



# TECHNICAL ASSIGNMENT 1

## Existing Construction Conditions

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Construction Management

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### **SHAARE TEFILA CONGREGATION**

Olney, Montgomery County, Maryland

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## **EXECUTIVE SUMMARY**

### **Project Schedule Summary**

The project is on a 12.4 month construction schedule beginning in October 2007 and finishing substantial completion in late October 2008.

### **Building Systems Summary**

Major items of interest for the project are the geothermal units and dual kitchen systems.

### **Project Cost Evaluation**

The cost comparison estimates resulted in similar figures ranging from \$8,000,000 to \$9,700,000. D4Cost and RSMMeans both fell under the actual \$10,200,000 project cost.

### **Site Plan of Existing Conditions**

The existing conditions are not congested and there is a large amount of sitework to be completed by contractor.

### **Local Conditions**

Local conditions require Demolition permits and Recycling program in Montgomery County.

### **Client Information**

The mission of the client is to develop and strengthen the community.

### **Project Delivery System**

The delivery system is Guaranteed Max Price and the contract is Lump-Sum.

### **Staffing Plan**

Forrester Construction Company is working under the Education Business Unit with multi-tier management.

## PROJECT SCHEDULE SUMMARY

The project is on a 12.4 month construction schedule beginning in October 2007 and finishing substantial completion in late October 2008. The major sequence is in preconstruction and VE solutions. During this time, environmental investigation and permitting takes place. Milestones include **notice to proceed** on October 15<sup>th</sup> 2007, **building enclosure** on April 1<sup>st</sup> 2008, **substantial completion** on September 30<sup>th</sup>, 2008 and **Owner occupation** by October 1<sup>st</sup> 2007. Sitework includes the demolition and removal of existing trees, residential structures, and curb and gutters. During the foundation phase the conveying system will be initiated by installing a jack hole. The structural sequence includes 6 mobile crane sequences to erect the first floor and roof system. During finishes ceramic tile and casework are to be installed on the first and lower level interior. Also of note are the scheduled non-work days for recognized Jewish holidays. See Figure



Figure 1.1 Project Schedule Summary

## BUILDING SYSTEMS SUMMARY

Yes	No	Work Scope	If yes, address these questions/ issues
X		Demolition Required?	<ul style="list-style-type: none"> <li>Asbestos and lead paint material from residential structure to be removed prior to demolition</li> <li>Existing curb, gutter and pavement to be sawcut, demolished and removed</li> <li>Existing trees to be properly removed</li> <li>Existing light and utility pole to be removed</li> </ul>
X		Structural Steel Frame	<ul style="list-style-type: none"> <li>Guy-wires used as temporary bracing for erection</li> <li>Lateral bracing for shoring basement, retaining wall, pit wall</li> <li>Mobile Crane used in 6 sequences</li> <li>Composite 6x6 W1.4xW1.4WWF, min thickness of 4-1/2"</li> </ul>
X		Cast in Place Concrete	<ul style="list-style-type: none"> <li>Composite slab, slab on grade, structural walls, footings, pea-gravel grout</li> <li>Forms, high density overlaid concrete form, class I</li> <li>Do not use calcium chloride in mix</li> <li>Fog spray materials before mix in hot weather</li> </ul>
	X	Precast Concrete	<ul style="list-style-type: none"> <li>No precast</li> </ul>
X		Mechanical System	<ul style="list-style-type: none"> <li>Mech room location, east wing/lower level, below sanctuary</li> <li>Water heaters, gas fired boilers, geothermal units, backup generator water-source heat pumps, energy recovery units</li> <li>Water distribution: hot, potable cold, hot water circulation</li> <li>Distribution system: natural gas, manufactured gas</li> <li>"Wet Pipe" system, automatic sprinklers</li> </ul>
X		Electrical System	<ul style="list-style-type: none"> <li>Service load, 2500 Amps 208Y/ 120V</li> <li>Lighting 120/208, Receptacles 120/208</li> <li>3 phase 4 wire</li> </ul>
X		Masonry	<ul style="list-style-type: none"> <li>Bearing walls and piers CMU</li> <li>Laid in 'M' or 'S' mortar with full head and bed joint</li> <li>Wall anchors to steel beams at 2'8" O.C./ column at 2'0" max</li> <li>Split-face &amp; Ground-face CMU, Cast stone masonry trim</li> </ul>
X		Curtain Wall	<ul style="list-style-type: none"> <li>Glazed aluminum storefront system, includes anchorage</li> <li>Used on South and West facing entrances</li> <li>Aluminum, anchors, concealed flashing, sealants</li> </ul>
X		Support of Excavation	<ul style="list-style-type: none"> <li>Pit walls/ Retain wall braced until supporting floors above and below are in place and have attained design strength</li> <li>Do not backfill walls until after floors at top and base of walls are in place</li> </ul>

Table 2.1 Building Systems Summary

## PROJECT COST EVALUATION

### Actual Building Cost

BID	PACKAGE	Constr Cost (CC)	SF PRICING
03 Concrete	Structural Concrete	\$708,038	15.80
04 Masonry	Masonry	\$16,595	2.60
05 Metals	Structural Steel	\$673,313	15.03
05 Metals	Miscellaneous Metals	\$82,390	1.84
06 Woods & Plastics	Rough Carpentry	\$187,437	4.18
06 Woods & Plastics	Architectural Millwork	\$219,860	4.91
06 Woods & Plastics	Struc Glued-Laminated Timber	\$52,410	1.17
07 Therm & Moist Protect	Roofing & Roofing Repairs	\$355,480	7.93
07 Therm & Moist Protect	Water Proofing	\$44,781	1.00
07 Therm & Moist Protect	Caulking	\$8,520	0.19
07 Therm & Moist Protect	E.I.F.S. Systems	\$26,524	0.59
07 Therm & Moist Protect	Siding Systems	\$57,130	1.28
08 Doors & Windows	Doors, Frames & Hardware	\$139,909	3.12
08 Doors & Windows	Storefront Glass & Glazing	\$435,435	9.72
08 Doors & Windows	Operable Partition	\$59,950	1.34
09 Finishes	Finishes	\$1,227,818	7.74
10 Specialties	Toilet Part & Compartments	\$9,180	0.20
10 Specialties	Signage & Display Boards	\$2,597	0.06
10 Specialties	Fire Extinguishers & Cabinets	\$591	0.01
10 Specialties	Toilet & Bath Accessories	\$3,430	0.08
10 Specialties	Vis Display & Marker Boards	\$9,525	0.21
10 Specialties	Loading Dock Equipment	\$500	0.01
10 Specialties	Miscellaneous Accessories	\$778	0.02
11 Equipment	Building Equipment	\$114,899	3.23
12 Furnishings	Furnishings	\$3,530	0.08
14 Conveying Systems	Elevator Systems	\$74,189	1.66
15 Mechanical	HVAC & Mechanical Systems	\$2,494,334	55.68
16 Electrical	Electrical Systems	\$1,115,434	24.90
	<b>Subtotal</b>	<b>\$8,124,577</b>	<b>164.58</b>

Table 3.1 Actual Building Cost

## Total Building Cost

BID	PACKAGE	PRICING	SF PRICING
01 General Conditions	General Conditions	\$813,467	18.16
02 Site Construction	Excavat & Sediment Control	\$329,879	7.36
02 Site Construction	Site Utilities	\$356,570	7.96
02 Site Construction	Asphalt/ Paving	\$164,391	3.67
02 Site Construction	Curb & Gutter, Walks	\$65,920	1.47
02 Site Construction	Landscaping	\$58,590	1.31
02 Site Construction	Decor Site & Constr Fencing	\$22,270	0.50
02 Site Construction	Building Final Cleaning	\$14,784	0.33
02 Site Construction	Surveys & Layout	\$44,400	0.99
02 Site Construction	Asbestos, Lead, Hazrd Matls	\$5,000	0.11
02 Site Construction	Segmented Retaining Walls	\$34,360	0.77
02 Site Construction	Misc Sitework/ Maintenance	\$22,750	0.51
	<b>Subtotal</b>	\$1,932,381	43.14
	(Construction Cost)	\$8,124,577	164.58
	<b>Total Construction Cost (TC)</b>	<b>\$10,056,958</b>	<b>207.72</b>

Table 3.2 Total Building Cost

## Building Systems Costs

BUILDING SYSTEM	PACKAGE	PRICING	SF PRICING
Mechanical	Fire Protection System	\$97,800	2.18
Mechanical	Mechanical Equipment	\$2,183,384	48.74
Mechanical	Geothermal System	\$213,150	4.76
Electrical	Electrical & Comm Systems	\$1,115,430	24.90
Structural	Structural Concrete	\$708,038	15.80
Structural	Masonry	\$116,595	2.60
Structural	Structural Steel	\$673,313	15.03
Structural	Structural Glue-Laminated Timber	\$52,410	1.17
Conveying	Elevator Systems	\$74,189	1.66
	<b>Mechanical System Cost</b>	<b>\$2,494,334</b>	<b>55.68</b>
	<b>Electrical System Cost</b>	<b>\$1,115,430</b>	<b>24.90</b>
	<b>Structural System Cost</b>	<b>\$1,550,356</b>	<b>34.60</b>
	<b>Conveying System Cost</b>	<b>\$74,189</b>	<b>1.66</b>

Table 3.3 Building Systems Cost

DIVISION/ SUBDIVISION	BASE COST	%	SQ COST
Bidding Requirements	\$347,231	4.31	\$12
General Requirments	\$428,539	5.28	\$15
Sitework	\$1,126,711	13.98	\$40
Concrete	\$329,126	4.08	\$12
Masonry	\$86,013	1.07	\$3
Metals	\$1,443,161	17.90	\$51
Woods & Plastics	\$212,051	2.63	\$7
Therm & Moist Protection	\$140,278	1.74	\$5
Doors & Windows	\$216,863	2.69	\$8
Finishes	\$862,948	10.71	\$30
Specialties	\$136,113	1.69	\$5
Equipment	\$166,821	2.07	\$6
Furnishings	\$188,609	2.34	\$7
Conveying Systems	\$110,734	1.37	\$4
Mechanical	\$1,094,617	13.58	\$38
Electrical	\$1,173,775	14.56	\$41
<b>Total</b>	<b>\$8,063,590</b>	<b>100</b>	<b>\$283</b>

Table 3.4 D4Cost 2002 Estimate



## RSMMeans Square Foot Estimate


RSMMeans QuickCost Estimator			
Project Title:	<b>Shaare Tefila Congregation</b>		
Model:	<b>Religious Education</b>		
Construction:	<b>Face Brick with Concrete Block Back-up / Steel Joists</b>		
Location:	<b>COLLEGE PARK, MD</b>		
Stories:	<b>1</b>		
Story Height (l.f.):	<b>12</b>		
Floor Area (s.f.):	<b>44,800</b>		
Data Release:	<b>2007</b>		
Wage Rate:	<b>Union</b>		
Basement:	<b>Not included</b>		
	 <p><i>Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly.</i></p>		
Cost Ranges	Low	Med	High
Total:	\$3,165,750	\$3,517,500	\$4,396,875
Contractor's Overhead & Profit:	\$791,438	\$879,375	\$1,099,219
Architectural Fees:	\$233,336	\$259,262	\$324,077
<b>Total Building Cost:</b>	<b>\$4,190,523</b>	<b>\$4,656,137</b>	<b>\$5,820,171</b>

Figure 3.1 RSMMeans Foot Estimate

### Assumptions

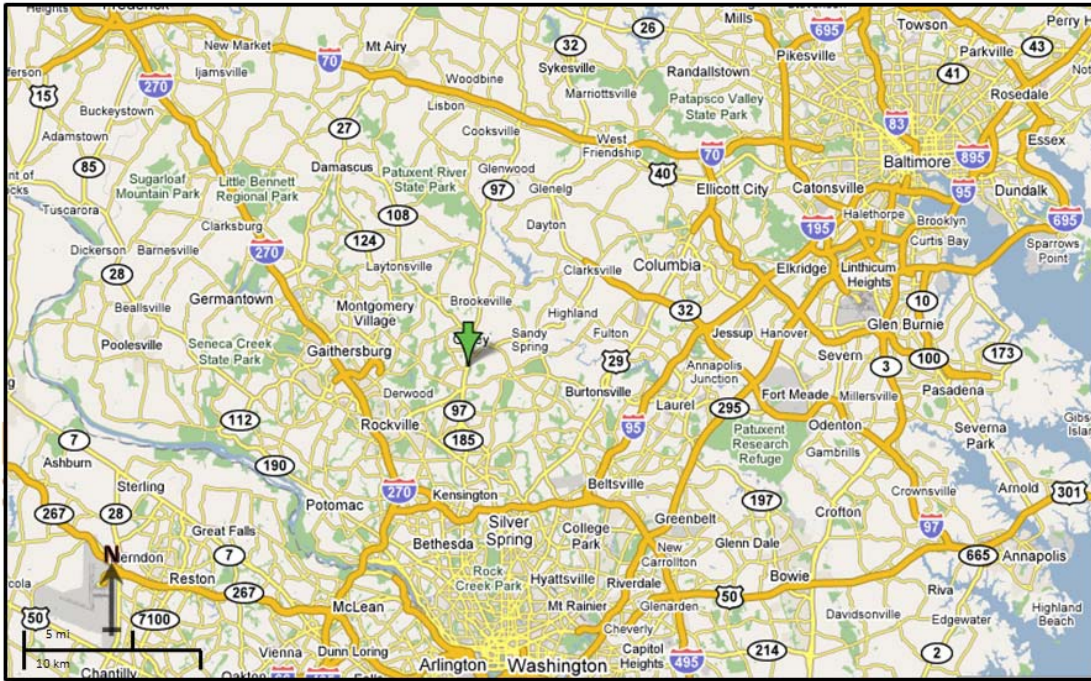
For the RSMMeans square foot estimate I have used quick estimate calculator which accounts for square foot, location, model type and historical data. Using RSMMeans I assumed the highest cost range as seen in figure 3.1. I also accounted the alternative roof system and additional conveying system by multiplying by an arbitrary factor of 1.6.

This gives a total of **\$9,312,273.6**

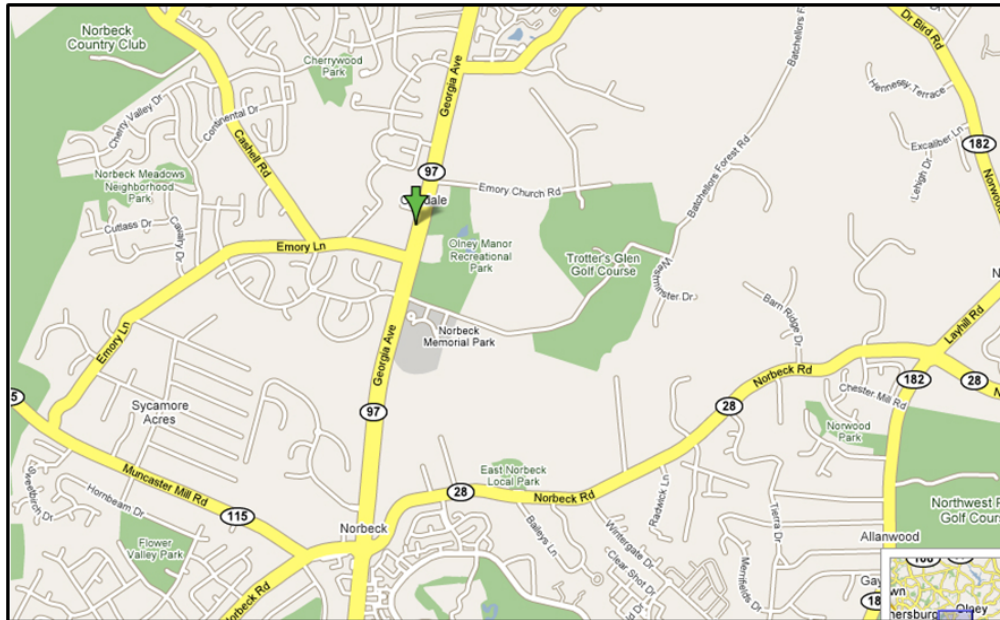
### Cost Estimate Comparison

Actual Building Cost	<b>\$8,124,577</b>
Total Project Cost	<b>\$8,144,760</b>
Building Systems Cost	<b>\$5,234,309</b>
D4Cost 2002	<b>\$9,312,274</b>
RSMMeans	<b>\$8,063,890</b>

# SITE PLAN OF EXISTING CONDITIONS



Shaare Tefila Congregation  
VICINITY PLAN



Shaare Tefila Congregation  
VICINITY PLAN ENHANCED

Figure 4.1 Vicinity Plans

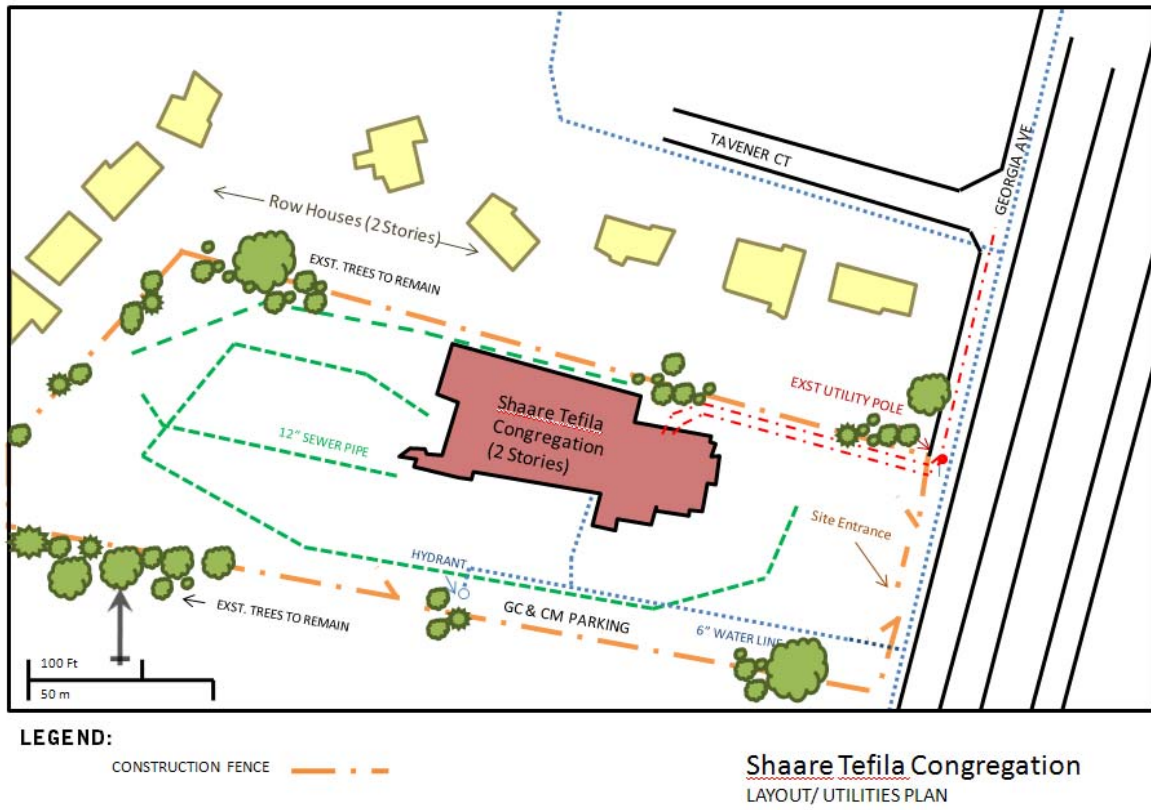


FIGURE 4.2 Layout Utilities Plan

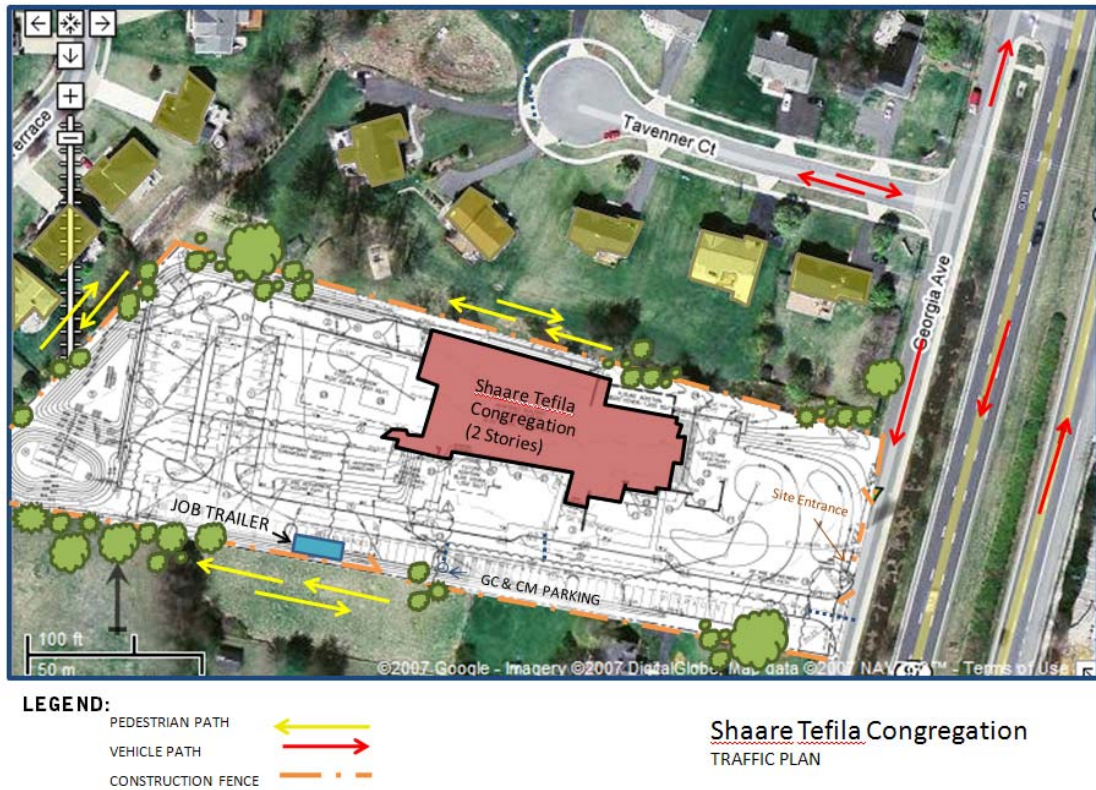


FIGURE 4.3 Traffic Plan

## LOCAL CONDITIONS

The construction site is located in Olney, Maryland, an unincorporated area of Montgomery County. At about 178,000 SF, the area is predominantly grass and trees with spread out 2 story residential homes north and west of the property. Vehicular and pedestrian access is restricted to the Georgia Avenue service road, located on the eastern boarder of the site. For construction, a gravel road will give vehicle access to the site. Due to the expanse of the property lot, ample room is available for on-site parking, on the south and western borders, as well as staging areas for steel. Montgomery County also has regional permit and fee requirements.

When a building is being razed or removed from a lot it is required to obtain a Demolition Permit, the purpose of which is to ensure that the lot is clear of debris and other health hazard material as well as that utility connections have been plugged and sealed. For areas over 5000 SF, a builder must apply for a Demolition Permit and Sediment Control Permit as well as pay required fees. These fees include Demolition fee, Automation Enhancement fee, Sediment Control fee, and Public Right of Way Permit fee, if there is no existing construction entrance. If asbestos is found on the property it must be removed in accordance with the Maryland Department of the Environment prior to demolition.

Additionally, all contractors performing work in Montgomery County are required to have recycling collection services at the project site and must sort items for collection. The county provides its own solid wastes hauling and collecting services, <https://www.montgomerycountymd.gov>, through the Division of Solid Waste Services.

The soil in According to an Environmental Report performed by Schnabel Engineering North, the underlying material in the vicinity consists of sandy silts, silty sands, clayey silt, and silty clay. According to the same 2003 report, ground water could be encountered at 8-20 ft below the ground surface. Ground water is also expected to flow northwesterly direction toward North Branch Rock Creek.

## **CLIENT INFORMATION**

The goal of Shaare Tefila Congregation is to provide the community with opportunities for comfort and growth. Education and discussions as well as family values are the corner stones of this Synagogue.

The building will serve as a new and more spacious home to the members of Montgomery county's Jewish community. Major Features include a 90 seat chapel for daily prayer, Khuddish room and Social Hall for special events, a functioning Youth Activiey Center, Nursery school, and administrative

The client is not an experienced builder so the only keys to success are an on time schedule, meaning no delays, an under budget project.

**PROJECT DELIVERY SUMMARY**

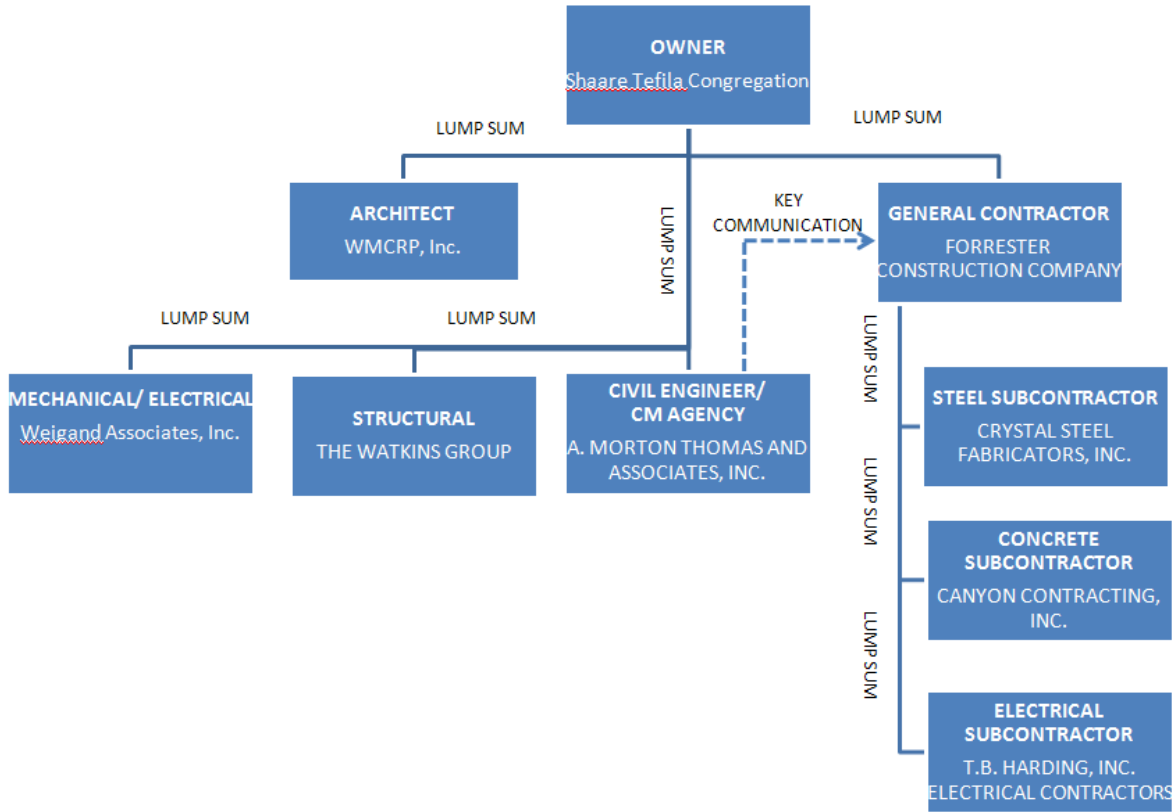


Figure 7.1 Project Delivery Organizational Chart

The project delivery method is a type of design-bid-build, with preconstruction services added. The actual method is:

**“Preconstruction Services/Design – Bid – Purchase – Build”**

Forrester Construction Company’s contract as a GC is a **negotiated bid**, and **lump sum payment**. The contractor was selected based on experience providing quality VE solutions, working with non-profit organizations, and performing quality work in the Education and Institutional markets. The remaining owner contracts were also acquired as lump sum. This was mostly because of the owner’s non-profit status, preferring a Guaranteed Max Price.

One unique aspect of the project organizational structure is the role of the Civil Engineer, **A. Morton Thomas and Associates**. For this project, the Civil Engineer is acting as both a CE, and as the owner’s representation. In this capacity the CE has a direct relationship with the GC, as noted in the figure 7.1. The reason for this assignment is the direct relationship that the CE has as a member of the Shaare Tefila congregation. As a cost solution this assignment also removes the cost of hiring a CM Agent.

## STAFFING PLAN

**Forrester Construction Company**, the General Contractor, staff their projects based on Building type and function. Shaare Tefila, being a Religious Education project is designated to the **Education and Government** group headed up by Mike Slattery. Specifically Steve Houff, the Project Executive in the Education group would correspond with the owner and manage the office side of the project.

The VP of Operations, Pete Zagorin usually gets with the Business Unit Leader and decides **which PM and Superintendent is the best fit for the job**, based on experience and availability. Mr. Zagorin has limited interaction beyond quality control with the Super at this point.

The Project Manager and Superintendent, for all intents and purposes, **run the project from this point**. The Assistant PM's responsibilities vary from job to job. On Shaare Tefila, Dan McCullough has taken more of the lead Project Manager role, while under the supervision of Senior PM, Arland Knipe.

The last tier of support is the Field Engineer. These team members are in a **rotational program and their responsibilities will vary** from Field rotation, to PM rotation, to Purchasing rotation. On this job, Ethan McCarthy is assisting Dan in the PM responsibilities.

