TOWN OF PALM BEACH

Office of the Town Clerk

REPORT OF THE SHORE PROTECTION BOARD MEETING HELD ON 2/15/96

I. CALL TO ORDER: A meeting of the Shore Protection Board of the Town of Palm Beach was called to order by the Chairman, Garrison D. Lickle, at 9:00 AM on February 15, 1996, in the Town Hall Council Chambers.

II. ROLL CALL: On roll call, the following members of the Board were found to be present: Chairman Lickle, Vice Chairman George M. Moffett, II, and Board members: Eileen C. Curran, Edward Hennessy, Jr., Charles C. Isiminger, Wayne F. Dimm, Gerald H. Levy, Joel Martino, Richard Raffo and Judy Schrafft. Staff members attending the meeting were: Town Manager Doney, Assistant Town Manager Elwell, Town Clerk Pollitt, and Town Attorney Randolph.

III. APPROVAL OF AGENDA: The agenda was approved with two changes. Mr. Lickle stated that there would be two reports by Mr. Isiminger instead of one. Also, Mr. Doney directed the Board's attention to item number four. He said the Report of the January 11, 1996, meeting is not ready for distribution at this time, but that report, as well as the one from today's meeting should be ready by the next Board meeting.

IV. CONSIDERATION OF REPORT OF THE SHORE PROTECTION BOARD MEETING ON JANUARY 11, 1996. Will be presented at the next Board meeting.

V. TOWN ATTORNEY'S REPORT REGARDING THE FEDERAL OBLIGATION TO MITIGATE DOWNDRIFT IMPACTS OF LAKE WORTH INLET. (Deferred from Meeting on January 11 19096)

Mr. Lickle stated that Attorney Randolph was running late and he asked if the Board could be updated on the sand transfer plant while waiting for Mr. Randolph.

Mr. Dusey said the contractor, Counties Corporation, has reported to the Town Council that they are unable to do the required work because the seismic report indicated that the rock shales down to minus 45 feet which was causing his string line to break. It was later determined that the rock was only a minus 12 feet from the top of the jetty, and two days ago the contractor agreed to return to the

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job. Mr. Dusey stated that in his opinion there is nothing to prevent the contractor from completing the work satisfactorily, and he has varied his procedures hoping the work will be completed by the end of March.

Mr. Dusey stated that the Corps of Engineers will probably start their maintenance dredging of the Inlet the first or second week of March, and that will take approximately one month. He said the Town may contract with the Corps contractor to take some sand from the Town's borrow site and place it in the Corps disposal site, which is the first 3,000 feet south of the south jetty. Hopefully this will make up for some sand which the Town has not gotten from the Sand Transfer Plant. Mr. Dusey explained that if you have a permitted borrow and a permitted site, it should not be difficult to put them together even though they were separate at the beginning. He said they are also exploring the possibility of acquiring permits which will allow the placing of new pipes at the bottom of the Inlet, particularly in the existing channels which were cut out for the old pipe.

The question was raised as to why the Town does not consider a temporary fix with a dredge pipe which would go across the inlet or around the front of the Inlet to implement the operation of the transfer plant. Mr. Dusey explained that a temporary fix requires a State permit which takes two or three months for approval.

Mr. Raffo stated that there has been pipe over the jetty for years, and he questioned if another permit was required to go over the jetty again. Mr. Dusey answered affirmatively. He said they may not need a permit to go over the jetty, but that would not be beneficial.

Mr. Raffo said he was told that the people doing the work are under the Inlet now and up to the jetty. Mr. Dusey said that was the directional bore which has failed three times because the pipe broke. He explained that they were talking about a pipe which will go over the north jetty, down the side, underneath on the bottom, and these trenches are already cut there and come up the other side that also requires a State permit.

Mr. Moffitt asked what happened to the engineering of this project, in which it appeared that there would be a lot of finger pointing between Engineers and Coastal. Mr. Dusey explained that he felt the engineering was sound, but the contractor has had some difficulty in performing the work. He said the work which was done the previous week confirmed that the engineer's original directions were fine, but the contractor is having difficulty executing them. Mr. Moffett asked if the engineer is Dames & Moore, and the contractor is Counties Corporation. Mr. Dusey replied that was correct.

Mr. Doney said there was some concern that Counties Corporation would just forfeit their bond and not go ahead with the operation, and that would necessitate finding another contractor. Mr. Doney said Counties Corp. is a good company and had been prequalified to do the job, and they are as puzzled as anyone about the failures.

Mr. Martino mentioned that after a storm a few years ago the State issued temporary permits which were obtained within 24 hours, and he wondered if this situation may be considered an emergency, and the Town could be issued an emergency permit. Mr. Dusey said he wasn't sure about that, but the Town Council is meeting in special session on Tuesday and will discuss contingency plans.

Mr. Isiminger explained that there is a specific set of criteria which determines whether or not you may qualify for an emergency permit, and it may be possible for the Town to meet that criteria. Mr. Isiminger said if the contractor is using the welded poly pipe it may be possible to use the same pipe for the buried pipe depending on how long it was in place, and how much it was buried in the Inlet. He said emergency permitting is a definite possibility.

Mrs. Schrafft asked why did the Town go with a new system of pipe embedded under the inlet, and she wondered what was wrong with the old system.

Mr. Dusey said that a number of things had been considered at the time. He said the biggest consideration was the permitting process itself.

Mrs. Schrafft inquired if it was possible to go back to the original system. Mr. Dusey said that was a possibility. He explained that there are a number of things being considered, one of which is the requirement of permitting to be able to lay pipes back in the Inlet, but the directional bore did not require permitting. He said they are down to about 60 or 70 feet now. Mr. Dusey explained that the original pipe was damaged by dredging in the Inlet, and there is always that potential. He said a better solution is to actually get under the Inlet where they don't have to worry about those things.

Mr. Martino wondered about the delay of the dredging by the Corps of Engineers which was supposed to begin in January. He said it then was due to begin in February and now it's due to begin in March. Mr. Martino asked if there was a conflict between getting the Sand Transfer Plant working and putting sand from the Inlet on the beach? Mr. Dusey said he did not think so.

Mr. Lickle asked if the fourth bore fails, why is the Town not proceeding, parallel to the project of applying for the right to place a pipe on the bottom of the Inlet? Mr. Dusey replied they are doing that. Mr. Doney explained that the Town is proceeding with emergency permitting also.

Mr. McLendon stated, if it is assumed that the contractor will fail again then a lot of what has been discussed makes sense. He said he is assuming that the contractor will not fail, and that should be the posture taken by everyone involved. Mr. McLendon said he thought it may be difficult to prove an emergency if there has been no sand transferred in the last five years. He said there are problems which need practicality. Mr. McLendon said it had been discussed with Mr. Dusey, the possibility of getting permits to be able to get additional

dredge material onto the beach from offshore as a possible quick fix for the beach. He said if this is a possibility his first choice would be to take sand from north of the Inlet which is part of the Inlet Management's recommendations for the future, but he said it was his understanding that this is almost impossible to do on a short term basis. Mr. McLendon said he felt the best decision is to go for expansion of the borrow pit as a source of sand, and if that is the decision he would like to be able to go ahead with it. He said he would like to give the contractor at least one more chance because that is the quickest and most cost effective way to proceed with the renourishment.

Mr. Dusey was questioned about where most of the sand will be coming from. Mr. Dusey replied that most of it would be from the mouth of the Inlet. He said there was a storm recently which probably moved some sand into the Inlet which is estimated to be 80,000 to 90,000 cubic yard range. Mr. Dusey explained that a northeast storm can move 50,000 cubic yards of sand into the Inlet in a couple of days.

Mr. Lickle stated that Mr. Randolph had arrived and they would now go back to agenda item number five.

Mr. Randolph referred to Stumpy Harris, formally known as Gordon Harris, and stated that Mr. Harris has provided him with a complete copy of his file regarding the Applegate case. Mr. Randolph said he would like to share a portion of that file with the members of the Board.

Mr. Randolph stated that the Applegate case was filed in 1992, and has been pending for more than four years and is still in its initial stages. He said there were still motions pending for summary judgement, and to dismiss, so it seems like the case is a long way from completion. Mr. Randolph reported that this is a lawsuit filed by the property owners to the south of the Canaveral Inlet, and a great deal of money has been expended on this case. Mr. Randolph said this case is a complaint for inverse condemnation.

Mr. Randolph informed the members of the Board that he would note the main points of the suit. He said on page 2, it is indicated that the taking commenced in 1950 when the Corps began the construction of the Canaveral harbor project in Brevard County, and has continued since. Mr. Randolph pointed out to the Board that this is a takings claim based on the fifth amendment.

Mr. Randolph said the facts in the case dealt with a 41 mile stretch of beach which, according to the complaint, prior to the digging of the inlet had continued to accrete as much as three feet of sand per year. Their claims are similar to claims which the Town would have, in that the dredging of the inlet interrupted the southerly flow of sand, or what is called the river of sand. Mr. Randolph stated that the Applegate suit claim has combined with their complaint, that precluding the drift of the sand to the south has caused threatened and endangered species to be jeopardized. Mr.

Randolph said that on page 6, paragraph 12 the suit claims that the erosion and flooding was foreseeable by the Corps, and that the Corps should be responsible for the loss of sand.

Mr. Randolph pointed to paragraph 13, page 6, where the indication is that the dredging project has trapped in excess of 68 million dollars worth of sand. He said those are the kinds of damages which the property owners are seeking in this suit. Mr. Randolph said the next point is on page 9, which relates to reliance. He said in that claim it indicates that in 1967 in recognition of its duty to protect and renourish the beaches, the Corps presented a plan to rebuild the beaches, and the remainder of the count goes on to say that, even though the Corps presented a plan in that particular case, the plan has not been completed, and they still do not have a sand transfer plan to take care of their problem. He stated that page 11 of his handout calls for construction of a sand transfer plant to be operated by the Corps to rectify the damage caused by the Corps, and also asked for damages in excess of $100,000,000 dollars.

Mr. Randolph said that initially this complaint was dismissed on the basis that there was no jurisdiction, that the statute of limitations had passed, and the people should have filed their suit when they first noticed the problem. He said that ruling was appealed and the court of claims threw out the lower courts opinion with regard to the jurisdictional matter, and said the people did have a cause of action because this is a continuing problem. Mr. Randolph explained that the problem is not one that happened, and then four years passed and they did not take their chance when it happened. He said it's happening every day, and because the taking of sand is continuing every day, therefore there is a cause for action. Mr. Randolph said that was considered to be a big victory at the beginning of the case because it kept them in court.

Mr. Randolph said they are still in court. There is a motion for summary judgement pending on one of the claims, and also a motion by the Federal government to dismiss several of the plaintiffs. Mr. Randolph stated that the details of the case are not important to the Town at this time, because there are differences in the two situations, not necessarily what is happening to the shore line, but what the Corps is doing here as opposed to what they are doing in the Canaveral Inlet.

Mr. Randolph referred to a letter dated January 1996 which was signed by several Senators and Congressmen such as Connie Mack, Bob Graham, Mark Foley, Alcee Hastings and others who have written to the Corps to express their concern for the Canaveral harbor inlet. Mr. Randolph called the attention of the Board to the beginning of the second paragraph on page one where it says "It has been brought to our attention that the Corps knew in 1966 that continued interception of southward littoral drift at the Canaveral harbor entrance and subsequent loss of that material to the south beach would result in a loss of about 475 acres of land during the project life of approximately 50 years."

Mr. Randolph said that the tenor of the letter is: "you knew about it when you began the project, you even stated it in your publications, yet you haven't done anything to rectify the problem." He said basically what the letter is urging is that the Corps stop their planning and get on with what they need to do to rectify the problem.

Mr. Lickle asked Mr. Randolph if this action as an inverse condemnation is the same action which would be brought under a Chapter 111, or is this a different theory than the damage issue under 111? Mr. Randolph said it is a different theory. Mr. Lickle asked has there ever been an attempt or success in claiming damages under 111? Mr. Randolph replied he hasn't specifically pursued that theory. He said he was unaware that the Board had gotten to the point where they had narrowed things down to the type of action that they would be looking for.

Mr. Lickle stated he would be interested in pursuing information as to whether Chapter 111 would be inappropriate, and if so, for what reason? Mr. Lickle said it was his understanding that the Town of Palm Beach was instrumental in putting that provision in the legislature to specifically allow for damage actions against the Corps in the event that something such as the Canaveral Inlet occurs. He said he would like to know whether or not 111 is a possible rescue vehicle for the Town's problem. Mr. Randolph said he had not investigated that possibility, but would be happy to do so.

Mr. Doney said that from the Staff's perspective and others, there have been a number of efforts to have the Federal Legislators assist the Town in pursuing the Section 111 matter. He explained that this particular document which is being distributed to the Board was prepared in 1994 to identify chronologically the many efforts, and actions to try to continue to get the Corps to fund responsibility under Section 111. He said the Section 111 study was superseded by the study called the Coast of Florida Study which is still not done and no word when it will be done. Also, there have been other delays by the Corps.

Mr. Doney stated that Congressman Shaw was aware of the Town's ongoing efforts. He also stated that if the Town decides to go forward with the Section 111 issue on a legal basis it is anticipated that it will be very, very expensive and time consuming. Mr. Doney reported that the Town has tried to persuade the Corps to follow up on their acknowledged responsibility, but unfortunately the Town has not been successful in that respect.

VI. PRESENTATION BY DR. MICHAEL S. BRUNO, STEVENS INSTITUTE OF TECHNOLOGY.

Dr. Bruno said he would like to share with the Board some of his experiences, and also some of the information and knowledge which was gained in New Jersey, a lot of which is applicable, and appropriate to the State of Florida.

Dr. Bruno presented slides to the Board, and explained that the New Jersey State Center is part of Davidson Laboratory which is a research laboratory at Stevens Institute of Technology in Hoboken, New Jersey. He said the Center was formed in 1992 by the State of New Jersey to provide essentially free on call service to State, County and Local government officials on matters related to shore protection, such as after a storm the Center would be requested to make post storm surveys, reconnaissance reports and recommend courses of action.

Dr. Bruno stated that their laboratory was founded in 1935, primarily on the basis of sailboat design, and testing. He said they are perhaps the most famous laboratory in the world in the area of naval architecture. Dr. Bruno explained that in 1989 they became more focused on coastal engineering, and that includes water quality as well as beach erosion problems. He said they make use of some very large wave tank facilities for their tests.

Dr. Bruno said they have one wave basin which is 75 feet square with a wave maker, and is approximately 5 feet deep. He said their more significant facility is their long wave tank which is 320 feet long, 12 feet wide and 6 feet deep. Dr. Bruno stated that about six years ago they constructed one of the largest indoor beaches in the world with a computer controlled wave maker in the tank, and approximately 50 tons of sand. He said they are able to generate waves in the tank in excess of two feet. Dr. Bruno explained that they are using the indoor facility to test new technologies, and have tested approximately 2 dozen different technologies in the last five years.

Dr. Bruno said that during the December 1992 storm, there was major loss of sand and boardwalks. Consequently the state asked Davidson Laboratory to begin looking for alternate technologies to what had happened in the past, and that became the prime focus of their Center. Dr. Bruno said there was very little rational planning of shore protection projects. Retreat is not a viable option in the state of New Jersey as it is not here in Palm Beach. He said the states are going to have to put forth the money.

Dr. Bruno showed a slide of a sea wall near Seabright which, he reported now has a lot of sand in front of it. He said the seawall dates back to the early 1900's and protected the railroad. Dr. Bruno stated that the seawall began as a small timber bulkhead and was then fronted by stone, then replaced by stone, and with each storm it was rebuilt bigger, better and stronger. Dr. Bruno showed that during a storm there is erosion, and removal of sand to off shore areas, and if the sand has not been carried too far there will be gradual accretion.

He said if the storm is severe the sand that is washed off shore will not return to the beach. Dr. Bruno said if a structure is not properly designed, then there is no place to go, and there is no buffer or supply of sand to keep the accretion process going, and in fact erosion is accelerated because there is a reflection off the wall.

Dr. Bruno addressed the installing of groins and revetments. He said he has observed that the Town is installing groins as part of the beach fill process. He stated that groins are now emerging as an option to control beach erosion, but at one time "groin" was a bad word not just in Florida but everywhere. Dr. Bruno said that groins, in combination with beachfill will extend the life of the beach fill, but as the National Research Council report stated, if the project is not maintained, structures like groins become part of the problem instead of part of the solution. Dr. Bruno explained that putting in a groin field without beach fill, or putting a groin field and beach fill in without maintaining the beach will cause problems in the long run by accelerating downdrift erosion.

Dr. Bruno said another answer could be what is called low profile groins. That is where the high elevation does not continue all the way out to the end as with the traditional groin structure. He stated that the low profile groin begins to slope down toward the ocean floor at the beach fill templet. He said with this type of groin, if the fill sand becomes eroded there still is an off shore area around the groin where sand is allowed to pass, and that helps dissipate the current.

Dr. Bruno referred to dunes. He said there has been a rush to plant and construct dunes, but when no beach exists, sometimes the results are just piles of sand. Dr. Bruno said that dunes are nature's last line of defense, and they are only supposed to be in contact with water during extreme storms, and not with every astronomical tide.

Dr. Bruno stated there is another problem which is the littoral drift or the river of sand. He said that is a dangerous way of thinking about the erosion because the river of sand has its direction tied to the direction from which the waves approach. If the winds approach from the north, the sand will travel to the south, and along most of the east coast the dominant waves will come from the north direction so that over the long term the direction is to the south. Dr. Bruno said that two summers ago in New Jersey they had an extreme reversal in the long shore drift for a period from April to September where wave angles were reversed, and there was erosion where there had not been erosion for years. Dr. Bruno said long shore drift should not be thought of as something which is cast in stone and is not going to change. He said it sometimes changes from year to year.

Dr. Bruno advised that when considering a bypassing operation, one of the things which should be considered is a careful monitoring program of the area to the south of the inlet, and take a look at where the drift is and where the deposition should be going. The

outfall should be well south of the inlet to avoid any return flow which usually happens. He said the return flow is usually in the vicinity of the inlet adjacent to the jetty. Dr. Bruno explained that if the flow is to the south in that area you will often see a reversal to the north, and you want to get out of the way of that, but you also want to be monitoring the beach so you will be able to identify any areas where there may be localized direction changes, and that may call for a change in the deposition pattern.

Dr. Bruno referred to the Manasquan, N.J. Inlet. He stated that the inlet jetties were constructed in 1934-35, and within five years the coastline adjusted to about a two block disparity in width with tremendous erosion to the north, and a very large build up in the south. In about 1980 the Army Corps of Engineers, as a demonstration project, installed a new set of concrete armor units, and tightened up the Manasquan Inlet and that dramatically accelerated erosion. Dr. Bruno said there is a lot of talk about the Federal Government getting out of the beach business, but remaining in the navigation business because that is in the nation's interest. He said he sees a lot of disagreement in the future because the stabilization of the navigation inlet did a lot of harm to the beaches, and one cannot be done without consideration for the other.

The question was asked of Dr. Bruno as to whether or not the angle of the Manasquan inlet is natural or created? Dr. Bruno replied that the angle of the jetty pretty much conformed with what was then the position of the natural channel. He said at that time the channel was not safe for navigation. Dr. Bruno explained that after the 1980 rehabilitation of the jetties, they have had zero dredging in the channel.

Mr. Lickle asked Dr. Bruno if the angle of the inlet either exacerbated the problem or diminished it? In other words, if the angle were 45 degrees in the other direction would it accumulate less accretion on the south side? Dr. Bruno replied that the angle of an inlet has the most significant affect or impact on the updrift and down drift affects on the beach. He said that in a natural inlet there is what is called natural by passing where there is a development of a shoal on the outer end of the inlet, and essentially sand walks along the outer end of that shoal and continues down drift. Dr. Bruno stated that is what they believe happens in completely natural inlets, which is totally unsafe for boat traffic.

Mrs. Schrafft said that given the fact that the littoral drift is the same here as in New Jersey, obviously we would not need to compensate for what the angle of the inlet is doing as the sand here builds up on the north side of the inlet. Dr. Bruno stated that the process is exactly the same.

Mr. Isiminger said the intriguing thing about the angle of the inlet is, that on the east coast of Florida where there is a net southerly littoral drift, the natural inlets such as Jupiter Inlet ran in a southeast direction, and he stated it was his expectation that where there is a natural northerly drift the inlet would run in a

northeastern direction, but that is not the case here. Dr. Bruno said that was a very good point. He said if he were to design the inlet he would either make it straight out or scooted north.

Dr. Bruno explained that the best shore protection is a wide beach. He said if the beach is protected by vegetated dunes it will not be greatly impacted by the water.

Dr. Bruno discussed the Beachsaver Reef and the PEP Reef. He said that he and Professor Dean of the University of Florida, Department of Coastal and Oceanographic Engineering, have cooperated on a number of studies, because they recognize that there are similarities between Florida and the northeast shore. He said there is not that much similarity in the function of the reefs and the intention of the way they were to be applied. Dr. Bruno stated it was his understanding that the P.E.P. reef was designed to protect the reef by diminishing the wave energy. The Beachsaver reef which was designed and patterned by Breakwaters International was designed to be placed either during or after a beach fill. It was not designed to capture sand but to retain it, and that process is facilitated by the creation of a current behind the reef. Dr. Bruno explained the reef is a series of modules interlocked, going parallel to the beach and submerged six feet below the water surface. He said the waves rush over the top of the modules losing some of their energy which can be as much as twenty percent. Dr. Bruno explained that the major effect of the reef is the following wave advance. He said that is where the wave rushes upon the beach, and returns as an undertow which is intercepted at the reef, then deflected up through openings forming a jet of water. That process forms a curtain of water which slows the sands migration over the top of the reef. Dr. Bruno said they would not recommend placing reefs in a figuration which has an open end.

Dr. Bruno was asked about the cost of the reefs. He said he thought they were about $500.00 per foot. He stated that most of the cost of the reefs which were installed in New Jersey were paid by the State.

Mr. Lickle stated that in order to avoid confusing what appears to be solutions in New Jersey with the current situation in Florida, it is his understanding that they would not recommend to the State of Florida that additional work with the reef which is parallel to the shore would be installed without closure on the sides. He said he is assuming that recommendation would apply to areas where there is no littoral drift or supply of sand. He asked if that understanding was wrong, and if the Town has that situation here, would we need to have the north and south ends open in order to allow the sand to move through the reef?

Dr. Bruno said these problems are dealt with on a case by case basis. He said they have in excess of 400 groin structures along the coast of New Jersey. He said they wish the groins were not there, but they are more expensive to remove than they are to put in, so if you are looking for other opportunities than the groins then you may want to compartmentalize some of the groin structures which may not be

working as effectively as they should. He said they would not advocate the construction of a groin specifically to compartmentalize the reef right now.

Dr. Bruno said their approach to the erosion, and their advice to the State is; look at the source of the problem, which is usually an absence of sand supply. He said that very often the lack of sand supply is associated with an inlet. He said if you address the problem directly, you address it at the inlet by bypassing or something of that nature. Dr. Bruno said if you cannot do that then you would need to import sand in some other way.

Dr. Bruno stated that there are some areas where beach nourishment is not the answer. It is not the cure all for every situation, but when searching for technologies other than beach nourishment groins seem to be a viable technology. The beaches should be insulated from the erosive sources, in this case, the current. Dr. Bruno said there are some areas near inlets, natural and otherwise, where the currents are strong enough that beach nourishment would not work. He said the strong currents would draw out the sediment at an accelerated rate.

Mr. Dimm asked Dr. Bruno if he would advise the Town to investigate a hard solution to the erosion problem at the inlet? Dr. Bruno said that while they are in support of a hard structure in the inlet in Avalon, N.J., the Town's beach is better off. Dr. Bruno explained that the inlet channel in Avalon is so close to the beach that there is very severe erosion, and pumping sand is not the solution because that would need to be done every two or three years.

Mr. Lickle said that in the case of the Cape May solution of boxing where a hard barrier, i.e. the breakwater, is installed between the two groins. Mr. Lickle asked if that would be effective for a situation where there is no supply of sand. Dr. Bruno said that was correct.

Mr. Lickle said in the Town's situation where there is a supply of sand, it would be dangerous to compartmentalize, but he asked if the Town should consider renourishment of the sand supply, either from dredging or by sand bypassing and would a hard structure placed parallel to the shore be beneficial? Dr. Bruno said he felt that a hard structure is something that the Town should consider especially since beach renourishment is not easy in the Palm Beach area. He said there is not a readily available source of sand, and the sand is expensive. Also, there are the sea turtles. Dr. Bruno said it is important to extend the life of renourishment, so a combination of structures with the beach fill seems the way to go.

Dr. Bruno said the Miami area beaches do not have the erosion problem, so when those beaches are renourished the sand stays. He advised that the Town should be having someone take seasonal beach profiles, and create a data base so that in five years from now it will be easier to determine if the rate of erosion is small enough to warrant beach renourishment alone. Dr. Bruno said if that is not the

case then the Town would need to go to a structural option which will prolong the life of the nourished beach.

Mr. Lickle said this is reminiscent of the P.E.P. reef. He said the Town has just gone from a parallel structure which is similar to the Breakwaters' structure, but the Town has now removed the parallel structural barrier and turned them basically into underground groins. He asked Dr. Bruno how these two systems go together as far as a possible recommendation vs. what the Town's actual results were? He said the reef project was only monitored for two years, and some are of the opinion that the project was pulled out too soon or that it should have been done in conjunction with a renourishment project. Dr. Bruno said it is his opinion that it was a mistake to do the reef by itself because of the sand deficit.

Dr. Bruno said the Town needs to address the cause of the problem. He said the cause of the problem was not the absence of the reef, but the absence of sand coming into the system. Dr. Bruno said that nothing could be done at that time on a large enough scale with the Inlet even if there had been proper bypassing, there probably was not enough volume to provide the necessary width. He said once the beach has narrowed to a certain point where there is impact on structures which were not designed to withstand such impact, and the situation is very severely accelerated. Dr. Bruno stated that the first course of action should have been a nourishment project, and there probably was not the background data to try and forecast how long a nourishment project alone would last.

Dr. Bruno said that perhaps there was not a strong enough argument to proceed with the nourishment project, and it should be partnered with the reef. He said it was his understanding that there were two separate permitting tracks, and he wondered why the state adopted that because he thought they could have also looked at a third track and put the two together. Dr. Bruno said that looking at structures, not as trapping mechanisms, but as ways to prolong the life of the beach is the way to go.

Mr. Lickle said it seems that the most important aspect right now is continued sand supply, either sand transfer or renourishment. Dr. Bruno said that is the so called soft solution.

Mr. Dimm said the Town has never tried a reef connected to the Inlet. He said the Town's reef was free standing, and probably would have had very different results had it not been. Dr. Bruno said if there is a very eroded beach near an inlet, that would be an option because the influence of the inlet current can be moved away from the beach. He said the goal is to insulate the beach from the currents.

Mr. Lickle asked if a more proper description of the devices would be erosion mitigation devices? Dr. Bruno said in some cases that was correct. Dr. Bruno advised that anything which provides a shelter from waves will diminish the strength of the current along the shore and will cause a buildup of sand behind it.

Mrs. Curran asked if it was true that because the sand pump has not been operating, there is not enough sand in the system to prevent the erosion problem at Mid-Town from extending further southward? Dr. Bruno answered that given enough time the erosion problem will extend throughout the Town.

Mr. Raffo stated that the Carolinas are installing groins or jetties, and they have been very successful from inlet to inlet. He said we have that problem here in Palm Beach. We have two inlets, one here and one to the south of the Town. Mr. Raffo said the Town wants to retain the sand, and build the beach, and we have a sand transfer plant which has not operated in five years. Mr. Raffo asked if these systems have worked in other areas, can they work in the Town's situation?

Dr. Bruno said there is a bit of back peddling now on groins. Although a groin field will retain sand and extend the life of the beach, all parties must sign on to that fact which assumes that the beach will remain in its stable configuration. Dr. Bruno stated that if the erosion returns to the way it was two years ago, then the groins could become a problem.

Mr. Raffo asked what if the groins are all built the same, and the groins are already installed, then four or five years later the groins are extended because the beach has accrued. Dr. Bruno explained that was the danger. He said that when the Town's planners or engineers develop a plan which says that Palm Beach needs a specific amount of beach, they should stick to that plan, and the focus should be on keeping that beach.

Mr. Raffo said the Town's beaches are in very bad shape and something must be done now. Dr. Bruno said the Town is doing significant work now. Mr. Raffo said the Town has nine miles of beach and they are only working on one mile. Dr. Bruno stated that the groin field will provide stability not only at Mid-Town because that portion of the beach fill will serve as an anchor for the beach both north and south.

Mr. Lickle asked if groins were installed between Lake Worth Inlet and Boynton Inlet, and if there was a straight line north to south and those groins extended no more than that line, say 100 feet, and the compartments are filled with sand would the shore line be moved out 100 feet from inlet to inlet? Also, if the sand transfer plant pumped 80,000 cubic yards per year, the sand would migrate down. Also, he stated as long as those compartments remain filled, and no erosion takes place the beach should last. Dr. Bruno said that is correct. He said when examining the overall shape of the beach, inlet to inlet a pattern will develop in the off shore contours, and previous records may reveal the same pattern except it would be much further out in the ocean. He said the contours should not be abruptly changed in any one section.

Mr. Moffett said it has been estimated that it would take 180,000 to 200,000 cubic yards of sand per year net to keep the Town's beaches

provide that sand. He asked if the Town should be considering replacing all of the estimated sand needed? Dr. Bruno said those estimates are always subject to change by huge amounts, and the number will change from year to year. He said if more sand is used than is coming in there will be erosion north of the inlet, and that is why a carefully placed measuring program is needed because that will indicate the need for sand replacement. Dr. Bruno said that 200,000 cubic yards of sand is a significant amount, if that amount is required.

Mr. Moffett stated that in the past five years the Town has lost 80,000 cubic feet of sand per year, so that leaves a deficit of 400,000 cubic feet to begin with. Dr. Bruno said the initial obligation is to replace what sand has been lost over many years. He said erosion doesn't happen in one year and it is impossible to fix it with one year's worth of input.

Mr. Isiminger said the discussion about the littoral drift is interesting. He commented that the Lake Worth Inlet has been very heavily litigated, and he thought that the court has agreed on 150,000 cubic yards of sand per year in the inlet to the south of the Town. He said he had heard rumors that the Jupiter Inlet goes to the 250,000 to 300,000 range. Mr. Isiminger said the indication is that the sand is being caught off shore by the inlets or being tied up in flood tidal shoals which explains why the drift becomes smaller going south.

Mr. Isiminger said that Dr. Bruno has stated that if the P.E.P. reef had worked in trapping sand, it would have had the same down drift impacts that are blamed on groins. Mr. Isiminger stated that no matter what the method may be, if you get sand on your beach which would not have been there, and you did not directly place it there, you have taken that sand from the system, and an argument could be made that you are robbing the down drift beach. He said the groins have had a bad name for many years because they work, they do what they are supposed to do, and that is trap sand from the system. Mr. Isiminger stated that recently the groins have been seen in a more positive light, and he felt that people have begun to realize that the sand must be provided up front, and it must be kept there.

Mr. Moffett asked Mr. Dusey why have they buried the groins on the Worth Avenue beach. Mr. Dusey said if the low profile groins and the ones which follow the contour of the natural beach are not buried, the ends of the groins will become exposed as the beach sloughs off into the ocean.

VII. REPORT BY BOARD MEMBER CHARLES ISIMINGER REGARDING THE NATIONAL CONFERENCE ON BEACH PRESERVATION TECHNOLOGY AT ST. PETERSBURG, FLORIDA, JANUARY 24-26, 1996.

Mr. Isiminger said he wished to apologize for not being able to attend the meeting in St. Petersburg, but he did wish to report on two other meetings.

Mr. Isiminger stated that Juno Beach has a Citizens Coalition with a little different approach than Palm Beach, and they are pushing for a beach nourishment project. He said the Coalition had a meeting with County Commissioner Karen Marcus, State Representative Tom Warner and a pretty good ball player named Jim Palmer who attracted approximately 150 people. He said that both of the government speakers made the point that Federal dollars are probably not going to be there, and Representative Warner stressed the point very strongly that the State dollars may not be there either. Mr. Isiminger said he was surprised to see both of them make the recommendation that the Town should consider doing the project on its own so there would be no waiting for the Federal and State time lines, and there would be no strings attached.

Mr. Isiminger said that Dr. Bruno made the point earlier that the Federal Government may be getting out of the beach business. He stated that could be a definite possibility which the Town should consider. He said the fact that the Federal Government will stay in the navigation business may help the Town get some sand from the Palm Beach Inlet placed on the beaches to the south. Mr. Isiminger stated that when it comes to direct participation of the Federal Government in a beach nourishment project, the possibility that the government will not be around should be seriously considered.

Mr. Isiminger said also there was a representative of Clay Shaw's office at the Juno Beach meeting. Unfortunately she did not speak, but it was his feeling that there was a general awareness that Federal money may not be there. He said that Rich Walesky, who is the Director of the Palm Beach County Department of Environmental Resources Management, was quoted in the Palm Beach Post as saying that Federal money is drying up. Mr. Isiminger stated it was interesting that at the Juno Beach meeting the funds were never mentioned, and his main objective seemed to be to get the Citizens Coalition to help Environmental Resources Management (DERM) in pushing through the Juno Beach nourishment project with Palm Beach County DERM as the local sponsor.

Mr. Isiminger stated that he was very impressed with Representative Tom Warner as he made the point that there are hundreds of communities through out the state, east and west coast all lining up and fighting for the same State and Federal dollars. Mr. Isiminger said the other significant comment was made by Karen Marcus. He said Commissioner Marcus did not mention the agency by name, but it was his feeling that Commissioner Marcus was referring to the Florida Inland Navigation District when she said they would like to give the beach

responsibility to an existing State wide body, with the taxing authority.

Mr. Isiminger said he was at a party over Christmas and Representative Sharon Merchant was speaking to Dave Roche of the Florida Inland Navigation District. He said the subject of conversation was regarding whether the Florida Inland Navigation District could assume beaches as part of their responsibility, therefore enabling the State to tap into that source of revenue. He said the State has a dedicated funding source for beaches. Mr. Isiminger said this is an issue which will be brought up frequently in the future.

Mr. Isiminger stated that FIND is currently accomplishing a dredging project in Juno Beach where they are dredging the Intracoastal waterway north of Donald Ross bridge, and pumping the sand down Donald Ross road to the beach in Juno. He said FIND originally estimated that they would have 130,000 cubic yards of sand, but he thought that upon completion the amount of sand will be closer to 250,000 cubic yards. He said FIND was able to enter the Juno project through their navigational responsibilities. Mr. Isiminger said that Juno was not originally a beach project but it was a way for FIND to get a foot in the door which would enable them to do beach projects.

Mr. Elwell said that Palm Beach County and the Town have not always been the best of friends, but in this case Palm Beach County deserves a pat on the back. He stated that FIND, because its responsibility is to dredge the Intracoastal, was considering using a preexisting agreement with the County to actually go to the County park in Juno Beach and dispose of the sand. Mr. Elwell said that was going to raise the level of the playing fields, parking lots and everything else. The improved park was going to become a spoil site, and then presumably a new improved park was supposed to be built on top of that. He stated that from an intergovernmental point of view it was crazy, and Palm Beach County asked if there was some way to get that sand on the beach which enabled the two agencies to complete the project.

Mr. Isiminger said it was certainly good for the County and Juno Beach. He said the County park was built on a FIND spoil area with the agreement that any time that FIND needed it, they could fill the ball fields. Mr. Elwell said that was correct, and FIND was not breaking any rules, but merely doing their job.

Mr. Isiminger stated that the net result of that project was that the County only paid twenty cents per cubic yard for the sand. He said it was not the best sand in the world, but it was adequate, and the reason the cost of the sand was only twenty cents per yard was because the bulk of the cost was paid by the Corps of Engineers, and possibly by FIND itself as part of their navigational responsibility.

Mr. Isiminger said two things came out of the meeting in Juno Beach. One of them was that navigation dredging should be done from

both the Inlet and the Intracoastal, and the other one was that there may be a future dedicated funding source called the Florida Inlet Navigation District, and/or the West Coast Inlet Navigation District.

Mr. Isiminger said the previous day he attended the Jupiter Island meeting which was also attended by Dr. David Aubrey who is a scientist from Massachusetts and has a private consulting firm there. He said that Dr. Aubrey made three points in his report which were:

A. **Less frequent large projects are better than more frequent small ones.** He said Jupiter Island was having a problem with continuing erosion and was being forced to pump sand every few years. Jupiter Island's project is privately funded, but they did not have enough money to do a large enough project so the sand was not staying. Mr. Isiminger said they went through a longer period, ended up with more money, and are currently in the process of doing a larger project.

B. **Hot spots exist along the shore line which are caused by physical features such as offshore bathymetry.** Mr. Isiminger said sometimes these physical features can be man made, but often those physical features were off shore bathymetry. He said in some cases they actually have an impact on the shore line through changes in the wave climate.

C. **The hot spots can be protected with what Dr. Aubrey calls artificial headlands.** Mr. Isiminger said he would tend to put them in the same category as groins, although Dr. Aubrey may not agree with that characterization.

It was stated that Deerfield Beach has headlands, and they just look like piles of rocks running on an angle to the wave action.

Mr. Isiminger said that in his secondary report at the meeting at Jupiter Island, Dr. Aubrey recommended that two headlands be placed at the Beach Club. He said Dr. Aubrey is aware of the value of groins in retaining sand, but renourishment must be combined with an original renourishment project and an obligation for continual maintenance.

Mr. Isiminger stated that Dr. Aubrey was of the opinion that his structures can be placed at between 850 and 1,000 feet apart. He said that would be good for a couple or reasons, and one is that you do not have groins every 300 feet or so, and the cost is reduced. Mr. Isiminger gave an example that at 6 headlands per mile times 13 miles between the inlets would call for 78 structures. He said Dr. Aubrey's cost is conservative, and the cost would be lower for multiple units. Mr. Isiminger said Dr. Aubrey has quoted a price of the 150 foot length headland at $212,000 if local stone is used, and $355,000 if granite is used. Mr. Isiminger said he felt it would be possible to purchase those structures for $200,000 per structure, and basically the cost amounts to approximately one million dollars per mile. He

said in Jupiter Island their current project has a 150 foot wide top of berm width, with a plus 10 feet top elevation, and a 10 to 1 seaward slope and that cost is approximately one and a half million dollars per mile.

Mr. Isiminger said he would recommend investigating the possibility of using Dr. Aubrey's product, but he also felt that there should be more discussion of what the maintenance obligations would be. Also, he said he would like Dr. Bruno's input on whether or not it is the Town's responsibility to keep the groins filled, or is the responsibility just to make sure that the Town has maintained an adequate bypassing volume to the south.

Dr. Bruno said there were two ways of assessing success. One is in the groin field, and the other is if there is no influence down drift. Dr. Bruno said that even a partially filled groin allows bypassing.

Mr. Isiminger asked Dr. Bruno about his settlement experiences with the beach saver reef and the mats placed on each side of the reefs. He said the Town in the past has used steel sheet pile groins which do not settle, and the cost is compatible, but the biggest draw back of the steel sheet pile groins is the aesthetics and dangers when they begin to rust. He expressed his feeling that if the groins were capped in concrete, then those two drawbacks would diminish.

Dr. Bruno said a structure such as Dr. Aubrey has suggested the should be stone graduated. He said there should be some small stone on the foundation then gradually built up, so if only boulders are put down there will be some settlement and movement. Dr. Bruno said as for the steel sheet piles, they have had a lot of success with timber groins as opposed to steel sheet piles, and he felt the timber groins are light years ahead of the steel sheet piles, because they do not have the corrosive tendencies, and he would caution against capping anything with concrete.

Mr. Isiminger said the problem with timber groins here is that there is a layer of rock which the steel can be driven into relatively easily, but the timber cannot. Dr. Bruno stated that if stone is placed under the boulders the amount of settlement will be limited.

Mr. Isiminger asked if the permeability itself or the roughness as far as reducing scour is a significant enough advantage over the stone to eliminate consideration of a sheet pile structure? Dr. Bruno answered negatively. He said that a sheet pile structure as opposed to a traditional groin makes a lot of sense, especially if you are in an area where stone is expensive. Dr. Bruno said with beach fill a narrow sheet pile groin does very well.

Mr. Lickle said the Board was very appreciative of Dr. Bruno's time and information. He said the Board would like to have Dr. Bruno return as the project comes to a conclusion, and possibly help the Board members tie their thoughts together. Also, he thanked Mr.

Hennessy who provided the funds which made it possible for Dr. Bruno to come to Florida.

VIII. Presentation by Peter Elwell, Assistant Town Manager, Regarding the Palm Beach Countywide Beaches and Shores Council. (Deferred from Meeting of January 11, 1996).

Mr. Elwell's presentation was deferred to the March 14th meeting.

IX. Consideration of Potential Individuals and/or Organizations to Invite to Attend Future Shore Protection Board Meetings for Information Exchange. (Continued from Meeting of January 11 1996).

Mr. Lickle said the Board has a list of several individuals who have been considered for information exchange at future meetings. He said earlier in the meeting the issue was raised concerning the creation of a State fund, and he wondered if there was anyone on the list who is involved in the fund at the State level, or otherwise is organizing, or even discussing the fund, because the Board would be interested in determining if that fund would be a viable alternative.

Mr. Elwell said that the Florida Shore and Beach Preservation Association is the group who have led the efforts to create a long term dedicated funding source, and possibly someone from that Association could attend.

Mr. Isiminger said the Association has discussed every thing from increasing sales tax to increasing dock stamp taxes. He said unfortunately he was not in St. Petersburg and is unaware whether or not they discussed FIND.

Mr. Elwell stated he did not know if the Association has discussed FIND. He said that every couple of years, they go to the Legislature, and they are doing that this year. Mr. Elwell said they are attempting to mobilize the coastal communities to support their efforts.

Mr. Isiminger said that FIND is a sleepy little agency with a small office in Juno with an executive director, an assistant, and maybe three employees, but they have a huge tax base second only to the South Florida Water Management District, and maybe not even to them in their tax base. He said a lot of people have tried to take over FIND because they are such a tremendous source of revenue, and in his opinion, the movement will continue to try to get FIND into beaches.

Mr. Lickle suggested that the Board might want to investigate who is the spokesperson for Florida Shores and Beaches Association who could inform the Board of actions, if any of the Association.

Mr. Elwell said they could speak with FIND directly to try to determine what official FIND may have who would consider taking on that responsibility. Mr. Elwell said there is a bigger picture of the people in the State who are seeking a dedicated funding source whether it's FIND or not. He suggested that possibly Debbie Flack would be the person to whom they should speak.

Mr. Lickle asked Mr. Elwell if there was an agenda available for the next Shore Protection Board meeting? Mr. Elwell said he wanted to confirm with the Board the names of people who they wish to bring to the next meeting, and also the DEP situation. Mr. Elwell asked if Dr. Dean and engineers, Eric Olsen and Tom Campbell were additional people they wish to attend the meeting? Mr. Lickle said that was correct.

Mr. Elwell said as far as the spokesperson for the Department of Environmental Protection, Mr. Kirby Green will be available for the May 9th meeting. Mr. Lickle said they would like to have in writing if possible that whoever speaks would be the "official spokesman." Mr. Elwell stated an appropriate representative from FIND, and possibly some legislators would be contacted.

X. Confirmation of Date & Time for the Next Meeting of the Shore Protection Board. (Tentative Date and Time: March 14, 1996 at 2:00 P.M.)

Mr. Lickle stated that the next meeting date of March 14, 1996 at 2:00 P.M. has been confirmed.

XI. Consideration of Revised Proposal for Dates & Times of May & October Meetings (Continued from Meeting of January 11, 1996).

Mr. Elwell said the Board has requested that the meetings scheduled for May and October be changed. He stated they have requested that the May meeting be held a week earlier and the October meeting be held one week later, Mr. Elwell said he just needed confirmation that the proposed dates will be satisfactory. The meeting dates were scheduled for May 9, 1996, and October 19,1996.

XII. Any Other Matters. There were none.

XIII. Adjournment. The meeting was adjourned at 5:50 P.M.

SHORE PROTECTION BOARD

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Garrison D. Lickle, Chairman

Prepared by:
Jacquelyn Reedy