installed.



**Figure 2** – East Wing Infinity Panels



**Figure 3** – Temporary Bracing for Infinity Panels

\* Photos for Figure 2 & 3 taken by Gjon Tomaj

In order to allow for some larger spans some structural steel is used in the middle common areas of each wing for the foyer, community living area, dining area and activity kitchen. These columns and beams will be installed using a truck mounted mobile crane due to its ease of accessibility around a tight site.

The only concrete work that will be placed is cast in place for the slab on grade and slab on deck using 4" normal weight with a strength of 4,000 PSI. The formwork consists of a light gauge edge screed and the concrete will be placed using concrete pump(s) with a trowel & fine broom finish.

The Mechanical System is a Variable Refrigerant Flow System (VRF) which allows an outdoor Rooftop Air Handling condensing unit to be connected to multiple indoor fan coil units, each individually controllable by its user, while modulating the amount of refrigerant being sent. This system is capable of cooling some spaces while heating others. A benefit of this is that it allows for an increase in useable floor space by removing mechanical equipment from inside the main building areas and only needing vertical mechanical shafts where necessary.

The Electrical System contains a 3000A 208/120V 3 Phase-4 wire MDP that connects to the two new wings as well as into the existing mansion. A 200 kW Natural Gas Emergency Generator is also available for the mansion, additions, and even the storage barn.

Although most of the structure is The Infinity System, the basement walls, elevator shafts and stair towers are all constructed using reinforced load-bearing CMU walls varying with 8" and 12" thicknesses. During the excavation for the basement, no excavation support system was used due to the vast amount of open space that is available as it can be sloped away from the existing mansion.

This project does not have any LEED requirements.

Liberty Lutheran's main goal is to construct a state-of-the-art facility for Assisted Living residents to feel like they're at home. Overall, the carefully selected project team will allow them to attain this main goal.

**\*See Appendix A for the presentation slides**

## **Appendix A: Technical Report #1 Presentation**



# The Mary J. Drexel Home Assisted Living Addition

Bala Cynwyd, Pennsylvania

Gjon Tomaj  
Construction Option  
Dr. Gannon | Advisor  
Technical Report 1 | 09/16/13

## Client Information

**Owner:** Liberty Lutheran Services

### Mission

- Faithfully provide vital resources for individuals and families facing life-changing situations, from the earliest stages of life through the many stages of aging.

### Building Purpose

- Continue tradition of excellence in senior care started by Mary J. Drexel home nearly 150 years ago.
- Growing popularity of the "Cultural Change" movement.

### Expectations

- Budget
- High Quality
- Coordinate with Owner Site Contractor
- Erosion Control
- Substantial Completion by February 5, 2014



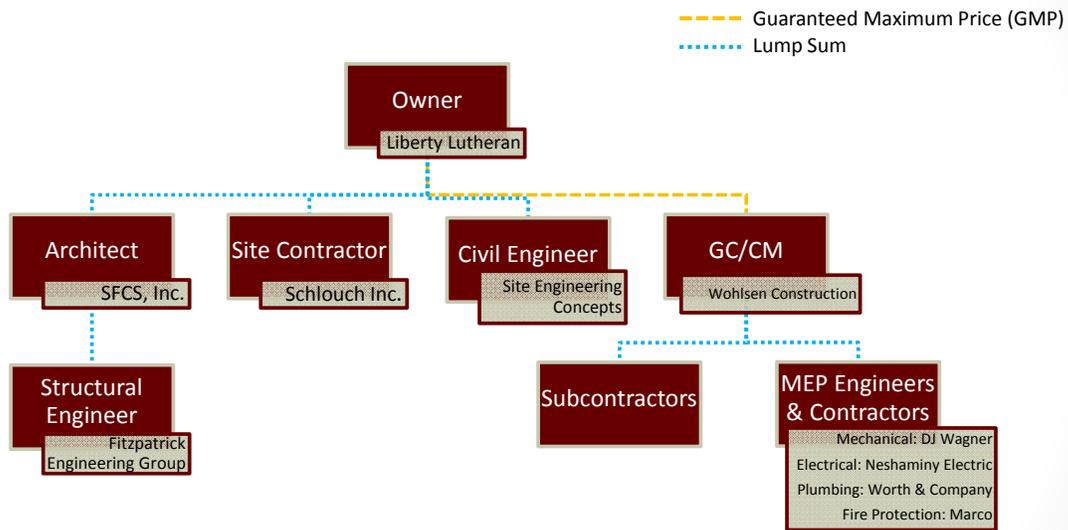
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Ambler, PA 19002



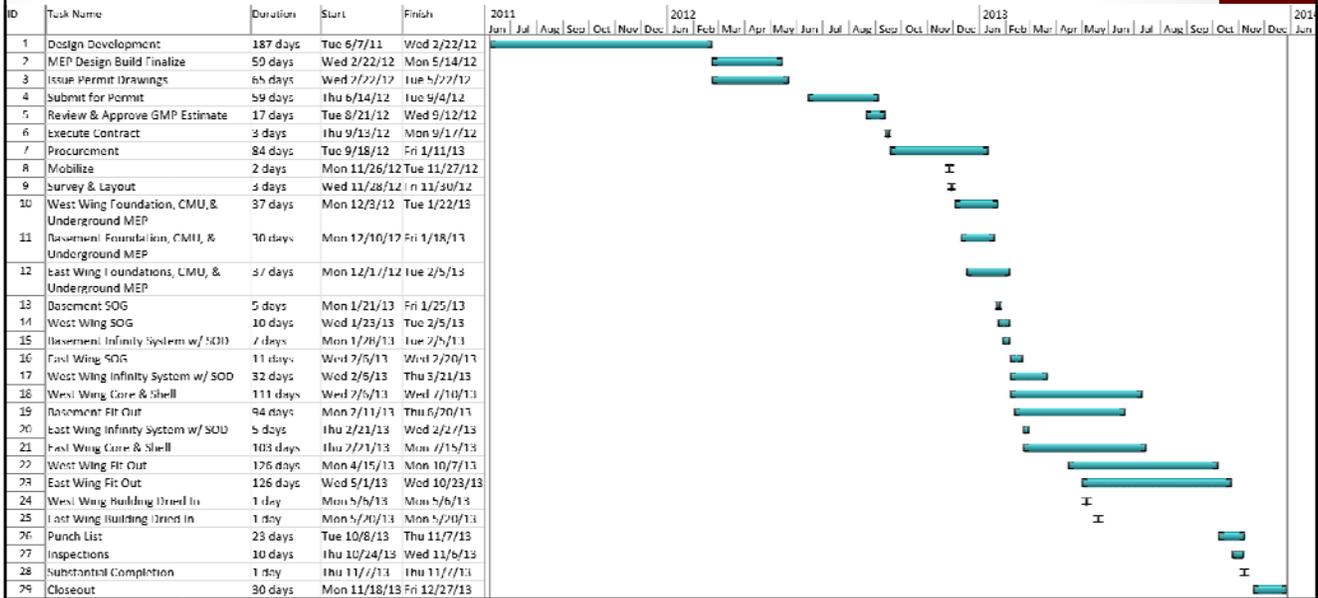
238 Belmont Ave  
Bala Cynwyd PA 19004

Logos courtesy of © 2013 libertylutheran.org & © 2013 Mary J. Drexel Home

# Project Delivery System



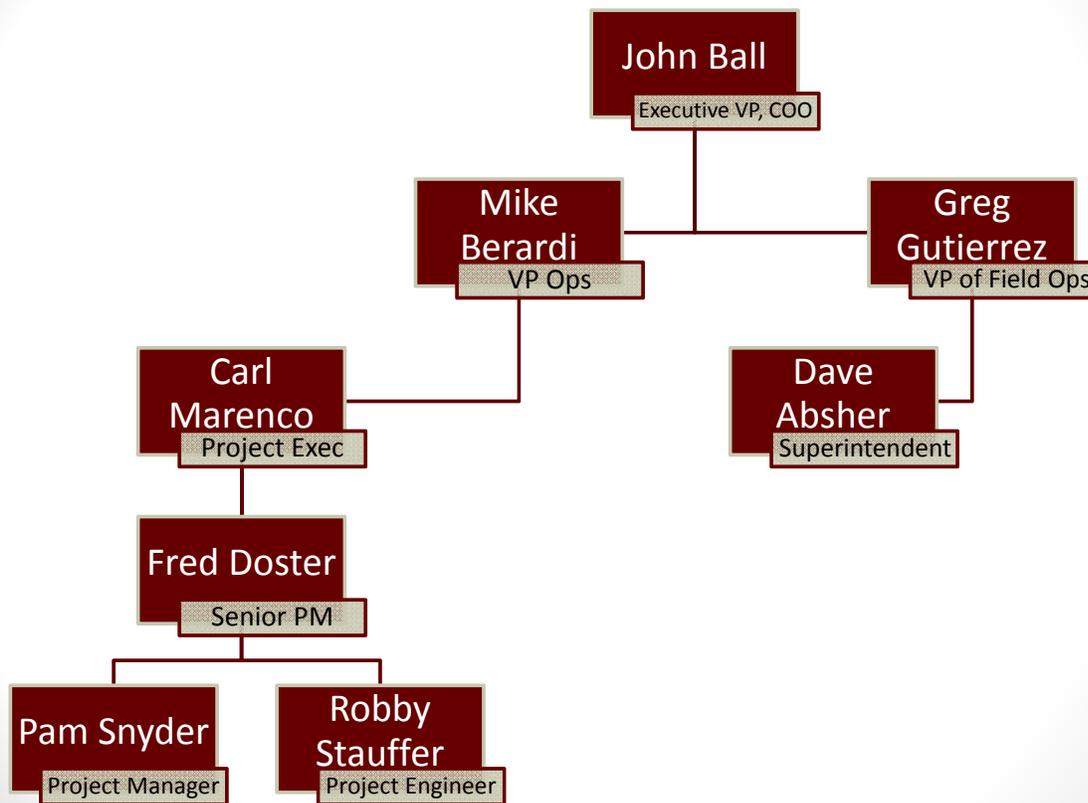
# Project Milestone Schedule Summary



Project: MID Milestone Schedule  
Date: Sun 9/15/13

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start only	Finish only	
Summary	Inactive Task	Duration only	Finish only		

# Staffing Plan



# Project Cost Evaluation

Actual Building Costs Summary		
Description	Cost \$	Cost \$ per Square Foot
Construction Costs	\$ 12,677,090	\$ 169.03
Total Project Costs*	\$ 14,609,579	\$ 194.79

\*Owner did not disclose land & site work costs  
(Total Cost data provided by Wohlsen Construction)

Square Foot Building Estimate Assisted – Senior Living with Brick Veneer/Steel Frame		
Description	Cost \$	Cost \$ per Square Foot
Construction Costs	\$ 10,400,000	\$ 138.67

Actual Building Construction Costs ~ 22% Higher

Building Systems Costs Summary		
Description	Cost \$	Cost \$ per Square Foot
Concrete	\$ 878,808	\$ 11.72
Mechanical	\$ 2,644,603	\$ 35.26
Electrical	\$ 1,199,969	\$ 16.00
Infinity Structure	\$ 1,037,123	\$ 13.83
Structural Steel	\$ 330,850	\$ 4.41

SF Building Systems Costs Summary		
Description	Cost \$	Cost \$ per Square Foot
Concrete	\$ 797,000	\$ 10.63
Mechanical	\$ 2,168,500	\$ 28.91
Electrical	\$ 2,077,000	\$ 27.69

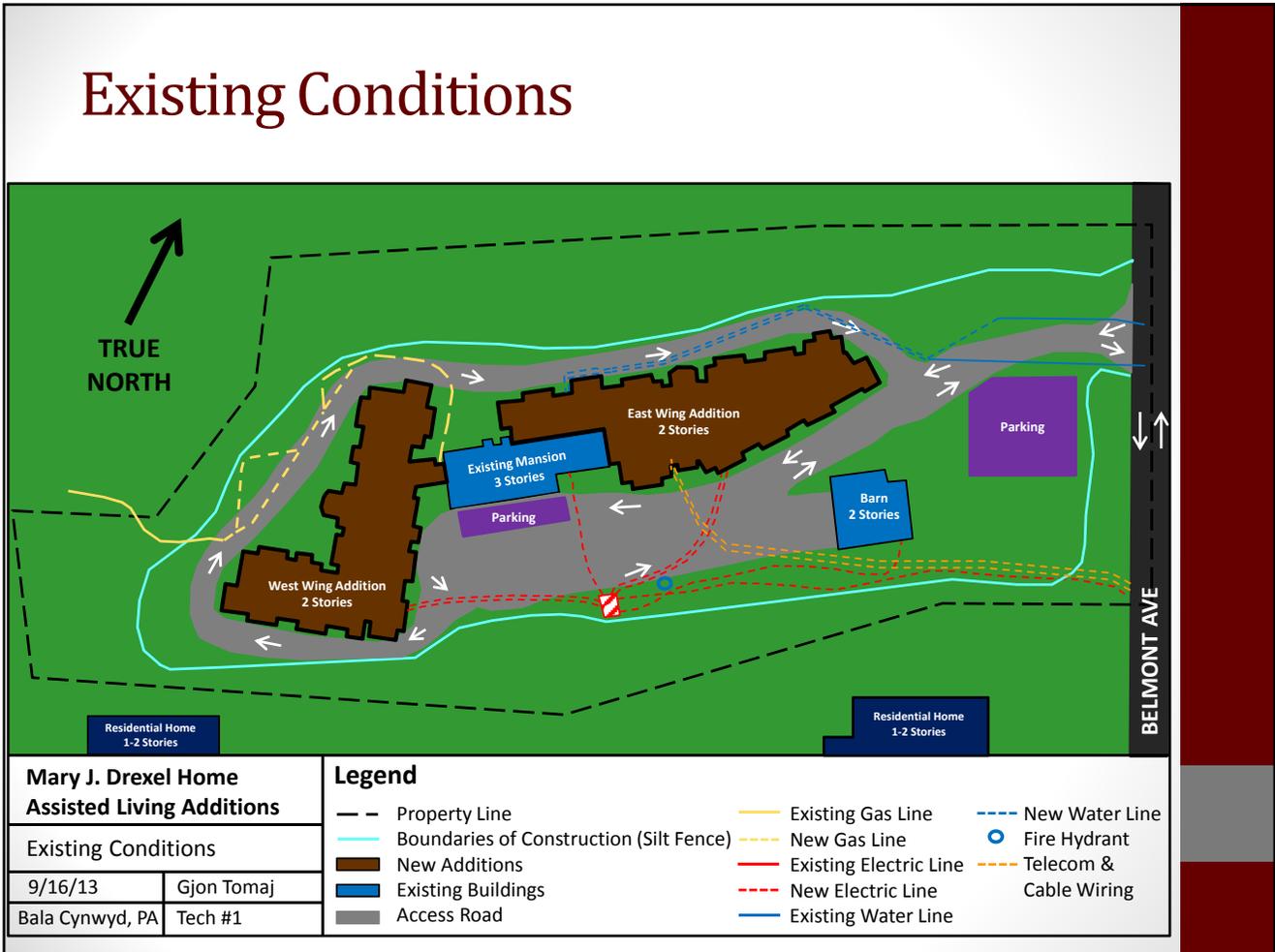
### Square Foot Estimate Assumptions

**Location:** PHILADELPHIA, PA  
**Story Count:** 2  
**Story Height (L.F.):** 12  
**Floor Area (S.F.):** 75000  
**Labor Type:** OPN  
**Basement Included:** No  
**Data Release:** Year 2013



SF Estimate courtesy of © Reed Construction Data 2013

# Existing Conditions



## Building Systems Summary

- Demolition / Asbestos Abatement
- Infinity Structural Steel System
  - Pre-fabricated load-bearing structural metal stud walls with concrete decks.

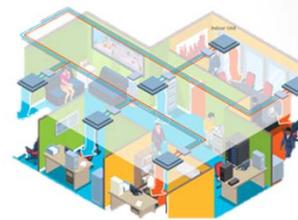


- Structural Steel
  - Foyer, Community Living Area, Dining Area, & Activity Kitchens (Larger Spans)
- Cast in Place Concrete
  - 4" NW Concrete (4,000 PSI) using light gauge edge screeds form

Infinity System on-site photos taken by Gjon Tomaj

## Building Systems Summary

- Mechanical System
  - Variable Refrigerant Flow System (VRF)
  - Rooftop Air Handling Units that supply multiple indoor units
  - (1) HVAC unit per resident and digital thermostat
- Electrical System
  - 3000A 208/120V 3 Phase-4 wire MDP
  - 200 kW Natural Gas Emergency Generator
- Masonry
  - Reinforced load-bearing 12" & 8" CMU walls used for basement walls, elevator shafts, and stairwells.
- Excavation
  - No support for basement excavation due to sloping ground.
- LEED
  - No LEED requirements



VRF image courtesy of © 2013 Johnson Controls



Excavation for basement photo courtesy of Wohlsen Construction