Project Description

New York City studies is developed with a variety of art institutions and tall buildings. Due to an ever-expanding population, the need for new architectural developments is high in New York. However, due to the expensive cost of living in Manhattan, many residents have turned to the outer boroughs such as Queens and Brooklyn. There are many reasons to build in Brooklyn, there is more space and availability to build land in Manhattan and the lower cost makes new developments possible near the boroughs. There is a huge increase in the number of construction projects in the City of Brooklyn.

The project is located at 8791 21st Ave. in Brooklyn, NY. The owner requested that the architecture have a modern appearance with a clean, sleek design. The project has been designed to cater to the residents of Brooklyn. The project has been designed to cater to the residents of Brooklyn.

However, due to the expensive cost of living in Manhattan, many residents have turned to the outer boroughs such as Queens and Brooklyn. There are many reasons to build in Brooklyn; there is more land territory to build on. In Downtown Brooklyn alone, more than $6.5 billion has been planned for new residential projects. Collaborative Designs proposal is to conceptually design, structurally develop and provide construction plans to fill a void in luxury living in Brooklyn. Shuriken Tower will accomplish all the objectives required and deliver a structurally sound, aesthetically pleasing and economically feasible structure.

The project is located at 8791 21st Ave. in Brooklyn, NY. The owner has demanded a residential building where his profits and investments can be maximized. Shuriken Tower will contain of 19 stories with a three story setback for penthouses. The first floor will consist of a lobby and commercial space. The other 15 stories comprise of apartment dwellings, including studios, one and two bedrooms. The 17th floor penthouses will have private terraces. The first story underground will be an underground parking lot with 114 parking spaces. The sub-cellar will feature amenities such as a bowling alley, a swimming pool, a spa and personal storage to fulfill the owners requirements. A 2.5 in green roof system was selected and a curtain wall glass facade system was chosen for the building.

In order to achieve this, a concrete flat plate construction optimal for residential construction was proposed. This is because the gravity system of a concrete flat plate consists of only an 8 in to 12 in concrete slab, as opposed to other structural systems such as steel. This also allows for the transfer beams to be used in the connections between the floors and the columns. The columns were designed using SAFE, a software that designs concrete columns and beams. The columns were designed to be 4 in to 6 in thick, and were placed in the four re-entrant corners of the structure since they are more effective than rectangular shaped columns. The slab reinforcement was designed using SAFE. The lateral force resistant system includes four central core concrete shear walls that are orthogonal to each other which will run up from the sub-cellar all the way to the roof of the structure. Enclosed in these walls, are four passenger elevators and one freight elevator. The framing layout for the chosen structural system was prepared.

Drawings and specifications for the structural plans must be delivered. Drawings should include a foundation plan, a footing schedule, a beam schedule, sections, notes and typical details. Structural analysis and the final design will be reviewed by the fire marshal to ensure that all safety regulations are met. The foundation system will entail isolated square footings for most columns. For locations where two columns are very close to another, a rectangular combined footing was utilized. The foundation wall and wall footing was analyzed and designed. All loads were determined in accordance to American Society of Civil Engineering Concrete Institute (ACI318-11) Building Code. Light gage metal stud framing was designed with the assistance of MarinoWare manufacturers catalog.

The building consists of 179 residential units. The building is 19 stories with a three story setback for penthouses. The first floor will consist of a lobby and commercial space. The other 15 stories comprise of apartment dwellings, including studios, one and two bedrooms. The 17th floor penthouses will have private terraces. The first story underground will be an underground parking lot with 114 parking spaces. The sub-cellar will feature amenities such as a bowling alley, a swimming pool, a spa and personal storage to fulfill the owner's requirements. A 2.5 in green roof system was selected and a curtain wall glass facade system was chosen for the building.

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Typical Floor Plan

Aboumoussa LLC
Shuriken Tower
Project number: A-103

As indicated on 5/16/2015 7:25:45 AM
LiveRoof LITE SYSTEM
Over Conventional Roofing Assembly

LiveRoof Lite Module
LiveRoof Engineered Soil
LiveRoof Green Roof Plants (Minimum 95% Soil Coverage at Installation)
Minimum 40-mil Polypropylene or EPDM Slip Sheet, Edges Overlapped & Seamed
EPDM, TPO or PVC Waterproofing Membrane
Bonding Adhesive
Insulation
Insulation Adhesive

Moisture Portals™

TOP VIEW
SIDE VIEW

ILLUSTRATIONS ARE TO CONCEPTUALLY ASSIST PROFESSIONALS IN DESIGNING LIVEROOF INSTALLATIONS. LIVEROOF DOES NOT ACCEPT RESPONSIBILITY FOR ENGINEERING BASED ON ILLUSTRATIONS. A QUALIFIED ROOFING SPECIALIST SHOULD BE CONSULTED TO DETERMINE APPROPRIATE WATERPROOFING AND ROOF DECK MATERIALS AND SUITABLE DESIGN.

LiveRoof System Saturated Weight: 15-17 lbs / sf

Not to Scale

LiveRoof, LLC
P.O. Box 533
Spring Lake, MI 49456
(800) 875-1392
www.liveroof.com
TOP OF FOOTING ELEVATIONS WITH RESPECT TO DATUM ELEVATION 0'-0" IS EQUAL TO ACTUAL ELEVATION 20.00'. ALL ELEVATIONS OF FLOORS, WALLS, FOOTINGS, TO DATUM ELEVATION.

1. TO ACTUAL ELEVATION 20.00' ALL ELEVATIONS OF FLOORS, WALLS, FOOTINGS, TO DATUM ELEVATION.

3. SEE FOOTING SCHEDULE ON THIS SHEET.

6. Relative to top of slab elevation.

7. NOTED:

- S-100's
- S-300's

LEGEND:

- 3'-0" 2'-6" 2'-6" 3'-0"
- 6'-0" x 6'-0"
- 8'-0" x 8'-0"
- 9'-0" x 9'-0"
- 10'-0" x 10'-0"
- #14 6@12" E.F.
- #5 12" E.F.

SHURIKEN TOWER

PARKING ROOF

27' - 0" x 2' - 0" x 4' - 0"

CELLAR

6@12" E.F.

3/8" = 1'-0"

FO-100

Foundation Plan

Aboumoussa LLC

5/16/2015 7:27:06 AM

Mark Milkis (mark.milkis@nyu.edu)

Construction Manager - Collaborative Design

Brooklyn, NY 111201

(559) 464-5547

Architect - Collaborative Design

6 Metrotech Center

Brooklyn, NY 111201

Mark Milkis (mark.milkis@nyu.edu)
ALL CONCRETE SHALL BE 28 DAY 4,000 PSI NORMAL WEIGHT CONCRETE.

TYPICAL SLAB REINFORCING SHALL BE 12" @ 12" O.C. BOTTOM EACH WAY. ALL BARS @ 12" O.C. TOP AND BOTTOM. EDGE OF EXTERIOR SLAB.

NORMAL WEIGHT CONCRETE.
SEE THE FOLLOWING DRAWINGS FOR ITEMS

BUILDING DATUM ELEVATION 0'-0" IS EQUAL

INDICATES COLUMN NUMBER

INDICATES COLUMN ABOVE

INDICATES COLUMN BELOW

TYPICAL SLAB REINFORCING SHALL BE 4

ALL ELEVATIONS INDICATED ON PLAN ARE

ALL CONCRETE SHALL BE 28 DAY 4,000 PSI

NOTES:

1. ELEVATIONS OF FLOORS, WALLS, FOOTINGS, ETC., SHOWN ON PLANS OR DETAILS REFER TO DATUM ELEVATION.

2. ELEVATION 43'-0" UNLESS OTHERWISE INDICATED ON PLAN. FLOOR TO FLOOR HEIGHT FOR FLOORS 2 - 14 SHALL BE 9'-6".

3. BARS @ 12" o.c. BOTTOM EACH WAY. ALL BARS SHOWN ON PLAN ARE ADDITIONAL AND SHALL BE TIED TO TYPICAL REBARS.

4. NORMAL WEIGHT CONCRETE.

5. RELATIVE TO TOP OF SLAB ELEVATION.

6. COLUMN LAYOUT PLANS STRUCTURAL FRAMING PLANS SECTIONS & DETAILS SCHEDULES

LEGEND:

S-103

Aboumoussa LLC
Shuriken Tower
Typical Floor Column Layout Plan

1/8" = 1'-0"

5/16/2015 7:27:19 AM
ALL CONCRETE SHALL BE 28 DAY 4,000 PSI S-200'S

SEE THE FOLLOWING DRAWINGS FOR ITEMS

ALL ELEVATIONS INDICATED ON PLAN ARE
ALL CONCRETE SHALL BE 28 DAY 4,000 PSI
INDICATES COLUMN ABOVE BUILDING DATUM ELEVATION 0'-0" IS EQUAL
TYPICAL SLAB REINFORCING SHALL BE   4
ALL ELEVATIONS INDICATED ON PLAN ARE

TYPICAL SLAB REINFORCING SHALL BE 6

ALL CONCRETE SHALL BE 28 DAY 4,000 PSI

BUILDING DATUM ELEVATION 0'-0" IS EQUAL
1. DECK SIZE IS 2 1/2" CONCRETE ON TOP OF 9/16" DECK, UNLESS OTHERWISE INDICATED.
2. BUILDING DATUM ELEVATION 0'-0" IS EQUAL TO ACTUAL ELEVATION 20.00'. ALL ELEVATIONS OF FLOORS, WALLS, FOOTINGS, ETC., SHOWN ON PLANS OR DETAILS REFER TO DATUM ELEVATION.
3. TOP OF SLAB IS AT DATUM ELEVATION 186'-6" UNLESS OTHERWISE INDICATED ON PLAN.
4. ALL CONCRETE SHALL BE 28 DAY 4,000 PSI NORMAL WEIGHT CONCRETE.
5. ALL ELEVATIONS INDICATED ON PLAN ARE RELATIVE TO TOP OF SLAB ELEVATION.
6. SEE THE FOLLOWING DRAWINGS FOR ITEMS NOTED:
   - COLUMN LAYOUT PLANS
   - STRUCTURAL FRAMING PLANS
   - SECTIONS & DETAILS
   - SCHEDULES

NOTES
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   COLUMN LAYOUT PLANS
   STRUCTURAL FRAMING PLANS
   SECTIONS & DETAILS
   SCHEDULES
   NOTES

ARCHITECT - Collaborative Design
6 Metrotech Center
Brooklyn, NY 111201
(559) 464-5547
Mark Milkis (mark.milkis@nyu.edu)
Jimmy Liang (jl4608@nyu.edu)
Leifu Wang (lw1401@nyu.edu)

STRUCTURAL ENGINEER - Collaborative Design
6 Metrotech Center
Brooklyn, NY 111201
(559) 464-5547
Mark Milkis (mark.milkis@nyu.edu)
Jimmy Liang (jl4608@nyu.edu)
Leifu Wang (lw1401@nyu.edu)

CONSTRUCTION MANAGER - Collaborative Design
6 Metrotech Center
Brooklyn, NY 111201
Rajai Fakhouri (rf1116@nyu.edu)
### Column Schedule

<table>
<thead>
<tr>
<th>Floor</th>
<th>Column</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>10TH FLOOR</td>
<td>EL 91'-0&quot;</td>
<td>12 x 24</td>
</tr>
</tbody>
</table>

**Sections & Details**

- **4 #8**
- **12 x 24**
- **12 x 36**
- **L12 x 36**

**Other Sections & Details:**

- **18 x 24**
- **24 x 24**
- **30 x 30**
- **36 x 36**

**Other Columns:**

- **5/16/2015 7:27:47 AM**
SHEAR WALLS FROM FOUNDATION TO 6TH FLOOR

SHEAR WALL TI REINFORCEMENT TO BE AS FLLOWS:

ALL SHEAR WALL ABOVE ROOF LEVEL SHALL BE PROVIDED TIES AND CROSS TIES WITHIN X ALTERNATE TIES MAY BE OMITTED WHERE "X" DISTANCE IS 6" OR LESS

REINFORCEMENT SHOWN SHALL HAVE #

SEE PLAN FOR SHEAR WALL LENGTH AND ZONE 2

Architect - Collaborative Design
6 Metrotech Center
Brooklyn, NY 111201
Mark Milkis (mark.milkis@nyu.edu)
Jimmy Liang (jl4608@nyu.edu)

Structural Engineer - Collaborative Design
6 Metrotech Center
MARK
(559) 464-5547
Mark Milkis (mark.milkis@nyu.edu)
Jimmy Liang (jl4608@nyu.edu)
Leifu Wang (lw1401@nyu.edu)

Construction Manager - Collaborative Design
6 Metrotech Center
Brooklyn, NY 111201
4 @ 12" REINF.

Rajai Fakhouri (rf1116@nyu.edu)

ZONE 2 ZONE 3

4 Typical Wall Ties Detail

ZONE 1 ZONE 2

NO.4 @ 12" E.W. E.F. (TYP.)

1' - 0" 1' - 0"

ZONE 1 4 @ 12" HORIZONTAL REINF. E.F.

UNIFORM LONGITUDINAL REINF., SEE SCHEDULE

4 @ 12" REINF.

ZONE 1 1' - 0"

ZONE 2

1' - 0" 1' - 0"

ZONE 1

ZONE 2

SW-4

1' - 0"

ZONE 1

ZONE 2

SW-5

1' - 0"

ZONE 1

ZONE 3

SW-8

1' - 0"

ZONE 2

ZONE 2

L2

4 @ 12" REINF.

ZONE 1

ZONE 3

ZONE 1

ZONE 3

SHEAR WALL SW-9 (SIM.) SW-10, SW-11, SW-12

1' - 0"