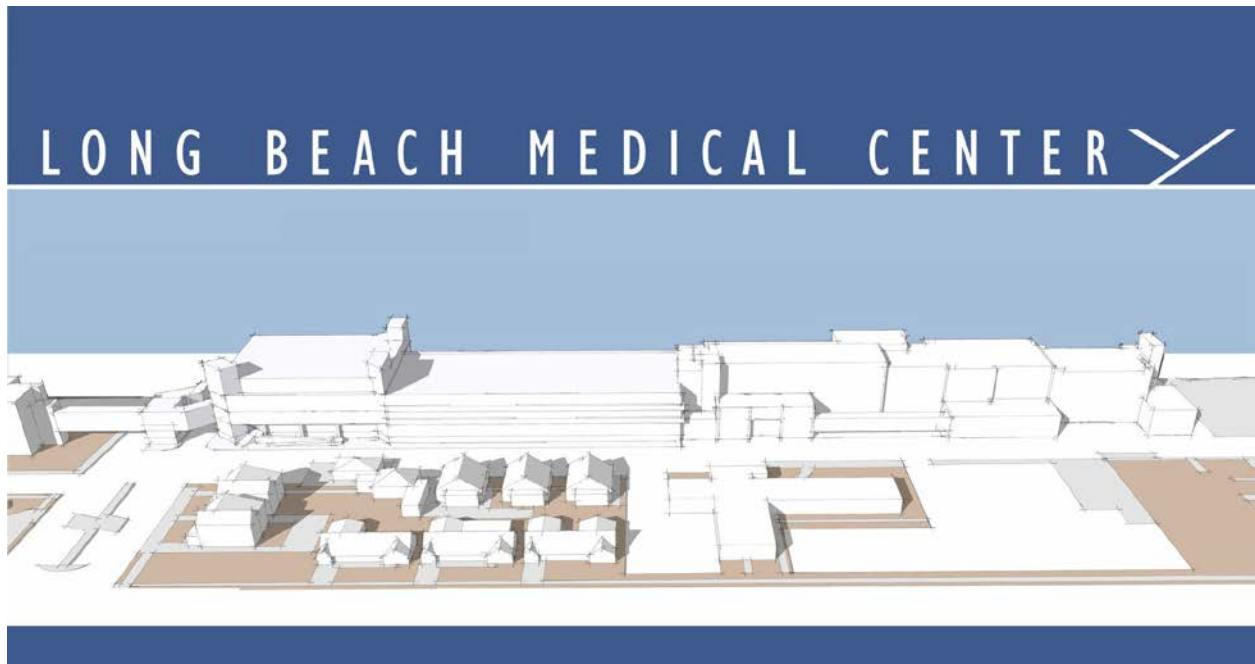




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SNCH – Long Beach Emergency Department Study



Long Beach Freestanding Emergency Study in West Building

March 2, 2015



LISTEN • DESIGN • DELIGHT

Executive Summary

On October 29, 2012 Hurricane Sandy came onshore in New York and New Jersey and inundated the Long Beach Medical Center (LBMC) site in Long Beach, New York, completely flooding all of the basement levels of the Medical Center.

The basements remained flooded for over three weeks. Dewatering operations were complicated by the continued intrusion of groundwater and sewage in the basements.

During the next few months, attempts were undertaken by LBMC to restore services to the Medical Center, with a primary emphasis on reopening the Emergency Department (ED) to restore critical emergency services to the Long Beach community. Temporary Electrical Distribution systems were installed in the Basement of the West building, and fire sprinkler repairs were completed. Environmental Remediation was also undertaken and completed to try and expedite the reopening of the ED.

In late 2013 and early 2014, planning efforts to initiate repairs to reopen the ED were developed with the input of the State of New York DOH and local regulatory authorities. FEMA was part of the approval process for this interim step to reopen the ED in time for the summer season of 2014. Negotiations for South Nassau Communities Hospital (SNCH) to acquire the assets of Long Beach Medical Center were underway as well through the proceedings of the bankruptcy of LBMC. However, due to delays in the bankruptcy process, the transfer of the LBMC properties to the control of SNCH did not occur in time for the summer 2014 ED opening and the work was not begun. Instead, as an interim measure to assist the Long Beach community in time for the summer of 2014, SNCH established an urgent care center on an adjoining site utilizing temporary trailers.

In the fall of 2014 it was determined (with FEMA approval) that the Central, Founders, and East wings of LBMC would be demolished as the repair costs necessary to bring them into code compliance were cost prohibitive. Additionally, the basements of the West and Main wings would need to be cleared of existing mechanical and electrical equipment as these areas are below the Base Flood Elevation (BFE) mandated by FEMA, prohibiting their use. The basements of the West and Main portions of the Medical Center contained the boilers for heating, the water systems and pumps, the main pharmacy, dietary and kitchen facilities, the morgue, and central supply departments, all of which were destroyed by the flooding of Hurricane Sandy.

In late 2014, after SNCH had finally acquired the LBMC properties, the process of reinvestigating the ED reopening was begun. However, due to the time elapsed between the 2013 proposal to reopen the ED (by LBMC) and final, court-approved transfer of control of the property in the fall of 2014, State regulatory officials indicated that the ED would have to be brought up to all current Federal and State codes and standards for Healthcare. The waivers that LBMC had been operating under to allow certain code deficiencies to remain (including life safety systems, healthcare facility planning requirements, and national building codes) would not be able to be continued or allowed.

An analysis by SNCH's planning and design team of the codes in late 2014 that would need to be met to reopen the ED required the following actions:

Architectural:

- The FGI (Facilities Guidelines Institute) codes, mandated by New York State, would need to be complied with, requiring:
 - Americans with Disabilities Act(ADA) upgrades and additional toilets/parking/ramping requirements
 - Increased programmatic room sizes
 - Additional support spaces
 - New energy code compliance throughout
- General IBC (International Building Code) requirements:
 - Upgraded exiting and egress stairs
 - Building separation requirements between the ED and adjacent Hospital space
 - Conditioning, fire separation, and secure protection of vacant Hospital space above and below the reopened ED

Structural:

- Seismic and lateral upgrades (for wind and earthquake protection) would be required to comply with code revisions since the initial construction of the West and Main portions of the Hospital, including additional structure and strengthening of existing structural elements.

Mechanical Electrical Plumbing and Fire Protection/Sprinkler:

- HVAC:
 - New Air Handlers and duct work
 - New duct distribution systems
 - New Exhaust systems
 - New Boilers
- Plumbing/Fire Protection/ Sprinkler:
 - New Hot Water System
 - New Water Distribution system
 - New ADA Fixtures throughout
 - Full Building Sprinkler upgrades
 - Relocation of Fire Pump
- Electrical
 - New Emergency and Normal Power systems with service separation requirements
 - New Lighting and Power
 - New IT / Nurse Call / Monitoring / Phones

Additional studies initiated by SNCH are underway with the goal of improving emergency care for the Long Beach community in time for the summer of 2015, but our analysis shows that it is not advisable to reopen the LBMC Emergency Department in its previous location.

ED WEST 9,000 sf	
<ul style="list-style-type: none"> Requires waivers to re-use existing space Relocation of mechanical and electrical equipment because it is below base flood elevation Add complexity to future construction of West and Main Very challenging programing if considered to be final location Requires future relocation based on prior Architect's concept plan 	
Delivery Date	
11/1/2015	
Best case scenario pending AHJ approvals & immediate decisions	
Free Standing ED SCOPE – Upgrades Needed based on FGI Guidelines	
<u>Architectural</u> <ul style="list-style-type: none"> Toilet upgrades necessary [Blitch Report Item 10] Square footage requirements (peds, bariatric, observation)[13, 14, 19] CT requirements [22] X-Ray requirements [20] ED Fire Separation [41] Exiting / Stairs – riser tread size and total stair width [41] Requirements for existing unused adjacent building space (Nassau County Fire Marshal & City of Long Beach) [41] Maintenance of existing unused adjacent building space (Nassau County Fire Marshal & City of Long Beach) [41] Waste Water tank separation required [42] Separate entrance for human decontamination needed [42] ADA Parking requirements [2] ADA Access & Ramp requirements [8] Existing building envelope not watertight [41] 	<u>MEP</u> [see MEP Engineer's Report] <ul style="list-style-type: none"> HVAC: <ul style="list-style-type: none"> No existing boiler Air Handler – significant replacement and repair Duct Distribution – significant replacement and repair New exhaust system Plumbing: <ul style="list-style-type: none"> New Hot Water system Relocate & upgrade water distribution system ADA / FGI requirements in existing rooms – upgrades needed i.e. fixtures New Medical Gases – central system and distribution Fire Protection / Sprinkler: <ul style="list-style-type: none"> New fire alarm / smoke detection Relocate Fire pump Floor 1, 2, 3 & Basement Fire Protection requirements (Nassau County Fire Marshall & City of Long Beach) Electrical: <ul style="list-style-type: none"> Emergency & Normal power Main Service separation New lighting / power New IT / nurse call / monitoring / phone
<u>Structural</u> [41] <ul style="list-style-type: none"> Only a small space on the first floor is being utilized – seismic and lateral upgrades required [see Structural Engineer's report] 	

A review of the existing West and Main portions of the existing Long Beach Medical Center (LBMC) was conducted at the request of South Nassau Communities (SNCH). Because the hospital has been out of operation since Hurricane Sandy in October of 2013, more than 6 months has passed and Regulatory Requirements are that the hospital be brought to present codes, precluding any waivers for non-complying existing conditions at the time of the Storm. The Basement of the West building must be vacated per code to relocate electrical systems and other utilities to the second level, out of the flood zone. Waivers may be required to allow the balance of the West and Main buildings to be "dark and cold" for the 5 level structure above and around the freestanding ED. The skin and roof of the balance of the West and Main building must be made watertight to protect the ED location. The skin of the West and Main building also do not meet current wind or energy codes for the State of New York and may have to be replaced. A three hour Code separation is required between the ED and the balance of the West and Main building. Please refer to the attached MEP report by ICT and the Structural analysis by Thornton Tomasetti of the West and Main building for detailed code analyses.

A preliminary review of the FGI (Facility Guidelines Institute) requirements indicate the following items which would need to be corrected prior to approvals granted for reopening the ED at the Hospital.

ID	2014 FGI GUIDELINES	REMARKS	STATUS
2.3 SPECIFIC REQUIREMENTS FOR FREESTANDING EMERGENCY FACILITY			
2.3-1 GENERAL			
1	1.2-2 and 2.1-1.2 FUNCTIONAL PROGRAM	Functional Program Required	Functional Program must be developed by SNCH.
2.3-1.3 SITE			
2	1.3-3.3 PARKING	<ul style="list-style-type: none"> - per local requirements - Dedicated patient & visitor parking - Emergency services patients - On-call clinicians - Public safety - Valet parking 	Does not meet code
3	1.3-3.4 EMERGENCY ACCESS	Separate access points for ambulance and pedestrians are provided.	Provided/Meets Code
4	1.3-3.1.1 SITE SIGNAGE		Does not meet code
5	1.3-3.1.2 SITE LIGHTING		Does not meet code
6	1.3-2.2 SECURITY		Does not meet code
2.3-3 DIAGNOSTIC AND TREATMENT AREAS			
7	2.2-3.1.3 EMERGENCY DEPARTMENT REQUIREMENTS	<ul style="list-style-type: none"> - Community Based Emergency – confirm if facility to be used during these types of emergencies - Evaluate capacity to handle a surge of patients above normal capacity - Designate specific areas for triage & management of incoming patients - Utility upgrades for these areas (O2, H2O, elec) - Depressurization control aerosolized infectious particles with 100% exhaust 	<p>Not Applicable</p> <p>Not Applicable</p> <p>Provided/Meets Code</p> <p>Does not meet code</p> <p>Does not meet code</p>

8	2.2-3.1.3.2 ENTRANCES	<ul style="list-style-type: none"> - Vehicular Drop-off & Pedestrian Entrances - Emergency vehicle entry cover/canopy – shelter for both the patient & medical - Confirm horizontal and vertical clearances needed for emergency vehicles - Ambulance entrance shall be minimum of 6' clear to accommodate bariatric stretchers, mobile patient lift devices and attendants (confirm bariatric lift requirements, if any) - Access control maintained at all times 	Provided/Meets Code
			Provided/Meets Code
			Provided/Meets Code
			Provided/Meets Code
			Provided/Meets Code
9	2.2-3.1.3.3 RECEPTION AND TRIAGE AREAS	<ul style="list-style-type: none"> - Observation of main entrance & public waiting area - riage – one each of following per Triage Room or 1 per 4 Triage bays/cubicles - Hand washing - Translation service - Telephone - Patient Privacy 	Provided/Meets Code
			Provided/Meets Code
			Provided/Meets Code
			Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code
10	2.2-3.1.3.4 PUBLIC WAITING AREA	<ul style="list-style-type: none"> - Toilet facilities - Drinking fountain - Telephones 	Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code
11	2.2-3.1.3.5 COMMUNICATIONS CENTER	<ul style="list-style-type: none"> - Directly accessible to nurses station - Communication connection to EMS 	Does not meet code
12	2.2-3.1.6 TREATMENT ROOM OR AREA	<ul style="list-style-type: none"> - Single Bed Treatment Rooms vs Multi-Bed Treatment Rooms 	Provided/Meets Code
13	2.2-3.1.3.6(4) PEDIATRIC FACILITIES	<ul style="list-style-type: none"> - Pediatric Treatment Rooms – located adjacent to a family waiting area and toilet; min. clear floor area – 120 s.f. - Pediatric Trauma Rooms – min. clear floor area 250 s.f. (if multiple bays, min. of 200 s.f. per patient) - Discrete pediatric emergency, if provided, the following requirements <ul style="list-style-type: none"> - Triage, registration & discharge area - Waiting area & a play room/area - Pediatric Treatment Rooms - At least one isolation room - 1 room for pelvic exam - Documentation area - Storage for supplies & medication 	Provided/Meets Code
			Provided/Meets Code
			Not Applicable
			Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
			Not Applicable
14	2.2-3.1.3.6(5) BARIATRIC TREATMENT ROOMS	<ul style="list-style-type: none"> - Min. clear floor area 200 s.f. (min. clear dimension of 12') - May be subdivided w/ cubicle curtains & sued for 2 non-bariatric patients - 5' clear on both sides & foot of bed - Patient lit (may be portable) - Floor mounted plumbing fixtures, grab bars & casework 	Does not meet code
			Does not meet code
			Does not meet code Does not meet code Does not meet code

15	2.2-3.1.3.6(6) TRAUMA/RESUSCITATION ROOMS FOR EMERGENCY PROCEDURES	<ul style="list-style-type: none"> - Single-Bed Trauma – min. clear floor area of 250s.f.; 5 ft. clear on all sides of stretcher - Multiple-Bed Trauma – min clear floor area of 200 s.f./patient; 5 ft. clear on all sides of stretcher - Hand Scrub facilities 	<p>Provided / Meets Code</p> <p>Not Applicable</p>
16	2.2-3.1.3.6(7) DIAGNOSTIC SERVICE AREAS	- Access to radiology and laboratory services required	Does not meet code
	2.2-3.1.3.6(8) HUMAN DECONTAMINATION AREA	<ul style="list-style-type: none"> - Outside entry door (not less than 10' from other entrances) - Min. clear floor area – 80 s.f - Interior door shall swing into room 	Does not meet code
17	2.2-3.1.3.6(10) FAST TRACK AREA. if provided	<ul style="list-style-type: none"> - Examination / Treatment area – min. clear floor area 100 s.f. - If required – separate procedure room with min. clear floor area 120 s.f. - Exam / Treatment area – 1 pelvic exam room required - Physicians/nurse workstation - Storage areas for supplies and medication 	<p>Not Applicable</p> <p>Not Applicable</p> <p>Not Applicable</p> <p>Not Applicable</p> <p>Not Applicable</p>
18	2.2-3.1.3.7 PATIENT TOILET ROOM	- Minimum of 1 patient toilet room per 6 treatment rooms or fraction thereof	Does not meet code
19	2.3-3.2 OBSERVATION BEDS	At least one bed shall have full cardiac monitoring	Provided / Meets Code
2.3-3.3 IMAGING SERVICES			
		- Minimum – Radiography and Fluoroscopy to be provided	Does not meet code
20	2.2-3.4.3.2 RADIOGRAPHY ROOM	<ul style="list-style-type: none"> - Min. clear floor area 180 s.f. - Hand-washing station - Shielded control alcove or room 	Does not meet code
21	2.2-3.4.3.3 RADIOGRAPHY/ FLUOROSCOPY	<ul style="list-style-type: none"> - Min clear floor area 250 s.f. - Hand-washing station - Separate toilet room w/ hand-washing with direct access from fluoro <ul style="list-style-type: none"> - Be able to leave without re-entering fluoro - Shielded control alcove or room 	Does not meet code
22	2.2-3.4.2 CT FACILITIES	<ul style="list-style-type: none"> - Existing, but not required - CT Scanner Room <ul style="list-style-type: none"> - Size per manufacturer - Min. 4' clearance on all sides of gantry assembly or table - CT control room - Refer to 2.2-3.4.2.2 	Does not meet code
2.3-3.6 AND 2.2-3.1.6 SUPPORT AREAS FOR EMERGENCY DEPARTMENT			
23	2.2-3.1.6.1 AND 2.1-2.6.1 ADMINISTRATIVE CENTER OR NURSE STATION	<ul style="list-style-type: none"> - Hand-washing station - Can be combined with or include centers for reception & communication - Space for medication storage - Decentralized nurse stations permitted - Visual observation of all traffic into the unit & of all patients shall be provided (where feasible) 	<p>Does not meet code</p> <p>Provided / Meets Code</p> <p>Provided / Meets Code</p>

24	2.2-3.1.6.2 SECURITY STATION	<ul style="list-style-type: none"> - When provided – locate near emergency entrance and triage/reception area - Have means of observing the public waiting areas & emergency department entrances, including pedestrian & ambulance entrances & as a means of controlling access 	Provided / Meets Code
			Provided / Meets Code
25	2.2-3.1.6.8 and 2.1-2.6.10 SOILED WORKROOM	<ul style="list-style-type: none"> - Clinical sink w/ a bedpan washer - Hand-washing station - Work counter - Separate covered containers 	Does not meet code
			Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code
26	2.2-3.1.6.9 and 2.1-2.6.9.2 CLEAN SUPPLY ROOM	<ul style="list-style-type: none"> - Supplies storage/holding only - No work counter required - No hand-washing required - If serves children, additional storage to accommodate equipment & supplies sized for pediatrics 	Does not meet code
			Does not meet code
27	2.2-3.1.6.11 and 2.1-2.6.11.4 EQUIPMENT SUPPLY STORAGE	<ul style="list-style-type: none"> - Wheelchair and stretcher storage area - Emergency Equipment storage area - Visual observation of staff - CPR carts, pumps, ventilator, patient monitoring, portable x-ray 	Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
28	2.2-3.1.6.12 and 2.1-2.6.12.2 ENVIRONMENTAL SERVICES ROOM	<ul style="list-style-type: none"> - Service sink or floor mounted mop sink. - Storage of supplies and housekeeping equipment - Hand-washing station or Hand Sanitizing Station 	Does not meet code
			Does not meet code
			Does not meet code
			Does not meet code
2.1-2.7 STAFF SUPPORT AREAS			
29	2.3-3.7.1 STAFF LOUNGE FACILITIES	<ul style="list-style-type: none"> - Immediately accessible to the diagnostic and treatment area - Lounge area - Lockers - Toilets 	Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
			Does not meet code
30	2.3-3.7.2 and 2.1-2.7.3 STAFF STORAGE FACILITIES	<ul style="list-style-type: none"> - Near nurses station - Securable closets or cabinet - Located near nurse station 	Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
		- Coat storage, if provided, shall be permitted in a central staff locker area.	Provided / Meets Code

2.3-4 PATIENT SUPPORT FACILITIES			
31	2.1-4.1 LABORATORY SERVICES	<ul style="list-style-type: none"> - Work counter - Sink - Hand-washing station - Refrigerated storage facility – Refer to 2.1-4.1.2.3 - Refrigerator shall be provided <ul style="list-style-type: none"> - Blood storage - Temperature monitoring and alarm - Requirements of Clinical Laboratory Improvement Act standards - Storage 	<p>Does not meet code Does not meet code Does not meet code Does not meet code</p> <p>Does not meet code Does not meet code Does not meet code Does not meet code</p>
32	2.3-4.2 and 2.1-2.6.6 PHARMACY SERVICES	<ul style="list-style-type: none"> - At a minimum, medication preparation room to be provided <ul style="list-style-type: none"> - Visual control of staff - Work counter - Hand-washing station - Lockable refrigerator - Locked storage for controlled drugs - Sharps container 	<p>Does not meet code Does not meet code</p> <p>Does not meet code Does not meet code Does not meet code Does not meet code Does not meet code</p>
33	2.3-4.3 and 2.1-2.6.7 NOURISHMENT AREA	<ul style="list-style-type: none"> - Hand-washing station - Work counter - Refrigerator - Microwave - Storage cabinets - Container for soiled food service (temporary storage) - Ice-making equipment <ul style="list-style-type: none"> - Must be provided within an enclosed room 	<p>Provided / Meets Code Provided / Meets Code Provided / Meets Code Provided / Meets Code Provided / Meets Code Provided / Meets Code</p> <p>Provided / Meets Code Provided / Meets Code</p>
2.3-5 GENERAL SUPPORT FACILITIES			
34	2.3-5.2 and 2.1-5.2 LINEN SERVICES	<ul style="list-style-type: none"> - Soiled linen holding room - Clean linen storage room - Cart storage area - Service entrance for loading and unloading linen - Control station for pickup/receiving 	<p>Linen Service to be outsourced Linen Service to be outsourced Linen Service to be outsourced Linen Service to be outsourced Linen Service to be outsourced</p> <p>Does not meet code</p>
35	2.3-5.3 and 2.1-5.3 MATERIALS MANAGEMENT	<ul style="list-style-type: none"> - Off-street unloading area - Receiving area - Central storage facilities 	<p>Materials Management to be outsourced</p> <p>Does not meet code Does not meet code</p> <p>Materials Management to be outsourced</p>
36	2.3-5.4 and 2.1-5.4 WASTE MANAGEMENT	<ul style="list-style-type: none"> - Centralized waste collection and storage space - Sharps Containers - Recycling container - Regulated waste holding space – Refer to 2.1-5.4.1.3 <ul style="list-style-type: none"> - Secured space, protected from weather and animals - Refrigeration requirements per local authorities 	<p>Does not meet code</p> <p>Does not meet code Does not meet code Does not meet code</p> <p>Does not meet code</p> <p>Does not meet code</p>
37	2.3-5.5 and 2.1-5.5 ENVIRONMENTAL SERVICES	<ul style="list-style-type: none"> - Environmental services room to be provided throughout facility 	<p>Provided / Meets Code</p>
	2.3-5.6 and 2.1-5.6 ENGINEERING AND MAINTENANCE SERVICES	<ul style="list-style-type: none"> - Mechanical/Electrical Rooms - Storage of Building Maintenance - Flammable Storage - Outdoor Equipment Storage 	<p>Does not meet code Does not meet code Does not meet code Does not meet code</p>

2.3-6 PUBLIC AND ADMINISTRATIVE AREAS			
38	2.3-6.1 ENTRANCE	<ul style="list-style-type: none"> - Well-marked, illuminated and covered entrance shall be provided at grade level. - Emergency vehicle entry cover shall provide shelter for both the patient and the emergency medical crew during transfer between vehicle and building - Ambulance entrance shall provide minimum of 6 ft. in clear width 	Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
39	2.3-6.2 PUBLIC WAITING AREA	<ul style="list-style-type: none"> - Public toilet room with hand-washing station - Access to telephone - Access to drinking water 	Provided / Meets Code
			Provided / Meets Code
			Provided / Meets Code
40	2.1-6.3 ADMINISTRATIVE AREAS	<ul style="list-style-type: none"> - General and Individual Offices, if provided – Refer to 2.1-6.3.3 - Multi-purpose room, if provided – Refer to 2.1-6.3.4 - Medical Records – Refer to 2.1-6.3.5 <ul style="list-style-type: none"> - Provisions for securing medical records of all media types. - Equipment and Supply Storage – Refer to 2.1-6.3.6 	Provided Offsite
			Provided Offsite
			Does not meet code
			Does not meet code
2.3-7 DESIGN AND CONSTRUCTION REQUIREMENTS			
41	2.1.7		Does not meet code
2.3-8 BUILDING SYSTEMS			
42	2.1-8		Does not meet code

REGULATED MATERIALS STATUS	
<p>Due to the confirmed and/or reasonably expected presence of regulated materials within the West and Main Building Basements and the entirety of the Central, East, and Founders Buildings, special conditions and requirements for the demolition activities will be required. The regulated materials confirmed and/or reasonably expected to be present include:</p>	
A.	Asbestos Containing Materials (ACMs) – Includes floor coverings, roofing systems, piping and HVAC system insulation, waterproofing coatings, and acoustical coatings. These materials are present, in varying formats and quantities, in all of the Project affected structures. ACM must be removed from the structures prior to the commencement of general demolition activities. Regulated disposal of ACM waste streams is required.
B.	Lead Based Paint (LBP) – Based on the chronology of construction of the structures, it is prudent to assume that all coated surfaces in the demolition area qualify as LBP. The presence of LBP requires certain actions on the part of the contractor as to personnel protective measures for his employees when conducting LBP disturbance activities. All waste streams that contain LBP and/or LBP coated components must be chemically profiled in accordance with USEPA based sampling and analysis procedures. Based on this testing, the waste stream will be classified as “hazardous” or not. Experience shows that only in unusual circumstances will the LBP waste streams assay to hazardous status. However, this status cannot, for practical and regulatory reasons, be forecast in advance of actual production of the waste stream(s).
C.	Lead Containing Materials – This category of materials includes lead sheeting, lead plumbing and drainage components, and vitreous (whiteware and ceramic tile) glazed components. Lead sheeting and lead plumbing and drainage components will be discretely removed prior to demolition and programmed for recycle. Waste streams containing elemental lead (Pb), such as vitreous (whiteware and ceramic tile) glazed components must be chemically profiled in accordance with USEPA based sampling and analysis procedures. Based on this testing, the waste stream will be classified as “hazardous” or not. Experience shows that only in unusual circumstances will such lead waste streams assay to hazardous status. However, this status cannot, for practical and regulatory reasons, be forecast in advance of actual production of the waste stream(s).

D.	<p>Universal Waste – Universal wastes include:</p> <ol style="list-style-type: none"> 1. Mercury (Hg) containing equipment (MCE) such as thermostats, barometers, manometers, temperature and pressure gauges, sprinkler system contacts, and mercury switches. 2. Intact batteries, defined as a device consisting of one or more electrically connected electrochemical cells which is designed to receive, store, and deliver electric energy. 3. Mercury Containing Lamps defined as fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. <p>While Universal Wastes must be disposed of or (in some cases) recycled under strict regulatory controls, the Universal Waste program provides a streamlined (when compared to conventional hazardous waste disposal requirements) regulatory process.</p>
E.	<p>Poly Chlorinated Biphenyls (PCBs) – Confirmed and potential PCB materials and devices present in the structures include:</p> <ol style="list-style-type: none"> 1. Window caulking at specific locations in the structures – This material must be discretely removed prior to demolition and programmed for disposal in accordance with regulatory requirements. 2. PCB Containing Fluorescent Light Ballasts - These devices must be discretely removed prior to demolition and programmed for recycle and/or disposal in accordance with regulatory requirements.

1. Background

On October 22, 2012, what would later become Hurricane Sandy developed into a tropical storm in the Caribbean Sea. The following day, the storm developed into a Category 1 hurricane. After making landfalls in Jamaica, Cuba, and Haiti, on October 26 Hurricane Sandy is a category 1 storm with sustained winds of 80 mph. Based on forecast tracks and intensity, New York, Maryland, Washington, D.C., Pennsylvania, and North Carolina declare a state of emergency.

On October 27, the National Weather Service downgrades Sandy to a tropical storm and then later reclassifies the storm as a Category 1 hurricane with sustained winds of 75 mph. New Jersey, Connecticut, and Massachusetts declare states of emergency. All major air carriers canceled all flights into and out of JFK, LaGuardia, and Newark-Liberty airports, and the Metro North and Long Island Railroads suspended service. The Tappan Zee Bridge was closed, and later the Brooklyn Battery Tunnel and Holland Tunnel were closed. On Long Island, evacuation was ordered for South Shore, including areas south of Sunrise Highway, north of Route 25A, and at areas of elevations of less than 16 feet above sea level on the North Shore. The evacuation order applied to the Long Beach Medical Center that is sited at an elevation of approximately 6' above sea level.

In the course of the day of October 28, the New York Metropolitan Transportation Authority ceased subway and commuter rail service at 7:00 PM with bus service suspended at 9:00 AM. The New York governor directed the mobilization of certain National Guard units. New York City ordered evacuations in low-lying areas of NYC and public school closures. Rhode Island declared a state of emergency. A federal state of emergency is declared in Connecticut, the District of Columbia, Delaware, Maryland, Massachusetts, New York and Rhode Island. The Port Authority of New York / New Jersey suspended all train service at midnight and airlines cancelled flights.

Sandy approached landfall on October 29 as a Category 2 storm. Hurricane force winds extended 175 miles out from the storm's eye, making it much larger than most storms of its type. 6,700 National Guard troops are activated in states affected by the Hurricane. Sandy weakened to a post-tropical cyclone in the evening of October 29 before making landfall along the coast of southern New Jersey. As Hurricane Sandy approached, Long Island appeared to be well out of its path. But the storm's wide field of damaging winds and rain, combined with an unusually high tide, delivered a major storm surge that affected both the north and south shores of the island.

2. LBMC Emergency Preparations

Throughout the weekend of October 27/28, the Long Beach Medical Center (LBMC) made preparations for the arrival of Hurricane Sandy. Evacuation commenced with the relocation of Hospital patients, followed by the evacuation of Komanoff Center (Nursing Home) residents. The LBMC Emergency Department remained in full capability operation until the complete evacuation of the Nursing Home was completed. The LBMC evacuation was completed by the evening of October 28.

During the October 27/28 period and into the day of October 29, LBMC Engineering Staff conducted storm preparations to protect the physical facility to the extent possible. These preparatory actions included: boarding up or otherwise covering building outer membrane openings (doors, windows, vents, etc.), filling and placing sand bags to protect ground level entrances and openings, procurement and pre-placement of dewatering pumps, filling diesel tanks to capacity for standby generator fuel, isolation and safe-stating liquid oxygen and nitrogen tanks, isolating and de-energizing electrical circuits at lower building levels vulnerable to flooding, and removal (to the extent possible) of portable medical equipment and computer systems to higher building elevations. The LBMC structures affected by these preparatory actions include the Nursing Home, West Building, Main Building, Central Building, East Building, Founders Building and Auditorium, FACTS Building, and Buildings 416, 424, 426, and 430.

LBMC maintained an onsite crew of personnel with critical skills to deal with possible emergencies during and immediately after the storm. These personnel included the LBMC CEO and Assistant Director, Chief Engineer, Maintenance Director, two Watch Engineers, and two Mechanics.

3. Sandy Landfall and Immediate Actions

By 5:00 PM on October 29, the Central, East, and Founders (CEF) Buildings had 1' to 2' of water surrounding the Buildings, with water entry only prevented by the sandbag barriers erected in the preceding days. Dewatering pumps within LBMC were activated as the water level exceeded the sandbag barrier protection. By 6:00 PM, the outside water level was approximately 2' above the sandbag protection elevation and overwhelmed the dewatering pump system capacity.

LBMC Staff were forced to retreat from the Central, East, and Founders (CEF) Buildings to the West and Main Buildings. All LBMC personnel were housed in the West/Main Buildings by 6:00 PM. All basements in all buildings continued to flood, far exceeding the dewatering capacity of the remaining pumps. LBMC Staff attempted to close watertight doors to isolate/restrict flooding in the basement subareas, but the doors proved to be

inoperable under the conditions of the storm. At approximately 7:00 PM, the Long Island Power Authority (LIPA) electrical supply to LBMC was lost. By 8:00 PM, the LBMC staff had exhausted their resources to restrict flooding and/or to dewater the facility.

By 2:00 AM on October 30, the grounds of the LBMC Campus were inundated with approximately 4' of water. The Basements of the West, Main, Central, East, and Founders Buildings were completely flooded with salt water. The 400 series Buildings and the FACTS Building were flooded to approximately 3' above floor elevation.

At approximately 7:00 AM, the floodwater had receded sufficiently to allow the LBMC Staff to leave the site to attend to personal business. The LBMC Staff regrouped at 2:00 PM and commenced evaluation of LBMC, initial exterior cleanup, and the installation of temporary services to allow the commencement of initial recovery operations. This initial evaluation determined that critical LBMC systems were damaged beyond the point of reasonable short term repair. These systems include:

- Electrical Distribution
- Steam/Hot Water Generation and Distribution
- Emergency Electrical Generation
- Telecommunications
- Sanitary and Wastewater Disposal
- Potable Water Distribution
- Fire Protection
- Support (Med-Gas, Environmental, Food Service)
- Vertical Transport System (Seven Elevators)

Emergency recovery contractor (ServPro) arrived the afternoon of October 30, and provided initial cleanup of movable exterior debris to clear access roads and the campus, temporary lighting, and general temporary labor. Soon after, New York State and LIPA provided portable generators, temporary lighting, and water pumps.

4. Initial Recovery

The Nursing Home, due to damage status and resident requirements, was given initial recovery priority. ServPro & LBMC Staff cleaned the Nursing Home, conducted necessary repairs, and generally prepared the facility for re-occupancy. These activities included removal of flood borne sediment and debris (demucking) from Floor 1, demolition of water damaged building materials, disposal of contaminated/wetted porous materials, and conducting deep sanitary and janitorial cleaning.

The Basements of the West, Main, Central, East, and Founders Buildings remained flooded to a level of approximately 4' above basement floor elevation. LBMC employed four 6" motor operated dewatering pumps, on a continuous basis, for approximately three weeks to dewater the West/Main Basements. The dewatering operation was complicated by the continued intrusion of groundwater and sewage into the basement areas. The Central, East, and Founders Building basements continued to have standing water.

LBMC Staff conducted operations to recover medical and support equipment from the West/Main basements. ServPro was engaged to remove business and medical files and conduct document recovery using freeze-dry methods.

By the end of October 31, the following activities were underway and/or completed:

- Diesel fuel was removed from storage tanks
- Temporary electrical was established to the Emergency Room back feed panels for lighting
- The fire sprinkler system was shutdown and repair of broken heads commenced
- Nursing Home was cleaned of rubbish and debris, portable equipment was removed and inventoried.

5. Chronology of Recovery Efforts by Month

A. November

LBMC relocates its administrative offices to a rented, downtown Long beach location. The Family Care Center (similar in function to an urgent care facility) was relocated from the Founders Building to a house in the vicinity owned by LBMC.

November 2 - LBMC formed the Working Group to develop the priorities, scope, phasing, and technical basis for the recovery effort. The Working Group consisted of LBMC Staff Engineering and Administration, RBSD Architects, and VVA Project Managers. The critical technical issues facing the LBMC Working Group included:

- Assignment of priorities in the context of restoration of services to the LBMC served community.
- Capability of the LBMC Staff to support recovery activities.

- Outside resources needed to evaluate and repair damaged/inoperative systems.
- Coordination of the installation and commissioning of temporary systems with the use of existing, partially operational systems.
- Insuring that the design of temporary systems and the repair of permanent systems results in meeting the long term and permanent requirements of LBMC.

November 2 - LBMC retained RBSD Architects, P.C. to design the LBMC Main Access and Hospital Lobby Replacement, In-patient Rehabilitation Unit, and the Temporary Pharmacy, Sterile Storage, Dirty and Clean Cart Rooms.

November 14 - FEMA representatives toured the LBMC facility for orientation and familiarization with the site.

November 19 - Rolands Electric, Inc. (Rolands) starts work on following assignments:

- Survey flood damage and mobilize to site.
- Install temporary panel, light, and power to Basement.
- Survey existing electrical equipment for repair or replacement.
- Work with Square D tech to survey main switchgear for recommendations. Report from Square D recommends replacement. Received quote from Square D.
- Surveyed the automatic transfer switches for the Main Generator, determined that these devices were damaged beyond repair, and developed the replacement cost estimate.
- Surveyed the automatic transfer switches for the Backup Generator; determined that these devices were damaged beyond repair, and developed the replacement cost estimate.
- Developed repair estimate for De-Aerating Feed Tank.
- Tested and cleaned Generator fuel tanks.
- Dewatered electrical pits and LIPA transformer pad.

- Attempted to repair the LIPA furnished generator for to provide power for the temporary heat system. The needed repairs were beyond the capability of field resources. LBMC requests LIPA to provide technical support to place generator in operational condition.
- Relocated LIPA generator to make space for temporary heating system. Electrically connected LIPA generator to temporary heat system following LIPA provided repair. Set up generator and distribution for temporary triage.
- Attempted to divorce generator power from offsite offices. This was not accomplished due to LIPA's inability to make the required system disconnect.

November 19 - FEMA representatives conducted a briefing for LBMC staff to outline the FEMA claims process.

November 19 – The following activities commenced:

- Preparations for heat connections to boilers
- Preparations for plumbing and electrical services to the Emergency Room Trailer. This was an early attempt to establish Emergency Room services for the Island. The Emergency Room Trailer was sourced from the Hackensack, New Jersey, Hospital.
- Recovery and temporary storage of Hospital and FACTS files.
- Arrangements for freeze dry recovery of hard copy files.

November 26 - The TD Bank ATM machine was removed from LBMC. The temporary boiler units for houses arrived and installation commenced.

November 27 - The Nursing Home is operating on temporary electrical service. The installation of new boilers is in progress. Pumps and motors are in the process of repair/rebuild. The electrical disconnect of all ground floor fan coils is underway. Repair/replacement of ceilings and flooring systems is in progress.

November 28 - LBMC Engineering Staff commenced removal of Main and West Basement equipment.

November 30 - Nursing Home temporary boiler units begin startup; partial Nursing Home heating system capability restored

November 30 - LVI Northstar collected and disposed two truckloads of oil/water mixture from LBMC basements pits and shafts

LBMC Engineering Staff conducted surveys of each of the five structures to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel are available, the documented discontinuities are temporarily, or, if possible, permanently, repaired.

B. December

December 2 - LBMC receives recovery contractor proposals for the demucking of the Main and West Basements.

December 3 - The LIPA generator was connected to the temporary boiler unit.

December 4 - Removal of all flood damaged electrical equipment in the West Basement commenced.

December 4 - LBMC Engineering Staff completes removal of Main and West Basement equipment in corridors. Contractor access granted.

December 7 - The Emergency Room Trailer is removed from the site. Nursing Home temporary boiler units are on line.

December 9 - Contractor proposals for the demucking of the Main and West Basements are evaluated by LBMC. The contract is awarded to LVI Northstar.

December 9 - LBMC Engineering Staff completes the draining of Hospital domestic water and cooling/heating systems.

December 12 - LBMC discussed and evaluated the use of a temporary modular unit placed in the parking lot for FACTS activities. A response to this proposal from the department of Health is expected by December 18.

December 12 - All houses are repaired; plumbing and waste systems are operational.

December 13 - The formal FEMA Kickoff Meeting was held. The purpose of this meeting was to initially assess the LBMC's needs, discuss disaster related damage, and set forth the plan of action for recovery of the LBMC facility.

December 14 - LVI Northstar commences Main and West Basements demolition.

December 21 - LVI Northstar collected and disposed three truckloads of oil/water mixture from LBMC basements pits and shafts.

December 26 – Omega conducts air quality sampling and analysis for biological organisms in the Nursing Home. The results are satisfactory.

December 26 - The assigned FEMA Public Assistance Coordinator (PAC) made the first visit to LBMC and met with LBMC staff to discuss FEMA Public Assistance policies and procedures.

December 27 - Omega Environmental Services produces the report of the asbestos survey of the West and Main Buildings basements. The report indicates the verified presence of asbestos containing building materials in each of these basements.

December 28 - Access to the Pharmacy and Storeroom is granted by authorities. The salvage, cleanout, and relocation of the Pharmacy to Floor 3 of the West Building commenced.

December 28 - Simplex commenced work on repair of the Nursing Home fire alarm system.

In the month of December, Rolands conducted the following operations:

- Installed weather proof switch board consisting of LIPA utility metering section and main breakers for the electrical distribution system.
- Installed LIPA meter socket and wiring in accordance with LIPA specifications and requirements.
- Removed flood water damaged LIPA secondary feeders into LBMC to accommodate new temporary feeders.
- Installed underground feeder from existing LIPA transformer to new switchboard location, including cutting, excavation, backfill and temporary patching of sidewalks and roadway.
- Terminated new feeder at LIPA transformer and new switchboard.

- Installed Square D panels for temporary electrical power distribution in LBMC. The first panel feeds the 4th floor mechanical room distribution panels. The second panel feeds the boiler room pumps, necessary for temporary heat. The third feeds Emergency Room panels and provides capacity for future loads that may be required.
- Installed temporary feeders from the temporary switchboard to the Building panels.
- Installed feeders from panel to location to be determined to rewire the Floor 4 mechanical room distribution. Existing feeder will be cut back, pull box installed and spliced to new temporary feeders.
- Installed panel in boiler room with feed to temporary distribution panel.
- Installed feed, combo motor starters and connect condensate pumps.
- Installed disconnect switch and feeds for connection of duplex condensate pumps.
- Installed temporary feeders from the temporary switchboard to back feed emergency panels. Existing feeder will be cut back, pull box installed and spliced to new temporary feeders.
- Rerouted and reconnected existing temporary panel being fed from portable generator to panel.

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

C. January

The first Biweekly Status Meeting was held by LBMC staff with the assigned resident FEMA team.

January 7 - LBMC Engineering Staff installed electrical power to Central Building to service critical equipment for the Family Care telephone and computer systems. Family Care telephone and computer systems were activated.

January 9 – LBMC orders replacement Kitchen Equipment for the Nursing Home Temporary Kitchen.

January 10 - Television Rental Company (TVR) completes system installation for the Nursing Home.

January 11 – Final system checks for the Nursing Home fire alarm system commenced.

January 13 - LVI Northstar (recovery contractor) commenced the demucking of Hospital West and Main Buildings and basements. The scope of these activities included:

- Removal of all porous materials except HVAC ductwork.
- Provision of temporary power necessary for the work.
- Installation of temporary lighting in strategic areas.

January 14 - Final system checks for the Nursing Home fire alarm system completed and satisfactory.

January 14 - Omega conducted air quality sampling for airborne fungal organisms in Nursing Home.

January 14 - Nursing Home project proposal awarded Fratello Construction Corporation (Fratello). Fratello was the lowest responsive bidder. The bid package was distributed Nursing Home repairs in November. However due to questions regarding the scope of work and eligibility issues the contract was not previously awarded.

January 14 - Nursing Home elevator shafts were pumped out to remove residual water.

January 14 - Further evaluation of the Nursing Home roof system was conducted by LBMC Engineering Staff and consultants.

January 16 - Telephone service was restored to LBMC administrative offices at 249 Park Avenue.

January 17 – The new control air compressor was installed to service Nursing Home.

January 17 - Rolands commenced Phase I of the electrical work with the temporary recovery of the Nursing Home system.

January 21 - LBMC Engineering Staff reviewed and approved Rolands electrical system drawings.

January 24 - The Fire Marshal conducted compliance inspection of the Nursing Home.

January 24 - The Fire Marshal Inspection Report details the "punch list" items that require correction. This Report was furnished to the Department of Health.

January 28 - The Nursing Home was relicensed and opened for operations.

January 28 - LVI Northstar tasked with installing and operating temporary heating systems to avoid further freeze damage.

January 29 - LBMC Engineering Staff conducted piping repairs for Floor 4 Mechanical Room (MER), fan coil leaks, and sprinkler piping leaks.

January 30 - Insurance adjusters were on site to evaluate Emergency Room water leaks.

January 30 - ServPro leaves site following completion of assigned Nursing Home recovery activities, including demucking of Floor 1, removal of water damaged building materials, disposal of contaminated/wetted porous materials, and conducting deep sanitary and janitorial cleaning of all Nursing Home areas.

January 31 - Contractors met with LBMC and provided LBMC with their plans and alternatives for moving the recovery forward.

January 31 - LBMC had the capability to partially heat the facility, but not to a sufficiently to prevent the freezing of water pipes, this condition resulted in pipe breaks and substantial water leakage to the interior of the structures. LVI Northstar was tasked with installing and operating temporary heating systems to avoid further freeze damage. After an extended period of relatively moderate weather from January 1 through 21, with average high temperatures of 44.5° F and average low temperatures of 32.1° F, a hard freeze period developed on January 22, when temperatures dropped to well below freezing. During the period of January 22 through 26, the temperature did not exceed 28 ° F and went as low as 12 ° F. This resulted in numerous water piping breaks due to apparent leakage past the block valves of systems isolated and drained in November or, in

the case of domestic water, the failure of the municipal supply system's isolation valves. In addition to the piping system failures, considerable water damage occurred to interior architectural surfaces. Throughout this period, LBMC staff again drained the affected systems and attempted to effectively isolate these systems. LVI Northstar was tasked with installing and operating temporary heating systems to avoid further freeze damage.

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

D. February

Biweekly Status Meetings were held by LBMC staff with the assigned resident FEMA team.

February 1 - LBMC authorizes LVI Northstar to continue with the operation of temporary environmental control systems to arrest further internal damage to the structures due to the absence of installed environmental control systems and sustain favorable environmental conditions to facilitate and optimize final structural drying operations. The execution of final environmental stabilization and drying included:

- Drying of internal structural materials and bulkhead cavities;
- Management of air quality during the remediation process to prevent the spread and/or formation of fungal organisms.
- The use of high velocity HEPA filtered air, in conjunction with heaters and dehumidifiers as the primary means of reducing building materials to a moisture content of 25% of the dry standard for the material affected.
- Installation and maintenance of containment systems to minimize the potential for microbial contamination spread and/or formation.

February 4 - The Counseling Center, formerly located in the FACTS Building was relocated to Baldwin, New York. The site preparation work was conducted by

LBMC Engineering Staff. Baldwin Mechanical Corp. performed necessary additional work to allow use of the facility.

February 5 - The existing, damaged, Hospital fire alarm system was removed and replaced with a new system.

February 5 – Work on the installation of Kitchen Facilities on Floor 3 of the Hospital commenced, including the walk-in freezer/refrigerator box and the necessary mechanical support systems.

February 6 - VVA Project Managers receives bids for Phase II (West) and III (Main) electrical repair and new equipment installations.

February 8 - Subsequent to a 2 ½" sprinkler pipe failure in the West Building ceiling near the bridge to the Nursing Home and associated water migration, Omega Environmental Services performed a water damage delineation study of the West Building, Floors 1 and 2. The summary findings of the study were that West Building interior sheetrock required removal and replacement, from 2' to 4' above floor level, at 71 locations including Patient Rooms, Treatment Rooms, Offices, Corridors, and Stairwells. This study generated the scope of work of for muck-out, water/mold remediation, soft demolition, water pump out, asbestos abatement and other environmental remediation work in sub-grade areas of the Building.

February 8 - LBMC placed the package for repairs to water damaged Hospital sheetrock out for bid.

February 11 - David M. Shapiro Disaster Consultants (DMS) is retained to assist LBMC in the FEMA Project Formulation and Cost Estimating process.

February 11 - LVI Northstar begins remediation of areas damaged by the failed 2 ½" sprinkler pipe. This work scope included the removal of ceilings and soft goods on Floors 2 and 3 of the West Building.

February 11 – Rolands commenced electrical work on the Main Campus electrical systems.

February 22 - JRM is awarded the contract for the "Temporary Build-out" of the Pharmacy, Sterile Storage, Clean and Dirty Cart Rooms; additional hospital repairs that included removal and replacement of damaged drywall on Floors 2 and 3; paint all walls of Floors 1, 2, and 3; replacement damaged VCT floor tile as required on Floor 1; and removal/replacement of all suspended ceiling tiles on needed and remove and replace all ceiling tiles on Floors 1, 2, and 3; all in the

Main and West Buildings. Subsequently, through the change order process, JRM was tasked with disinfecting wall tracks, providing air scrubbers; replacement of chill and domestic water pipe insulation on Floors 1 and 2 of the West and Main Buildings; and the repair of eight shower stalls on Floor 3, including CMU patch, plaster work, and ceramic tile repair.

February 22/25 - Omega Environmental Services conducted a water damage mapping and hazard materials inspection throughout the Central, East, and Founders basement and sub-basement levels.

February 26 - LBMC directs LVI Northstar to conduct thorough external ventilation ("air out") of the Hospital Buildings, as weather conditions permit,

February 26 – LBMC insurance adjusters conduct water damage surveys of the facility.

February 26 - LBMC directs LVI Northstar to conduct thorough external ventilation ("air out") of the Hospital Buildings, as weather conditions permit,

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

E. March

March 6 - Omega issues *Post Super-Storm Sandy Corrective Action Work Plan* on March 6 for remediation of Central, East, and Founders Basements and crawlspaces. The summarized elements of this Plan include:

- Clean all concrete/masonry surfaces
- Remove and correctly dispose of all sub-grade drywall, layered ceiling assemblies, and other finishes, including batt insulation and aluminum studs.
- Remove and correctly dispose of remaining contents including
 - Porous items including wood
 - Non-porous metal/plastic
 - Computer/electronic equipment
 - Medical equipment

- Portable mechanical equipment
- Basement and crawlspace areas with standing water:
 - Complete pump-out into water tanker truck for off-site disposal at a permitted wastewater treatment facility.
 - Scrape/clean-out muck from all surfaces
 - Sewage indicator bacteria were detected; use of worker PPE to avoid all skin contact required.
 - Report any continuing water intrusion to LBMC.
- Asbestos
 - Water impacted ACM was identified in the basement and crawlspace level; due to water saturation, no elevated asbestos fiber levels discovered.
 - No suspect debris noted on floors or in standing water during Feb. 2013 inspection.
 - Abate pipe fittings and floor tile; Non-friable floor mastic and water proofing to be maintained in place.
- House and electrical/mechanical system components routed through Sub-grade levels:
 - Recommended scope is to complete muck-out/cleanup and turn over space to General Contractor/Trades for mechanical system restoration work and eventual space re-build.
 - If an electrical/mechanical component obstructs removal of a water-impacted finish material, then remediation Contractor shall first verify whether the item can be demolished prior to proceeding.
 - Electrical equipment is not salvageable due to submersion in salt water.
- No petroleum or chemical releases have been noted.

March 7 - LBMC retained VVA Project Managers to administer scope of work and bid document preparation, bid solicitation, bid review, bid award recommendations, and project management of the "Temporary Build-out" construction and other LBMC repair activities on Floors 1, 2, and 3 of the of the West and Main Buildings.

March 22 - LVI Northstar bids for and is awarded the contract to conduct the scope of work detailed in the *Omega Post Super-Storm Sandy Corrective Action Work Plan*. Omega issues the *Asbestos Survey Report* on March 6 for the Main and West Basement areas, noting the presence of asbestos containing building

materials (ACBMs) including flooring materials and mastic, waterproofing bituminous material, pipe insulation, and bulkhead penetration packings.

March 22 - LVI Northstar commenced the servicing of 17 air handling units (AHU) located in the Floor 4 Mechanical Penthouse. The scope of work included pressure washing and disinfecting coils, blowers, and drip pans and the installation of new filters.

March 25 - LVI Northstar commenced demolition of the Central, East, and Founders basements.

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

F. April

April 1 - Rolands begins Phase II (West) and III (Main) electrical repair and installations. The work of the Phase II and III projects is summarized below. Specific and greater detail of the Scope of Work is contained in the Rolands' letter proposal to I. Schneider (WA Project Managers) dated February 6, 2013.

- West Building
 - Disconnected and removed existing normal and emergency switchgear, automatic transfer switches, and wiring not to be reused in old electric closet. Cut back existing feeders as required to connect to new electrical distribution. Tested insulation of all existing feeders to be reused to verify integrity. Installed additional switchgear sections to rewire all existing building loads not included addressed in the Phase I scope such as fire pumps, chillers, and additional distribution panels.
 - Installed fused disconnect for fire pump. Replaced existing normal power fire pump feeder with new and connect new fire pump controller. Replaced existing normal power fire pump feeder with new. Connect new fire pump controller.
 - Removed existing south generator feeders to building and replaced with temporary aluminum feeders. Install new pull box in building to distribute emergency feeds. Rewired existing

south generator sub-panel. Installed automatic transfer switches and manual transfer switch. Installed distribution panel with breakers to feed transfer switches for emergency power. Installed fused disconnect switches for remaining emergency feeders to transfer switches. Installed distribution panel with breakers to feed the transfer switches for normal power. Installed new generator start wiring from all new transfer switches to generator. Installed feeds for normal and emergency feeds to transfer switches.

- Installed distribution panel to replace existing DPX distribution panel that feeds Radiology equipment. Replaced existing feeder to new DPX distribution panel. Install new distribution panel to replace existing DP-B-1 that feeds West Building lighting panels. Replaced existing feeder to new DP-B-1 panel. Install new distribution panel to replace existing ECDP that feeds Emergency Room panels and miscellaneous loads in Basement. Installed new feeder to panel ECDP from new ATS #3. Installed new distribution panel to distribute emergency feeders from ATS-1B. Installed new feeder to ATS-1B distribution panel. Furnish and install five transformers for Radiology equipment. Installed input feeders to all transformers.
- Traced out all normal and emergency feeders to determine optimum rewire plan for all loads. Replaced and/or cut back and insulation test all wiring for reuse.
- **Main Building**
 - Disconnected and removed all existing main distribution switch gear, automatic transfer switch, disconnects, bus duct, and miscellaneous conduit and wire to allow for new temporary switchgear. Install new switchgear Main Building loads. Cut back existing Main Building service feeders from bus duct, test insulation to verify integrity, spliced on new feeders and extend to new temporary switchgear and connect. If insulation testing of cables failed, cables were replaced.
 - Relocated LIPA generator to north of building to be used as emergency source of power for Main Building. Installed automatic transfer switch for emergency power. Installed temporary feeder from LIPA generator to automatic transfer

switch. Installed temporary feeder from temporary switch gear to automatic transfer switch for normal power. Installed temporary panel to feed LIPA generator block heater, battery charger etc. to allow generator to serve as a standby power source. Installed control wiring for generator start to allow generator to serve as a standby power source. Installed distribution panel for Main Building emergency load distribution. Installed feeder from automatic transfer switch to distribution panel.

- Traced out all normal and emergency feeders to determine optimum rewire plan for all loads. Replaced and/or cut back and insulation test all wiring potentially programmed for reuse.

April 22 - 95% of Phase II (West) and III (Main) electrical work is completed. In addition, the temporary generator is providing electrical power to Central, East, and Founders Buildings.

April 24 - Main and West Building air handling units are placed in operation. The building is capable of being heated by LBMCs steam boilers.

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

G. May

May 2 – FEMA representatives verify that Medical Gas System was restored to operation in the West and Main Buildings. The new Nitrous Oxide system including bottles, piping and manifold was placed in the West Basement. The remaining components of the medical gas system were located in the Mechanical Penthouse of the West Building.

May 2 – FEMA representatives verify that two cable driven passenger elevators in the West Building, serving the Basement and Floors 1, 2, 3, and 4 were in operation.

May 9 - LIPA restores system electrical power to the West and Main Buildings in the first week of May. All external (temporary) electric power panels are

disconnected at this time and reconnected to the Buildings' permanent electrical distribution system.

May 15 - Omega Environmental Services conducted the asbestos and lead based paint survey of the Central, East, and Founders Buildings. The *Asbestos and Lead Survey; Central, East & Founders Building Wings* report indicates the verified presence of asbestos containing building materials including (ACBMs) including flooring materials and mastic, ceiling tile, pipe insulation, spray applied structural fireproofing, felt underlayment, and fire-door insulation. Lead Based Paint (LBP) coating systems are widely distributed throughout each of these structures.

May 21 - Demucking of Central, East, and Founders Buildings basements is completed.

The Central, East, and Founders Buildings continue to operate on temporary electrical power and air scrubbers.

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

H. June

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

LBMC presents the damage claim for all wings of the hospital, FACTS Building and doctor's cottages on E Bay Street.

I. July - December

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system

penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

Weekly meetings attended with FEMA, NYSOEM, LBMC and DMS to develop and support the DDD, SOW and cost estimated presented to FEMA for the permanent repairs to the hospital. In December all groups were in substantial agreement of the eligible damages to the hospital.

FEMA promises a draft of the PW before the Christmas Holidays.

J. January

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

Weekly meetings attended with FEMA, NYSOEM, LBMC and DMS to develop and support the DDD, SOW and cost estimated presented to FEMA for the permanent repairs to the hospital.

On January 3, 2014 LBMC was forced to request LIV/Northstar to re-install ice fighters and heat jets into the CEF wings due to extremely cold temperatures.

K. February

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

Weekly meetings attended with FEMA, NYSOEM, LBMC and DMS to develop and support the DDD, SOW and cost estimated presented to FEMA for the permanent repairs to the hospital.

SNCH engaging FEMA OCC concerning transfer of eligibility from LBMC to SNCH.

February 14 – LBMC official files for bankruptcy.

L. March

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

Weekly meetings attended with FEMA, NYSOEM, LBMC and DMS to develop and support the DDD, SOW and cost estimated presented to FEMA for the permanent repairs to the hospital.

M. April

LBMC Engineering Staff conducts continues surveys of each structure to determine the location of outer membrane damage and discontinuities, including broken windows, roof membrane damage/failures, and damaged system penetrations. On an assigned priority basis and as qualified personnel, supplies, and equipment are available, the documented discontinuities are temporarily, or, if possible, permanently repaired.

Weekly meetings attended with FEMA, NYSOEM, LBMC and DMS to develop and support the DDD, SOW and cost estimated presented to FEMA for the permanent repairs to the hospital.

April 2 – LVI/Northstar begins removal of heating equipment.

I. C. Thomasson Associates, Inc.

Preliminary MEP Feasibility Study
To Restore Emergency Department Services
at Long Beach, NY



15 December 2014

PREPARED BY:

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TABLE OF CONTENTS

1.0	Introduction and Background	1
2.0	Code Review.....	1
3.0	Non Conformance Issues.....	1
	Mechanical and Plumbing Systems.....	2
	Electrical Systems	4

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1.0 INTRODUCTION AND BACKGROUND

I. C. Thomasson Associates, Inc. (ICT) performed a mechanical, electrical, plumbing and fire protection feasibility study of the Long Beach Medical Center Emergency Department (LBMC ED) to restore it to a functioning ER. The LBMC ED is located in the West Building First Floor. The LBMC ED was decommissioned after the Hurricane Sandy event in October 2012. Temporary power and HVAC services were restored shortly thereafter; however, since then it has remained non-functional as an emergency department.

The boilers, electrical switchgear, domestic hot water heaters, fire pump and most support systems that serve the LBMC ED are all located in the basement of West and Main Hospital. With the exception of the switchgear and fire pump (both replaced in kind after the flood), all of the supporting equipment was damaged beyond repair. This includes hydronic piping, domestic piping, and sprinkler piping systems.

In addition, the LBMC ED is heated and cooled from an existing air handler located in the fourth floor mechanical penthouse. Air is ducted through chases from the penthouse to the first floor. The chillers are located in the penthouse and are sized for the entire West and Main Hospital. They are oversized if they are to be used solely for the Emergency Department, and may not turn down to the minimal loads required by the Emergency Department.

It will be more cost effective to install new systems dedicated to serve the new repurposed ER in lieu of repairing or replacing existing mechanical, electrical, plumbing, fire protection, or IT systems that presently serve the space.

2.0 CODE REVIEW

The LBMC West Building was built under the 1984 New York Standard Building Code. The New York Department of Health and Healthcare Facility guidelines have changed over the years. Not all of these changes have been implemented in the current Emergency Department. Waivers have been granted, and full code upgrade adherence has not been required in the past. Our opinion is that the LBMC Emergency Department would have to be brought up to current FGI and New York Department of Health codes and guidelines with no waivers if it is to be re-opened.

CURRENT CODES BASIS OF DESIGN

International Building Code – 2009 edition.

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International Mechanical Code – 2009 edition.

International Plumbing Code – 2009 edition.

National Electrical Code (NEC) – 2008 edition.

National Fire Protection Association – Applicable and locally adopted provisions.

Guidelines for Design and Construction of Health Care Facilities, 2014 edition (FGI).

IBC Seismic – Category C.

3.0 NON CONFORMANCE ISSUES

MECHANICAL AND PLUMBING SYSTEMS

HVAC

1. **Filtration and Ventilation Standard** – Provide a new dedicated HVAC system to serve the new ED space. The HVAC system shall have MERV 6 pre filters and MERV 14 final filters installed. Vent fans to be on equipment branch power.

2. **HVAC Ductwork** – Provide new supply, return, and exhaust ductwork per the FGI, and IMC requirements.

3. **Ventilation Requirement** –

Verify the outdoor air intake is a minimum of 25 feet from all exhaust discharge or plumbing vents, and a minimum of 3 feet above a roof surface.

Provide dedicated infectious isolation exhaust fan and pressure monitor with audio/visual alarm as required by the architectural floor plans.

Provide DDC controls for the air handler, and associated systems. Provide DDC alarm to facility operator upon a loss of heating or cooling to the space.

Provide dedicated ED Waiting exhaust fan to meet 2010 FGI requirements

4. **Building Partition Construction and Occupancy Separation** - Inspect all penetrations of the new 2 hour occupancy separation and either remove and cap or install rated assembly penetrations consistent with the UL details for all duct, piping and conduit.

5. **International Building Code Requirement** - Any newly installed equipment, duct work, or piping to meet 2009 IBC seismic design requirements for occupancy category IV, Seismic Design category C.

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6. **Department of Health Licensure Requirement** - Heating systems are connected to the new emergency generator, and that sufficient fuel capacity is on site to meet FGI requirements.
7. **Piping and Hydronic Distribution Systems** – All piping systems including plumbing, HVAC, fire sprinkler, are new and dedicated to the new ED space. All hot and cold piping to be insulated per the State Energy code minimum requirements.
8. **Domestic Water, Plumbing Systems** – Provide for a new city water entrance on the main level adjacent to the new ER. The new ED floor plan will require new plumbing fixtures –(sinks, toilets) to meet the FGI guidelines. Add additional plumbing fixtures where required by the architectural floor plan. All distribution piping to be copper with soldered joints. All piping is to be insulated per the State Energy Code Minimum requirements. New drain and vent piping will be cast iron piping with no hub couplings. Saw cutting and core drilling of the existing floor slab will be required where new fixtures are being added.
9. **Medical Gas System** - Provide new medical gas system per FGI, NYDOH requirements.
 - Minimum outlet counts and locations per the 2010 FGI guidelines.
 - Manifold certification to meet all NFPA 99 requirements
 - Storage Room to meet all NFPA 99 requirements, including ventilation.
 - Master alarm panel to be added to ED Nurses Station for staff monitoring.
 - Provide whole system certification by an independent licensed agent.
10. **Fire Protection System** – Provide new fire water entrance adjacent to the new city water entrance. Provide all new sprinkler piping dedicated to the ED. Provide quick response sprinkler heads throughout the area of renovation and relocate arm over piping or provide additional run out piping as required.

ELECTRICAL SYSTEMS

1. **Normal and Emergency Power Distribution** - The existing ED is fed from a normal power service switchboard in the basement electrical room. It is also fed emergency power from the same basement electrical room. Current FGI and NEC codes require physical separation of normal and emergency switchgear. The normal electrical service is rated for, 4000A, 120/208V and fed from a 1000 KVA pad mounted transformer across the street from the hospital. The emergency generator is located adjacent to the primary LBMC utility transformer across the street also.

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It is not cost effective to provide separate rooms for the existing normal and emergency switchgear in its present location. In addition, the basement is not flood proof. Significant dollars would be required to provide flood proofing, and AHJ code approved access. Therefore, new primary and emergency electrical switchgear rooms will be required on the first level adjacent to the new ED.

2. **Emergency Power Generator and Distribution–**

LBMC has a generator that may be sufficient for the new ED. It will have to be tested and re-certified if it is to remain in service.

The present emergency power distribution system is not separated by the three transfer switches per National Electric Code (NEC); Life Safety, Critical, and Equipment. The entire emergency distribution system will require replacement.

A power system study is required to ensure system coordination per the NEC.

Additional emergency receptacles are required to meet the new FGI guidelines and NEC.

3. **Code Compliance / Equipment Clearance –** Provide new panels in electrical room to ensure adequate clearance to comply with NEC.

Emergency panels and conduits shall be installed in separate room/path from normal power panels and conduits.

4. **Code Compliance / Wiring Systems –** The existing electrical distribution system is in flexible metal cables and conduit system (MC). It will be more cost effective to replace the entire electrical distribution system from the new primary and emergency distribution panels than to test, re-certify the few circuits that could possibly remain.

MC cables have to be replaced with wiring in conduit for emergency circuits for FSED.

MC cables rated for Hospital Care Facility (HCF) may be used for normal circuits only.

5. **Building Partition Construction and Occupancy Separation -** Inspect all existing penetrations of 2 hour occupancy separation and install rated assembly penetrations consistent with the UL details for all conduit.

6. **Code Compliance / Emergency Power for HVAC System -** The Air Handling units and exhaust systems serving the FSED shall be connected to the Equipment branch of the emergency power system per NEC.

7. **Tenant Improvement –** The existing CT is requested by the Tenant to be connected to emergency power.

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8. **Code Compliance / Lighting System** - Existing lighting fixtures shall be replaced to meet New York Energy Code.
9. **Code Compliance / Fire Alarm System** - A new FSED will require a fire alarm system with automatic detection such as smoke and heat detectors and system monitoring for the fire protection system.

Audio/visual alarms will have to comply with ADA.

10. **Nurse Call System** - The existing Nurse Call system is not functioning. The control equipment is located in a small closet along with the IT equipment. A Nurse Call system is required for FSED.

11. **Code Compliance / International Building Code Requirement** - Any newly installed equipment shall comply to NEC and applicable codes for the City of Long Beach.

Provide seismic restraints to meet 2009 IBC seismic design requirements for occupancy category IV, Seismic Design category C.

12. **Functionality / Data Network** - The existing data network appears to be Cat 5 type. The existing cables and outlets should be tested for functionality. A new data closet will need to be established. The current data equipment is housed in a small closet with no ventilation, and does not function. Replace the data network system with a new system that coordinates with the SNCH facilities.

Additional data outlets needed for Patient Monitoring system for a FSED.

13. **Emergency Communication** - Provide new emergency communication system.

Thornton Tomasetti

Building Solutions

Long Beach Medical Center Preliminary Structural Feasibility Study for West and Main Buildings

Long Beach Medical Center
455 E Bay Drive
Long Beach, New York 11561

Thornton Tomasetti
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TABLE OF CONTENTS

1.0	Introduction and Background	1
2.0	Code review	1
3.0	Lateral Force Resisting System	2
4.0	Diaphragm.....	4
5.0	Foundation	4
6.0	Conclusions.....	5
7.0	Limitations	5

1.0 INTRODUCTION AND BACKGROUND

Thornton Tomasetti, Inc. (TT) performed a structural feasibility study of the West and Main buildings of the Long Beach Medical Center (LBMC), at the request of Ronald Blicht, and on behalf of South Nassau Communities Hospital. Our study to date includes the review of architectural, structural, and topographic survey construction documents provided by the client. The study also includes a comparison of the current 2010 New York State Building Code (NYSBC) live and lateral load requirements to those of the 1961 and 1984 NYSBC which were the applicable codes at the time the buildings were originally constructed. TT has identified the necessary structural upgrades to make these buildings compliant with the current NYSBC.

The Main building, constructed in 1972, is approximately 41 feet above ground level, and is a four story steel frame structure with a composite concrete slab on metal deck floor system. The foundation consists of concrete foundation walls and concrete pile caps supported on friction piles. The West building, constructed in 1989, is approximately 59 feet above ground level, and is a 5 story steel frame structure with a composite concrete slab on metal deck floor system. The foundation consists of timber pile groups.

TT understands that the site sustained significant damage as a result of the CAT-90 Sandy event in October of 2012. As part of the rehabilitation work, the West and Main buildings of the LBMC will undergo significant renovations, which will involve space reconfiguration covering more than 50% of the building area. This work is considered “Level 3” alterations per the NYSBC and the code requires the building to be brought into compliance with the wind and seismic forces currently used for design of new structures.

2.1 CODE REVIEW

The Main and West buildings were constructed using the 1961 and 1984 NYSBC, respectively, based on the date of the structural construction documents. Any structural alterations to these buildings must comply with the 2010 NYSBC. TT compared the live load and lateral load requirements of the 1961 and 1984 building codes to the 2010 NYSBC to determine the extent to which the design loads have changed since the original construction.

2.2 LIVE LOADS

Comparison of the design live loads for the hospital from each of the building codes is tabulated below. As shown in table 1, most of the current design live loads are still consistent with those from the historical code except for the public space and corridors above the first floor which have increased and laboratories which has decreased from 100 psf to 60 psf. This indicates that the new construction of the Main and West buildings are unlikely to substantially increase the live loads on the existing floor system. Once the new design of the Main and West buildings is finalized, TT will determine if local reinforcement is required in the areas where the live load has increased.

Table 1 Live loads

	<u>1961 NYSBC</u> (psf)	<u>1984 NYSBC</u> (psf)	<u>2010 NYSBC</u> (psf)
Operating room	60	60	60
Laboratories	100	100	60
Patient room	40	40	40
Roof	20	20	20
Public space	75	75	
Corridors, above first floor	40	40	80

2.3 LATERAL LOADS

TT reviewed the lateral load requirements in both the historical and the 2010 NYSBC for the Main and West buildings. The 1961 and 1984 NYSBC did not have a seismic load requirement and thus the lateral load resisting system of the building was designed for the wind load. The 2010 NYSBC refers to ASCE 7-05 Minimum Design Loads for Buildings and Other Structures for the calculation of the wind and seismic load requirements for design of new buildings. TT calculated and compared the seismic loads per the 2010 code and the wind loads per historical and 2010 codes. The seismic load has been found to govern the lateral load for the new design of the Main and West buildings. Table 2 compares the 2010 and historical calculated base shear for the wind and seismic loads.

Table 2 Base shear from lateral loads

Main Building	1961 NYSBC (kip)	2010 NYSBC (kip)
Wind	121	365
Seismic	-	505

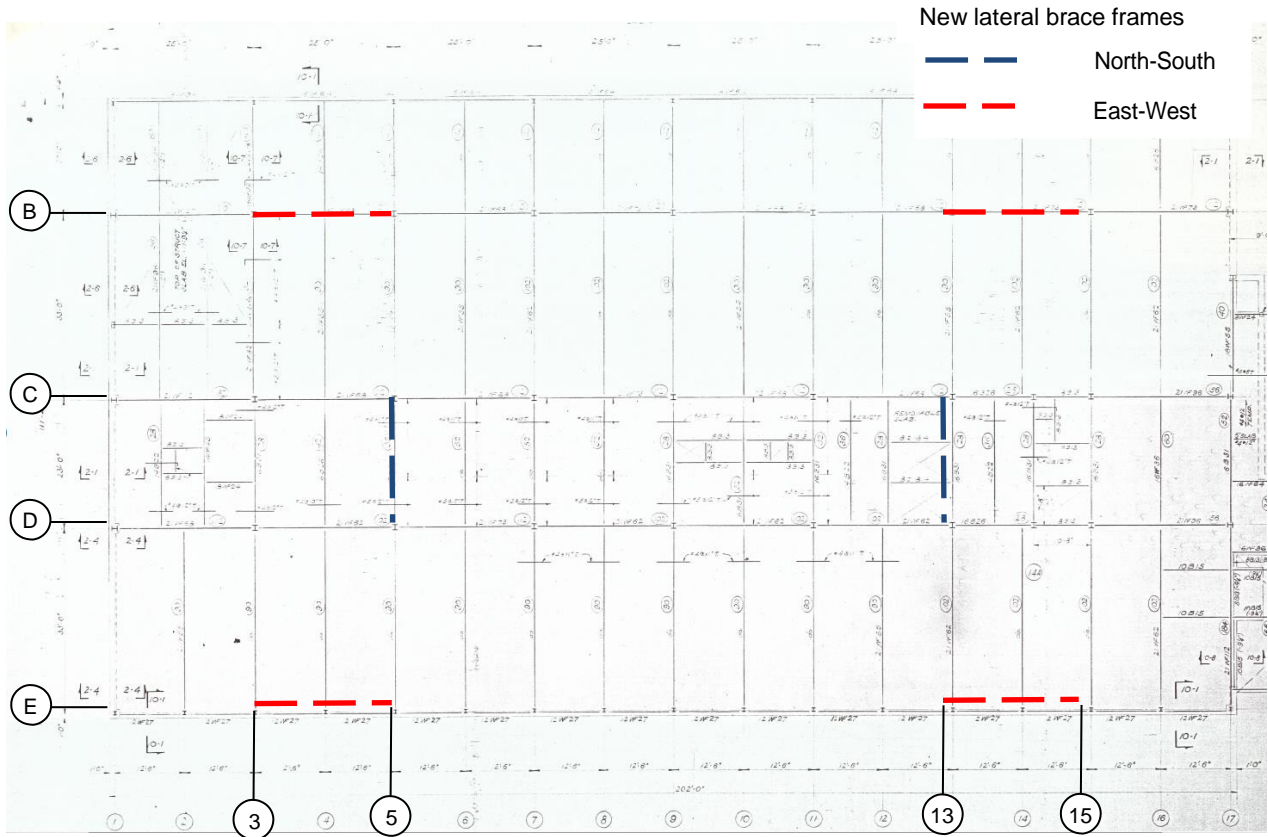
West Building	1984 NYSBC (kip)	2010 NYSBC (kip)
Wind	124	400
Seismic	-	495

3.0 LATERAL FORCE RESISTING SYSTEM

The existing structure of the Main and West buildings was not designed to resist seismic loads. Therefore, both buildings require structural upgrade to satisfy the seismic requirements of the 2010 NYSBC. A new lateral frame system shall be incorporated into the main building structure to provide the required stiffness and strength under a seismic event. TT performed feasibility studies of several lateral frame options for the existing structure based on the structural drawings provided. The preliminary structural analysis was performed using engineering hand calculations and structural analysis software to evaluate the effect of the seismic loading. A steel braced frame system is the most efficient solution to structurally upgrade both buildings. Diagonal steel braces will be added between existing columns in two orthogonal directions.

The Main building's east-west braced frames are designed to be located along the gridline B and E between gridlines 3-5 and 13-15 and the north-south frames are along the gridline 5 and 13 between the gridline C and D as shown in Figure 1. The West building's east-west braced frames are designed to be along the gridlines B and D between gridlines 2-3 and the north-south frames are located at the gridline 2 and 5 between gridlines B-C and D, as shown in Figure 2. The columns, girders and connections of the existing structure may require local reinforcement to accommodate the lateral load design.

TT will coordinate the location of the new brace frames with the architect to allow for open space and access requirements.



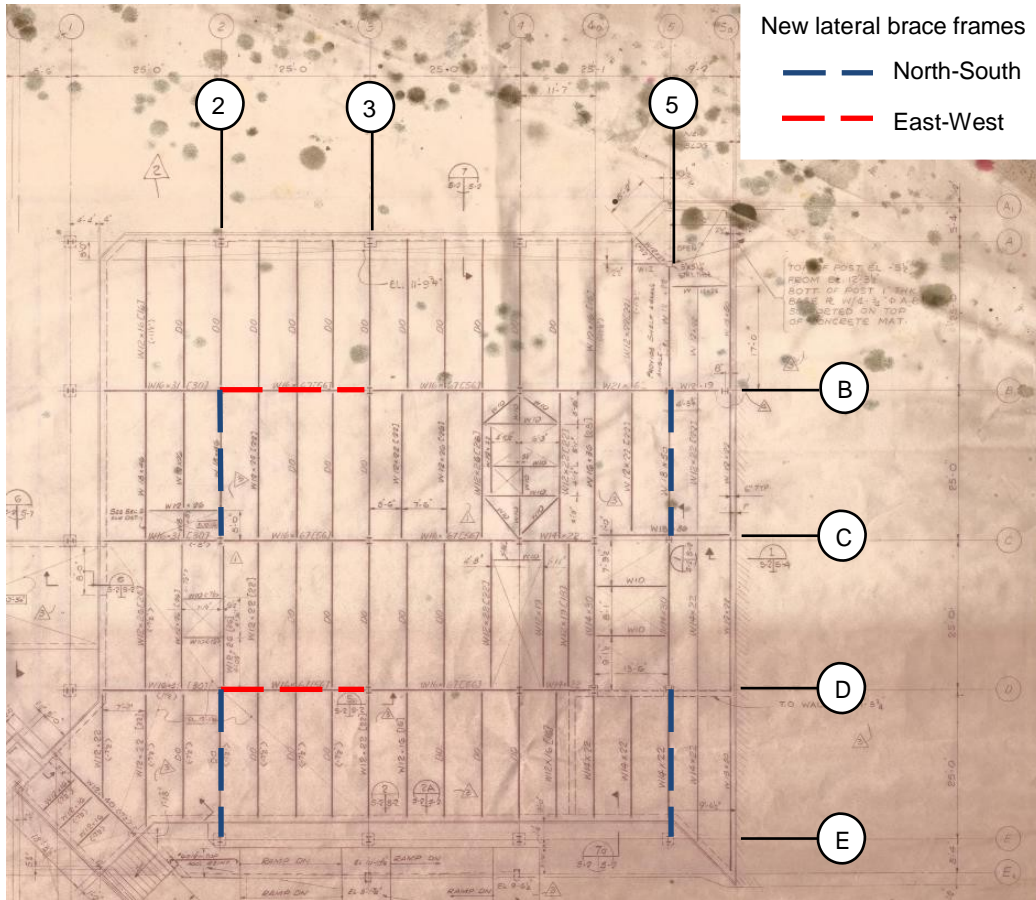


Figure 2 Plan view of the new braced frames in the West building

4.0 DIAPHRAGM

The floor diaphragm at each level must be engaged to transfer the lateral load to the steel braced frames. The existing floor of the Main building is a 5 ½” composite slab comprised of a 3 ½” thick concrete on top of 2” metal deck flute. The West building floor consists of 4” concrete on top of a 1 ½” metal deck with a total of 5 ½” composite floor slab. The capacity of the floor diaphragm appears to be adequate in general for the lateral load of 2010 NYSBC. In some locations the diaphragm may require local reinforcement to allow for the shear force transfer into the new braced frame system.

5.0 FOUNDATION

The columns of the Main building typically sit on pile caps. Each pile cap is supported on friction piles consisting of steel pipes filled with concrete driven into the layer of sand under the last stratum of organic material, silt, clay, or other compressible material. Based on our preliminary study and relying on the available information on the drawings, it is unlikely that the piles will need reinforcement for the uplift under the seismic event. However, due to the lack of geotechnical information the capacity of the foundation system to transfer the shear forces cannot be determined at this time.

The West building foundation system consists of timber pile groups driven into the bearing material. In locations where there is uplift in the columns as a result of the lateral loads, the footings will most likely have to be reinforced for the uplift. Similarly the shear capacity of the foundation system cannot be determined at this time without further geotechnical information. TT

recommends a geotechnical engineer be retained by the owner to investigate the capacity of the soil and pile foundations for both buildings.

6.1 CONCLUSIONS

Based on our review of the structural drawings and the New York State Building codes, TT evaluated the impact of the "Level 3" alterations on the existing structure for both the Main and West buildings. Structural feasibility studies were performed to evaluate the structural retrofits necessary to satisfy the current code requirements. TT's conclusions are as follows based on the currently proposed renovation plans:

1. In general, the new live loads based on the proposed renovations are unlikely to overload the existing floor slab. However, local areas may require reinforcement once the structural design is finalized with the detailed architectural plan.
2. The Main and West Building structures both require the addition of a lateral force resisting system to satisfy the 2010 NYSBC seismic design requirements.
3. Steel braced frames are recommended to satisfy the lateral load requirements of the 2010 building code. Diagonal braces will be added between existing columns along two column lines in each direction to complete the lateral system in the existing structures.
4. The floor diaphragms appear adequate in general to meet the lateral load requirements of 2010 NYSBC. However, a few areas may require local reinforcement to transfer the lateral forces to the new braced frame system.
5. The foundation system of the Main building appears adequate to resist the uplift from the seismic load as based on our understanding of the available drawing information. However, the foundation system of the West building may have to be reinforced at locations where the column is subjected to uplift. Shear capacity of the footings cannot be determined at this time. A geotechnical engineering firm should be engaged by the owner to investigate the soil properties and to make recommendations for the foundation system reinforcement.

7.0 LIMITATIONS

Findings presented in this report are for the sole use of Blitch Knevel Architects, LLC in their evaluation of the subject property, and have been prepared under the terms and conditions of our engagement agreement with Blitch Knevel Architects, LLC. This report is not intended for use by other parties and may not contain sufficient information for the purposes of other parties or uses.

This report is based on our understanding of the alterations and intended use of the two subject buildings and is limited to those assumptions. We will provide an updated report with additional details and recommendations if requested. It will be amended and revised if more information is provided.

Our professional services were performed in accordance with the standards of skill and care generally exercised by other professional consultants acting under similar circumstances and conditions at the time the services were performed.