74th Street Project Report
for
Public Health and Health Planning Council
Ad HOC Advisory Committee on Environmental and Construction Standards Regarding Storm Mitigation Design

June 27, 2013
Report Content

- Site Plan, Exterior Rendering, Building Section
- Project Narrative
- Program Listing / Building Gross Area
- Storm Mitigation Design Strategy
  - Exhibit - Flood Barriers at Property Line Exhibit
  - Exhibit - Mission Critical Clinical Programs and Support Functions Located Above 100 & 500 Year Flood Elevations
- Public Health and Health Planning Council
  - Ad HOC Advisory Committee on Environmental and Construction Standards
  - Design Response to Critical & Commercial Buildings Systems Matrix
Site Plan
Ground Floor Plan

CUNY
MSKCC
Rendered Elevation
North
Grid Line H – Future Bldg Removal

Project Stacking

Grid “H”
Project Narrative

• The proposed Memorial Sloan Kettering Ambulatory Care Center at 74th Street will be an ambulatory care center specifically for the diagnosis and treatment of cancer. The 23-story center will contain approximately 759,615 square feet. It will provide sufficient space to meet the current demand for ambulatory care, as well as anticipated growth projections through 2026. The center will be located on the far-east end of the block between 73rd and 74th Streets and York Avenue and the FDR Drive in Manhattan.

• By 2026, the building is projected to accommodate over 1,300 patients, 2,600 visitors and 1,600 staff per day. The hours of operation for the facility will primarily be 7 AM – 10 PM, Monday through Friday, with a small volume of bone marrow transplant patients on Saturday/Sunday (no more than 20 patients/day).
Program Listing

• Square Footage = 726,274 BGSF

• The building will include
  – Clinic space for Hematologic, Thoracic, Endocrinology, Head and Neck and other oncology services, including an outpatient bone marrow transplantation program;
  – Infusion Rooms for standard chemotherapy and early stage trials of new drugs and biologic agents
  – Consultative services including, Dental, Speech and Swallowing, Cardiology, Pulmonary, Pre-surgical Testing, Cutaneous Lymphoma and Outpatient Rehabilitation
  – A Radiation Oncology program including: three linear accelerators, one MRI Simulation Suite and one CT Simulation Suite
  – A Diagnostic Imaging program including: three CTs, two PET/CTs, two MRIs, two General X-ray Units and four Ultrasound Rooms
  – An Interventional Radiology Program including: three Angio/CT Units and one PET/CT
  – Clinical Support Services to meet building needs including:
    • Chemotherapy and Retail Pharmacies, Laboratory Medicine and Pathology services
    – Academic and Administrative Offices/Conference Center
Storm Mitigation Design Strategy

• The project has taken a proactive approach to flood protection, as the site is located on the edge of a FEMA designated flood plain. The site is protected up to the FEMA 500 year flood level by flood barriers at the property line.

• Door and drive openings are protected with operable flood gates.

• The waterproof foundation is designed to resist the pressure of the water and extends above grade where needed to maintain the barrier.

• All mission critical clinical programs and support functions have been located above the fourth floor.
Storm Mitigation Design Strategy

• *Infrastructure systems have been located above flood elevations.*
  – Con Ed vaults, network compartments and switch gear are all on the second level.
  – An electrical distribution closet on the ground floor serves the lower levels.
  – All chillers and air handlers are located on the second floor and higher.
  – IT, the MDF and UPS are located on the third floor and the IDF serving the cellar levels and ground floor will be located on the second floor.
  – The fire pump, gas meter and medical gas system are all located on the second floor or higher.

• *Only elements which cannot be moved above grade, by code or weight, are located in the cellar levels.*
  – The fuel oil tank supplying the emergency generator (located on the roof) is located in the sub cellar within a water tight containment room.
  – The storm water detention tank is in the sub-cellar, due to its weight.
  – All utility point of entries will be done with waterproof fittings.
Flood Barriers at Property Line
Mission Critical Clinical Programs and Support Functions
Located Above 100 & 500 Year Flood Elevations

Memorial Sloan Kettering 74th Street Ambulatory Care Center

Perkins Eastman | ennead
Operable Flood Barriers

Flood Protection
Barrier Types

Demountable / Stackable Flood Barrier
- Requires Manual Installation
- Easy to Install
- Requires Storage
- Jamb and/or Foundation mounted
- Intermediate supports / connectors available

Bottom Hinged Flood Panel
- Automatic Operation
- Water Actuated or Electric/Manual Override
- Requires horizontal space at grade
- Dimensionally challenging (coordination with foundation wall, drainage, property line)

Recessed / Lifting Flood Barrier
- Automatic Operation
- Water Actuated or Electric/Manual Override
- Requires vertical space below grade
- Dimensionally challenging (coordination with foundation wall)

All egress must be maintained with flood barriers in place

Memorial Sloan Kettering 74th Street Ambulatory Care Center
<table>
<thead>
<tr>
<th>Utility Services</th>
<th>Risk Addressed</th>
<th>Item</th>
<th>Proposed Measure</th>
<th>Critical Facility</th>
<th>Report Page Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incoming Electric Service</strong></td>
<td>Flood</td>
<td>1a.</td>
<td>Locate or relocate incoming service above FEMA flood evaluation. Con Ed interior secondary service is located on the 2nd floor.</td>
<td>Req</td>
<td>BP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1b.</td>
<td>Existing Utility Rooms to be made watertight with bulkhead or submarine doors and extensive waterproofing. Waterproof cable entries below flood plain. Not applicable; Con Ed transformers, network protectors and building main service switchgear is all located on the 2nd floor.</td>
<td>N/A</td>
<td>Req.</td>
</tr>
<tr>
<td></td>
<td>Extreme Heat</td>
<td>1c.</td>
<td>Existing Utility Rooms to be made watertight with bulkhead or submarine doors and extensive waterproofing. Waterproof cable entries below flood plain. Electrical points of entry are sealed at the foundation wall. High voltage feeders are concrete encased within the building and run express from the POE to the 2nd floor electrical service.</td>
<td>Req</td>
<td>Req.</td>
</tr>
<tr>
<td></td>
<td>Wind</td>
<td>1d.</td>
<td>Electric Utility Rooms to be provided with ventilation and/or air conditioning to maintain room temperature to stay below equipment temperature ratings. Use ASHRAE Weather Data. Installed in accordance with Con Ed interior vault requirements; transformers are naturally ventilated, network protector rooms are mechanically ventilated and service switchgear rooms are air conditioned.</td>
<td>Req</td>
<td>BP</td>
</tr>
<tr>
<td></td>
<td>Flood</td>
<td>1e.</td>
<td>Evaluate overhead distribution (where permissible) versus direct buried based on potential wind and flood events. Design overhead distribution to FEMA Wind Zone Maps. Not applicable; Con Ed electrical distribution in this area is all below grade.</td>
<td>N/A</td>
<td>BP</td>
</tr>
<tr>
<td><strong>Incoming IT Service</strong></td>
<td>Flood</td>
<td>2a.</td>
<td>Locate or relocate incoming services above FEMA flood evaluation using approved cables. Two discrete points of entry will enter below grade with link seals at the foundation wall. The transition from service provider cable to interior rated cable will happen at a splice point above the DFE within the building; the cable will continue to run to the Point of Presence room located on the 3rd floor.</td>
<td>Req</td>
<td>BP</td>
</tr>
<tr>
<td>(Telephone &amp; Data)</td>
<td></td>
<td>2b.</td>
<td>If existing Utility Rooms cannot be relocated, consider redundant wireless communication and data system. A cable pathway between the stacking local floor IDF closet has been provided to allow for a microwave antenna on the roof.</td>
<td>Req</td>
<td>Page 14</td>
</tr>
<tr>
<td><strong>Provider Interruption</strong></td>
<td>Flood</td>
<td>3a.</td>
<td>Locate or relocate incoming gas service above FEMA flood evaluation. Point of entry into the building will be provided with link seals and an isolation valve at the foundation wall. Meter assembly will be located in a room located on the 2nd floor.</td>
<td>Req</td>
<td>BP</td>
</tr>
<tr>
<td><strong>Gas Service</strong></td>
<td>Flood</td>
<td>3b.</td>
<td>Existing Gas Service Rooms to be made watertight with bulkhead or submarine doors and extensive waterproofing.</td>
<td>N/A</td>
<td>Req.</td>
</tr>
<tr>
<td></td>
<td>Flood</td>
<td>4a.</td>
<td>Locate or relocate incoming domestic water service above FEMA flood evaluation. Point of entry into the building will be provided with link seals at the foundation wall. Domestic water pumps and fire service pumps will be located on the 2nd floor.</td>
<td>Req</td>
<td>BP</td>
</tr>
<tr>
<td><strong>Domestic Water</strong></td>
<td>Flood</td>
<td>4b.</td>
<td>Consider water storage tanks on site. There is a 12,500 gallon suction tank located on the 2nd floor for approximately one day of domestic water usage in the event of a utility failure. Two 35,000 gallon combination domestic water/fire protection tanks are located on the roof. A 45,000 gallon storm water detention tank located in the Sub-Cellar provide cooling tower makeup water.</td>
<td>BP</td>
<td>BP</td>
</tr>
<tr>
<td><strong>Steam Service</strong></td>
<td>Flood</td>
<td>5a.</td>
<td>Locate or relocate incoming steam service above FEMA flood evaluation. Not applicable; building does not use utility steam.</td>
<td>N/A</td>
<td>BP</td>
</tr>
</tbody>
</table>
## System Matrix: Options and Opportunities: Critical & Commercial Buildings

This matrix illustrates the kind of changes that can be integrated into code, using healthcare facilities as a category of building.

<table>
<thead>
<tr>
<th>Utility Services</th>
<th>Risk Addressed</th>
<th>Item</th>
<th>Proposed Measure</th>
<th>New</th>
<th>Existing</th>
<th>Report Page # Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Pump</td>
<td>Flood</td>
<td>7a.</td>
<td>Locate fire pumps above FEMA floodplain elevation. If not feasible due to code or inadequate street pressure, provide submersible watertight room. Review with FDNY. Fire pumps are located on the 2nd floor.</td>
<td>Req</td>
<td>BP</td>
<td>Page 15, 18</td>
</tr>
<tr>
<td>Emergency &amp; Standby Power</td>
<td>Flood</td>
<td>8a.</td>
<td>Locate or relocate generators above FEMA flood elevation. Two 250kW generators located on the roof.</td>
<td>Req</td>
<td>Req</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Wind</td>
<td>8b.</td>
<td>Protect exterior equipment from wind-blown damage and projectiles. Generators are located within the roof well enclosure.</td>
<td>BP</td>
<td>BP</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Extreme Heat</td>
<td>8c.</td>
<td>Evaluate capacity to serve life safety loads during extreme heat. Generators are sized in an N-1 redundant mode for life safety loads. Both engines will run in the event of a loss of normal power and thru a load shedding program will maintain life safety loads as the highest priority.</td>
<td>BP</td>
<td>BP</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Extended Widespread Outage</td>
<td>8d.</td>
<td>Evaluate and add additional loads above Code mandated to fulfill the building's functional requirements during prolonged outages. Provide additional standby generation. 5 MW of emergency generators have been designed to pick up the majority of the building's heating, cooling, ventilation and telecommunication systems. In addition, a 1MW cogeneration unit has also been designed for the project and is capable of ticking off additional loads in the event of a prolonged power outage.</td>
<td>BP</td>
<td>BP</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**BP= Best Practice, Req.=Required, *N/A for healthcare**