

# Kanter Real Estate, LLC Joint Application for Individual Environmental Resource Permit 2nd RAI Response

Submitted to: Florida Department of Environmental Protection



Prepared by:  
The Carol Group, Inc.



Century Oil, Inc. (Pollister)



Clementi Environmental Consulting, LLC



CLEMENTI ENVIRONMENTAL CONSULTING, LLC

For: Kanter Real Estate, LLC  
2601 South Bayshore Drive, Suite 1450  
Miami, Florida 33133  
May 23, 2016

- 1. The applicant has not sufficiently demonstrated that the proposed impacts to wetlands and other surface waters has been reduced to the furthest extent practicable. Please provide details to support the well pad size and why it cannot be further reduced. Additionally, it appears that the impacts associated with the proposed spoil area could be further reduced by utilizing the spoil for the berm around the fill pad or eliminated entirely by hauling the spoil offsite. Staff acknowledges that the applicant may wish to use the spoil to restore the area at the end of the operation of the site; however, there is concern that the material may no longer possess the existing soil characteristics if it is stockpiled above the seasonal high water elevation for 10-30 years, a timeframe described in the submittal. Please describe the practicability of design modifications for the site that could eliminate or reduce adverse impacts to the wetlands associated with the well pad and spoil area. Additionally, please note that an ERP permit modification will be required for any future restoration activities. [62-330.301(1); 62-330.302(1), F.A.C., 10.2.7(a), A.H. Volume I]**

The applicant concurs that the material may no longer possess the existing soil characteristics if it is stockpiled for 10 to 30 years. Therefore, the applicant has decided not to have a spoil area and will haul the muck that would have comprised the spoil area from the site instead. This will reduce the impact to wetlands by one acre. Please see **Attachment 1**, which shows a revised diagram of the Well location and Well site.

The well pad size cannot practicably be reduced further. In response to your request, the applicant reviewed the well pad design carefully in order to determine whether the well pad size could be further reduced. The well pad needs to be of an adequate size to address the needs of a producing well. It will be five acres in order to accommodate adequate stormwater design and to allow the applicant to store all its equipment on site within the berm. Please note that the proposed well pad is similar in size to other oil well pads in the region.

- 2. Pursuant to 62-330.301(1)(h), F.A.C., the applicant must provide reasonable assurance that the project will not cause adverse impacts to a Work of the District established under Section 373.086, F.S. Water Conservation Area (WCA) 3B is listed as a Work of the District and subject to Right of Way (ROW) permitting. The South Florida Water Management District has indicated that a waiver of criteria, which requires District Governing Board approval, is required due to proposed fuel tanks, oil containers and other potentially toxic or hazardous materials stored on site. Please demonstrate that the proposed project will not cause adverse impacts to a Work of the District. Additionally, submit a copy of the ROW permit as evidence that the applicant has the legal and administrative capability of ensuring that the activity will be undertaken in accordance with the terms and conditions of the permit, pursuant to 62-330.301(1)(j), F.A.C. Pursuant to 62-330.301(1)(h), F.A.C., the applicant must provide reasonable assurance that the project will not cause adverse impacts to a Work of the District established under Section 373.086, F.S. Water Conservation Area (WCA) 3B is listed as a Work of the District and subject to Right of Way (ROW) permitting. The South Florida Water Management District has indicated that a waiver of criteria, which requires District Governing Board approval, is required due to proposed fuel tanks, oil containers and other potentially toxic or hazardous materials stored on site. Please demonstrate that the proposed project will not cause adverse impacts to a Work of the District. Additionally, submit a copy of the ROW permit as evidence that the applicant has the legal and administrative capability of ensuring that the activity will be undertaken in accordance with the terms and conditions of the permit, pursuant to 62-330.301(1)(j), F.A.C.**

The proposed activity will not impact the Works of the District. As demonstrated in Kanter's permit application and November 3, 2015 response to the Department's request for additional information (RAI), the project was designed to eliminate or reduce environmental impacts to the Well site—an already degraded portion of WCA 3—during construction and operation of the Well. The applicant has committed, upon request, to restore the project site to the condition of the surrounding environment at the time of the project's completion. Furthermore, the applicant's use of the levees for transportation purposes will not impact the structural integrity of the levees; the applicant's proposed use is within the District's size and weight parameters.

As described in Applicant's Handbook Volume I, section 3.1.4(g), the applicant is aware of the requirement for a permit under Chapter 40E-63, F.A.C. Neither the Applicant's Handbook nor any other applicable law require the applicant to obtain this permit as a prerequisite for an ERP. The applicant will not begin the project without this permit.

Under Rule 62-330.301(1)(j), F.A.C., the applicant has the financial, legal, and administrative capability of ensuring that the activity will be undertaken in accordance with the terms and conditions of the permit, if issued. It has provided financial assurances as required under Chapter 62-330, F.A.C., owns the property on which the activity will occur, and has administrative responsibility for all contractors who will work on the project.

**3. It appears that the proposed turbidity or silt fence proposed around the spoil area may not be sufficient to contain the spoil material during construction or in post-development. Staff is concerned that the silt material and nutrients could discharge into adjacent wetlands and create additional direct and secondary impacts to resources or water quality. Please discuss the practicability of constructing a berm with liner or other additional method of containment for the proposed spoil area. [10.2.4, A.H. Volume I]**

The applicant no longer proposes a spoil area, so this issue has been resolved.

**4. The submittal indicates that the applicant will conduct water quality monitoring for the duration of the project. Please provide specifics for this monitoring including locations, frequency, acceptable limits for various water quality parameters and steps to be taken if the monitoring indicates that these limits are exceeded. [10.2.4, A.H. Volume I]**

As indicated in Applicant's Handbook Volume II, Sections 4.9.1 and 4.9.4, it is the applicant's understanding that the Department's permitting staff will provide specifics and state the reason for the monitoring requirement in the Staff Report for this permit. The applicant recommends that the surface water samples be taken quarterly and tested for at least the following constituents: 8260, 8270, TRPH, sulphates, chlorides, TDS, DO and turbidity. The acceptable limits for these water quality parameters will be determined by the Department. The steps to be taken if the monitoring indicates that these limits are exceeded will depend upon the water quality parameter exceeded. Steps to be taken will be negotiated with the Department on a case-by-case basis. Included as **Attachment 4** are diagrams of the site with potential locations for background water sampling locations and water quality monitoring wells. The applicant will, however, defer to the Department on the final placement and number of water quality monitoring wells and all other monitoring requirements.

5. **The submitted information indicates that the spoil area and well pad berm will be stabilized with native grasses. Please provide additional information regarding the species of native grasses to be planted so that the Department has assurance that inappropriate vegetation is not being introduced into this environmentally sensitive area. [10.2.4, A.H. Volume I]**

We will plant the following species of native grasses:

- Muhly grass (*Muhlenbergia capillaris*)
- Saw grass (*Cladium jamaicense*)
- Smooth cord grass (*Spartina bakeri*)
- Elliot's love grass (*Eragrostis ellioti*)

6. **Although dewatering is not anticipated, a potential dewatering plan was proposed in the event the proposed dredge and fill plan is not sufficient. The dewatering plan described as being in Attachment 1(I) appears to be missing. Please submit the details for this cofferdam dewatering plan. The details should include any temporary dikes, discharge locations, time periods, and methods for preventing turbid discharges. [10.2.4, A.H. Volume I]**

It is not anticipated that dewatering will be necessary for the proposed construction of the oil well pad. If dewatering activities are necessary, the contractor will be responsible for developing the dewatering plan and obtaining appropriate permits, as is common standard construction practice. Therefore, no dewatering plan is proposed for this permit.

7. **The proposed vegetation monitoring described as a measure to address 62-330.302(1)(a)2, F.A.C. appears to be sufficient to address secondary impacts. The narrative describes quarterly vegetative monitoring and nuisance/exotic vegetation maintenance extending 50 feet into the adjacent wetlands around the entire perimeter of the project area. Please provide this narrative as an exhibit that can be referenced by permit condition so that the Department has assurance that no secondary impacts will occur to adjacent wetlands. [10.2.7, A.H. Volume I]**

Please see **Attachment 7**.

8. **The submittal indicates that mitigation bank credits will be purchased from Hole-In-The-Donut Mitigation Bank; however, as previously discussed with Rosanne Clementi on November 20, 2015, the project is not located within the bank's service area. Please provide an alternate mitigation plan that adequately offsets the proposed adverse impacts to wetlands and other surface waters. If a Uniform Mitigation Assessment Method (UMAM) bank is proposed, then it is noted that staff agrees with the UMAM scores previously discussed onsite on October 11, 2015, and submitted with the latest RAI response. [10.3, A.H. Volume I]**

The applicant now proposes offsetting the proposed adverse impacts to wetlands and other surface waters via real property conveyance of nearby Kanter-owned lands for preservation purposes. Kanter's proposal, preservation adjustment factor analysis, and UMAM Worksheet Parts I and II for preservation are included as **Attachment 8**.

9. **Pursuant to Section 5.2 of Vol. II, gravity control devices shall incorporate dimensions no smaller than 6 square inches of cross sectional area, two inches minimum dimension, and 20 degrees for**

**"V" notches. Systems which are limited by a discharge structure with an orifice no larger than the minimum dimensions described herein shall be presumed to meet the discharge quantity criteria.**

**The minimum acceptable size bleeder per SFWMD is 3 inches. Please revise plans to reflect the minimum size.**

The applicant revised the plans to change the bleeder to 3 inches. Please see the revised plans, included as **Attachment 9**.

**10. Pursuant to Section 5.1 of Vol. II, please provide assurance that the proposed rip-rap protection will result in acceptable scour velocities.**

Please see **Attachment 10** for the rip-rap apron scour velocity calculations.

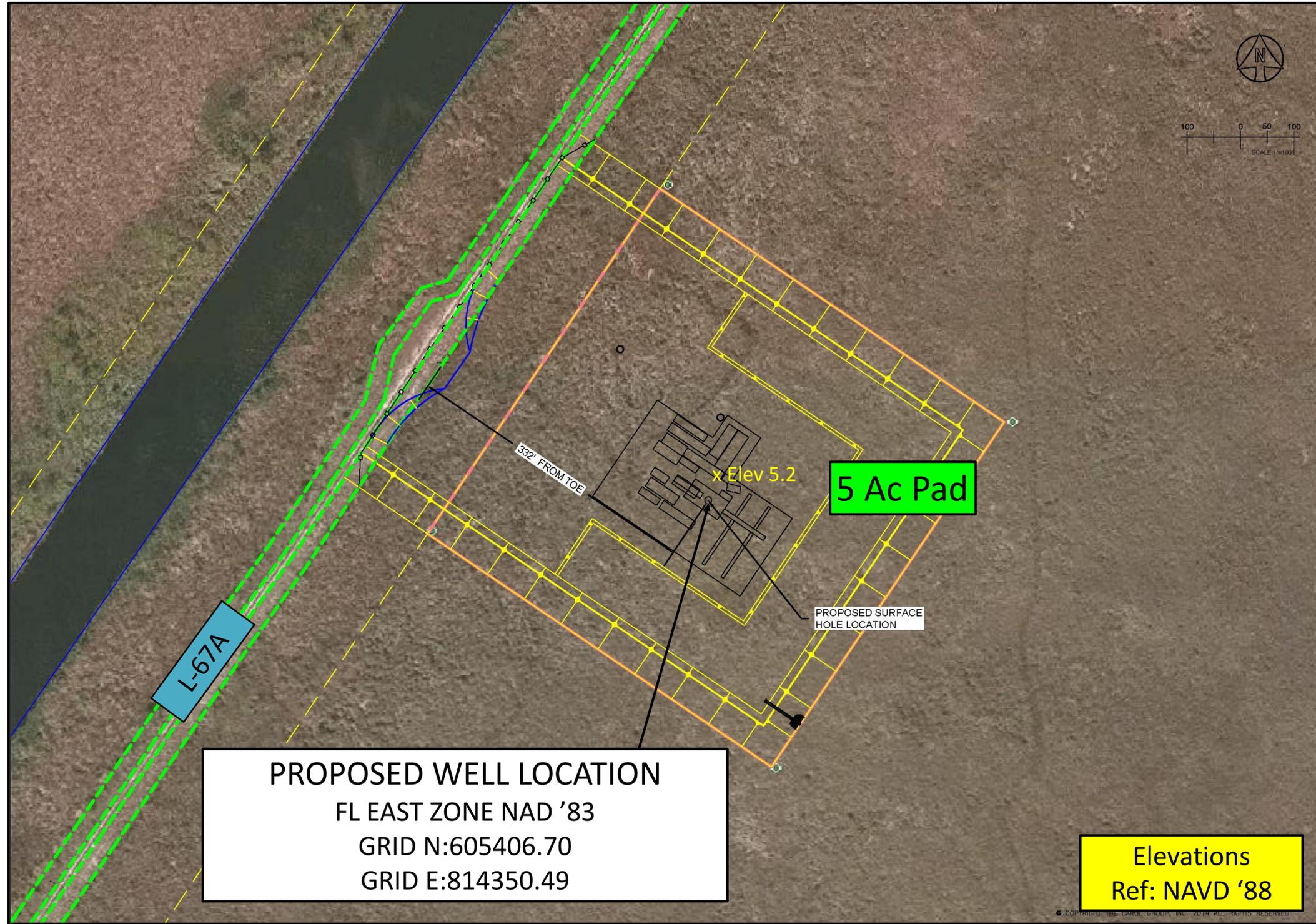
**11. The application indicates that the secondary containment areas will collect rainwater, oils, grease, and other fluids and direct them to a sump. Please indicate how the containment area is hydraulically separated from the proposed site's stormwater management system. Please provide the containment area storage volume and explain if it is part of the overall site's stormwater system volume.**

The sump is a piece of 8-foot diameter steel culvert that is 8 feet long and buried vertically around the conductor pipe with a one-foot thick floor of concrete. This sump is considered primary containment. Fluids collected in the sump are pumped back into the working pits. When appropriate, excess fluids and containment fluids are hauled off site to a disposal facility. The main containment area is lined with 20-mil PVC liner and surrounded with a detention berm. See sheets C-2.02, 2.03 and 2.05, in **Attachment 9**.

**On the plans, please delineate impervious (lined) vs pervious (unlined) areas and provide transitional details. Provide details (size, cross-section) of the proposed sump and describe its operation.**

Please see sheets C-2.02, C-2.03, and C-2.05 in **Attachment 9**.

## Attachment 1: Site Diagram



**PROPOSED WELL LOCATION**  
FL EAST ZONE NAD '83  
GRID N:605406.70  
GRID E:814350.49

**5 Ac Pad**

**Elevations**  
Ref: NAVD '88

**THE CAROL GROUP, INC**

*Professional Engineers and Surveyors*

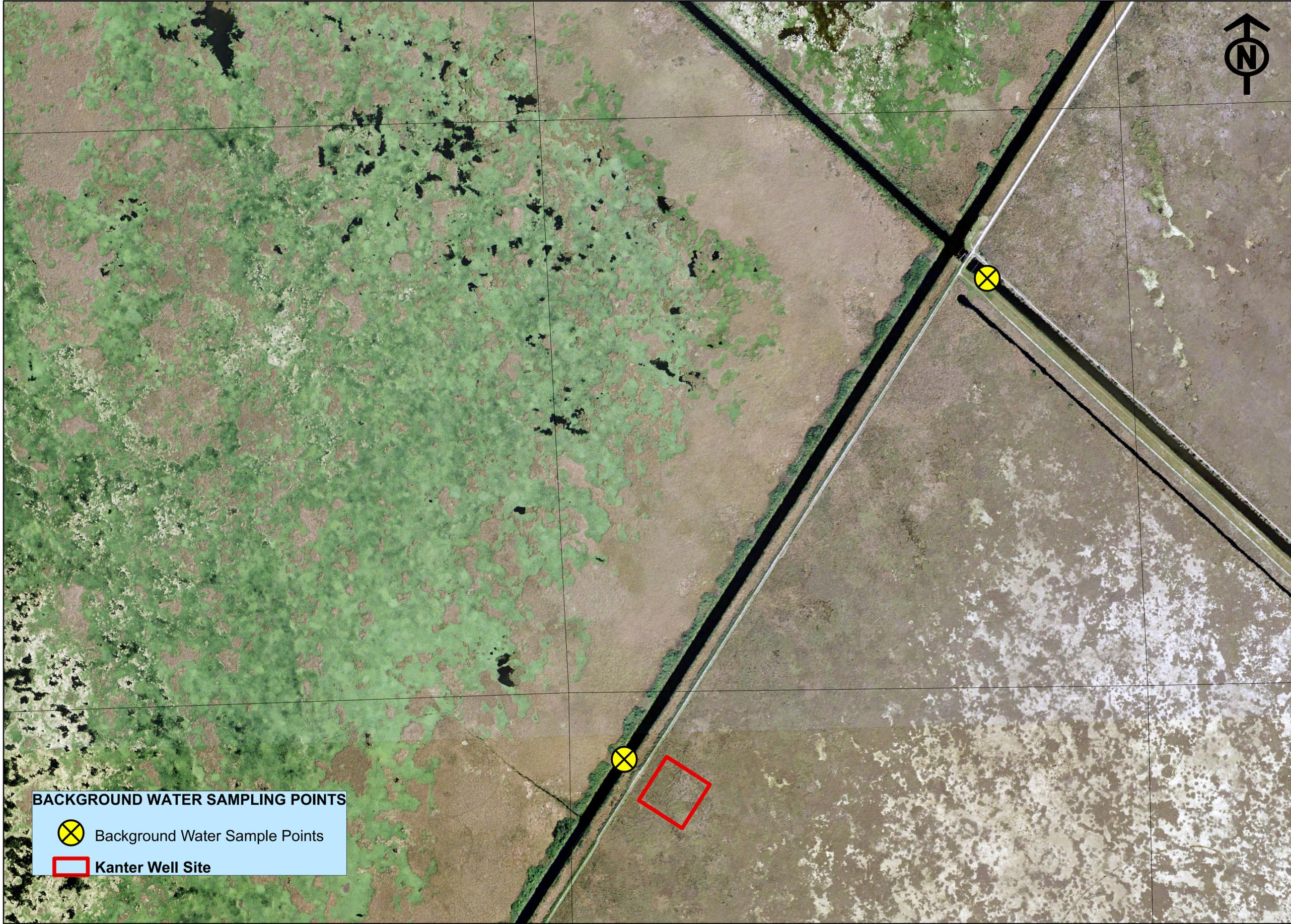
**208 Dal Hall Boulevard  
Lake Placid, FL 33852**

**Kanter 23-2**  
**OnSite Water Well Location**  
**Broward County, FL**

DATE:	PROJECT NO.
	FILE NO.
	SCALE

SHEET NUMBER  
**6.3**

## Attachment 4: Proposed Water Quality Sampling Sites



**BACKGROUND WATER SAMPLING POINTS**

-  Background Water Sample Points
-  Kanter Well Site

**KANTER REAL ESTATE. LLC**  
**06-0336409-001**



CLEMENTI ENVIRONMENTAL CONSULTING, LLC



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**KANTER REAL ESTATE. LLC**

**06-0336409-001**



**Monitoring Wells**

-  Monitoring Wells
-  Kanter Well Site

## Attachment 7: Vegetation Monitoring

### Measures to address the risk of spreading nonnative, invasive plant species

The project area and surrounding habitat are replete with nonnative and invasive plants. All equipment will be washed to remove offsite seed sources. Kanter will implement a base line vegetation monitoring plan to assess the vegetation community within 50 feet of the project containment berm. The applicant will continue monitoring on a quarterly basis to determine if additional nuisance species have been introduced. If the data shows an increase in nuisance and exotic species, the applicant will implement a quarterly maintenance program reduce cover to the base line condition.

On the following page is a diagram of the vegetative monitoring transects that Kanter will use around the project area.



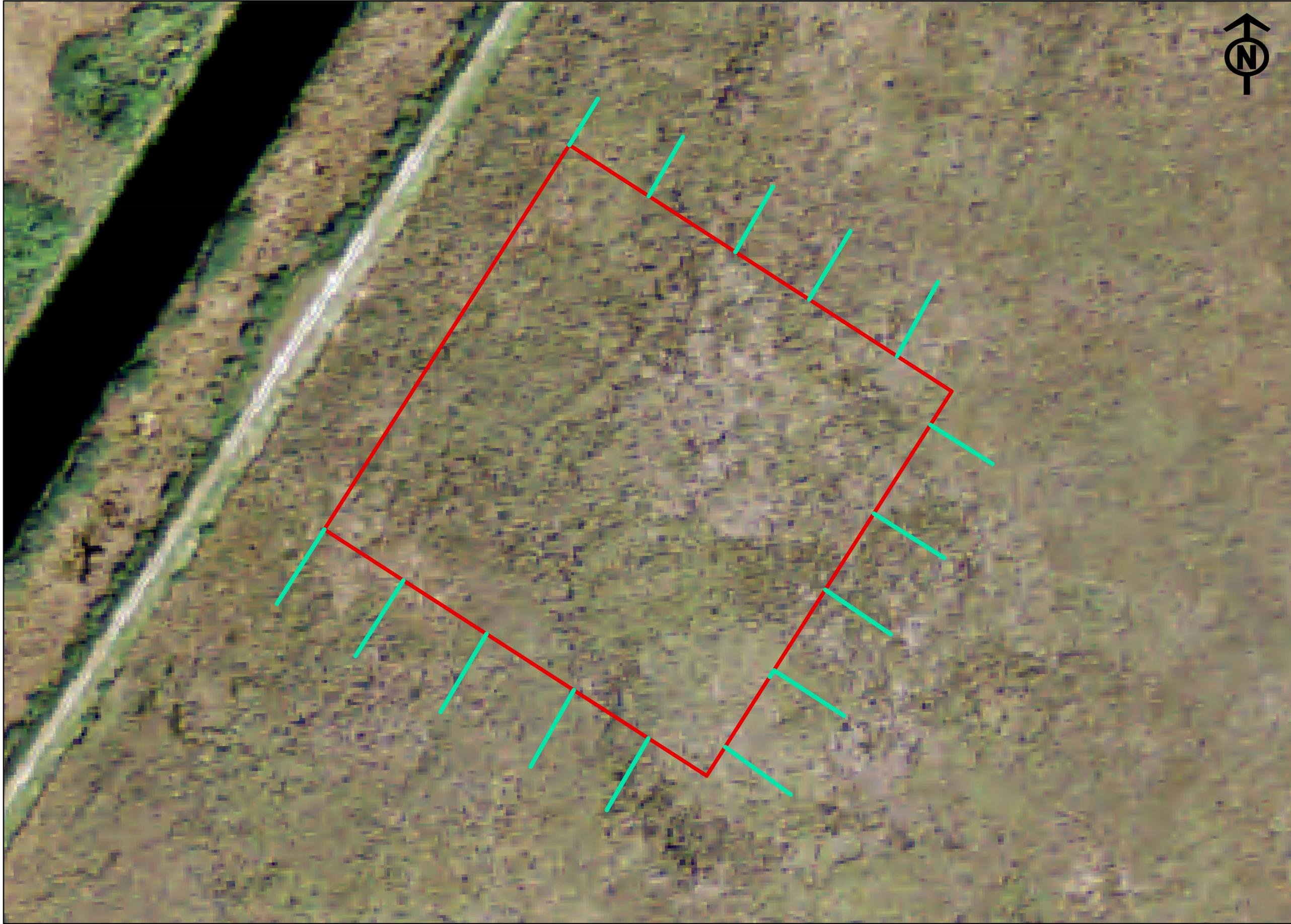
CLEMENTI ENVIRONMENTAL CONSULTING, LLC

50' Transects

-  Vegetation Monitoring Transect
-  Kanter Well Site

**KANTER REAL ESTATE. LLC**

**06-0336409-001**



## Attachment 8: Preservation Mitigation Proposal

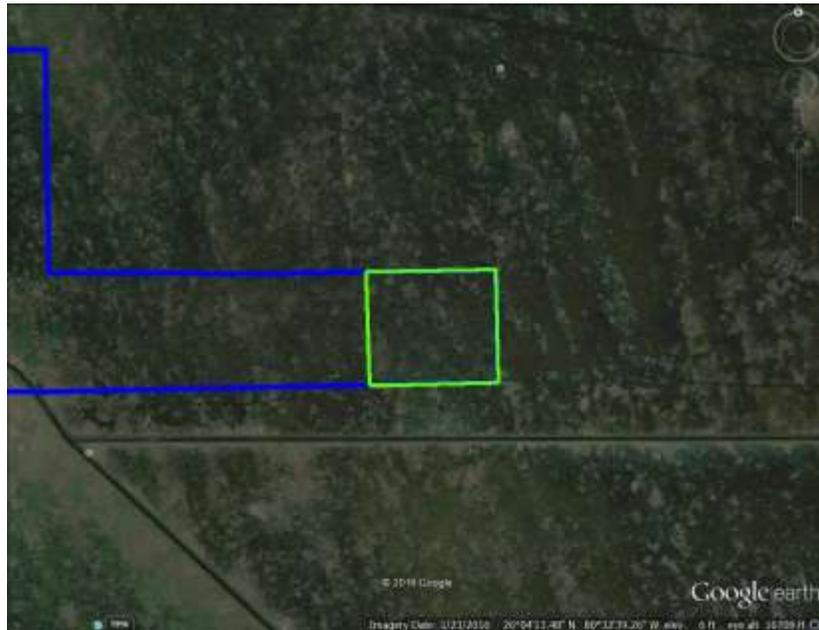


CLEMENTI ENVIRONMENTAL CONSULTING, LLC

Kanter Well Application Number 1366  
FDEP ERP Application Number 06-0336409-001  
Preservation as Compensation for Wetland Impacts

The property owner owns 9,000 acres of land in the area called Kanter North (See Attached Aerial). The land is not encumbered by a conservation easement. The owner has all mineral, gas and oil rights on this property. The owner has a legal document that describes the access that the District is obligated to provide. The property is designated in the Future Broward County Land Use Plan Map as "Conservation Use" and "Reserve Water Supply Areas". The following uses are permitted under this designation: fire towers, telecommunication facilities, active outdoor recreation uses such as hunting, fishing, boating, air boating and off road vehicles; camping facilities, boat ramps and docks; passive outdoor recreation such as wildlife sanctuaries and feeding stations, nature centers and trails, outdoor research stations and walkways. The owner has plans to create income from this property. There is ready access from the boat ramp on I-75 or Everglades Holiday Park for implementation of several recreational activities for profit. One such use could be airboat races or rallies. We completed the UMAM form to determine the amount of preservation that would be adequate to offset the 5.83 acres of impact. There is a benefit to preserving some of this property. We have chosen a portion of the property that is the easternmost. The preservation provides a 32:1 ratio of compensation.





186.36 acres

Attached are the UMAM forms for the preservation and our justification for our preservation adjustment factor. We do not intend to manage the property and therefore have diminished the preservation factor to reflect this. It is our intent that the state and federal agencies will maintain this area with their surrounding maintenance programs. However we have taken no credit for the management of the property. The applicant will have a legal description prepared for this area before the permit is issued.

## Kanter Permit Application 06-0336409-001

The preservation adjustment factor shall be scored on a scale from 0 (no preservation value) to 1 (optimal preservation value), on one-tenth increments. The score shall be assigned based on the applicability and relative significance of the following considerations:

1. The extent to which proposed management activities within the preserve area promote natural ecological conditions such as fire patterns or the exclusion of invasive exotic species. **We are not proposing to manage the preservation area-0 Ideally it would be managed by the FWS or SFWMD**

2. The ecological and hydrological relationship between wetlands, other surface waters, and uplands to be preserved. **Hydrologically contiguous with thousands of acres of District lands.-0.2**

3. The scarcity of the habitat provided by the proposed preservation area and the degree to which listed species use the area. **Not scarce in the area-0**

4. The proximity of the area to be preserved to areas of national, state, or regional ecological significance, such as national or state parks, Outstanding Florida Waters, and other regionally significant ecological resources or habitats, such as lands acquired or to be acquired through governmental or non-profit land acquisition programs for environmental conservation, and whether the areas to be preserved include corridors between these habitats. **Within the Everglades land holdings of the District and COE-.2**

5. The extent and likelihood of potential adverse impacts if the assessment area were not preserved. **If the area is not preserved the owner has the rights to operate airboat and swamp buggy tournaments, allow various recreational activities including camping- .2**

(b) The preservation adjustment factor is multiplied by the mitigation delta assigned to the preservation proposal to yield an adjusted mitigation delta for preservation.

**0.6 adjustment factor**

**PART I – Qualitative Description  
(See Section 62-345.400, F.A.C.)**

<b>Site/Project Name</b> Kanter Sunniland 23-1		<b>Application Number</b>	<b>Assessment Area Name or Number</b> WCA 3-Kanter North	
<b>FLUCCs code</b> 641 - Freshwater Marsh		<b>Further classification (optional)</b>		<b>Mitigation</b> Preservation Area
				<b>Assessment Area Size</b> 160 to 377 acres
<b>Basin/Watershed Name/Number</b> WCA 3	<b>Affected Waterbody (Class)</b> Class III	<b>Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)</b> OFW		
<b>Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands</b> Everglades habitat on the east side of the Miami Canal and south of I-75.				
<b>Assessment area description</b> Wetland is a freshwater marsh dominated by Jamaica Sawgrass ( <i>Cladium mariscus jamaicense</i> ).				
<b>Significant nearby features</b> Miami Canal		<b>Uniqueness (considering the relative rarity in relation to the regional landscape.)</b> Historic Everglades (same as surrounding landscape)		
<b>Functions</b> Water quality improvements, sheet flow, wildlife habitat, carbon dioxide sequestration		<b>Mitigation for previous permit/other historic use</b> No previous permit or mitigation requirements		
<b>Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )</b> Florida Panther, Everglade Snail Kite, Cape Sable Seaside Sparrow, West Indian Manatee, Wood Stork, Eastern Indigo Snake, Everglades Mink, Southeastern Kestrel, Florida Sandhill Crane, Florida Black Bear, White Ibis, Snowy Egret, Little Blue Heron, Tricolored Heron, Limpkin, Roseate Spoonbill		<b>Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)</b> Florida Panther (E), Everglade Snail Kite (E), Cape Sable Seaside Sparrow (E), West Indian Manatee (E), Wood Stork (E), Eastern Indigo Snake (T), Everglades Mink (T), Southeastern Kestrel (T), Florida Sandhill Crane (T), Florida Black Bear (T), White Ibis (SSC), Snowy Egret (SSC), Little Blue Heron (SSC), Tricolored Heron (SSC), Limpkin (SSC), Roseate Spoonbill (SSC). Non-intense use.		
<b>Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests,</b> Numerous wildlife studies of the area have been completed by others				
<b>Additional relevant factors:</b> The property owner owns 9,000 acres of land in the area called Kanter North. The land is not encumbered by a conservation easement. The owner has all mineral, gas and oil rights on this property. The property is designated in the Future Broward County Land Use Plan Map as "Conservation Use" and "Reserve Water Supply Areas". The following uses are permitted under this designation: fire towers, telecommunication facilities, active outdoor recreation uses such as hunting, fishing, boating, air boating and off road vehicles; camping facilities, boat ramps and docks; passive outdoor recreation such as wildlife sanctuaries and feeding stations, nature centers and trails, outdoor research stations and wa kways. The owner has plans to create income from this property. There is ready access from the boat ramp on I-75 for implementation of several recreational activities for profit.				
<b>Assessment conducted by:</b> The Carol Group, Inc.		<b>Assessment date(s):</b> Apr-16		

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

<b>Site/Project Name</b> Kanter Sunniland 23-1	<b>Application Number</b>	<b>Assessment Area Name or Number</b> WCA 3
<b>Preservation</b> freshwater marsh on Kanter North	<b>Assessment conducted by:</b> The Carol Group, Inc. and Rosanne Clementi	<b>Assessment date:</b> Apr-16

<b>Scoring Guidance</b> The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed
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<b>Optimal (10)</b>	<b>Moderate(7)</b>	<b>Minimal (4)</b>	<b>Not Present (0)</b>
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support  w/o pres or current 6 with 6	Adjacent wildlife habitats outside the assessment area are the WCAs. These natural areas provide support for expected listed species. The wetland area is adjacent to the Miami Canal and levee that has introduced invasive species. The area is accessible by airboat and jon boat.
.500(6)(b)Water Environment (n/a for uplands)  w/o pres or current 7 with 7	Aquatic environment is appropriate for the freshwater marsh. Assessment area hydroperiod appropriate and minimally impacted by levees or ditches. Water inputs from groundwater rainfall. Water quality appears to be relatively unimpacted by surrounding land use.
.500(6)(c)Community structure  w/o pres or current 6 with 7	Removing airboat, camping and swamp buggy traffic activities will help the vegetation and sediment recover from these excessive uses.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres 0.63333	with 0.66667

If preservation as mitigation,
Preservation adjustment factor = 0.7
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres = 0.633 x 5.83=3.69

Delta = [with-current]
0.03333

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta*(pres adj factor) =0.033*.6=0.0198

186.3636 acres preserved at PAF of .7

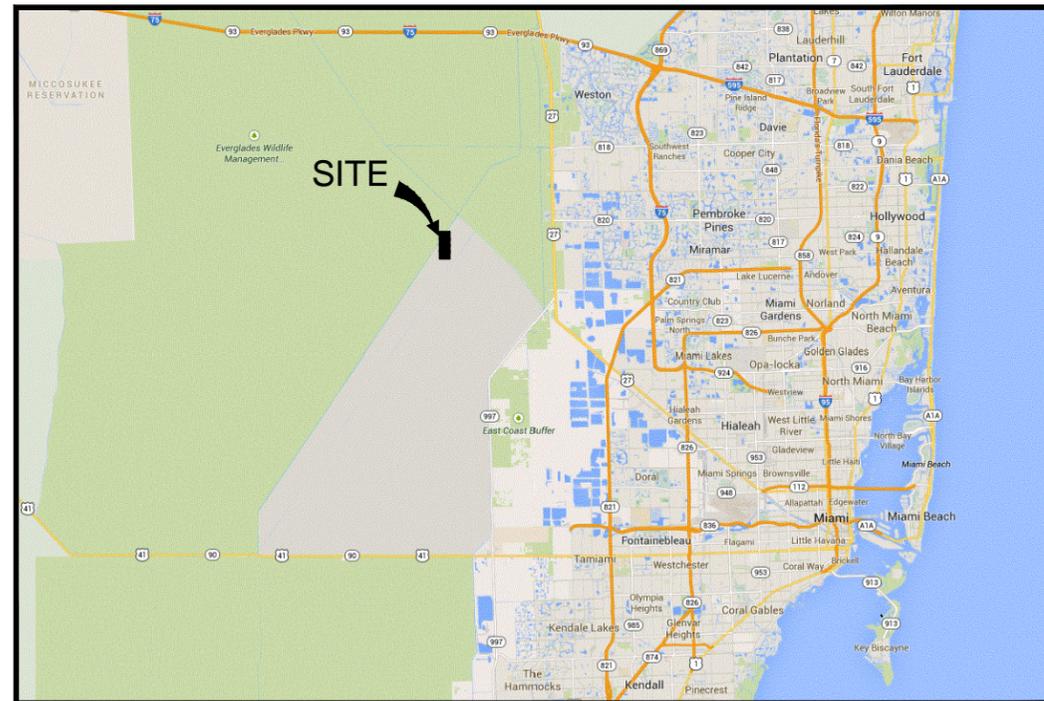
## Attachment 9: Revised Plan Set

# KANTER 23-2

BROWARD COUNTY, FLORIDA

SECTION 23, TOWNSHIP 51 S, RANGE 38 E,

JOSEPH R. GARDNER  
FL REG # 75711  
REGISTERED PROFESSIONAL ENGINEER  
AND SURVEYOR IN THE STATE OF FLORIDA



LOCATION MAP

## SHEET INDEX

## NUMBER

COVER SHEET	C-1.00
SITE INFORMATION & GENERAL NOTES	C-1.01
AERIAL / FLUCCS MAP	C-2.01
MASTER SITE / GRADING PLAN	C-2.02
EQUIPMENT LAYOUT	C-2.03
TYPICAL SECTIONS	C-2.04-2.05
DETAILS	C-2.06-2.07
SWPPP	C-3.01



208 DAL HALL BOULEVARD , LAKE PLACID, FLORIDA 33852 (863) 659-1198

FL CA NO. 30023

## REVISIONS:

PROJECT NO. KA2014.03	SET DATE 01/26/2016

GENERAL NOTES:

- THE CONTRACTOR SHALL HAVE ALL REQUIRED PERMITS IN-HAND PRIOR TO BEGINNING CONSTRUCTION, AND SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMITS OBTAINED BY THE CLIENT AND THOSE PERMITS OBTAINED BY THE CONTRACTOR.
- AT LEAST THREE CALENDAR DAYS PRIOR TO THE PRECONSTRUCTION CONFERENCE; THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A TENTATIVE BASE CONSTRUCTION SCHEDULE, TRAFFIC CONTROL PLAN, PRECONSTRUCTION SURVEY, AND SEDIMENT AND EROSION CONTROL PLAN. NO WORK SHALL BEGIN PRIOR TO APPROVAL OF THE CONSTRUCTION SCHEDULE, TRAFFIC CONTROL PLAN, PRECONSTRUCTION SURVEY, AND SEDIMENT AND EROSION CONTROL PLAN.
- THE CONSTRUCTION SCHEDULE SHALL DESCRIBE IN DETAIL HOW THE CONSTRUCTION IS TO BE PHASED, ESTABLISH START AND FINISH DATES FOR ALL SIGNIFICANT CONSTRUCTION ACTIVITIES, AND IDENTIFY ALL CONTROLLING ITEMS OF WORK. THE SCHEDULE IS TO BE APPROVED BY THE ENGINEER, AND SHALL BE UPDATED ON A MONTHLY BASIS TO REFLECT ACTUAL WORK PROGRESS. THE UPDATED SCHEDULE SHALL BE SUBMITTED TO THE ENGINEER NO LATER THAN THREE DAYS PRIOR TO EACH SCHEDULED MONTHLY PROGRESS MEETING. PAYMENT FOR PREPARING, UPDATING AND SUBMITTING THE SCHEDULE SHALL BE INCLUDED IN THE PAY ITEM FOR MOBILIZATION.
- THE PRECONSTRUCTION SURVEY SHALL VERIFY THE CONTROL POINTS AND BENCH MARK ELEVATIONS PROVIDED BY THE ENGINEER AND SHALL ALSO ESTABLISH THE LOCATION AND DESCRIPTION OF ALL ADDITIONAL REFERENCE POINTS AND THE LOCATIONS, DESCRIPTIONS, AND ELEVATIONS OF ALL ADDITIONAL BENCHMARKS TO BE USED IN CONSTRUCTING THE PROJECT. THE SURVEY SHALL BE SIGNED AND SEALED BY A PROFESSIONAL SURVEYOR AND MAPPER REGISTERED IN THE STATE OF FLORIDA. SIGNIFICANT INCONSISTENCIES BETWEEN THE FIELD NOTES AND THE CONTROL POINTS AND BENCH MARK ELEVATIONS PROVIDED BY THE ENGINEER SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO ISSUANCE OF THE NOTICE TO PROCEED. PAYMENT SHALL BE INCLUDED IN THE PAY ITEM FOR MOBILIZATION.
- THE GEOTECHNICAL INFORMATION SHOWN ON THE DRAWINGS WAS OBTAINED FOR USE IN ESTABLISHING DESIGN CRITERIA FOR THE PROJECT. THIS INFORMATION MAY NOT ACCURATELY REFLECT ACTUAL SOIL CONDITIONS AS TO THE DEPTH, EXTENT OR CHARACTER OF THE MATERIAL TO BE ENCOUNTERED IN CONSTRUCTION OF THE PROJECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE SUCH EXAMINATION OF THE SITE OF THE WORK AS MAY BE NECESSARY TO DETERMINE THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
- THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING ALL PROPERTY CORNERS AND MONUMENTS SHOWN ON THE DRAWINGS OR FOUND DURING CONSTRUCTION. IF A PROPERTY CORNER OR MONUMENT IS DESTROYED OR DISTURBED, THE CONTRACTOR WILL HAVE IT REPLACED AND CERTIFIED BY A PROFESSIONAL SURVEYOR AND MAPPER REGISTERED IN THE STATE OF FLORIDA. ALL COSTS FOR PRESERVING, REPLACING AND CERTIFYING PROPERTY CORNERS AND MONUMENTS WILL BE INCLUDED IN THE PAY ITEM FOR MOBILIZATION.
- ANY NATIONAL GEODETIC SURVEY MONUMENT WITHIN THE LIMITS OF CONSTRUCTION MUST BE PROTECTED. IF IN DANGER OF DAMAGE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND:
 

FDEP, BUREAU OF SURVEY AND MAPPING, MS 100  
3900 COMMONWEALTH BLVD.  
TALLAHASSEE, FLORIDA 32399

(850) 245-2555 (OFFICE)  
(850) 245-2572 (FAX)
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS BASED ON INFORMATION PROVIDED BY THE UTILITY OWNERS, AVAILABLE RECORDS, AND SURVEYED FIELD INFORMATION. THE INFORMATION MAY NOT REFLECT ACTUAL CONDITIONS, INCLUDE ALL UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED, OR SHOW THE UTILITIES IN THE CORRECT HORIZONTAL OR VERTICAL LOCATIONS. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS NECESSARY TO ESTABLISH THEIR LOCATIONS AND AVOID DAMAGE. THE FOLLOWING UTILITIES SHOULD BE CONTACTED FOR INFORMATION CONCERNING TYPE AND LOCATION OF THEIR FACILITIES. THE LIST MAY NOT INCLUDE ALL UTILITIES IN THE AREA.
 

SUNSHINE STATE ONE-CALL OF FLORIDA                      811 OR 800-432-4770 (5 DAYS NOTIFICATION PRIOR TO CONSTRUCTION)
- ALL UTILITIES IN CONFLICT WITH CONSTRUCTION ARE TO BE ADJUSTED OR RELOCATED BY OTHERS UNLESS NOTED OTHERWISE ON THE DRAWINGS OR DIRECTED BY THE ENGINEER.
- LIMITS OF CONSTRUCTION ARE DEFINED IN THE PLANS AND CONSIST OF ROADWAY RIGHTS-OF-WAY, CLIENT PROPERTIES, DRAINAGE RIGHTS-OF-WAY, PERMANENT DRAINAGE AND/OR UTILITY EASEMENTS, AND TEMPORARY CONSTRUCTION EASEMENTS.
- THE CONTRACTOR SHALL PUT FORTH EVERY REASONABLE EFFORT TO MINIMIZE DISRUPTION AND DISTURBANCE OF ADJACENT PROPERTIES.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL TREES AND LANDSCAPING ON ADJACENT PROPERTIES, AND WILL BE SOLELY LIABLE FOR DAMAGE TO VEGETATION ON PROPERTIES ADJACENT TO CONSTRUCTION WORK ZONES. ALL TREES WITHIN THE LIMITS OF CONSTRUCTION THAT ARE NOT IDENTIFIED ON THE PLANS TO BE REMOVED SHALL BE PROTECTED TO THE MAXIMUM EXTENT PRACTICABLE. TREE PROTECTION BARRICADES SHALL BE INSTALLED AND MAINTAINED AROUND ALL TREES THAT ARE TO BE PROTECTED AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL NOT DISTURB GRASSING OR LANDSCAPING OUTSIDE CONSTRUCTION WORK ZONES. THE CONTRACTOR SHALL BE SOLELY LIABLE FOR DAMAGE TO VEGETATION OUTSIDE CONSTRUCTION WORK ZONES AND SHALL RESTORE AT NO COST TO THE CLIENT ANY AREAS THAT ARE DAMAGED INCLUDING AREAS WITHIN THE LIMITS OF CONSTRUCTION OR ON ADJACENT PROPERTIES USING, TO THE EXTENT PRACTICABLE, THE SAME TYPES AND SIZES OF PLANT MATERIAL THAT EXISTED PRIOR TO CONSTRUCTION.
- DISTURBED AREAS SHALL BE COMPACTED (AT A MINIMUM) EQUAL TO ADJACENT UNDISTURBED GROUND EXCEPT WHEN OTHERWISE SPECIFIED.
- ALL DISTURBED AREAS WITHIN CONSTRUCTION WORK ZONES ARE TO BE GRASSED EXCEPT FOR AREAS THAT ARE BELOW NORMAL WATER LEVEL. EXISTING GRASSED AREAS SHALL BE REPLANTED WITH SOD OF THE SAME GRASS TYPE AS EXISTING, UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. SOD WILL BE USED FOR DISTURBED AREAS NOT CURRENTLY GRASSED. REINFORCEMENT MAT SHALL BE INSTALLED BENEATH SOD PLACED ON SLOPES OF 2H:1V OR STEEPER, AND THE SOD SHALL BE STAPLED. COSTS FOR REINFORCEMENT MAT, STAPLING, FERTILIZING, AND WATERING SHALL BE INCLUDED IN THE UNIT PRICE OF THE PAY ITEM FOR PERFORMANCE TURF.
- PRIOR TO REQUESTING A FINAL INSPECTION, THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOUR COMPLETE SETS OF CERTIFIED AS-BUILT RECORD DRAWINGS AND TWO COPIES OF THE DIGITAL FILES ON CD-ROM DISKS.
- EXCAVATED MATERIAL SHALL NOT BE DEPOSITED IN LOCATIONS WHERE IT COULD BE WASHED AWAY BY HIGH WATER OR BY STORMWATER RUNOFF, AND STOCKPILES SHALL BE COVERED OR ENCIRCLED WITH SEDIMENT CONTAINMENT DEVICES.
- STABILIZATION MEASURES SHALL BE INITIATED FOR EROSION AND SEDIMENT CONTROL ON DISTURBED AREAS AS SOON AS PRACTICABLE, BUT IN NO CASE MORE THAN 14 DAYS AFTER CONSTRUCTION ACTIVITY IN THOSE PORTIONS OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL DISTURBED LAND AREAS SHALL BE COMPLETED IMMEDIATELY AFTER FINAL GRADING. WHEN IT IS NOT POSSIBLE TO PERMANENTLY PROTECT A DISTURBED AREA IMMEDIATELY AFTER GRADING OPERATIONS, TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED. ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL PERMANENT MEASURES ARE IN PLACE AND ESTABLISHED.

SUPPLEMENTAL GENERAL NOTES:

- ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). TOPOLOGY WAS PREPARED BY THE ENGINEER AND IS NOT CONSIDERED PART OF THE SURVEY AND IS ONLY FOR INFORMATIONAL PURPOSES.
  - THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PREVENTION, CONTROL, AND ABATEMENT OF EROSION, WATER POLLUTION, AND THE TRANSPORTATION OF ERODED MATERIALS OFF SITE.
  - THE CONTRACTOR SHALL PREPARE A SEDIMENT AND EROSION CONTROL PLAN TO ACCOMPANY THE STORMWATER POLLUTION PREVENTION PLAN AND THE SEDIMENT AND EROSION CONTROL PLAN INCLUDED IN THESE PLANS. THE SEDIMENT AND EROSION CONTROL PLAN SHALL BE PREPARED IN ACCORDANCE WITH THE "FLORIDA EROSION AND SEDIMENT CONTROL MANUAL" AND SHALL BE SPECIFIC TO THE MEANS, METHODS, AND SEQUENCE OF CONSTRUCTION TO BE EMPLOYED BY THE CONTRACTOR AND SHALL IDENTIFY THE TYPES AND LOCATIONS OF CONTROLS THAT ARE TO BE IMPLEMENTED DURING EACH PHASE OF CONSTRUCTION AS SHOWN ON THE APPROVED CONSTRUCTION SCHEDULE TO MINIMIZE EROSION, PREVENT THE TRANSFER OF ERODED MATERIALS ONTO ANY OFF SITE PARCEL OR INTO ANY RECEIVING WATER, AND PREVENT VIOLATING STATE AND/OR FEDERAL PERMIT REQUIREMENTS. PAYMENT FOR PREPARING AND SUBMITTING THE SEDIMENT AND EROSION CONTROL PLAN AND FOR ANY MODIFICATIONS TO THE SEDIMENT AND EROSION CONTROL PLAN DURING CONSTRUCTION WILL BE INCLUDED IN THE PAY ITEM FOR MOBILIZATION. THE SEDIMENT AND EROSION CONTROL PLAN SHALL DESCRIBE BUT NOT BE LIMITED TO THE FOLLOWING ITEMS FOR EACH PHASE OF CONSTRUCTION OPERATIONS OR ACTIVITIES:
    - TYPES AND LOCATIONS OF ALL EROSION CONTROL DEVICES
    - ESTIMATED TIME EROSION CONTROL DEVICES WILL BE IN OPERATION
    - SCHEDULES FOR MONITORING AND MAINTENANCE OF EROSION CONTROL DEVICES
    - METHODS OF MAINTAINING EROSION CONTROL DEVICES
    - METHODS FOR CONTAINMENT OR REMOVAL OF POLLUTANTS OR HAZARDOUS WASTES
    - NAME AND PHONE NUMBERS OF PERSON RESPONSIBLE FOR MONITORING AND MAINTAINING EROSION CONTROL DEVICES
  - NO CONSTRUCTION ACTIVITIES SHALL BEGIN UNTIL THE SEDIMENT AND EROSION CONTROL PLAN HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER.
  - THE CONTRACTOR SHALL UPDATE THE SEDIMENT AND EROSION CONTROL PLAN AND/OR THE DEWATERING PLAN WHENEVER THERE IS A CHANGE IN CONSTRUCTION SEQUENCE OR ACTIVITIES THAT HAS A SIGNIFICANT EFFECT ON THE POTENTIAL FOR THE DISCHARGE OF POLLUTANTS OFF SITE OR INTO ANY RECEIVING WATER AND SHALL SUBMIT THE UPDATED PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
  - EROSION AND SEDIMENT CONTROLS SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION AND SHALL BE IN PLACE BEFORE DISTURBING SOIL UPSTREAM OF THE CONTROL.
  - FIELD CONDITIONS MAY REQUIRE THE USE OF ADDITIONAL TYPES AND QUANTITIES OF SEDIMENT AND EROSION CONTROL DEVICES DURING CONSTRUCTION AS DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
  - THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROL DEVICES PRIOR TO SUSPENSION OF WORK ACTIVITIES EACH DAY, IMMEDIATELY AFTER EACH RAINFALL, AND AT LEAST DAILY DURING PROLONGED RAINFALL TO ENSURE THAT THE DEVICES ARE PROPERLY LOCATED AND MAINTAINED FOR EFFECTIVENESS. ANY REQUIRED REMEDIAL ACTION SHALL BE PERFORMED IMMEDIATELY.
  - SEDIMENT TRAPPED BY THE EROSION CONTROL DEVICES IS TO BE REMOVED BY THE CONTRACTOR AFTER EACH RAIN STORM.
  - THE AMOUNT OF AREA DISTURBED AT ONE TIME SHALL BE LIMITED TO THE MINIMUM NECESSARY TO ADEQUATELY IMPLEMENT THE WORK. CONSTRUCTION OPERATIONS SHALL BE CONTROLLED TO MINIMIZE UNPROTECTED AREAS EXPOSED TO WEATHER, AND AREAS OUTSIDE THE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED.
  - EXCAVATED MATERIAL SHALL NOT BE DEPOSITED IN LOCATIONS WHERE IT COULD BE WASHED AWAY BY HIGH WATER OR BY STORMWATER RUNOFF, AND STOCKPILES SHALL BE COVERED OR ENCIRCLED WITH SEDIMENT CONTAINMENT DEVICES.
  - STABILIZATION MEASURES SHALL BE INITIATED FOR EROSION AND SEDIMENT CONTROL ON DISTURBED AREAS AS SOON AS PRACTICABLE, BUT IN NO CASE MORE THAN 14 DAYS AFTER CONSTRUCTION ACTIVITY IN THOSE PORTIONS OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.
  - PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL DISTURBED LAND AREAS SHALL BE COMPLETED IMMEDIATELY AFTER FINAL GRADING. WHEN IT IS NOT POSSIBLE TO PERMANENTLY PROTECT A DISTURBED AREA IMMEDIATELY AFTER GRADING OPERATIONS, TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED. ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE MAINTAINED UNTIL PERMANENT MEASURES ARE IN PLACE AND ESTABLISHED.
- OIL PAD FILL SPECIFICATION:
- SELECT FILL: SELECT FILL SHALL BE CLEAN, WELL-GRADED MATERIAL FREE FROM DEBRIS, PEAT, ROOTS, SEEDS OF NUISANCE OR EXOTIC SPECIES, ORGANIC MATERIAL, CLODS, AND STONES WITH A DIAMETER GREATER THAN 3 INCHES (76 MM) IN ANY DIRECTION. SELECT FILL SHALL HAVE AN AVERAGE ORGANIC CONTENT OF NOT MORE THAN 2%. SELECT FILL SHALL BE PLACED WHERE INDICATED ON THE DRAWINGS. SELECT FILL IS REQUIRED WHERE HIGHER CONTROL OF MATERIALS AND PLACEMENT IS NEEDED SUCH AS WATER RETAINING EMBANKMENT CORES, ROADWAY EMBANKMENTS, AND ADJACENT TO STRUCTURES. SELECT FILL MAY BE MATERIAL EXCAVATED FOR THE WORK (NATIVE) OR MAY BE IMPORTED. THE CONTRACTOR MAY BLEND NATIVE MATERIALS TO ACHIEVE A MATERIAL THAT MEETS THE REQUIREMENTS FOR SELECT FILL. SELECT FILL SHALL MEET THE FOLLOWING UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487) DESIGNATIONS, SW, SP, SC. FILL MATERIAL SHALL NOT CONTAIN ANY PARTICLES LARGER THAN 3 INCHES (76 MM) IN DIAMETER, AND THE UPPER 1-FOOT SHALL NOT CONTAIN PARTICLE SIZES LARGER THAN 2 INCHES (51 MM) IN DIAMETER.
  - RANDOM FILL: RANDOM FILL SHALL BE CLEAN, WELL-GRADED MATERIAL, THAT IS THOROUGHLY MIXED AND FREE FROM DEBRIS, CLODS, SEEDS OF NUISANCE OR EXOTIC SPECIES, AND STONES WITH A DIAMETER IN ANY DIRECTION GREATER THAN THOSE SPECIFIED IN THE BELOW TABLE. RANDOM FILL SHALL HAVE AN ORGANIC CONTENT OF LESS THAN 5% BY WEIGHT. TIGHTER RESTRICTIONS ON STONE SIZE ARE CONSIDERED IN THE TOP LAYER OF FILL, AS PER SUBSECTION 3.03 F. FINAL DRESSING OF SLOPES, IF THE AREA IS TO BE SEEDED, SODDED, OR LANDSCAPED. RANDOM FILL SHALL BE PLACED WHERE INDICATED ON THE DRAWINGS. RANDOM FILL IS REQUIRED WHERE STABLE BACKFILL IS NEEDED TO MAINTAIN SLOPES AND GRADES, BUT SHALL NOT RETAIN WATER OR BE ADJACENT TO STRUCTURES. SELECT FILL HAS A MAXIMUM PARTICLE SIZE OF 3 INCHES AND MAXIMUM COMPACTED LIFT THICKNESS OF 12 INCHES.
  - OIL PAD SHALL CONSIST OF A SELECT FILL CORE AND RANDOM BACKFILL SIDE SLOPES (UNLESS OTHERWISE INDICATED) AND SHALL BE PLACED TO THE LINES AND GRADES AS SHOWN ON THE DRAWINGS. THE LEVEE CORE IS DEFINED BY THE AREA INSIDE THE TOP OF BANK OF THE PERIMETER BERM. AT NO LOCATION SHALL THE COMPLETED TOP ELEVATION BE LOWER THAN INDICATED. COMPLETED SIDE SLOPES SHALL BE UNIFORM FROM TOP TO TOE, AND SHALL BE SMOOTHLY TRANSITIONED.
  - MATERIALS SUITABLE FOR SELECT FILL SHALL BE PLACED IN THE CORE OF THE OIL PAD IN HORIZONTAL LAYERS NOT EXCEEDING 12 INCHES IN LOOSE THICKNESS AND COMPACTED AS INDICATED.
  - RANDOM FILL SHALL BE PLACED TO ITS FINAL POSITION ON EACH SIDE OF THE SELECT FILL CONCURRENT WITH SELECT FILL PLACEMENT.
  - ROCKS EXCEEDING THE ACCEPTABLE SIZE SHALL BE EITHER STOCKPILED OR CRUSHED TO THE ACCEPTABLE SIZE FOR USE. THE ACCEPTABLE SIZES OF ROCKS ARE SHOWN IN THE DEFINITIONS SECTION OF THIS SPECIFICATION.
  - MATERIAL DEPOSITED DURING EXCAVATION WILL HAVE A HIGH MOISTURE CONTENT, AND SHALL THEREFORE BE DRIED PRIOR TO FINAL INCORPORATION IN THE LEVEE EMBANKMENT TO OBTAIN SUITABLE MOISTURE CONTENT (WITHIN PLUS OR MINUS TWO PERCENT OF OPTIMUM MOISTURE DENSITY) TO PERMIT PLACEMENT AND COMPACTION. DRYING MAY CONSIST OF ALLOWING THE MATERIAL TO DRAIN FOR A SUFFICIENT PERIOD TO ACHIEVE THE NECESSARY MOISTURE CONTENT OR BY MECHANICAL MEANS. FOLLOWING THE DRYING PERIOD, ORGANIC AND NON-ORGANIC MATERIALS SHALL BE COMPLETELY MIXED.
  - FOLLOWING MIXING, MATERIALS SHALL BE PLACED ABOVE EXISTING GRADE IN HORIZONTAL LAYERS NOT EXCEEDING 12 INCHES IN LOOSE THICKNESS AND COMPACTED.
  - THE MATERIAL SHALL BE COMPACTED TO NOT LESS THAN 95 PERCENT OF THE MAXIMUM DENSITY AT OPTIMUM SOIL MOISTURE CONTENT +/- 2% AS DETERMINED BY ASTM D1557.
  - BACKFILL IN WATER SHALL BE CONSTRUCTED BY DUMPING SUCCESSIVE LOADS IN UNIFORMLY DISTRIBUTED LAYER IN THICKNESS NECESSARY TO SUPPORT HAULING EQUIPMENT WHILE PLACING SUBSEQUENT LAYERS. THE REMAINING PORTION THAT IS 1 FOOT ABOVE THE WATER SHALL BE PLACED IN 1-FOOT LIFTS AND COMPACTED IN ACCORDANCE WITH SECTION 02200 OF THE TECHNICAL SPECIFICATIONS.
  - FINAL DRESSING OF SLOPES: FOLLOWING THE COMPLETION OF EMBANKMENT PLACEMENT AND COMPACTION, THE CONTRACTOR SHALL GRADE EMBANKMENT SLOPES AND ADJACENT TRANSITION AREAS SO THAT THEY ARE REASONABLY SMOOTH AND FREE FROM IRREGULAR SURFACE CHANGES.
    - IN AREAS WHERE THE EMBANKMENT IS TO HAVE GRASS, SOD, OR LANDSCAPING, THE MATERIAL WITHIN THE TOP ONE FOOT SHALL BE FREE OF ANY ROCKS GREATER THAN 2 INCHES (51 MM) IN DIAMETER.
    - THE DEGREE OF FINISH SHALL BE THAT ORDINARILY OBTAINED FROM BLADE GRADER OR SIMILAR OPERATIONS.
    - PROVIDE ROUNDINGS AT BOTTOM OF SLOPES AND OTHER BREAKS IN GRADE.

SITE DATA SUMMARY

OWNER/APPLICANT:  
NAME  
STREET ADDRESS  
CITY, STATE ZIP CODE

SECTION: 23 TOWNSHIP: 51S RANGE: 38E

PAD BOUNDARY AREA = 217,799 SF = 5.00 AC  
STORMWATER MGMT BASIN = 252,835 SF = 5.03 AC  
WETLAND IMPACTS = 257,247 SF = 5.90 AC

5 AC SITE DEVELOPMENT AREA DATA:

BUILDING AREA = 0 SF = 0 AC =0 %  
PVT. / CONC. = 0 SF = 0 AC =0 %  
IMPERVIOUS AREA = 10,400 SF = 0.24 AC =5 %  
PERVIOUS AREA = 207,400 SF = 4.76 AC =95 %

**THE CAROL GROUP, INC**

Professional Engineers and Surveyors

208 Dal Hall Boulevard Lake Placid, FL 33852

GENERAL NOTES

KANTER 23-2

Broward County, Florida

TCG PROJECT: KA2014.03

CHECKED BY: WRH DESIGNED BY: JRB

DATE: 01/26/2016

SHEET C-1.01

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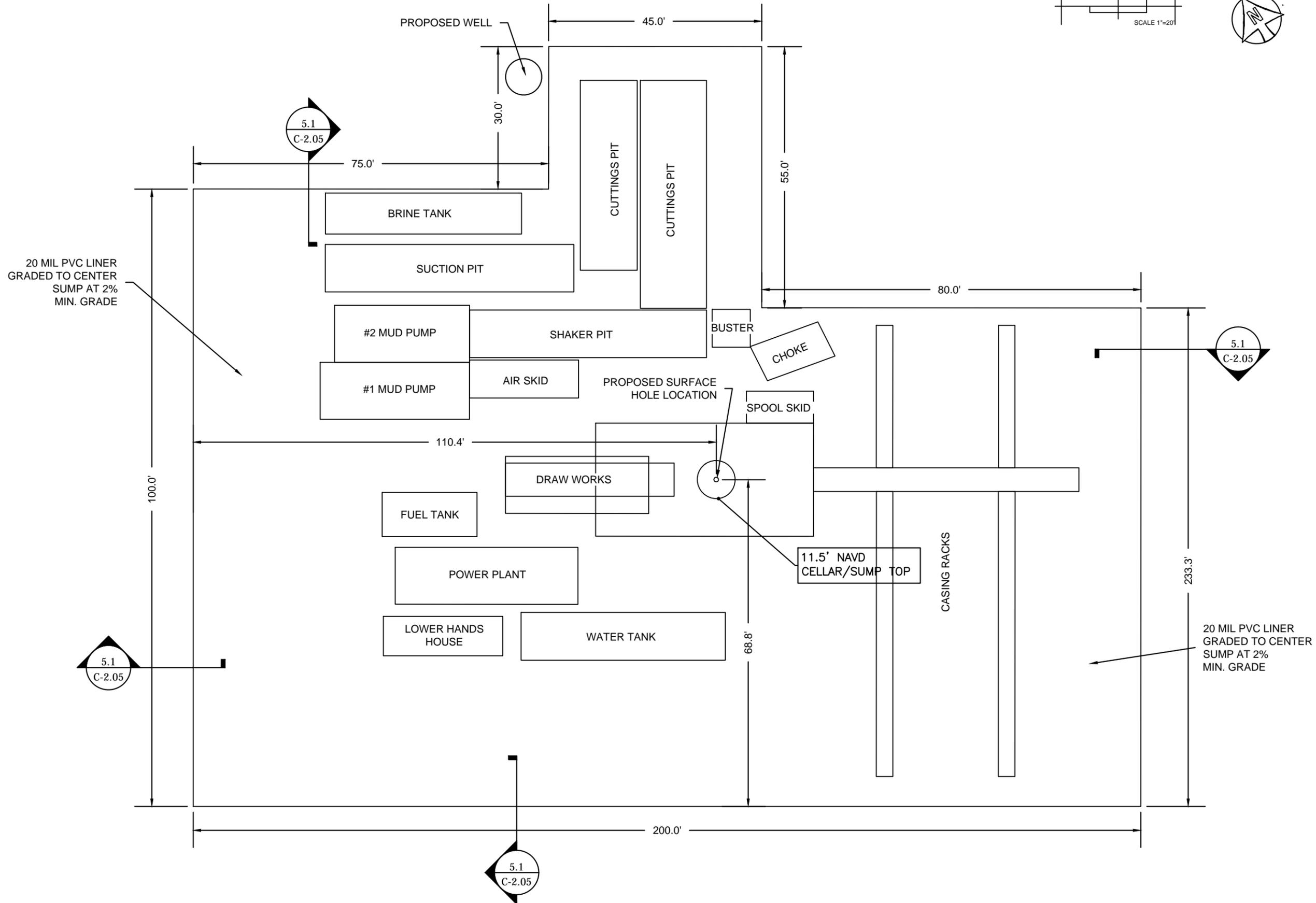
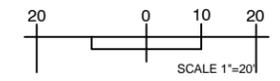
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*Professional Engineers and Surveyors*  
208 Dal Hall Boulevard Lake Placid, FL 33852

AERIAL / FLUCCS MAP  
KANTER 23-2  
Broward County, Florida

TCG PROJECT:  
KA2014.03

CHECKED BY: WRH	DESIGNED BY: JRB
DATE: 01/26/2016	
SHEET C-2.01	





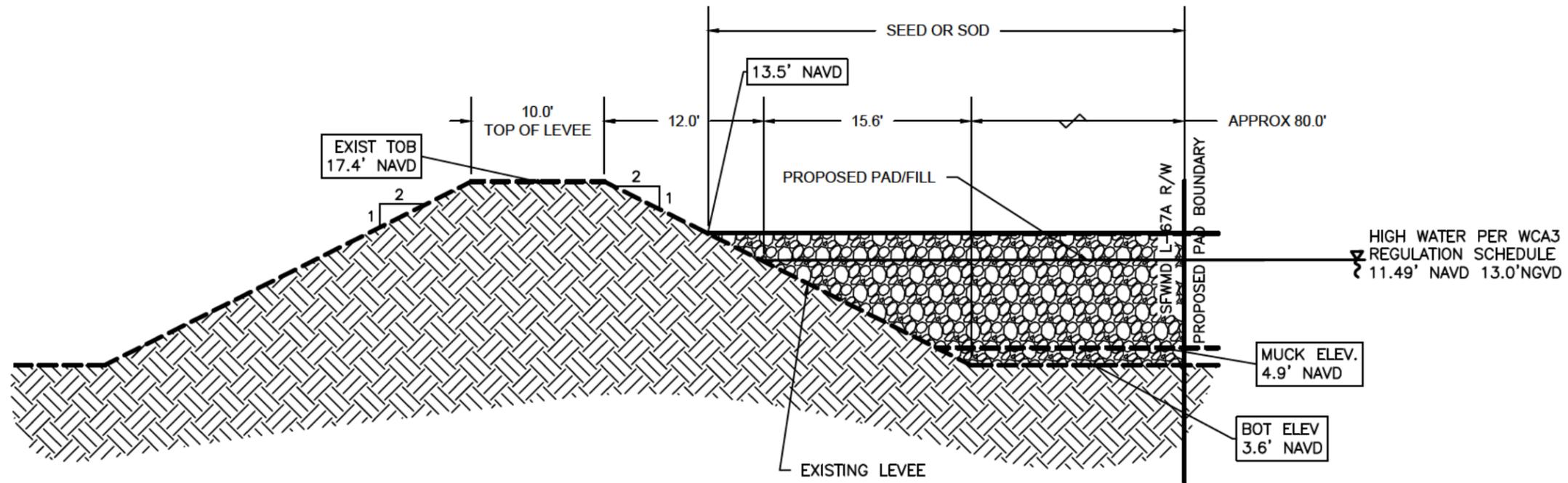
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EQUIPMENT LAYOUT  
 KANTER 23-2  
 Broward County, Florida

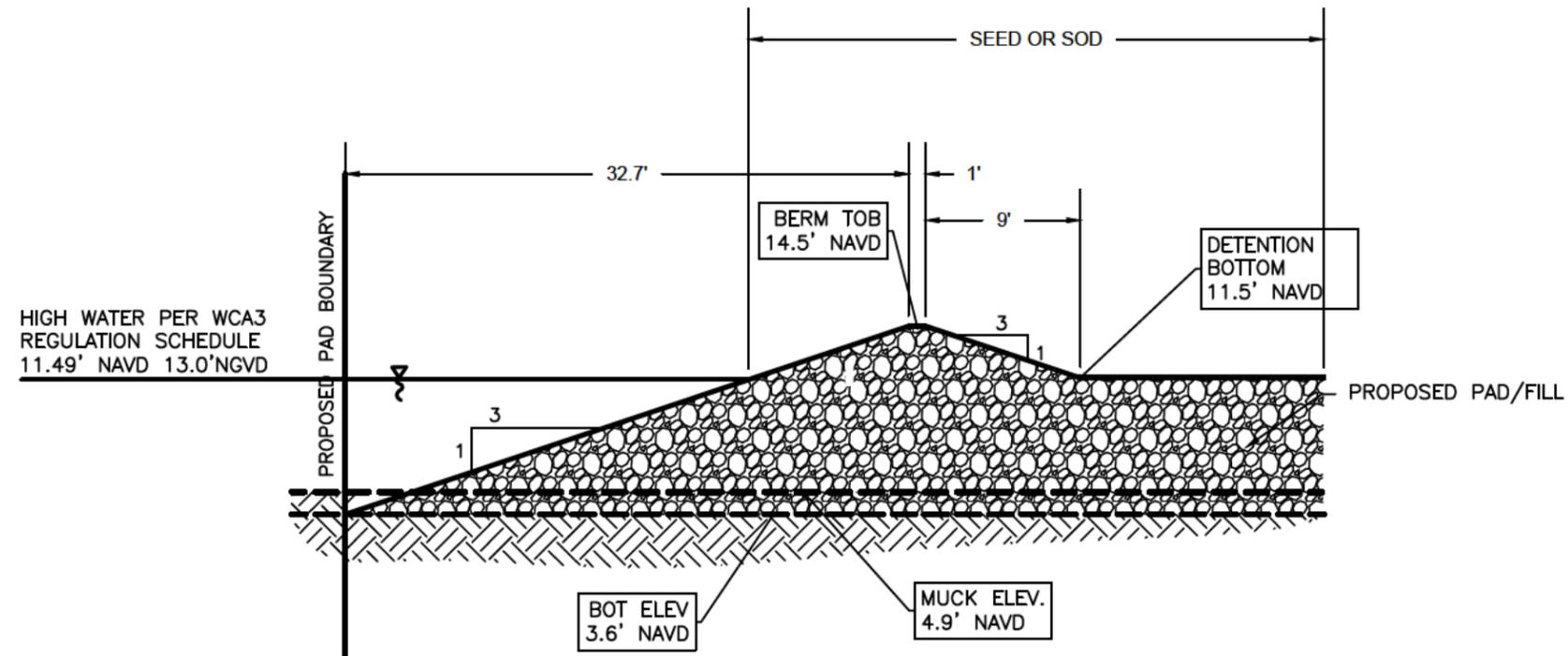
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1 TYPICAL SECTION AT LEVEE SFWMD L-67A R/W

Scale: 1:10



2 TYPICAL SECTION AT PAD BOUNDARY

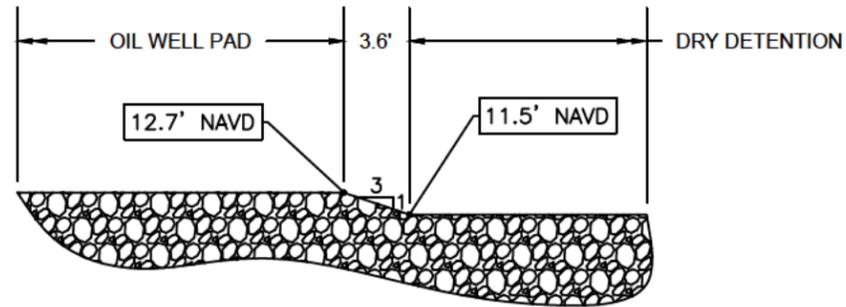
Scale: 1:10

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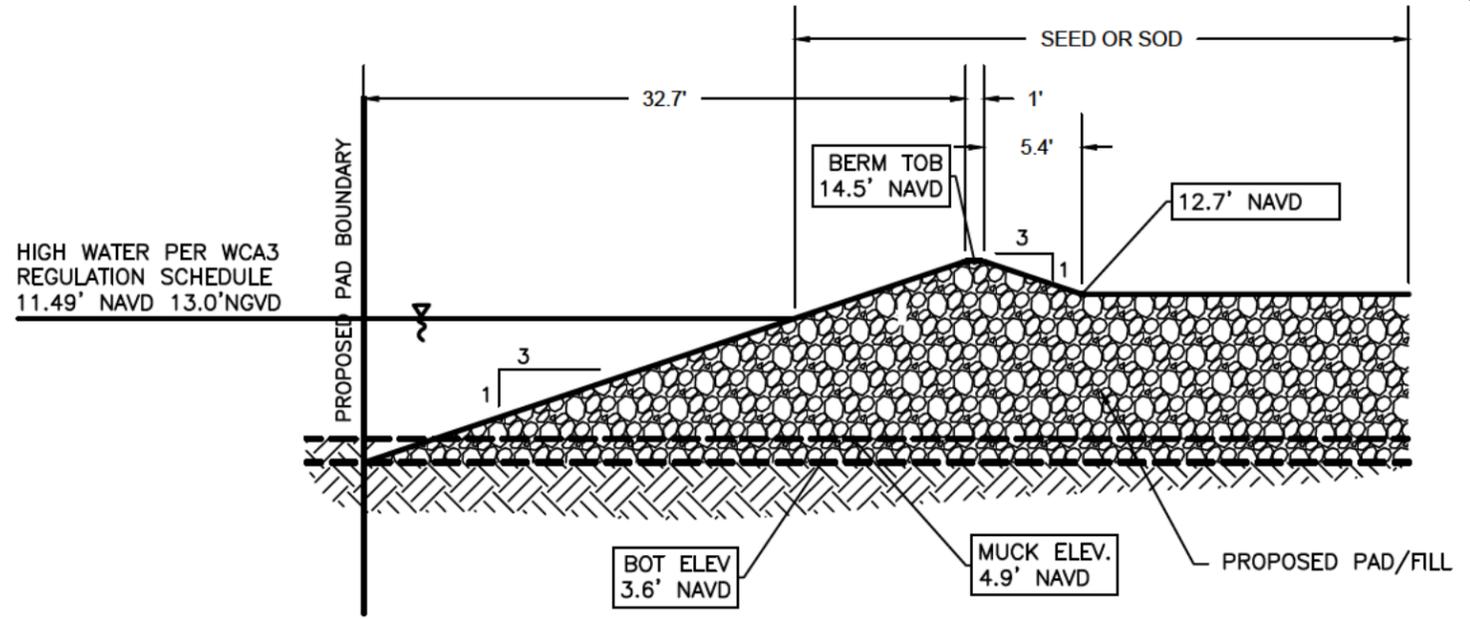
TYPICAL SECTIONS  
KANTER 23-2  
Broward County, Florida

TCG PROJECT: KA2014.03  
CHECKED BY: WRH DESIGNED BY: JRB  
DATE: 01/26/2016  
SHEET  
C-2.04



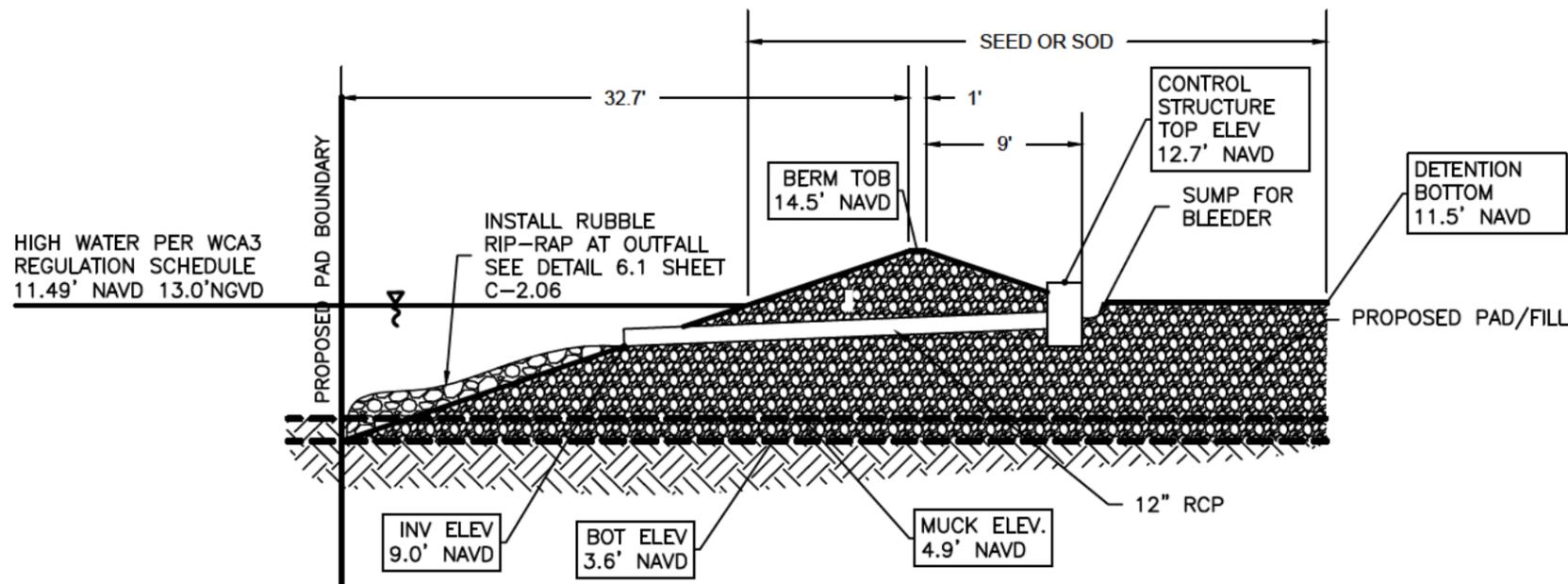
3 DETENTION TYPICAL SECTION

Scale: 1:10



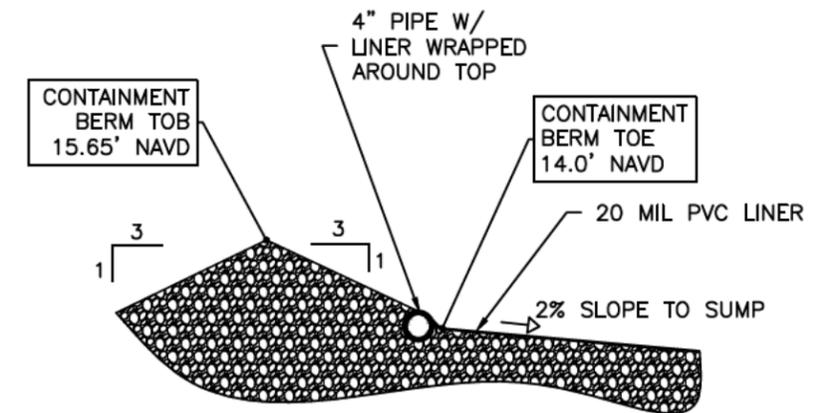
4 TYPICAL SECTION AT PAD BOUNDARY

Scale: 1:10



5 TYPICAL SECTION AT CONTROL STRUCTURE

Scale: 1:10



5.1 TYPICAL SECTION AT LINER

N.T.S.

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TYPICAL SECTIONS  
KANTER 23-2  
Broward County, Florida

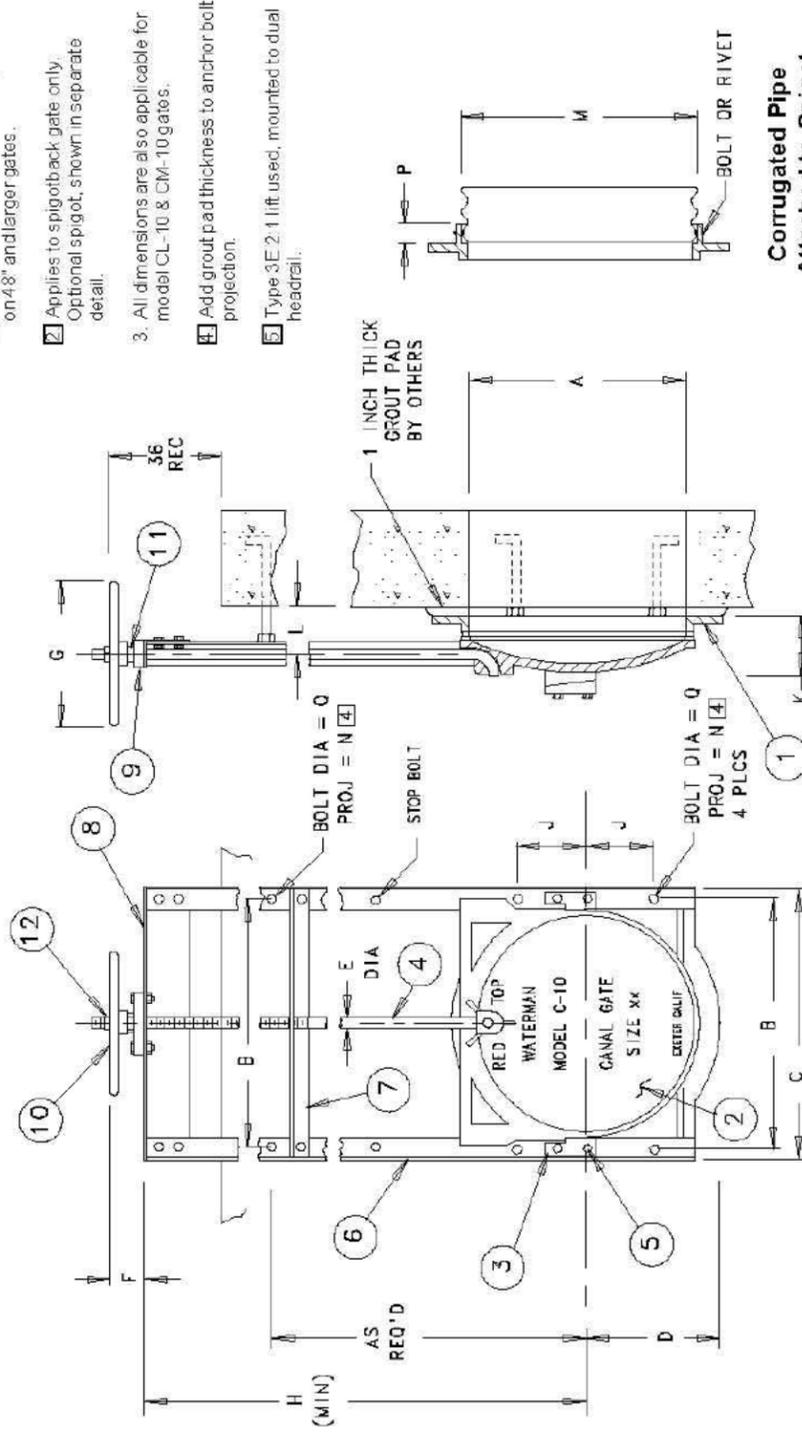
TCC PROJECT: KA2014.03  
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DATE: 01/26/2016  
SHEET: C-2.05

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DATE OF ENDORSEMENT: 01/26/2016



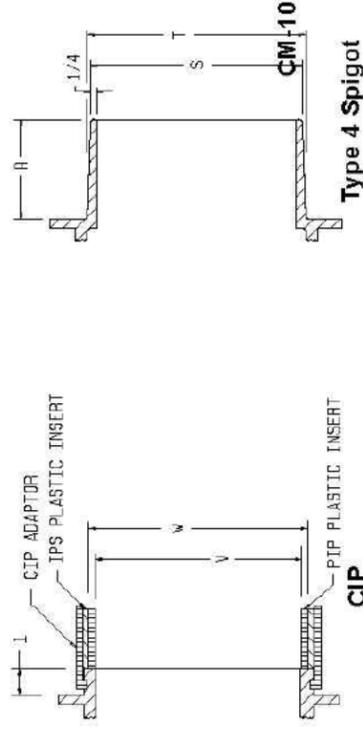
# CANAL GATES

## C-10 CANAL GATE



- NOTES**
- TYPE 2 lubricated ball bearing lift used on 48" and larger gates.
  - Applies to spigotback gate only. Optional spigot, shown in separate detail.
  - All dimensions are also applicable for model CL-10 & CM-10 gates.
  - Add grout pad thickness to anchor bolt projection.
  - Type 3/E 2-1 lift used, mounted to dual headrail.

**Corrugated Pipe Attached to Spigot Back Frame**



PARTS LIST		
No.	Name	Qty.
1	Frame	1
2	Cover	1
3	Wedge (Right & Left)	1 ea
4	Stem	1
5	Wedge Bolts	4
6	Guide Rail	2
7	Stem Support	A/R
8	Head Rail	1
9	Lift Collar	1
10	Handwheel	1
11	Lift Nut	1
12	Limit Nut	1

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W
6	8	9 3/8	4	7/8	2 1/8	10	24	3	3 1/2	2 3/8	7	3 1/2	2 1/4	1 1/2	-	-	-	6.180	8.645
8	10	12	4 7/8	7/8	2 7/8	10	24	3	3 3/4	2 1/2	9	3 1/2	2 1/4	1 1/2	4	7 1/4	8	8.180	8.645
10	12	14 1/2	6	7/8	2 3/4	10	24	4	3 3/4	2 1/4	11	3 1/2	2 1/4	1 1/2	4 3/4	8 3/4	10	10.680	11.240
12	14	15 7/8	7	7/8	2 1/2	10	24	4	3 1/2	3	13	4	2 1/4	1 1/2	4	11 1/4	12	12.270	12.780
14	16	17 3/4	8	7/8	2 1/4	10	24	5	4 1/4	3 1/2	15	4	2 1/4	1 1/2	4 1/4	14 1/4	15	-	-
15	17	18 7/8	8 3/8	7/8	2 1/2	10	30	5	4 1/2	3 1/2	16	4	2 1/4	1 1/2	4 1/4	14 1/4	15	-	-
16	18 3/4	20 1/8	9 3/8	7/8	2 1/2	10	32	5 1/2	4 1/2	3 1/2	17	4 1/2	2 1/4	1 1/2	4 1/4	14 1/4	15	-	-
18	21	22 7/8	10 1/2	1	3 1/8	12	34	6	4 1/2	4 1/4	19	4 1/2	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
20	23 3/4	25 1/8	11 3/4	1	3 1/8	12	38	7	4 3/4	4	21	4 1/2	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
21	24	25 7/8	12 1/4	1	3 1/8	12	40	7	4 3/4	4	22	4 1/2	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
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36	39 3/4	42 1/8	20 1/2	1 1/2	4	15	62	12	6 1/4	5 3/8	37	6	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
42	45 3/4	48 1/8	23 3/8	1 1/2	5	18	84	14	7	6	43	6	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
48	51 3/4	54 1/8	26 3/4	1 1/2	6	24	90	16	7 3/8	6 1/8	49 3/8	6	2 1/4	1 1/2	4 1/4	17 1/4	18	-	-
54	58 1/2	61 1/8	30	2	6	30	100	18	7 7/8	6 1/2	55 1/2	7	3	1	4 1/4	17 1/4	18	-	-
60	65	68	34	2	6	30	102	20	8 1/8	7 1/8	61 1/8	8	3 1/4	1	4 1/4	17 1/4	18	-	-
72	77 1/2	80 1/4	41	2	13	5	121	25 1/2	10 3/8	8 3/4	73 1/4	8	3 3/4	1	4 1/4	17 1/4	18	-	-

GATE DIMENSIONS IN INCHES



16C

7

### CANAL GATE SPECIFICATION

N.T.S.

CANAL GATE DETAIL

KANTER 23-2

Broward County, Florida

REVISIONS

Professional Engineers and Surveyors

208 Dal Hall Boulevard Lake Placid, FL 33852

JOSEPH L. BARBER  
FL REG. 70111

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ENGINEER OF RECORD

TCG PROJECT:  
KA2014.03

CHECKED BY: WRH  
DESIGNED BY: JRB

DATE:  
01/28/2016

SHEET  
C-2.07



TEMPORARY STAGING AREA  
EXISTING LEVEE TURNAROUND

FLOATING TURBITIDY BARRIER  
OR SILT FENCE

FLOATING TURBITIDY BARRIER  
OR SILT FENCE

FLOATING TURBITIDY BARRIER  
OR SILT FENCE

REVISIONS

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STORMWATER POLLUTION PREVENTION PLAN  
KANTER 23-2

Broward County, Florida

TCG PROJECT:  
KA2014.03

CHECKED BY: MWM    DESIGNED BY: JRB

DATE:  
01/26/2016

SHEET  
C-3.01

JOSEPH B. BARBER  
FL. REG. # 73111  
DRAWN BY: MWM  
CHECKED BY: JRB  
DATE: 01/26/2016

## Attachment 10: Rip-Rap Apron Calculations

## Rip Rap Apron Design

per FHWA publication FHWA-NHI-06-086

Known:

$$Q = 4.23 \text{ ft}^3/\text{s} \quad \text{modeled discharge}$$

$$D = 1.0 \text{ ft}$$

$$TW = 0.4D \quad \text{Tailwater} < 0.4D \text{ so use } 0.4D$$

$$y_n = 0.4 \text{ ft} \quad \text{normal pipe depth see chart} > \text{supercritical flow}$$

Compute adjusted D for supercritical flow

$$\text{Eq 10.5} \quad D' = \frac{D + y_n}{2} = \frac{1 + 0.4}{2} = 0.7'$$

Compute minimum  $D_{50}$  RipRap size

$$\text{Eq 10.4} \quad D_{50} = 0.2 D' \left( \frac{Q}{\sqrt{g} D'^{2.5}} \right)^{4/3} \left( \frac{D}{TW} \right)$$

$$D_{50} = 0.2(0.7) \left( \frac{4.23}{\sqrt{32.2} (0.7)^{2.5}} \right)^{4/3} \left( \frac{0.7}{0.28} \right)$$

$$D_{50} = 0.78 \text{ ft} = 9.3 \text{ inches}$$

Estimate Apron Dimensions

From Table 10.1

Class 3 RipRap

$$D_{50} = 10''$$

$$\text{width at End} = 3D + \frac{2}{3}L$$

$$\text{Apron Length} = 5D$$

$$\text{Apron Depth} = 2.4 D_{50}$$

$$\text{Apron Length} = 5(1) = 5 \text{ ft}$$

$$\text{Apron Depth} = 2.4(10) = 24 \text{ inches} = 2 \text{ ft}$$

$$\text{width of apron end} = 3(1) + \frac{2}{3}(5) = 6.3 \text{ ft}$$

