# Client Information

Renuka Hospitality L.L.C. is a private owner of one Holiday Inn Express in the south Jersey area. Their goal is to increase occupancy capacity and to provide alternate building usage.

Renuka Hospitality L.L.C. chose the location and size of the existing site to allow for expansion. The original design of the existing building was small to allow the business to grow. Once revenue was sufficient to expand the owner had the adjacent land to construct the new 3-story hotel addition and pool/gym facilities.

The expansion was developed for traditional growth of a company. With only 49 existing room units this particular Holiday Inn Express is on the smaller end of the spectrum. At the current size the hotel was not generating enough revenue to higher manager staff positions. Since those key staff members do not currently exist, the hotel must be operated internally meaning that the building owner must run the facility to generate profit. The owner also owns a large portion of the market share and they believe that their location outside of Atlantic City, NJ is a prime enough to fill their expanded 39 units.

The addition of a pool, spa, gym, and meeting rooms were also developed to increase profit. The pool itself is now a requirement of the Holiday Inn Express brand, and the gym and spas are other amenities that traveler's seek when looking for hospitality. The meeting rooms will help bring in corporate traveler's and be able to accommodate larger groups.

One of the largest concerns for the owner is that the construction does not affect the continuous operation of existing facilities. The existing hotel will be fully functional during the construction phases. With the hotel being a place for rest and comfort, the noise created by construction processes can pose troublesome therefore construction must be done during appropriate operating hours. Also keeping the site clean and having available parking spots is needed to allow for continuous business.

The schedule is also a very important concern for the owner. The end date of construction and occupancy is in April 2010. For this location summer is prime time for

tourist and generates the largest revenue period. It is urgent that the schedule does not extend into this time frame.

As for cost the owner is less worried about this because they are using a GC and the contract budget must be met. Any over charges or change orders are to be paid by the GC.

# Project Schedule Summary

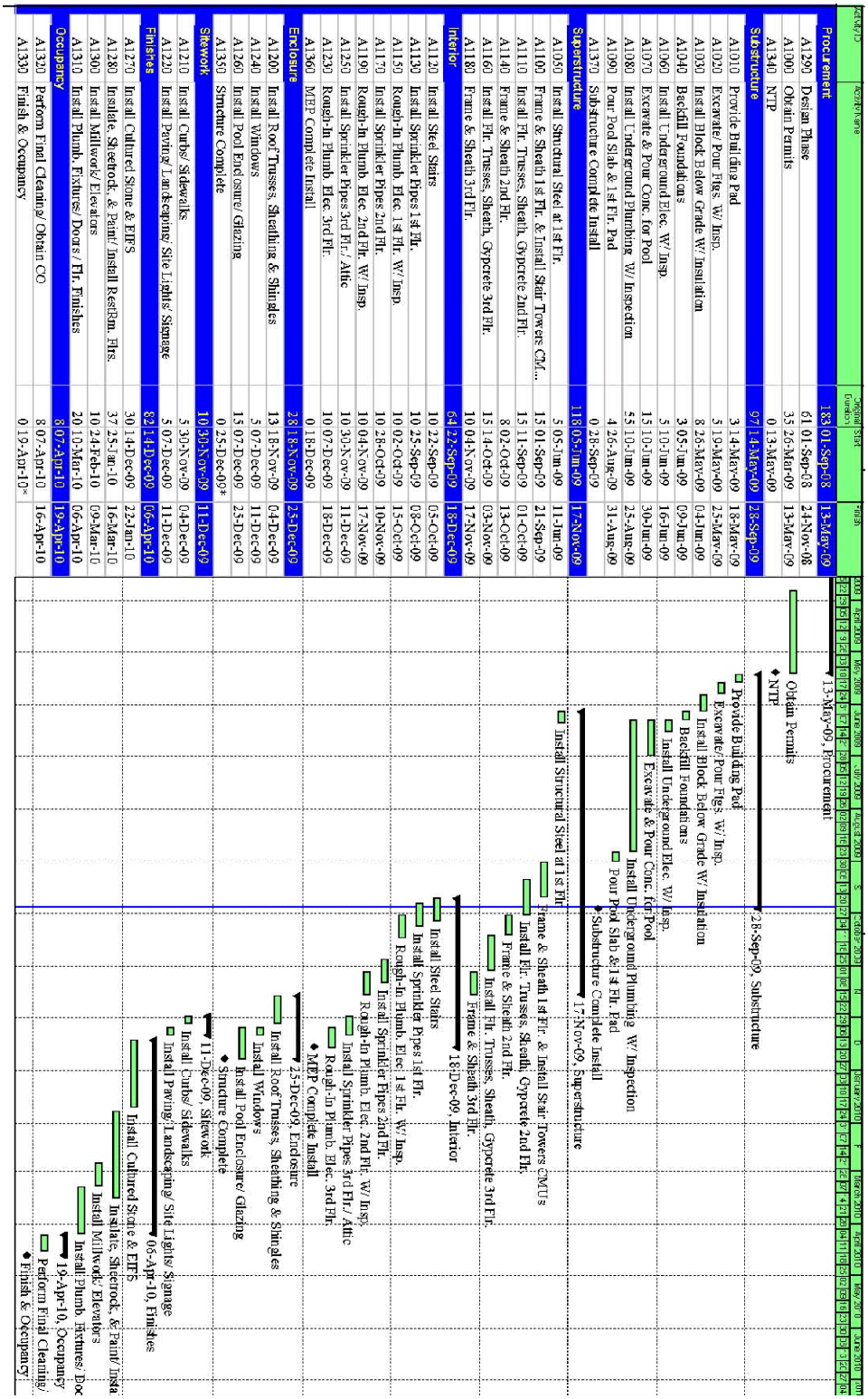
The schedule for Holiday Inn Express addition was geared around peak revenue creating periods. For the Atlantic City, NJ area summer is the best time of the year for tourism and for hotel revenue. This is why the design had been completely finished 3 months before construction had started.

The substructure phase was started in March of 2009 and ends towards the end of August 2009. As you can see below there is a large amount of time allotted for the placement of underground plumbing. My instinct tells me that this delay is due to the continuous usage of the existing structure. The owner most likely did not want to bring more equipment and construction on site until after the summer so they don't lose summer revenue. Also a small portion of the first floor existing structure must be demolished in order to construct the first floor connection and the hotel would have to be closed during that process.

The superstructure begins in September of 2009 except the first floor structural steel which was installed during the substructure phase of construction. During the fall, winter, and early spring months the business is pretty slow and it is a great time for the superstructure to be constructed with little effect on revenue. By mid November 2009 all of the exterior curtain walls are framed and the floor trusses are installed. MEP rough-in is installed almost simultaneously with the superstructure and is completed in mid December 2009.

After the superstructure is complete the roof is enclosed and after rough-in is complete the curtain walls and pool are to be enclosed ending in late December 2009. Site work is being constructed during the enclosure phase.

Floor and exterior wall finishing began in mid December 2009 and finished in early April 2010 along with the installation of fixtures, elevators, and millwork. By mid April the owner has decided to use the rest of the budget to try and add as many wow factors as possible before the summer season and occupancy. Occupancy is permitted after April 19, 2010 but will depend on owner decisions.



| Activity ID | Activity Name | Original Duration | Start | Finish |
|---|---|---|---|---|
| **Procurement** | | 183 | 01-Sep-08 | 13-May-09 |
| A1290 | Design Phase | 61 | 01-Sep-08 | 24-Nov-08 |
| A1000 | Obtain Permits | 35 | 26-Mar-09 | 13-May-09 |
| A1340 | NTP | 0 | 13-May-09 | |
| **Substructure** | | 97 | 14-May-09 | 28-Sep-09 |
| A1010 | Provide Building Pad | 3 | 14-May-09 | 16-May-09 |
| A1020 | Excavate/ Pour Ftgs. W/ Insp. | 5 | 19-May-09 | 25-May-09 |
| A1030 | Install Block Below Grade W/ Insulation | 8 | 26-May-09 | 04-Jun-09 |
| A1040 | Backfill Foundations | 3 | 05-Jun-09 | 09-Jun-09 |
| A1060 | Install Underground Elec. W/ Insp. | 5 | 10-Jun-09 | 16-Jun-09 |
| A1070 | Excavate & Pour Conc. for Pool | 15 | 10-Jun-09 | 30-Jun-09 |
| A1080 | Install Underground Plumbing W/ Inspection | 55 | 10-Jun-09 | 25-Aug-09 |
| A1090 | Pour Pool Slab & 1st Flr. Pad | 4 | 26-Aug-09 | 31-Aug-09 |
| A1370 | Substructure Complete Install | 0 | 28-Sep-09 | |
| **Superstructure** | | 118 | 05-Jun-09 | 17-Nov-09 |
| A1050 | Install Structural Steel at 1st Flr. | 5 | 05-Jun-09 | 11-Jun-09 |
| A1100 | Frame & Sheath 1st Flr. & Install Stair Towers CMU... | 15 | 01-Sep-09 | 21-Sep-09 |
| A1110 | Install Flr. Trusses, Sheath, Gypcrete 2nd Flr. | 15 | 11-Sep-09 | 01-Oct-09 |
| A1140 | Frame & Sheath 2nd Flr. | 8 | 02-Oct-09 | 13-Oct-09 |
| A1160 | Install Flr. Trusses, Sheath, Gypcrete 3rd Flr. | 15 | 14-Oct-09 | 03-Nov-09 |
| A1180 | Frame & Sheath 3rd Flr. | 10 | 04-Nov-09 | 17-Nov-09 |
| **Interior** | | 64 | 22-Sep-09 | 18-Dec-09 |
| A1120 | Install Steel Stairs | 10 | 22-Sep-09 | 05-Oct-09 |
| A1130 | Install Sprinkler Pipes 1st Flr. | 10 | 25-Sep-09 | 08-Oct-09 |
| A1150 | Rough-In Plumb. Elec. 1st Flr. W/ Insp. | 10 | 02-Oct-09 | 15-Oct-09 |
| A1170 | Install Sprinkler Pipes 2nd Flr. | 10 | 28-Oct-09 | 10-Nov-09 |
| A1190 | Rough-In Plumb. Elec. 2nd Flr. W/ Insp. | 10 | 04-Nov-09 | 17-Nov-09 |
| A1250 | Install Sprinkler Pipes 3rd Flr./ Attic | 10 | 30-Nov-09 | 11-Dec-09 |
| A1230 | Rough-In Plumb. Elec. 3rd Flr. | 10 | 07-Dec-09 | 18-Dec-09 |
| A1360 | MEP Complete Install | 0 | 18-Dec-09 | |
| **Enclosure** | | 28 | 18-Nov-09 | 25-Dec-09 |
| A1200 | Install Roof Trusses, Sheathing & Shingles | 13 | 18-Nov-09 | 04-Dec-09 |
| A1240 | Install Windows | 5 | 07-Dec-09 | 11-Dec-09 |
| A1260 | Install Pool Enclosure/ Glazing | 15 | 07-Dec-09 | 25-Dec-09 |
| A1350 | Structure Complete | 0 | 25-Dec-09* | |
| **Sitework** | | 10 | 30-Nov-09 | 11-Dec-09 |
| A1210 | Install Curbs/ Sidewalks | 5 | 30-Nov-09 | 04-Dec-09 |
| A1220 | Install Paving/ Landscaping/ Site Lights/ Signage | 5 | 07-Dec-09 | 11-Dec-09 |
| **Finishes** | | 82 | 14-Dec-09 | 06-Apr-10 |
| A1270 | Install Cultured Stone & EIFS | 30 | 14-Dec-09 | 22-Jan-10 |
| A1280 | Insulate, Sheetrock, & Paint/ Install RestRm. Fixs. | 37 | 25-Jan-10 | 16-Mar-10 |
| A1300 | Install Millwork/ Elevators | 10 | 24-Feb-10 | 09-Mar-10 |
| A1310 | Install Plumb. Fixtures/ Doors/ Flr. Finishes | 20 | 10-Mar-10 | 06-Apr-10 |
| **Occupancy** | | 8 | 07-Apr-10 | 19-Apr-10 |
| A1320 | Perform Final Cleaning/ Obtain CO | 8 | 07-Apr-10 | 16-Apr-10 |
| A1330 | Finish & Occupancy | 0 | 19-Apr-10* | |

# Building Systems Summary

Demolition

- Demolition occurs in August 2009
- The existing unit directly across from the lobby will be demoed along with the lobby itself for renovations. The unit will be turned into a lobby expansion and will be the connection to the pool room and addition.
- Salvaged furniture and fixtures are to be reused in the new addition.

Structural Steel

- The only structural steel used on the project are columns on the first floor.
- Columns range from 4" x 4" x 3/16" to 5" x 5" x ¼" and W10 x 68.
- Structural steel is installed in June 2009 and is completed in a 5 day period.

Cast in Place Concrete

- Continuous footings, Slab on grade, Concrete pool, Column footers
- All concrete has a minimum 28 day compressive strength of 3500psi.
- Footers used the ground as formwork, and the sizes ranged from 3' x 3' x 12" to 9'-3" x 11'-7" x 12".
- The slab on grade is 4" thick with 6 x 6 W1.4 x W1.4 WWM. Formwork was typical horizontal 2x4 edge forms. The concrete was placed via direct chute.
- All of the concrete is placed between May and August 2009.

Mechanical System

- The mechanical system is broken up into 3 main parts.
- The entire system consists of 2 desert air systems and 3 HVAC units.
- The hotel rooms each have Amana 9,000 BTU PTAC units with digital controls.
- The desert air systems are used in the pool area and are designed by the manufacturer.
- Unit #1 is a 120,000 BTU gas hot air with 5 ton A/C and is used in the new meeting room areas. Unit #1 is located in the storage room on the first floor.

- Unit # 2 is a 40,000 BTU gas hot air with 2 ton A/C and is used in the new electrical room and vending area. Unit #2 is also located in the storage room on the first floor.
- Unit #3 is 100,000 BTU gas hot air with 3.5 ton A/C and is used in the gym, pool equipment room, pool toilet rooms, and the pool/gym vestibule. Unit #3 is located on the roof above the gym.
- Mitsubishi slim-ductless m-series multi-split heat pumps are used in the stair towers.
- Fire suppression consist of expanded sprinkler systems on all floors

Electrical System

- Lighting is typically 2' x 2' ceiling mounted fluorescent lights in the meeting room area. The hallways and pool room are illuminated by ceiling recessed hi-hats. The hotel units are lit using decorative lamps to match existing rooms.
- The electrical system for the addition is to be connected to the existing utilities.
- A new 600 Amp/3phase panelboard is added to the existing switchgear unit in the first floor electrical room.
- 6 new panels are installed. 3 of the panels are 225 Amp/3phase, one panel is 250 Amp/3phase, and the last 2 panels are 300 Amp/3phase.

Masonry

- The 2 stair towers are constructed of 8" CMUs and are fire-rated.
- Scaffolding is used for the entire height.

Curtain Wall

- The wall system is typical 2 x 6 stud walls @ 16" O/C.
- The first floor exterior is topped with cultured stone veneer.
- The second and third floor exteriors are topped with typical EIFS.

Excavation Support

- Little excavation is to be done since there is no basement. Excavation consists of digging for the pool and foundation.
- Typical shoring and trench-boxes were used.

# Local Conditions

The Holiday Inn Express Addition is being constructed in Absecon, NJ just outside of Atlantic City, NJ on a 2.18 acre property. This site currently has a 3-story existing hotel building and the majority of extra space is currently used for parking and landscape. The proposed addition will be located on the existing retention basin south of the existing hotel.

For the Absecon, NJ areas there are height and area restrictions. For a three story building the allowable height is 60'-0" and the allowable area is 25,200 SF/Floor. This building meets these requirements because the proposed height is 40'-0" and the total area is 53,390 SF which is less than the allowed 75,600 SF.

Absecon, NJ is very big on recycling and so is DRK Associates which is why they plan to achieve 50% recycling on the project. Wood, concrete, steel, and glass will be recycled and the rest of the debris will be separated. Teesdale Trash Removal will be responsible for renting out the dumpsters and for waste removal. The dumpsters will be pulled once or twice per week at a rate of $350/pull.

Four soil samples were taking on the property and their complete detail can be seen in Appendix A Figure 1. The soil logs showed that the type of soil tends to be loamy sands for about 45" then medium-coarse sand below that. There are no signs of large aggregates or boulders so the site should be easy to excavate and backfill. No drilling is necessary. The highest water table is approximately 120" below grade but should not pose a threat since there is no basement and the foundation shall not exceed 48" below grade and the pool shall not exceed 96" below grade.

The contractor must construct inlet sediment filters specific locations to prevent transportation of sediment into the stormwater management system. Silt fences should also be constructed on downhill slopes. In addition the contractor is responsible for cleaning surrounding areas including public right-of-ways and neighboring properties.

# Site Plan of Existing Conditions

The Holiday Inn Express addition is being constructed on the south side of the existing building. The addition is limited to setbacks of 35'-0" on the front and sides and 30'-0" on the rear from the property line as shown in the figure below. That being said the size of the addition was constrained to a limited area and the footprint is almost on each of the setback lines.

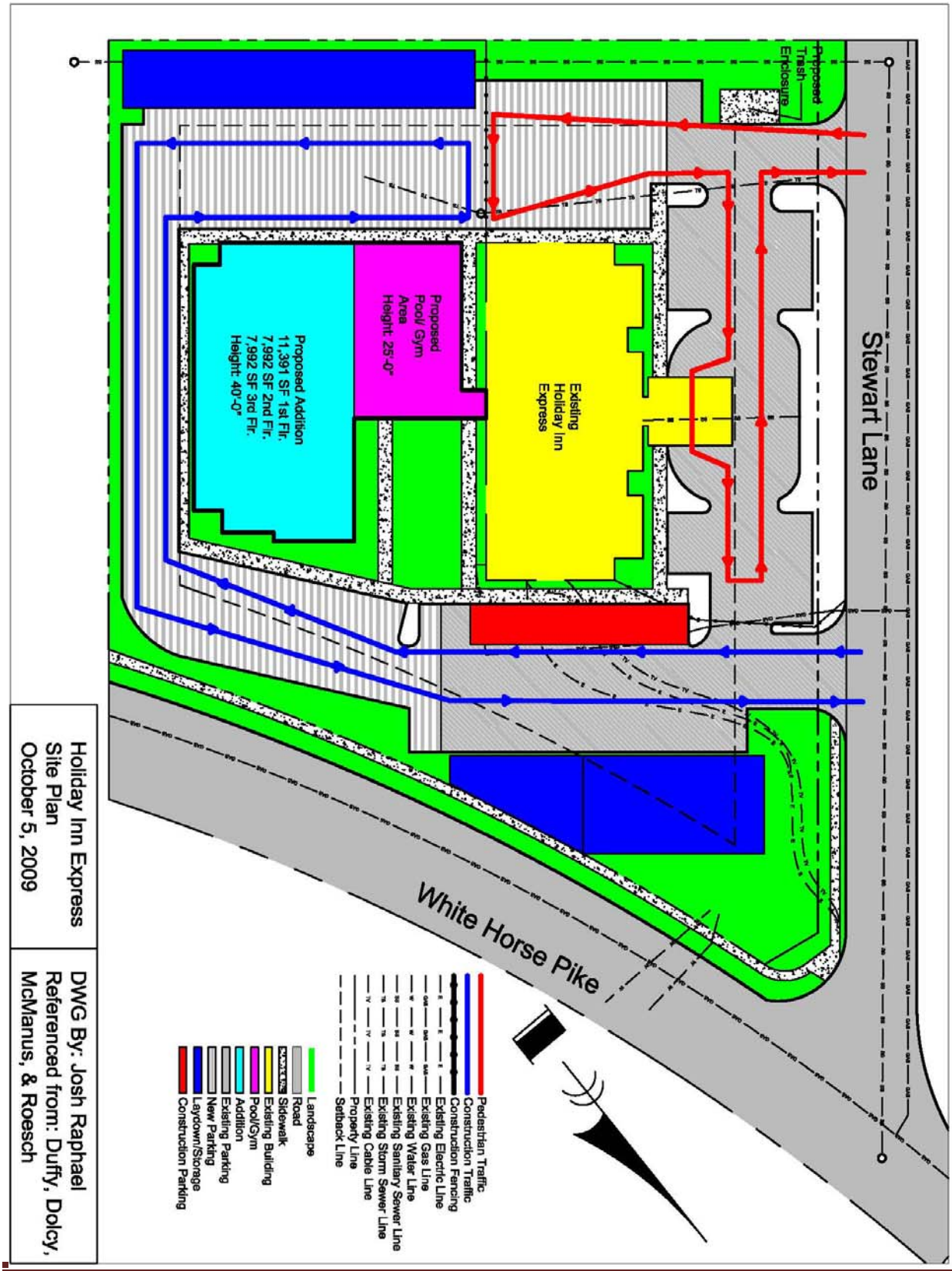
The addition plans to be connected to all the existing utilities available to the existing building. This will allow the existing and new buildings to act as one whole hotel.

Since the building will remain fully operable during construction the temporary customer parking will be in the front and to the right of the existing building. The rest of the existing and new parking spaces will be used for construction traffic, material laydown, storage, temporary trash facilities, equipment, and construction parking.

The site is accessible by making a right off of the White Horse Pike onto Stewart Lane. The accessible route could cause some delay due to traffic but all the materials and the contractors are local so this should not be a problem. The major concern for the site access is that with only one entrance is directing the customer parking away from the construction traffic. The use of signs and fencing will be very helpful in this situation.

The site is restricted to using only the area inside of the property line because surrounding the site on three sides are main roads and the last side is heavily forested area. This site could become tight and cluttered but luckily since DRK is the contractor for all MEPS systems they are the only ones on site and will have little coordination problems.

Overall the main concern for the site is construction traffic not interfering with pedestrian traffic and having construction areas noticeably fenced off with clear signage.


Stewart Lane
White Horse Pike
Proposed Trash Enclosure
Existing Holiday Inn Express
Proposed Pool/ Gym Area Height: 25'-0"
Proposed Addition 11,391 SF 1st Flr. 7,992 SF 2nd Flr. 7,992 SF 3rd Flr. Height: 40'-0"
Holiday Inn Express
Site Plan
October 5, 2009
DWG By: Josh Raphael
Referenced from: Duffy, Dolcy, McManus, & Roesch
Pedestrian Traffic
Construction Traffic
Construction Fencing
Existing Electric Line
Existing Gas Line
Existing Water Line
Existing Sanitary Sewer Line
Existing Storm Sewer Line
Existing Cable Line
Property Line
Setback Line
Landscape
Road
Sidewalk
Existing Building
Pool/Gym
Addition
Existing Parking
New Parking
Laydown/Storage
Construction Parking

# Site Layout Planning

Although the site is fairly open with a lot of room to move around, site planning is still an issue because the land is to be shared with the existing hotel being operable. One thing that I was not aware of when writing my tech 1 assignment was the implementation of a second construction entrance at the south end of the site were the new hotel addition is being constructed. This additional entrance allows less interaction between the existing facility operations and the new addition construction. Because the existing entrance and the parking in the front and partially on the side will still be used for existing operations most construction traffic will arrive through the new temporary entrance.

The site layout will appear differently during two different phases of construction. The phases are Excavation, Demolition, & Substructuture, and Superstructure. These two site layouts can be found in Appendix A Figures 2 and 3 at the back of this assignment.

## Excavation, Demolition, & Substructure

During this phase of construction four main pieces of equipment are used. An excavator, a bull dozer, and a direct chute concrete truck. Construction for this phase begins May 14, 2009 and ends on August 31, 2009.

Shallow excavation is needed for the new hotel addition to allow underground piping and foundation work. They must excavate much deeper for the pool area. The excavator can be removed from the site on June 30, 2009 after the pool area is completely excavated.

The bull dozer is used to help assist in the demolition of the one existing room that will act as the new lobby connection. In addition the dozer moves the removed soil around the site and can also be removed from the site along with the excavator.

The direct chute concrete truck is used for pouring the footings and pads of the substructure and can be removed from the site upon substructure completion.

## Superstructure

The superstructure will only be using the crane and man power to complete construction. This phase will begin on September 1, 2009 and will be finished on December 25, 2009.

The framing of the building is done by hand and does not utilize any equipment until the third floor joists are being installed. A 125' reach crawler crane is used to install the third floor and roof of the hotel addition. The crane will begin at the south end of the addition near the west staircase and move towards the east staircase for the third floor and back for the roof installation. The crane can be removed from site after the roof is installed.

# Project Cost Evaluation

The Holiday Inn Express actual total project cost is $4,000,000. This is a rough but close estimate of the project. The contract cost for the design of the architectural and MEPS drawings from Harry S. Harper Architects was $25,000. The contract cost for the construction from DRK Associates was approximately $3,092,937 (# is rough estimate and has changed.) The remaining balance of $882,063 is budgeted to be used by the owner to purchase furniture, fixtures, and equipment.

In the figure below you can see the actual estimate and two other cost estimates. The first estimate which was created by using the 2009 RS Means Square Footage Estimate text. In appendix I you can see that I used the square foot estimate of a 2-3 story Motel and interpolated for the Cost/SF and you can also see where the cost adjustments and location factor were determined from. This estimated a total project cost of $4,686,892 which is 117% larger than the actual cost. This estimate was most likely larger because part of project is a pre-manufactured pool house enclosure which would have a cheaper Cost/SF than a 2-3 story Motel.

The second estimate was created using the D4 Cost program and the probable cost statement can be found in Appendix A Figure 4. The D4 estimated a total project cost of $3,532,364 which is under budget at only 88% the actual cost. The main reason for this budget to be low is most likely due to the fact that the owner plans to spend up to $1,000,000 on FFE's and the D4 only accounted for about 25% of that.

Overall the best estimate to use would be the RS Means Square Foot estimate because although the cost was a little high the estimate was fairly close to the actual budget. Also the owner explained that because of these economic times and the location of the addition labor was surprisingly cheaper than usual and could also account for the RS means being over budgeted.

## Cost Breakdown

| | Cost | Cost/SF |
|---|---|---|
| Total Project Cost | $4,000,000 | $146 |
| Total Hotel Cost | $3,373,344 | $124 |
| Total Pool Cost | $340,000 | $12.53 |
| Design Cost | $25,000 | $0.92 |
| Systems | | . |
| Mechanical | $257,432 | $9.42 |
| Electrical | $367,000 | $13.42 |
| Plumbing | $280,037 | $10.24 |
| Structural Steel | $95,000 | $3.47 |
| Fire Suppression | $65,000 | $2.38 |
| Concrete (Site+Building) | $200,000 | $7.31 |
| Building Masonry | $70,000 | $2.56 |

## Square Footage Cost

| | |
|---|---|
| Total Building Area | 27355 SF |
| Total Building Perimeter | 493 LF |
| Story Height | 10 FT |
| Interpolated RS Means Value | $160.44 Cost/SF |
| **Total Project Cost** | **$4,388,836** |

## Means Cost Adjustment & Breakdown

| | | |
|---|---|---|
| Adjustment for Story Height | Add | $1.60 Cost/FT |
| Adjustment for Perimeter | Add | $4.60 Cost/100FT |
| Location Factor | | 1.05 |
| **Final RS Means SF Cost** | | **$171.34 Cost/ST** |
| **Total Project Cost** | | **$4,686,892** |

## D4 Estimate

| | |
|---|---|
| Total Project Cost | $3,532,364 |
| Total Building Cost | $3,062,580 |
| General Requirements | $183,350 |
| Bidding Requirements | $125,863 |
| Site Work | $286,309 |

# Detailed Structural System Estimate

The Holiday Inn Express addition has a minimum amount of structural steel and concrete. The first floor is the only floor with steel columns and there are a variety of steel beams throughout the building but not enough to give a decent structural estimate. The foundation and first floor slab is the only place where concrete is used. The floor joists are wood beams and the exterior walls are wood studs. In addition the stair cases are CMU masonry. Since the building is mainly constructed of wood and masonry I decided to also do a detailed estimate of those structural elements.

The steel estimate was determined by using structural drawings and counting the individual pieces. The concrete estimate was determined by using the first floor area for the slab and counting column footings and the length of the continuous footings to determine CY's. For the wood estimate the floor area and joist spacing were used to calculate the number of pieces at each different length to get a LF amount. The amount of stud pieces were determined by using the building perimeter and stud spacing. The masonry was also determined using the perimeter of the foundation wall and stair cases.

The Summary of the structural estimate shown below the assumptions gives a total of $232,161. This estimate may seem low but this does not include the pool area addition because the portion is designed by a manufacturer so determining structural elements is not possible using my drawing set. The detailed Structural Estimate can be found in Appendix A figure 5 at the back of this assignment.

## Assumptions

- R.S. Means 2009
- Location factor of 1.05 for Atlantic City used in structural estimate summary
- Overhead & Profit not included
- Used concrete slab (4" thk.) unreinforced
- Used closest R.S. Means values for unlisted column sizes

| Detailed Structural Estimate | | |
|---|---|---|
| **Location Factor =** | **1.05** | |
| **Steel** | | |
| Columns | | $10,437.00 |
| Beams | | $18,010.00 |
| | | |
| **Wood** | | |
| Floor Joists | | $72,701.00 |
| Studs | | $26,601.00 |
| | | |
| **Concrete** | | |
| Floor Slab | | $33,200.00 |
| Foundation | | $26,106.00 |
| | | |
| **Masonry** | | |
| CMU's | | $45,106.00 |
| | | |
| | **Total =** | $232,161.00 |

# General Conditions Estimate

The general conditions estimate was broken up into four different categories of analysis. These categories consist of Personnel, Utilities/Facilities, Site Office Support, and General Requirements. The personnel cost were determined by speaking with the DRK Associates representative who gave me rough estimates of yearly salaries for each position. The rest of the sections were determined by using R.S. Means 2009 and also an early schedule of values prepared by DRK Associates. The final cost for the general conditions estimate which is in the summary below is $341,458. This calculates out to %8.5 of the original bid price. A reason for this unusually high percentage is because R.S. means typically deals with larger buildings causing some of the figures to be larger.

The detailed General Conditions Estimate can be found in Appendix A Figure 6 at the back of this assignment.

| General Conditions Summary | | |
|---|---|---|
| | | |
| Personnel | | $293,800.00 |
| Utilities/Facilities | | $8,399.00 |
| Site Office Support | | $12,365.00 |
| General Requirements | | $26,894.00 |
| | Total = | $341,458.00 |