THE STATE OF SOUTH CAROLINA
IN THE COURT OF APPEALS

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APPEAL FROM HORRY COUNTY
Court of Common Pleas

The Honorable Benjamin H. Culbertson, Circuit Court Judge

CASE NO. 2016-CP-26-06495

Cornell Patton, Melissa Patton, Chad Webb and Amy Webb..... Appellants

vs.

Prestwick Land Limited Partnership; Prestwick Homeowners Association, Inc.; Jackson Companies; City of Myrtle Beach; South Carolina Department of Transportation; Horry County; Myrtle Beach Air Force Base Redevelopment Authority; Nelson L. Hardwick & Associates, Inc.; Bermuda Gardens Homeowners' Association d/b/a Homeowners of Ocean Walk Property Owners Association; Campgrounds, Inc.; and Prestwick Property Owners Association, Inc., Defendants

OF WHICH:
Prestwick Land Limited Partnership, Jackson Companies and Campgrounds, Inc. are ..... Respondents

City of Myrtle Beach, Third-Party Plaintiff,

vs.

Phil Eaves and Elizabeth Eaves, Third-Party Defendants, Counterclaimants, Cross-Claimants..... Appellants

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RECORD ON APPEAL
VOLUME II

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STATE OF SOUTH CAROLINA) IN THE COURT OF COMMON PLEAS

COUNTY OF HORRY) 2016-CP-26-6495

Cornell Patton, Melissa Patton, Chad Webb and Amy Webb,

Plaintiffs,

versus

Prestwick Land Limited Partnership, Prestwick Homeowners Association, Inc., Jackson Companies, City of Myrtle Beach, South Carolina Department of Transportation, Horry County and Myrtle Beach Air Force Base Redevelopment Authority, Nelson L. Hardwick & Associates, Inc., Bermuda Gardens Homeowners' Association d/b/a Homeowners of Ocean Walk Property Owners Association; Campgrounds, Inc., and Prestwick Property Owners Association Inc.,

Defendants.

February 27, 2019

City of Myrtle Beach,

Third-Party Plaintiff,

versus

Phil Eaves and Elizabeth Eaves,

Third-Party Defendants/ Counterclaimants/ Crossclaimants.

Homeowners of Ocean Walk Property Owners Association,	)
Defendant/Fourth-Party Plaintiff,	)
Versus	)
Rose Real Estate, Inc.,	)
Fourth-Party Defendant.	)

B E F O R E:

Honorable Benjamin H. Culbertson
Horry County Courthouse
Conway, South Carolina

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Jackson Companies and Campgrounds, Inc.

Grace L. Hurley, CVR-CM-M
Circuit Court Reporter

P-1 Packet of Documents

(On the record, February 27, 2019.)

THE COURT: All right. Next is 2016-CP-26-6495, Cornell Patton and others versus Prestwick Land Limited Partnership and others. According to my roster this is a motion for summary judgment. Please give the court reporter your name and who you represent.

MR. CONNELL: Your Honor, my name's Gene Connell. I represent the Plaintiff.

MR. BAXTER: I'm Doug Baxter and I'm here on behalf of the Defendants, Prestwick Land Limited Partnership, Campgrounds, Inc., and Jackson Companies.

THE COURT: All right. Mr. Baxter, this is your motion?

MR. BAXTER: Yes, Your Honor.

THE COURT: All right.

MR. CONNELL: Your Honor, before we get started, I filed an affidavit yesterday asking for some additional time, the reason being this is a, this is a significant construction case and that we've taken a lot of depositions, but I'm not ready to -- we, we need a lot more discovery. The Plaintiffs' expert has not been finished, his deposition that was taken for a day and a quarter, and we haven't finished that yet, and there are other issues that we got to get, including Doug's client, before the motion for summary judgment should be heard.

THE COURT: Well, I mean, that's one of the things that

the court considers in ruling on a motion for summary judgment. I have -- I can't grant summary judgment unless I can find that there are no disputes as to any material facts and one is entitled to judgment as a matter of law. If discovery is outstanding and that'll indicate a dispute as to a material fact, then the judge -- then it -- the motion might be premature. So that's an argument you can make. What's your position on the summary judgment motion? I would say either withdraw it and file it when it's ripe for hearing or if Mr. Baxter says it's ripe for hearing now I'll go ahead and hear it, but if you're saying discovery's ongoing then that's something that I'll have to take into consideration.

MR. CONNELL: All right, sir.

MR. BAXTER: Your Honor, just so you understand our position on this, we, we filed this identical motion back in April of last year. It came up for a hearing. At that time Gene said, called me up and said, "Hey, I've -- you know, we need to do more discovery." We had mediation coming up. I withdrew the motion at that time to allow for the additional discovery. So this is actually -- this is the second time I filed this motion. This was filed October 24th of 2018. The -- we, we, we have -- we've done a fair amount of discovery since then. However, and I'll, I'll, I'll address the -- the issues he's raising about we need more discovery, we, we do not believe so because the, the discovery have to do with

other parties, other Defendants not related to us.

THE COURT: All right. Well, go ahead.

MR. BAXTER: Additionally, we've -- his, his experts -- this, this arises out of a lawsuit that occurred in 2000. My client was the developer of the property. After five years of discovery, etcetera, etcetera, they reached a settlement. Prior to the settlement being reached in 2000, my client, the developer, turned all of the property over to the association. It, it sold all its lots. It turned control of the -- it, it did everything -- it got rid of everything and ceased doing business prior to the settlement in 2005. Now, it wasn't officially dissolved until 2007, but, you know, in our affidavit it, it indicates that, that prior -- before the settlement we ceased to do business. The issues that Gene has raised in his affidavit we asked his expert, okay, you know, you've come out, you've got new opinions. He was the same expert from the previous one. "Is there anything new pertaining to my clients," and he said no. He, he said, "These are the problems I've found," and I said, "Well, you were aware of all those back in -- prior to settlement of this case in 2005." "Yes. I was aware of those." We've taken his clients' depositions. "Is there anything you're aware of," you know, "What are your complaints against my clients," you know, "They did the following. You know, they, they didn't -- they didn't tell us our property was in a flood zone. They,

they didn't properly design the drainage system." "Were you aware of all those issues prior to the settlement in 2005?" "Yes, we were aware of all that." The other issue he's talking about is the -- he's saying, "Well, you conveyed -- the drainage system that you conveyed to the association was not proper, wasn't operating," asked his client, I said, "Were you aware that we were conveying the property, including the drainage system," and he says, "Yes, not only was I aware of it, but I opposed that being done," and that was done in 2002, 2003. So, you know, our position is there's nothing new to discover. We've -- this case has been pending for not quite, you know, two and a half years. We've done a lot of discovery. My, my client is unique from all the other Defendants in that --

THE COURT: Yeah. And now, tell me your client, again, and what are their --

MR. BAXTER: Okay. Prestwick --

THE COURT: -- position.

MR. BAXTER: -- Prestwick Land Limited Partnership was the developer of Prestwick Subdivision.

THE COURT: Okay.

MR. BAXTER: The -- it was dissolved in 2007. The -- because under the statute if you dissolve a limited partnership and you bring a subsequent lawsuit you name the managing partner. The managing partner is Campgrounds, Inc.

Campgrounds, Inc., didn't do anything with this other than it was the managing partner of the limited liability partnership which is the developer of the property.

THE COURT: All right.

MR. BAXTER: The other client, named party is the Jackson Companies. There is no such thing as Jackson Companies. That's just kind of a generic name of the, the Jackson family that has Ocean Lakes Campground. There's, there's a corporation that owns that. Prestwick was developed by this limited liability partnership. They also -- there's a corporation that owns Crystal Lake Campground. That, collectively that's referred to as the Jackson Companies.

THE COURT: Well, I mean, what are the Jacksons' involvement in this lawsuit with Prestwick?

MR. BAXTER: The -- Prestwick Limited Land Partnership was one of the partnerships that they were involved in.

THE COURT: Okay.

MR. BAXTER: It was considered, you know, generically they talk about the Jackson Companies. You know, they own all that land and property there on 544 and developed -- and did the campground, etcetera, etcetera. So it -- the, the true party in this lawsuit is Prestwick Land Limited Partnership. They were the developer of the subdivision. All the causes of action arise out of the, the development and sale of the property to the Plaintiffs.

We have -- Your Honor, if I could, I'm going to hand up some documents. I've given Gene a copy of this. The documents I'm handing you are a copy of the settlement agreement signed in 2005. That, that, that has been filed several times in this lawsuit. It's, it's a, it's a record. The other documents are the Eaves' lawsuit from 2000, the Pattons' lawsuit from 2000 and then a copy of the stipulation of dismissal with prejudice for those lawsuits. All, all these, all these items are public record. I'm just, for your convenience, I'm just sharing those with you.

THE COURT: All right. So Cornell Patton and Melissa Patton are the same Pattons in 2000-CP-26-765?

MR. BAXTER: Yes, sir.

THE COURT: Okay.

MR. BAXTER: And then the Eaves or Mr. Eaves sold his house to Chad Webb and Amy Webb in -- I think in 2007, 2008.

THE COURT: All right.

MR. BAXTER: Your Honor, we have, we have a filed a memorandum and attached to that is an affidavit from Dennis Wade who was the then -- he was previously the president, CEO of Prestwick Land Limited Partnership up until the time it was dissolved. He goes through a number of events and the -- and I'll just briefly touch on these dates. The -- in January of 1997 they submitted the plans for the storm water management for this subdivision where this house is located to the office

of Coastal, whatever OC -- OCRM, which is DHEC, and also Horry County. That was approved. They began construction in February of 1997, and then in -- not sure of the exact date it was completed, but it was completed prior to October 10th of 1997, and the reason we know that is that's the date that the OCRM issued a letter, which is attached, saying, "This system has been built pursuant to all the compliance, it meets all the regulations, etcetera, etcetera. You can begin selling lots."

The, the lots were sold to the Plaintiff in -- I don't have that here, but in, in the late nineties, I mean, in the late 1990s. Then in -- and at that time the, the -- my client was -- controlled the board, the association.

Beginning in 2000 they began conveying the -- all of the common elements, which included the drainage system to the association. March 24th of 2000 they turned control of the board over to the association. 2003 they filed with the court supplemental declaration of covenants, restrictions where they basically said, "We're turning over control of the board, we're turning over control of the architectural, we're turning everything over to the association," and in 2004 is when they sold the last lot that they owned in the subdivision. So as of 2004 they didn't own any property within the subdivision. It was then dissolved in 2007.

These dates are important because everything that my

client has been accused of, every, every defect, every complaint, everything they are suing them for occurred before the settlement agreement in 2005. We have raised a number of defenses and reasons for granting summary judgment. There's four of them. They're all separate, independent, not dependent upon each other, and I'll start with the settlement agreement. It's our position this agreement settled any claims which they had or could have arising out of the allegations in the complaint. My client paid almost $250,000 to settle that case. Collectively they paid $470,000. So it's not, it's not one they paid nuisance. I mean, they paid real good money to settle what they perceive to be a complete settlement of this claim, and we think that because of the fact that the -- everything that we could be sued for occurred before the settlement, then any claims they would have for those actions have been settled. Now, I understand Gene's going to argue, "Oh, no, we didn't mean that. What, you know, every time there's a flood or every time they have new damages we can sue you." It's our position settlement don't work that way. You know, if you -- if, if I'm in an accident and we settle you can't say, "Well, I found new injuries. I found this." I mean, everything we did acquired -- occurred before 2005. Now, if, if, if the Court buys into that argument, we also have -- we've asserted statute of repose, which at the time -- let me get this -- was 13 years. The, the statute of

repose run -- would have begin running no later than October of 1997, which is when the, the, the drainage system was completed. We -- this lawsuit was filed in 2016, which would have been six years after the statute of repose ran. So we think that just based upon that, the -- well, I take that -- and, and actually there was an amendment to the statute of repose in 2005 that went from 13 years to eight years, but regardless, we're well outside of the, the, the statute of repose. The, the other issue that we're arguing is the dismissal was with prejudice, and the law in South Carolina provides that a dismissal with prejudice indicates an adjudication on the merits and operating as res judicata, including subsequent litigation to the same extent as if the action had been tried to a final adjudication. Under the law if, if we're being sued for the same allegations that were ongoing in the 2000 lawsuit, the dismissal with prejudice is, is, is considered to be an adjudication in our favor of all those issues.

Now, the -- I've -- you know, again, the, the -- our argument is that anything we did would have occurred before the dismissal with prejudice. So anything -- you know, all our actions that you would look at it's our position that, A, they were settled; B, there, there was an adjudication in our favor because the court ruled, you know, we're dismissing it with prejudice. So you can't -- they can't come back in and

say, "We're going to sue you for the same actions. We're going to sue you for poorly designing the, the drainage system. We're going to sue you for conveying the property to us. You didn't tell us it was in a flood zone." By, by virtue of the dismissal with prejudice, the Court -- that's considered to be an adjudication of, "Okay, no, you can't argue this. You know, the, the, the -- we did not commit any type of negligence or create -- any of those causes of action are considered to be resolved in our favor." Now, and, and equally important, if you compare the previous complaints to the current complaint, and I'm not accusing Gene of being lazy, but he took the same complaint and added a few additional, you know, under "you're negligent in the following particulars," and you know, he goes, you know, A, B, C, D, E, F, G, those are identical up until some, I don't know, about two thirds of the way through. He adds some new allegations to that. So other than there being some additional particulars of negligence, it's the same complaint. Now, the, the importance here is that the new allegations in the complaint have nothing to do with us. After the settlement occurred, there was some additional development on surrounding property, has nothing to do with my client. These are totally separate, independent, nothing to do with the Jackson Companies, developments, people went in and put in subdivisions. As part of that they -- there's a drainage

ditch or canal. They altered that. They changed that. So all of the new allegations have to do -- have nothing to do with my client. So the only allegations in the current complaint are the same allegations as in the previous complaint which was dismissed with prejudice. So, again, we, we think that any one of those grounds are more than sufficient for a dismissal, and again, we're, we're unique. There's also lots of other parties. We are unique in that the, the other parties are ongoing concerns. The other parties, you know, they're alleging, "Well, you continued to put water into the drainage, you know, you contributed to our flooding, you developed a new property, you allowed this property to be developed, you went in and changed the direction of the drainage ditch," etcetera, etcetera. All those are new things that occurred after 2005, but none of those have anything to do with my client, totally unrelated. So we think that, you know, that those are three reasons, very good reasons why we should be granted summary judgment. I mean, you know, bottom line is, you know, under their theory we could be here, you know, 200 years from now with people who bought the property and sold ten times saying, "Okay. We're suing you because this drainage system you put in in 1997 we -- still hadn't been fixed, even though you don't own it and you can't fix it, we're, we're going to continue to sue you every time there's a, you know, heavy rain or we're suing you

because you lied to the original purchasers, and even though you settled with them and paid them money and, and they were fully aware of all this when they sold the property to somebody else, you know, the, the" -- you know, I guess we could argue the, what is it rule against perpetuity because if you buy into their arguments, this thing will never end. You know, we'll, we'll be back till all of us are retired, you know, continuing to try this case because there's no way to end it. You know, even a ruling against us, you can say, "Well, no, we only, we only sued you because of this recent flood even though the court found you didn't do anything wrong, that only had to do with that flood. You know, there's a new flood we're going to sue you for." So we just think that for, you know, you know, common sense, if nothing else, dictates that my client should be dismissed from this lawsuit and, and again, their, their complaints there's other parties that didn't participate in the settlement. There's other parties that have been involved in these new activities, and if they got a problem that's who they need to pursue. So we just ask the Court grant summary judgment.

THE COURT: All right. Mr. Connell.

MR. CONNELL: Well, Your Honor, this thing's been going on since the early 1990s. The litigation's been going on since then, and the whole thing deals with the -- these Plaintiffs' houses in Prestwick that continually to flood

every time we have a storm, and I'm not talking about two inches. I'm talking about four and five and six feet. The properties are so worthless at this point that you can't sell them, and FEMA would like to buy them if we can figure out a way to do that, but Mr. and Mrs. Patton came there in 1997, built their house, and the Webbs bought the Eaves' house, and when they got there to begin with the first thing they were given was this property report. I want to give you a copy of this if I can, Your Honor.

THE COURT: All right.

MR. CONNELL: And if you look at page 21 of the property report it indicates that this property does not flood and is not in a flood plain. That's what they were told by the Defendants that were selling it, sold some 600 lots in this particular area. It's paragraphs water coverage and flood plain on page 21. This, this document was given to each individual before Mr. Patton built a $600,000 home on the property. So, so you understand that -- the course of the litigation, in 1999 Hurricane Floyd came through. There's a canal behind the Plaintiffs' houses. I'll call it a canal for want of a better word. It's a creek, ditch, whatever. That canal overtopped its banks and went into the Plaintiffs' houses, and the canals from Prestwick all go into the same canal. So a lawsuit was brought, and the argument was is, "We have flooding and we were not in a flood plain," and that's,

that's incident number one, 1999.

So after about five and a half years that case was settled for that one incident, and I think Your Honor has the settlement agreement up there with him.

THE COURT: I have the one that Mr. Baxter gave me.

MR. CONNELL: Yeah. It's -- Doug gave you, it's page two, I think, where it says any and all claims if Your Honor have that.

THE COURT: Yeah. Any and all claims.

MR. CONNELL: So, yes, sir, so on the top page two of the, of the release, Your Honor, this was an issue when the case was settled. The issue was whether or not there was a -- whether or not they were going to get a future release, and obviously we knew that this may happen again, and so we did not agree to a future release. We only agreed to a release up until the day it was signed for any prior flooding. Well, fast forward to where we are today, we've had probably four or five floods since then. So our position is this release clearly sets out that we can't sue you for something prior to the signing of this release in regard to this claim, but any new claims we can sue you for. There's no future release clause in the claim, but we would point that out to Your Honor.

And already I think in evidence, Your Honor may have this, it's -- it was -- this, this issue has been argued

before. I don't think you heard it. I want to say that a judge from Camden heard that, this exact issue, and so there's an affidavit already in the file, I'll hand this to Your Honor, from Cornell Patton, and Mr. Patton says, "It's my understanding and belief that the release agreement that was signed did not include future claims because I wasn't going to release a future claim if we actually had one, another hurricane that came about." So Mr. Patton in his, in his affidavit clearly sets forth that, and the last time we were over here with another Defendant, the Court denied the motion and said that was an issue of fact for the jury as to what these releases meant, and the Defendants were free to put those releases into evidence and argue that they intended those releases to pay for any future claims. So now you're --

THE COURT: But I mean, what do you -- but the release it says that the Pattons, their heirs, executors, administrators, assigns or successors hereafter -- see, they waived -- where was it I read --

MR. CONNELL: If Your Honor looks at the first paragraph up at the top, "From the beginning of the world," up to the date of signing, basically. Then it references those cases and those civil action numbers only, and, and the reason why it does that is because the, the problem had not been fixed and everyone knew that this was going to happen again, and of course, it did, and it's happened multiples times since then.

So the release --

THE COURT: Well, I mean, it says that they are released from, "Any claims, causes of action, demands whatsoever both at law and in equity which they ever had, now have or which they or their successors or assigns can, shall or may have."

MR. CONNELL: Up to the point of the signing of the document and not -- and Mr., Mr. Patton explains that in his affidavit as to not being a future release clause, and if that, if that is an issue that's an issue of fact for the jury and, and this issue, Your Honor, this release was passed around for probably two months prior to this, and there were negotiations about what the meaning of it was going to be, and the Defendants wanted a future release clause, and we said no. So there is no future release clause, and Mr. Patton is the only person who could offer any testimony to that. There's no one else who's been -- who's offered anything in that regard, and he has -- he said in his affidavit that, "I understood the language was only for that particular flood up to that date and for no other flood events, future flood events but for any prior flood events," and that's what we believe that document means, and we believe that's an issue of fact for the jury. So that, that issue is something that the, the -- that we think the Court should consider.

Now, a couple of other things that have been argued about the statute of repose, Your Honor, the statute of repose as

Your Honor knows from messing with construction cases, it's -- was 13 years during this period of time, and when it was, when it was 13 years there's also a statute that says, "And by the way you can't get any defense from the statute of repose if you were an owner and you committed gross negligence or you were involved in violations of building codes, recklessness, fraud," etcetera, and that's 15-3-670.

Now, Mr. Taylor's deposition, which hasn't been finished, I'll hand that up to Your Honor. Mr. Taylor's deposition was taken in this case for these floods, these floods happened in 2000 -- we're talking about Hurricane Matthew and 2015-16 flood. Mr. Taylor's deposition was not finished, but he indicated in his deposition that there are, there are problems with the system and the way it is, and so one of the factual issues that Your Honor has -- that we argue should be developed is Prestwick did not go defunct until 2007, and so one of the issues is if they didn't go defunct till 2007 what were they doing, what had they done? They sold the drainage system to the homeowners association. Did they pay them any money? Did they agree to do any fixes? Did they agree to repair the system? Did they -- was there -- what exactly was -- engineering was being done? So, Your Honor, we would argue because the deposition of Mr. Taylor's not been finished that that's a factual issue.

Now, let me show you this, Your Honor. So fast forward

to 2013. That's a lot of documents. I apologize. In 2013 the Horry County realized this was a major problem for the Prestwick area. So Horry County commissioned a study, cost over a million dollars, to study what the flooding, what flooding problems were in the Prestwick area and how they were, and Thomas and Hutton, the engineering group that you have in front of you, was hired to actually do that, and Thomas and Hutton's report is some 150 pages, and they detail all sorts of defects that are going to, that are going to continue to have -- you're going to continue to have problems in the area every time there's water, and as Your Honor said earlier, this is a separate car wreck from the, from the first one. This is the same thing, but in a separate incidence, separate damages. Each time Mr. And Mrs. Patton and Mr. and Mrs. Webb's house gets flooded they have a three to $500,000 cost of repair. So it's not the same repair that they had back in 1999. We're talking about this -- a different fix every time.

THE COURT: Yeah. But you got a different owner of the car in the wreck, so to speak. I mean --

MR. CONNELL: We got a --

THE COURT: -- as I understand, Mr. Baxter's client has not had any involvement in this since 2005.

MR. CONNELL: That's what they say. We haven't been able to get their deposition to take that as I indicated. That's

what they're --

THE COURT: Oh, so his client's deposition has not been taken yet?

MR. CONNELL: That's right.

THE COURT: So why have you delayed in taking his deposition?

MR. CONNELL: We -- not that I've delayed it. We've taken, we've taken a bunch of depositions, days and days of them, just haven't gotten to that part yet. They --

THE COURT: Well, I mean, they filed a motion for summary judgment over a year, or close to a year ago.

MR. CONNELL: They did, but they wanted to take all of our clients' depositions to see what they had to say about it first and take our engineer, and that took, you know, probably -- well, it was a week for, a week for one set of depositions and then that --

THE COURT: So you're saying that you think that their client has had involvement in this development since 2007?

MR. CONNELL: I'm saying that I think that they did have involvement, and I'm also saying that regardless of that it doesn't really matter. It's a different event based on --

THE COURT: Well, see, I don't think so. I think if I owned some property or I've got property and I sell it to you and that property has resulted in damage to your property, if all of the occurrences happened, you know, what 10, 11, 12

years after I've gotten rid of the property the current property owner would be responsible.

MR. CONNELL: No, sir, because now we've got, respectfully, you've got combined and concurring Defendants, additional other Defendants are in the case out of -- created additional water that have all combined and concurred to cause additional damage and additional injuries to the Plaintiff each time there's a water event.

THE COURT: So you're liable for any damages that occur on any property that you've ever owned in your life?

MR. CONNELL: No, sir. I'm saying that you're liable under the circumstances where you have a situation like this where you know that this thing hasn't been repaired and you realize there's other development and you're just one of the actors.

THE COURT: So if you've got a hole on your yard, somebody steps in it, breaks their leg, you settle that claim, you sell that property, 20 years later somebody steps in that hole, breaks their leg, they can come back and sue you?

MR. CONNELL: No, sir. I don't think that's the case, but I do think in a situation where you have 12 or 15 Defendants and this Defendant is putting water from properties that it had into the same ditch as these other Defendants that have come together, that they're all combining and concurring, and I think that's, that's --

THE COURT: So what's the distinction between water going into the canal and a hole that somebody steps in and breaks their leg?

MR. CONNELL: Well, the distinction I would think is is that when that particular owner leaves the property they have done something to either fix that or repair it. In this particular case, these Defendants knew and knew at the time this case was settled that this was going to be an ongoing event, and they were going to develop other property in the area, and there was going to be other development, and all of that was something that they knew was going to be very costly and they decided not to do that, and I think that's a different situation when you're selling, they were selling over 650 lots in there, and they continued to sell those lots into 2007 knowing full well that this was going to be a problem that was going to continue on and making money from that, and I think that's a big difference from what you're -- from your, from your issue with the hole and the -- in the front yard.

So, Your Honor, our position about that is is that different flood events with different actors are different occurrences. I mean, it's clearly a different occurrence than it was the first time because the property has changed. The swales have changed, how they did it, what they did to them. What -- we don't know what they did after this lawsuit was

settled yet. We have no idea whether they came in there and said, "We're going to take -- make these changes to the property." Did they do anything? They own the golf course, too. Did they do anything to the golf course? Did they cut more ditches? Did they repair it? Those issues are somewhat addressed in the 2013 Thomas and Hutton report that those are problems. So that -- those issues, I believe, create additional factual issues as to what's been done since then and that the Court should not grant summary judgment because of all these factual issues.

Now, let me point out a couple of other things here. The statute of repose appears to be an issue. I don't think it is because if they did some work during that period of time or decided -- what if they decided not to do work, they said, you know, "We're not going to do this work, but we're going to pay the homeowners association" --

THE COURT: Well, and that, and that was my point. That's the property owner that says, "Well, I'm not going to fill in this hole. I'm going to sell the lot."

MR. CONNELL: But we -- and, and I'm with you, but we don't know that because we don't -- we haven't had those depositions to figure out -- "When I, when I gave these properties over to the homeowners association did Prestwick Limited Liability partnership pay them $250,000?" Did they say, "You just take them?" Did they say, "Okay. We're going

to do these repairs," or did they -- was there some negotiation between them, or they said, "Well, we're going to cut this ditch and we're going to do this and we're going to do that." All those issues -- all those factual issues need to be developed in the case to figure out where we are with it, and, and then finally, Your Honor, this is probably -- if you, if you had a, if you had a chance to just look at this report, these people, the Plaintiffs live every day wondering whether or not they're going to get another flood event and whether their houses are going to be flooded. They have no ability to sell the houses whatsoever. They have no ability if they, if their federal flood insurance is ever released they can never get it back, and the federal government is involved in the actual sale of that insurance, and so these houses are virtually worthless, these two houses in this crook of this particular canal area, and so we would argue to Your Honor that, that the whole setup is gross negligence. The way it was set up, the way the subdivision was developed Mr. Taylor will say that and said partially that during one day of his deposition, and the way that the, that the water was pushed off the golf course and how it was done, we think, gets us past summary judgment at this point.

THE COURT: All right.

MR. BAXTER: Your Honor, just --

THE COURT: Anything in rely?

MR. BAXTER: Yes, sir. The -- and, and I thank you so much for that great analogy about stepping in a hole. I wish, I wish I'd thought of that myself because that, that's exactly what occurred here, and not only -- I'd add to that analogy is that the Plaintiff in the subsequent lawsuit knew of the hole, knew the property was being conveyed because, again, there, there was nothing hidden here. We told the Plaintiffs, "We're conveying this property," the -- and it was pursuant -- it wasn't just nilly willy, "We're going to dump the" -- this was a -- there was a master deed and bylaw that provided, "Okay, we're going to develop this at some point in time. We've sold our lots. Common elements will be turned over to the association." We, we gave all the notification to everybody. There's deeds saying, "We're turning it over. There's no, there's no restrictions on it." Every -- that's all of record. Everybody was aware of it. The, the other thing in Mr. Taylor's deposition the -- on the statute of repose, the, the gross negligence, breach of building code, I, I asked him those questions. I said, you know, "Is there a violation of the building code? You know, was this built per the, you know, the restrictions and laws and statutes in effect at the time," and he said, "I don't know. I've never looked into that." This, this was after -- this was just recently. I said, "Well, are you going to look at it?" He said, "Well, I don't have any plans to." So their expert, his

own testimony does not take it outside the statute of repose. You know, he didn't testify to any gross negligence. He didn't testify to any building code violations. I asked him, "Has there been any changes to it since the 2000 lawsuit?" "No. To my knowledge our drainage system is the same." Everything he had -- I said, "What are the problems?" He said, "Well, there's a swale missing. There's this." All of those they were aware of before. So his deposition actually supports our position, and, and again, he, -- the, the building code violation he would have to say, "I did a study. I compared it. You're in violation of the regulations," which is contrary to DHEC's findings that it was built per all the regulations.

The other thing, you know, Gene handed you up the -- claiming, well, basically, we lied to them. Those allegations are in the original complaint. They're saying, "You failed to inform the Plaintiff that the drainage easement would flood their property, providing the Plaintiffs with a property report," etcetera, etcetera, basically say, "You lied to us and you did a bad system." Unlike the other cases about the settlement, which I disagree with, but okay, you know, maybe there is a factual dispute as to the settlement, there is no factual dispute that this action was dismissed with prejudice and every allegation against us that's in this lawsuit was part of that, and by virtue of the dismissal with prejudice

there's been an adjudication in our favor saying, "You didn't do that, you did not breach a duty of care because, you know, those allegations were dismissed." That'd be like you granting summary judgment on this and saying, "Well, you didn't do anything wrong." Come back later and Gene says, "Oh, no, no, we're talking about another flood," you know, and, you know, but it's, it's identical to that, whether it's summary judgment, where it's a jury verdict, where it's a dismissal with prejudice, there is an adjudication that we did not breach a duty of care owed to these Plaintiffs for those particular allegations raised in that complaint. So forget the settlement agreement. Forget the statute of repose. There has been a finding, a judicial finding that we did not breach, breach a duty of care as to the allegations against my clients, and, and just briefly on the Thomas and Hutton study, I've, I've told Gene, I said, "This is who owns that property." Crystal Lake, I've, I've told him that. It's not owned by Prestwick Land Limited Partnership, and, and just so you understand, that study -- what they're recommending is they said, "Well, here's how we think we can fix it. One, we, we put bigger pipes under Highway 17." They looked at that, and they said that's too expensive. You'd have to tear up the road, close the road. That's just not an alternative. "How about this, how about we reroute the water into Crystal Lakes, not that Crystal Lakes is contributing or there's water coming

that, that damages them," they're just saying how about this, "We'll put the water into Crystal Lakes, and, oh, by owner of Crystal Lakes you've got to dig your lake out deeper and you need -- you have to agree to allow us to do it." It's not a -- it's not a -- they're, they're not doing anything that's damaging them. They're just saying, "Wait a minute, why should we now have our property flooded?" You know, and they declined to participate in that particular fix, but again, even if that does create a cause of action, that's not -- they need to amend the complaint and add that party. So we just think it's clear that the Prestwick Land Limited Partnership, Campgrounds, Inc., and the Jackson Companies should be dismissed, and, and just one thing, Your Honor, briefly, the, the Eaves sold the property to the Webbs. As part of the settlement agreement it provided that, "From now on, if you sell this property, you have to disclose to them that there is this litigation, there was flooding," all those things. The Eaves may or may not have done that. Their explanation is, "Oh, we thought the problem had been fixed when we sold." The Webbs said, "We were aware of all this litigation. We were aware of anything," but regardless, you know, we weren't even in existence at the time they bought the property, and, and again, it gets back to your analogy of saying, "Okay, whoever buys this property for the next two or 300 years, any time something happens they can come back and sue you even though

they bought it knowing about it. They were aware of the litigation. They're aware of the problems. They're just saying, 'Well, we, we thought maybe it had been fixed,'" even though our client had taken no action. So we just, I think for those reasons we should be granted summary judgment.

THE COURT: All right.

MR. CONNELL: Your Honor, could I have one minute or we -- if --

THE COURT: No. I've heard enough. I'm going to go ahead -- I'm granting summary judgment. I think that they are not involved, at least as far as Mr. Baxter's clients are concerned, not involved in it. They settled the prior lawsuit. There was a dismissal with prejudice, and as I say, I don't see the big distinction between the hole in the ground and the, the drainage, it all as a result of the drainage, and I think that you had a prior lawsuit that alleged that they were negligent in the development. That lawsuit was settled. They've turned the property over to the homeowners associations. They're no longer a part of the development and now you've got the same parties suing them for faulty drainage again, and so I think they are entitled to, at least as far as Mr. Baxter's clients are concerned, that they're entitled to summary judgment. All right.

MR. CONNELL: Your Honor, can I request a ruling on my additional request for additional discovery, too, since you're

going to make that.

THE COURT: Yeah. I mean, the fact of the matter, the case is two and a half years old, and you haven't shown how his clients are involved in this other than their involvement that existed at the time of the prior lawsuit.

MR. CONNELL: Your Honor, but my affidavit, I think shows that, but --

THE COURT: Yeah. I mean, the fact of the matter is is that your, your clients were involved in that prior lawsuit. It was a suit against Mr. Baxter's clients that dealt with the drainage problem. The same allegations exist in this case, and they're -- the allegations against Mr. Baxter's clients have not changed from the allegations in the first lawsuit, they're the same, which was dismissed with prejudice.

MR. CONNELL: Well, Your Honor, it's our position they have. I understand your -- that's what you're finding.

THE COURT: Yeah.

MR. CONNELL: But I think they have.

THE COURT: Okay. Well, there's nothing that shows that there is a disputed fact as to what they have done subsequent to dismissal of that prior action with prejudice. There are no new allegations against them.

MR. CONNELL: Well, but we haven't been able to take their deposition to find out what they did after they knew about the hole in your, in your argument.

THE COURT: And I understand and that, that -- I mean, you've had two and a half years to take their depositions. So I mean, the fact of the matter is is he filed this motion for summary judgment eight --

MR. BAXTER: In April.

THE COURT: -- ten, ten months ago --

MR. CONNELL: I understand that, Your Honor, but --

THE COURT: -- which put you on notice that they were seeking summary judgment.

MR. CONNELL: -- but they want to take my client's depositions ahead of time. I mean, they want to take all my Plaintiffs' depositions before we can even do the other.

THE COURT: Why? Has that been a condition that you've required?

MR. CONNELL: No, but I mean --

MR. BAXTER: I've not taken any depositions. Other parties have. No. We just --

THE COURT: Oh, okay.

MR. CONNELL: You've asked questions in every one of them.

MR. BAXTER: Well, I mean --

THE COURT: But I mean, have you, have you conditioned your clients' depositions on waiting until after you've taken his clients' depositions?

MR. BAXTER: No, Your Honor.

MR. CONNELL: No, but that's the normal course of things.

THE COURT: Okay. Okay.

MR. CONNELL: I mean, they usually take the Plaintiffs' depositions first.

THE COURT: All right.

MR. CONNELL: Your Honor, can I get you to add -- to mark all the exhibits so we can make sure we have a record.

MR. BAXTER: Yeah.

THE COURT: All right. Let's -- oh, so you haven't e-filed Mr. Patton's.

MR. CONNELL: His, his is already in the record from another -- when the another --

MR. BAXTER: Your Honor, all, all that is -- there's been prior -- the, the settlement agreement was entered by Gene. There's an affidavit that he referenced that's already in the file.

THE COURT: Yeah. But this has the caption of this lawsuit.

MR. BAXTER: Right.

MR. CONNELL: It does. Because that was another judge ruled on that for another Defendant, and so I -- that's already in the record.

MR. BAXTER: Right.

MR. CONNELL: I was giving you a copy of that because I think --

THE COURT: No. This has original signatures to it.

MR. CONNELL: Well, probably what happened is is there are four or five with original signatures, but that, that's in the -- this is, I think, in the court file.

MR. BAXTER: Right, but --

THE COURT: Okay.

MR. CONNELL: I think some judge from Camden, I believe, heard this motion; right? I think that's right.

THE COURT: I don't know.

MR. BAXTER: Well, the settlement agreement is in the record.

MR. CONNELL: I just want to make sure I have my record.

THE COURT: All right.

MR. BAXTER: The other document --

THE COURT: Go through here and -- hold for a second, Mr. Baxter. Let him go through here. Pull out what you want put in the record as an exhibit.

MR. CONNELL: All right. Thank you, Your Honor.

THE COURT: Yeah.

MR. CONNELL: Here are the documents.

THE COURT: All right. What -- all of this?

MR. CONNELL: Yes, sir.

THE COURT: Collectively. Any objection?

MR. BAXTER: None, Your Honor.

THE COURT: All right. Plaintiffs' Exhibit One

collectively introduced without objection.

(Plaintiffs' Exhibit Number One [Packet of Documents] entered into evidence and appropriately marked.)

THE COURT: All right. Anything else?

MR. CONNELL: No, Your Honor.

THE COURT: All right. Mr. Baxter, if you'd prepare an order. Okay.

MR. BAXTER: Thank you, Your Honor.

THE COURT: All right. Thank you.

(Adjourned.)

CERTIFICATE

I, the undersigned, Grace L. Hurley, Official Court Reporter for the State of South Carolina, do hereby certify that the foregoing is a true, accurate and complete transcript of the hearing held in the case of Cornell Patton, et al. versus Prestwick Land Limited Partnership, et al., held in the Court of Common Pleas for Horry County, Horry County Courthouse, Conway, South Carolina, on February 27, 2019.

I do hereby certify that I am neither of kin, counsel, nor interest to any party hereto.

Grace L. Hurley

Grace L. Hurley, CVR-CM-M
Official Reporter

June 28, 2019.

STATE OF SOUTH CAROLINA	)	
	)	COURT OF COMMON PLEAS
COUNTY OF HORRY	)	2016-CP-26-06495
CORNELL PATTON, ET AL.	)	
PLAINTIFFS	)	
vs.	)	TRANSCRIPT OF RECORD
	)	
PRESTWICK LAND LIMITED PARTNERSHIP, ET AL.	)	
DEFENDANTS	)	

May 29, 2019
Horry, South Carolina

B E F O R E:

THE HONORABLE BENJAMIN CULBERTSON, JUDGE.

A P P E A R A N C E S:

GENE M. CONNELL, JR., ESQUIRE
Attorney for the Plaintiffs

DOUGLAS C. BAXTER, ESQUIRE
Attorney for the Defendants

MONICA YATES, ESQUIRE
Attorney for the Defendants

HATTIE O. GORDON
Circuit Court Reporter

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Certificate of Reporter 32

E X H I B I T S

NO EXHIBITS WERE MARKED OR ADMITTED INTO THE RECORD

COLLOQUY

THE COURT: This is 2016-CP-26-06495. Cornell Patton, Melissa Patton, Chad Webb and Amy Webb v. Prestwick Land Limited Partnership and others.

According to my roster the matters before the Court on Motion to Amend Answer of Fourth Party Defendant, Rose Real. Please give the court reporter your names and -- oh, also a motion to reconsider. Please, give the court reporter your name and who you represent.

MR. CONNELL: I'm Gene Connell, and I represent the Plaintiffs, the Pattons and the Webbs. And the motion to amend is consented to. I think everybody has consented to that, I believe.

MS. YATES: Your Honor, I'm here for Christina Bissette. We represent the fourth party plaintiff.

THE COURT: All right. Please give the court reporter your name.

MS. YATES: Monica Yates.

COURT REPORTER: Monica Yates?

MS. YATES: Yes, ma'am. Y-A-T-E-S. We represent the Ocean Wall Homeowners Association. We do not oppose the motion. We leave that to the discretion of the Court.

THE COURT: Mr. Baxter, who do you represent?

MR. BAXTER: Your Honor, I'm here on the -- in conjunction with motion to reconsider. And I represent

Prestwick Land Limited Partnership, Jackson Companies and Campgrounds, Inc.

THE COURT: All right. Well, I'll grant the motion to amend with consent of everyone. All right. Let me hear on the motion to reconsider. Whose motion is that?

MR. CONNELL: Your Honor, that's my motion.

THE COURT: All right.

MR. CONNELL: Your Honor, you heard this case probably an hour and a half one day, and probably my least favorite thing to do is to come back and ask the Court to reconsider, but the rule requires it as you know.

THE COURT: Right.

MR. CONNELL: So I have to come back and ask you in a gentle way to reconsider that we respectfully believe you erred in some of the issues that are in the order. The order granting summary judgment, this is -- and I don't know, but you probably don't remember anything about this case, but let me go back.

THE COURT: Is this the flooding issues?

MR. CONNELL: Yes, sir.

THE COURT: And I think your argument was every time it flooded that created a new cause of action.

MR. CONNELL: That's creates -- that's our argument. That's one of our arguments.

THE COURT: All right.

MR. CONNELL: Your Honor, the Pattons and the Webbs own property in the Prestwick Lake Subdivision in the Myrtle Beach area. And their homes are side by side, and there is a ditch behind the property and that ditch is connected to a series of our ditches. And their property has repetitive flooding.

I think we're up to six times now. But in 1999 a lawsuit was brought against these same defendants for a flood that occurred in 1999, and that case was settled with some of the same defendants.

You fast forward into 2016. Another flood occurred, and we argue that that's a separate occurrence and that flood flooded their houses again. That's what this lawsuit is about. There are similar defendants before, but there are also new defendants because our expert has indicated that they put water into the ditches that also overflowed that flooded the Plaintiff's property.

So, Your Honor issued an order that is about seven or eight pages. And it's on a whole host of issues. We have filed a motion for reconsideration and have put down 17 points that we would ask the Court to reconsider on. And those points are wide ranging because Your Honor's order could have an affect on the other defendants in this case based on what you assigned previously.

So I will try to go through them briefly. Our first

point, Your Honor, is that the Plaintiffs' depositions were taken, and our expert's was taken partially during the course of about two weeks. And Doug's defendants, the ones you granted summary judgment for, Prestwick property owners or Prestwick Land Partnership and Campgrounds, Inc. and the others, his argument was based upon part of the deposition that was not completed of Robert Taylor, our expert.

And one of the arguments that I made Your Honor was that they didn't complete the deposition. There was no cross examination that was -- that had been finished, and that Your Honor should consider just the evidence that he presented because he got to ask questions. And so, Your Honor, we ask that the Court vacate the order in which you rely only upon the partial deposition of Mr. Taylor because no -- all the other defendants, and myself, did not get to ask any questions about his testimony regarding the liability.

THE COURT: All right. What portion is that of the order? I don't recall?

MR. CONNELL: That -- you want the order? Would you like a copy?

THE COURT: Well, no, just tell me. I'm sure it's here, but you are going to have to tell me what part I relied exclusively on his testimony and what part.

MR. CONNELL: Your Honor, that, the issue of discovery, that was raised before was not addressed by the Court's order, but the Court's order says on Page -- let's see. Pages Four and Five. In fact, Robert Taylor, the property owner's engineering expert, testified that he could give no opinion as to whether Prestwick Storm Water Management Systems Plan or the as built condition failed to meet the minimum requirements of the South Carolina Water Management System.

The deposition, Your Honor, was taken for about 7 and a half hours. And it was not completed and many of the defendants did not got to ask any questions nor did I get to ask any questions because that was the only day that we had for that. So, Your Honor, I asked, during the course of the prior motion, that Your Honor not rule until the deposition is completed of Mr. Taylor.

THE COURT: Now, who -- Mr. Taylor is whose expert.

MR. CONNELL: He's my expert on the flooding. How it's caused.

THE COURT: What is it you're going to ask him and he's going to say? If he's your expert what is he going to say that shows this to be an error?

MR. CONNELL: I think he's going to say -- I don't think this is the proper paraphrase of what happened, but I think he's going to say that all of the defendants

combined and concur caused this particular flooding, and it's going to be repetitive flooding that is going to occur all the time. So I think taking it out of context and taking part of the deposition and relying on that, Your Honor, respectfully, and not allowing the deposition to be completed would not be an appropriate way to grant summary judgment. And that's throughout the orders.

THE COURT: But I mean if he says what you say he's going to say then the Statute of Repose would just be inapplicable in this case and there would always be a pending action in perpetuity.

MR. CONNELL: As Your Honor knows from some recent Court of Appeals opinions the Statute of Repose is pretty much inapplicable if there is express negligence, regardless. And that's one of our arguments that we're going to make at -- if we have trial in this case.

So I mean the fact that we don't have -- I haven't been able to present the evidence cause the deposition wasn't completed I think puts me behind the eight ball in regard to arguing with Your Honor -- with the defendants about what the expert is going to say through the end of the case.

THE COURT: But I mean he's your expert. Why didn't you just get an affidavit from him that says what you want him to said in opposition?

MR. CONNELL: I think there is an affidavit.

THE COURT: Do what?

MR. CONNELL: I think there is an affidavit. I think I filed an affidavit when I brought claim against the engineer in the case. But I don't think that makes a difference, respectfully, Your Honor. I think it really matters that we should have been able to complete the entire deposition.

THE COURT: And I understand what you're saying, and I would agree with that but for the fact that this is your expert. So you ought to know exactly what he's going to say, whether it's going to help your case and what his testimony is going to be without a deposition.

They may have never -- they might have said that we don't want to take his deposition, and it would have never been scheduled. I mean the purpose for the deposition was for them to find out what your expert was going to say. So why is ---

MR. CONNELL: Your Honor, the purpose of the deposition, respectfully, was for us to develop any evidence that would have been necessary. The rules allow deposition to be used for any purpose. And, of course, in this particular case the purpose of the deposition was to find out what all of his opinions were about each of these ten defendants that are in the case.

THE COURT: So you acknowledge that your deposition could come up and kill your whole case. Gene is wrong. This isn't my testimony.

MR. CONNELL: No. I don't think the deposition is going to kill the case. I just don't think we got to the end where I can ask the questions.

THE COURT: But if he doesn't give you the answers you're looking for.

MR. CONNELL: If he doesn't I'll lose.

THE COURT: All right.

MR. CONNELL: I think that's one of the issues that we have in the case.

THE COURT: So you're going into deposition with your expert blind not knowing what your expert is going to say?

MR. CONNELL: No, sir. I know what he's going to so.

THE COURT: And that is?

MR. CONNELL: Doug only asked ten minutes worth of questions. I think that that -- I know what he's going to say.

THE COURT: Okay. And what's he going to say?

MR. CONNELL: He's going to say that, as I said, all of the development combined and concurred and that as a result of that this flooding is a result of all these defendants causing this flooding.

THE COURT: Okay. All right. Go ahead.

MR. CONNELL: Do you want me to go through each of them, Your Honor?

THE COURT: Well, I mean you said we've got 17 that you've got to go through?

MR. CONNELL: Your Honor, the reason why I've got 17 exceptions is because the order is very extensive as to what Your Honor ruled on.

THE COURT: All right. Well, let's go through them one at a time. All right. Mr. Baxter.

MR. BAXTER: Your Honor, first of all, the -- Mr. Connell, we did not rely upon Robert Taylor's deposition. Mr. Connell is the one who introduced it as an exhibit, and that's why it was included in the order because he introduced the deposition.

The reason it wasn't important to us is that we were going on the Statute of Repose. They didn't have the burden of proving gross negligence. He was saying, well, maybe there is gross negligence, but there is not. And the other important distinction here is the reason I didn't take very long with his deposition is, you know, he did the initial investigation back in 2000.

This is one where my client put in the drainage system in the 1999, I believe. We turned the property over to the Association by 2004 at the latest. Actually, it was earlier. We had sold all the lots by 2005. We

turned -- we were basically out of business before the original settlement agreement was entered into. We have done nothing since.

THE COURT: Well, I understand that, but I mean, so his argument is -- let me hear from you, Mr. Connell; that they didn't rely on the deposition. You're the one that introduced the deposition at the motion hearing.

MR. CONNELL: Well, Your Honor, how -- I mean that's what he relies on in the order. He sites what Mr. Taylor -- and I think you do rely on it. You did talk about it.

MR. BAXTER: I wanted to avoid this. I wasn't about to put it in. And, Your Honor, the important -- the other important thing that he's ignoring is that the questions I have for Mr. Taylor was -- I said.

"Q "Okay. Do you have any opinions that are different than the opinions you had from the original?

"A No. I've not looked at anything.

"Q You have any information they've done anything else the original lawsuit?

"A No.

"Q Are you planning on doing an investigation to determine whether there is anything new with regard to my client?

"A No. I've not been asked to do that.

Now, if Gene Yow goes back to him and say, "Look, you're going to have to start a whole new investigation and find some stuff." The totality of his testimony is I've done nothing. I've not looked at anything. I've not got any opinions concerning the work that was done by my client back in 1999. The only thing new he does say is that, well, there has been a lot of other development going on that has affected this.

And, again, all this occurred after my client had gotten out of there. So I agree we you. His testimony was, "I've got nothing new on your client. I've got no opinions on the -- I've not looked at the plans. I've not looked at construction. I have no opinions that would lead to a finding of gross negligence."

Now, the fact he may come back and later say, 'The totality of the cause of the flooding has no bearing on your findings in this case." And the other thing, and I don't know if you remember, we actually -- we had filed our motion for summary judgment a year earlier than -- we filed it last spring based upon Gene's request that -- to allow additional time.

So we had withdrawn the motion and then refiled it this past December, January. So part of the argument and the rules -- and that actually is addressed in the case --

in the order that says, "That Plaintiff -- that there may be later evidence. We cannot escape summary judgment on the mere hope that something will develop later at trial." And, basically, that's what he's doing here.

I mean this is not a case where we rushed in and he was not given an opportunity. There was plenty of opportunities. I don't think that, you know -- again, unless his expert is going to go out and do a whole new investigation, which I don't think is proper after we've taken his deposition. There is really nothing to add. It has no bearing on the outcome.

THE COURT: All right. Ms. Yates, any argument one way or there other.

MS. YATES: No, Your Honor.

THE COURT: All right. Mr. Connell, anything on reply on that?

MR. CONNELL: Not on that issue, Your Honor.

THE COURT: All right. All right. What's next?

MR. CONNELL: Your Honor, we argue that the order does not address the issue of who created the hazard. We believe that the defendants created the defective design in the drainage system, and the order does not address that. And we believe that that is fatal to the order because they're the ones that built the thing to begin with. And I realize, Your Honor, I think you argued --

you didn't argue, but you did make the point if you build a home on a piece of property are you liable for that later on if you sell the property. That was one of the things you --

THE COURT: In perpetuity.

MR. CONNELL: And, Your Honor, my argument about that is there is no South Carolina case law about that. There is case law around the country that talks about that exact issue, and it's split as to whether or not you, as an owner, are liable after you sell something. And the cases that I have been able to find are mostly about plants; rock site plants, asphalt plants.

THE COURT: I mean what you -- did the -- the issue I was caught in is even, and I didn't -- I'm not implying that they created the hazard, but if they created the hazard, they no longer own the property, how can they come back and correct the hazard?

If you're the property owner you're just going to say, "No. You created it. You're liable for it. No, you can't come fix it because I don't want to be liable for it. And it's always on you until the end of creation."

MR. CONNELL: In the cases that I've explored around the country that talk about whether or not there is akin to a product that you have built you're still responsible for, and so my argument to you at the time was that that's

a novel issue. That has not yet been decided in South Carolina. And that the Court shouldn't grant summary judgment on a novel issue like that when that is an issue that, certainly, the Court of Appeals or whoever is going to hear it is going to want to understand what that means.

THE COURT: All right.

MR. BAXTER: Your Honor, first of all, the -- I think there needs to be a distinction between; okay, if we build something we're protected by the statue of repose. If it's saying, well, no, it's not something we built. It's because you own a piece of property that you conveyed that had some type of hazard on it.

The courts -- I agree. There is no case directly on point, however, since this time I've done some additional research. And I think if you look at the law in South Carolina it talks about that the -- or a -- whether it's a dangerous condition or a nuisance or something. It's not previous ownership or current ownership. It just says the -- "There has to be a requisite level of control in order to find limitability."

And I think that's where we would be protected cause once we conveyed it we lost control of the property. There are actually some cases that talk about if I own a piece of property and I lease it and I give up custody and control, the courts have said, "Okay. In order for the

premises liability, in order for the nuisance cases there has to be some ability to control the property. So while I think there is not a case directly on point if you apply the law to that case then, you know, you avoid the situation.

Like I jokingly said, this would be a violation of the rule against perpetuity. You would forever liable, and there could be a succession of owners that are all -- you know, and it's never repaired. You don't have the ability to repair it. And so that's really -- that is not one of the, you know -- that is not one of the reasons for us being granted summary judgement.

Again, our summary judgment is based upon the Statute of Repose, based upon the settlement, and also based upon the fact that there was an entry of a dismissal with prejudice which works as res judicata as to all issues against my client.

So that was an issue we talked about that we had concerns about, but you know, that is not my grounds for you granting summary judgment to us.

THE COURT: All right. Mr. Connell, anything in reply -- or Ms. Yates.

MS. YATES: No, Your Honor.

THE COURT: Mr. Connell, anything in reply?

MR. CONNELL: No, Your Honor.

THE COURT: All right. What's next?

MR. CONNELL: Your Honor, you've also discussed previously the Statute of Repose. Briefly, that's a factual issue in the case based upon the depositions that were presented and the evidence that we presented that shows that there would be gross negligence and it occurred.

The lawsuit was file within 13 years. So there is -- there is a finding in the order, Your Honor, based upon Mr. Taylor again saying that nothing has changed. And that's what you based this Statute of Repose argument on in the order. We think that's an error based on what we presented.

THE COURT: All right.

MR. BAXTER: Your Honor, again, we presented evidence that the -- for the Statute of Repose all we have to show is that there has been -- and, again, because it's been so long originally it was 13. And now it's eight, but regardless of which year it's outside the Statute of Repose.

We have met our burden. Gene raised the issue of there being gross negligence. He has the burden of proving that. He put in Robert Taylor's deposition. The questions we have for Mr. Taylor, clearly, he does not identify any of the evidence of gross negligence.

Specifically, we went through -- okay, did you identify any violation of any statute, regulation, etc. etc. which can be evidence of gross negligence. So they've got the burden of proving gross negligence, and there is no evidence of gross negligence.

We're not obligated to disprove it. They're obligated to prove it. So I mean he's now trying to shift the burden to us saying we failed to disprove gross innocence just because he said they have -- you know, they're the ones that have to come in with some evidence. And there is zero evidence of gross negligence.

THE COURT: All right. Ms. Yates, any argument?

MS. YATES: No, Your Honor.

THE COURT: All right. Mr. Connell, anything in reply?

MR. CONNELL: Your Honor, just in reply to that, the deposition was taken with about ten parties. And each person started asking questions. And Mr. Baxter is relying on the questions he asked which at the end of the deposition, as you know, I would have been able to ask questions of the expert, too, and get it on the record.

THE COURT: Yeah, but I mean in the prior motion for summary judgment why didn't you just get an affidavit from your expert saying that it was gross negligence?

MR. CONNELL: Well, the prior motion for summary

judgment was withdrawn so that we could take his deposition.

THE COURT: Well, wait a minute.

MR. CONNELL: Is that what you're asking?

THE COURT: No. I'm talking about the -- what we're seeking reconsideration on now.

MR. CONNELL: Cause I, quite frankly, Your Honor, I didn't think that you were going to grant summary judgment when we hadn't completed the deposition.

THE COURT: Okay. All right.

MR. CONNELL: So, Your Honor, I would just say that Mr. Taylor's deposition hadn't been completed would have shed light on some of the questions that he asked and would have proven gross negligence.

THE COURT: All right. What's next.

MR. CONNELL: The next issue, Your Honor, is there is a finding of fact in the order that the 2000 settlement as Your Honor remembers now in 1999 this same things occurs. Flooding occurred and a lawsuit was brought. A settlement was entered into, and Your Honor, finds in the order that the 2000 settlement is unambiguous as to the meaning of the terms of the settlement. And as a result summary judgment is appropriate because of that settlement.

And as Your Honor may or may not remember, but during the course of our discussions about that issue I raised

the issue of what the meaning of the word were in the settlement. And as the Court probably knows most contracts are to be decided by a jury. And one of the big issues in the case is is there a release for future claims. And the Plaintiffs did not release any future claims because we thought this might happen again.

And so Your Honor's decision to find that the 2000 settlement was unambiguous we respectfully suggest that should be up to a jury. They can use that as a sword to the trial of the case, but Your Honor, finding that based upon the lack of evidence we don't think was appropriate.

THE COURT: All right. Mr. Baxter.

MR. BAXTER: Your Honor, again, the language is unambiguous, and again, I think to important distinction with us and anyone else is the fact that a settlement -- everything we had done occurred before this settlement. And Gene -- they're now saying, well, now there has been future development. There have been all of these things occurring.

In fact his own clients testified, and we didn't put those in, that, well -- we thought, you know, that the problem had been fixed at the time of the settlement. So, clearly, the language is not unambiguous. Again, I think the important distinction here is that, you know, they're talking about things occurring -- not releasing for things

that occur in the future. But nothing we've done -- everything we did occurred in the past. So we think that ruling is correct.

THE COURT: All right. Ms. Yates, Any argument?

MS. YATES: Nothing, Your Honor.

THE COURT: Anything in reply, Mr. Connell?

MR. CONNELL: Yes, Your Honor. In reply the next flooding event from the time that the lawsuit was brought in 2000 was not until 2016 when there was future development, when there was a new engineer who built a new subdivision next door when there were all these problems with the drainage.

And so it's not that it was fixed. The Plaintiffs didn't have any notice that this was going to happen again until it happened again, and its happened three times since then.

THE COURT: All right. What's next?

MR. CONNELL: Your Honor, you in your order applied the Doctrine of Res Judicata and said that these are the same parties and this is the same situation and the lawsuit that occurred in 2000 resolved that.

And, Your Honor, our argument to that is that this is a different flooding event. There are additional defendants in the case. We admit that they are the same parties. Part of the people are the same parties as there

were before. But we also would say to the Court that that it's a different event, and it's a different flooding event that happened 16 years later. And then as a result of that the Doctrine of Res Judicata could not apply.

Just like if you and I where in a motor vehicle accident today and then ten years later there is a new motor vehicle wreck you couldn't apply the Doctrine of Res Judicata to that first wreck.

THE COURT: Well, no. I mean if you and I are in a wreck and you said, "I was negligent," and ten years from now you and I are in another wreck and you.

MR. CONNELL: Yes, sir.

THE COURT: And you're relying on my negligence that happened ten year ago that would be res judicata. Is that as I understand, Mr. Baxter, you're relying on their development back in 1999 as creating a continuing nuisance that has never been remedied. But it's still what they did back in 1999.

MR. CONNELL: We're relying not only on that but on their failure to repair and fix.

THE COURT: But they don't own the property so they can't repair or fix.

MR. CONNELL: Up until 2007. That's what we're saying is the issue in the case.

THE COURT: All right.

MR. BAXTER: Your Honor, just briefly. Mr. Connell is talking damages. The res judicata goes to the allegation of negligence against my client. Using your analogy that would be like if you tried the case for an automobile accident and the jury found that, you know, that you were not negligent and then later on Mr. Connell says, "Well, now, I've got a new injury. I'm suing you for new injury arising out of the automobile accident," res judicata goes to the original finding there was no negligence.

So regardless of what damages occur the res judicata -- the allegations against my client are identical in both lawsuits, basically. So anything that they they allege against us there is in essence a finding in our favor that there was no negligence, you know, failing to perform, etc, etc. All of those things. We're adjudicated in our favor based upon the stipulation of dismissal.

So regardless whether there is some new damages we are talking about the allegations of negligence. There is what res judicata, too, because it is the same alligations.

THE COURT: Ms. Yates, anything?

MS. YATES: No, Your Honor.

THE COURT: All right. Anything in reply, Mr.

Connell?

MR. CONNELL: No, Your Honor.

THE COURT: All right. What's next?

MR. CONNELL: Your Honor, there is indication in the order that there is a release of future flood damage claims. And that -- we take the position, Your Honor, that that's not the case. There isn't any release of any future flood damages, and those are specifically reserved. And that's an issue of fact for the jury if they want to present that.

THE COURT: All right. Mr. Baxter.

MR. BAXTER: Your Honor, just the same argument about the release is unambiguous.

THE COURT: All right. That's the -- all right.

MR. CONNELL: The settlement agreement.

THE COURT: The settlement agreement. Okay. I got you.

MR. CONNELL: Yes, Your Honor.

THE COURT: All right. Ms. Yates, any position?

MS. YATES: Nothing, Your Honor.

THE COURT: All right. Mr. Connell, anything further on that issue?

MR. CONNELL: No, Your Honor.

THE COURT: All right. What's next?

MR. CONNELL: Your Honor, one of the arguments that's

put forth in the order is an argument that an order of dismissal was signed by the Court with prejudice. And the argument is you settled this case for this event. And as a result you can't bring a case for an event which occurs 16 years later.

And, Your Honor, we believe that that order would not preclude a case bring brought for an event which occurred 16 year after that event that occurred in 1999. We believe, Your Honor, that the Court was in error to respectfully in granting relief on that provision of the summary judgment order simply because the two cases are different. There are a lot of different parties that there weren't in the first case, and it's a different event.

THE COURT: All right. Mr. Baxter.

MR. BAXTER: Your Honor, again, the -- and I'm not sure what he's arguing about. Presume he's talking about the order dismissal with prejudice. Again, our argument is not the damages. Our argument is that there is res judicata as to the allegations of negligence.

Basically, there is the finding that we were not negligent. We did not fail to disclose. We did not do this, and they're wanting to relitigate the same issues and make the same allegations of negligence that were raised in previous cases. Again, that's the res judicata

argument.

THE COURT: All right. Ms. Yates?

MS. YATES: Nothing, Your Honor.

THE COURT: All right. Mr. Connell, anything in reply?

MR. CONNELL: No, Your Honor.

THE COURT: All right. What's next?

MR. CONNELL: Your Honor, we argued in our motion for reconsideration that each new flood triggers a different and new event. And that argument was not addressed in the Court's order, and we believe the Court is going -- if the Court is going to correctly reconsider the order then it ought to consider what the Plaintiffs' argument was at that time which is each event, each flooding event, is a different event.

And the Court ought to address -- if the Court doesn't agree with me then it ought to address why it doesn't think that's the case. That's not addressed in the order and that's something we need to have addressed in the case.

THE COURT: I mean if I just don't think it is then how do you want me to address it? What is it you want me to do?

MR. CONNELL: I want -- if you don't think it is then just denied it, but I just need to have you -- I need to

have the Court make a ruling on that issue. That was one of the arguments that I made before. If you don't agree I understand.

THE COURT: Yes.

MR. CONNELL: You can certainly deny it, but I just need something so that I can get review of that, Your Honor, if you please.

THE COURT: Okay. Mr. Baxter.

MR. BAXTER: One of the big issues in the case is what do you do when you have continual flooding from an event that was cause on different dates. And the Court hasn't really addressed that in the order.

THE COURT: All right. I acknowledge that it flooded in 2016 is not -- the cause is different damage than the flood in 1999. But the question is whether or not the defendant has a continuing liability in perpetuity for property that he doesn't own anymore. He can't go on and correct.

MR. CONNELL: And, respectfully ---

THE COURT: I mean I agree. If it rains today that's at different event. That's a new event than if it rained yesterday. I grant you that. It's a new event.

MR. CONNELL: Yes, sir.

THE COURT: But I don't understand how you want me to address it in the order with regards to this defendant's

motion for summary judgment?

MR. CONNELL: No case law -- the defendants have offered no case law for that position I see at all.

THE COURT: That it's not a new event or that it is a new event?

MR. CONNELL: Is or isn't. They've offered no authority for their proposition. And in the order, if Your Honor looks at it, there isn't any authority for that.

THE COURT: I mean you haven't offered any authority that it is.

MR. CONNELL: But, Your Honor, that's my point about it being a novel issue. It shouldn't be decided on summary judgment.

THE COURT: Okay. All right. What's next?

MR. CONNELL: Your Honor, I think I've covered all of them in kind of summary fashion.

THE COURT: All right. I'm going to deny your motion.

MR. CONNELL: Okay. Thank you, Your Honor.

THE COURT: All right.

MR. BAXTER: Thank you, Your Honor. Are you going to do a Form Four?

THE COURT: Yeah, I'm just going to do a Form Four. You've got it on record.

MR. CONNELL: I appreciate it.

THE COURT: What all the arguments were.

MR. CONNELL: Thank you, sir.

THE COURT: Thank you.

END OF TRANSCRIPT OF RECORD

CERTIFICATE OF REPORTER

STATE OF SOUTH CAROLINA)
)
COUNTY OF HORRY)

I, HATTIE O. GORDON, Official Court Reporter for the 4th Judicial Circuit of the State of South Carolina, do hereby certify that the foregoing is a true, accurate and complete Transcript of Record of the proceedings had and evidence introduced in the trial of the captioned case, relative to appeal, in the Court of Common Pleas for Horry County, South Carolina, on the 29th day of May, 2019.

I do further certify that I am neither of kin, counsel nor interest to any party hereto.

August 28, 2019



HATTIE O. GORDON, Court Reporter

RECEIPT FOR EXHIBITS

CASE NO. 2016-CP26-6495 JUDGE Culbertson

PLANTIFF Cornell Patton etal. PLTF'S ATTY. M. Connell

DEFENDANT: Pustwich etal. DEF'D ATTY. D. Baxter

DATE TRIAL STARTED: 2-27-19 DATE TRIAL ENDED: 2-27-19

Received of Dian L Hurley, Court Reporter for the above case, these exhibits:

	This space for Clerk of court's use
1. Plaintiffs Packet of Documents	
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This 27th day of Feb., 2019. Page ____ of ____

HORRY COUNTY CLERK OF COURT

By: Barbara Floyd

STATE OF SOUTH CAROLINA)
) IN THE COURT OF COMMON PLEAS
COUNTY OF HORRY)

CORNELL PATTON AND MELISSA PATTON,

PLAINTIFF,

VS.) DOCKET NO: 2000-CP-26-765

PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH, PIRATELAND CAMPGROUND, INC., HORRY COUNTY, AND MYRTLE BEACH AIR FORCE BASE REDEVELOPMENT AUTHORITY,

DEFENDANTS,

PIRATELAND CAMPGROUND, INC.,
THIRD PARTY PLAINTIFF,

VS.

ROBERT L. BELLAMY & ASSOCIATES, INC.,

THIRD PARTY DEFENDANT.

SCOTT WERTER AND CHARISE WERTER,

PLAINTIFF,

VS.) DOCKET NO: 2000-CP-26-775

PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH, PIRATELAND CAMPGROUND, INC., AND HORRY COUNTY,

DEFENDANTS.

PIRATELAND CAMPGROUND, INC.,
THIRD PARTY PLAINTIFF,

VS.

ROBERT L. BELLAMY & ASSOCIATES, INC.,

THIRD PARTY DEFENDANT.

PHIL EAVES,

PLAINTIFF,

VS.

PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH, PIRATELAND CAMPGROUND, INC., HORRY COUNTY, AND MYRTLE BEACH AIR FORCE BASE REDEVELOPMENT AUTHORITY,

DEFENDANTS.

DOCKET NO: 2000-CP-26-780

PIRATELAND CAMPGROUND, INC.,
THIRD PARTY PLAINTIFF,

VS.

ROBERT L. BELLAMY & ASSOCIATES, INC.,

THIRD PARTY DEFENDANT.

SCOTT PLYLER AND MICHELLE PLYLER,

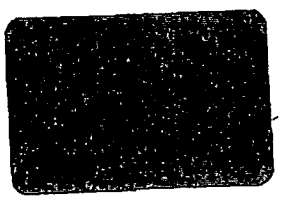
PLAINTIFFS,

VS.

PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH, PIRATELAND

DOCKET NO: 2001-CP-26-2540

HORRY COUNTY
05 SEP 26 AM 10:44
MELANIE HUGGINS
CLERK OF COURT



CAMPGROUND, INC., HORRY COUNTY AND MYRTLE BEACH AIR FORCE BASE REDEVELOPMENT AUTHORITY,

DEFENDANTS.

PIRATELAND CAMPGROUND, INC.,
THIRD PARTY PLAINTIFF,

VS.

ROBERT L. BELLAMY & ASSOCIATES, INC.,

THIRD PARTY DEFENDANT.

HORRY COUNTY
05 SEP 26 AM 10:44
MELANIE HUGGINS
CLERK OF COURT

STIPULATION OF DISMISSAL AS TO THE DEFENDANTS, PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, AND CITY OF MYRTLE BEACH

It has been made to appear to the Court that the parties hereto have settled their differences and these matters are no longer at issue as to the Defendants, Prestwick Land Limited Partnership, Jackson Companies, and City of Myrtle Beach. Upon motion of William E. Lawson, Attorney for the Defendants, Prestwick Land Limited Partnership and Jackson Companies, and Charles B. Jordan, Jr., Attorney for the Defendant, City of Myrtle Beach, with the consent of Gene M. Connell, Jr., Attorney for the Plaintiffs, Cornell Patton and Melisa Patton, Scott Werter and Charis Werter, Phil Eaves, and Scott Plyler and Michelle Plyler, IT IS HEREBY STIPULATED by and between the parties that the above

captioned matter be dismissed as to the Defendants, Prestwick Land Limited Partnership, Jackson Companies, and City of Myrtle Beach, with prejudice, pursuant to Rule 41(a)(1).

DATED THIS 12th day of September, 2005.

WE SO STIPULATE:

WILLIAM E. LAWSON,
ATTORNEY FOR DEFENDANTS,
PRESTWICK LAND LIMITED PARTNERSHIP AND JACKSON COMPANIES

CHARLES B. JORDAN, JR.,
ATTORNEY FOR DEFENDANT, THE CITY OF MYRTLE BEACH

GENE M. CONNELL, JR.
ATTORNEY FOR PLAINTIFFS

STATE OF SOUTH CAROLINA)
) SETTLEMENT AGREEMENT AND RELEASE
COUNTY OF HORRY)

KNOW ALL MEN BY THESE PRESENTS that CORNELL PATTON, MELISSA PATTON, SCOTT WERTER, CHARISE WERTER, PHIL EAVES, ELIZABETH EAVES, SCOTT PLYLER AND MICHELL PLYLER, (hereinafter referred to as "Landowners"), for and in consideration of the sum of FOUR HUNDRED SEVENTY THOUSAND AND NO/100 – ($470,000.00) - DOLLARS, and other good and valuable consideration to the undersigned in hand paid on behalf of Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., Bellamy Engineering, Inc., Horry County, and Myrtle Beach Air Force Base Redevelopment Authority, (hereinafter referred to as "Defendants") (receipt whereof is hereby acknowledged), have remised, released and forever discharged and by these presents do for me or us, my, or our heirs, executors, administrators, successors, and assigns remise, release, and forever mutually discharge the said Defendants, her/his or their heirs, executors or administrators or its successors as the case may be of and from all, and all manner of action and actions, cause and causes of action, suits, debts, sums of money, accounts, reckonings, bonds, bills, specialties, covenants, contracts, controversies, agreements, promises, variances, trespass, and trespasses, damage and damages, judgments, extents, executions, claim and claims, and demand and demands whatsoever both at law and in equity which the undersigned, , ever had, now has, or which, the undersigned, CORNELL PATTON, MELISSA PATTON, SCOTT WERTER, CHARISE WERTER, PHIL EAVES, ELIZABETH EAVES, SCOTT PLYLER AND MICHELL PLYLER, their heirs, executors, administrators, assigns or successors

hereafter can, shall, or may have, for, upon or by reason of any matter, cause or thing whatever from the beginning of the world up to the day, hour, minutes of the execution of these presents, and with special reference to the following specifically stated matter or thing, to-wit:

> **ANY AND ALL CLAIMS** for property damage/inverse condemnation, nuisance, breach of easement/negligence/trespass arising out of or in connection with drainage from the drainage easement which abutted the property of the Landowners located at Prestwick Subdivision located in Horry County, South Carolina and any and all other claims arising out of or in connection with Civil Action Nos. 2000-CP-26-0765; 2000-CP-26-0775; 2000-CP-0780; 2001-CP-26-2540 filed with the Clerk of Court for Horry County, South Carolina.

NOW THEREFORE, in consideration of the foregoing, and of the mutual promises and covenants set forth hereinafter, the parties agree as follows:

1. Payment of Settlement Amount:

Subject to all of the terms and conditions contained herein, Defendants agree to pay to the Landowners the sum of **FOUR HUNDRED SEVENTY THOUSAND AND NO/100 – ($470,000.00 - DOLLARS**. This amount shall be paid by and on behalf of Defendants in the following shares:

1) Prestwick Land Limited Partnership and the Jackson Companies: Two Hundred Forty-Six Thousand, Six Hundred Sixty-Six and 66/100 - ($246,666.66) - Dollars;

2) City of Myrtle Beach: One Hundred Twenty-Three Thousand, Three Hundred Thirty-Three and 33/100 - ($123,333.33)-Dollars;

3) Pirateland Campground, Inc. and Bellamy Engineering, Inc.: Sixty Thousand and No/100 - ($60,000.00) - Dollars; and

plain." Should the present form of the Disclosure Statement change, Plaintiffs shall check "yes" to any question, which is substantially similar to those set forth in the preceding sentence. Under the Explanation section of the Disclosure Statement, Plaintiff shall disclose that:

> AS TO LANDOWNERS PATTON: Due to Hurricane Floyd, floodwaters entered the first floor of the house. Additionally, the garage and yard experience periodic flooding. This flooding has damaged property located in the garage and the yard including landscaping and HVAC units. The berm located at the rear of the property was constructed by the homeowner and the sole responsibility for its upkeep shall be with the owner of this property. Further information may be reviewed in Civil File 2000-CP-26-765 at the Horry County Courthouse.
>
> AS TO LANDOWNERS EAVES: Due to Hurricane Floyd, floodwaters covered the first floor of the home while it was under construction. Additionally, the garage and yard experience periodic flooding. This flooding has damaged property located in the garage and the yard, including landscaping. The berm located at the rear of the property was constructed by the homeowner and the sole responsibility for its upkeep shall be with the owner of this proper. Further information may be reviewed in Civil File 2000-CP-26-780 at the Horry County Courthouse.
>
> AS TO LANDOWNERS WERTER: It is stipulated and agreed by the parties that the Werters have sold their property. Attached to the Settlement Agreement and Release is a letter of May 12th, 2005, from Edward T. Kelaher to H.J. Haar, Esquire, with attached State of South Carolina Residential Property Condition Disclosure Statement that it is incorporated within this Release as fully as if repeated verbatim. Further information may be reviewed in Civil File 2000-CP-26-775 at the Horry County Courthouse.
>
> AS TO LANDOWNERS PLYLER: The Plylers have had standing water on their property. The berm located at the rear of the property was constructed by the landowners and the sole responsibility for its upkeep shall be with the owner of this property. Further information may be reviewed in Civil File No. 01-CP-26-2540 at the Horry County Courthouse.

4. Dismissal

Within ten (10) business days of receipt of the Settlement Amount, Landowners agree to dismiss, with prejudice, the above-described actions. Defendants agree to consent to the filing of the dismissal and to sign the same.

5. Confidentiality:

The parties agree to keep the terms of this Agreement confidential. The terms of this Agreement must be disclosed by the Landowners, their heirs, executors, administrators, assigns and successors, to any person obtaining an interest in Landowners' property. The Defendants shall have the right, but not the obligation, to advise any subsequent Purchasers of the Landowners' property of the contents of this Settlement Agreement and Release. Further, the terms of this Agreement may be disclosed to a parties' insurer and in any action concerning the terms of this Agreement.

6. No Admissions:

The parties agree that this Agreement is executed in compromise of disputed claims, that neither this Agreement nor the payment of the Settlement Amounts shall be construed as an admission of liability on the part of any Defendant. Each Defendant specifically denies liability to any and all Landowners and wishes merely to avoid the expense, inconvenience, and uncertainty of continued litigation and to resolve this matter by compromise and so that each Defendant may avoid any future claims and causes of action related to any future flooding of Landowners' property.

7. No Assignment

Landowners warrant that none has assigned, transferred, or conveyed in any manner all or any part of their legal claims or legal rights against any or all of Defendants in connection with the matters described in the pleadings in the Actions.

8. Construction

The parties to this Agreement have had the full benefit of counsel and enter into this agreement freely, voluntarily, and knowingly. This Agreement has likewise been reviewed by counsel for all parties, and accordingly should be deemed to be jointly drafted.

9. Entire Agreement.

This Agreement is an integrated agreement, containing the entire understanding between the parties regarding the matters addressed herein and, except as set forth in this Agreement, no representations, warranties or promises have been made or relied upon by the parties to this Agreement. This Agreement shall prevail over all prior communications regarding the matters contained herein.

IN WITNESS WHEREOF, the parties, have executed this agreement as of the 2 day of ~~August~~ September, 2005.

LANDOWNERS:

CORNELL PATTON

MELISSA PATTON

WITNESSES:

Michelle Sanders

SCOTT WERTER

CHARISE WERTER

WITNESSES:

Michelle Sanders

PHIL EAVES

ELIZABETH EAVES

WITNESSES:

Michelle Sanders

SCOTT PLYLER

MICHELL PLYLER

WITNESSES:

Michelle Sanders

STATE OF SOUTH CAROLINA)
)
COUNTY OF HORRY)

IN THE COURT OF COMMON PLEAS
FIFTEENTH JUDICIAL CIRCUIT

Cornell Patton and Melissa Patton,)
)
Plaintiff,)
)
-vs-)
)
Prestwick Land Limited Partnership,)
Jackson Companies, City of Myrtle)
Beach, Pirateland Campground, Inc.,)
and Horry County,)
)
Defendants.)

COVER SHEET FOR CIVIL ACTION

Docket No.: 2000-765

00 FEB 24 A 10:

The cover sheet and the information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. The form is required for the use of the Clerk of Court for the purpose of docketing. It must be filled out completely, signed, and dated. **A copy of this Cover Sheet must be served on the defendant(s) along with the Summons and Complaint.**

NATURE OF ACTION: *(Check one category for the main cause of action)*

( ) TORT – Motor Vehicle
( ) TORT – Professional Malpractice
( ) TORT – Unfair Trade Practices, and Other Economic or Business-Related Wrongs
( ) TORT – Products Liability
(X) TORT – General or Other

( ) PCR

( ) GOV/ADM – Property Seizure
( ) GOV/ADM – General or Other

( ) CONTRACT – Debt Collection
( ) CONTRACT – Employment
( ) CONTRACT – Construction
( ) CONTRACT – Wrongful Breach
( ) CONTRACT – General or Other

( ) REAL PROPERTY

( ) MINOR SETTLEMENTS
( ) DOMESTICATE FOREIGN JUDGMENT
( ) OTHER *(Please Describe)*

JURY DEMAND (X) YES ( ) NO

Note: Information requested on this form is preliminary in nature, and for administrative purposes only. The response to this request for information on jury demand merely indicates a likelihood that a jury trial will or will not be requested and does NOT constitute a demand for or a waiver of trial by jury pursuant to applicable rules or statutes.

DOCKETING INFORMATION *(Check one box)*

( ) This case is subject to arbitration (all cases with monetary damages less than $25,000 are subject to arbitration, unless otherwise exempt).
(X) This case is subject to mediation (all cases not subject to arbitration must be mediated, unless otherwise exempt).
( ) This case is exempt from ADR, and certificate is attached.

Gene M. Connell, Jr.
Name of Plaintiff/Plaintiff's Attorney (please type or print clearly)

Signature of Plaintiff/Plaintiff's Attorney
KELAHER, CONNELL & CONNOR, P.C.
Post Office Drawer 14547
Surfside Beach, SC 29587-4547
(843) 238-5648

Date: February 16, 2000

564

SEE REVERSE SIDE FOR FURTHER IMPORTANT INFORMATION

STATE OF SOUTH CAROLINA)
)
COUNTY OF HORRY)

IN THE COURT OF COMMON PLEAS
FIFTEENTH JUDICIAL CIRCUIT
C/A NO. 2000-CP-26-765

Cornell Patton and Melissa Patton,

Plaintiff,

-vs-

Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., and Horry County,

Defendants.

SUMMONS

00 FEB 24 AM 9:36

TO: THE DEFENDANT ABOVE-NAMED:

YOU ARE HEREBY SUMMONED and required to answer the Complaint in this action, of which a copy is herewith served upon you, and to serve a copy of your answer to the said Complaint on the subscriber or subscribers at his or their office at Suite 209, The Courtyard, 1500 U.S. Highway 17 North, Post Office Drawer 14547, Surfside Beach, South Carolina 29587 within thirty (30) days after the service hereof; exclusive of the day of such service; and if you fail to answer the Complaint within the time aforesaid; the Plaintiff in this action will apply to the Court for the relief demanded in the Complaint and judgment by default will be rendered against you for the relief demanded in the Complaint.

KELAHER, CONNELL & CONNOR, P.C.

Gene M. Connell, Jr.
Suite 209 The Courtyard
1500 U.S. Highway 17 North
Post Office Drawer 14547
Surfside Beach, SC 29587-4547
(843) 238-5648
Attorney for Plaintiff

February 16, 2000
Surfside Beach, SC

STATE OF SOUTH CAROLINA	)	IN THE COURT OF COMMON PLEAS
	)	FIFTEENTH JUDICIAL CIRCUIT
COUNTY OF HORRY	)	C/A NO. 2000-CP-26-_____
Cornell Patton and Melissa Patton,	)	
	)	
Plaintiff,	)	
	)	
-vs-	)	COMPLAINT
	)	
Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., and Horry County,	)	(Property Damage/Inverse Condemnation/ Negligence/Trespass)
	)	
	)	JURY TRIAL DEMANDED
Defendants.	)	

The Plaintiffs, complaining of the Defendants, would respectfully allege unto this Court as follows:

1. The Plaintiffs are owners and residents of 1288 Strathmill Court, Myrtle Beach, South Carolina, located in the Prestwick community.

2. The Defendant, Prestwick Land Limited Partnership, is a partnership organized and existing pursuant to the laws of the State of South Carolina and doing business as a developer of the Prestwick Subdivision.

3. The Defendant, Jackson Companies, is a corporation organized and existing pursuant to the laws of the State of South Carolina, and, upon information and belief, is the owner of Prestwick Land Limited Partnership and/or the General Partner.

4. The Defendant, City of Myrtle Beach, is a governmental entity organized and existing pursuant to the laws of the State of South Carolina and doing business as a City.

5. The Defendant, Pirateland Campground, Inc., is a campground organized and existing as a corporation for recreational campground.

6. The Defendant, Horry County, is a governmental entity organized and existing pursuant to the laws of the State of South Carolina and doing business as a County.

7. That the Plaintiffs purchased a lot in the Prestwick Subdivision with the address known as 1288 Strathmill Court, Myrtle Beach, South Carolina 29575.

8. That the Plaintiffs, after purchasing this lot, did build a residence upon the lot which was to be where they were going to live.

9. That prior to purchasing the lot the Plaintiffs were shown what was called "a small creek" which abutted the Plaintiffs' property.

10. That the Plaintiffs were provided with a Property Report which stated that "None of the lots or any portion of any lot are covered by water at any time of the year." The Property Report further stated that "None of the lots in this Property Report are located within a flood plain." Also, the Property Report stated that "None of the lots in the subdivision required drainage."

11. That because of the representations made in this Report the Plaintiffs purchased their property.

12. That, in fact, the property in question had been subject to flooding from a drainage ditch which was represented to the Plaintiffs as "a creek" previous to the Plaintiffs purchasing the property.

13. That the Defendants, Jackson Companies and Prestwick Land Limited Partnership, were aware of potential flooding from the drainage easement and insisted to the Plaintiffs that in fact the property had not flooded.

14. That these Defendants, through their officers, agents and/or employees, were negligent, reckless, willful and wanton in one or more of the following particulars:

a. in failing to inform Plaintiffs that the drainage easement would flood their property;

b. in providing the Plaintiffs with a Property Report which stated that no flooding had ever occurred when this was, in fact, not true;

c. in providing the Plaintiffs with a Property Report which stated that the property had never been under water when, in fact, this was not true;

d. in failing to advise the Plaintiffs that the property sometimes flooded and, in fact, had been under water;

e. in failing to warn, advise and inform the Plaintiffs that the drainage easement sometimes flooded;

f. in failing to advise the Plaintiffs that the creek on the back of the property drained the entire Air Force Base property;

g. in failing to inform the Plaintiffs that during times of heavy rains their property would flood;

h. in failing to inspect the property to make sure that it would not flood prior to purchase by the Plaintiffs;

i. in designing the creek in such a way so that all the water from Prestwick would flow through the Plaintiffs' property and cause flooding;

j. in connecting a series of ditches and pipes so that all the water would flow through the drainage easement unto the Plaintiffs' property;

k. in channeling water in such a way that would flood the Plaintiffs' home and property;

l. in failing to devise a method for channeling water away from the Plaintiffs' property;

m. in failing to advise the Plaintiffs that water would channel over their property;

n. in failing to drain water into spillways and/or divert water away from the Plaintiffs' property.

15. That as a direct and proximate result, the Plaintiffs suffered severe and catastrophic damage to their home and residence, including floodwater inside their home, damage to their personal property, damage to their floors, walls, electrical, baseboards, air conditioning, heating, tile, and other aspects of their home.

16. That Plaintiffs suffered damages, not including depreciation, damages as a stigmatized or distressed property and loss of value, loss of use, and must disclose the flooding problem, thus, reducing market value to their home as a result of this incident.

17. That the Plaintiffs ask for judgment against Defendant Jackson Companies and Defendant Prestwick Land Limited Partnership for actual damages, punitive damages, and for the costs of this action.

FOR A SECOND CAUSE OF ACTION
AS TO THE DEFENDANTS, PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH
(Nuisance)

18. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

19. All of the above-named Defendants' conduct in channeling water through various pipes and ditches onto the Plaintiffs' property resulted in an unreasonable interference with Plaintiffs' use and enjoyment of their property, which reoccurs every time there is heavy rain.

20. The aforementioned action is a nuisance and severe damage has been done to the Plaintiffs' property as outlined in the First Cause of Action.

21. The Plaintiffs ask for judgment against these Defendants for actual damages for nuisance and also request a permanent injunction requiring these Defendants to not channel water through ditches and the like onto or near the Plaintiffs' property.

FOR A THIRD CAUSE OF ACTION
AS TO THE DEFENDANT PIRATELAND CAMPGROUND
(Negligence)

22. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

23. That the Defendant Pirateland Campground, through its officers, agents and/or employees, did build a road downstream from the Plaintiff, across the creek and/or drainage easement.

24. That when this road was built so that the Defendant Pirateland could use the land on the other side of the creek to park campers the Defendant Pirateland, through its officers, agents and/or employees, failed to put appropriate piping to allow the water to drain underneath the road into the ocean.

25. That the Defendant Pirateland Campground was negligent, reckless, willful and wanton in one or more of the following particulars:

a. in failing to have an engineer size the pipes in such a manner so that the water would not back up on the Plaintiffs' property;

b. in putting in undersized pipes so that the water would not drain;

c. in failing to provide such engineering that the entire creek did drain as it had before the road was placed across;

d. in failing to have proper engineering advice or expertise before building the road and placing the pipes underneath the road;

e. in failing to warn the Plaintiff of the undersized pipes;

f. in failing to inspect the work to make sure that undersized pipes were not placed under the road.

26. That as a direct and proximate result, the Plaintiffs suffered severe and catastrophic damage to their home and property; that one of the causes of this damage was this Defendant's

building of a road and blocking downstream the drainage easement with undersized pipe; that Plaintiffs suffered property depreciation, property damage, damage to their home, will continue to have damage to their home during heavy rain, are the owners of a distressed property, and will be unable to sell the property for what they paid for it because they will have to disclose the flooding that occurred.

27. That Plaintiffs ask for judgment against Pirateland for actual damages, punitive damages and for the costs of this action.

FOR A FOURTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Breach of Easement/Negligence)

28. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

29. The drainage ditch which abuts the Plaintiffs' property is, in fact, the drainage ditch which goes all the way from the former Myrtle Beach Air Force Base into the Atlantic Ocean through Pirateland Campground.

30. That the Defendants, City of Myrtle Beach and Horry County, had an agreement with the United States Air Force to cover any and all rights and liabilities of the United States Air Force when the property was purchased.

31. That an easement exists as of October 30, 1958 wherein the United States Air Force was to maintain an easement for water drainage through a channel that would go by the Plaintiffs' property through Pirateland Campground and into the Atlantic Ocean.

32. The Defendants, City of Myrtle Beach and Horry County, took over this easement when they took over the former Myrtle Beach Air Force Base property.

33. That this easement provided that the United States Air Force and its successors in interest, the City of Myrtle Beach and Horry County, were to maintain the easement including to trim all underbrush, remove any trees and obstructions, including vegetation structures or obstacles within the limits of the right of way as is necessary to provide adequate clearance and to eliminate interference with.

34. That the aforementioned drainage easement was never maintained by the City of Myrtle Beach or Horry County.

35. That after the Plaintiffs' property flooded, Plaintiffs complained to the City of Myrtle Beach, and at that point the City of Myrtle Beach employees, officers, and/or agents did begin the job of maintaining the easement and clearing the easement of all obstructions.

36. That for years these obstructions through the drainage easement were not cleared such that it caused water to back up onto Plaintiffs' property.

37. That Defendants, City of Myrtle Beach and Horry County, through their officers, agents and/or employees, were negligent, reckless, willful, and wanton in one or more of the following particulars:

a. in failing to maintain the easement;

b. in failing to keep the underbrush out of the drainage easement;

c. in failing to maintain the easement on a regular basis;

d. in failing to inspect the easement for obstruction;

e. in failing to perform under the terms of the easement;

f. in failing to have regular work crews clean the easement.

38. That as a direct and proximate result the Plaintiffs suffered severe damage to their property and home by waters which came onto their property and into their house. That Plaintiffs

have suffered depreciation to their property, loss of personal property, loss of real property, damage to the interior and exterior of their home, and will continue to have these problems for the remainder of the time they live on the aforementioned property.

39. That Plaintiffs ask for judgment against Defendants for actual damages, punitive damages, and the costs of this action.

FOR A FIFTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Breach of Easement)

40. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

41. That Defendants, City of Myrtle Beach and Horry County, as successors in interest to United States of America did breach their agreement to Plaintiffs to keep the aforementioned easement clean, maintained and inspected so that water would move in an unobstructed manner through the drainage easement.

42. The Plaintiffs ask for damages against the City of Myrtle Beach and Horry County for breach of its easement as more particularly described in the aforementioned cause of action.

43. The Plaintiffs ask for judgment against these Defendants for breach of easement, for attorney's fees and for costs.

FOR A SIXTH CAUSE OF ACTION
AS TO THE DEFENDANTS JACKSON COMPANIES AND PRESTWICK
(Negligence)

44. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

45. That the Defendants Jackson Companies along with Prestwick/Prestwick Land Limited Partnership are the owners of many areas upstream from Plaintiffs' property.

46. That the Defendant Jackson Companies along with Prestwick Land Limited Partnership Corporation has constructed many artificial drainage ditches throughout their property, including Prestwick and Crystal Lakes. That these drainage ditches all connect to a drainage ditch which flooded Plaintiffs' property.

47. That these Defendants did channel water directly into the drainage ditch which damaged Plaintiffs' property.

48. That the Defendant Jackson Companies was negligent, reckless, willful and wanton in one or more of the following particulars:

a. in building artificial channels to direct water to Plaintiffs' property;

b. in failing to warn Plaintiffs;

c. in failing to maintain drainage easement;

d. in failing to do a drainage study before connecting ditches to the ditch which caused damage to Plaintiffs' property;

e. in failing to inspect, engineer, investigate, and advise Plaintiffs that this Defendant was connecting other ditches upstream which would dump water on the Plaintiffs' property.

49. That Plaintiffs will continue to suffer flooding; will have ongoing damages, have property damage from the last heavy rain, are unable to sell their property for a fair market price, have a distressed property because of the flooding and will be required to disclose the flooding problem for the remainder of time which Plaintiffs live there. That Plaintiffs will be unable to sell their property at a reasonable price. That the damages sustained are a direct result of the artificial channeling by these Defendants.

50. That Plaintiffs ask for damages against Prestwick and Jackson Companies for actual and punitive damages:

FOR A SEVENTH CAUSE OF ACTION
AS TO ALL DEFENDANTS
(Trespass)

51. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

52. That water from all Defendants' properties was channeled officially onto the Plaintiffs' property.

53. That the aforementioned channeling is a trespass and has caused damage to the Plaintiffs' property, caused erosion, and has threatened Plaintiffs' home and lot.

54. That Defendants through a master drainage stormwater management system have in effect devised and/or connected all ditches such that water flows over Plaintiffs' property.

55. That after each rain Plaintiffs have significant erosion and damage to their property and, thus, there is a continual trespass on Plaintiffs' property.

56. That Plaintiffs have tried to mitigate their damages, but have been unable to do so.

57. That stormwater from all the Defendants' property is physically moved onto the Plaintiffs' property in a deliberate scheme and/or plan.

58. That the aforementioned affirmative acts by all Defendants invade the Plaintiffs' property in an intentional manner and cause great and grievous irreparable harm to the Plaintiffs' property.

59. That Plaintiffs asks for an injunction requiring all Defendants to immediately cease and desist from channeling artificially any water into ditches which flow through the Plaintiffs' property since this causes irreparable harm to Plaintiffs' property.

60. That Plaintiffs further asks this Court to issue its Order requiring all Defendants to halt this continuing trespass immediately.

61. Further, the Plaintiffs ask for damages to their home, their property, for depreciation because they are unable to sell their house, for loss of use of the property, and for a fix moving the water away from Plaintiffs' property.

62. That Plaintiffs ask this Court issue its order awarding damages to the Plaintiffs enjoining all Defendants from dumping water artificially into the easement and for such other and further relief as the Court may deem just, necessary and proper.

FOR AN EIGHTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Inverse Condemnation)

63. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

64. That the Defendants City of Myrtle Beach and Horry County, through affirmative, aggressive, governmental acts, have effectively condemned Plaintiffs' property by allowing all of the stormwater from Myrtle Beach Air Force Base to be channeled artificially along the rear of Plaintiffs' property.

65. That these governmental Defendants entered into a common scheme or plan whereby all of the water from the Myrtle Beach Air Force Base, Crystal Lakes, and Prestwick was channeled through various pipes and ditches to the Plaintiffs' home.

66. That these acts by these Defendants were affirmative, positive and aggressive acts and were taken on behalf of the Defendants City of Myrtle Beach and Horry County for a public purpose and that they are, in fact, permanent since the drainage system for the entire Myrtle Beach Air Force Base runs next to the Plaintiffs' property.

67. That Plaintiffs believe that their property has been inversely condemned as mentioned in the first cause of action each time heavy rains occur Plaintiffs suffer irreparable harm and erosion.

68. That the Plaintiffs have suffered damages as outlined in the first cause of action and further suffer continuing irreparable harm and ask that the Court issue its Order awarding actual damages to Plaintiffs and also enjoining these Defendants from channeling any water through the pipes and/or ditches under and around the Plaintiffs' property.

69. That the acts of these Defendants are intentional, aggressive and act on behalf of a governmental agency.

70. Further, that this is a taking of private property for public purpose in violation of the United States and South Carolina Constitutions and that Plaintiffs request actual damages, an injunction, and attorney's fees as required by state law.

WHEREFORE, Plaintiffs request judgment as follows:

A. On the First Cause of Action for actual damages, punitive damages and the costs of this action.

B. On the Second Cause of Action as to all Defendants for actual damages, punitive damages and the costs of this action.

C. On the Third Cause of Action as to Pirateland for actual and punitive damages.

D. On the Fourth Cause of Action as to the City of Myrtle Beach and Horry County for actual and punitive damages.

E. On the Fifth Cause of Action as to City of Myrtle Beach and Horry County for actual and punitive damages.

F. On the Sixth Cause of Action as to Prestwick and Jackson Companies for actual and punitive damages.

G. On the Seventh Cause of Action against all Defendants for actual and punitive damages.

H. On the Eighth Cause of Action against the Defendant City of Myrtle Beach and Defendant Horry County for actual damages, punitive damages, and attorney fees.

KELAHER, CONNELL & CONNOR, P.C.

Gene M. Connell, Jr.
Suite 209 The Courtyard
1500 U.S. Highway 17 North
Post Office Drawer 14547
Surfside Beach, SC 29587-4547
(843) 238-5648
Attorney for Plaintiff

February 16, 2000
Surfside Beach, SC

STATE OF SOUTH CAROLINA)
)
COUNTY OF HORRY)

IN THE COURT OF COMMON PLEAS
FIFTEENTH JUDICIAL CIRCUIT

Phil Eaves,

Plaintiff,

-vs-

Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., and Horry County,

Defendants.

COVER SHEET FOR CIVIL ACTION

00 FEB 24 AM 10:13

Docket No.: 2000-780

The cover sheet and the information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. The form is required for the use of the Clerk of Court for the purpose of docketing. It must be filled out completely, signed, and dated. **A copy of this Cover Sheet must be served on the defendant(s) along with the Summons and Complaint.**

NATURE OF ACTION: *(Check one category for the main cause of action)*

( ) TORT – Motor Vehicle
( ) TORT – Professional Malpractice
( ) TORT – Unfair Trade Practices, and Other Economic or Business-Related Wrongs
( ) TORT – Products Liability
(✓) TORT – General or Other

( ) PCR

( ) GOV/ADM – Property Seizure
( ) GOV/ADM – General or Other

( ) CONTRACT – Debt Collection
( ) CONTRACT – Employment
( ) CONTRACT – Construction
( ) CONTRACT – Wrongful Breach
( ) CONTRACT – General or Other

( ) REAL PROPERTY

( ) MINOR SETTLEMENTS
( ) DOMESTICATE FOREIGN JUDGMENT
( ) OTHER *(Please Describe)* _____

JURY DEMAND (X) YES ( ) NO

Note: Information requested on this form is preliminary in nature, and for administrative purposes only. The response to this request for information on jury demand merely indicates a likelihood that a jury trial will or will not be requested and does NOT constitute a demand for or a waiver of trial by jury pursuant to applicable rules or statutes.

DOCKETING INFORMATION *(Check one box)*

( ) This case is subject to arbitration (all cases with monetary damages less than $25,000 are subject to arbitration, unless otherwise exempt).
(✓) This case is subject to mediation (all cases not subject to arbitration must be mediated, unless otherwise exempt).
( ) This case is exempt from ADR, and certificate is attached.

Gene M. Connell, Jr.
Name of Plaintiff/Plaintiff's Attorney (please type or print clearly)

Signature of Plaintiff/Plaintiff's Attorney
KELAHER, CONNELL & CONNOR, P.C.
Post Office Drawer 14547
Surfside Beach, SC 29587-4547
(843) 238-5648

Date: February 16, 2000

SEE REVERSE SIDE FOR FURTHER IMPORTANT INFORMATION

STATE OF SOUTH CAROLINA)	IN THE COURT OF COMMON PLEAS
)	FIFTEENTH JUDICIAL CIRCUIT
COUNTY OF HORRY)	C/A NO. 2000-CP-26-780

Phil Eaves,

Plaintiff,

-vs-

Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., and Horry County,

Defendants.

SUMMONS

FILED
00 FEB 24 AM 10:13

TO: THE DEFENDANT ABOVE-NAMED:

YOU ARE HEREBY SUMMONED and required to answer the Complaint in this action, of which a copy is herewith served upon you, and to serve a copy of your answer to the said Complaint on the subscriber or subscribers at his or their office at Suite 209, The Courtyard, 1500 U.S. Highway 17 North, Post Office Drawer 14547, Surfside Beach, South Carolina 29587 within thirty (30) days after the service hereof; exclusive of the day of such service; and if you fail to answer the Complaint within the time aforesaid; the Plaintiff in this action will apply to the Court for the relief demanded in the Complaint and judgment by default will be rendered against you for the relief demanded in the Complaint.

KELAHER, CONNELL & CONNOR, P.C.

Gene M. Connell, Jr.
Suite 209 The Courtyard
1500 U.S. Highway 17 North
Post Office Drawer 14547
Surfside Beach, SC 29587-4547
(843) 238-5648
Attorney for Plaintiff

February 16, 2000
Surfside Beach, SC

STATE OF SOUTH CAROLINA)	IN THE COURT OF COMMON PLEAS
)	FIFTEENTH JUDICIAL CIRCUIT
COUNTY OF HORRY)	C/A NO. 2000-CP-26-_____

Phil Eaves,

Plaintiff,

-vs-

Prestwick Land Limited Partnership, Jackson Companies, City of Myrtle Beach, Pirateland Campground, Inc., and Horry County,

Defendants.

COMPLAINT

(Property Damage/Inverse Condemnation/ Negligence/Trespass)

JURY TRIAL DEMANDED

00 FEB 24 AM 10:13

The Plaintiffs, complaining of the Defendants, would respectfully allege unto this Court as follows:

1. The Plaintiffs are owners and residents of 1284 Strathmill Court, Myrtle Beach, South Carolina, located in the Prestwick community.

2. The Defendant, Prestwick Land Limited Partnership, is a partnership organized and existing pursuant to the laws of the State of South Carolina and doing business as a developer of the Prestwick Subdivision.

3. The Defendant, Jackson Companies, is a corporation organized and existing pursuant to the laws of the State of South Carolina, and, upon information and belief, is the owner of Prestwick Land Limited Partnership and/or the General Partner.

4. The Defendant, City of Myrtle Beach, is a governmental entity organized and existing pursuant to the laws of the State of South Carolina and doing business as a City.

5. The Defendant, Pirateland Campground, Inc., is a campground organized and existing as a corporation for recreational campground.

6. The Defendant, Horry County, is a governmental entity organized and existing pursuant to the laws of the State of South Carolina and doing business as a County.

7. That the Plaintiffs purchased a lot in the Prestwick Subdivision with the address known as 1284 Strathmill Court, Myrtle Beach, South Carolina 29575.

8. That the Plaintiffs, after purchasing this lot, did build a residence upon the lot which was to be where they were going to live.

9. That prior to purchasing the lot the Plaintiffs were shown what was called "a small creek" which abutted the Plaintiffs' property.

10. That the Plaintiffs were provided with a Property Report which stated that "None of the lots or any portion of any lot are covered by water at any time of the year." The Property Report further stated that "None of the lots in this Property Report are located within a flood plain." Also, the Property Report stated that "None of the lots in the subdivision required drainage."

11. That because of the representations made in this Report the Plaintiffs purchased their property.

12. That, in fact, the property in question had been subject to flooding from a drainage ditch which was represented to the Plaintiffs as "a creek" previous to the Plaintiffs purchasing the property.

13. That the Defendants, Jackson Companies and Prestwick Land Limited Partnership, were aware of potential flooding from the drainage easement and insisted to the Plaintiffs that in fact the property had not flooded.

14. That these Defendants, through their officers, agents and/or employees, were negligent, reckless, willful and wanton in one or more of the following particulars:

a. in failing to inform Plaintiffs that the drainage easement would flood their property;

b. in providing the Plaintiffs with a Property Report which stated that no flooding had ever occurred when this was, in fact, not true;

c. in providing the Plaintiffs with a Property Report which stated that the property had never been under water when, in fact, this was not true;

d. in failing to advise the Plaintiffs that the property sometimes flooded and, in fact, had been under water;

e. in failing to warn, advise and inform the Plaintiffs that the drainage easement sometimes flooded;

f. in failing to advise the Plaintiffs that the creek on the back of the property drained the entire Air Force Base property;

g. in failing to inform the Plaintiffs that during times of heavy rains their property would flood;

h. in failing to inspect the property to make sure that it would not flood prior to purchase by the Plaintiffs;

i. in designing the creek in such a way so that all the water from Prestwick would flow through the Plaintiffs' property and cause flooding;

j. in connecting a series of ditches and pipes so that all the water would flow through the drainage easement unto the Plaintiffs' property;

k. in channeling water in such a way that would flood the Plaintiffs' home and property;

l. in failing to devise a method for channeling water away from the Plaintiffs' property;

m. in failing to advise the Plaintiffs that water would channel over their property;

n. in failing to drain water into spillways and/or divert water away from the Plaintiffs' property.

15. That as a direct and proximate result, the Plaintiffs suffered severe and catastrophic damage to their home and residence, including floodwater inside their home, damage to their personal property, damage to their floors, walls, electrical, baseboards, air conditioning, heating, tile, and other aspects of their home.

16. That Plaintiffs suffered damages, not including depreciation, damages as a stigmatized or distressed property and loss of value, loss of use, and must disclose the flooding problem, thus, reducing market value to their home as a result of this incident.

17. That the Plaintiffs ask for judgment against Defendant Jackson Companies and Defendant Prestwick Land Limited Partnership for actual damages, punitive damages, and for the costs of this action.

FOR A SECOND CAUSE OF ACTION
AS TO THE DEFENDANTS, PRESTWICK LAND LIMITED PARTNERSHIP, JACKSON COMPANIES, CITY OF MYRTLE BEACH
(Nuisance)

18. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

19. All of the above-named Defendants' conduct in channeling water through various pipes and ditches onto the Plaintiffs' property resulted in an unreasonable interference with Plaintiffs' use and enjoyment of their property, which reoccurs every time there is heavy rain.

20. The aforementioned action is a nuisance and severe damage has been done to the Plaintiffs' property as outlined in the First Cause of Action.

21. The Plaintiffs ask for judgment against these Defendants for actual damages for nuisance and also request a permanent injunction requiring these Defendants to not channel water through ditches and the like onto or near the Plaintiffs' property.

FOR A THIRD CAUSE OF ACTION
AS TO THE DEFENDANT PIRATELAND CAMPGROUND
(Negligence)

22. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

23. That the Defendant Pirateland Campground, through its officers, agents and/or employees, did build a road downstream from the Plaintiff, across the creek and/or drainage easement.

24. That when this road was built so that the Defendant Pirateland could use the land on the other side of the creek to park campers the Defendant Pirateland, through its officers, agents and/or employees, failed to put appropriate piping to allow the water to drain underneath the road into the ocean.

25. That the Defendant Pirateland Campground was negligent, reckless, willful and wanton in one or more of the following particulars:

a. in failing to have an engineer size the pipes in such a manner so that the water would not back up on the Plaintiffs' property;

b. in putting in undersized pipes so that the water would not drain;

c. in failing to provide such engineering that the entire creek did drain as it had before the road was placed across;

d. in failing to have proper engineering advice or expertise before building the road and placing the pipes underneath the road;

e. in failing to warn the Plaintiff of the undersized pipes;

f. in failing to inspect the work to make sure that undersized pipes were not placed under the road.

26. That as a direct and proximate result, the Plaintiffs suffered severe and catastrophic damage to their home and property; that one of the causes of this damage was this Defendant's

building of a road and blocking downstream the drainage easement with undersized pipe; that Plaintiffs suffered property depreciation, property damage, damage to their home, will continue to have damage to their home during heavy rain, are the owners of a distressed property, and will be unable to sell the property for what they paid for it because they will have to disclose the flooding that occurred.

27. That Plaintiffs ask for judgment against Pirateland for actual damages, punitive damages and for the costs of this action.

FOR A FOURTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Breach of Easement/Negligence)

28. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

29. The drainage ditch which abuts the Plaintiffs' property is, in fact, the drainage ditch which goes all the way from the former Myrtle Beach Air Force Base into the Atlantic Ocean through Pirateland Campground.

30. That the Defendants, City of Myrtle Beach and Horry County, had an agreement with the United States Air Force to cover any and all rights and liabilities of the United States Air Force when the property was purchased.

31. That an easement exists as of October 30, 1958 wherein the United States Air Force was to maintain an easement for water drainage through a channel that would go by the Plaintiffs' property through Pirateland Campground and into the Atlantic Ocean.

32. The Defendants, City of Myrtle Beach and Horry County, took over this easement when they took over the former Myrtle Beach Air Force Base property.

33. That this easement provided that the United States Air Force and its successors in interest, the City of Myrtle Beach and Horry County, were to maintain the easement including to trim all underbrush, remove any trees and obstructions, including vegetation structures or obstacles within the limits of the right of way as is necessary to provide adequate clearance and to eliminate interference with.

34. That the aforementioned drainage easement was never maintained by the City of Myrtle Beach or Horry County.

35. That after the Plaintiffs' property flooded, Plaintiffs complained to the City of Myrtle Beach, and at that point the City of Myrtle Beach employees, officers, and/or agents did begin the job of maintaining the easement and clearing the easement of all obstructions.

36. That for years these obstructions through the drainage easement were not cleared such that it caused water to back up onto Plaintiffs' property.

37. That Defendants, City of Myrtle Beach and Horry County, through their officers, agents and/or employees, were negligent, reckless, willful, and wanton in one or more of the following particulars:

a. in failing to maintain the easement;

b. in failing to keep the underbrush out of the drainage easement;

c. in failing to maintain the easement on a regular basis;

d. in failing to inspect the easement for obstruction;

e. in failing to perform under the terms of the easement;

f. in failing to have regular work crews clean the easement.

38. That as a direct and proximate result the Plaintiffs suffered severe damage to their property and home by waters which came onto their property and into their house. That Plaintiffs

have suffered depreciation to their property, loss of personal property, loss of real property, damage to the interior and exterior of their home, and will continue to have these problems for the remainder of the time they live on the aforementioned property.

39. That Plaintiffs ask for judgment against Defendants for actual damages, punitive damages, and the costs of this action.

FOR A FIFTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Breach of Easement)

40. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

41. That Defendants, City of Myrtle Beach and Horry County, as successors in interest to United States of America did breach their agreement to Plaintiffs to keep the aforementioned easement clean, maintained and inspected so that water would move in an unobstructed manner through the drainage easement.

42. The Plaintiffs ask for damages against the City of Myrtle Beach and Horry County for breach of its easement as more particularly described in the aforementioned cause of action.

43. The Plaintiffs ask for judgment against these Defendants for breach of easement, for attorney's fees and for costs.

FOR A SIXTH CAUSE OF ACTION
AS TO THE DEFENDANTS JACKSON COMPANIES AND PRESTWICK
(Negligence)

44. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

45. That the Defendants Jackson Companies along with Prestwick/Prestwick Land Limited Partnership are the owners of many areas upstream from Plaintiffs' property.

46. That the Defendant Jackson Companies along with Prestwick Land Limited Partnership Corporation has constructed many artificial drainage ditches throughout their property, including Prestwick and Crystal Lakes. That these drainage ditches all connect to a drainage ditch which flooded Plaintiffs' property.

47. That these Defendants did channel water directly into the drainage ditch which damaged Plaintiffs' property.

48. That the Defendant Jackson Companies was negligent, reckless, willful and wanton in one or more of the following particulars:

a. in building artificial channels to direct water to Plaintiffs' property;

b. in failing to warn Plaintiffs;

c. in failing to maintain drainage easement;

d. in failing to do a drainage study before connecting ditches to the ditch which caused damage to Plaintiffs' property;

e. in failing to inspect, engineer, investigate, and advise Plaintiffs that this Defendant was connecting other ditches upstream which would dump water on the Plaintiffs' property.

49. That Plaintiffs will continue to suffer flooding; will have ongoing damages, have property damage from the last heavy rain, are unable to sell their property for a fair market price, have a distressed property because of the flooding and will be required to disclose the flooding problem for the remainder of time which Plaintiffs live there. That Plaintiffs will be unable to sell their property at a reasonable price. That the damages sustained are a direct result of the artificial channeling by these Defendants.

50. That Plaintiffs ask for damages against Prestwick and Jackson Companies for actual and punitive damages.

FOR A SEVENTH CAUSE OF ACTION
AS TO ALL DEFENDANTS
(Trespass)

51. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

52. That water from all Defendants' properties was channeled officially onto the Plaintiffs' property.

53. That the aforementioned channeling is a trespass and has caused damage to the Plaintiffs' property, caused erosion, and has threatened Plaintiffs' home and lot.

54. That Defendants through a master drainage stormwater management system have in effect devised and/or connected all ditches such that water flows over Plaintiffs' property.

55. That after each rain Plaintiffs have significant erosion and damage to their property and, thus, there is a continual trespass on Plaintiffs' property.

56. That Plaintiffs have tried to mitigate their damages, but have been unable to do so.

57. That stormwater from all the Defendants' property is physically moved onto the Plaintiffs' property in a deliberate scheme and/or plan.

58. That the aforementioned affirmative acts by all Defendants invade the Plaintiffs' property in an intentional manner and cause great and grievous irreparable harm to the Plaintiffs' property.

59. That Plaintiffs asks for an injunction requiring all Defendants to immediately cease and desist from channeling artificially any water into ditches which flow through the Plaintiffs' property since this causes irreparable harm to Plaintiffs' property.

60. That Plaintiffs further asks this Court to issue its Order requiring all Defendants to halt this continuing trespass immediately.

61. Further, the Plaintiffs ask for damages to their home, their property, for depreciation because they are unable to sell their house, for loss of use of the property, and for a fix moving the water away from Plaintiffs' property.

62. That Plaintiffs ask this Court issue its order awarding damages to the Plaintiffs enjoining all Defendants from dumping water artificially into the easement and for such other and further relief as the Court may deem just, necessary and proper.

FOR AN EIGHTH CAUSE OF ACTION
AS TO THE DEFENDANTS CITY OF MYRTLE BEACH AND HORRY COUNTY
(Inverse Condemnation)

63. The Plaintiffs reallege and reiterate each and every allegation as fully as if repeated verbatim herein.

64. That the Defendants City of Myrtle Beach and Horry County, through affirmative, aggressive, governmental acts, have effectively condemned Plaintiffs' property by allowing all of the stormwater from Myrtle Beach Air Force Base to be channeled artificially along the rear of Plaintiffs' property.

65. That these governmental Defendants entered into a common scheme or plan whereby all of the water from the Myrtle Beach Air Force Base, Crystal Lakes, and Prestwick was channeled through various pipes and ditches to the Plaintiffs' home.

66. That these acts by these Defendants were affirmative, positive and aggressive acts and were taken on behalf of the Defendants City of Myrtle Beach and Horry County for a public purpose and that they are, in fact, permanent since the drainage system for the entire Myrtle Beach Air Force Base runs next to the Plaintiffs' property.

67. That Plaintiffs believe that their property has been inversely condemned as mentioned in the first cause of action each time heavy rains occur Plaintiffs suffer irreparable harm and erosion.

68. That the Plaintiffs have suffered damages as outlined in the first cause of action and further suffer continuing irreparable harm and ask that the Court issue its Order awarding actual damages to Plaintiffs and also enjoining these Defendants from channeling any water through the pipes and/or ditches under and around the Plaintiffs' property.

69. That the acts of these Defendants are intentional, aggressive and act on behalf of a governmental agency.

70. Further, that this is a taking of private property for public purpose in violation of the United States and South Carolina Constitutions and that Plaintiffs request actual damages, an injunction, and attorney's fees as required by state law.

WHEREFORE, Plaintiffs request judgment as follows:

A. On the First Cause of Action for actual damages, punitive damages and the costs of this action.

B. On the Second Cause of Action as to all Defendants for actual damages, punitive damages and the costs of this action.

C. On the Third Cause of Action as to Pirateland for actual and punitive damages.

D. On the Fourth Cause of Action as to the City of Myrtle Beach and Horry County for actual and punitive damages.

E. On the Fifth Cause of Action as to City of Myrtle Beach and Horry County for actual and punitive damages.

F. On the Sixth Cause of Action as to Prestwick and Jackson Companies for actual and punitive damages.

G. On the Seventh Cause of Action against all Defendants for actual and punitive damages.

H. On the Eighth Cause of Action against the Defendant City of Myrtle Beach and Defendant Horry County for actual damages, punitive damages, and attorney fees.

KELAHER, CONNELL & CONNOR, P.C.

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(843) 238-5648
Attorney for Plaintiff

February 16, 2000
Surfside Beach, SC

READ THIS PROPERTY REPORT BEFORE SIGNING ANYTHING

See pg 21

This Report is prepared and issued by the developer of this subdivision. It is NOT prepared or issued by the Federal Government.

Federal law requires that you receive this Report prior to your signing a contract or agreement to buy or lease a lot in this subdivision. However, NO FEDERAL AGENCY HAS JUDGED THE MERITS OR VALUE, IF ANY, OF THIS PROPERTY.

If you receive this Report prior to signing a contract or agreement, you may cancel your contract or agreement by giving notice to the seller any time before midnight on the seventh day following the signing of the contract or agreement.

If you did not receive this Report before you signed a contract or agreement, you may cancel the contract or agreement any time within two years from the date of signing.

Name of Subdivision: PRESTWICK

Name of Developer PRESTWICK LAND LIMITED PARTNERSHIP

Date of This Report June 23, 1993

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Note: In this Property Report, the words "You" and Your" refer to the buyer. The words "We", "Us" and "Our" refer to the developer.

RISKS OF BUYING LAND

The future value of any land is uncertain and dependant upon many factors. DO NOT expect all land to increase in value.

Any value which your lot may have will be affected if the roads, utilities and all proposed improvements are not completed.

Resale of your lot may difficult or impossible, since you may face the competition of our own sales program and local real estate broker may not be interested in listing your lot.

Any subdivision will have an impact on the surrounding environment. Whether or not the impact is adverse and the degree of impact, will depend upon the location, size, planning and extent of development. Subdivisions which adversely affect the environment may cause governmental agencies to impose restrictions on the use of the land. Changes in plant and animal life, air and water quality and noise levels may affect your use and enjoyment of your lot and your ability to sell it.

In the purchase of real estate, many technical requirements must be met to assure that you receive proper title. Since this purchase involves a major expenditure of money, it is recommended that you seek professional advice before you obligate yourself.

-WARNING-

THROUGHOUT THE PROPERTY REPORT THERE ARE SPECIFIC WARNINGS CONCERNING THE DEVELOPER, THE SUBDIVISION OR INDIVIDUAL LOTS. BE SURE TO READ ALL WARNINGS CAREFULLY BEFORE SIGNING ANY CONTRACT OR AGREEMENT.

GENERAL INFORMATION

This report covers seven (7) lots located in Phase I, twenty-three (23) lots in Phase III, and thirty-eight (38) lots in Phase IV of Prestwick Subdivision, Horry County, South Carolina for a total of sixty-eight (68) lots. See page 28 for a listing of these lots. Additional lots may be offered as a part of this development. It is estimated that this subdivision will eventually contain approximately 1,169 dwelling units composed of cluster homes, patio homes, condominiums and single family dwellings. The subdivision may be a part of a larger overall development of approximately 2,000 acres composed of residential lots and dwellings, multi-family, cluster and patio homes, public and commercial units, private recreational tracts, and public or private golf courses, but the developer may never proceed with any development outside of the subdivision.

The developer of this subdivision is:

Prestwick Land Limited Partnership
1710 Highway 544
Myrtle Beach, SC 29575
803 293-6001

Answers to any questions and information about this subdivision may be obtained by telephoning the developer at the number listed above.

PRESTWICK LIMITED PARTNERSHIP, AN AFFILIATED ENTITY, OWNS AND OPERATES THE GOLF COURSE AND RELATED RECREATIONAL FACILITIES AS A MEMBERS CLUB. YOUR PURCHASE OF A LOT GIVES YOU NO RIGHT TO USE RECREATIONAL FACILITIES UNLESS YOU ARE ACCEPTED FOR MEMBERSHIP IN THE CLUB. THE COSTS OF INITIATION FEES AND ANNUAL DUES ARE SUBSTANTIAL. IF YOU CHOOSE TO JOIN THE CLUB, YOU SHOULD FILE AN APPLICATION AT THE SAME TIME YOU SIGN THE CONTRACT TO PURCHASE THE LOT AND REFUND OF YOUR EARNEST MONEY FOR YOUR LOT WILL BE MADE, IF YOU DESIRE, SHOULD YOU FAIL TO BECOME A MEMBER. THE VALUE OF YOUR LOT MAY BE ADVERSELY AFFECTED BY YOUR INABILITY TO BECOME A MEMBER AND USE CLUB FACILITIES. YOU SHOULD CAREFULLY CONSIDER YOUR PURCHASE OF A LOT IF IT IS BASED ON COMPLETION OF THESE FACILITIES OR YOUR ABILITY TO BECOME A CLUB MEMBER.

IF YOU MAKE APPLICATION FOR CLUB MEMBERSHIP AFTER YOU HAVE PURCHASED A LOT AND SUCH MEMBERSHIP IS REFUSED, NO REFUND OF THE PURCHASE PRICE OF YOUR LOT WILL BE MADE. THE COSTS OF A CLUB MEMBERSHIP MAY BE SUBSTANTIAL AND THE VALUE OF YOUR LOT MAY BE ADVERSELY AFFECTED BY YOUR FAILURE TO BECOME A CLUB MEMBER.

TITLE TO THE PROPERTY AND LAND USE

A person with legal title to property generally has the right to own, use and enjoy the property. A contract to buy a lot may give you possession but doesn't give you legal title. You won't have legal title until you receive a valid deed. A restriction or an encumbrance on your lot, or on the subdivision, could adversely affect your title.

Here we will discuss the sales contract you will sign and the deed you will receive. We will also provide you with information about any land use restrictions and encumbrances, mortgages, or liens affecting your lot and some important facts about payment, recording and title insurance.

METHOD OF SALE

Sales Contract and Delivery of Deed

We intend that all sales will be for cash. As a cash purchaser you will be required to pay the full purchase price at the time of closing. We will deliver to you a general warranty deed, free and clear of all liens and encumbrances and subject only to those restrictions, covenants, reservations, and easements of record at the time of closing. The closing will be within ninety (90) days from the date you sign a Contract to buy a Lot. Your deed will be recorded by the settlement agent.

Mortgage loans may be available to you through local banks if you meet their credit requirements. You should consult with one (1) or more local banks if mortgage financing is desired. We do not represent that such financing is now or will in the future be available.

Type of Deed

The transfer of legal title to you will be accomplished by a general warranty deed.

ENCUMBRANCES, MORTGAGES, AND LIENS

The lots registered hereby are encumbered by a mortgage lien to NationsBank of South Carolina, N.A., securing a loan in the amount of Fifteen Million and No/100 ($15,0300,000.00) Dollars dated November 12, 1992.

Release Provisions

Lots will be released from the Mortgage at the time of execution of the warranty deed. The releases are processed by us. The lender has agreed to execute the releases of individual lots from the Mortgage upon payment of a release fee equal to fifty (50%) percent of the gross sales price of the lot. The release provisions are included in the recorded mortgage.

The release provisions in the mortgage on lots in this subdivision may be exercised only by us. Therefore, if we default on the mortgage before obtaining a release of your lot, you may lose your lot and any money you have paid for it.

RECORDING THE CONTRACT AND DEED

Method or Purpose of Recording

The recording of a sales contract gives no protection in South Carolina except that the developer cannot sell the lot to a third party during the term of the contract. The recording of a deed protects you from subsequent creditors of the developer. Under the procedure used by us, the Contract cannot be recorded as the form for executing and witnessing the contract does not meet the recording requirements of South Carolina law. Your deed is recordable and your settlement agent will be responsible for recording the deed in Horry County, at your expense.

UNLESS YOUR CONTRACT OR DEED IS RECORDED YOU MAY LOSE YOUR LOT THROUGH THE CLAIMS OF SUBSEQUENT PURCHASERS OR SUBSEQUENT CREDITORS OF ANYONE HAVING ANY INTEREST IN THE LAND.

Title Insurance

You should obtain an attorney's opinion of title or title insurance policy which will describe the rights of ownership which are being acquired in the lot. We recommend that you have any attorney or other appropriate professional interpret the opinion or policy.

PAYMENTS

Escrow

You may lose your earnest money deposit on your lot if we fail to deliver legal title to you as called for in the contract because it is not held in an escrow which fully protects you.

Prepayment

Prepayment of your Note and Mortgage will depend upon the terms and conditions of the Note and Mortgage required by the lender, if you finance any portion of the purchase price through a lending institution.

Default

If you default prior to transfer of title, we will, at our sole option, either retain all down payments or earnest money deposits as liquidated damages or seek such other remedies and damages available to us under the laws of South Carolina, including recovering reasonable attorneys fees and costs incurred by us as a result of your default.

RESTRICTIONS ON THE USE OF YOUR LOT

Restrictive Covenants

Restrictive Covenants for Prestwick Subdivision have been recorded in the Office of the Clerk of Court for Horry County, Conway, South Carolina by Prestwick Limited Partnership which is affiliated with the Developer. The Developer has the right to enforce the restrictive covenants to the same extent any individual lot owner has such enforcement rights.

A complete copy of these restrictions is available upon request. The major provisions of these agreements will be discussed in the paragraphs below. However, this discussion will only highlight certain areas of the covenants and should not be a substitute for careful study of the restrictions by you.

The covenants provide for the rights of Prestwick Limited Partnership to approve (or disapprove) the architectural plan for any house or addition to any house, or any lot improvement. This blanket authority extends to purely aesthetic considerations, such as the exterior color, finishes, size, shape, location and dimensions of the residence, landscaping, fences, walls, piers, decks, swimming pools, exterior lighting, tennis courts, playground equipment, basketball goals, mail boxes, signs and the like.

Normally, it is required that the exterior of the residence be completed within 12 months of commencement of construction. You may not temporarily or permanently occupy your residence until the

exterior has been completed. All plans and site plans for your residence and other improvements to your lot must be approved prior to their construction.

No signs or ornaments may be placed on any lot, except with written permission of Prestwick Limited Partnership.

You must provide adequate off the street automobile parking for your residence prior to occupancy and in accordance with reasonable standards established by Prestwick Limited Partnership. No on-the-street parking will be permitted unless authorized by Prestwick Limited Partnership. No modular home or residence trailer, mobile home, manufactured home tent, barn, or other similar outbuilding or structure may be placed on your lot at any time without prior written approval and such approval would normally be limited to temporary use reasonably essential to economical, orderly, and efficient construction during the construction process only. Boats, trailers, golf carts, motorcycles, motorbikes, recreational vehicles, tractors, utility trailers and campers are not allowed except upon prior written approval of Prestwick Limited Partnership.

The covenants contain restrictions on household pets, sound devices, display of laundry, antennas, satellite dishes, radio transmissions, subdivision of lots, docks and power boats. The houses must be constructed within the height limitations and have a minimum heated square footage established by the Restrictions, the Review Board or in your contract or deed.

The covenants provide that the Property Owners' Association or any property owner can institute judicial proceedings against you to enforce the provisions of the covenants.

The covenants include additional limitations on your right to sell your lot by including a right of first refusal held by Prestwick Limited Partnership on the resale of all lots and by limited access to the property to the roads built by Prestwick Limited Partnership, by restricting access to the lots by the general public and by reserving the right to charge fees for the use of the roads.

The Restrictive Covenants prohibit the time sharing but allow vacation multiple ownership (13 or less owners) of dwellings within Prestwick.

The term of the covenants is twenty-five (25) years (1987-2012) at which time the covenants shall be automatically extended for successive periods of ten (10) years, unless by a vote of the Prestwick Limited Partnership and two-thirds ($^{2}/_{3rds}$) of the then lot owners it is agreed to change in whole, or in part, or to eliminate entirely the said restrictive covenants.

Easements

The subdivision is not subject to any type of flood control or flowage easement or other easements other than those shown on the recorded plat of the lots subject to this Property Report which will have an effect on the purchaser's building or lot use plans except special easements reserved in the Covenants affecting golf fairway lots, twenty-five (25') feet in width for golf course maintenance and forty (40') feet for landscaping. There are setback and drainage easements and utility easements which affect all lots and there may be pedestrian easements or other easements noted in the covenants which do not have an effect on the purchaser's building or lot use plans. No easements are permitted within building areas. See complete copy of the Restrictive Covenants and the recorded plats for details.

PLATS, ZONING, SURVEYING, PERMITS AND ENVIRONMENT

Plats

The subdivision plats for all lots offered hereby have received approval from Horry County and are recorded in the Office of the Register of Mesne Conveyances, Horry County Courthouse, Conway, South Carolina.

Zoning

The lots offered hereby are limited to single family residential houses only. This use conforms to the planned unit development zoning requirements of Horry County and the Restrictive Covenants.

Surveying

Each lot covered by this Property Report has been surveyed and marked for identification.

Permits

Prior to construction of a residence on your lot by your licensed building contractor, you must obtain a building permit from the Building Inspector for Horry County at the Horry County Courthouse in Conway, South Carolina. The charge for this permit will vary depending upon the cost of construction of the building. For details, you should contact the Building Inspector's office.

Environment

No determination has been made as to the possible adverse effects the subdivision may have upon the environment and surrounding area.

ROADS

ACCESS TO THE SUBDIVISION

Primary access to the subdivision is via South Carolina State Highway 544, a two lane asphalt highway that runs east and west, to Lakewood School Road. The wearing width of Highway 544 is twenty-four (24') feet. Maintenance is provided by the South Carolina Department of Highways with state funds derived from various taxes which are ultimately paid by all taxpayers. The State is currently widening Highway 544 to four lanes. The widening of 544 should be completed by August, 1997.

Access to the subdivision from Highway 544 is by Lakewood School Road, a two lane asphalt road with a load bearing width of 22 feet, maintained by the South Carolina Department of Highways with State funds, and by Lakeview Drive, a two lane asphalt road with a wearing width of 22 feet, maintained by Horry County with County funds derived from various taxes which are ultimately paid by all taxpayers of Horry County. We are not aware of any planned improvements to these roads.

ACCESS WITHIN THE SUBDIVISION

Access within the subdivision is by private roads. The roads in Phases I, II and III are complete and the Property Owners' Association has assumed responsibility for maintenance of these roads. The roads in Phase IV will be dedicated to the use of the lot owners upon completion. We will provide for access to your lot, subject to the restrictive covenants. We have agreed to convey title to the roads in Phase IV to Property Owners' Association, Inc., upon completion of same.

We are responsible for the construction of the roads and there is no cost to you for the initial construction of the roads. There is financial assurance of completion of the roads in Phase IV in this filing in the form of a Letter of Credit filed with Horry County.

All roads within Phase I, II, III and IV of the subdivision have or will have a wearing surface of 20' and two lanes, with the exception of the Links Road, formerly Gleneagle Drive, which is a 22' wide two lane road. All roads in Phase I, II and III of the subdivision are complete and we will pay for the completion the road network in Phase IV.

The estimated starting date of construction; present percentage of construction now complete; the estimated completion

dates for roads in Phase IV; the present surface; and the final surfaces are set forth in the following chart.

Unit	Estimated Starting Date	Percentage of Construction Now Complete	Estimated Completion Date	Present Surface	Final Surface
Phase IV					
	Feb. 15, 1997	45%	June, 1997	Dirt	Asphalt

We are not obligated to complete or pave any portions of the roads which are not located in Phase I, II, III or IV of the subdivision.

It is the Prestwick Property Owners' Association, Inc.'s (Property Owners' Association) responsibility through assessments of its members to maintain the roads after initial construction is completed. They shall be maintained so as to provide access on a year-round basis.

The table below identifies the distance (in miles) from the center of the subdivision to nearby communities.

NEARBY COMMUNITIES	POPULATION	DISTANCE OVER PAVED ROADS	DISTANCE OVER UNPAVED ROADS	TOTAL
Myrtle Beach	30,000	1 mile	0	1 mi.
Conway*	13,000	15 miles	0	15 mi.
Charleston	100,000	90 miles	0	90 mi.
Columbia	100,000	135 miles	0	135 mi.

* County Seat

UTILITIES

Here we will discuss the availability and cost of basic utilities. The areas covered will be water, sewer, electricity, telephone and fuel or other energy sources.

WATER

Grand Strand Water and Sewer Authority (a public agency), Post Office Box 1537, Conway, South Carolina 29526 will provide the central water system. The water lines in Phase I, II and III have been dedicated to the Grand Strand Water and Sewer Authority. The Authority will supply the water from its presently completed central supply plant and administer the water system. All water lines in Phase I, II and III have been completed.

The current percentage of completion of the extension of the water lines and availability for water service for lots in Phase IV are set forth in the table below:

Tract, Block, Lots	Estimated Starting Date (month/year	Percentage of Construction Now Complete	Estimated Service Availability Date (month/year
All lots in Phase IV	Feb. 15, 1997	90%	June, 1997

There is assurance by the Grand Strand Water and Sewer Authority of a sufficient supply of water to serve all lots in this statement of record.

The purity and chemical content of the water system has been tested; the tests show that the water meets all standards for a public water supply.

There will be no cost to you for installation or construction of the lines except for an impact fee of $380.00 and a meter base of $295.00.

You may not install an individual system and you must connect to the central system.

SEWER

This subdivision will use the existing central sewerage system of Grand Strand Water and Sewer Authority, Post Office Box 1537, Conway, South Carolina 29526. All lot owners will be subscribers to the system and will be entitled to service. Sewer lines in Phase I, II and III have been extended in front of or adjacent to all lots in this filing by us at no cost to you.

The entity that will own and be responsible for the operation and maintenance of the sewer system is Grand Strand Water and Sewer Authority, a public agency which is regulated by S.C. Department of Health and Environmental Control. We will dedicate all such lines to Grand Strand Water and Sewer Authority.

The current percentage of completion and the estimated availability dates for sewer service for lots in Phase IV registered hereby are set forth in the table hereinbelow:

Tract, Block, Lots	Estimated Starting Date (month/year	Percentage of Construction Now Complete	Estimated Service Availability Date (month/year
All lots in Phase IV	Feb. 1997	90%	June, 1997

Fees will be payable to Grand Strand Water and Sewer Authority. There will be no cost to you for installation or construction of the sewer system but you will have to pay a one time impact fee of $840.00 and other sewer charges of $106.00.

Once you have tapped to the sewer system, you will be assessed a monthly charge of $9.52 and additional charges of $.99/m gallons for water and $1.31/m gallons for sewer up to 8,325 gallons of consumption; thereafter there is a $.20 increase for each additional 1,000 gallons of consumption for water and sewer. An availability or standby fee of $9.52 billed monthly may be charged for water and sewer to those purchasers of lots having sewer and water lines running within 100 feet of a lot line, until a dwelling is constructed. You will be required to tap into the sewer system prior to occupancy. The rates and charges for sewer and water are current charges and are subject to increases.

You may not install an individual system and you must connect to the central system.

ELECTRICITY

The Santee Cooper Authority, 2003 Oak Street, Myrtle Beach, South Carolina, 29577, a public utility company, has agreed to supply electric service to Prestwick. Primary service lines have been extended in front of, or adjacent to, each lot in Phases I, II and III by the Authority. The following table details the current state of construction for lots in Phase IV and the estimated service availability dates.

Tract, Block, Lots	Estimated Starting Date (month/year	Percentage of Construction Now Complete	Estimated Service Availability Date (month/year
All lots in Phase IV	Feb. 15, 1997	0%	June, 1997

Electricity is currently available to all of the lots in Phases I, II and III. Santee Cooper Authority will provide service to the lots with no charge to you for the construction costs of extending service. The installation of customer service is under the control of the electric company and not us. Since we are not responsible for providing electric service to your lot, we can give no assurance it will be available to your lot in Phase IV, Section C by June, 1997. Service is usually provided within seven (7) business days after a request is made by you to Santee Cooper Authority after the estimated service availability date.

TELEPHONE SERVICE

The Horry Telephone Cooperative, Inc., P. O. Drawer 1820, Conway, South Carolina, a customer owned company, whose rates are regulated by a public agency, South Carolina Public Service Commission, will supply telephone service to Phases I, II and III in the subdivision. The service lines have been extended in front of, or adjacent to, each lot in Phase I, II and III. GTE, P. O. Box 31122, Tampa, Florida 33631-3122, a public utility whose rates are regulated by the South Carolina Public Service Commission, will supply telephone service to Phase IV of the subdivision. The following chart details the estimated completion and service availability for lots in Phase IV.

Tract, Block, Lots	Estimated Starting Date (month/year	Percentage of Construction Now Complete	Estimated Service Availability Date (month/year
All lots in Phase IV	Feb. 15, 1997	20%	June, 1997

You will not be responsible for any of the construction costs incurred to extend telephone service to your lot. All of these costs will be paid by Horry Telephone Cooperative, Inc. or GTE. The installation of customer service is under the control of the telephone company and not us. Service will usually be available within seven (7) business days upon request by purchaser after the estimated service availability date in the chart above. Service is presently available for all lots in Phases I, II and III.

FUEL AND OTHER ENERGY SOURCES

Electricity will be the only energy source in the subdivision. Propane gas is available if desired by you from Suburban Propane, 1215 Third Ave., S., Post Office Box 2112, Myrtle Beach, South Carolina 29577-2112. There will be no cost for installation charge and a storage tank will be loaned to you at no charge.

FINANCIAL INFORMATION

The discussion in this section will focus on our financial information.

A copy of our unaudited balance sheet and statement of receipts and disbursements of funds as of January 31, 1996 is available from us upon request.

LOCAL SERVICES

FIRE PROTECTION

Fire protection is available year round from Socastee Rural Volunteer Fire Department at Socastee, South Carolina. The nearest station is less than two (2) miles away. At present there is no cost to you for this service.

POLICE PROTECTION

Police protection is available on a year round basis from the Horry County Police Department.

SCHOOLS

Elementary school is available at Lakewood (grades 1-5), middle school is available at St. James (grades 6-9) and high school is available at Socastee High School (grades 10-12). Bus transportation is available within the subdivision.

HOSPITALS

The nearest hospitals are Conway General Hospital, Highway 501, Conway, South Carolina, and Columbia Grand Regional Medical Hospital, U.S. Highway 17 Bypass, Myrtle Beach, South Carolina.

Ambulance service is available through Ambulance Service of Horry County, Surfside, South Carolina.

PHYSICIANS AND DENTISTS

The nearest physicians and dentists are located in neighboring Myrtle Beach and Surfside Beach, South Carolina.

SHOPPING FACILITIES

Shopping facilities are located in neighboring Myrtle Beach and Surfside Beach, South Carolina and surrounding areas.

MAIL SERVICE

The U. S. Post Office provides mail service to the subdivision.

PUBLIC TRANSPORTATION

There is no public transportation within the subdivision, nor to nearby towns. The nearest public bus transportation is available in Myrtle Beach, eight (8) miles from the subdivision. Air and bus service to other towns is available in neighboring Myrtle Beach. Rail service is available in Florence, South Carolina, which is approximately 75 miles away. Private taxi companies provide service within the subdivision.

RECREATIONAL FACILITIES

ALL OF THE RECREATIONAL FACILITIES LISTED BELOW ARE OWNED BY PRESTWICK LIMITED PARTNERSHIP AND ARE AVAILABLE ONLY TO MEMBERS OF THE PRESTWICK GOLF CLUB, INC. AND OTHERS DESIGNATED BY PRESTWICK LIMITED PARTNERSHIP FROM TIME TO TIME. SEE THE WARNING ON PAGE 2 OF THIS PROPERTY REPORT.

There are no recreational facilities in the subdivision which are maintained substantially for the use of lot owners. Prestwick Limited Partnership, an affiliated entity, has constructed the recreational facilities listed below for use by the Prestwick Golf Club, Inc. members and others as designated from time to time by Prestwick Limited Partnership. The golf course, clubhouse and tennis courts and swimming pool are located within the subdivision.

Some of the lots registered hereby abut portions of the Prestwick Golf Club Golf Course which is within the subdivision. The facilities will be available to members of the golf club and others as Prestwick Limited Partnership designate from time to time. The fact that a lot abuts this golf course or is in the subdivision does not entitle its owner to play on the golf course or to become a member of the Prestwick Golf Club, Inc.

You, as well as non-lot owners who will be approved by Prestwick Limited Partnership, will be eligible for, but not guaranteed, membership in the recreational facilities described herein. You must apply for admission to the Club if you desire to be a member, but you are not required to do so.

The following chart details the current state of construction and the estimated availability dates of facilities to be constructed:

Facility	Percentage of Construction	Estimated Date of Start of Construction	Estimated Date Available	Financial Assurance Now Complete	Buyer's Annual Assessment Cost or Month/Year Completion
Golf Course (18 holes) Driving Range	Complete	Complete	Available	Completed	Set out on Page___ by Membership Type
Tennis Facility (entire subdivision) 13 Courts	100%	Complete	Available	Completed	
Permanent Clubhouse (1)	100%	Complete	Available	Completed	
Temporary Clubhouse	100%	Complete	Available	Completed	
Indoor Swimming Pool & Health Club	100%	Complete	Available	Completed	
Outdoor Swimming Pool	100%	Complete	Available	Completed	

Types of Memberships*

The Prestwick Golf Club, Inc. (the "Club"), a golf club controlled by Prestwick Limited Partnership, an affiliated entity, has been organized to govern the rights of members of the recreational facilities. There are presently, six (6) categories of memberships offered: Resident Full Family Memberships, Non-Resident Full Family Memberships, Social Memberships, Corporate Memberships, Junior Memberships, and Tennis and Health Club Members. The maximum number of Resident Full Family Memberships shall be Five Hundred Fifty (550), the maximum number of all memberships shall be Nine Hundred Fifty (950). Members will be required to pay membership fees and user fees as determined from time to time by Prestwick Limited Partnership. The current types of memberships, membership fees, user fees, and dues are set out herein.

Privileges of Membership

1. Resident Full Family Membership: This membership grants you and your immediate family and children under the age of 21 to the use of the golf course, driving range, tennis, clubhouse, health club and swimming facilities at Prestwick. The only charges in addition to the monthly dues would be for cart fees, food, drink and other purchases. You presently must be a resident property owner in Prestwick to qualify for this membership. However, Prestwick Limited Partnership may allow non-property owners to be full family members with the same privileges as a Resident Full Family Member. The initation fee for a transferable Resident Full Family Membership is $12,000.00 and $9,500.00 for a non-transferable Resident Full Family Membership.

2. Non-Resident Full Family Membership: This membership grants you the same usage of the facilities as a Resident Full Family Member; however, monthly membership fees are reduced and the number of rounds of golf played in any one calendar year is limited by Prestwick Limited Partnership. The initation fees are the same as for Resident Full Family Memberships.

3. Social Membership: This type of membership grants you the use of the tennis, clubhouse, health club and pool facilities and grants you a right to use the golf course for a fee. The purpose of the social membership is to give individuals who are not Full Family Members the opportunity to play golf or tennis and use the health club on a preferred basis for a fee and allows such members a right to participate in the club activities through the clubhouse, health club and pool facilities. You do not have to be a resident or property owner of Prestwick in order to qualify as a Social Member. You must be at least 21 years of age. The initation fee for Social Members is $2,500.00.

4. Executive Membership: This type of member has the same privileges as a Resident Full Family Member except that there is no initation fee. Instead there is an annual membership fee of $2,500.00. Non-property owners may be Executive Members.

5. Junior Membership: Presently, any members under 30 years of age may be a junior member regardless of the type of membership. This type of member has the same privileges as a regular member. The current initiation fee, subject to increase or decrease by Prestwick Limited Partnership, paid by Junior Members is 1/2 of the regular Membership for that type membership and the current dues (annual cost) are the same as the current regular Membership. Presently, at age 30 these members must apply for full memberships and pay any additional initiation fees due.

6. Tennis and Health Club Membership: This type of member has the right to use the tennis courts and use the health club facilities and swimming pools without paying the hourly rate fees. This type of member has no right to play the golf course or use its facilities, except as a guest of the member or as permitted by Prestwick Limited Partnership. These members may be non-residents or non-property owners. Presently non-resident members must live at least thirty-five (35) miles away from the clubhouse. These requirements are subject to change by Prestwick Limited Partnership at any time. The initation fee for such membership is $700.00. Pool only memberships are available for an annual fee of $400.00 with no annual dues.

Upon approval of the Board of Govenors of the Club, you may, at your option, become a member of the Club by payment of an initiation fee and dues. The current initiation fees (as of 12/31/96) range up to $12,000.00 for a Resident Full Family Membership which is subject to change in the future. If you sell your lot you may retain your membership, if the maximum number of memberships allowed for that category of membership of the Club have not been utilized. If you do retain your membership, such membership shall be subject to cancellation by the Club if there are not sufficient memberships of that category to allow all of the lot owners to have a membership in that category.

Members of the Club will be subject to the rules and regulations established by the Board of Governors of the Club and Prestwick Limited Partnership from time to time. Prestwick Limited Partnership may allow staff and owners, their family and children and other guests and invitees to use the golf course facilities, tennis courts, swimming pools and health club with or without charge, and Prestwick Limited Partnership may issue temporary memberships upon terms set by such partnership.

WHO MAY USE THE FACILITIES

Current Golf Club Fees (subject to change) are as follows:

Types of Memberships	Golf Green Fees	Tennis Hourly Rate	Swim Daily	Health Club Costs Daily	Health Club Costs Annual
A. Residential/Full Family Membership	$ 0	$ 0	$ 0	$ 0	$1,890
B. Non-Resident Full Family Member	$ 0	$ 0	$ 0	$ 0	$1,260
C. Executive Member	$ 0	$ 0	$ 0	$ 0	$2,500
E. Tennis and Health Club Member (Resident)	N/A	$ 0	$ 0	$ 0	$ 700
F. Social Member	$25	$ 0	$ 0	$ 0	$ 630
G. Guest of Member					
(1) Accompanied	$35	$ 4	$ 2	$10	
(2) Unaccompanied	$50	$15	$ 2	$20	

Non-Resident Tennis and Health Club Members annual cost is $504.00 1/2 of Resident Member. All members using the golf course must pay cart rental fees.

Constructing the Facilities

Preswick Limited Partnership, an affiliated entity, has constructed the golf course, tennis courts, swimming pools, health club and golf club house. All such construction costs have been paid by Prestwick Limited Partnership and you will not be required to pay any of these costs.

Maintaining the Facilities

Prestwick Limited Partnership, an affiliated entity, owns all recreational facilities. The members of the Club and others designated by Prestwick Limited Partnership have the right to use these facilities. Prestwick Limited Partnership is responsible for the operation and maintenance of these facilities. All fees paid by Members of the Prestwick Club shall be paid to and utilized by Prestwick Limited Partnership for operation and maintenance of the facilities and for such other use as Prestwick Limited Partnership deems appropriate. The Property Owners' Association will not be responsible for maintenance unless such Association obtains title to the facilities. In such case the Association will operate the facilities with funds from user charges and annual user dues and fees as outlined in the Declaration of Covenants and Restrictions and By-Laws of the Prestwick Property Owners' Association.

Transfer of the Facilities

Prestwick Limited Partnership, an affiliated entity, may or may not transfer the title of the facilities in the future, but if it does transfer the Club facilities, members shall have the first right of refusal to purchase the facilities for the price set by Prestwick Limited Partnership for sale to a third party. Prestwick Limited Partnership may transfer the facilities to the Property Owner's Association free and clear of encumbrances or may sell the Club facilities to those members of the Club who are willing to pay the purchase price or to anyone else. However, such sale shall not terminate the right of the members who do not participate in the purchase to use the club so long as they abide by the rules and regulations set by the purchasers or the Club's Board of Governors.

Permits

All permits necessary for the construction of the golf course, the clubhouse and the tennis and pool facilities were obtained by the Developer prior to the construction of such facilities.

Who May Use the Facilities

The use of the tennis courts, swimming pools, clubhouse, health club and golf course and driving range is limited to members of the Club, their designees, guests of members and guests and/or invitees as Prestwick Limited Partnership designates from time to time.

A property owner who is not a member of the Club may not use the Club facilities except as a guest. The Club may limit or restrict use of the Club facilities by guests.

THE RECREATIONAL FACILITIES ARE NOT AUTOMATICALLY AVAILABLE TO LOT OWNERS IN THE SUBDIVISION. LOT OWNERS MAY APPLY FOR MEMBERSHIP IN THE CLUB ON THE TERMS AND CONDITIONS PREVAILING FOR MEMBERSHIP AT THE TIME OF APPLICATION. THE OWNERSHIP OF A LOT IN PRESTWICK DOES NOT ENTITLE YOU TO USE THE CLUB FACILITIES OR TO BECOME A MEMBER OF THE CLUB.

SUBDIVISION CHARACTERISTICS AND CLIMATE

In this section we will discuss the basic terrain of the subdivision, its climate and any nuisances or hazards in this area.

GENERAL TOPOGRAPHY

Generally level sandy loam soil, mostly in pine timber with some hardwood bays. Elevations vary from +30' to +20' above Mean Sea Level. Five (5%) percent of the total acreage of Prestwick Subdivision is to remain as natural open space and zero (0%) percent as developed parkland. There are no steep slopes (20% or more) in the area of any lot registered hereby on which building is allowable. There are no rock outcroppings, unstable or expansive soil conditions which could necessitate the use of special construction techniques to build on or use any lot in the subdivision.

WATER COVERAGE

X None of the lots or any portions of any lot are covered by water at any time of the year.

DRAINAGE AND FILL

None of the land in the subdivision will require drainage. All lots will require some fill dirt before construction of a single or multiple story residential structure using methods of X construction presently used in this area of South Carolina. If, because of the design of the house, fill dirt is desired or required, it can be obtained at a cost not to exceed $4,000.00 depending upon the individual lot and the design of the house being constructed thereon.

FLOOD PLAIN

None of the lots in this Property Report are located within a flood plain or an area designated by any Federal, State or local agency as being flood prone. Flood insurance is available from independent insurance companies. Flood insurance is not required in connection with the financing of any improvements to the lots. The cost of flood insurance varies according to company and location of the lot.

FLOODING AND SOIL EROSION

There is a program in effect to control soil erosion, sedimentation and flooding throughout the lots registered hereby. Streets have been constructed with side swales to carry storm runoff to existing lakes or canals. Lakes will be or have been constructed along the drainage lows with properly designed overflows and discharge. The street design, with its side swales,

allows for the storm water which falls on the lots to drain to the swales and thence along the above described route for discharge. Because of the relative flatness of the terrain, sedimentation and siltation is not a serious problem. We are obligated to comply with the program, which has been approved by Horry County. The program began in December, 1987 and has been completed for all the lots registered hereby.

NUISANCES

The land is not subject to any unpleasant odors, noises, pollutants or other nuisances, except on infrequent occasions, when airplanes landing at the Myrtle Beach Jetport, located approximately one (1) mile from the subdivision, fly at low altitudes over the subdivision. Lots 330 through 337 and Lots 364, 365 and 366 in Phaste IV will abut Catherine Drive which will be a public county maintained road running through Prestwick which otherwise is a private subdivision. There will be no vehicular access to Catherine Drive from such lots.

HAZARDS

We do not know of any unusual safety factors which affect the subdivision. We know of no proposed plan, private or governmental, for construction of any facility which may create a nuisance, hazard or adversely affect the use of the land.

At times hurricanes and tropical storms approach the South Carolina coast from the Atlantic and could be a major threat to the subdivision. The most recent example was Hurricane Hugo in 1989. The subdivision is also subject to forest fires and to earthquakes although the last recorded major earthquake was in 1886. Tornadoes are rare but possible in the area of the subdivision. All owners are advised to obtain flood and earthquake insurance on their property if they are concerned about such risks.

CLIMATE

The climate is temperate, and in the hurricane zone of the South Carolina coast. Summer temperatures range from a high of approximately 104 degress to a low of 54 degrees, with a mean summer temperature of approximately 75 degrees.

Winter temperatures range from a high of approximately 85 degrees to a low of approximately 10 degrees with a mean winter temperature of 50 degrees. The average annual rainfall is 50 inches. There is no appreciable snowfall in this area.

OCCUPANCY

One hundred eighty (180) homes in the Prestwick subdivision were occupied on a full-time or part-time basis as of Dec. 1, 1996.

ADDITIONAL INFORMATION

In this heading we will discuss the following areas:

1. The Property Owners' Association
2. The Annual Real Estate Taxes
3. Resale or Exchange Program
4. Equal Opportunity in Lot Sales
5. Listing of Lots

THE PROPERTY OWNERS ASSOCIATION

The property owners association, Prestwick Property Owners' Association, Inc. was incorporated in South Carolina in November, 1987, as a not for profit corporation and is operating as such at present.

Prestwick Limited Partnership, an affiliated entity with the Developer, has the right to exercise control over the Prestwick Property Owners' Association, Inc. Prestwick Limited Partnership will exercise control of the Prestwick Property Owners' Association, Inc. to the extent that it is entitled to be allowed a Special Voting Membership by which it is entitled to the same number of votes as are cumulatively held by all other members of the Prestwick Property Owners' Association, Inc. plus one, until earlier of (i) the date it has conveyed at least 90% of the lots and dwelling units within the property or (ii) the total amount of assessments paid, total amount of Association operating deficits funded by it and total amount of outstanding loans by it to the Association outstanding exceed cumulatively the total amount of assessments paid by all single family lot owner Members in such year.

Membership in Prestwick Property Owners' Association, Inc. is a prerequisite to owning property. The Association will accept all lot owners as members. Property owners are subject to an annual assessment by the Association. Currently the assessment for a completed dwelling unit is $673.92 and for a vacant lot the assessment is $457.60. This annual payment may be increased each year by the percentage of increase in the consumer price index for the previous year, or at the option of the Association, may be increased each year up to ten (10%) percent of the maximum authorized payment for the previous year. The funds derived from the Annual Assessment shall be used for the payment of maintenance, improvement and operational expenses of the subdivision, including Common Properties, walkways, strets, roads, recreational amenities and for any other purpose necessary or desirable in the opinion of the Board of Directors of the Association, for the general benefit of the Subdivision. The judgment of the Board of Directors of the Association as to the expenditure of assessments and fees shall be final; provided, however, no funds shall be used for the original

construction of subdivision streets, roads, water system or sewer system. We are liable for fees or assessments levied by the Association for lots to which we retain title at a rate set out in the Covenants.

In addition to the annual assessment, the Association may levy special assessments for (a) construction or reconstruction, repair or replacement of Common Properties or Common Area of the subdivision, including the fixtures and personal property related thereto; (b) additions to the Common Properties or Common Area of the Subdivision; and (c) providing the necessary facilities and equipment to offer the services authorized in the By-Laws; and (d) repaying any loan made to the Association to enable it to perform the duties and functions authorized in the By-Laws.

The primary function of the Property Owners Association is to govern the use of the common properties, collect and administer assessments and enforce the restrictive covenants applicable to the subdivision.

The Prestwick Property Owners' Association, Inc. will not hold architectural control over the Subdivision. Architectural control is vested in the Review Board which will be appointed by Prestwick Limited Partnership until 100% of the lots and Dwellings are sold or until control is conveyed to the Association by Prestwick Limited Partnership.

There are no functions or services that Prestwick Limited Partnership now provide at no charge for which the Association may be required to assume responsibility in the future.

The Association will establish reserve funds from its Annual Assessments and/or initial assessments to be held in reserve in an interest bearing account or investments as a reserve for (a) major rehabilitation or major repairs, (b) emergency and other repairs as required as a result of storm, fire, natural disaster, or other casualty loss not covered by insurance, (c) recurring periodic maintenance, and (d) initial costs of new service to be performed by the Association.

A large number of the dwelling units in the Prestwick Subdivision shall be constructed prior to being conveyed to the Owner and shall not be covered by this Report. However, the Owners of these dwelling units will be members who shall cast their votes (one vote for each dwelling unit) at all meetings of the members of the Prestwick Property Owners' Association, Inc., and these dwelling owners shall have the same rights, duties and obligations as the members who own lots covered by this Property Report as set forth in the Declaration of Covenants.

TAXES

After taking title, you will be required to pay Horry County Real Property taxes. Taxes assessed for the year during which you receive title to your lot will be prorated between you and us as of the date of closing. Thereafter, you will be required to pay all taxes levied against the property. Annual real estate taxes for lots in the subdivision currently range from approximately $200.00 to $800.00 based on the assessed value of the lot and upon the 1995 Horry County property tax rate of 177 mils on 6% of the assessed value of each lot. The taxes are subject to change annually.

RESALE OR EXCHANGE PROGRAM

We have no program to assist you in the resale of your lot. We have made no provisions for exchanging your lot. You may not post any signs on your lot. We have a right of first refusal to repurchase your lot should you decide to sell it to a thirty party.

UNUSUAL SITUATIONS

Within the Prestwick Subdivision there are also patio homes and condominium projects. Owners of the dwelling in such projects are members of the Prestwick Property Owners' Association, Inc. and the owners of each dwelling has one vote and is treated as one member.

LOT LISTING

Lots 1, 61, 88 and 148 of Prestwick, Phase I, on that certain plat prepared by Post Buckley, Schuch and Jernigan, Inc. dated September 14, 1989 and recorded in Plat Book 106 at Page 182, and Lots 173, 175, and 177 of Prestwick, Phase I, on that certain plat of Terry M. Watson dated May 23, 1990 and recorded in Plat Book 111 at Page 115, records of Horry County.

Lots 271, 273, 274, 275, 276, 278, 279, 280, 282, 284, 285, 286, 289, 291, 292, 293, 295, 296, 297, 298 and 299 of Prestwick, Phase III-D, on that certain plat prepared by DDC Engineers, Incorporated, dated December 7, 1994 and recorded in Plat Book 133 at Page 220, records of Horry County.

Lots 330 through 367 of Prestwick Phase IV-C and IV-D, on that certain plat prepared by DDC Engineers, Incorporated, dated December 7, 1994 and revised January 12, 1995 and recorded in Plat Book 147 at Page 244, records of Horry County.

COST SHEET, SIGNATURE OF SENIOR EXECUTIVE OFFICER

COST SHEET

In addition to the purchase price of your lot, there are other expenditures which must be made. Listed below are the major costs. There may be other fees for use of the recreational facilities.

All costs are subject to change.

Sales Price of Lot

Cash Price of Lot	$_____	
Finance Charge	$_____	
		$_____

Estimated One-Time Charges

1.	Water Connection Fee	$ 295.00	
2.	Sewer Connection Fee	$ 106.00	
3.	Constsruction costs to extend electric and/or telephone service	$ None	
4.	Other (Identify)		
	(a) Water Impact Fee	$ 380.00	
	(b) Sewer Impact Fee	$ 840.00	
			$_____

Total of estimated sales price and one time charges $_____

Estimated annual charges, exclusive of utility use fees

1.	Taxes - average unimproved lot after sale to purchaser	$ 550.00
2.	Dues and assessments (Unimproved lot)	$ 457.60

The information contained in this Property Report is an accurate description of our subdivision and development plans.

PRESTWICK LAND LIMITED PARTNERSHIP
By: Ocean Lakes Campgrounds, Inc. as General Partner

By: _____
Donald Babb
CEO

RECEIPT, AGENT CERTIFICATION AND CANCELLATION PAGE

PURCHASER RECEIPT
IMPORTANT: READ CAREFULLY

NAME OF SUBDIVISION: PRESTWICK
OILSR NUMBER: 0-07177-46-0A Date of Report: 3/2/99

We must give you a copy of this Property Report and give you an opportunity to read it before you sign any contract or agreement. By signing this receipt, you acknowledge that you have received a copy of the Property Report.

Received by: Elizabeth M Eaves Date: 3-2-99

Street Address: 3810 Rice Hope Dr. State: SC Zip: 29575
Myrtle Beach

If any representations are made to you which are contrary to those in this report, please notify the:

Office of Interstate Land Sales Registration
HUD Building, 451 Seventh Street, S.W.
Washington, DC 20410

.....

AGENT CERTIFICATION

I certify that I have made no representations to the person(s) receiving this Property Report which are contrary to the information contained in this Property Report.

Lot 362 Tract Ph IV D Block _____
Name of Sales Person: Deborah Shine
Signature: Deborah H. Shine Date: 3/2/99

.....

PURCHASER CANCELLATION

If you are entitled to cancel your purchase contract, and wish to do so, you may cancel by personal notice, or in writing. If you cancel in person or by telephone, it is recommended that you immediately confirm the cancellation by certified mail. You may use the form below.

Name of Subdivision: _____
Date of Contract: _____

This will confirm that I/we wish to cancel our purchase contract.

Purchaser(s) Signature: _____ Date: _____

STATE OF SOUTH CAROLINA

COUNTY OF HORRY

IN THE COURT OF COMMON PLEAS
FIFTEENTH JUDICIAL CIRCUIT
C/A NO. 2016-CP-26-06495

Cornell Patton, Melissa Patton, Chad Webb and Amy Webb,

Plaintiffs,

vs.

Prestwick Land Limited Partnership; Prestwick Homeowners Association, Inc.; Jackson Companies; City of Myrtle Beach; South Carolina Department of Transportation; Horry County; Myrtle Beach Air Force Base Redevelopment Authority; Nelson L. Hardwick & Associates, Inc.; Homeowners of Ocean Walk Property Owners Association; Campgrounds, Inc.; and Prestwick Property Owners Associates, Inc.,

Defendants.

City of Myrtle Beach,

Third-Party Plaintiff,

vs.

Phil Eaves and Elizabeth Eaves,

Third-Party Defendants/ Counterclaimants /Cross-Claimants/.

vs.

Homeowners of Ocean Walk Property Owners Association,

Defendant/Fourth-Party Plaintiff,

vs.

Rose Real Estate, Inc.,

Fourth-Party Defendant.

AFFIDAVIT OF CORNELL PATTON

PERSONALLY APPEARED BEFORE ME, Cornell Patton, who first being duly sworn, deposes and states as follows:

1. My name is Cornell Patton and I am one of the Plaintiffs in this action. I have just been provided a copy of the Affidavit of Thomas "Buddy" Styers dated October 1, 2018 and wish to apprise the Court of the situation concerning my personal residence.

2. I live in Prestwick with my wife and have built a house there. My home has been periodically flooded by various storms and rain events as a result of a ditch which borders my property.

3. This is the second lawsuit I have had to file regarding flooding. The first lawsuit that was filed was 2000-CP-26-00765 and was the result of Hurricane Floyd flooding my house.

4. After that flood, I decided to trace the ditch behind my house and walked the entire length of it from my house onto the old Myrtle Beach Air Force Base. I found that the ditch behind my house is the main source of drainage for the Myrtle Beach Air Force Base and for the eastern end of the Myrtle Beach Air Force Base airfield. All of the ditches on the Myrtle Beach Air Force Base connect together. Some of those ditches flow to the east of U.S. Highway 17 Bypass beside my house.

5. The ditches have all been constructed and are used for drainage and an enormous amount of water goes through the ditch beside my house from the Myrtle Beach Air Force Base.

6. The Myrtle Beach Air Force Base Redevelopment Authority has had control over those ditches in the past. I disagree with the statements in the Affidavit of Thomas "Buddy" Styers that the ditches only drain the old Myrtle Beach Air Force Base Housing Authority. The ditches involved in this lawsuit are a patchwork of ditches which are interconnected throughout the entire Myrtle Beach Air Force Base and continue to be so even to this day.

7. In the prior lawsuit that I filed entitled *Patton v. Prestwick Land Limited Partnership*, 2000-CP-26-00765, Myrtle Beach Air Force Base Redevelopment Authority was named as a defendant and actually paid some damages. Since that time, new storms have damaged my property and I have brought a new lawsuit. When I signed the Settlement Agreement and Release dated September 2, 2005, it was never my intention that it would cover future storm events. In fact, the only release I signed was a release up to the date of the execution of that Release. I refer the Court to page 2 of the Release which states "whatever from the beginning of the world up to the day, hour, minutes of the execution of these presents . . . ." I understood this language to mean that a release that I signed was only for that particular flood event and for other flood events prior to that date. Since that time, I have had a new flood event and new rain events, all of which have damaged my property. It was never my intention, belief or understanding that the Release which has been presented in this case would bar me from further lawsuits over future flooding. In fact, discussions were held on this very topic and I understood when I signed the Release that it would in no way prohibit me from bringing another claim should I have another flood event.

8. It has always been my contention and belief based on my personal review of the ditch system that the Myrtle Beach Air Force Base Redevelopment Authority, which is the agency charged with redeveloping the Base for civilian use, had responsibility and authority over all of the common elements on the Base, such as the ditches, the roads, the green spaces, the sewers and the electrical utility easement. The Myrtle Air Force Beach Redevelopment Authority and its officers, agents, and employees took no action as redevelopment occurred in changing the course of the ditch, in attempting to reduce the flow of water in the ditch behind my house or in attempting to divert the water such that I would not receive the type of flow I receive on my property during a big event.

9. In sum, the Myrtle Beach Air Force Base Redevelopment Authority has not maintained, changed, or repaired the drainage system which flows into the ditch behind the Plaintiffs' property and this is precisely one of the reasons why I continue to flood.

10. Finally, I note that because the Myrtle Beach Air Force Base Redevelopment Authority has certain statutory authority as found in S.C. Code Section 31-12-70(9) that Authority has the statutory duty to repair any works, streets, roads, public utilities and is part of their mission. It is my testimony that the Myrtle Beach Air Force Base Redevelopment Authority has not done so in this case and that the water behind my house continues to flow from the series of interconnected ditches on the Myrtle Beach Air Force Base and during storm events floods my property.

FURTHER AFFIANT SAYETH NOT.

Cornell Patton

SWORN AND SUBSCRIBED before me,
this 10 day of October, 2018.

Notary Public for South Carolina
My Commission Expires: 1-24-27

STATE OF SOUTH CAROLINA
COURT OF COMMON PLEAS
COUNTY OF HORRY

CORNELL PATTON, MELISSA PATTON, CHAD WEBB AND AMY WEBB,

Plaintiffs,

vs. CASE NO. 2016-CP-26-06495

PRESTWICK LAND LIMITED PARTNERSHIP; PRESTWICK HOMEOWNERS ASSOCIATION, INC.; JACKSON COMPANIES; CITY OF MYRTLE BEACH; SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION; HORRY COUNTY; MYRTLE BEACH AIR FORCE BASE REDEVELOPMENT AUTHORITY; NELSON L. HARDWICK & ASSOCIATES, INC.; BERMUDA GARDENS HOMEOWNERS ASSOCIATION D/B/A HOMEOWNERS OF OCEAN WALK PROPERTY OWNERS ASSOCIATION; CAMPGROUNDS, INC.; AND PRESTWICK PROPERTY OWNERS ASSOCIATES, INC.,

Defendants.

(Caption continued on next page)

DEPOSITION OF: ROBERT K. TAYLOR

DATE: November 19, 2018

TIME: 10:14 a.m.

A. WILLIAM ROBERTS, JR., & ASSOCIATES

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Charleston, SC (843) 722-8414
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Charlotte, NC (704) 573-3919
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CAPTION CONTINUED:
CITY OF MYRTLE BEACH,
Third-Party Plaintiff,
vs.
PHIL EAVES AND ELIZABETH EAVES,
Third-Party Defendants/
Counterclaimants/Cross-Claimants.

DATE: November 19, 2018
TIME: 10:14 a.m.

LOCATION: Law Offices of
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2103 Farlow Street
Suite B
Myrtle Beach, SC

TAKEN BY: Counsel for the Defendant
REPORTED BY: SHERY E. GARGIR, CSR

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(INDEX AT REAR OF TRANSCRIPT)

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ROBERT K. TAYLOR
being first duly sworn, testified as follows:
EXAMINATION
BY MR. BATTLE:
Q. Mr. Taylor, my name is Kirk Battle. I'm the attorney for Horry County in this matter -- hold on a second.
MR. BATTLE: Can you all be quiet because I can't think if there's talking. Thank you.
BY MR. BATTLE:
Q. Kirk Battle. Horry County. This is your deposition, sir. I know you've been to many before. Just a reminder, though, it's not a marathon.
You're welcome to take breaks. You can go to the bathroom whenever you want. If I say something that doesn't make sense, I suspect this will be frequent, please feel free to ask me. I can rephrase it, go over it any way you like.
If me or one of the other attorneys does an objection to the form, what they are doing is flagging the record. You still have to, by law, answer the question; however, they are flagging the record for down the road as to whether or not the

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testimony is admissible.
If I missed something on the checklist, I know one of these fine folks will correct me.
Can you say your full name for the record, please?
A. Robert K. Taylor.
Q. Where do you live, Mr. Taylor?
A. In Greenville County.
Q. Do you have any family or kin in Horry County?
A. Not that I'm aware of.
Q. Let's see. Any businesses, church work, clubs, anything like that in Horry County?
A. Not that I'm aware of.
Q. Okay. So let's see. You're an expert in this case. Do you mind stating your credentials for the record.
A. I can certainly state some. If you want to push on more, I'll do that.
I have bachelor and master's degrees in Engineering. I've been a professional engineer in South Carolina since the early '80s. I don't remember which year, maybe '83.
I've done numerous work, undergraduate and graduate, in fluid mechanics. I've studied and

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worked on drainage and flow problems at various sites over the years.
That's kind of it in a nutshell. I've been qualified as an expert witness in multiple state courts and federal courts and local courts.
Q. That's fine, sir. And you've provided a complete CV to Mr. Connell?
A. I would not say that it's a complete CV. I would say it's a summary representative CV.
Q. All right. How many cases have you testified in that involve flooding?
A. I don't know. I think I was asked that about, what was it, 15 or so years ago in another part of this matter.
And I don't remember if I knew then. I couldn't say now. Potentially a handful. Depends on what's meant by flooding, but potentially a handful.
Q. How many of those cases have involved drainage issues?
A. Well, drainage tends to be at least a minor and maybe a major issue in most flooding situations.
Q. So my question was, how many cases have you -- is the answer, you don't know again?

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A. Okay. You're referring to drainage in general, not just general drainage with respect to flooding. Is that correct?
Q. How many cases have you testified in that involved draining -- drainage?
A. I would say probably a handful.
Q. And is a handful more than five, less than five?
A. Five, plus or minus a little.
Q. How often have you testified for Gene Connell in cases?
A. Well, Gene Connell and his firm have been a client so probably a dozen or so.
Q. You were an expert in the prior lawsuit; correct?
A. That's correct.
Q. Have you ever designed a drainage system for an HOA?
A. I have not worked as any design engineer to design drainage systems for HOAs.
Q. In any capacity, for municipalities?
A. I've certainly worked on issues relating to design, but not been responsible for the design of a drainage system.
Q. When you say worked on issues relating

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to design, what does that mean?
A. Well, I've given an example of, I think the first one was when I was a graduate student, one of the projects that I was involved with was doing an analysis of San Francisquito Creek and it certainly served as drainage, particularly after rains.
Q. Where was that?
A. It's on the border of Palo Alto. I believe it's the border between Palo Alto and Menlo Park in places but I'm not positive on that now.
Q. Is there any other examples of doing design work related to drainage in any form?
A. Well, over the years, I've done calculations with respect to particular issues on elements of design of drainage systems, but I've not been the one to sit down and come up with the drawings for drainage projects.
Q. Have you ever dealt with regulations? Have you gotten anything licensed or affirmed by any government entity?
A. I certainly have been involved with regulations for government entities over the years.
Q. Can you give us some examples of that?
A. Well, it could be anything from

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building codes is one example. I worked on quality review of major federal government projects and a related project to that, an environmental impact study which related to government regulations.
Q. Any work with a realtor or a developmental organization?
A. I don't think so. I can't recall any.
Q. Any work -- and I guess you've already answered this with the drainage one -- but any work with getting drainage certified for a construction project?
A. The only thing I can think of in that category right off would be where there has been a problem and I've worked with either insurance adjustors or the property managers as far as what needs to be done.
And in terms of what needs to be done, that would relate to getting it certified. But I don't recall having done anything that would involve filling out the paperwork to try to convince a government organization to approve something.
Q. So any involvement like the measuring of water flow or gauging how much the impact statement of, like, a drainage system would be?

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A. Certainly measuring water flow from a fluid mechanic's point of view, a fair amount, or liquid flow I should say as well.
And what was the other half of the question?
Q. Just in regards to any sort of development or construction?
A. Not meaning to say anything different than what I said before, but when I've worked with problems involving construction of all sorts, including drainage issues, it's sometimes been with the insurance people, what needs to be done, what needs to be fixed, how does it need to be done with property owners, the same sort of thing.
That's all from a side issue rather than being brought in to design something.
Q. And -- sure. And I don't mind explaining the gist of my questions. Would you say that you're called in after the facility or building is constructed or before?
A. Well, it's generally I do what sometimes has been called post-incident analysis. I've looked at things that are -- that have not turned out the way they expected to determine what happened and what to make of them and what to do to

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make them correct or improved.
But that also means that it's things that had changed and that activity would be before they had changed.
Q. Do you have any examples of pre-incident -- I guess there wouldn't be anything such as like pre-incident, but you understand what I'm asking about is you're being called in as an expert after the fact; correct?
A. Yes.
Q. Okay.
A. But along with that -- and I can't think of any right offhand -- but I've certainly had times where I've worked with clients on -- is this -- they are saying is this a good design? Do I need to do something before I put it out in the public to make it safer or more reliable and so on and so forth, so I've had some of those, but not a whole lot.
Q. Can you think of the names or locations of any of these structures?
A. And these are engineering issues, not necessarily structures but one was an individual trying to design a new type of trailer and trailer hitch and wanted me to go through analysis of it to

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see from his prototype what I thought of the -- of its potential failing under different circumstances and how it can be improved.

So he had built a prototype but he had not put it out on the market yet and so that was not a hydraulic structure but that was an example of doing something before there is a problem.

Q. Are there any examples with hydraulic structures?

A. I can't think of any. I'm not saying there were none, but I can't think of any.

Q. That's fine. And it's just a kind of a general wraparound before we start getting to the exhibits.

Can you explain to me what the basis of your expertise is for evaluating the canal?

A. Some of it is, I would call it just basic practical engineering. Another is the fluid mechanics and the long-term specialty in fluid mechanics.

And part of that is dynamics as well. Those are related to fluid mechanics.

MR. BATTLE: If you don't mind picking up Exhibit 1. I know you've a chance to review it but just go ahead and go over it again. I've

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highlighted the relevant portions. It's pretty short.

(DFT. EXH. 1, Affidavit of Robert Taylor, was marked for identification.)

THE WITNESS: This looks like what you had put on the table in front of me a little while ago.

BY MR. BATTLE:

Q. Only the first two pages, sir.

A. Okay.

Q. So maybe what I'll do is I'll hand them to you. This is Exhibit 1 and let me take the rest of these. Sorry about that.

A. That's okay.

Q. Just take a moment to review that and let me know when you are ready to talk about it.

MS. DUPRE: Is that the affidavit?

MR. BATTLE: Yes.

THE WITNESS: Okay.

BY MR. BATTLE:

Q. So let's just go over it.

This is Paragraph 2.

"I have performed extensive work on the canal behind the home of the Pattons in Prestwick."

What does extensive work mean?

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A. Well, let's see. I was involved in this, I guess, about 15 years ago and it stayed in the system. I'm sure I did some calculations. I don't remember exactly what all I did at that time.

But I had substantial involvement in dealing with this in the early litigation.

Q. How much of your records from that initial lawsuit have you retained?

A. And I don't know if Mr. Connell told you, but in going into semiretirement and purging my files, I started purging things that were more than 10 or 12 years old.

And guess what happened six months before I got called back on this?

Q. I understand that. That's fine.

MR. CONNELL: And we've located some black-and-white photos that we'll get to you that he's given to me this weekend.

BY MR. BATTLE:

Q. Anything else or is it just -- when you say purge, are we talking about like shredding, dumped, the City dump?

A. Most were dumped. I did keep the negatives from my photographs.

Q. Are you aware of the dump where you

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dropped it at?

A. No, but --

MR. CONNELL: Horry County.

THE WITNESS: That's an interesting issue, how long do you keep things and --

BY MR. BATTLE:

Q. You're within the statute. I think it's ten years --

A. I know but I've kept things -- I've kept some evidence one time that the insurance adjustor said, "Throw away," and I said that I shouldn't get rid of it.

And about five years later, I had a call from a lawyer saying, "Do you still have this evidence?"

So I tend to keep things longer than I have to and, unfortunately, we missed this one by a few months.

Q. All right. Paragraph 3, as far as highlighted area, you said:

"The developer to the east of the plaintiffs hired Hardwick & Associates to reconfigure the canal by changing its course."

And then in 4:

"It was negligent to change the course

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of the canal as this has channeled more water on the plaintiffs' property."

Is it safe to say that your basic position is that changing the course of the canal is what's causing the flooding?

MS. DUPRE: Objection to form.

THE WITNESS: What I'm saying is that changing the course is a contributor rather than the cause.

BY MR. BATTLE:

Q. Okay.

A. No way would I suggest that it is the cause.

Q. And your language speaks that: "Causes more flooding by artificial means on the plaintiffs and should not have been approved by the County in light of the well-known propensity of this canal to flood."

What are the indicators that changing the course of the canal would have caused more flooding?

A. Okay. There are several thing that go along with changing that course of the canal.

One is that when you put a right angle or close to a right angle, I don't know whether

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it's exactly a right angle, that does increase the resistance, all things being equal.

The second is the -- from what I understand the purpose of changing this canal was to provide more space to put more houses, which all other things being equal, would increase the flooding because of the nature of the building of the houses.

And, of course, filling in the land and making it go higher and giving the water a smaller place to go as the creek begins to rise.

And so a place that was competing with -- let's just call it the Patton property -- for water, in other words, another lowlands which could have absorbed some was being taken over as a part of changing the course because it was built in and raised.

Q. Have you done any measurements of the changes to the canal?

A. No, I have not. I have not gone in and put a tape to it and that sort of thing.

Q. Is this purely an eyeballing situation?

A. Well, there are diagrams showing how it was changed. The canal certainly appears to be wide enough not to be a bottleneck in that area but

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having the right-angle turn does increase the resistance to flow.

Q. Which diagrams are you referring to?

A. There have been a bunch of them over the time period I've seen.

Q. Is there -- help me out a little bit. If there were so many --

A. I can't remember which one. I wish we had everything up on the wall with a big number on them.

Q. I'm sure we'll get there.

Can you describe how this backing-up action, as you called it, works in term of fluid dynamics? What's the water doing that -- why does it just flood at the 90-degree turn?

A. Why does it just flood the 90-degree turn is what you're saying?

Q. Yes. Why is that -- it's not like a dam. I understand how dam stops water but how does a 90-degree turn do it?

A. Well, the basic thing in fluid mechanics is that there are certain changes that confine the flow in different ways, such as an elbow, and we'll go back to an elbow.

An elbow in a pipe, depending on

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various factors, counts as resistance, as so many feet of length of pipe, so water flows downhill, and so for water to flow from one end of a straight canal to another it needs to be sloped down.

Well, a curve requires typically some additional slope to compensate because it represents more length than the actual length of the curve.

That was a convoluted way of putting it but you feel free to ask me to clear that up.

Q. No. I think I understand what you're saying. I've been doing my homework. Don't worry.

So do you think that -- would it be possible to modify the canal as it exists now to resolve the turn issue?

For example, you were referring to slope. If they shored up the bank or dredged it out more so there was a slope there, would that resolve the flow issue?

A. Let me put it this way that may well answer your question without answering it directly.

It might be clearer that way. If a canal is very narrow and it's widened and a curve is put in there, that could be the equivalent of a wider curve than a narrow canal.

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But putting this curve in there also went along with adding additional houses that would not have been there had the curve not been put in there.

And an additional development is typically what causes an additional problem with the flow or with the hydraulic system, I should say.

Q. And how did the additional housing cause the --

A. Well, because you have more pavement, more roofs, so forth, which causes more rapid concentration of the flow. That's one.

And, in addition, it's my understanding and what I can glean from the information that the ground level where those houses are is substantially higher than it was beforehand.

And, therefore, it does not absorb water when flooding begins, before it gets to the top of the berm but it does not absorb water. And so in certain rains, that adds to the problem.

Q. Is it your understanding that water has flowed over the berms at the Pattons' property?

A. No. I mean evidently the berm could be 20 feet high and it wouldn't do that much good.

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Now, I understand that it flowed around it at one time and there has been some correcting and maybe some contention on that correction at one time.

But with the water level coming up for the -- it's more difficult to drain the Patton property because they tried to drain their yard into a water level that's higher than their yard and, of course, that doesn't flow without a substantial pumping boost like they have in New Orleans, that sort of thing.

Q. I understand. So in regards to fixing the bend in the canal, is there any feasible way for the County to go in and alter or change the structure of the canal as it exists now and make an impact on the water flow?

A. You're talking about the canal at the point of the curve or at the canal anywhere?

Q. Probably just the point of the curve for right now. Let's contain it, contain the question.

A. Making it wider would have a small impact on the positive direction.

Q. And how much is small? Like 10 percent?

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A. Let's say it depends on the flow. It depends on how much 17 is being bottlenecked and the culvert under 17.

But the curve adds an amount to the flooding problem. It's a problem. It is not the major problem.

Q. And I know this is kind of a "wonkie" one, but is there like a percentage amount that you think the curve is responsible? Is it 50 percent? 70 percent?

I mean -- I noticed that in 2003 you were willing to bring out a big fancy hierarchy so --

A. Well, I wouldn't call it a big fancy hierarchy. Somehow I was being pushed to identify the major responsibilities there.

But the effect of the curve depends on a lot of what's happening downstream, of how 17 is backing up.

And when I say 17, I'm talking about the culvert under 17. If it's not backing up at all, then the curve may be having more of an effect than if it is, and if it's not backing up at all, then the water level in the canal at the Patton property area, I don't know whether that would be a

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problematic water level.

One can't tell right now. It's a potential of being at a problematic level.

Q. It sounds like what you're describing then is that depending on how much water is inside the canal system dictates whether or not the bend in the canal is having a significant impact or not?

A. Well, obviously with almost no -- very light water like now, it doesn't make any difference.

Q. Okay.

A. There could be ten curves in there when there is almost no flow.

Q. Is there -- do you have a water, like a rainwater amount, I think we call them flood events, you know the system -- 25-, 50-, 100-year flood events?

A. Yes.

Q. Do you have a specific flood event that the canal ceases to be able -- ceases -- or begins to become a problem?

A. I don't have it numerically. I do have it in terms of obviously some of the events that we've had in recent years have been problematic and I would say they are frequent enough that they are

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not all 500-year events and they are not all 100-year events.

Q. And that's getting more into the -- you're talking about frequency of the storms, not necessarily -- scratch that.

You're referring to the fact that we're having more and more hurricanes; right?

A. I was referring to the fact that we've had more floodings -- I would just call it the Patton property for lack of -- not wanting to include everybody, just call it that.

Q. All right. You mentioned the culvert under 17. Can you list off all of the factors you think are causing the flooding for the plaintiffs' property at this time?

MR. CONNELL: For each defendant? Is that what you're saying?

MR. BATTLE: At some point there is going to have to be -- it's going to have to happen.

THE WITNESS: All the factors you're asking for that affect the flooding over the plaintiffs' property. Is that what you're asking for?

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BY MR. BATTLE:

Q. Yes.

A. Okay. Boy, where does one start?

First of all, you've got the property being, from what I understand, being presented as being a non-flooding piece of land. And then selling and building houses on that basis.

Then there is the internal planning of the development and then the potential lack of following the plans regarding handling of water runoff which certainly had the design and maintenance of the channel over the years.

We've got the conduit on Highway 17.

We have a causeway and a dam down below which I would -- I know some of that contributes to the blockage under 17 or the reduced flow under 17 which contributes to the problem.

You've got the runoff from the golf course.

You've got the design of, I think, it's Crystal Lake, in the absence of effectively -- more effectively using it for flood control.

You've got the building across the creek which the canal was rerouted in order to accommodate which has pluses and minuses.

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And I think some of the pluses may be not -- some of the minuses in terms of flood control are not really looked at.

Q. We can take a break there. There is so much to unpack from just that.

A. Okay.

Q. Do you have any more, sir?

A. I may have left out some specifics but the generalities are there.

Q. There you go. All right. Did the developer -- you know, did the developer that was constructing across the canal make any changes to water flow besides altering the canal course? You mentioned pluses and minuses. This question kind of gets to that.

A. Okay. You're talking about water flow. Certainly on his property he made changes. He put in drainage pipes coming out from the development into the canal, so he certainly altered water flow there.

I don't have the specifics on how much fill he put in there, but it looks like he did put in fill so there was fill but that can change water flow characteristics and understanding and he put in retention facilities too.

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Q. Have you looked at the amount of water that the retention facilities maintain?

A. I haven't seen those numbers. If I did, I didn't fully absorb them.

Q. Well, I'll just get to them on the road. Okay.

And so did the retention facilities and things like that, when you say pluses and minuses, do they balance out the changes that the development has created for the water flow outside the canal?

That was kind of a poor question.

A. I think it was a nice question.

Q. Okay.

A. You worded it well. I'm just -- thinking about the balances with pluses and minuses, is there a balance of some sort and it comes out one way and the other way.

And my take on it would be, without having had the chance to really study it, is that under some circumstances the pluses -- which means the pluses being less problems -- the pluses may outweigh the minuses and in other circumstances the minuses may outweigh the pluses, the circumstances being intensity of rain, length of rain, total

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accumulation, these sort of things.
So this is similar to the question about the canal in terms of the County having any kind of construction solution for this situation.
Q. Is it basically during like a normal rain flow the system works; correct?
A. That's my understanding. I wish I was around to observe the level that the water comes up the canal for each rain that comes along, a single thunderstorm, multiple thunderstorms, a front coming through and stalling and all these different things and exactly how all these things work.
But the characteristics from what I understand have been that the pluses and minuses balance out some of the time and some of the time it's the minuses are more substantial than the pluses.
Q. And would it be safe to say that you're describing when a hurricane hits, it floods basically?
A. Maybe not basically but certainly that would include when a hurricane hits, it tends to flood worse than it needs to.
Q. And so if you can unpack that statement to me, how much does it need to flood when a

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hurricane hits?
A. You know, you picked up on my answer and that is a very clever question in response.
As an example, and I hate to go into personal things here, but, for example, the house that I used to have was in Columbia and I picked that house partly because it was about five feet above the road, the ground yard was. A lot of the neighbors' houses were one to two feet above the road.
When the big rain of '15 hit Columbia, my house was high and dry. The neighbors all around were flooded. So I think the rain we had what happened would be expected with the topology there.
And so to have a development where it can't handle that, you just don't put houses, at least non-built up hours in areas that can flood like that.
And certainly when you do have houses in marginal areas for major events, you don't do things in draining systems to make it worse.
Q. Have you -- there are a lot of questions I have like the specifics of the housing development.

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Have you reviewed the numbers at all in terms of how much the engineers said the water flow was increasing or decreasing because of their work, what we're calling the property across the canal -- in my mind, it's called Bermuda Gardens. It's not called that anymore, you know how they change those names.
But that's what they were in the original plans so when I say Bermuda Gardens, that what I'm referring to.
A. And we know that it's across the creek.
Q. Did you evaluate at all the engineer studies, the claims about input and output of water?
A. I saw that briefly a little while ago, while we were waiting and they are claiming that there is a reduction of water flow by their changes.
Q. Okay.
A. I didn't see that they took into account the fact that they had the extra houses in there that would not have been there had they not changed the creek.
And so had they had the same facilities in terms of ponds and so forth, I don't think they

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did that calculation.
And I also didn't see anything with respect to how they raised the ground level by putting in fill, the effect of that on the neighborhood.
Q. So we're going to do a thing where I say what my understanding of what you meant was and you tell me if I've got it right or not.
A. Okay.
Q. They did not account for the impact that all the concrete and the roofs, as you called it earlier, would have on the flow; right?
A. I don't think I quite said that.
Q. What did you say? Well, Mr. Taylor, you understand what I'm saying here. I'm trying to get --
A. I understand that and I'm trying to help you here. They took that into account. They had -- they changed curve numbers which to me would be representative of putting in concrete fills and so forth.
Q. So let's just go one at a time. So they did account for the pavement, the roofs, and the displacement the houses would cause; correct?
A. They had an accounting for it, yes.

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From the way I read it, and I had about two minutes on that page, so the way I read it, they attempted to take into account the fact that they had roofs and sidewalks and streets and so forth.

Q. The major thing they did not account for was you called it extra houses. But you're just talking housing period, or do you mean that they have houses outside the scope of their permit?

A. Neither. When they changed the course of the creek, that gave them more land to build more houses on.

And what I was suggesting was that had they had the same infrastructure of storage ponds and so forth and left that area, let's say, to the right of the creek -- to the right of the old creek going downstream left that low, that would have given more capacity for the creek to flood into that area rather than being forced to -- rather than rise quite as high.

Q. So --

A. Go ahead.

Q. So your contention then is by raising up the property, all that big wall of sand, I guess, or dirt or fill or whatever it is, they basically created a barrier where instead of the

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water being able to go out onto the land, it then just hits that wall and keeps flowing?

A. It basically forces it up higher. I mean it's just like getting rid of a retention pond in a way. And they did put in some small retention ponds.

Q. What technique did you use to come to this conclusion?

A. Addition and subtraction and multiplication.

Q. So this is just looking at the plans and eyeballing it?

A. Well, looking at the volume of space. They appear to have raised it up about six feet. I don't know if that's exactly accurate or not but it appears that they raised it about six feet.

And I don't know how many extra acres they created. Let's say they created three additional acres, so that's about a million cubic feet.

Q. And so this is just -- I don't mind explaining this. I'm trying to figure out the models or is all of your data coming from just looking at the plans?

A. And that part, seeing -- estimating

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kind of where the creek went, looking at some drawings and you have the drawing there, which I'm going to get to see again soon, I hope, just gives me an estimate of the amount of land.

You know I said three acres. It might be an acre and a half. It might be five acres. I'm not sure.

Q. That's fine. The goal of the question is to figure out the basis for all of these opinions and so what I'm hearing is that it's coming strictly from the plans as you see them?

A. The plans and then talking with Mr. Patton and having him point the way that it went before. Again, it's ballpark. It can't be precise and typically the hydrology stuff is not precise.

People take it out three decimal places sometimes and that's not needed.

Q. So is it your opinion that the County should not have approved this new development because of the area's history?

A. Or approved it to be different. But in general, I think until 17 got fixed, they shouldn't have been approving a lot of the stuff that went in upstream of the 17 culvert.

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Q. Now when you say, 17 is fixed, what do you mean?

A. My apologies. I refer to that very loosely. I mean the culvert substantially enlarged, another culvert put in, another train pass put in to cross 17 to drain the field.

That's something that's got to be done because 17 is a bottleneck and a lot of things contribute to the problem.

Q. Are there any other factors that should have told them to not approve development in this area?

A. First of all, I didn't say not approve development, but not an intensive development. And if I said, development I meant -- let's see.

Q. My reading of Paragraph 4:

"Such a change in the canal direction causes more flooding by artificial means and should not have been approved by the County."

So I guess, how would you phrase it?

A. It may be not even approved development. But with the problem that you have, my take on it is, don't approve any development until you get the problem solved as a part of it.

And, additionally, don't approve any

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development that has potential to make things worse.

Q. Okay.

A. Now, if they put in six houses on stilts, that's a development, but I would see no problem with that.

Q. So getting back to the question, was there anything other than the pipe, than the Highway 17 culvert to tell the County that they should not be approving development here?

A. Well, there is the flooding that has been taking place.

Q. Okay.

A. There has been very substantial flooding. You've got a real problem with those houses on Prestwick.

They should never have been built on -- and never been sold as un-flooded properties. But you've got a real bottleneck there and things downstream of 17 seem to affect the flow too, so the whole thing needs to be straightened out and someone needs to straighten it out before you get houses in there.

Q. And this goes back to the question we were talking about of the scale of water which the

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system can withstand.

You know Horry County's code has got to be up to a 25-year storm event; correct?

A. That's what I understand and that bothers me that that is that low.

Q. That's fine. So hypothetically speaking, do you at any point intend to testify that they aren't up to 25-year flood events standard?

A. I have not paid a whole lot of attention to 25-year flood events, which I can't remember exactly how many inches and how many time periods and that sort of thing is.

I considered realistically what happened in Myrtle Beach, what rain has happened there.

And in this situation, we have had I don't know how many floods in less than 25 years. So there is some -- if someone says that it meets the 25-year definition, but you've got six floods in 25 years, something is wrong with how a person is using the numbers.

Q. And I'll just cut to the chase. You're not going to testify that they are violating their own code of regulations.

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It sounds like what you're saying the codes and regulations themselves are flawed?

A. I would say there is some of both in there. I mean we haven't had, whatever it is, six, 500-year events in the last 15 to 20 years. I mean it's just -- so, yes, the regulation is flawed, yes.

I raise the question of how has this land lasted longer than 25 years and so to make it legitimate, to say, okay, whatever this 25-year thing is, we'll just let people build houses all over the place and just turn it over to the federal government and FEMA to take care of it, something is wrong with that.

Q. I understand. So it sounds like you're saying that you think there is something wrong with the codes and regulations.

A. I think requiring only 25 years rather than something longer is problematic.

Q. Do you intend to ever cite or claim that it's not up to the 25-year standard?

A. I haven't really addressed that. I just addressed that it's a problem -- it's been a problem that it keeps flooding and whether we keep on having 100-year floods year after year, so to

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speak, I just haven't addressed that.

Q. That's fine. Are there any defects in the certification process that you're going to assert?

A. I haven't studied the certification process yet. I've just looked at the results.

Q. Anything on the DHAC permits?

A. I haven't looked at that sort of thing.

Q. Okay. OCRM and their certification plans? Any note on that?

A. I haven't really addressed the certification of plans other than I'm not specifically aware of plans where governmental organizations were deliberately bought off, so to speak, by developers. I haven't addressed that.

Q. What now --

A. Convinced. Let's say convinced. That you didn't have developers convincing the government to relax things. I haven't addressed that potential.

Q. Do you think somebody bribed Horry County to accept these plans?

A. I use bought off in a general sense of using convince, anything to convince. Like the swales were not built. They were supposed to be

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there in the plans. Somebody approved it. I don't know how that happened.

Q. You understand that they have to approve the plans before the construction begins; right?

A. Yes.

Q. Is there a building code that wasn't met?

A. I have no idea.

Q. Based on your review of the property, does it look like it's going to flood again, the property?

A. Yes.

Q. There you go. Does it -- do you know what storm event will cause it to flood?

A. You know, if I could do that, I would be in a different business.

Q. Should every hurricane cause it to flood that hits this area?

A. Boy, that's an interesting question. Should a hurricane -- well, we wish that it wouldn't, but could there be a hurricane that comes through here that would not cause it to flood, and by flood, we mean, let's say water up to the garage floor level of the Patton house?

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Q. How high is that?

A. I think it's 11 or 12 feet above the sea level. Those are the numbers that we see on various maps where typically the 14 to 17 is where a lot of buildings are.

I can see a hurricane come through that would not get water up to there.

Q. Okay.

A. But it would have to be small, fast and get a certain edge of it, I would think.

Q. And I know -- I try not to repeat myself but sometimes it happens.

You don't have a specific flood event that will guarantee, cause the canal to flood every time, do you? Can you name one?

A. You mean a named flood event?

Q. Not a name --

A. Go ahead.

Q. Like how much rain -- let me rephrase this.

What amount of water has to hit the canal for it to cause flooding?

A. You know, I started to do that calculation but did not. And I'm trying to remember the calculations that I did.

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It's my -- this area that drains through the creek is, I think, around 1,400 acres. Is that -- I could ask you if that's accurate. Are we in agreement on that?

Q. Are you talking about Prestwick or Bermuda Gardens?

A. The whole area with the red line around it which has an outflow through this.

Q. I mean, I'm not going to hold it against you, if that's the wrong -- I don't know the whole watershed. Sure.

A. I believe the watershed, the overall drainage area is about that. Well, a significant rain event, I think, is close to 50 million gallons or something like that.

And I certainly think that 50 million gallons in a day or so would completely overwhelm the system, which has happened.

Q. Which storm was that?

A. Oh, that's just a hypothetical. A heavy storm.

Q. Does the water permanently stand on the plaintiffs' property when the flooding happens?

A. While it's flooding, it's permanent but after the flooding has stopped, it's off.

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Q. So it goes away once the water level goes back down?

A. Yes, of course.

Q. Okay.

A. I didn't mean to make the question into a joke.

Q. It's okay. It's the only way you can get through this stuff sometimes.

Do you need a break, Mr. Taylor?

A. Not yet. We're fine.

Q. All right. Do you have a comprehensive list of all the times the plaintiffs' property has flooded?

A. No, I don't.

Q. Okay.

A. They have probably told me but I have not written them down.

Q. And the subject of this lawsuit is primarily the 2015, 2016 flood events. Does that sound right?

A. Yes. And the background is earlier ones than that, yes.

Q. Do you know what the first flood event was post-Bermuda Gardens construction?

A. I'm not sure if I remember which one,

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no.
Q. Does 2010 sound about right?
A. I remember a discussion of one around that time period, but I don't know when construction was finished on Bermuda Gardens.
Q. Okay.
A. I may have seen that. I just don't have it committed to memory. 2010 is the year before then.
Q. This is kind of a hypothetical one, but would the property have still flooded during Hurricane Matthew, that was the first flood incident alleged in this lawsuit, if no changes to the canal had occurred?
A. No changes since when?
Q. If -- let's start bigger than that.
Would the property have still flooded during Hurricane Matthew if there had been no development -- if Bermuda Gardens did not exist?
A. I don't remember the numbers on Hurricane Matthew and when it was. When was it? What were the numbers?
Q. It's 2015. Oh, gosh, I don't know.
A. The one in September?
Q. '16?

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A. '15 was a big event and --
Q. 2015 was the massive one and '16 is the -- what's the 2015 storm? So flood event -- let's call them the 2015 and 2016 storm as we go. I don't have a lot of storm questions.
A. Okay.
Q. Would the property have still flooded in 2015 if Bermuda Gardens did not exist and none of the changes had occurred?
A. I think it would have. I think Bermuda Gardens contributed a small amount to that but they contributed something.
Q. So the property would have still flooded even if this whole thing was still totally natural?
A. Yes. There was a lot of factors which contributed to that and you can take away one of those factors, or maybe most of them, but any individual factor could be taken away which would not have stopped a certain flooding event from occurring.
Those factors tend to make the flooding event a little bit more and all put together make it substantially more.
Q. If there is no Bermuda Gardens in 2015,

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what's causing the flooding?
A. Well, everything else. And you can take away any one item and it still occurs.
Q. All right. And that holds true for the 2016 storm event as well?
A. That certainly is my take on it.
Q. What would happen if there was no canal at all?
A. You know, I don't know where the water would go, but it would find a low area, wherever it is.
Q. Is the approval of the canal changes and construction of Bermuda Gardens -- I kind of wrap them all up into one bundle in my head --
A. Sure.
Q. -- but is the approval of the Bermuda Gardens development the only negligent act that you're alleging by Horry County -- that you are testifying to about Horry County?
A. I've been looking more at what occurred and haven't kept close association with individual organizational entities, but to the extent that they have had a hand in the canal all together -- and I can't remember whether they have a maintenance responsibility over it or not -- but

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it's the various approvals along the line at times and there is a lack of maintenance of the canal.
Q. When you say lack of maintenance, what is that?
A. The canal had been very poorly maintained at one time. It's much improved now.
Q. When was it poorly maintained?
A. Back in the late '90s, I think it was.
Q. Is there --
A. I don't remember when the improvements were made.
Q. Is there any -- is lack of maintenance a cause of flooding in 2015 or 2016?
A. I can't rule it out but I can't point to anything right off. Also it depends on what you mean by maintenance.
I was referring to keeping it cleaned out and so forth. And, for example, the brush washed down that had not been taken out and partially clogged up the 17 culvert.
I don't know, but that's another lack of maintenance. It's an issue, if it did, and somebody I talked to talked about some partial clogging up with trash of leaves and that sort of thing.

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Q. Who did you talk to?
A. I don't remember. It might have been 15 years ago. But I don't remember but my contact was certainly out there.
Q. Okay.
A. I can't rule it out.
MR. BATTLE: Here is Exhibit 2.
(DFT. EXH. 2, Copy of photograph, was marked for identification.)
BY MR. BATTLE:
Q. Is that a picture of the canal that is the subject of this lawsuit?
A. It looks like it.
Q. It is.
A. Okay.
Q. And you said you've done no measurements of this canal?
A. That's correct.
Q. If the canal is deeper and wider in addition to the directional changes made, does that improve the water flow?
A. In general it would, yes.
Q. If they went in there with backhoes and stuff and made it even deeper and even wider, would that improve the water flow?

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A. Okay. It would improve the water flow through that area at that time, yes.
Q. I'm kind of doubling back and I know that you've addressed this, but what should Horry County have required Bermuda Gardens to do in order to make the area not flood during major storm events?
A. Well, I made a suggestion before in the extreme, and it was a little kind of facetious, but if it approved six houses on stilts. That's an extreme.
Q. Okay.
A. Lower density, less fill, more retention. I don't know if they would have required a new way of getting water to the ocean or not.
Q. Okay.
A. Those sort of things. If they had a new and adequate way of getting water to the ocean, then they would build high rises there if they wanted to, so to speak, figuratively speaking.
MR. BATTLE: So this is Exhibit 3.
(DFT. EXH. 3, Handwritten notes, was marked for identification.)

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BY MR. BATTLE:
Q. Are these your personal notes from the 2003 lawsuit?
A. I believe so, yes.
Q. So I'm obviously just doing a checklist. So in 2003 you said:
"Approval of the subdivision drainage plans caused the flooding" -- or one of the factors, I think would be a better way to put it.
Are the plans themselves flawed or is it the failure to follow through on them that's causing the issues?
MR. BAXTER: Objection. Form.
MR. CONNELL: It's for the group.
THE WITNESS: Was it the plans or the way it was built?
BY MR. BATTLE:
Q. Yes. And that was a pretty loaded question.
In your notes for 2003, you wrote:
"Approval of subdivision development and drainage plan."
I'm assuming since it's 2003 and there is no such thing as Bermuda Gardens you're referring to Prestwick. Is that what you're

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referring to?
A. Yes. As I recall at the time, there may be some other development around there but I don't remember what it was.
Q. Was your opinion based on were the plans themselves inadequate and never been approved or were the plans not followed through on and built properly?
MR. BAXTER: Objection. Form.
THE WITNESS: It should be both.
BY MR. BATTLE:
Q. All right. What was wrong with the plans?
A. I would say for this one, with Prestwick only in mind and that's limited just to Prestwick, I think there should initially have been a berm, a well-built berm required and a pump, an adequate pump.
Now, I've heard mention there's a pumping station somewhere or there was talk about a pumping station but I don't know which it was and I have never been shown a pumping station.
Q. And --
A. And that's with respect to these low lots. It doesn't apply to the lots higher up.

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Q. This is a kind of a recap of the dispute that we had earlier. Are they not following their own regulations or are the regulations inadequate?

A. You're talking about the County?

Q. Yes. And I'm referring to the 2003 notes so I'm not trying to recap the Bermuda Gardens questions but you understand the line of questioning?

A. Yes. Well, again, one of the puzzles is that there was a plan and it wasn't built according to plan and the way that it missed the plan made it more prone to flooding.

I just have to say it was an inadequate drainage plan for the project and without getting into what the County picked up on and required but it didn't happen or what they did not pick up on that they should have.

Q. So to paraphrase back, it ain't draining enough. You're not going to comment to any mistakes or anything the County should or should not have seen other than just the plain fact of the matter?

A. That's just part of it. The fact that the swales were in the drawings and I couldn't find

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any swales there, that means they weren't built. That's not just, it floods there and so therefore it's bad.

Q. So that gets into -- it sounds like what you are saying is that the plans were never followed?

A. Or they were changed in a way that I was not informed of and that I was not aware of.

Q. When did you last inspect Prestwick swales or drainage?

A. I last looked at it yesterday. That's as close to this event as I could do.

Q. What did you see?

A. Well, I certainly saw the ditch that had been cleaned out a lot. I saw the curve. I saw the new development.

And since I'm about six, three, I stood in the Prestwick backyard and my eyes seemed to be basically level with the floor of the patio of the house across the way. I concluded that it had been roughly raised about six feet.

Q. Is that the clubhouse over at Bermuda Gardens?

A. I don't think so. I think it was an individual house. It's next to the house with the

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swimming pool or next to a building with a swimming pool.

Q. It's a long stretch. I'm not sure where you were.

A. I didn't look for swales again throughout the community but I didn't see any just in walking around but I covered that adequately 15 years ago.

Q. So did you see -- do you intend to testify to any changes at Prestwick or it's your opinion that it hasn't changed at all in 15 years?

A. I hadn't thought about doing it either way. I just -- I need to get my photographs eventually and Mr. Connell has the negatives -- or I still have the negatives I guess, but he has volunteered to make photographs and then I can compare.

Q. So as of this time, you don't have an opinion about Prestwick's drainage system at the property?

A. What has been done since then?

Q. Yes.

A. I believe I looked at the golf course drainage for the first time. I don't think I walked over there though I may have 15 years ago.

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And I was interested to see in the golf course flow just coming off those few acres of golf course was greater than the flow coming down the ditch, excluding the golf course.

So it looked to me like a little more than half the flow as it got to Highway 17 was from the golf course.

Q. Do you think the golf course is one of the factors contributing to the flooding?

A. Certainly in terms of heavy rain, if the golf course had a totally different path, then the flooding would be less.

Q. "Coordination of drainage plans." What does that mean?

A. Well, if you've got a bunch of different developments or sections of the development going into the creek and at the time you approve one, it may be reasonably adequate.

But if you don't take into account what's going to come right down the pike after it, if you don't take into account improvements, if you have two developments where they have the same runoff rate such that they hit the bottleneck at the same time, it makes it worse.

If you have different retentions and

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different runoff rates and they hit the bottleneck at different times so that's the coordination of drainage plans. That's an example.

Q. And I know we talked about this in terms of like the municipality, but do you have any examples of drainage systems that were constructed in this manner or that you had any involvement with?

A. I have looked primarily into individual issues in drainage systems rather than overall coordination but I have considered taking into account other sources of water.

Q. "Projects dumping into ditch Catherine Drive." I actually -- there was a lot of talk about Catherine Drive in the 2003 case and I never got exactly what it was all about. What's the Catherine Drive issue?

A. I don't remember from 2003. I don't.

Q. And it looked like they were just saying that water came off the road or is Catherine Drive like a neighborhood?

A. I believe Catherine Drive is a little bit part of like a causeway. And if I've got the right street, I think part of it was supposed to be wetlands at one point and the developer changed it

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around and then there is a question of whether part of it is artificial or an unplanned retention pond or not.

And I think that's the area that's being talked about, but I don't specifically remember from 2003.

Q. Is that a contributing factor today or has it been resolved?

A. If it's where I'm thinking of, it could be -- it could improve the situation. It could if it was done a little differently.

Q. How would it need to be improved?

A. I think by turning the path-through into a retention pond.

Q. How big of a retention pond?

A. I don't know the area that it would be and I don't know how much it would improve either. It may not be a lot.

Q. Okay.

A. I think this was addressed in the Thomas & Hutton study, the 2010 one. I think they analyzed it. It was studied and I'm not positive if I'm putting the discussion with the right location there.

Q. "Working on drainage system."

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Is that just maintaining the canal? I'm just reading from your notes.

A. That's what it says there and I don't remember from 2003 what it means other than I had been working on it and they had done some things that hindered rather than helped or that they should be working on it more to coordinate everything. I'm not sure what that meant at that time.

Q. Let's see. Do you intend -- you're not going to offer any opinion as far as ownership of the canal or legal duties?

A. I want to avoid legal duty sorts of issues.

Q. You will or you won't?

A. I want to avoid who really owns it and who is really responsible.

Q. Then if you're telling me that you're not going to go into it, then we don't have to --

A. I don't plan to go into it and certainly if I do, Mr. Connell will let you know.

Q. All right. And we talked about maintenance already.

There's a note with Pirate Land. And I know you mentioned that previously but tell me

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about that. How is that contributing to the flooding?

A. The dam is the causeway and what it is in looking at this kind of a pond, kind of a sluice, or whatever you call it, just below Highway 17 there is water that's relatively still moving.

And this water level is about a foot below the exit of the culvert. But there are markings on a fence post and other things that show that the water has left markings about, at least two feet above where it is now.

And so that would mean that the water level there would be at least a foot over the bottom of the exit of the culvert under 17 which means it would impede the flow which means at a minimum the water would have been up at least two feet above the current level which would put it a foot over the bottom of the exit of the culvert under 17 which is enough to negatively affect the flow rate through the culvert under 17.

And the water could have been much higher than that, but that's the level of -- kind of the water markings I saw on some of the posts.

Q. When did you see those water markings?

A. Yesterday.

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Q. Yesterday?
A. I probably saw them before but didn't pay much attention to them.
Q. You measured them yesterday?
A. No. I looked at them and estimated.
Q. And is that a contributing factor to the flooding now?
A. I think it would be, not the marks themselves, of course, but the indication that the water was that high in that body of water.
Q. And so to paraphrase, the water -- the dam causes the water to fill up over the culvert's exit from 17 which backs up water flow?
A. Yes, it slows down the amount of the water that can go through.
MR. BATTLE: All right. Let's take 5 or 10 or 20.
(A recess transpired.)
MR. BATTLE: Now I'm going to give you a real flashback to the past. That's a page from your 2000 depo. It's Volume 1, Page 115 for those who are keeping track.
(DFT. EXH. 4, Portions of previous deposition of Robert Taylor, was marked for identification.)

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BY MR. BATTLE:
Q. I figured rather than go through your 2003 depo piece by piece, I would just select one of the ones that felt like one of your most comprehensive answers and go into that and then I have a feeling that these other folks will have some other page cites for you.
I think at this point in the deposition you and a gentleman named Arrigo Carrotti had been going back and forth for a while?
A. I think I remember that name, yes.
Q. You would remember Arrigo.
Could I have you just review your answer real quick?
A. Okay.
Q. All right. You're saying property floods because the water gets too high and enters the properties, and it is also, you say, mismanagement of flow within Prestwick.
Does that sound like an accurate description of your testimony?
A. Yes.
Q. Are those still issues today?
A. Yes.
Q. You say:

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"The ditch could be 100 feet wide and 20 feet deep but that would not prevent it."
Do you stand by that statement?
A. Well, it wouldn't prevent water from flowing onto the property from elsewhere in Prestwick.
Q. So if the ditch was 100 feet wide and 20 feet deep, would the water overflowing cease to be a problem?
A. Water overflowing what?
Q. I don't mind explaining the angle of my question. I'm trying to assess whether or not making the ditch wider and deeper fixes the water flow issue and it looks like your answer in 2003 was indicating that it would?
A. Well, it would fix the issue of the ditch being too narrow or too slow to handle the water flow.
And I think there I was -- first of all, the Prestwick water is getting on to the property here and flooding it.
There were not -- and there could have been catch basins on the street level which basically would catch almost all this flow and it could either be a big pumping station or the water

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of the canal or ditch was below the Prestwick -- I mean below the lot there, then it would flow on out.
If the water was above the lot, pumping station could have done it. So the water being -- water in the ditch being high or low doesn't make that much difference if it's combined with adequate catch basins and pumping stations.
That being said, and I don't know at this time if what we're referring to is the whole ditch, but if the total flow path to the ocean had been this extreme, 20 feet deep and 100 feet wide, so to speak, and 20 feet doesn't help any because that's below the water level, sea level.
But if the whole path had been like that, then it would have been low enough for the Pattons' house and the other lots there to drain into it which would have been no problem.
But when the water level of the ditch gets up above the Pattons' yard, then there is a problem.
Q. When you say pump station, do you have like a recommendation or specification, what kind of pumping station would they need?
A. I don't know how many cubic feet a

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minute it would have to do or how many gallons a minute but if you had a catch basin of adequate size with these big pumps that would pump the water out even though the ditch was -- we're calling it a ditch, we're calling it a canal, we're calling it everything here -- but no matter what the water level is at the pumping station it would pump the water out of Prestwick.

Q. So do you think that the pumping station would resolve the flooding situation?

A. It would have to be combined with a much better catch basin and so forth and then hoping that the dike and berm never breaks.

Q. Okay.

A. And the power stays on, or you have a generator added to it, and you're really getting into complexities.

Q. This is a somewhat off the path question.

Do you know what a cross section for a canal is?

A. I know the term but I don't know -- I haven't done calculations that are going to specify that. Is that what you mean?

Q. Yes.

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A. No, I haven't.

Q. Do you have a cross section of a canal at all that you constructed yourself, I mean?

A. You mean constructed a canal or drawing out the cross section?

Q. Drawing out the cross section for this canal?

A. No, I haven't. I know that the cross section can be plenty large so that it is no longer the main bottleneck.

Q. All right.

MR. BATTLE: All right. Mr. Taylor, this is the letter from Horry County to the Prestwick homeowners on Strathmill Court.

(DFT. EXH. 5, letter from Horry County to Prestwick Homeowners, dated June were4, 2014 was marked for identification.)

BY MR. BATTLE:

Q. Could you just take a moment to review that?

A. Okay.

Q. Have you reviewed the Thomas and Hutton study which this letter is discussing?

A. Yes. And I think this is discussing something like -- was it 1 or 2-A and 4-C or

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something like that. I don't remember the numbers for sure.

Q. Were there any flaws in the methodology of the Thomas and Hutton study?

A. It was so big and there was so much data that I don't know if I could address that.

Q. That's fine. That's kind of an unfair question. I understand where you're coming from.

Do you know of any at this time that you intend to testify about?

A. Flaws or --

Q. Anything that Thomas and Hutton did that makes it inaccurate, flawed, incorrect?

A. I would have liked to see them put in meaningful dollar estimates on some of the ones that they said were too expensive to consider and those happened to be the best ones I think or some of the better ones.

Q. I think they gave -- well, we'll get into Exhibit 6 but there are dollar estimates.

A. I know that there was one place where it didn't have it.

Q. Now --

A. Or they did it later in another one. That's right.

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Q. Okay. So no math errors, technical errors that you have detected at this time?

A. I haven't looked at it from that perspective, just seeing what was there.

Q. And I'm checking my corners and you're checking yours. You don't have anything that you're going to testify about that you know of right now; correct?

A. That's correct. Is that the sort of thing that if I do, I should let Mr. Connell know and he will let you know?

Q. You're going to let me know.

A. Okay.

Q. What kind of rain event is the Thomas and Hutton report checking for?

A. I think they are going up to the 100th year.

Q. Do you think their assessment to the various solutions for the community is accurate?

A. It's reasonable at first blush. Whether it's really accurate without going through and checking everything, I don't know. But it's at first blush reasonable.

Q. What happens after first blush? I mean that's going out on date Number 2 and 3. How do

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you feel about the study?
A. I don't know if that's in the cards for me to spend the equivalent time that they spent going through and doing this.
Q. So this probably backpedals back to my initial question. Do you have -- are you going to testify that their assessments are mathematically incorrect, not the final decision but --
A. I haven't tried to identify going back and checking numbers and so forth and checking to see if they entered things in computer code and represented acreage and soil types correctly and that sort of thing.
MR. BATTLE: And I'll go ahead and enter Exhibit 6. I don't expect nearly as much commentary on this. There is a fair amount of commentary towards the end where I've highlighted it.
(DFT. EXH. 6, Thomas & Hutton Study, was marked for identification.)
BY MR. BATTLE:
Q. Do you recognize Exhibit 6?
A. Yes. September, 2012.
Q. And is that the Thomas Hutton study that we're talking about, a portion of it?

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A. That's one of their studies. I know there were different portions issued at different times.
Q. And I'll stipulate that Exhibit 6 is the one that breaks down the financial costs associated with each option.
A. Okay.
Q. And Exhibit 5 is describing the conclusions the study has made; correct?
A. Among other things.
Q. Fair enough.
A. Not limited to.
Q. Fair enough.
A. Okay.
Q. So out of the 14 options in Exhibit 6, the County described the two that were -- essentially had the most impact, correct, or the three options that had the most impact?
A. I'll have to look at it to see if it's three or not. I see two are highlighted right off. I think it's your doings.
Q. And most of my questions will revolve around the letter more than the study. I know the study is a lot of data.
A. By the way, this is what I'm referring

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to here (indicating). On Page 8 where it has a column that says, "Lake dredging not included."
That's talking about Crystal Lake so that's not the one that includes the cost of it. Maybe it estimates it in a paragraph somewhere.
Q. Do you think that the letter from 2014 picked -- do you think that it picked the three most reasonable solutions or most effective solutions to the flooding issue?
A. Let's see. There is Crystal Lake and then the Highway 17. What was the third one?
Q. The third one was increase the berm size around the properties.
A. Okay. The third one has not yet shown the need for that. That's certainly a good idea to do that most likely.
One of the things that disturbs me about this Number 5 is basically the Pirate Land and -- Pirate Land Campgrounds, they don't want -- it looks like they don't want the 17 culvert any bigger because that would increase the flow so they are admitting that the 17 culvert limits the flow on their property; therefore, backing up is what they want to continue to do evidently.
Q. So getting back to my question though,

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are there any other solutions in the Thomas and Hutton study that you think Horry County should have looked at besides increasing Crystal Lake or increasing the culvert under 17?
A. I don't know whether it makes sense to define another drainage path or not. I haven't looked at that. And evidently that's probably so expensive that nobody is thinking about it.
That's my guess on that but I haven't tried to estimate it.
Q. So you don't have an issue with them selecting those two as the most impactful solutions?
A. I think of all the contributory factors, those would tend to take care of the most.
Q. I'll just narrow that down a bit.
Essentially the Crystal Lake solution is create a giant retention pond upstream and improve the drainage of it as well under the ocean. Does that sound right to you, do you think?
A. It would smooth out the drainage toward the ocean which would help alleviate the 17 problem.
Q. All right. Would making the pipe bigger under Highway 17 resolve the channeling

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issues?
A. Depends on how much bigger but it could be made big enough to really be helpful.
Q. And how does that interact with the issues with the Pirate Land dam? It seems like kind of making the pipe bigger, if the water is still backing up, it's not going to resolve anything.
A. You kind of do it a lot broader. It doesn't do much to make it deeper.
Q. Okay.
A. A little bit but not much.
Q. But, again, if I understand what you were testifying about earlier about Pirate Land which is that the water basically gets stuck in that retention pond and then their exit out to the ocean causes it all to back up, how does making the pipe wider under 17 help with that?
A. Well, it doesn't help Pirate Land. Most of the time it has no effect on Pirate Land.
But when you get conditions that it would clog up the conduit under 17 with the current culvert, you get those conditions with a bigger culvert it would pour more flow into the Pirate Land or put a higher peak flow, the same amount of

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water going in there.
Q. So basically you would just increase the capacity of Pirate Land to hold more water?
A. Or broaden the spillway or whatever. It is what it is. But, see, when you get water going over 17 which I understand but I haven't seen, if it's actually going over 17, then Pirate Land gets that bigger flow anyhow.
It's that elevation of water level in the entry to 17 that is from the top of the conduit up to the road level that you can have that increase of water level which creates a problem upstream which doesn't create any more significant problem downstream.
And then once it starts going over 17, if it does that again, and I understand that it has done that, then that makes the Pirate Land problem great again.
Q. Can you name what storm or event caused water to go over 17?
A. No, I can't. I just -- someone had mentioned it one time that it was bad enough that it went over 17.
Q. Do you know who that was?
A. No, I don't remember who that was. And

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whether it did or not, I don't know, but if it does, then that puts a lot more water down on Pirate Land.
Q. Are you familiar with who lives at Pirate Land?
A. I may know somebody there but, no, I don't. I don't know who lives there.
Q. Would it surprise you to learn that it's a retirement community?
A. Being Myrtle Beach, no, it would not surprise me if it's a retirement community there. What's a cool place for a retiree -- Pirate Land. They'll run you over with a golf cart if you don't watch out.
Q. The letter finally concludes that the only remaining solution for the property owners is to improve their own berms. Have you evaluated the plaintiffs' berms yet?
A. I've looked at them and they seem to have generally done the job but they are not good, long-term berms, I don't think.
Q. What's wrong with them?
A. Oh, they are just there. They just looked like dirt was piled there. It's kind of like -- I'm trying to think what it looks like, but

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it doesn't appear to be really a capable permanent structure, but it may be.
You know, trees have been growing in for quite a while so it's holding so far.
Q. Did you evaluate the berms over by the Webbs' property?
A. Webb is the next door or --
Q. The younger couple.
A. Next door to the Pattons?
Q. Yes.
A. I don't think I ever got on those and looked at those.
Q. And I've got -- we'll get into the photography in a second.
A. Okay.
Q. Does that letter from Horry County basically put the plaintiffs on notice about their decision regarding the canal issues?
A. Well, it's basically saying that we don't want to go to the trouble of going under 17 and we don't want to upset the people down at Pirate Land and that we don't want to do anything that people upstream at Crystal Lake would not like in order to help people down in the lowlands.
Q. So do you think it is putting them on

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notice of the County's decision regarding this area?
A. It looks like they are saying, take care of your own problem.
Q. Do you think it's reasonable for the County to spend -- I mean let's just look at the tables -- $815,000 to improve the culvert over 17 Business to prevent flooding for two houses potentially?
A. Versus just buying out the houses?
Q. That's not the question.
Do you think it's reasonable as of 2014 when this letter was produced for the County to not want to spend $815,000 for two houses?
A. Well, I think the County had approved building houses there. Once you look at it philosophically, once you improve the house, you need to deal with the infrastructure that basically can make the house close to worthless.
Q. Is that for the Crystal Lake as well? I understand the 667,000 but when it says lake dredging not included, we both know that dredging the lake would cost a fortune; right?
A. Yes. And that's the problem with selling lots and building houses in flood plains.

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Somebody has to bear the brunt of it and who is it?
Q. And that's -- I'm not getting -- expecting anything more out of you than just acknowledging that neither of those solutions are cost effective.
A. Well, I would say under 17 there may be more than those two houses at stake in terms of that culvert. That's an example.
Q. What other houses would be impacted by changing the culvert?
A. Well, it depends on how much more development is flooding in there, where the Crystal dam reaches in a big storm and these -- you don't know what's coming down the pike.
Q. So my understanding is that your basis for that is that it would be a sound investment for the future?
A. You know, that's a good way of putting it.
Q. There you go. Did Horry County employ experts and engineers to study this water basin?
A. I think they did.
Q. Okay.
A. But I don't know for sure. I didn't pay attention to who did what or whose suggestion

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but if they did, they did.
Q. You're not even going to give me that one? You have the study right in front of you.
A. Was that done for -- okay. I read that correctly now. Okay. My apologies.
Q. Did Horry County hire a major engineering firm --
A. They spent all this money. That's Horry County. That's right, yes, they did.
Q. Thank you.
A. Thank you.
Q. Does it appear that they made a conscious decision weighing multiple options about how to resolve this situation?
A. I didn't --
Q. I understand that you don't agree --
A. Yes. It looks like they made a decision. They said for the following reasons, the two people need to be able to take care of their own problems.
MR. BATTLE: Let's do these two photographs, Exhibits 7 and 8.
(DFT. EXH. 7, copies of photographs, was marked for identification.)
(DFT. EXH. 8, copies of photographs,

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was marked for identification.)
BY MR. BATTLE:
Q. Mr. Taylor, I'll stipulate to you those photographs are of the berm alongside the Webbs' lot and that's also, in Exhibit 8, I think that is the pond you were discussing that's by Catherine Drive. Does that sound correct to you?
A. It doesn't look familiar. Neither one of them look familiar. So Numbers 1 and 2, I can't quite tell where that is.
Q. All right. For the image in Exhibit 7, the one your finger is still on --
A. Oh, that's not a 1. It's a 7. Okay.
Q. Does that berm wall look high enough to protect the Webb and Pattons' property?
A. I can't tell from here what's -- what is what in that photograph.
Q. And you haven't had a chance to look at this area?
A. I may have but I can't -- I don't remember what sense that is, for example. I think it's two houses down from the Webbs or one house down from the Webbs, but I'm not sure, that fence.
Q. Would making this pond bigger have any impact at all? And we can go back, if you look at

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Exhibit --
A. Well, let me back up. And I realize I do recognize this but the grass was not so green at the time I was there. And these have been taken a good while ago.
And I believe that little riffraff dam has been washed out, if that's what I think it is. There's only a little bit of it that remains.
Q. Okay.
A. But I didn't see anything that looks just like that, but there was -- that's probably it and that's water draining off the golf course, if I'm correct.
Q. And that's the area that you were referring to earlier in your deposition off Catherine Drive and the golf course retention pond?
A. Yes. Except there is a little pond over here but you can tell from the riffraff that it's not very deep and it's been washed out now.
But above -- if this is Catherine Drive (indicating), this white line in Number 7, there's a potential for a pond on the other side of it too. You have one drainage pipe and another at a little lower level so that could have been a retention pond. This is something of a pond there.

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Q. And do you think that any improvements could be made to that pond to help with the flooding situation?
A. I do but that's -- yeah, because that little bit of riffraff doesn't do the job.
Q. Would increasing the size -- I'll stipulate to you that that berm wall is running alongside the Webbs' property. Would increasing the size of that berm help control flooding at all?
A. I don't know if the water has a potential of coming up over it or not.
Q. Okay.
A. So it looks like it's reasonable if it's designed high enough.
Q. Put it this way, would making the berms taller hurt the properties at all, make the situation worse?
A. Generally it would help with the potential if the water gets high enough to go over a lower berm but if it gets high enough to break through a higher berm, then you have more force of water coming in and a more substantial flooding event.
The longer you hold it back and the more it builds up, the more destructive it is if it

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breaks through.
Q. Now, that would be a pretty big storm, would it not?
A. It would.
Q. I mean this is kind of an interesting question and I might as well ask it now.
Is there such a storm that's so big that there is no system that could contain it?
A. Like a Noah's ark kind of storm.
Q. Sure. At what point -- I mean this is just kind of something that I feel has to be asked for the grounding purpose, but at what point do you admit that it's an act of God and there is not a system that could contain it?
A. Well, these low houses -- well, you know, could there be a storm that would flood every house in Prestwick? I might argue that too. That would be more unlikely.
Q. I have no doubt but what I'm trying to sort of gauge here is we've talked a lot about what's the bare minimum to cause flooding; right?
A. Uh-huh.
Q. Say "yes" or "no."
A. Okay. Yes, we've talked about the bare minimum.

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Q. And so now my question is, as we move away from the berm topic, what size storm event, is there no -- is it just an act of God?
At what point do we say there is no man-made structure that can contain this amount of water, period?
A. Okay. Well, that's -- with respect to these two properties, they should not have been built but they were.
A storm that puts -- and I don't know the elevation but say a sheet of two feet of water going over 17, if you get something that big, you have to have a berm that could restrain that height of water.
Q. So --
A. And that would probably be a bigger storm than we've seen in our lifetime, probably.
Q. And that gets like -- so, for example, to give context to my question, you talked a lot about I'm not addressing the regs individually. I'm just talking about the properties flooding; correct?
A. Uh-huh.
Q. You've got to say "yes" or "no."
A. Yes.

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Q. So my question is, at what point is there no system that can manage a storm of that size. So you said two feet of water over 17. That's like an ice glacier melted on top of the state. Is there like a point at which you acknowledge that the County -- that there is no way to create a system that can contain water flow? Like at what point is man going to just have to put up with mother nature?

A. Well, that's -- back to my point is that 17 is the final barrier down there and there is so much water that would cover 17, then you could have five times as much rain and it still would not raise it up that much.

Q. Okay.

A. So that's not quite the right way of putting it. But you're not going to have a rain big enough, I don't think, to get two feet of water constantly flowing over 17.

You might have Crystal Lake breaking its dam, breaking through and a surge come through that's higher, then that's a whole different sort of analysis.

Q. So your litmus test for a storm system that no amount of drainage planning could withstand

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is when water is on top of 17?

A. Well, that's a way of illustrating a limit as to how high the water can be. I mean because that would mean that it would be slightly higher than whatever that elevation is in the creek right by the Patton property.

I mean people in the middle of Prestwick are not getting flooded by an event like that.

Q. An event like what?

A. Like a foot or two feet of water over 17.

Q. So what's your gauge for that?

A. Well, the elevation -- the way I've looked at the maps looks like you can have water a foot or two over 17 that's not higher than the interior of Prestwick so a lot of development is built so you could have that rain.

Q. So as it stands here today -- I feel like I've asked this two or three times. What storm event is there no manmade structure that can withstand it? And you've said two feet on top of 17 but now I feel like you're backtracking off of it.

A. I'm just saying that's the biggest

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event I can imagine would be one that would put two feet of water over 17 and that would kind of limit the height of the water so you could build a berm around whatever needed to be built around that water that was high enough to be two feet over 17 and that would not break the berm.

Q. Okay.

A. But then you've got to get the water flowing from uphill Prestwick out of the Pattons' backyard, so to speak, and that would require pumps, big pumps.

Q. So I'm going to ask a fourth time and see if you can answer that. What storm event is so big that no manmade structure can reasonably be expected to account for it?

A. Well, I can't imagine one that would be here that would be that way.

Q. So you're saying that that's impossible?

A. Well, in terms of water that would put that much water over 17, and at the same time you have a pumping station that's hit by lightning and knocked out and then the water is going to flood the Prestwick's house.

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Q. So your testimony is that there is no such thing as a storm that cannot be accommodated by a structure?

A. If you're looking for --

Q. I'm asking for a simple, straight answer. What storm size does it take for you to -- I don't mind unpacking the whole thing. Give me a second, sir, please.

A. Okay.

Q. You've already said that you're not paying attention to specific regs and codes.

A. Yes.

Q. You're just talking about, well, the property is flooding so there must be something wrong. Is that an accurate summary of your testimony so far?

A. Well, we know there are things wrong and the property is flooding.

Q. Okay.

A. Not only because, yes.

Q. At what point does that logic cease to apply because the storm is so big?

A. And what I'm saying is a combination of things. And it's not just in terms of rainfall is the point that I was making.

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If you have rainfall and lightning knocks out the pumps and a tornado twists over a big tree in the berm and reaches the berm -- I mean you've got to have a major event to be unable to contain it if the limit on the water height is roughly two feet over 17.

MR. BATTLE: Let's keep going. This is Exhibit 9.

(DFT. EXH. 9, June 14, 2001 affidavit, was marked for identification.)

BY MR. BATTLE:

Q. This is recapping all the things that we have already discussed. The dam and the causeway at Pirate Land were causing resistance to water flow in 2001; correct?

A. Yes.

Q. And that was a substantial part of the prior lawsuit?

A. I don't know how substantial but it was part of it, I think.

Q. How much responsibility does the rainstorm have for causing the flooding in this situation?

A. Well, no rain, no problem.

Q. There you go. Is it possible -- never

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mind. Scratch that.

Can you cite any time any storm event that was as large as the 2015 and 2016 flood events where the properties did not flood?

A. I can't cite any.

Q. Are you saying that's impossible?

A. Possible that any storm that was as big as the ones in '15 and '16 did not flood? Is that what you're saying?

Q. Yes.

A. I don't know.

Q. Do you know the rainfall amount for the 2015 and 2016 flood events?

A. I don't know specific to the Myrtle Beach area. I know that some areas were in the neighborhood of 15 to 16 inches and some areas with perhaps 20 and some with less.

Q. All right. Do you have any testimony regarding the FEMA program?

A. I haven't dealt with that.

Q. That's fine.

A. Okay.

Q. Do you intend to testify at all about the flood insurance or the buyout for that program?

A. I don't -- I have not evaluated those

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and if I'm asked whether I'm aware that they occur, I know that they occur.

Q. That's fine.

A. Okay. And with most of these, if Mr. Connell wants me to get into them and I can, he'll be responsible for telling you.

Q. Have you ever participated in any development of building codes?

A. No, not building codes.

Q. Do you have any knowledge about how building regulations are created?

A. I've been invited to attend some of these things where you have proposals and committees to evaluate and so forth and comments, but I have not done so.

Q. Have you ever had any involvement with -- you answered this earlier. Sorry.

This is slightly retreading ground but if, hypothetically speaking, if the Bermuda Gardens application fully complied with all building codes on what grounds do you think Horry County should have denied the building permit?

A. Is that building codes or flood control codes and all sorts of codes or just the building of the houses?

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Q. Let's say Bermuda Gardens is fully compliant with all codes, can you state -- assuming hypothetically all codes, any one you can name, if they are fully compliant with all of them, what grounds did Horry County have to deny their building permits?

A. Well, codes are often considered to be a minimum and I can't state to legal issues to denying permits that meet the bare minimum, but maybe if there is something else wrong with it.

Q. If other government entities approved the Bermuda Gardens plans such as DHAC or OCRM do you think they are responsible as well for -- let's just take a break.

(Pause in the proceedings.)

(Mr. Patton joins in the proceedings.)

BY MR. BATTLE:

Q. All right. We're about right at the bend so I won't be too much longer.

If those entities also signed off on the Bermuda Gardens plans and said they were code compliant, do you think that they should also be held responsible for this situation today?

A. If indeed they were not code compliant, they should be, but also in consideration that the

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code is an absolute minimum and so there are often considerations other than the actual code.

MR. BATTLE: All right. Moving to Exhibit 10, the stormwater report for Bermuda Cottages.

(DFT. EXH. 10, Stormwater report for Bermuda Cottages, dated May 25, 2006, was marked for identification.)

BY MR. BATTLE:

Q. If you could take a minute to review Exhibit 10, please. I've highlighted the portions that I plan to discuss.

A. Okay. I don't think that I've seen it before today. Maybe it was hidden somewhere and I just didn't see it but --

Q. You'll have to take that up with Mr. Connell.

A. Okay.

Q. This the 2006 stormwater report with Bermuda Gardens. Portions of it are missing. It's quite lengthy. I thought I'd just add the parts that I wanted to ask about so I'll add now that this is not a complete copy of it.

A. Okay.

Q. And you just said you have not looked

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at this at all?

A. I don't remember seeing it before today. So I have not studied the different sections of it and the assumptions that go into it and that sort of thing.

Q. Okay. What year event are they planning for?

A. They are planning for a 25-year event.

Q. Are they making the canal deeper and wider?

A. Yes. Well, they are -- well, I don't see that right off but they have changed it and it is wider where it goes into an almost right-angle curve than it had been at some time in the past.

Q. And that's what you were talking about earlier, ways to accommodate the right-angle curve. Is that one of the ways to accommodate it?

A. Yes. They deepen the right angle and there is less resistance than if it's shallow and narrow.

Q. And is this stormwater report claiming that they are actually going to reduce the amount of water going into the drain system?

A. I see they are claiming they reduced the peak. I haven't -- let's see. Are they saying

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they reduced total water or just the peak, I think.

Q. It should be on the -- toward the end on the third page. I'll flash it to you. That's what I'm looking for.

A. Okay.

Q. There you go.

A. Okay.

Q. And is the method they are doing that by installing retention ponds and dry retention systems?

A. I see they are doing six retention ponds and one dry system.

Q. Is that going to be sufficient to offset any issues created by the bend in the canal for a 25-year event?

A. Okay. They have not addressed any changes in the canal. They have not addressed whether it would do the same thing, whether the -- I am not saying the improvements, but the retention ponds would do the same thing if the additional lots were not included in the development, the initial lots that were created by the change of the canal.

Q. So you're saying that they are failing to take into account the additional housing?

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A. If they had the same, let's call it positive things that they did with fewer houses and less fill, I don't see that they addressed it that way.

And their assumption is that they would put all these extra houses out there and try to improve it with these extra houses.

And I'm not sure, I don't see how they have included the adverse effect of taking out that amount of let's call it wetlands and lowlands.

Q. So basically by raising the property up with fill and turning -- paving it over with housing, this creates retention impact that they are not addressing?

A. Well, I see they are addressing it supposedly for a unit as a whole, but if they had eliminated those houses that were built on the extra space and still had the same retention treatments and so forth and left as acres where these extra houses went in a natural state or maybe improved in some way like debris and so forth and there is no comparison with that.

And I think that could well have been better than what's here now. So rather than having an improvement which they say will be a slight

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degradation.
Q. When you say extra houses, what does that mean? Are you talking about like all of the houses?
A. The houses that went in this area that they created by changing the channel.
Q. Okay. So I mean you're not talking about they went outside the scope of their permit. You're saying the houses alongside the channel.
A. Yes, these in this corner here (indicating). The existing channel was like this (indicating) and I think the new channel goes like that (indicating).
Q. Okay.
A. And that's my understanding of it. So this was more of a natural flow area. It was -- I don't know for sure but you'll have to ask somebody else but I think it was a good bit over than what they filled these up to be (indicating). So as water overflowed, this would be an area to fill in.
Q. Mr. Taylor, the Bermuda housing is here (indicating). This is still -- I'm pretty sure that's undeveloped.
A. See, the new channel comes down like this.

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Q. Right.
MR. CONNELL: Look at the difference.
BY MR. BATTLE:
Q. You're describing -- hold still. You're talking about the housing --
A. Yes.
Q. Okay. I see now. Thank you. I understand.
A. Okay.
Q. So when they assert that the development will actually reduce the amount of water they put into the canal by 27 percent, you're saying that doesn't really matter.
A. I'm saying I don't see that they have included the effects from reducing that as kind of a lowlands flood area.
Q. And of those -- the two diagrams you're referring to it's basically a before and after; correct?
A. Yes. That's a good way of putting it, yes.
Q. And is the before diagram an accurate drawing of the area, the predevelopment diagram; is that accurate?
A. I have to assume so.

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Q. And so to me one of the big questions is, doesn't the predevelopment diagram depict a 90-degree turn in the canal?
A. It deviates more than 90 degrees than post does. In other words, this angle is not as great as that angle.
Q. What's the angle in the predevelopment?
A. I don't have anything to measure it.
Q. Do you have any basis for that statement other than just looking at the two diagrams?
A. Just looking at the diagrams.
Q. Okay.
A. Having seen it before and having seen it now but I didn't get an overhead view of it before.
Q. So there was a turn in the canal before 2006; correct?
A. There was a turn, yes.
Q. But your testimony is that you don't think it was as sharp?
A. It's not as sharp.
Q. And your basis for that is just eyeballing a hand-drawn diagram?
A. And eyeballing it before. If I had a

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good drone before and after to take pictures of it, I would have done that, but I don't do that.
Q. So you don't have any maps or drawings to indicate the condition of the canal before and after the development?
A. I think in my photographs before, I have something which shows that before the development, my photographs from '99 or '03 or whenever it was.
MR. BATTLE: Okay. I'm going to hand you Exhibits 11, 12 and 13.
(DFT. EXH. 11, Google maps, was marked for identification.)
(DFT. EXH. 12, Google maps, was marked for identification.)
(DFT. EXHS. 13, Google maps, were marked for identification.)
MR. CONNELL: What's the question?
BY MR. BATTLE:
Q. So can you make out the canal in the 2003 satellite image? 11, 12 and 13 are satellite pictures taken from Google Earth.
A. Okay.
Q. Can you make out where the canal is in the 2003 images?

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A. Those are 11 and 12?
Q. Yes, sir.
A. Well, I see what looks like it. I don't know what this is. I guess it's some kind of a road going across the property there, but I did not travel in that area.
Q. And the way I usually orient myself is I find the culvert on 17 and then follow it up. That might help you.
But essentially speaking, can you see where there is already a significant turn in the canal before development?
A. Yes, I see this turn right up here (indicating).
Q. Okay.
A. And it comes down to go across 17 and into this waterway here (indicating) into Pirate Land.
Q. And so my point is, there was already a bend in the canal before any development occurred; correct?
A. Correct, yes.
Q. And if that is already the case, then the County did not approve any kind of significant alteration in the flow dynamics, did they?

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A. Well, the bend is much closer to a right angle now.
Q. And how do you know that it changed significantly?
A. Looking at the various diagrams and pictures. Again, I did not fly over it to take a look at it.
Q. Okay. Would that create issues with the affidavit you filed with this lawsuit if in fact the County did not approve any significant flow changes?
A. Well, if they didn't approve it, then they didn't approve it and that would be my opinion.
Q. I understand. But I don't mind explaining the context of this.
If the canal already turns sharply, how does the County approving the Bermuda Gardens plans make anything worse?
A. Well, if -- and I don't think it's correct that if the angle was the same then the existence of that angle does not change things.
The fact is that instead of taking a diagonal -- if it was more of an around the perimeter sort of approach, lengthens it a little

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bit which increases the resistance a little bit.
But you've got this lowlands area here (indicating) which is -- in addition to this other major area is changing from a lowlands into housing with a lot of fill.
And I don't know how much fill it is, but if it was the same like before, like the Pattons' property, there is six feet of fill so it might not have been the same height before but if it was, it would be about six feet of fill.
Q. And so now the issue is, it's not so much the canal turn as it is that the area got filled in and the water can't go through anymore.
A. It can't receive and accumulate water, but we're not dropping the right angle turn. The closer the right-angle turn, making the turn steeper, does affect the water flow and adds an extra resistance to it.
Q. Is there any element in the Thomas and Hudson study or the Bermuda Gardens water report that appears to be an over act by the defendant, Horry County, that they are intentionally dumping water on someone's property?
A. Is there anything in the report that says it's an intentional act by anyone to dump

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water on somebody else's property?
Q. Yes.
A. I don't see anything that says we want to get Mr. Patton and make his property flood. I see things that there is not as much concern for that as there are other people's own financial interests.
Q. Winding down now, Mr. Taylor, can you give me a nice, neat list of the negligent acts of Horry County in this matter?
A. Well, I don't think I can give you a nice, neat list. Various things get brought up.
I basically think it started with the approval, however it happened with Prestwick, to make the properties in question built -- to declare that they were never flooded and buildable. I think looking at the elevation, that would tell you that that's a problem.
Now maybe Horry County could require houses on stilts or elevated houses for that area or require fill or whatever but I think that's where it started.
And then the fact that Prestwick did not follow the plans that supposedly were approved, that either got by Horry County with a wink and a

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nod or whatever, I don't how that happened.
And then future development --
Q. To stop you right there. Do you have any foundation at all for asserting bribery or anything like that occurred?
A. I wasn't saying bribery, no.
Q. I heard a wink and a nod. What does that mean to you?
A. Well, what that means to me, yeah, that's just as good. Go ahead and do it that this way or, yes, I think they did it the way they said they built it. We are not going to inspect it again, that sort of thing.
Now, did somebody go out and take the plans and look at that drainage plan and say, yes, this is built the way it was supposed to be and approved? I don't know.
Q. Do you have anything else?
A. Okay. Considering that there has been the flooding issue, I don't see the extra scrutiny of, you know, we've got to really improve this situation and make it right.
They are saying, oh, this will be inconvenient to fix it this way and it would be inconvenient to fix it this way, we'll just let

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Mr. Patton take care of his problems.
Q. And when you say inconvenient, we're talking about multimillion dollar solutions; correct?
A. I thought the conduit was supposed to be 800,000. Is that not correct?
Q. Do you think that's a reasonable figure for the County to expend for two houses in an HOA?
A. I don't know what the houses are worth. I haven't looked into that.
Q. Do you have any other issues?
A. Anything else I mentioned before. I can't think of any others that haven't already been discussed.
Q. Is the water permanently located on the Webb and Pattons' property?
A. There is not permanent flooding on the property so there is no permanent flooding on the property.
Q. Is the property going to flood for every 25-year storm event?
A. I can't predict those sorts of things.
Q. A 50-year storm event? Will it flood for that?
A. I can't predict that.

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Q. Is the property only going to flood in a 100-year storm event or larger?
A. I would think it would flood with something small than that. How much smaller, I don't know.
MR. BATTLE: No further questions. Any attorneys want to take this seat?
THE WITNESS: It's about lunchtime.
MR. BATTLE: Do you folks want to go off the record?
(A recess transpired.)
EXAMINATION
BY MR. BAXTER:
Q. Mr. Taylor, I'm Doug Baxter. I'm here on behalf of Prestwick Land Limited Partners and Campground, Inc., and basically these are the original developers at Prestwick.
A. Okay.
Q. Now, you have -- let's back up. Did you review the original plans, the site work plans?
A. I believe so. That was in the past but I don't think so recently.
Q. And did you review a single set of plans, multiple set of plans or do you recall?

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A. I don't recall.
Q. Did you review the plans of which were submitted prior to construction?
A. I don't remember the dates on the plans. At the time I thought they were the appropriate plans, but I can't remember the specific information on the information box that would tell me now which they were.
Q. Do you know if they were the as-built plans?
A. Again, my understanding was that they were the appropriate plans and I don't remember from that 15 or so years -- 18 years, whatever years ago.
Q. Now, back in the late '90s when this was built, what rules, regulations, statutes, ordinances governed the construction of a stormwater management system for a development such as Prestwick?
A. I don't know right now what it was. I looked through the information that was available and worked with it.
And I don't know if we had that discussion before about the -- you know, after about 12 or 15 years, I purged my files so I don't

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have it.
Q. Well, you have given opinions concerning the plans; correct?
A. That's correct.
Q. And what's that opinion as to just the plans? Are they sufficient?
A. Well, I remember looking at the difference between what I saw on the ground and what the plans said.
I don't remember now whether I did enough to say these were wonderful plans or not. My conclusion was that even looking at the plans, those two or three lots were potentially problematic and that there were some features that we were trying to deal with that.
Q. Well, do you believe that they were deficient?
A. The plans?
Q. Yes. The design, the plans, whatever. Were they deficient?
A. Looking at it from what I looked at 18 years ago or whatever it was, I remember that I thought that they did not do the job, whether they were deficient with respect to some standards or not.

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Q. Well, that's my next question. You don't remember what standards there were for a stormwater management system such as was at Prestwick in the late '90s?
A. I don't remember now and, of course, as I said, I dealt with that 15 or 18 years ago.
Q. And I want to differentiate between your opinion as to, I looked at this and I thought there might be some problems with those lots versus the design did not comply with the minimum standards as promulgated by the state or local government?
A. I don't specifically remember saying they did not meet the standards, but I do remember the issue of what I saw being built was not as good, so to speak, if you use the word good as what was in the drawings.
That's not to say that I concluded that the drawings were totally adequate. It's just what was built was not as good.
Q. Well, the -- and I'm just -- I want to make sure we differentiate between the two.
You understand the standards as established by whatever governmental entity set the minimum requirements for the stormwater's

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management design; correct?
A. They set minimum requirements, yes.
Q. You can always do more and better than that; correct?
A. And minimum requirements may be inadequate in some situations.
Q. All right. But in this case, you do not have any opinion as to whether the plans and design did not meet the minimum requirements of whatever standard regulation, law, ordinance was in effect in 1999?
A. Let me answer that in terms of I did not -- I don't remember having gone step by step with every feature of the plans and comparing it with a standard.
Q. So your answer is, no, you do not have an opinion that it deviates or does not meet the minimum requirements for any governmental law, ordinance, regulation, whatever?
A. It's not quite like that. I don't have any opinion as to a specific item which I compared side by side, minimum standard.
And, of course, it seems to have been built differently than the standards -- I mean than the design.

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Is that difference the critical element of flooding or is that difference minimal?
Q. Well, again, are you saying and if you are, I just need to know, if you're saying it does not?
Are you familiar with the Stormwater Management and Sediment Reduction Act?
A. In the past, I have dealt with it.
Q. Does the design, the plans, did they meet the minimum requirements of the Stormwater Management and Sediment Reduction Act?
A. And I vaguely recall that my opinion at the time was, no, they didn't, but I don't remember the specific things so I would have to go back over and compare the two.
Q. Okay. Well, that's very important. I need to know what and how they did not meet the minimum requirements and you are unable to do that?
A. I can't do that now as a part of this because that was going on a long time ago and now things have happened.
Q. Are you familiar with the -- I mean we talked about the 25-year storm event. And is that kind of the general rule for the minimum for the Stormwater Management System?

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A. My understanding is that it has been broadly used as a general rule. I have some problems with that as I'm sure other people do too, but I understand that it's commonly used.

Q. I mean it's actually referenced in either of these statutes or the accompanying regulations. Were you aware of that?

A. I know there has been reference to that, yes.

Q. Does the -- did the plan designs that you saw -- and I understand you disagree with the 25-year being the minimum, they should be designed for something better than that -- but did the plans meet the 25-year storm requirement?

A. That was part of what I was answering before is that a lot of that when I was dealing with the plans and the drawings and so forth was 17 or so years ago and I have not gotten back into that at this stage.

And certainly from a performance point of view, the problems with just seeing the overall system and how it operates so --

Q. Let me stop you there. Do you have the expertise to give that opinion that something does or doesn't meet the 25-year storm requirement?

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A. I have the expertise to do that if I can go back and go into the details of the drawings.

That was something that I did some 18 years ago and that's what I -- I don't remember exactly what I said about it at that time.

Q. Did you read over your deposition?

A. A good bit of it, yes.

Q. In your deposition, did you say under oath that it does not comply with the requirements of the Stormwater Management and Sediment Reduction Act?

A. I don't remember that and whether that was being referred to specific plans or the plans as represented by what was built and indeed what was built --

Q. Okay.

A. -- represented the plans.

Q. Okay. So are you going to do something between now and trial or you're not planning on doing that?

A. I think a lot is coming up here in the deposition that when I talk about it with Mr. Connell we may decide to do some other things and if we do, I'm sure he'll let everybody know.

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Q. Okay. I'm going to ask you the same questions. As-built, and I understand you're saying that the -- from what you observed the as-built was different than the plans; correct?

A. That's correct, yes.

Q. And specifically you talked about the swales?

A. Yes.

Q. Were there other things?

A. There was a catch basin problem too, I believe.

Q. And where was that located?

A. That was -- I think there was one right in front of Mr. Pattons' house, but there are other catch basins in that area, but I think that that was the one.

Q. Now, would going in and putting in the swales and addressing the catch basin, would that fix the flooding?

A. It depends on what else is done. We have got the problem of the water in the creek. If you don't have a berm it's going to come up and onto the Pattons' property.

If you do have a berm, then you have a problem dumping the water from the Patton property

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into the creek. And when I say creek, it's the creek or the ditch or whatever you want to call it.

And as I say, there was some mention, I think, that one of Pattons' neighbors referred to a pumping station and whether he meant at the time it was under consideration or not, I don't know.

But if the water in the creek is over the Patton property level, then there is no way to deal with it --

Q. Now the --

A. -- without a pumping station.

Q. The items you identified as being different from the plans, you're not sure if those were the original plans or those were the as-built plans; correct?

A. That's correct. My impression is they were appropriate -- the appropriate plans at the time but how they were labeled, I don't remember.

Q. And with a project it is -- there are circumstances under which you can change the plans or you can change what you're building or you can deviate from the plans so long as it's appropriate and approved, et cetera?

A. Properly approved and all that, yes.

Q. Do you know if that was done in this

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case?
A. I don't recall if that was done in this case.
Q. Were you aware that the DEHAC -- let me ask you this. Who was in charge of approving the stormwater management system back in the late '90s?
A. You know, I don't remember specifically from the things I've looked at back, you know, 18 years ago.
Q. Would you -- if I were to tell that it was DEHAC, The Office of Ocean and Coastal Resource Management, would you disagree with that?
A. I wouldn't disagree with that. I wouldn't absolutely confirm it though.
Q. Were you -- did you review any of the paperwork by which DEHAC approved both the plans and the system as-builts? Were you aware of that?
A. You mean back in the late '90s?
Q. Yes, sir.
A. I don't remember from being involved with it 15 to 18 years ago, and I don't -- if I have that information now, I don't remember it as part of what I reviewed recently.
Q. And the swales, having -- in order to comply with the minimum standards, were the swales

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necessary?
A. I don't remember that specifically but I know that they would be helpful. Especially if you have catch basins without a whole lot of slope going into them, you want the water to be directed to them, if the catch basins can take water away, but if they can't, then the whole thing becomes problematic again.
Q. But let me ask this. As built, did it comply with the minimum requirements under the South Carolina Stormwater Management Act?
A. That I don't remember from back in that time.
Q. And you mentioned a pump station. Is that something that is required under any governmental statute, law or regulation standard?
A. Well, without knowing specifically, I would say that there are situations where pump stations are required.
Q. Okay.
A. Now, whether one -- whether they have entered into a dialogue in the Myrtle Beach area, I don't know.
Q. Well -- and, again, I'm trying to differentiate between what was required by law

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versus what would have been a good idea to do.
A. Okay.
Q. And can you tell me that the pumping station was required by law to meet the various standards, regulations?
A. If I reviewed that back then, 18 years ago, I don't remember now.
Q. And you reviewed the -- I think you testified earlier that you think maybe the lots shouldn't have been developed because of the location where they were, et cetera, et cetera.
A. Their elevation and so forth and all those factors.
Q. Was there any law that prohibited developing it?
A. There probably was -- I'd probably have to say that there certainly was, probably with respect to disclosure.
If there is nothing else, there may be some other things too but --
Q. But as far as the developer, you're saying that as long as it was disclosed that it was flood prone or a cause of the elevation?
A. No. I'm saying that's one thing. There may be some others too.

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Q. Is, in fact, at the time, were the lots, were they located in a flood zone?
A. I remember looking at the map and I don't remember what it said in terms of the boundaries with respect to the different level flood zones.
Q. Now, the berm that was built, does that help with water that's flowing out of the Prestwick subdivision or development or is that just to keep water from off the property coming on to the Patton and Eaves properties?
A. Well, it's almost entirely the latter. I mean there are the check valves which allows water to go off and so it's primarily to keep it in.
I mean to keep it in the creek, not keeping it in the yard.
Q. And when you're building a berm such as that should that be designed by an engineer?
A. I don't know whether that's a should or not. There are a lot of people who know a lot about it who are not engineers and so that's typically the sort of thing that one would see an engineer being involved in.
Q. Do you know if that was done in this

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case?
A. I don't know.
Q. Let me ask you, if you just go and pile dirt as a berm or dam, you can actually make the problem worse, you can restrict the drainage off of the property by trying to keep water from coming on to the property?
A. Yes. There is no other way of water getting off except going off the edge into the creek, then if you stop that, you've stopped it.
Q. And have you studied or examined those berms to determine whether they in any way restrict water leaving their lots?
A. Well, they have good size, maybe close to one foot, maybe ten inches or so, multiple pipes going out with ground shapes like a small swale to lead the way, with a check valve.
And there are grates with piping underneath so they would restrict an extremely heavy flow. It would overwhelm the drains.
But I don't think they would prevent flow otherwise. And if rain was heavy enough to overwhelm those, they would overwhelm the creek too most likely.
Q. Now, your deposition was taken twice in

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the previous case; correct?
A. Yes. Was it something like 2001 and 2003 or --
Q. The last deposition, I believe, was taken in 2003.
A. Okay.
Q. After your deposition in 2003 and -- or between 2003 when your deposition was taken and most recently when you went back out there, did you visit that property?
A. I certainly visited on 17, just out of curiosity as I was on the beach. I did not go into Prestwick that I recall until very recently.
Q. Well, here's my question. Between 2003 and, say, 2017, 2016, do you have any information as to any work done by Prestwick Limited Land Partnership with regards to the drain system in the Prestwick development?
A. At that time, I don't think I was aware of anything. I mean it was pretty much off the radar.
Q. So any opinions you have about the work that Prestwick Limited Land Partnership did, that would have been work they did before 2003?
A. And anything that I may have learned

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about it in the past few days or weeks.
Q. Let me ask you, have you learned anything about Prestwick Land Limited Partnership, any work that they would have done after, say, 2003, 2004?
A. I don't think I've picked up on who had it done, but certainly some work has been done in the area with respect to drainage.
And so what Prestwick specifically has done as compared to the Pattons and the others to help their own situation, I'm not aware of what specifically Prestwick has done. I'm allowing that some things that were done may have been done by Prestwick.
Q. What were those things?
A. Well, whatever they were. I'm not saying that I have confidence that Prestwick has done absolutely nothing.
Q. But you don't have any information that they have done anything since 2003?
A. Well, I have information that things were done and whether Prestwick did them or somebody else, I don't know.
Q. What were the things that were done?
A. That's some things with respect to the

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golf course drainage and some photographs that were shown to me earlier. I think those were done in a meeting.
And whether Prestwick participated in some berm improvement or if it was left all to the Pattons, et cetera, I don't know.
And they could have changed some drainage pipe in the golf course and I don't know about that.
Q. Let me ask you this. Do you know whether Prestwick Land Limited Partnership owned the golf course?
A. Okay. There are kind of multiple Prestwicks and organizations and I haven't purely differentiated that.
Q. Okay.
A. So I can refer to the golf course drainage without knowing exactly who did it.
Q. So you don't know -- you're just using Prestwick generically?
A. Yes. And, unfortunately, I haven't been on top of it like you guys have probably been where you know everything about everybody.
But I'm using Prestwick generically most of the time but now that you reminded me, I do

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remember that that golf course is probably part of one of the homeowners' sort of -- or some other organization.

Q. Did any of the -- what information were you given with regards to why we're in this lawsuit? Why are the plaintiffs suing the defendants?

A. My take on it has been two more flooding events and multiple things have been done in the meanwhile that have contributed in some way to those flooding events.

And so the desire is to get this thing fixed once and for all and nobody -- not nobody but there doesn't seem to be that cooperation in getting it fixed or taken care of or resolved.

Q. And the flood events were 2015 and 2016?

A. And there may have been some others too and there are different kinds of flood events. One is where you have water backing up in the yard and another one where you have water in the house or floor level or above or whatever.

I think there were two that were definitely in the structure from my understanding. Whether there were others that were minor, I don't

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remember the specifics.

Q. Okay.

A. I don't have a timeline. That would be the part of it. If I really got into it, I would have a timeline with each event and how much rain they had and what work was done.

Q. And I understand from your previous testimony that you don't know or you're not in a position to testify as to -- and I'm talking specifically as to the Prestwick development.

A. The corporation that developed it. Okay.

Q. No. I'm just taking about the Prestwick development.

A. Okay.

Q. You cannot sit here and tell me what constitutes a 25-year storm; is that correct?

A. That's just something I haven't committed to memory as to how much rain, over what periods of time and so forth.

I know the information is out there. I just don't have it on the top of my head.

Q. And do you know how many 25-year storms there have been since 2003?

A. 25 to 25-plus? No, no, I don't.

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Q. No. I'm talking just specifically, 25 years?

A. Well, really it wouldn't be exactly 25 years, but meaning the 25-year old threshold without meeting say the 100-year threshold.

Q. Are you aware that there have been events, rain events which have met the 100-year standard?

A. That's my understanding that there have been, yes.

Q. And my question is, assuming that the minimum requirements are that you design a stormwater drainage system such that it meets a 25-year storm event, my question is, have the plaintiffs had any damage or flooding with just a 25-year storm event?

A. And I haven't put that standard of how many inches and how many hours and days and so forth meets which one of the flooding events.

Part of it is that these lots are definitely low and definitely flood prone. If there have been some methods to try to deal with it, those efforts have been unsuccessful so far.

And if indeed we've had half a dozen 100-year storms in the past 20 years, then somebody

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is not probably looking at the definition of what is a 25-year storm, so they are hanging their hat on something that's not a good milestone.

Q. But that's up to some regulator or governmental entity to make that determination or an engineer to make that determination what -- strike that. I withdraw that question.

A. Okay.

Q. But sitting here today, you cannot say that the -- that there have been any 25-year or less storm events during which the plaintiffs experienced flooding, can you?

A. Okay. I can't say definitively what year ratings each of the events was where they had some flooding.

And as I say, it's something that I could do is make sure I have a timeline with everything laid out when changes occurred and when such rains occurred and how high the water got and so forth, but I haven't done that.

Q. Well, ever. Have they ever experienced flooding from a 25-year or less storm event?

A. And I don't have that information either way, so I can't say right now that they have or have not.

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Q. So it's possible and you have no opinion or you are unable to say one way or the other whether the stormwater management system, they have experienced flooding, as a result of it not meeting the minimum standard of the 25-year storm event?

A. I don't know if I agree with that. There is something in that that I'm missing and then what I'd have to do to answer that because I can't answer that without going back and looking at each storm and the definition of a 25-year storm and trying to compare with each one.

I was looking at it much more to the point of was the plan adequate for the storms that occurred in this area rather than a specific artificial designated amount.

Q. But, again, I'm differentiating between what you think should be done versus what the minimum requirements are.

You have no opinion or you cannot give any testimony that the stormwater management system has not met the minimum requirements?

A. I'm not able to say that right now. I haven't looked at it from the point of view of trying to establish the details of each rain event.

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and compare it with the 25 year, so if I can do that, then I will have an opinion on that.

Q. Now, have you -- you've talked about that there may have been stuff done, there may have been some additions or changes or alterations.

Other than that, since you have been looking at this, you have not discovered any problems or any deficiencies that you missed during the previous litigation?

A. There are some changes in the system phase that are different now. I think the 17 is a bit more clear contributor to this.

And I think it's even more clear now how much the rising of the creek interferes with getting rid of the water that comes through Prestwick. Those two things.

Q. Are you aware of any additional work, alterations done by Prestwick Land Limited Partnership between, say, 2003 when you were giving your deposition and 2007?

A. There is something that rings a bell about something happening in 2006, but I can't remember what it was.

Q. Okay.

A. And that may well be a document that I

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haven't seen.

Q. As far as -- and I'm going to give you another date -- September 2nd of 2005.

Have you identified any deficiencies or problems that would have been in existence as of this date, that date, that you didn't find in the first go-around?

A. I don't remember from just looking at those dates and what happened.

Q. Assuming that this case, the previous case ended in September of 2005, are you aware of or can you give any testimony that there were problems that existed before that date that weren't identified before that date?

A. I can't remember everything to be specifically aware of, but I can allow that that could have well have happened.

Q. But you can't sit here and say that there were some problems that we were unaware of or we couldn't have known about or they were hidden or anything like that; correct?

A. I don't remember anything specifically. But, again, I would allow that it's very possible that that was the case.

Q. And specifically with regards to

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Prestwick Limited Land Partnership, is there anything that you have determined or learned that they did or that their work was deficient that you didn't know about in the previous litigation?

A. Anything that I'm aware of as of the September of '06 that I was not aware of?

Q. No. As of 2003 when you gave your deposition.

A. Okay. But anything I'm aware of now that I was not aware of in --

Q. Right. You're looking back and saying, oh, we missed this or I should have discovered this or this was somehow latent and I was unaware of this until now. Is there anything --

A. Well, of course there are some details I was aware of then that I've forgotten about and I can't remember now --

Q. Right.

A. -- for example, the routing of some of the conduits from the catch basin that I've understood recently that are not routed the way they were supposed to be that I fully understand that, understand whether the same thing affected it in '03 or not.

And so this is something that has come

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up but I don't know if it's as a reminder and I was aware of it back then or not.

Q. Let me ask you, was there anything that was latent or hidden or you could not have discovered back in 2003 that was in existence in 2003 that now you look back and say, oh, well, this -- since all this happened, I found this or this is something new that I could not have discovered back in 2003?

A. Well, there may be some things that I could have but not practical like sending one of these little robot things down through the conduits to see if the underground piping, to see if there is something there. That could be done but I didn't do it.

Q. But sitting here, you can't identify anything --

A. No --

Q. I want to know is there something that you found that would have been in existence in 2003 that you were unaware of in 2003, not what you could or you might but sitting here today that you can say, here's a problem that I failed to identify or I was unaware of back in 2003?

A. Okay. I think I mentioned these

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before. One is that I don't think in 2003 I appreciated the significance of the limitations of the conduit of 17, under 17.

And also I didn't -- I don't remember as fully appreciating the role of the rising creek and how that would just totally limit the drainage from the Patton property.

I may have. I just don't remember if I appreciated it quite as full as I do now.

Q. And so let me narrow it down. With regards to the -- and I want to just ask you about the drainage system within Prestwick.

A. Within Prestwick?

Q. Yes, sir.

A. Okay. Well then, the extent that you don't have swales guiding the water to catch basins.

Q. Okay. You were fully aware of that; correct?

A. I was aware of that before but I was not quite as aware of the significance of that with respect to getting water out into the creek.

Q. But you were aware that the swales were not present?

A. Yes.

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Q. I'm talking about something -- is there something new you were unaware of --

A. You're talking about --

Q. You identified the swales as a problem and it could contribute to the flooding.

A. And I've identified a little more about the process of how it does. Okay. So you're not asking that.

Q. No, I'm talking about, is there something new that you have found that you were unaware of back in 2003 --

A. In terms of --

Q. -- in Prestwick, the drainage system?

A. Okay. Within -- well, we'll call it hardware. The fact that -- and I don't know the different dates of how the berm was put up in there.

But evidently some places of berm were low and were filled in, but I mean I would have been fully aware that those were low back in '03.

Q. And do you know who put in the berm?

A. Oh, I was told but I forgot whether it was -- I think it was Patton and his neighbor.

Q. Let me narrow it down even more. With regards to the drainage system as designed and

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built by Prestwick Limited Land Partnership, are you aware of any problems today that you were unaware of back in 2003?

A. You mean problems with hardware?

Q. Yes, sir.

A. So hardware, so to speak, if we can use that term?

Q. Right.

A. And we're excluding the golf course because that's a different organization.

Q. Right.

A. I don't think that I am aware of additional hardware problems.

Q. And I'm asking the question as we settled the previous case and I want to make sure, is there something that we didn't cover in the previous case that we need to cover in this case?

A. No.

Q. So you're unaware of anything?

A. I can't -- I can't remember pointing to any one specific thing and saying that was clogged up or that wall blocked that swale or something like that.

Q. One second. Did you review -- and I think they referred to it as the Jackson Clemson

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study?
A. The which?
Q. The Jackson Clemson study --
A. I don't remember. I don't --
Q. -- back in the '90s?
A. -- remember Clemson being in there but I remember the Jackson name.
Q. The legal requirements, whether it's by statute, organization -- no, statute, regulation, ordinance, whatever, that is intended to protect or provide drainage for owners within the subdivision or is that intended to address the water leaving the subdivision?
A. I think the greater emphasis is on the water leaving. Of course, it can be with respect to water coming in to it, but that would be somebody else's doing.
Q. So it's more intended to protect the adjoining property or the property downstream versus the people contained within?
A. But it's also between one and another. I mean you can have a huge subdivision. You can't have one house dumping everything into the other one's basement.
Q. Do you know Mike Wooten, DDC engineer?

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A. I don't think so.
Q. And you don't know the process for -- you've never -- you personally gone through the process of submitting plans for approval with the appropriate governmental entity, getting them approved and then actually building it and getting final approval?
A. That has not been my job.
Q. And other than this case, have you ever been involved in a lawsuit or have you been retained as an expert in which that was an issue, whether the plans complied with the plans and the as-built complied with the plans and construction complied with the stormwater management?
A. I can't separate that out from just plans complying with the various regulations and whether they included stormwater. I don't remember.
But I've looked over plans and consulted on whether they met things.
Q. Let me ask you this. And we're talking, say, a subdivision or development?
A. Yes.
Q. Have you ever been retained or given an opinion with regards to an individual lot or lot

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owners having flooding problems within the subdivision?
A. Yes, I have. And I'm hesitating because I'm trying to remember specifically which ones and I'm not able to --
Q. And I'm not talking about the guy next to me built a house and my lot floods or there was a new development and -- I'm talking about contained within any confines of a development.
Have you looked at and rendered an opinion with regard to the drainage system within the confines of the development affecting an owner within a development?
A. Which would also be one neighbor and another --
Q. Right.
A. -- neighbor.
Q. Right. So let's eliminate neighbors and neighbors.
A. And I have within a subdivision and I don't remember the specifics. Somebody after the neighbor built something, their retaining wall came down, that sort of thing.
Q. I got you. Where the developer or builder was the defendant. Have you been involved

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in any cases like that, within the confines of the development?
A. I think so. If I have, it's been ten years or more and I don't remember which ones.
MR. BAXTER: That's all I have.
EXAMINATION
BY MR. MCLEAN:
Q. My name is Joe McLean. I represent the Department of Transportation. I have some questions for you. I may refer to my clients as DOT from time to time.
A. I understand, yes.
Q. DOT owns U.S. Highway 17 and the culvert that runs under U.S. Highway 17 and so that's what I want to talk to you about.
A. Okay.
Q. I want to make sure I understand what your opinions are pertaining to this culvert. But first I want to set up a little timeline that may be helpful. At least it will to me because that's how my brain works.
A. Good.
Q. Do you know when the culvert under U.S. Highway 17 was installed?
A. I don't know specifically. I think

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somebody speculated in the '50s or '60s but that's all -- I think that's the extent of my exposure to that information.

Q. Do you know what size the culvert is?

A. I understand it's seven by seven and it is approximately that, although every time I look at, it looks like the height is a little bit higher than the width is wide, but that's maybe an optical illusion but it looks that way.

Q. How long is it?

A. You know, I don't remember. I saw that information but I don't remember what it was.

Q. Do you know if the culvert as it sits there today is the same culvert that was originally installed under Highway 17 or has it been modified or changed over the years?

A. I'm not sure whether 17 was put in as a four lane so I can't answer that.

Q. When was the Prestwick subdivision developed?

A. I don't know exactly but I think part of it was in the '90s and I think I saw that from dates on the drawings in the past but I don't remember.

Q. Was it after this culvert was

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installed?

A. I think so.

Q. When was Crystal Lake built?

A. Oh, I don't have that information either.

Q. Do you know if it was before or after this culvert was installed?

A. I don't know. I'd be happy to learn those things, but I don't know.

Q. When was the drainage canal built?

A. I think I saw that information and it may have been in the '50s but I'm not sure. I'm just speculating there.

Q. Do you know if it was built before or after the culvert was installed under Highway 17?

A. Well, most likely there was a culvert there of some sort or else you wouldn't run the drainage ditch to that but it may not have been the same culvert.

Q. How many times has that canal been modified since it was originally built?

A. Probably several but I don't know how many.

Q. When were the Patton and Webb -- his neighbor is Webb --

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A. Yes.

Q. -- when were their homes built?

A. I saw that many years ago. I suspect it was in the '90s but I don't have the dates.

Q. Do you know how far it is from the location of the culvert to the location of the plaintiffs' homes? What distance is it?

A. I saw that and something like 12- or 1,400 feet comes to mind but I can't picture that number. That's my impression.

Q. Would that distance be relevant to a determination as to whether or not the culvert is a contributing cause of the flooding of the plaintiffs' homes?

A. That distance would be a factor to determine that, yes.

Q. Have you done any calculations regarding that distance as it may relate to the culvert being a possible contributing factor to the flooding?

A. I may have done some calculations. It's more of a generalized assessment of the size and condition of the culvert -- I mean the size and condition of the ditch and how that relates to the culvert size.

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Q. In general would it be true that the farther -- the greater distance from the culvert to the homes the less likelihood it is that the culvert could be a contributing cause to the flooding of the homes?

A. As a general principle, yes, but it is not absolutely true.

Q. Sure. When did the homes first flood?

A. That I'm aware of it was '99, I believe.

Q. When were the berms built?

A. That was something I was exposed to and I don't remember that. It looks like it was 15 to 20 years ago.

Q. There has been testimony about a dam or a causeway on the east side of U.S. Highway 17 in the Pirate Land property.

A. Yes.

Q. When was that installed or built?

A. I don't know and you're making me realize that there is a lot of information that I don't have on a timeline that, as I discussed, it might be nice to have a timeline. Maybe some of you guys have that for all these things.

Q. Was that before or after -- do you know

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if that was before or after the culvert was installed under U.S. Highway 17?

A. I don't know. I'd have to speculate on that.

Q. There has been testimony about housing, a residential subdivision called Bermuda Cottages. When was it built?

A. In the last decade or so.

Q. You said you had heard someone tell you, I believe you said that, that water has overtopped Highway 17 at the location of the culvert. Did I understand your testimony to be correct?

A. That's what I said and that was my impression that someone had said that, and they might have been speculating if it does. But I thought I heard it said that it did.

Q. Who told you that or who did you hear say that?

A. I don't remember.

Q. Did this person that told you this tell you when the water had overtopped Highway 17 at the location of the culvert?

A. No. And I looked on that as a limiting height for the water. Once it tops 17, if it does,

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it just can't get much higher.

Q. But you don't have any firsthand knowledge of water ever overtopping Highway 17 --

A. That's correct, no firsthand knowledge.

Q. I believe in the complaint the culvert is referred to as a dam. Is a culvert the same thing as a dam?

A. I wouldn't call it that.

Q. It's not a dam. A culvert is not a dam, is it?

A. No. There can be a culvert, so to speak, in a dam but it's typically not.

Q. Are you aware of whether or not the Department of Transportation, DOT, sends any water into the canal upstream of plaintiffs' properties?

A. Well, possibly, yes, but I don't know. It's one of the roads that crosses the canal or ditch or whatever we call, it has a watershed off of it into the ditch and then that's sending it away.

So I haven't checked to see if those are county roads or state roads or whatever.

Q. Or private roads?

A. Or private roads, yes.

Q. And the dates of the storm event that

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have brought us here today are October 4th and 5th, 2015, correct, that's one of them?

A. I thought it was September, but if it's October, that's fine, yes.

Q. And September 2, 2016?

A. That sounds about right but I don't have those memorized.

Q. Do you know if DOT had any involvement in the design or building of the canal or the relocation or modification of the canal?

A. Certainly on the original building of the canal, one would expect that they would have had some input but that's just expectation, not knowledge.

Q. You testified that it is now clearer to you that the culvert is a contributor to the flooding of the plaintiffs' lots.

A. Yes, the size of the culvert is a restrictor of the flow.

Q. Okay. That being said, what size should it be?

A. I haven't done that calculation. I think some others have maybe suggested a calculation.

Q. So you're of the opinion that the

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culvert is too small?

A. Too small for what's going on upstream, yes.

Q. Does DOT have any responsibility for what's going on upstream?

A. That's an interesting question. I would say they probably have some responsibility for what can be anticipated to be going on upstream but that would be it.

Q. All these things are going on around the east side and the west side of the culvert, but it hasn't changed those things, has it?

A. I don't think it has changed, no.

Q. But all these things -- other things are changing around it but you still think DOT should replace that culvert and make it larger?

A. Okay. What I was saying from that former question was that new roads are built in all the time and the drainage going under them and as we look into the future of what is going to be going on upstream and how that character is going to change.

And how far in the future, whenever it was built, did people know that Myrtle Beach was going to grow, I suspect so, so I haven't looked at

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trying to address how far in the future DOT should have looked, and whether they had a crystal ball as to what developers might do.

Q. Of course that -- if they are going to enlarge that culvert or even build a bridge, they are going to have to close down Highway 17; correct?

A. Well, I would think they would have to at a time and build some temporary pavement on the shoulders and that sort of thing.

Q. It's going to involve major traffic disruptions if they do it half and half?

A. It would involve disruption, yes.

Q. What would be done for temporary drainage while the culvert is being replaced or a bridge is being built?

A. There are various ways around that but I'm certain people with the Highway Department have done that before and know how to do that.

Q. If a bridge were built or made larger, that would significantly -- that would increase the flow of water downstream into the Pirate Land property; is that correct?

A. That's correct.

Q. And that could potentially adversely

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affect those properties; correct?

A. They don't want that. That's correct.

Q. They know that could impact them.

A. That's what somebody said, yes.

Q. DOT didn't have anything to do with building that dam or causeway in Pirate Land, did they?

A. I would think not. I don't know if they were even sought out for approval.

Q. So tell me what your opinions are regarding the culvert and it being a contributor to the flooding.

You've told me that it needs to be enlarged in some way to anticipate future growth or just needs to be enlarged.

What else? What other opinions do you have pertaining to the culvert?

A. Well, in terms of when you have heavy stormwater, it becomes a constriction of the flow of the water to the ocean. And that constriction relates to the flooding of some uphill properties and the ability to drain out of uphill properties and not just flooding into them, the inability to drain out.

And if it's -- it's kind of a

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combination thing that if DOT looks at the future to see, to try to see what the needs are going to be.

You know, if they build roads wider than they have to be because of future traveling and culverts can take that into account, future water.

But then developers and approval -- builders' approval organizations can look at the infrastructure that's there and it appears as a major kind of break in communication planning of whatever that nobody took all these into account.

And so is DOT supposed to think 50 years ahead of time? I can't answer that. The developers are supposed to look and see what's a few hundred yards downstream or upstream, or whatever, yes, they should.

Q. Would it make any difference if I told you that the culvert was initially installed in 1933? That's long before the '50 or '60s.

A. That's 80 years planning ahead of time, isn't it?

Q. And U.S. Highway 17 was widened in 1959 to four lanes and the culvert was made longer but not wider at that time.

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A. Okay. That explains it. Then that seems more -- yes, that sound more reasonable that it was built originally as a two lane and they just lengthened the culvert rather than widening it.

Q. So you just believe that the culvert should be wider to handle more water. Is that the bottom line?

A. And it could be taller too but the wider is the main thing.

Q. Okay. Bigger?

A. Bigger.

Q. Okay.

A. To move more water --

Q. Yes.

A. -- underneath Highway 17.

Q. What else about the culvert? Are there any other opinions that you have about that culvert other than it should be larger, bigger, handle more water?

A. I haven't looked at the approach and exit very much to say whether something should be -- wanting to do something to those to help it out. But the main thing is it's a point of resistance to the flow.

Q. Due to, in your opinion, it's

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undersized. Is that why it is a point of resistance?

A. I think that's the main thing. I don't see any argument with the height-width ratio and those sorts of things.

Q. Well, I mean it's true. They could build a bridge there and just open it wide up, couldn't they?

A. Yes, they certainly could have and certainly could still. But most of the time, it's a very small flow.

Q. And would the flooding affect the two homes up, some distance away? What did you tell me?

A. I said it was around 12-, 1,400 feet or something like that.

Q. 1,200 to 1,400 away?

A. That's my estimate. I saw a number and I can't remember whether that's it or not.

Q. We can measure it.

A. Yes.

MR. MCLEAN: I think that's all I have for you now. Thank you.

EXAMINATION

BY MR. JORDAN:

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Q. My name is Charles Jordan and I represent the City of Myrtle Beach. And I'll try not to repeat all the questions that you've already answered.

A. Okay.

Q. The prior case we were involved in was settled in September of 2005.

A. Okay.

Q. As a result, the claimants built a berm out there that you're aware of, I believe?

A. Yes.

Q. Did you have any role in the construction of the berm?

A. I did not. I wasn't down there with the construction of the berm. There may well have been discussions of the needs -- the benefits of what a berm could do, the pros and cons of it.

Q. Did you do any of the design, calculations or anything like that for it?

A. I don't think so. Like height to base ratios and that sort of thing, and type of soil, no.

Q. Do you believe that the berm has rectified the flooding problem out there?

A. It's rectified part of it.

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Q. And in what way?

A. It prevents the rise of level in the creek -- and pardon me for using creek and ditch and all these things interchangeably. There is only one that we're talking about right here.

But it can have a -- it can rise above the normal banks and not flood the Pattons' property and the other properties there.

Q. Okay.

A. But, of course, the problem exists of getting water off of the Pattons' property. And, therefore, the pipes were put in with check valves so that it can drain out.

Q. Does the Pattons' property still flood now?

A. The Pattons' property is still flooded since then but not from the creek overflow but from the rise of the level of the creek.

When the creek raises to the point where it would overflow, if the berms weren't there, it's at the point where water from within Prestwick dumps down into the plaintiffs' yards and can't get out without a pumping station.

Q. So the current flooding that the Pattons are experiencing isn't from the creek

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backing up, but it's from the water sheet flowing across Prestwick and not being able to get into the creek?

A. Almost. The creek backing up prevents the water getting out. So it's not the creek backing up that puts the water in. It's the creek backing up that keeps water from getting out.

Q. Okay. Let me try to put it a different way then. I mean let me say this a different way now.

Water coming down the creek, upstream from the Pattons --

A. Yes.

Q. -- today, water falling down that creek isn't getting into the Pattons' house. Is that a true statement?

A. Today I don't think it is. For a while, it was going around the end of where they built the berm and coming back in --

Q. But I think they --

A. -- and I think that they ended up correcting that but it's preventing the water that falls on Prestwick from getting out.

Q. Gotcha. So the Pattons have fixed the idea of the creek actually overrunning the berm,

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you believe?
A. It's at least partially fixed. I can't -- I didn't use surveying instruments to go out and see exactly what level it was but it addressed it. Whether it's completely fixed, I don't know.
Q. But to the best of your knowledge, it did fix --
A. It certainly improved that and reduced the tendency of the creek to flow directly or indirectly or end run into their yard and house.
Q. At some point in time -- I think the berm was built in the 2005, 2006 timeframe. I'm going to ask you this question.
Do you believe that in 2007 after the berm was completed, would it have been a misrepresentation for a real estate agent for Prestwick to represent to a potential purchaser for Strathmill Court that the flooding problem had been rectified?
A. I would say it would be.
Q. It would be a misrepresentation to have said that?
A. Yes.
Q. Why is that?

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A. Well, because the flooding problem had not been rectified. A particular aspect of the flooding problem had been rectified in that water from the creek generally won't come directly into the property.
And when you mention the name of the street, I assume that's the name of the same street --
Q. Yes, sir. Strathmill. I believe that's right.
MR. CONNELL: It is.
THE WITNESS: -- that the Pattons are on.
MR. JORDAN: Let me show you what has been marked as Exhibit Number 14.
(DFT. EXH. 14, Diagram of Outfall Number 1, was marked for identification.)
MR. CONNELL: What's that? You never gave us this before.
MR. JORDAN: This is a Stormwater Master Plan, Myrtle Beach Air Force Base, Final Report. This is what it comes from anyway. This is a map of what's generally known as Seagate Village. This was in the prior -- this was documents I got out of the prior lawsuit.

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MR. CONNELL: This is in the city of Myrtle Beach, right? Seagate Village is part of the city.
MR. JORDAN: Yes, Seagate Village is within the City of Myrtle Beach.
MR. CONNELL: Those are the old military duplexes.
MR. JORDAN: Yes, those are the old military duplexes.
Q. Yes, I can represent to you at least that there is a hardline here, this line at the bottom between Seagate Village and what's called -- Crystal Lake is here (indicating)?
A. Yes.
Q. Do you see that?
A. Yes.
Q. That line is actually -- I believe the municipal boundary of the City of Myrtle Beach is actually that line.
I don't know exactly where it goes after it leaves here, but it goes straight on out.
And if you look at Alpha Number 1, Alpha Number 1 is where Seagate Village drains into the canal and you can kind of see the canal as it comes out, it takes sort of a dogleg to the right

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and down straight?
A. And it also has a branch that goes over to Crystal Lake.
Q. I'm asking you that. Is that correct? Does it have a branch that goes into Crystal Lake?
A. That's what I thought I'd understood.
Q. Okay.
A. Crystal Lake would be a buffer of some sort.
Q. Okay.
A. But I did not go out and inspect and verify it.
Q. All right. This was taken from a stormwater master plan of the former Myrtle Beach Air Force Base and they ended up -- they separated the Air Force Base into different outfalls, different places where the Air Force Base drains.
My question to you is, do you -- would you agree with me or not that the only portion of the former Myrtle Beach Air Force Base that drains into the creek is that area on Exhibit 14 which is outlined in yellow?
A. I can't say whether it does or not only looking at this.
Q. Okay. Have you done any studies as to

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what part of the former Myrtle Beach Air Force Base actually drains into that creek?

A. I have not other than reading materials that quote the number of something like 13- to 1,400 acres as watersheds for that creek.

Q. But you have no independent knowledge whether or not it is true that the area outlined in yellow is the only part of the Air Force Base that drains into the creek?

A. What I assume by that question is that you're saying a lot of the rest of this is outside of the Air Force Base.

Q. Correct. I will represent to you everything to the top of the page is part of Air Force Base.

A. Okay. I'd have to go back and check what I saw as the outline of the watershed area.

Q. Okay. What do you have that outlines the watershed?

A. Some of those Thomas and Hutton drawings.

Q. Okay.

A. Is it Thomas and Hutton? Is that correct?

Q. Yes, sir. Thomas and Hutton.

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A. Okay.

Q. I represent the City of Myrtle Beach. Earlier when you began your deposition, Mr. Battle asked you what factors contributed to the flooding of the Pattons' property, the plaintiffs' property -- I guess there are two plaintiffs -- and you gave us a list of nine. I want to go over those with you. I wrote those down.

A. Okay.

Q. And I want to ask you if the City of Myrtle Beach had any role in that or not?

A. Okay.

Q. The first thing you said was, a representation that there was no flooding. Do you know if the City of Myrtle Beach made any representations to the plaintiffs that their property does not flood?

A. I don't know that they gave any representations but I don't know if they had other information or interactions with Prestwick that Prestwick had come to the conclusion that it was okay to say that.

Q. Do you know if Prestwick is within the City of Myrtle Beach or not?

A. I don't think that it is but I don't

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know.

Q. It's not. My information is that it's not.

A. Okay.

Q. But I'm not testifying.

A. Yours is better than mine, it looks like.

Q. Do you know if the City of Myrtle Beach had any role in the internal planning of the Prestwick development?

A. I don't know that, whether or not that's part of one of the people that the developers talked to in the process. I haven't asked that question. I don't know the answer to that.

Q. Do you know if the City of Myrtle Beach had any role in the developers of Prestwick failing to follow their development plans?

A. I don't know about that.

Q. Do you know if the City of Myrtle Beach has any -- had any role in the design of the ditch?

A. The original design of the ditch?

Q. Yes, sir. Let's start with the original design of the ditch. Do you know if they had any role in the original design of the ditch?

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A. I don't but I can imagine they may have but I haven't seen that information.

Q. Do you know if the City of Myrtle Beach had any role in the redesign of the ditch?

A. I don't know but I would suspect that part of the ditch is in the City and they may have.

Q. Have you seen any documents that show that the City of Myrtle Beach had any role in the redesign of the ditch?

A. I'm not in possession of any. As I said, I suspect they may have had some awareness of that.

Q. Have you talked to anybody that would give you the indication that the City of Myrtle Beach had any role in the redesign of the ditch?

A. I have not.

Q. Do you know if the City of Myrtle Beach has any role in the maintenance of the ditch? And let me divide the ditch --

MR. CONNELL: Outside of the City or --

MR. JORDAN: Let me divide this.

Q. Exhibit 14 shows Outfall Number 1.

A. Yes.

Q. I will represent to you that Outfall

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Number 1 is on the dividing line -- the best of my information is -- on the dividing line between the City of Myrtle Beach and Horry County.

A. Okay.

Q. And the boundary of Myrtle Beach is south of that outfall or below the line of Outfall 1 is outside the city. Above the line is inside the city.

So I'm going to ask you, below the line, below Outfall Number 1.

Do you know if the City of Myrtle Beach has any -- had any role or has any role in the maintenance of the ditch outside of Outfall Number 1?

A. I don't know that they have. I wouldn't be surprised if they had been involved in some coordination but I don't know anything about that.

Q. Since 2005, since the settlement of the case in 2005, do you know if the City of Myrtle Beach has performed any maintenance on the ditch outside of Outfall Number 1?

MR. CONNELL: What does that mean?

BY MR. JORDAN:

Q. Okay. Since 2005, do you know if the

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City of Myrtle Beach has maintained any portion of the ditch between Outfall Number 1 and Highway 17?

A. I am not sure about that. I remember being exposed to the -- how the right of way was whatever and the exchange was made and it was somehow done at a different time and just exactly who has any control over what right of way, but I can't say whether or not the City was part of that.

Q. Have you seen any documents that would indicate to you that the City of Myrtle Beach has performed any maintenance on the ditch from, let's say, Outfall Number 1 all the way to the Atlantic Ocean after 2005?

A. I don't specifically remember but I can't preclude there being -- having some involvement if that's part of the right of way issues and different people being involved in that right of way issue.

Q. Have you seen any document that would indicate to you that the City of Myrtle Beach has any legal duty to maintain the ditch from Outfall Number 1 to the Atlantic Ocean?

A. I don't remember seeing such.

Q. Inside Outfall Number 1, this is inside of the yellow area, or let's say anything upstream

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of Outfall Number 1, do you know who designed the ditches that flow into Outfall Number 1?

A. I certainly don't know what engineer did it and likely, but I don't know, it was related to the military.

Q. Do you know if the City of Myrtle Beach had any role in the design and construction of the ditches that fall into Outfall Number 1?

A. I don't know which way that was at the time it took place.

Q. Do you know when those ditches would have been constructed?

A. Long time ago.

Q. Would those ditches have been constructed before the development of the Prestwick subdivision?

A. Most likely.

Q. Do you know if the City of Myrtle Beach maintains the ditches that flow into Outfall Number 1?

MR. CONNELL: Which side? Inside or outside of the --

MR. JORDAN: That go into Outfall Number 1 so any ditch upstream --

MR. CONNELL: Okay.

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THE WITNESS: So if that's in the City, it's on common ground, I would think that they did. I don't have documents that say that or I don't remember documents that say that.

BY MR. JORDAN:

Q. Getting back to my list. Number 4 was the design and maintenance of the channel.

Number 5 was the conduit under 17.

Do you know if the City of Myrtle Beach had any role in specifying the size conduit under U.S. Highway 17?

A. I don't know about what happened back in the '30s and how the DOT coordinated with the different players and so I just can't say on that.

Q. You listed -- you talked about the causeway and dam in Pirate Lane. Do you know if the dam and causeway within Pirate Lane is within the City of Myrtle Beach?

A. No, I haven't addressed that. I don't know.

Q. Do you know if the City of Myrtle Beach had any role in the design or construction of the causeway and dam at Pirate Lane?

A. I don't know.

Q. You mentioned the golf course runoff.

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Do you know if the City of Myrtle Beach had any role in designing the stormwater runoff from the golf course?

A. I don't have any knowledge of that.

Q. By the golf course, I assume you mean Prestwick Golf Course?

A. Yes.

Q. There's a lot of golf courses around here.

A. I assumed that as well also.

Q. Do you know if the golf course is within the City of Myrtle Beach?

A. I don't know that. I think you were representing this yellow line as the border of the City down this way (indicating), so I haven't checked to see exactly what's included or not.

Q. Okay. You mentioned the design of Crystal Lake. Do you know if the City of Myrtle Beach had any role in the design of Crystal Lake?

A. I don't know but I would suspect that they had some role in Crystal Lake but, again, I don't know.

Q. Have you seen any documents that would support any indication that the City of Myrtle Beach had any role in the design or

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maintenance or upkeep of Crystal Lake?

A. If I have seen them, I don't recall their content.

Q. Have you spoken with anyone who gave you any indication that the City of Myrtle Beach was involved in the design, upkeep or maintenance of Crystal Lake?

A. If I have had, I don't remember it.

Q. You mentioned -- we've talked about the building across the creek which goes by several names.

Which name are we using?

MR. BATTLE: The name in all the plans is Bermuda Gardens. So that's the one that we've been using.

BY MR. JORDAN:

Q. Okay. Bermuda Gardens as we've been calling it this morning. Do you know if the City of Myrtle Beach had any role in the approval of any plans for Bermuda Gardens?

A. I don't know that.

Q. Do you know if Bermuda Gardens is within the City of Myrtle Beach?

A. If it was, they had some involvement in it. If it wasn't they didn't. They most likely

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didn't but I don't know.

Q. Have you seen any documents or talked to anyone that would give you any indication that the City of Myrtle Beach had any role in the development of Bermuda Gardens?

A. I don't remember if I have.

Q. Are you aware of any development that has taken place within the watershed of the creek that occurred within the city limits of the City of Myrtle Beach since 2005?

Let me rephrase this total question again. I got a lot of qualifications.

Since 2005, are you aware of any development that has taken place within the watershed of the creek that is also located within the City of Myrtle Beach?

A. I have not checked that out. And I would have to do that so I may be aware of some things that would meet those limits or that don't meet those limits. I don't know.

Q. How is the City of Myrtle Beach responsible for the flooding of the Pattons' property?

A. Well, the terminology responsible for the flooding implies that they alone are

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responsible. I think I view it as having a contributing factor.

Q. Okay.

A. And it relates to a lot of the water that goes down the creek comes off the City of Myrtle Beach territory.

Q. Okay.

A. Let's just say it that way. And then there are various things that can be done to make the timing of that water be less harmful, timing of the flow.

I have seen nothing suggesting that they have done some of those things which really positively affect the timing.

Myrtle Beach, of course, is aware that more -- from whenever they built the Air Force -- when the military base was built, that more water was going downstream.

So being conscious of what leaves their property and the times and whether it be catch basins, something to slow the water down, speed the water up, whatever, holding ponds, in light of the development downstream, it appears that that has not been done.

And some of that relates to maintenance

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of the ditch that they were involved in as well.
So what I can think of now is not one of the primary factors but it's at least a second tier contributing factor.
Q. Can you put a percentage on that? Is it a 1 percent contributing factor or a 5 percent contributing factor?
A. I'm going to have to go back and put on the thinking cap again if I'm going to be given the task of trying to do a percentage factor for everybody.
Q. Have you done any calculations that you can specifically show me that would tell me exactly what the City of Myrtle Beach should have done that it has not done?
A. No, I'm not prepared to do that at this time. It's primarily the water coming off of there is a non-negligible factor and the rate of which the water comes off and the things that can be done to reduce that doesn't seem to be part of the solution so far.
Q. Besides the City not doing something that you believe maybe it should have done, are you aware of the City of Myrtle Beach affirmatively doing anything that has contributed to the flooding

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of the Pattons' property?
A. Okay. And this may seem counterintuitive but the better maintained those ditches are within the City the more of a rapid and peaking flow of water comes out and goes down.
So when they positively cut that grass short, and it seems kind of humorous and you laugh and I laugh too, but that's all part of looking at the -- what they call the time and concentration of water flow.
And I don't think they did anything because they wanted to make it worse on the Pattons. There is no question of that.
But they no doubt have done several things which may be nice things to do but make it a little more contributing to the problem than to the Pattons.
Q. Do you know if the City of Myrtle Beach has increased the size of Outfall Number 1 at any time?
A. As I recall, Outfall Number 1 goes under a little bridge. I read that. Is that correct?
Q. I believe so.
A. Okay. And I shouldn't be asking you

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questions.
Q. I answered. I don't know either.
A. Okay. And trees have been cut down which increases the effective size. I didn't see any signs of recent earth moving equipment or anything.
Q. Do you know who -- go ahead.
A. But there at the County exit on both sides of that bridge, you can see that some maintenance has taken place at some time in the recent decade.
Q. Do you know who performed that maintenance?
A. No, I don't.
Q. If you could look at Exhibit 3 for me, please.
A. Okay.
Q. Exhibit 3, at the very top, you say, "Myrtle Beach City." Your handwriting is better than mine, but I still can't read it.
A. Well, I might not be able to either.
Q. Can you please read that to me and -- first of all, when were these notes made? Let's back up.
Were those notes made in connection

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with the prior lawsuit?
A. Yes.
Q. Okay.
A. A long time ago. Sometime before '03.
Q. All right. What does it say about the City of Myrtle Beach?
A. Let me see. My writing was worse then than it is now.
Q. And if you could, if you could read it and kind of explain to me what you meant by it.
A. "Drainage, maintenance and outflow of water."
Q. Okay.
A. That's the first line.
Q. Is that what we've discussed?
A. Yes.
"Changes on base."
Q. Okay. Changes on the base. What do you mean by that?
A. Widening of the road, changing the drains off of the road, building additional buildings, that sort of thing.
Q. Are you aware of any changes on the base that occurred within the watershed of the ditch?

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A. Okay. At the time that I wrote that, I understood that essentially the whole -- a lot more of the area was in the watershed and that part of the purpose of the drainage was the drainage from the flight line. The flight line is outside.

Q. The drainage field?

A. Yes.

Q. Okay.

A. So it's a little bit confusing to me as to whether that border that you gave me was really indeed accurate or not.

So I go on the basis that the drainage was -- came off of more than just what you've outlined.

Q. All right.

A. And then, "Permits." That's just a question of what permits were done with respect to what's in Myrtle Beach.

Q. Are you aware of any permits that have been issued by the City of Myrtle Beach after 2005 within the drainage field of the ditch?

A. I have not looked at that so I don't know.

Q. Are you aware of any permits that were issued by the City of Myrtle Beach after -- let's

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back up.

Are you aware of any permits issued by the City of Myrtle Beach on or before the development of Prestwick, where the Pattons live -- on or after the development of the area where the Pattons live?

A. Not specifically. I'm not saying there are not any. I'm just --

Q. You just don't know?

A. I just don't know about them other than this, some newer construction and remodeling in the area.

Q. How about -- and just basic remodeling of a building usually would not materially contribute to the flooding?

A. May not.

Q. How about the last one?

A. "Drainage from other city property."

Q. Do you mean property owned by the City or property in the City?

A. Property in the City that may be in that field.

Q. Are you aware of any changes in any property within the City after 2005?

A. Within the --

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Q. Drainage field.

A. Drainage field. Not specifically. I have not tried to divide things up in pre and post 2005.

Q. Here -- and this is one of the questions I want to ask. I'm from Conway. My mom grew up in a neighborhood where it got flooded during Hurricane Florence.

Do you believe upstream municipalities on the Waccamaw River have liability for the flooding that occurred in Conway as a result of Hurricane Florence?

A. Upstream, you mean --

Q. Yes, sir.

MR. CONNELL: I offered him as an engineering expert, not a legal expert on upstream --

MR. JORDAN: I'm asking him. He told me if water falls in the City of Myrtle Beach, I'm liable.

If water falls in the town of Lake Waccamaw --

MR. CONNELL: Well, you've got an artificial channel going across --

MR. JORDAN: Well, I disagree that it's an artifical channel.

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THE WITNESS: Now, wait a minute. I didn't say that any water falls in Myrtle Beach they were --

BY MR. JORDAN:

Q. If any water falls in the City of Myrtle Beach that flows into this channel, does that make the City of Myrtle Beach liable for the Pattons' flooding?

A. I don't think I said that.

Q. Okay.

A. I said if they do something to increase the negative impact of it, it could.

Q. All right. So the only thing is to increase the negative impact of it?

A. Well --

Q. I'm just wondering what you said.

A. Well, it depends on what was there first too.

Q. Okay.

A. But now the City of Conway and -- well, certainly -- and I'll just give you an example.

Another town built a dam, built it shoddily, the dam washes out during a heavy flow and it wipes out the city below, of course, they have a responsibility, I think.

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Q. Right.
A. So it can be, yes.
Q. In that regards?
A. Yes.
Q. Are you aware of this creek or this drainage or are you aware of how it existed prior to any development in the area?
A. Back when it was pine forest and burrs.
Q. Pretty much. That's what I'm asking.
A. I haven't tried to think back that far.
Q. Okay. You had mentioned in your prior testimony that these houses were built in marginal areas. What does that mean?
A. Well, this is with respect to, I think, the flooding and water problems. There are areas where one can be confident, one could build on top of a hill, so to speak.

And then there are areas where you have to ask the question of what's going to happen here in a big rain.

And certainly there are ways of solving this problem, even if you don't do anything to 17. You build a big berm. You put in a big pumping station. You put the house on stilts.

You don't need to do all those but --

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and even bring in fill to make the garage higher and don't have a patio, have a raised deck and just live with it if anything happens.

So that's marginal. That's when you have to do those sorts of things. And we've all driven by some of the rivers like the Black River and seen these mobile homes sticking up on 12-foot piers and things like that.

There are ways of dealing with it. But that's marginal. You can't build a standard house there.

Q. If the land flooded prior to the Pattons building on that property, do you believe the City of Myrtle Beach has responsibility that the Pattons build in a place that floods and they then experience flooding in their home?
A. That's where the City and County kind of get into each other's throat. The County approved it and said, "Hey, that's fine," if indeed they said that.

And then if the City is doing things that contributes to it in whatever way through not doing something or doing something, that brings an interesting situation of your brother saying, do it, and then you do something and it makes it

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worse.
Q. I guess what I'm saying is, if the outfall -- we're looking at the outfall on Exhibit 14. That's the base housing. That was built back in the '50s, I think.
A. Okay.
Q. If that drainage system has remained basically unchanged since the '50s, with normal maintenance being done on it, if the area where the Pattons' lot is flooded in 1960 and '65 and 1970 and 1980, and this drainage area has stayed substantially the same since then, should the City -- should the City of Myrtle Beach be liable because the Pattons built in a place that was flooding prior to their building there?
MR. CONNELL: Again, you're asking him a legal conclusion. He's an engineering expert.
THE WITNESS: I would only answer in terms of, did the City of Myrtle Beach contribute to it by doing or not doing things that incrementally increased the water level.
BY MR. JORDAN:
Q. All right.
A. And there are a lot of contributors that are smaller than the others to this problem.

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Q. I was just wondering -- okay. So your testimony then is, let's say because the house the Pattons' built flooded every time that there was a big rain storm from 1957, when this was built onwards, if they build there and they still flood, then it's your testimony that the City of Myrtle Beach has some responsibility for their flooding?
A. These are interesting issues as to where the borderlines are. And I don't know the details of the City of Myrtle Beach taking over from the military and what role they had in improving from the military and what role they had in digging the ditches, if they did, and all these sorts of things.

It would be interesting to have a record of exactly what happened after each rain over the last 75 years, wouldn't it?
Q. Would that make a difference in your analysis?
A. I think it could add information which would shed light on certain things and it may make a difference and it may not.
Q. On what certain things would it shed light on?
A. Well, the statistics if there was an

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increase in water level of the creek with every incremental piece of development that went on would tend to indicate that development does indeed have a role in that.

And if an Air Force Base and a military base increases the peak flow down, and then somebody else builds something and that increases the peak flow and somebody else does something, then they say, well, I'm the first one, so I don't count. I don't know. That's an interesting point.

Q. We'll leave it at that then.

MR. CONNELL: Let's take a five-minute break then.

(A recess transpired.)

EXAMINATION

BY MR. NEILL:

Q. Mr. Taylor, my name is Mark Neill and I represent Rose Real Estate, Inc., which was the entity which owned the property on which Bermuda -- what are we calling it -- Bermuda Cottages was later developed which later became Ocean Walk.

Let me ask you this because no one has asked you this yet. What did you do in preparation for your deposition here today?

A. Well, yesterday, I went back over the

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site to see what had changed and to refresh myself.

Q. And when you say the site, what are you referring to?

A. That particular area of Prestwick, top of the berm for a while and then around Highway 17, both sides of it where the culvert was, the inflow and outflow.

Q. Did you do anything with regards to the -- I'll call it the canal -- upstream with like where Bermuda Cottages is or any of the other properties?

A. Well, yes. And thank you. And a little bit of modification to that. Up in the general -- the area between Crystal Lake and the old military base, I looked at that area there too and saw Crystal Lake and looked at it.

Q. Did you just walk the ditch? What did you do as far as --

A. I walked along the edge of it but did not get down into it or go on an extended time.

Q. And how much time did you take to do all that?

A. Probably a couple of hours, something like that.

Q. Did you review any other documents or

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anything else in preparation for today?

A. Yes. And as you may have heard before that I last worked on this matter about 15 years ago and I guess just a few months before Gene called me back, I purged my file.

So I reviewed some of the things that he had, that he had from a prior deposition when I brought my file to a deposition.

Q. So is that basically your deposition transcript from the previous case and any exhibits that were attached --

A. And some exhibits and then he sent me the Thomas and Hutton reports.

Q. Okay.

A. And some photographs of the flooding and just of the house and things like that.

Q. Do you have any other items besides those at your office that didn't get purged other than those negatives that we talked about --

A. I think negatives are the only things that didn't get purged. That's because I always keep them separate.

Q. Okay.

A. And they don't take up much space.

Q. Other than the inspections that you did

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yesterday, between 2005, which I think was when the first case was settled and yesterday, had you been back to the property to look at it for any other reasons during that time?

A. I had not been back into Prestwick at all that I can recall. I wouldn't have an occasion to. But having driven on 17, I had stopped and just looked at the culvert just out of -- not just the culvert, but the ditch, just out of interest of something that I have been involved in and wanted to see what was going on and nothing of note --

Q. Okay.

A. -- popped up on those times that I was there.

Q. Now, we had talked about a little bit earlier how you've never been involved with the process of designing and submitting a stormwater drainage plan for a development in the past; is that correct?

A. That is right other than I may have talked with people who were and given them some guidance or asked questions or brainstormed with them.

Q. Can you tell me, did you ever review or look at anything that was submitted to any

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government entity with regards to Bermuda Cottages when it was being developed?
A. There was something that passed through as another exhibit a little while ago that was about three pages that was put into evidence. I don't recall who that was presented to and I see you're going through maybe some of that but not what I was particularly referring to.
Q. Well, let's talk about prior to today. Had you ever reviewed any of the plans or documents that were submitted to the County as part of the approval process for Bermuda Cottages?
A. I don't recall if Mr. Connell had sent it to me and somehow I got -- I missed it in going through all those documents.
Q. So you don't recall ever seeing what the design plans were --
A. No.
Q. -- for the stormwater management, and none of the calculations or any of those type of things?
A. I wasn't aware of those things and in preparing for this and reading documents, I saw that land was developed and that was the first I knew of it.

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Q. And when was it that you first learned that the property had been developed?
A. I think Mr. Connell may have told me when he first contacted me on this several months ago.
Q. Would that have been sometime near when your affidavit was done for this case? I believe that was done November of '17?
A. Was it that long ago?
Q. Does that sound about right?
A. Whenever it was, it was.
Q. Okay. I can tell you.
A. Okay.
Q. It was filed on November 27 of 2017.
A. Okay.
Q. So approximately a year ago.
A. Yes.
Q. It looks like it was signed November 10.
A. Okay.
Q. Now, can you tell me at the time that Bermuda Cottages was submitted for development, what standards was the government implementing -- strike that.
What standards were the County

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governments implementing to determine whether the stormwater drainage plan was sufficient? What standards would they look at at that time?
A. I don't know what they looked at at that time.
Q. So you don't know what guidelines they were using in whether they determined to approve or disapprove a set of plans?
A. No. I have in the past reviewed guidelines and I don't remember what organization puts them out.
Q. What about State guidelines. Are you aware of any of the guidelines that were used at that time?
A. I did not look into what guidelines they used at that time.
Q. So sitting here today, you don't know what those guidelines would have been back in 2006?
A. No, I don't know what guidelines were used back in 2006. And I've looked at it on the basis of what factors in the development would lead to an increased water problem.
Q. But sitting here, you're not aware of any governmental minimum requirement guidelines that were used to determine whether the plans were

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sufficient or --
A. No, I wasn't trying to compare the governmental minimums. I was looking at what could contribute to water flow problems at various times.
Q. So when you were forming your opinions with regards to this litigation, you weren't forming those in reference to any governmental guidelines, but instead your own guidelines. Would that be fair?
A. Well, no, it wasn't my own guidelines saying that a slope should be this much here or drainage -- or that a holding pond should be so deep or pavement should have been -- a roof should be no more than 8 percent of the land. I wasn't having guidelines like that. I was looking at, does this potentially increase the drainage problem in that area, rather than did they meet each little -- cross every "T" and dot every "I."
Q. Okay. Have you ever seen the actual plans for Bermuda Cottages?
A. I haven't seen the plans at all, no. I saw some diagrams earlier.
Q. So you don't know what the actual specifications were for the retainage ponds or any

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fill that was provided for any of the drainage outflow. You don't know what those were?

A. I've never got those specifics on that. I can see that it looked like the amount of fill that was used and they tried to take care of it themselves, yes.

Q. How much fill did they use?

A. I don't know that. As I say, the ground level was about six feet above the -- just across the creek in the Pattons'. Whether that's all fill or not, I don't know.

Q. Did you perform any tests or calculations to determine it was six feet?

A. No, I did not go over there.

Q. Did you just eyeball it?

A. No. It was fairly clear, just looking across the creek that it was about six feet higher.

Q. Okay.

A. Whether it was five and a half or six and a half, I can't say.

Q. But you do not know if any of the stormwater plans would have calculated that as part of what the plan is going for the development?

A. Whether they were taking into account the amount of fill, I don't know to what extent

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they did.

Q. Okay. And you don't know how deep any of the retention ponds were or how much water they were designed to retain?

A. I don't know those things. There were ponds there, yes.

Q. Do you know, back in 2006, what were the standards that the stormwater drainage plan would have been built to? Would it have been a 25-year event? Would it have been a 100-year event? Would it have been a 500-year event? What standard would they have used back in --

A. It's my understanding is that 25-year was commonly used. I don't know if it was universal. It's just how it got to be commonly used.

Q. Do you have an opinion as to whether Bermuda Cottages' stormwater plans were inadequately designed not to accommodate a 25-year flood event?

A. What do you mean by accommodate? I don't understand that.

Q. Would it be your opinion that the design plan for Bermuda Cottages was not able to handle a 25-year flood event?

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A. Okay.

Q. Do you have an opinion on that?

A. Let's see if I can say it this way. I was handling it with respect to the development itself and handling it with respect to not increasing any element of down flow -- of outflow over what it would have been otherwise.

And that you can have your rainfalls of different periods, different intensities. You can have quite a variation.

And then there are other things besides dealing with the land that they had to develop. They created new land, so to speak, by changing the channel.

And so I took into account whether this was likely under some rainfall events that were reasonable would be likely to increase the backup and flooding problem.

Q. But would it be able to handle a 25-year flooding event?

A. And I look at a flooding event like a 25-year as being variable. You know, you can have different intensities for different time periods and so I did not go back and look at all the limits.

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You know, if you have a 25-year event two days after a 20-year event, and I just did not look at how that distinguishes the difference.

I'm looking at what's typical in the area and can that increase the contribution to the increase in creek level.

Q. So would it be fair to say that in basing your opinions, you're not applying a 25-year flood event?

A. I'm not applying a strict 25-year flood event. That's right.

Q. And do you know who is responsible for determining what a 25-year flood event is?

A. Probably either appointed or elected officials.

Q. So you think it's some elected official who does this?

A. Well, I said appointed and/or elected officials. I don't think that there was one person who decided for all of the East Coast or something.

Q. Do you know, is it state or national level? Do you have any idea who this person is?

A. I think it starts at national, but I haven't followed that.

Q. Have you ever looked to see what a

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25-year flood event is?
A. I've seen definitions of the different flood events and I don't recall the technical specifics of each of the durations and peaks and things like that.
Q. And you haven't done that with regards to--
A. No.
Q. -- Bermuda Cottages?
A. No, I have not done that with regard to this issue. I'm looking at the overall performance, not the strict adherence to some minimum standard.
Q. Okay. So can you tell me what test and studies have you performed that you can show to us that show that there is additional water being placed into the canal by Bermuda Cottages?
A. Okay. Well, some of it is by the increase in curve number that they put in their documents. And then --
Q. I'm sorry. Explain to me what you mean by curve number.
A. It has do with the ferocity of the ground and how rapid it flows in and out and that sort of thing.

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Q. And that's what I'm getting at. What tasks have you performed that can tell me what those numbers are?
Other than just saying it's happening, what tests do you have that tell me how much is going into there, how fast it's going, how it's affecting that canal?
What do you have that can scientifically document that?
A. Okay. In terms of being measured during a storm and having a flow meter, I have not done that and I doubt if anybody else did that either.
Q. Are there tests that you can perform to determine those?
A. You can certainly approximate it with a test by going out and then putting some sort of flow meter in all the representative outflow areas, but that doesn't take care of it all so you have to put estimates in there with them.
Q. Is it possible, since those tests haven't been performed, that there isn't a significant difference between the pre-development flow into the ditch and the post-development flow into the ditch?

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A. Certainly in some rains it will be more, some rains it will be less.
Q. And -- sorry.
A. So, yes, when you have catch basins and you have a relatively -- I shouldn't say catch basins. Holding ponds, whatever you want to call them, in moderate rains they can do a good job of basically halfway filling up or filling out and there's very little outflow.
And then when they get to be full and you have more pavements and roofs and things like that, then once they are roughly full, then if the rain keeps on coming, then you can have a lot more going into the ditch.
Q. Have you done any tests to determine what that level would be, how much rain has to fall before that becomes an impact --
A. I did some calculations on Clear Lake. I did not have specifics on this development so I did not know the -- just how much it would take in terms of how big the holding ponds are.
Q. So you don't know if it would be a 25-year flood event, a 100-year flood event, a 500-year flood event that would create enough rain for that to impact the canal?

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A. I don't know at what stage it would, but part of it is that by moving the canal, they took land that would normally be low and would be fillable, so to speak, and converted it to housing.
And had they had the same amount of these holding ponds and had fewer houses in the system by not having cut the canal in a different way, then the system would be much more effective at keeping the peak water flow out of the development from increasing, the height of the canal.
Q. Are there state standards that prevent them from taking those steps?
A. I suspect there are all sorts of minimum standards which developers try to either meet or try to meet or appear to meet. So there are standards out there.
Q. But do you know what they did there does not meet those standards? Are you giving that opinion?
A. I'm not addressing the minimum standards.
Q. Okay.
A. I'm addressing the likely contributing factors, whether small or large.

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Q. So you're not able to say that what they did there with the rerouting of the canal somehow violates some standards and design and installation of the stormwater --

A. No. My experience over the decades is there are a lot of situations where standards are just -- totally don't do the job.

And to blindly say, I met the minimum standard, I wash my hands and I'm perfectly clean, you're missing a lot.

Q. So what would your standard be, if you were designing that stormwater?

A. Part of it would be looking at this system, how development has been going on in this area and looking at the history of flooding that has happened over in the Prestwick area and the troubles they have had.

And then say, not how can I do the absolute minimum, but how can I, as a person who, as a builder, is putting my property up above the property that's flooding and can likely increase the flooding.

How can I be a good citizen, so to speak, or a good neighbor or responsible person and make sure that I'm not contributing to this.

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And then you look down and see that something of a bottleneck in Highway 17 underpass and you say, I'm just upstream from that. Everything else that goes into this creek negatively impacts the people around, so I'm going to do more than just protect myself, meet the minimum standards, which probably I think apply to a free-flowing drainage area and just let that be it.

Q. Without looking at the plans for Bermuda Cottages, how do you know that they did not do that?

A. And that's a good question. I don't think I know for sure but I've looked at what they seem to be -- someone seemed kind of proud of having reduced the outflow on certain conditions by a certain amount over what they say was probably the case beforehand which may or may not have been the actual case beforehand.

And I forgot where this is going now.

Q. Well, let's talk about that real quick because we talked about -- this is Exhibit 10 to your deposition, which was the stormwater report for Bermuda Gardens that was prepared by Nelson Hardwick & Associates.

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And I think you were just discussing a second ago that in their report they concluded that the post-development discharge will be less than the pre-development -- pre-development in storage provided excess minimum by approximately 27 percent.

Can you tell me what calculations you have performed that are in disagreement with the conclusions of Mr. Hardwick regarding pre versus post-discharge into the canal?

A. Okay. I did not see anything where they utilized the little triangle that was cut off for one thing.

They say that they are putting in more storage than required in some areas and about the same as required in other areas.

Having gotten this today, I haven't gone in and tried to analyze all that.

So how is the post-development discharge going to be less than pre-development? Where does the water go if it doesn't go offsite?

Q. Well, wouldn't they move the other retention ponds?

A. But it eventually goes offsite. It doesn't stay there all year.

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Q. Well, what calculations do you have that show that Mr. Hardwick's conclusion here is not correct?

A. Well, his conclusions depend on assumptions and if he -- I don't understand how as you build a place with a lot of roofs and pavement and have less water that leak into the site than you would have beforehand.

Q. I guess what I'm asking you for is what scientific calculations do you have that shows that these calculations are not correct?

A. Okay. I'm not saying these calculations are not correct. It's some of the assumptions and there's no mention of this extra triangle that was cut off in there.

Q. I want to go ahead and show you. This is the back two pages of that report. I want to go ahead and show you, there's two parts to this. There is a three-page --

MR. CONNELL: That's already been marked?

MR. NEILL: Yes, this is part of 10, the same thing.

Q. There is a pre-development basin map and then there is a post-development basin map.

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Now, in the upper left, top corner, is this the triangle that you're talking about here (indicating) --

A. Yes.

Q. The part that is to the upper left of the canal? That's the triangle you're talking about?

A. Uh-huh.

Q. So this does show as part of this report that they did consider that triangle, does it not?

A. Yes. They did consider it. And let's see how to describe this. If this were not developed and filled, then that would in essence have been something of the equivalent space of a lake or holding pond.

Q. Okay. What calculations do you have that show that would be a holding pond?

A. Well, because with the canal coming down through here (indicating), just like the Prestwick property, the water just builds up in there as the water builds up in the canal so that would be something of a buffer.

Q. So do you have a topographical map or a survey or anything that would show that?

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A. I don't.

Q. Okay.

A. I don't know. And I would have wished I had 17 or 18 or 19 or whatever years ago, I wish I had some meters and gone through the whole length of the canal.

Q. Gotcha.

A. I didn't anticipate this back then.

Q. Let's talk about that because we had talked a little bit earlier about how we rerouted the canal that's shown on both the pre-development, which is the existing canal, and then on the post-development map, we're showing this is how they rerouted the canal; is that correct?

A. That's correct.

Q. And it's shown as the relocated canal on the post-development basin map?

A. Yes.

Q. Is that correct?

A. Yes.

Q. Now, you talked earlier about this turn here that the relocated canal made.

A. Yes.

Q. Now, the pre-existing canal had two turns in it; is that correct?

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A. Yes. One was very slight and the other one was definitely less than the new one.

Q. Do you know what the angles were on these turns?

A. I don't know what they were. I talked with Mr. Patton and he said he thought this was one about 20 degrees.

Q. But you have not conducted any measurements with --

A. No, unfortunately, I did not consider that something that people were going to do and I didn't -- that they were going to change the channel so I didn't go out there and try to document it.

Q. What about the relocated canal? Have we conducted any measurements with regards to that angle?

A. I've looked at it and I assume that this drawing is much more correct than what was existing -- meandering -- somewhat meandering because I don't really mean meandering but like that sort of thing.

Q. Have you done any calculations that would let us know the effect that would have on the canal with the change from the way it was pre-development to post-development?

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A. You mean just the canal itself?

Q. Yes. Have you done any testing of any kind with regards to how that affects the flow of water?

A. No, no testing.

Q. Okay.

A. And I can see that work has been done on the canal.

Q. Are you aware of any flooding that the plaintiffs have had which didn't involve a rainfall event that exceeded a 25-year flood level?

A. I think I was asked that and since I haven't gone and compared each event with the 25-year-old statistics -- not 25-year old, the 25-year statistics, I can't say that.

Q. So you can't testify whether they have or have not?

A. No, I would have to go back and look at the statistics of the rain and compare that with the specifics of the 25 year.

Q. Now, we had some discussion earlier -- actually throughout this whole process today that there are numerous contributing factors to the flooding; is that correct?

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A. That's correct.
Q. Have you taken the time to allocate any type of percentage that the development of Bermuda Cottages would contribute to that flooding?
A. I have not. And I have thought about that and it might be a little arbitrary if I did it at this stage.
I'd be happy to sit down and brainstorm with any or all of you and just see what we thought was the fair distribution of that by the different factors.
But that would be something that you would -- I can have my technical input and then everybody could have their input and we could talk about it and I'd be happy to do that.
Q. Do you believe that Bermuda Cottage's impact would be less or more than 50 percent?
A. I believe it would be less than 50 percent.
Q. Now, you talked a little bit earlier about what kind of steps can the homeowners take, the plaintiffs in this case, to help them with their flooding problems. What kinds of things can they do to help themselves?
A. Okay. One of the things that I noticed

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when I was there at their place and, you know, they have got these grates in the yards. You've been there, I'm sure.
Q. Yes.
A. And they have grates near the driveway of the street, the catch basin. If they were to put in a, basically an extended grate with a structure under it all the way across the front of their property, they would catch all the water coming down from the top.
They could put a berm or little berm around the side of their property and then put in a pumping station with back-up electrical power.
Then the chances of their having repeat flooding events would be substantially reduced.
So the grating in the front, like a big catch basin, a long extended one, would take care of water coming down from the rest of Prestwick. The pumping station would pump it out.
If the creek level is up above their yard level, you would have to pump it out and make sure that there are good check valves.
Q. Do you have any estimate as to what a system like that cost?
A. No. I can guess and you can guess and

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everybody else can guess.
Q. Okay.
A. But the trick is with the pumping station you have to have adequate capacity and create the berms that can catch everything and to have back-up power to the pumping station and back-up pumps so if one pump fails, another one comes in and they have got power.
Q. What about any other remedies they can make?
A. I don't think you can put the house -- jack the house up on stilts.
Q. Could you raise it?
A. That's what I mean.
Q. I mean, could you raise the foundation?
A. You could potentially do that. That's one of the things I thought about before, jack the house up six feet or four feet or whatever.
Q. Okay.
A. Then you've got the problems with the yard and garage. If you get the garage up, you need to bring in fill and snatch your driveway up so the garage fill is high enough too.
That's the brainstorming kind of things that you could do that all there and solve their

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problem.
Q. We talked earlier about the issues with -- that you testified to where you opine that there is additional water flowing off of the Bermuda Cottage's development, the change in the canal direction during the development.
Were there any other opinions that you had where the development of Bermuda Cottage is contributing to the plaintiffs' flooding issues?
A. I think what I mentioned is it.
Q. Okay.
A. If I get into this further and come up with something else, I will let Mr. Connell know and he will let you know.
MR. NEILL: That's all the questions I have.
Thank you, Mr. Taylor.
THE WITNESS: Thank you.
THE REPORTER: I'd like to ask counsel if anyone would like a copy of the transcript.
MR. CONNELL: Are you coming back for the second part of the deposition?
THE REPORTER: I never know.
MR. CONNELL: You are. We'd like you to come back. We need you to come back.

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MS. DUPRE: I'd like a rough copy.
THE REPORTER: Is a week okay to get you the rough?
MS. DUPRE: Yes, that's fine.
THE REPORTER: Would anyone else like a rough?
MS. BISSET: I'd like a rough.
MS. THOMAS: Just a rough draft would be fine.
MR. WATKINS: I'll take a rough draft also if you're doing it.
MR. Mclean: I'll wait on the final.
MR. BATTLE: I'll take --
THE REPORTER: You get everything because you ordered -- actually, I'm not sure about the rough. Would you like a rough?
MR. BATTLE: Yes, I'd like a rough. Just digital is fine.
MR. BAXTER: I'd like a rough.
MR. NEILL: I'll take a rough, please.
MR. CONNELL: And I'd like a rough also, please.
(The witness, after having been advised of his right to read and sign this transcript, does not waive that right.)

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(The deposition adjourned at 4:19 p.m.)

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CERTIFICATE OF REPORTER

I, Shery E. Gargir, Court Reporter and Notary Public for the State of South Carolina at Large, do hereby certify that the foregoing transcript is a true, accurate, and complete record.

I further certify that I am neither related to nor counsel for any party to the cause pending or interested in the events thereof.

Witness my hand, I have hereunto affixed my official seal this 3rd day of December, 2018 at Myrtle Beach, Horry County, South Carolina.

Shery E. Gargir
Court Reporter
My Commission expires
November 29, 2028

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SIGNATURE OF DEPONENT

DEPONENT: Robert K. Taylor
DEPOSITION DATE: 11/19/2018
AWR JOB #: 22424
CASE #: 2016-CP-26-06495

(Please return both Signature of Deponent pages)

I, the undersigned, Robert K. Taylor, do hereby certify that I have read the foregoing deposition and find it to be a true and accurate transcription of my testimony, with the following corrections, if any:

PAGE	LINE	CHANGE	REASON

SIGNATURE OF DEPONENT (CONTINUED)

DEPONENT: Robert K. Taylor
DEPOSITION DATE: 11/19/2018
AWR JOB #: 22424
CASE #: 2016-CP-26-06495

PAGE	LINE	CHANGE	REASON

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Robert K. TaylorDate

I certify, as the Court Reporter and Notary Public for the State of South Carolina at Large, that the deponent was advised of his or her right to read and sign said deposition both verbally and in writing. If the deponent fails to execute and return foregoing Signature of Deponent pages within the thirty (30) days allowed pursuant to the Rules of Civil Procedure, the original transcript may be filed with the Court.



_____
Court Reporter
Notary Public

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DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS
CRYSTAL LAKE
ALTERNATIVE 4C IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

PREPARED FOR:

HORRY COUNTY
STORMWATER DEPARTMENT

AUGUST 6, 2013

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BACKGROUND AND INTRODUCTION

Horry County is experiencing rapid growth and in certain places, the pace of development continues to outgrow the capacity of the existing drainage system. Flooding concerns have been voiced by many of the businesses and residents in the Lakewood-Pirateland Swash Basin (Exhibit 1). Structural flooding of several business and/or homes has been recorded on at least two occasions in the past.

The Lakewood-Pirateland Basin drains 1,560 acres including the Lakewood and Pirateland Campgrounds, Long Bay Estates, and portions of the Myrtle Beach State Park, all east of US Highway 17 Business. West of US Highway 17 Business, the basin provides drainage for the Prestwick Subdivision and Country Club, Crystal Lakes Mobile Home Park, Seagate Village (formerly part of Myrtle Beach Air Force Base), and commercial properties along the highway. Drainage is conveyed through a swash to the Atlantic Ocean.

The Horry County Stormwater Department intends to implement a three phased approach to improving drainage in the basin – including (1) the development of a hydrology and hydraulic model, (2) alternatives analysis and recommendations, and (3) implementation of the recommended improvements if deemed financially feasible.

Phase 1

Phase 1 of the Lakewood-Pirateland Swash Drainage Project included six tasks including:

- Task 1 – Data Collection
- Task 2 – Field Reconnaissance
- Task 3 – Surveying
- Task 4 – Existing Conditions Model Development
- Task 5 – Model Calibration
- Task 6 – Phase 1 Study Findings and Report

Phase 1 of the Lakewood-Pirateland Swash Drainage Project was documented in the report *Lakewood-Pirateland Swash Drainage Study* (Thomas & Hutton, February 29, 2012).

Phase 1 Additional Analysis

Due to certain findings of the Phase 1 report, the Horry County Stormwater Department requested additional study of the Lakewood-Pirateland Swash Drainage Basin. In particular, the County commissioned additional survey and drainage system analysis of the minor collection system draining through Strathmill Court. The additional survey and drainage system analysis work was documented in a Technical Memorandum *Lakewood-Pirateland Swash Drainage Improvements – Strathmill Court Study Findings* (Thomas & Hutton, May 3, 2012).

Phase 2

Phase 2 of the Lakewood-Pirateland Drainage Study included the assessment of alternatives that could be implemented within the basin that would address flood issues – particularly the structural flooding of businesses along Highway 17 Business and homes in the Prestwick subdivision. Phase 2 was conducted under the following five tasks:

- Task 1 – Alternative Projects Screening
- Task 2 – Alternative Project Evaluation
- Task 3 – Alternative Post Improvement Conditions Model Development
- Task 4 – Opinion of Probable Cost and Benefit Analysis
- Task 5 – Phase 2 Study Findings and Report

The Phase 2 assessment included developing eight (8) alternative improvement projects (some with up to three options), determining the effectiveness of each option (using the previously established ICPR model – see Exhibit 1), estimating the probable construction cost of each alternative, and providing recommended improvement(s).

The alternative improvements with the potential to alleviate the identified structural flooding were developed and screened for further assessment. The following projects were selected for further assessment as part of Phase 2 of the study.

- Alternative 1: Improvements to the existing culvert under US Hwy 17 Business
  - Alternative 1A: Addition of a 5'x10' CBC underneath US Hwy 17 Business and improvements to approximately 1,200 LF of Channel
  - Alternative 1B: Addition of a 7'x7' CBC underneath US Hwy 17
  - Alternative 1C: Addition of a 42" RCP underneath US Hwy 17 Business
- Alternative 2: Detention on a parcel adjacent the main channel (Graham Walden Tract)
  - Alternative 2A: Detention of flow entering the main channel from across Catherine Avenue (flow from the camper storage area along US Hwy 17 Business)
  - Alternative 2B: Diversion and detention of flows entering the pond/wetland area along Catherine Avenue (flows from the Prestwick Sub-division)
  - Alternative 2C: Off-line detention of flows in the main channel
- Alternative 3: Detention on a wooded area between Prestwick Phase IV and Sea Gate Village
- Alternative 4: Total and partial diversion of flows from the main channel (adjacent Sea Gate Village) to Crystal Lake
  - Alternative 4A: Partial diversion of high flows to Crystal Lake through a side-flow weir from the main channel
  - Alternative 4B: Total diversion of the flow from the main channel (draining the northern Sea Gate Village tributary)
  - Alternative 4C: Total diversion of the flow from the main channel (draining the northern and southern Sea Gate Village tributaries)
- Alternative 5: Detention in the common areas of Sea Gate Village
- Alternative 6: Modification of the pond control structure in Prestwick Phase 1

In addition to the alternative projects listed above that address the structural flooding (US Hwy 17 Business and Strathmill Court), local improvement alternatives that address potential flooding of the Strathmill Court residences were also selected for further assessment. These alternatives include:

- Alternative 7: Diversion of the local Strathmill Court drainage system to the main channel
- Alternative 8: Improvements to the local flood protection system along the main channel at Strathmill Court

The finding and recommendations from the Phase 2 work included the following:

> *Based on the results of the proposed conditions ICPR modeling and the opinions of probable construction cost for Alternatives 2A, 2B, 2C, 3, 4B, 5, and 6, it appears that with the limited improvement in flooding conditions and the relatively high cost that these alternatives are not viable for implementation and thus are not considered further.*
>
> *Only Alternative 1A totally addresses the structural (including garage) flooding (up to the 100-yr rainfall event) reported and as identified by the existing conditions modeling. The other alternatives that had significant impact on flooding included Alternatives 1B, 1C and 4C. Alternative 4C's opinion of probable construction cost does not include a cost for the lake bottom excavation/dredging. This cost would be significant (approximately $1M to $3M), which would render the alternative to be cost prohibitive. In addition, Alternative 4C would require a radical modification of the lakes operation (lower NWL by approximately 4.5 feet), which could be unacceptable to local residents.*
>
> *Alternative 4A provides moderate improvement with a relatively inexpensive capital cost, but does not address structural flooding through the 100-yr rainfall event. Alternative 8 could address flooding at the Strathmill Court locations (up to the 100-year event), but would most likely need to be implemented by private entities, since most of the infrastructure is on private lands without a dedicated easement to a public entity.*
>
> *It is recommended that the County pursue the implementation of Alternative 1A as a long term solution to structural flooding in the watershed and possibly implement Alternative 4A as an interim, partial solution to flooding the watershed.*

Phase 2 Additional Analysis

Alternative 4A would involve the "lowering" of Crystal Lake. The Lake's current normal water level (NWL) is approximately 13.3 (ft. NGVD 88). The existing contributing area to Crystal Lake is relatively small (92.7 acres) and thus does not receive a lot of runoff. The Lake's existing control structure (which seldom outflows due to the low runoff amount and large storage volume), has an overflow weir at elevation 17.0 and control structure outflow pipe at elevation 13.5. The bottom elevations vary (in fact, "islands" are sometime formed in the Lake at low water), but averages approximate 10.6.

To allow more of the adjacent area to flow into the Lake, the operation and control of the Lake would be lowered such that the NWL would be elevation 10.0. This would allow the runoff from Seagate Village to be diverted to the Lake, increasing the contributing area to approximately 397.0 acres. The runoff from the increased contributing area would be temporarily detained and release back to the main drainage system at a lower rate, preventing the flooding currently experienced downstream.

To lower the NWL of the Lake would require the bottom of the Lake to be lowered to an elevation to maintain a normal depth of approximately 6 feet to prevent the growth of aquatic plants. Thus, the bottom of the Lake would be lowered to elevation 4.0. In addition to the lowering of the Lake, various off-site (that is, not within Crystal Lake) improvements would be needed to divert the runoff from Seagate Village into Crystal Lake.

Pursuant to a meeting between Thomas & Hutton, Horry County and the Jackson Companies (owner of Crystal Lake), the County decided to further study the Crystal Lake alternative (Alternative 4C). This alternative, although significantly more expensive than the recommended alternative (Alternative 1A), has other potential benefits and would lessen peak flows downstream. The additional benefits may include: improved water quality downstream, additional depth/recreation opportunities at Crystal Lake, and additional water source for the Prestwick Golf Course since it draws from Crystal Lake, Alternative 1A would increase flows and thus peak water surface elevations downstream of US Hwy 17 Business, potentially aggravating flooding. Horry County requested Thomas & Hutton to perform additional assessment of the Crystal Lake option to include assessing potential construction approaches, refine the conceptual design of the proposed improvements, and refine the opinion of probable construction cost for the proposed improvement. The additional assessment also includes a topographic/bathymetric survey of the lake and geotechnical investigation. The following sections summarize the findings of the addition analysis conducted under Phase 2.

BATHYMETRIC/TOPOGRAPHIC SURVEY

Thomas & Hutton conducted a limited bathymetric and topographic survey of Crystal Lake. The topographic survey was from the top of bank to the water level of the lake. Readily visible above ground improvements including storm drainage outfall pipes and structures within the survey limits were also surveyed. The bathymetric survey was conducted roughly on a 200-ft. by 200-ft. grid across the lake. The bathymetric and topographic survey measurements were merged to produce a composite survey of the entire lake within the top of bank. The survey data was further combined with LiDAR topography data of the surrounding area to produce a single existing conditions surface.

The water surface elevation of the lake at the time of the survey was approximately 13.3. The elevation of the bottom of the Lake varied from approximately 5.0 to 14.6, with an average bottom elevation of approximately 10.6 The elevation of the bottom of the Lake is highly variable; however, the level of survey (200-foot grid) may not accurately represent all topographic features in the Lake.

GEOTECHNICAL EXPLORATION

A geotechnical exploration was conducted to evaluate subsurface conditions at the site as they relate to the potential dredging and excavation activities and also to determine the potential reuse of excavated materials. The geotechnical exploration included four standard penetration test (SPT) borings at widely-spaced locations around the perimeter of the lake. Soil sampling and penetration testing was performed. Subsurface water levels were measured and the recovered soil samples were classified and some of the recovered soil samples were subjected to laboratory tests. Refer to Appendix A for the report prepared summarizing the findings of the geotechnical exploration.

CONSTRUCTION ALTERNATIVES ASSESSMENT

Thomas & Hutton investigated and assessed viable construction alternatives for the proposed improvements to Crystal Lake. Various dredge/excavation methods were discussed with several local and regional contractors to refine the construction methods. Essentially, two viable methods were determined for the construction: 1) mechanical excavation and haul by truck from the Lake (that is pumped to control runoff and groundwater seepage) and 2) hydraulic dredging of the lake via a barge mounted dredge floated on the Lake.

Two options as to "handling" the excavated/dredged material were also assessed. Option 1 would include the exaction/dredging of the entire Lake and stockpiling the material on an adjacent site and Option 2 would include the exaction/dredging of a portion of the Lake and filling a portion of the Lake (so as to result in a "balance" project, i.e. no off-site transport of material). Thomas & Hutton also contacted two local mass excavation/grading contractors and two regional dredging contractors to discuss various components of the project, potential construction methods and issues, and estimated unit costs for construction.

Based on this input and other factors, Thomas & Hutton refined Alternative 4C to include Option 1 (excavation/dredge to off-site location) and Option 2 (excavate/dredge on-site). Option 1 is further divided into sub-options by the location of the off-site stockpile/dredge disposal site. The Jackson Company owns Crystal Lake and the land adjacent it (undeveloped area to the northwest of the Lake). Material hauled off-site from Crystal Lake could be placed on (or in) an existing borrow site/pond (commonly referred to as the 15.0 acre Crystal Lake borrow site). The material could also be stockpiled on a new site cleared/constructed on the adjacent property. These options are discussed further in detail below.

REFINED CONCEPTUAL DESIGN

Based on the findings of the previous tasks and other input, the proposed conceptual improvements (Crystal Lake Alternative 4C) were further refined from the Phase 2 Report. The conceptual plan for Option 1 is illustrated in Exhibit 2. The conceptual plan for Option 2 is illustrated in Exhibit 3. The off-site improvements to divert the flow coming from Seagate Village are illustrated in Exhibit 4.

The original ICPR alternative model established for Phase 2 was refined to reflect the alternative design and confirm that the recommended configuration will meet the flood improvement goals of the project. Table 1 summarizes the existing and proposed Alternative 4C – Option 1 peak water surface elevations and compares them to the historically flooded structures. Table 2 summarizes the existing and proposed Alternative 4C – Option 2 peak water surface elevations and compares them to the historically flooded structures.

The revised ICPR modeling indicates that both Alternative 4C Options prevent first floor structural flooding of the historically flooded structures (Camper County and 1284/1288 Stratmill Ct.) up to and including the 100-year storm event. However, the garage area of 1288 Stratmill Ct. may be subject to flooding for the 100-year event for Option 1 and for the 50-year and 100-year events for Option 2.

OPINION OF PROBABLE CONSTRUCTION COST

Based on the refined concept plans for Alternative 4C – Option 1 and Option 2 and the off-site improvements, the opinion of probable construction costs were refined. Material quantities were estimated from the revised concept plans and units costs are based on discussions with the local and regional contractors and on recent bids and contracts for similar work as found in T&H's records for recent projects in the area. The detailed opinions of probable construction cost are included at the end of this report and are summarized in Table 3.

The opinions of probable construction cost where calculated as follows:

- Alternative 4C – Option 1A.1 - Full Lake Dredging - New Disposal Site
- Alternative 4C – Option 1A.2 - Full Lake Dredging - Existing Borrow/Disposal Site
- Alternative 4C – Option 1B.1 - Full Lake Excavation - New Stockpile Site

- Alternative 4C – Option 1B.1 - Full Lake Excavation - Existing Borrow/Stockpile Site
- Alternative 4C – Option 2A - Partial Lake Dredging / Partial Lake Fill
- Alternative 4C – Option 2B - Partial Lake Excavation / Partial Lake Fill
- Alternative 4C – Off-site Improvements

For clarification, Alternative 4C was the original alternative from the Phase 2 report that proposed the diversion of the Seagate Village are to Crystal Lake and the modification of Crystal Lake to function under the proposed conditions and provide flood protection downstream. For consistency, that alternative nomenclature was held constant for this report. Options 1 and 2 refer to whether the Lake would be excavated fully (Option 1) or partially excavated and partially filled (Option 2). A and B refers to method of construction – dredging (A) or mechanical excavation and hauling (B). The sub-alternatives under Option 1 (i.e. 1A.1 or 1A.2) refer to the location of the off-site material disposal (for dredging) or stockpile (for excavation and haul). Constructing a new off-site disposal/stockpile site is signified by .1 and utilizing an existing site is signified by .2. The opinion of probable construction costs are include as the end of this report.

The complete Alternative 4C project would include the Off-site Improvements and one of the Lake (full or partial) dredging or excavation Options.

FINDINGS AND RECOMMENDATIONS

As discussed in the Background and Introductions section, drainage improvement Alternative 4C would alter the drainage pattern from Seagate Village and divert the stormwater flows from the existing main channel to Crystal Lake. This modification would increase the Crystal Lake contributing drainage area from approximately 97 acres to 397 acres. The alternative improvement would also include the modification of Crystal Lake to make it function in a way as to 1) allow positive drainage from Seagate Village, 2) temporarily store the runoff before releasing it to the main channel and 3) allow the Lake to continue to function as an amenity to the Crystal Lake mobile home park. The existing NWL would be lowered from approximately elevation 13.3 to elevation 10.0, and the bottom would be lowered from approximately elevation 10.6 to elevation 4.0.

The Lake modification could be implemented either fully (Option 1) or partially (Option 2). Option 1 would modify the entire Lake (approximately 37.0 acres at the existing NWL of 13.3) by either dredging or mechanically excavating the Lake deeper. Option 2 would include the partial dredging (or excavating) and the partial filling of the Lake. Option 2, as proposed would be a "balanced" project – i.e. that amount of excavation is equal to the amount of fill and thus no material need to be transported off-site. Option 2 would result in a Lake with a water area of approximately 23.6 acres (at the new NWL of elevation 10.0). This option would also "create" approximately 13.6 acres of new upland (filled lake) area measured at new top of bank.

Option 1 and Option 2 provide essentially the same level of flood protection benefit (Refer to Tables 1 and 2). Both options are predicted to protect the historically flooded structures (1284/1288 Stratmill Ct. and Camper Country) from structural flooding (flooding above the finished floor elevation) up to and including the 100-year storm event. However, both options would not prevent flooding of the lower garage area of 1284 Stratmill Ct. for events larger than and including the 50-year storm event. Option 1 provides an approximate 0.5 foot lower water surface elevation (WSE). Option 1 improves peak WSEs in the main channel by approximately 2.0 feet for all events and Option 2 improves them by approximately 1.5 feet.

As discussed in the Opinion of Probable Construction Cost section, the total Alternative 4C improvement project would include the off-site improvements (estimated at a cost of $439,000) and one of the option sceneries (estimate at a cost of ($1,131,000 to $2,618,000). Thus the minimum cost of Alternative 4C would be $1,570,000 (Option 2B and Off-site Improvements) and the maximum would be $3,057,000 (Option 1A.1 and Off-site Improvements). Given that the various options result in similar flood protection benefits, the recommended improvement should be the most cost efficient. Therefore it is recommended that **Option 2B** with **Off-site Improvements** be implemented.

Additional project considerations are discussed below.

Permitting

Preliminary contact was made with the US Army Corp of Engineers (wetlands) and SC Department of Health and Environmental Control (mining) to assess potential permitting issues. The USACOE could not provide an opinion as to the potential need for a wetland disturbance (Section 404) permit. However, it was indicted that if the Lake was not excavated from wetlands, that it most likely would not require a wetlands disturbance permit. Of course, a full wetland verification and jurisdictional determination should be conducted prior to proceeding with the project. SCDHEC indicated that a mining permit would probably not be required, but several variables (like the commercial sale of the material) could affect that determination. Full coordination with SCDHEC should be conducted prior to initiating the project. Also, a NPDES Construction General Permit (SDHEC) and Coastal Zone Consistency (OCRM) would be required for the project.

Effect on Adjacent Properties

Crystal Lake is surrounded by residential properties essentially on all sides. These properties may be affected by the construction of the proposed improvements. The construction of the off-site improvements is relatively small and given proper considerations, any negative impacts on adjacent properties could be mitigated. The excavation or dredging of Crystal Lake could affect adjacent properties negatively while in operation. Excavation and dredging operations could take up to four (4) months to complete. Dredging may be more acceptable since the Lake would remain active (i.e. full of water), noise would be relatively minor, and dust and truck traffic would be eliminated. However, give the proper consideration and construction practices, the effects of the excavation of the Lake could be minimized.

Appendix A

(Mineral Soils Analysis)

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS
CRYSTAL LAKE
ALTERNATIVE 4C IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

APPENDIX A

J-23453.0001

Prepared by:

THOMAS & HUTTON

Savannah, GA | Charleston, SC | Myrtle Beach, SC | Brunswick, GA | Wilmington, NC

REPORT OF GEOTECHNICAL EXPLORATION

Crystal Lake Modifications

Horry County, South Carolina
S&ME Project No. 1633-13-127

Prepared For:

Thomas & Hutton
Post Office Box 1522
Mount Pleasant, South Carolina 29465

Prepared By:

S&ME

1330 Highway 501 Business
Conway, South Carolina 29526

May 16, 2013

S&ME

May 16, 2013

Thomas & Hutton
Post Office Box 1522
Mount Pleasant, South Carolina 29465

Attention: Mr. Rick Karkowski, P.E.

Reference: **Report for Geotechnical Exploration**
Crystal Lake Modifications
Horry County, South Carolina
S&ME Project No. 1633-13-127

Dear Mr. Karkowski:

S&ME, Inc. is pleased to submit this report of soil test boring results for the referenced site. The exploration was performed to evaluate subsurface conditions surrounding Crystal Lake, and was performed in general accordance with S&ME Proposal number 1633-0357-12.r1, dated January 4, 2013, and authorized on April 15, 2013 via email correspondence. This report presents a brief discussion of our understanding of the project and the results of our exploration.

PROJECT INFORMATION AND SITE DESCRIPTION

Crystal Lake is an existing lake of approximately 39.46 acres in area, located within a residential area of Horry County, near Surfside Beach, South Carolina. We understand that modifications to the lake and related drainage features are under consideration by Horry County, in order to improve stormwater drainage in the local area. The modifications may include dredging and/or excavation of the existing lake and altering the lake normal water level (NWL) by design and construction of replacement downstream control structures.

Although design is in the preliminary stages at this time, we understand that the existing lake NWL will likely be lowered about 4.4 feet, and that the post-construction lake bottom will be about 6 feet below the new NWL. It is anticipated that dredging depths of up to about 10 feet may be required to remove existing materials beneath the lake and achieve design contours.

According to the available information, Crystal Lake was created after the site was utilized as a local borrow source for residential development. It is presumed that borrow

excavation did not extend to depths beneath the existing lake bottom surface, such that materials underlying the lake are relatively undisturbed Coastal Plain deposits, rather than fill materials placed back into an over excavated borrow area. The lake was observed to be relatively shallow, with several area grassy area sandbars observed and water depths of about 6 feet or less.

A site vicinity plan of the project site is provided in the Appendix as Figure 1.

EXPLORATION PROGRAM

Four soil test borings were conducted at the approximate locations shown on the Test Location Sketch in the Appendix as Figure 2. The borings were performed using a trailer drill rig. Mud rotary techniques were used to advance the boring to the termination depth of 20 feet for B-1 and B-2 and 30 feet for B-3 and B-4.

Standard Penetration Tests (SPT) were performed in the borings using an automatic hammer, at 2.5-foot intervals in the top 10 feet, then at 5-foot intervals thereafter, in general accordance with ASTM D 1586, to provide an index for estimating strength parameters and relative consistency of subsurface soils. Subsurface water measurements were unable to be accurately measured upon completion of drilling due to use of drilling fluids. However water level measurements were obtained approximately 24 hours after the completion of drilling of the test borings. Split-spoon samples routinely obtained from the standard penetration tests were transported to our laboratory and visually classified according to the textural nomenclature of the Unified Soil Classification System (ASTM D 2488).

SUBSURFACE CONDITIONS

Detailed descriptions and stratifications are provided on the Boring Logs located in the Appendix. A brief summary of the conditions encountered at our boring locations for each proposed sign location is provided below.

Surface Conditions

At boring locations B-1, B-2, and B-4 sparse grass was encountered at the surface with approximately 3 inches of topsoil. No topsoil was encountered at boring location B-3.

Soil Stratification

Starting from the surface at boring B-3 and underlying the 3 inches of topsoil at the remaining borings we generally encountered poorly graded sand (SP), and silty sands (SP-SM) until termination of borings. These soils consisted of mostly fine to medium sands with few to trace of low to medium plasticity fines. These soils were typically tan, brown, and gray in color, and were moist to saturated. The SPT N-value of these soils ranged from 3 to 17 blows per foot (bpf) indicating a very loose to medium dense relative density. These soils are suitable for reuse as construction materials after the soils are excavated and allowed to dry to within 3 percent of their optimum moisture contents.

In boring B-3 an elastic silt (ML) was encountered from depths 8.5 feet to 13 feet. This soil consisted of mainly medium to high plasticity fines with few fine sands. It was gray in color and saturated. The SPT N-value for this material was 1 (bpf) indicating a very soft consistency.

Laboratory testing was conducted on one sample from each boring. An overview of the sample data is provided in Table 1 below.

Table 1 – Laboratory Testing

Boring	Depth, ft.	Classification	Natural Moisture	Fines Content	Liquid Limit	Plastic Limit	Plastic Index
B-1	6.0 – 7.5	SP-SM	42.9%	5.5%	N/A	N/A	NP
B-2	13.5 – 15.0	SP	22.3%	1.7%	N/A	N/A	NP
B-3	8.5 – 10.0	ML	87.9%	72.4%	47	32	15
B-4	13.0 – 15.0	SP	31.9%	1.8%	N/A	N/A	NP

Detailed laboratory results are provided for your review in the Appendix.

Subsurface Water

An overview of the subsurface water conditions encountered at each of the proposed sign locations is provided in Table 2 below.

Table 2 – Subsurface Water Conditions

Boring	Water Depth Below Surface (ft) After 24 Hours
B-1	0
B-2	0
B-3	3.5
B-4	10

Subsurface water levels may fluctuate seasonally at the site, being influenced by rainfall variation and other factors. Site construction activities can also influence water elevations.

LIMITATIONS OF THIS REPORT

This report has been prepared in accordance with generally accepted engineering practice for specific application to this project. Any wetland, environmental, or contaminant assessment efforts are beyond the scope of this geotechnical exploration and therefore, those issues are not addressed in this geotechnical exploration report. No other warranty, expressed or implied, is made.

Analysis submitted in this report is based, in part, upon the data obtained from the geotechnical exploration. The nature and extent of variations between and outside of the boring made may not become evident until excavation begins.

CLOSURE

S&ME, Inc. appreciates the opportunity to have provided our geotechnical services on this project. If you have any questions concerning this report, please do not hesitate to contact us at (843) 347-7800.

Respectfully submitted,
S&ME, Inc.

Joshua B. Jordan E.I.T.
Staff Professional

Christopher J. Brown, P.E.
Engineering Department Manager

APPENDIX

SITE VICINITY PLAN

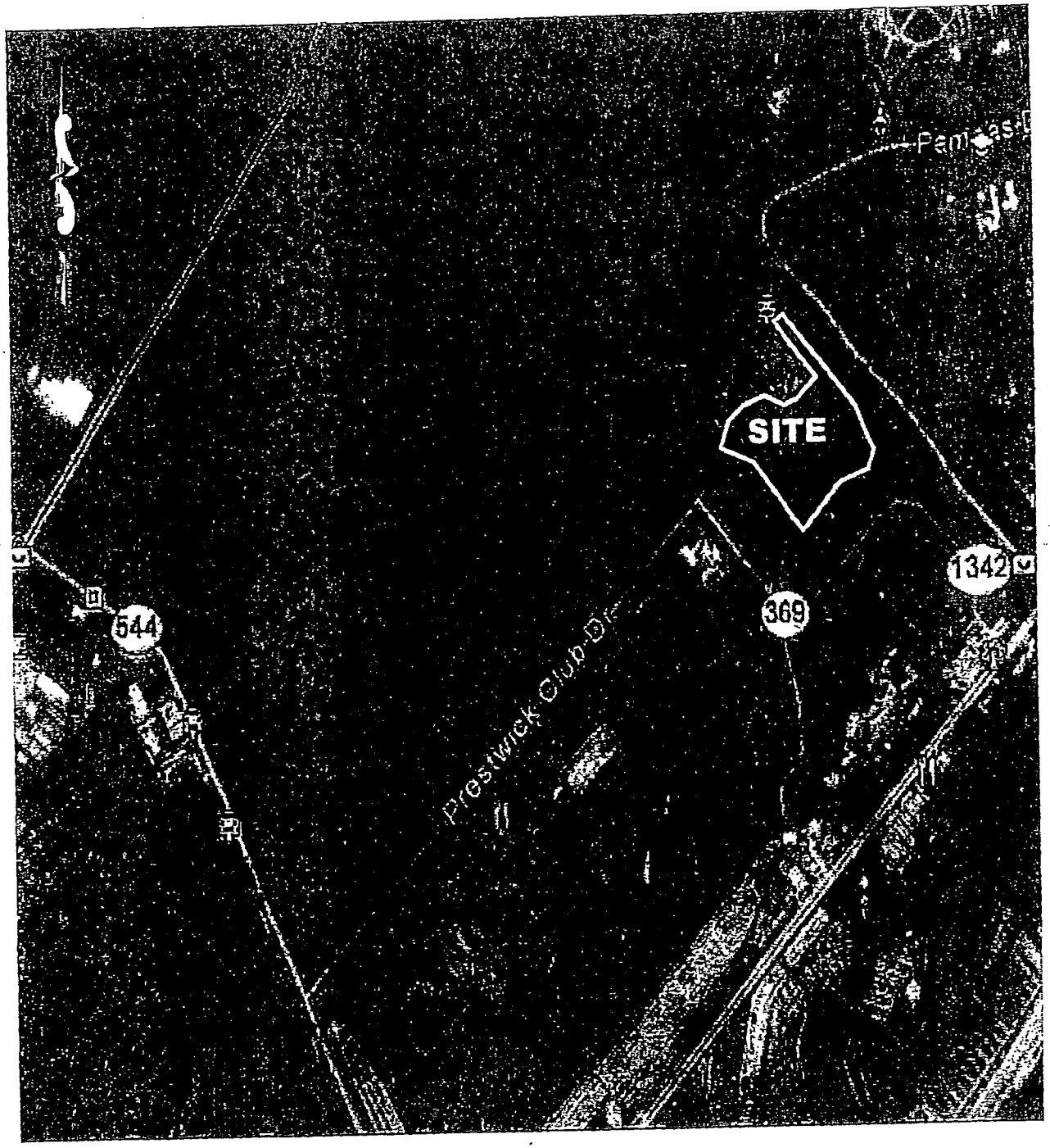
TEST LOCATION SKETCH

SUMMARY OF EXPLORATION PROCEDURES

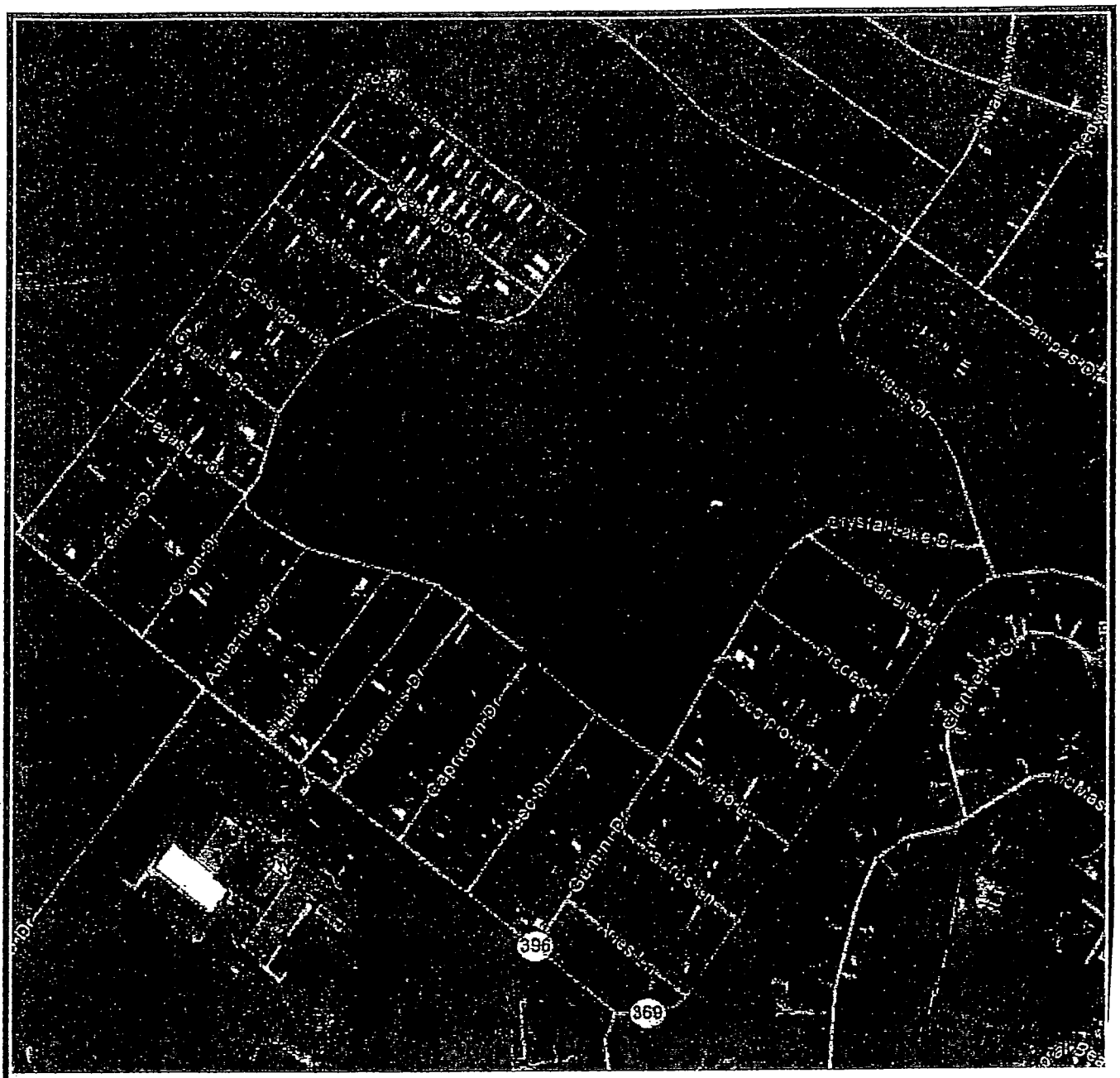
SOIL CLASSIFICATION CHART

SOIL TEST BORING LOGS

LABORATORY TEST RESULTS



SCALE: NTS	S&ME	Site Vicinity Map Crystal Lakes Mobile Home Park Myrtle Beach, South Carolina	FIGURE NO 1
SOURCE: Google			
DRAWN BY: CJB			
DATE: April 29, 2013		JOB NO. 1633-13-127	



B-1 – 20 foot boring

B-2 – 20 foot boring

B-3 – 30 foot boring

B-4 – 30 foot boring

Approximate Boring Location

SCALE: NTS	S&ME	Test Location Sketch Crystal Lakes Mobile Home Village Myrtle Beach, South Carolina	FIGURE NO 2
SOURCE: Google			
DRAWN BY: CJB			
DATE: April 29, 2013		JOB NO. 1633-13-127	

SUMMARY OF EXPLORATION PROCEDURES

The American Society for Testing and Materials (ASTM) publishes standard methods to explore soil, rock and ground water conditions in Practice D-420-98, "*Standard Guide to Site Characterization for Engineering Design and Construction Purposes.*" The boring and sampling plan must consider the geologic or topographic setting. It must consider the proposed construction. It must also allow for the background, training, and experience of the geotechnical engineer. While the scope and extent of the exploration may vary with the objectives of the client, each exploration includes the following key tasks:

- Reconnaissance of the Project Area
- Preparation of Exploration Plan
- Layout and Access to Field Sampling Locations
- Field Sampling and Testing of Earth Materials
- Laboratory Evaluation of Recovered Field Samples
- Evaluation of Subsurface Conditions

The standard methods do not apply to all conditions or to every site. Nor do they replace education and experience, which together make up engineering judgment. Finally, ASTM D 420 does not apply to environmental investigations.

RECONNAISSANCE OF THE PROJECT AREA

Where practical, we reviewed available topographic maps, county soil surveys, reports of nearby investigations and aerial photographs when preparing the boring and sampling plan. Then we walked over the site to note land use, topography, ground cover, and surface drainage. We observed general access to proposed sampling points and noted any existing structures.

Checks for Hazardous Conditions - State law requires that we notify the Palmetto Utility Protection Service (PUPS) before we drill or excavate at any site. PUPS is operated by the major water, sewer, electrical, telephone, CATV, and natural gas suppliers of South Carolina. PUPS forwarded our location request to the participating utilities. Location crews then marked buried lines with colored flags within 72 hours. They did not mark utility lines beyond junction boxes or meters. We checked proposed sampling points for conflicts with marked utilities, overhead power lines, tree limbs, or man-made structures during the site walkover.

BORINGS AND SAMPLING

Soil Test Boring with Rotary Wash

Soil sampling and penetration testing were performed in general accordance with ASTM D1586, "*Standard Test Method for Penetration Test and Split Barrel Sampling of Soils.* A rotary drilling process was used to advance the hole and a heavy drilling fluid was circulated in the bore holes to stabilize the sides and flush the cuttings. At regular intervals, drilling tools were removed and soil samples were obtained with a standard 1.4 inch I. D., two-inch O. D., split barrel sampler. The sampler was first seated six inches to

penetrate any loose cuttings, then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler through the two final six inch increments was recorded as the penetration resistance (SPT N) value. The N-value, when properly interpreted by qualified professional staff, is an index of the soil strength and foundation support capability.

Subsurface Water Level Determination

Subsurface water levels in the borings were measured during the onsite exploration by measuring depths from the existing grade to the current water level using a tape.

SUMMARY OF LABORATORY TESTING PROCEDURES

Examination of Recovered Soil Samples

Soil and field records were reviewed in the laboratory by the geotechnical professional. Soils were classified in general accordance with the visual-manual method described in ASTM D 2488, "*Standard Practice for Description and Identification of Soils (Visual-Manual Method)*". Representative soil samples were selected for classification testing to provide grain size and plasticity data to allow classification of the samples in general accordance with the Unified Soil Classification System method described in ASTM D 2487, "*Standard Practice for Classification of Soils for Engineering Purposes*". The geotechnical professional also prepared the final boring and sounding records enclosed with this report.

Moisture Content Testing of Soil Samples by Oven Drying

Moisture content was determined in general conformance with the methods outlined in ASTM D 2216, "*Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil or Rock by Mass.*" This method is limited in scope to Group B, C, or D samples of earth materials which do not contain appreciable amounts of organic material, soluble solids such as salt or reactive solids such as cement. This method is also limited to samples which do not contain contamination.

A representative portion of the soil was divided from the sample using one of the methods described in Section 9 of ASTM D 2216. The split portion was then placed in a drying oven and heated to approximately 110 degrees C overnight or until a constant mass was achieved after repetitive weighing. The moisture content of the soil was then computed as the mass of water removed from the sample by drying, divided by the mass of the sample dry, times 100 percent. No attempt was made to exclude any particular particle size from the portion split from the sample.

Liquid and Plastic Limits Testing

Atterberg limits of the soils was determined generally following the methods described by ASTM D 4318, "*Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.*" Albert Atterberg originally defined "limits of consistency" of fine grained soils in terms of their relative ease of deformation at various moisture contents. In current engineering usage, the *liquid limit* of a soil is defined as the moisture content, in percent, marking the upper limit of viscous flow and the boundary with a semi-liquid state. The *plastic limit* defines the lower limit of plastic behavior, above which a soil behaves plastically below which it retains its shape upon drying. The *plasticity index* (PI) is the range of water content over which a soil behaves plastically. Numerically, the PI is the difference between liquid limit and plastic limit values.

Representative portions of fine grained Group A, B, C, or D samples were prepared using the wet method described in Section 10.1 of ASTM D 4318. The liquid limit of each sample was determined using the multipoint method (Method A) described in Section 11, or the one-point method (Method B) described in Section 13. The liquid limit is by

definition the moisture content where 25 drops of a hand operated liquid limit device are required to close a standard width groove cut in a soil sample placed in the device.

Multi-Point Method
After each test, the moisture content of the sample was adjusted and the sample replaced in the device. The test was repeated to provide a minimum of three widely spaced combinations of N versus moisture content. When plotted on semi-log paper, the liquid limit moisture content was determined by straight line interpolation between the data points at N equals 25 blows.

One-Point Method
The procedure for the one-point method is the same as the multi-point method except that the number of blows required to close the groove is 20 to 30. If less than 20 or more than 30 blows are required, the water content of the soil is adjusted and the procedure is repeated. The liquid limit is determined in accordance with Section 14.

The plastic limit was determined using the procedure described in Sections 15 through 17 of ASTM D 4318. A selected portion of the soil used in the liquid limit test was kneaded and rolled by hand until it could no longer be rolled to a 3.2 mm thread on a glass plate. This procedure was repeated until at least 6 grams of material was accumulated, at which point the moisture content was determined using the methods described in ASTM D 2216.

Grain Size Analysis of Samples

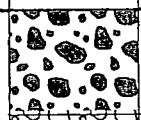
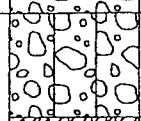
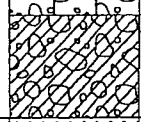
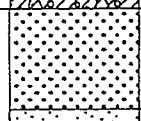
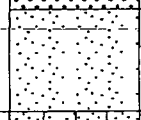
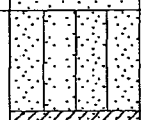
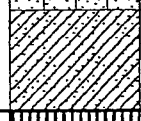
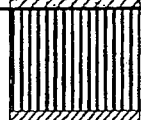
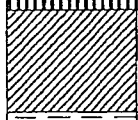
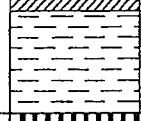
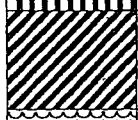
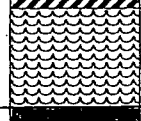
The distribution of particle sizes greater than 75 mm was determined in general accordance with the procedures described by ASTM D 421, *"Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants", and D 422, "Standard Test Method for Particle Size Analysis of Soils,"* except that the hydrometer portion of the test standard was not utilized. During preparation samples were divided into two portions. The material coarser than the No. 30 U.S. sieve size fraction was dry sieved through a nest of standard sieves as described in Article 6. Material passing the No. 30 sieve was independently passed through a nest of sieves down to the No. 200 size.

Percent Fines Determination of Samples

A selected specimen of soils was washed over a No. 200 sieve after being thoroughly mixed and dried. This test was conducted in general accordance with ASTM D 1140, *"Standard Test Method for Amount of Material Finer Than the No. 200 Sieve."* Method A, using water to wash the sample through the sieve without soaking the sample for a prescribed period of time, was used and the percentage by weight of material washing through the sieve was deemed the "percent fines" or percent clay and silt fraction.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

S&ME

PROJECT: Crystal Lakes Myrtle Beach, South Carolina S&ME Project No. 1633-13-127	BORING LOG B-1
DATE DRILLED: 5/1/13	ELEVATION:
DRILL RIG: CME 45-B	BORING DEPTH: 20.0 ft
DRILLER: Gerald	WATER LEVEL: 0' 24 hr
HAMMER TYPE: Automatic	LOGGED BY: Chris Brown
SAMPLING METHOD: Split spoon	NORTHING: / EASTING:
DRILLING METHOD: Mud Rotary	NOTES:

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / ROD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 6080	N VALUE
		TOPSOIL - Approximately 3 inches thick.									
		SILTY SAND (SM) - Mostly fine to medium sand, some low to medium plasticity fines, dark brown, wet to saturated, medium dense to loose.			1		3	8	8		16
					2		3	7	8		15
5					3		5	4	4		8
		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace of low to medium plasticity fines, gray, saturated, very loose to loose.			4		3	2	2		4
10											
					5		2	3	3		6
15											
					6		3	3	3		6
20		Boring terminated at 20 ft									

S&ME BORING LOG SPT LOGS.GPJ S&ME.GDT 6/16/13

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.

S&ME

PROJECT: Crystal Lakes Myrtle Beach, South Carolina S&ME Project No. 1633-13-127		BORING LOG B-2
DATE DRILLED: 5/1/13	ELEVATION:	NOTES:
DRILL RIG: CME 45-B	BORING DEPTH: 20.0 ft	
DRILLER: Gerald	WATER LEVEL: 0' 24 hr	
HAMMER TYPE: Automatic	LOGGED BY: Chris Brown	NORTHING: / EASTING:
SAMPLING METHOD: Split spoon		
DRILLING METHOD: Mud Rotary		

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 6080	N VALUE
		TOPSOIL - Approximately 3 inches thick.									
		POORLY GRADED SAND (SP) - Mostly fine to course sand, trace of low to medium plasticity fines, brown, tan, and gray, wet to saturated, very loose to loose.			1		2	2	3		5
		- - - - Finger size roots from 0 to 2.5 feet.			2		3	3	3		6
5					3		1	2	2		4
					4		2	2	2		4
10											
					5		3	3	2		5
15											
					6		2	3	2		5
20		Boring terminated at 20 ft									

S&ME BORING LOG SPT LOGS.GPJ S&ME.GDT 5/18/13

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S&ME

PROJECT: Crystal Lakes
Myrtle Beach, South Carolina
S&ME Project No. 1633-13-127

BORING LOG B-3

DATE DRILLED: 5/1/13	ELEVATION:	NOTES:
DRILL RIG: CME 45-B	BORING DEPTH: 30.0 ft	
DRILLER: Gerald	WATER LEVEL: 3.5' 24 hr	
HAMMER TYPE: Automatic	LOGGED BY: Chris Brown	NORTHING: / EASTING:
SAMPLING METHOD: Split spoon		
DRILLING METHOD: Mud Rotary		

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / ROD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
5		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace of low to medium plasticity fines, brown, moist to wet, very loose to medium dense.	▼		1		3	4	4		8
					2		9	10	7		17
					3		3	1	2		3
10		ELASTIC SILT WITH SAND (ML) - Mostly medium to low plastic fines, few fine sands, gray, saturated, very soft.			4		1	1	0		1
15		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace of low to medium plasticity fines, gray, tan and brown, saturated, loose to medium dense.			5		4	4	4		8
					6		4	3	2		5
20					7		5	5	5		10
25					8		5	6	6		12
30		Boring terminated at 30 ft									

S&ME BORING LOG SPT LOGS.GPJ S&ME.GDT 5/16/13

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S&ME

PROJECT: Crystal Lakes
Myrtle Beach, South Carolina
S&ME Project No. 1633-13-127

BORING LOG B-4

DATE DRILLED: 5/1/13
DRILL RIG: CME 45-B
DRILLER: Gerald
HAMMER TYPE: Automatic
SAMPLING METHOD: Split spoon
DRILLING METHOD: Mud Rotary

ELEVATION:
BORING DEPTH: 30.0 ft
WATER LEVEL: 10' 24 hr
LOGGED BY: Chris Brown

NOTES:

NORTHING: EASTING:

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / ROD	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS 10 20 30 6080	N VALUE
		TOPSOIL - Approximately 3 inches thick.									
		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace of low to medium plasticity fines, tan and brown, moist to wet, very loose to loose.			1	SS	4	4	5		9
					2	SS	4	3	3		6
5					3	SS	1	2	2		4
			▼		4	SS	1	2	2		4
10											
		SILTY SAND (SM) - Mostly fine to medium sand, some low to medium plasticity fines, dark brown, wet to saturated, loose.			5	SS	4	4	4		8
15											
					6	SS	3	4	3		7
20											
		POORLY GRADED SAND (SP) - Mostly fine to medium sand, trace of low to medium plasticity fines, gray, saturated, loose to medium dense.			7	SS	3	4	5		9
25											
					8	SS	6	6	7		13
30		Boring terminated at 30 ft									

S&ME BORING LOG SPT LOGS.GPJ S&ME.GDT 5/16/13

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S&ME

Tables

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS
CRYSTAL LAKE
ALTERNATIVE 4C IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

TABLES

J-23453.0001

Prepared by:

THOMAS & HUTTON

Table 1
Alternative 4C - Option 1
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions					Alternative No. 4c Opt 1					Difference				
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	12.39	13.25	13.50	13.82	14.20	0.51	0.10	-0.12	-0.28	-0.50
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.78	14.15	14.66	0.00	0.00	-0.02	-0.16	-0.32
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.07	14.45	14.91	0.00	0.00	-0.04	-0.10	-0.22
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.98	15.17	15.39	0.00	0.00	-0.04	-0.09	-0.23
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.54	14.99	0.00	0.00	-0.04	-0.07	-0.18
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.30	10.06	10.77	11.51	12.28	-0.57	-2.03	-1.98	-1.92	-1.84
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.91	0.00	0.00	0.00	0.03	-0.16
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.01	11.83	12.20	12.62	13.11	-0.62	-1.16	-1.28	-1.36	-1.48
CL-02	13.10	13.52	13.72	14.07	14.60	11.29	12.15	12.54	12.97	13.47	-1.81	-1.37	-1.18	-1.10	-1.13
CL-03	13.10	13.52	13.72	14.07	14.60	11.38	12.31	12.68	13.10	13.58	-1.72	-1.21	-1.04	-0.97	-1.02
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	11.48	12.49	12.90	13.37	13.90	-3.39	-2.76	-2.51	-2.22	-1.90
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	4.71	5.83	6.03	6.16	6.26	-0.60	-0.35	-0.27	-0.24	-0.23
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.71	6.94	7.29	0.00	0.00	-0.07	-0.12	-0.11
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.34	3.34	3.83	4.21	4.57	-0.41	-0.97	-0.84	-0.76	-0.69
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.22	4.30	4.61	4.88	5.19	-0.55	-0.59	-0.57	-0.55	-0.43
MAIN-03	9.19	11.67	12.42	13.17	13.91	7.31	9.42	10.21	11.07	11.90	-1.88	-2.25	-2.21	-2.10	-2.01
MAIN-04	9.41	11.78	12.49	13.21	13.94	7.66	9.65	10.42	11.20	12.00	-1.75	-2.13	-2.07	-2.01	-1.94
MAIN-05	9.74	12.00	12.67	13.35	14.05	8.08	9.94	10.66	11.41	12.20	-1.66	-2.06	-2.01	-1.94	-1.85
MAIN-06	9.87	12.09	12.75	13.43	14.12	8.24	10.06	10.77	11.51	12.28	-1.63	-2.03	-1.98	-1.92	-1.84
MAIN-07	9.97	12.12	12.77	13.44	14.13	8.26	10.10	10.80	11.53	12.30	-1.71	-2.02	-1.97	-1.91	-1.83
MAIN-07A	10.07	12.16	12.79	13.45	14.13	8.29	10.14	10.84	11.56	12.31	-1.78	-2.02	-1.95	-1.89	-1.82
MAIN-08	10.16	12.21	12.82	13.47	14.15	8.32	10.18	10.88	11.60	12.34	-1.84	-2.03	-1.94	-1.87	-1.81
MAIN-08A	10.32	12.33	12.93	13.55	14.21	8.34	10.24	10.94	11.66	12.40	-1.98	-2.09	-1.99	-1.89	-1.81
MAIN-09	10.39	12.38	12.98	13.59	14.24	8.35	10.27	10.97	11.69	12.43	-2.04	-2.11	-2.01	-1.90	-1.81
MAIN-10	10.52	12.45	13.04	13.63	14.32	8.56	10.33	11.02	11.74	12.47	-1.96	-2.12	-2.02	-1.89	-1.85
MAIN-11	10.56	12.47	13.06	13.69	14.30	8.66	10.35	11.04	11.75	12.48	-1.90	-2.12	-2.02	-1.94	-1.82
MAIN-12	10.68	12.54	13.12	13.72	14.39	8.75	10.41	11.09	11.79	12.51	-1.93	-2.13	-2.03	-1.93	-1.88
MAIN-13	11.08	12.70	13.24	13.81	14.45	9.16	10.63	11.28	11.93	12.60	-1.92	-2.07	-1.96	-1.88	-1.85
MAIN-14	11.12	12.72	13.26	13.82	14.47	9.24	10.65	11.29	11.94	12.61	-1.88	-2.07	-1.97	-1.88	-1.86
MAIN-15	11.63	12.99	13.48	13.98	14.58	10.07	11.06	11.58	12.14	12.76	-1.56	-1.93	-1.90	-1.84	-1.82
MAIN-16	11.67	13.02	13.51	14.00	14.66	10.07	11.06	11.58	12.14	12.76	-1.60	-1.96	-1.93	-1.86	-1.90
MAIN-17	11.70	13.07	13.56	14.06	14.68	12.32	13.16	13.41	13.72	14.10	0.62	0.09	-0.15	-0.34	-0.58
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.14	12.93	13.17	13.45	13.94	-0.35	-0.44	-0.61	-0.76	-0.84
MAIN-19	12.93	13.64	14.00	14.39	14.90	11.98	12.70	12.93	13.40	13.92	-0.95	-0.94	-1.07	-0.99	-0.98
MAIN-20	15.19	16.18	16.64	17.15	17.55	11.75	12.51	12.92	13.39	13.92	-3.44	-3.67	-3.72	-3.76	-3.63
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.13	15.59	15.76	16.00	16.18	-0.30	-0.75	-1.02	-1.26	-1.47
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.41	15.93	16.13	16.40	16.61	-0.18	-0.54	-0.77	-0.97	-1.12
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.89	16.63	16.95	17.60	18.30	-0.07	-0.29	-0.69	-0.77	-0.69
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.03	16.70	17.06	17.68	18.35	-0.06	-0.28	-0.63	-0.72	-0.66
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.06	19.19	19.62	19.78	19.89	0.01	-0.20	-0.05	-0.03	-0.03
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.23	4.57	5.10	5.59	5.87	-0.08	-0.05	-0.04	-0.06	-0.01
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	4.68	5.80	6.00	6.14	6.24	-0.59	-0.37	-0.29	-0.24	-0.24
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	4.71	5.95	6.24	6.48	6.71	-0.63	-0.62	-0.61	-0.65	-0.70
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.79	0.00	0.00	0.00	0.01	-0.02
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	11.61	11.94	12.37	12.88	0.00	-0.93	-1.32	-1.49	-1.28
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.67	10.25	10.87	11.58	12.34	-0.33	-1.88	-1.92	-1.89	-1.83
PW-02	10.15	12.29	13.00	13.90	14.83	9.89	10.66	11.23	11.98	12.81	-0.26	-1.63	-1.77	-1.92	-2.02
PW-03	10.49	12.33	13.03	13.92	14.85	10.38	11.02	11.45	12.12	12.88	-0.11	-1.31	-1.58	-1.80	-1.97
PW-05	10.10	12.43	13.16	13.94	14.63	9.78	10.55	11.25	12.03	12.85	-0.32	-1.88	-1.91	-1.91	-1.78
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.63	14.81	15.60	0.00	-0.07	-0.55	-1.61	-1.46
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.75	14.92	15.68	0.00	-0.07	-0.52	-1.56	-1.43
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.49	0.00	0.00	0.00	0.07	-0.26
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.39	0.00	0.00	0.00	0.02	-0.05
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.41	0.00	0.00	0.00	0.02	-0.05
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.19	12.30	12.34	12.58	0.00	-0.02	-0.44	-0.96	-1.37
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.75	0.00	0.00	0.00	-0.06	-0.03
STOR-05	16.67	19.10	19.91	20.70	21.57	16.68	19.10	19.91	20.70	21.56	0.01	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.67	19.11	19.93	20.74	21.62	-0.01	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Notes: MAIN-03 FF El. of Comper County = 13.31
MAIN-07 FF El. of 1284/1288 Stratmill Ct. = 13.43; Min Garage El. (1284 Stratmill Ct.) = 11.47

Table 2
Alternative 4C - Option 2
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions 2	10	25	50	100	Alternative No. 4c Opt 2 2	10	25	50	100	Difference (4C Opt 2 - Exist.) 2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	12.39	13.25	13.63	14.17	14.79	0.51	0.10	0.01	0.07	0.09
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.78	14.21	14.85	0.00	0.00	-0.02	-0.10	-0.13
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.07	14.45	14.91	0.00	0.00	-0.04	-0.10	-0.22
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.99	15.18	15.41	0.00	0.00	-0.03	-0.08	-0.21
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.54	14.99	0.00	0.00	-0.04	-0.07	-0.18
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.30	10.58	11.32	12.13	12.83	-0.57	-1.51	-1.43	-1.30	-1.29
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.91	0.00	0.00	0.00	0.03	-0.16
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.31	12.32	12.72	13.19	13.66	-0.32	-0.67	-0.76	-0.79	-0.93
CL-02	13.10	13.52	13.72	14.07	14.60	11.60	12.68	13.12	13.61	14.13	-1.50	-0.84	-0.60	-0.46	-0.47
CL-03	13.10	13.52	13.72	14.07	14.60	11.72	12.82	13.25	13.73	14.23	-1.38	-0.70	-0.47	-0.34	-0.37
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	11.85	13.06	13.56	14.11	14.74	-3.02	-2.19	-1.85	-1.48	-1.06
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	4.84	5.95	6.10	6.22	6.32	-0.47	-0.23	-0.20	-0.18	-0.17
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.71	6.95	7.30	0.00	0.00	-0.07	-0.11	-0.10
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.41	3.65	4.05	4.41	4.75	-0.34	-0.66	-0.62	-0.56	-0.51
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.34	4.48	4.72	5.01	5.35	-0.43	-0.41	-0.46	-0.42	-0.27
MAIN-03	9.19	11.67	12.42	13.17	13.91	7.51	9.98	10.84	11.73	12.51	-1.68	-1.69	-1.58	-1.44	-1.40
MAIN-04	9.41	11.78	12.49	13.21	13.94	7.85	10.21	10.98	11.84	12.58	-1.56	-1.57	-1.51	-1.37	-1.36
MAIN-05	9.74	12.00	12.67	13.35	14.05	8.27	10.47	11.22	12.05	12.75	-1.47	-1.53	-1.45	-1.30	-1.30
MAIN-06	9.87	12.09	12.75	13.43	14.12	8.43	10.58	11.32	12.13	12.83	-1.44	-1.51	-1.43	-1.30	-1.29
MAIN-07	9.97	12.12	12.77	13.44	14.13	8.48	10.63	11.36	12.16	12.84	-1.49	-1.49	-1.41	-1.28	-1.29
MAIN-07A	10.07	12.16	12.79	13.45	14.13	8.55	10.69	11.40	12.18	12.86	-1.52	-1.47	-1.39	-1.27	-1.27
MAIN-08	10.16	12.21	12.82	13.47	14.15	8.63	10.74	11.44	12.22	12.88	-1.53	-1.47	-1.38	-1.25	-1.27
MAIN-08A	10.32	12.33	12.93	13.55	14.21	8.70	10.83	11.54	12.30	12.95	-1.62	-1.50	-1.39	-1.25	-1.26
MAIN-09	10.39	12.38	12.98	13.59	14.24	8.73	10.87	11.58	12.34	12.99	-1.66	-1.51	-1.40	-1.25	-1.25
MAIN-10	10.52	12.45	13.04	13.65	14.32	9.00	10.94	11.64	12.39	13.03	-1.52	-1.51	-1.40	-1.26	-1.29
MAIN-11	10.56	12.47	13.06	13.69	14.30	9.07	10.96	11.66	12.41	13.04	-1.49	-1.51	-1.40	-1.28	-1.26
MAIN-12	10.68	12.54	13.12	13.72	14.39	9.18	11.03	11.72	12.45	13.08	-1.50	-1.51	-1.40	-1.27	-1.31
MAIN-13	11.08	12.70	13.24	13.81	14.45	9.56	11.27	11.91	12.57	13.17	-1.52	-1.43	-1.33	-1.24	-1.28
MAIN-14	11.12	12.72	13.26	13.82	14.47	9.61	11.30	11.92	12.58	13.18	-1.51	-1.42	-1.34	-1.24	-1.29
MAIN-15	11.63	12.99	13.48	13.98	14.58	10.45	11.63	12.17	12.77	13.33	-1.18	-1.36	-1.31	-1.21	-1.25
MAIN-16	11.67	13.02	13.51	14.00	14.66	10.45	11.63	12.17	12.78	13.34	-1.22	-1.39	-1.34	-1.22	-1.32
MAIN-17	11.70	13.07	13.56	14.06	14.68	12.32	13.16	13.62	14.16	14.78	0.62	0.09	0.06	0.10	0.10
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.14	13.10	13.60	14.15	14.77	-0.35	-0.27	-0.18	-0.06	-0.01
MAIN-19	12.93	13.64	14.00	14.39	14.90	11.98	13.09	13.58	14.13	14.76	-0.95	-0.56	-0.42	-0.26	-0.14
MAIN-20	15.19	16.18	16.64	17.15	17.55	11.86	13.08	13.57	14.12	14.75	-3.33	-3.10	-3.07	-3.03	-2.80
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.13	15.59	15.76	16.00	16.18	-0.30	-0.75	-1.02	-1.26	-1.47
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.41	15.93	16.13	16.40	16.61	-0.18	-0.54	-0.77	-0.97	-1.12
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.89	16.63	16.95	17.60	18.30	-0.07	-0.29	-0.69	-0.77	-0.69
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.03	16.70	17.06	17.68	18.35	-0.06	-0.28	-0.63	-0.72	-0.66
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.06	19.19	19.62	19.78	19.89	0.01	-0.20	-0.05	-0.03	-0.03
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.28	4.65	5.16	5.64	5.88	-0.03	0.03	0.02	-0.01	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	4.81	5.93	6.08	6.20	6.30	-0.46	-0.24	-0.21	-0.18	-0.18
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	4.85	6.13	6.39	6.64	6.89	-0.49	-0.44	-0.46	-0.49	-0.52
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.78	0.00	0.00	0.00	0.01	-0.03
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	11.61	11.94	12.42	13.16	0.00	-0.93	-1.32	-1.44	-1.00
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.67	10.67	11.38	12.19	12.88	-0.33	-1.46	-1.41	-1.28	-1.29
PW-02	10.15	12.29	13.00	13.90	14.83	9.89	10.94	11.64	12.48	13.32	-0.26	-1.35	-1.36	-1.42	-1.51
PW-03	10.49	12.33	13.03	13.92	14.85	10.38	11.17	11.76	12.54	13.34	-0.11	-1.16	-1.27	-1.38	-1.49
PW-05	10.10	12.43	13.16	13.94	14.63	9.78	10.98	11.76	12.63	13.42	-0.32	-1.45	-1.40	-1.31	-1.21
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.66	15.01	16.30	0.00	-0.07	-0.52	-1.41	-0.76
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.78	15.11	16.36	0.00	-0.07	-0.49	-1.37	-0.75
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.43	0.00	0.00	0.00	0.07	-0.32
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.36	0.00	0.00	0.00	0.02	-0.08
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.39	0.00	0.00	0.00	0.02	-0.07
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.19	12.30	12.41	12.89	0.00	-0.02	-0.44	-0.89	-1.06
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.75	0.00	0.00	0.00	-0.06	-0.03
STOR-05	16.67	19.10	19.91	20.70	21.57	16.68	19.10	19.91	20.70	21.56	0.01	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.67	19.11	19.93	20.74	21.62	-0.01	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Notes: MAIN-06 FF El. of Camper County = 13.31
MAIN-07 FF El. of 1284/1288 Stratmil Ct. = 13.43; Min Garage El. (1284 Stratmil Ct.) = 11.47

TABLE 3
Opinion of Probable Construction Cost Summary

Option	Description	Opinion of Probable Construction Cost
1A.1	Full Lake Dredging - New Disposal Site	$ 2,618,000
1A.2	Full Lake Dredging - Existing Borrow/Disposal Site	$ 2,337,000
1B.1	Full Lake Excavation - New Stockpile Site	$ 1,964,000
1B.2	Full Lake Excavation - Existing Borrow/Stockpile Site	$ 2,024,000
2A	Partial Lake Dredging / Partial Lake Fill	$ 1,459,000
2B	Partial Lake Excavation / Partial Lake Fill	$ 1,131,000
Off-Site	Off-site Channel and Pipe Improvements	$ 439,000
Recommended	**Option 2B and Off-Site Improvements**	**$ 1,570,000**

Probable Construction Costs

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

CRYSTAL LAKE

ALTERNATIVE 4C IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

OPINIONS OF PROBABLE CONSTRUCTION COSTS

J-23453.0001

Prepared by:

THOMAS & HUTTON

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 1A.1 - Dredge - New Disposal Site**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 20,000.00	$ 20,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 10,000.00	$ 10,000
4	Silt Fence	4,900	LF	$ 3.00	$ 14,700
5	Construction Entrance	2	EA	$ 2,300.00	$ 4,600
6	Clearing and Grubbing	23.0	AC	$ 7,000.00	$ 161,000
7	Excavation and Berm Construction	90,000	CY	$ 4.00	$ 360,000
8	Grading	32,500	SY	$ 0.30	$ 9,750
9	Outfall Structure and Discharge Pipe	1	EA	$ 7,500.00	$ 7,500
10	Influent Line - 18" HDPE	400	LF	$ 25.00	$ 10,000
11	Outfall Ditch - Improvement	700	LF	$ 10.00	$ 7,000
12	Grassing	32,500	SY	$ 0.30	$ 9,750
	Dredging				
13	Dredge Mobilization/Demobilization	1	LS	$ 75,000.00	$ 75,000
14	Selective Lake Dredging	350,000	CY	$ 4.50	$ 1,575,000
	Lake Restoration				
15	Grading	16,000	SY	$ 0.30	$ 4,800
16	Grassing	16,000	SY	$ 0.30	$ 4,800
				SUBTOTAL:	$ 2,275,900
				Contingency (15%):	$ 341,385
				TOTAL:	$ 2,617,285
				SAY:	**$ 2,618,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 1A.2 - Dredge - Exist. Disposal Site**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 20,000.00	$ 20,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 7,500.00	$ 7,500
4	Silt Fence	3,700	LF	$ 3.00	$ 11,100
5	Construction Entrance	2	EA	$ 2,300.00	$ 4,600
6	Excavation and Berm Construction	65,000	CY	$ 4.00	$ 260,000
7	Grading	23,111	SY	$ 0.30	$ 6,933
8	Outfall Structure and Discharge Pipe	1	EA	$ 7,500.00	$ 7,500
9	Influent Line - 18" HDPE	1,200	LF	$ 25.00	$ 30,000
10	Outfall Ditch - Improvement	1,600	LF	$ 10.00	$ 16,000
11	Grassing	23,111	SY	$ 0.30	$ 6,933
	Dredging				
12	Dredge Mobilization/Demobilization	1	LS	$ 75,000.00	$ 75,000
13	Selective Lake Dredging	350,000	CY	$ 4.50	$ 1,575,000
	Lake Restoration				
14	Grading	16,000	SY	$ 0.30	$ 4,800
15	Grassing	16,000	SY	$ 0.30	$ 4,800
				SUBTOTAL:	$ 2,032,167
				Contingency (15%):	$ 304,825
				TOTAL:	$ 2,336,992
				SAY:	**$ 2,337,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 1B.1 - Excavate - New Stockpile Site**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	13.8	AC	$ 7,000.00	$ 96,519
5	Silt Fence	2,940	LF	$ 3.00	$ 8,820
6	Grading	66,736	SY	$ 0.30	$ 20,021
7	Grassing	66,736	SY	$ 0.30	$ 20,021
	Excavation				
8	Mobilization / Demobilization	1	LS	$ 40,000.00	$ 40,000
9	Water Management	4	MN	$ 25,000.00	$ 100,000
10	Selective Lake Excavation	350,000	CY	$ 4.00	$ 1,400,000
	Lake Restoration				
11	Grading	16,000	SY	$ 0.30	$ 4,800
12	Grassing	16,000	SY	$ 0.30	$ 4,800
				SUBTOTAL:	$ 1,706,981
				Contingency (15%):	$ 256,047
				TOTAL:	$ 1,963,028
				SAY:	**$ 1,964,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 1B.2 - Excavate - Exist. Stockpile Site**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Silt Fence	3,100	LF	$ 3.00	$ 9,300
5	Temporary Haul Road	1,000	LF	$ 10.00	$ 10,000
6	Grading	72,600	SY	$ 0.30	$ 21,780
7	Grassing	72,600	SY	$ 0.30	$ 21,780
	Excavation				
8	Mobilization / Demobilization	1	LS	$ 40,000.00	$ 40,000
9	Water Management	4	MN	$ 25,000.00	$ 100,000
10	Selective Lake Excavation	350,000	CY	$ 4.50	$ 1,575,000
	Lake Restoration				
11	Grading	16,000	SY	$ 0.30	$ 4,800
12	Grassing	16,000	SY	$ 0.30	$ 4,800
				SUBTOTAL:	$ 1,759,460
				Contingency (15%):	$ 263,919
				TOTAL:	$ 2,023,379
				SAY:	**$ 2,024,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 2A - Partial Dredge/Fill**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
	Dredging				
1	Layout	1	LS	$ 2,000.00	$ 2,000
2	Testing	1	LS	$ 5,000.00	$ 5,000
3	Clear and Grub Banks	2.4	AC	$ 7,000.00	$ 16,800
4	Dredge Mobilization/Demobilization	1	LS	$ 75,000.00	$ 75,000
5	Selective Lake Dredging	250,000	CY	$ 4.50	$ 1,125,000
	Lake Restoration				
6	Grading	73,511	SY	$ 0.30	$ 22,053
7	Grassing	73,511	SY	$ 0.30	$ 22,053
8	Miscellaneous Drainage	1	LS	$ 20,000.00	$ 20,000
				SUBTOTAL:	$ 1,267,906
				Contingency (15%):	$ 190,186
				TOTAL:	$ 1,458,092
				SAY:	**$ 1,459,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Option 2B - Partial Excavate/Fill**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
	Excavation				
1	Layout	1	LS	$ 2,000.00	$ 2,000
2	Testing	1	LS	$ 5,000.00	$ 5,000
3	Clear and Grub Banks	2.4	AC	$ 7,000.00	$ 16,800
4	Mobilization/Demobilization	1	LS	$ 40,000.00	$ 40,000
5	Selective Lake Excavation	250,000	CY	$ 3.50	$ 875,000
	Lake Restoration				
6	Grading	73,511	SY	$ 0.30	$ 22,053
7	Grassing	73,511	SY	$ 0.30	$ 22,053
8	Miscellaneous Drainage	1	LS	$ 20,000.00	$ 20,000
				SUBTOTAL:	$ 982,906
				Contingency (15%):	$ 147,436
				TOTAL:	$ 1,130,342
				SAY:	$ **1,131,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : RPK
Alternative : **4C - Off-site Improvements**

THOMAS & HUTTON

DATE PREPARED : 8/6/13	REVISED:
BASIS FOR ESTIMATE	
	(Master plan)
X	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 20,000.00	$ 20,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Silt Fence	200	LF	$ 3.00	$ 600
5	Rock Ceck Dam	10	EA	$ 500.00	$ 5,000
6	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
7	Tree Protection	1,640	LF	$ 3.50	$ 5,740
8	Water Management	1	LS	$ 10,000.00	$ 10,000
	Demolition				
9	Clearing and Grubbing	3.25	AC	$ 7,000.00	$ 22,750
10	Demo. Exist. Flash Board Riser	1	EA	$ 1,500.00	$ 1,500
11	Demo. Exist. 30" RCP	66	LF	$ 10.00	$ 660
12	Demo. Exist. 36" RCP	98	LF	$ 10.00	$ 980
13	Demo. Exist. (2) 8'x8' CBC	20	LF	$ 100.00	$ 2,000
14	Demo. Exist. 60" CMP	80	LF	$ 25.00	$ 2,000
15	Remove and Dispose Existing Pavement	426	SY	$ 3.50	$ 1,491
	Construction				
16	Channel Excavation	7,600	CY	$ 8.00	$ 60,800
17	Channel Fill - Compacted in Lifts	2,400	CY	$ 4.00	$ 9,600
18	Grading	15,730	SY	$ 1.00	$ 15,730
19	48" RCP	650	LF	$ 150.00	$ 97,500
20	Headwall - (3) 48" RCP	4	EA	$ 5,000.00	$ 20,000

Lakewood Prichett Swash Drainage Study 2012

Phase II - Drainage Improvement Alternatives Study

Lakewood '12 Part II

Narrative Report

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

PREPARED FOR:

HORRY COUNTY

STORMWATER DEPARTMENT

SEPTEMBER 24, 2012

J-23453.404

Prepared by:

THOMAS & HUTTOI

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OPINIONS OF PROBABLE CONSTRUCTION COST

Alternative 1A – Highway 17 Business Culvert Improvements and Main Channel Improvements
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Alternative 8 – Strathmill Court Flood Protection System Improvements

EXHIBITS

Exhibit 1 – Exisitng Conditions ICPR Link-Node Schmatic
Exhibit 2 – Improvement Alternatives

BACKGROUND AND INTRODUCTION

Horry County is experiencing rapid growth and in certain places, the pace of development continues to outgrow the capacity of the existing drainage system. Flooding concerns have been voiced by many of the businesses and residents in the Lakewood-Pirateland Swash Basin (Exhibit 1). Structural flooding of several business and/or homes has been recorded on at least two occasions in the past.

The Lakewood-Pirateland Basin drains 1,560 acres including the Lakewood and Pirateland Campgrounds, Long Bay Estates, and portions of the Myrtle Beach State Park, all east of US Highway 17 Business. West of US Highway 17 Business, the basin provides drainage for the Prestwick Subdivision and Country Club, Crystal Lakes Mobile Home Park, Seagate Village (formerly part of Myrtle Beach Air Force Base), and commercial properties along the highway. Drainage is conveyed through a swash to the Atlantic Ocean.

The Horry County Stormwater Department intends to implement a three phases approach to improving drainage in the basin – including (1) the development of a hydrology and hydraulic model, (2) alternatives analysis and recommendations, and (3) implementation of the recommended improvements if deemed financially feasible.

Phase 1

Phase 1 of the Lakewood-Pirateland Swash Drainage Project included six tasks including:

- Task 1 – Data Collection
- Task 2 – Field Reconnaissance
- Task 3 – Surveying
- Task 4 – Existing Conditions Model Development
- Task 5 – Model Calibration
- Task 6 – Phase 1 Study Findings and Report

Phase 1 of the Lakewood-Pirateland Swash Drainage Project was documented in the report *Lakewood-Pirateland Swash Drainage Study* (Thomas & Hutton, February 29, 2012).

Phase 1 Additional Analysis

Due to certain findings of the Phase 1 report, the Horry County Stormwater Department requested additional study of the Lakewood-Pirateland Swash Drainage Basin. In particular, the County commissioned additional survey and drainage system analysis of the minor collection system draining through Strathmill Court. The additional survey and drainage system analysis work was documented in a Technical Memorandum *Lakewood-Pirateland Swash Drainage Improvements – Strathmill Court Study Findings* (Thomas & Hutton, May 3, 2012).

Phase 2

Phase 2 of the Lakewood-Pirateland Drainage Study included the assessment of alternatives that could be implemented within the basin that would address flood issues – particularly the structural flooding of businesses along Highway 17 Business and homes in the Prestwick subdivision. Phase 2 was conducted under the following five tasks:

- Task 1 – Alternative Projects Screening
- Task 2 – Alternative Project Evaluation
- Task 3 – Alternative Post Improvement Conditions Model Development
- Task 4 – Opinion of Probable Cost and Benefit Analysis
- Task 5 – Phase 2 Study Findings and Report

The following sections describe each task conducted as part of Phase 2 of the Lakewood-Pirateland Swash Drainage Study.

ALTERNATIVE PROJECTS SCREENING

Alternative improvement projects where developed that addressed the structural flooding issues identified in Phase 1 of the project – mainly the flooding upstream of the US Hwy 17 Business at the business (Camper County) just west of the highway and the two residences in the Prestwick Sub-division (1284 and 1288 Strathmill Ct.).

Alternative improvement projects with the potential to alleviate the identified structural flooding were developed and screened for further assessment. The following projects were selected for further assessment as part of Phase 2 of the study.

- Alternative 1: Improvements to the existing culvert under US Hwy 17 Business
  - Alternative 1A: Addition of a 5'x10' CBC underneath US Hwy 17 Business and improvements to approximately 1,200 LF of Channel
  - Alternative 1B: Addition of a 7'x7' CBC underneath US Hwy 17
  - Alternative 1C: Addition of a 42" RCP underneath US Hwy 17 Business
- Alternative 2: Detention on a parcel adjacent the main channel (Graham Walden Tract)
  - Alternative 2A: Detention of flow entering the main channel from across Catherine Avenue (flow from the camper storage area along US Hwy 17 Business)
  - Alternative 2B: Diversion and detention of flows entering the pond/wetland area along Catherine Avenue (flows from the Prestwick Sub-division)
  - Alternative 2C: Off-line detention of flows in the main channel
- Alternative 3: Detention on a wooded area between Prestwick Phase IV and Sea Gate Village
- Alternative 4: Total and partial diversion of flows from the main channel (adjacent Sea Gate Village) to Crystal Lake
  - Alternative 4A: Partial diversion of high flows to Crystal Lake through a side-flow weir from the main channel
  - Alternative 4B: Total diversion of the flow from the main channel (draining the northern Sea Gate Village tributary)
  - Alternative 4C: Total diversion of the flow from the main channel (draining the northern and southern Sea Gate Village tributaries)
- Alternative 5: Detention in the common areas of Sea Gate Village
- Alternative 6: Modification of the pond control structure in Prestwick Phase 1

In addition to the alternative projects listed above that address the structural flooding (US Hwy 17 Business and Strathmill Court), local improvement alternatives that address potential flooding of the Strathmill Court residences were also selected for further assessment. These alternatives include:

- Alternative 7: Diversion of the local Strathmill Court drainage system to the main channel
- Alternative 8: Improvements to the local flood protection system along the main channel at Strathmill Court

The locations of the alternative projects are show on Exhibit 2. Detail conceptual plans for each alternative project (except Alternative 6) are illustrated in the Figures 1A, 1B, 1C, 2A, 2B, 2C, 3, 4A, 4B, 4C, 5 (2 sheets), 7 and 8.

ALTERNATIVE PROJECTS POST-IMPROVEMENT CONDITIONS MODEL DEVELOPMENT

For alternative projects 1 through 6, individual post-improvement conditions ICPR stormwater models were developed to assess the effectiveness of each alternative project. The model inputs are based on the alternative project's conceptual plan depicted in the figures. The alternative projects were optimized to maximize the flood control effect of project while minimizing impact to adjacent properties or structures. The alternative projects were also refined to fit the physical parameters of the area to be improved, including elevations, storage areas, etc. The following are a brief description of each alternative as refined in the post-conditions modeling process.

Alternative 1A – US Highway 17 Business Culvert Improvements and Main Channel Improvements

This alternative consists of installing a 5'x10' CBC underneath US Highway 17 Business parallel to the existing 7'x7' CBC. The proposed alternative would include the reconstruction and expansion of the upstream and downstream headwall/wingwalls and aprons. In addition, the alternative would include improvements (widening to 20' bottom width with 2:1 side slopes) to approximately 1,200 LF of the main channel upstream of US Highway 17 Business. This alternative was optimized to prevent flood of structures (including garages) up to and including the 100-year event.

Alternative 1B – US Highway 17 Business Culvert Improvements

This alternative consists of installing a 7'x7' CBC underneath US Highway 17 Business parallel to the existing 7'x7' CBC. The proposed alternative would include the reconstruction and expansion of the upstream and downstream headwall/wingwalls and apron. The alternative produced significantly lower peak water surface elevations upstream of US Highway 17 Business and eliminated finished floor (FF) flooding (up to the 100-year event) at the two locations. However, garage flooding could continue to occur after this improvement for some larger events.

Alternative 1C – US Highway 17 Business Culvert Improvements

This alternative consists of installing a 42" RCP underneath US Highway 17 Business parallel to the existing 7'x7' CBC. The proposed alternative would include the reconstruction and expansion of the upstream and downstream headwall/wingwalls and apron. This alternative was optimized to be the minimum improvement needed to prevent FF flooding of structures (up to the 100-year event). However, similar to Alternative 1B, garage flooding could continue to occur after this improvement for some larger events.

Alternative 2A – Detention Pond at Catherine Drive

This alternative consists of constructing a 0.67-acre wet detention pond adjacent Catherine Drive on the Graham Walden Tract. The alternative would include diverting drainage from the exiting 30" RCP under Catherine Drive into the proposed detention pond. The ponds normal water and stormwater release would be controlled by a structure that would discharge directly to the main channel.

This alternative resulted in only minor improvements to peak water surface elevations and mainly or smaller storm events (i.e. 2-, 10- and 25-yr events), with no significant improvement for larger events.

Alternative 2B – Detention Pond at Catherine Drive

This alternative consists of constructing a 0.62-acre wet detention pond adjacent Catherine Drive on the Graham Walden Tract. The alternative maintains the drainage from the exiting 30" RCP under Catherine Drive in a ditch on the southeast side of the property. The alternative would divert the stormwater from the existing pond/wetland that received runoff from the Prestwick sub-division into the new pond.

The diversion would include the installation of triple 60-inch RCP pipes from the existing wetland/pond to the proposed pond. The proposed pond would outfall to the main channel through triple 60-inch RCP pipes. The alternative would also include the abandonment of the outfall of the existing pond/wetland (which is essentially a narrow ditch).

This alternative resulted in minor improvements to peak water surface elevations (mainly the area of the main channel adjacent the Strathmill Court properties), but no improvement downstream (i.e. immediately upstream of US Highway 17 Business).

Alternative 2C – Detention Pond at Catherine Drive

This alternative consists of constructing a 0.80-acre dry detention pond adjacent Catherine Drive on the Graham Walden Tract. The alternative maintains the drainage from the exiting 30" RCP under Catherine Drive in a ditch on the southeast side of the property. The alternative would serve as an off-line detention area for high flows from the main channel.

High flows would spill into the detention area through a rip-rap weir. The stormwater would flow back into the main channel after the storm passes, with the lowest part of the detention area being drained by a small 18-inch RCP drain pipe.

This alternative resulted in only minor improvements to peak water surface elevations and mainly for smaller storm events (i.e. 2- and 10-yr events), with no significant improvement for larger events.

Alternative 3 – Detention Pond at Lakeview Drive

This alternative is the construction of a 3.35-acre wet detention pond in the area between Lakeview Drive and Seagate Village (currently a wood tract of land). The detention pond would be an in-line detention pond that would receive flows from Seagate Village and Crystal Lake. The pond would outfall through a control structure immediately upstream of the bridge at Lakeview Drive.

This alternative resulted in moderate improvements to peak water surface elevations in the main channel, with improvements at the structure flooding location of nearly 0.25 feet. However, this alternative would not eliminate structural flooding for the 100-year event.

Alternative 4A – Crystal Lake Modifications

This alternative would be the construction of a side-discharge weir that would allow higher flows in the channel between Seagate Village and Crystal Lake to overflow into Crystal Lake during most events (including the 2-yr). The weir would be rip-rap lined at an elevation of approximately 14.5 feet, which is slightly above the NWL of the lake at the time of the survey conducted for this study (December 2011). The weir would preclude the lake from reaching water levels above 14.5 feet. A wooden raised boardwalk is proposed for the existing walking trail adjacent Seagate Village to span the proposed weir.

This alternative resulted in improvements to peak water surface elevations for the 100-year storm event by nearly 0.4 feet at the two structural flooding locations. However, this would not eliminate the potential of flooding during the 100-year rainfall event.

Alternative 4B – Crystal Lake Modifications

To better utilize Crystal Lake, this alternative would modify the control structure of the lake and lower the NWL to elevation of the existing outfall pipe (elevation 13.5 feet). The modification would be relatively inexpensive, but could result in areas of the lake bottom becoming partially exposed. Partial areas of the lake bottom are currently exposed (December 2011) at the current NWL of 14.39 feet.

The alternative would also include the diversion of a portion of the Seagate Village into Crystal Lake. This would include the abandonment of an existing culvert in the channel between Seagate Village and Crystal Lake that would force drainage through a proposed culvert (triple 48-inch RCP) into the lake. This alternative would convert Crystal Lake into an in-line detention pond with a portion of Seagate Village drainage passing through the lake.

This alternative is nearly successful in eliminating structural flooding at the two locations up to the 100-year rainfall event. However, it does not eliminate the potential for structural flooding through the 100-year event. This alternative would significantly impact Crystal Lake. Potentially to mitigate the effect, the lake's bottom could be lowered by dredging. However, it would be a significant project and cost to dredge out a portion of the lake.

Alternative 4C – Crystal Lake Modifications

To best utilize Crystal Lake would require a significant modification to the operation and appearance of the lake. This alternative would replace the lake's control structure and outfall to allow for the NWL in the lake to be elevation 10.0 feet. This would allow drainage from all of Seagate Village to be diverted to Crystal Lake and thus be detained in the large lake. The existing bottom elevation of Crystal Lake is unknown, but from visual observation, portions of the bottom are significantly higher than elevation 10.0. Thus a significant project would be required to increase the depth of the lake to accommodate this alternative.

This alternative significantly improves the peak water surface elevations downstream in the main channel (and some contributing systems). This alternative would eliminate the potential for structural flooding at the two locations up to and including the 100-year rainfall event.

Alternative 5 – Detention Ponds at Seagate Village

The common areas of Seagate Village allow for the opportunity to construct two wet detention ponds that could provide flood protection benefits while possibly providing an amenity to the adjacent residents. The ponds would include a 6.80-acre pond in the common area between Pelican Avenue and Mockingbird Street / Hemlock Avenue. A second 2.32-acre pond would be constructed on the common area between Sycamore Avenue and Walnut Avenue. The ponds NWL would be set to the invert of the large culverts under Spruce Drive. The control structures would be constructed immediately upstream (east) of Spruce Drive and outfall through the existing culverts under Spruce Drive.

This alternative improves the downstream peak water surface elevations moderately for all storm events; however, it will not totally eliminate the potential for structural flooding from the 100-year rainfall event.

Alternative 6 – Prestwick Pond Control Structure Modification

This alternative is the modification to the outfall control structure for the pond in Prestwick Phase 1 (located on the Prestwick Golf Course). The ponds NWL would be lowered to increase stormwater detention capacity and the outflow would be regulated to maximize detention in the pond. This alternative did not improve peak water surface elevations in the main channel and provides no flood protection benefit.

Post-Improvement Conditions ICPR Stormwater Model Results

The post-improvement conditions ICPR stormwater model were executed for the 2-, 10-, 25-, 50- and 100-year storm events. The results (maximum simulated water surface elevations) for each alternative are compared to the existing conditions in the attached tables. Refer to Exhibit 1 for the Existing Conditions ICPR Model Link-Node Schematic for the location of the nodes included in the tables.

The tables identify the nodes associated with structural flooding - MAIN-03 (Camper Country) and MAIN-07 (1284 and 1288 Strathmill Ct.) in yellow. Structural flooding is defined as the peak water surface elevation above the finished floor elevation. Structural flooding is also highlighted in yellow at the nodes if occurring for the scenario/event. Structural flooding occurs at MAIN-03 (Camper Country) at approximately elevation 13.31 and at MAIN-07 (1284 and 1288 Strathmill Ct.) at approximately elevation 13.43. For example, MAIN-03 (Camper Country) floods under existing conditions for the 100-year storm event (elevation 13.91) and MAIN-07 (1284 and 1288 Strathmill Ct.) floods under existing conditions for the 50-year event (elevation 13.44) and 100-year event (elevation 14.13). The garages of 1284 and 1288 Strathmill Ct. are significantly lower than their finished floor elevations, and this could be subject to flooding for smaller rainfall events.

The tables also identify improvement (decrease) in predicted peak water surface elevations from existing conditions at each node as well as potential increases in predicted water surface elevations. Improvements are marked in green, while increases in water surface elevations are marked in red. Only relatively large differences in water surface elevations are noted. Minor variances (i.e. +/- 0.1 ft.) are not highlighted in the tables.

ALTERNATIVE PROJECTS EVALUATION

The alternative project exhibits include information including contour elevations, existing utilities (generally buried water and sewer), edge of pavement, property lines, build footprints, and aerial photography. This information was used in refining the alternative concepts and also in developing the opinions of probable costs for the alternatives.

In addition to the ten alternatives discussed above, two additional alternatives local to the structural flooding on Strathmill Court were developed. These alternatives are discussed below.

Alternative 7 – Strathmill Court Drainage Diversion

This alternative would divert the local Strathmill Court drainage system to the main channel. This improvement would serve to improve the capacity of the drainage system to move local drainage to the main channel and bypass the relatively flat Strathmill Court area. The improvement would include a flap gate, which with the pipe improvements would help prevent the potential backup of stormwater in the low are between the berm along the main channel and the Strathmill Court residences.

Alternative 8 – Strathmill Court Flood Control System Improvements

The alternative would improve the existing Strathmill Court flood control system that was apparently constructed by the residents or other private entities. This alternative would include the raising (and strengthening) of the existing berm as well as the lengthening of the berm to tie to existing ground. The existing and proposed berm elevation would be 14.5 feet. This elevation is dictated by the predicted peak water surface elevation in the main channel (which is controlled by the elevation of the overtopping of US Highway 17 Business).

This alternative would also require the installation of various flap gates to control the back flow of water into the protected area. This would include various privately and publically owned drainage pipes. It should be noted that the construction methods of the existing berm and privately owned pipes is unknown and thus the structural soundness would have to be confirmed prior to being improved.

OPINION OF PROBABLE CONSTRUCTION COST

Individual opinions of probable construction cost were developed for each alternative. The opinions of probable construction cost are included at the end of this report and are summarized in the table below.

Alternative	Opinion of Probable Construction Cost	Note
Alternative: 1A - Hwy 17 Business Culvert Impr. and Channel Impr.	$ 815,000	
Alternative: 1B - Highway 17 Business Culvert Improvements	$ 393,000	
Alternative: 1C - Highway 17 Business Culvert Improvements	$ 229,000	
Alternative: 2A - Detention Pond at Catherine Drive	$ 671,000	
Alternative: 2B - Detention Pond at Catherine Drive	$ 750,000	
Alternative: 2C - Detention Pond at Catherine Drive	$ 541,000	
Alternative: 3 - Detention Pond at Lakeview Drive	$ 3,317,000	
Alternative: 4A - Crystal Lake Modification	$ 95,000	
Alternative: 4B - Crystal Lake Modification	$ 142,000	Lake dredging not included
Alternative: 4C - Crystal Lake Modification	$ 667,000	Lake dredging not included
Alternative: 5 - Detention Ponds at Seagate Village	$ 4,896,000	
Alternative: 6 - Prestwick Pond Control Structure Modification	$ 15,000	
Alternative: 7 - Strathmill Court Drainage Diversion	$ 148,000	
Alternative: 8 - Strathmill Court Flood Protection System Imp.	$ 110,000	

FINDINGS AND RECOMMENDATIONS

Based on the results of the proposed conditions ICPR modeling and the opinions of probable construction cost for Alternatives 2A, 2B, 2C, 3, 4B, 5, and 6, it appears that with the limited improvement in flooding conditions and the relatively high cost that these alternatives are not viable for implementation and thus are not considered further.

Only Alternatives 1A totally address the structural (including garage) flooding (up to the 100-yr rainfall event) reported and as identified by the existing conditions modeling. The other alternatives that had significant impact on flooding included Alternatives 1B, 1C and 4C. Alternative 4C's opinion of probable construction cost does not include a cost for the lake bottom excavation/dredging. This cost would be significant (approximately $1M to $3M), which

would render the alternative to be cost prohibitive. In addition, Alternative 4C would require a radical modification of the lakes operation (lower NWL by approximately 4.5 feet), which could be unacceptable to local residents.

Alternative 4A provides moderate improvement with a relatively inexpensive capital cost, but does not address structural flooding through the 100-yr rainfall event. Alternative 8 could address flooding at the Strathmill Court locations (up to the 100-year event), but would most likely need to be implemented by private entities, since most of the infrastructure is on private lands without a dedicated easement to a public entity.

It is recommended that the County pursue the implementation of Alternative 1A as a long term solution to structural flooding in the watershed and possibly implement Alternative 4A as an interim, partial solution to flooding the watershed.

Figures 1-2

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

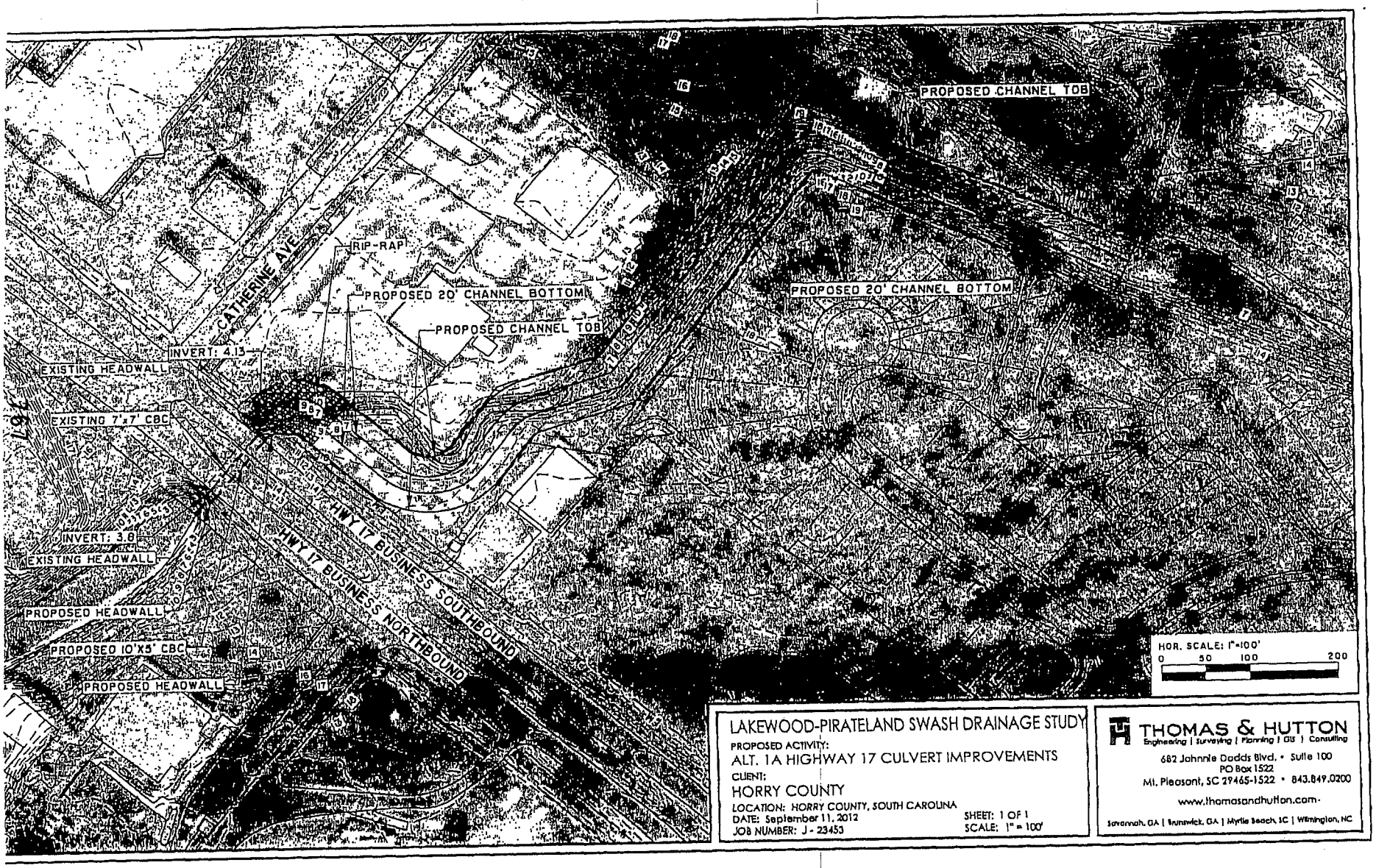
FIGURES

SEPTEMBER 18, 2012

J-23453.404

Prepared by:

THOMAS & HUTTON



LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

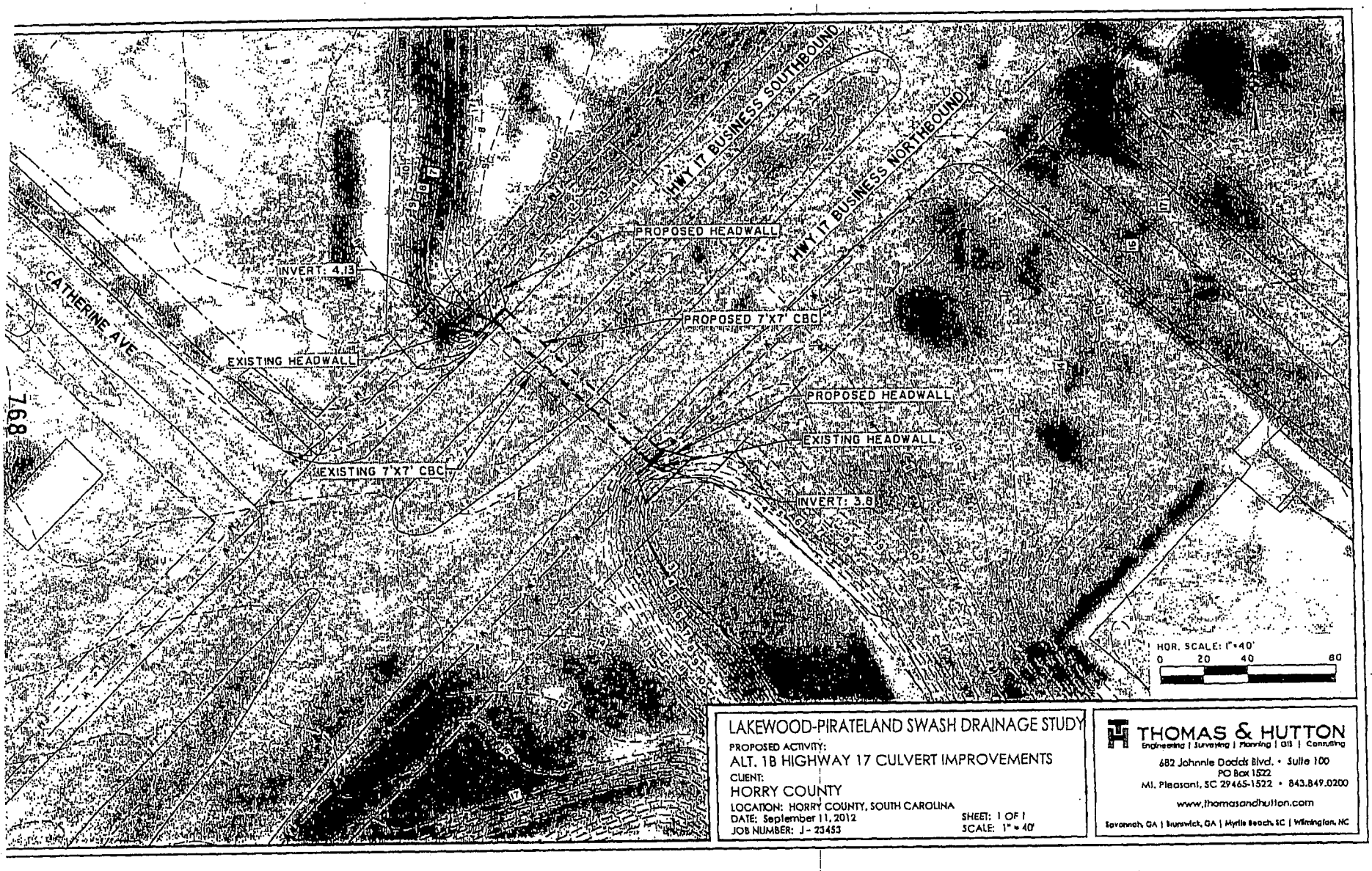
PROPOSED ACTIVITY:
ALT. 1A HIGHWAY 17 CULVERT IMPROVEMENTS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: September 11, 2012
JOB NUMBER: J - 23453

SHEET: 1 OF 1
SCALE: 1" = 100'

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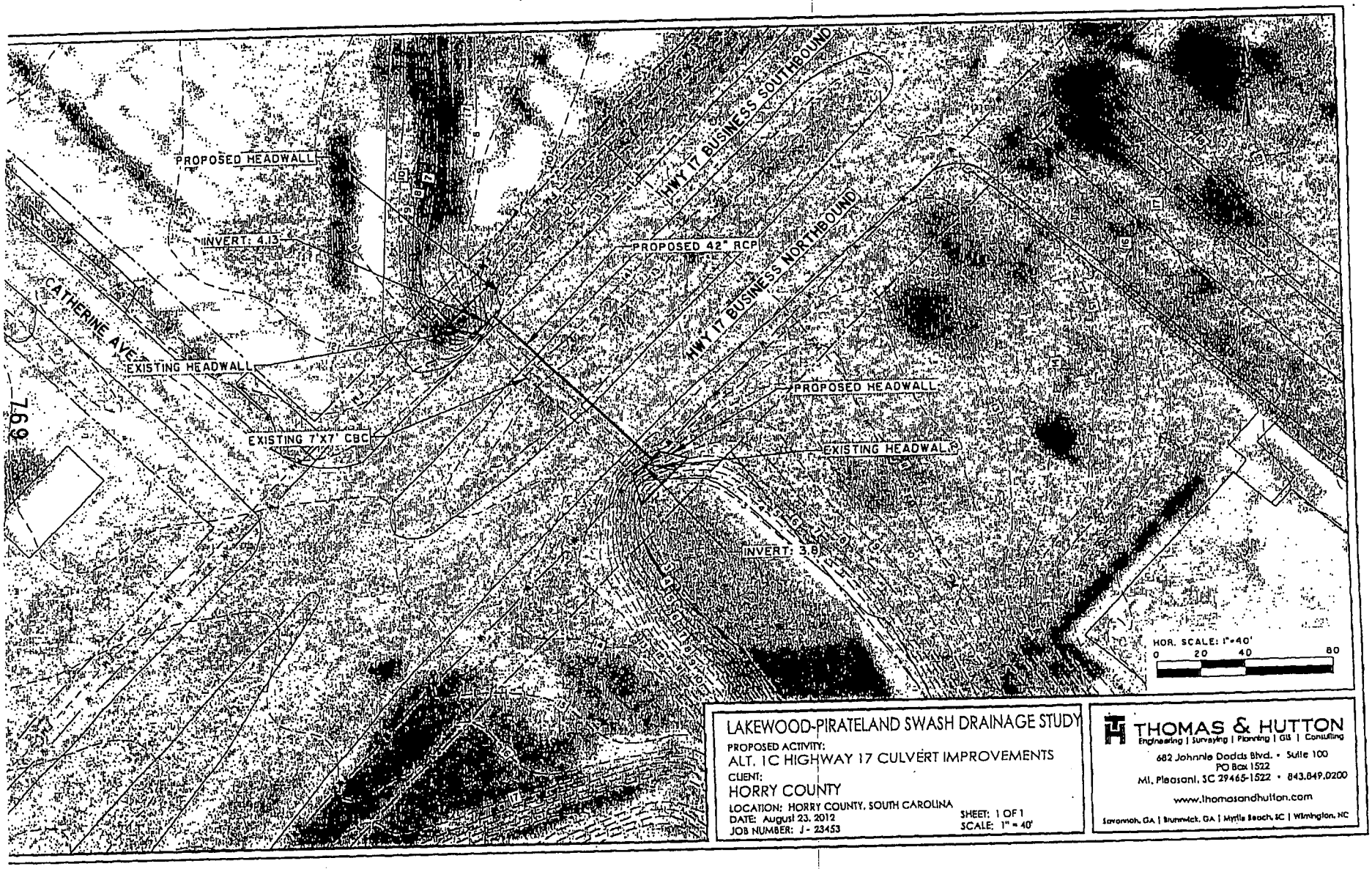
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 1B HIGHWAY 17 CULVERT IMPROVEMENTS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: September 11, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 40'

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LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

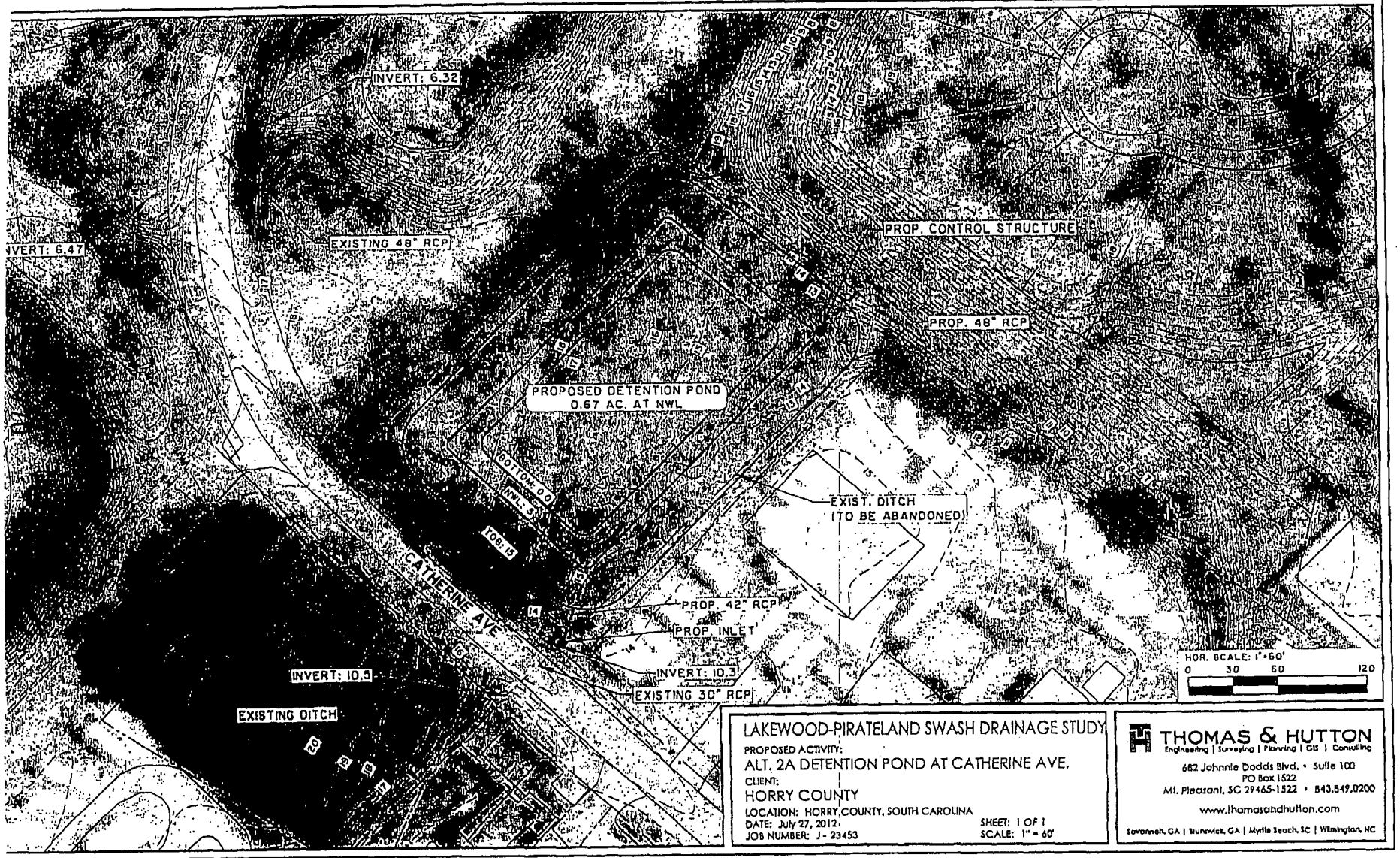
PROPOSED ACTIVITY:
ALT. 1C HIGHWAY 17 CULVERT IMPROVEMENTS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: August 23, 2012
JOB NUMBER: J - 23453

SHEET: 1 OF 1
SCALE: 1" = 40'

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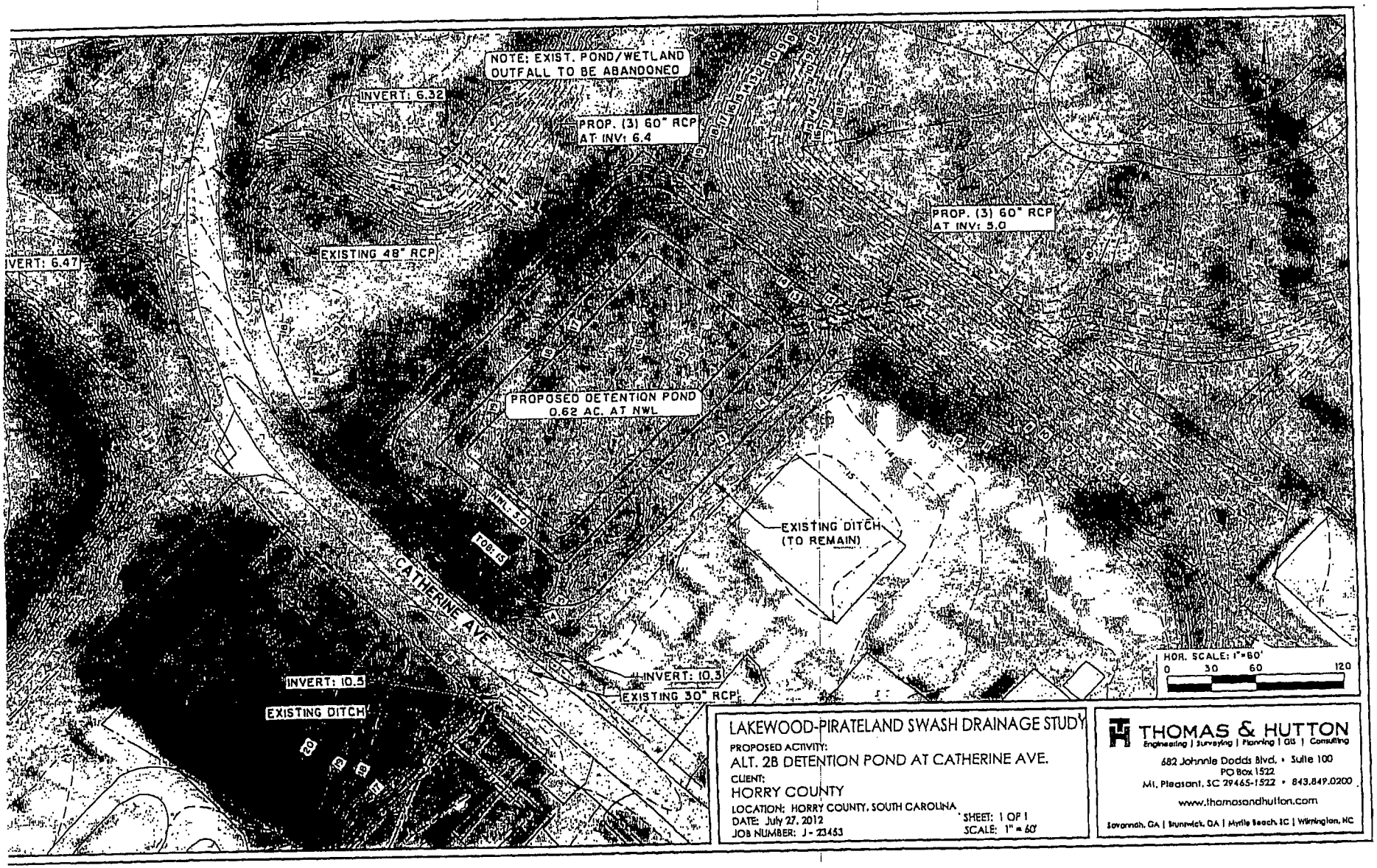
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 2A DETENTION POND AT CATHERINE AVE.

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 60'

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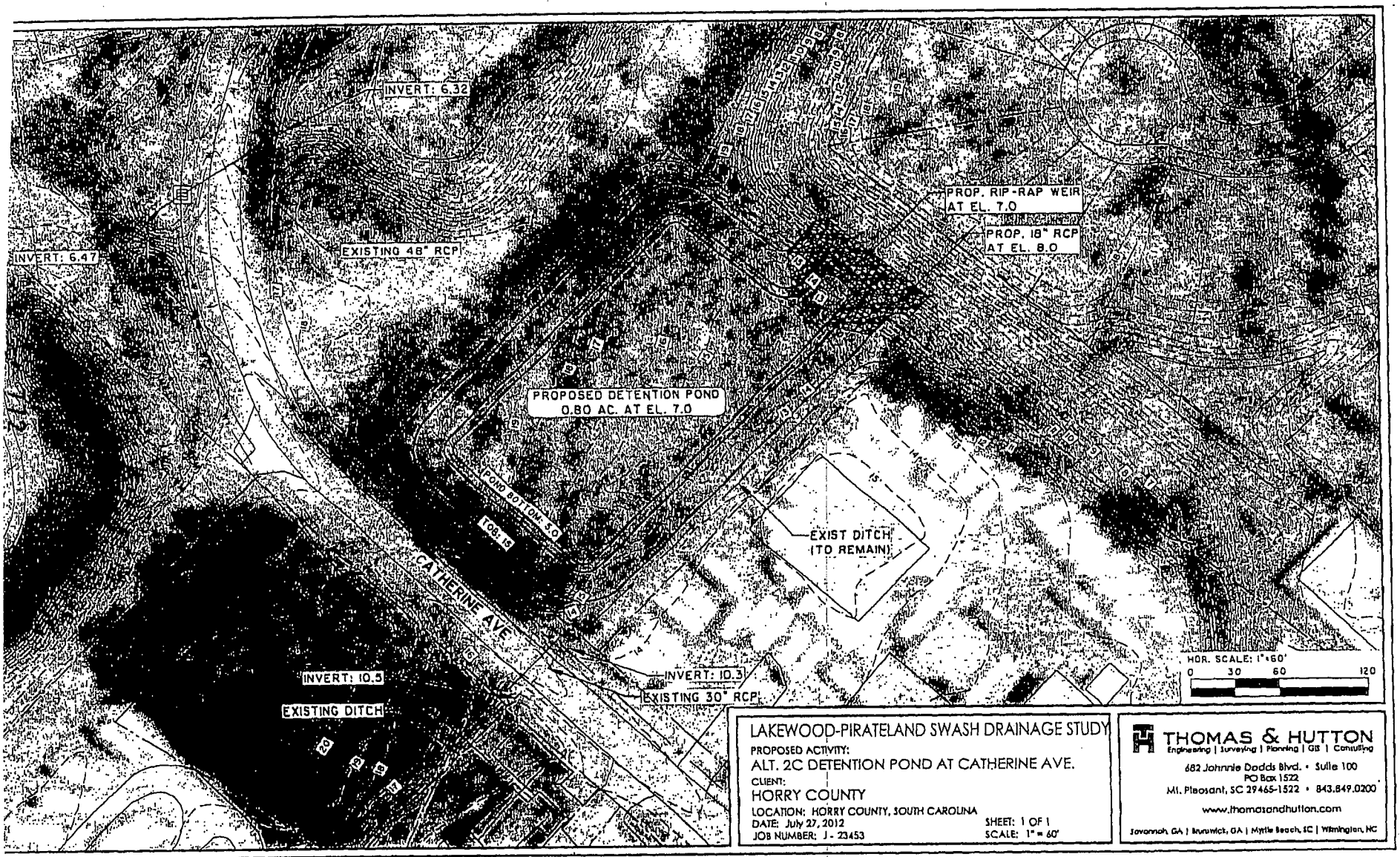
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 2B DETENTION POND AT CATHERINE AVE.

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 60'

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LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

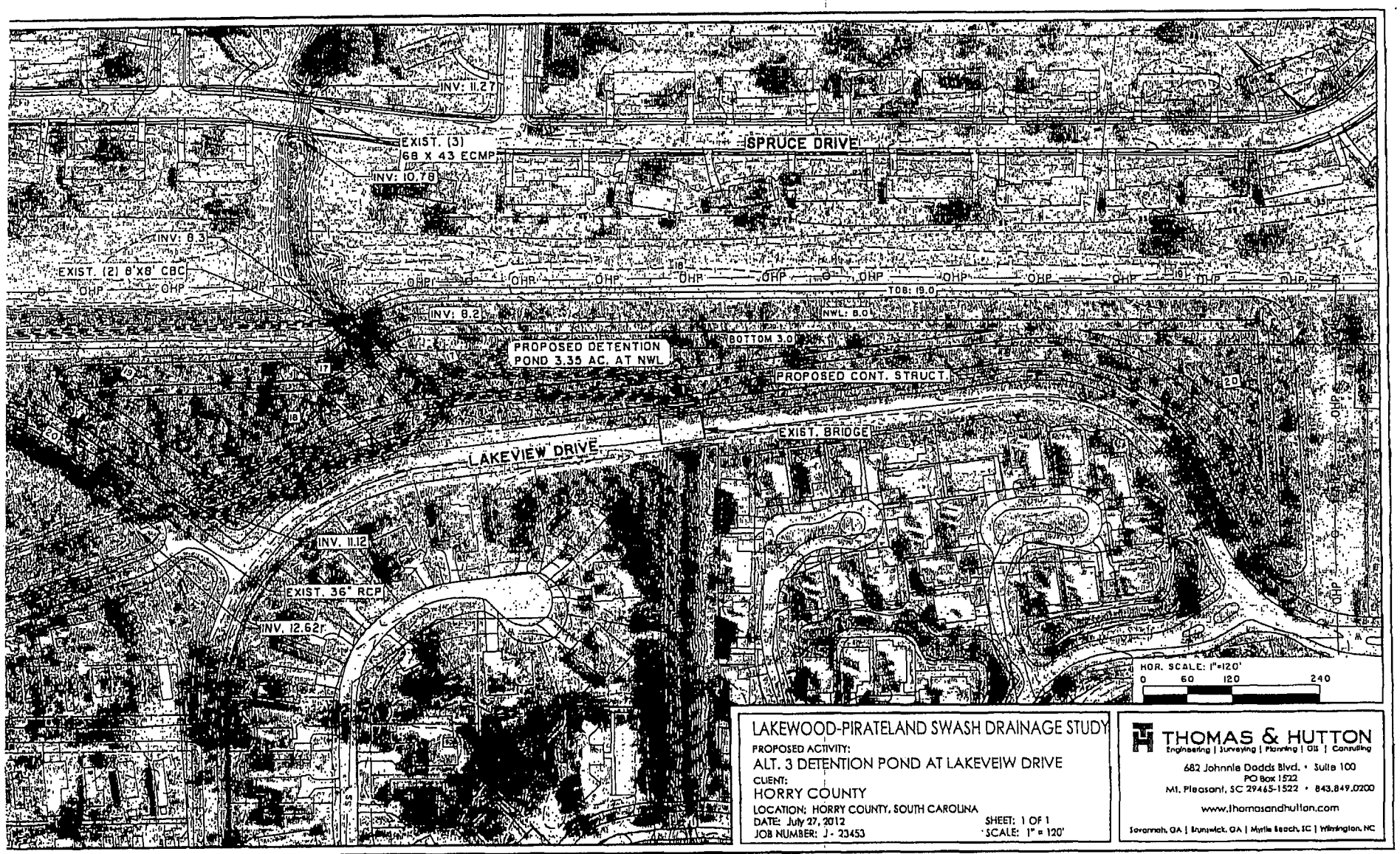
PROPOSED ACTIVITY:
ALT. 2C DETENTION POND AT CATHERINE AVE.

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 60'

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Figure 3



LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

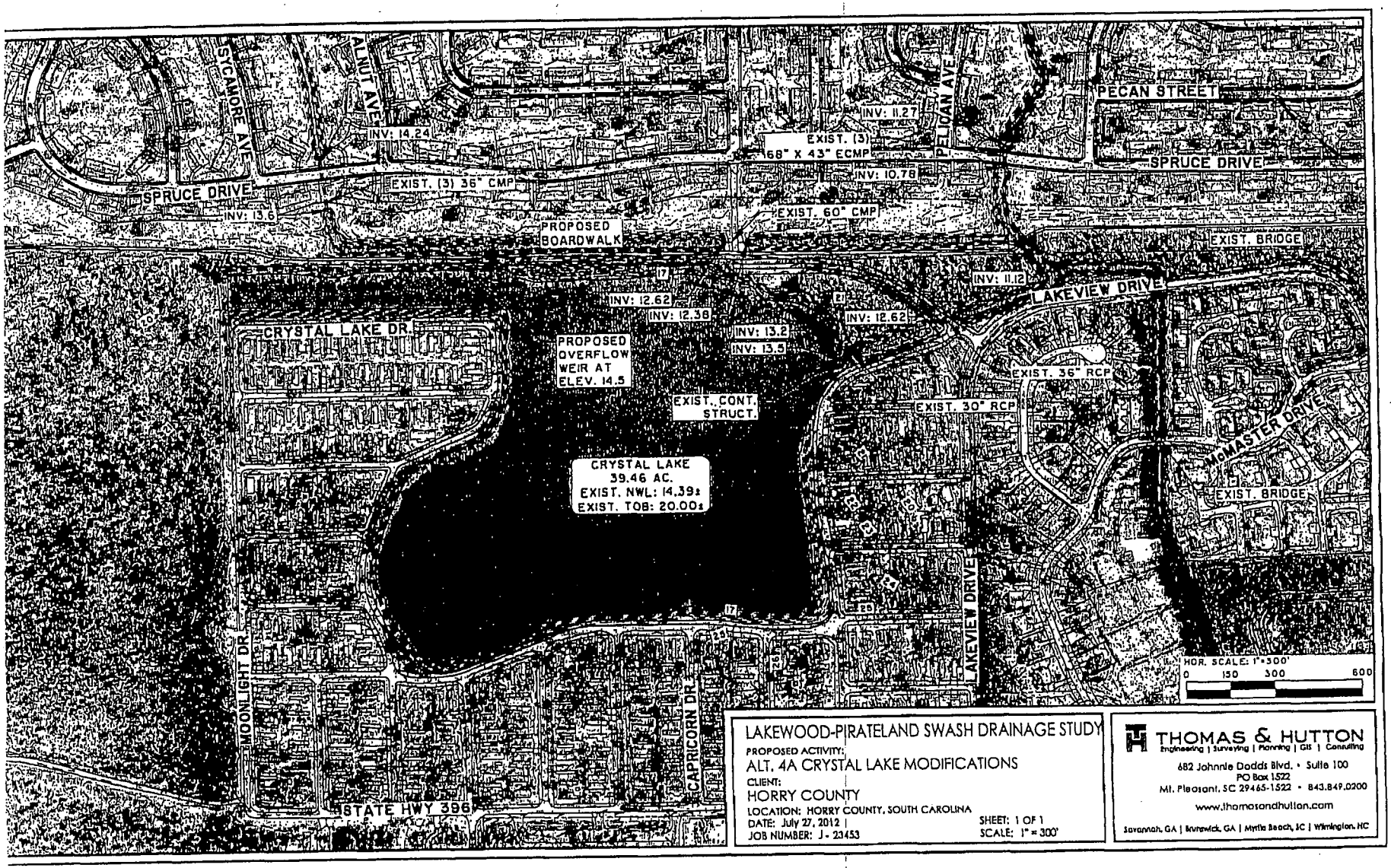
PROPOSED ACTIVITY:
ALT. 3 DETENTION POND AT LAKEVEIW DRIVE

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 120'

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Figure 4



LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

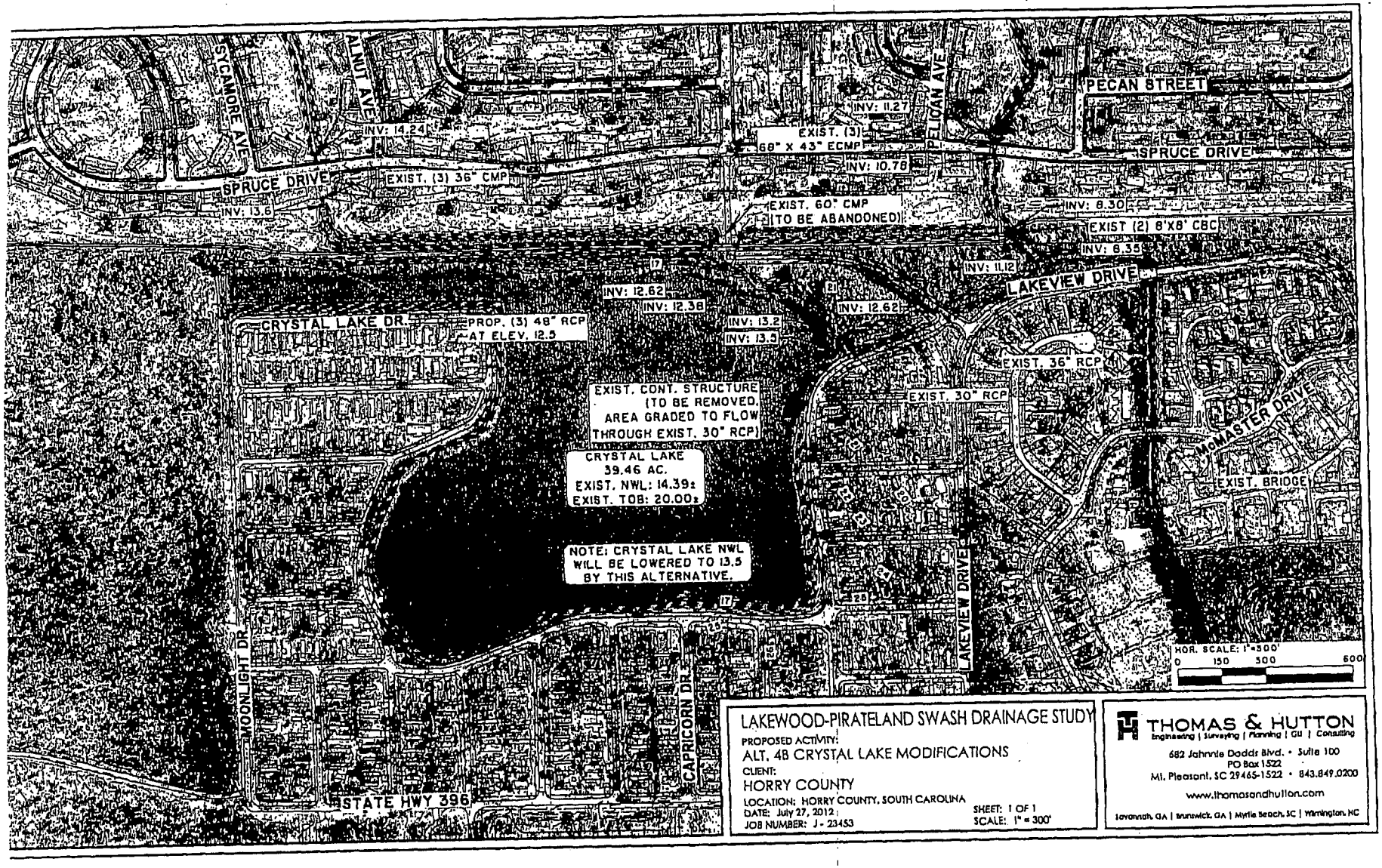
PROPOSED ACTIVITY:
ALT. 4A CRYSTAL LAKE MODIFICATIONS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453

SHEET: 1 OF 1
SCALE: 1" = 300'

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LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

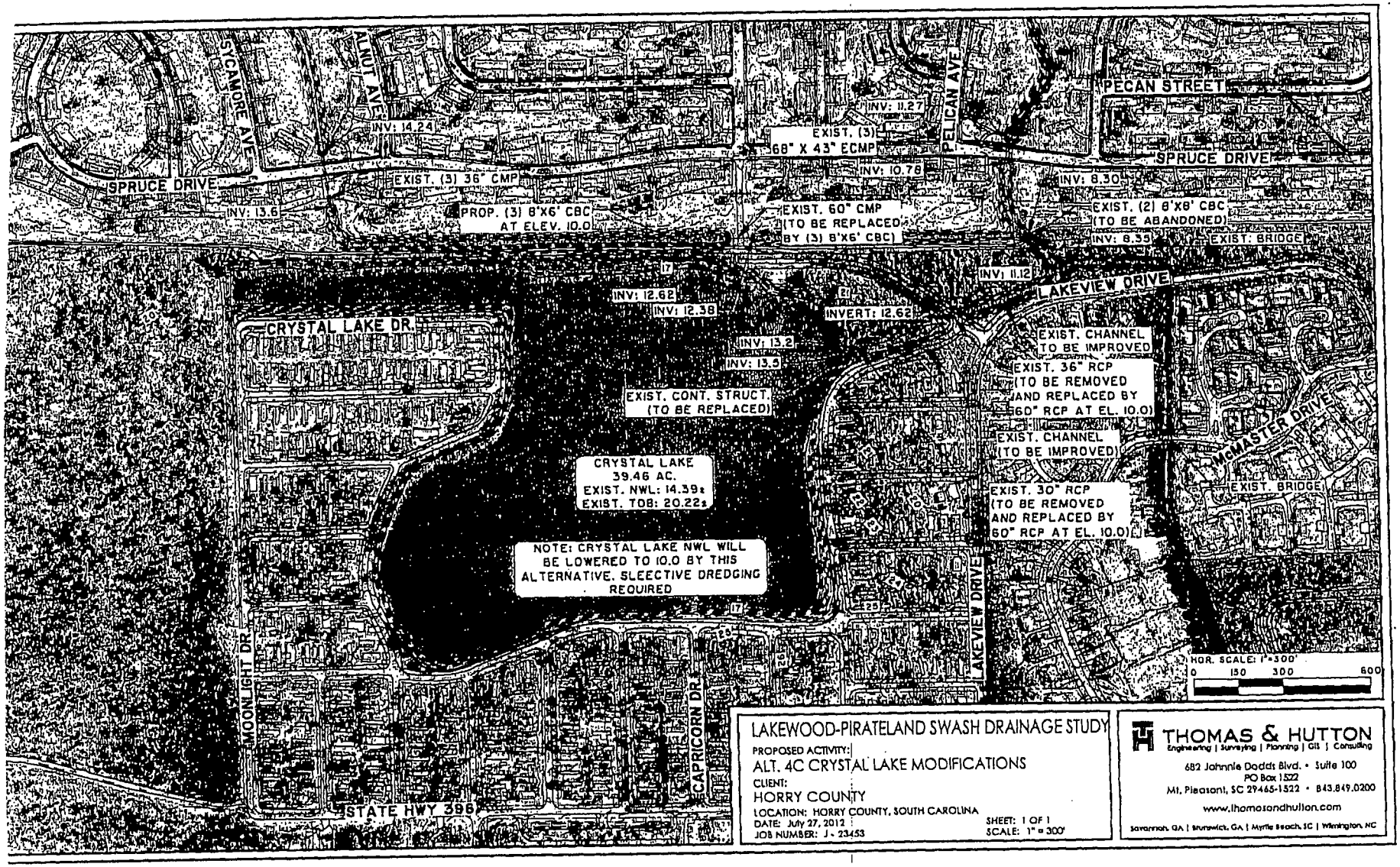
PROPOSED ACTIVITY:
ALT. 4B CRYSTAL LAKE MODIFICATIONS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453

SHEET: 1 OF 1
SCALE: 1" = 300'

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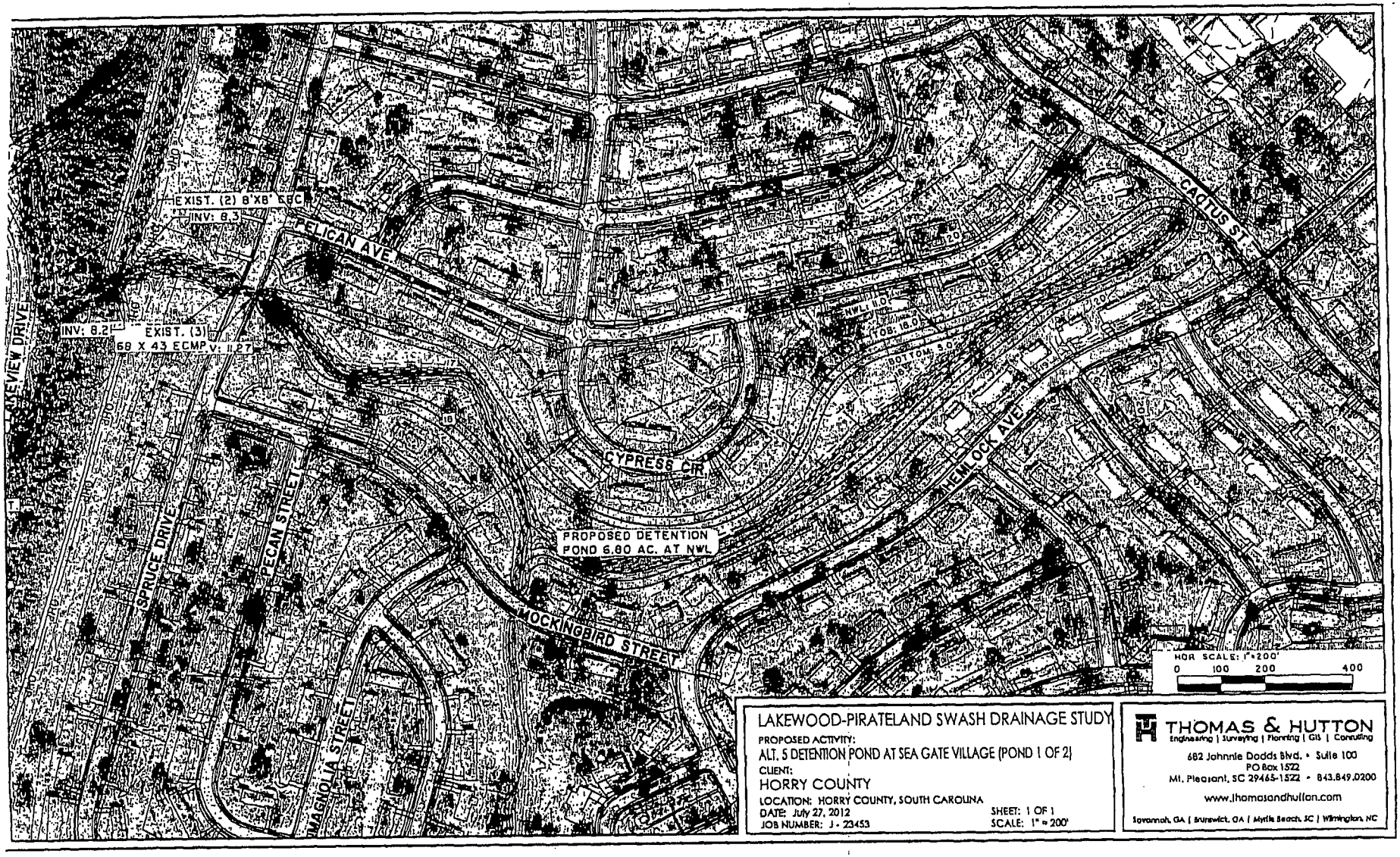
PROPOSED ACTIVITY:
ALT. 4C CRYSTAL LAKE MODIFICATIONS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 300'

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Figures 5-8



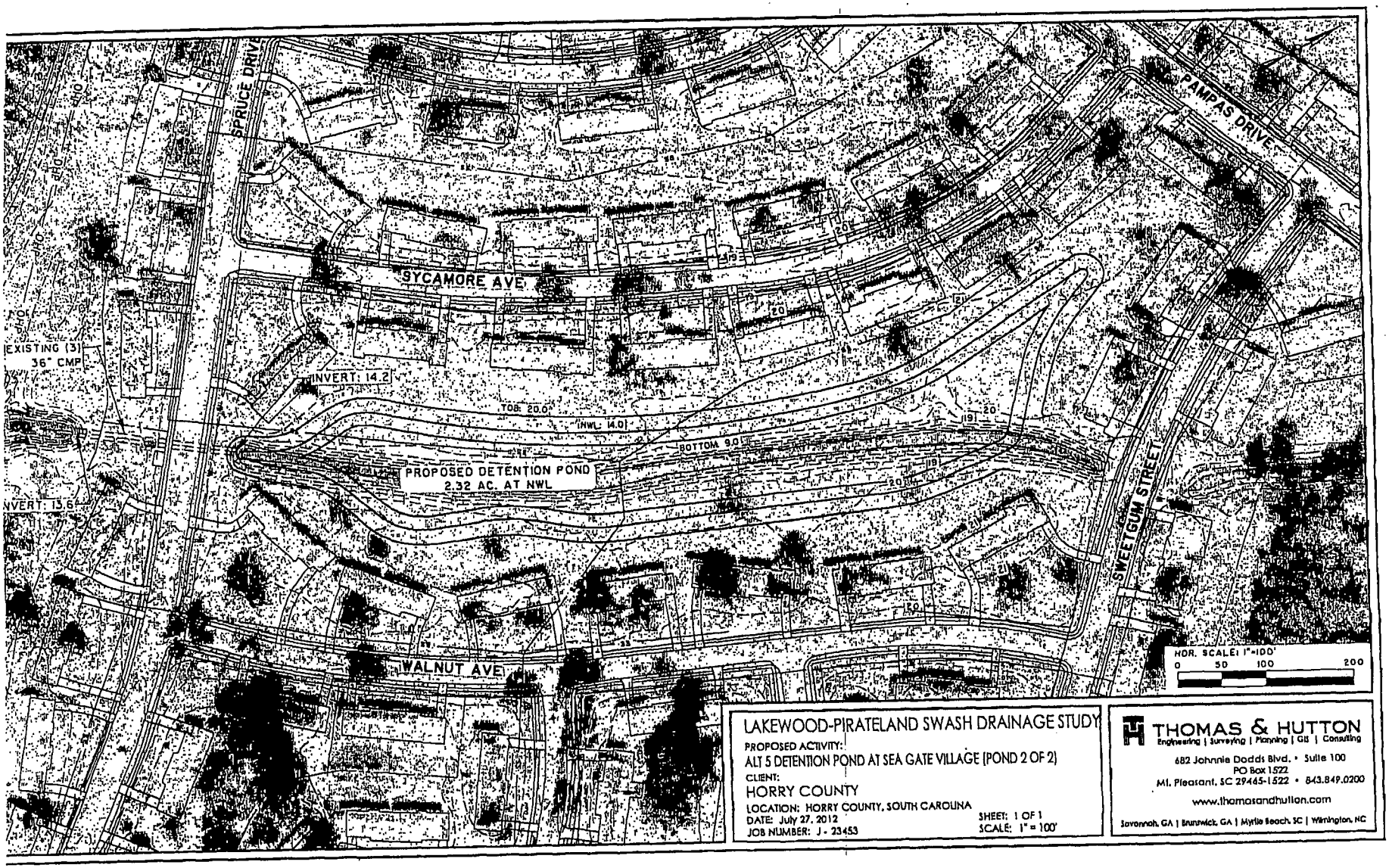
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 5 DETENTION POND AT SEA GATE VILLAGE (POND 1 OF 2)

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 200'

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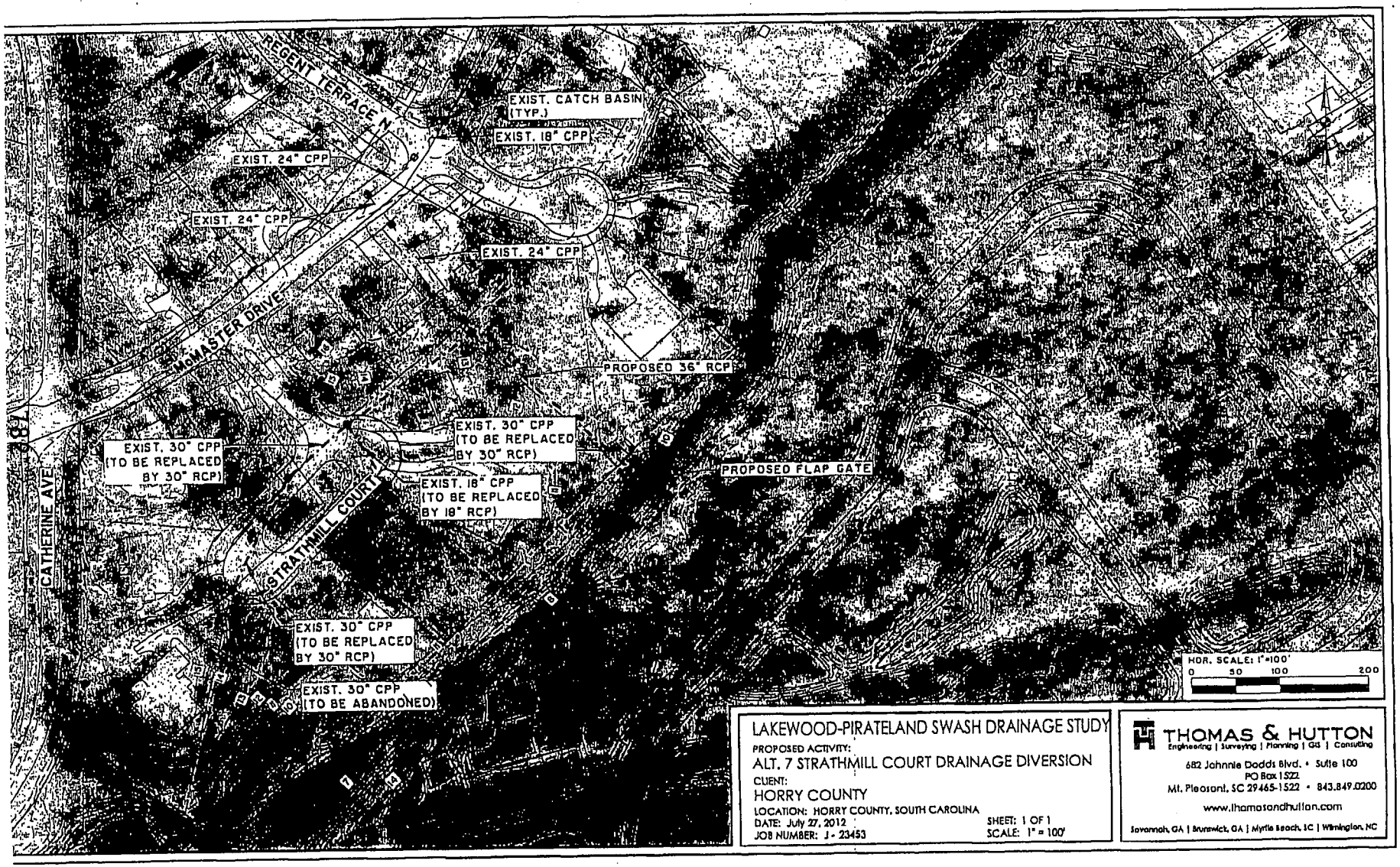
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT 5 DETENTION POND AT SEA GATE VILLAGE (POND 2 OF 2)

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 100'

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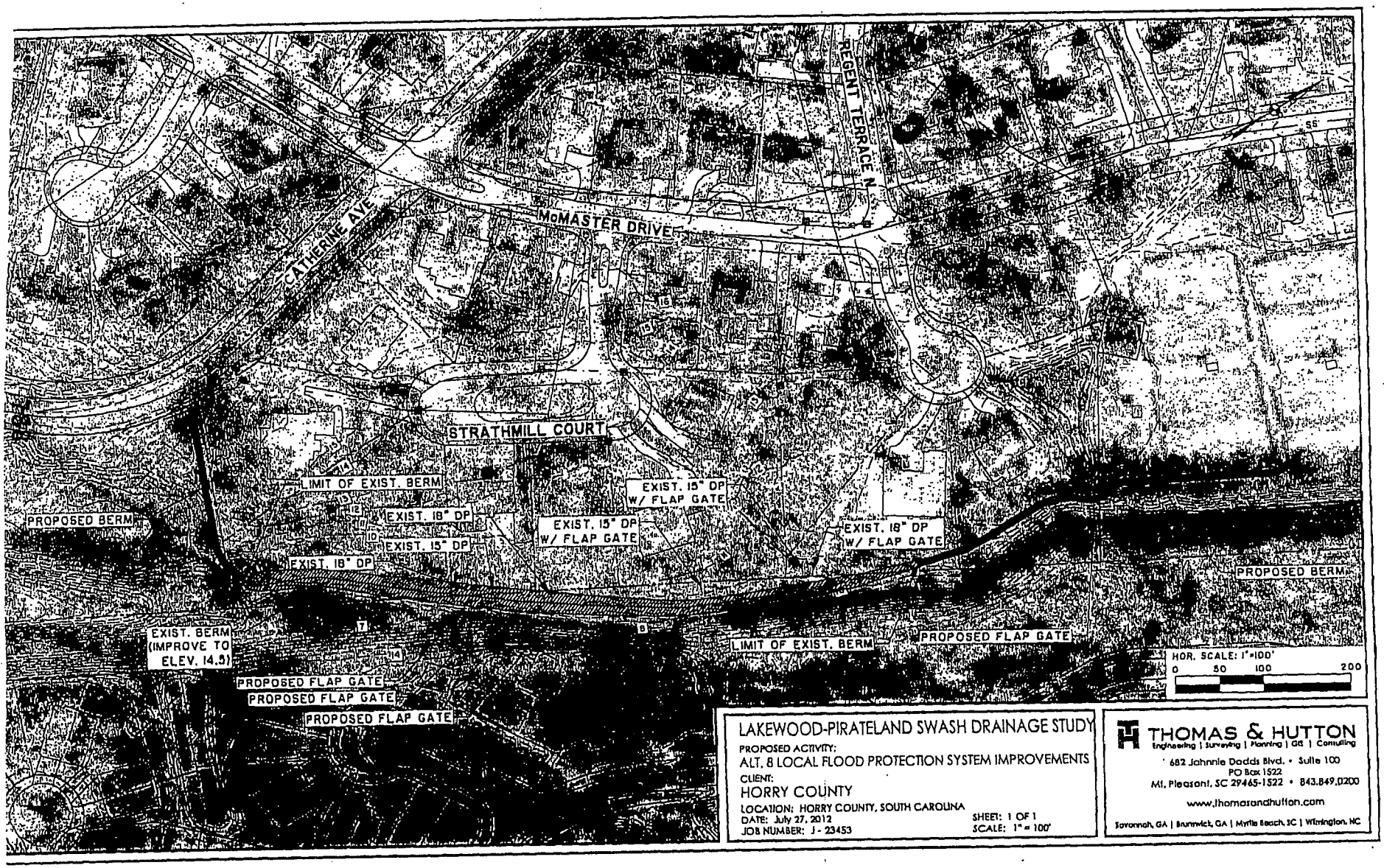
LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 7 STRATHMILL COURT DRAINAGE DIVERSION

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 100'

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LAKEWOOD-PIRATELAND SWASH DRAINAGE STUDY

PROPOSED ACTIVITY:
ALT. 8 LOCAL FLOOD PROTECTION SYSTEM IMPROVEMENTS

CLIENT:
HORRY COUNTY

LOCATION: HORRY COUNTY, SOUTH CAROLINA
DATE: July 27, 2012
JOB NUMBER: J - 23453
SHEET: 1 OF 1
SCALE: 1" = 100'

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SCANNED

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

TABLES

SEPTEMBER 18, 2012

J-23453.404

Prepared by:

THOMAS & HUTTON

Savannah, GA | Charleston, SC | Myrtle Beach, SC | Brunswick, GA | Wilmington, NC

Alternative 1A
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions 2	10	25	50	100	Alternative No. 1A 2	10	25	50	100	Difference 2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.86	12.96	13.33	13.78	14.27	-0.02	-0.19	-0.29	-0.32	-0.43
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.12	14.69	0.00	0.00	-0.04	-0.19	-0.29
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.43	14.93	0.00	0.00	-0.05	-0.12	-0.20
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.98	15.17	15.43	0.00	0.00	-0.04	-0.09	-0.19
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.52	15.00	0.00	0.00	-0.04	-0.09	-0.17
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.84	16.94	0.00	0.00	0.00	-0.01	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.30	9.69	9.92	10.44	10.95	-0.57	-2.40	-2.83	-2.99	-3.17
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.91	0.00	0.00	0.00	0.03	-0.16
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.61	12.73	13.10	13.55	14.03	-0.02	-0.26	-0.38	-0.43	-0.56
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.69	13.93	14.29	0.00	-0.01	-0.03	-0.14	-0.31
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.69	13.93	14.29	0.00	-0.01	-0.03	-0.14	-0.31
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.30	6.24	6.40	6.55	6.70	-0.01	0.06	0.10	0.15	0.21
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.63	6.85	7.15	7.50	0.00	0.04	0.07	0.09	0.10
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.74	4.47	4.98	5.42	5.79	-0.01	0.16	0.31	0.45	0.53
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.76	5.00	5.43	5.72	5.96	-0.01	0.11	0.25	0.29	0.34
MAIN-03	9.19	11.67	12.42	13.17	13.91	6.95	8.68	9.25	9.77	10.26	-2.24	-2.99	-3.17	-3.40	-3.65
MAIN-04	9.41	11.78	12.49	13.21	13.94	7.20	8.91	9.46	9.98	10.47	-2.21	-2.87	-3.03	-3.23	-3.47
MAIN-05	9.74	12.00	12.67	13.35	14.05	7.57	9.20	9.72	10.24	10.74	-2.17	-2.80	-2.95	-3.11	-3.31
MAIN-06	9.87	12.09	12.75	13.43	14.12	7.81	9.40	9.91	10.43	10.93	-2.06	-2.69	-2.84	-3.00	-3.19
MAIN-07	9.97	12.12	12.77	13.44	14.13	8.36	9.90	10.36	10.84	11.31	-1.61	-2.22	-2.41	-2.60	-2.82
MAIN-07A	10.07	12.16	12.79	13.45	14.13	8.91	10.35	10.77	11.23	11.67	-1.16	-1.81	-2.02	-2.22	-2.44
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.32	10.68	11.10	11.56	12.00	-0.84	-1.53	-1.72	-1.91	-2.15
MAIN-08A	10.32	12.33	12.93	13.55	14.21	9.69	11.16	11.61	12.10	12.56	-0.63	-1.17	-1.32	-1.45	-1.65
MAIN-09	10.39	12.38	12.98	13.59	14.24	9.82	11.32	11.78	12.28	12.77	-0.57	-1.06	-1.20	-1.31	-1.47
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.11	11.54	11.99	12.49	12.97	-0.41	-0.91	-1.05	-1.14	-1.35
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.20	11.61	12.05	12.54	13.03	-0.36	-0.86	-1.01	-1.15	-1.27
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.42	11.80	12.23	12.72	13.22	-0.26	-0.74	-0.89	-1.00	-1.17
MAIN-13	11.08	12.70	13.24	13.81	14.45	10.96	12.22	12.60	13.05	13.53	-0.12	-0.48	-0.64	-0.76	-0.92
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.00	12.26	12.64	13.09	13.58	-0.12	-0.46	-0.62	-0.73	-0.89
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.61	12.73	13.10	13.54	14.02	-0.02	-0.26	-0.38	-0.44	-0.56
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.65	12.77	13.15	13.59	14.07	-0.02	-0.25	-0.36	-0.41	-0.59
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.68	12.84	13.22	13.68	14.18	-0.02	-0.23	-0.34	-0.38	-0.50
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.22	13.51	13.89	14.31	0.00	-0.15	-0.27	-0.32	-0.47
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.55	13.82	14.13	14.47	0.00	-0.09	-0.18	-0.26	-0.43
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.60	5.11	5.61	5.87	0.00	-0.02	-0.03	-0.04	-0.01
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.26	6.22	6.38	6.53	6.69	-0.01	0.05	0.09	0.15	0.21
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.33	6.69	7.14	7.55	7.90	-0.01	0.12	0.29	0.42	0.49
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.79	0.00	0.00	0.00	0.01	-0.02
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	11.61	12.02	12.76	13.50	0.00	-0.93	-1.24	-1.10	-0.66
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.67	10.06	10.24	10.59	11.05	-0.33	-2.07	-2.55	-2.88	-3.12
PW-02	10.15	12.29	13.00	13.90	14.83	9.89	10.59	10.88	11.53	12.20	-0.26	-1.70	-2.12	-2.37	-2.63
PW-03	10.49	12.33	13.03	13.92	14.85	10.38	10.98	11.24	11.79	12.38	-0.11	-1.35	-1.79	-2.13	-2.47
PW-05	10.10	12.43	13.16	13.94	14.63	9.78	10.36	10.61	11.06	11.62	-0.32	-2.07	-2.55	-2.88	-3.01
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.64	14.75	14.89	0.00	-0.07	-0.54	-1.67	-2.17
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.76	14.86	15.01	0.00	-0.07	-0.51	-1.62	-2.10
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.49	0.00	0.00	0.00	0.07	-0.26
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.39	0.00	0.00	0.00	0.02	-0.05
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.41	0.00	0.00	0.00	0.02	-0.05
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.19	12.31	12.36	12.37	0.00	-0.02	-0.43	-0.94	-1.58
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.75	0.00	0.00	0.00	-0.06	-0.03
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.62	0.00	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Notes: MAIN-03 FF El. of Camper County = 13.31
MAIN-07 FF El. of 1284/1288 Stratmil Ct. = 13.43; Min Garage El. (1284 Stratmil Ct.) = 11.47

Alternative 1B
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions 2	Existing Conditions 10	Existing Conditions 25	Existing Conditions 50	Existing Conditions 100	Alternative No. 1B 2	Alternative No. 1B 10	Alternative No. 1B 25	Alternative No. 1B 50	Alternative No. 1B 100	Difference 2	Difference 10	Difference 25	Difference 50	Difference 100
AF-01	11.88	13.15	13.42	14.10	14.70	11.87	13.03	13.42	13.88	14.35	-0.01	-0.12	-0.00	-0.22	-0.35
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.18	14.77	0.00	0.00	-0.04	-0.13	-0.21
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.47	14.99	0.00	0.00	-0.05	-0.08	-0.14
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.99	15.20	15.47	0.00	0.00	-0.03	-0.06	-0.15
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.55	15.05	0.00	0.00	-0.04	-0.06	-0.12
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.84	16.94	0.00	0.00	0.00	-0.01	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.34	10.88	11.41	11.94	12.44	-0.53	-1.21	-1.34	-1.49	-1.68
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.91	0.00	0.00	0.00	0.03	-0.16
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.63	12.82	13.21	13.67	14.14	0.00	-0.17	-0.27	-0.31	-0.45
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.70	13.97	14.28	0.00	0.00	-0.02	-0.10	-0.32
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.70	13.97	14.28	0.00	0.00	-0.02	-0.10	-0.32
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.29	6.23	6.39	6.52	6.66	-0.02	0.05	0.09	0.12	0.17
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.62	6.84	7.13	7.48	0.00	0.03	0.06	0.07	0.08
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.74	4.46	4.93	5.34	5.71	-0.01	0.15	0.26	0.37	0.45
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.76	5.00	5.40	5.68	5.91	-0.01	0.11	0.22	0.25	0.29
MAIN-03	9.19	11.67	12.42	13.17	13.91	7.35	9.20	9.78	10.41	11.00	-1.84	-2.47	-2.64	-2.76	-2.91
MAIN-04	9.41	11.78	12.49	13.21	13.94	8.32	9.93	10.52	11.06	11.53	-1.09	-1.85	-1.97	-2.15	-2.41
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.09	10.62	11.15	11.68	12.18	-0.65	-1.38	-1.52	-1.67	-1.87
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.34	10.87	11.40	11.94	12.44	-0.53	-1.22	-1.35	-1.49	-1.68
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.50	11.02	11.53	12.04	12.52	-0.47	-1.10	-1.24	-1.40	-1.61
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.68	11.18	11.65	12.14	12.60	-0.39	-0.98	-1.14	-1.31	-1.53
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.83	11.34	11.80	12.28	12.71	-0.33	-0.87	-1.02	-1.19	-1.44
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.07	11.64	12.10	12.58	13.02	-0.25	-0.69	-0.83	-0.97	-1.19
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.15	11.75	12.22	12.71	13.16	-0.24	-0.63	-0.76	-0.88	-1.08
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.34	11.90	12.36	12.85	13.30	-0.18	-0.55	-0.68	-0.78	-1.02
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.40	11.94	12.40	12.89	13.34	-0.16	-0.53	-0.66	-0.80	-0.96
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.57	12.08	12.53	13.02	13.48	-0.11	-0.46	-0.59	-0.70	-0.91
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.03	12.38	12.79	13.26	13.72	-0.05	-0.32	-0.45	-0.55	-0.73
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.07	12.42	12.83	13.30	13.76	-0.05	-0.30	-0.43	-0.52	-0.71
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.63	12.82	13.21	13.67	14.14	0.00	-0.17	-0.27	-0.31	-0.44
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.66	12.86	13.25	13.71	14.17	-0.01	-0.16	-0.26	-0.29	-0.49
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.70	12.92	13.32	13.80	14.27	0.00	-0.15	-0.24	-0.26	-0.41
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.27	13.59	13.99	14.40	0.00	-0.10	-0.19	-0.22	-0.38
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.58	13.88	14.20	14.56	0.00	-0.06	-0.12	-0.19	-0.34
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.60	5.12	5.61	5.87	0.00	-0.02	-0.02	-0.04	-0.01
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.26	6.22	6.37	6.50	6.64	-0.01	0.05	0.08	0.12	0.16
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.33	6.69	7.10	7.48	7.79	-0.01	0.12	0.25	0.35	0.38
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.78	0.00	0.00	0.00	0.01	-0.03
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	11.90	12.58	13.31	13.87	0.00	-0.64	-0.68	-0.55	-0.29
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.72	10.96	11.47	12.00	12.50	-0.28	-1.17	-1.32	-1.47	-1.67
PW-02	10.15	12.29	13.00	13.90	14.83	9.93	11.19	11.71	12.29	13.14	-0.22	-1.10	-1.29	-1.61	-1.69
PW-03	10.49	12.33	13.03	13.92	14.85	10.40	11.36	11.82	12.39	13.21	-0.09	-0.97	-1.21	-1.53	-1.64
PW-05	10.10	12.43	13.16	13.94	14.63	9.84	11.25	11.84	12.45	13.01	-0.25	-1.18	-1.32	-1.49	-1.62
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.64	14.87	15.88	0.00	-0.07	-0.54	-1.55	-1.18
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.75	14.97	15.95	0.00	-0.07	-0.52	-1.51	-1.16
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.48	0.00	0.00	0.00	0.07	-0.27
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.38	0.00	0.00	0.00	0.02	-0.06
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.40	0.00	0.00	0.00	0.02	-0.06
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.13	12.21	12.23	12.40	0.00	-0.08	-0.53	-1.07	-1.55
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.75	0.00	0.00	0.00	-0.06	-0.03
STOR-05	16.67	19.10	19.91	20.70	21.57	16.68	19.10	19.91	20.70	21.56	0.01	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.67	19.11	19.93	20.74	21.61	-0.01	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Notes: MAIN-03 FF El. of Camper County = 13.31
MAIN-07 FF El. of 1284/1288 Stratmill Ct. = 13.43; Min Garage El. (1284 Stratmill Ct.) = 11.47

Alternative 1C
Maximum Node Elevation Comparison

Node	Scenario / Event										Difference				
	Existing Conditions					Alternative No. 1C									
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.87	13.06	13.47	13.95	14.43	-0.01	-0.09	-0.15	-0.15	-0.27
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.22	14.82	0.00	0.00	-0.04	-0.09	-0.16
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.50	15.02	0.00	0.00	-0.05	-0.05	-0.11
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.00	15.22	15.52	0.00	0.00	-0.02	-0.04	-0.10
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.58	15.08	0.00	0.00	-0.04	-0.03	-0.09
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.50	11.38	12.01	12.66	13.33	-0.37	-0.71	-0.74	-0.77	-0.79
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.89	0.00	0.00	0.00	0.03	-0.18
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.63	12.86	13.28	13.76	14.25	0.00	-0.13	-0.20	-0.22	-0.34
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	13.99	14.28	0.00	0.00	-0.01	-0.08	-0.32
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	13.99	14.28	0.00	0.00	-0.01	-0.08	-0.32
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.30	6.22	6.35	6.46	6.57	-0.01	0.04	0.05	0.06	0.08
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.61	6.82	7.10	7.44	0.00	0.02	0.04	0.04	0.04
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.74	4.42	4.83	5.17	5.48	-0.01	0.11	0.16	0.20	0.22
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.76	4.97	5.33	5.56	5.76	-0.01	0.08	0.15	0.13	0.14
MAIN-03	9.19	11.67	12.42	13.17	13.91	8.23	10.49	11.28	12.03	12.87	-0.96	-1.18	-1.14	-1.14	-1.04
MAIN-04	9.41	11.78	12.49	13.21	13.94	8.72	10.81	11.49	12.20	12.96	-0.69	-0.97	-1.00	-1.01	-0.98
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.30	11.21	11.85	12.52	13.20	-0.44	-0.79	-0.82	-0.83	-0.85
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.50	11.38	12.00	12.65	13.33	-0.37	-0.71	-0.75	-0.78	-0.79
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.64	11.46	12.06	12.69	13.35	-0.33	-0.66	-0.71	-0.75	-0.78
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.79	11.56	12.13	12.73	13.37	-0.28	-0.60	-0.66	-0.72	-0.76
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.92	11.66	12.22	12.78	13.41	-0.24	-0.55	-0.60	-0.69	-0.74
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.13	11.88	12.41	12.95	13.54	-0.19	-0.45	-0.52	-0.60	-0.67
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.21	11.97	12.50	13.03	13.61	-0.18	-0.41	-0.48	-0.56	-0.63
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.39	12.09	12.61	13.13	13.68	-0.13	-0.36	-0.43	-0.50	-0.64
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.44	12.12	12.64	13.15	13.70	-0.12	-0.35	-0.42	-0.54	-0.60
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.59	12.23	12.73	13.24	13.78	-0.09	-0.31	-0.39	-0.48	-0.61
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.04	12.48	12.93	13.43	13.94	-0.04	-0.22	-0.31	-0.38	-0.51
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.08	12.51	12.96	13.45	13.97	-0.04	-0.21	-0.30	-0.37	-0.50
MAIN-15	11.43	12.99	13.48	13.98	14.58	11.43	12.86	13.28	13.76	14.25	0.00	-0.13	-0.20	-0.22	-0.33
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.67	12.90	13.32	13.80	14.28	0.00	-0.12	-0.19	-0.20	-0.38
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.70	12.96	13.38	13.87	14.36	0.00	-0.11	-0.18	-0.19	-0.32
MAIN-18	12.49	13.37	13.78	14.23	14.78	12.49	13.30	13.65	14.06	14.50	0.00	-0.07	-0.13	-0.15	-0.28
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.60	13.92	14.26	14.66	0.00	-0.04	-0.08	-0.13	-0.24
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.61	5.12	5.63	5.88	0.00	-0.01	-0.02	-0.02	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.26	6.21	6.34	6.44	6.55	-0.01	0.04	0.05	0.06	0.07
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.33	6.65	7.00	7.32	7.59	-0.01	0.08	0.15	0.19	0.18
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.78	0.00	0.00	0.00	0.01	-0.03
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.12	12.83	13.57	13.95	0.00	-0.42	-0.43	-0.29	-0.21
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.78	11.44	12.05	12.71	13.39	-0.22	-0.69	-0.74	-0.76	-0.78
PW-02	10.15	12.29	13.00	13.90	14.83	9.97	11.63	12.26	13.12	14.09	-0.18	-0.66	-0.74	-0.78	-0.74
PW-03	10.49	12.33	13.03	13.92	14.85	10.41	11.72	12.31	13.16	14.12	-0.08	-0.61	-0.72	-0.76	-0.73
PW-05	10.10	12.43	13.16	13.94	14.63	9.90	11.73	12.43	13.15	13.90	-0.20	-0.70	-0.73	-0.79	-0.73
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.75	15.55	16.62	0.00	-0.07	-0.43	-0.87	-0.44
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.86	15.62	16.67	0.00	-0.07	-0.41	-0.84	-0.44
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.50	0.00	0.00	0.00	0.07	-0.25
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.38	0.00	0.00	0.00	0.02	-0.06
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.40	0.00	0.00	0.00	0.02	-0.06
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.07	12.21	12.43	13.11	0.00	-0.14	-0.53	-0.87	-0.84
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.77	0.00	0.00	0.00	-0.06	-0.01
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.61	0.00	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.63	0.00	0.00	0.00	0.01	-0.01

Notes: MAIN-03 FF El. of Camper County = 13.31
MAIN-07 FF El. of 1284/1288 Stratmill Ct. = 13.43; Min Garage El. (1284 Stratmill Ct.) = 11.47

Alternative 2A
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions					Alternative No. 2a					Difference				
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.87	13.08	13.55	14.03	14.63	-0.01	-0.07	-0.07	-0.07	-0.07
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.25	14.85	0.00	0.00	-0.04	-0.06	-0.13
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.07	14.51	15.04	0.00	0.00	-0.04	-0.04	-0.09
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.01	15.25	15.56	0.00	0.00	-0.01	-0.01	-0.06
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.16	14.59	15.10	0.00	0.00	-0.03	-0.02	-0.07
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
Alt2-Pond						9.57	12.19	12.63	13.29	13.88	n/a	n/a	n/a	n/a	n/a
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	13.11	13.85	0.00	0.00	0.00	-0.10	-0.09
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.73	11.94	12.65	13.33	14.04	-0.14	-0.15	-0.10	-0.10	-0.08
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.57	16.05	0.00	0.00	0.00	0.00	-0.02
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.83	0.00	0.00	0.00	0.00	0.00
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.63	12.91	13.40	13.90	14.51	0.00	-0.08	-0.08	-0.08	-0.08
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.02	14.52	0.00	0.00	-0.01	-0.05	-0.08
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.03	14.52	0.00	0.00	-0.01	-0.04	-0.08
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.27	6.16	6.29	6.39	6.48	-0.04	-0.02	-0.01	-0.01	-0.01
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.76	7.04	7.38	0.00	0.00	-0.02	-0.02	-0.02
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.72	4.25	4.62	4.93	5.23	-0.03	-0.06	-0.05	-0.04	-0.03
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.74	4.85	5.13	5.40	5.60	-0.03	-0.04	-0.05	-0.03	-0.02
MAIN-03	9.19	11.67	12.42	13.17	13.91	8.99	11.50	12.30	13.06	13.82	-0.20	-0.17	-0.12	-0.11	-0.09
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.22	11.62	12.38	13.11	13.85	-0.19	-0.16	-0.11	-0.10	-0.09
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.58	11.84	12.56	13.26	13.97	-0.16	-0.16	-0.11	-0.09	-0.08
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.73	11.93	12.65	13.33	14.04	-0.14	-0.16	-0.10	-0.10	-0.08
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.82	11.97	12.67	13.35	14.05	-0.15	-0.15	-0.10	-0.09	-0.08
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.93	12.01	12.69	13.36	14.05	-0.14	-0.15	-0.10	-0.09	-0.08
MAIN-08	10.16	12.21	12.82	13.47	14.15	10.03	12.06	12.72	13.38	14.07	-0.13	-0.15	-0.10	-0.09	-0.08
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.20	12.19	12.83	13.46	14.13	-0.12	-0.14	-0.10	-0.09	-0.08
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.27	12.25	12.88	13.50	14.17	-0.12	-0.13	-0.10	-0.09	-0.07
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.42	12.32	12.94	13.55	14.24	-0.10	-0.13	-0.10	-0.08	-0.08
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.47	12.34	12.96	13.60	14.23	-0.09	-0.13	-0.10	-0.09	-0.07
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.61	12.42	13.02	13.62	14.31	-0.07	-0.12	-0.10	-0.10	-0.08
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.04	12.59	13.15	13.71	14.38	-0.04	-0.11	-0.09	-0.10	-0.07
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.08	12.61	13.17	13.72	14.39	-0.04	-0.11	-0.09	-0.10	-0.08
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.63	12.91	13.40	13.90	14.50	0.00	-0.08	-0.08	-0.08	-0.08
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.67	12.94	13.43	13.92	14.59	0.00	-0.08	-0.08	-0.08	-0.07
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.70	12.99	13.49	13.98	14.60	0.00	-0.08	-0.07	-0.08	-0.08
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.32	13.73	14.15	14.71	0.00	-0.05	-0.05	-0.06	-0.07
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.61	13.96	14.34	14.83	0.00	-0.03	-0.04	-0.05	-0.07
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.63	5.15	5.65	5.88	0.00	0.01	0.01	0.00	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.23	6.15	6.27	6.37	6.46	-0.04	-0.02	-0.02	-0.01	-0.02
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.30	6.53	6.81	7.09	7.38	-0.04	-0.04	-0.04	-0.04	-0.03
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.80	0.00	0.00	0.00	0.00	-0.01
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.37	13.12	13.80	14.09	0.00	-0.17	-0.14	-0.06	-0.07
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.90	11.98	12.69	13.38	14.09	-0.10	-0.15	-0.10	-0.09	-0.08
PW-02	10.15	12.29	13.00	13.90	14.83	10.07	12.14	12.91	13.80	14.74	-0.08	-0.15	-0.09	-0.10	-0.09
PW-03	10.49	12.33	13.03	13.92	14.85	10.45	12.19	12.93	13.82	14.75	-0.04	-0.14	-0.10	-0.10	-0.10
PW-05	10.10	12.43	13.16	13.94	14.63	10.00	12.28	13.07	13.85	14.55	-0.10	-0.15	-0.09	-0.09	-0.08
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.59	15.10	16.37	17.02	0.00	-0.02	-0.08	-0.05	-0.04
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.70	15.18	16.43	17.06	0.00	-0.02	-0.09	-0.05	-0.05
PW-07	14.25	17.64	17.97	18.17	18.75	14.25	17.64	17.97	18.18	18.72	0.00	0.00	0.00	0.01	-0.03
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.86	20.43	0.00	0.00	0.00	-0.01	-0.01
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.89	20.45	0.00	0.00	0.00	0.00	-0.01
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95						n/a	n/a	n/a	n/a	n/a
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.17	14.29	0.00	0.00	0.00	-0.01	-0.01
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.60	15.78	0.00	0.00	0.00	0.00	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.62	0.00	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.76	21.64	0.00	0.00	0.00	0.00	0.00

Alternative 2B
Maximum Node Elevation Comparison

Node	Scenario / Event										Difference				
	Existing Conditions					Alternative No. 2b									
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.87	13.07	13.52	13.99	14.54	-0.01	-0.08	-0.10	-0.11	-0.16
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.24	14.83	0.00	0.00	-0.04	-0.07	-0.15
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.51	15.03	0.00	0.00	-0.05	-0.04	-0.10
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.00	15.24	15.54	0.00	0.00	-0.02	-0.02	-0.08
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.58	15.09	0.00	0.00	-0.04	-0.03	-0.08
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
Alt2-Pond						9.36	11.76	12.51	13.27	13.97	n/a	n/a	n/a	n/a	n/a
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	13.12	13.85	0.00	0.00	0.00	-0.09	-0.09
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.58	11.83	12.53	13.21	13.92	-0.29	-0.26	-0.22	-0.22	-0.20
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.59	16.02	0.00	0.00	0.00	0.02	-0.05
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.82	0.00	0.00	0.00	0.00	-0.01
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.63	12.89	13.37	13.86	14.42	0.00	-0.10	-0.11	-0.12	-0.17
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.01	14.43	0.00	0.00	-0.01	-0.06	-0.17
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.01	14.43	0.00	0.00	-0.01	-0.06	-0.17
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.31	6.17	6.29	6.39	6.48	0.00	-0.01	-0.01	-0.01	-0.01
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.77	7.05	7.39	0.00	0.00	-0.01	-0.01	-0.01
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.75	4.27	4.63	4.93	5.23	0.00	-0.04	-0.04	-0.04	-0.03
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.77	4.86	5.15	5.40	5.60	0.00	-0.03	-0.03	-0.03	-0.02
MAIN-03	9.19	11.67	12.42	13.17	13.91	9.11	11.57	12.33	13.07	13.82	-0.08	-0.10	-0.09	-0.10	-0.09
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.34	11.69	12.41	13.12	13.85	-0.07	-0.09	-0.08	-0.09	-0.09
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.51	11.79	12.49	13.17	13.89	-0.23	-0.21	-0.18	-0.18	-0.16
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.58	11.83	12.53	13.21	13.92	-0.29	-0.26	-0.22	-0.22	-0.20
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.70	11.87	12.56	13.22	13.93	-0.27	-0.25	-0.21	-0.22	-0.20
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.82	11.92	12.59	13.23	13.94	-0.25	-0.24	-0.20	-0.22	-0.19
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.94	11.98	12.62	13.26	13.95	-0.22	-0.23	-0.20	-0.21	-0.20
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.14	12.12	12.74	13.35	14.02	-0.18	-0.21	-0.19	-0.20	-0.19
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.21	12.19	12.80	13.39	14.06	-0.18	-0.19	-0.18	-0.20	-0.18
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.38	12.27	12.86	13.45	14.13	-0.14	-0.18	-0.18	-0.18	-0.19
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.43	12.29	12.89	13.47	14.12	-0.13	-0.18	-0.17	-0.22	-0.18
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.58	12.37	12.95	13.51	14.20	-0.10	-0.17	-0.17	-0.21	-0.19
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.03	12.56	13.10	13.62	14.28	-0.05	-0.14	-0.14	-0.19	-0.17
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.07	12.58	13.12	13.64	14.29	-0.05	-0.14	-0.14	-0.18	-0.18
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.63	12.89	13.37	13.86	14.42	0.00	-0.10	-0.11	-0.12	-0.16
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.66	12.92	13.40	13.88	14.49	-0.01	-0.10	-0.11	-0.12	-0.17
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.70	12.98	13.46	13.94	14.51	0.00	-0.09	-0.10	-0.12	-0.17
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.31	13.71	14.12	14.63	0.00	-0.06	-0.07	-0.09	-0.15
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.61	13.95	14.32	14.76	0.00	-0.03	-0.05	-0.07	-0.14
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.32	4.64	5.15	5.65	5.88	0.01	0.02	0.01	0.00	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.27	6.16	6.28	6.37	6.46	0.00	-0.01	-0.01	-0.01	-0.02
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.34	6.55	6.82	7.09	7.38	0.00	-0.02	-0.03	-0.04	-0.03
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.81	0.00	0.00	0.00	0.00	0.00
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.31	13.05	13.75	14.00	0.00	-0.23	-0.21	-0.11	-0.16
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.59	11.84	12.62	13.44	14.20	-0.41	-0.29	-0.17	-0.03	0.03
PW-02	10.15	12.29	13.00	13.90	14.83	9.71	12.01	12.84	13.85	14.85	-0.44	-0.28	-0.16	-0.05	0.02
PW-03	10.49	12.33	13.03	13.92	14.85	10.34	12.06	12.87	13.87	14.86	-0.15	-0.27	-0.16	-0.05	0.01
PW-05	10.10	12.43	13.16	13.94	14.63	9.52	12.14	13.00	13.91	14.65	-0.58	-0.29	-0.16	-0.03	0.02
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.57	15.04	16.40	17.07	0.00	-0.04	-0.14	-0.02	0.01
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.68	15.13	16.46	17.11	0.00	-0.04	-0.14	-0.02	0.00
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.17	18.75	0.00	0.00	0.00	0.00	0.00
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.87	20.44	0.00	0.00	0.00	0.00	0.00
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.89	20.46	0.00	0.00	0.00	0.00	0.00
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.16	12.68	13.23	13.87	0.00	-0.05	-0.06	-0.07	-0.08
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.17	14.29	0.00	0.00	0.00	-0.01	-0.01
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.60	15.78	0.00	0.00	0.00	0.00	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.62	0.00	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.76	21.64	0.00	0.00	0.00	0.00	0.00

Alternative 2C
Maximum Node Elevation Comparison

Node	Scenario / Event										Difference				
	Existing Conditions					Alternative No. 2c									
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.87	13.09	13.56	14.03	14.63	-0.01	-0.06	-0.06	-0.07	-0.07
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.25	14.89	0.00	0.00	-0.04	-0.06	-0.09
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.07	14.52	15.06	0.00	0.00	-0.04	-0.03	-0.07
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.01	15.25	15.58	0.00	0.00	-0.01	-0.01	-0.04
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.16	14.59	15.10	0.00	0.00	-0.03	-0.02	-0.07
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
Alt2-Pond						9.63	11.88	12.58	13.26	13.97	n/a	n/a	n/a	n/a	n/a
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	13.12	13.86	0.00	0.00	0.00	-0.09	-0.08
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.77	11.98	12.66	13.34	14.04	-0.10	-0.11	-0.09	-0.09	-0.08
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.57	16.05	0.00	0.00	0.00	0.00	-0.02
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.83	0.00	0.00	0.00	0.00	0.00
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.62	12.92	13.42	13.91	14.51	-0.01	-0.07	-0.06	-0.07	-0.08
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.03	14.52	0.00	0.00	-0.01	-0.04	-0.08
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.71	14.03	14.52	0.00	0.00	-0.01	-0.04	-0.08
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.28	6.17	6.29	6.39	6.48	-0.03	-0.01	-0.01	-0.01	-0.01
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.77	7.04	7.38	0.00	0.00	-0.01	-0.02	-0.02
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.73	4.26	4.62	4.93	5.23	-0.02	-0.05	-0.05	-0.04	-0.03
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.75	4.86	5.14	5.40	5.60	-0.02	-0.03	-0.04	-0.03	-0.02
MAIN-03	9.19	11.67	12.42	13.17	13.91	9.06	11.55	12.31	13.07	13.82	-0.13	-0.12	-0.11	-0.10	-0.09
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.29	11.67	12.39	13.12	13.85	-0.12	-0.11	-0.10	-0.09	-0.09
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.63	11.88	12.58	13.26	13.97	-0.11	-0.12	-0.09	-0.09	-0.08
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.77	11.98	12.66	13.34	14.04	-0.10	-0.11	-0.09	-0.09	-0.08
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.86	12.01	12.68	13.35	14.05	-0.11	-0.11	-0.09	-0.09	-0.08
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.96	12.05	12.71	13.36	14.06	-0.11	-0.11	-0.08	-0.09	-0.07
MAIN-08	10.16	12.21	12.82	13.47	14.15	10.06	12.10	12.74	13.39	14.07	-0.10	-0.11	-0.08	-0.08	-0.08
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.22	12.23	12.84	13.47	14.13	-0.10	-0.10	-0.09	-0.08	-0.08
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.29	12.28	12.89	13.51	14.17	-0.10	-0.10	-0.09	-0.08	-0.07
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.43	12.35	12.95	13.55	14.24	-0.09	-0.10	-0.09	-0.08	-0.08
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.48	12.38	12.97	13.61	14.23	-0.08	-0.09	-0.09	-0.08	-0.07
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.61	12.45	13.03	13.63	14.31	-0.07	-0.09	-0.09	-0.09	-0.08
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.03	12.61	13.16	13.72	14.38	-0.05	-0.09	-0.08	-0.09	-0.07
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.07	12.64	13.18	13.73	14.39	-0.05	-0.08	-0.08	-0.09	-0.08
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.62	12.92	13.42	13.91	14.51	-0.01	-0.07	-0.06	-0.07	-0.07
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.66	12.96	13.44	13.93	14.59	-0.01	-0.06	-0.07	-0.07	-0.07
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.69	13.00	13.50	13.99	14.60	-0.01	-0.07	-0.06	-0.07	-0.08
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.33	13.73	14.16	14.71	0.00	-0.04	-0.05	-0.05	-0.07
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.62	13.97	14.35	14.83	0.00	-0.02	-0.03	-0.04	-0.07
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.63	5.15	5.65	5.88	0.00	0.01	0.01	0.00	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.24	6.16	6.27	6.37	6.46	-0.03	-0.01	-0.02	-0.01	-0.02
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.31	6.54	6.82	7.09	7.38	-0.03	-0.03	-0.03	-0.04	-0.03
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.80	0.00	0.00	0.00	0.00	-0.01
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.41	13.14	13.81	14.09	0.00	-0.13	-0.12	-0.05	-0.07
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.92	12.02	12.70	13.39	14.09	-0.08	-0.11	-0.09	-0.08	-0.08
PW-02	10.15	12.29	13.00	13.90	14.83	10.09	12.18	12.92	13.81	14.74	-0.06	-0.11	-0.08	-0.09	-0.09
PW-03	10.49	12.33	13.03	13.92	14.85	10.46	12.22	12.95	13.83	14.76	-0.03	-0.11	-0.08	-0.09	-0.09
PW-05	10.10	12.43	13.16	13.94	14.63	10.02	12.32	13.08	13.86	14.55	-0.08	-0.11	-0.08	-0.08	-0.08
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.60	15.11	16.38	17.02	0.00	-0.01	-0.07	-0.04	-0.04
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.70	15.19	16.43	17.06	0.00	-0.02	-0.08	-0.05	-0.05
PW-07	14.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.18	18.72	0.00	0.00	0.00	0.01	-0.03
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.86	20.43	0.00	0.00	0.00	-0.01	-0.01
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.89	20.45	0.00	0.00	0.00	0.00	-0.01
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.15	12.67	13.23	13.88	0.00	-0.06	-0.07	-0.07	-0.07
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.17	14.29	0.00	0.00	0.00	-0.01	-0.01
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.60	15.78	0.00	0.00	0.00	0.00	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.62	0.00	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.76	21.64	0.00	0.00	0.00	0.00	0.00

Alternative 3
Maximum Node Elevation Comparison

Node	Scenario / Event										Difference				
	Existing Conditions					Alternative No. 3									
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.61	13.22	13.77	14.27	14.65	-0.27	0.07	-0.15	-0.17	-0.05
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.90	14.42	14.98	0.00	0.00	-0.10	-0.11	0.00
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.15	14.60	15.12	0.00	0.00	0.04	0.05	-0.01
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.03	15.30	15.62	0.00	0.00	0.01	0.04	0.00
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.21	14.63	15.14	0.00	0.00	0.02	0.02	-0.03
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.84	16.94	0.00	0.00	0.00	-0.01	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.71	0.00	0.00	0.00	-0.22	-0.23
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.52	11.74	12.46	13.16	13.90	-0.35	-0.35	-0.29	-0.27	-0.22
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	16.01	0.00	0.00	0.00	0.03	-0.06
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.82	0.00	0.00	0.00	0.00	-0.01
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	10.73	10.73	10.73	10.73	10.73	n/a	n/a	n/a	n/a	n/a
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.80	14.19	14.58	0.00	-0.01	0.08	0.12	-0.02
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.80	14.19	14.58	0.00	-0.01	0.08	0.12	-0.02
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.22	6.13	6.26	6.36	6.46	-0.09	-0.05	-0.04	-0.04	-0.03
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.74	7.01	7.36	0.00	0.00	-0.04	-0.05	-0.04
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.69	4.16	4.53	4.84	5.16	-0.06	-0.15	-0.14	-0.13	-0.10
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.70	4.79	5.05	5.33	5.56	-0.07	-0.10	-0.13	-0.10	-0.06
MAIN-03	9.19	11.67	12.42	13.17	13.91	8.76	11.30	12.09	12.88	13.68	-0.43	-0.37	-0.33	-0.29	-0.23
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.01	11.42	12.18	12.93	13.71	-0.40	-0.36	-0.31	-0.28	-0.23
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.38	11.64	12.38	13.08	13.83	-0.36	-0.36	-0.29	-0.27	-0.22
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.52	11.74	12.46	13.16	13.90	-0.35	-0.35	-0.29	-0.27	-0.22
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.62	11.78	12.48	13.18	13.91	-0.35	-0.34	-0.29	-0.26	-0.22
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.72	11.82	12.51	13.19	13.91	-0.35	-0.34	-0.28	-0.24	-0.22
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.81	11.87	12.55	13.21	13.93	-0.35	-0.34	-0.27	-0.24	-0.22
MAIN-08A	10.32	12.33	12.93	13.55	14.21	9.96	11.99	12.65	13.30	14.00	-0.36	-0.34	-0.28	-0.25	-0.21
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.01	12.05	12.70	13.34	14.04	-0.38	-0.33	-0.28	-0.25	-0.20
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.16	12.12	12.74	13.38	14.05	-0.36	-0.33	-0.28	-0.25	-0.27
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.20	12.14	12.78	13.42	14.15	-0.36	-0.33	-0.28	-0.27	-0.15
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.32	12.21	12.83	13.45	14.17	-0.36	-0.33	-0.29	-0.27	-0.22
MAIN-13	11.08	12.70	13.24	13.81	14.45	10.70	12.38	12.96	13.55	14.24	-0.38	-0.32	-0.28	-0.24	-0.21
MAIN-14	11.12	12.72	13.26	13.82	14.47	10.74	12.40	12.98	13.56	14.25	-0.38	-0.32	-0.28	-0.24	-0.22
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.44	13.13	13.70	14.19	14.57	-0.19	-0.14	-0.22	-0.21	-0.01
MAIN-16	11.67	13.02	13.51	14.00	14.66	8.61	8.61	8.61	8.61	8.61	n/a	n/a	n/a	n/a	n/a
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.46	13.17	13.74	14.23	14.62	-0.24	0.10	0.18	0.17	-0.06
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.47	13.42	13.90	14.36	14.72	-0.02	0.05	0.12	0.15	-0.06
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.92	13.66	14.08	14.51	14.85	-0.01	0.02	0.08	0.12	-0.05
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.32	4.64	5.16	5.65	5.88	0.01	0.02	0.02	0.00	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.19	6.12	6.24	6.35	6.44	-0.08	-0.05	-0.05	-0.03	-0.04
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.26	6.48	6.74	7.02	7.32	-0.08	-0.09	-0.11	-0.11	-0.09
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.80	0.00	0.00	0.00	0.00	-0.01
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.09	12.84	13.57	13.99	0.00	-0.45	-0.42	-0.29	-0.17
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.77	11.78	12.50	13.21	13.95	-0.23	-0.35	-0.29	-0.26	-0.22
PW-02	10.15	12.29	13.00	13.90	14.83	9.96	11.95	12.73	13.61	14.56	-0.19	-0.34	-0.27	-0.29	-0.27
PW-03	10.49	12.33	13.03	13.92	14.85	10.40	12.01	12.77	13.63	14.58	-0.09	-0.32	-0.26	-0.29	-0.27
PW-05	10.10	12.43	13.16	13.94	14.63	9.86	12.09	12.89	13.68	14.42	-0.24	-0.34	-0.27	-0.26	-0.21
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.58	14.95	16.24	16.93	0.00	-0.03	-0.23	-0.18	-0.13
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.69	15.04	16.30	16.97	0.00	-0.03	-0.23	-0.18	-0.14
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.18	18.68	0.00	0.00	0.00	0.01	-0.07
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.86	20.42	0.00	0.00	0.00	-0.01	-0.02
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.89	20.44	0.00	0.00	0.00	0.00	-0.02
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.16	12.53	13.09	13.74	0.00	-0.05	-0.21	-0.21	-0.21
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.27	0.00	0.00	0.00	-0.02	-0.03
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.59	15.78	0.00	0.00	0.00	-0.01	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.68	19.10	19.91	20.70	21.56	0.01	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.67	19.11	19.93	20.74	21.61	-0.01	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Alternative 4A
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions					Alternative No. 4a					Difference				
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.80	12.86	13.29	13.75	14.30	-0.08	-0.29	-0.33	-0.35	-0.40
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.10	14.64	0.00	0.00	-0.04	-0.21	-0.34
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.42	14.88	0.00	0.00	-0.05	-0.13	-0.25
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.98	15.19	15.46	0.00	0.00	-0.04	-0.07	-0.16
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.51	14.96	0.00	0.00	-0.04	-0.10	-0.21
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.84	16.94	0.00	0.00	0.00	-0.01	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.56	0.00	0.00	0.00	-0.22	-0.38
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.71	11.77	12.43	13.05	13.76	-0.16	-0.32	-0.32	-0.38	-0.36
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.99	0.00	0.00	0.00	0.03	-0.08
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.82	0.00	0.00	0.00	0.00	-0.01
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.52	12.66	13.13	13.59	14.19	-0.11	-0.33	-0.35	-0.39	-0.40
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.68	13.91	14.27	0.00	-0.01	-0.04	-0.16	-0.33
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.68	13.91	14.27	0.00	-0.01	-0.04	-0.16	-0.33
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.86	15.36	15.57	15.81	16.07	-0.01	0.11	0.16	0.22	0.27
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.24	6.14	6.26	6.36	6.46	-0.07	-0.04	-0.04	-0.04	-0.03
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.77	7.05	7.39	0.00	0.00	-0.01	-0.01	-0.01
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.70	4.17	4.54	4.85	5.15	-0.05	-0.14	-0.13	-0.12	-0.11
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.71	4.80	5.07	5.34	5.55	-0.06	-0.09	-0.11	-0.09	-0.07
MAIN-03	9.19	11.67	12.42	13.17	13.91	9.01	11.34	12.06	12.75	13.53	-0.18	-0.33	-0.36	-0.42	-0.38
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.23	11.46	12.15	12.82	13.56	-0.18	-0.32	-0.34	-0.39	-0.38
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.57	11.67	12.34	12.97	13.68	-0.17	-0.33	-0.33	-0.38	-0.37
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.71	11.77	12.43	13.05	13.76	-0.16	-0.32	-0.32	-0.38	-0.36
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.80	11.80	12.45	13.06	13.76	-0.17	-0.32	-0.32	-0.38	-0.37
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.90	11.84	12.48	13.08	13.77	-0.17	-0.32	-0.31	-0.37	-0.36
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.99	11.90	12.52	13.10	13.79	-0.17	-0.31	-0.30	-0.37	-0.36
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.13	12.01	12.61	13.18	13.84	-0.19	-0.32	-0.32	-0.37	-0.37
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.19	12.06	12.66	13.21	13.87	-0.20	-0.32	-0.32	-0.38	-0.37
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.33	12.13	12.72	13.26	13.94	-0.19	-0.32	-0.32	-0.37	-0.38
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.37	12.15	12.73	13.27	13.93	-0.19	-0.32	-0.33	-0.42	-0.37
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.50	12.21	12.78	13.32	14.00	-0.18	-0.33	-0.34	-0.40	-0.39
MAIN-13	11.08	12.70	13.24	13.81	14.45	10.91	12.37	12.90	13.40	14.06	-0.17	-0.33	-0.34	-0.41	-0.39
MAIN-14	11.12	12.72	13.26	13.82	14.47	10.95	12.40	12.92	13.42	14.07	-0.17	-0.32	-0.34	-0.40	-0.40
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.52	12.66	13.13	13.59	14.18	-0.11	-0.33	-0.35	-0.39	-0.40
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.55	12.69	13.15	13.61	14.25	-0.12	-0.33	-0.36	-0.39	-0.41
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.58	12.73	13.20	13.66	14.26	-0.12	-0.34	-0.36	-0.40	-0.42
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.17	12.83	13.25	13.70	14.30	-0.32	-0.54	-0.53	-0.51	-0.48
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.60	12.98	13.33	13.75	14.35	-0.33	-0.66	-0.67	-0.64	-0.55
MAIN-20	15.19	16.18	16.64	17.15	17.55	14.53	15.10	15.34	15.61	15.88	-0.66	-1.08	-1.30	-1.54	-1.67
MAIN-21	15.43	16.34	16.78	17.26	17.65	14.92	15.35	15.56	15.81	16.06	-0.51	-0.99	-1.22	-1.45	-1.59
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.30	15.70	15.83	16.04	16.25	-0.29	-0.77	-1.07	-1.33	-1.48
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.86	16.56	16.82	17.43	18.07	-0.10	-0.36	-0.82	-0.94	-0.92
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.01	16.64	16.95	17.52	18.13	-0.08	-0.34	-0.74	-0.88	-0.88
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.07	19.07	19.60	19.77	19.88	0.02	-0.32	-0.07	-0.04	-0.04
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.32	4.64	5.15	5.65	5.88	0.01	0.02	0.01	0.00	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.21	6.13	6.25	6.34	6.44	-0.06	-0.04	-0.04	-0.04	-0.04
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.27	6.47	6.74	6.99	7.28	-0.07	-0.10	-0.11	-0.14	-0.13
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.80	0.00	0.00	0.00	0.00	-0.01
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.27	13.01	13.73	13.98	0.00	-0.27	-0.25	-0.13	-0.18
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.89	11.81	12.47	13.10	13.81	-0.11	-0.32	-0.32	-0.37	-0.36
PW-02	10.15	12.29	13.00	13.90	14.83	10.06	11.98	12.68	13.53	14.49	-0.09	-0.31	-0.32	-0.37	-0.34
PW-03	10.49	12.33	13.03	13.92	14.85	10.45	12.04	12.71	13.55	14.50	-0.04	-0.29	-0.32	-0.37	-0.35
PW-05	10.10	12.43	13.16	13.94	14.63	10.00	12.11	12.85	13.58	14.29	-0.10	-0.32	-0.31	-0.36	-0.34
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.56	14.89	16.17	16.86	0.00	-0.05	-0.29	-0.25	-0.20
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.66	14.99	16.23	16.91	0.00	-0.06	-0.28	-0.25	-0.20
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.20	18.64	0.00	0.00	0.00	0.03	-0.11
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.86	20.41	0.00	0.00	0.00	-0.01	-0.03
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.88	20.43	0.00	0.00	0.00	-0.01	-0.03
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.08	12.51	13.01	13.61	0.00	-0.13	-0.23	-0.29	-0.34
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.26	0.00	0.00	0.00	-0.02	-0.04
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.59	15.78	0.00	0.00	0.00	-0.01	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.61	0.00	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.76	21.64	0.00	0.00	0.00	0.00	0.00

Alternative 4B
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions					Alternative No. 4b					Difference				
	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	11.65	12.67	13.07	13.57	14.05	-0.23	-0.48	-0.55	-0.53	-0.65
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.10	14.58	0.00	0.00	-0.04	-0.21	-0.40
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.42	14.85	0.00	0.00	-0.05	-0.13	-0.28
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.98	15.16	15.41	0.00	0.00	-0.04	-0.10	-0.21
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.15	14.51	14.93	0.00	0.00	-0.04	-0.10	-0.24
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.84	16.94	0.00	0.00	0.00	-0.01	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.32	0.00	0.00	0.00	-0.22	-0.62
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.43	11.51	12.20	12.84	13.52	-0.44	-0.58	-0.55	-0.59	-0.60
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.89	0.00	0.00	0.00	0.03	-0.18
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.27	12.42	12.89	13.39	13.92	-0.36	-0.57	-0.59	-0.59	-0.67
CL-02	13.10	13.52	13.72	14.07	14.60	13.39	13.90	14.10	14.32	14.62	0.29	0.38	0.38	0.25	0.02
CL-03	13.10	13.52	13.72	14.07	14.60	13.40	13.92	14.12	14.34	14.62	0.30	0.40	0.40	0.27	0.02
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.32	14.96	15.22	15.52	15.85	-0.55	-0.29	-0.19	-0.07	0.05
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.10	6.10	6.23	6.34	6.44	-0.21	-0.08	-0.07	-0.06	-0.05
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.76	7.04	7.38	0.00	0.00	-0.02	-0.02	-0.02
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.58	4.05	4.45	4.78	5.08	-0.17	-0.26	-0.22	-0.19	-0.18
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.58	4.72	4.98	5.28	5.50	-0.19	-0.17	-0.20	-0.15	-0.12
MAIN-03	9.19	11.67	12.42	13.17	13.91	8.68	11.06	11.80	12.52	13.27	-0.51	-0.61	-0.62	-0.65	-0.64
MAIN-04	9.41	11.78	12.49	13.21	13.94	8.93	11.18	11.91	12.59	13.32	-0.48	-0.60	-0.58	-0.62	-0.62
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.29	11.41	12.11	12.76	13.44	-0.45	-0.59	-0.56	-0.59	-0.61
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.43	11.50	12.20	12.84	13.52	-0.44	-0.59	-0.55	-0.59	-0.60
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.51	11.54	12.22	12.85	13.53	-0.46	-0.58	-0.55	-0.59	-0.60
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.60	11.59	12.25	12.87	13.53	-0.47	-0.57	-0.54	-0.58	-0.60
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.68	11.64	12.29	12.89	13.55	-0.48	-0.57	-0.53	-0.58	-0.60
MAIN-08A	10.32	12.33	12.93	13.55	14.21	9.81	11.75	12.38	12.96	13.60	-0.51	-0.58	-0.55	-0.59	-0.61
MAIN-09	10.39	12.38	12.98	13.59	14.24	9.86	11.80	12.42	12.99	13.63	-0.53	-0.58	-0.56	-0.60	-0.61
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.00	11.86	12.47	13.03	13.69	-0.52	-0.59	-0.57	-0.60	-0.63
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.05	11.88	12.49	13.06	13.68	-0.51	-0.59	-0.57	-0.63	-0.62
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.18	11.95	12.54	13.09	13.74	-0.50	-0.59	-0.58	-0.63	-0.65
MAIN-13	11.08	12.70	13.24	13.81	14.45	10.59	12.12	12.66	13.18	13.80	-0.49	-0.58	-0.58	-0.63	-0.65
MAIN-14	11.12	12.72	13.26	13.82	14.47	10.63	12.14	12.68	13.20	13.81	-0.49	-0.58	-0.58	-0.62	-0.66
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.27	12.41	12.89	13.39	13.92	-0.36	-0.58	-0.59	-0.59	-0.66
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.30	12.44	12.91	13.41	13.98	-0.37	-0.58	-0.60	-0.59	-0.68
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.33	12.48	12.94	13.46	13.98	-0.37	-0.59	-0.62	-0.60	-0.70
MAIN-18	12.49	13.37	13.78	14.21	14.78	11.33	12.48	12.94	13.46	13.99	-1.16	-0.89	-0.84	-0.75	-0.79
MAIN-19	12.93	13.64	14.00	14.39	14.90	11.50	12.48	12.94	13.46	13.99	-1.43	-1.16	-1.06	-0.93	-0.91
MAIN-20	15.19	16.18	16.64	17.15	17.55	14.32	14.96	15.22	15.52	15.85	-0.87	-1.22	-1.42	-1.63	-1.70
MAIN-21	15.43	16.34	16.78	17.26	17.65	14.32	14.96	15.22	15.52	15.85	-1.11	-1.38	-1.56	-1.74	-1.80
MAIN-22	15.59	16.47	16.90	17.37	17.73	14.32	14.96	15.22	15.52	15.85	-1.27	-1.51	-1.68	-1.85	-1.88
MAIN-23	15.96	16.92	17.44	18.37	18.99	15.95	16.68	17.02	17.83	18.47	-0.01	-0.24	-0.42	-0.54	-0.52
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.08	16.74	17.12	17.89	18.51	-0.01	-0.24	-0.57	-0.51	-0.50
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.06	19.25	19.62	19.79	19.90	0.01	-0.14	-0.05	-0.02	-0.02
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.27	4.58	5.10	5.60	5.87	-0.04	-0.04	-0.04	-0.05	-0.01
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.06	6.08	6.21	6.32	6.42	-0.21	-0.09	-0.08	-0.06	-0.06
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.11	6.38	6.65	6.92	7.20	-0.23	-0.19	-0.20	-0.21	-0.21
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.79	0.00	0.00	0.00	0.00	-0.02
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.04	12.81	13.58	13.95	0.00	-0.50	-0.45	-0.28	-0.21
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.75	11.56	12.24	12.89	13.57	-0.25	-0.57	-0.55	-0.58	-0.60
PW-02	10.15	12.29	13.00	13.90	14.83	9.95	11.74	12.44	13.32	14.26	-0.20	-0.55	-0.56	-0.58	-0.57
PW-03	10.49	12.33	13.03	13.92	14.85	10.41	11.82	12.49	13.35	14.28	-0.08	-0.51	-0.54	-0.57	-0.57
PW-05	10.10	12.43	13.16	13.94	14.63	9.86	11.85	12.62	13.35	14.07	-0.24	-0.58	-0.54	-0.59	-0.56
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.80	15.90	16.73	0.00	-0.07	+0.38	-0.52	-0.33
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.91	15.96	16.78	0.00	-0.07	-0.36	-0.52	-0.33
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.22	18.57	0.00	0.00	0.00	0.05	-0.18
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.88	20.39	0.00	0.00	0.00	0.01	-0.05
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.90	20.41	0.00	0.00	0.00	0.01	-0.05
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.01	12.38	12.88	13.40	0.00	-0.20	-0.36	-0.42	-0.55
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.55	15.77	0.00	0.00	0.00	-0.05	-0.01
STOR-05	16.47	19.10	19.91	20.70	21.57	16.47	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.61	0.00	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Alternative 4C
Maximum Node Elevation Comparison

	Scenario / Event										Difference				
	Existing Conditions					Alternative No. 4c									
Node	2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
AF-01	11.88	13.15	13.62	14.10	14.70	12.25	13.18	13.48	13.84	14.30	0.37	0.03	-0.14	-0.26	-0.40
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.76	14.17	14.74	0.00	0.00	-0.04	-0.14	-0.24
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.06	14.47	14.97	0.00	0.00	-0.05	-0.08	-0.16
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	14.98	15.17	15.42	0.00	0.00	-0.04	-0.09	-0.20
AF-05	13.28	13.94	14.19	14.41	15.17	13.28	13.94	14.15	14.55	15.03	0.00	0.00	-0.04	-0.06	-0.14
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.87	16.98	0.00	0.00	0.00	-0.01	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.14	0.00	0.00	0.00	-0.22	-0.80
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.30	9.87	10.61	11.34	12.11	-0.57	-2.22	-2.14	-2.09	-2.01
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.60	15.91	0.00	0.00	0.00	0.03	-0.16
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.81	0.00	0.00	0.00	0.00	-0.02
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.37	12.01	12.28	12.66	13.11	-0.26	-0.98	-1.20	-1.32	-1.48
CL-02	13.10	13.52	13.72	14.07	14.60	11.42	12.19	12.52	12.93	13.40	-1.68	-1.33	-1.20	-1.14	-1.20
CL-03	13.10	13.52	13.72	14.07	14.60	11.46	12.30	12.64	13.04	13.50	-1.64	-1.22	-1.08	-1.03	-1.10
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	11.50	12.44	12.82	13.26	13.78	-3.37	-2.81	-2.59	-2.33	-2.02
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	4.64	5.77	6.00	6.14	6.24	-0.67	-0.41	-0.30	-0.26	-0.25
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.71	6.94	7.29	0.00	0.00	-0.07	-0.12	-0.11
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.31	3.23	3.76	4.15	4.52	-0.44	-1.08	-0.91	-0.82	-0.74
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.16	4.23	4.58	4.84	5.14	-0.61	-0.66	-0.60	-0.59	-0.48
MAIN-03	9.19	11.67	12.42	13.17	13.91	7.19	9.22	10.02	10.88	11.72	-2.00	-2.45	-2.40	-2.29	-2.19
MAIN-04	9.41	11.78	12.49	13.21	13.94	7.55	9.44	10.25	11.02	11.83	-1.86	-2.34	-2.24	-2.19	-2.11
MAIN-05	9.74	12.00	12.67	13.35	14.05	7.97	9.74	10.50	11.24	12.03	-1.77	-2.26	-2.17	-2.11	-2.02
MAIN-06	9.87	12.09	12.75	13.43	14.12	8.12	9.87	10.61	11.34	12.11	-1.75	-2.22	-2.14	-2.09	-2.01
MAIN-07	9.97	12.12	12.77	13.44	14.13	8.13	9.90	10.64	11.36	12.13	-1.84	-2.22	-2.13	-2.08	-2.00
MAIN-07A	10.07	12.16	12.79	13.45	14.13	8.15	9.94	10.67	11.39	12.14	-1.92	-2.22	-2.12	-2.06	-1.99
MAIN-08	10.16	12.21	12.82	13.47	14.15	8.16	9.97	10.70	11.42	12.17	-2.00	-2.24	-2.12	-2.05	-1.98
MAIN-08A	10.32	12.33	12.93	13.55	14.21	8.18	10.02	10.76	11.48	12.23	-2.14	-2.31	-2.17	-2.07	-1.98
MAIN-09	10.39	12.38	12.98	13.59	14.24	8.20	10.04	10.79	11.51	12.25	-2.19	-2.34	-2.19	-2.08	-1.99
MAIN-10	10.52	12.45	13.04	13.63	14.32	8.42	10.10	10.83	11.55	12.29	-2.10	-2.35	-2.21	-2.08	-2.03
MAIN-11	10.56	12.47	13.06	13.69	14.30	8.61	10.12	10.85	11.56	12.29	-1.95	-2.35	-2.21	-2.13	-2.01
MAIN-12	10.68	12.54	13.12	13.72	14.39	8.68	10.18	10.89	11.60	12.33	-2.00	-2.36	-2.23	-2.12	-2.06
MAIN-13	11.08	12.70	13.24	13.81	14.45	8.92	10.38	11.07	11.74	12.41	-2.16	-2.32	-2.17	-2.07	-2.04
MAIN-14	11.12	12.72	13.26	13.82	14.47	9.01	10.41	11.09	11.75	12.42	-2.11	-2.31	-2.17	-2.07	-2.05
MAIN-15	11.63	12.99	13.48	13.98	14.58	9.79	10.90	11.38	11.94	12.57	-1.84	-2.09	-2.10	-2.04	-2.01
MAIN-16	11.67	13.02	13.51	14.00	14.66	9.79	10.90	11.38	11.95	12.57	-1.88	-2.12	-2.13	-2.05	-2.09
MAIN-17	11.70	13.07	13.56	14.06	14.68	12.15	13.09	13.38	13.75	14.20	0.45	0.02	-0.18	-0.31	-0.48
MAIN-18	12.49	13.37	13.78	14.21	14.78	11.88	12.83	13.13	13.50	13.96	-0.61	-0.54	-0.65	-0.71	-0.82
MAIN-19	12.93	13.64	14.00	14.39	14.90	11.62	12.55	12.86	13.29	13.81	-1.31	-1.09	-1.14	-1.10	-1.09
MAIN-20	15.19	16.18	16.64	17.15	17.55	11.58	12.47	12.84	13.29	13.81	-3.61	-3.71	-3.80	-3.86	-3.74
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.18	15.66	15.84	16.08	16.27	-0.25	-0.68	-0.94	-1.18	-1.38
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.43	15.98	16.18	16.45	16.67	-0.16	-0.49	-0.72	-0.92	-1.06
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.90	16.64	16.98	17.64	18.34	-0.06	-0.28	-0.66	-0.73	-0.65
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.04	16.72	17.09	17.71	18.39	-0.05	-0.26	-0.60	-0.69	-0.62
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.06	19.22	19.62	19.78	19.89	0.01	-0.17	-0.05	-0.03	-0.03
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.20	4.54	5.08	5.58	5.86	-0.11	-0.08	-0.06	-0.07	-0.02
PIRLNDPOND02	5.29	6.17	6.29	6.38	6.48	4.61	5.74	5.97	6.12	6.22	-0.44	-0.43	-0.32	-0.26	-0.26
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	4.63	5.87	6.19	6.43	6.66	-0.71	-0.70	-0.66	-0.70	-0.75
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.27	20.79	0.00	0.00	0.00	0.01	-0.02
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	11.61	11.94	12.37	12.88	0.00	-0.93	-1.32	-1.49	-1.28
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.67	10.15	10.72	11.42	12.17	-0.33	-1.98	-2.07	-2.05	-2.00
PW-02	10.15	12.29	13.00	13.90	14.83	9.89	10.62	11.13	11.88	12.68	-0.26	-1.67	-1.87	-2.02	-2.15
PW-03	10.49	12.33	13.03	13.92	14.85	10.38	11.00	11.39	12.05	12.78	-0.11	-1.33	-1.64	-1.87	-2.07
PW-05	10.10	12.43	13.16	13.94	14.63	9.78	10.46	11.10	11.87	12.69	-0.32	-1.97	-2.06	-2.07	-1.94
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.54	14.63	14.79	15.44	0.00	-0.07	-0.55	-1.63	-1.62
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.65	14.75	14.90	15.52	0.00	-0.07	-0.52	-1.58	-1.59
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.24	18.49	0.00	0.00	0.00	0.07	-0.26
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.89	20.39	0.00	0.00	0.00	0.02	-0.05
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.91	20.41	0.00	0.00	0.00	0.02	-0.05
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.19	12.31	12.34	12.50	0.00	-0.02	-0.43	-0.96	-1.45
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.24	0.00	0.00	0.00	-0.02	-0.06
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.54	15.75	0.00	0.00	0.00	-0.06	-0.03
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.62	0.00	0.00	0.00	0.01	0.00
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Alternative 5
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions 2	Existing Conditions 10	Existing Conditions 25	Existing Conditions 50	Existing Conditions 100	Alternative No. 5 2	Alternative No. 5 10	Alternative No. 5 25	Alternative No. 5 50	Alternative No. 5 100	Difference 2	Difference 10	Difference 25	Difference 50	Difference 100
AF-01	11.88	13.15	13.62	14.10	14.70	11.24	12.87	13.40	13.89	14.47	-0.64	-0.28	-0.22	-0.21	-0.23
AF-02	12.81	13.52	13.80	14.31	14.98	12.32	13.26	13.59	14.06	14.61	-0.49	-0.26	-0.21	-0.25	-0.37
AF-03	13.13	13.84	14.11	14.55	15.13	13.61	14.10	14.27	14.53	14.92	0.48	0.26	0.16	-0.02	-0.21
AF-04	14.41	14.82	15.02	15.26	15.62	13.09	13.09	13.09	13.09	13.09	n/a	n/a	n/a	n/a	n/a
AF-05	13.28	13.94	14.19	14.61	15.17	13.62	14.14	14.32	14.57	14.95	0.34	0.20	0.13	-0.04	-0.22
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.46	16.31	16.82	16.92	0.00	-0.13	-0.11	-0.03	-0.02
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.54	16.34	16.85	16.96	0.00	-0.13	-0.11	-0.03	-0.02
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	12.99	13.69	0.00	0.00	0.00	-0.22	-0.25
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.30	11.71	12.50	13.20	13.88	-0.57	-0.38	-0.25	-0.23	-0.24
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.59	16.01	0.00	0.00	0.00	0.02	-0.06
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.82	0.00	0.00	0.00	0.00	-0.01
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.06	12.70	13.26	13.78	14.36	-0.57	-0.29	-0.22	-0.20	-0.23
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.67	13.88	14.37	0.00	-0.01	-0.05	-0.19	-0.23
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.51	13.67	13.88	14.37	0.00	-0.01	-0.05	-0.19	-0.23
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.06	6.13	6.26	6.36	6.46	-0.25	-0.05	-0.04	-0.04	-0.03
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.74	7.01	7.36	0.00	0.00	0.00	-0.05	-0.04
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.56	4.13	4.54	4.86	5.16	-0.19	-0.18	-0.13	-0.11	-0.10
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.54	4.77	5.06	5.35	5.56	-0.23	-0.12	-0.12	-0.08	-0.06
MAIN-03	9.19	11.67	12.42	13.17	13.91	8.20	11.27	12.13	12.92	13.66	-0.99	-0.40	-0.29	-0.25	-0.25
MAIN-04	9.41	11.78	12.49	13.21	13.94	8.48	11.39	12.23	12.98	13.69	-0.93	-0.39	-0.26	-0.23	-0.25
MAIN-05	9.74	12.00	12.67	13.35	14.05	8.88	11.61	12.42	13.12	13.81	-0.86	-0.39	-0.25	-0.23	-0.24
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.04	11.71	12.50	13.20	13.88	-0.83	-0.38	-0.25	-0.23	-0.24
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.13	11.75	12.53	13.22	13.89	-0.84	-0.37	-0.24	-0.22	-0.24
MAIN-07A	10.07	12.16	12.79	13.45	14.13	9.23	11.79	12.55	13.23	13.90	-0.84	-0.37	-0.24	-0.22	-0.23
MAIN-08	10.16	12.21	12.82	13.47	14.15	9.32	11.85	12.58	13.25	13.91	-0.84	-0.36	-0.24	-0.22	-0.24
MAIN-08A	10.32	12.33	12.93	13.55	14.21	9.44	11.97	12.69	13.34	13.98	-0.88	-0.36	-0.24	-0.21	-0.23
MAIN-09	10.39	12.38	12.98	13.59	14.24	9.49	12.03	12.74	13.38	14.01	-0.90	-0.35	-0.24	-0.21	-0.23
MAIN-10	10.52	12.45	13.04	13.63	14.32	9.67	12.10	12.80	13.42	14.08	-0.85	-0.35	-0.24	-0.21	-0.24
MAIN-11	10.56	12.47	13.06	13.69	14.30	9.73	12.12	12.82	13.47	14.07	-0.83	-0.36	-0.24	-0.22	-0.23
MAIN-12	10.68	12.54	13.12	13.72	14.39	9.85	12.19	12.88	13.49	14.15	-0.83	-0.35	-0.24	-0.23	-0.24
MAIN-13	11.08	12.70	13.24	13.81	14.45	10.22	12.38	13.01	13.58	14.22	-0.86	-0.32	-0.23	-0.23	-0.23
MAIN-14	11.12	12.72	13.26	13.82	14.47	10.26	12.40	13.03	13.60	14.23	-0.86	-0.32	-0.23	-0.22	-0.24
MAIN-15	11.63	12.99	13.48	13.98	14.58	10.99	12.70	13.26	13.78	14.35	-0.64	-0.29	-0.22	-0.20	-0.23
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.02	12.73	13.29	13.80	14.43	-0.65	-0.29	-0.22	-0.20	-0.23
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.04	12.78	13.34	13.85	14.44	-0.66	-0.29	-0.22	-0.21	-0.24
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.19	13.20	13.61	14.02	14.55	-0.30	-0.17	-0.17	-0.19	-0.23
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.64	13.55	13.87	14.21	14.68	-0.29	-0.09	-0.13	-0.18	-0.22
MAIN-20	15.19	16.18	16.64	17.15	17.55	14.62	16.21	16.56	16.91	17.28	-0.57	0.03	-0.08	-0.24	-0.27
MAIN-21	15.43	16.34	16.78	17.26	17.65	14.98	16.37	16.70	17.03	17.38	-0.45	0.03	-0.08	-0.23	-0.27
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.15	16.50	16.82	17.15	17.48	-0.44	0.03	-0.08	-0.22	-0.25
MAIN-23	15.96	16.92	17.44	18.37	18.99	15.51	16.99	17.51	18.01	18.53	-0.45	0.07	-0.13	-0.36	-0.46
MAIN-24	16.09	16.98	17.69	18.40	19.01	17.12	17.49	17.81	18.32	18.87	1.03	0.51	0.12	-0.08	-0.14
MAIN-25	17.05	19.39	19.67	19.81	19.92	14.60	14.60	14.60	14.60	14.60	n/a	n/a	n/a	n/a	n/a
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.30	4.61	5.13	5.64	5.88	-0.01	-0.01	-0.01	-0.01	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.03	6.11	6.25	6.35	6.44	-0.24	-0.06	-0.04	-0.03	-0.04
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.08	6.46	6.75	7.03	7.32	-0.26	-0.11	-0.10	-0.10	-0.09
PW POND-01	19.17	19.50	19.81	20.26	20.81	19.17	19.50	19.81	20.26	20.80	0.00	0.00	0.00	0.00	-0.01
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.08	12.89	13.61	13.98	0.00	-0.46	-0.37	-0.25	-0.18
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	9.67	11.76	12.55	13.25	13.93	-0.33	-0.37	-0.24	-0.22	-0.24
PW-02	10.15	12.29	13.00	13.90	14.83	9.89	11.93	12.77	13.65	14.54	-0.24	-0.36	-0.23	-0.25	-0.29
PW-03	10.49	12.33	13.03	13.92	14.85	10.38	11.99	12.81	13.67	14.56	-0.11	-0.34	-0.22	-0.25	-0.29
PW-05	10.10	12.43	13.16	13.94	14.63	9.78	12.06	12.93	13.72	14.40	-0.32	-0.37	-0.23	-0.22	-0.23
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.57	14.98	16.27	16.92	0.00	-0.04	-0.20	-0.15	-0.14
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.68	15.07	16.33	16.97	0.00	-0.04	-0.20	-0.15	-0.14
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.64	17.97	18.18	18.67	0.00	0.00	0.00	0.01	-0.08
PW-08	16.53	18.79	19.40	19.87	20.44	16.53	18.79	19.40	19.86	20.42	0.00	0.00	0.00	-0.01	-0.02
PW-09	16.58	18.81	19.42	19.89	20.46	16.58	18.81	19.42	19.89	20.44	0.00	0.00	0.00	0.00	-0.02
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.72	20.14	20.59	0.00	0.00	0.00	0.00	0.00
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.20	22.36	22.51	0.00	0.00	-0.01	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.16	12.56	13.12	13.72	0.00	-0.05	-0.18	-0.18	-0.23
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.16	14.27	0.00	0.00	0.00	-0.02	-0.03
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.59	15.78	0.00	0.00	0.00	-0.01	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	19.10	19.91	20.70	21.56	0.00	0.00	0.00	0.00	-0.01
STOR-06	16.68	19.11	19.93	20.73	21.62	16.68	19.11	19.93	20.74	21.61	0.00	0.00	0.00	0.01	-0.01
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.20	19.97	20.77	21.64	0.00	0.00	0.00	0.01	0.00

Alternative 6
Maximum Node Elevation Comparison

Node	Scenario / Event: Existing Conditions 2	Existing Conditions 10	Existing Conditions 25	Existing Conditions 50	Existing Conditions 100	Alternative No. 6 2	Alternative No. 6 10	Alternative No. 6 25	Alternative No. 6 50	Alternative No. 6 100	Difference 2	Difference 10	Difference 25	Difference 50	Difference 100
AF-01	11.88	13.15	13.62	14.10	14.70	11.88	13.15	13.62	14.10	14.70	0.00	0.00	0.00	0.00	0.00
AF-02	12.81	13.52	13.80	14.31	14.98	12.81	13.52	13.80	14.31	14.98	0.00	0.00	0.00	0.00	0.00
AF-03	13.13	13.84	14.11	14.55	15.13	13.13	13.84	14.11	14.55	15.13	0.00	0.00	0.00	0.00	0.00
AF-04	14.41	14.82	15.02	15.26	15.62	14.41	14.82	15.02	15.26	15.62	n/a	n/a	n/a	n/a	n/a
AF-05	13.28	13.94	14.19	14.61	15.17	13.28	13.94	14.19	14.61	15.17	0.00	0.00	0.00	0.00	0.00
AF-06	13.85	15.59	16.42	16.85	16.94	13.85	15.59	16.42	16.85	16.94	0.00	0.00	0.00	0.00	0.00
AF-07	14.50	15.67	16.45	16.88	16.98	14.50	15.67	16.45	16.88	16.98	0.00	0.00	0.00	0.00	0.00
BERMGRN01	12.37	12.72	12.85	13.21	13.94	12.37	12.72	12.85	13.20	13.93	0.00	0.00	0.00	-0.01	-0.01
BERMGRN02	9.87	12.09	12.75	13.43	14.12	9.87	12.08	12.75	13.42	14.11	0.00	-0.01	0.00	-0.01	-0.01
BERMGRN03	14.43	15.04	15.33	15.57	16.07	14.43	15.04	15.33	15.57	16.07	0.00	0.00	0.00	0.00	0.00
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.69	16.08	16.24	16.48	16.83	0.00	0.00	0.00	0.00	0.00
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.72	15.21	15.41	15.62	15.88	0.00	0.00	0.00	0.00	0.00
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.00	0.00	0.00	0.00	0.00
CL-01	11.63	12.99	13.48	13.98	14.59	11.63	12.99	13.48	13.98	14.59	0.00	0.00	0.00	0.00	0.00
CL-02	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.72	14.07	14.59	0.00	0.00	0.00	0.00	-0.01
CL-03	13.10	13.52	13.72	14.07	14.60	13.10	13.52	13.72	14.07	14.60	0.00	0.00	0.00	0.00	0.00
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	14.87	15.25	15.41	15.59	15.80	0.00	0.00	0.00	0.00	0.00
LKWDPOND01	5.31	6.18	6.30	6.40	6.49	5.31	6.18	6.30	6.40	6.49	0.00	0.00	0.00	0.00	0.00
LKWDPOND02	6.31	6.59	6.78	7.06	7.40	6.31	6.59	6.78	7.06	7.40	0.00	0.00	0.00	0.00	0.00
MAIN-01	2.75	4.31	4.67	4.97	5.26	2.75	4.31	4.67	4.97	5.26	0.00	0.00	0.00	0.00	0.00
MAIN-02	3.77	4.89	5.18	5.43	5.62	3.77	4.89	5.18	5.43	5.62	0.00	0.00	0.00	0.00	0.00
MAIN-03	9.19	11.67	12.42	13.17	13.91	9.19	11.67	12.41	13.16	13.90	0.00	0.00	-0.01	-0.01	-0.01
MAIN-04	9.41	11.78	12.49	13.21	13.94	9.41	11.78	12.49	13.20	13.93	0.00	0.00	0.00	-0.01	-0.01
MAIN-05	9.74	12.00	12.67	13.35	14.05	9.74	11.99	12.66	13.34	14.04	0.00	-0.01	-0.01	-0.01	-0.01
MAIN-06	9.87	12.09	12.75	13.43	14.12	9.87	12.08	12.75	13.42	14.11	0.00	-0.01	0.00	-0.01	-0.01
MAIN-07	9.97	12.12	12.77	13.44	14.13	9.97	12.12	12.77	13.43	14.12	0.00	0.00	0.00	-0.01	-0.01
MAIN-07A	10.07	12.16	12.79	13.45	14.13	10.07	12.15	12.79	13.44	14.13	0.00	-0.01	0.00	-0.01	0.00
MAIN-08	10.16	12.21	12.82	13.47	14.15	10.16	12.21	12.82	13.46	14.14	0.00	0.00	0.00	-0.01	-0.01
MAIN-08A	10.32	12.33	12.93	13.55	14.21	10.32	12.33	12.92	13.54	14.20	0.00	0.00	-0.01	-0.01	-0.01
MAIN-09	10.39	12.38	12.98	13.59	14.24	10.39	12.38	12.98	13.58	14.24	0.00	0.00	0.00	-0.01	0.00
MAIN-10	10.52	12.45	13.04	13.63	14.32	10.52	12.45	13.04	13.63	14.32	0.00	0.00	0.00	0.00	0.00
MAIN-11	10.56	12.47	13.06	13.69	14.30	10.56	12.47	13.06	13.68	14.30	0.00	0.00	0.00	-0.01	0.00
MAIN-12	10.68	12.54	13.12	13.72	14.39	10.68	12.54	13.11	13.71	14.39	0.00	0.00	-0.01	-0.01	0.00
MAIN-13	11.08	12.70	13.24	13.81	14.45	11.08	12.70	13.24	13.80	14.45	0.00	0.00	0.00	-0.01	0.00
MAIN-14	11.12	12.72	13.26	13.82	14.47	11.12	12.72	13.26	13.81	14.46	0.00	0.00	0.00	-0.01	-0.01
MAIN-15	11.63	12.99	13.48	13.98	14.58	11.63	12.99	13.48	13.98	14.58	0.00	0.00	0.00	0.00	0.00
MAIN-16	11.67	13.02	13.51	14.00	14.66	11.67	13.02	13.51	14.00	14.66	0.00	0.00	0.00	0.00	0.00
MAIN-17	11.70	13.07	13.56	14.06	14.68	11.70	13.07	13.56	14.05	14.68	0.00	0.00	0.00	-0.01	0.00
MAIN-18	12.49	13.37	13.78	14.21	14.78	12.49	13.36	13.78	14.21	14.78	0.00	-0.01	0.00	0.00	0.00
MAIN-19	12.93	13.64	14.00	14.39	14.90	12.93	13.64	14.00	14.39	14.89	0.00	0.00	0.00	0.00	-0.01
MAIN-20	15.19	16.18	16.64	17.15	17.55	15.19	16.18	16.64	17.15	17.55	0.00	0.00	0.00	0.00	0.00
MAIN-21	15.43	16.34	16.78	17.26	17.65	15.43	16.34	16.78	17.26	17.65	0.00	0.00	0.00	0.00	0.00
MAIN-22	15.59	16.47	16.90	17.37	17.73	15.59	16.47	16.90	17.37	17.73	0.00	0.00	0.00	0.00	0.00
MAIN-23	15.96	16.92	17.64	18.37	18.99	15.96	16.92	17.64	18.37	18.99	0.00	0.00	0.00	0.00	0.00
MAIN-24	16.09	16.98	17.69	18.40	19.01	16.09	16.98	17.69	18.40	19.01	0.00	0.00	0.00	0.00	0.00
MAIN-25	17.05	19.39	19.67	19.81	19.92	17.05	19.39	19.67	19.81	19.92	n/a	n/a	n/a	n/a	n/a
PIRLNDPOND01	3.31	4.62	5.14	5.65	5.88	3.31	4.60	5.13	5.64	5.88	0.00	-0.02	-0.01	-0.01	0.00
PIRLNDPOND02	5.27	6.17	6.29	6.38	6.48	5.27	6.17	6.29	6.38	6.48	0.00	0.00	0.00	0.00	0.00
PIRLNDPOND03	5.34	6.57	6.85	7.13	7.41	5.34	6.57	6.85	7.13	7.41	0.00	0.00	0.00	0.00	0.00
PW POND-01	19.17	19.50	19.81	20.26	20.81	17.92	19.01	19.28	19.62	20.24	-1.25	-0.49	-0.53	-0.64	-0.57
PW POND-02	16.71	17.81	18.23	18.42	18.56	16.71	17.81	18.23	18.42	18.56	0.00	0.00	0.00	0.00	0.00
PW POND-03	10.87	12.54	13.26	13.86	14.16	10.87	12.54	13.25	13.86	14.16	0.00	0.00	-0.01	0.00	0.00
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.50	16.71	16.79	16.87	16.98	0.00	0.00	0.00	0.00	0.00
PW-01	10.00	12.13	12.79	13.47	14.17	10.00	12.13	12.79	13.46	14.16	0.00	0.00	0.00	-0.01	-0.01
PW-02	10.15	12.29	13.00	13.90	14.83	10.15	12.28	13.00	13.89	14.83	0.00	-0.01	0.00	-0.01	0.00
PW-03	10.49	12.33	13.03	13.92	14.85	10.49	12.32	13.02	13.91	14.84	0.00	-0.01	-0.01	-0.01	-0.01
PW-05	10.10	12.43	13.16	13.94	14.63	10.09	12.40	13.13	13.90	14.59	-0.01	-0.03	-0.03	-0.04	-0.04
PW-06A	14.17	14.61	15.18	16.42	17.06	14.17	14.57	14.92	16.18	16.83	0.00	-0.04	-0.26	-0.24	-0.23
PW-06B	14.25	14.72	15.27	16.48	17.11	14.25	14.66	15.01	16.23	16.87	0.00	-0.06	-0.26	-0.25	-0.24
PW-07	16.25	17.64	17.97	18.17	18.75	16.25	17.35	17.68	17.90	18.36	0.00	-0.29	-0.29	-0.27	-0.39
PW-08	16.53	18.79	19.40	19.87	20.44	16.52	18.20	18.77	19.28	19.92	-0.01	-0.59	-0.63	-0.59	-0.52
PW-09	18.58	18.81	19.42	19.89	20.46	16.57	18.25	18.81	19.31	19.94	-0.01	-0.56	-0.61	-0.58	-0.52
PW-13	18.58	19.35	19.72	20.14	20.59	18.58	19.35	19.71	20.12	20.56	0.00	0.00	-0.01	-0.02	-0.03
PW-14	21.52	21.96	22.12	22.29	22.45	21.52	21.96	22.12	22.29	22.45	0.00	0.00	0.00	0.00	0.00
PW-15	21.74	22.07	22.21	22.36	22.51	21.74	22.07	22.21	22.36	22.51	0.00	0.00	0.00	0.00	0.00
PW-16	23.53	23.97	24.11	24.26	24.39	23.53	23.97	24.11	24.26	24.39	0.00	0.00	0.00	0.00	0.00
PW-17	23.78	24.33	24.57	24.84	25.17	23.78	24.33	24.57	24.84	25.17	0.00	0.00	0.00	0.00	0.00
STOR-01	11.70	12.21	12.74	13.30	13.95	11.70	12.21	12.73	13.30	13.95	0.00	0.00	-0.01	0.00	0.00
STOR-02	12.48	13.45	13.85	14.18	14.30	12.48	13.45	13.85	14.18	14.30	0.00	0.00	0.00	0.00	0.00
STOR-03	12.70	13.59	13.96	14.28	14.39	12.70	13.59	13.96	14.28	14.39	0.00	0.00	0.00	0.00	0.00
STOR-04	14.82	15.18	15.35	15.60	15.78	14.82	15.18	15.35	15.60	15.78	0.00	0.00	0.00	0.00	0.00
STOR-05	16.67	19.10	19.91	20.70	21.57	16.67	18.82	19.66	20.49	21.35	0.00	-0.28	-0.25	-0.21	-0.22
STOR-06	16.68	19.11	19.93	20.73	21.62	16.67	18.84	19.69	20.53	21.41	-0.01	-0.27	-0.24	-0.20	-0.21
STOR-07	18.07	19.20	19.97	20.76	21.64	18.07	19.09	19.76	20.57	21.44	0.00	-0.11	-0.21	-0.19	-0.20

Probable Construction Costs

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

OPINIONS OF PROBABLE CONSTRUCTION COST

SEPTEMBER 18, 2012

J-23453.404

Prepared by:

THOMAS & HUTTON

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 1A - Hwy 17 Culvert Impr. and Channel Impr.

THOMAS & HUTTON

DATE PREPARED : 9/11/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 10,000.00	$ 10,000
2	Layout	1	LS	$ 4,000.00	$ 4,000
3	Testing	1	LS	$ 10,000.00	$ 10,000
4	Maintenance of Traffic	1	LS	$ 25,000.00	$ 25,000
5	Clearing and Grubbing	3.2	AC	$ 6,000.00	$ 19,200
6	Removal and Disposal of Exist Asphalt	446	SY	$ 8.00	$ 3,572
7	Silt Fence	200	LF	$ 4.00	$ 800
8	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
9	Water Management	1	LS	$ 15,000.00	$ 15,000
10	Groundwater Control	1	MO	$ 25,000.00	$ 25,000
11	Excavation, Haul and Dispose	13,233	CY	$ 20.00	$ 264,656
12	5'x10' CBC	110	LF	$ 1,500.00	$ 165,000
13	Demo and Replace 12" Sewer Force Main	100	LF	$ 120.00	$ 12,000
14	Demo and Replace 8" Water Main	100	LF	$ 80.00	$ 8,000
15	Concrete Headwall w/ Rip Rap	2	EA	$ 20,000.00	$ 40,000
16	Misc. Rip-Rap w/ filter cloth	722	SY	$ 30.00	$ 21,667
17	Full Depth Hot Mix Asphalt	179	TON	$ 100.00	$ 17,858
18	Guard Rail	100	LF	$ 50.00	$ 5,000
19	Grading	15,488	SY	$ 2.00	$ 30,976
20	Grassing	15,488	SY	$ 5.00	$ 77,440
				SUBTOTAL:	$ 651,352
				Contingency (25%):	$ 162,838
				TOTAL:	$ 814,189
				SAY:	**$ 815,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included.

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 1B - Hwy 17 Culvert Improvements (7'x7'CBC)

THOMAS & HUTTON

DATE PREPARED : 8/22/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Maintenance of Traffic	1	LS	$ 25,000.00	$ 25,000
5	Clearing and Grubbing	0.4	AC	$ 6,000.00	$ 2,400
6	Removal and Disposal of Exist Asphalt	267	SY	$ 8.00	$ 2,133
7	Silt Fence	200	LF	$ 4.00	$ 800
8	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
9	Water Management	1	LS	$ 5,000.00	$ 5,000
10	Groundwater Control	1	MO	$ 25,000.00	$ 25,000
11	Excavation, Haul and Dispose	1,070	CY	$ 20.00	$ 21,400
12	7'x7' CBC	110	LF	$ 1,200.00	$ 132,000
13	Demo and Replace 12" Sewer Force Main	100	LF	$ 120.00	$ 12,000
14	Demo and Replace 8" Water Main	100	LF	$ 80.00	$ 8,000
15	Concrete Headwall w/ Rip Rap	2	EA	$ 20,000.00	$ 40,000
16	Full Depth Hot Mix Asphalt	107	TON	$ 100.00	$ 10,667
17	Guard Rail	100	LF	$ 50.00	$ 5,000
18	Grading	1,750	SY	$ 2.00	$ 3,500
19	Grassing	1,750	SY	$ 5.00	$ 8,750
				SUBTOTAL:	$ 303,700
				Contingency (25%):	$ 75,925
				TOTAL:	$ 379,625
				SAY:	**$ 380,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included.

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 1B - Hwy 17 Culvert Improvements (42" RCP)

THOMAS & HUTTON

DATE PREPARED : 8/22/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Maintenance of Traffic	1	LS	$ 25,000.00	$ 25,000
5	Clearing and Grubbing	0.4	AC	$ 6,000.00	$ 2,400
6	Removal and Disposal of Exist Asphalt	267	SY	$ 8.00	$ 2,133
7	Silt Fence	200	LF	$ 4.00	$ 800
8	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
9	Water Management	1	LS	$ 5,000.00	$ 5,000
10	Groundwater Control	1	MO	$ 25,000.00	$ 25,000
11	Excavation, Haul and Dispose	500	CY	$ 20.00	$ 10,000
12	42" RCP	110	LF	$ 100.00	$ 11,000
13	Demo and Replace 12" Sewer Force Main	100	LF	$ 120.00	$ 12,000
14	Demo and Replace 8" Water Main	100	LF	$ 80.00	$ 8,000
15	Concrete Headwall w/ Rip Rap	2	EA	$ 15,000.00	$ 30,000
16	Full Depth Hot Mix Asphalt	107	TON	$ 100.00	$ 10,667
17	Guard Rail	100	LF	$ 50.00	$ 5,000
18	Grading	1,750	SY	$ 2.00	$ 3,500
19	Grassing	1,750	SY	$ 5.00	$ 8,750
				SUBTOTAL:	$ 161,300
				Contingency (25%):	$ 40,325
				TOTAL:	$ 201,625
				SAY:	**$ 202,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included.

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 2A - Detention Pond at Catherine Drive

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	1.5	AC	$ 9,000.00	$ 13,500
5	Silt Fence	500	LF	$ 4.00	$ 2,000
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Groundwater Control	1	MO	$ 25,000.00	$ 25,000
8	Excavation, Haul and Dispose	19,800	CY	$ 20.00	$ 396,000
9	Concrete Catch Basin	1	EA	$ 3,300.00	$ 3,300
10	42" RCP	50	LF	$ 100.00	$ 5,000
11	Concrete Control Structure	1	EA	$ 3,300.00	$ 3,300
12	48" RCP	75	LF	$ 120.00	$ 9,000
13	Misc. Rip-Rap w/ filter cloth	45	SY	$ 30.00	$ 1,350
14	Grading	5,500	SY	$ 2.00	$ 11,000
15	Grassing	5,500	SY	$ 5.00	$ 27,500
16	Fencing	1,000	LF	$ 25.00	$ 25,000
				SUBTOTAL:	$ 536,250
				Contingency (25%):	$ 134,063
				TOTAL:	$ 670,313
				SAY:	**$ 671,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 2B - Detention Pond at Catherine Drive

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	1.5	AC	$ 9,000.00	$ 13,500
5	Silt Fence	500	LF	$ 4.00	$ 2,000
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Groundwater Control	1	MO	$ 25,000.00	$ 25,000
8	Excavation, Haul and Dispose	19,400	CY	$ 20.00	$ 388,000
9	60" RCP	720	LF	$ 125.00	$ 90,000
10	Misc. Rip-Rap w/ filter cloth	112	SY	$ 30.00	$ 3,360
11	Grading	5,500	SY	$ 2.00	$ 11,000
12	Grassing	5,500	SY	$ 5.00	$ 27,500
13	Fencing	1,000	LF	$ 25.00	$ 25,000
14	Fill Exisiting Outfall	1	EA	$ 7,500.00	$ 7,500
				SUBTOTAL:	$ 599,660
				Contingency (25%):	$ 149,915
				TOTAL:	$ 749,575
				SAY:	**$ 750,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 2C - Detention Pond at Catherine Drive

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	1.5	AC	$ 9,000.00	$ 13,500
5	Silt Fence	500	LF	$ 4.00	$ 2,000
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Groundwater Control	1	MO	$ 10,000.00	$ 10,000
8	Excavation, Haul and Dispose	16,100	CY	$ 20.00	$ 322,000
9	18" RCP	65	LF	$ 40.00	$ 2,600
10	Misc. Rip-Rap w/ filter cloth	150	SY	$ 30.00	$ 4,500
11	Grading	5,500	SY	$ 2.00	$ 11,000
12	Grassing	5,500	SY	$ 5.00	$ 27,500
13	Fencing	1,000	LF	$ 25.00	$ 25,000
				SUBTOTAL:	$ 432,400
				Contingency (25%):	$ 108,100
				TOTAL:	$ 540,500
				SAY:	**$ 541,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 3 - Detention Pond at Lakeview Drive

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	8.1	AC	$ 6,000.00	$ 48,300
5	Silt Fence	5,000	LF	$ 4.00	$ 20,000
6	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
7	Groundwater Control	2	MO	$ 25,000.00	$ 50,000
8	Excavation, Haul and Dispose	110,000	CY	$ 20.00	$ 2,200,000
9	Control Structure	1	EA	$ 25,000.00	$ 25,000
10	Misc. Rip-Rap w/ filter cloth	650	SY	$ 30.00	$ 19,500
11	Grading	22,990	SY	$ 2.00	$ 45,980
12	Grassing	22,990	SY	$ 5.00	$ 114,950
13	Fencing	4,500	LF	$ 25.00	$ 112,500
				SUBTOTAL:	$ 2,652,830
				Contingency (25%):	$ 663,208
				TOTAL:	$ 3,316,038
				SAY:	**$ 3,317,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 4A - Chrystal Lake Improvements

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	0.2	AC	$ 9,000.00	$ 1,800
5	Silt Fence	600	LF	$ 4.00	$ 2,400
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Tree Protection	100	LF	$ 3.35	$ 335
8	Water Management	1	LS	$ 5,000.00	$ 5,000
9	Excavation, Haul and Dispose	1,200	CY	$ 20.00	$ 24,000
10	Misc. Rip-Rap w/ filter cloth	670	SY	$ 30.00	$ 20,100
11	Grading	500	SY	$ 2.00	$ 1,000
12	Grassing	200	SY	$ 5.00	$ 1,000
12	Replace asphalt sidewalk	115	SY	$ 22.00	$ 2,530
13	Wooden Boardwalk	270	SF	$ 12.00	$ 3,240
				SUBTOTAL:	$ 75,705
				Contingency (25%):	$ 18,926
				TOTAL:	$ 94,631
				SAY:	**$ 95,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
Alternative : **4B - Crystal Lake Modification**

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Silt Fence	40	LF	$ 4.00	$ 160
5	Clearing and Grubbing	0.1	AC	$ 9,000.00	$ 900
6	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
7	Tree Protection	100	LF	$ 3.35	$ 335
8	Water Management	1	LS	$ 5,000.00	$ 5,000
9	Remove Flash Board Riser	1	EA	$ 1,500.00	$ 1,500
10	Misc. Excavation and Grading (Lake)	200	CY	$ 25.00	$ 5,000
11	48" RCP	210	LF	$ 330.00	$ 69,300
12	Abandon 60" CMP	1	EA	$ 1,000.00	$ 1,000
13	Misc. Rip-Rap w/ filter cloth	270	SY	$ 30.00	$ 8,100
14	Grading	400	SY	$ 2.00	$ 800
15	Grassing	400	SY	$ 5.00	$ 2,000
15	Asphalt sidewalk	115	SY	$ 22.00	$ 2,530
16	Selective Lake Dredging	UNK	SY	UNKNOWN	UNKNOWN
				SUBTOTAL:	$ 113,225
				Contingency (25%):	$ 28,306
				TOTAL:	$ 141,531
				SAY:	**$ 142,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
Alternative : **4C - Crystal Lake Modification**

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Silt Fence	200	LF	$ 4.00	$ 800
5	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
6	Tree Protection	200	LF	$ 3.35	$ 670
7	Water Management	1	LS	$ 10,000.00	$ 10,000
8	Clearing and Grubbing	0.5	AC	$ 9,000.00	$ 4,500
9	Demo. Exist. Flash Board Riser	1	EA	$ 1,500.00	$ 1,500
10	Demo. Exist. 30" RCP	80	LF	$ 10.00	$ 800
11	Demo. Exist. 36" RCP	100	LF	$ 10.00	$ 1,000
12	Demo. Exist. (2) 8'x8' CBC	30	LF	$ 100.00	$ 3,000
13	Demo. Exist. 60" CMP	80	LF	$ 25.00	$ 2,000
14	Remove and Dispose Existing Pavement	250	SY	$ 3.50	$ 875
15	Improve Exist. Channel	1,500	LF	$ 100.00	$ 150,000
16	(3) 8'x6' CBC	120	LF	$ 2,500.00	$ 300,000
17	60" RCP	180	LF	$ 125.00	$ 22,500
18	Full Depth Hot Mix Asphalt	66	TON	$ 100.00	$ 6,600
19	Misc. Excavation and Grading (Lake)	500	CY	$ 25.00	$ 12,500
20	Selective Lake Dredging	UNK	SY	UNKNOWN	UNKNOWN
				SUBTOTAL:	$ 533,345
				Contingency (25%):	$ 133,336
				TOTAL:	$ 666,681
				SAY:	**$ 667,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 5 - Detention Ponds at Seagate Village

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	16.4	AC	$ 2,000.00	$ 32,800
5	Silt Fence	600	LF	$ 4.00	$ 2,400
6	Constrcution Entrance	2	EA	$ 2,300.00	$ 4,600
7	Groundwater Control	2	MO	$ 25,000.00	$ 50,000
8	Excavation, Haul and Dispose	165,200	CY	$ 20.00	$ 3,304,000
9	Demo and Replace Existing 8" Water Main	200	LF	$ 78.00	$ 15,600
10	Demo and Replace Exist. Sewer MH	3	EA	$ 2,800.00	$ 8,400
11	Sewer MH	3	EA	$ 2,000.00	$ 6,000
12	Demo and Replace Gravity Sewer	910	LF	$ 80.00	$ 72,800
13	Control Structure	2	EA	$ 25,000.00	$ 50,000
14	Misc. Rip-Rap w/ filter cloth	500	SY	$ 30.00	$ 15,000
15	Grading	49,000	SY	$ 2.00	$ 98,000
16	Grassing	49,000	SY	$ 5.00	$ 245,000
				SUBTOTAL:	$ 3,916,600
				Contingency (25%):	$ 979,150
				TOTAL:	$ 4,895,750
				SAY:	**$ 4,896,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 7 - Stratmill Court Drainage Diversion

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	0.3	AC	$ 9,000.00	$ 2,250
5	Silt Fence	200	LF	$ 4.00	$ 800
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Removal and Disposal of Exist Asphalt	370	SY	$ 8.00	$ 2,960
8	Demo and Replace Exist. 18" CPP w/ RCP	80	LF	$ 45.00	$ 3,600
9	Demo and Replace Exist. 30" CPP w/ RCP	430	LF	$ 65.00	$ 27,950
10	Demo and Replace Exist. CB / MH	5	EA	$ 2,800.00	$ 14,000
11	Full Depth Hot Mix Asphalt	148	TON	$ 100.00	$ 14,800
12	36" RCP	260	LF	$ 85.00	$ 22,100
13	Flap Gate	1	EA	$ 4,000.00	$ 4,000
14	Misc. Rip-Rap w/ filter cloth	30	SY	$ 30.00	$ 900
15	Grading	1,450	SY	$ 2.00	$ 2,900
16	Grassing	1,450	SY	$ 5.00	$ 7,250
				SUBTOTAL:	$ 117,810
				Contingency (25%):	$ 29,453
				TOTAL:	$ 147,263
				SAY:	**$ 148,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

OPINION OF PROBABLE CONSTRUCTION COST

PROJECT : **Lakewood-Pirateland Swash Drainage Study**
LOCATION : Horry County
ESTIMATOR : EAK / RPK
ALTERNATIVE: 8 - Stratmill Court Flood Protection System Imp.

THOMAS & HUTTON

DATE PREPARED : 8/1/12	REVISED:
BASIS FOR ESTIMATE	
x	(Master plan)
	(Preliminary design)
	(Final design)
	(Other)

OPINION OF PROBABLE CONSTRUCTION COST

Since the Engineer has no control over the cost of labor, materials, equipment, over the Contractor's methods of determining prices, or over competitive bidding or market conditions, the Opinions of Probable Construction Costs provided for herein are made on the basis of his experience and qualifications. These opinions represent his best judgment as a design professional familiar with the construction industry. However, the Engineer cannot and does not guarantee that proposals, bids, or the construction cost will not vary from Opinions of Probable Construction Costs prepared by him.

ITEM	DESCRIPTION	NUMBER OF UNITS	UNIT MEASURE	COST PER UNIT	COST TOTAL COST
1	Mobilization	1	LS	$ 5,000.00	$ 5,000
2	Layout	1	LS	$ 2,000.00	$ 2,000
3	Testing	1	LS	$ 5,000.00	$ 5,000
4	Clearing and Grubbing	0.4	AC	$ 9,000.00	$ 3,600
5	Silt Fence	1,400	LF	$ 4.00	$ 5,600
6	Constrcution Entrance	1	EA	$ 2,300.00	$ 2,300
7	Berm	640	LF	$ 40.00	$ 25,600
8	Improve Exist. Berm	800	LF	$ 20.00	$ 16,000
9	Grading	3,200	SY	$ 2.00	$ 6,400
10	Grassing	3,200	SY	$ 5.00	$ 16,000
				SUBTOTAL:	$ 87,500
				Contingency (25%):	$ 21,875
				TOTAL:	$ 109,375
				SAY:	**$ 110,000**

Notes:

1. No landscaping or irrigation costs included.
2. No soft costs included such as Engineering, Surveying, Permitting, Legal, Land Acquisition, etc.
3. No mitigation (wetland) fees included.
4. No property cost (drainage easement, temporary const. easements, right-of way, etc.) included

E

Exhibits

DRAINAGE STUDY

PHASE 2 – ALTERNATIVE IMPROVEMENTS

FOR:

LAKEWOOD – PIRATELAND SWASH

HORRY COUNTY, SC

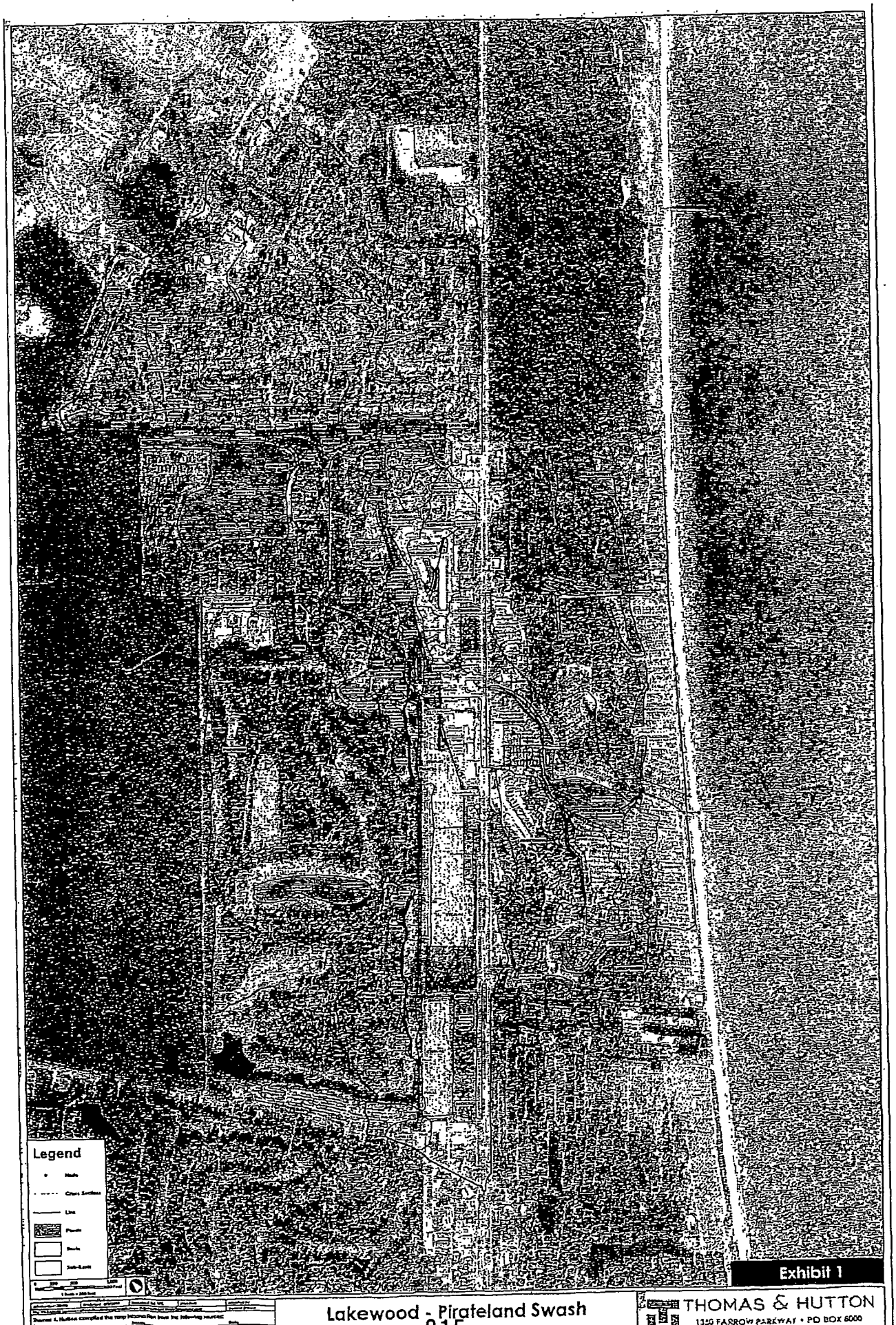
EXHIBITS

SEPTEMBER 18, 2012

J-23453.404

Prepared by:

THOMAS & HUTTON


Legend
Exhibit 1
Lakewood - Pirateland Swash
Drainage Study - Phase 2
THOMAS & HUTTON
1350 FARROW PARKWAY • PO BOX 6000
MYRTLE BEACH, SC 29578-6000 • 843.839.3445
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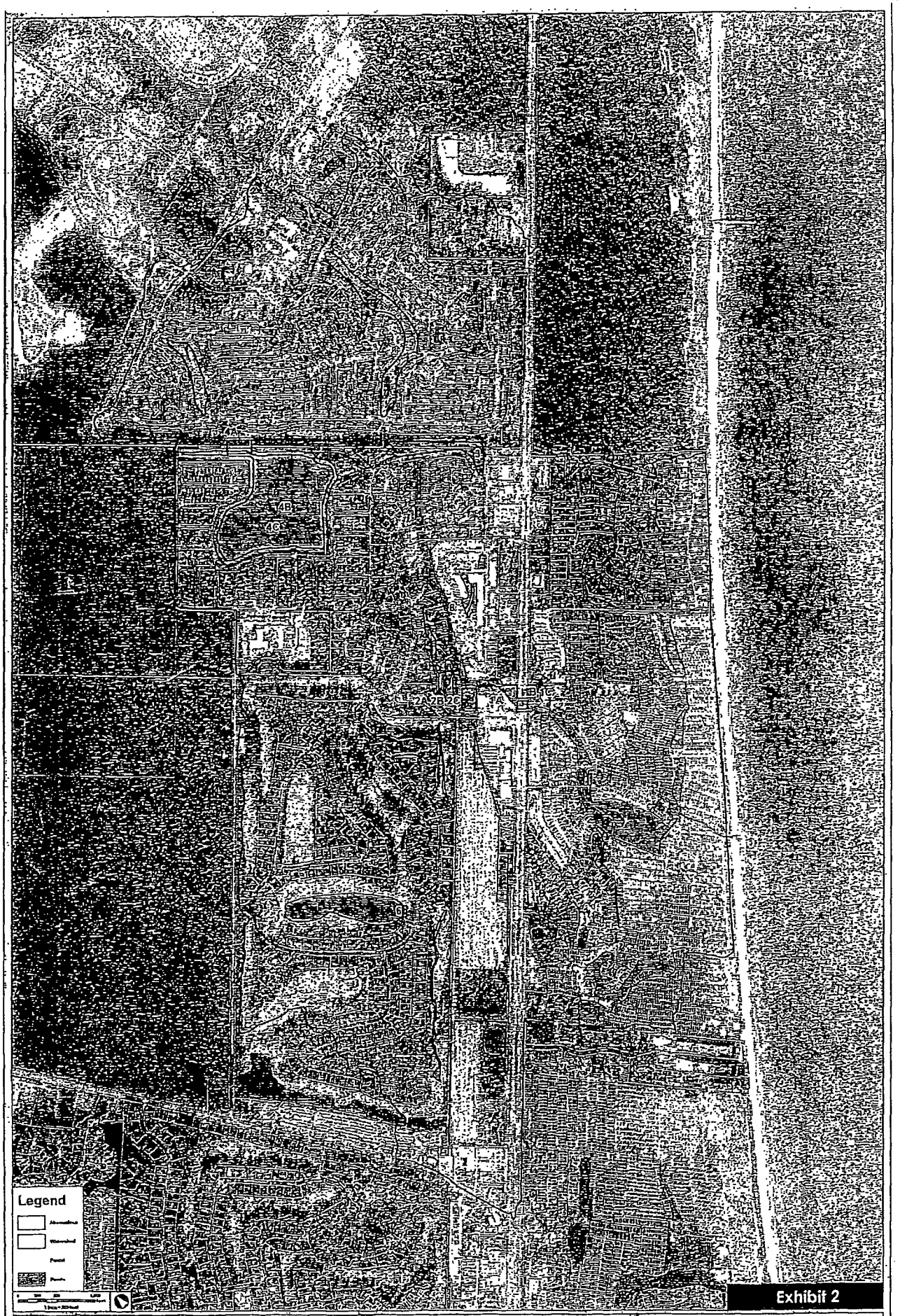


Exhibit 2

Lakewood - Pirateland Swash
Drainage Study - Phase 2

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Swale Design

Phase I

Drainage Study and Technical Manual

LAKE WOOD II
Phase I

Report and Appendices A-C

Lakewood-Pirateland Swash Drainage Study

February 29, 2012

Horry County, South Carolina



THOMAS & HUTTON

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DRAINAGE STUDY

FOR:

LAKEWOOD – PIRATELAND SWASH

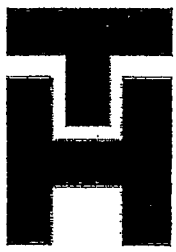
HORRY COUNTY, SC

PREPARED FOR:

HORRY COUNTY STORMWATER DEPARTMENT

FEBRUARY 29, 2012

J-23453.404



Prepared by:

THOMAS & HUTTON

Savannah, GA | Charleston, SC | Myrtle Beach, SC | Brunswick, GA | Wilmington, NC

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BACKGROUND AND INTRODUCTION

Horry County is experiencing rapid growth and in certain places, the pace of development continues to outgrow the capacity of the existing drainage system. Flooding concerns have been voiced by many of the businesses and residents in the Lakewood-Pirateland Swash Basin (Exhibit 1). Structural flooding of several business and/or homes has been recorded on at least two occasions in the past.

The Lakewood-Pirateland Basin drains 1,560 acres including the Lakewood and Pirateland Campgrounds, Long Bay Estates, and portions of the Myrtle Beach State Park, all east of US Highway 17 Business. West of US Highway 17 Business, the basin provides drainage for the Prestwick Subdivision and Country Club, Crystal Lakes Mobile Home Park, Seagate Village (formerly part of Myrtle Beach Air Force Base), and commercial properties along the highway. Drainage is conveyed through a swash to the Atlantic Ocean.

The purpose of this report is to document the development of the Phase 1 Hydrologic and Hydraulic Model for the Lakewood-Pirateland Swash Drainage Basin Project. The hydrologic and hydraulic model is intended to be capable of simulating the existing conditions within the study area and to serve as the basis for the analysis alternatives conceptual design of future improvements.

The Horry County Stormwater Department intends to implement a three phases approach to improving drainage in the basin – including (1) the development of a hydrology and hydraulic model, (2) alternatives analysis and recommendations, and (3) implementation of the recommended improvements.

Phase 1 of the Lakewood-Pirateland Swash Drainage Project included six tasks as follows:

- Task 1 – Data Collection
- Task 2 – Field Reconnaissance
- Task 3 – Surveying
- Task 4 – Existing Conditions Model Development
- Task 5 – Model Calibration
- Task 6 – Phase 1 Study Findings and Report

PHASE 1- HYDROLOGIC AND HYDRAULIC MODEL DEVELOPMENT

Data Collection

Thomas and Hutton has collected various data to build and calibrate a hydrologic and hydraulic model to simulate existing conditions in the Lakewood-Pirateland Swash Drainage Basin. The data collected generally falls within four broad categories:

- Geographic Information System (GIS) Data
- Construction Plans / As-built Plans / Design Reports
- Rainfall Data

Horry County GIS Data – The Horry County Stormwater Department supplied T&H with GIS data as part of the project, and T&H utilized data previously obtained from Horry County for the project. These data include a drainage system inventory (catch basins, discharge points, inlets, junction boxes, drainage line – open and closed, ponds and other hydrographic features), impervious areas, roads, property parcels, LiDAR topography, and land use / land cover.

City of Myrtle Beach GIS Data – T&H had previously obtained GIS data from the City of Myrtle Beach that was used for this project. This included a drainage system inventory (junctions, nodes, outfalls, structures, ditch lines, pipe lines, etc.

Other GIS Data – T&H utilized its extensive GIS data library as part of the project. Additional data used included aerial photography (historic and recent) and soils mapping (SSURGO) data.

Construction Plans / As-built Plans/ Design Reports – T&H collected various plans and reports for infrastructure built within the basin. This included partial plans for the initial phase of the Prestwick development, as-built plans for certain later phases of the Prestwick development, as-built plans and reports for recent developments in the Ocean Lakes Camper Storage and Village, and as-built plans for Bermuda Gardens. In addition to this, T&H accessed the SCDOT on-line plans library and downloaded plans for roads in the basin including US Hwy 17 Business, School Road (now Prestwick Club Drive, Lakeview Drive and Hwy 396) and Catherin Drive.

Rainfall Data - Daily and hourly rainfall data were collected from available rain gauges for the Hurricane Floyd (September 14-16, 1999) event and the September 26-30, 2010 storm event for calibration purpose. A location map for the local rainfall gauges with available data is included as Figure 1. Table 1 summarizes the daily total rainfall amounts for both events and Figure 2 compares the daily rainfall amounts for the five gages with available September 2010 rainfall data. Hourly rainfall data was used for input in the H&H model. The hourly data used for the Hurricane Floyd event calibration was taken from the Grand Strand Airport in North Myrtle Beach, SC and the hourly data for the September 2010 event was taken from the USGS Gage 02110729 (Hwy 707) in Socastee, SC. Figures 4 and 5 illustrate the hourly rainfall data for the Hurricane Floyd and September 2010 events, respectively.

Field Reconnaissance

Using the collected GIS data, the basin and sub-basins were delineated, flow patterns were determined and major drainage features were identified. Exhibit 1 illustrates the basin and sub-basins developed for this study. The basin was divided into 49 sub-basins based on the digital elevation model (DEM) and drainage infrastructure.

Field reconnaissance was conducted on various dates to confirm the basin and sub-basin delineation, document drainage infrastructure, assess reported flooding locations, and coordinate with stakeholders. Field reconnaissance was conducted October 27, 2011 (pre-project preparation), December 13, 2011 (in coordination with Dave Zabeck, Prestwick HOA contact; Paul Kaufman, Prestwick GC Superintendent; Dave Fuss, Horry County SW; and Eric Hasara, Horry County SW), December 21, 2011 and finally on February 9, 2012. During the field reconnaissance geo-referenced photography was taken to document the drainage infrastructure. Exhibit 2 illustrates the locations of the photo documentation and includes a selection of photographs.

The field reconnaissance findings were used to refine the basin, sub-basins and ICPR model link-node connectivity. Additionally, photographs and measurements within the basin were used to determine high water mark elevations of Hurricane Floyd and September 2010 events. A local business, Camper Country, located at 5500 S Kings Highway allowed measurements to be taken for flood levels that occurred during Hurricane Floyd. Flooding occurred 13 inches above the finished floor elevation of their Sales Service building as confirmed by water stains. Additionally, the business provided photographs that revealed the high water mark for the September 2010 storm event. This information was used to determine needed survey data.

Surveying

Based on the basin / sub-basin delineation and the identification of the major drainage system, surveying was conducted to gather detailed information for input in the H&H model. Surveying was conducted on two separate occasions December 15-16, 2011 and February 16, 2012. Approximately thirty-five channel cross section and 15 structures (culvert, bridge, or outfall) were surveyed. In addition, the finished floor elevations of critical structures and a high water mark where surveyed. This data was used in building and calibrating the H&H model.

Existing Conditions Model Development

The data collected during Tasks 1, through 3 where used to develop the input for an H&H model of major sub-basins and major drainage system for the Lakewood-Pirateland Swash Drainage Basin. The Interconnected Channel and Pond Routing (ICPR) Model by Streamline Technologies was used to develop the H&H model. Exhibit 3 is a node-link schematic ICPR model developed.

The ICPR program is capable of modeling rainfall and stormwater runoff and to perform hydraulic routing through the storm drainage system. The ICPR program is a FEMA approved model that has the ability to analyze complex interconnected drainage systems dynamically over extended time periods.

The hydrologic input for ICPR consists of information for each drainage sub-basin within the project. Input variables include runoff curve number, rainfall distribution pattern, hydrograph peaking factor, contributing area, and time of concentration. The ICPR program generates runoff hydrographs for each sub-basin based on these user-specified variables. Hydrographs are generated by ICPR using the SCS Unit Hydrograph Method.

Hydrologic inputs for each sub-basin include the contributing area, composite curve number and the time of concentration. The following paragraphs summarize the calculation of the hydrologic input.

Composite Curve Number – Composite curve numbers (CNs) were calculated using the land use/land cover grid (LULC) obtained from Horry County. This LULC grid if 4-feet by 4-feet and is comprised of approximately 20 different LULCs. Hydrologic soils group (HSG) data available from the USDA SSURGO GIS soils coverage for Horry County was overlain the 4-foot by 4-foot grid and a single HSG (A, A/D, B, B/D, C, and D) was assigned to each cell base on the majority of cell coverage.

A LULC-HSG matrix was developed for the project. The matrix was developed for each potential LULC-HSG combination, and is based on literature values (i.e. TR-55), past experience and professional judgment. The LULC-HSG Matrix developed for this study is included as Table 2. Based on the LULC-HSG matrix and the unique LULC-HSG in the grid, a single CN value was assigned to each cell. The CNs of the cells falling within each sub-basin where averaged, to produce an area weighted composite CN for each sub-basin.

Time of Concentration – A time of concentration (Tc) value was estimated for each sub-basin. The Tc was calculated based on the NRCS, three part travel time method documented in TR-55. The three equations used are summarized below:

Sheet Flow: (hr)

$$t_1 = \frac{0.007(nL)^{0.8}}{P_2^{0.05} \times S^{0.4}}$$

Symbol	Dimension	Units
n	Manning's n	--
L	Length of flow	ft
P_2	2 yr event rainfall	in
S	Slope	ft/ft

Shallow Concentrated Flow: (hr)

$$t_2 = \frac{L}{3600 \times V}$$

Symbol	Dimension	Units
L	Length of flow	ft
V*	Velocity	ft/s

*Based on TR-55 velocity-slope relationship

Pipe Flow: (hr)

$$t_3 = \frac{L}{3600 \times V}$$

Symbol	Dimension	Units
L	Length of flow	ft
V*	Velocity	ft/s

*Assumed to be 2 ft/s

Time of Concentration: (hr)

$$t_c = t_1 + t_2 + t_3$$

The longest flow path for each sub-basin was estimated by visually inspecting the available topographic and drainage system GIS data. The longest flow paths were digitized in GIS and split into three segments representing sheet flow, shallow concentrated flow, and pipe flow. The Slope of each line segment was determined using the available elevation data. The Tc calculations are summarized in Table 3.

Additional hydrologic data input in the ICPR model includes the following:

- SCS Unit Hydrograph Method
- SCS Type III Statistical Rainfall Distribution
- 256 Peaking Factor
- Design Storm Rainfall Amounts
  - 2-year, 24-hour = 4.5 inches
  - 10-year, 24-hour = 6.7 inches
  - 25-year, 24-hour = 7.6 inches
  - 50-year, 24-hour = 8.6 inches
  - 100-year, 24-hour = 9.7 inches

The ICPR model also consists of input data for a system of nodes and links (i.e. hydraulic data). Nodes represent locations where flows enter or exit the system, pipe or channel characteristics change, or where stage/storage/time relationships are provided. Links represent traditional types of hydraulic conveyance such as pipes, channels, drop structures, weirs, etc. The sizes, inverts, lengths, and Manning n values for all links are model input. In addition to pipe information, pond and other area's (i.e. wetlands) stage-storage information and the respective outfall structure information is input into the ICPR model.

Input data for the hydraulic portion of the H&H model was developed from a variety of sources including GIS, survey, and as-built data. Where applicable the data source is noted in the model as a comment for the particular input. Nodes we located at strategic locations to simulate the hydraulics of the basin's drainage system. Surveyed cross section data was merged with LiDAR topography data to produce "full-valley" cross sections for model input. Major lake, ponds and other storage areas are simulated as stage-area nodes to properly account for the detention of hydrographs in the system. Road overtopping and overland flow paths were simulated as weirs in the model for the accurate simulation of flooding conditions. Exhibit 4 is the ICPR link-node schematic for the developed model, and graphically illustrates the location and alignment of various model input.

The ICPR model was executed for the 2, 10, 25, 50, and 100-year storm events to initially evaluate the validity of the model results. During this evaluation, model adjustments and additional inputs were made to produce reasonable results.

Model Calibration

Following the development and assessment of the existing conditions H&H model, the model results were assessed under two known flooding events – Hurricane Floyd (in September 1999) and an extreme rainfall event in September 2010. Refer to Table X for a summary of recorded daily rainfall totals for the two events. Figures X and X illustrate the hourly rainfall pattern for the Hurricane Floyd and September 2010 events, respectively.

Hurricane Floyd

The Hurricane Floyd event produced approximately 13.56 inches of rain over a 32 hour period according to the rain gauge at the Grand Strand Airport in North Myrtle Beach. This is the only available rain gauge for the Hurricane Floyd event. The gauge is relatively distant from the Lakewood-Pirateland Swash Basin, however, the widespread rainfall associated with the hurricane allows for the use of the rainfall data as representative for the Lakewood-Pirateland Swash Basin.

ICPR model input was developed to simulate the rainfall of the Hurricane Floyd event as measured at the Grand Strand Airport. The model was then executed for a 72 hour simulation. The resulting maximum water surface elevations (WSEs) were extracted from the ICPR results and mapped at the appropriate node locations in the GIS system. Figure 5 illustrates the resulting maximum WSE in the lower portion of the basin near US HWY 17 Business, where flooding was reported during the actual Hurricane Floyd event.

The simulated maximum WSEs where compared to the known flooding conditions during the event to determine if the model was re-producing the flooding conditions. Structural flooding was report during the event at Camper County's showroom, 1284 Strathmill Ct. and 1288 Strathmill Ct. As summarized in Figure 5, the model reproduces the reported/measured flooding conditions during the event. The simulated flooding of the Camper County's showroom building

compares favorably with the measured high water mark measured there. In addition, the simulation reproduced finished floor flooding of 1284 Strathmill Ct. and 1288 Strathmill Ct., which is consistent with flooding reported by the owners. Other structures in the area (Camper Country repair building and Port of Siam) were not simulated as flooding, which is consistent with the reports that they did not flood during the event.

September 2010

The September 2010 event produced from 8.27 to 13.14 inches of rain over a 5 day period. Gauges closest to the watershed had some of the largest rainfall amounts recorded (See Table X and Figure X). The event appears to be two successive periods of heavy rainfall amounts generally on September 27, 2010 and September 29, 2010. For this purposes of this study the USGS gage at Hwy 707 was used for hourly rainfall data.

ICPR model input was developed to simulate the rainfall of the September 2010 event as measured at the USGS rain gauge. Two models were developed to simulate the event. The first period of rainfall produced 8.27 inches of rain in 72 hours, which was simulated in the model first. The second period produced 4.87 inches of rain in 48 hours, which was simulated second. The results from the first period were used to define the initial conditions for the second event. Also, the curve numbers of the second periods simulation were adjusted to reflect an Antecedent Moisture Condition (AMC) III condition, accounting for the saturated soil conditions for the second event.

The resulting maximum water surface elevations (WSEs) of the second simulation were extracted from the ICPR results and mapped at the appropriate node locations in the GIS system. Figure 6 illustrates the resulting maximum WSE in the lower portion of the basin near US HWY 17 Business, where flooding was reported during the actual September 2010 event.

The simulated maximum WSEs where compared to the known flooding conditions during the event to determine if the model was re-producing the flooding conditions. High water was reported at Camper County's showroom (but no structural flooding) and garage flooding was reported at 1284 Strathmill Ct. As summarized in Figure 6, the model reproduces the reported/measured flooding conditions during the event. The simulated flooding of the Camper County's site compares favorably with the measured high water mark measured there. In addition, the simulation garage flooding at 1284 Strathmill Ct. is consistent with flooding reported by the owners.

Based on the results of the above simulations, it appears as if the ICPR model constructed is capable of reproducing conditions in the basin (particularity in the area of Hwy 17 Business), and no significant adjustment of model input was needed. Refer to Appendix X for a full listing of the maximum WSEs simulated for both flood events.

FINDINGS AND RECOMMENDATIONS

Thomas and Hutton have developed a hydrologic and hydraulic model of the Lakewood-Pirateland Swash Basin and has confirmed the validity of model results with two historical flood events. The model results for the 2-, 10-, 25-, 50-, and 100-year design events are summarized in Appendix B. A print out of the model input is included in Appendix C, and the ICPR model and associated GIS files are included on Data Cd in Appendix D. The work documented in this report and the attached deliverables completes Phase I of the drainage study.

The upcoming Phase 2 - Alternatives Analysis and Improvement Recommendations will include screening, selecting, and evaluating potential alternatives to improve drainage conditions in the basin. These alternatives may include additional stormwater storage, culvert and channel improvements to reduce flooding. A cost benefits analysis will be required to evaluate alternatives. Thomas & Hutton is prepared to immediately continue to work with Horry County Stormwater Department on Phase 2. Below is our proposed approach.

Phase 2 – Alternatives Analysis and Improvement Recommendations

The second phase of the Lakewood-Pirateland Swash Basin Drainage Study will be to screen, select and evaluate potential alternatives to improve drainage conditions in the basin. Phase 2 will include the following tasks:

- Task 1 – Alternative Projects Screening
- Task 2 – Alternative Projects Evaluation
- Task 3 – Alternative Post-Improvement Conditions Model Development
- Task 4 – Opinion of Probable Cost and Benefit Analysis
- Task 5 – Phase 2 Study Findings and Report

The second phase of the study will be the selection and evaluation of alternatives such as additional stormwater storage, or culvert and channel improvements to reduce flooding. A cost benefit analysis will be required to evaluate the alternatives. Two meetings with County staff and two meetings with regulatory agencies are anticipated.

Task 1 - Alternative Projects Screening

Alternative improvement projects will be developed that will address the issues identified. The improvement projects may be independent (a specific project to address a single issue), cumulative (multiple projects may need to address a single issue), or multi-purpose (a single project may address multiple issues).

A preliminary improvement map showing the location of each potential project will be generated. T&H will discuss each potential project with the County in a workshop meeting and based on the input from the County and other factors, a preferred set of proposed projects will be selected for further assessment.

Task 2 – Post-Improvement Conditions Model Development

The preferred projects will be assessed further by incorporating the proposed improvements in a post-improvement conditions ICPR model. The model will be based on the existing conditions model and included the proposed improvements. The ICPR model input will be such that the cumulative impact of the phased projects can be assessed. The proposed improvements will be optimized and sizing and configurations will be documented. The ICPR model will be executed for the 2-, 10-, 25-, 50- and 100-year storm events.

Task 3 – Projects Evaluation

Utilizing available mapping data (aerials, contours, utilities, etc.), each proposed project selected for further evaluation will be conceptually illustrated in plan view to further assess the feasibility and constructability of the project. Various factors such as land, right-of-way, or easement requirements, potential utility conflicts and relocations, and road impacts will be determined.

A preliminary phased implementation plan will be developed. The phasing plan will accounting for various factors including relative cost, impact on reducing drainage/flooding issues, land acquisition needs, permitting requirements, etc. Initial coordination will be conducted with resource and permitting agencies at this time to confirm permittability and potential permit requirements.

Tasks 2 and 3 may be conducted concurrently and iteratively as modeling may prove one project more (or less) effective than anticipated and the project evaluation may determine that a project is infeasible or must be adjusted due to a constraint.

Task 4 – Opinion of Probable Cost and Benefit Analysis

Based on the refined concept plan for each proposed project, and individual opinion of probable construction cost will be developed. The costs will be based on recent bids and contracts for similar work as provided by the County and as found in T&H's records for recent projects in the area. Other costs (such as addition maintenance costs, if any) will also be incorporated in the costs of the project.

A benefit analysis of the proposed projects will be conducted. The benefit analysis will attempt to quantify the prevented damage costs, loss of business revenue, and other tangible benefits over the life of the proposed projects. Intangible benefits, such as providing emergency or evacuation access, elimination of nuisance flooding, and improve to water quality (if any) will also be accounted for. The costs will be compared to the benefits and the selected projects and/or the project phasing may be adjusted accordingly.

Task 5 – Phase 2 Study Findings and Report

The tasks and findings of Phase 2 will be documented in a report. The report will include the details of each project and the phasing plan for future reference by the County as implementation funds may become available or partnering opportunities are presented.

A draft of the report will be provided to the County for review and comment. A final report addressing the County's comments will be produced at the conclusion of the project.

Table 1
Weather Station Daily Rainfall Data Comparison

Hurricane Floyd (1999)								
Station	Location	City	Daily Rainfall (in)					Total Rainfall (in) Sept. 14-16, 1999
			9/14	9/15	9/16	-	-	
KCRE	Grand Strand Airport	N Myrtle Beach, SC	0.46	10.91	2.19	-	-	13.56

September Event (2010)								
Station	Location	City	Daily Rainfall (in)					Total Rainfall (in) Sept. 26-30, 2010
			9/26	9/27	9/28	9/29	9/30	
KSCURFS4	Oceanside Village	Garden City, SC	1.06	2.01	1.77	3.46	1.06	9.36
KSCMYRTL17	J L Schwartz WWTF	Myrtle Beach, SC	2.12	3.59	0.80	2.92	0.97	10.40
KCRE	Grand Strand Airport	N Myrtle Beach, SC	0.60	2.72	0.86	2.04	2.05	8.27
USGS 02110729	HWY 707	Socastee, SC	1.91	4.97	1.43	4.78	0.05	13.14
DHEC Surfside	HWY 544	Myrtle Beach, SC	1.39	3.36	2.15	5.07	0.75	12.72
Average	-	-	1.42	3.33	1.40	3.65	0.98	10.78

Table 2
Curve Number Matrix

Land Use	Curve Number						
	HSG A	HSG A/D	HSG B	HSG B/D	HSG C	HSG D	Water
Bare Land	39	39	61	61	74	80	100
Beach	50	50	50	50	50	50	100
Cropland	74	74	83	83	88	90	100
Deciduous Forested Wetland	30	77	55	77	70	77	100
Evergreen Forested Wetland	30	77	55	77	70	77	100
Golf Course	39	39	61	61	74	80	100
Grass	39	39	61	61	74	80	100
Impervious	98	98	98	98	98	98	100
Mixed Forested Wetland	30	77	55	77	70	77	100
Other Palustrine Wetland	30	77	55	77	70	77	100
Paved Road	98	98	98	98	98	98	100
Shrub	30	73	48	73	65	73	100
Structure	98	98	98	98	98	98	100
Unpaved Road	77	77	94	94	91	94	100
Upland Deciduous Forest	30	77	55	77	70	77	100
Upland Evergreen Forest	30	77	55	77	70	77	100
Upland Mixed Forest	30	77	55	77	70	77	100
Water	100	100	100	100	100	100	100

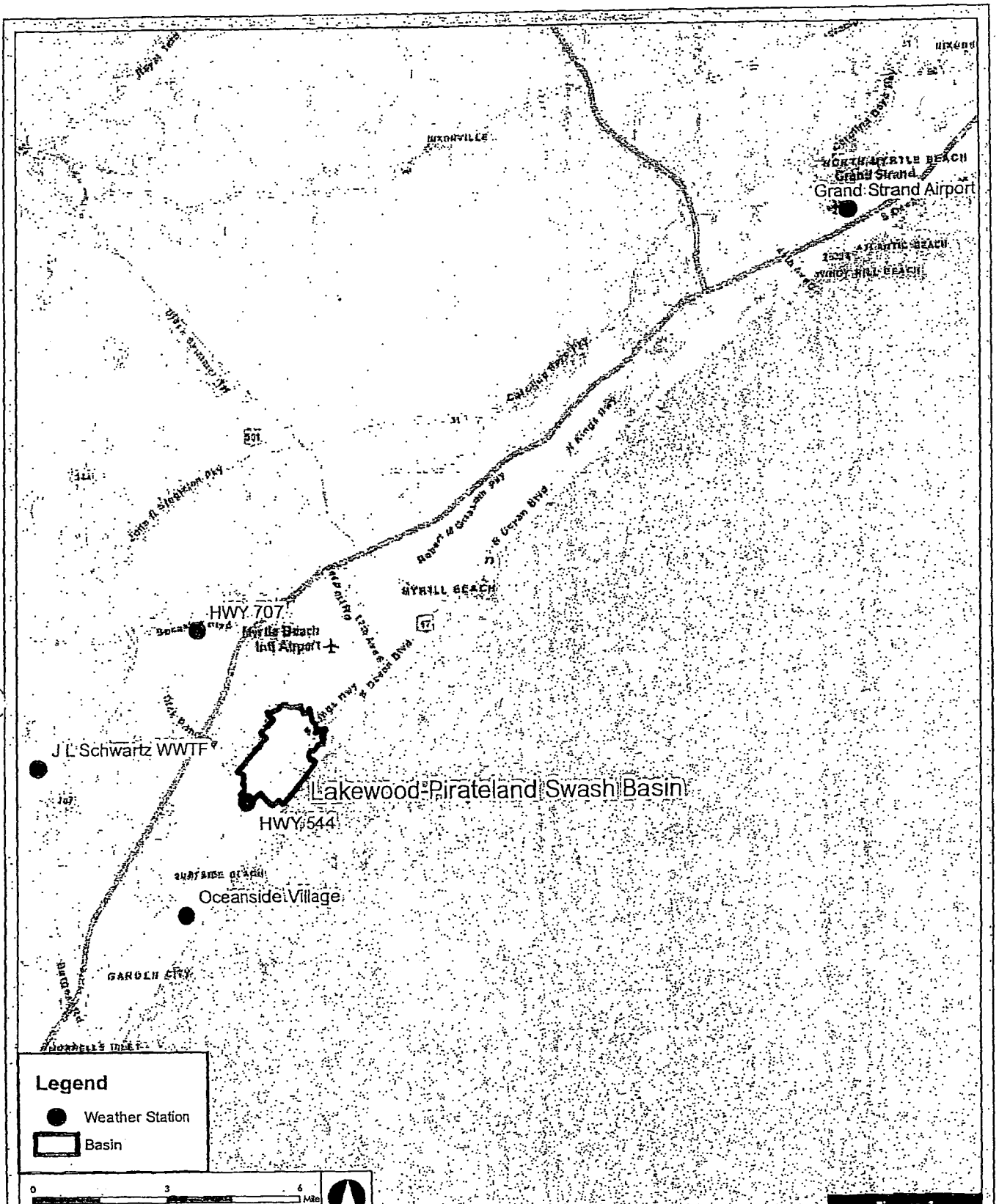


Figure 1

Thomas & Hutton compiled the map information from the following sources:

Data	Source	Date
Basin	TAR	2011
Weather Station	Weather Underground	2012
Aerial	Bing Maps	2011

DISCLAIMER

Thomas & Hutton shall not be liable for any errors, for this list, omitted or omitted data. For all other reasons (Thomas & Hutton) shall not be liable for any errors or inconsistencies investigation of the data, and assumes no representations as to the accuracy or completeness of the data. Please see each source for complete disclaimers for all its respective datasets.

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Lakewood - Pirateland Swash Drainage Study

Horry County, South Carolina

Weather Station Location Map

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Figure 2
Weather Station Daily Rainfall Data Comparison
September 26-30,2010

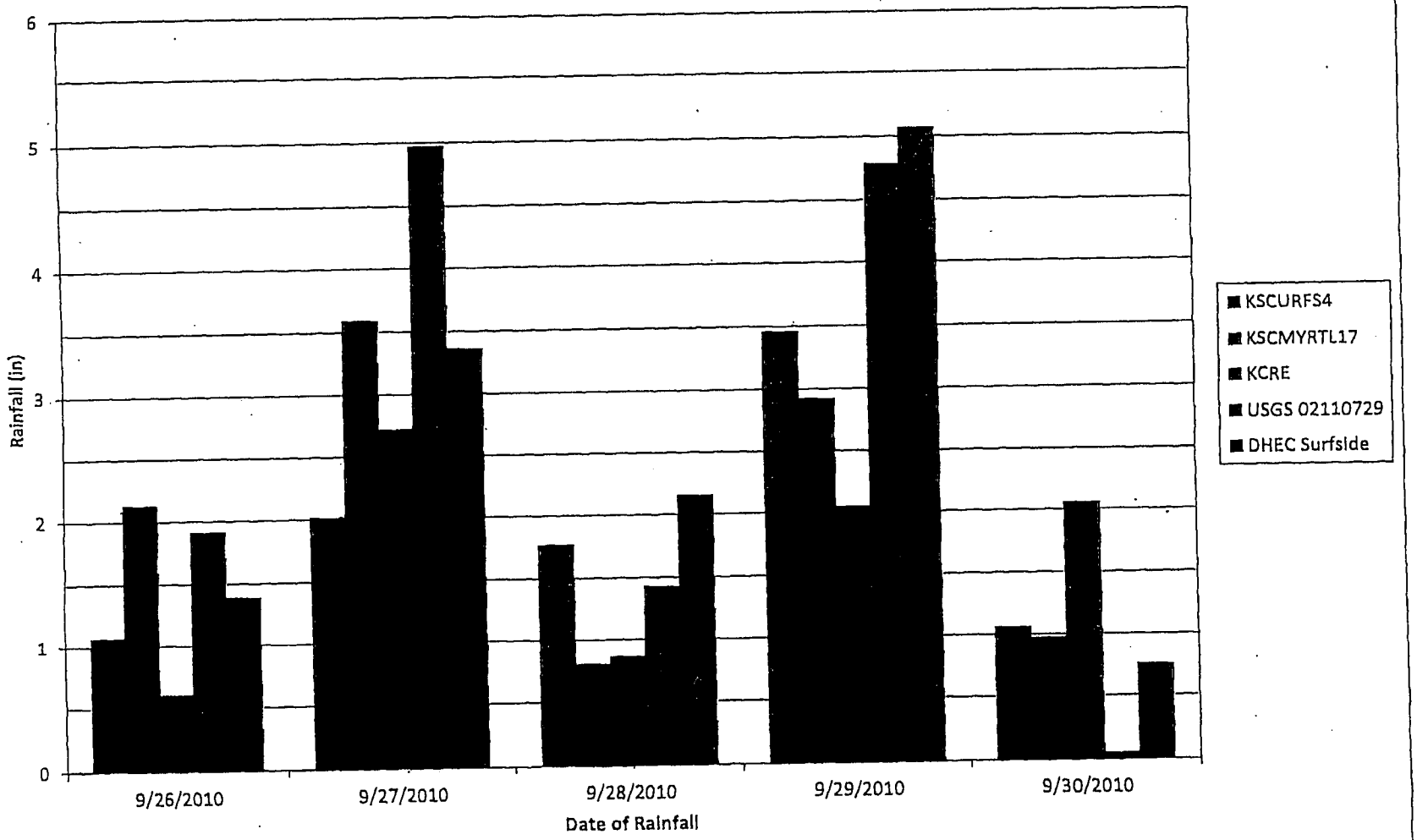


Figure 3
Hourly Rainfall, Grand Strand Airport
Hurricane Floyd, September 14-16, 1999

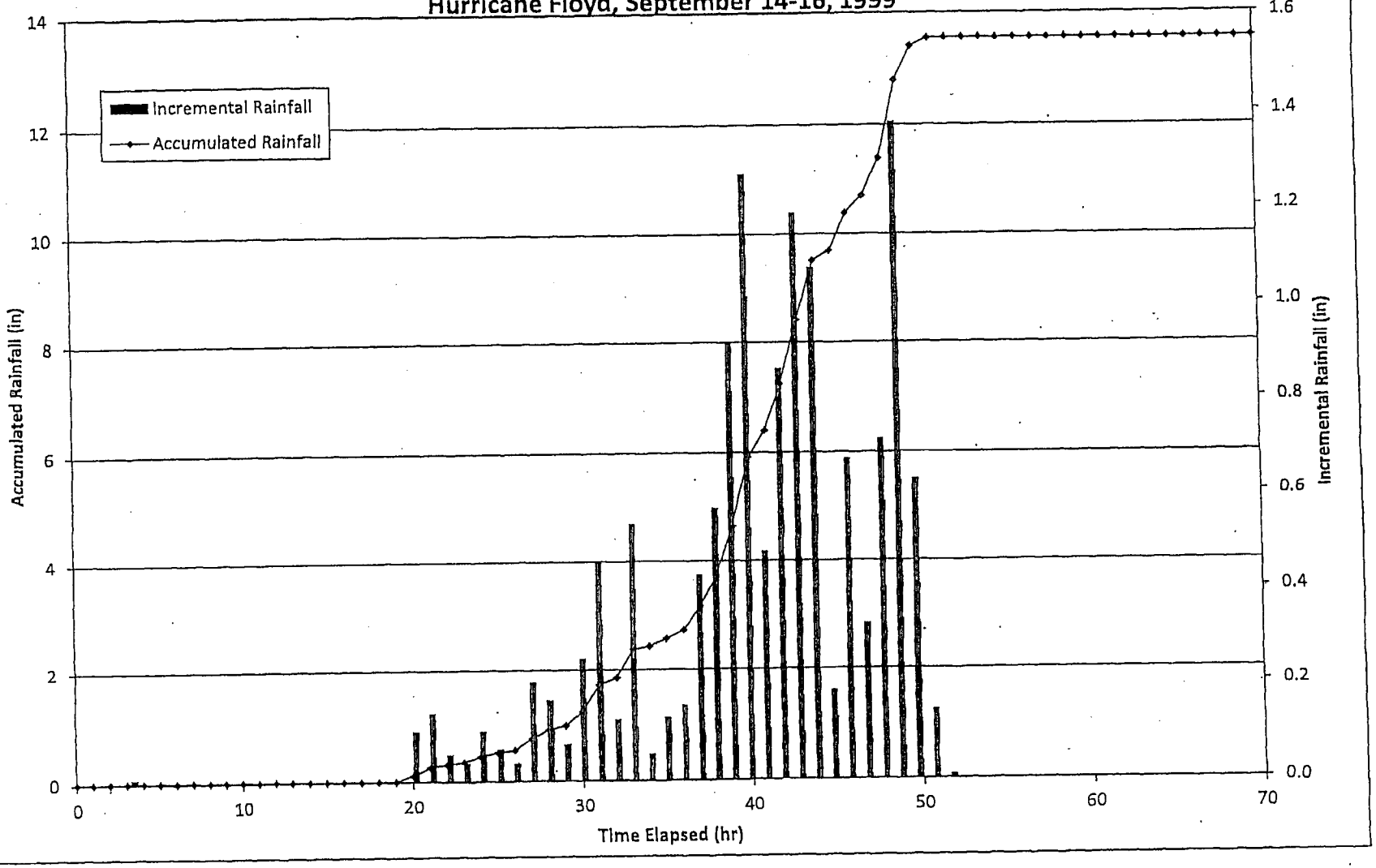
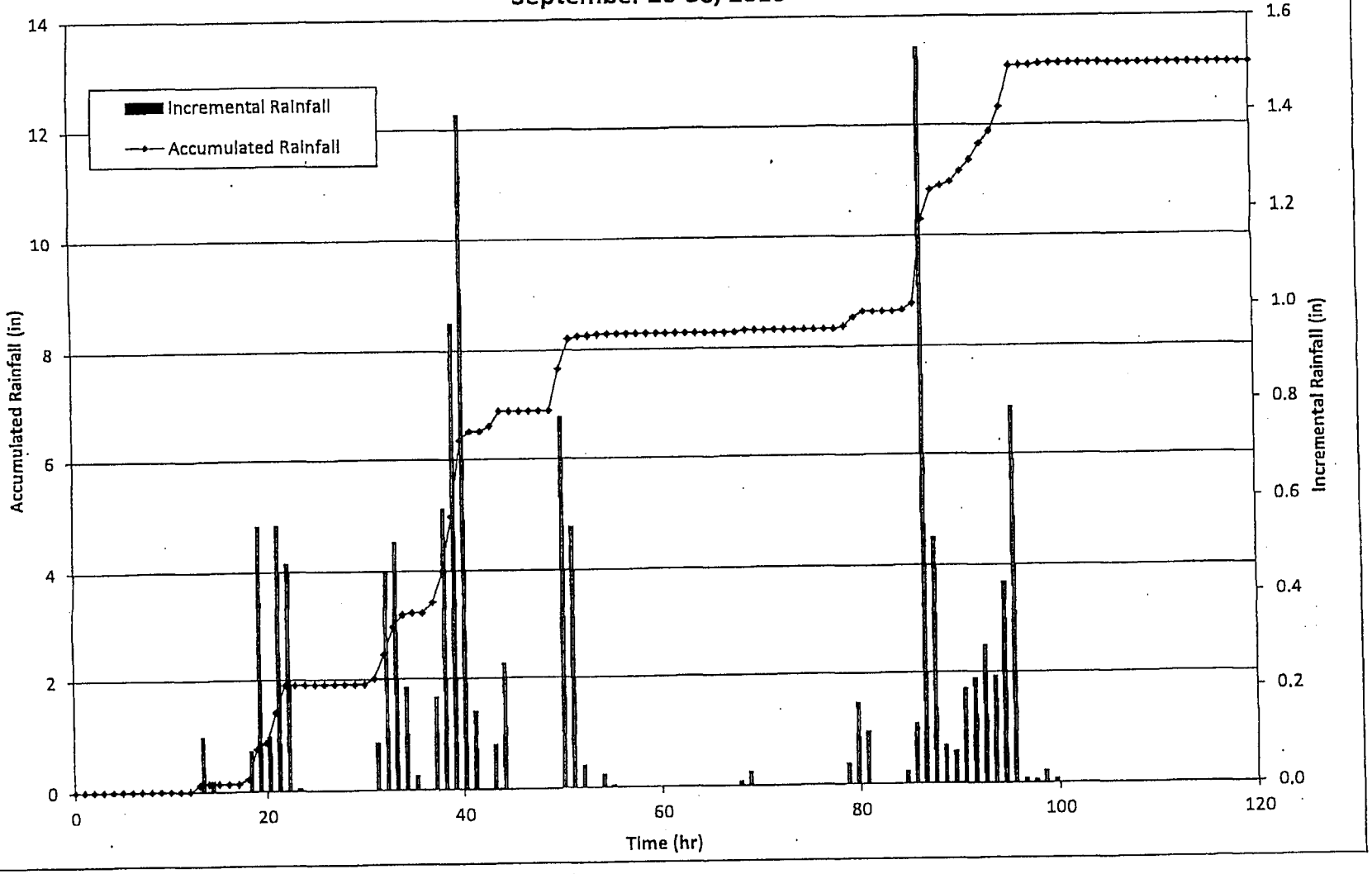


Figure 4
Hourly Rainfall, HWY 707
September 26-30, 2010



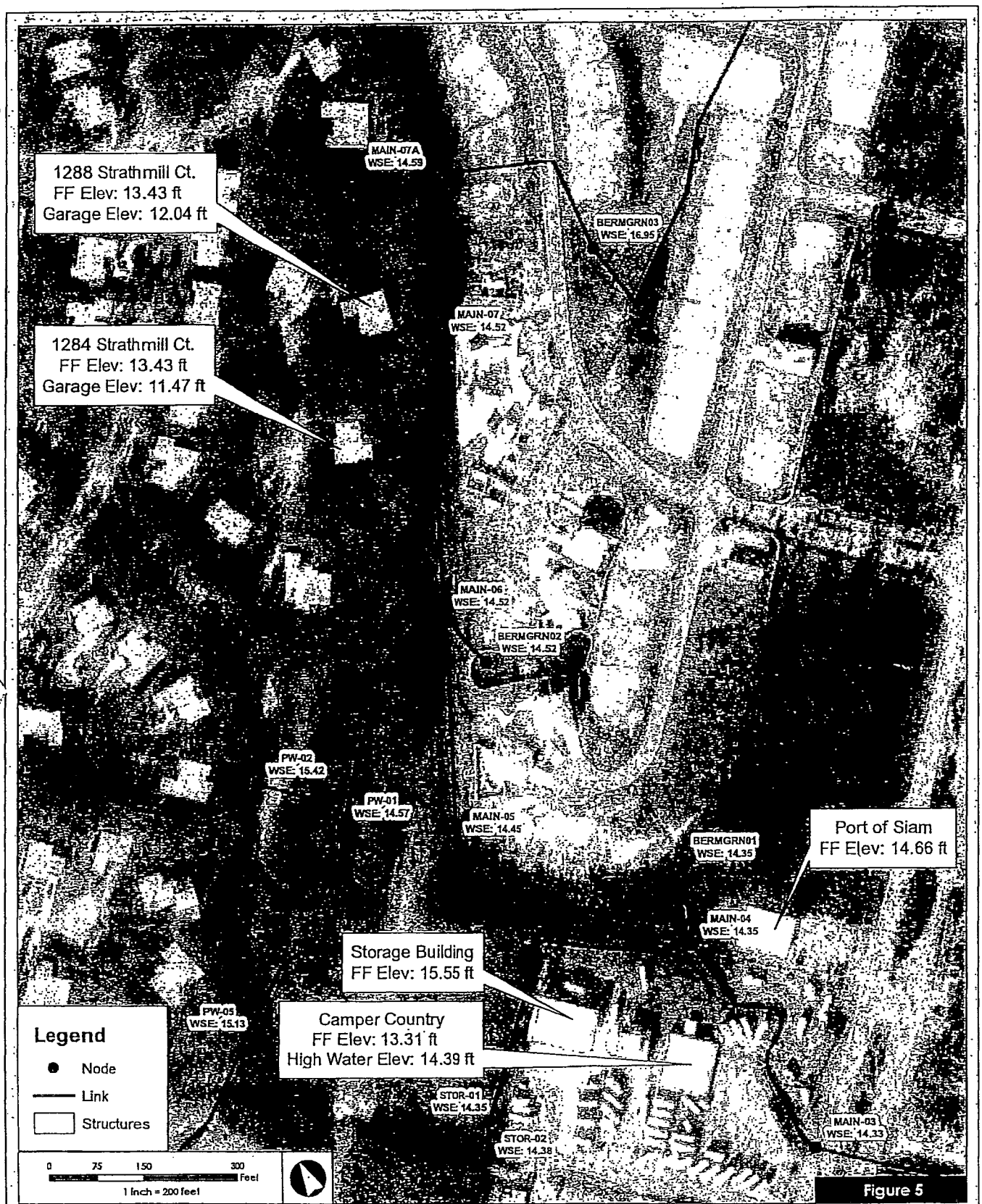


Figure 5

Lakewood - Pirateland
Swash Drainage Study
Horry County, South Carolina
ICPR Model Calibration
Hurricane Floyd

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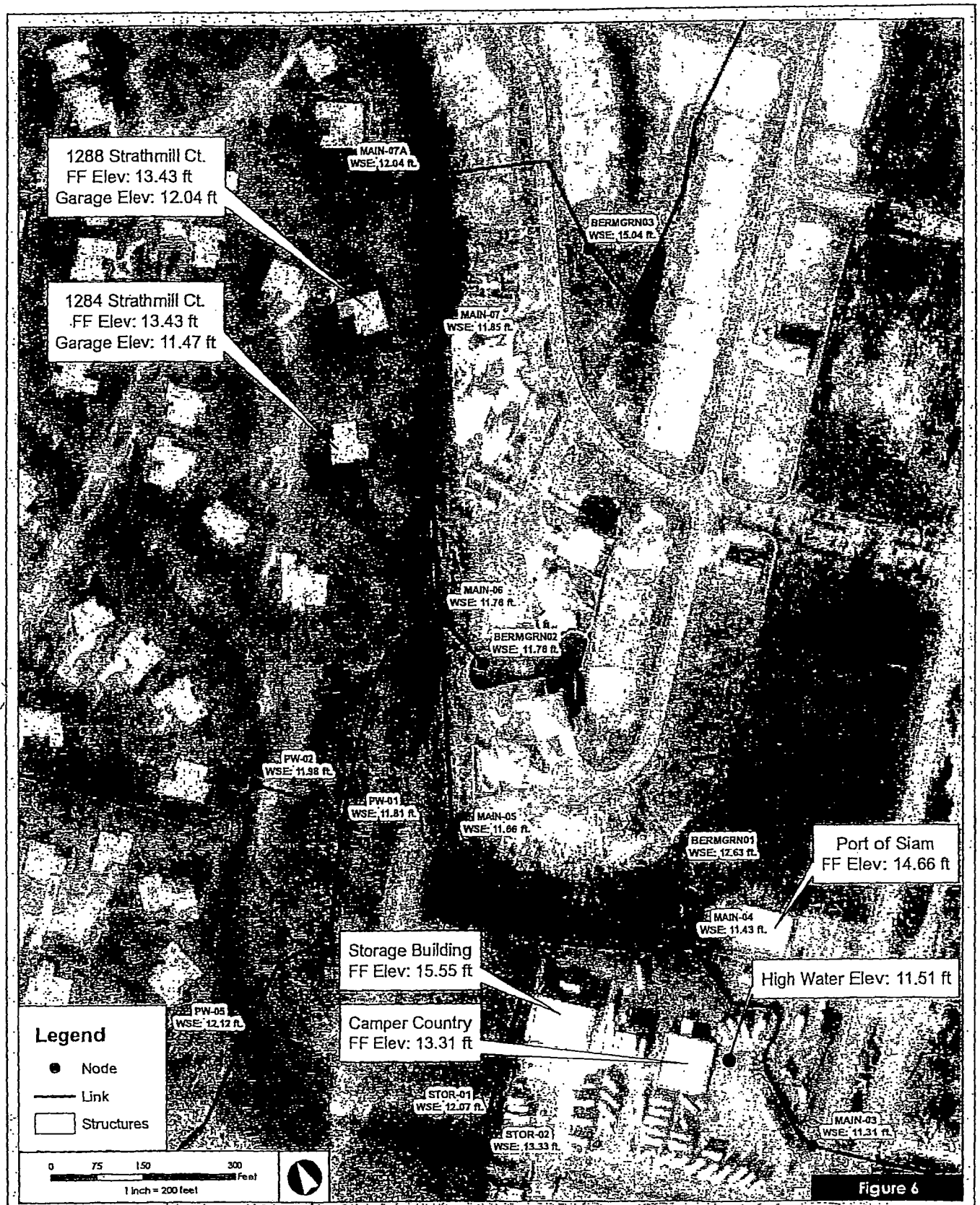


Figure 6

Lakewood - Pirateland
Swash Drainage Study
Horry County, South Carolina
ICPR Model Calibration
September 2010

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Appendix A
Time of Concentration Variables and Results

Basin Name	Sheet Flow Variables					Shallow Concentrated Flow Variables					Pipe Flow Variables			Time of Concentration
	Length (ft)	P2 (in)	Slope (ft/ft)	Manning's n	T sheet (min)	Length (ft)	Slope (ft/ft)	Land Cover	TR-55 Vel. (ft/s)	T shallow (min)	Length (ft)	Vel. (ft/s)	T pipe (min)	(min)
AF-02	117.1	4.6	0.0	0.240	41.0	515.2	0.0	unpaved	0.7	13.2	2499.9	2.0	20.8	75.0
AF-03	131.9	4.6	0.0	0.240	33.4	342.4	0.0	unpaved	0.7	7.8	1148.9	2.0	9.6	50.8
AF-04	223.3	4.6	0.0	0.240	159.4	962.6	0.0	paved	0.3	48.9	1308.8	2.0	10.9	219.2
AF-06	128.8	4.6	0.0	0.240	22.5	920.0	0.0	unpaved	0.6	25.6	1163.4	2.0	9.7	57.8
AF-07	146.9	4.6	0.0	0.240	41.4	1520.5	0.0	unpaved	0.6	44.3	315.3	2.0	2.6	88.3
BERMGRN01	135.1	4.6	0.0	0.011	3.4	490.9	0.0	unpaved	1.0	8.5	–	–	–	15.0
BERMGRN02	135.6	4.6	0.0	0.011	2.9	410.4	0.0	paved	0.8	8.2	–	–	–	15.0
BERMGRN03	76.5	4.6	0.0	0.240	31.4	442.6	0.0	unpaved	0.3	24.6	–	–	–	56.0
BERMGRN04	209.6	4.6	0.0	0.240	61.9	649.9	0.0	unpaved	0.9	12.4	–	–	–	74.3
BERMGRN05	156.3	4.6	0.0	0.240	31.2	500.7	0.0	unpaved	0.8	10.5	–	–	–	41.8
CL-02	215.4	4.6	0.0	0.240	47.8	1067.5	0.0	unpaved	0.8	22.8	–	–	–	70.7
CRYSTAL_LAKE	114.4	4.6	0.0	0.240	56.3	1135.4	0.0	paved	0.6	34.1	–	–	–	90.4
LKWDPOND01	254.6	4.6	0.0	0.240	34.9	979.0	0.0	unpaved	0.9	17.4	–	–	–	52.3
LKWDPOND02	184.2	4.6	0.0	0.240	36.0	973.9	0.0	unpaved	0.5	34.7	–	–	–	70.7
MAIN-01	151.8	4.6	0.0	0.011	2.1	1800.3	0.0	paved	0.7	43.9	–	–	–	46.1
MAIN-03	93.1	4.6	0.0	0.240	26.1	955.6	0.0	unpaved	1.1	14.1	–	–	–	40.2
MAIN-06	107.7	4.6	0.0	0.240	27.3	332.7	0.0	unpaved	1.0	5.8	–	–	–	33.1
MAIN-11	91.5	4.6	0.0	0.011	2.5	571.6	0.0	unpaved	0.9	10.7	–	–	–	15.0
MAIN-14	234.8	4.6	0.0	0.240	142.6	1052.4	0.0	unpaved	0.9	19.8	–	–	–	162.4
MAIN-15	179.5	4.6	0.0	0.240	35.3	684.8	0.0	unpaved	1.2	9.8	–	–	–	45.1
MAIN-17A	184.8	4.6	0.0	0.011	2.6	1272.2	0.0	paved	1.0	20.5	–	–	–	23.2
MAIN-17B	165.0	4.6	0.0	0.011	2.0	2286.0	0.0	unpaved	0.5	71.7	–	–	–	73.7
MAIN-21	224.9	4.6	0.0	0.240	77.2	1204.1	0.0	unpaved	0.3	63.2	–	–	–	140.4
MAIN-23	253.3	4.6	0.0	0.240	39.5	534.1	0.0	paved	0.6	15.0	1095.6	2.0	9.1	63.6
MAIN-25	146.7	4.6	0.0	0.011	3.7	1614.8	0.0	unpaved	0.2	125.1	1253.7	2.0	10.4	139.2
PIRLNDPOND01	282.1	4.6	0.0	0.240	67.1	3543.9	0.0	unpaved	0.4	147.9	–	–	–	215.0
PIRLNDPOND02	142.9	4.6	0.0	0.011	3.5	1290.0	0.0	paved	0.8	27.5	–	–	–	31.0
PIRLNDPOND03	164.4	4.6	0.0	0.011	2.8	632.6	0.0	unpaved	1.0	10.5	–	–	–	15.0
PW-01	216.4	4.6	0.0	0.240	92.3	2437.5	0.0	unpaved	0.8	51.6	–	–	–	143.9
PW-02	191.7	4.6	0.0	0.240	131.7	3142.0	0.0	unpaved	0.6	82.0	–	–	–	213.7
PW-03	286.3	4.6	0.0	0.240	91.3	1403.5	0.0	unpaved	1.0	24.5	–	–	–	115.8
PW-05	103.6	4.6	0.0	0.240	48.1	361.6	0.0	unpaved	1.5	4.0	–	–	–	52.1
PW-06A	133.7	4.6	0.0	0.240	125.0	279.4	0.0	unpaved	1.3	3.6	–	–	–	128.6
PW-06B	72.7	4.6	0.0	0.240	13.5	301.5	0.0	unpaved	1.0	5.3	–	–	–	18.8
PW-07	65.2	4.6	0.0	0.011	1.3	444.5	0.0	unpaved	1.0	7.4	–	–	–	15.0
PW-08	61.8	4.6	0.0	0.240	14.5	266.7	0.0	paved	1.5	2.9	–	–	–	17.4
PW-09	231.8	4.6	0.0	0.240	47.3	1087.4	0.0	paved	1.1	15.8	–	–	–	63.1
PW-13	185.4	4.6	0.0	0.240	54.5	944.7	0.0	unpaved	1.0	15.7	–	–	–	70.2
PW-14	86.6	4.6	0.0	0.240	10.0	246.6	0.0	unpaved	0.0	82.6	–	–	–	92.7
PW-16	214.1	4.6	0.0	0.240	61.5	625.7	0.0	unpaved	1.1	9.9	–	–	–	71.4
PW-17	94.0	4.6	0.0	0.011	1.6	357.2	0.0	paved	1.3	4.5	–	–	–	15.0
PWPOND01	221.2	4.6	0.0	0.240	25.6	2819.3	0.0	paved	0.6	80.6	–	–	–	106.2
PWPOND02	193.6	4.6	0.0	0.240	34.9	4462.1	0.0	unpaved	0.4	167.7	–	–	–	202.6
PWPOND03	210.8	4.6	0.0	0.240	40.0	1598.7	0.0	unpaved	0.4	69.0	–	–	–	108.9
PWPOND04	107.8	4.6	0.0	0.011	2.3	337.4	0.0	paved	1.0	5.9	–	–	–	15.0
STOR-03	164.0	4.6	0.0	0.240	43.1	1141.3	0.0	unpaved	0.8	23.0	–	–	–	66.1
STOR-04	273.6	4.6	0.0	0.240	143.7	3429.7	0.0	unpaved	0.4	143.7	–	–	–	287.4
STOR-05	280.9	4.6	0.0	0.011	3.6	1598.9	0.0	unpaved	0.5	56.2	–	–	–	59.7
STOR-07	192.2	4.6	0.0	0.011	3.9	2010.7	0.0	unpaved	0.5	73.4	–	–	–	77.4

Appendix B
Maximum Water Surface Elevations
Design Storms and Historical Event Calibration

Node Name	Maximum WSE for Design Storm (ft)					Max. WSE Sept. 2010 (ft)	Max. WSE Floyd Event (ft)
	2-year	10-year	25-year	50-year	100-year		
AF-01	13.72	15.44	16.14	16.77	17.36	15.50	15.38
AF-02	14.08	15.72	16.50	17.03	17.82	15.59	15.78
AF-03	14.13	15.73	16.50	17.05	17.84	15.61	15.83
AF-04	14.60	15.85	16.56	17.08	17.85	15.73	16.04
AF-05	14.14	15.82	16.61	17.00	17.71	15.58	15.84
AF-06	14.38	16.69	16.88	17.11	17.93	16.57	16.87
AF-07	14.61	16.70	16.89	17.12	17.93	16.58	16.89
BERMGRN01	12.37	12.72	12.85	13.40	13.97	12.63	14.35
BERMGRN02	9.81	11.95	12.74	13.62	14.16	11.76	14.52
BERMGRN03	14.43	15.04	15.33	15.64	16.09	15.04	16.95
BERMGRN04	15.69	16.08	16.24	16.48	16.83	15.99	17.43
BERMGRN05	14.72	15.21	15.41	15.62	15.88	14.97	15.05
BNDY	2.05	2.05	2.05	2.05	2.05	2.05	2.05
CL-01	13.26	15.04	15.88	16.21	17.12	14.86	15.10
CL-02	13.28	15.10	15.99	16.20	17.29	14.85	15.13
CL-03	13.28	15.08	15.95	16.23	17.21	14.86	15.13
CRYSTAL LAKE	14.87	15.25	15.41	15.59	15.80	15.54	16.52
LKWDPOND01	5.31	6.16	6.29	6.41	6.48	6.14	6.65
LKWDPOND02	6.31	6.59	6.76	7.04	7.37	6.67	7.92
MAIN-01	2.76	4.25	4.65	5.01	5.25	4.17	5.94
MAIN-02	3.75	4.84	5.10	5.37	5.56	4.78	6.09
MAIN-03	9.08	11.52	12.40	13.37	13.95	11.31	14.33
MAIN-04	9.28	11.63	12.47	13.40	13.97	11.43	14.35
MAIN-05	9.63	11.85	12.65	13.54	14.09	11.66	14.45
MAIN-06	9.81	11.95	12.74	13.62	14.16	11.76	14.52
MAIN-07	10.28	12.02	12.77	13.63	14.17	11.85	14.52
MAIN-07A	10.71	12.21	12.91	13.74	14.26	12.04	14.59
MAIN-08	11.04	12.34	13.00	13.78	14.29	12.18	14.61
MAIN-08A	11.99	12.87	13.38	14.06	14.46	12.76	14.73
MAIN-09	12.19	13.16	13.71	14.12	14.86	12.84	14.82
MAIN-10	12.09	13.05	13.57	15.06	14.67	13.62	14.88
MAIN-11	12.86	14.32	15.02	14.72	16.24	13.14	14.88
MAIN-12	12.76	14.17	14.84	15.52	15.92	14.30	14.93
MAIN-13	13.20	14.95	15.79	15.02	17.02	14.04	14.98
MAIN-14	12.90	14.38	15.08	16.08	16.15	14.77	14.99
MAIN-15	13.32	15.19	16.09	16.00	17.40	14.70	15.10
MAIN-16	13.12	14.89	15.88	16.92	17.01	15.43	15.13
MAIN-17	13.74	15.64	16.40	16.59	17.65	15.33	15.36
MAIN-18	13.75	15.58	16.33	16.78	17.58	15.50	15.41
MAIN-19	13.81	15.62	16.39	16.78	17.66	15.51	15.45
MAIN-20	15.19	16.20	16.91	17.46	18.27	16.07	16.86
MAIN-21	15.43	16.35	17.01	17.53	18.31	16.23	17.01
MAIN-22	15.59	16.48	17.10	17.61	18.35	16.35	17.13
MAIN-23	15.96	16.91	17.78	18.55	19.33	16.75	18.10
MAIN-24	16.09	16.98	17.82	18.58	19.34	16.81	18.14
MAIN-25	17.05	19.39	19.68	19.82	19.93	18.96	19.75
PIRLNDPOND01	3.30	4.63	5.16	5.65	5.88	5.35	6.14
PIRLNDPOND02	5.28	6.15	6.28	6.39	6.47	6.13	6.63
PIRLNDPOND03	5.35	6.54	6.84	7.19	7.41	6.49	7.60
PW POND-01	19.17	19.50	19.80	20.25	20.79	19.62	22.21
PW POND-02	16.71	17.81	18.23	18.42	18.56	17.89	18.63
PW POND-03	11.16	12.63	13.34	13.93	14.30	12.47	14.62
PW POND-04	16.50	16.71	16.79	16.87	16.98	16.42	16.42
PW-01	9.95	11.99	12.78	13.66	14.20	11.81	14.57
PW-02	10.11	12.15	13.00	14.07	14.77	11.98	15.42
PW-03	10.47	12.20	13.03	14.09	14.79	12.03	15.43
PW-05	10.04	12.29	13.15	14.11	14.66	12.12	15.13
PW-06A	14.17	14.60	15.18	16.49	17.06	14.62	18.11
PW-06B	14.25	14.71	15.26	16.54	17.10	14.73	18.15
PW-07	16.25	17.63	17.96	18.16	18.74	17.82	20.08
PW-08	16.53	18.78	19.38	19.85	20.40	19.03	21.85
PW-09	16.58	18.80	19.40	19.87	20.42	19.05	21.87
PW-13	18.58	19.35	19.72	20.14	20.59	19.66	22.02
PW-14	21.52	21.96	22.12	22.29	22.45	21.96	22.30
PW-15	21.74	22.07	22.21	22.36	22.51	22.06	22.35
PW-16	23.53	23.97	24.11	24.26	24.39	23.91	24.09
PW-17	23.78	24.33	24.57	24.84	25.17	24.12	24.23
STOR-01	11.70	12.13	12.72	13.47	13.99	12.07	14.35
STOR-02	12.48	13.45	13.85	14.19	14.30	13.33	14.38
STOR-03	12.70	13.59	13.96	14.28	14.39	13.48	14.49
STOR-04	14.82	15.18	15.35	15.60	15.78	15.24	15.96
STOR-05	16.69	19.00	19.76	20.46	21.46	19.38	23.33
STOR-06	16.65	19.23	20.09	21.01	21.18	19.32	23.39
STOR-07	18.07	19.25	20.07	20.89	21.82	19.50	23.40

Appendix C

Basins

Name: AF-02 | Node: AF-02 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 75.00
Area(ac): 69.680 | Time Shift(hrs): 0.00
Curve Number: 75.47 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: AF-03 | Node: AF-03 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 51.00
Area(ac): 17.810 | Time Shift(hrs): 0.00
Curve Number: 77.75 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: AF-04 | Node: AF-04 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 219.00
Area(ac): 58.000 | Time Shift(hrs): 0.00
Curve Number: 77.59 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: AF-06 | Node: AF-06 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 58.00
Area(ac): 39.190 | Time Shift(hrs): 0.00
Curve Number: 70.36 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: AF-07 | Node: AF-07 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 88.00
Area(ac): 31.950 | Time Shift(hrs): 0.00
Curve Number: 65.69 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BERMGRN01 | Node: BERMGRN01 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0
Rainfall File: | Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 | Time of Conc(min): 15.00
Area(ac): 3.450 | Time Shift(hrs): 0.00
Curve Number: 80.36 | Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BERMGRN02 | Node: BERMGRN02 | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 | Peaking Factor: 256.0

Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 3.100
Curve Number: 79.36
DCIA(%): 0.00
Storm Duration(hrs): 0.00
Time of Conc(min): 15.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: BERMGRN03
Group: BASE
Node: BERMGRN03
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 12.410
Curve Number: 78.54
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 56.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: BERMGRN04
Group: BASE
Node: BERMGRN04
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 11.790
Curve Number: 77.39
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 74.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: BERMGRN05
Group: BASE
Node: BERMGRN05
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 5.770
Curve Number: 84.03
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 42.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: CL-02
Group: BASE
Node: CL-02
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 11.340
Curve Number: 55.40
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 71.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: CRYSTAL_LAKE
Group: BASE
Node: CRYSTAL LAKE
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 92.700
Curve Number: 79.64
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 90.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: LKWDPOND01
Group: BASE
Node: LKWDPOND01
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 45.110
Curve Number: 75.22
DCIA(%): 0.00
Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 52.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: LKWDPOND02 Node: LKWDPOND02 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 71.00
Area(ac): 46.270 Time Shift(hrs): 0.00
Curve Number: 64.23 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-01 Node: MAIN-01 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 46.00
Area(ac): 24.790 Time Shift(hrs): 0.00
Curve Number: 53.22 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-03 Node: MAIN-03 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 40.00
Area(ac): 14.600 Time Shift(hrs): 0.00
Curve Number: 69.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-06 Node: MAIN-06 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 33.00
Area(ac): 11.370 Time Shift(hrs): 0.00
Curve Number: 78.83 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-11 Node: MAIN-11 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 15.00
Area(ac): 5.630 Time Shift(hrs): 0.00
Curve Number: 82.52 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-14 Node: MAIN-14 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 162.00
Area(ac): 5.160 Time Shift(hrs): 0.00
Curve Number: 71.92 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-15 Node: MAIN-15 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 45.00
Area(ac): 5.870 Time Shift(hrs): 0.00
Curve Number: 67.28 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: MAIN-17A	Node: MAIN-17	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00		
Area(ac): 8.840	Time Shift(hrs): 0.00		
Curve Number: 68.77	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: MAIN-17B	Node: MAIN-17	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 74.00		
Area(ac): 15.310	Time Shift(hrs): 0.00		
Curve Number: 64.16	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: MAIN-21	Node: MAIN-21	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 140.00		
Area(ac): 16.440	Time Shift(hrs): 0.00		
Curve Number: 67.03	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: MAIN-23	Node: MAIN-23	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 64.00		
Area(ac): 38.170	Time Shift(hrs): 0.00		
Curve Number: 75.40	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: MAIN-25	Node: MAIN-25	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 139.00		
Area(ac): 47.050	Time Shift(hrs): 0.00		
Curve Number: 76.63	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: PIRLNDPOND01	Node: PIRLNDPOND01	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		
Rainfall Amount(in): 0.000	Time of Conc(min): 215.00		
Area(ac): 299.240	Time Shift(hrs): 0.00		
Curve Number: 59.79	Max Allowable Q(cfs): 999999.000		
DCIA(%): 0.00			

Name: PIRLNDPOND02	Node: PIRLNDPOND02	Status: Onsite	
Group: BASE	Type: SCS Unit Hydrograph CN		
Unit Hydrograph: Uh256	Peaking Factor: 256.0		
Rainfall File:	Storm Duration(hrs): 0.00		

Rainfall Amount(in): 0.000 Time of Conc(min): 31.00
Area(ac): 40.230 Time Shift(hrs): 0.00
Curve Number: 74.20 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PIRLNDPOND03 Node: PIRLNDPOND03 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 15.00
Area(ac): 30.300 Time Shift(hrs): 0.00
Curve Number: 70.66 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-01 Node: PW-01 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 144.00
Area(ac): 29.050 Time Shift(hrs): 0.00
Curve Number: 68.81 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-02 Node: PW-02 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 214.00
Area(ac): 11.120 Time Shift(hrs): 0.00
Curve Number: 61.64 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-03 Node: PW-03 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 116.00
Area(ac): 23.190 Time Shift(hrs): 0.00
Curve Number: 74.54 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-05 Node: PW-05 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 52.00
Area(ac): 2.300 Time Shift(hrs): 0.00
Curve Number: 72.23 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-06A Node: PW-06A Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 129.00
Area(ac): 4.410 Time Shift(hrs): 0.00
Curve Number: 80.09 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PW-06B Node: PW-06B Status: Onsite

Group: BASE
Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 3.840
Curve Number: 76.71
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 19.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-07
Group: BASE
Node: PW-07
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 13.900
Curve Number: 80.35
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 15.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-08
Group: BASE
Node: PW-08
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 5.920
Curve Number: 75.06
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 17.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-09
Group: BASE
Node: PW-09
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 23.490
Curve Number: 73.51
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 63.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-13
Group: BASE
Node: PW-13
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 15.980
Curve Number: 50.07
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 70.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-14
Group: BASE
Node: PW-14
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 1.690
Curve Number: 38.12
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 93.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-16
Group: BASE
Node: PW-16
Type: SCS Unit Hydrograph CN
Status: Onsite

Unit Hydrograph: Uh256
Rainfall File:
Rainfall Amount(in): 0.000
Area(ac): 4.840
Curve Number: 38.60
DCIA(%): 0.00

Peaking Factor: 256.0
Storm Duration(hrs): 0.00
Time of Conc(min): 71.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: PW-17 Node: PW-17 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 15.00
Area(ac): 4.130 Time Shift(hrs): 0.00
Curve Number: 68.87 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PWPOND01 Node: PW POND-01 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 106.00
Area(ac): 98.030 Time Shift(hrs): 0.00
Curve Number: 61.72 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PWPOND02 Node: PW POND-02 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 203.00
Area(ac): 139.650 Time Shift(hrs): 0.00
Curve Number: 65.08 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PWPOND03 Node: PW POND-03 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 109.00
Area(ac): 18.690 Time Shift(hrs): 0.00
Curve Number: 80.71 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: PWPOND04 Node: PW POND-04 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 15.00
Area(ac): 10.750 Time Shift(hrs): 0.00
Curve Number: 86.90 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: STOR-03 Node: STOR-03 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 66.00
Area(ac): 31.190 Time Shift(hrs): 0.00
Curve Number: 82.04 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: STOR-04 Node: STOR-04 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 287.00

Area(ac): 52.770 Time Shift(hrs): 0.00
Curve Number: 67.06 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: STOR-05 Node: STOR-05 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 25.300 Time Shift(hrs): 0.00
Curve Number: 68.62 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: STOR-07 Node: STOR-07 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 77.00
Area(ac): 29.510 Time Shift(hrs): 0.00
Curve Number: 70.51 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

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Nodes

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Name: AP-01 Base Flow(cfs): 0.000 Init Stage(ft): 9.920
Group: AP Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: AP-02 Base Flow(cfs): 0.000 Init Stage(ft): 11.270
Group: AP Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: AP-03 Base Flow(cfs): 0.000 Init Stage(ft): 11.100
Group: AP Warn Stage(ft): 16.500
Type: Stage/Area

Stage(ft)	Area(ac)

Name: AP-04 Base Flow(cfs): 0.000 Init Stage(ft): 13.090
Group: AP Warn Stage(ft): 19.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: AP-05 Base Flow(cfs): 0.000 Init Stage(ft): 11.940
Group: AP Warn Stage(ft): 16.500
Type: Stage/Area

Stage(ft)	Area(ac)

Name: AP-06 Base Flow(cfs): 0.000 Init Stage(ft): 12.000

Group: AF
Type: Stage/Area
Warn Stage(ft): 16.500

Stage(ft)	Area(ac)

Name: AF-07
Group: AF
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 13.660
Warn Stage(ft): 17.500

Stage(ft)	Area(ac)

Name: BERMGRN01
Group: BERMGRN
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 11.800
Warn Stage(ft): 16.000

Data from as-built

Stage(ft)	Area(ac)
11.800	0.5700
17.000	0.5700

Name: BERMGRN02
Group: BERMGRN
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 8.650
Warn Stage(ft): 16.250

Data from as-built

Stage(ft)	Area(ac)
8.650	0.3900
17.000	0.3900

Name: BERMGRN03
Group: BERMGRN
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 13.400
Warn Stage(ft): 18.000

Data from as-built

Stage(ft)	Area(ac)
13.000	2.3100
20.000	2.3100

Name: BERMGRN04
Group: BERMGRN
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 14.760
Warn Stage(ft): 16.500

Invert Data from as-built, Area from LiDAR

Stage(ft)	Area(ac)
14.650	0.0100
15.000	0.1200
16.000	1.7800
17.000	2.0900

Name: BERMGRN05
Group: BERMGRN
Type: Stage/Area
Base Flow(cfs): 0.000
Init Stage(ft): 13.700
Warn Stage(ft): 18.000

Stage(ft)	Area(ac)
13.700	0.3500
20.000	0.3500

Name: BNDY
Group: MAIN
Type: Time/Stage
Base Flow(cfs): 0.000
Init Stage(ft): 2.050
Warn Stage(ft): 4.000

Time(hrs)	Stage(ft)
0.00	2.050
72.00	2.050

Name: CL-01 Base Flow(cfs): 0.000 Init Stage(ft): 10.730
Group: CL Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CL-02 Base Flow(cfs): 0.000 Init Stage(ft): 12.620
Group: CL Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CL-03 Base Flow(cfs): 0.000 Init Stage(ft): 12.620
Group: CL Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: CRYSTAL LAKE Base Flow(cfs): 0.000 Init Stage(ft): 14.390
Group: CL Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
14.390	39.4600
17.000	39.4600
20.000	41.7500

Name: LKWDPOND01 Base Flow(cfs): 0.000 Init Stage(ft): 3.000
Group: CAMP Warn Stage(ft): 5.500
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	2.5400
4.000	2.5400
5.000	2.6000
6.000	3.1500
10.000	3.1500

Name: LKWDPOND02 Base Flow(cfs): 0.000 Init Stage(ft): 6.000
Group: CAMP Warn Stage(ft): 9.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	5.6100
10.000	5.6100

Name: MAIN-01 Base Flow(cfs): 0.000 Init Stage(ft): 2.050
Group: MAIN Warn Stage(ft): 5.100
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	0.0100
10.000	0.0100

Name: MAIN-02 Base Flow(cfs): 0.000 Init Stage(ft): 2.050
Group: MAIN Warn Stage(ft): 5.500
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	0.0100
10.000	0.0100

Name: MAIN-03 Base Flow(cfs): 0.000 Init Stage(ft): 4.130
Group: MAIN Warn Stage(ft): 9.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	0.0100
20.000	0.0100

Name: MAIN-04 Base Flow(cfs): 0.000 Init Stage(ft): 4.130
Group: MAIN Warn Stage(ft): 11.000
Type: Stage/Area

Stage(ft)	Area(ac)
4.000	0.0100
20.000	0.0100

Name: MAIN-05 Base Flow(cfs): 0.000 Init Stage(ft): 4.340
Group: MAIN Warn Stage(ft): 19.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-06 Base Flow(cfs): 0.000 Init Stage(ft): 6.460
Group: MAIN Warn Stage(ft): 13.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-07 Base Flow(cfs): 0.000 Init Stage(ft): 8.110
Group: MAIN Warn Stage(ft): 14.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-07A Base Flow(cfs): 0.000 Init Stage(ft): 8.110
Group: MAIN Warn Stage(ft): 13.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-08 Base Flow(cfs): 0.000 Init Stage(ft): 8.220
Group: MAIN Warn Stage(ft): 13.250
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-08A Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 16.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-09 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-10 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-11 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-12 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-13 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-14 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-15 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-16 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Stage(ft)	Area(ac)

Name: MAIN-17 Base Flow(cfs): 0.000 Init Stage(ft): 9.480
Group: MAIN Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-18 Base Flow(cfs): 0.000 Init Stage(ft): 10.200
Group: MAIN Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-19 Base Flow(cfs): 0.000 Init Stage(ft): 11.500
Group: MAIN Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-20 Base Flow(cfs): 0.000 Init Stage(ft): 12.380
Group: MAIN Warn Stage(ft): 22.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-21 Base Flow(cfs): 0.000 Init Stage(ft): 13.060
Group: MAIN Warn Stage(ft): 21.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-22 Base Flow(cfs): 0.000 Init Stage(ft): 13.190
Group: MAIN Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-23 Base Flow(cfs): 0.000 Init Stage(ft): 14.240
Group: MAIN Warn Stage(ft): 17.500
Type: Stage/Area

Storage simulates street flooding, estiamted from LiDAR data

Stage(ft)	Area(ac)
14.240	0.0100
17.000	0.1000
18.000	0.2800
19.000	1.9500

Name: MAIN-24 Base Flow(cfs): 0.000 Init Stage(ft): 14.380
Group: MAIN Warn Stage(ft): 19.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: MAIN-25 Base Flow(cfs): 0.000 Init Stage(ft): 14.600
Group: MAIN Warn Stage(ft): 19.000
Type: Stage/Area

Storage simulates upstream channel storage

Stage(ft)	Area(ac)
14.600	0.0100
17.000	0.1000
18.000	0.3400
19.000	0.5600

Name: PIRLNDPOND01 Base Flow(cfs): 0.000 Init Stage(ft): 2.050
Group: CAMP Warn Stage(ft): 5.000
Type: Stage/Area

Stage(ft)	Area(ac)
2.000	20.5200
5.000	24.6000
6.000	39.1200

Name: PIRLNDPOND02 Base Flow(cfs): 0.000 Init Stage(ft): 2.050
Group: MAIN Warn Stage(ft): 5.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	11.1200
2.050	11.1200
5.000	12.8500
6.000	16.7500
10.000	16.7500

Name: PIRLNDPOND03 Base Flow(cfs): 0.000 Init Stage(ft): 2.050
Group: MAIN Warn Stage(ft): 6.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	2.0900
2.050	2.0900
5.000	2.4000
6.000	2.7000
7.000	3.7200
10.000	3.7200

Name: PW POND-01 Base Flow(cfs): 0.000 Init Stage(ft): 18.500
Group: PW Warn Stage(ft): 21.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.000	9.0200
19.000	9.9800
20.000	11.1500
21.000	13.8200

Name: PW POND-02 Base Flow(cfs): 0.000 Init Stage(ft): 16.300
Group: PW Warn Stage(ft): 19.000
Type: Stage/Area

Estimated from LiDAR data
Includes Golf Course flooding to the west

Stage(ft)	Area(ac)
16.300	1.3500
17.000	1.5400
18.000	4.2000
19.000	4.2000

Name: PW POND-03 Base Flow(cfs): 0.000 Init Stage(ft): 9.410
Group: PW Warn Stage(ft): 13.500
Type: Stage/Area

Estimated from LiDAR

Stage(ft)	Area(ac)
9.410	0.1000
10.000	0.1000
11.000	0.1500
12.000	0.2000
13.000	0.2500
14.000	0.6500

Name: PW POND-04 Base Flow(cfs): 0.000 Init Stage(ft): 16.000
Group: PW Warn Stage(ft): 18.500
Type: Stage/Area

Stage(ft)	Area(ac)
15.000	0.6100
20.000	0.6100

Name: PW-01 Base Flow(cfs): 0.000 Init Stage(ft): 6.400
Group: PW Warn Stage(ft): 10.000
Type: Stage/Area

Stage(ft)	Area(ac)
6.000	0.3500
7.000	0.7000
8.000	1.1000
9.000	1.2600
10.000	1.4300
11.000	1.6100

Name: PW-02 Base Flow(cfs): 0.000 Init Stage(ft): 7.680
Group: PW Warn Stage(ft): 12.000
Type: Stage/Area

Stage(ft)	Area(ac)
5.000	0.0100
15.000	0.0100

Name: PW-03 Base Flow(cfs): 0.000 Init Stage(ft): 8.880
Group: PW Warn Stage(ft): 14.000
Type: Stage/Area

Stage(ft)	Area(ac)
10.000	0.0100
20.000	0.0100

Name: PW-05 Base Flow(cfs): 0.000 Init Stage(ft): 6.470
Group: PW Warn Stage(ft): 15.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: PW-06A Base Flow(cfs): 0.000 Init Stage(ft): 12.000
Group: PW Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)

12.000	0.2100
20.000	0.2100

Name: PW-06B Base Flow(cfs): 0.000 Init Stage(ft): 13.200
Group: PW Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
13.000	0.2600
16.000	0.2600
20.000	1.0500
21.000	1.0500

Name: PW-07 Base Flow(cfs): 0.000 Init Stage(ft): 14.000
Group: PW Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)
14.000	0.5100
20.000	0.5100

Name: PW-08 Base Flow(cfs): 0.000 Init Stage(ft): 14.000
Group: PW Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)
14.000	0.4400
16.000	0.4400
18.000	1.8500

Name: PW-09 Base Flow(cfs): 0.000 Init Stage(ft): 15.000
Group: PW Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
15.000	0.4000
16.000	0.4000
18.000	0.7600
19.000	2.1600
20.000	4.0000

Name: PW-13 Base Flow(cfs): 0.000 Init Stage(ft): 18.000
Group: PW Warn Stage(ft): 22.000
Type: Stage/Area

Stage(ft)	Area(ac)
18.000	0.4600
19.000	0.4600
22.000	1.3900

Name: PW-14 Base Flow(cfs): 0.000 Init Stage(ft): 21.000
Group: PW Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
21.000	0.0100
26.000	0.0100

Name: PW-15 Base Flow(cfs): 0.000 Init Stage(ft): 21.500
Group: PW Warn Stage(ft): 26.000
Type: Stage/Area

Stage(ft)	Area(ac)
20.000	0.0100
27.000	0.0100

Name: PW-16 Base Flow(cfs): 0.000 Init Stage(ft): 23.000
Group: PW Warn Stage(ft): 28.000
Type: Stage/Area

Stage(ft)	Area(ac)
20.000	0.0100
30.000	0.0100

Name: PW-17 Base Flow(cfs): 0.000 Init Stage(ft): 23.000
Group: PW Warn Stage(ft): 28.000
Type: Stage/Area

Stage(ft)	Area(ac)
23.000	0.2000
28.000	0.2000

Name: STOR-01 Base Flow(cfs): 0.000 Init Stage(ft): 10.300
Group: STOR Warn Stage(ft): 14.500
Type: Stage/Area

estimated data

Stage(ft)	Area(ac)

Name: STOR-02 Base Flow(cfs): 0.000 Init Stage(ft): 10.500
Group: STOR Warn Stage(ft): 13.000
Type: Stage/Area

Stage(ft)	Area(ac)
10.000	0.0100
15.000	0.0100

Name: STOR-03 Base Flow(cfs): 0.000 Init Stage(ft): 11.000
Group: STOR Warn Stage(ft): 13.500
Type: Stage/Area

Stage(ft)	Area(ac)
10.000	0.5600
20.000	0.5600

Name: STOR-04 Base Flow(cfs): 0.000 Init Stage(ft): 14.000
Group: STOR Warn Stage(ft): 17.000
Type: Stage/Area

Stage(ft)	Area(ac)
14.000	1.6200
20.000	1.6200

Name: STOR-05 Base Flow(cfs): 0.000 Init Stage(ft): 15.000
Group: STOR Warn Stage(ft): 18.000
Type: Stage/Area

Stage(ft)	Area(ac)
10.000	0.0100

20.000	0.0100

Name: STOR-06 Base Flow(cfs): 0.000 Init Stage(ft): 15.000
Group: STOR Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
10.000	0.0100
20.000	0.0100

Name: STOR-07 Base Flow(cfs): 0.000 Init Stage(ft): 16.500
Group: STOR Warn Stage(ft): 20.000
Type: Stage/Area

Stage(ft)	Area(ac)
15.000	1.3500
16.000	1.5600
20.000	2.0500

==== Cross Sections ====

Name: AF LINK-01 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.570	0.060000
2.970	17.690	0.060000
5.940	17.790	0.060000
8.910	17.810	0.060000
11.880	17.830	0.060000
14.850	17.880	0.060000
17.820	17.900	0.060000
20.790	17.900	0.060000
23.760	17.900	0.060000
26.730	17.820	0.060000
29.700	17.730	0.060000
32.670	17.390	0.060000
35.630	16.560	0.060000
38.600	15.570	0.060000
41.570	14.550	0.060000
44.540	13.690	0.060000
47.510	13.050	0.035000
50.480	12.370	0.035000
53.450	11.710	0.035000
56.420	11.050	0.035000
59.390	10.310	0.035000
62.360	9.780	0.035000
65.330	9.440	0.035000
68.300	9.390	0.035000
71.270	9.440	0.035000
74.240	10.280	0.035000
77.210	11.350	0.035000
80.180	12.160	0.035000
83.150	12.620	0.035000
86.120	13.050	0.035000
89.090	13.460	0.060000
92.060	13.900	0.060000
95.030	14.470	0.060000
98.000	14.850	0.060000
100.970	15.280	0.060000
103.940	15.680	0.060000
106.900	16.050	0.060000
109.870	16.380	0.060000
112.840	16.730	0.060000
115.810	17.060	0.060000
118.780	17.340	0.060000
121.750	17.600	0.060000
124.720	17.750	0.060000

Name: AF LINK-01 US Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.630	0.060000
2.960	17.540	0.060000
5.920	17.450	0.060000
8.890	17.370	0.060000
11.850	17.310	0.060000
14.810	17.170	0.060000
17.770	17.040	0.060000
20.730	16.900	0.060000
23.700	16.730	0.060000
26.660	16.350	0.060000
29.620	15.740	0.060000
32.580	13.910	0.060000
35.540	12.630	0.060000
38.510	11.330	0.035000
41.470	10.710	0.035000
44.430	10.530	0.035000
47.390	10.390	0.035000
50.350	10.260	0.035000
53.320	10.050	0.035000
56.280	9.910	0.035000
59.240	9.820	0.035000
62.200	10.010	0.035000
65.160	10.110	0.035000
68.130	9.940	0.035000
71.090	10.050	0.035000
74.050	10.150	0.035000
77.010	11.070	0.035000
79.970	12.110	0.035000
82.940	13.500	0.060000
85.900	15.050	0.060000
88.860	16.230	0.060000
91.820	16.720	0.060000
94.790	17.070	0.060000
97.750	17.340	0.060000
100.710	17.620	0.060000
103.670	17.810	0.060000
106.630	17.840	0.060000
109.600	17.910	0.060000

Name: AP LINK-03 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.660	0.060000
2.950	17.740	0.060000
5.900	17.830	0.060000
8.850	17.830	0.060000
11.800	17.780	0.060000
14.760	17.720	0.060000
17.710	17.720	0.060000
20.660	17.750	0.060000
23.610	17.790	0.060000
26.560	17.770	0.060000
29.510	17.690	0.060000
32.460	17.540	0.060000
35.410	17.270	0.060000
38.370	16.930	0.060000
41.320	16.470	0.060000
44.270	15.500	0.060000
47.220	13.890	0.060000
50.170	12.420	0.060000
53.120	11.430	0.035000
56.070	11.070	0.035000
59.020	11.020	0.035000
61.980	11.000	0.035000
64.930	11.010	0.035000
67.880	10.950	0.035000
70.830	10.890	0.035000
73.780	10.950	0.035000
76.730	10.950	0.035000
79.680	11.000	0.035000
82.630	10.970	0.035000
85.590	10.980	0.035000
88.540	11.380	0.035000
91.490	12.220	0.035000
94.440	13.320	0.060000
97.390	14.430	0.060000
100.340	15.420	0.060000
103.290	16.230	0.060000
106.240	16.690	0.060000

109.190	17.030	0.060000
112.150	17.350	0.060000
115.100	17.520	0.060000
118.050	17.600	0.060000
121.000	17.730	0.060000
123.950	17.850	0.060000
126.900	17.970	0.060000
129.850	18.050	0.060000
132.800	18.110	0.060000
135.760	18.170	0.060000
138.710	18.230	0.060000

Name: AF LINK-03 US Group: BASE
Encroachment: No

AF LINK-03 US

Station(ft)	Elevation(ft)	Manning's N
0.000	17.680	0.060000
2.980	17.580	0.060000
5.960	17.520	0.060000
8.940	17.460	0.060000
11.920	17.390	0.060000
14.890	17.300	0.060000
17.870	17.190	0.060000
20.850	17.070	0.060000
23.830	16.950	0.060000
26.810	16.790	0.060000
29.790	16.610	0.060000
32.770	16.390	0.060000
35.750	16.050	0.060000
38.720	15.440	0.060000
41.700	14.530	0.060000
44.680	13.290	0.035000
47.660	12.270	0.035000
50.640	11.550	0.035000
53.620	11.210	0.035000
56.600	11.100	0.035000
59.580	11.270	0.035000
62.560	11.840	0.035000
65.530	12.620	0.035000
68.510	13.600	0.035000
71.490	14.270	0.060000
74.470	14.690	0.060000
77.450	15.080	0.060000
80.430	15.610	0.060000
83.410	16.210	0.060000
86.390	16.750	0.060000
89.360	17.190	0.060000
92.340	17.560	0.060000
95.320	17.830	0.060000
98.300	18.000	0.060000
101.280	18.110	0.060000
104.260	18.220	0.060000
107.240	18.310	0.060000
110.220	18.330	0.060000

Name: AF LINK-04 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.210	0.060000
2.990	17.200	0.060000
5.980	17.160	0.060000
8.960	17.100	0.060000
11.950	17.010	0.060000
14.940	16.900	0.060000
17.930	16.760	0.060000
20.910	16.590	0.060000
23.900	16.380	0.060000
26.890	15.990	0.060000
29.880	15.420	0.060000
32.870	14.640	0.060000
35.850	13.540	0.035000
38.840	12.500	0.035000
41.830	11.810	0.035000
44.820	11.680	0.035000
47.800	11.950	0.035000
50.790	12.470	0.035000
53.780	13.100	0.035000
56.770	13.850	0.035000

59.760	14.540	0.035000
62.740	15.080	0.060000
65.730	15.720	0.060000
68.720	16.300	0.060000
71.710	16.800	0.060000
74.690	17.270	0.060000
77.680	17.670	0.060000
80.670	17.930	0.060000
83.660	18.050	0.060000
86.640	18.090	0.060000
89.630	18.080	0.060000
92.620	18.120	0.060000
95.610	18.120	0.060000
98.600	18.190	0.060000
101.580	18.210	0.060000
104.570	18.190	0.060000
107.560	18.150	0.060000
110.550	18.200	0.060000

Name: AF LINK-04 US Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	19.430	0.060000
2.990	19.420	0.060000
5.980	19.400	0.060000
8.970	19.320	0.060000
11.960	19.260	0.060000
14.950	19.200	0.060000
17.940	19.060	0.060000
20.930	18.930	0.060000
23.920	18.860	0.060000
26.910	18.840	0.060000
29.900	18.790	0.060000
32.900	18.700	0.060000
35.890	18.640	0.060000
38.880	18.610	0.060000
41.870	18.600	0.060000
44.860	18.540	0.060000
47.850	18.540	0.060000
50.840	18.530	0.060000
53.830	18.460	0.060000
56.820	18.350	0.060000
59.810	18.120	0.060000
62.800	17.810	0.060000
65.790	17.410	0.060000
68.780	16.970	0.060000
71.770	16.450	0.060000
74.760	15.940	0.060000
77.750	15.380	0.035000
80.740	14.480	0.035000
83.730	13.450	0.035000
86.720	13.090	0.035000
89.710	13.440	0.035000
92.700	14.120	0.035000
95.690	15.320	0.035000
98.690	16.210	0.035000
101.680	16.800	0.060000
104.670	17.270	0.060000
107.660	17.540	0.060000
110.650	17.710	0.060000
113.640	17.840	0.060000
116.630	17.930	0.060000
119.620	18.070	0.060000
122.610	18.240	0.060000
125.600	18.280	0.060000
128.590	18.400	0.060000
131.580	18.550	0.060000
134.570	18.690	0.060000
137.560	18.770	0.060000
140.550	18.820	0.060000
143.540	18.780	0.060000
146.530	18.730	0.060000
149.520	18.700	0.060000
152.510	18.720	0.060000
155.500	18.780	0.060000
158.490	18.840	0.060000
161.480	18.970	0.060000
164.480	19.100	0.060000
167.470	19.220	0.060000
170.460	19.400	0.060000
173.450	19.550	0.060000
176.440	19.580	0.060000

179.430	19.560	0.060000
182.420	19.550	0.060000
185.410	19.530	0.060000

Name: AF LINK-05 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	18.190	0.060000
2.990	18.110	0.060000
5.990	18.040	0.060000
8.980	17.940	0.060000
11.980	17.750	0.060000
14.970	17.530	0.060000
17.970	17.420	0.060000
20.960	17.330	0.060000
23.960	17.300	0.060000
26.950	17.190	0.060000
29.950	17.030	0.060000
32.940	16.940	0.060000
35.940	16.830	0.060000
38.930	16.470	0.060000
41.920	15.690	0.060000
44.920	14.260	0.035000
47.910	12.890	0.035000
50.910	12.170	0.035000
53.900	11.790	0.035000
56.900	11.630	0.035000
59.890	11.690	0.035000
62.890	12.360	0.035000
65.880	13.060	0.035000
68.880	14.000	0.035000
71.870	15.050	0.035000
74.860	15.570	0.060000
77.860	15.980	0.060000
80.850	16.280	0.060000
83.850	16.620	0.060000
86.840	16.820	0.060000
89.840	16.890	0.060000
92.830	16.940	0.060000
95.830	16.980	0.060000
98.820	16.940	0.060000
101.820	17.030	0.060000
104.810	17.110	0.060000
107.810	17.150	0.060000
110.800	17.170	0.060000
113.790	17.170	0.060000
116.790	17.140	0.060000

Name: AF LINK-05 US Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.090	0.060000
2.970	17.150	0.060000
5.950	17.180	0.060000
8.920	17.180	0.060000
11.890	17.210	0.060000
14.870	17.130	0.060000
17.840	17.040	0.060000
20.820	16.950	0.060000
23.790	16.730	0.060000
26.760	16.330	0.060000
29.740	15.360	0.060000
32.710	14.060	0.035000
35.680	12.790	0.035000
38.660	12.080	0.035000
41.630	11.940	0.035000
44.600	12.030	0.035000
47.580	12.330	0.035000
50.550	12.890	0.035000
53.530	13.710	0.035000
56.500	14.650	0.035000
59.470	15.610	0.035000
62.450	16.200	0.060000
65.420	16.530	0.060000
68.390	16.690	0.060000
71.370	16.770	0.060000

74.340	16.790	0.060000
77.310	16.870	0.060000
80.290	16.780	0.060000
83.260	16.730	0.060000
86.240	16.720	0.060000
89.210	16.710	0.060000
92.180	16.710	0.060000
95.160	16.670	0.060000
98.130	16.730	0.060000
101.100	16.750	0.060000
104.080	16.740	0.060000
107.050	16.760	0.060000
110.020	16.770	0.060000
113.000	16.890	0.060000
115.970	17.160	0.060000
118.940	17.290	0.060000
121.920	17.270	0.060000
124.890	17.250	0.060000
127.870	17.240	0.060000
130.840	17.240	0.060000
133.810	17.240	0.060000
136.790	17.240	0.060000
139.760	17.260	0.060000

Name: AF LINK-07 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.850	0.060000
2.990	17.730	0.060000
5.970	17.550	0.060000
8.960	17.440	0.060000
11.950	17.380	0.060000
14.930	17.330	0.060000
17.920	17.220	0.060000
20.910	17.120	0.060000
23.890	17.150	0.060000
26.880	17.100	0.060000
29.870	17.020	0.060000
32.850	16.980	0.060000
35.840	16.900	0.060000
38.830	16.900	0.060000
41.810	16.950	0.060000
44.800	16.960	0.060000
47.790	16.930	0.060000
50.770	16.920	0.060000
53.760	17.000	0.060000
56.750	17.080	0.060000
59.730	17.120	0.060000
62.720	17.180	0.060000
65.710	17.210	0.060000
68.690	17.220	0.060000
71.680	17.230	0.060000
74.670	17.220	0.060000
77.650	17.200	0.060000
80.640	17.160	0.060000
83.630	17.090	0.060000
86.610	17.040	0.060000
89.600	17.000	0.060000
92.590	16.940	0.060000
95.570	16.930	0.060000
98.560	16.910	0.060000
101.550	16.840	0.060000
104.530	16.690	0.060000
107.520	16.480	0.060000
110.510	16.280	0.060000
113.490	16.040	0.060000
116.480	15.650	0.060000
119.470	14.990	0.035000
122.450	14.160	0.035000
125.440	13.540	0.035000
128.430	13.080	0.035000
131.410	12.710	0.035000
134.400	12.570	0.035000
137.390	12.830	0.035000
140.370	13.350	0.035000
143.360	14.010	0.035000
146.350	14.580	0.035000
149.330	15.030	0.035000
152.320	15.370	0.035000
155.310	15.660	0.035000
158.290	15.860	0.035000
161.280	15.920	0.060000

164.270	16.040	0.060000
167.250	16.170	0.060000
170.240	16.220	0.060000
173.230	16.320	0.060000
176.210	16.410	0.060000
179.200	16.490	0.060000
182.190	16.560	0.060000
185.170	16.770	0.060000
188.160	16.960	0.060000
191.150	17.060	0.060000
194.130	17.070	0.060000
197.120	17.050	0.060000
200.110	17.020	0.060000
203.090	16.990	0.060000
206.080	17.010	0.060000
209.070	17.020	0.060000
212.050	17.040	0.060000
215.040	17.050	0.060000
218.030	17.070	0.060000
221.010	17.080	0.060000
224.000	17.090	0.060000
226.990	17.080	0.060000
229.970	17.080	0.060000
232.960	17.090	0.060000
235.950	17.100	0.060000
238.930	17.120	0.060000
241.920	17.170	0.060000
244.900	17.210	0.060000
247.890	17.240	0.060000
250.880	17.260	0.060000
253.860	17.270	0.060000
256.850	17.290	0.060000
259.840	17.310	0.060000
262.820	17.340	0.060000
265.810	17.390	0.060000
268.800	17.410	0.060000
271.780	17.270	0.060000
274.770	17.160	0.060000
277.760	17.030	0.060000
280.740	17.160	0.060000
283.730	17.510	0.060000
286.720	17.740	0.060000
289.700	18.020	0.060000
292.690	18.230	0.060000
295.680	18.370	0.060000
298.660	18.450	0.060000
301.650	18.490	0.060000
304.640	18.510	0.060000
307.620	18.520	0.060000

Name: AF LINK-07 US Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	20.000	0.060000
2.970	19.870	0.060000
5.940	19.740	0.060000
8.910	19.670	0.060000
11.870	19.600	0.060000
14.840	19.520	0.060000
17.810	19.440	0.060000
20.780	19.360	0.060000
23.750	19.280	0.060000
26.720	19.200	0.060000
29.690	19.070	0.060000
32.660	18.990	0.060000
35.620	18.880	0.060000
38.590	18.800	0.060000
41.560	18.840	0.060000
44.530	18.850	0.060000
47.500	18.830	0.060000
50.470	18.800	0.060000
53.440	18.710	0.060000
56.410	18.550	0.060000
59.370	18.470	0.060000
62.340	18.490	0.060000
65.310	18.420	0.060000
68.280	18.390	0.060000
71.250	18.340	0.060000
74.220	18.250	0.060000
77.190	18.050	0.060000
80.160	17.790	0.060000

83.120	17.390	0.060000
86.090	16.850	0.035000
89.060	16.190	0.035000
92.030	15.330	0.035000
95.000	14.510	0.035000
97.970	14.030	0.035000
100.940	13.740	0.035000
103.910	13.660	0.035000
106.870	13.670	0.035000
109.840	14.050	0.035000
112.810	14.930	0.035000
115.780	15.840	0.035000
118.750	16.520	0.035000
121.720	17.150	0.035000
124.690	17.480	0.035000
127.660	17.690	0.060000
130.620	17.850	0.060000
133.590	18.060	0.060000
136.560	18.120	0.060000
139.530	18.140	0.060000
142.500	18.180	0.060000
145.470	18.230	0.060000
148.440	18.290	0.060000
151.410	18.330	0.060000
154.370	18.350	0.060000
157.340	18.240	0.060000
160.310	18.240	0.060000
163.280	18.280	0.060000

Name: CATH_OV Group: STOR
Encroachment: No

Data from LiDAR

Station(ft)	Elevation(ft)	Manning's N
0.000	14.790	0.000000
2.990	14.800	0.000000
5.980	14.770	0.000000
8.970	14.790	0.000000
11.960	14.810	0.000000
14.950	14.750	0.000000
17.940	14.730	0.000000
20.940	14.710	0.000000
23.930	14.710	0.000000
26.920	14.670	0.000000
29.910	14.680	0.000000
32.900	14.680	0.000000
35.890	14.650	0.000000
38.880	14.630	0.000000
41.870	14.640	0.000000
44.860	14.560	0.000000
47.850	14.580	0.000000
50.840	14.580	0.000000
53.830	14.530	0.000000
56.830	14.530	0.000000
59.820	14.520	0.000000
62.810	14.480	0.000000
65.800	14.440	0.000000
68.790	14.450	0.000000
71.780	14.430	0.000000
74.770	14.360	0.000000
77.760	14.340	0.000000
80.750	14.320	0.000000
83.740	14.310	0.000000
86.730	14.220	0.000000
89.720	14.140	0.000000
92.710	14.130	0.000000
95.710	14.140	0.000000
98.700	14.130	0.000000
101.690	14.090	0.000000
104.680	14.090	0.000000
107.670	14.070	0.000000
110.660	14.030	0.000000
113.650	14.040	0.000000
116.640	14.070	0.000000
119.630	14.060	0.000000
122.620	14.050	0.000000
125.610	14.060	0.000000
128.600	14.100	0.000000
131.600	14.050	0.000000
134.590	14.060	0.000000
137.580	14.060	0.000000
140.570	14.010	0.000000
143.560	14.010	0.000000
146.550	14.010	0.000000

149.540	14.010	0.000000
152.530	14.020	0.000000
155.520	14.040	0.000000
158.510	14.050	0.000000
161.500	14.000	0.000000
164.490	14.030	0.000000
167.480	14.080	0.000000
170.480	14.070	0.000000
173.470	14.070	0.000000
176.460	14.090	0.000000
179.450	14.130	0.000000
182.440	14.150	0.000000
185.430	14.180	0.000000
188.420	14.190	0.000000
191.410	14.180	0.000000
194.400	14.150	0.000000
197.390	14.130	0.000000
200.380	14.150	0.000000
203.370	14.170	0.000000
206.370	14.190	0.000000
209.360	14.210	0.000000
212.350	14.230	0.000000
215.340	14.240	0.000000
218.330	14.230	0.000000
221.320	14.270	0.000000
224.310	14.290	0.000000
227.300	14.330	0.000000
230.290	14.350	0.000000
233.280	14.370	0.000000
236.270	14.370	0.000000
239.260	14.360	0.000000
242.250	14.400	0.000000
245.250	14.460	0.000000
248.240	14.490	0.000000
251.230	14.490	0.000000
254.220	14.480	0.000000
257.210	14.510	0.000000
260.200	14.510	0.000000
263.190	14.540	0.000000
266.180	14.580	0.000000
269.170	14.590	0.000000
272.160	14.590	0.000000
275.150	14.590	0.000000
278.140	14.600	0.000000
281.140	14.620	0.000000
284.130	14.620	0.000000
287.120	14.620	0.000000
290.110	14.650	0.000000
293.100	14.660	0.000000
296.090	14.660	0.000000
299.080	14.690	0.000000

Name: Channel-01 DS Group: BASE
Encroachment: No

Cross section derived from LiDAR data

Station(ft)	Elevation(ft)	Manning's N
0.000	5.260	0.030000
2.950	5.220	0.030000
5.890	5.190	0.030000
8.840	5.180	0.030000
11.780	5.120	0.030000
14.730	5.100	0.030000
17.670	5.050	0.030000
20.620	5.050	0.030000
23.560	4.990	0.030000
26.510	4.920	0.030000
29.450	4.800	0.030000
32.400	4.770	0.030000
35.340	4.690	0.030000
38.290	4.510	0.030000
41.230	4.240	0.030000
44.180	3.890	0.030000
47.120	3.600	0.030000
50.070	3.240	0.030000
53.010	2.690	0.030000
55.960	2.050	0.030000
58.900	1.100	0.030000
61.850	0.260	0.030000
64.790	0.020	0.030000
67.740	0.110	0.030000
70.680	0.220	0.030000
73.630	0.380	0.030000
76.570	1.200	0.030000

79.520	2.020	0.030000
82.460	2.840	0.030000
85.410	3.500	0.030000
88.350	3.770	0.030000
91.300	3.900	0.030000
94.240	3.980	0.030000
97.190	3.980	0.030000
100.140	4.070	0.030000
103.080	4.200	0.030000
106.030	4.270	0.030000
108.970	4.360	0.030000
111.920	4.490	0.030000
114.860	4.560	0.030000
117.810	4.690	0.030000
120.750	4.720	0.030000
123.700	4.780	0.030000
126.640	4.920	0.030000
129.590	4.960	0.030000
132.530	5.000	0.030000
135.480	5.050	0.030000
138.420	5.050	0.030000
141.370	5.160	0.030000
144.310	5.310	0.030000
147.260	5.470	0.030000
150.200	5.600	0.030000
153.150	5.700	0.030000
156.090	5.840	0.030000

Name: Channel-01 US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	12.210	0.035000
3.000	12.060	0.035000
6.000	11.900	0.035000
9.000	11.770	0.035000
12.000	11.820	0.035000
15.000	11.930	0.035000
17.990	12.070	0.035000
20.990	12.360	0.035000
23.990	12.000	0.035000
26.990	11.150	0.035000
29.990	10.670	0.035000
32.990	10.520	0.035000
35.990	10.340	0.035000
38.990	10.070	0.035000
41.990	9.260	0.035000
44.990	8.640	0.035000
47.980	8.270	0.035000
50.980	8.140	0.035000
53.980	8.160	0.035000
56.980	8.070	0.035000
59.980	7.850	0.035000
62.980	7.610	0.035000
65.980	7.300	0.035000
68.980	6.940	0.035000
71.980	6.190	0.035000
74.980	4.850	0.035000
77.980	3.180	0.035000
80.970	1.800	0.030000
83.970	1.070	0.030000
86.970	0.600	0.030000
89.970	0.420	0.030000
92.970	0.300	0.030000
95.970	0.180	0.030000
98.970	0.160	0.030000
101.970	0.130	0.030000
104.970	0.570	0.030000
107.970	1.070	0.030000
110.960	1.600	0.030000
113.960	2.170	0.030000
116.960	2.790	0.035000
119.960	3.400	0.035000
122.960	3.500	0.035000
125.960	3.770	0.035000
128.960	4.020	0.035000
131.960	4.250	0.035000
134.960	4.650	0.035000
137.960	4.970	0.035000
140.960	5.190	0.035000
143.950	5.780	0.035000
146.950	6.440	0.035000
149.950	6.820	0.035000

152.950	7.020	0.035000
155.950	7.430	0.035000
158.950	8.090	0.035000
161.950	9.000	0.035000
164.950	10.010	0.035000
167.950	10.920	0.035000
170.950	11.230	0.035000
173.950	11.380	0.035000
176.940	11.470	0.035000
179.940	11.460	0.035000
182.940	11.450	0.035000
185.940	11.420	0.035000
188.940	11.320	0.035000
191.940	11.090	0.035000
194.940	11.290	0.035000

Name: Channel-02 DS Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
8.990	8.150	0.030000
590.220	6.710	0.030000
593.210	6.680	0.030000
596.190	6.670	0.030000
599.180	6.650	0.030000
602.170	6.600	0.030000
605.160	6.620	0.030000
608.150	6.630	0.030000
611.130	6.630	0.030000
614.120	6.580	0.030000
617.110	6.600	0.030000
620.100	6.570	0.030000
623.080	6.520	0.030000
626.070	6.510	0.030000
629.060	6.570	0.030000
632.050	6.540	0.030000
635.040	6.560	0.030000
638.020	6.630	0.030000
641.010	6.680	0.030000
644.000	6.680	0.030000
646.990	6.740	0.030000
649.980	6.860	0.030000
652.960	6.970	0.030000
655.950	7.090	0.030000
658.940	7.100	0.030000
661.930	7.090	0.030000
664.910	7.070	0.030000
667.900	7.040	0.030000
670.890	7.030	0.030000
673.880	7.030	0.030000
676.870	7.090	0.030000
679.850	7.150	0.030000
682.840	7.180	0.030000
685.830	7.180	0.030000
688.820	7.220	0.030000
691.810	7.240	0.030000
694.790	7.360	0.030000
697.780	7.280	0.030000
700.770	7.120	0.030000
703.760	7.040	0.030000
706.740	7.120	0.030000
709.730	7.090	0.030000
712.700	6.790	0.030000
715.660	6.490	0.030000
718.620	6.430	0.030000
721.580	6.410	0.030000
724.550	6.280	0.030000
727.510	5.950	0.030000
728.200	6.210	0.035000
740.950	0.930	0.035000
764.410	0.550	0.035000
776.800	5.100	0.035000
777.870	5.470	0.035000
780.840	5.210	0.035000
783.800	4.820	0.030000
786.760	4.630	0.030000
789.720	4.450	0.030000
792.690	4.290	0.030000
795.650	4.320	0.030000
798.610	4.500	0.030000
801.580	4.710	0.030000
804.540	4.810	0.030000
807.500	4.890	0.030000

810.460	4.970	0.030000
813.430	5.000	0.030000
816.390	5.020	0.030000
819.350	5.020	0.030000
822.310	5.010	0.030000
825.280	5.020	0.030000
828.240	5.070	0.030000
831.200	5.130	0.030000
834.200	5.220	0.030000
837.200	5.260	0.030000
840.200	5.340	0.030000
843.200	5.410	0.030000
846.200	5.460	0.030000
849.200	5.510	0.030000
852.200	5.520	0.030000
855.200	5.560	0.030000
858.200	5.600	0.030000
861.200	5.590	0.030000
864.200	5.610	0.030000
867.200	5.740	0.030000
870.200	5.710	0.030000
873.200	5.640	0.030000
876.200	5.570	0.030000
879.200	5.500	0.030000
882.200	5.450	0.030000
885.200	5.460	0.030000
888.200	5.330	0.030000
891.200	5.160	0.030000
894.200	5.140	0.030000
897.200	5.100	0.030000
900.200	5.130	0.030000
903.190	5.260	0.030000
906.190	5.460	0.030000
909.190	5.660	0.030000
912.190	5.810	0.030000
915.190	6.000	0.030000
918.190	6.150	0.030000
921.190	6.300	0.030000
924.190	6.450	0.030000
927.190	6.510	0.030000
930.190	6.530	0.030000
933.190	6.570	0.030000
936.190	6.580	0.030000
939.190	6.590	0.030000
942.190	6.610	0.030000
945.190	6.590	0.030000
948.190	6.560	0.030000
951.190	6.510	0.030000
954.190	6.500	0.030000
957.190	6.520	0.030000
960.190	6.600	0.030000
963.190	6.650	0.030000
966.190	6.610	0.030000
969.190	6.610	0.030000
972.190	6.640	0.030000
975.190	6.590	0.030000
978.190	6.520	0.030000
981.190	6.520	0.030000
984.190	6.510	0.030000
987.190	6.460	0.030000
990.190	6.390	0.030000
993.190	6.330	0.030000
996.190	6.300	0.030000
999.180	6.340	0.030000
1002.180	6.330	0.030000
1005.180	6.300	0.030000
1008.180	6.210	0.030000
1011.180	6.070	0.030000
1014.180	6.040	0.030000
1017.180	5.980	0.030000
1020.180	5.880	0.030000
1023.180	5.720	0.030000
1026.180	5.610	0.030000
1029.180	5.640	0.030000
1032.180	5.700	0.030000
1035.180	5.780	0.030000
1038.180	5.890	0.030000
1041.180	5.940	0.030000
1044.180	5.990	0.030000
1047.180	6.050	0.030000
1050.180	6.200	0.030000
1053.180	6.270	0.030000
1056.180	6.310	0.030000
1059.180	6.410	0.030000
1062.180	6.480	0.030000
1065.180	6.510	0.030000
1068.180	6.470	0.030000

1071.180	6.380	0.030000
1074.180	6.310	0.030000
1077.180	6.330	0.030000
1080.180	6.370	0.030000
1083.180	6.400	0.030000
1086.180	6.440	0.030000
1089.180	6.460	0.030000
1092.180	6.440	0.030000
1095.180	6.410	0.030000
1098.170	6.380	0.030000
1101.170	6.320	0.030000
1104.170	6.410	0.030000
1107.170	6.540	0.030000
1110.170	6.570	0.030000
1113.170	6.590	0.030000
1116.170	6.650	0.030000
1119.170	6.700	0.030000
1122.170	6.680	0.030000
1125.170	6.620	0.030000
1128.170	6.550	0.030000
1131.170	6.520	0.030000
1134.170	6.520	0.030000
1137.170	6.500	0.030000
1140.170	6.480	0.030000
1143.170	6.480	0.030000
1146.170	6.380	0.030000
1149.170	6.350	0.030000
1152.170	6.330	0.030000
1155.170	6.300	0.030000
1158.170	6.240	0.030000
1161.170	6.140	0.030000
1164.170	6.060	0.030000
1167.170	6.000	0.030000
1170.170	5.920	0.030000
1173.170	5.930	0.030000
1176.170	6.060	0.030000
1179.170	6.200	0.030000
1182.170	6.380	0.030000
1185.170	6.380	0.030000
1188.170	6.300	0.030000
1191.170	6.220	0.030000
1194.160	6.220	0.030000
1197.160	6.190	0.030000
1200.160	6.160	0.030000
1203.160	6.240	0.030000
1206.160	6.360	0.030000
1209.160	6.480	0.030000
1212.160	6.570	0.030000
1215.160	6.650	0.030000
1218.160	6.820	0.030000
1221.160	6.960	0.030000
1224.160	6.900	0.030000
1227.160	6.780	0.030000
1230.160	6.750	0.030000
1233.160	6.640	0.030000
1236.160	6.620	0.030000
1239.160	6.630	0.030000
1242.160	6.640	0.030000
1245.160	6.660	0.030000
1248.160	6.680	0.030000
1251.160	6.710	0.030000
1254.160	6.750	0.030000
1257.160	6.700	0.030000
1260.160	6.710	0.030000
1263.160	6.710	0.030000
1266.160	6.680	0.030000
1269.160	6.650	0.030000
1272.160	6.590	0.030000
1275.160	6.590	0.030000
1278.160	6.640	0.030000
1281.160	6.610	0.030000
1284.160	6.570	0.030000
1287.160	6.680	0.030000
1290.160	6.730	0.030000
1293.150	6.660	0.030000
1296.150	6.590	0.030000
1299.150	6.330	0.030000
1302.150	6.130	0.030000
1305.150	6.040	0.030000
1308.150	5.970	0.030000
1311.150	6.010	0.030000
1314.150	6.130	0.030000
1317.150	6.290	0.030000
1320.150	6.380	0.030000
1323.150	6.420	0.030000
1326.150	6.470	0.030000
1329.150	6.530	0.030000

1332.150	6.630	0.030000
1335.150	6.760	0.030000
1338.150	6.860	0.030000
1341.150	6.910	0.030000
1344.150	6.950	0.030000
1347.150	6.980	0.030000
1350.150	6.970	0.030000
1353.150	6.960	0.030000
1356.150	6.980	0.030000
1359.150	7.080	0.030000
1362.150	7.170	0.030000
1365.150	7.200	0.030000
1368.150	7.240	0.030000
1371.150	7.320	0.030000
1374.150	7.350	0.030000
1377.150	7.270	0.030000
1380.150	7.230	0.030000
1383.150	7.260	0.030000
1386.150	7.260	0.030000
1389.140	7.170	0.030000
1392.140	7.190	0.030000
1395.140	7.250	0.030000
1398.140	7.240	0.030000
1401.140	7.200	0.030000
1404.140	7.200	0.030000
1407.140	7.190	0.030000
1410.140	7.130	0.030000
1413.140	7.070	0.030000
1416.140	7.050	0.030000
1419.140	6.980	0.030000
1422.140	6.930	0.030000
1425.140	7.050	0.030000
1428.140	7.050	0.030000
1431.140	6.990	0.030000
1434.140	6.870	0.030000
1437.140	6.730	0.030000
1440.140	6.620	0.030000
1443.140	6.540	0.030000
1446.140	6.520	0.030000
1449.140	6.550	0.030000
1452.140	6.590	0.030000
1455.140	6.680	0.030000
1458.140	6.840	0.030000
1461.140	7.000	0.030000
1464.140	7.140	0.030000
1467.140	7.310	0.030000
1470.140	7.310	0.030000
1473.140	7.400	0.030000
1476.140	7.540	0.030000
1479.140	7.680	0.030000
1482.140	7.820	0.030000
1485.140	7.900	0.030000
1488.130	7.930	0.030000
1491.130	7.930	0.030000
1494.130	7.920	0.030000
1497.130	7.900	0.030000
1500.130	7.890	0.030000
1503.130	7.870	0.030000
1506.130	7.870	0.030000
1509.130	7.910	0.030000
1512.130	7.940	0.030000
1515.130	7.970	0.030000
1518.130	8.000	0.030000
1521.130	8.020	0.030000
1524.130	8.020	0.030000
1527.130	8.070	0.030000
1530.130	8.050	0.030000
1533.130	8.040	0.030000
1536.130	8.080	0.030000
1539.130	8.070	0.030000
1542.130	8.000	0.030000
1545.130	7.940	0.030000
1548.130	7.930	0.030000
1551.130	7.890	0.030000
1554.130	7.830	0.030000
1557.130	7.810	0.030000
1560.130	7.780	0.030000
1563.130	7.780	0.030000
1566.130	7.730	0.030000
1569.130	7.680	0.030000
1572.130	7.670	0.030000
1575.130	7.660	0.030000
1578.130	7.630	0.030000
1581.130	7.590	0.030000
1584.120	7.510	0.030000
1587.120	7.440	0.030000
1590.120	7.520	0.030000

1593.120	7.580	0.030000
1596.120	7.690	0.030000
1599.120	7.750	0.030000
1602.120	7.790	0.030000
1605.120	7.860	0.030000
1608.120	7.910	0.030000
1611.120	8.000	0.030000
1614.120	8.020	0.030000
1617.120	7.980	0.030000
1620.120	8.000	0.030000
1623.120	8.090	0.030000
1626.120	8.120	0.030000
1629.120	8.090	0.030000
1632.120	8.090	0.030000
1635.120	8.120	0.030000
1638.120	8.140	0.030000
1641.120	8.120	0.030000
1644.120	8.180	0.030000
1647.120	8.310	0.030000
1650.120	8.310	0.030000
1653.120	8.380	0.030000
1656.120	8.370	0.030000
1659.120	8.390	0.030000
1662.120	8.340	0.030000
1665.120	8.350	0.030000
1668.120	8.380	0.030000
1671.120	8.360	0.030000
1674.120	8.270	0.030000
1677.120	8.190	0.030000
1680.120	8.170	0.030000
1683.110	8.210	0.030000
1686.110	8.210	0.030000
1689.110	8.140	0.030000
1692.110	8.090	0.030000
1695.110	8.060	0.030000
1698.110	8.150	0.030000
1701.110	8.240	0.030000
1704.110	8.310	0.030000
1707.110	8.350	0.030000
1710.110	8.330	0.030000
1713.110	8.310	0.030000
1716.110	8.300	0.030000
1719.110	8.270	0.030000
1722.110	8.260	0.030000
1725.110	8.290	0.030000
1728.110	8.360	0.030000
1731.110	8.440	0.030000
1734.110	8.470	0.030000
1737.110	8.490	0.030000
1740.110	8.490	0.030000
1743.110	8.570	0.030000
1746.110	8.610	0.030000
1749.110	8.620	0.030000
1752.110	8.620	0.030000
1755.110	8.580	0.030000
1758.110	8.550	0.030000
1761.110	8.670	0.030000
1764.110	8.770	0.030000
1767.110	8.830	0.030000
1770.110	8.900	0.030000
1773.110	8.980	0.030000
1776.110	9.050	0.030000
1779.100	9.190	0.030000
1782.100	9.310	0.030000
1785.100	9.380	0.030000
1788.100	9.430	0.030000
1791.100	9.400	0.030000
1794.100	9.510	0.030000

Name: Channel-02 US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	6.980	0.025000
2.990	7.020	0.025000
5.980	6.970	0.025000
8.970	6.950	0.025000
11.960	6.970	0.025000
14.950	6.980	0.025000
17.940	6.900	0.025000
20.930	6.680	0.025000
23.920	6.450	0.025000
26.910	6.290	0.025000

29.900	6.270	0.025000
32.890	6.190	0.025000
35.880	6.140	0.025000
38.870	6.040	0.025000
41.870	6.080	0.025000
44.860	6.140	0.025000
47.850	6.180	0.025000
50.840	6.190	0.025000
53.830	6.140	0.025000
56.820	6.100	0.025000
59.810	6.110	0.025000
62.800	6.050	0.025000
65.790	6.060	0.025000
68.780	5.990	0.025000
71.770	5.970	0.025000
74.760	6.010	0.025000
77.750	6.030	0.025000
80.740	5.990	0.025000
83.730	5.940	0.025000
86.720	5.970	0.025000
89.710	6.000	0.025000
92.700	6.010	0.025000
95.690	6.020	0.025000
98.680	6.030	0.025000
101.670	6.010	0.025000
104.660	5.960	0.025000
107.650	5.910	0.025000
110.640	5.890	0.025000
113.630	5.910	0.025000
116.620	6.010	0.025000
119.610	5.850	0.025000
122.610	5.840	0.025000
125.600	5.830	0.025000
128.590	5.820	0.025000
131.580	5.810	0.025000
134.570	5.760	0.025000
137.560	5.720	0.025000
140.550	5.710	0.025000
143.540	5.700	0.025000
146.530	5.690	0.025000
149.520	5.670	0.025000
152.510	5.600	0.025000
155.500	5.600	0.025000
158.490	5.580	0.025000
161.480	5.530	0.025000
164.470	5.510	0.025000
167.460	5.470	0.025000
170.450	5.480	0.025000
173.440	5.460	0.025000
176.430	5.370	0.025000
179.420	5.290	0.025000
182.410	5.250	0.025000
185.400	5.170	0.025000
188.390	5.170	0.025000
191.380	5.190	0.025000
194.370	5.180	0.025000
197.360	5.190	0.025000
200.360	5.200	0.025000
203.350	5.140	0.025000
206.340	5.200	0.025000
209.330	5.270	0.025000
212.320	5.220	0.025000
215.310	5.220	0.025000
218.300	5.240	0.025000
221.290	5.280	0.025000
224.280	5.300	0.025000
227.270	5.290	0.025000
230.260	5.310	0.025000
233.250	5.370	0.025000
236.240	5.440	0.025000
239.230	5.550	0.025000
242.220	5.630	0.025000
245.210	5.730	0.025000
248.200	5.800	0.025000
251.190	5.820	0.025000
254.180	5.760	0.025000
257.170	5.720	0.025000
260.160	5.690	0.025000
263.150	5.650	0.025000
266.140	5.620	0.025000
269.130	5.620	0.025000
272.120	5.630	0.025000
275.110	5.620	0.025000
278.100	5.610	0.025000
281.100	5.560	0.025000
284.090	5.530	0.025000
287.080	5.480	0.025000

290.070	5.470	0.025000
293.060	5.460	0.025000
296.050	5.430	0.025000
299.040	5.400	0.025000
302.030	5.410	0.025000
305.020	5.420	0.025000
308.010	5.450	0.025000
311.000	5.460	0.025000
313.990	5.400	0.025000
316.980	5.360	0.025000
319.970	5.330	0.025000
322.960	5.320	0.025000
325.950	5.300	0.025000
328.940	5.330	0.025000
331.930	5.360	0.025000
334.920	5.330	0.025000
337.910	5.330	0.025000
340.900	5.350	0.025000
343.890	5.330	0.025000
346.880	5.370	0.025000
349.870	5.400	0.025000
352.860	5.420	0.025000
355.850	5.410	0.025000
358.840	5.340	0.025000
361.840	5.320	0.025000
364.830	5.330	0.025000
367.820	5.340	0.025000
370.810	5.380	0.025000
373.800	5.390	0.025000
376.790	5.360	0.025000
379.780	5.330	0.025000
382.770	5.360	0.025000
385.760	5.440	0.025000
388.750	5.550	0.025000
391.740	5.610	0.025000
394.730	5.600	0.025000
397.720	5.610	0.025000
400.710	5.620	0.025000
403.700	5.630	0.025000
406.690	5.630	0.025000
409.680	5.640	0.025000
412.670	5.660	0.025000
415.660	5.670	0.025000
418.650	5.690	0.025000
421.640	5.710	0.025000
424.630	5.680	0.025000
427.620	5.560	0.025000
430.610	5.440	0.025000
433.600	5.420	0.025000
436.590	5.420	0.025000
439.580	5.420	0.025000
442.580	5.410	0.025000
445.570	5.410	0.025000
448.560	5.400	0.025000
451.550	5.420	0.025000
454.540	5.490	0.025000
457.530	5.590	0.025000
460.520	5.660	0.025000
463.510	5.690	0.025000
466.500	5.720	0.025000
469.490	5.730	0.025000
472.480	5.760	0.025000
475.470	5.690	0.025000
478.460	5.820	0.025000
481.450	5.910	0.025000
484.440	5.980	0.025000
487.430	6.050	0.025000
490.420	6.040	0.025000
493.410	6.030	0.025000
496.400	5.990	0.025000
499.390	5.870	0.025000
502.380	5.800	0.025000
505.370	5.730	0.025000
508.360	5.600	0.025000
511.350	5.440	0.025000
514.340	5.400	0.025000
517.330	5.440	0.025000
520.330	5.520	0.025000
523.320	5.580	0.025000
526.310	5.560	0.025000
529.300	5.530	0.025000
532.290	5.470	0.025000
535.280	5.400	0.025000
538.270	5.450	0.025000
541.260	5.470	0.025000
544.250	5.510	0.025000
547.240	5.480	0.025000

550.230	5.430	0.025000
553.220	5.520	0.025000
556.210	5.560	0.025000
559.200	5.560	0.025000
562.190	5.540	0.025000
565.180	5.610	0.025000
568.170	5.640	0.025000
571.160	5.650	0.025000
574.150	5.680	0.025000
577.140	5.750	0.025000
580.130	5.810	0.025000
583.120	5.880	0.025000
586.110	5.950	0.025000
589.100	5.950	0.025000
592.090	5.210	0.035000
609.040	4.850	0.035000
612.500	0.780	0.035000
635.650	1.140	0.035000
643.960	4.670	0.035000
656.990	5.730	0.035000
660.950	5.570	0.025000
663.950	5.620	0.025000
666.940	5.690	0.025000
669.930	5.740	0.025000
672.930	5.780	0.025000
675.920	5.780	0.025000
678.910	5.770	0.025000
681.910	5.770	0.025000
684.900	5.770	0.025000
687.900	5.810	0.025000
690.890	5.820	0.025000
693.880	5.810	0.025000
696.880	5.770	0.025000
699.870	5.710	0.025000
702.860	5.720	0.025000
705.860	5.750	0.025000
708.850	5.780	0.025000
711.850	5.810	0.025000
714.840	5.820	0.025000
717.830	5.810	0.025000
720.830	5.750	0.025000
723.820	5.620	0.025000
726.820	5.610	0.025000
729.810	5.590	0.025000
732.800	5.610	0.025000
735.800	5.650	0.025000
738.790	5.730	0.025000
741.780	5.720	0.025000
744.780	5.770	0.025000
747.770	5.840	0.025000
750.770	5.870	0.025000
753.760	5.960	0.025000
756.750	5.980	0.025000
759.750	5.950	0.025000
762.740	5.930	0.025000
765.730	5.930	0.025000
768.730	5.930	0.025000
771.720	5.930	0.025000
774.720	5.940	0.025000
777.710	5.860	0.025000
780.700	5.890	0.025000
783.700	5.930	0.025000
786.690	5.950	0.025000
789.690	5.910	0.025000
792.680	5.850	0.025000
795.670	5.860	0.025000
798.670	5.730	0.025000
801.660	5.590	0.025000
804.650	5.560	0.025000
807.650	5.520	0.025000
810.640	5.520	0.025000
813.640	5.470	0.025000
816.630	5.440	0.025000
819.620	5.460	0.025000
822.620	5.470	0.025000
825.610	5.520	0.025000
828.600	5.550	0.025000
831.600	5.460	0.025000
834.590	5.500	0.025000
837.590	5.540	0.025000
840.580	5.580	0.025000
843.570	5.650	0.025000
846.570	5.700	0.025000
849.560	5.760	0.025000
852.560	5.840	0.025000
855.550	5.840	0.025000
858.540	5.860	0.025000

861.540	5.890	0.025000
864.530	5.930	0.025000
867.520	5.930	0.025000
870.520	5.960	0.025000
873.510	6.040	0.025000
876.510	6.030	0.025000
879.500	6.010	0.025000
882.490	6.070	0.025000
885.490	6.130	0.025000
888.480	6.160	0.025000
891.470	6.220	0.025000
894.470	6.240	0.025000
897.460	6.300	0.025000
900.460	6.360	0.025000
903.450	6.380	0.025000
906.440	6.350	0.025000
909.440	6.340	0.025000
912.430	6.220	0.025000
915.420	6.210	0.025000
918.420	6.220	0.025000
921.410	6.140	0.025000
924.410	6.130	0.025000
927.400	6.020	0.025000
930.390	5.950	0.025000
933.390	5.900	0.025000
936.380	5.830	0.025000
939.380	5.760	0.025000
942.370	5.710	0.025000
945.360	5.690	0.025000
948.360	5.730	0.025000
951.350	5.830	0.025000
954.340	5.910	0.025000
957.340	5.990	0.025000
960.330	6.100	0.025000
963.330	6.160	0.025000
966.320	6.270	0.025000
969.310	6.220	0.025000
972.310	6.180	0.025000
975.300	6.250	0.025000
978.290	6.290	0.025000
981.290	6.320	0.025000
984.280	6.300	0.025000
987.280	6.300	0.025000
990.270	6.360	0.025000
993.260	6.370	0.025000
996.260	6.370	0.025000
999.250	6.420	0.025000
1002.250	6.510	0.025000
1005.240	6.470	0.025000
1008.230	6.430	0.025000
1011.230	6.420	0.025000
1014.220	6.410	0.025000
1017.210	6.430	0.025000
1020.210	6.380	0.025000
1023.200	6.400	0.025000
1026.200	6.470	0.025000
1029.190	6.510	0.025000
1032.180	6.540	0.025000
1035.180	6.620	0.025000
1038.170	6.610	0.025000
1041.160	6.540	0.025000
1044.160	6.500	0.025000
1047.150	6.440	0.025000
1050.150	6.420	0.025000
1053.140	6.410	0.025000
1056.130	6.300	0.025000
1059.130	6.210	0.025000
1062.120	6.050	0.025000
1065.120	5.950	0.025000
1068.110	5.960	0.025000
1071.100	5.910	0.025000
1074.100	5.950	0.025000
1077.090	6.060	0.025000
1080.080	6.130	0.025000
1083.080	6.160	0.025000
1086.070	6.240	0.025000
1089.070	6.300	0.025000
1092.060	6.400	0.025000
1095.050	6.450	0.025000
1098.050	6.510	0.025000
1101.040	6.550	0.025000
1104.030	6.580	0.025000
1107.030	6.540	0.025000
1110.020	6.590	0.025000
1113.020	6.660	0.025000
1116.010	6.650	0.025000
1119.000	6.660	0.025000

1122.000	6.720	0.025000
1124.990	6.760	0.025000
1127.990	6.780	0.025000
1130.980	6.750	0.025000
1133.970	6.750	0.025000
1136.970	6.740	0.025000
1139.960	6.710	0.025000
1142.950	6.660	0.025000
1145.950	6.650	0.025000
1148.940	6.640	0.025000
1151.940	6.600	0.025000
1154.930	6.560	0.025000
1157.920	6.580	0.025000
1160.920	6.600	0.025000
1163.910	6.540	0.025000
1166.900	6.480	0.025000
1169.900	6.410	0.025000
1172.890	6.380	0.025000
1175.890	6.340	0.025000
1178.880	6.280	0.025000
1181.870	6.200	0.025000
1184.870	6.160	0.025000
1187.860	6.150	0.025000
1190.850	6.010	0.025000
1193.850	5.880	0.025000
1196.840	5.760	0.025000
1199.840	5.720	0.025000
1202.830	5.790	0.025000
1205.820	5.890	0.025000
1208.820	6.010	0.025000
1211.810	6.160	0.025000
1214.810	6.330	0.025000
1217.800	6.450	0.025000
1220.790	6.500	0.025000
1223.790	6.560	0.025000
1226.780	6.630	0.025000
1229.770	6.730	0.025000
1232.770	6.780	0.025000
1235.760	6.800	0.025000
1238.760	6.850	0.025000
1241.750	6.860	0.025000
1244.740	6.890	0.025000
1247.740	6.890	0.025000
1250.730	6.900	0.025000
1253.720	6.980	0.025000
1256.720	7.070	0.025000
1259.710	7.080	0.025000
1262.710	7.060	0.025000
1265.700	7.040	0.025000
1268.690	7.020	0.025000

Name: Channel-04 DS Group: BASE

Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	16.920	0.040000
3.000	16.910	0.040000
6.000	16.660	0.040000
9.000	16.370	0.040000
12.000	16.090	0.040000
15.000	15.900	0.040000
18.000	15.710	0.040000
21.000	15.490	0.040000
24.000	15.290	0.040000
26.990	14.890	0.040000
29.990	14.510	0.040000
32.990	14.400	0.040000
35.990	14.660	0.040000
38.990	14.850	0.040000
41.990	14.830	0.040000
44.990	14.830	0.040000
47.990	14.930	0.040000
50.990	14.790	0.040000
53.990	14.760	0.040000
56.990	14.520	0.040000
59.990	14.050	0.040000
62.990	13.800	0.040000
65.990	13.740	0.040000
68.990	13.740	0.040000
71.990	13.610	0.040000
74.980	13.490	0.040000
77.980	13.530	0.040000
80.980	13.550	0.040000

83.980	13.590	0.040000
86.980	13.640	0.040000
89.980	13.640	0.040000
92.980	13.610	0.040000
95.980	13.590	0.040000
98.980	13.590	0.040000
101.980	13.570	0.040000
104.980	13.560	0.040000
107.980	13.540	0.040000
110.980	13.450	0.040000
113.980	13.390	0.040000
116.980	13.350	0.040000
119.980	13.270	0.040000
122.980	13.230	0.040000
125.970	13.100	0.040000
128.970	12.980	0.040000
131.970	12.930	0.040000
134.970	12.980	0.040000
137.970	12.960	0.040000
140.970	12.850	0.040000
143.970	12.720	0.040000
146.970	12.540	0.040000
149.970	12.280	0.040000
152.970	12.020	0.040000
155.970	11.940	0.040000
158.970	11.870	0.040000
161.970	11.840	0.040000
164.970	11.880	0.040000
167.970	11.810	0.040000
170.970	11.670	0.040000
173.970	11.600	0.040000
176.960	11.580	0.040000
179.960	11.530	0.040000
182.960	11.490	0.040000
185.960	11.410	0.040000
188.960	11.350	0.040000
191.960	11.320	0.040000
194.960	11.270	0.040000
197.960	11.200	0.040000
200.960	11.130	0.040000
203.960	11.070	0.040000
206.960	11.040	0.040000
209.960	11.040	0.040000
212.960	11.040	0.040000
215.960	11.020	0.040000
218.960	10.930	0.040000
221.960	10.840	0.040000
224.950	10.810	0.040000
227.950	10.820	0.040000
230.950	10.770	0.040000
233.950	10.700	0.040000
236.950	10.720	0.040000
239.950	10.710	0.040000
242.950	10.660	0.040000
245.950	10.620	0.040000
248.950	10.590	0.040000
251.950	10.590	0.040000
254.950	10.530	0.040000
257.950	10.480	0.040000
260.950	10.410	0.040000
263.950	10.370	0.040000
266.950	10.320	0.040000
269.950	10.250	0.040000
272.950	10.190	0.040000
275.940	10.130	0.040000
278.940	10.090	0.040000
281.940	10.050	0.040000
284.940	9.990	0.040000
287.940	10.020	0.040000
290.940	10.070	0.040000
293.940	10.080	0.040000
296.940	10.040	0.040000
299.940	10.000	0.040000
302.940	9.950	0.040000
305.940	9.940	0.040000
308.940	9.900	0.040000
311.940	9.850	0.040000
314.940	9.830	0.040000
317.940	9.880	0.040000
320.940	9.880	0.040000
323.940	9.830	0.040000
326.930	9.780	0.040000
329.930	9.740	0.040000
332.930	9.780	0.040000
335.930	9.810	0.040000
338.930	9.760	0.040000
341.930	9.770	0.040000

344.930	9.780	0.040000
347.930	9.780	0.040000
350.930	9.820	0.040000
353.930	9.830	0.040000
356.930	9.780	0.040000
359.930	9.730	0.040000
362.930	9.600	0.040000
365.930	9.450	0.040000
368.930	9.330	0.040000
371.930	9.290	0.040000
374.920	9.340	0.040000
377.920	9.090	0.040000
380.920	8.560	0.040000
383.920	7.850	0.040000
386.920	6.620	0.040000
389.920	5.460	0.040000
393.920	3.490	0.040000
398.200	3.580	0.040000
401.920	5.010	0.040000
404.920	5.620	0.040000
407.920	6.800	0.040000
410.920	8.520	0.040000
413.920	9.930	0.040000
416.920	10.780	0.040000
419.920	11.410	0.040000
422.920	11.700	0.040000
425.910	11.830	0.040000
428.910	11.850	0.040000
428.910	11.850	0.040000
431.910	11.850	0.040000
431.910	11.850	0.040000
434.910	11.820	0.040000
434.910	11.820	0.040000
437.910	11.900	0.040000
437.910	11.900	0.040000
440.910	11.970	0.040000
440.910	11.970	0.040000
443.910	12.000	0.040000
443.910	12.000	0.040000
446.910	12.050	0.040000
446.910	12.050	0.040000
449.910	12.070	0.040000
449.910	12.070	0.040000
452.910	12.050	0.040000
452.910	12.050	0.040000
455.910	12.180	0.040000
455.910	12.180	0.040000
458.910	12.240	0.040000
458.910	12.240	0.040000
461.910	12.310	0.040000
461.910	12.310	0.040000
464.910	12.420	0.040000
464.910	12.420	0.040000
467.910	12.490	0.040000
467.910	12.490	0.040000
470.910	12.580	0.040000
470.910	12.580	0.040000
473.910	12.650	0.040000
473.910	12.650	0.040000
476.900	12.670	0.040000
476.900	12.670	0.040000
479.900	12.730	0.040000
479.900	12.730	0.040000
482.900	12.810	0.040000
482.900	12.810	0.040000
485.900	12.890	0.040000
485.900	12.890	0.040000
488.900	12.990	0.040000
488.900	12.990	0.040000
491.900	13.090	0.040000
491.900	13.090	0.040000
494.900	13.300	0.040000
494.900	13.300	0.040000
497.900	13.450	0.040000
497.900	13.450	0.040000
500.900	13.590	0.040000
500.900	13.590	0.040000
503.900	13.740	0.040000
503.900	13.740	0.040000
506.900	13.790	0.040000
506.900	13.790	0.040000
509.900	13.910	0.040000
509.900	13.910	0.040000
512.900	14.080	0.040000
512.900	14.080	0.040000
515.900	14.300	0.040000
515.900	14.300	0.040000

518.900	14.490	0.040000
518.900	14.490	0.040000
521.900	14.550	0.040000
521.900	14.550	0.040000
524.890	14.640	0.040000
524.890	14.640	0.040000
527.890	14.730	0.040000
527.890	14.730	0.040000
530.890	14.770	0.040000
530.890	14.770	0.040000
533.890	14.840	0.040000
533.890	14.840	0.040000
536.890	14.860	0.040000
536.890	14.860	0.040000
539.890	14.880	0.040000
539.890	14.880	0.040000
542.890	14.910	0.040000
542.890	14.910	0.040000
545.890	14.920	0.040000
545.890	14.920	0.040000
548.890	14.940	0.040000
548.890	14.940	0.040000
551.890	14.960	0.040000
551.890	14.960	0.040000
554.890	14.980	0.040000
554.890	14.980	0.040000
557.890	15.060	0.040000
557.890	15.060	0.040000
560.890	15.120	0.040000
560.890	15.120	0.040000
563.890	15.170	0.040000
563.890	15.170	0.040000
566.890	15.200	0.040000
566.890	15.200	0.040000
569.890	15.250	0.040000
569.890	15.250	0.040000
572.890	15.280	0.040000
572.890	15.280	0.040000
575.880	15.320	0.040000
575.880	15.320	0.040000
578.880	15.350	0.040000
578.880	15.350	0.040000
581.880	15.420	0.040000
581.880	15.420	0.040000
584.880	15.480	0.040000
584.880	15.480	0.040000
587.880	15.490	0.040000
587.880	15.490	0.040000
590.880	15.540	0.040000
590.880	15.540	0.040000
593.880	15.570	0.040000
593.880	15.570	0.040000
596.880	15.610	0.040000
596.880	15.610	0.040000
599.880	15.630	0.040000
599.880	15.630	0.040000
602.880	15.640	0.040000
602.880	15.640	0.040000
605.880	15.630	0.040000
605.880	15.630	0.040000
608.880	15.670	0.040000
608.880	15.670	0.040000
611.880	15.750	0.040000
611.880	15.750	0.040000
614.880	15.780	0.040000
614.880	15.780	0.040000
617.880	15.840	0.040000
617.880	15.840	0.040000
620.880	15.870	0.040000
620.880	15.870	0.040000
623.870	15.860	0.040000
623.870	15.860	0.040000
626.870	15.910	0.040000
626.870	15.910	0.040000
629.870	15.940	0.040000
629.870	15.940	0.040000
632.870	15.970	0.040000
632.870	15.970	0.040000
635.870	16.010	0.040000
635.870	16.010	0.040000
638.870	16.070	0.040000
638.870	16.070	0.040000
641.870	16.130	0.040000
641.870	16.130	0.040000
644.870	16.130	0.040000
644.870	16.130	0.040000
647.870	16.160	0.040000

647.870	16.160	0.040000
650.870	16.160	0.040000
650.870	16.160	0.040000
653.870	16.170	0.040000
653.870	16.170	0.040000
656.870	16.260	0.040000
656.870	16.260	0.040000
659.870	16.250	0.040000
659.870	16.250	0.040000
662.870	16.250	0.040000
662.870	16.250	0.040000
665.870	16.250	0.040000
665.870	16.250	0.040000
668.870	16.260	0.040000
668.870	16.260	0.040000
671.870	16.270	0.040000
671.870	16.270	0.040000
674.860	16.220	0.040000
674.860	16.220	0.040000
677.860	16.280	0.040000
677.860	16.280	0.040000
680.860	16.360	0.040000
680.860	16.360	0.040000
683.860	16.360	0.040000
683.860	16.360	0.040000
686.860	16.450	0.040000
686.860	16.450	0.040000
689.860	16.470	0.040000
689.860	16.470	0.040000
692.860	16.500	0.040000
692.860	16.500	0.040000
695.860	16.540	0.040000
695.860	16.540	0.040000
698.860	16.630	0.040000
698.860	16.630	0.040000
701.860	16.720	0.040000
701.860	16.720	0.040000
704.860	16.820	0.040000
704.860	16.820	0.040000
707.860	16.840	0.040000
707.860	16.840	0.040000
710.860	16.940	0.040000
710.860	16.940	0.040000
713.860	17.010	0.040000
713.860	17.010	0.040000
716.860	17.090	0.040000
716.860	17.090	0.040000
719.860	17.180	0.040000
719.860	17.180	0.040000
722.860	17.250	0.040000
722.860	17.250	0.040000
725.850	17.330	0.040000
725.850	17.330	0.040000
728.850	17.410	0.040000
728.850	17.410	0.040000
731.850	17.440	0.040000
731.850	17.440	0.040000
734.850	17.460	0.040000
734.850	17.460	0.040000
737.850	17.500	0.040000
737.850	17.500	0.040000
740.850	17.580	0.040000
740.850	17.580	0.040000
743.850	17.640	0.040000
743.850	17.640	0.040000
746.850	17.590	0.040000
746.850	17.590	0.040000
749.850	17.600	0.040000
749.850	17.600	0.040000
752.850	17.650	0.040000
752.850	17.650	0.040000
755.850	17.680	0.040000
755.850	17.680	0.040000
758.850	17.730	0.040000
758.850	17.730	0.040000
761.850	17.770	0.040000
761.850	17.770	0.040000
764.850	17.780	0.040000
764.850	17.780	0.040000
767.850	17.860	0.040000
767.850	17.860	0.040000
770.850	17.870	0.040000
770.850	17.870	0.040000
773.840	17.890	0.040000
773.840	17.890	0.040000
776.840	17.980	0.040000
776.840	17.980	0.040000

779.840	18.000	0.040000
779.840	18.000	0.040000
782.840	18.030	0.040000
782.840	18.030	0.040000
785.840	18.080	0.040000
785.840	18.080	0.040000
788.840	18.120	0.040000
788.840	18.120	0.040000
791.840	18.140	0.040000
791.840	18.140	0.040000
794.840	18.210	0.040000
794.840	18.210	0.040000
797.840	18.280	0.040000
797.840	18.280	0.040000
800.840	18.300	0.040000

Name: Channel-04 US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	16.650	0.050000
3.000	16.590	0.050000
6.000	16.520	0.050000
8.990	16.390	0.050000
11.990	16.330	0.050000
14.990	16.210	0.050000
17.990	16.130	0.050000
20.990	16.000	0.050000
23.980	15.880	0.050000
26.980	15.760	0.050000
29.980	15.480	0.050000
32.980	14.950	0.050000
35.980	14.490	0.050000
38.980	14.170	0.050000
41.970	14.130	0.050000
44.970	13.940	0.050000
47.970	13.830	0.050000
50.970	13.700	0.050000
53.970	13.580	0.050000
56.960	13.480	0.050000
59.960	13.330	0.050000
62.960	13.130	0.050000
65.960	12.990	0.050000
68.960	12.920	0.050000
71.950	12.850	0.050000
74.950	12.750	0.050000
77.950	12.660	0.050000
80.950	12.580	0.050000
83.950	12.510	0.050000
86.940	12.350	0.050000
89.940	12.160	0.050000
92.940	12.030	0.050000
95.940	11.830	0.050000
98.940	11.600	0.050000
101.940	11.410	0.050000
104.930	11.250	0.050000
107.930	11.160	0.050000
110.930	11.210	0.050000
113.930	11.230	0.050000
116.930	11.210	0.050000
119.920	10.870	0.050000
122.920	10.030	0.050000
125.920	9.190	0.050000
128.920	8.310	0.050000
131.920	7.370	0.050000
134.910	6.910	0.050000
137.910	6.430	0.050000
141.890	4.120	0.050000
146.780	3.610	0.050000
151.750	4.080	0.050000
155.900	6.160	0.050000
158.900	6.530	0.050000
161.900	6.960	0.050000
164.900	7.740	0.050000
167.890	8.580	0.050000
170.890	9.390	0.050000
173.890	10.120	0.050000
176.890	10.480	0.050000
179.890	10.610	0.050000
182.880	10.780	0.050000
185.880	11.010	0.050000
188.880	11.240	0.050000
191.880	11.400	0.050000

194.880	11.520	0.050000
197.870	11.610	0.050000
200.870	11.600	0.050000
203.870	11.570	0.050000
206.870	11.570	0.050000
209.870	11.650	0.050000
212.860	11.690	0.050000
215.860	11.700	0.050000
218.860	11.750	0.050000
221.860	11.800	0.050000
224.860	11.850	0.050000
227.860	11.890	0.050000
230.850	11.940	0.050000
233.850	11.950	0.050000
236.850	12.000	0.050000
239.850	12.040	0.050000
242.850	12.040	0.050000
245.840	12.120	0.050000
248.840	12.210	0.050000
251.840	12.210	0.050000
254.840	12.220	0.050000
257.840	12.260	0.050000
260.830	12.340	0.050000
263.830	12.410	0.050000
266.830	12.520	0.050000
269.830	12.600	0.050000
272.830	12.720	0.050000
275.820	12.810	0.050000
278.820	12.890	0.050000
281.820	12.980	0.050000
284.820	13.060	0.050000
287.820	13.140	0.050000
290.820	13.240	0.050000
293.810	13.300	0.050000
296.810	13.340	0.050000
299.810	13.370	0.050000
302.810	13.380	0.050000
305.810	13.370	0.050000
308.800	13.430	0.050000
311.800	13.570	0.050000
314.800	13.680	0.050000
317.800	13.720	0.050000
320.800	13.720	0.050000
323.790	13.740	0.050000
326.790	13.800	0.050000
329.790	13.860	0.050000
332.790	13.930	0.050000
335.790	13.870	0.050000
338.780	13.840	0.050000
341.780	13.820	0.050000
344.780	13.790	0.050000
347.780	13.770	0.050000
350.780	13.770	0.050000
353.780	13.870	0.050000
356.770	13.960	0.050000
359.770	14.070	0.050000
362.770	14.210	0.050000
365.770	14.300	0.050000
368.770	14.400	0.050000
371.760	14.530	0.050000
374.760	14.670	0.050000
377.760	14.760	0.050000
380.760	14.890	0.050000
383.760	14.970	0.050000
386.750	14.970	0.050000
389.750	14.980	0.050000
392.750	15.000	0.050000
395.750	14.950	0.050000
398.750	14.910	0.050000
401.740	14.860	0.050000
404.740	14.800	0.050000
407.740	14.730	0.050000
410.740	14.620	0.050000
413.740	14.510	0.050000
416.740	14.460	0.050000
419.730	14.400	0.050000
422.730	14.340	0.050000
425.730	14.350	0.050000
428.730	14.360	0.050000
431.730	14.340	0.050000
434.720	14.400	0.050000
437.720	14.450	0.050000
440.720	14.490	0.050000
443.720	14.560	0.050000
446.720	14.580	0.050000
449.710	14.550	0.050000
452.710	14.540	0.050000

455.710	14.500	0.050000
458.710	14.500	0.050000
461.710	14.560	0.050000
464.700	14.550	0.050000
467.700	14.520	0.050000
470.700	14.560	0.050000
473.700	14.580	0.050000
476.700	14.550	0.050000
479.700	14.570	0.050000
482.690	14.590	0.050000
485.690	14.570	0.050000
488.690	14.590	0.050000
491.690	14.600	0.050000
494.690	14.610	0.050000
497.680	14.650	0.050000
500.680	14.690	0.050000
503.680	14.690	0.050000
506.680	14.620	0.050000
509.680	14.530	0.050000
512.670	14.440	0.050000
515.670	14.340	0.050000
518.670	14.290	0.050000
521.670	14.350	0.050000
524.670	14.400	0.050000
527.660	14.400	0.050000
530.660	14.350	0.050000
533.660	14.330	0.050000
536.660	14.310	0.050000
539.660	14.300	0.050000
542.660	14.360	0.050000
545.650	14.400	0.050000
548.650	14.440	0.050000
551.650	14.480	0.050000
554.650	14.580	0.050000
557.650	14.620	0.050000
560.640	14.690	0.050000
563.640	14.750	0.050000
566.640	14.800	0.050000
569.640	15.000	0.050000
572.640	15.200	0.050000
575.630	15.420	0.050000
578.630	15.650	0.050000
581.630	15.810	0.050000
584.630	15.990	0.050000
587.630	16.120	0.050000
590.620	16.210	0.050000

Name: Channel-05 US Group: BASE
Encroachment: No

Survey data only

Station(ft)	Elevation(ft)	Manning's N
0.000	19.250	0.050000
31.970	17.700	0.050000
55.670	11.220	0.050000
66.570	4.340	0.050000
69.280	5.170	0.050000
74.860	5.090	0.050000
77.430	7.510	0.050000
101.430	17.280	0.050000
111.100	16.850	0.050000

Name: Channel-06 US Group: BASE
Encroachment: No

LiDAR only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.170	0.060000
3.000	17.120	0.060000
5.990	17.050	0.060000
8.990	16.980	0.060000
11.990	16.880	0.060000
14.980	16.760	0.060000
17.980	16.710	0.060000
20.980	16.680	0.060000
23.970	16.670	0.060000
26.970	16.720	0.060000
29.960	16.800	0.060000
32.960	16.770	0.060000

35.960	16.770	0.060000
38.950	16.730	0.060000
41.950	16.700	0.060000
44.950	16.630	0.060000
47.940	16.570	0.060000
50.940	16.600	0.060000
53.940	16.500	0.060000
56.930	16.490	0.060000
59.930	16.450	0.060000
62.930	16.390	0.060000
65.920	16.290	0.060000
68.920	16.190	0.060000
71.920	16.140	0.060000
74.910	16.090	0.060000
77.910	15.990	0.060000
80.910	15.890	0.060000
83.900	15.810	0.060000
86.900	15.700	0.060000
89.890	15.610	0.060000
92.890	15.550	0.060000
95.890	15.480	0.060000
98.880	15.370	0.060000
101.880	15.280	0.060000
104.880	15.210	0.060000
107.870	15.100	0.060000
110.870	15.000	0.060000
113.870	14.930	0.060000
116.860	14.930	0.060000
119.860	14.860	0.050000
122.860	14.560	0.050000
125.850	14.160	0.050000
128.850	13.680	0.050000
131.850	13.140	0.050000
134.840	12.510	0.050000
137.840	11.790	0.050000
140.840	11.100	0.050000
143.830	10.480	0.050000
146.830	9.780	0.050000
149.820	8.930	0.050000
152.820	8.160	0.050000
155.820	7.520	0.050000
158.810	6.970	0.050000
161.810	6.600	0.050000
164.810	6.620	0.050000
167.800	6.770	0.050000
170.800	6.810	0.050000
173.800	6.700	0.050000
176.790	6.600	0.050000
179.790	6.500	0.050000
182.790	6.460	0.050000
185.780	6.480	0.050000
188.780	6.500	0.050000
191.780	6.510	0.050000
194.770	6.530	0.050000
197.770	6.550	0.050000
200.760	6.710	0.050000
203.760	6.950	0.050000
206.760	7.160	0.050000
209.750	7.360	0.050000
212.750	7.560	0.050000
215.750	7.760	0.050000
218.740	7.960	0.050000
221.740	8.140	0.050000
224.740	8.280	0.050000
227.730	8.480	0.050000
230.730	8.730	0.050000
233.730	8.980	0.050000
236.720	9.250	0.050000
239.720	9.610	0.050000
242.720	9.770	0.050000
245.710	9.730	0.060000
248.710	9.400	0.060000
251.710	9.030	0.060000
254.700	9.100	0.060000
257.700	9.300	0.060000
260.690	9.520	0.060000
263.690	9.770	0.060000
266.690	10.040	0.060000
269.680	10.210	0.060000
272.680	10.310	0.060000
275.680	10.430	0.060000
278.670	10.530	0.060000
281.670	10.720	0.060000
284.670	11.020	0.060000
287.660	11.330	0.060000
290.660	11.630	0.060000
293.660	11.930	0.060000

296.650	12.160	0.060000
299.650	12.420	0.060000
302.650	12.670	0.060000
305.640	12.760	0.060000
308.640	12.790	0.060000
311.640	12.810	0.060000
314.630	12.990	0.060000
317.630	13.250	0.060000
320.620	13.490	0.060000
323.620	13.520	0.060000
326.620	13.520	0.060000
329.610	13.610	0.060000
332.610	13.710	0.060000
335.610	13.990	0.060000
338.600	14.260	0.060000
341.600	14.360	0.060000
344.600	14.460	0.060000
347.590	14.600	0.060000
350.590	14.590	0.060000
353.590	14.640	0.060000
356.580	14.650	0.060000
359.580	14.730	0.060000
362.580	14.910	0.060000

Name: Channel-07 US Group: BASE
Encroachment: No

LiDAR only

Station(ft)	Elevation(ft)	Manning's N
0.000	18.680	0.050000
3.000	18.670	0.050000
5.990	18.680	0.050000
8.990	18.690	0.050000
11.990	18.660	0.050000
14.980	18.630	0.050000
17.980	18.650	0.050000
20.980	18.650	0.050000
23.970	18.560	0.040000
26.970	17.700	0.040000
29.970	16.300	0.040000
32.960	14.630	0.040000
35.960	12.910	0.040000
38.960	11.420	0.040000
41.960	9.870	0.040000
44.950	8.510	0.040000
47.950	8.120	0.040000
50.950	8.110	0.040000
53.940	8.280	0.040000
56.940	8.310	0.040000
59.940	8.460	0.040000
62.930	8.860	0.040000
65.930	9.380	0.040000
68.930	9.920	0.040000
71.920	10.410	0.040000
74.920	10.830	0.040000
77.920	11.190	0.040000
80.910	11.550	0.040000
83.910	11.900	0.040000
86.910	12.170	0.040000
89.900	12.340	0.040000
92.900	12.450	0.060000
95.900	12.510	0.060000
98.890	12.550	0.060000
101.890	12.630	0.060000
104.890	12.710	0.060000
107.880	12.770	0.060000
110.880	12.840	0.060000
113.880	12.950	0.060000
116.870	13.060	0.060000
119.870	13.100	0.060000
122.870	12.960	0.060000
125.870	12.640	0.060000
128.860	12.440	0.060000
131.860	12.390	0.060000
134.860	12.400	0.060000
137.850	12.450	0.060000
140.850	12.520	0.060000
143.850	12.490	0.060000
146.840	12.430	0.060000
149.840	12.460	0.060000
152.840	12.280	0.060000
155.830	12.110	0.060000
158.830	11.920	0.060000
161.830	11.830	0.060000

164.820	11.730	0.060000
167.820	11.630	0.060000
170.820	11.580	0.060000
173.810	11.390	0.060000
176.810	11.250	0.060000
179.810	11.210	0.060000
182.800	11.170	0.060000
185.800	11.140	0.060000
188.800	11.130	0.060000
191.790	11.190	0.060000
194.790	11.290	0.060000
197.790	11.310	0.060000
200.780	11.110	0.060000
203.780	10.760	0.060000
206.780	10.580	0.060000
209.780	10.580	0.060000
212.770	10.620	0.060000
215.770	10.660	0.060000
218.770	10.630	0.060000
221.760	10.760	0.060000
224.760	10.830	0.060000
227.760	11.000	0.060000
230.750	11.010	0.060000
233.750	10.900	0.060000
236.750	10.860	0.060000
239.740	10.890	0.060000
242.740	11.080	0.060000
245.740	11.260	0.060000
248.730	11.230	0.060000
251.730	11.350	0.060000
254.730	11.560	0.060000
257.720	11.620	0.060000
260.720	11.590	0.060000
263.720	11.440	0.060000
266.710	11.390	0.060000
269.710	11.580	0.060000
272.710	11.740	0.060000
275.700	11.810	0.060000
278.700	11.770	0.060000
281.700	11.610	0.060000
284.690	11.650	0.060000
287.690	11.820	0.060000
290.690	12.070	0.060000
293.690	12.240	0.060000
296.680	12.290	0.060000
299.680	12.350	0.060000
302.680	12.430	0.060000
305.670	12.510	0.060000
308.670	12.580	0.060000
311.670	12.570	0.060000
314.660	12.620	0.060000
317.660	12.660	0.060000
320.660	12.720	0.060000
323.650	12.760	0.060000
326.650	12.820	0.060000
329.650	12.850	0.060000
332.640	12.880	0.060000
335.640	12.890	0.060000
338.640	12.870	0.060000
341.630	12.870	0.060000
344.630	12.860	0.060000
347.630	12.930	0.060000
350.620	13.020	0.060000
353.620	13.160	0.060000
356.620	13.190	0.060000
359.610	13.260	0.060000
362.610	13.320	0.060000
365.610	13.350	0.060000
368.600	13.380	0.060000
371.600	13.430	0.060000
374.600	13.500	0.060000
377.600	13.570	0.060000
380.590	13.680	0.060000
383.590	13.740	0.060000
386.590	13.770	0.060000
389.580	13.840	0.060000
392.580	13.880	0.060000
395.580	13.920	0.060000
398.570	13.940	0.060000
401.570	13.970	0.060000
404.570	14.000	0.060000
407.560	14.050	0.060000
410.560	14.080	0.060000
413.560	14.160	0.060000
416.550	14.180	0.060000
419.550	14.240	0.060000
422.550	14.340	0.060000

425.540	14.430	0.060000
428.540	14.520	0.060000
431.540	14.630	0.060000
434.530	14.720	0.060000
437.530	14.800	0.060000
440.530	14.880	0.060000

Name: Channel-08A US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	17.040	0.030000
3.000	17.110	0.030000
5.990	17.090	0.030000
8.990	17.060	0.030000
11.980	17.020	0.030000
14.980	17.010	0.030000
17.970	17.050	0.030000
20.970	17.020	0.030000
23.970	17.020	0.030000
26.960	17.040	0.030000
29.960	17.060	0.030000
32.950	17.060	0.030000
35.950	17.060	0.030000
38.940	17.030	0.030000
41.940	17.050	0.030000
44.940	16.990	0.030000
47.930	16.950	0.030000
50.930	16.900	0.030000
53.920	16.850	0.030000
67.420	17.160	0.030000
103.460	12.000	0.030000
112.670	5.440	0.035000
116.270	5.300	0.035000
120.060	5.530	0.035000
124.730	8.490	0.035000
133.240	8.320	0.035000
141.600	13.410	0.035000
143.760	13.670	0.035000
151.070	10.140	0.060000
157.920	11.200	0.060000
158.770	10.940	0.060000
161.770	10.940	0.060000
164.770	11.110	0.060000
167.760	11.270	0.060000
170.760	11.460	0.060000
173.750	11.570	0.060000
176.750	11.690	0.060000
179.740	11.810	0.060000
182.740	11.900	0.060000
185.740	12.000	0.060000
188.730	12.020	0.060000
191.730	12.070	0.060000
194.720	12.150	0.060000
197.720	12.190	0.060000
200.710	12.170	0.060000
203.710	12.130	0.060000
206.710	12.100	0.060000
209.700	12.120	0.060000
212.700	12.150	0.060000
215.690	12.230	0.060000
218.690	12.450	0.060000
221.680	12.600	0.060000
224.680	12.630	0.060000
227.680	12.740	0.060000
230.670	12.730	0.060000
233.670	12.650	0.060000
236.660	12.640	0.060000
239.660	12.610	0.060000
242.650	12.620	0.060000
245.650	12.650	0.060000
248.650	12.670	0.060000
251.640	12.610	0.060000
254.640	12.530	0.060000
257.630	12.520	0.060000
260.630	12.490	0.060000
263.620	12.420	0.060000
266.620	12.440	0.060000
269.620	12.490	0.060000
272.610	12.510	0.060000
275.610	12.510	0.060000
278.600	12.500	0.060000
281.600	12.520	0.060000

284.590	12.570	0.060000
287.590	12.610	0.060000
290.590	12.590	0.060000
293.580	12.460	0.060000
296.580	12.320	0.060000
299.570	12.280	0.060000
302.570	12.290	0.060000
305.560	12.350	0.060000
308.560	12.420	0.060000
311.560	12.420	0.060000
314.550	12.390	0.060000
317.550	12.420	0.060000
320.540	12.440	0.060000
323.540	12.450	0.060000
326.530	12.440	0.060000
329.530	12.370	0.060000
332.530	12.230	0.060000
335.520	12.080	0.060000
338.520	11.960	0.060000
341.510	11.970	0.060000
344.510	12.040	0.060000
347.500	11.970	0.060000
350.500	11.900	0.060000
353.500	11.910	0.060000
356.490	11.970	0.060000
359.490	12.090	0.060000
362.480	12.140	0.060000
365.480	12.160	0.060000
368.470	12.190	0.060000
371.470	12.240	0.060000
374.470	12.270	0.060000
377.460	12.320	0.060000
380.460	12.450	0.060000
383.450	12.720	0.060000
386.450	12.900	0.060000
389.440	13.080	0.060000
392.440	13.320	0.060000
395.440	13.560	0.060000
398.430	13.670	0.060000
401.430	13.780	0.060000
404.420	13.920	0.060000
407.420	14.080	0.060000
410.410	14.330	0.060000
413.410	14.590	0.060000
416.410	14.770	0.060000
419.400	14.920	0.060000
422.400	15.100	0.060000
425.390	15.270	0.060000
428.390	15.340	0.060000
431.390	15.400	0.060000
434.380	15.450	0.060000
437.380	15.510	0.060000
440.370	15.570	0.060000
443.370	15.630	0.060000
446.360	15.680	0.060000
449.360	15.740	0.060000
452.360	15.800	0.060000
455.350	15.850	0.060000
458.350	15.910	0.060000
461.340	15.970	0.060000
464.340	16.030	0.060000
467.330	16.080	0.060000

Name: Channel-08B US Group: BASE
Encroachment: No

LiDAR only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.540	0.030000
2.990	17.610	0.030000
5.990	17.640	0.030000
8.980	17.650	0.030000
11.980	17.690	0.030000
14.970	17.710	0.030000
17.970	17.730	0.030000
20.960	17.710	0.030000
23.960	17.700	0.030000
26.950	17.700	0.030000
29.940	17.690	0.030000
32.940	17.620	0.030000
35.930	17.500	0.030000
38.930	17.350	0.030000
41.920	17.200	0.030000
44.920	16.950	0.030000

47.910	16.550	0.030000
50.900	16.170	0.030000
53.900	15.760	0.030000
56.890	15.560	0.030000
59.890	15.450	0.030000
62.880	15.440	0.030000
65.880	15.520	0.030000
68.870	15.610	0.030000
71.870	15.630	0.030000
74.860	15.510	0.030000
77.850	15.260	0.030000
80.850	15.100	0.030000
83.840	15.150	0.035000
86.840	14.700	0.035000
89.830	13.480	0.035000
92.830	11.790	0.035000
95.820	10.340	0.035000
98.820	8.930	0.035000
101.810	8.220	0.035000
104.800	8.560	0.035000
107.800	9.140	0.035000
110.790	9.620	0.035000
113.790	10.010	0.035000
116.780	10.600	0.035000
119.780	11.150	0.035000
122.770	11.890	0.035000
125.760	12.850	0.035000
128.760	13.770	0.035000
131.750	14.580	0.035000
134.750	14.800	0.035000
137.740	14.730	0.060000
140.740	14.510	0.060000
143.730	14.300	0.060000
146.730	14.040	0.060000
149.720	13.640	0.060000
320.400	14.570	0.060000
323.390	14.890	0.060000
326.390	14.950	0.060000
329.380	14.880	0.060000
332.380	14.820	0.060000
335.370	14.890	0.060000
338.370	15.010	0.060000
341.360	15.150	0.060000
344.360	15.240	0.060000
347.350	15.210	0.060000
350.340	15.190	0.060000
353.340	15.320	0.060000
356.330	15.470	0.060000
359.330	15.570	0.060000
362.320	15.700	0.060000
365.320	15.780	0.060000
368.310	15.820	0.060000
371.310	15.900	0.060000
374.300	16.000	0.060000
377.290	16.040	0.060000
380.290	16.070	0.060000
383.280	16.140	0.060000
386.280	16.250	0.060000
389.270	16.360	0.060000
392.270	16.470	0.060000
395.260	16.550	0.060000
398.250	16.690	0.060000
401.250	16.760	0.060000
404.240	16.850	0.060000
407.240	17.010	0.060000

Name: Channel-09A US Group: BASE
Encroachment: No

LiDAR only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.780	0.060000
2.970	17.830	0.060000
5.950	17.810	0.060000
8.920	17.750	0.060000
11.890	17.670	0.060000
14.860	17.570	0.060000
17.840	17.570	0.060000
20.810	17.700	0.060000
23.780	17.870	0.060000
26.750	17.790	0.060000
29.730	17.660	0.060000
32.700	17.530	0.060000

35.670	17.450	0.060000
38.640	17.420	0.060000
41.620	17.460	0.060000
44.590	17.580	0.060000
47.560	17.790	0.060000
50.530	17.910	0.060000
53.510	17.970	0.060000
56.480	17.840	0.060000
59.450	17.560	0.060000
62.420	17.580	0.050000
65.400	17.480	0.050000
68.370	16.920	0.050000
71.340	15.520	0.050000
74.310	13.570	0.050000
77.290	11.620	0.035000
80.260	10.170	0.035000
83.230	9.580	0.035000
86.200	9.480	0.035000
89.180	9.710	0.035000
92.150	10.190	0.035000
95.120	10.670	0.035000
98.090	11.180	0.035000
101.070	12.020	0.035000
104.040	13.420	0.050000
107.010	14.680	0.050000
109.980	15.320	0.050000
112.960	16.360	0.050000
115.930	17.130	0.050000
118.900	17.160	0.060000
121.880	17.120	0.060000
124.850	17.230	0.060000
127.820	17.360	0.060000
130.790	17.540	0.060000
133.770	17.640	0.060000
136.740	17.680	0.060000
139.710	17.730	0.060000
142.680	17.770	0.060000
145.660	17.770	0.060000
148.630	17.750	0.060000
151.600	17.730	0.060000
154.570	17.730	0.060000
157.550	17.700	0.060000
160.520	17.690	0.060000
163.490	17.630	0.060000
166.460	17.590	0.060000
169.440	17.570	0.060000
172.410	17.540	0.060000
175.380	17.510	0.060000
178.350	17.530	0.060000
181.330	17.570	0.060000
184.300	17.590	0.060000

Name: Channel-09B US Group: BASE
Encroachment: No

Survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	18.200	0.060000
11.000	17.250	0.060000
83.900	17.320	0.060000
96.440	17.840	0.060000
106.500	6.450	0.035000
114.930	7.050	0.035000
121.620	6.010	0.035000
123.600	8.170	0.035000
137.310	18.820	0.035000
137.310	18.820	0.060000
170.360	19.000	0.060000
197.210	19.470	0.060000

Name: Channel-10 US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	18.680	0.060000
42.390	17.280	0.060000
47.490	17.290	0.060000
61.710	17.090	0.060000
67.110	14.390	0.035000
72.650	11.610	0.035000

77.200	7.750	0.035000
82.640	7.310	0.035000
86.910	7.610	0.035000
87.590	8.600	0.035000
91.520	9.320	0.035000
91.520	9.320	0.035000
97.080	12.560	0.035000
102.270	16.720	0.035000
121.540	17.110	0.060000
124.500	16.970	0.060000
127.470	16.900	0.060000
130.430	16.970	0.060000
133.400	17.000	0.060000
136.360	16.950	0.060000
139.330	16.890	0.060000
142.290	16.850	0.060000
145.260	16.850	0.060000
148.220	16.890	0.060000
151.180	16.910	0.060000
154.150	16.870	0.060000
157.110	16.810	0.060000
160.080	16.770	0.060000
163.040	16.710	0.060000
166.010	16.620	0.060000
168.970	16.520	0.060000
171.930	16.370	0.060000
174.900	16.200	0.060000
177.860	16.080	0.060000
180.830	15.920	0.060000
183.790	16.070	0.060000
186.760	16.150	0.060000
189.720	16.270	0.060000
192.690	16.530	0.060000
195.650	16.740	0.060000
198.610	16.920	0.060000
201.580	17.120	0.060000
204.540	17.320	0.060000
207.510	17.490	0.060000
210.470	17.500	0.060000
213.440	17.530	0.060000

Name: Channel-11 DS Group: BASE

Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
0.000	17.830	0.060000
58.480	17.320	0.060000
66.920	17.230	0.060000
81.810	16.640	0.060000
86.640	14.750	0.035000
91.180	10.330	0.035000
96.390	7.610	0.035000
100.990	6.730	0.035000
106.050	6.920	0.035000
111.750	9.490	0.035000
116.040	12.500	0.035000
119.640	15.700	0.035000
119.640	15.700	0.035000
122.060	16.660	0.035000
137.830	17.700	0.060000
140.830	17.590	0.060000
143.830	17.520	0.060000
146.820	17.450	0.060000
149.820	17.440	0.060000
152.810	17.460	0.060000
155.810	17.550	0.060000
158.810	17.610	0.060000
161.800	17.700	0.060000
164.800	17.780	0.060000
167.800	17.860	0.060000
170.790	17.940	0.060000
173.790	18.020	0.060000
176.790	18.100	0.060000
179.780	18.080	0.060000
182.780	18.040	0.060000
185.770	17.990	0.060000
188.770	17.960	0.060000
191.770	17.970	0.060000
194.760	17.980	0.060000
197.760	17.980	0.060000
200.760	18.050	0.060000
203.750	18.160	0.060000
206.750	18.180	0.060000

209.750	18.220	0.060000
212.740	18.310	0.060000
215.740	18.440	0.060000
218.740	18.450	0.060000

Name: Channel-11 US Group: BASE
Encroachment: No

Cross section derived from LiDAR data, wetted section supplemented by survey data

Station(ft)	Elevation(ft)	Manning's N
17.920	18.050	0.060000
71.130	16.230	0.060000
83.990	7.910	0.035000
86.910	6.880	0.035000
90.460	6.340	0.035000
95.840	9.700	0.035000
106.230	11.760	0.035000
114.910	17.160	0.035000
126.290	18.180	0.035000
164.310	18.290	0.060000

Name: Channel-12 US Group: BASE
Encroachment: No

Survey only

Station(ft)	Elevation(ft)	Manning's N
94.270	20.490	0.060000
127.540	20.270	0.060000
131.970	17.710	0.035000
138.550	14.150	0.035000
146.900	8.610	0.035000
156.650	7.800	0.035000
158.800	10.530	0.035000
171.390	11.690	0.035000
187.750	19.790	0.035000

Name: Channel-13 DS Group: BASE
Encroachment: No

Survey only

Station(ft)	Elevation(ft)	Manning's N
0.000	20.050	0.060000
37.990	20.440	0.060000
153.350	18.870	0.060000
169.310	8.800	0.035000
173.050	8.430	0.035000
176.000	10.200	0.035000
188.870	10.420	0.035000
197.030	15.640	0.035000
206.160	18.610	0.035000
214.100	20.230	0.035000

Name: Channel-13 US Group: BASE
Encroachment: No

Survey only

Station(ft)	Elevation(ft)	Manning's N
0.000	17.730	0.060000
95.550	17.550	0.060000
111.830	17.180	0.060000
119.040	11.580	0.035000
128.820	8.640	0.035000
134.230	8.390	0.035000
139.180	7.650	0.035000
151.890	18.280	0.035000
178.890	19.770	0.060000

Name: Channel-14 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N

0.000	17.210	0.060000
2.910	17.430	0.060000
5.820	17.660	0.060000
8.730	17.890	0.060000
11.640	18.070	0.060000
14.550	18.010	0.060000
17.460	17.720	0.060000
20.370	17.490	0.060000
23.290	16.780	0.060000
26.200	15.770	0.060000
29.110	14.660	0.035000
32.020	13.300	0.035000
34.930	11.970	0.035000
37.840	11.160	0.035000
40.750	10.740	0.035000
43.660	10.410	0.035000
46.570	10.050	0.035000
49.480	9.640	0.035000
52.390	9.400	0.035000
55.300	9.400	0.035000
58.210	9.680	0.035000
61.120	10.340	0.035000
64.030	11.350	0.035000
66.950	12.630	0.035000
69.860	13.880	0.035000
72.770	14.960	0.035000
75.680	15.800	0.060000
78.590	16.440	0.060000
81.500	16.970	0.060000
84.410	17.430	0.060000
87.320	17.640	0.060000
90.230	17.840	0.060000
93.140	18.030	0.060000

Name: Channel-14 US Group: BASE
Encroachment: No

Survey data only

Station(ft)	Elevation(ft)	Manning's N
20.890	17.980	0.060000
40.810	16.590	0.060000
57.970	8.690	0.035000
63.980	8.660	0.035000
69.850	8.610	0.035000
82.910	15.720	0.035000
94.610	16.940	0.060000

Name: Channel-15 DS Group: BASE
Encroachment: No

LiDAR data only

Station(ft)	Elevation(ft)	Manning's N
0.000	18.330	0.060000
2.970	18.230	0.060000
5.940	18.140	0.060000
8.910	18.010	0.060000
11.880	17.810	0.060000
14.850	17.730	0.060000
17.820	17.560	0.060000
20.790	17.420	0.060000
23.760	17.320	0.060000
26.720	17.200	0.060000
29.690	16.980	0.060000
32.660	16.650	0.060000
35.630	15.870	0.035000
38.600	14.860	0.035000
41.570	13.820	0.035000
44.540	12.830	0.035000
47.510	11.850	0.035000
50.480	10.900	0.035000
53.450	10.210	0.035000
56.420	10.430	0.035000
59.390	11.350	0.035000
62.360	12.850	0.035000
65.330	14.750	0.035000
68.300	16.390	0.035000
71.270	17.330	0.060000
74.230	17.680	0.060000
77.200	17.870	0.060000

THE STATE OF SOUTH CAROLINA
IN THE COURT OF APPEALS

APPEAL FROM HORRY COUNTY
Court of Common Pleas

RECEIVED
APR 24 2020
SC Court of Appeals

The Honorable Benjamin H. Culbertson, Circuit Court Judge

CASE NO. 2016-CP-26-06495

Cornell Patton, Melissa Patton, Chad Webb and Amy Webb..... Appellants

vs.

Prestwick Land Limited Partnership; Prestwick Homeowners Association, Inc.; Jackson Companies; City of Myrtle Beach; South Carolina Department of Transportation; Horry County; Myrtle Beach Air Force Base Redevelopment Authority; Nelson L. Hardwick & Associates, Inc.; Bermuda Gardens Homeowners' Association d/b/a Homeowners of Ocean Walk Property Owners Association; Campgrounds, Inc.; and Prestwick Property Owners Association, Inc., Defendants

OF WHICH:
Prestwick Land Limited Partnership, Jackson Companies and
Campgrounds, Inc. are ..... Respondents

City of Myrtle Beach, Third-Party Plaintiff,

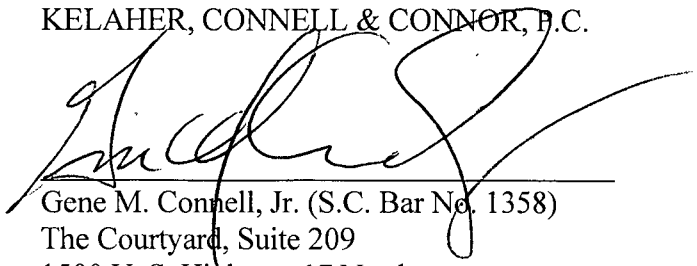
vs.

Phil Eaves and Elizabeth Eaves, Third-Party Defendants,
Counterclaimants, Cross-Claimants..... Appellants

CERTIFICATE OF COUNSEL

The undersigned hereby certifies that this Record on Appeal contains all materials proposed to be included by any of the parties and not any other material.

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April 3, 2020