Cinema-Dining Terrace Expansion

Suburbia, USA

Technical Report I

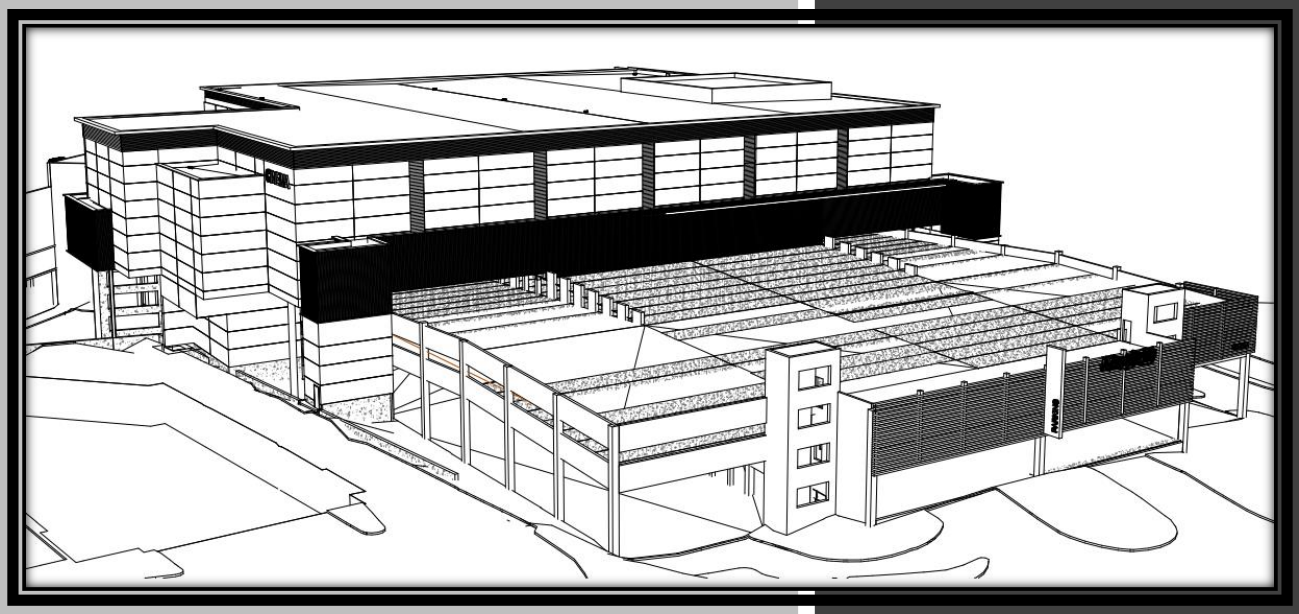


Image Courtesy of The Whiting-Turner Contracting Company

Nicholas Kline

Cinema-Dining Terrace Expansion

9/30/2013

Executive Summary

This Cinema-Dining Terrace Expansion project consists of a 16 screen cinema at the mall's level 3 sitting on top of an existing parking structure, an expansion to the food court, and the addition of restaurant space at the concourse level. The Arclight Cinema sitting on top of the parking garage added complications dealing with the structure, logistics, and in the end, pushed the cost up much higher. This project is not striving for LEED of any kind and has no significant sustainability designs included.

Client Information

The anonymous owner for the Cinema-Dining Terrace Expansion project in Suburbia, USA is the owner of multiple such Malls throughout the US. Since they own multiple malls, they deal with renovating and updating very often. This often interaction gives great opportunity to find Contractors and Engineering Firms that they like to work with. Once they have chosen the companies that can provide the work they desire consistently, they can then build strong relationships. These strong relationships lead to repeat work for all the companies. The Whiting-Turner Contracting Company is one of the companies that has built a very strong relationship with the owner. This relationship helps the owner feel comfortable that all their goals for the project will be met. The main goals of the owner are to increase the size and quality of their mall in order to increase their revenue. The nicer and larger their mall is, the more people that will come and spend money there. The owner's main concerns are that people will be less inclined to come to their mall during construction do to the lack of parking available and the appearance of the site. Getting the parking garage open before the holiday season and keeping a clean site, are two of the main concerns that need to be met to make the owner happy.

Building Systems

Demolition

In order for this project to begin the construction of the new Cinema, they must first demo and modify the existing parking garage that it will be on top of. This demolition consist of removing half of the 4th floor concrete double T's, removing stair and elevator towers where necessary, and building soldier piles in select locations. The phasing plan showing the precast Tees removal and the stair & elevator demolition can be seen in

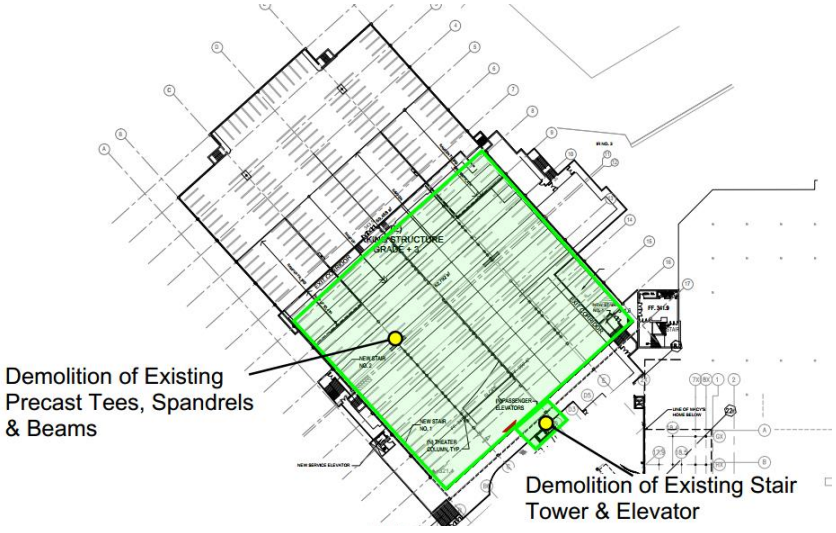


Image from Phasing Plans provided by The Whiting-Turner Contracting Company

the image above. Besides the demolition in the garage though, there is also demolition going on inside the food court on tenant spaces and the ceiling to prepare for that areas renovation as well.

Structural

The primary structural design for this cinema and dining terrace is structural steel with composite beams and decking. The steel will also tie into the concrete shear walls to add extra stability to the structure. The structural plan for this building got complicated in the design phase when it came to how to put and foundation in and build on top of the garage without disturbing the structural stability of the garage itself.

Foundation

The foundation work done to support this new cinema consists of micropiles & pilecaps, sandwich footings, and spread footings. These foundations will work around and with the existing foundation of the parking garage in order to add stability and save time and space.

Mechanical

The HVAC for the existing food court will continue to be used with some modifications to ductwork and diffusers where necessary. The food court runs on a Variable Air Volume system where as the concourse and restrooms run on a Constant Volume system. For the fire suppression system, they will still be using the existing system, with added piping where needed, but will also be adding a Fire Sprinkler Room with a Fire Pump. The mechanical system for the Cinema is still being designed at this time.

Electrical

The electrical system consists of a 750 kVA transformer for the mall and a 150 kVA transformer for the fire pump. These transformers connect to multiple panels throughout the mall. The electrical system for the cinema is still being designed at this time.

Curtain Wall

The Cinema curtain wall is primarily a combination of metal panels, glass, and EIFS. This envelope adds an elegant look to the building that will help attract customers but also added to the high cost.

Project Delivery System

With the owners experience in projects like this, they chose Contractors and Engineers that they had experience with and knew they could trust to accomplish their goals. With B&R Construction Services, they did a Design Build contract because they are confident that B&R will be able to achieve the job set before them relating to the MEP design. This also was true when it came down to the Design-Bid-Build contract; Whiting-Turner was an easy choice for the owner. See Slide 5 for other key contracts and companies involved.

Staffing Plan

The staff chosen by Whiting-Turner for this project is a team from Chris Hoyson's Group at WT. Chris is a VP and has a great group that are all well versed in working together. Below you can see the details of the staffing plan.

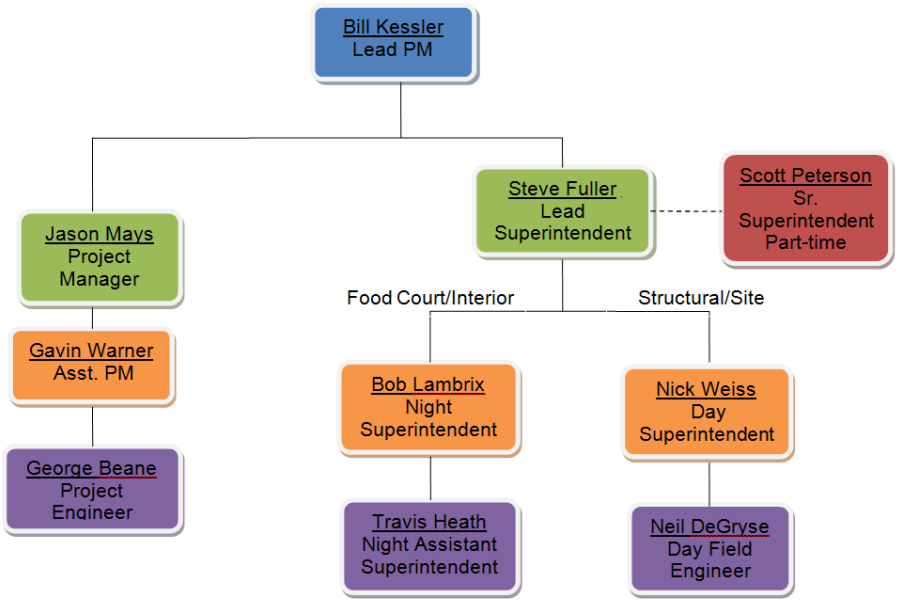


Image from documents provided by The Whiting-Turner Contracting Company

Existing Conditions Site Plan

The existing conditions site plan shows the existing utilities, the existing mall, the neighboring strip mall, the access roads on the mall site and the main roads leading to it. The mall is going to limit the site as best they can because of the parking already being lost by shutting down the parking garage. Limited area for workers to park and laydown areas will be issues to deal with when creating site logistics plans.

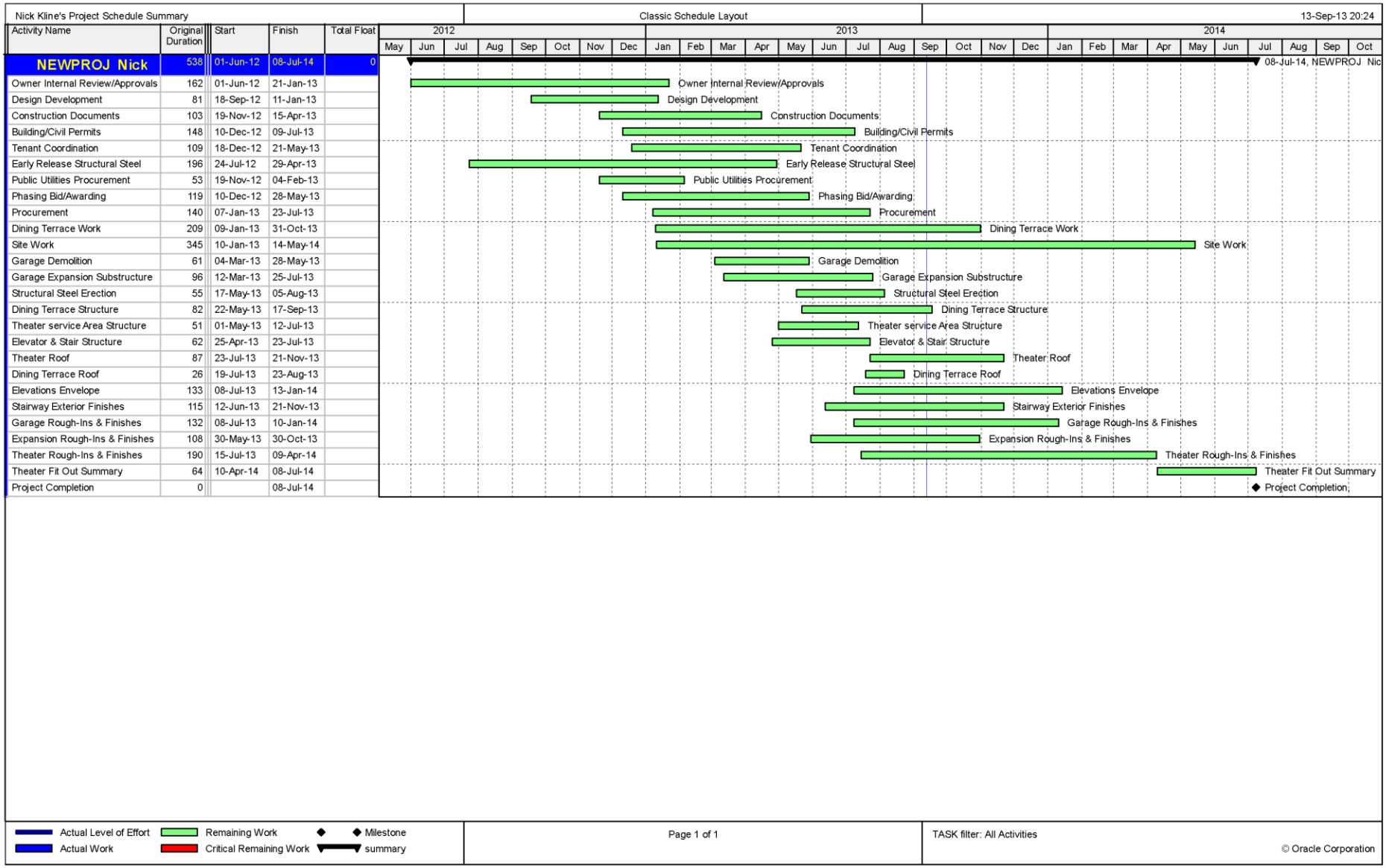
Schedule Summary

Overall, the project begins June 1st, 2012 and runs about 1.5 years up until project completion on July 8th, 2014. Staying on top of all the activities is essential for this project where the schedule and getting done on time is most important. The foundation work is one of the big keys that can hold up most of the project if it gets delayed. This makes it a large focus especially early in the project.

Project Cost Evaluation

The complications with this project, such as building on top of an existing parking garage, add severely when it comes down to the cost. The overall construction cost is $40,165,592.00 and the total project cost is $50,223,763.00. These numbers are far higher than the RS Means square foot estimate of $7,524,000.00. This is caused mostly by the fact that the estimate only looks at it being a movie theater, when this project is also a food court renovation. The complications of structurally and logistically building on top of a parking garage also add allot of costs. The theater façade then also adds costs with the metal panels, glass, and EIFS. Overall, a square foot estimate isn't a very accurate way to get a good approximate price with a project style.

Appendix


Nick Kline's Project Schedule Summary
Classic Schedule Layout
13-Sep-13 20:24
2012
2013
2014
May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct
Activity Name | Original Duration | Start | Finish | Total Float
NEWPROJ Nick | 538 | 01-Jun-12 | 08-Jul-14 | 0
Owner Internal Review/Approvals | 162 | 01-Jun-12 | 21-Jan-13
Design Development | 81 | 18-Sep-12 | 11-Jan-13
Construction Documents | 103 | 19-Nov-12 | 15-Apr-13
Building/Civil Permits | 148 | 10-Dec-12 | 09-Jul-13
Tenant Coordination | 109 | 18-Dec-12 | 21-May-13
Early Release Structural Steel | 196 | 24-Jul-12 | 29-Apr-13
Public Utilities Procurement | 53 | 19-Nov-12 | 04-Feb-13
Phasing Bid/Awarding | 119 | 10-Dec-12 | 28-May-13
Procurement | 140 | 07-Jan-13 | 23-Jul-13
Dining Terrace Work | 209 | 09-Jan-13 | 31-Oct-13
Site Work | 345 | 10-Jan-13 | 14-May-14
Garage Demolition | 61 | 04-Mar-13 | 28-May-13
Garage Expansion Substructure | 96 | 12-Mar-13 | 25-Jul-13
Structural Steel Erection | 55 | 17-May-13 | 05-Aug-13
Dining Terrace Structure | 82 | 22-May-13 | 17-Sep-13
Theater service Area Structure | 51 | 01-May-13 | 12-Jul-13
Elevator & Stair Structure | 62 | 25-Apr-13 | 23-Jul-13
Theater Roof | 87 | 23-Jul-13 | 21-Nov-13
Dining Terrace Roof | 26 | 19-Jul-13 | 23-Aug-13
Elevations Envelope | 133 | 08-Jul-13 | 13-Jan-14
Stairway Exterior Finishes | 115 | 12-Jun-13 | 21-Nov-13
Garage Rough-Ins & Finishes | 132 | 08-Jul-13 | 10-Jan-14
Expansion Rough-Ins & Finishes | 108 | 30-May-13 | 30-Oct-13
Theater Rough-Ins & Finishes | 190 | 15-Jul-13 | 09-Apr-14
Theater Fit Out Summary | 64 | 10-Apr-14 | 08-Jul-14
Project Completion | 0 | | 08-Jul-14
08-Jul-14, NEWPROJ Nic
Owner Internal Review/Approvals
Design Development
Construction Documents
Building/Civil Permits
Tenant Coordination
Early Release Structural Steel
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Phasing Bid/Awarding
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Garage Expansion Substructure
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Dining Terrace Structure
Theater service Area Structure
Elevator & Stair Structure
Theater Roof
Dining Terrace Roof
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Stairway Exterior Finishes
Garage Rough-Ins & Finishes
Expansion Rough-Ins & Finishes
Theater Rough-Ins & Finishes
Theater Fit Out Summary
Project Completion
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
summary
Page 1 of 1
TASK filter: All Activities
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Square Foot Cost Estimate Report

Estimate Name:	**Cinema-Dining Terrace Expansion**
	Bethesda , MD
Building Type:	**Movie Theater with Metal Sandwich Panels / Steel Joists**
Location:	**SILVER SPRING, MD**
Story Count:	**1**
Story Height (L.F.):	**30**
Floor Area (S.F.):	**70000**
Labor Type:	**STD**
Basement Included:	**No**
Data Release:	**Year 2013 Quarter 3**
Cost Per Square Foot:	**$107.49**
Building Cost:	**$7,524,000.00**

Costs are derived from a building model with basic components.

Scope differences and market conditions can cause costs to vary significantly.

		% of Total	Cost Per S.F.	Cost
A Substructure		**10.63%**	**9.98**	**698500**
A1010	**Standard Foundations**		0.66	46500
	KSF, 12" deep x 24" wide			
A1030	**Slab on Grade**		4.94	346000
	Slab on grade, 4" thick, non industrial, reinforced			
A2010	**Basement Excavation**		3.06	214500
	site storage			
A2020	**Basement Walls**		1.31	91500
	thick			
B Shell		**26.01%**	**24.42**	**1709500**
B1010	**Floor Construction**		0.35	24500
	span, 22.5" deep, 100 PSF superimposed load, 145 PSF total load			
B1020	**Roof Construction**		10.09	706500
	wall, 60'x50' bay, 40 PSF superimposed load, 71" deep, 65 PSF total load			
	wall, 60'x50' bay, 40 PSF superimposed load, 71" deep, 65 PSF total load,			
B2010	**Exterior Walls**		3.85	269500
	spacing			
	spacing, wind columns			
B2020	**Exterior Windows**		3.69	258500
	face			
B2030	**Exterior Doors**		1.18	82500
	hardware, 6'-0" x 10'-0" opening			
	0" opening			
B3010	**Roof Coverings**		5.26	368000
	mopped			
	Insulation, rigid, roof deck, composite with 2" EPS, 1" perlite			
	Roof edges, aluminum, duranodic, .050" thick, 6" face			
	Gravel stop, aluminum, extruded, 4", mill finish, .050" thick			
C Interiors		**22.45%**	**21.08**	**1475500**
C1010	**Partitions**		2.94	206000
	Concrete block (CMU) partition, light weight, hollow, 6" thick, no finish			
C1020	**Interior Doors**		1.58	110500
	3'-0" x 7'-0" x 1-3/8"			
C1030	**Fittings**		0.09	6500
	Toilet partitions, cubicles, ceiling hung, stainless steel			
	Directory boards, outdoor, 36" x 36"			
C2010	**Stair Construction**		2.61	182500
	Stairs, steel, cement filled metal pan & picket rail, 20 risers, with landing			
C3010	**Wall Finishes**		2.49	174000
	2 coats paint on masonry with block filler			
	Painting, masonry or concrete, latex, brushwork, primer & 2 coats			
C3020	**Floor Finishes**		5.71	399500
	Carpet, tufted, nylon, roll goods, 12' wide, 36 oz			
	Carpet, padding, add to above, minimum			
	Tile, ceramic natural clay			
C3030	**Ceiling Finishes**		5.66	396500
	channel grid, suspended support			

D Services		**34.59%**	**32.48**	**2273500**
D2010	**Plumbing Fixtures**		**9.09**	**636500**
	Water closet, vitreous china, bowl only with flush valve, wall hung			
	Urinal, vitreous china, wall hung			
	Lavatory w/trim, vanity top, PE on CI, 19" x 16" oval			
	Service sink w/trim, PE on CI,wall hung w/rim guard, 22" x 18"			
	Water cooler, electric, wall hung, dual height, 14.3 GPH			
D2020	**Domestic Water Distribution**		**0.07**	**5000**
	Gas fired water heater, residential, 100< F rise, 30 gal tank, 32 GPH			
D2040	**Rain Water Drainage**		**0.21**	**14500**
	Roof drain, DWV PVC, 5" diam, 10' high			
	Roof drain, DWV PVC, 5" diam, for each additional foot add			
D3050	**Terminal & Package Units**		**9.77**	**684000**
	38.33 ton			
D4010	**Sprinklers**		**3.98**	**278500**
	Wet pipe sprinkler systems, steel, light hazard, 1 floor, 10,000 SF			
	SF			
D4020	**Standpipes**		**0.79**	**55000**
	Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, 1 floor			
	floors			
D5010	**Electrical Service/Distribution**		**0.33**	**23000**
	phase, 4 wire, 120/208 V, 400 A			
	Feeder installation 600 V, including RGS conduit and XHHW wire, 400 A			
	V, 1 phase, 400 A			
D5020	**Lighting and Branch Wiring**		**6.59**	**461000**
	Receptacles incl plate, box, conduit, wire, 2.5 per 1000 SF, .3 watts per SF			
	Miscellaneous power, to .5 watts			
	Central air conditioning power, 3 watts			
	fixtures @32 watt per 1000 SF			
	Daylight dimming control system, 10 fixtures per 1000 SF			
D5030	**Communications and Security**		**1.47**	**103000**
	wire, sound systems, 12 outlets			
	detectors, includes outlets, boxes, conduit and wire			
	Fire alarm command center, addressable with voice, excl. wire & conduit			
D5090	**Other Electrical Systems**		**0.19**	**13000**
	gas/gasoline operated, 3 phase, 4 wire, 277/480 V, 7.5 kW			
E Equipment & Furnishings		**6.31%**	**5.93**	**415000**
E1020	**Institutional Equipment**		**1.56**	**109500**
	platters & autownd, econ			
	rectifiers, xenon, 1000W			
	mm, economy			
	wall, acrylic, 1/4" thick			
E1090	**Other Equipment**		**0**	**0**
E2010	**Fixed Furnishings**		**4.36**	**305500**
	upholstered, economy			
F Special Construction		**0%**	**0**	**0**
G Building Sitework		**0%**	**0**	**0**

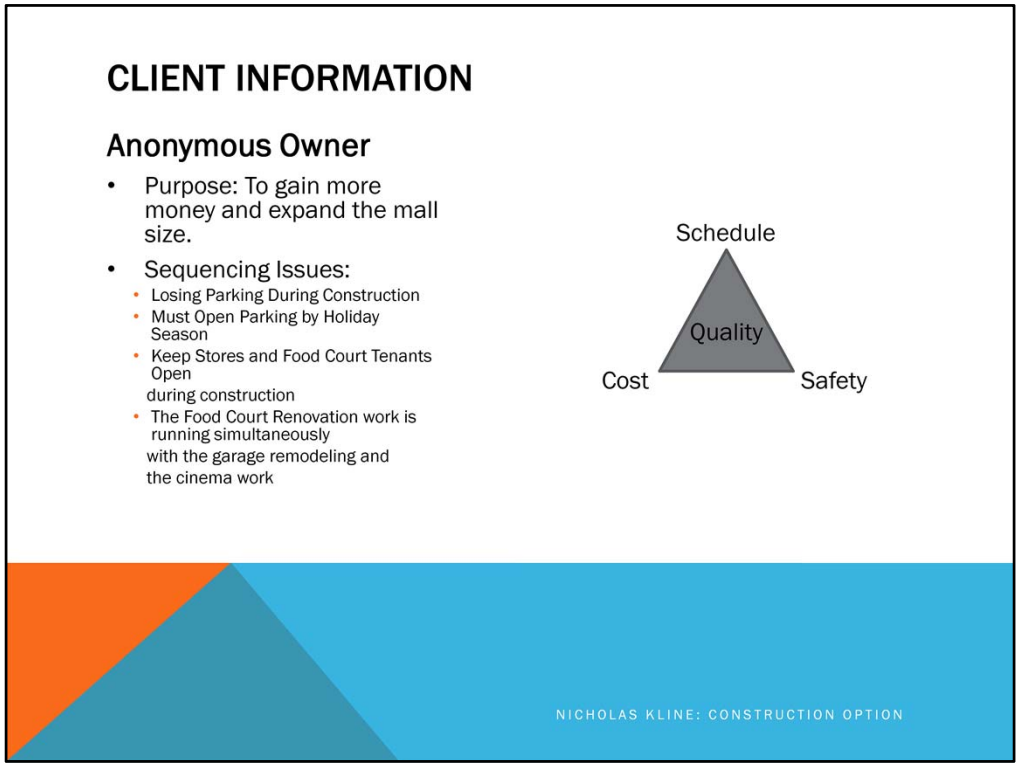
SubTotal	**100%**	**$93.89**	**$6,572,000.00**
Contractor Fees (General Conditions,Overhead,Profit)	**7.0 %%**	**$6.57**	**$460,000.00**
Architectural Fees	**7.0 %%**	**$7.03**	**$492,000.00**
User Fees	**0.0 %%**	**$0.00**	**$0.00**
Total Building Cost		**$107.49**	**$7,524,000.00**

CINEMA-DINING TERRACE EXPANSION

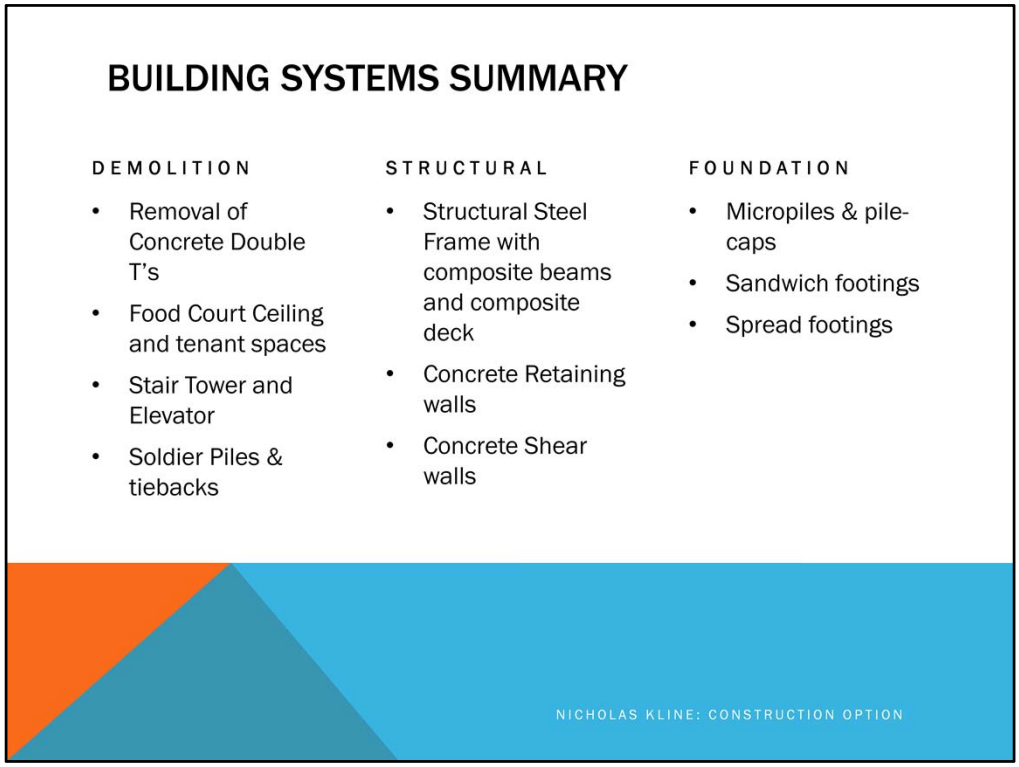
Suburbia USA

NICHOLAS KLINE: CONSTRUCTION OPTION
ADVISOR: RAY SOWERS

9/16/2013

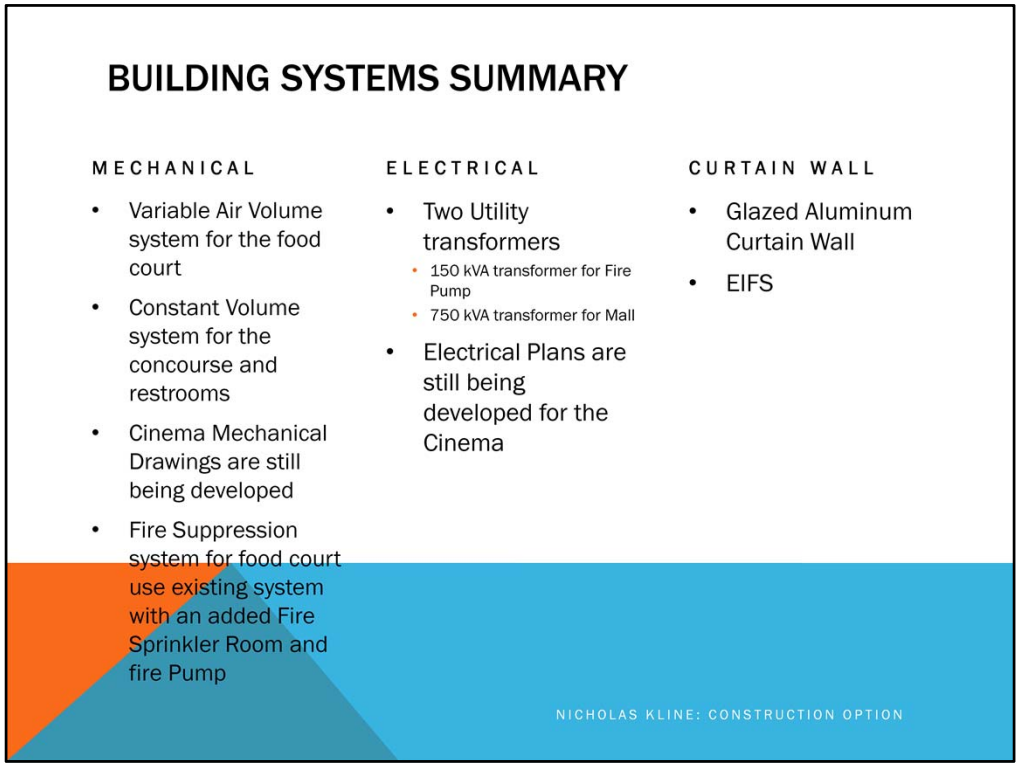


- Main Concerns
  - Schedule
    - Opening parking back up for the Holiday Season
    - Allowing access to all stores and the food court during construction
  - Safety
    - Keep workers safe on site
    - Keep customers safe around the site

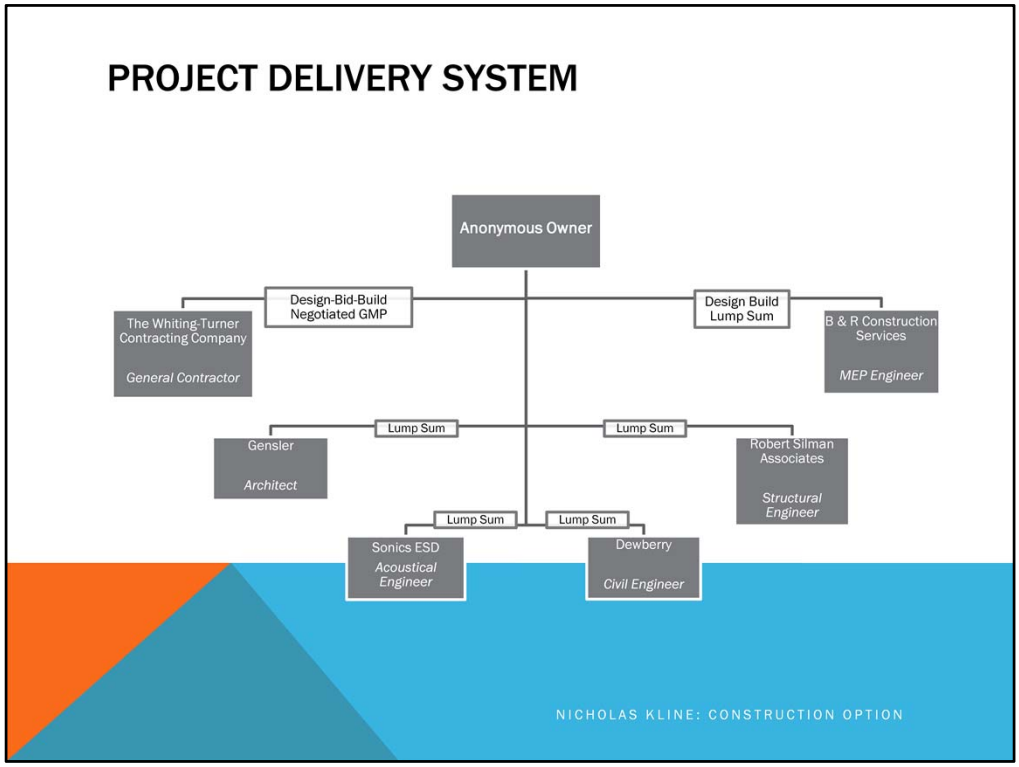


- Demolition
  - Removal of Concrete Double T's
    - Half of 4th floor were permanently removed to make room for the Cinema
    - Removed using two 400 ton Hydro cranes
    - Double T's were about 60 ft long by 9 ft wide weighing around 25 tons so to remove the pieces, they would be cut in half for a safer pick with the crane
    - Some Double T's were removed through the center of the building on all floors to make room for the tower crane being brought in to erect the steel
  - Food Court Ceiling and Tenant Spaces
    - The food court ceiling was ripped out for easier access when replacing and coordinating
    - The food court renovation forced the tenants closest to the parking garage to vacate so that those areas could be barricaded and either torn down or renovated.
  - Stair Tower and Elevator
    - The stair tower and elevator in between the mall and the garage had to be removed for the cinema and food court to connect
    - The south side stair tower had to be removed for the new egress stair to be put in
  - Soldier Piles and Tiebacks

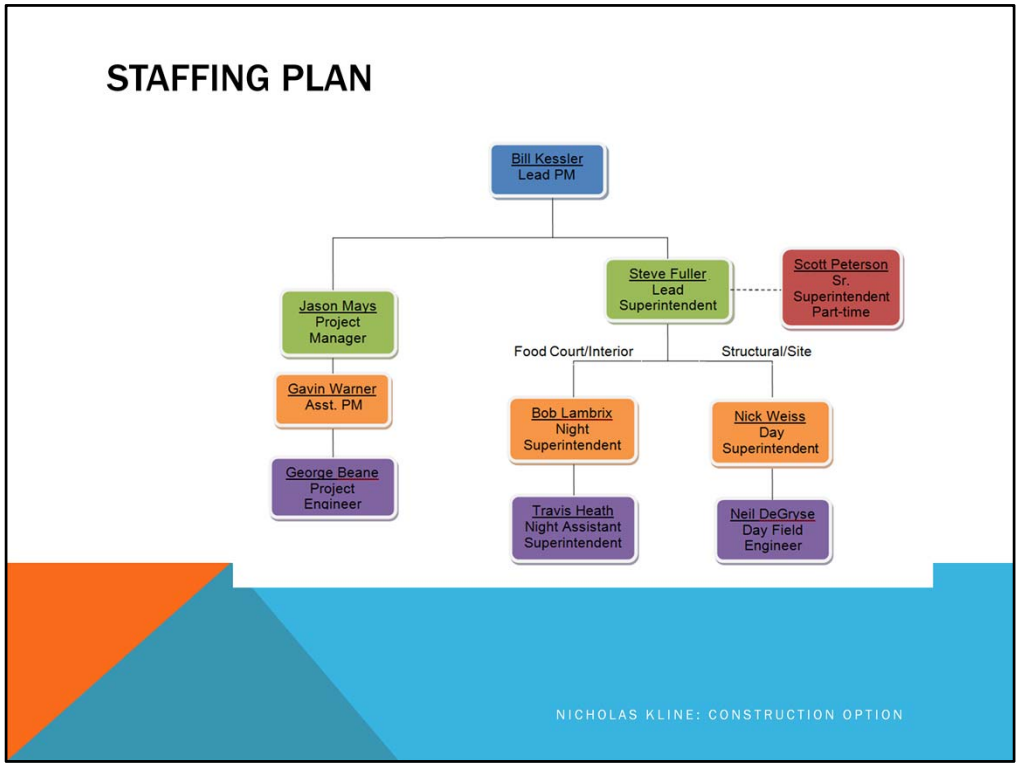
        - Needed for the excavation on the south side to add the new foundation
        - For extra support for the Hydro crane to allow the crane to get close enough to the building to make its farthest picks
- Structural
    - Structural Steel Frame
        - Composite Beams
        - Composite Deck
        - Columns go through existing parking garage
    - Concrete Shearwalls
        - Two 50’ tall shear walls tied into the steel frame
        - Running along the North and south direction
- Foundation
    - Micropiles & pilecaps
        - Used primarily along the ring road to add structural support for new steel columns
    - Sandwich footings
        - Poured new footings around existing column footings
        - Drilled through existing footings and used a thread bar to connect the new and existing footings
    - Spread footings
        - Used around stairwells and elevators



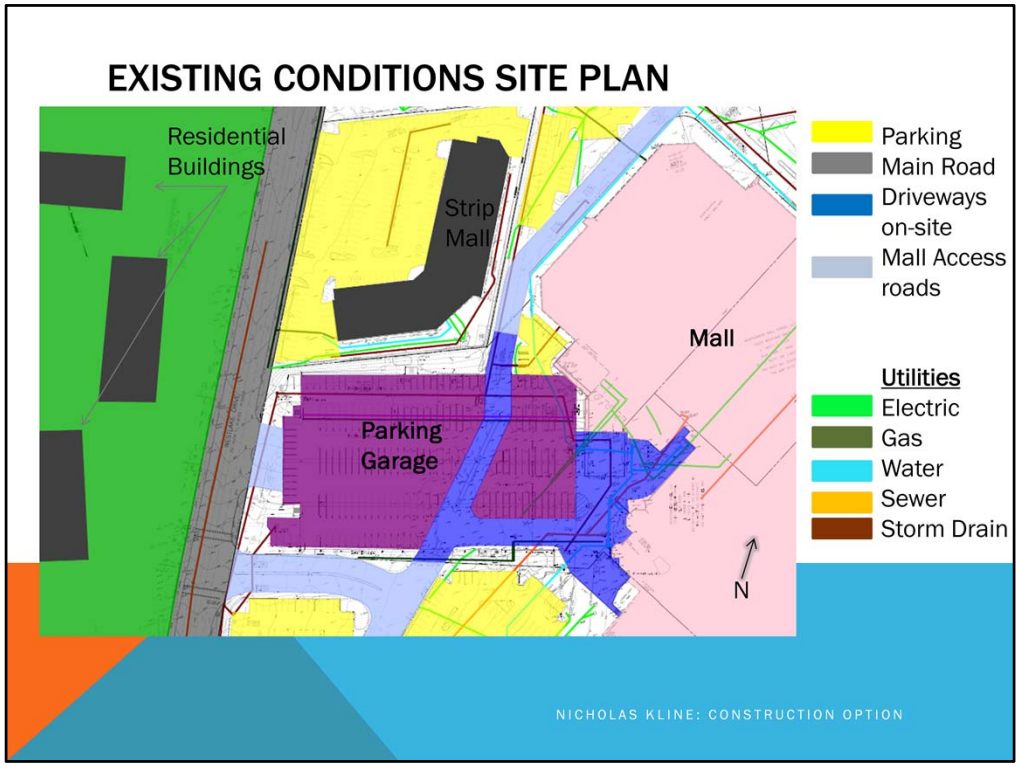
- Electrical
    - Transformers connect to the multiple panels that very between 460/265V and 208Y/120V
- Curtain Wall
    - Glazed Aluminum Curtain Wall is backed by board insulation on either cold-rolled channels, CMU, or structural steel framing
    - EIFS is backed by thermal or semi-rigid insulation on either cold-formed channels, furring channels, or structural steel framing
    - Cinema and the Main Entrance are primarily covered by the Composite Metal Panels, Glass, and/or EIFS



- Owner Relationships
    - This owner also owns multiple Malls throughout the USA so they have good relationships with all kinds of contractors
    - This owner is a frequent client of Whiting-Turner, especially with the Chris Hoyson Group

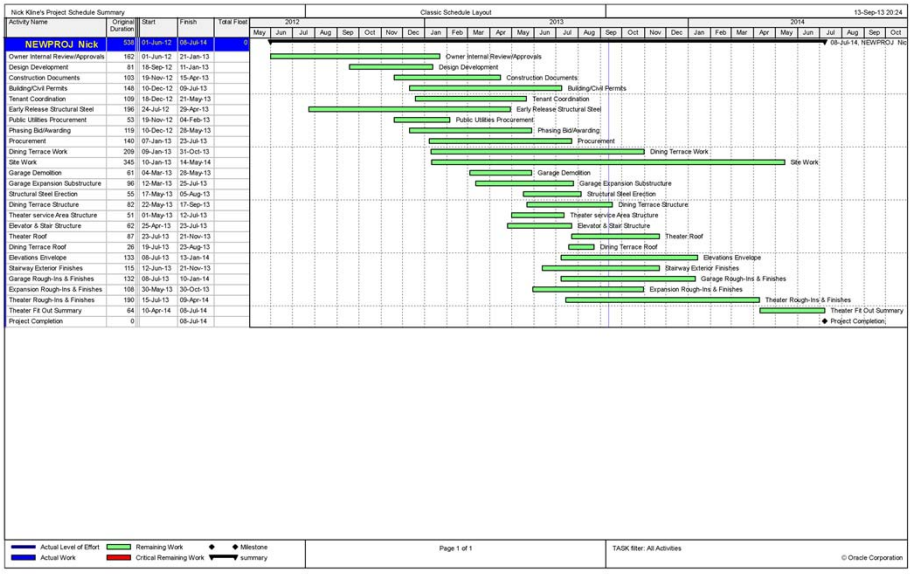


- The Whiting-Turner Contracting Company Staffing Plan
  - VP Chris Hoyson's Group
  - Worked together multiple times so they have good group chemistry

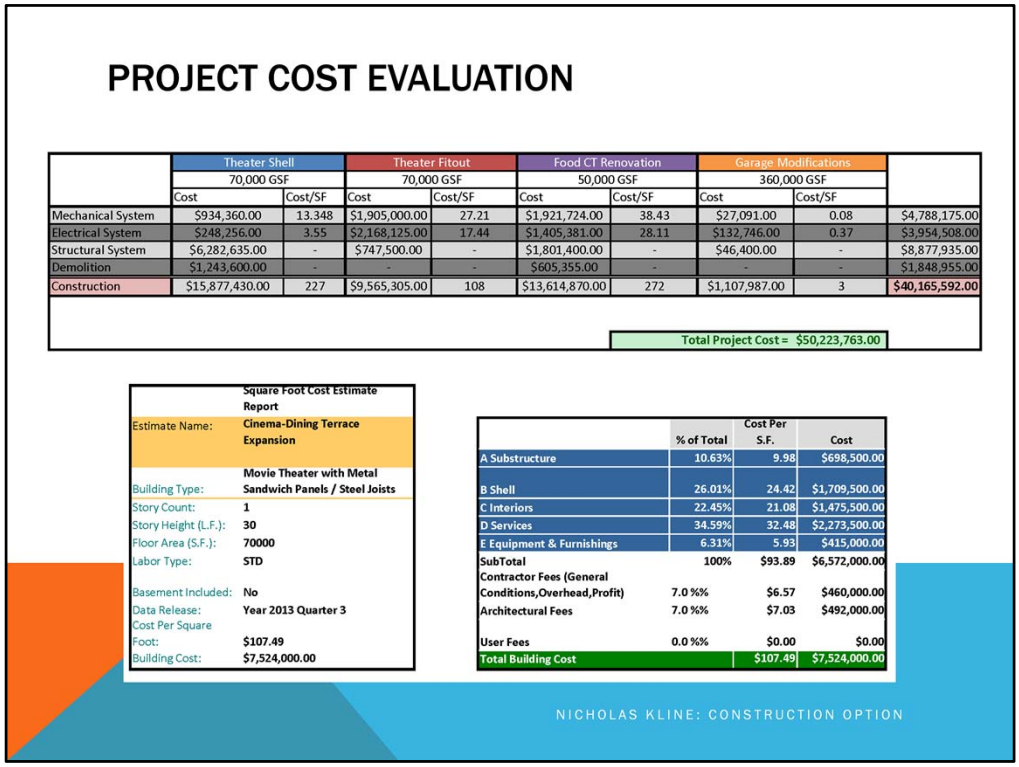


- Site is in Suburbia, USA
  - Not seen is a large highway less than a half-mile to the west creating relatively simple material transport by truck
  - Electric, Gas, Water, Sewer, and Storm Drain Lines can all be seen but most won't be an issue for the new construction
  - The site is limited by the mall because of the resistance to give up more parking spaces
  - The parking garage has a drive aisle that runs under it on the ground floor that also allows access to the loading docks for multiple mall tenants
  - On the north side, there is a strip mall that keeps the site from being expanded that way

SCHEDULE SUMMARY



- 538 day schedule (about 1.5 years)
- Keys to the schedule
    - Foundations need to be done in order for the steel to be erected
    - Working on the interior and dining terrace during all outside work



- Construction Cost: $40,165,592.00
- Total Project Cost: $50,223,763.00
- Square Foot Estimate: $7,524,000.00
    - Reasons for huge difference
        - Square foot Estimate only represents a Movie Theater
        - The finishes in the Theater are of higher quality
        - The structural system to build on top of an existing parking garage is far more expensive