STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

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STATE OF FLORIDA, AGENCY FOR HEALTHCARE ADMINISTRATION,

Petitioner,

vs. DOAH CASE NO. 17-5769

REHABILITATION CENTER AT HOLLYWOOD HILLS, LLC,

Respondent.

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DEPOSITION OF:	WILLIAM SCOTT CRAWFORD, PE
DATE:	February 16, 2018
TIME:	3:35 p.m. to 5:22 p.m.
PLACE:	Renaissance Tampa International Plaza 4200 Jim Walter Boulevard Tampa, Florida
PURSUANT TO:	Notice by counsel for Respondent for purposes of discovery, use at trial or such other purposes as are permitted under the Florida Rules of Civil Procedure
BEFORE:	Juliana M. Cary, RPR Notary Public, State of Florida

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I N D E X

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WILLIAM SCOTT CRAWFORD, P.E.,
the witness herein, being first duly sworn on oath, was examined and deposed as follows:

DIRECT EXAMINATION

BY MR. SMITH:

Q Would you please state your name.

A William Scott Crawford.

Q Mr. Crawford, I am Geoff Smith, and we just met. I'm an attorney, and I represent Rehabilitation Center at Hollywood Hills. We're here today in a deposition because you've been identified as an expert witness, that you'll be presenting testimony in this proceeding in which the State is seeking to revoke the license of what I'll refer to in today's deposition as Hollywood Hills.

So I usually start a deposition by asking the witness, would you agree to share with me the opinions you've formed and the bases of those opinions and discuss with me any documents or information you've reviewed?

A Yes.

Q Let's start with, have you describe for me or give me a thumbnail sketch of your education and professional career, just kind of a big picture.

A Well, I was raised in a household where my

father had an AC, air conditioning, contracting business. In life, I worked in the field hanging ductwork, and servicing units, and things like that when I was teenager.

I got to the point where I decided I wanted to go to college and learn how to draw pictures of and design it, didn't want to hang duct anymore. So I went to Manatee Community College at the time, got an associate's degree, went to the University of Florida, got a bachelor's of science in mechanical engineering. Graduated in 1981 with honors.

Went back to work in my father's business for nine years and did new construction, but was essentially managing people and buying products, and wanted to do more engineering. So I decided after nine years to join Frank Williams, who was in his 70s, I believe, at the time, 60s or 70s, older engineer.

I started with Frank Williams in 1990, and then I made an agreement and bought him out in 1994 and changed the name to Crawford Williams Engineering. And I've been self-employed as Crawford Williams Engineering since 1994.

The majority of the work we do at this time is senior housing design. I'm not a -- normally I work for architects and developers, not attorneys, so.

Q From 1994 to the present, has your focus been senior housing development or design?

A Probably more in the last five years. I've done several projects, but more in the last five years I've done -- because I don't know if you're aware, there was a moratorium on skilled nursing facilities for a long time. And they released 3,800 beds a couple years ago, so I've been doing skilled nursing facilities since then because the developers are now building them again.

Q Is your focus in the skilled nursing facilities with design for the HVAC systems?

A Yes.

MR. MENTON: What does the V stand for? Ventilation?

A Yes. Heating, ventilation, air conditioning.

BY MR. SMITH:

Q And you're a licensed professional engineer?

A Yes.

Q Ever have any problems with the board of engineers; in other words, any kind of disciplinary proceedings?

A No, never had any complaints. I did move in 1998, and my renewal wasn't forwarded to my address, so I didn't renew. And I had to notify them and then I had to pay a fine and take an ethics course to get my

license again because it expired because I didn't renew. I renewed my business license, but my engineering --

Q Did they make you retake a test or anything?

A No. They made me take a 20-hour ethics course, believe it or not, and I paid a fine. I don't remember what the fine was. But anyway, then I got my licensed renewed.

I've never had a complaint or any disciplinary action by the Board of Professional Engineers.

Q Does Crawford Williams employee other engineers?

A Yes.

Q How many engineers do you have?

A Presently, we have two other engineers besides myself, and one of those assisted me in -- the professional engineer assisted me on this job on the loads and also attended a site visit with me.

Q Who is that?

A His name is Brent Gordon.

Q And is he also a mechanical engineer?

A Yes. He graduated the University of Florida. He's been working for me for five years, I believe.

Q PE?

A He just passed his PE this last October. In the state of Florida, you have to work four years for

another engineer before you can take the test, so.

Q Can you give me a sense of how did you come to be involved in this case? Who contacted you? How did you end up becoming an expert?

A Well, I think it was a reference from another engineer, but then Gabe called me directly and I spoke to Gabe. I'm sorry, Steve called me.

Q Steve Menton?

A Yes.

Q You said it was from, you thought you were referred from another engineer. Do you know who?

A Yes. It was Andy Gonci, who used to work for me. He's now a PE on his own.

Q And he had been called -- he wanted to do it and said, I don't want to do it --

A No, I actually never spoke to Andy about it. I don't know how he got involved. I just got a heads up, they may be calling you kind of thing.

Q Do you have a written agreement with the law firm or with the State?

A It's just an hourly rate agreement.

Q Is it like a written contract agreement, or is it an --

A Contract. It's something that I signed.

Q What's your hourly rate on this assignment?

A $250 an hour.

Q Is it the same for what we're doing today versus site visit versus research?

A Yes. It's just a flat fee.

Q Do you know how much time you've spent thus far?

A For this one, personally I've spent probably 25 to 30 hours. I think Brent has probably another 20 hours in himself. I haven't seen his timesheets, but that's just a rough estimate.

Q What documents have you reviewed thus far? Strike that. Let me ask a broader question.

So what was your understanding, from talking with the attorneys, what was your role and the scope of services that you would be providing?

A Well, they wanted me to analyze the things that were done at the facility and if they were sufficient to maintain the temperature that they needed to be. I think they had to stay below 81 degrees. It's to analyze the building and the steps taken by the facility to insure that was the case.

Q And did they provide you with any information as to the steps that were taken, any assumptions or, you know, factual background information?

A I think they told me, you know, what they,

when they lost the chiller. They'd given me portable air conditioning units, documentation on the number of portable air conditioners, they supplied me with the crime scene photos, which spots the units.

I was given a set of plans for a generator replacement, which this set came from. That was done in 2016, I believe. We also did a site visit a week ago.

Q So the attorneys told you when the chiller went out?

A Yeah.

Q Did they just give you -- how did they convey that; just orally or in an email?

A I got you. I read is it James Williams' deposition? I think he states in there it was 3:30 on Sunday the 10th.

Q So you reviewed Mr. Williams' deposition?

A Yes.

Q Go ahead and tell me, what documents have you reviewed?

A The plans of the generator replacement in 2016, I reviewed the deposition of James Williams, and the crime scene photos I think is what I was given.

Q Is that it? Anything else?

MR. WARREN: I think everything you got today is a good start.

A Yeah. I mean, that was essentially it. The crime scene photos.

BY MR. SMITH:

Q You have a stack of documents with you. Can you go through and tell me what each of them is?

A These are the crime scene photos. I didn't put those on the table. I didn't think you wanted to see those.

The notice, obviously. And then this is James Williams' deposition. Life safety plan, which I have marked up with the photos. This is a plan I highlighted the areas we did load calculations in. This is a summary of the load calculations.

This is all weather data. This is the spot cooler information, and that's the notice. I think that's pretty much it.

This is an owner's manual. There are some other manufacturer's data. This is the spot coolers.

Q You said you made a site inspection?

A I did.

Q Can you tell me, what did you observe during the site inspection?

A Well, we walked around. We identified where the units were that were installed in the building. We took measurements. It was operational when we visited.

So we took measurements of the windows and the walls, because we had to do a load calculation, heights, things like that. We also identified where all the systems were installed in the building.

We looked at the chiller and saw the size of the chiller that was installed, and just generally the building construction, looked at the different building construction. It appeared that this was a different building than this. This looks like an addition to me. This is a different construction type than this.

Q And you're indicating the --

A The east end of the building. This square that was added, this appears to be different -- the construction was different here than it was here.

Q And on the drawing, if you could just tell me, what's the date on this drawing?

A This is a life safety plan from 5/6/2016. It was part of the generator replacement.

Q And it has letters and circles, A, B, C, D, E?

A Yeah. Those are smoke compartments.

Q So they have the smoke compartments A, B, C, D, E, correct?

A Yeah. Both floors.

Q And what you were just indicating as it looked like maybe different construction was the smoke

compartment A --

A The smoke compartment on both floors looks to be different.

MS. SMITH: Do you mind if I come over and look at some things, orient myself?

THE WITNESS: Yeah, go ahead. I don't care.

A This is north there. That's the east parking lot.

BY MR. SMITH:

Q You've indicated on your drawing a yellow highlighter line. Can you tell me, what is that line?

A I just highlighted where the nursing site was different. Their line was on the plan. I just highlighted what was different. The psych unit is this little piece down here and all this.

Q So on the first floor, the psych unit is much smaller?

A It's 4,000 square feet.

Q Why don't we run through the first floor. What is the square footage for the psych?

A 4,053 is what I measured. We took this and put it on a CAD background and we measured on CAD. So our numbers are pretty close to these, but they're not exactly the same.

Q And then the first floor of the rehab center?

A 28,187.
Q And then second floor psych?
A 15,678. And these are our measurements.
Q Right. And second floor rehab?
A 14,631.
Q So the second floor is roughly, the second floor -- I'm sorry, the second floor rehab is roughly half the size of the first floor rehab?
A Yeah, close.
Q So tell me then -- you've given me what you reviewed. Did you get an understanding of, from reading James Williams, of what his reaction was when they lost the power to the chillers?
A Yeah. I read in his deposition that he had ordered portable air conditioners in advance and had ten of them on site, nine of them which worked, one was non-functional.
Q And you said you had some information from the manufacturer. Who was the manufacturer of the spot coolers?
A They're Weltem. They're made in Korea.
Q Are they marketed under a brand name of ICEN, or I-C-E-N?
A Yeah, that's their tradename. That's what's on the cover, but they're actually marketed in the

United States under the name of AmeriCool, because I had to -- when I was doing the research on the units, I can't read Korean, so I had to download the AmeriCool manual because this one was in Korean.

Q Tell me what you learned from the -- I'd like to --

MR. SMITH: I know we don't have a copy. Do we have his documents on a -- electronically or something that we can use?

A I think I'll just turn them over to these guys and --

MR. WARREN: What do you want to look at it?

MR. SMITH: All of it. I want to have copies of it. But we'll attach them so we can -- the court reporter will have them, and you can give us copies.

(Discussion off the record.)

MR. SMITH: We're going to call Exhibit 173 the life safety drawings for generator replacement.

(Respondent's Exhibit 173 was marked for identification.)

BY MR. SMITH:

Q Did you tell me that was 2016?

A Yeah. The date on it is 05/06/2016. So May 6th, 2016.

Q And then we'll call 174 this document, which is -- if you don't mind, I'll just mark it for you.

A Go ahead.

Q It's --

MR. WARREN: Spec sheet.

BY MR. SMITH:

Q Spec sheet for various spot coolers. And I guess you've highlighted in yellow --

A The two that were there.

Q -- the two that were there?

A Yep.

(Respondent's Exhibit 174 was marked for identification.)

BY MR. SMITH:

Q And then we'll call 175 --

A Owner's manual.

Q Owner's manual. And then you've got -- let's just go ahead finish marking documents.

A All right. This is just research on portable air conditioners. This was another manufacturer because their owner's manual doesn't mention the optional ceiling kit accessory in their owner's manual. This was another manufacturer that discusses the optional ceiling kit.

Q Let me understand that one. Let's take a look

at it.

You said this is not specifically for the same manufacturer?

A No.

Q But it's --

A Another manufacturer of portable air conditioners.

MS. SMITH: That's 186?

MR. SMITH: 176.

A And that one is just Google research, just a general commentary on portable air conditioners.

(Respondent's Exhibits 175 and 176 were was marked for identification.)

BY MR. SMITH:

Q And then let's call your next document -- you said you had heat load calculations?

A Yeah. These are heat load summaries for the first and second floors for the units that went out.

Q So 177 we're marking as your load summaries?

A Yes. So you're calling this the same one, 176, for both of these?

Q No, no, no. 176 I thought was this document.

A No. You wrote it on this one. That's just a general how-to, portable air conditioner research.

Q I didn't realize those were two different

documents.

A I'm sorry.

Q How to vent your portable AC?

A That's just --

Q That's a general something that you found on Google?

A Yeah. Discussion of portable ACs ventilation.

Q 177 is the optional ceiling kit.

MS. SMITH: The heat load will be 178?

A Heat load summary is 178?

BY MR. SMITH:

Q Right.

(Respondent's Exhibits 177 and 178 were marked for identification.)

A I didn't give you weather data, right?

BY MR. SMITH:

Q 179, weather data.

(Respondent's Exhibit 179 was marked for identification.

A The only thing else I have is field notes, then I have a couple plans you can mark if you want.

BY MR. SMITH:

Q Are they additional copies of the same plan?

A I keynoted the photos on this one. That's the only reason it's different.

MR. WARREN: You're going to want to mark that one.

A I marked the spot cooler locations and the photo locations. It's the same plan, but I just marked where the spot coolers were and the --

BY MR. SMITH:

Q Hold on. You're ahead of me.

(Discussion off the record.)

A 180 is handwritten, and 181 is the marked drawings.

(Respondent's Exhibits 180 and 181 were marked for identification.)

A What else do I have?

BY MR. SMITH:

Q Safety with photo locations, right?

A Yes.

Q While I'm on that, how did you determine the photo locations? Did you talk to somebody?

A No. I just went there and looked at them.

Q You just looked at the photos?

A Yeah. A lot of them have room numbers and things like that. So, I mean, I just went through and -- not everybody is on here, but the ones I can identify where they were, I put them on here. And there were some that had the gun readings. I put the gun readings

on here, too. Like, for example, this is 71, 73 pointing at this wall, and the the gun reading says 100.9.

And then this is important to you. This is a markup of what we did to take off when we did the load calculations. We consider this the patient areas, and this was the first floor west, first floor east, and then the second floor. This is the areas we actually did our load calculations on.

(Respondent's Exhibit 182 was marked for identification.)

BY MR. SMITH:

Q That's 182. 182 is a two-page drawing with your markup of load calculations --

A It's actually three pages.

Q There's three pages?

A First floor east and west and then the second floor.

Q That's all the documents?

A This is James Williams' testimony.

MR. MENTON: I will say for the record that he had asked us to get copies of the actual building plans, and we asked for those when we were at the facility. We weren't able to get those at the time. We are going to try to get those through the

city and try to see what we can get through them.

So if he gets those -- as you'll see as you go through this stuff, he's made very conservative estimates based upon what is available. But when we get the building plans, they'll probably refine those. If we get them, we'll make them available.

BY MR. SMITH:

Q So you have another set of drawings?

A This is our field notes when we were there. This is just what we marked up when we were down there.

Q The drawings, is that -- what is the source of those drawings?

A What is the source of the drawings?

Q Did you draw those?

A No, no, no. They're based on these backgrounds. We just, I believe it came off the life safety plan, because there's still some things on here that are safety related. We kind of cleaned it up, though. These are the field notes of where we measured temperatures and things like that and where we located units. Kind of a scribbling.

Q We'll call it 183, field notes.

A It's more for our use.

MR. WARREN: Composite all those.

(Respondent's Composite Exhibit 183 was marked

for identification.)

A If you can understand it, good for you. I think that's all I have. Everything else was marked.

BY MR. SMITH:

Q I'll go through the documents, but probably a more efficient use of our time is -- now I know what you've looked at. So tell me what conclusions or opinions you've reached based on all this information that you've looked at.

A Well, in a nutshell, you didn't have enough capacity, and what they did made it worse. That's it in a nutshell.

You had an 125-ton chiller that went down, and they brought in 15 tons of portable coolers. So they lost 125 tons and replaced it with 15 tons.

On the skilled nursing side of that, if you do the area proration, because I don't know exactly the capacity, but essentially the skilled nursing is about 85 tons, and they replaced that with nine tons total on the skilled nursing side. And the psych side is the balance of that, so. Didn't really concern ourselves with the psych side much.

Q Do you have an opinion as to -- obviously it doesn't match the capacity of the permanent chiller?

A Correct.

Q But what would be the effect of -- assuming the spot coolers are working, functional, what is the effect of putting them out in the locations that they did in terms of trying to keep the air, you know, comfortable, or at least trying to keep the temperature down from going up to excessive levels?

MR. WARREN: Objection to form. Go ahead.

A Essentially, the capacity of the spot coolers was insufficient to cool the space in the patient areas. We did load calculations to determine what the requirements would be, and that's what the summary of this is, the load calculations in the summary.

So I'm a design engineer. I do design for new buildings, and we design everything to scope and size all the time. Usually they come to us and they say, here is my building, I want to maintain 75 in it, how many tons do I need to do that. And we size the equipment, we size the air distribution, the air handlers, all that stuff, and we determine the capacity required to maintain a set point.

In this case --

BY MR. SMITH:

Q And that's for a permanent, what you just described, people come to you and ask you to design --

A Whoever designed that 125-ton chiller, that's

what they do.

Q I understand. So that's what you would do in a normal design situation?

A Right. So, on that same level, because that's the way we think, we said, okay, what would be the capacity required to maintain 81 degrees in the facility in the patient areas only, not even taking in the PT, or admin, or dining room, kitchen, all those things. That's what we highlighted there, was in the patient rooms only or patient areas only, what would be the capacity required to cool those spaces to 81 degrees. So that was the logic for our approach.

Q Okay.

A So we did the load summaries, we took the envelope load summaries based upon what we saw at the site. We saw the construction at the site, the concrete block walls, the fiberboard roof construction, the barrel tile, the flat roof on this part. From that information, we made our best estimate of what the hard values, U-values were of those construction types, and we did the load calculations based on the number of people, lighting in the hallways -- we didn't take the lighting in the rooms. We didn't include that. We didn't include the TVs. We tried to be conservative, giving the benefit of the doubt, because I wanted to

really know what the answer was, not try to skew it.

So we took the patient areas and we did the load calculations. On our best estimates, the number of people, staff, you know, computers, lights -- because essentially load is two things: you've got the envelope load, and you've got the internal loads. Internal loads don't really change. The envelope loads change all the time.

So anyway, what we did is created a load profile, and the load profile is what I showed you earlier, the summary. And we said with nothing, just a blank building, here is what I would need in a load profile to maintain 81 degrees. And you can see there's sometimes a day where I only need, you know -- in the middle of the night, I only need four-and-a-half tons, but in the middle of the afternoon, I need 12.4 tons to do that. This is the first floor patient areas.

Q So the middle of the night you said you would need four --

A Well, I think the lowest point is 4.4 tons in the middle of the night, at 4:00 in the morning.

Q Let me just ask you, the spot coolers they had deployed, to your understanding, on the first floor was how many spot coolers?

A Well, that's debatable. If you look at the

crime scene photos, they show more than -- the testimony of James Williams, James Williams said they had four. The crime scene shows five. So we took five because worst case.

Q So five spot coolers. And what is the capacity of those? What's the tonnage capacity?

A 5.8 tons total.

Q So 5.8 tons. So at least as to the middle of the night, it would meet that load capacity analysis?

A Well, it wouldn't lose ground. It would maintain basically. Because what this is is a snapshot. This is a snapshot at one time. It doesn't have any, it doesn't tell you what cumulative effect there is over time. It tells you at that particular moment in time, this is how many tons I need. It's a snapshot. It's assuming everything in the room is that temperature.

Q Let me go to the -- you said you had basically -- what scenario -- does it give you like hour by hour? I'm not looking at the document.

A Yeah. Those are Monday and Tuesday. Those are the two days. We took the Carrier Hourly Analysis Program, we physically put in the temperature profile, which we got from the IFAS facility, it's six miles away, and we put in the actual numbers and calculated the load based on those numbers in the patient areas

only, and that created what we call load profile.

Q Now, is the zone -- I'm sorry. I just want to catch up with you. You have the hour and --

A That's midnight.

Q Right. I get the hours. Then you have something called OA temperature.

A Outdoor air temperature. That's the weather data.

Q Then you have a zone temp?

A That's the set point inside.

Q What do you mean, set point?

A What you're trying to maintain.

Q And you have it at 80.7 to up to --

MS. SMITH: Why does it change?

A Why does it change?

BY MR. SMITH:

Q Yes.

A It's just basically saying that it fluctuates within a few degrees. I don't know the answer exactly why it changes, you know, .01 degrees, but it does change. I mean, we just put this in the computer program, and we put all the data in, and that's what it predicted the set points to be.

Q What's RH?

A Relative humidity.

Q And how did you -- is that the outdoor relative humidity or --

A No. That's what it is inside. 80.8 and 69 percent RH.

Q And then zone sensible load, BTU?

A Sensible load, BTU per hour. Sensible load is just the temperature change. It doesn't have any humidity in it.

Q And then the far right column that says zone?

A That's actually mislabeled. It should be tons.

Q It should be zone tons that you would need to maintain?

A That's actually mislabeled. If you look at the second floor, it's labeled right. It's just tons. That's the tons we need to maintain the temperature in the space.

Q Let me look at it. So this is, page 1 of 178 is the first floor?

A That's the first floor with nothing running. It's just the load in the building. This is the first floor when you put the AC units in there because they actually produce more heat than they cool. And our contention is that they were not ventilated to a vented -- they weren't ducted to a ventilated space. They were

ducted to a closed space.

Q All right. Hold on for one second. Before we get to that part of it, I want to understand this part of it.

Let's assume -- before we move on to how they were ventilated and what heat they were producing, what this document, Exhibit 178, tells me is that if I look at that far right column, that's the tons that they would need.

And the first page is the first floor, right?

A That's the first floor, correct.

Q And what they would, what they had, according to your estimate, was 5.8 tons of capacity with the spot coolers?

A Correct.

Q And so --

A So there were a few times on the first floor that it would maintain, not necessarily go backwards.

Q Right. So in the early morning hours. Then on the second floor, how many spot coolers did you find were located on the second floor.

A Three.

Q And what was the total tons per three spot coolers on the second floor?

A 3.3 tons.

So before you leave the first floor, let's talk about the impact of the AC units, because it's the other thing you have in your hand.

Q What's the impact of the --

A You have two things: this is without the AC units, this is with the heat added from the AC units.

Q Just so I understand, page 1 is the first floor, bottom of the page is the second floor?

A No, no. They're both the first floor. This is Monday, Tuesday, Monday, Tuesday, first floor, first floor.

Q Thank you. So the first two pages are first floor?

A Yes.

Q The second page is -- you're saying you're adding in --

A The heat of the condensers added back into the space. Because essentially what happened was they vented them to a confined space, but there's nowhere for it to go, so it comes back into the space.

Q And how did you calculate the --

A The added heat?

Q The added heat, yeah.

A Well, we took 20 percent of the evaporator. Because most condensers, which I researched, is 15 to 25

percent. Heat rejection is greater than the evaporative cooling. So basically, if you put this unit in a room, close the door, it gets warmer, not cooler. Okay. They put off more heat than they cool. That's the way they work. The condensers put off more heat than the evaporators cool, because it's essentially the work of the compressor is added to the evaporator cooling to get the total heat rejection.

So what we did on the second page was add in the heat that was coming back into the space from the ceiling.

Q And walk me through the calculation to add heat coming back from the ceiling.

A You add the condenser, the heat rejection, 20 percent of the evaporative cooling. If you have 5.8 tons, you take 20 percent of that and add it back in.

Q And where did the 20 percent come in?

A The middle range, from 15 to 25 percent.

Q What is the basis of the 15 to 25 percent?

A That's the average range for a condenser heat rejection, total rejection to evaporative cooling.

Q And what is the source if I wanted to go find -- do you have that document with you, the average range of total heat rejection from a condenser?

A We looked at it earlier, didn't we?

MR. WARREN: Yeah, you did.

A I have to find it. I'm not sure exactly where it is. Can I see that stuff? I paper-clipped a bunch of stuff together.

BY MR. SMITH:

Q If we can, we'll just mark this. This is the Condenser Total Heat of Rejection.

(Respondent's Exhibit 184 was marked for identification.)

A I had a couple things clipped in there. This is the original chiller. I don't know if you need that.

BY MR. SMITH:

Q We'll just mark that as 184.

I'm sorry. You have another document?

A This is the chiller that's there. That's the model number of the chiller.

Q 185 is --

A The spec sheet for the chiller.

Q Spec sheet for the chiller.

(Respondent's Exhibit 185 was marked for identification.)

BY MR. SMITH:

Q So the document, Exhibit 184, gives me the background information and the equation for calculating the total heat rejection?

A Uh-huh. Yes.

Q And did you do that calculation?

A We used 20 percent. If you look at the next page, it gives you the range. I don't know the numbers on the unit. There wasn't enough data on that unit to do that.

So it says it averages 15 to 25 percent for that rejection. So we used 20 percent, not 25.

Q I'm sorry. Can you just -- heat rejection, the equipment typically have a full load heat rejection factor in the range of 1.15 to 1.25.

A Correct. 15 to 25 percent.

Q That's 15 to 25 percent?

A Right.

Q It says, compressors used in HVAC equipment. Is there any difference between the compressor that's used in a spot cooler?

A No. They're all the same. Compressors are pretty much generic when it was comes to direct dispatching systems.

Q Okay. So you said if we --

A If you go back to that first floor, we added the heat back in that was going into the ceiling and back into the space, and that's where you get that load profile from.

So you can see from that one, if I can look at it, it says, at certain times of the day, we needed 12.9 tons to cool that space.

Q That's if you were going to keep it at 81?

A Right.

Q Did you run this calculation if you said the temperature was going to be at whatever, 82, 84, 85?

A No. Because the testimony James gave is it never got above 81. The impact of those units on the first floor wasn't that great. It only added a ton to the space. The impact was really felt on the second floor.

Q Walk me through the calculation that you would do to -- you mentioned envelope load versus internal load.

What are we looking at in Exhibit 178, pages 1 and 2? Does that include --

A That's the total load.

Q That's the total envelope load plus --

A Internal loads. Right.

Q Is there some document that will tell me what were your assumptions on internal load?

A No. I didn't break it down. Internal load consists of lighting, computers, people, things that are internal to the space. The envelope load includes the

windows, doors, exterior doors, walls, roof, window -- it's the envelope of the building.

Q So if my expert HVAC mechanical engineer wants to recreate your calculations, what would be your key assumptions for your envelope rating, how well it holds --

MR. WARREN: Do you have an expert?

Q -- heat or cold?

MR. SMITH: Yes, we do.

A Well, you have to take the U-value of the walls.

BY MR. SMITH:

Q I'm sorry?

A You have to take the U-value of the walls.

Q What did you use?

A The inverse of the R-value. We took the block walls with stucco, concrete block, drywall, and furring in the old building. In the new building, we used R2. The roof was a fiberboard-type roof. We used a two-inch board of R5 plus the barrel tile. The new roof is a flat roof. It's a pan. We used three inches of R-value on the roof.

Q What's an R-value?

A Resistance, R-value. Like R19, like insulation value. The U value is the inverse of that.

Q I know this all sounds very simple to you, but to me, I'm --

A I'm trying not to --

Q So what other, you know -- again, I'm going to hand this to a mechanical engineer to say, you know, I want you to go back and try to recreate the same, you know, the same --

A Okay.

Q So is that sufficient information for him to do that?

A Well, he's got to know the people. We took a half a watt per square foot for lighting. The number of people is based on the beds plus staff.

Q So half a watt per square foot --

A Right.

Q -- for lighting and then --

A That's in the corridors only. We didn't use the patient rooms, because the patient rooms are incandescent. They were really high. But we didn't use those because we assumed they would be off.

Q And then your patient or person load is how many people did you assume?

A It's the number of beds. It's right here.

Q So just tell me --

A 82 beds on the first floor and 70 on the

second for 152-bed unit, licensed beds.

Q 152 beds, so you figured 152 people. Did you add staff?

A Yes.

Q And how many staff did you add?

A I believe we had four on each floor. I think it was eight total. I'd have to look back at that.

Q The 152 beds was all the skilled nursing facility?

A Uh-huh.

Q Yes?

A That's what they're licensed for.

Q And that was your assumption, 152 residents, plus how many staff?

A I believe we took eight. I could be off by one or two only.

Q So that's -- you've got 160 people. And when you do this calculation, this load calculation, is there a particular computer program or model that's used?

A Yes.

Q What is it called?

A It's called an Hourly Analysis Program by Carrier.

Q Hourly?

A Yeah. It's HAP, H-A-P, Hourly Analysis

Program.

Q By Carrier?

A Uh-huh.

Q Is that a -- what's the typical use of that program? Is it for design of new buildings?

A Uh-huh. That's what you use to design buildings with.

Q So this would answer the question, if you were designing a new building, to maintain that temperature, what would you need to maintain that temperature in terms of load?

A We would never design for 81 degrees, though.

Q If the patient load was lower, do you know what the degree of impact was? Let's say if it was 120 or 122.

A We took the seated-at-rest number. So it's like 600 BTUs per person, something like that. It's not a real big number. We just took the number of beds because we assumed -- we didn't know how many people were in there.

Q All right. And you said you have additional documents with your load capacity on 178?

A We did the same thing for the second floor. And we did the base load with nothing going on, and that was the first document. That's the base load that says,

okay, on a load profile, the snapshot at any given time on Monday and Tuesday, this is the load it required, this is the amount of refrigeration and capacity required to maintain 81 degrees.

Q And basically, you had 3. --

A 3.

Q 3.3 available. And then I could compare that in the far right-hand column and see that, again, in the overnight hours, it seems like at least some of the overnight hours is --

A Well, that's without the units running down below. This is with the units running on the first floor. And the way we determined that was we took the roof cavity above the ceiling of the first floor and determined that that was a confined space. So the temperature in the confined space would be elevated to -- we took 95. It's probably hotter than that.

We took the temperature drop across the floor and then the U-value of the floor where there's no insulation. It's just concrete block, masonry slab. And we took the U-value of .4, the area times the delta T, and then we got the temperature transmission across the floor.

So we essentially create the floor load by dumping all the heat into this ceiling. It created a

warm floor to this floor. Similar to when you go skiing and you stay in a place that has a heated floor. Have you been to one of those places where you walk around barefoot and it's nice and comfortable? Kind of like that.

Q Tell me again so my expert can recreate it. What were your assumptions as to the warm-floor effect of venting into the ceiling on the first floor?

A Well, we took the ceiling space at 95 degrees. Normally, you wouldn't insulate between floors because you would think that the floors would be the same temperature. So on a two-story building, they're both conditioned floors, so you wouldn't take any transmission to the floor.

But what happened was when these things were vented into this confined space, they raised the temperature of the ceiling -- of the space between the ceiling tile and the floor, which transmitted to the second floor through the slab. So we added the floor load to the base load, and that's how we came up with the second number. So you can see sometimes on the second floor, we needed 4.9 tons to cool it, day one.

Q And what assumption do you make about how that 95 degree passes through concrete and --

A It's no assumptions. You just calculate the

heat transfer. You know the U-value of concrete, you know the area of the floor.

Q Well, okay, so that's all I'm trying to get so my guy can recreate it.

A There's no assumption there.

Q There's a U-value of concrete that you use?

A Correct.

Q You assume 95 percent temperature?

A No. 95 degrees.

Q 95 degrees temperature.

A So the delta T would be 15 degrees for an 80-degree floor above it. So we use 15-degree delta T, .4 for a U-value, and then took the heat through the floor, added the floor load to the base load to get the total load.

Q And that also included that same calculation you did, same calculation that you did for the compressor load itself on the second floor?

A No. We didn't even consider that. There was one area on the second floor that was actually vented. This little, small compartment right here, this space has vents in it. This one maybe got outside, vented to the outside. These down here were still enclosed.

You know, when they build these buildings, they separate them into smoke compartments so when

there's a fire in one area, it doesn't go to the other. So they have airtight compartments between the spaces. Everything you see, C, D, and A, that's a smoke-tight compartment. So by design, they don't let the air go from one to the other.

Q So on the space between floor one and floor two, did you determine was there any venting or opportunity for the heat to leave each of the compartments and go to the outside?

A There was no venting.

Q How did you determine that?

A Look above the ceiling and see if you see any light, for one thing. It's just an air -- it's a solid, dark compartment. We looked on the outside. There's no exterior vents anywhere. So there was nowhere for that air to go.

It went into the ceiling cavity, and those ceilings are so leaky, they just come back out somewhere else. You can't blow into a straw with your finger over it. It has to go somewhere. The heat went into the ceiling, dispersed, and came out somewhere else.

Q As far as what you based your determination that there was no venting, you made a visual inspection of the outside envelope of the building?

A Yes, we did. And inside. We popped the

ceiling tiles in every cavity.

Q So then in each smoke compartment, you looked up inside to see if you could see any light?

A Right. Correct.

Q Do you know if there were --

A Well, more than that, we took a flashlight and looked at the perimeter walls to see if there were any openings.

Q And is there any kind of eave or anything where --

A Between the first and second floor, no.

Q And there's no other opportunity for -- how about for on the second floor?

A The second floor doesn't have vented soffits. It did have these two gable vents on this little smoke compartment right here. These two go all the way up. But there were two gables here that were vented.

And the second floor has a higher volume, too. It's a sloped roof. So it heats up, but it takes longer because there's more air volume.

This has very little space. There might be two feet between the ceiling and the deck. That's generous. And so this space is very confined, so it didn't take long to heat this up. When you're dumping hot air in there, it's going to heat up pretty quick.

Q Right. When you say pretty quick, if I'm a geologist, that could be -- I don't know. They measure things in eons.

A No, no, I can't predict time.

Q A day?

A The air change, if you just took the air change volume, and you have to take the CFM discharge of the unit and figure out how many times to change the air, it wouldn't take a day. It would be hours.

Q To reach 95 degrees?

A Yeah. I mean, your discharge air coming off those units is probably 95 plus.

Q And how did you determine the 95 degrees in the ceiling?

A I just took a conservative number. I think it's higher than that. I think it was probably more like 100 and 110. But we just determined that -- most condensers, there's a 20-degree rise across the condenser coil. So we took 15-degree rise.

So if it's 80 degrees in a building and you're putting 80 degrees through a condenser and then pumping it out the top, 15 degrees is conservative. I think it's probably more 20, 25 degrees. But we just based it on the delta T across the condenser and the discharge area of that unit.

Q Anything else you did with the load calculations other than what you've told me?

THE WITNESS: Did I miss anything?

MR. WARREN: I think you've covered it.

BY MR. SMITH:

Q As far as the load capacity, if you were to add say somewhere between 50 and a hundred people that were moving about in the building, would that increase the load capacity that would be needed to keep things cool?

MR. WARREN: Object to form. Go ahead.

A People put off heat. But if you're referring to the evacuation, I mean, it was 75 degrees when they started evacuating people outside. If anything, opening the door is probably cooling it off a little bit.

So to answer your question, people put off heat, and more people in a space would require more load, but not a significant amount. I mean, 600 BTs' a person. So there's 12,000 BTs in a ton. Do the math. It takes a lot of people to make a ton.

Where is my calculator?

Okay. 20 people is one ton basically.

Q 20 people per ton basically?

A I mean, yeah. That's rough numbers. Yeah.

Q Is that at rest or moving about?

A 600 is considered like sedentary work. It's not -- I mean, there's different ranges. I don't have the actuary with me, but they give you different numbers for different levels of work. Aerobic exercise here and seated here.

Q Is there anything else that you did in your load calculations that we haven't discussed?

A No. We just determined that the floor load was significantly increasing the temperature on the second floor. I mean, it was far more than the 3.3 tons that they had available.

Q So your conclusion would be that they did not have the sufficient capacity to maintain the building at 81 degrees?

A That's correct.

Q Have you made any calculation or determination of what you believed the temperature was at any given time from September 10th when the power was, to the chiller was lost in the afternoon up through the time of the evacuation? Have you --

A No. There's so many factors, that's pretty hard to predict the temperature. I mean, it's the thermal mass of the building, how long did it take to heat up? The properties of the building, is it -- heavy construction takes longer to heat up and also takes a

long time to cool it down.

So the rate of heat, I don't know what the rate of heat gain would be necessarily in the building, so I can't -- it's harder to predict the actual temperature at any one time in the building. There's so many factors, it's pretty hard to do that.

Q I just want to be clear. You're not going to offer any opinions on how hot it was in terms of temperature at any given time in the building?

A Well, my opinion is going to be there was no way they maintained 81 degrees in the second floor.

Q I got that part. So are you going to say it's 85, 90, 95?

A I'm not going to speculate to the temperature. I'm just going to say there's no possible way they can maintain 81 on the second floor.

Q How about on the first floor?

A If you were in very close proximity to one of those coolers, maybe. Like if you were within -- well, the manual, which you have somewhere over there, states that you're required to -- that one of these units will cover 355 square feet. Okay. That's what their application manual says. So if you're in an 18-by-18 area, according to their manual, they can condition that area.

Q Have you done a calculation using the manual of how many coolers you thought they would need?

A I'll do it for you real quick. If you do the area, 355 -- let's just take the patient area. Forget that. 12,545 divided by 355. 35, and they had three.

Q You're saying that's for the second floor?

A Yeah.

Q What was the square footage on the second floor of the patient care?

A 12,545 is what we measured.

Q Why would there be -- so if that's what the manufacturer is saying --

A It's right here.

Q -- why would your load capacity calculations be -- hold on. Let me get my question out.

Your load capacity analysis, it seemed that for some of the area, second floor, just the envelope -- I'm sorry, just second floor without the added load from the first floor, that you had times of the day where the three spot coolers seemed to be sufficient to keep the temperature at 81.

A 3.3, is there any of those times?

Q Let's see. There is 3.3 -- there is like, I guess, the early morning hours --

A Yeah.

Q -- it would do that.

A To answer your question, I don't know how they came up with their number.

Q You would agree with me there appears to be a big disconnect between 35 coolers and your load analysis which is saying, at least in the early morning hours, you would need maybe three?

A You've got to understand the --

MR. WARREN: Object to form. Go ahead.

A That's a load profile. And what I would do with that information, I would take the highest number and say that's the amount of capacity I need to cool the space.

BY MR. SMITH:

Q As far as the manufacturer's manual, do you know at what, when -- the 355 square feet that they're giving, to what temperature would it keep the 355 square feet, to keep it a 74, 72?

A It's not stated in the manufacturer's material, so I don't know. Like I said, I don't know how they arrived at that number. That's just their number.

Q Between the two, is there one that you think would be more accurate what -- the manufacturer's number that they've given, if you wanted to know how many do I

need to keep it at 81 degrees, would you say your load analysis or the manufacturer number that they've generally given is more accurate?

MR. WARREN: Object to form. Go ahead.

A Well, the manufacturer's number is somewhat generic. The load analysis is specific to the building with the actual take-offs for spaces, and the people, and walls, and so forth. So I would say the load analysis is more accurate. But again, with the load analysis, you can't take the lowest. You have to take the highest.

When I design a building, I don't take the lowest number. I take the highest number because it can't work just for two hours. It's got to work all the time.

So when I design a building -- whoever designed this building, they came up with 125 tons needed to cool this space. That was obviously on a design day, but there are several days when it's not going to take 125 tons. It's going to take half of that or less.

Q And how many tons per unit do you get for this spot cooler?

A What's the tons per unit?

Q Yeah.

A They're 1.1 tons.
Q 1.1 tons.
A 13,200. There was one on the first floor that was 16,800 BTUs.
Q And did you take that into account, the 16,800?
A Yes. That's part of the 5.8 tons on the first floor.
Q Got you.
A Yeah. There were three of them that were on the second floor were all the same, 3.3 tons, or 1.1 tons each. There were four 13,200 BT units on the first floor, or 1.1, and one that was 16,800.
Q Is there anything else in the load calculations, any other opinions about the load calculations that you haven't shared with me so far? I'm getting ready to move off if there's not another.
A I think we've covered that pretty well. Like I said, generally I would do a load profile, and I have to take the worst case. I take the highest load, and that's how I would size a unit.
Q Is there some reason in the temperatures in your analysis you did the 11th and the 12th but not the 13th?
A Just because those are the two days of, full

days of weather data. The 13th was a part day. Like I think it was 6:00 or 6:30 when they started evacuations. So we just took two full days of weather data.

Q I'm going to show you Exhibit 175, which is the AmeriCool manual. Is there any other information that you've used -- I see some highlighting on page 13.

A It's the highlight of the high-pressure controls. I was just highlighting they have high-pressure controls in there. So if it's too hot in the space and it can't reject the heat, it goes off of high pressure.

Q Do you have any indication or do you have an opinion as to whether these units would have shut off because of high pressure?

A I have no way of knowing that.

Q In the photographs that you reviewed, did you look at the temperature readings on any of the spot coolers, and could you tell if the spot coolers were running at the time that those photos were taken?

A There was one photo, I think, of one that had a 74 maybe, I think. I'd have to go back and review them.

Q There's two temperature readings on the gauge. One is the temperature reading --

A The current temperature.

Q The current temperature meaning the temperature in the building?

A It means the temperature at that spot cooler.

Q Around the spot cooler?

A Yes. Then there's also a temperature set point next to it.

Q Do you know how far out the cool would radiate from the spot cooler, you know, how far out you would have that 74 reading? Would it be --

A I don't know. It wouldn't be very far, but -- according to the manufacturer, it was an 18-by-18 area. 355 is what they say.

Q So that would be some way to try to get a sense of how far out --

A Nine feet this way, nine feet this way. That's what the manufacturer says. I mean, there's a reason they call them spot coolers, because they're designed to cool a specific area.

Q Right. It's not intended to be a replacement for a --

A Right.

Q -- full HVAC system?

A No.

Q It's kind of something you --

A In the proximity of those in the hallways.

And there was none in the patient rooms, so they would cool that area in the hallway.

Q So would deployment of the spot coolers, you think it made it worse in the building in terms of heat?

A I think it did on the second floor.

Q How about -- and on the first floor?

A I think it had a marginal impact on the first floor. I don't think it was as significant as the impact on the second floor just because the heat was just coming back in the space. It wasn't heating up the slab.

MR. MENTON: For disclosure, we are going to ask him what the indications would be if you closed all the windows or mostly -- mainly closing the windows, what that would be.

BY MR. SMITH:

Q Go ahead and tell me, in your load analysis, is there any assumption as to whether windows are opened or closed?

A That's assumed they're closed. Yeah, we did loads based with closed windows. There was two fans -- this, like I said, this seems to be a newer -- these had constant ventilation, and those fans would have been running. And so they were pulling air out of the building, and we did include that in our load.

Q Tell me about the two fans. You mean like building fans --

A These components right here. Yeah, this -- you know, these are all intermittent exhausts. These are like bathroom fans in your house where you turn the light on, the fan comes on. AHCA doesn't allow that anymore.

This was done later because obviously -- this had constant ventilation. This had a fan at the end, which ACHA requires now. And it was pulling air -- on the day I was there, it was running. And it's pulling air out the building, and it's only pulling the exhaust from the bathrooms and areas like that.

So we estimated it based on ten air changes of our exhaust. That's what AHCA requires for bathrooms and janitor's closets. And so we did have some infiltration based on those fans running.

These were intermittent, so we didn't take those. Those are a switch for lights.

Q And I just want to understand. With the fans, are you saying they're exhausting to the outside?

A Uh-huh.

Q From where?

A From the bathrooms, and the janitor's closets, and anything that had to be negative. So they were

actually pulling some heat out of the building, and we calculated that infiltration because it would be pulling air from outside in.

Q Did you, during your site visit, note whether -- as far as the HVAC system itself, how it was ducted and where the air handlers were?

A We located all the units. They were mostly above the ceiling. There were two on the floor in closets, but most of them were above the ceiling, fan coil units. And we took good measurements on a typical room unit.

Q And tell me about the room units. What are those?

A They're chilled water fan coils. They have a thermostat which controls a three-way valve on a coil, and it's just a single return, single supply.

Q Is there an air handler, a fan in that individual room unit?

A There is a fan in the unit. Correct.

Q What effect does it have if that -- because my understanding is the power to the chiller, so there was no chilled water running, went out --

A Right.

Q -- but the fan units could continue to run.

A Just moves air around. I mean, it don't cool

-- it actually adds heat because you've got the horsepower of the motor you now have to add. They just move air. They don't cool anything. The cooling is all done by the chilled water blowing air across that coil.

Q Do you know how quickly, once the chiller lost power, how quickly would it, the water lose its ability to provide cooling? How quickly would the chilled water --

A I mean, it doesn't take long at all. It's only coming out at 45 degrees. So it warms up pretty fast when it stops flowing. The pumps went out, too, so there would be no flow. So it wouldn't have any residual effects very long at all.

Q Let me go to Exhibit 174. This was a spec sheet. Other than finding the BTU data, did you use that for any other purpose?

A No. I used it to find the manufacturer, which I used to find the Weltem, or the American version of Weltem.

Q Then Exhibit 175, I guess that's what you called the owner's manual?

A Right.

Q Just tell me any other use that you made of this document.

A Just to see the capacity of the units, the

note that it had high-pressure controls, and also to look at the area of recommendation for those by the manufacturer, the application area.

Q What you were telling me about the square footage area?

A Yeah. That's called the application area on the second page, I think. I think I highlighted that.

Q Did you use it for any other purpose?

A No. Just to determine the capacity.

Q Does it speak to the venting at all?

A No, their brochures didn't cover the venting. That's why I had to start looking at other manufacturers that discussed that.

One thing before you leave that, if you look at the second page of that document -- I'm sorry, this one. This one, the second page is --

Q This one is Exhibit 174.

A I'm sorry. The second page shows you there's other options. They do make water cooling units on remote condensers. They're not required to have the air blowing into an attic or ceiling. They could have used a water-cooled unit, which would have not required any venting at all. It would just take water and reject heat into the water. There were options for them to use that style.

Q As to that option or the option of maybe using more spot coolers, did you do some analysis to say in the time period leading up to the landfall of Hurricane Irma, how many of those were out and about and available from --

A No.

Q -- rental companies?

A I didn't survey the rental companies to see what they had.

Q Did you read Mr. Williams' deposition that he wanted to get more spot coolers?

A I did.

Q But ten was what they had, and ten is what he took?

A I read that. He also got four from Memorial later, I guess, and one of them didn't work. One was non-functional.

Q Would you agree that during the time of a natural disaster, laying your hands on whether it's air cooled or water cooled or vented to the ceiling or self-contained, obtaining spot coolers might be a difficult task?

MR. WARREN: Object to form. Go ahead.

A I never tried, so I can't answer that.

BY MR. SMITH:

Q Have you ever seen Home Depot on a hurricane day?

A I've been in Home Depot. I bought plywood.

Q It can be pretty challenging, true?

MR. WARREN: Object to form.

A Like I said, I've never tried a spot cooler.

BY MR. SMITH:

Q Anything else that you used the owner's manual for that you haven't discussed, or the spec sheet?

A Not that I'm aware of.

Q So that's Exhibits 174 and 175. Where is 176? Let me see what we've got next.

A That's just the discussion of venting. There it is. It just says why it's necessary to vent, because it rejects heat. I just thought I'd print it out.

Q And you say how to vent --

A In that article, they discuss how to vent to a window, which I didn't print all that.

Q And did you arrive at the conclusion that you should not vent to the ceiling based on your review of this?

A Well, I think it had to be more than this article. I think I knew that anyway when I first talked to Steve and Dave. I said, where did they reject the heat to? That was one of my first questions. Because

any air conditioning system, it works by absorbing heat and rejecting it somewhere else. That's how they work.

Q What did you make of the language that says portable air conditioners can also be vented through a window, wall, ceiling, or even a door?

A I meant you have to reject the heat somewhere other than the room. You can't reject the heat back in the same room you're trying to cool.

Q But you could put it into a ceiling space?

A Well, not if it's not ventilated you can't. I mean, it's got to go to a ventilated space. That's what this says more clearly. This just says it needed to be vented to the exterior or required venting.

Q You directed me to 177 --

A Right.

Q -- exhibit, and it says, for ceiling kit users. And you've --

A Which is what that two-by-two tile is. It goes into the ceiling and, that hose, that's a kit.

Q And it says that, note, the space where the makeup air and discharge air is directed, normally above a drop ceiling, must be well ventilated and large enough for the heat load to be absorbed.

Is that the language that you're referencing?

A That is.

Q Have you done any Google research to determine if there's any information available on, specifically for an ICEN spot cooler? How do you install ICEN spot cooler? Have you done that search?

A Not for that brand. I mean, portable air conditioners in general are all the same. I didn't really look at ICEN. ICEN is made by Weltem. That is that Korean company.

Q Did you find other information on how to vent that you didn't print out and bring with you today?

For example, did you find any information online that would have told you that you take the ceiling tile, remove it, put in that ICEN replacement ceiling tile and duct it to the ceiling?

A No, I didn't find anything that specifically said ICEN or talked about -- the only thing I found was what I printed with the ceiling kit requirements, that you have to ventilate -- you have to reject the heat to a ventilated space.

Q But if -- does it, you know, this -- you said that there was a high-pressure control on the ICEN units, right?

A That's correct.

Q And so if, in fact, you were venting to a ceiling space and it wasn't well ventilated and the heat

built up, then it would shut off because of the high-pressure control, right?

MR. WARREN: Object to form. Go ahead.

A Well, it's possible, but in this case, it was dumping the heat back into the space. Those ceiling tiles you see are not very -- they're very porous. If I blow air above that ceiling, it's going to come right back down because it's dumping it into an acoustical ceiling that went nowhere, and it came back in the space.

BY MR. SMITH:

Q Well, this document, Exhibit 177, says, if the condenser discharge and return space is unventilated, closed off, or unable to handle the heat load, the makeup air will continue to get hotter until the system is not able to handle the high heat buildup. This will lead to the unit tripping its high-pressure safety switch, and if this occurs, you'll get an HP on the control panel.

So, I mean, these units come with a, sort of a safety feature that if it's not properly ventilating and it's building up, then it should trip off?

MR. WARREN: Object to form.

BY MR. SMITH:

Q Is that right?

MR. WARREN: Go ahead.

A Well, no. They come with a system that keeps the compressor from overheating. So the high-pressure control is in the condenser. So when the condenser temperature gets too high, it trips the high-pressure control so it doesn't fry the compressor.

So in this case, you're blowing into an acoustical ceiling, but it's coming back out of the ceiling. So it's raising the temperature of the ceiling, but it's, you know -- it's not like blowing into a straw with your finger on it. It's coming out somewhere.

BY MR. SMITH:

Q And this warning or this description of the, how the -- venting into a confined space, you don't think they mean in a typical drop ceiling with the acoustic tiles; they're talking about something else in this Exhibit 177?

MR. WARREN: Object to form. Go ahead.

A I don't know what they mean by confined space. Confined space to me is an unventilated space. So, I mean, when you're discharging it into an acoustical ceiling, normally -- like on the second floor, we have this one area right here that had the louver vents. We discharge it into the ceiling, the heat was able to go

out these louvers. It was a ventilated space.

On the first floor, we have no ventilated space. It goes into the ceiling, comes back out through the ceiling tiles into the first floor, but at the same time, it heats up that space above the ceiling. As I said, we took 95 degrees, but I think it was hotter than that above that ceiling.

BY MR. SMITH:

Q But on the first floor, I thought you told me earlier that you thought that, you know, they may have been maintaining on the first floor.

MR. WARREN: Object to form.

BY MR. SMITH:

Q I thought that's what you had told me.

A No. I said in close proximity to the cooler, it's possible to maintain temperature, you know, but not uniformly throughout the floor.

Q Okay. Let's go ahead and talk about 176, and 177 was the ceiling kit information.

178 is your load calculations, which I had gotten all your information on load calculations at this point, correct?

A Yes, sir.

Q Let me look at 179.

A That's just weather data.

Q And this is just what you used in your load calculations?

A Yes.

Q And you sourced it up in the corner that it's from UF/IFAS extension historical weather data?

A Correct.

Q Do you have 180? What is 180?

A My field notes. That was a typical room.

Q And this is from your site visit?

A Yeah. Took measurements in that room, that typical room. And then the red is calculations we did back at the office when I took that, calculated the capacity of that unit based on what we measured in the field.

Q What does it mean -- oh, the 68 tons was for the common areas on the --

A Let me see if I can refresh my memory.

Oh, I was saying that the patient rooms were about 68 tons. So the balance is the common areas. Just based on this number of -- essentially the rooms were one ton each. 10,440, it's a little less than a ton each. I was just trying to speculate how much the patient rooms took up and how much the common areas just to give myself a sense of what we're dealing with capacity-wise.

Q We have 181, which would have been --
A What's 181?
Q Let me take a quick look. I may have marked it, but if it's the drawing --
(Discussion off the record.)
BY MR. SMITH:
Q 181 is a drawing, life safety, with the photo locations.
A That's this one.
Q Other than simply putting on that drawing where the photos were taken, what information did you include on this drawing?
A Well, I showed the spot coolers based on the photos.
Q And is there a conclusion --
A Locations.
Q Okay. And you wrote in the temperatures and the photos?
A That were on the guns, yeah.
Q And what conclusions did you reach as far as the information that is on Exhibit 181?
A Well, obviously I looked at the gun readings. They were measuring surface temperatures in the building. They weren't measuring air temperatures. They were measuring surface temperatures.

So, I mean, quite honestly, surface temperatures take a lot longer to come down and go up. So they're more stable than air temperatures. So, you know, the fact they're reading 100 degrees, it means the surface -- the room air was at one point that hot and now it -- if it cools down, the surface temperatures take longer to cool down because of the thermal mass. So they don't respond as quickly as air. Air can change temperatures pretty quick, but surfaces don't.

Q Would typically -- after the overnight hours, what would happen as the sun comes up and the surface is receiving sunlight?

MR. WARREN: Object to form.

BY MR. SMITH:

Q Would that cause the surface temperatures to rise or decrease?

A Well, if it had direct sunlight on it, it would -- just like if you sat out in the sun, you'd feel warmer. Some of these are in the hallways. They didn't have any light on them. So if it had direct sun, it would change the surface temperature. But it takes longer -- thermal mass, I mean, when things heat up, it takes a long time to cool them down, too. It depends on the material, but some --

Q Do you have an opinion on the photograph --

MR. MENTON: You cut him off. He was still talking.

BY MR. SMITH:

Q I'm sorry. You can continue, if I did cut you off.

A I don't recall. Go ahead.

Q Do you have an opinion as to whether the temperatures taken by the police department at 11:30 on September 13th are reflective of the temperatures that would have existed at some earlier point in time?

MR. WARREN: Object to form. Go ahead.

A Like I said, the surface temperature of the material takes longer to change than the air temperatures. So it would have -- I think it was like three hours or four hours after they evacuated the building. I mean, it might have -- I don't know if it went up or down based on the temperature, but it wouldn't vary by more than a couple degrees because it just takes longer, I mean, to heat up, to cool down.

BY MR. SMITH:

Q Do you have some calculation or information that you can share with us on how long it would take?

So say from 4:00 a.m. in the morning until 11:30 in the morning, how much would the surface temperature have increased or decreased?

A It's very hard to predict that. You would have to know the density of the material, you would have to know the temperature variation within that timeframe.

Q Would it be fair to say you can't really conclude with any kind of certainty that the temperatures taken by the police at 11:30 in the morning are going to be reflective of the temperatures that existed at 3:00 in the morning?

MR. WARREN: Object to form.

A Well, again --

(Phone ringing.)

A The question again, please.

BY MR. SMITH:

Q The temperatures taken at 11:30, there's no way that you can say with any degree of certainty that the temperatures that were taken at 11:30 in the morning on September 13th are going to be reflective of the temperatures that were existent at 3:00 in the morning on September 13th?

MR. WARREN: Object to form.

A Well, I can say that the temperature wouldn't vary that much because of the storage of thermal mass, of the materials. The air temperature could change quicker than the surface temperature of the materials. The rate of change is pretty hard to predict because you

have to know -- there's quite a few variables to that.
BY MR. SMITH:
Q First of all, the surface temperatures are not going to reflect the ambient air temperature?
MR. WARREN: Object to form.
BY MR. SMITH:
Q Is that true?
A Not necessarily. Something in this room -- if the air temperature is 73 and you touch that wall, it's probably 73, too. I mean, everything reaches equilibrium in the room.
MS. SMITH: What if you touch that lightbulb?
A Well, that lightbulb is generating heat. That wall's not.
MS. SMITH: That's right.
BY MR. SMITH:
Q If you have a lamp shade and you take the temperature off the lamp shade, it's not going to reflect what the air temperature is, right?
MR. WARREN: Object to form.
A They're not apples to apples. You're taking a heat-producing item and saying the temperature of that surface is not the same as the room. If I took a benign, you know, piece of wood or drywall or something in the room, they would be close to air temperature.

BY MR. SMITH:

Q Let me ask you this: When the heat exhaust was going into the ceiling, is there any way for that exhaust to find its way into wall cavities?

A I don't know the construction type, how the walls are sealed. Typically, in nursing homes, they're pretty tight seals between the walls and the ceiling cavities, but I don't know, for example, in this particular case if it's sealed between the wall cavity and the ceiling cavity.

Q But if there's opportunity for heat to find its way into the wall cavity, would it stand to reason that the wall temperature, for example, might not reflect what the ambient air temperature is?

MR. WARREN: Object to form.

A It's speculation. I don't know. I don't know how the construction, the building is constructed. I don't know if the wall cavity is open to the seal or not. Typically, they're not.

BY MR. SMITH:

Q I think I asked you earlier, are you planning then that you think that you can extrapolate, based on the temperature readings taken by the police department at 11:30, that you can extrapolate to some point in time and tell me what you think the ambient air temperature

in the building was?

MR. WARREN: Object to form.

A I don't think I said I could speculate on the air temperature. I can say with certainty it was above 81, though.

BY MR. SMITH:

Q You told me that, and you said you weren't going to tell me how far above 81. And I just wanted to go back and --

A I don't know the answer to that. I mean, I believe -- the load calculations, everything shows me it's above 81, but I don't know what the temperature was.

Q And you're not going to offer some opinion as to how far above 81 it was in the building at any time, correct?

A No.

MR. WARREN: Object to form.

A You know, like I said, there's so many variables to predict temperature that I would not predict the temperature of this place. I can tell you what the refrigeration capacity required to maintain 81 degrees. And if you don't have that, the temperature is going to climb into space. To what extent it climbs is based on a lot of factors.

BY MR. SMITH:

Q And I understand you told me it's based on lot of factors. I just have to have a clear record.

You're not going to tell me, here's my estimate of what that was, what the temperature was at some point in time?

MR. WARREN: Object to form.

A I've never offered an estimate of space temperature. I just said it's more than 81.

BY MR. SMITH:

Q And you don't plan to do that here, you don't plan to offer some other estimate of what the temperature was?

A No.

Q All right. We were talking about your -- I got sidetracked talking about the photographs that you've marked on Exhibit 181, the photo locations.

MR. WARREN: What is this one, Geoff?

MR. SMITH: It's 181. Thank you.

BY MR. SMITH:

Q Is there anything else you've concluded or observed based upon your notations on Exhibit 181?

A No. This is more or less what I used to locate the spot coolers and determine their capacity and try to orientate myself with the photos.

Q Is there any other observation or information that you plan to make about the temperature readings that are shown in the photos? Is there any other information that, conclusions, observations that you would make based on that information?

A No. This was just a recording of what was shown on the crime scene photos.

Q In your field notes, there's intermittent exhaust fan vented through exterior.

A That's what I told you. In the old space, they have a duct from the fan that goes from the light -- it switched the light and goes to the outside into a wall cap. AHCA would never allow that now.

Q Okay. But where is it and --

A Every bathroom.

Q Every bathroom. So the exhaust fan would pull air out of the building?

A If it was running, but they typically aren't running. They're intermittent. They turn them off with a light switch.

Q But the exhaust would exhaust out air from inside the building?

A Yes. They would exhaust the bathrooms. In this case, they were continuous. They had fans running. That's the way they do it now. This was just

intermittent exhaust with a switch.

Q And just for our record, this space was smoke compartment A?

A Yes. I'm sorry.

MR. WARREN: First floor.

A First floor, second floor.

BY MR. SMITH:

Q Well, if the fans aren't on, but they're -- wouldn't the -- wouldn't that be a pathway to vent to the outside? Even if they're not, you know, pulling air, wouldn't it just find its way --

A They're ducted, and they go into the fan itself, which goes up into the ceiling below. So it's not open to the cavity above. It's ducted from the fan to the exterior. If you look up above the ceiling, there's no opening in that duct. It's from the fan to the wall cap.

Q So from the fan to the --

A There's an exterior wall cap out here. If you look at these photos, you'll see wall caps on that building.

Q And the wall cap, is it just like a slanted, keep the rain out of it, but it --

A Yeah. It's got a little back draft tamper in it typically.

Q But it allows air to come out or in, right?

A No, not in. It's got a little baffle on it. It's like a dryer vent or something, wall cap. When you flip the fan on, it blows air out, pops the thing open.

Q All right. Any other observations on 181?

A No, not that I'm aware of.

MR. MENTON: Just for disclosure, probably ask him about the conservative nature of the estimates made and how that impacts on the load calculations, just to put that in perspective a little bit. I mean, not to quantify it.

A Yeah. We just -- I mean, in our -- we didn't include any of the PT or admin area, we didn't include the dining room, we didn't include the kitchen. We tried to limit our calculations just to the patient wings.

BY MR. SMITH:

Q And do you know if those areas were left open and were they trying to cool those areas with the spot coolers?

A They weren't -- I don't know. There was no information about spot coolers in the kitchen. I mean, I'm sure they had to eat for three days. I'm sure they were using the kitchen. There was no information about the kitchen in any of the documents.

Q Let's take a look at Exhibit 182. What was that? I think you said you had a drawing with three sheets that you did your load calculation areas on.

A I just highlighted the patient areas, what we consider patient areas. So when you look at those numbers, this is what it reflects.

Q So the highlighted yellow would just be -- that's the area that you were calculating what -- your load calculations would pertain to those areas on the first and second floor?

A Correct. The first floor, I mean, there's a lot of kitchen, a lot space on the first floor that's not included. The second floor is really the whole floor. When you look at the second floor, it's really the whole floor because there's nothing but patient areas on the second floor. That was just delineating what was included in the load calculations. Those were the plans we were measuring from.

Q That was Exhibit 182.

And then Exhibit 183 is --

A These are field notes when we were out there at the site. I don't know what you can glean from this. This is where we sketched out where the units were, and we measured this blind return. We did it just trying to find them all, basically. Most of them were above the

ceiling and only two that are down below. So we popped a lot of ceiling tiles.

Q 184 is a condenser total heat of rejection. I think you already told me about it. That's just the calculation formula that you used to --

A Oh, yeah. That's just, yeah, the numbers we used to come up with the heat, it came back into the first floor.

Q Right. That was the 15 to 25 percent?

A Right.

Q Which you chose 25 percent?

A 20.

Q 20. And then 185 was the information on the chiller.

A Right.

Q And what did you glean from looking at the information on the chiller that's there?

A Just the total capacity, 125 tons.

Q Did you use that for anything other than saying that's what they put in?

A That's what they lost.

Q That's what they lost. You told me earlier they were trying to replace it with --

A Yeah. They lost 125 and put 15 in.

Q And do you know what that chiller is capable

of doing in terms of keeping the building cool? Would they be able to keep it at 71 degrees?

A I don't know. I don't know the answer. I didn't do those kind of load calculations. Apparently it does the job, apparently.

Q Are there other conclusions or opinions that you formed that we haven't discussed so far?

THE WITNESS: Can you think of anything?

A I think we've discussed everything.

MR. WARREN: No. I mean, other than if you're able to get the plans from the city.

A Yeah. We didn't have access to those. When we went to the site, they indicated they had them, but we never got a copy of them.

MS. ALLISON: Excuse me. I think we said we would look for them.

MS. SMITH: Stop, stop, stop.

MR. MENTON: Hold on, hold on, hold on.

A What I started to say was James Williams indicated he had plans when I asked him when I first walked in the door, and before you interjected.

BY MR. SMITH:

Q Be that as it may, we'll address discovery issues through discovery, and we'll go from there. But I just want to make sure I've gotten all your opinions

and the information that you intend to share in this proceeding.

A I think you have. I mean, I --

MR. SMITH: All right. I don't have any other questions.

MR. WARREN: We'll read.

(Deposition concluded at 5:22 p.m.)

CERTIFICATE OF OATH

STATE OF FLORIDA

COUNTY OF HILLSBOROUGH

I, the undersigned authority, certify that WILLIAM SCOTT CRAWFORD, PE personally appeared before me and was duly sworn.

WITNESS my hand and official seal this 20th day of February, 2018.

_____

JULIANA M. CARY, RPR
Notary Public - State of Florida
My Commission Expires: 6/7/20
Commission No.: FF992000

REPORTER'S CERTIFICATE

STATE OF FLORIDA

COUNTY OF HILLSBOROUGH

I, Juliana M. Cary, RPR certify that I was authorized to and did stenographically report the deposition of WILLIAM SCOTT CRAWFORD, PE; that a review of the transcript was requested; and that the transcript is a true and complete record of my stenographic notes.

I further certify that I am not a relative, employee, attorney, or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the outcome of the foregoing action.

Dated this 20th day of February, 2018 IN THE CITY OF TAMPA, COUNTY OF HILLSBOROUGH, STATE OF FLORIDA.

_____

Juliana M. Cary, RPR

PLEASE ATTACH TO THE DEPOSITION OF WILLIAM SCOTT CRAWFORD, PE TAKEN ON FEBRUARY 16, 2018 IN THE CASE OF STATE OF FLORIDA, AGENCY FOR HEALTH CARE ADMINISTRATION V. REHABILITATION CENTER AT HOLLYWOOD HILLS, LLC

PAGE	LINE	CORRECTION AND REASON THEREFOR

I HAVE READ THE FOREGOING PAGES AND, EXCEPT FOR ANY CORRECTIONS OR AMENDMENTS INDICATED ABOVE, I HEREBY SUBSCRIBE TO THE ACCURACY OF THIS TRANSCRIPT.

_____ _____

WILLIAM SCOTT CRAWFORD, PE DATE

_____ _____

WITNESS TO SIGNATURE DATE