(REVISED)
STRUCTURAL ANALYSIS REPORT

For

ME5001
SONESTA
157 High Street
Portland, ME 04101

Equipment Room on 9th Floor

Prepared for:

SAI at&t

STATE OF MAINE
DANIEL P. HAMM
No. 10344
LICENSED PROFESSIONAL ENGINEER

5-31-16

Dated: May 31, 2016 (Rev. 1)
May 17, 2016

Prepared by:

Hudson Design Group LLC

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SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the structure that will support the existing AT&T equipment located in the areas depicted in the latest HDG's construction drawings.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's proposed equipment.

This office conducted an on-site visual survey of the existing structure on April 12, 2016. Attendees included Edvin Broka (HDG – CAD Designer).

CONCLUSION SUMMARY:

Building plans prepared by Aliberti Larochelle & Hodson dated January 8, 1980 were available and were obtained for our use. A limited visual survey of the structure was completed in or near the areas of the proposed work.

Based on our evaluation, we have determined that the existing structure **IS CAPABLE** of supporting the proposed equipment loading with the following modifications:

- **Remove the existing battery rack.**
- **Relocate four existing Ericsson cabinets to be positioned directly over an existing concrete-encased steel floor beam.**
- **See the latest HDG construction drawings for detailed requirements.**

EQUIPMENT CONFIGURATION:

(3) RBS 2206 Cabinets (Wt. = 850 lbs/each)

(1) BBS 2000 Cabinet (Wt. = 1900 lbs)

(1) Power Plant Cabinet (Wt. = 500 lbs)

(1) FIF Rack (Wt. = 300 lbs)

(1) RRUW Rack (Wt. = 180 lbs)

(1) RBS 3206 Cabinet (Wt. = 440 lbs)

(2) HVAC Units (Wt. = 150 lbs/each)

(1) Misc. Equipment (Wt. = 200 lbs)

(1) DC Power Plant (Wt. = 2100 lbs)

(1) RBS 6601 Rack (Wt. = 200 lbs)

*Proposed loading in bold

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DESIGN CRITERIA:

1. International Building Code (IBC) 2009, and ASCE 7-05 (Minimum Design Loads for Buildings and Other Structures).

   Wind Analysis:

Reference Wind Speed:	110 mph	(FIG 6-1C; ASCE 7-05)
Category:	C	(Section 6.5.6.3; ASCE 7-05)

   Roof:

Ground Snow, P_g:	50 psf	(FIG 7-1; ASCE 7-05)
Importance Factor, I:	1.0	(Category II)
Exposure Factor, Ce:	0.9	(Fully Exposed)
Thermal Factor, Ct:	1.0	(Typical Structure)
Flat Roof Snow Load:	**31.5 psf**	**(P_f=0.7*Ce*Ct*I*P_g)**

2. EIA/TIA -222- G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

City/Town:	Portland
County:	Cumberland
Wind Load:	100 mph
Nominal Ice Thickness:	1 inch

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EXISTING FLOOR CONSTRUCTION:

The existing equipment room floor construction consists of a 3" +/- reinforced concrete floor slab supported by a system of concrete encased steel beams and columns.

EQUIPMENT SUPPORT RECOMMENDATIONS:

HDG recommends placing the new equipment in the existing AT&T equipment room located on the 9th floor of the existing building structure.

Limitations and assumptions:

1. Reference the latest HDG construction drawings for all the equipment locations details.
2. Mount all equipment per manufacturer's specifications.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
5. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.

FIELD PHOTOS:

Photo 1: Sample photo illustrating the existing equipment room.

Photo 2: Sample photo illustrating the existing room floor structure.

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Calculations

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References:

- International Building Code (IBC) 2009
- ASCE 7-05 (Minimum Design Loads for Buildings and Other Structures)

EQUIPMENT LOADING:

	Weight (LBS)
• RBS 2206 Cabinets	2550
• BBS 2000 Cabinet	1900
• Power Plant Cabinet	500
• FIF Rack	300
• RRUW Rack	180
• RBS 3206 Cabinet	440
• HVAC Units	300
• Misc. Equipment	400
• **DC Power Plant**	**2100**
• **RBS 6601 Rack**	**200**
TOTAL EQUIPMENT WEIGHT	**~ 9000 LBS**

Total Equipment Room Area = 790 SF

TOTAL AREA LOAD = 9000 LBS/790 SF = **11.4 PSF < 40 PSF; Therefore, OK!**

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Referenced Documents

Hudson Design Group LLC

September 12, 2008

AT&T
580 Main Street
Bolton, MA 01740

RE: Structural Assessment
Site Number: ME5001
Site Name: Sonesta Hotel

Hudson Design Group LLC (HDG) has been authorized by AT&T to assess the structural capability of this referenced site with regard to the existing structure's ability to support the following field changes: **(1) Replace six outer antennas (Model Allgon 7334) with six (Model Allgon 7770) antennas. (2) Install one (Node B) 24" x 24"indoor radio cabinet (Max weight = 440#).**

Hudson Design Group performed a visual survey of the above structure, has completed a review of photos, referenced design documents prepared by Aliberti, LaRochelle & Hudson dated 1/08/80 and has performed a structural review of the existing floor beams to support the proposed loading. The existing equipment locations are referenced in HDG's attached drawings.

Based on our review, we have determined that the designated location of the proposed indoor radio cabinet (Node B) and the existing roof top tower **ARE ADEQUATE** to support the above field changes. This evaluation is based on the requirements of the TIA/EIA-222-F and the requirements of the IBC2003. Calculations and referenced documents will be submitted upon request.

This determination was based on the following limitations and assumptions:

1. Equipment and locations should not deviate from the attached SK-1 dated 9/12/08 drawing without written approval of the engineer.
2. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
3. This conclusion is based upon the assumption that the existing antenna support structure(s) was/were constructed per the referenced plans and its components are free from damage or defects at this time.
4. **Though note part of the scope, HDG strongly recommends that the existing Battery Bank be immediately relocated from its current location, to be supported by two new W6x15 steel beams that will transfer the full load of the batteries through the floor and directly to the building's steel beams below. Currently a 3" +/- thick cast-in place, concrete floor of unknown reinforcement is supporting the equipment and batteries. Also it is recommended to relocate the four existing Ericson Cabinets to be positioned directly over an existing steel floor beam as shown on the attached Sketch SK-1. Contact HDG for proposed detailed construction documents.**

If you have any questions about this project, please contact our office.

Respectfully Submitted,
Hudson Design Group LLC

Andre R. Vanasse, P.E.
Sr. Structural Engineer

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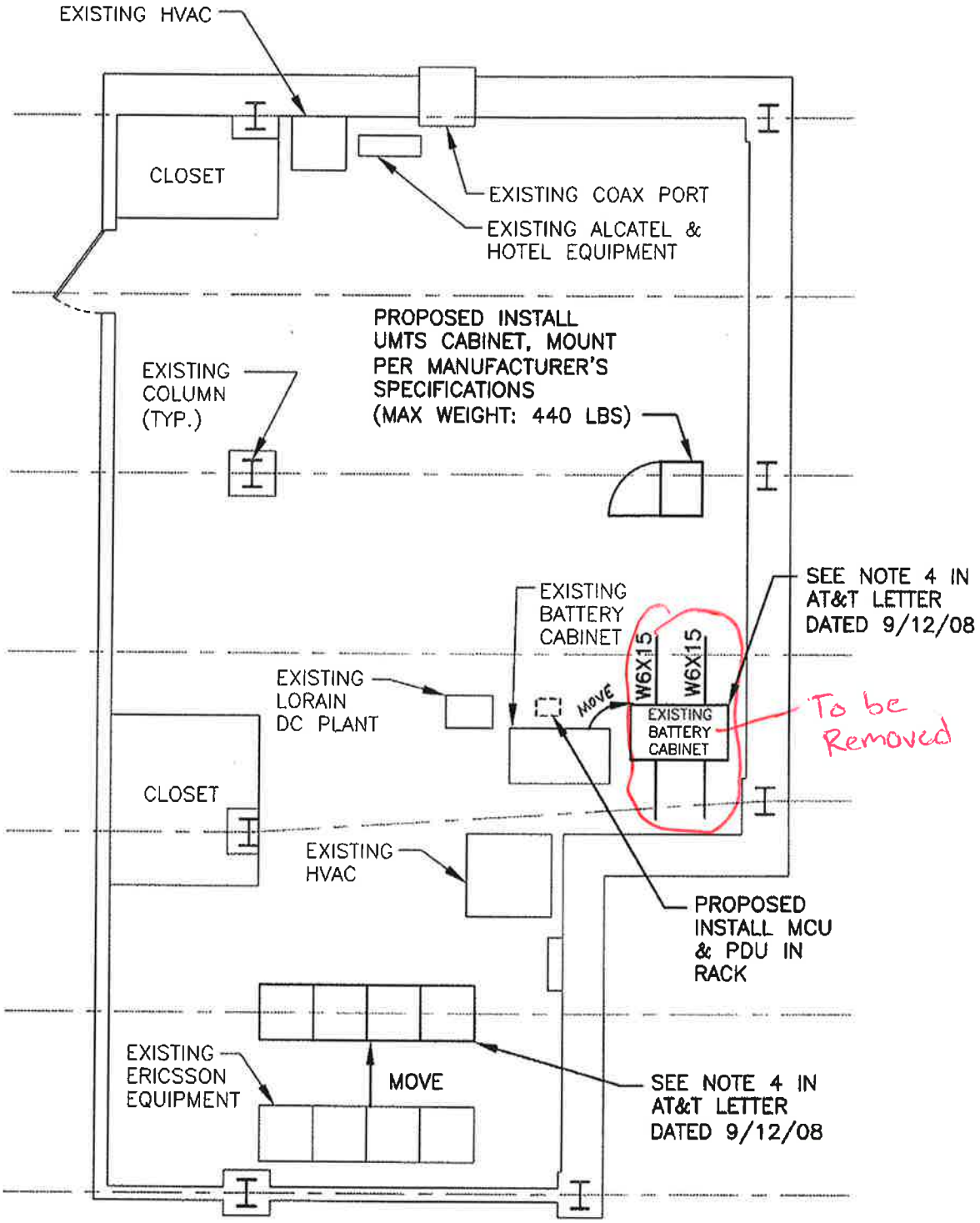

SK-1 **EQUIPMENT ROOM PLAN**

SCALE: 3/16"= 1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"

SITE NO: 5001 SITE NAME: SONESTA PORTLAND ADDRESS: 157 HIGH STREET PORTLAND, ME 04102	at&t 580 MAIN STREET BOLTON, MA 01740	SITE TYPE: ROOFTOP	DATE: 09/12/08
		DRAWN BY: GB	SCALE: NTS